NM30 – Managed 8-Port Rugged Industrial Ethernet Switch

- **Managed 8-port rugged Ethernet switch**
- **Fast or Gb BASE-T Ethernet via M12 connectors on the front panel**
- **PoE+ Power Sourcing Equipment (PSE), up to 60 W output power**
- **Special switch protocols including Quality of Service (QoS)**
- **Up to 4096 VLANs**
- **Redundancy and flow control**
- **Rugged aluminium enclosure with IP40 protection**
- **Fanless and maintenance-free design**
- **Ultra wide range power supply input (14.4 to 154 VDC) with interruption class S2**
- **-40°C to +70 (+85)°C operating temperature**
- **Compliant to EN 50155 (railways)**
- **Compliant to ISO 7637-2 (E-mark for automotive)**

The NM30 family is a range of 8-port fanless and maintenance-free managed Ethernet switches, developed specifically for rough environmental conditions in rolling stock and automotive applications.

The NM30 range of managed switches provide the additional ability to configure, manage and monitor the LAN which allows more control over how data travels through the network and who has access. The switch also includes special switch protocols like QoS (Quality of Service) to prioritize network traffic, as well as virtual LANs (VLANs), redundancy and port mirroring.

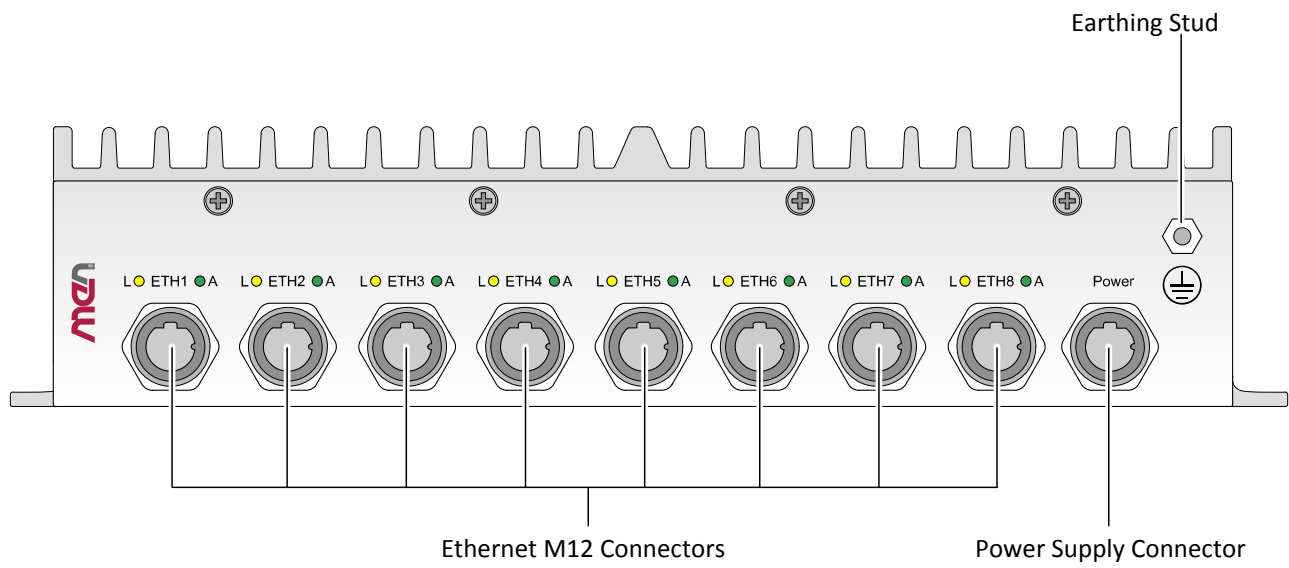The NM30 range provide eight channels at the front panel, accessible through M12 connectors and cover different application requirements including with or without PoE+ (Power Over Ethernet +), and either 100 Mb or 1Gb Ethernet interfaces.

The voltage supply for the NM30 Managed Ethernet Switch is designed for maximum flexibility and supports wide range input supply voltages from 14.4 to 154 VDC, and meets all EN50155 class S2 requirements for voltages ranging 24 to 110 VDC.

The NM30 is designed for fanless operation at temperatures ranging from -40 to +70°C. Its special aluminium housing has ingress protection IP40 and cooling fins which serve as a heatsink for the internal electronics, and in this way provides conduction cooling.

As a member of MEN's family of extremely rugged industrial box PCs, the NM30 provides the same flexibility and scalability, as well as a look and feel which is common to the family.

Diagram

Earthing Stud

L○ ETH1 ●A   L○ ETH2 ●A   L○ ETH3 ●A   L○ ETH4 ●A   L○ ETH5 ●A   L○ ETH6 ●A   L○ ETH7 ●A   L○ ETH8 ●A   Power

Ethernet M12 Connectors   Power Supply Connector

Technical Data

Supported Port Types	■ The following configurations are available:
	    □ 8x 10/100BASE-T managed switch (Model: 09NM30-00)
	    □ 8x 10/100BASE-T managed switch, 8x PoE + PSE with max. 60 W output power (Model: 09NM30-01)
	    □ 8x 10/100/1000BASE-T managed switch (Model: 09NM30-02)
	    □ 8x 10/100/1000BASE-T managed switch, 8x PoE + PSE with max. 60 W output power (Model: 09NM30-03)

Protocols and Functionality	■ General Network Support
	    □ IPv4
	    □ IPv6 Ready
	    □ IPv6 Ready Phase 2
	■ Host Configuration Protocols
	    □ DHCP Server / Client
	    □ DHCP Option 82
	    □ DHCP Snooping
	    □ DHCP ARP Inspection
	■ DNS
	    □ DNS Client (RFC 2136)
	    □ DNS Proxy (RFC 5625)

Ports and Port Control	■ Energy Efficient Ethernet (IEEE 802.3az) ■ ETH Signal Equalization and Power Control ■ Port state (admin), speed, duplex mode and flow control ■ Port frame size (Jumbo Frames: 9216 Bytes max.) ■ Port status (link monitoring) and statistics (MIB counters) ■ Port VeriPHY (cable diagnostics), ActiPHY™ and ■ PerfectReach™ ■ Inband management (VRAP)

Switch Management and Monitoring	■ OAM
	    □ Link OAM: IEEE 802.3ah (a.k.a. EFM)
	    □ CFM: IEEE 802.1ag
	    □ ITU-T Y.1731 Down-MEP, ITU-T Y.1731 Up-MEP, ITU-T Y.1731 MIP
	    □ MEF E-LMI Configuration Management
	    □ SMAC/DMAC Swap
	    □ OAM Performance Monitoring MEF35 Phase 1
	■ SNMP Management v1, v2c, v3 (RFC 1212, 1901-1908, 3411-3418)
	■ SNMP v1 Traps (RFC 1157) with multiple destinations
	■ LLDP (IEEE 802.10AB)
	■ TIA 1057 LLDP-MED extensions
	■ CDP (Cisco Discovery Protocol)
	■ RMON Group 1, 2, 3 and 9 (RFC 2819)
	■ Syslog (RFC 5424)
	■ sFlow (RFC 3176)
	■ Port and Flow Mirroring
	■ Fallback Firmware

Configuration Management	■ TFTP (RFC 1350) ■ Fallback Configuration ■ Configurable by Web / CLI / Telnet /SSL / Console

Technical Data

Redundancy and Flow Control	■ Static Link Aggregation
	■ IEEE 802.3ad Link Aggregation Protocol
	■ IEEE 802.3X Back Pressure Flow Control
	■ IEEE 802.1D Spanning Tree Protocol (STP)
	■ IEEE 802.1w Rapid STP (RSTP)
	■ IEEE 802.1s Multiple STP (MSTP)
	■ BDPU Guard / Restrict Role
	■ ITU-T:G.8032 Ring Protection
	■ ITU-T:G.8031 Linear Protection
	■ IEEE 802.1ag / ITU-T Y.1731 Connectivity Fault Protection
	■ Loop Protection
Security	■ Network Access Server (NAS):
	□ Port-based IEEE 802.1x
	□ Single and multiple IEEE 802.1x
	□ MAC based authentication
	□ VLAN and QOS assignment
	□ Guest VLAN
	■ RADIUS accounting (RFC 2866ff)
	■ MAC address limit and MAC freeze
	■ IP MAC Binding / Binfind dynamic to static
	■ TACACS+ Accounting
	■ Web and CLI Authentication
	■ IP Source guard
	■ Authorization (15 user levels)
	■ DHCP Snooping (RFC 2132)
	■ Dynamic ARP Inspection
VLAN	■ VLAN Tagging and Trunking (IEEE 802.1Q)
	■ Supported VLAN Types:
	□ Private Static VLAN (RFC 5517)
	□ MAC, Protocol, IP-Subnet and Port based VLAN (IEEE 802.1Q)
	□ VOICE VLAN (IEEE 802.1Q, IEEE 802.1P)
	■ Dynamic VLANs (GVRP)
	■ Multicast VLAN Registration (IEE 802.1ak MRP and MVRP)
Multicast	■ IPv4 Internet Group Management protocol (IGMP) v1, v2, v3
	■ Maximum number of IGMP Groups:
	□ 8000 for Layer2
	□ 8000 for IP4/IP6
	■ IPv6 Multicast Listener Protocol (MLD) v1, v2
	■ Multicast VLAN registration protocol (MVR)
	■ MRP/GMRP Multicast Registration Protocol (IEEE 802.1ak)
QoS	■ Active Priority Queues per Port: 8
	■ Class of Service (IEEE 802.1p)
	■ Port and queue egress shaper
	■ Storm control (for Unicast, Broadcast, Multicast, unknown)
	■ Port and Queue Egress shaper
	■ Scheduler Mode (weighted and fair scheduling)
	■ Port Default/User Priority and Input Priority Mapping
	■ DCSP remarking (RFC 2474)
	■ QoS control list (QCL mode))
	■ Random Early Detection (RED, RFC 2309)
	■ Policers (port, service, queue and global/VCAP - ACL)
	■ DiffServ (RFC 2474) and Tag remarking

Technical Data

Synchronization	- NTPv4 Client (RFC 5005) - IEEE 1588v2 PTP with one-step and two-step clock - IEEE 1588v2 PTP with redundant master clocks - IEEE 1588v2 boundary clock - IEEE 1588v2 unicast and multicast support
Supported Industrial Ethernet Protocols	- EtherNet/IP - Modbus/TCP - Profinet (Essential: IEEE 802.1Q)
Power Over Ethernet Features	- Power over Ethernet functions on all ports (Models: 09NM30-01 and 09NM30-03) - PSE (Power Sourcing Equipment) function - Up to 60 W total output power - PoE starts in auto mode - Run time PoE+ behaviour programmable via service interface
Service Interface	- Console interface - USB 2.0 Series B rear console interface for local system management - Web interface - Web based control and management interface over any Ethernet port
Front Interfaces	- Ethernet - Eight M12 connectors, 100BASE-T (100 Mbit/s) (Models: 09NM30-00 and 09NM30-01), or - Eight M12 connectors, 1000BASE-T (1 Gbit/s) (Models: 09NM30-02 and 09NM30-03) - Ethernet LED - Power supply - One M12 connector for ultra wide range power - Power status LED - Indicates power supply stability or range validity
Rear Interfaces	- USB - One Series A connector, USB 2.0 (480 Mbit/s)
Electrical Specifications	- Supply voltage 14.4 VDC to 154 VDC - Nominal voltages 24, 36, 48, 72, 96 and 110V VDC, according to EN50155 - Power interruption class S2 (10 ms) 18 VDC to 32 VDC - Code H, Starting Profile Level II (50ms @ min 8V), according to ISO 16750 - Power consumption +10 W Max. (Models: 09NM30-00 and 09NM30-02) +85 W Max. with 60W PoE Max. (Models: 09NM30-01 and 09NM30-03)
Mechanical Specifications	- Dimensions: Height 44.1 mm x Width 220 mm x Length 164 mm - Weight: Less than 1.5 kg (depending on configuration)

Technical Data

Environmental Specifications	■ IP protection
	  □ IP40 (except front plate)
	  □ Front plate: IP30
	  □ Up to IP65 (Option)
	■ Temperature range (operation)
	  □ -40°C to 70°C (screened), with up to 85°C for 10 minutes according to class Tx (EN 50155)
	  □ Fanless operation
	■ Temperature range (storage): -40°C to +85°C
	■ Relative humidity (operation): max. 95% non-condensing
	■ Relative humidity (storage): max. 95% non-condensing
	■ Altitude: -300 m to +3000 m
	■ Shock: 50 m/s², 30 ms (EN 61373)
	■ Vibration (function): 1 m/s², 5 Hz to 150 Hz (EN 61373)
	■ Vibration (lifetime): 7.9 m/s², 5 Hz to 150 Hz (EN 61373)
	■ Conformal coating of internal components

Reliability	■ MTBF: tbd h @ 40°C according to IEC/TR 62380 (RDF 2000)

Safety	■ Flammability
	  □ UL 94V-0
	■ Fire Protection
	  □ EN 45545-2
	■ Electrical Safety
	  □ EN 60950-1, class I equipment

EMC Conformity (Automotive)	■ ECE R10 (prepared for E-Mark) ■ ISO 16750-H-K-D-C-C-IP30 (On request)
EMC Conformity (Railway)	■ EN 50121-3-2
Software Support	■ Firmware for configuration and management included

Configuration & Options

Standard Configurations

Article No.	Housing	Input Voltage	Ethernet Connectors	PoE
09NM30-00	Aluminium with IP40 protection	14.4 to 154 VDC, 24 to 110 VDC nom.	8 x 10/100BASE-T	No
09NM30-01	Aluminium with IP40 protection	14.4 to 154 VDC, 24 to 110 VDC nom.	8 x 10/100BASE-T	Yes
09NM30-02	Aluminium with IP40 protection	14.4 to 154 VDC, 24 to 110 VDC nom.	8 x 10/100/1000BASE-T	No
09NM30-03	Aluminium with IP40 protection	14.4 to 154 VDC, 24 to 110 VDC nom.	8 x 10/100/1000BASE-T	Yes

Ordering Information

Standard NM30 Models		
	09NM30-00	Managed 8-port 10/100 MBit Ethernet switch, no PoE, 14.4 to 154 VDC, EN 50155 class Tx compliant -40 to +70°C (screened), conformal coating
	09NM30-01	Managed 8-port 10/100 MBit Ethernet switch, with PoE, 14.4 to 154 VDC, EN 50155 class Tx compliant -40 to +70°C (screened), conformal coating
	09NM30-02	Managed 8-port 10/100/1000 MBit Ethernet switch, no PoE, 14.4 to 154 VDC, EN 50155 class Tx compliant -40 to +70°C (screened), conformal coating
	09NM30-03	Managed 8-port 10/100/1000 MBit Ethernet switch, with PoE, 14.4 to 154 VDC, EN 50155 class Tx compliant -40 to +70°C (screened), conformal coating

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