Industrial Automation Network Switch Factory - Official Technical Overview & Hardware Datasheet

INDUSTRIAL AUTOMATION NETWORK SWITCH FACTORY

OFFICIAL TECHNICAL OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

The Industrial Automation Network Switch Factory (IAN-SF) represents a paradigm shift in hardened networking infrastructure for mission-critical industrial environments. Engineered specifically for the rigors of automated manufacturing, energy grids, and intelligent transportation systems, the IAN-SF series delivers deterministic switching performance across extended temperature ranges (-40°C to +75°C) while maintaining compliance with IEC 61850, IEEE 1588v2, and PROFINET standards. This document provides the definitive technical specification and architectural overview for network architects, systems integrators, and procurement professionals.



HARDWARE ARCHITECTURE & SILICON

The IAN-SF platform is built upon a fault-tolerant, fanless thermal dissipation chassis utilizing advanced convection cooling geometries. At its core resides a seventh-generation network processor with integrated Time-Sensitive Networking (TSN) acceleration logic and hardware-based frame preemption. The backplane employs a non-blocking crossbar fabric with 80 Gbps switching capacity on entry models, scaling to 336 Gbps on the modular SF-8400 series. All printed circuit board assemblies undergo conformal coating (acrylic or polyurethane variants selectable at order) to resist vibration, humidity, and corrosive atmospheric conditions per IPC-CC-830B.

KEY FEATURES & ROUTING LOGIC

- Deterministic Ethernet: Full IEEE 802.1Qbv (Time-Aware Shaper) and 802.1AS-Rev (gPTP) support for synchronized motion control loops with sub-microsecond jitter.

- Zero-Packet-Loss Redundancy: Hardware-implemented Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR) per IEC 62439-3 with < 2 ms switchover.

- Industrial Protocol Transparency: Deep packet inspection (DPI) offload for EtherNet/IP, Modbus TCP, PROFINET RT/IRT, and SERCOS III; automatic QoS mapping.

- Cybersecurity Fabric: Integrated MACsec (802.1AE) on all Gigabit interfaces, TPM 2.0 secure boot, and role-based CLI access with RADIUS/TACACS+.

- Ruggedized M12 and RJ45 Interfaces: Optional M12 X-coded 10/100/1000 ports with IP67 sealing; standard RJ45 ports feature double-shielded magnetics with 6 kV surge protection.

COMPLIANCE & STANDARDS

- Industrial: IEC 61850-3 (substation automation), IEEE 1613 (electric power environment), EN 50155 (rolling stock), EN 50121-4 (railway EMC)

- Hazardous Locations: Class I Division 2 (Groups A-D), ATEX Zone 2, IECEx

- EMC: EN 61000-6-2 (industrial immunity), EN 61000-6-4 (emissions), CISPR 32 Class A

- Environmental: RoHS3, REACH, WEEE, ISO 9001:2015 manufacturing certification

TECHNICAL SPECIFICATIONS

Switching Architecture: Store-and-forward with cut-through mode selectable per port

MAC Table: 16K entries

Jumbo Frame Support: 9,600 bytes

VLANs: 4,096 active (802.1Q) / 4,094 (Q-in-Q)

Routing Protocol Support (Layer 3 SKUs): Static, RIP v1/v2, OSPF v2/v3, VRRP, PIM-SM/DM

Operating Temperature: -40 °C to +75 °C (fanless) / -40 °C to +85 °C (with optional industrial fan kit)

Storage Temperature: -40°C to +85°C

Humidity: 5% to 95% non-condensing

Altitude: -200 m to 4,000 m operational

MTBF (Telcordia SR-332): 785,000 hours at 40°C

Parameter	**Specification**
Form Factor	1RU (19-inch rack-mount) or DIN-rail compact (field models)

Switching Capacity	80 Gbps (entry) / 336 Gbps (modular chassis)
Power Supply	Dual hot-swappable redundant AC (100-240 VAC, 50/60 Hz) or DC (24/48 VDC, polarity protection)
Power Consumption (Typical)	25W (8-port) to 180W (modular fully loaded)
Cooling Method	Fanless convection (standard) / Optional intelligent variable-speed fans (high-temp SKUs)
Ingress Protection	IP40 (standard RJ45 models) / IP67 (M12 X-coded variants)
Surge Protection	±6 kV on power lines, ±4 kV on signal ports per IEC 61000-4-5



ORDERING SKU INFORMATION

SF-3208-8T: 8-port 10/100/1000BASE-T, industrial fanless, dual 24-48 VDC input

SF-3216-8P8T: 16-port (8 PoE+ 30W, 8 Gigabit), 240W power budget

SF-3228-4S: 24 x 10/100/1000 + 4 x 1G SFP, Layer 2+ static routing

SF-8400-6X: Modular 6-slot chassis, 4 x 10G SFP+ uplinks, dual hot-swappable AC/DC

SF-8412-M12: 12-port M12 X-coded 1G, IP67, 4 x 1G SFP, EN 50155 compliant

All models include 1 RU or compact DIN-rail mounting brackets, console cable (RJ45 to DB9), and 2-year hardware warranty. Extended 5-year and 10-year lifecycle assurance packages available.