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PMC663 Dual Ethernet Module

USER's MANUAL

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General Information

INTRODUCTION

This manual describes operation, configuration and installation instructions for the **RAMiX, PMC663** PMC Module. The **PMC663** is a dual LAN interface card, offering two, fully independent 10/100 Mbit Ethernet channels. Designed to be plugged onto a host's printed circuit board, the **PMC663** provides an extremely compact, economical high performance Ethernet solution.

FEATURES

The **PMC663** complies with the CMC specification for PCI Mezzanine Cards (commonly known as PMC). As such, it will directly connect to any Single Board Computer (SBC), or Expansion Card that supports PMC modules. All initialization and functional configuration of the **PMC663** is done automatically by software. Features implemented on the **PMC663** include:

- Two, independent 10/100Mbit Ethernet controllers drive separate LAN connections.
- Each controller is capable of connecting to 10BaseT, 100BaseT or 10Base5 (AUI) LAN media.
- Each Ethernet channel can auto negotiate to determine (and configure for) the highest bandwidth options available on the media to which it is connected; configuration options may also be loaded to the controller from the software driver.
- In 10BaseT/100BaseT modes full duplex operation is supported.
- Automatic power up configuration per PCI specification

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HARDWARE INSTALLATION

Introduction

This chapter provides unpacking, hardware preparation and installation procedures for the **PMC663** module.

UNPACKING INSTRUCTIONS

RAMiX boards are protected by an anti-static envelope and/or wrapping. Observe anti-static precautions and work at an approved anti-static workstation when unpacking the board

- The **PMC663** is shipped in an individual, reusable shipping box. When you receive the shipping container, inspect it for any evidence of physical damage. If the container is damaged, request that the carrier's agent be present during unpacking and inspection of the unit.

Unpack the **PMC663** module from shipping carton. Check and verify that all items are present by referring to the packing list.

INCLUDED ITEMS

Each **PMC663** is shipped with the following items:

1. Two cables for connecting between **PMC663** front panel and standard Ethernet hub
2. Two RJ45 couplers suitable for extending the connection to a 10BaseT media

HANDLING

Electronic assemblies use devices that are sensitive to static discharge; this applies to both the PMC663 and the host board to which it will be mounted on. Observe anti-static procedures when handling these boards. The PMC663 should be in an anti-static plastic bag or conductive foam for storage or shipment.

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PMC663 INSTALLATION

The **PMC663** Module is now ready for installation. Turn all system power off. Remove the host board from the chassis (if currently installed). Locate the PMC connectors on the host board. Carefully plug the **PMC663** into the mating connectors on the host's printed circuit board. Be sure module is seated properly into CMC connectors on the host. Use screws to fasten module into host PCB. (See Figure 2.1)

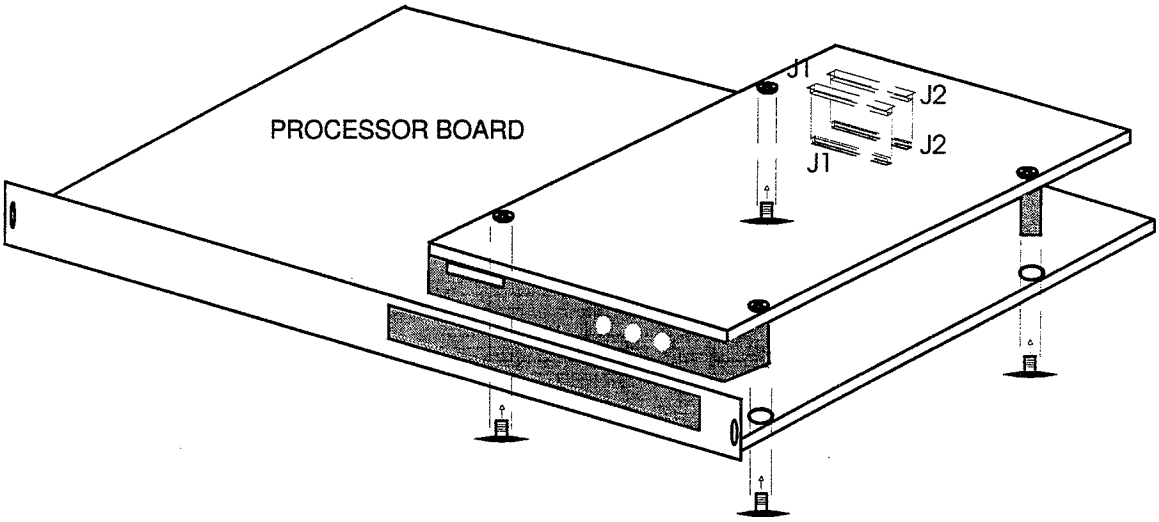


Figure 2.1 Typical Installation of PMC663

1. Remove the four screws from bottom of the stand-offs of the **PMC663**
2. Line-up the J1 and J2 on the host PCB to **PMC663**, J1 & J2.
3. Push the **PMC663** down (make sure the connectors J1 and J2 are positioned properly).
4. Use the four screws to connect the **PMC663** stand offs to the host PCB.

Connection to the Local Network Media

The **PMC663** has two small connectors on the front panel, one for each Ethernet channel. A special cable is provided to transition from these card edge style connectors to the standard RJ45 used on Ethernet hubs. To attach the **PMC663** to the local network, simply insert the RJ45 end of the cable into the hub, and connect the other end to the desired front panel receptacle.

POINT to POINT OPERATION

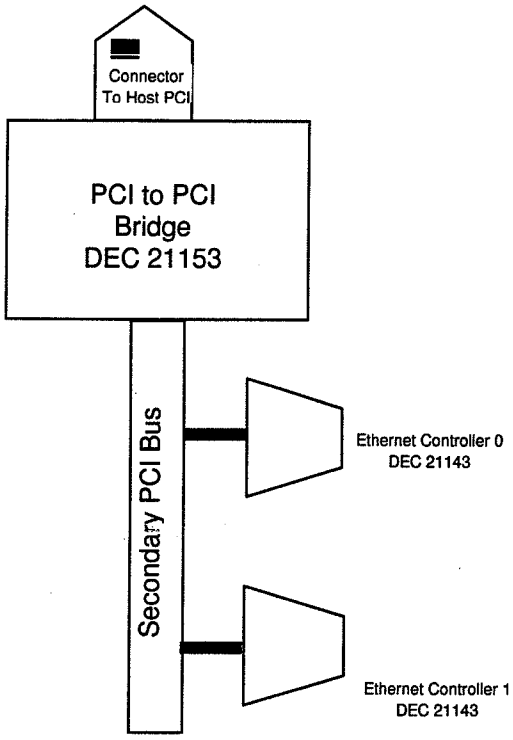
Both 10BaseT and 100BaseT can be used in a point to point mode, with a simple crossover connector. For more information consult RAMiX technical support.

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Theory of Operation

One of the specification requirements of the PMC standard is that a PMC module creates a single busload on the host (e.g. SBC) PCI bus. To achieve this requirement, the **PMC663** has a PCI to PCI Bridge as the first functional element. Logically behind the bridge are the two Ethernet controllers with external PHYS layer (for 100BaseT) and media isolation.

BLOCK DIAGRAM



PCI to PCI BRIDGE

The PCI to PCI Bridge creates the electrical loading isolation necessary to ensure correct operation of the **PMC663** with any host system. The original definition of PCI anticipated the use of bridges to satisfy the requirement of changing configurations, and so included within the standard appropriate definitions for bridge initialization. As a result, integration of the **PMC663** into the operating environment of the host it is attached to is fully automatic and supported by all standard BIOS or OS initialization code.
Once the bridge is configured, the Secondary PCI bus is a logical extension to the Host bus, requiring no special attention from the Ethernet software driver. The PCI to PCI Bridge on the **PMC663** is a state-of-the-art component, capable of supporting full PCI transaction bandwidth.

ETHERNET CONTROLLERS

The Ethernet Controllers on the PCM663 have enjoyed several years of active evolution, featuring improvements at both the PCI bus and Ethernet interface. Each controller is a fully independent unit, with local FIFO buffers to decouple PCI and Ethernet activity. Decoupling the Ethernet and PCI ensures that data transfers will meet the timing requirements of each transaction (which is of

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particular importance on the Ethernet) regardless of the loading on the other bus interface. These FIFO buffers are sufficiently deep to support sustained, full bandwidth Ethernet traffic while allowing extended latency on the PCI bus. When doing data transfer on the PCI bus the Ethernet controller is capable of burst transactions, which is critical to obtain the potential bandwidth of the PCI protocol.

10BaseT, 100BaseT CONNECTIONS

Both 10BaseT and 100BaseT connection is via front panel connector. Data rate is either automatically determined during configuration based upon activity on the external media (i.e. the bandwidth of the LAN to which the **PMC663** is attached), or can be set to specific values by the software driver. The same connector is used for both 10 and 100Mbit operation.

10Base5 (AUI) CONNECTION

The **PMC663** may be configured for use with a 10Base5 (Thicknet) LAN.

- Configuration for 10Base5 is an assembly time operation, made based upon options specified in the **PMC663** purchase request. 10Base5 operation precludes use of 10BaseT or 100BaseT.

If configured for 10Base5 (AUI), signals are routed to the J4 CMC connector. (This connector is only installed when the 10Base5 option is specified). External routing is the responsibility of the host PCB to which the **PMC663** has been mounted.

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SPECIFICATIONS

General

General specifications for **PMC663** are listed below.

CHARACTERISTICS	SPECIFICATIONS
10Base-T or 100 Base-TX Autodetect on each Ethernet channel *OR* 10Base5 AUI	Auto-negotiation of Link Line (10/100BaseT operation)
Cable	UTP Category 5
Compatibility	IEEE1386, IEEE802.3, ANSI 8802-3
Interface	PCI Revision 2.1
Size	IEEE1386, Standard Single PMC
Drivers	VxWorks,pSOS,Lynx, Digital UNIX, Windows NT. (Contact RAMiX for additional software support information)
Temperature Operating Storage	 0°C to 65°C -40°C to 85°C
Power Requirements	+3.3V @ 1.5A (typical)

10Base5 J4 Pin Out

The connection between the Ethernet signals and the J4 pins for AUI is:

AUI Signal	port 1 J4 pin	Port 2 J4 pin
ODM	4	7
ODP	3	8
RDM	2	9
RDP	1	10
TDP	5	11
TDM	6	12

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SUPPORT INFORMATION

INTRODUCTION

This chapter provides the warranty and support information for the **PMC663** Module.

WARRANTY TERMS

RAMiX Inc. warrants all standard (off-the-shelf) and non-standard (custom) products to be free of defects in materials and workmanship under normal use for the applicable warranty period. This warranty is void if the failure has resulted from accident, abuse, alteration, or misapplication by the customer.

PRODUCT RETURNS & WARRANTY PERIOD

The following guidelines describe warranty terms for product returns. Before returning products, notify RAMiX of the problem and get a Return Material Authorization (RMA) number. The **PMC663** has a five-year warranty.

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