Technical data sheet Safety laser scanner Part no.: 53800306 RSL420P-L/CU400P-AIDA





- Technical data
- Dimensioned drawings
- Electrical connection
- Operation and display
- Accessories

The Sensor People In der Braike 1, 73277 Owen

Leuze electronic GmbH + Co. KG info@leuze.com • www.leuze.com Phone: +49 7021 573-0 • Fax: +49 7021 573-199

We reserve the right to make technical changes eng • 2021-01-28

Technical data

Basic data

Series	RSL 400
Application	Mobile danger zone guarding
	Mobile side guarding
	Stationary access guarding
	Stationary danger zone guarding
Functions	

Functions

PROFIsafe Resolution, selectable

Characteristic parameters

Туре	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 protective functions	1 Piece(s)
Number of independent sensor confi- gurations	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
Laser light wavelength	905 nm
Laser class	1, IEC/EN 60825-1:2007
Transmitted-signal shape	Pulsed
Repetition frequency	90 kHz

1 mm

20 %

0.1 °

0 ... 50 m

Measurement data

Distance resolution Detection range Diffuse reflection Angular resolution

Electrical data

Protective circuit

Overvoltage protection

Performance data	
Supply voltage U _B	24 V, DC, -30 20 %
Current consumption (without load), max.	900 mA, (use power supply unit with 3 A)
B	

Power consumption, max.

22 W, For 24 V, plus output load

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/pe	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	С
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

Interface

Туре	Bluetooth, USB
Bluetooth	
Function	Configuration/parametering
Frequency band	2,400 2,483.5 MHz
Radiated transmitting power	Max. 4.5 dBm (2.82 mW), class 2
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.
Connection Number of connections	4 Piece(s)
Connection 1	
Function	Voltage supply
Type of connection	PROFINET push-pull 24V
Connection 2	
Function	Ethernet, input
Type of connection	PROFINET RJ45 push-pull IEC 61076- 3-117 var. 14
Connection 3	
Function	Ethernet, output

Type of connection **Connection 4** Function Type of connection

Voltage supply PROFINET push-pull 24V

3-117 var. 14

PROFINET RJ45 push-pull IEC 61076-

Technical data

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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

Classification

Customs tariff number	85365019
eCl@ss 5.1.4	27272705
eCl@ss 8.0	27272705
eCl@ss 9.0	27272705
eCl@ss 10.0	27272705
eCl@ss 11.0	27272705
ETIM 5.0	EC002550
ETIM 6.0	EC002550
ETIM 7.0	EC002550

Operation and display

Type of display	Alphanumerical 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

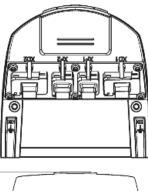
Degree of protection	IP 65
Protection class	III, EN 61140
Certifications	TÜV Süd
Test procedure for EMC in accordance	DIN 40839-1/3
with standard	EN 61496-1
Test procedure for oscillation in accordance with standard	EN 60068-2-6
Test procedure for continuous shock in accordance with standard	IEC 60068-2-29
US patents	US 10,304,307B
	US 7,656,917 B
	US 7,696,468 B
	US 8,520,221 B

Dimensioned drawings

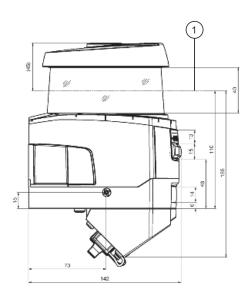
All dimensions in millimeters

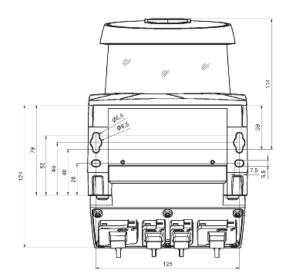
Dimensions safety laser scanner with connection unit









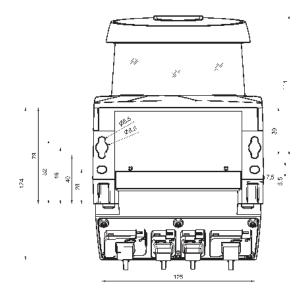


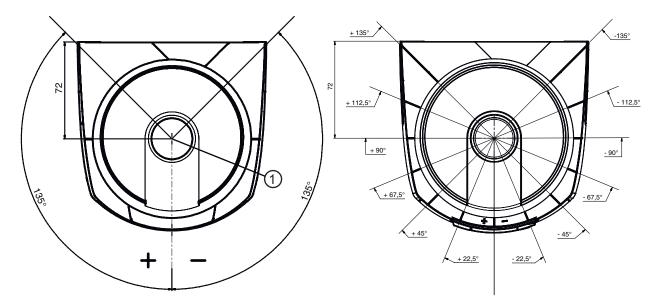
1 Scan level



Dimensioned drawings

Mounting dimensions safety laser scanner with connection unit





1 Reference point for distance measurement and protective field radius

Electrical connection

Connection 1

Function Type of connection No. of pins XD1

Voltage supply PROFINET push-pull 24V 5 -pin Leuze

Electrical connection

Pin Pin assignment +241/

1	+24V
2	0 V
3	+24V
4	0 V
5	GND

Connection 2

.

1

2

3

4

5

6

7

8

XF1

Function	Ethernet, input
Type of connection	PROFINET RJ45 push-pull IEC 61076-3-117 var. 14
Connector housing	FE/SHIELD

Pin Pin assignment

Conductor color TD+ Yellow TD-Orange RD+ White n.c. n.c. _ RD-Blue n.c. n.c. _



Connection 3

Function	Ethernet, output
Type of connection	PROFINET RJ45 push-pull IEC 61076-3-117 var. 14
Connector housing	FE/SHIELD

XF2

Pin	Pin assignment	Conductor color
1	TD+	Yellow
2	TD-	Orange
3	RD+	White
4	n.c.	-
5	n.c.	-
6	RD-	Blue
7	n.c.	-
8	n.c.	-



Connection 4

Function	
Type of connection	
No. of pins	

XD2

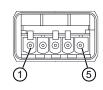
Voltage supply
PROFINET push-pull 24V
5 -pin

Pin **Pin assignment**

1 +24V	
2 0 V	
3 +24V	
4 0 V	
5 GND	



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Operation and display

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 Red, continuous light Red, continuous light Red, flashing Green, continuous light Off Performance Performance Res deactivated on RES activated and released Protective field occupied Performance Performance Res deactivated and blocked but ready to be unlocked - protective field occupied Performance Performance<th>LE</th><th>D</th><th>Display</th><th>Meaning</th>	LE	D	Display	Meaning
Red, fisshing Error Green, continuous light OSD on Vellow, fisshing Protective field occupied Yellow, continuous light RES detactivated on RES activated and released Vellow, continuous light RES activated and blocked but ready to be unlocked - protective field free and linked sensor is enabled if applicable Vellow, continuous light RES activated and blocked but ready to be unlocked - protective field free and linked sensor is enabled if applicable Vellow, continuous light Free warning field Vellow, fisshing Pour field mode: warning field 3 free Blue, continuous light Four field mode: warning field 2 interrupted Vellow, fisshing Four field mode: warning field 2 interrupted Vellow, fisshing Four field mode: warning field 2 interrupted Vellow, fisshing Four field mode: warning field 2 interrupted Vellow, fisshing Four field mode: warning field 2 interrupted Vellow, fisshing Proof NO	1	-	Off	Device switched off
3 Cifeen, continuous light OSSD on 2 Ciff RES declivated 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 Ciff Blue, continuous light Warning field interrupted 4 Off Four field mode: warning field 3 free 5 Off Four field mode: warning field 2 interrupted 6 Off Four field mode: warning field 2 interrupted 6 Off No function 7 PWR Off 8 PS Off 6 Off Provice switched off 7 Red, continuous light Error during self test or internal communication problems 7 PWR Off Provice switched off 8 PS Off Provice switched on, supply voltage applied, no internal error 9 NET Actionatous light Provice on PROFIsafe active 7 Off Provice on PROFIsafe active Provice			Red, continuous light	OSSD off
2 Off RES deactivated or RES activated and released Yelow, fashing Protective field occupied Yelow, 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 5 Off Four field mode: warning field 3 interrupted 6 Off Four field mode: warning field 3 interrupted 6 Off Pollow, flashing 7 PWR Off Device switched off 8 Red, continuous light Error during self test or internal communication problems 6 Off PROFINET wave function active 6 Off Green, flashing PROFINET wave function active 7 Green, flashing Device switched off Green, flashing 8 PS Off Green, flashing Device on PROFIsafe active 8 PS Off Green, flashing Device on PROFIsafe active 9 NET Off Green, flashing PROFINET oommunication on tintialized or witched off 9 NET Off Green, continuous light Buse continuous light <			Red, flashing	Error
Vellow, flashing Yealow, continuous light Protective field occupied 3 - Off Free warning field 5 - Vellow, flashing Four field mode: warning field 3 interrupted 6 - Off No function 7 PWR Off No function 6 - Off No function 7 PWR Off No function 7 PWR Off Device switched off 7 PWR Off Device switched off 7 PWR Off Protective field store 7 <			Green, continuous light	OSSD on
Vellow, continuous light RES activated and blocked but ready to be unlocked - protective field fine era minifield interupted 3 • Off Free warning field interrupted 4 • Off Four field mode: warning field 3 free 5 • Vellow, fishing Four field mode: warning field 3 free 6 • Off Four field mode: warning field 3 free 7 Vellow, fishing Four field mode: warning field 3 interrupted 6 • Off No function 7 PWR Off No function 8 PC Off No function and initialized or internal communication problems 6 • Off Prover field mode: warning field 2 interrupted 7 PWR Off Red, continuous light Prover field mode: warning field 2 interrupted 8 PC Off Green, fishing Prover field mode: warning field 2 interrupted 9 PS Off Green, fishing Prover field mode: warning field 2 interrupted 9 NET Off Green, fishing Prover field mode: warning field	2	-	Off	RES deactivated or RES activated and released
Process Off Free warning field 4			Yellow, flashing	Protective field occupied
Blue, continuous light Warning field interrupted 4 - Off Four field mode: warning field 3 free 5 - Off Four field mode: warning field 3 interrupted 5 - Off Four field mode: warning field 3 interrupted 5 - Off No function 7 PWR Off Device switched off 6 Continuous light Error during self test or internal communication problems 6 Off Red, continuous light Error during self test or internal communication problems 6 Off Red, continuous light Error during self test or internal communication problems 7 PWR Off Red, fiashing Error during self test or internal communication problems 6 Off Green, continuous light Device switched on, supply voltage applied, no internal error 8 PS Off Green, fiashing Device in passive state or PROFINET wave function active 7 Red, fiashing PROFINET communication not initialized or inactive Green, continuous light 8 PS Off Gr			Yellow, continuous light	
4 · Off Four field mode: warning field 3 free 5 · Yellow, flashing 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 7 PWR Off PROFINET wave function active 6 oren, continuous light Device in passive state or PROFINET wave function active 6 ren, flashing Device on PROFIsafe active 7 Red, flashing PROFIsafe active 8 PR Off Green, continuous light 9 NET Off PROFIsafe configuration failed 9 Red, continuous light PROFINET active, data exchange with IO controller active 9 Red, continuous light PROFINET active, data exchange with IO controller active	3	-	Off	Free warning field
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5 · Yellow, flashing Four field mode: warning field 2 interrupted 6 · Off No function 7 PWR Add, continuous light Error during self test or internal communication problems 7 PWR Add, continuous light Error during self test or internal communication problems 8 PS Off PROFINET wave function active 7 PMR Off PROFINET wave function active 7 PROFINET save function active Device switched on, supply voltage applied, no internal error 7 PROFINET communication not initialized or switched off Green, continuous light 8 PS Off PROFINET avee function active 9 PRF Off Green, continuous light Device on PROFINET communication ror 9 NET Off Green, continuous light PROFINET communication not initialized or inactive 9 NET Off Green, flashing PROFINET active, data exchange with IO controller active 9 NET Off Green, continuous light PROFINET active, data exchange or exchange or invalid 10 Name Off Red, continuous light Bus error, no communication 11 NKACT1 Off Derev/orange, flashing Ethernet link active, n	4	-	Off	Four field mode: warning field 3 free
6 Off No function 7 PWR Off Device switched off 8 PS Off Device switched off 8 PS Off Device switched on, supply voltage applied, no internal error 8 PS Off Device in passive state or PROFINET wave function active 6 Off PROFINET wave function active 6 Green, continuous light Device on PROFIsafe communication not initialized or switched off 7 PKR Off PROFINET wave function active 6 Green, continuous light Device in passive state or PROFINET wave function active 7 Red, flashing Device on PROFIsafe configuration failed 7 Red, continuous light PROFISafe configuration failed 7 Red, continuous light PROFISafe configuration failed 7 PROFINET communication or to initialized or inactive Green, flashing 7 PROFINET communication or pROFINET wave function active Green, flashing 8 PROFINET communication or pROFINET wave function active Green, flashing 9 NET Off Off 9 Red, flashing			Blue, continuous light	Four field mode: warning field 3 interrupted
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 Green, flashing Device in passive state or PROFISafe communication not initialized or switched off 6 Green, continuous light Device on PROFISafe communication failed 7 PKR Off PROFIsafe communication rot initialized or inactive Green, flashing Device on PROFISafe communication failed PROFISafe communication error 9 NET Off PROFINET communication or to initialized or inactive Green, flashing PROFINET communication or PROFINET wave function active Green, flashing PROFINET communication or PROFINET wave function active Green, flashing PROFINET communication or PROFINET wave function active Green, flashing PROFINET communication or PROFINET wave function active Green, flashing PROFINET communication or PROFINET wave function active Green, flashing Red, continuous light PROFINET active, data exchange or exchange of invalid data Red, flashing Red,	5	-	Yellow, flashing	Four field mode: warning field 2 interrupted
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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 communication not initialized or switched off Green, continuous light Device on PROFIsafe active PROFIsafe communication error PROFIsafe communication error 9 NET Off Green, flashing PROFINET communication or PROFINET wave function active Green, flashing PROFINET bus initialization or PROFINET wave function active Green, continuous light PROFINET active, data exchange with IO controller active Orange, flashing Ethernet configuration failed, no data exchange or exchange of invalid data Red, continuous light Bus error, no communication 10 LNK/ACT1 Off Green, continuous light Ethernet link active, no current data transmission Green, continuous light Ethernet link active, no current data transmission 11 LNK/ACT2 Off Green, continuous light Ethernet link active, no current data transmission			Green, flashing	PROFINET wave function active
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11 LNK/ACT2 Off No Ethernet link present Green, continuous light Ethernet link active, no current data transmission			Green, continuous light	Ethernet link active, no current data transmission
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/orange, flashing Ethernet link active, current data transmission			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.

	WARNING! INVISIBLE LASER RADIATION – CLASS 1 LASER PRODUCT
	The device satisfies the requirements of IEC 60825-1:2014 (EN 60825-1:2014) 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. 56" from 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 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
	53800132	BTF815M	Mounting bracket	Application: Mounting bracket for floor mounting Dimensions: 186 mm x 120 mm x 288 mm Scan level height: 150 mm Color: Yellow, RAL 1021 Type of fastening, at system: Through-hole mounting Type of fastening, at device: Screw type Material: Metal
A	53800133	BTF830M	Mounting bracket	Application: Mounting bracket for floor mounting Dimensions: 186 mm x 275 mm x 288 mm Scan level height: 300 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
P	53800131	BTP800M	Loop guard	Dimensions: 160 mm x 169 mm Color: Black Material: Metal

General

 Part no.	Designation	Article	Description
430400	RS4-clean-Set1	Cleaning set	Number of cleaning cloths: 40 Piece(s) Content of cleaning fluid: 150 ml

Services

	Part no.	Designation	Article	Description
\bigcirc	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.

Accessories

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 Part no.	Designation	Article	Description
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.

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

 Leuze electronic GmbH + Co. KG
 info@leuze.com • www.leuze.com
 We reserve the right to make technical changes

 The Sensor People
 In der Braike 1, 73277 Owen
 info@leuze.com • www.leuze.com
 were electronic GmbH + Co. KG