

DIN-Rail Systems

A modular concept based on individual components which can be combined in flexible built-to-order configurations for a wide range of embedded IoT applications

The logo for M&N, featuring the letters 'm' and 'n' in a stylized, lowercase font. The 'm' is red and the 'n' is black, with a registered trademark symbol (®) to the right.

Always reliable. Always ahead.

The logo for IRIS Certification, featuring the word 'IRIS' in a bold, sans-serif font with a stylized eye icon to the right, and the word 'Certification' in a smaller font below it.

DIN-Rail Embedded Computers

An Innovative and Industry-Leading Approach!

With the DIN-Rail family you can easily put together your own tailor-made computer system that is perfectly suited for your specific application. Combine all necessary functions from a selection of modules for DIN rail mounting.

The DIN-Rail systems from MEN are a selection of individual pre-fabricated modules that can variably combine features as required for a range of embedded rail onboard, wayside and industrial IoT applications. The modules are combined in flexible built-to-order configurations that can be conveniently mounted on a space-saving standard DIN rail.

Modular Concept for Vast Number of Applications

The modular computers, expansions and power supplies of the DIN-Rail system concept are suitable for a variety of applications. The concept specifications include enclosure dimensions, mounting, cooling and IP protection. In addition, extension connectors and their pin-outs are defined.

The computer modules offer mid-range CPU performance with low power dissipation and are therefore the perfect choice for e.g. predictive maintenance, CCTV, data protection, ticketing systems, or to act as a diagnostics server.

Fast Time-to-Market with Flexible Extension Modules

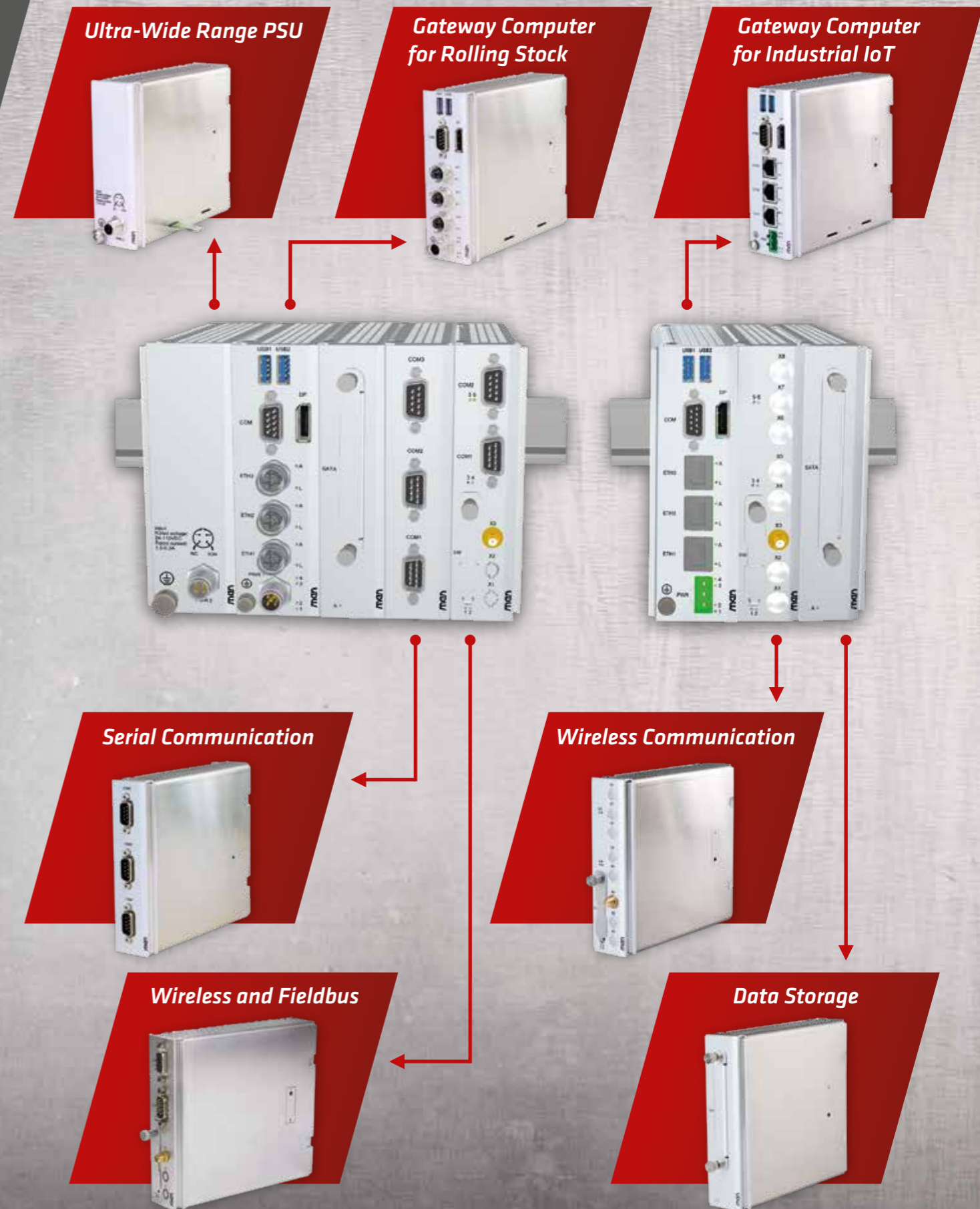
Easy integration of pre-fabricated extension modules allows application specific configurations to be assembled and delivered in short time. The extension modules provide interfaces like MVB, CAN, audio, binary and analog I/O as well as wireless functions like LTE Advanced, WLAN and GNSS. A removable shuttle with one or two 2.5" SATA HDD/SSD disks can extend the DIN-rail system for storage intensive applications.

An ultra-wide range PSU module can be integrated when a power input of 24 V to 110 V DC nominal is needed.

Flexible, Space-Saving & Future-Proof

Various mounting options facilitate the integration of the boxes into an existing environment. The standard 35 mm DIN rail mounting offers space saving mounting of all system modules on a single rail. Wall mounting and mounting in a 19" rack using adaption brackets are an option.

Long-term availability of 15 years (gateway computers) and 10 years (extensions) from product start minimizes life-cycle management.



Modular Gateway Computers

MC50M/MC50I – Embedded System for IoT, Security and Predictive Maintenance

- » Intel Atom E3900 series
- » Up to 8 GB DDR3 RAM with ECC
- » Trusted Platform Module
- » M.2 NVMe slot for storage
- » Gb Ethernet, USB 3.0, RS232, RS485/422, DisplayPort
- » Input voltage 24 V DC nom. with ignition
- » Full range power supply 16 V DC to 60 V DC

MC50M

- » M12 connectors
- » EN 50155 compliant (railways)
- » -40°C to +70°C (+85°C), fanless

MC50I

- » RJ45 connectors
- » -40°C to +70°C, fanless



Low Power CPU for IoT/Network Applications

MC50M and MC50I are fully modular DIN rail mounted gateway computers for digital railway, public transport and industrial automation applications. The computing platforms feature an Intel Atom E3900 series CPU with low power dissipation and scalability in performance and memory. These DIN-Rail computers are the ideal basis for functions such as security gateway, predictive maintenance, CCTV, data protection or ticketing system, or to act as a diagnostics server.

Modular System for Easy Configuration

The gateway computers MC50M and MC50I can be stand-alone products, but due to MEN's modular concept they offer flexible built-to-order configurations. The boxes can be easily combined with prefabricated extension and PSU modules.

Power Saving Design and Security Features

The board management controller provides enhanced reliability and reduced downtime. The Trusted Platform Module supports security and encryption features. With the ignition switch for remote control of booting and shutdown, the platform provides additional features for power saving.

In-Vehicle Qualified and Long-Term Availability

The CPU module MC50M is qualified for rolling stock and wayside applications; the MC50I for wayside and information technology applications. In combination with the prefabricated PSU module MP1, the MC50M achieves the standard supply voltage range for use in rail vehicles.

Long term availability of 15 years from product start minimizes life-cycle management for both types of MEN's Din-Rail based gateway computers.

Power Supply Unit

MP1 – Ultra-Wide Range PSU for Transportation

The MP1 is a PSU module for use in transportation. The power input allows an operating input voltage range from 24 V DC to 110 V DC nominal, which is EN 50155 compliant. Due to MEN's modular concept, the MP1 offers flexibility in built-to-order configurations.

In combination with the pre-fabricated CPU Module MC50M, it extends the standard power supply voltage range of the computer module, making it also suitable for use in rolling stock applications.



- » Ultra-wide range power input: 24 V DC to 110 V DC nominal
- » Full range supply voltage: 16.8 V DC to 138 V DC
- » EN 50155 compliant
- » -40°C to +70°C (+85°C), fanless

Extension Modules

ME1 – Wireless Communication Module

The ME1 is a modular extension for embedded applications in transportation, adding wireless connectivity to the MC50M/MC50I system CPU. It comes with two M.2 slots for high speed LTE modems (LTE Advanced or LTE). For each M.2 slot, two front-accessible micro-SIM card slots are available. The PCI Express Mini Card slot is prepared for adding a WLAN module. For GPS/GLONASS functions, the box has an onboard GNSS receiver which can be connected via antenna connector.



- » LTE Advanced via M.2
- » 4 micro-SIM card slots
- » WLAN via PCIe Mini Card
- » GNSS receiver
- » Conduction cooling of modems
- » -40 °C to +70 °C (+85 °C), fanless



Find the complete product range under:
www.men.de/din-rail-systems

Extension Modules

Why MEN?

Development and production of rugged and reliable products

Our boards and systems are developed to meet requirements such as temperature ranges between -40°C and +85°C through convection or conduction cooling, shock, vibration, chemical influence or the option of coating against humidity right from the start.

Development based on quality management systems of our markets

We are certified according to ISO 9001 and ISO 14001, plus EN/AS 9100 (aerospace) and IRIS (railways) and provide systems according to ISO 7637-2 (road traffic) requirements. We develop according to the GRESS requirements by Airbus and are preparing for EFQM (European Foundation for Quality Management).

Development based on relevant standards know-how for our markets

Preparing products for environmental qualification according to vertical market standards is one of our key services, for example EN 50155 (railways), DO-160G (airborne), German Lloyd (ships) or ISO 7637-2 (automotive E-Mark).

Fully automated, high-quality in-house production

To achieve the highest product quality, our manufacturing and test process is fully automated. Vapor-phase soldering assures smooth processing of the components. Traceability is guaranteed by time stamps throughout the whole process.

All relevant environmental tests in-house

We carry out the preliminary qualifications in our own environmental test lab (temperature, shock, vibration, humidity), high-voltage and EMC chambers. Further calculations and analyses include MTBF, FMEA, Hazard Tree, HASS or HALT.

FPGA technology expertise

FPGAs allow us to customize our hardware without touching the board layout while keeping costs low, even in small quantities. FPGA-based solutions are flexible, offer long-term availability and support extended temperature operation.

Custom design of computer boards and systems

Often the most cost-effective solution results in a custom design – while using as many standard components as possible. Synergy effects emerge through the mutual development of standard and custom boards and systems, completed by the built-to-order approach of MEN's box PCs and 19"-based application-ready and turnkey systems.

Complete system solutions based on in-house mechanical design

Whether a 19" system, wall-mount, standalone or DIN rail is needed, we guarantee overall operability of each system, minimizing the integration effort and the handling cost on the customer's side. The quality of our systems is assured by applying traceability through the V-model.

Customer assistance in configuration of mission-critical systems

Computer architectures with safety-critical requirements are very complex. Considerations include safety-critical characteristics and levels (SIL, DAL), reliability questions, error behavior modes and the major IEC and EN standards – backed by a professional safety and risk management.

ME2 – Data Storage Unit

The ME2 data storage module is a modular extension for DIN-Rail systems. The integrated shuttle is suitable for a 2.5" SATA hard disk/SSD. For a higher storage capacity, two ME2 modules with up to 8 TB can be combined in one system.

- » Hard disk drive or solid state drive shuttle
- » 2.5" SATA HDD/SSD slot
- » Up to two ME2 modules per system
- » -40 °C to +70 °C (+85 °C), fanless

ME3 – Serial Communication Interface

The ME3 expansion module has additional serial interfaces. With the three COM ports on the front, four UARTs can be addressed. The standard product has one RS232 port, one RS232/RS422/RS485 port and either one RS422/RS485 or IBIS port (Master or Slave).

- » 2 RS232
- » 2 RS422/RS485
- » IBIS Master
- » IBIS Slave
- » -40 °C to +70 °C (+85 °C), fanless

ME4 – Wireless and Fieldbus Interface

The ME4 comes with one M.2 slot for high speed LTE modems (LTE or LTE Advanced) providing two front-accessible micro-SIM card slots. For GPS/GLONASS functions, the box has an onboard GNSS receiver. Additionally the module is equipped with one PCI Express Mini Card slot which is prepared for adding an MVB, CAN bus or audio module.

- » LTE Advanced via M.2
- » 2 micro-SIM card slots
- » MVB, CAN bus or audio via PCIe Mini Card
- » GNSS receiver
- » Conduction cooling of M.2 and PCIe Mini Cards
- » -40 °C to +70 °C (+85 °C), fanless

Extension Module ME2



Extension Module ME3



Extension Module ME4





LEADING THE EMBEDDED FUTURE

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- » Open Source Automation Development Lab (OSADL)
- » PCI-SIG (Peripheral Component Interconnect Special Interest Group)
- » PICMG (PCI Industrial Computer Manufacturers Group)
- » RSSI (Railway Systems Suppliers, Inc. Trade Association)
- » UNIFE (Union des Industries Ferroviaires Européennes)
- » USB-IF (Universal Serial Bus Implementers Forum, Inc.)
- » Wind River (Partner Eco System)
- » ZVEI (German Electrical and Electronic Manufacturers Association)

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