



Smart power distribution solutions  
Automating the secondary distribution  
network - a prerequisite for smart grids

# Smart power distribution solutions for medium-voltage networks

## Automating for increased operational efficiency

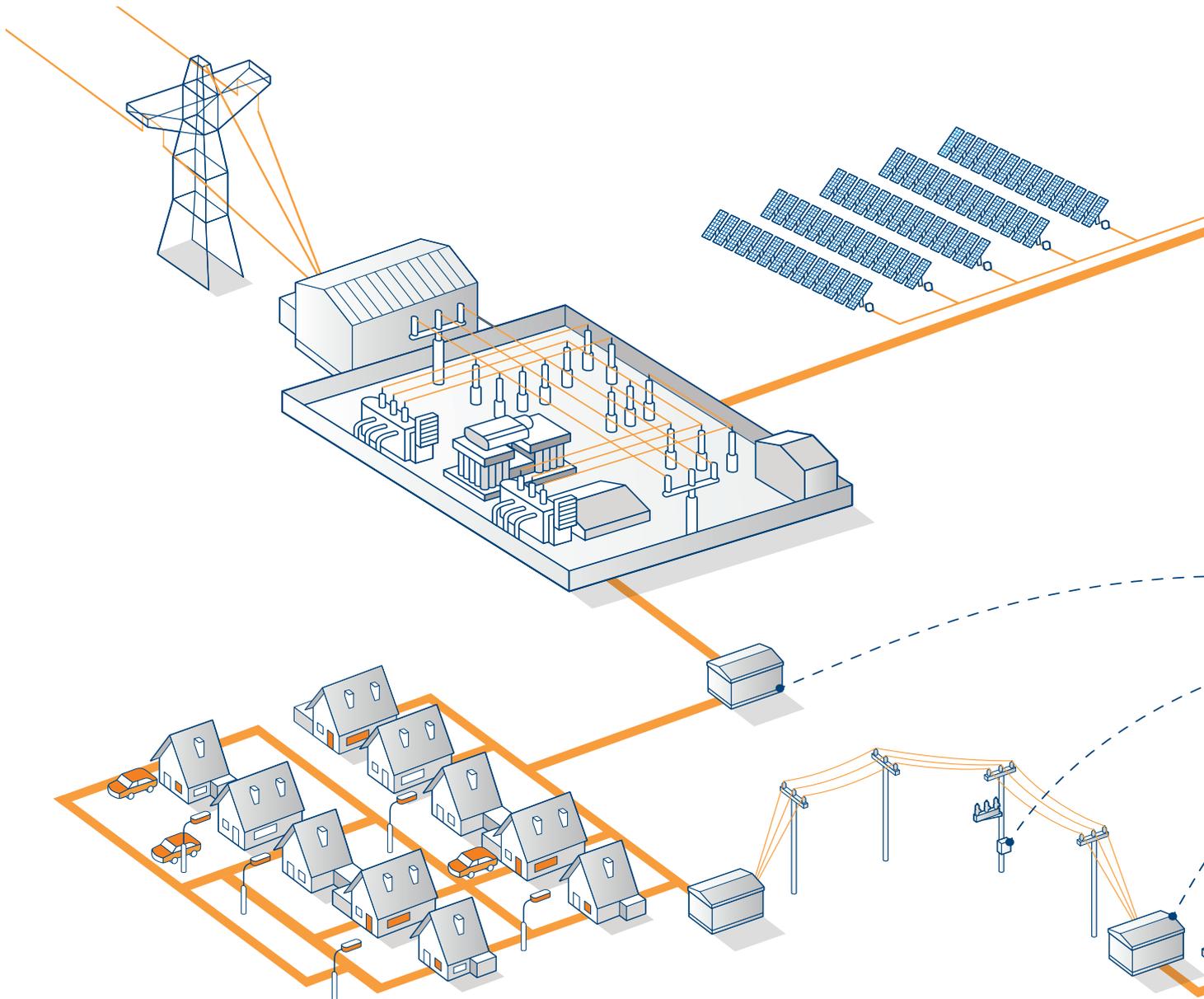
Gain more efficient utilization of the secondary distribution network through automation and minimize the effect of power outages.

### It's easy to implement a smarter grid

- Solutions for electrical utilities: smart equipment already integrated into a compact secondary substation, ring main unit or overhead line switching equipment
- For original equipment manufacturers (OEM) and system integrators we offer a broad range of devices - available also as packaged smart cabinet solutions

### Best fit for every need

- Complete offering covering all needs, from measurements to communication and protection
- Ready to be deployed on both new and existing installations in all types of distribution networks



### **Evolves with the grid and enables the Internet of Things**

- Real-time situational awareness provides better support for decision making, as you get more and up-to-date data to analyze in order to optimize your operations and improve power quality

### **The next level in grid efficiency**

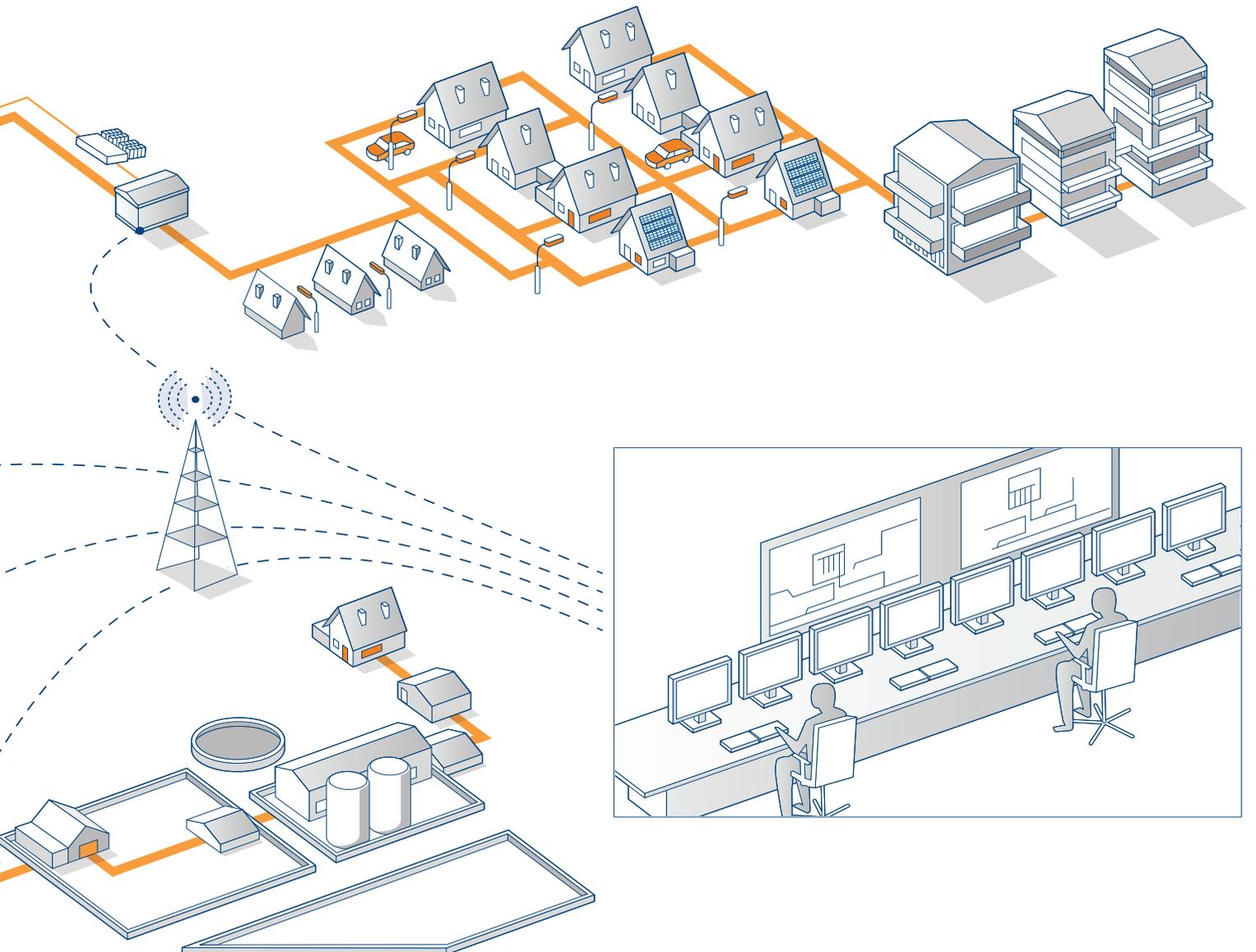
- Find the faults accurately and quickly with superior fault management
- Benefit from using the same reliable and proven technology as in the primary substations
- Meet the requirements of future grids, with increased amounts of distributed generation and changing power flows, already today

### **Minimize your costs**

- Avoid penalties with more efficient grid management
- Retrofit solutions make the most out of your existing equipment

### **Excel in customer satisfaction**

- Fewer power outages with shorter duration thanks to ABB's state-of-the-art earth-fault protection methods, fast communication and accurate fault location
- Utilities can more easily allow customers to feed into the grid from, for example, their own solar panels



# Integrated solutions to enhance grid reliability for new or existing installations

## Integrated automation solutions for cable networks

ABB has a wide portfolio of smart power distribution solutions, that can be integrated into secondary switchgears, as well as complete compact secondary substations (CSS) - delivered as turnkey solutions.

The remote monitoring and control REC615 (1) is an integrated protection and control relay in the Relion® product family. The relay is the perfect-fit in demanding automated urban solutions, where critical infrastructure demands an uninterrupted power supply. The REC615 can act as a complete control device for the secondary switchgear as it can control one circuit-breaker and eight switch disconnectors.

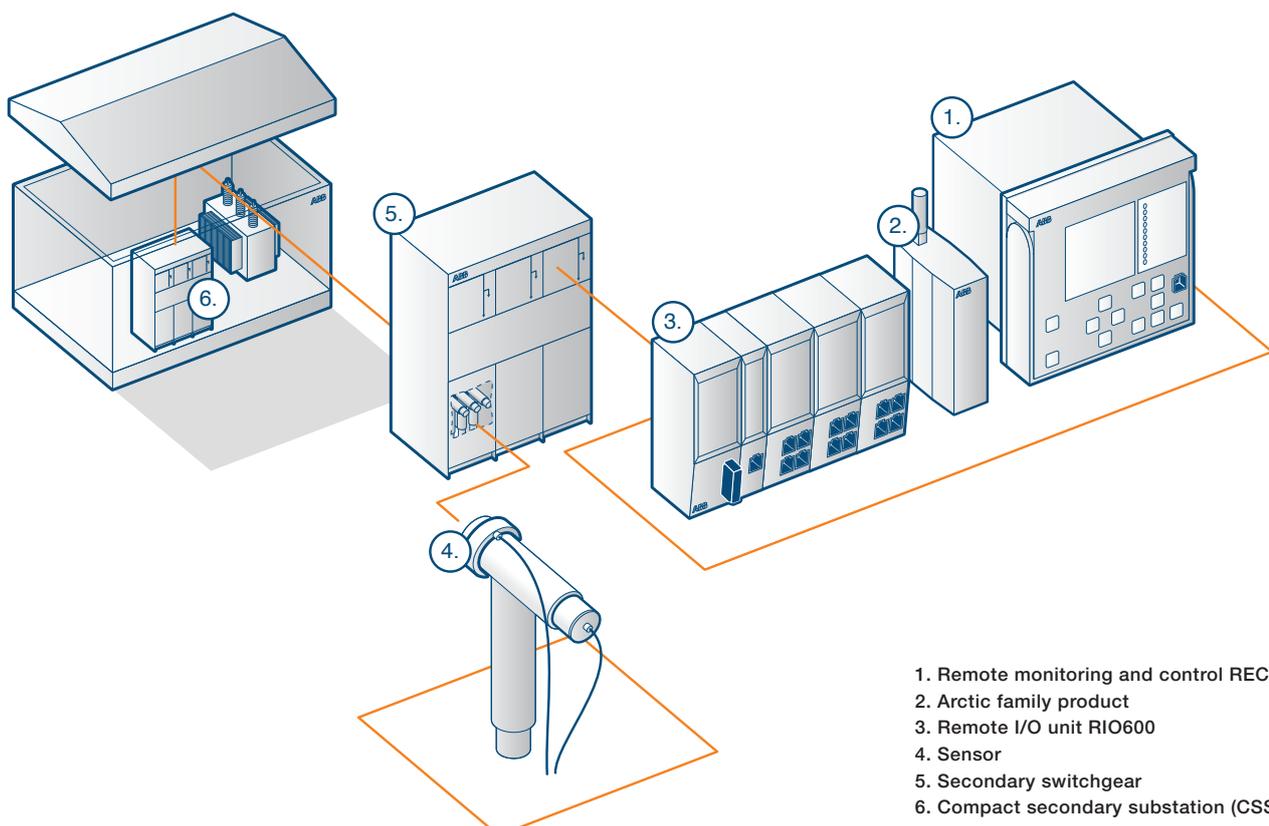
The protection relay has vast communication and protection capabilities, including long distance communication protocols that deliver the protection device data to the control center. The connection between the REC615 and the SCADA system can be done securely and cost-efficiently over public wireless networks.

For ring main units (RMU) applications where only remote control and monitoring is needed, our comprehensive range of communication gateways and wireless controllers (2) are found in the Arctic product family.

Even the most demanding types of earth-faults can be detected with ABB's proven fault detection algorithms. Our philosophy when it comes to fault passage indication (FPI) functionality is to detect the fault with the same accuracy on both the primary substation level and on the secondary substation level.

These algorithms are used in the sensor module of the Remote I/O unit RIO600 (3). Sensor technology (4) can be integrated into the secondary switchgear design (5) and can also be used in retrofit applications. ABB also supports traditional current and voltage transformer (CT/VT) technology.

All of this technology and equipment can be delivered as a ready-made solution integrated into a standard CSS (6) - fully tested and ready to be taken into use.



### Integrated automation solutions for overhead lines

The solutions are also applicable to overhead line equipment such as switch disconnectors and reclosers (4) and range from basic monitoring and remote control of switch disconnectors, to advanced earth-fault detection and leading-edge protection functionality for the reclosers.

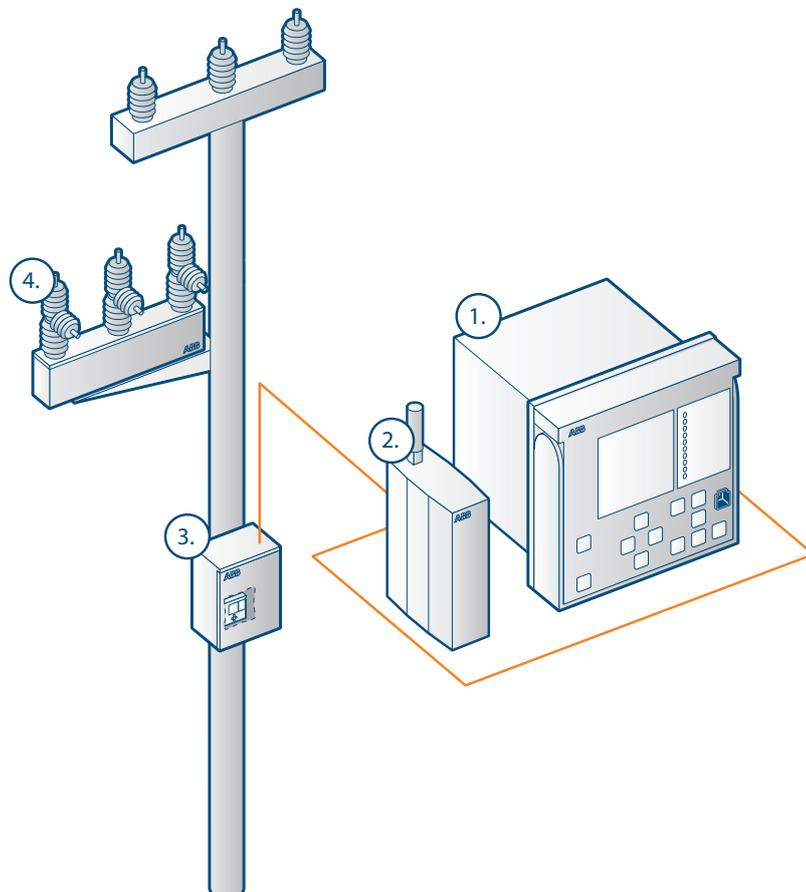
The RER615 is a dedicated recloser protection and control relay (1). It is equipped with the same long distance communication protocols, which enable smooth integration into the supervisory control and data acquisition (SCADA) system.

For basic applications, the Arctic product family can provide monitoring and control for switch disconnectors as well as gateway functionality (2).

The smart control cabinet (3) and recloser (4) are delivered as a ready-made and tested solutions. All electronics are located in the control cabinet for easy maintenance.

### Benefits

- Meets your requirements today and in the future: scalable solutions from basic monitoring to advanced protection functionality for new or existing installations
- Smooth integration into the distribution management system (DMS) or SCADA system with ready-made solutions
- Cost savings with sensor technology, which allows easy integration of measuring devices, has less environmental impact and a smaller footprint
- Sensor technology is ideally implemented as it is accurate, increases safety and provides greater rating standardization
- Increased accuracy and reliability in the distribution network, from protection relay to fault passage indicator, as the same advanced fault detection algorithm is used in all devices
- Simplified engineering effort thanks to harmonized protection and fault detection schemes, as the same solution can be applied on both the overhead lines and in the cable network



1. Recloser protection and control RER615
2. Arctic family product
3. Smart control cabinet
4. Recloser

# Smart cabinet solutions for medium-voltage networks

## Real-time monitoring and remote control

ABB's smart control cabinets are based on standardized ready-to-be-deployed solutions. There are cabinet variants for both overhead line and underground cable networks. The cabinets are suitable for all applications, ranging from basic monitoring functionality to more advanced solutions with accurate measurements and protection of the assets.

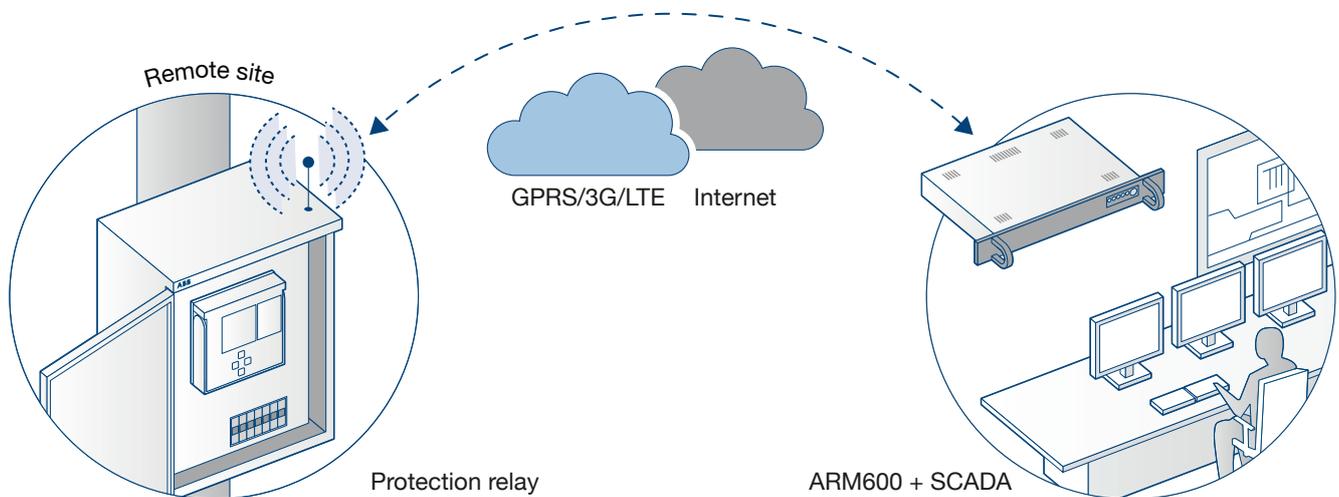
The control cabinets are available in different sizes and materials to suit different requirements and applications. For harsh environmental outdoor applications, there is a stainless steel cabinet available. There are also painted metal steel variants and a lighter cabinet variant made of reinforced plastic available for indoor applications.

### Benefits

- Easy implementation of smart grid applications with the wide range of standardized cabinet solutions suitable for both new and retrofit installations
- Optimize and make existing installations smarter through adding measurement and more advanced protection functionality
- Less engineering effort needed with these complete smart control cabinets, which include also solutions with already integrated wireless communication over public networks
- Increased reliability and efficiency in running the communication network with support for large amounts of nodes, including condition monitoring and remote management of the communication equipment



Secure, fast and cost-efficient wireless communication over public wireless networks



# Product listing

## Key components for a smarter grid



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### Relion® REC615 and RER615 protection and control relays

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The REC615 and RER615 are grid automation protection and control relays for remote control and monitoring, protection, fault indication, power quality analysis and automation in medium-voltage secondary distribution systems. These devices can be applied to new or already existing secondary distribution substations. These protection relays enhance grid reliability, ranging from basic, non-directional overload protection to extended protection functionality with power quality analyses - to meets today's requirements for smart grids and supports the protection of cable feeders and overhead lines in isolated neutral, resistance-earthed, compensated and solidly earthed networks.



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### Remote I/O unit RIO600

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RIO600 allows maximum I/O flexibility and provides seamless IEC 61850 connectivity between substation binary and analog signals. The units offer Fault Passage Indication (FPI) functionality and enables accurate current and voltage measurements from the medium-voltage network utilizing ABB's lightweight sensor technology. Based on the measured values, RIO600 gives directional fault passage indication and reports it to the upper level system. RIO600 supports the use of ABB sensors, both retrofit type sensors, and as integrated into our indoor switchgear or outdoor switches and reclosers.



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### COM600 Substation Management Unit series

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The COM600 substation management units offer an all-in-one user interface, automation platform and gateway designed for IEC 61850-based substation automation communication. These versatile substation automation and data management units are used together with protection relays and other communication devices to enable smart distribution solutions. The units accommodate web technology-based functionality, which provides access to substation devices via a web browser-based human machine interface (web-HMI).



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### RTU540 product line

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The RTU540 gateways can be used to bridge old and new technology, these products can combine existing devices and new standards protocols (such as IEC 61850) into one substation automation system. RTU540 incorporates advanced features like programmable logic control and a human machine interface (HMI) that allows real-time insight into the status of the grid.



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### Arctic wireless controller ARC600

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The wireless controller ARC600 is a compact device for remote control and monitoring of secondary substations, such as network disconnectors, load break switches and ring main units (RMU). It enables the SCADA system to wirelessly monitor and control the field devices over cost-efficient public cellular networks.



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### Arctic wireless gateways ARG600, ARR600, ARP600 and M2M gateway ARM600

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The Arctic family gateways provide secure and reliable wireless monitoring and control of field devices over public cellular networks from a central site or a control center to enable remote real-time grid automation. The devices offer industrial quality connectivity by supporting TCP/IP-based protocols as well as protocol conversion from legacy serial protocols. There is also support for communication security and encryption protocols, as well as condition monitoring and remote management.

# Contact us

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