#### ISO 9001:2008 / ATEX



# Photoelectric Sensor with Analog Output IRS/IRN/IRD-2A/-I(-GD)

## IRN-2A/-I/I4-GD

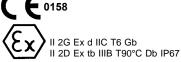
II 3G Ex nA IIB T4 Gc

IRD-A/-I/I4-GD



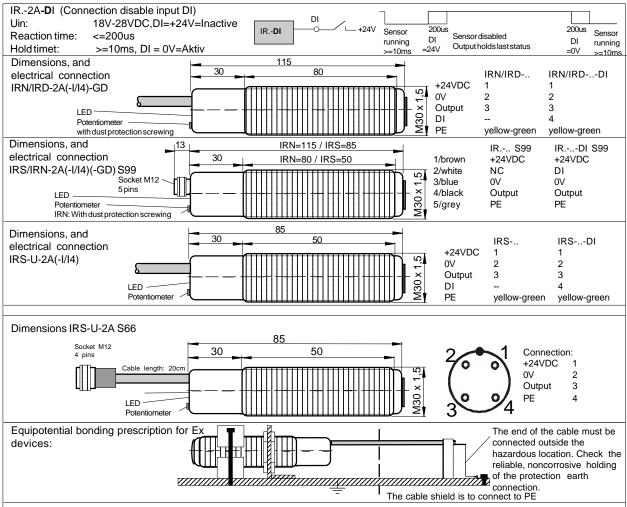
Range, appr. NTU 80 to NTU 500

Also applicable with different types of fibre optics, also as light barrier
Type IRD applicable in Ex Zones 1, 2, 21, 22



Technical data	Type V-Out Type I-Out	IRS-U-2A IRS-U-2A-I/I4	IRN-2A-0 IRN-2A-1/14		IRD-2A-GD IRD-2A-I/I4-GD
Type of Ex protection Gas, at 94/9/EG	Type 1-Out	none	II 3G Ex nA IIE		II 2G Ex d IIC T6 Gb
Type of Ex protection Dust, at 94/9/EG		none			D Ex tb IIIB T90°C Db IP67
Applicable in Ex Zones		none	2, 22		1, 2, 21, 22
Output signal range, voltage		0.0	03VDC - 10.5VDC( Ri	pple:<20mV)	
Output signal range, current			- 21mA (Ripple:<40uA		
Voltage output, nominal range, on white pa			utput voltage at a dist		
Current output, nominal range, on white pa			utput current at a dista		
Possible range for turbidity measurement		NTU80 - NTU500, wi	th adapted fibre optic, 10VD		to adjust at this value
Light source			Infrared 8		
Optical Beam pattern			appr.10	)°	
Response time			5ms 24 VDC (20 to	201/DC1	
Supply voltage Current consumption			24 VDC (20 to		
Maximum power dissipation			1.3W		
Output type, voltage, IR.(-U)-2A		PNP ou	tput impedance appr. 2		to 1MO
Output type, current, IR.(-U)-2A-I			tput impedance appr. 5		
Input, only types IR <b>DI</b> (Disable input)		11111, 00	PNP compatible		10 10022
Housing			M30, brass, nic		
Enclosure rating, at EN 60529		IP 54	IP 67		IP67
Vibration and shock resistance			ion: 30g over 20Hz to		00g for 3ms
Working temperature range TAmb		-20°C < TAmb < +60°			-20°C < TAmb < +50°C
Connection cable		3+PE	x 0,5mm <sup>2</sup> , shielded,	TPE, oil resistant	, Length: 3m
Connection cable, types IRDI		4+PE	x 0,5mm <sup>2</sup> , shielded,	TPE, oil resistant,	Length: 3m
Socket, types IRS/IRN S99			berg, M12 male recep	tacle, type RSF	5 contacts
Accessories, all types		- 2 nuts M30 (or 1 cl			
Accessories, types IRN/IRDGD			ew with packing ring f		sealing
Accessories, types IRNGD S99			rice, mount at the cab		
			nection. (black synthe		nonnocted!! ==!f == -!'
		- 1x Warning plate ' for gluing on the co		supply voltage	connected", self-sealing,
		- 1x Protection cap for			
Accessories, not included, only for IRS/IF	N. S00		RKTS 5-298/xx or RK	M/TH 5-208/vv	
Options:	000	-IRDI:	With disable input	W 111 0 200/XX	
Spirono.		-IRA- <b>I4</b> :	Sensors with current	t output 4 - 20m	A
		-Cable length:	up to 100m, on req		
		-IRN/IRD-2A/I/I4- <b>OP</b> :	With limited optical	radiant power at	EN 60079-28.
		II 2(1)G Ex d [op is	Ga] IIC T6 Gb, II 2(1	)D Ex tb [op is D	a] IIIB T100°C Db IP67
		-IRS-U-2/4A/I/I4 <b>S66</b> :			m, mounted optic DL30
			Range 5V ouput vo		
					tic type:QW/2,3-50-U-SE
			With 10 turns speci	ial notantiamatar	
		-IRS-U-2A/ <b>MT</b> :			
		-IRS <b>S140</b> :	Enclosure rating: IP	65	
			Enclosure rating: IP Special for applicati	65 on with fibre opt	ic: QWS-1500/2,3-50-U-SE
		-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> :	Enclosure rating: IP Special for applicati and with socket M12	65 on with fibre opt 2: Lumberg RSF	5, 5 pins
		-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> :	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se	65 on with fibre opt 2: Lumberg RSF eries IRS-U-2A/I-0	5, 5 pins GF, for applications with
ATEX related designations:		-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> :	Enclosure rating: IP Special for applicati and with socket M12	65 on with fibre opt 2: Lumberg RSF eries IRS-U-2A/I-0	5, 5 pins GF, for applications with
<b>3</b>	rer with address	-IRS <b>S140</b> : -IRS-U-2A-I <b>S142</b> : -IRS-U-2/4A/I/I4 <b>S19</b> :	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series	65 on with fibre opt 2: Lumberg RSF ries IRS-U-2A/I-0 Y1 (Special	5, 5 pins GF, for applications with adoption)
CE 0158 Manufactui	IIC T6 Gb. II 2	-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> : -IRS-U-2/4A/I/I4 <b>\$19</b> :	Enclosure rating: IP Special for applicati and with socket M1: Replacement for se fibre optics series  Electrical IP67 EC certif	65 con with fibre opt 2: Lumberg RSF eries IRS-U-2A/I-C Y1 (Special data according	5, 5 pins GF, for applications with adoption)
CE 0158 Manufactui	IIC T6 Gb. II 2	-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> : -IRS-U-2/4A/I/I4 <b>\$19</b> :	Enclosure rating: IP Special for applicati and with socket M1: Replacement for se fibre optics series  Electrical IP67 EC certif	65 con with fibre opt 2: Lumberg RSF eries IRS-U-2A/I-C Y1 (Special data according	5, 5 pins BF, for applications with adoption) to the chart VS 10 ATEX E 130 X
CE 0158 Manufactur Type IRDGD: II 2G Ex d Type IRNGD: Ex II 3G Ex n	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> : -IRS-U-2/4A/I/I4 <b>\$19</b> :	Enclosure rating: IP Special for applicati and with socket M1: Replacement for se fibre optics series  Electrical IP67 EC certif Dc IP67 Declarati	65 on with fibre opt 2: Lumberg RSF sries IRS-U-2A/I-CY1 (Special data according ication number: B on by manufactu	5, 5 pins BF, for applications with adoption) to the chart VS 10 ATEX E 130 X
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> : -IRS-U-2/4A/I/I4 <b>\$19</b> :  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif to IP67 Declarati al number (Week/Year	65 on with fibre opt 2: Lumberg RSF tries IRS-U-2A/I-CY1 (Special data according fication number: B on by manufactu )	5, 5 pins BF, for applications with adoption) to the chart VS 10 ATEX E 130 X
CE 0158 Manufactur Type IRDGD: II 2G Ex d Type IRNGD: Ex II 3G Ex n	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> : -IRS-U-2/4A/I/I4 <b>\$19</b> :  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif to IP67 Declarati al number (Week/Year	on with fibre opt 2: Lumberg RSF ries IRS-U-2A/I-CY1 (Special data according ication number: B on by manufactu ) Light barrier —	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> : -IRS-U-2/4A/I/I4 <b>\$19</b> :  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif to IP67 Declarati al number (Week/Year	65 on with fibre opt 2: Lumberg RSF tries IRS-U-2A/I-CY1 (Special data according fication number: B on by manufactu )	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS S140: -IRS-U-2A-I S142: -IRS-U-2/4A/I/I4 S19: D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser Light barrier with fibre optic	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif to IP67 Declarati al number (Week/Year	on with fibre opt 2: Lumberg RSF 1: Lumberg RSF 1: Lumberg RSF 1: Lumbers RS-U-2A/I-C 1: Lu	5, 5 pins BF, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS <b>\$140</b> : -IRS-U-2A-I <b>\$142</b> : -IRS-U-2/4A/I/I4 <b>\$19</b> :  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif to IP67 Declarati al number (Week/Year	on with fibre opt 2: Lumberg RSF ries IRS-U-2A/I-CY1 (Special data according ication number: B on by manufactu ) Light barrier —	5, 5 pins BF, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS S140: -IRS-U-2A-I S142: -IRS-U-2/4A/I/I4 S19: D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser Light barrier with fibre optic  Proximity switch —	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif to IP67 Declarati al number (Week/Year	on with fibre opt 2: Lumberg RSF 2: Lumberg RSF 2: Light lig	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X arer at 94/9/EC  Light beam interrupted
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS S140: -IRS-U-2A-I S142: -IRS-U-2/4A/I/I4 S19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser Light barrier with fibre optic  Proximity switch Proximity switch	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif to IP67 Declarati al number (Week/Year	on with fibre opt 2: Lumberg RSF 2: Lumberg RSF 2: Limberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X arer at 94/9/EC  Light beam interrupted
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS S140: -IRS-U-2A-I S142: -IRS-U-2/4A/I/I4 S19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser with fibre optic  Proximity switch Proximity switch with fibre optic	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif DC IP67 Declarati ial number (Week/Year  Light beam free	on with fibre opt 2: Lumberg RSF 2: Lumberg RSF 2: Light lig	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X arer at 94/9/EC  Light beam interrupted
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser with fibre optic  Proximity switch with fibre optic  The brightness of the ser with fibre optic	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif to IP67 Declarati ial number (Week/Year  Light beam free  ELED and the	on with fibre opte 2: Lumberg RSF sries IRS-U-2A/I-C (Special data according ication number: B on by manufactur)  Light barrier with fibre optic  Proximity switch with fibre optic	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X arer at 94/9/EC  Light beam interrupted
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS S140: -IRS-U-2/4A/I/14 S19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of the output level, is dep	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif oc IP67 Declarati ial number (Week/Year  Light beam free  Light beam free  LED and the endant on the	on with fibre opte 2: Lumberg RSF sries IRS-U-2A/I-C (Special data according ication number: B on by manufactur)  Light barrier with fibre optic  Proximity switch with fibre optic	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X arer at 94/9/EC  Light beam interrupted
CE 0158  Type IRDGD:  Type IRNGD:  TA: -20°C < TAmb < +50°C  Tunction and LED indication	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser with fibre optic  Proximity switch with fibre optic  The brightness of the ser with fibre optic	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif oc IP67 Declarati ial number (Week/Year  Light beam free  e LED and the endant on the cted light.	on with fibre opte 2: Lumberg RSF sries IRS-U-2A/I-C (Special data according ication number: B on by manufactur)  Light barrier with fibre optic  Proximity switch with fibre optic	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h
CE 0158	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS S140: -IRS-U-2/4A/I/14 S19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of the output level, is dep	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif oc IP67 Declarati ial number (Week/Year  Light beam free  Light beam free  LED and the endant on the	on with fibre opt 2: Lumberg RSF ries IRS-U-2A/I-C (Special data according ication number: B on by manufactur)  Light barrier — with fibre optic  Proximity switch with fibre optic  No light detection	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF
CE 0158 Manufactur Type IRDGD: II 2G Ex d Type IRNGD: II 3G Ex n TA: -20°C < TAmb < +50°C Date of c  Function and LED indication	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS S140: -IRS-U-2/4A/I/14 S19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of the output level, is dep	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif oc IP67 Declarati ial number (Week/Year  Light beam free  e LED and the endant on the cted light.	on with fibre opte 2: Lumberg RSF Pries IRS-U-2A/I-C MSP	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X arer at 94/9/EC  Light beam interrupted  h
CE 0158 Manufactur Type IRDGD: II 2G Ex d Type IRNGD: Ex II 3G Ex n TA: -20°C < TAmb < +50°C Date of c  Function and LED indication	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the serior with fibre optic  Proximity switch with fibre optic  The brightness of the output level, is dep quantity of the detection of the detection of the company of	Enclosure rating: IP Special for applicati and with socket M1: 3: Replacement for se fibre optics series  Electrical IP67 EC certif oc IP67 Declarati ial number (Week/Year  Light beam free  e LED and the endant on the cted light.	on with fibre opte 2: Lumberg RSF sries IRS-U-2A/I-CY1 (Special data according ication number: B on by manufactu ) Light barrier with fibre optic Proximity switch with fibre optic  No light detect  0.06-21m. (4-20mA)	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X arer at 94/9/EC  Light beam interrupted  h   cited. Output=Off, LED=OFF  A  A  A
CE 0158  Type IRDGD:  Type IRNGD:  TA: -20°C < TAmb < +50°C  Tunction and LED indication	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch with fibre optic  The brightness of thoutput level, is dep quantity of the deter	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for sefibre optics series  Electrical IP67 EC certification number (Week/Year Light beam free LED and the endant on the cited light.	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption)  to the chart VS 10 ATEX E 130 X  arer at 94/9/EC  Light beam interrupted  h
CE 0158  Type IRDGD:  Type IRNGD:  TA: -20°C < TAmb < +50°C  Tunction and LED indication	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the serior with fibre optic  Proximity switch with fibre optic  The brightness of the output level, is dep quantity of the detection of the detection of the company of	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for sefibre optics series  Electrical IP67 EC certifical number (Week/Year Light beam free LED and the endant on the cited light.  Page 18	on with fibre opte 2: Lumberg RSF sries IRS-U-2A/I-CY1 (Special data according ication number: B on by manufactu ) Light barrier with fibre optic Proximity switch with fibre optic  No light detect  0.06-21m. (4-20mA)	5, 5 pins 3F, for applications with adoption)  to the chart VS 10 ATEX E 130 X  arer at 94/9/EC  Light beam interrupted  h
CE 0158 Manufactur Type IRDGD: II 2G Ex d Type IRNGD: II 3G Ex n TA: -20°C < TAmb < +50°C Date of c Trunction and LED indication	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the serior with fibre optic  Proximity switch with fibre optic  The brightness of the output level, is dep quantity of the detection of the detection of the company of	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for sefibre optics series  Electrical IP67 EC certification number (Week/Year Light beam free LED and the endant on the sted light.  Output  Output  0.03-	on with fibre opte 2: Lumberg RSF stries IRS-U-2A/I-CY1 (Special data according ication number: B on by manufactu ) Light barrier with fibre optic Proximity switch with fibre optic  No light detect  0.06-21m. (4-20mA) R 500.	5, 5 pins 3F, for applications with adoption)  to the chart VS 10 ATEX E 130 X  arer at 94/9/EC  Light beam interrupted  h
CE 0158  Type IRDGD:  Type IRNGD:  TA: -20°C < TAmb < +50°C  Tunction and LED indication	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Deral 5 to 8 of the ser Light barrier with fibre optic  Proximity switch with fibre optic  The brightness of thoutput level, is dep quantity of the detection of th	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for sefibre optics series  Electrical IP67 EC certifical number (Week/Year Light beam free LED and the endant on the cited light.  Page 18	on with fibre opte 2: Lumberg RSF stries IRS-U-2A/I-CY1 (Special data according ication number: B on by manufactu ) Light barrier with fibre optic Proximity switch with fibre optic  No light detect  0.06-21m. (4-20mA) R 500.	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X arer at 94/9/EC  Light beam interrupted  h
CE 0158 Manufactur Type IRDGD: II 2G Ex d Type IRNGD: II 3G Ex n TA: -20°C < TAmb < +50°C Date of c  Function and LED indication	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for se fibre optics series  Electrical IP67 EC certification peclaration number (Week/Year  Light beam free  Light beam free  +24VDC  Output  Output  Output  Output  Output	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF  A  Output  IRDA-I t
CE 0158  Type IRDGD:  Type IRNGD:  TA: -20°C < TAmb < +50°C  Tunction and LED indication  Wiring and connection	IIC T6 Gb, II 2 A IIB T4 Gc, II construction: Nun	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for sefibre optics series  Electrical IP67 EC certification number (Week/Year Light beam free LED and the endant on the sted light.  Output  Output  0.03-	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X arer at 94/9/EC  Light beam interrupted  h
CE 0158 Manufactur Type IRDGD: II 2G Ex d Type IRNGD: Ex II 3G Ex n TA: -20°C < TAmb < +50°C Date of c  Function and LED indication  Wiring and connection	IIC T6 Gb, II 2 A IIB T4 Gc, II	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for se fibre optics series  Electrical IP67 EC certification peclaration number (Week/Year  Light beam free  Light beam free  +24VDC  Output  Output  Output  Output  Output	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF  A  Output  IRDA-I t
CE 0158 Manufactur Type IRDGD: II 2G Ex d Type IRNGD: Ex II 3G Ex n TA: -20°C < TAmb < +50°C Date of c  Function and LED indication  Wiring and connection  Dutput diagram The content of the con	IIC T6 Gb, II 2 A IIB T4 Gc, II construction: Nun	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for se fibre optics series  Electrical IP67 EC certification peclaration number (Week/Year  Light beam free  Light beam free  +24VDC  Output  Output  Output  Output  Output	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF  A  Output  IRDA-I t
CE 0158  Type IRDGD:  II 2G Ex d  II 3G Ex n  TA: -20°C < TAmb < +50°C Date of c  Function and LED indication  Wiring and connection	IIC T6 Gb, II 2 A IIB T4 Gc, II construction: Nun	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for se fibre optics series  Electrical IP67 EC certification peclaration number (Week/Year  Light beam free  Light beam free  +24VDC  Output  Output  Output  Output  Output	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF  A  Output  IRDA-I t
CE 0158  Type IRDGD:  II 2G Ex d  II 3G Ex n  TA: -20°C < TAmb < +50°C Date of c  Function and LED indication  Wiring and connection	IIC T6 Gb, II 2 A IIB T4 Gc, II construction: Nun	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for se fibre optics series  Electrical IP67 EC certification peclaration number (Week/Year  Light beam free  Light beam free  +24VDC  Output  Output  Output  Output  Output	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF  A  Output  IRDA-I t
CE 0158  Type IRDGD:  II 2G Ex d  II 3G Ex n  TA: -20°C < TAmb < +50°C Date of c  Function and LED indication  Wiring and connection	IIC T6 Gb, II 2 A IIB T4 Gc, II construction: Nun	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for se fibre optics series  Electrical IP67 EC certification peclaration number (Week/Year  Light beam free  Light beam free  +24VDC  Output  Output  Output  Output  Output	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF  A  Output  IRDA-I t
CE 0158  Type IRDGD:  II 2G Ex d  II 3G Ex n  TA: -20°C < TAmb < +50°C Date of c  Function and LED indication  Wiring and connection	IIC T6 Gb, II 2 A IIB T4 Gc, II construction: Nun	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for se fibre optics series  Electrical IP67 EC certification peclaration number (Week/Year  Light beam free  Light beam free  +24VDC  Output  Output  Output  Output  Output	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF  A  Output  IRDA-I t
CE 0158  Type IRDGD:  II 2G Ex d  II 3G Ex n  TA: -20°C < TAmb < +50°C Date of c  Function and LED indication  Wiring and connection	IIC T6 Gb, II 2 A IIB T4 Gc, II construction: Nun	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for se fibre optics series  Electrical IP67 EC certification peclaration number (Week/Year  Light beam free  Light beam free  +24VDC  Output  Output  Output  Output  Output	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF  A  Output  IRDA-I t
CE 0158  Type IRDGD:  II 2G Ex d  II 3G Ex n  TA: -20°C < TAmb < +50°C Date of c  Function and LED indication  Wiring and connection	IIC T6 Gb, II 2 A IIB T4 Gc, II construction: Nun	-IRS \$140: -IRS-U-2A-I \$142: -IRS-U-2/4A/I/I4 \$19:  D Ex tb IIIB T90°C Db 3D Ex tb IIIB T135°C Derail 5 to 8 of the ser  Light barrier with fibre optic  Proximity switch proximity switch with fibre optic  The brightness of though the deter  PNP=OFF R 25\Omega_ NPNP=OFF R 25\Omega_ IRS/IRDA	Enclosure rating: IP Special for application and with socket M1:  3: Replacement for se fibre optics series  Electrical IP67 EC certification peclaration number (Week/Year  Light beam free  Light beam free  +24VDC  Output  Output  Output  Output  Output	on with fibre opte 2: Lumberg RSF 2:	5, 5 pins 3F, for applications with adoption) to the chart VS 10 ATEX E 130 X rer at 94/9/EC  Light beam interrupted  h   cted. Output=Off, LED=OFF  A  Output  IRDA-I t

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#### Installation prescriptions for hazardous locations

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The local equipotential bonding have to be done. The protective earth (PE) is solid connected with the housing. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certificated Ex housings. All cable terminals must be connected outside hazardous locations. Other then original manufacturer, additional optical lenses are not allowed in hazardous locations. In Ex zones 21 and 22, do not operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced.

Type IRD-2A(-I/I4)-GD: Only applicable in Ex Zones 1, 2 and 21, 22. Type IRN-2A(-I/I4)-GD: Only applicable for the Ex zones 2 and 22. The maximum input voltage Um=30VDC must not be exceeded.

Type IRN-2A(-I/I4)-GD: Only applicable for the Exzones 2 and 22. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5-298/xx (Straight type) RKWTH 5-298/xx (Right angle type), are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the protection cap for the sensor socket must be fitted, when no connection cable is connected. The maximum input voltage Um=30VDC must not be exceeded.

#### General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables.

#### Function

Corresponding to the quantity of detected light, the output of the sensor generates an analog output signal. Without fibre optics or with fibres 2 in1 type, the sensor is applicable as relative distance detection device or similar applications. With 2-2 type fibres, function as light barrier, the sensor can be used for turbidity measurement or similar applications. Dependent on the selected type, the output generates a voltage signal from 0.03V to 10.5VDC or a current loop, 0.06 or 4mA to 21mA. Please check the permissible load for the two different types of outputs. For best measurement results the sensor cab be adjusted by the potentiometer.

#### Nominal range

The nominal range is defined as function "distance measurement" on white paper. At the nominal distance the output level shows the middle of the output range. The real output level is depended on the color, the form, the dimension, and the surface finish of the object.

## Sensors with disable input, types IR.-..-..DI:

If several sensors are installed close to another, it is necessary to use sensors with disable input. By using the disable input DI, each sensor can be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual influence is precluded. The response time of the DIinput is 200us.

0V or not connected = emitter enabled High (24VDC) DI= = emitter disabled

For a correct function the sensor must be enabled for at minimum >= 10ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time. The DI input is PNP compatible

#### Fibre optics

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas.

#### Maintenance

Protect the sensor and the fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

## General safety instructions:

"WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCA-TIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MOD-ULES. DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS". The mounting of the sensor in dusty locations without fixed cordset or protection cap results in a high ignition risk. The sensors must not be used for Accident-Prevention! In worst case the output can change to any state! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations:

EN 60079-14, ATEX 118a, single directive 1999/92/EC.

The sensor and the fibre optic are conform to the following standards: EN60079-0:2009, EN60079-1:2007, EN60079-15:2010, EN60079-31:2010, EN 60825-1:2006, EN 60825-2:2004; EN 60529; EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4. Ex protection: 94/9/EC (ATEX 100a), Machine directive: 2006/42/EC, EMC: 2004/108/EC, RoHS: 2002/95/EC.

#### General Notes, disposal

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

## EC-Declaration of conformity

Model IRD: EC-Certification No. BVS 10 ATEX E 130 X. DEKRA. Model IRN: ATEX declaration by manufacturer at 94/9/EC

ATEX certification of quality type production of Ex devices at the directive 94/9/EC Certification No: BVS 03 ATEX ZQS / E118. The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001:2008 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG



Rugghölzli 2 CH - 5453 Busslingen



# Photoelectric Sensor with Analog Output IRS/IRN/IRD-4A/-I(-GD)

IRN-4A/-I-GD

II 3G Ex nA IIB T4 Gc II 3D Ex tb IIIB T135°C Dc IP67

Housing M30

• With voltage or current loop output available

• Applicable for range measurement or position detection

Applicable as turbidimeter with glass fibre optics, reflective method. Range, appr. NTU 80 to NTU 500

Also applicable with different types of fibre optics, also as light barrier

Type IRD applicable in Ex Zones 1, 2, 21, 22
 Type IRN applicable in Ex Zones 2, 22



Technical data Type	e V-Out
Type of Ex protection Gas, at 94/9/EG	none II 3G Ex nA IIB T4 Gc II 2G Ex d IIC T6 Gb
Type of Ex protection Dust, at 94/9/EG	none II 3D Ex tb IIIB T135°C Dc IP67 II 2D Ex tb IIIB T90°C Db IP67
Applicable in Ex Zones	none 2, 22 1, 2, 21, 22
Output signal range, voltage	0.03VDC - 10.5VDC( Ripple:<20mV)
Output signal range, current	0.06mA - 21mA (Ripple:<40uA), (4mA - 20mA optional)
Voltage output, nominal range, on white paper. A4	
Current output, nominal range, on white paper. A4	
Possible range for turbidity measurement	NTU80 - NTU500, with adapted fibre optic, 10VDC/20mA, at NTU80, to adjust at this value
Light source	Infrared 870nm
Optical Beam pattern	appr.10°
Response time	5ms
Supply voltage	24 VDC (20 to 28VDC)
Current consumption	50mA
Maximum power dissipation	1.5W
Output type, voltage, IR.(-U)-4A	PNP, output impedance appr. 25Ω, RLoad: $2k\Omega$ to $1M\Omega$
Output type, current, IR.(-U)-4A-I	NPN, output impedance appr. 500 $\Omega$ , RLoad: 0 $\Omega$ to 100 $\Omega$
Input, only types IRDI (Disable input)	PNP compatible, Ri 10kΩ
Housing	M30, brass, nickel plated
Enclosure rating, at EN 60529	IP 54 IP 67 IP67
Vibration and shock resistance	Vibration: 30g over 20Hz to 2kHz. Shock: 100g for 3ms
Working temperature range TAmb	-20°C < TAmb < +60°C   -20°C < TAmb < +50°C   -20°C < TAmb < +50°C
Connection cable	3+PE x 0,5mm², shielded, TPE, oil resistant, Length: 3m
Connection cable, types IRDI	4+PE x 0,5mm², shielded, TPE, oil resistant, Length: 3m
Socket, types IRS/IRN S99	Lumberg, M12 male receptacle, type RSF 5 contacts
Accessories, all types	- 2 nuts M30 (or 1 clamp on request)
Accessories, types IRN/IRDGD	- 1x Spare safety screw with packing ring for potentiometer sealing
Accessories, types IRNGD S99	- 1x Safety lock device, mount at the cable connection,
	for locking the connection. (black synthetic device)
	- 1x Warning plate "Do not separate when supply voltage connected", self-sealing,
	for gluing on the cord set.
	- 1x Protection cap for the sensor socket.
Accessories, not included, only for IRS/IRN St	
Options:	- IRDI (with disable input)
	- IRA-I4: Sensors with current output 4 - 20mA
	- Cable length up to 100m, on request
	- IRN/IRD-4A-OP: With limited optical radiant power at EN 60079-28.
	II 2(1)G Ex d [op is Ga] IIC T6 Gb, II 2(1)D Ex tb [op is Da] IIIB T100°C Db IP67
	-IRS-U-4A <b>S66</b> : Socket Binder 713/4, at cable 200mm, mounted optic DL30
	Range 5V ouput voltage at distance 75cm
	-IRS-U-4A/ <b>MT</b> : With 10 turns special potentiometer
	-IRS <b>S140</b> : Enclosure rating: IP 65
	-IRS-U-4A <b>S135</b> : With external potentiometer at cable 2xAWG24, length: 3m.
	Must not be connected at supply voltage without mounted external
	potentiometer.
	-IRS-U <b>\$193</b> : Replacement for series IRS-U-4A/I-GF, for applications with fibre
	optics seriesY1 (Special adoption)
ATEX related designations:	η οριίου συπου (Οροσίαι ασομποπ)
CE 0158 Manufacturer with	h address Electrical data according to the chart
	6 Gb, II 2D Ex tb IIIB T90°C Db IP67 EC certification number: BVS 10 ATEX E 130 X
T IDN OD. (Fx)	T4 Gc, II 3D Ex tb IIIB T135°C Dc IP67 Declaration by manufacturer at 94/9/EC
Type IRNGD: V-V II 3G Fx nA IIR 1	
	rigor. Numeral 5 to 8 of the serial number (Meak/Var)
TA: -20°C < TAmb < +50°C Date of construc	ction: Numeral 5 to 8 of the serial number (Week/Year)
	ction: Numeral 5 to 8 of the serial number (Week/Year)  Light barrier Light barrier
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic with fibre optic with fibre optic
TA: -20°C < TAmb < +50°C Date of construc	ction: Numeral 5 to 8 of the serial number (Week/Year)  Light barrier Light barrier
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic Light beam free Light beam interrupted
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic with fibre optic with fibre optic
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch  Proximity switch  Proximity switch  Proximity switch  Proximity switch  Proximity switch
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic Light beam free  Proximity switch
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch  Proximity switch  With fibre optic  Proximity switch  With fibre optic  Proximity switch  With fibre optic
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch  Proximity switch  With fibre optic  The brightness of the LED and the  Proximity switch  With fibre optic  Light beam interrupted  Proximity switch  With fibre optic
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch  Proximity switch  With fibre optic  The brightness of the LED and the output level, is dependant on the
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  Light beam free  Proximity switch with fibre optic  Proximity switch with fibre optic  No light detected. Output=Off, LED=OFF
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  Light barrier with fibre optic  Light beam interrupted  Proximity switch with fibre optic  No light detected. Output=Off, LED=OFF with fibre optic  No light detected. Output=Off, LED=OFF with fibre optic
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch  Proximity switch  With fibre optic  Light beam free  Proximity switch  With fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  House of the serial number (Week/Year)  Light barrier with fibre optic  Light beam interrupted  Proximity switch  With fibre optic  No light detected. Output=Off, LED=OFF
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  Light barrier with fibre optic  Light beam interrupted  Proximity switch with fibre optic  No light detected. Output=Off, LED=OFF with fibre optic  No light detected. Output=Off, LED=OFF with fibre optic
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch With fibre optic  Proximity switch With fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF  Light barrier With fibre optic  Light beam interrupted  Proximity switch With fibre optic  No light detected. Output=Off, LED=OFF  0.06-21mA (4-20mA)  A  POSSIBLE OFF  1.20
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch  Proximity switch  With fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF  R 25Ω  Light barrier with fibre optic  Light beam interrupted  Proximity switch  With fibre optic  No light detected. Output=Off, LED=OFF  (4-20mA)  R 500Ω  A  R 500Ω
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch  Proximity switch  With fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF  R 25\Omega Output  Light barrier with fibre optic  Light beam interrupted  Proximity switch  With fibre optic  No light detected. Output=Off, LED=OFF  (4-20mA)  R 500\Omega Output  Output
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF  R25\Omega Output  RS/IRDA   V 0.03-
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free  Proximity switch  Proximity switch  With fibre optic  Light beam free  Proximity switch  With fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF  R 25\(\Omega\$ Output  IRS/IRDA-I  Light barrier with fibre optic  Light beam interrupted  Proximity switch  With fibre optic  No light detected. Output=Off, LED=OFf  (4-20mA)  R 500\(\Omega\$ Output  IRS/IRDA-I
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF R 25\Omega Output  IRS/IRDA V-Out  Light barrier with fibre optic  Light beam interrupted Proximity switch with fibre optic  No light detected. Output=Off, LED=OFf (4-20mA) R 500\Omega Output IRS/IRDA-I I-Out
TA: -20°C < TAmb < +50°C Date of construc	Light barrier with fibre optic  Light beam free Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF R 25\Omega Output  IRS/IRDA V-Out  Light barrier with fibre optic  Light beam interrupted Proximity switch with fibre optic  No light detected. Output=Off, LED=OFf (4-20mA) R 500\Omega Output IRS/IRDA-I I-Out
TA: -20°C < TAmb < +50°C Date of construction and LED indication  Wiring and connection	Light barrier with fibre optic  Light beam free  Proximity switch  Proximity switch  With fibre optic  Light beam free  Proximity switch  With fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF  R 25\(\Omega\$ Output  IRS/IRDA-I  Light barrier with fibre optic  Light beam interrupted  Proximity switch  With fibre optic  No light detected. Output=Off, LED=OFf  (4-20mA)  R 500\(\Omega\$ Output  IRS/IRDA-I
TA: -20°C < TAmb < +50°C Date of construction and LED indication  Wiring and connection  Output diagram 25	Light barrier with fibre optic  Light beam free Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF R 25\Omega Output  IRS/IRDA V-Out  Light barrier with fibre optic  Light beam interrupted Proximity switch with fibre optic  No light detected. Output=Off, LED=OFf (4-20mA) R 500\Omega Output IRS/IRDA-I I-Out
TA: -20°C < TAmb < +50°C Date of construction and LED indication  Wiring and connection  Output diagram 25 (measured on white paper, 20 measured on 25 measured 25 measured on 25 measured 25	Light barrier with fibre optic  Light beam free Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF R 25\Omega Output  IRS/IRDA V-Out  Light barrier with fibre optic  Light beam interrupted Proximity switch with fibre optic  No light detected. Output=Off, LED=OFf (4-20mA) R 500\Omega Output IRS/IRDA-I I-Out
TA: -20°C < TAmb < +50°C Date of construction and LED indication  Wiring and connection  Output diagram 25 (measured on white paper, 20 measured on 25 measured 25 measured on 25 measured 25	Light barrier with fibre optic  Light beam free Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF R 25\Omega Output  IRS/IRDA V-Out  Light barrier with fibre optic  Light beam interrupted Proximity switch with fibre optic  No light detected. Output=Off, LED=OFf (4-20mA) R 500\Omega Output IRS/IRDA-I I-Out
TA: -20°C < TAmb < +50°C Date of construction and LED indication  Wiring and connection  Output diagram 25 (measured on white paper, 20 measured on 25 measured 25 measured on 25 measured 25	Light barrier with fibre optic  Light beam free Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF R 25\Omega Output  IRS/IRDA V-Out  Light barrier with fibre optic  Light beam interrupted Proximity switch with fibre optic  No light detected. Output=Off, LED=OFf (4-20mA) R 500\Omega Output IRS/IRDA-I I-Out
TA: -20°C < TAmb < +50°C Date of construction and LED indication  Wiring and connection  Output diagram 25 (measured on white paper, 20 measured on 25 measured 25 measured on 25 measured 25	Light barrier with fibre optic  Light beam free Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF R 25\Omega Output  IRS/IRDA V-Out  Light barrier with fibre optic  Light beam interrupted Proximity switch with fibre optic  No light detected. Output=Off, LED=OFf (4-20mA) R 500\Omega Output IRS/IRDA-I I-Out
TA: -20°C < TAmb < +50°C Date of construction and LED indication  Wiring and connection  Output diagram 25  (measured on white paper, 20	Light barrier with fibre optic  Light beam free Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF R 25\Omega Output  IRS/IRDA V-Out  Light barrier with fibre optic  Light beam interrupted Proximity switch with fibre optic  No light detected. Output=Off, LED=OFf (4-20mA) R 500\Omega Output IRS/IRDA-I I-Out
TA: -20°C < TAmb < +50°C Date of construction and LED indication  Wiring and connection  Output diagram (measured on white paper, 80g, 20cmx30cm) Potentiometer on MAXIMUM	Light barrier with fibre optic  Light beam free Proximity switch with fibre optic  Proximity switch with fibre optic  The brightness of the LED and the output level, is dependant on the quantity of the detected light.  PNP=OFF R 25\Omega Output  IRS/IRDA V-Out  Light barrier with fibre optic  Light beam interrupted Proximity switch with fibre optic  No light detected. Output=Off, LED=OFf (4-20mA) R 500\Omega Output IRS/IRDA-I I-Out

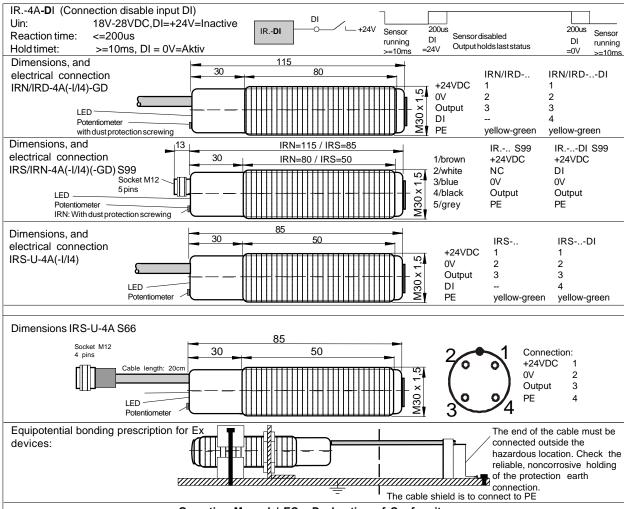
Rugghölzli 2 CH - 5453 Busslingen Tel. +41 (0)56 222 38 18 Fax +41 (0)56 222 10 12

4 5

35 40 Distance cm

mailbox@sentronic.com www.sentronic.com

6 5



#### Installation prescriptions for hazardous locations

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The local equipotential bonding have to be done. The protective earth (PE) is solid connected with the housing. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certificated Ex housings. All cable terminals must be connected outside hazardous locations. Other then original manufacturer, additional optical lenses are not allowed in hazardous locations. In Ex zones 21 and 22, do not operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced.

Type IRD-4A(-I/I4)-GD: Only applicable in Ex Zones 1, 2 and 21, 22. Type IRN-4A(-I/I4)-GD: Only applicable for the Ex zones 2 and 22. The maximum input voltage Um=30VDC must not be exceeded.

Type IRN-4A(-I/I4)-GD: Only applicable for the Exzones 2 and 22. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5-298/xx (Straight type) RKWTH 5-298/xx (Right angle type), are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the protection cap for the sensor socket must be fitted, when no connection cable is connected. The maximum input voltage Um=30VDC must not be exceeded.

#### General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables.

#### Function

Corresponding to the quantity of detected light, the output of the sensor generates an analog output signal. Without fibre optics or with fibres 2 in 1 type, the sensor is applicable as relative distance detection device, for turbidity measurement based on reflective measurement, or similar applications. With 2-2 type fibres, function as light barrier, for different measurement methods. Dependent on the selected type, the output generates a voltage signal from 0.03V to 10.5VDC or a current loop, 0.06 or 4mA to 21mA. Please check the permissible load for the two different types of outputs. For best measurement results the sensor cab be adjusted by the potentiometer.

The nominal range is defined as function "distance measurement" on white paper. At the nominal distance the output level shows the middle of the output range. The real output level is depended on the color, the form, the dimension, and the surface finish of the object.

#### Sensors with disable input, types IR.-..-..DI:

If several sensors are installed close to another, it is necessary to use sensors with disable input. By using the disable input DI, each sensor can be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual influence is precluded. The response time of the DIinput is 200us.

0V or not connected = emitter enabled High (24VDC) DI= = emitter disabled

For a correct function the sensor must be enabled for at minimum >= 10ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time. The DI input is PNP compatible

#### Fibre optics

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas.

#### Maintenance

Protect the sensor and the fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

## General safety instructions:

'WARNING - EXPLOSION HAZARD - WHEN IN HAZARDOUS LOCA-TIONS, TURN OFF POWER BEFORE REPLACING OR WIRING MOD-ULES. DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS". The mounting of the sensor in dusty locations without fixed cordset or protection cap results in a high ignition risk. The sensors must not be used for Accident-Prevention! In worst case the output can change to any state! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations:

EN 60079-14, ATEX 118a, single directive 1999/92/EC.

The sensor and the fibre optic are conform to the following standards: EN60079-0:2009, EN60079-1:2007, EN60079-15:2010, EN60079-31:2010, EN 60825-1:2006, EN 60825-2:2004; EN 60529; EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4. Ex protection: 94/9/EC (ATEX 100a), Machine directive: 2006/42/EC, EMC: 2004/108/EC, RoHS: 2002/95/EC.

#### General Notes, disposal

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations. EC-Declaration of conformity

Model IRD: EC-Certification No. BVS 10 ATEX E 130 X. DEKRA.

Model IRN: Declaration by manufacturer at 94/9/EC

ATEX certification of quality type production of Ex devices at the directive 94/9/EC Certification No: BVS 03 ATEX ZQS / E118. The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001:2008 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG

SENTRONIC AG Produkte, Support und Ser

Rugghölzli 2 CH - 5453 Busslingen

#### ISO 9001:2000/ATEX

# Photoelectric Sensor with Analog Output IRS/IRN/IRD-1LA

## IRD-1LA/AI-GD

II 2 G EEx d IIC T6

**( E** 0158

Housing M30

• With voltage or current loop output available

• Also for using with different types of fibre optics

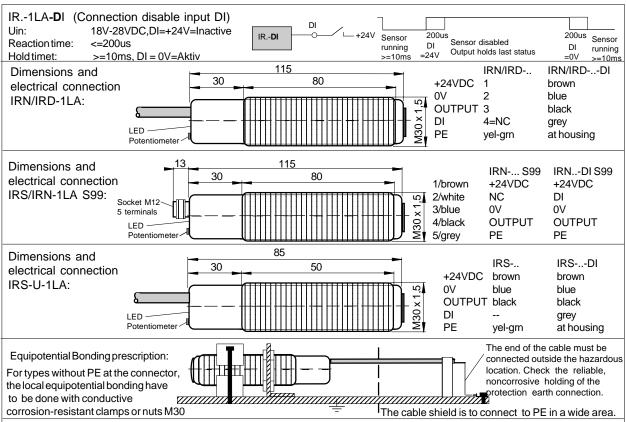
• Applicable for range measurement or as turbidimeter

• Usable for position detection

• Type IRD applicable in Ex Zones 1+20/21



II 1/2 D IP67 T90°C		licable in Ex Zones 1+20/21 licable in Ex Zones 2+22	<u>(C.</u>	II 3 D IP67 T90°C
Technical Data	Type V-Out Type I-Out		IRN-1LA-GD IRN-1LAI-GD	IRD-1LA-GD IRD-1LAI-GD
Type of Ex protection, Gas at EN 94/9		none	II 2G EEx d IIC T6	II 3G EEx nA II T6
Type of Ex protection, Dust at EN 94/9	9EC	none	II 1/2D IP67 T90°C	II 3D IP67 T90°C
Applicable in Ex Zones		none	Zones 1,2 and 20/21,22	Zones 2 and 22
Output signal range	V-Out		C-10.5VDC(Ripple:<20n	nV)
	I-Out		A (Ripple:<40uA), (4mA - 2	
Optical range, (adjustable)	V-Out	0.1110 ( 21110	5VDC/10cm	orn (optional)
(On white paper 80g, 20cm x 30cm)	I-Out		10mA/10cm	
	1-Out			
Lightsource			Infrared, 880nm	
Beampattern			appr.12°	
Maximum radiant intensity			4.5mW/mm <sup>2</sup>	
Response time			5ms	
Supplyvoltage			24 VDC (20 to 28VDC)	
Current consumption			maximum 60mA	
Maximum power dissipation			1.4W	
Output	V-Out	PNP, Outpu	ıt impedance appr. 25 $\Omega$ , R	L: 2kΩ to 1MΩ
'	I-Out		t impedance appr. 500Ω, F	
Input, only types IRDI (Disable inp			PNP compatible, Ri 10kΩ	
Housing	ut)		ellow brass (Ms 58), nickel	nlated
Enclosure rating at EN 60529		IP 54	IP 67	IP67
	ıro TA	-20°C < TA < +60°C	-20°C < TA < +50°C	-20°C < TA < +50°C
Maximum working ambient temperatu	IIE IA			
Connection cable			nm² or 3+PE x 0,75mm², s	
Connection cable, types IRDI			0,2mm²), shielded / L=3m	
Sensor socket, types IRN \$99			12 male receptacle, type R	SF 5 contacts
Accessories, all types		- 2 nuts M30 (or 1 clamp		
Accessories, types IRN/IRDGD		- 1x Spare safety screw wi	th packing ring for potentio	meter sealing
Accessories, types IRNGD S99		- 1x Safety lock device, m	ount at the cable connection	on, for locking the
7 31		connection. (black syr		, 3
			t separate when supply vol	tage connected" self-
		sealing, for gluing on the	cord set	tago comicotoa , com
		- 1x Protection cap for the	condition	
	DN 000			
Accessories optional, only type IRS/I	RN S99		aight type: RKTS 5-298/xx	
			15-298/xx, Lumberg M12/	
Options - IRDI (with disable input) - IRS/IRN/IRD-1LX: Output fur - IRS/IRN \$99: Socket types,			Sensors with current output tage	4 - 20mA
ATEX related designations		CE 0158	Manufactu	rer with address
711 E711 clated designations		Device type		, II 1/2 D IP67 T90°C
		201.001,90		, II 3 D IP67 T90°C
		Certification number, type		
		TA: -20°C < TA < +50°C	Electrical	data according to the chart
		Date of construction: Num	erals 4 to 7 of the serial num	ber
Function and LED indication		LB with	LB with	
Tanodon and LLB maleadon		fibro ontic	filono ontio	
		full quanti	ty of light fibre optic	reduced quantity of light
			<u></u>	
		Proximity \(\bigcup_{\text{\curl }}\)	_ = = □ Proximity	<b>—</b>
		sensor	_ sensor	
		The brightness of the LED	and the entropy the real it is the	andont on the surrently of
		The brightness of the LED	and the output level, is dep	bendant on the quantity of
		the detected light.	ı	
Output configuration			+20-28VDC	
Output configuration		PNP=OFF		( ^ )
		\ <b> </b> \	Out	(A) 0.1-21mA
		R 25Ω	K 5	00Ω (4.20m Δ)
				Out
		IRS/IRDA		S/IRDA-I
				Out
			0V	oV OV
	• • • • • • • • • • • • • • • • • • • •		-	
Output diagram	20			
(measured on white Paper,	7 23 18			
80g, 20cmx30cm)	≦ O 16			
Potentiometer at minimum and	5 14 <b>1</b>			
maximum position	Vout in VDC/2 18 10 10 10 8 8	MAX		
maximum position	5 5 10	MIN		
<u> </u>	2 ರ ೀ 📑			
	· •			
	4 +			
	1.25	3.75 6.25 8.75 11.		21.3 23.8 26.3
		Di	stance in cm	



#### **Operating Manual:** Ex protection:

#### General prescriptions for all Ex types:

It is necessary to take into consideration the valid international and national DI= rules and regulations. The maximum input voltage Um=30VDC must not be DI= exceeded. The local equipotential bonding have to be done. At sensors with a PE-terminal, the protective earth (PE) is solid connected with the housing. At sensors without a PE-terminal, connect the housing reliable and noncorrosive to the general protection earth by using the nuts M30. The cable have to be protected against damages. To connect cables inside hazardous locations only use certificated EEx e housings. All cable terminals must be connected outside hazardous locations. Use only original manufactured fibre optics and additional optical lenses, other additional optical lenses are not allowed in hazardous locations. In Ex zones 20/21and 22, do not Fibre optics operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced.

Type: IRD-1LA/AI: Applicable in Ex zones 1, 2 and 20/21, 22. For the zones 20/21 only the front part (optical lens) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

Type: IRN-1LA/AI-GD: Only applicable in Ex zones 2 and 22.

Type: IRN-1LA/AI-GD S99: Only applicable in Ex zones 2 and 22. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5-298/xx (Straight type) RKTW/RKWTH 5-298/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the socket protection cap must be fitted, when the connection cable is NOT connected.

#### General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to General Notes 02 high voltage cables.

#### Function

Corresponding to the quantity of detected light, the output of the sensor generates an analog output signal. Without fibre optics or with fibres 2 in 1 type, the sensor is applicable as relative distance detection device or similar G applications. With 2-2 type fibres, function as light barrier, the sensor can be used for turbidity measurement or similar applications. Dependent on the selected type, the output generates a voltage signal from 0.1V to 10VDC or a current loop, 0 or 4mA to 20mA. Please check the permissible load for the two different types of outputs. For best measurement results the sensor can be adjusted by the potentiometer.

#### Sensors with disable input, types IR.-..-..-DI:

f several sensors are installed close to another, it is necessary to use sensors with disable input. By using the disable input DI, each sensor can

be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual influence is precluded. The response time of the DI-input is 200us

0V or not connected = emitter enabled High (24VDC) = emitter disabled

For a correct function the sensor must be enabled for at minimum >= 10ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time. The DI input is PNP compatible.

#### Nominal range

The nominal range is defined as function "distance measurement" on white paper. At the nominal distance the output level shows the middle of the output range. The real output level is depended on the color, the form, the dimension. and the surface finish of the object.

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas.

#### Maintenance

Protect the sensor and the optional fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

#### **Safety Informations**

The sensors types IRS/IRN/IRD-.. must not be used for Accident-Prevention! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations. ATEX118a, EX-RL(BGR104), ElexV, TrbF, TRD, UVV, BetrSichV(ATEX137), Einzel-RL 1999/92/EG.

#### Standards met:

- EN 50014,IRD: EN 50018,IRN: EN 50021,EN 50281-1-1;
- EN 61000-6-1/-2, EN 61000-6-3/4; EN 60529
- Ex protection: 94/9/EG (ATEX 100a)
- Machine directive: 98/37/EG
- Low voltage directive: 73/23/EWG, 93/68/EWG
- EMC 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG
- RoHS, 2002/95/EG

Rugghölzli 2

CH - 5453 Busslingen

We reserve the right to modify our equipment. Our equipment neither emit or contain any damaging or siliconized substances. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

#### **Declaration of Conformity**

Certification, series IRD-..: DMT 99 ATEX E 056

Certification, series IRN-..: Declaration of conformity by manufacturer at 94/9/EC. Tech File No: AN-MAT-02-EX-E056.

ATEX certification of quality type production of Ex devices at the directive 94/9/EC Certification No: BVS 03 ATEX ZQS / E118

The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001:2000 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG





## Photoelectric Sensor with Analog Output IRS/IRN/IRD-2LA

IRD-2LA/AI-GD

IRN-2LA/AI-GD

**6** 0158

Housing M30

• With voltage or current loop output available

• Also for using with different types of fibre optics

• Applicable for range measurement

• Applicable as turbidimeter

II 2 G EEx d IIC T6 • Usable for position detection

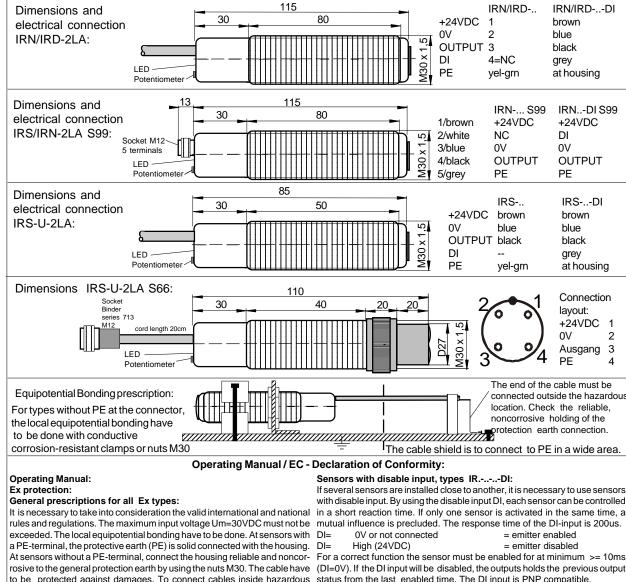
II 1/2 D IP67 T90°C

• Type IRD applicable in Ex Zones 1+20/21

• Type IRD applicable in Ex Zones 2+22

II 3 G EEx nA II T6 II 3 D IP67 T90°C

II 1/2 D IP67 T90°C	<ul> <li>Type IRN appli</li> </ul>	icable in Ex Zones 2+22		/ II 3 D IP67 T90°C
	Type V-Out	IRS-U-2LA	IRN-2LA-GD	IRD-2LA-GD
Technical Data	Type I-Out	IRS-U-2LAI	IRN-2LAI-GD	IRD-2LAI-GD
Type of Ex protection		none	EEx nA II T6	EEx d IIC T6
Applicable in Ex Zones		none	Zones 2 and 22	Zones 1 and 20/21
Category/grouping				II 2 G, II 1/2 D IP67 T90°C
Output signal range	V-Out		OC - 10.5VDC(Ripple:<20m	
Optical range, (adjustable)	I-Out V-Out		A (Ripple:<40uA), (4mA - 20 5cm to 50cm / 5VDC/20cm	
(On white paper 80g, 20cm x 30cm)	I-Out		2.5cm to 50cm / 10mA/20cm	
Light source	1-Out		Infrared, 880nm	ı
Beampattern			appr.12°	
Maximum radiant intensity			4.5mW/mm²	
Response time			5ms	
Supply voltage			24 VDC (20 to 28VDC)	
Current consumption			maximum 60mA	
Maximum power dissipation			1.4W	
Output	V-Out	PNP, Outpu	ut impedance appr. 25 $\Omega$ , RI	L: 2kΩ to 1MΩ
•	I-Out		It impedance appr. $500\Omega$ , F	
Input, only types IR DI (Disable inp	out)		PNP compatible, Ri 10kΩ	
Housing		M30, y	ellow brass (Ms 58), nickel	plated
Protection rating at EN 60529		IP 54	IP 67	IP67
Maximum working ambient temperate	ure TA	-20°C < TA < +60°C	-20°C < TA < +50°C	-20°C < TA < +50°C
Connection cable			PE x 0,5mm², shielded / L=	
Connection cable, types IRDI			(0,2mm²), shielded / L=3m,	<u>_</u>
Sensor socket, types IRN \$99		Lumberg, M	12 male receptacle, type RS	SF 5 contacts
Accessories, all types		- 2 nuts M30 (or 1 clamp of		
Accessories, types IRN/IRDGD	Pafati la alc da vias		th packing ring for potentiomet	
Accessories, types IRNGD S99 - 1x S		o not separate when supply vol		
		the sensor socket.	age connected , con coamig,	ior graing on the ora con
Options - IR <b>DI</b> (with disable input)		- IRA- <b>I4</b> :	Sensors with current output	4 - 20mA
- IRS/IRN/IRD-2LX: Output fu				
- IRS-U-2LA <b>S66</b> : With addition				
<ul> <li>IRS/IRN \$99: Socket types</li> <li>IRS-U-2LA \$133: With socket</li> </ul>			GD <b>\$110</b> :With additional optic	DS30 and special reflector
- IRS/IRN/IRD-2LA-I4 <b>S137</b> : Re				00-2-T-GF and QPR-6/320
ATEX related designations		CE 0158		rer with address
G		Device type		, II 1/2 D IP67 T90°C
		Continue in the second of the second		, II 3 D IP67 T90°C
		Certification number, type TA: -20° < TA < 50°		ΓΕΧ E 056/N1/N4 data according to the chart
			nerals 4 to 7 of the serial numb	
Function and LED indication		LB with	I D with	
Tanodon and EED maloadon		fibro ontic	filoso ontio	
		full quant	ity of light _ Tibre optic r	reduced quantity of light
		Drovimity -	Proximity	——————————————————————————————————————
		Proximity sensor	■ Floxillity ■ sensor	
		301301		<b>─</b>
		The brightness of the LCD	and the cutout lavel to the	and ant on the acception of
			and the output level, is dep	bendant on the quantity of
		the detected light.	-1.00.00\/5.0	
Output configuration			+20-28VDC	120-20100
		PNP=OFF	0.1	(A ) <sub>0.1-21mA</sub>
		R 25Ω		00Ω (4.20 - Α)
		L-WW-0-	_ L-W	v
		IRS/IRDA		S/IRDA-I
				Out
			_ 0V	0V
Output diagram	20			
(measured on white Paper,	18			
80a 20cmy30cm)	2 16			
Potentiometer at minimum and	2 14		AV III	
Potentiometer at minimum and maximum position	Vout in VDC/2	MIN MA	<b>*</b>	
±	£ 10			
<u>[on</u>	8 out			
	6			
	4 <del>     </del> 2.5 7	.5 12.5 17.5 22.5	27.5 32.5 37.5 42.5	47.5 52.5 57.5
	2.5		nce in cm	47.0 02.0 07.0
		215tu		



DI

IR.-DI

200us

DI

=24V

Sensor disabled

Output holds last status

Sensor

running

>=10ms

200us Sensor

>=10ms

DI

=0V

to be protected against damages. To connect cables inside hazardous locations only use certificated EEx e housings. All cable terminals must be connected outside hazardous locations. Use only original manufactured fibre optics and additional optical lenses, other additional optical lenses are not allowed in hazardous locations. In Ex zones 20/21and 22, do not operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced

IR.-2LA-DI (Connection disable input DI)

<=200us

Reaction time:

Hold timet:

18V-28VDC,DI=+24V=Inactive

>=10ms, DI = 0V=Aktiv

Type: IRD-2LA/AI: Applicable in Ex zones 1, 2 and 20/21, 22. For the zones 20/21 only the front part (optical lens) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

Type: IRN-2LA/AI-GD: Only applicable in Ex zones 2 and 22

Type: IRN-2LA/AI-GD S99: Only applicable in Ex zones 2 and 22. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5-186/xx (Straight type) RKTW/RKWTH 5-186/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the socket protection cap must be fitted, when the connection cable is NOT connected.

## General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to

Corresponding to the quantity of detected light, the output of the sensor generates an analog output signal. Without fibre optics or with fibres 2 in 1 type, the sensor is applicable as relative distance detection device or similar applications. With 2-2 type fibres, function as light barrier, the sensor can be used for turbidity measurement or similar applications. Dependent on the selected type, the output generates a voltage signal from 0.1V to 10VDC or a current loop, 0 or 4mA to 20mA. Please check the permissible load for the two different types of outputs. For best measurement results the sensor can be adjusted by the potentiometer.

status from the last enabled time. The DI input is PNP compatible.

## Nominal range

The nominal range is defined as function "distance measurement" on white paper. At the nominal distance the output level shows the middle of the output range. The real output level is depended on the color, the form, the dimension, and the surface finish of the object.

#### Fibre optics

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas.

#### Maintenance

Protect the sensor and the optional fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

#### **Safety Informations**

The sensors types IRS/IRN/IRD-.. must not be used for Accident-Prevention! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations. ATEX118a, EX-RL(BGR104), ElexV, TrbF, TRD, UVV, BetrSichV(ATEX137), Einzel-RL 1999/92/EG.

- Standards met:
- EN 50014,IRD: EN 50018,IRN: EN 50021,EN 50281-1-1;
- EN 61000-6-1/-2, EN 61000-6-3/4; EN 60529
- Ex protection: 94/9/EG (ATEX 100a)
- Machine directive: 98/37/EG
- Low voltage directive: 73/23/EWG, 93/68/EWG
- EMC 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG
- RoHS, 2002/95/EG

We reserve the right to modify our equipment. Our equipment neither emit or contain any damaging or siliconized substances. No longer usable or irreparable units must be disposed of in accordance with local waste disposal

#### **Declaration of Conformity**

Approvals: DMT 99 ATEX E 056/N1/N4

The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG

Rugghölzli 2 CH - 5453 Busslingen





## Photoelectric Sensor with Analog Output IRS/IRN/IRD-5LA

IRD-5LA/AI-GD

IRN-5LA/AI-GD

**E** 0158

Housing M30

• With voltage or current loop output available

• Also for using with different types of fibre optics

• Applicable for range measurement

Applicable as turbidimeter

II 1/2 D IP67 T90°C

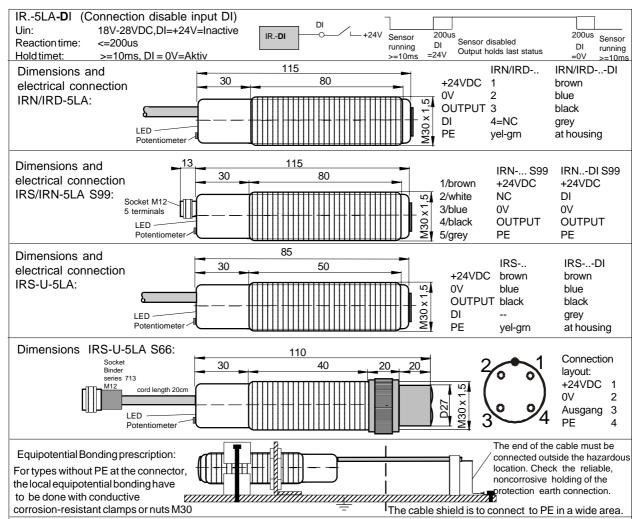
• Type IRD applicable in Ex Zones 1+20/21

• Type IRN applicable in Ex Zones 2+22

II 2 G EEx d IIC T6 • Usable for position detection



Type of Exprotection Applicable in Ex Zones Anone Anon		Type II TI Tabbi	cable in Ex Zones 2+22			113 D 1P67 190°C
Applicable in Ex Zones  Category / grouping  U-Out  Category / grouping  V-Out  Output signal range  V-Out  Output signal range  V-Out  Output signal range  V-Out  Output signal range  V-Out  Optical range, (adjustable)  V-Out  Optical range, (adjustable)  V-Out  On white paper 80g, 20cm x 30cm)  I-Out  Consense and Ripplex-40uA), (4mA - 20mA optional)  Consense and seasons a		Type V-Out	IRS-U-5LA IRS-U-5LAI	IRN-5L	_AI-GD	IRD-5LA-GD IRD-5LAI-GD
Category/grouping						
Output signal range  V-Out I-Out I-O						Zones 1 and 20/21
Pottal range, (adjustable)   V-Out   2.5cm to 50cm / 50Vc50cm   V-Out   2.5cm to 50cm / 10mA/50cm   V-Out   2.5cm to 50cm / 10mA/50cm   V-Out   2.5cm to 50cm / 10mA/50cm   V-Out   Infrared, 880nm   Appr.12°   V-Out   Appr.12°   V-Out						
Optical range, (adjustable) (On white paper 80g, 20cm x 30cm) I-Out (Asmwind maximum adjant intensity (Asmwind maximum adjant intensity) (Asmwind maximum power dissipation (Output V-Out (Input, only types IRDI (Disable input)) (Input, o	tput signal range	V-Out				
Con white paper 80g, 20cm x 30cm   I-Out   2.5cm to 50cm / 10mA/50cm   Infrared, 880cm   Search pattern   Appr.12°   AbmW/mm²   Response time   5ms   Supply voltage   24 VDC (20 to 28VDC)   Courrent consumption   Maximum power dissipation   1.4W   PNP, Output impedance appr. 250g, RL: 26Q to 1MQ.   Output only types IRDI (Disable input)   PNP, Output impedance appr. 500g, RL: 0Q to 100Q   Input, only types IRDI (Disable input)   PNP, Output impedance appr. 500g, RL: 0Q to 100Q   Input, only types IRDI (Disable input)   PNP compatible, RI 10kQ		I-Out	0.1mA - 2	21mA (Ripple:<40	uA), (4mA - 2	0mA optional)
Lightsource Beampattern  Maximum radiant intensity  A.5mW/mm² Response time  Supply voltage  24 VDC (20 to 28VDC)  Current consumption  Maximum power dissipation  Output  V-Out  PNP, Output impedance appr. 500Ω, RL: 0Ω to 100Ω  Input, only types IRDI (Disable input)  Housing  Protection rating at EN 60529  Maximum working ambient temperature TA  -20°C < TA < +60°C  Connection cable  Connection cable, types IRDI  A x AWG24 (0,2mm²), Shielded / L=3m  Connection cable, types IRS99  Lumberg, M12 male receptacle, type RSF 5 contacts  Accessories, 1l types  -2 nuts M30 (or 1 clamp on request)  -1 x Spars safety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars adety screw with packing ring for potentiometer sealing  -1 x Spars year sealing with a cord length of 20cm. Nomial range spars year sealing with a cord length of 20cm. Nomial range spars year year year	tical range, (adjustable)	V-Out		2.5cm to 50cm	/ 5VDC/50cm	n
Beampattern Maximum radiant intensity Response time Supply voltage 24 VDC (20 to 28VDC) Current consumption Maximum power dissipation V-Out PNP, Output impedance appr. 25Ω, RL: 2kΩ to 1MΩ NPN, Output impedance appr. 50ΩΩ, RL: 0Ω to 100Ω Input, only types IRDI (Disable input) Protection rating at EN 60529 Protection rating at EN 60529 Maximum working ambient temperature TA Protection rating at EN 60529 Protection rating at EN 80529 Protection rating at EN 80529 Maximum working ambient temperature TA Protection rating at EN 80529 Protection rating at EN 80529  Maximum working ambient temperature TA Protection rating at EN 80529 Protection rating at EN 80529  Maximum working ambient temperature TA Protection rating at EN 80529 Protection rating at EN 80529  Maximum working ambient temperature TA Protection rating at EN 80529  Maximum working ambient temperature TA Protection rating at EN 80529  Maximum working ambient temperature TA Protection rating at EN 80529  Maximum working ambient temperature TA Protection rating at EN 80529  Maximum working ambient temperature TA Protection rating at EN 80529  Maximum working ambient temperature TA Protection rating at EN 80529  Maximum working ambient temperature TA Protection rating at EN 80524 (D. 20°C < TA < 50°C < TA < 50°	n white paper 80g, 20cm x 30cm)	I-Out		2.5cm to 50cm	/ 10mA/50cm	n
Maximum radiant intensity Response time Supply voltage Supply vol	htsource			Infrared	l, 880nm	
Response time 24 VDC (20 to 28VDC) Current consumption	am pattern			app	r.12°	
Response time  Current consumption  Maximum power dissipation  Dutput  V-Out  PNP, Output impedance appr. 25Ω, RL: 2kΩ to 1MΩ  I-Out  NPN, Output impedance appr. 500Ω, RL: 0Ω to 100Ω  PNP compatible, R: 10kΩ  Housing  M30, yellow brass (N85), nickel plated  Protection rating at EN 60529  Maximum working ambient temperature TA  -20°C < TA < +60°C  -20°C < TA < +50°C  -20°C < TA < +50°C  -20°C < TA < -50°C  -20°C < TA < 50°C  -20°C < TA < -50°C  -20°C < TA < -50°C  -20°C < TA < -50°	ximum radiant intensity			4.5m\	N/mm <sup>2</sup>	
Supply voltage  Current consumption  Maximum power dissipation  Output  V-Out  PNP, Output impedance appr. 25Ω, RL: 2kΩ to 1MΩ  NPN, Output impedance appr. 25Ω to 10Ω  NPN,	sponse time					
Current consumption   Maximum 60mA   1.4W						
Maximum power dissipation  Output  V-Out  PNP, Output impedance appr. 50Ω, RL: 2kΩ to 1MΩ  NPN, Output impedance appr. 50ΩΩ, RL: ΩΩ to 10ΩΩ  Input, only types IRDI (Disable input)  PNP compatible, Ri 10kΩ  M30, yellow brass (Ms 58), nickel plated  Protection rating at EN 60529  IP 54  IP 67  Maximum working ambient temperature TA  -20°C < TA < +60°C  -20°C < TA < +50°C  -20°C <						
Output V-Out IPNP, Output impedance appr. 25Ω, RL: 2kΩ to 1MΩ IPNP, Output impedance appr. 25Ω, RL: 2kΩ to 1MΩ NPN, Output impedance appr. 25Ω, RL: 2kΩ to 1MΩ NPN, Output impedance appr. 50ΩΩ, RL: ΩΣ to 10ΩΩ IPNP compatible, Ri 10kΩ PNP compatib						
Input, only types IRDI (Disable input)  Housing  Protection rating at EN 60529  Protection rating at EN 60529  Maximum working ambient temperature TA  -20°C < TA +60°C  -20°C < TA < +50°C  -20°C < TA < -50°C  -20°C < TA <		\/ Out	DND O			L: 2kO to 1MO
Input, only types IRDI (Disable input)   PNP compatible, Ri 10k\(\Omega\$   M30, yellow brass (Ms 58), nickel plated   Protection rating at EN 60529   IP 54   IP 67   IP	ιραι					
Housing M30, yellow brass (Ms 58), nickel plated Protection rating at EN 60529   IP 54   IP 67   IP67   IP6			NPN, O			<u>«L: 0Ω to 100Ω</u>
Protection rating at EN 60529  Maximum working ambient temperature TA  -20°C < TA < +60°C  -20°C < TA < +50°C  -20°C < TA < +5		)				
Maximum working ambient temperature TA  -20°C < TA < +60°C  -20°C < TA < +50°C  -20°C < TA < +20°C < TA < +20						
Connection cable  Connection cable, types IRDI  A x AWG24 (0,2mm²), shielded / L=3m PE at the housing Sensor socket, types IRNS99  Lumberg, M12 male receptacle, type RSF 5 contacts  Accessories, all types  - 2 nuts M30 (or 1 clamp on request)  Accessories, types IRN/IRDGD  - 1x Spare safety screw with packing ring for potentiometer sealing  - 1x Safety lock device, mount at the cable connection, for locking the connection, (black synthetic device)  - 1x Warning plate "Do not separate when supply voltage connected", self-sealing, for gluing on the cable connector.  - 1x Protection cap for the sensor socket.  Options  - IRDI (with disable input)  - IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage  - IRS-IRS-IRS-IRS-S99: Socket types, M12, Lumberg, 5 terminals  - Cable length up to 100m  ATEX related designations  CE 0158  Device type  Certification number, type IRD:  Certification number, type IRD:  Certification number, type IRD:  DMT 93 ATEX E oS6/M1/NA/NS  Electrical data according to the chap and of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic  The brightness of the LED and the output level, is dependant on the quantity the detected light.  Output configuration						IP67
Connection cable Connection cable, types IRDI Connection cable, types IRDI 4 x AWG24 (0,2mm²), shielded / L=3m, PE at the housin Sensor socket, types IRNS99 Lumberg, M12 male receptacle, type RSF 5 contacts Accessories, all types Accessories, types IRN/IRDGD -1 x Spare safety screw with packing ring for potentiometer sealing -1 x Safety lock device, mount at the cable connection, for locking the connection, (black synthetic device) -1 x Warning plate "Do not separate when supply voltage connected", self-sealing, for gluing on the cable connector1 x Protection cap for the sensor socket.  Options -IRDI (with disable input) -IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage with current output 4 - 20mA -IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage -IRS-U-5LA \$66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range -IRS/IRN \$99: Socket types, M12, Lumberg, 5 terminals - Cable length up to 100m  ATEX related designations  CE 0158 Device type  Certification number, type IRD:  Certification number, type IRD: DMT 99 ATEX E 056/N1/N4/NS Electrical data according to the chapter of the construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light  Froximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration	ximum working ambient temperature	• TA	-20°C < TA < +60°	C -20°C < T	A < +50°C	-20°C < TA < +50°C
Connection cable, types IRDI  Sensor socket, types IRNS99  Lumberg, M12 male receptacle, type RSF 5 contacts  Accessories, all types  - 2 nuts M30 (or 1 clamp on request)  Accessories, types IRNGD  - 1x Spare safety screw with packing ring for potentiometer sealing  Accessories, types IRNGD S99  - 1x Safety lock device, mount at the cable connection, for locking the connection. (black synthetic device)  - 1x Warning plate "Do not separate when supply voltage connected", self-sealing, for gluing on the cable connector.  - 1x Protection cap for the sensor socket.  Options  - IRDI (with disable input)  - IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage  - IRS-U-5LA \$66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range  - IRS/IRN \$99: Socket types, M12, Lumberg, 5 terminals  - Cable length up to 100m  ATEX related designations  CE 0158  Device type  RD: II 3 G EEx nA II C T6, II 3 D IP6  Certification number, type IRD: DMT 99 ATEX E 056/M1/N4/NS  Electrical data according to the characteristic proximity  - The brightness of the LED and the output level, is dependant on the quantity of the detected light.  Output configuration  Output configuration				3+PE x 0.5mm <sup>2</sup>	, shielded / L=	-3m
Sensor socket, types IRN\$99    Caressories, all types   -2 nuts M30 (or 1 clamp on request)    -3			4 x AWG			
Accessories, all types  - 2 nuts M30 (or 1 clamp on request) Accessories, types IRN/IRDGD  - 1x Spare safety screw with packing ring for potentiometer sealing Accessories, types IRNGD S99  - 1x Safety lock device, mount at the cable connection, for locking the connection. (black synthetic device) - 1x Warning plate "Do not separate when supply voltage connected", self-sealing of guling on the cable connector 1x Protection cap for the sensor socket.  Options - IRDI (with disable input) - IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage - IRS-U-5LA S66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range - IRS/IRN S99: Socket types, M12, Lumberg, 5 terminals - Cable length up to 100m  ATEX related designations  CE 0158  Device type - IRS-II 3 G EEx rd IIC T6, II 1/2 D IPG - IRS-II 3 G Ex rd IIC T6, II 1/2 D IPG - IRS-II 3 G Ex rd IIC T6, II 1/2 D IPG - IRS-II 3 G Ex rd IIC T6, II 1/2 D IPG - IRS-II 3 G Ex rd IIC T6, II 1/2 D IPG - IRS-II 3 G Ex rd IIC T6, II 1/2 D IPG - IRS-II 3 G				, , , , , , , , , , , , , , , , , , , ,		<u> </u>
Accessories, types IRN/IRDGD  - 1x Spare safety screw with packing ring for potentiometer sealing  - 1x Safety lock device, mount at the cable connection, for locking the connection. (black synthetic device)  - 1x Warning plate "Do not separate when supply voltage connected", self-sealing, for gluing on the cable connector.  - 1x Protection cap for the sensor socket.  Options  - IRDI (with disable input)  - IRS/IRN/IRD-SLX: Output function invertible by the polarity of the supply voltage  - IRS-U-SLA Se6: With additional lens type DL30, socket type Binder 713/terminals with a cord length of 20cm. Nomial range  - IRS-U-SLA Se6: With additional lens type DL30, socket type Binder 713/terminals with a cord length of 20cm. Nomial range  - IRS-IRN S99: Socket types, M12, Lumberg, 5 terminals  - Cable length up to 100m  ATEX related designations  CE 0158  Device type  - IRD: II 2 G EEx d IIC T6, II 1/2 D IPC  RRN: II 3 G EEx nA IIC T6, II 3 D IPC  Certification number, type IRD:  TA: -20° < TA < 50°  Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with  fibre optic  - The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration				•	naoio, type N	o. o oomaoto
- 1x Safety lock device, mount at the cable connection, for locking the connection. (black synthetic device) - 1x Warning plate "Do not separate when supply voltage connected", self-sealing, for gluing on the cable connector 1x Protection cap for the sensor socket.  Options - IRDI (with disable input) - IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage - IRS-U-5LA \$66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range - IRS/IRN \$99: Socket types, M12, Lumberg, 5 terminals - Cable length up to 100m  ATEX related designations  CE 0158 Device type Certification number, type IRD: DMT 99 ATEX E 656/N1/N4/N5 TA: -20° < TA < 50° Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light  Proximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration					for notentioned	ter sealing
for locking the connection. (black synthetic device)  - 1x Warning plate "Do not separate when supply voltage connected", self-sealing, for gluing on the cable connector.  - 1x Protection cap for the sensor socket.  Options  - IRDI (with disable input)  - IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage  - IRS-U-5LA \$66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range  - IRS/IRN \$99: Socket types, M12, Lumberg, 5 terminals  - Cable length up to 100m  ATEX related designations  CE 0158  Device type  - IRS-IRS in IRS i						or ocaling
- 1x Warning plate "Do not separate when supply voltage connected", self-sealing, for gluing on the cable connector 1x Protection cap for the sensor socket.  Options - IRDI (with disable input) - IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage - IRS-U-5LA \$66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range - IRS/IRN \$99: Socket types, M12, Lumberg, 5 terminals - Cable length up to 100m  ATEX related designations  CE 0158 Device type RD: RR: II 3 G EEx d IIC 76, II 12 D IPE Certification number, type IRD: DMT 99 ATEX E 056/N1/N4/N5 TA: -20° < TA < 50° Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light  Proximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration	Addedned, typed have CD Coo			.,	,	
connected", self-sealing, for gluing on the cable connector 1x Protection cap for the sensor socket.  Options - IRDI (with disable input) - IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage - IRS-U-5LA \$66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range - IRS/IRN \$99: Socket types, M12, Lumberg, 5 terminals - Cable length up to 100m  ATEX related designations  CE 0158 Device type   IRD: II 2 G EEx d IIC 76, II 1/2 D IPG   IRN: II 3 G EEx nA IIC 76, II 3 D IPG   IRN: II 3 G EEx nA IIC 76, II 3 D IPG   IRN: II 3 G EEx nA IIC 76, II 1/2 D IPG   IRN: I						ne .
Options - IRDI (with disable input) - IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage - IRS-U-5LA \$66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range - IRS/IRN \$99: Socket types, M12, Lumberg, 5 terminals - Cable length up to 100m  ATEX related designations  CE 0158 Device type  Certification number, type IRD: DAT 99 ATEX E 056/N1/N4/N5 TA: -20° < TA < 50° Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light fibre optic reduced quantity  Proximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  PNP=OFF						
- IRS/IRN/IRD-5LX: Output function invertible by the polarity of the supply voltage - IRS-U-5LA \$66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range - IRS/IRN \$99: Socket types, M12, Lumberg, 5 terminals - Cable length up to 100m  ATEX related designations  CE 0158 Device type  Certification number, type IRD: TA: -20° < TA < 50° Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light  Proximity Sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  Output configuration  Output configuration						
- IRS-U-5LA \$66: With additional lens type DL30, socket type Binder 713/4-terminals with a cord length of 20cm. Nomial range - IRS/IRN \$99: Socket types, M12, Lumberg, 5 terminals - Cable length up to 100m  ATEX related designations  CE 0158 Device type  Certification number, type IRD: TA: -20° < TA < 50° Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light Proximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  Output configuration	tions - IRDI (with disable input)		- IRA- <b>I</b> 4	: Sensors with	current output	4 - 20mA
ATEX related designations  CE 0158 Device type Certification number, type IRD: TA: -20° < TA < 50° Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light Proximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  Amunfacturer with address IRD: II 2 G EEx d IIC T6, II 1/2 D IP6 IRN: II 3 G EEx nA IIC T6, II 3 D IP6 IRN: II 3 G EEx nA IIC T6, II 3 D IP6 IRN: II 3 G EEx nA IIC T6, II 3 D IP6 IRN: II 3 G EEx nA IIC T6, II 1/2 D IP6 IRN: II 1/2 G EEx nA IIC T6, II 1/2 D IP6 IRN: II 1/2 G EEx nA IIC T6, II 1/2 D IP6 IRN: II 1/2 G EEx nA IIC T6, II 1/2 D IP6 IRN: II 1/2 G EEx nA IIC T6, II 1/2 D IP6 IRN: II 1/2 G EEx	<ul> <li>IRS/IRN/IRD-5LX: Output funct</li> </ul>	tion invertible b	y the polarity of the supply	y voltage		
ATEX related designations  CE 0158 Device type  Certification number, type IRD:  TA: -20° < TA < 50° Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light Proximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  CE 0158 Device type (Ex) IRD: II 2 G EEx d IIC T6, II 1/2 D IP6 IRN: II 3 G EEx nA IIC T6, II 1/2 D IP6 IRN: II 1/2 D IP6 IR	- IRS-U-5LA S66: With additional	lens type DL3	0, socket type Binder 713/	4-terminals with a c	ord length of 20	0cm. Nomial range: 150cm.
Device type    IRD:    2 G EEx d    IC T6,    1/2 D    Property	<ul> <li>IRS/IRN S99: Socket types, M</li> </ul>	112, Lumberg,	5 terminals - Cable le	ngth up to 100m		
Device type    IRD:   I 2 G EEx d   IIC T6,   I 1/2 D   P6   IRN:   II 3 G EEx nA   IIC T6,   II 3 D   P6   IRN:   II 3 G EEx nA   IIC T6,   II 3 D   P6   IRN:   II 3 G EEx nA   IIC T6,   II 3 D   P6   IRN:   II 3 G EEx nA   IIC T6,   II 3 D   P6   IRN:   II 3 G EEx nA   IIC T6,   II 3 D   P6   IRN:   II 3 G EEx nA   IIC T6,   II 1/2 D   P6   IRN:   II 1/2 D   II	ΓEX related designations		CE 0158	Ma	anufacturer with	h address
Certification number, type IRD: DMT 99 ATEX E 056/N1/N4/N5 TA: -20° < TA < 50° Electrical data according to the characteristic Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light fibre optic reduced quantity  Proximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  Certification number, type IRD: DMT 99 ATEX E 056/N1/N4/N5 Electrical data according to the characteristic da	ŭ		Device type	€ IR	D: II 2 G EEx d	IIC T6, II 1/2 D IP67 T90°C
TA: -20° < TA < 50°  Date of construction: Numerals 4 to 7 of the serial number  Function and LED indication  LB with fibre optic full quantity of light fibre optic reduced quantity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  TA: -20° < TA < 50°  Electrical data according to the characteristic part of the serial number  LB with fibre optic reduced quantity reduced quantity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.						*
Function and LED indication  LB with fibre optic full quantity of light fibre optic reduced quantity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration						
Function and LED indication  LB with fibre optic full quantity of light fibre optic reduced quantity proximity sensor  The brightness of the LED and the output level, is dependant on the quantity the detected light.  Output configuration  LB with fibre optic reduced quantity proximity sensor  The brightness of the LED and the output level, is dependant on the quantity sensor  The brightness of the LED and the output level, is dependant on the quantity sensor  The brightness of the LED and the output level, is dependant on the quantity sensor						
fibre optic  full quantity of light  proximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  PNP=OFF			Date of construction:	Numerals 4 to 7 of	the serial num	ber
fibre optic  full quantity of light  proximity sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  PNP=OFF	nction and LED indication		I B with		I R with	
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Sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  PNP=OFF			full qu	uantity of light	libre obtic	reduced quantity of light
Sensor  The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  PNP=OFF			L	── <b></b>		
The brightness of the LED and the output level, is dependant on the q the detected light.  Output configuration  PNP=OFF			,		,	
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Output configuration +20-28VDC +A						— <u> </u>
Output configuration +20-28VDC +A			The brightness of the I	FD and the outpu	ıt level is der	nendant on the quantity of
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Output configuration PNP=OFF			and activited fight.			
Output configuration PNP=OFF						
	utput configuration			T2U-28VDC		
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			IDE/IDD A		··-	Out
IRS/IRDA ( V ) IRS/IRDA-I			1 V		1 — 1	
V-Out 0.05-10.5VDC 1-Out			v-Out		\  \  <b>\</b>   <b>-</b> \	
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	og, 20cmx30cm) otentiometer at minimum and un the parameter at	8 6 4			85 95	105 115 125 135



## **Operating Manual:**

#### Ex protection:

#### General prescriptions for all Ex types:

It is necessary to take into consideration the valid international and national rules and regulations. The maximum input voltage Um=30VDC must not be exceeded. The local equipotential bonding have to be done. At sensors with a PE-terminal, the protective earth (PE) is solid connected with the housing. At sensors without a PE-terminal, connect the housing reliable and noncorrosive to the general protection earth by using the nuts M30. The cable have to be protected against damages. To connect cables inside hazardous locations only use certificated EEx e housings. All cable terminals must be connected outside hazardous locations. Use only original manufactured fibre optics and additional optical lenses, other additional optical lenses are not allowed in hazardous locations. In Ex zones 20/21and 22, do not operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced

Type: IRD-5LA/AI: Applicable in Ex zones 1, 2 and 20/21, 22. For the zones 20/21 only the front part (optical lens) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

Type: IRN-5LA/AI-GD: Only applicable in Ex zones 2 and 22

Type: IRN-5LA/AI-GD S99: Only applicable in Ex zones 2 and 22. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5-186/xx (Straight type) RKTW/RKWTH 5-186/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the socket protection cap must be fitted, when the connection cable is NOT connected.

#### General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to

GD

Corresponding to the quantity of detected light, the output of the sensor generates an analog output signal. Without fibre optics or with fibres 2 in 1 type, the sensor is applicable as relative distance detection device or similar applications. With 2-2 type fibres, function as light barrier, the sensor can be used for turbidity measurement or similar applications. Dependent on the selected type, the output generates a voltage signal from 0.1V to 10VDC or a current loop, 0 or 4mA to 20mA. Please check the permissible load for the two different types of outputs. For best measurement results the sensor System ISO 9001 with the ATEX module "Production", declares: can be adjusted by the potentiometer.

#### Sensors with disable input, types IR.-..-..DI:

If several sensors are installed close to another, it is necessary to use sensors with disable input. By using the disable input DI, each sensor can be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual influence is precluded. The response time of the DI-input is 200us.

0V or not connected = emitter enabled High (24VDC) = emitter disabled

For a correct function the sensor must be enabled for at minimum >= 10ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time. The DI input is PNP compatible.

## Nominal range

The nominal range is defined as function "distance measurement" on white paper. At the nominal distance the output level shows the middle of the output range. The real output level is depended on the color, the form, the dimension, and the surface finish of the object.

#### Fibre optics

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas.

#### Maintenance

Protect the sensor and the optional fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer

#### **Safety Informations**

The sensors types IRS/IRN/IRD-.. must not be used for Accident-Prevention! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations. ATEX118a, EX-RL(BGR104), ElexV, TrbF, TRD, UVV, BetrSichV(ATEX137), Einzel-RL 1999/92/EG.

- Standards met:
- EN 50014,IRD: EN 50018,IRN: EN 50021,EN 50281-1-1;
- EN 61000-6-1/-2, EN 61000-6-3/4; EN 60529
- Ex protection: 94/9/EG (ATEX 100a)
- Machine directive: 98/37/EG
- Low voltage directive: 73/23/EWG, 93/68/EWG
- EMC 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG

#### **General Notes**

We reserve the right to modify our equipment. Our equipment neither emit or contain any damaging or siliconized substances. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

#### **Declaration of Conformity**

Approvals: DMT 99 ATEX E 056/N1/N4/N5

The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety

Hans Bracher, Matrix Elektronik AG





Rugghölzli 2 CH - 5453 Busslingen





# Photoelectric Proximity Switch IRS/IRN/IRD Housing M30 • Also for using with fibre optics • Type IRD, applicable in ex zones, 1 and 20, 21

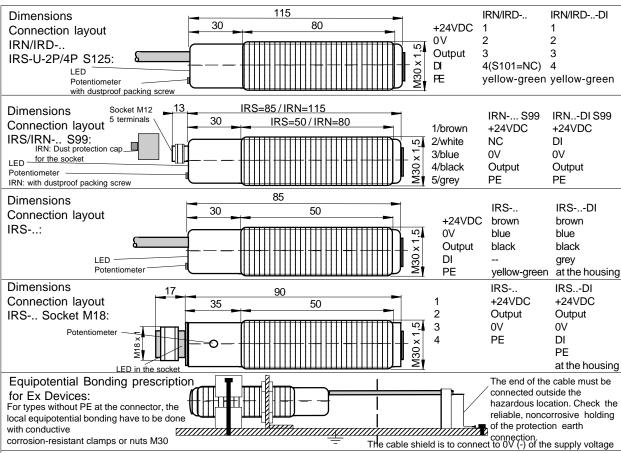
IRD-.. **( €** 0158

• Type IRD, applicable in ex zones 1 and 20, 21

• Type IRN, applicable in ex zones 2 and 22



Technical Data	IRS-U- 2/4/10/15/25/30N/P	IRN- 2/4/10/15/25/30N/P-GI	
Type of Ex protection, Gas, at 94/9/EC	none	II 3G Ex nA IIB T4	II 2G Ex d IIC T6
Type of Ex protection, Dust, at 94/9/EC	none	II3DExtDA22IP67T135°C	II 1/2D ExtDA20/A21 IP67 T90
Applicable in Ex Zones		Zones 2 and 22	Zones 1,2 and 20/21,22
Range (on white paper A4,80g)	0.2m to 3	Bm (Designations 2, 4, 10,	15, 25, 30)
ight source		Infrared 870nm	
Optical angle (at nominal range)		appr. 10°	
Maximum optical radiant power		<=35mW	
Response time		100Hz (1ms / 500Hz, on re	
Supply voltage	24 VDC (20 t	28VDC), absolute maximu	um Um=30VDC
Current consumption		maximum 60mA	
Maximum power dissipation	_	1.68W	
Dutput Dutput	Push-	Pull, 100mA, short circuit pr	
nput, only types IRDI (Disable Input)		PNP compatible, Ri 10kΩ	
lousing		ellow brass, type Ms58, nick	
Enclosure rating at EN 60529	IP 54	IP 67	IP67
Vorking temperature range TA		-20°C < TA < +50°C	
Shock and vibrating resistance		Hz to 2kHz. Shock:50g for	
Electrical connection cable		mm <sup>2</sup> , shielded, TPE/PUR, le	
electrical connection cable, types IRDI		mm <sup>2</sup> , shielded, TPE/PUR, le	
Socket for types IRS/IRN S99		M12, Lumberg type RSF,	5 terminals
Accessories, all types	- 2 nuts M30 (optional 1 cla		
Accessories, types IRD + IRNGD	- 1x Spare safety screw w		meter sealing
Accessories, only type IRNGD S99	- 1x Safety lock device, m		
	connection. (black syntl		-
	- 1x Warning plate "Do not		oltage connected",
	self-sealing, for gluing o		<u> </u>
	- 1x Protection cap for the		
Accessories, optional for the types S99	- Single ended cordset, typ		TH 5-298/xx,Lumberg
Accessories, not included, only IRS-U S125	- Spare safety screw with p		
Options - Cable length up to 100m	- IRS with connector, type		<u>U</u>
- IR4/10- <b>1kHz:</b> 1kHz switching f - IR <b>1N:</b> For near range ap			
- IR2- <b>W:</b> With wide optical			
- IR2- <b>10kHz:</b> 10kHz switching			
•	icy: <b>1.5kHz</b> , with special high	levible oil resistant cable	for trailing length: 10m
	optic, type: AD-4-W 15 / Cable		ioi tialiing, lengtii. Toili
	50us / Cable length: 5m	riengin. om	
	nberg RSF 5 , 5 terminals		
	nnerd RSE 5 5 ferminais		
	ms/500Hz / Cable: 10m, Ölfle		
- IRS-U-2P/4P <b>\$125</b> : Potentiometer with	ms/500Hz / Cable: 10m,Ölfle h dust proof screwing. (IRS-U-2		
<ul> <li>IRS-U-2P/4P S125: Potentiometer with</li> <li>IRS/IRN/IRDN/P VA: With additional potential</li> </ul>	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 Ilution indication output	P S125: Range = 180mm+-	
- IRS-U-2P/4P <b>S125</b> : Potentiometer with IRS/IRN/IRDN/P <b>VA</b> : With additional potential Processing Franciscon Processing Processing Franciscon Processing Francisco P	ms/500Hz / Cable: 10m,Ölfle h dust proof screwing. (IRS-U-2	P S125: Range = 180mm+	
<ul> <li>IRS-U-2P/4P S125: Potentiometer with</li> <li>IRS/IRN/IRDN/P VA: With additional potential</li> </ul>	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 Ilution indication output	P S125: Range = 180mm+- supply voltage polarity	-5%)
- IRS-U-2P/4P <b>S125</b> : Potentiometer with IRS/IRN/IRDN/P <b>VA</b> : With additional potential IRS/IRN/IRD <b>NP</b> : With output function	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier	P S125: Range = 180mm+- supply voltage polarity Light barrie	er — t
- IRS-U-2P/4P <b>S125</b> : Potentiometer with IRS/IRN/IRDN/P <b>VA</b> : With additional potential IRS/IRN/IRD <b>NP</b> : With output function	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 llution indication output on selection by changing the	P S125: Range = 180mm+- supply voltage polarity Light barrie	er —
- IRS-U-2P/4P <b>S125</b> : Potentiometer with IRS/IRN/IRDN/P <b>VA</b> : With additional potential IRS/IRN/IRD <b>NP</b> : With output function	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier	P S125: Range = 180mm+- supply voltage polarity Light barrie ti interrupted with fibre o	er Beam interrupte
- IRS-U-2P/4P <b>S125</b> : Potentiometer with IRS/IRN/IRDN/P <b>VA</b> : With additional potential IRS/IRN/IRD <b>NP</b> : With output function	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier — with fibre optics Beam no	P S125: Range = 180mm+- supply voltage polarity Light barrie ti interrupted with fibre o	er Beam interrupte
- IRS-U-2P/4P <b>S125</b> : Potentiometer with IRS/IRN/IRDN/P <b>VA</b> : With additional potential IRS/IRN/IRD <b>NP</b> : With output function	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam no	P S125: Range = 180mm+- supply voltage polarity Light barrie with fibre o Proximity:	er Beam interrupte
- IRS-U-2P/4P <b>S125</b> : Potentiometer with IRS/IRN/IRDN/P <b>VA</b> : With additional poor IRS/IRN/IRD <b>NP</b> : With output function	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam no Proximity switch with fibre optic	P S125: Range = 180mm+ supply voltage polarity Light barrie to interrupted with fibre o Proximity: with fibre	er Beam interrupte switch optic
- IRS-U-2P/4P <b>S125</b> : Potentiometer with IRS/IRN/IRDN/P <b>VA</b> : With additional potention and LED display	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier — with fibre optics Beam no Proximity switch — with fibre optic— reflection detected	P S125: Range = 180mm+ supply voltage polarity Light barrie to interrupted with fibre o Proximity: with fibre	er Beam interrupte switch Optic Opti
- IRS-U-2P/4P \$125: Potentiometer with a continuous potention and LED display  Function and LED display  Property of the continuous potention and LED display  RSN/IRNN IRDN	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier — with fibre optics Beam no Proximity switch — with fibre optic — reflection detecte	P S125: Range = 180mm+  supply voltage polarity  Light barrie with fibre o  Proximity: with fibre o  A, LED=ON  +20-28VDC	er Beam interrupte switch — — — — — — — — — — — — — — — — — — —
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- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  - IRS/IRN/IRDNP: With output function and LED display	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected.	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre o Proximity: with fibre o Proximity: with fibre d, LED=ON +20-28VDC 1 /brown	er Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with a continuous potention and LED display  Function and LED display  Property of the continuous potention and LED display  RSN/IRNN IRDN	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam no Proximity switch with fibre optic reflection detecte	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre o Proximity: with fibre o Proximity: with fibre o Proximity: with fibre o Proximity: with fibre o The proximity:	prics Beam interrupte switch ————————————————————————————————————
- IRS-U-2P/4P \$125: Potentiometer with a continuous potention and LED display  Function and LED display  Property of the continuous potention and LED display  RSN/IRNN IRDN	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier — with fibre optics Beam no Proximity switch with fibre optic — reflection detecte	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre o Proximity: with fibre o Proximity: with fibre d, LED=ON +20-28VDC 1 /brown	er Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with a continuous potention and LED display  Function and LED display  Property of the continuous potention and LED display  RSN/IRNN IRDN	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam no Proximity switch with fibre optic reflection detected PNP=OF R 15Ω	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys the fibre of proximitys with fibre of proximitys with fibre of proximitys the fibre of proximitys with fibre of proximitys the fibre of proximitys of proximitys with fibre of proximitys the fibre of proximi	er Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  - IRS/IRN/IRDNP: With output function and LED display	ms/500Hz / Cable: 10m , Ölfle h dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam no Proximity switch with fibre optic reflection detecte	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys the fibre of proximitys with fibre of proximitys with fibre of proximitys the fibre of proximitys with fibre of proximitys the fibre of proximitys of proximitys with fibre of proximitys the fibre of proximi	er Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with a continuous potention and LED display  Function and LED display  RSN/IRNN IRDN	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam no Proximity switch with fibre optic reflection detected PNP=OF R 15Ω  NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre o Proximity: with fibre o Proximity: with fibre o no re +20-28VDC F 1/brown Out 3/black	prics Beam interrupte switch ————————————————————————————————————
- IRS-U-2P/4P \$125: Potentiometer with a continuous potention and LED display  Function and LED display  Property of the continuous potention and LED display  RSN/IRNN IRDN	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2) Illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected PNP=OF R 15Ω  NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre o Proximity: with fibre o Proximity: with fibre o no re +20-28VDC F 1/brown Out 3/black - 2/blue	prics Beam interrupte switch ————————————————————————————————————
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRS-IN / IRNN IRDN  Output low side switching (NPN)	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2) Illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected PNP=OF R 15Ω  NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre o Proximity: with fibre o Proxi	prics Beam interrupte switch ————————————————————————————————————
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2) Illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected PNP=OF R 15Ω  NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre o Proximitys with fibre o Proximitys with fibre o no re +20-28VDC 1 /brown Out 3 /black - 2 / blue +20-28VDC	prics Beam interruptes switch — — — — — — — — — — — — — — — — — — —
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- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam no Proximity switch with fibre optic reflection detected PNP=OF R 15Ω  NPN=ON PNP=ON R 15Ω	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximitys and proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys and proximitys  Out	prics Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam no Proximity switch with fibre optic reflection detected PNP=OF R 15Ω NPN=ON NP	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of Proximitys and Proximitys with fibre of Proximitys with fibre of Proximitys with fibre of Proximitys and Proximitys with fibre of Proximitys with fibre of Proximitys with fibre of Proximitys and Proximitys with fibre of Proximitys with fibre of Proximitys with fibre of Proximitys and Proximitys with fibre of Proximitys and Proximitys with fibre of Proximitys and Proximitys a	PNP=OFF  Per Polics  Beam interrupte switch
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  RSN / IRNN IRDN Output low side switching (NPN)  RSP / IRNP IRDP	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected PNP=ON R 15Ω  PNP=ON R 15Ω  PNP=ON R 15Ω	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximity: with fibre	prics Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  RSN / IRNN IRDN Output low side switching (NPN)  RSP / IRNP IRDP	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam no Proximity switch with fibre optic reflection detected PNP=OF R 15Ω  NPN=ON PNP=ON R 15Ω	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximity: with fibre	prics Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected NPNP=ON R 15Ω NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximitys of proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys of proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys of proximitys with fibre of proximitys with fibre of proximitys of proximitys with fibre of proximitys with fibre of proximitys of proximitys of proximitys with fibre of proximitys of proxim	PNP=OFF  PNP=ON  PNP=OFF  1 /brown  R 15Ω Out  2 / blu  PNP=OFF  1 /brown  R 15Ω Out  3 / black  NPN=OFF
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected PNP=ON R 15Ω  PNP=ON R 15Ω  PNP=ON R 15Ω	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximity: with fibre	prics Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-IV-2P/4P \$125: Potentiometer with additional potention and LED display  IRS-IN-IRN-IN-IN-IN-IN-IN-IN-IN-IN-IN-IN-IN-IN-IN	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected NPNP=ON NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximitys of proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys of proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys with fibre of proximitys of proximitys with fibre of proximitys with fibre of proximitys of proximitys with fibre of proximitys with fibre of proximitys of proximitys of proximitys with fibre of proximitys of proxim	er — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRS/IRN/IRDNP: With additional potention and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP Output high side switching (PNP)	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2) Illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected NPNP=ON NPN=ON NPN=O	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of Proximitys and Julian State of Proximitys with fibre of Proximitys and Julian State of Proximitys with fibre of Proximitys and Julian State of Proximitys with fibre of Proximitys with fibre of Proximitys and Julian State of Proximitys with fibre of Proximitys and Julian State of Proximitys and Julian State of Proximitys with fibre of Proximitys and Julian State of Proximitys and Julian Sta	er Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRS/IRN/IRDNP: With additional potention and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected NPNP=ON NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximity: yield the proximity: with fibre of proximity: with fibre of proximity: yield the proximity: yield th	er — P-P-P-P-ON 1 /brown 2 /blue -
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRS-IN/IRDNP: With output function and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2) Illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected PNP=OF R 15Ω  NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximitys and proximitys  Sensor and	er — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRS/IRN/IRDNP: With additional potention and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2) Illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected PNP=OF R 15Ω  NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of Proximitys  - 2 / blue - 3 / black - 2 / blue - 3 / black - 4 / black - 5 / blue - 5 / blue - 5 / blue - 6 / black - 7 / blue - 8 / black - 9 / blue - 9	er Beam interrupte switch optic - +20-28VD   PNP=ON 1 /brow   R 15\Omega Out   NPN=OFF   NPN=OFF   NPN=OFF   1 /browr   R 15\Omega Out   3 / black   NPN=OFF   1 /browr   R 15\Omega Out   3 / black   NPN=OFF   NPN=ON   - 2 / blue   200us Senses
- IRS-U-2P/4P \$125: Potentiometer with additional potention and LED display  IRS-IN/IRDNP: With output function and LED display  IRSN / IRNN IRDN Output low side switching (NPN)  IRSP / IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2) Illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected PNP=OF R 15Ω  NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximitys and proximitys with fibre of proximitys and proximitys with fibre of proximitys with fibre of proximitys and proximitys with fibre of proximitys and proximitys with fibre of proximitys  - 2 / blue	er — — — — — — — — — — — — — — — — — — —
- IRS-IV-2P/4P \$125: Potentiometer with additional potention and LED display  IRS-IN/IRN-INP: With output function and LED display  IRS-IN/IRN-IN IRD-IN Output low side switching (NPN)  IRS-IP/IRN-IP IRD-IP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us Hold time: >=7.5ms, DI = 0V=Enable	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected NPNP=ON R 15Ω NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximitys and proximitys with fibre of proximitys and proximitys with fibre of proximitys with fibre of proximitys and proximitys with fibre of proximitys and proximitys with fibre of proximitys  - 2 / blue	PNP=OFF  PNP=ON  A 15Ω  Out  NPN=OFF  - 2 / blue  PNP=OFF  1 / brown  R 15Ω  Out  NPN=OFF  - 2 / blue  PNP=OFF  - 2 / blue  PNP=OFF  - 2 / blue  PNP=OFF  - 2 / blue  - 200us Sens  DI enable  DI ena
- IRS-IU-2P/4P \$125: Potentiometer with additional potention and LED display  IRS-IN/IRN-INP: With additional potention and LED display  IRS-IN/IRN-IN IRD-IN Output low side switching (NPN)  IRS-IP/IRN-IP IRD-IP Output high side switching (PNP)  IRI-IPI (with optional Disable Input) Uin: 18V-28VDC, DI=+24V=Disable Response time: <=200us Hold time: >=7.5ms, DI = 0V=Enable  ATEX related designations: CE0158  Manufacturer with	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2 illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected NPNP=ON R 15Ω NPN=ON	P S125: Range = 180mm+ supply voltage polarity Light barrie with fibre of proximitys and proximitys with fibre of proximitys with fibre of proximitys and proximitys of proximitys with fibre of proximitys and proximitys of proximitys with fibre of proximitys of proximitys with fibre of proximitys and proximitys of proximitys of proximitys with fibre of proximitys of proximitys of proximitys of proximitys of proximitys with fibre of proximitys	prics Beam interrupte switch — — — — — — — — — — — — — — — — — — —
- IRS-U-2P/4P \$125: Potentiometer with Additional potential Potent	ms/500Hz / Cable: 10m , Ölfleh dust proof screwing. (IRS-U-2) Illution indication output on selection by changing the Light barrier with fibre optics Beam not proximity switch with fibre optic reflection detected PNP=OF R 15Ω NPN=ON	P S125: Range = 180mm+  supply voltage polarity  Light barrie with fibre of proximity: with fibr	PNP=OFF  PNP=OF  1 /brown  R 15Ω Out  NPN=OFF  1 /brown  R 15Ω Out  NPN=OFF  1 /brown  R 15Ω Out  NPN=OFF  2 / blue  200us Sens DI enable enabled olds previous state  of the serial number



#### Ex protection

#### General regulations for all types of Ex devices:

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The maximum rated supply voltage Um = 30VDC must not be exceeded. The local equipotential bonding have to be done. The protective earth (PE) is solid connected with the housing. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certificated Ex e housings. All cable terminals must be connected outside hazardous locations. Other then original manufacturer, additional optical lenses are not allowed in hazardous locations. In Ex zones 20/21 and 22, do not operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced.

**Types IRD-..:** Are applicable in Ex zones 1, 2 and 20/21, 22. For the zones 20/21 only the front part (optical lens) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

Types IRN-..-GD: Are applicable in Ex zones 2 and 22.

Types IRN-..-GD S99: Are only applicable in Ex zones 2 & 22 hazardous locations. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5-298/xx (Straight type) RKTW/RKWTH 5-298/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the protection cap for the socket must be fitted, when the connection cable is NOT connected.

#### General mounting prescriptions

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables.

#### Function IR .-..- N/P

The sensor works basically as proximity switch on diffuse optical reflections. If the sensor detects reflected light, the LED shows red and the output switches on +24VDC (P types) or 0V (N types). If no reflected light will be recognized, the output switches to 0V (P types) or +24VDC (N types). The push-pull output allows to connect the load to +24VDC or 0V.

#### Function IRD-25N S101

The sensor works basically as proximity switch on diffuse optical reflections. If the sensor detects reflected light, the LED shows red and the output switches on 0V. If no reflected light will be recognized, the output switches to +24VDC. The push-pull output allows to connect the load to +24VDC or 0V. By changing the polarity of the supply voltage, the output function will be inverted.

### Optional pollution indication output , series "VA":

The VA output will be activated by polluted lenses or reduced optical input signal. If only reduced optical input signal will be detected, the LED shows yellow and the pollution indication output will be activated. If no light can be detected both outputs are switched OFF and the LED shows red. If strong light is detected only the standard output is switched ON, the pollution indication output is switched OFF and the LED shows green.

Sensors with disable input, types IR......DI:

If several sensors are installed close to another, it is necessary to use

sensors with disable input. By using the disable input DI, each sensor can be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual influence is precluded.

0V or not connected = emitter enabled High (24VDC) = emitter disabled

For a correct function the sensor must be enabled for at minimum >= 7.5ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time.

The DI input is PNP compatible.

#### Optical range

The nominal range for the types IR.-2/4/10/15 is defined on white paper A4, 80g. The nominal range for the types IR.-25/30 is defined on white paper 1m-2, 80g. The range will be influenced by the color, kind of surface and shape of the object.

#### Fibre optics

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas. Fibre optics for Ex zones must only be driven by sensors series IRN and IRD.

#### Maintenance

Protect the sensor and the optional fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

#### Safety Informations

The dismounting of the connector safety lock device while the supply voltage is connected is hazardous! The mounting of the sensor in dusty locations without fixed cordset or protection cap results in a high ignition risk. The sensors types IRS/IRN/IRD-.. must not be used for Accident-Prevention! In worst case of disturbance, the output can show any state. When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations. ATEX 118a, ElexV, TRbF, TRD, UVV, EX-RL(BGR104), BetrSichV(ATEX137), Single directive 1999/92/EG

### Standards met:

EN 60079-0:2004, EN 60079-1:2004, EN 60079-15:2006-05, EN 60079-28:2007, EN 60241-0:2004, EN 61241-1:2004; EN 60529:2000, EN 60950-1:2006; EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4; Protection: 94/9/EC (ATEX 100a)

Machine directive: 2006/46/EC. RoHS: 2002/95/EC. Low voltage directive: 73/23/EWG, 93/68/EWG. EMC: 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG

#### General Notes

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

#### CE Declaration of Conformity

Certification, series IRD-..: DMT 99 ATEX E 056

Certification, series IRN-..: Declaration of conformity by manufacturer at 94/9/EC. Tech File No: AN-MAT-08-EX-E056.

ATEX certification of quality type production of Ex devices at the directive 94/9/EC Certification No: BVS 03 ATEX ZQS / E118

The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001:2008 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG



Ruaahölzli 2 CH - 5453 Busslingen Tel. +41 (0)56 222 38 18 Fax +41 (0)56 222 10 12 mailbox@sentronic.com www.sentronic.com

Spanieli-





## Photoelectric Proximity Switch IRS/IRN/IRD-...I

## IRD-..I **( €** 0158

Housing M30

Also for using with fibre optics

Type IRD, applicable in ex zones 1 and 20, 21

• Type IRN, applicable in ex zones 2 and 22

(Ex) II 3 G EEX nA II T6

IRN-...I-GD

	IDO II	IDM	IDD
Туре	IRS-U-	IRN-	IRD-
Technical Data	2/4/10/15/25/30I	2/4/10/15/25/30I-GD	2/4/10/15/25/30
Type of ex protection	none	EEx nA II T6	EEx d IIC T6
Applicable in ex zones	none	Zones 2, 22	Zones 1, 2, 20/21, 22
Category			II 2 G, II 1/2 D IP67 T90°C
Range (on white paper A4,80g)	0.2m to 3m (Designations 2, 4, 10, 25, 30)		
Light source		Infrared 880nm	
Beam pattern (at nominal range)		appr. 12°	
Response time		5ms	
Supplyvoltage		24 VDC (20 to 28VDC)	
Current consumption		maximum 60mA	
Maximum power dissipation		1.68W	
Output	Push-P	Pull, 100mA, short circuit pro	tected
Input, only types IRI-DI (Disable Input)		PNP compatible, Ri $10k\Omega$	
Housing	M30, yel	low brass, type Ms58, nicke	elplated
Protection rating at EN 60529	IP 54	IP 67	IP67
Ambient temperature range TA		-20°C < TA < +50°C	
Electrical connection		, 3+PE x 0,5mm <sup>2</sup> + Shield	
Electrical connection, types IRI-DI	Cable, 4 x AWG2	4 (0,2mm²)+ Shield / L=3m	, PE at the housing
Socket for types IRS/IRN S99	Socket N	M12, Lumberg type RSF, 5	terminals
Accessories, all types	- 2 nuts M30 (optional 1 c	clamp on demand)	
Accessories, types IRDI+ IRNI-GD	- 1x Spare safety screw v	with packing ring for potenti	ometer sealing
Accessories, only type IRNIGD S99	- 1x Safety lock device, r	nount at the cable connecti	on, for locking the
	connection. (black synt	thetic device)	
	- 1x Warning plate "Do no	ot open/close when supply	voltage
	connected", self-sealing	g, for gluing on the cable co	nnector.
	- 1x Protection cap for the	e sensor socket.	
Accessories optional	- Single ended cordset, s	traight type: RKTS 5-298/x	x or
only type IRNGD S99		H 5-298/xx , Lumberg M12	
Options - IRI-DI (with emitter disable input	t) - IR4/10I- <b>1</b>	kHz (1kHz switching frequence	cy)
- IRSI with connector, type Binde		NPI (Only PNP output type, Ou	t = H when light dtected
- IR2I-10kHz (10kHz switching free		th up to 100m	
<ul><li>- IRS/IRNI(-GD) S99: Connector:</li></ul>	M12, Lumberg , 5 terminals		

Function and LED display Light barrier -Light barrier -رہ۔۔۔ ╼╫╼┙ with fibre optics Beam not interrupted with fibre optics Beam interrupted Proximity switch Proximity switch with fibre opticwith fibre optic reflection detected, LED=ON no reflection detected, LED=OFF -○ +20-28VDC -0 +20-28VDC Function on standard connection: Output low side switching (NPN) Connection layout: 1 /brown 1 /brown PNP=OFF PNP=ON 1 / brown 2 / blue R 15Ω R 15Ω = +24VDC Out  $=0\overline{V}$ W~--0 W/~~o 3 / black 3 /black 3 / black = Output 4/ grey = Disable-input (only.-DI) NPN=ON NPN=OFF yellow-green white/blank = PE = Cable shield - 2/blue - 2/blue -> +20-28VDC Function on reversed connection: 2 /blue 2 /blue PNP=OFF Output high side switching (PNP) PNP=ON Connection layout: 1 / brown 2 / blue ₩ Out R 15Ω Out = 0V ₩V—○ 3/black = +24V = Output 3 / black 3 / black NPN=OFF 4/ grey yellow-green NPN=ON = Disable-input (only.-DI) = Cable shield white/blank 1 / brown 1 / brown IR.-.I-DI (with optional Disable Input) 18V-28VDC,DI=+24V=Disable Uin: 200us Sensor disabled 200us Sensor IR.-DI Sensor <=200us Response time: DI enabled enabled Output holds previous state Hold time: >=7.5ms, DI = 0V=Enable =24V >=7.5ms ATEX related designations CE 0158 Manufacturer with address Device type IRD: II 2 G, II 1/2D IP67 T90°C / IRN: II 3 G, II 3 D IP67 T90°C Certification number, series IRD: DMT 99 ATEX E 056 (ξx) TA: -20° < TA < 50° Electrical data according to the chart

Date of construction: Numeral 4 to 7 of the serial number

#### Ex protection:

#### General regulations for all types of Ex devices:

It is necessary to take into consideration the valid international and national rules and regulations. The maximum rated supply voltage Um = 30VDC must not be exceeded. The local equipotential bonding have to be done. The protective earth (PE) is solid connected with the housing. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certificated Exe housings. All cable terminals must be connected outside hazardous locations. Other then original manufacturer, additional optical lenses are not allowed in hazardous locations. In Ex zones 20/21 and 22, do not operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced.

Types: IRD-..I are applicable in Exzones 1, 2 and 20/21, 22. For the zones 20/21 only the front part (optical lens) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

Types: IRN-..I-GD are applicable in Ex zones 2 and 22.

Types: IRN-..I-GD S99 are only applicable in Ex zones 2 & 22 hazardous locations. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5-298/xx (Straight type) RKTW/RKWTH 5-298/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the protection cap for the socket must be fitted, when the connection cable is NOT connected.

#### General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables.

The sensor works basically as proximity switch on diffuse optical reflections. By changing the polarity of the supply voltage, the output function will be inverted. If the sensor detects reflected light, the LED shows red and the output switches on 0VDC or +24VDC dependent of the polarity of the supply voltage. If no reflected light will be recognized, the LED distinguished and the output switches on +24VDC or 0V dependent of the polarity of the supply voltage. The push-pull output allows to connect the load to +24VDC

#### Sensors with disable input, types IR.-..I-..-DI:

If several sensors are installed close to another, it is necessary to use sensors with disable input. By using the disable input DI, each sensor can be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual influence is precluded.

0V or not connected = emitter enabled DI= High (24VDC) DI == emitter disabled

For a correct function the sensor must be enabled for at minimum >= 7.5ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time.

The DI input is PNP compatible.

#### Optical range

The nominal range for the types IR.-2/4/10/15I is defined on white paper A4, 80g. The nominal range for the types IR.-25/30I is defined on white paper 1m-2, 80g. The range will be influenced by the color, kind of surface and shape of the object

#### Fibre optics

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas. Fibre optics for Exzones 0 and 20 must only be driven by ATEX approved sensors with limited optical output power at

#### DMT 99 ATEX 056/N5!

#### Maintenance

Protect the sensor and the optional fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean, with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

#### Safety Informations

The sensors types IRS/IRN/IRD-.. must not be used for Accident-Prevention! In worst case of disturbance, the output can show any state. When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations. ATEX118a, EX-RL(BGR104), ElexV, TrbF, TRD, UVV, BetrSichV(ATEX137), Einzel-RL 1999/92/EG.

Standards met:

EN 50014. EN 50281-1-1, IRD: EN 50018, IRN: EN 50021:

EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4; EN 60529

Ex protection: 94/9/EG (ATEX 100a) - Machine directive: 98/37/EG

Low voltage directive: 73/23/EWG, 93/68/EWG

- EMC: 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG

Tech. File Rev.: EXD\_NA5A:2003

#### General Notes

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

#### **Declaration of Conformity:**

#### Approvals: DMT 99 ATEX E 056/N1/N4/N5

The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001 with the ATEX module "Production", declares:

> nik AG Hans Brach

FEB.16,06/HB e7, b b RSND





# Photoelectric Proximity Switch IRS / IRN / IRD - .. - XC IRN-..-XC-GD Housing M30 IRD-..-XC

Applicable with different fibre optics

• Type IRD, applicable in Ex Zones 1, 2, 20/21, 22

• Type IRN, applicable in Ex Zones 2, 22

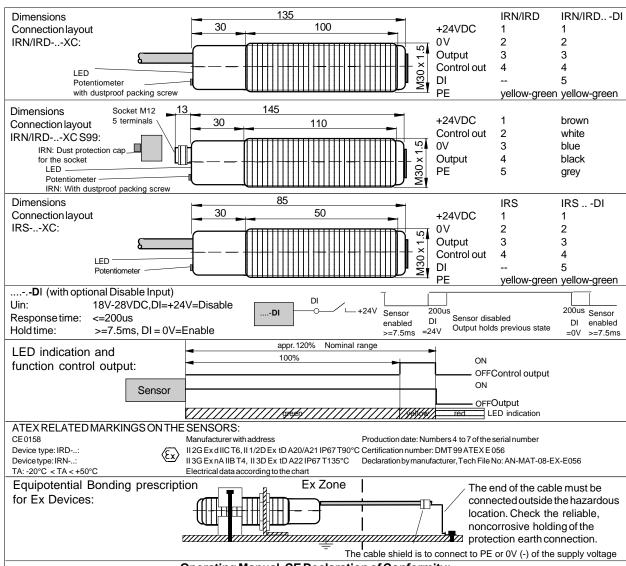
II 3G Ex nA IIB T4 • Robust sensor for industrial applications II 3D Ex tD A22 IP67 T135°C



II 2G Ex d IIC T6 II 1/2D Ex tD A20/21 IP67 T90°C

II 3D Ex tD A22 IP67 T135°C		II 1/2	2D Ex tD A20/21 IP67 T90°C
Technical Data Type	IRS-5/10/15/20-XC	IRN-5/10/15/20-XC-GD	IRD-5/10/15/20-XC
Type of Ex protection Gas, at 94/9/EG	None	II 3G Ex nA IIB T4	II 2G Ex d IIC T6
Type of Ex protection Dust, at 94/9/EG	None	II 3D ExtD A22 IP67 T135°C	II 1/2D Ex tD A20/A21 IP67 T90°C
Applicable in Ex zones	None	2, 22	1, 2, 20/21, 22
Range (adjustable)	INOTIC	IR5-XC = 0.5m	1, 4, 40/41, 44
(on white paper. A4. 80g)		IR10-XC = 1.0m	
(on write paper. 74. eeg)		IR15-XC = 1.5m	
		IR20-XC = 2.0m	
Response time		5ms	
Light source		Infrared, 880nm	
Optical beam angle (Distance 2m)		appr.12°	
Maximum radiant intensity		3.5mW/mm²	
Supply voltage		20VDC - 28VDC	
Maximum current consumption		60mA	
Maximum power dissipation		1.4W	
Output	PNP, sho	ort circuit protected, maximu	ım 100mA
Control output (Pollution indication)	PNP, sho	ort circuit protected, maximu	ım 100mA
Emitter disable input, only typesDI		PNP compatible, Ri=10kΩ	
Housing	M	30, yellow brass, nickel pla	nted
Enclosure rating, at EN 60529	IP54	IP67	IP67
Operating temperature range TA		-20°C < TA < +50°C	
Connection cable, types IRN and IRD		, PUR/TPE, oil resistant, for	
Connection cable, type IRS		m² + PE, shielded, PVC, Ler	
Connection cable, types IRDI		m <sup>2</sup> + PE, shielded, PVC, Ler	
Socket, types IRS/IRN-5/10/15/20-XC S99		12, Lumberg type RSF 5, 5	terminals
Accessories included, all types	- 2 nuts M30 (or 1 clamp		
Accessories included, only IRN and IRD		th packing ring for potentiom	
Accessories, included,		ount at the cable connection	,
only IRN-5/10/15/20-XC S99		n. (black synthetic device)	Da Nat Bia
		NING - Explosion Hazard - [	
		Live Unless Area Is Known	
		, for gluing on the cable con	nector
Accessories, not included	- 1x Protection cap for the	S 5-298/xx (straight type), o	
only IRS/IRN-5/10/15/20-XC S99	RKTW/RKWTH 5-298/xx		''
Options	- Cable length up to 100r		
Options		er disable input (not for type	ac \$00)
	- IRXC:-2kHz: Switch		es 399)
	- IR5-XC:-5kHz: Switch		
	- IRS/IRNXC <b>S99</b> : Soc		
		oil resistant, type ÖLFLEX 8	810CP for cable traving
		e oil resistant, type ÖLFLEX	
		External multi-turn (MT3) of	
		r range adjustement, at a s	` , ,
Function and LED display		Light barrier	
and			
	with fibre optics Beam no	t interrupted with fibre optic	s Beam interrupted
	Proximity switch —	Proximity swit	ch —
	with fibre optic—	with fibre opti	
		u   '	
-	Reflection dete		ection detected,
Function at standard supply voltage wiring:	LED=YELLOW or GI		LED=RED
Cable socket	1/	1	1/1
+24VDC 1 1		24VDC	° +24VDC
0V 2 3 Output 3 4	PNP=ON		PNP=OFF
Output 3 4 Control output 4 2	R 15Ω	9 (1)	R 15Ω
Disable input (onlyDI) 5	└ <b>\</b> \\\ 3	/4 Out	└^\\\\○ 3/4 Out
NC (to connect at 0V) 6 PE yel-grn 5	o 2	/3 -	
Cable shield white blank	0 2	73 -	
Function at reversed supply voltage wiring:	2/		2/3
Cable socket		24VDC	° +24VDC
+24VDC 2 3 0V 1 1	PNP=OFF	t 4	PNP=ON
Output 3 4	R 15Ω		R 15Ω
Control output 4 2 Disable input (onlyDI) 5	-\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Out	\(\)\\\\-\-0 3 Out
Disable input (onlyDI) 5 NC (to connect at 0V) 6			
PE yel-grn 5		/1 -	○ 1/1 -
Cable shield white blank			

IRSND\_XC\_GD\_e14/2009-08-18/HB



#### Mounting prescriptions

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The maximum input voltage Um=30VDC must not be exceeded. The local equipotential bonding have to be done. The protective earth (PE) is solid connected with the housing. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use hazardous locations. Additional optical lenses are not allowed in hazardous locations. In Ex zones 20/21 and 22, do not operate the sensors without fixed by the manufacturer. dustproof sealing crew. After adjust the potentiometer, the dustproof sealing **Safety Information** crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced.

Type IRD-.XC: Only applicable in Ex zones 1, 2 and 20/21, 22. For the zones 20/21 only the front part (optical lens) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

Type IRN-.XC-GD: Only applicable in Ex zones 2 and 22.

Type IRN-.XC-GD S99: Only applicable for the Ex zones 2 and 22. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable Standards met: connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5-298/ xx (Straight type) RKTW/RKWTH 5-298/xx (Right angle type), are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the protection cap for the sensor socket must be fitted, when no connection cable is connected. General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short.

The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables. Do not exceed the maximum ratings.

The sensor works basically as proximity switch on diffuse optical reflections. If the sensor detects reflected light, the output switches to +24VDC or 0V dependent of the polarity of the supply voltage. If the sensor works under safe conditions the LED shows green. If the sensor detects only poor reflected light, the LED shows yellow and the Control Output switches to +24VDC. If no reflected light will be recognized, the LED shows red, the outputs switches to 0V and the control-output is switching OFF. The load on the outputs must be connected to 0V.

#### Sensors with disable input, types IR.-..-XC-DI:

If several sensors are installed close to another, it is necessary to use sensors with disable input. By using the disable input DI, each sensor can be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual

influence is precluded

0V or not connected = emitter enabled

High (24VDC) = emitter disabled For a correct function the sensor must be enabled for at minimum >= 7.5ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time.

The DI input is PNP compatible. Maintenance

For a high reliability hold the lens and the mirror free from sediment. No special certificated Ex e housings. All cable terminals must be connected outside maintenance is required. If the lens or the mirror becomes dirty, they should be cleaned with a non-aggressive cleaning liquid. Equipment must only be repaired

#### Safety Informations

The dismounting of the connector safety lock device while the supply voltage is connected is hazardous! The mounting of the sensor in dusty locations without fixed cordset or protection cap results in a high ignition risk. The sensor IRS/ IRN/IRD-..-XC must not be used for Accident-Prevention! In worst case the output can change to any state! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations. ATEX 118a, ElexV, TRbF, TRD, UVV, EX-RL(BGR104), BetrSichV(ATEX137), Single directive 1999/92/EC

- EN 60079-0:2004, EN 60079-1:2004, EN 60079-15:2006-05, EN 60079-28:2007, EN 60241-0:2004, EN 61241-1:2004; EN 60529:2000, EN 60950-1:2006;
- EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4;
- Ex-Protection: 94/9/EC (ATEX 100a)
- Machine Directive: 2006/46/EC
- RoHS: 2002/95/EC
- Low Voltage Directive: 73/23/EWG, 93/68/EWG
- EMC: 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG

#### **General Notes**

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

CE Declaration of Conformity
Certification, series IRD-..: DMT 99 ATEX E 056

Certification, series IRN-..: Declaration of conformity by manufacturer at 94/9/ EC. Tech File No: AN-MAT-08-EX-E056.

ATEX certification of quality type production of Ex devices at the directive 94/9/ EC Certification No: BVS 03 ATEX ZQS / E118

The conformity of the devices with the EC standards and directives and the ECtype examination certificate and the observation of the Quality Safety System ISO 9001:2008 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG

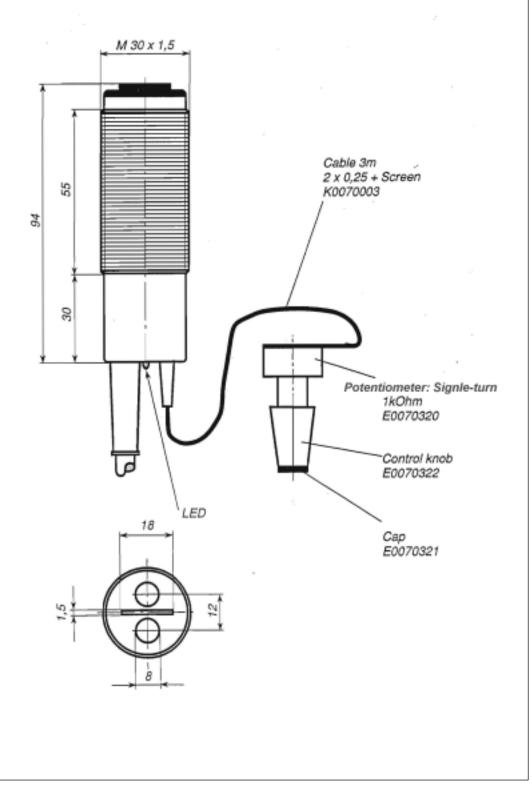


Rugghölzli 2 CH - 5453 Busslingen

# Dimensions: IRS-5XC/10XC-MT3 M 30 x 1,5 Cable 3m 2 x 0,25 + Screen 55 K0070003 94 Potentiometer: 10 turns 1kOhm : 740083 30 12 Ø 6,34 LED 18



## Dimensions: IRS-5XC/10XC-ST3







# Photoelectric Proximity Switch IRS/IRN/IRD-15N/P S157 / S160 / S180 Housing M30 O158 Also for using with fibre and in the state of the

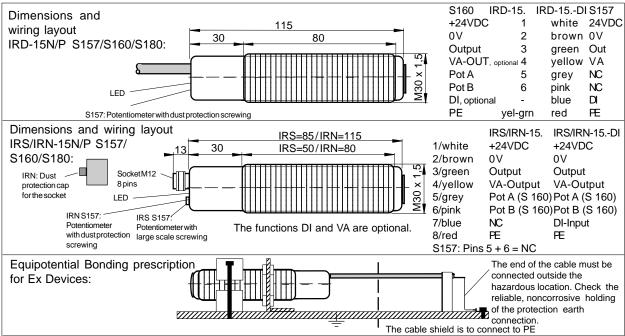
**( (** 0158

Housing M30Also for using with fibre optics

• Type IRD, applicable in ex zones 1 and 20/2

Type IRN, applicable in ex zones 2 and 22

Ŧ	IDO II 4ENID 0400	IRN-15N/P-GD S1	II 3D Ex tD A22 IP67 T1
Type Technical Data	IRS-U-15N/P S160		
			/S180 IRD-15N/P-GD S157/S
Type of Ex protection, Gas, at 94/9/EG	none	II 3G Ex nA IIB T	
Type of Ex protection, Dust, at 94/9/EG	none	II3DExtDA22IP67T135	
Applicable in Ex Zones		Zones 2 and 22	Zones 1,2 and 20/21
Range (on white paper A4,80g)		1.5m	
Light source		Infrared 880nm	1
Beam pattern (at nominal range)		appr. 12°	
Response time		0.5ms / 1kHz	
Supply voltage	24 VDC (20		maximum Um=30VDC
Current consumption		maximum 60mA	1
Maximum power dissipation		1.68W	
Output	Push-P	ull, 100mA, short circ	
Input, only types IRDI (Disable Input)		PNP compatible, Ri 1	
Housing	M30, yell	ow brass, type Ms58	3, nickel plated
Enclosure rating at EN 60529	IP54	IP67	IP67
Working temperature range TA		-20°C < TA < +50	D°C
Electrical connection	Socket M12, Lumbe	rg RSF 8, 8 terminals	
Accessories, all types	- 2 nuts M30 (optional 1		, , ,
Accessories, types IRD + IRNGD	- 1x Spare safety scre	w with packing ring	for potentiometer sealing
Accessories,	- 1x Safety lock device	mount at the cable	connection, for locking the
only types IRN-15N/P-GD S160/S157/S180	connection. (black		commodacii, for foothing the
511ly types 11(14 1014/1 GB G100/G101/G100			en supply voltage connected
		ng on the cable conn	
	- 1x Protection cap for		COLOI.
Accessories, optional for the types IRS and IRN			98/xx or RKWTH 8-298/xx
			90/XX UI KKWIH 0-290/XX
Options		mitter disable input	tout and O calcum LED
			tput and 3-colour LED
		urn potentiometer fixe	
		nal multiturn potention	
		urn potentiometer fixe	
	and re	educed hysteresis (3	3%)
Connection of the external potentiometer:	P ext. = max. $1k\Omega$		SENSOR MUST NOT BI
(Only S160)		Terminal Pot A	DRIVEN WITHOUT WIR
(3) 3.33)		TOTTIMICAL TOTT	
			EXTERNAL POTENTION
		Terminal Pot B(-)	ETER!
Function and LED display	Light barrier —	L Code ( )	
T different and EED display		Light b	
	with fibre optics Beam no	ot interrupted with fib	re optics Beam interrupt
	Proximity switch —	T = = Proxin	nity switch —
	·		
	with fibre optic—	——□── with fil	h w a a w ti a
			bre optic —
	rofloation datasts		
	reflection detecte	ed, LED=ON r	no reflection detected, LED=0
IRSN/IRNN IRDN		ed, LED=ON r +20-28VDC	no reflection detected, LED=0 +20-28VI
IRSN / IRNN IRDN Output low side switching (NPN)		ed, LED=ON r +20-28VDC	no reflection detected, LED=0
	PNP=OF	ed, LED=ON r +20-28VDC t F 1/white t	no reflection detected, LED=0 +20-28VI
	PNP=OF	ed, LED=ON r +20-28VDC F 1/white out	no reflection detected, LED=0 +20-28VI PNP=ON 1/wh R 15Ω Out
	PNP=OF	ed, LED=ON r +20-28VDC t F 1/white t	no reflection detected, LED=0 +20-28VI
	PNP=OF	ed, LED=ON r +20-28VDC = 1/white	no reflection detected, LED=0 +20-28VI PNP=ON 1/wh R 15Ω Out
	PNP=OF R 15Ω W—o	ed, LED=ON r +20-28VDC F 1/white Out 3/green	no reflection detected, LED=0 +20-28VI PNP=ON 1/wh R 15Ω Out NPN=OFF
	PNP=OF R 15Ω W—o	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown	PNP=ON 1/wh R 15Ω Out NPN=OFF NPN=OFF - 2/bre
Output low side switching (NPN)	PNP=OF R 15Ω W—o	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC	PNP=ON 1/wh R 15Ω Out NPN=OFF  NPN=OFF  - 2/bro +20-28VD
Output low side switching (NPN)  IRSP/IRNP IRDP	PNP=OF R 15Ω NPN=ON	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC	PNP=ON 1/wh R 15Ω Out NPN=OFF  NPN=OFF  - 2/brc +20-28VD
Output low side switching (NPN)	PNP=OF R 15Ω NPN=OF NPN=OF	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC J	PNP=OFF  no reflection detected, LED=0 +20-28VI PNP=ON 1/wh R 15Ω Out 3/greer - 2/bre 0 +20-28VI PNP=OFF 1/whit
Output low side switching (NPN)  IRSP/IRNP IRDP	PNP=OF R 15Ω NPN=ON NPN=ON PNP=OI R 15Ω	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC N 1/white Out	PNP=OFF  PNP=OFF  PNP=OFF  PNP=OFF  1/whit  PNP=OFF  1/whit  PNP=OFF  1/whit  PNP=OFF  1/whit  PNP=OFF  1/whit  PNP=OFF  1/whit
Output low side switching (NPN)  IRSP/IRNP IRDP	PNP=OF R 15Ω NPN=OF NPN=OF	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC N 1/white	PNP=OFF  no reflection detected, LED=0 +20-28VI PNP=ON 1/wh R 15Ω Out 3/greer - 2/bre 0 +20-28VI PNP=OFF 1/whit
Output low side switching (NPN)  IRSP/IRNP IRDP	PNP=OF R 15Ω NPN=ON NPN=ON PNP=OI R 15Ω	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC N 1/white Out 3/green	PNP=OFF  PNP=OFF  NPN=OFF  NP
Output low side switching (NPN)  IRSP/IRNP IRDP	PNP=OF R 15Ω NPN=OF NPN=OF R 15Ω NPN=OF R 15Ω NPN=OF	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC N 1/white Out 3/green	PNP=OFF  PNP=OFF  PNP=OFF  PNP=OFF  1/whit  PNP=OFF  1/whit  PNP=OFF  1/whit  PNP=OFF  1/whit  PNP=OFF  1/whit  PNP=OFF  1/whit
Output low side switching (NPN)  IRSP/IRNP IRDP	PNP=OF R 15Ω NPN=OF NPN=OF R 15Ω NPN=OF R 15Ω NPN=OF	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown - +20-28VDC N 1/white Out 3/green FF	PNP=OFF  PNP=OFF  NPN=OFF  NP
Output low side switching (NPN)  IRSP/IRNP IRDP  Output high side switching (PNP)	PNP=OF R 15Ω NPN=Of NPN=Of R 15Ω NPN=Of NPN=Of NPN=Of	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC N 1/white Out 3/green FF	PNP=OFF PNP=ON PNP=OFF NPN=ON NPN=ON NPN=ON NPN=ON NPN=ON NPN=ON NPN=ON
Output low side switching (NPN)  IRSP/IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input)	PNP=OF R 15Ω NPN=Of NPN=Of NPN=O	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC N 1/white Out 3/green FF - 2/brown	PNP=OFF PNP=OFF NPN=OFF NPN=O
Output low side switching (NPN)  IRSP/IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable	PNP=OF R 15Ω NPN=Of NPN=Of NPN=Of NPN=Of NPN=Of NPN=Of	ed, LED=ON r +20-28VDC F 1/white Out 3/green N - 2/brown +20-28VDC N 1/white Out 3/green FF - 2/brown	PNP=OFF PNP=OFF NPN=ON
Output low side switching (NPN)  IRSP/IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us	PNP=OF R 15Ω NPN=Of PNP=OI R 15Ω NPN=OI NPN=O	ed, LED=ON r +20-28VDC r - 1/white Out 3/green r - 2/brown r +20-28VDC r 1/white Out 3/green r - 2/brown r - 2/brown r	PNP=OFF PNP=OFF NPN=OFF NPN=OFF NPN=OFF NPN=OFF NPN=OFF NPN=OFF NPN=OFF NPN=OFF NPN=OFF NPN=ON NPN=
Output low side switching (NPN)  IRSP/IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us Hold time: >=7.5ms, DI = 0V=Enable	PNP=OF R 15Ω NPN=Of NP	ed, LED=ON r +20-28VDC r - 1/white Out 3/green r +20-28VDC r - 2/brown r +20-28VDC r 1/white Out 3/green r FF r - 2/brown r -	PNP=OFF NPN=OFF NPN=O
Output low side switching (NPN)  IRSP/IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us	PNP=OF R 15Ω NPN=Of NP	ed, LED=ON r +20-28VDC F 1/white Out 3/green - 2/brown +20-28VDC N 1/white Out 3/green FF - 2/brown  V Sensor 2000s enabled DI sensor enabled DI sensor 24V Outp S=7.5ms = 24V Outp Manufacturer with acceptance of the content of the	PNP=ON 1/whit PNP=ON 1/whit PNP=OFF 1/whit PNP=ON 1/whit PNP=OFF 1/whit PNP=ON 3/green NPN=ON 2/brow 3/green NPN=ON
Output low side switching (NPN)  IRSP/IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us Hold time: >=7.5ms, DI = 0V=Enable	PNP=OF R 15Ω NPN=Of NPN	ed, LED=ON r +20-28VDC F 1/white Out 3/green - 2/brown +20-28VDC N 1/white Out 3/green FF - 2/brown  V Sensor 200us enabled D1 >=7.5ms =24V Manufacturer with ac II 2G Ex d IIC T6, II	PNP=ON 1/whit PNP=ON 1/whit PNP=OFF 1/whit PNP=ON 3/green NPN=ON 3/green NPN=ON 200us Ser disabled but holds previous state DI ena ena end of ddress 1/2D Ex tD A20/A21 IP67 T90°C
Output low side switching (NPN)  IRSP/IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us Hold time: >=7.5ms, DI = 0V=Enable	PNP=OF R 15Ω NPN=Of NPN	ed, LED=ON r +20-28VDC F 1/white Out 3/green - 2/brown +20-28VDC N 1/white Out 3/green FF - 2/brown  V Sensor 200us enabled DI out >=7.5ms =24V Out Manufacturer with act II 2G Ex d IIC T6, II II 3G Ex nA IIB T4, III	PNP=ON 1/white 1/whit
Output low side switching (NPN)  IRSP/IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us Hold time: >=7.5ms, DI = 0V=Enable	PNP=OF R 15Ω NPN=OF R 15Ω NPN=O	ed, LED=ON r +20-28VDC F 1/white Out 3/green - 2/brown +20-28VDC N 1/white Out 3/green FF - 2/brown  V Sensor 200us enabled DI Out >=7.5ms =24V  Manufacturer with ac II 2G Ex d IIC T6, II II 3G Ex nA IIB T4, DMT 99 ATEX E 056	PNP=ON 1/white 1/s 1/s 20 Out 3/greer NPN=OFF 1/white 1/s 1/s 20 Out 3/green NPN=OFF 1/white 1/s 1/s 20 Out 3/green NPN=ON 2/brow 3/green NPN=ON 200us Ser DI ena = 0V >=7 Out 200us Ser
Output low side switching (NPN)  IRSP/IRNP IRDP Output high side switching (PNP)  IRDI (with optional Disable Input) Uin: 18V-28VDC,DI=+24V=Disable Response time: <=200us Hold time: >=7.5ms, DI = 0V=Enable	PNP=OF R 15Ω NPN=Of NPN	ed, LED=ON r +20-28VDC F 1/white Out 3/green - 2/brown +20-28VDC N 1/white Out 3/green FF - 2/brown  V Sensor 200us enabled DI Out >=7.5ms =24V  Manufacturer with ac II 2G Ex d IIC T6, II II 3G Ex nA IIB T4, DMT 99 ATEX E 056	PNP=ON 1/whit PNP=OFF 1/whit PNP=ON 3/green NPN=ON 1/whit PNP=ON 3/green NPN=ON 3/green NPN=ON 200us Ser DI ena ena env >=7 ddress 1/2D Ex tD A22/A21 IP67 T90°c ufacturer at 94/9/EC



#### Ex protection:

#### General regulations for all types of Ex devices:

It is necessary to take into consideration the valid international and national rules and regulations. The maximum rated supply voltage Um = 30 VDC must not be exceeded. The local equipotential bonding have to be done. The protective earth (PE) is solid connected with the housing. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certificated Ex e housings. All cable terminals must be connected outside hazardous locations. Other then original manufacturer, additional optical lenses are not allowed in hazardous locations. In Exzones 20/21 and 22, do not operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced.

Types: IRD-.. are applicable in Exzones 1, 2 and 20/21, 22. For the zones 20/21 only the front part (optical lens) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

Types: IRN-..-GD are only applicable in Ex zones 2 & 22 hazardous locations. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 8-298/xx (Straight type) RKTW/RKWTH 8-298/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the protection cap for the socket must be fitted, when the connection cable is not connected

#### General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables

## Function IR.-..-N/P

The sensor works basically as proximity switch on diffuse optical reflections. If the sensor detects reflected light, the LED shows red and the output switches on +24VDC (P types) or 0V (N types). If no reflected light will be recognized, the output switches to 0V (P types) or +24VDC (N types). The push-pull output allows to connect the load to +24VDC or 0V.

## Optional pollution indication output , series "VA": The VA output will be activated by polluted lenses or reduced optical input

signal. If only reduced optical input signal will be detected, the LED shows yellow and the pollution indication output will be activated. If no light can be detected both outputs are switched OFF and the LED shows red. If strong light is detected only the standard output is switched ON, the pollution indication output is switched OFF and the LED shows green.

## Optical power adjustment by the external potentiometer $1k\Omega$ ,

With the potentiometer the sensor can be adapted at different requirements. THE SENSOR MUST NOT BE CONNECTED AT THE SUPPLY VOLTAGE WITHOUT WIRED EXTERNAL POTENTIOMETER! THE MAXIMUM VALUE OF THE EXTERNAL POTENTIOMETER MUST BE EQUAL OR LESS THEN  $1k\Omega$ . The terminal Pot B is internal connected at 0V. The series S157 is provided with a fixed at the sensor mounted potentiometer.

#### Sensors with disable input, types IR.-..-DI:

If several sensors are installed close to another, it is necessary to use sensors with disable input. By using the disable input DI, each sensor can

be controlled in a short reaction time. If only one sensor is activated in the same time, a mutual influence is precluded.

DI= 0V or not connected = emitter enabled DI= High (24VDC) = emitter disabled

For a correct function the sensor must be enabled for at minimum >= 7.5ms (DI=0V). If the DI input will be disabled, the outputs holds the previous output status from the last enabled time. The DI input is PNP compatible.

#### Optical range

The nominal range is defined on white paper A4, 80g. The range will be influenced by the color, kind of surface and shape of the object.

#### Fibre optics

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas. Fibre optics for Ex zones 0 and 20 must only be driven by ATEX approved sensors with limited optical output power at DMT 99 ATEX 056.

#### Maintenance

Protect the sensor and the optional fibre optics against pollution. If the fibre optics or the sensor lenses are contaminated, clean with alcohol. Do not use aggressive solvents. Optical fibres can be destroyed by strong solvents. Equipment must only be repaired or serviced by the manufacturer.

#### Safety Informations

The dismounting of the connector safety lock device while the supply voltage is connected is hazardous! The mounting of the sensor in dusty locations without fixed cordset or protection cap results in a high ignition risk. The sensors types IRS/IRN/IRD-.. must not be used for Accident-Prevention! In worst case of disturbance, the output can show any state. When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations. ATEX118a, EX-RL(BGR104), ElexV, TrbF, TRD, UVV, BetrSichV(ATEX137), Einzel-RL 1999/92/EG.

Standards met:

- EN 60079-0:2004, EN 60079-1:2004, EN 60079-15, EN 60079-28:2007, EN 60241-0:2004, EN 61241-1:2004;
- EN 60529:2000, EN 60950-1:2006;
- EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4;
- Ex-Protection: 94/9/EC (ATEX 100a)
- Machine Directive: 98/37/EC
- RoHS: 2002/95/EC
- Low Voltage Directive: 73/23/EWG, 93/68/EWG
- EMC: 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG
- Tech. File Rev.: AN-MAT-08-EX-E056

#### **General Notes**

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

### CE Declaration of Conformity

Certification, series IRD-..: DMT 99 ATEX E 056

Certification, series IRN-..: Declaration of conformity by manufacturer at 94/9/EC. Tech File No: AN-MAT-08-EX-E056.

ATEX certification of quality type production of Ex devices at the directive 94/9/EC Certification No: BVS 03 ATEX ZQS / E118

The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001:2008 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG







II 2G Ex d IIC T6 II 1/2D Ex tD A20/21 IP67 T90°C



# Diffuse reflective photoelectric sensors IRS/IRN/IRD-2X(-GD) 10KHZ (S160) -.. Housing M30 IRN-...-GD • Applicable with different types of fibre optics IRD-.. **(€** 0158

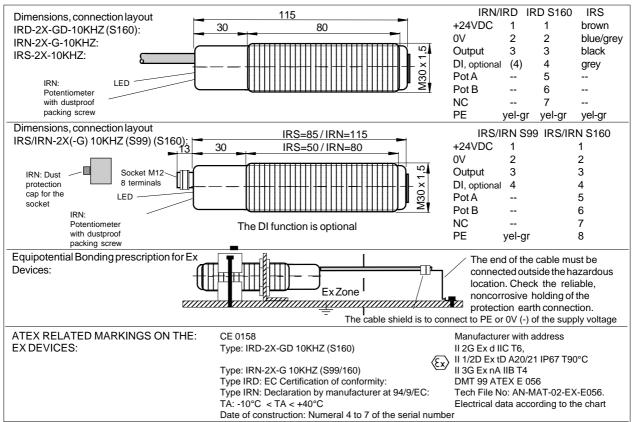
• Type IRD, applicable in Ex Zones 1, 2, 20/21, 22

• Type IRN, applicable in Ex Zones 2



II 1/2D Ex tD A20/21 IP67 T90°C  • Short resp	onse time, 10kHz	,	II 3G Ex nA IIB T4
Type Technical Data	IRS-2X 10KHZ (S160)	IRN-2X-G 10KHZ (S16	0) IRD-2X-GD 10KHZ (S160)
Type of Ex protection Gas, at 94/9/EG	None	II 3G Ex nA IIB T4	II 2G Ex d IIC T6
Type of Exprotection Gas, at 94/9/EG Type of Ex protection Dust, at 94/9/EG			II 1/2D Ex tD
Type of Ex protection Dust, at 94/9/EG	None	None	
A			A20/21 IP67 T90°C
Applicable in Ex zones	None	2	1, 2, 20/21, 22
Rated sensing distance		cm ( on white paper, A4,	
Sensing distance adjustment	Potentiometer at th	e device / S160: Externa	al potentiometer 1k $\Omega$
Light source		Infrared LED, 880nm	
Optical output power			
Directional angle		5° to 15°	
Response time		45us / 11.1kHz	
Power reset time		20ms	
Power supply voltage	24 VD0	C +-10%, Um = maximum	30VDC
Current consumption		80mA	
Output type	Sr	nart power switch (push-	oull)
Current switching		00mA, short circuit protec	
Input, only types IRDI (Disable input)		PNP compatible, Ri 10kg	
Housing		ickel plated. Lens cover:	
Enclosure rating at EN 60529	IP 54	IP 67	IP67
Shock and vibrating resistance	Vibration: 30g over 20l	Hz to 2kHz. Shock:50g fo	r each direction (X, Y, Z)
Operating and storage temperature range TA		-10°C < TA < +40°C	
Connection cable, jacket	PVC		UR/TPE
Connection cable	3G/4Gx0.5mm2, L=3m	4G or 5Gx0.5r	nm2, shielded, L=5m
	Wires colored	Wire	snumbered
Connection cable, IRD-2X-GD-10KHZ S160	7G x 0.5m	m², Vollflex NUM CY, sh	
Socket, IRS/IRN-2X 10KHZ S99		M12, Lumberg RSF 5, 5	
Socket, IRS/IRN-2X 10KHZ S160		M12, Lumberg RSF 8, 8	
Accessories included, all types			terriniais
	- 2 nuts M30 (or 1 clamp, o		
Accessories, only IRN-2X-G 10KHZ S99 + S160	- 1x Safety lock device, mou		
			Not Disconnect While Circuit Is
	cable connector	To Be Non-Hazardous", s	elf-sealing, for gluing on the
	- 1x Protection cap for the se		
Accessories, only ATEX devices with potentiomete	- 1x Spare safety screw w	ith packing ring for poten	tiometer sealing
Options	- IR. DI: With emitter disable	input	
	- IRS/IRN S99: Socket M12,	Lumberg RSF 5	
	- IRD <b>S160</b> : External potention	ometer at the cable end for	sensitivity adjustment.
	- IRS/IRN S160: Connection	for external potentiometer a	at the socket M12
Wiring for external potentiometer:	P ext. = max. 1kR	ead Pot A	ENSOR MUST NOT BE
(Only \$160)		.ead Pot A DF	RIVEN WITHOUT CON-
(- , )	→	NE	ECTED EXTERNAL POTEN
			OMETER!
Function and LED display			
T diliction and LED display	Light barrier —	Light barrie	·───────────
	with fibre optics Beam no	t interrupted with fibre o	ptics Beam interrupted
	Proximity switch —	T   Dravimity	nuitab -
	1 TOXITITITY SWITCH	Proximity:	switch —
	with fibre optic—	with fibre	ontic —
		<b>U</b>	
	Reflection detected, LE	D=ON No refle	ction detected, LED=OFF
Connection for Light-ON function:		+24VDC	_+
IRN/IRD IRD S160 IRS IRS/IRN S99 IRS/IRN S16			14
+24VDC 1 1 brown 1 1	PNP=ON		PNP=OFF
0V 2 2 blue/grey 3 2	R 15Ω	9 \	R 15Ω
Output 3 3 black 4 3 DI (optional) (4) 4 grey 4	<b>├</b> \\\	Out	∕√√o Out
POT A (S160) 5 5		,1 /	1
POT B (S160) 6 6	NPN=OF	F   † /_	NPN=ON
NC 7 7	P \ <b>!</b> }	9 \	! <b>-</b> \/
PE yel-gr yel-gr yel-gr 5 8 Cable shield white white white		OV	→ 0V
Connection for Dark-ON function:		+24VDC	→ +24VDC
IRN/IRD IRD S160 IRS IRS/IRN S99 IRS/IRN S16		.27700	¥ 124VDC
	PNP=OF	F   1 →	PNP=ON
+24VDC 2 2 blue/grey 3 2	/ TI /FINF=OF	·   b \	. 1 \ /
+24VDC 2 2 blue/grey 3 2 0V 1 1 brown 1 1	1 8 11/	Ι Υ `	R 150
+24VDC 2 2 blue/grey 3 2 2 0V 1 1 brown 1 1 1 0utput 3 3 black 4 3	R 15Ω	'	R 15 $\Omega$
+24VDC 2 2 blue/grey 3 2 0V 1 1 1 brown 1 1 Output 3 3 black 4 3 DI (optional) (4) 4 grey 4	1 8 11/	'	R 15Ω 
+24VDC 2 2 blue/grey 3 2 2 0V 1 1 brown 1 1 1 0utput 3 3 black 4 3	R 15Ω	Out	Out
+24VDC 2 2 blue/grey 3 2 0V 1 1 1 brown 1 1 Output 3 3 black 4 3 DI (optional) (4) 4 grey 4 POT A (S160) 5 5	R 15Ω	Out	R 15Ω WV—o Out NPN=OFF
+24VDC 2 2 blue/grey 3 2 0V 1 1 1 brown 1 1 Output 3 3 black 4 DI (optional) (4) 4 grey 4 POT A (S160) 5 5 POT B (S160) 6 6 NC 7 7 PE yel-gr yel-gr yel-gr 5 8	R 15Ω NPN=ON	Out	NPN=OFF
+24VDC         2         2         blue/grey         3         2           0V         1         1         brown         1         1           Output         3         3         black         4         3           DI (optional)         (4)         4         grey          4           POT A (S160)          5           5           POT B (S160)          6           6           NC          7           7           PE         yel-gr         yel-gr         yel-gr         5         8           Cable shield         white         white         white	R 15Ω	Out	
+24VDC         2         2         blue/grey         3         2           0V         1         1         brown         1         1           Output         3         3         black         4         3           DI (optional)         (4)         4         grey          4           POT A (S160)          5           5           POT B (S160)          6           6           NC          7           7           PE         yel-gr         yel-gr         yel-gr         5         8           Cable shield         white         white         white         white	R 15Ω NPN=ON	Out	NPN=OFF
+24VDC         2         2         blue/grey         3         2           0V         1         1         brown         1         1           Output         3         3         black         4         3           DI (optional)         (4)         4         grey          4           POT A (S160)          5           5           POT B (S160)          6           6           NC          7           7           PE         yel-gr         yel-gr         yel-gr         5         8           Cable shield         white         white         white	R 15Ω NPN=ON	Out  DV  The state of the state	NPN=OFF  OV
+24VDC         2         2         blue/grey         3         2           0V         1         1         brown         1         1           Output         3         3         black         4         3           DI (optional)         (4)         4         grey          4           POT A (S160)          5           5           POT B (S160)          6           6           NC          7           7           PE         yel-gr         yel-gr         yel-gr         5         8           Cable shield         white         white         white         white	R 15Ω NPN=ON	Out  OV  Sensor 50us Sensor d	NPN=OFF  OV  50us Sensor
+24VDC         2         2         blue/grey         3         2           0V         1         1         brown         1         1           Output         3         black         4         3           DI (optional)         (4)         4         grey          4           POT A (S160)          5           5           POT B (S160)          6           6           NC          7           7           PE         yel-gr         yel-gr         5         8           Cable shield         white         white         white   IRDI (with optional Disable Input) Uin:  18V-26.4VDC,DI=+24V=Disable	R 15Ω NPN=ON	Out  OV  Sensor 50us enabled DI Sensor d	NPN=OFF  0 0V

IRSND-2X-10KHZ-S160\_e2,2009-01-23/HB



#### **Mounting prescriptions** Ex protection:

General regulations for all types of Ex devices:

It is necessary to take into consideration the valid international and national rules and regulations (EN 60079-14). The maximum rated supply voltage Um = 30VDC must not be exceeded. The local equipotential bonding have to be done. The protective earth (PE) is solid connected with the housing. The cable have to be installed and protected against damages. The cable with termination fittings, or in cable tray systems and installed in a manner to avoid tensile stress at the termination fittings. To connect cables inside hazardous locations only use certificated Ex e housings. All cable terminals must be connected outside hazardous locations. Other then original manufacturer, additional optical lenses are not allowed in hazardous locations. In Ex zones 20/21 and 22, do not operate the sensors without fixed dustproof sealing crew. After adjust the potentiometer, the dustproof sealing crew with undamaged packing ring, must be screwed down. Damaged or lost screws or packing rings must be replaced.

Types IRD-2X-GD 10KHZ (S160) are applicable in Ex zones 1, 2 and 20/ 21, 22. For the zones 20/21 only the front part (optical lens) can be mounted inside the zone 20. The rear part with the cable must be in the zone 21.

Types IRN-2X-G 10KHZ (S99 / S160) are only applicable in the Ex zone 2 hazardous locations. Do not separate the connector when the supply voltage is connected to the cable. When installing the sensor, the safety lock device must be fitted at the cable connector. The additional adhesive warning label must be fixed to the connector housing at the connection cable. Lumberg cordsets RKTS 5/8-298/xx (Straight type) RKTW/RKWTH 5/8-298/xx (Right angle type) are allowed ONLY. It is necessary to take into consideration the mounting prescription of the connector manufacturer. In dusty locations, the protection cap for the socket must be fitted, when the connection cable is NOT connected.

#### General mounting prescriptions:

Do not exceed the maximum ratings. The electrical connections must be exactly as shown in the connection diagram. The cable shield must be connected short. The cable shield should be connected to the protection earth, large-surfaced. Connection cables must not be installed parallel to high voltage cables.

#### Function IR.-2X(-GD) 10KHZ (S99, S160)

The sensor works basically as proximity switch on diffuse optical reflections. By changing the polarity of the supply voltage, the output function will be inverted. If the sensor detects reflected light, the LED shows red and the output switches on 0VDC or +24VDC dependent of the polarity of the supply voltage. If no reflected light will be recognized, the LED distinguished and the output switches on +24VDC or 0V dependent of the polarity of the supply voltage. The load must be connected OV or +24VDC. The sensor will be influenced by other alternating light sources. Protect the sensing area an the sensor against alternating light sources.

#### Sensitivity adjustment with the external potentiometer 1kR, only Type S160

Use the potentiometer to adjust the sensor at different marking discs, POF, mechanical and other arrangements. Set the potentiometer as well, that the output signal will be free of failures over the operating range. The sensor must not be driven without connected potentiometer. If no potentiometer is connected the emitter LED may be destroyed. The maximum rating for the potentiometer is 1 kR. The lead Pot B is internal connected to 0V.

#### Sensors with disable input, types IR.-..-DI:

If several sensors are installed close to another, it is necessary to use

sensors with disable input. By using the disable input DI, each sensor can be controlled in a short reaction time. The response time is 50us. If only one sensor is activated in the same time, a mutual influence is precluded. The sensor must be activated for >=100us.

0V or not connected = emitter enabled High (24VDC) = emitter disabled

#### Sensing distance / sensitivity

The nominal range is defined on white paper A4, 80g. The range will be influenced by the color, kind of surface and shape of the object.

#### Fibre optics

For efficiently detection solutions look for our multiple program of fibre optics, also for high temperature areas. Fibre optics for Ex zones 0 and 20 must only be driven by ATEX approved sensors with limited optical output power at DMT 99 ATEX 056!

#### Maintenance

No special maintenance is required. If the lenses becomes dirty, they should be cleaned with a non-aggressive cleaning liquid. Equipment must only be repaired by the manufacturer.

#### Safety instructions

The dismounting of the connector safety lock device while the supply voltage is connected is hazardous! The mounting of the sensor in dusty locations without fixed cordset or protection cap results in a high ignition risk. The sensor IRS/IRN/IRD-.. must not be used for Accident-Prevention! In worst case the output can change to any state! When installing and operating with the sensor, it is necessary to take into consideration the relevant international and other national regulations: ATEX118a, EX-RL(BGR104), ElexV, TrbF, TRD, UVV, BetrSichV(ATEX137), Single directive 1999/92/EC Standards met:

- EN 60079-0:2004, EN 60079-1:2004, EN 60079-15, EN 60079-28:2007, EN 60241-0:2004, EN 61241-1:2004;
- EN 60529:2000, EN 60950-1:2006;
- EN 61000-4-2 to EN 61000-4-6, EN 61000-6-1/-2, EN 61000-6-4;
- Ex-Protection: 94/9/EG (ATEX 100a)
- Machine Directive: 98/37/EG
- RoHS: 2002/95/EG
- Low Voltage Directive: 73/23/EWG, 93/68/EWG
- EMC: 89/336/EWG, 91/263/EWG, 92/31/EWG, 93/68/EWG
- Tech. File Ref.: AN-MAT-02-EX-E056

#### **General Notes**

We reserve the right to modify our equipment. Our equipment is designed such way, that it has the least possible adverse effect on the environment. It neither emit or contain any damaging or siliconized substances and use a minimum of energy and resources. No longer usable or irreparable units must be disposed of in accordance with local waste disposal regulations.

#### **EC Declaration of Conformity**

Type IRD-...-GD: EC type certification. No: DMT 99 ATEX E 056 Type IRN-...-G: Declaration of conformity by manufacturer at 94/9/EC.

Tech File No: AN-MAT-02-EX-E056.

ATEX certification of quality type production of Ex devices at the directive 94/ 9/EC Certification No: BVS 03 ATEX ZQS / E118

The conformity of the devices with the EC standards and directives and the EC-type examination certificate and the observation of the Quality Safety System ISO 9001:2000 with the ATEX module "Production", declares:

Hans Bracher, Matrix Elektronik AG

