



# PICS150-01000 Core-1

picoScan100

2D LIDAR SENSORS

**SICK**  
Sensor Intelligence.



Ordering information

| Type                 | part no. |
|----------------------|----------|
| PICS150-01000 Core-1 | 1134608  |

Other models and accessories → [www.sick.com/picoScan100](http://www.sick.com/picoScan100)



Detailed technical data

Features

|                            |                                                                                         |
|----------------------------|-----------------------------------------------------------------------------------------|
| Application                | Indoor, Outdoor                                                                         |
| Variant                    | Standard (not pre-configured)                                                           |
| Measurement principle      | HDDM <sup>+</sup>                                                                       |
| Light source               | Infrared (905 nm)                                                                       |
| Laser class                | 1 (IEC 60825-1:2014, EN 60825-1:2014+A11:2021)                                          |
| Aperture angle             |                                                                                         |
|                            | Horizontal 276°                                                                         |
| Scanning frequency         | 15 Hz<br>25 Hz<br>Depends on the Dynamic Sensing Profile <sup>1)</sup>                  |
| Angular resolution         |                                                                                         |
|                            | Horizontal 0.25°<br>0.33°<br>1°<br>Depends on the Dynamic Sensing Profile <sup>1)</sup> |
| Scan field flatness        | ± 1°                                                                                    |
| Working range              | 0.05 m ... 25 m <sup>1)</sup>                                                           |
| Blind zone                 | 0 m ... 0.05 m                                                                          |
| Scanning range             |                                                                                         |
|                            | At 90% remission and 10 klx 25 m<br>At 10% remission and 10 klx 12 m                    |
| Spot size                  | Divergence, typ.: 4.8 mrad<br>On the optics cover: 8 mm                                 |
| Amount of evaluated echoes | 3                                                                                       |

<sup>1)</sup> For details, see the working range diagram in the technical drawings section.

## Mechanics/electronics

|                               |                                                                                                                    |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Connection type</b>        | 2 x M12 round connector                                                                                            |
| <b>System plug</b>            | See system plug 2116047, Assembled to the rear                                                                     |
| <b>Supply voltage</b>         | 9 V DC ... 30 V DC                                                                                                 |
| <b>Power consumption</b>      | Typ. 4.5 W, max. 17 W with loaded digital outputs, see system plug 2116047                                         |
| <b>Output current</b>         | ≤ 200 mA                                                                                                           |
| <b>Housing material</b>       | Aluminum with Suretec650 coating                                                                                   |
| <b>Housing color</b>          | Anthracite gray (RAL 7016)                                                                                         |
| <b>Optical hood</b>           | Polycarbonate, scratch-resistant coating                                                                           |
| <b>Enclosure rating</b>       | IP65 (IEC 60529:1989+AMD1:1999+AMD2:2013) <sup>1)</sup><br>IP67 (IEC 60529:1989+AMD1:1999+AMD2:2013) <sup>1)</sup> |
| <b>Protection class</b>       | III (IEC 61140:2016-11)                                                                                            |
| <b>Electrical safety</b>      | IEC 61010-1:2010-06+AMD1:2016                                                                                      |
| <b>Weight</b>                 | 220 g, without system plug                                                                                         |
| <b>Dimensions (L x W x H)</b> | 60 mm x 60 mm x 82 mm                                                                                              |
| <b>Ventilation element</b>    | Yes                                                                                                                |
| <b>MTBF</b>                   | > 100 years                                                                                                        |

<sup>1)</sup> With system plug connected.

## Safety-related parameters

|                         |                                                                 |
|-------------------------|-----------------------------------------------------------------|
| <b>MTTF<sub>D</sub></b> | > 100 years, at 25 °C ambient temperature (EN ISO 13849-1:2015) |
|-------------------------|-----------------------------------------------------------------|

## Functions

|                        |                                                                                                                                                                                         |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Digital add-ons</b> | Data Reduction & Data Preparation package<br>Reliability package<br>Multi-echo technology<br>LMDscandata (data format)<br>Reflector detection<br>IMU (Inertial Measurement Unit)<br>PTP |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Performance

|                                               |                                                                                                                        |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Data output per scan segment</b>           | Segment size 30° at ≤ 25 Hz                                                                                            |
| <b>Scan/frame rate</b>                        | 12,546 measurement point/s ... 82,803 measurement point/s, Depends on the Dynamic Sensing Profile and number of echoes |
| <b>Latency of the measurement data output</b> | Segment size 30° at < 25 Hz: ≤ 10 ms (3 σ), Depends on the Dynamic Sensing Profile and number of echoes                |
| <b>Detectable object shape</b>                | Almost any                                                                                                             |
| <b>Systematic error</b>                       | Typ. ± 20 mm <sup>1)</sup><br>Max. ± 30 mm                                                                             |
| <b>Statistical error</b>                      | ≤ 2 mm (0.05 m ... 5 m) <sup>2)</sup>                                                                                  |
| <b>Integrated application</b>                 | Output of measurement data<br>2D Object Detection                                                                      |
| <b>Number of field sets</b>                   | 48 fields                                                                                                              |
| <b>Simultaneous evaluation cases</b>          | Max. 20 (The number of simultaneous evaluation cases depends on the field geometry)                                    |

<sup>1)</sup> Typical value; real value depends on ambient conditions and the selected Dynamic Sensing Profile.

<sup>2)</sup> 10 klx and 100 klx.

### Interfaces

|                               |                                                                                                                |
|-------------------------------|----------------------------------------------------------------------------------------------------------------|
| <b>Ethernet</b>               | ✓ , UDP/IP Singlecast (Compact, MSGPACK), UDP/IP Multicast (Compact, MSGPACK), TCP/IP (LMDscandata)            |
| Function                      | Measurement data output (distance, RSSI, time stamp, reflector mark), Field status information, DHCP, NTP, PTP |
| Data transmission rate        | 10 Mbit/s ... 100 Mbit/s, half/full-duplex                                                                     |
| <b>Digital inputs/outputs</b> | 3, customizable, see system plug 2116047                                                                       |
| <b>Optical indicators</b>     | 2 LEDs                                                                                                         |
| <b>Configuration software</b> | SOPASair (web browser)<br>SOPAS ET (software)<br>REST API                                                      |
| <b>Driver</b>                 | ROS1, ROS2, C++, Python                                                                                        |

### Ambient data

|                                            |                                                                                                                                                                                                                                           |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Object remission</b>                    | 1.8 % ... > 1,000 % (Reflector)                                                                                                                                                                                                           |
| <b>Electromagnetic compatibility (EMC)</b> |                                                                                                                                                                                                                                           |
| Emitted radiation                          | Industrial environment (IEC 61000-6-4:2018 / EN IEC 61000-6-4:2019 / IEC 61000-6-4:2006+A1:2010 / EN 61000-6-4:2007+A1:2011)                                                                                                              |
| Emitted radiation                          | Business and commercial areas as well as small enterprises (IEC 61000-6-8:2020 / EN IEC 61000-6-8:2020)                                                                                                                                   |
| Electromagnetic immunity                   | Industrial environment (IEC 61000-6-2:2016 / EN IEC 61000-6-2:2019 / IEC 61000-6-2:2005 / EN 61000-6-2:2005 / EN 61000-6-2:2005/AC:2005)                                                                                                  |
| Application areas                          | Automotive (UN ECE R10) <sup>1)</sup>                                                                                                                                                                                                     |
| Application areas                          | Agricultural and forestry machinery (ISO 14982-1, ISO 14982-2) <sup>1) 2)</sup>                                                                                                                                                           |
| Application areas                          | Earthmoving and construction machinery (ISO 13766-1) <sup>1) 2)</sup>                                                                                                                                                                     |
| <b>Vibration resistance</b>                |                                                                                                                                                                                                                                           |
| Sine resonance scan                        | 10 Hz ... 1,000 Hz, 1 g <sup>3)</sup>                                                                                                                                                                                                     |
| Sine test                                  | 10 Hz ... 500 Hz, 10 g, 10 frequency cycles <sup>3)</sup>                                                                                                                                                                                 |
| Noise test                                 | 10 Hz ... 500 Hz, 13.5 g RMS, 5 h <sup>4)</sup>                                                                                                                                                                                           |
|                                            | Short restriction in measurement data availability possible during peak loads.                                                                                                                                                            |
| <b>Shock resistance</b>                    | 100 g, 6 ms, ± 3 single shocks/axis <sup>5)</sup><br>40 g, 6 ms, ± 4,000 continuous shocks/axis <sup>5)</sup><br>50 g, 3 ms, ± 5,000 continuous shocks/axis <sup>5)</sup><br>Short restriction in measurement data availability possible. |
| <b>Ambient operating temperature</b>       | -33 °C ... +50 °C                                                                                                                                                                                                                         |
| <b>Storage temperature</b>                 | -40 °C ... +70 °C                                                                                                                                                                                                                         |
| <b>Temperature change</b>                  | -33 °C ... +50 °C, 10 cycles <sup>6)</sup>                                                                                                                                                                                                |
| <b>Damp heat</b>                           |                                                                                                                                                                                                                                           |
| Cyclical                                   | + 25 °C ... + 55 °C, 95 % RH, non-condensing (operation/storage/transport) (EN 60068-2-30)                                                                                                                                                |
| Static                                     | + 40 °C, 93 % RH, non-condensing (operation) (EN 60068-2-78)                                                                                                                                                                              |

<sup>1)</sup> Load dump: from ISO 16750-2 Test B Severity Level 4 passed for 12 V systems. Required in case of transient disturbances on the input filtering signal lines (de-bounce > 10 ms).

<sup>2)</sup> The requirements of ISO 13766-1 and DIN EN ISO 14982-1 for immunity to electrostatic discharge (ESD) are only met in areas that can be easily touched from the outside.

<sup>3)</sup> IEC 60068-2-6:2007.

<sup>4)</sup> IEC 60068-2-64:2008.

<sup>5)</sup> IEC 60068-2-27:2008.

<sup>6)</sup> EN 60068-2-14:2009.

|                                      |           |                                             |
|--------------------------------------|-----------|---------------------------------------------|
| <b>Permissible relative humidity</b> | Operation | < 80 %, Non-condensing (EN 60068-2-30:2005) |
|                                      | Storage   | ≤ 90 %, Non-condensing (EN 60068-2-30:2005) |
| <b>Ambient light immunity</b>        |           | 100 klx, indirect                           |
| <b>Altitude (above sea level)</b>    |           | < 5,000 m                                   |

- 1) Load dump: from ISO 16750-2 Test B Severity Level 4 passed for 12 V systems. Required in case of transient disturbances on the input filtering signal lines (de-bounce > 10 ms).
- 2) The requirements of ISO 13766-1 and DIN EN ISO 14982-1 for immunity to electrostatic discharge (ESD) are only met in areas that can be easily touched from the outside.
- 3) IEC 60068-2-6:2007.
- 4) IEC 60068-2-64:2008.
- 5) IEC 60068-2-27:2008.
- 6) EN 60068-2-14:2009.

## General notes

|                    |                                                                                                         |
|--------------------|---------------------------------------------------------------------------------------------------------|
| <b>Note on use</b> | The sensor does not constitute a safety component as defined by relevant legislation on machine safety. |
|--------------------|---------------------------------------------------------------------------------------------------------|

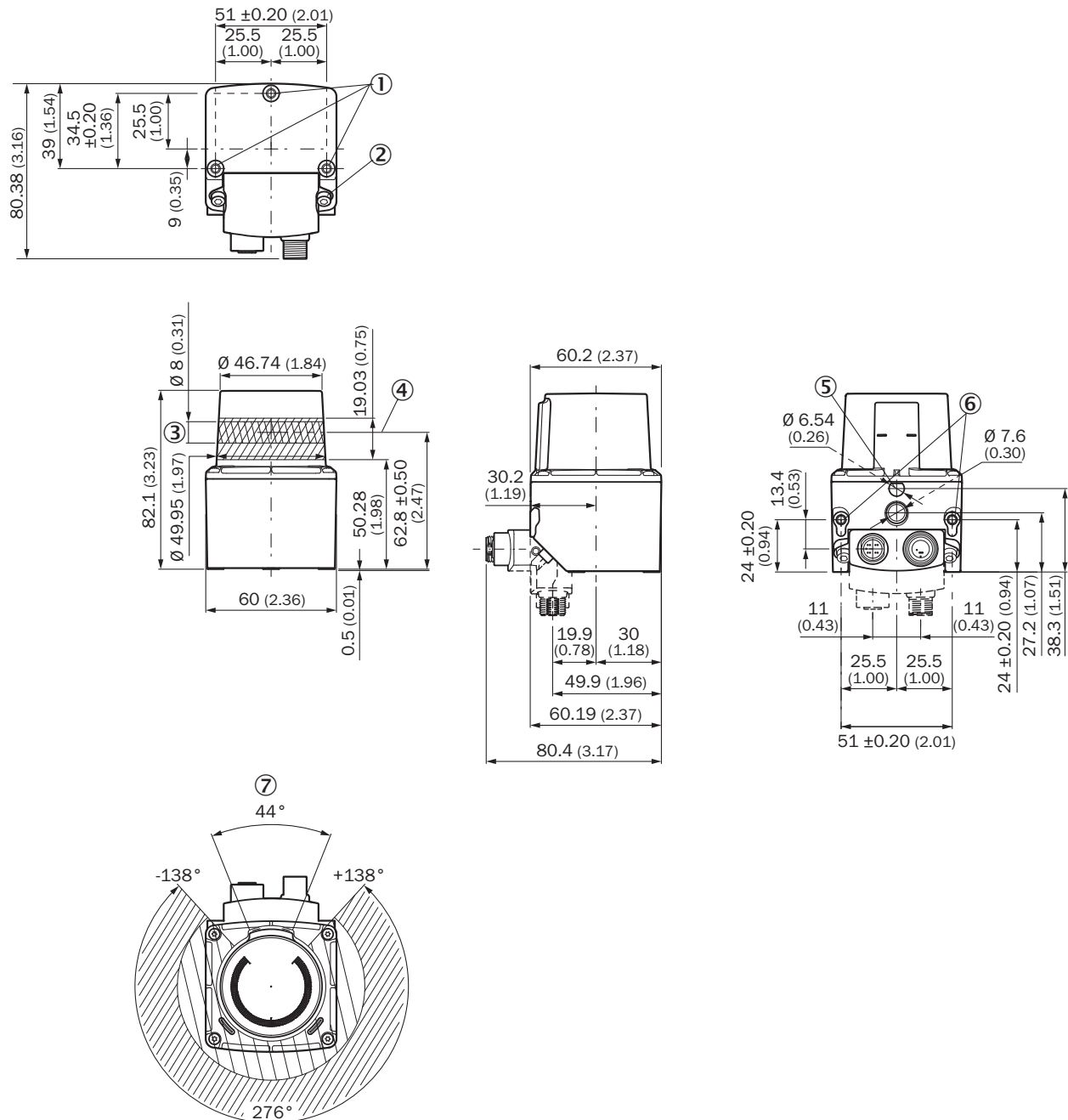
## Certificates

|                                       |   |
|---------------------------------------|---|
| <b>EU declaration of conformity</b>   | ✓ |
| <b>UK declaration of conformity</b>   | ✓ |
| <b>ACMA declaration of conformity</b> | ✓ |
| <b>China-RoHS</b>                     | ✓ |
| <b>cTUVus certificate</b>             | ✓ |

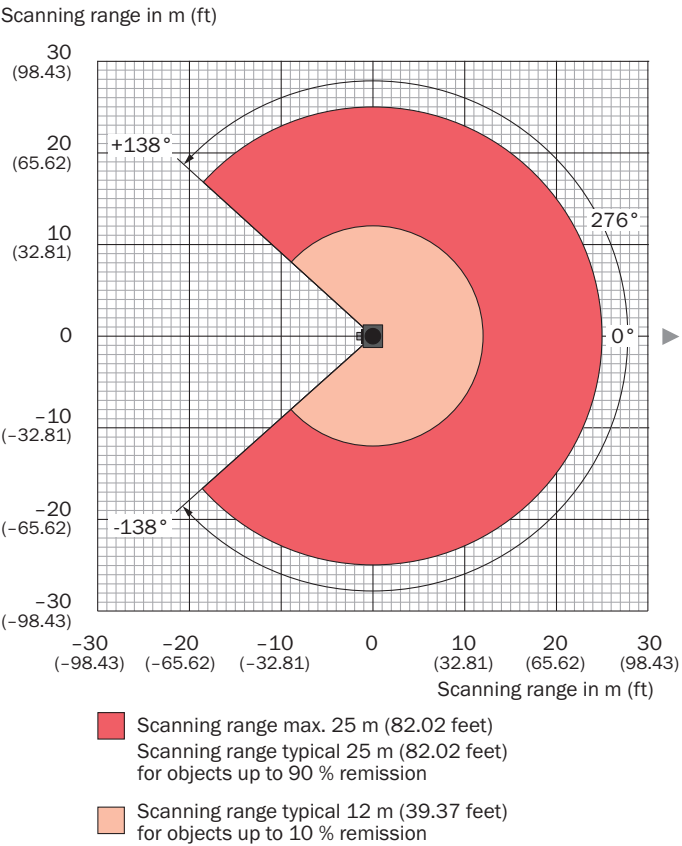
## Classifications

|                       |          |
|-----------------------|----------|
| <b>ECLASS 5.0</b>     | 27270990 |
| <b>ECLASS 5.1.4</b>   | 27270990 |
| <b>ECLASS 6.0</b>     | 27270913 |
| <b>ECLASS 6.2</b>     | 27270913 |
| <b>ECLASS 7.0</b>     | 27270913 |
| <b>ECLASS 8.0</b>     | 27270913 |
| <b>ECLASS 8.1</b>     | 27270913 |
| <b>ECLASS 9.0</b>     | 27270913 |
| <b>ECLASS 10.0</b>    | 27270913 |
| <b>ECLASS 11.0</b>    | 27270913 |
| <b>ECLASS 12.0</b>    | 27270913 |
| <b>ETIM 5.0</b>       | EC002550 |
| <b>ETIM 6.0</b>       | EC002550 |
| <b>ETIM 7.0</b>       | EC002550 |
| <b>ETIM 8.0</b>       | EC002550 |
| <b>UNSPSC 16.0901</b> | 41111615 |

### Dimensional drawing



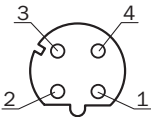
Working range diagram Working range for picoScan150 Core



All specified working range values apply to the “Standard” sensitivity mode

| Dynamic Sensing Profile | Minimum |      | Typical |      |         |      |
|-------------------------|---------|------|---------|------|---------|------|
|                         | 100 klx |      | 10 klx  |      | 100 klx |      |
|                         | 10 %    | 90 % | 10 %    | 90 % | 10 %    | 90 % |
| 15 Hz & 0.33°           | 10 m    | 25 m | 12 m    | 25 m | 10 m    | 25 m |
| 15 Hz & 1°              | 10 m    | 25 m | 12 m    | 25 m | 10 m    | 25 m |
| 25 Hz & 0.25°           | 10 m    | 25 m | 12 m    | 25 m | 10 m    | 25 m |

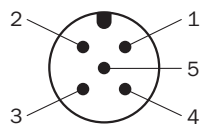
Connection type Ethernet



M12 female connector, 4-pin, D-coded

- ① TX+
- ② RX+
- ③ TX-
- ④ RX-

### PIN assignment



- ①  $V_s$
- ② I/O 2
- ③ GND
- ④ I/O 1
- ⑤ I/O 3

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**For us, that is “Sensor Intelligence.”**

## WORLDWIDE PRESENCE:

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