



TMS/TMM88 Dynamic

Maximum precision in dynamic applications

SICK
Sensor Intelligence.

Advantages



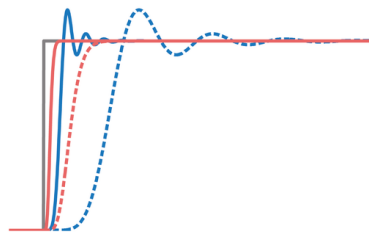
Precision in any position

Thanks to innovative MEMS technology and an intelligent sensor fusion filter, the TMS/TMM88 Dynamic inclination sensors offer high signal quality and fast response times – even under external acceleration influences. With application-specific programming via a wide range of interfaces, and intuitive programming solutions, they adapt to different application conditions. Connection to the machine controllers is particularly easy using an M12 male connector or open stranded wires as well as customer-specific adaptations. This variety offers users a high degree of flexibility and convenience. The dynamic inclination sensors also deliver precise measurement results over a range of 360° (single-axis) and ± 90° (dual-axis) – for reliable performance in a variety of applications.

IP66
IP68
IP69K

Rugged in numerous environments

For demanding outdoor applications, the TMS/TMM88 Dynamic offers reliable protection thanks to its encapsulated electronics. With enclosure ratings up to IP69K, the sensor is suitable for use in harsh conditions such as high temperatures and UV radiation, and can even withstand high-pressure cleaning.



High signal quality

Digital filters in the inclination sensor can be adjusted for specific applications to minimize vibration effects and ensure a stable data basis. The sensor fusion algorithm also enables precise measurement of inclination angles in mobile applications. It combines data from accelerometers and gyroscopes to provide reliable inclination signals.



Individually programmable

The TMS/TMM88 Dynamic sensor can be individually programmed via various interfaces. The handheld PGT12-Pro or the control unit allow fine alignment to optimize sensor performance for specific applications. This ensures a high level of functionality in different environments.

Product variants for different customer needs

The TMS/TMM88 Dynamic series of dynamic inclination sensors comprises the TMx88D-A, TMx88D-P and TMx88D-M product variants. The main differences are in the measurement accuracy and the housing material. This allows the appropriate inertial sensor to be selected depending on the application.



TMx88D-A and TMx88D-P

Thanks to their high dynamic measurement accuracy, the TMx88D-A and TMx88D-P variants are very well suited for use in mobile applications, for example, in agricultural and construction machinery. The dynamic inclination sensors are available in both a cost-effective plastic housing and a powder-coated aluminum housing. With these variants, the sensor fusion algorithm can be easily adapted via the controller or the PGT-12-Pro handheld programming device.



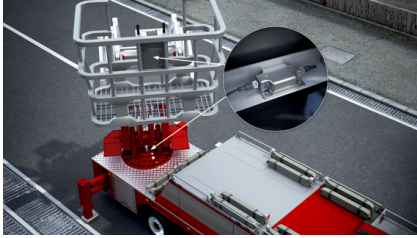
TMx88D-M

In addition to a very high dynamic measurement accuracy, the sensors also solve measuring tasks with stringent requirements on static measurement accuracy. Their range of application therefore includes not only mobile automation but also areas such as solar thermal energy. Thanks to an advanced sensor fusion algorithm with adaptive damping, the sensor also adapts independently to changing movement patterns. It therefore offers a consistently high performance even in changing conditions. The TMx88D-M variant has a particularly rugged zinc die cast housing.



Very high performance in static and dynamic applications

Inertial sensors from SICK show off their strengths in many areas. In mobile applications such as in agricultural and forestry machinery, construction machinery or automated guided vehicle systems, the rugged sensor design and the powerful algorithm for sensor fusion with extensive parameterization options ensure stable measured values. In applications with slow movements, such as the alignment of solar modules, in warehousing applications or in crane and lifting technology, the classic inclination sensors score points with their reliable MEMS technology and high cost-effectiveness.



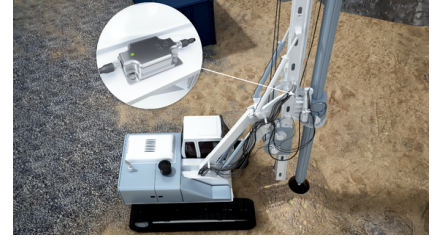
Determining the inclination of the aerial rescue truck cage

In order to transport people smoothly and horizontally, the two-dimensional inclination sensor determines the inclination of the cage and sends this information to the higher-level control for regulation purposes. With its compensated cross sensitivity and configurable vibration suppression, the inclination sensor enables precise, reliable positioning.



Leveling the excavator arm

When space is limited, precise control of the excavator arm is important to prevent damage to the surrounding infrastructure. To improve these work processes, the absolute position of the moving parts in relation to each other must be known. Inclination sensors reliably record this position by measuring the inclination of the upper and lower carriages and the bagger arm. Absolute encoders on the respective arm joints support the measurement. Rugged linear encoders - integrated into the hydraulic cylinders of the excavator arm - offer an alternative method for determining an exact position.



Monitoring the drilling angle

Drilling units must be precisely positioned and adjusted to ensure successful drilling. The inclination sensor determines the X and Y coordinates for this purpose. High accuracy across the entire measuring range, outstanding temperature stability, compensated cross sensitivity, and configurable vibration suppression make the TMS/TMM88 Dynamic the ideal solution for this challenging task.



Technical data overview

Number of axis	1 / 2 (depends on variant)				
Communication interface	CANopen / SAE J1939 (depends on variant)				
Measurement range	<table border="0"> <tr> <td>1-dimensional</td> <td>360°</td> </tr> <tr> <td>2-dimensional</td> <td>± 90°</td> </tr> </table>	1-dimensional	360°	2-dimensional	± 90°
1-dimensional	360°				
2-dimensional	± 90°				
Housing material	Plastic (PBT) Aluminum Die-cast zinc (depends on variant)				
Connection type	Male connector, 1x, M12, 5-pin Female connector, 1x, M12, 5-pin				
Programmable/configurable	Over PGT-12-Pro				
Accuracy					

Product description

The inclination sensors from the TMS/TMM88 Dynamic product family are setting new standards with respect to signal quality and response time. Thanks to an intelligent sensor fusion filter, not only are they extremely quick to respond – they are also highly precise, even when influenced by external accelerations. The foundation for this is a six-axis inertial measurement unit (IMU), consisting of an acceleration sensor and a gyroscope that is based on MEMS technology. Various configuration options enable the dynamic inclination sensors to be flexibly adapted to the application. The rugged design with enclosure ratings up to IP69 is able to withstand even the harshest ambient conditions.

At a glance

- Single-axis (360°) and two-axis (+/-90°) inclination sensors based on a six-axis IMU
- Adaptive intelligent sensor fusion filter (type-dependent)
- High accuracy up to 0.1° for dynamic movements
- Interfaces: CANopen, SAE J1939
- Customizable settings
- Shock resistance: 100 g
- Enclosure rating: IP67/69

Your benefits

- Inclination measurement in two axes without mutual interference
- Single-axis angle measurement over the full 360° with configurable zero point
- High signal quality and quick response time thanks to innovative and powerful sensor fusion algorithm
- Access to raw data of the acceleration sensor and gyroscope opens up additional application possibilities
- Use under the harshest conditions possible thanks to completely encapsulated electronics and high enclosure rating
- Flexible configuration via CANopen or SAE J1939

Fields of application

- Agricultural and forestry machinery
- Construction machinery
- Special vehicles
- Automated guided vehicle systems
- Crane and lifting technology

Ordering information

Other models and accessories → www.sick.com/TMS_TMM88_Dynamic

- **Programmable/configurable:** ✓

Communication interface	Number of axis	Measuring range	Housing material	Type	Part no.
CANopen	1	360°	Aluminum	TMS88D-ACI360	1098668
			Plastic (PBT)	TMS88D-PCI360	1094483
			Die-cast zinc	TMS88D-MCI360A	1139499
	2	± 90°	Aluminum	TMM88D-ACI090	1098669
			Plastic (PBT)	TMM88D-PCI090	1094485
			Die-cast zinc	TMM88D-MCI090A	1139501
				TMM88D-MCI090AS01	1155178
SAE J1939	1	360°	Aluminum	TMS88D-AJI360	1098670
			Plastic (PBT)	TMS88D-PJI360	1094486
			Die-cast zinc	TMS88D-MJI360A	1139503
	2	± 90°	Aluminum	TMM88D-AJI090	1098671
			Plastic (PBT)	TMM88D-PJI090	1094488
			Die-cast zinc	TMM88D-MJI090A	1139504

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