



# PICS150-01000 Prime-1

picoScan100

2D LIDAR SENSORS

**SICK**  
Sensor Intelligence.



### Ordering information

Type	part no.
PICS150-01000 Prime-1	1134609

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



### Detailed technical data

#### Features

<b>Application</b>	Indoor, Outdoor
<b>Variant</b>	Standard (not pre-configured)
<b>Measurement principle</b>	HDDM <sup>+</sup>
<b>Light source</b>	Infrared (905 nm)
<b>Laser class</b>	1 (IEC 60825-1:2014, EN 60825-1:2014+A11:2021)
<b>Aperture angle</b>	Horizontal 276°
<b>Scanning frequency</b>	15 Hz 20 Hz 25 Hz 30 Hz 40 Hz 50 Hz Depends on the Dynamic Sensing Profile <sup>1)</sup>
<b>Angular resolution</b>	Horizontal 0.05° 0.1° 0.125° 0.25° 0.33° 0.5° 1° Depends on the Dynamic Sensing Profile <sup>1)</sup>
<b>Scan field flatness</b>	± 1°
<b>Working range</b>	0.05 m ... 60 m <sup>1)</sup>
<b>Blind zone</b>	0 m ... 0.05 m

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

<b>Scanning range</b>	
At 90% remission factor and 10 klx	47 m
At 10% remission factor and 10 klx	25 m
<b>Spot size</b>	Divergence, typ.: 4.8 mrad On the optics cover: 8 mm
<b>Amount of evaluated echoes</b>	3

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

### Mechanics/electronics

<b>Connection type</b>	1 x "Ethernet" connection, 4-pin M12 female connector, D-coded 1 x "POWER" connection, 5-pin M12 plug, A-coded
<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> 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
<b>MTTFd</b>	> 100 years (at 25 °C ambient temperature), EN ISO 13849-1:2015

<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)
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### Functions

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

<b>Data output per scan segment</b>	Segment size 30° at ≤ 25 Hz, Segment size 60° at ≥ 30 Hz
<b>Scan/frame rate</b>	44,161 measurement point/s ... 165,603 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)

<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.

	Segment size 60° at ≥ 30 Hz: ≤ 15 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> 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 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) SOPAS ET (software) REST API
<b>Driver</b>	ROS1, ROS2, C++, Python

### Ambient data

<b>Remission factor</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>

<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.

	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> 40 g, 6 ms, ± 4,000 continuous shocks/axis <sup>5)</sup> 50 g, 3 ms, ± 5,000 continuous shocks/axis <sup>5)</sup> 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)
<b>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

<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).

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

<sup>6)</sup> 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.
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### Certificates

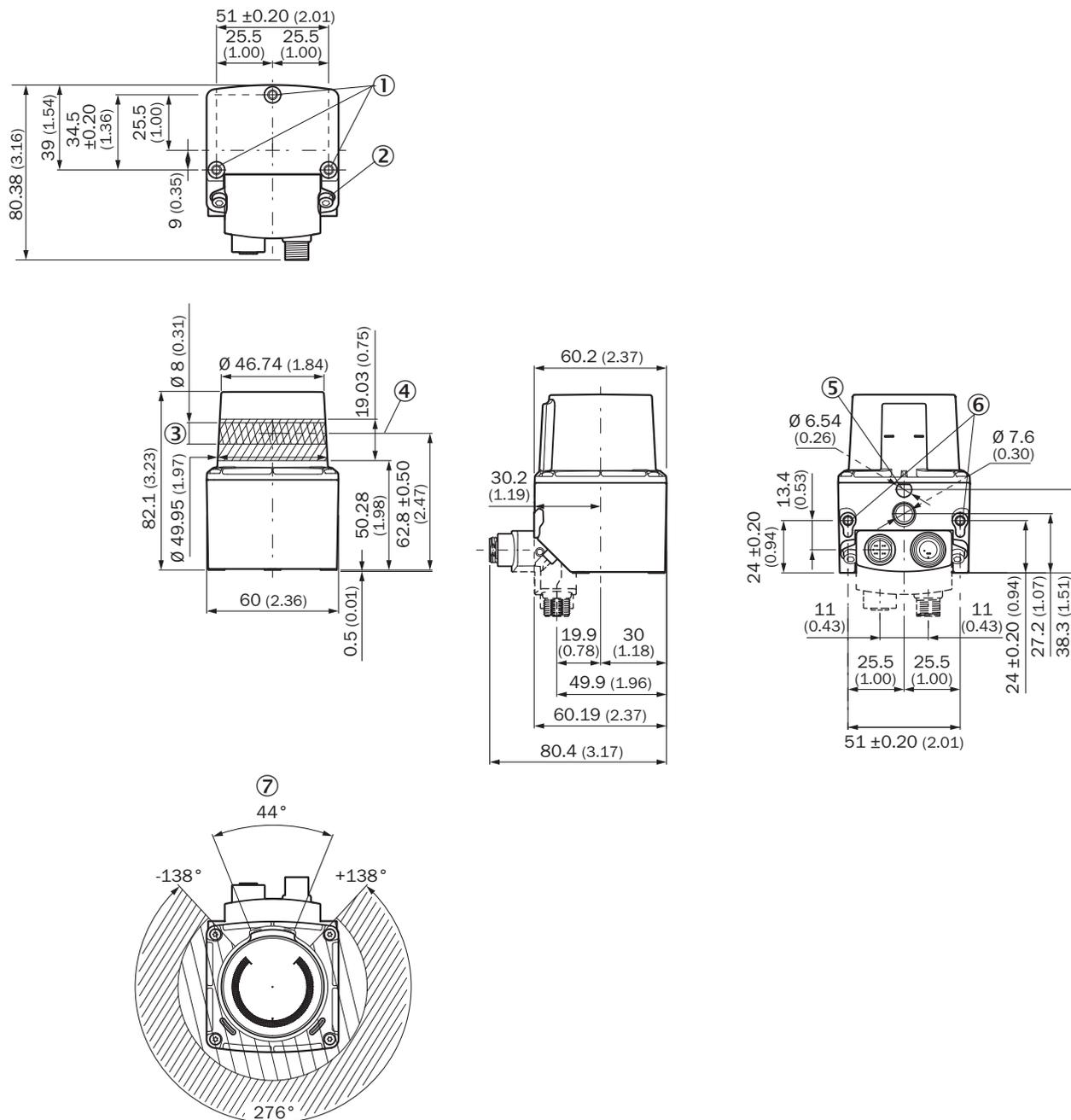
<b>EU declaration of conformity</b>	✓
<b>UK declaration of conformity</b>	✓
<b>ACMA declaration of conformity</b>	✓
<b>China RoHS</b>	✓
<b>cTUVus certificate</b>	✓
<b>Information according to Art. 3 of Data Act (Regulation EU 2023/2854)</b>	✓

### 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

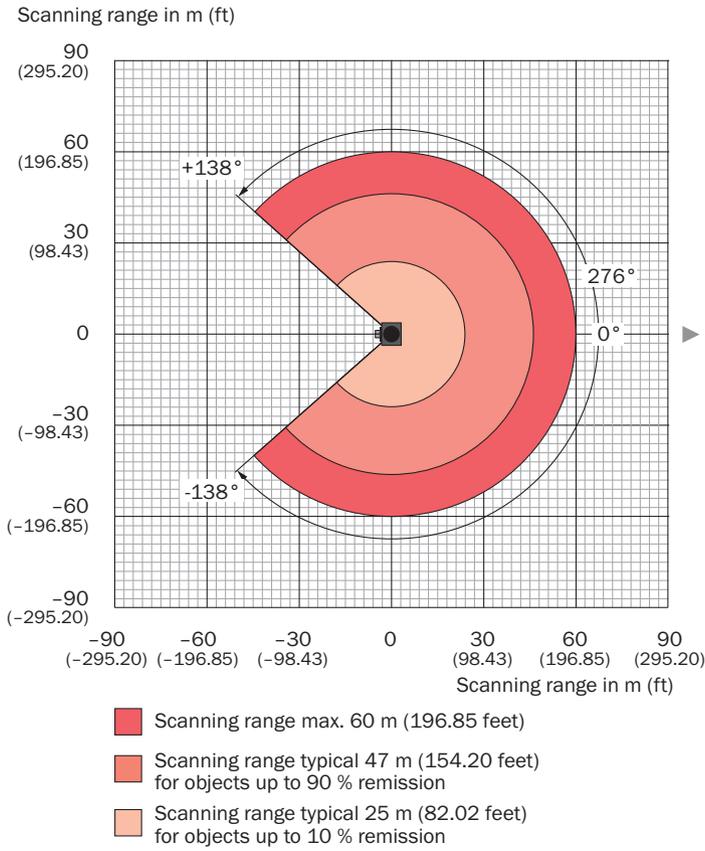
Dimensional drawing



Dimensions in mm (inch)

- ① M4 threaded mounting hole; 4.2 mm deep; tightening torque 2.5 nm
- ② Tightening torque 2.5 nm, screw included in plug unit
- ③ Sending area
- ④ Transmission axis
- ⑤ Support point
- ⑥ M4 threaded mounting hole; 5.4 mm deep, tightening torque 2.5 nm
- ⑦ Area in which no reflective surfaces are allowed for mounted devices

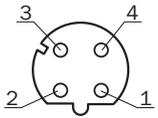
### Working range diagram Working range for picoScan150 Prime-1



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

Dynamic Sensing Profile		Minimum		Typical				On high reflective targets and reflectors
		100 klx		10 klx		100 klx		
		10 %	90 %	10 %	90 %	10 %	90 %	
<b>15 Hz &amp; 0.33°</b>	Included in Prime	-	-	34 m	51 m	23 m	44 m	60 m
<b>15 Hz &amp; 0.5°</b>	Optional	-	-	34 m	51 m	23 m	44 m	60 m
<b>15 Hz &amp; 1°</b>	Included in Prime	-	-	34 m	51 m	23 m	44 m	60 m
<b>20 Hz &amp; 0.1°</b>	Included in Prime	14 m	27 m	23 m	38 m	16 m	31 m	45 m
<b>20 Hz &amp; 0.25°</b>	Optional	-	-	29 m	51 m	20 m	38 m	60 m
<b>25 Hz &amp; 0.25°</b>	Optional	17 m	33 m	28 m	51 m	19 m	36 m	60 m
<b>30 Hz &amp; 0.1°</b>	Optional	-	-	21 m	26 m	15 m	26 m	30 m
<b>40 Hz &amp; 0.25°</b>	Included in Prime	15 m	29 m	25 m	47 m	17 m	32 m	60 m
<b>50 Hz &amp; 0.25°</b>	Optional	-	-	23 m	44 m	16 m	31 m	55 m
<b>15 Hz &amp; 0.05°</b>	Optional	-	-	21 m	21 m	15 m	21 m	25 m
<b>40 Hz &amp; 0.125°</b>	Optional	-	-	21 m	26 m	14 m	26 m	30 m

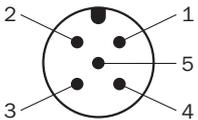
### Connection type Ethernet



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.

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