

SMART
SENSOR
BUSINESS

 **Leuze electronic**

the **sensor** people



2018 / 2019

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SMART
SENSOR
BUSINESS

SMART IS
TO THINK **EASY**,
TO SHARE **EXPERIENCE**,
TO BE **CLOSE**,
TO CREATE THE **FUTURE**



"More than 50 years of experience made Leuze electronic a real expert in innovative and efficient sensor solutions for industrial automation. With our wide sales- and service-network, our knowledgeable consulting and our reliable customer service we are always close to you – worldwide."

Ulrich Balbach,
Managing Director



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EASY

Technology must serve people. Complex and technically sophisticated products should be as **easy** and intuitive to use as possible by our customers. This is both an aspiration and a development maxim – to the benefit of our customers.

EXPERI- ENCE

More than 50 years of **experience** and a close relationship with our customers have made us true experts in specific industries. This is how we develop individual sensor solutions for and with our customers.

PROXI- MITY

Think global, act local – this characterizes the sensor people. **Customer proximity** means not only being there for our customers 24/7, providing them with sound advice, and supporting them with an extensive range of services, but also responding to their individual desires and needs worldwide.

FUTURE

Sensors are the basis for all automation and for Industry 4.0 or IIoT. Together with our customers and strategic partners we are working on **future-oriented technologies** in order to make data and information available worldwide.

EASY

SMART IS
TO THINK
EASY

“Our development motto is quite simple – all products must be easy and intuitive to operate for our customers – easier than the previous models and similar devices on the market.”

Dr. Marie-Theres Heine,
Product Manager –
Binary Switching Sensors



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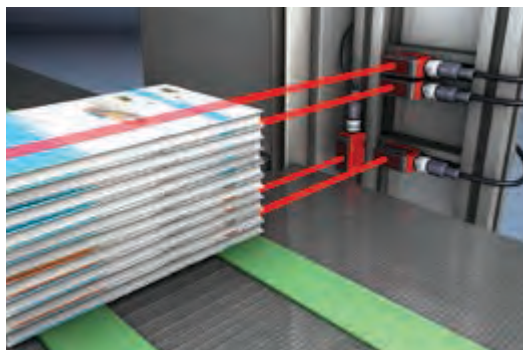
COMPLEX TECHNOLOGY – **EASY TO OPERATE!**

**We do not budge on this issue –
if it is not “easy to operate,” we will not develop it!**

Even in the development of new products, Leuze electronic is steadfast on keeping with its customers' desire for simple operation. This is the company's development maxim. It means that we only develop products that are easy to operate, preferably even easier than the previous models or comparable products on the market.

These sensors offer unlimited freedom

Our new devices of the C-generation offer complete liberty when it comes to selecting the sensor alignment. The switching thresholds can be configured by button, line, IO-Link, or the traditional potentiometer – anything is possible.



A code reader that is up and running in three minutes

Our camera-based code reader DCR 200i is setting a new standard in terms of performance and implementation. It takes no more than three minutes to parameterize the code reader via its two control buttons and start using it – it doesn't get any easier!



**EXPERI-
ENCE**

SMART IS TO SHARE **EXPERIENCE**

“Many years of industrial experience has made us a top expert in various industries. Together with our customers, we develop efficient sensor solutions that are made specifically for their requirements.”

Jörg Beintner,
Industry Manager – Machine Tools



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INDUSTRY ORIENTATION IS KEY TO SUSTAINABLE SUCCESS

Our experience in the industry is a true treasure trove that we don't mind sharing with our customers

To be real specialists and have expert knowledge requires focus. We are experts in intralogistics, the packaging industry, machine tools, the automotive industry, and medical technology. In these industries, we offer our customers solid know-how based on many years of experience as well as the support of our industry experts who are familiar with all the unique requirements and peculiarities of these industries. This enables us to offer tailor-made solutions for a large variety of complex customer requirements, no matter how challenging they are.

Precision and reliability matter for machine tools

Today more than ever, characteristics such as accuracy and reliability are demanded of machine tools and of the sensors used on those tools. As a result of increasing digitization, the networking of systems is becoming more and more important as well. Many of our solutions are providing the corresponding functionalities already today.



When efficient intralogistics are a matter of competition

System manufacturer Bürkert Fluid Control Systems from Ingelfingen (Germany) has significantly increased its level of automation at the "Campus Criesbach" location in order to serve its customers even faster and more efficiently. Intelligent sensor solutions from Leuze electronic make it possible.



**PROXIM-
ITY**

SMART IS TO BE **CLOSE**

“To us, being close to our customers means treating them as guests. We make every effort to ensure that they feel at home with us and are happy to come back.”

Junghee Lee,
Customer Service Manager –
Leuze electronic South Korea



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TOP CUSTOMER SERVICE IS A NATURAL PART OF OUR ACTIVITIES

Our customers are guests who love to come back

If our customers feel at home with us, they are also sure to return. Junghee Lee's job is to make every effort to ensure that her customers feel right at home with Leuze electronic. This is precisely the aim of our continuously expanding and customized services. The 24/7 service hotline and the customer proximity with our 22 branches and 42 sales partners around the globe are just some of the very real examples of our commitment to service and customer orientation.

The right service, every time

We accompany our customers during the entire life cycle of their machines or systems by providing competent advice and offering our comprehensive support and services. Our 24/7 service hotline for technical questions offers worldwide support for customer inquiries.

Always here for you, no matter when or where – worldwide

In our service center we are in touch with our customers around the clock, worldwide, ready to address their questions and wishes. We make sure that our customers' machines and systems run reliably. With our presence in five continents, we are also physically close to our customers.

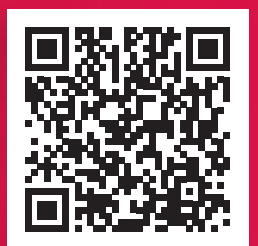


FUTURE

SMART IS TO CREATE THE **FUTURE**

"We are developing the technological standards of the future. Together with our customers and international technology partners, we are working on viable concepts for tomorrow's industrial automation."

Moritz Mullis,
Development Engineer –
Competence Center Electronics



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INTELLIGENT SENSORS PROVIDE THE FOUNDATION FOR INDUSTRY 4.0 AND IIOT

We have a very clear idea of what the future will look like, and we develop suitable sensor concepts for it

Together with international technology partners such as Microsoft and the OPC Foundation, among others, we are designing the technological standards of tomorrow and are already optimally preparing our products for this today. For example, already today some of our sensors, such as bar code readers or optical data transceivers, are sending their data directly to the cloud where they can be used for further analysis or services. Interfaces such as IO-Link or EtherNet also aim to facilitate the communication and networking of sensors and make the information available worldwide.

Remote diagnostics with DDLS 500

Our DDLS 500 data transmission photoelectric sensor is the world's first device to provide remote access and remote diagnostics via Ethernet using its integrated web server. Here Leuze electronic is a pioneer and sets the standard for the future.



Into the future with bar code reader BCL 348i

In cooperation with Microsoft, we are developing a sensor solution with Industry 4.0 capability which is based on the BCL 348i bar code reader and transfers the data directly to the Azure Cloud via OPC UA and back to the sensor. The bar code reader can also be controlled directly via the app.



SMART
SENSOR
BUSINESS

WE ARE THE **SENSOR PEOPLE**

For more than 50 years, we have been developing, producing, and marketing efficient sensor solutions for industrial automation.

Leuze electronic at a glance

Foundation	1963
Company structure	GmbH & Co. KG, wholly family-owned
Executive management	Ulrich Balbach
Headquarters	Owen, Germany
Distribution companies	18
Production locations	5
Technological competence centers	3
Distributors	42
Employees	> 1,200

Product range

Switching sensors
Measuring sensors
Products for safety at work
Identification
Data transmission systems
Industrial image processing
Accessories

Industry expertise

Intralogistics
Packaging industry
Machine tools
Automotive industry
Medical technology

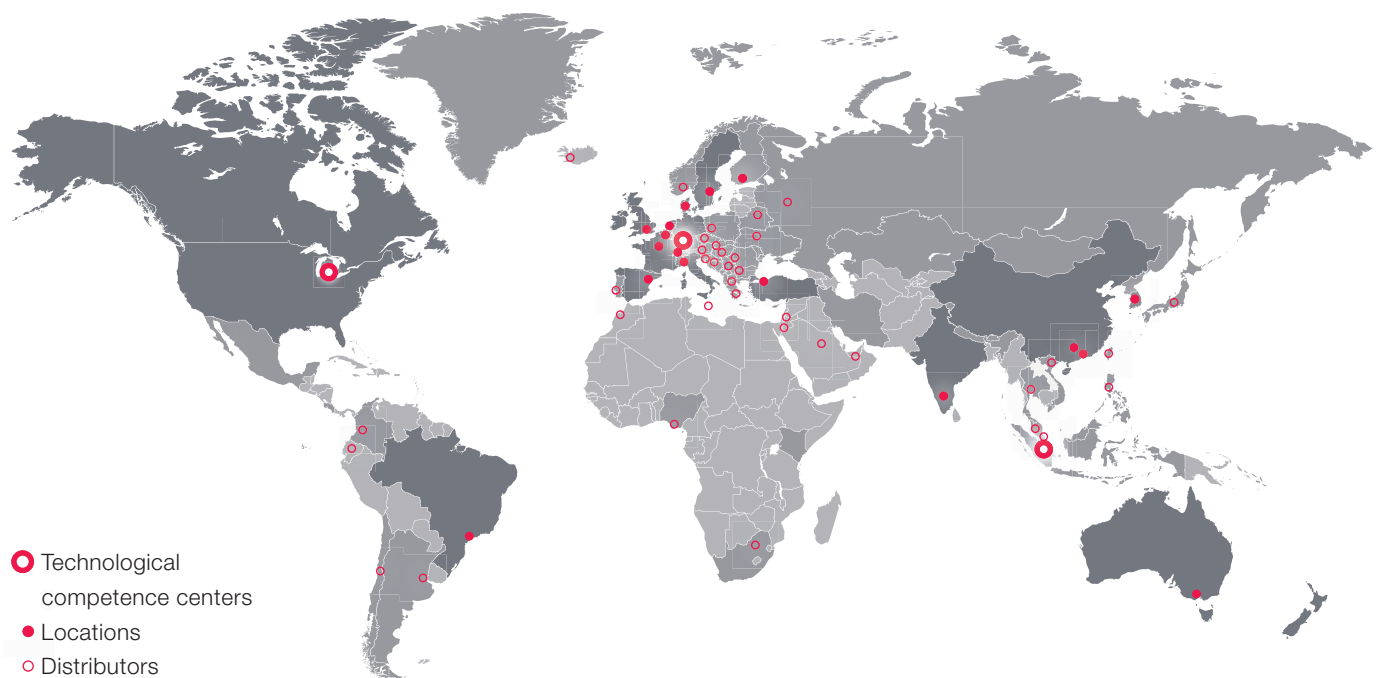


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ALWAYS CLOSE TO YOU

Short distances are important to us – both within and outside of our company. We therefore place great value on being personally, quickly, and easily accessible to you at our locations around the world. We produce our sensors on four continents, allowing us to offer you reliable product availability.



Australia/New Zealand | Belgium | Brazil | China | Denmark/Sweden | France | Germany | Great Britain | Hong Kong | India | Italy | the Netherlands | Switzerland | Singapore | Spain | South Korea | Turkey | USA/Canada

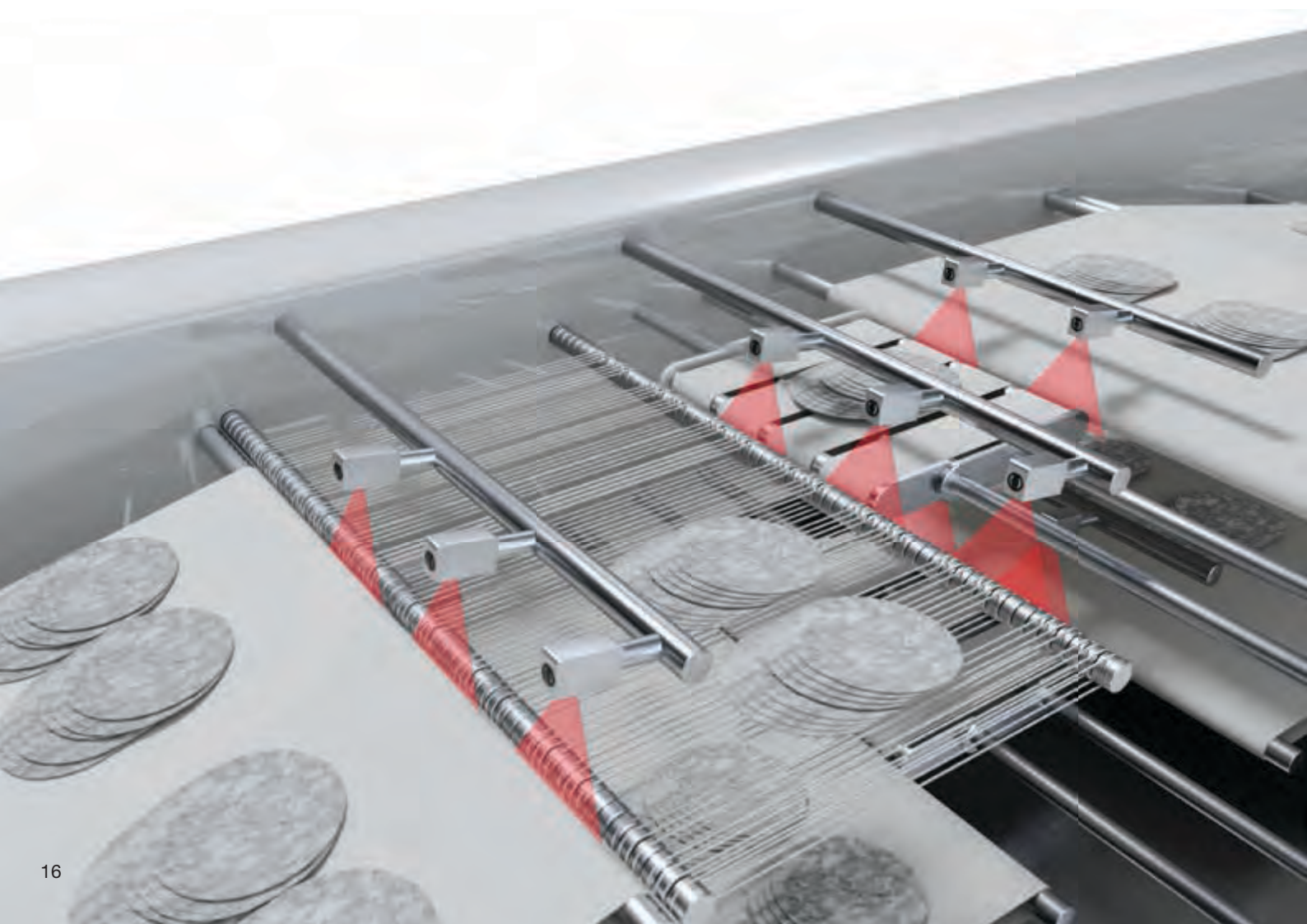
SWITCHING SENSORS

Dependable switching: All objects and packaging are detected stably and reliably

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 dual channel IO-Link data and can, thus, be integrated in all applications. Many series offer helpful additional functions to facilitate service intervals that are as long as possible.



Versatile miniature sensors: short response times, high degree of protection and new mounting bracket

With very long operating ranges, short response times and degrees of protection IP 67 and IP 69K, the 3C series sensors are suitable for applications in assembly, material flow and in the packaging field.

The series offers operating principles and light spot variants for the reliable detection of even transparent objects. The compact sensors are extremely robust and resistant against cleaning agents. This is verified by the ECOLAB certification as well as the highest degrees of protection.

There are two new mounting variants: an integrated M3 threaded sleeve for simple mounting without nuts as well as reinforced through holes.

3C SERIES

- All operating principles available
- Autocollimation with automatic sensitivity readjustment (tracking) for the smallest differences
- Best performance in this size (11 × 34 × 18 mm)
- Range of models with many light spots; switching behavior appropriate for your application
- Degrees of protection IP 67 and IP 69K and ECOLAB certification





Photoel. sensors / diffuse sensors, cubic housing



2 series
Universal, micro



3C series
Universal, mini

Specifications		
Dimensions excl. plug, W × D × H	8 × 23 × 12 mm	11 × 32 × 17 mm
Operating voltage	10 – 30 V DC	10 – 30 V DC
Switching outputs	PNP, NPN	PNP, NPN
Connection type	Cable, cable+M8 / M12	M8, cable, cable+M8 / M12
Degree of protection	IP 67	IP 67, IP 69K
Certifications	CE 	CE CDRH 
Housing	Thermoelastic elastomer	Plastic
Throughbeam photoelectric sensors		
Operating range*	0 – 2 m	0 – 10 m
Light source	Red light	Red light
Switching	Light, dark	Light, antivalent
Switching frequency	385 Hz	1,000 Hz
Retro-reflective photoelectric sensors		
Operating range*	0.07 – 4 m	0 – 7 / 0.02 – 5.5 / 0 – 3 m
Light source	Red light	Red light / infrared / laser (class 1)
Switching	Light, dark	Light, dark, antivalent
Switching frequency	700 Hz	1,000 / 1,500 / 3,000 Hz
Energetic diffuse sensor		
Operating range*		
Light source		
Switching		
Switching frequency		
Diffuse sensors with background suppression		
Operating range*	Permanently set to 15 mm, 30 mm, 50 mm	5 – 600 mm
Light source	Red light	Red light / laser (class 1)
Switching	Light, dark	Light, antivalent
Switching frequency	700 Hz	1,000 / 3,000 Hz
Options		
Transparent media		X
Protective sensors category 2		
Warning output		X
Activation input		X
Active ambient light suppression A ² LS		X
Features		
	Pin-point LED ▪ Powerful interference suppression ▪ 2 inlaid metal sleeves ▪ Sensor with a laser-like light spot ▪ Polarized retro-reflective photoelectric sensor with glass optics	ECOLAB ▪ Two housings: through holes with metal sleeves or threaded sleeves ▪ Sensor with different light-spot geometry and V-configuration ▪ Laser variants ▪ Teach-in ▪ Bottle detection. Contrast sensors ▪ Devices with IO-Link communication interface

* Typical operating range limit



5 series
Standard



10 series
TOF, long range laser



110 series
HT 110



15 series
Standard

14 × 33 × 20 mm	25 × 65 × 55 mm	50 × 23 × 50 mm	15 × 43 × 30 mm
10–30 V DC	18–30 V DC	18–30 V DC	10–30 V DC
PNP, NPN	Push-pull, IO-Link	2 × push-pull	PNP, NPN
M8, cable, cable+M8 / M12	Cable+M12, cable, turnable M12 connector	Turnable M12 connector	M12, cable, cable+M12
IP 67	IP 67	IP 67, IP 69K	IP 66, IP 67
US	US CDRH	US	US
Plastic	Plastic	PMMA	Plastic
0–15 m			0–35 m
Red light			Red light / infrared
Antivalent			Light, dark
500 Hz			500 Hz
0.02–6 m			0–8 / 0–10 m
Red light			Red light
Antivalent			Light, dark
500 Hz			500 Hz
0–1 m			
Red light / infrared			
Antivalent			
500 Hz			
0–400 mm	50–8,000 mm / 25,000 mm	100–5,000 mm (WH) / 3,000 mm (BK)	0–1,000 mm
Red light	Red light laser (class 1)	Laser, red, 655 nm	Red light / infrared
Light, dark	Light	Light	Light, dark
1,000 Hz	40 Hz	250 Hz	500 Hz
X			
	X		
X	X	X	
X	X		
Simple mounting by means of integrated threaded sleeves ▪ Flexible cable outlet to the rear or downward ▪ Fast alignment through <i>brightvision</i> ▪ Detection of semitransparent media ▪ Teach variants available	Turnable M12 connector ▪ All devices with IO-Link interface ▪ Light/dark switching via teach button ▪ Window function ▪ Adaptation to the application by means of configurable filters and gain values ▪ Propagation time of the radiated light (TOF)	All devices with IO-Link interface ▪ Turnable M12 connector ▪ 2 switching points ▪ Small black/white error ▪ High repeatability ▪ Adjustment via teach buttons ▪ Propagation time of the radiated light (TOF)	Mechanically adjustable operating range. Sensitivity adjustment ▪ Retro-reflective sensor with large function reserve / for stretch-wrapped containers

Photoel. sensors / diffuse sensors, cubic housing



25 LR series
TOF, long range



25C series
Universal

Specifications		
Dimensions excl. plug, W × D × H	15 × 43 × 30 mm	15 × 43 × 30 mm
Operating voltage	10–30 V DC	10–30 V DC
Switching outputs	PNP, NPN	PNP, NPN
Connection type	M12, cable	M8 / M8+snap / M12, cable, cable+M8 / M12
Degree of protection	IP 67	IP 67, IP 69K
Certifications	CDRH	
Housing	Plastic	Plastic
Throughbeam photoelectric sensors		
Operating range*		0–35 m
Light source		Red light
Switching		Light, antivalent
Switching frequency		500 Hz
Retro-reflective photoelectric sensors		
Operating range*		0–12 / 0–15 m
Light source		Red light / laser
Switching		Light, dark, antivalent
Switching frequency		1,500 / 2,000 Hz
Energetic diffuse sensor		
Operating range*		0–650 mm
Light source		Red light
Switching		Light, dark, antivalent
Switching frequency		500 Hz
Diffuse sensors with background suppression		
Operating range*	50–3,500 mm	0–1,000 mm
Light source	Infrared TOF (light propagation time measurement)	Red light / infrared
Switching	Light, dark	Light, dark, antivalent
Switching frequency	40 / 75 Hz	1,500 Hz
Options		
Transparent media		X
Protective sensors category 2 / 4		X (type 2)
Warning output		X
Activation input	X	X
Active ambient light suppression A ² LS		X
Features		
	Detection of objects with low diffuse reflection > 2% ▪ 2 teachable switching points (TOF) ▪ Line teach and deactivation ▪ All devices with IO-Link interface for configuration (including adaptation to the application) and process data transfer ▪ Very good fading	ECOLAB, M4 metal threaded sleeves, sensors with small and long light spot ▪ Sensor for bay positioning / for the detection of broken containers ▪ Focused light spot ▪ Foreground suppression ▪ High function reserve ▪ For stretch-wrapped packages

* Typical operating range limit



28 series
Standard, multimount



46C series
Universal, long range



49C series
Universal current



8 series
Metal

15 × 47 × 32 mm	19 × 75 × 43 mm	31 × 110 × 56 mm	15 × 48 × 38 mm
10–30 V DC	10–30 V DC	10–30 V DC / 20–250 V AC/DC	10–30 V DC
PNP, NPN	PNP, NPN, push-pull	PNP, NPN, relay, MOSFET	PNP, NPN, push-pull
M12, cable, cable+M12	M12, cable, cable+M12	Cable, terminals	M12, cable
IP 67	IP 67, IP 69K	IP 67, IP 69K	IP 67, IP 69K
CE cUL US	CE CDRH cUL US	CE CDRH cUL US	CE CDRH cUL US
Plastic	Plastic	Plastic	Metal, glass
0–15 m	0–150 m	0–150 m	0–20 / 0–100 m
Red light	Red light / infrared	Red light / infrared	Red light / laser (class 2)
Antivalent	Light, dark, antivalent	Light, dark, antivalent	Light, dark, antivalent
500 Hz	500 Hz	25 / 150 / 500 Hz	1,500 / 2,800 Hz
0.02–6 m	0.15–30 m	0.05–30 m	0–8 / 0–21 m
Red light	Red light / red light laser (class 1)	Red light / infrared	Red light / laser (class 1)
Antivalent	Light, dark, antivalent	Light, dark, antivalent	Light, dark, antivalent
500 Hz	500 Hz	25 / 150 / 500 Hz	1,500 / 2,800 Hz
0–0.85 m			
Red light			
Antivalent			
500 Hz			
	5–3,000 mm	5–3,000 mm	5–400 mm
	Red light / infrared / red light laser (class 1/2)	Red light / infrared	Red light / infrared / laser (class 1/2)
	Light, dark, antivalent	Light, dark, antivalent	Light, antivalent
	250 Hz	25 / 150 Hz	1,000 / 1,000 / 2,000 Hz
			X
	X		X
X	X	X	
X	X	X	X
Universal front- and plug-side M18-hole mounting option ▪ Easy through-hole assembly with anti-rotation protection for mounting nuts on the housing ▪ Fast alignment through <i>brightvision</i>	Teach button ▪ Retro-reflective photoelectric sensor with light-band for objects with openings / irregular shape ▪ Can be used as muting sensor ▪ Roller conveyor sensor ▪ Anti-dust sensor ▪ Parallel-operation photoelectric sensor ▪ Extreme background suppression ▪ Devices with IO-Link interface	Photoelectric sensors with a particularly high function reserve ▪ Optional time function and optics heating ▪ Terminal compartment accessible from front ▪ Spring terminals	Luminescence sensors ▪ Foreground suppression ▪ Turnable connector ▪ Film detection ▪ Bottle detection ▪ ECOLAB

Photoel. sensors / diffuse sensors, cubic housing



Specifications

Dimensions excl. plug, W × D × H

Operating voltage

Switching outputs

Connection type

Degree of protection

Certifications

Housing

Throughbeam photoelectric sensors

Operating range*

Light source

Switching

Switching frequency

Retro-reflective photoelectric sensors

Operating range*

Light source

Switching

Switching frequency

Energetic diffuse sensor

Operating range*

Light source

Switching

Switching frequency

Diffuse sensors with background suppression

Operating range*

Light source

Switching

Switching frequency

Options

Transparent media

Protective sensors category 2

Warning output

Activation input

Active ambient light suppression **A²LS**

Features

* Typical operating range limit



96 series
Metal, long range



18B series
Metal, detection of
transparent objects



53 series
Stainless steel,
HYGIENE design



55 series
Stainless steel,
WASH DOWN design

30 × 90 × 70 mm	15 × 47 × 32.5 mm	14 × 54 × 20 mm	14 × 36 × 25 mm
18–30 V DC / 20–230 V AC/DC	10–30 V DC	10–30 V DC	10–30 V DC
PNP, NPN, push-pull, relay	PNP, NPN, analog	Push-pull	Push-pull
M12, terminals	M12, cable	M8, cable	M8, cable+M12, cable
IP 67, IP 69K	IP 67, IP 69K	IP 67, IP 69K	IP 67, IP 69K
CE CDRH C UL US	CE C UL US	CE CDRH C UL US	CE CDRH C UL US
Metal	Metal	Stainless steel 316L	Stainless steel 316L
0–39 / 0–150 m		0–10 m	0–10 m
Red light / infrared		Red light	Red light
Light, dark, antivalent		Antivalent	Antivalent
500 Hz		1,000 Hz	1,000 Hz
0–28 / 0.1–18 m	0–6 m	0–5 / 0–3 m	0–6 / 0–3 m
Red light / infrared	Red light	Red light / laser (class 1)	Red light / laser (class 1)
Light, dark, antivalent	Light, dark, antivalent	Antivalent	Antivalent
1,000 Hz	5,000 / 1,500 Hz	1,000 / 2,000 Hz	1,000 / 2,000 Hz
30–700 / 20–1,200 mm			
Red light / infrared			
Light, antivalent			
1,000 Hz / 20 Hz			
100–1,200 / 10–2,500 / 50–6,500 / 12,000 / 25,000 mm		5–600 mm	5–600 mm
Red light / infrared / red light laser (class 1/2) / infrared laser (class 1)		Red light / infrared / laser (class 1)	Red light / infrared / laser (class 1)
Light, dark, antivalent		Antivalent	Antivalent
300 / 10 Hz		1,000 / 2,000 Hz	1,000 / 2,000 Hz
X	X	X	X
X			
X	X		
X		X	X
X	X	X	X
Optics heating ▪ Switching delay ▪ Up to 3 switching points ▪ Deactivation ▪ L/D switching ▪ Mechanically adjustable operating range ▪ Teach-in ▪ Versions for Ex zones 2 and 22 / with window function / for collision protec- tion / feed-through monitoring	Bottle detection ▪ Foil detection < 20 µm ▪ Target mark detection ▪ Aligned optics ▪ Tracking ▪ EasyTune ▪ User guidance ▪ Trigger function with reduced signal jitter ▪ IO-Link interface	HYGIENE design ▪ CleanProof+ ▪ ECOLAB, EHEDG ▪ Foil detection < 20 µm ▪ Bottle detection ▪ Contrast sensors	WASH-DOWN design ▪ CleanProof+ ▪ ECOLAB ▪ Foil detection < 20 µm ▪ Bottle detection ▪ Contrast sensors ▪ Versions for Ex zone 2 and 22

Photoel. sensors / diffuse sensors, cylindrical housing



412 series
M12, cylindrical



618 series
M18, cylindrical



**318(B) series,
328 series**
M18, cylindrical

Specifications			
Dimensions excl. plug, W × D × H	M12 × 55 mm	M18 × 46 mm, M18 × 60 mm	M18 × 46 mm, M18 × 60 mm
Operating voltage	10 – 30 V DC	10 – 30 V DC	10 – 30 V DC
Switching outputs	PNP	PNP, NPN, push-pull	PNP, NPN, push-pull
Connection type	M12, cable	M12, cable	M12, cable
Degree of protection	IP 67	IP 67	IP 67
Certifications			CDRH US
Housing	Metal	Full metal, stainless steel, plastic	Full metal, stainless steel, plastic
Throughbeam photoelectric sensors			
Operating range*	0 – 8 m	0 – 15 / 0 – 23 / 0 – 120 m	0 – 15 / 0 – 23 / 0 – 120 m
Light source	Red light	Red light / infrared / laser (class 1)	Red light / infrared / laser (class 1)
Switching	Light, dark	Light, dark, antivalent	Light, dark, antivalent
Switching frequency	500 Hz	500 / 1,000 / 5,000 Hz	500 / 1,000 / 5,000 Hz
Retro-reflective photoelectric sensors			
Operating range*	0.05 – 1.6 m	0 – 7 / 0.02 – 6 / 0.1 – 15 m	0 – 7 / 0.02 – 6 / 0.1 – 15 m
Light source	Red light	Red light / laser (class 1)	Red light / laser (class 1)
Switching	Light, dark	Light, dark, antivalent	Light, dark, antivalent
Switching frequency	700 Hz	500 / 5,000 Hz	500 / 5,000 Hz
Energetic diffuse sensor			
Operating range*	0 – 400 mm	0 – 140 / 0 – 1,000 / 0 – 300 / 0 – 280 mm	0 – 140 / 0 – 1,000 / 0 – 300 / 0 – 280 mm
Light source	Red light	Red light / infrared / laser	Red light / infrared / laser
Switching	Light, dark	Light, dark, antivalent	Light, dark, antivalent
Switching frequency	700 Hz	500 / 1,000 / 5,000 Hz	500 / 1,000 / 5,000 Hz
Diffuse sensors with background suppression			
Operating range*		1 – 140 mm	1 – 140 mm
Light source		Red light	Red light
Switching		Antivalent	Antivalent
Switching frequency		1,000 Hz	1,000 Hz
Options			
Transparent media		X	X
Protective sensors category 2		X	X
Warning output			
Activation input		X	X
Active ambient light suppression A²LS		X	X
Features			
		Bracket versions ▪ Simple alignment with omni-mount ▪ Embedded mounting option ▪ Variants with M18 stainless steel sleeve and full-metal version ▪ Variant available with preset range and as label sensor	Bracket versions ▪ Simple alignment with omni-mount ▪ Embedded mounting option ▪ Variants with M18 stainless steel sleeve and full-metal version ▪ Variant available with preset range and as label sensor

* Typical operating range limit

Inductive switches



IS 255, 288
Miniature sensors,
cubic housing



IS 240, 244/ISS 244
Standard, cubic

Specifications		
Dimensions	5 × 5 mm 8 × 8 mm	12 × 40 mm 40 × 40 mm
Operating voltage	10 – 30 V DC	10 – 30 V DC
Operating range	1.5 – 3 mm	4 – 20 mm
Switching outputs	PNP, NPN	PNP, NPN
Switching frequency	Up to 5,000 Hz	Up to 1,400 Hz
Connection type	M8, cable + M8, cable	M8, M12, terminal, cable
Degree of protection	IP 67	IP 67, IP 69K
Certifications	CE cUL US	CE cUL US
Housing	Metal housing	Plastic

Features

Cubic miniature housing
 ■ Also available with increased operating range

Bright status display ■ Complementary switching outputs (NO+NC)
 ■ Increased ranges ■ M12 plug, turnable 270° and thus suitable even for angled connection cables
 ■ 360° visibility through 4-way LED indicator on the sensor head

Inductive switches



IS 203, 204, 205, 206







Miniature sensors,
cylindrical housing



IS 208, 212, 218, 230
Standard, cylindrical



IS 208, 212, 218, 230
Stainless steel

Specifications			
Dimensions	Ø 3.0 × 22 mm M5 × 25 mm Ø 4.0 × 25 mm Ø 6.5 × 35 mm	M8 × 45 mm M12 × 45 mm M18 × 64 mm M30 × 64 mm	M8 × 45 mm M12 × 60 mm M18 × 64 mm M30 × 64 mm
Operating voltage	10 – 30 V DC	10 – 30 V DC	10 – 30 V DC
Operating range	1 – 3 mm	2 – 40 mm	2 – 40 mm
Switching outputs	PNP NO (make-contact), NC (break-contact)	PNP, NPN NO (make-contact), NC (break-contact)	PNP, NPN NO (make-contact), NC (break-contact)
Switching frequency	Up to 5,000 Hz	Up to 5,000 Hz	Up to 600 Hz
Connection type	M8, cable + M8, cable	M12, cable + M12, cable	M8, M12, cable
Degree of protection	IP 67	IP 67	IP 67, IP 68, IP 69K
Certifications	 	 	 
Housing	Stainless steel sleeve (V2A)	Metal	Stainless steel (V2A & V4A)
Features			
	Cylindrical miniature housing ■ Also available with increased operating range	Also available as sensor with: ■ Short housing design ■ Increased ranges ■ AC/DC device versions ■ Correction factor 1 (material-independent detection)	Full stainless steel housing from a single piece (V2A & V4A) ■ Resistant against vibration and pressure shocks ■ Mechanically resistant against impacts on the active surface ■ Also available as a model with 316L stainless steel (ECOLAB) suitable for use in hygienic applications

Capacitive sensors



LCS-1
Capacitive sensors,
cylindrical



LCS-1
Capacitive sensors,
cubic



LCS-2
Capacitive sensors,
cylindrical

Specifications			
Dimensions	M12: 53–75 mm M18: 73–88.5 mm M30: 66.5–79 mm / 87.3 mm	54 × 20.3 × 5.5 mm 40 × 40 × 10 mm	M12: 55–68 mm M18: 70–85 mm M30: 85–98 mm
Operating voltage	10–30 V DC / 12–35 V DC	10–30 V DC	10–30 V DC
Operating range	1–30 mm	1–20 mm	1–30 mm
Switching frequency	100 Hz (10 Hz with IO-Link)	100 Hz	100 Hz
Switching function	PNP, NPN NO (make-contact), NC (break-contact) Partially reversible	PNP, NPN NO (make-contact), NC (break-contact) Partially reversible	PNP, NPN NO (make-contact), NC (break-contact) Partially reversible
Types of installation	Embedded / non-embedded	Embedded	Embedded / non-embedded
Housing	Metal / plastic / Teflon (PTFE)	Plastic	Metal / plastic
Connection	M12 connector / PUR cable 2 m / PTFE cable 2 m	M12 connector / PUR cable 2 m / PUR cable 0.3 m	M12 connector / PUR cable 2 m
Certifications	CE c Ⓢ US	CE c Ⓢ US	CE
Degree of protection	IP 67	IP 67	IP 67
IO-Link	M18 and M30 version		

Features			
	Adjustable switching distances ▪ Versions with potentiometer or teach buttons ▪ PTFE for rough environmental conditions ▪ Analog and IO-Link interfaces	Switching distances adjustable by means of potentiometer ▪ Compact and flat design	Adjustable switching distances ▪ Versions with potentiometer

Fiber optic sensors

Ultrasonic sensors



LV46x

Fiber optic amplifiers

GF

Glass fiber optics

Specifications

Dimensions excl. plug, W × D × H		Ø 4 × 250 / 500 / 1,000 / 3,000 / 5,000
Operating voltage	10 – 30V DC	
Switching outputs	PNP, NPN, IO-Link	
Connection type	M8, cable, cable+M8, cable+M12	Ø 2.2 plugged
Degree of protection	IP 65	IP 65
Certifications	CE	CE
Housing	Plastic	Silicone, brass, stainless steel

Throughbeam photoelectric sensors

Operating range*		0 – 450 mm
Light source	Red light, infrared	Red light, infrared (with LV46x)
Switching	Light, dark	
Switching frequency	250 Hz ... 50 kHz	

Retro-reflective photoelectric sensors

Operating range*

Light source

Switching

Switching frequency

Energetic diffuse sensor

Operating range*

Light source

Switching

Switching frequency

Diffuse sensors with background suppression

Operating range*

Light source

Switching

Switching frequency

Options

Repeatability

Switching hysteresis

Resolution

Laser class

Features

For glass fiber and plastic fiber optics

- High-speed or long-range amplifier
- Teach-in ▪ Sensitivity adjustment
- Time functions ▪ Multifunction input
- IO-Link

Straight or lateral optical outlet

- Multiple fiber core ▪ Various ancillary lenses
- Heat resistant, highly precise, oil and chemical resistant



KF
Plastic fiber optics



USS 18, 420
Ultrasonic sensors,
cubic



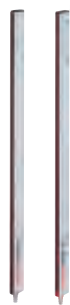
300 series
Ultrasonic sensors,
cylindrical



400 series
Ultrasonic sensors,
cylindrical

Ø 2.2 × 500 / 2055	15 × 33 × 50 mm 20 × 15 × 42 mm	M18 × 46.3 / 74.3 / 77.6 mm M30 × 88.8 mm	M12 × 70 mm M18 × 51.8 / 75 / 82.8 mm M30 × 75 / 142.5 mm
	10–30 V DC / 12–30 V DC	10–30 V DC / 12–30 V DC	10–30 V DC / 12–30 V DC
	PNP, NPN	PNP, NPN	PNP, NPN
Ø 2.2 plugged	M8, M12	M12	M8, M12, cable
	CE	CE c Ⓢ US	CE c Ⓢ US
Plastic, models with bending protection	Metal, plastic	Plastic	Metal, plastic
0–1,700 mm	0–650 mm		0–6,000 mm
Red light, infrared (with LV46x)	Ultrasonics (300 kHz)		Ultrasonics (200 / 310 kHz)
	NO/NC (object detected)		
	100 Hz		7 / 8 Hz
	0–400 mm	0–300, 0–800, 0–400, 0–1,600 mm	
	Ultrasonics (290 kHz)	Ultrasonics (300 / 230 kHz)	
	NC (object detected)	NC (object detected)	
	20 Hz	8 / 5 / 1 Hz	
0–270 mm			
Red light, infrared (with LV46x)			
	10–200 (100–1,000) mm	40–300, 50–400, 80–1,200, 150– 1,600, 250–3,500, 350–6,000 mm	10–200, 40–400, 25–400, 150– 1,300, 300–3,000, 600–6,000 mm
	Ultrasonics (240–400 kHz)	Ultrasonics (200 / 230 / 300 kHz)	Ultrasonics (200 / 310 kHz)
	NO/NC (object detected)	NO/NC (object detected)	NO/NC (object detected)
	10 / 50 Hz	1 / 2 / 5 / 8 / 10 Hz	7 / 8 / 20 / 50 Hz
Straight or lateral optical outlet ▪ Various ancillary lenses ▪ Arrays, V-arrangement ▪ Various types of fiber structure, e.g., highly flexible, coax ▪ Highly precise or heat resistant, models with bending protection	Configurable via PC ▪ Various opening angles and sound lobes ▪ 1 or 2 switching outputs	Configurable via PC ▪ Teach-in ▪ Design with angle head ▪ 1 or 2 switching outputs ▪ Synchronization and multiplex function ▪ Temperature compensation	Configurable via PC ▪ Teach-in ▪ Design with angle head ▪ 1 or 2 switching outputs ▪ IO-Link interface ▪ Synchronization and multiplex function ▪ Temperature compensation

Light curtains



CSL 505
Switching



CSL 710
Switching



CSR 780
Switching

Specifications			
Function	Throughbeam principle	Throughbeam principle	Reflection principle
Dimensions excl. plug, W × D × H	10 × 27 × 150 ... 3,180 mm 12 × 58 × 120 ... 480 mm	29 × 35 × 168 ... 2,968 mm	28.6 × 34.2 × 142.8 ... 478.8 mm
Operating voltage	24 V DC	18–30 V DC	18–30 V DC
Outputs	2x outputs / push-pull	4 I/Os (configurable) + IO-Link	Push-pull
Connection type	M8	M12	M12
Degree of protection	IP 65	IP 65	IP 65
Certifications	CE c SP US	CE c SP US	CE c UL US
Operating range*	Up to 7,000 mm	Up to 8,000 mm	700 mm
Light source	Infrared	Infrared	Infrared
Cycle time	1 ms per beam	30 µs per beam	> 2 ms (depending on measurement field length)
Measurement field length	35–3,100 mm	160–2,960 mm	96 / 432 mm
Resolution	5, 12.5, 25, 50, 100 mm	5, 10, 20, 40 mm	1 mm
Number of beams	Max. 160	Max. 592	
Operation	Autocalibration, configuration software, configuration by means of pin assignment	Display in 5 languages, configuration software	Status displays for detection / interruption of first and last beam
Features			
	2 switching ranges ▪ Narrow profile ▪ Through holes ▪ Blind holes with thread ▪ Suitable for low-temperature applications down to –30 °C	8 switching ranges ▪ Simple area splitting ▪ 4 switching outputs + 1 IO-Link ▪ Robust metal housing ▪ Extremely fast cycle time ▪ Display for diagnosis and alignment ▪ Suitable for low-temperature applications down to –30 °C	Detection of extremely small objects (1 mm) ▪ Warning output for contamination display ▪ High object speed (< 3.5 m/sec for 1 × 10 × 10 mm) ▪ Robust metal housing ▪ Optimal setting using reference teach, indicator LED ▪ Reflective tape as reflector

* Typical operating range limit

Forked sensors



**(I)GSU 14D / GSU 06
GK 14**







Label detection,
ultrasonics / capacitive



(I)GS 63B, 61
Label detection, optical



GS (L) 04
Optical

Specifications			
Operating voltage	10–30V DC / 12–30V DC	10–30V DC / 24V DC	10–30V DC
Switching outputs	Push-pull	Push-pull	PNP, NPN
Connection type	M8, M12, cable	M8, cable, cable+M12	M8
Degree of protection	IP 62 / IP 65	IP 65	IP 65
Certifications	  US*1	  US*2	 CDRH  US
Housing	Metal	Metal, plastic	Metal
Throughbeam sensors			
Mouth width	4 mm; 1 mm	3 mm	20 / 30 / 50 / 80 / 120 / 220 mm
Light source	Ultrasonics	Infrared	Red light / laser (class 1)
Switching	Light, dark, antivalent	Light, dark, antivalent	Light, dark
Switching frequency	Up to 5,000 Hz	10,000 Hz	1,500 / 5,000 Hz
Options			
Operation	Teach	Teach / potentiometer	Potentiometer
Warning output	X	X	

Features

Detection of transparent media and paper labels ▪ Automatic tracking of the ALC switching threshold ▪ Teach-in ▪ Model with mechanical tape guide ▪ Splice inspection ▪ Multiple-track label detection of the VSU 15

Detection of paper labels ▪ Automatic tracking of the switching threshold ALC function ▪ Storage of up to 10 teach values in the sensor ▪ Removable operating head on potentiometer version

Detection of small objects
▪ Light/dark switching on device

*1 (I)GSU 14D and GSU 06 only

*2 (I)GS 63, GS 61 only

Special sensors








**KRT 20, 21, 18B,
55, 3B**
Contrast sensors



CRT 20B, 44B
Color sensors



LRT 8
Luminescence sensors

Specifications			
Function	Contrast distinction	Color evaluation	Luminescence detection
Dimensions excl. plug, W×D×H	31 × 53 × 80 mm 15 × 47 × 33 mm 14 × 36 × 25 mm 11 × 32 × 17 mm	30 × 82 × 53 mm 17 × 46 × 50 mm	15 × 48 × 38 mm
Operating voltage	10–30 V DC / 12–30 V DC	10–30 V DC / 24 V DC / 12–28 V DC	10–30 V DC
Outputs	PNP, NPN, push-pull Analog, IO-Link	1 × PNP / 4 × PNP or 1 × NPN / 4 × NPN or 3 × PNP / 3 × NPN	PNP, NPN
Connection type	M12, M8, cable+M8, cable, cable+M12	M12	M12
Degree of protection	IP 67, IP 69K	IP 67	IP 67
Certifications	 	 	
Operating range*	13–80 mm	12 mm 60 mm 32 mm	0–400 mm
Light source	LED, laser (class 1)	LED	LED
Switching frequency	2,500–50,000 Hz	6,000 / 1,500 / 500 Hz	1,500 Hz
Transmitter color	RGB / white / red laser	RGB / white	UV / blue
Light beam gate	Lateral or frontal	Lateral or frontal	Front
Light spot shape	Round / rectangular	Round / rectangular	Round
Light spot orientation	Lengthwise, sideways	Vertical	
Operation	Teach-in, EasyTune, IO-Link, potentiometer	Teach-in	Potentiometer
Features			
Tracking function for faded marks ▪ Display for optimum adaptation to the application ▪ Automatic luster suppression ▪ Temperature compensation ▪ Pulse stretching ▪ Light/dark switching ▪ Reversible switching threshold ▪ ECOLAB ▪ IO-Link process data ▪ IO-Link configuration ▪ IO-Link diagnosis ▪ Additional function for weak contrasts		Small construction ▪ Glass optics ▪ Turnable M12 connector ▪ ECOLAB	Small construction ▪ Sensitivity adjustment ▪ ECOLAB ▪ Detection of any kind of luminescence ▪ Detection of white paper ▪ Detection of printed luminescence marks ▪ Detection of luminescence marks on wood

* Typical operating range limit

Double sheet monitoring / splice detection



DB 12B, 112B, 14B / GSU 710, 712

Double sheet monitoring

VSU 12 / IGSU 14C, 14D

Splice detection

Description

The double-sheet monitoring systems reliably prevent the infeed of multiple sheets. This helps reliably prevent damage and the creation of scrap in machines that process paper and cardboard stacks. The systems operate on the basis of various physical principles and are thus able to cover nearly the entire range of applications.

Typical applications

Double sheet detection of

- Paper sheets
- Cardboard sheets
- Films

Splice detection, e.g. on

- Paper rolls

Technical information

Physical principles:

- Capacitive
- Ultrasonics (Ø12 mm or 18 mm, short construction)

Working ranges:

- From 20 g/m²... 1,200 g/m² (cardboard thickness 2 mm)
- Detection of 1/2 or 2/3 plies
- Outputs for single or double sheets
- Configuration facility

Models:

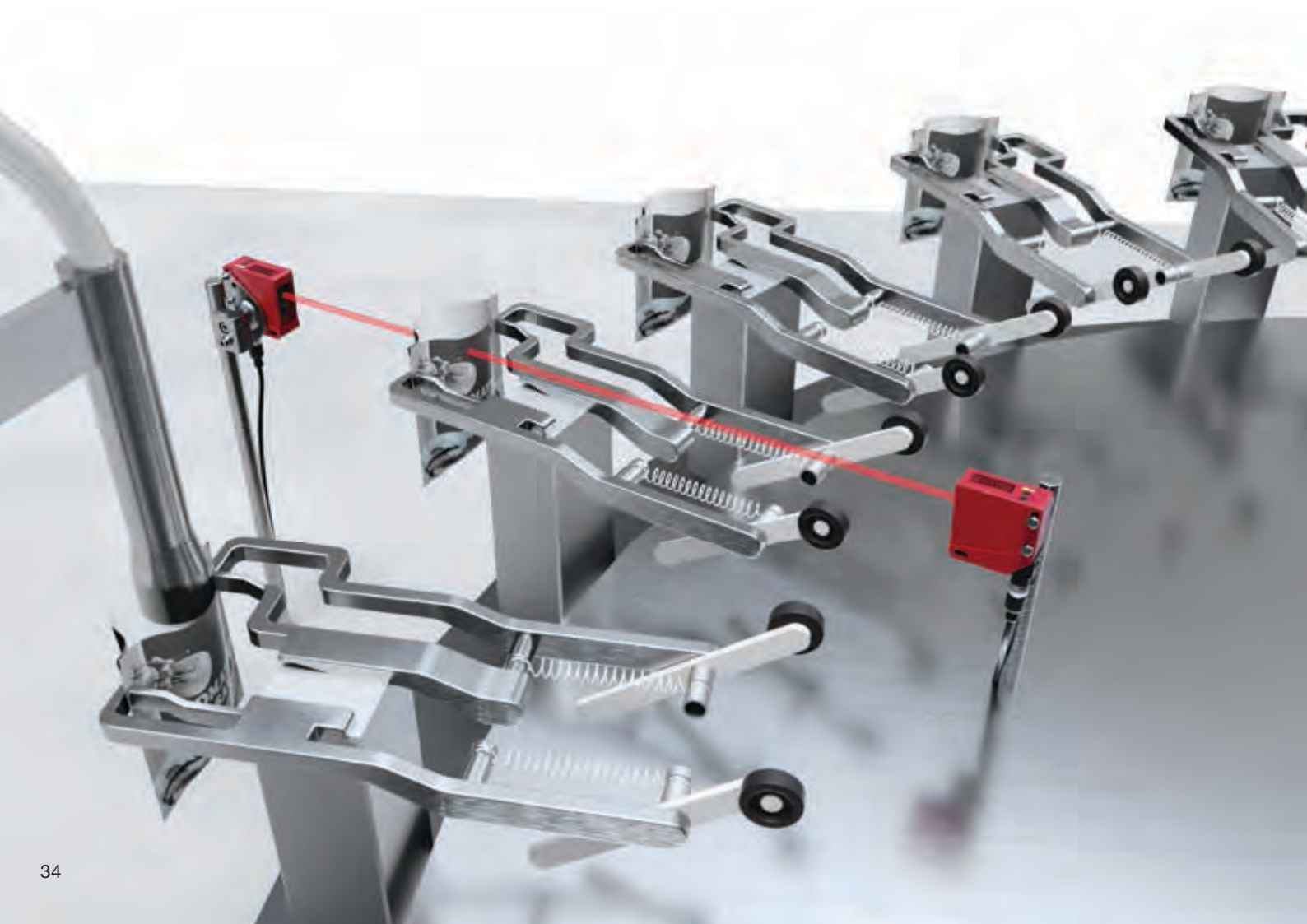
- Individual components (M12, M18)
- Compact fork designs

MEASURING SENSORS

Find the right balance: A large selection of technologies and designs ensures the optimum solution for your application

Measuring sensors position transport vehicles or movable system parts and monitor parameters such as speed and temperature. Small to very large distances are thereby measured with high precision and resolution.

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, PROFIBUS, PROFINET or EtherCAT.



Flexible distance sensors: product range for pallet warehouse now complete

The 10 and 110 series with two or three switching points are ideally suited for the following applications: push-through protection in multi-depth pallet warehouses, detection of aisle ends for high-bay storage devices or shuttles as well as compartment occupation checks for containers and pallets.

Our product range of distance sensors has now been complemented with the new ODS 110 analog output signal as well as the HT 110 with two independent switching points and an operating range of up to five meters. The technical specifications and compact design expand our wide product range and now open the door to even more applications – nearly independent of material, surface and angle.

10/110 SERIES

- Very tolerant to different surfaces and detection angles
- Compact design
- Teach button for switching point adjustment
- With U/I, IO-Link or 2 switching points



Distance sensors



ODSL 8
Optical distance sensors



ODS 9
Optical distance sensors



ODS 10
Optical distance sensors

Specifications			
Function	Distance measurement, optical	Distance measurement, optical	Distance measurement, optical
Dimensions excl. plug, W × D × H	15 × 48 × 38 mm	21 × 50 × 50 mm	25 × 65 × 55 mm
Operating voltage	18–30 V DC	18–30 V DC (analog, IO-Link)	18–30 V DC (analog, IO-Link)
Outputs	4–20 mA 1–10 V 2 × push-pull	4–20 mA 1–10 V, 0–10 V RS 232 / RS 485 Push-pull IO-Link	4–20 mA 1–10 V, 0–10 V Push-pull IO-Link
Connection type	M12	M12	M12
Degree of protection	IP 67, IP 69K	IP 67	IP 67
Certifications	CE CDRH	CE CDRH c Ⓛ US	CE CDRH c Ⓛ US
Measurement range	20–500 mm	50–650 mm	50–8,000 mm 100–25,000 mm (against reflective tape)
Measurement principle	Optical / LED / laser (class 2)	Optical / laser (class 1, 2)	Optical / laser (class 1)
Measurement time	2–7 ms	2 ms	3,4–1,020 ms (adjustable)
Ultrasonic frequency			
Resolution	0.03–0.5 mm	0.01–0.5 mm	1 mm
Operation	Teach-in	Teach-in Configuration software Display	Buttons on the foil display or Sensor Studio

Features			
	Compact metal housing ▪ Turnable M12 connector ▪ Triangulation measurement	Display for measured value display and configuration ▪ Turnable M12 connector ▪ Triangulation measurement ▪ Supports the IO-Link smart sensor profile	Display for measured value display and configuration ▪ Turnable M12 connector ▪ All devices with IO-Link interface ▪ Propagation time measurement (TOF)

* Typical operating range limit



ODS 110
Optical distance sensors



ODSL 30
Optical distance sensors



ODSL 96B
Optical distance sensors



300, 400 series
Measuring ultrasonic sensors

Distance measurement, optical	Distance measurement, optical	Distance measurement, optical	Distance measurement, ultrasonics
50 × 23 × 50 mm	79 × 69 × 149 mm	30 × 90 × 70 mm	M18 × 46.3 / 51.8 / 74.3 / 75 / 77.6 / 82.8 mm M30 × 75 / 88.8 / 142.5 mm
18–30 V DC (analog)	10–30 V DC 18–30 V DC (analog)	10–30 V DC 18–30 V DC (analog, IO-Link)	10–30 V DC 12–30 V DC
4–20 mA 1–10 V 1x push-pull	4–20 mA 1–10 V RS 232 / RS 485 1 × PNP, 2 × PNP, 3 × PNP	4–20 mA 1–10 V, 0–10 V RS 232 / RS 485 Push-pull IO-Link	PNP (NPN)
M12	M12, cable	M12, cable	M12
IP 67, IP 69K	IP 67	IP 67, IP 69K	IP 67
CE cUL US	CE CDRH cUL US	CE CDRH cUL US ECOLAB	CE cUL US
50–3,000 mm 50–5,000 mm (against white)	200–65,000 mm	60–25,000 mm	25–400 / 50–400 / 80–1,200 / 150–1,300 / 250–3,500 / 300–3,000 / 350–6,000 / 600–6,000 mm
Optical / laser (class 2)	Optical / laser (class 2)	Optical / LED / laser (class 1, 2)	Ultrasonics
2 ms	30–100 ms	1–100 ms	0.1–1 s 200 kHz / 310 kHz
1 mm	1 mm	0.1–3 mm	1 mm
Teach-in or Sensor Studio	Teach-in Display	Teach-in Configuration software Display	Teach-In IO-Link

All devices with IO-Link interface
▪ Turnable M12 connector
▪ Adjustment via teach button
▪ Propagation time measurement (TOF)

Metal housing ▪ Display for measured value display and configuration
▪ M12 plug ▪ Ex devices are also available ▪ Phase measurement

Robust metal housing ▪ Display for measured value display and configuration ▪ M12 plug ▪ Ex devices are also available ▪ Triangulation measurement
▪ Propagation time measurement (TOF) ▪ Phase measurement

3/5 operating modes ▪ Temperature-compensated ▪ Metal/plastic housing
▪ Small dead zone

Sensors for positioning



AMS 300i
Optical
laser distance sensors



BPS 8
Bar code
positioning systems



BPS 300i
Bar code
positioning systems

Specifications			
Function	Distance measurement, optical	Position detection, optical	Position detection, optical
Operating range	40 / 120 / 200 / 300 m	10,000 m	10,000 m
Working range		60 ... 120 mm, 80 ... 140 mm	50 ... 170 mm
Interfaces	Integrated: PROFIBUS and SSI PROFINET PROFINET and SSI DeviceNet EtherCAT EtherNet/IP CANopen Ethernet TCP/IP, UDP Interbus-S RS 232, RS 422, RS 485 SSI	Integrated: RS 232	Integrated: PROFINET PROFIBUS SSI RS 422 RS 232 RS 485
Connectivity		With MA 8-01 connection unit RS 485 With MA 200i connection unit PROFINET IO/RT, PROFIBUS, Ethernet TCP/IP, UDP, IP, EtherCAT, DeviceNet, CANopen	
Functional principle	Against reflector	Against bar code tape	Against bar code tape
Measurement value output	1.7 ms	3.3 ms	1 ms
Reproducibility	±0.9 / 1.5 / 2.1 / 3 mm (3 sigma)	±1 mm (3 sigma)	±0.15 mm (3 sigma)
Accuracy	±2 / 2 / 3 / 5 mm		
Degree of protection	IP 65	IP 67	IP 65
Light source	Red light laser (class 2)	Red light laser (class 2)	Red light laser (class 2)
Supply voltage	18–30 V DC	5 V DC (24 V DC via MA 8-01)	18–30 V DC
Operating temperature	–5 °C ... +50 °C (–30 °C ... +50 °C with heating)	0 °C ... +40 °C	–5 °C ... +50 °C (–35 °C ... +50 °C with heating)
Options	Speed measurement and monitoring	Customer-specific configuration facility	Speed measurement and monitoring
Certifications	CDRH US	CDRH US	CDRH US

Features			
	Absolute measurement system with very high accuracy, tested by the Physikalisch Technische Bundesanstalt (German Metrology Institute) ▪ Simultaneous use of the PROFIBUS and SSI; alternatively, PROFINET and SSI interface ▪ Easy programming via extensive configuration file ▪ Optionally with heating ▪ Multiple language menu-driven display ▪ Heatable reflectors available as accessories	Distance measurements of up to 10,000 m, also for curves, gradients and track switches ▪ Curve-going, horizontally and vertically ▪ Compact metal housing ▪ Turnable M12 connector ▪ Large selection of different protocols via external connection units	Positioning on curves, gradients and track switches ▪ Curve-going, horizontally and vertically ▪ Metal housing ▪ 3 selectable connection systems ▪ Fast, secure and position-neutral installation using special mounting device ▪ Extensive diagnostic options ▪ Easy programming via GSD file ▪ Optionally with heating or display

3D sensors







LPS 36, 36 HI
LES 36, 36 HI
LRS 36
 Light section sensors



ROD 4 (plus)
 Area scanning
 Laser distance sensors

Specifications

Function	Distance measurement, light section, optical	Distance measurement, scanner, optical
Dimensions excl. plug, W×D×H	56 × 74 × 160 mm	140 × 148 × 133 mm 141 × 167 × 168 mm
Operating voltage	18 – 30 V DC	24 V DC
Outputs	4 – 20 mA 1 – 10 V Ethernet 4 × push-pull PROFIBUS	Ethernet / RS 232 / RS 422 4 × PNP, 8 reversible detection field pairs
Connection type	M12	Sub-D, M12, M16
Degree of protection	IP 67	IP 65
Certifications	 CDRH 	 CDRH 
Operating range*	200 – 800 / 200 – 600 mm	0 – 65,000 mm
Measurement principle	Optical / laser (class 2M)	Optical / laser (class 1)
Measurement time	10 ms	20 – 40 ms/scan
Measurement field width / Scanning angle	Max. 600 mm / max. 140 mm	190°
Resolution	0.1 – 6 mm	5 mm
Mouth width		
Number of inspection tasks	16	7
Operation	Configuration software Display	Configuration software

Features

LPS 36: light section sensor for 2D/3D object measurement ▪ LPS 36 HI: highly precise with a resolution of 0.1 mm ▪ LES 36: light section sensor for width/height and position measurement ▪ LRS 36: light section sensor for object detection in up to 16 detection fields ▪ Alignment aid with OLED display; inputs: activation, cascading, trigger ▪ Optional: encoder port

ROD 4: laser scanner for object detection ▪ ROD 4 plus: laser scanner for 2D/3D object measurement ▪ Optional: heating ▪ Dust suppression



* Typical operating range limit

Sensors for compartment fine positioning



IPS 200i
Sensors for positioning

LSIS 472i
Smart camera



Typical applications		
Presence/completeness monitoring		
Dimension/position monitoring		
Position and type detection		
Code reading		
Measurement		
Compartment fine positioning	Single compartment depth	Single + double compartment depth
Monitoring camera		
Sensor / cameras		CMOS (Global Shutter)
Resolution (pixel)	1,280 × 960	752 × 480
Focal point	Reading distance 100 ... 600 mm Marker dependent	50 mm ... ∞ (focal length 8 mm) 75 mm ... ∞ (focal length 16 mm)
Interface		Integrated: Ethernet, RS 232
Connectivity	Ethernet TCP/IP, UDP	With MA 200i connection unit PROFINET IO/RT PROFIBUS EtherCAT DeviceNet CANopen
Digital inputs/outputs	3x IN; 5x OUT	8, configurable
Fast EtherNet		Yes
Optional	Cables, mounting devices, reflectors	Cables, mounting devices, reflectors, heating model to -35°C
Number of test routines	Typ. 4	Typically 2 to 4
Configuration / Operating system	Web-based configuration tool (webConfig tool) XML commands; 2x operational controls	Configuration via PC using standard Web browser (webConfig tool)
Options	Configuration on the device	Teach function via display
Dimensions, W × H × D	43 × 61 × 44 mm	75 × 113 × 55 mm
Certifications	CE	CE

Features

Time savings through fast commissioning with a web-based configuration tool and by making adjustments directly on the device ▪ Innovative alignment system via feedback LEDs simplifies alignment power reserve
▪ One device for the entire region of interest from 100–600 mm ▪ Can be used flexibly thanks to high-performance, infrared LED illumination that is independent of ambient light
▪ Model with integrated heating for use to -30 °C (coming soon)

Very well suited for industrial use through glass window ▪ Metal housing and homogeneous integrated illumination (IR) ▪ Degree of protection IP 65 / IP 67 ▪ Position output via switching outputs or interface
▪ Flexible use through motor-driven focus adjustment

Light curtains Forked sensors



CML 700i
Measuring



CML 720i EX
Measuring



GS 754(B)
CCD forked sensors

Specifications			
Function	Size/contour detection, optical	Size/contour detection, optical	Edge/diameter measurement, optical
Dimensions excl. plug, W × D × H	29 × 35 × 168 ... 2,968 mm	29 × 35 × 168 ... 2,968 mm	19.4 × 81.5 × 91 mm 20 × 155 × 91.5 mm
Operating voltage	18 – 30 V DC	18 – 30 V DC	10 – 30 V DC (digital) 18 – 30 V DC (analog)
Outputs	Analog, CANopen, IO-Link, PROFIBUS PROFINET RS 485 (MODBUS)	CANopen, IO-Link, 2 to 4 I/Os (configurable)	2 × 4 – 20 mA 2 × 0 – 10 V RS 232 / RS 422 / RS 485 1 × PNP, 2 × PNP
Connection type	M12	M12	M12
Degree of protection	IP 65	IP 54	IP 67
Certifications	CE c SP US	CE	CE c UL US
Operating range*	Up to 10,500 mm	Up to 10,500 mm	
Light source / Measurement principle	Infrared	Infrared	Optical / LED
Cycle time / Measurement time	10 / 30 µs per beam / 1 ms	30 µs per beam / 1 ms	Min. 2.5 ms
Measurement field length / Scanning angle	160 – 2,960 mm	130 – 2,870 mm	25 mm
Resolution	5, 10, 20, 40 mm	5, 10, 20, 40 mm	14 µm
Number of beams	Max. 592	Max. 592	
Mouth width			27 mm / 98 mm
Mouth depth			42 mm
Operation	Display in 5 languages Configuration software	Display in 5 languages Configuration software	Terminal program
Features			
Short cycle times of 30 µs per beam ▪ CML 730i: cycle times of 10 µs per beam ▪ Detection of transparent media ▪ Display for diagnosis and alignment ▪ Standard profile for simple mounting ▪ Robust metal housing ▪ Suitable for low-temperature applications down to –30 °C		Certified for applications in potentially explosive areas of group II, category 3, zone 2 (gas) and zone 22 (dust) ▪ Display for diagnosis and alignment ▪ Standard profile for simple mounting ▪ Robust metal housing	
		Detection of transparent media ▪ Foil detection > 0.1 mm ▪ Turnable M12 connector	

* Typical operating range limit

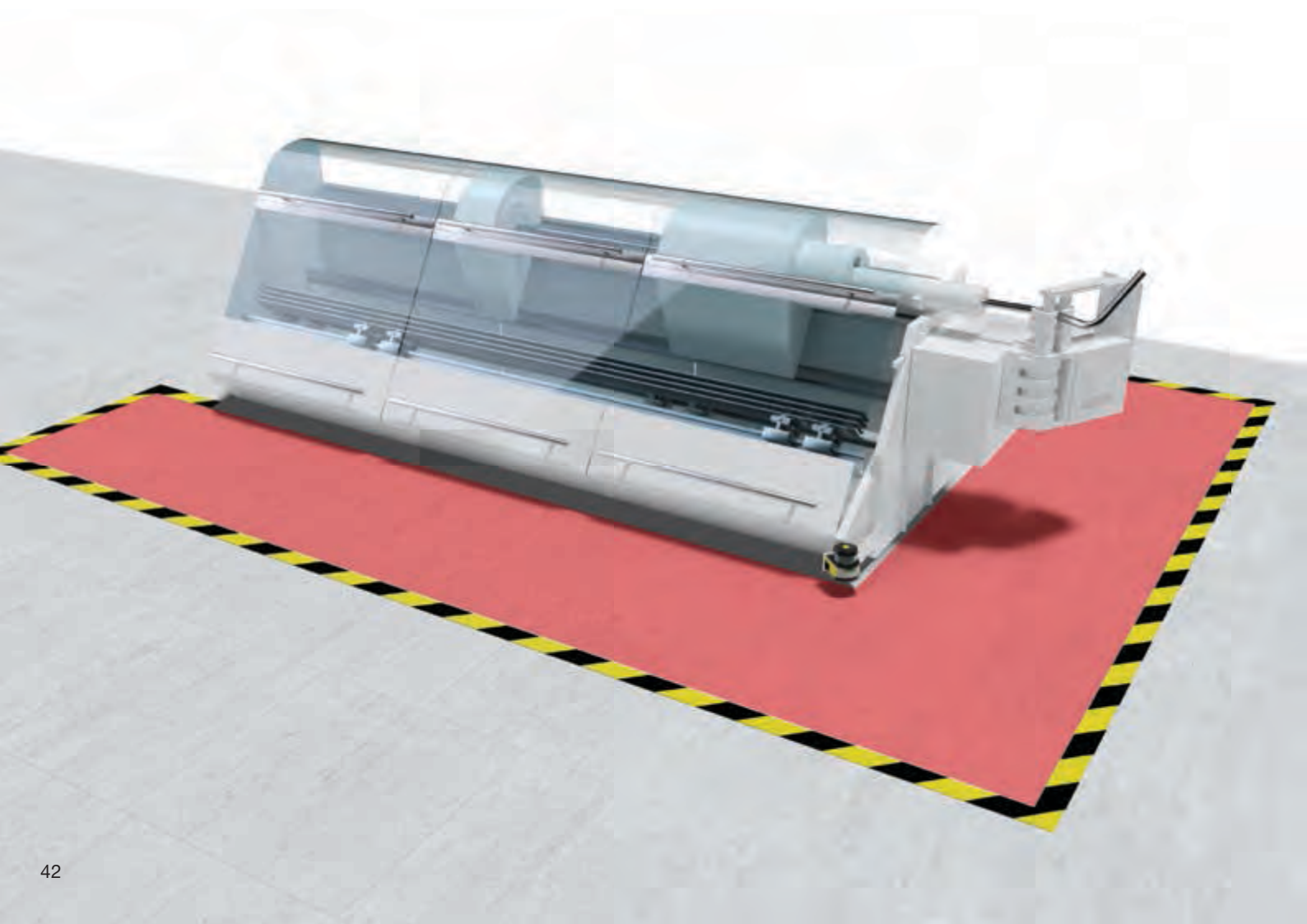
PRODUCTS FOR SAFETY AT WORK

From a single source: Products and services that protect the operator and facilitate efficient processes

Today, machine safety no longer means just personnel protection. It also makes an important contribution to the efficient and smooth flow of processes.

As one of the technology leaders in the area of optoelectronic safety sensors, we offer competent and extensive consultation on the topic of safety at work. In addition to our wide range of safety sensors, we also offer safety switches and safety locking devices as well as safe control components. We provide you with well thought-out and reliable solutions for safety at work from a single source.

In doing so, we place great importance on the simple and efficient integration and installation of our safety solutions. Innovative connection concepts, integrated alignment aids, operating mode selection without PC and integrated gateway functions are just a few examples here.



Highly efficient safety laser scanner: clever area protection and access guarding

With the RSL 400 safety laser scanner, we have set a new standard worldwide in the supreme discipline of safety sensor technology.

Thanks to our decades of experience, we have succeeded in developing a device which, through clever detailed solutions, combines reliable operation with simple configuration and installation of devices.

In many cases the RSL 400 can even be used to perform tasks that previously required two safety laser scanners.

RSL 400

- Scanning angle of 270° and operating range of 8.25 m
- Easy-to-mount, removable connection unit that remains secured in place when replacing the scanner
- 2 independent protective functions in one device
- PROFINET/PROFIsafe interface for simple integration in industrial networks
- High-quality data output for navigation of automated guided vehicles and first-class safety technology in a single device



Safety laser scanners



RSL 410
Safety laser scanners

RSL 420, 425
Safety laser scanners



Specifications

Type in accordance with EN IEC 61496	Type 3	Type 3
SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	SIL 2	SIL 2
Performance Level (PL) in accordance with EN ISO 13849-1	PL d	PL d
Resolution (adjustable)	30 / 40 / 50 / 60 / 70 / 150 mm	30 / 40 / 50 / 60 / 70 / 150 mm
Operating range	3 / 4.5 / 6.25 / 8.25 m	3 / 4.5 / 6.25 / 8.25 m
Scanning angle	270°	270°
Number of field pairs/quads	1 / 1	10 / 10
Dimensions, W × H × D	140 × 149 × 140 mm	140 × 149 × 140 mm
Safety-related switching outputs	2 PNP transistor outputs	2 PNP transistor outputs
Connection type	M12 connector, configuration and diagnosis via Ethernet TCP/IP and Bluetooth	Cable or connector, 16-pin, configuration and diagnosis via Ethernet TCP/IP, USB and Bluetooth
Certifications		

Functions

Selectable functions: resolution, dynamic contactor monitoring (EDM), start/restart interlock (RES) <ul style="list-style-type: none"> ▪ Vertical access guarding with reference boundary monitoring ▪ Four-field mode 	Selectable functions: resolution, dynamic contactor monitoring (EDM), start/restart interlock (RES) <ul style="list-style-type: none"> ▪ Vertical access guarding with reference boundary monitoring ▪ Four-field mode ▪ E-stop linkage ▪ RSL 425: measurement value output for AGV navigation
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Features

1 field pair/quad <ul style="list-style-type: none"> ▪ Basic functions such as automatic start/restart, start/restart interlock (RES), contactor monitoring (EDM) can be selected ▪ Optimum handling by means of separate intelligent connection unit with integrated configuration memory and large, plain-text display with integrated electronic spirit level ▪ Ethernet TCP/IP and Bluetooth interface for simple and convenient configuration and diagnosis ▪ 3 configurable signal outputs 	10 field pairs/quads <ul style="list-style-type: none"> ▪ Basic functions such as automatic start/restart, start/restart interlock (RES), contactor monitoring (EDM) can be selected ▪ Optimum handling by means of separate intelligent connection unit with integrated configuration memory and large, plain-text display with integrated electronic spirit level ▪ Ethernet TCP/IP and Bluetooth interface for simple and convenient configuration and diagnosis ▪ 4 configurable signal outputs ▪ RSL 425: Output of high-quality measurement values for distance and signal strength via UDP, angular resolution 0.1°, configurable
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RSL 430
Safety laser scanners



RSL 440, 445
Safety laser scanners



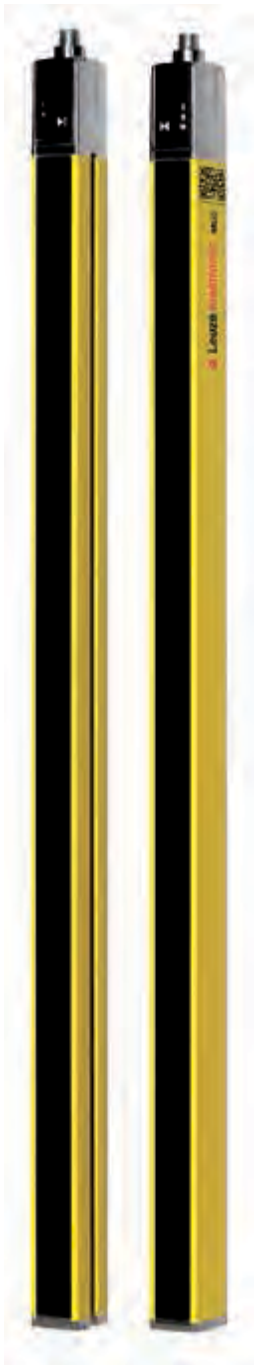
RSL 420P
Safety laser scanner
PROFI-safe



RSL 450P, 455P
Safety laser scanner
PROFI-safe

Type 3	Type 3	Type 3	Type 3
SIL 2	SIL 2	SIL 2	SIL 2
PL d	PL d	PL d	PL d
30 / 40 / 50 / 60 / 70 / 150 mm	30 / 40 / 50 / 60 / 70 / 150 mm	30 / 40 / 50 / 60 / 70 / 150 mm	30 / 40 / 50 / 60 / 70 / 150 mm
3 / 4.5 / 6.25 / 8.25 m	3 / 4.5 / 6.25 / 8.25 m	3 / 4.5 / 6.25 / 8.25 m	3 / 4.5 / 6.25 / 8.25 m
270°	270°	270°	270°
10+10 / 10	100 / 50	10 / 10	100 / 50
140 × 149 × 140 mm	140 × 149 × 140 mm	140 × 169 × 140 mm	140 × 169 × 140 mm
2x2 PNP transistor outputs	2x2 PNP transistor outputs	PROFI-safe, 1 protective field	PROFI-safe, 4 parallel protective fields
Cable or connector, 29-pin, configuration and diagnosis via Ethernet TCP/IP, USB and Bluetooth	Cable or connector, 29-pin, configuration and diagnosis via Ethernet TCP/IP, USB and Bluetooth	3x M12 connections for 2-port switch and voltage supply, configuration also via USB and Bluetooth	3x M12 connections for 2-port switch and voltage supply, configuration also via USB and Bluetooth
Selectable functions: resolution, dynamic contactor monitoring (EDM), start/restart interlock (RES) ▪ Vertical access guarding with reference boundary monitoring ▪ Four-field mode ▪ E-stop linkage ▪ Safe time delay, internal ▪ Data output, configurable	Selectable functions: resolution, dynamic contactor monitoring (EDM), start/restart interlock (RES) ▪ Vertical access guarding with reference boundary monitoring ▪ Four-field mode ▪ E-stop linkage ▪ Safe time delay, internal ▪ Data output, configurable ▪ RSL 445: measurement value output for AGV navigation	Selectable functions: resolution, start/restart interlock (RES) ▪ Vertical access guarding with reference boundary monitoring ▪ Four-field mode	Selectable functions: resolution, start/restart interlock (RES) ▪ Vertical access guarding with reference boundary monitoring ▪ Four-field mode ▪ Data output, configurable ▪ RSL 455: measurement value output for AGV navigation
10+10 field pairs/quads, reversible ▪ Two independent protective functions and OSSD pairs ▪ Basic functions such as automatic start/restart, start/restart interlock (RES), contactor monitoring (EDM) can be selected ▪ Optimum handling by means of separate intelligent connection unit with integrated configuration memory and large, plain-text display with integrated electronic spirit level ▪ Ethernet TCP/IP and Bluetooth interface for simple and convenient configuration and diagnosis ▪ 9 configurable signal outputs ▪ Safe, internal switch-off delay (Stop 1)	100 field pairs / 50 quads, reversible. ▪ Two independent protective functions and OSSD pairs ▪ Basic functions such as automatic start/restart, start/restart interlock (RES), contactor monitoring (EDM) can be selected ▪ Optimum handling by means of separate intelligent connection unit with integrated configuration memory and large, plain-text display with integrated electronic spirit level ▪ Ethernet TCP/IP and Bluetooth interface for simple and convenient configuration and diagnosis ▪ Up to 10 independent sensor configurations, ideal for mobile applications ▪ 9 configurable signal outputs ▪ Safe, internal switch-off delay (Stop 1) ▪ RSL 445: Output of high-quality measurement values for distance and signal strength via UDP, angular resolution 0.1°, configurable	Optimum handling through removable connection unit with integrated 2-port PROFINET switch and integrated configuration memory ▪ Conformance Class C, IRT-capable ▪ 10 field pairs/quads, reversible ▪ Basic functions such as automatic start/restart, start/restart interlock (RES), can be selected ▪ Large, plain-text display with integrated electronic spirit level ▪ Configuration also via Bluetooth interface	Optimum handling through removable connection unit with integrated 2-port PROFINET switch and integrated configuration memory ▪ Conformance Class C, IRT-capable ▪ 100 field pairs / 50 quads, reversible ▪ Evaluation of up to 4 protective fields ▪ Basic functions such as automatic start/restart, start/restart interlock (RES), can be selected ▪ Large, plain-text display with integrated electronic spirit level ▪ Configuration also via Bluetooth interface ▪ Up to 10 independent sensor configurations, ideal for mobile applications ▪ RSL 455P: Output of high-quality measurement values for distance and signal strength via UDP, angular resolution 0.1°, configurable









Safety light curtains



MLC 310
Type 2
safety light curtains



MLC 320
Type 2
safety light curtains

Specifications		
Type in accordance with EN IEC 61496	Type 2	Type 2
SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	SIL 1	SIL 1
Performance Level (PL) in accordance with EN ISO 13849-1	PL c	PL c
Resolution	20 / 30 / 40 / 90 mm	20 / 30 / 40 / 90 mm
Operating range (depending on resolution)	15 / 10 / 20 / 20 m	15 / 10 / 20 / 20 m
Protective field height (type-dependent)	150 ... 3,000 mm	150 ... 3,000 mm
Profile cross section	29 × 35 mm	29 × 35 mm
Safety-related switching outputs (OSSDs)	2 PNP transistor outputs	2 PNP transistor outputs
Connection type	M12	M12
Certifications	   	   
Functions		
	Transmission channel changeover ▪ Range reduction	Transmission channel changeover. Range reduction ▪ Start/restart interlock (RES) ▪ Contactor monitoring (EDM) ▪ 7-segment display
Features		
	Configuration by wiring – automatic transfer to replacement device after device exchange	Configuration by wiring – automatic transfer to replacement device after device exchange



MLC 510
Type 4
safety light curtains



MLC 520
Type 4
safety light curtains



















MLC 530
Type 4
safety light curtains



NEW

MLC 530 SPG
Type 4
safety light curtains

Type 4	Type 4	Type 4	Type 4
SIL 3	SIL 3	SIL 3	SIL 3
PL e	PL e	PL e	PL e
14 / 20 / 30 / 40 / 90 mm 6 / 15 / 10 / 20 / 20 m	14 / 20 / 30 / 40 / 90 mm 6 / 15 / 10 / 20 / 20 m	14 / 20 / 30 / 40 / 90 mm 6 / 15 / 10 / 20 / 20 m	30 / 40 / 90 mm 10 / 20 / 20 m
150 ... 3,000 mm	150 ... 3,000 mm	150 ... 3,000 mm	150 ... 3,000 mm
29 × 35 mm	29 × 35 mm	29 × 35 mm	29 × 35 mm
2 PNP transistor outputs or AS-i Safety interface	2 PNP transistor outputs	2 PNP transistor outputs	2 PNP transistor outputs
M12	M12	M12	M12
   	   	   	   
Transmission channel changeover ■ Range reduction.	Transmission channel changeover ■ Range reduction ■ Start/restart interlock (RES) ■ Contactor monitoring (EDM) ■ 7-segment display	Transmission channel changeover ■ Range reduction ■ Start/restart interlock (RES) ■ Contactor monitoring (EDM) ■ 7-segment display, linkage ■ Fixed and floating beam blanking ■ Reduced resolution ■ Timing controlled 2-sensor muting ■ Muting-timeout extension ■ Partial muting	Transmission channel changeover ■ Range reduction ■ Start/restart interlock (RES) ■ 7-segment display ■ Fixed blanking ■ Integrated muting function with control via PLC signal (no muting sensors necessary)
Configuration by wiring – automatic transfer to replacement device after device exchange ■ Extra impact- resistant models available	Configuration by wiring – automatic transfer to replacement device after device exchange ■ Extra impact- resistant models available	Configuration by wiring – automatic transfer to replacement device after device exchange ■ Linkage with safety devices via contact or OSSD output saves effort in downstream evaluation circuit ■ Multiple scanning and reduced resolution for operation which is immune to interference ■ Integrated muting and blanking function can be activated during operation ■ Extra impact-resistant models available	Configuration by wiring – automatic transfer to replacement device after device exchange ■ Efficient access guarding without muting sensors: high level of availability and protection against tampering with a very compact system design

Safety light curtains



MLC 511 AIDA
Type 4
safety light curtains



The external MLC alignment aid is a practical tool with which the transmitter can be precisely aligned more quickly.

Specifications	
Type in accordance with EN IEC 61496	Type 4
SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	SIL 3
Performance Level (PL) in accordance with EN ISO 13849-1	PL e
Resolution	14 / 30 mm
Operating range	6 / 10 m
Protective field height (type-dependent)	300 ... 1,800 mm
Profile cross section	29 × 35 mm
Safety-related switching outputs (OSSDs)	2 PNP transistor outputs
Connection type	M12
Certifications	CEULCS

Functions
Transmission channel changeover <ul style="list-style-type: none">▪ Range reduction▪ Automatic start/restart

Features
Plug connection with AIDA-compliant M12 pin assignment (4-pin) (Automatisierungs-Initiative deutscher Automobilisten (AIDA) = Automation initiative of German automobile manufacturers) ▪ Configuration by wiring – automatic transfer to replacement device after device exchange



MLC 520
Host-Guest
Type 4
safety light curtains



MLC 520
EX2
Type 4
safety light curtains



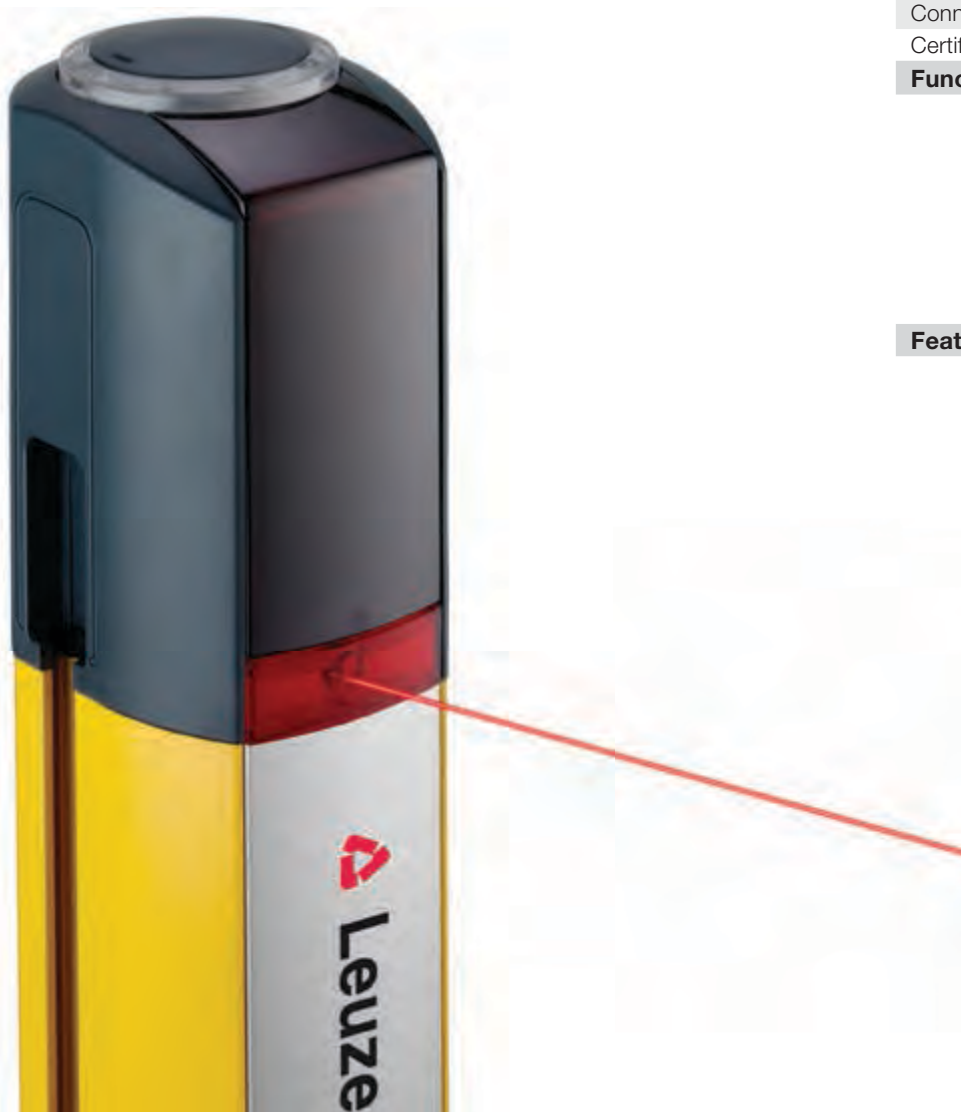
MLC 510
IP 67/69K
Type 4
safety light curtains



MLC 520-S
Type 4
safety light curtains

Type 4	Type 4	Type 4	Type 4
SIL 3	SIL 3	SIL 3	SIL 3
PL e	PL e	PL e	PL e
14 / 20 / 30 / 40 / 90 mm	20 / 30 mm	14 / 30 mm	14 / 24 mm
6 / 15 / 10 / 20 / 20 m	15 / 10 m	4.8 / 8 m	6 m
300 ... 1,800 mm	600 ... 1,500 mm	300 ... 1,200 mm	150 ... 1,200 mm
29 × 35 mm	29 × 35 mm	Ø 52.5 mm	15,4 × 32.6 mm
2 PNP transistor outputs AS-i Safety interface	2 PNP transistor outputs	2 PNP transistor outputs	2 PNP transistor outputs
M12	M12	Cable, 15 m	160 mm cable with M12 connector
Transmission channel changeover <ul style="list-style-type: none"> ▪ Range reduction ▪ Start/restart interlock (RES) ▪ Contactor monitoring (EDM) ▪ 7-segment display ▪ Cascadable 	Transmission channel changeover <ul style="list-style-type: none"> ▪ Range reduction ▪ Start/restart interlock (RES) ▪ Contactor monitoring (EDM) ▪ 7-segment display 	Transmission channel changeover <ul style="list-style-type: none"> ▪ Range reduction 	Start/restart interlock (RES) <ul style="list-style-type: none"> ▪ Contactor monitoring (EDM) ▪ Cascadable via adapter cable
Host, middle-guest and guest devices combine point of operation guarding with area protection ▪ Configuration by wiring – automatic transfer to replacement device after device exchange	Certified for applications in potentially explosive areas of group II, category 3, zone 2 (gas) and zone 22 (dust) ▪ Configuration by wiring – automatic transfer to replacement device after device exchange	The configuration is simply performed by means of wiring ▪ Pre-mounted in transparent, encapsulated tube	Extra slim design without dead zones <ul style="list-style-type: none"> ▪ Especially fine length grid of 30 mm ▪ Configuration by wiring – automatic transfer to replacement device after device exchange

Multiple light beam safety devices



Specifications

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

Number of beams/beam
distance

Operating range

Profile cross section

Safety-related switching
outputs (OSSDs)

Connection type

Certifications

Functions

Features



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



















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

Type 2 / Type 4	Type 2 / Type 4	Type 2 / Type 4	Type 2 / Type 4
SIL 1 / SIL 3	SIL 1 / SIL 3	SIL 1 / SIL 3	SIL 1 / SIL 3
PL c / PL e	PL c / PL e	PL c / PL e	PL c / PL e
2 / 500 mm 3 / 400 mm 4 / 300 mm	2 / 500 mm 3 / 400 mm 4 / 300 mm	2 / 500 mm 3 / 400 mm 4 / 300 mm	2 / 500 mm 3 / 400 mm 4 / 300 mm
0.5 ... 50 m or 20 ... 70 m (transmitter-receiver systems) 0.5 ... 6/8 m (transceiver systems)	0.5 ... 50 m or 20 ... 70 m (transmitter-receiver systems) 0.5 ... 6/8 m (transceiver systems)	0.5 ... 50 m or 20 ... 70 m (transmitter-receiver systems) 0.5 ... 6/8 m (transceiver systems)	0.5 ... 50 m or 20 ... 70 m (transmitter-receiver systems) 0.5 ... 6/8 m (transceiver systems)
52 x 65 mm	52 x 65 mm	52 x 65 mm	52 x 65 mm
2 PNP transistor outputs AS-i Safety interface	2 PNP transistor outputs	2 PNP transistor outputs	2 PNP transistor outputs
M12	M12	M12	M12
   	   	   	   
Automatic start/restart	Automatic start/restart ▪ Start/restart interlock (RES), selectable ▪ Contactor monitoring (EDM), selectable ▪ Configurable operating modes	Start/restart interlock (RES), contactor monitoring (EDM), selectable ▪ 2-sensor muting (timing controlled, sequence controlled) ▪ Muting-timeout extension to up to 100 hours ▪ Configurable operating modes ▪ 7-segment display	Start/restart interlock (RES), contactor monitoring (EDM), selectable ▪ 2-sensor muting (timing controlled, sequence controlled), 4-sensor muting (timing controlled) ▪ Muting-timeout extension to up to 100 hours ▪ Configurable operating modes ▪ 7-segment display
Transceiver systems available in 2- or 3-beam version ▪ Transmitter-receiver systems available in 2-, 3- or 4-beam version ▪ The configuration is simply performed by means of wiring, i. e. no software, PC or DIP switch are necessary ▪ The use at ambient temperatures as low as -30 °C is possible ▪ Options: integrated laser alignment aid (with transmitter-receiver systems), integrated status indicator	Transceiver systems available in 2- or 3-beam version ▪ Transmitter-receiver systems available in 2-, 3- or 4-beam version ▪ The configuration is simply performed by means of wiring, i. e. no software, PC or DIP switch are necessary ▪ The use at ambient temperatures as low as -30 °C is possible ▪ Options: integrated laser alignment aid (with transmitter-receiver systems), integrated status indicator	Transceiver systems available in 2- or 3-beam version ▪ Transmitter-receiver systems available in 2-, 3- or 4-beam version ▪ Integrated muting function, no additional muting module is necessary ▪ The configuration is simply performed by means of wiring, i. e. no software, PC or DIP switch are necessary ▪ The use at ambient temperatures as low as -30 °C is possible ▪ Options: integrated laser alignment aid (with transmitter-receiver systems), integrated muting and status indicator	Transceiver systems available in 2- or 3-beam version ▪ Transmitter-receiver systems available in 2-, 3- or 4-beam version ▪ Integrated muting function, no additional muting module is necessary ▪ The configuration is simply performed by means of wiring, i. e. no software, PC or DIP switch are necessary ▪ The use at ambient temperatures as low as -30 °C is possible ▪ Options: integrated laser alignment aid (with transmitter-receiver systems), integrated muting and status indicator


Protective sensor sets
and accessories



UDC / DC
Device columns



UMC
Mirror columns

Description		
	The UDC / DC device columns enable the stable, freestanding mounting of protective sensors and safety light curtains on the floor ▪ The robust profile construction in high-quality design will win you over with simple device mounting and the quick vertical and axial alignment in just a few steps.	By combining UMC mirror columns with protective sensors or safety light curtains, cost-effective, multiple-side danger zone guarding can be realized ▪ Robust design and simple handling also increase the effectiveness of the safety device.
	Features	
	Simple, stepless mounting and height adjustment of the installed devices by means of supplied mounting brackets ▪ Design with closed or open top by means of simple, snap-in column cover ▪ Protection against device contamination and damage by means of easy-to-replace protective screens ▪ Automatic resetting after mechanical impacts with special spring elements (UDC) ▪ Complete mounting set for floor fixing included with delivery (UDC)	Individual mirror, adjustable separately in height and alignment, for beam deflection with multiple light beam safety devices ▪ Axially adjustable continuous mirror surface for beam deflection with safety light curtains ▪ Automatic resetting after mechanical impacts with special spring elements ▪ Complete mounting set for floor fixing included with delivery





MLC-UDC
Protective sensor sets



MLD-UDC
Protective sensor sets



Set-AC-M
Muting sensor sets



MLDSET
Protective sensor sets

In addition to the MLC 500 safety light curtain as an optical protective device, these sets also include device columns in which the safety sensor is pre-mounted in such a manner that it can very easily be height-adjusted.

In addition to the MLD 500 multiple light beam safety device as an optical protective device, these sets also include device columns in which the safety sensor is pre-mounted in such a manner that it can very easily be height-adjusted.

The **Set-AC-M** muting sensor sets for protective sensors and safety light curtains simplify the setup and operation of muting solutions

- The sets are **optimally tailored to modern machines and systems** both mechanically and electrically and through their innovative design.

The **MLDSET** protective sensor sets offer complete solutions for access guarding in which muting functions are needed for material transport

- The pre-mounted sets ensure efficient installation and quick and easy commissioning. Tailored to various muting tasks, a number of Plug & Play models are available.

Transmitter-receiver system with safety light curtain MLC 500

- Set for access guarding with hand/finger detection
- Optimally matched mechanically; pre-mounted and pre-aligned
- Device column with complete mounting kit for exact floor alignment; automatic resetting after mechanical impacts thanks to special spring elements

Plug & Play solutions, optionally as transceiver or transmitter-receiver system

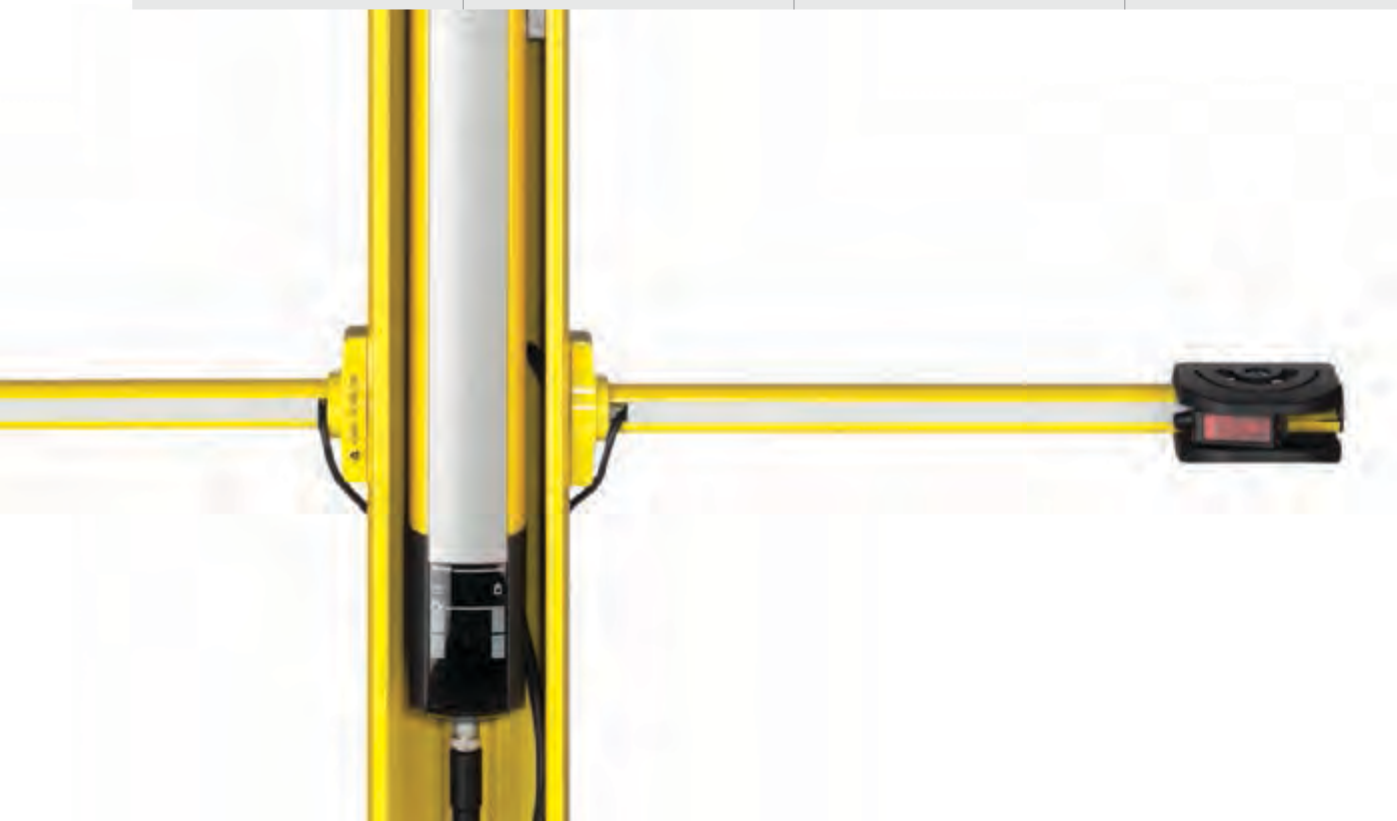
- Set for access guarding, i.e. pre-mounted transmitter / receiver or transceiver / deflecting mirror in device column
- Optimally matched mechanically; pre-mounted and pre-aligned
- Device column with complete mounting kit for exact floor alignment; automatic resetting after mechanical impacts thanks to special spring elements

Pre-mounted and aligned muting sensors for direct connection to the safety sensors

- 2-sensor muting (timing controlled & sequential); 4-sensor muting (timing controlled)
- Simple lateral mounting on device columns as well as on protective sensors and safety light curtains
- Optimally matched to transceiver systems through the use of retro-reflective photoelectric sensors (only one-sided wiring)
- Fast start-up through immediately ready-to-use, turnkey design

Pre-mounted and aligned protective sensor systems in device columns for direct integration in machine and system controls

- 2-sensor muting (timing controlled & sequential); 4-sensor muting (timing controlled)
- Simple logistical handling through individual complete solutions in a single set
- Fast start-up of the complete system through immediately ready-to-use, turnkey design with pluggable connections



Single light beam safety devices













MLD 500
Type 4 single light beam
safety devices



SLS 46C
Type 4 single light beam
safety devices

Specifications

Type in accordance with EN IEC 61496	Type 4 (self-monitoring)*	Type 4 in combination with a MSI-TRM safety relay
Operating range	0.5 ... 70 m 20 ... 100 m	0.5 ... 40 m 5 ... 70 m
Operating voltage U_B	+24V DC \pm 20 %	24 V DC, \pm 20 % (incl. residual ripple)
Operating temperature	-30 ... +55 °C	-30 ... +60 °C
Dimensions, W x H x D	52 x 65 x 193 mm	20.5 x 77 x 44 mm
Housing	Metal	Plastic
Light source	Infrared	Red light / infrared
Switching outputs	2 PNP transistor outputs (OSSDs)	2 push-pull transistor outputs
Connection type	M12 AS-i Safety interface	Cable 2 m M12
Certifications	   	     

Functions

Automatic start/restart ■ Start/restart interlock (RES), selectable ■ Contactor monitoring (EDM), selectable ■ Timing controlled 2-sensor muting ■ Sequence controlled 2-sensor muting ■ Configurable operating modes	LED indicator ■ Activation input for test and series connection ■ Active ambient light suppression (A ² LS) ■ Diagnostic output
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Features

The use at ambient temperatures as low as -30 °C is possible ■ Degree of protection IP 67 ■ Optional: integrated laser alignment aid ■ The configuration is simply performed by means of wiring, i. e. no software, PC or DIP switch are necessary	Single beam safety device with high function reserve ■ Compact plastic housing with degree of protection IP 67 ■ Clearly visible alignment indicator in the front screen ■ ECOLAB
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* For safety classification see
MLD 500 multiple light beam
safety device



SLS 518

Type 4 single light beam safety devices



SLS 46C

Type 2 single light beam safety devices



















SLSR 25B

Type 2 single light beam safety devices



SLS 318

Type 2 single light beam safety devices

Type 4 in combination with a MSI-TRM safety relay	Type 2 in combination with a safety monitoring device	Type 2 in combination with a safety monitoring device	Type 2 in combination with a safety monitoring device
0 ... 8 m (infrared LED) 0 ... 40 m (red light laser)	0.5 ... 40 m 5 ... 70 m	0.5 ... 20 m	0 ... 10 m
+24 V DC ± 15 % (incl. residual ripple)	24 V DC, ± 20 % (incl. residual ripple)	10 ... 30 V DC (incl. residual ripple)	10 ... 30 V DC
–25 ... +55 °C (infrared LED) –10 ... +50 °C (red light laser)	–30 ... +60 °C	–30 ... +55 °C	–25 ... +65 °C
M18 × 91 mm	20.5 × 77 × 44 mm	15 × 51.3 × 28.8 mm	Cylindrical construction, M18 × 1
Plastic	Plastic	Plastic	Plastic Metal housing on request
Infrared LED, red light laser	Red light / infrared	Red light	Red light
PNP transistor output	2 push-pull transistor outputs	2 push-pull Transistor outputs	PNP transistor output
M12	Cable 2 m M12	Cable 2 m M8 M12 Cable+M12	Cable 2 m M12
   	   	   	   
LED indicator ▪ Activation input for test and series connection ▪ Diagnostic output	LED indicator ▪ Activation input for test and series connection ▪ Active ambient light suppression (A ² LS) ▪ Diagnostic output	LED indicator, activation input for test and series connection ▪ Active ambient light suppression (A ² LS)	LED indicator ▪ Activation input for test and series connection
Compact plastic housing with degree of protection IP 67 ▪ Compact, cylindrical M18 construction for use in limited spaces	Single beam safety device with high function reserve ▪ Compact plastic housing with degree of protection IP 67 ▪ Clearly visible alignment indicator in the front screen	Single beam safety device with high function reserve ▪ Compact plastic housing with degree of protection IP 67 ▪ Wide voltage range 10 to 30V ▪ All common connection variants	Degree of protection IP 67 ▪ 2 antivalent push-pull switching outputs for light/dark switching and as control function ▪ Visible red light in straight optics ▪ Switching frequency 1,000 Hz ▪ Adjustable sensitivity

AS-i-safety product range



MLC 510 / AS-i
Type 4
safety light curtains



MLD 500 / AS-i
Type 4 multiple light beam
safety devices



MLD 500 / AS-i
Type 4 single light beam
safety devices

Specifications			
Type in accordance with EN IEC 61496	Type 4	Type 4	Type 4
SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	SIL 3	SIL 3	SIL 3
Performance Level (PL) in accordance with EN ISO 13849-1	PL e	PL e	PL e
AS-i profile	Safe slave	Safe slave	Safe slave
Slave address	1 ... 31, programmable (factory setting = 0)	1 ... 31, programmable (factory setting = 0)	1 ... 31, programmable (factory setting = 0)
Connection type	M12	M12	M12
Current consumption from AS-i circuit	50 mA (transmitter) 150 mA (receiver)	50 mA (transmitter) Max. 140 mA (receiver, type-dependent)	50 mA (transmitter) Max. 140 mA (receiver, type-dependent)
Sensor response time	3 ... 39 ms (type-dependent)	25 ms	25 ms
Restart delay time	100 ms or 500 ms	100 ms or 500 ms	100 ms or 500 ms
Certifications			
Function extension with ASM1 / ASM1E safety monitor			
	Start/restart interlock ▪ Contactor monitoring (EDM), selectable	Start/restart interlock ▪ Contactor monitoring (EDM), selectable ▪ Timing controlled 2- or 4-sensor muting ▪ Sequence controlled 2-sensor muting ▪ Muting-timeout extension	Start/restart interlock ▪ Contactor monitoring (EDM), selectable
Features			
	Integrated AS-i interface for direct M12 connection to the AS-interface network ▪ Safe data transfer of the OSSD signals via AS-interface ▪ Device swap-out without PC via SERVICE function of the AS-i safety Monitor ▪ Direct control without unique AS-i address possible ▪ Also available as host/middle-guest/guest variants	Integrated AS-i interface for direct M12 connection to the AS-interface network ▪ Safe data transfer of the OSSD signals via AS-interface ▪ Device swap-out without PC via SERVICE function of the AS-i safety Monitor ▪ Integrated muting indicator, integrated status indicator, direct control without unique AS-i address possible	Integrated AS-i interface for direct M12 connection to the AS-interface network ▪ Safe data transfer of the OSSD signals via AS-interface ▪ Device swap-out without PC via SERVICE function of the AS-i safety Monitor ▪ Direct control without unique AS-i address possible





ASM1 / ASM1E
AS-i safety monitors
category 4



ASM2 / ASM2E
AS-i safety monitors
category 4

Specifications

SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	SIL 3	SIL 3
Performance Level (PL) in accordance with EN ISO 13849-1	PL e	PL e
Safety category in accordance with EN ISO 13849-1	4	4
Stop category in accordance with EN IEC 60204-1	0 and 1	0 and 1
Supply voltage	24 V DC, $\pm 15\%$	24 V DC, $\pm 15\%$
System reaction time	Max. 40 ms (monitor without sensor reaction time)	Max. 40 ms (monitor without sensor reaction time)
Degree of protection	IP 20	IP 20
Number of safety monitors per AS-interface network	4 (with maximum 31 integrated AS-i slaves)	4 (with maximum 31 integrated AS-i slaves)
Certifications	CE  cUL US	CE  cUL US

Functions

<p>E-Stop monitoring functions</p> <ul style="list-style-type: none"> Start/restart interlock Dynamic contactor monitoring (EDM) Muting Timing controlled 2-sensor muting Sequence controlled 4-sensor muting 1 and 2-channel OSSD relay outputs Status LED indicator System signal output 	<p>E-Stop monitoring functions</p> <ul style="list-style-type: none"> Start/restart interlock Dynamic contactor monitoring (EDM) Muting Timing controlled 2-sensor muting Sequence controlled 4-sensor muting 1 and 2-channel OSSD relay outputs Status LED indicator System signal output
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Features

<p>Up to 31 safe AS-i slaves can be connected</p> <ul style="list-style-type: none"> Freely selectable assignment (Drag&Drop) of the sensors to OSSDs with "asimon" PC software 32 logic devices (e.g. OR, AND, FLIPFLOP) and turn on/off delays can be configured for the monitoring devices RS 232 interface for PC-supported system configuration and system diagnostics as well as configuration data transfer to replacement device Immediate switch-off STOP 0 and delayed switch-off STOP 1 of the release circuits can be configured Teach-in SERVICE button for automatic system integration of AS-i sensors on sensor exchange 	<p>Safe activation of safe AS-i actors with the same safe AS-i address</p> <ul style="list-style-type: none"> Primary start and E-Stop functions via safe coupling of neighboring AS-i networks 48 logic devices (e.g. OR, AND, FLIPFLOP) and turn on/off delays can be configured for the monitoring devices Auxiliary signals for start/restart interlock Error reset of the AS-i actor In addition, all functions and features of the ASM1E safety monitor are available
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Safety switches and safety locking devices








S20, S200
Safety switches



S300
Safety position switches



S400, S410
Safety hinge switches

Specifications			
Type	Type 2 locking device without guard interlocking in acc. with EN ISO 14119	Type 1 locking device without guard interlocking in acc. with EN ISO 14119	Type 1 locking device without guard interlocking in acc. with EN ISO 14119
Housing / Degree of protection	Glass fiber reinforced plastic (S20) or metal (S200) / both IP 67	Glass fiber reinforced plastic or metal, both IP 67	Metal, IP 67 / IP 69K
Actuators	Mechanical tongue, with low coding level in accordance with EN ISO 14119	Actuated by unencoded cam in accordance with EN ISO 14119	Safety switch in hinge, internal, encapsulated
Locking type, -force			
Connection type	Cable entry M20 × 1.5 (S20: optional 3-way), M12	Cable entry M20 × 1.5 (1- or 3-way), M12	Cable or M12, top, bottom, at wall side
Certifications	CE  c  US	CE  c  US	CE  c  US
Functions			
	Integration in control circuits up to category 4 in accordance with EN ISO 13849-1	Integration in control circuits up to category 4 in accordance with EN ISO 13849-1 ▪ Stop command with automatic or manual forced actuation	Integration in control circuits up to category 4 in accordance with EN ISO 13849-1 ▪ Mechanical hinge with integrated safety switch
Features			
	Easy mounting with standard construction ▪ Universal use with 5 actuator approach directions ▪ Various actuators for different installation conditions and applications from normal duty (S20) to heavy duty (S200) ▪ Self-centering through funnel-shaped insertion opening ▪ Large double-bridge contacts for long life expectancy (S200)	Metal housing for heavy duty applications ▪ Switching direction selectable ▪ Universal use with individually set actuator approach directions and angles in 10° grid ▪ Actuator extremely durable / robust	180 ° maximum opening angle of the protective device ▪ Repeatable setting (switching angle alignment) with misaligned doors ▪ Compact, rounded-off construction design in robust metal version ▪ Encapsulated, internal actuator guarantees proper functioning, even under difficult environmental conditions ▪ Extremely manipulation-safe with covered screws (unobtrusive sturdy design with rear-side mounting) ▪ S410 model with wider fork dimensions for special materials


S420

Safety hinge switches


L10

















Safety locking devices


L100, L200

Safety locking devices


L300

Safety locking devices

Type 1 locking device without guard interlocking in acc. with EN ISO 14119	Type 2 locking device with guard interlocking in acc. with EN ISO 14119	Type 2 locking device with guard interlocking in acc. with EN ISO 14119	Type 4 locking device with guard interlocking in acc. with EN ISO 14119
Stainless steel, IP 67 / IP 69K	Glass fiber reinforced plastic or metal / both IP 67	Glass fiber reinforced plastic / IP 66 (L100), metal / IP 67 (L200)	Metal, IP 67 / IP 69K
Safety switch in hinge, internal, encapsulated	Mechanical tongue, with low coding level in accordance with EN ISO 14119	Mechanical tongue, with low coding level in accordance with EN ISO 14119	Mechanical tongue with RFID-encoded actuator in accordance with EN ISO 14119; AC-L300-SCA: low AC-L300-UCA: high
	Mechanical (manual, delayed actuator release approx. 15 or 20 s), or with key, max. 1,000 N	Mechanical (spring), electro-mechanical (magnet), max. 1,100 N (L100), max. 2,500 N (L200)	Electro-mechanical (magnet), max. 7,500 N
Cable or M12, at wall side	Cable entry M20 × 1.5	Cable entry M20 × 1.5 (3-way)	Cable entry M20 × 1.5 (3-way), M12 (8-pin)
   	   	   	   
Two models: – Contact allocation – Two safety-related switching outputs (OSSDs) ▪ On-site diagnostics via 4 multi-color LEDs ▪ 2 electronic inputs, +E13 signal output ▪ Integration in control circuits up to category 4 in accordance with EN ISO 13849-1	Integration in control circuits up to category 4 in accordance with EN ISO 13849-1 ▪ Mechanical guard interlocking with manual locking and unlocking	Integration in control circuits up to category 4 in accordance with EN ISO 13849-1 ▪ Mechanical guard interlocking (spring-force) ▪ Electro-magnetic guard interlocking (magnet-force) ▪ Auxiliary release, escape release button (L200) ▪ Illuminated displays for magnet activation (L200)	Integration in control circuits up to category 4 / Performance Level PL e in accordance with EN ISO 13849-1 ▪ Contactless actuator with RFID technology ▪ High coding level in accordance with EN ISO 14119 ▪ 2 safety-related switching outputs (OSSDs) ▪ On-site diagnostics via 5 LEDs ▪ Auxiliary release with/without lock ▪ Escape release button
180 ° maximum opening angle of the protective device ▪ Repeatable setting (switching angle alignment) with misaligned doors ▪ Compact, rounded-off construction design in robust metal version ▪ Encapsulated, internal actuator guarantees proper functioning, even under difficult environmental conditions ▪ Extremely tamperproof through covered screws (unobtrusive, sturdy design with rear mounting), stainless steel housing for use in areas with extremely high hygienic requirements ▪ Can support loads of up to 2,000 N	Universal use with 5 actuator approach directions ▪ Multiple heavy-duty actuator series AC-AHxx for a wide range of installation conditions ▪ Self-centering through funnel-shaped insertion opening ▪ Reduced wiring through manual locking and releasing, optionally with knurled nut or key ▪ Economical locking device with compact construction.	Universal use with 5 actuator approach directions ▪ Multiple heavy-duty actuators for a wide range of installation conditions ▪ Self-centering through funnel-shaped insertion opening ▪ Adjustable switch-on power reduction (L100) ▪ "Heavy duty" use, including under tough, harsh ambient conditions and external mechanical stresses (L200) ▪ Ergonomically optimized panic button, selectable position (L200)	Universal use with 4 actuator approach directions, actuator is easy to center ▪ Interlocking with dirt-resistant bushing for actuator ▪ "Heavy duty" use, including under tough, harsh ambient conditions and external mechanical stresses ▪ Ergonomically optimized panic button, selectable position ▪ Optional: safety door handle, lock-out protection

Safety proximity sensors



MC 300
Magnetically coded
sensors



RD 800
Safety transponders

Specifications		
Type	Type 4 interlock device, contactless actuation in accordance with EN ISO 14119	Type 4 interlock device, contactless actuation in accordance with EN ISO 14119
Category in accordance with EN IEC 13849-1	Up to 4 (depending on the number of sensors)	4
Performance Level (PL) in accordance with EN ISO 13849-1	Up to e (depending on the number of sensors)	e
Dimensions (housing)	M30 × 36 mm (MC 330) 36 × 26 × 13 mm (MC 336) 88 × 25 × 13 mm (MC 388)	87.5 × 25 × 18 mm (sensor) 45 × 25 × 18 mm (actuator)
Assured switching distances (Sao, Sar)	< 6 mm, > 14 mm (MC 330) < 3 mm, > 11 mm (MC 336) < 6 mm, > 30 mm (MC 388)	12 mm, 10 mm
Switching tolerance	± 1 mm	
Contact type	1NO / 1NC, 2NO	
Code type	Actuator with low coding level in accordance with EN ISO 14119	Actuator with standard code, unique code for low, high coding level in accordance with EN ISO 14119
Connection type	M8, M12, cable, cable+M12	M12
Min. approach speed of actuator towards sensor	50 mm/s	
Response time	3 ms	7 ms (typical), 12 ms (max.)
Certifications		
Functions		
	Safety system in combination with a suitable Leuze electronic evaluation unit (see safety relays) or the MSI 400 safety control ■ Integration in control circuits up to category 4 in accordance with EN ISO 13849-1	Start/restart interlock ■ Contactor monitoring (EDM), selectable ■ Additional control output

Features

Not sensitive to dust, humidity and the like (dirt level 3 in accordance with EN 60947-1) ■ Highly tamperproof
 ■ Approach actuation directions lengthwise, high, deep ■ Flexible connection via M8 connector, PVC or PUR connection cable (2 m, 5 m, 10 m), each firmly integrated in the housing
 ■ Integrated compact design
 ■ Large switching hysteresis (tolerant in event of vibrations or warped doors)
 ■ Delivery contents including actuator and screws / lock ring

Compact housing with high degree of protection (IP 67, IP 69K)
 ■ Pre-programmed or teach-in function
 ■ Individual or multiple application (series connection) ■ Diagnosis via 4 multi-color LEDs



Safety command devices








ERS 200
E-Stop rope switch



ESB 200
E-Stop button



Specifications		
Type	E-Stop command device in accordance with EN ISO 13850, EN 60947-5-5	E-Stop command device in accordance with EN ISO 13850, EN 60947-5-5
Housing / Degree of protection	Metal, IP 67	UV-resistant, impact-resistant plastic, IP 67, IP 69K
Actuators	Stainless steel bolt, red, steel rope with sheathing	Button, 40 mm diameter, red, self-locking
Actuation	Position-independent per rope (pull: 83 N / 235 N, slacken: 63 N / 147 N). Pull on forced separation: 90 N / 250 N.	Position-dependent, manual, per button (25 N)
Mounting	Straight, angular	Structure
Connection type	Cable entry M20 × 1.5 (1- or 3-way), M12	Cable entry M20 × 1.5, M16 × 1.5 M12
Certifications	  	 
Functions		
	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	Integration in control circuits up to category 4 in accordance with EN ISO 13849-1 ▪ Position-dependent E-Stop command input. Reset function (via rotary knob or key)
Features		
	Machine is stopped by pulling the rope or on rope breakage ▪ Simple rope adjustment by means of switching point indicator ▪ Clicks in on both sides with friction-locking contacts ▪ Compact metal housing ▪ Use even under difficult conditions ▪ Precise bolt guide	2 safety circuits, 1 signal circuit ▪ Either screw terminals or M12 connection ▪ Sturdy housing with "STOP" signal ring ▪ Protected screw fitting ▪ Ergonomically optimized

Safety relays



**MSI-SR-2H1
MSI-SR-2H21**















**MSI-SR-ES20
MSI-SR-ES31**



**MSI-MC310
MSI-MC311**

Specifications

Device type/function	Evaluation unit	Evaluation unit	Evaluation unit
Category / Performance Level (PL) in accordance with EN ISO 13849-1	1 / PL c 4 / PL e	3 / PL d 4 / PL e	4 / PL e
SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	SIL 1 / SIL _{CL} 1 SIL 3 / SIL _{CL} 3	SIL 2 / SIL _{CL} 2 SIL 3 / SIL _{CL} 3	–
Number of release contacts (NO contact)	1 (change-over contact) 2	2 3	2 2
Number of signal contacts (NC contact)	1 (change-over contact) 1	– 1	1 –
Start / restart	Through synchronous actuation	Automatic, manual	Automatic, manual
Contactor monitoring (EDM)	– X	X X	X X
Regression delay	20 ms 50 ms	70 ms 60 ms	20 ms 20 ms
Max. continuous current per path	5 A 6 A	6 A 8 A	3 A 3 A
Ambient temperature, operation	–25 ... +55 °C	–25 ... +55 °C	MC 310: 0 ... +55 °C MC 311: –5 ... +55 °C
Dimensions with screw terminals (W × H × D)	96.5 × 22.5 × 91.5 mm 96.5 × 22.5 × 114.1 mm	96.5 × 22.5 × 91.5 mm 96.5 × 22.5 × 107.6 mm	96.5 × 22.5 × 113.6 mm
Certifications	CE cULUS    	CE cULUS    	CE cULUS    

Sensors / application

	Two-hand operating units 2H1: type III A, EN 574 2H21: TYP III C, EN 574	E-Stop Safety switches with relay contacts	Safety solenoid switches Inputs: MC 310: 1 NC contact, 1 NO contact; MC 311: 2 NC contacts
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Features



MSI-SR-LC21
MSI-SR-LC21M



MSI-SR-LC31AR
MSI-SR-LC31MR



MSI-SR4
MSI-SR5



MSI-SR-LC21DT03
MSI-SR-LC21DT30
MSI-DT30

Evaluation unit	Evaluation unit	Evaluation unit	Evaluation unit with time delay
4 / PL e	4 / PL e	4 / PL e	4 / PL e LC21: 3 / PL d for delayed contact
SIL 3 / SIL _{CL} 3	SIL 3 / SIL _{CL} 3	SIL 3 / SIL _{CL} 3	SIL 3 / SIL _{CL} 3 2 / SIL _{CL} 2 for delayed contact
2	3	3	LC21: 2 + 1 delayed
1	1	2	2 + 2 delayed
Automatic, manual	Automatic (AR), manual (MR)	Automatic, manual	Automatic, manual
X	X	X	X
25 ms	10 ms	10 ms	LC21: 25 ms 20 ms
6 A	8 A	3 A 2 A	6 A 6 A
–25 ... +55 °C	–25 ... +55 °C	0 ... +55 °C	–25 ... +55 °C –20 ... +55 °C
96.5 × 22.5 × 114 mm	96.5 × 22.5 × 114 mm	99.5 × 22.5 × 111.5 mm	96.5 × 22.5 × 114 mm 96.5 × 22.5 × 111.5 mm
E-Stop safety switches: – with relay contacts – with OSSD outputs – with magnetic contacts Safety light barrier Safety laser scanner LC21M: 4-conductor PS mat	E-Stop safety switches: – with relay contacts – with OSSD outputs – with magnetic contacts Safety light barrier Safety laser scanner	E-Stop safety switches: – with relay contacts – with OSSD outputs – with magnetic contacts Safety light barrier Safety laser scanner	E-Stop safety switches: – with relay contacts – with OSSD outputs – with magnetic contacts Safety light barrier Safety laser scanner
		SR5: 2 inputs (1- or 2-channel) for parallel evaluation of 2 sensors	Delay 0.15 – 3 s (MSI-SR-LC21DT03) ▪ Delay: 1.5 – 30 s (MSI-SR-LC21DT30) ▪ Delay: 0.1 – 30 s. (MSI-DT-30)

Safety relays



MSI-RM2
MSI-SR-CM32



MSI-SR-CM42R



MSI-SR-CM43
MSI-SR-CM43DT03

Specifications

Device type/function	Output extension for OSSDs	Contact extension	Contact extension, contact extension with time delay
Category / Performance Level (PL) in accordance with EN ISO 13849-1	4 / PL e	4 / PL e	3 / PL d
SIL in accordance with IEC 61508 and EN IEC 62061 (SILCL)	SIL 3 / SIL _{CL} 3	SIL 3 / SIL _{CL} 3	SIL 2 / SIL _{CL} 2
Number of release contacts (NO contact)	2 (change-over contact) 3	2 × 2	4
Number of signal contacts (NC contact)	1 2	2 × 1	3
Start / restart	Automatic	Automatic	Automatic
Contactor monitoring (EDM)			
Regression delay	10 ms 20 ms	15 ms	40 ms 3 s
Max. continuous current per path	3 A 6 A	6 A	6 A
Ambient temperature, operation	0 ... +50 °C –25 ... +55 °C	–25 ... +65 °C	–25 ... +55 °C
Dimensions (with screw terminals)	99 × 17.5 × 111.5 mm 96.5 × 22.5 × 114 mm	96.5 × 22.5 × 114 mm	96.5 × 22.5 × 114 mm
Certifications			

Sensors / application

Safety light barrier
Safety laser scanner
Safety switch with OSSD outputs
Additionally for CM 32: extension for safety PLCs

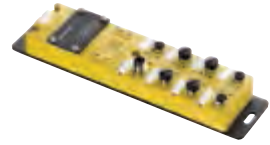
Extension for safety relays and safety PLCs

Extension for safety relays and safety PLCs

Features

2 extensions in one device

Fixed delay: 3 s (DT03)



MSI-CM52

MSI-SR-SM42OS

**MSI-TR1/2/S
MSI-TRM**

MSI-MD-FB




Contact extension	Monitoring of standstill and low speed	Evaluation unit for periodic testing	Muting controller
4 / PL e	4 / PL e	4 / PL e	4 / PL e
SIL 3 / SIL _{CL} 3	SIL 3 / SIL _{CL} 3	SIL 3 / SIL _{CL} 3	SIL 3 / SIL _{CL} 3
5	2 (semiconductor)	2	OSSD pair
2	2 (semiconductor)	2 (semiconductor)	–
Automatic	Automatic, manual	Automatic, manual	Manual
20 ms	X	X	
6 A	12 ms + 1,6 / f _{ST}	20 ms 130 ms	
–20 ... +55 °C	2 A	3 A	
96.5 × 22.5 × 114.5 mm	–25 ... +55 °C	–30 ... +60 °C –25 ... +55 °C	–30 ... +60 °C
96.5 × 22.5 × 114.5 mm	96.5 × 22.5 × 121 mm	99 × 22.5 × 111.5 mm	225 × 60 × 37 mm
		 (in combination with SLS 46C)	
Extension for safety relays and safety PLCs	Proximity switch, A/B incremental transmitter, HTL	Testable optoelectronic protective devices of type 2 (MSI-TR1/2/S) Testable optoelectronic protective devices of type 4 (MSI-TRM)	Safety light barrier, safety multiple light beam devices, additional muting sensors
	Speed limit / monitoring frequency 0.5 – 99 Hz	1 or 2 input circuits, up to 3 sensors each ■ Fixed delay: 0.6 s (TRS) ■ Filter time 130 ms (TR2)	

Programmable safety controls



MSI 410
MSI 410.F50

Specifications

Device type/function	Safety control base module
Category / Performance Level (PL) in accordance with EN ISO 13849-1	4 / PL e
SIL in accordance with IEC 61508 or EN IEC 62061 (SILCL)	3
Inputs / outputs / Inputs or outputs, configurable	20 / 4 / –
Maximum switching power per output	4 A
Test outputs / signal generators	4 / 4
Interfaces	USB mini
Fieldbus protocols	
Supply voltage	16.8 ... 30 V DC
Ambient temperature, operation	
Dimensions	45 × 96 × 115 mm
Certifications	  

Functions

40 certified function blocks

- Expandable to up to 116 safe inputs / 56 safe outputs and 2 gateway modules
- F50 model with special function blocks for press control and standstill/rotational speed monitoring

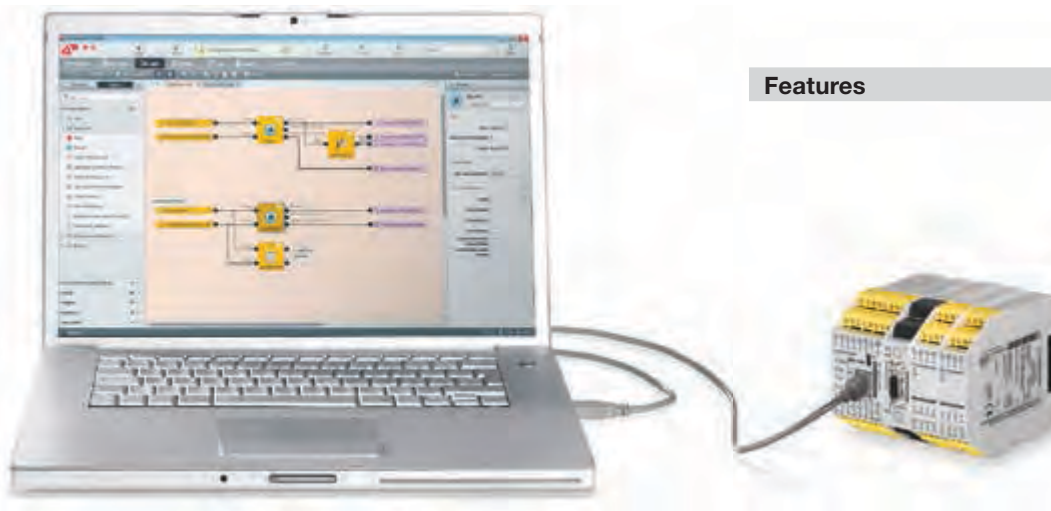
Features

Configuration via MSI.designer configuration software (license-free): supports up to 300 function blocks in one project, integrated simulation with logic analyzer, configurable report, online diagnosis

- Removable program memory in SD card format, 512 MB
- Designs with screw or spring-cage terminals

MSI.designer

- Easy hardware configuration
- Simple logic programming
- Simulation and logic analysis for testing the safety function right from a PC
- Force mode for detailed function tests
- Configurable report for professional and well-organized documentation
- Online diagnosis for a fast state overview, including remote maintenance





MSI 420, 430
MSI 420.F50
MSI 430.F50














MSI-EM-I8
MSI-EM-I084



MSI-EM-I084NP



MSI-FB-EtherCAT
MSI-FB-PROFIBUS
MSI-FB-CANopen

Safety control base module	Safe extension module	Non-safe extension module	Gateway
4 / PL e	4 / PL e		
3	3		
16 / 4 / 4	8 / – / – 8 / 4 / –	4 / 4 / 4	
4 A	4 A	0.5 A	
4 / 4	8 / 2 (EM-I8) 2 / 2 (EM-I084)		
USB mini, Ethernet TCP/IP			2x RJ45 socket 1x RS485 (Sub-D) screw terminal, 5-pin
MSI 430: PROFINET IO, EtherNet/IP and Modbus TCP integrated			EtherCAT PROFIBUS-DP CANopen
16.8 ... 30 V DC	16.8 ... 30 V DC	16.8 ... 30 V DC	Via base module
45 × 96 × 115 mm	22.5 × 93.7 × 120.8 mm	22.5 × 93.7 × 120.8 mm	22.5 × 96.5 × 121 mm
  	  	  	 
40 certified function blocks ▪ Expandable to up to 116 safe inputs / 56 safe outputs and 2 gateway modules ▪ F50 model with special function blocks for press control and standstill/rotational speed monitoring	Safe extension modules ▪ Each base module can be expanded by up to 12 freely selectable extension modules	Non-safe extension modules for economical actuation of non-safety relevant elements (e.g., signal lights) ▪ Each base module can be expanded by up to 12 freely selectable extension modules	Each base module can be expanded with up to 2 gateway modules
Configuration via MSI.designer configuration software (license-free): supports up to 300 function blocks in one project, integrated simulation with logic analyzer, configurable report, online diagnosis ▪ Removable program memory in SD card format, 512 MB ▪ Designs with screw or spring-cage terminals			

ALWAYS THE **RIGHT** **SERVICE** FOR YOUR PROCESS

Legal security and efficient safety at work are successfully combined quickly and easily with our range of services.



For many people, complex planning or engineering tasks or the management of functional safety make the set of issues related to safety at work a closed book. In the area of legal security in particular, information gaps often exist. With our extensive, qualified offer on safety at work, you are on the safe side legally and can fulfill all legal guidelines easily.

We support your service department and, in the event of limited resources, make available the appropriately qualified team. We work with our experts to ensure the safety of your machines and systems. Your production and service team is free to perform its actual tasks. Our product range is accompanied by an extensive range of training courses tailored to your needs.

Our service offerings include



Status check
Safety technology
(MSSC)



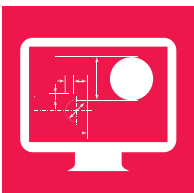
Status check
CE (MCSC)



Risk analysis /
assessment
(MRAS)



Conformity assess-
ment of machines
(MCMS)



Development
support for
machine safety
(MSEN)



Safety inspection
(MSIN)

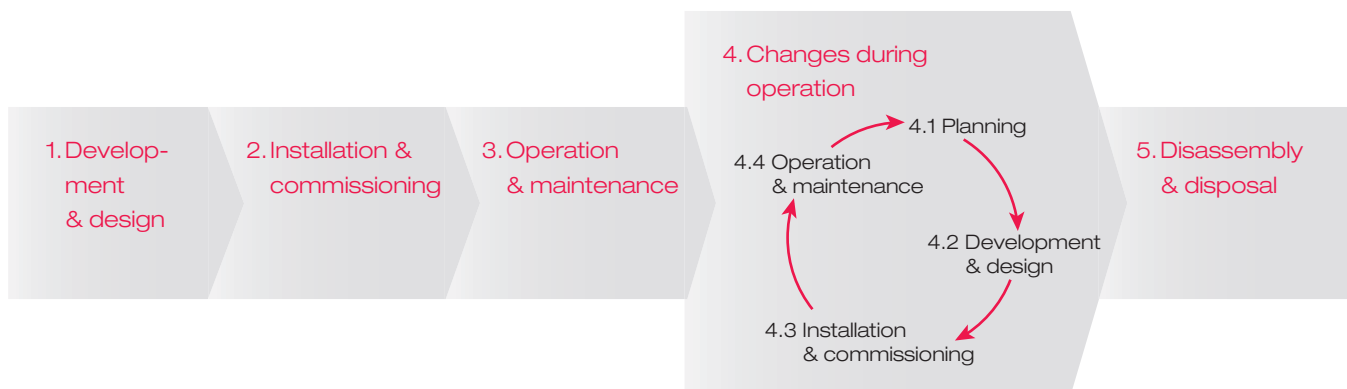


Functionality
of protective
devices (MSPT)



Validation and
verification of
safety functions
(MSVV)

Stages of a machine life cycle



The right services at a glance

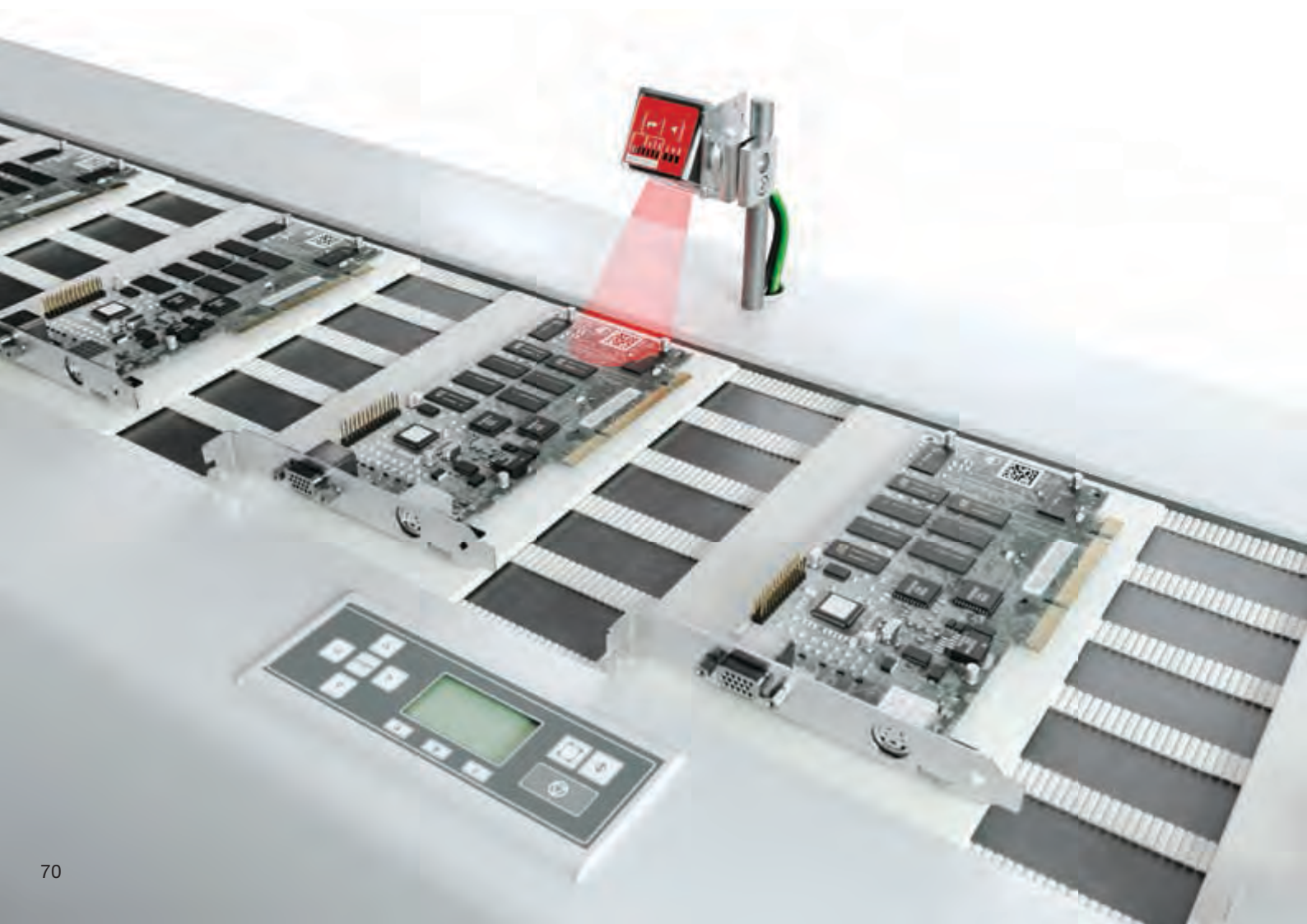
Services		1. Development & design	2. Installation & commissioning	3. Operation & maintenance	4.1 Planning	4.2 Development & design	4.3 Installation & commissioning	4.4 Operation & maintenance	5. Disassembly & disposal
	Status check		●	●				●	
	Safety technology								
	Status check CE	●		●		●	●	●	
	Risk analysis / assessment	●		●	●	●		●	●
	Conformity assessment of machines	●			●	●			
	Development support	●				●			
	Machine safety								
	Safety inspections		●	●			●	●	
	Functionality of protective devices		●	●			●	●	●
	Validation and verification of safety functions		●				●		

IDENTIFICATION

Reliably detected:
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: e.g. mobile hand-held scanners for bar codes, 2D-codes or DPM codes, stationary laser scanners in line or raster scanner versions as well as high-speed scanners or scanners for the deep-freeze area with integrated heating.



Precise bar code reader: the latest technology and numerous equipment options

For gapless product traceability, automatic identification of 1D- or 2D-codes is essential. The BCL 300i stationary bar code reader is used primarily for the reliable identification of bar codes on containers and packages.

With the innovative code reconstruction technology, even soiled or damaged codes can be reliably detected. This increases system availability.

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

BCL 300i

- Modular connection technology through pluggable connection hoods
- Integrated fieldbus interfaces, such as PROFINET or Ethernet IP
- 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, 55
Bar code readers



CR 100
Bar code readers



Specifications		
Reading distance (dependent on version)	50 – 230 mm	15 – 67 mm
Smallest resolution	0.127 mm	0.15 mm
Scanning rate	330 scans/s	700 scans/s
Optics models	M	M
Reading method	Single line scanner	Single line scanner Deflecting mirror
Inputs/outputs	1 / 1	1 / 1
Interfaces	Integrated: RS 232 USB	Integrated: RS 232
Connectivity		
Supply voltage	5V DC	5V DC
Degree of protection	IP 54	IP 40
Network master		
Certifications	CE 	CE 
Accessories		
Optional	MA-CR adapter circuit board	MA-CR adapter circuit board
Mounting devices		
Features		
	Very small construction ■ Configurable operating modes, including – among others – presenta- tion mode	Output format selectable ■ Alignment mode ■ LED indicator ■ Large reading field even at close range



BCL 8
Bar code readers



BCL 20
Bar code readers



BCL 300i
Bar code readers



BCL 500i
Bar code readers

40 – 160 mm	50 – 450 mm	20 – 700 mm	200 – 2,400 mm
0.125 mm	0.15 mm	0.127 mm	0.2 mm
600 / 500 scans/s	1,000 / 800 scans/s	1,000 scans/s	1,000 scans/s
N, M	N, B, M, F	N, M, F, L, J	N, M, F, L
Single line scanner Deflecting mirror	Single line scanner Raster scanner	Single line scanner Raster scanner Deflecting mirror Oscillating mirror Code reconstruction technology	Single line scanner Oscillating mirror Deflecting mirror Code reconstruction technology
1 / 1	1 / 1 or 2 / 2	1 / 1	2 / 2
Integrated: RS 232	Integrated: RS 232 RS 485	Integrated: RS 232 / 485 / 422 multiNet PROFIBUS PROFINET IO/RT Ethernet TCP/IP, UDP Ethernet IP EtherCAT	Integrated: RS 232 / 485 / 422 multiNet PROFIBUS PROFINET IO/RT Ethernet TCP/IP, UDP Ethernet IP
With MA 8 connection unit (point to point) RS 485	With connection unit MA 2 / 4 multiNet	With MA 200i connection unit DeviceNet, CANopen	With MA 200i connection unit EtherCAT, DeviceNet, CANopen
With MA 200i connection unit PROFINET IO/RT, PROFIBUS, Ethernet TCP/IP, UDP, Ethernet/IP EtherCAT, DeviceNet, CANopen	With MA 200i connection unit PROFINET IO/RT, PROFIBUS, Ethernet TCP/IP, UDP, Ethernet/IP, EtherCAT, DeviceNet, CANopen		
5 V DC (10 – 30 V DC via MA)	10 – 30 V DC	18 – 30 V DC	10 – 30 V DC
IP 67	IP 65	IP 65	IP 65
MA 31	MA 31	MA 31	Integrated
CE CDRH c UL US	CE CDRH c UL US	CE CDRH c UL US	CE CDRH c UL US

BT 8

BT 20, BT 21

BT 56, BT 59, BT 300 W, BT 300

BT 56, BT 59

Reads all common 1D-codes including
Pharmacode ■ Robust industrial
version in a metal housing – IP 67
■ M12 connection type or cable variant
■ Reference code comparison

Automatic detection of code type and
code quality ■ Failsafe storage of
parameters ■ Integrated multiNet
■ 12 optics models

Integrated fieldbus connectivity
■ Code reconstruction technology (CRT)
■ Available as a front scanner,
deflecting mirror and oscillating mirror
model ■ Simple configuration via USB
interface without additional software
or GSD/GSDML file ■ Modular
connection type via M12 hood with
integrated connectors, terminal hood
or cable hood ■ Optional with display
and as heating model

“webConfig” software integrated in the
device permits configuration via USB
interface without additional software
■ Multiple language menu-driven
display ■ M12 connection type
■ Integrated fieldbus connectivity for
convenient fieldbus link, networking
and configuration via the GSD/GSDML
file ■ Code reconstruction technology
(CRT) for reliable identification of dam-
aged codes ■ Optional heating models
to –35 °C

Stationary bar code readers



BCL 600i
Bar code readers



BCL 900i
Bar code readers



Specifications		
Reading distance (dependent on version)	300 – 1,500 mm	450 – 1,700 mm
Smallest resolution	0.25 mm	0.33 mm
Scanning rate	800 – 1,000 scans/s	1,000 scans/s
Optics models	M, F	M
Reading method	Single line scanner Oscillating mirror Code reconstruction technology	Single line scanner Code reconstruction technology
Inputs/outputs	2 / 2	3 / 2
Interfaces	Integrated: RS 232 / 485 / 422 multiNet PROFIBUS PROFINET IO/RT Ethernet TCP/IP, UDP	Integrated: RS 232 / 422 Ethernet TCP/IP, UDP Ethernet IP
Connectivity	With MA 200i connection unit EtherCAT, DeviceNet, CANopen	With MA 900 connection unit RS 232 / 422, Ethernet TCP/IP, UDP, Ethernet/IP, With MA 200i connection unit PROFINET IO/RT, PROFIBUS, EtherCAT, DeviceNet, CANopen
Supply voltage	10 – 30 V DC	10 – 30 V DC
Degree of protection	IP 65	IP 65
Network master	Integrated	MA 31
Certifications	CE CDRH cUL US	CE CDRH cUL US
Accessories		
Optional		Ext. parameter memory
Mounting devices	BT 56, BT 59	BT 900
Features		
	“webConfig” software integrated in the device permits configuration via USB interface without additional software ■ Multiple language menu-driven display ■ M12 connection type ■ Integrated fieldbus connectivity for convenient fieldbus link and networking ■ Code reconstruction technology (CRT) for reliable identification of damaged codes ■ Optimized for modules from 0.25 to 0.5 mm	Code reconstruction technology (CRT) ■ Optionally as modular scanner portal (MSP) system

Stationary 2D-code readers



DCR 40
Stationary
2D-code readers



DCR 50, 55
Stationary
2D-code readers



DCR 80, 85
Stationary
2D-code readers

Typical applications

Code reading	All common 1D-codes such as EAN/UPC GS1 DataBar, Pharma Code and all common 2D-codes such as Data Matrix, QR code or Aztec	All common 1D-codes such as EAN/UPC GS1 DataBar, Pharma Code and all common 2D-codes such as Data Matrix, QR code or Aztec	Data Matrix, bar code, QR code, PDF 417, Aztec, GS1 Databar and others.
Sensor / cameras	CMOS (Rolling Shutter)	CMOS (Rolling Shutter)	CMOS (Rolling Shutter)
Resolution (pixel)	1280 × 960	1280 × 960	960 × 640
Focal point	85 mm	85 mm	91 mm
Interfaces	Integrated: RS 232	Integrated: RS 232, USB (DCR 55)	Integrated: RS 232
Digital inputs/outputs	1 / 1	1 / 1	1 / 1
Configuration / Operating system	Configuration with the "Leuze Sensor Studio". Alternatively, via online commands or configuration codes	Configuration with the "Leuze Sensor Studio". Alternatively, via online commands or configuration codes	Configuration with the "Leuze Sensor Studio". Alternatively, via online commands or configuration codes
Options	MA-CR adapter circuit board for test purposes	MA-CR adapter circuit board for test purposes	MA-CR adapter circuit board for test purposes
Dimensions, W × H × D	20.5 × 11.9 × 16.4 mm	31.6 × 12.7 × 27.5 mm 31.5 × 20 × 40.3 mm	39 × 27.4 × 25 mm 39 × 25 × 55.5 mm
Certifications	CE	CE cUL US*	CE

Features

Very small and light scan engine with integrated decoder for all common 1D and 2D codes ■ Data transmission via a configurable RS 232 interface

Compact code reader as module or in aluminum housing ■ CMOS imager and integrated decoder for all commonly used 1D and 2D codes ■ RS 232 or USB interface, one trigger input, one switching output, degree of protection IP 54

Excellent reading and decoding characteristics ■ Reading of very small, high-density codes ■ Large reading field ■ Integrated illumination ■ Blue alignment LED

* Series DCR 55 only

Stationary 2D-code readers



LSIS 220
Stationary
2D-code readers



DCR 200i
Stationary
2D-code readers



LSIS 422i
Stationary
2D-code readers
(C-mount model)

Typical applications			
Code reading	Data Matrix, bar code, QR code, PDF 417, Aztec, GS1 Databar and others	Data Matrix, bar code, QR code, Pharmacode, Aztec, GS1 Databar and others	Data Matrix Code, bar code, Pharmacode
Sensor / cameras	CMOS (Global Shutter)	CMOS (Global Shutter)	CMOS (Global Shutter)
Resolution (pixel)	844 × 640	1,280 × 960	752 × 480
Focal point	127 mm	U optics: 50 mm N optics: 70 mm M optics: 105 mm F optics: 185 mm L optics: 285 mm	50 mm ... ∞ (focal length 8 mm) 75 mm ... ∞ (focal length 16 mm)
Interfaces	Integrated: RS 232 USB	Integrated: Ethernet TCP/IP, UDP PROFINET IO/RT RS 232 RS 422	Integrated: Ethernet RS 232 TCP/IP, UDP
Connectivity	With MA 21 connection unit multiNet With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP, IP EtherCAT DeviceNet CANopen	With MA 200i connection unit PROFIBUS Ethernet TCP/IP, UDP, IP EtherCAT DeviceNet CANopen	With MA 21 connection unit multiNet With MA 200i connection unit PROFINET IO/RT PROFIBUS EtherCAT DeviceNet CANopen
Digital inputs/outputs	1 / 1	2 / 2	8, configurable
Number of test routines	Memory capacity for 1 parameter set in the camera	Memory capacity for 1 parameter set in the camera	Typically 10 to 60, depending on scope of test
Configuration / Operating system	Configuration via bar code or PC with setup program	Configuration via configuration codes, smartphone app or via PC using standard web browser without software to be installed additionally (webConfig tool)	Configuration via PC using standard Web browser without software to be installed additionally (webConfig tool)
Options	Optional: connection cables ▪ Mounting devices: BTU 300M, BT 8-0	Optional: connection cables ▪ Optical filters ▪ Housing hoods ▪ External illumination ▪ Mounting devices: BTU 320M-D12, BT 320M. MA 150 modular connection unit	Reading of directly marked Data Matrix Codes ▪ Multiple code reading ▪ Display of the code content ▪ Evaluation of the code quality of printed codes ▪ Reference code comparison ▪ Image memory ▪ Optional: connection cables, optical filters ▪ Mounting devices: BT 56, BT 59
Dimensions, W × H × D	47 × 40 × 32 mm	43 × 61 × 44 mm	75 × 113 × 55 mm 75 × 113 × 106 mm
Certifications	CE c UL US	CE c UL US	CE c UL US

Features			
	Camera system for omnidirectional reading of bar codes and 2D-codes ▪ Integrated illumination and decoder ▪ Degree of protection IP 65	Camera system for omnidirectional reading of bar codes, stacked codes and 2D-codes ▪ Integrated illumination and decoder ▪ High object speed of up to 7 m/s ▪ Integrated teach functions for simple adjustments via buttons ▪ Optional robust stainless steel housing	Camera system for omnidirectional reading of bar codes and 2D-codes ▪ Integrated illumination (depends on type: white, IR or RGBW) and decoder ▪ Degree of protection IP 65 / IP 67 ▪ Flexible use through motor-driven focus adjustment

RFID systems



RFI 32
Stationary RFID readers



RFM 12, 32, 62
Stationary
RFID read/write systems

Specifications		
Working frequency	125 kHz	13.56 MHz
Max. RFID reading distance	80 mm	400 mm
Max. speed	6.0 m/s	6.0 m/s
Interfaces	Integrated: RS 232	Integrated: RS 232
Connectivity	With MA 21 connection unit multiNet	With MA 21 connection unit multiNet
	With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP EtherCAT DeviceNet EtherNet/IP CANopen	With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP EtherCAT DeviceNet EtherNet/IP CANopen
Function	RFID reading	RFID reading / writing
Possible transponder types	– Disc – High temperature proof up to 200 °C	– Disc – High temperature proof up to 220 °C – Smart label
Supply voltage	12 – 30 V DC	12 – 30 V DC
Degree of protection	IP 65	IP 65 / IP 67
Certifications	CE	CE

Features

Compact RFID reading unit
 ■ High degree of protection for tough industrial application ■ Mounting also in between conveyor rollers

Compact RFID write/read unit
 ■ High degree of protection for tough industrial application ■ Mounting also in between conveyor rollers ■ RFM 32 is also available as device with Ex certification

Mobile code readers



IT 1300g

Bar code hand-held readers



IT 1450g, 1452g

Bar code hand-held readers



**IT 1280i, IT 1910i-1D,
IT 1911i-1D**

Bar code hand-held readers

Specifications			
Reading method	Line imager	Area imager With Bluetooth	Laser/area imager With Bluetooth
Reading distance	10 – 660 mm	37 – 360 mm	20 – 4,600 mm
Interfaces	Integrated: RS 232 / USB Keyboard Wedge PS 2	Integrated: RS 232 / USB Keyboard Wedge PS 2	Integrated: RS 232 / USB Keyboard Wedge PS 2
Connectivity	With MA 21 connection unit multiNet With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP EtherCAT DeviceNet CANopen	With MA 21 connection unit multiNet With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP EtherCAT DeviceNet CANopen	With MA 21 connection unit multiNet With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP EtherCAT DeviceNet CANopen
Accessories	Cable for: RS 232, USB, Keyboard-Wedge; desktop support, wall support, power supply unit	Cable for: RS 232, USB, Keyboard-Wedge; desktop support, wall support, power supply unit	Cable for: RS 232, USB, Keyboard-Wedge; desktop support, wall support, power supply unit
Supply voltage	4.5 – 5.5 V DC	4.5 – 5.5 V DC	4.5 – 5.5 V DC
Area of application	Degree of protection IP 41	Degree of protection IP 41	Tough industrial use Degree of protection IP 65
Code types	Bar codes	Bar codes	Bar codes
Certifications	CE	CE	CE

Features			
	Large reading field for bar code detection ▪ Ergonomic and robust housing ▪ Operating temperature 0 °C ... +50 °C	Large reading field for bar code detection ▪ Ergonomic and robust housing ▪ Operating temperature 0 °C ... +45 °C	Large reading field for bar code detection ▪ Ergonomic and very robust housing for rough applications ▪ Operating temperature from –30 °C ... +50 °C (IT 1280i, IT 1910i-1D) –20 °C ... +50 °C (IT1911i-1D)



IT 1900g, 1902g
Mobile 2D-code readers



IT 1910i, 1911i
IT 1980i, 1981i
Mobile 2D-code readers



IT 1920i
Mobile 2D-code readers



HS 6608, HS 6678
Mobile 2D-code readers

Area imager	With Bluetooth	Area imager	With Bluetooth	Area imager	Area imager	With Bluetooth
0 – 561 mm		25 – 16,000 mm		0 – 170 mm	0 – 147 mm	
Integrated: RS 232 / USB Keyboard Wedge PS 2		Integrated: RS 232 / USB Keyboard Wedge PS 2		Integrated: RS 232 / USB	Integrated: RS 232 / USB Keyboard Wedge PS 2	
With MA 21 connection unit multiNet		With MA 21 connection unit multiNet		With MA 21 connection unit multiNet	With MA 21 connection unit multiNet	
With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP EtherCAT DeviceNet CANopen		With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP EtherCAT DeviceNet CANopen		With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP EtherCAT DeviceNet CANopen	With MA 200i connection unit PROFINET IO/RT PROFIBUS Ethernet TCP/IP, UDP EtherCAT DeviceNet CANopen	
Cable for: RS 232, USB, Keyboard-Wedge; holder, power supply unit, base station		Cable for: RS 232, USB, Keyboard-Wedge; holder, power supply unit, base station		Cable for: RS 232, USB; power supply unit, mounting bracket	Cable for: RS 232, USB, Keyboard-Wedge; holder, power supply unit, base station	
4.5 – 5.5 V DC		4.5 – 5.5 V DC		4.5 – 5.5 V DC	4.5 – 5.5 V DC	
High-contrast codes Degree of protection IP 41		Tough industrial use High-contrast codes Degree of protection IP 65		Reading of directly marked codes (laser or matrix printed) with low contrast Degree of protection IP 65	Tough industrial use Reading of directly marked codes (laser or matrix printed) with low contrast Degree of protection IP 65, IP 67	
Bar codes and 2D-codes		Bar codes and 2D-codes		Bar codes and directly marked 2D-codes	Bar codes and directly marked 2D-codes	
CE		CE		CE	CE	

Large reading field for detection of high-contrast codes ■ Ergonomic and robust housing ■ Operating temperature 0 °C ... +50 °C

Large reading field for detection of high-contrast codes ■ Ergonomic and very robust housing for rough applications ■ Operating temperature from –30 °C ... +50 °C (IT 1910i, IT 1980i) –20 °C ... +50 °C (IT 1911i, IT 1981i)

High resolution for directly marked parts (laser or matrix printed) and labels ■ Ergonomic and robust housing ■ Operating temperature 30 °C ... +50 °C

High resolution for directly marked codes ■ Display for successful reading with LED, signal tone and vibration ■ Ergonomic and robust housing ■ Operating temperature –30 °C ... +50 °C (HS 6608) –20 °C ... +50 °C (HS 6678)

Modular connection units



MA 8, 150
Point to Point



MA 2, 100
Point to Point
multiNet Slave



MA 4, 4D
Point to Point
multiNet Slave

Specifications

Connection type	1 plug M12, 5 pin 2 sockets M12, 5 pin	1 connector, 4 M12 sockets	Spring terminals, 5 PGs		Spring terminals, 5 PGs
Interfaces	RS 232 RS 485	RS 232 RS 422	RS 232 RS 485 multiNet Slave Maintenance interface RS 232 9 pin Sub-D	RS 232 RS 422 RS 485 multiNet Slave	RS 232 RS 485 multiNet Slave Service interface RS 232 9 pin Sub-D
Properties	1 switching input 1 switching output	Decentralized distribution of the signals	2/1 switching input 2/1 switching output Network address	1 switching input 1 switching output Network address Termination	2/1 switching input 2/1 switching output Network address Automatic parameter memory
Degree of protection	IP 54	IP 54	IP 54	IP 54	IP 54
Certifications	CE c UL US	CE c UL US	CE c UL US	CE c UL US	CE

BCL 8	KB 008 / direct (MA 8 only)			
BCL 21			Direct	Direct
BCL 22			Direct	Direct
BCL 300i			KB 301-3000 (only MA 100)	
BCL 500i			KB-500-3000-Y (only MA 100)	
BCL 900i				
DCR 200i	Direct (MA 150 only)			
LSIS 222			KB M12A-8P-MA-3000	
LSIS 4x2i			KB JST	
RFI / RFM			Direct (MA 2 only)	
ODS 96				
Mobile code readers				
BPS 8	KB 008 / direct (MA 8 only)			

● The red dots denote assignment of the connection units to the relevant devices. See catalog, for more combination possibilities.

m = multiNet



MA 900
Point to Point



MA 31
multiNet Master



MA 200i
Fieldbus gateway



MD 200i, 700i
IO-Link master

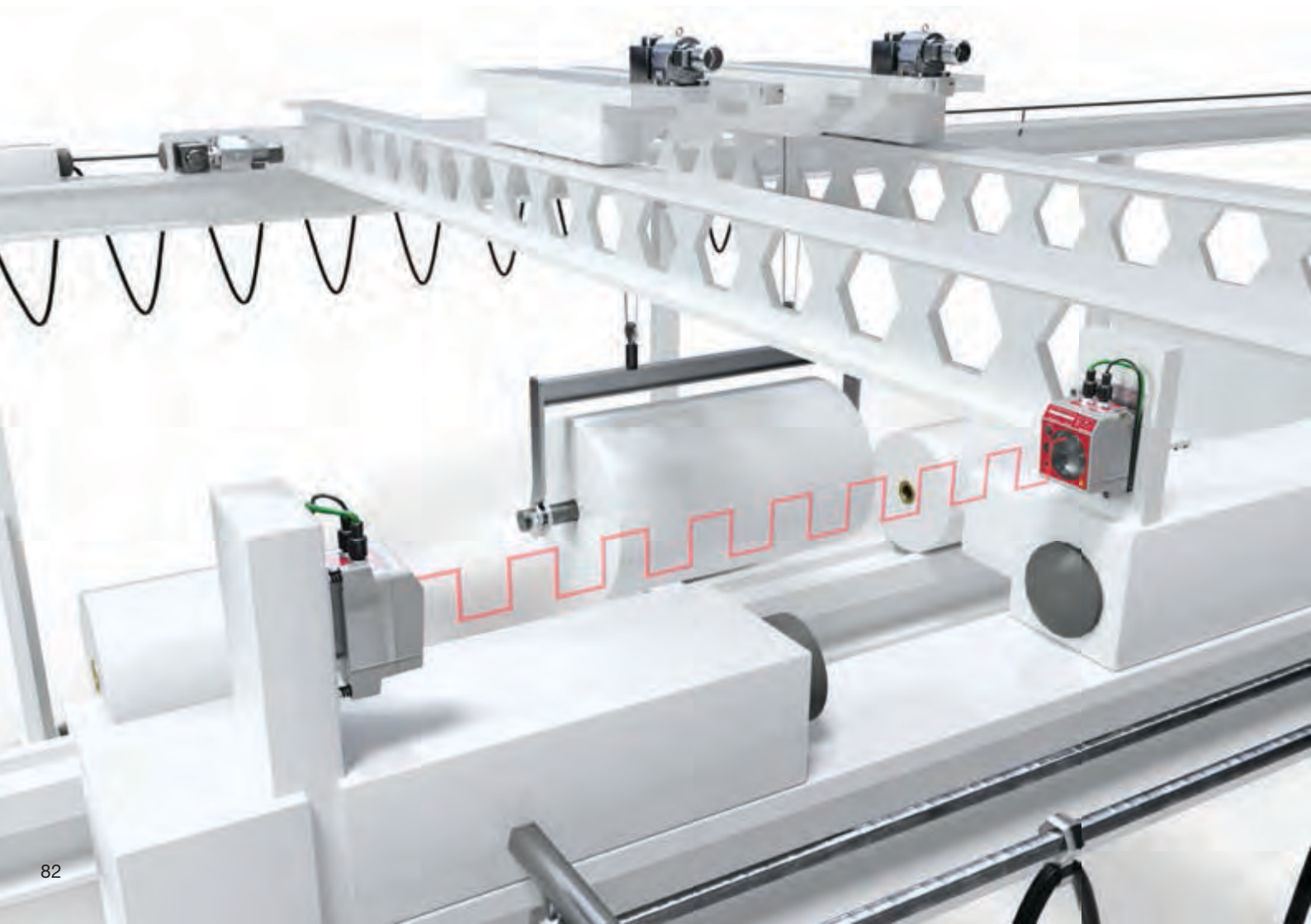
Spring terminals, 8 PGs	Spring terminals, 5 PGs, M12 connection sets available (optional)	4x M12 1x plug connection RS 232	
RS 232 RS 422 RS 485	RS 232 – or RS 422 –, TTY – Host multiNet master RS 485 multiNet Slave Service interface RS 232 9 pin Sub-D	PROFIBUS PROFINET IO/RT Ethernet TCP/IP EtherCAT DeviceNet EtherNet/IP CANopen	PROFINET IO-Link master EtherNet/IP IO-Link master
3 switching inputs 4 switching outputs Optional external parameter memory	2 switching inputs 2 switching outputs Network address Automatic parameter memory	Integrated switch Voltage IN/OUT 1 switching input 1 switching output	4 ports, M12 8 ports, terminals, DIN rail mounting
IP 65	IP 65	IP 65	IP 20 / IP 67
CE cUL US	CE	CE cUL US	CE cUL US
		KB JST-M12A-5P-3000 connection set	● For connecting switching sensors with IO-Link and M12 cable, 4- or 5-wire
		Direct	●
		KB 301-3000-MA200	
		KB 500-3000-Y	
KB 900 ●			●
		KB M12-8P- MA-3000	●
		KB JST-M12A-8P- Y-3000	●
		Direct	●
		KB-JST-3000	●
		KB-JST-HS-300	●
		KB JST-M12-5P-3000	●

DATA TRANSMISSION

And then there was light:
Transmit data quickly and easily

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

This technology is used with high-bay storage devices, side-tracking skates, electroplating plants as well as gantry cranes. We offer optical data transceivers with various operating ranges and different fieldbus interfaces. The sensors are characterized by their easy alignment with integrated laser alignment aid as well as a bar graph indicator, thereby allowing them to be quickly put into operation. Operating ranges up to 500 meters and an integrated diagnostics function make them unique.



Powerful data transmission photoelectric sensor: with integrated web server for remote diagnostics

The DDLS 500 data transmission photoelectric sensor enables contact-free communication wherever mechanical systems are pushed to their limits, e.g. with high-bay storage devices. The integrated web server, which can handle remote diagnostics, is globally unique.

The DDLS 500 is also characterized as a PROFINET participant with real-time data transmission over up to 200 meters. Models available with various operating ranges and interface protocols. Furthermore, we offer optional equipment features, such as a laser pointer for alignment 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 200

Optical data transmission



DDLS 500

Optical data transmission

Specifications		
Operating range	120, 200, 300, 500 m	40, 120, 200 m
Light source	Infrared LED	Infrared laser (laser class 1)
Transmission rate	2 Mbit/s	100 Mbit/s
Interfaces	PROFIBUS CAN DeviceNet Interbus Rockwell DH+ or RIO RS 422	PROFINET EtherNet IP EtherNet TCP/IP EtherCat UDP
Degree of protection	IP 65	IP 65
Supply voltage	18–30 V DC	18–30 V DC
Operating temperature	–5 °C ... +50 °C (–30 °C ... +50 °C with heating)	–5 °C ... +50 °C (–35 °C ... +50 °C with heating)
Certifications	CEULUS	CECDRHULUS

Features	<div>No-contact, wear-free data transmission ▪ Integrated mounting and alignment plate ▪ Optionally with heating</div>	<div>Transparent, real-time transmission of all TCP/IP- and UDP-based protocols ▪ Very simple diagnostics of the transmission technology ▪ Pre-mounted and complete delivery of all mounting and alignment elements ▪ Integrated laser pointer for simple alignment (available optionally) ▪ Simple remote maintenance via web browser-based user interface (available optionally) ▪ Device models as PROFINET network participants</div>
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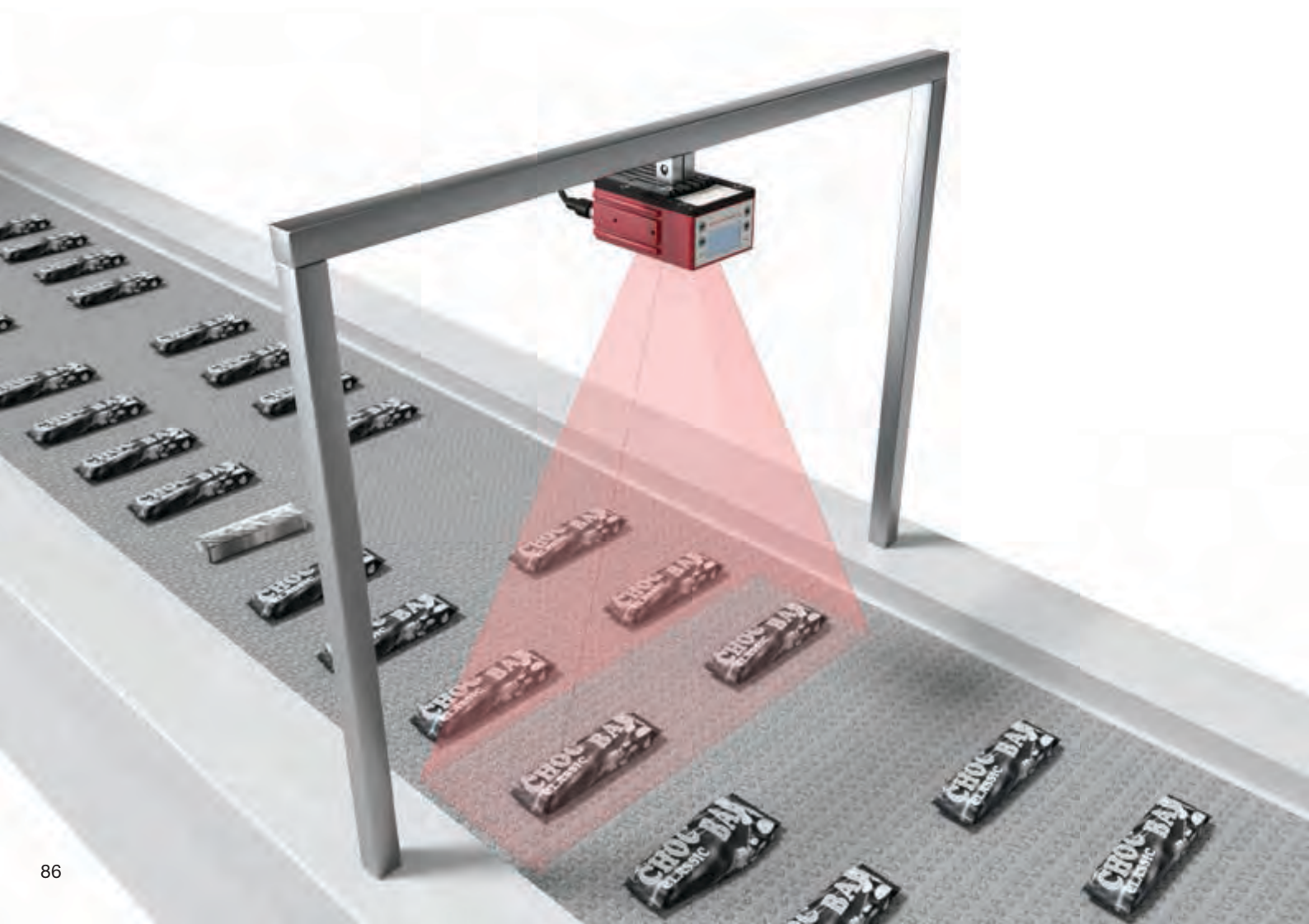
INDUSTRIAL IMAGE PROCESSING

Picture-perfect connection: Innovative smart-camera technology paired with extensive code-reading know-how

In material processing, it is often necessary to monitor processes and areas that the system operator cannot access or which are not easily visible, especially under harsh ambient conditions.

The LCAM 408i industrial IP camera provides insight in real-time. If individual process steps need to be checked during the manufacturing of products, image processing is used. The LSIS 400i smart camera is used above all for object detection, position determination or quality assurance in manufacturing processes.

The product family includes devices for bar code and 2D-code reading, powerful tools such as measurement systems for edge scanning for dimension monitoring or BLOB analysis for completeness and presence control.



High-performance camera technology: fast identification and economical quality assurance

The LSIS 462i smart camera is used anywhere different labels must be detected and evaluated at high speed. It reads printed and directly marked 1D- or 2D-codes absolutely reliably – independent of contrast.

In addition to BLOB analysis and code reading, it is now also possible to measure distances and geometric shapes such as circles, lines and edges, with a user interface.

Due to the broad function range, the LSIS 462i is, in many, ways the best and most efficient solution for quality inspection, code reading and measurement tasks.

LSIS 462i

- 3 functions in one device (BLOB analysis, code reading, measurement through edge scanning)
- Fast integration via standard web browser
- Integrated display and well-structured software simplify operation
- All parameters are stored in the device and enable high availability
- Pulsed or continuous operation depending on the application



Smart cameras





LSIS 412i
Smart camera



LSIS 462i
Smart camera



LCAM 408i
Industrial IP camera

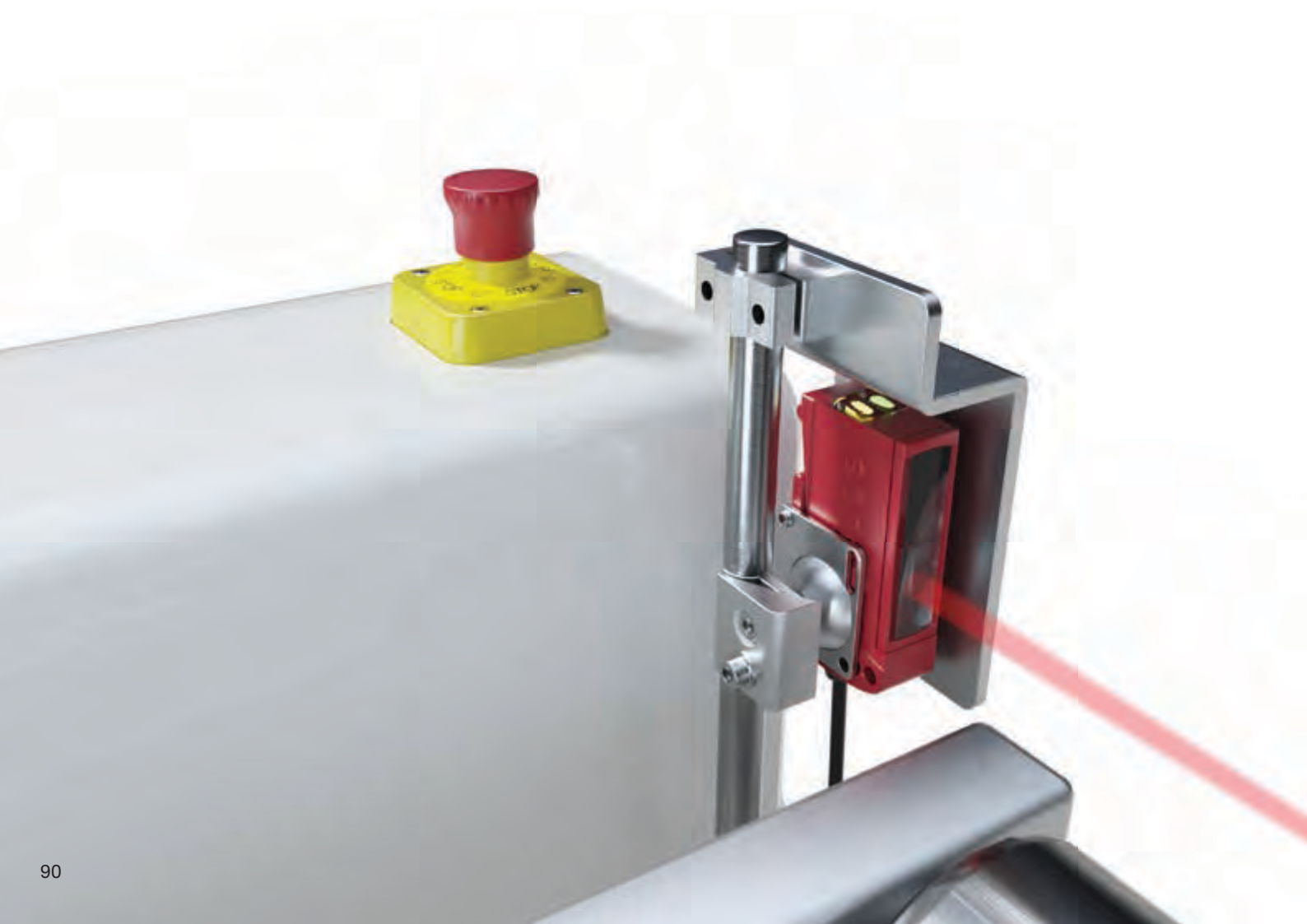
Typical applications			
Presence/ completeness monitoring	X	X	
Dimension / position monitoring	X	X	
Position and type detection	X	X	
Code reading		Data Matrix, bar code, Pharmacode	
Measurement		X	
Compartment fine positioning			
Monitoring camera			X
Sensor / cameras	CMOS (Global Shutter)	CMOS (Global Shutter)	Color CMOS
Resolution (pixel)	752 × 480	752 × 480	2,592 × 1,944
Focal point	50 mm ... ∞ (focal length 8 mm) 75 mm ... ∞ (focal length 16 mm) Depends on lens with C-mount models	50 mm ... ∞ (focal length 8 mm) 75 mm ... ∞ (focal length 16 mm) Depends on lens with C-mount models	500 mm ... ∞
Interface	Integrated: Ethernet, RS 232	Integrated: Ethernet, RS 232	Integrated: Ethernet
Connectivity	With MA 200i connection unit PROFINET IO/RT PROFIBUS EtherCAT DeviceNet CANopen	With MA 200i connection unit PROFINET IO/RT PROFIBUS EtherCAT DeviceNet CANopen	
Digital inputs/outputs	8, configurable	8, configurable	n. a.
Fast EtherNet	Yes	Yes	Gigabit
Optional	Cables, mounting devices, external illumination	Cables, mounting devices, external illumination	Cables, mounting devices, external illumination
Number of test routines	Typically 10 to 60, depending on scope of test	Typically 10 to 60, depending on scope of test	n. a.
Configuration / Operating system	Configuration via PC using standard Web browser (webConfig tool)	Configuration via PC using standard Web browser (webConfig tool)	Configuration via PC using standard Web browser (webConfig tool)
Options		Such as LSIS 422i (s. p. 72)	
Dimensions, W × H × D	75 × 113 × 55 mm	75 × 113 × 55 mm	75 × 113 × 55 mm
Certifications	CE c_{UL} US	CE c_{UL} US	CE
Features			
	Very well suited for industrial use through glass or plastic window ▪ Metal housing and homogeneous integrated illumination (depends on type: white, IR or RGBW) ▪ Degree of protection IP 65 / IP 67 ▪ Flexible use through motor-driven focus adjustment	Very well suited for industrial use through glass or plastic window ▪ Metal housing and homogeneous integrated illumination (depends on type: white, IR or RGBW) ▪ Degree of protection IP 65 / IP 67 ▪ Flexible use through motor-driven focus adjustment	Very well suited for industrial use through glass window and metal housing ▪ Degree of protection IP 65 / IP 67 ▪ 5 megapixel color camera chip for live transmission in MJPEG format

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/en/accessories.





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.

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.



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.

Reflectors

Just how reliably retro-reflective photoelectric sensors can detect depends upon the selected reflector, among other things. That is why we offer various fitting solutions made of plastic, film, and glass for all conceivable conditions.



Power supply

A reliable and machine-independent power supply with 1- and 3-phase power supplies is an elementary part of an optimum and efficient sensor system. For this reason, we also offer load circuit monitoring modules to ensure a higher level of safeguarding against failure.

Signaling devices

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



Connection-technik











Connection and interconnection cables



User-configurable connectors



Distribution boxes

Specifications			
Interfaces	CANopen, DeviceNet, Ethernet, Interbus-S, PROFIBUS DP, SSI	CANopen, DeviceNet, Ethernet, Interbus-S, PROFIBUS DP, SSI	–
Screw fitting	CUZN, stainless steel	Knurling in CUZN or V4A	–
No. of pins	3-, 4-, 5-, 8-, 12-, 19-pin	3-, 4-, 5-, 8-pin	4, 6, 8, 10-pin
Lengths	2, 5, 10 m	–	3, 5, 10 m
Shield	Shielded via the knurling; conducted/unshielded	Shielded via the knurling; conducted/unshielded	Unshielded
Degree of protection	IP 65 / 67 / 69K	IP 65 / 67	IP 65 / 67 / 69K
Mechanical life time	> 100 mating cycles	> 100 mating cycles	> 100 mating cycles
Certifications	  	  	 
Functions			
	Sensor-actuator voltage supply ▪ Signal transmission	Sensor-actuator voltage supply ▪ Signal transmission	Collector cable for pluggable, passive, actuator-sensor distribution box ▪ Voltage supply ▪ Signal transmission
Features			
	<p>Wide selection of connection and interconnection cables for industrial automation in a variety of application areas</p> <ul style="list-style-type: none"> ▪ Interconnection cables extruded on both ends or connection cables with open cable end ▪ LED status indicator: green / orange <p>Cable properties:</p> <ul style="list-style-type: none"> ▪ Halogen-free PUR – for harsh operating conditions with maximum abrasion resistance, drag-chain compatible and very resistant to oils, coolants and lubricants ▪ PVC – for moderate mechanical demands, easy to strip, highly resistant to ECOLAB-certified cleaning agents in hygiene applications 	<p>With configurable connectors, individual cable lengths can be realized and thereby facilitate maximum flexibility in machine planning</p>	<p>Passive distribution box for either M8 or M12 sensor connection for simple bundling of sensors and actuators</p> <ul style="list-style-type: none"> ▪ LED status indicator: green / orange ▪ Material: plastic ▪ Standardized mounting ▪ Lightweight construction

Signaling devices



Signaling column, type A



Signaling column, type E



Other signaling devices

Specifications			
Operating voltage	24 V DC $\pm 10\%$	24 V AC/DC, $\pm 10\%$	24 V AC/DC, $\pm 10\%$
Degree of protection	IP 66	IP 66	IP 65
Diameter	70 mm	70 mm, 40 mm	30 / 45 / 65 mm and others
Certifications			
Housing	Plastic, PC-ABS	Plastic, PC	Plastic, PC
Functions			
	Optical & acoustic signaling for displaying machine states	Optical & acoustic signaling for displaying machine states	Optical & acoustic signaling for displaying machine states
Features			
	<p>Flexible configuration: 5 different colors (red, orange, green, blue, white)</p> <ul style="list-style-type: none"> ▪ Simple mounting: base mounting: 3 stand heights with plastic foot ▪ Module connection via bayonet lock ▪ Position-independent – protection against interchanging ▪ Transparent calottes/uniform, clear glass optics ▪ Single-sound & multi-sound buzzer modules (up to 105 dB) ▪ Preassembled models & freely configurable elements ▪ Signal image: continuous light & flashing light ▪ Multicolor with 7 different colors 	<p>6 different colors (red, orange, green, blue, white, yellow)</p> <ul style="list-style-type: none"> ▪ Base mounting, bracket mounting, horizontal mounting ▪ Single-sound buzzer module ▪ Preassembled models & freely configurable elements ▪ Signal image: continuous light & flashing light 	<p>Various installation versions: signaling columns, panel-mount modules, multitone & beacon</p>

Mounting systems



Mounting bracket



Rod mounting



Other mounting systems

Specifications			
Material	Galvanized steel, stainless steel	Galvanized steel, stainless steel, aluminum	Galvanized steel, stainless steel, aluminum, plastic
Mounting at device	Screw type	Screw type	Screw type or clampable
Mounting at system	Screw type	Clampable on rod	Screw type
Functions			
	Mounting bracket with possibility for device alignment	Mounting bracket with flexible alignment and alignment function for the device	Fixed mounting, with limit stop in some cases
Features			
	Diverse versions for various sensors	Diverse versions for various sensors and reflectors	Diverse versions for various sensors with cylindrical design

Reflectors



**Standard reflectors,
micro-triad-type
reflectors**



Reflective tapes



**Reflectors with
higher resistance**

Specifications			
Material	PMMA	PMMA	Stainless steel and scratch-resistant plastics
Triple reflector size	0.3 – 4 mm	0.3 – 4 mm	0.3 – 4 mm
Functions			
	Various sizes, from 20 to 180 mm	Various films from 9 to 920 mm, also available as rolls of 45.7 m	Different designs available
Features			
	Adhesive, pluggable and screw-type versions	Adhesive and self-adhesive versions	Adhesive, clampable and screw-type versions ■ Versions with increased resistance for intensive use of cleaning agents

Switching Sensors

Optical Sensors
Ultrasonic Sensors
Fiber Optic Sensors
Inductive Switches
Forked Sensors
Light Curtains
Special Sensors

Measuring Sensors

Distance Sensors
Sensors for Positioning
3D Sensors
Light Curtains
Forked Sensors

Products for Safety at Work

Optoelectronic Safety Sensors
Safe Locking Devices, Switches and Proximity Sensors
Safe Control Components
Machine Safety Services

Identification

Bar Code Identification
2D-Code Identification
RF Identification

Data Transmission / Control Components

MA Modular Connection Units
Data Transmission
Safe Control Components
Signaling Devices
Connection Technology and Passive Distribution Boxes

Industrial Image Processing

Light Section Sensors
Smart Camera

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