MPL AG honored by 2020 Military & Aerospace Electronics Innovators Awards

The MILCOTS-4x (PIP40 Family) was recognized among the best by the 2020 Military & Aerospace Electronics Innovators Awards. An esteemed and experienced panel of judges from the aerospace and defense community recognized MPL AG as a Gold honoree.

2020 Military&Aerospace Electronics INNOVATORS AWARDS

GOLD HONOREE

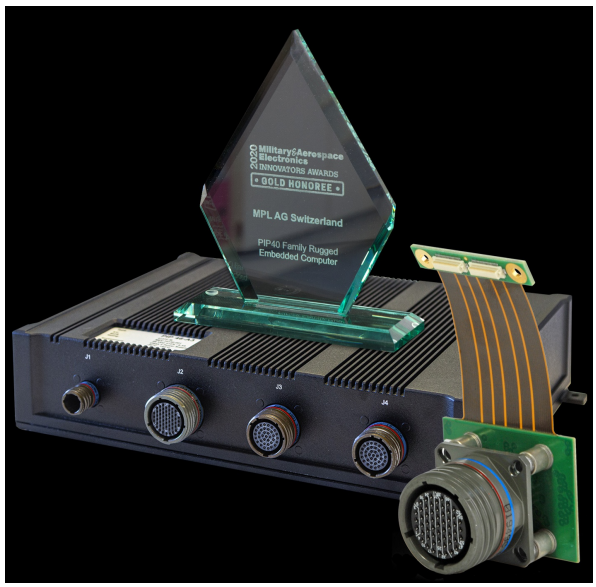
SWaP-C Mission Control Computer with 9th Gen Intel CPUs built in IP67 Housing

The MILCOTS-4x Mission Computer was developed with the target to meet the MIL-STD-810 as well as parts of the DO-160 specifications. The solution is installed in a compact IP67 housing with a total of four MIL connectors.

Innovative Impact

Rugged solutions used in defense, traffic or maritime applications need to withstand sever shock and vibrations as they are installed in vehicles, airplanes or ships. Generally, the interface of those solutions is wired to some heavy duty connectors like MIL-DTL-38999 or similar. A critical point with those connections is the mismatch of the wires that need to be used. On the CPU board side, the wire needs to be as thin as possible and on the MIL 38999 connectors side it requires the best match for the connector pin. Generally, a rather bulky wire. Hence on both side in most cases one does not have the right wire size. Therefore, one needs to compromise on the wire size on both sides. Not ideal for a reliable long-term system solution.

In the described environments one can expect continuous vibration, maybe combined with shock and other extreme conditions like temperature. Soldered or crimped wires have the risk, even if they have a perfect size, that the joint will break sooner or later during its operation. As described in most cases the perfect size wire cannot be chosen.



What can be done

To overcome this condition, MPL designed adapter PCB's that on one end interfaces directly, without the need of wires, to the CPU board. An on the other hand the adapter PCB is designed such that the interfaces are on individual high density lockable headers. The pins of the MIL-DTL-38999 connector or another rugged connector are directly soldered on a Rigid-Flex PCB. The flexible part of the Rigid-Flex has a mating parts of the lockable header of the adapter PCB and the rugged connector can be installed straight into the IP67 housing. With this unique solution the connection will be reliable over the lifetime of the product and will withstand easy any shock and/or vibration condition.

This can be done as MPL AG engineers all hardware (electronics as well as mechanics) locally at MPL in Switzerland with our own engineering team.

Unique Features

One of the many solutions we did so far is based on the Intel 9th Generation CPUs. MPL's engineering team focused to eliminating as much as possible of the wires to provide a long-term reliability of the product. Not only the board, but also interconnections to the interfaces externally available.

The presented solution is a unique new fanless embedded computer family. We can offer solutions with soldered CPUs (9th gen. Celeron, i3, i7 and Xeon) out of the IOTG roadmap with long-term availability. Decades of experience from MPL (since 1985) in developing and producing extremely robust embedded solutions have made the PIP40 Family possible. With the size, optimized boards “SWaP-C” can be achieved.

For prototyping we have a path to provide same electronics from stock. The solution comes with common connectors. The enable the engineering team to develop and test the SW during the time of adjusting the housing and connectors to the customer specific needs. The prototype is being supplied with a conductive cooling concept as well.

Fit, Form and Function (FFF) over years of the PIP solutions and the unmatched reliability are key arguments. Shock and vibration as well as extended temperatures complete the unique design to provide a real rugged and long-term available product.

The basic PIP4x is equipped with interfaces such as display port, DVI-D, USB 3.1, serial lines, and LAN ports. Further expansions can be done over the internal expansion interfaces like m.2, mPCIe and PCIe/104. This allows to add ARINC, 1553, GPS WLAN, LTE, GPIOs, CAN to name a few. Those can easy and trouble free be integrated into the systems. This makes the PIP4x solution flexible and cost efficient be customized. As mass storage, SATA, mSATA m.2 and NVMe can be chosen.

All MPL products are designed for long-term availability and the PIP40 Family will be available at least until 2034. MPL's own component stock guarantees repair for up to 20 years. Extended temperature ranges can be fulfilled and are tested in MPL's own climatic chambers according to customer's request.

The PIP40 Family is 100% engineered & manufactured by MPL AG in Switzerland. The solution meets or exceeds the most common standards. References are: EN 55022, EN 55024, EN 61000, MIL-STD-461E, EN 60068, EN 50155, MIL-STD-810G, EN 60601, EN 60950, CE, IEC 60945, IACS and E10.

Weblink for the MILCOTS-4x: www.mpl.ch/t2061.html

Weblink for the MILCOTS-4x: www.mpl.ch/t24g0.html

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