VTI Instruments

DATA SHEET

CMX18

18-SLOT 3U PXI EXPRESS CHASSIS

FEATURES

18-slot PXI Express chassis with 1 system controller slot, 6 peripheral slots, 10 hybrid slots, and 1 timing slot

High bandwidth PCIe Gen 2 backplane with 2 GB/s bandwidth per slot (4 GB/s on high-bandwidth slots) and 8 GB/s system bandwidth

Rugged construction with extended 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

AMETEK® ADVANCED MEASUREMENT TECHNOLOGY

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RELIABLE DATA FIRST TIME EVERY TIME

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OVERVIEW

SLOT CONFIGURATIONTIONS

The CMX18 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 PXI Express hybrid slot delivers connectivity to either a x4 PCI Express link or to the 32-bit, 33 MHz PCI bus on the backplane. This allows PXI Express, hybrid-compatible, or 32-bit cPCI/PXI-1 modules (without J2 connector) to be used in this slot.

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 CMX18 uses a 4-lane Gen 2 PCIe backplane to achieve unmatched data rates of up to 2 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

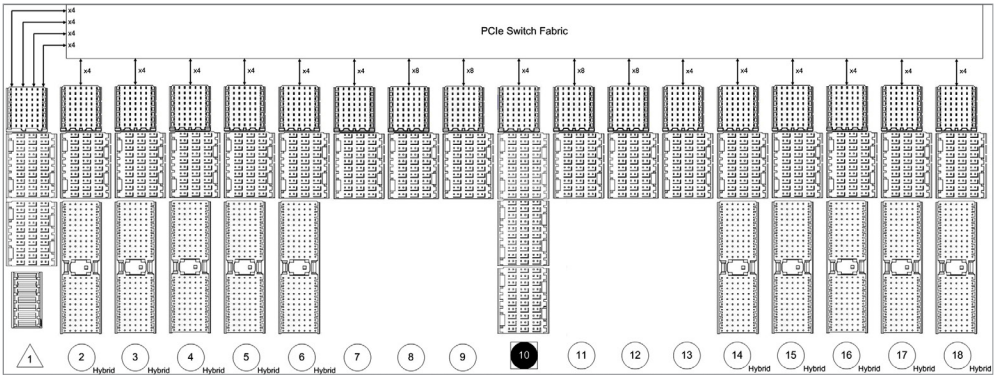
The CMX18 includes a pair of IN/OUT BNC connectors in the rear to bring in an external 10 MHz reference clock. When a 10 MHz clock signal is detected on the IN connector, the internal clock is phase locked to the external clock. This reference clock may also be driven by a system timing module in slot 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 CMX18'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.

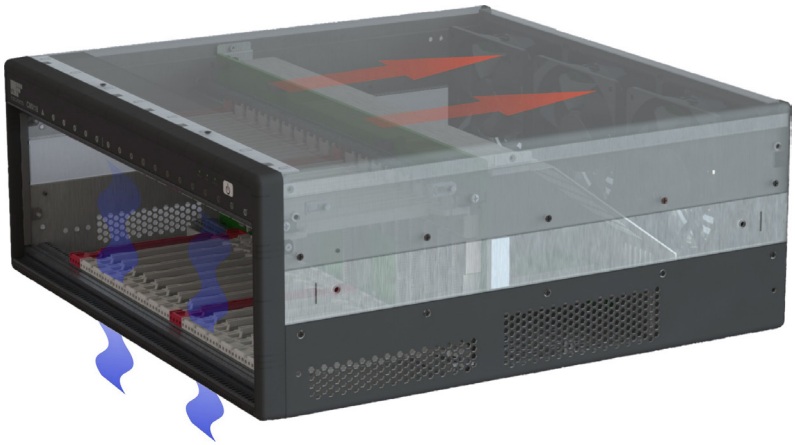


IEEE-1588 DISTRIBUTION

The CMX18 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 CMX18 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 CMX18 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

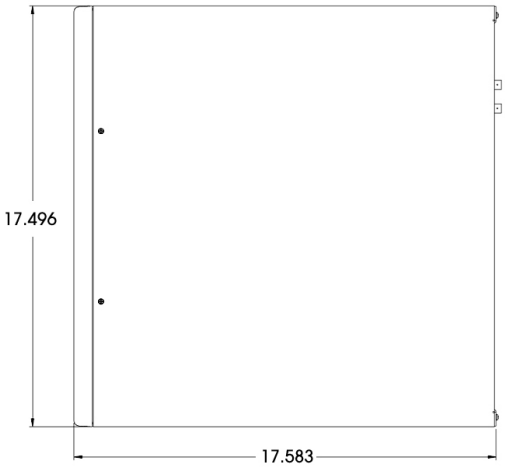
The CMX18 monitors its own internal temperature using temperature sensors placed within the chassis. This temperature can be read using the RS-232 on the chassis. An LED on the front panel notifies users of over temperature conditions.

POWER MONITORING

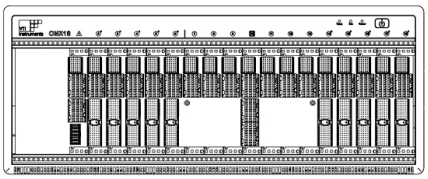
The system monitoring microcontrollers ensures that the voltage rails are within operating specifications. Voltage rails can also be monitored using the DB-9 connector in the rear of the chassis. A remote inhibit input is also available on the connector that allows the chassis to be turned off remotely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

FAN MONITORING AND FAN SPEED ADJUSTMENT

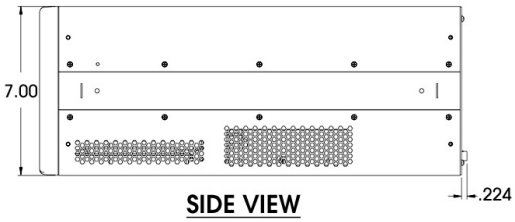
The fan speed can be set to either auto-mode or high. When set in auto-mode, the temperature reading from the temperature sensors are used to automatically optimize the fan speed. Additionally, the fan health and speed are monitored by the microcontroller.



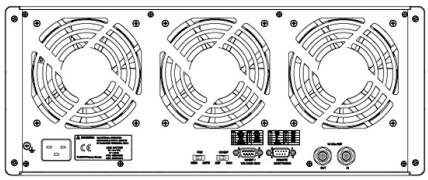
TOP VIEW



FRONT VIEW



SIDE VIEW



REAR VIEW

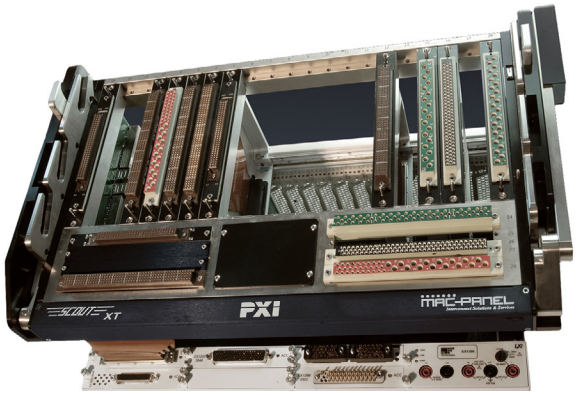
Options and Accessories

TABLE-TOP AND RACK-MOUNT OPTIONS

The CMX18 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.

RECEIVER ASSEMBLIES AND INTEGRATED SUBASSEMBLIES

Cable and pull-through receiver assemblies are available for the entire range of PXI Express products offered by VTI



The CMX18 is also available as a part of the CMX34 integrated core ATE subsystem. The CMX34 combines the CMX18 with an EX1208A 16-slot LXI mainframe to create a tightly synchronized subassembly that is uniquely optimized for switching and I/O. In addition, the CMX34 includes mass interface connectivity options that provide a fully integrated switching and instrumentation subsystem that includes cabling and receiver modules and can be readily dropped in to a test system.

Detailed Specifications

GENERAL	
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 slot (slots 2-6, 14-18)
MODULE SIZE	3U
BANDWIDTH	
SLOT	2 GB/s
	4 GB/s on slots 8, 9, 11, 12
MAINFRAME	8 GB/s
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: PXI_CLK10	
MAX SLOT-TO-SLOT SKEW	300 ps
ACCURACY	±50 ppm Max
BNC OUTPUT AMPLITUDE	1 Vpk-pk ±20% square-wave into 50 Ω, 2 Vpk-pk unloaded
BNC OUTPUT IMPEDANCE	50 Ω ±5 Ω
100MHZ SYSTEM REFERENCE CLOCK: PXI_CLK100	
MAX SLOT-TO-SLOT SKEW	100 ps
ACCURACY	±25 ppm Max
EXTERNAL 10 MHZ CLOCK SOURCE	
INPUT REQUIREMENT	
FREQUENCY INPUT	10 MHz ± 100 ppm max
INPUT SIGNAL	100 mVPP to 5 VPP (square or sine)
INPUT IMPEDANCE	50Ω ± 5Ω
ELECTRICAL	
AC INPUT	
INPUT VOLTAGE RANGE	85 to 264 VAC
INPUT FREQUENCY RANGE	47 to 63 Hz
POWER RATING	
MAX DC POWER OUTPUT	800 W
EFFICIENCY	85% (typical)
+3.3V MAX LOAD	60 A
+5V MAX LOAD	29 A
+12V MAX LOAD	45 A
-12V MAX LOAD	2.5 A
+5V STANDBY MAX LOAD	2 A
COOLING	
FANS	Three 185 CFM fans
PER SLOT COOLING CAPACITY	30 W
CHASSIS COOLING INTAKE	Bottom of chassis
CHASSIS COOLING EXHAUST	Rear of chassis
SLOT AIRFLOW DIRECTION	Bottom of module to top of module

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Detailed Specifications

ENVIRONMENTAL SPECIFICATIONS	
OPERATING TEMPERATURE	-10° C to 55° C (Meets MIL-PRF-28800G Class 2 Limits Temperature)
STORAGE TEMPERATURE	-20° C to 70° C
HUMIDITY	10 to 90% non-condensing
ALTITUDE	3,000 ft.
FUNCTIONAL SHOCK	30 G, half-sine, 11 ms pulse duration (Meets MIL-PRF-28800G Class 2 Limits for Shock)
RANDOM VIBRATION	
OPERATING	5 to 500 Hz, 0.31 Grms, 3 axes
NON-OPERATING	5 to 500 Hz, 2.46 Grms, 3 axes
MECHANICAL	
DIMENSION	4U x 17.5" W x 17.9" 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

Ordering Information

70-0501-000	CMX18, 18-slot 3U PXI Express Chassis
70-0501-001	Rack-mount kit, CMX18
RELATED PRODUCTS	
CMX09	CMX09, 9-slot 3U PXI Express Chassis
EMX-2500	Gigabit Ethernet LXI Controller for PXI Express
EMX18	18-Slot PXI Express Chassis with integrated gigabit Ethernet interface
CMX34	Integrated PXIe/LXI Core ATE Subsystem

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