The MVME5100 is designed to meet the needs of OEMs servicing the defense and aerospace, industrial automation and medical market segments.

- MPC7410 or MPC750 microprocessor with 32KB/32KB L1 cache
- Up to 2MB of secondary backside cache
- 100 MHz frontside bus
- Up to 512MB of on-board ECC SDRAM – expandable up to 1GB with optional RAM500 memory expansion modules
- 17MB flash memory
- Dual IEEE P1386.1 compatible 32/64-bit PMC expansion slots
- 64-bit PCI expansion mezzanine connector allowing up to four more PMCs
- Dual 16550 compatible async serial ports
- Dual 10BaseT/100BaseTX Ethernet
- 32KB NVRAM and time-of-day clock with replaceable battery backup
- Four 32-bit timers and one watchdog timer
- On-board debug monitor
- Single VME slot even when fully configured with two PMC modules and both add-on memory mezzanines

The Emerson Network Power MVME5100 series is the flagship of the Emerson PowerPlus II VME Architecture line, enabling supercomputing levels of performance in a single VMEbus slot. Based on an integrated PCI bridge-memory controller ASIC designed by Emerson, PowerPlus II takes memory performance to new levels with 582MB/s memory read bandwidth and 640MB/s burst write bandwidth.

The MVME5100 series utilizes the PowerPlus II Architecture to support full PCI throughput of 264MB/s without starving the processor from its memory. The MVME5100 is designed to meet the needs of OEMs servicing the defense and aerospace, industrial automation and medical market segments.
Overview

I/O COMPATIBILITY
Historically, Emerson has offered two tracks in its PowerPC® Architecture VME portfolio. The first track (which includes the MVME2600/2700) provides typical single-board computer I/O features including Ethernet, SCSI, multiple serial ports, a parallel port and a single PMC slot. The on-board I/O is routed to P2 and made available to the user via Emerson MVME761 or MVME712M transition boards. The second track (which includes the MVME2300/2400) offers limited on-board I/O (Ethernet and a single serial port both via the front panel) but provides dual PMC slots enabling maximum user I/O customization.

The MVME5100 merges the best features of both tracks enabling the OEM to support varying I/O requirements with the same base platform, simplifying part number maintenance, technical expertise requirements and sparing.

P2 I/O MODES
The MVME5100 supports two, jumper-configurable P2 I/O modes; PMC and IPMC. PMC mode is backward compatible with the MVME2300/MVME2400. In PMC mode, 64 pins from PMC slot 1 and 46 pins from PMC slot 2 are available on P2 for PMC rear I/O.

In IPMC mode, the MVME5100 supports legacy MVME761 or MVME712M I/O modules (with limited PMC I/O) when an IPMC761 or IPMC712 PMC card is populated in PMC slot 1. In this configuration, PMC slot 2 contains some signals that are reserved for extended SCSI.

IPMC MODULES
The IPMC761 and IPMC712 are optional add-on PMC modules that provide backward compatibility with previous-generation Emerson products (such as MVME2600 and MVME2700) using the MVME761 or MVME712M transition board. IPMC modules provide rear I/O support for the following:

- One single-ended Ultra Wide SCSI port
- One parallel port
- Four serial ports (2 or 3 async and 1 or 2 sync/async, depending on module)

With this PMC card configuration, the memory mezzanine, one PMC slot and the PMCspan are still available, providing support for OEM product customization.
**TRANSITION MODULES**

The MVME761 transition module provides industry-standard connector access to the IEEE 1284 parallel port, a 10BaseT or 100BaseT port via an RJ-45 connector, two DB-9 connectors providing access to the asynchronous serial ports configured as EIA-574 DTE and two HD-26 connectors providing access to the sync/async serial ports. These serial ports, labeled as Serial 3 and Serial 4 on the faceplate of the MVME761, are individually user-configurable as EIA-232, DCE or DTE via the installation of Emerson Serial Interface Modules (SIMs). A P2 adapter board provides interface signals to the MVME761 transition module. Two separate P2 adapter boards are available: one for 3-row backplanes and one for 5-row backplanes. The 3-row P2 adapter board provides connection for 8-bit SCSI. A 5-row P2 adapter board supports 16-bit SCSI and PMC I/O.

The MVME712M transition module provides industry-standard connector access to the Centronics parallel port, a narrow SCSI port, and four DB-25 connectors providing access to the asynchronous/synchronous serial ports jumper configurable as EIA-232 DCE or DTE via the installation of Emerson Serial Interface Modules (SIMs). A P2 adapter board provides interface signals to the MVME761 transition module. The two separate P2 adapter boards are available: one for 3-row backplanes and one for 5-row backplanes. The 3-row P2 adapter board provides connection for 8-bit SCSI. A 5-row P2 adapter board supports 16-bit SCSI and PMC I/O.

**Software Support**

**FIRMWARE MONITOR**

Firmware must fulfill the traditional functions of test and initialization and provide operating system boot support. The MVME5100 firmware monitor exceeds these requirements with a proven monitor from the embedded VME leader. It expands features like power-up tests with extensive diagnostics, as well as a powerful evaluation and debug tool for simple checkout or when high-level development debuggers require additional support. All this is included with the MVME5100 firmware; plus it supports booting both operating systems and kernels.

**OPERATING SYSTEMS AND KERNELS**

MVME5100 supports booting a variety of operating systems, including VxWorks from Wind River Systems, Inc., Integrity from Green Hills, and Linux from a variety of partners.

**Specifications**

<table>
<thead>
<tr>
<th>PROCESSOR</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MPC7410</td>
<td>MPC750</td>
</tr>
<tr>
<td>Clock Frequency:</td>
<td>400/500 MHz</td>
</tr>
<tr>
<td>On-chip Cache (I/D):</td>
<td>32K/32K</td>
</tr>
<tr>
<td>On-chip Cache (I/D):</td>
<td>32K/32K</td>
</tr>
<tr>
<td>Secondary Cache:</td>
<td>2MB</td>
</tr>
</tbody>
</table>

**MAIN MEMORY**

- **Type:** PC100 ECC SDRAM with 100 MHz bus
- **Capacity:** Up to 512MB on-board, expandable to 1GB with RAM500 memory mezzanines
- **Single Cycle Accesses:** 10 Read/5 Write
- **Read Burst Mode:** 7-1-1-1 idle; 2-1-1-1 aligned page hit
- **Write Burst Mode:** 4-1-1-1 idle; 2-1-1-1 aligned page hit
- **Architecture:** 64-bit, single interleave

**FLASH MEMORY**

- **Type:** EEPROM, on-board programmable
- **Capacity:** 1MB via two 32-pin PLCC/CLCC sockets; 16MB surface mount
- **Read Access (16MB port):** 70 clocks (32-byte burst)
- **Read Access (1MB port):** 262 clocks (32-byte burst)
NVRAM
- Capacity: 32KB (4KB available for users)
- Cell Storage Life: 50 years at 55°C
- Cell Capacity Life: 5 years at 100% duty cycle, 25°C
- Removable Battery: Yes

VMEBUS ANSI/VITA 1-1994 VME64 (IEEE STD 1014)
- Controller: Tundra Universe
- DTB Master: A16–A32; D08–D64, BLT
- DTB Slave: A24–A32; D08–D64, BLT, UAT
- Arbiter: RR/PRI
- Interrupt Handler/Generator: IRQ 1–7/Any one of seven IRQs
- System Controller: Yes, jumperable or auto detect
- Location Monitor: Two, LMA32

COUNTERS/TIMERS
- TOD Clock Device: M48T37V
- Real-Time Timers/Counters: Four, 32-bit programmable
- Watchdog Timer: Time-out generates reset

ETHERNET INTERFACE
- Controller: Two Intel® 82559ER
- Interface Speed: 10/100Mbps
- PCI Local bus DMA: Yes, with PCI burst
- Connector: One routed to front panel RJ-45, one routed to front panel RJ-45 or optionally routed to P2, RJ-45 on MVME761

ASYNCRONOUS SERIAL PORTS
- Controller: 16C550C UART
- Number of Ports: Two, 16550 compatible
- Configuration: RS-232 DTE/DCE
- Async Baud Rate, bps max.: 38.4K EIA-232, 115Kbps raw
- Connector: One routed to front panel RJ-45, one on planar for development use

DUAL IEEE P1386.1 PCI MEZZANINE CARD SLOTS
- Address/Data: A32/D32/D64, PMC PN1, PN2, PN3, PN4 connectors
- PCI Bus Clock: 33 MHz
- Signaling: 5V
- Power: +3.3V, +5V, ±12V; 7.5 watts maximum per PCI slot
- Module Types: Two single-wide or one double-wide, front panel or P2 I/O

PCI EXPANSION CONNECTOR
- Address/Data: A32/D32/D64
- PCI Bus Clock: 33 MHz
- Signaling: 5V
- Connector: 114-pin connector located on the planar of the MVME5100

POWER REQUIREMENTS
(not including power required by PMC or IMPC modules)

<table>
<thead>
<tr>
<th>Module Type</th>
<th>+5 V ± 5%</th>
<th>+12 V ± 10%</th>
<th>−12 V ± 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVME5100</td>
<td>3.0 A typ.</td>
<td>8.0 mA typ.</td>
<td>2.0 mA</td>
</tr>
</tbody>
</table>

BOARD SIZE
- 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.)

IPMC Modules

PMC INTERFACE
- Address/Data: A32/D32/D64, PMC PN1, PN2, PN3, PN4 connectors
- PCI Bus Clock: 33 MHz
- Signaling: 5V
- Module Type: Basic, single-wide; P2 I/O

SCSI BUS
- Controller: Symbios 53C895A
- PCI Local Bus DMA: Yes, with PCI local bus burst
- Asynchronous (8-bit mode): 5.0MB/s
- Ultra SCSI: 20.0MB/s (8-bit mode), 40.0MB/s (16-bit mode)
- Note: 16-bit SCSI operation precludes the use of some PMC slot 2 signals.

SYNCHRONOUS SERIAL PORTS
- Controller: 85230/8536
- Number of Ports: Two (IPMC761); one (IPMC712)
- Configuration: IPMC761: TTL to P2 (both ports), SIM configurable on MVME761; IPMC712: EIA-232 to P2
- Baud Rate, bps max.: 2.5M sync, 38.4K async
- Oscillator Clock Rate (PCLK): 10 MHz/5 MHz
ASYNCHRONOUS SERIAL PORTS
- Controller: 16C550 UART; 85230/8536
- Number of Ports: Two (IPMC761); three (IPMC712)
- Configuration: EIA-574 DTE (IPMC761); EIA-232 (IPMC712)
- Async Baud Rate, bps max.: 38.4K EIA-232, 115Kbps raw

PARALLEL PORT
- Controller: PC97307
- Configuration: 8-bit bi-directional, full IEEE 1284 support; Centronics compatible (minus EPP and ECP on MVME712M)
- Modes: Master only

POWER REQUIREMENTS
(Additional power load placed on MVME5100 series with IPMC installed)

<table>
<thead>
<tr>
<th></th>
<th>+5V ± 5%</th>
<th>+12V ± 10%</th>
<th>–12V ± 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVME5100:</td>
<td>3.8 A max.</td>
<td>8.0 mA typ.</td>
<td>2.0 mA typ.</td>
</tr>
<tr>
<td></td>
<td>3.0 A typ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MVME5110-21xx:</td>
<td>3.8 A max.</td>
<td>8.0 mA typ.</td>
<td>2.0 mA typ.</td>
</tr>
<tr>
<td></td>
<td>3.1 A typ.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MVME5110-22xx:</td>
<td>4.7 A max.</td>
<td>8.0 mA typ.</td>
<td>2.0 mA typ.</td>
</tr>
<tr>
<td></td>
<td>3.5 A typ.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transition Modules

I/O CONNECTORS

<table>
<thead>
<tr>
<th></th>
<th>MVME761</th>
<th>MVME712M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asynchronous Serial Ports:</td>
<td>Two, DB-9 labeled as COM1 and COM2</td>
<td>Three, DB-25 labeled Serial 1, Serial 2 and Serial 3</td>
</tr>
<tr>
<td>Synchronous Serial Ports:</td>
<td>Two, HD-26 labeled as Serial 3 and Serial 4 (user-configurable via installation of SIMs); two 60-pin connectors on MVME761 planar for installation of two SIMs</td>
<td>One, DB-25 labeled as Serial 4</td>
</tr>
<tr>
<td>Parallel Port:</td>
<td>HD-36, Centronics compatible</td>
<td>D-36, Centronics compatible</td>
</tr>
<tr>
<td>Ethernet:</td>
<td>10BaseT or 100BaseTX, RJ-45</td>
<td>Not available</td>
</tr>
<tr>
<td>SCSI:</td>
<td>8- or 16-bit, 50- or 68-pin connector via P2 adapter</td>
<td>8-bit, standard SCSI D-50</td>
</tr>
</tbody>
</table>
## All Modules

### ENVIRONMENTAL

(Minimum of 400 LFM of forced air cooling is recommended for operation in the higher temperature ranges.)

<table>
<thead>
<tr>
<th></th>
<th>Operating</th>
<th>Non-operating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>0°C to +55°C (inlet air temp. with forced air cooling*)</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Humidity (NC)</td>
<td>5% to 90%</td>
<td>5% to 90%</td>
</tr>
<tr>
<td>Vibration</td>
<td>2 Gs RMS, 20–2000 Hz random</td>
<td>6 Gs RMS, 20–2000 Hz random</td>
</tr>
</tbody>
</table>

### 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)

- This product was tested in a representative system to the following standards:
  - CE Mark per European EMC Directive 89/336/EEC with Amendments; Emissions: EN55022 Class B; Immunity: EN55024

### SAFETY

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

### DEMONSTRATED MTBF

(based on a sample of eight boards in accelerated stress environment)

- Mean: 190,509 hours
- 95% Confidence: 107,681 hours
### Ordering Information

All models of the MVME51xx are available with either VME Scanbe front panel (-xxx1) or IEEE 1101 compatible front panel (-xxx3).

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVME51005E-0161</td>
<td>512MB ECC SDRAM, 17MB flash and 1MB L2 cache Scanbe 5E</td>
</tr>
<tr>
<td>MVME51005E-0163</td>
<td>512MB ECC SDRAM, 17MB flash and 1MB L2 cache IEEE 5E</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVME51105E-2161</td>
<td>400 MHz MPC7410, 512MB ECC SDRAM, 17MB flash and 2MB L2 cache Scanbe 5E</td>
</tr>
<tr>
<td>MVME51105E-2163</td>
<td>400 MHz MPC7410, 512MB ECC SDRAM, 17MB flash and 2MB L2 cache IEEE 5E</td>
</tr>
<tr>
<td>MVME51105E-2261</td>
<td>500 MHz MPC7410, 512MB ECC SDRAM, 17MB flash and 2MB L2 cache Scanbe 5E</td>
</tr>
<tr>
<td>MVME51105E-2263</td>
<td>500 MHz MPC7410, 512MB ECC SDRAM, 17MB flash and 2MB L2 cache IEEE 5E</td>
</tr>
</tbody>
</table>

### 400/500 MHz MPC7410 Commercial Models

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPC7126E-002</td>
<td>Multifunction rear I/O PMC module; 8-bit SCSI, Ultra Wide SCSI, one parallel port, three async and one sync/async serial ports</td>
</tr>
<tr>
<td>MVME712M6E</td>
<td>Transition module connectors: One DB-25 sync/async serial port, three DB-25 async serial port, one AUI connector, one D-36 parallel port, and one 50-pin 8-bit SCSI; includes 3-row DIN P2 adapter module and cable</td>
</tr>
</tbody>
</table>

### MVME761M Compatible I/O

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPMC7616E-002</td>
<td>Multifunction rear I/O PMC module; 8-bit SCSI, one parallel port, two async and two sync/async serial ports</td>
</tr>
<tr>
<td>MVME7616E-001</td>
<td>Transition module: Two DB-9 async serial port connectors, two HD-26 sync/async serial port connectors, one HD-36 parallel port connector, one RJ-45 10/100 Ethernet connector; includes 3-row DIN P2 adapter module and cable (for 8-bit SCSI)</td>
</tr>
<tr>
<td>MVME7616E-011</td>
<td>Transition module: Two DB-9 async serial port connectors, two HD-26 sync/async serial port connectors, one HD-36 parallel port connector, and one RJ-45 10/100 Ethernet connector; includes 3-row DIN P2 adapter module and cable (for 16-bit SCSI); requires backplane with 5-row DIN connectors</td>
</tr>
</tbody>
</table>

### Related Products

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMCSpan26E-002</td>
<td>Primary PMC expansion for MVME5100/5110/5500 w/IEEE handles, 6E</td>
</tr>
<tr>
<td>PMCSpan26E-010</td>
<td>Secondary PMC expansion for PMCSpan26E-002 w/IEEE handles, 6E</td>
</tr>
<tr>
<td>RAM5005E-006</td>
<td>Stackable (top) 256MB ECC SDRAM mezzanine 5E</td>
</tr>
<tr>
<td>RAM5005E-016</td>
<td>Stackable (bottom) 256MB ECC SDRAM mezzanine 5E</td>
</tr>
</tbody>
</table>

### Documentation

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>V5100A/IH</td>
<td>MVME5100 Installation and Use</td>
</tr>
<tr>
<td>V5100A/PG</td>
<td>Programmer’s Reference Guide</td>
</tr>
<tr>
<td>VME761A/IH</td>
<td>MVME761 Transition Module Installation and Use</td>
</tr>
<tr>
<td>VME712MA/IH</td>
<td>MVME712 Transition Module Installation and Use</td>
</tr>
<tr>
<td>PPCBugA1/UM</td>
<td>PPCBug Firmware Package User’s Manual (volumes one and two)</td>
</tr>
<tr>
<td>PPCBugA2/UM</td>
<td>PPCBug Diagnostics Manual</td>
</tr>
<tr>
<td>PPCDBIA/UM</td>
<td>PPCBug Diagnostics Manual</td>
</tr>
</tbody>
</table>
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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- Embedded Power
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- Outside Plant
- Power Switching & Control
- Precision Cooling
- Services
- Site Monitoring
- Surge & Signal Protection

Emerson Network Power

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