

# MH70R

## Main Server with Intel Xeon D for Railway Data Center Modular Virtualization Computer for the Connected Train

- » Intel Xeon D-1500 (Broadwell DE) CPU with up to 16 cores
- » 2 × 10 Gb Ethernet and 1 × 1 Gb Ethernet
- » 3G/4G, wireless and GPS modem slots
- » Hot-swappable SATA Rev. 3.x HDD/SSD 2.5" slots
- » Compact 40 HP application-ready rack- or wall-mounted system
- » Modular design
- » Open source virtualization platform



### Main Server Unit and Centralized Platform

The MH70R main server unit acts as the central component of the railway data center. Several distributed functions are combined into a centralized platform, which reduces the amount of devices within the application environment. It consists of one high-performance, high-bandwidth multi-core CPU board offering 10 Gigabit and Gigabit Ethernet interfaces, legacy serial I/O such as RS232, and USB 3.0 interfaces. The most common wireless communication functions and some storage are implemented on CompactPCI Serial peripheral boards in the system.

### menRDC Railway Data Center

menRDC is the mobile office IT computer for virtually all non-vital train applications, e.g., PIS, media streaming, onboard internet or diagnosis server. It is a general purpose, modular platform. The hardware of menRDC is solely based on standard technologies, supporting a flexible and scalable configuration of the end system with plug-and-play wireless communication channels, storage extensions, connectivity to other train computers, or I/O interfaces to sensors and actuators. Other standard systems offered as part of menRDC are the [MH70S data storage system](#) and the [NH30 Managed Gigabit Ethernet Switch](#).

### High-Performance CPU, Virtualization and Security

The system is based on a high-performance Intel Xeon-D processor. Being an open virtualization platform, it supports Intel VT-x and VT-d technology to virtualize several functions, e.g., video surveillance or ticketing. The software can be developed without hardware which reduces the development time. It also supports a Trusted Platform Module (TPM) for security implemented through cryptography, as well as an error-correcting code (ECC) memory, board and system management control, and a watchdog timer to ensure reliability.

### Modular Design

The system consists of a modular 40 HP CompactPCI Serial system which can be wall or rack-mounted. The hot-pluggable and easy to exchange HDD/SSD shuttles allow easy maintenance in the field. The system is cooled by using an additional fan tray at the bottom of the system. Cooling is independent of the mounting position. The PC offers a multitude of configuration possibilities resulting in a fast time-to-market.

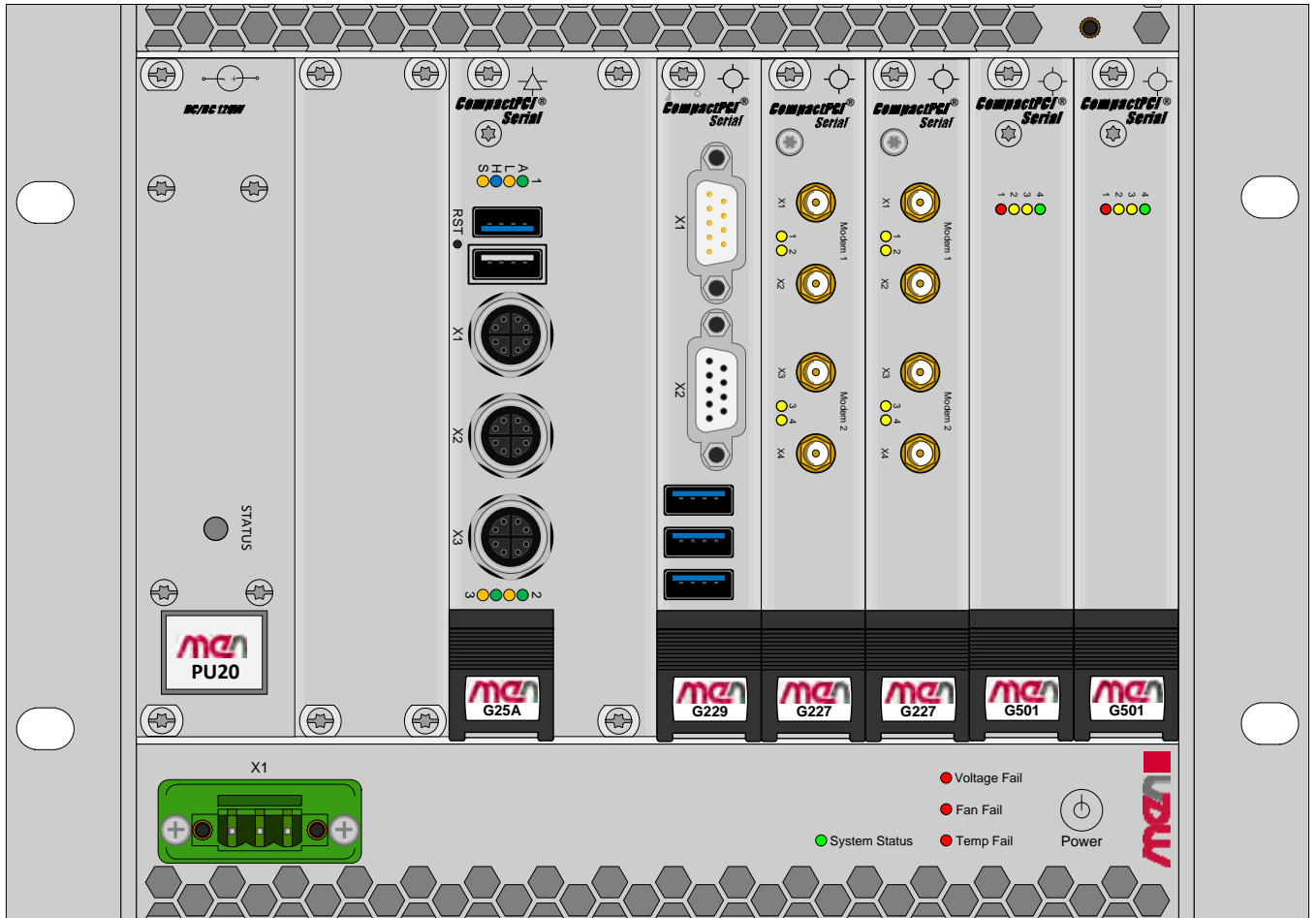
### Designed for Harsh Environments

The MH70R is designed for operation in a -40°C to +70°C temperature range according to EN 50155 class TX. The system withstands shock and vibration for reliable operation and a longer product life-time.

### Long-Term Availability

With a guaranteed standard life-time of 7 years the MH70R facilitates the client's life-cycle management by making the system available at least for this time period.

Slot				<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
	PSU		CPU	I/O	I/O	I/O	I/O	I/O	I/O



## Diagram

## CPU Board

- CPCI Serial 3U Board
- Configurable: yes
- Basic Configuration
  - Intel Pentium D-1519, 4 cores, 8 GB DDR4 DRAM with ECC, 3U/8HP, 2 10Gb Ethernet (M12 X-coded), 1 1Gb Ethernet (M12 X-coded), 1 USB 2.0, 1 RS232 for service (Type A USB connector), -40°C to +70°C @ 1.5m/s airflow, conformal coating
- Possible Configurations
  - Intel Xeon D-1539, 8 cores
  - Intel Xeon D-1577, 16 cores
- Mass Storage (optional)
  - microSD card

## Supervision and Control

- Dedicated shelf controller monitors power, CPU status, temperature; controls fan; provides status LEDs and power button
  - [More information on AF2 Shelf Controller for CompactPCI and CompactPCI Serial Systems](#)

## Power Supply

- PSU 3U
- Configurable: yes
- Basic Configuration
  - 120 W, 3U 6 HP PSU, wide range input 24 to 110 V DC, 24 V DC nom., output 12 V / 5 V / 3.3 V DC, -40°C to +85°C, conformal coating
- Possible Configuration
  - 120 W, 3U 6 HP PSU, wide range input 100 to 240 V AC, output 12 V / 5 V / 3.3 V DC, -40°C to +85°C, conformal coating
- Normal operation if external voltage is present

## Serial I/O

- CPCI Serial 3U Board
- Configurable: yes
- CompactPCI Serial slot: 2
- Basic Configuration
  - 3 USB3.0, 1 RS232, 1 RS422/485, 1 m.2 NVMe SSD 240 GB
  - [More information on G229 Serial I/O Expansion Board](#)
- Possible Configurations
  - RS232, not optically isolated, -40°C to +85°C, conformal coating
  - RS232, optically isolated, -40°C to +85°C, conformal coating
  - RS422/485, full duplex, optically isolated, -50°C to +85°C, conformal coating
  - VGA PCI Express MiniCard MPX-750, operating temperature 0°C to +40°C

## Wireless Functionality

- CPCI Serial 3U Board
- Configurable: yes
- CompactPCI Serial slot: 3, 4
- 2 PCI Express Mini Card slots (USB and PCIe), -40°C to +85°C (screened)
  - [More information on G227 PCI Express Mini Card Carrier for Wireless Functions](#)
- Basic Configuration
  - WLAN PCI Express MiniCard DNXA-116, -40°C to +85°C (screened)
  - MC7304 PCI Express MiniCard, full-size on USB: LTE, DC-HSPA+, HSPA+, HSDPA, HSUPA, WCDMA, GSM, GPRS, EDGE, and GNSS, -40 to +85°C

## Mass Storage

- CPCI Serial 3U Board
- Configurable: yes
- CompactPCI Serial peripheral slot: 5, 6
- Basic Configuration
  - Two 2.5" SATA HDD/SSD shuttle, hot swap support, -40°C to +85°C (qualified components)
  - Two SSD SATA 1TB 2.5"

**Mechanical Specifications**

- Dimensions:
  - 210 mm x 175 mm x 225 mm max. without brackets
  - 4U, 40 HP
- Mounting Possibilities
  - Wall-mount
  - Rack-mount in 19" cabinet
  - Two systems side-by-side to build a single 19" chassis (with additional kit)

**Environmental Specifications**

- Temperature range (operation): up to EN 50155 class TX depending on configuration
- Temperature range (storage): -40°C to +85°C
- Cooling concept
  - Air-cooled, forced convection with fan tray at system bottom
- Altitude: -300 m to +3000 m
- Shock: EN 61373 category 1 class B
- Vibration: EN 61373 category 1 class B
- Protection rating
  - IP20 (IEC 60529)

**Safety**

- Electrical Safety
  - EN 62368-1
  - EN 50155
  - EN 50153
  - EN 50122-1
- Flammability (PCBs)
  - UL 94 V-0

**EMC (Railway)**

- Radiated Emission
  - EN 55022 class B
  - EN 50121-3-2
  - EN 50121-4
- Conducted Emission
  - EN 55022 class B
  - EN 50121-3-2
  - EN 50121-4
- Immunity
  - EN 55024
  - EN 50121-3-2
  - EN 50121-4

**Software Support**

- Linux
- Windows (on request)

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

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