

# Laser light sensor

## VLM350-F280-R4-1002

- Comparison of up to 32 height profiles
- Evaluation frequency 30 Hz
- Output of X/Z offset
- Intelligent exposure time control
- Laser class 1, eyesafe
- Data Matrix control codes for parameterization

Laser light sensor for profile matching; Comparison of up to 32 height profiles; Output of X/Z offset; Resolution: 752 x 480 pixel; Measuring range: X = 40 ... 160 mm, Z = 60 ... 350 mm; Scan rate: 30 s-1; 2 digital outputs; RS-485 interface

## Function

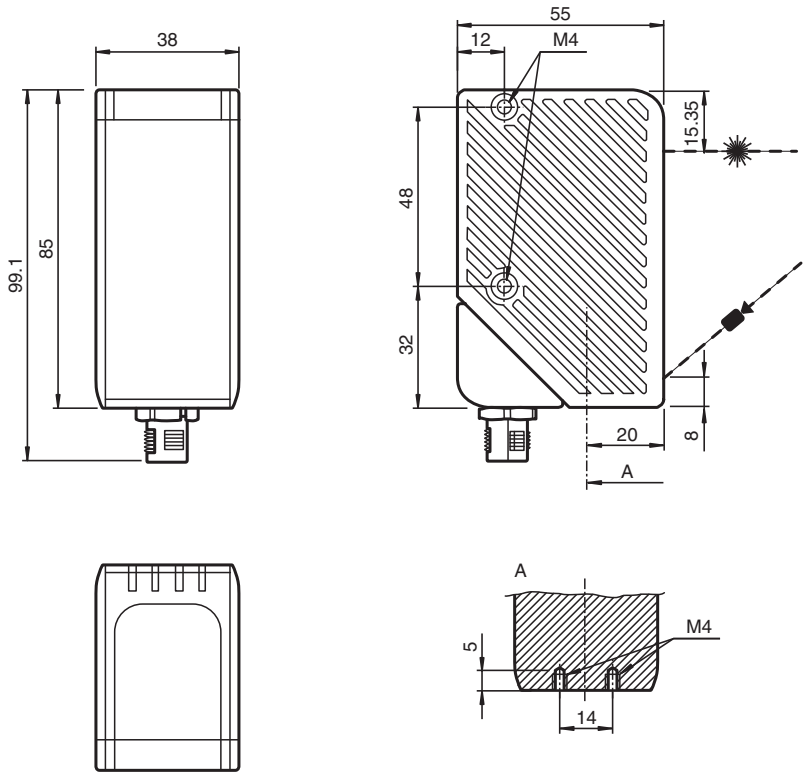
The SmartRunner Matcher compares current height profiles with a previously taught-in height profile. The Matcher is based on innovative SmartRunner technology and combines the light section method for detecting height profiles with a 2-D vision sensor. The light section method involves projecting a laser line onto an object. This is then detected by a camera at a specific angle. A height profile is then created using the triangulation principle. This innovative laser technology provides reliable measurements on different surfaces.

## Safety Information

CLASS 1
LASER PRODUCT
IEC 60825-1: 2007 certified.
Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

Release date: 2020-04-27 Date of issue: 2020-04-27 Filename: 284586-100005_eng.pdf

## Dimensions




## Technical Data

| | |
|---|---|
| **General specifications** | |
| Measurement range | X = 40 ... 160 mm ; Z = 60 ... 350 mm |
| 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<br>DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS |
| Laser class | 1 |
| Wave length | Measurement laser: 660 nm |
| Pulse length | Measurement laser: 0.5 ms |
| Maximum optical power output | Measurement laser: 15 mW |
| Laser monitoring | The safety system switches off the laser when the laser current is too high |
| Scan rate | 30 $s^{-1}$ |
| Evaluation frequency | 30 Hz |
| Resolution | X > 0.44 mm ; Z > 0.4 mm<br>at 60 mm read distance |
| **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 |

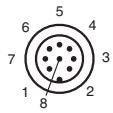
Release date: 2020-04-27 Date of issue: 2020-04-27 Filename: 284586-100005_eng.pdf

## Technical Data

| | | |
|---|---|---|
| Function indicator | | Trigger: LED yellow ; object detected : LED red / green |
| 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 | | RS 485 interface |
| Physical | | Switchable terminal resistor |
| Protocol | | binary code |
| Transfer rate | | 38400 ... 230400 Bit/s |
| **Input** | | |
| Input voltage | | 24 V |
| Number/Type | | External triggering + 1 Input |
| Switching threshold | | low: < 2.5 V, high: > 8 V |
| **Output** | | |
| Number/Type | | 2 digital outputs |
| Switching type | | PNP |
| Switching voltage | | 24 V |
| Switching current | | 150 mA each output |
| **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 60825-1:2007 |
| **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!) |
| Storage temperature | | -20 ... 70 °C (-4 ... 158 °F) |
| **Mechanical specifications** | | |
| Degree of protection | | IP67 |
| Connection | | 8-pin, M12 x 1 connector ( supply + RS485 + Inputs/Outputs ) ; can be rotated 90° ; Grounding : Grounding clip for PCV system |
| Material | | |
| Housing | | PC/ABS |
| Optical face | | Plastic pane |
| Mass | | approx. 125 g |
| Tightening torque, fastening screws | | max. 2 Nm |
| **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 |

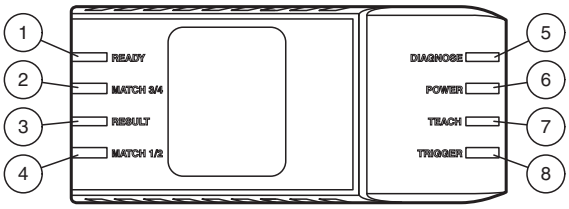
Release date: 2020-04-27 Date of issue: 2020-04-27 Filename: 284586-100005_eng.pdf

## Connection




| Pin | Signal |
|---|---|
| 1 | IN Trigger |
| 2 | +UB |
| 3 | Data+ RS-485 |
| 4 | Data- RS-485 |
| 5 | Teach |
| 6 | Good |
| 7 | GND |
| 8 | Bad |

## Assembly




| | | |
|---|---|---|
| 1 | Ready | green/red |
| 2 | Match 3/4 | green/yellow |
| 3 | Result | green/red |
| 4 | Match 1/2 | green/yellow |
| 5 | Diagnose | red |
| 6 | Power | green |
| 7 | Teach | yellow |
| 8 | Trigger | yellow |

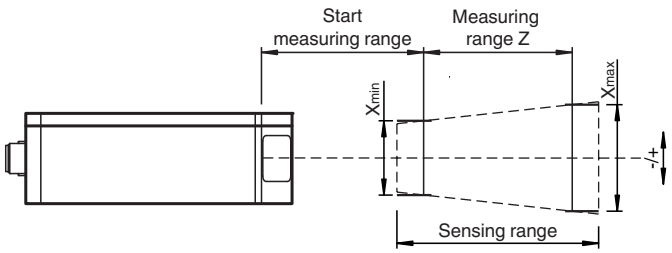
## Accessories

| | | |
|---|---|---|
|  | **V19-G-5M-PUR-ABG** | Female cordset, M12, 8-pin, shielded, PUR cable |
|  | **VLX-MB2** | Mounting bracket |
|  | **VLX-MB1** | Mounting bracket |
|  | **PCV-USB-RS485-Converter Set** | USB to RS 485 interface converter |
|  | **V19-G-BK0,6M-PUR-U-V1-G-SRMAT** | Cordset for SmartRunner Matcher, M12 to M12, 8/4-pin, PUR cable |
|  | **VLX-F231-B6** | Interface module with PROFIBUS interface for SmartRunner |
|  | **VLX-F231-B17** | Interface module with PROFINET interface for SmartRunner |
|  | **VLX-F231-B21** | Interface module with EtherCAT interface for SmartRunner |
|  | **VLX-F231-B25** | Interface module with EtherNet/IP interface for SmartRunner |

Release date: 2020-04-27 Date of issue: 2020-04-27 Filename: 284586-100005_eng.pdf

## Installation Conditions

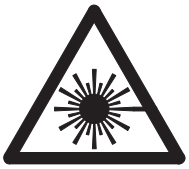
Measuring range




## Accessories

Other suitable accessories can be found at www.pepperl-fuchs.com

## 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.

Release date: 2020-04-27 Date of issue: 2020-04-27 Filename: 284586-100005_eng.pdf