

NM50 – Mobile Gateway & WLAN Access Point

- Freescale™ 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)
- Compliant to ISO 7637-2 (E-mark for automotive)



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

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.

The NM50 Access Point is based on QorIQ™ Power PC CPU technology from Freescale™. 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

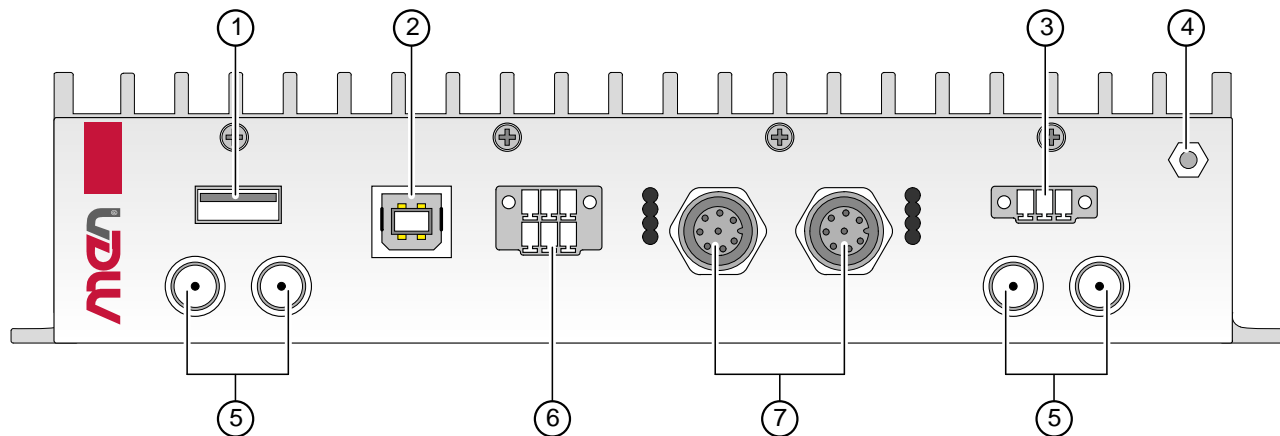
flexibility and scalability, as well as a look and feel which is common to the family.

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.

The voltage supply for the NM50 Access Point is designed for maximum flexibility and supports wide range input supply voltages from 14.4 to 154 VDC (with optional support for a reduced range of 9 to 50.4 VDC), and meets all EN 50155 requirements for voltages ranging from 24 to 110 VDC. It is also fully compliant to ISO 7637-2 (E-mark for automotive) standard. The NM50 Access Point can also be powered by Power over Ethernet.

The NM50 comes in two standard versions and can be adapted to meet the customer's specific needs. Some of the most important options include the number of WLAN radios, the power supply range, the PoE supply and type of upstream link.

Diagram



- ① USB 2.0 Type A Interface (full configuration version only)
- ② USB 2.0 Type B Interface (full configuration version only)
- ③ Power Supply Connector
- ④ Earthing Stud
- ⑤ 4 x Antenna on RP-TNC Connectors (configuration dependent)
- ⑥ Discrete I/O (full configuration version only)
- ⑦ 2 x Gigabit Ethernet on M12 Connectors (configuration dependent)

Technical Data

CPU	<ul style="list-style-type: none"> ■ Freescale™ QorIQ™ P1013 <ul style="list-style-type: none"> □ One high-performance Power Architecture e500v2 core □ 800 MHz processor core frequency
Memory	<ul style="list-style-type: none"> ■ 32 KB L1 instruction cache ■ 32 KB L1 data cache ■ 256 KB L2 cache/SRAM ■ 1 GB DDR3 SDRAM system memory <ul style="list-style-type: none"> □ Soldered ■ 32 MB NOR Flash
Mass Storage	<ul style="list-style-type: none"> ■ Via USB 2.0 host port at the front
I/O	<ul style="list-style-type: none"> ■ One USB 2.0 host port <ul style="list-style-type: none"> □ Series A connector at front panel □ Firmware and configuration update support □ Only available on the NM50 version with full configuration ■ One USB 2.0 device port <ul style="list-style-type: none"> □ Series B connector at front panel □ Console-mode maintenance support □ Only available on the NM50 version with full configuration ■ Ethernet 1 <ul style="list-style-type: none"> □ 10/100/1000Base-T Ethernet channels □ Via M12 connector at front panel □ Two LEDs to signal LAN link and activity status ■ Ethernet 2 <ul style="list-style-type: none"> □ 10/100/1000Base-T Ethernet channels □ Via M12 connector at front panel □ Two LEDs to signal LAN link and activity status □ Only available on the NM50 version with full configuration ■ Antenna connectors (dependent on configuration) <ul style="list-style-type: none"> □ 4 Type RP-TNC antenna connectors at front panel □ 2 Type RP-TNC antenna connectors at back panel ■ 8 LEDs at front panel (dependent on configuration) <ul style="list-style-type: none"> □ Power status □ Fault LED: Indicates error codes from the board controller □ 4 for Ethernet link and activity status □ 2 user LEDs
Discrete I/O (Only available on the NM50 version with full configuration)	<ul style="list-style-type: none"> ■ Via a 6-pin double row connector at front panel ■ Opto-isolated output (open collector) user programmable status output <ul style="list-style-type: none"> □ 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 <ul style="list-style-type: none"> □ 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 <ul style="list-style-type: none"> □ Active low signal to disable RF operation □ Direct disable of radio operation on either WLAN or cellular cards ■ Discrete input levels <ul style="list-style-type: none"> □ Input current for high: >5 mA □ Input current for low: <1 mA □ Input switching level: 40..±5% ■ Independent input reference voltage range 0..1.54 V ■ Optocoupler shutter control option ■ Only available on the NM50 version with full configuration

Technical Data

Front Connections

- One USB 2.0 (Series A)
 - Only available on the NM50 version with full configuration
- One USB 2.0 (Series B)
 - Only available on the NM50 version with full configuration
- Two Ethernet (M12)
 - Ethernet 2 only available on the NM50 version with full configuration
- Four Antennae (RP-SMA)
- One Discrete I/O
 - Only available on the NM50 version with full configuration

Two PCI Express® Mini Card slots

- For functions such as
 - Mobile service standards: GSM (2G), UMTS (3G), LTE (4G) and derivatives
 - Wireless communication: WLAN / WiFi IEEE 802.11 and derivatives
 - Positioning: GPS, GLONASS, GALILEO
- 1 SIM card slot on PCI Express® Mini Card slot 2

Miscellaneous

- Management I/F
 - Integrated FW WEB/browser based setup and maintenance
 - Local interface
 - Firmware update from USB and Ethernet
- Firewall
 - Full featured firewall
 - SSID show/hide
 - MAC/IP/port filtering
 - Multiple zone
- Security
 - WEP 64 and 128 bit
 - WPA/WPA2 Personal and Enterprise
- General Protocols
 - Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, 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
- Software initiated restart
- Watchdog

Connectivity

- USB host at front for mass storage
- USB device for maintenance
- WiFi Network
 - Up to two WiFi 802.11 b/g/n/ac modems (UC-Option)
 - 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
 - 3.5G/4G modem (UC-Option)

Technical Data

Electrical Specifications	<ul style="list-style-type: none">■ Primary power supply<ul style="list-style-type: none">□ NM50 Entry version: 9..50.4 VDC□ NM Entry version: nominal voltages 12, 24 and 36 VDC according EN50155□ NM50 High End version: 14.4..154 VDC□ NM50 High End version: nominal voltages 24, 36, 48, 72, 96 and 110VDC according EN50155■ Power consumption: Less than 15 W■ Power interruption class S2 (10 ms)■ Power over Ethernet function only available on the NM50 version with full configuration
Mechanical Specifications	<ul style="list-style-type: none">■ Dimensions: Height 44 mm x Width 125 mm x Length 220 mm■ Weight: approx. 1.5 kg (depending on configuration)■ Mounting<ul style="list-style-type: none">□ Wall mount or top mount
Environmental Specifications	<ul style="list-style-type: none">■ Temperature range (operation):<ul style="list-style-type: none">□ -40..70°C, with up to 85°C for 10 minutes according to class Tx (EN 50155)□ 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 on request [oder: (falls Standard)] (standard)
MTBF	<ul style="list-style-type: none">■ 70 000 h
Safety	<ul style="list-style-type: none">■ Flammability<ul style="list-style-type: none">□ UL 94V-0■ Fire Protection<ul style="list-style-type: none">□ EN 45545-2■ Electrical Safety<ul style="list-style-type: none">□ EN 60950-1, class I equipment
EMC Conformity (Automotive)	<ul style="list-style-type: none">■ ISO7637-2 (E-mark)

Configuration & Options

Standard Configurations

Article No.	CPU	Housing	Input Voltage	Antenna Connectors	Ethernet Connectors	USB Connectors	Discrete I/O
09NM50-00	Freescale QorIQ P1013, 800 MHz	Aluminium with IP40 protection	9..50.4 VDC	2 x RP-TNC	1 x M12	No	No
09NM50-01	Freescale QorIQ P1013, 800 MHz	Aluminium with IP40 protection	14.4..154 VDC (24..110 VDC nominal) PoE option	4 x RP-TNC	2 x M12	Yes	Yes

Ordering Information

Standard NM50 Models	Model	Description
	09NM50-00	9 to 50.4 VDC 1 radio, 2 antenna connectors, 1 M12 1Gb LAN, EN 50155 class Tx compliant, -40 to +70°C (screened), conformal coating
	09NM50-01	12 to 154 VDC, 2 radio, 4 antenna connectors, 2 M12 1Gb LAN, USB Host and USB device, 2 discrete inputs, 1 isolated output, EN 50155 class Tx compliant, -40 to +70°C (screened), conformal coating

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