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GE Fanuc Automation

PMC682 and PMC682J4

Hardware Reference and Installation Manual

Document Number: Rx-URM 038 Rev A



Embedded Systems

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Preface

Purpose

This manual describes the design and operational features of the GE Fanuc Embedded Systems product, as well as installation procedures.

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Conventions

This manual uses the following conventions:

Convention	Meaning
Return	Press the key that executes commands or terminates a sequence. This key is labeled Return or Enter depending on your keyboard.
<CTRL> X	While you hold down the Ctrl key, press any other key. GE Fanuc Embedded Systems monitor commands are case sensitive. You must enter commands in the correct case, as printed in the text.
Courier type	Indicates examples of system output or user input.
Italics	In commands and examples, italics indicate a value (e.g., the name of a file) that you should supply.
[ ]	Square brackets in command descriptions enclose the optional command qualifiers. Do not type the brackets when entering information enclosed in the brackets.
|	A vertical bar in command descriptions indicates that you have a choice between two or more entries. Select one entry unless the entries are optional.
{ }	Braces indicate that you are required to specify one (and only one) of the enclosed options. Do not type the braces when you enter the command.
( )	Parentheses enclose a set of options that must be specified together.
0xNNNN	Hexadecimal values are indicated with the 0x prefix.

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1 GENERAL INFORMATION

1.1 INTRODUCTION

This manual describes operation, configuration and installation instructions for the GE Fanuc Embedded Systems, PMC682 PCI Mezzanine Card (PMC). The PMC682 provides a high performance ethernet 10/100 Mbit with auto-negotiation. In addition the PMC682 provides two serial ports which can be selected as either RS422/232/485. The RS422/485 can be terminated on the PMC682. The PMC682 will respond with low bus overhead and high determinism. These features can be critical in high performance data acquisition systems.

1.2 FEATURES

The PMC682 (PMC682J4) complies with the CMC specification for PCI Mezzanine Cards. 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 PMC682 (PMC682J4) is done automatically by software. Features implemented on the PMC682 (PMC682J4) include:

- On board DMA
- All configuration via PCI initialization transactions.
- Can sustain data transfer at full PCI bandwidth.

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2 HARDWARE INSTALLATION

2.1 Introduction

This chapter provides unpacking, hardware preparation and installation procedures for the PMC682 module.

2.2 Unpacking Instructions

GE Fanuc Embedded Systems 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

Note: The PMC682 (PMC682J4) 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 PMC682 (PMC682J4) module from shipping carton. Check and verify that all items are present by referring to the packing list.

2.2.1 Included Items

Each PMC682 (PMC682J4) is shipped with the following items:

- PMC682 PMC Assembly

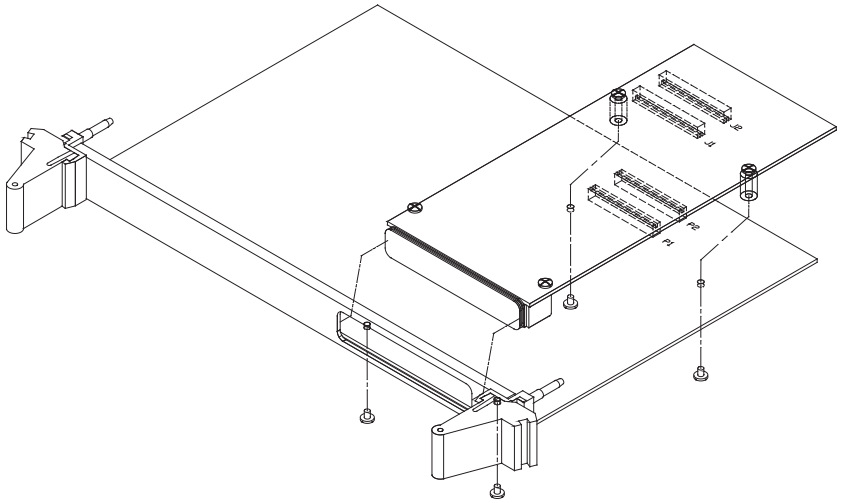
2.3 Handling

Electronic assemblies use devices that are sensitive to static discharge; this applies to both the PMC682 (PMC682J4) and the host board to which it will be mounted on. Observe anti-static procedures when handling these boards. The PMC682 should be in an anti-static plastic bag or conductive foam for storage or shipment.

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3 PMC682 INSTALLATION

The PMC682 (PMC682J4) 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 PMC682 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 below):



1. Remove the four screws from bottom of the stand-offs of the PMC682
2. Line-up the J1 & J2 on the host PCB to PMC682, J1 & J2
3. Push the PMC682 down (make sure the connectors J1 and J2 are positioned properly).
4. Use the four screws to connect the PMC682 stand offs to the host PCB.
5. The PMC682J4 has an additional connector for the rear I/O routing.

3.1 Front Panel Connector

The front panel connector is a male Micro D-Sub style for PMC682 and a Flush RJ-45 connector for 10/100 ethernet.

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4 Front Panel Indicators

PMC682 Front panel indication.

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5 I/O Signal Pin-outs

Each serial port has four control signals:

- TX - Transmitted Data
- RX - Received Data
- CTS - Clear To Send
- RTS - Ready To Send

To support differential signalling standards (e.g., RS422) each signal has a positive and negative line. When using a single ended standard (e.g., RS232) use the negative designation.

All I/O signals are available at the front panel connector (PMC682) or the J4 “backplane” connector (PMC682J4). The following table details all connections:

Port #	Signal	Front Panel D-Sub (PMC682)		J4 Pin (PMC682J4)	
		Positive	Negative	Positive	Negative
0	RX	1	2	15	16
	TX	4	3	18	17
	RTS	6	7	20	21
	CTS	9	8	23	22
1	RX	1	2	24	25
	TX	4	3	27	26
	RTS	6	7	29	30
	CTS	9	8	32	31

Ground is available on the front panel connector of Micro D-Sub pin 5. For the J4 option the ground is on pins 28, and 19. The PMC682J4 option has the 10/100 ethernet routed to the J4 connector. The pin outs are defined as follow:

Pin 1 - Center TAP for TX (pin 4-5 of the RJ, this connection is optional)

Pin 3 - TDX+

Pin 5 - TDX-

Pin 7 - RDX+

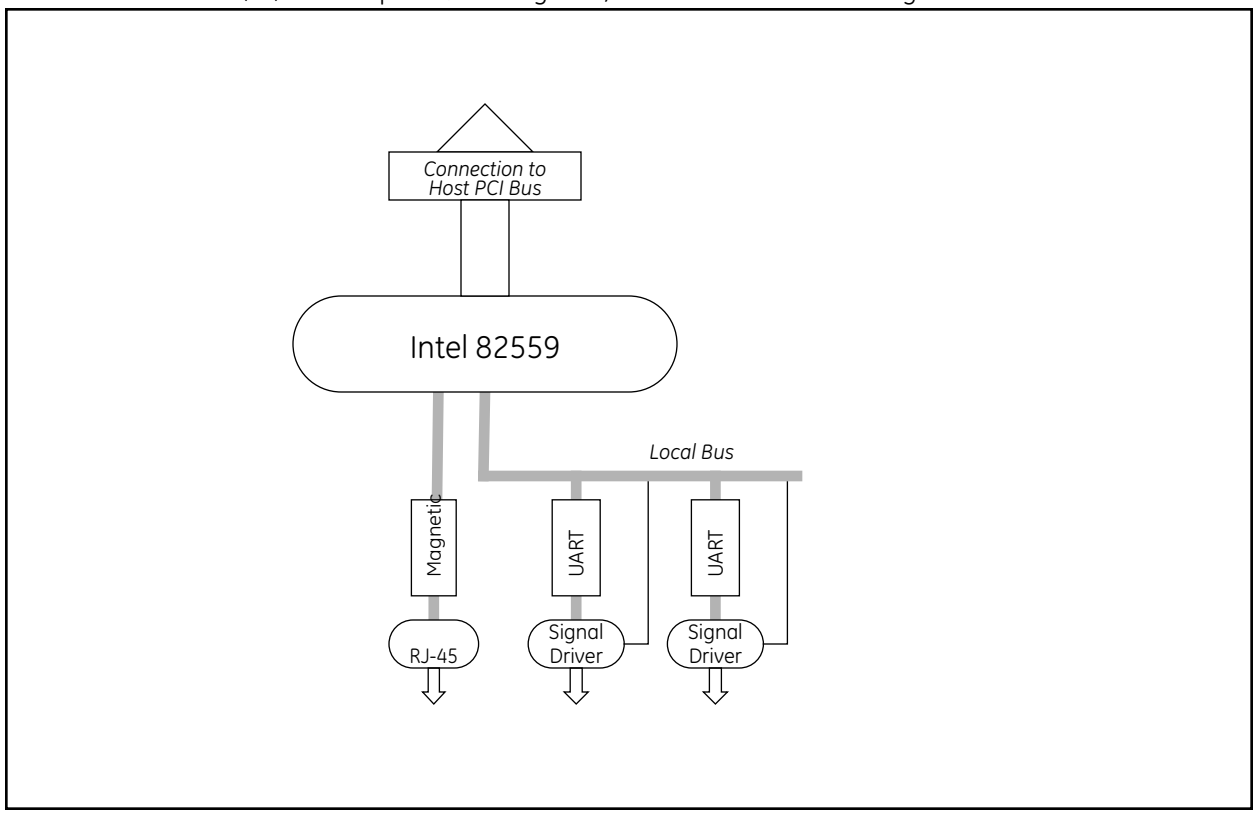
Pin 9 - RDX-

Pin 11 - Center TAP of the RX (pin 7-8 of the RJ, this connection is optional)

Pin 13 - Chassis GND.

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The PMC682(J4) is a complete I/O subsystem, illustrated in the block diagram.



5.1 PMC682 Subsystems

There are two switches on the PMC682 (PMC682J4) module. The SW1 selection the Serial Driver mode. SW1 has four position. When a switch is in the OFF state it has a value of one and a value of zero in the ON position. There are 9 mode of operation for the Driver.

SW1 value Mode Selection

4321 (indication on the switch)

0000 Tri-state

0010 RS232 (V.28)

1110 V.35

0100 RS422 (V.11 with Termination 120 Ohms)

0101 RS422 (V.11 with out Termination)

1100 RS449 (V.11 with Termination 120 Ohms)

1101 EIA530 (V.11 with Termination 120 Ohms)

1111 EIA530A (V.11 with Termination 120 Ohms)

0110 V.36 with Termination 120 Ohms

For example for the RS232 setting, the SW1 should be set ON at positions 1,3 and 4. The position 2 to the OFF position.

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The SW2 selects the RS485 half duplex option. SW2 position one and two, when in the ON position, connects the RTS signal to the Transmit enable signal for channel zero and one respectively. Position three and four, when in the ON position, connects RX to TX for channel zero and one respectively.

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6 SPECIFICATIONS

6.1 General

General specifications for PMC682 (PMC682J4) are listed below:

CHARACTERISTICS	SPECIFICATIONS
DRAM Memory Subsystem	up to 512Mbyte
Compatibility	IEEE802.3
Interface: PCI 33Mhz 32/64bit	PCI Revision 2.2
Size	IEEE1386, Standard Single PMC
Drivers	VxWorks,pSOS,Lynx,Linux, Contact GE Fanuc Embedded Systems for additional software support information)
Temperature Operating Storage	 0 degree C to 65 degree C -40 degree C to 85 degree C
Power Requirements	+3.3V @ 1.5A (typical) +5V @ 0.3A (typical)

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