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IC697VHD100 PMC IDE Hard Disk Adapter

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GE Fanuc Automation

Programmable Control Products

IC697VHD100
PMC IDE Hard Disk Adapter

Installation Manual

GFK-2079   514-750432-000 A   April 2002

Warnings, Cautions, and Notes
as Used in this Publication

<div style="text-align:center">

Warning

</div>

Warning notices are used in this publication to emphasize that hazardous voltages, currents, temperatures, or other conditions that could cause personal injury exist in this equipment or may be associated with its use.

In situations where inattention could cause either personal injury or damage to equipment, a Warning notice is used.

<div style="text-align:center">

Caution

</div>

Caution notices are used where equipment might be damaged if care is not taken.

<div style="text-align:center">

Note

</div>

Notes merely call attention to information that is especially significant to understanding and operating the equipment.

This document is based on information available at the time of its publication. While efforts have been made to be accurate, the information contained herein does not purport to cover all details or variations in hardware or software, nor to provide for every possible contingency in connection with installation, operation, or maintenance. Features may be described herein which are not present in all hardware and software systems. GE Fanuc Automation assumes no obligation of notice to holders of this document with respect to changes subsequently made.

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CIMSTAR	Modelmaster	Series 90	VersaPro
Field Control	Motion Mate	Series Five	VuMaster
GEnet	ProLoop	Series One	Workmaster

Contents

Chapter	*Introduction, Description, and Specifications*
1	

This manual describes installation of the IC697VHD100 PMC IDE Hard Disk Adapter.

Reference Material and Other GE Fanuc Manuals

For the most up-to-date physical description and specifications for the IC697VHD100, refer to: GE Fanuc specification number GFK-2112.

The following IEEE Specifications apply to the IC697VHD100:

IEEE P1386.1 PMC Mezzanine Card (PMC) Specification
IEEE Standards Department
Copyright and Permissions
445 Hoes Lane, P.O. Box 1331
Piscataway, NJ   08855-1331

IEEE P1386 Common Mezzanine Card (CMC) Specification
IEEE Standards Department
Copyright and Permissions
445 Hoes Lane, P.O. Box 1331
Piscataway, NJ   08855-1331

PCI Local Bus Specification, Revision 2.1
PCI Special Interest Group
P.O.Box 14070
Portland, OR 97214
1-800-433-5177 (USA)
503-797-4207 (International)

General Description

The IC697VHD100 provides access to both an on-board hard disk drive and to external disk drives. The on-board hard disk is logically located on the Primary Channel and can perform Ultra DMA transfers up to 66Mbytes/second with Bus Mastering.

Up to two external drives can be connected to the IC697VHD100. These drives are connected via a 40-pin header extended through the front panel. These drives are logically located on the Secondary Channel and can perform Ultra DMA transfers up to 100Mbytes/second with Bus Mastering.

The IC697VHD100 is designed to meet all requirements, both physical and electrical, of the IEEE P1386.1 PCI Mezzanine Card (PMC) Specification and the IEEE P1386 Common Mezzanine Card (CMC) Specification. The user can connect this board to any GE Fanuc processor board configured to receive a PMC-type card. The IC697VHD100 also conforms to Revision 2.1 of the PCI Local Bus Specification.

Board Features

- On-Board Ultra DMA 66 Hard Disk Drive

- External Ultra DMA 100 Disk Drive interface via front bezel header

- Drive activity LEDs for both Primary and Secondary Channels

- PCI Local Bus Specification Revision 2.1 compliant

- PCI interface 32 bits at 33MHz

- 3.3 volt/ 5.0 volt tolerant PCI signaling

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 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 for service and repair to ensure that safety features are maintained.

Chapter 2

Configuration and Installation

This chapter describes the physical installation and configuration of the PMC IDE Hard Disk Adapter.

The IC697VHD100 is designed to be used within any GE Fanuc SBC system that allows the installation of a PCI Mezzanine Card (PMC) interface based on the P1386.1 Specification. This chapter contains step-by-step instructions for the physical installation of the IC697VHD100.

Physical Installation

1. The four host mounting screws attached to the IC697VHD100 must be removed before the board can be installed into the Host chassis. Two of the screws are installed in the standoffs, located closest to the PMC connectors. The other two are screwed into the bezel. Remove the four screws (do not remove the screws that hold the bezel and the standoffs to the PCB board).

<div align="center">

Caution

</div>

Some of the components assembled on GE Fanuc's 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.

2. Turn off power to the SBC.

3. Place the SBC in a position so that the PMC Interface is easily accessible.

4. With the component side of the IC697VHD100 facing the SBC and oriented such that the front panel bezel of the PMC board faces the front panel of the SBC, slip the front panel bezel of the PMC board into the SBC PMC front panel port. See Figure 2-1.

Figure 2-1: Installing the IC697VHD100Board
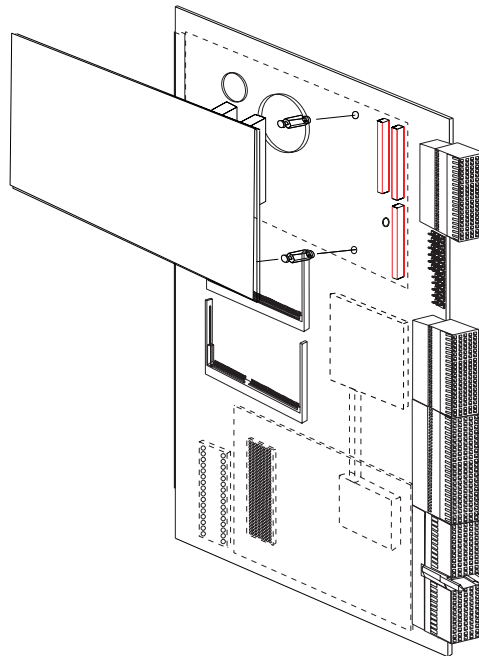
5. Taking care that the PMC alignment pin on the SBC aligns with the alignment hole located near the PMC connectors in the IC697VHD100, connect the PMC board to the PMC connectors on the SBC and press until the unit is snug.

6. Install the screws that were removed from the board in step 1 through the host SBC into the IC697VHD100 standoffs and bezel. Tighten until secure (do not overtighten). This step secures the IC697VHD100 to the host SBC.

7. Re-install the SBC/IC697VHD100 assembly into the Host chassis.

Connector Pinouts

The IC697VHD100 has several connectors for its I/O ports. Wherever possible, the IC697VHD100 uses connectors and pinouts typical for any desktop PC. This ensures maximum compatibility with a variety of systems.

PCI Mezzanine Card Connectors

The IC697VHD100 utilizes standard PMC P1 and P2 connectors. Tables 2-1 and 2-2 provide the pinout and Figure 2-2 illustrates the connector layout and location of pin 1.

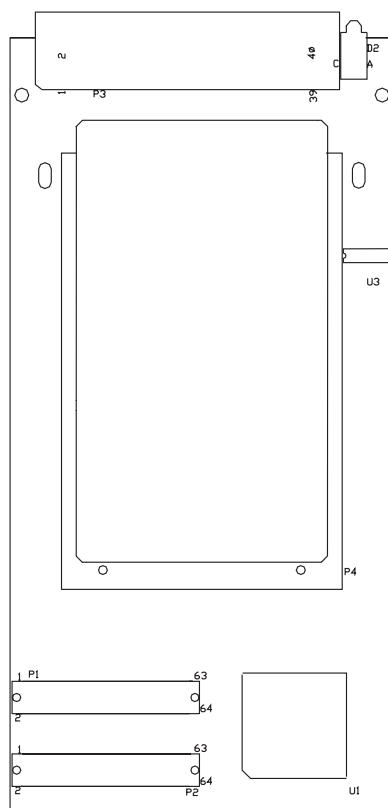**Figure 2-2: IC697VHD100 Connector Layout**

Table 2-1: P1 Connector Pinout

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	NC	17	REQ#	33	FRAME#	49	AD9
2	NC	18	VCC 5.0V	34	GND	50	VCC 5.0V
3	GND	19	VCC IO	35	GND	51	GND
4	INTA#	20	AD31	36	IRDY#	52	C/BE[0]
5	NC	21	AD28	37	DEVSEL#	53	AD6
6	NC	22	AD27	38	VCC 5.0V	54	AD5
7	BUSMODE1#	23	AD25	39	GND	55	AD4
8	VCC 5.0V	24	GND	40	LOCK#	56	GND
9	NC	25	GND	41	NC	57	VCC IO
10	NC	26	C/BE[3]	42	NC	58	AD3
11	GND	27	AD22	43	PAR	59	AD2
12	NC	28	AD21	44	GND	60	AD1
13	CLK	29	AD19	45	VCC IO	61	AD0
14	GND	30	GND	46	AD15	62	VCC 5.0V
15	GND	31	VCC IO	47	AD12	63	GND
16	GNT#	32	AD17	48	AD11	64	NC

Table 2-2: P2 Connector Pinout

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	NC	17	NC	33	GND	49	AD8
2	NC	18	GND	34	NC	50	VCC 3.3V
3	NC	19	AD30	35	TRDY#	51	AD7
4	tied to pin 5	20	AD29	36	VCC 3.3V	52	NC
5	tied to pin 4	21	GND	37	GND	53	VCC 3.3V
6	GND	22	AD26	38	STOP#	54	NC
7	GND	23	AD24	39	PERR#	55	NC
8	NC	24	VCC 3.3V	40	GND	56	GND
9	NC	25	IDSEL	41	VCC 3.3V	57	NC
10	NC	26	AD23	42	SERR#	58	NC
11	BUSMODE2#	27	VCC 3.3V	43	C/BE[1]	59	GND
12	VCC 3.3V	28	AD20	44	GND	60	NC
13	RST#	29	AD18	45	AD14	61	NC
14	BUSMODE3#	30	GND	46	AD13	62	VCC 3.3V
15	VCC 3.3V	31	AD16	47	GND	63	GND
16	BUSMODE4#	32	C/BE[2]	48	AD10	64	NC

Secondary IDE Front Panel Connector

The IC697VHD100 utilizes a standard IDE configuration for the P3 connector. Table 2-3 provides the pinout and Figure 2-2 illustrates the connector layout and location of Pin 1.

Table 2-3: P3 Connector Pinout

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
1	RESET#	11	DATA3	21	DMARQ	31	INTRQ
2	GND	12	DATA12	22	GND	32	DWORDSIZE#
3	DATA7	13	DATA2	23	DIOW#	33	DA1
4	DATA8	14	DATA13	24	GND	34	CBLIO#
5	DATA6	15	DATA1	25	DIOR#	35	DA0
6	DATA9	16	DATA14	26	GND	36	DA2
7	DATA5	17	DATA0	27	IORDY	37	CS0#
8	DATA10	18	DATA15	28	ALE#	38	CS1#
9	DATA4	19	GND	29	DMACK#	39	ACT#
10	DATA11	20	NC	30	GND	40	GND

1.8 inch Hard Drive Connector

The pin assignments for the P4 connector are shown in Table 2-4. Figure 2-2 illustrates the connector layout and location of Pin 1.

Table 2-4: P4 Connector Pinout

Pin No.	Signal	Pin No.	Signal	Pin No.	Signal	Pin No.	Signal
A1	NC	8	DATA10	21	DMARQ	34	CBLIO#
B1	NC	9	DATA4	22	GND	35	DA0
C1	NC	10	DATA11	23	DIOW#	36	DA2
D1	NC	11	DATA3	24	GND	37	CS0#
E1	NC	12	DATA12	25	DIOR#	38	CS1#
F1	NC	13	DATA2	26	GND	39	ACT#
1	RESET#	14	DATA13	27	IORDY	40	GND
2	GND	15	DATA1	28	GND	41	VCC_3.3V
3	DATA7	16	DATA14	29	DMACK#	42	VCC_3.3V
4	DATA8	17	DATA0	30	GND	43	GND
5	DATA6	18	DATA15	31	INTRQ	44	NC
6	DATA9	19	GND	32	IOCS16#	45	GND
7	DATA5	20	NC	33	DA1	46	GND

Chapter 3

Theory of Operation

The IC697VHD100 is compliant with both the Peripheral Communication Interface (PCI) Specification 2.1 and PCI Mezzanine Card (PMC) P1386.1 Specification. The PCI Specification 2.1 requires that any interface to the PCI bus contain a PCI Configuration Space Register as shown in Table 1-1. The registers are located in the configuration space and contain the base addresses of the four PCI memory windows utilized by the IC697VHD100.
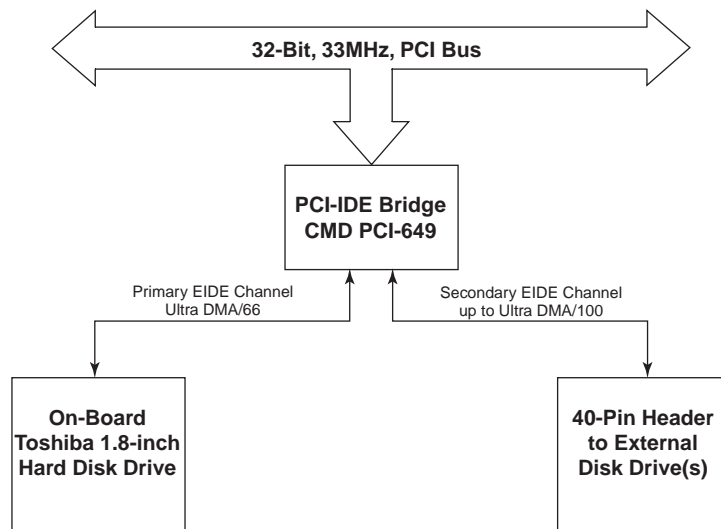
Figure 3-1: IC697VHD100 Functional Block Diagram

Table 3-1 PCI Configuration Space Registers

31			16	15		00	Register Address
Device ID (00C0h)				Vendor ID (102Ch)			00h
Status				Command			04h
Class Code 03h (Base Class) 00h (Sub Class)				Revision ID			08h
BIST	Header Type	Latency Timer		Cache Line Size			0Ch
PCI Base Address 0 for Memory-Mapped Configuration Registers							10h
Reserved							14h
Reserved							18h
Reserved							1Ch
Reserved							20h
Reserved							24h
Reserved							28h
Reserved				Reserved			2Ch
PCI Base Address for Expansion ROM BIOS							30h
Reserved							34h
Reserved							38h
Max_Lat	Min_gnt		Interrupt Pin		Interrupt Line		3Ch

Chapter 4

Maintenance

This chapter provides information relative to the care and maintenance of the PMC IDE Hard Disk Adapter.

If the product malfunctions, verify the following:

- Software

- System configuration

- Electrical connections

- Jumper or configuration settings

- Boards fully inserted into their proper connector location

- Connector pins are clean and free from contamination

- No components of adjacent boards are disturbed when inserting or removing the board from the VMEbus card cage

- Quality of cables and I/O connections

User level repairs are not recommended. Contact your authorized GE Fanuc distributor for a Return Material Authorization (RMA) Number. **This RMA Number must be obtained prior to any return.**

System Driver Software

Introduction

The IC697VHD100 is a PMC-based PCI-IDE hard disk drive adapter utilizing the CMD Technology PCI-649 controller chip. The IC697VHD100 provides an on-board Ultra DMA/66 hard disk drive on the primary channel and a 40-pin, front-panel accessible connector. The front panel header allows for the connection of up to two Ultra DMA/66/100 devices on the secondary channel.

To optimize performance of Ultra DMA/66/100 devices connected to the IC697VHD100, install the driver software located on the distribution CD-ROM provided with the unit. Instructions for installation of the drivers during the installation of Microsoft Windows NT 4.0 and Windows 2000 operating systems are provided in the following sections.

Ultra DMA/66/100 Driver Disk Preparation

The Ultra DMA drivers for Windows NT 4.0 and Windows 2000 are provided on the distribution CD-ROM. Before attempting the installation of one of these operating systems, the appropriate driver files must be copied to a blank, user-supplied floppy disk.

To create a Windows NT 4.0 or Windows 2000 driver disk, browse to the \WinNT4\ or \Win2K\ directory respectively on the distribution CD-ROM. Copy all files and folders to a blank floppy disk and label it 'CMD CSA-64xx IDE Driver'.

Windows NT 4.0

1. Begin the installation of Windows NT 4.0 according to the instructions accompanying the Windows NT installation CD-ROM.

2. When 'Setup is inspecting your computer's hardware configuration' displays, press F6.

3. Insert the CMD CSA-64xx IDE Driver disk in the floppy drive.

4. When prompted to specify additional devices, press S, Enter, Enter. When 'CMD CSA-64xx IDE Driver' displays, press Enter. After files are copied from the floppy, press Enter to continue with the installation.

5. After Windows NT 4.0 is completely installed, copy 'Cmdcfgnt.exe' from the driver floppy to the \winnt\system32 directory. Run the executable to optimize the CMD controller.

Note

The 'readme.txt' file on the driver disk provides additional information about the installation of the driver.

Windows 2000

1. Begin the installation of Windows 2000 according to the instructions accompanying the Windows 2000 installation CD-ROM.

Note

Do not press F6 when prompted to install third-party drivers. The driver will be installed after Windows 2000 is completely installed.

2. Complete the installation of Windows 2000, allowing the host computer to restart as necessary.

3. When Windows 2000 is completely installed, right-click on 'My Computer' and click 'Properties.' Click the 'Hardware' tab. Click the 'Device Manager' button.

4. Insert the CMD CSA-64xx IDE Driver disk in the floppy drive.

5. Double click on 'IDE ATA/ATAPI controllers'. Double-click on 'Standard Dual Channel PCI IDE Controller'. Click the 'Driver' tab. Click the 'Update Driver' button.

6. When the 'Upgrade Device Driver Wizard' appears, click 'Next'. Select 'Search for a suitable driver for my device' and click 'Next'. Select 'Floppy disk drives' and click 'Next'. When the wizard locates the driver on the floppy disk, click 'Next'.

7. Click 'Yes', 'Finish', 'Close'.

8. Click 'Yes' to restart the computer.

Note

The 'readme.txt' file on the driver disk provides additional information about the installation of the driver.