Marine Maritime Certified Industrial Switches - Official Technical Overview & Hardware Datasheet

MARINE MARITIME CERTIFIED INDUSTRIAL SWITCHES

PRODUCT OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

The Marine Maritime Certified Industrial Switches represent the definitive benchmark for network connectivity in harsh marine environments. Engineered for absolute reliability aboard vessels, offshore platforms, and port infrastructures, this product family delivers carrier-grade switching performance while complying with the most stringent maritime classification society rules (DNV, Lloyd’ s Register, ABS, BV). Designed to withstand extreme temperatures, continuous vibration, salt-laden atmospheres, and electromagnetic interference, these switches ensure uninterrupted bridge-to-bridge, onboard surveillance, and propulsion control communications.

All units feature conformal-coated PCBs, sealed IP54 to IP67 ingress protection, dual redundant power inputs (24/48 VDC, 110/230 VAC optional), and wide operating temperature ranges (-40 ° C to +85 ° C). The hardware forwarding engine integrates IEEE 802.1X port security, MSTP, GVRP, and Layer 2/Layer 3

static routing, enabling deterministic performance for mission-critical maritime automation and ISM code compliance.



HARDWARE ARCHITECTURE & SILICON

The switching platform is built around a ruggedized, fanless conduction-cooled architecture that eliminates single points of mechanical failure. The base model incorporates a Marvell Prestera or Broadcom BCM-series packet processor with 8 to 28 Gigabit Ethernet ports, including up to 4 SFP fiber uplinks for long-reach backbone connectivity. Forwarding is non-blocking at wire speed, with a 52 Gbps to 128 Gbps switching fabric capacity depending on SKU.

Key internal subsystems:

- **PHY Layer Isolation**: Galvanically isolated Ethernet ports protect against

ground loop currents and lightning surges, meeting IEC 61000-4-5 Level 4 surge immunity.

- **Memory Architecture**: 256 MB to 1 GB DDR3 DRAM plus 64 MB to 256 MB NAND flash for robust packet buffering and dual-image bootloader redundancy.

- **Power Subsystem**: Dual-input terminal block with polarity reverse protection, overcurrent (60 VDC max) and under-voltage lockout; optional 802.3at/af PoE+ (30W per port) for powering maritime IP cameras and wireless APs.

KEY FEATURES & ROUTING LOGIC

- **Maritime Compliance**: Full certification to IACS E10, IEC 60945 (Maritime Navigation Equipment), and Lloyd’ s Register Type Approval – suitable for ECDIS, RADAR, and propulsion network integration.

- **Ring Redundancy**: Supports ITU-T G.8032 ERPS (Ethernet Ring Protection Switching) with sub-50ms failover, plus industrial MRP (IEC 62439-2) for deterministic automation loops.

- **Layer 3 Capabilities**: Static routes, RIP v1/v2, and OSPF v2 (optional) for segmented bridge-to-engine control system architecture.

- **Harsh Environment Hardening**: Conformal coating (acrylic or silicone), salt mist tested per ISO 9227 (500 hours), vibration 5g RMS (5–500 Hz) per IEC

60068-2-6, and shock 50g/11ms semi-sine.

- **Cybersecurity Engine**: Port-based 802.1X RADIUS client, SSH v2, SNMP v3 encrypted management, DHCP snooping, and dynamic ARP inspection to prevent onboard cyber intrusions.

COMPLIANCE & STANDARDS

- Maritime Type Approvals: DNV (DNV-CG-0339), Lloyd's Register (02/EN/2015), Bureau Veritas (NR 467), ABS, CCS
- Environmental: IP54 (base), IP67 (optional sealed variant); IEC 60529, IEC 60068-2-78 (damp heat)
- EMC: EN 60945, IEC 61000-4-2 (ESD Level 4), IEC 61000-4-3 (radiated immunity 10 V/m)
- Industrial Networking: IEEE 802.1Q (VLAN), 802.1w RSTP, 802.1s MSTP, 802.3ad LACP, 802.1AB LLDP
- Safety: IEC 62368-1, Class I Division 2 (optional for hazardous zone monitoring)

TECHNICAL SPECIFICATIONS

Parameter	**Specification**
Form Factor	Compact 1RU (44 x 180 x 130 mm) to

	19" Rackmount 1RU/2RU
Switching Capacity	52 Gbps (8-port) to 128 Gbps (28-port), non-blocking
Forwarding Rate	77 Mpps to 190 Mpps (64-byte packets)
Power Supply	Dual redundant 24/48 VDC (9 – 60 VDC) or optional 110/230 VAC + DC mixed
Ingress Protection	IP54 standard, IP67 optional sealed version
Operating Temperature	-40 ° C to +85 ° C (fanless conduction-cooled)
Storage Temperature	-50°C to +95°C
Relative Humidity	5% to 100% condensing (salt mist resistant)
MTBF (Telcordia SR-332)	> 850,000 hours at 40°C ambient
Vibration & Shock	IEC 60068-2-6 (5g RMS), IEC 60068-2-27 (50g/11ms)
Network Management	CLI, Web GUI, SNMP v1/v2c/v3, RMON, Syslog
Certifications	DNV, LR, ABS, BV, IEC 60945, IACS E10, CE, FCC Part 15

ORDERING SKU INFORMATION

- **MSI-208GT-M**: 8x 10/100/1000BASE-T (PoE+ optional), 2x Gigabit SFP, -40°C to +75°C, IP54, dual 24/48 VDC

- **MSI-216GF-M**: 16x Gigabit SFP, 8x combo Gigabit RJ45, Layer 2/Lite L3, dual AC/DC (110/230 VAC + 48 VDC), DNV certified

- **MSI-228GM-M**: 24x RJ45 PoE+, 4x 10G SFP+, fanless, -40°C to +85°C, IP67 sealed, LR Type Approved

- **MSI-MRS-5000**: Modular chassis, up to 28 ports, 2x hot-swappable PSU modules, IEC 60945 and ABS certified for wheelhouse backbone



WARRANTY & SUPPORT

All marine maritime switches carry a standard 5-year limited hardware warranty with global advance replacement depots in Rotterdam, Singapore, Houston, and Shanghai. 24/7 technical support and factory-direct commissioning assistance are included for qualifying vessels and offshore installations.