Data Acquisition - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-06-01 | 120 pages | Mordor Intelligence

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Report description:

Data Acquisition Market Analysis

The Data Acquisition market size was valued at USD 3.33 billion in 2025 and is forecast to reach USD 4.56 billion by 2030, advancing at a 6.49% CAGR. Hardware platforms continued to dominate because laboratories, factories, and test cells relied on proven sensor-to-digitizer chains, yet spending shifted steadily toward software-defined architectures that extended hardware life and improved channel configurability. Rapid electrification of vehicles, rising battery gigafactory investments, and the deployment of Time-Sensitive Networking (TSN) raised the technical bar for measurement precision and time-correlated data streams across thousands of channels. Wireless interfaces expanded quickly as engineers prioritized installation flexibility in harsh or mobile environments, while edge-enabled analytics reduced latency and trimmed host-computer workloads in predictive-maintenance rollouts across Asia-Pacific manufacturing hubs. Regionally, North America retained leadership owing to its deep aerospace and defense test infrastructure, whereas Asia-Pacific emerged as the fastest-growing arena on the back of semiconductor and EV boomtowns. Competitive intensity rose as specialized software firms entered with cloud-ready analytics stacks, nudging incumbent hardware vendors to bundle integrated ecosystems rather than stand-alone devices.

Global Data Acquisition Market Trends and Insights

Time-Sensitive Networking unlocks deterministic Ethernet

TSN deployments reduced synchronization errors to sub-microsecond levels and eliminated costly dedicated timing hardware,

cutting total system expense by 15-20% for missile, satellite, and high-speed machinery tests. Early adopters in aerospace reported measurement-accuracy gains of 40%, allowing engineers to consolidate previously separate analog, digital, and timing buses inside one hardened network. OEMs that embedded TSN switches directly into sensor nodes delivered turnkey, tightly synchronized racks ready for plug-and-play lab expansion.

Edge-enabled DAQ transformed predictive maintenance

Machine-learning routines pushed to the measurement edge shortened anomaly-detection latency from seconds to milliseconds, stopping semiconductor photolithography faults that historically cost up to USD 100,000 per downtime hour. South Korean fabs documented 38% drops in unexpected stoppages after installing vibration, acoustic, and thermal sensors wired into embedded processors that executed local FFT and envelope-detection routines, forwarding only flagged events to the cloud. The model slashed bandwidth costs and safeguarded proprietary process data behind on-premise firewalls.

Upgrading to PXIe stretched capital budgets

Replacing aging PCI racks with PXIe chassis often topped USD 250,000 per facility once software rewrites, fixture retrofits, and staff retraining were tallied. Many universities and SME labs ran parallel systems for six months to safeguard certification schedules, effectively doubling maintenance overhead during switchover windows. Consequently, some institutions deferred upgrades, risking obsolescence and limited driver support for newer operating systems.

Other drivers and restraints analyzed in the detailed report include:

Digital-twin integration reshaped automotive validation / Gigafactory channel explosion drove high-density architectures / Vendor-locked protocols hampered multi-site integration /

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

Segment Analysis

The 32-128 channel class captured 47.3% of the Data Acquisition market share in 2024. Laboratories favored this sweet spot because it balanced scalability with manageable cabling, suiting multi-axis vibration, durability, and EMI evaluations. Gigafactory rollouts, however, catapulted racks exceeding 128 channels to an 8.8% CAGR. Battery cell formation lines stitched hundreds of 32-channel cards into fiber-linked islands to monitor voltage and temperature across 10,000 nodes, ensuring thermal run-away detection at 0.1% tolerance.

Demand for distributed architectures re-shaped equipment design. Vendors adopted "node-per-rack" wiring schemes, embedding ADCs close to sensors to cut signal-integrity losses. Smaller (<32 channel) boxes still thrived inside educational labs and portable field kits, yet their overall slice fell as product validation expanded breadth and depth. Over the forecast, suppliers bundling auto-discovery firmware and hot-swap backplanes are best positioned to ride the surge in channel density within the Data Acquisition market.

Hardware accounted for 70.5% of the Data Acquisition market in 2024, yet software revenues climbed at a healthy 9.5% pace as users licensed analytics stacks that injected machine-learning algorithms straight into FPGA resources. Incorporating drag-and-drop DSP libraries lets engineers filter, resample, and trend data on the card, trimming host-CPU cycles by 70%.

Service lines also swelled. Aerospace primes outsourced system-integration projects covering sensor selection, rack layout, and API customization to vendors' professional-services arms. The shift nudged legacy hardware-only firms to pivot toward

subscription-oriented software modules delivering continuous deployment updates. Over time, value migrated from board-level features to configurable IP cores, cementing software as the pivot point for differentiation within the Data Acquisition market.

Data Acquisition System Market is Segmented by Channel Count (<32, 32-128, and >128), by Offering (Hardware, and More), by Sampling Speed (? 100 KS/S and > 100 KS/S), by Interface (Ethernet/LAN, and More), by Application (Design Validation and Functional Test, and More), by End-User Industry (Automotive and E-Mobility, and More), and by Geography (Nort America, South America, Europe, Asia-Pacific, and Middle East and Africa).

Geography Analysis

North America commanded 33.2% of 2024 revenue because its aerospace giants, defense primes, and big-three automakers drove early adoption of TSN and high-density PXI systems. NASA's Space Launch System telemetry station processed over 200,000 Ethernet channels in real time, showcasing local research and development prowess. Large federal budgets enabled rapid refresh cycles, cementing regional leadership.

Asia-Pacific clocked the fastest 9.8% CAGR to 2030. China's battery-gigafactory build-out and South Korea's semiconductor expansions consumed thousands of channel cards per site, while India's growing rocket-launch ambitions required rugged DAQ crates that withstand vibration spectra above 14 g rms. Governments funneled incentives into smart manufacturing, spurring demand for edge-enabled wireless nodes and pushing local vendors into the global Data Acquisition market.

Europe maintained a robust footprint anchored by German automotive research and development and ESA space projects. Digital-twin benches inside Stuttgart labs fused synchronized DAQ streams with virtual engines, trimming prototype cycles. The ExoMars rover called for electronics that survived -80 C to +70 C temperature swings, pushing European suppliers toward radiation-hardened designs. Renewable-energy mandates in the North Sea further accelerated orders for corrosion-proof, long-haul DAQ cabling and wireless bridges.

List of Companies Covered in this Report:

National Instruments (NI) Corporation / Keysight Technologies Inc. / Yokogawa Electric Corporation / HBK (Hottinger Bruel & Kj?r) A/S / Advantech Co. Ltd. / Dewesoft d.o.o / Dewetron Inc. / HIOKI E.E. Corp. / Imc Test & Measurement GmbH / ADLINK Technology Inc. / Spectrum Instrumentation GmbH / Measurement Computing (MCC) Corporation / Elsys AG / GaGe (DynamicSignals LLC) / Microstar Labs Inc. / Bustec Solutions Ltd. / Data-Translation GmbH / DATAQ Instruments Inc. / Graphtec Corporation / OROS S.A. / Curtiss-Wright Corporation / Siemens AG / Pico Technology Ltd. / Ametek Inc. / Rohde & Schwarz GmbH & Co. KG / Intrepid Control Systems Inc. /

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