

# GLOBAL SUBSTATION AUTOMATION MARKET (2013 – 2018)

By Components – IEDS (Digital Relays, Smart Meters, Recloser Controller, Capacitor Bank Controller) & Communication Technology (Optical Fiber, PLC, Copper Wire, Ethernet), SCADA & Geography

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# Report Description

## Key Take-aways

- Global Substation Automation market statistics with detailed classifications and splits by revenue.
- The report covers the expected penetration rate of substation automation in each application, component, and geography, which gives an in-depth insight of the extent to which the particular application will be successful.
- Impact analysis of the market dynamics with factors currently driving and restraining the growth of the market, along with their impact in the short, medium, and long term landscapes.
- Complete value chain, allied industry segments & value chain analysis of the global substation automation industry and their impacts on the market.
- Detailed segmentation of global substation automation market by components with a focus on cross segment markets like applications, and geographies.
- Illustrative segmentation, analysis, and forecast of the major geographical markets to give an overall view of market.
- The future of each type of substation automation market & industry from both - technical and market-oriented perspectives with techno-market oriented roadmaps till 2018.
- Detailed competitive landscape with identification of the key players with respect to each type of substation automation market, in-depth market share analysis with individual revenue, market shares, and market share rankings.
- Competitive intelligence from the company profiles, key player strategies, game-changing developments such as product launches and acquisitions.

## Report Description

Substation Automation is an integration of various protections, control and data acquisition functions on an automated platform with minimal number of units to reduce the operating costs, lessen the control panel and room space, and to eliminate redundant equipment. The automation functions and applications ranging from supervisory control and data acquisition (SCADA) and alarm processing to integrated voltage variation control, metering to record information generated by substation devices in order to optimize the management of assets and enhance operation and maintenance efficiencies with minimal human intervention.

The substation automation market segmentation revolves around the five major market parameters namely: component, communication network, substation types, applications, and geography.

IEDs are the major components of substation automation

market which includes Digital Relays, Programmable Logical Controllers, Smart Meters/Digital Transducers, Load Tap Changer Controller, Capacitor Bank Controller and Recloser Controller.

Wired communication network are considered in the substation automation which includes copper wire communication, fiber optic communication, Ethernet (Copper or Optic Fiber) communication, and Power line communication (PLC). Types of the substations in the report are Transmission substation, Distribution substation and Collector substation. Collector substation is the substation where power is gathered from various sources such as wind farm).

SCADA market is also included in the substation automation market. The substation automation market is also mapped against geography which includes North America, Europe, APAC and ROW.

# Report Description

## Markets Covered

The substation automation market is segmented into:

- Components:
  - o IEDs –Programmable Logical Controller, Digital Protective Relays, Digital Transducers/Smart Meters, Load Tap Changer Controller, Capacitor Bank Controller, Recloser Controller
  - o Communication Networks - Copper Wire communication, Fiber Optic communication, Ethernet (Copper or Optic Fiber) communication, and Power Line Communication (PLC)
- Types: Transmission substation, Distribution substation and Collector substation
- Applications: Supervisory Control and Data Acquisition (SCADA).
- Geographies: North America, Europe, Asia-Pacific (APAC), and Rest of the World (ROW).

## Stake Holders

- IED Manufacturers
- SCADA Solution Providers
- Communication Network Providers
- Power Utilities
- Turnkey Contractors
- Distributors and Traders
- Research Organizations
- Forums, Alliances and Associations

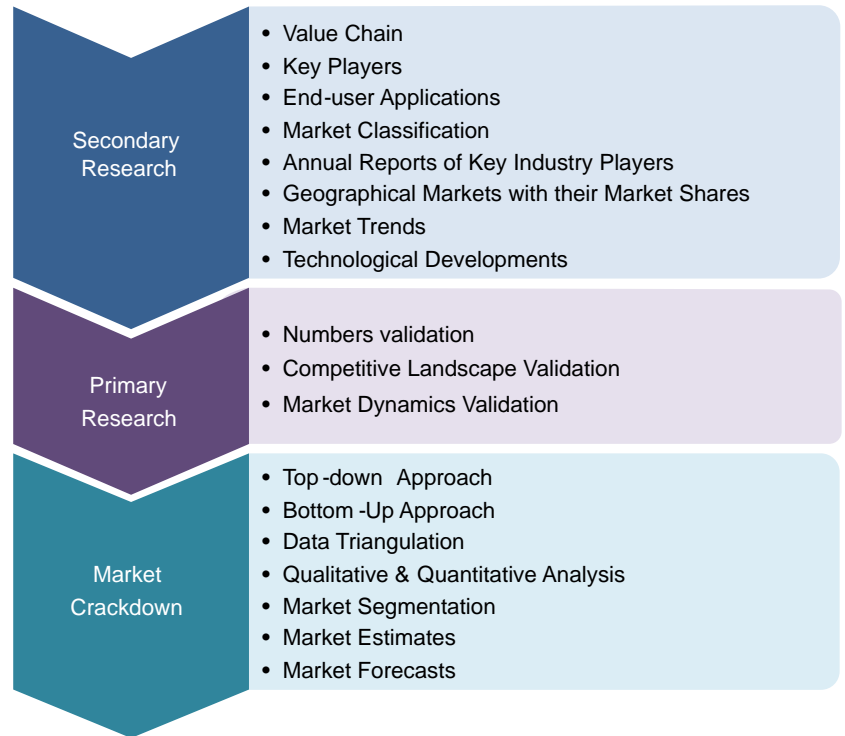
## Research Methodology

Research methodology	Description
Secondary Research	<ul style="list-style-type: none"> <li>• Various secondary sources, directories, and databases such as Factiva and OneSource have been used to identify and collect information useful for this extensive study.</li> <li>• Additional commercial insight has been extracted from various market reports, whitepapers, research presentations, articles, and professional experts.</li> <li>• Companies' news and their financial reports were analysed.</li> </ul>
Primary Research	<ul style="list-style-type: none"> <li>• Telephonic conversations and discussions were conducted with industry veterans, researchers, and substation automation providers to gain first hand data.</li> <li>• Gained market share of the players, geographical split, and growth rate of the industry from primary research.</li> <li>• Latest trends happening in substation automation market.</li> </ul>

# Report Description

## Steps in Research Methodology

We have used extensive secondary sources, directories, and databases such as Factiva, OneSource to identify and collect information useful for this extensive technical and commercial study of the substation automation market. The primary sources – experts from related industries and preferred substation automation providers have been interviewed to obtain and verify critical information as well as assess the future prospects. The self-illustrative figure above shows the market research methodology applied in making this report based on substation automation market.



## Markets Size

The size of the overall market was derived by forecast techniques based on the usage of different components such as IEDs and communication networks used for the substation automation, the analysis of the application areas, and the trend for various geographical regions. The geographical split is

determined using secondary sources verified by primary sources. It is based on various parameters such as numbers of players in a particular region and the extent of research activity occurring in geographies like North America, Europe, APAC & ROW.

## Key Data Points taken from Secondary Sources

- Data for extensive and exhaustive segmentation and classification of the global substation automation market.
- Revenue of the companies from annual reports and database portals such as Manta, Factiva, and OneSource. Dun & Bradstreet.
- Market growth rates and potential applications from technical papers and published research reports.
- The recent activities of the major players contributing towards the market of substation automation.
- Validation and triangulation of all the numbers and graphs.
- Segmentation breakups, split-ups, and percentage shares.
- Data for market revenue and volume.
- Key industry trends of the top players of the substation automation market.

## Report Description

- Qualitative insights into various aspects of the market, key trends, emerging areas.
- Quantitative data for mathematical and statistical calculations.
- Company statistics (quantitative) and developments (qualitative) for company profiles.

### Key Data Points taken from Primary Sources

- Validation of various data points determined from secondary research and analysis. Data points such as commercialization year, penetration rate, and expected shipments.
- Market dynamics: drivers and restraints of the overall market.
- Future prospects for the substation automation market.
- Current and proposed production volumes of particular categories by market players.
- Validation of numbers of the various product and end-user application markets.
- Pricing estimation and validation of the pricing and forecasting model.
- Market shares of key industry players in the market.
- Forecast for various market segments of the overall markets and validation of the forecast data.
- Technological landscape, competition between technologies, industry preferences, market dynamics.

### Assumptions Made for this Report

All the general assumptions, terminologies & application key notes for market statistics & calculations, year-wise assumptions, forecast assumptions, and related important aspects for this research study are mentioned below.

### Report Assumptions

Research methodology	Assumption
Currency value	All the forecasts are done with the revenue and volume calculated under the standard assumption that the globally accepted currency - the U.S. Dollar's value remains constant over the next five years.
Exchange rates and currency Conversion	For conversion of various currencies to USD, average historical exchange rates were used according to the year specified. For all historical and current exchange rates required for calculations & currency conversions - OANDA - website was used in this research study.
Average Selling Prices (ASP)	The ASPs (average selling prices), wherever applied, are calculated using all kinds of suitable statistical and mathematical methods and considering external qualitative factors affecting the prices. All the calculations interconnected between the tables are done considering the finalized ASPs.

## Report Description

Research methodology	Assumption
Niche market segments	For niche market segments where accurate data of the respective time line was not available, the data was calculated using trend line analysis. In some instances, where mathematical and statistical models could not be applied to arrive at the number, generalization of specific related trends to that particular market was done.
Qualitative analysis	The qualitative analysis done from the quantitative data arrived at is solely based on the understanding of the market and its trends by the team of experts involved in making this report.
SCADA	The market of SCADA only includes the contribution towards substation automation.
Total market	In substation automation market IEDs, communication network and SCADA is included to derive the total market.
Communication technology	Wired communications are only considered in substation automation which includes Power Line Communication, Optical Fiber Communication, Copper wire communication and Ethernet (Copper or Fiber).
IEDs	The major IEDs included in the report are Programmable Logical Controller, Digital Transducer / Smart Meter, Digital Relays, Load Tap Controller, Capacitor Bank Controller and Recloser Controller.

### List of Companies covered during Study

- ABB (Switzerland)
- Alstom SA (France)
- Amperion (U.S.)
- Cisco Systems (U.S.)
- Cooper Power Systems (U.S.)
- EATON Corporation (Ireland)
- Echelon (U.S.)
- Encore Networks (U.S.)
- General Electric (U.S.)
- Grid Net (U.S.)
- Infrac Systems (U.S.)
- ITRON (U.S.)
- Landis+GYR (Switzerland)
- NovaTech (U.S.)
- RuggedCom (Canada)
- S&C Electric (U.S.)
- Seimens (Germany)
- Schneider Electric (France)
- Schweitzer Engg Lab (U.S.)
- Trilliant (U.S.)
- Tropos Networks (U.S.)

## Executive Summary

The power utilities have an extreme focus on reducing the transmission and distribution loss and are very positive towards deploying substation automation. The conventional electric grid does not support two-way communications whereas substation automation does that which helps in the reduction of transmission and distribution loss. The substation automation technology uses specialized sensors, dedicated software, and efficient two-way communication systems. Intelligent electronic devices like digital transducer, protective relays, recloser controller, programmable logical control and so on helps in monitoring and controlling the substation equipment.

IEDs are considered to be the key component of substation automation; it helps in improving operational efficiencies and reliability and gives more scope for enhancing predictive maintenance and planning. Programmable Logical Controller (PLC) & Digital Relays is considered to be the key component of IEDs. The PLC is rapidly replacing the Conventional Remote Terminal Units (RTUs) with smart RTUs which are integrated with PLCs or standalone PLCs operating in various sub-functions in automation whereas Digital Relays are used to protect expensive and critical equipment as transformers, distribution and transmission lines and often use more than one coil to calculate condition of electrical circuit and to trip circuit breaker if fault is detected.

Substation Automation is incomplete without communication as all the IEDs and monitoring devices located at substation and on the field actually generate a data that has to be passed on to the

utility data centre which is remotely located. Wired communications are majorly used in substation automation. The preferred wired communications in substation automation are power line communication, optical fibre communication, copper wire communication & Ethernet. Optical fiber communication is gaining more popularity as it has advantages over conventional copper wire communication such as lower attenuation and interference.

SCADA system is also being used for controlling, gathering and analysing real-time data. The SCADA systems enables the data transfer between a central host system and a number of Remote Terminal Units (RTUs) or Programmable Logic Controllers (PLCs), and the central host and the operator terminals.

North America is considered to be the leader in the overall market of substation automation whereas APAC is expected to grow exponentially. The countries like China & India are the major stakeholders in defining the future growth rate of the APAC market.

There are various companies contributing towards the substation automation market such as Schneider Electric (France), Rockwell Automation (U.S.), Eaton (U.S.) and so on are the major companies providing Programmable logic controller. Companies like SEL Inc. (U.S), GE (U.S.), ABB (Switzerland) are the major supplier of digital relays. Companies like GE (U.S.), ABB (Switzerland), Alstom (France) Siemens (Germany) and so on are also leading the turnkey projects.

**Global Substation Automation Market Revenue, By Module, 2012 - 2018 (\$Billion)**

Module	2012	2013	2014	2015	2016	2017	2018	CAGR% (2013-2018)
IEDs	74.62	xx	xx	xx	xx	xx	xx	2.6%
Communication Network	16.50	xx	xx	xx	xx	xx	xx	13.8%
SCADA	0.61	xx	xx	xx	xx	xx	xx	11.2%
<b>Total</b>	91.72	xx	xx	xx	xx	xx	xx	5.2%

The global substation automation market is estimated to reach \$xx billion in 2018 from \$xx billion in 2013 at a CAGR of 5.2% from 2013 to 2018. The overall CAGR of this market is low as

energy industry globally already has a big market and requires huge capital investments for new projects. Also market in western countries is already matured and thus has a slow

## Executive Summary

growth rate. IEDs play a significant role in total substation automation market as it has maximum share of almost xx% as of 2013 in the total market. IEDs market is estimated to reach \$xx billion in 2018 from \$xx billion in 2013 at a CAGR of 2.6% from

2013 to 2018. Communication networks though not contributing much in market share but has highest CAGR for this market as being the important part of automation, it also has dedicated vendor base across geographies.

**Global Substation Automation Market Revenue, By Components, 2012 - 2018 (\$Billion)**

Components	2012	2013	2014	2015	2016	2017	2018	CAGR% (2013-2018)
Programmable Logical Controller	15.00	xx	xx	xx	xx	xx	xx	3.1
Digital Transducer / Smart Meter	7.69	xx	xx	xx	xx	xx	xx	5.4
Digital Relays	18.33	xx	xx	xx	xx	xx	xx	0.7
Load Tap Controller	11.02	xx	xx	xx	xx	xx	xx	1.0
Capacitor Bank Controller	6.77	xx	xx	xx	xx	xx	xx	3.4
Recloser Controller	9.81	xx	xx	xx	xx	xx	xx	3.7
Others	6.00	xx	xx	xx	xx	xx	xx	3.2
<b>Total</b>	<b>74.62</b>	<b>xx</b>	<b>xx</b>	<b>xx</b>	<b>xx</b>	<b>xx</b>	<b>xx</b>	<b>2.6</b>

The global substation automation components market is expected to reach \$xx billion in 2018 from \$xx billion in 2013 at a CAGR of 2.6% from 2013 to 2018. Digital protective relays are expected to have the maximum share among all other components as being the most essential and critical part of substations. Followed by the programmable logical controller

that has numerous applications and could replace the Remote Terminal Units (RTUs). It is expected to grow at a CAGR of 3.1% from 2013 to 2018. Smart meters showing the maximum CAGR of 5.4% from 2013 to 2018 are not only being used for power consumption measurement at customer side but have various measurement and recording applications within the substation.

**Global Substation Communication Market Revenue, By Technology, 2012 – 2018 (\$Billion)**

Technology	2012	2013	2014	2015	2016	2017	2018	CAGR% (2013-2018)
Power Line Communication	1.03	xx	xx	xx	xx	xx	xx	18.4
Optical Fiber Communication	5.09	xx	xx	xx	xx	xx	xx	16.7
Copper Wire Communication	8.32	xx	xx	xx	xx	xx	xx	9.9
Ethernet (Copper or Fiber)	2.05	xx	xx	xx	xx	xx	xx	17.3
<b>Total</b>	<b>16.50</b>	<b>xx</b>	<b>xx</b>	<b>xx</b>	<b>xx</b>	<b>xx</b>	<b>xx</b>	<b>13.8</b>



## Executive Summary

The global substation automation communication market is expected to reach \$xx billion in 2018 from \$xx billion in 2013 at a CAGR of 13.8% from 2013 to 2018. Communication networks shows the highest CAGR growth among all other segment in substation automation as being a very important part of automation and also has a dedicated market and high technology developments. Currently copper wire

communication has the maximum share among other technologies for being conventionally used and still dominates the existing markets, but in the coming five year optical fiber communication is expected to grow at a higher CAGR of 16.7% and is expected to reach \$xx billion in 2018 from \$xx billion in the year 2013.

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## Sample Tables

Global Substation Automation Market Revenue, By Type, 2012 - 2018 (\$Billion)								
Types	2012	2013	2014	2015	2016	2017	2018	CAGR% (2013-2018)
Transmission Substation								
Distribution Substation								
Collector Substation								
<b>Total</b>								

Global Substation Automation Market Revenue, By Geography, 2012 - 2018 (\$Billion)								
Region	2012	2013	2014	2015	2016	2017	2018	CAGR% (2013-2018)
North America								
Europe								
APAC								
ROW								
<b>Total</b>								

Global Digital Transducer/Smart Meter Market Revenue, By Application, 2012 - 2018 (\$Billion)								
Application	2012	2013	2014	2015	2016	2017	2018	CAGR% (2013-2018)
Equipment Monitoring								
Power Measuring								
Fault Recording								
Others								
<b>Total</b>								

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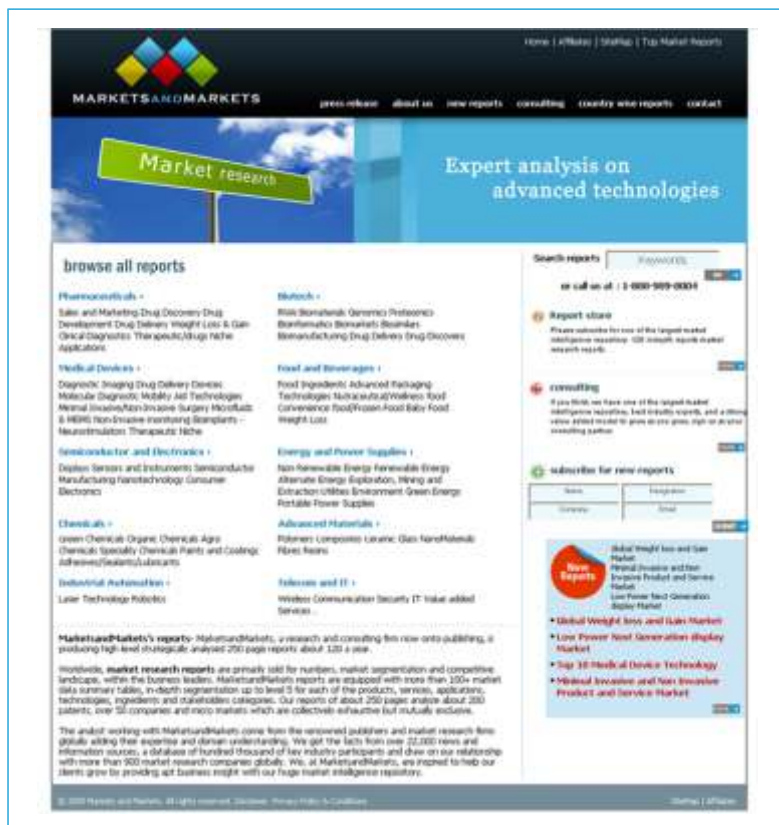
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