

Tilt Sensor Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The tilt sensor market is expected to register a CAGR of 8.29% over the forecast period. As the importance and requirement of horizontal as well as vertical alignment are increasing for reliable operation of plants and machinery, the application of tilt sensors for angular position detection or leveling of mobile machinery is growing as they measure the angle of the respective object in relation to gravity.

Key Highlights

The use of tilt sensors for angular position detection or leveling of mobile machinery is growing as the importance and requirement of horizontal and vertical alignment for the reliable operation of plants and machinery grows. Tilt sensors measure the angle of the respective object in relation to gravity.

With the development of MEMS technology in the sensors market along with miniaturization, the adoption level has increased over the years for tilt sensors. The demand for tilt sensors has widened for application across the fields, including aerospace, automotive, telecommunication as well gaming applications, which has gained traction recently.

Though the cross-border investments have diluted recently due to the global economic slowdown, the real estate industry and architectural investments by the governments are fueling the growth in the construction business, driving the demand for construction equipment and the application of precision sensors like tilt sensors in the industry has widened.

In addition to the growing demand for MEMS-based tilt or inclination sensors, the use of tilt sensors based on the force balance principle has been constrained due to their expensive cost. This is one of the factors that have an impact on market growth.

In the agricultural industry, worker safety remains a top priority. Agricultural vehicles such as tractors, cranes, man-lifts, off-road vehicles, and lift platforms must be operated safely to avoid injury to the operator or those nearby.

Furthermore, these industries' reliance on the utilization of autonomous control functions has substantially increased over time.

Due to these characteristics, as well as the rising demand for vehicle efficiency, safety, and operator comfort, sensors with a focus on tip-over protection, platform leveling, and tilt warnings have become important in these industries.

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Demand from Automotive and Transportation Segment to Grow Significantly

The application of tilt or inclination sensors is increasing in the automotive. These are being used along with gyroscopes primarily for improving passengers' safety and vehicle efficiency. The application of tilt sensors in the automotive are used in various applications, including electronic parking brakes, roll over detection, electronic stability control, and idle stop-start, among others. Additionally, with the increasing investments by automotive companies for automation in vehicles, the application has widened for ADAS & inertial navigation, hill-start assistance, and dynamic headlight leveling. For instance, Mercedes has developed self-leveling headlights to adapt to the inclination of turns on the road. For the same, the company has deployed tilt sensors for this automation.

Moreover, the automotive industry is moving with its step toward the development of autonomous vehicles. These vehicles' production and adoption rates have witnessed rapid growth in recent years. For instance, in March 2019, BMW started its new plant for manufacturing autonomous electric cars. UBS has also stated that AV production and sales revenue is expected to reach USD 243 billion by 2030.

Additionally, it is also found that the demand for MEMS sensors will increase to solve the problems of tilt angles of vehicles and avoid car theft by towing; a tilt detection system equips in modern cars. The MEMS sensors become a better solution than Electrolytic fluid tilt sensors as these sensors have a 3-axis MEMS accelerometer used to measure the inclination angle concerning the ground.

For instance, in January 2022, Aceinna Inc. announced the sensors such as INS401 INS and GNSS/RTK, a turnkey solution for autonomous vehicle precise positioning. The INS401 is part of Aceinna's new product portfolio that provides high accuracy and high integrity localization for developers and manufacturers of an advanced driver-assistance system (ADAS) and autonomy solutions for vehicles of all types.

More investments and expansion plans in these developments are expected to continue in the forecast period, which is estimated to drive the demand for tilt sensors in the industry.

Asia Pacific Region is Expected to Hold the Largest Market Share

The tilt sensor market in the Asia-Pacific region is expected to dominate the market due to a significant increase in the investments in the development of infrastructure, aerospace and defense, and telecom industry, along with the presence of a strong semiconductor market in the region especially driven by China, Japan, and South Korea.

Additionally, India is one of the major economies driving the demand in the region. The country's power and cement industries are expected to aid the metals and mining sector; the country is also observing an increase in demand for iron and steel. The demand is expected to drive the construction and mining equipment market, resulting in growth in the demand for precision sensors like tilt sensors.

According to IBEF, India produces 95 minerals, four fuel-related, ten metallic minerals, 23 non-metallic minerals, three atomic minerals, and 55 minor minerals. The country is the third-largest producer of coal and fourth in Iron ore. Owing to these factors, the country is among the largest mining equipment markets.

Moreover, China's demand for sensors has multiplied over the last few years. Both production and demand will continue to grow over the next decade. The Chinese economy has maintained rapid growth for over 20 years, stimulated by a steady increase in industrial production, imports and exports, consumption, and capital investment in the construction industry.

Also, China has a large audience of smartphones and other consumer electronics. Hence the growth in end-user industries of tilt sensors is analyzed to propel the sensors market.

Companies in China are focusing on expanding their businesses by innovating new products and supplying them. For instance, in

November 2020, Zhichuan's inclinometer empowered the Indonesian Gold Mine known as Martabe Gold Mine. To achieve "zero accidents" for employees and contractors and strive to reduce the risk of accidents, Agincourt Resources has a Martabe gold mine safety management system with a ZC sensor ZCTCX300 wireless remote inclinometer monitoring system.

Further, Japan is making significant contributions and the region and many others; it is home to a variety of well-known automotive and transportation companies, aerospace and defense companies, and mining and construction companies. This is another factor driving market growth in the region.

Tilt Sensor Market Competitor Analysis

The market for tilt sensors is moderately fragmented because of the presence of many major companies in the market offering the products. These companies are continuously investing in making strategic partnerships and product developments to gain more market share. Some of the recent developments by the companies are listed below.

January 2022 - ComNav Technology announced an upgrade to the global market's T300 and T300 Plus GNSS receivers, including an upgrade to the new GNSS-K8 platform for both receivers and a replacement for the tilt sensor with the T300 Plus IMU module.

December 2021 - Yokohama National University has developed a tilt sensor that uses a conductive liquid material that captures digital binary signals. The device was able to capture tilt information using binary signals such as DC on/off status, allowing the group to simultaneously measure tilt angle and orientation in two dimensions.

Additional Benefits:

The market estimate (ME) sheet in Excel format
3 months of analyst support

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