VTI Instruments

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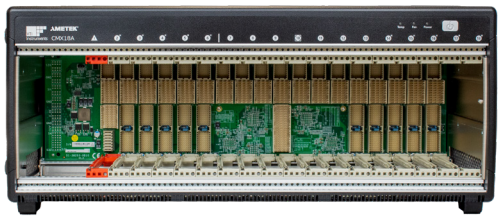
CMX18A

18-SLOT 3U PXI EXPRESS CHASSIS | UP TO 8GB/S



FEATURES

- 18-slot PXI Express chassis with 1 system controller slot, 6 peripheral slots, 10 hybrid slots, and 1 timing slot
- Configurable PCIe switch fabric, can be configured as four link x4, two-link x8 PXI Express chassis
- Rugged construction with 0°C to 55°C operating temperature range
- True 4U chassis
- IEEE-1588 distributed instrument synchronization
- Built-in system-monitoring provides confidence in system operation and simplifies debugging
- Rack mount options available

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Overview

Slot Configurations

The CMX18A is an 18-slot PXI Express mainframe with 1 system controller slot, 6 PXIe Peripheral slots, 10 PXIe hybrid slot and 1 PXIe timing slot. The ten PXI Express hybrid peripheral slots are all connected with PCIe x4 lanes. Each slot can accommodate a 3U PXI Express/CompactPCI Express/hybrid slot compatible PXI-1/CompactPCI peripheral module.

The PXIe timing slot accepts either a PXI Express module or a PXI Express system timing controller for advanced timing and synchronization. The system controller slot has configurable 4x4, 2x8 and 1x8 links, which makes it very flexible allowing all PXIe controllers to be supported per spec.

High Bandwidth

The CMX18A uses a 4-lane Gen 2 PCIe backplane to achieve unmatched data rates of up to 4 GB/s per slot and 8 GB/s system. PXI Express slots 8, 9, 11 and 12 are high bandwidth and provide connectivity to a x8 PCI Express link which allows 4 GB/s data rates. The high bandwidth allows the chassis to be used with high-speed instruments like digitizers, oscilloscopes, and signal generators.

External Clock

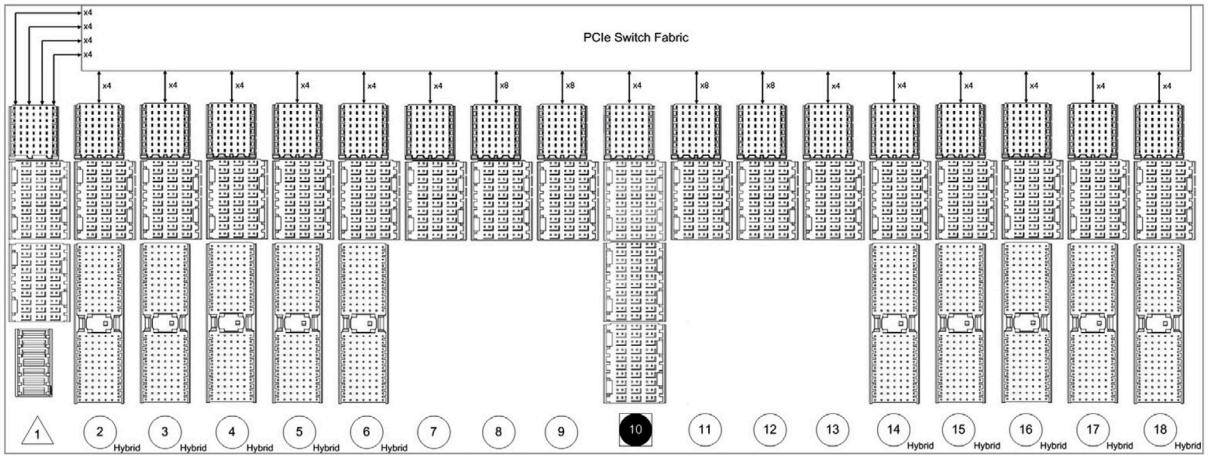
The CMX18A includes a pair of IN/OUT BNC connectors in the rear to bring in an external 10 MHz reference clock. When a 10 MHz clock signal is detected on the IN connector, the internal clock is phase locked to the external clock. This reference clock may also be driven by a system timing module in slot 10. System timing controllers provide a high-stability clock source and the ability to drive the PXI star and PXI Express differential star triggers. In addition timing controllers typically have the ability to import and export the PXI trigger lines on the backplane. The OUT BNC connector provides a buffered, non-TTL version of the 10 MHz reference clock.

Advanced PCIe Switch Fabric

The CMX18A's advanced switch fabric uses innovative methods like non-transparent bridging and partitionable switch architecture to allow slot-to-slot direct communication and true multi-root support.

Slot-to-slot direct communication allows data from any slot to be read directly by another slot, without having to go through the controller and host. This allows extremely high-speed, deterministic data transfers between slots, which is very useful for example in applications that require closed loop control.

True multi-root support allows any slot to be used as a root-complex which means a data processing or memory unit can be plugged into any slot on the chassis. This combined with slot-to-slot communication capability allows data to be streamed directly from a plugin module to a root complex for storage or processing, without burdening the host processor.



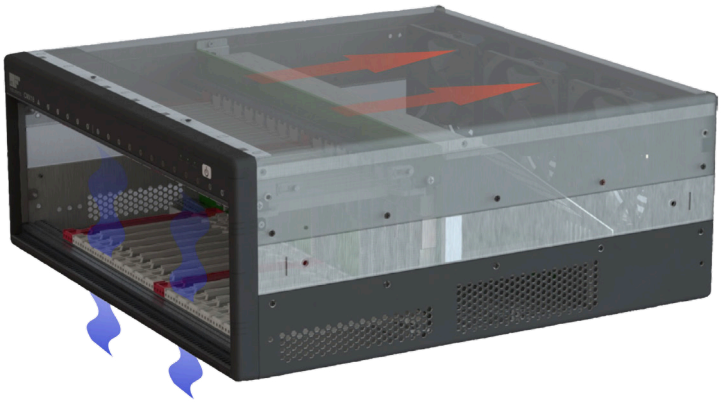
CMX18A Backplane Layout

IEEE-1588 Distribution

The CMX18A backplane contains a built-in mechanism for distributing an IEEE-1588 time source to the plugin modules. This mechanism is only supported when using the EMX-2500 Gigabit Ethernet LXI controller, and allows timestamping of data from all plugin modules on a common time-base for advanced timing and synchronization. In addition, it also provides the capability to synchronize PXI systems with LXI instruments.

Innovative Cooling, Reduced Noise

The CMX18A uses innovative cooling methods to optimize airflow while keeping noise under control. Air is pulled from the bottom and sides of the chassis, rather than the top, and exhausted through the rear. The absence of apertures on the top surface of the chassis protects it from damage due to spills.



System Monitoring and Simplified Maintenance

The CMX18A comes standard with handles and rubber stoppers for table-top use. The absence of apertures on the top surface protects it from damage due to spills. Traditional rack-mount options with front and rear support brackets are available.

Temperature Monitoring

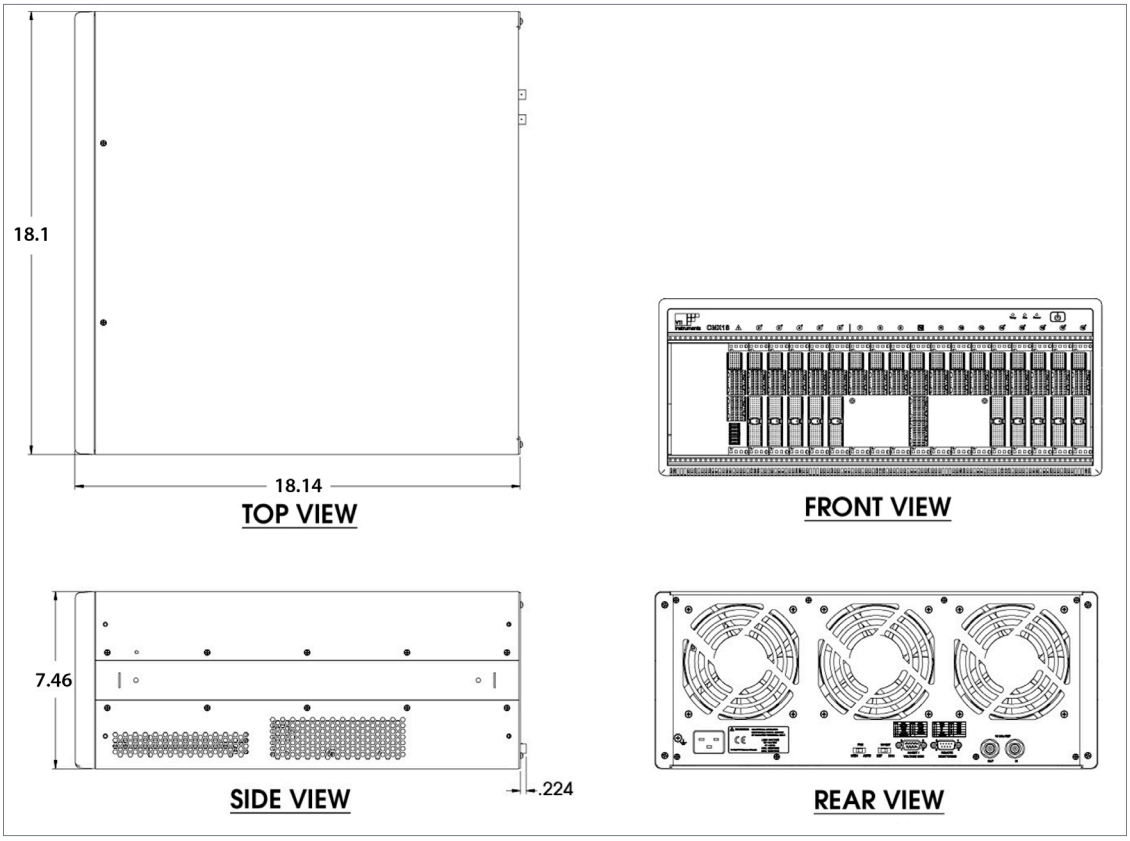
The CMX18A monitors its own internal temperature using temperature sensors placed within the chassis. This temperature can be read using the RS-232 on the chassis. An LED on the front panel notifies users of over temperature conditions.

Power Monitoring

The system monitoring microcontrollers ensures that the voltage rails are within operating specifications. Voltage rails can also be monitored using the DB-9 connector in the rear of the chassis. A remote inhibit input is also available on the connector that allows the chassis to be turned off remotely if a fault condition occurs.

Fan Monitoring and Fan Speed Adjustment

The fan speed can be set to either auto-mode or high. When set in auto-mode, the temperature reading from the temperature sensors are used to automatically optimize the fan speed. Additionally, the fan health and speed are monitored by the microcontroller.



Options and Accessories

Table-Top and Rack-Mount Options

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Detailed Specifications

Specifications	
SLOTS	
Total Slots	18 slots
PXI Express System Controller	1 slot (slot 1)
PXI Express Peripheral	6 slots (slots 7-9, 11-13)
PXI Express Timing	1 slot (slot 10)
PXI Express Hybrid	10 slots (slots 2-6, 14-18)
Module Size	3U
Bandwidth	Up to 8 GB/s system bandwidth Up to 4 GB/s peripheral bandwidth for dedicated slots (8,9,11,12)
Standards Compliance	PXI-5 PXI Express Hardware Specifications PXI-1 hardware specifications Rev 2.2 PICMG EXP.0 R1.0 specification
SYSTEM SYNCHRONIZATION CLOCKS	
10 MHz System Reference Clock Max Slot-To-Slot Skew Accuracy BNC Output Amplitude BNC Output Impedance	PXI_CLK10 300ps ±25 ppm 1 Vpk-pk ±20% square-wave into 50 Ω, 2 Vpk-pk unloaded 50 Ω ±5 Ω
100 MHz System Reference Clock Max Slot-To-Slot Skew Accuracy	PXIe_CLK100 100 Ps ±25 ppm Max
External 10 MHz Clock Source Input Requirement Frequency Input Input Signal Input Impedance	 10 MHz ± 100 ppm Max 100 mVPP To 5 VPP (Square or Sine) High Impedance
ELECTRICAL	
AC INPUT: Input Voltage Range Input Frequency Range	 100-240 VAC 50-60 Hz
POWER RATING: Max DC Power Output Efficiency +3.3V Max Load +5V Max Load +12V Max Load -12V Max Load +5V Standby Max Load	 800 W 85% (Typical) 60 A 29 A 45 A 2.5 A 2A
COOLING	
Fans	Three 185.9 CFM Fans
Per Slot Cooling Capacity	38.2 W
Chassis Cooling Intake	Bottom of Chassis
Chassis Cooling Exhaust	Rear of Chassis
Slot Airflow Direction	Bottom of Module to Top of Module

(continued next page)

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Detailed Specifications (continued)

Specifications	
ENVIRONMENTAL SPECIFICATIONS	
Operating Temperature	0˚ C To 55˚
Storage Temperature	-20˚ C To 70˚ C
Humidity	10 To 90% Non-Condensing
Altitude	2,000 M
Functional Shock	30 G, half-sine, 11 ms pulse duration
RANDOM VIBRATION: Operating Non-Operating	 5 To 500 Hz, 0.3 Grms, 3 Axes 5 To 500 Hz, 2.46 Grms, 3 Axes
MECHANICAL	
Dimension	4U x 18.1" W x 7.46" H x 18.14" D
SAFETY AND EMC	
Safety Compliance	EN 61010-1, IEC 61010-1 UL 61010-1, CSA 61010-1 2006/95/EC; Low-Voltage Directive (safety)
EMC Compliance	EN 61326 (IEC 61326): Class A emissions, basic immunity EN 55011 (CISPR 11): Group 1, Class A emissions AS/NZS CISPR 11: Group 1, Class A emissions FCC 47 CFR Part 15B: Class A emissions ICES-001: Class A emissions
RoHS Compliance	RoHS3 Directive (EU Directive 2015/863 dt 4th June 2015

Specifications subject to change without notice.

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Ordering Information

Model	Configuration
70-0699-000R	Chassis, CMX18A, Table Top, 18 Slot, 3U PXI Express, 8GB/s
70-0699-100R	CMX18A, Rackmount Kit
70-0463-901R	Kit, 3U Blank Panels, Qty 5
70-0698-200R	PXI/PXIe Filler Panel Kit, Qty 9 3U 1 Slot panels

Related Products

Model	Configuration
CMX09A	CMX09A, 9-slot 3U PXI Express Chassis
EMX-2500	Gigabit Ethernet LXI Controller for PXI Express

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