SMART
SENSOR
BUSINESS

Leuze electronic

the sensor people

Figure can vary

Part no.: 53800267
RSL425-S/CU416-5
Safety laser scanner




Contents

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Technical data

Basic data	
Series	RSL 400
Application	Mobile danger zone guarding Mobile side guarding Stationary access guarding Stationary danger zone guarding
Special design	
Special design	Measurement data output optimized for vehicle navigation
Functions	
Functions	Dynamic contactor monitoring (EDM), selectable E-stop linkage Four-field mode Resolution, selectable
Characteristic parameters	
Type	3 , IEC/EN 61496
SIL	2 , IEC 61508
SILCL	2 , IEC/EN 62061
Performance Level (PL)	d , EN ISO 13849-1
PFH_D	9E-08 per hour
Mission time T_M	20 years , EN ISO 13849-1
Category	3 , EN ISO 13849
Protective field data	
Scanning angle	270 °
Minimum adjustable range	50 mm
Number of field pairs, reversible	10
Number of quads, reversible	10
Number of protective functions	1 Piece(s)
Number of independent sensor configurations	1
Diffuse reflection, min.	1.8 %
Operating range	0 ... 3 m
Warning field data	
Number of field pairs	10
Operating range	0 ... 20 m
Object size	150 mm x 150 mm
Diffuse reflection, min.	10 %
Optical data	
Light source	Laser , Infrared
Laser light wavelength	905 nm
Laser class	1 , IEC/EN 60825-1:2007
Transmitted-signal shape	Pulsed
Repetition frequency	90 kHz
Measurement data	

Detection range	0 ... 50 m , Diffuse reflection > 90%
Diffuse reflection	20 %
Angular resolution	0.1 °
Distance resolution, radial	1 mm
Distance resolution, lateral	0.1 °
Systematic measurement error D_{meas} - D_{real}	min.: -20 mm typ.: -10 mm max.: 0 mm (Diffuse reflection: 1.8% … retro-reflector Measurement range: 0.2 … 25 m)
Measurement value noise	10 mm , 1 σ (• Diffuse reflection: 1.8% … 20% Measurement range: 0 … 9 m • Diffuse reflection: 20% … retro-reflector Measurement range: 0 … 25 m)
Laser spot (H x W), 10 m	60 mm x 13 mm
Laser spot (H x W), 20 m	165 mm x 24 mm
Laser spot (H x W), 30 m	265 mm x 40 mm
Laser spot (H x W), 40 m	285 mm x 57 mm

Electrical data	
Protective circuit	Overvoltage protection
Performance data	
Supply voltage U_B	24 V , DC , -30 ... 20 %
Current consumption (without load), max.	700 mA , (use power supply unit with 3 A)
Power consumption, max.	17 W , For 24 V, plus output load
Outputs	
Number of safety-related switching outputs (OSSDs)	2 Piece(s)
Safety-related switching outputs	
Type	Safety-related switching output OSSD
Switching voltage high, min.	20.8 V
Switching voltage low, max.	2 V
Voltage type	DC
Safety-related switching output 1	
Assignment	Connection 1, gray wire
Switching element	Transistor , PNP
Safety-related switching output 2	
Assignment	Connection 1, pink wire
Switching element	Transistor , PNP

Service interface	
Type	Bluetooth
Bluetooth	
Function	Configuration/parametering
Frequency band	2,400 ... 2,483.5 MHz
Radiated transmitting power	Max. 4.5 dBm (2.82 mW), class 2
Type	USB
USB	
Function	Configuration/parametering
Connection	USB 2.0 mini-B, socket
Transmission speed, max.	12 Mbit/s
Cable length	≤ 5m Longer cable lengths are possible using active cables.

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Connection	
Number of connections	2 Piece(s)
Connection 1	
Type of connection	Cable
Function	Machine interface
Cable length	5,000 mm
Sheathing material	PVC
Cable color	Black
Number of conductors	16 -wire
Wire cross section supply	1 mm²
Wire cross section signals	0.14 mm²
Connection 2	
Type of connection	Connector
Function	Data interface
Thread size	M12
Type	Female
Material	Metal
No. of pins	4 -pin
Encoding	D-coded
Cable properties	
Cable resistance, max.	15 Ω

Mechanical data	
Dimension (W x H x L)	140 mm x 149 mm x 140 mm
Housing material	Metal Plastic , Diecast zinc ,
Lens cover material	Plastic/PC
Net weight	3,000 g
Housing color	Yellow, RAL 1021
Type of fastening	Mounting plate Through-hole mounting Via optional mounting device

Operation and display	
Type of display	Alphanumerical display LED indicator
Number of LEDs	3 Piece(s)
Type of configuration	Software Sensor Studio
Operational controls	Software Sensor Studio

Environmental data	
Ambient temperature, operation	0 ... 50 °C
Ambient temperature, storage	-20 ... 60 °C
Relative humidity (non-condensing)	15 ... 95 %

Certifications	
Degree of protection	IP 65
Protection class	III , EN 61140
Certifications	TÜV Süd
Test procedure for EMC in accordance with standard	DIN 40839-1/3 EN 61496-1

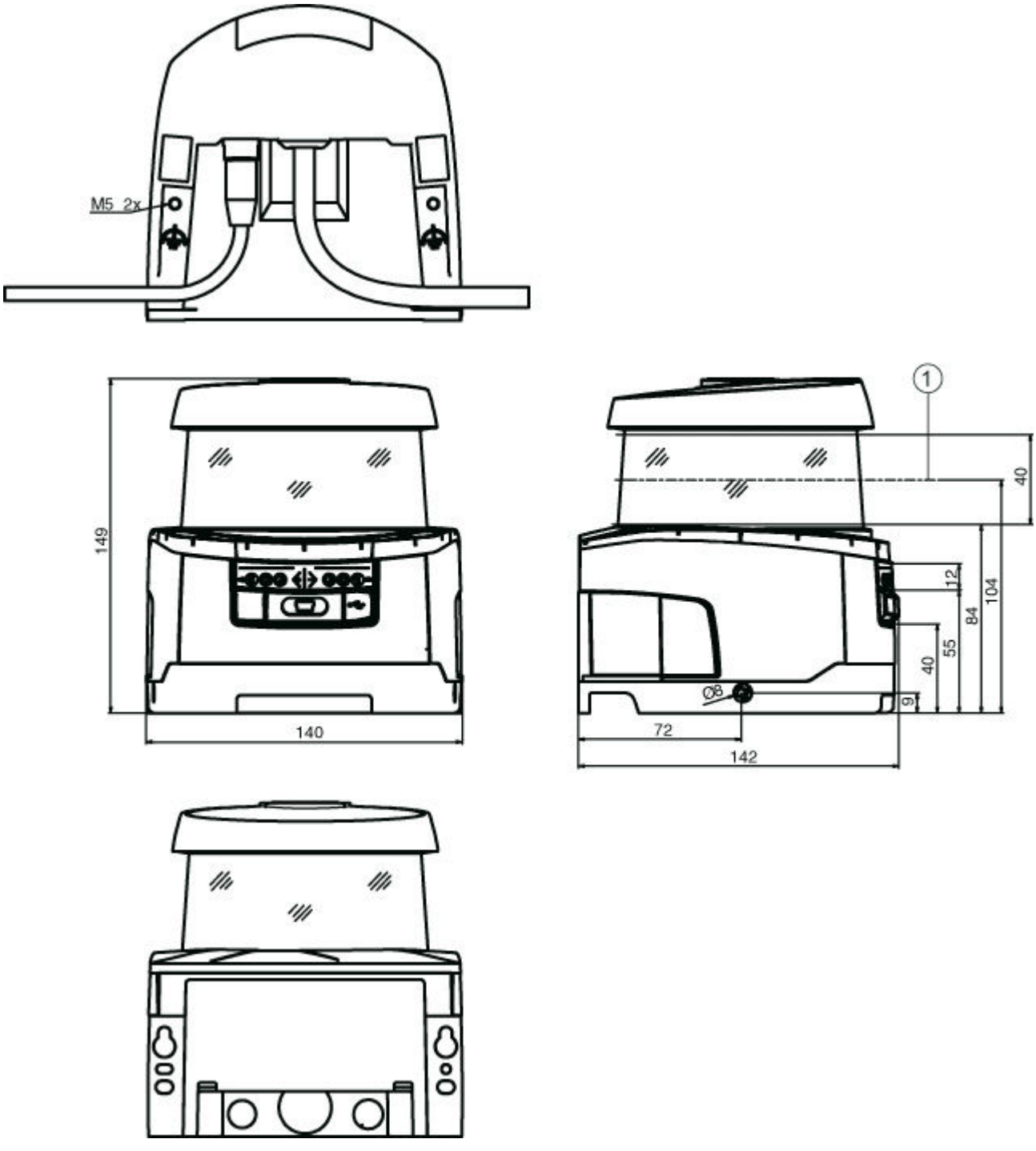
Test procedure for oscillation in accordance with standard	EN 60068-2-6
Test procedure for continuous shock in accordance with standard	IEC 60068-2-29
US patents	US 2016/0086469 A US 7,656,917 B US 7,696,468 B US 8,520,221 B

Classification	
Customs tariff number	85365019
eCl@ss 8.0	27272705
eCl@ss 9.0	27272705
ETIM 5.0	EC002550
ETIM 6.0	EC002550

Dimensioned drawings

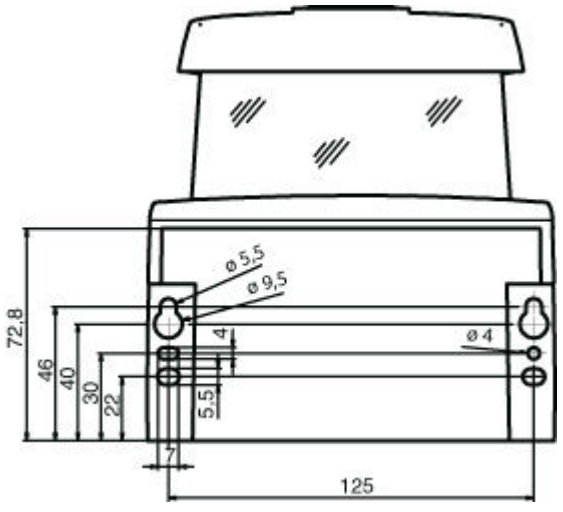
All dimensions in millimeters

Dimensions safety laser scanner with connection unit

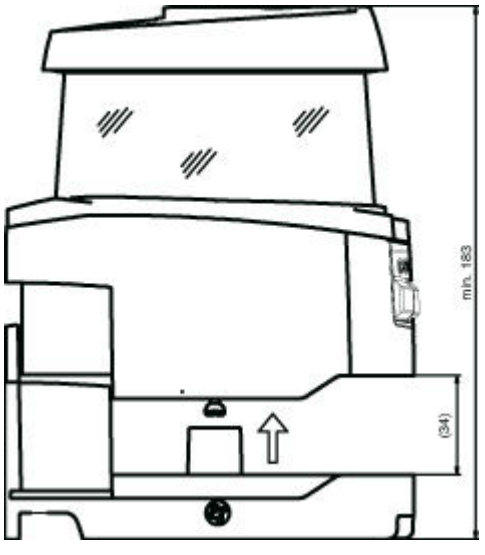


1 Scan level

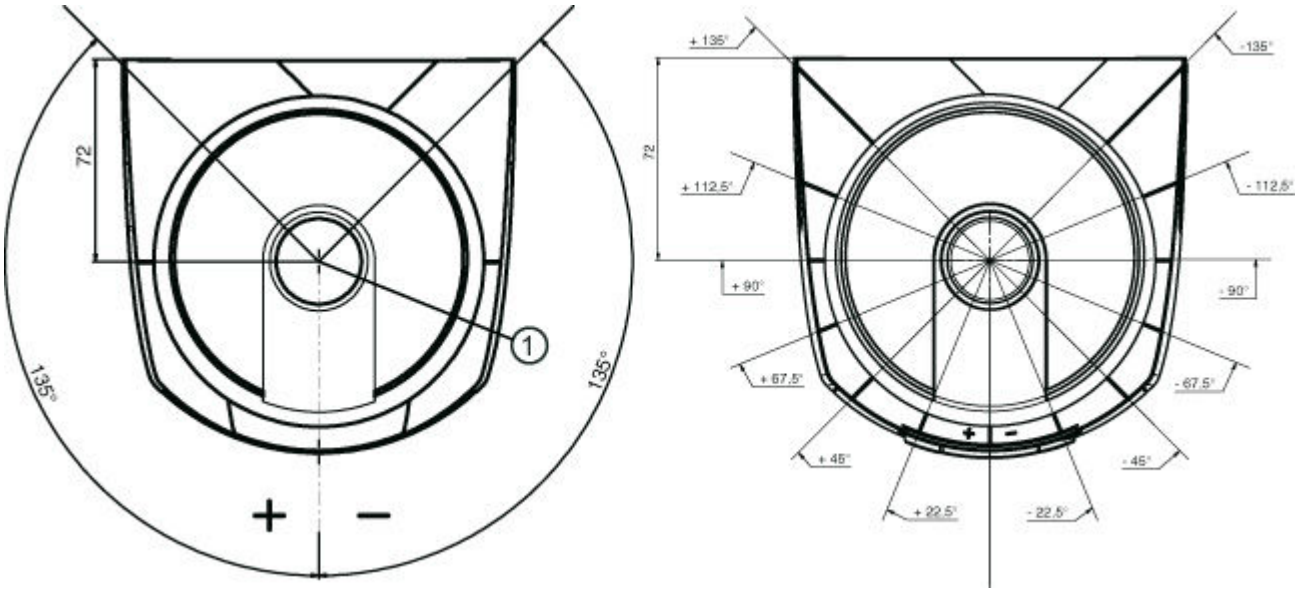
Mounting dimensions safety laser scanner with connection unit



Minimum space requirements for installation and replacement of scanner unit



Dimensions of scanning range



1 Reference point for distance measurement and protective field radius

Electrical connection

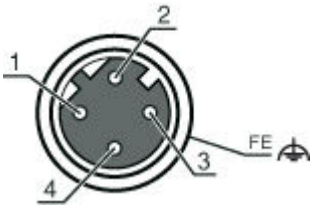
Connection 1	
Type of connection	Cable
Function	Machine interface
Cable length	5,000 mm
Sheathing material	PVC
Cable color	Black
Number of conductors	16 -wire
Wire cross section	
Wire cross section supply	1 mm²
Wire cross section signals	0.14 mm²

Conductor color	Conductor assignment
White	RES1
Brown	+24V
Green	EA1
Yellow	A1
Gray	OSSDA1
Pink	OSSDA2
Blue	GND / Ground
Red	MELD
Black	F1
Violet	F2
Gray Pink	F3
Blue Red	F4
Green White	F5

Conductor color	Conductor assignment
Brown Green	SE1
White Yellow	SE2
Brown Yellow	A2

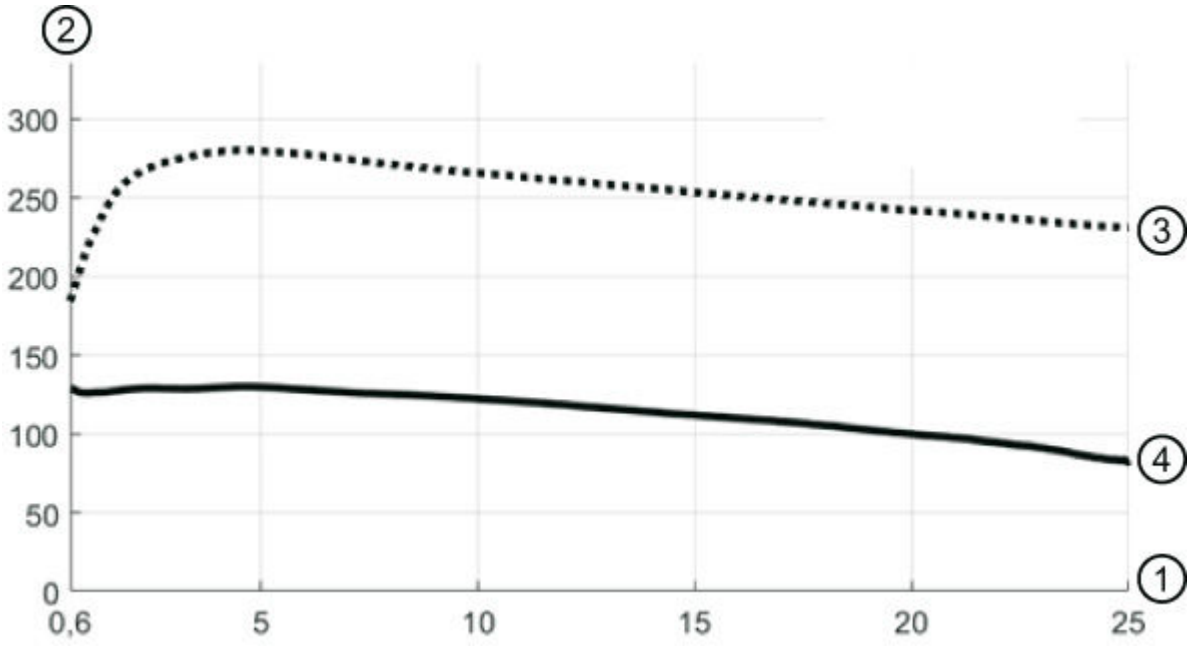
Connection 2	
Type of connection	Connector
Function	Data interface
Thread size	M12
Type	Female
Material	Metal
No. of pins	4 -pin
Encoding	D-coded
Connector housing	FE/SHIELD

Pin	Pin assignment	Conductor color
1	TD+	Yellow
2	RD+	White
3	TD-	Orange
4	RD-	Blue
5		



Diagrams

Signal strength curves depending on the distance



1 Object distance [m]
2 Signal strength

3 Retro-reflector film
4 White surface
The figure shows a typical curve of the signal strength transmitted by the safety sensor as a function of the measured object distance and object diffuse reflection for the following boundary conditions:
• Angle of incidence of the laser beam: 0°
• Share of area of the light spot on the object: 100%

Operation and display

LEDs

LED	Display	Meaning
1	Off	Device switched off
	Red, continuous light	OSSD off
	Red, flashing	Error
	Green, continuous light	OSSD on
2	Off	RES deactivated or RES activated and released
	Yellow, flashing	Protective field occupied
	Yellow, continuous light	RES activated and blocked but ready to be unlocked - protective field free and linked sensor is enabled if applicable
3	Off	Free warning field
	Blue, continuous light	Warning field interrupted
4	Off	Four field mode: warning field 3 free
	Blue, continuous light	Four field mode: warning field 3 interrupted
5	Yellow, flashing	Four field mode: warning field 2 interrupted

Notes

Observe intended use!

- The product may only be put into operation by competent persons.
- Only use the product in accordance with its intended use.

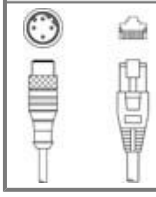
WARNING! INVISIBLE LASER RADIATION – LASER CLASS 1

The device satisfies the requirements of IEC 60825-1:2007 (EN 60825-1:2007) safety regulations for a product of **laser class 1** as well as the U.S. 21 CFR 1040.10 regulations with deviations corresponding to "Laser Notice No. 50" from June 24, 2007.

- Observe the applicable statutory and local laser protection regulations.
- The device must not be tampered with and must not be changed in any way.
  There are no user-serviceable parts inside the device.
  Repairs must only be performed by Leuze electronic GmbH + Co. KG.

Accessories

Connection technology - Interconnection cables

	Part no.	Designation	Article	Description
	50135081	KSS ET-M12-4A-RJ45-A-P7-050	Interconnection cable	Suitable for interface: Ethernet Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin Connection 2: RJ45 Shielded: Yes Cable length: 5,000 mm Sheathing material: PUR

Mounting technology - Mounting brackets

	Part no.	Designation	Article	Description
	53800134	BT840M	Mounting bracket	Application: Mounting on chamfered 90° corner Dimensions: 84.9 mm x 72 mm x 205.2 mm Color: Yellow, RAL 1021 Type of fastening, at system: Through-hole mounting Type of fastening, at device: Screw type Material: Metal

Mounting

	Part no.	Designation	Article	Description
	53800131	BTP800M	Loop guard	Dimensions: 160 mm x 169 mm Color: Black Material: Metal

Services

	Part no.	Designation	Article	Description
	S981051	CS40-I-141	Safety inspection "Safety laser scanners"	Details: Checking of a safety laser scanner application in accordance with current standards and guidelines. Inclusion of the device and machine data in a database, production of a test log per application. Conditions: It must be possible to stop the machine, support provided by customer's employees and access to the machine for Leuze employees must be ensured. Restrictions: Travel costs and accommodation expenses charged separately and according to expenditure.
	S981047	CS40-S-141	Start-up support	Details: For safety devices including stopping time measurement and initial inspection. Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses. Restrictions: Max. 3 h., no mechanical (mounting) and electrical (wiring) work performed, no changes (attachments, wiring, programming) to third-party components in the nearby environment.