



Figure can vary

**Part no.: 53800149**  
**RSL445-XL**  
**Safety laser scanner**



## Contents

- Technical data
- Dimensioned drawings
- Operation and display
- Notes
- Accessories

## Technical data

| <b>Basic data</b>                           |   |
|---|---|
| Series                                      | RSL 400   |
| Application                                 | Mobile danger zone guarding<br>Mobile side guarding<br>Stationary access guarding<br>Stationary danger zone guarding  |
| <b>Special design</b>                       |   |
| Special design                              | Measurement data output optimized for vehicle navigation  |
| <b>Functions</b>                            |   |
| Functions                                   | Data output, configurable<br>Dynamic contactor monitoring (EDM), selectable<br>E-stop linkage<br>Four-field mode<br>Resolution, selectable<br>Safe time delay, internal |
| <b>Characteristic parameters</b>            |   |
| Type  | 3 , IEC/EN 61496  |
| SIL   | 2 , IEC 61508   |
| SILCL                                       | 2 , IEC/EN 62061  |
| Performance Level (PL)                      | d , EN ISO 13849-1  |
| PFH <sub>D</sub>                            | 9E-08 per hour  |
| Mission time T <sub>M</sub>                 | 20 years , EN ISO 13849-1   |
| Category                                    | 3 , EN ISO 13849  |
| <b>Protective field data</b>                |   |
| Scanning angle                              | 270 °   |
| Minimum adjustable range                    | 50 mm   |
| Number of field pairs, reversible           | Up to 100   |
| Number of quads, reversible                 | 50  |
| Number of protective functions              | 2 Piece(s)  |
| Number of independent sensor configurations | Up to 10  |
| Diffuse reflection, min.                    | 1.8 %   |
| Operating range                             | 0 ... 8.25 m  |
| <b>Warning field data</b>                   |   |
| Number of field pairs                       | Up to 100   |
| Operating range                             | 0 ... 20 m  |
| Object size                                 | 150 mm x 150 mm   |
| Diffuse reflection, min.                    | 10 %  |
| <b>Optical data</b>                         |   |
| 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  |

## Part no.: 53800149 – RSL445-XL – Safety laser scanner

| <b>Measurement data</b>                            |  |
|--|--|
| 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<br>typ.: -10 mm<br>max.: 0 mm<br>(Diffuse reflection: 1.8% ... retro-reflector<br>Measurement range: 0.2 ... 25 m)  |
| Measurement value noise                            | 10 mm , 1 $\sigma$<br>(• Diffuse reflection: 1.8% ... 20%<br>Measurement range: 0 ... 9 m<br>• Diffuse reflection: 20% ... retro-reflector<br>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   |

| <b>Electrical data</b>                             |   |
|--|---|
| Protective circuit                                 | Overvoltage protection                    |
| <b>Performance data</b>                            |   |
| 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         |
| <b>Outputs</b>                                     |   |
| Number of safety-related switching outputs (OSSDs) | 4 Piece(s)                                |
| <b>Safety-related switching outputs</b>            |   |
| Type   | Safety-related switching output OSSD      |
| Switching voltage high, min.                       | 20.8 V                                    |
| Switching voltage low, max.                        | 2 V                                       |
| Voltage type                                       | DC  |
| <b>Safety-related switching output 1</b>           |   |
| Switching element                                  | Transistor , PNP                          |
| <b>Safety-related switching output 2</b>           |   |
| Switching element                                  | Transistor , PNP                          |
| <b>Safety-related switching output 3</b>           |   |
| Switching element                                  | Transistor , PNP                          |
| <b>Safety-related switching output 4</b>           |   |
| Switching element                                  | Transistor , PNP                          |

| <b>Service interface</b>    |                                 |
|-----------------------------|---------------------------------|
| Type                        | Bluetooth                       |
| <b>Bluetooth</b>            |                                 |
| 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                             |

## Part no.: 53800149 – RSL445-XL – Safety laser scanner

### USB

|                          |  |
|--------------------------|--|
| Function                 | Configuration/parametering                                     |
| Connection               | USB 2.0 mini-B, socket   |
| Transmission speed, max. | 12 Mbit/s  |
| Cable length             | ≤ 5m<br>Longer cable lengths are possible using active cables. |

### Connection

#### Cable properties

### Mechanical data

|                       |   |
|-----------------------|---|
| Dimension (W x H x L) | 140 mm x 149 mm x 140 mm  |
| Housing material      | Metal<br>Plastic , Diecast zinc ,                                       |
| Lens cover material   | Plastic/PC  |
| Net weight            | 2,000 g   |
| Housing color         | Yellow, RAL 1021  |
| Type of fastening     | Mounting plate<br>Through-hole mounting<br>Via optional mounting device |

### Operation and display

|                       |   |
|-----------------------|---|
| Type of display       | Alphanumerical display<br>LED indicator |
| Number of LEDs        | 6 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<br>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 10,304,307B<br>US 7,656,917 B<br>US 7,696,468 B<br>US 8,520,221 B |

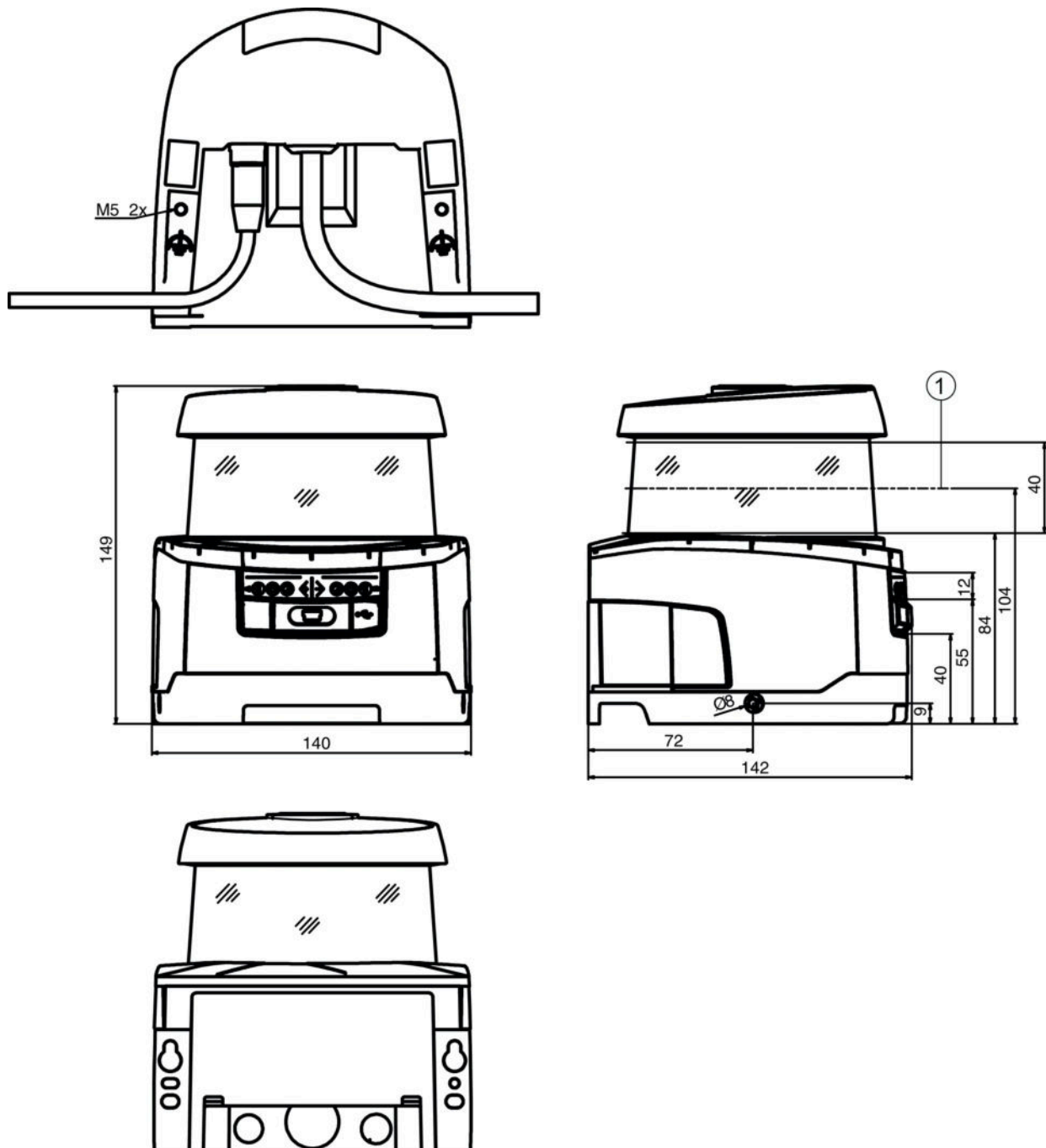
### Classification

|                       |          |
|-----------------------|----------|
| 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

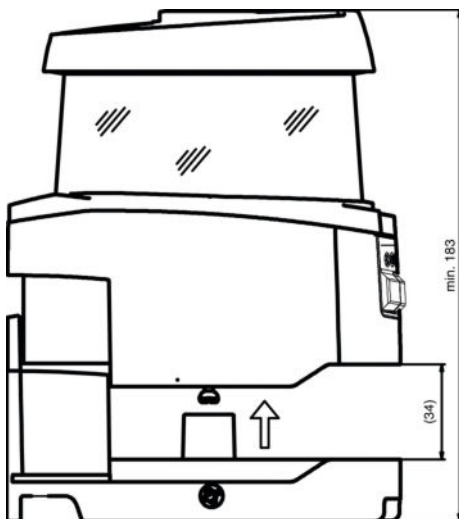


1 Scan level

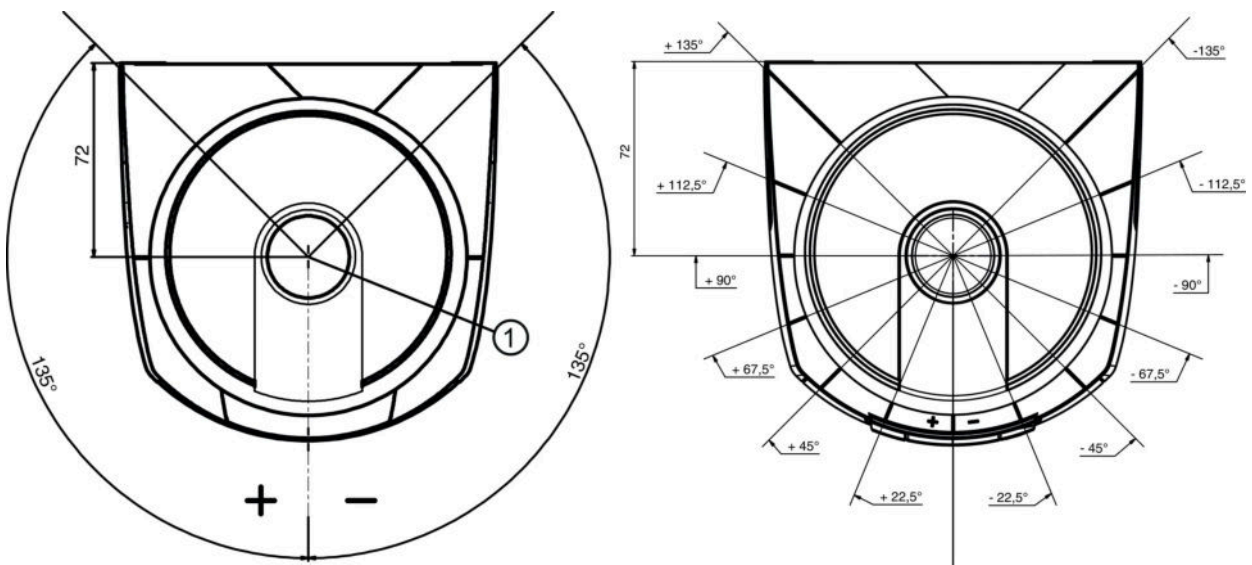
Mounting dimensions safety laser scanner with connection unit



Minimum space requirements for installation and replacement of scanner unit



Dimensions of scanning range



1 Reference point for distance measurement and protective field radius

## 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                      | Free warning field  |
|     | Blue, continuous light   | Warning field interrupted   |
| 5   | 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 |
| 6   | Off                      | Device switched off   |
|     | Red, continuous light    | OSSD off  |
|     | Red, flashing            | Error   |
|     | Green, continuous light  | OSSD on   |

## 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.


Part no.: 53800149 – RSL445-XL – Safety laser scanner

## Accessories


### Connection technology - Connection boxes

|   | Part no. | Designation | Article         | Description   |
|---|----------|-------------|-----------------|---|
|  | 53800122 | CU429-10000 | Connection unit | Number of connections: 2 Piece(s)<br>Connection 1: Cable, 10,000 mm, PVC, 29 -wire<br>Connection 2: Connector, M12, D-coded, 5 -pin<br>Dimensions: 140.2 mm x 72.8 mm x 140.3 mm<br>Color: Black<br>Type of fastening: Bayonet system |



### Mounting technology - Mounting brackets

|   | Part no. | Designation | Article          | Description  |
|---|----------|-------------|------------------|--|
|  | 53800132 | BTF815M     | Mounting bracket | Application: Mounting bracket for floor mounting<br>Dimensions: 186 mm x 120 mm x 288 mm<br>Scan level height: 150 mm<br>Color: Yellow, RAL 1021<br>Type of fastening, at system: Through-hole mounting<br>Type of fastening, at device: Screw type<br>Material: Metal |

### Mounting technology - Other

|   | Part no. | Designation | Article         | Description  |
|---|----------|-------------|-----------------|--|
|  | 53800130 | BTU800M     | Mounting system | Dimensions: 54.5 mm x 90 mm x 192 mm<br>Color: Black<br>Type of fastening, at system: Through-hole mounting<br>Type of fastening, at device: Screw type<br>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.<br>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.<br>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.<br>Conditions: Devices and connection cables are already mounted, price not including travel costs and, if applicable, accommodation expenses.<br>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.   |

#### Note

A list with all available accessories can be found on the Leuze electronic website in the Download tab of the article detailed page.