

MVME7100 Series

VMEbus Single-Board Computer

■ Embedded Computing for
Business-Critical Continuity™

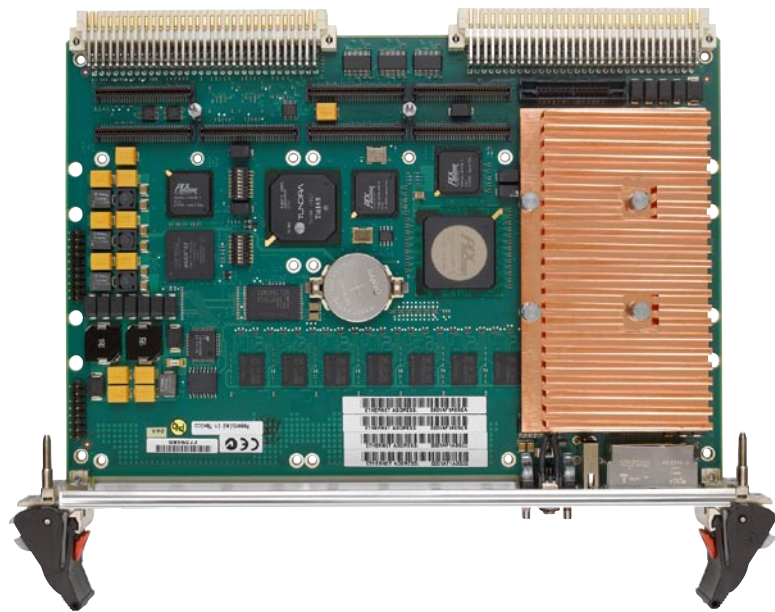
The MVME7100 adds performance and features while protecting the fundamental investment in VMEbus and related technologies

- System-on-chip Freescale MPC8641D with dual PowerPC® e600 processor cores, dual integrated memory controllers, DMA engine, PCI Express interface, Ethernet, and local I/O
- Four Gigabit Ethernet ports
- Up to 2GB of DDR2 ECC memory, 128MB Nor flash and 4 or 8GB Nand flash
- USB 2.0 controller for integrating cost-effective peripherals
- 2eSST VMEbus protocol offering interoperability with products such as the MVME6100 and MVME3100 at higher bandwidths
- Board support packages for VxWorks, LynxOS, and Linux
- Dual 33/66/100MHz PMC-X sites for expansion via industry standard modules with support for processor PMCs
- 8x PCI Express expansion connector for PMC-X and XMC expansion using Emerson XMCspan
- MVME721A direct-connect rear transition module (RTM) for I/O routing through rear of compact VMEbus chassis

The Emerson Network Power MVME7100, one of the first VMEbus products with the system-on-chip MPC8641D processor, offers a growth path for VMEbus customers with applications on the previous generation of VME, specifically the MPC74xx processors. The system-on-chip implementation offers power/thermal, reliability, and lifecycle advantages not typically found in alternative architectures.

The Emerson MVME7100 single-board computer (SBC) helps OEMs of industrial, medical, and defense/aerospace VMEbus platforms add performance and features for competitive advantage while still protecting the fundamental investment in VMEbus and related technologies. Customers can keep their VMEbus infrastructure (chassis, backplanes, and other VMEbus and PMC boards) while improving performance and extending the lifecycle. Also, the extended lifecycle of Emerson computing products helps reduce churns in development and support efforts resulting from frequent product changes.

The faster processor and 2eSST VMEbus interface (the same as on the MVME3100 and MVME6100) combine to offer significant performance improvement. New cost-effective peripherals can be integrated easily using USB interfaces.




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Backward Compatibility

The MVME7100 series continues the direction of providing a migration path from Emerson's embedded controllers such as the MVME16x, MVME17x, MVME2300/MVME2400, and from Emerson SBCs such as the MVME2600/2700 to a single platform. The MVME7100 series, like the MVME3100, MVME5100, MVME5500, and MVME6100 series, merged the best features of Emerson's embedded controllers and SBCs enabling OEMs to support varying I/O requirements with the same base platform, simplifying part number maintenance, technical expertise requirements, and sparing.

The MVME7100 series offers customers an alternate migration path from the MVME2100, MVME2300, MVME2400, MVME2600, MVME2700, MVME3100, MVME5100, MVME5500 and MVME6100 boards to allow them to take advantage of features such as the integrated MPC8641D SoC processor, DDR2 memory, Gigabit Ethernet, PCI-X, PCI Express, USB, and 2eSST.

PCI EXPANSION

The MVME7100 has an 8x PCI Express connection to support PCI Express expansion carriers such as the Emerson XMCspan.

TRANSITION MODULES

The MVME721A transition module provides industry-standard connector access to two 10/100/1000BaseTX ports, and four asynchronous serial ports configured as EIA-232 DTE. All of these are via RJ-45 connectors. The MVME721A RTM is designed to directly connect to the VME backplane in chassis' with an 80mm deep rear-transition area.

Software Support

FIRMWARE MONITOR

The MVME7100 firmware (known as MOTLoad) is resident in the MVME7100 flash and provides power-on self-test (POST enhancements available after release), initialization and operating system booting capabilities. In addition, it provides a debugger interface similar to the time proven "BUG" interface on previous VMEbus boards from Emerson.

OPERATING SYSTEMS AND KERNELS

The MVME7100 series supports booting a variety of operating systems including a complete range of real-time operating systems and kernels. A VxWorks board support package, LynxOS board support

package and Linux support will be available for the MVME7100 series.

Specifications

PROCESSOR

- Microprocessor: Freescale MPC8641D with dual PowerPC e600 cores
- Clock Frequency: 1.0 or 1.3 GHz
- On-chip L1 Cache (I/D): 32K/32K per core
- On-chip L2 Cache: 1MB per core

SYSTEM CONTROLLER

- Integrated within MPC8641D

MAIN MEMORY

- Type: Double data rate (DDR2) SDRAM
- Speed: DDR2-533 or DDR2-600
- Capacity: 1GB or 2GB
- Configurations: Dual memory controller

FLASH MEMORY

- Type: Normal flash, on-board programmable
 - ▲ Capacity: 128MB
 - ▲ Write Protection: Hardware via switch, software via register or sector lock
- Type: Nand flash, on-board programmable
 - ▲ Capacity: 4GB or 8GB
 - ▲ Write Protection: Software via register
- Type: MRAM
 - ▲ Capacity: 512MB

NON-VOLATILE MEMORY

- Type: SEEPROM, on-board programmable
 - ▲ Capacity: 128KB (available for users), 8KB baseboard Vital Product Data (VPD), and two (2) 256B Serial Presence Detect (SPD)

VMEBUS INTERFACE

- Compliance: ANSI/VITA 1-1994 VME64 (IEEE STD 1014), ANSI/VITA 1.1-1997 VME64 Extensions, VITA 1.5-199x 2eSST
- Controller: Tundra Tsi148 PCI-X to VMEbus bridge with support for VME64 and 2eSST protocols
- DTB Master: A16, A24, A32, A64; D08-D64, SCT, BLT, MBLT, 2eVME, 2eSST
- DTB Slave: A16, A24, A32, A64; D08-D64, SCT, BLT, MBLT, 2eVME, 2eSST, UAT

- Arbiter: RR/PRI
- Interrupt Handler/Generator: IRQ 1-7/Any one of seven IRQs
- System Controller: Yes, switchable or auto detect
- Location Monitor: Two, LMA32

ETHERNET INTERFACE

- Controller: MPC8641D Triple Speed (TSEC) Ethernet Controllers
- Interface Speed: Four @ 10/100/1000Mbps (TSEC)
- Connector: Two Gigabit Ethernet ports routed to front panel RJ-45, two Gigabit Ethernet ports to VMEbus P2 connector, pin out matching MVME721A RTM
- Indicators: Link status/speed/activity

ASYNCHRONOUS SERIAL PORTS

- Port 1
 - ▲ Controller: MPC8641D Duart (second port N/C)
 - ▲ Number of Ports: One 16550 compatible
 - ▲ Configuration: EIA-232 DTE (RxD, TxD, RTS, CTS)
 - ▲ Async Baud Rate, bps max.: 38.4K EIA-232, 115Kbps raw
 - ▲ Connector: One front panel Mini DB9
- Ports 2-5
 - ▲ Controller: Exar ST16C544D Quart
 - ▲ Number of Ports: Four 16550 compatible
 - ▲ Configuration: EIA-232 (RxD, TxD, RTS, CTS)
 - ▲ Async Baud Rate, b/s max: 38.4K EIA-232, 115Kbps raw
 - ▲ Connector: Via VMEbus P2 connector, pinout matching MVME721A RTM
- USB Interface
 - ▲ Controller: NEC μ 720101
 - ▲ Configuration: USB 2.0
 - ▲ Number of ports: One
 - ▲ Connector: One powered port routed to front panel

DUAL IEEE P1386.1 PCI MEZZANINE CARD SLOTS

- Address/Data: A32/D32/D64, PMC PN1, PN2, PN3, PN4 connectors (PN4 for PMC1 only)
- PCI Bus Clock: 33 MHz, 66 MHz or 100 MHz PCI/PCI-X
- Signaling: 3.3V
- Power: +3.3V, +5V, \pm 12V

- Module Types: Two single-wide or one double-wide, front panel or P2 I/O, PMC and PrPMC support, PMC1 site Pn4 routed to VMEbus P2 connector rows A and C

PCI EXPANSION CONNECTOR FOR INTERFACE TO XMCSPAN BOARDS

- 8x PCI Express interface
- One 76-pin connector located on MVME7100 planar

COUNTERS/TIMERS

- TOD Clock Device: Maxim DS1375 I2C device with battery backup
- Cell Storage Life: 10 years at 25° C
- Cell Capacity Life: One year at 100% duty cycle, 25° C
- Removable Battery: Yes
- Real-Time Timers/Counters: Four, 32-bit programmable timers in PLD; four, 32-bit programmable/cascadable timers in MPC8641D
- Watchdog Timer: In PLD

BOARD SIZE AND WEIGHT

- Height: 233.4 mm (9.2 in.)
- Depth: 160.0 mm (6.3 in.)
- Front Panel Height: 261.8 mm (10.3 in.)
- Width: 19.8 mm (0.8 in.)
- Max. Component Height: 14.8 mm (0.58 in.)
- Weight: TBD (IEEE handles)

POWER REQUIREMENTS

(Not including power required by PMC or IPMC modules)

	+5V \pm 5%
MVME7100:	TBD

CALCULATED MTBF

- 122,480 hours calculated using Mil Std 217

OTHER FEATURES

- RoHS compliant
- Jumper-less configuration
- On-board temperature sensor (Analog Devices ADT7461)
- JTAG header for connection of diagnostic tools

FRONT PANEL

- IEEE handles
- Connectors for serial, Gigabit Ethernet and USB ports
- Openings for PMC sites

Transition Modules

I/O CONNECTORS

- MVME721A
 - ▲ Asynchronous Serial Ports: Four, RJ-45, labeled as COM2-5
 - ▲ Ethernet: Two 10/100/1000BaseTX, RJ-45

NON-VOLATILE STORAGE

- 8KB VPD SEEPROM

BOARD SIZE

- Height: 233.4 mm (9.2 in.)
- Depth: 80.0 mm (3.1 in.)
- Front Panel Height: 261.8 mm (10.3 in.)
- Front Panel Width: 19.8 mm (0.8 in.)

CALCULATED MTBF

- 894,657 hours calculated using Mil Std 217

All Modules

ENVIRONMENTAL

	Operating	Non-operating
Temperature:	0° C to +55° C (inlet air temp. with forced air cooling)	-40° C to +85° C
Humidity (NC):	5% to 90%	5% to 90%
Vibration:		1 G RMS, 5-100 Hz sine 2 G RMS, 15-2000 Hz sine 0.01g2/Hz (4.5 GRMS) 15-2000 Hz random
Shock:		20 G peak (half sine) 11ms

SAFETY

All printed wiring boards (PWBs) are manufactured with a flammability rating of 94V-0 by UL recognized manufacturers.

ELECTROMAGNETIC COMPATIBILITY (EMC)

- Intended for use in systems meeting the following regulations:
 - ▲ U.S.: FCC Part 15, Subpart B, Class A (non-residential)
 - ▲ Canada: ICES-003, Class A (non-residential)
- Emerson board products are tested in a representative system to the following standards, results pending:
 - ▲ CE Mark per European EMC Directive 89/336/EEC with Amendments; Emissions: EN55022 Class B; Immunity: EN55024

Ordering Information	
Part Number	Description
MVME7100-0161	1 GHz 8641D, 1 GB DDR2 memory, 4GB Nand flash, SCANBE
MVME7100-0163	1 GHz 8641D, 1 GB DDR2 memory, 4GB Nand flash, IEEE
MVME7100-0171	1.3 GHz 8641D, 2 GB DDR2 memory, 8GB Nand flash SCANBE
MVME7100-0173	1.3 GHz 8641D, 2 GB DDR2 memory, 8GB Nand flash IEEE
Related Products	
XMCSpan-001	XMC Expansion, IEEE handles
MVME7216E-101	Rear transition module

SOLUTION SERVICES

Emerson Network Power provides a portfolio of solution services optimized to meet your needs throughout the product lifecycle. Design services help speed time-to-market. Deployment services include global 24x7 technical support. Renewal services enable product longevity and technology refresh. Plus solution extras include enhanced warranty and repairs.

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- DC Power Systems
- Outside Plant
- Site Monitoring
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- Surge & Signal Protection

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