Oil and Gas Ruggedized Outdoor Network Switch - Official Technical Overview & Hardware Datasheet

OIL AND GAS RUGGEDIZED OUTDOOR NETWORK SWITCH: PRODUCT OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

The Oil and Gas Ruggedized Outdoor Network Switch (hereinafter referred to as the "Platform") is a carrier-grade, environmentally hardened switching solution purpose-built for upstream, midstream, and downstream hydrocarbon operations. Designed to withstand extreme ambient temperatures, corrosive atmospheres, continuous vibration, and explosive gas hazards, this platform delivers deterministic Layer 2/Layer 3 forwarding in wellheads, refineries, pipelines, offshore platforms, and remote tank farms. The unit is completely fanless, sealed to IP68 ingress protection, and compliant with hazardous location certifications (Class I Division 2 / ATEX Zone 2).



HARDWARE ARCHITECTURE & SILICON

The platform integrates a fault-tolerant, conduction-cooled central processing unit coupled with a wire-speed Ethernet switching ASIC operating without any moving mechanical components. The internal architecture separates management plane, control plane, and data plane to ensure continuous packet forwarding even during software upgrades or management session interruptions. A dual-redundant isolated power input stage accepts 12-60 VDC wide-range nominal voltage with transient surge protection up to 4 kV. The system enclosure is fabricated from marine-grade 316L stainless steel or hard-anodized aluminum, coated with a chemical-resistant, UV-stabilized polyester powder finish. All external connectors are sealed with IP68-rated M12 X-coded or industrial RJ45 variants, supporting both copper and fiber physical media.

KEY FEATURES & ROUTING LOGIC

- Environmental Hardening: Operational ambient temperature range -40°C to +75°C (-40°F to +167°F) without solar loading; extended -40°C to +85°C with cold start capability. Humidity 5% to 100% condensing with conformal-coated PCBA.

- Hazardous Location Compliance: ATEX/IECEx Zone 2, Class I Division 2 Groups A-D, Class I Zone 2; IEC 60079-0, IEC 60079-15. Also rated for offshore DNV-GL type approval.

- Industrial Protocol Support: Native Layer 2 switching (IEEE 802.1Q VLAN, GVRP, 802.1ad Q-in-Q, 802.1w RSTP, 802.1s MSTP, 802.1D STP). Layer 3 static routing, RIP v1/v2, OSPF v2, VRRP, and Policy-Based Routing. Support for Ethernet/IP, PROFINET, Modbus TCP, DNP3, and IEC 61850 GOOSE message prioritization.

- Cybersecurity & Hardening: Port-based MACsec (IEEE 802.1AE) line-rate encryption, DHCP Snooping, Dynamic ARP Inspection, IP Source Guard, RADIUS/TACACS+, SSHv2, SNMPv3, and secure boot. Role-based administrative access control.

- Power Redundancy: Dual isolated industrial power inputs with reverse polarity protection, overload protection, and programmable alarm relay for mains failure detection. Power consumption typical: 18W, maximum: 28W.

- Managed Port Density: 8x or 16x 10/100/1000BASE-T(X) industrial RJ45 (M12 or sealed RJ45) plus 4x 100/1000BASE-X SFP slots for fiber uplinks (single-mode or multimode). Optional 2x 10G SFP+ uplink expansion module.

COMPLIANCE & STANDARDS

Certification registers include IEC 61000-6-2 (Industrial Immunity), IEC 61000-6-4 (Industrial Emissions), IEEE 1613 (Electric Power Substations), IEC 61850-3 (Substation Hardened), EN 50121-4 (Railway Trackside), and MIL-STD-810G for shock, vibration, altitude, and humidity. MTBF calculated per Telcordia SR-332 Issue 4 (Ground Fixed, 40°C) exceeding 650,000 hours.

TECHNICAL SPECIFICATIONS

Parameter	**Specification**
Form Factor	IP68 Sealed, Fanless, DIN-rail or wall-mount, 1U height equivalent (50mm x 220mm x 180mm)

Switching Capacity	12.8 Gbps (8-port) / 25.6 Gbps (16-port) non-blocking fabric
Forwarding Rate	9.5 Mpps (8-port) / 19 Mpps (16-port) at 64-byte frames
Power Supply	Dual isolated 12-60 VDC, reverse polarity protected, 4kV surge withstand
Operating Temperature	-40°C to +75°C continuous (fanless), cold start -40°C
Ingress Protection	IP68 (2m submerged, 72 hours), NEMA 6P
MAC Address Table	16K entries
Jumbo Frame	Up to 10,240 bytes
MTBF	650,000 hours (Telcordia SR-332, 40°C GB)

ORDERING SKU INFORMATION

SKU: OGS-RSW-1084: 8x 10/100/1000Tx M12 X-coded + 4x GbE SFP, -40°C to +75°C, ATEX Zone 2, dual 12-60 VDC inputs.

SKU: OGS-RSW-1684: 16x 10/100/1000Tx M12 + 4x GbE SFP, same

environmental rating.

SKU: OGS-RSW-1684-10G: Add 2x 10G SFP+ uplink module.

SKU: OGS-ACC-PS-DC-60: Dual-redundant 60W DIN-rail power supply (24 VDC output, wide input 90-264 VAC).

SKU: OGS-ACC-CBL-M12-2M: 2-meter M12 to RJ45 industrial patch cord, IP68.

