Leuze electronic

the sensor people

Product Overview 2010/2011

PRODUCT LINE

Superior products ...

... superior solutions.

Leuze electronic offers the highest quality products that have been proven in industrial applications worldwide, along with a leading track record of increasing reliability and efficiency for our customers.

- Packaging ■ Filling ■ Labeling
- Material Handling
- Printing ■ Graphic ■ Paper
- Automotive ■ Industrial
- Woodworking
- Machine Tools
- Robotic Cells

Superior engineering for an efficient world.

International business – international success.

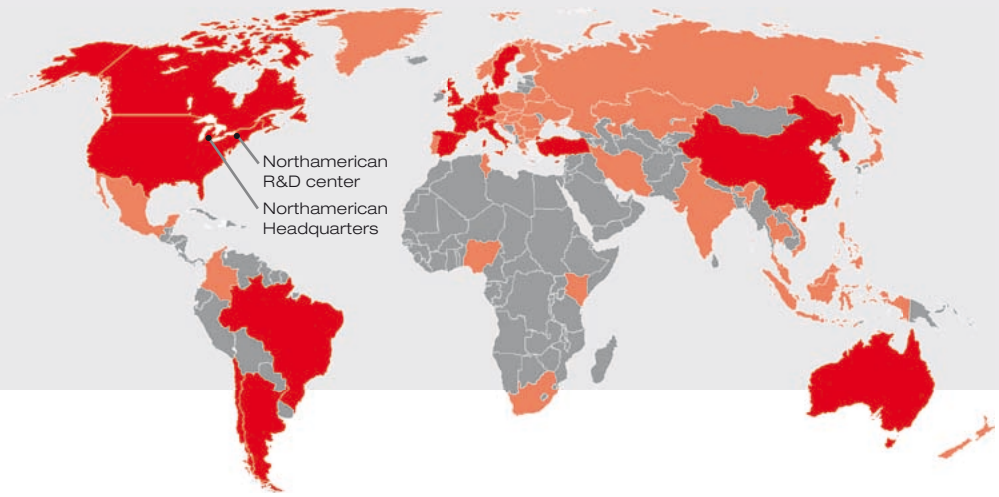
Using the most cutting-edge technology, our highly qualified specialists will provide you with solutions that are optimal for your applications. Versatility, productivity and control have been designed into every one of our products.

With 16 wholly owned subsidaries and more than 40 sales representatives world wide Leuze electronic offers unparalleled expertise in product selection, integration support, training, trouble-shooting and production enhancement. Also, with over 12,000 products and our global service network, we have earned a superior reputation for providing high-technology value added products and outstanding customer support.

16 wholly owned subsidiaries

- USA
- France
- Great Britain
- Italy
- Netherlands
- Sweden
- Switzerland
- Spain
- Brazil
- Mexico
- China
- South Korea
- Australia
- Belgium
- Turkey
- Denmark

42 sales representatives



Leuze electronic North America
Headquarters
New Hudson, Michigan, USA

Leuze electronic North America
Manufacturing Facilities
New Hudson, Michigan, USA

Leuze electronic North America
R&D-Center
Rochester, New York, USA

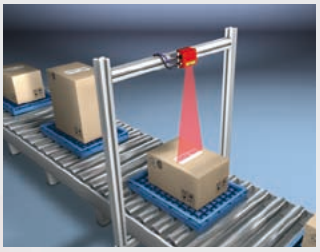
German innovation – since 1861.

Our success story.

Founded in 1861 as a textile mill, Leuze engineered a way to be able to detect the presence of yarn in winding machines and developed the first optical sensor in the world for this application. The need for optical sensors increased dramatically over the years and by 1963, Leuze electronic was founded.

Today – as one of the leading manufacturers of optoelectronic sensors – our world-class development and manufacturing facilities continually design new and innovative products. Offering the most extensive range of sensors available, our solutions are quality engineered to give our customers a decisive advantage and increase productivity and profitability by reducing installation, set up and change-over times.

Founded in southern Germany in 1861 ...



... today new innovations in sensor technology.

The sensor people – a tradition of excellence.

Our people make the difference.

Great people are the key to success. Our highly trained, highly qualified people have more than 45 years of experience in manufacturing and in implementing sensor solutions. With annual sales of over $164 million, Leuze electronic has proven over and over to have a wealth of experience and application know-how. Our continuous strive for perfection, drive innovation and participation in industrial workgroups increases our development of new sensor standards worldwide.

Our sensor people are eager to learn every detail about your application, your unique needs and your business. This allows us to engineer quality products that give you a decisive advantage to increase productivity, efficiency and profitability by reducing installation, set up and change-over times for the success of your business. Our commitment to our customers and partners along with the wide selection of sensors, sensor systems and individually tailored custom solutions will make the difference for you.

Leuze electronic proudly presents.

New in 2010.

Innovation and technical excellence is the driving force behind our business. This is why we are consistently enhancing our product portfolio. Two of our new product highlights are:

LSiS 400*i*: The latest revolution in camera technology.

- Superior processing power
- Real-time defect image storage
- Fast integration through web configuration
- Flexible due to motor driven focus adjustment
- Internal homogeneous LED-lighting, fully configurable
- Ethernet connectivity
- IP65 housing

LPS/LES: High precision line profile scanning, best in class.

- 200 – 800mm depth. up to 600mm wide, resolution 0.5 – 3mm
- Best in class performance/price ratio
- Encoder connectivity to generate 3D-profiles
- Ethernet interface
- Can be daisy-chained
- Smallest sensor in its class

Best in class products.

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Optoelectronic Sensors

Reliability and Efficiency.

Reliability and efficiency are the most important features of a sensor. Our focus has always been for our customers' systems to operate flawlessly with our sensors. Leuze sensors have the highest reliability rating in the industry and withstand the toughest conditions. Our state of the art technology keeps your productivity at its most efficient.




- A²LS (Active Ambient Light Suppression) significantly eliminates interference from external light sources such as sunlight or task lighting.

- brightvision® technology includes a highly visible light spot for easy alignment in addition to bright indicating LEDs on top of the sensor to ensure output switching and power.

- Auto-correct aids in applications such as clear glass detection: as the lens accumulates dust, the sensor adjusts automatically to compensate for the interference.

- Background suppression in our sensors has the best behavioural response ratio for black to white in the market. This makes it the most reliable sensor to disregard a bright background and detect a dull or dark object.

- IO-Link is a new international standard in industrial networks that Leuze electronic has developed together with other leading companies. It is a user-friendly system, with easy to follow instructions for setting multiple sensors and pin-pointing problems individually via your control system. Overall system reliability is increased as your network recognizes and sets each device.

Detection Sensors

3B Series
General purpose

Specifications		
Dimens. excl. plug, W × H × D		11 × 32 × 17 mm
Operating voltage		10 – 30 V DC
Switching outputs		PNP, NPN, push-pull
Connection type		M8, cable, cable+M8/M12
Protection class		IP 67, IP 69 K
Certifications		CE CDRH c UL us
Housing		Plastic
Throughbeam photoelectric sensors		
Operating range*		0 – 10 m
Light source		Red light
Switching		Light, antivalent
Switching frequency		1000 Hz
Retro-reflective photoelectric sensors		
Operating range*		0 – 7/0.02 – 5.5/0 – 3 m
Light source		Red light/infrared/laser
Switching		Light/dark, antivalent
Switching frequency		1000/1000/2000 Hz
Diffuse reflection light scanners		
Operating range*		0 – 550 mm
Light source		Red light
Switching		Light, dark, antivalent
Switching frequency		1000 Hz
Diffuse reflection light scanners with background suppression		
Operating range*		5 – 400 mm
Light source		Red light
Switching		Light, antivalent
Switching frequency		1000 Hz
Options		
Transparent media		X
Protective photoelectric sensors category 2		
Warning output		X
Activation input		X
A^2LS		X
Features		
		Sturdy metal sleeves. Scanner with a wide light spot. Teach-In. Foil detection < 20 µm. Bottle detection. ECOLAB. Contrast scanner. Versions for Ex zone 2 and 22.

* Typical operating range limit

53 Series Stainless steel housing	**55 Series** Stainless steel housing	**25 Series** General purpose	**18 Series** Clear glass detection
			
14 × 54 × 20 mm	14 × 36 × 25 mm	15 × 39 × 29 mm	15 × 50 × 33 mm
10 – 30 V DC	10 – 30 V DC	10 – 30 V DC	10 – 30 V DC
Push-pull	Push-pull	PNP, push-pull	PNP, NPN, 4 – 20 mA
M8, cable+M8	M8, cable+M12	M8, M12, cable, cable+M8/M12	M8, M12, cable
IP 67, IP 69 K	IP 67, IP 69 K	IP 67, IP 69 K	IP 67, IP 69 K
CE CDRH c UL us	CE CDRH c UL us	CE CDRH c UL us	CE c UL us
Stainless steel 316L	Stainless steel 316L	Plastic	Metal, stainless steel VA
0 – 10 m	0 – 10 m	0 – 24 m	
Red light	Red light	Red light	
Antivalent	Antivalent	Light, antivalent	
1000 Hz	1000 Hz	500 Hz	
0 – 5/0 – 3 m	0 – 5/0 – 3 m	0 – 10/0.05 – 15 m	0 – 5 m
Red light/laser	Red light/laser	Red light/laser	Red light
Antivalent	Antivalent	Light, dark, antivalent	Light/dark
1000/2000 Hz	1000/2000 Hz	500/2000 Hz	1500 Hz
		5 – 800 mm	
		Red light	
		Antivalent	
		500 Hz	
5 – 400 mm	5 – 400 mm	5 – 400 (800)	
Red light	Red light	Red light/infrared	
Antivalent	Antivalent	Antivalent	
1000 Hz	1000 Hz	500/200 Hz	
X	X	X	X
		X	
		X	X
		X	
X	X	X	X
HYGIENE-Design. Clean*Proof*+. ECOLAB. EHEDG. Foil detection < 20 µm. Bottle detection. Contrast scanner. Versions for Ex zone 2 and 22.	WASH DOWN-Design. Clean*Proof*+. ECOLAB. Foil detection < 20 µm. Bottle detection. Contrast scanner. Versions for Ex zone 2 and 22.	Teach-In. Mechanically adjustable scanning range. Sensitivity adjustment. Sensor for vertical positioning. Retro-reflective sensor with large performance reserve / for stretch-wrapped containers. ECOLAB.	Tracking function. Teach-In. Foil detection < 20 µm. Bottle detection. ECOLAB.

Detection Sensors

8 Series
High performance

Specifications		
Dimens. excl. plug, W × H × D		15 × 48 × 38 mm
Operating voltage		10 – 30 V DC
Switching outputs		PNP, NPN, push-pull
Connection type		M12, cable
Protection class		IP 67, IP 69 K
Certifications		CE CDRH c UL us
Housing		Metal, glass
Throughbeam photoelectric sensors		
Operating range*		0 – 20/0 – 100 m
Light source		Red light/laser
Switching		Antivalent/light
Switching frequency		1500/2800 Hz
Retro-reflective photoelectric sensors		
Operating range*		0 – 8/0 – 20 m
Light source		Red light/laser
Switching		Antivalent/light, dark
Switching frequency		1500/2800 Hz
Diffuse reflection light scanners		
Operating range*		5 – 800 mm
Light source		Red light
Switching		Antivalent
Switching frequency		1500 Hz
Diffuse reflection light scanners with background suppression		
Operating range*		5 – 400 mm
Light source		Red light/infrared/laser
Switching		Antivalent/light
Switching frequency		1000/1000/2000 Hz
Options		
Transparent media		X
Protective photoelectric sensors category 2		X
Warning output		X
Activation input		
A^2LS		X
Features		
		Contrast scanner, luminescence scanner. Foreground suppression. Ultrasonic sensors. Turnable connector. Foil detection. Bottle detection. ECOLAB.

* Typical operating range limit

95 Series Clear glass detection	46B Series General purpose	93 Series Close object detection	96 Series Full featured
			
17 × 66 × 35 mm	18 × 75 × 43 mm	20 × 60 × 44 mm	30 × 90 × 70 mm
10 – 30 V DC/18 – 30 V DC	10 – 30 V DC	10 – 30 V DC	10 – 30 V DC/20 – 230 V AC/DC
PNP, NPN	PNP, push-pull, relay	PNP	PNP, NPN, relay
M12	M12, cable+M12, cable	M12, cable	M12, terminals
IP 67, IP 69 K	IP 67, IP 69 K	IP 65	IP 67, IP 69 K
CE c UL us	CE CDRH c UL us	CE	CE CDRH c UL us
Metal	Plastic	Metal	Metal, plastic
0 – 18/0 – 20 m	0 – 60 m		0 – 39/0 – 150 m
Red light/infrared	Red light		Red light/infrared
Antivalent	Light, antivalent		Light, dark, antivalent
1000 Hz	500 Hz		500 Hz
0 – 9 m	0.05 – 18 m		0 – 28/0.1 – 18 m
Red light	Red light		Red light/infrared
Light, antivalent	Light, dark, antivalent		Light, dark, antivalent
1000 Hz	500 Hz		1000 Hz
10 – 900/10 – 400 mm	30 – 900 mm	0 – 220 mm	30 – 700/20 – 1200 mm
Red light/infrared	Red light	Infrared	Red light/infrared
Antivalent	Antivalent	Light	Light, antivalent
1000 Hz	500 Hz	250 Hz	1000 Hz
20 – 500 mm	5–1800/0–2500/50–1200 mm		100–1200/10–2500/50–6500 mm
Red light/infrared	Red light/infrared/laser		Red light/infrared/laser
Antivalent	Light, dark, antivalent		Light, dark, antivalent
1000 Hz	200/200/1000 Hz		300/300/100 Hz
X			X
X	X		X
X	X	X	X
X	X		X
X	X	X	X
Foreground suppression. Operator guidance for transparent media. Bottle detection. Foil detection.	Scanner with optimized light spot for roller conveyors. Retro-reflective sensor for stretch-wrapped containers. Versions for Ex zone 2 and 22. ECOLAB.	Foreground and background suppression. Maximum detection reliability through V-optics.	Optics heating. Switching delay. Wide angle. Up to 3 switching points. Diagnosis. Analog output (current/voltage). Foreground suppression. L/D switching. Mech. adjustable scanning range. Teach-In. ECOLAB. Versions for Ex zone 2 and 22.

Cylindrical Sensors
Mini Sensors
Fiber Optic Amplifiers

Specifications		
Dimens. excl. plug, W × H × D		M12 × 55 mm
Operating voltage		10 – 30 V DC
Switching outputs		PNP
Connection type		M12, cable
Protection class		IP 67
Certifications		CE
Housing		Metal
Throughbeam photoelectric sensors		
Operating range*		0 – 8 m
Light source		Red light
Switching		Light/dark
Switching frequency		500 Hz
Retro-reflective photoelectric sensors		
Operating range*		0.05 – 1.6 m
Light source		Red light
Switching		Light/dark
Switching frequency		700 Hz
Diffuse reflection light scanners		
Operating range*		0 – 400 mm
Light source		Red light
Switching		Light/dark
Switching frequency		700 Hz
Diffuse reflection light scanners with background suppression		
Operating range*		
Light source		
Switching		
Switching frequency		
Options		
Transparent media		
Protective photoelectric sensors category 2		
Warning output		
Activation input		
A^2LS		
Features		

* Typical operating range limit

318 Cylindrical Sensors	618 Cylindrical Sensors	Mini Sensors	LVS Fiber Optic Amplifier
			
M18 × 50 mm	M18 × 60 mm		
10 – 30 V DC	10 – 30 V DC	10 – 30 V DC	10 – 30 V DC
PNP, NPN, push-pull	PNP	PNP, NPN, relay	PNP, NPN
M12, cable	M12	M12, cable	M8, cable, terminals
IP 67	IP 67	IP 65	IP 65
CE CDRH c UL us	CE		CE
Stainless steel, plastic	Metal	Metal, stainless steel, plastic	Metal, plastic
0 – 45/0 – 120 m	0 – 12 m	0 – 35 m	0 – 1 m
Infrared/laser	Infrared	Infrared	Red light/infrared
Antivalent	Light/dark	Light/dark	Light/dark
1000/5000 Hz	500 Hz	70/1000 Hz	1500/1000 Hz
0.02 – 6/0.02 – 6/0.1 – 15 m	0 – 7 m	0 – 1.5 m	
Red light/infrared/laser	Red light	Infrared	
Antivalent	Light/dark	Light/dark	
1000/1000/5000 Hz	500 Hz	70/1000 Hz	
0 – 700/0 – 350 mm	0 – 300 mm	0 – 50 mm	0 – 100 mm
Infrared/laser	Infrared	Infrared	Red light/infrared
Antivalent	Light/dark	Light/dark	Light/dark
1000/5000 Hz	500 Hz	70/1000 Hz	1500/1000 Hz
1 – 140 mm			
Red light			
Antivalent			
1000 Hz			
X			
X			
X		X	
Bracket versions.			Glass fiber and plastic fiber optics. Teach-In. Sensitivity adjustment. Time functions. Activation input.

Inductive Switches

		IS 206, IS 208 IS 212, IS 218 IS 230 Standard		**S 212 IS 218 IS 230** Food & Beverage
				
Specifications				
Dimensions		Ø 6.5 × 35 mm M8 × 45 mm M12 × 50 mm M18 × 50 mm M30 × 50 mm		 M12 × 50 mm M18 × 50 mm M30 × 50 mm
Operating voltage		10 – 30 V DC		10 – 30 V DC
Range		up to 3 mm up to 4 mm up to 10 mm up to 20 mm up to 40 mm		 up to 10 mm up to 20 mm up to 40 mm
Switching outputs		PNP, NPN NO (make-contact), NC (break-contact)		PNP, NPN NO (make-contact), NC (break-contact)
Switching frequency		up to 5000 Hz up to 5000 Hz up to 3000 Hz up to 2000 Hz up to 1500 Hz		 up to 400 Hz up to 200 Hz up to 100 Hz
Connection type		M8, M12, cable		M12
Protection class		IP 67		IP 68 + IP 69K
Certifications		CE c UL us		CE
Housing		Metal, plastic		Stainless steel 316L
Features				
				Full-metal housing. ECOLAB.

Measuring Sensors

	LPS/LES Line profile scanner	ROD 4 (plus) Area scanner
		
Specifications		
Function	Line profile scanner, optical	Distance measurement, scanner, optical
Dimens. excl. plug, W × H × D	74.3 × 160 × 56 mm	140 × 148 × 133 mm 141 × 167 × 168 mm
Operating voltage	18 - 30V DC	24 V DC
Outputs	Ethernet	Ethernet/RS 232/RS 422 4 × PNP, 8 protective fields switchable
Connection type	M12	Sub-D, M12, M16
Protection class	IP 67	IP 65
Certifications	CE C UL US aprox. Q1, 2010	CE CDRH C UL US
Operating range*	200 - 800 mm	0 – 65000 mm
Measurement principle	Optical/laser	Optical/laser
Measurement time	10 ms/scan	40 ms/scan
Measuring panel width/angular range		190°
Resolution	0.5 - 3 mm	5 mm
Mouth width		
Mouth depth		
Operation	Configuration software OLED display	Configuration software
Features		
	OLED display for measured value display and configuration.	Optional: heating. Dust suppression.

* Typical operating range limit

ODS 25 **ODSL 8** **ODS 96B** Distance measurement	**ODSL 30** Distance measurement	**CCD Fork** **GS 754** Edge detection	**USDS** Ultrasonic distance measurement
			
Distance measurement, optical	Distance measurement, optical	Edge detection	Distance measurement, ultrasonics
15 × 36 × 27 mm 15 × 48 × 38 mm 30 × 90 × 70 mm	79 × 69 × 149 mm	19 × 81.5 × 91.5 mm 20 × 155 × 91.5 mm	M18 × 104 mm M30 × 150 mm
10 – 30 V DC 18 – 30 V DC (analogue)	10 – 30 V DC 18 – 30 V DC (analogue)	18 – 30 V DC	20 – 30 V DC
4 – 20 mA 1 – 10 V RS 232/RS 485 1 × PNP/2 × push-pull	4 – 20 mA 1 – 10 V RS 232/RS 485 3 × PNP/NPN	2 × 4 – 20 mA 2 × 0 – 10 V RS 232/RS 422/RS 485 3 × PNP	4 – 20 mA 0 – 10 V 1 × PNP, 2 × PNP
M12	M12	M12	M12
IP 67, IP 69 K	IP 67	IP 54	IP 67, IP 65
CE CDRH c UL us	CE CDRH c UL us	CE	CE c UL us
25 – 200 mm 20 – 500 mm 60 – 10,000 mm	200 – 30000 mm		0 – 6000 mm
Optical/LED/Laser	Optical/laser	Optical/LED	Ultrasonics
1 – 5 ms	30 – 100 ms	min. 20 ms	100 ms – 1 s
		25 mm	
0.01 – 3 mm	0.1 – 1 mm	14 µm	1 – 9 mm
		29 mm/100 mm	
		42 mm	
Teach-in Configuration software OLED display	LC display	Terminal program	Potentiometer, optional: Configuration software
OLED display for measured value display and configuration. Versions for Ex zone 1 and 21.	LC display for measured value display and configuration.		Temperature compensation.

Specialty Sensors

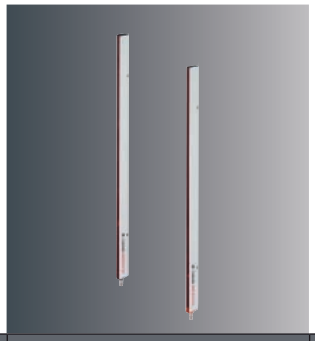
KRT 20 **KRT 8** **KRT 3B** Contrast scanner	**CRT 20** **CRT 20B** **CRT 442** Color Scanners	**LRT 440** **LRT 40** **LRT 8** Luminescence Scanners
		

Specifications	KRT 20 / KRT 8 / KRT 3B Contrast scanner	CRT 20 / CRT 20B / CRT 442 Color Scanners	LRT 440 / LRT 40 / LRT 8 Luminescence Scanners
Function	Contrast distinction	Color detection	Luminescence detection
Dimensions excl. plug, W × H × D	30 × 80 × 53 mm 15 × 48 × 38 mm 11 × 32 × 17 mm	30 × 80 × 53 mm 12 × 40 × 22 mm	23 × 70 × 43 mm 22 × 32 × 14.5 mm 15 × 48 × 38 mm
Operating voltage	12 – 30 V DC 10 – 30 V DC	12 – 30 V DC 24 V DC	10 – 30 V DC
Outputs	PNP, NPN, push-pull Analogue	1 × PNP/4 × PNP or 1 × NPN/4 × NPN Analogue	PNP, NPN
Connection type	M12, M8	M12	M12, cable
Protection class	IP 67, IP 69 K	IP 67	IP 67, IP 69 K
Certifications	CE c UL us	CE c UL us	CE c UL us
Operating range*	10, 12, 14.5, 20, 50 mm	12, 20, 50 mm 60 mm	20, 50, 100, 150 mm
Light source	LED, Laser	LED	LED
Switching frequency	25000/8000/6000/10000 Hz	6000/1500 Hz	600/2000/1500 Hz
Transmitter color	RGB/green/white/red laser	RGB	UV/blue
Light beam gate	Lateral or frontal	Lateral or frontal	Front
Light spot shape	4-fold/single	Square	Round
Light spot position	Lengthwise, sideways, oval	Lengthwise	
Operation	Teach-In, EasyTune	Teach-in	Teach-In, potentiometer, remote calibration
Features			
	Temperature compensation. Large dynamic range. Pulse stretching. Light/dark switching. Reversible control rod. ECOLAB. IO-Link.	Small construction. Glass optics. Turning connector. ECOLAB.	Small construction. Sensitivity adjustment. ECOLAB.

* Typical operating range limit

Measuring Light Curtains

VARIO B
PRG 108
Switching



KONTUR*flex*
Measuring

Specifications				
Function		One-way principle Reflection principle		One-way principle
Dimensions excl. plug, W × D × H		10 × 27 × 120 … 3370 mm 12 × 58 × 120 … 315 mm 22 × 80 × 25 mm		40 × 40 × 82 … 3202 mm
Operating voltage		24 V DC 10 – 30 V DC		24 V DC
Outputs		PNP, NPN		PNP, RS 232, RS 485 MODBUS, PROFIBUS CANopen
Connection type		M8, cable, cable + M12		M12
Protection class		IP 54, IP 67		IP 65
Certifications		CE		CE c UL us
Operating range*		5000 mm 3000 mm		4000 mm
Light source		Infrared/red light		Infrared
Cycle time		1 ms per beam / 2 ms		max. 25 ms
Measurement field length		35 – 3100/60 mm		80 – 3200 mm
Resolution		5, 12.5, 25, 50, 100 mm 6 mm		5, 10, 20 mm
No. of beams		max. 64/max. 8		max. 512
Operation		Autocalibration, PC configuration, configuration of switching output		Configuration via PC or system controller, inloop diagnostic facility
Features				
		2 switching ranges. Suppression of 4 light axes. Through holes. Blind holes with thread.		Max. 4 systems with up to 512 beams per controller. Versions for Ex zone 2 and 22.

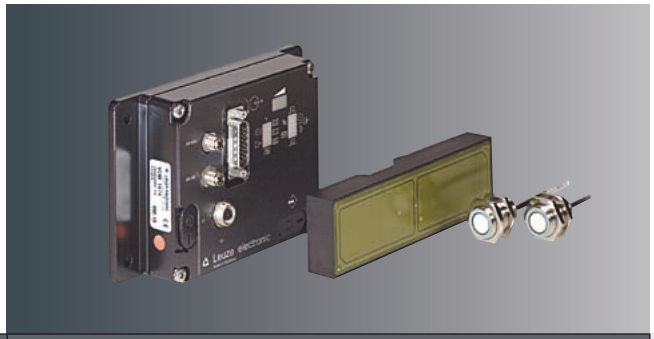
* Typical operating range limit

Forked Sensors

	GSU 06 (I)GSU 14B Ultrasonic label detection	GS 06 GS 21 GS 61 (I)GS 63 Infared label detection	GS (L) 04 Laser edge detection
			
Specifications			
Dimensions excl. plug, W × H × D			
Operating voltage	10 – 30 V DC/12 – 30 V DC	10 – 30 V DC/24 V DC	10 – 30 V DC
Switching outputs	PNP, NPN, push-pull	PNP, push-pull	PNP, NPN
Connection type	M8, M12, cable, cable+M12	M8, cable, cable+M12	M8
Protection class	IP 62/IP 65	IP 65/IP 67	IP 65
Certifications	CE c UL us	CE c UL us	CE
Housing	Metal	Metal, plastic	Metal
Throughbeam sensors			
Mouth width	0.9 – 4 mm	2 – 8 mm	20/30/50/80/120/220 mm
Light source	Ultrasonics/capacitive	Infrared	Red light/laser
Switching	Light/dark/antivalent	Light/dark/antivalent	Light/dark
Switching frequency	up to 5000 Hz	1000/8000/10000 Hz	1500/3000 Hz
Options			
Operation	Teach	Teach/potentiometer	Potentiometer
Warning output	X	X	
Features			
	Detection of transparent + paper labels. Multichannel detection of labels with VSU 15.	Detection of paper labels ALC function. Storage of up to ten teach values in the sensor. Removable operating head on potentiometer version.	Detection of small objects. Light/dark switching on device.

Double Sheet Monitoring
Splice Detection

Double Sheet Monitoring
DB 12B, DB 112B, DB 14B
Splice Detection VSU 12



Description

The double-sheet monitoring systems from Leuze electronic reliably prevents the intake of multiple sheets. This helps 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 reels

Technical information

Physical principles:
- Capacitive
- Ultrasonics (∅ 12 mm or 18 mm, short construction)

Working ranges:
- From 20 g/m² to 1200 g/m² (cardboard thickness 2 mm)
- Detection of 1/2 or 2/3 plies
- Outputs for single or double sheets
- Configuration facility

Certifications

DB12 CE

DB112 CE

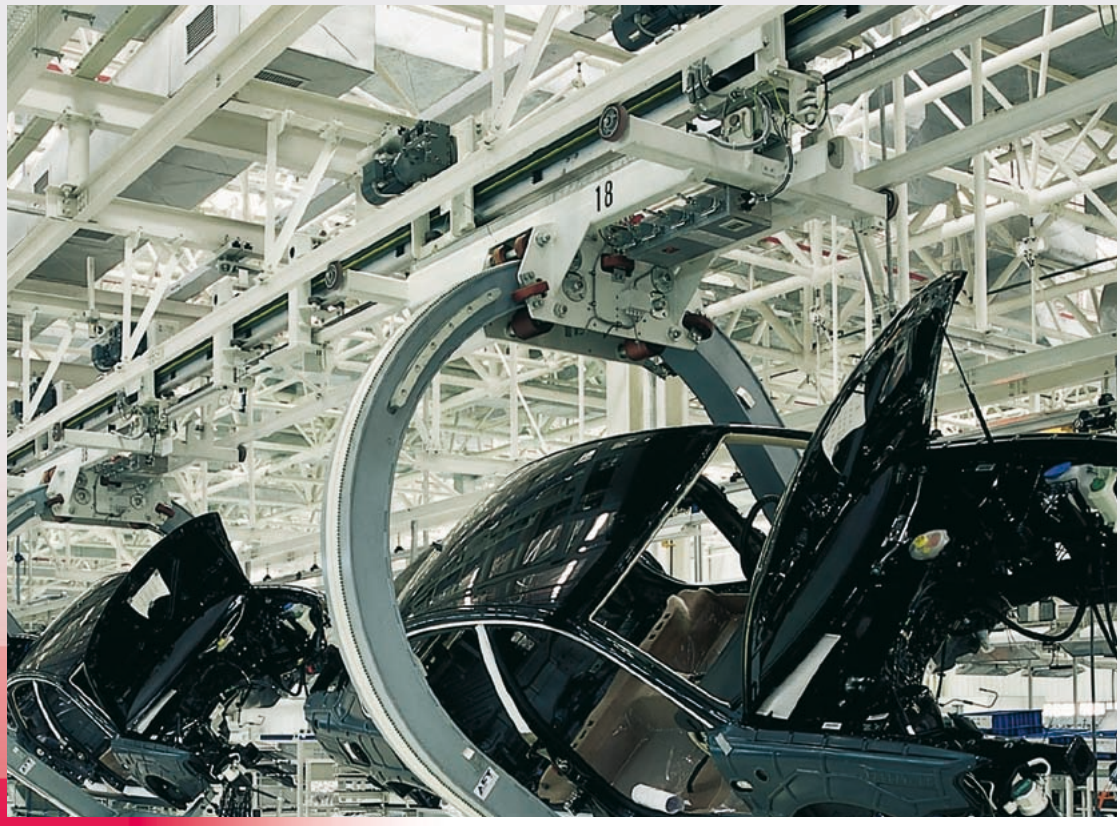
DB14B CE

VSU12 CE

Identification Systems
Data Transmission Devices
Distance Measurement / Positioning Devices

Innovation is our strength.

Advanced new technologies combined with communication protocols gives Leuze electronic a wide range of logistical products. This offers our customers maximum flexibility for system solutions and industrial networks. Our superior products include barcode readers, data transmission products and distance measurement devices.



- CRT (code reconstruction technology) can reconstruct barcodes that are misaligned or damaged offering increased reliability and flexibility for barcode placement and positioning.

- The Barcode Positioning System (BPS) has an accuracy of one millimeter (0.040 inches) over distances of up to 10,000 meters (3,280 feet). It is i.e. used to determine the absolute position of shuttles on conveyor systems, the position of cranes, the position and speed of shuttle trains, etc.

- Optical data transmission devices can communicate secured data up to 500 meters (1,640 feet) via a variety of protocols.

- Communication Protocols we offer include Profibus, Ethernet TCP/IP, RS232, RS485, DeviceNet, Ethernet IP, Interbus, DH+ , RI/O, CanOpen, Modbus, TTY and many more.

Stationary Barcode Readers

BCL 8
1D laser barcode reader

BCL 21
BCL 22
1D laser barcode reader

Specifications				
Reading distance (dependent on version)		40 – 160 mm		50 – 450 mm
Smallest resolution		0.125 mm		0.15 mm
Scanning rate		600/500 scans/s		1000/800 scans/s
Lens variant		N, M		N, M, F
Reading method		Single Line Scanner		Single Line Scanner Raster Scanner
Inputs/outputs		1/1		1/1 2/2
Interfaces – Host (– Service)		RS 232 (RS 232)		RS 485 RS 232 (RS 232) (RS 232)
Supply voltage		5 V DC (10 – 30 V DC via MA 8.1)		10 – 30 V DC
Protection class		IP 67		IP 65
Network master		MA 31		MA 31
PROFIBUS DP Interbus-S		MA 41 DP-k HS MA 41 IS		MA 42 DP-k MA 42 IS
Certifications		CE CDRH c UL us		CE CDRH c UL us
Accessories				
Optional				
Mounting systems		BT 8		BT 20, BT 21
Features				
		Reads all common 1D codes including pharmaceutical codes. Robust industrial version in a metal housing – IP 67. M12 connection technology or cable variant. Reference code comparison.		Automatic detection of code type and code quality. Failsafe storage of parameters.

BCL 31 **BCL 32** **BCL 34** 1D laser barcode reader	**BCL 500*i*** **BCL 501*i*** **BCL 504*i*** **BCL 508*i*** 1D laser barcode reader	**BCL 80** 1D laser barcode reader	**BCL 90** 1D laser barcode reader
			
10 – 750 mm	200 – 2400 mm	300 – 2400 mm (others on request)	500 – 2100 mm
0.2 mm	0.2 mm	0.2 mm	0.2 mm
1000/800 scans/s	1000 scans/s adjustable (800 – 1200 scans/s)	600 scans/s adjustable (400 – 800 scans/s)	800 scans/s adjustable (600 – 1200 scans/s)
M, F, L, J for Ink-Jet application	N, M, F, L	N1, N2, M, L	N, M, F
Single Line Scanner Raster Scanner	Single Line Scanner Oscillating mirror Deflection mirror Code fragment technology	Single Line Scanner Raster Scanner Oscillating mirror	Single Line Scanner Oscillating mirror Code fragment technology autoFocus
1/1 2/2 1/1	2/2	2/2	6/4
RS 485 RS 232 PROFIBUS DP integrated (RS 232) (RS 232) (RS 232)	RS232/ RS 485 PROFIBUS DP Ethernet 485/422 integrated integrated (USB)	RS 232 RS 485 (RS 232)	RS 232 RS 422/485 (RS 232)
10 – 30 V DC	10 – 30 V DC	18 – 36 V DC	18 – 30 V DC
IP 65	IP 65	IP 65	IP 65
MA 31	integrated	MA 30	MA 31
MA 42 DP-k MS 34 MA 42 IS	integrated	MA 40 DP-k MA 40 IS	MA 41 DP-k MA 41 IS
CE CDRH c UL us	CE CDRH c UL us	CE	CE
Service display MSD 101 for BCL 34			Ext. parameter memory
BT 56, BT 59	BT 56, BT 59	BT 56, BT 58, BT 59	BT 90
BCL 34 with integrated PROFIBUS interface. Heated option available. Special inkjet optics for codes applied directly to cardboard. Compact size, permitting mounting between two conveyor lines.	Integrated field bus connectivity. Code reconstruction technology (CRT). "WebConfig" software integrated in the device permits configuration via USB interface without additional software. Multiple language menu-driven display. M12 connection system. Integrated fieldbus connectivity for convenient fieldbus link and networking Code reconstruction technology (CRT) for reliable identification of damaged codes. Optional heating models to –35 °C.	Max. range up to 2800 mm. Protection class IP 65. Reference code comparison.	Integrated autofocus Code reconstruction technology (CRT). Available as "CAX" (compact omnidirectional scanner). Optionally as modular scanner portal (MSP) system.

Barcode Modular Interface Units

Technical data	MA 8.1 Point to point	MA 2/2L Point to point multiNet guest	MA 4/MA 4D Point to point multiNet guest	MA 4L MA 4DL Point to point multiNet guest
				
Connection, wiring	1 plug M12, 5 pin 2 sockets M12, 5 pin	Spring terminals, 5 PGs	Spring terminals, 5 PGs	Spring terminals, 5 PGs
Interfaces	RS 232	RS 232 RS 485 multiNet guest, Service interface – RS 232 9 pin Sub-D	RS 232 RS 485 multiNet guest, Service interface – RS 232 9 pin Sub-D	RS 232 – or RS 422 –, TTY – Host, RS 485 multiNet guest, Service interface – RS 232 9 pin Sub-D
Features	1 switching input and 1 switching output	2/1 switching input 2/1 switching output Network address	2/1 switching input 2/1 switching output Network address Automatic parameter memory	2/1 switching input 2/1 switching output Network address Automatic parameter memory
Protection class	IP 67	IP 54	IP 54/IP 65	IP 65
Certifications	CE c UL us	CE	CE	CE
BCL 8	Cable 008/direct ●			
BCL 21		Direct Ⓜ	Direct Ⓜ	
BCL 22		Direct ●	Direct ●	Direct Ⓜ
BCL 31		Cable 031/ Cable 040/direct Ⓜ	Cable 031 Ⓜ	
BCL 32		Cable 031/ Cable 040/direct ●	Cable 031 ●	Cable 031/ Cable 040/direct Ⓜ
BCL 80				
BCL 90				
LSIS 122		KB M12A-8P- MA-3000 ●		
VR 2300		Cable 031/ Cable 040 ●		
RFI/RFM		Direct ●		

● A red dot indicates compatibility with barcode reader.

Ⓜ = multiNet

For other combination possibilities, see catalog.

MA 10 Point to point multiNet guest	**MA 90** Point to point multiNet guest	**MA 40/41/ 42 DP-k** **MA 30/31** multiNet master	**MA 40/41/ 42 IS** Fieldbus gateway	**MA 21** multiNet guest protocol converter
				
Spring terminals, 5 PGs	Spring terminals, 8 PGs	Spring terminals, 5 PGs, M12 connection sets available (optional)	Spring terminals, 5 PGs, M12 connection sets available (optional)	Spring terminals, 5 PGs, M12 connection sets available (optional)
RS 232 – or RS 422 –, TTY – Host, RS 485 multiNet guest, Service interface – RS 232 9 pin Sub-D	RS 232, RS 422, RS 485 multiNet guest, Service interface – RS 232 9 pin Sub-D	RS 232 – or RS 422 –, TTY – Host, multiNet master RS 485, multiNet guest Service interface – RS 232 9 pin Sub-D	RS 232 Interbus-S Service interface – RS 232 9 pin Sub-D	RS 232, RS 422 –, TTY – Host, RS 485 multiNet guest, Service interface – RS 232 9 pin Sub-D
2 switching inputs 2 switching outputs Network address Automatic parameter memory	6 switching inputs 4 switching outputs Network address Optional external parameter memory	2 switching inputs 2 switching outputs Network address Automatic parameter memory	1 switching input	Network address
IP 65	IP 54	IP 65	IP 65	IP 65
CE	CE	CE	CE	CE
			●	Cable 008/direct (m)
			Direct ●	
			Cable 031 ●	
Cable 040/direct (m)		Cable 040 (MA 30)/ Direct (m)	Cable 040/ Direct ●	
	Cable 090 (m)		Cable 090 ●	
			KB M12A-8P-MA-3000 ●	KB M12A-8P-MA-3000 (m)
			Cable 031 ●	Cable 040 B (m)
			Direct ●	Direct (m)

Stationary 2D & 1D Barcode Reader

		LSIS 122 **LSIS 123** CCD		**visionREADER 2300** CCD
				
Typical applications				
Presence/ completeness monitoring				
Dimension/ position monitoring				
Character reading				
Code reading		Data Matrix, barcode, QR Code, PDF 417, Aztec, RSS and others		Data Matrix, barcode, QR Code,
Print quality monitoring				
Color detection				
Pattern detection				
Other applications				
Sensor/cameras		CCD		CMOS
Resolution (pixel)		1280 × 960		800 × 600
Focal point		100 mm		20, 55, 80, 130 mm
Interfaces Host Service		USB/RS 232 USB/RS 232		RS 232 RS 232
Digital inputs/outputs		1/1		2/2
Fast Ethernet				
Optional		USB, RS 232 cable, Power supply unit		MA 2, MA 42 IS MA 42 DP-k, MA 21
Number of test routines		Memory capacity for 1 parameter set in the camera		Memory capacity for 1 parameter set in the camera
Configuration/ operating system		Configuration via PC with setup program or barcode		Configuration via PC with setup program
Options				Data Matrix (ECC200) on directly marked items. Teach-in via digital input, reference code, AIM verifier, error image storage
Dimensions, W × H × D		47 × 40 × 32 mm		80 × 60 × 64 mm
Certifications		**C UL US aprox. Q2, 2010**		**CE C UL US**
Features				
		Camera system for omnidirectional scanning of 2D codes and barcodes. Compact housing, integrated lighting and decoder. Protection class IP 65.		Camera system for omnidirectional scanning of 2D codes and barcodes. Compact housing, integrated lighting and decoder. Protection class IP 65.

Industrial Image Processing Systems

	LSIS 400i	vision POWERBOX	proCHECK
			
Typical applications			
Presence/completeness monitoring	X	X	X
Dimension/ position monitoring	X	X	X
Character reading		X	X
Code reading		Data Matrix, Barcode, Pharmacode, RSS Ltd, PDF 417, QR-Code	Data Matrix, Barcode, RSS, MicroPDF, PDF 417, Pharmacode/ QR-Code
Print quality monitoring		X	X
Color detection		X	X
Pattern detection		X	X
Other applications	Position and type detection		Blister control
Sensor/cameras	Global shutter CMOS	CCD/digital, FireWire (IEEE 1394)	CCD
Resolution (pixel)	752 × 480	From 656 × 494 / 1392 × 1040 / opt. more (color or monochrome)	From 652 × 494 to 1298 × 1024 (color or monochrome)
Focal point	50 mm ... 5 m	Depending on lens	Depending on lens
Interfaces Host Service	RS 232 Ethernet	Ethernet, opt. RS 232 n. a.	RS 232 n. a.
Digital inputs/outputs	8, configurable	16/16	1/48
Fast Ethernet	Yes	Yes	Yes
Optional	Cable, mounting devices, external illumination	Remote maintenance	Remote maintenance, statistical functions, downtime analysis
Number of test routines	max. 60	No practical restriction in number of storable test programs	No practical restriction in number of storable test programs
Configuration/ operating system	Via integrated webConfig tool	Microsoft® Windows®XP	Microsoft® Windows®XP
Options	Integrated, homogeneous illumination	Storage of: error images, camera parameters, results in database; visualization; sequential control; AIM verifier; camera calibration	Intelligent software tools, safety manager (access and status control), storage of measurement data in database
Dimensions, W × H × D	75 × 55 × 113 mm	200 × 180 × 280 mm	481 × 177 × 500 mm
Certifications	CE c UL US pending	CE	CE
Features			
	Smart camera with homogeneous, integrated illumination. With integrated focus adjustment. Fast configuration directly via the webConfig tool integrated in the smart camera. Very well suited for industrial use through glass window, metal housing, M12 connection technology and protection class IP 65.	Flexible image processing for complex and interlinked tasks. Operation of two cameras at a compact PC. FireWire technology.	High-speed image processing with excellent operating convenience, asynchronous operation of several cameras. Operation of up to 4 cameras per frame grabber.

Data Transmission Devices - Optical

	DDLS 78	DDLS 200	DLSP 160S
			
Specifications			
Data transmission	Serial	Serial	Parallel
Range	200 m	500 m	2.6 m
Light source	Red light/infrared LED	Infrared LED	Infrared LED
Max. transmission rate	38.4 kbits/s	2000 kbits/s	≤ 400 µs
Interfaces–Host	TTY RS 232 RS 422 RS 485	RS 422 RS 485 Fiber-optic cable	Parallel 2 × 8 I/Os
Supported protocols	PROFIBUS SINEC L2 Transparent mode	PROFIBUS (DP/FMS/MPI) Interbus-S (copper/fiber optics), Rockwell Automation (DH+; Remote I/O), DeviceNet, CANopen, Ethernet, PROFINET	
Protection class	IP 65	IP 65	IP 65
Supply voltage	12 – 30 V DC	18 – 30 V DC	16 – 35 V DC
Operating temperature	–10 °C to +50 °C	–5 °C to +50 °C (–30 °C to +50 °C with optics heating)	–20 °C to +60 °C
Certifications	CE	CE c UL us	CE
Features			
	Full-duplex transmission in one housing. Galvanically isolated interfaces. Usable with optics heating up to –35 °C.	No-contact, wear-free data transmission. Not influenced by ambient light. Integrated mounting and alignment plate. Heated option available. All common internationally used interfaces available. PROFIBUS and Ethernet variants with M12 connector.	Transmitter and receiver in one housing (same device). Minimal space requirement. Parallel data transmission.

Distance Measurement/ Positioning Devices - Optical

	AMS 200 Laser positioning	BPS 8 Barcode positioning	BPS 34/37 Barcode positioning
			
Specifications			
Range	40/120/200 m	10000 m	10000 m
Interfaces – Host (– Service)	Simultaneous use of PROFIBUS, SSI and RS 232 or of Interbus and RS 232	RS 232 (RS 485 via MA 8-01) (RS 232)	PROFIBUS DP/ SSI (RS 232)
Functional principle	Against reflector	Against barcode tape	Against barcode tape
Measurement value output	1.6 ms	3.3 ms	2 ms
Integration time	~7 ms	~13 (~6) ms	~8 (~4) ms
Reproducibility	0.3/0.5/0.7 mm (1 sigma)	± 1 (2) mm to taught points	± 1 (2) mm to taught points
Protection class	IP 65	IP 67	IP 65
Light source	Red light laser	Red light laser	Red light laser
Supply voltage	18 – 30 V DC	5 V DC (24 V DC via MA 8-01)	10 – 30 V DC
Operating temperature	–5 °C to +50 °C (–30 °C to +50 °C with optics heating)	0 °C up to +40 °C	0 °C to +50 °C (–30 °C to +40 °C with optics heating)
Options	Speed measurement and monitoring	Customer-specific configuration facility	Speed measurement and monitoring
Certifications	CE c UL us	CE CDHR c UL us	CE CDHR c UL us
Features			
	Absolute measurement system with very high accuracy, tested by the Physikalisch Technische Bundesanstalt (German Metrology Institute) Simultaneous use of the PROFIBUS, SSI and RS 232 interface. Device model with Interbus and RS 232 interface. Easy programming via extensive GSD file. Heated option available. Multiple language menu-driven display.	Compact housing and protection class IP 67. Customer-specific configuration. Extremely simple installation using special fastening unit. Innovative positioning on corners, inclines and diverters.	Integrated PROFIBUS or SSI interface. Integrated speed measurement Innovative positioning on corners, inclines and diverters. Heated option available. Convenient programming of the PROFIBUS model via comprehensive GSD file.

Hand-Held Barcode Readers

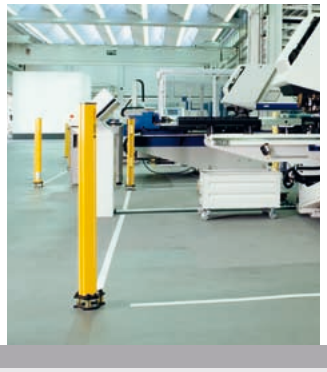
		IT 3800g 1D reader		IT 3800i 1D reader
				
Specifications				
Reading method		Line imager		Line imager
Reading distance		10 – 660 mm		0 – 2080 mm
		Keyboard-Wedge USB, RS 232		Keyboard-Wedge USB, RS 232
Interfaces		Cable for: RS 232, USB, Keyboard-Wedge; desktop support, wall support, power supply unit		Cable for: RS 232, USB, Keyboard-Wedge; desktop support, wall support, power supply unit
Supply voltage		4.5 – 12 V DC		4.5 – 14 V DC
		Barcodes Protection class IP 41		Tough industrial use Protection class IP 54
Types of codes		Barcodes		Barcodes
Certifications		CE c UL us		CE c UL us
Features				
		Large reading field for barcode detection. Ergonomic and robust housing. Operating temperature 0 °C … 50 °C.		Large reading field for barcode detection. Ergonomic and robust housing. Operating temperature –30 °C … 50 °C.

IT 3820 IT 3820i 1D reader	IT 4600 IT 4800 2D reader	IT 4820 IT 4820i 2D reader	IT 6300 IT 6320 2D reader
			
Line-imager with Bluetooth	Area-imager	Area-imager with Bluetooth	Imager
0 – 1120 mm	53 – 333 mm	36 – 315 mm	0 – 160 mm
Bluetooth	Keyboard-Wedge RS 232, USB	Bluetooth	USB, RS 232, PS 2
Cable for: RS 232, USB, TTL, Keyboard-Wedge; base station ST 2020, power supply unit	Cable for: RS 232, USB, Keyboard-Wedge; holder, power supply unit	Cable for: RS 232, USB, Keyboard-Wedge; holder, power supply unit, base station ST 2020	Cable for: USB, RS 232, PS 2, Keyboard-Wedge; power supply unit
9 V DC	4.5 – 14 V DC	9 V DC	5 V DC
Barcodes Protection class IP 41 | IP 54	For high-contrast codes Protection class IP 41 | IP 54	For high-contrast codes Protection class IP 41 | IP 54	Reading of directly marked codes (laser or matrix printed) with low contrast, protection class IP 54
Barcodes	Barcodes and 2D codes	Barcodes and 2D codes	Barcodes and directly marked 2D codes
CE c UL us	CE c UL us	CE c UL us	CE c UL us
Ergonomic and robust housing. Operating temperature 0 °C … 50 °C.	Large reading field for detection of high-contrast codes. Operating temperature 0 °C … 50 °C Ergonomic and robust housing.	Large reading field for detection of high-contrast codes. Operating temperature 0 °C … 50 °C Ergonomic and robust housing.	High resolution for directly marked parts (laser or matrix printed) and labels. Operating temperature 0 °C … 50 °C Ergonomic and robust housing.

Safety Sensors
Safety Systems

Versatile safety solutions.

Our light curtains have outstanding features with options such as muting, blanking and initiation. Leuze offers our customers the unique programmable software, Safety Lab, so they may utilize these features in any combination to their maximum. As a result, our customers can easily custom-configure our light-curtains to their special needs and quite often experience higher efficiency and productivity.




- Safety Lab is a software tool that allows to custom-configure light curtain features like muting, blanking and initiation in any combination for highest flexibility and efficiency.
- The Leuze electronic rugged light curtain housings are the most durable on the market. This is very important during installation, initial alignment phase, clearing and in hostile environments.
- Systems offer AS-i safe as a standardized communication network that increases the level of system protection and simplifies communication.
- 2 Year Warranty on American Made light curtains which is the longest standard, off-the-shelf warranty in the industry.
- Immediate exchange program for laser scanners.
- 24-hour turnaround available on light-curtains.

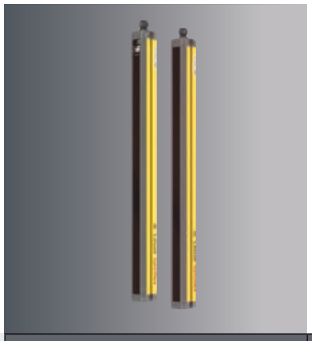
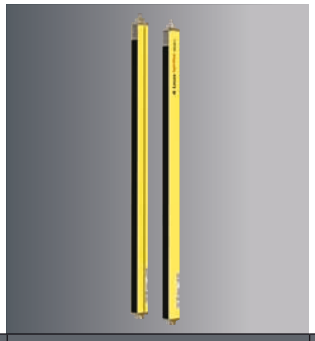
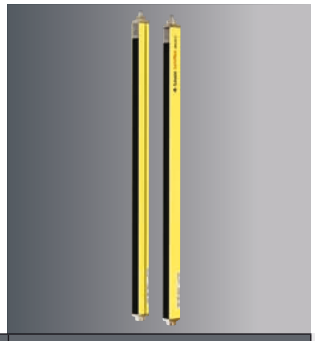
Safety Laser Scanners

	RS4-6M Type 3 Safety Laser Scanners	RS4-2E Type 3 Safety Laser Scanners	RS4-4E Type 3 Safety Laser Scanners
			
Specifications			
Type in accordance with IEC/EN 61496	Type 3	Type 3	Type 3
SIL in accordance with IEC 61508 and IEC/EN 62061	SIL 2	SIL 2	SIL 2
Performance Level (PL) in accordance with EN ISO 13849-1	PL d	PL d	PL d
Resolution (adjustable)	30/40/50/70/150 mm	70 / 150 mm	30/40/50/70/150 mm
Range	1.6/2.2/2.8/6.25 m	2.15 m	1.6/2.2/2.8/4.00 m
Number of detection zones	8	4	8
Dimensions, W × H × D	140 × 155 × 13 mm	140 × 155 × 135 mm	140 × 155 × 135 mm
Safety-related switching outputs (OSSD)	2 PNP transistor outputs AS-i Safety Interface, PROFIsafe Interface	2 PNP transistor outputs	2 PNP transistor outputs AS-i Safety Interface, PROFIsafe Interface
Connection system	Sub-D15, Sub-D9 for configuration, safety bus systems: M12 plug, IR interface for parametering	Sub-D15, Sub-D9 for configuration	Sub-D15, Sub-D9 for configuration, safety bus systems: M12 plug, IR interface for parametering
Certifications			
Functions			
	Start/restart interlock (RES), selectable. Monitored detection zone pair changeover. Warning zone monitoring. Additional alarm output **Function package MotionMonitoring** Movement monitoring of side-tracking skates	Start/restart interlock (RES), selectable. Monitored detection zone pair changeover. Warning zone monitoring. Additional alarm output. **Function package Basic** Danger zone guarding on small systems	Start/restart interlock (RES), selectable. Monitored detection zone pair changeover. Warning zone monitoring. Additional alarm output. **Function package Extended** Vertical access guarding with reference boundary monitoring
Features			
	Safeguarding of expansive danger areas and broad access points. Automatic configuration on device exchange with intelligent ConfigPlug. Any type of detection/warning zone contours and configurations. Zone pair changeover possible during operation. Compact design and easy-to-use software.	Horizontal danger zone guarding. Compatible with all other devices of the RS4 family. Automatic configuration on device exchange with intelligent ConfigPlug. Any type of detection/warning zone contours and configurations. Zone pair changeover possible during operation. Compact design and easy-to-use software.	Danger zone guarding, point of operation guarding, access guarding. Automatic configuration on device exchange with intelligent ConfigPlug. Any type of detection/warning zone contours and configurations. Zone pair changeover possible during operation. Compact design and easy-to-use software.

Safety Light Curtains

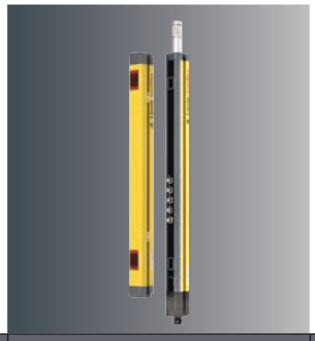
COMPACT*plus*
Type 4 Safety Light Curtains

Specifications		
Type in accordance with IEC/EN 61496		Type 4
SIL in accordance with IEC 61508 and IEC/EN 62061		SIL 3
Performance Level (PL) in accordance with EN ISO 13849-1		PL e
Resolution		14/30/50/90 mm
Range		6/18/18/18 m
Protective field height (type-dependent)		150 … 3000 mm
Profile cross-section		52 × 55 mm
Safety-related switching outputs (OSSD)		2 PNP transistor outputs, 2 relay outputs AS-i Safety Interface PROFIsafe Interface
Connection system		Cable gland Hirschmann plug Brad Harrison plug M12 plug
Certifications		CE c UL us
Functions		
		2 transmission channels, selectable. Cascadable. Start/restart interlock. Dynamic contactor monitoring (EDM). Parallel/Sequential Muting with override. Blanking (with teach-in), reduced resolution. Operating mode, 1-cycle or 2-cycle control.
Features		
		Integrated control and monitoring functions mean external control devices not required. Plug-in module with saved device parameters for fast device exchange. M12 local connection socket for connecting local sensors and signal devices. Optimum application adjustment with SafetyLab configuration and diagnosis software. Models with integrated AS-i Safety or PROFIsafe interface.

COMPACT Type 4 Safety Light Curtains	**COMPACT EX1/EX2** Type 4 Safety Light Curtains, ATEX Group II, Cat. 2/3	**SOLID-4E** Type 4 Safety Light Curtains	**SOLID-2/SOLID-2E** Type 2 Safety Light Curtains
			
Type 4	Type 4	Type 4	Type 2
SIL 3	SIL 3	SIL 3	SIL 2
PL e	PL e	PL e	PL d
14/30/50/90 mm	14/30 mm	14/20/30/40/90 mm	20/30/40/90 mm
6/18/18/18 m	6/18 m	6/14/9/20/20 m	15/10/20/20 m
150 … 3000 mm	750, 1050, 1500 mm	150 … 1800 mm	150 … 1800 mm
52 × 55 mm	EX1: diameter approx. 150 mm EX2: 52 × 55 mm	30 × 34 mm	30 × 34 mm
2 PNP transistor outputs AS-i-Safety Interface	2 PNP transistor outputs	2 PNP transistor outputs	2 PNP transistor outputs
Cable gland Hirschmann plug Brad Harrison plug M12 plug	Cable gland	M12 plug	M12 plug
CE SB	CE Ex	CE c UL us	CE SB
2 transmission channels, selectable. Cascadable. Start/restart interlock. Dynamic contactor monitoring (EDM), 7-segment display	2 transmission channels, selectable. Cascadable. Start/restart interlock. Dynamic contactor monitoring (EDM), 7-segment display	2 transmission channels, selectable. Start/restart interlock. Dynamic contactor monitoring (EDM), 7-segment display. Cascadable	2 transmission channels, selectable. Start/restart interlock. Dynamic contactor monitoring (EDM). Integrated cyclical testing (100 ms). 7-segment display.
Fault-free operation of adjacent devices with selection of different transmission channels. Maintenance-free with safety transistor outputs (OSSDs). MultiScan for environments with extreme stray light (e.g. welding sparks, flash lamps). Function extension with MSI Safety Relays	Fault-free operation of adjacent devices with selection of different transmission channels. Maintenance-free with safety transistor outputs (OSSDs). Complies with ATEX Directive 94/9/EC. Ignition protection type “d” pressure-encapsulated (EX1), “nA” non-sparking (EX2). Gas: Temperature class T6 (EX1), T4 (EX2). Dust: Permissible ignition temp. > 85°C (EX1) and > 135° C (EX2).	Fault-free operation of adjacent devices with selection of different transmission channels. Slim and robust aluminum housing (30 mm × 34 mm) Easy function selection with external wiring. Function extension with MSI Safety Relays	Slim and robust aluminum housing (30 mm × 34 mm) Easy function selection with external wiring. Function extension with MSI Safety Relays

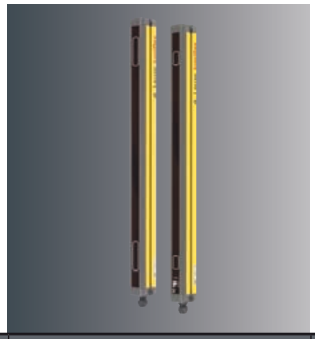
Transceiver and Multiple Light Beam Safety Devices

COMPACT*plus*
CPRT-m
Type 4 Transceivers with Muting and Override



COMPACT*plus*
Type 4 Multiple Light Beam Safety Devices

Specifications				
Type in accordance with IEC/EN 61496		Type 4		Type 4
SIL in accordance with IEC 61508 and IEC/EN 62061		SIL 3		SIL 3
Performance Level (PL) in accordance with EN ISO 13849-1		PL e		PL e
No. of beams		2		2/3/4
Beam distance		500 / 600 mm		500/400/300 mm
Range (type-dependent)		0 … 6.5 m		0 … 18 m
Profile cross-section		52 × 55 mm		52 × 55 mm
Safety-related switching outputs (OSSD)		2 PNP transistor outputs 2 relay outputs AS-i Safety Interface PROFIsafe Interface		2 PNP transistor outputs 2 relay outputs AS-i Safety Interface PROFIsafe Interface
Connection system		Cable gland Hirschmann plug Brad Harrison plug M12 plug		Cable gland Hirschmann plug Brad Harrison plug M12 plug
Certifications		CE c UL us		CE c UL us
Functions				
		2 transmission channels, selectable. Start/restart interlock. Dynamic contactor monitoring (EDM). 2 or 4-sensor Parallel Muting. Muting restart override function. Output for Muting lamp. 7-segment display.		2 transmission channels, selectable. Start/restart interlock. Dynamic contactor monitoring (EDM). 2 or 4-sensor Parallel Muting. Muting restart override function. Output for Muting lamp. 7-segment display.
Features				
		Muting sensors, start/restart button, lamp can be connected directly on the device via integrated or external sensor connection module. Further Muting operating modes can be selected via switch, no PC required, plug-in parameter module. Muting override function for safe removal of the object after switch-offs. Integrated evaluation unit; no external control devices required. Connection option of E-STOP command device or Safety Switch. Models with integrated AS-i Safety or PROFIsafe interface.		Muting sensors, start/restart button, lamp can be connected directly on the device via integrated or external sensor connection module. Further Muting operating modes can be selected via switch, no PC required, plug-in parameter module. Muting override function for safe removal of the object after switch-offs. Integrated evaluation unit; no external control devices required. Connection option of E-STOP command device or Safety Switch. Models with integrated AS-i Safety or PROFIsafe interface.

COMPACT*laser* Type 4 Multiple Light Beam Safety Devices	**COMPACT** Type 4 Multiple Light Beam Safety Devices	**COMPACT EX2** Type 4 Multiple Light Beam Safety Devices, ATEX Group II, ATEX Cat. 3	**ROBUST** Type 4 and Type 2 Multiple Light Beam Safety Devices
			
Type 4	Type 4	Type 4	Type 4/Type 2 (in combination with a Safety Interface or a test monitoring unit)
SIL 3	SIL 3	SIL 3	on request
PL e	PL e	PL e	on request
2/3	2/3/4	2/3	2/3/4
500/400 mm	500/400/300 mm	500/400 mm	500/400/300 mm
6 … 70 m	0 … 18 m, 6 … 70 m	0.8 … 18 m	0.5 … 8 m/50 m (in combination with active deflection mirror AMI 42)
52 × 55 mm	52 × 55 mm	52 × 55 mm	52 × 57 mm
2 PNP transistor outputs AS-i Safety Interface	2 PNP transistor outputs AS-i Safety Interface	2 PNP transistor outputs	Type 4: 2 relay outputs, AS-i Safety Interface, Type 2: PNP transistor output
Cable gland (PG13,5) Hirschmann plug M12 plug	Cable gland (PG13,5) Hirschmann plug M12 plug	Cable gland	Cable gland (PG11) M12 plug
CE cULus	CE cULus	CE Ex	CE cULus
2 transmission channels, selectable. Start/restart interlock. Dynamic contactor monitoring (EDM). Integrated red light alignment lasers per beam. 7-segment display	2 transmission channels, selectable. Start/restart interlock. Dynamic contactor monitoring (EDM). 7-segment display.	2 transmission channels, selectable. Start/restart interlock. Dynamic contactor monitoring (EDM). 7-segment display.	Automatic start/restart. LED indicators. Type 2: Activation input for testing and series connection
Fast start (commissioning) or on-site realignment with red light alignment laser per beam. Technologically mature system solution with UMC deflection mirror columns for multiple side access guards. UMC deflection mirror columns with integrated spirit levels for time-saving prealignment. Automatic resetting of the UMC deflecting columns after mechanical impacts/blows with patented spring elements. Transistor output or AS-i Safety Interface available.	Fault-free operation of adjacent devices with selection of different transmission channels. MultiScan for environments with extreme stray light (e.g. welding sparks, flash lamps). Function extension with MSI Safety Relays	Fault-free operation of adjacent devices with selection of different transmission channels. Maintenance-free with safety transistor outputs (OSSDs). Complies with ATEX Directive 94/9/EC. Ignition protection type, “nA” non-sparking. Gas: Temperature class T4. Dust: Permissible ignition temp. > 135 °C	Integrated optics heating for use in temperature range –25 … +55 °C Protection class IP 67. Glass optics with mounting option for laser alignment aid. Models with integrated Muting lamp.

Single Light Beam Safety Devices

SLS 78/R
Type 4 Single Light Beam Safety Devices

SLSR 25B
Type 2 Single Light Beam Safety Devices

Specifications				
Type in accordance with IEC/EN 61496		Type 4		Type 2 in combination with a test monitoring unit
Operating range		0 … 60 m		0.5 … 20 m
Operating voltage U_B		24 V DC ± 15 %		10 … 30 V DC (incl. residual ripple)
Operating temperature		–25 … +60 °C		–30 … +55 °C
Dimensions, W × H × D		38 × 127 × 99 mm		15 × 51.3 × 28.8 mm
Housing		Metal		Plastic
Switching outputs		2 relay outputs (OSSDs)		2 push-pull switching outputs
Connection system		Cable gland (PG11) Spring terminals Plug connection, DIN 43651		2 m cable M8 plug M12 plug
Certifications		CE		CE
Functions				
		Operating mode “Protective operation without restart interlock”. Ambient light suppression. Integrated optics heating. LED indicator.		LED indicator. Activation input for test and series connection. Active ambient light suppression (A²LS)
Features				
		Integrated optics heating enables use under extreme environmental conditions. Operating temperature –25 °C to +60 °C. High mechanical and chemical resistance. Rapid connection with screwless spring terminals.		Single beam safety device with high performance reserve. Solid plastic housing with protection class IP 67 for industrial use. Wide voltage range from 10 to 30 V with PNP transistor output. All common connection variants.

SLSR 46B Type 2 Single Light Beam Safety Devices	**SLS 96** Type 2 Single Light Beam Safety Devices	**SLS 318** Type 2 Single Light Beam Safety Devices	**LS 763** Type 2 Single Light Beam Safety Devices
			
Type 2 in combination with a test monitoring unit	Type 2 in combination with a test monitoring unit	Type 2 in combination with a test monitoring unit	Type 2 in combination with a test monitoring unit
0.5 … 40 m	0 … 50 m (infrared light) 0 … 30 m (red light)	0 … 10 m	0 … 6 m
10 … 30 V DC (incl. residual ripple)	10 … 30 V DC (incl. residual ripple)	10 … 30 V DC	24 V DC ± 15 %
–30 … +55 °C	–20 … +60 °C	–25 … +65 °C	–20 … +60 °C
18.5 × 77 × 43 mm	30 × 90 × 70 mm	Cylindrical construction, M18 × 1	27 × 14.6 × 52 mm
Plastic	Metal plastic	Plastic Metal housing on request	Metal
2 push-pull	PNP transistor output	PNP transistor output	PNP transistor output
Cable 2 m M12 plug	Cable gland M12 plug	Cable, 2 m M12 plug	Cable 2.5 m M8 plug
CE	CE	CE	CE
LED indicator. Activation input for test and series connection. Active ambient light suppression (A²LS)	LED indicator. Activation input for test and series connection.	LED indicator. Activation input for test and series connection.	LED indicator. Activation input for test and series connection.
Single beam safety device with high performance reserve. Solid plastic housing with protection class IP 67 for industrial use. Wide voltage range from 10 to 30 V with PNP transistor output. Clearly visible alignment indicator in the front screen.	High performance reserve in the visible red light and infrared light range. Wide voltage range from 10 to 30 V with PNP transistor output. Optics heating for use with low temperatures (SLS 96 M/P-1071). Variants for multiple axis operation (SLS 96 K/P-1207).	Protection class IP 67. 2 antivalent push-pull switching outputs for light/dark switching and as control function. Visible red light in straight optics. Switching frequency 1000 Hz. Adjustable sensitivity.	Compact construction with shock-resistant metal housing and glass optics. Infrared single beam safety device with high performance reserve. Flexible PUR connection cable for industrial application or connection via M8 connector.

AS-i Safety Product Range

RS4/AS-i
Type 3 Safety Laser Scanners

Specifications		
Type in accordance with IEC/EN 61496		Type 3
SIL in accordance with IEC 61508 and IEC/EN 62061		on request
Performance Level (PL) in accordance with EN ISO 13849-1		on request
AS-i profile		Safe guest
Guest address		1 … 31, programmable (factory setting = 0)
Connection system		M12 plug, IR interface for parametering
Current consumption from AS-i circuit		50 mA
Sensor response time		85 ms (corresponds to 2 scans), up to 16 scans can be set (645 ms)
Restart delay time		Min. 160 ms (after detection zone release)
Certifications		
Function extension with ASM1/ASM1E Safety Monitor		
Features		
		Integrated AS-i interface for direct M12 connection to the AS-interface network. Bus addressing with AS-interface address programming device directly via M12 device plug. Diagnostic data transmission and warning zone monitoring via AS-interface bus. Any type of detection/warning zone contours and configurations. Zone pair changeover possible during operation. 3 function packages

COMPACT*plus*/AS-i Type 4 Safety Light Curtains and Multiple Light Beam Safety Devices	**COMPACT/AS-i** Type 4 Safety Light Curtains and Multiple Light Beam Safety Devices	**ASKM1** AS-i Coupling Modules for Safety Sensors	**ASKM2** AS-i Coupling Module for Safety Light Curtains SOLID-2 and SOLID-4E
			
Type 4	Type 4		Type 4
SIL 3			SIL 3
PL e	PL e	Cat. 4 (in accordance with EN ISO 13849 and EN 954-1)	Cat. 4 (in accordance with EN ISO 13849 and EN 954-1)
Safe guest	Safe guest	Safe guest	Safe guest
1 … 31, programmable (factory setting = 0)	1 … 31, programmable (factory setting = 0)	1 … 31, programmable (factory setting = 0)	1 … 31, programmable (factory setting = 0)
M12 plug, IR interface for parametering	M12 plug	M12 plug for sensors, clamping technology for AS-i flat cable	M12 plug for sensors, clamping technology for AS-i flat cable
40 mA	Transmitter: Max. 130 mA, Receiver: Max. 140 mA	≤ 45 mA	≤ 270 mA
10 … 66 ms	10 … 54 ms		
20 … 5,000 ms, can be set with software, SafetyLab, factory setting 100 ms (after protective field release)	100/500 ms (after protective field release)		
CE c UL US	CE c UL US	CE	CE c UL US
Start/restart interlock. Dynamic contactor monitoring (EDM). Diagnostic data transfer via AS-interface	Start/restart interlock. Dynamic contactor monitoring (EDM). Diagnostic data transfer via AS-interface	Connectable sensors, control devices with contact-based outputs. Safety Switch, 1 and 2-channel. E-STOP command devices, 1 and 2-channel. Safety Sensors with relay outputs, 1 and 2-channel.	Connectable protective sensors: Safety Light Curtain SOLID-2, Safety Light Curtain SOLID-4E
Integrated AS-i interface for direct M12 connection to the AS-interface network. Bus addressing with AS-interface address programming device directly via M12 device plug. Diagnostics data transfer, Muting sensors status, Muting active, weak signal via AS-interface. Device swap-out without PC via SERVICE function of the AS-i Safety Monitor. Direct connection of Muting sensors, start/restart button or Muting indicator directly on the receiver or via external connection module. Muting restart function possible via AS-interface by calling up AS-i IC parameters.	Integrated AS-i interface for direct M12 connection to the AS-interface network. Bus addressing with AS-interface address programming device directly via M12 device plug. Diagnostics data transfer, centralized alarm (e.g. weak signal) via AS-interface. Device swap-out without PC via SERVICE function of the AS-i Safety Monitor.	Safe AS-interface network device for connecting 1 or 2 Safety Sensors with contact-based outputs. LED indicators: AS-i status, inputs. AS-interface addressing via integrated addressing port. Simple bus connection with AS-i clamping technology. Protection class IP 67, mounting plate for DIN rail and screw-on mounting.	Safe AS-interface network device for the connection of 1 Leuze electronic Safety Light Curtain SOLID-2 or SOLID-4E. LED indicators: AS-i status, inputs. Fault message retrievable via AS-interface. AS-interface addressing via integrated addressing port. Simple bus connection with AS-i clamping technology. Mounting plate for DIN rail and screw-on mounting.

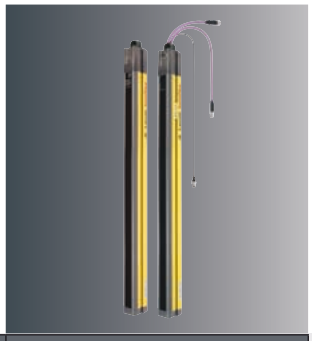
AS-i Safety Product Range

Specifications		ASM1/ASM1E AS-i Safety Monitors Category 4		ASM2/ASM2E AS-i Safety Monitors Category 4
				
SIL in accordance with IEC 61508 and IEC/EN 62061		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 and EN 954-1		4		4
STOP category in accordance with IEC/EN 60204-1		0 and 1		0 and 1
Supply voltage		24 V DC, ±15 %		24 V DC, ±15 %
System reaction time		Max. 40 ms (monitor without sensor reaction time)		Max. 40 ms (monitor without sensor reaction time)
Protection class		IP 20		IP 20
Number of Safety Monitors per AS-interface network		4 (with maximum 31 integrated AS-i guests)		4 (with maximum 31 integrated AS-i guests)
Certifications		CE SP c UL us		CE SP UL
Functions				
		Emergency STOP monitoring functions. Start/restart interlock. Dynamic contactor monitoring (EDM). Muting (2-sensor parallel, 4-sensor sequential), 1- or 2-channel OSSD relay outputs, LED status indicator. System signal output.		Emergency STOP monitoring functions. Start/restart interlock. Dynamic contactor monitoring (EDM). Muting (2-sensor parallel, 4-sensor sequential), 1- or 2-channel OSSD relay outputs, LED status indicator. System signal output.
Features				
		Up to 31 safe AS-i guests can be connected. Freely selectable assignment (Drag&Drop) of the sensors to OSSDs with “asimon” PC software. 48 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 OSSDs can be configured. Teach-in SERVICE button for automatic system integration of AS-i sensors on sensor exchange.		Safe activation of safe AS-i actors with the same safe AS-i address. Primary start and E-STOP functions via safe coupling of neighboring AS-i networks. 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.

Safety Sensor Technology for PROFIBUS DP

RS4/PROFIsafe
Type 3 Safety Laser Scanners

COMPACT*plus*/ PROFIsafe
Type 4 Safety Light Curtains and Multiple Light Beam Safety Devices



Specifications				
Type in accordance with IEC/EN 61496		Type 3		Type 4
SIL in accordance with IEC 61508 and IEC/EN 62061		on request		SIL 3
Performance Level (PL) in accordance with EN ISO 13849-1		on request		PL e
Safety-related switching output (OSSD)		PROFIsafe interface		PROFIsafe interface
Connection system		M12 plug (b-coded for PROFIBUS DP), IR interface for parametering		M12 plug (b-coded for PROFIBUS DP), IR interface for parametering
PROFIsafe driver version		V2		V2
PROFIBUS DP data rate		9.6 kBd … 12 mBd		9.6 kBd … 12 mBd
Configuration/ parameter setting		With software		With software, teach-in, switch
Configuration interface		Infrared		Infrared
Inputs and outputs		Input for reset button		5 inputs, 2 outputs for reset button, Muting sensors, Muting indicators, etc.
Cyclic safe data		1 byte		4 byte
Acyclic data		Measured values, error data, warnings		Protective field individual beam data, error data, warnings
Certifications		CE		CE
Functions				
		Diagnostic data transfer via PROFIBUS DP. Start/restart interlock (RES), selectable. Plus all functions and modules of the used safety PLC.		Diagnostic data transfer via PROFIBUS DP. Plus all functions and modules of the used safety PLC.
Features				
		Integrated PROFIsafe connection unit with PROFIsafe version V2. Fast real-time transfer of safe cyclical data. Acyclic DP-V1 services for online diagnostics and measurement value logging. Automatic parameter download and verification when replacing a device with proxy function block. Direct access via PROFIBUS DP or infrared interface for on-site configuration and diagnostics. Tool Calling Interface (TCI) support.		Integrated PROFIsafe connection unit with PROFIsafe version V2. Fast real-time transfer of safe cyclical data. Acyclic DP-V1 services for online diagnostics and measurement value logging. Automatic parameter download and verification when replacing a device with proxy function block. Integrated interface for local control and status signals saves on additional bus nodes. Tool Calling Interface (TCI) support.

Safety Switches and Safety Locking Devices

	S20, S200 Safety Switches	S300 Safety Position Switch
		
Specifications		
Type	Locking device without guard interlocking in acc. with EN 1088	Locking device without guard interlocking in acc. with EN 1088
Housing / Protection class	Glass fiber reinforced plastic (S20) or metal (S200) / both IP 67	Metal / IP 67
Actuator	Series (S20: AC-ANxx, S200: AC-AHxx), external: straight, angular, resilient, alignable	Plunger or roller with lever, mounted
Actuation	1 × above, 4 × side (90°)	1 × above, 4 × side (90°), 360°, switching direction left-right one side, both sides
Locking type, -force		
Connection system	M20 × 1.5 cable entry (S20: optional 3-way)	M20 × 1.5 cable entry (3-way)
Certifications	CE c UL us	CE c UL us
Functions		
	Integration in control circuits up to category 4 in accordance with EN ISO 13849 and EN 954-1	Integration in control circuits up to category 4 in accordance with EN ISO 13849 and EN 954-1, stop command with automatic or manual forced actuation
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 with funnel-shaped entry opening. Large double-bridge contacts for long service life (S200).	Metal housing for “heavy duty” applications Switching direction selectable. Universal use with individually set actuator approach directions and -angles in 10° grid. Roll actuator extremely long-life/ robust due to special treatment.

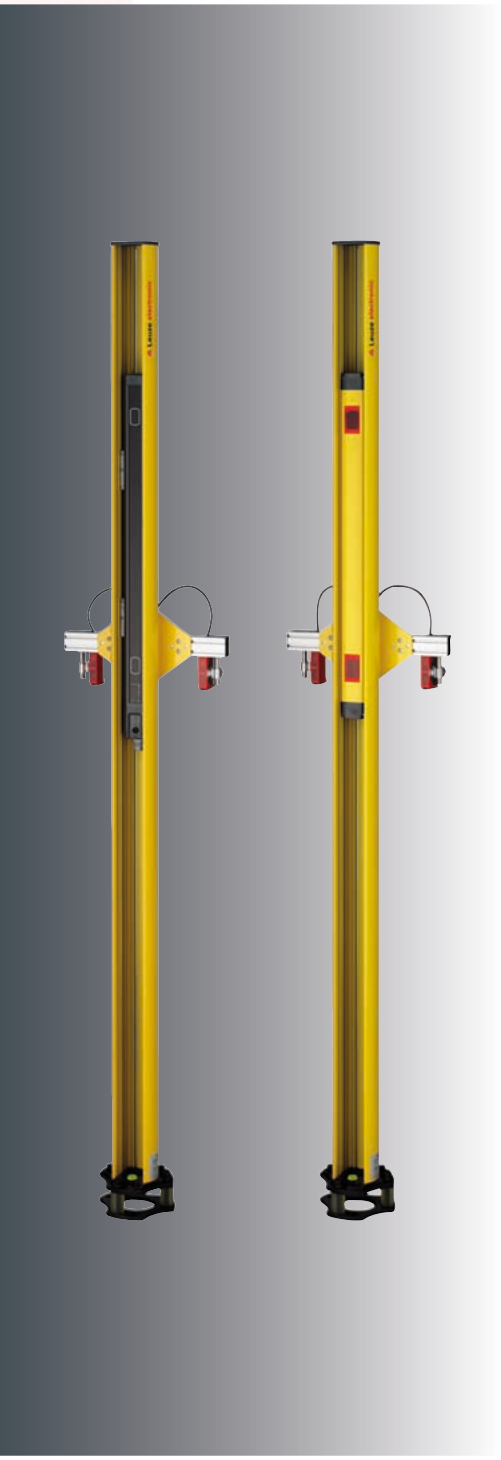
S400 Safety Hinge Switches	**L10** Safety Locking Devices	**L100, L200** Safety Locking Devices	**ERS200** Safety Command Device
			
Locking device without guard interlocking in acc. with EN 1088	Interlock device with locking according to EN 1088	Interlock device with locking according to EN 1088	E-STOP control device in accordance with EN 60947-5-5
Metal / IP 67	Glass fiber reinforced plastic or metal / both IP 67	Glass fiber reinforced plastic / IP 66 (L100), metal / IP 67 (L200)	Metal, IP 67
Safety Switch in hinge, internal, encapsulated	Series (AC-AHxx), external: straight, angular, resilient, adjustable	Series (L100: AC-AHxx, L200: AC-AHLxx), external: straight, angular, resilient, adjustable	E-STOP Rope Switch, internal
Actuation angle 180°	1 × above, 4 × side (90°)	1 × above, 4 × side (90°)	Via rope (pull: 83 N, slacken: 63 N, pull on forced separation: 90 N)
	Mechanical (manual, delayed actuator release approx. 15 to 20 s), max. 1000 N	Mechanical (spring), electro-mechanical (magnet), max. 1100 N (L100), max. 2500 N (L200)	
Cable or M12 plug	Cable entry M20 × 1.5	M20 × 1.5 cable entry (3-way)	M20 × 1.5 cable entry (3-way)
CE c UL us	CE c UL us	CE c UL us	CE c UL us
Integration in control circuits up to category 4 in accordance with EN ISO 13849 and EN 954-1, mechanical hinge with integrated Safety Switch	Integration in control circuits up to category 4 in accordance with EN ISO 13849 and EN 954-1, mechanical guard interlocking with manual locking and unlocking	Integration in control circuits up to category 4 in accordance with EN ISO 13849 and EN 954-1, mechanical guard interlocking (spring-force), electro-magnetic guard interlocking (magnet-force), auxiliary release, emergency release (L200), illuminated displays for magnet activation (L200)	Integration in control circuits up to category 4 in accordance with EN ISO 13849 and EN 954-1, position-independent E-STOP command input, reset function (reset button with indicator), rope head with alignment indicator
Maximum protective device opening angle of 180°. 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 conditions. Extremely manipulation-safe with covered screws (unobtrusive sturdy design with rear-side mounting).	Universal use with 5 actuator approach directions. Multiple heavy-duty actuator series AC-AHxx for a wide range of installation conditions. Self-centering with funnel-shaped entry opening. Reduced wiring through manual locking and releasing. 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 with funnel-shaped entry 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).	Machine is stopped by pulling the rope or on rope breakage. Simple setup through switching point indicator. Easy integration with 3 cable approach directions Clicks in on both sides with friction-locking contacts. Compact metal housing.

Safety Relays and Safety Interfaces

	MSI-RM2 Electro-mechanical Safety Relays	MSI-2H Electro-mechanical Safety Relays
		
Specifications		
Type in accordance with IEC/EN 61496-1 (Annex A)		
SIL in accordance with IEC 61508 and IEC/EN 62061		
Performance Level (PL) in accordance with EN ISO 13849-1		on request
Category in accordance with EN ISO 13849 and EN 954-1	Up to 4 (depending on the category of the upstream protective device)	Up to 4 (depending on the category of the upstream protective device)
Stop category in accordance with IEC/EN 60204-1		0
Signal output	Relay output (n.c.)	Relay output (n.c.)
Response time	10 ms	20 ms
Safety-related switching outputs (OSSD)	2 relay outputs (changeover)	2 relay outputs (n.o.)
Secondary switching device (SSD)		
Dimensions, W × H × D	17.5 × 99 × 113.6 mm	22.5 × 99 × 113.6 mm
Certifications	CE UL c UL	CE
Functions		
	Signal conversion of electronic outputs of active optoelectronic protective devices on potential-free relay contacts	Automatic start/restart. Start/restart interlock (RES), optionally with/without. Static contactor monitoring (EDM). Contact multiplication. Simultaneity monitoring of the two-hand buttons. Cross circuit monitoring.
Features		
	Monitoring external contactors in the signal circuit with the upstream protective device 2 release circuits, 1 break contact as signal circuit for contactor monitoring (EDM) Cost-effective relay interface for safety-related sensors with RES and EDM. Housing width 17.5 mm	Two-hand control unit in accordance with EN 574 type III C. Controlled start by checking the feedback circuit and button contacts Two-channel control with cross circuit monitoring. Simultaneity monitoring, 0.5 s. 2 release circuits, 1 NC contact as signal circuit. Potential-free safety-related switching outputs. LED displays, K1 and K2, supply voltage. Housing width 22.5 mm.

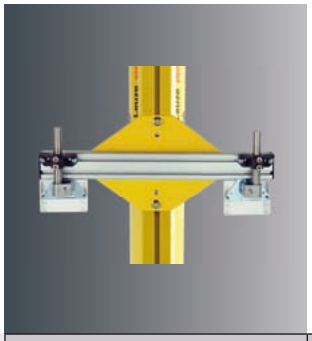
MSI-SR4 Electro-mechanical Safety Relays	**MSI-s, -i, -m** Configurable relays	**MSI-sx, -ix, -mx** Configurable relays with extended functionality	**TNT 35** Test Monitoring Modules for Type 2 Sensors
			
	Type 4	Type 4	Type 2
SIL 3	on request	on request	SIL 2
PL e	on request	on request	PL d
Up to 4 (depending on the category of the upstream protective device)	Up to 4 (depending on the category of the upstream protective device)	Up to 4 (depending on the category of the upstream protective device)	2
0	0	0	0
Relay output (n.c.)	2 transistor outputs	4 transistor outputs	2 transistor outputs
10 ms	22 to 64 ms depending on Safety Sensor	22 to 64 ms depending on Safety Sensor	< 20 ms
3 relay outputs (n.o.)	2 relay outputs (n.o.)	3 relay outputs (2 n.o., 1 n.c.)	2 relay outputs (n.o.)
		Relay output (n.o.)	
22.5 × 99 × 113.6 mm	35/52.5/70 × 99 × 113.6 mm	35/52.5/70 × 99 × 113.6 mm	45 × 99 × 113.6 mm
CE cULus	CE cULus **('e'-versions only)**	CE cULus **('e'-versions only)**	CE c cULus US
Automatic start/restart. Start/ restart interlock (RES), optionally with/without. Static contactor monitoring (EDM). Cross circuit monitoring.	Start/restart interlock (RES), optionally with/without static or dynamic contactor monitoring (EDM). Inputs with cross-circuit monitoring. Light curtain cycle control for single or dual cycle operation with or without Muting. Sequential or Parallel Muting with automatic mode detection.	Start/restart interlock (RES) optionally with/without static or dynamic contactor monitoring (EDM). Inputs with cross circuit monitoring. Light curtain cycle control. Muting with additional AOPD or E-STOP. Muting system solution for separate Muting of two AOPDs and connection of additional Safety Switch. Relay switching cycle for preventive maintenance and additional message outputs.	Test monitoring unit for periodic testing of type 2 sensors. Multiple monitoring of type 2 sensors in daisy chain connection. Start/ restart interlock (RES), optionally with/without. Static contactor monitoring (EDM), with/without optional. Signal outputs "Safety on" and "Error".
Very short response time. Monitored start/restart button. 3 release circuits, 1 NC contact as signal circuit. Potential-free safety-related switching outputs. LED displays, K1 and K2, supply voltage, automatic start/restart. Housing width 22.5 mm.	Safety Interface for connecting 1 type 4/type 3 AOPDs or 2 type 2 AOPDs. Light curtain cycle control in acc. with IEC 61496-1 with or without Muting. Separate Muting of 2 AOPDs at the entrance and exit of a production cell. Easy function selection via DIP switch. PC diagnostics interface.	Safety Interface for connecting 2 type 4/type 3 AOPDs or 4 type 2 AOPDs and/or Safety Switches. Light curtain cycle control and rear area monitoring, e.g. on press brakes.. Muting system solution for 2 AOPDs with E-STOP or moveable guard monitoring. Easy function selection via DIP switch. PC diagnostics interface.	Constant cyclical testing every 2 s without process interruption of the machine function during the test. 2 safety relay outputs with internal monitoring. Up to 6 Leuze type 2 sensors can be connected in daisy chain. LED indicators for all important functions and operating states.

Sensor Accessories and Signal Devices



		CPSET		ROBUST SET
				
		CPSET is a Safety Sensor Set with integrated Muting and various Muting modes. All necessary components are already pre-assembled and are mechanically and electrically harmonized with one another. The sets can be anchored permanently as freestanding devices using special foot elements. The factory-set parametering is already adjusted to the respective application instance and reduces input at the setup site to a minimum. For sensor specifications, see COMPACT*plus* Multiple Light Beam Safety Devices or CPRT-m.		ROBUST SETS contain pretty much everything required for the efficient setup of access guarding. If a Muting function is needed, this can be implemented by an additional MSI Safety Relay in the switch cabinet. The ROBUST SET is easy to connect and can be anchored permanently as a freestanding device using special foot elements. For specifications, see ROBUST Multiple Light Beam Safety Devices (number of beams: 2, beam spacing: 500 mm).
Certifications		CE c UL us		CE c UL us
Features				
		Integrated Muting-function enables Muting with optical sensors or induction loops. Plug & Play Muting complete solutions with plug-in connections Efficient setup – quick start-up. Various sets with Multiple Light Beam Safety Devices or Muting Transceivers (premounted in the device column). Premounted Muting components and display and control unit with start button for unlocking start/ restart interlock.		Extensive set for access guarding, if necessary also with Muting (2-sensor or 4-sensor Muting), e.g. with additional MSI-mx Safety Relays in the switch cabinet. Efficient setup – quick start-up. ROBUST Transceiver with integrated Muting Indicator. Integrated optics heating for use with extreme environmental conditions.

MMS
Muting Mounting Systems



Installation and initial operation times can be significantly reduced with the correct accessories.
The mmS Muting mounting systems are ex-works fully preassembled mounting brackets for Light Barriers and reflectors in 2- and 4-sensor Muting applications. In combination with the DC or UDC device columns and the
Multiple Light Beam Safety Devices of the ROBUST, COMPACT and COMPACT*plus* series, complete Muting solutions (CPSET) can be implemented which are optimally matched to one another.

Mounting system for Muting sensors suitable for DC/UDC device columns.
Sensor support is available in various standard geometries for 2- and 4-sensor Muting.
Flexible horizontal and vertical positioning of the sensors and reflectors is possible.
12 mm V2A rod mounting system for fixing Muting sensors.
Ex-works mounted reflectors included in delivery.

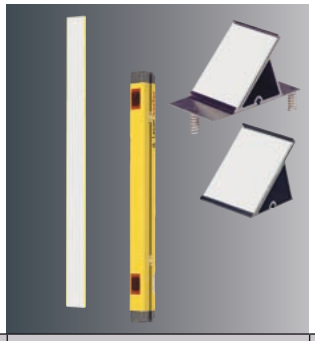
UDC, DC
Device columns

UMC, MC
Deflecting Mirror Columns

The UDC/DC device columns enable the freestanding mounting of Leuze electronic Multiple Light Beam Safety Devices and Safety Light Curtains on the floor.
The UMC/MC-1000, -1300, -1600 and -1900 deflecting mirror columns have a continuous mirror for beam deflection. The UMC/MC-1002, -1602, -1303 and -1304 deflection mirror columns are equipped with 2, 3 or 4 individually adjustable mirrors that deflect the light beams of Multiple Light Beam Safety Devices.

Easy mounting, quick vertical and axial alignment in just a few steps.
Robust profile construction in high quality design.
Complete mounting kit for floor fixing included with delivery (UDC, UMC).
Automatic resetting after mechanical impacts with special spring elements (UDC, UMC).
Simple vertical height adjustment of the built-in devices by means of 2 supplied mounting brackets (UDC, DC).
UMC, MC: Suitable for COMPACTlaser with integrated laser alignment aid. Continuous mirror surface for beam deflecting of Safety Light Curtains. Or replacement and separately alignable individual mirrors, light beam distance preset in acc. with EN 999.

UM60, US, PM, CPM
Deflection mirror



The combination of Safety Light Curtains and UM60 deflection mirrors enables cost-effective, multiple-side danger area guarding, e.g. at manual feed-in areas on machinery.
The US series individual deflection mirrors are specially designed for 90° beam deflections of single beam safety devices.
The deflection mirror systems of the PM and CPM series are used for the 2 × 90° beam deflection of 2- and 4-beam Leuze transceivers.

UM
Continuous mirror surface for beam deflecting of Safety Light Curtains.
Robust aluminum profile housing.
Slim and flat construction,
60 mm wide.
Easy mounting, fast alignment with mounting angles (in the preferred angles, 0°, 45° and 90°, as well as swiveling).

US
Glass mirror with precise alignment option in all 3 axes.
Mirror can rotate by 90° on mounting plate.

PM, CPM
Easy alignment with integrated, optically aligned mirror system.
Closed profile housing prevents soiling and damage to the mirror.

General Information Accessories

LA laser alignment aids are mounted directly on the sensor housing or on the device column with no additional wiring. They use a red-light laser (battery operated, laser class 2) to visibly mark the point of incidence of the sensor beams, thereby ensuring simple and convenient alignment.

PS protective screens, which can be mounted directly on the device, prevent damage to the front screen of the device, e.g by welding sparks.

The display and control units AC are used with access guarding with or without Muting. As a fixed component of some CPSET Safety Sensor Sets, they make a significant contribution to being able to quickly set up Muting solutions.

PS
Protective window material: PMMA, clear.
Effective protection, easy to install, robust.
Various window lengths of 300 mm to 1800 mm.

AC
Plastic box with reset button for start/restart interlock and for Muting restart/override.
All devices with additional LED indicator (except AC-BB-RES).
Simple mounting on hard guard.
Connection to COMPACT*plus* sensors as well as to MSI-m Safety Relays (model AC-ABF-SL1).

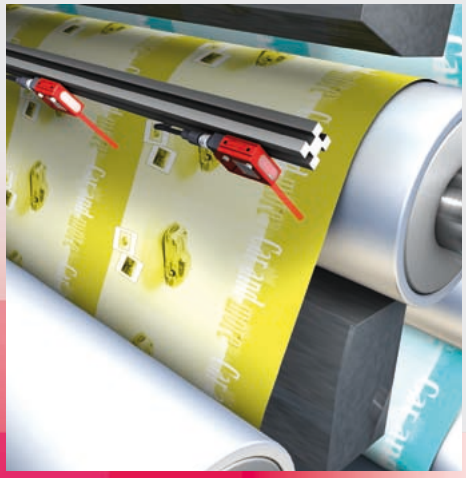
That's why size matters – Our engineering services.

Machine Safety Systems

A well designed and correctly implemented safety system can help increase your efficiency, your productivity and your profits. Our expert consultants are members of regulatory committees to ensure all systems fulfill the requirements for safety on the job. We access a huge database of safety standards and regulations which are constantly updated with the latest developments and trends in safety. Therefore, Leuze electronic systems are designed to meet or exceed the current and future safety standards and regulations for the United States, Canada and Europe. With our support, OEMs, system integrators and end users become safety compliant.

Our safety services include

- Safety inspection
- Safety assessments
- Layout of safe machine guarding, circuitry and guarding systems
- Machine safety upgrades



Integration Support and Services

No matter what the application, Leuze electronic can help you find a robust solution that will work efficiently and successfully in your machine, system or production line. We have the experience and know how to help you with design, integration and start-up.

Our engineering support services include

- Support for the integration of Leuze electronic products with control systems and/or ERP-systems.
- Development of solutions that integrate multiple Leuze electronic products in one system.
- Software module development support.
- Evaluation of existing solutions while providing new and improved solutions concerning cost, efficiency and reliability.
- Troubleshooting and field service.
- Preventative maintenance including software upgrades, life cycle management, calibration and reconfiguration.
- Management of light curtain configuration database for reduced inventory and set-up time.

Custom Sensor Solutions

Along with our wide selection of quality standardized products, Leuze electronic has a history and reputation of building sensors exactly to customer specifications. Our worldwide network of sensor specialists and engineers has the Research and Development and engineering capacity to develop new cutting-edge products or customize existing products according to your requirements and special application needs.

Our custom design offerings include*

- Special technical features
- Special connector cable
- Custom mounting hardware
- Custom protective guarding/mounting
- Lens material
- iP-rating
- Special label
- Custom product/project specifications
- Different color of housing

*Applies usually to sensors for detection and measuring for large projects that are typically over 1,000 pieces.

Optoelectronic Sensors

Cubic Series
Cylindrical Sensors, Mini Sensors, Fibre Optic Amplifiers
Measuring Sensors
Special Sensors
Light Curtains
Forked Sensors
Double Sheet Monitoring, Splice Detection
Inductive Switches
Accessories

Identification Systems
Data Transmission Systems
Distance Measurement

Barcode Readers
RF-IDent-System
Modular Interfacing Units
Industrial Image Processing Systems
Optical Data Transmission Systems
Optical Distance Measurement/Positioning
Mobile Code Readers

Safety Sensors
Safety Systems
Safety Services

Safety Laser Scanners
Safety Light Curtains
Transceiver and Multiple Light Beam Safety Devices
Single Light Beam Safety Devices
AS-i-Safety Product Range
Safety Sensor Technology for PROFIBUS DP
Safety Switches, Safety Locking Devices, Safety Command Devices
Safety Relays
Sensor Accessories and Signal Devices
Safety Engineering Software
Machine Safety Services

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