

Extremely Rugged Computer Solution based on Intel® 9th Gen. Processor

General Description

The PIP44 is a high performance, low power and highly integrated rugged Embedded Computer, based in the latest Intel technology. The solution is available in a compact aluminum housing with DIN-Rail or flange, a rugged MIL IP67 enclosure, a 19" rack system or an open frame solution with a cooling plate. All configurable depending on your application or needs. The unique chassis solutions allows to operate the PIP44 in a moderate as well as in harsh environments. The design integrates standard connectors for easy connection or lockable headers, depending on housing choice or needs. Therefore, the PIP44 can be used for any high quality x86 application where a complete but still expandable solution is needed.

PIP44 Highlights

The PIP housings offer sufficient space for 2.5" SSD or other expansions like UPS, RAID, etc.. Two mPCIe and three m.2 slots allow to expand the system very easy. The internal expansion bus allows to integrate PCIe/104 or PCIe cards. These expansion possibilities give a maximum on customization for additional interfaces and features. Particular precautions during the design have been taken that the entire system EMC is within the CE and FCC limits and standards like EN50155, IEC 60945 or MIL-STD-810 can be met.

Key features are:

- Up to 64GB DDR4 ECC memory
- Fanless operation, also from -40°C to +85°C
- Long term availability
- Extremely flexible
- AMT / vPro support

The PIP44 has been designed to withstand any harsh environments and extreme temperature conditions. The special rugged design, combined with the best industrial-grade components, offer high reliability and long-term performance.

The **PIP44** is available for different Industries and is the perfect embedded computer solution for industrial environments, railway applications, MIL/COTS, SWaP-C applications, or whenever a rugged long-term available computer is needed.



All MPL products are 100% designed and manufactured in Switzerland (since 1985).



PIP44 for rough use in military environment



PIP44 for integration in existing housing



PIP44 used in rugged railway application

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Technical Features

| | |
|---|--|
| Board Key Data | |
| Processor | Intel i3-9100HL |
| # of cores / threads | 4 / 4 |
| Clock speed | 1.6 / 2.9 GHz |
| L2 Cache | 6 MB |
| TDP | 25W |
| Chipset | Intel CM246 |
| Memory | 2x dual-channel DDR4 SODIMM slot, supports up to 32GB modules (total board memory 64GB) |
| BIOS | On-board soldered 32MB Flash, MPL engineered BIOS (AMI), customizable |
| TPM | Trusted Platform Support TPM 2.0 |
| Watchdog Timer | Configurable granularity 1-255 sec. or 1-255 min. |
| Indicator LEDs | Power, HDD, LAN |
| Mass Storage | |
| SATA | 2x SATA 3.0 ports |
| mSATA | 2x mSATA Full-Mini Card combo socket with SATA 3.0 & USB 2.0 |
| m.2 | 1x NVMe or SATA SSD |
| Interfaces | |
| Graphics Interfaces | Display Port (DP) up to 4096x2160 (DP) and DVI-D (LVDS / eDP up to 1920 x 1200 optional) Triple display capable, ESD protected. Gen3 PCIe port x16 (PEG) for graphic card. |
| USB | 8x USB 3.1 ports, supports USB keyboards and mice as legacy devices 4x additional internal USB2.0 ports |
| LAN | AMT / vPro support *, optional up to 5 LAN ports |
| Serial Ports | 4x full modem RS232 or RS422/485 ports, ESD protected and isolated on external DB9 connectors |
| HDAudio | Intel HDAudio signals, available on a 1 mm header, sound card (HDSOUND-1) is available |
| Expansions | |
| mPCIe | 2x mPCIe PCI Express Gen3, x1 lane & USB 2.0 (combined with mSATA) |
| m.2 | 2x communication slot (1x Key-A, PCIe/USB 2.0 & 1x Key-B, USB 3.x/PCIe/SATA), dual SIM connector |
| PCIe/104 | 1x PCIe/104 slot (4x PCIe x1 lane, x16 PEG port, 2x USB 2.0) |
| Power | |
| Input Voltage | 10 - 36 VDC input range, ESD and EMC protected power input (optionally up to 110VDC) Protection against: reverse polarity, up to 150V load dump Combinded power button and ignition input, specifically for vehicles |
| Power consumption | 5-100 Watt (Enhanced Intel Speed Step Technology) |
| Environment | |
| Storage Temperature | -45°C up to +85°C (-49°F to +185°F) |
| Operating Temperature | -20°C to +60°C (-4°F to +140°F) |
| Ext. Temp. (optional) | -40°C to +85°C (-40°F to +185°F) |
| Relative Humidity | 5% to 95% non condensing, optional coating available |
| Standard Compliance | |
| The PIP44 is designed to meet or exceed the most common standards. Particular references are: | |
| EMC | EN 55022, EN 55024, EN 61000, MIL-STD-461E |
| Shock & Vibration | EN 60068 |
| Environmental & Safety | EN 50155, MIL-STD-810G, EN 60601, EN 60950 |
| Approval List | CE, IEC 60945, IACS E10 |

Packaging

| Chassis version | length | width | heights | weight | |
|-----------------|--------|-------|-------------|----------------------------|--|
| DIN Rail | 270 x | 162 x | 62/83/120mm | 2.2 kg (4.85 lb.) with HDD | (custom color or foil available) |
| Flange | 290 x | 162 x | 62/83/120mm | 2.2 kg (4.85 lb.) with HDD | (custom color or foil available) |
| Open Frame | 260 x | 154 x | 33mm | 1.0 kg (2.2 lb.) | (custom cooling plate available) |
| IP67 MIL | 304 x | 234 x | 75/95mm | 3.0 kg (6.6 lb.) | (custom housings and connectors available) |

The aluminum housings are internally chromated, externally powder coated or anodized, no ventilation holes.
The cooling plate for the open frame versions is chromated. Depopulated versions or solutions with headers can be offered.

Specifications are subject to change without notice

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