

NL31

Robust 12-Port Fully Managed Ethernet Switch with PoE Layer 2/3 Switch with M12 Front Connectors & Fiber Option

- » 12x 10/100/1000BASE-TX ports
- » 2x 10/100/1000BASE-TX uplink ports with bypass relay on one uplink pair
- » M12 A-, D- or X-coded (screwed and push-pull)
- » 10x PoE+ Power Sourcing Equipment, up to 300 W
- » Ultra-wide range rail power supply: 24 V DC to 110 V DC
- » ITU-T G.8031/G.8032 Ethernet linear and ring protection switching
- » 2x 1000BASE-SX fiber uplink (Q-ODC) (optional)
- » -40 °C to +70 °C (+85 °C), fanless
- » EN 50155 compliant (railways)



"NL" Family Principle

MEN's "NL" Ethernet switch family principle is based on a wide range of configuration options (e.g., amount of Ethernet ports, fiber connections or Power over Ethernet) to easily adapt the switch to application requirements.

Flexible Concept in a Small Housing

The NL31 is a 12+2-port fully managed layer 2/3 Ethernet switch, providing a wide range of configuration options with 12 M12 Gigabit Ethernet ports. M12 connectors can be configured to be A-, D- or X-coded and combinations are also possible. The X-coded connectors are designed as push-pull and screwed variants (Harting concept). The NL31 offers two optional Ethernet fiber ports with 1000BASE-SX as standard variant. The mechanical concept is an extremely compact, high-quality aluminum housing providing high port density and ultra-high ruggedness. It is designed for wall-mounting, but mounting in a 19" rack is also an option.

Performance, Security and Diagnostic Features

The 29 Gbit/s, TCAM based, store-and-forward switching matrix of the NL31 allows high-performance layer 2 switching over all connected interfaces. For easy remote management and access, layer 3 protocols, e.g., IPv4/IPv6 and DHCP, are integrated. The switch provides extended security features like SNMPv3, SSH and HTTPS.

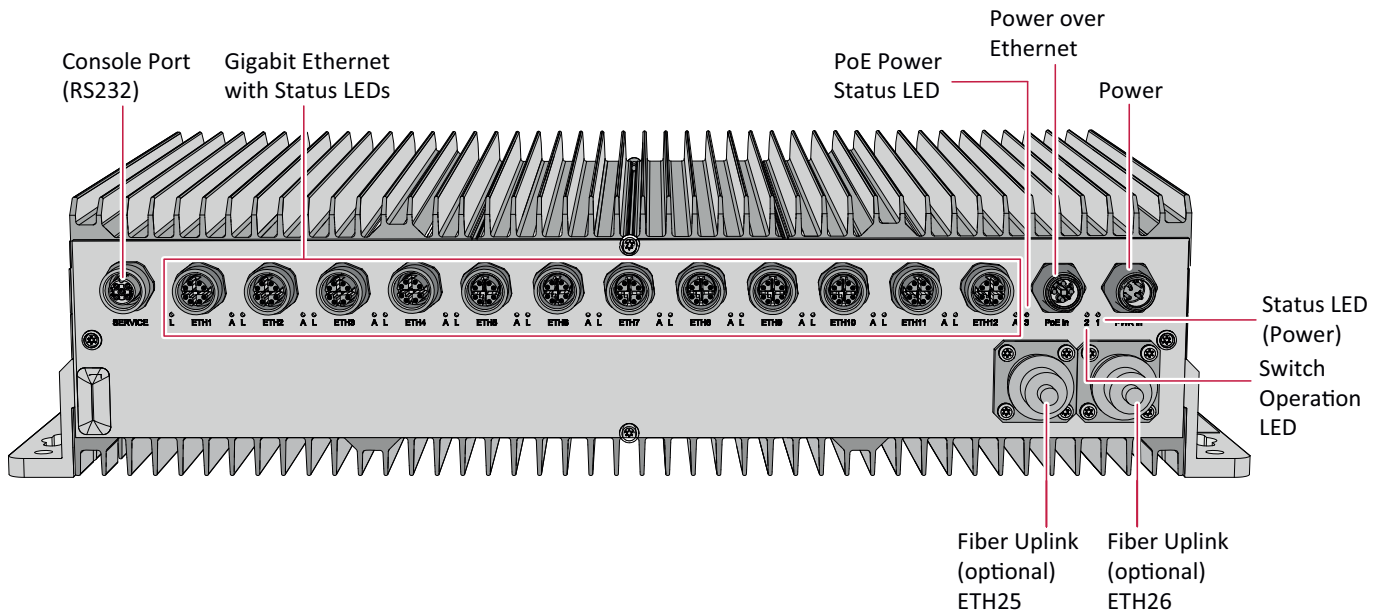
Traffic isolation (VLAN) and switching redundancy protocols (e. g., STP, RSTP, MSTP) provide safe running of the network using redundant data paths in the event of a fault. The ITU-T G.8031/G.8032 ring and linear protection switching feature set makes NL31 able to create network ring scenarios with recovery time under 50 ms. Monitoring and diagnosis functions, e.g., sFlow or SNMPv1, v2c, v3 are provided.

Wide-Range Power Supply and Power over Ethernet

The EN 50155 compliant supply voltage range of 24 V DC to 110 V DC provides maximum flexibility for using the switch. The NL31 comes with internal Power over Ethernet for 10 ports with a maximum of 30 W per port and a total of 90 W. With external PoE supply PU28, up to 300 W PoE output power are available (in load sharing mode with internal PoE power supply).

Maintenance Free and Extremely Rugged

The NL31 is designed for fanless operation at temperatures ranging from -40 °C to +70 °C (10 min @ +85 °C). The cooling fins serve as a heat sink for the internal electronics. It is maintenance-free and developed specifically for rough environmental conditions in rolling stock applications. Long-term availability until 2026 from product start minimizes lifecycle management by making the system available at least for this period of time.



Switch Key Features

- Switching Matrix
 - Total switching capacity of chipset: 29 Gbit/s
 - MAC address table size: 8192
 - Switching algorithm: Store-and-forward, TCAM high-speed (Ternary Content-Addressable Memory)
- General Network Support
 - IPv4
 - IPv6
 - IPv6 Ready Logo approved
- Protocols and Functionality
 - DHCP ARP inspection
 - DHCP Option 82
 - DHCP Server/Client
 - DHCP snooping
 - DNS Client (RFC 2136)
 - DNS Proxy (RFC 5625)
- Ports and Port Control
 - Energy Efficient Ethernet (IEEE 802.3az)
 - ETH Signal Equalization and Power Control
 - Inband management (VRAP)
 - Port frame size (Jumbo Frames: 9216 bytes/packet max.)
 - Port state (admin), speed, duplex mode and flow control
 - Port status (link monitoring) and statistics (MIB counters)
 - Port VeriPHY (cable diagnostics), ActiPHY and PerfectReach
- User Configuration Interfaces
 - Command line interface (CLI) via console, SSHv2, Telnet
 - Web interface (HTTP/HTTPS) via IPv4, IPv6
- **For more information on the switch firmware features see the firmware product page.**

Power Over Ethernet

- PSE (Power Sourcing Equipment)
- Supply classes 0, 1, 2, 3, 4
- Number of PoE ports: 10
- Total PoE power available: 90 W (300 W with external power supply)

Interfaces

- Ethernet
 - 2x 1000BASE-SX, Q-ODC, receptacle
 - 12x 10/100/1000BASE-T, M12, X-coded, receptacle
 - 12x 10/100/1000BASE-T, M12, A-coded, receptacle
 - 10x 10/100BASE-T, M12, D-coded, receptacle
 - 2x 10/100/1000BASE-T, M12, A-coded, receptacle
 - D-coded connectors are typically combined with two A-coded connectors for uplink.
 - **For possible combinations contact MEN.**
- Serial
 - 1x RS232, M12, A-coded, receptacle
- LED
 - Status: power status, system status
 - Ethernet: link, activity
- Power
 - 1x power in, M12, A-coded, plug
 - 1x PoE in, M12, L-coded, plug

Supervision and Control

- Temperature measurement
- Watchdog timer

Electrical Specifications

- Supply voltage
 - 24 V DC to 110 V DC nom. (EN 50155)
 - 52 V DC (PoE+)
- Power consumption
 - 130 W max. (with maximum PoE load)

Mechanical Specifications

- Dimensions
 - (W) 390 mm, (D) 236 mm, (H) 89 mm
- Weight: 6.0 kg max.
- Mounting possibilities
 - Wall-mount
 - Rack-mount in 19" cabinet
- Cooling
 - Air cooling, natural convection, airflow 0.4 m/s
- Protection rating: IP30

Product Compliance: Rail - Rolling Stock

- Operating temperature: -40 °C to +70 °C, +85 °C for 10 min (EN 50155:2017, class OT4, ST1)
- Storage temperature: -40 °C (EN 50155:2017) to +85 °C (EN 60068-2-2, Bb)
- Pollution degree: EN 50124-1:2017, class PD2
- Humidity: +55 °C and +25 °C, 100 % max. (EN 50155:2017)
- Shock: 30 ms @ 50 m/s² (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B)
- Vibration: 10 min @ 2.02 m/s² and 5 h @ 11.44 m/s² (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B x 2)
- Power supply
 - General compliance with power supply requirements of EN 50155:2017
 - Interruption of voltage supply: 10 ms (EN 50155:2017, class S2)
- Electrical Safety
 - EN 50155:2017
 - EN 50153:2014 + A1:2017
 - EN 50124-1:2017
 - EN ISO 13732-1:2008
- Fire protection: EN 45545-2:2013 + A1:2015, HL3
- EMC emission
 - EN 50121-3-2:2016
 - Regelung Nr. EMV 06 :2014-07-29, Anhang E: Messung an Geräten
- EMC immunity: EN 50121-3-2:2016
- Useful life: 20 years (EN 50155:2017, class L4)
- Protective coatings: EN 50155:2017, class PC2 (Any PCB protected on both sides)

Reliability

- MTBF: 350 000 h @ 40 °C according to IEC/TR 62380 (RDF 2000)

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