

NM50

IOT & Gateway Computer or WLAN Access Point Rugged Embedded Railway & Automotive Network Box

- » NXP PowerPC QorIQ P1013, 800 MHz
- » Fanless and maintenance-free design
- » 2 Gigabit Ethernet ports on M12 connectors
- » 1 USB 2.0 Type A port, 1 USB 2.0 Type B port
- » Up to 6 antennas on RP-TNC connectors
- » Wireless LAN according to IEEE802.11b/g/n
- » Aluminum housing with IP30 protection
- » -40°C to +85°C operating temperature
- » Dual RF, simultaneous 2.4 GHz and 5 GHz band support
- » Ultra wide range power supply input, with interruption class S2
- » Electrically isolated
- » Compliant to EN 50155 (railways)



Maintenance Free and Extremely Rugged

The NM50 is a fanless and maintenance-free wireless access point, specifically designed for use in railway cars operating in rugged environmental conditions.

High Speed Internet for Multiple WLAN Devices

The NM50 Access Point can support up to two WLAN modules, and provides reliable high speed internet and local data connection to multiple WLAN compatible devices. A configurable firewall protects WLAN clients and supports secure and uninterrupted internet data access.

High Performance Processor in a Conduction Cooled System

The NM50 Access Point is based on QorIQ Power PC CPU technology from NXP. The system is designed for fanless operation in temperatures ranging from -40 to +70°C (+85°C for up to 10 minutes). Its special aluminium housing with cooling fins serves 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 NM50 provides the same flexibility and scalability, as well as a look and feel which is common to the family.

Extended Coverage and Increased Service Availability

A redundant upstream connection to a local server, or downstream to other access points, to extend coverage and increase availability of service, is achieved via the two Gigabit Ethernet ports available on 8-pin M12 connectors.

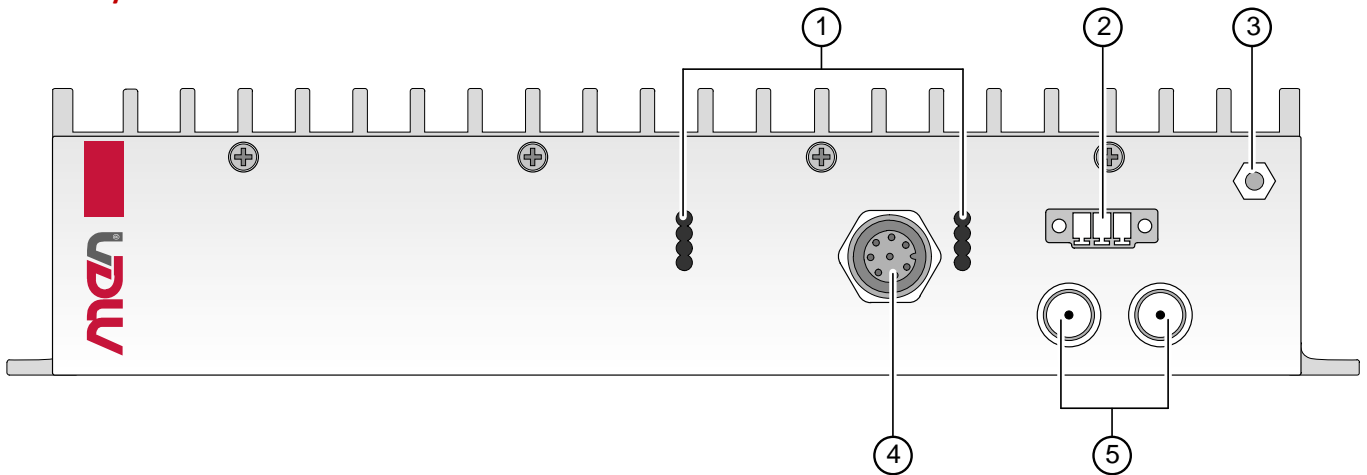
Wide Range Power Input and Compliant to Railway Standards

The voltage supply for the fully configured NM50 Access Point is designed for maximum flexibility and supports wide range input supply voltages from 14.4 to 154 VDC, and meets all EN 50155 requirements for voltages ranging from 24 to 110 VDC.

Adaptable to Specific Application Needs

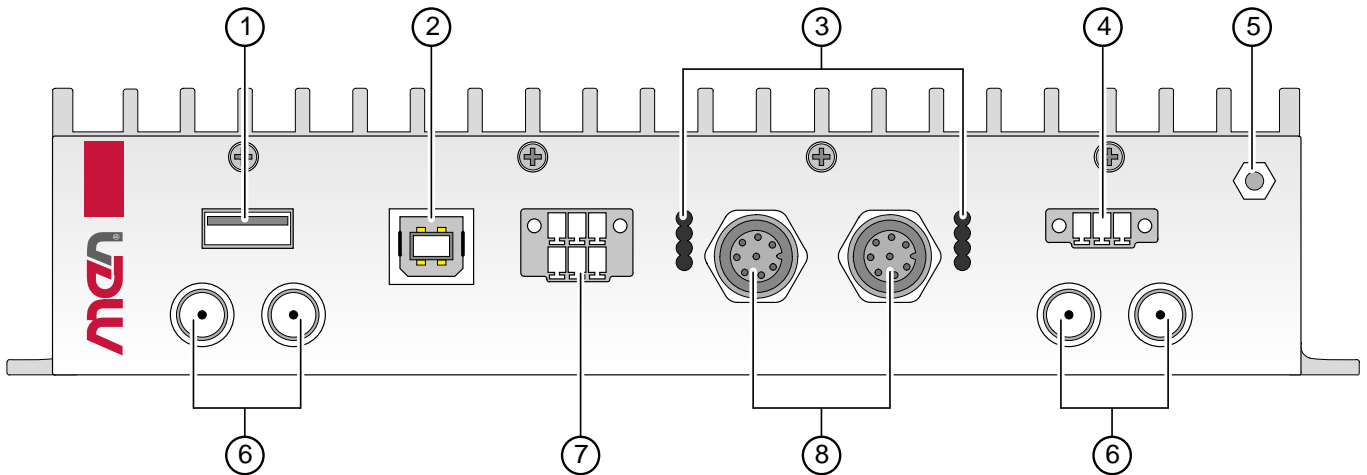
The NM50 comes in two standard versions and can be adapted to meet specification application needs. Some of the most important configuration options include the

Entry Level: 09NM50-00



- | | |
|--------------------------|--|
| ① Status/Activity LEDs | ④ Gigabit Ethernet M12 A-Coded Connector |
| ② Power Supply Connector | ⑤ Antenna RP-TNC Connectors |
| ③ Earthing Stud | |

High End: 09NM50-01



- | | |
|----------------------------|---|
| ① USB 2.0 Type A Interface | ⑤ Earthing Stud |
| ② USB 2.0 Type B Interface | ⑥ Antenna RP-TNC Connectors |
| ③ Status/Activity LEDs | ⑦ Discrete I/O |
| ④ Power Supply Connector | ⑧ Gigabit Ethernet M12 A-Coded Connectors |

CPU

- NXP QorIQ P1013
 - One high-performance Power Architecture e500v2 core
 - 800 MHz processor core frequency

Memory

- 32 KB L1 instruction cache
- 32 KB L1 data cache
- 256 KB L2 cache/SRAM
- 1 GB DDR3 SDRAM system memory
 - Soldered
- 32 MB NOR Flash

Mass Storage

- Via USB 2.0 host port at the front (Model: 09NM50-01)

Protocols and Functionality

- Management I/F
 - Integrated FW WEB/browser based setup and maintenance
 - Local interface
 - Firmware update from USB and Ethernet
- Firewall
 - NAT (Network Address Translation)
 - iptables
 - SSID show/hide
 - MAC/IP/port filtering
- Security
 - WEP 64 and 128 bit
 - WPA/WPA2 Personal and Enterprise
- General Protocols
 - Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNMP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP
- AP Protocols
 - ARP, BOOTP, DHCP, STP/RSTP (IEEE 802.1D/w)
- Routing
 - Optional feature when Cellular upstream option is selected
 - Static and dynamic routing, IPv4 IPv6, TCP/IP, UDP, ICMP, STP, RSTP, MSTP, RIPv1, RIPv2, RIPng
- Remote monitoring and maintenance via Ethernet and WLAN
- Local monitoring and maintenance via USB device port (Model: 09NM50-01)
- Software initiated restart
- Watchdog

Connectivity

- USB host at front for mass storage (Model: 09NM50-01)
- USB device for maintenance (Model: 09NM50-01)
- WiFi Network
 - Up to two WiFi 802.11b/g/n modems (optional)
 - 2x2 MIMO supported
 - Optional antenna diversity for each radio
 - Maximum data rate 300 Mbit/s (n); 54 Mbit/s (g), 11 Mbit/s (b)
 - Both 2.4GHz and 5GHz supported (depending on configuration)
 - Unlimited parallel users; Bandwidth-limited to 60 per WiFi RF interface
- Cellular Network (on request)
 - 3.5G/4G modem

Discrete I/O (Model: 09NM50-01)

- Opto-isolated output (open collector) user programmable status output
 - Reports device status to external devices
 - Freely programmable via Web browsers or console I/F
 - Report sevice error signal/flag to host option
- Opto-isolated output user programmable input
 - Freely programmable via Web browsers or console I/F
 - Report external device status to Access Point option
 - Report 'engine off' in bus applicaion option
- One dedicated W_Disable input
 - Active low signal to disable RF operation
 - Direct disable of radio operation on either WLAN or cellular cards
- Discrete input levels
 - Input current for high: >5 mA
 - Input current for low: <1 mA
 - Input switching level: 40..±5%
- Independent input reference voltage range 0..154 V
- Optocoupler shutter control option
- Only available on the NM50 version with full configuration

Front Interfaces

- One USB 2.0 Type A, host port (Model: 09NM50-01)
 - Type A connector at front panel
 - Firmware and configuration update support
- One USB 2.0 Type B, device port (Model: 09NM50-01)
 - Type B connector at front panel
 - Console-mode maintenance support
- Ethernet 1
 - 10/100/1000Base-T Ethernet channels
 - M12 8-pin A-coded connector
 - Two LEDs to signal LAN link and activity status
- Ethernet 2 (Model: 09NM50-01)
 - 10/100/1000Base-T Ethernet channels
 - M12 8-pin A-coded connector
 - Two LEDs to signal LAN link and activity status
- Antenna
 - Two Type RP-TNC antenna connectors (Model: 09NM50-00)
 - Four Type RP-TNC antenna connectors (Model: 09NM50-01)
- Discrete I/O (Model: 09NM50-01)
 - 6-pin double row connector, 3.5 mm
- LEDs
 - Power status
 - Fault LED: Indicates error codes from the board controller
 - Ethernet link and activity status
 - User LEDs for WLAN activity
- Power Input
 - RM3.5 3-pol plug-in connector

In-System Interfaces

- One PCI Express Mini Card slot with one WLAN radio PCI Express Mini Card installed (09NM50-00)
- Two PCI Express Mini Card slots with two WLAN radio PCI Express Mini Cards installed (09NM50-01)
- One SIM card slot on PCI Express Mini Card slot 2 (09NM50-01)

Electrical Specifications

- Primary power supply
 - 14.4 to 154 VDC, nominal voltages 24, 36, 48, 72, 96 and 110 VDC according to EN50155
- Power consumption: Less than 15 W (09NM50-00)
- Power interruption class S2 (10 ms)

Mechanical Specifications

- Dimensions: Height 44 mm x Width 125 mm x Length 220 mm
 - Weight: approx. 1.5 kg (depending on configuration)
 - Mounting
 - Wall mount or top mount
-

Environmental Specifications

- Temperature range (operation):
 - -40 to 70°C, with up to 85°C for 10 minutes according to class Tx (EN 50155)
 - Natural convection, fanless operation
 - Temperature range (storage): -40..+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 - 150 Hz (EN 61373)
 - Vibration (lifetime): 7.9 m/s², 5 Hz - 150 Hz (EN 61373)
 - Conformal coating of internal components
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MTBF

- 70 000 h
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Safety

- Flammability (PCBs)
 - UL 94 V-0
 - Fire Protection
 - EN 45545-2
 - Electrical Safety
 - EN 60950-1, class I equipment
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Software Support

- OpenWrt Firmware
-

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Up-to-date information, documentation and ordering information:

www.men.de/products/nm50/

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