

# MH70S

## Rugged Data Storage & NAS Computer with Intel Core i3/i5/i7 Modular Embedded System for Industrial Automation & Railway Transport

- » Compact 40 HP turn-key system
- » Rack-mounted or wall-mounted
- » Fanless operation or forced-air cooling
- » Intel Core i7 or Celeron, TPM optional
- » Up to 16 GB DDR3 DRAM soldered, ECC
- » Up to 20 TB storage capacity (depending on RAID level and HDD sizes)
- » Up to 5 hot-swappable HDD/SSD carriers in different RAID configurations
- » Single or redundant power supply (AC or DC)
- » Optional WLAN, LTE, GPS or GLONASS
- » Optional PoE PSE capable 4-port switch
- » Compliant to EN 50155 (railways)



### Modular, Built-to-Order Configuration

The MH70S is a modular turn-key storage PC which meets the requirements of storage intensive applications such as digital video recorders, content servers or NAS. It is designed for use in trains, trams or industrial environments.

The system consists of a modular 40 HP CompactPCI Serial system which can be wall or rack-mounted. The system can be 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 which are built to order resulting in a fast time-to-market.

### Storage, Ethernet Switch and Wireless Functionality

Thanks to its up to five HDD/SSD carriers (2 HDDs each), the MH70S forms a high performance and high capacity storage system. Up to eight PoE PSE ports supplying eight devices with a maximum of 100 Watts in total can be implemented. For robust and safe operation, the HDD carriers can be configured in RAID 0, 1 or 5 while the carriers themselves have their own internal RAID 0, 1 and JBOD hardware configuration possibility.

The system offers up to 2 Gigabit Ethernet interfaces at the front of the CPU board. PCI Express Mini cards for wireless functions such as WLAN and UMTS can also be provided.

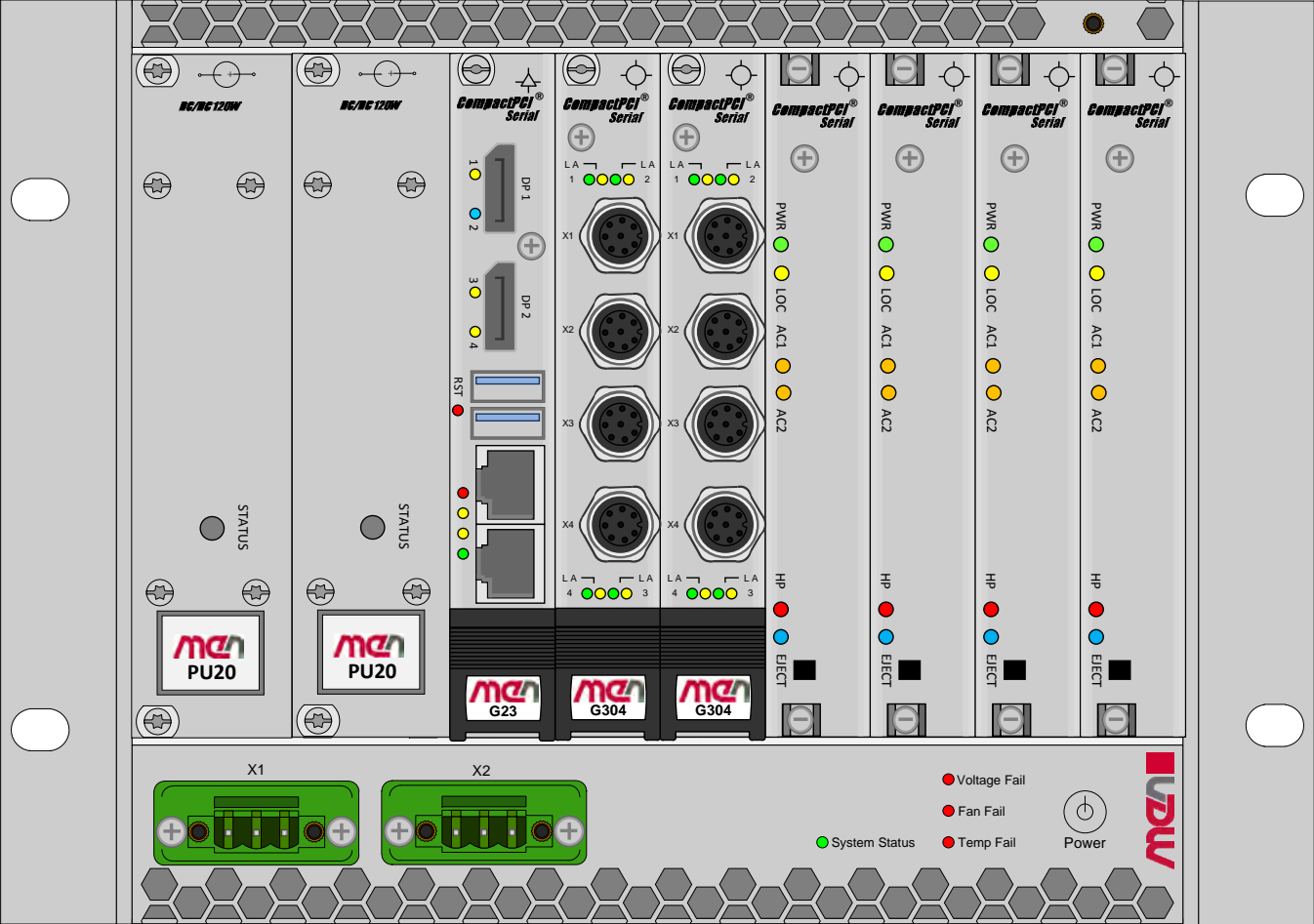
### High-Performance Processor and System Control

The system is based on a high-performance Intel Core i7 processor supporting Intel AMT functionality. Data security can be assured using a TPM module. A system management controller complements the self-control and self-monitoring capabilities. It manages life-time information about, e.g., the fans, power supplies and can be used for manual shutdown.

### Redundant Power Supply

The pre-configured system offers two PSU slots to ensure reliability and redundancy. Normal operation is guaranteed if at least one external voltage is present. AC or DC power supplies can be implemented. Each power supply has its own power source. This allows the system to be fed from independent power distribution networks assuring fail-over functionality and power-cut bridging.

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



Diagram



**CPU Board**

- CPCI Serial 3U Board
- Configurable: yes
- Possible Configurations:
  - Intel Celeron 2002E 1.5 GHz, 4 GB DDR3 DRAM with ECC, front: 2 DisplayPort, 2 USB, 2 Gb Ethernet (RJ45), -40°C to +85°C, conformal coating
  - Intel Core i7-4700EQ 2.4 GHz, 16 GB DDR3 DRAM with ECC, front: 2 DisplayPort, 2 USB, 2 Gb Ethernet (RJ45), 0°C to +60°C
- Mass Storage
  - SSD mSATA, 8 GB, -40°C to +85°C or
  - SSD mSATA 3.x, 64 GB, MLC, -40°C to +85°C

**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
- Possible Configurations:
  - 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
  - 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
- Two separate power inlet connectors
- Normal operation if at least one external voltage is present

**Wireless Functionality via PCI Express Mini Cards**

- CPCI Serial 3U Board
- Configurable: yes
- Possible in CompactPCI Serial peripheral slot: 1, 2
- 3 PCI Express Mini Card slots (USB and PCIe), -40°C to +85°C
  - [More information on G227 PCI Express Mini Card carrier](#)

**Ethernet Interface Functionality**

- CPCI Serial 3U Board
- Configurable: yes
- Possible in CompactPCI Serial peripheral slot: 1
- Possible Configurations
  - 4 1000Base-T Ethernet interfaces, 4 RJ45 connectors at front, 0°C to +60°C
  - 4 1000Base-T Ethernet interfaces, 4 M12 connectors at front, -40°C to +85°C, conformal coating

**Ethernet Switch Functionality**

- CPCI Serial 3U Board
- Configurable: yes
- Possible in CompactPCI Serial peripheral slot: 1, 2
- Possible Configurations
  - 5-port unmanaged Gigabit Ethernet Switch (4 front ports, 1 rear port) with PoE+ (60 W max), USB PoE management, RJ45, -40°C to +70 (+85)°C
  - 4-port unmanaged Gigabit Ethernet Switch with PoE, M12, -40°C to +70 (+85)°C, conformal coating

**Mass Storage**

- CPCI Serial 3U Board
- Configurable: yes
- Possible in CompactPCI Serial peripheral slot: 2, 3, 4, 5, 6
- Possible Configurations
  - Two 2.5" SATA HDD/SSD shuttle, hot swap, RAID 0, 1 JBOD support, -40°C to +85°C, conformal coating

**Mechanical Specifications**

- Dimensions:
  - (W) 210 mm, (D) 225 mm, (H) 175 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

**Environmental Specifications**

- Temperature range (operation): EN 50155 class TX depending on configuration
  - 0°C to +50°C for high performance passenger information / video distribution systems with PoE and fans
- Temperature range (storage): -40°C to +85°C
- Cooling concept
  - Air-cooled, forced convection with fan tray at system bottom
- Relative humidity (operation): according to EN 60068-2-30, non-condensing
- Relative humidity (storage): according to EN 60068-2-30
- Altitude: -300 m to +3000 m
- Shock: according to EN 61373 category 1 class B
- Vibration: according to EN 61373 category 1 class B
- International Protection Rating (IEC 60529): IP20

**Product Compliance: Radio Equipment**

- EMC basic compliance: The product is prepared to comply with the Radio Equipment Directive 2014/53/EU (RED). Standards compliance depends on the assembled radio (wireless) device.

**Safety**

- Electrical Safety
  - EN 60950-1: Class I equipment
- Flammability (PCBs)
  - UL 94 V-0

**EMC Conformity**

- EN 55022 class B (radiated and conducted emissions)
- EN 55024 (immunity)

**Software Support**

- Linux
- OpenMediaVault for Network Attached Storage
- Windows Embedded Standard 7 (on request)

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