

## Technical data sheet

## Safety laser scanner

Part no.: 53800331

RSL420P-L/CU400P-4M12



For illustration purposes only

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## Technical data

### Basic data

|             |  |
|-------------|--|
| Series      | RSL 400  |
| Application | Mobile danger zone guarding<br>Mobile side guarding<br>Stationary access guarding<br>Stationary danger zone guarding |

### Functions

|           |   |
|-----------|---|
| Functions | PROFIsafe                                 |
| 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           | 10                    |
| Number of quads, switchable                 | -                     |
| Number of protective functions              | 1 Piece(s)            |
| Number of independent sensor configurations | 1                     |
| Diffuse reflection, min.                    | 1.8 %                 |
| Operating range                             | 0 ... 6.25 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        |
| 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                   |
| <b>Performance data</b>                  |  |
| Supply voltage U <sub>B</sub>            | 24 V, DC, -30 ... 20 %                   |
| Current consumption (without load), max. | 900 mA, (use power supply unit with 3 A) |
| Power consumption, max.                  | 22 W, For 24 V, plus output load         |
| <b>Outputs</b>                           |  |
| Number of signal outputs, configurable   | 4 Piece(s)                               |

### Time behavior

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

### Interface

|                                  |   |
|----------------------------------|---|
| Type                             | PROFINET  |
| <b>PROFINET</b>                  |   |
| Function                         | Process   |
| PROFINET device                  | Device acc. to Spec V2.3.4  |
| GSDML                            | GSDML acc. to Spec V2.3.2   |
| Profile                          | PROFINET/PROFIsafe  |
| Conformance class                | C   |
| Network load class               | III   |
| Security level                   | 1   |
| Switch functionality             | IRT-ready 2-port switch acc. to IEEE 802, integrated in connection unit |
| <b>Port properties</b>           |   |
|                                  | Auto-Crossover  |
|                                  | Auto-Negotiation  |
|                                  | Auto-Polarity   |
| I&M                              | 0 - 4   |
| Supported topologies             | MRP client  |
|                                  | SNMP  |
| Safety-related switching signals | 1 Piece(s)  |

### Service interface

|                             |  |
|-----------------------------|--|
| Type                        | Bluetooth, Ethernet, USB                                       |
| <b>Ethernet</b>             |  |
| Function                    | Configuration/parametization                                   |
|                             | TCP/IP   |
| Connection                  | M12 connector, 4-pin, D-coded                                  |
| <b>Bluetooth</b>            |  |
| Function                    | Configuration/parametization                                   |
| Frequency band              | 2,400 ... 2,483.5 MHz  |
| Radiated transmitting power | Max. 4.5 dBm (2.82 mW), class 2                                |
| <b>USB</b>                  |  |
| 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 | 4 Piece(s)     |
| <b>Connection 1</b>   |                |
| Function              | Voltage supply |
| Type of connection    | Connector      |
| Thread size           | M12            |
| Type                  | Male           |
| Material              | Metal          |
| No. of pins           | 5 -pin         |
| Encoding              | L-coded        |

## Technical data

### Connection 2

|                    |   |
|--------------------|---|
| Function           | PROFINET/PROFIsafe communication, input |
| Type of connection | Connector                               |
| Thread size        | M12                                     |
| Type               | Female                                  |
| Material           | Metal                                   |
| No. of pins        | 4 -pin                                  |
| Encoding           | D-coded                                 |

### Connection 3

|                    |  |
|--------------------|--|
| Function           | PROFINET/PROFIsafe communication, output |
| Type of connection | Connector                                |
| Thread size        | M12                                      |
| Type               | Female                                   |
| Material           | Metal                                    |
| No. of pins        | 4 -pin                                   |
| Encoding           | D-coded                                  |

### Connection 4

|                    |                |
|--------------------|----------------|
| Function           | Voltage supply |
| Type of connection | Connector      |
| Thread size        | M12            |
| Type               | Female         |
| Material           | Metal          |
| No. of pins        | 5 -pin         |
| Encoding           | L-coded        |

### Mechanical data

|                       |   |
|-----------------------|---|
| Dimension (W x H x L) | 140.2 mm x 170 mm x 142 mm  |
| Housing material      | Metal<br>Plastic  |
| Metal housing         | Diecast zinc  |
| Lens cover material   | Plastic/PC  |
| Net weight            | 4,300 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       | Alphanumeric display<br>LED indicator |
| Number of LEDs        | 10 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   | 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 |

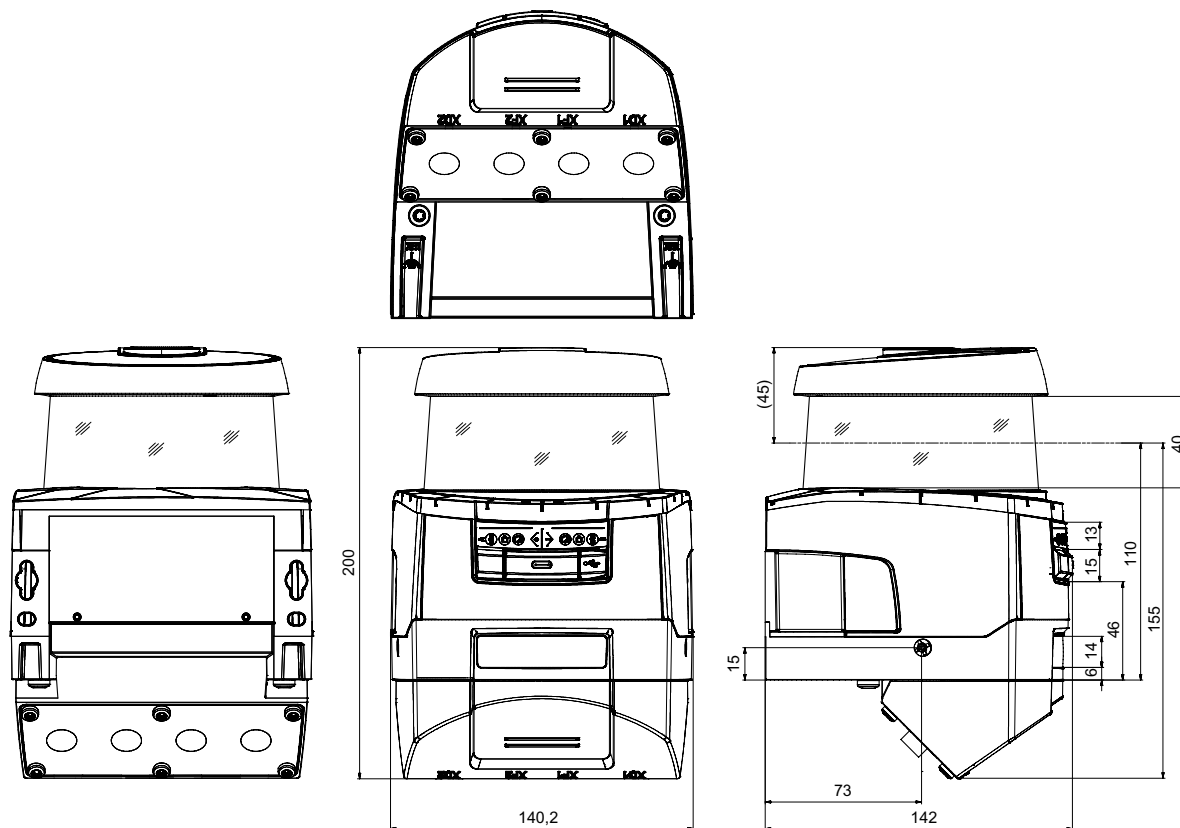
### Classification

|                       |          |
|-----------------------|----------|
| 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 |
| UNSPSC 26.08          | 32151804 |

# Dimensioned drawings

All dimensions in millimeters

## Dimensions safety laser scanner with connection unit



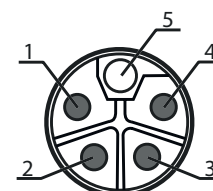
## Electrical connection

### Connection 1

### XD1

|                    |                |
|--------------------|----------------|
| Function           | Voltage supply |
| Type of connection | Connector      |
| Thread size        | M12            |
| Type               | Male           |
| Material           | Metal          |
| No. of pins        | 5 -pin         |
| Encoding           | L-coded        |

| Pin | Pin assignment     |
|-----|--------------------|
| 1   | L1, 24V DC (US1 +) |
| 2   | N2, 0V DC (US2 -)  |
| 3   | N1, 0V DC (US1 -)  |
| 4   | L2, 24V DC (US2 +) |
| 5   | GND                |



# Electrical connection

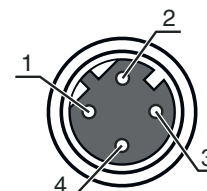
## Connection 2

## XF1

|                    |   |
|--------------------|---|
| Function           | PROFINET/PROFIsafe communication, input |
| 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 |
|-----|----------------|
|-----|----------------|

|   |     |
|---|-----|
| 1 | TD+ |
| 2 | RD+ |
| 3 | TD- |
| 4 | RD- |



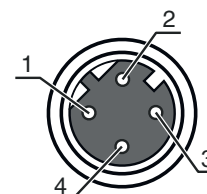
## Connection 3

## XF2

|                    |  |
|--------------------|--|
| Function           | PROFINET/PROFIsafe communication, output |
| 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 |
|-----|----------------|
|-----|----------------|

|   |     |
|---|-----|
| 1 | TD+ |
| 2 | RD+ |
| 3 | TD- |
| 4 | RD- |



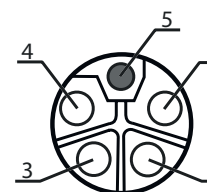
## Connection 4

## XD2

|                    |                |
|--------------------|----------------|
| Function           | Voltage supply |
| Type of connection | Connector      |
| Thread size        | M12            |
| Type               | Female         |
| Material           | Metal          |
| No. of pins        | 5 -pin         |
| Encoding           | L-coded        |

| Pin | Pin assignment |
|-----|----------------|
|-----|----------------|

|   |                    |
|---|--------------------|
| 1 | L1, 24V DC (US1 +) |
| 2 | N2, 0V DC (US2 -)  |
| 3 | N1, 0V DC (US1 -)  |
| 4 | L2, 24V DC (US2 +) |
| 5 | GND                |



# 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                      | 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  |
| 6 -         | Off                      | No function   |
| 7 PWR       | Off                      | Device switched off   |
|             | Red, continuous light    | Error during self test or internal communication problems   |
|             | Green, flashing          | PROFINET wave function active   |
| 8 PS        | Green, continuous light  | Device switched on, supply voltage applied, no internal error   |
|             | Off                      | PROFIsafe communication not initialized or switched off   |
|             | Green, flashing          | Device in passive state or PROFINET wave function active  |
|             | Green, continuous light  | Device on PROFIsafe active  |
|             | Red, flashing            | PROFIsafe configuration failed  |
| 9 NET       | Red, continuous light    | PROFIsafe communication error   |
|             | Off                      | PROFINET communication not initialized or inactive  |
|             | Green, flashing          | PROFINET bus initialization or PROFINET wave function active  |
|             | Green, continuous light  | PROFINET active, data exchange with IO controller active  |
|             | Orange, flashing         | Ethernet topology error   |
| 10 LNK/ACT1 | Red, flashing            | Ethernet configuration failed, no data exchange or exchange of invalid data   |
|             | Red, continuous light    | Bus error, no communication   |
|             | Off                      | No Ethernet link present  |
|             | Green, continuous light  | Ethernet link active, no current data transmission  |
|             | Green/orange, flashing   | Ethernet link active, current data transmission   |
| 11 LNK/ACT2 | Off                      | No Ethernet link present  |
|             | Green, continuous light  | Ethernet link active, no current data transmission  |
|             | Green/orange, flashing   | Ethernet link active, current data transmission   |

## 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**

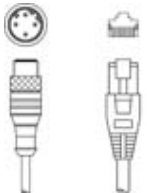
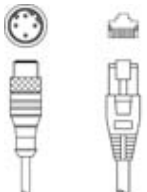
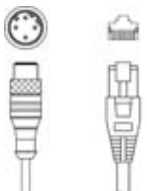
The device satisfies the requirements of IEC/EN 60825-1:2014 safety regulations for a product of **laser class 1** and complies with 21 CFR 1040.10 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

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                                 |
|  | 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 |
|  | 53800131 | BTP800M     | Loop guard       | Color: Black<br>Material: Metal  |

# Accessories

## 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.   |

### Note



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