

## Technical data sheet

## Safety laser scanner

Part no.: 53800311

RSL420P-XL/CU400P-AIDA-OF



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 |

### Special version

|                 |                                       |
|-----------------|---------------------------------------|
| Special version | AIDA-compliant with fiber-optic cable |
|-----------------|---------------------------------------|

### 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 ... 8.25 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. | 1,000 mA, (use power supply unit with 3 A) |
| Power consumption, max.                  | 24 W, For 24 V, plus output load           |

### Outputs

|                                        |            |
|----------------------------------------|------------|
| Number of signal outputs, configurable | 4 Piece(s) |
|----------------------------------------|------------|

### Time behavior

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

### Interface

|      |          |
|------|----------|
| Type | PROFINET |
|------|----------|

#### PROFINET

|                                  |                                                                         |
|----------------------------------|-------------------------------------------------------------------------|
| 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 |
| Port properties                  | 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 |
|------|--------------------------|

#### 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                                                   |
|                          | Longer cable lengths are possible using active cables. |

### Connection

|                       |            |
|-----------------------|------------|
| Number of connections | 4 Piece(s) |
|-----------------------|------------|

#### Connection 1

|                    |                        |
|--------------------|------------------------|
| Function           | Voltage supply         |
| Type of connection | PROFINET push-pull 24V |

#### Connection 2

|                    |                                            |
|--------------------|--------------------------------------------|
| Function           | PROFINET/PROFIsafe communication, input    |
| Type of connection | PROFINET SCRJ push-pull ISO/IEC 61754-24-2 |

## Technical data

### Connection 3

|                    |                                            |
|--------------------|--------------------------------------------|
| Function           | PROFINET/PROFIsafe communication, output   |
| Type of connection | PROFINET SCRJ push-pull ISO/IEC 61754-24-2 |

### Connection 4

|                    |                        |
|--------------------|------------------------|
| Function           | Voltage supply         |
| Type of connection | PROFINET push-pull 24V |

### Mechanical data

|                       |                              |
|-----------------------|------------------------------|
| Dimension (W x H x L) | 140.2 mm x 200 mm x 142 mm   |
| Housing material      | Metal                        |
|                       | Plastic                      |
| Metal housing         | Diecast zinc                 |
| Lens cover material   | Plastic/PC                   |
| Net weight            | 4,500 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        | 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  |
|                                                                 | 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

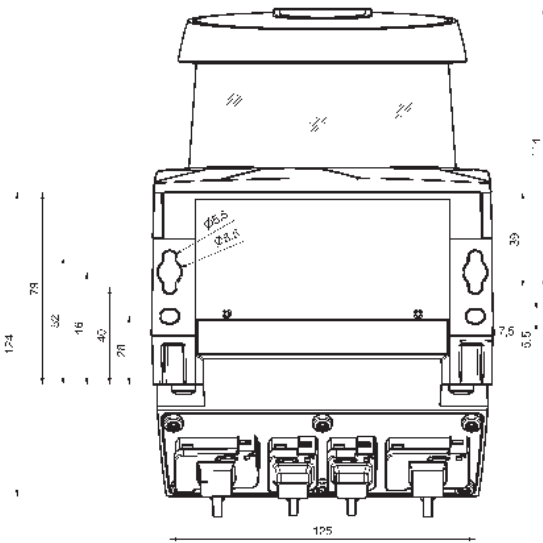
Dimensions safety laser scanner with connection unit



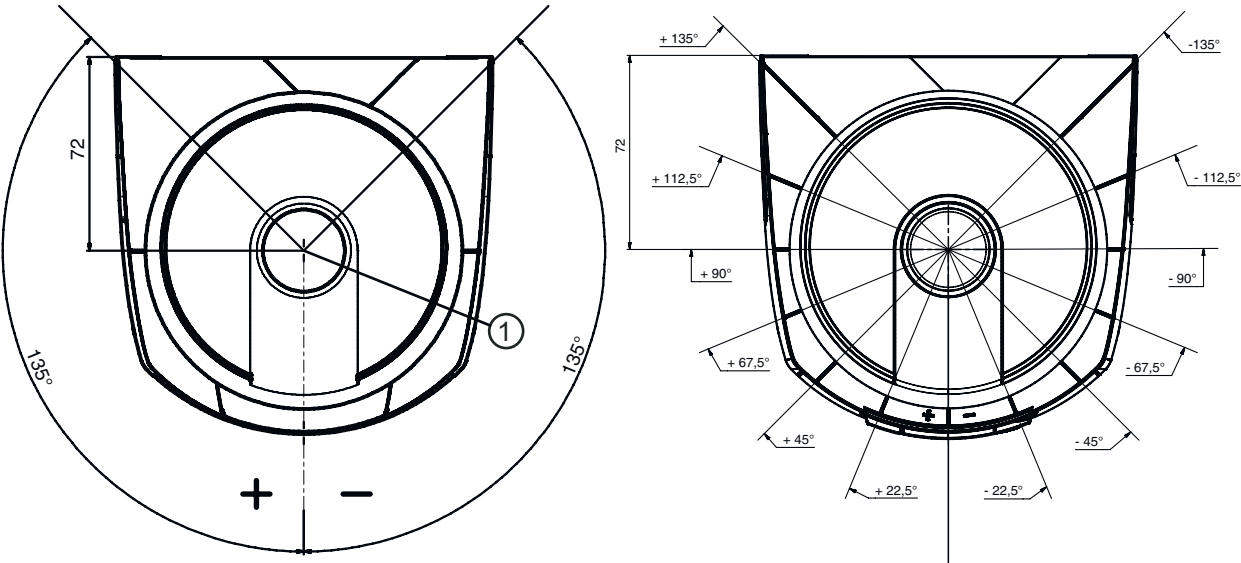
1 Scan level

Dimensioned drawings

Mounting dimensions safety laser scanner with connection unit



Dimensions of scanning range



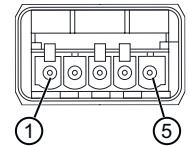
1 Reference point for distance measurement and protective field radius

Electrical connection

|                    |                        |
|--------------------|------------------------|
| Connection 1       | XD1                    |
| Function           | Voltage supply         |
| Type of connection | PROFINET push-pull 24V |
| No. of pins        | 5 -pin                 |

## Electrical connection

| Pin | Pin assignment |
|-----|----------------|
| 1   | +24 V          |
| 2   | 0 V            |
| 3   | +24 V          |
| 4   | 0 V            |
| 5   | GND            |

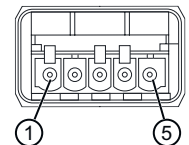


| Connection 2       | XF1                                        |
|--------------------|--------------------------------------------|
| Function           | PROFINET/PROFIsafe communication, input    |
| Type of connection | PROFINET SCRJ push-pull ISO/IEC 61754-24-2 |

| Connection 3       | XF2                                        |
|--------------------|--------------------------------------------|
| Function           | PROFINET/PROFIsafe communication, output   |
| Type of connection | PROFINET SCRJ push-pull ISO/IEC 61754-24-2 |

| Connection 4       | XD2                    |
|--------------------|------------------------|
| Function           | Voltage supply         |
| Type of connection | PROFINET push-pull 24V |
| No. of pins        | 5 -pin                 |

| Pin | Pin assignment |
|-----|----------------|
| 1   | +24 V          |
| 2   | 0 V            |
| 3   | +24 V          |
| 4   | 0 V            |
| 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                                                                                         |
|       | Green, continuous light  | Device switched on, supply voltage applied, no internal error                                                         |
| 8 PS  | 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                                                                                        |
|       | Red, continuous light    | PROFIsafe communication error                                                                                         |
| 9 NET | Off                      | PROFINET communication not initialized or inactive                                                                    |
|       | Green, flashing          | PROFINET bus initialization or PROFINET wave function active                                                          |

## Operation and display

| LED         | Display                 | Meaning                                                                     |
|-------------|-------------------------|-----------------------------------------------------------------------------|
| 9 NET       | Green, continuous light | PROFINET active, data exchange with IO controller active                    |
|             | Orange, flashing        | Ethernet topology error                                                     |
|             | Red, flashing           | Ethernet configuration failed, no data exchange or exchange of invalid data |
| 10 LNK/ACT1 | Red, continuous light   | Bus error, no communication                                                 |
|             | Off                     | No Ethernet link present                                                    |
|             | Green, continuous light | Ethernet link active, no current data transmission                          |
| 11 LNK/ACT2 | Green/orange, flashing  | Ethernet link active, current data transmission                             |
|             | 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

### 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 |

## Accessories

### 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.                                                                                                                                         |

#### Note



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