



## TiM series

EFFICIENT DETECTION – ABSOLUTELY ACCURATE AT MEASURING

2D LiDAR sensors

**SICK**  
Sensor Intelligence.

## SMALL HOUSING, HIGH PERFORMANCE – WITH SAFETY

Whether your application involves picking up the presence of an object in a specific area (detection) or determining its exact position (ranging), the 2D LiDAR sensors in the TiM series are a highly efficient solution for both tasks – and they are safety devices with performance level b in accordance with EN ISO 13849-1:2015.

Every 2D LiDAR sensor of the TiM series has its particular strengths in surface monitoring. But even the common basis of the sensors is impressive. All LiDAR sensors work with the HDDM technology developed by SICK, for example, enabling

them to deliver particularly stable measured values. Everything works highly efficiently too, because all LiDAR sensors can be integrated both into your stationary plant and your mobile vehicle quickly and easily.



### HDDM and HDDM+ technology

SICK's innovative HDDM technology produces very stable measurements: Multiple laser pulses are emitted in a swift chronological sequence and their reflections from the measuring object are calculated to produce a mean value. This approach ensures seamless scanning and reliable results, even in the presence of dirt, dust, moisture, and ambient light. Some variants of the TiM series are based on the advanced HDDM+ technology variant. Depending on the variant, these are characterized by certain advantages.

### The laser scanner principle

The 2D LiDAR sensors of the TiM series are based on the laser scanner principle and use time-of-flight measurement. Laser scanners scan their surroundings by emitting a laser pulse which they then direct in the required direction using a moving mirror. When the laser pulse hits an object in the scan range, it is reflected and sent back to the laser scanner's receiver. By calculating the time difference between sending and receiving and also the signal strength, the position of the object is detected with millimeter accuracy.



### Efficient detection with the TiM series

LiDAR sensors have one specific task in “detection” applications, namely to detect whether or not an object is located in a defined scanning field. Switching outputs deliver the result “object in field” or “object not in field” within fractions of a second. The LiDAR sensors can detect whether a bay in a high-bay warehouse is full or empty, for example → see page 4.

LiDAR sensors are often used in detection processes to prevent vehicle collisions. These non-contact sensors scan the environment and keep track of important objects at all times. If there is a risk of a collision, the scanners can be relied upon to output a warning via the switching outputs prior to an accident occurring.

### Field evaluation and measurement data output with TiM7xx – double benefits

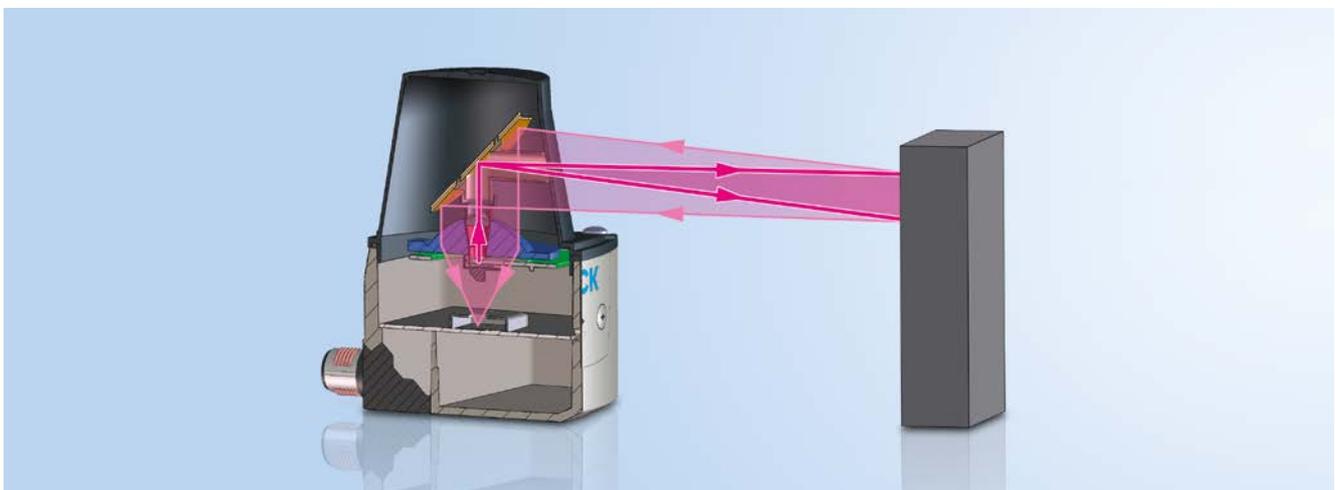
The sensors of the TiM7xx product family offer simultaneous field evaluation and measurement data output in one device, therefore completing the performance range of the TiM series. Localization tasks and collision avoidance can be implemented at the same in both stationary and mobile applications.

### Ranging with the TiM series – complete measurement accuracy

LiDAR sensors for ranging applications detect the exact position of an object in the scanning field and output this data and the object’s coordinates at the interface of the sensor in a digital, machine-readable format. This information includes distance data in the form of polar coordinates with distance and angle. Even the energy level of the reflected signal is fed back. The result is an accurate map of the scanned area. If objects or sensors are mobile, the data can even be analyzed in 3D, with directions of movement being mapped.

### Functionally secure – TiM361S and TiM7xxS

The safety-related variants TiM361S (field evaluation) and TiM7xxS (field evaluation and measurement data output) can be used for both stationary and mobile applications. Certification according to EN ISO 13849-1:2015 (category B and PL b) enables use for personal protection in presence and access monitoring in industrial environments as well as for mobile platforms or service robots taking into account EN ISO 13482:2014.



Principle of operation of a laser scanner with time-of-flight measurement.

## THE TiM SERIES: THREE LETTERS – FIVE PRODUCT FAMILIES – NUMEROUS POSSIBLE APPLICATIONS

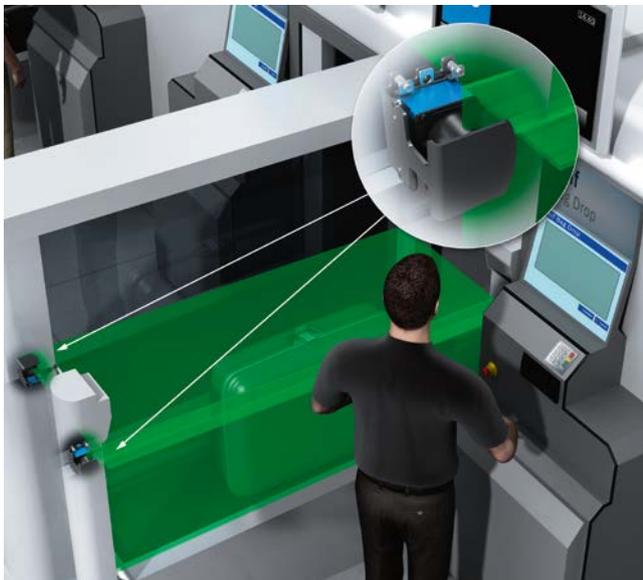
There are numerous tasks to be undertaken in the field of surface monitoring. Although all of the LiDAR sensors of the TiM series are able to rise to these challenges, each individual sensor plays its trump card in a different area.

### TiM1xx – the efficient detection solution

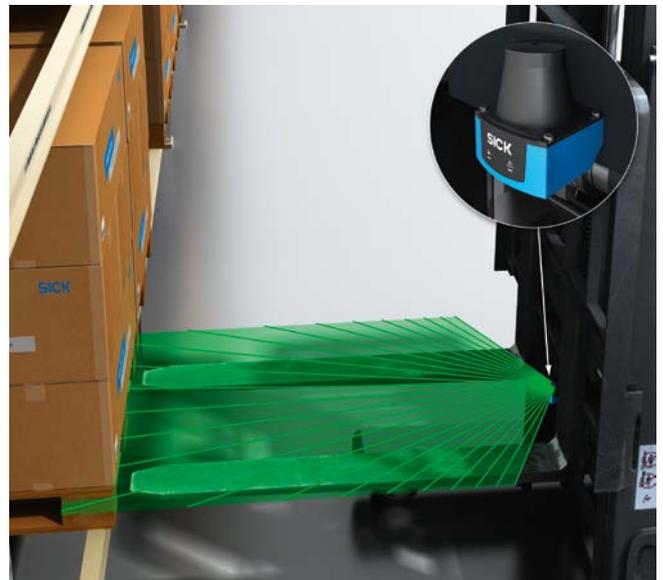
The TiM1xx is all about combining reliable object detection and collision avoidance with low running costs. Although its compact design allows it to be installed virtually unnoticed in plant systems, its field of view of 200° means that hardly anything passes by it unnoticed. And with the help of IO-Link, it is ideal for networking.



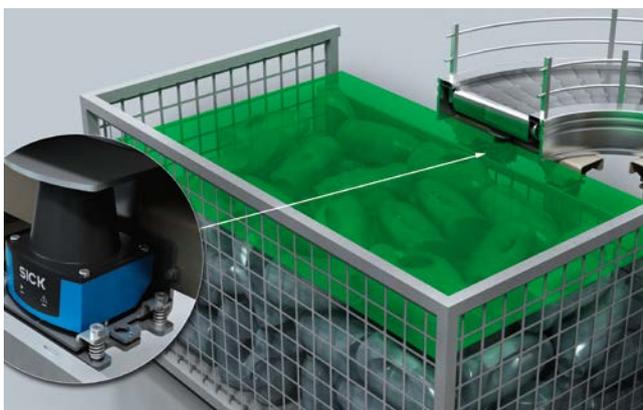
### Typical applications



Detection of oversized bags at a check-in terminal.



Detection of empty bays in a high-bay warehouse.



Protrusion monitoring and part counting at the material box.



Protection of valuable objects in a museum.

### Rotating male connectors on the outside, modern HDDM+ technology on the inside

The TiM1xx LiDAR sensor can offer flexibility and leeway in installation, because the rotating male connector on its housing enables it to be mounted and aligned in various positions according to the needs of the application. Its internal values are also impressive. Built-in HDDM+ technology means that the TiM1xx can work unaffected by ambient light and other sources of ambient interference with even more reliable measured values.

## TiM2xx – economical, compact 2D LiDAR sensor for industrial and virtual applications

The e-commerce industry is growing. And with it the demand for automation solutions so as to meet the growing requirements on logistics infrastructure and the transport of goods. The TiM2xx is equipped for this trend. It can be used to economically generate reference maps of the environment and localize mobile platforms at the same time. With its compact design and weight of just 150 g, it is optimally suited for use in small autonomous vehicles. The TiM2xx monitors indoor areas of up to 200 m<sup>2</sup> at 15 scans per minute and detects even the smallest changes there.

### New smart media as fields of application

In addition to industrial applications such as mobile automation, the TiM2xx also caters for new fields of applications. For example in the field of new smart, interactive media such as virtual nature walls or games. In these applications, the TiM2xx detects for example the location of a person's hand on an interactive surface or the location of their entire body. The sensor transfers the relevant measurement data in a signal which then triggers a response, e.g., the display of a new image or the opening of an information window.

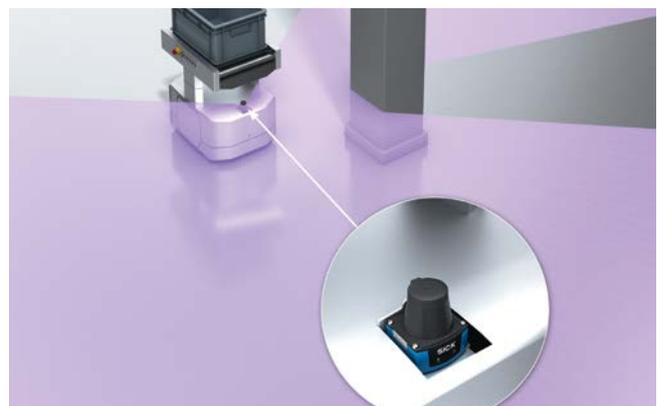
### Typical applications



Simultaneous localization and mapping (SLAM).



TiM2xx in use on a large touch display.



Anti-collision application in small autonomous vehicles.

## TiM3xx – the intelligent solution for collision avoidance and object detection

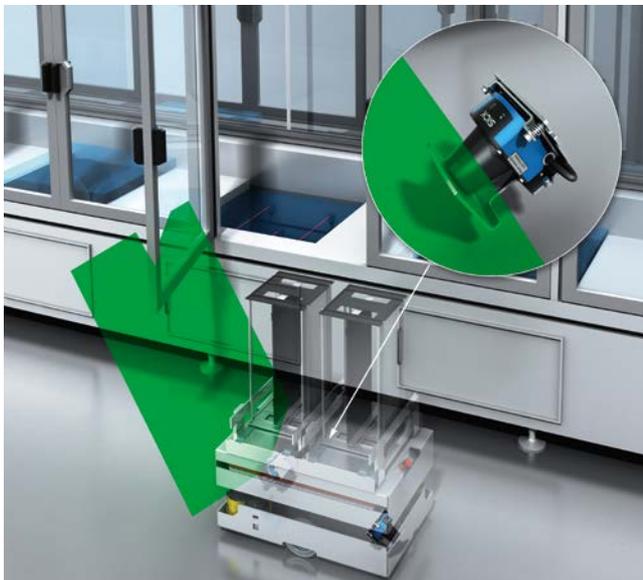
The TiM3xx is a highly intelligent device inside a compact housing. This combination makes it a flexible and user-friendly 2D LiDAR sensor for mobile and stationary applications. Thanks to the low power consumption, it is perfect for collision avoidance in automated guided vehicle systems (AGV systems) or presence monitoring in high-bay warehouses – and all that up to a scanning range of 10 m. As a safety component, the TiM361S can be used in accordance with EN ISO 13849-1:2015 (category B and PL b) in mobile and stationary personal protection applications up to a scanning range of 4 m.

### Multiple fields with a single touch of a button: “Touch and teach”

Depending on the variant, the TiM3xx gives you 16 pre-configured field sets, each containing three fields that can be selected and evaluated via input wiring. Rectangular, radial and free fields are available. The dimensions of the field shape are also very easy to adjust, as the “touch and teach” automated teach-in program can be started at the touch of a button without ever connecting to a computer. It takes less than two minutes to configure the TiM3xx and make it ready for operation. With the TiM361S, parameterization is done only via the USB interface.



### Typical applications



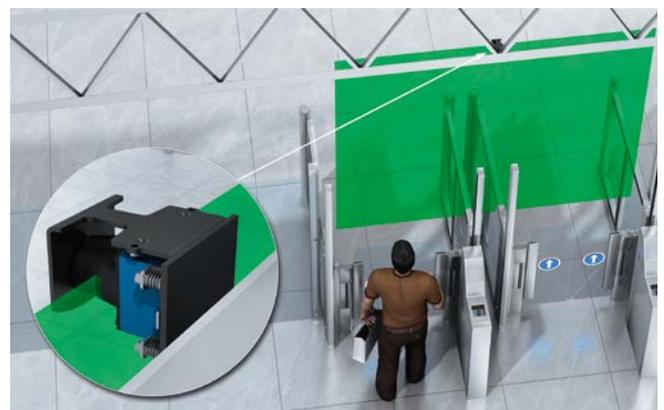
Preventing collisions between AGV systems and hanging objects.



Mobile service robots at the airport.



Two-dimensional collision avoidance for automatically guided vehicle systems.



Anti-climb monitoring at automated boarding gates.

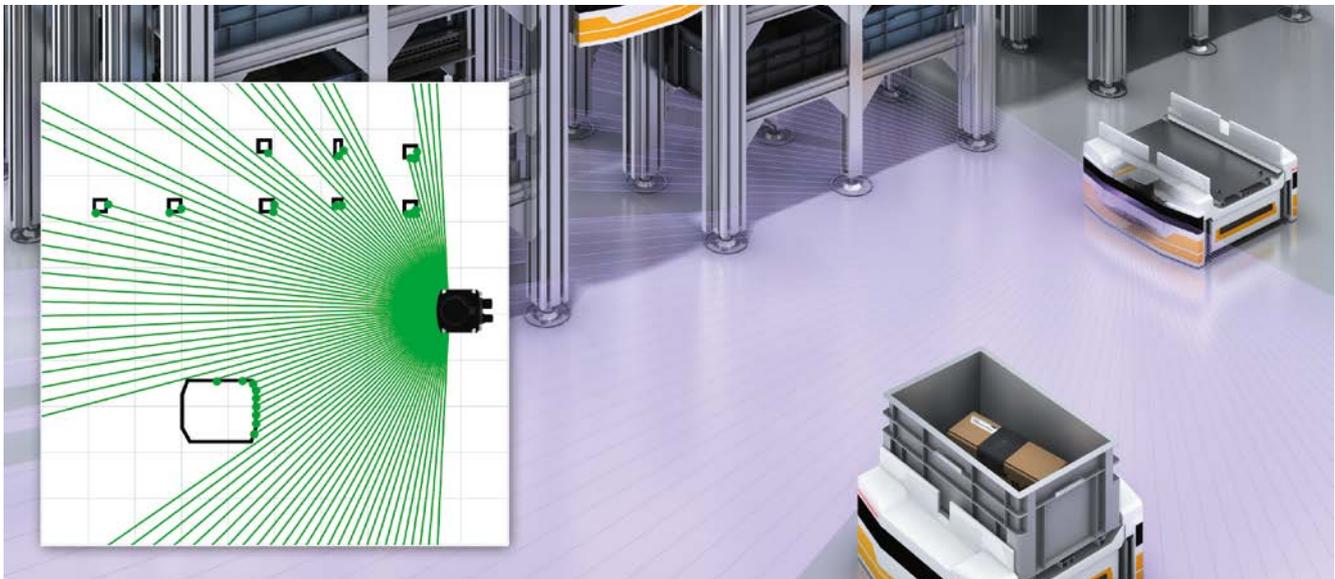
## TiM5xx – flexible with Ethernet interface

The TiM5xx is incredibly flexible. Meticulously measuring its surroundings with coverage of up to 25 meters and a 0.33° raster, it monitors and signals movements in the scanning field. With its compact size and industrial-strength design, the TiM5xx is ideal for use in small automated guided vehicles (AGVs) and mobile platforms. With a monitored area of 1,470 m<sup>2</sup>, it detects sufficient contour properties based on natural landmarks to localize automated vehicles.

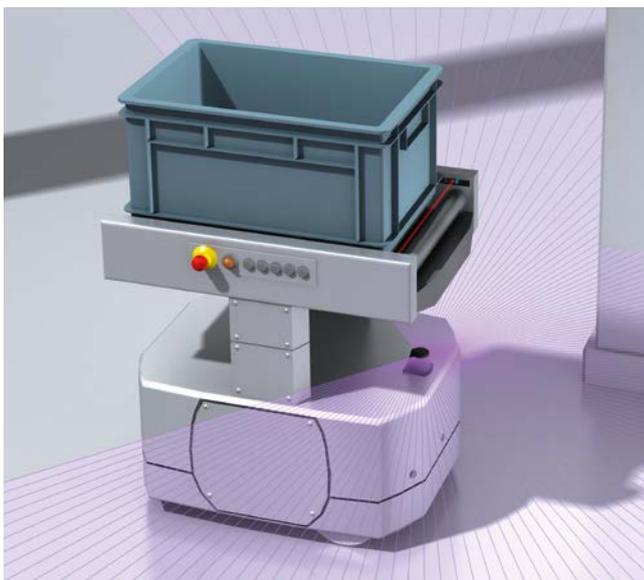
### Integrated Ethernet interface included

The TiM5xx outputs measurement data for each individual angle in the form of a machine-readable data string (ASCII or binary format). Everything – including object distance and signal strength – is relayed via a USB or Ethernet interface. The data can be visualized in SOPAS or imported into a customer-specific application. With its compact design, the TiM5xx is even suitable for narrow and angular installation conditions.

## Typical applications



Localization of automated guided vehicles.



Simultaneous localization and mapping for service robots.



Level and board detection.

## TiM7xx – two functions united in one device

The TiM7xx unites the two central functions of field evaluation and measurement data output of the TiM series in just one sensor. With a working range of 25 meters, the 2D LiDAR sensor monitors up to 48 freely-configurable fields – and outputs measurement data via Ethernet TCP/IP. The TiM7xx therefore allows for localization and collision avoidance at the same time.

### Play it safe

For the first time, the TiM7xxS is allowing for the simultaneous, safety-related evaluation of individual protective fields (collision avoidance) and safety-related measurement data (localization) in accordance with EN ISO 13849-1:2015 (category B and PL b) up to a scanning range of 5 m and a remission of 5 %.

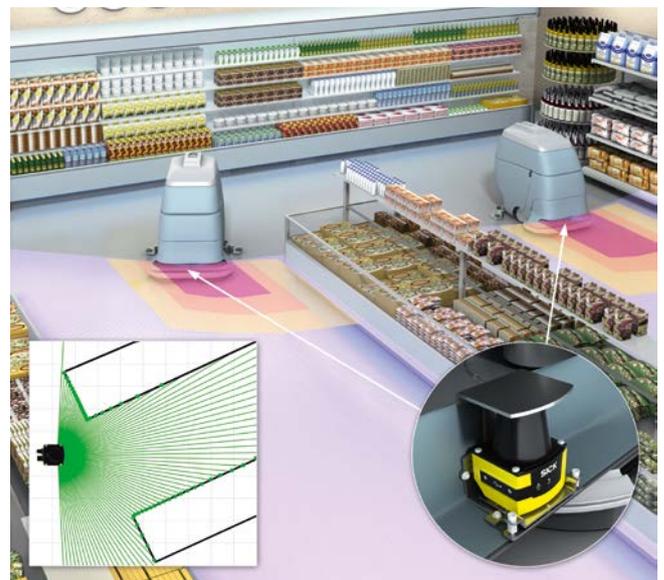
## Typical applications



Localization and collision avoidance in automated warehouses.



Collision avoidance and localization for small automated guided vehicles.



Collision avoidance and localization of mobile robots and platforms.



# PRODUCT FAMILY OVERVIEW

	 <p><b>TiM1xx</b></p>	 <p><b>TiM2xx</b></p>	
	Sensor for area monitoring: small, simple, cost-effective	Compact. Cost-effective. Reliable.	

Technical data overview			
Application	Indoor	Indoor	
Measurement principle	HDDM <sup>+</sup>	HDDM <sup>+</sup>	
Integrated application	Field evaluation	Output of measurement data	
Aperture angle	200°	240°	
Angular resolution	1°	1°	
Working range	0.05 m ... 10 m	0.05 m ... 10 m	
Scanning range at 10% remission	1.2 m ... 3 m, depending on the angle	0.05 m ... 3 m, depending on the angle	
Scanning frequency	14.5 Hz	14.5 Hz	
Ambient operating temperature	-10 °C ... +50 °C	-10 °C ... +50 °C	
IO-Link	✓	-	
Serial	-	-	
USB	-	-	
Ethernet	-	✓	
Digital inputs	1	0	
Digital outputs	2	1	
Weight	90 g / 122 g	150 g	

At a glance			
	<ul style="list-style-type: none"> <li>• Small, simple, and cost-effective sensor for area monitoring</li> <li>• Monitoring of an area of up to 200 m<sup>2</sup></li> <li>• Low weight of up to 122 g</li> <li>• Field evaluation using integrated software algorithms</li> <li>• Low power consumption of typically 2.7 W</li> <li>• Configuration and cloning using IO-Link</li> <li>• Industrial design</li> </ul>	<ul style="list-style-type: none"> <li>• Quick measurement data output via Ethernet interface</li> <li>• Working range up to 10 m with focused aperture angle</li> <li>• Distance measurement with fine angular resolution and HDDM<sup>+</sup> technology</li> <li>• Configuration via SOPAS ET and standard telegram</li> <li>• Compact, light plastic housing</li> <li>• Low power consumption (typ. 2.9 W)</li> </ul>	

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**TiM3xx**

The safe and reliable detection solution



**TiM5xx**

Complete measurement accuracy



**TiM7xx**

Simultaneous field evaluation and measurement data output in just one device

Indoor / Outdoor HDDM+ / HDDM Field evaluation, Field evaluation with flexible fields, Protective field evaluation with flexible fields	Indoor / Outdoor HDDM+ / HDDM Output of measurement data	Indoor / Outdoor HDDM+ / HDDM Field evaluation with flexible fields, output of measurement data, Protective field evaluation with flexible fields
270°	270°	270°
1° / 0.33°	1° / 0.33°	0.33°
0.05 m ... 10 m, > 50% remission	0.05 m ... 25 m	0.05 m ... 25 m
2 m / 8 m	2 m / 8 m	8 m
15 Hz	15 Hz	15 Hz
-25 °C ... +50 °C	-25 °C ... +50 °C	-25 °C ... +50 °C
-	-	-
-	✓	-
✓	✓	✓
✓	✓	✓
4	0	4
3	1	3
150 g / 250 g	150 g / 250 g	250 g

- Incredibly compact, light, and economical sensor
- Field evaluation using intelligent software algorithms
- Configuration interface accessible from the side  
When the device is mounted
- Low power consumption (typically 4 W)
- TiM3xxS only: Certified to Machinery Directive 2006/42/EG and DIN EN ISO 13849-1:2015

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- Monitoring area of up to 1,470 m<sup>2</sup> with just one sensor
- High ambient light tolerance due to HDDM technology
- Rugged housing with up to an IP 67 enclosure rating
- Low power consumption (typ. 4 W)
- Compact design with a housing height of just 86 mm maximum
- Integrated Ethernet interface
- Long sensing range of up to max. 25 m
- Industry-standard design and M12 male connector

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- Wide detection range: 0.05 m up to maximum 25 m
- Low power consumption (typically: 4 W)
- Immediate commissioning and configuration via USB and Ethernet
- Intelligent field evaluation and measurement data output in one device
- Rugged design suitable for industry thanks to enclosure rating up to IP67

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# SENSOR FOR AREA MONITORING: SMALL, SIMPLE, COST-EFFECTIVE



## Product description

TiM1xx is a small, simple, cost-effective laser scanner for a wide variety of area-monitoring applications. It is the starter model of the 2D LiDAR sensors from SICK and opens up new application possibilities with its compact design. TiM1xx is the ideal sensor for challenging presence-monitoring applications. HDDM+ technology ensures reliable object detection and offers maximum

machine availability even under difficult conditions. With the TiM1xx, detection fields of up to 15.7 m<sup>2</sup> are easy to configure via software. The integrated IO-Link interface makes sure that commissioning can be performed as quickly as possible and enables flexibility during application as well as simple parameter cloning.

## At a glance

- Small, simple, and cost-effective sensor for area monitoring
- Monitoring of an area of up to 200 m<sup>2</sup>
- Low weight of up to 122 g
- Field evaluation using integrated software algorithms
- Low power consumption of typically 2.7 W
- Configuration and cloning using IO-Link
- Industrial design

## Your benefits

- Low installation effort thanks to monitoring of a 200° field of view
- Low overall operating costs
- Low space requirements thanks to compact dimensions
- Rapid commissioning thanks to simple configuration of the detection zone with software
- Low installation costs and rapid replacement thanks to rotatable connector, IO-Link, and parameter cloning
- Particularly suitable for use in battery-operated vehicles thanks to low power consumption



## Additional information

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→ [www.sick.com/TiM1xx](http://www.sick.com/TiM1xx)

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

## Features

	TiM10x	TiM15x
Light source	Infrared (850 nm)	
Laser class	1 (IEC 60825-1:2014, EN 60825-1:2014)	
Aperture angle	200°	
Scanning frequency	14.5 Hz	
Working range	0.05 m ... 3 m	0.05 m ... 10 m
Scanning range at 10% remission	1.2 m ... 1.5 m, depending on the angle	2.8 m ... 3 m, depending on the angle

## Performance

	TiM10x	TiM15x
Response time	Typ. 70 ms	
Systematic error <sup>1)</sup>	± 50 mm	± 40 mm
Statistical error <sup>1)</sup>	20 mm	30 mm
Integrated application	Field evaluation	
Number of field sets	1 field set	
Simultaneous evaluation cases	1 (2 fields)	

<sup>1)</sup> Typical value; actual value depends on environmental conditions.

## Interfaces

IO-Link	✓
Function	AUX, parameterization
Digital inputs	1
Delay time	69 ms ... 30,015 ms (configurable)
Dwell time	69 ms ... 30,015 ms (configurable)
Optical indicators	2 LEDs (ON, switching status)

## Mechanics/electronics

	TiM10x	TiM15x
Supply voltage <sup>1)</sup>	9 V DC ... 28 V DC	10 V DC ... 28 V DC
Power consumption	Typ. 2.2 W	Typ. 2.7 W
Enclosure rating	IP65 (IEC 60529:1989+AMD1:1999+AMD2:2013)	
Protection class	III (IEC 61140:2016-1)	
Weight	90 g, without connecting cables	122 g, without connecting cables
Dimensions (L x W x H)	60 mm x 60 mm x 75.8 mm	

<sup>1)</sup> When using IO-Link output  $V_s > 18$  V.

## Ambient data

	TiM10x	TiM15x
Electromagnetic compatibility (EMC)	IEC 61000-6-3:2006+AMD1:2010 / IEC 61000-6-2:2005	
Vibration resistance		
Sine resonance scan <sup>1)</sup>	10 Hz ... 500 Hz	10 Hz ... 1,000 Hz
Sine test <sup>1)</sup>	10 Hz ... 500 Hz, 5 g, 10 frequency cycles	10 Hz ... 150 Hz, 1 g, 1 frequency cycles
Noise test <sup>2)</sup>	10 Hz ... 500 Hz, 5 g RMS, 2 h	10 Hz ... 200 Hz, 5 g RMS, 2 h

<sup>1)</sup> IEC 60068-2-6:2007.

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

<sup>3)</sup> EN 60068-2-30:2005.

	TiM10x	TiM15x
Ambient operating temperature	-10 °C ... +50 °C	
Storage temperature	-30 °C ... +70 °C	
Permissible relative humidity <sup>3)</sup>	≤ 95 %, Non-condensing	
Ambient light immunity	80,000 lx	30,000 lx

<sup>1)</sup> IEC 60068-2-6:2007.

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

<sup>3)</sup> EN 60068-2-30:2005.

### Ordering information

- **Application:** Indoor
- **Measurement principle:** HDDM<sup>+</sup>
- **Connection type:** 1 x 5-pin M12 male device connector (rotatable)
- **Digital outputs:** 2 (Push-pull)
- **Angular resolution:** 1°
- **Housing color:** Light blue (RAL 5012)

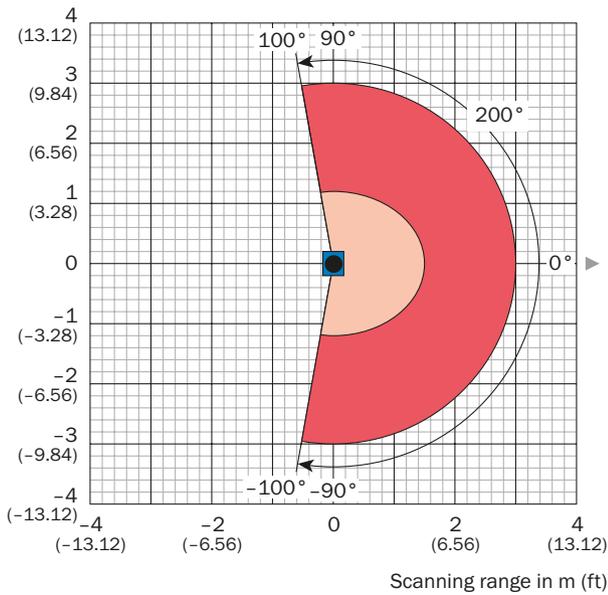
Sub product family	Type	Part no.
TiM10x	TiM100-3010200	1077524
TiM15x	TiM150-3010300	1093243



Working range diagram

TiM10x

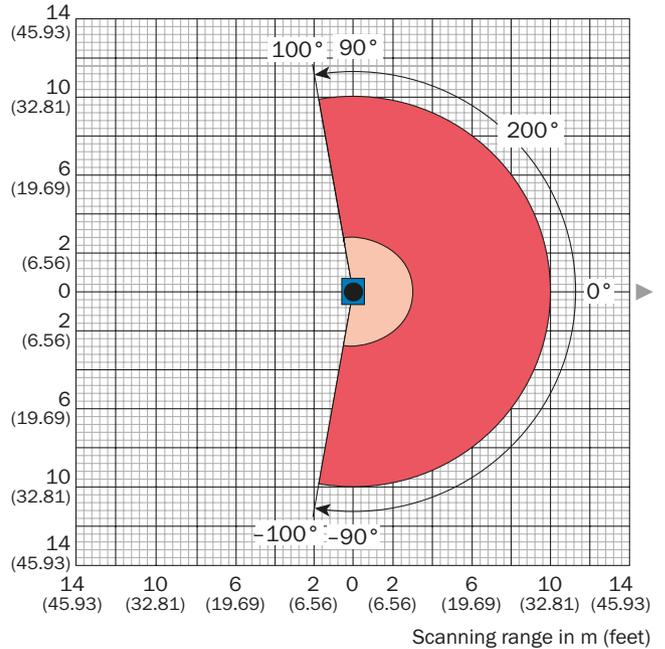
Scanning range in m (ft)



- Scanning range max. 3 m (9.84 ft)
- Scanning range 1.2 m to 1.5 m (3.94 ft to 4.92 ft) for objects with 10 % remission, dependent on the angle

TiM15x

Scanning range in m (feet)



- Scanning range max. 10 m (32.81 ft)
- Scanning range 2.8 m to 3 m (9.19 ft to 9.84 ft) for objects with 10 % remission, dependent on the angle

Recommended accessories

Mounting systems

Mounting brackets and plates

	Brief description	Part no.
	Mounting kit	2082188
	Q-lock mounting system	2083311

Connection systems

Modules and gateways

	Brief description	Type	Part no.
	IO-Link V1.1 Class A port, USB2.0 port, optional external power supply 24V / 1A	IOLA2US-01101 (SiLink2 Master)	1061790

Plug connectors and cables

	Signal type/ application	Connection type head A	Connection type head B	Cable	Length of cable	Part no.
	Sensor/actuator cable	Female connector, M12, 5-pin, straight, A-coded	Male connector, M12, 5-pin, straight, A-coded	5-wire, CE, UL	2 m	2096009
			Flying leads	5-wire, CE, UL	2 m	2095617

For more accessories, see → 48



## COMPACT. COST-EFFECTIVE. RELIABLE.



### Product description

The TiM2xx is a compact, cost-effective and reliable 2D LiDAR sensor for a range of applications. Its HDDM+ technology ensures reliable presence monitoring, localization and object detection along with maximum machine availability. The installed rotatable M12 male connector allows for flexibility when installing the sensor and makes it the most com-

compact of its kind. The TiM2xx offers a monitored area of up to 200 m<sup>2</sup>. The sensor transmits data in real time via its integrated Ethernet interface, thereby enabling simple sensor integration into any industrial control. The SOPAS engineering tool and standard telegram ensure simple configuration.

### At a glance

- Quick measurement data output via Ethernet interface
- Working range up to 10 m with focused aperture angle
- Distance measurement with fine angular resolution and HDDM+ technology
- Configuration via SOPAS ET and standard telegram
- Compact, light plastic housing
- Low power consumption (typ. 2.9 W)

### Your benefits

- Quick installation and commissioning
- Simultaneous localization and mapping (SLAM)
- Reliable object detection and maximum machine availability
- Easy and transmittable parameterization
- Small space requirements and easy machine integration thanks to the small dimensions and rotatable male connector
- Particularly well-suited for use in battery-operated vehicles



### Additional information

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→ [www.sick.com/TiM2xx](http://www.sick.com/TiM2xx)

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

## Features

Light source	Infrared (850 nm)
Laser class	1 (IEC 60825-1:2014, EN 60825-1:2014)
Aperture angle	240°
Scanning frequency	14.5 Hz
Working range	0.05 m ... 10 m
Scanning range at 10% remission	0.05 m ... 3 m, depending on the angle

## Performance

Response time	Typ. 70 ms
Systematic error <sup>1)</sup>	± 40 mm
Statistical error <sup>1)</sup>	30 mm
Integrated application	Output of measurement data

<sup>1)</sup> Typical value; actual value depends on environmental conditions.

## Interfaces

Ethernet	Function	✓, TCP/IP Parameterization
Digital inputs		0
Optical indicators		2 LEDs ("device ready")

## Mechanics/electronics

Supply voltage	10 V DC ... 28 V DC
Power consumption	Typ. 2.9 W
Enclosure rating	IP65 (IEC 60529:1989+AMD1:1999+AMD2:2013)
Protection class	III (IEC 61140:2016-1)
Weight	150 g, without connecting cables
Dimensions (L x W x H)	60 mm x 60 mm x 75.8 mm

## Ambient data

Electromagnetic compatibility (EMC)	IEC 61000-6-3:2006+AMD1:2010 / IEC 61000-6-2:2005
Vibration resistance	
Sine resonance scan <sup>1)</sup>	10 Hz ... 1,000 Hz
Sine test <sup>1)</sup>	10 Hz ... 150 Hz, 5 g, 20 frequency cycles
Noise test <sup>2)</sup>	10 Hz ... 1,000 Hz, 3.38 g RMS, 8 h
Shock resistance <sup>3)</sup>	10 g, 16 ms, ± 1,000 continuous shocks/axis 15 g, 11 ms, ± 3 single shocks/axis
Ambient operating temperature	-10 °C ... +50 °C
Storage temperature	-30 °C ... +70 °C
Ambient light immunity	30,000 lx

<sup>1)</sup> IEC 60068-2-6:2007.

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

<sup>3)</sup> IEC 60068-2-27:2008.

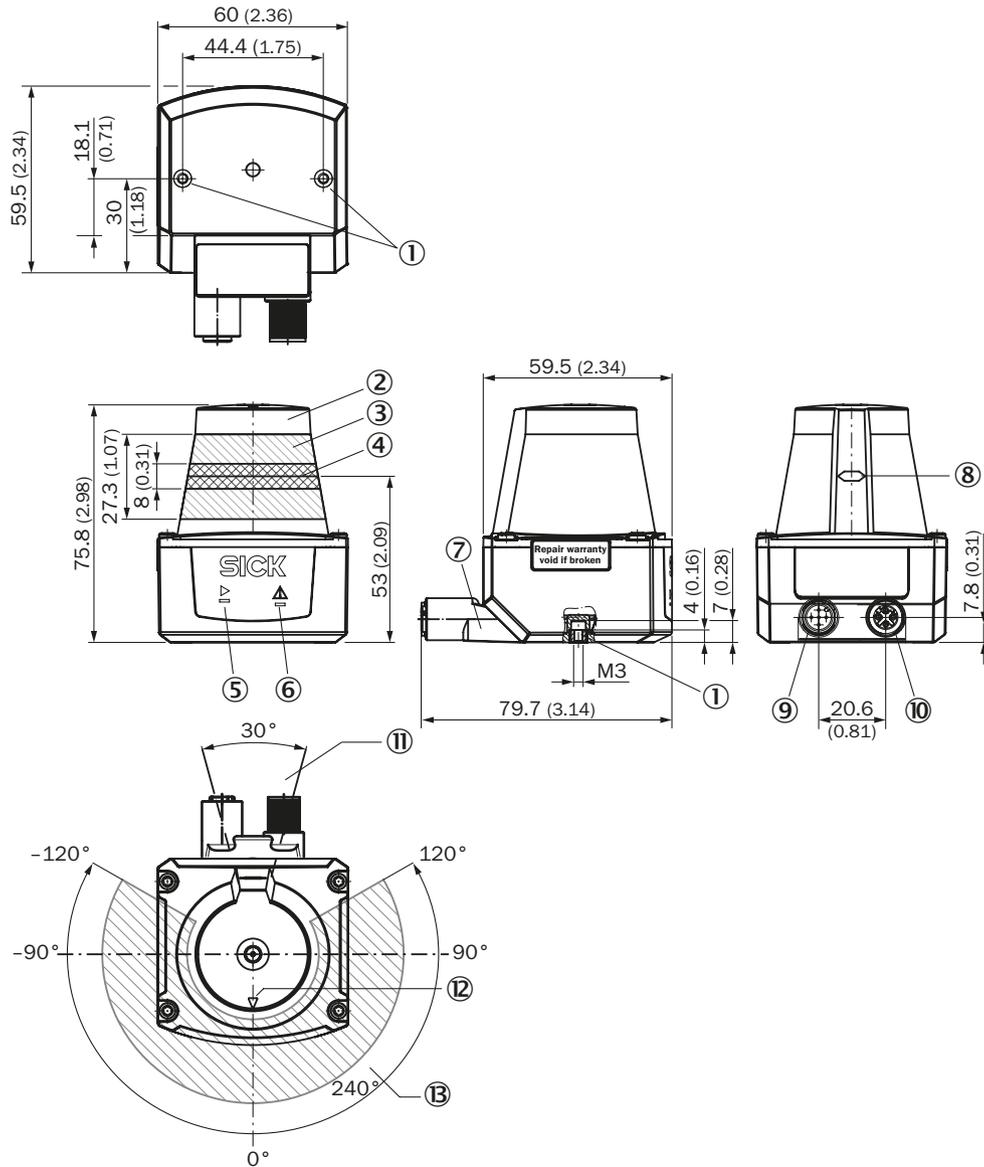
Ordering information

- **Application:** Indoor
- **Measurement principle:** HDDM+
- **Connection type:** 1 x “Ethernet” connection, 4-pin M12 female connector, 1 x connection “Power”, 12-pin, M12 male connector

Digital outputs	Angular resolution	Housing color	Type	Part no.
1 (Push-pull, “Device Ready”)	1°	Light blue (RAL 5012)	TiM240-2050300	1104981

**Dimensional drawing** (Dimensions in mm (inch))

TiM2xx



- ① M3 threaded mounting hole, 2.8 mm deep (blind hole thread), max. tightening torque 0.7 Nm
- ② Optical hood
- ③ Receiving range (light inlet)
- ④ Transmission range (light emission)
- ⑤ Green LED
- ⑥ Red LED
- ⑦ Swivel connector unit with electrical connections (9) and (10)
- ⑧ Marking for the position of the light emission level
- ⑨ Connection "Power/Synchronization output" 5-pin, M12 male connector
- ⑩ "Ethernet" connection, 4-pin M12 female connector
- Ⓐ Area in which no reflective surfaces are allowed for mounted devices
- Ⓑ Bearing marking to support alignment (0° axis)
- Ⓒ 240° aperture angle (visual range)

Recommended accessories

Mounting systems

Mounting brackets and plates

	Brief description	Part no.
	Mounting kit	2082188
	Q-lock mounting system	2083311

Connection systems

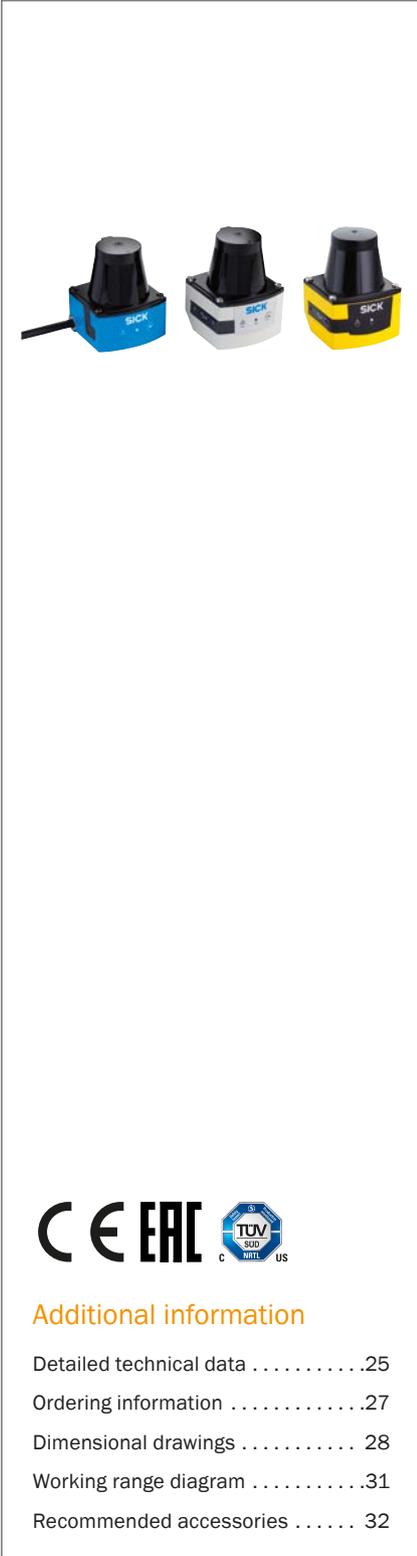
Plug connectors and cables

	Signal type/ application	Connection type head A	Connection type head B	Cable	Length of cable	Part no.
	Power	Female connector, M12, 5-pin, straight, A-coded	Flying leads	4-wire	5 m	6036159
	Ethernet	Male connector, M12, 4-pin, straight, D-coded	Male connector, RJ45, 8-pin, straight	4-wire, twisted pair, AWG26	5 m	6034415

For more accessories, see → 48



# THE SAFE AND RELIABLE DETECTION SOLUTION



## Product description

The TiM3xx 2D LIDAR sensor uses HDDM technology, which minimizes machine downtimes thanks to high measurement accuracy and ambient light immunity. Its monitoring field can reach up to 10 m. Commissioning is quick and easy thanks to 16 preconfigured field sets (each with 3 fields), which are selected via the input circuit. The TiM3xx is flexible, cost-effective, and user-friendly.

It is particularly suitable for mobile and stationary applications in factory automation and logistics automation. A version certified for safety-related applications according to EN ISO 13849-1:2015 is also available (TiM3xxS). Low power consumption and a compact and rugged design makes the TiM3xx ideal for use on mobile platforms.

## At a glance

- Incredibly compact, light, and economical sensor
- Field evaluation using intelligent software algorithms
- Configuration interface accessible from the side when the device is mounted
- Low power consumption (typically 4 W)
- TiM3xxS only: Certified to Machinery Directive 2006/42/EG and DIN EN ISO 13849-1:2015

## Your benefits

- Low operating costs
- Flexible installation due to compact dimensions
- Low implementation and replacement costs due to M12 x 12 or D-Sub male connector
- Long battery service life when used in battery-operated vehicles
- Easy commissioning thanks to pre-configured field sets
- Low costs as a result of monitoring large fields (up to 235 m<sup>2</sup>) with just one scanner
- No cabling required between sender and receiver
- For TiM3xxS only: Can be used in safety-related applications

→ [www.sick.com/TiM3xx](http://www.sick.com/TiM3xx)

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

## Features

	TiM31x	TiM32x	TiM35x	TiM36x	TiM361S
Light source	Infrared (850 nm)				
Laser class	1 (IEC 60825-1:2014, EN 60825-1:2014)				
Aperture angle	270°				
Scanning frequency	15 Hz				
Working range	0.05 m ... 4 m		0.05 m ... 10 m		0.05 m ... 10 m (> 50% remission)
Safety-related working range	-				0.05 m ... 4 m (At 5% remission)
Blind zone	-				0 m ... 0.05 m
Scanning range at 10% remission	2 m		8 m		

## Performance

	TiM31x	TiM32x	TiM35x	TiM36x	TiM361S
Response time	Typ. 67 ms		1 scan, typ. 67 ms 2 scans, ≤ 134 ms		
Systematic error <sup>1)</sup>	± 40 mm		± 60 mm		
Statistical error	< 30 mm <sup>1)</sup>		< 20 mm <sup>1)</sup>		< 20 mm <sup>1)</sup> < 10 mm <sup>2)</sup>
Integrated application	Field evaluation	Field evaluation with flexible fields			Protective field evaluation with flexible fields
Protective field tolerance	-				100 mm, 0.66° (DIN CLC/TS 62046:2009, 5% remission)
Number of field sets	16 field triples (48 fields, 1 triple (3 fields) can be configured directly at the scanner)	16 field triples (48 fields, 1 triple (3 flexible fields) can be configured directly at the scanner)	16 field triples (48 fields, contour as reference; 1 triple (3 flexible fields) can be configured directly at the scanner)		16 field triples (48 protective fields)
Simultaneous evaluation cases	1 (3 fields)		1 (3 fields) 2 (2 fields for detection and 1 field for contour as reference)		3 simultaneous protective fields (per field set)

<sup>1)</sup> Typical value at 90% remission up to the maximum sensing range; actual value depends on ambient conditions.

<sup>2)</sup> Typical value at 10% remission up to a sensing range of 6 m, actual value depends on ambient conditions.

## Interfaces

	TiM31x	TiM32x	TiM35x	TiM36x	TiM361S
USB	✓				
Remark	Micro USB				
Function	AUX, parameterization				
Ethernet	-		✓, TCP/IP		-
Function	-		AUX, parameterization		-
Digital inputs	4				4 (PNP, for field set switching)
Delay time	67 ms ... 30,000 ms (configurable)				
Dwell time	67 ms ... 600,052 ms (configurable)				
Optical indicators	2 LEDs (ON, switching status)				

## Mechanics/electronics

	TiM31x	TiM32x	TiM35x	TiM36x	TiM361S
<b>Supply voltage</b>	9 V DC ... 28 V DC				
<b>Power consumption</b>	Typ. 4 W, 16 W with 4 max. loaded digital outputs				
<b>Enclosure rating</b>	IP65 (IEC 60529:1989+AM-D1:1999+AMD2:2013)		IP67, applies only when the plastic cover of the "Aux interface" is closed (IEC 60529:1989+AM-D1:1999+AMD2:2013)		
<b>Protection class</b>	III (IEC 61140:2016-1)				
<b>Weight</b>	150 g, without connecting cables		250 g, without connecting cables		
<b>Dimensions (L x W x H)</b>	60 mm x 60 mm x 79 mm		60 mm x 60 mm x 86 mm		

## Ambient data

	TiM31x	TiM32x	TiM35x	TiM36x	TiM361S
<b>Electromagnetic compatibility (EMC)</b>					
Emitted radiation	Residential area (EN 61000-6-3:2007+AMD:A1:2011)				
Electromagnetic immunity	Industrial environment (EN 61000-6-2:2005)				
<b>Vibration resistance</b>					
Sine resonance scan <sup>1)</sup>	10 Hz ... 1,000 Hz				
Sine test <sup>1)</sup>	10 Hz ... 500 Hz, 5 g, 10 frequency cycles				
Noise test <sup>2)</sup>	10 Hz ... 250 Hz, 4.42 g RMS, 5 h				
<b>Shock resistance <sup>3)</sup></b>	50 g, 11 ms, ± 3 single shocks/axis 25 g, 6 ms, ± 1,000 continuous shocks/axis 50 g, 3 ms, ± 5,000 continuous shocks/axis				
<b>Ambient operating temperature <sup>4)</sup></b>	-10 °C ... +50 °C		-25 °C ... +50 °C		-10 °C ... +50 °C
<b>Storage temperature <sup>4)</sup></b>	-30 °C ... +70 °C		-40 °C ... +75 °C		
<b>Switch-on temperature</b>	-10 °C ... +50 °C				
<b>Temperature change <sup>5)</sup></b>	-10 °C ... +50 °C, 10 cycles		-25 °C ... +50 °C, 10 cycles		
<b>Damp heat <sup>6)</sup></b>	+25 °C ... +55 °C, 95 % rF, 6 cycles				
<b>Permissible relative humidity</b>					
Operation	< 80 %, Non-condensing (EN 60068-2-30:2005)				
Storage	≤ 90 % rF, Non-condensing (EN 60068-2-30:2005)				
<b>Ambient light immunity</b>	80,000 lx				80,000 lx 3,000 lx, in direct light

<sup>1)</sup> IEC 60068-2-6:2007.

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

<sup>3)</sup> IEC 60068-2-27:2008.

<sup>4)</sup> IEC 60068-2-14:2009.

<sup>5)</sup> EN 60068-2-14:2009.

<sup>6)</sup> EN 60068-2-30:2005.

## Ordering information

## Non safety-related sensor variants

Sub product family	Application	Measurement principle	Connection type	Digital outputs	Angular resolution	Housing color	Type	Part no.
TiM31x	Indoor	HDDM <sup>+</sup>	Open wires (2.0 m) <sup>1)</sup>	3 (NPN, additional 1 x "Device Ready")	1°	Light blue (RAL 5012)	TiM310-0130000S02	1069932
			1 x 15-pin D-sub HD male connector (0.9 m)	3 (PNP, additional 1 x "Device Ready")	1°	Light blue (RAL 5012)	TiM310-1030000	1052627
				3 (NPN, additional 1 x "Device Ready")	1°	Light blue (RAL 5012)	TiM310-1030000S02	1062221
				3 (PNP, additional 1 x "Device Ready")	1°	Light blue (RAL 5012)	TiM310-1130000	1056550
TiM32x	Indoor	HDDM <sup>+</sup>	Open wires (2.0 m) <sup>1)</sup>	3 (NPN, additional 1 x "Device Ready")	1°	Light blue (RAL 5012)	TiM320-0131000S02	1069933
			1 x 15-pin D-sub HD male connector (0.9 m)	3 (PNP, additional 1 x "Device Ready")	1°	Light blue (RAL 5012)	TiM320-1031000	1063467
				3 (PNP, additional 1 x "Device Ready")	1°	Light blue (RAL 5012)	TiM320-1131000	1062219
TiM35x	Outdoor	HDDM <sup>+</sup>	1 x "Ethernet" connection, 4-pin M12 female connector 1 x connection "Power", 12-pin, M12 male connector 1 x Micro USB female connector, type B	3 (NPN, additional 1 x "Device Ready")	1°	Gray (RAL 7032)	TiM351-2134001	1067299
				3 (PNP, additional 1 x "Device Ready")	1°	Gray (RAL 7032)	TiM351-2134001S02	1080181
TiM36x	Outdoor	HDDM <sup>+</sup>	1 x "Ethernet" connection, 4-pin M12 female connector 1 x connection "Power", 12-pin, M12 male connector 1 x Micro USB female connector, type B	3 (PNP, additional 1 x "Device Ready")	0.33°	Gray (RAL 7032)	TiM361-2134101	1071399
				3 (NPN, additional 1 x "Device Ready")	0.33°	Gray (RAL 7032)	TiM361-2134101S02	1080182

<sup>1)</sup> Delivery in part with male connector, but it can be disconnected (see "Technical information").

## Safety-related sensor variant TiM361S

- **Category:** B (EN ISO 13849-1:2015)
- **Performance level:** PL b (EN ISO 13849-1:2015)
- **Performance class SRS/SRSS:** B (IEC TS 62998-1:2019)
- **MTTF<sub>d</sub> (mean time to dangerous failure):** 100 years at 25 °C ambient temperature (EN ISO 13849-1:2015)
- **T<sub>m</sub> (mission time):** 20 years (EN ISO 13849-1:2015)

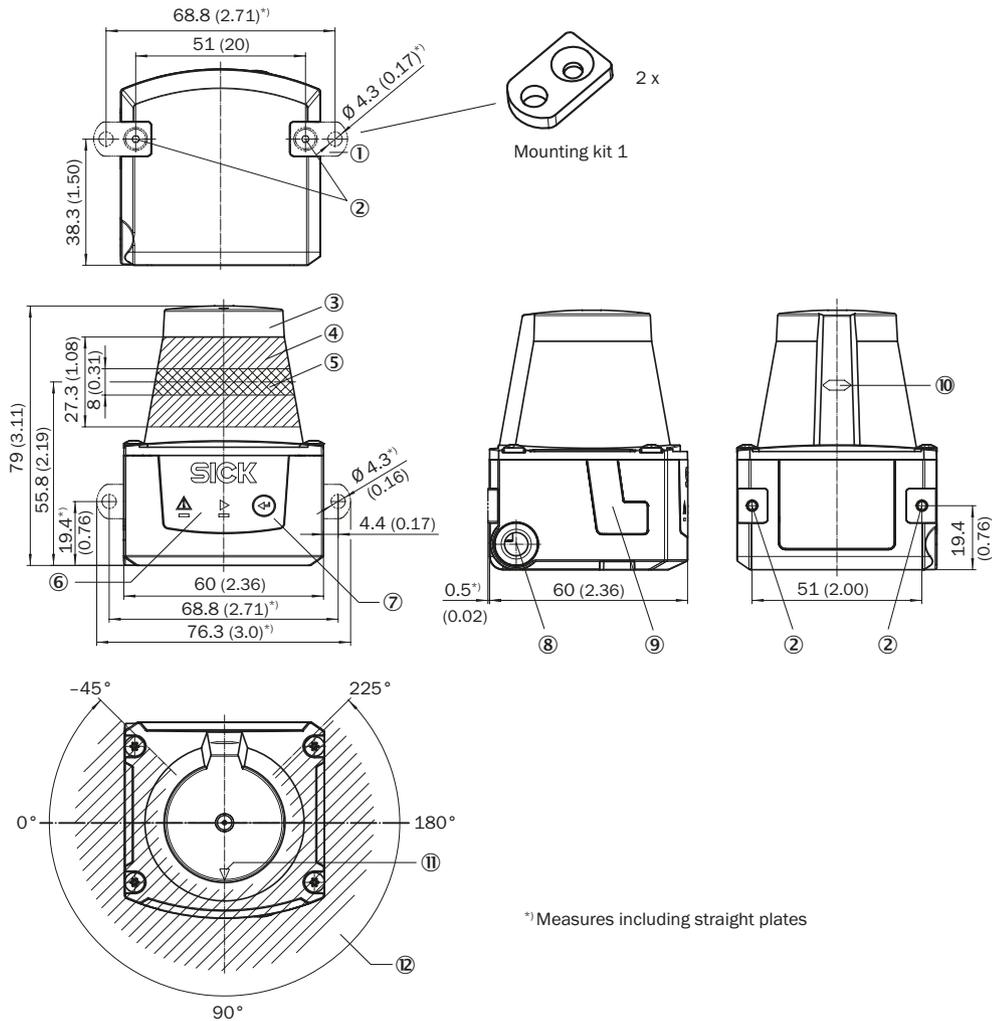
Sub product family	Application	Measurement principle	Connection type	Digital outputs	Angular resolution	Housing color	Type	Part no.
TiM361S	Indoor	HDDM	1 x "Ethernet" connection, 4-pin M12 female connector 1 x connection "Power", 12-pin, M12 male connector 1 x Micro USB female connector, type B	3 (PNP, to display a protective field violation, additional 1 x "Device Ready")	0.33°	Yellow	TiM361S-2134101	1090608

<sup>1)</sup> Delivery in part with male connector, but it can be disconnected (see "Technical information").

Dimensional drawings (Dimensions in mm (inch))

TiM31x

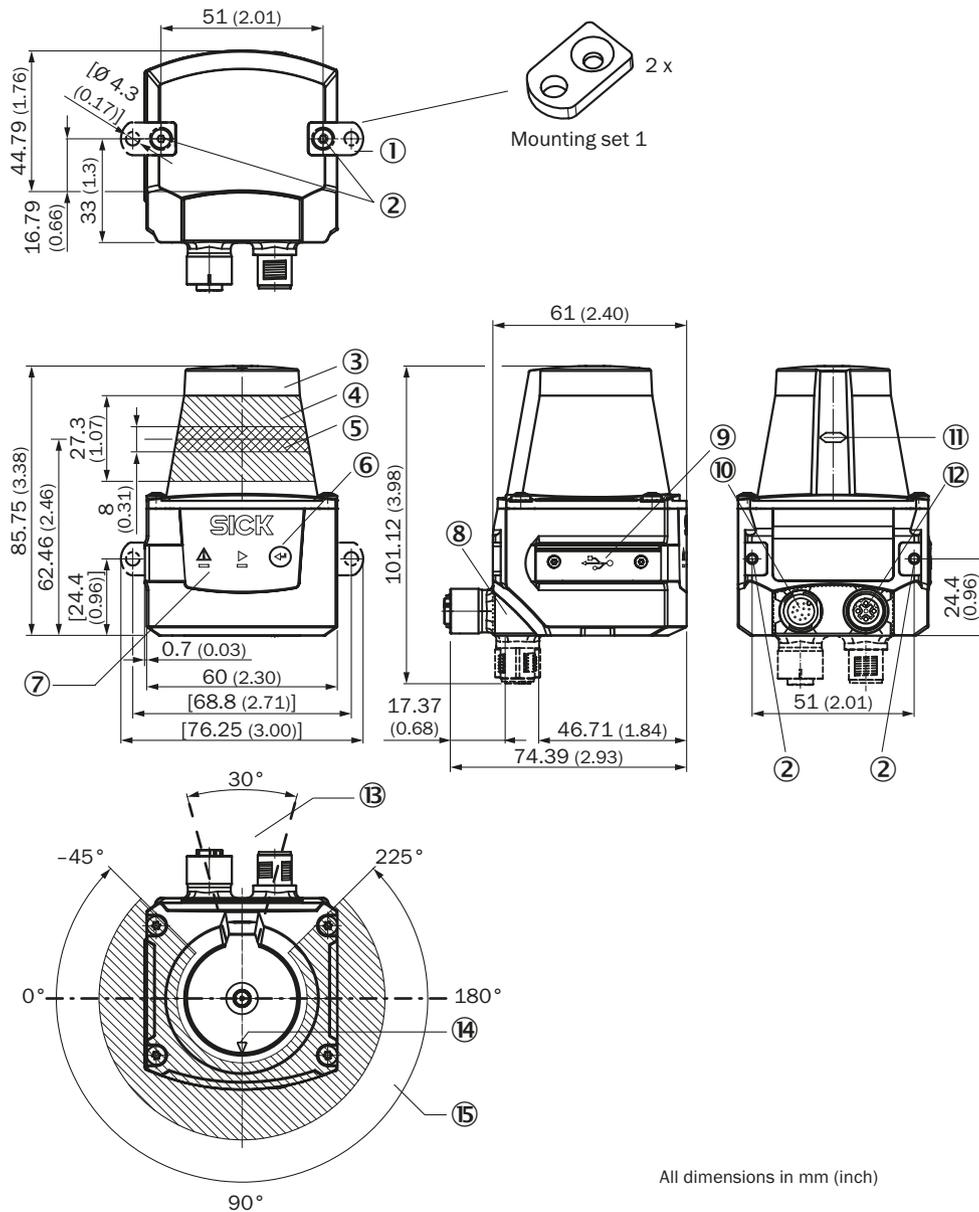
TiM32x



<sup>\*)</sup> Measures including straight plates

- ① 2 x straight plates with M3 x 4 mm screw (included in delivery)
- ② M3 threaded mounting hole, 2.8 mm deep (blind hole thread), max. tightening torque 0.8 Nm
- ③ Optical hood
- ④ Receiving range (light inlet)
- ⑤ Transmission range (light emission)
- ⑥ Red and green LED (status displays)
- ⑦ Function button for teach-in
- ⑧ Connecting cable outlet (connection for power/digital inputs/outputs)
- ⑨ Micro USB female connector, type B
- ⑩ Marking for the position of the light emission level
- ⑪ Bearing marking to support alignment (90° axis)
- ⑫ Aperture angle 270° (scanning angle)

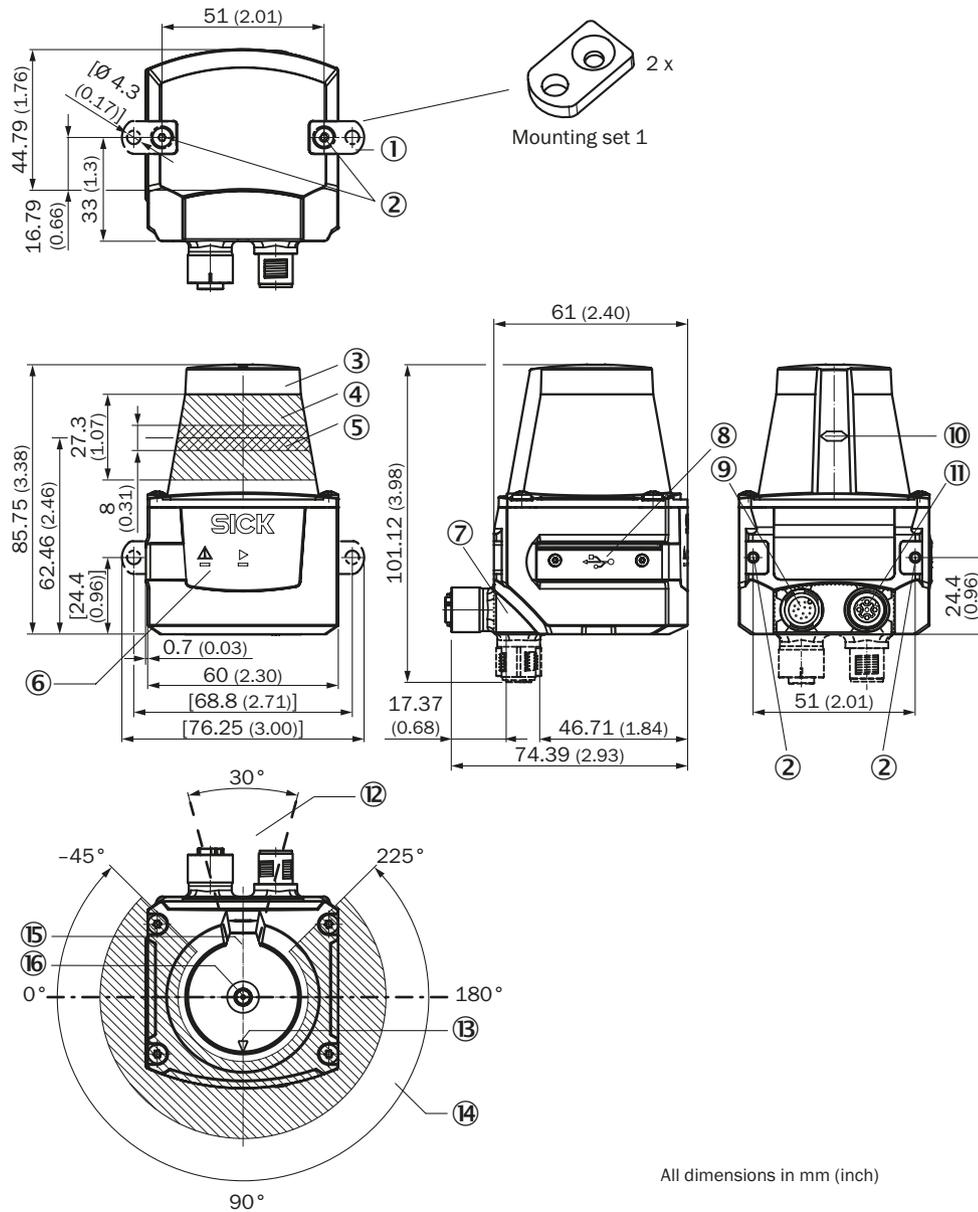
TiM35x  
TiM36x



All dimensions in mm (inch)

- ① 2 x straight plates with M3 x 4 mm screw (included in delivery)
- ② M3 threaded mounting hole, 2.8 mm deep (blind hole thread), max. tightening torque 0.8 Nm
- ③ Optical hood
- ④ Receiving range (light inlet)
- ⑤ Transmission range (light emission)
- ⑥ Function button for teach-in
- ⑦ Red and green LED (status displays)
- ⑧ Swivel connector unit
- ⑨ Micro USB female connector, type B
- ⑩ Connection "Power", 12-pin, M12 male connector
- ⑪ Marking for the position of the light emission level
- ⑫ "Ethernet" connection, 4-pin M12 female connector
- ⑬ Area in which no reflective surfaces are allowed for mounted devices
- ⑭ Bearing marking to support alignment (90° axis)
- ⑮ Aperture angle 270° (scanning angle)

TiM361S

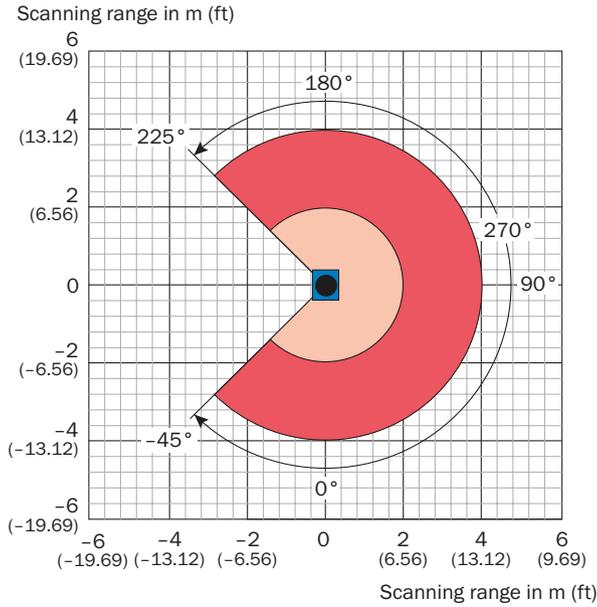


All dimensions in mm (inch)

- ① 2 x straight plates with M3 x 4 mm screw (included in delivery)
- ② M3 threaded mounting hole, 2.8 mm deep (blind hole thread), max. tightening torque 0.8 Nm
- ③ Optical hood
- ④ Receiving range (light inlet)
- ⑤ Transmission range (light emission)
- ⑥ Red and green LED (status displays)
- ⑦ Swivel connector unit
- ⑧ Micro USB port, behind the black rubber plate ("Aux interface" connection for configuration with PC)
- ⑨ "Power/inputs and outputs" connection, 12-pin M12 male connector
- ⑩ Marking for the position of the light emission level
- ⑪ 4-pin M12 female connector: not assigned
- ⑫ Area in which no reflective surfaces are allowed for mounted devices
- ⑬ Bearing marking to support alignment (90° axis)
- ⑭ Aperture angle 270° (scanning angle)
- ⑮ Internal reference target
- ⑯ Measurement origin

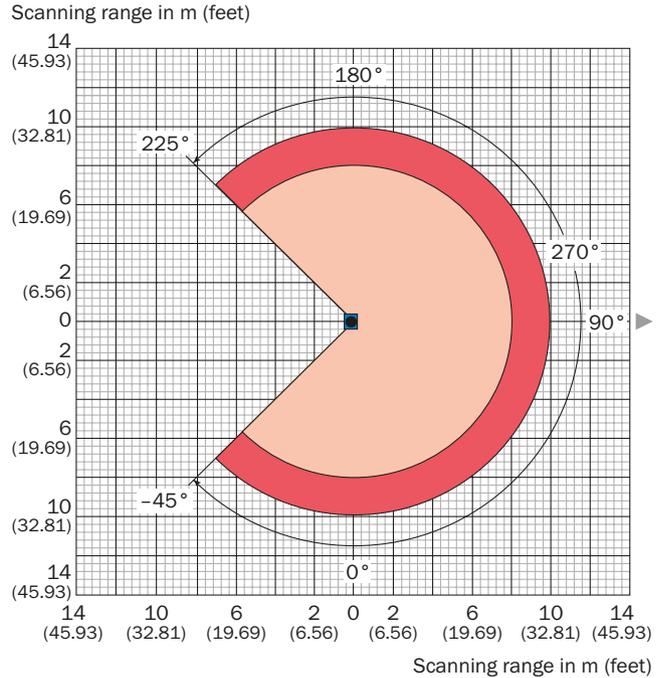
Working range diagram

TiM31x  
TiM32x



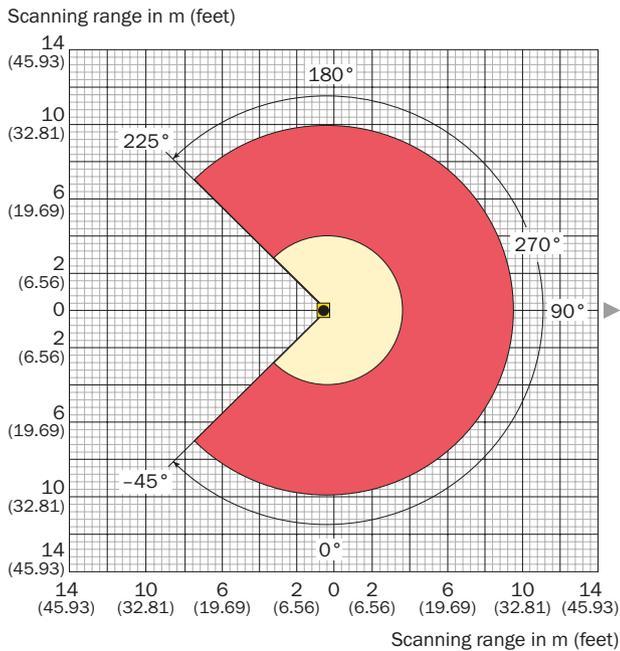
- Scanning range max. 4 m (13.12 feet)
- Scanning range typical 2 m (6.56 feet) for objects up to 10 % remission

TiM35x  
TiM36x



- Scanning range max. 10 m (32.81 feet)
- Scanning range typical 8 m (26.25 feet) for objects up to 10 % remission

TiM361S



- Range for **not safety-related** detection:  
0.05 m to max. 10 m (32.81 feet)
- Range for **safety-related** detection:  
0.05 m to max. 4 m (13.21 feet)

**Attention!** From the measurement origin up to a distance of 0.05 m (0.17 feet) no objects are detected (blind zone!) over the entire radial field of view (scanning range of 270°).

Recommended accessories

Mounting systems

Mounting brackets and plates

	Brief description	Part no.	TiM31x	TiM32x	TiM35x	TiM36x	TiM-S
	Mounting kit with shock absorber	2086074	●	●	●	●	●
	Mounting set, fender and alignment aid	2086761	-	-	●	●	●
	Mounting set 2, fender and alignment aid	2061776	●	●	-	-	-

Connection systems

Plug connectors and cables

	Signal type/ application	Connection type head A	Connection type head B	Cable	Length of cable	Part no.	TiM31x	TiM32x	TiM35x	TiM36x	TiM-S
	Power, serial, CANopen, digital I/Os	Female connector, D-Sub-HD, 15-pin, straight	Flying leads	Extension cable, 15-wire, AWG26	2 m	2043413	●	●	-	-	-
	Power, I/O	Female connector, M12, 12-pin, straight, A-coded	Flying leads	12-wire	5 m	6054974	●	●	●	●	●
	Ethernet	Male connector, M12, 4-pin, straight, D-coded	Male connector, RJ45, 8-pin, straight	4-wire, twisted pair, AWG26	5 m	6034415	-	-	●	●	-
				4-wire, Ecolab, AWG26	5 m	6050200	-	-	●	●	-
	USB 2.0	Male connector, USB-A	Male connector, Micro-B	-	2 m	6036106	●	●	●	●	●

4DproConnectivity

Modules

	Brief description	Type	Part no.	TiM31x	TiM32x	TiM35x	TiM36x	TiM-S
	Small connection module for one sensor, 4 cable glands (only for TiM3xx-10xxxxx)	CDB730-001	1055981	●	●	-	-	-

For more accessories, see → 48



## COMPLETE MEASUREMENT ACCURACY



### Product description

More than just object detection: The TiM5xx 2D LiDAR sensor is a non-contact ranging solution within the TiM series from SICK. Thanks to its HDDM technology, the TiM5xx is able to monitor large areas in indoor and outdoor applications – regardless of the surface or ambient light. Enclosed in a compact, rugged housing, the TiM5xx provides accurate measurement data from the scanned surface, making it possible to

determine additional information such as the size and shape of objects. The TiM5xx is flexible for use in a variety of industrial applications as well as in building automation. The integrated Ethernet interface makes for easy implementation and remote maintenance. The TiM5xx is an efficient solution for stationary use as well as for use on automated guided vehicles (AVG) and in other mobile applications.

### At a glance

- Monitoring area of up to 1,470 m<sup>2</sup> with just one sensor
- High ambient light tolerance due to HDDM technology
- Rugged housing with up to an IP 67 enclosure rating
- Low power consumption (typ. 4 W)
- Compact design with a housing height of just 86 mm maximum
- Integrated Ethernet interface
- Long sensing range of up to max. 25 m
- Industry-standard design and M12 male connector

### Your benefits

- Reliable object detection independent of the surface and ambient light
- IP 67 enclosure rating can be relied upon to withstand both indoor and outdoor conditions
- Easy integration into compact automated guided vehicles (AGV) due to small size
- Ethernet interface makes for easy implementation and remote maintenance
- Can determine additional information such as object size, shape, etc. through measurement data output
- Low implementation costs due to scalability: Sensor telegram is identical to sensor telegrams for 2D LiDAR sensors in the SICK portfolio



### Additional information

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→ [www.sick.com/TiM5xx](http://www.sick.com/TiM5xx)

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

## Features

	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x
Light source	Infrared (850 nm)				
Laser class	1 (IEC 60825-1:2014, EN 60825-1:2014)				
Aperture angle	270°				
Scanning frequency	15 Hz				
Working range	0.05 m ... 4 m	0.05 m ... 10 m		0.05 m ... 25 m	
Scanning range at 10% remission	2 m	8 m			

## Performance

	TiM51x	TiM55x	TiM56x	TiM57x	TiM57x	TiM58x
Response time	Typ. 67 ms					
Systematic error <sup>1)</sup>	± 40 mm	± 60 mm				
Statistical error	< 30 mm <sup>1)</sup>	< 20 mm <sup>1)</sup>	< 20 mm <sup>1)</sup>		< 20 mm <sup>1)</sup>	
			< 10 mm <sup>2)</sup> , depending on type <sup>3)</sup>			
Integrated application	Output of measurement data					

<sup>1)</sup> Typical value at 90% remission up to the maximum sensing range; actual value depends on ambient conditions.

<sup>2)</sup> Typical value at 10% remission up to a sensing range of 6 m, actual value depends on ambient conditions.

<sup>3)</sup> HDDM variants only.

## Interfaces

	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	
Serial	Function	✓, RS-232	-			
	Host	Host	-			
	Data transmission rate	460.8 kBaud	-			
USB	Remark	✓	Micro USB			
	Function	AUX, parameterization				
Ethernet	-	✓, TCP/IP				
Digital inputs	0					
Optical indicators	2 LEDs (ON, switching status)	2 LEDs (ON, "device ready")				

## Mechanics/electronics

	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x
Supply voltage	9 V DC ... 28 V DC				
Power consumption	Typ. 4 W				
Enclosure rating	IP65 (IEC 60529:1989+AM D1:1999 +AMD2:2013)	IP67, applies only when the plastic cover of the "Aux interface" is closed (IEC 60529:1989+AMD1:1999+AMD2:2013)			
Protection class	III (IEC 61140:2016-1)				
Weight	150 g, without connecting cables	250 g, without connecting cables			
Dimensions (L x W x H)	60 mm x 60 mm x 79 mm	60 mm x 60 mm x 86 mm			

Ambient data

	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x
<b>Electromagnetic compatibility (EMC)</b>					
Emitted radiation	Residential area (EN 61000-6-3:2007+AMD:A1:2011)				
Electromagnetic immunity	Industrial environment (EN 61000-6-2:2005)				
<b>Vibration resistance</b>					
Sine resonance scan <sup>1)</sup>	10 Hz ... 1,000 Hz				
Sine test <sup>1)</sup>	10 Hz ... 500 Hz, 5 g, 10 frequency cycles				
Noise test <sup>2)</sup>	10 Hz ... 250 Hz, 4.42 g RMS, 5 h				
<b>Shock resistance <sup>3)</sup></b>	50 g, 11 ms, ± 3 single shocks/axis 25 g, 6 ms, ± 1,000 continuous shocks/axis 50 g, 3 ms, ± 5,000 continuous shocks/axis				
<b>Ambient operating temperature <sup>4)</sup></b>	-10 °C ... +50 °C		-25 °C ... +50 °C		
<b>Storage temperature <sup>4)</sup></b>	-30 °C ... +70 °C		-40 °C ... +75 °C		
<b>Temperature change <sup>5)</sup></b>	-25 °C ... +50 °C, 10 cycles				
<b>Damp heat <sup>6)</sup></b>	+25 °C ... +55 °C, 95 % rF, 6 cycles				
<b>Permissible relative humidity <sup>6)</sup></b>	≤ 95 %, Non-condensing				
<b>Ambient light immunity</b>	80,000 lx				

<sup>1)</sup> IEC 60068-2-6:2007.

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

<sup>3)</sup> IEC 60068-2-27:2008.

<sup>4)</sup> IEC 60068-2-14:2009.

<sup>5)</sup> EN 60068-2-14:2009.

<sup>6)</sup> EN 60068-2-30:2005.

Ordering information

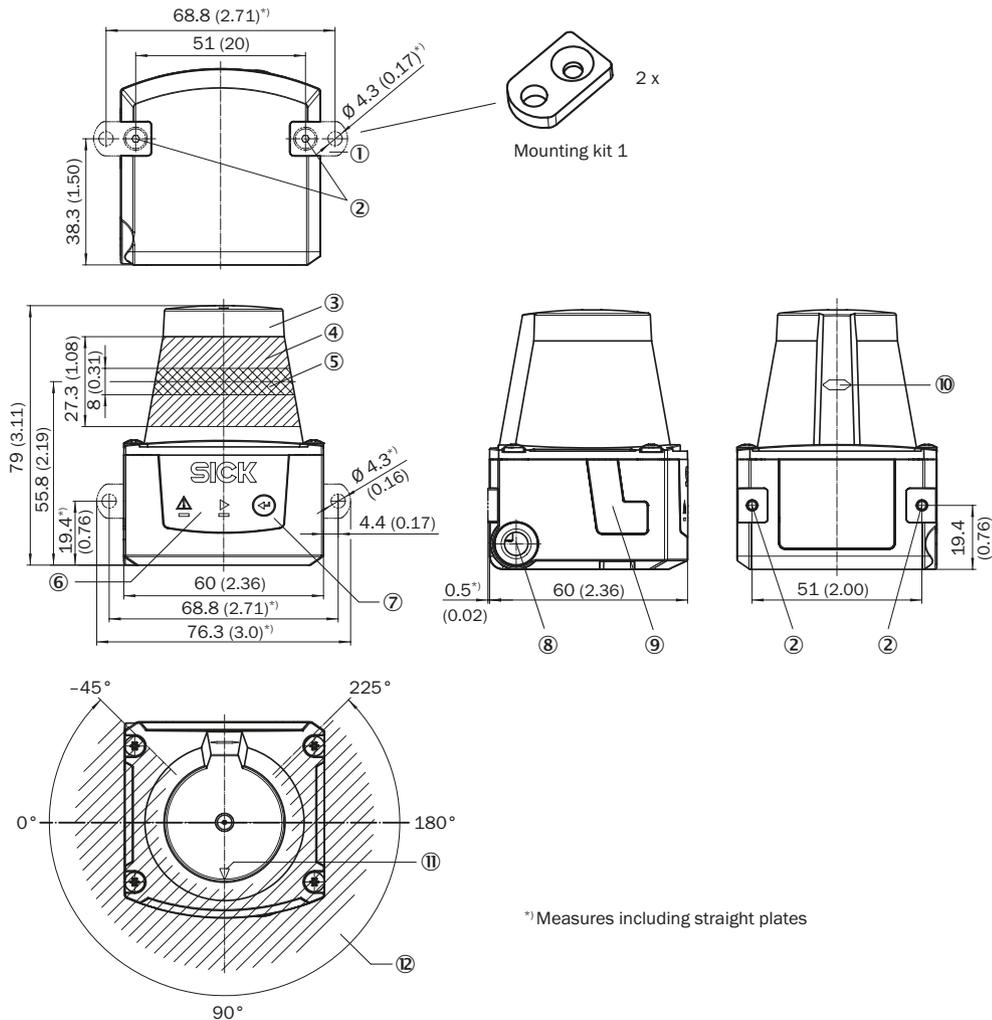
- **Digital outputs:** 1 (PNP, "SYNC"/"device ready")

Sub product family	Application	Measurement principle	Connection type	Angular resolution	Housing color	Type	Part no.
TiM51x	Indoor	HDDM*	1 x cable with 12-pin M12 male connector (0,3 m) 1 x Micro USB female connector, type B	1°	Light blue (RAL 5012)	TiM510-9950000S01	1062210
TiM55x	Outdoor	HDDM*	1 x "Ethernet" connection, 4-pin M12 female connector 1 x connection "Power/Synchronization output" 5-pin, M12 male connector 1 x Micro USB female connector, type B	1°	Gray (RAL 7032)	TiM551-2050001	1060445
TiM56x	Outdoor	HDDM*	1 x "Ethernet" connection, 4-pin M12 female connector 1 x connection "Power/Synchronization output" 5-pin, M12 male connector 1 x Micro USB female connector, type B	0.33°	Gray (RAL 7032)	TiM561-2050101	1071419
		HDDM	1 x "Ethernet" connection, 4-pin M12 female connector 1 x connection "Power/Synchronization output" 5-pin, M12 male connector 1 x Micro USB female connector, type B	0.33°	Gray (RAL 7032)	TiM561-2050101S80	1106065

Sub product family	Application	Measurement principle	Connection type	Angular resolution	Housing color	Type	Part no.
TiM57x	Outdoor	HDDM	1 x "Ethernet" connection, 4-pin M12 female connector 1 x connection "Power/Synchronization output" 5-pin, M12 male connector 1 x Micro USB female connector, type B	0.33°	Gray (RAL 7032)	TiM571-2050101	1075091
			1 x "Ethernet" connection, cable, with RJ45 male connector (1 m) 1 x "Power/Synchronization output" connection, 5-wire cable with open end (1 m) 1 x Micro USB female connector, type B	0.33°	Gray (RAL 7032)	TiM571-9950101S01	1079742
TiM58x	Outdoor	HDDM+	1 x "Ethernet" connection, 4-pin M12 female connector 1 x connection "Power/Synchronization output" 5-pin, M12 male connector 1 x Micro USB female connector, type B	0.33°	Gray (RAL 7032)	TiM581-2050101	1099504

Dimensional drawings (Dimensions in mm (inch))

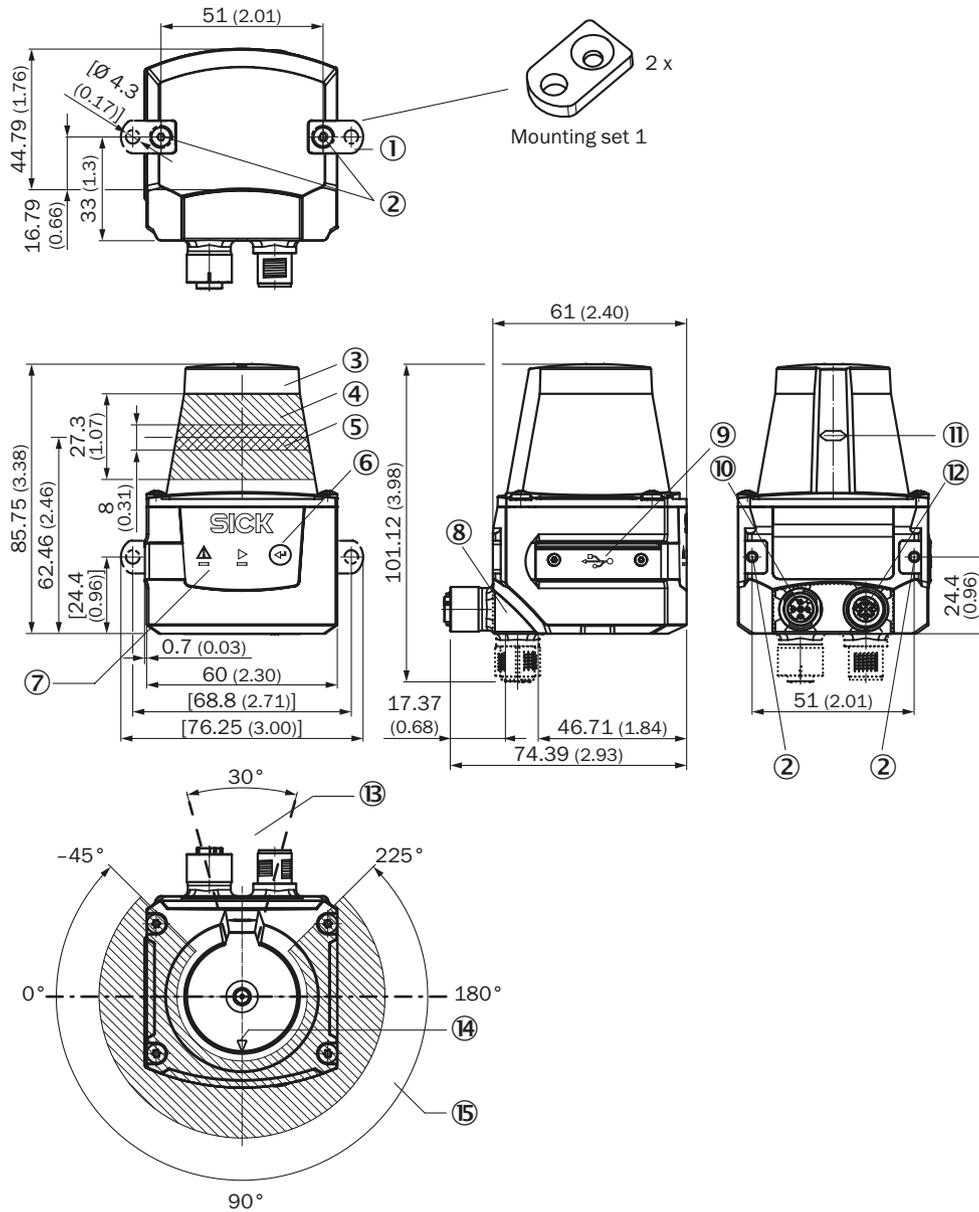
TiM51x



<sup>\*)</sup>Measures including straight plates

- ① 2 x straight plates with M3 x 4 mm screw (included in delivery)
- ② M3 threaded mounting hole, 2.8 mm deep (blind hole thread), max. tightening torque 0.8 Nm
- ③ Optical hood
- ④ Receiving range (light inlet)
- ⑤ Transmission range (light emission)
- ⑥ Red and green LED (status displays)
- ⑦ Function button for teach-in
- ⑧ Connecting cable outlet (connection for power/digital inputs/outputs)
- ⑨ Micro USB female connector, type B
- ⑩ Marking for the position of the light emission level
- ⑪ Bearing marking to support alignment (90° axis)
- ⑫ Aperture angle 270° (scanning angle)

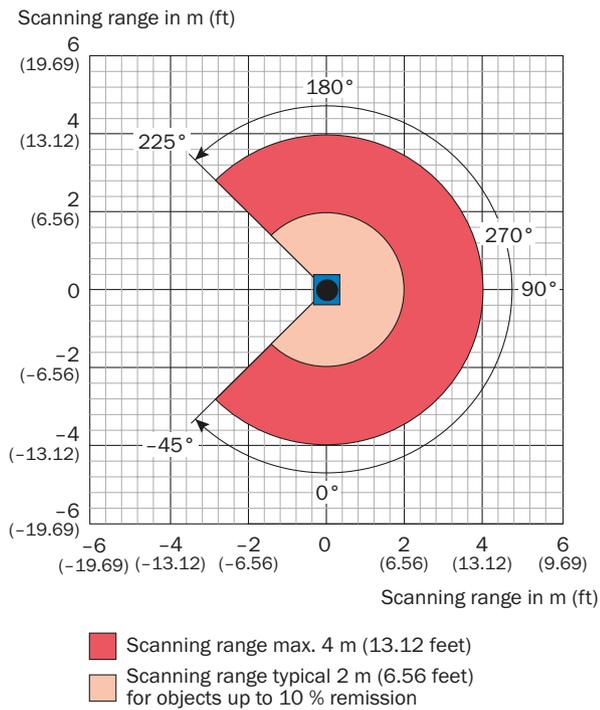
TiM55x  
TiM56x  
TiM57x  
TiM58x



- ① 2 x straight plates with M3 x 4 mm screw (included in delivery)
- ② M3 threaded mounting hole, 2.8 mm deep (blind hole thread), max. tightening torque 0.8 Nm
- ③ Optical hood
- ④ Receiving range (light inlet)
- ⑤ Transmission range (light emission)
- ⑥ Push-button (no function)
- ⑦ Red and green LED (status displays)
- ⑧ Swivel connector unit
- ⑨ Micro USB female connector, type B
- ⑩ Connection "Power/Synchronization output" 5-pin, M12 male connector
- ⑪ Marking for the position of the light emission level
- ⑫ "Ethernet" connection, 4-pin M12 female connector
- ⓑ Area in which no reflective surfaces are allowed for mounted devices
- Ⓕ Bearing marking to support alignment (90° axis)
- ⓐ Aperture angle 270° (scanning angle)

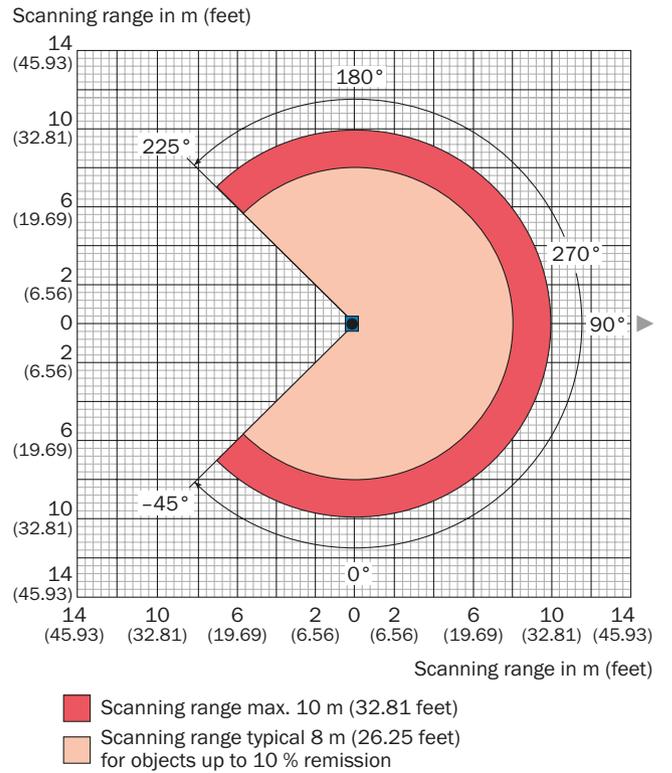
Working range diagram

TiM51x



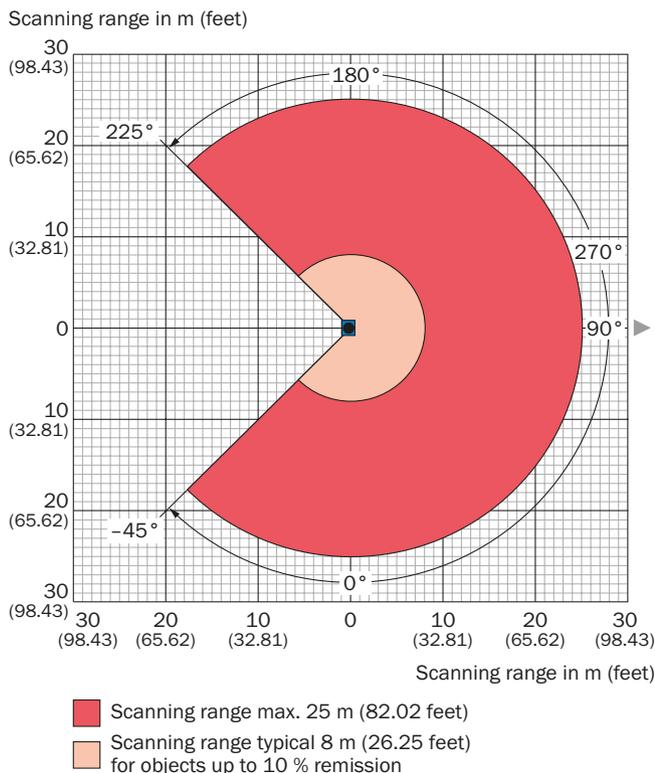
TiM55x

TiM56x



TiM57x

TiM58x



## Recommended accessories

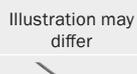
### Mounting systems

#### Mounting brackets and plates

	Brief description	Part no.	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x
	Mounting kit with shock absorber	2086074	●	●	●	●	●
	Mounting kit, fender and alignment aid	2086761	-	●	●	●	●
	Mounting set 2, fender and alignment aid	2061776	●	-	-	-	-

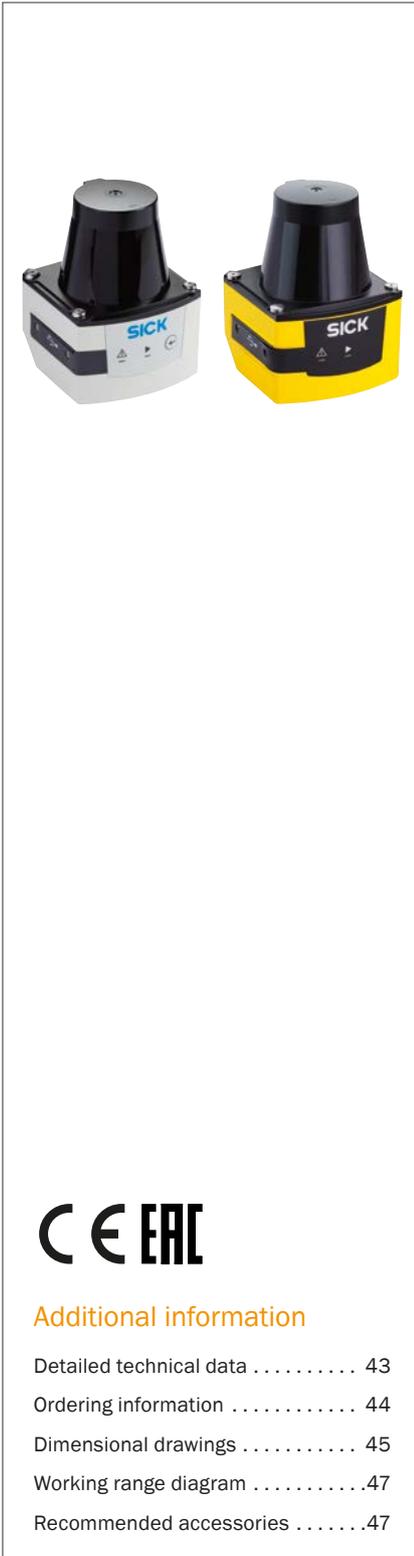
### Connection systems

#### Plug connectors and cables

	Signal type/ application	Connection type head A	Connection type head B	Cable	Length of cable	Part no.	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x
	Power, I/O	Female connector, M12, 12-pin, straight, A-coded	Flying leads	12-wire, twisted pair	5 m	6042735	●	-	-	-	-
				12-wire	5 m	6054974	●	-	-	-	-
	Power	Female connector, M12, 5-pin, straight, A-coded	Flying leads	4-wire	5 m	6036159	-	●	●	●	●
	Ethernet	Male connector, M12, 4-pin, straight, D-coded	Male connector, RJ45, 8-pin, straight	4-wire, twisted pair, AWG26	5 m	6034415	-	●	●	●	●
				4-wire, Ecolab, AWG26	5 m	6050200	-	●	●	●	●
	USB 2.0	Male connector, USB-A	Male connector, Micro-B	-	2 m	6036106	●	●	●	●	●

For more accessories, see → 48

# SIMULTANEOUS FIELD EVALUATION AND MEASUREMENT DATA OUTPUT IN JUST ONE DEVICE



### Additional information

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 Ordering information . . . . . 44  
 Dimensional drawings . . . . . 45  
 Working range diagram . . . . .47  
 Recommended accessories . . . . .47

### Product description

SICK is adding the TiM7xx to the TiM series for a seamless and scalable 2D-LiDAR sensor portfolio. This sensor combines intelligent field evaluation and measurement data output in one device. This makes it possible to output both data about the presence of an object in a defined area and exact measured data of the scanned surface. The TiM7xx is SICK’s solution for reducing the

number of sensors needed for mobile applications. This enables customers to develop customized solutions for their applications. The compact design of the sensors is ideal for applications such as mobile platforms, automated guided vehicles (AGVs) and mobile service robots. The TiM7xx supports localization and collision avoidance in these applications.

### At a glance

- Wide detection range: 0.05 m up to maximum 25 m
- Low power consumption (typically: 4 W)
- Immediate commissioning and configuration via USB and Ethernet
- Intelligent field evaluation and measurement data output in one device
- Rugged design suitable for industry thanks to enclosure rating up to IP67

### Your benefits

- Enables new solutions for mobile applications by combining intelligent field evaluation and measurement data output.
- Reliable object detection independent of the object, even with strong ambient light
- The measurement data output enables capture of additional data about parameters such as object size, shape, etc.
- Easy integration into compact AGVs thanks to small size of the sensor
- Easy commissioning with rotatable connections and accessories perfectly attuned to the sensors; only a few adjustable SOPAS software parameters are necessary for commissioning
- Improved behavior for edge hits thanks to HDDM+

→ [www.sick.com/TiM7xx](http://www.sick.com/TiM7xx)

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

## Features

	TiM78x	TiM781S	TiM771S
Light source	Infrared (850 nm)		
Laser class	1 (IEC 60825-1:2014, EN 60825-1:2014)		
Aperture angle	270°		
Scanning frequency	15 Hz		
Working range	0.05 m ... 25 m		
Safety-related working range	-	0.05 m ... 5 m (At 5% remission)	
Blind zone	-	0 m ... 0.05 m	
Scanning range at 10% remission	8 m		

## Performance

	TiM78x	TiM781S	TiM771S
Response time	1 scan, typ. 67 ms 2 scans, ≤ 134 ms		
Systematic error <sup>1)</sup>	± 60 mm		
Statistical error	< 20 mm <sup>1)</sup>		< 20 mm <sup>1)</sup> < 10 mm <sup>2)</sup>
Integrated application	Field evaluation with flexible fields, output of measurement data	Protective field evaluation with flexible fields, output of measurement data	
Protective field tolerance	-	100 mm, 0.66° (DIN CLC/TS 62046:2009, 5% remission)	
Number of field sets	16 field triples (48 fields, contour as reference; 1 triple (3 flexible fields) can be configured directly at the scanner)	16 field triples (48 protective fields)	
Simultaneous evaluation cases	3 simultaneous fields (per field set)	3 simultaneous protective fields (per field set)	

<sup>1)</sup> Typical value at 90% remission up to the maximum sensing range; actual value depends on ambient conditions.

<sup>2)</sup> Typical value at 10% remission up to a sensing range of 6 m, actual value depends on ambient conditions.

## Interfaces

Ethernet	✓, TCP/IP
USB	✓
Remark	Micro USB
Function	Parameterization
Digital inputs	4 (PNP, for field set switching)
Delay time	67 ms ... 30,000 ms (configurable)
Dwell time	67 ms ... 600,052 ms (configurable)
Optical indicators	2 LEDs (ON, "device ready")

## Mechanics/electronics

Supply voltage	9 V DC ... 28 V DC
Power consumption	Typ. 4 W, 16 W with 4 max. loaded digital outputs
Enclosure rating	IP67, applies only when the plastic cover of the "Aux interface" is closed (IEC 60529:1989+AMD1:1999+AMD2:2013)
Protection class	III (IEC 61140:2016-1)
Weight	250 g, without connecting cables
Dimensions (L x W x H)	60 mm x 60 mm x 86 mm

Ambient data

	TiM78x	TiM781S	TiM771S
<b>Electromagnetic compatibility (EMC)</b>			
Emitted radiation	Residential area (IEC 61000-6-3:2006+AMD1:2010)		
Electromagnetic immunity	Industrial environment (IEC 61000-6-2:2005)		
<b>Vibration resistance</b>			
Sine resonance scan <sup>1)</sup>	10 Hz ... 1,000 Hz		
Sine test <sup>1)</sup>	10 Hz ... 500 Hz, 5 g, 10 frequency cycles		
Noise test <sup>2)</sup>	10 Hz ... 250 Hz, 4.42 g RMS, 5 h		
<b>Shock resistance <sup>3)</sup></b>	50 g, 11 ms, ± 3 single shocks/axis 25 g, 6 ms, ± 1,000 continuous shocks/axis 50 g, 3 ms, ± 5,000 continuous shocks/axis		
<b>Ambient operating temperature <sup>4)</sup></b>	-25 °C ... +50 °C	-10 °C ... +50 °C	
<b>Storage temperature <sup>4)</sup></b>	-40 °C ... +75 °C		
<b>Temperature change <sup>5)</sup></b>	-25 °C ... +50 °C, 10 cycles		
<b>Damp heat <sup>6)</sup></b>	+25 °C ... +55 °C, 95 % rF, 6 cycles		
<b>Permissible relative humidity <sup>6)</sup></b>	≤ 95 %, Non-condensing		
<b>Ambient light immunity</b>	80,000 lx	80,000 lx	3,000 lx, in direct light

<sup>1)</sup> IEC 60068-2-6:2007.

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

<sup>3)</sup> IEC 60068-2-27:2008.

<sup>4)</sup> IEC 60068-2-14:2009.

<sup>5)</sup> EN 60068-2-14:2009.

<sup>6)</sup> EN 60068-2-30:2005.

Ordering information

Non safety-related sensor variant

- **Connection type:** 1 x “Ethernet” connection, 4-pin M12 female connector, 1 x connection “Power”, 12-pin, M12 male connector, 1 x Micro USB female connector, type B
- **Angular resolution:** 0.33°

Sub product family	Application	Measurement principle	Digital outputs	Housing color	Type	Part no.
TiM78x	Outdoor	HDDM*	3 (PNP, additional 1 x “Device Ready”)	Gray (RAL 7032)	TiM781-2174101	1096807

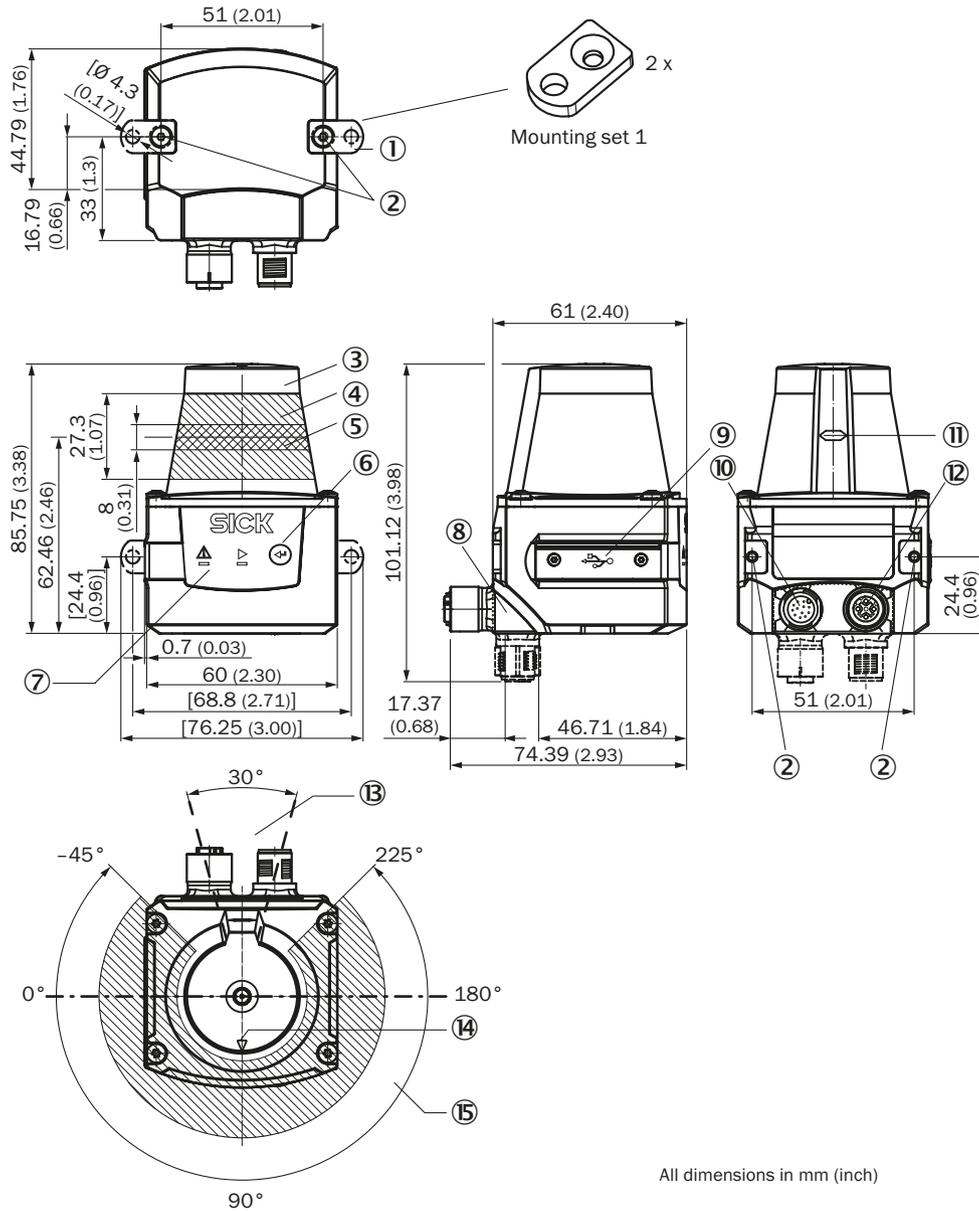
Safety-related sensor variant

- **Connection type:** 1 x “Ethernet” connection, 4-pin M12 female connector, 1 x connection “Power”, 12-pin, M12 male connector, 1 x Micro USB female connector, type B
- **Angular resolution:** 0.33°
- **Category:** B (EN ISO 13849-1:2015)
- **Performance level:** PL b (EN ISO 13849-1:2015)
- **Performance class SRS/SRSS B** (IEC TS 62998-1:2019)
- **MTTF<sub>p</sub> (mean time to dangerous failure):** 100 years, at 25 °C ambient temperature (EN ISO 13849-1:2015)
- **T<sub>m</sub> (mission time):** 20 years (EN ISO 13849-1:2015)

Sub product family	Application	Measurement principle	Digital outputs	Housing color	Type	Part no.
TiM78x	Indoor	HDDM*	3 (PNP, to display a protective field violation, additional 1 x “Device Ready”)	Yellow	TiM781S-2174104	1096363
TiM77x	Indoor	HDDM		Yellow	TiM771S-2174104	1105052

**Dimensional drawings** (Dimensions in mm (inch))

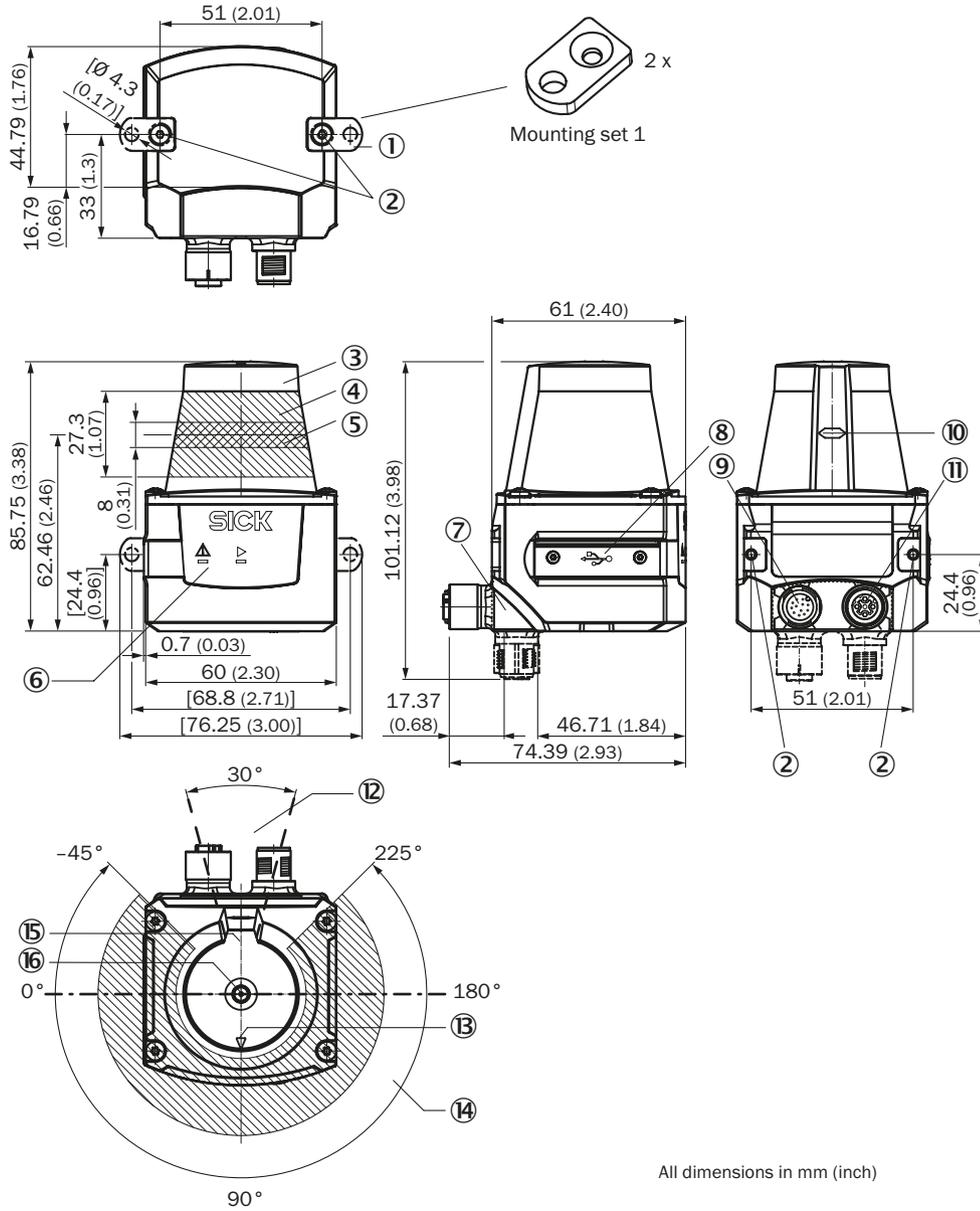
**TiM78x**



All dimensions in mm (inch)

- ① 2 x straight plates with M3 x 4 mm screw (included in delivery)
- ② M3 threaded mounting hole, 2.8 mm deep (blind hole thread), max. tightening torque 0.8 Nm
- ③ Optical hood
- ④ Receiving range (light inlet)
- ⑤ Transmission range (light emission)
- ⑥ Function button for teach-in
- ⑦ Red and green LED (status displays)
- ⑧ Swivel connector unit
- ⑨ Micro USB female connector, type B
- ⑩ Connection "Power", 12-pin, M12 male connector
- ⑪ Marking for the position of the light emission level
- ⑫ "Ethernet" connection, 4-pin M12 female connector
- ⓑ Area in which no reflective surfaces are allowed for mounted devices
- Ⓕ Bearing marking to support alignment (90° axis)
- Ⓖ Aperture angle 270° (scanning angle)

TiM781S, TiM771S



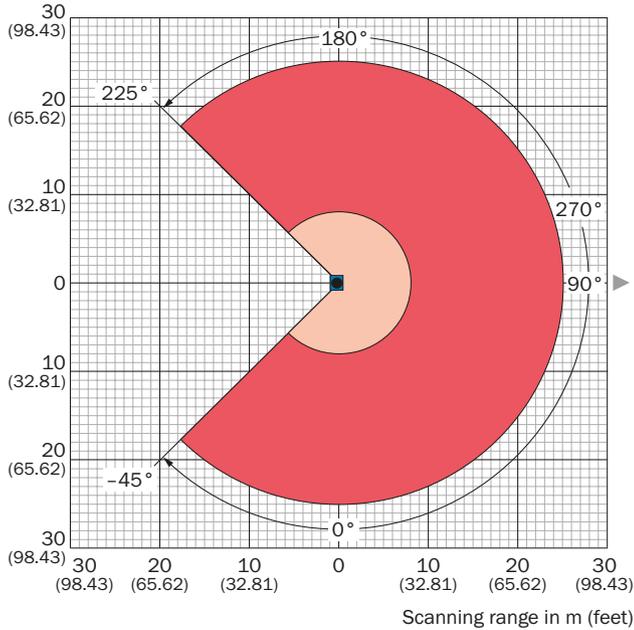
All dimensions in mm (inch)

- ① 2 x straight plates with M3 x 4 mm screw (included in delivery)
- ② M3 threaded mounting hole, 2.8 mm deep (blind hole thread), max. tightening torque 0.8 Nm
- ③ Optical hood
- ④ Receiving range (light inlet)
- ⑤ Transmission range (light emission)
- ⑥ Red and green LED (status displays)
- ⑦ Swivel connector unit
- ⑧ Micro USB port, behind the black rubber plate ("Aux interface" connection for configuration with PC)
- ⑨ "Power/inputs and outputs" connection, 12-pin M12 male connector
- ⑩ Marking for the position of the light emission level
- ⑪ 4-pin M12 female connector: not assigned
- ⑫ Area in which no reflective surfaces are allowed for mounted devices
- ⑬ Bearing marking to support alignment (90° axis)
- ⑭ Aperture angle 270° (scanning angle)
- ⑮ Internal reference target
- ⑯ Measurement origin

## Working range diagram

### TiM78x

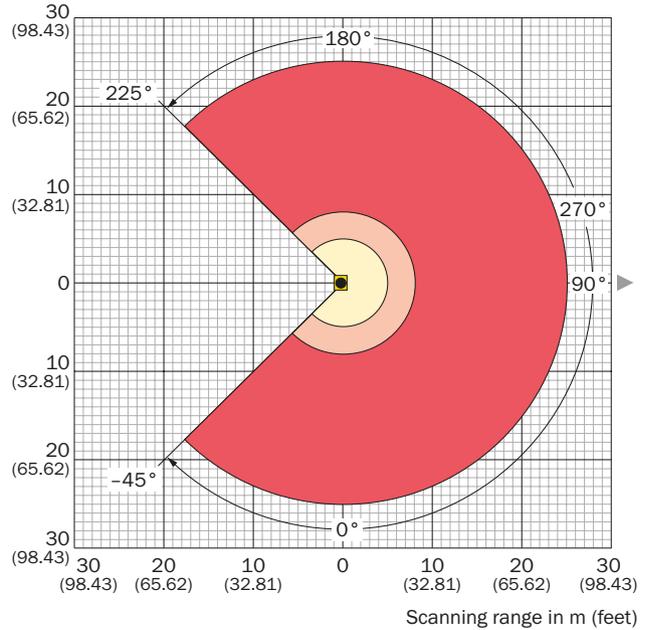
Scanning range in m (feet)



- Scanning range max. 25 m (82.02 feet)
- Scanning range typical 8 m (26.25 feet) for objects up to 10 % remission

### TiM781S, TiM771S

Scanning range in m (feet)



- Range for **not safety-related** detection at > 50% remission: 0.05 m (0.17 feet) to max. 25 m (82.02 feet)
- Range for **not safety-related** detection 10% remission: 0.05 m (0.17 feet) to max. 8 m (26.25 feet)
- Range for **safety-related** detection at 5% remission: 0.05 m (0.17 feet) to max. 5 m (16.40 feet)

**Attention!** From the measurement origin up to a distance of 0.05 m (0.17 feet) no objects are detected (blind zone!) over the entire radial field of view (scanning range of 270°).

## Recommended accessories

### Mounting systems

#### Mounting brackets and plates

	Brief description	Part no.
	Mounting kit with shock absorber	2086074
	Mounting kit, fender and alignment aid	2086761

### Connection systems

#### Plug connectors and cables

	Signal type/application	Connection type head A	Connection type head B	Cable	Length of cable	Part no.
	Power, I/O	Female connector, M12, 12-pin, straight, A-coded	Flying leads	12-wire	5 m	6054974
					10 m	6054973
	Ethernet	Male connector, M12, 4-pin, straight, D-coded	Male connector, RJ45, 8-pin, straight	4-wire, Ecolab, AWG26	5 m	6050200

For more accessories, see → 48

TiM series

Mounting systems

Mounting brackets and plates

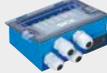
	Brief description	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S
	Mounting kit	2082188	●	●	-	-	-	-	-	-	-	-	-	-	-
	Mounting kit with shock absorber	2086074	-	-	●	●	●	●	●	●	●	●	●	●	●
	Mounting kit with sun shade/weather protection	2068398	-	-	-	-	●	●	-	●	●	●	●	●	●
	Mounting kit, fender and alignment aid	2086761	-	-	●	●	●	●	●	●	●	●	●	●	●
	Mounting set 2, fender and alignment aid	2061776	-	-	●	●	●	●	●	●	●	●	●	-	●
	Q-lock mounting system	2083311	●	●	-	-	-	-	-	-	-	-	-	-	-

Other mounting accessories

	Brief description	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S
	For loosening and tightening M12 plug connectors to the system plug with defined torque (0,4 Nm)	2081618	●	-	-	-	●	●	-	●	●	●	●	●	●

Connection systems

Modules and gateways

	Brief description	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S
	Relay connection box for wiring voltage supply and I/Os as well as four volt-free outputs; with cover contact.	2082916	-	-	●	●	●	●	-	-	-	-	-	●	-
	IO-Link V1.1 Class A port, USB2.0 port, optional external power supply 24V / 1A	1061790	●	-	-	-	-	-	-	-	-	-	-	-	-
 Illustration may differ	Small connection module for one sensor, 4 cable glands (only for TiM3xx-10xxxxx)	1055981	-	-	●	●	-	-	-	-	-	-	-	-	-

Plug connectors and cables

	Signal type/application	Connection type head A	Connection type head B	Cable	Length of cable	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S			
	Power	Female connector, M12, 5-pin, straight, A-coded	Flying leads	4-wire	5 m	6036159	-	●	-	-	-	-	-	●	●	●	●	-	-			
					10 m	6036160	-	●	-	-	-	-	-	●	●	●	●	-	-	-	-	
					20 m	6036161	-	●	-	-	-	-	-	●	●	●	●	-	-	-	-	-
	Power, I/O	Female connector, M12, 12-pin, straight, A-coded	Flying leads	12-wire, twisted pair	5 m	6042735	-	-	●	●	●	●	●	-	-	-	-	●	-			
					10 m	6042736	-	-	●	●	●	●	●	-	-	-	-	●	-	-	-	
					20 m	6042737	-	-	●	●	●	●	●	-	-	-	-	●	-	-	-	
				12-wire	5 m	6054974	-	-	●	●	●	●	●	-	-	-	-	●	●	-	-	
					10 m	6054973	-	-	●	●	●	●	●	-	-	-	-	●	●	-	-	
					20 m	6054972	-	-	●	●	●	●	●	-	-	-	-	●	●	-	-	
	Ethernet	Male connector, M12, 4-pin, straight, D-coded	Male connector, RJ45, 8-pin, straight	4-wire, twisted pair, AWG26	2 m	6034414	-	●	-	-	●	●	-	●	●	●	●	●	-			
					5 m	6034415	-	●	-	-	●	●	-	●	●	●	●	●	●	●	-	
				4-wire, Ecolab, AWG26	5 m	6050200	-	●	-	-	●	●	-	●	●	●	●	●	●	●	●	●
					5 m	6054493	-	-	-	-	●	●	-	●	●	●	●	●	●	●	●	-
				4-wire, twisted pair, AWG26	10 m	6030928	-	●	-	-	●	●	-	●	●	●	●	●	●	●	●	-
					10 m	6050201	-	●	-	-	●	●	-	●	●	●	●	●	●	●	●	●
				4-wire, CAT5, CAT5e	10 m	6054492	-	-	-	-	●	●	-	●	●	●	●	●	●	●	●	-
					20 m	6036158	-	●	-	-	●	●	-	●	●	●	●	●	●	●	●	-
				4-wire, Ecolab, AWG26	20 m	6050596	-	●	-	-	●	●	-	●	●	●	●	●	●	●	●	●
					20 m	6050685	-	-	-	-	●	●	-	●	●	●	●	●	●	●	●	-
					Power, serial, CANopen, digital I/Os	Female connector, D-Sub-HD, 15-pin, straight	Flying leads	Extension cable, 15-wire, AWG26	2 m	2043413	-	-	●	●	-	-	-	-	-	-	-	-
					USB 2.0	Male connector, USB-A	Male connector, Micro-B	-	2 m	6036106	-	-	●	●	●	●	●	●	●	●	●	-

	Signal type/application	Connection type head A	Connection type head B	Cable	Length of cable	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S	
	Sensor/actuator cable	Female connector, M12, 5-pin, straight, A-coded	Male connector, M12, 5-pin, straight, A-coded	5-wire, CE, UL	2 m	2096009	●	-	-	-	-	-	-	-	-	-	-	-	-	
			Flying leads	5-wire, CE, UL	2 m	2095617	●	-	-	-	-	-	-	-	-	-	-	-	-	-
		Female connector, M12, 5-pin, angled, A-coded	Male connector, M12, 5-pin, straight, A-coded	5-wire, CE, UL	2 m	2095601	●	-	-	-	-	-	-	-	-	-	-	-	-	-
			Flying leads	5-wire, CE, UL	2 m	2095772	●	-	-	-	-	-	-	-	-	-	-	-	-	-
		-	Female connector, M12, 4-pin, straight, A-coded	Flying leads	4-wire	2 m	2088079	-	-	-	-	-	-	●	●	●	●	-	-	-

Sensor Integration Gateway

	Type	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S
	SIG200-0A0412200	1089794	●	-	-	-	-	-	-	-	-	-	-	-	-
	SIG200-0A0G12200	1102605	●	-	-	-	-	-	-	-	-	-	-	-	-

Reflectors and optics

Optics cloths

	Brief description	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S
	Cloth for cleaning optical surfaces	4003353	●	●	●	●	●	●	●	●	●	●	●	●	●

Reflectors

	Brief description	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S
	Self-adhesive, not suitable for photoelectric retro-reflective sensors with polarisation filter, customizable length by roll	5600079	-	-	-	-	-	-	●	●	●	●	●	●	●

Further accessories

Test and monitoring tools

	Brief description	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S
 Illustration may differ	Alignment aid for detecting the infrared light of SICK sensors.	2101720	●	●	●	●	●	●	●	●	●	●	●	●	-
 Illustration may differ	Scan finder, receiver to localize infrared scans	6020756	●	●	●	●	●	●	●	●	●	●	●	●	-

Cleaning agent

	Brief description	Part no.	TiM1xx	TiM2xx	TiM31x	TiM32x	TiM35x	TiM36x	TiM51x	TiM55x	TiM56x	TiM57x	TiM58x	TiM78x	TiM-S
	Plastic cleaner and care product, anti-static, 0.5 liter	5600006	●	●	●	●	●	●	●	●	●	●	●	●	●

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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.

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