

Robotic Sensors - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

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Report description:

Robotic Sensors Market Analysis

The robotic sensors market size reached USD 0.73 billion in 2025 and is forecast to expand to USD 1.10 billion by 2030, advancing at an 8.66% CAGR. Growth stems from record-high industrial-robot deployments, rapid gains in collaborative and humanoid platforms, and the steady infusion of edge-AI modules that elevate perception accuracy and response times. Force-torque devices underpin precision assembly lines, while vision systems accelerate as deep-learning models migrate from the cloud to the robot arm. Semiconductor makers now bundle sensing, processing, and safety logic on a single chip, giving factories lower latency and better cyber-physical resilience. End-users in automotive, electric-vehicle, and healthcare domains intensify spending on multimodal sensing to improve yield, traceability, and human-machine cooperation. Regionally, Asia-Pacific's dense manufacturing base and policy incentives support scale economics, whereas South America's automation catch-up provides a high-growth runway.

Global Robotic Sensors Market Trends and Insights

Industrial-robot installations hit record levels

Global operational stock crossed 4 million units in 2024, forcing manufacturers to adopt richer sensing suites that go beyond encoders to vision, force, and tactile modalities. FANUC's 500i-A CNC control, with 2.7 μ s CPU throughput, illustrates how faster on-board computing now digests complex sensor streams in real time. Collaborative cells amplify demand for redundant safety

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sensing, while Delta's D-Bot cobots demonstrate payload-specific plug-and-play sensor packages that simplify integration. High install volumes shorten the payback period for advanced perception, locking in orders across the robotic sensors market.

E-commerce logistics demand for sensorised AMRs

Robust online retail lifted the global mobile-robot space to USD 4.5 billion in 2024, propelling need for wide-angle perception, mapping, and package-quality assessment inside dynamic warehouses. Low-cost 3D ultrasonic arrays such as Sonair's deliver 180° 180 degree coverage while undercutting LiDAR by up to 80%, trimming capital hurdles for mid-tier fulfilment centers. AI-enhanced vision now differentiates between pallet racks, forklifts, and staff apparel, boosting uptime and throughput. Touch-enabled grippers let AMRs handle fragile SKUs, expanding use cases and fuelling sensor volumes.

Persistent MEMS supply-chain volatility

Trade restrictions on gallium and antimony alongside natural-disaster risks at Asian foundries strain lead times and elevate die-level costs. Sourceability forecasts continued wafer-start bottlenecks through 2026, squeezing availability for high-pin-count sensor ASICs. Labor shortages add uncertainty, prompting some OEMs to dual-source or relocate backend packaging, yet such moves raise capital intensity and operational complexity.

Other drivers and restraints analyzed in the detailed report include:

Rapid price decline of six-axis force-torque sensors / Regulatory incentives for human-robot collaboration / CapEx barriers for SMEs in emerging markets /

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

Segment Analysis

Vision sensors are forecast to post a 13.4% CAGR from 2025-2030, outpacing all other categories. At the same time, force-torque devices retained 28% share of the robotic sensors market in 2024. The mass adoption of high-speed visual inspection and pick-and-place tasks legitimises investment in on-board GPUs and ASICs that compress inference latency below 30 ms. As camera prices slide, even mid-tier OEMs adopt dual-sensor stereo rigs to tackle depth estimation. Force sensing stays indispensable for press-fit, deburring, and electronic-connector assembly, where sub-newton accuracy safeguards yield. Cognex's 2023 revenue of USD 837.5 million signals cyclical yet resilient appetite for machine vision hardware when capex rebounds.

Sensor miniaturization lets builders co-locate proximity, temperature, and vision modules within tight robot wrists, reducing cabling and electromagnetic noise. Tactile arrays such as XELA Robotics' uSkin, with 0.1 gram-force sensitivity, deepen dexterity on grippers, but they still sit in the "others" bucket of the robotic sensors market. The fusion of stereo vision, IMU, and force vectors bolsters compliance control during assembly of irregular parts, a capability prized in wearable-device lines and customised orthopedics. Standardised M12 connectors and Power-over-Ethernet streamline installation, widening accessibility for SMEs. Over the forecast window, suppliers that offer modular, AI-ready vision suites are expected to capture a disproportionate slice of incremental robotic sensors market size in this segment.

Industrial robots have historically anchored demand, accounting for 55% of the robotic sensors market size in 2024. Their entrenched role in welding, painting, and electronics assembly ensures a stable replacement cycle. However, humanoid platforms are projected to lead growth with a 38.5% CAGR through 2030, energised by sustained venture capital inflows and component cost deflation. Tacta Systems' capital raise underscores confidence that humanoids can address logistics, retail, and eldercare gaps once safety and dexterity reach human parity.

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Collaborative robots continue to win midsize factories that need flexible line changeovers and cannot afford extensive guarding. Edge-AI subsystems now allow 'zero-programming' teach modes, lowering skill thresholds and expanding the addressable user base. Professional service robots surge across hospitals and airports, where infection-control or passenger-service tasks require reliable perception and gentle interaction. Yaskawa's MOTOMAN NEXT family demonstrates self-optimising motion planning, a trend that multiplies sensor count per unit as platforms aim for situational awareness. Over the horizon, accelerated adoption in humanoids will further diversify the robotic sensors market, giving suppliers a potent new volume pool beyond classical industrial automation.

The Robotic Sensors Market Report is Segmented by Sensor Type (Force & Torque Sensors, Vision Sensors, and More), Robot Type (Industrial Robots, Collaborative Robots, Service Robots - Professional, and More), End-User Industry (Automotive & EV, Electronics & Semiconductor, and More), Sensing Technology (Strain-Gauge, Capacitive, Optical, and More), and Geography. The Market Forecasts are Provided in Terms of Value (USD).

Geography Analysis

Asia-Pacific led with 35% revenue share in 2024, buoyed by China's industrial-upgrade subsidies, Japan's Society 5.0 blueprint, and South Korea's memory-chip investment wave. OMRON's JPY 876.1 billion net sales validate robust regional appetite for sensor-driven automation. Close proximity to MEMS fabs compresses lead times, while local tier-one automakers and electronics giants guarantee baseline demand. Geopolitical frictions around chip export controls, however, may force supply-chain re-routing and incremental costs.

Europe follows, anchored by Germany's Industry 4.0 roadmap and rigorous safety statutes that elevate certified sensing systems. SICK's EUR 2.307 billion turnover in 2024 underscores healthy momentum, especially in automotive and logistics hubs. Southern Europe's growing cobot footprint, exemplified by FANUC's Iberia expansion, widens market breadth. Nordic firms push envelope applications in offshore wind and mining, where IP-rated, vibration-hardy sensors prevail.

North America remains innovation-centric, with US labs refining AI-on-edge perception and Canadian mines adopting rugged sensors for autonomous hauling. Mexico's near-shoring trend channels production lines into Bajio corridors, pulling demand for cost-effective sensing. South America, despite lower installed base, is on track for the fastest CAGR at 10.6% as Brazilian automakers, Argentinian grain handlers, and Chilean lithium refiners automate to offset labor shortages and meet ESG audits. Regional development banks and multinationals co-finance pilot projects, seeding long-run sensor demand across the robotic sensors market.

List of Companies Covered in this Report:

ATI Industrial Automation (Novanta Inc.) / Bota Systems AG / Baumer Group / FANUC Corporation / FUTEK Advanced Sensor Technology, Inc. / Honeywell International Inc. / Infineon Technologies AG / OMRON Corporation / Sensata Technologies Holding plc / TE Connectivity Ltd. / Tekscan, Inc. / Sick AG / Keyence Corporation / Cognex Corporation / Epson Robotics (Seiko Epson Corp.) / Yaskawa Electric Corporation / Delta Electronics, Inc. / DENSO Wave Incorporated / Bosch Rexroth AG / Rockwell Automation, Inc. / Schunk GmbH and Co. KG /

Additional Benefits:

 The market estimate (ME) sheet in Excel format /
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