# Laser light sensor

# VLE700-F280-B12-1200

- Height profile output
- Area image output
- Resolution 1280 x 960 pixel
- Intelligent exposure time control
- Laser class 1, eyesafe

Laser light sensor for profile matching; Resolution: 1280 x 960 Pixel; Measuring range: X = 60 ... 345 mm, Z = 100 ... 700 mm; Scan rate: 30 s-1; Ethernet TCP/IP interface

## Function

The SmartRunner Explorer is based on the innovative SmartRunner technology and outputs both height profiles and area images. SmartRunner technology combines the light-sectioning method for acquiring height profiles with the acquisition of area images via the integrated area illumination. In the light section method, a laser line is projected onto an object. This is captured at a specific angle by a camera. A height profile is then created using the triangulation principle. This laser technology enables reliable height profile recording on different surfaces.

## Dimensions
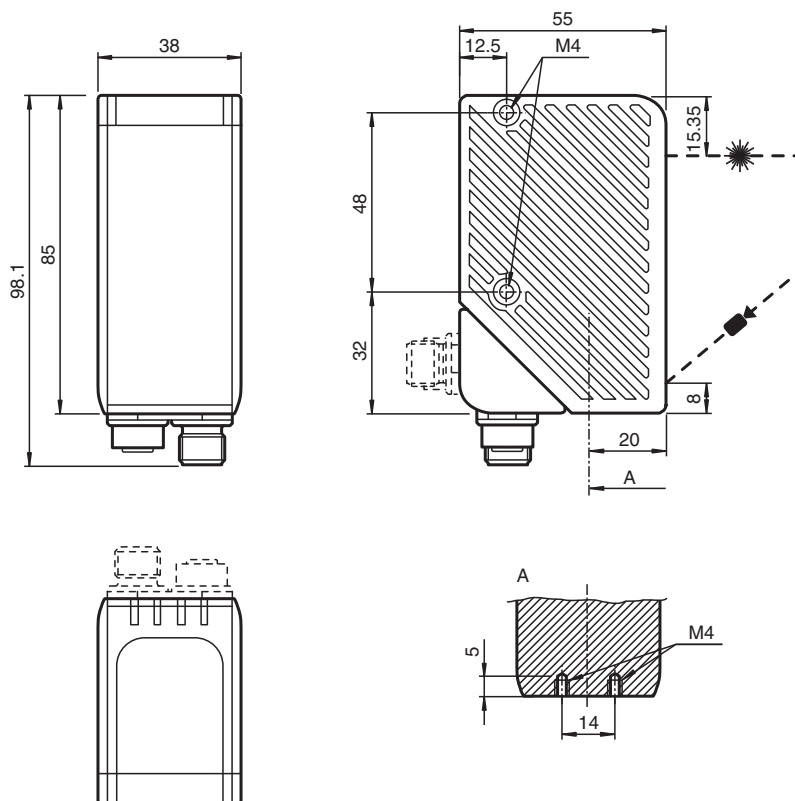


## Technical Data

### General specifications

| | |
|---|---|
| Measuring range | X = 60 ... 345 mm ; Z = 100 ... 700 mm |

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## Technical Data

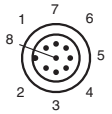| | | |
|---|---|---|
| Light source | | laser diode |
| Light type | | red laser + Integrated LED lightning red 650 nm |
| Laser nominal ratings | | |
| Note | | VISIBLE LASER RADIATION , DO NOT STARE INTO BEAM DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS |
| Laser class | | 1 |
| Wave length | | Measuring laser: 660 nm |
| Beam divergence | | ± 16 ° |
| Pulse length | | < 3 ms |
| Repetition rate | | < 30 Hz |
| Maximum optical power output | | 15 mW |
| max. pulse energy | | < 4.5 µJ |
| Laser monitoring | | The safety system switches off the laser when the laser current is too high |
| Scan rate | | 30 $s^{-1}$ |
| Resolution | | X>0.1 mm; Z>0.2 mm at 100 mm distance<br>X>0.3 mm; Z>2.0 mm at 400 mm distance<br>X>0.5 mm; Z>5 mm at 700 mm distance |

**Nominal ratings**

| | | |
|---|---|---|
| Camera | | |
| Number of pixels | | 1280 x 960 pixels |

**Functional safety related parameters**

| | | |
|---|---|---|
| $MTTF_d$ | | 20 a |
| Mission Time ($T_M$) | | 10 a |
| Diagnostic Coverage (DC) | | 0 % |

**Indicators/operating means**

| | | |
|---|---|---|
| Operation indicator | | LED green |
| Diagnostics indicator | | LED yellow / red |
| Function indicator | | Trigger: LED yellow |
| Control elements | | 2 push-buttons |

**Electrical specifications**

| | | |
|---|---|---|
| Operating voltage | $U_B$ | 24 V  ± 20 %  , PELV |
| No-load supply current | $I_0$ | max. 250 mA |
| Power consumption | $P_0$ | max. 6 W , Outputs without load |

**Interface**

| | | |
|---|---|---|
| Interface type | | Ethernet |
| Protocol | | TCP/IP |
| Transfer rate | | 100 MBit/s |

**Input**

| | | |
|---|---|---|
| Input voltage | | 24 V |
| Number/Type | | External triggering |
| Switching threshold | | low: < 2.5 V, high: > 8 V |

**Compliance with standards and directives**

| | | |
|---|---|---|
| Standard conformity | | |
| Noise immunity | | EN 61000-6-2:2005 |
| Emitted interference | | EN 61000-6-4:2007/A1:2011 |
| Degree of protection | | EN 60529 |
| Shock and impact resistance | | EN 60068-2-27:2009 |
| Laser class | | IEC 60825-1:2014 |

**Approvals and certificates**

| | | |
|---|---|---|
| CCC approval | | CCC approval / marking not required for products rated ≤36 V |
| Approvals | | CE |

**Ambient conditions**

| | | |
|---|---|---|
| Operating temperature | | -20 ... 45 °C (-4 ... 113 °F) ,   (noncondensing; prevent icing on the lens!) |

Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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## Technical Data

| | |
|---|---|
| Storage temperature | -20 ... 70 °C (-4 ... 158 °F) |
| **Mechanical specifications** | |
| Degree of protection | IP67 |
| Connection | 8-pin, M12 x 1 connector ( supply + Inputs/Outputs ) + 4-pin, M12x1 socket, D-coded (LAN) ; can be rotated 90° ; |
| Material | |
|    Housing | PC/ABS |
|    Optical face | Plastic pane |
| Mass | approx. 125 g |
| Tightening torque, fastening screws | max. 2 Nm |
| Dimensions | |
|    Height | 85 mm |
|    Width | 38 mm |
|    Depth | 55 mm |
| **General information** | |
| Note | **Security Instructions:**<br> - Read the operating instructions before attempting commissioning<br> - Installation, connection and adjustments should only be undertaken by specialist personnel<br> - Not a safety component in accordance with the EU Machinery Directive |

## Connection Assignment



| Pin | Signal |
|---|---|
| 1 | IN Trigger |
| 2 | +UB |
| 3 | n.c. |
| 4 | n.c. |
| 5 | n.c. |
| 6 | n.c. |
| 7 | GND |
| 8 | n.c. |

| Pin | Signal |
|---|---|
| 1 | TX+ Ethernet |
| 2 | RX+ Ethernet |
| 3 | TX- Ethernet |
| 4 | RX- Ethernet |

## Assembly



| | | |
|---|---|---|
| 1 | READY | green/red |
| 2 | POWER | green |
| 3 | RESULT | - |
| 4 | TRIGGER | yellow |
| 5 | n.c. | - |
| 6 | n.c. | - |
| 7 | LINK | green |
| 8 | RX/TX | yellow |

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## Installation Conditions

Measuring range
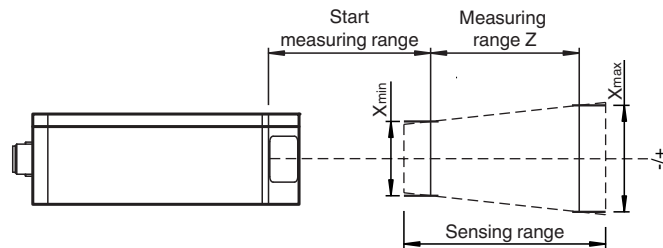


## Safety Information

**LASERLICHT**
**LASER LIGHT**

**LASER KLASSE 1**
**CLASS 1 LASER PRODUCT**

## Safety Information

Laser Class 1 Information

The irradiation can lead to irritation especially in a dark environment. Do not point at people!

Maintenance and repairs should only be carried out by authorized service personnel!

Attach the device so that the warning is clearly visible and readable.

The warning accompanies the device and should be attached in immediate proximity to the device.

Caution – Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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