Digital Substation Market by Transformers, Busbars, Circuit Breakers, Protection Relays, Switchgears, Interfacing Units, Fiber-optic Communication Networks, SCADA Systems, Transmission Substation and Distribution Substation - Global Forecast to 2030

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Report description:

The global digital substation market is projected to reach USD 19.78 billion by 2030, up from USD 14.41 billion in 2025, at a CAGR of 6.5% during the forecast period.

https://mnmimg.marketsandmarkets.com/Images/digital-substation-market-img-overview.webp

The digital substation market is growing steadily, driven by the shift from traditional power infrastructure to intelligent, automated systems. Utilities and transmission operators are increasingly investing in digital substations to boost operational reliability, enhance asset visibility, and enable predictive maintenance with real-time data analytics. The integration of renewable energy sources, especially solar and wind, into transmission networks is speeding up the deployment of digital substations that can manage variable power flows and maintain grid stability. Advances in sensors, protection relays, and SCADA systems are facilitating quicker fault detection, less downtime, and better interoperability across networks. Additionally, government initiatives promoting smart grids and decarbonization are opening opportunities for adopting modular, cybersecurity-focused, and IoT-enabled substation designs. As digital twin and process bus technologies develop, the digital substation market is expected to play a key role in shaping the future of efficient, sustainable, and intelligent power transmission systems.
"New installations to register the fastest growth in the installation type segment in the digital substation market."
New installations are expected to show the fastest growth in the digital substation market during the forecast period. Utilities worldwide are prioritizing the replacement of aging grid infrastructure with advanced digital systems to enhance operational

efficiency, grid reliability, and renewable energy integration. As nations modernize transmission and distribution networks, new digital substations equipped with intelligent electronic devices (IEDs), process bus systems, and SCADA platforms are being deployed to support real-time monitoring and remote operations. Governments and regulatory bodies are also promoting the deployment of new substations through smart grid development programs and renewable integration initiatives. In regions such as Asia Pacific and the Middle East, rapid urbanization and industrialization are driving demand for new high-voltage substations to support grid expansion and stability. With benefits like reduced maintenance, improved safety, and enhanced data-driven decision-making, new installations are expected to surpass retrofit projects and drive significant growth in the global digital substation market.

"Transformers segment to account for the largest share among hardware in the digital substation market."

Transformers are expected to hold the largest share of the hardware segment in the digital substation market. As vital components of power transmission and distribution systems, transformers facilitate voltage conversion, manage power flow, and support efficient grid operation. The adoption of digital transformers equipped with sensors, monitoring systems, and communication interfaces is rapidly increasing as utilities shift toward real-time condition monitoring and predictive maintenance. These digital features improve grid reliability by detecting faults, optimizing load distribution, and minimizing downtime. Additionally, the integration of renewable energy sources like solar and wind has heightened the need for high-performance transformers capable of handling variable generation and bidirectional power flows. Technological innovations, such as digital twin modeling and fiber-optic current sensing, further enhance operational efficiency and lifecycle management. With ongoing grid modernization initiatives and rising demand for intelligent, cybersecure hardware, transformers are poised to maintain their dominant role within the digital substation hardware segment throughout the forecast period.

"Europe is expected to account for the second-largest market share in 2025."

Europe is expected to hold the second-largest share of the digital substation market during the forecast period, driven by strong commitments to renewable energy integration, grid modernization, and decarbonization. The European Union's emphasis on smart grid infrastructure, through initiatives like the Green Deal and REPowerEU, is speeding up the deployment of digital substations across transmission and distribution networks. Countries such as Germany, the UK, France, and the Nordics are actively investing in next-generation substation automation systems to support high renewable penetration and cross-border power exchange. Utilities in the region are also prioritizing cybersecurity and IEC 61850 compliance to ensure secure, interoperable grid communication. Additionally, the increasing replacement of aging substations and the expansion of offshore wind and interconnector projects are driving further demand. Supported by advanced technological ecosystems and leading OEMs such as Siemens Energy, ABB, and Schneider Electric, Europe continues to be a key contributor to innovation and adoption within the global digital substation landscape.

The break-up of the profile of primary participants in the digital substation market

- By Company Type: Tier 1 - 40%, Tier 2 - 30%, Tier 3 - 30%
- By Designation Type: Directors - 30%, Managers - 20%, Others - 50%
- By Region Type: Europe - 30%, North America - 20%, Asia Pacific - 40%, Rest of the World - 10%

Note: Other designations include sales, marketing, and product managers.

The three tiers of the companies are based on their total revenue as of 2024, Tier 1: >USD 1 billion, Tier 2: USD 500 million-1 billion, and Tier 3: USD 500 million

The major players in the digital substation market with a significant global presence include Hitachi Energy (Switzerland), Siemens Energy (Germany), GE Vernova (US), ABB Ltd. (Switzerland), Schneider Electric (France), and others.

Research Coverage

The report segments the digital substation market and forecasts its size by module, type, installation type, voltage, architecture type, industry, and region. It also provides a comprehensive review of drivers, restraints, opportunities, and challenges impacting market growth. The report covers both qualitative and quantitative aspects of the market.

Reasons to Buy the Report:

The report will assist market leaders and new entrants by providing approximate revenues for the overall digital substation

market and its segments. It will help stakeholders understand the competitive landscape and gain insights to strengthen their market position and develop effective go-to-market strategies. Additionally, the report offers key market insights, including main drivers, restraints, opportunities, and challenges.

The report provides insights into the following pointers

-□Analysis of key drivers (increasing adoption of smart grid infrastructure, rising integration of renewable energy sources, and growing demand for advanced substation automation), restraints (high initial investment and implementation complexity, and limited interoperability between legacy and digital systems), opportunities (expanding deployment of IEC 61850-compliant substations, and growing adoption of digital twins and AI/ML-based predictive maintenance solutions), and challenges (cybersecurity vulnerabilities in connected grid environments, and shortage of skilled workforce for system integration and maintenance)

-□Product Development/Innovation: Detailed insights on upcoming technologies, research & development activities, and new product launches in the digital substation market

-□Market Development: Comprehensive information about lucrative markets - the report analyzes the digital substation market across varied regions

-□Market Diversification: Exhaustive information about new products, untapped geographies, recent developments, and investments in the digital substation market

-□Competitive Assessment: In-depth assessment of market shares, growth strategies, and product offerings of leading players, including Hitachi Energy (Switzerland), Siemens Energy (Germany), GE Vernova (US), ABB Ltd. (Switzerland), and Schneider Electric (France)

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