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

MPL AG is an ISO9001 certified company

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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

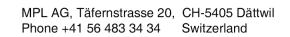| Chassis version	length	width	heights	weight	
DIN Rail	270 x	162 x	62/83/120mm	2.2 kg (4.85 lb.) with HDD	(custom color or foil available)
Flange	290 x	162 x	62/83/120mm	2.2 kg (4.85 lb.) with HDD	(custom color or foil available)
Open Frame	260 x	154 x	33mm	1.0 kg (2.2 lb.)	(custom cooling plate available)
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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