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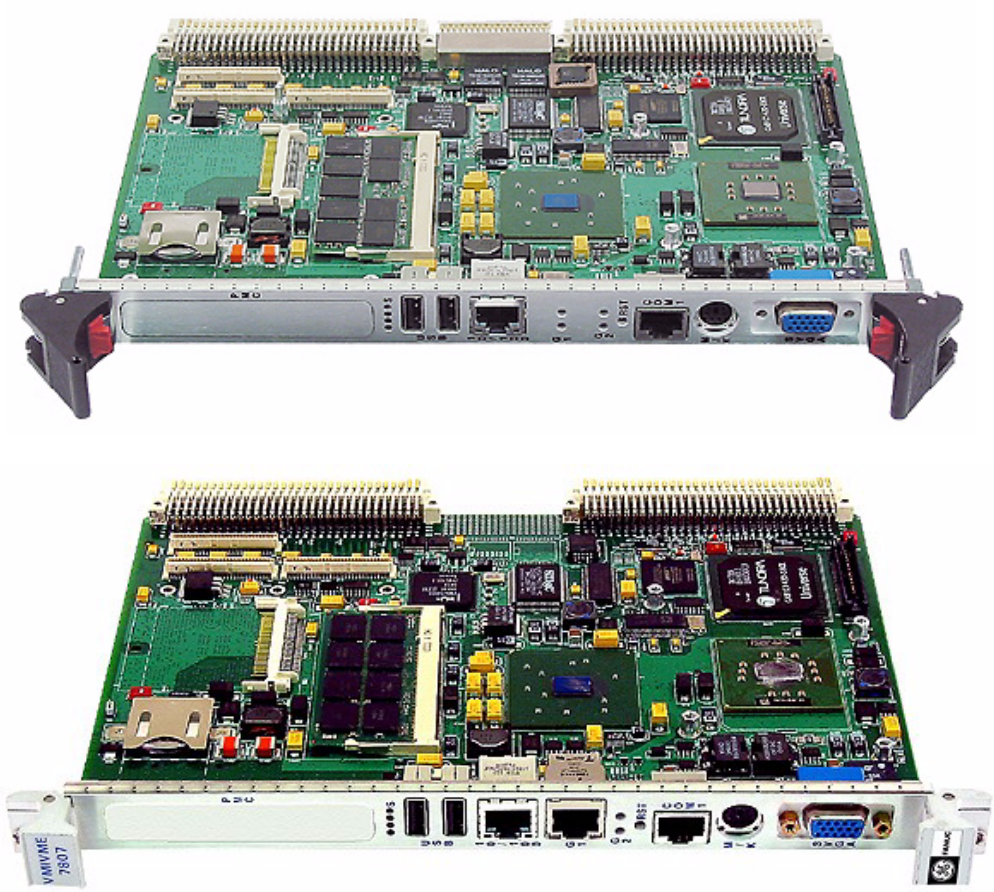
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GE Fanuc Automation



VMIVME-7807
VME-7807RC*

Intel® Pentium® M-Based VME SBC

PRODUCT MANUAL
500-007807-000 REV. F

***NOTE: THE VME-7807RC IS DESIGNED TO MEET THE EUROPEAN UNION (EU) RESTRICTION OF HAZARDOUS SUBSTANCE (RoHS) DIRECTIVE (2002/95/EC) CURRENT REVISION.**

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RoHS Compliance

The VMIVME-7807 uses the Intel 82546EB Dual Gigabit Ethernet Controller.

The VME-7807RC uses the Intel 82546GB Dual Gigabit Ethernet Controller.

There are no other differences in Form, Fit or Function between the standard product or the RoHS compliant product with the exception of the RoHS product is free of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs). In conjunction with the WEEE (Waste Electrical & Electronic Equipment) Directive 2002/96/EC (January 27, 2003).

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Overview

Introduction

GE Fanuc Embedded Systems' VMIVME-7807/VME-7807RC are full featured Pentium® M-based, single board computers (SBCs) in a single-slot, passively cooled, VME Eurocard form factor. These products utilize the advanced technology of Intel®'s 855GME chipset.

The VMIVME-7807/VME-7807RC provide features typically found on desktop systems such as:

- 1.0GB DDR SDRAM using one SODIMM and an optional 512MB of solder-in memory for a maximum of 1.5GB
- Built-in SVGA support (front panel connection)
- Digital video controller (rear I/O) DVI-D with dual head display capabilities
- 10/100 Mbit Ethernet controller (front panel connection)
- Dual Gigabit Ethernet supporting (front panel or rear I/O)
- Optional P0 with VITA 31.1 interface
- Serial ATA (SATA) support (rear I/O)
- Serial port COM1 (front panel connection)
- Ultra IDE drive support (rear I/O)
- Real-Time clock/calendar
- Front panel reset switch
- Miniature speaker
- Keyboard/Mouse port (front panel connection)

The 855GME chipset allows the VMIVME-7807/VME-7807RC to provide enhanced features such as integrated video and Ultra ATA/100 IDE support. The VMIVME-7807/VME-7807RC are capable of executing many of today's desktop operating systems such as Microsoft®'s Windows® XP, Windows 2000 and a wide variety of Linux® based operating systems. The standard desktop features of the VMIVME-7807/VME-7807RC are described in Chapter 2 of this manual.

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The VMIVME-7807/VME-7807RC provide features useful to embedded applications such as:

- Three serial ports: COM2, COM3 and COM4 (rear I/O)
- Four USB 2.0 ports (two on front panel and two rear I/O)
- 32KB of nonvolatile RAM
- Remote Ethernet booting
- Up to 2GB of CompactFlash on secondary IDE (optional)
- Software-selectable Watchdog Timer with reset

Additionally, the VMIVME-7807/VME-7807RC offer one PMC expansion site (PCI-X, 66MHz) with front panel access. The VMIVME-7807/VME-7807RC are capable of executing many of today's operating systems such as VxWorks®, Solaris™ or QNX®. The embedded features of the VMIVME-7807/VME-7807RC are described in Chapter 3 of this manual.

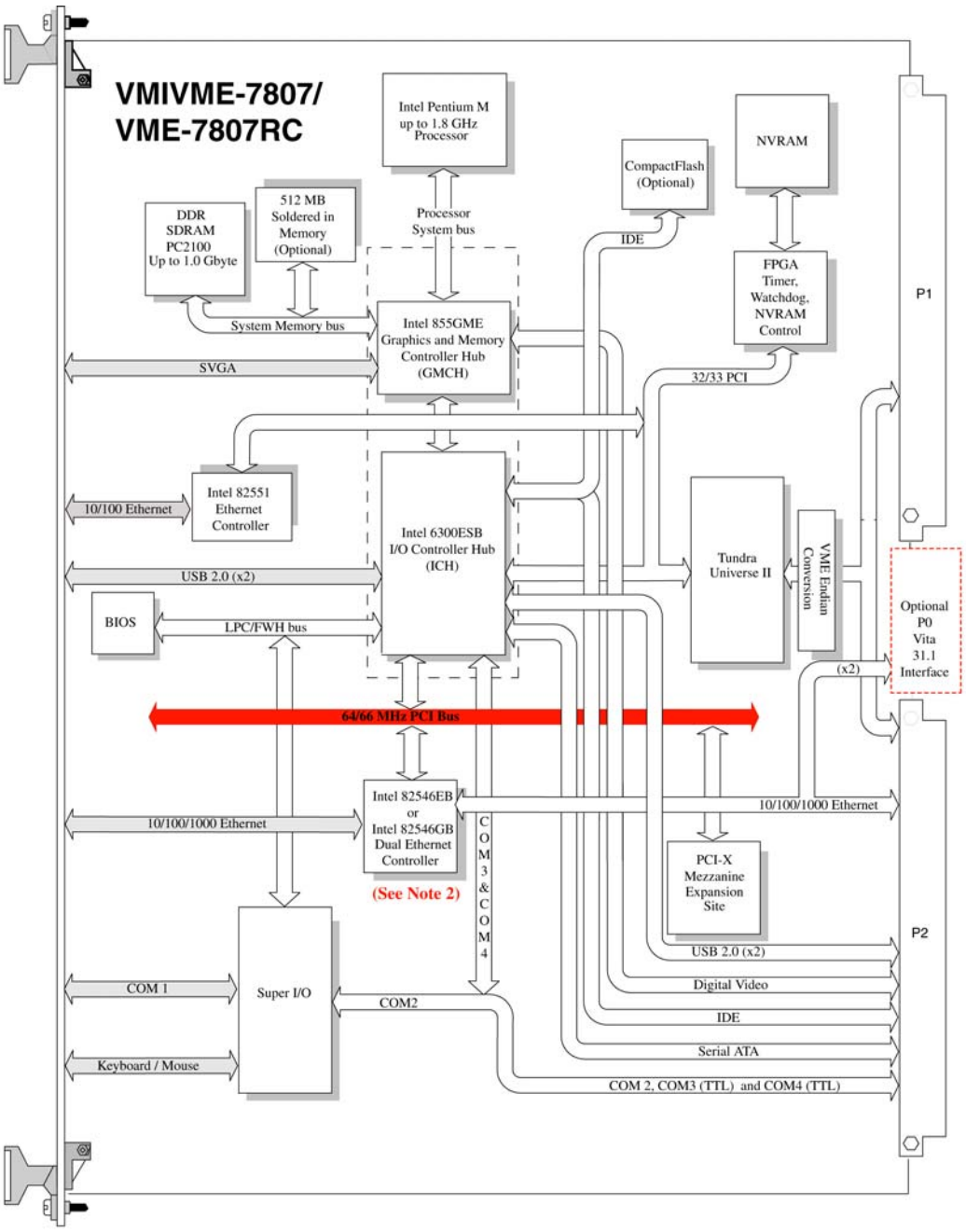
The VMIVME-7807/VME-7807RC are suitable for use in applications ranging from telecommunications, simulation, instrumentation, industrial control, process control and monitoring, factory automation, automated test systems, data acquisition systems and anywhere that the highest performance processing power in a single VME slot is desired.

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Intel 855GME Chipset

The VMIVME-7807/VME-7807RC incorporate the latest Intel chipset technology, the 855GME. This chipset utilizes Advanced Hub Architecture (AHA). The AHA allows for increased system performance by separating many high-bandwidth I/O accesses from PCI accesses, relieving bottlenecks on the PCI bus. Furthermore, the 855GME chipset brings new levels of integration to motherboard chipsets and provides additional features such as Integrated LVDS and Serial ATA.

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NOTE 1: When the P0 option is chosen, the two Gigabit Ethernet ports **are not** routed to the front panel or the P2 connector.
NOTE 2: The Intel 82546GB Ethernet Controller is used on the VME-7807 RoHS version of the product **ONLY**.

Figure 1 VMIVME-7807/VME-7807RC Block Diagram

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Organization of the Manual

This manual is composed of the following chapters and appendices:

Chapter 1 - Installation and Setup describes unpacking, inspection, hardware jumper settings, connector definitions, installation, system setup and operation of the VMIVME-7807/VME-7807RC .

Chapter 2 - Standard Features describes the unit design in terms of the standard PC memory and I/O maps, along with the standard interrupt architecture.

Chapter 3 - Embedded PC/RTOS Features describes the unit features that are beyond standard functions.

Maintenance provides information relative to the care and maintenance of the unit.

Compliance provides applicable information regarding regulatory compliance.

Appendix A - Connector Pinouts illustrates and defines the connectors included in the unit's I/O ports.

Appendix B - AMI BIOS Setup Utility describes the menus and options associated with the AMI (system) BIOS.

Appendix C - Argon BIOS describes the menus and options associated with the LAN Boot BIOS.

Appendix D - System Driver Software describes the steps required to load system drivers.

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References

Intel Pentium M Processor Datasheet
June 2003, Order Number 252612-002

Intel 855GME Chipset Graphics and Memory Controller Hub (GMCH)
March 2003, Order Number 252615-001

Intel 6300ESB I/O Controller Hub
February 2004, Order Number 300641-001

PCI Local Bus Specification, Rev. 2.2
PCI Special Interest Group
P.O. Box 14070
Portland, OR 97214
(800) 433-5177 (U.S.)
(503) 797-4207 (International)
(503) 234-6762 (FAX)

LPC47M107 100-Pin Enhanced Super I/O with LPC Interface for Consumer Applications
Standard Microsystems Corp.
80 Askay Dr.
Hauppauge, NY 11788-8847
www.smsc.com

CMC Specification, P1386/Draft 2.0 from:
IEEE Standards Department
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Piscataway, NJ 08855-1331

PMC Specification, P1386.1/Draft 2.0 from:
IEEE Standards Department
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445 Hoes Lanes, P.O. Box 1331
Piscataway, NJ 08855-1331, USA

The following is useful information related to the operation of the I^2C controllers:

The I^2C Specification version 2.0
Philips Semiconductor
811 East Arques Ave.
Sunnyvale, CA 94088-3409
(800) 234-7381
www.semiconductors.philips.com

I^2C/SMBus-Compatible Remote/Local Temperature Sensors with Overtemperature Alarms
Maxim Integrated Products, Inc.
120 San Gabriel Drive
Sunnyvale, CA 94086 USA
408-737-7600
800-629-4642
Fax: 408-737-7194
www.maxim-ic.com

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Safety Summary

The following general safety precautions must be observed during all phases of the operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of this product.

GE Fanuc Embedded Systems assumes no liability for the customer's failure to comply with these requirements.

Ground the System

To minimize shock hazard, the chassis and system cabinet must be connected to an electrical ground. A three-conductor AC power cable should be used. The power cable must either be plugged into an approved three-contact electrical outlet or used with a three-contact to two-contact adapter with the grounding wire (green) firmly connected to an electrical ground (safety ground) at the power outlet.

Do Not Operate in an Explosive Atmosphere

Do not operate the system in the presence of flammable gases or fumes. Operation of any electrical system in such an environment constitutes a definite safety hazard.

Keep Away from Live Circuits

Operating personnel must not remove product covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

Do Not Service or Adjust Alone

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

Do Not Substitute Parts or Modify System

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the product. Return the product to GE Fanuc Embedded Systems for service and repair to ensure that safety features are maintained.

Dangerous Procedure Warnings

Warnings, such as the example below, precede only potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING: Dangerous voltages, capable of causing death, are present in this system. Use extreme caution when handling, testing, and adjusting.

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Safety Symbols Used in This Manual

STOP: This symbol informs the operator that a practice or procedure should not be performed. Actions could result in injury or death to personnel, or could result in damage to or destruction of part or all of the system.

WARNING: This sign denotes a hazard. It calls attention to a procedure, practice, or condition, which, if not correctly performed or adhered to, could result in injury or death to personnel.

CAUTION: This sign denotes a hazard. It calls attention to an operating procedure, practice, or condition, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the system.

NOTE: Calls attention to a procedure, practice, or condition which is essential to highlight.

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CHAPTER
1

Installation and Setup

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Introduction

This chapter describes the hardware jumper settings, connector descriptions, installation, system setup and operation of the VMIVME-7807/VME-7807RC .

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Unpacking Procedures

Any precautions found in the shipping container should be observed. All items should be carefully unpacked and thoroughly inspected for damage that might have occurred during shipment. The board(s) should be checked for broken components, damaged printed circuit board(s), heat damage and other visible contamination. All claims arising from shipping damage should be filed with the carrier and a complete report sent to GE Fanuc Embedded Systems Customer Care along with a request for advice concerning the disposition of the damaged item(s).

CAUTION: Some of the components assembled on GE Fanuc Embedded Systems products may be sensitive to electrostatic discharge and damage may occur on boards that are subjected to a high energy electrostatic field. When the board is placed on a bench for configuring, etc., it is suggested that conductive material be inserted under the board to provide a conductive shunt. Unused boards should be stored in the same protective boxes in which they were shipped.

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Hardware Setup

The VMIVME-7807/VME-7807RC are factory populated with user-specified options as part of the VMIVME-7807/VME-7807RC ordering information. The memory size and CompactFlash sizes are not user-upgradable. To change memory or CompactFlash size, contact Customer Care to receive a Return Material Authorization (RMA). RMAs are available from rma@gefanuc.com.

GE Fanuc Embedded Systems Customer Care is available at: 1-800-GEFANUC (1-800-433-2682),1-780-401-7700 or
E-mail us at support.embeddedsystems@gefanuc.com

The VMIVME-7807/VME-7807RC are tested for system operation and shipped with factory-configured jumpers and switches. The physical location of the switches, jumpers and connectors for the SBC are illustrated in Figure 1-1 on page 24. The definitions of the SBC switches, jumpers and connectors are included in Table 1-1 through Table 1-4. Please note that the VMIVME-7807/VME-7807RC offer one PMC site designated PMC #1 as shown in Figure 1-1 on page 24.

CAUTION: All jumpers marked *User Configurable* in the following tables may be changed or modified by the user. All jumpers marked *Factory Configured* should not be modified by the user.

Care must be taken when making jumper modifications to ensure against improper settings or connections. Improper settings may result in damage to the unit.

Modifying any jumper not marked *User Configurable* will void the Warranty and may damage the unit.

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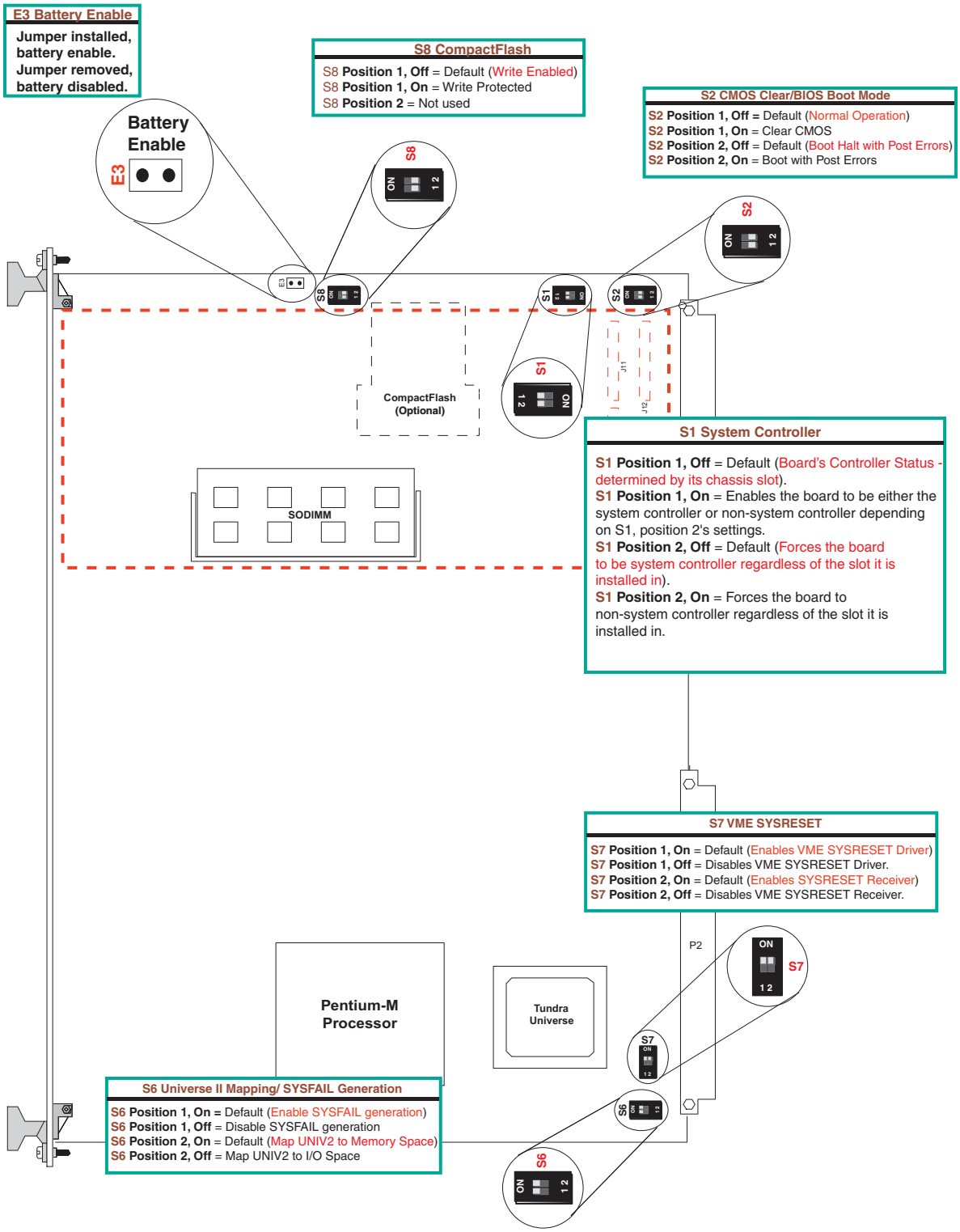


Figure 1-1 VMIVME-7807/VME-7807RC PMC Site and Switch Locations

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Table 1-1 SBC Connectors and Switches

Connector	Function
P1	VME interface connector
P2	USB 2.0, Serial ATA, digital video, IDE, COM2, 3 and 4, optional Gigabit Ethernet
P0	VITA 31.1 Interface connector (optional)
P3	CompactFlash socket
J16 and J17	USB ports
J10	Keyboard/Mouse PS/2 Type connector
J9	ITP connector
J15	10/100 Mb RJ45 Ethernet connector
J18	Gigabit Ethernet connector (optional)
J11, J12 and J13	PMC Site Connector
J22	Serial port connector (COM1)
J19	SVGA connector
J21	GE Fanuc Embedded Systems' PCI expansion connector (PMC237CM1/V)
B1	Battery
Switches	**Function**
S1	System Controller
S2	CMOS clear switch/BIOS Boot Mode
S4	Reset switch (Front Panel)
S6	Map Universe II to I/O Space
S7	VME SYSRESET

Table 1-2 Battery Enable (**User Configurable**) - Jumper (E3)

Select	Jumper Position
Battery Enabled	**On**
Battery Disabled	Off

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Table 1-3 VME System Controller (**User Configurable**) - Switch (S1)

Position	Function	State
1 - 4	**Normal Operation (Default)**	**Off**
1 - 4	Enables System or non-system controller (any slot)	On
2 - 3	Force system controller (any slot)	Off
2 - 3	Force system or non-system controller (any slot)	On

NOTE: The BIOS has the capability (not currently enabled) of password protecting casual access to the unit's CMOS set-up screens. The Password Clear switch allows the user to clear the CMOS and password in the case of a system BIOS malfunction or forgotten password.

Table 1-4 Password Clear/BIOS Boot Mode (**User Configurable**) - Switch (S2)

Position	Function	State
1 - 4	**Normal**	**Off**
1 - 4	Clear CMOS/Password	On
2 - 3	Boot with Post Errors	On
2 - 3	**Boot Halt on Post Errors**	**Off**

To clear the CMOS password:

1. Turn off power to the unit.
2. Move switch S2 position 1 to On.
3. Wait approximately 5 seconds.
4. Move switch S2 position 1 to Off.
5. Power up the unit.

When power is reapplied to the unit, the CMOS password will have been cleared and the CMOS will be set to its defaults.

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Table 1-5 Universe II Mapping/SYSFAIL Generation (**User Configurable**) - Switch (S6)

Position	Function	State
1 - 4	**Map UNIV2 to I/O Space**	**On**
1 - 4	Map UNIV2 to Memory Space	Off
2 - 3	**Enable SYSFAIL Generation**	**On**
2 - 3	Disable SYSFAIL Generation	Off

Table 1-6 VME Strapping (**User Configurable**) - Switch (S7)

Position	Function	State
1 - 4	Enable VME SYSRESET Driver	Off
2 - 3	Enable SYSRESET Receiver	Off

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Installation

The VMIVME-7807/VME-7807RC conform to the VME physical specification for a 6U board. The VMIVME-7807/VME-7807RC can be used for system control or as a peripheral board. They can be plugged directly into any standard chassis accepting either type of board.

The following steps describe the GE Fanuc Embedded Systems-recommended method for installation and powerup of the VMIVME-7807/VME-7807RC :

1. If a PMC module is to be used, connect it to the VMIVME-7807/VME-7807RC prior to board installation (as shown in Figure 1-2 on page 29). Refer to the Product Manual for the PMC module for configuration and setup.

NOTE: Air flow requirements as measured at the output side of heatsink is to be greater than 450LFM.

2. Insert the VMIVME-7807/VME-7807RC into a VME chassis system controller or peripheral slot. While ensuring that the board is properly aligned and oriented in the supporting board guides, slide the board smoothly forward against the mating connectors. Use the ejector handles to firmly seat the board.
3. All needed peripherals can be accessed from the front panel or the rear I/O VMIACC-0586/ACC-0586RC or VMIACC-0590/ACC-0590RC Rear Transition Modules (RTMs). Each connector is clearly labeled on the front panel and detailed pinouts are in Appendix A.
4. Connect a keyboard and mouse if the system has not been previously configured.
5. The VMIVME-7807/VME-7807RC feature an optional CompactFlash Disk resident on the board. Refer to Chapter 3 for set up details.
6. If an external drive module is installed, the BIOS Setup program must be used to configure the drive types. See Appendix B to properly configure the system.
7. If a drive module is present, install the operating system according to the manufacturer's instructions.

BIOS Setup

The VMIVME-7807/VME-7807RC have an onboard BIOS Setup program that controls many configuration options. These options are saved in a special non-volatile, battery-backed memory chip and are collectively referred to as the board's 'CMOS Configuration'. The CMOS configuration controls many details concerning the behavior of the hardware from the moment power is applied.

Details of the VMIVME-7807/VME-7807RC BIOS setup program are included in Appendix B.

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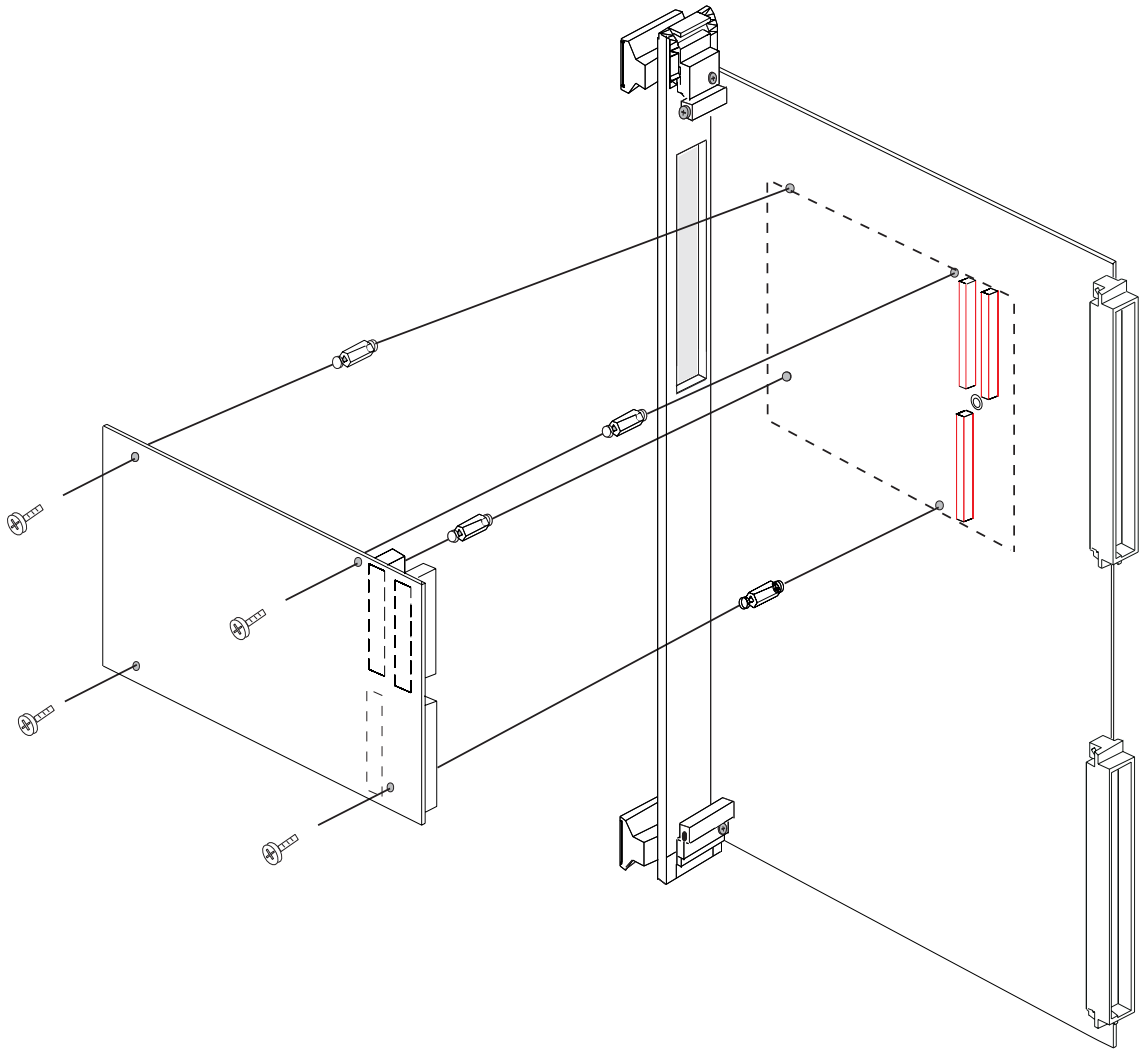


Figure 1-2 Installing a PMC Card on the VMIVME-7807/VME-7807RC

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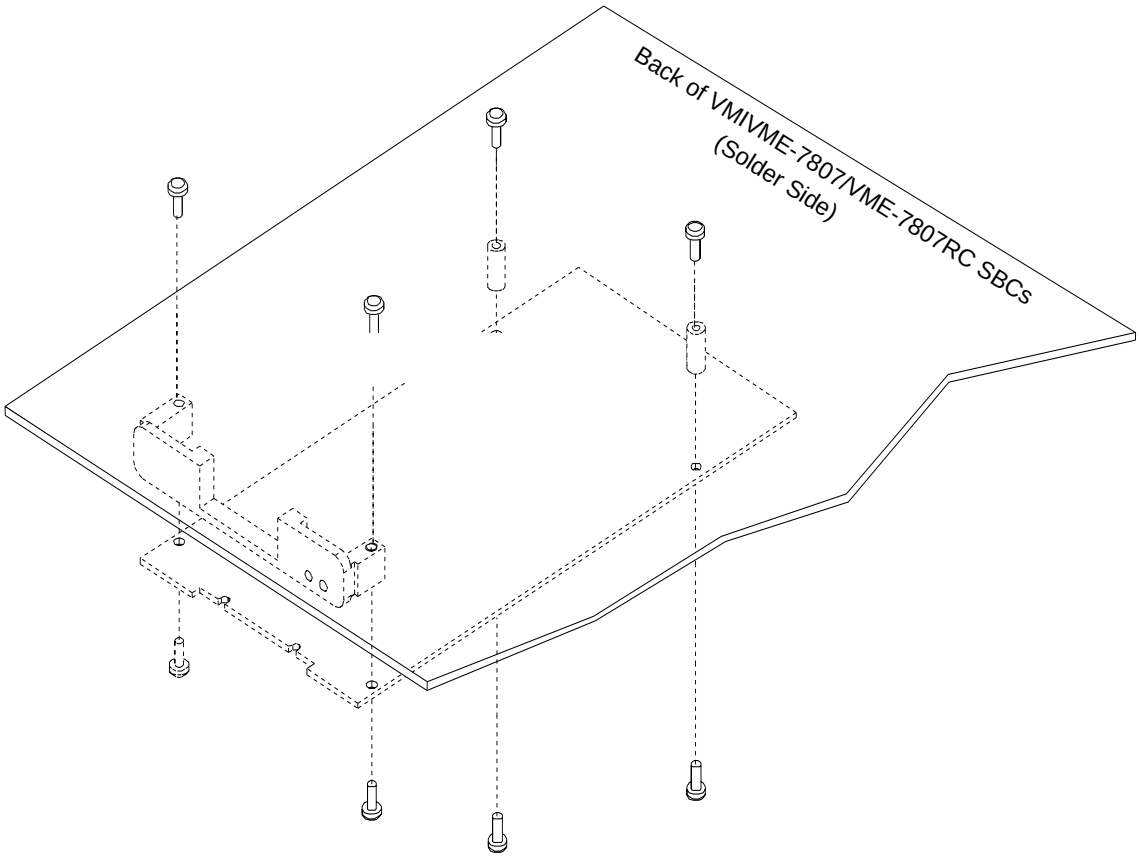


Figure 1-3 Backside Mounting for the PMC Card

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Front/Rear Panel Connectors

The VMIVME-7807/VME-7807RC provide front panel access for the PMC expansion site, an optional Gigabit Ethernet port, one 10/100 RJ45 connector, one serial port, SVGA, keyboard/mouse, the manual reset switch and the status LEDs. A drawing of the VMIVME-7807/VME-7807RC front panels are shown in Figure 1-5. The front panel connectors and indicators are labeled as follows:

- 10/100 10/100 Mbit Ethernet connector
- G1 10/100/1000 Mbit Ethernet connector 1 (or LEDs) port 1
- G2 10/100/1000 Mbit Ethernet LEDs port 2
- M/K Mouse/keyboard connector
- COM1 Serial Port
- RST Manual reset switch
- S Status LEDs
- SVGA Analog Video connector

The VMIVME-7807/VME-7807RC provide rear I/O support for the following: digital video, Serial ATA, COM2, 3 and 4, IDE drive and two USB ports. These signals are accessed by the use of an RTM such as the VMIACC-0586/ACC-0586RC and the VMIACC-0590/ACC-0590RC, which terminates into industry standard connectors.

The front panel connectors, including connector pinouts and orientation, for the VMIVME-7807/VME-7807RC are defined in Appendix A. Rear panel connections are defined in the appropiate RTM Installation Guide. Contact Sales for compatible RTMs offered by GE Fanuc Embedded Systems.

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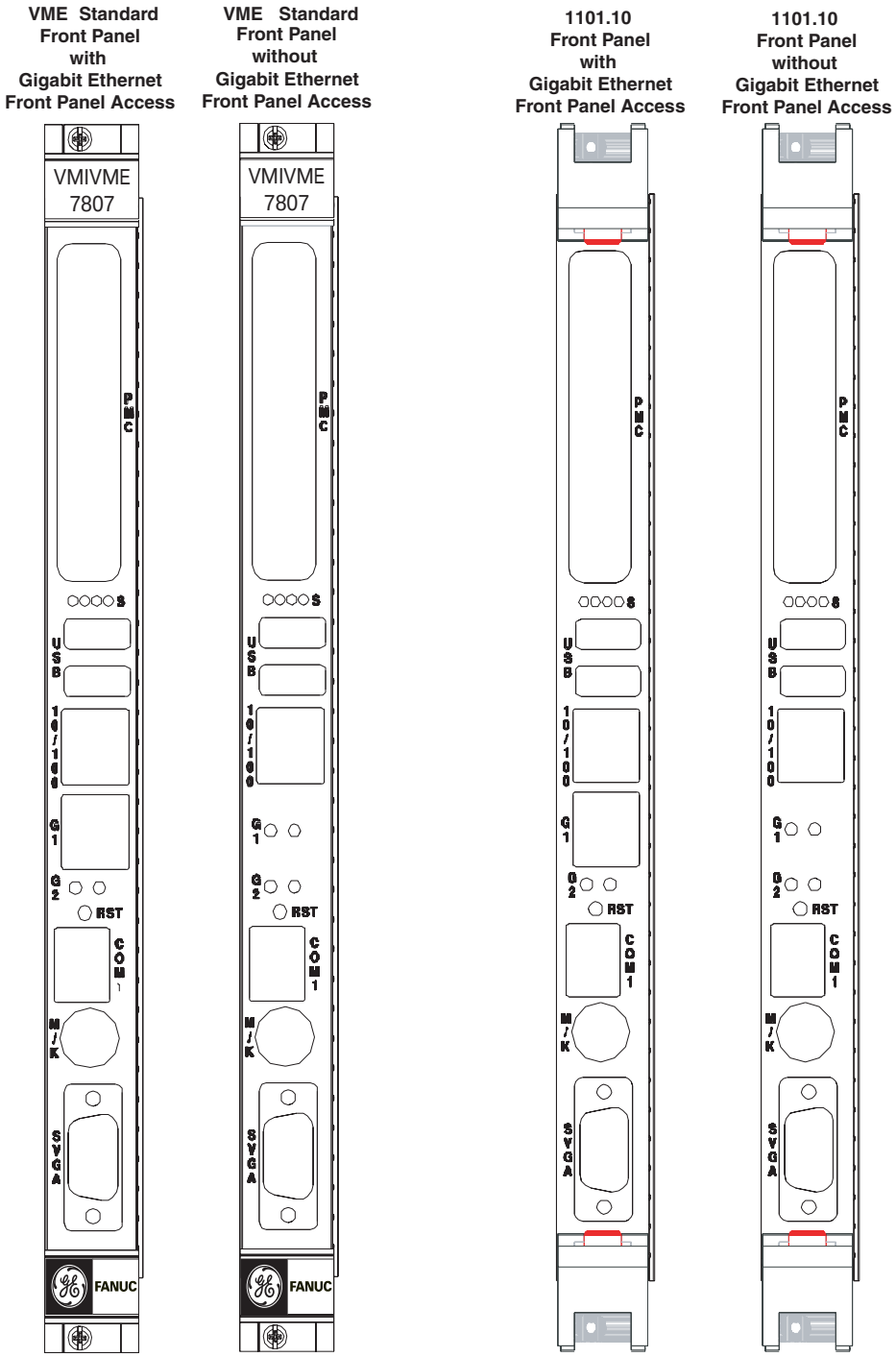
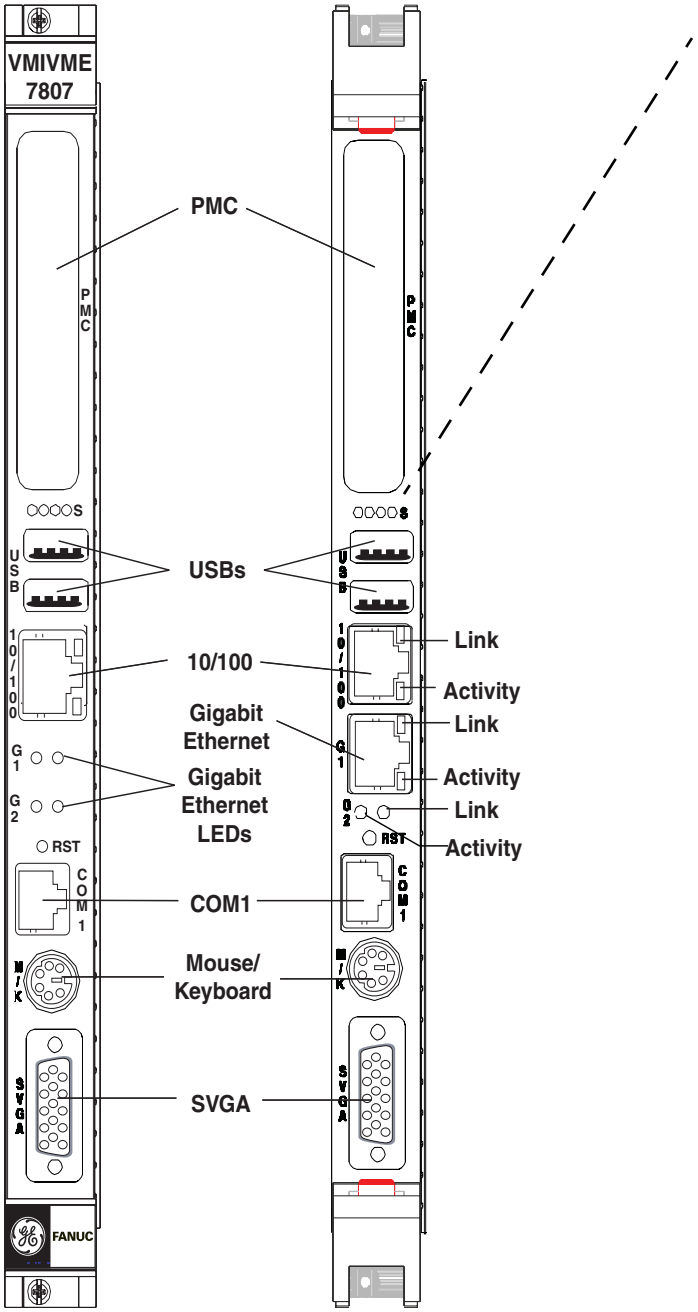


Figure 1-4 VMIVME-7807/VME-7807RC Front Panels

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Front Panel Layout



Status LEDs (from left to right)

Sysfail	*VME failure*- Lights during VME SYSFAIL condition, (Red LED).
PWR	*Power* - Indicates when power is applied to the board, (Green LED).
IDE	*Activity Indicator* - Flashes when IDE activity is occurring, (Yellow LED).
Boot Done	*Booting* - Indicates BIOS Boot is in progress. When LED is off, CPU has finished POST and is ready, (Red LED).
RST Switch	*Reset* - Allows the system to be reset from the front panel.

10/100 Ethernet LEDs

Link	Indicates the Ethernet is active, (Green LED).
Activity	Indicates whether 10BaseT (Yellow LED) or 100BaseTX Green LED) mode is active.

Front Gigait Ethernet LEDs

Link	Indicates the Ethernet is active, (Yellow LED).
Activity	Indicates whether 10BaseT (LED Off), 100BaseTX (Yellow LED) or 1000BaseT (Green LED) Ethernet mode is active.

Rear Gigait Ethernet LEDs

Link	Indicates the Ethernet is active, (Green LED).
Activity	Indicates whether 10BaseT (LED Off), 100BaseTX (Yellow LED) or 1000BaseT (Green LED) Ethernet mode is active.

Figure 1-5 Front Panels Layout

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CHAPTER 2

Standard Features

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Video Graphics Adapter 40

Introduction

The VMIVME-7807/VME-7807RC are Pentium M processor-based single board computers compatible with modern industry standard desktop systems. The VMIVME-7807/VME-7807RC therefore retain industry standard memory and I/O maps along with a standard interrupt architecture. The integrated peripherals described in this section (such as serial ports, USB ports, IDE drives, floppy drives, video controller and Ethernet controller) are all memory mapped the same as similarly equipped desktop systems, ensuring compatibility with modern operating systems.

The following sections describe the standard features of the VMIVME-7807/VME-7807RC.

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CPU

The VMIVME-7807/VME-7807RC CPUs are factory populated with Pentium M processors. The CPU speed and Memory/CompactFlash size are user specified as part of the VMIVME-7807/VME-7807RC ordering information.

To change memory size or CompactFlash size contact Customer Care to receive a Return Material Authorization (RMA). RMAs are available at rma@gefanuc.com.

GE Fanuc Embedded Systems Customer Care is available at: 1-800-GEFANUC (or 1-800-433-2682), 1-780-401-7700 or
E-mail us at support.embeddedsystems@gefanuc.com.

Physical Memory

The VMIVME-7807/VME-7807RC provide DDR Synchronous DRAM (SDRAM) as onboard system memory. Memory can be accessed as bytes, words or longwords.

The VMIVME-7807/VME-7807RC accept one 200-pin DDR SDRAM SODIMM along with the optional solder-in 512MB onboard memory, for a maximum capacity of 1.5GB. The onboard DRAM is accessible to the VME through the PCI-to-PCI bridge and is addressable by the local processor.

NOTE: Memory capacity may change due to part availability.

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PCI Device Interrupt Map

The PCI bus-based external devices include the Universe IID bridge, PMC site, Ethernet controllers, FPGA and the GE Fanuc Embedded Systems connector. The default BIOS maps these external devices to the PCI Interrupt Request (PIRQx) lines of the 6300ESB I/O controller Hub. This mapping is defined in Table 2-1.

Table 2-1 PCI Device Interrupt Mapping by the BIOS

Device	PGNT	PREQ	IDSEL	IRQ	Vendor ID	Device ID
Universe IID	PCI0_GNT[1]#	PCI0_REQ[1]#	PCI0_AD[29]	PCI_IRQE#	10E3H	0001H
PMC Site	PCI_GNT[3]#	PCI_REQ[3]#	PCI_AD[30]	PCI_IRQC#	Customer	Customer
Gigabit Ethernet #1	PCI_GNT[0]#	PCI1_REQ[0]#	PCI_AD[21]	PCI_IRQA#	8086H	1010H 1079H*
Gigabit Ethernet #2	PCI_GNT[1]#	PCI1_REQ[0]#	PCI_AD[21]	PCI_IRQB#	8086H	1010H 1079H*
82551	PCI_GNT[2]#	PCI0_REQ[2]#	PCI_AD[28]	PCI_IRQF#	8086H	N/A
FPGA	N/A	N/A	PCI_AD[21]	PCI_IRQD#	N/A	N/A
GE Fanuc Embedded Systems Conn	PCI_GNT[3]#	PCI0_REQ[3]#	PCI_AD[20]	PCI_IRQ[A:D]#	N/A	N/A

* The Device ID for the Intel 82546EB is 1010H.
The Device ID for the Intel 82546GB is 1079H.

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Integrated Peripherals

The VMIVME-7807/VME-7807RC incorporate an SMSC Super I/O (SIO) chip. The SIO provides the VMIVME-7807/VME-7807RC with two 16550 UART-compatible serial ports, keyboard and mouse port. The keyboard and mouse ports are available via the front panel using a standard PS/2 type connector. COM1 is accessed via the front panel. COM2 is routed to the VME P2 connector.

COM ports 3 and 4 are also provided by the 6300ESB I/O Controller Hub and are routed to the VME P2 connector.

The parallel IDE interface is provided by the Intel 6300ESB I/O Controller Hub. The IDE interface supports two channels: primary and secondary. The secondary channel is routed onboard to the optional CompactFlash socket. The primary channel is routed out of the VME P2 backplane connector to an RTM which terminates into a standard 40-pin header. This channel can support a master and slave drive. The IDE interface on the VMIVME-7807/VME-7807RC supports Ultra ATA/33, Ultra ATA/66 and Ultra ATA/100 drives and automatically determines the proper operating mode based on the type of drive used. In order to properly function in the Ultra ATA/100 mode, a special 80 conductor cable must be used instead of the standard 40 conductor cable. This cable is typically available from the Ultra ATA/100 drive manufacturer.

A Serial ATA Drive Interface is also provided by the 6300ESB I/O Controller Hub. The Serial ATA port can be used alone or in limited conjunction with the parallel IDE interface.

NOTE: Selection of drive type (parallel or serial), along with detailed IDE/ATA selections is available in the CMOS Advanced BIOS Setup Menu.

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Ethernet Controller

The network capability is provided by the Intel 82546EB for the VMIVME-7807 or the Intel 82546GB for the VME-7807RC Ethernet Controller for Gigabit Ethernet and the Intel 82551 10/100 Mbit Ethernet. These Ethernet controllers are PCI bus based and are software configurable. The VMIVME-7807/VME-7807RC supports 10BaseT, 100BaseTX and 1000BaseT Ethernet.

10BaseT

A network based on the 10BaseT standard uses unshielded twisted-pair cables, providing an economical solution to networking by allowing the use of existing telephone wiring and connectors. The RJ45 connector is used with the 10BaseT standard. 10BaseT has a maximum length of 100 meters.

100BaseTX

The VMIVME-7807/VME-7807RC also supports the 100BaseTX Ethernet. A network based on a 100BaseTX standard uses unshielded twisted-pair cables and a RJ45 connector. 100BaseTX has a maximum length of 100 meters.

1000BaseT

The VMIVME-7807/VME-7807RC support 1000BaseT Ethernet using the Intel 82546EB for the VMIVME-7807 or the Intel 82546GB for the VME-7807RC dual Ethernet controller. The interface uses shielded cables with four pairs of conductors, along with an RJ45 connector on the front panel or routed to the VME P2 connector. The Gigabit Ethernet is also available with the optional VITA 31.1 routed out of the optional P0 connector.

NOTE: Ethernet activity is noted on the front panel LEDs by a blinking yellow LED. The yellow LED will be on continuously when the Ethernet port is linked but with no activity.

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Video Graphics Adapter

The SVGA port on the VMIVME-7807/VME-7807RC is controlled by the Intel 855GME Graphic and Memory Controller Hub (GMCH). The GMCH is hardware and BIOS compatible with the industry SVGA and digital video standards supporting both VESA high-resolution and extended video modes. Table 2-2 and Table 2-3 show the graphics video modes supported by the GMCH video controller for analog monitors.

Table 2-2 Supported Graphics Video Resolutions for Windows 2000 (Analog)

Screen Resolution	Maximum Colors	Maximum Refresh Rates (Hz)
640 x 480	256, High and True are supported at all resolutions.	85
768 x 1024		85
800 x 600		85
1024 x 768		85
1024 x 1280		75
1200 x 1600		60
1280 x 1024		75
1600 x 1200		60

Table 2-3 Supported Graphics Video Resolutions for Windows XP (Analog)

Screen Resolution	Maximum Colors	Maximum Refresh Rates (Hz)
640 x 480	High and True are supported at all resolutions.	85
800 x 600		85
1024 x 768		85
1080 x 1280		75
1600 x 1200		60

Not all SVGA monitors support resolutions and refresh rates beyond 640 x 480 at 85Hz. Do not attempt to drive a monitor to a resolution or refresh rate beyond its capability.

NOTES: The VMIACC-0586/ACC-0586RC or the VMIACC-0590/ACC-0590RC RTMs are required for graphics operation when using the digital video out the P2 backplane connector.

The default setup in the BIOS for Digital Video Output is 800x600.

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Digital Visual Interface (DVI)

The VMIVME-7807/VME-7807RC have a Digital Visual Interface that provides a high-speed digital connection for visual data types that are display technology independent. DVI is a display interface developed in response to the proliferation of digital flat-panel displays. For the most part, these displays are currently connected to an analog Video Graphics Array (VGA) interface and, thus, require a double conversion.

The digital signal from the computer must be converted to an analog signal for the analog VGA interface, then converted back to a digital signal for processing by the flat-panel display. This inherently inefficient process takes a toll on performance and video quality and adds cost. In contrast, when a flat-panel display is connected to a digital interface, no digital-to-analog conversion is required.

DVI uses Silicon Image's PanelLink, a high-speed serial interface that uses Transition Minimized Differential Signaling (TMDS) to send data to the monitor. The DFP and VESA Plug and Display interfaces also use PanelLink. For this reason, DVI can work with these previous interfaces by using adapter cables (depending on the signal quality of the adapter.)

DVI also supports the VESA Display Data Channel (DDC) and the Extended Display Identification Data (EDID) specifications. DDC is a standard communications channel between the display adapter and monitor. EDID is a standard data format containing monitor information such as vendor information, monitor timing, maximum image size, and color characteristics. EDID information is stored in the display and is communicated over the DDC. EDID and DDC enable the system, display and graphics adapter to communicate so that the system can be configured to support specific features available in the display.

DVI Connectors

The DVI connector has 24 pins that can accommodate up to two TMDS links and the VESA DDC and EDID services. The DVI specification defines two types of connectors (see Figure 1):

- DVI-Digital (DVI-D) supports digital displays only (used on the VMIVME-7807/VME-7807RC)
- DVI-Integrated (DVI-I) supports digital displays and is backward compatible with analog displays (not supported)

The VMIVME-7807/VME-7807RC use the DVI-I connector with a single TMDS link. The DVI-I interface accommodates a 12- or 24-pin DVI plug connector or a new type of analog plug connector that uses four additional pins, plus a ground plane plug to maintain a constant impedance for the analog RGB signals.

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Dual Head Video

The VMIVME-7807/VME-7807RC are capable of driving two monitors at the same time using the Intel 855GME GMCH. The graphics controller allows the use of one digital monitor connected to the VMIACC-0590/ACC-0590RC or VMIACC-0586/ACC-0586RC RTMs, routed out the rear I/O P2 connector. The second is a standard SVGA monitor connected to the front panel of the VMIVME-7807/VME-7807RC, using a standard DB15 connector.

Dual Head Setup Procedure:

1. Boot Windows 2000.
2. In the windows desktop right click.
3. When the menu appears, scroll down to the 'Graphics Options' and then click on 'Graphics Properties'. The Intel 82852/82855GM/GME graphics controller properties menu will appear. From this menu you can choose the display mode of choice.

The monitors can be displayed in several modes:

- Monitor Mode - In this mode only the SVGA monitor is displayed.
- Digital Mode - In this mode only the Digital is displayed.
- Dual Display Clone Mode - In this mode both the SVGA and the Digital monitors are displayed, with the desktop the same on both monitors.
- Extended Desktop Mode - In this mode the two monitors are displayed as one desktop.

4. After making your choice click 'OK' to apply the changes.

NOTE: When using the Dual Head mode, the maximum resolution for each monitor is 1600x1200 for the 855GME. Refer to manufacturer's documentation for the resolutions of each monitor used.

Hot Keys

The Intel 855GME Graphic and Memory Controller allows the use of hot keys to set up the monitors:

Action	Hot Key Combination
Enable Monitor	<CRTL><ALT><F1>
Enable Notebook	<CRTL><ALT><F3>
Enable Digital Display	<CRTL><ALT><F4>
Invoke Graphics Properties	<CRTL><ALT><F12>
Rotate Normal	<CRTL><ALT><UP>
Rotate 90 Degrees	<CRTL><ALT><LEFT>
Rotate 180 Degrees	<CRTL><ALT><DOWN>
Rotate 270 Degrees	<CRTL><ALT><RIGHT>

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Digital Video Display Modes

High-resolution digital graphics and multimedia-quality video are supported on the VMIVME-7807/VME-7807RC using the 855GME (GMCH) chipset internal graphics controller. Screen resolutions up to 1,600 x 1,200 x 256 colors (single view mode) are supported by the graphics adapter.

Table 2-4 Partial List of Display Modes Supported

Resolution	Bits Per Pixel (Frequency in Hz)		
	8-bit Indexed	16-bit	24-bit
320 x 200	70	70	70
320 x 240	70	70	70
352 x 480	70	70	70
352 x 576	70	70	70
400 x 300	70	70	70
512 x 384	70	70	70
640 x 400	70	70	70
640 x 480	60, 70, 72, 75, 85	60, 70, 72, 75, 85	60, 70, 72, 75, 85
720 x 480	75, 85	75, 85	75, 85
720 x 576	60, 75, 85	60, 75, 85	60, 75, 85
800 x 600	60, 70, 72, 75, 85	60, 70, 72, 75, 85	60, 70, 72, 75, 85
1,024 x 768	60, 70, 72, 75, 85	60, 70, 72, 75, 85	60, 70, 72, 75, 85
1,152 x 864	60, 70, 72, 75, 85	60, 70, 72, 75, 85	60, 70, 72, 75, 85
1,280 x 720	60, 75, 85	60, 75, 85	60, 75, 85
1,280 x 960	60, 75, 85	60, 75, 85	60, 75, 85
1,280 x 1,024	60, 70, 72, 75, 85	60, 70, 72, 75, 85	60, 70, 75, 85
1,600 x 900	60, 75, 85	60, 75, 85	
1,600 x 1,200	60, 70, 72, 75		

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CHAPTER 3

Embedded PC/RTOS Features

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Introduction

GE Fanuc Embedded Systems' VMIVME-7807/VME-7807RC feature additional capabilities beyond those of a typical desktop computer system. The units provide four software-controlled, general-purpose timers along with a programmable Watchdog Timer for synchronizing and controlling multiple events in embedded applications. The VMIVME-7807/VME-7807RC also provide a bootable CompactFlash Disk system and 32KB of non-volatile RAM. Also, the VMIVME-7807/VME-7807RC support an embedded intelligent VME bridge to allow compatibility with the most demanding VME applications. These features make the unit ideal for embedded applications, particularly where standard hard drives and floppy disk drives cannot be used.

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VME Bridge

In addition to their desktop functions, the VMIVME-7807/VME-7807RC have the following VME features:

- Complete six-line Address Modifier (AM-Code) programmability
- VME data interface with separate hardware byte/word swapping for master and slave accesses
- Support for VME64 multiplexed MBLT 64-bit VME block transfers
- User-configured interrupter
- User-configured interrupt handler
- System Controller mode with programmable VME arbiter (PRI, SGL and RRS modes are supported)
- VME BERR bus error timer (software programmable)
- Slave access from the VME to local RAM and mailbox registers
- Full-featured programmable VME requester (ROR, RWD and BCAP modes are supported)
- System Controller auto detection
- Complete VME master access through five separate Protected-mode memory windows

The VMIVME-7807/VME-7807RC support High Throughput DMA transfers of bytes, words and longwords in both Master and Slave configurations.

If Endian conversion is not needed, GE Fanuc Embedded Systems offers a special "Bypass" mode that can be used to further enhance throughput (not available for byte transfers).

The VMIVME-7807/VME-7807RC VME interface is provided by the PCI-to-VME bridge built around the Tundra Semiconductor Corporation Universe II VME interface chip. The Universe II provides a reliable high-performance 64-bit VME-to-PCI interface in one design. The functions and programming of the Universe-based VME interface are addressed in detail in a companion manual titled: *GE Fanuc Embedded Systems' Tundra Universe II Based VME Interface Product Manual (500-000211-000)*.

I²C/SMBus Temperature Sensor

The MAX6657MSA can be monitored and controlled on the SMBus at address **0x98 for the VMIVME-7807/VME-7807RC**. This will allow the user to monitor and set up the two alarms available ($\overline{\text{ALERT}}$ and $\overline{\text{OVERT1}}$).

For more information on the Maxim MAX6657MSA contact them directly at:

1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

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Embedded PCI Functions

The VMIVME-7807/VME-7807RC provide non-volatile RAM (NVRAM), timers and a Watchdog Timer via the PCI bus. These functions are required for embedded and real time applications. The PCI configuration space of these embedded functions are shown below.

Table 3-1 PCI Configuration Space Registers

31	16	15	00	Register Address
Device ID 0004		Vendor ID 114A		00h
Status		Command		04h
Class Code			Revision ID	08h
BIST	Header Type	Latency Timer	Cache Line Size	0Ch
PCI Base Address 0 for Memory-Mapped VME Control registers (BAR0)				10h
PCI Base Address 1 for Memory-Mapped 32kB NVRAM (BAR1)				14h
PCI Base Address 2 for memory-mapped Watchdog and other timers (BAR2)				18h
Reserved				1Ch
Reserved				20h
Reserved				24h
Reserved				28h
Subsystem ID 7807		Subsystem Vendor ID 114A		2Ch
Reserved				30h
Reserved				34h
Reserved				38h
Max_Lat	Min_gnt	Interrupt Pin	Interrupt Line	3Ch

The “Device ID” field indicates that the device is for VME products (00) and indicates the supported embedded feature set.

The “Vender ID” and “Subsystem Vendor ID” fields indicate GE Fanuc Embedded Systems’ PICMG assigned Vender ID (114A).

The “Subsystem ID” field indicates the model number of the product (7807).

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Timers

General

The VMIVME-7807/VME-7807RC provide four user-programmable timers (two 16-bit and two 32-bit) which are completely dedicated to user applications and are not required for any standard system function. Each timer is clocked by independent generators with selectable rates of 2MHz, 1MHz, 500kHz and 250kHz. Each timer may be independently enabled and each is capable of generating a system interrupt on timeout.

Events can be timed by either polling the timers or enabling the interrupt capability of the timer. A status register allows for application software to determine which timer is the cause of any interrupt.

Timer Control Status Register 1 (TCSR1)

The timers are controlled and monitored via the Timer Control Status Register 1 (TCSR1) located at offset 0x00 from the address in BAR2. The mapping of the bits in this register are as follows:

Field	Bits	Read or Write
Timer 1 Caused IRQ	TCSR1[0]	R/W
Timer 1 Enable	TCSR1[1]	R/W
Timer 1 IRQ Enable	TCSR1[2]	R/W
Timer 1 Clock Select	TCSR1[4..3]	R/W
Timer 2 Caused IRQ	TCSR1[8]	R/W
Timer 2 Enable	TCSR1[9]	R/W
Timer 2 IRQ Enable	TCSR1[10]	R/W
Timer 2 Clock Select	TCSR1[12..11]	R/W
Timer 3 Caused IRQ	TCSR1[16]	R/W
Timer 3 Enable	TCSR1[17]	R/W
Timer 3 IRQ Enable	TCSR1[18]	R/W
Timer 3 Clock Select	TCSR1[20..19]	R/W
Timer 4 Caused IRQ	TCSR1[24]	R/W
Timer 4 Enable	TCSR1[25]	R/W
Timer 4 IRQ Enable	TCSR1[26]	R/W
Timer 4 Clock Select	TCSR1[28..27]	R/W
Reserved	All Other Bits	R/W

All of these bits default to "0" after system reset.

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Each timer has an independently selectable clock source which is selected by the bit pattern in the “Timer x Clock Select” field as follows:

Clock Rate	MSb	LSb
2MHz	0	0
1MHz	0	1
500kHz	1	0
250kHz	1	1

Each timer can be independently enabled by writing a “1” to the appropriate “Timer x Enable” field. Similarly, the generation of interrupts by each timer can be independently enabled by writing a “1” to the appropriate “Timer x IRQ Enable” field.

If an interrupt is generated by a timer, the source of the interrupt may be determined by reading the “Timer x Caused IRQ” fields. If the field is set to “1”, then the respective timer caused the interrupt. Note that multiple timers can cause a single interrupt. Therefore, the status of all timers must be read to ensure that all interrupt sources are recognized.

A particular timer interrupt can be cleared by writing a “0” to the appropriate “Timer x Caused IRQ” field. Alternately, a write to the appropriate Timer x IRQ Clear (TxIC) register will also clear the interrupt. When clearing the interrupt using the “Timer x Caused IRQ” fields, note that it is very important to ensure that a proper bit mask is used so that other register settings are not affected. The preferred method for clearing interrupts is to use the “Timer x IRQ Clear” registers described on page 52.

Timer Control Status Register 2 (TCSR2)

The timers are also controlled by bits in the Timer Control Status Register 2 (TCSR2) located at offset 0x04 from the address in BAR2. The mapping of the bits in this register are as follows:

Field	Bits	Read or Write
Read Latch Select	TCSR2[0]	R/W
Reserved	All Other Bits	R/W

All of these bits default to “0” after system reset.

The “Read Latch Select” bit is used to select the latching mode of the programmable timers. If this bit is set to “0”, then each timer output is latched upon a read of any one of its address. For example, a read to the TMRCCR12 register latches the count of timers 1 and 2. A read to the TMRCCR3 register latches the count of timer 3. This continues for every read to any one of these registers. As a result, it is not possible to

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capture the values of all four timers at a given instance in time. However, by setting this bit to "1", all four timer outputs will be latched only on reads to the Timer 1 & 2 Current Count Register (TMRCCR12). Therefore, to capture the current count of all four timers at the same time, perform a read to the TMRCCR12 first (with a 32-bit read), followed by a read to TMRCCR3 and TMRCCR4. The first read (to the TMRCCR12 register) causes all four timer values to be latched at the same time. The subsequent reads to the TMRCCR3 and TMRCCR4 registers do not latch new count values, allowing the count of all timers at the same instance in time to be obtained.

Timer 1 & 2 Load Count Register (TMRLCR12)

Timers 1 & 2 are 16-bits wide and obtain their load count from the Timer 1 & 2 Load Count Register (TMRLCR12), located at offset 0x10 from the address in BAR2. The mapping of bits in this register are as follows:

Field	Bits	Read or Write
Timer 2 Load Count	TMRLCR12[31..16]	R/W
Timer 1 Load Count	TMRLCR12[15..0]	R/W

When either of these fields are written (either by a single 32-bit write or separate 16-bit writes), the respective timer is loaded with the written value on the next rising edge of the timer clock, regardless of whether the timer is enabled or disabled. The value stored in this register is also automatically reloaded on terminal count (or timeout) of the timer.

Timer 3 Load Count Register (TMRLCR3)

Timer 3 is 32-bits wide and obtains its load count from the Timer 3 Load Count Register (TMRLCR3), located at offset 0x14 from the address in BAR2. The mapping of bits in this register are as follows:

Field	Bits	Read or Write
Timer 3 Load Count	TMRLCR3[31..0]	R/W

When this field is written, Timer 3 is loaded with the written value on the next rising edge of the timer clock, regardless of whether the timer is enabled or disabled. The value stored in this register is also automatically reloaded on terminal count (or timeout) of the timer.

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Timer 4 Load Count Register (TMRLCR4)

Timer 4 is 32-bits wide and obtains its load count from the Timer 4 Load Count Register (TMRLCR4), located at offset 0x18 from the address in BAR2. The mapping of bits in this register are as follows:

Field	Bits	Read or Write
Timer 4 Load Count	TMRLCR4[31..0]	R/W

When this field is written, Timer 4 is loaded with the written value on the next rising edge of the timer clock, regardless of whether the timer is enabled or disabled. The value stored in this register is also automatically reloaded on terminal count (or timeout) of the timer.

Timer 1 & 2 Current Count Register (TMRCCR12)

The current count of timers 1 & 2 may be read via the Timer 1 & 2 Current Count Register (TMRCCR12), located at offset 0x20 from the address in BAR2. The mapping of bits in this register are as follows:

Field	Bits	Read or Write
Timer 2 Count	TMRCCR12[31..16]	R.O.
Timer 1 Count	TMRCCR12[15..0]	R.O.

When either field is read, the current count value is latched and returned. There are two modes that determine how the count is latched depending on the setting of the "Read Latch Select" bit in the WDT Control Status Register (CSR2). See the CSR2 register description for more information on these two modes.

Timer 3 Current Count Register (TMRCCR3)

The current count of Timer 3 may be read via the Timer 3 Current Count Register (TMRCCR3), located at offset 0x24 from the address in BAR2. The mapping of bits in this register are as follows:

Field	Bits	Read or Write
Timer 3 Count	TMRCCR3[31..0]	R.O.

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When this field is read, the current count value is latched and returned. There are two modes that determine how the count is latched depending on the setting of the "Read Latch Select" bit in the WDT Control Status Register (CSR2). See the CSR2 register description for more information on these two modes.

Timer 4 Current Count Register (TMRCCR4)

The current count of Timer 4 may be read via the Timer 4 Current Count Register (TMRCCR4), located at offset 0x28 from the address in BAR2. The mapping of bits in this register are as follows:

Field	Bits	Read or Write
Timer 4 Count	TMRCCR4[31..0]	R.O.

When this field is read, the current count value is latched and returned. There are two modes that determine how the count is latched depending on the setting of the "Read Latch Select" bit in the WDT Control Status Register (CSR2). See the CSR2 register description for more information on these two modes.

Timer 1 IRQ Clear (T1IC)

The Timer 1 IRQ Clear (T1IC) register is used to clear an interrupt caused by Timer 1. Writing to this register, located at offset 0x30 from the address in BAR2, causes the interrupt from Timer 1 to be cleared. This can also be done by writing a "0" to the appropriate "Timer x Caused IRQ" field of the timer Control Status Register (CSR1). This register is write only and the data written is irrelevant.

Timer 2 IRQ Clear (T2IC)

The Timer 2 IRQ Clear (T2IC) register is used to clear an interrupt caused by Timer 2. Writing to this register, located at offset 0x34 from the address in BAR2, causes the interrupt from Timer 2 to be cleared. This can also be done by writing a "0" to the appropriate "Timer x Caused IRQ" field of the timer Control Status Register (CSR1). This register is write only and the data written is irrelevant.

Timer 3 IRQ Clear (T3IC)

The Timer 3 IRQ Clear (T3IC) register is used to clear an interrupt caused by Timer 3. Writing to this register, located at offset 0x38 from the address in BAR2, causes the interrupt from Timer 3 to be cleared. This can also be done by writing a "0" to the appropriate "Timer x Caused IRQ" field of the timer Control Status Register (CSR1). This register is write only and the data written is irrelevant.

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Timer 4 IRQ Clear (T4IC)

The Timer 4 IRQ Clear (T4IC) register is used to clear an interrupt caused by Timer 4. Writing to this register, located at offset 0x3C from the address in BAR2, causes the interrupt from Timer 4 to be cleared. This can also be done by writing a “0” to the appropriate “Timer x Caused IRQ” field of the timer Control Status Register (CSR1). This register is write only and the data written is irrelevant.

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Watchdog Timer

General

The VMIVME-7807/VME-7807RC provide a programmable Watchdog Timer (WDT) which can be used to reset the system if software integrity fails.

WDT Control Status Register (WCSR)

The WDT is controlled and monitored by the WDT Control Status Register (WCSR) which is located at offset 0x08 from the address in BAR2. The mapping of the bits in this register are as follows:

Field	Bits	Read or Write
SERR/RST Select	WCSR[16]	R/W
WDT Timeout Select	WCSR[10..8]	R/W
WDT Enable	WCSR[0]	R/W

All of these bits default to "0" after system reset. All other bits are reserved.

The "WDT Timeout Select" field is used to select the timeout value of the Watchdog Timer as follows:

Timeout	WCSR[10]	WCSR[9]	WCSR[8]
135s	0	0	0
33.6s	0	0	1
2.1s	0	1	0
524ms	0	1	1
262ms	1	0	0
131ms	1	0	1
32.768ms	1	1	0
2.048ms	1	1	1

The "SERR/RST Select" bit is used to select whether the WDT generates an SERR# on the local PCI bus or a system reset. If this bit is set to "0", the WDT will generate a system reset. Otherwise, the WDT will make the local PCI bus SERR# signal active.

The "WDT Enable" bit is used to enable the Watchdog Timer function. This bit must be set to "1" in order for the Watchdog Timer to function. Note that since all registers default to zero after reset, the Watchdog Timer is always disabled after a reset. The Watchdog Timer must be re-enabled by the application software after reset in order for the Watchdog Timer to continue to operate. Once the Watchdog Timer is enabled, the application software must refresh the Watchdog Timer within the selected timeout period to prevent a reset or SERR# from being generated. The Watchdog Timer is

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refreshed by performing a write to the WDT Keepalive register (WKPA). The data written is irrelevant.

WDT Keepalive Register (WKPA)

When enabled, the Watchdog Timer is prevented from resetting the system by writing to the WDT Keepalive Register (WKPA) located at offset 0x0C from the address in BAR2 within the selected timeout period. The data written to this location is irrelevant.

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NVRAM

The VMIVME-7807/VME-7807RC provide 32KB of non-volatile RAM. This memory is mapped in 32K of address space starting at the address in BAR1. This memory is available at any time and supports byte, short word and long word accesses from the PCI bus. The contents of this memory are retained when the power to the board is removed.

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VME Control

The following table shows the register definitions for the VMIVME-7807/ VME-7807RC (offset from BAR0).

Table 3-2 Register Definitions Offset From BAR0

Register Name	Offset	
VMECOMM	0x00	
Bit Name	**Bit**	**Definition**
MEC_SEL	0	Master big-endian enable bit 1=Big Endian, 0=Little Endian bit
SEC_SEL	1	Slave Big-Endian enable bit 1=Big Endian, 0=Little Endian
ABLE	2	Auxiliary BERR logic enable bit 1=Aux. BERR enabled 0=Aux. BERR disabled
BTO	3	Bus error timer enabled 1=enabled, 0=disabled
BTOV [1:0]	5:4	Timeout value
		00 - 16µs
		01 - 64µs
		10 -256µs
		11 - 1.00ms
BERRI	6	BERR interrupt enable 1=Interrupt enabled 0=Interrupt disabled
BERRST	7	BERR status read/clear bit 1=Clear BERR status, 0=Do nothing
SFENA	8	Enables generation of VME SYSFAIL upon WDT timeout 1= Enable SYSFAIL generation, 0=Disable
Unused	9	Not Used
BPENA	10	Endian conversion bypass bit 1=bypass, 0=Not bypassed
VBENA	11	VME enable bit (VBENA) 1 = enabled, 0 = disabled
Unused	31:12	Not Used
VBAM	**0x04**	
VME_ADDR	5:0	Latched VME Address Modifier
Unused	31:6	Not Used
SEC_SEL	0x001	
VBAR	**0x08**	
VME_ADDR	All	Latched VME Address

Please refer to Table 3-1, “PCI Configuration Space Registers,” on page 47 for more information concerning BAR0.

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CompactFlash Disk

The VMIVME-7807/VME-7807RC feature an optional onboard CompactFlash mass storage system with a capacity of up to 2GB. This CompactFlash Disk appears to the user as an intelligent ATA (IDE) disk drive with the same functionality and capabilities as a “rotating media” IDE hard drive. The VMIVME-7807/VME-7807RC BIOS includes an option to allow the board to boot from the CompactFlash with user-provided operating system.

Configuration

The CompactFlash Disk resides on the VMIVME-7807/VME-7807RC as the secondary IDE bus master device (the secondary IDE bus slave device is not assignable).

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Remote Ethernet Booting

The VMIVME-7807/VME-7807RC are capable of booting from a server using either 10/100 Mb or the Gigabit Ethernet over a network utilizing the ARGON Boot ROM BIOS. The BIOS gives you the ability to remotely boot the VMIVME-7807/ VME-7807RC using a variety of network protocols. The Ethernet must be connected through either front panel (RJ45) connectors to boot remotely. This feature allows users to create systems without the worry of disk drive reliability or the extra cost of adding CompactFlash drives.

Boot BIOS Features:

- Netware (802.1, 802.3 or EthII), TCP/IP (DHCP or BootP), RPL and PXE boot support
- Unparalleled boot sector virus protection
- Detailed boot configuration screens
- Comprehensive diagnostics
- Optional disabling of local boots
- Dual-boot option lets users select network or local booting

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Maintenance

If a GE Fanuc Embedded Systems product malfunctions, please verify the following:

1. Software resident on the product
2. System configuration
3. Electrical connections
4. Jumper or configuration options
5. Boards are fully inserted into their proper connector location
6. Connector pins are clean and free from contamination
7. No components or adjacent boards were disturbed when inserting or removing the board from the chassis
8. Quality of cables and I/O connections

If products must be returned, contact GE Fanuc Embedded Systems for a Return Material Authorization (RMA) Number. **This RMA Number must be obtained prior to any return**. RMAs are available at rma@gefanuc.com.

GE Fanuc Embedded Systems Customer Care is available at: 1-800-GEFANUC (or 1-800-433-2682), 1-780-401-7700, or E-mail us at support.embeddedsystems@gefanuc.com.

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Maintenance Prints

User level repairs are not recommended. The drawings and diagrams in this manual are for reference purposes only.

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Compliance Information

This chapter provides the applicable information regarding regulatory compliance for the VMIVME-7807/VME-7807RC.

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CE

GE Fanuc Embedded Systems has evaluated the VMIVME-7807/VME-7807RC and they have met the following standards:

- EN55024
- EN55022, Class A
- EN61000-4-2
- EN61000-4-3
- EN61000-4-4
- EN61000-4-5
- EN61000-4-6

International Compliance

These products have also met the following international levels.

European Union

- EN55024 (1998 w A1:01 & A2: 03)
- CISPR22, EN55022 (Class A)
- CISPR11, EN55011(Class A, Group 1)

United States

- FCC Part 15, Subpart B, Section 109, Class A
- CISPR 22 (1997), Class A
- ANSI C63.4 (2003) method

Australia/New Zealand

- AS/NZS CISPR 22 (2002) Class A using:
  EN55022 (1998) Class A

Japan

- VCCI (April 2005) Class A using:
  CISPR 22 (1997) Class A
  ANSI C63.4 (2003) method

Canada

- ICES-003 Class A using:
  CISPR 22 (1997) Class A
  ANSI C63.4 (2003) Method

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FCC Part 15

These devices comply with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Class A

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

NOTICE: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canadian Regulations

The VMIVME-7807/VME-7807RC Class A digital apparatus comply with Canadian ICES-003.

NOTE: Any equipment tested and found compliant with FCC Part 15 for unintentional radiators or EN55022 (previously CISPR 22) satisfies ICES-003.

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Appendix

A

Connector Pinouts

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Introduction

The VMIVME-7807/VME-7807RC VME SBCs have several connectors for their I/O ports. Wherever possible, the VMIVME-7807/VME-7807RC use connectors and pinouts typical for any desktop PC. This ensures maximum compatibility with a variety of systems.

Connector diagrams in this appendix are generally shown in a natural orientation with the SBC mounted in a VME chassis.

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VME Connector Pinout

Figure A-1 shows the location of the VME P1 and P2 connectors and their orientation on the VMIVME-7807/VME-7807RC. Table A-1 shows the pin assignments for the VME P1 connector. Table A-2 on page 69 is the connector pinout for the P2 connector.

VME P1 Connector and Pinout

Table A-1 VME P1 Connector Pinout

Pin #	P1 Row A Signal	P1 Row B Signal	P1 Row C Signal	P1 Row D Signal	P2 Row Z Signal
1	D00	BBSY#	D08	N/C	N/C
2	D01	BCLR#	D09	N/C	N/C
3	D02	ACFAIL#	D10	N/C	N/C
4	D03	BG0IN#	D11	N/C	N/C
5	D04	BG0OUT#	D12	N/C	N/C
6	D05	BG1IN#	D13	N/C	N/C
7	D06	BG1OUT#	D14	N/C	N/C
8	D07	BG2IN#	D15	N/C	N/C
9	GND	BG2OUT#	GND	VCC_3.3	N/C
10	SYSCLK	BG3IN#	SYSFAIL#	VCC_3.3	N/C
11	GND	BG3OUT#	BERR#	VCC_3.3	N/C
12	DS1#	BR0#	SYSRESET#	N/C	N/C
13	DS0#	BR1#	LWORD#	VCC_3.3	N/C
14	WRITE#	BR2#	AM5	N/C	N/C
15	GND	BR3#	A23	VCC_3.3	N/C
16	DTACK#	AM0	A22	N/C	N/C
17	GND	AM1	A21	VCC_3.3	N/C
18	AS#	AM2	A20	N/C	N/C
19	GND	AM3	A19	N/C	N/C
20	IACK#	GND	A18	N/C	N/C
21	IACKIN#	N/C	A17	N/C	N/C
22	IACKOUT#	N/C	A16	N/C	N/C
23	AM4	GND	A15	N/C	N/C
24	A07	IRQ7#	A14	N/C	N/C
25	A06	IRQ6#	A13	N/C	N/C
26	A05	IRQ5#	A12	N/C	N/C
27	A04	IRQ4#	A11	N/C	N/C
28	A03	IRQ3#	A10	N/C	N/C
29	A02	IRQ2#	A09	N/C	N/C
30	A01	IRQ1#	A08	N/C	N/C
31	-12 V	N/C	+12 V	N/C	N/C
32	+5V	+5V	+5V	NC	N/C

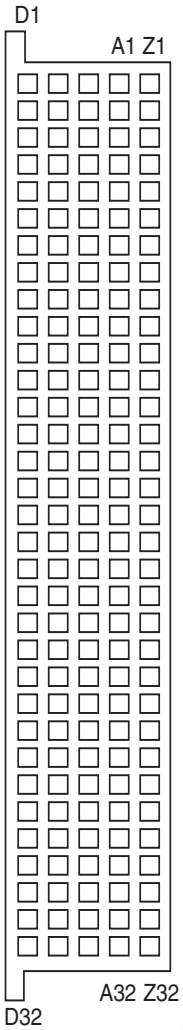


Figure A-1 VME P1 Connector Diagram

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VME P2 Connector and Pinout

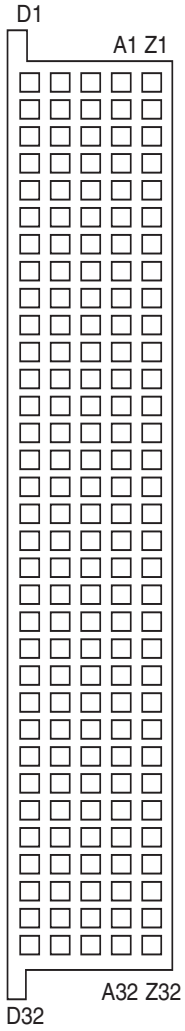


Table A-2 VME P2 Connector Pinout

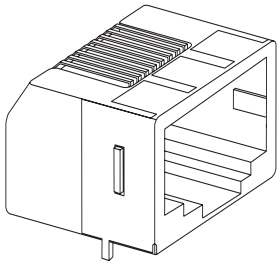
Pin #	P2 Row A Signal	P2 Row B Signal	P2 Row C Signal	P2 Row D Signal	P2 Row Z Signal
1	N/C	+5V	PCIB_ RST#	SER3_RI#	ICH_SATA_TXP0
2	IDE_PDD8	GND	IDE_PDD7	SER3_DCD#	GND
3	IDE_PDD9	N/C	IDE_PDD6	SER3_DSR#	ICH_SATA_TXN0
4	IDE_PDD10	A24	IDE_PDD5	SER3_DTR#	GND
5	IDE_PDD11	A25	IDE_PDD4	SER3_IN	ICH_SATA_RXP0
6	IDE_PDD12	A26	IDE_PDD3	SER3_OUT	GND
7	IDE_PDD13	A27	IDE_PDD2	SER3_RTS#	ICH_SATA_RXN0
8	IDE_PDD14	A28	IDE_PDD1	SER3_CTS#	GND
9	IDE_PDD15	A29	IDE_PDD0	GND	ICH_SATA_TXP1
10	IDE_PREQ	A30	VCC_5.0	DVI_TXC-	GND
11	IDE_PDIOW#	A31	GND	DVI_TXC+	ICH_SATA_TXN1
12	IDE_PDIOR#	GND	GND	DVI_TX0-	GND
13	IDE_PIORDY#	+5V	GND	DVI_TX0+	ICH_SATA_RXP1
14	GND	D16	GND	DVI_TX1-	GND
15	GND	D17	IDE_PDDACK#	DVI_TX1+	ICH_SATA_RXN1
16	GND	D18	IDE_IRQ14	DVI_TX2-	GND
17	IDE_PDA[1]	D19	IDE_PDA2	DVI_TX2+	USB_OC3#
18	IDE_PDCS1#	D20	IDE_PDA0	GND	GND
19	HD_ACTA#	D21	IDE_PDCS3#	DVO_DDCLK	USB_P3P_L
20	USB_P2P_L	D22	Port2_Link#	DVO_DDCDATA	GND
21	N/C	D23	UDMA_PRI_DET	DVI_HTPLG	USB_P3N_L
22	USB_P2N_L	GND	SP2_RI#B	SER4_RI#	GND
23	GND	D24	SP2_DCD#B	SER4_DCD#	SP3_4_232_422
24	MDIB0_P_P2	D25	SP2_DSR#B	SER4_DSR#	GND
25	MDIB0_N_P2	D26	SP2_DTR#B	SER4_DTR#	MDIB2_P_P2
26	GND	D27	SP2_RXB	SER4_IN	GND
27	MDIB1_P_P2	D28	SP2_TXB	SER4_OUT	MDIB2_N_P2
28	MDIB1_N_P2	D29	SP2_RTS#B	SER4_RTS#	GND
29	GND	D30	SP2_CTS#B	SER4_CTS#	MDIB3_P_P2
30	N/C	D31	USB_OC2#	SP4_Active	GND
31	Port2_link100#	GND	SP3_Active	GND	MDIB3_N_P2
32	Port2_Link1000#	+5V	Port2_Activity#	N/C	GND

Figure A-2 VME P2 Connector Diagram

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Serial Connector (J22) and Pinout

COM1 serial port connector is a standard RJ45 connector as shown in Figure A-3.



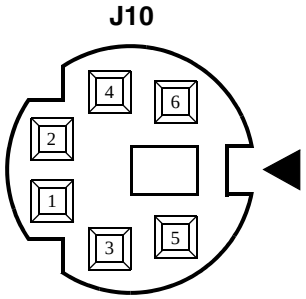
COM 1 Serial Port Connector			
RJ45 Pin	**DIR**	**RS232 Signal**	**Function**
1	In	DCD	Data Carrier Detect
2	Out	RTS	Request to Send
3		CGND	Chassis Ground
4	Out	TXD	Transmit Data
5	In	RXD	Receive Data
6		GND	Ground
7	In	CTS	Clear to Send
8	Out	DTR	Data Terminal Ready

Figure A-3 Serial Connectors and Pinouts

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Mouse/Keyboard Connector and Pinout (J10)

The mouse/keyboard connector (J10) is a standard 6-pin female mini-DIN PS/2 connector as shown in Figure A-4. The mouse/keyboard connector uses a "Y" splitter cable to separate the mouse and keyboard signals. The "Y" splitter cable is shown in Figure A-5 on page 72, the pinout in shown in Table A-3 on page 72.



Keyboard/Mouse Connector*		
Pin	**Dir**	**Function**
1	In/Out	Mouse Data
2	In/Out	Keyboard Data
3		Ground
4		+5V
5	Out	Mouse Clock
6	Out	Keyboard Clock
Shield		Chassis Ground
*An adapter cable is included with the VMIVME-7807/VME-7807RC to separate the keyboard and mouse connector.		

Figure A-4 Mouse Connector and Pinout

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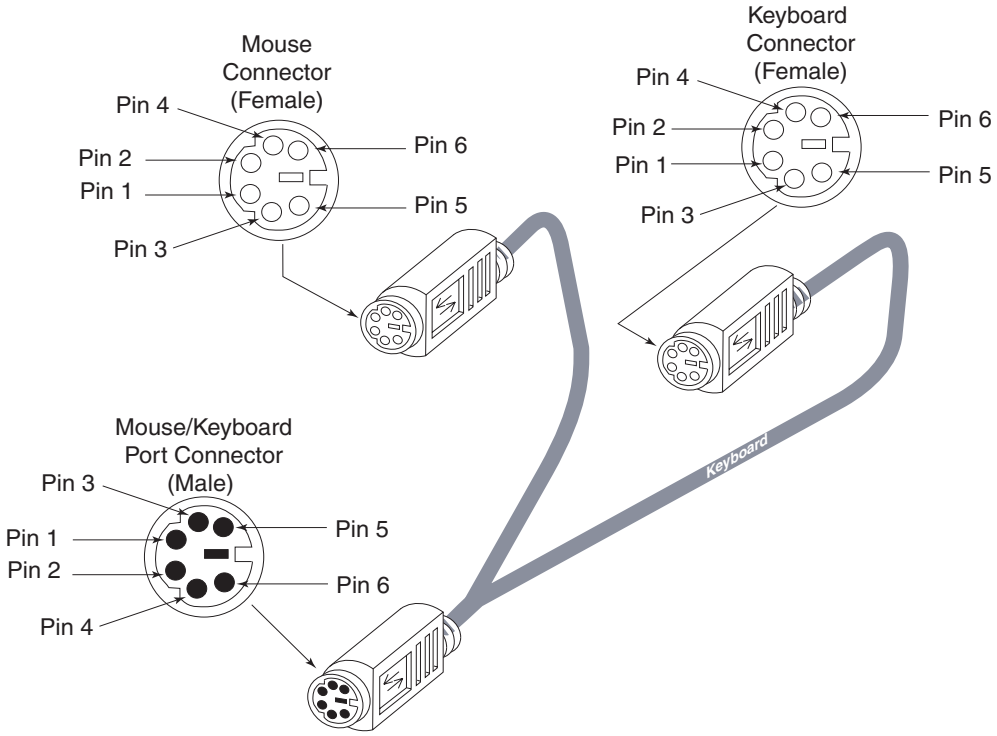


Figure A-5 Mouse/Keyboard Y Splitter Cable

Table A-3 Keyboard/Mouse Y Splitter Cable

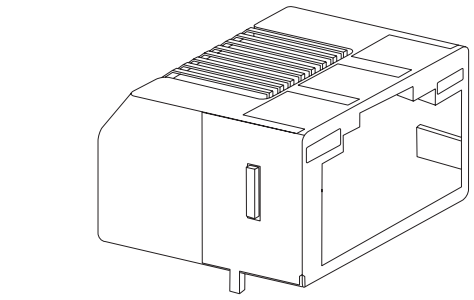
Keyboard			Mouse		
Pin	**Dir**	**Function**	**Pin**	**Dir**	**Function**
1	In/Out	Keyboard Data	1	In/Out	Mouse Data
2		Unused	2		Unused
3		Ground	3		Ground
4		+5V	4		+5V
5	Out	Keyboard Clock	5	Out	Mouse Clock
6		Unused	6		Unused
Shield		Chassis Ground	Shield		Chassis Ground

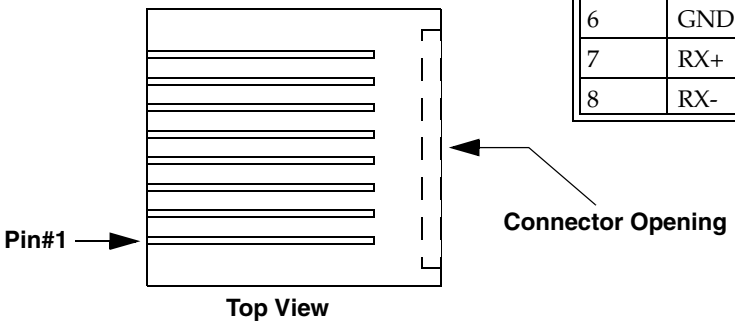
NOTE: The Mouse/Keyboard pinout shown above has pins 2 (Keyboard Data) and 6 (Keyboard Clock) signals on the Mouse cable. This may not work with some Keyboard and Mouse devices. We recommend that you contact ***support.embeddedsystems@gefanuc.com*** for more information.

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Ethernet Connector Pinout (10/100Mbit) J15

The pinout diagram for Ethernet connector J15 is shown in Figure A-6.





Ethernet Connectors		
PIN	**Signal Name**	
1	TD+	Transmit Data
2	TD-	Transmit Data
3	GND	Ground
4	CGND	Chassis GND
5	CGND	Chassis GND
6	GND	Ground
7	RX+	Receive Data
8	RX-	Receive Data

Figure A-6 Ethernet Connector and Pinout

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PMC Site Connectors and Pinouts

PMC (J11) Connector and Pinout

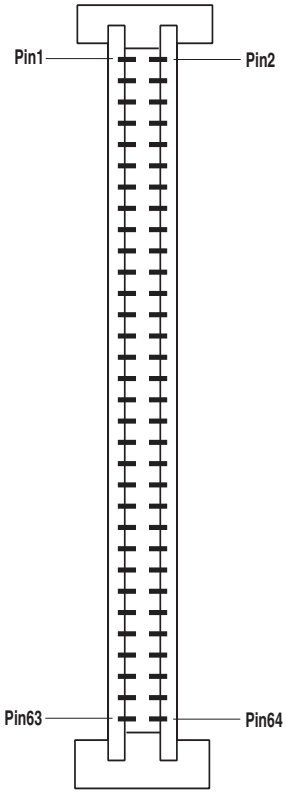


Table A-4 PMC (J11) Connector Pinout

PMC Connector (J11)				PMC Connector (J11)			
Left Side		Right Side		Left Side		Right Side	
Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	GND	2	-12V	33	FRAME#	34	GND
3	GND	4	INTA#	35	GND	36	PCI_IRDY#
5	INTB#	6	INTC#	37	DEVSEL#	38	VCC_5.0
7	BMODE1#	8	VCC_5.0	39	PCIXCAP	40	PCI1_LOCK#
9	INTD#	10	N/C	41	SDONE#	42	PMC_SB0#
11	GND	12	N/C	43	PAR	44	GND
13	CLK3_PCI1	14	GND	45	VCC_3.3	46	AD[15]
15	GND	16	PCI1_GNT3	47	AD[12]	48	AD[11]
17	PCI1_REQ3#	18	VCC_5.0	49	AD[9]	50	VCC_5.0
19	VCC_3.3	20	AD[31]	51	GND	52	PCI1_C/BE#0
21	AD[28]	22	AD[27]	53	AD[6]	54	AD[5]
23	AD[25]	24	GND	55	AD[4]	56	GND
25	GND	26	C/BE#3	57	VCC_3.3	58	AD[3]
27	AD[22]	28	AD[21]	59	AD[2]	60	AD[1]
29	AD[19]	30	VCC_5.0	61	AD[0]	62	VCC_5.0
31	VCC_3.3	32	AD[17]	63	GND	64	PCI1_REQ64#

Figure A-7 PMC (J11) Connector

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PMC (J12) Connector and Pinout

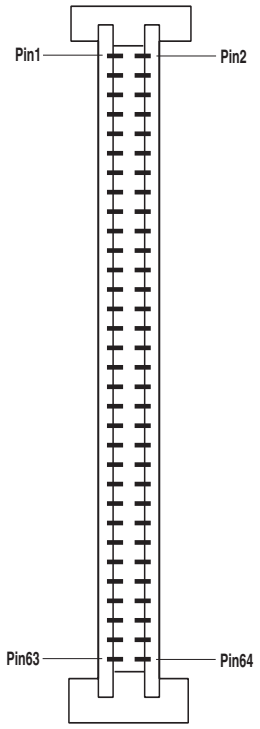


Table A-5 PMC (J12) Connector Pinout

PMC Connector (J12)				PMC Connector (J12)			
Left Side		Right Side		Left Side		Right Side	
Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	VCC_12.0	2	VCC_3.3	33	GND	34	N/C
3	GND	4	N/C	35	PCI1_TRDY#	36	VCC_3.3
5	VCC_3.3	6	GND	37	GND	38	STOP#
7	GND	8	N/C	39	PCI1_PERR#	40	GND
9	N/C	10	N/C	41	VCC_3.3	42	SERR#
11	BMODE2#	12	VCC_3.3	43	PCI1_C/BE#1	44	GND
13	PCIB_RESET#	14	BMODE3#	45	AD[14]	46	AD[13]
15	VCC_3.3	16	BMODE4#	47	M66EN	48	AD[10]
17	N/C	18	GND	49	AD[8]	50	VCC_3.3
19	AD[30]	20	AD[29]	51	AD[7]	52	N/C
21	GND	22	AD[26]	53	VCC_3.3	54	N/C
23	AD[24]	24	VCC_3.3	55	N/C	56	GND
25	PMC_IDSEL	26	AD[23]	57	N/C	58	N/C
27	VCC_3.3	28	AD[20]	59	GND	60	N/C
29	AD[18]	30	GND	61	ACK64#	62	VCC_3.3
31	AD[16]	32	PCI1_C/BE#2	63	GND	64	N/C

Figure A-8 PMC (J12) Connector

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PMC (J13) Connector and Pinout

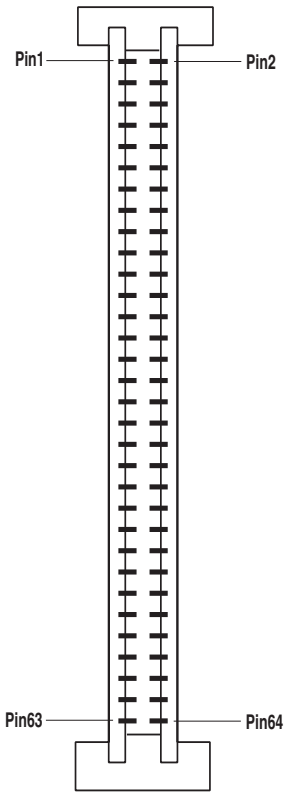


Figure A-9 PMC (J13) Connector

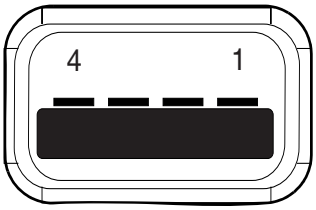
Table A-6 PMC (J13) Connector Pinout

PMC Connector (J13)				PMC Connector (J13)			
Left Side		Right Side		Left Side		Right Side	
Pin	Name	Pin	Name	Pin	Name	Pin	Name
1	N/C	2	GND	33	GND	34	AD[48]
3	GND	4	PCI1_C/BE#7	35	AD[47]	36	AD[46]
5	PCI1_C/BE#6	6	PCI1_C/BE#5	37	AD[45]	38	GND
7	PCI1_C/BE#4	8	GND	39	VCC_3.3	40	AD[44]
9	VCC_3.3	10	N/C	41	AD[43]	42	AD[42]
11	AD[63]	12	AD[62]	43	AD[41]	44	GND
13	AD[61]	14	GND	45	GND	46	AD[40]
15	GND	16	AD[60]	47	AD[39]	48	AD[38]
17	AD[59]	18	AD[58]	49	AD[37]	50	GND
19	AD[57]	20	GND	51	GND	52	AD[36]
21	VCC_3.3	22	AD[56]	53	AD[35]	54	AD[34]
23	AD[55]	24	AD[54]	55	AD[33]	56	GND
25	AD[53]	26	GND	57	VCC_3.3	58	AD[32]
27	GND	28	AD[52]	59	N/C	60	N/C
29	AD[51]	30	AD[50]	61	N/C	62	GND
31	AD[49]	32	GND	63	GND	64	N/C

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USB Connectors (J16 and J17)

The USB ports are two industry standard 4-position shielded connectors. Figure A-10 shows the connector and pinout for the USB ports.



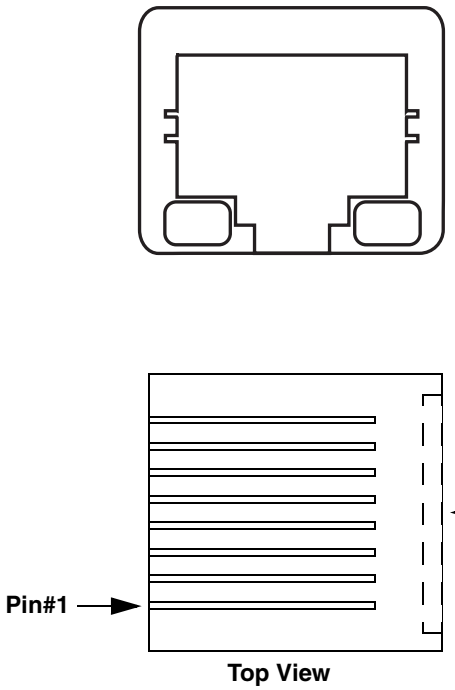
USB Connector (J16 and J17)		
Pin	**Signal**	**Function**
1	USB_VCC	USB Power
2	USB-	USB Data -
3	USB+	USB Data +
4	USBG	USB Ground

Figure A-10 USB Connectors and Pinouts

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Gigabit Ethernet Connector and Pinout (J18)

The pinout diagram for the dual Gigabit Ethernet connector and pinout are shown in Figure A-11.



ETHERNET CONNECTOR (10BaseT, 100BaseTX, 1000BaseT)		
PIN	**Signal Name**	
1	TD+	Transmit Data
2	TD-	Transmit Data
3	RD+	Receive Data
4	TX_CT_OUT	Transmit Center Tap Out
5	TX_CT_OUT	Transmit Center Tap Out
6	RD-	Receive Data
7	RX_CT_OUT	Receive Center Tap Out
8	RX_CT_OUT	Receive Center Tap Out

Figure A-11 Dual Gigabit Ethernet Connector (J18) and Pinout

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Appendix

B

AMI BIOS Setup Utility

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Boot Setup 84
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Chipset Setup 86
Exit Menu 87

Introduction

This appendix gives a brief description of the setup options in the system BIOS. Due to the custom nature of GE Fanuc Embedded Systems' Single Board Computers, your BIOS options may vary from the options discussed in this appendix.

AMI refers to their BIOS setup screens as ezPORT. For a complete description of all the options available with the AMI BIOS, please visit www.ami.com and download their ezPORT PDF file. The options listed on AMI's web site may not be available on your system.

To Access the First Boot setup screen press the F11 key at the beginning of boot.

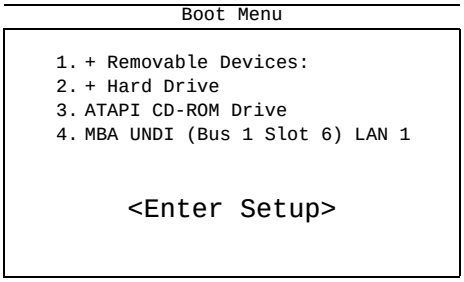
To access the ezPORT setup screens, press the DEL key at the beginning of boot.

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First Boot

The VMIVME-7807/VME-7807RC have a First Boot menu enabling the user to, on a one time basis, select a drive device to boot from. This feature is useful when installing from a bootable disk. For example, when installing Windows XP from a CD, enter the First Boot menu and use the arrows keys to highlight ATAPI CD-ROM Drive. Press ENTER to continue with system boot.

This feature is accessed by pressing the F11 key at the very beginning of the boot cycle. The selection made from this screen applies to the current boot only, and will not be used during the next boot-up of the system. If you have trouble accessing this feature, disable the QuickBoot Mode in the Boot BIOS setup screen. Exit, saving changes and retry accessing the First Boot menu.



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Main

The Main BIOS setup menu screen has two main areas. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. Options in blue can be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white and a text message in the right frame gives a brief description of the option.

The Main menu reports the BIOS revision, processor type and clock speed, and allows the user to set the system’s clock and calendar. Use the left and right arrow keys to select other screens.

Below is a sample of the Main screen. The information displayed on your screen will reflect your actual system.

```
                              BIOS SETUP UTILITY
Main      Advanced    PCIPnP      Boot        Security    Chipset     Exit

System Overview                                          Use [Enter], [TAB]
                                                         Or [SHIFT-TAB] to
AMIBIOS                                                  Select a field.
Version : 08.00.10
Build Date : 03/02/04                                    Use [+] or [-] to
ID  : 07807_010                                          Configure system
                                                         Time.
Processor
Type  : Intel(R) Pentium (R) M processor 1600MH
Speed  : 1600MHz

System Memory
Size  : 1016MB

System Time    [11:39:40]                                ←→  Select Screen
System Date    [Tue 03/04/2004]                          ↑↓  Select Item
                                                         +-  Change Field
                                                         Tab Select Field
                                                         F1  General Help
                                                         F10 Save and Exit
                                                         ESC Exit

                  002.53 (C) Copyright 1985-2002, American Megatrends, Inc.
```

NOTE: Options shown may not be available on your system.

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Advanced BIOS Setup

The Advanced BIOS Setup menu allows the user to configure some CPU settings, the IDE bus, SCSI devices, other external devices and internal drives.

Select the *Advanced* tab from the ezPORT setup screen to enter the Advanced BIOS Setup screen. You can select the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. A sample of the Advanced BIOS Setup screen is shown below.

NOTE: Changes in this screen can cause the system to malfunction. If problems are noted after changes have been made, reboot the system and access the BIOS. From the Exit menu select 'Load Failsafe Defaults' and reboot the system. If the system failure prevents access to the BIOS screens, refer to Chapter One for instructions on clearing the CMOS.

```
                              BIOS SETUP UTILITY
Main | Advanced | PCIPnP | Boot | Security | Chipset | Exit

Advanced Settings                                  Configure CPU.

WARNING: Setting wrong values in below sections
         may cause system to malfunction.

➢  CPU Configuration
➢  IDE Configuration
➢  Floppy Configuration
➢  SuperIO Configuration
➢  Remote Access Configuration
➢  USB Configuration

                                                   ←→   Select Screen
                                                   ↑↓   Select Item
                                                   Enter Go to Sub Screen
                                                   F1   General Help
                                                   F10  Save and Exit
                                                   ESC  Exit

                  002.53 (C) Copyright 1985-2002, American Megatrends, Inc.
```

NOTE: Options shown may not be available on your system.

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PCI/PnP Setup

Included in this screen is the control of internal peripheral cards, as well as various interrupts. From this menu, the user can also determine if the system's plug-and-play is enabled or disabled.

NOTE: Changes in this screen can cause the system to malfunction. If problems are noted after changes have been made, reboot the system and access the BIOS. From the Exit menu select '`Load Failsafe Defaults`' and reboot the system. If the system failure prevents access to the BIOS screens, refer to Chapter One for instructions on clearing the CMOS.

Below is a sample screen of the PCI/PnP menu; options in your system may be different from those shown.

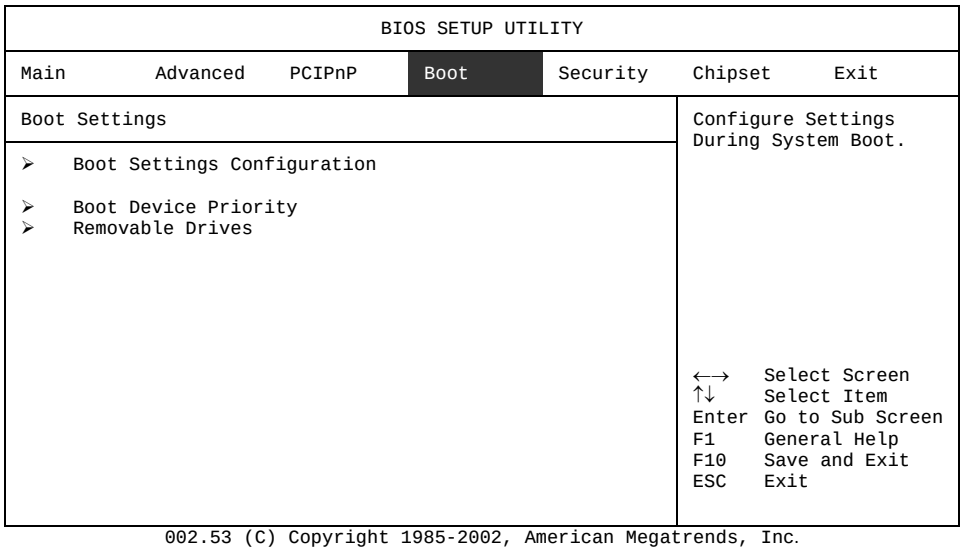
```
                              BIOS SETUP UTILITY
Main      Advanced   PCIPnP   Boot      Security   Chipset   Exit
Advanced PCI/PnP Settings                          NO: lets the BIOS
                                                   configure all the
WARNING: Setting wrong values in below sections    devices in the system.
         may cause system to malfunction.          YES: lets the
                                                   operating system
Plug & Play O/S                        [No]        configure Plug and
PCI Latency Timer                      [64]        Play (PnP) devices not
Allocate IRQ to PCI VGA                [Yes]       required for boot if
Palette Snooping                       [Disabled]  your system has a Plug
PCI IDE BusMaster                      [Disabled]  and Play operating
OffBoard PCI/ISA IDE Card              [Auto]      system.


IRQ3                                   [Available]
IRQ4                                   [Available]
IRQ5                                   [Available]  ←→  Select Screen
IRQ7                                   [Available]  ↑↓  Select Item
IRQ9                                   [Available]  +-  Change Option
IRQ10                                  [Available]  F1  General Help
IRQ11                                  [Available]  F10 Save and Exit
IRQ14                                  [Available]  ESC Exit
                  002.53 (C) Copyright 1985-2002, American Megatrends, Inc.
```


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Boot Setup

Use the Boot Setup menu to set the priority of the boot devices, including booting from a remote network. The devices shown in this menu are the bootable devices detected during POST. If a drive is installed that does not appear, verify the hardware installation. Also available in this screen are 'Boot Settings' which allow the user to set how the basic system will act, for example, support for PS/2 mouse and whether to use 'Quick Boot' or not.

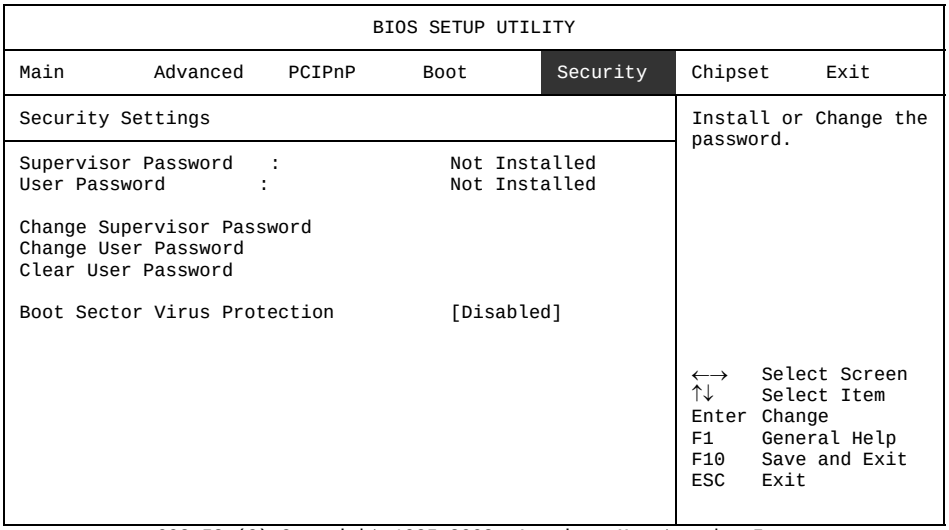


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Security Setup

The ezPORT setup provides both a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.

The system can be configured so that all users must enter a password every time the system boots or when ezPORT setup is executed, using either the Supervisor password or User password.



To reset the security in the case of a forgotten password you must drain the NVRAM and reconfigure.

To clear the CMOS password:

1. Turn off power to the unit.
2. Move switch S2 position 1 to On.
3. Wait approximately 5 seconds.
4. Move switch S2 position 1 to Off.
5. Power up the unit.

When power is reapplied to the unit, the CMOS password will have been cleared, and the CMOS will be set to its defaults.

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Chipset Setup

Select the various options for chipsets located in the system (for example, the CPU configuration and configurations for the North and South Bridge). The settings for the chipsets are processor dependent and care must be used when changing settings from the defaults set at the factory. Below is a sample of the Chipset Setup screen; the actual options on your system may vary.

NOTE: Changes in this screen can cause the system to malfunction. If problems are noted after changes have been made, reboot the system and access the BIOS. From the Exit menu select '`Load Failsafe Defaults`' and reboot the system. If the system failure prevents access to the BIOS screens, refer to Chapter One for instructions on clearing the CMOS.

```
                              BIOS SETUP UTILITY
Main      Advanced   PCIPnP    Boot      Security  Chipset   Exit

Advanced Chipset Settings                    Intel Montara GML
                                             NorthBridge chipset
WARNING: Setting wrong values in below section Configuration options.
         may cause system to malfunction.

➢  Intel Montara NorthBridge Configuration
➢  Hance Rapids SouthBridge Configuration
➢  CPCI (HINT HB6) Bridge Configuration
➢  Lan (8254EB) Port Routing Options

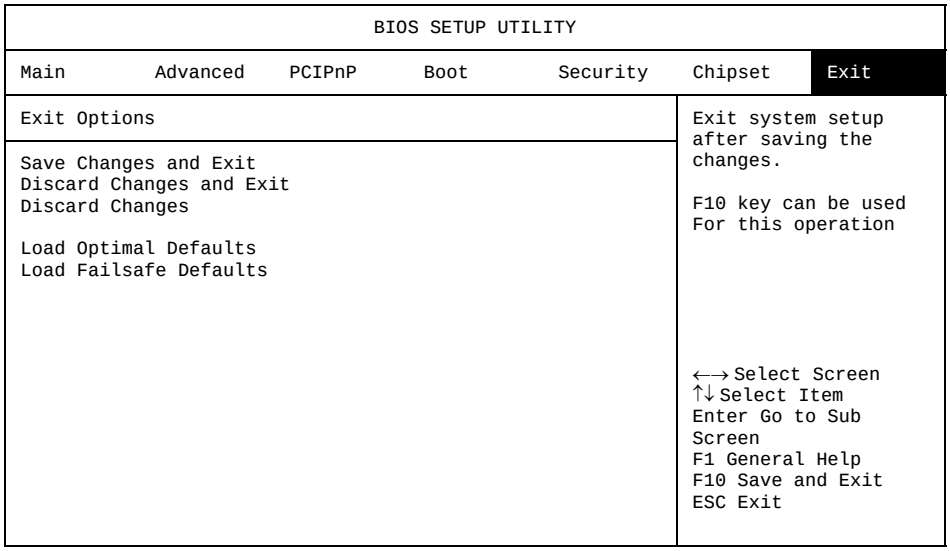
                                             ←→  Select Screen
                                             ↑↓  Select Item
                                             Enter Go to Sub Screen
                                             F1  General Help
                                             F10 Save and Exit
                                             ESC Exit

                  002.53 (C) Copyright 1985-2002, American Megatrends, Inc.
```


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Exit Menu

Select the *Exit* tab from the ezPORT setup screen to enter the Exit BIOS Setup screen. You can display an Exit BIOS Setup option by highlighting it using the <Arrow> keys. The Exit BIOS Setup screen is shown below.



If changes have previously been made in the BIOS and the system malfunctions, reboot the system and access this screen. Select 'Load Failsafe Defaults' and continue the reboot.

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Appendix
C

Argon BIOS

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Introduction

The VMIVME-7807/VME-7807RC include an Argon BIOS option which allows the SBCs to be booted from a network. This appendix describes the procedures to enable this option and the Argon BIOS Setup screens.

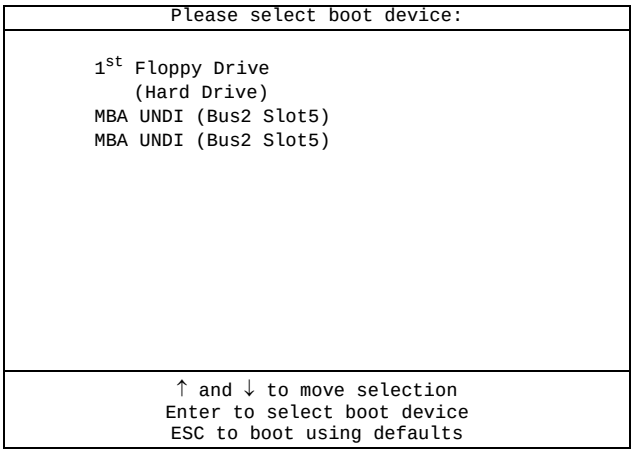
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Boot Menus

There are two methods of enabling the Argon BIOS option. The first method is the *First Boot* menu. The second is the *Boot* menu from the BIOS Setup Utility.

First Boot Menu

Press F11 at the very beginning of the boot cycle, which will access the *First Boot* menu. Selecting "Managed PC Boot Agent (MBA)" to boot from the LAN in this screen applies to the current boot only, at the next reboot the VMIVME-7807/VME-7807RC will revert back to the setting in the Boot menu.



Using the arrow keys, highlight *Managed PC Boot Agent (MBA)*, and press the ENTER key to continue with the system boot.

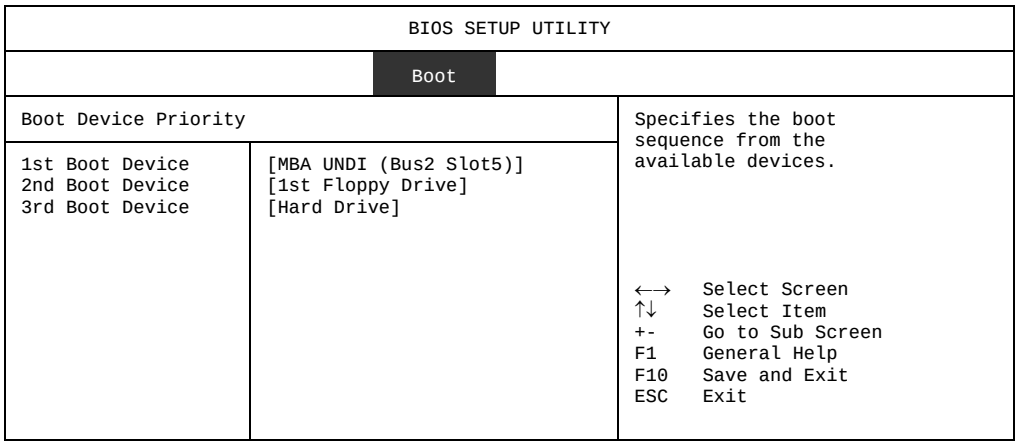
Boot Menu

The second method of enabling the Argon BIOS option is to press the DEL key during system boot. This will access the BIOS Setup Utility. Advance to the Boot menu, and to the Boot Device Priority sub-menu. Use the arrow keys to highlight the Managed PC Boot Agent (MBA) option. Repeat entering <+> until the desired MBA is at the top of the list.

Advance to the Exit menu, select "Exit Saving Changes" and press ENTER. When the system prompts for confirmation, press "Yes". The computer will then restart the system boot-up.

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BIOS Features Setup

After the Managed PC Boot Agent has been enabled, there are several boot options available to the user. These options are RPL (default), TCP/IP, Netware and PXE. The screens below show the defaults for each boot method.

RPL

```
Argon Managed PC Boot Agent (MBA) v4.00 (BIOS Integrated)
(c) Copyright 2002 Argon Technology Corporation
All rights reserved
```

```
                                Configuration

     Boot Method:               RPL

     Config Message:            Enabled
     Message Timeout:           3 Seconds
     Boot failure Prompt:       Wait for timeout
     Boot Failure:              Next boot device
```

```
Use cursor keys to edit: Up/Down change field, Left/Right change value
ESC to quit, F9 restore previous settings, F10 to save
```

TCP/IP

```
Argon Managed PC Boot Agent (MBA) v4.00 (BIOS Integrated)
(c) Copyright 2002 Argon Technology Corporation
All rights reserved
```

```
                                Configuration

     Boot Method:               TCP/IP

     Protocol                   DHCP
     Config Message:            Enabled
     Message Timeout:           3 Seconds
     Boot failure Prompt:       Wait for timeout
     Boot Failure:              Next boot device
```

```
Use cursor keys to edit: Up/Down change field, Left/Right change value
ESC to quit, F9 restore previous settings, F10 to save
```


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Netware

```
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```

```
                                Configuration

      Boot Method:              Netware

      Protocol                  802.3
      Config Message:           Enabled
      Message Timeout:          3 Seconds
      Boot failure Prompt:      Wait for timeout
      Boot Failure:             Next boot device
```

```
Use cursor keys to edit: Up/Down change field, Left/Right change value
ESC to quit, F9 restore previous settings, F10 to save
```

PXE

```
  Argon Managed PC Boot Agent (MBA) v4.00 (BIOS Integrated)
  (c) Copyright 2002 Argon Technology Corporation
  All rights reserved
```

```
                                Configuration

      Boot Method:              PXE

      Config Message:           Enabled
      Message Timeout:          3 Seconds
      Boot Failure Prompt:      Wait for timeout
      Boot Failure:             Next boot device
```

```
Use cursor keys to edit: Up/Down change field, Left/Right change value
ESC to quit, F9 restore previous settings, F10 to save
```


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Appendix

D

System Driver Software

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Introduction

The VMIVME-7807/VME-7807RC provide high-performance video, Local Area Network (LAN) access and associated software drivers. High-performance video is provided by the embedded Intel 855GME chipset. High-performance LAN operation is provided by a dual-port Intel 82546EB for the VMIVME-7807 or the Intel 82546GB for the VME-7807RC Gigabit Ethernet controller and the 82551 10/100 Mbit Ethernet controller. The LAN adapters can be configured to allow access to two separate, physical networks. Each LAN adapter is capable of running 10BaseT and 100BaseTX. The Gigabit adapter is capable of running 1000BaseT.

To optimize performance of each of these PCI-based subsystems, the user must install the driver software located on the distribution CD-ROM provided with the unit. Detailed instructions for the installation of the drivers under Microsoft Windows 2000 Professional and XP Professional are provided in the following section.

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Microsoft Windows 2000 Professional Software Driver Installation

NOTE: Prior to installing device drivers, Windows 2000 should be updated to Service Pack 4 or later. Visit http://support.microsoft.com and search for the latest Service Pack information.

Video Driver Installation

1. If not already present, insert the Windows Drivers CD-ROM.
2. Click 'Start', 'Run', 'Browse'. In the 'Look in' pull-down selection menu, select the CD-ROM drive. Double-click on the 'Video' folder. Double-click on 'win2k_xp141'. Click 'OK'.
3. At the 'Intel(R) Extreme Chipset Graphics Driver Software' window, click 'Next'.
4. At the 'Intel(R) Extreme Graphics 2' window, click 'Next'.
5. Click 'Yes' to agree to the software license agreement.
6. Ensure 'Yes, I want to restart my computer now' is selected and click 'Finish'. The computer will restart. The video resolution settings may be changed as desired.

NOTE: If only analog video is being used, ensure that '*Monitor*' is selected as the default video device in the driver.

6300ESB (Hance Rapids) ICH Chipset Software Installation

1. If not already present, insert the Windows Drivers CD-ROM.
2. Click 'Start', 'Run', 'Browse'. In the 'Look in' pull-down selection menu, select the CD-ROM drive. Double-click on the 'Hance Rapids' folder. Double-click on the 'Applications' folder. Double-click on 'infinst_enu'. Click 'OK'.
3. At the 'Intel Chipset Software Installation Utility' window, click 'Next'. Click 'Yes' to agree to the software license agreement. Click 'Next'. At each of the following 'Hardware Installation' windows, click 'Continue Anyway'.
4. Ensure 'Yes, I want to restart my computer now' is selected and click 'Finish'. The computer will restart.

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USB 2.0 EHCI Host Controller

Depending on how the operating system and the latest service pack were installed, the USB 2.0 controller driver may or may not be running. Visit http://support.microsoft.com and search for ***Availability of USB 2.0 Support in Windows 2000 SP1***, for more information on this topic.

To determine whether the driver for the USB 2.0 controller is running, right-click on 'My Computer', and select 'Manage'. In the left pane of the 'Computer Management' window, click on 'Device Manager'. In the right pane, click on the '+' next to 'Universal Serial Bus controllers' to expand the group. If there is a 'Standard Enhanced PCI to USB Host Controller' listed in the group, the USB 2.0 EHCI Host Controller driver is already running, and no further configuration is necessary for the device.

If there is a device labeled 'Universal Serial Bus (USB) controller' under the 'Other devices' section in the right pane of the 'Computer Management' window, the driver has not been installed. To install the driver, right-click on the 'Universal Serial Bus (USB) controller' and select 'Properties' from the drop-down menu. 'Next' select the 'Driver' tab and select 'Update Driver'. When the wizard starts, choose 'Next' and 'Search for a suitable driver' and 'Next again'. The Hardware Update Wizard will find the appropriate driver and begin installation automatically. Click 'Next' as necessary then click 'Finish' and 'Close' to close the drivers properties dialog box. Device Manager will relocate the device to the 'Universal Serial Bus controllers' section in the right pane.

Ethernet Adapter Drivers Installation

1. If not already present, insert the Windows Drivers CD-ROM.
2. Right-click on 'My Computer', and select 'Manage'. In the left pane of the 'Computer Management' window, click on 'Device Manager'.
3. **Intel(R) PRO/1000 MT Dual Port Server Adapter.** Perform this step for each of the Ethernet controllers under the 'Other devices' section in the right pane of the 'Computer Management' window. Right-click on the 'Ethernet Controller' and select 'Properties' from the drop-down menu. Select the 'Driver' tab and select 'Update Driver'. When the wizard starts ensure 'Install the software automatically' is selected and click 'Next'. The Hardware Update Wizard will find the appropriate driver and begin installation automatically. Click 'Finish'. Device Manager will relocate the devices to the 'Network adapters' section in the right pane.
4. Click 'X' to close the 'Computer Management' window.
5. Changes may be made to the network configuration as desired.

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Microsoft Windows XP Professional Software Driver Installation

NOTE: Prior to installing device drivers, Windows XP should be updated to Service Pack 1a or later. Visit http://support.microsoft.com and search for the latest Service Pack information.

Video Driver Installation

1. If not already present, insert the Windows Drivers CD-ROM.
2. Click 'Start', 'Run', 'Browse'. In the 'Look in' pull-down selection menu, select the CD-ROM drive. Double-click on the 'Video' folder. Double-click on 'win2k_xp141'. Click 'OK'.
3. At the 'Intel(R) Extreme Chipset Graphics Driver Software' window, click 'Next'.
4. At the 'Intel(R) Extreme Graphics 2' window, click 'Next'.
5. Click 'Yes' to agree to the software license agreement.
6. Ensure 'Yes, I want to restart my computer now' is selected and click 'Finish'. The computer will restart. The video resolution settings may be changed as desired.

NOTE: If only analog video is being used, ensure that '*Monitor*' is selected as the default video device in the driver.

6300ESB (Hance Rapids) Chipset Software Installation

1. If not already present, insert the Windows Drivers CD-ROM.
2. Click 'Start', 'Run', 'Browse'. In the 'Look in' pull-down selection menu, select the CD-ROM drive. Double-click on the 'Hance Rapids' folder. Double-click on the 'Applications' folder. Double-click on 'infinst_enu'. Click 'OK'.
3. At the 'Intel Chipset Software Installation Utility' window, click 'Next'. Click 'Yes' to agree to the software license agreement. Click 'Next'. At each of the following 'Hardware Installation' windows, click 'Continue Anyway'.
4. Ensure 'Yes, I want to restart my computer now' is selected and click 'Finish'. The computer will restart.

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USB 2.0 EHCI Host Controller

Depending on how the operating system and the latest service pack were installed, the USB 2.0 controller driver may or may not be running. Visit http://support.microsoft.com and search for ***Availability of USB 2.0 Support in Windows XP SP1***, for more information on this topic.

To determine whether the driver for the USB 2.0 controller is running, click 'Start', right-click on 'My Computer', and select 'Manage'. In the left pane of the 'Computer Management' window, click on 'Device Manager'. In the right pane, click on the '+' next to 'Universal Serial Bus controllers' to expand the group. If there is a 'Standard Enhanced PCI to USB Host Controller' listed in the group, the USB 2.0 EHCI Host Controller driver is already running, and no further configuration is necessary for the device.

If there is a device labeled 'Universal Serial Bus (USB) controller' under the 'Other devices' section in the right pane of the 'Computer Management' window, the driver has not been installed. To install the driver, right-click on the 'Universal Serial Bus (USB) controller' and select 'Update Driver'. Ensure 'Install the software automatically' is selected and click 'Next'. The Hardware Update Wizard will find the appropriate driver and begin installation automatically. Click 'Finish'. Device Manager will relocate the device to the 'Universal Serial Bus controllers' section in the right pane.

Ethernet Adapter Drivers Installation

1. If not already present, insert the Windows Drivers CD-ROM.
2. Click 'Start', right-click on 'My Computer', and select 'Manage'. In the left pane of the 'Computer Management' window, click on 'Device Manager'.
3. **Intel(R) PRO/1000 MT Dual Port Server Adapter.** Perform this step for each of the Ethernet controllers under the 'Other devices' section in the right pane of the 'Computer Management' window. Right-click on the 'Ethernet Controller' and select 'Update Driver'. Ensure 'Install the software automatically' is selected and click 'Next'. The Hardware Update Wizard will find the appropriate driver and begin installation automatically. Click 'Finish'. Device Manager will relocate the devices to the 'Network adapters' section in the right pane.
4. Click 'X' to close the 'Computer Management' window.
5. Changes may be made to the network configuration as desired.

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Additional Resources

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