

Merging Unit Market Forecasts to 2034 – Global Analysis By Component (Hardware and Software), Type, Communication Protocol, Application, End User and By Geography

<https://marketpublishers.com/r/M4CC1E13EA69EN.html>

Date: July 2026

Pages: 0

Price: US\$ 4,150.00 (Single User License)

ID: M4CC1E13EA69EN

Abstracts

According to Statistics MRC, the Global Merging Unit Market is accounted for \$0.4 billion in 2026 and is expected to reach \$0.6 billion by 2034 growing at a CAGR of 5.4% during the forecast period. Merging units are intelligent electronic devices that digitize analog signals from instrument transformers, including current transformers and voltage transformers, converting them into digital data format for transmission to protection and control systems in substations. These devices are essential components in digital substations, enabling the transition from conventional analog systems to IEC 61850-compliant digital substation architectures. The market serves transmission substations, distribution substations, generation plants, and industrial facilities, with end users including utilities, independent power producers, industrial enterprises, and commercial facilities. Growing investments in smart grid infrastructure, increasing adoption of digital substation technologies, and rising demand for reliable power supply are key drivers of market expansion across all regions.

Market Dynamics:

Driver:

Growing investments in digital substations and smart grid infrastructure

The increasing global investments in digital substation modernization and smart grid infrastructure are primary drivers for the merging unit market. Digital substations offer advantages including reduced cabling, enhanced data accuracy, improved reliability,

and simplified maintenance compared to conventional substations. Merging units are fundamental components of digital substations, enabling the digitization of analog signals for protection and control applications. Utilities worldwide are investing in substation automation and grid modernization to improve operational efficiency, power quality, and renewable energy integration. Government initiatives promoting smart grid development and infrastructure modernization are accelerating digital substation adoption, creating substantial demand for merging units across transmission, distribution, and generation applications.

Restraint:

High implementation costs and integration challenges with legacy infrastructure

The significant capital investment required for digital substation implementation and integration with existing legacy systems represent major restraints for the merging unit market. Retrofitting existing substations with merging units and digital infrastructure requires substantial investment in new equipment, cabling, and communication networks. Integration with legacy protection and control systems presents technical challenges and requires specialized expertise. Workforce training for digital substation technologies adds to implementation costs and timelines. The transition from analog to digital systems requires significant planning and coordination. These cost and integration barriers may slow adoption, particularly among utilities with constrained capital budgets and extensive legacy infrastructure.

Opportunity:

Integration with IEC 61850 and advanced communication protocols

The global standardization of IEC 61850 communication protocol for substation automation presents significant opportunities for the merging unit market. IEC 61850 enables interoperability between devices from different manufacturers, creating competitive markets and reducing vendor lock-in. The protocol supports advanced communication features, enabling real-time data exchange for protection, control, and monitoring applications. Merging units compliant with IEC 61850-9-2 for sampled values and IEC 61850-8-1 for GOOSE messaging are increasingly adopted globally. As standards adoption expands and interoperability improves, merging unit deployment accelerates across substation modernization projects, creating substantial market opportunities for compliant products.

Threat:

Cybersecurity vulnerabilities in digital substation communication

Cybersecurity risks associated with digital communication networks in substations pose significant threats to the merging unit market. Merging units communicate critical protection and control data over digital networks, creating potential attack vectors for cybercriminals. Compromised merging units could provide false data or be manipulated to cause protection misoperation, potentially leading to power outages or equipment damage. Regulatory cybersecurity requirements impose compliance obligations on utilities and equipment manufacturers. Security validation and ongoing vulnerability management add operational costs. These cybersecurity risks may lead risk-averse utilities to delay digital substation adoption or implement additional protective measures, affecting market growth.

Covid-19 Impact:

The COVID-19 pandemic had a mixed impact on the merging unit market. Supply chain disruptions affected component availability and equipment manufacturing, causing project delays. Lockdowns and social distancing measures limited site access for installation and commissioning activities. However, remote monitoring and control capabilities enabled by digital substations demonstrated value during the pandemic, reinforcing the business case for substation automation investment. Utilities continued grid modernization planning and investment, though project timelines extended. Post-pandemic, substation automation and digitalization investment has resumed and accelerated, driven by grid modernization priorities and government infrastructure spending.

The Transmission Substations segment is expected to be the largest during the forecast period

The Transmission Substations segment is expected to account for the largest market share during the forecast period, driven by the critical role of transmission infrastructure in power grid reliability and the significant investment in transmission substation modernization. Transmission substations require merging units to digitize high-voltage instrument transformer signals for protection and control applications. High-voltage transmission networks are the backbone of power systems, ensuring reliable power delivery across regions. Utilities prioritize transmission infrastructure investment, including substation automation and digitalization. Merging units in transmission

substations support wide-area monitoring, protection, and control. With significant transmission investment globally, this segment maintains the largest market share throughout the forecast period.

The Industrial Enterprises segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the Industrial Enterprises segment is predicted to witness the highest growth rate, fueled by increasing industrial automation, growing captive power generation, and rising demand for reliable power supply in industrial facilities. Industrial enterprises including manufacturing plants, data centers, and heavy industries are investing in substation modernization to improve power quality, reliability, and operational efficiency. The adoption of digital substation technologies in industrial facilities is accelerating as process automation and digitalization become priorities. Merging units enable integration of substation data with industrial control systems and enterprise management platforms. As industrial automation advances and power reliability becomes increasingly critical, the industrial enterprises segment delivers the fastest market growth.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share, supported by significant grid modernization investment, early adoption of digital substation technologies, and established utility infrastructure. The United States has substantial transmission and distribution infrastructure requiring modernization. Utility investment in substation automation and smart grid technologies creates consistent demand. Strong regulatory frameworks supporting grid reliability and modernization drive technology adoption. Major merging unit manufacturers and technology providers have significant presence in the region. With ongoing infrastructure modernization and replacement, North America maintains its dominant market position throughout the forecast period.

Region with highest CAGR:

Over the forecast period, the Asia-Pacific region is anticipated to exhibit the highest CAGR, driven by rapid infrastructure development, expanding power generation capacity, and significant grid expansion across countries including China, India, Japan, and Southeast Asia. The region's fast-growing economies are investing heavily in power infrastructure to support industrialization and urbanization. New transmission and

distribution projects create substantial merging unit demand. Grid modernization and smart grid initiatives support technology adoption. Government investments in renewable energy integration create additional substation requirements. As infrastructure investment accelerates across the region, Asia Pacific delivers the fastest merging unit market growth globally.

Key players in the market

Some of the key players in Merging Unit Market include ABB Ltd., Siemens AG, Schneider Electric SE, GE Vernova, Hitachi Energy, Artech, Toshiba Corporation, Schweitzer Engineering Laboratories (SEL), NR Electric Co., Ltd., Ingeteam, Efacec, Schniewindt GmbH & Co. KG, Shanghai Sieyuan Electric, CYG Sunri Co., Ltd., Beijing Sifang Automation, Wuhan Haomai Electric Power, Guangdong Baiyun Electric, and Power Grid Components Inc.

Key Developments:

In June 2026, Hitachi Energy expanded its digital manufacturing ecosystem, committing an investment of approximately INR 2,000 crore to establish a fully digital, smart-grid-ready Large Power Transformer factory in Vadodara, India, to support massive regional non-fossil fuel energy integration.

In March 2026, Siemens announced its new SIPROTEC V software-defined protection and control system at DISTRIBUTECH 2026, a virtualized platform that subscribes to Sampled Values published by field-level merging units over an IEC 61850-9-2 process bus, consolidating up to 60 hardware Intelligent Electronic Devices (IEDs) onto a single COTS server.

In February 2026, GE Vernova introduced its GridBeats™ APS (Automation and Protection System) software-defined grid automation solution at DTECH 2026, allowing utilities to consolidate hundreds of individual communication packages and seamlessly capture digital data streams from network merging units.

In February 2025, LF Energy reached its v1.0 release for the SEAPATH reference platform, incorporating long-term virtualization solution compatibility for virtualized Protection, Automation, and Control (vPAC) applications supported by ABB's SSC600 software engine.

Components Covered:

Hardware

Software

Types Covered:

Standalone Merging Units

Embedded Merging Units

Communication Protocols Covered:

IEC 61850-9-2

IEC 61850-8-1

Proprietary Protocols

Applications Covered:

Transmission Substations

Distribution Substations

Generation Plants

Industrial Facilities

End Users Covered:

Utilities

Independent Power Producers (IPPs)

Industrial Enterprises

Commercial Facilities

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of Africa

What our report offers:

Market share assessments for the regional and country-level segments

Strategic recommendations for the new entrants

Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)

Strategic recommendations in key business segments based on the market estimations

Competitive landscaping mapping the key common trends

Company profiling with detailed strategies, financials, and recent developments

Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

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