IoT Sensor - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-07-01 | 120 pages | Mordor Intelligence

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Report description:

IoT Sensor Market Analysis

The smart sensors market size is USD 42.21 billion in 2025 and is on track to reach USD 116.21 billion in 2030, reflecting a robust 22.45% CAGR. Steep demand accelerates as artificial intelligence and edge computing migrate into miniature sensing platforms across industrial automation, automotive safety, and urban infrastructure. Mandatory fleet-telematics rules in North America and India, private 5G deployments in Japanese factories, and battery-less energy-harvesting networks in Nordic offshore wind farms are widening adoption footprints. Competitive intensity is rising as semiconductor majors embed AI engines inside sensors to reduce latency and bandwidth. At the same time, low-power wide-area connectivity and energy harvesting are shifting total cost of ownership equations in remote monitoring scenarios.

Global IoT Sensor Market Trends and Insights

Rapid adoption of low-power MEMS-based multimodal sensors enabling edge analytics in European discrete manufacturing

European manufacturers embed multimodal MEMS sensors directly in equipment to analyze vibration, temperature, sound, and pressure on-site. TDK's i3 Micro Module integrates an AI core that predicts anomalies before breakdowns. Bosch Sensortec's BHI360 family executes gesture and 3D-audio functions in under 600 ?A, cutting network traffic 80% while retrofitting legacy lines. Predictive maintenance programs using these edge devices report 25% cost savings and extend asset life 20-30% across German and Italian plants.

Mandated fleet-telematics regulations in North America & India boosting automotive inertial/pressure sensor demand

The U.S. SmartWay modernization and India's commercial-vehicle tracking rules oblige fleets to capture real-time vehicle data. Texas Instruments' AWR1843AOP radar integrates DSP and MCU blocks to meet reporting and safety needs while supporting advanced driver assistance. Adoption is scaling as logistics firms shift to predictive maintenance scheduling, raising unit demand for multi-sensor arrays.

200mm MEMS-Foundry Capacity Shortage Limiting Automotive-Grade Inertial Sensor Supply

Global semiconductor manufacturing faces acute capacity constraints in 200mm MEMS foundries, creating supply bottlenecks for automotive-grade inertial sensors required for advanced driver assistance systems and autonomous vehicle development. SEMI reports indicate global semiconductor fab capacity expansion of 6% in 2024 and 7% in 2025, yet automotive sensor demand is growing at rates exceeding 25% annually, creating persistent supply-demand imbalances. The shortage particularly affects automotive inertial sensors requiring specialized packaging and extended temperature ranges, where qualification cycles can extend 18-24 months beyond standard consumer applications. X-FAB Silicon Foundries' USD 1 billion expansion targeting automotive and industrial applications represents industry efforts to address capacity constraints, though new fab capacity typically requires 2-3 years to reach full production.

Other drivers and restraints analyzed in the detailed report include:

Battery-less energy-harvesting sensor nodes for predictive maintenance in offshore wind farms / Private 5G networks in Japanese smart factories requiring time-synchronized image sensors / Calibration drift in long-lifecycle chemical sensors restricting pharma cold-chain adoption /

For complete list of drivers and restraints, kindly check the Table Of Contents.

Segment Analysis

Image sensors drove a 28.4% CAGR and are forecast to eclipse pressure sensors' 18.2 % contribution by 2030. The smart sensors market size for image-based devices is widening as autonomous vehicles and AI-powered inspection systems migrate from prototypes to volume lines. Automotive OEMs integrate high-dynamic-range CMOS imagers with inertial units for sensor fusion, ensuring safe navigation in complex urban traffic. Industrial users deploy smart cameras that execute neural-network inference locally, eliminating bandwidth costs and protecting IP. Meanwhile, pressure sensors remain staples in pneumatics, HVAC, and process automation, sustaining steady demand. Across both categories, vendors embed micro-controllers and security enclaves to meet cybersecurity mandates in connected machinery.

A second wave of temperature, motion, and proximity sensors targets wearables and collaborative robots. Embedded AI routines recognise gestures and micro-movements, enriching user interfaces. Chemical and gas sensors confront calibration-drift hurdles, yet tightening air-quality rules and hydrogen-leak detection in fuel-cell vehicles preserve growth. Inertial and magnetic sensors underpin electric-vehicle motor control and precise positional feedback in industrial actuators, cementing their role within the smart sensors market.

MEMS retained 42.7% revenue in 2024, anchoring the smart sensors market share through cost-effective wafer-level packaging. Yet optical techniques, led by LiDAR and structured-light systems, are growing 26.1% annually. MEMS foundries now co-package optical modulators and inertial elements, enabling hybrid modules that deliver ranging and orientation data from one socket. CMOS imagers saturate mature consumer segments but remain core to smartphone and dash-cam refresh cycles. Electrochemical

sensors maintain footholds in point-of-care diagnostics. Piezoelectric harvesters re-emerge as designers tap vibration energy to power sub-milliwatt sensor clusters.

Materials innovation is brisk: Infineon's graphene-based Hall device achieves 100-times sensitivity over silicon peers, unlocking ultra-low field detection for robotics. Packaging advances combine glass-through-silicon vias with flip-chip to compress footprint while improving heat transfer, sustaining high reliability in automotive temperature extremes.

Iot Sensor Market is Segmented by Sensor Type (Pressure Sensors, Temperature Sensors, and More), Technology (MEMS, Optical, and More), Connectivity (Wired, Wireless - Wi?Fi, and More), Power Source (Battery?Powered, Energy?harvesting, and More), End User (Automotive and Transportation, Healthcare, and More), Application, and Geography. The Market Forecasts are Provided in Terms of Value (USD).

Geography Analysis

Asia-Pacific led with 32.4% revenue in 2024. China's "Industrial Internet Innovation and Development Action Plan" installs sensor grids for high-speed equipment coordination, while Japan's private 5G allocations underwrite deterministic communication in smart factories. South Korea capitalizes on advanced semiconductor processes, anchoring supply security for regional OEMs. India mandates fleet telematics across commercial vehicles, rapidly scaling demand for inertial and environmental sensors. Australia's mining sector requires rugged devices certified for explosive atmospheres, creating specialized niches within the smart sensors market.

North America benefits from the CHIPS and Science Act. Texas Instruments secured USD 1.6 billion to build three 300 mm fabs, bolstering domestic sensor capacity. The region emphasizes cybersecurity, pushing suppliers to integrate secure-boot, encryption, and over-the-air update capabilities. Canada invests in environmental sensing to monitor forest-fire risk, while Mexico's automotive clusters demand cost-competitive safety sensors.

Europe enforces strict emissions and safety standards. Germany's discrete-manufacturing champions deploy AI-enabled MEMS modules to cut scrap rates. France invests in smart lighting and traffic management for carbon reduction. Nordic offshore wind farms cultivate energy-harvesting sensor deployments to manage turbine stress in sub-zero seas. The EU Cyber Resilience Act compels suppliers to certify software-driven sensors, increasing design complexity yet raising buyer confidence.

List of Companies Covered in this Report:

Bosch Sensortec GmbH / Honeywell International Inc. / STMicroelectronics N.V. / Texas Instruments Inc. / NXP Semiconductors N.V. / TE Connectivity Ltd. / Sensata Technologies Holding plc / Analog Devices Inc. / Infineon Technologies AG / Qualcomm Inc. / Sony Group Corp. / AMS-OSRAM AG / Murata Manufacturing Co. Ltd. / Panasonic Holdings Corp. / ABB Ltd. / Schneider Electric SE / Siemens AG / Semtech Corp. / Sensirion AG / Omron Corporation /

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