

## Stronger Grids, Smarter Security

Power applications face increasing cybersecurity threats as critical infrastructures become more connected. To ensure reliable and secure operation, the international standard IEC 62443 provides a recognized framework for protecting industrial control systems against cyber risks. ORing's substation products are IEC 62443-4-2 certified, delivering trusted security and compliance for power and utility networks.



### ★ Cyber-hardened IEC 62443-4-2 ★

#### L2 Product Spotlight

Optimized for Renewable and Distributed Power Systems



**IGS-9084GP-LA**  
Gigabit Ethernet Switch

• 8GE + 4G SFP



**IGPS-9084GP-LA**  
Gigabit PoE Switch

• 8G/PSE + 4G SFP



**IGS-9168GP**  
Gigabit Ethernet Switch

• 16GE + 8G SFP



**RGPS-92222GCP**  
Gigabit PoE Switch

• 22G/PSE + 2G Combo PSE + 2G SFP

IEC 61850-3 Certified – Substation-Grade Reliability



**IGS-P9812GP**  
Substation Switch

• 8GE + 12 SFP



**IGS-P9164GC**  
Substation Switch

• 16GE + 4G Combo



**RES-P9242GCL**  
Substation FE Switch

• 24FE + 2G Combo



**RGS-P9000**  
Substation Modular Switch

• 4-slots

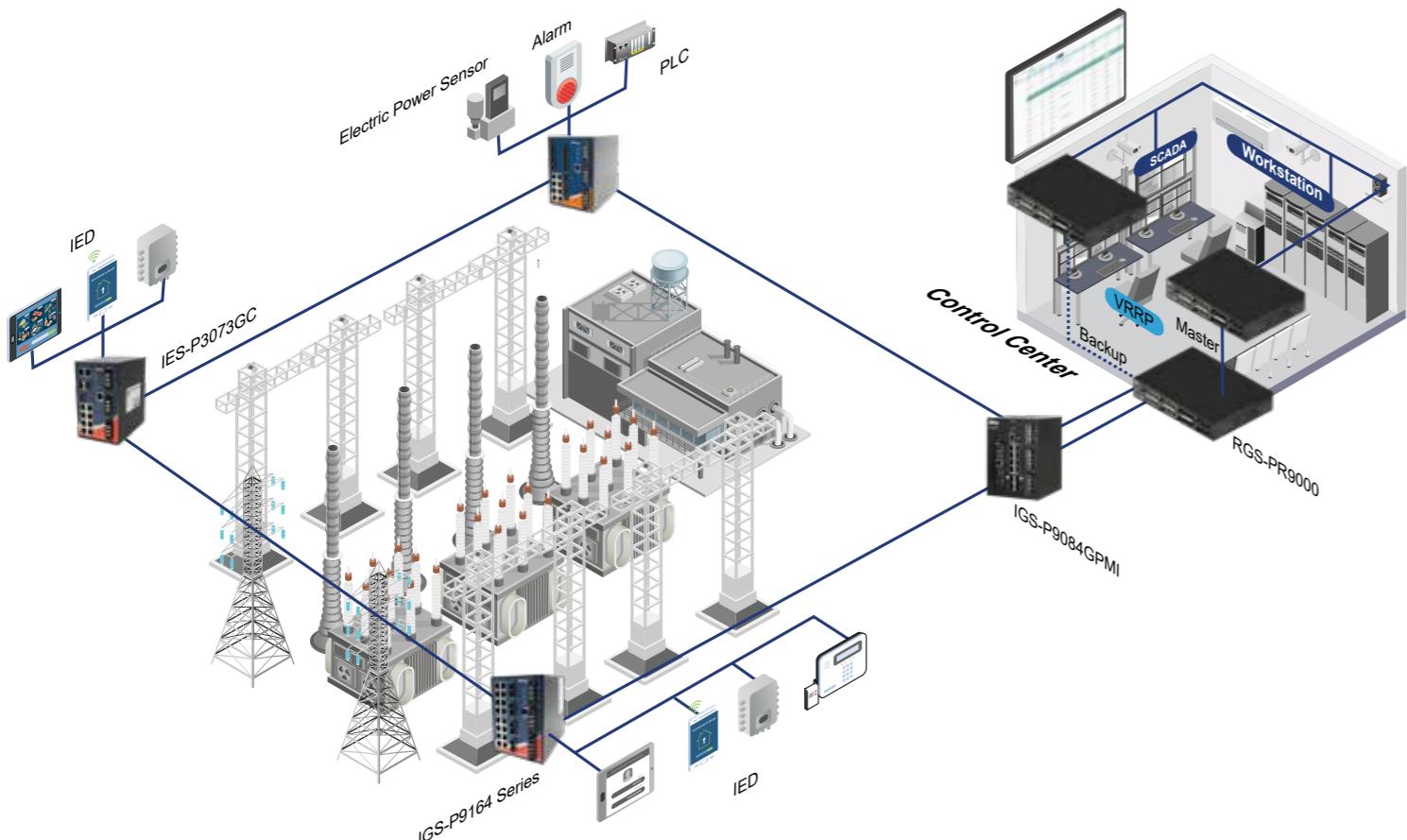


## Where Reliability Meets Resilience: Intelligent Protection for Modern Substations



**ORing**  
[www.ORingnet.com](http://www.ORingnet.com)

## Powerful, Reliable, and Secure Networking



### ★ What We Offer ★



#### High-availability Network

- IEC 61850-3/IEEE 1613 certified products
- Zero-time recovery: IEC 62439-3 HSR/PRP
- Network redundancy



#### Secure OT Networks

- Our Ethernet switches certified to IEC 62443-4-2
- Open-Vision Pro integrates with FortiGate to deliver a co-prevention solution
- Automated vulnerability testing — ensuring every product is **Secure by Design**



#### Optimize Transmission Quality

- IEC 61850 QoS
- Protect from EMI: Multiple fiber design
- 10Gb/s connection

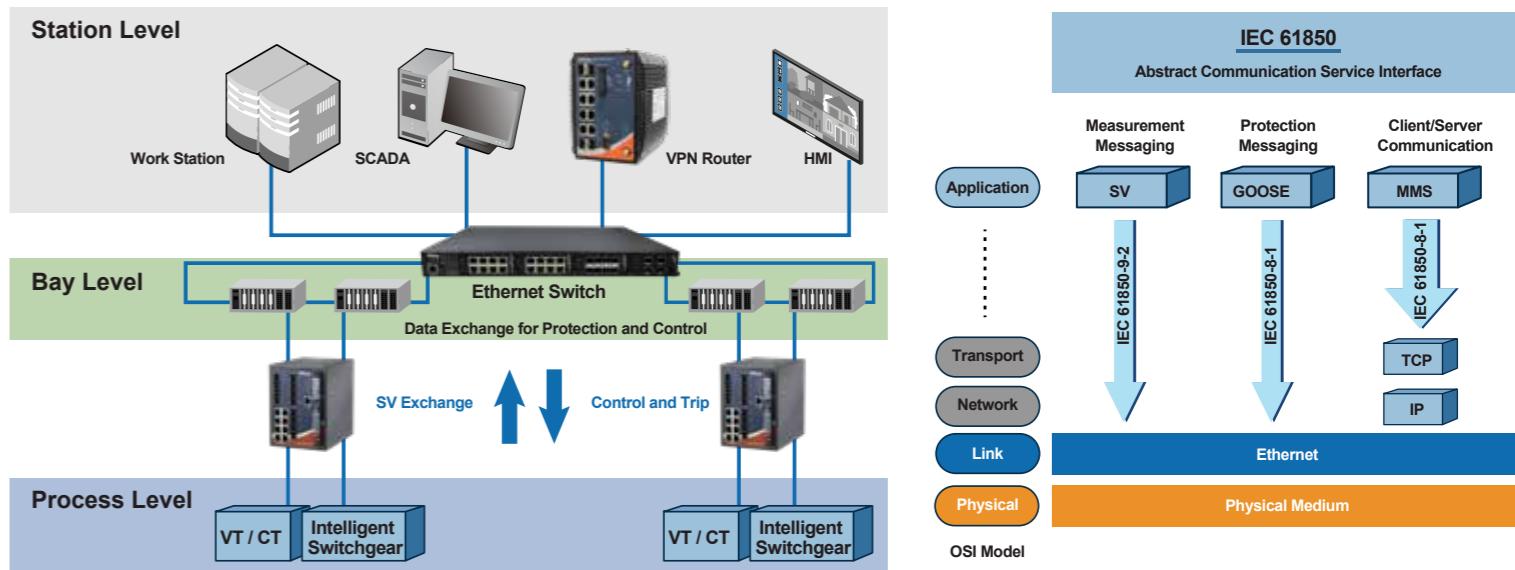


#### High Compatibility

- Hardware-based IEEE 1588 V2 (PTP)
- Modbus TCP and Ethernet/IP
- Built-in MMS server

## About IEC 61850 Substation

IEC 61850 revolutionized substation automation by solving the challenge of interoperability between devices from different manufacturers. The standard defines standardized object models that represent both equipment and functions consistently across all compliant devices, ensuring devices communicate effectively and respond to events predictably.



**ORing's IEC 61850-3 switches built-in MMS server, and provide ICD file, allowing customers to integrate the device into the architecture more easily.**

**MMS** (Manufacturing Message Specification)  
For monitoring substation status

**GOOSE** (Generic Object Oriented Substation Events)  
For status updates and sending command requests

**SV** (Sampled Values)  
For transmitting power line current and voltage values



#### IEC 61850 Networking Requirements

High Reliability



HSR, PRP, RSTP, MSTP, O-Ring, O-Chain, MRP, and G.8032 ERPS ensure network reliability.

Real-Time Communication



Full support for GOOSE, SV, and MMS access control to meet low-latency networking demands.

VLAN Segmentation



Secure Segmentation: VLAN, ACL, and subnetting for clear OT/IT separation.

Priority Control



Prioritized Performance: QoS guarantees low-latency delivery for GOOSE and SV traffic.



#### IEC 62443 Countermeasures with ORing

**“ With Secure Development Lifecycle and Shift-Left Security, we build cybersecurity into every power solution.”**

# Modular Ethernet Switches



Optional Module List													
Ethernet													
For IGS-P9084GPMI / RGS-P9000 slot 1-3 / RGS-PR9000 slot 1-3						For RGS-P9000 slot 4 / RGS-PR9000 slot 4							
<b>SWM-80GT</b> 8 GbE RJ45	<b>SWM-60GT-M12</b> 6 GbE M12	<b>SWM-04FX-SC</b> 4-port FX SC	<b>SWM-04GP_4</b> 4-port 1G SFP socket	<b>SWM-02GP+_4</b> 2-port 10G SFP+ socket									
<b>SWM-04FX-ST</b> 4-port FX ST	<b>SWM-04GF-SC</b> 4-port 1G FX SC	<b>SWM-04GF-ST</b> 4-port 1G FX ST	<b>SWM-04GP+_4</b> 4-port 10G SFP+ socket	<b>SWM-04GF-SC_4</b> 4-port 1G FX SC									
<b>SWM-06TIL</b> • 6-port 10Base-T1L • Single-pair Ethernet (SPE)	<b>SWM-08GP</b> 8 100/1000 SFP socket	<b>SWM-20GT-HSR</b> • 2 Gigabit Combo • Supports HSR/PRP	<b>SWM-04GF-ST_4</b> 4-port 1G FX ST										

Wireless				Serial					
X86 CPU Module									
<b>APM-820</b> • 802.11n/ac WIFI • 1GE RJ45				<b>DSM-221-I</b> 2-port RS422/485					
<b>RTM-1002-D5G</b> • 5G NR • 1GE RJ45				<b>DSM-141</b> 4-port RS232					
<b>MFS-CE10</b> • Atom® X6413E • 1GE RJ45				<b>IOM-11400</b> • 4 AI, 1 DI, 1DO • 1-port RS485					
				<b>IOM-44000</b> • 4 DI, 4 DO • 1-port RS485					

# Reliability and Availability in Substations

The foundation of reliable substation operation rests on three key pillars, ensuring stability and dependability even under harsh conditions.



## Error Minimization

Robust hardware design with comprehensive EMC protection safeguards sensitive electronics in harsh environments. IEC 61850-3 specifies EMC requirements for substation equipment, while IEEE 1613 defines environmental and testing standards for networking devices, covering extreme temperatures, EMI, and mechanical stress.

## Rapid Detection

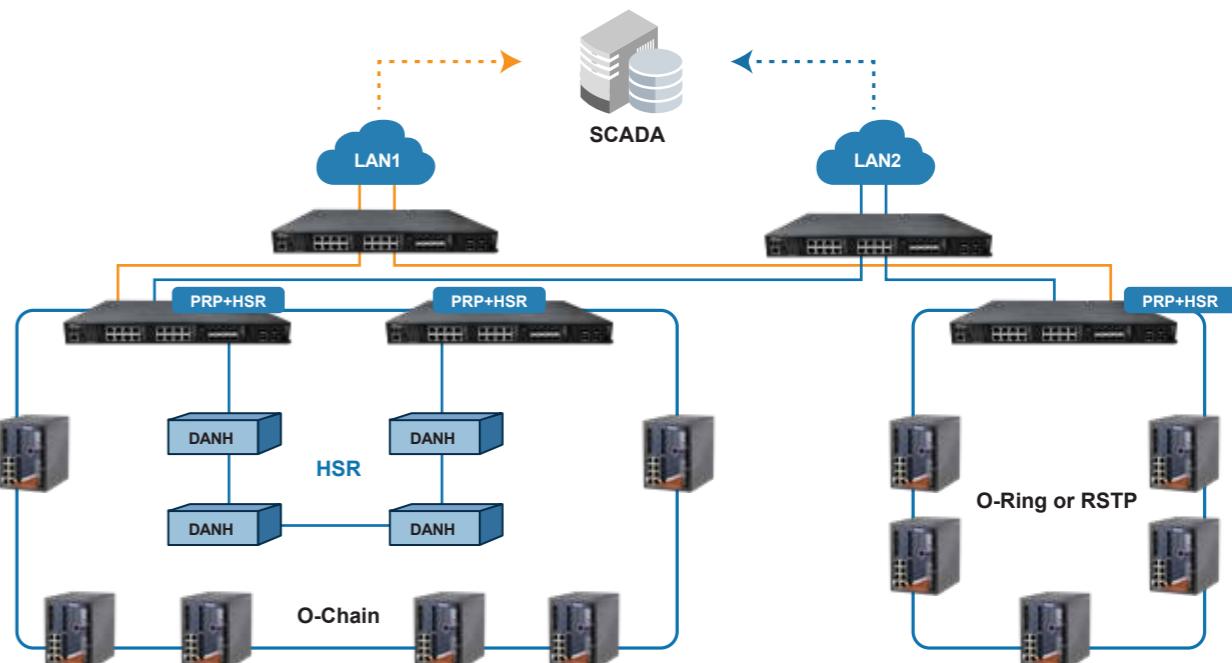
Digital Diagnostic Monitoring (DDM) is transforming fiber optic maintenance in substations by enhancing traditional SFP monitoring capabilities to deliver comprehensive oversight of transceivers. This proactive system monitors critical parameters in real-time.

## Efficient Recovery

Standard network segments often use RSTP with recovery times of a few seconds, while mission-critical applications require zero-recovery-time protocols like PRP and HSR. These approaches support scalability with rings and chains, providing tailored resilience for different criticality levels.

## Precise time synchronization

IEEE 1588 V2 is essential within a substation to guarantee the synchronized operation of measurement devices linked to the power grid. ORing's IEC 61850-3 Ethernet switches support 2 PTP profiles: IEEE C37.238 and IEC 61850-9-3. The precision of these clocks can range from milliseconds to microseconds, contingent upon the specific application.



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