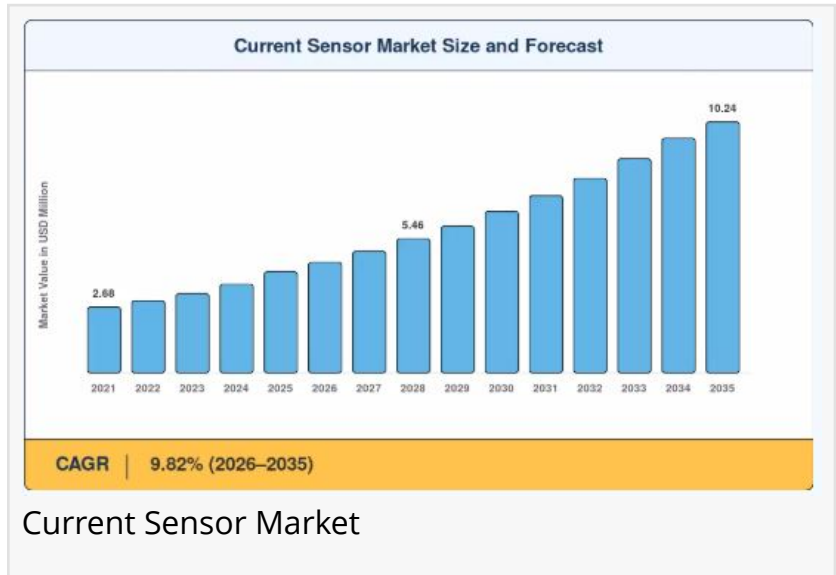


Current Sensor Market Set for Significant Expansion with 9.82% CAGR During the Forecast Period 2026–2035

Current Sensor Market Size, Share and Research Report By Loop (Open Loop, And Closed Loop) By Sensing Type (Direct Current Sensing, And Indirect Current Sensing

SEOUL, SEOUL, SOUTH KOREA, June 17, 2026 /EINPresswire.com/ -- The global [Current Sensor Market](#) is undergoing a massive transformation, driven by an increasing corporate demand for real-time power monitoring, energy-efficient electrification architectures, and smart grid integration across automotive, industrial, and renewable energy landscapes. Blending advanced Hall-effect sensing technology with predictive power analytics and [Internet of Things \(IoT\)](#) connectivity, the market is poised for explosive growth over the next decade.



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Current Sensor Market is witnessing strong growth due to increasing adoption of electric vehicles, industrial automation, renewable energy systems, and smart power management solutions.”

*Market Research Future
(MRFR)*

The global Current Sensor Market size is expected to surge from its foundational base, mimicking the rapid scaling seen in semiconductor and electrification platforms, as it rides a wave of steady Compound Annual Growth Rate (CAGR) in specific current sensing hardware segments and an overall robust CAGR in digital power management integration. The current sensor market reached an estimated USD 4.12 billion in 2025 and is forecast to climb from USD 4.52 billion in 2026 to USD 10.24 billion by 2035, registering a CAGR of 9.82% across the forecast window.

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□ Key Drivers Fueling Market Growth

The convergence of three distinct technological and economic pillars is accelerating the expansion of the current sensor market:

□ Electric Vehicle Electrification & Automotive Powertrain Monitoring:

Electrification mandates across the automotive sector are the primary catalyst behind current sensor market growth. The European Union's Euro 7 emissions standard—requiring real-time powertrain current monitoring in every new vehicle sold after 2025—and the U.S. Inflation Reduction Act's USD 7,500 EV tax credits have accelerated OEM procurement of Hall-effect current sensing ICs and shunt resistor current measurement solutions at an unprecedented pace.

The automotive and transportation segment held approximately 35% of the current sensor market in 2025, propelled by [EV battery management system](#) (BMS) requirements and ADAS power monitoring demands. As EV production volumes continue to scale globally, precise current measurement across motor drives, fast DC chargers, and battery pack balancing circuits has become a non-negotiable silicon requirement.

□ Renewable Energy Integration & Smart Grid Infrastructure:

Global renewable electricity capacity is anticipated to increase by more than 59% from 2020 levels to over 4,799 GW by 2026, equivalent to the total present world capacity of nuclear and fossil fuel generation combined. Every solar inverter, wind turbine converter, and grid-tied energy storage system requires high-accuracy current sensors to manage power flow, prevent overload conditions, and ensure regulatory compliance with grid interconnection standards.

Fluxgate current transducers for high-accuracy grid-tied inverters and fiber-optic current sensors for high-voltage substation monitoring are among the fastest-growing technology segments, reflecting the critical role of current sensing in enabling reliable, safe renewable energy integration at scale.

□ TMR Technology Advancement & Next-Generation Sensing Architectures:

A decisive technology shift is reshaping the current sensor market landscape. Legacy shunt-based architectures, dominant for decades in industrial motor drives, are giving way to non-contact current sensing for EV battery management systems and advanced tunneling magnetoresistance (TMR) sensor designs.

TMR sensor development attracted over USD 320 million in combined R&D investment from leading semiconductor firms between 2023 and 2025, signaling a market migration toward

galvanically isolated, high-bandwidth solutions that reduce board space by up to 40%. In October 2025, Allegro MicroSystems introduced the ACS37100 the first production-ready 10 MHz TMR current sensor in the industry—operating with a 50-nanosecond response time, making it ideal for EV power systems, clean energy conversion, and AI data center power monitoring applications.

□ Market Segmentation Analysis:

To provide a granular understanding of the landscape, global market research highlights a comprehensive segmentation across several key domains:

1. By Loop

Open Loop: Held the dominant market share at 56.2% in 2024, benefiting from lower cost and simpler circuit architecture for consumer electronics, industrial automation, and general-purpose power monitoring applications where ultra-high bandwidth is not critical.

Closed Loop: Expected to deliver the highest long-term CAGR through 2035 due to its superior accuracy, wider dynamic range, and magnetic flux compensation properties, making it the preferred architecture for high-performance automotive and grid-infrastructure current sensing deployments.

2. By Sensing Type

Direct Current Sensing: The dominant sensing method in 2025, favored for its higher accuracy and real-time monitoring capabilities essential for industrial automation, electric vehicles, and renewable energy systems where reliable performance and precise energy management are critical. Projected to reach USD 2.2 billion by 2035.

Indirect Current Sensing: Growing at an accelerating pace, leveraging magnetic field detection and Rogowski coil architectures to deliver galvanically isolated current measurement in high-voltage environments. Projected to reach USD 2.62 billion by 2035, reflecting its expanding role in grid infrastructure and EV fast-charging applications.

3. By Technology Type

Hall-Effect Current Sensing ICs: Dominated the market with approximately 44% revenue share in 2025, reflecting their strong cost-performance advantage in automotive, consumer electronics, and industrial applications requiring compact, integrated current measurement without electrical isolation complexity.

Isolated Current Sensors: Comprising fluxgate transducers, current transformers, and TMR-based architectures, isolated sensors are the fastest-growing technology segment, driven by

safety requirements in EV battery packs, solar inverters, and high-voltage industrial motor drives where galvanic isolation is mandatory.

Non-Isolated Current Sensors: Including shunt resistor-based and inline measurement solutions, non-isolated sensors retain strong volume demand in cost-sensitive applications such as consumer battery management, SMPS units, and low-voltage IoT power management modules.

Fiber-Optic Current Sensors: Forecast to deliver a CAGR of 13.1% through 2035, gaining significant traction in high-voltage substation monitoring and transmission line sensing where electromagnetic interference immunity and intrinsic safety are paramount requirements.

4. By Current Range

Less than 100A: The highest-volume range segment, serving consumer electronics, wearable devices, IoT sensors, and compact industrial power supplies where low-current, high-accuracy measurement in miniaturized packages is essential.

100A–1,000A: The dominant range segment by revenue, reflecting strong demand from industrial motor drives, EV battery systems, renewable energy inverters, and commercial UPS units where mid-range current measurement combines versatility with high performance and energy efficiency compliance.

More than 1,000A: A specialized high-growth segment serving grid infrastructure, large industrial converters, railway traction systems, and utility-scale energy storage where robust current sensing under extreme electrical stress conditions is required.

5. By Application

Motor Drives: The leading application segment, where current sensors enable precise torque control, stall detection, and energy optimization in industrial servo systems, HVAC compressors, and EV traction motor inverters.

Battery Management Systems (BMS): A critical and fast-growing application driven by EV and stationary storage proliferation, requiring ultra-accurate coulomb counting and state-of-charge estimation across large multi-cell battery packs.

Fast DC Chargers (EV): An emerging high-growth application as global EV charging infrastructure expands, requiring current sensors capable of monitoring high-voltage DC flows with microsecond response times to ensure charge safety and efficiency compliance.

Grid Infrastructure: Including smart metering, substation automation, and demand response systems, where current sensors provide the real-time power quality data essential for grid stability management and renewable energy dispatch optimization.

UPS & SMPS, Converters & Inverters: Representing stable volume demand from data center power infrastructure, industrial automation, and telecommunications power systems where continuous, high-reliability current monitoring is a baseline operational requirement.

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□ Regional Insights

North America: North America commands the largest regional share at approximately 33% of the current sensor market in 2025, driven by surging data-center power monitoring demand for AI workloads, federal grid modernization programs, and robust EV infrastructure investment. The US current sensor market is projected to grow from USD 620.31 million in 2025 to USD 1.325 billion by 2035 at a CAGR of 7.8%, underpinned by the Inflation Reduction Act's incentives for EV adoption and clean energy deployment. Strong consumer electronics and industrial automation demand from established semiconductor ecosystems further reinforces the region's leadership position.

Asia-Pacific: Asia-Pacific is both the largest single-region market at approximately 43.7% revenue share in 2024 and the fastest-growing region, registering a CAGR exceeding 10.5% through 2035. China's massive EV production subsidies, India's Production Linked Incentive (PLI) scheme for semiconductor manufacturing, and the region's deep electronics manufacturing supply chain across Taiwan, South Korea, and Japan collectively drive this dominance. Rapid urbanization, expanding renewable energy installations, and widespread adoption of industrial automation across technologically intensive commercial hubs make Asia-Pacific the single most critical geography for current sensor procurement globally.

Europe: Europe holds the second-largest share at approximately 27% of global current sensor market revenue, anchored by stringent functional-safety standards and aggressive renewable-energy integration targets. The EU's Euro 7 emissions regulation, mandating real-time powertrain current monitoring in all new vehicles, has accelerated automotive-grade Hall-effect sensor and fluxgate transducer procurement across the region's Tier-1 automotive supplier ecosystem. Europe's leadership in offshore wind energy and cross-border grid interconnection projects also sustains robust demand for high-voltage current sensing solutions in power generation and transmission infrastructure.

Middle East & Africa and South America: The Middle East & Africa and South America represent emerging growth corridors for the current sensor market, driven by large-scale smart-city initiatives, expanding industrial electrification programs, and rapidly growing renewable energy project pipelines. GCC nations' national energy transition roadmaps and Brazil's hydroelectric and solar power expansion are creating new procurement volumes for grid-infrastructure current sensing solutions, while increasing consumer electronics manufacturing activity is

progressively building regional demand for compact, low-power current sensor ICs.

□ Top Key Companies

The global current sensor landscape is highly consolidated around critical semiconductor vendors, precision analog specialists, and magnetic sensing technology pioneers, which include:

Infineon Technologies AG: A dominant global leader piloting advanced Hall-effect and TMR current sensor ICs for automotive EV powertrain, industrial motor drive, and renewable energy inverter applications across international markets.

Honeywell International Inc.: A global leader combining precision magnetic sensing expertise with robust industrial-grade current transducer products to serve commercial buildings, aerospace, and critical power infrastructure sectors worldwide.

Texas Instruments Incorporated: A major analog semiconductor provider delivering high-accuracy, low-drift current sensing amplifiers and integrated shunt monitor ICs for industrial automation, battery management, and power supply applications.

Allegro MicroSystems, Inc.: A scaling current sensor innovator specializing in Hall-effect and TMR-based isolated current sensing ICs, including the industry-first 10 MHz ACS37100 TMR sensor, designed for EV, clean energy, and AI data center power monitoring.

Tamura Corp.: An international specialist bringing precision closed-loop fluxgate current transducers to industrial motor control, railway traction, and grid-tied renewable energy converter markets across Asia-Pacific and Europe.

TDK Corporation: A global leader combining advanced magnetic material science with integrated current sensing module design to deliver automotive-qualified and industrial-grade current measurement solutions at scale.

LEM International SA: A pioneer in high-accuracy, galvanically isolated current and voltage transducers for industrial drives, railway, and renewable energy applications, renowned for fluxgate and Hall-effect transducer precision.

Eaton Corporation PLC: A major global power management company integrating current sensing technology across its circuit protection, UPS, and industrial power distribution product ecosystems for energy-efficient infrastructure deployments.

Sensitec GmbH: An emerging magnetoresistive current sensor specialist delivering compact, high-bandwidth AMR and GMR sensor solutions for precision industrial automation, servo drive, and energy metering applications.

Pulse Electronics: An international provider bringing inductive current sensing transformers and power conversion components to telecommunications infrastructure, server power supplies, and industrial electronics markets globally.

□ Emerging Trends and Future Outlook

The future of the current sensor market lies in the breakdown of silos between macro-power system monitoring and micro-device level silicon integration. Industry leaders are focusing on creating cohesive digital environments where a current sensor IC doesn't just measure electron flow, but continuously generates power telemetry data via connected IoT endpoints to optimize the next energy management deployment cycle. This data simultaneously allows system architects to refine predictive fault detection models and proactively push protective alerts to motor controllers and battery management systems before a catastrophic over-current or thermal runaway event occurs.

As multi-vector electrification trends—spanning EV proliferation, smart grid modernization, AI data center power scaling, and industrial automation decarbonization—continue to merge with miniaturized IoT sensor architectures, the automated transmission of real-time current waveforms, historical energy consumption baselines, and verifiable fault indicators will become a standard benchmark. This ensures that the current sensor market remains highly accurate, fast-responding, and structurally resilient against the complex and evolving power management challenges of a fully electrified global economy through 2035 and beyond.

□ FAQs

Q – How do continuous IoT-integrated current monitoring tools affect the total addressable market for current sensors?

Ans – Automated real-time current tracking and IoT-integrated monitoring solutions lower the power system evaluation barriers for industrial and EV operators by 40% to 60%, removing immediate manual verification friction.

Q – What core methodologies should system designers verify before deploying isolated current sensors in EV battery management applications?

Ans – Designers must analyze historical thermal drift and offset voltage performance across the full automotive temperature range (-40°C to +125°C), simulate sensor response under dynamic fast-charge current profiles against worst-case electromagnetic interference baselines.

□□□ Regional & Country-Level Reports by Market Research Future:

US Current Sensor Market:

<https://www.marketresearchfuture.com/reports/us-current-sensor-market-18144>

□□□ Comprehensive Research by Market Research Future:

High Density Interconnect Pcb Market-

<https://www.marketresearchfuture.com/reports/high-density-interconnect-pcb-market-7290>

Display Driver Market-

<https://www.marketresearchfuture.com/reports/display-driver-market-7315>

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