Extremely Rugged Computer Solution
based on Intel® 9th Generation Processor

General Description

The PIP40 Product Family 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 PIP40 product range 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 PIP40 Family can be used for any high quality x86 application where a complete but still expandable solution is needed.

PIP40 Family Highlights

The PIP housings offer sufficient space for 2.5" SSD or other expansions like UPS, RAID..). 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 memory *
■ Fanless operation, also from -40°C to +65°C
■ Long term availability
■ Extremely flexible
■ AMT / vPro support *

* depending on selected CPU

The PIP40 Family 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 PIP40 Family 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).

PIP40 Family built in standard PIP housing

PIP40 Family for rough use in military environment

PIP40-S Family for integration in existing housing

PIP40 Family used in rugged railway application

MPL AG is an ISO9001 certified company

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Technical Features

Board Key Data

	PIP41R	PIP44R	PIP46R	PIP49R	
Processor	Celeron G4930E	Intel i3-9100HL	Intel i7-9850HE	Xeon E-2276ME	additional
# of cores / threads	2 / 2	4 / 4	6 / 12	6 / 12	CPUs are
Clock speed	2.4 GHz	1.6 / 2.9 GHz	2.7 / 4.4 GHz	2.8 / 4.5 GHz	available
Passmark	2624	6354	12258	14397	IOTG
L2 Cache	2 MB	6 MB	9 MB	12 MB	roadmap
TDP	35W	25W	45W	45W	

Chipset	Intel CM246
Memory	2x dual-channel ECC DDR4 SODIMM slot, supports up to 32GB modules (total board memory 64GB*) (PIP46 DDR4 only, no ECC)
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
RAID	RAID 0/1/5/10 on SATA or mSATA (Intel RST)

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	Internal 4x full modem TTL (optional RS232 or RS422/485 ports on 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 +65°C (-40°F to +149°F)
Relative Humidity	5% to 95% non condensing, optional coating available

Standard Compliance

The PIP40 Family 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

depending on selected CPU

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)
Open Frame-S	218	x	154	x	33mm	0.9 kg (2.0 lb.)	(short version)
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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