

ESW4100 Series

The NGVA Vehicle Backbone

The definitive multi-port Access/Core switch for fully integrated tactical vehicle networks. Optimized for NATO Generic Vehicle Architecture (NGVA) deployments, its massive, customizable port layout connects every internal sensor, radar, and crew screen into a single, cohesive backbone. Native TSN support guarantees that critical fire-control data and drive-by-wire commands always hit their targets with zero network jitter.

Key Features

Primary Network Role	Fully Managed Layer 3 Access/Core hybrid Switch
Ethernet Interfaces	Ultra-high density up to 64 customizable ports (1G to 40G)
Non-Blocking Throughput	Up to 200 Gbps line-rate capacity
Boot-up Time	Fast operational deployment (<20 seconds)
TSN Support	Native IEEE 802.AS determinism for time-critical vehicle systems (NGVA compliant)
PoE Capability	Integrated PoE and PoE+ support
Tactical Zeroization	Support to wipe encryption keys and configuration data during an emergency

Capabilities

The ESW4100 series is the definitive architectural backbone for modern integrated vehicle platforms and advanced tactical programs. Designed from the ground up for massive scalability, this Access/Core hybrid switch supports up to 64 ports and can handle extreme data loads with a total bandwidth capability of up to 200 Gbps across speeds ranging from 1G to 40G.

Its standout capability is full native support for Time-Sensitive Networking (TSN) via IEEE 802.1AS. This compliance guarantees microsecond-precise time synchronization and deterministic traffic scheduling, ensuring that mission-critical fire control, weapon systems, and drive-by-wire commands are never delayed by standard network traffic. A fast boot-up time of under 20 seconds ensures high operational readiness.

The capabilities of the ESW4100 series include:

- **NGVA & TSN Ready:** Native IEEE 802.1AS Time-Sensitive Networking (TSN) support enables deterministic, time-synchronized communications for modern vehicle architectures.
- **High-Capacity Backbone Switching:** Delivers up to 200 Gbps of switching capacity for bandwidth-intensive mission systems and sensor networks.
- **Scalable High-Density Design:** Supports configurations of up to 64 ports, ranging from 1G to 40G Ethernet interfaces.
- **Deterministic Real-Time Performance:** Ensures predictable low-latency delivery of critical traffic, including fire control, mission management, and drive-by-wire communications.
- **Rapid Operational Readiness:** Achieves full system startup and traffic forwarding in less than 20 seconds following power-on.
- **Built for Modern Vehicle Architectures:** Engineered as a high-performance core backbone for armoured vehicles, mission systems, sensor-fusion applications, and NGVA-compliant combat platforms.

Form factors

The ESW4100 series offers different form factors depending on best fit for a particular use case.

Standard 19"/2 form factor	Customized form factor	Customized ultra small form factor
		
▪ Form, fit and function over multiple generations ▪ Long-term roadmaps	▪ Project driven form factor	▪ Project driven form factor ▪ Limited power input protection to minimize form factor

MilDef 19"/2 modular design

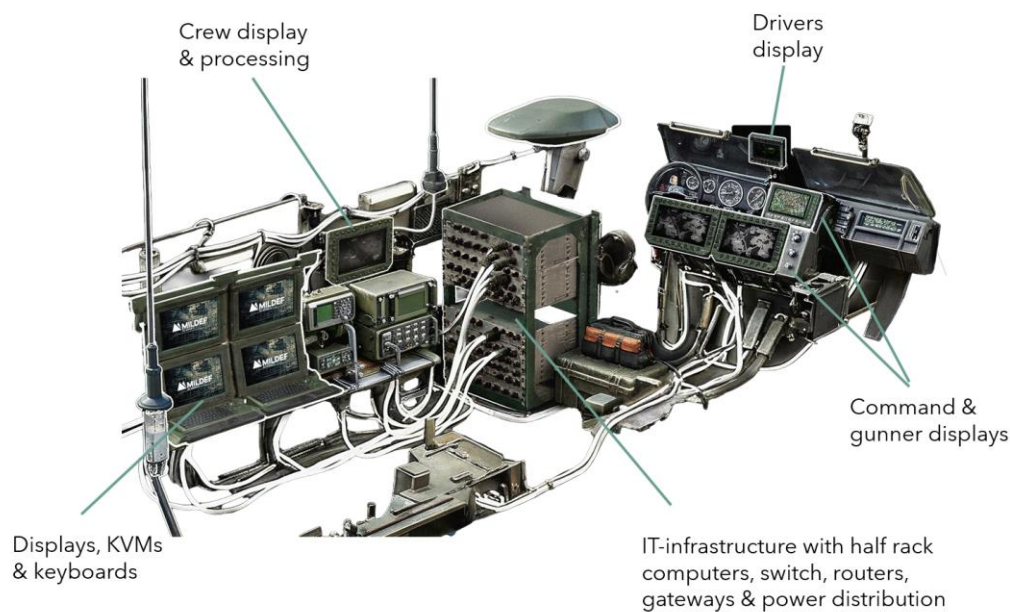
The MilDef 19"/2® addresses the requirements for small, high performance IT hardware. The modular design and broad product offering (computer, network, power and peripherals) enables the use of 19"/2® units as building blocks for creating built to purpose solution. Same form factor over multiple generations enable reuse of cable, mounting solution etc for midlife upgrades along the system life cycle.

Solution provider

MilDef offers solution and integration delivering seamless, end-to-end solutions by integrating hardware and software into complete systems that meet customer requirements. Managing integration projects/programs to ensure alignment with mission objectives/business strategy and technological capabilities.

Hardware ECO-system

Our hardware offering including all the building blocks for complete IT infrastructure for the tactical edge, such as displays, network products, power products, docking stations, mounting solutions etc.



Use case

The ESW4100 series is a core component of many tactical platform designs. Some use case examples are:

- **Armoured Vehicle Architectures:** Serves as the core network backbone for NGVA-compliant platforms, connecting mission systems, vetronics, sensors, and battle management equipment.
- **Remote Weapon Stations & Fire Control Systems:** Provides deterministic, time-synchronized communications for fire control, targeting, and other mission-critical functions.
- **ISR & Sensor Fusion Systems:** Aggregates high-bandwidth data from cameras, radar, sensors, and processing nodes with predictable low-latency performance.
- **Advanced Tactical Platforms:** Enables scalable TSN-enabled backbone networking for next-generation combat vehicles and mission systems.

Specifications

System & Interfaces			
Switch Platform	Microchip SparX-5i	Switching Architecture	Managed Layer 3
Primary Network Role	Access/Core Switch - Flexible, highly scalable architecture - High-capability access or central switch - Multi-gigabit vehicle backbone	Boot-up Time (typical)	< 20 seconds
Ethernet Ports & Interfaces	Up to 64 ports - Highly configurable 1G to 40G - Role (access/uplink) determined by network design and switch configuration	PoE Capability	- PoE (IEEE 802.3af) - PoE+ (IEEE 802.3at)
Switching Capacity	Up to 200 Gbps Non-blocking line-rate		
Core Capabilities			
Network Services	Advanced Layer 3 Switching & Distribution	Secure Boot	Yes
Security Functions	802.1X, TCAM-Based Protection, Storm Control	Zeroization	Yes
Traffic Prioritization (QoS)	Hardware-Based QoS and TSN Support	MACsec	Selective Depending on PHY configurations
Tactical & Mission Services			
Time-Sensitive Networking	- gPTP (IEEE 802.1AS) (TSN) - PTP (IEEE1588) - NTP (RFC 5905)	Resilience Features	ERPS (ITU-T G.8032), VRRP, MSTP
Multicast Services	Hardware-Accelerated Multicast Distribution		
Deployment & Architecture			
Primary Mission Use Case	Vehicle Backbone and Tactical Distribution Networking	Network Position	Distribution Layer
Typical Deployment	NGVA Vehicle Backbone, Tactical Platforms, High-Density Access Networks		
Environmental			
MIL-STD-810			
Shock operating	Functional Shock. 40G/11ms	Noise level	Max noise level of 40 dB SPL 1 m (3.3 ft)
Temp. operating	-40 to 65°C (-40 to 149 °F)*	Salt fog	5 ± 1%
Temp. storage	-40 to 71°C (-40 to 160 °F)*	Temp. shock	55 °C (131 °F) / -40 °C (-40 °F)*
Humidity	Aggravated, 95 ± 4% RH	Vibration	Rotary wing aircraft - helicopter
IP Class	IP65*		Truck/trailer - loose cargo
Low air pressure	Rapid Decompression 8000 ft / 40000 ft		Ground vehicles - ground mobile tracked
	Operation/Air Carriage 15,000 ft		Ground vehicles - ground mobile wheeled
Optional standards			
RTCA/D0160, VG, DEFSTAN, MIL-STD, etc can be included on request.			
EMC			
MIL-STD-461			
EMI/EMS	Ground Army	ESD	CS118
Optional standards			
RTCA/D0160, VG, DEFSTAN, MIL-STD, etc can be included on request.			
Power			
Vehicle Power	MIL-STD-1275		
Optional standards			
VG, DEFSTAN, MIL-STD, etc can be included on request.			

*Higher available on request