

## Technical data sheet Safety laser scanner

Part no.: 53800235

RSL440-L/CU429-5



For illustration purposes only

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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 |

### Functions

|           |                                                |
|-----------|------------------------------------------------|
| Functions | Data output, configurable                      |
|           | Dynamic contactor monitoring (EDM), selectable |
|           | E-stop linkage                                 |
|           | Four-field mode                                |
|           | Safe time delay, internal                      |
| Restart   | Start/restart interlock (RES), 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 <sub>D</sub>            | 9E-08 per hour           |
| Mission time T <sub>M</sub> | 20 years, EN ISO 13849-1 |
| Category                    | 3, EN ISO 13849          |

### Protective field data

|                                             |                       |
|---------------------------------------------|-----------------------|
| Resolution (adjustable)                     | 30/40/50/60/70/150 mm |
| Minimum adjustable range                    | 50 mm                 |
| Number of field pairs, switchable           | Up to 100             |
| Number of quads, switchable                 | 50                    |
| Number of protective functions              | 2 Piece(s)            |
| Number of independent sensor configurations | Up to 10              |
| Diffuse reflection, min.                    | 1.8 %                 |
| Operating range                             | 0 ... 6.25 m          |

### Warning field data

|                          |                 |
|--------------------------|-----------------|
| Number of field pairs    | Up to 100       |
| Operating range          | 0 ... 20 m      |
| Object size              | 150 mm x 150 mm |
| Diffuse reflection, min. | 10 %            |

### Optical data

|                          |                        |
|--------------------------|------------------------|
| Light source             | Laser, Infrared        |
| Wavelength               | 905 nm                 |
| Laser class              | 1, IEC/EN 60825-1:2014 |
| Transmitted-signal shape | Pulsed                 |
| Repetition frequency     | 90 kHz                 |
| Angular resolution       | 0.1 °                  |
| Scanning angle           | 270 °                  |

### Electrical data

|                                          |                                          |
|------------------------------------------|------------------------------------------|
| Protective circuit                       | Overvoltage protection                   |
| Performance data                         |                                          |
| Supply voltage U <sub>B</sub>            | 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 signal outputs, configurable             | 9 Piece(s) |
| Number of safety-related switching outputs (OSSDs) | 4 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                                   |
| Switching current, max.      | 300 mA                               |

### 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         |

### Safety-related switching output 3

|                   |                                |
|-------------------|--------------------------------|
| Assignment        | Connection 1, yellow/gray wire |
| Switching element | Transistor, PNP                |

### Safety-related switching output 4

|                   |                               |
|-------------------|-------------------------------|
| Assignment        | Connection 1, pink/green wire |
| Switching element | Transistor, PNP               |

### Time behavior

|               |          |
|---------------|----------|
| Response time | 80 ms, ≥ |
|---------------|----------|

### Service interface

|            |                               |
|------------|-------------------------------|
| Type       | Bluetooth, Ethernet, USB      |
| Ethernet   |                               |
| Function   | Configuration/parametization  |
|            | TCP/IP                        |
| Connection | M12 connector, 4-pin, D-coded |

### Bluetooth

|                             |                                 |
|-----------------------------|---------------------------------|
| Function                    | Configuration/parametization    |
| Frequency band              | 2,400 ... 2,483.5 MHz           |
| Radiated transmitting power | Max. 4.5 dBm (2.82 mW), class 2 |

### USB

|                          |                                                                |
|--------------------------|----------------------------------------------------------------|
| Function                 | Configuration/parametization                                   |
| 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

|                       |            |
|-----------------------|------------|
| Number of connections | 2 Piece(s) |
|-----------------------|------------|

## Technical data

### Connection 1

|                            |                      |
|----------------------------|----------------------|
| Function                   | Machine interface    |
| Type of connection         | Cable                |
| Cable length               | 5,000 mm             |
| Sheathing material         | PVC                  |
| Cable color                | Black                |
| Number of conductors       | 29 -wire             |
| Wire cross section supply  | 1 mm <sup>2</sup>    |
| Wire cross section signals | 0.14 mm <sup>2</sup> |

### Connection 2

|                    |                |
|--------------------|----------------|
| Function           | Data interface |
| Type of connection | Connector      |
| 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                      |
| Metal housing         | 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       | Alphanumeric display   |
|                       | 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               |
| Approvals                                                       | c TÜV Süd US                |
|                                                                 | c UL US                     |
|                                                                 | 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              |
|                                                                 | US 7,656,917 B              |
|                                                                 | US 7,696,468 B              |
|                                                                 | US 8,520,221 B              |

### Classification

|                       |          |
|-----------------------|----------|
| Customs tariff number | 85365019 |
| ECLASS 5.1.4          | 27272705 |
| ECLASS 8.0            | 27272705 |
| ECLASS 9.0            | 27272705 |
| ECLASS 10.0           | 27272705 |
| ECLASS 11.0           | 27272705 |
| ECLASS 12.0           | 27272705 |
| ECLASS 13.0           | 27272705 |
| ECLASS 14.0           | 27272705 |
| ECLASS 15.0           | 27272705 |
| ECLASS 16.0           | 27272705 |
| ETIM 5.0              | EC002550 |
| ETIM 6.0              | EC002550 |
| ETIM 7.0              | EC002550 |
| ETIM 8.0              | EC002550 |
| ETIM 9.0              | EC002550 |
| ETIM 10.0             | EC002550 |

## Dimensioned drawings

All dimensions in millimeters

Dimensions safety laser scanner with connection unit



1 Scan level

## Dimensioned drawings

## Mounting dimensions safety laser scanner with connection unit



### Minimum space requirements for installation and replacement of scanner unit



## Dimensioned drawings

### Dimensions of scanning range



1 Reference point for distance measurement and protective field radius

## Electrical connection

### Connection 1

|                            |                      |
|----------------------------|----------------------|
| Function                   | Machine interface    |
| Type of connection         | Cable                |
| Cable length               | 5,000 mm             |
| Sheathing material         | PVC                  |
| Cable color                | Black                |
| Number of conductors       | 29 -wire             |
| Wire cross section supply  | 1 mm <sup>2</sup>    |
| Wire cross section signals | 0.14 mm <sup>2</sup> |

### Conductor color

### Conductor assignment

|                |              |
|----------------|--------------|
| White          | RES1         |
| Brown          | +24 V        |
| 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           |
| Brown / Green  | SE1          |
| White / Yellow | SE2          |
| Brown / Yellow | A2           |
| Gray / White   | A3           |
| Brown / Gray   | A4           |
| Pink / White   | EA2          |
| Brown / Pink   | EA3          |

## Electrical connection

### Conductor color

### Conductor assignment

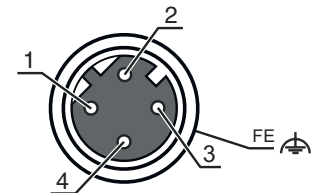
|               |        |
|---------------|--------|
| Blue / White  | EA4    |
| Blue / Brown  | F6     |
| Red / White   | F7     |
| Brown / Red   | F8     |
| Black / White | F9     |
| Black / Brown | F10    |
| Gray / Green  | RES2   |
| Gray / Yellow | OSSDB1 |
| Green / Pink  | OSSDB2 |

### Connection 2

|                    |                |
|--------------------|----------------|
| Function           | Data interface |
| Type of connection | Connector      |
| 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 |     |        |



## Operation and display

| 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.



### ATTENTION! INVISIBLE LASER RADIATION – CLASS 1 LASER PRODUCT



The device satisfies the requirements of IEC/EN 60825-1:2014 safety regulations for a product of **laser class 1** and complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

- ⚡ 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 | Application: Oil and lubricant resistant<br>Suitable for interface: Ethernet<br>Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin<br>Connection 2: RJ45<br>Shielded: Yes<br>Cable length: 5,000 mm<br>Sheathing material: PUR  |
|  | 50135082 | KSS ET-M12-4A-RJ45-A-P7-100 | Interconnection cable | Application: Oil and lubricant resistant<br>Suitable for interface: Ethernet<br>Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin<br>Connection 2: RJ45<br>Shielded: Yes<br>Cable length: 10,000 mm<br>Sheathing material: PUR |
|  | 50135083 | KSS ET-M12-4A-RJ45-A-P7-150 | Interconnection cable | Application: Oil and lubricant resistant<br>Suitable for interface: Ethernet<br>Connection 1: Connector, M12, Axial, Male, D-coded, 4 -pin<br>Connection 2: RJ45<br>Shielded: Yes<br>Cable length: 15,000 mm<br>Sheathing material: PUR |

### Mounting technology - Mounting brackets

|  | Part no. | Designation | Article          | Description                                                                                                                                                                                    |
|--|----------|-------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 53800134 | BT840M      | Mounting bracket | Application: Mounting on chamfered 90° corner<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 |

## Accessories

|                                                                                  | Part no. | Designation | Article          | Description                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------|----------|-------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 53800132 | BTF815M     | Mounting bracket | Application: Mounting bracket for floor mounting<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 |
|  | 53800133 | BTF830M     | Mounting bracket | Application: Mounting bracket for floor mounting<br>Scan level height: 300 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

|                                                                                  | Part no. | Designation | Article    | Description                     |
|----------------------------------------------------------------------------------|----------|-------------|------------|---------------------------------|
|  | 53800131 | BTP800M     | Loop guard | Color: Black<br>Material: Metal |

## General

|                                                                                    | Part no. | Designation    | Article      | Description                                                                                      |
|------------------------------------------------------------------------------------|----------|----------------|--------------|--------------------------------------------------------------------------------------------------|
|  | 430400   | RS4-clean-Set1 | Cleaning set | Number of cleaning cloths: 40 Piece(s)<br>Content of cleaning fluid: 150 ml<br>Net weight: 616 g |

## Services

|                                                                                    | Part no. | Designation | Article           | Description                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------|----------|-------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | S981051  | CS40-I-141  | Safety inspection | 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. |
|  | 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.                                                                                                                                         |

Accessories

| Note                                                                             |                                                                                                                                  |
|----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
|  | <p>A list with all available accessories can be found on the Leuze website in the Download tab of the article detailed page.</p> |