nanoScan3

THE SMALLEST SAFETY LASER SCANNER FROM SICK – EXTREMELY RUGGED AND HIGHLY PRECISE

Safety laser scanners

SICK
Sensor Intelligence.

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

➕ **High availability to prevent downtimes**

SMALL SIZE. HIGH PERFORMANCE.

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

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 FUNTIONS AND ACCURATE MEASURED VALUES

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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. This is thanks to the innovative safeHDDM® scanning technology in the rugged metal housing. It determines the distance of objects based on 80,000 light pulses per revolution. This, together with a 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 compact design is the ideal 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.

80 mm

101 mm
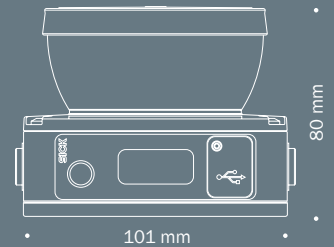
Smart integration

Time-saving and cost-efficient: The nanoScan3 can be mounted quickly and simply, is easy to wire, and can be integrated into a variety of controllers via I/O, EtherNet/IP™ CIP Safety™ or EFI-pro. And thanks to the system plug with integrated configuration memory, the device can be replaced in no time at all.

Intuitive configuration

The nanoScan3 can be tailored to a wide variety of 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 SMALLEST SAFETY LASER SCANNER FROM SICK – EXTREMELY RUGGED AND HIGHLY PRECISE

Product description

The nanoScan3 is the smallest safety laser scanner from SICK. It is well suited for the protection and localization of mobile platforms. Thanks to the reliable safeHDDM® scanning technology, it delivers high-precision measurement data and is extremely resistant to ligh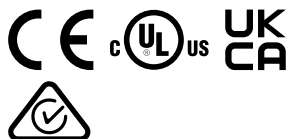t, dust or dirt. The easy operation of the Safety Designer configuration software and the clever integration options of the nanoScan3 ensure flexibility in applications and also save time. The nanoScan3 therefore offers a high level of performance and availability in a compact housing, thereby securing system productivity.

At a glance

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

Your benefits

- Smallest safety laser scanner from SICK for simple and space-saving design-in 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
- Very high level of flexibility when adjusting the vehicle speed and direction
- Simple integration into different control systems via EtherNet/IP™ CIP Safety™, I/O and EFI-pro
- Quick device exchange without rewiring or reconfiguration

Additional information

→ **www.sick.com/nanoScan3**

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

Detailed technical data

More detailed data can be found in the operating instructions. Download ➜ **www.sick.com/nanoScan3**

Features

	nanoScan3 Core I/O	nanoScan3 Pro I/O	nanoScan3 Pro I/O – EFI-pro	nanoScan3 Pro – EFI-pro	nanoScan3 Pro – EtherNet/IP™
Application	Indoor				
Protective field range	3 m				
Warning field range	10 m				
Distance measuring range	40 m				
Number of simultaneously monitored fields	≤ 4 [1] [2]	≤ 8 [1] [2]		≤ 8 [1]	
Number of fields	8 [3]	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		≥ 85 ms	≥ 70 ms	≥ 85 ms
Protective field supplement	65 mm				

[1] Protection, warning or contour detection fields.

[2] Please note the number of available OSSD pairs.

[3] Please note the number of available inputs and OSSD pairs.

Safety-related parameters

	nanoScan3 Core I/O	nanoScan3 Pro I/O	nanoScan3 Pro I/O – EFI-pro	nanoScan3 Pro – EFI-pro	nanoScan3 Pro – EtherNet/IP™
Type	Type 3 (IEC 61496)				
Safety integrity level	SIL2 (IEC 61508)				
Category	Category 3 (EN ISO 13849)				
Performance level	PL d (EN ISO 13849)				
PFH_D (mean probability of a dangerous failure per hour)	8.0×10^{-8}				
T_M (mission time)	20 years (EN ISO 13849)				
Safe state in the event of a fault	At least one OSSD is in the OFF state.		At least one OSSD is in the OFF state. The safety outputs via the network are logic 0.	The safety outputs via the network are logic 0.	

Functions

	nanoScan3 Core I/O	nanoScan3 Pro I/O	nanoScan3 Pro I/O – EFI-pro	nanoScan3 Pro – EFI-pro	nanoScan3 Pro – EtherNet/IP™
Restart interlock	✔				
External device monitoring (EDM)	✔				
Multiple sampling	✔				
Monitoring case switching	✔				
Simultaneous monitoring	✔				
Static protective field switching	✔				

	nanoScan3 Core I/O	nanoScan3 Pro I/O	nanoScan3 Pro I/O – EFI-pro	nanoScan3 Pro – EFI-pro	nanoScan3 Pro – EtherNet/IP™
Dynamic protective field switching	–	✔			
Safe contour detection	✔				
Contour as a reference	✔				
Integrated configuration memory	✔				
Measured data output	Via Ethernet				
Safe SICK device communication via EFI-pro	–		✔		–

Interfaces

	nanoScan3 Core I/O	nanoScan3 Pro I/O	nanoScan3 Pro I/O – EFI-pro	nanoScan3 Pro – EFI-pro	nanoScan3 Pro – EtherNet/IP™
Connection type	Depending on system plug				
Universal I/Os	3 [1]	4 [1]		–	
Outputs					
OSSD pairs	1	≤ 2 [2]		–	
Safety outputs via network	–		8		
Inputs					
Universal inputs	≤ 1 [3]	≤ 8 [3]		–	
Dynamic switching signals	–	≤ 4 [2]		–	
Static control inputs	≤ 1 [2]	≤ 6 [2]		–	
Configuration method	PC with Safety Designer (Configuration and Diagnostic Software)				
Configuration and diagnostics interface	USB 2.0, micro USB				
Data interface					
Services	CoLa 2 (configuration and diagnostics using Safety Designer) Data output DHCP SNTP		EtherNet/IP™ CIP Safety™ CoLa 2 (configuration and diagnostics using Safety Designer) Data output DHCP SNMP SNTP (client and server)		
Fieldbus, industrial network			EFI-pro		EtherNet/IP™
RPI (requested packet interval)	–		5 ms ... 1,000 ms, multiple of 5 ms		
Supported protocol versions	–				Common Industrial Protocol: The CIP Networks Library Volume 1, Edition 3.29 EtherNet/IP™: The CIP Networks Library Volume 2, Edition 1.26 CIP Safety™: The CIP Networks Library Volume 5, Edition 2.21
Display elements	Graphic color display, LEDs				

[1] Freely programmable as input or output, e.g. external device monitoring input, reset input, static control input, contamination warning, warning field, reset required.

[2] Availability depends on the configuration of the universal I/Os and universal inputs.

[3] Freely programmable input, e.g. external device monitoring input, reset input, static control input.

Electrical data

Protection class	III (EN 61140)
Supply voltage V$_s$	24 V DC (16.8 V DC ... 30 V DC)
Power consumption	3.9 W (without output load)

Mechanical data

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

Ambient data

Enclosure rating	IP65 (IEC 60529)
Ambient light immunity	≤ 40 klx (IEC 61496-3) [1]
Ambient operating temperature	–10 °C ... +50 °C
Storage temperature	–25 °C ... +70 °C
Vibration resistance	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)
Shock resistance	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/s², 11 ms 100 m/s², 16 ms
EMC	IEC 61496-1, IEC 61000-6-2, IEC 61000-6-3

[1] Typical ambient light immunity, for ambient light sources directly in the scan plane in accordance with IEC 61496-3: ≤ 3 klx.

Other information

|	
Type of light	Pulsed laser diode
Wave length	905 nm
Detectable remission factor	1.8% to several 1000%
Laser class	1 (21 CFR 1040.10 and 1040.11, IEC 60825-1)

Ordering information

Items supplied nanoScan3:
- Safety laser scanner without system plug
- Safety instruction
- Mounting instructions
- Operating instructions for download ➜ www.sick.com/nanoScan3
- Safety Designer (configuration and diagnostic software) for download ➜ www.sick.com/safety_designer

The system plug has to be ordered separately. For details, see "Accessories".

Sub product family	Integration in the control system	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
nanoScan3 Pro I/O – EFI-pro	Local inputs and outputs (I/O), EFI-pro	3 m	128	NANS3-CAAZ30AA1	1126792
nanoScan3 Pro – EFI-pro	EFI-pro	3 m	128	NANS3-CAAZ30ZA1	1126793
nanoScan3 Pro – EtherNet/IP™	CIP Safety™ over EtherNet/IP™	3 m	128	NANS3-CAAZ30IZ1	1126794

Dimensional drawing
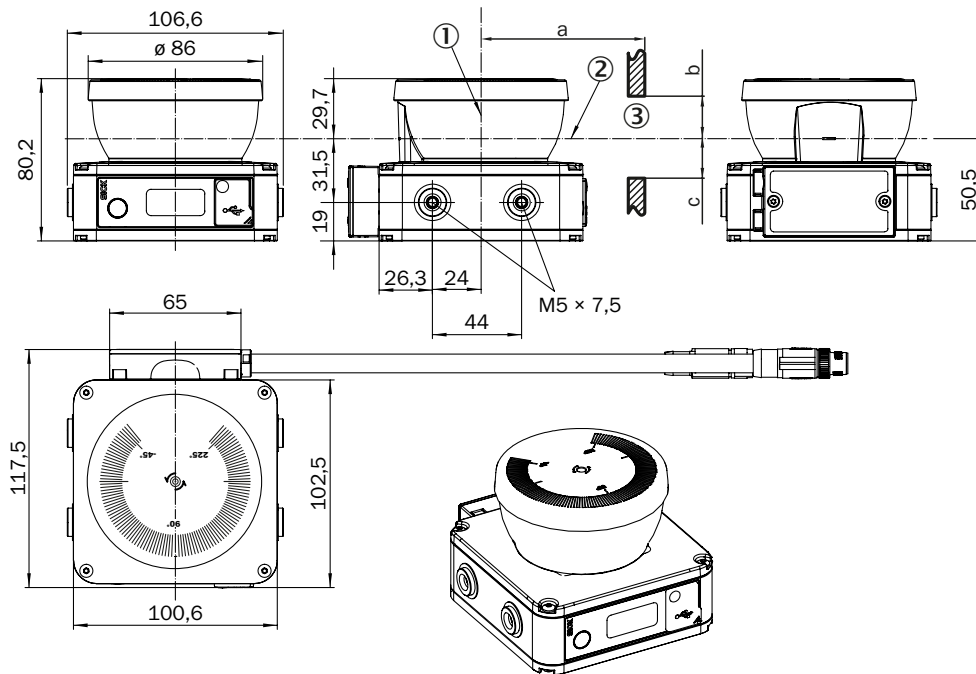
① Mirror axis of rotation

② Scan plane

③ Required viewing slit (a: length of the viewing slit, b: minimum height above the scan plane, c: minimum height below the scan plane. See the operating instructions for details.)

Accessories required for commissioning

Description	Number	Items supplied	Further information
Mounting bracket	1	–	➜ Mounting brackets and plates
System plug	1	–	➜ Plug connectors and cables
Connecting cable	1	–	➜ www.sick.com/nanoScan3
M12-RJ45 connection cable (only required for system plug with Ethernet)	1	–	➜ www.sick.com/nanoScan3
Connection cable for configuration and diagnosis	1	–	➜ www.sick.com/nanoScan3
Safety Designer (configuration and diagnostic software)	1	–	➜ www.sick.com/safety_designer
Operating instructions	1	–	➜ www.sick.com/nanoScan3

Accessories

Mounting systems

Mounting brackets and plates

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

Plug connectors and cables

System plugs

- **Model:** Integrated configuration memory

	Description	Type	Part no.	nanoScan3 Core I/O	nanoScan3 Pro I/O	nanoScan3 Pro I/O – EFI-pro	nanoScan3 Pro – EFI-pro	nanoScan3 Pro – EtherNet/IP™
	System connection; voltage supply: cable 300 mm with M12 male connector, 4-pin, A-coded, Ethernet: cable 250 mm with M12 female connector, 4-pin, D-coded	NANSX-AAAAAEZZ1	2105154	–	–	–	●	●
	System connection; voltage supply: cable 300 mm with M12 male connector, 8-pin, A-coded, Ethernet: cable 250 mm with M12 female connector, 4-pin, D-coded	NANSX-AAABAEZZ1	2104949	●	–	–	–	–
	System connection; voltage supply: cable 300 mm with M12 male connector, 8-pin A-coded	NANSX-AAABZZZZ1	2105106	●	–	–	–	–
	System connection; voltage supply: cable 300 mm with M12 male connector, 17-pin, A-coded, Ethernet: cable 250 mm with M12 female connector, 4-pin, D-coded	NANSX-AAACAEZZ1	2104860	–	●	●	–	–
	System connection; voltage supply: cable 300 mm with M12 male connector, 17-pin A-coded	NANSX-AAACZZZZ1	2105107	–	●	–	–	–
	System connection; voltage supply: cable 2 m with flying leads, 17-wire, Ethernet: cable 250 mm with M12 female connector, 4-pin, D-coded	NANSX-AACCAEZZ1	2105108	–	●	●	–	–
	System connection; voltage supply: cable 0.8 m with flying leads, 17-wire, Ethernet: cable 250 mm with M12 female connector, 4-pin, D-coded	NANSX-AACCAEZZ1S01	2128780	–	●	●	–	–
	System connection; voltage supply: cable 2 m with flying leads, 17-wire	NANSX-AACCZZZZ1	2105109	–	●	–	–	–
	System connection; voltage supply: cable 0.8 m with flying leads, 17-wire	NANSX-AACCZZZZ1S01	2128781	–	●	–	–	–

Connecting cables

	Connection type		Model	Conductor cross section	Length of cable	Type	Part no.					
	Female connector, M12, 8-pin, straight	Flying leads	PUR, halogen-free, unshielded	0.25 mm^2	2 m	DOL-1208G02MD25KM1	2079314	●	–	–	–	–
					5 m	DOL-1208G05MD25KM1	2079315	●	–	–	–	–
					10 m	DOL-1208G10MD25KM1	2079316	●	–	–	–	–
					20 m	DOL-1208G20MD25KM1	2092105	●	–	–	–	–
					30 m	DOL-1208G30MD25KM1	2092106	●	–	–	–	–
	Female connector, M12, 4-pin, straight	Flying leads	PUR, halogen-free, unshielded	0.34 mm^2	2 m	YF2A14-020UB3XLEAX	2095607	–	–	–	●	●
					5 m	YF2A14-050UB3XLEAX	2095608	–	–	–	●	●
					10 m	YF2A14-100UB3XLEAX	2095609	–	–	–	●	●
					15 m	YF2A14-150UB3XLEAX	2095610	–	–	–	●	●
					20 m	YF2A14-200UB3XLEAX	2095611	–	–	–	●	●
					25 m	YF2A14-250UB3XLEAX	2095615	–	–	–	●	●
	Female connector, M12, 17-pin, straight	Flying leads	PUR, shielded	0,14 mm^2	2 m	YF2A2D-020UV2XLEAX	2114287	–	●	●	–	–
					5 m	YF2A2D-050UV2XLEAX	2114296	–	●	●	–	–
					10 m	YF2A2D-100UV2XLEAX	2114297	–	●	●	–	–

Connection cables

	Connection type	Model	Length of cable	Type	Part no.	nanoScan3 Core I/O	nanoScan3 Pro I/O	nanoScan3 Pro I/O – EFI-pro	nanoScan3 Pro – EFI-pro	nanoScan3 Pro – EtherNet/IP™
	Male connector, M12, 4-pin, straight	Male connector, M12, 4-pin, straight	5 m	SSL-1204-G05ME90	6045277	●	●	●	●	●
			10 m	SSL-1204-G10ME90	6045279	●	●	●	●	●
			20 m	SSL-1204-G20ME90	6063693	●	●	●	●	●
		Male connector, RJ45, 8-pin, straight	PUR, halogen-free, shielded	20 m	SSL-2J04-G20ME60	6063700	●	●	●	●	●
	Male connector, M12, 4-pin, straight	Male connector, M12, 4-pin, straight	PUR, halogen-free, shielded	2 m	YM2D24-020PN1M2D24	2106159	●	●	●	●	●
		Male connector, RJ45, 4-pin, straight	2 m	YM2D24-020PN1MRJA4	2106182	●	●	●	●	●
			PUR, halogen-free, shielded	5 m	YM2D24-050PN1MRJA4	2106184	●	●	●	●	●
			10 m	YM2D24-100PN1MRJA4	2106185	●	●	●	●	●
	Male connector, Micro-B, 4-pin, straight	Male connector, USB-A, 4-pin, straight	Unshielded	2 m	USB cable	6036106	●	●	●	●	●
			PVC, shielded	5 m	YMUSA4-050VG4MUIA4	2118400	●	●	●	●	●

Further accessories

Test and monitoring tools

	Description	Items supplied	Type	Part no.					
	Alignment aid for detecting the infrared light (wavelength 780 nm to 1050 nm) of SICK sensors	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	●	●	●	●	●

Optics cloths

	Description	Type	Part no.					
	Cloth for cleaning optical surfaces	Lens cloth	4003353	●	●	●	●	●

Spare parts

	Description	Type	Part no.					
	nanoScan3 optics cover spare part set with seal and screws	nanoScan3 optics cover spare part set	2111696	●	●	●	●	●

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SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 11,000 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.

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