协堡™ 上海协堡电子有限公司 ShangHai ShinePoin Electronics CO.,LTD.
地址：上海市闵行区新骏环路115号寰启商务大厦1幢906室 TEL：021-50933055 FAX：021-51686291

# SLDS-E100A

## LASER DISTANCE SENSOR

# 1 .Introduction:

The SLDS-Series sensors are powerful distance-measuring instruments for integration into industrial applications. They allow accurate and contactless distance measurement over a wide range using the laser beam reflection on a measuring surface / target (see the illustration in figure 1).

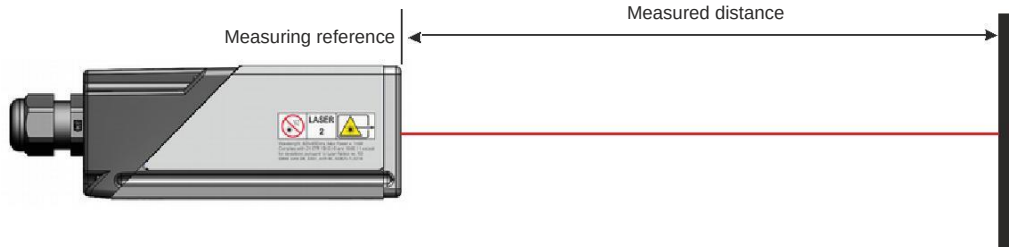



Figure 1: Standard application for measuring distances

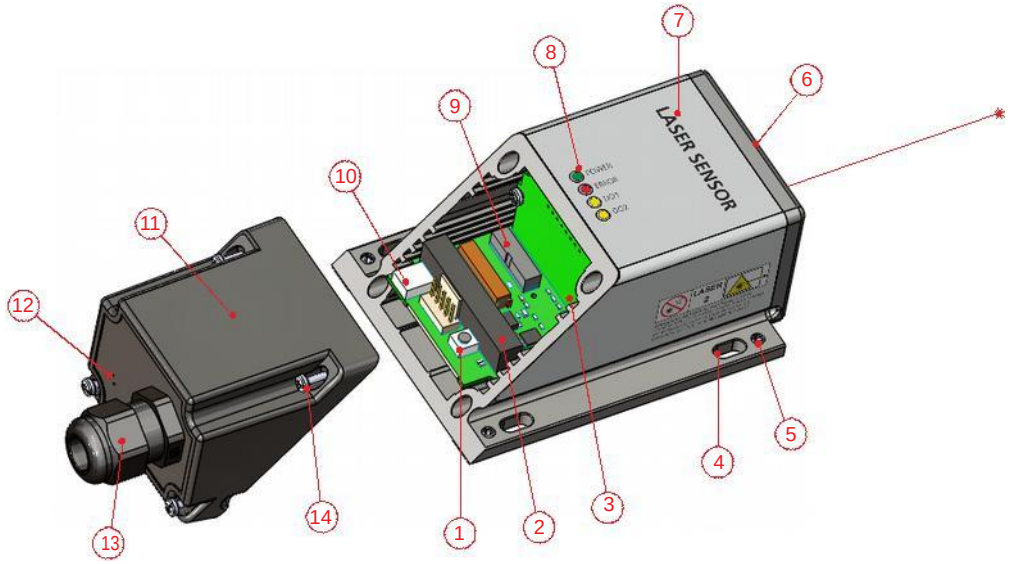
**Key features:**

- Measurement range 0.05 up to 500 m
- Measuring accuracy up to ±1.0 mm (@ 2σ)
- High measurement speed (up to 250 Hz, 1000 Hz output rate)
- Several serial interfaces (RS-232, RS-422, SSI and USB)
- Exchangeable cover for Industrial Ethernet (PROFINET, ETherNet/IP or EtherCAT interface as accessorie)
- Connection of up to 10 sensors on a single RS-422 line
- Wide range of power supply (12...30 VDC)
- Programmable analog output (0/4...20 mA)
- One programmable digital input (DI1)
- Two programmable digital outputs (DO1 and DO2)
- Digital output for error signalization (DOE)
- Selectable digital output type (NPN, PNP, Push-Pull)
- 4 LED's for status signaling
- ASCII protocol to control external displays
- Screw terminal for easy connection of the D-Series sensors
- IP65 (protected against ingress of dust and water)
- Wide range of operating temperature (down to -40°C and up to +60°C, for devices with extended temperature range)
- Visible red laser, laser class II (<0.95 mW)

- Accessories for easy use of the sensor

## 1.1 Components:

The components with some helpful detail information of the SLDS-Series devices are marked in figure 3.

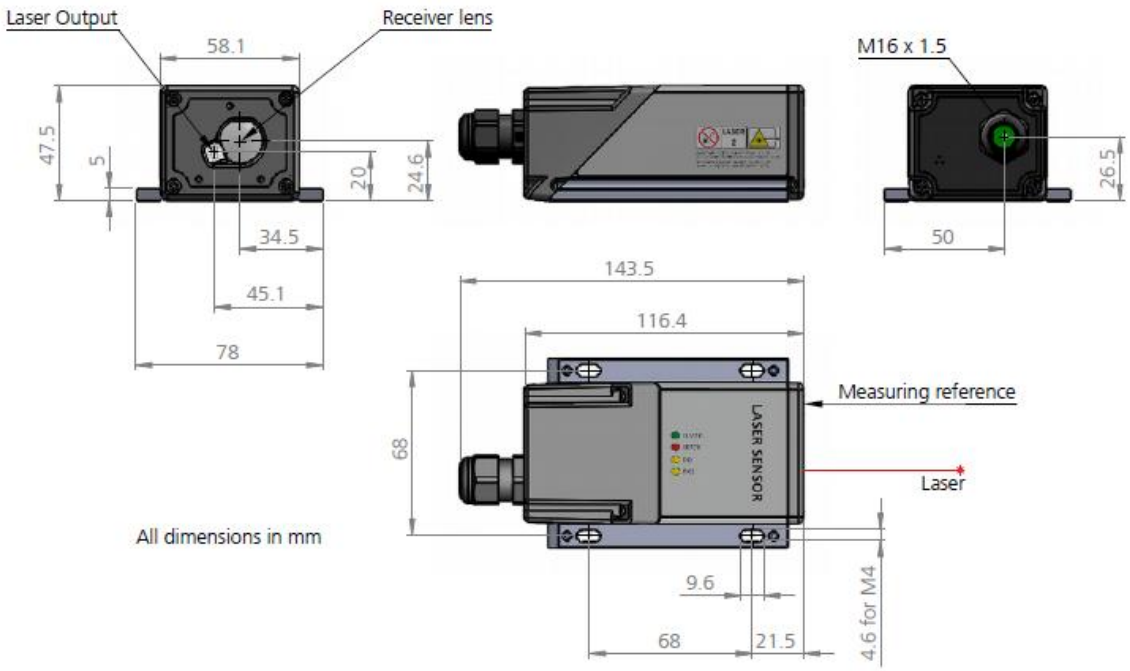



1) Reset push button
2) Screw terminal block & plug. For conductor cross section 0.14...1.5 $mm^2$. (Power supply, digital input / output, analog output, RS-232 and RS-422 / RS-485 / SSI)
3) Shield tab for an adequate receptacle
4) Slot hole for installation and alignment (M4 or M3 screws)
5) Hexagon socket set screw for sensor alignment
6) Sensor front (Laser beam output and receiver lens)
7) Product label (for more details, see in chapter 7.9)
8) Status LED's (Power, error, digital outputs)
9) Industrial Ethernet interface
10) USB 2.0 Mini-B
11) Exchangeable cover or optional interfaces
12) Valve diaphragm
13) Cable gland M16 x 1.5 mm (Cable diameter: 5...10 mm,tool size: 20 mm)
14) Screws, Philips Slotted Combo (Philips size 1, slot size 2)

## 2. Specifications:

| TYPE | **SLDS-E100A** |
|---|---|
| Part number | 500632 |
| Typical measuring accuracy<br>@ 2σ (95.4% confidence level)<br>@ 1σ (68.3% confidence level) | <br>±1.0 mm<br>±0.5 mm |
| Typical repeatability<br>@ 2σ (95.4% confidence level)<br>@ 1σ (68.3% confidence level) | <br>±0.3 mm<br>±0.15 mm |
| Measuring range on natural surfaces | 0.05...50 m |
| Measuring range on orange (reflective) foil | ~40...150 m |
| Measuring reference | From front edge |
| Smallest unit displayed | 0.1 mm |
| Accuracy of the analog output | ±0.1%<br>Programmable span (12 Bit) |
| Max. measuring rate | 50 Hz |
| Output rate for tracking measurement | up to 50 Hz |
| Typical time for a measurement<br>Single measurement<br>Tracking | <br>0.05...4 s<br>0.02...4 s |
| Light source | Laser diode 620-690 nm (red, typical 650 nm)<br>IEC/EN 60825-1:2014; Class 2<br>FDA 21 CFR 1040.10 and Laser Notice 50<br>Beam divergence: 0.16 x 0.6 mrad, Pulse duration: 0.2...0.8 x $10^{-9}$ s<br>Maximum radiant power: 1 mW |
| Typical laser life time | 50'000 h @ 20°C |
| Typical diameters (elliptic) of laser spot on target at a defined distance | 4 mm / 2 mm @ 5 m<br>7 mm / 3 mm @ 10 m<br>17 mm / 9 mm @ 30 m<br>28 mm / 13 mm @ 50 m<br>55 mm / 30 mm @ 100 m |
| Power supply | 0.15A@24V |
| Temperature range during operation | -10...+50°C |
| Temperature range during storage | -40...+70°C |
| Dimensions | 140 x 78 x 48 mm |
| Weight | 350 g |
| Material<br>Main sensor body<br>Sensor front & Standard exchangeable cover | <br>Aluminum Alloy EN-AW 6060 (Anodized 20um)<br>Mineral reinforced nylon resin |

## 2.1 Physical dimensions:




## 2.2 Measuring accuracy definition:

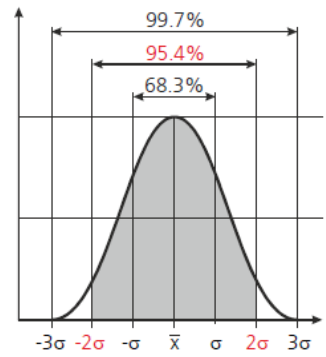


Figure 5: Measuring accuracy definition

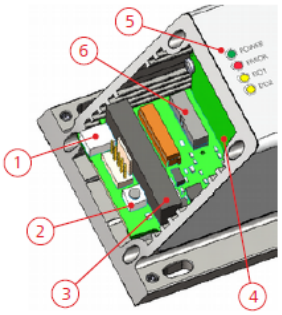
The measuring accuracy corresponds to the ISO-recommendation ISO/R 1938-1:2015 with a statistical confidence level of 95.4% (i.e. ± twice the standard deviation σ, see figure 5 on the left). The typical measuring accuracy relates to average conditions for measuring. It is ±1.0 mm for the Dxx-10-xxx and ± 3.0 mm for the Dxx-30-xxx valid in the tracking mode.

Maximum deviation may occur under unfavorable conditions such as bright sunlight or when measuring to poorly reflecting or very rough surfaces. Measuring accuracy may deteriorate by approximately ±0.02 mm/m for distances above 30m.

The D-Series laser sensors do not compensate changes of atmospheric environment. These changes can influence the accuracy if measuring long distances (>150 m) under conditions very different from 20°C, 60% relative humidity and 953 mbar air pressure. The influences of the atmospheric environment are described in H. Kahmen & W. Faig: "*Surveying*", (1988).

# 3 .Electrical components:

The main electrical components of the D-Series sensors are described in the following chapter. The overview of the relevant components are labeled in figure 6.




1) USB 2.0 Mini-B
(see chapter 3.10 for details)
2) Reset push button
(see chapter 3.2 for detailed reset process description)
3) Screw terminal block & plug (Pitch: 3.5 mm, conductor cross section: 0.14...1.5 mm²).
(Power supply and sensor interfaces, see chapter 3.1, 3.4, 3.5, 3.6, 3.7, 3.8 and 3.9)
4) Shielding tab
(suitable for receptacle, see chapter 3.1 for details)
5) Status LED's (POWER, ERROR, DO1, DO2)
(see chapter 3.3 for detailed LED status)
6) Industrial Ethernet interface (Exchangeable cover)
(see chapter 3.11 for details)

## 3.1 Status LED:

| POWER | ERROR | DO1 | DO2 | Status of sensor – Description |
|---|---|---|---|---|
| ● | | | | The device is powered and ready for operation → Normal sensor operation. |
| ● | ● | | | The device is powered but an error occurred during the normal sensor operation. The error code is transmitted over the serial interfaces. For information about the error code number, see chapter 6.6. |
| ● | | ● | ● | The device is powered and running → Normal sensor operation. One and / or both digital output (DO1, DO2) can be ON or OFF depending on the configured switching levels (for more details see chapter 3.4 and 4). |
| ● | ● | ● | ● | Flash for about 0.5 seconds during reset procedure with the reset push button (see chapter 3.2) |
| | ● | ● | ● | The device is in error state. See the error code on the serial interface and contact Dimetix if error persists after power cycle and reset. |

上海协堡电子有限公司

电话：021-50933055，18602106983

传真：021-51686291

地址：上海市闵行区新骏环路 115 号寰启商务大厦 1 幢 906 室