Pro+ CORPORATION

Leuze

Product overview

2026

The Sensor People

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Our company
Everything at a glance

In a constantly changing industrial world, we work together with our customers to find the best solution for their sensor applications: innovatively, precisely and efficiently.

Key figures

Foundation	1963
Company structure	GmbH + Co. KG, wholly family-owned
Executive management	Salvatore Buccheri, Dr. Henning Grönzin, Helge Held
Headquarters	Owen, Germany
Subsidiaries	22
Production locations	5
Technological competence centers	3
Distributors	40
Employees	1,200

Product range

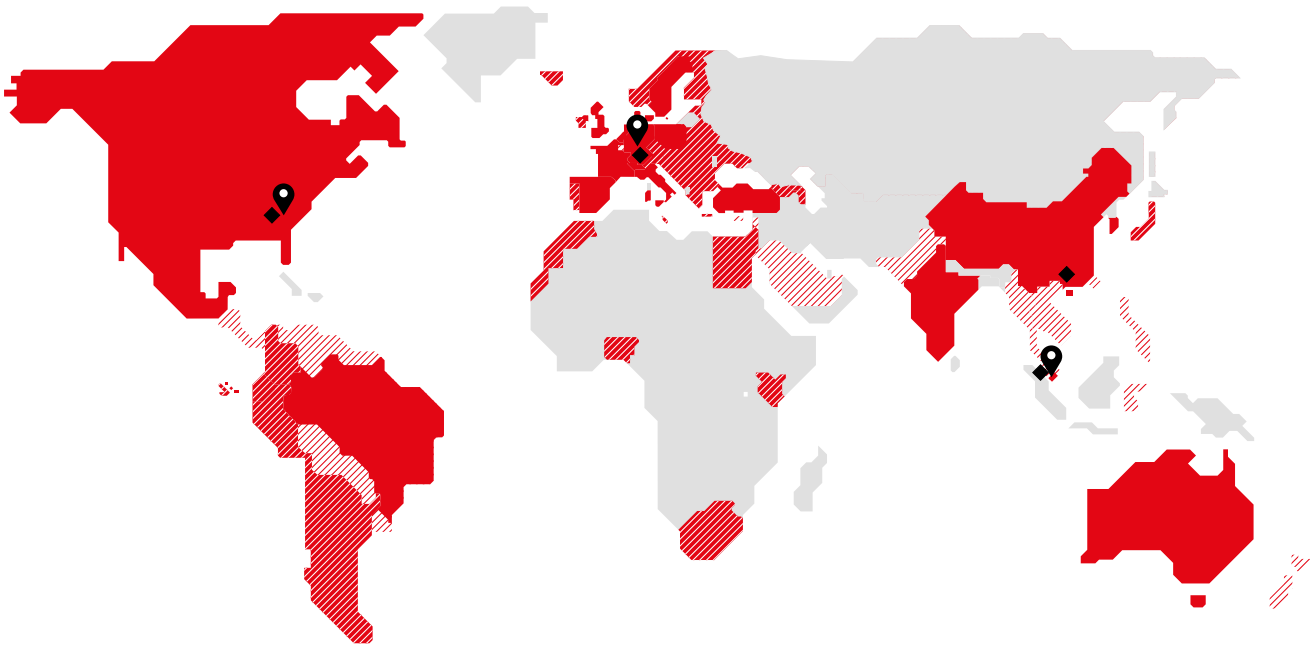
— Switching sensors
— Measuring sensors
— Safety
— Identification
— Data transmission
— Network and connection technology
— Industrial image processing
— Accessories and supplementary products

Leuze electronic GmbH + Co. KG

In der Braike 1
73277 Owen
Phone: +49 7021 573-0
Fax: +49 7021 573-199
E-mail: info@leuze.com
www.leuze.com

Our Locations
At work for you around the world

Your success is our motivation. We therefore place great value on always being personally, quickly, and easily accessible to you. We produce on four continents, allowing us to offer you reliable product availability.



- Technological competence centers
- Production locations
- Subsidiaries
- Distributors
- Distribution through neighboring country

Technological competence centers

Owen, Germany
Duluth/Georgia, USA
Singapore

Production locations

Owen, Germany
Unterstadion, Germany
Duluth/Georgia, USA
Shenzhen, China
Malacca, Malaysia

Subsidiaries

Australia/New Zealand
Austria
Belgium
Brazil
China
Denmark/Sweden
Germany – headquarters
Germany – distribution company
France
Great Britain
Hong Kong
India
Italy
Mexico
Poland
Singapore
South Korea
Spain
Switzerland
The Netherlands
Turkey
USA/Canada

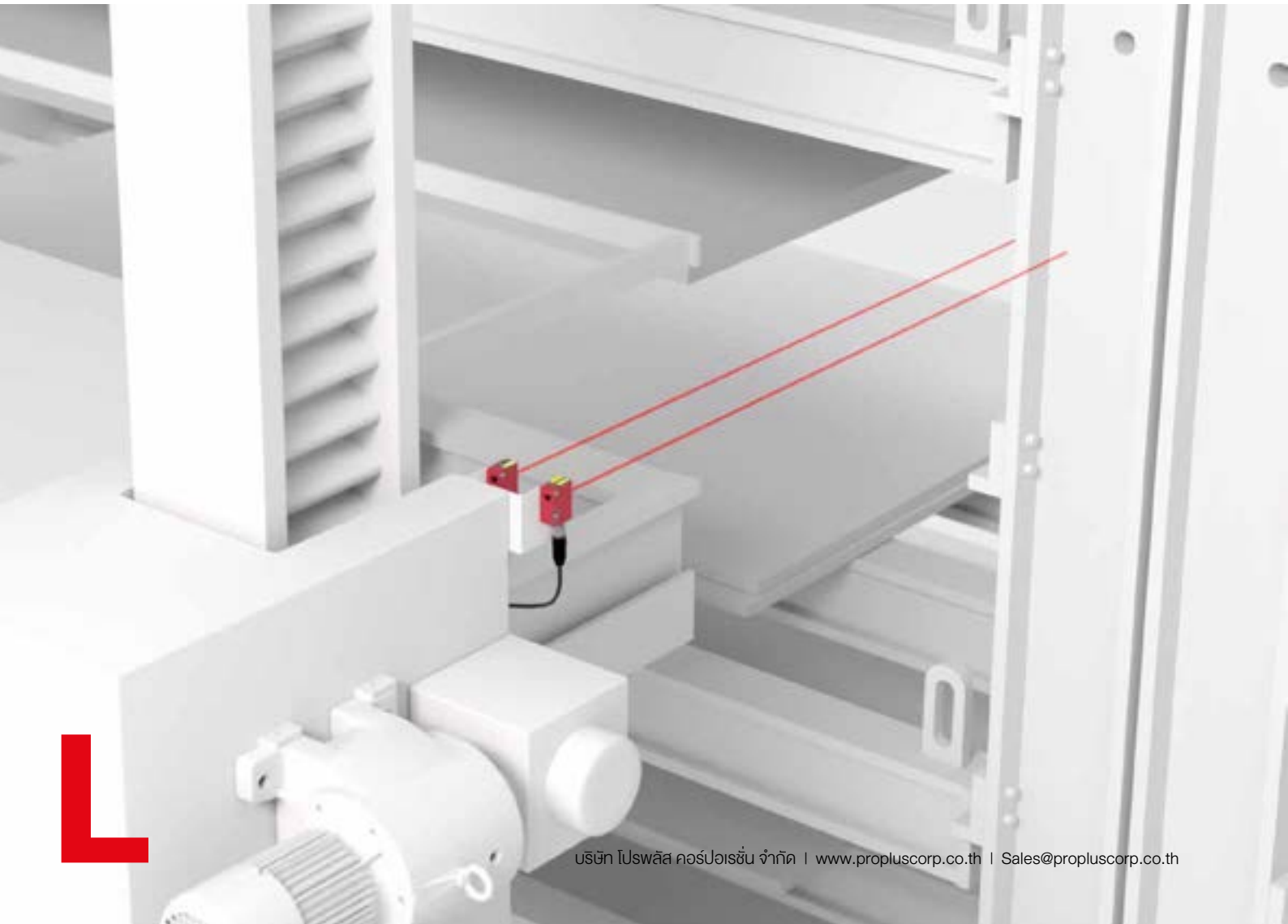
Switching sensors

Well switched: Stable and reliable detection of all objects and packaging

Using various operating principles and technologies, switching sensors detect objects reliably – at either the start or end point of the application.

We offer a variety of sensors that detect an object optoelectronically, with ultrasonics, inductively or capacitively, and output a stable switching signal. We meet the diverse requirements from the production and packaging industry with a large number of different light spots, operating principles, designs and sizes.

The usability when aligning and adjusting the switching point is simple and intuitive for all models. The sensors output standardized switching signals, NPN/PNP as well as IO-Link data, and can thus be integrated into all applications. Many series offer helpful additional functions to facilitate service intervals that are as long as possible.



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To the point: New sensors with Power PinPoint® LED

Our optical sensors with Power PinPoint® LED are even easier to commission and ensure high process reliability.

Photoelectric proximity switches and photoelectric sensors with Power PinPoint® LED utilize innovative light source technology. Thanks to the newly developed light-emitting diode, the sensors' optical system generates a light spot that retains its size, shape and homogeneity throughout the sensor's entire working range.

Your benefits

- Simple sensor commissioning for object detection thanks to small, round, homogeneous light spot over the sensor's entire working range
- Perfect object tracking with precise start and end detection of the object with pinpoint response behavior
- Diffuse sensors detect small objects particularly reliably thanks to their optimum response behavior and high precision. Sensors with Power PinPoint® LEDs can also be used instead of laser light scanners in some applications
- Better detection results in applications with small reflectors and long distances thanks to higher function reserves for retro-reflective sensors
- Greater detection reliability with throughbeam photoelectric sensors in parallel operation of several sensors thanks to the compact light beam with low divergence and improved diffused light suppression

Optical sensors

		Photoel. sensors / diffuse sensors, cubic housing	
		2 series Universal, micro	**23 series** Standard
Technical data	Dimensions without connector (W x H x D)	8 mm x 23.1 mm x 12 mm	11.4 mm x 34.2 mm x 18.3 mm
	Supply voltage U_B	10 ... 30 V, DC	10 ... 30 V, DC
	Interface		
	Switching outputs	Transistor	Transistor
	Connection type	Cable | Cable with connector, M8 | Cable with connector, M12	Cable | Cable with connector, M8 | Cable with connector, M12 | Connector, M8
	Degree of protection	IP 67	IP 67
	Housing material	Plastic	Plastic
	Compatibility of materials		
	Ambient temperature, operation	-30 °C ... 55 °C	-40 °C ... 60 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 2 m	0 m ... 10 m
	Light source	LED, Red	LED, Red
	Switching frequency	385 Hz	500 Hz
	Operational controls		
Retro-reflective photoelectric sensors	Min./max. operating range limit	0.07 m ... 4 m	0.1 m ... 6 m
	Light source	LED, Red	LED, Red
	Switching frequency	700 Hz	500 Hz
	Operational controls		
Energetic diffuse sensor	Min./max. operating range limit		0 m ... 0.7 m
	Light source		LED, Red
	Switching frequency		500 Hz
	Operational controls		Multiturn potentiometer
Diffuse sensors with background suppression	Min./max. operating range limit	0.001 m ... 0.06 m	0.005 m ... 0.4 m
	Light source	LED, Red	LED, Red
	Switching frequency	700 Hz	1,000 Hz
	Operational controls		Multiturn potentiometer
Functions	Activation input	X	
	Suppression of HF illumination (LED)		
	Autocollimation		
	Extra long light spot (XL)		
	Small light spot (S)	X	
	Teach input		
	Tracking function		
	Warning output		

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3C series
Universal, mini

11.4 mm x 34.2 mm x 18.3 mm	11 mm x 32.4 mm x 20 mm	15 mm x 46.5 mm x 31.8 mm
10 ... 30 V, DC | 12 ... 30 V, DC	10 ... 30 V, DC	10 ... 30 V, DC
IO-Link		
Transistor	Transistor	Transistor
Cable | Cable with connector, M8 | Cable with connector, M12 | Connector, M8	Cable | Cable with connector, M8 | Cable with connector, M12 | Cable with connector, Snap-in, M8 | Cable with JST connector | Connector, M8	Cable | Cable with connector, M8 | Cable with connector, M12 | Connector, M12
IP 67 | IP 69K	IP 67	IP 67
Plastic	Plastic	Plastic
ECOLAB	ECOLAB	
-40 °C ... 60 °C	-40 °C ... 60 °C	-40 °C ... 60 °C
0 m ... 10 m	0 m ... 17.5 m	0 m ... 15 m
Laser, Red | LED, Red	LED, Infrared | LED, Red | Power PinPoint® LED, Red	LED, Infrared | LED, Red
1,000 Hz ... 3,000 Hz	900 Hz	500 Hz
270° potentiometer		
0 m ... 7 m	0.02 m ... 7.5 m	0.02 m ... 6 m
Laser, Red | LED, Red | Power PinPoint® LED, Red	LED, Red | Power PinPoint® LED, Red	LED, Red
1,500 Hz ... 3,000 Hz	500 Hz ... 1,000 Hz	500 Hz
270° potentiometer | Teach button	270° potentiometer	Teach button
	0.001 m ... 1 m	0 m ... 0.85 m
	LED, Infrared | LED, Red	LED, Red
	900 Hz	500 Hz
	Multiturn potentiometer	Teach button
0.005 m ... 0.6 m	0.002 m ... 0.4 m	
Laser, Red | LED, Infrared | LED, Red | Power PinPoint® LED, Red	LED, Infrared | LED, Red | Power PinPoint® LED, Red	
250 Hz ... 3,000 Hz	1,000 Hz	
Multiturn potentiometer | Teach button	Multiturn potentiometer	
X		
X		
X		
X	X	
X		
X		
X		
X		

5B series
Standard

28 series
Standard, multimount

Optical sensors

		Photoel. sensors / diffuse sensors, cubic housing	
		15 series Standard	**25C series** Universal
Technical data	Dimensions without connector (W x H x D)	15 mm x 42.7 mm x 30 mm	15 mm x 42.7 mm x 30 mm
	Supply voltage U_B	10 ... 30 V, DC	10 ... 30 V, DC | 12 ... 30 V, DC
	Interface		IO-Link
	Switching outputs	Transistor	Transistor
	Connection type	Cable | Cable with connector, M12 | Connector, M8 | Connector, M12	Cable | Cable with connector, M8 | Cable with connector, M12 | Cable with connector, Snap-in, M8 | Connector, M8 | Connector, M12
	Degree of protection	IP 67	IP 67 | IP 69K
	Housing material	Plastic	Plastic
	Compatibility of materials		ECOLAB
	Ambient temperature, operation	-40 °C ... 60 °C	-40 °C ... 60 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 30 m	0 m ... 400 m
	Light source	LED, Red	LED, Infrared | LED, Red | Power PinPoint® LED, Red
	Switching frequency	500 Hz	100 Hz ... 1,500 Hz
	Operational controls		270° potentiometer
Retro-reflective photoelectric sensors	Min./max. operating range limit	0 m ... 10 m	0 m ... 25 m
	Light source	LED, Red	Laser, Red | LED, Red | Power PinPoint® LED, Red
	Switching frequency	500 Hz	1,500 Hz ... 2,500 Hz
	Operational controls	270° potentiometer	270° potentiometer | Multiturn potentiometer | Teach button
Diffuse sensors with background suppression	Min./max. operating range limit	0.012 m ... 1 m	0 m ... 1.3 m
	Light source	LED, Infrared | LED, Red	Laser, Red | LED, Infrared | LED, Red | Power PinPoint® LED | Power PinPoint® LED, Red
	Switching frequency	500 Hz	250 Hz ... 2,500 Hz
	Operational controls	Multiturn potentiometer	Multiturn potentiometer | Teach button
Functions	Activation input		X
	Suppression of HF illumination (LED)		X
	Autocollimation		X
	Dynamic reference diffuse sensor		X
	Extra long light spot (XL)		X
	Small light spot (S)		X
	Teach input		X
	Tracking function		X
	Warning output		X

NEW

33C series
Stainless steel, Hygiene design

NEW

35C series
Stainless steel, Wash-Down design

36 series
Standard

18.8 mm x 52.8 mm x 32.4 mm	18.8 mm x 55.3 mm x 32.4 mm	20.5 mm x 76.3 mm x 44 mm
10 ... 30 V, DC | 12 ... 30 V, DC	10 ... 30 V, DC | 12 ... 30 V, DC	10 ... 30 V, DC
IO-Link	IO-Link	
Transistor	Transistor	Transistor
Connector, M8	Cable | Cable with connector, M12 | Connector, M12	Cable | Cable with connector, M8 | Cable with connector, M12 | Connector, M12
IP 67 | IP 68 | IP 69K	IP 67 | IP 68 | IP 69K	IP 67
Stainless steel	Stainless steel	Plastic
CleanProof+ | ECOLAB | Johnson Diversey	CleanProof+ | ECOLAB | Johnson Diversey	
-40 °C ... 60 °C	-40 °C ... 60 °C	-40 °C ... 60 °C
0 m ... 400 m	0 m ... 400 m	0 m ... 100 m
LED, Infrared | Power PinPoint® LED, Red	LED, Infrared | Power PinPoint® LED, Red	LED, Red
100 Hz ... 1,500 Hz	100 Hz ... 1,500 Hz	300 Hz
270° potentiometer	270° potentiometer	270° potentiometer
0 m ... 25 m	0 m ... 25 m	0.3 m ... 21 m
Laser, Red | Power PinPoint® LED, Red	Laser, Red | Power PinPoint® LED, Red	LED, Red
1,500 Hz ... 2,500 Hz	1,500 Hz ... 2,500 Hz	300 Hz
270° potentiometer | Multiturn potentiometer | Teach button	270° potentiometer | Multiturn potentiometer | Teach button	
0 m ... 1.2 m	0 m ... 1.2 m	0.01 m ... 2.5 m
Laser, Red | LED, Red | Power PinPoint® LED, Red	Laser, Red | LED, Red | Power PinPoint® LED, Red	LED, Infrared | LED, Red
300 Hz ... 2,500 Hz	300 Hz ... 2,500 Hz	250 Hz
Multiturn potentiometer | Teach button	Multiturn potentiometer | Teach button	Multiturn potentiometer
X	X	
X	X	
X	X	
X	X	
X	X	
X	X	

Optical sensors

		Photoel. sensors / diffuse sensors, cubic housing	
		46C series Universal, long range CE UKCA CDRH ECOLAB	**49C series** Universal current CE UKCA CDRH
Technical data	Dimensions without connector (W x H x D)	20.5 mm x 76.3 mm x 44 mm	31 mm x 104 mm x 55.5 mm
	Supply voltage U_B	10 ... 30 V, DC	20 ... 250 V, AC/DC | DC | 10 ... 30 V, DC
	Interface	IO-Link	
	Switching outputs	Transistor	MOSFET semiconductor | Relay | Transistor
	Connection type	Cable | Cable with connector, M12 | Connector, M12	Cable | Terminal
	Degree of protection	IP 67 | IP 69K	IP 67
	Housing material	Plastic	Plastic
	Compatibility of materials	ECOLAB	
	Ambient temperature, operation	-40 °C ... 60 °C	-40 °C ... 60 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 150 m	0 m ... 150 m
	Light source	LED, Infrared | LED, Red	LED, Infrared | LED, Red
	Switching frequency	500 Hz	25 Hz ... 500 Hz
	Operational controls	270° potentiometer	270° potentiometer | Teach button
Retro-reflective photoelectric sensors	Min./max. operating range limit	0.1 m ... 30 m	0.1 m ... 30 m
	Light source	LED, Red	LED, Red
	Switching frequency	250 Hz ... 500 Hz	25 Hz ... 500 Hz
	Operational controls	270° potentiometer | Teach button	270° potentiometer | Teach button
Diffuse sensors with background suppression	Min./max. operating range limit	0.005 m ... 3 m	0.005 m ... 3 m
	Light source	Laser, Red | LED, Infrared | LED, Red	LED, Infrared | LED, Red
	Switching frequency	100 Hz ... 1,000 Hz	25 Hz ... 250 Hz
	Operational controls	Multiturn potentiometer	Multiturn potentiometer | Teach button
Functions	Activation input	X	X
	Autocollimation		
	Extra long light spot (XL)	X	
	Small light spot (S)	X	
	Teach input		
	Tracking function		
	Warning output	X	X

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53C series
Stainless steel, Hygiene design

55C series
Stainless steel, Wash-Down design

18B series
Metal, detection of transparent objects

53C series	55C series	18B series
14 mm x 35.4 mm x 20.4 mm	14 mm x 35.4 mm x 25 mm	15 mm x 47 mm x 32.5 mm
10 ... 30 V, DC | 12 ... 30 V, DC	10 ... 30 V, DC	10 ... 30 V, DC
IO-Link	IO-Link	IO-Link
Transistor	Transistor	Transistor
Cable | Connector, M8	Cable | Cable with connector, M12 | Connector, M8	Cable | Connector, M12
IP 67 | IP 68 | IP 69K	IP 67 | IP 68 | IP 69K	IP 67 | IP 69K
Stainless steel	Stainless steel	Metal
CleanProof+ | ECOLAB | Johnson Diversey	CleanProof+ | ECOLAB | Johnson Diversey	ECOLAB
-40 °C ... 60 °C	-40 °C ... 60 °C	-40 °C ... 60 °C
0.05 m ... 10 m	0 m ... 80 m	
LED, Red	LED, Infrared | LED, Red	
1,000 Hz	350 Hz ... 1,000 Hz	
0 m ... 5 m	0 m ... 6 m	0 m ... 7.2 m
Laser, Red | LED, Red	Laser, Red | LED, Red	LED, Red
1,500 Hz ... 3,000 Hz	1,500 Hz ... 3,000 Hz	500 Hz ... 5,000 Hz
Teach button	Teach button	270° potentiometer | Multiturn potentiometer | Teach button
0.005 m ... 0.45 m	0.005 m ... 0.6 m	
Laser, Red | LED, Red	Laser, Red | LED, Infrared | LED, Red	
750 Hz ... 3,000 Hz	750 Hz ... 3,000 Hz	
Multiturn potentiometer | Teach button	Multiturn potentiometer | Teach button	
X	X	
X	X	X
X	X	
X	X	
X	X	
X	X	X

Optical sensors

		Photoel. sensors / diffuse sensors, cubic housing	
		8 series Metal	**96 series** Metal, long range
Technical data	Dimensions without connector (W x H x D)	15 mm x 48 mm x 38 mm	30 mm x 90 mm x 70 mm
	Supply voltage U_B	10 ... 30 V, DC	10 ... 30 V, DC | 18 ... 30 V, DC | 20 ... 230 V, AC/DC
	Switching outputs	Transistor	Relay | Transistor
	Connection type	Cable | Connector, M12	Connector, M12 | Terminal
	Degree of protection	IP 67 | IP 69K	IP 67 | IP 69K
	Housing material	Metal	Metal
	Compatibility of materials	ECOLAB	ECOLAB
	Ambient temperature, operation	-40 °C ... 60 °C	-40 °C ... 60 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 100 m	0 m ... 150 m
	Light source	Laser, Red | LED, Red	LED, Infrared | LED, Red
	Switching frequency	1,500 Hz ... 2,800 Hz	20 Hz ... 500 Hz
	Operational controls	Multiturn potentiometer	270° potentiometer
Retro-reflective photoelectric sensors	Min./max. operating range limit	0 m ... 21 m	0 m ... 18 m
	Light source	Laser, Red | LED, Red	LED, Red
	Switching frequency	1,000 Hz ... 2,800 Hz	20 Hz ... 1,000 Hz
	Operational controls	Multiturn potentiometer	270° potentiometer | Multiturn potentiometer
Diffuse sensors with background suppression	Min./max. operating range limit	0.007 m ... 0.4 m	0.05 m ... 30 m
	Light source	Laser, Red | LED, Infrared | LED, Red	Laser, Infrared | Laser, Red | LED, Infrared | LED, Red
	Switching frequency	200 Hz ... 2,000 Hz	10 Hz ... 300 Hz
	Operational controls	Multiturn potentiometer	Multiturn potentiometer | Teach button
Functions	Activation input		X
	Autocollimation	X	
	Small light spot (S)		X
	Teach input	X	
	Tracking function	X	
	Warning output	X	X

Optical sensors

Photoel. sensors / diffuse sensors, cylindrical housing

		318(B) series, 328 series M18, cylindrical CE UKCA CDRH	**412B series** M12, cylindrical CE UKCA
Technical data	Thread size	M18	M12
	Length	46 mm ... 61 mm	51 mm ... 60 mm
	Supply voltage U_B	10 ... 30 V, DC	10 ... 36 V, DC
	Switching outputs	Transistor	Transistor
	Connection type	Cable | Cable with connector, M12 | Connector, M12	Cable | Connector, M12
	Degree of protection	IP 67	IP 67
	Housing material	Plastic | Stainless steel	Metal | Stainless steel
	Ambient temperature, operation	-40 °C ... 65 °C	-25 °C ... 55 °C
Throughbeam photoelectric sensors	Min./max. operating range limit	0 m ... 23 m	0 m ... 50 m
	Light source	LED, Infrared | LED, Red	Laser, Red | LED, Red
	Switching frequency	500 Hz	1,000 Hz ... 5,000 Hz
	Operational controls		270° potentiometer
Retro-reflective photoelectric sensors	Min./max. operating range limit	0.02 m ... 6 m	0.02 m ... 2.3 m
	Light source	LED, Red	LED, Red
	Switching frequency	500 Hz	1,000 Hz
	Operational controls	Teach button	
Energetic diffuse sensor	Min./max. operating range limit	0.001 m ... 1 m	0.004 m ... 0.66 m
	Light source	LED, Infrared | LED, Red	LED, Red
	Switching frequency	500 Hz	1,000 Hz
	Operational controls	Teach button	270° potentiometer
Diffuse sensors with background suppression	Min./max. operating range limit	0.001 m ... 0.14 m	
	Light source	LED, Red	
	Switching frequency	1,000 Hz	
	Operational controls	270° potentiometer	
Func-tions	Small light spot (S)	X	

Optical sensors

Long-range sensors

NEW

ODT 3C
TOF, long range

Technical data	Dimensions without connector (W x H x D)	11.4 mm x 34.2 mm x 18.3 mm
	Supply voltage U_B	10 ... 30 V, DC | 12 ... 30 V, DC
	Interface	IO-Link
	Switching outputs	Transistor
	Connection type	Cable | Cable with connector, M8 | Cable with connector, M12 | Connector, M8
	Degree of protection	IP 67 | IP 69K
	Housing material	Plastic
	Compatibility of materials	ECOLAB
	Ambient temperature, operation	-40 °C ... 60 °C
Diffuse sensors with background suppression	Min./max. operating range limit	0.01 m ... 2 m
	Light source	Laser, Red | LED, Red
	Switching frequency	7 Hz ... 750 Hz
	Operational controls	Teach button
Func-tions	Teach input	

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25 LR series
TOF, long range

110 series
TOF, long range laser

10 series
TOF, long range laser

25 LR series	110 series	10 series
15 mm x 38.9 mm x 28.7 mm	23 mm x 50 mm x 50 mm	25 mm x 65 mm x 55 mm
18 ... 30 V, DC	18 ... 30 V, DC	18 ... 30 V, DC
IO-Link	IO-Link	IO-Link
Transistor	Transistor	Transistor
Cable | Cable with connector, M12 | Connector, M12	Connector, M12	Cable | Cable with connector, M12 | Connector, M12
IP 66 | IP 67	IP 67 | IP 69K	IP 67
Plastic	Plastic	Plastic
-30 °C ... 50 °C	-40 °C ... 60 °C	-40 °C ... 50 °C
0.05 m ... 3 m	0 m ... 5 m	0.05 m ... 25 m
LED, Infrared	Laser, Red	Laser, Red
2 Hz ... 30 Hz	500 Hz	40 Hz
Teach button	Control buttons | PC software	Membrane keyboard
X		X

Inductive switches

Inductive switches, cylindrical

NEW

IS D08, D12, D18, D30

IS 203, 204, 205, 206
Miniature sensors, cylindrical housing

Technical data	Diameter	8 mm | 12 mm | 18 mm | 30 mm	3 mm | 4 mm | 5 mm | 6.5 mm
	Thread size	M8 | M12 | M18 | M30	M5
	Type of installation	Embedded/flush | Non-embedded/non-flush	Embedded/flush
	Supply voltage U_B	10 ... 30 V, DC	10 ... 30 V, DC
	type. operating range limit S_n	2 mm ... 30 mm	1 mm ... 3 mm
	Switching outputs	NPN | PNP	PNP
	Switching principle	NC (normally closed) | NO (normally open)	NC (normally closed) | NO (normally open)
	Switching frequency, max.	1,500 Hz	5,000 Hz
	Connection type	Cable | Connector, M8 | Connector, M12 | M12	Cable | Cable with connector, M8 | Connector, M8
	Degree of protection	IP 67	IP 67
	Housing	Metal | Stainless steel	Metal | Stainless steel
	Active surface	Plastic	Plastic
	Features	Optimized price-performance ratio | Robust bend protection | Single and double scanning range	Also available with increased operating range | Cylindrical miniature housing | Housing made of stainless steel (V2A)

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IS 208, 212, 218, 230
Standard, cylindrical

IS 208, 212, 218, 230
All stainless steel

IS 212, 218, 230
AC/DC - sensors

8 mm | 12 mm | 18 mm | 30 mm	8 mm | 12 mm | 18 mm | 30 mm	12 mm | 18 mm | 30 mm
M8 | M12 | M18 | M30	M8 | M12 | M18 | M30	M12 | M18 | M30
Embedded/flush | Non-embedded/non-flush	Embedded/flush | Non-embedded/non-flush	Embedded/flush | Non-embedded/non-flush
10 ... 30 V, DC | 10 ... 36 V, DC	10 ... 30 V, DC	10 ... 320 V, AC/DC
1.5 mm ... 40 mm	2 mm ... 40 mm	2 mm ... 15 mm
NPN | PNP	NPN | PNP	
NC (normally closed) | NC contact – Antivalent | NO (normally open) | NO contact – Antivalent	NC (normally closed) | NO (normally open)	NC (normally closed) | NO (normally open)
5,000 Hz	600 Hz	3,000 Hz
Cable | Cable with connector, M8 | Cable with connector, M12 | Connector, M8 | Connector, M12	Cable | Connector, M8 | Connector, M12	Cable
IP 67	IP 68 | IP 69K	IP 67
Metal | Stainless steel	Stainless steel	Metal
Plastic	Stainless steel	Plastic
Also available with increased operating range | Antivalent switching outputs (NO+NC) | Increased range | Models with short housing design	Also available as a model with 316L stainless steel (ECOLAB) suitable for use in hygienic applications | Correction factor 1 (material-independent detection) | Full stainless steel housing from a single piece (V2A & V4A) | Mechanically resistant against impacts on the active surface | Resistant against vibration and pressure shocks	

Inductive switches

Inductive switches, cubic

IS 255, 288
Miniature sensors, cubic housing

IS 240, 244 / ISS 244
Standard, cubic

Technical data	Dimension (W x H x L)	5 mm x 5 mm x 25 mm | 8 mm x 8 mm x 40 mm | 8 mm x 8 mm x 59 mm	12 mm x 40 mm x 26 mm | 40 mm x 40 mm x 66 mm | 40 mm x 40 mm x 67 mm | 40 mm x 40 mm x 118 mm
	Type of installation	Embedded/flush	Embedded/flush | Non-embedded/non-flush
	Supply voltage U_B	10 ... 30 V, DC	10 ... 30 V, DC
	type. operating range limit S_n	1.5 mm ... 3 mm	4 mm ... 40 mm
	Switching outputs	NPN | PNP	NPN | PNP
	Switching principle	NC (normally closed) | NO (normally open)	NC contact – Antivalent | NO (normally open) | NO contact – Antivalent
	Switching frequency, max.	5,000 Hz	1,400 Hz
	Connection type	Cable | Cable with connector, M8 | Connector, M8	Cable | Connector, M8 | Connector, M12 | Terminal
	Degree of protection	IP 67	IP 67 | IP 68 | IP 69K
	Housing	Metal	Plastic
	Features	Also available with increased operating range | Cubic miniature housing	360° visibility through 4-way LED indicator on the sensor head | Antivalent switching outputs (NO+NC) | Bright status display | Increased range | M12 plug, turnable 270° and thus suitable even for angled connection cables

Capacitive sensors

Capacitive sensors, cubic

NEW

LCS-1

LCS-2

Technical data	Dimension (W x H x L)	40 mm x 40 mm x 10 mm | 54 mm x 20.3 mm x 5.5 mm	50 mm x 20 mm x 5.5 mm
	Type of installation	Embedded/flush	Embedded/flush | Non-embedded/non-flush
	Supply voltage U_B	10 V DC ... 30 V DC	10 V DC ... 30 V DC
	Typ. operating range limit S_n	1 mm ... 20 mm	1 mm ... 10 mm
	Switching outputs	NPN | PNP | Push-pull	NPN | PNP
	Switching principle	NC (normally closed) | NO (normally open) | Normally closed contact (NC)/normally open contact (NO)	NC (normally closed) | NO (normally open)
	Switching frequency	100 Hz	100 Hz
	Connection type	Cable | Connector, M8	Cable
	Degree of protection	IP 67	IP 65
	Operational controls	Multiturn potentiometer (11 turns) | Multiturn potentiometer (20 turns)	Multiturn potentiometer (12 turns)
	Housing	Plastic	Plastic
	Features	Compact and flat design | Switching distances adjustable by means of potentiometer	Compact and flat design | Switching distances adjustable by means of potentiometer

Capacitive sensors

		Capacitive sensors, cylindrical	
		LCS-1	**LCS-2**
		CE UKCA	CE UKCA
Technical data	Thread size	M12 | M18 | M30	M12 | M18 | M30
	Type of installation	Embedded/flush | Non-embedded/non-flush	Embedded/flush | Non-embedded/non-flush
	Supply voltage U_B	10 V DC ... 30 V DC	10 V DC ... 30 V DC
	Typ. operating range limit S_n	1 mm ... 25 mm	1 mm ... 30 mm
	Switching outputs	NPN | PNP	NPN | PNP
	Switching principle	NC (normally closed) | NO (normally open) | Normally closed contact (NC)/normally open contact (NO), programmable	NC (normally closed) | NO (normally open)
	Interface	IO-Link	
	Switching frequency	100 Hz	100 Hz
	Connection type	Cable | Connector, M12	Cable | Connector, M12
	Degree of protection	IP 67	IP 67
	Operational controls	Multiturn potentiometer (12 turns) | Multiturn potentiometer (20 turns) | Teach button	Multiturn potentiometer
	Housing	Metal | Plastic | Stainless steel	Metal | Plastic
	Features	Analog and IO-Link interfaces | Models with chemical-resistant PTFE housing | Switching distances adjustable by means of potentiometer or teach button	Switching distances adjustable by means of potentiometer

Fiber optic sensors

Fiber optic amplifiers

LV46x

Technical data	Dimensions without connector (W x H x D)	10 mm x 31 mm x 62 mm | 10 mm x 31.5 mm x 72 mm | 10 mm x 33 mm x 79.4 mm
	Supply voltage U_B	10 V DC ... 24 V DC
	Switching frequency	250 Hz ... 50,000 Hz
	Connection type	Cable | Cable with connector, M8 | Cable with connector, M12 | Connector, M8
	Degree of protection	IP 50 | NEMA 1
	Interface	IO-Link
	Switching outputs	NPN | PNP | Push-pull
	Switching principle	Dark switching | IO-Link / light switching (PNP)/dark switching (NPN) | Light/dark switchable | Light switching
	Analog outputs	Current | Voltage
	Selectable inputs/outputs	Activation input | Multiplex operation | Teach input
	Light source	LED, Infrared | LED, Red
	Operational controls	Control buttons | Multiturn potentiometer | Rocker pressure switch | Slide switch
	Housing	Plastic
Features	Special version	Large operating range | Short response time | Time function

Fiber optic sensors

Fiber optics

GF
Glass fiber optics

KF
Plastic fiber optics

Technical data	Operating principle	Diffuse reflection principle | Throughbeam principle	Diffuse reflection principle | Throughbeam principle
	Design	Cylindrical	Cubic | Cylindrical
	Outer diameter	2.9 mm ... 7 mm	1 mm ... 4 mm
	Fiber length	200 mm ... 5,000 mm	210 mm ... 5,000 mm
	Fiber sheathing	Nickel-plated brass | Silicone | Stainless steel | Stainless steel (SUS303)	PE | PTFE
	Fiber head	Aluminum | Stainless steel | Stainless steel (SUS303)	Metal | Plastic | Stainless steel | Zinc
	Light beam exit	bent 90° | Front | Lateral with lens | Lateral without lens | On face	bent 90° | Front | Lateral
	Laying	standard	Flexible | Highly flexible | standard
	Smallest bending radius	R23 | R40	R1 | R2 | R10 | R15 | R25 | R60
	Area of application	General applications | Oil and chemical resistant	General applications | Highly precise object detection | Oil and chemical resistant | Precise object detection
	Ambient temperature, operation	-40 °C ... 300 °C	-55 °C ... 105 °C
Features	Special version	Heat resistant | Robust bend protection	Area detection | Heat resistant | Robust bend protection | V-optics

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Ultrasonic sensors

		Ultrasonic sensors, cubic	
			NEW
		18 series	**420B series**
		CE UKCA	CE UKCA
Technical data	Dimensions without connector (W x H x D)	15 mm x 50 mm x 33 mm	20.5 mm x 41 mm x 15 mm
	Supply voltage U_B	10 V DC ... 30 V DC	12 V DC ... 30 V DC
	Switching outputs	NPN | PNP	Push-pull
	Interface		IO-Link
	Connection type	Connector, M12	Connector, M8
	Degree of protection	IP 65	IP 67
	Operational controls	Step switch	Teach button
	Housing	Metal	Plastic
Through-beam principle	Operating range	0 m ... 0.65 m	
	Switching frequency	100 Hz	
	Switching principle	NO (normally open)	
	Ultrasonic frequency	300 kHz	
Diffuse reflection principle with background suppression	Operating range		0.01 m ... 1 m
	Switching frequency		8 Hz ... 20 Hz
	Switching principle		Dark switching (PNP)/light switching (NPN) | IO-Link / light switching (PNP)/dark switching (NPN) | Light switching (PNP)/dark switching (NPN)
	Teach inputs		1 Piece(s)
	Ultrasonic frequency		220 kHz ... 370 kHz
Features	Special version		Multiplex operation | Synchronous operation | Teach input

Ultrasonic sensors

Technical data	Thread size
	Length
	Supply voltage U_B
	Switching outputs
	Interface
	Connection type
	Degree of protection
	Operational controls
	Housing
Reflection principle	Operating range
	Switching frequency
	Switching principle
	Teach inputs
	Ultrasonic frequency
Diffuse reflection principle with background suppression	Operating range
	Switching frequency
	Switching principle
	Inputs/outputs
	Teach inputs
	Ultrasonic frequency
Features	Special version

Ultrasonic sensors, cylindrical

200 series	300 series	400 series
M8 | M12 | M18 | M30	M18 | M30	M12 | M18 | M30
55 mm ... 78 mm	60.3 mm ... 98.8 mm	50 mm ... 104.3 mm
18 V DC ... 30 V DC	10 V DC ... 30 V DC	12 V DC ... 30 V DC
NPN | PNP | Push-pull	NPN | PNP	PNP | Push-pull
IO-Link		IO-Link
Connector, M8 | Connector, M12	Connector, M12	Connector, M12
IP 67	IP 67	IP 67 | IP 68
	Control buttons	Control buttons
Metal	Plastic	Metal
	0 m ... 1.6 m	
	1 Hz ... 8 Hz	
	NO (normally open)	
	1 Piece(s)	
	230 kHz ... 300 kHz	
0.02 m ... 6 m	0.04 m ... 6 m	0.015 m ... 6 m
2 Hz ... 20 Hz	2 Hz ... 10 Hz	1.6 Hz ... 12 Hz
Dark switching | IO-Link / light switching (PNP)/dark switching (NPN) | Light switching	NC (normally closed) | NO (normally open)	IO-Link / light switching (PNP)/dark switching (NPN) | IO-Link / NC contact/NO contact | Light switching (PNP)/dark switching (NPN) | NC (normally closed) | NC contact/NO contact | NO (normally open)
	1 Piece(s)	1 Piece(s)
1 Piece(s)	1 Piece(s)	1 Piece(s)
80 kHz ... 484 kHz	75 kHz ... 300 kHz	75 kHz ... 310 kHz
Teach input	2 independent switching outputs | Multiplex operation | Synchronous operation | Teach input	2 independent switching outputs | Multiplex operation | Synchronous operation | Teach input

Light curtains

Technical data	Application
	Profile cross section
	Measurement field length
	Beam spacing
	Number of beams
	Minimum object diameter
	Operating range
	Interface
	Supply voltage U_B
	Connection type
	Degree of protection
	Light source
	Housing
	Cycle time
	Response time per beam
	Operational controls
	Type of configuration
	Ambient temperature, operation
	Type of display
Features	Diagonal-beam scanning
	Crossed-beam scanning
	Parallel-beam scanning

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CSL 505
Throughbeam principle, narrow design

CSL 710
Throughbeam principle, standard design

CSR 780
Reflection principle

Precise object detection	Precise object detection	Ejection monitoring on machines | Precise object detection
10 mm x 27 mm | 12 mm x 58 mm	29 mm x 35.4 mm | 29 mm x 54.8 mm | 30.4 mm x 40.3 mm | 30.4 mm x 54.8 mm	34.2 mm x 28.6 mm
35 mm ... 3,150 mm	150 mm ... 2,960 mm	96 mm ... 432 mm
5 mm | 12.5 mm | 25 mm | 50 mm | 100 mm	5 mm | 10 mm | 20 mm | 40 mm	1 mm
8 Piece(s) ... 96 Piece(s)	8 Piece(s) ... 592 Piece(s)	
7.5 mm ... 102.5 mm	10 mm ... 50 mm	1 mm
0.3 m ... 6.5 m	0.1 m ... 7 m	0 m ... 0.7 m
	IO-Link	
18 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 30 V DC
Connector, M8	Connector, M12	Connector, M12
IP 65	IP 65 | IP 67	IP 65
LED, Infrared	LED, Infrared	LED, Infrared
Metal	Metal	Metal
12 ms ... 100 ms	1 ms ... 82 ms	
1,000 µs	30 µs	
	Membrane keyboard	Teach button
Software | Via pin assignment	Software | Teach-in	
-30 ... 50 °C	-30 ... 60 °C	0 ... 55 °C
LED	LED | OLED display	LED
X	X	
X	X	
X	X	

Laser scanners

NEW

ROD 100

CE CDRH

Technical data	Application	Collision avoidance | Completeness check | Overhang control
	Detection range	0.08 ... 25 m | Diffuse reflection > 90% | 7 m at 1.8 % reflection | 15 m at 10 % reflection | 25 m at 90 % reflection
	Number of field sets	16 field triple zones can be configured
	Systematic error	±10 mm
	Statistical error (1σ)	≤5 mm (0.08 – 7 m) ≤10 mm (7 – 15 m) ≤6 mm (0.08 – 25 m) for reflectors
	Detection angle	275 °
	Angular resolution	0.2° at 80 Hz
	Interface	Ethernet for configuration
	Light source	Laser, Infrared, 905 nm
	Laser class in accordance with IEC/EN 60825-1	1
	Digital switching outputs	5 Piece(s) PNP, Max. 30 V DC / 50 mA
	Digital switching inputs	4 Piece(s) PNP, 3.5 mA / 24 V
	Connection	Connector, M12
	Dimensions without connector (W x H x D)	80 mm x 80 mm x 85 mm
	Housing material	Diecast zinc
	Lens cover material	Plastic
	Ambient temperature, operation	-30 ... 60 °C
	Degree of protection	IP 67
Features	Type of configuration	Software ROD configurator

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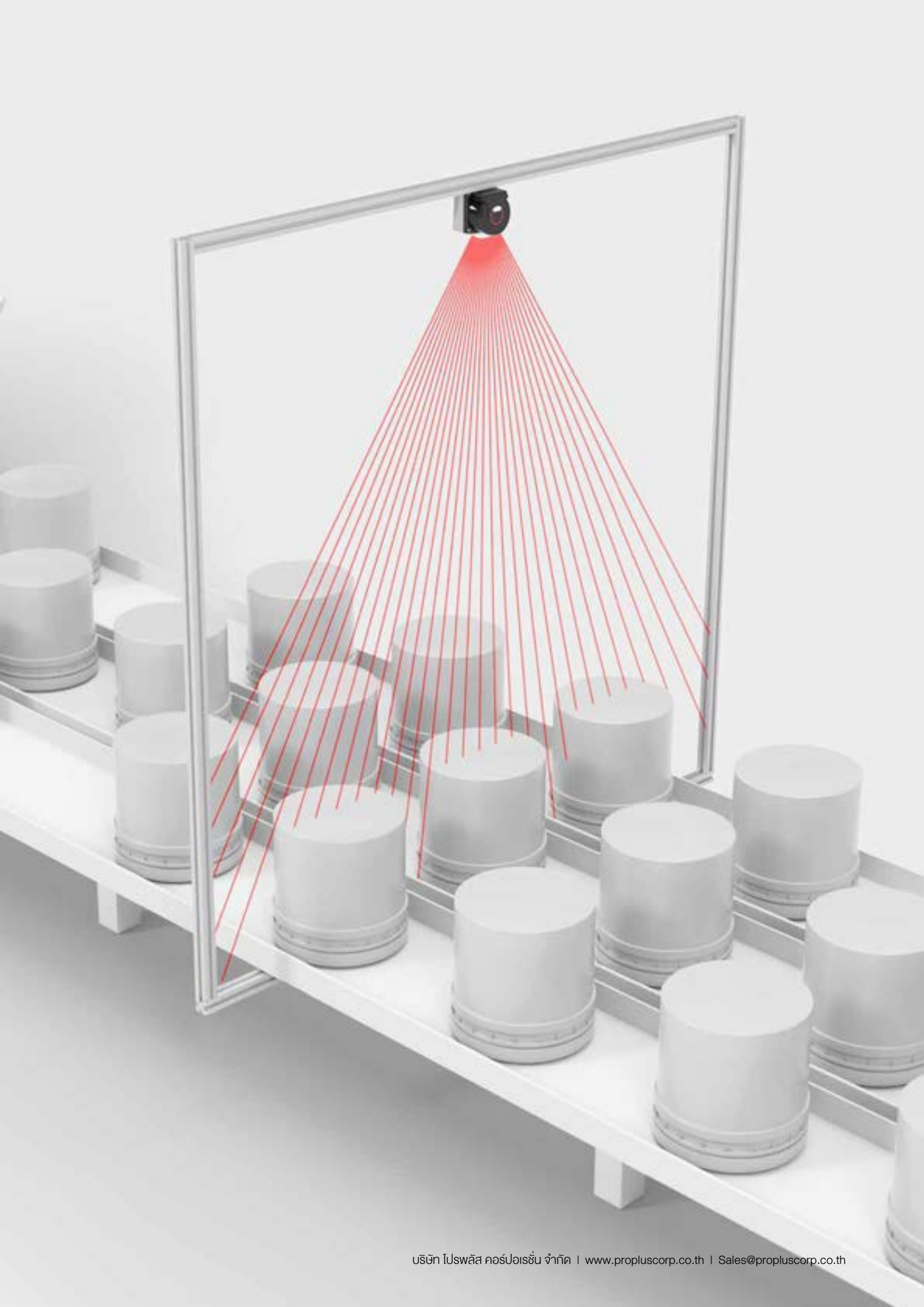

Fork sensors

Label detection

GS 61
Label detection, optical

GS 63B
Label detection, optical

Technical data	Application	Detection of non-transparent labels	Detection of non-transparent labels
	Principle of physics	Optical	Optical
	Interface		
	Switching outputs	Push-pull	Push-pull
	Switching frequency	10,000 Hz	10,000 Hz
	Response time	0.05 ms	0.05 ms
	Operational controls	Multiturn potentiometer | Teach button	Multiturn potentiometer | Teach button
	Mouth width	3 mm	3 mm
	Mouth depth	41 mm	61 mm
	Dimensions without connector (W x H x D)	11 mm x 30 mm x 60 mm	11 mm x 30 mm x 80 mm
	Supply voltage U_B	10 V DC ... 30 V DC	10 V DC ... 30 V DC
	Connection type	Cable | Cable with connector, M12 | Connector, M8	Cable | Cable with connector, M8 | Cable with connector, M12 | Connector, M8
	Plug outlet	Horizontal (parallel to belt movement) | Vertical (perpendicular to belt movement)	Horizontal (parallel to belt movement) | Vertical (perpendicular to belt movement)
	Degree of protection	IP 65	IP 67
	Housing	Plastic	Metal | Plastic
Features	Special version	Teach input	Article set | Teach input | Warning output

GSU 12
Label detection, ultrasonics

(I)GSU 14E
Label detection, ultrasonics

GSX 14E
Label detection, ultrasonics, optical

Detection of non-transparent labels | Detection of transparent labels	Detection of non-transparent labels | Detection of transparent labels	Detection of non-transparent labels | Detection of transparent labels
Ultrasonics	Ultrasonics	optical and ultrasonics
	IO-Link	IO-Link
Push-pull	Push-pull	Push-pull
1,750 Hz	2,000 Hz	2,000 Hz
0.24 ms	0.2 ms	0.2 ms
Teach button	Control buttons	Control buttons
4 mm	4 mm	4 mm
80 mm	80 mm	80 mm
22 mm x 46.9 mm x 96 mm	22 mm x 46.9 mm x 96 mm	22 mm x 46.9 mm x 96 mm
12 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 30 V DC
Connector, M8 | Connector, M12	Connector, M12	Connector, M12
Horizontal (parallel to belt movement)	Horizontal (parallel to belt movement) | Vertical (perpendicular to belt movement)	Horizontal (parallel to belt movement) | Vertical (perpendicular to belt movement)
IP 65	IP 65	IP 65
Metal	Metal	Metal
	ALC function (tracking) | easyTeach function | Manual fine tuning of the switching threshold | Teach input | Warning output	ALC function (tracking) | easyTeach function | Manual fine tuning of the switching threshold | Teach input | Warning output

Fork sensors

Label detection

GK 14
Label detection, capacitive

Technical data	Application	Detection of non-transparent labels | Detection of transparent labels
	Principle of physics	Capacitive
	Switching outputs	NPN | PNP
	Switching frequency	5,000 Hz
	Response time	0.1 ms
	Operational controls	Multiturn potentiometer
	Mouth width	1 mm
	Mouth depth	85 mm
	Dimensions without connector (W x H x D)	24 mm x 36.5 mm x 110 mm
	Supply voltage U_B	10 V DC ... 30 V DC
	Connection type	Connector, M12
	Plug outlet	Horizontal (parallel to belt movement) | Vertical (perpendicular to belt movement)
	Degree of protection	IP 65
	Housing	Metal

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Fork sensors

Object detection

GS 04B
Object detection, optical

GS 08B
Object detection, optical

Technical data	Application	Detection of small parts	Detection of small parts
	Switching outputs	NPN | PNP | Push-pull	Push-pull
	Interface	IO-Link	IO-Link
	Switching frequency	5,000 Hz ... 10,000 Hz	5,000 Hz
	Response time	0.05 ms ... 0.1 ms	0.1 ms
	Operational controls	270° potentiometer	270° potentiometer
	Light source	Laser, Red | LED, Infrared | LED, Red	Laser, Red | LED, Red
	Mouth width	5 mm | 10 mm | 20 mm | 30 mm | 40 mm | 50 mm | 60 mm | 70 mm | 80 mm | 90 mm | 100 mm | 120 mm | 170 mm | 220 mm	30 mm | 50 mm | 80 mm | 120 mm
	Mouth depth	17 mm | 25 mm | 35 mm | 45 mm | 55 mm | 60 mm | 110 mm	35 mm | 55 mm | 60 mm
	Supply voltage U_B	10 V DC ... 30 V DC	10 V DC ... 30 V DC
	Connection type	Connector, M8	Connector, M8
	Degree of protection	IP 67	IP 67
	Housing	Metal	Stainless steel

Luminescence sensors

LRT 8

Technical data	Application	Detection of any kind of luminescence | Detection of red marks on wood | Detection of white paper | Detection of yellow print marks
	Dimensions without connector (W x H x D)	15 mm x 48 mm x 38 mm
	Operating range limit	0 m ... 0.5 m
	Supply voltage U_B	10 V DC ... 30 V DC
	Switching outputs	NPN | PNP
	Switching inputs	L/D switching
	Connection type	Connector, M12
	Degree of protection	IP 67
	Switching frequency	1,500 Hz
	Light source	LED, Blue | LED, UV
	Compatibility of materials	ECOLAB
	Housing	Metal
	Operational controls	Multiturn potentiometer
Features	Special version	Autocollimation

BIO
Organic
BIO
Organic
BIO
Organic
ORANGE-JUICE
ORANGE-JUICE

Contrast sensors

KRT 18B

KRT 3C

		KRT 18B	KRT 3C
Technical data	Dimensions without connector (W x H x D)	15 mm x 47 mm x 32.5 mm	11.4 mm x 34.2 mm x 18.3 mm
	Supply voltage U_B	12 V DC ... 30 V DC	12 V DC ... 30 V DC
	Operating range	13 mm ± 3 mm	14.5 mm ±2mm | 60 mm ±20mm
	Interface	IO-Link	IO-Link
	Switching outputs	Analog output, Current | Analog output, Voltage | Transistor, Push-pull	Transistor, NPN | Transistor, PNP | Transistor, Push-pull
	Connection type	Connector, M12	Cable | Cable with connector, M8 | Cable with connector, M12 | Connector, M8
	Degree of protection	IP 67 | IP 69K	IP 67 | IP 69K
	Light source	LED, RGB | LED, White	Laser, Red | LED, RGB | LED, White
	Light spot orientation	Horizontal | Vertical	Horizontal | Vertical
	Light beam exit	Front	Front
	Light spot shape	Rectangular	Oval | Rectangular
	Switching frequency	15,000 Hz ... 22,000 Hz	4,000 Hz ... 10,000 Hz
	Operational controls	Button(s) | Multiturn potentiometer | Teach button	Teach button
	Housing	Metal	Plastic
	Compatibility of materials	ECOLAB	ECOLAB
Functions	Autocollimation		
	Short response time	X	
	Crop mark system		
	Synchronization input		
	Teach input	X	X
	Tracking for automatic signal tracking	X	
	Time function		X

KRT 55	KRT 20	KRT 21
CE UKCA ECOLAB	CE UKCA	CE UKCA
14 mm x 35.5 mm x 25 mm	30 mm x 80 mm x 53 mm	31 mm x 53 mm x 80.1 mm
10 V DC ... 30 V DC	12 V DC ... 30 V DC	10 V DC ... 30 V DC
13 mm ± 2 mm	12 mm ±1mm | 20 mm ±2mm | 50 mm ±5mm	9 mm ± 3 mm
Transistor, PNP	Analog output, Current | Transistor, NPN | Transistor, PNP	Transistor, NPN | Transistor, PNP
Cable | Cable with connector, M12 | Connector, M8	Connector, M12	Connector, M12
IP 67 | IP 69K	IP 67 | IP 69K	IP 67
LED, RGB | LED, White	LED, RGB	LED, RGB
Vertical	in center | Vertical	Vertical
Front	On face	On face
Rectangular	Rectangular | Round	Rectangular
10,000 Hz	16,000 Hz ... 50,000 Hz	15,000 Hz
Teach button	Membrane keyboard | Via service interface	Teach button
Stainless steel	Metal	Plastic
CleanProof+ | ECOLAB		
	X	
	X	
	X	
X		
X	X	X

Color sensors

NEW

		CRT 448	CRT 648
		CE UKCA	ECOLAB IO-Link
Technical data	Application	Detection of three colors	Detection of one color | Detection of up to 7 colors
	Dimensions without connector (W x H x D)	17 mm x 50 mm x 50 mm	25 mm x 50 mm x 50.5 mm
	Supply voltage U_B	12 V DC ... 28 V DC	18 V DC ... 30 V DC
	Operating range	12 mm ... 32 mm	18 mm ... 150 mm
	Interface		IO-Link
	Switching outputs	NPN | PNP	PNP / NPN switchable | Push-pull
	Teach inputs	1 Piece(s)	1 Piece(s)
	Connection type	Connector, M12	Connector, turning 270°, M12
	Degree of protection	IP 67	IP 67 | IP 69
	Light source	LED, White	LED, White
	Light spot shape		Rectangular
	Switching frequency	500 Hz	3 Hz ... 3,000 Hz
	Housing	Plastic	Metal
	Operational controls		Control buttons
Features	Special version	3 switching outputs | Synchronization input	For glossy objects (not suitable for black objects) | RGB color output via IO-Link | Teach input (configurable sync / key lock)

Double sheet monitoring / splice detection

DB 12B, 112B, 14B
Double sheet monitoring

VSU 12 / IGSU 14E
Splice detection

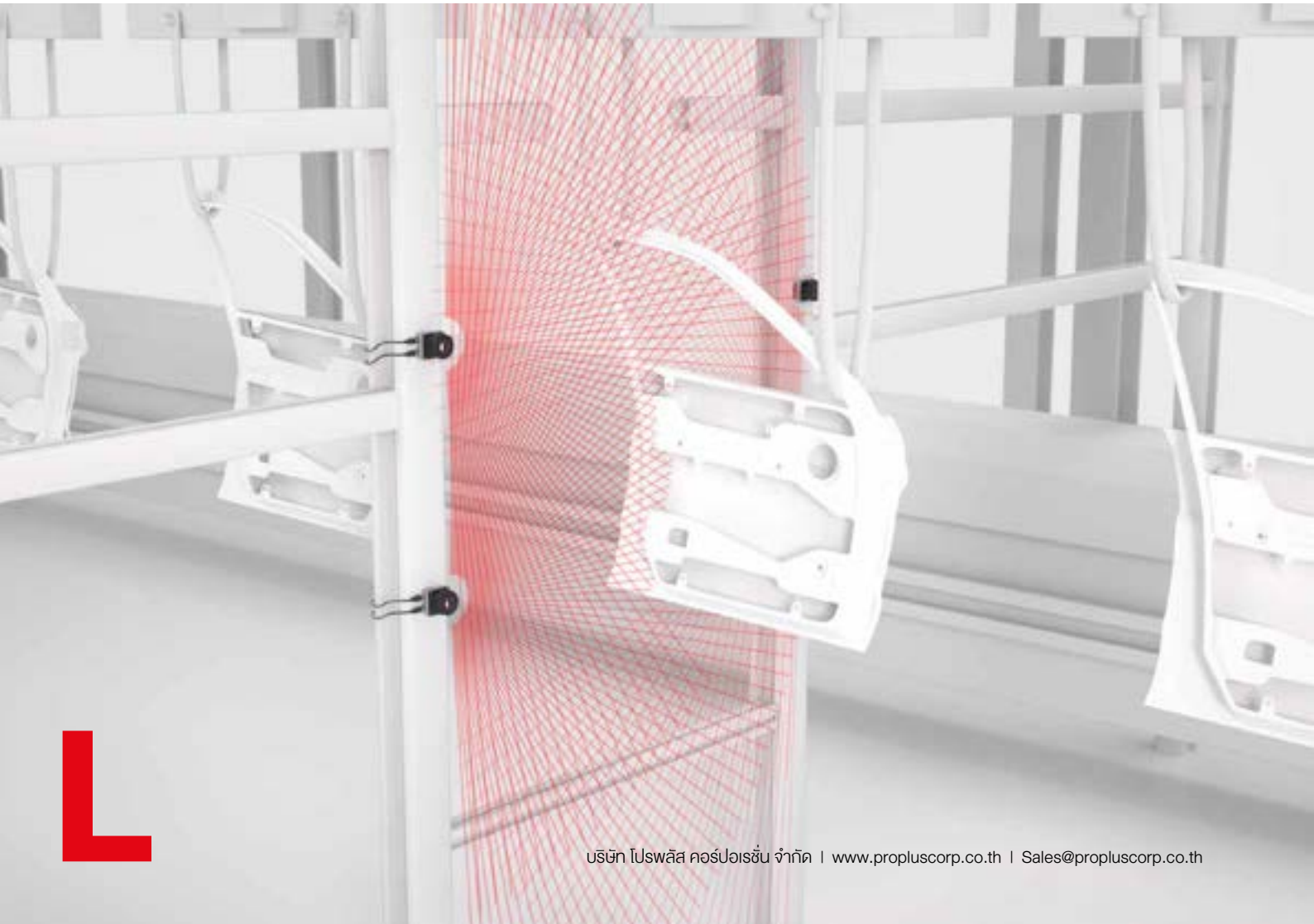
		DB 12B, 112B, 14B Double sheet monitoring	VSU 12 / IGSU 14E Splice detection
Technical data	Application	Double sheet monitoring	Splice inspections
	Principle of physics	Capacitive | Ultrasonics	Ultrasonics
	Medium		Transparent and not transparent
	Operating range	0.006 m ... 0.03 m	
	Mouth depth		80 mm
	Mouth width		4 mm
	Design	Cubic | Cylindrical	Cubic | Fork
	Interface		IO-Link
	Digital switching outputs	2 Piece(s) ... 7 Piece(s)	2 Piece(s)
	Analog outputs	1 Piece(s)	
	Switching inputs	1 Piece(s) ... 2 Piece(s)	
	Teach inputs	1 Piece(s)	1 Piece(s)
	Supply voltage U_B	18 V DC ... 30 V DC	10 V DC ... 30 V DC
	Switching frequency	200 Hz	200 Hz ... 2,000 Hz
	Degree of protection	IP 54 | IP 65	IP 65
	Ambient temperature, operation	0 °C ... 50 °C	0 °C ... 60 °C
	Housing material	Metal	Metal
Features	Special version		easyTeach function | Integrated paper tear monitoring | Manual fine tuning of the switching threshold | Teach input | Warning output

Measuring sensors

Intelligent test and control through measuring sensors

Measuring sensors can actively check distances, calculate absolute distances for the positioning of axes in plant construction and monitor other parameters in order to intelligently and independently initiate actions and, e.g., intervene in processes for control purposes.

We offer a large selection of different sensor technologies and designs that you can use to find solutions to measuring applications. Various powerful technologies facilitate optimum adaptation of our measuring sensors to a wide range of application requirements. Depending on the application, various communication interfaces are also available, such as IO-Link, bus interfaces or Ethernet-based interfaces.



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Contour measurement and navigation with laser scanners for efficient manufacturing and logistics processes

The new laser scanners in the ROD 300 series for contour measurement and the ROD 500 as a high-resolution variant for navigation tasks stand out for their high scanning rates combined with high angular resolution.

Manufacturing and logistics processes can thus be organized with maximum efficiency. Thanks to the scanning frequency of up to 80 Hz, even fast-moving objects can be detected reliably. The integrated window monitoring supports predictive maintenance and ensures high system availability.

Thanks to its compact design, the laser scanners can also be integrated into confined production environments and small automated guided vehicles (AGVs).

ROD 300/500

- Maximum precision and attention to detail thanks to high angular resolution of up to 0.025°
- Detection of fast objects thanks to high scanning frequency of up to 80 Hz
- Predictive maintenance through window monitoring
- Outstanding integrability due to compact design
- Use in high and low temperature ranges
- Robust design with IP 67

Distance sensors

Optical distance sensors

ODSL 8

ODS 9

		ODSL 8	ODS 9
Technical data	Measurement range	25 ... 45 mm | 20 ... 200 mm | 20 ... 500 mm	50 ... 100 mm | 50 ... 200 mm | 50 ... 450 mm | 50 ... 650 mm | 50 ... 1,050 mm
	Response time	2 ... 7 ms	1 ... 8 ms
	Resolution (type-dependent)	0.1 mm	0.01 mm
	Supply voltage U_B	18 V DC ... 30 V DC	10 V DC ... 30 V DC
	Light source	Laser, Red	Laser, Red
	Degree of protection	IP 67 | IP 69K	IP 67
	Operational controls	Rotary switch	Control buttons | LC Display | PC software
	Display	LED	LED | OLED display
	Housing	Metal, Diecast zinc	Plastic
	Dimensions without connector (W x H x D)	15 mm x 48 mm x 38 mm	21 mm x 50 mm x 50 mm
	Outputs	Analog output, Current | Analog output, Voltage | Digital switching output, Transistor, Push-pull	Analog output, Configurable, factory setting: current | Digital switching output, Transistor, Push-pull
	Interface		IO-Link | RS 232 | RS 485
	Connection type	Connector, M12, Turning, 90°	Cable with connector, M12, Turning, 90° | Connector, M12, Turning, 90°
	Optical distance measurement principle	Triangulation	Triangulation
	Type of scanning system	Against object	Against object
Features	Special version		Activation input | Deactivation input | Teach input
	Display for measured value display and configuration		X
	Ex marking acc. to EN 60079		
	Propagation time measurement (TOF)		
	Phase measurement		
	Triangulation measurement	X	X
	Supports the IO-Link smart sensor profile		X

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ODS 10	**ODS 110**	**ODSL 30**
CE UKCA CDRH	CE UKCA ECOLAB	CE UKCA CDRH
50 ... 8,000 mm, at 6 ... 90% diffuse reflection | 100 ... 25,000 mm, In combination with cooperative target reflective tape 7-A	100 ... 3,000 mm, Factory setting of the analog output	200 ... 30,000 mm | 200 ... 65,000 mm
3,4 ... 1000 ms, adjustable	4 ... 20 ms	30 ... 100 ms
1.0 mm	1.0 ... 5.0 mm	1.0 mm
18 V DC ... 30 V DC	18 V DC ... 30 V DC	10 V DC ... 30 V DC
Laser, Red	Laser, Red	Laser, Red
IP 67	IP 67 | IP 69K	IP 67
Control buttons | PC software	Control buttons | PC software	LC Display | Membrane keyboard
LED | OLED display	LED	LC Display | LED
Plastic	Plastic	Metal, Aluminum | Metal, Diecast aluminum
25 mm x 65 mm x 55 mm	23 mm x 50 mm x 50 mm	79 mm x 69 mm x 150 mm | 135 mm x 143 mm x 290 mm
Analog output, Configurable, factory setting: current | Digital switching output, Transistor, Push-pull	Analog output, Current | Analog output, Voltage | Digital switching output, Transistor, Push-pull	Analog output, Voltage, Current | Digital switching output, Transistor, Push-pull
IO-Link	IO-Link	RS 232 | RS 485
Cable | Cable with connector, M12, Turning, 90° | Connector, M12, Turning, 90°	Connector, M12, Turning, 90°	Connector, M12
Time of flight	Time of flight	Phase measurement
Against object | Against reflector	Against object	Against object

Activation input | Deactivation input | Teach input		Ex-protected
X		X
		X
X	X	
		X

Distance sensors

		Optical distance sensors
		ODSL 96B
		CE UKCA CDRH
Technical data	Measurement range	100 ... 600 mm | 150 ... 800 mm | 60 ... 2,000 mm | 120 ... 1,400 mm | 150 ... 1,200 mm | 150 ... 1,500 mm | 150 ... 2,000 mm | 150 ... 2,300 mm | 300 ... 10,000 mm | 300 ... 25,000 mm
	Response time	1 ... 60 ms
	Resolution (type-dependent)	0.1 ... 0.5 mm
	Supply voltage U_B	10 V DC ... 30 V DC
	Light source	Laser, Infrared | Laser, Red | LED, Infrared | LED, Red
	Degree of protection	IP 67 | IP 69K
	Operational controls	Membrane keyboard | PC software | Teach button
	Display	LED | OLED display
	Housing	Metal, Aluminum alloy | Metal, Diecast zinc | Plastic
	Dimensions without connector (W x H x D)	30 mm x 90 mm x 70 mm | 150 mm x 150 mm x 124 mm
	Outputs	Analog output, Current | Analog output, Voltage | Digital switching output, Transistor, Push-pull
	Interface	IO-Link | RS 232 | RS 485
	Connection type	Cable | Connector, M12
	Optical distance measurement principle	Time of flight | Triangulation
	Type of scanning system	Against object | Against reflector
Features	Special version	Ex-protected | Extra long light spot (XL) | Small light spot (S)
	Display for measured value display and configuration	X
	Ex marking acc. to EN 60079	X
	Propagation time measurement (TOF)	X
	Phase measurement	X
	Triangulation measurement	X

Distance sensors

Measuring ultrasonic sensors, cubic

NEW

420B series

Technical data	Dimensions without connector (W x H x D)	20.5 mm x 41 mm x 15 mm
	Measurement range	10 mm ... 1,000 mm
	Resolution	< 0.3 mm / < 0.5 mm
	Switching frequency	8 Hz ... 20 Hz
	Ultrasonic frequency	220 kHz ... 370 kHz
	Supply voltage U_B	12 V DC ... 30 V DC
	Switching outputs	Analog output, Current | Analog output, Voltage | Transistor, Push-pull
	Interface	IO-Link
	Connection type	Connector, M8
	Degree of protection	IP 67
	Operational controls	Teach button
	Housing	Plastic

Distance sensors

Technical data	Thread size
	Length
	Measurement range
	Resolution
	Switching frequency
	Ultrasonic frequency
	Supply voltage U_B
	Switching outputs
	Switching inputs
	Inputs/outputs selectable
	Interface
	Connection type
	Degree of protection
	Operational controls
	Housing
Features	Special version

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Measuring ultrasonic sensors, cylindrical

NEW

200 series	300 series	400 series
M18 | M30	M18 | M30	M12 | M18 | M30
55 mm ... 78 mm	60.3 mm ... 98.8 mm	50 mm ... 104.3 mm
80 mm ... 6,000 mm	40 mm ... 6,000 mm	15 mm ... 6,000 mm
1.0 mm	5 mm | 6 mm | < 2 mm	0.1 ... 0.5 mm | 1.0 mm | < 0.3 mm / < 0.5 mm
2 Hz ... 5 Hz	1 Hz ... 10 Hz	1.6 Hz ... 12 Hz
80 kHz ... 200 kHz	75 kHz ... 300 kHz	75 kHz ... 310 kHz
18 V DC ... 30 V DC	10 V DC ... 30 V DC	12 V DC ... 30 V DC
Analog output, Current | Analog output, Voltage | Transistor, Push-pull	Analog output, Current | Analog output, Voltage | Transistor, NPN | Transistor, PNP	Analog output, Current | Analog output, Voltage | Transistor, PNP | Transistor, Push-pull
	Teach input	Teach input
	1 Piece(s)	1 Piece(s)
IO-Link		IO-Link
Connector, M12	Connector, M12	Connector, M12
IP 67	IP 67	IP 67 | IP 68
	Control buttons	Control buttons
Metal	Plastic	Metal
Multiplex operation | Synchronous operation	Multiplex operation | Synchronous operation | Teach input	Multiplex operation | Synchronous operation | Teach input

Sensors for positioning

Technical data	Measurement range
	Depth of field
	Interface
	Reproducibility (1 sigma)
	Resolution
	Max. traverse rate
	SIL
	Performance Level (PL)
	Error reaction time
	Degree of protection
	Light source
	Laser class
	Ambient temperature, operation (with / without heating)
	Dimensions without connector (W x H x D)
	Housing material
Features	Functions

Bar code positioning systems

BPS 300i
Various connection concepts

FBPS 600i
Reliable position output

BPS 8
Position detection in extremely compact design

10,000,000 mm	10,000,000 mm	10,000,000 mm
50 mm ... 170 mm	50 mm ... 170 mm	60 mm ... 140 mm
EtherCAT | EtherNet IP | PROFIBUS DP | PROFINET | RS 232 | RS 422 | RS 485 | SSI	2-channel SSI with CRC | 2-channel standard SSI | PROFINET | SSI	RS 232
0.05 mm	0.15 mm	1 mm
0.001 mm ... 10 mm	0.01 mm ... 1 mm	0.001 mm ... 100 mm
10 m/s	10 m/s	4 m/s
	3, EN 61508	
	e, ISO / EN ISO 13849-1 | e, ISO / EN ISO 13849-1:2015	
	10 ms (configurable)	
IP 65	IP 65	IP 67
Laser, Red	Laser, Red	Laser, Red
1	1	2
-35 ... 50 °C | -5 ... 50 °C	-35 ... 60 °C | -5 ... 60 °C	0 ... 40 °C
100 mm x 108.7 mm x 48.3 mm	105 mm x 112.5 mm x 51.5 mm | 116.3 mm x 112.5 mm x 51.5 mm	15 mm x 48 mm x 40.3 mm | 51 mm x 61 mm x 17.4 mm
Diecast aluminum	Diecast aluminum	Diecast zinc
Heating	Heating | Safe position detection | Safe speed	

Sensors for positioning

Laser positioning systems

		AMS 300i	**AMS 100i**
		CE cULus CDRH	CE UKCA cULus CDRH
Technical data	Application	Collision protection of cranes / gantry cranes | Positioning of electroplating plants | Positioning of skillet systems and side-tracking skates | Positioning of stacker cranes	Collision protection of cranes / gantry cranes | Positioning of electroplating plants | Positioning of skillet systems and side-tracking skates | Positioning of stacker cranes
	Measurement range	200 ... 40,000 mm | 200 ... 120,000 mm | 200 ... 200,000 mm | 200 ... 300,000 mm	100 ... 40,000 mm | 100 ... 120,000 mm
	Interface	CANopen | DeviceNet | EtherCAT | Ethernet | EtherNet IP | Interbus-S | PROFIBUS DP | PROFINET | RS 232 | RS 422 | RS 485 | SSI	EtherNet TCP/IP | SSI
	Accuracy	2 mm | 3 mm | 5 mm	+/- 2 mm
	Reproducibility (3 sigma)	0.9 mm | 1.5 mm | 2.1 mm | 3 mm	0.6 mm (with measurement range from 500 mm)
	Resolution, adjustable	0.001 ... 10 mm	0.001 ... 10 mm
	Supply voltage U_B	18 V DC ... 30 V DC	18 V DC ... 30 V DC
	Light source	Laser, Red	Laser, Red
	Laser class	2	2
	Light spot size / at sensor distance	40 mm / 40,000 mm | 100 mm / 120,000 mm | 150 mm / 200,000 mm | 225 mm / 300,000 mm	40 mm / 40,000 mm | 100 mm / 120,000 mm
	Degree of protection	IP 65	IP 65
	Operational controls	Membrane keyboard	Membrane keyboard
	Type of display	LC Display | LED	LC Display | LED
	Housing	Diecast zinc/aluminum	Diecast aluminum
	Optics cover	Glass	Glass
	Ambient temperature, operation (without / with heating)	-30 ... 50 °C | -5 ... 50 °C	-30 ... 60 °C | -5 ... 60 °C
	Dimensions without connector (W x H x D)	84 mm x 166.5 mm x 159 mm	70 mm x 139 mm x 118 mm
Features	Heating	X	X
	Interference-free when installed next to data transmission system DDLS	X	X

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3D sensors / fork sensors

		3D sensors
		LPS 36, 36 HI, LES 36, 36 HI, LRS 36
		CE UKCA CDRH
Technical data	Application	3D object detection (LES & LRS) | Contour measurement (LPS) | Object measurement (LES & LPS)
	Inputs / outputs	Activation input | Analog output | Digital switching input | Digital switching output
	Interface	Ethernet | PROFIBUS DP
	Light source	Laser, Red
	Laser class	2M
	Detection range	200 ... 800 mm
	Resolution	1 ... 3 mm | 0.1 ... 0.9 mm
	Measurement range	200 ... 600 mm | 200 ... 800 mm
	Degree of protection	IP 67
	Supply voltage U_B	18 ... 30 V, DC
	Operational controls	Membrane keyboard
	Display	LC Display | LED
	Dimensions without connector (W x H x D)	56 mm x 160 mm x 74 mm
Features	Special version	Plastic screen | Synchronization input

3D sensors / fork sensors

Laser scanners

NEW

ROD 300/500

CE CDRH

Technical data	Application	Container checking | Contour measurement | Navigation
	Measurement range	0.08 ... 25 m
	Detection angle	275 °
	Angular resolution	0.025° at 10 Hz | 0.05° at 20 Hz | 0.1° at 40 Hz | 0.2° at 50 Hz | 0.2° at 80 Hz
	Measurement time	12.5 ... 25 ms | 12.5 ... 100 ms
	Measurement value resolution	2 mm
	Interface	Ethernet
	Light source	Laser, Infrared, 905 nm
	Laser class in accordance with IEC/EN 60825-1	1
	Connection	Connector, M12
	Dimensions without connector (W x H x D)	80 mm x 80 mm x 85 mm
	Housing material	Diecast zinc
	Lens cover material	Plastic
	Ambient temperature, operation	-30 ... 60 °C
	Degree of protection	IP 67
Features	Functions	Output of distance value and signal amplitude per angle segment
	Driver	ROS1 / ROS 2 driver

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3D sensors / fork sensors

Measuring fork sensors

GS 754B

Technical data	Application	Detection of transparent objects | Film detection > 0.1 mm
	Measurement field length	25 mm
	Mouth width	27 mm | 98 mm
	Mouth depth	42 mm
	Inputs/outputs	Analog output, Current | Analog output, Voltage | Inputs/outputs selectable
	Interface	RS 232 | RS 422
	Minimum object diameter	0.5 mm
	Reproducibility (1 sigma)	0 ... 0.03 mm
	Output cycle	0.012 s ... 3 s
	Response time	12 ms
	Light source	LED, Infrared
	Connection type	Connector, M12
	Degree of protection	IP 67
	Dimensions without connector (W x H x D)	19.4 mm x 82.1 mm x 91 mm | 20.4 mm x 157 mm x 91 mm

Sensors for compartment fine positioning

IPS 200i
Sensors for positioning

IPS 400i
Sensors for positioning

		IPS 200i	IPS 400i
Technical data	Application	Single compartment depth	Double compartment depth
	Camera type	Monochrome	Monochrome
	Resolution (pixel)	1,280 px x 960 px	1,280 px x 960 px
	Marker size (round)	5 ... 15 mm | 5 ... 20 mm	13 ... 15 mm
	Working range	50 mm ... 600 mm	250 mm ... 1,900 mm
	Reproducibility (1 sigma)	0.1 mm, depending on the application	0.2 mm, (Compartment depth 2: 0.5 mm) depending on the application
	Interface	Ethernet | EtherNet IP | PROFINET	Ethernet | EtherNet IP | PROFINET
	Switching outputs	5 Piece(s)	5 Piece(s)
	Switching inputs	3 Piece(s)	3 Piece(s)
	Light source	LED, Infrared	LED, Infrared
	Configuration/parametrization	Configuration codes | Teach-in | Via web browser	Configuration codes | Teach-in | Via web browser
	Supply voltage U_B	18 ... 30 V, DC	18 ... 30 V, DC
	Degree of protection	IP 65	IP 65
	Dimensions without connector (W x H x D)	43 mm x 61 mm x 44 mm	43 mm x 61 mm x 44 mm
Accessories	Mounting devices	BT 320M | BTU 320M-D12	BT 320M | BTU 320M-D12
	External illumination	IL AL	IL AL
	Reflectors	MTKZ	MTKZ
Features	Heating	X	X

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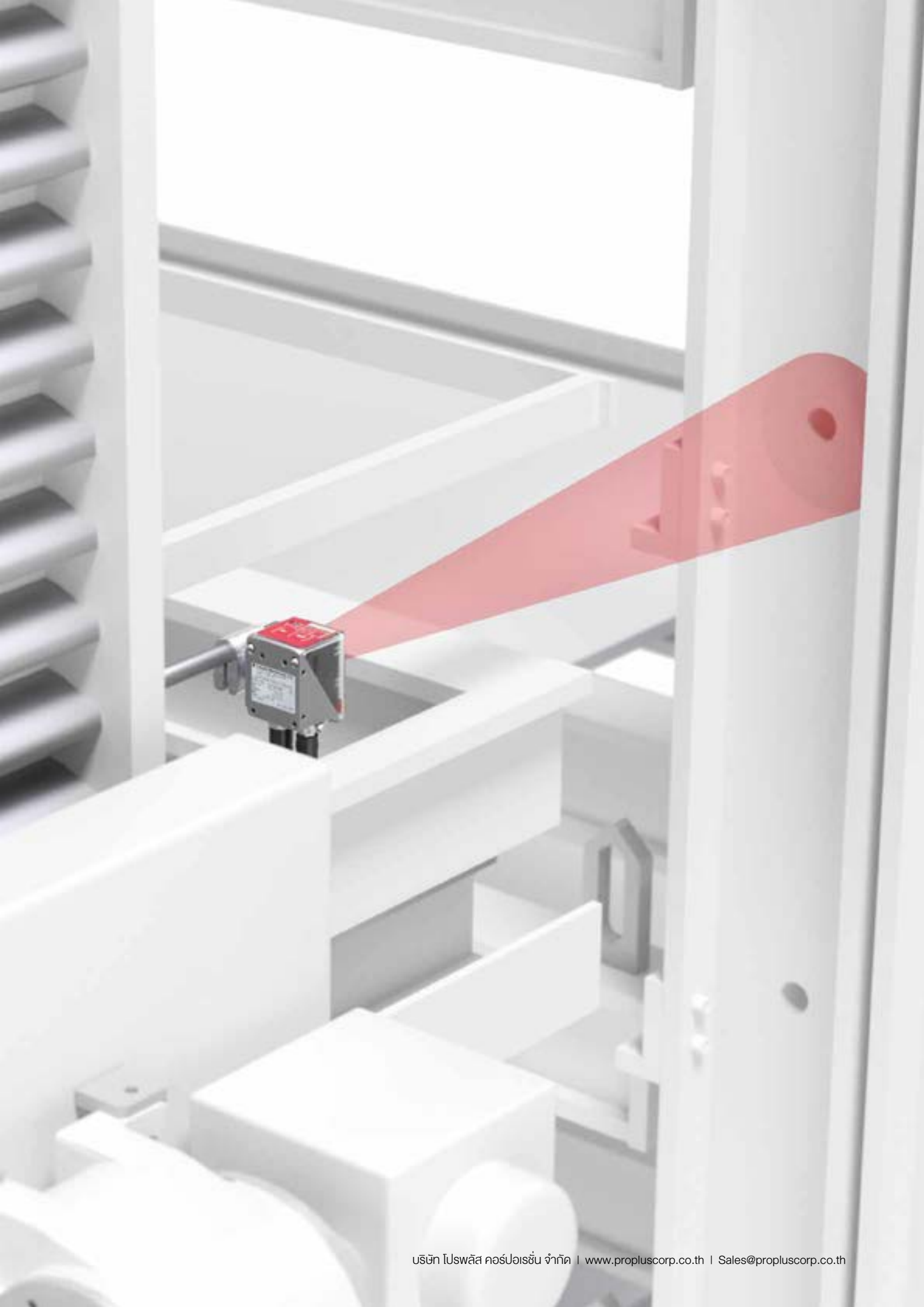

Light curtains / volume measurement system

Technical data	Application
	Profile cross section
	Measurement field length
	Beam spacing
	Number of beams
	Operating range*
	Interface
	Outputs
	Supply voltage U_B
	Connection type
	Degree of protection
	Ex-zone
	Light source
	Housing
	Cycle time
	Response time per beam
	Operational controls
	Type of configuration
	Ambient temperature, operation
	Type of display
Features	Diagonal-beam scanning
	Crossed-beam scanning
	Parallel-beam scanning
	Ex-protected

* Guaranteed operating range

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CML 700i
Measuring

CML 720i EX
Measuring

CMS 700i
Measuring

Detection of transparent films | Detection of transparent objects | Object detection in film tube | Object measurement | Radiation of semi-transparent media	Object measurement	Evaluation of protrusions and deformations | Measurement of height, length, width, orientation angle, object distance to the conveyor edge
29 mm x 35.4 mm | 30.7 mm x 40.3 mm | 30.7 mm x 54.8 mm | 31 mm x 77 mm | 31 mm x 117 mm	30.7 mm x 40.3 mm | 30.7 mm x 54.8 mm	
150 mm ... 2,960 mm	130 mm ... 2,220 mm	
5 mm | 10 mm | 20 mm | 40 mm	10 mm | 20 mm	5 mm
7 Piece(s) ... 592 Piece(s)	7 Piece(s) ... 940 Piece(s)	
0.1 m ... 9.5 m	0.3 m ... 7 m	0.1 m ... 4.5 m
CANopen | IO-Link | PROFIBUS DP | PROFINET | RS 485 Modbus	CANopen | IO-Link	EtherNet TCP/IP | PROFINET
Analog output, Freely configurable | Analog output, Voltage / Current		4x I/Os
18 V DC ... 30 V DC	18 V DC ... 30 V DC	100 V AC ... 263 V AC
Connector, M12	Connector, M12	Connector, M12 | Earthing strap | Harting connector | Mains plug | Screw fitting
IP 65 | IP 67	IP 65	IP 54 (switch cabinet) | IP 65 (light curtain)
	2 | 22	
LED, Infrared	LED, Infrared	LED, infrared
Metal	Metal	Metal
1 ms ... 18.16 ms	1 ms ... 7.12 ms	
10 µs ... 30 µs	30 µs	10 µs
Membrane keyboard	Membrane keyboard	Rotary switch
Software | Teach-in	Software	performed via webConfig
-30 ... 60 °C	-30 ... 60 °C	0 ... 45 °C
LED | OLED display	LED | OLED display	LED
X	X	
X	X	
X	X	
	X	

Safety at Leuze

Safety Thought Further.
For all your safety applications worldwide.

Global industry is in a constant state of change. And with it, the complex requirements for safety concepts to protect people and systems. At the same time, the importance of smooth process is growing constantly as a result of automation and networking.

Our driving force is the desire to guarantee you gapless safety, efficient material flow and maximum availability at all times. To this end, we have bundled our expertise in the field of occupational and machine safety into a single portfolio: Safety at Leuze.

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Efficient safety with minimal space requirements

The RSL 200 safety laser scanners are optimized for minimum space requirements. With a range of 3.0 m, 275° scan angle and dimensions of just 80 x 80 x 86 mm, they are particularly suitable for use on AGVs and AMRs. Plus clever details, such as the rotatable connections and the diagnostics app, ensure simple integration and efficient safety. The RSL 400 is available for longer operating ranges and additional functions.

RSL 200

- Thanks to their small dimensions of 80 x 80 x 86 mm, the devices can be perfectly integrated even in compact AGVs and AMRs
- Reliable operation: Robust against dirt and particles in the air as well as shocks and vibrations
- Different functional variants ensure the right solution every time
- Up to 32 switchable field sets for dynamic adaptation to the protection situation
- High-quality data output for the navigation of AGVs and AMRs
- Simple integration thanks to standard M12 connections with rotatable connections
- Quick access to status information and easy diagnostics with the RSL 200 app

Safety laser scanners

		NEW	NEW
		RSL 210	**RSL 220**
		CE	CE
Technical data	Type in accordance with EN IEC 61496	3	3
	SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	2	2
	Performance Level (PL) in accordance with EN ISO 13849-1	d	d
	Protected field range	0 ... 3 m	0 ... 3 m
	Resolution (adjustable)	50/70 mm	50/70 mm
	Scanning angle	275 °	275 °
	Angular resolution	0.2 °	0.2 °
	Range, warning field	0 ... 15 m	0 ... 15 m
	Response time	75 ms	75 ms
	Number of protective functions	1 Piece(s)	1 Piece(s)
	Number of field pairs / 4-field sets		
	Number of field triples, switchable	1 Piece(s)	8 Piece(s)
	Number of warning fields per field triple	2 Piece(s)	2 Piece(s)
	Number of independent sensor configurations		
	Measurement data operating range (90% diffuse reflection)		
	Dimension (W x H x L)	80 mm x 80 mm x 86 mm	80 mm x 80 mm x 86 mm
	Temperature range	0 ... 50 °C	0 ... 50 °C
	Degree of protection	IP 65	IP 65
	Safety-related switching outputs	2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP
	Connection	Connector, M12, 8-pin	Connector, M12, 8-pin
	Interfaces for configuration and diagnosis	Bluetooth | USB 2.0	Bluetooth | USB 2.0
Functions	Dynamic contactor monitoring (EDM), selectable		
	Field triple changeover	X	X
	Field triple monitoring	X	X
	Fixed selection of one field triple	X	X
	Contactor monitoring (EDM)	X	X
Features	Features	Removable configuration memory | Rotatable cylindrical connector, M12	Removable configuration memory | Rotatable cylindrical connector, M12

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NEW

RSL 230

CE

3
2
d
0 ... 3 m
50/70 mm
275 °
0.2 °
0 ... 15 m
75 ms
1 Piece(s)
32 Piece(s)
2 Piece(s)
80 mm x 80 mm x 86 mm
0 ... 50 °C
IP 65
2 Piece(s), Transistor, PNP
Connector, M12, 12-pin
Bluetooth | Ethernet | USB 2.0
X
X
X
X
Removable configuration memory | Rotatable cylindrical connector, M12

NEW

RSL 235

CE

3
2
d
0 ... 3 m
50/70 mm
275 °
0.2 °
0 ... 15 m
75 ms
1 Piece(s)
32 Piece(s)
2 Piece(s)
0 ... 25 m
80 mm x 80 mm x 86 mm
0 ... 50 °C
IP 65
2 Piece(s), Transistor, PNP
Connector, M12, 12-pin
Bluetooth | Ethernet | USB 2.0
X
X
X
X
Navigation data (UDP) | Removable configuration memory | Rotatable cylindrical connector, M12

RSL 410
Safety laser scanner

CE CDRH

3
2
d
0 ... 3 m | 0 ... 4.5 m | 0 ... 6.25 m | 0 ... 8.25 m
30/40/50/60/70/150 mm
270 °
0.1 °
0 ... 20 m
80 ms, ≥
1 Piece(s)
1 / 1
1
140.2 mm x 148.6 mm x 140.3 mm
0 ... 50 °C
IP 65
2 Piece(s), Transistor, PNP
Cable with Sub-D, 15-pin | Connector, M12, 8-pin
Bluetooth | Ethernet
X
Integrated level | Large plain-text display | Removable connection unit with integrated configuration memory

Safety laser scanners

RSL 420, 425
Safety laser scanner

RSL 430
Safety laser scanner

		RSL 420, 425	RSL 430
Technical data	Type in accordance with EN IEC 61496	3	3
	SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	2	2
	Performance Level (PL) in accordance with EN ISO 13849-1	d	d
	Protected field range	0 ... 3 m | 0 ... 4.5 m | 0 ... 6.25 m | 0 ... 8.25 m	0 ... 3 m | 0 ... 4.5 m | 0 ... 6.25 m | 0 ... 8.25 m
	Resolution (adjustable)	30/40/50/60/70/150 mm	30/40/50/60/70/150 mm
	Scanning angle	270 °	270 °
	Angular resolution	0.1 °	0.1 °
	Range, warning field	0 ... 20 m	0 ... 20 m
	Response time	80 ms, ≥	80 ms, ≥
	Number of protective functions	1 Piece(s)	2 Piece(s)
	Number of field pairs / 4-field sets	8 / 8 | 10 / 10	10 + 10 / 10 + 10
	Number of independent sensor configurations	1	2
	UDP measurement data output optimized for AGV navigation	RSL 425	
	Measurement data operating range (90% diffuse reflection)	0 ... 50 m	
	Dimension (W x H x L)	140 mm x 149 mm x 140 mm	140 mm x 149 mm x 140 mm
	Temperature range	0 ... 50 °C	0 ... 50 °C
	Degree of protection	IP 65	IP 65
	Safety-related switching outputs	2 Piece(s), Transistor, PNP	4 Piece(s), Transistor, PNP
	Connection	Cable, 16 -wire | Cable with connector, M30, 16-pin | Cable with Sub-D, 15-pin	Cable, 29 -wire | Cable with connector, M30, 30-pin
	Connection, devices with PROFIsafe		
	Interfaces for configuration and diagnosis	Bluetooth | Ethernet | USB	Bluetooth | Ethernet | USB
Functions	Dynamic contactor monitoring (EDM), selectable	X	X
	E-stop linkage	X	X
	Safe, internal switch-off delay (STOP 1)		X
Features	Features	Integrated level | Large plain-text display | Removable connection unit with integrated configuration memory	Integrated level | Large plain-text display | Removable connection unit with integrated configuration memory

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RSL 440, 445
Safety laser scanner

RSL 420P
PROFIsafe safety laser scanners

RSL 450P, 455P
PROFIsafe safety laser scanners

3	3	3
2	2	2
d	d	d
0 ... 3 m | 0 ... 4.5 m | 0 ... 6.25 m | 0 ... 8.25 m	0 ... 3 m | 0 ... 4.5 m | 0 ... 6.25 m | 0 ... 8.25 m	0 ... 3 m | 0 ... 4.5 m | 0 ... 6.25 m | 0 ... 8.25 m
30/40/50/60/70/150 mm	30/40/50/60/70/150 mm	30/40/50/60/70/150 mm
270 °	270 °	270 °
0.1 °	0.1 °	0.1 °
0 ... 20 m	0 ... 20 m	0 ... 20 m
80 ms, ≥	80 ms, ≥	80 ms, ≥
2 Piece(s)	1 Piece(s)	4 Piece(s)
Up to 100 / 50	10 / -	Up to 100 / 50
Up to 10	1	Up to 10
RSL 445		RSL 455
0 ... 50 m		0 ... 50 m
140 mm x 149 mm x 140 mm	140.2 mm x 170 mm x 142 mm | 140.2 mm x 200 mm x 142 mm	140.2 mm x 170 mm x 142 mm | 140.2 mm x 200 mm x 142 mm
0 ... 50 °C	0 ... 50 °C	0 ... 50 °C
IP 65	IP 65	IP 65
4 Piece(s), Transistor, PNP	PROFIsafe	PROFIsafe
Cable, 29 -wire | Cable with connector, M30, 30-pin	Connector, M12, 4-pin | Connector, M12, 5-pin | PROFINET push-pull 24V	Connector, M12, 4-pin | Connector, M12, 5-pin | PROFINET push-pull 24V
	3x M12 connector for 2-port switch and voltage supply or 4x M12 connector (L-coded) with additional voltage output | AIDA variant with push-pull connectors, communication via copper or fiber-optic cable	3x M12 connector for 2-port switch and voltage supply or 4x M12 connector (L-coded) with additional voltage output | AIDA variant with push-pull connectors, communication via copper or fiber-optic cable
Bluetooth | Ethernet | USB	Bluetooth | Ethernet | PROFINET | USB	Bluetooth | Ethernet | PROFINET | USB
X		
X		
X		
Integrated level | Large plain-text display | Removable connection unit with integrated configuration memory	Integrated level | Large plain-text display | Removable connection unit with integrated 2-port PROFINET switch and integrated configuration memory, Conformance Class C, IRT-capable	Integrated level | Large plain-text display | Removable connection unit with integrated 2-port PROFINET switch and integrated configuration memory, Conformance Class C, IRT-capable

Safety light curtains

ELC 100
Type 4 safety light curtains

MLC 310
Type 2 safety light curtains

		ELC 100	MLC 310
Technical data	Type in accordance with EN IEC 61496	4	2
	SIL in accordance with IEC 61508 or EN IEC 62061 (SILCL)	3	1
	Performance Level (PL) in accordance with EN ISO 13849-1	e	c
	Resolution	17 mm | 30 mm	20 mm | 30 mm | 40 mm | 90 mm
	Operating range	0.5 ... 3 m | 0.5 ... 6 m	0 ... 10 m | 0 ... 15 m | 0 ... 20 m
	Protective field height	300 mm ... 1,500 mm	150 mm ... 3,000 mm
	Response time	4.7 ms ... 21.2 ms	3 ms ... 34 ms
	Profile cross section	34.7 mm x 39.3 mm	29 mm x 35.4 mm
	Temperature range	0 ... 50 °C	-15 ... 55 °C | 0 ... 55 °C
	Degree of protection	IP 65	IP 65
	Safety-related switching outputs (OSSDs)	2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP
	Connection type	Cable with connector, M12, 4-pin	Connector, M12, 4-pin | Connector, M12, 5-pin
Functions	Display	LED	LED
	Range reduction, transmission channel changeover		X
	Automatic start/restart	X	X
	Start/restart interlock (RES)		
	Contactor monitoring (EDM)		
	Configuration by means of wiring		
	AS-i Safety interface		
	Extra shock-resistant	X	

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MLC 320
Type 2 safety light curtains

MLC 510
Type 4 safety light curtains

MLC 520
Type 4 safety light curtains

2	4	4
1	3	3
c	e	e
20 mm | 30 mm | 40 mm | 90 mm	14 mm | 20 mm | 30 mm | 40 mm | 90 mm	14 mm | 20 mm | 30 mm | 40 mm | 90 mm
0 ... 10 m | 0 ... 15 m | 0 ... 20 m	0 ... 6 m | 0 ... 10 m | 0 ... 15 m | 0 ... 20 m	0 ... 6 m | 0 ... 10 m | 0 ... 15 m | 0 ... 20 m
150 mm ... 3,000 mm	150 mm ... 3,000 mm	150 mm ... 3,000 mm
3 ms ... 31 ms	3 ms ... 108 ms	3 ms ... 64 ms
29 mm x 35.4 mm	29 mm x 35.4 mm	29 mm x 35.4 mm
0 ... 55 °C	-30 ... 55 °C | 0 ... 55 °C	-30 ... 55 °C | 0 ... 55 °C
IP 65	IP 65	IP 65
2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP
Connector, M12, 5-pin | Connector, M12, 8-pin	Connector, M12, 5-pin	Connector, M12, 5-pin | Connector, M12, 8-pin
7-segment display | LED	LED	7-segment display | LED
X	X	X
	X	
X		X
X		X
X		X
	X	
	X	X

Safety light curtains

MLC 530
Type 4 safety light curtains

MLC 530 SPG
Type 4 safety light curtains

		MLC 530	MLC 530 SPG
Technical data	Type in accordance with EN IEC 61496	4	4
	SIL in accordance with IEC 61508 or EN IEC 62061 (SILCL)	3	3
	Performance Level (PL) in accordance with EN ISO 13849-1	e	e
	Resolution	14 mm | 20 mm | 30 mm | 40 mm | 90 mm	14 mm | 30 mm | 40 mm | 90 mm
	Operating range	0 ... 6 m | 0 ... 10 m | 0 ... 15 m | 0 ... 20 m	0 ... 10 m | 0 ... 20 m
	Protective field height	150 mm ... 3,000 mm	150 mm ... 3,000 mm
	Response time	3 ms ... 64 ms	100 ms
	Profile cross section	29 mm x 35.4 mm	29 mm x 35.4 mm
	Temperature range	-30 ... 55 °C | 0 ... 55 °C	-30 ... 55 °C
	Degree of protection	IP 65	IP 65
	Safety-related switching outputs (OSSDs)	2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP
	Connection type	Connector, M12, 5-pin | Connector, M12, 8-pin	Connector, M12, 5-pin | Connector, M12, 8-pin
Functions	Display	7-segment display | LED	7-segment display | LED
	Range reduction, transmission channel changeover	X	X
	Automatic start/restart		
	Start/restart interlock (RES)	X	X
	Contactor monitoring (EDM)	X	
	Configuration by means of wiring	X	X
	Blanking, fixed or movable	X	X
	2-sensor muting, timing controlled	X	
	Smart Process Gating		X
	Linkage of safety output	X	X
	Cascading (triple)		
	AS-i Safety interface		
	Ex marking acc. to EN 60079		
	Extra shock-resistant	X	

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MLC 511 AIDA
Type 4 safety light curtains

MLC 520 Host-Guest
Type 4 safety light curtains

MLC 520 EX2
Type 4 safety light curtains

4	4	4
3	3	3
e	e	e
14 mm | 30 mm	14 mm | 20 mm | 30 mm | 40 mm | 90 mm	20 mm | 30 mm
0 ... 6 m | 0 ... 10 m	0 ... 6 m | 0 ... 10 m | 0 ... 15 m | 0 ... 20 m	0 ... 9 m | 0 ... 10 m
300 mm ... 1,800 mm	150 mm ... 1,800 mm	450 mm ... 1,800 mm
4 ms ... 77 ms	2 ms ... 39 ms	7 ms ... 100 ms
29 mm x 35.4 mm	29 mm x 53 mm	30.7 mm x 40.3 mm
0 ... 55 °C	0 ... 55 °C	0 ... 55 °C
IP 65	IP 65	IP 65
2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP
Connector, M12, 4-pin	Cable with connector, M12, 8-pin | Connector, M12, 5-pin | Connector, M12, 8-pin	Connector, M12, 5-pin | Connector, M12, 8-pin
LED	7-segment display | LED	7-segment display | LED
X	X	X
X		
	X	X
	X	X
	X	X
	X	
	X	
		X

Safety light curtains

MLC 510IP 67/69K
Type 4 safety light curtains

MLC 520-S Extra slim design
Type 4 safety light curtains

Technical data	Type in accordance with EN IEC 61496	4	4
	SIL in accordance with IEC 61508 or EN IEC 62061 (SILCL)	3	3
	Performance Level (PL) in accordance with EN ISO 13849-1	e	e
	Resolution	14 mm | 20 mm | 30 mm | 90 mm	14 mm | 24 mm
	Operating range	0 ... 8 m | 0 ... 12 m | 0 ... 4.8 m	0.2 ... 6 m
	Protective field height	300 mm ... 1,650 mm	150 mm ... 1,200 mm
	Response time	4 ms ... 33 ms	7 ms ... 17 ms
	Profile cross section	Ø 52.5 mm	15.4 mm x 32.6 mm
	Temperature range	0 ... 55 °C	-10 ... 55 °C
	Degree of protection	IP 65 | IP 66 | IP 67 | IP 69K	IP 65
	Safety-related switching outputs (OSSDs)	2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP
	Connection type	Cable with connector, M12, 5-pin	Cable with connector, M12, 5-pin
Functions	Display	LED	
	Range reduction, transmission channel changeover	X	
	Automatic start/restart	X	X
	Start/restart interlock (RES)		X
	Contactor monitoring (EDM)		X
	Cascading (triple)		X
	Extremely slim design		X
	AS-i Safety interface	X	
	Degrees of protection IP 67/IP 69K, mounted in protective tube	X	

Leuze electronic MLC
Leuze electronic MLC

Multiple light beam safety devices

MLD 310, 510
Type 2 / 4 multiple light beam safety devices

Technical data	Type in accordance with EN IEC 61496	2 | 4
	SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	1 | 3
	Performance Level (PL) in accordance with EN ISO 13849-1	c | e
	Number of beams	2 Piece(s) | 3 Piece(s) | 4 Piece(s)
	Beam spacing	300 mm | 400 mm | 500 mm
	Transmitter-receiver systems operating range	0.5 ... 50 m | 20 ... 70 m
	Transceiver systems operating range	0.5 ... 6 m | 0.5 ... 8 m
	Response time	25 ms ... 30 ms
	Profile cross section	52 mm x 64.7 mm
	Ambient temperature, operation	-30 ... 55 °C
	Degree of protection	IP 67
	Safety-related switching outputs (OSSDs)	2 Piece(s), Transistor, PNP
	Connection type	Connector, M12, 5-pin
Functions	Type of display	LED
	Start/restart interlock (RES)	
	Contactor monitoring (EDM), selectable	
	Configuration by means of wiring	
	Range reduction (for transmitter-receiver systems)	X
	Integrated laser alignment aid (optional for transmitter-receiver systems)	X
	2-sensor muting (timing controlled)	
	2-sensor muting (sequence controlled)	
	4-sensor muting (timing controlled)	
	Alternative connection for second muting signal, muting enable function, muting-timeout extension, partial muting	
	Integrated status indicator (optional)	X
	AS-i Safety interface (optional)	MLD 510

MLD 320, 520
Type 2 / 4 multiple light beam safety devices

MLD 330, 530
Type 2 / 4 multiple light beam safety devices

MLD 335, 535
Type 2 / 4 multiple light beam safety devices

2 | 4	2 | 4	2 | 4
1 | 3	1 | 3	1 | 3
c | e	c | e	c | e
2 Piece(s) | 3 Piece(s) | 4 Piece(s)	2 Piece(s) | 3 Piece(s) | 4 Piece(s)	2 Piece(s) | 3 Piece(s) | 4 Piece(s)
300 mm | 400 mm | 500 mm	300 mm | 400 mm | 500 mm	300 mm | 400 mm | 500 mm
0.5 ... 50 m | 20 ... 70 m	0.5 ... 50 m | 20 ... 70 m	0.5 ... 50 m | 20 ... 70 m
0.5 ... 6 m | 0.5 ... 8 m	0.5 ... 6 m | 0.5 ... 8 m	0.5 ... 6 m | 0.5 ... 8 m
25 ms	50 ms	50 ms
52 mm x 64.7 mm	52 mm x 64.7 mm	52 mm x 64.7 mm
-30 ... 55 °C	-30 ... 55 °C	-30 ... 55 °C
IP 67	IP 67	IP 67
2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP
Connector, M12, 5-pin | Connector, M12, 8-pin	Connector, M12, 5-pin | Connector, M12, 8-pin	Connector, M12, 5-pin | Connector, M12, 8-pin
LED	7-segment display | LED	7-segment display | LED
X	X	X
X	X	X
X	X	X
X	X	X
X	X	X
	X	X
	X	X
		X
	X	X
X	X	X

Protective sensor sets and accessories

DC / UDC
Device columns

UMC
Mirror columns

Description	Features	For freestanding, stable floor assembly of: MLD 300, MLD 500 multiple light beam safety devices and MLC 500, MLC 300 safety light curtains	For multi-sided safeguarding of danger zones together with: MLD 300, MLD 500 multiple light beam safety devices and MLC 500, MLC 300 safety light curtains
Consisting of	Column*	DC device column | UDC device column	UMC mirror column
	Safety sensor		
	Number of muting sensors		
	Type of muting sensors**		
	Number of individual mirrors		2 Piece(s) | 3 Piece(s) | 4 Piece(s)
	Mirror length (continuous mirror)		970 mm ... 1,870 mm
	Accessories, included in the set	Mounting accessories | Protective screen (optional)	Mounting accessories
	Column height without foot	840 mm ... 3,100 mm	900 mm ... 1,600 mm

* UDC device column: with automatic resetting after mechanical impact

** With reflectors

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MLD-UDC
Protective sensor sets

MLDSET
Protective sensor sets

Set-AC-M
Muting sensor sets

Pre-assembled sets. For fast mounting and easy commissioning, immediately ready for use.	Complete sets for access guarding with muting function. Pre-assembled, fast mounting and easy commissioning, immediately ready for use through pluggable connections.	Pre-assembled sets for fast mounting and error-free commissioning of muting applications. Function in combination with MLD multiple light beam safety devices and MLC safety light curtains.
UDC device column	UDC device column	
MLD 500 multiple light beam safety device, transmitter/receiver or transceiver/mirror systems	MLD 500 multiple light beam safety device with muting function	
	2 Piece(s) | 4 Piece(s)	1 Piece(s) | 2 Piece(s) | 4 Piece(s)
	PRK 25B retro-reflective photoelectric sensors | PRK 25C retro-reflective photoelectric sensors	PRK 25C retro-reflective photoelectric sensors
Mounting accessories | Protective screen (optional)	Connection module | Mounting accessories | Mounting brackets for sensors/reflectors | Protective screen (optional)	Mounting brackets
900 mm ... 1,900 mm	1,300 mm ... 1,600 mm	

Single light beam safety devices

Technical data	Type in accordance with EN IEC 61496
	SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)
	Performance Level (PL) in accordance with EN ISO 13849-1
	Operating range
	Light source
	Housing material
	Dimension (W x H x L)
	Ambient temperature, operation
	Degree of protection
	Safety-related switching outputs (OSSDs)
	Switching outputs
	Connection type
Functions	Display
	Start/restart interlock (RES)
	Contactor monitoring (EDM), selectable
	Configuration by means of wiring
	Range reduction
	Integrated laser alignment aid
	2-sensor muting (timing or sequence controlled)
	Alternative connection for second muting signal, muting enable function, muting-timeout extension
	AS-i Safety interface

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MLD 500
Type 4 single light beam safety devices

SLS 46C
Type 4 single light beam safety devices

SLS 46C
Type 2 single light beam safety devices

4	4, In combination with MSI-TRMB safety relay	2, In combination with a suitable test monitoring unit, e.g. MSI-TR1B
3	3, In combination with MSI-TRMB safety relay	1, In combination with a suitable test monitoring unit, e.g. MSI-TR1B
e	e, In combination with MSI-TRMB safety relay	c, In combination with a suitable test monitoring unit, e.g. MSI-TR1B
0.5 ... 70 m | 20 ... 100 m	5 ... 70 m | 0.25 ... 40 m	0.5 ... 40 m | 5 ... 70 m
LED, Infrared	LED, Infrared | LED, Red	LED, Infrared | LED, Red
Metal	Plastic	Plastic
52 mm x 193 mm x 64.7 mm	20.5 mm x 76.3 mm x 44 mm	20.5 mm x 76.3 mm x 44 mm
-30 ... 55 °C	-30 ... 60 °C	-30 ... 60 °C
IP 67	IP 67 | IP 69K	IP 67 | IP 69K
2 Piece(s), Transistor, PNP		
1 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP	2 Piece(s), Transistor, PNP
Connector, M12	Cable, 2,000 mm | Connector, M12	Cable, 2,000 mm | Connector, M12
7-segment display | LED	LED	LED
X		
X		
X		
X		
X		
X		
X		
X		

Safety Radar Systems

		Radar sensors
		LBK S/SBV
		CE UKCA
System	SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	2
	Performance Level (PL) in accordance with EN ISO 13849-1	d
	Category in accordance with EN ISO 13849-1	2 | 3
	Operating principle	Detection of movement | Detection of persons
	Response time	100 ms
	Ambient temperature, operation	-30 ... 60 °C
Sensor	Operating range	0 ... 4 m | 0 ... 5 m | 0 ... 9 m
	Angle of radiation, horizontal	5° - 100° | 10° - 100° | Adjustable in 5° increments | Adjustable in 10° increments | Narrow: 50° | Wide: 110°
	Angle of radiation, vertical	20° | Narrow: 15° | Wide: 30°
	Restart delay time (automatic start)	4,000 ms | 10,000 ms
	Frequency range	24,000 ... 24,500 MHz | 60,600 ... 62,800 MHz
	Emitted power	≤ 13 dBm | ≤ 16 dBm
	Dimensions (W x H x L)	158 mm x 135 mm x 71 mm | 165 mm x 123 mm x 49 mm
	Connection	Connector, M12, 5-pin
	Supply voltage U_B	12 V, DC, -20 ... 20 %
	Degree of protection	IP 67

Safety Radar Systems

		Controller
		LBK ISC
		CE UKCA
System	SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	2
	Performance Level (PL) in accordance with EN ISO 13849-1	d
	Category in accordance with EN ISO 13849-1	2 | 3
	Operating principle	Detection of movement | Detection of persons
	Response time	100 ms
	Ambient temperature, operation	-30 ... 60 °C
Controller	Signal outputs	The PNP transistor outputs can be configured as signal outputs
	Inputs	2x two-channel | 4x one-channel
	Number of sensors in a system	6
	Functions	Changeover between configurations | Configuration memory | Connection of up to 6 sensors | Deactivation of sensor groups | Slot for MicroSD card | Start/restart interlock (RES), selectable | Synchronization of controllers
	Dimensions (W x H x L)	105 mm x 58 mm x 103 mm | 106 mm x 33 mm x 103 mm | 106 mm x 58 mm x 103 mm
	Degree of protection	IP 20
With I/O interface	Safety-related switching outputs	2 x 2 PNP transistor outputs (OSSDs)
	Configuration and diagnosis	Ethernet TCP/IP (optional) | micro USB
	Switchable configurations	8
	SD card slot	Optional
With safe fieldbus interface	Safety-related switching outputs	CIPsafety | PROFIsafe or FSoE, additional 2 x 2 PNP transistor outputs (OSSDs)
	Configuration and diagnosis	Ethernet TCP/IP | micro USB
	Switchable configurations	32
	SD card slot	Optional

Safety switches

Technical data	Type
	Safety
	Function
	Actuators
	Housing material
	Degree of protection
	Contact allocation
	Connection type
	Cable entry
	Dimension (W x H x L)
Functions	Functions
Features	Features

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S20, S200
Safety switches

S300
Safety position switch

S400, S410
Safety hinge switch

S20, S200	S300	S400, S410
Interlock device without guard interlocking, ISO 14119	Interlock device without guard interlocking, ISO 14119	Interlock device without guard interlocking, ISO 14119
For safety applications up to performance level PL e / SIL 3	For safety applications up to performance level PL e / SIL 3	For safety applications up to performance level PL e / SIL 3
Safety switches with separate actuator	Safety switches with plunger and roll actuator	Safety switches and door hinge in one component
Mechanical tongue, with low coding level in accordance with EN ISO 14119	Actuated by unencoded cam in accordance with EN ISO 14119	Encapsulated position switch inside hinge
Metal | Plastic	Metal | Plastic	Metal
IP 67	IP 67	IP 67 | IP 69K
1NC + 1NO | 2NC | 2NC + 1NO | 3NC	1NC + 1NO | 2NC + 1NO	2NC + 1NO
Connector, M12 | Terminal	Connector, M12 | Terminal	Cable | Cable with connector, M12 | Connector, M12
1 Piece(s), M20x1.5 | 1 Piece(s), PG13.5 | 3 Piece(s), M20x1.5	1 Piece(s), M20x1.5 | 3 Piece(s), M20x1.5	
30.8 mm x 30.8 mm x 93 mm | 40 mm x 38 mm x 109.5 mm | 40 mm x 38.6 mm x 108.9 mm | 52.2 mm x 31.6 mm x 90.5 mm	40 mm x 39 mm x 97 mm | 56 mm x 33 mm x 88 mm | 56 mm x 33 mm x 107 mm	49 mm x 22.5 mm x 100.6 mm | 79 mm x 22.5 mm x 100.6 mm
Positive-opening contacts for integration in a safety circuit | Universal use with 5 actuator approach directions | Up to 8 different actuators	6 different plunger and roll actuators | Positive-opening contacts for integration in a safety circuit | Switching direction selectable	180° maximum opening angle of the protective device, adjustable switching point | Optional additional hinges (without contacts) | Positive-opening contacts for integration in a safety circuit
Easy mounting with standard construction | High-quality silver contacts for long life expectancy	Extremely durable and robust | Universal use with individually set actuator approach directions and angles in 10° grid	Elegant design for discreet and effective integration in the system | Hidden cable routing thanks to connection on rear side | High protection against tampering through encapsulated position switch | Model S410 with wide fork dimension for attachment to special materials, e.g. glass

Safety locking devices

L100
Safety locking devices

Technical data	Type	Interlock device with guard interlocking, ISO 14119
	Safety	For safety applications up to performance level PL e / SIL 3
	Housing material	Plastic
	Degree of protection	IP 67
	Actuators	Mechanical tongue, with low coding level in accordance with EN ISO 14119
	Encoding	
	Locking type	Electromagnetic | Spring force
	Operating principle	Power to lock – Actuator locked if electromagnet is activated | Power to release – Actuator locked if electromagnet is deactivated
	Locking force, max.	1,100 N
	Extraction force, unlocked actuator	30 N
	Connection type	Terminal
	Cable entry	3 Piece(s), M20 x 1.5
Functions	Integration in the safety circuit	Positive-opening contacts for integration in the safety circuit
	Type of display	
	Release device (optional)	
	Special functions	
Features	Features	Multiple heavy-duty actuators for a wide range of installation conditions | Universal use with 5 actuator approach directions

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L200
Safety locking devices

L250
Safety locking devices

L300
Safety locking devices

L200	L250	L300
Interlock device with guard interlocking, ISO 14119	Interlock device with guard interlocking	Interlock device with guard interlocking
For safety applications up to performance level PL e / SIL 3	Performance Level PL e / SIL 3 with a single device	Performance Level PL e / SIL 3 with a single device
Metal	Plastic	Metal
IP 67	IP 67 | IP 69K	IP 65 | IP 67 | IP 69K
Mechanical tongue, with low coding level in accordance with EN ISO 14119	Mechanical tongue with RFID-encoded actuator in accordance with EN ISO 14119	Mechanical tongue with RFID-encoded actuator in accordance with EN ISO 14119
	AC-L250-SCA: low | AC-L250-UCA: high	AC-L300-SCA: low | AC-L300-UCA: high
Electromagnetic | Spring force	Electromagnetic | Spring force	Electromagnetic | Spring force
Power to lock – Actuator locked if electromagnet is activated | Power to release – Actuator locked if electromagnet is deactivated	Power to lock – Actuator locked if electromagnet is activated | Power to release – Actuator locked if electromagnet is deactivated	Power to lock – Actuator locked if electromagnet is activated | Power to release – Actuator locked if electromagnet is deactivated
2,800 N	2,100 N	9,750 N
30 N	20 N	30 N
Terminal	Cable with connector, M12 | Connector, M12	Connector, M12 | Connector, M23 | Terminal
3 Piece(s), M20 x 1.5		1 Piece(s), M20x1.5 | 3 Piece(s), M20x1.5
Positive-opening contacts for integration in the safety circuit	OSSD safety-related switching outputs	OSSD safety-related switching outputs
LED	LED	LED
Auxiliary release with lock | Escape release button	Auxiliary release | Auxiliary release with lock | Escape release button	Auxiliary release | Escape release button
	CD-B command devices with coordinated function and design	Models with integrated command and E-Stop buttons
Multiple heavy-duty actuators for a wide range of installation conditions | Universal use with 5 actuator approach directions | Variable installation options: Flexible and independent alignment of device head and escape release	Flexibly mounted actuator enables secure closing even with warped doors | Independent alignment of connection cable and auxiliary release/escape release | Large center opening for actuator shaft | Lockout-tagout (optional) | Optional door handle for simple mounting of switches and actuators | Optional remote escape unlocking button with 5 m cable | Variable installation options: Front and side mounting with just 2 screws, independent alignment of connection cable and auxiliary release/escape release	Flexibly mounted actuator enables secure closing even with warped doors | Large center opening for actuator shaft | Lockout-tagout (optional) | Optional door handles for simple mounting of switches and actuators | Variable installation options: Flexible and independent alignment of device head and escape release

Safety proximity sensors

MC 300
Magnetically coded sensors

RD 800
Safety transponder

		MC 300	RD 800
Technical data	Switch type in accordance with EN ISO 14119	Type 4 interlock device, contactless actuation, low coding level	Type 4 interlock device, contactless actuation, high coding level
	Performance level / category in accordance with EN ISO 13849-1	PL e / cat. 4 in combination with a suitable evaluation unit	PL e / cat. 4
	Housing material	Plastic	Plastic
	Degree of protection	IP 67	IP 67 | IP 69K
	Dimension (W x H x L)	25 mm x 13 mm x 88 mm | 26.2 mm x 13 mm x 36 mm | M30 x 36 mm	25 mm x 18 mm x 72 mm
	Assured cut-in distance (Sao), max.	3 mm ... 9 mm	10 mm
	Assured cut-out distance (Sar), min.	11 mm ... 30 mm	16 mm
	Contact allocation / safety output	1NC + 1NO | 2NO | 2NO + 1NO (signaling)	Safety-related switching output OSSD
	Actuator coding	Actuator with low coding level in accordance with EN ISO 14119	Actuator with low or high coding level in accordance with EN ISO 14119
	Connection type	Cable with connector, M12 | Cable with wire-end sleeves | Connector, M8	Cable | Connector, M12
Features	Features	Contactless actuation without mechanical contacts | LED status indicator | Long life expectancy | Magnetically coded (reed contacts) | Not sensitive to soiling	Connection in series with up to 32 devices possible | Contactless actuation without mechanical contacts | Long life expectancy | Models with programming input for teaching-in actuators | Not sensitive to soiling | RFID coded, maximum protection against manipulation | Status and diagnostics display via 4 LEDs

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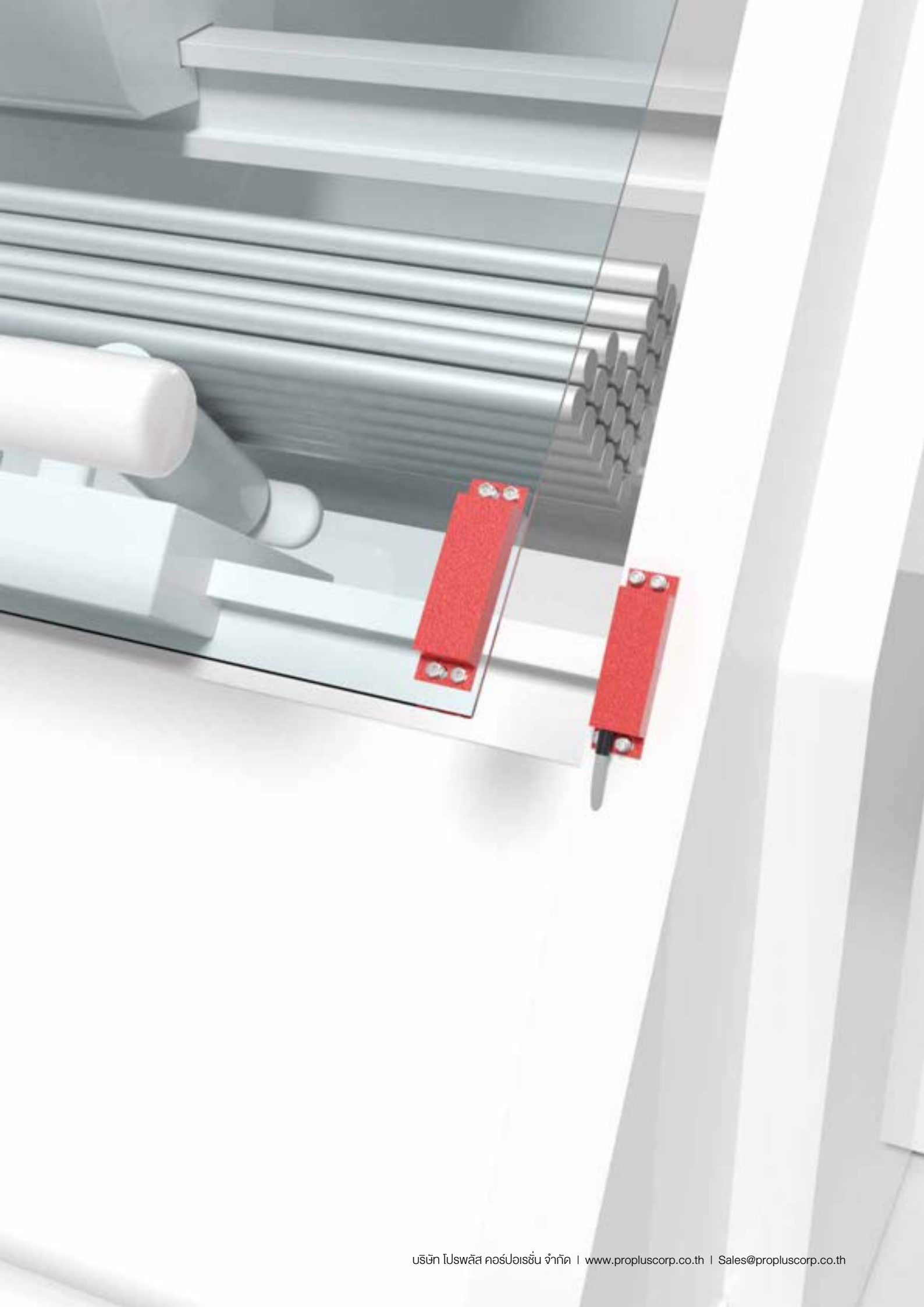

Safety command devices

Technical data	Switch type
	Type of actuation
	Actuation directions
	Type of unlocking
	Extraction force, unlocked actuator
	Actuation force (pull-out with forced separation)
	Actuation force (slacken)
	Button actuation force
	Contact allocation
	Housing material
	Degree of protection
	Type of connection
	Number of cable entries
Features	Functions

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ERS 200
E-Stop rope switch

ESB 200
E-Stop buttons

CD-B
Command device

E-Stop command device, EN ISO 13850	E-Stop command device, EN ISO 13850	E-Stop command device, EN ISO 13850
Rope	E-Stop button, red	Button, blue | Button, white/button, blue | Button, white/button, blue/E-Stop button, red
On longitudinal axis | To left | To right		
Indicator button (pull)	Rotary release	Rotary release
83 N | 235 N		
90 N | 250 N		
63 N | 147 N		
	25 N	
1NC + 1NO | 2NC | 2NC + 1NO	2NC | 2NC + 1NO	1NO | 2NC + 2NO | 2NO
Metal	Plastic	Plastic
IP 67	IP 67 | IP 69K	IP 65
Connector | Terminal	Connector | Terminal	Connector
1 Piece(s) | 3 Piece(s)	5 Piece(s)	
Clicks in on both sides with positive-opening contacts | Integration in control circuits up to category 4 in accordance with EN ISO 13849-1 | Position-independent E-STOP command input | Reset function (reset button with indicator) | Rope head with alignment indicator | Simple rope adjustment by means of switching point indicator	Position-dependent E-Stop command input | Protected screw fitting | Reset function (via rotary knob or key)	Dimensions and design identical to L250 series locking devices | Position-dependent E-Stop command input | Protected screw fitting | Reset function (via rotary knob, for E-Stop button)

Safety relays

MSI-SR4B

MSI-SR5B

		MSI-SR4B	MSI-SR5B
Technical data	Application	E-Stop circuits | Optoelectronic protective devices | Position switches (mechanical contacts) | Solenoid switches (reed contacts, equivalent) | Transponder switches (OSSD outputs)	E-Stop circuits | Optoelectronic protective devices | Position switches (mechanical contacts) | Solenoid switches (reed contacts, equivalent) | Transponder switches (OSSD outputs)
	Functions	Contactor monitoring (EDM) | Cross circuit monitoring | Start/restart interlock (RES)	Contactor monitoring (EDM) | Cross circuit monitoring | Double sensor monitoring | Start/restart interlock (RES)
	Restart	Automatic | Manual	Automatic | Manual
	SIL in accordance with IEC 61508	3	3
	Performance Level (PL) in accordance with EN ISO 13849-1	e	e
	Category in accordance with EN ISO 13849-1	4	4
	Continuous current per current path, max.	3 A | 6 A	2 A | 6 A
	Supply voltage U_B	24 V, -20 ... 20 %, AC/DC	24 V, -20 ... 20 %, DC
	Power consumption, max.	3 W, For 24 V, plus output load	4.8 W, For 24 V, plus output load
	Number of outputs, safety-oriented, non-delayed, contact-based	3 Piece(s)	2 Piece(s)
	Number of outputs, safety-oriented, delayed, contact-based	0 Piece(s)	0 Piece(s)
	Number of outputs, signaling function, non-delayed, contact-based	1 Piece(s)	0 Piece(s)
	Number of outputs, signaling function, non-delayed, semiconductor	0 Piece(s)	0 Piece(s)
	Response delay time	10 ms	10 ms
	Type of terminal	Screw terminal | Spring-cage terminal	Screw terminal | Spring-cage terminal
	Dimension (W x H x L)	22.5 mm x 99 mm x 114.1 mm | 22.5 mm x 111 mm x 114.1 mm	22.5 mm x 99 mm x 114.1 mm | 22.5 mm x 111 mm x 114.1 mm
	Ambient temperature, operation	0 ... 55 °C	0 ... 55 °C

MSI-SR-LC31AR, MSI-SR-LC31MR

MSI-SR-LC21

MSI-SR-ES31

E-Stop circuits | Optoelectronic protective devices | Position switches (mechanical contacts) | Solenoid switches (reed contacts, equivalent) | Transponder switches (OSSD outputs)	E-Stop circuits | Optoelectronic protective devices | Position switches (mechanical contacts) | Solenoid switches (reed contacts, equivalent) | Transponder switches (OSSD outputs)	E-Stop circuits | Position switches (mechanical contacts)
Cross circuit monitoring | One- or two-channel actuation	Contactor monitoring (EDM) | Start/restart interlock (RES)	Contactor monitoring (EDM) | Start/restart interlock (RES)
Automatic | Manual	Automatic | Manual	Automatic | Manual
3	3	2
e	e	d
4	4	3
8 A	6 A	8 A
24 V, -15 ... 10 %, AC/DC	24 V, -15 ... 10 %, AC/DC	24 V, -15 ... 10 %, AC/DC
1.6 W, For 24 V, plus output load	2 W, For 24 V, plus output load	1.3 W, For 24 V, plus output load
3 Piece(s)	2 Piece(s)	3 Piece(s)
0 Piece(s)	0 Piece(s)	0 Piece(s)
1 Piece(s)	1 Piece(s)	1 Piece(s)
0 Piece(s)	0 Piece(s)	0 Piece(s)
10 ms	25 ms	60 ms
Screw terminal | Spring-cage terminal	Screw terminal | Spring-cage terminal	Screw terminal | Spring-cage terminal
22.5 mm x 96.5 mm x 114 mm | 22.5 mm x 106.5 mm x 114 mm	22.5 mm x 96.5 mm x 114 mm | 22.5 mm x 106.5 mm x 114 mm	22.5 mm x 96.5 mm x 114 mm | 22.5 mm x 106.5 mm x 114 mm
-25 ... 65 °C	-25 ... 55 °C	-25 ... 55 °C

Safety relays

MSI-SR-2H21

MSI-MC310

		MSI-SR-2H21	MSI-MC310
Technical data	Application	Evaluation unit for two-hand control devices in accordance with DIN EN ISO 13851 type IIIC	Evaluation unit for magnetically coded sensors with antivalent reed contacts
	Functions	For stop category 0 | Monitoring of the synchronous actuation | Two-channel actuation (one normally open contact and one normally closed contact for each)	For stop category 0 | Start/restart interlock (RES) | Static contactor monitoring (EDM)
	Restart	Through synchronous actuation	Automatic | Manual
	SIL in accordance with IEC 61508	3	3
	Performance Level (PL) in accordance with EN ISO 13849-1	e	e
	Category in accordance with EN ISO 13849-1	4	4
	Continuous current per current path, max.	6 A	3 A
	Supply voltage U_B	24 V, -15 ... 10 %, AC/DC	24 V, -10 ... 10 %, AC/DC
	Power consumption, max.	2.4 W, For 24 V, plus output load	4.6 W, For 24 V, plus output load
	Number of outputs, safety-oriented, non-delayed, contact-based	2 Piece(s)	2 Piece(s)
	Number of outputs, safety-oriented, delayed, contact-based	0 Piece(s)	0 Piece(s)
	Number of outputs, signaling function, non-delayed, contact-based	1 Piece(s)	1 Piece(s)
	Number of outputs, signaling function, non-delayed, semiconductor	0 Piece(s)	0 Piece(s)
	Response delay time	50 ms	20 ms
	Type of terminal	Screw terminal | Spring-cage terminal	Screw terminal
	Dimension (W x H x L)	22.5 mm x 96.5 mm x 114 mm | 22.5 mm x 107 mm x 114 mm	22.5 mm x 99 mm x 113.6 mm
	Ambient temperature, operation	-25 ... 55 °C	0 ... 55 °C

MSI-SR-LC21DT30

MSI-RM2B

MSI-SR-CM42R

Moving guards, electro-sensitive protective equipment for controlled stopping (stop category 0 and 1 in accordance with IEC 60204)	Signal conversion of electronic safety outputs on potential-free relay contacts	Extension unit for base devices in safety applications
Cross circuit monitoring | One- or two-channel operation | Start/restart interlock (RES) | Time-delayed shutdown (STOPP1)	Feedback path for EDM integration	
Automatic | Manual	Automatic	Automatic
3	3	3
e	e	e
4	Up to 4 (depending on the category of the upstream protective device)	4
6 A	3 A	6 A
24 V, -15 ... 10 %, AC/DC	24 V, -20 ... 20 %, DC	24 V, -20 ... 20 %, DC
2.6 W, For 24 V, plus output load	2.5 W, For 24 V, plus output load	1.4 W
2 Piece(s)	2 Piece(s)	4 Piece(s)
1 Piece(s)	0 Piece(s)	0 Piece(s)
0 Piece(s)	1 Piece(s)	2 Piece(s)
0 Piece(s)	0 Piece(s)	0 Piece(s)
25 ms	10 ms	15 ms
Screw terminal | Spring-cage terminal	Screw terminal | Spring-cage terminal	Screw terminal | Spring-cage terminal
22.5 mm x 96.5 mm x 114 mm | 22.5 mm x 106.5 mm x 114 mm	17.5 mm x 99 mm x 114.1 mm | 17.5 mm x 111 mm x 114.1 mm	22.5 mm x 96.5 mm x 114 mm | 22.5 mm x 106.5 mm x 114 mm
-25 ... 55 °C	0 ... 50 °C	-25 ... 65 °C

Safety relays

MSI-SR-CM43

Technical data	Application	Extension unit for safety relays
	Functions	Monitoring of proximity switches
	Restart	Automatic
	SIL in accordance with IEC 61508	2
	Performance Level (PL) in accordance with EN ISO 13849-1	d | e
	Category in accordance with EN ISO 13849-1	3 | 4
	Continuous current per current path, max.	6 A
	Supply voltage U_B	24 V, -20 ... 20 %, DC
	Power consumption, max.	1.5 W
	Number of outputs, safety-oriented, non-delayed, contact-based	4 Piece(s)
	Number of outputs, safety-oriented, delayed, contact-based	0 Piece(s)
	Number of outputs, signaling function, non-delayed, contact-based	3 Piece(s)
	Number of outputs, signaling function, non-delayed, semiconductor	0 Piece(s)
	Response delay time	40 ms
	Type of terminal	Screw terminal | Spring-cage terminal
	Dimension (W x H x L)	22.5 mm x 96.5 mm x 114 mm | 22.5 mm x 106.5 mm x 114 mm
	Ambient temperature, operation	-25 ... 55 °C

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MSI-TR1B/2B

Evaluation unit for type 2 single beam safety devices in accordance with IEC/EN 61496
“Error” signal output | “Safety ON” signal output | Contactor monitoring (EDM) | Increased availability through additional filter time | Periodic function test | Start/restart interlock (RES)
Automatic | Manual
1
c
2
2 A
24 V, -20 ... 20 %, DC
4.8 W, For 24 V, plus output load
2 Piece(s)
0 Piece(s)
0 Piece(s)
2 Piece(s)
20 ms | 130 ms
Screw terminal | Spring-cage terminal
22.5 mm x 99 mm x 114.1 mm | 22.5 mm x 111 mm x 114.1 mm
-30 ... 60 °C

MSI-TRMB

Evaluation unit for type 4 single beam safety devices in accordance with IEC/EN 61496
Contactor monitoring (EDM) | Periodic function test | Start/restart interlock (RES)
Automatic | Manual
3
e
4
3 A
24 V, -20 ... 20 %, DC
3 W, For 24 V, plus output load
2 Piece(s)
0 Piece(s)
0 Piece(s)
1 Piece(s)
130 ms
Screw terminal | Spring-cage terminal
22.5 mm x 99 mm x 114.1 mm | 22.5 mm x 111 mm x 114.1 mm
-25 ... 55 °C

MSI-MD-FB

Muting interface for muting applications in combination with standard variants of the MLC and ELC safety light curtains, as well as MLD multiple light beam safety devices
Muting-timeout extension | Muting enable function | Sequence controlled 2-sensor muting | Sequence controlled 4-sensor muting | Timing controlled 2-sensor muting
Automatic | Manual
3
e
4
0.3 A
24 V, -20 ... 20 %, DC
3.6 W, For 24 V, plus output load
5 ms
Connector, M12
60 mm x 38.3 mm x 225 mm
-30 ... 60 °C

Programmable safety controls

MSI 420

MSI 430

		MSI 420	MSI 430
Technical data	Type of article	Safety control	Safety control
	Category in accordance with EN ISO 13849-1	4	4
	Performance Level (PL) in accordance with EN ISO 13849-1	Up to and including e	Up to and including e
	SIL in accordance with IEC 61508 and SILCL in accordance with EN IEC 62061	3	3
	Number of safe I/Os	16 IN, 4 OUT, 4 programmable I/O	16 IN, 4 OUT, 4 programmable I/O
	Maximum switching power per output	≤ 4 A	≤ 4 A
	Interface	Ethernet | USB	Ethernet | USB
	Supply voltage U_B	24 V, DC	24 V, DC
	Ambient temperature, operation	-25 ... 65 °C	-25 ... 65 °C
	Dimension (W x H x L)	45 mm x 96.5 mm x 121 mm | 45 mm x 107 mm x 121 mm	45 mm x 96.5 mm x 121 mm | 45 mm x 107 mm x 121 mm
	Type of terminal	Screw terminal | Spring-cage terminal	Screw terminal | Spring-cage terminal
	Total output current, max.		
Functions	Expandable with up to 12 I/O modules	X	X
	Configuration via mini USB	X	X
	Configuration via Ethernet (TCP/IP)	X	X
	3 Industrial Ethernet protocols on-board: PROFINET, EtherNet IP, Modbus TCP		X
	Transfer of diagnostic data via external fieldbus gateways	X	X
	Program memory in SD card format (512 MB)	X	X
	Freely configurable with MSI.designer (license-free)	X	X
	40 certified function modules	X	X
	Up to 300 function modules in a project	X	X
	Other functions	Configurable report | Integrated simulation with logic analyzer | Online diagnosis	Configurable report | Integrated simulation with logic analyzer | Online diagnosis

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MSI-EM-I8, MSI-EM-I084

MSI-EM-IO84NP

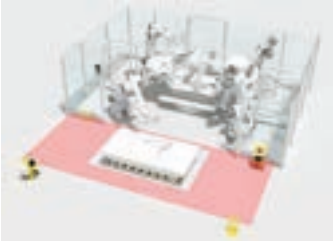
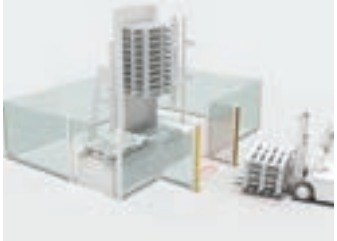
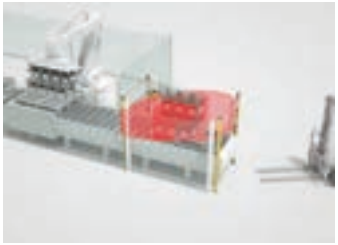
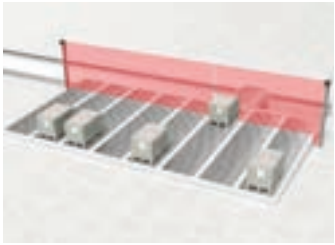
MSI-FB EtherCAT/PROFIBUS/CANopen

Safe I/O module | Safe input module	Non-safe I/O module	Fieldbus gateway
4		
e		
3		
8IN | 8IN,4OUT	4 IN, 4 OUT, 4 programmable I/O	
4 A	0.5 A	
		CANopen | EtherCAT | PROFIBUS DP
24 V, DC	24 V, DC	24 V, DC
-25 ... 65 °C	-25 ... 65 °C	-25 ... 55 °C
22.5 mm x 96.5 mm x 120.8 mm | 22.5 mm x 107 mm x 120.8 mm	22.5 mm x 96.5 mm x 120.8 mm | 22.5 mm x 107 mm x 120.8 mm	22.5 mm x 96.5 mm x 121 mm | 22.5 mm x 96.5 mm x 126.5 mm
Screw terminal | Spring-cage terminal	Screw terminal | Spring-cage terminal	Screw terminal
	4 A	

Safety Solutions

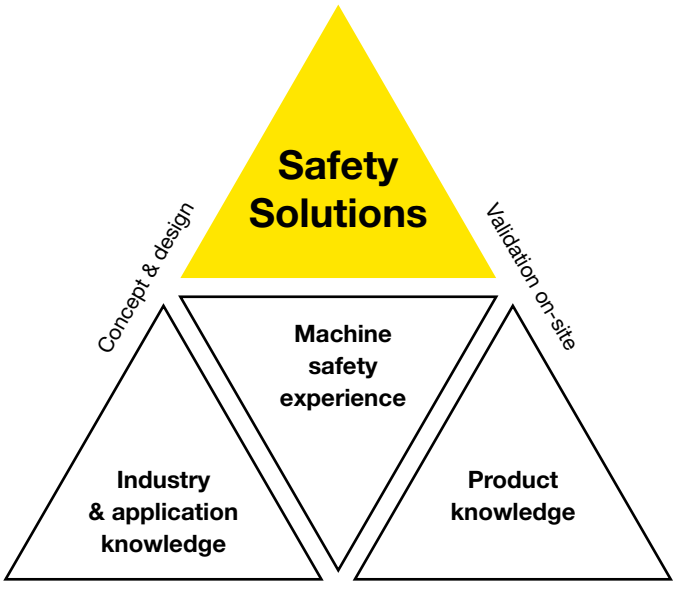
Easy. Safe. Productive.

The increasing automation of processes places growing demands on safety concepts.
Classic concepts such as muting are often pushed to their limits here, e.g. at transfer stations and material locks. Our innovative safety solutions guarantee gapless safety, efficient material flow and high availability of your system, even with automatic processes.

Advantages for you

- Save time and money with our pre-developed safety solutions
- All safety solutions are CE certified and compliant with standards. This gives you legal security.
- The intelligent and innovative safety concepts ensure smooth processes and seamless safety – even where classic concepts reach their limits
- Every safety solution is individually tailored to your system layout
- Our teams of certified safety experts are with you throughout the project



Easy. Safe. Productive.

Benefit from our experience

Innovative ideas are based on experience and know-how.
For more than 30 years, we have been supporting safety-related applications in different industries by offering a broad range of products. Our safety experts have comprehensive knowledge of the latest norms and standards and extensive experience in designing safety concepts. This allows us to develop efficient safety solutions for use in automated environments.

- Global network of certified experts for the creation of safety concepts and the validation of the solutions on-site
- In-house Solutions Engineering Center
- Development and design according to the V-model in accordance with EN ISO 13849-1
- Extensive selection of in-house safety products

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Complete solutions for your systems

Our solutions are based on qualified safety concepts which, if necessary, can also be extended or created new.
We take care of all the necessary process steps, from standards research to start-up support. And in the project, each solution is individually adapted to your system layout.

Concept and design

The conceptualization and design of the safety solutions is carried out entirely by our Solutions Engineering Center.
This includes:
- Directives and standard research
- Creation of the safety concept and the system architecture
- Software development and validation
- Comprehensive documentation, including CE declaration of conformity

Services – Individual for your project

Each safety solution is individually adapted to your system and is supported by us in the project until handover:
- Engineering services with parameterization according to project requirements
- Start-up support
- Validation of the safety function

Hardware and software components

Our safety solutions include all the necessary hardware and software components for integration into your system:
- Safety sensors
- Safety control
- Leuze safety program
- Compact switch cabinet, as required
- Wiring

The path to your solution

Gather requirements
- Examine layout and danger zones, clarify processes
- Check risk assessment, define protective goals
- Clarify timing

Selection of the safety concept
- Evaluation of the requirements by our safety experts
- Selection of the appropriate safety concept and the required components

Configuration and parameterization
- Configuration of the safety system
- Programming and parameterization according to requirements
- Project-specific documentation

Installation and commissioning
- Provision of the mounting and installation instructions
- Mounting and installation of the system components
- Support during commissioning and the integration in the control

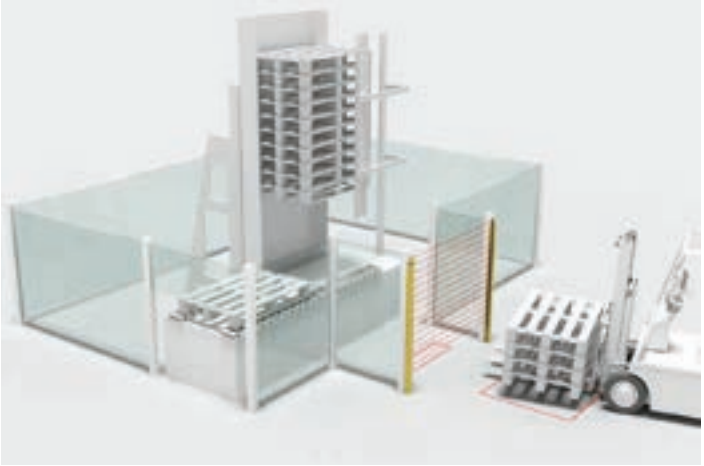
Safety inspection and acceptance
- Validation of the safety function
- Initial inspection of the safety devices
- Creation of the acceptance documentation

Safety solutions – examples

Easy. Safe. Productive.

Access guarding on pallet magazines – with automatic restart

Requirement:
Access guarding of the pallet magazine should prevent the entry of persons and simultaneously permit the entry of pallets by a forklift truck. After the forklift truck has again left the transfer area, restart should occur automatically to minimize the interruption of the work process.



Solution:
The access area is protected by a safety light curtain. In addition, induction loops are embedded in the floor in the areas in front of and behind the safety sensor. The safety system can thereby distinguish between forklift truck and persons.

Advantages for you

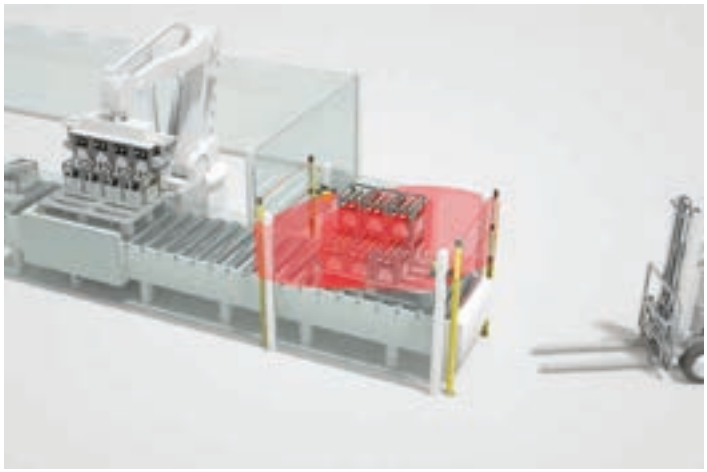
— Optimum system utilization through automatic restart of the machine without manual operator interventions
— High reliability and availability
— Low service costs
— Optimum protection against manipulation
— Simple integration in the safety circuit of the primary control

System components and safety parameters

— Safety sensor: MLC 500 safety light curtain, with device columns for floor mounting
— Induction-loop set with evaluation unit
— System control: MSI 400 safety control
— Leuze safety program
— PL d in accordance with ISO 13849-1, SILCL 2 in accordance with IEC 62061
— 2-channel safety output

Access monitoring at material transfer station

Requirement:
The robot cell is fed automatically. The material is loaded onto the conveyor line, e.g. using a forklift truck, and then transported into the cell. Access to the cell must be safeguarded.
To guarantee optimum capacity utilization of the robot cell, the safety concept must also allow uninterrupted operation of the cell during loading.



Solution:
The loading area of the conveyor line is guarded at both the entry and exit side by multiple light beam safety devices. The area between the photoelectric sensors is monitored for the presence of persons by means of safety radar sensors.

Advantages for you

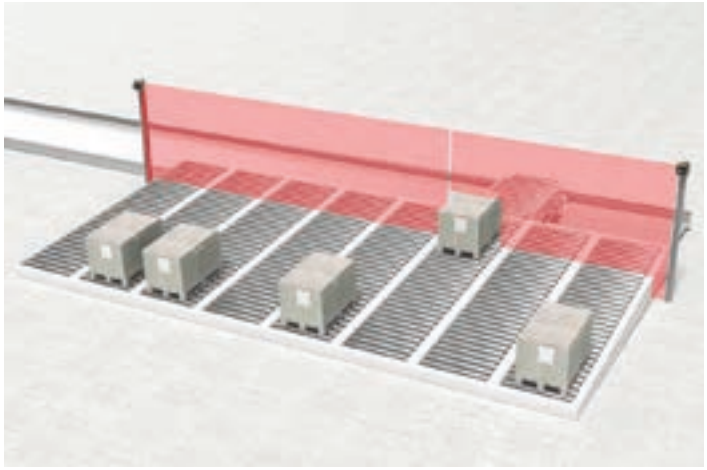
— Higher capacity utilization of the system through interruption-free operation of the robot cell, even during loading
— Infeed of transported goods of any shape or size thanks to an optimized safety concept
— Safe and reliable even under demanding conditions, e.g. with fully loaded or empty pallets
— Supports automatic starting of the conveyor line to improve efficiency and safety
— No operator action required
— No visual monitoring of the danger zone necessary

System components and safety parameters

— Safety sensors: MLD 500 multiple light beam safety devices, LBK safety radar sensors with controller
— System control: MSI 400 safety control
— Leuze safety program
— PL e in accordance with EN ISO 13849-1, SILCL 3 in accordance with IEC 62061
— 2-channel safety output, 2 signal outputs

Access guarding on multi-track transport systems

Requirement:
Pallets are output on individual tracks that are fed via a cross conveyor. The cross conveyor and the area located behind it are to be safeguarded against entry by persons. The protection should only release the track on which the pallet is output.



Solution:
Access guarding takes place via two vertically oriented safety laser scanners. From the system control, the safety system receives the information about the track onto which the pallet is output and adapts the protective field for the passage of the pallet accordingly. The entire process is monitored for safety.

Advantages for you

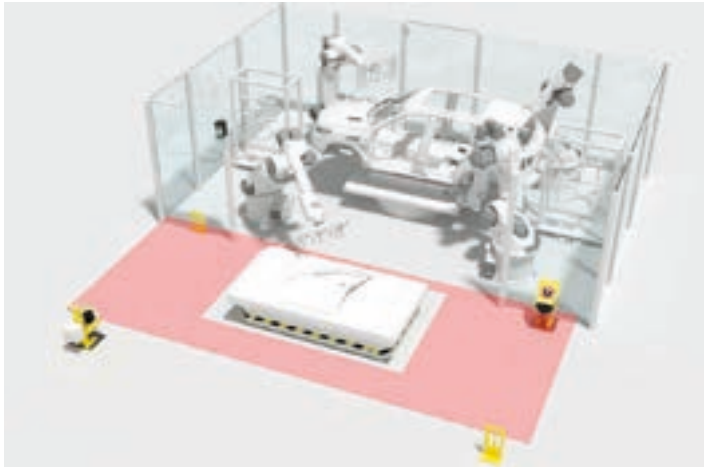
— Continuous monitoring of the entire transfer area for up to 10 tracks and width of up to 9 m
— Gapless safety during the transport cycles
— High reliability and availability
— Optimum protection against manipulation
— No additional trigger sensors necessary
— Easily retrofittable

System components and safety parameters

— Safety sensors: RSL 400 laser scanner
— System control: Leuze MSI 400
— Leuze safety program
— PL d in accordance with EN ISO 13849-1, SILCL 2 in accordance with IEC 62061
— 2-channel safety output

Safeguarding of robot/AGV transfer stations

Requirement:
The danger zone of the robot and the working range of the transfer station should be safeguarded against entry by persons during the entire process. The vehicle should be able to enter and exit the work area fully automatically.



Solution:
The entire area of the transfer station is safeguarded with safety laser scanners. As the vehicle passes through, the protective field dynamically adapts to the position of the vehicle by blanking the outline of the AGV from the protective field.

Advantages for you

— Monitoring for the entry and presence of persons
— Gapless safety during the entire cycle
— No restrictions during part transfer, e.g., for parts that protrude at the front or side
— Autonomous system, simple safety integration

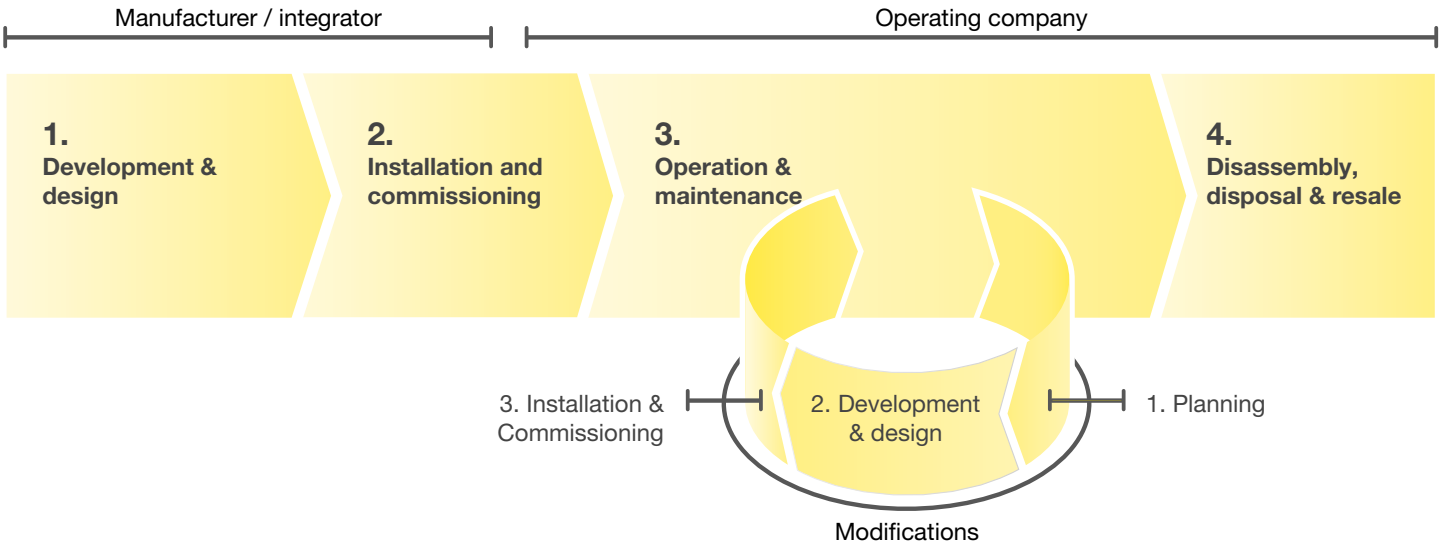
System components and safety parameters

— Safety sensors: RSL 400 laser scanner
— System controls: Siemens SIMATIC S7
— Leuze safety program
— PL d in accordance with EN ISO 13849-1, SILCL 2 in accordance with IEC 62061
— 2-channel safety output

Machine Safety Services

Sustainable machine safety begins with professional planning of the safety systems and spans the entire lifecycle of a machine. Our teams of experienced and certified experts offer the appropriate support here.

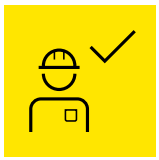
Stages of a machine life cycle



When designing and constructing machines, we create the safety-related concept together with you and support you in its realization. During operation, we regularly perform tests to ensure the permanent function of the safety systems. If changes are made to existing machines, we provide you with support on everything from the safety-related planning to renewed commissioning.

Through our services, you benefit from our many years of experience in the area of machine safety and our extensive industry and application knowledge. Efficient safety-related solutions for every phase of a machine's life cycle are thereby created together.

Our service offerings



Status check “safety technology on machines and systems”

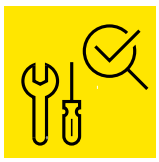
— Our experts analyze the safety-related condition of your machinery and check whether the current safety-related requirements are satisfied in accordance with the current state of the art.
— In the event of deviations, we provide recommendations on what corrections can be performed so as to comply with legal requirements.

Risk assessment and hazard assessment

In accordance with applicable directives, the manufacturer of a machine is required to perform a risk assessment. This also applies in the case of significant modifications or extensions of machines.

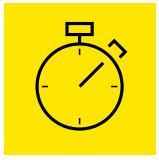
The national regulations for the operation of machines require employers to conduct a hazard assessment before using work equipment and to update this assessment at regular intervals according to the current state of the art.

— Our experts support you in identifying the dangers, in assessing and evaluating the risks as well as in defining the risk-reducing measures.



Inspection of protective devices

— Within the scope of the initial or regular inspection, we check the condition, mounting and correct function of the protective device as well as the correct integration in the safe part of the machine control
— We summarize the results of the tests in a detailed report.
If necessary, this includes practically oriented suggestions on how deviations can be corrected.



Stopping time measurement

For the correct placement of the protective device, the required minimum distance between protective device and dangerous movements is to be calculated. To do this, the stopping time of the machine must be known. With the stopping time measurement, we determine this value reliably.

— By measuring the stopping time within the scope of regular inspections, any wear, such in brake components, can be detected in good time.

Status check “CE marking of machines”

During the development of machines, the specifications from the machinery directive must be adhered to and documented by the manufacturer. This is confirmed with the Declaration of Conformity and the CE marking.

— We check the documentation for completeness and give recommendations of how any deviations can be corrected.

Conformity assessment in accordance with the European machinery directive

The machinery directive defines the procedure for the design and construction of machines for satisfying the applicable safety and health protection requirements. This is a prerequisite for the Declaration of Conformity and the CE marking.

— We help you comply with and implement the legal requirements of the machinery directive.

Safety concept and safety design

The measures necessary for risk minimization are known from the risk analysis.
The safety concept and the safety functions are developed on the basis of these requirements.

— With our extensive industry knowledge and our many years of safety-related experience, we create practically oriented concept proposals for you and support you during their implementation.

Verification and validation

To avoid errors during the implementation of safety functions, both the hardware as well as the software must be checked to determine whether the requirements of the functional specification were met completely and correctly. The function test of all safety functions is to be performed according to the validation plan.

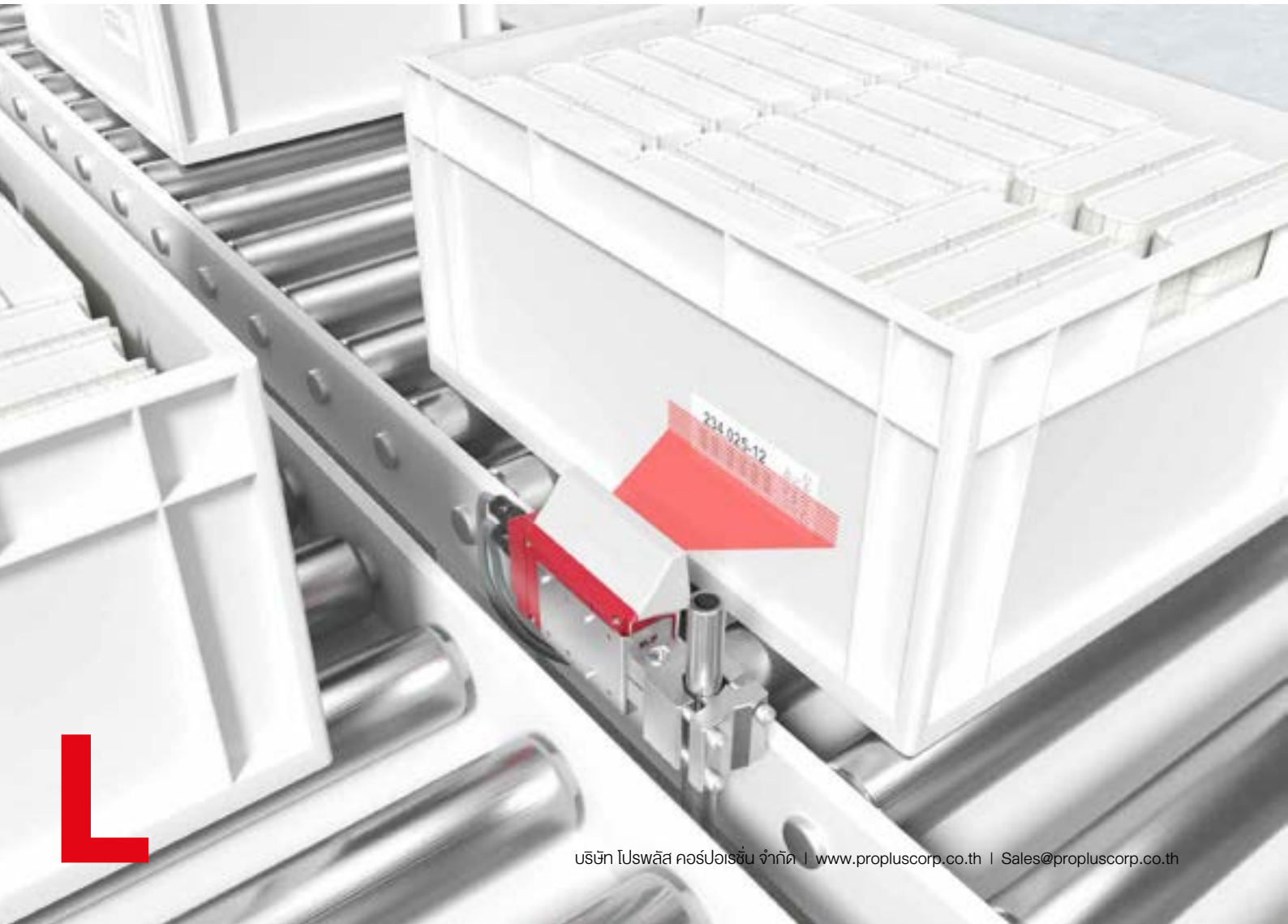
— We support you during the planning, development and execution of the function tests as well as with the creation of the required documentation.

Identification

Well captured: Automatic bar code identification for continuous traceability

In many areas of production and logistics, goods and materials are labeled with bar codes or 2D-codes. They are used for identification in the automation process and simultaneously ensure the traceability of the production and packaging process of every single product.

We offer various technologies for reading these codes: Stationary laser scanners in line or raster scanner versions, bar code scanners for the deep-freeze sector with integrated heating, camera-based 2D code scanners and mobile hand-held scanners for bar codes, 2D codes and DPM codes.



Our bar code readers: Proven technology and many equipment variants

For gapless product traceability, automatic identification of 1D-codes is essential. The BCL 300i stationary bar code reader is used primarily for the identification of bar codes on containers and packages.

With the innovative code reconstruction technology, even soiled or damaged codes can be reliably detected, no-reads minimized and system availability significantly increased.

Through the modular design with many equipment options, the BCL 300i can be adapted flexibly and optimally to the specific application.

BCL 300*i*

- Modular connection technology through pluggable connection hoods
- PROFINET, Ethernet/IP or EtherCAT
- Variants as line scanners, raster scanners, deflecting and oscillating mirrors available
- Code reconstruction technology (CRT) for reliable identification of damaged codes
- Optionally with display and heating

Stationary bar code readers

CR 50, CR 55
Miniature scanner

CR 100
Miniature scanner

		CR 50, CR 55	CR 100
Technical data	Reading distance (dependent on version)	40 mm ... 250 mm	15 mm ... 72 mm
	Modulus size	0.1 mm ... 0.5 mm	0.15 mm ... 0.5 mm
	Scanning rate	330 scans/s	700 scans/s ... 780 scans/s
	Reading method	Line scanner	Line scanner | Line scanner with deflecting mirror
	Switching outputs	1 Piece(s)	1 Piece(s)
	Switching inputs		1 Piece(s)
	Selectable inputs/outputs		
	Interface	RS 232 | USB	RS 232
	Configuration/parametrization	Software	
	Supply voltage U_B	4.5 V DC ... 5.5 V DC	4.9 V DC ... 5.4 V DC
	Degree of protection	IP 54	IP 40
	Ambient temperature, operation (< 0°C with heating possible)	0 ... 40 °C | 0 ... 50 °C	0 ... 45 °C
	Housing	Metal | Plastic	Metal
Accessories	MA 200i connection unit		
	MA 8 connection unit		
	Mounting devices		
Features	AutoConfig		
	AutoReflAct		
	Alignment mode		X
	LED indicator		X
	Reference code comparison		

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BCL 8
Miniature scanner

BCL 92, BCL 95
Miniature scanner

BCL 148
Bar code readers for laboratory automation

25 mm ... 160 mm	25 mm ... 275 mm	30 mm ... 310 mm
0.12 mm ... 0.5 mm	0.15 mm ... 0.5 mm	0.127 mm ... 0.5 mm
500 scans/s ... 600 scans/s	600 scans/s	750 scans/s
Line scanner	Line scanner	Line scanner
	2 Piece(s)	
	2 Piece(s)	1 Piece(s)
1 Piece(s)		
RS 232	RS 232	RS 232 | RS 485
4.75 V DC ... 5.5 V DC	4.75 V DC ... 30 V DC	18 V DC ... 30 V DC
IP 67	IP 54	IP 65
0 ... 40 °C	5 ... 40 °C	5 ... 40 °C
Metal	Metal	Metal
CANopen | DeviceNet | EtherCAT | EtherNet IP | EtherNet TCP/IP | PROFIBUS | PROFINET RT | UDP		
RS 485		
BT 8		
X	X	
X		
X	X	
X	X	
X	X	

Stationary bar code readers

		BCL 200i Compact scanner CE UKCA CDRH	**BCL 300i** Compact scanner CE UKCA CDRH
Technical data	Reading distance (dependent on version)	40 mm ... 255 mm	20 mm ... 700 mm
	Modulus size	0.2 mm ... 0.5 mm	0.127 mm ... 0.8 mm
	Scanning rate	1,000 scans/s	1,000 scans/s
	Reading method	Line scanner with deflecting mirror | Raster scanner with deflecting mirror	Line scanner | Line scanner with deflecting mirror | Oscillating-mirror scanner | Raster scanner | Raster scanner with deflecting mirror
	Switching outputs	1 Piece(s)	
	Switching inputs	1 Piece(s)	
	Selectable inputs/outputs		2 Piece(s)
	Interface	Ethernet | EtherNet IP | PROFINET	EtherCAT | Ethernet | EtherNet IP | MultiNet Plus | OPC-UA | PROFIBUS DP | PROFINET | RS 232 | RS 422 | RS 485
	Configuration/parametrization	Via web browser	Via web browser
	Supply voltage U_B	18 V DC ... 30 V DC	18 V DC ... 30 V DC
	Degree of protection	IP 65	IP 65
	Ambient temperature, operation (< 0°C with heating possible)	0 ... 40 °C	-35 ... 40 °C | 0 ... 40 °C
	Housing	Metal	Metal
Accessories	MA 200i connection unit		CANopen | DeviceNet
	MA 900 connection unit		
	Mounting devices	BT 56 | BT 300-1 | BT 300W	BT 56 | BT 59 | BT 300 | BT 300W
Features	AutoConfig	X	X
	AutoControl	X	X
	AutoReflAct	X	X
	Code fragment technology	X	X
	Alignment mode	X	X
	LED indicator	X	X
	Reference code comparison	X	X
	Heating		X

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BCL 500i Large reading distance CE UKCA CDRH	**BCL 600i** Large reading distance CE UKCA CDRH	**BCL 900i** Large reading distance CE UKCA CDRH
200 mm ... 2,400 mm	400 mm ... 1,450 mm	450 mm ... 1,700 mm
0.25 mm ... 1 mm	0.25 mm ... 0.5 mm	0.25 mm ... 0.5 mm
1,000 scans/s	800 scans/s ... 1,000 scans/s	1,000 scans/s
Line scanner | Oscillating-mirror scanner	Line scanner | Oscillating-mirror scanner	Line scanner
		2 Piece(s)
		3 Piece(s)
4 Piece(s)	4 Piece(s)	
Ethernet | EtherNet IP | MultiNet Plus | PROFIBUS DP | PROFINET | RS 232 | RS 422 | RS 485	Ethernet | EtherNet IP | PROFIBUS DP | PROFINET | RS 232 | RS 422 | RS 485	Ethernet | RS 232 | RS 422
Via web browser	Via web browser	Via web browser
10 V DC ... 30 V DC	10 V DC ... 30 V DC	10 V DC ... 30 V DC
IP 65	IP 65	IP 65
-35 ... 40 °C | 0 ... 40 °C	-35 ... 40 °C | 0 ... 40 °C	0 ... 50 °C
Metal	Metal	Metal
CANopen | DeviceNet | EtherCAT	CANopen | DeviceNet | EtherCAT	CANopen | DeviceNet | EtherCAT | PROFIBUS | PROFINET RT
		EtherNet IP | EtherNet TCP/IP | RS 232 | RS 422 | UDP
BT 56 | BT 59	BT 56 | BT 59	BT 900
X	X	X
X	X	
X	X	
X	X	X
X	X	X
X	X	X
X	X	
X	X	

Stationary 2D-code readers

NEW

DCR 100i

DCR 200i

		DCR 100i	DCR 200i
Technical data	Software functions	Reading of 1D codes | Reading of 2D codes	Reading of 1D codes | Reading of 2D codes
	Code types, readable	2D-codes | Bar codes | DPM (directly marked codes)	2D-codes | Bar codes | Stacked codes
	Reading distance (dependent on version)	40 mm ... 550 mm	40 mm ... 1,000 mm
	Modulus size	0.08 mm ... 0.5 mm	0.1 mm ... 1 mm
	Sensor	CMOS (Global Shutter)	CMOS (Global Shutter)
	Resolution (pixel)	1,080 px x 1,280 px	1,280 px x 960 px
	Light source	LED, Red	LED, Infrared | LED, Red
	Switching outputs	2 Piece(s)	2 Piece(s)
	Switching inputs	1 Piece(s)	2 Piece(s)
	Selectable inputs/outputs		2 Piece(s)
	Interface	Ethernet | RS 232	Ethernet | EtherNet IP | OPC-UA | PROFINET | RS 232 | RS 422
	Configuration/parametrization	Configuration codes | Software | Teach-in	Configuration codes | Teach-in | Via web browser
	Supply voltage U_B	12 V DC ... 28 V DC	18 V DC ... 30 V DC
	Degree of protection	IP 64	IP 65 | IP 67 | IP 69K
	Ambient temperature, operation	0 °C ... 50 °C	-30 °C ... 50 °C
	Dimensions without connector (W x H x D)	44 mm x 29 mm x 53 mm	43 mm x 61 mm x 44 mm | 46 mm x 61 mm x 46 mm
	Housing	Metal	Metal | Plastic | Stainless steel
	Compatibility of materials		ECOLAB
Accessories	MA 200i connection unit		CANopen | DeviceNet | EtherCAT | EtherNet IP | EtherNet TCP/IP | PROFIBUS | UDP
	MA 21 connection unit		
	MA 150 connection unit		Point to Point
	Mounting devices	BT DCR 100	BT 320M | BTU 320M-D12
	Cover hood		
	Illuminations		
	Lenses		
Features	Special version		Heating | Optional with NPN switching inputs/outputs | Polarization filter

*cULus DCR 55 only

NEW

DCR 1048i

DCR 50, 55*

LSIS 220

DCR 1048i	DCR 50, 55*	LSIS 220
Count codes | Detect codes | DPM (directly marked codes) | Locate codes | Printing quality verification | Reading of 1D codes | Reading of 2D codes	Reading of 1D codes | Reading of 2D codes	Reading of 1D codes | Reading of 2D codes
2D-codes | Bar codes | DPM (directly marked codes)	2D-codes | Bar codes	2D-codes | Bar codes
50 mm ... 2,000 mm	30 mm ... 425 mm	50 mm ... 330 mm
0.127 mm ... 0.5 mm	0.127 mm ... 0.528 mm	0.127 mm ... 1 mm
Sony global shutter	CMOS (Global Shutter) | CMOS (Rolling Shutter)	CMOS (Global Shutter)
1,440 px x 1,080 px	1,280 px x 800 px | 1,280 px x 960 px	844 px x 640 px
LED, red / white, internally switchable		
5 Piece(s)	1 Piece(s)	1 Piece(s)
3 Piece(s)	1 Piece(s)	1 Piece(s)
Ethernet | EtherNet IP | PROFINET	RS 232 | USB | USB (HID, CDC)	RS 232 | USB
Vision Studio software	Software	
18 V DC ... 30 V DC	4.75 V DC ... 5.25 V DC	4.75 V DC ... 30 V DC
IP 67	IP 54	IP 65
0 °C ... 50 °C	-10 °C ... 50 °C	0 °C ... 40 °C
45 mm x 85 mm x 35 mm	21.6 mm x 11.8 mm x 15.8 mm | 31.5 mm x 20 mm x 40.3 mm | 31.6 mm x 12.7 mm x 27.5 mm	40 mm x 32 mm x 47 mm
Metal	Metal | Plastic	Metal
		CANopen | DeviceNet | EtherCAT | EtherNet IP | EtherNet TCP/IP | PROFIBUS | UDP
		MultiNet Plus
BTK IVS 1048		BTU 300M-D12
AC IVS		
IL BA, IL AL, IL SP		
Lens S-M12		
	Scan Engine Module	

RFID systems

NEW

RDH 100

CE

Technical data	Memory access	Read/Write
	Reading distance	
	Reading/writing range, max.	60 mm
	Working frequency	13.56 MHz
	Transponder, readable	ISO/IEC 14443A/B | ISO/IEC 15693 | NFC Types 2, 5
	Interface	IO-Link
	Transmission speed	COM3 (230,4 kbit/s)
	Switching outputs	
	Switching inputs	
	Supply voltage U_B	18 V DC ... 36 V DC
	Ex device group	
	Type of connection	Connector
	Degree of protection	IP 67
	Ambient temperature, operation	-32 °C ... 60 °C
	Dimensions without connector (W x H x D)	75 mm
	Housing	Nickel-plated brass | Plastic
Network connection	With MA 21 connection unit	
	With MA 200i connection unit	

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NEW

RDH 200	**RFI 32**	**RFM 32, 62**
CE	CE	CE
Read/Write	Read only	Read/Write
	80 mm	
120 mm		110 mm | 400 mm
13.56 MHz	0.125 MHz	13.56 MHz
ISO/IEC 14443A/B | ISO/IEC 15693 | NFC Types 2, 5	EM4102	ICodeSLI | Infineon MyD | TagIT HFI
IO-Link | RS 232	RS 232	RS 232
COM3 (230,4 kbit/s)	4,000 Bd	4,000 Bd
1 Piece(s)	1 Piece(s)	1 Piece(s)
1 Piece(s)	1 Piece(s)	1 Piece(s)
18 V DC ... 36 V DC	12 V DC ... 30 V DC	12 V DC ... 30 V DC
		II
Connector	Cable with socket connectors (10+6)	Cable with socket connectors (10+6)
IP 67	IP 65	IP 65 | IP 67
-32 °C ... 60 °C	-25 °C ... 70 °C	-25 °C ... 65 °C
99 mm x 42 mm x 68 mm	76 mm x 30 mm x 102 mm	76 mm x 30 mm x 102 mm | 298 mm x 34 mm x 298 mm
Plastic	Plastic	Plastic
	MultiNet Plus	MultiNet Plus
	CANopen | DeviceNet | EtherCAT | EtherNet IP | EtherNet TCP/IP | PROFIBUS | PROFINET RT | UDP	CANopen | DeviceNet | EtherCAT | EtherNet IP | EtherNet TCP/IP | PROFIBUS | PROFINET RT | UDP

Mobile code readers

NEW

IT 1470g, 1472g

CE

IT 1960g, 1962g

CE

Technical data	Reading distance	5 mm ... 400 mm	0 mm ... 1,115 mm
	Type of connection	Bluetooth | RJ41	Bluetooth | RJ41
	Modulus size	0.127 mm ... 0.508 mm	
	Code types, readable	2/5 Interleaved | Aztec | Codabar | Codablock | Code 39 | Code 93 | Code 128 | Data Matrix Code | DotCode | EAN 8/13 | EAN 128 | EAN Addendum | GS1 Databar | GS1 Databar Expanded | GS1 Databar Limited | GS1 Databar Omnidirectional | GS1 Databar Stacked | GS1 Databar Truncated | Maxicode | Micro PDF | Micro QR | PDF417 | QR code | UPC	2/5 Interleaved | Aztec | Codabar | Code 39 | Code 93 | Code 128 | Composite Codes | Data Matrix Code | DotCode | EAN 8/13 | EAN 128 | EAN Addendum | GS1 Databar | GS1 Databar Expanded | GS1 Databar Limited | GS1 Databar Omnidirectional | GS1 Databar Stacked | GS1 Databar Truncated | Maxicode | Micro PDF | Micro QR | Others on request | PDF417 | QR code | UPC
	Resolution (pixel)	1,040 px x 720 px	1,280 px x 1,080 px
	Interface	PS/2 | RS 232 | USB	PS/2 | RS 232 | USB
	Supply voltage U_B	3.7 V DC | 4...5.5 V DC	4.4 ... 5.5 V DC | 4.75 ... 5.25 V DC
	Degree of protection	IP 42 | IP 40	IP 52
	Laser class		
	Drop height	1.8 m	1.8 m
	Ambient temperature, operation	0 ... 50 °C	0 ... 50 °C
	Ambient temperature, storage	-40 ... 70 °C | -40 ... 60 °C	-40 ... 70 °C
	Dimensions without connector (W x H x D)	62 mm x 169 mm x 82 mm | 173 mm x 82 mm x 62 mm	70 mm x 108 mm x 160 mm
Network connection	With MA 21 connection unit	MultiNet Plus	
	With MA 200i connection unit	CANopen | DeviceNet | EtherCAT | EtherNet TCP/IP | PROFIBUS | PROFINET RT | UDP	CANopen | DeviceNet | EtherCAT | EtherNet TCP/IP | PROFIBUS | PROFINET RT | UDP
Features	Areas of application	For dry and clean environments.	For dry and industrial environments

NEW

IT 1920i

IT 2100, IT 2105

HS 6608, HS 6678

CE	CE	CE
0 mm ... 170 mm	0 mm ... 1,033 mm	0 mm ... 147 mm
RJ41	Bluetooth | RJ41	Bluetooth | RJ41
0.076 mm ... 0.508 mm		
2/5 Interleaved | Codabar | Code 39 | Code 93 | Data Matrix Code | Directly-marked 2D-codes | EAN 8/13 | GS1 Databar | Micro PDF | Micro QR | Others on request | PDF417 | QR code | UPC	2/5 Interleaved | Aztec | Codabar | Codablock | Code 39 | Code 49 | Code 93 | Code 128 | Composite Codes | Data Matrix Code | EAN/UPC | EAN 8/13 | EAN 128 | EAN Addendum | GS1 Databar | GS1 Databar Expanded | GS1 Databar Limited | GS1 Databar Omnidirectional | GS1 Databar Stacked | GS1 Databar Truncated | Maxicode | Micro PDF | Micro QR | Others on request | PDF417 | QR code | UPC	Aztec | Codabar | Code 11 | Code 39 | Code 93 | Code 128 | Composite Codes | Data Matrix Code | EAN/UPC | GS1 Databar | Maxicode | Micro PDF | Micro QR | MSI Plessey | PDF417 | QR code
844 px x 640 px	1,280 px x 1,080 px	1,280 px x 960 px
PS/2 | RS 232 | USB	PS/2 | RS 232 | USB	PS/2 | RS 232 | USB
4 ... 5.5 V DC	3.7 V DC | 4...5.5 V DC	4.5 ... 5.5 V DC
IP 65	IP 65 | IP 68	IP 65 | IP 67
2	1 | 2	2
2 m	3 m	2.4 m
-30 ... 50 °C	-30 ... 50 °C | -20 ... 50 °C	-30 ... 50 °C | -20 ... 50 °C
-40 ... 70 °C	-40 ... 70 °C	-40 ... 70 °C
74.5 mm x 193 mm x 134 mm	75.8 mm x 139.5 mm x 194.8 mm | 76 mm x 139.5 mm x 194.8 mm	77 mm x 185 mm x 132 mm | 77 mm x 185 mm x 143 mm
MultiNet Plus		MultiNet Plus
CANopen | DeviceNet | EtherCAT | EtherNet TCP/IP | PROFIBUS | PROFINET RT | UDP	CANopen | DeviceNet | EtherCAT | EtherNet TCP/IP | PROFIBUS | PROFINET RT | UDP	CANopen | DeviceNet | EtherCAT | EtherNet TCP/IP | PROFIBUS | PROFINET RT | UDP
For reading directly marked codes (engraved, dot-peened and laser-etched). | For rough or contamination-susceptible industrial environments.	For reading directly marked codes (engraved, dot-peened and laser-etched). | For rough or contamination-susceptible industrial environments.	For reading directly marked codes (engraved, dot-peened and laser-etched). | For rough or contamination-susceptible industrial environments.

Network and connection technology

Correctly connected: with our extensive range of connections for all areas of automation

Sensors are integrated in control and automation processes using connection technology. Depending on production conditions, the connection types have different advantages.

We offer you an extensive range of connections, from the cable, to the connector and connection box to the IO-Link master for applications without primary control or hybrid solutions.

The connectors and interconnection cables are available in various materials and versions for all requirements and applications in the area of automation. Our wide product range affords you maximum flexibility in the planning of your machine.

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Performance at the highest level: Multiprotocol IO-Link master in IP 69K design with A and B ports

In addition to PROFINET, the MD 798i also supports EtherNet/IP and Modbus TCP and detects the currently used industrial Ethernet protocol automatically. With its high degree of protection IP 65, IP 67 and IP 69K, it is ideal for use in harsh environments. With 4 A ports and 4 B ports, IO-Link devices with high power requirements can also be operated reliably.

The completely web-based configuration concept offers an optimum stand-alone solution. IO-Link sensors can be parameterized completely via the web server and, thanks to the high level of performance, process data is visible live and in charts.

IO-Link master

- For simple integration in industrial networks with automatic detection
- Robust housing design with IP 65, IP 67 and IP 69K
- 4 A ports and 4 B ports with electrical isolation of the voltage supply on the B ports
- Module cloning for device exchange and extension to new devices
- Stand-alone system with completely integrated web server, no further software necessary

Connection units

MD 798i
IO-Link master

Technical data	Sensor connections	8 Piece(s)
	Number of interface connections	2 Piece(s)
	Connections for voltage supply	2 Piece(s)
	Connection	Connector, M12, A-coded | Connector, M12, D-coded | Connector, M12, L-coded
	Interface	Automatic protocol detection | EtherNet IP | IO-Link | Modbus TCP | PROFINET
	Switching outputs	4 Piece(s)
	Switching inputs	4 Piece(s)
	Degree of protection	IP 65 | IP 67 | IP 69K
	Housing	PA 6 GF 30
	Ambient temperature, operation	-40 ... 70 °C
	Dimensions without connector (W x H x D)	60.4 mm x 39 mm x 230.4 mm

NEW

MD 742
IO-Link hub

MD 708
Ethernet switch

MD 7XXP
Passive distribution boxes

8 Piece(s)		8 Piece(s)
	4 Piece(s) ... 8 Piece(s)	
1 Piece(s)	1 Piece(s)	
Connector, M8 | Connector, M12, A-coded	Connector, M12, A-coded | Connector, M12, D-coded	Cable | Connector, M12, A-coded | Connector, M23, A-coded | Terminal
IO-Link	Ethernet	
16 Piece(s)		
8 Piece(s) ... 16 Piece(s)		
IP 65 | IP 67 | IP 69K	IP 67	IP 65 | IP 67
PA 6 GF 30	Diecast zinc, chemically nickel-plated	TPU / PA UL 94 HB
-40 ... 70 °C	-25 ... 60 °C	-20 ... 70 °C | -5 ... 70 °C
32 mm x 39 mm x 144.3 mm | 54 mm x 27.4 mm x 150 mm	55 mm x 21 mm x 95 mm | 55 mm x 21 mm x 145 mm	30 mm x 31.5 mm x 127 mm | 30 mm x 35 mm x 132 mm | 50 mm x 15 mm x 150 mm | 50 mm x 32 mm x 90 mm | 50 mm x 32 mm x 140 mm | 50 mm x 36.5 mm x 150 mm

Modular connection units

MA 8
Point to Point

MA 100
Point-to-point multiNet slave

		MA 8	MA 100
Technical data	Connection	Connector, M12, A-coded	Terminal
	Interface	RS 232 | RS 485	RS 232 | RS 485
	Degree of protection	IP 67	IP 54
	Housing	PA 66	PC
	Supply voltage U_B	10 ... 30 V, DC	18 ... 30 V, DC
	Dimensions without connector (W x H x D)	32 mm x 25 mm x 86 mm	128.8 mm x 47.4 mm x 181 mm
Series	BCL 8 / BPS 8	X	
	BCL 92		
	BCL 95		
	BCL 300i		X
	BCL 500i		X
	BCL 600i		X
	BCL 900i		
	DCR 200i		
	Mobile code readers		
	ODS 96B		
	RFI / RFM		X

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MA 150
Point to Point

Connector, M12, A-coded | Connector, M12, B-coded
IP 67
Diecast zinc
18 ... 30 V, DC
55 mm x 31 mm x 95 mm
X
X
X

MA 200i
Fieldbus gateway

Connector, M12, A-coded | Connector, M12, B-coded | Connector, M12, D-coded | Plug connector | Sub-D, Male
CANopen | EtherCAT | Ethernet | EtherNet IP | PROFIBUS DP | PROFINET | RS 232
IP 65
Diecast aluminum
18 ... 30 V, DC
107 mm x 40 mm x 180 mm
X
X
X
X
X
X
X
X
X
X
X

MA 900
Point to Point

Sub-D, Female
RS 232 | RS 422
IP 65
PC
193 mm x 180 mm x 71 mm
X

Cables and connectors

		Connection and interconnection cables	User-configurable connectors
		CE UKCA	CE UKCA
Technical data	Suitable for interface	CANopen | DeviceNet | Ethernet | Interbus-S | IO signal | PROFIBUS DP | RS 232 | RS 422 | RS 485 | SSI | USB	Ethernet | IO signal
	Sheathing material	PUR | PVC | TPE | TPU	
	Cable length	200 mm ... 50,000 mm	
	Encoding	A-coded | B-coded | D-coded | L-coded | X-coded	A-coded | B-coded | D-coded | L-coded | X-coded
	Connection	Connector | JST ZHR connector | RJ45 | Socket connector | Sub-D | USB	Connector | RJ45 | Sub-D
	Type of contact		Insulation-piercing connecting device | Screw terminal | Solder connection
	Thread size	M8 | M12 | M16 | M23 | M30	M8 | M12 | M30
	Version	Angled | Axial	Angled | Axial
	No. of pins	3-pin ... 26-pin	3-pin ... 30-pin
	Handle body	PP | PUR | TPU	Metal | Plastic
	Shielded	No | Yes	Yes
	Degree of protection	IP 65 | IP 66K | IP 67 | IP 68 | IP 69 | IP 69K	IP 67
	Application	Chemical resistant | Hygienic and wet areas | Oil and lubricant resistant	
	Resistance of the outer sheathing against	Acids | Bases | Chemicals | Flame retardant | Gasoline | Hydrolysis, microbe | Oil | Ozone | P3- topactive | Seawater	
	Properties of the outer sheathing	Abrasion-resistant | Easily machine-processable | Increased thermal capacity | Matt, low-adhesion | Recyclable	
	Outer sheathing does not contain	Cadmium | CFC | Halogen | Lead | Silicone | Substances interfering with wetting agents	

Industrial image processing

Image processing devices check quality, identify components and provide insights as well as data for production optimization

Vision sensors are used e.g. in the packaging industry and intralogistics as a solution for various image-based inspection tasks. They are compact image processing systems in sensor format which provide everything needed to solve inspection applications in a housing suitable for industrial environments. Vision sensors are ideal for compartment fine positioning, code reading, presence detection as well as measuring and counting.

With industrial IP cameras, the visual monitoring of areas which are not accessible or difficult to access by plant operators is possible.

Switching light section sensors are designed to perform scanning, two-dimensional object detection along a laser line. They are especially well suited for completeness monitoring or product monitoring in the case of multiple track transport.

Simple Vision Sensors: Easy to operate and as powerful as a camera system

The Simple Vision product range offers quick and easy entry into image processing used in industrial automation. Whether presence or absence detection, part detection or inspection, measuring, counting or code reading – we will always have the right solution for your specific applications.

Image capture, processing and communication functions are all integrated in just one image processing sensor. This results in a multifunctional, modular, extremely reliable and easy-to-implement image processing solution.

Powerful, embedded software tools work either independently or together in a job pipeline without the need for an external control. Simple Vision makes things easy.

IVS 1000i

- All-rounder model for detection, inspection and identification
- Fast commissioning
- Integrated digital interfaces: TCP/IP, PROFINET, Ethernet/IP, FTP or SFTP
- Exchangeable lenses
- Integrated high-performance LED illumination

Industrial IP camera

Technical data	Suitable for
	Chip
	Software functions
	Camera type
	Working range
	Resolution (pixel)
	Focal length
	Interface
	Degree of protection
	Supply voltage U_B
	Dimensions without connector (W x H x D)
	Housing
	Optics cover
Features	Features

LCAM 308
Industrial IP camera

LCAM 408i
Industrial IP camera

LCAM 408i ... MT
Industrial IP camera

Use in intralogistics applications	Use of cleaning agents	Use of coolants and lubricants
CMOS	CMOS	CMOS
Image memory | Image transfer | Livestream transmission | REST-API | Video memory	Image transfer	Image transfer
Color	Color	Color
500 mm ... ∞	1,000 ... 5,000 mm	1,000 ... 5,000 mm
1,280 px x 720 px	2,592 px x 1,944 px	2,592 px x 1,944 px
1.33 mm ... 3 mm	4 mm	4 mm
Ethernet	Ethernet	Ethernet
IP 65	IP 65 | IP 67	IP 65 | IP 67
18 ... 28 V DC | 18 ... 30 V DC	18 ... 30 V DC	18 ... 30 V DC
84.6 mm x 38.3 mm x 114 mm	75 mm x 55 mm x 113 mm	76.5 mm x 66 mm x 126 mm
Diecast aluminum	Diecast aluminum	Diecast aluminum
Plastic (PMMA+) with scratch-resistant Indium protective coating	Glass	Glass (seal material: FKM)
		Optics can be cleaned via compressed air connection with max. 6 bar

Vision sensors

		NEW **IVS 1000i / DCR 1000i**	NEW **IVS 108**
Technical data	Software functions	Count codes | Counting: surfaces, edges, forms | Detect codes | DPM (directly marked codes) | Locate: surface, edge, form | Locate codes | Measuring: angle, circle, distance, point-to-point, point-to-line | Parts detection: brightness, contrast, surface pixels, edge pixels | Printing quality verification | Reading of 1D codes | Reading of 2D codes	Presence control
	Sensor	Sony global shutter	
	Camera type	Monochrome	
	Resolution (pixel)	1,440 px x 1,080 px | 736 px x 480 px	320 px x 240 px
	Reading distance / working range	50 ... 2,000 mm, depending on lens	50 ... 150 mm
	Field of view		at 50 mm: 20 mm x 15 mm | at 150 mm: 54 mm x 41 mm
	Modulus size	0.127 mm ... 0.5 mm	
	Focal length	8 mm	7 mm
	Electronic shutter speed	0.025 ... 2 ms	
	Interface	Ethernet | PROFINET	Ethernet
	Configuration/parametrization	Vision Studio software	Switch | Teach-in | Via web browser
	Switching outputs	5 Piece(s) | MOSFET semiconductor	3 Piece(s) | Transistor
	Switching inputs	3 Piece(s)	2 Piece(s)
	Degree of protection	IP 67	IP 65 | IP 67
	Supply voltage U_B	18 ... 30 V DC	10 ... 30 V DC
	Dimensions without connector (W x H x D)	45 mm x 85 mm x 35 mm	47 mm x 58 mm x 58 mm
	Housing	Diecast zinc	Aluminum
	Optics cover	Plastic / PMMA	Plastic / PMMA
Accessories	Mounting devices	BTK IVS 1048	
	Cover hood	AC IVS	
	Illuminations	IL BA, IL AL, IL SP	
	Lenses	Lens S-M12	

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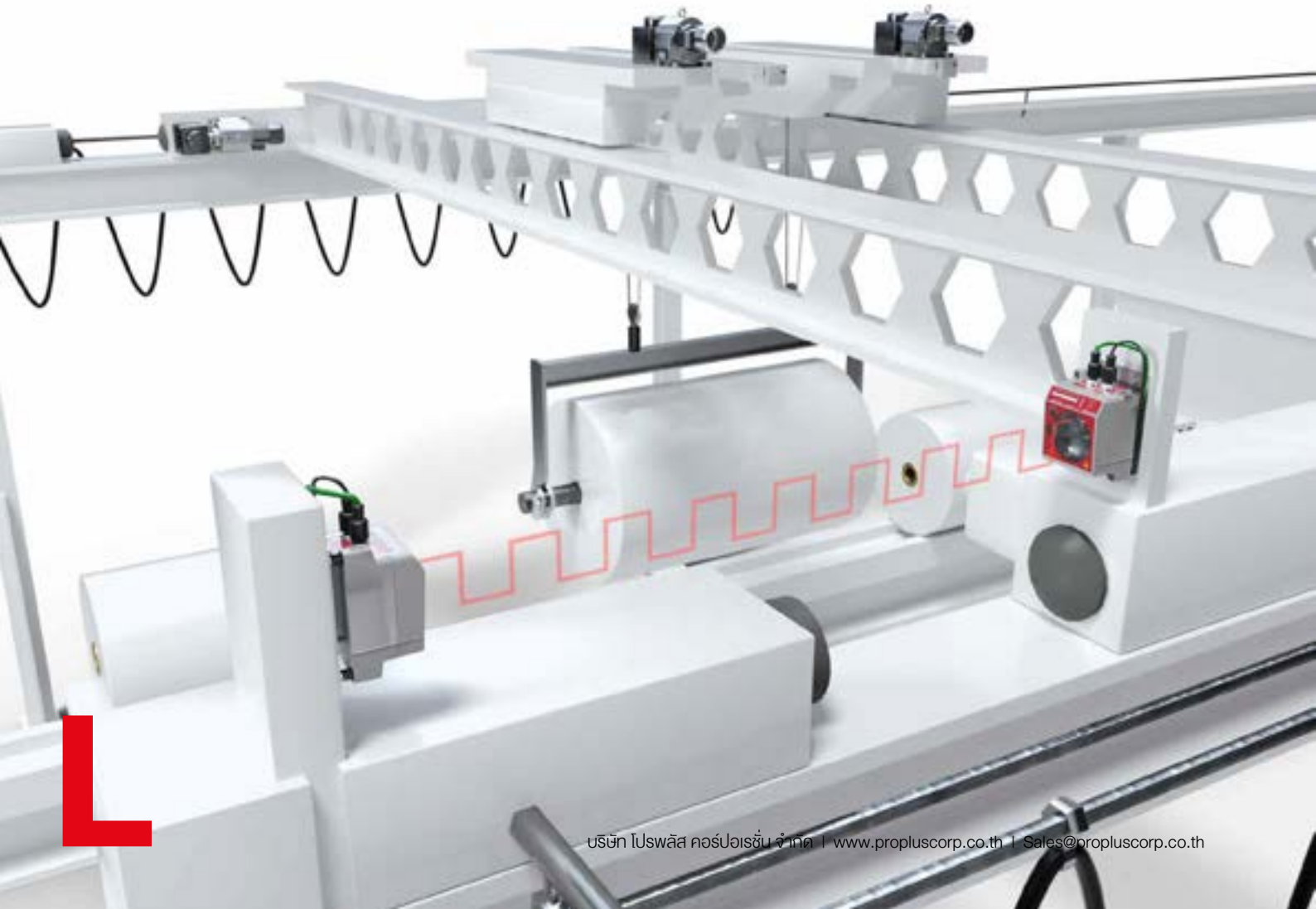
Data transmission

Contact-free transmission of information by means of infrared light

Optical data transmission enables transparent, contact-free and wear-free transmission of industrial Ethernet protocols through light emissions.

This technology is used with stacker cranes, transfer cars, electroplating plants as well as gantry cranes. We offer optical data transceivers with various operating ranges and different Ethernet networks. The sensors are characterized by their easy alignment with integrated laser alignment aid, an integrated diagnosis function as well as a bar graph indicator, thereby allowing them to be quickly put into operation.



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Data transmission photoelectric sensor with integrated web server for remote diagnosis

With a bandwidth of 100 Mbit/s, the DDLS 500 data transmission photoelectric sensor enables contact-free communication wherever WLAN or wired transmission systems are pushed to their limits. The integrated web server, which can handle remote diagnostics, is globally unique.

The DDLS 500 also stands out as a PROFINET participant with real-time data transmission over 200 meters. Models available for various operating ranges and interface protocols. Furthermore, we offer optional equipment features, such as a laser pointer for fast mounting or optics heating.

DDLS 500

- Pre-mounted mounting and alignment plate
- Operating ranges of 40 m, 120 m and 200 m
- Optionally with heating, web server and laser alignment aid
- Can be used for all industrial Ethernet networks as well as TCP/IP communication

Optical data transmission

DDLS 500
with 100 Mbit/s real-time transmission

DDLS 200
with 2 Mbit/s transmission rate

		DDLS 500	DDLS 200
Technical data	Working range	100 ... 40,000 mm | 100 ... 120,000 mm | 100 ... 200,000 mm	200 ... 30,000 mm | 200 ... 80,000 mm | 200 ... 120,000 mm | 200 ... 200,000 mm | 200 ... 300,000 mm | 200 ... 500,000 mm
	Light source	Laser, Infrared	LED, Infrared
	Laser class	1M	
	Interfaces	EtherCAT link down 5 ms | EtherCAT link down 70 ms | EtherCAT Safety-over-EtherCAT (FSoE) | EtherNet TCP/IP | PROFINET | PROFIsafe over PROFINET	CANopen | DeviceNet | Interbus-S | PROFIBUS DP | Rockwell DH+/RIO | RS 422 | RS 485
	Type of display	Bar graph | LED	Bar graph | LED
	Degree of protection	IP 65	IP 65
	Supply voltage U_B	18 ... 30 V, DC	18 ... 30 V, DC
	Ambient temperature, operation (with / without heating)	-35 ... 50 °C | -5 ... 50 °C	-30 ... 50 °C | -5 ... 50 °C
	Dimensions without connector (W x H x D)	100 mm x 156 mm x 99.5 mm	89.25 mm x 196.5 mm x 111.8 mm
	Housing	Diecast aluminum	Diecast aluminum
Features	Operation of parallel light axes	X	X
	Remote diagnosis via web server	X	
	Heating	X	X
	Integrated laser alignment aid	X	
	Not influenced by reflective surfaces	X	X
	Wide angle version	X	X

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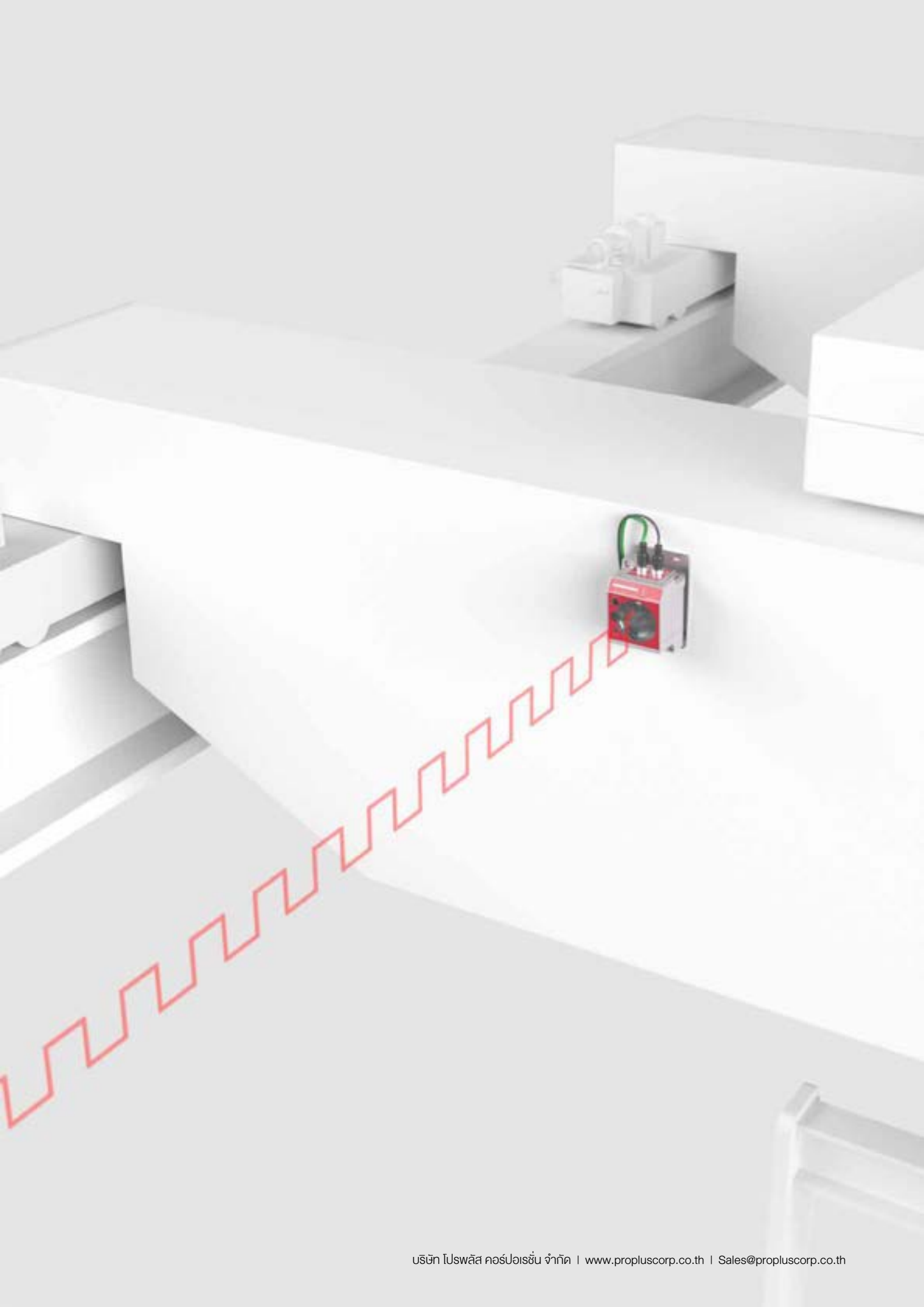
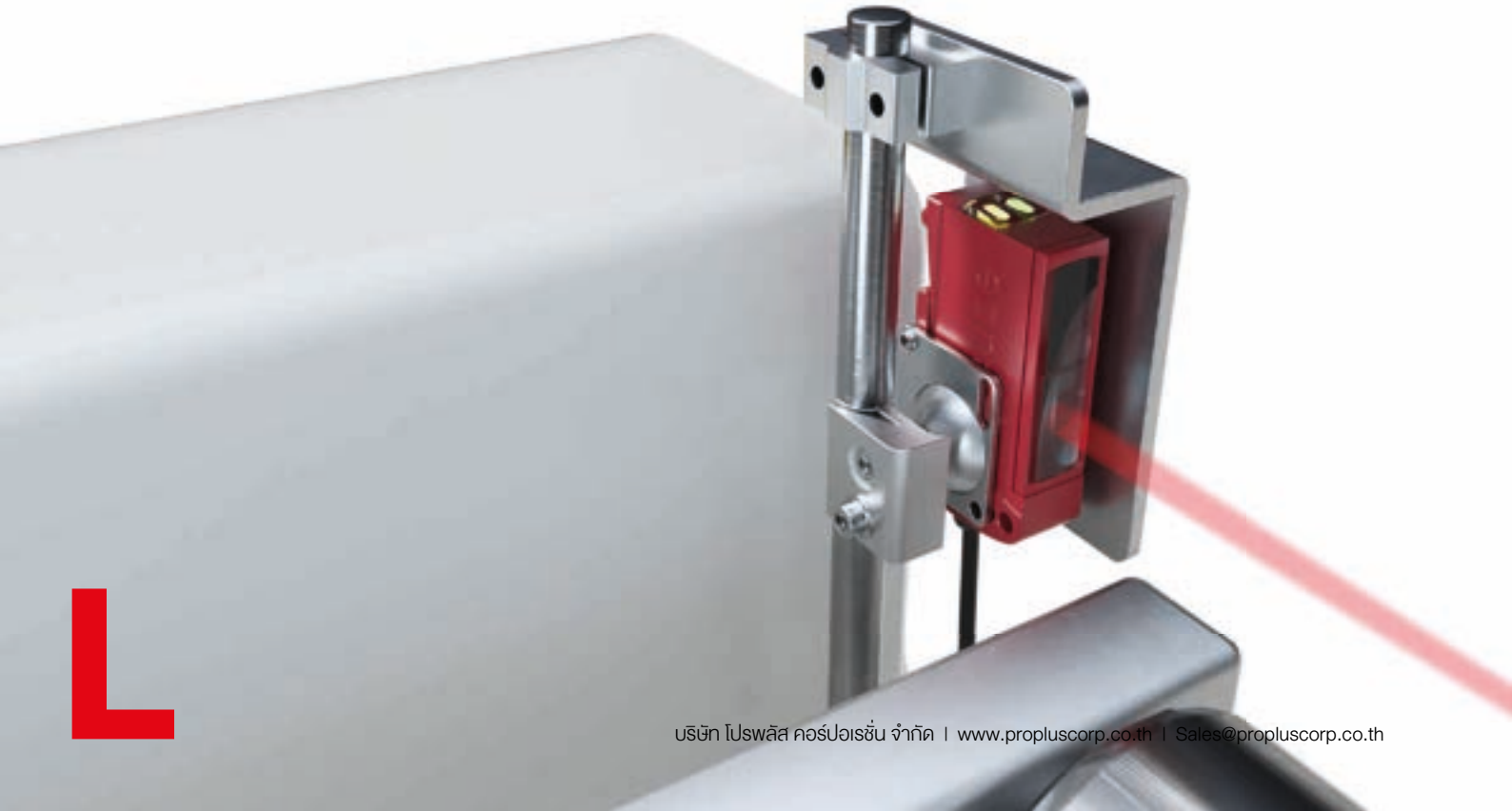


Accessories and supplementary products

Smooth running: Full performance with the right accessories and perfectly matched components

Efficient work requires more than just a sensor. Almost as important are the appropriate accessories, which allow the sensor to utilize its full functionality. No matter if you need easy mounting, uncomplicated connection or reliable signaling, you can easily find the right accessories for your application in our extensive product range.

You can find our complete accessories range on our website at www.leuze.com.



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Mounting systems

We place great emphasis on our products being easy to mount and simple to align. For this reason, you will find specially-attuned mounting systems in our product range such as mounting brackets, rod holders or device columns.

Cables

To facilitate the integration of our sensors, we offer a large variety of connection and interconnection cables with M8, M12, and M23 connectors – straight or angled, and with or without LED.

Connection units

Today, sensors, safety switches and cameras are linked together via active or passive sensor distribution boxes with fieldbus interfaces from our product range to ensure more flexibility and transparency during installation.

Mounting brackets and device and mirror columns

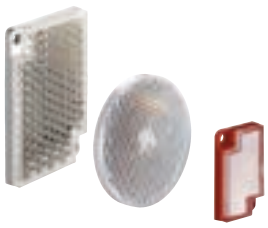
The mounting brackets designed for our safety sensors ensure simple mounting and alignment of the devices. Device columns for freestanding floor assembly and mirror columns for multi-sided safeguarding simplify the installations.

Signaling devices

For signaling in automated systems, we offer an extensive product range of single- and multi-colored as well as acoustic transducers in order to ensure productivity and efficiency.

Reflectors

Just how reliably retro-reflective photoelectric sensors can detect depends upon the selected reflector, among other things. We offer reflectors with plastic or stainless steel housings as well as reflective tapes for different requirements.



Signaling devices

NEW

TL 305 tower light

Technical data	Diameter	50.6 mm
	Interface	IO-Link
	Supply voltage U_B	18...30 V, DC | 24 V, DC
	Type of signaling	Optical | Optical and acoustic
	Signal image	Continuous, blinking, flashing light | Continuous light
	Colors of the modular tower light elements	
	Segments of the preassembled tower lights (ascending)	Blue, green, orange, red | Green, orange, red | User defined via IO-Link: RGB color space, Factory settings: red, green, yellow, blue, white, orange, pink | White, blue, green, orange, red
	Tone type	Continuous tone | Continuous tone, slow intermittent (1 Hz), rapid intermittent (2.5 Hz)
	Sound pressure	80 dB | 95 dB
	Type of connection	Connector, M12
	Housing material	Aluminum
	Degree of protection	IP 20 | IP 65
Features	Features	Aluminum housing with robust and high-quality design | IO-Link models with different operating modes and extensive selection of colors | Models with predefined color assignment and models with IO-Link interface available | Preconfigured tower light with three, four or five segments, optionally with acoustic signaler

Tower light, type A

Tower light, type E

D9 tower light

70 mm	40 mm | 70 mm	
24 V, DC, 10 %	24 V, AC/DC, 10 % | 24 V, DC, 10 %	24 V, AC/DC, 10 %
Acoustic | Optical | Optical and acoustic	Acoustic | Optical	Optical and acoustic
Continuous light | Continuous or flashing light | Flashing light	Continuous light | Flashing light	Continuous light
Blue | Clear | Green | Orange | Red | Yellow	Blue | Clear | Green | Orange | Red | Yellow	
Green, orange, red | Green, orange, red, single sound buzzer		Green, orange, red
Continuous or pulse tone | Continuous tone | Pulse tone	Continuous or pulse tone	Continuous or pulse tone
100 dB | 105 dB	80 ... 80 dB | 100 ... 100 dB	70 ... 90 dB
Cable | Cable, soldered to lens / open end | Connector, M12		Terminal
Plastic	Plastic	Plastic
IP 66	IP 66 | IP66, UL Type 4/4X/13	IP 65
Flexible configuration: differently colored calottes (6 colors as well as the multicolor calotte), various stand and mounting options as well as different buzzer versions are available | Modular, freely configurable tower light elements and also preassembled models available | Transparent calottes/uniform clear glass optics	Colored calottes | Flexible configuration: differently colored calottes (6 colors), various stand and mounting options as well as a buzzer element are available | Modular tower light elements	Preassembled tower lights with three segments and acoustic signaler in semicircular form | Simple wall mounting

Mounting systems

Mounting brackets

Rod mounting

Technical data	Design of mounting device	Angle, L-shape | Angle, Z-shape | Bracket mounting | Mounting plate | Retaining clip	12 mm rod | Mounting system | Protection hood | Rod | Z-shaped rod, 12 mm
	Type of mounting device	Adjustable | Rigid	Adjustable | Clampable | Rigid | Swiveling | Turning
	Material	Aluminium, anodized | Aluminum | Steel, galvanized | V2A	Aluminum | Diecast aluminum | Steel, galvanized | V2A | V4A
	Type of fastening, at system	Groove mounting | Mounting thread | Through-hole mounting	9 ... 30 mm rods | Clampable | Screw type | Sheet metal mounting bracket | Through-hole mounting

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Clamp brackets

Mounting brackets for hand-held scanners

Other mounting systems

Mounting clamp | Sliding block	Protection hood | Table foot | Wall mounting	Adapter plate | Air wipe unit with cross-flow fan | Angle, L-shape | Angle, U-shape | Cable routing | Mounting clamp | Mounting plate | Profile kit
Adjustable | Clampable | Rigid	Adjustable | Rigid | Swiveling	Adjustable | Clampable | Hinged | Rigid | Swiveling | Turning
Metal | Plastic	Aluminum, painted | Plastic	Aluminium, anodized | Aluminum | Diecast aluminum | Steel, galvanized
Groove mounting | Mounting thread | Through-hole mounting	Mounting thread | Self-supporting | Suspended (rope) | Through-hole mounting	Clampable | Groove mounting | Mounting thread | Through-hole mounting

Reflectors and reflective tapes

Technical data	Design
	Structure
	Material
	Triple reflector size
	Min./max. diameter
	Min./max. width
	Min./max. height
	Degree of protection
	Min./max. operating temperature
	Compatibility of materials
Features	Special version

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Standard reflectors, micro-triad-type reflectors

Reflective tapes

Reflectors with higher resistance

		ECOLAB
Rectangular | Round	Rectangular	Rectangular | Round
Mikrotriple | Triple	Mikrotriple | Triple	Mikrotriple | Triple
PMMA | PMMA8N	PMMA	PES | PET | Solidchem | Stainless steel
0.3 mm ... 12 mm	0.3 mm	0.3 mm ... 12 mm
17 mm ... 84 mm		8.5 mm ... 17 mm
10 mm ... 914 mm	5 mm ... 1,000 mm	7 mm ... 51.3 mm
20 mm ... 914 mm	9 mm ... 45,700 mm	7 mm ... 56 mm
IP 67 | IP 40		IP 65 | IP 67 | IP 69K
-40 °C ... 120 °C	-40 °C ... 80 °C	-40 °C ... 150 °C
		Alcohol | CleanProof+ | ECOLAB | H2O2
Anti-fog coating | Heating | Heat resistant		

Our product range at a glance

Switching Sensors
- Optical Sensors
- Inductive Switches
- Capacitive Sensors
- Ultrasonic Sensors
- Fiber Optic Sensors
- Laser Scanners
- Fork Sensors
- Light Curtains
- Special Sensors

Measuring Sensors
- Distance Sensors
- Sensors for Positioning
- 3D Sensors
- Light Curtains
- Laser Scanners
- Bar Code Positioning Systems
- Fork Sensors

Safety
- Safety Solutions
- Safety Laser Scanners
- Safety Light Curtains
- Single and Multiple Light Beam Safety Devices
- Safety Radar Systems
- Safe Locking Devices, Switches and Proximity Sensors
- Safety PLCs and Relays
- Machine Safety Services

Identification
- Bar Code Identification
- 2D Code Identification
- RF Identification

Data Transmission
- Optical Data Transmission Systems

Network and Connection Technology
- Connection Technology
- Modular Connection Units

Industrial Image Processing
- Light Section Sensors
- Industrial IP Cameras
- Vision Sensors

Accessories and Supplementary Products
- Signaling Devices
- Mounting Systems
- Reflectors

Leuze
The Sensor People

To Whom It May Concern

Date: 01 July 2026

Authorized Representation

We hereby confirm that,

PROPLUS CORPORATION CO., LTD.
22/304 Moo 6, Bueng, Sriracha,
Chonburi 20230, Thailand

is our official representative for Thailand.

PROPLUS CORPORATION CO., LTD. is empowered to provide comprehensive technical and commercial support while ensuring the supply of genuine Leuze manufactured products.

This confirmation is valid until December 31, 2027.

For and on behalf of Leuze electronic S.E.A Pte Ltd

Kamil Abd Manan
Sales Director
Southeast Asia

ตัวแทนจำหน่ายอย่างเป็นทางการ

PROPLUS CORPORATION
บริษัท โปรพลัส คอร์ปอเรชั่น จำกัด

Mobile : 099-6103519 | 099-7358459
Email : Sales@propluscorp.co.th
Web : www.Propluscorp.co.th

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