CV1

High Performance Rugged 3U CompactPCI® Embedded Computer

Features
- Freescale™ MPC7447A G4 host processor with 512 KB on-chip L2 cache
- Marvell® MV64460 PowerPC® System Controller (Discovery® III) bridge chip
- System controller or peripheral mode operation
- DDR SDRAM: 256 MB with ECC
- Soldered boot flash: 128 MB with multiple levels of write-protection
- 32 KB NVRAM
- Real-time clock with backup power from system
- Temperature sensor
- Watchdog timer
- Two 10/100/1000 Base-TX ports to backplane
- RS-232 (COM1) serial port
- RS-422/485 (COM2) serial port
- PMC extension slot, 32-bit 33/66 MHz with rear I/O
- 10 GPIO ports (eight dedicated, two shared)
- Single slot
- Conduction or convection cooled

The CV1 is a rugged 3U CompactPCI® PowerPC® single board computer featuring Freescale™ Semiconductor’s MPC7447A G4 processor supporting a core processor speed of 1 GHz and a system bus clock rate of 167 MHz.

The CV1 includes the Marvell® MV64460 (Discovery® III) System Controller with integrated 167 MHz SDRAM controller, two Gigabit Ethernet ports, two 32-bit 33/66 MHz PCI bus interfaces, and two serial I/O ports.

The CV1 hosts one single-wide IEEE1386.1 PMC site for expanding I/O capability. The PMC site resides on a dedicated 32-bit 33/66 MHz PCI bus.

For status and control capability, the CV1 provides ten general-purpose I/O lines to the backplane with separate interrupts and interrupt masking capability.

The CV1 employs the PLX PCI 6254 Dual Mode cPCI Bridge that handles 32-bit data transfers to and from the cPCI backplane. Through its dual mode functionality the PCI 6254 allows the CV1 to operate as a system controller or peripheral processor card.

The CV1 is available in ruggedized conduction-cooled or convection-cooled configurations.
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Specifications

Processor
- Freescale MPC7447A PowerPC G4 processor
- Core processor speed: 1 GHz
- High performance, 32-bit PowerPC RISC architecture
- Superscalar processor
- 32 KB L1 instruction and data caches
- 512 KB L2 on-chip cache
- 64-bit 167 MHz System Bus from MV64460 System Controller

DDR SDRAM
- 256 MB of soldered DDR333 SDRAM (PC3200)
- Memory Controller from MV64460 System Controller
- 64-bit 167 MHz Memory Bus (72-bit with ECC)

Flash ROM
- 128 MB flash memory
- Multiple levels of write-protection

PCI Interface
- Two PCI Bus interfaces from MV64460 System Controller
- PCI Bus 0: 32-bit 33/66 MHz, +3.3 VIO, dedicated to PMC site
- PCI Bus 1: 32-bit 33/66 MHz, dedicated to cPCI bridge

cPCI Backplane Bridge
- PCI 6254 cPCI Bridge
- PICMG 2.0 R3.0-compliant
- 32-bit cPCI data transfers at 33 or 66 MHz
- Auto-detect system controller slot for controller or peripheral mode

NOTE: The CV1 is not compatible with a 64-bit backplane.

PMC Extension Slot
- Single IEEE P1386/1386.1-2001-compatible PMC site on dedicated PCI bus
- Rear I/O support (+3.3 VIO)

NVRAM/Real-time clock
- 32 KB non-volatile RAM
- STK17T88 NVRAM device
- Real-time clock feature
- Backup power (+3.3V supplied from the system)

Gigabit Ethernet
- Two 10/100/1000 Base-TX Ethernet ports to backplane
- Two on-board Gigabit Ethernet PHYs
- MAC/RGMII interface from MV64460 System Controller

Serial Ports
- Two Multi-Protocol Serial Controller (MPSC) ports from MV64460 System Controller
- COM1: RS-232 (asynchronous)
- COM2: RS-422/485 (synchronous and asynchronous)

General-Purpose I/O
- 10 programmable GPIO ports (eight dedicated, two shared)
- Programmable for line direction (input, output), input polarity (inverted, non-inverted), output type (TTL, open-drain), and interrupt masking
- Independent interrupts for each port

Watchdog Timer
- MV64460 System Controller

Temperature Sensor
- CPU die and ambient temperature
- Software readable from –55°C to +125°C
Power Requirements
- +5 V, +3.3V—required
- ±12V—only if required by installed PMC module
- +3.3V—required for RTC battery backup

Power Allowances - PMC slot
- PMC power max.: 7.5 W
- +5V, +3.3V, ±12V

Power Consumption
- Total (processor at 1 GHz, 256 MB SDRAM): 40 W. This value is a calculated maximum.
- Inrush: TBD
- BATT+ for RTC: battery backup: 10µA

Mechanical
- PICMG 2.0 and VITA 30.1 compliant
- 3U, 1 slot wide
- 100 mm x 160 mm
- Weight: C-Style: 15.2 oz.
  N-Style: 9.6 oz.

Temperature
- Tests performed with 7.5W PMC load

<table>
<thead>
<tr>
<th>Range</th>
<th>Operating</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard (C)</td>
<td>0°C to +70°C</td>
<td>-40°C to +85°C</td>
</tr>
<tr>
<td>Extended (N)</td>
<td>-40°C to +85°C</td>
<td>-55°C to +105°C</td>
</tr>
</tbody>
</table>

Humidity
- Operating: 5 - 95% @ 40°C
- Storage: 5 - 95% @ 40°C

Altitude
- Operating: 15,000 ft. (4.5 km)
- Storage: 40,000 ft. (12 km)

Shock
- C-Style
  - 12g / 6 ms, 3-axes, up & down, 5 hits/direction
- N-Style
  - 40g / 11 ms, 3-axes, up & down, 5 hits /direction
  - 100g / 6 ms, 3-axes, up & down, 5 hits / direction

Vibration
- C-Style
  - 2 g rms @ 5–100 Hz, 60 minutes each axis
- N-Style
  - 12 g rms @ 5–2000 Hz, 60 minutes each axis

MTBF
- Calculations are available in accordance with MIL-HDBK-217. Please contact SBS for latest values.

Safety
- Designed to meet standard UL1950/60950

Emissions
- Designed to meet FCC Part 15, Subpart A
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Block Diagram

Ordering Information

CV123000C
256 MB SDRAM, MPC7447A 1GHz processor, convection-cooled version
256 MB SDRAM, MCP7447A 1GHz processor, convection-cooled version

Hardware Accessories
CV1-TM: I/O transition module for 6U VME backplane (IEEE 1101.11-1998 compliant)

Operating Systems
GE Fanuc Embedded Systems supports various operating systems. Please contact us for current offerings.
For detailed information and further options, contact GE Fanuc Embedded Systems.

About GE Fanuc Intelligent Platforms
GE Fanuc Intelligent Platforms is a leading global provider of embedded computing solutions for a wide range of industries and applications. Our comprehensive product offering includes many types of I/O, single board computers, high performance signal processors, fully integrated, rugged systems including flat panel displays, plus high speed networking and communications products. The company is headquartered in the U.S. and has design, manufacturing and support offices throughout the world. Whether you're looking for one of our standard products or a fully custom solution, GE Fanuc Intelligent Platforms has the breadth, experience and 24/7 support to deliver what you need. For more information, visit www.gefanuc.com.

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Additional Resources
For more information, please visit the GE Fanuc Intelligent Platforms web site at:

www.gefanuc.com

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