# 19"/2 ® ESW4102


## NGVA Switch in a 19"/2® form factor

The 19"/2® ESW4100 Series switch gives you reliable, high performance switching on TWELVE GigE and FOUR 10GigE Multimode Fibre Ethernet ports in a compact rugged form factor that is optimized for low Size, Weight and Power (SWaP) to meet military requirements without sacrificing reliability, ruggedness or performance.

### Small form factor

The MilDef 19"/2 form factor is optimized for reduced size, weight, and power (SWaP) to meet industry and military requirements without sacrificing reliability, ruggedness or performance.

### Flexible mounting

The 19"/2 standard enables flexible mounting options for a wide array of integration scenarios. The unit can be mounted in a standard 19" rack, half racks, or directly on to a surface and at any angle.

### Customizable

Are you looking for additional features and functions? MilDef specializes in customized solutions, to include change of connectors, chassis modifications, mounting solutions, etc. Contact your nearest MilDef Sales Office and we will help you tailor a solution to meet your exact requirements.

### Features

- 10GBASE-SR, MM 850nm
- Based on the Microchip SparX-5i
- Management through Serial and Web
- IGMP and MLD support
- RSTP and MSTP support
- Layer 3 capablities
- 12-36 VDC
- DEF-STAN 59-411, Land Class A
- Passively cooled
- TSN

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## Connector Interfaces

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|---|---|
| **SERVICE** (back) | • 1x RS232 Service |
| **X1 DC IN** (front) | • 1x Power |
| **X2** (front) | • 1x Console RS232 |
| **X3-X5** (front) | 3 connectors which each has:<br>• 2x ETH 1000BASE-T |
| **X6-X7** (back) | 2 connectors which each has:<br>• 2x ETH 10GBASE-SR |
| **X8-X10** (back) | 3 connectors which each has:<br>• 2x ETH 1000BASE-T |

## Other Interfaces

10x LAN indicator (back)

6x LAN indicator (front)

1x System button (front)

## Technical Specification

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| **Blanking** | Enable/disable all externally visible indicators from emitting light via the "blanking command" |
| **Blanking** | Double-pressing the System button |
| **Fiber characteristics** | MM 850 nm 50/125 |
| **Forwarding rate** | Nonblocking wire-speed switching performance for all frame size |
| **High availability** | VRRP |
| **LAN 1000BASE-T** | 1000BASE-T standard |
| **LAN 10GBASE-SR** | 10GBASE-SR, MM 850nm |
| **Layer 2 switching** | IEEE 802.1 + 802.3 standard, LLDP, Link Aggregation, Trunking, Mirroring, MSTP, RSTP |
| **Management** | ICLI, Web UI, MIB, SNMP, Syslog, DHCP server |
| **Multicast** | IGMP snooping, IGMP filtering, IGMP querier, MLD snooping |
| **Quality of service** | Policing, shaping and autoQoS |
| **Reference design** | Based on the Microchip SparX-5i |
| **Routing** | IPv4/IPv6 Layer 3 static and dynamic routing (IPv4 only is supported) |
| **Security** | 802.1x, DHCP snooping, dynamic ARP inspection, IP source guard, SSH, RADIUS, BPDU guard, ARP Snooping |
| **TSN** | Delay reduction with support for cut-through in the queue system and IEEE 802.1Qbu/IEEE 802.3br frame preemption<br>Per-stream filtering and policing (IEEE 802.1Qci)><br>Time-aware shaping and scheduling (IEEE 802.1Qbv (TAS) and IEEE 802.1Qch (CQF))<br>Redundancy with IEEE 802.1CB frame replication and eleminitation for reliability (FRER) as well as protection switching (line or ring)<br>Support for 802.1CM/D2.2 TSN for fronthaul<br>IEEE 1588-2008 (v2)<br>Support for NTP timestamping formats and GOOSE protocol frames<br>Hardware processing and PTP frame generation |
| **Timing and synchronization** | NTP |
| **Virtualization** | VRF-lite |
| **Electronics ground to chassis** | Isolated |
| **MIL-STD-1275E** | Fully compliant |
| **Polarity protection** | Protected against incorrect polarity connection on the power input within the normal operating voltage range |
| **Power consumption** | 30 W |
| **Power input** | 12-36 VDC |
| **Power to chassis** | Isolated |
| **Power to electronics ground** | Isolated |
| **Chassis material** | Aluminum |
| **Coating and color** | AE0305-6603120 Axalta (RAL 6031) |
| **Cooling** | Passively cooled |
| **Dimensions depth** | 321 mm (11.8 in) back connectors included |
| **Dimensions width and height** | 220 x 43.4 mm (8.66 x 1.71 in) (WxH) |
| **Earth point** | M6 12 mm |
| **Surface treatment chassis** | Chromit-Al |
| **Weight** | 2.7 kg (6 lbs) |
| **MTBF** | > 100,000 h |
| **CE** | Compliant |

## Environmental Specification

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|---|---|
| **Functional shock - Operating** | MIL-STD-810H, Method 516.8, Procedure I - Functional shock. Table 516.8-IV, Terminal peak sawtooth pulse, Ground materiel<br>40 g<br>11 ms |
| **High temperature - Operating** | MIL-STD-810H, Method 501.7, Procedure II - Operation<br>55 °C (131 °F) |
| **High temperature - Storage** | MIL-STD-810H, Method 501.7, Procedure I - Storage<br>71 °C (160 °F) |
| **Humidity** | MIL-STD-810H, Method 507.6, Procedure II - Aggravated<br>95 ± 4% RH<br>Ten 24-hour cycles |
| **IP Class (Solid Particle Protection)** | IP Class 6X |
| **IP Class (Water)** | IP Class X5 |
| **Low air pressure - Rapid decompression** | MIL-STD-810H, Method 500.6, Procedure III - Rapid decompression<br>2,438 m (8,000 ft)<br>12,192 m (40,000 ft) |
| **Low air pressure - Operating** | MIL-STD-810H, Method 500.6, Procedure II - Operation/air carriage<br>4,572 m (15,000 ft) |
| **Low temperature - Operating** | MIL-STD-810H, Method 502.7, Procedure II - Operation<br>-40 °C (-40 °F) |
| **Low temperature - Storage** | MIL-STD-810H, Method 502.7, Procedure I - Storage<br>-40 °C (-40 °F) |
| **Noise level** | Maximum noise level of 40 dB SPL A-weighting at 1 m (3.3 ft) distance |
| **Salt fog** | MIL-STD-810H, Method 509.7<br>5 ± 1% (by weight)<br>Two cycles, 24 h wet + 24 h dry / cycle |
| **Temperature shock - Operating** | MIL-STD 810H, Method 503.7, Procedure I-C, - Multi-cycle shocks from constant extreme temperature<br>55 °C (131 °F)<br>-40 °C (-40 °F) |
| **Vibration - Helicopter** | MIL-STD-810H, Method 514.8, Procedure I - General vibration, Category 14 - Rotary wing aircraft - helicopter |
| **Vibration - Loose cargo** | MIL-STD-810H, Method 514.8, Procedure II - Loose cargo transportation, Category 5 - Truck/trailer - loose cargo |
| **Vibration - Tracked vehicle** | MIL-STD-810H, Method 514.8, Procedure I - General vibration, Category 20 - Ground vehicle - ground mobile, Tracked vehicle |
| **Vibration - Wheeled vehicle** | MIL-STD-810H, Method 514.8, Procedure I - General vibration, Category 20 - Ground vehicle - ground mobile, Wheeled vehicle |

## EMC Specification

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| **EMI conducted CE102** | MIL-STD-461F, Method CE102, Conducted emissions, power leads<br>BASIC CURVE<br>10 kHz - 10 MHz |
| **EMI conducted DCE01.B** | DEF STAN 59-411, Method DCE01.B, Conducted emissions on primary power lines<br>Land service class A<br>500 Hz - 150 MHz |
| **EMI conducted DCE02.B** | DEF STAN 59-411, Method DCE02.B, Conducted emissions on control signal lines and secondary power lines<br>Land service class A<br>20 Hz - 150 MHz |
| **EMI conducted DCE03.B** | DEF STAN 59-411, Method DCE03.B, Exported transients on primary power lines<br>Land service 28 VDC Systems |
| **EMI conducted DCS01.B** | DEF STAN 59-411, Method DCS01.B, Conducted emissions on primary power lines<br>Land service<br>20 Hz - 50 kHz |
| **EMI radiated DRE01.B** | DEF STAN 59-411, Method DRE01.B, Radiated emissions electric field<br>Land service class A<br>10 kHz - 18 GHz |
| **EMI radiated DRE02.B** | DEF STAN 59-411, Method DRE02.B, Radiated emissions magnetic field<br>Air, land and sea service<br>20 Hz - 100 kHz |
| **EMI radiated DRE03.B** | DEF STAN 59-411, Method DRE03.B, Radiated emissions electric field tuned antenna<br>Land service class A<br>1.6 MHz - 30 MHz |

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| **EMI radiated RE102** | MIL-STD-461F, Method RE102, Radiated emissions, electric field<br>Navy Mobile & Army<br>2 MHz - 18 GHz |
| **EMS conducted CS101** | MIL-STD-461F, Method CS101, Conducted susceptibility, power leads<br>CURVE #1<br>30 Hz - 150 kHz |
| **EMS conducted CS114** | MIL-STD-461F, Method CS114, Conducted bulk susceptibility<br>Army, Ground<br>10 kHz - 200 MHz |
| **EMS conducted CS115** | MIL-STD-461F, Method CS115, Conducted susceptibility, bulk cable injection, impulse excitation |
| **EMS conducted CS116** | MIL-STD-461F, Method CS116, Conducted susceptibility, damped sinusoidal transients, cables and power leads<br>10 kHz - 100 MHz |
| **EMS conducted DCS02.B** | DEF STAN 59-411, Method DCS02.B, Conducted susceptibility on control, signal and power lines<br>Land service non safety critical<br>50 kHz - 400 MHz |
| **EMS conducted DCS03.B** | DEF STAN 59-411, Method DCS03.B, Conducted susceptibility on control and signal lines<br>Land and sea service<br>20 Hz - 50 kHz |
| **EMS conducted DCS05.B** | DEF STAN 59-411, Method DCS05.B, Externally generated transients<br>Land and sea service |
| **EMS conducted DCS06.B** | DEF STAN 59-411, Method DCS06.B, Imported long transient susceptibility AC and DC systems<br>28 VDC land service<br>100 kHz |
| **EMS radiated DRS01.B** | DEF STAN 59-411, Method DRS01.B, Radiated susceptibility magnetic field<br>Air, land and sea service<br>20 Hz - 100 kHz |
| **EMS radiated DRS02.B** | DEF STAN 59-411, Method DRS02.B, Radiated susceptibility electric field<br>Land service class A<br>10 kHz - 18 GHz |
| **EMS radiated DRS03.B** | DEF STAN 59-411, Method DRS03.B, Magnetic field (DC) susceptibility<br>Land and sea service |
| **EMS radiated RS103** | MIL-STD-461F, Method RS103, Radiated susceptibility, electric field<br>Army<br>2 MHz - 1 GHz |
| **ESD** | EN61000-4-2:2009 Level 3<br>EN55024:1998 Performance criteria B + A1:2001 + A2:2003 |
| **ESD DCS10.B** | DEF STAN 59-411, Method DCS10.B, Electrostatic discharge |