

# Using the OVR outdoor vacuum recloser as a SCADA switch in modern electrical networks



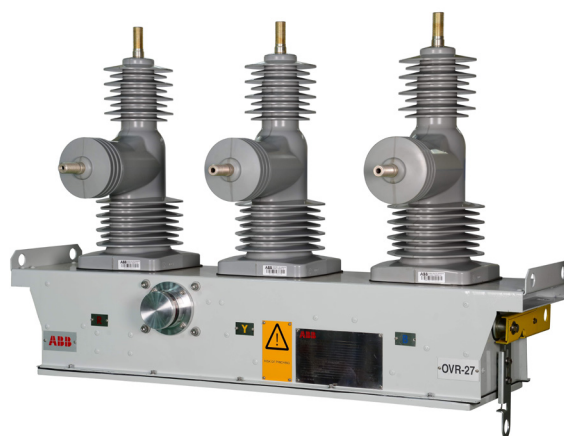
Enable real-time data collection, precise time synchronization, enhanced automation and more efficient electrical distribution network management with the combination of ABB's OVR recloser, Relion® RER615 or third-party relays, various communication protocols and robust SCADA systems.

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01 OVR recloser

## Revealing the dynamics of electrical distribution networks

In the constantly evolving landscape of electrical distribution networks, a combination of technological innovations is reshaping the foundations of the industry. This paper explores the elements driving the evolution of overhead distribution networks, navigating the integration of innovative components such as ABB's OVR recloser and its synergy with its electronic controller.

This paper also covers the fundamental role played by various communication protocols, transcending the barriers to connectivity through radio, general packet radio services (GPRS), satellite and fiber optic communication. This comprehensive integration aims to establish robust connections with supervisory control and data acquisition (SCADA) systems, allowing for real-time data acquisition and proactive network monitoring. Particular attention is paid to the accuracy of real-time electrical measurements, highlighting the essential requirement for accurate time synchronization facilitated by pioneering GPS time-synchronization technology.



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### Improved management and automation — maintaining network stability

By exploring the complexities of distributed medium voltage disconnect switches, we clarify their critical role in protecting distribution networks from faults. Remotely controlled switches help ensure timely protection and fast power restoration during grid demands. Emphasizing automation in medium voltage networks, we highlight the adaptability of communication protocols such as IEC 61850, in synergy with the Relion RER615 relay. This relay incorporates the necessary attributes for remote control, monitoring, protection and analysis of electrical quality, establishing its indispensable nature in medium voltage secondary distribution systems.



### Seamless integration of SCADA communication protocols — driving connectivity and surveillance

In the search for real-time connectivity and perpetual surveillance, the integration of communication protocols emerges as the vanguard of technological innovation. Various protocols, particularly DNP 3.0 and traverse media such as radio, GPRS, satellite and fiber optics, pave the way for instant connections with SCADA systems. These protocols act as conduits to enable a continuous flow of data in real time, fostering an unbreakable network surveillance environment. It is worth highlighting the ideal fusion of GPRS/EDGE mobile networks to seamlessly incorporate remotely controlled disconnect switches (RCDS) in SCADA/DMS systems. The exceptional capabilities of GPRS gateways elevate the efficiency of data transmission, helping ensure accurate time synchronization at local levels for precise event sealing, thereby maintaining data integrity and reliability within the network.



### Advanced analysis — optimizing SCADA system efficiency

Within the scope of SCADA systems, advanced analytics emerge as indispensable tools to help optimize operational efficiency. These models predict patterns, detect anomalies and provide early warning signals. Your ability to identify failures and potential disruptions before they materialize is critical. Predictive analytics models, for example, identify potential system failures, enabling proactive maintenance and, therefore, reducing downtime and repair costs. Similarly, prescriptive analytics models adjust system parameters, improving network performance and reducing system failures.

### Cybersecurity — safeguarding SCADA system resilience

In a time when protection against cyber threats is of key importance, cybersecurity assumes a fundamental role in strengthening SCADA systems. Their interconnected nature and dependence on third-party networks expose these systems to various risks. Measures such as firewalls, intrusion detection systems, antivirus software and periodic security audits become essential to mitigate vulnerabilities and possible security violations, helping ensure system integrity and reliability.



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**Accuracy in real-time electrical measurements —  
the basis for reliability**

Real-time process data transmission within SCADA/DMS systems operates on an event basis with update rates typically ranging between five and 10 seconds. Precise time synchronization at the local level, facilitated by GPS time-synchronization technology, becomes essential to accurately time events. This precision strengthens the reliability and trustworthiness of critical electrical measurements, reinforcing the network's resilience in the face of uncertainties.

**GPS time-synchronization technology —  
the epitome of accuracy**

GPS time-synchronization technology, recognized for its high level of precision and accuracy, emerges as the definitive solution to help ensure time synchronization in electrical measurements. This technology relies on GPS satellites to transmit time signals to GPS receivers, allowing synchronization of internal clocks between devices within the network. This constant synchronization facilitates accurate recording of event time and contributes to the stability of the power system. Widely adopted in the telecom industry, GPS time sync finds its niche in the power industry due to its reliability and accuracy.

**OVR recloser and third-party controllers —  
pioneering technological advances**

At the center of the transformative revolution in electrical distribution networks is the technological achievement of ABB's OVR recloser. Acting as a precisely designed outdoor three-phase vacuum recloser, the OVR recloser assumes critical functions within substation outlet bay equipment and functions as a crucial circuit breaker or SCADA switch in overhead ring networks. Its ingenious compact design — which consolidates protective voltage and current sensors along with the circuit breaker into a single-pole structure — helps significantly reduce substation space requirements and land use. It can be seamlessly integrated with third-party relays. This advanced recloser not only promises but delivers improved operational efficiency and functional effectiveness, setting unprecedented standards in distribution network infrastructure.

A cornerstone of the OVR recloser's flexibility is its capacity to integrate with third-party protective relays designed to fulfill a broad spectrum of roles, from protection and monitoring to control and automation. With a robust design and adaptable features, the OVR recloser stands out as the system of choice in a variety of contexts, from industrial power to utility distribution networks, thanks to its compatibility with third-party relays.

**Evolution of SCADA systems —  
catalyst for energy management**

A transformative evolution characterized by advances in manufacturing, computing, software and telecommunications has redefined SCADA systems. These highly distributed systems exert unprecedented efficiency in managing dispersed objects within electrical power distribution networks. Centralized monitoring and control from dispatcher control centers (DCCs) allow these systems to proactively respond to failures, issuing supervisory commands for smooth operations, data collection and environmental monitoring, strengthening network resilience.

### **Advantages of SCADA systems for distribution system operators**

SCADA systems are emerging as essential tools for distribution system operators (DSOs) because they facilitate real-time data collection, fault responses, efficient power disconnection and restoration within distribution networks. SCADA's remote monitoring and control capabilities encompass protection, power quality analysis and automation within medium voltage secondary distribution systems, optimizing operational efficiency.

### **Pioneers in the efficiency of electrical distribution networks**

In conclusion, the convergence of pioneering technologies, such as ABB's OVR recloser with RER615 relay or third-party relays, various communication protocols and robust SCADA systems, heralds a monumental change within electrical distribution networks. These groundbreaking innovations collectively revolutionize network operations, enabling real-time data collection, precise time synchronization, enhanced automation and efficient management. The transformative evolution of SCADA systems marks a new chapter in energy management and network control, enabling operators to navigate contemporary distribution networks with skill and efficiency. The integration of these advances propels the industry forward, laying the foundation for the future.