



## nanoScan3

THE WORLD'S SMALLEST SAFETY LASER SCANNER –  
HIGHLY PRECISE AND EXTREMELY ROBUST

Safety laser scanners

**SICK**  
Sensor Intelligence.



# MINIMUM SIZE. MAXIMUM PERFORMANCE.



## Compact

Big functionality in a little package: Thanks to the low sensor height of 80 mm, even small AGVs and mobile robots can be equipped with the nanoScan3.

⊕ Simple, space-saving design for mobile platforms



## Reliable

Robust in everyday use: Thanks to the patented safeHDDM® scan technology, the nanoScan3 safety laser scanner reliably delivers precise measurement data even under difficult ambient conditions. And it does so with maximum safety.

⊕ High availability to prevent downtimes

# SAFETY IN ITS FINEST FORM: THE nanoScan3 LASER SCANNER

Highly precise and extremely rugged safety laser scanners need not take up much space. The nanoScan3 from SICK with its small installation size is opening up new possibilities in the design of small automated guided vehicles (AGVs) and mobile robots. Specially developed for compact mobile platforms, its safety functions can be tailored to the environment. The nanoScan3, just like its “big brother” the microScan3, employs the reliable and accurate safeHDDM® scanning technology. Thanks to its compact size, the nanoScan3 is increasing the level of efficiency and safety in numerous production and logistics applications.



Additional information:  
→ [www.sick.com/nanoscan3](http://www.sick.com/nanoscan3)



## User-friendly

Straightforward to use: The license-free Safety Designer software makes configuration, commissioning, and diagnosis quick and easy. Status information is presented quickly and clearly on the display and via the well-visible LEDs on the device.

⊕ Saves time during configuration and diagnostics



## Smart

Little also in terms of effort: Safety-compliant machine integration and uncomplicated device changeover. Communication, configuration and diagnostics can either be performed decentrally directly on the device, or centrally over the network.

⊕ Fast and cost-efficient mounting and commissioning



# PRECISELY SOLVED: SMART SAFETY FUNCTIONS AND ACCURATE MEASURED VALUES

## SAFETY FOR SMALL MOBILE APPLICATIONS

Built for harsh industrial environments, the nanoScan3 reliably delivers precise measurement data via an Ethernet-based output. This compact technology package is impervious to sources of interference such as dust, contamination, and ambient light thanks to the advanced safeHDDM® scan technology and its rugged metal housing. It determines the distance of objects based on 80,000 light pulses per revolution. This, together with an outstanding 275-degree scanning angle and a protective field range of 3 m, makes it ideally suited for trouble-free, productive, and safe operation in the area of manufacturing or logistics.



The nanoScan3 has been designed specifically for use in small mobile platforms.

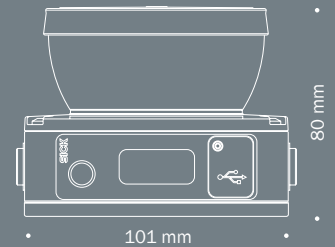
Its high-precision measurement data are ideally suited for accurate localization and safe navigation of mobile assistance systems, service robots, autonomous transport platforms as well as collaborative robots (cobots).

This ultrasmall safety laser scanner from SICK delivers reliable safety and precise localization for your application.



## nanoScan3: A LOT OF PERFOR- MANCE IN A SMALL HOUSING

The nanoScan3 with its ultracompact design is the perfect solution when installation space is at a premium. With a sensor installation height of 80 mm, it is the right choice where no compromise in performance is possible.



### Smart integration

Time-saving and cost-efficient: The nanoScan3 can be mounted quickly and securely, is easy to wire, and can be integrated into a variety of controllers. And thanks to the system plug with integrated configuration memory, the device can be replaced in no time at all.




### Intuitive configuration

The nanoScan3 adapts to diverse tasks and environments, thereby ensuring processes run smoothly. All functions can be easily configured via the convenient step-by-step instructions in the Safety Designer software.



# THE WORLD'S SMALLEST SAFETY LASER SCANNER – HIGHLY PRECISE AND EXTREMELY ROBUST



The top part of the illustration shows four scenarios where the scanner is used to detect obstacles (boxes) in a path. Below this is a photograph of the nanoScan3 scanner, a compact black and yellow device with a lens on top and a status indicator on the front.

**CE c UL US**

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## Product description

nanoScan3 is the smallest safety laser scanner from SICK. It is perfectly suited for the protection and localization of mobile platforms. Thanks to the reliable safeHDDM® scan technology, it delivers high-precision measurement data and is extremely resistant to light, dust or dirt. The easy operation of the Safety Designer

configuration software and the clever integration options of the nanoScan3 offer a high level of flexibility for any application while also saving time. The nanoScan3 therefore offers the highest level of performance and availability in a compact housing, thereby securing system productivity.

## At a glance

- Only 80 mm high
- Extremely resistant to light, dust and dirt thanks to the safeHDDM® scan technology
- High-precision measurement data via Ethernet interface
- Protective field range: 3 m, scanning angle: 275°
- Up to 128 freely configurable fields
- Safe machine integration via I/Os
- System plug with configuration memory

## Your benefits

- The smallest safety laser scanner for easy and space-saving design for mobile platforms
- High availability for the prevention of downtime
- 2-In-1: Reliable safety and precise localization
- Saves time during configuration and diagnostics thanks to user-friendly Safety Designer software
- The highest level of flexibility when adjusting the vehicle speed and direction
- Flexible connection to different control systems with standardized interfaces
- Quick device exchange without rewiring or reconfiguration

→ [www.sick.com/nanoScan3](http://www.sick.com/nanoScan3)

For more information, simply enter the link or scan the QR code to get direct access to technical data, CAD design models, operating instructions, software, application examples, and much more.



## Detailed technical data

More information can be found in the operating instructions. Download → [www.sick.com/nanoScan3](http://www.sick.com/nanoScan3)

## Features

	nanoScan3 Core I/O	nanoScan3 Pro I/O
Protective field range	3 m	
Warning field range	10 m	
Number of simultaneously monitored fields	≤ 4 <sup>1)</sup> <sup>2)</sup>	≤ 8 <sup>1)</sup> <sup>2)</sup>
Number of fields	8 <sup>3)</sup>	128
Number of monitoring cases	2	128
Scanning angle	275°	
Resolution (can be configured)	20 mm, 30 mm, 40 mm, 50 mm, 60 mm, 70 mm, 150 mm, 200 mm	
Angular resolution	0.17°	
Response time	≥ 70 ms	
Protective field supplement	65 mm	

<sup>1)</sup> Protection, warning or contour detection fields.

<sup>2)</sup> Please note the number of available OSSD pairs.

<sup>3)</sup> Please note the number of available inputs and OSSD pairs.

## Safety-related parameters

Type	Type 3 (IEC 61496)
Safety integrity level	SIL2 (IEC 61508) SILCL2 (EN 62061)
Category	Category 3 (EN ISO 13849)
Performance level	PL d (EN ISO 13849)
PFH <sub>0</sub> (mean probability of a dangerous failure per hour)	8.0 x 10 <sup>-8</sup> (EN ISO 13849)
T <sub>M</sub> (mission time)	20 years (EN ISO 13849)
Safe status when a fault occurs	At least one OSSD is in the OFF state.

## Functions

Restart interlock	✓
External device monitoring (EDM)	✓
Multiple sampling	✓
Monitoring case switching	✓
Simultaneous monitoring	✓
Static protective field switching	✓
Dynamic protective field switching	✓
Reliable contour detection	✓
Contour as reference	✓
Integrated configuration memory	✓
Measurement data output	✓, via Ethernet



## Interfaces

	nanoScan3 Core I/O	nanoScan3 Pro I/O
<b>Universal I/O</b>	3 <sup>1)</sup>	4 <sup>1)</sup>
<b>Outputs</b>		
OSSD pairs	1	≤ 2 <sup>2)</sup>
<b>Inputs</b>		
Universal inputs	–	8 <sup>3)</sup>
Dynamic control inputs	–	2 <sup>2)</sup>
Static control inputs	1	≤ 6 <sup>2)</sup>
<b>Configuration method</b>	PC with Safety Designer (configuration and diagnostic software)	
<b>Configuration and diagnostic interface</b>	USB 2.0, micro USB	
<b>Status indicators</b>	Graphical color display, LEDs	

<sup>1)</sup> Freely programmable as input or output, e.g., external device monitoring input, reset input, static control input, contamination warning, warning field, reset required.

<sup>2)</sup> Availability depends on the configuration of the universal I/Os and universal inputs.

<sup>3)</sup> Freely programmable input, e.g. external device monitoring input, reset input, static control input.

## Electrical data

<b>Protection class</b>	III (EN 61140)
<b>Supply voltage U<sub>v</sub></b>	24 V DC (16.8 V DC ... 30 V DC)
<b>Power consumption</b>	3.9 W (without output load)

## Mechanical data

<b>Dimensions (W x H x D)</b>	106.6 mm x 80 mm x 117.5 mm (including system plug)
<b>Weight</b>	0.67 kg
<b>Housing material</b>	Aluminum
<b>Housing color</b>	RAL 1021 (colza yellow), RAL 9005 (black)
<b>Optics cover material</b>	Polycarbonate

## Ambient data

<b>Enclosure rating</b>	IP65 (IEC 60529)
<b>Ambient light immunity</b>	≤ 40 klx (IEC 61496-3) <sup>1)</sup>
<b>Ambient operating temperature</b>	–10 °C ... +50 °C
<b>Storage temperature</b>	–25 °C ... +70 °C
<b>Vibration resistance</b>	IEC 60068-2-6, IEC 60068-2-64, IEC 60721-3-5, IEC TR 60721-4-5, IEC 61496-3
Class	5M1 (IEC 60721-3-5)
<b>Shock resistance</b>	IEC 60068-2-27, IEC 60721-3-5, IEC TR 60721-4-5, IEC 61496-3
Class	5M1 (IEC 60721-3-5)
Continuous shock	50 m/s <sup>2</sup> , 11 ms 100 m/s <sup>2</sup> , 16 ms
<b>EMC</b>	IEC 61496-1, IEC 61000-6-2, IEC 61000-6-3

<sup>1)</sup> Typical ambient light immunity, for ambient light sources directly in the scan plane in accordance with IEC 61496-3: ≤ 3 klx.

## Other data

<b>Type of light</b>	Pulsed laser diode
<b>Wavelength</b>	905 nm
<b>Detectable remission</b>	1.8% ... several 1,000%
<b>Laser class</b>	1 (21 CFR 1040.10 and 1040.11, IEC 60825-1)



## Ordering information

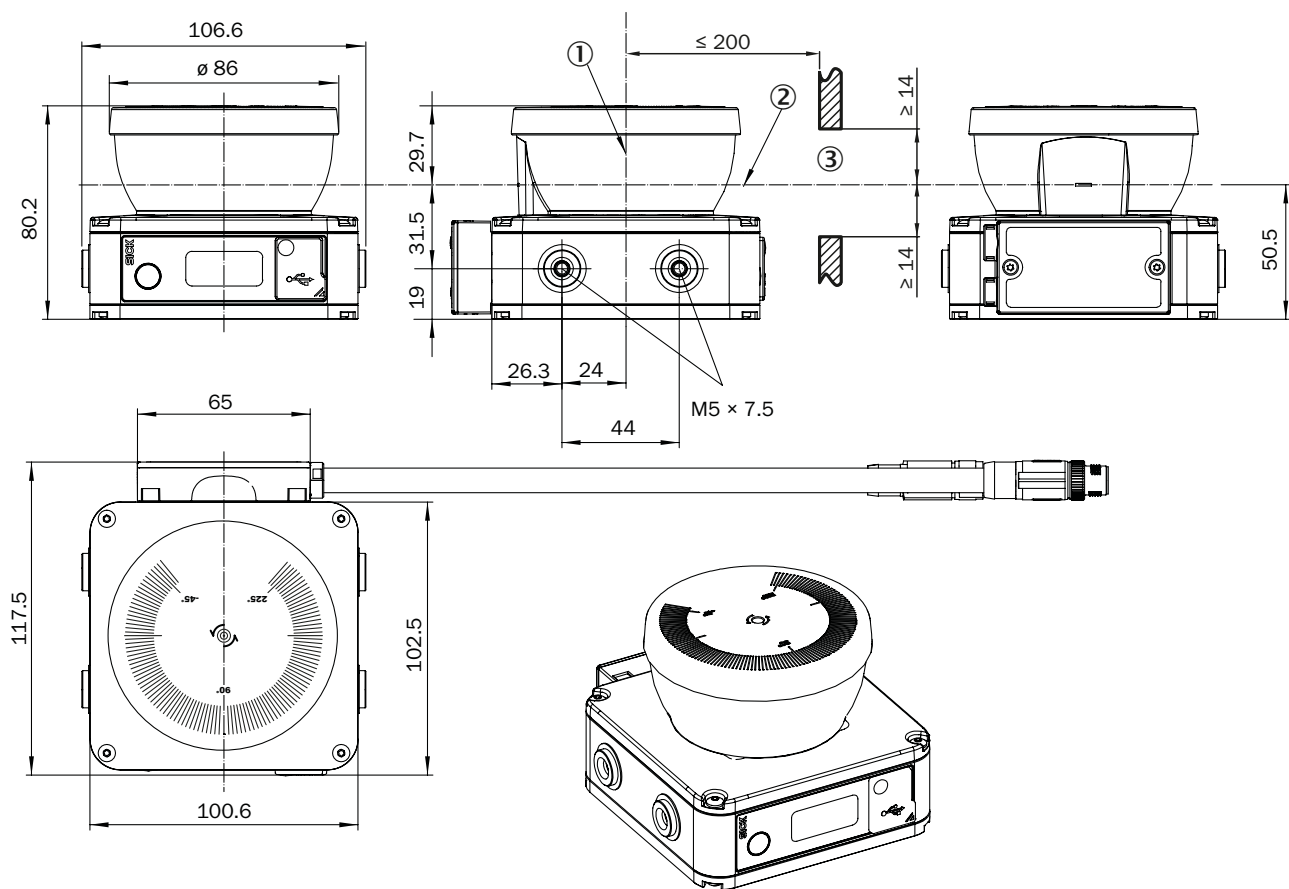
nanoScan3 scope of delivery:

- safety laser scanner without system plug
- Safety note
- Mounting instructions
- Operating instructions for download → [www.sick.com/nanoScan3](http://www.sick.com/nanoScan3)
- Safety Designer (configuration and diagnostic software) for download → [www.sick.com/safety\\_designer](http://www.sick.com/safety_designer)

The system plug has to be ordered separately! For details, see „Accessories“.

Variant	Integration in the control	Protective field range	Number of fields	Type	Part no.
nanoScan3 Core I/O	Local inputs and outputs (I/O)	3 m	8	NANS3-AAAZ30AN1	1100333
nanoScan3 Pro I/O	Local inputs and outputs (I/O)	3 m	128	NANS3-CAAZ30AN1	1100334

## Dimensional drawing (dimensions in mm)



- ① Mirror rotational axis
- ② Scan plane
- ③ Required viewing slit



### Accessories required for commissioning

Description	Quantity	Scope of delivery	Additional information
Mounting kit	1	-	→ Mounting brackets and plates
System plug	1	-	→ Plug connectors and cables
Connecting cable	1	-	→ <a href="http://www.sick.com/nanoScan3">www.sick.com/nanoScan3</a>
M12-RJ45 connection cable (only required for system plug with Ethernet)	1	-	→ <a href="http://www.sick.com/nanoScan3">www.sick.com/nanoScan3</a>
Connection cable for configuration and diagnostics	1	-	→ <a href="http://www.sick.com/nanoScan3">www.sick.com/nanoScan3</a>
Safety Designer (configuration and diagnostic software)	1	-	→ <a href="http://www.sick.com/safety_designer">www.sick.com/safety_designer</a>
Operating instructions	1	-	→ <a href="http://www.sick.com/nanoScan3">www.sick.com/nanoScan3</a>

### Accessories

#### Mounting systems







##### Mounting brackets and plates

Figure	Description	Packing unit	Type	Part no.	nanoScan3 Core I/O	nanoScan3 Pro I/O
	Mounting bracket	1 item	Mounting kit 1a	2111767	●	●
	Mounting bracket with optics cover protection	1 item	Mounting kit 1b	2111768	●	●
	Alignment bracket, alignment with cross-wise axis and depth axis possible	1 item	Mounting kit 2a	2111769	●	●
	Alignment bracket with protection for the optics cover, alignment with cross-wise axis and depth axis possible	1 item	Mounting kit 2b	2111770	●	●

#### Connectivity

##### Plug connectors and cables

##### System plug

Figure	Description	Type	Part no.	nanoScan3 Core I/O	nanoScan3 Pro I/O
	System connection; voltage supply: M12 male connector, 8-pin, A-coded	NANSX-AAABZZZZ1	2105106	●	-
	System connection; voltage supply: M12 male connector, 8-pin, A-coded, Ethernet: M12 female connector, 4-pin, D-coded	NANSX-AAABAEZZ1	2104949	●	-
	System connection; voltage supply: M12 male connector, 17-pin, A-coded	NANSX-AAACZZZZ1	2105107	-	●
	System connection; voltage supply: M12 male connector, 17-pin, A-coded, Ethernet: M12 female connector, 4-pin, D-coded	NANSX-AAACAEZZ1	2104860	-	●
	System connection; voltage supply: Flying leads, 17-wire	NANSX-AACCZZZZ1	2105109	-	●
	System connection; voltage supply: Flying leads, 17-wire, Ethernet: M12 female connector, 4-pin, D-coded	NANSX-AACCAEZZ1	2105108	-	●





## Reflectors and optics

## Lens cloths


Figure	Description	Type	Part no.	nanoScan3 Core I/O	nanoScan3 Pro I/O
	Cloth for cleaning optical surfaces	Lens cloth	4003353	●	●

## Additional accessories


## Test and monitoring tools

Figure	Description	Type	Part no.	nanoScan3 Core I/O	nanoScan3 Pro I/O
 Illustration may differ	Alignment aid for detecting the infrared light of SICK sensors. Scope of delivery: Alignment aid, pedestal, display aid, mounting instructions	Alignment aid	2101720	●	●
	50 mm diameter, 500 mm length	Test rod 50 mm	2095105	●	●
	70 mm diameter, 500 mm length	Test rod 70 mm	2095139	●	●
	Test rod holder for test rods with 50 mm and 70 mm diameter	Test rod holder	4096204	●	●

## Cleaning agent

Figure	Description	Type	Part no.	nanoScan3 Core I/O	nanoScan3 Pro I/O
	Plastic cleaner and polish, anti-static, 0.5 liters	Plastic cleaner	5600006	●	●

## Spare parts

Figure	Description	Type	Part no.	nanoScan3 Core I/O	nanoScan3 Pro I/O
	nanoScan3 optics cover spare part set with seal and screws	nanoScan3 optics cover spare part set	2111696	●	●

For additional accessories, visit → [www.sick.com/nanoScan3](http://www.sick.com/nanoScan3)

## SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 10,000 employees and over 50 subsidiaries and equity investments as well as numerous agencies worldwide, SICK is always close to its customers. 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.

SICK has extensive experience in various industries and understands their processes and requirements. With intelligent sensors, SICK delivers exactly what the 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 SICK a reliable supplier and development partner.

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

**That is “Sensor Intelligence.”**

### **Worldwide presence:**

Australia, Austria, Belgium, Brazil, Canada, Chile, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Hong Kong, India, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Poland, Romania, Russia, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, United Arab Emirates, USA, Vietnam.

Detailed addresses and further locations → [www.sick.com](http://www.sick.com)