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RELIABLE SECURE CONNECTIVITY

XER7000 Series

IEC-61850 HSR/PRP Redundancy Managed Ethernet Switch

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CE

FEATURE HIGHLIGHTS

- Up to 4 x 10/100/1000 BASE T(X) RJ45 ports and 4 x 1Gbps SFP ports
- Dedicated management port
- IEC61850-3 and IEEE1613 certification
- IEC62439-3 clause 4 (PRP) and clause 5 (HSR) compliant
- Up to 4 HSR or PRP instances (Redbox/Quadbox supported)
- IEEE1588 TC/BC hardware time stamp
- -40 to +75 operation temperature range
- Wide voltage input range support

PRODUCT DESCRIPTION

Agatel XER7000 series is engineered to ensure maximum system availability and data integrity for digital substations requiring zero packet-lost redundancy. It supports PRP/HSR, ensuring seamless redundancy for substations and process automation systems. Time-critical applications benefit from its hardware-based IEEE 1588v2 PTP support. Certified for IEC 61850-3, it meets stringent substation requirements with a highly durable design.

This series offers four 10/100/1000 Ethernet ports and four 100/1000BaseSFP slots, along with one specified management port. It supports various topologies, such as Redbox and Quadbox.

Versatile high performance: XER7000 series supports up to 8 full gigabit ports. It also supports 4 RJ45 and 4 SFP fiber module slots, allowing you to use it in various environments.

Reliability and security: XER7000 series supports HSR/PRP, achieving zero packet loss network redundancy. It also supports different redundancy topologies like Redbox, Quadbox, and can handle up to 4 sets of HSR/PRP instances simultaneously. It also complies with IEC62443-4 secure functions.

High power and redundancy: XER7000 series supports dual power supplies and offers different voltage input combinations (DC, DC+AC/HV), making it suitable for digital power plants.

Industry-specific features: XER7000 series complies with the IEC61850-3 and IEEE1613 regulations for power substations, making it suitable for harsh environments. It also features IEEE1588 hardware support for TC/BC, enabling high-precision timing applications. Additionally, it operates reliably in extreme temperatures ranging from -40 to +75 degrees Celsius.

TECHNICAL SPECIFICATIONS

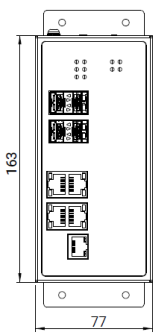
Switch Properties	
VLAN Table	4096
VLAN ID Range	1~4094
MAC table	16K
Ethernet	
Standards	IEEE 802.3 for 10BASE-T IEEE 802.3u for 100BASE-T(X) IEEE 802.3ab for 1000BASE-T IEEE 802.3z for 1000BASE-X IEEE 802.3x full-duplex flow control & half-duplex backpressure IEEE 802.1Qbb priority-based flow control IEEE 802.1Q VLAN Tag (4K VLANs) IEEE 802.1p Quality of Service IEEE 802.1x Network Access Control IEEE 802.3az Energy Efficient Ethernet
Protocols	IPv4, SNMPv1/v2/v3, ICMP, Telnet, SSH, SMTP, RMON, HTTP, HTTPs, LLDP, 802.1x, Radius, TACACS+, QoS, ACL, IEEE1588, VLAN, Mirror, SD card backup, Port mirror
Redundancy	HSR, PRP, RSTP, ERPS
Time Synchronization	Network Synchronization: Precision Network Synchronization NTP Server/Client, SNTP: IEEE 1588 hardware-based TC (E2E/P2P), BC 802.1AS
Automation Profiles	Modbus/TCP device status registers provided
SNMP MIB	MIB II, IF-MIB, SNMPv2 MIB, BRIDGE-MIB, RMON MIB Group 1,2,3,9, RFC 1157, RFC 1213, RFC 1215, RFC 1493, RFC 1643, RFC 1757, RFC 2011, RFC2012, RFC 2013, RFC 2233, RFC 2571, RFC2742, RFC 2819, RFC 2863, RFC 3411, RFC 3412, RFC 3413, RFC 3414, RFC 3415,
Interfaces	
RJ45 Ports	Up to 4 10/100/1000BASE-T(X) auto negotiation speed
Fiber Optics Ports	Up to 4 x 1000BASE-X SFP and 2 x 2500Base-X SFP
Console	RS232 (RJ45 connector)
Relay Output	2 relay outputs with current carrying capacity of 1A @ 24 VDC
Reset Button	Can reset Switch configuration to default factory setting by this button
LED Indicators	Run, ALM, P1, P2, P3, DI, PRP, HSR, Quadbox, Coupling
Power	
Rated supply voltage	12-120 VDC, 110-380 VDC, 110-240 VAC
Input supply voltage	9.6-144 VDC, 96-456 VDC, 80-264 VAC
Connector	5-Pin 5.08mm Lockable Terminal Block
Reverse Polarity Protection	Yes
Physical Properties	
Casing	Aluminum casing, IP30 protection level, suitable for most industrial control applications
Dimensions	77 x 167 x 138mm
Installation	DIN-Rail , Wall mount (optional kit)
Environmental	
Operating Temperature	-40 ~ +75℃
Storage Temperature	-40 ~ +85℃
Relative Humidity	0-95% (non-condensing)

Regulatory Approvals	
Safety	UL/EN/IEC (CB) 62368-1
EMI FCC	FCC Part 15, Subpart B, Class A
EMI CE	EN 55032:2015/A11:2020 Class A EN 61000-6-4: 2007 + A1: 2011 EN 61000-3-2: 2014, Class A EN 61000-3-3: 2013
EMS CE	EN 55035 :2017/A11:2020 EN 61000-6-2 2005
Substation	IEC-61850-3, IEEE1613

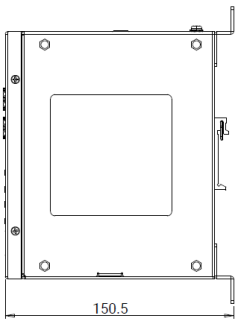
Test	
IEC 61000-4-2	ESD: Contact Discharge Air Discharge: ±8KV, ±15KV: Level 4
IEC 61000-4-3	RS: Enclosure Port: 10(V/m), 80-1000MHz, 80% AM, 1~3GHz: Level 3
IEC 61000-4-4	EFT: AC Power Port: ±4.0kV @2.5kHz: Level 4 EFT: DC Power Port: ±4.0kV @2.5kHz: Level 4 EFT: Signal Port: ±2.0KV @2.5kHz: Level 4
IEC 61000-4-5	Surge: AC Power Port: Line-to-Line ±2.0kV: Level 4 Surge: AC Power Port: Line-to-Earth ±4.0kV: Level 4 Surge: DC Power Port: Line-to-Line ±1.0kV: Level 3 Surge: DC Power Port: Line-to-Earth ±2.0kV: Level 3 Surge: Signal Port: Line-to-Earth ±4.0kV: Level 4
IEC 61000-4-6	CS: AC Power Port: 10V rms 0.15-80MHz, 80% AM: Level 3 CS: DC Power Port: 10V rms 0.15-80MHz, 80% AM: Level 3 CS: Signal Port: 10V rms 0.15-80MHz, 80% AM: Level 3
IEC 61000-4-8	PFMF: Enclosure: 100A/m continuous, 1000A/m (3s): Level 5
IEC 61000-4-10	Damped Osc. Magnetic Field: Enclosure: 100A/m, 100kHz, 1MHz: Level 5
IEC 61000-4-11	DIP: AC Power Port: Drop 70% 3 times/s (1period), Drop 40% 3 times/1ms (50 period), Drop 100% 3 times/50m (5-50 per.)
IEC 61000-4-12	Damped Oscillatory: AC Power Port: 2.5kV common,1kV diff.mode: Level 3 Damped Oscillatory: Signal Port: 2.5kV common,1kV diff.mode: Level 3
Shock	MIL-STD-810G Method 516.5
Drop	MIL-STD-810F Method 516.5
Vibration	MIL-STD-810F Method 514.5 C-1 & C-2
RoHS2	Yes
Warranty	5 Years

DIMENSIONS

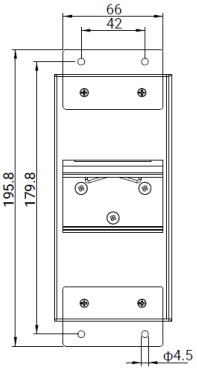
Front View



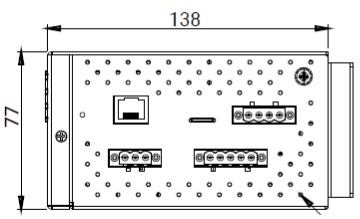
Side View

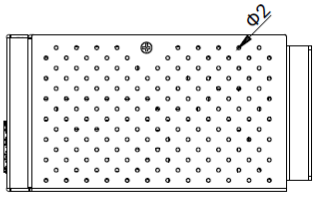


Rear View



Top & Bottom View

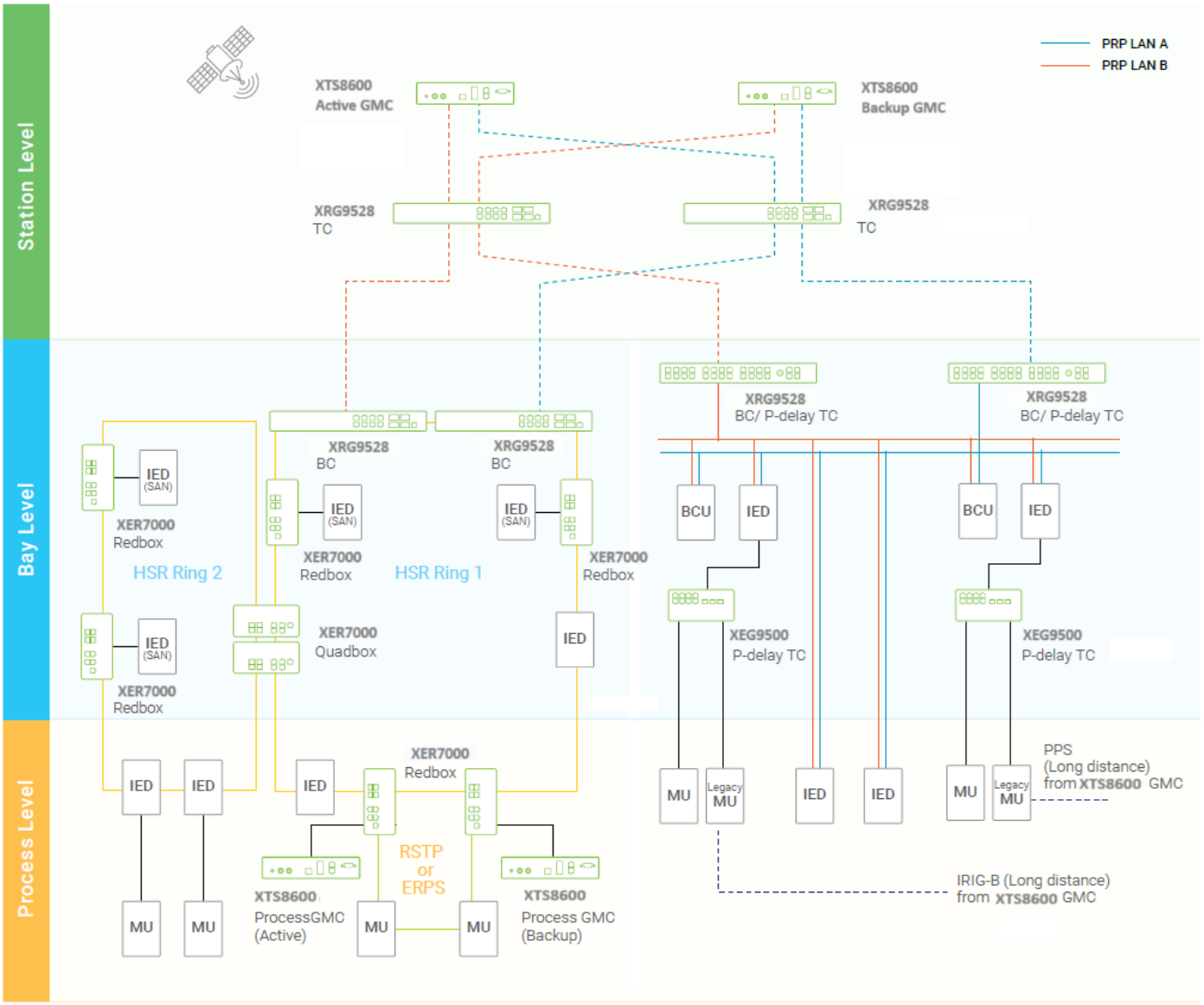




Application

In modern substation topologies, network redundancy plays a crucial role in ensuring reliable communication and continuous operation. The IEC 61850 Standard adopts High-availability Seamless Redundancy (HSR) and Parallel Redundancy Protocol (PRP) to achieve this, and redundancy boxes, or “redboxes,” are key components in implementing these protocols, particularly for integrating on-HSR/PRP devices into redundant networks.

XER7000 series act as an intermediary, connecting single-attached nodes (SANs) to HSR rings or PRP networks, thereby extending redundancy benefits to all equipment. In more complex setups, quadboxes—consisting of four interconnected redboxes—can be employed to create robust, fault-tolerant network architectures. These configurations enhance system resilience by providing multiple paths for data transmission, minimizing downtime, and ensuring seamless communication



ORDERING INFORMATION

Model	10/100/1000 RJ-45	100/1000 SFP	Management port	Input Power
XER7004-DC	2	2	1	2 x 12-120VDC
XER7004-HV	2	2	1	2 x 12-120VDC +110-380 VDC/110-240 VAC
XER7008-DC	4	4	1	2 x 12-120VDC
XER7008-HV	4	4	1	2 x 12-120VDC +110-380 VDC/110-240 VAC

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WHO WE ARE

Built on 20 years of experience in designing and manufacturing industrial networking products, **Agatel** was established from the UK to serve the infrastructure and industrial sectors in EMEA markets with reliable connectivity for mission-critical systems in demanding environments.

Experienced in hardware and software design and integration, we produce high-quality yet cost-effective industrial networking and communication products with great customization capabilities and robust implementations, equipping our customers for reliable secure industrial networks.

WHAT WE OFFER

The needs of our customers' industry are different from those of corporate IT environments – industrial operating environments are tough and the impact of failure in the field can lead to business threatening situations, hence our products will have lifetimes in excess of 20 years.

From entry-level to high-performance industry-certified hardware, **Agatel** offers a full solution spectrum to suit our customers' budgets and application requirements, with features such as industrial-grade reliability, integrated security, network redundancy, and advanced performance.

Our product solution profile includes industrial Ethernet switches, network time servers, media converters, industrial wireless devices, and serial device servers, covering a wide array of mission-critical applications such as automation, security, transport, water, oil and gas, and power grids.

WHY CHOOSE US

We help our customers reduce downtime and operational costs of their industrial applications in harsh environments. Leading system integrators in EMEA rely on our niche technical expertise and product quality to increase their applications' robustness, revenues, and competitive differentiation.

Agatel ruggedized high-quality solutions are designed to deliver zero-network-downtime for harsh project demands, allowing for reliable connectivity to keep people and assets safe and secure in harsh and hazardous environments, and allowing customers to focus on growing their business.

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