



## NAV2xx

Sophisticated 2D LiDAR sensor for navigation of automated guided vehicle systems

**SICK**  
Sensor Intelligence.

## Advantages



## NAV series – Precise measurement of natural landmarks (contour data) right through to localization based on detected reflector positions – flexibility of today.

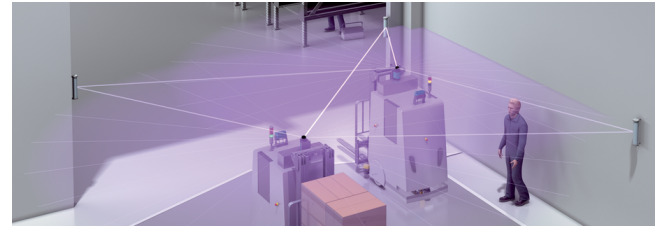
Today's LiDAR-based localization systems for automated guided vehicle (AGV) systems or autonomous mobile robots (AMR) determine their current position based on ambient data. They do this using contour data (natural landmarks) or also the position data of installed reflectors. Vehicle speed, surface characteristics of the vehicle's route, or frequently changing (dynamic) ambient conditions necessitate so-called mixed mode operation in some areas.

The sensors in the NAV series offer a special feature: The acquisition of contour data and optional simultaneous detection of reflector positions are supported in the same variant. This combines the advantages of both technologies for localizing autonomous vehicles in industrial environments.



### NAV2xx

The compact and rugged NAV210 and NAV245 sensors are the first choice for medium and smaller automated guided vehicle (AGV) systems. The precise acquisition of ambient data and concurrent output of reflector positions provide the basis for precise and highly dynamic navigation in warehouses (and refrigerated areas as well). If required, the contour or reflector positions or also both data packages can be output together.

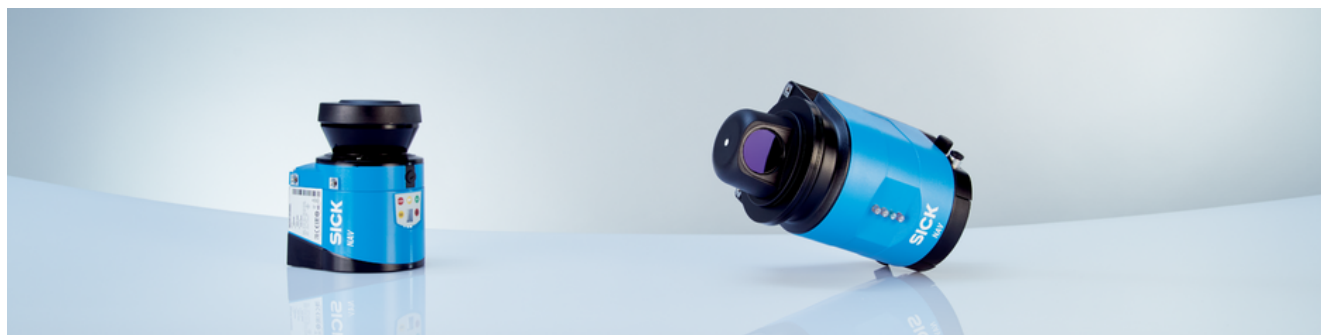


### NAV3xx

The sensors in the NAV3xx product family are the right choice for localizing larger automated guided vehicle (AGV) systems. Thanks to the large scanning range of up to 250 m, the sensors can detect contours or reflectors even in wide and open areas or long corridors.



**Rugged and reliable measurement data acquisition meets flexibility: The output logs of the NAV product family make it possible to utilize the raw data, reflector positions or also the current vehicle position.**



## Reliability and flexibility – the right characteristics for effectiveness and success have been combined in the NAV product family

The 2D LiDAR sensors in the NAV product family from SICK meet the current requirements on modern automated guided vehicles (AGVs): A reliable measurement technology that is fit for everyday use is the basis for success and profitability in many industrial applications.



### NAV2xx

Small and medium sized vehicles require sensors with a compact design that promise reliable and fault free operation. The sensors in the NAV2xx product family ensure both, and are therefore used for example to determine the position of tuggers in warehouses or also for cleaning robots.

Selection guide according to product characteristics:

- Output log for contour data and/or reflector data; mixed mode navigation possible
- SOPAS tool: Parameterization, visualization
- Ambient operating temperature:  $-30\text{ }^{\circ}\text{C}$ - $+50\text{ }^{\circ}\text{C}$
- Scanning frequency: 25 Hz
- Working range up to 50 m; to reflectors: 30 m; to targets with 10% remission: 18 m

For more information visit [www.sick.com/NAV2xx](http://www.sick.com/NAV2xx)



### NAV3xx

To localize larger and more complex vehicles, it is essential to have a large scanning range as well as a measuring angle over  $360^{\circ}$ . This provides ambient data with an all-round view within a radius of up to 500 m. Data in large assembly halls/terminals or in long corridors are reliably acquired. Contours and/or reflector positions are detected even over large distances.

Selection guide according to product characteristics:

- Output log for contour data, reflector positions and vehicle position
- SOPAS tool: Parameterization, visualization, layout determination, layout checking, position calculation
- Ambient operating temperature:  $0\text{ }^{\circ}\text{C}$ - $+50\text{ }^{\circ}\text{C}$
- Scanning frequency: 8 Hz
- Large working range up to 250 m; to reflectors: 70 m; to targets with 10% remission: 35 m

For more information visit [www.sick.com/NAV3xx](http://www.sick.com/NAV3xx)



**Reliable position determination thanks to a rugged measurement technology based on customizable data logs – the NAV product family from SICK.**



The NAV2xx variant devices offer established technologies for localizing small and medium autonomous industrial vehicles. The result is rugged and yet compact 2D LiDAR sensors that are unrivaled:



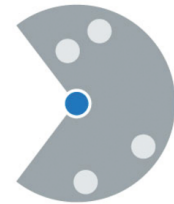
**Compact lightweight**

The NAV2xx, which only weighs 1.1 kg, is approximately half the weight of the NAV3xx. Its dimensions are significantly more compact than the sensors of the NAV3xx product family.



**Protection in harsh application areas**

The IP67 enclosure rating ensures the NAV2xx functions efficiently, even in harsh environments.



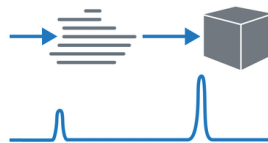
**Ideal solution for small and medium scanning ranges**

With a maximum scanning range of up to 50 m (up to 30 m to reflectors), the NAV2xx demonstrates its high performance in small and medium transport vehicles to the fullest.



**Integrated heating system for cold environments**

The NAV2xx can be used in refrigerated warehouses or in outdoor areas with its integrated heating system. Vehicles routes that pass through outdoor areas (e. g., trips from one building to another) therefore do not pose a problem anymore.



**2-echo technology**

High reliability even under poor ambient conditions thanks to the 2-echo technology and IP67 variants.



**Large working range**

up to 50 meters.



**The NAV product family provides a high level of application flexibility thanks to customizable algorithms right through to device variants that are also suitable for outdoor areas. NAV – the right choice!**



## Technical data overview

<b>Application</b>	Indoor / Outdoor / Indoor (depending on type)	
<b>Aperture angle</b>	Horizontal	270°
<b>Working range</b>	0.5 m ... 50 m, 30 m on reflectors (depending on type)	
<b>Scanning range</b>	At 10% remission factor	18 m
	At 90% remission factor	50 m
<b>Scanning frequency</b>	≥ 25 Hz	
<b>Ambient operating temperature</b>	-30 °C ... +50 °C	
<b>Ethernet</b>	✓	
<b>Serial</b>	✓	
<b>Weight</b>	1.1 kg	

## Product description

The NAV2xx 2D LiDAR sensors also work with precision and reliability in small and medium-sized vehicles. Thanks to its integrated heating, excellent vibration resistance, and enclosure rating up to IP 67, the NAV2xx even satisfies requirements for use outdoors or in cold storage. Priced to ensure outstanding value for money, the 2D LiDAR sensors support scanning ranges of up to 30 m on reflectors and up to 50 m on spatial contours. When combined with raw data collection, the technology even allows guided track-controlled vehicles to travel in areas where it is not possible to apply reflector marks (automated truck loading or block storage areas, for example). Integrated evaluation of measurement data reduces computing load in the vehicle computer – ensuring reliable position determination in real time.

## At a glance

- Integrated data evaluation for determining reflector positions
- Large working range on reflector (30 m), 10% remission (18 m), spatial contours (50 m)
- Large detection angle
- High scanning frequency with low angular resolution on reflectors
- High resistance to temperature thanks to integrated heating and IP 65 / IP 67

## Your benefits

- Reliable position determination and navigation even in highly demanding ambient condition, thanks to the enclosure rating up to IP 67, integrated heating, and vibration resistance
- Compact size – suitable even for use in small vehicles
- Precise, fast collection of spatial contour data and/or simultaneous determination of reflector data in real time
- Integrated evaluation of measured data reduces computing load in the vehicle computer
- Excellent flexibility, as guided-track control is possible even in areas without reflector marks

## Fields of application

- Small and medium-sized AGVs
- Shuttle vehicles and automated forklift trucks
- Goods transportation systems
- Cleaning robots
- Automatic truck loading

## Ordering information

Other models and accessories → [www.sick.com/NAV2xx](http://www.sick.com/NAV2xx)

- **Color:** Light blue (RAL 5012)
- **Scanning frequency:** ≥ 25 Hz

Working range	Enclosure rating	Connection type	Type	Part no.
0.5 m ... 50 m	IP65	2 x M12 male connector/female connector	NAV210-10100	1103318
0.5 m ... 50 m, 30 m on reflectors	IP65	2 x M12 male connector/female connector	NAV245-10100S01	1090559
	IP67	4 x M12 male connector/female connector	NAV245-10100	1074308

## 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:

Contacts and other locations –[www.sick.com](http://www.sick.com)