

MPMC-931x

Multi-Platform Modular Computer Single-slot
3U VPX or CompactPCI System

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Key Features

- Rugged design
- SWaP optimized
- Cold-plate cooled or natural convection chassis
- EMI filters and gaskets
- Supports either VPX or Compact PCI form factors
- Supports up to 3 XMC sites

Applications

- Mission computer
- UAVs
- Benign laboratories
- Harsh avionics environments
- Airborne platforms
- Ground vehicles

Overview

The Curtiss-Wright Defense Solutions MPMC-931x family of 3U single-slot systems are leading edge, flexible and rugged processing systems that can be readily configured to meet the needs of any military or aerospace requirements, from benign laboratory to harsh avionics environments. The MPMC-931x is an integrated information processing system, providing complete hardware and software solutions.

Packaged in an ultra compact 3U form factor and equipped with unprecedented processing power, the MPMC-931x is an affordable low-risk computing system.

The slim profile of the MPMC-931x allows the unit to fit easily into available nooks on any platform making it ideal for space constrained applications such as UAVs, airborne platforms, ground vehicles, and other harsh avionic environments that require a rugged mission computer.

The MPMC-931x can be configured with a variety of boards from Curtiss-Wright's embedded computing product library, depending on your system requirements.

System Overview

The MPMC-931x is a single-slot 3U system that supports either VPX™ or Compact PCI® (cPCI) form factors. It allows one 3U module (single board computer (SBC) or specialized I/O card) and three X/PMC modules (with two built-in mezzanine sites and one site hosted by an SBC in the main system slot) all housed in a rugged cold-plate cooled chassis. The MPMC-931x can be configured to support both Power Architecture® and Intel®-based SBCs.

The MPMC-931x is a rugged computer designed to fill multiple roles in air and land vehicles. It is a packaged Commercial Off The Shelf (COTS) solution that can greatly reduce up front development costs and through achieving economies of scale in production, reduces recurring costs while meeting the I/O, performance and environmental requirements of the system. The MPMC-931x achieves these challenging goals through high-quality engineering and designing for the future. The MPMC-931x is a modular system consisting of multiple VPX or cPCI backplanes, front connector interfaces, front panels, sidewalls, SBCs and X/PMCs (depending on selected SBC).

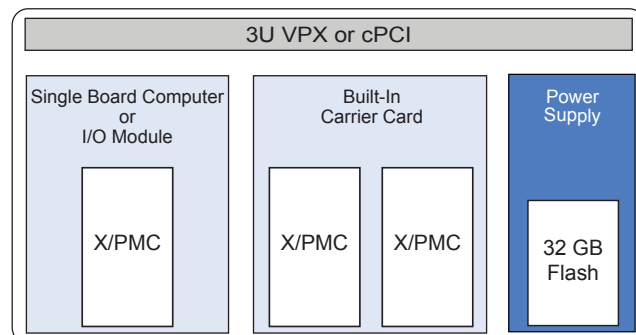


Figure 1: MPMC-931x block diagram

Specifications Summary

Processing

- Intel, Power Architecture, or ARM

3U backplane

- VPX or cPCI

Mechanical

- Volume optimized
- Weight: Under 5 lbs (2.27 kg) fully populated
- Dimensions (L x W x H): 7.80 x 4.89 x 4.50" (198.12 x 124.21 x 114.30 mm)

Power supply

- 28 VDC input per MIL-STD-704E, DO-160E

Optional interfaces

- MIL-STD-1553
- ARINC 429
 - + Individually selectable as RX or TX
- DVI, LVDS or VGA
- Optional PowerPC™ video processor
- Video input
 - + NTSC, PAL, RS-170

Environmental Qualifications

The MPMC-931x is a highly ruggedized computing system that has been rigorously tested to ensure its operation in the harshest environments. Following are listed the industry standards that Curtiss-Wright MPMC systems are qualified to.

MIL-STD-810 US Army standard testing

- Low pressure
- Temperature: high and low
- Temperature shock
- Rain
- Humidity
- Fungus
- Salt fog
- Sand and dust
- Explosive atmosphere

- Leakage
- Acceleration
- Shock
- Gunfire vibration
- Temp, humidity, vibration
- Icing, freezing rain

DO-160 environmental conditions and test procedures for airborne equipment

- Temperature/altitude
- Temperature variation
- Humidity
- Operation shocks
- Crash safety
- Vibration
- Waterproofness
- Fluid susceptibility
- Fungus resistance
- Magnetic effect
- Power input
- Voltage spike
- Audio frequency conducted susceptibility
- RF susceptibility
- Emission of RF energy
- Lightening induced transient susceptibility
- Electrostatic discharge

MIL-STD-461 EMC testing of military equipment

- Electromagnetic interference (EMI)

Standard System COTS Components

Curtiss-Wright has fully developed and tested several MPMC-931x system configurations with board level components that offer industry standard I/O to meet typical requirements of modern military mission control and flight computing systems. Further, these pre-developed system configurations have already passed rigorous environmental qualification testing, therefore reducing the risk and delivery time for customers (see the qualification section for more information).

Power

The following table reflects the power dissipation at varying operating temperatures for a fully populated MPMC-931x system.

TABLE 1		Power dissipation at varying operating temperatures
OPERATING TEMPERATURE	POWER DISSIPATION	
-40 to +55°C	80W	
-40 to +60°C	70W	
-40 to +71°C	55W	

Cooling Technology

The MPMC-931x utilizes cold-plate cooling technology to keep temperature rise at a minimum. The Curtiss-Wright boards in the system utilize a combination of thermal management layers within the Printed Wiring Board (PWB) and aluminum thermal frames that provide cooling paths for mezzanine cards and high-powered components such as the processors, caches, and bridge devices. Heat is transferred from the modules to the chassis via the thermal interface of the modules' heat-frame and wedge-locks. From there, the heat is then channeled to the chassis outer walls and dissipated into a cold plate on platform.

To ensure the highest levels of performance, the MPMC-931x chassis has been designed to meet or surpass MIL-STD-810 Qualifications for Military Equipment and DO-160E Environmental Conditions for Airborne Equipment. The MPMC-931x has successfully passed numerous environmental tests including temperature, altitude, shock, vibration, fluid susceptibility, voltage spikes, electrostatic discharge and more (see the environmental qualifications section for more information). Circuit cards installed in the sealed compact chassis are completely isolated from external environmental conditions such as humidity, dust and sand. Optimal system cooling is ensured via thermal transfer between the card edge of its conduction-cooled 3U cards and the chassis's sidewalls, and a rugged integrated fan provides the necessary cooling air across the walls. EMI filters and gaskets provide increased system security and reliability.

Software Support

The MPMC-931x is currently available with different software support options depending on the system configurations.

Ordering Information

Please contact your local sales representative for available configurations and/or custom options.