

## Rugged Railway Computer Solution with Intel® Core™ i7 and Celeron® Processor

### General Description

The PIP30 Product Family is a high performance, low power, and highly integrated rugged Embedded Computer, designed for railway operation. The solution is available in a compact aluminum housing with flange mounting. The unique chassis solutions allows to operate the PIP30 in a moderate as well as in harsh environments without the need of a fan or ventilation holes. The design integrates standard connectors for easy connection or lockable headers, depending on project needs. Therefore, the PIP30 Family can be used for any high quality x86 application where a complete but still expandable solution is needed.

### PIP30 Family Highlights

The PIP housings offer sufficient space for up to four 2.5" HDD/SSD or other expansions like UPS, RAID..). Two mPCIe slots allow to expand the system very easy. The internal expansion bus allows to integrate PCI or PCIe cards. This 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:

- On-board soldered DDR3 ECC RAM up to 4GB (up to 12GB via SO-DIMM slot)
- 4 independent GigE Ethernet ports on RJ45 (optionally on M12, fiber, PoE+)
- Fanless operation, also with -40°C to 75°C
- Long term availability\*
- Extremely flexible

The PIP30 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.

*\* Typically 10 years or more, 20+ years repair-ability*

MPL's Railway Solutions are EN50155 certified and all units undergo severe environmental testing to ensure reliable performance under a variety of power conditions, such as voltage variations, power interruptions, and supply changeover. The systems are also tested to withstand environmental disturbances, like vibration, shock, and extreme temperature.



All MPL products are 100% designed and manufactured in Switzerland.

MPL AG is an ISO9001 certified company



**RAIL-PIP37** used in combination with Profibus & LAN ports on M12 connectors.



**RAIL-PIP38** used as Vision Server with PoE+



**RAIL-PIP38** as Wi-Fi Server with redundant 110V power supply



**RAIL-PIP31** with GPS and LTE used as maintenance monitoring device

## Technical Features

| Board Key Data                                                                                       |                                                                                                                                                                                                                                                                                       |                      |                 |                 |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------|-----------------|
|                                                                                                      | PIP31-1                                                                                                                                                                                                                                                                               | PIP32-1              | PIP37-1         | PIP38-1         |
| Processor                                                                                            | Intel Celeron 927UE                                                                                                                                                                                                                                                                   | Intel Celeron 1047UE | Intel i7-3517UE | Intel i7-3555LE |
| # of cores / threads                                                                                 | 1 / 1                                                                                                                                                                                                                                                                                 | 2 / 2                | 2 / 4           | 2 / 4           |
| Clock speed                                                                                          | 1.5 GHz                                                                                                                                                                                                                                                                               | 1.4 GHz              | 1.7 / 2.8 GHz   | 2.5 / 3.1 GHz   |
| L2 Cache                                                                                             | 1 MB                                                                                                                                                                                                                                                                                  | 2 MB                 | 4 MB            | 4 MB            |
| Passmark (all cores)                                                                                 | 566                                                                                                                                                                                                                                                                                   | 1188                 | 3807            | 4080            |
| Chipset                                                                                              | Intel QM77 (Panther Point), supports ACPI power states S1, S4, and S5, USB 3.0...                                                                                                                                                                                                     |                      |                 |                 |
| Memory                                                                                               | 4GB DDR3 on-board soldered ECC RAM<br>1x 204-pin dual-channel DDR3 SODIMM slot, supports up to 8GB modules (total board memory 12GB)                                                                                                                                                  |                      |                 |                 |
| BIOS                                                                                                 | On-board soldered 8MB Flash, MPL engineered BIOS (SecureCore by Phoenix), customizable                                                                                                                                                                                                |                      |                 |                 |
| TPM                                                                                                  | Trusted Platform Support                                                                                                                                                                                                                                                              |                      |                 |                 |
| Watchdog Timer                                                                                       | Configurable granularity 1-255 sec. or 1-255 min.                                                                                                                                                                                                                                     |                      |                 |                 |
| Indicator LEDs                                                                                       | Power, Reset, HDD LAN, and Wi-Fi LEDs, 2 user programmable LEDs                                                                                                                                                                                                                       |                      |                 |                 |
| Mass Storage                                                                                         |                                                                                                                                                                                                                                                                                       |                      |                 |                 |
| SATA                                                                                                 | 2x SATA 3.0 ports and 2x SATA 2.0 ports, RAID 0/1/5/10 support                                                                                                                                                                                                                        |                      |                 |                 |
| mSATA                                                                                                | 1x mSATA Full-Mini Card combo socket with SATA 2.0 & USB 2.0                                                                                                                                                                                                                          |                      |                 |                 |
| eSATAp                                                                                               | Powered external SATA port with SATA 2.0 and USB 2.0, ESD protected connector                                                                                                                                                                                                         |                      |                 |                 |
| Interfaces                                                                                           |                                                                                                                                                                                                                                                                                       |                      |                 |                 |
| Graphics Interfaces                                                                                  | Display Port (DP) up to 2560x1600 (DP) and DVI-I and 24-bit LVDS up to 1920 x 1200<br>Dual display capable, ESD protected. Gen3 PCIe port x16 (PEG) for graphic card.                                                                                                                 |                      |                 |                 |
| USB                                                                                                  | 4x USB 3.0 ports, 2x USB 2.0 ports, supports USB keyboards and mice as legacy devices<br>3x additional internal USB2.0 ports                                                                                                                                                          |                      |                 |                 |
| LAN                                                                                                  | 4x GbE ports (Intel 82574IT) on RJ45 , ESD protected connectors, Wake on LAN support                                                                                                                                                                                                  |                      |                 |                 |
| Serial Ports                                                                                         | 2x full modem RS232 ports, ESD protected external DB9 connectors<br>2x additional RS232/485 ports (optional)                                                                                                                                                                          |                      |                 |                 |
| PS/2                                                                                                 | For keyboard and mouse, 1x 6-pin Mini-DIN connector, ESD protected                                                                                                                                                                                                                    |                      |                 |                 |
| HDAudio                                                                                              | Intel HDAudio signals, available on a 1 mm header, sound card (HDSOUND-1) is available                                                                                                                                                                                                |                      |                 |                 |
| Expansions                                                                                           |                                                                                                                                                                                                                                                                                       |                      |                 |                 |
| mPCIe                                                                                                | 2x mPCIe PCI Express Gen2, x1 lane & USB 2.0 (1 combined with mSATA)                                                                                                                                                                                                                  |                      |                 |                 |
| ePCIe                                                                                                | 1x external PCI Express Gen2, x1 lane port with 500 MB/s, ESD protected connector                                                                                                                                                                                                     |                      |                 |                 |
| PCI/104-Express                                                                                      | 1x PCIe/104 slot (4x PCIe x1 lane, 2x USB 2.0), PCI/104 slot (33 or 66 MHz PCI bus)                                                                                                                                                                                                   |                      |                 |                 |
| Power                                                                                                |                                                                                                                                                                                                                                                                                       |                      |                 |                 |
| Input Voltage                                                                                        | 8 - 36 VDC input range, ESD and EMC protected power input (optionally up to 110VDC)<br>Protection against: up to -36 VDC over voltage , reverse polarity, up to 150V load dump<br>Reset & Power button*, Ignition input for vehicles* (*also available on a 4-pin Mini-DIN connector) |                      |                 |                 |
| Power consumption                                                                                    | PIP31: 11-17 Watt / PIP32: 11-19 Watt / PIP37: 11-33 Watt / PIP38: 11-36 Watt<br>(Enhanced Intel Speed Step Technology, all LANs operational)                                                                                                                                         |                      |                 |                 |
| 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), with full CPU, 3D video and memory usage, fanless                                                                                                                                                                                                    |                      |                 |                 |
| Ext. Temp. (optional)                                                                                | -40°C to +75°C (-40°F to +167°F), fanless , final test in climate chamber with test protocol                                                                                                                                                                                          |                      |                 |                 |
| Relative Humidity                                                                                    | 5% to 95% non condensing, optional coating available                                                                                                                                                                                                                                  |                      |                 |                 |
| Standard Compliance                                                                                  |                                                                                                                                                                                                                                                                                       |                      |                 |                 |
| The PIP30 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                                                                                                                                                                                                                                                               |                      |                 |                 |
| Certification                                                                                        | EN 50155 Class Tx                                                                                                                                                                                                                                                                     |                      |                 |                 |

## 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. |        |       |               |                            |                                            |

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