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GE Fanuc Automation

Programmable Control Products

Panel C
Industrial Computer

Hardware User's Manual

GFK-2251 *May 2003*

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Warnings, Cautions, and Notes as Used in this Publication

Warning

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.

Caution

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

Note: 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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Content of This Manual

This manual describes the features and operation of the following Panel C industrial computer products:

15.0" Industrial Computer with Windows NT® operating system

15.0" Industrial Computer with Windows 2000® operating system

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Chapter 1

Panel C Industrial Computer Features

The Panel C industrial computer is a high performance workstation designed primarily for use as a hardware platform for Human Machine Interface (HMI) and/or Supervisory Control and Data Acquisition (SCADA) software packages running on Windows NT® or Windows 2000® operating systems.

The Panel C industrial computer is a fully self contained PC-compatible computer with a built-in flat screen display and resistive touch screen. The unit is housed in a rugged metal case to protect the system against dust, water, and damage.

Panel C industrial computers accept either 115 VAC or 230 VAC input power.

The unit is supplied completely assembled and requires only mounting and connecting. The use of special clips to secure the unit to the panel eliminates the need for mounting holes and requires only one cut-out to mount the unit.

Before powering up your system for the first time, you should refer to the procedures in Chapter 2, which contains information you need to set up the operating system and network communications.



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Feature Summary

When you purchase a Panel C, you receive:

- Industrial computer with the operating system software installed.
- Installation hardware
- Microsoft Windows documentation, software distribution, Certificate of Authenticity and license agreement
- Power cord
- Image Recovery Disk with instructions.
- Installation/User's Manual

Feature	***Description***
Operating system	Microsoft Windows NT or Windows 2000
CPU	Intel PIII 1 GHz
Cache	128K L2
Expansion slots	One PCI, one shared PCI/ISA
Hard disk	20GB (minimum) (Removable)
Floppy disk drive	3.5 inch, 1.44MB (external connection)
RAM	256MB Maximum installed by factory. Maximum upgrade: 512MB with non-registered, non-ECC DIMMs,
Display	15.0” Color Active Matrix TFT –XGA 1024 x 768 resolution
Touch Screen	High Resolution Resistive 1024 x 1024
Parallel ports	One side access (LPT1)
Serial port	Two side access (RS232)
USB ports	Three available, two front access USB ports, one side access port.
Compact Flash	Type I, Compact Flash port.
Communications	PCI 10/100 Ethernet (RJ-45) (side access)
Keyboard port	PS/2, Side access
Mouse port	PS/2, Side access
CD-ROM	32X (minimum) side access external connector.
Front Panel Keypads	74 Front panel keys; 26 Function keys. Refer to Chapter 5 for keypad layout.

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Removable Hard Disk Drive

The Hard Disk Drive can be quickly removed for servicing or substitution.

Warning

Before installing or removing the Hard Disk Drive, remove power from the unit. The proper method for removing power from the unit is to switch off power at the circuit breaker.

CD-ROM

The external CD-ROM connector is located on the side access panel.

Warning

Before installing or removing the CD-ROM, remove power from the unit. The proper method for removing power from the unit is to switch off power at the circuit breaker.

Front Panel Keypads

The front panel is supplied with 26 function keys that double as a full alpha keypad. You can enter all 26 alpha characters, selecting lower or upper case via the Fn and CAPS LOCK keypads. A full numeric keypad with 13 additional alpha characters is available with the SHIFT keypad. There are 12 control keys and 4 arrow keys. There are 16 special function keypads for use in application software.

Status LEDs

Front panel mounted LEDs indicate Power, Hard Disk Drive (HDD) status, Compact Flash inserted, and System error status. An LED will also indicate when the Fn keypad is selected. The floppy drive has its own status indicator.

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Front Access Panel

The Panel C is equipped with a front access panel that provides access to the Compact Flash port and two USB ports.

Warning

Do not connect or disconnect to Compact Flash or USB ports while power is applied to the industrial computer, unless the area is known to be non-hazardous.

For Non-incendive field connections, refer to Control Drawing DR00, which is provided in Appendix A.

I/O Channels

The Panel C industrial computer provides the following I/O interface channels:

- Two RS-232 serial ports, COM1 and COM2 are accessible on the side panel.
- One enhanced parallel port, LPT1 is located on the side.
- PS2 connectors for Keyboard and Mouse.
- Three USB ports (includes two USB ports in the front access panel and one USB port on the right side panel).
- Connector for external floppy disk drive (side access)
- Connector for external CD-ROM drive (side access)
- Video output (side access)
- Ethernet 10/100 base T (RJ-45) (side access)

If the end application requires serial or parallel interfaces in addition to those provided by the standard system, these can be provided by the addition of specific PCI or ISA I/O cards. A wide selection is available from third party sources to provide user flexibility.

Warning

Do not connect or disconnect to COM1, COM2, and LPT1 ports while power is applied to the industrial computer, unless the area is known to be non-hazardous.

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Network Interface

The Panel C includes an autosensing 10/100 Ethernet adapter that provides a RJ-45 connector for shielded twisted pair cable.

Warning

Do not connect or disconnect to Ethernet port while power is applied to the industrial computer, unless area is known to be non-hazardous.



Figure 1-1. Ethernet port and side expansion slots

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Expansion Slots

The Panel C industrial computer provides multiple expansion slots.

- One PCI slot
- One shared expansion slot for either PCI or ISA

All the expansion slots within the system use the standard PC card clamping system.

Warning

Do not connect or disconnect expansion cards or cables while power is applied to the unit, unless area is known to be non-hazardous.

Application Software

Unit is available as a standalone product or bundled with a variety of GE Fanuc software titles.

GE Fanuc's Industrial-Hardened Computers can be bundled with our award winning software—offering an unbeatable combination of design flexibility, power, and reliability in a packaged hardware / software solution. The power of GE Fanuc's automation software along with the rugged NEMA 4 construction and extensive functionality of these units makes them ideal for the most demanding industrial applications.

A bundled solution from GE Fanuc takes the worry out of selecting technically compatible hardware and software and finding support for the combined solution. A complete bundled solution tested and supported at the factory—providing added value, minimizing start-up issues, and saving you time.

For more information regarding bundled solutions, contact your representative or visit us online at: www.gefanuc.com.

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Chapter 2

Powerup and Software Installation

This chapter contains information you need to set up your Panel C industrial computer's operating system and network communications.

Setup

Before you attempt to power up the system for the first time, inspect the unit for loose or damaged components. Remove the top cover and make sure there are no loose or damaged assemblies. Applying power to a system with damaged components may cause additional damage.

Initial Startup Procedure

Warning

Installation of the Panel C industrial computer in hazardous locations requires the use of a cable mounting clamp with the power connector.

Caution

Do not connect or disconnect external devices, such as a printer, keyboard or a mouse while the unit is powered on. Failure to observe this precaution could result in damage to the equipment.

1. Plug the power cable into the unit's power connector and connect to the power source.
2. Plug in the serial/parallel data transfer cables and screw the plugs to the connectors.
3. Power up the unit and check whether any concealed damage has been caused by incorrect transportation, incorrect operating/storage conditions or incorrect handling (e.g. smoke coming out of the unit, etc.). If you notice any damage, remove power from the unit immediately and secure it against unintentional use.

During power up, the processor runs its normal diagnostic checks and indicates the presence of any errors with screen prompts .

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Startup for Windows NT Systems

Connecting a PS/2 keyboard and Mouse is recommended before you get started. The soft keyboard and touch panel will not work until the Windows 2000 operating system is licensed. Therefore an external keyboard is required to license the product.

1. Plug in the keyboard and PS/2 mouse (if available).
2. Connect the input power cord.
3. Read license agreement
4. TAB to your choice and press ENTER.
5. Press ENTER to start the Windows NT Setup.
6. Type your name
7. Press the TAB key and type your company name.
8. Press ENTER.
9. Enter the Authentication number found on your Windows NT manual. You will need to use the TAB key to get to each number field. If correct, press ENTER.

Note: Computer names must be less than or equal to ten characters to run CIMPLICITY Plant Edition HMI software.

10. Enter a Computer name. This name must be unique to other computers on the same network. Press ENTER.

Note: Your system has been set up to enable auto logon. Auto logon allows the operating system to boot without your having to use a keyboard to press CTL-ALT-DEL.

11. You will be prompted for a password.
    - To use the auto logon feature, type **admin** for the password. Press the TAB key and type **admin** in the Confirm Password box. Press ENTER.
    - To skip the password, press ENTER
    - To assign a password, type in a password, press the TAB key, and type the password in the Confirm Password box. Press ENTER.
12. Press ENTER to continue with the operating system Setup.
13. After completing setup, the system will copy files over and finalize its setup.
14. At the end of the setup process, you will be asked to reboot the system. Press ENTER.

Login Recommendation

If you type **admin** as your Administrator password, your industrial computer will automatically log on as Administrator.

Log onto the system as Administrator when you power up the system. Doing so eliminates the requirement to log on to Panel C when you run the Panel C Demo or any other project that includes a user named Administrator. All Panel C projects are configured with an Administrator user by default.

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Startup for Windows 2000 Systems

Before you get started, you need to connect a PS/2 keyboard. A PS/2 mouse is recommended to help navigate through the setup screens.

1. Plug in the keyboard, PS/2 mouse (if available), and power cord.
2. Power on the unit.
3. Read the license agreement.
4. Select your choice and press NEXT >.
5. Choose your regional settings (US default) and press NEXT >.
6. Type your name.
7. Press the TAB key and type your company name.
8. Press NEXT >.
9. Enter your Windows 2000 Product Key found on the back of the Panel C computer itself. When correct, press NEXT >.

   Note: Computer names must be less than or equal to ten characters to run CIMPLICITY Plant Edition HMI software. Each computer on a network ***must*** have a unique name

10. Enter a Computer name. This name must be different from other computer names on the same network. Press Next >.
11. If desired, enter an Administrator password. You will need to enter it twice to confirm. When done, press Next >.
12. You can now set the Date, Time and Time Zone for the computer. When the information is correct, press Next >.
13. Choose Typical settings for the factory setting of TCP/IP protocol at IP 111.111.111.111 and subnet 255.0.0.0, or, choose Custom and press Next > to change these settings. Consult your network Administrator for your network's configuration settings.
14. Choose whether this computer will be on a workgroup or domain and enter the name and press Next >.
15. After completing the network setup, the system will finalize its setup.

At the end of the setup process, you will be asked to reboot the system. Press Finish.

After restarting, you will need to configure the login settings for Windows 2000. When the "Network Identification Wizard" dialog box appears press Next >.

The "Users of This Computer" dialog box appears.

- If you wish to have the computer automatically log on with the administrator account, select the "User name" pull down and choose "Administrator." Enter the password used in step 11 and press NEXT >. The computer will automatically log on when it starts up.
- If you wish to require a logon when the computer is restarted, select "Users must enter a user name and password to use this computer" and press NEXT >. You will then be asked for a user name and password when the computer starts up.

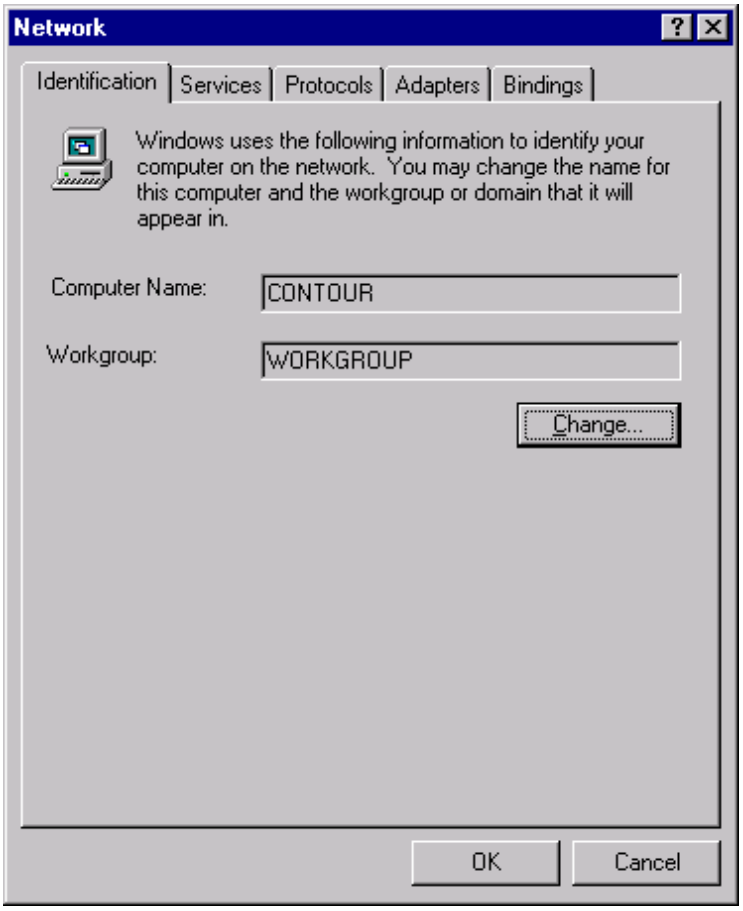
16. Press Finish and the setup is complete.

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Configuring the Industrial Computer to Run on a Microsoft Network

Before configuring your Panel C computer for a network, you should consult your network administrator. Duplicate TCP/IP addresses and duplicate computer names on the same network can cause network problems.

1. Click the Start Icon, then click Settings, and Control Panel.
2. In the Control panel window, double click the Network icon. The Network dialog box appears.



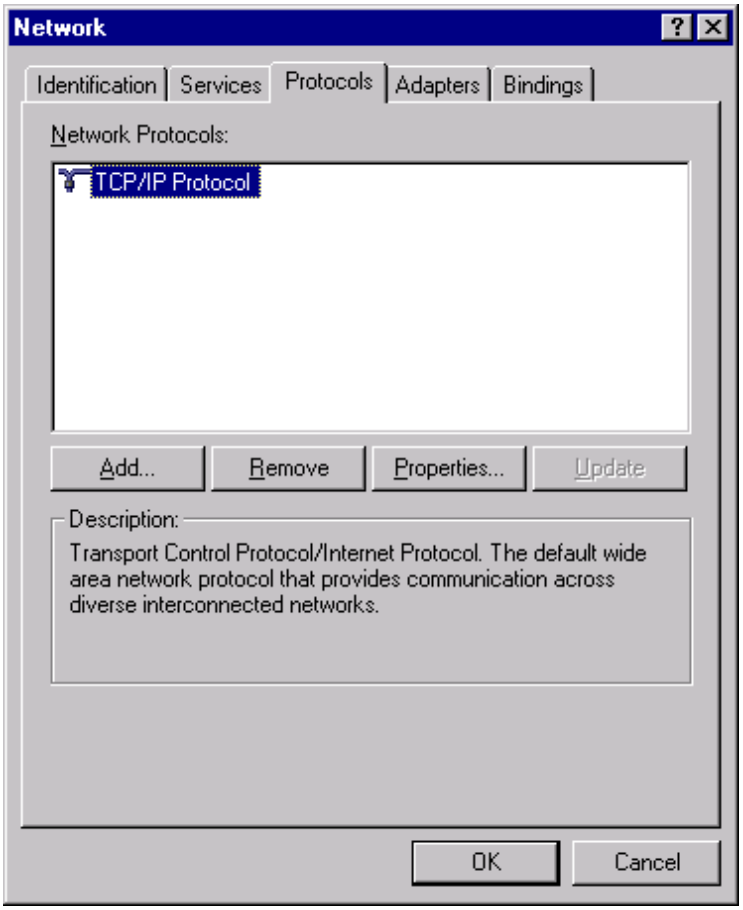
3. On the Identification tab, click Change. You will need to verify your Computer Name (entered at machine startup) and Workgroup name.

Note: Computer names must be less than or equal to ten characters to run Panel C software. Each computer on a network must have a unique name.

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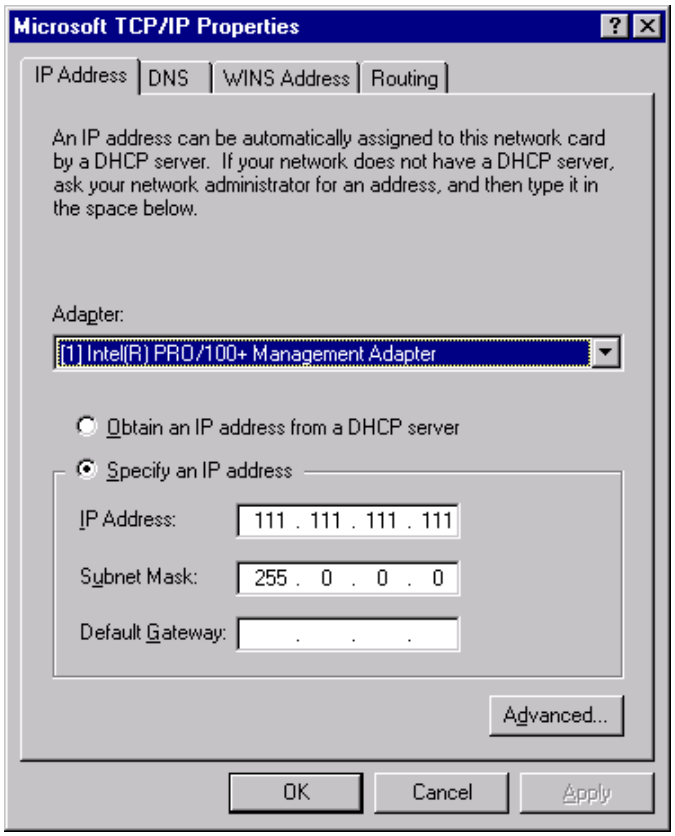
4. To modify the TCP/IP properties,

   A. Go to the Protocols Tab, highlight TCP/IP protocol, and click Properties.



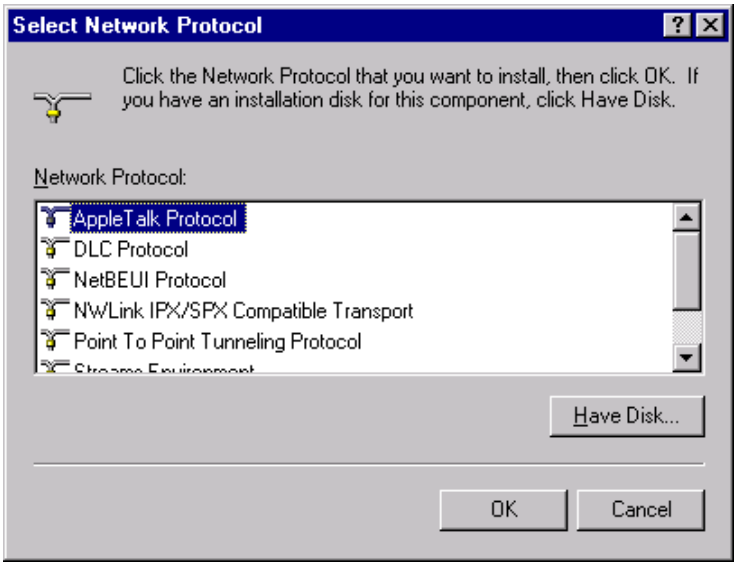
   B. In the Microsoft TCP/IP Properties, change the Address from 111.111.111.111 to a unique address and change the subnet mask from 255.0.0.0 to your subnet mask. If your network's IP addresses are controlled by a DHCP server, change the setting from Specify an IP address to Obtain an IP address from a DHCP Server.

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Note: The factory setting for the IP is 111.111.111.111 and for the Subnet is 255.0.0.0. If necessary, consult your network engineer to select appropriate addresses.

5. To add other protocols such as NetBEUI, on the Protocols tab of the Network dialog box, click Add. A list of available protocols will appear. Choose the protocol you wish to install and click OK. The system may ask where the Setup files are located. They are in the C:\I386\ directory.

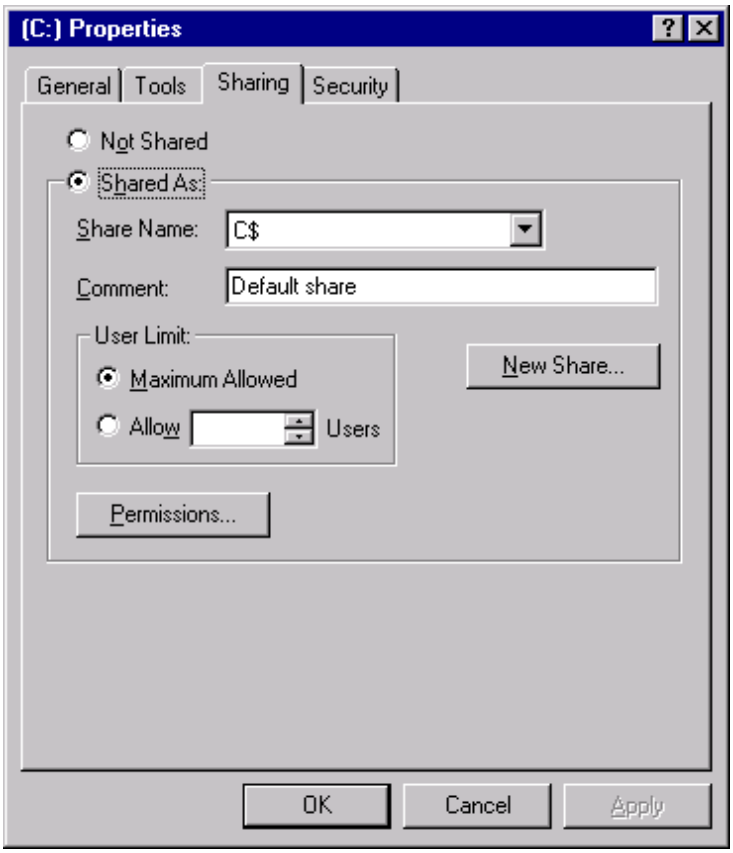


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Note: It is recommended that after the system accesses the original Windows NT install files, the Windows NT Service Pack be reinstalled to update any files that were added or overwritten.

6. When you have finished setting up the Network, click OK in the Network dialog box. Click Yes to reboot your system now.

7. The network shares for the system have been left at their default administrative settings. To modify them, double click My Computer on the desktop, highlight C:, and view the drive's properties by clicking File, Properties. Select the Sharing tab.



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Installing Application Software

The Windows operating system and GE Fanuc software are loaded onto the industrial computer at manufacture. If it is necessary to reload software, follow the instructions in the documentation supplied with the software.

Directory Structure

The contents of the industrial computer hard drive, as shipped from GE Fanuc are listed below.

C:\i386	**Windows OS CD**
C:\Drivers\Touch	**Touch screen drivers**
C:\Drivers\Ethernet	**Network drivers**
C:\SP6	**Service pack 4 drivers (NT ONLY)**

Add any Other Dirs for Service Pacs per Op

Note: If you reload any Windows NT component requiring files, such as a network driver, you must reload service pack 6.

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Image Recovery

The following procedure provides instruction on how to use the *Field Image Recovery Disk* (44A749863-G01Rxx). This disk will enable you to recover all software on your computer as received initially from GE Fanuc.

Caution

Before attempting an Image Recovery on your unit, make sure to record all critical settings and conduct a full back up of all software projects and critical documents. You will also need to have your application software registration and Microsoft Authorization Numbers handy. This process will clear all contents from your Hard Drive and return your system to the factory configuration.

Instructions for Image Recovery

1. Prior to Image Recovery, you will need to connect the following equipment:
   - a standard PS/2-type keyboard
   - an external floppy disk drive (available from GE Fanuc – **IC850FDD101**)
2. Insert the *Field Image Recovery Disk* into the floppy drive.
3. After inserting the Recovery Disk, the system will prompt you to restore the image. Select **<1>** to “RESTORE SYSTEM TO ORIGINAL CONDITION”. If you have initiated this process in error, press **<2>** and Exit the Recovery program.
4. Select **<1>** again to “PROCEED WITH SOFTWARE RESTORE”. Choose **<2>** to cancel Recovery and exit to MS-DOS .
5. At this point the factory image will be recovered from a hidden partition on the Hard Drive. This will take approximately 12 minutes. When prompted, reboot your system.
6. After rebooting your unit, the system will bring you to the initial startup screens as received from the factory.

If you have questions about this procedure, please contact 1-800 GE FANUC.

Shutting Down the Computer

Caution

To avoid damaging files, always shut down Windows software before removing power from your Panel C.

To shut down Windows operating system software, select Shut Down from the Start menu.

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Chapter 3

Hardware Installation

This chapter describes the procedures for the safe location and securing of the Panel C industrial computer. The Panel C industrial computers have been designed to ensure simple installation of the system.

A single cut-out in the mounting panel is all that is required when mounting the industrial computer. No extra mounting holes are needed. Instead, 10 clips are supplied and are used to secure the unit from behind the mounting panel.

This chapter also describes how to install ISA and PCI cards.

Warnings for Class 1 Division 2 Approval

- Input and output wiring methods must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction.
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, or D or non-hazardous locations only.
- WARNING - Explosion Hazard - Substitution of components may impair suitability for Class 1 Division 2.
- WARNING - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- WARNING - Explosion Hazard - Do not replace equipment unless power has been switched off or the area is known to be non-hazardous.
- Equipment shall be connected to no greater than a 20 Amp branch circuit.
- Do not install or remove SCSI devices or cards while circuit is alive.
- WARNING – Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.
- Replace battery only with Duracell part number 2032 or Panasonic part number BR2032. Use of another battery may present a risk of fire or explosion.
- Keyboard and mouse are to be used for initial programming only and not to be left connected.
- For non-incendive field connections, refer to Control Drawing DR00, which is provided in Appendix A.

Note: The proper method for removing power from the unit is to switch off power at the circuit breaker.

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Installation Guidelines

AC Input Power

- The Panel C input power shall be connected to no greater than a 20 Amp branch circuit.
- To remove power from the unit, the proper method is to switch off power at the circuit breaker.

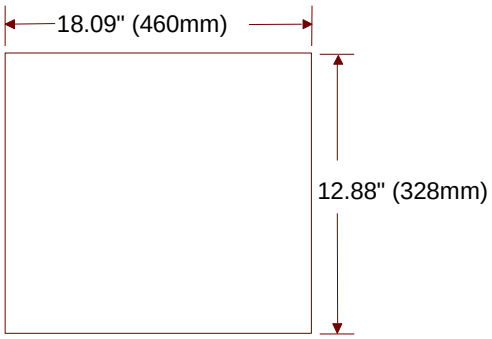
Panel Mounting

- In an industrial environment, the panel into which the unit is mounted should provide protection from dust, dirt and water.
- The panel should be capable of supporting the weight (22.2lb/10.07kg) of the industrial computer without distortion to the panel. The mounting clips will support a panel thickness of up to 5mm (0.2 inch).
- All of the mounting clips must be fitted properly to achieve a seal between the industrial computer and the panel to which it is mounted.
- Inlets and outlets must have at least 25mm of space around them and not be obstructed.

  Adequate airflow around the exterior of the unit is important to the interior temperature of the unit. Fans are used to create air flow through the industrial computer ensuring that a correct working temperature is maintained. There are three fans in the unit. One of the fans is located on top of the CPU chip and is used to cool the processor. The second fan is built into the power supply housing and blows air out of the unit. The third fan is located on the rear of the chassis cover and pulls air into the unit.

Cutting the Panel Cutout

Cut an opening in the panel to the dimensions shown. The cut-out dimensions of 18.09" (460mm) x 12.88" (328mm) allow a 1.2mm clearance on each edge of the industrial computer front assembly. The unit requires a minimum of 178mm (7") depth when mounted.



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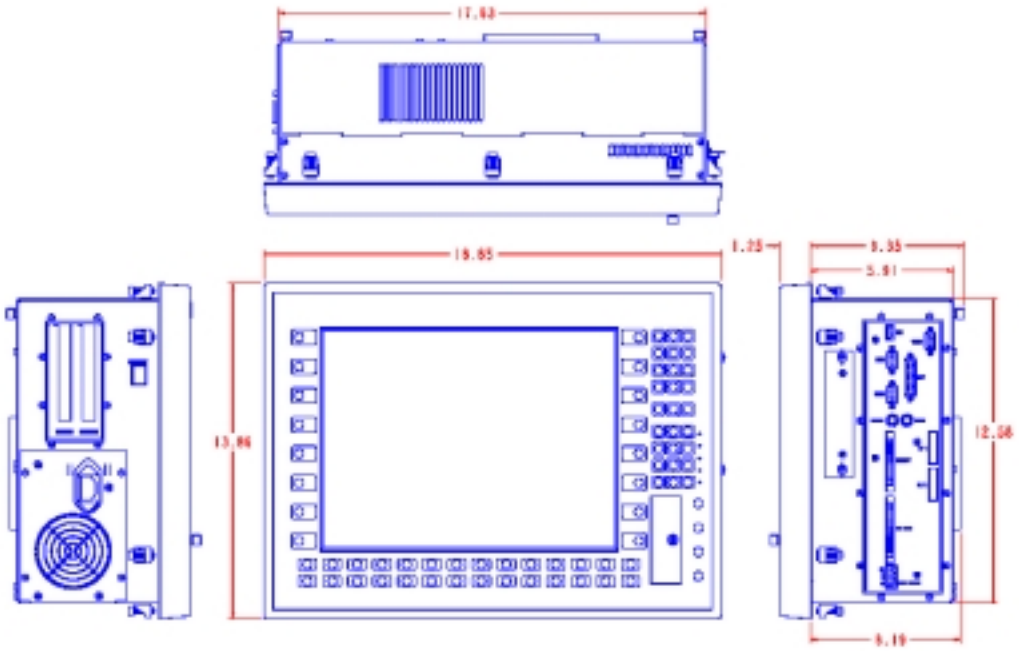


Figure 3-1. Panel C Industrial Computer Dimensions

Installing Panel Mounting Clips

1. Position the Front Panel in the cut-out and fit the 10 retaining clips into the slots on the industrial computer. To produce a good seal, you must use all the clips.
2. Screw in the tightening screws on each clip so that the clip is held snug. To ensure a seal between the computer front panel and the mounting panel, the clips must be tightened evenly. (Tighten each of the clips in turn, a little at a time.) Torque setting must be within 2.6 to 4.4 in-lbs (0.29 to 0.50 newton-meters).

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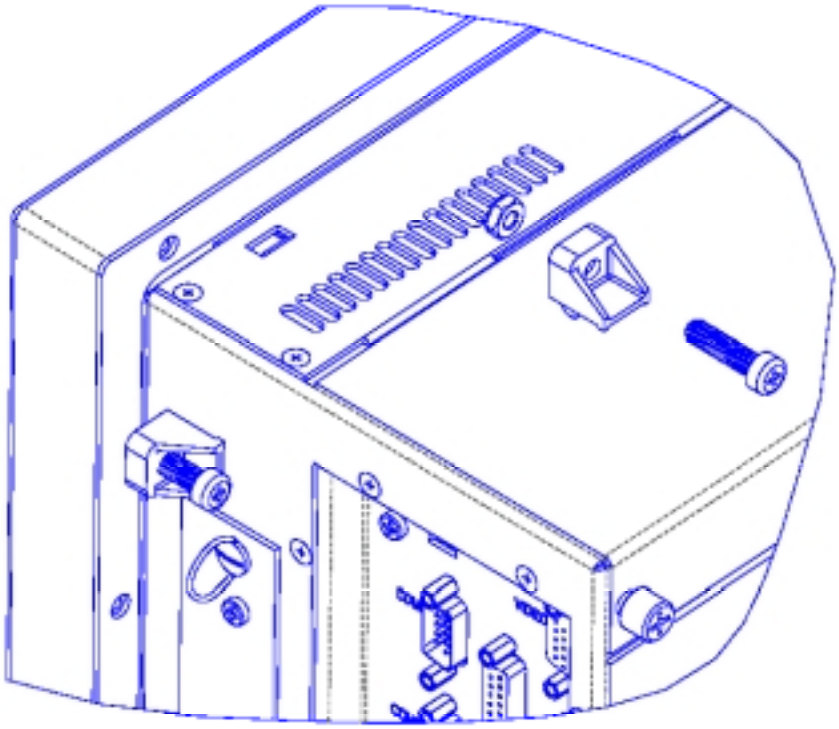


Figure 3-2. Installing Retaining Clips

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Installing Expansion Cards

The Panel C industrial computer provides multiple expansion slots.

- One PCI slot
- One Shared ISA/PCI slot

Note: If your card is a Legacy ISA type, follow the instructions on page 3-6, then proceed with installation.

All the expansion slots within the system allow the card to be clamped into place using standard PC card clamping.

The top cover of the industrial computer must be removed in order to access the ISA and PCI bus cards. Two thumb screws are used to secure the panel cover to the unit.

When the thumb screws are loosened, the back plate will slide upwards and can then be lifted clear of the main unit.

Warning

Do not connect or disconnect expansion cards or cables while circuit is alive unless area is known to be non-hazardous.

Caution

To avoid damage from electrostatic discharge, adhere to the following precautions when installing ISA and PCI cards:

- The card is packaged in a static-safe bag that protects the product during shipping. Before removing the card from this bag, be prepared to handle it in a static-safe environment.
- Wear a properly functioning antistatic strap and be sure that you are fully grounded. Never touch the card, or any components inside the computer, unless you are wearing an antistatic strap.
- Any surface upon which you place the unprotected card should be static-safe, facilitated by antistatic mats, if possible.
- Extra caution should be taken in cold, dry weather, when static charges can easily build up.

Blanking Plates

Blanking plates are fitted to each unused card position. These blanking plates can be removed as necessary in order to install new cards. Any empty slots must have a blanking plate fitted to maintain agency EMI approvals.

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Configuring Expansion Cards (Legacy ISA Only)

Caution

For most applications an IRQ or address cannot be shared by more than one resource. If more than one resource is set to the same interrupt or address, the application may not respond properly and could cause your PC to lock up. Following these instructions when installing Legacy ISA cards will prevent problems with resource conflicts.

Legacy ISA cards are the oldest standard and require memory, I/O, and IRQ settings to be manually set on the card using jumpers, DIP switches, or a configuration program. The card and system need to have the same hardware settings.

1. Connect a keyboard, turn on the system power, and press F2 when prompted to enter the BIOS Setup program.
2. Select Advanced, then PCI Configuration, and PCS/PNP ISA Resource Exclusion.
3. If the card requires one or more interrupts, go to an IRQ that currently reads "Available" and change it to "Reserved" by pressing +/-. Do ***not*** use an IRQ that already reads "Reserved."
4. If the card requires memory space, press the arrow key to return to the PCI Configuration screen. Select PCI/PNP ISA UMB Region Exclusion. Go to a memory block that currently reads "Available" and change it to "Reserved" by pressing +/-. Do ***not*** use a memory block that already reads "Reserved."
5. Press ESC to exit the configuration screen. In the Exit menu, select Exit Saving Changes and to save and exit Setup. When the screen goes blank, turn off the power.
6. If the card has jumpers or DIP switches, set them so that they match the IRQ and memory addresses set in the BIOS Setup.
7. Set the I/O port settings of the card (if any) so that they fall within the ranges labeled "Available" in the following table.
8. If the card is set up using a configuration program, proceed with installation, run the card's configuration program. Set the IRQ and memory address settings to be the same as those put into BIOS Setup. Set the I/O port settings (if any) to a range labeled "Available" in the following table.

Table 3-1. I/O Port Range Table

000-1FF	Reserved
200-277	Available
278-2FF	Reserved
300-377	Available
378-3DF	Reserved
3E0-3EF	Reserved
3F0-3FF	Reserved

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Chapter

4

Connectors and Cabling

This chapter describes the connector layout and cabling requirements on the standard Panel C industrial computer. Power and communication connectors are described in this section.

Communication connectors are provided from the main CPU motherboard. Some of the CPU motherboard connectors are available under the front access panel as well as on the right side of the unit.

- Three USB ports, including two USB ports (front access) and one USB port (side access).
- One Compact Flash port (front access)
- PS/2 Keyboard (side access)
- PS/2 mouse port (side access)
- Connector for external floppy disk drive (side access)
- Connector for external CD-ROM drive (side access)
- Video output (side access)
- Parallel port, LPT1 (side access)
- Two serial ports, COM1 and COM2 (side access)
- Ethernet 10/100 base T (RJ-45) (side access)

For details about connectors on proprietary cards you have installed in your industrial computer, refer to the manufacturer's documentation provided with your card.

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Power Input

The power supply input to the industrial computer uses a standard IEC cable, which is provided with the unit.

For power requirements, refer to specifications in chapter 8. There are no user-serviceable fuses.

Warning

For all equipment that is connected to a power outlet, the socket outlet shall be installed near the equipment and shall be easily accessible. (For non-hazardous locations only.)

Caution

External devices (printer, external disk drive etc.) should not be powered up when connecting to ports.

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Communications Ports

Two USB ports and a Compact Flash port are located behind the front access cover in the lower right-hand side of the unit (Figure 4-1). To open the cover, loosen the thumb screw.

All other ports are located on the right side panel (Figure 4-2).

Port Configurations

Port	*IRQ*	*Addresses*
COM1	4	3F8h
COM2	3	2F8h
COM3 (Touch Option)	9	2E8h
LPT1	7	378h

USB Ports

These USB ports, along with the USB port on the side of the unit, are intended for such tasks as initial set up, downloading data, and uploading software. It is not intended for these ports to be connected continuously to devices.

Compact Flash Port

A Compact Flash device can be connected to this port for tasks such as backing up data.

For nonincendive field wiring, use only 64MB flash card SANDISK SDCFBI-64-101-00



Figure 4-1. Connectors Located Behind Front Access Panel

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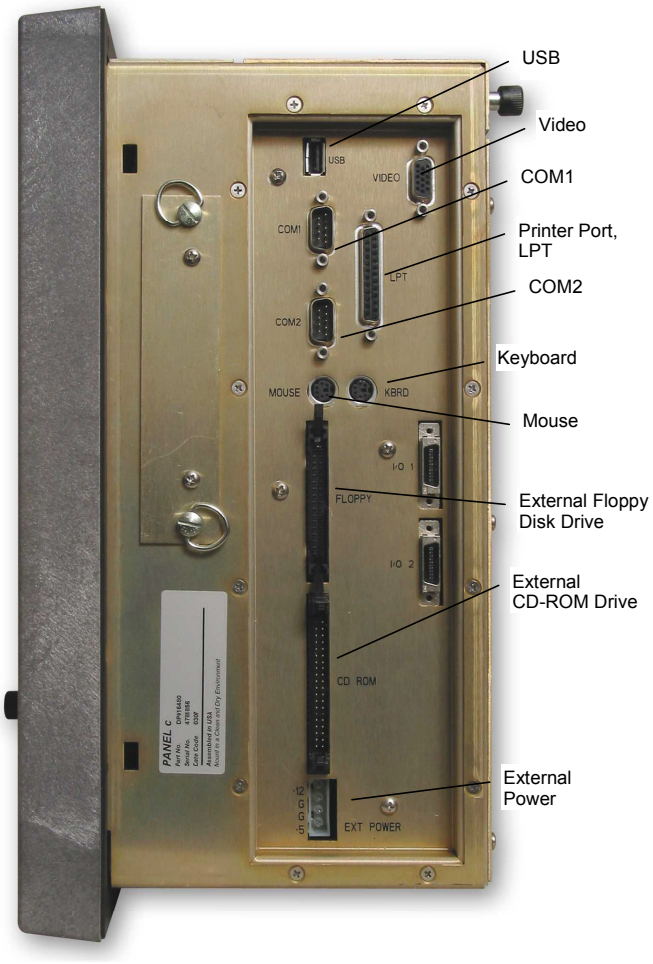


Figure 4-2. Connector Locations on Right Side Panel

Mouse and Keyboard Ports

Two PS2 ports, labeled MOUSE and KBRD, are located on the right side access panel. This temporary connection is intended to be used for such things as initial setup, downloading data, uploading software, etc.

Keyboard/Mouse (6-pin mini-DIN PS/2 socket)

Pin Number	*Signal name*
1	Data
2	NC
3	GND
4	+5V
5	Clock
6	NC

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Floppy Disk Drive and CD-ROM Ports

Connectors for an external floppy disk drive and an external CD-ROM drive are located on the right side access panel. These ports are labeled accordingly. This temporary connection is intended to be used for such things as initial setup, downloading data, uploading software, etc.

Video Output Port

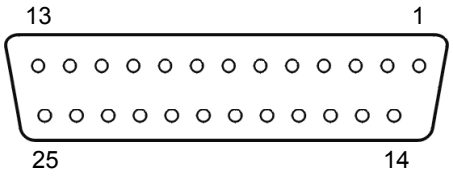
Video monitor output is accessible on the DB15 side access connector. The pinouts are shown in the following table: This port is not intended to be connected continuously to a video monitor.

VGA DB15	
1	RED
2	GREEN
3	BLUE
4	MONITOR ID BIT 2
5	SELF TEST (GND)
6	GND
7	GND
8	GND
9	NC
10	GND
11	MONITOR ID BIT 0
12	MONITOR ID BIT 1
13	H SYNC
14	V SYNC
15	MONITOR ID BIT 3

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Printer Port LPT1

A 25-pin D-type female printer port (LPT1) connector is available on the right side access panel. The port is labeled accordingly and is not intended to be connected continuously to printers.

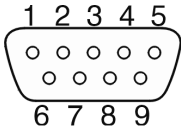


Pin	*Assignment*	*Pin*	*Assignment*
1	Strobe	10	Acknowledge
2	Data Bit 0	11	Busy
3	Data Bit 1	12	Paper End
4	Data Bit 2	13	Select Out
5	Data Bit 3	14	Auto Feed XT
6	Data Bit 4	15	Error
7	Data Bit 5	16	Initialize Printer
8	Data Bit 6	17	Select In (from Printer)
9	Data Bit 7	18 to 25	Ground

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Serial Communication Ports

The COM1and COM2 serial ports are available on the side panel. The COM3 serial port is used by the touchscreen and is not accessible to the user. The standard 9-pin D-sub connector pin out is shown below.



RS-232C Name	*Pin*	*Assignment*
CF	1	DCD (Data Carrier Detect)
BB	2	RX (Receive Data)
BA	3	TX (Transmit Data)
CD	4	DTR (Data Terminal Ready)
AB	5	GND (Signal Ground)
CC	6	DSR (Data Set Ready)
CA	7	RTS (Request to Send)
CB	8	CTS (Clear to Send)
CE	9	RI (Ring Indicator)

Shielding

The D type connector covers should be metallized plastic or die cast metal and terminated with 360-degree termination of the shield, as illustrated in Figure 4-3 below.

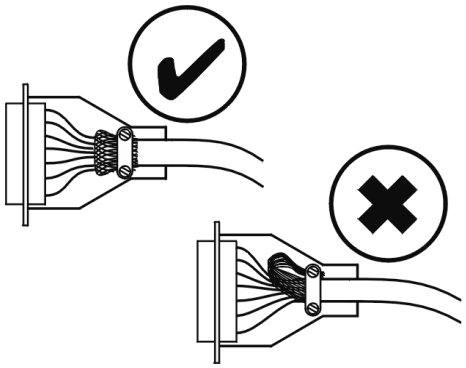


Figure 4-3. High Frequency Grounding

Grounding

Serial cables (COM1 and COM2) must be shielded and grounded in order to maintain CE Mark compliance, provide higher EMC immunity, and satisfy the requirements of IEC/EN61000-4-4 and IEC/EN61000-4-5. The shield conductor should remain continuous to the unit, and insulation should be removed only at the grounding point. The grounding should be such that a 360-degree contact is made to the cable shield. Figure 4-4 shows an example with the insulating cover of the cable stripped back.

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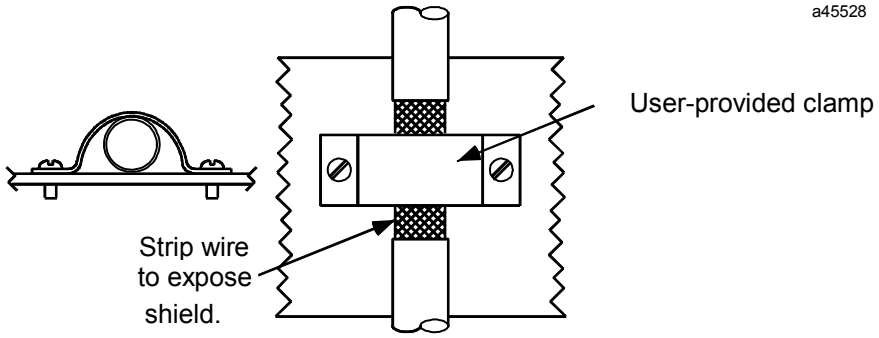
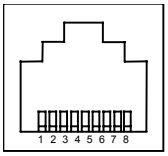


Figure 4-4. Cable Cover Shielding

Ethernet Communication Port

The Panel C provides an RJ-45 (10BaseT/100BaseT) Ethernet connector on the left side of the unit. The RJ-45 twisted pair connector is an 8-pin MAU MDI connector.



Pin No.	*Signal*	*Description*
1	TD+	Transmit Data +
2	TD-	Transmit Data –
3	RD+	Receive Data +
4	NC	no connection
5	NC	no connection
6	RD-	Receive Data –
7	NC	no connection
8	NC	no connection

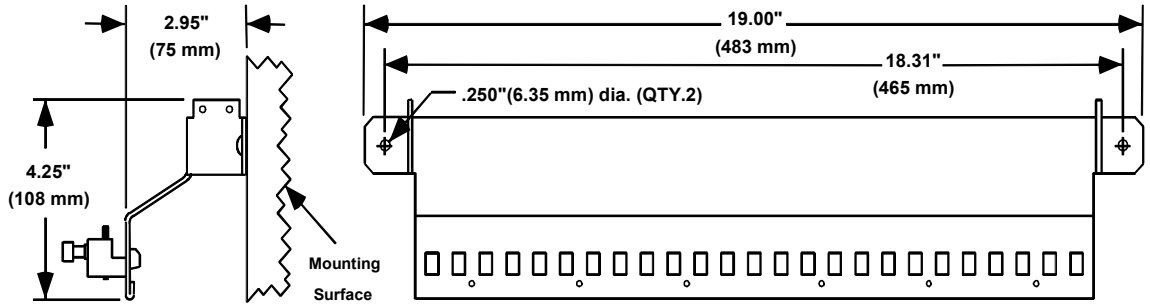
Grounding

Ethernet cable must be shielded and grounded in order to maintain CE Mark compliance, provide higher EMC immunity, and satisfy the requirements of IEC/EN61000-4-4, IEC/EN61000-4-5, and ANSI C37.90a. The shield conductor should remain continuous to the unit, and insulation should be removed only at the grounding point. The grounding should be such that a 360-degree contact is made to the cable shield. Figure 4-4 shows an example with the insulating cover of the cable stripped back.

Alternate Grounding Method

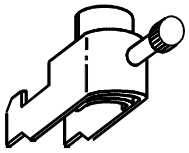
An alternative to the user-provided clamp as described in the previous sections, is the cable shield clamping assembly (IC697ACC736) available from GE Fanuc. This cable shield clamping assembly provides a high frequency ground for shielded cables via a ground plate and six cable clamps. Figure 4-5 shows the dimensions required for mounting. The figure also shows a cable clamp.

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Side View with Spacing Requirements

Front View with Mounting Dimensions



Cable Clamp

(Six cable clamps included with assembly.)

*** Additional cable clamps available (12 per package), catalog number IC697ACC737.**

Figure 4-5. Ground Plate Outline, Mounting Dimensions, and Cable Clamp

The ground plate should be mounted near the unit. The cable clamp provides mechanical relief as well as electrical grounding. A typical installation is shown in Figure 4-6.

The cable clamp attaches to the ground plate by sliding it into two adjacent slots at the selected location for the cable. The cable is inserted between the ground plate and the cable clamp after removing the required section of the cable's outer cover. Tighten the cable clamp by turning the thumbscrew clockwise. *Do not over-tighten the thumbscrew—hand-tighten or tighten lightly with a tool.*

Note: If you are installing the ground plate on a painted surface, the paint must be removed where the ground plate is to be mounted to ensure a good ground connection between the plate and mounting surface.

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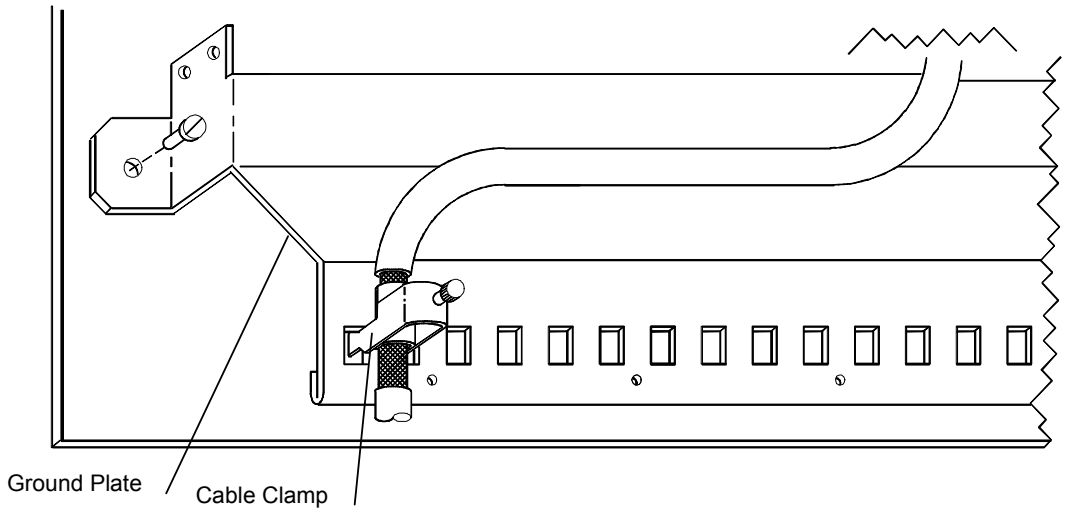


Figure 4-6. Example of Cable Shield Clamping Assembly Installation

The maximum diameter cable that can be used with the cable clamp is 0.51 inches (13mm) as shown below in Figure 4-7. Minimum cable diameter that can be used with the clamp is 0.24 inches (6mm). Multiple cables can be placed in the clamp if the cable diameter is smaller than the minimum.

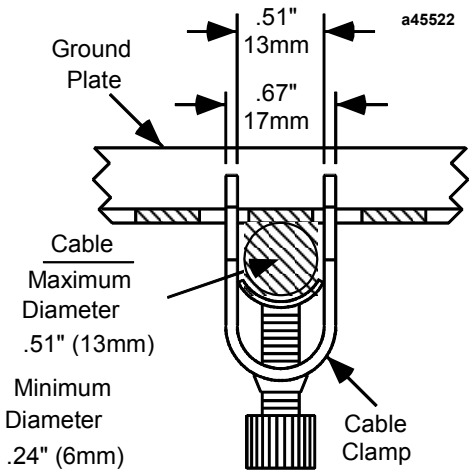


Figure 4-7. Cross Section of Cable Secured by Clamp

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The insulating cover on the shielded cable must be removed to allow maximum contact between the cable shield and the cable clamp as shown in Figure 4-6.

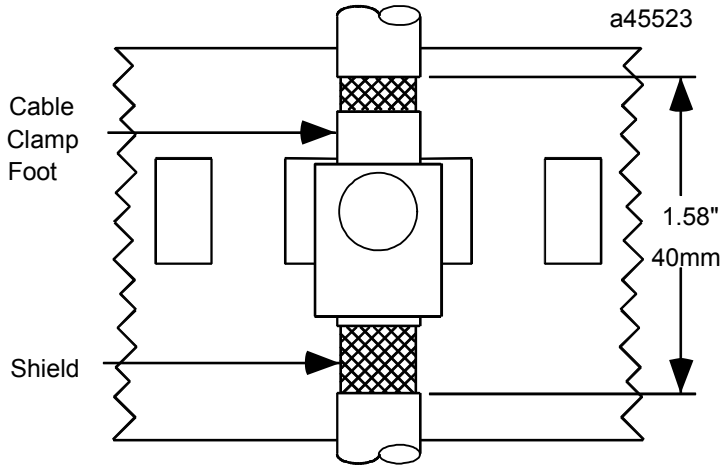


Figure 4-8. Clamped Cable with Exposed Shield

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Chapter 5 System Operation

This chapter provides details of system operation. The following topics are covered:

- System Peripherals
- External Keyboard and Mouse
- Graphic System
- Operator Interface
- Communications

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System Peripherals

Removable Hard Disk Drive

The Panel C industrial computer system has a single removable hard disk drive. The drive is located on the side of the unit. The disk drive has a standard EIDE/ATA-2 interface. The standard size is 20GB or larger.

To remove the disk drive,

1. Shut down the operating system and remove power from the computer.
2. Turn the locking keys ¼ turn. The locking keys cannot be removed from the drive assembly.
3. Using the handles on the locking keys, pull the drive out of the enclosure.
4. Disconnect the IDE interface cable from the hard drive.

CD-ROM Drive

Panel C industrial computers include a connector for an external CD-ROM drive option. The CD-ROM connector and power connector are located on the side access panel.

Floppy Disk Drive

Panel C industrial computers include a connector for an external 3.5” 1.44Mb floppy disk drive option. The floppy drive connector and power connector are located on the side access panel.

External Keyboard and Mouse

An external keyboard and mouse (both using PS/2 connectors) can be attached via the connectors on the side access panel.

The touch screen and PS/2 mouse will work simultaneously if the mouse is Microsoft or IBM PS/2 compatible.

Graphic System

The standard Panel C industrial computer includes a 15 inch color TFT (XGA resolution) screen. The flat screen display has the following features:

- High Luminance (equal to or greater than 200cd/m2)
- Wide angle viewing
- A built-in back light with a long life back light tube (equal to or greater than 25,000 hrs)

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Operator Interfaces

Keypads



The Panel C industrial computer incorporates a keypad with 75 front panel keys to provide a wide range of alphanumeric and control functions.

- Function keys, which provide 26 alpha characters when used in the Function (FN) mode
- Full numeric keypad with special character keys when used in the SHIFT mode
- Control keys including 4 arrow keys
- 16 Operator defined keys

The main keypad returns the same scan codes as a standard PC/AT keyboard, listed in Table 5-1.
If an external PC/AT keyboard is connected, the integral keypads remain functional.

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Table 5-1. Membrane Keypad Scan Codes [Reviewers: Verify AT Character and scan codes here]

	Without SHIFT Key		With SHIFT Key		With CAPS LOCK Key	
Keypad	**AT Character**	**Scan Code (Hex)**	**AT Character**	**Scan Code**	**AT Character**	**Scan Code (Hex)**
7	7	0837	\	2B5C	\	2B5C
8	8	0938	/	352F	/	352F
9	9	0A39	:	273A	:	273A
4	4	0534	;	273B	;	273B
5	5	0635	,	332C	,	332C
6	6	0736	"	2822	"	2822
1	1	0231	%	0625	%	0625
2	2	0332	[	1A5B	[	1A5B
3	3	0433	]	1B5D	]	1B5D
0	0	0B30	_	0C5F	_	0C5F
-	-	4A2D	+	4E2B	+	4E2B
. (PERIOD)	. (PERIOD)	342E	?	353F	?	353F
INSERT	Insert	5200	*	372A	*	372A
ENTER	ENTER	1C0D	ENTER	1C0D	ENTER	1C0D
ESCAPE	Escape	011B	Escape	011B	Escape	011B
TAB	Tab	0F09	Shift Tab	0F00	Shift Tab	0F00
PRINT	None	None	None	None	None	None
SPACE	Space	3920	Space	3920	Space	3920
ALT	Left alternate	None	None	None	None	None
CTRL	CTRL	None	None	None	None	None
DELETE	Delete	5300	Delete	5300	Delete	5300
PAGE↑	Pageup	4900	Pageup	4900	Pageup	4900
BKSP	BKSP	0E08	BKSP	0E08	BKSP	0E08
HOME	Home	4700	Home	4700	Home	4700
PAGE↓	Pagedown	5100	Pagedown	5100	Pagedown	5100
END	End	4F00	End	4F00	End	4F00
←	Left arrow	4B00	Left arrow	4B00	Left arrow	4B00
→	Right arrow	4D00	Right arrow	4D00	Right arrow	4D00
↑	Up arrow	4800	Up arrow	4800	Up arrow	4800
↓	Down arrow	5000	Down arrow	5000	Down arrow	5000
LOCK CAPS	LOCK CAPS	None	None	None	None	None
SHIFT (1)	SHIFT (1)	None	None	None	None	None
F1	F1	3B00	a	1E61	A	1EF1
F2	F2	3C00	b	3062	B	3042
F3	F3	3D00	c	2E63	C	2E43
F4	F4	3E00	d	2064	D	2044
F5	F5	3F00	e	1265	E	1245
F6	F6	4000	f	2166	F	2146
F7	F7	4100	g	2267	G	2247
F8	F8	4200	h	2368	H	2348
F9	F9	4300	i	1769	I	1749
F10	F10	4400	J	246A	J	244A
F11	F11	8500	k	256B	K	254B
F12	F12	8600	l	266C	L	264C

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Table 5-1. Membrane Keypad Scan Codes – Continued

	Without SHIFT Key		*With SHIFT Key*		*With CAPS LOCK Key*	
Keypad	***AT Character***	***Scan Code (Hex)***	***AT Character***	***Scan Code***	***AT Character***	***Scan Code (Hex)***
F13	Ctrl Alt F3	6A00	m	326D	M	324D
F14	Ctrl Alt F4	6B00	n	316E	N	314E
F15	Ctrl Alt F5	6C00	o	186F	O	184F
F16	Ctrl Alt F6	6D00	p	1970	P	1950
F17	Ctrl Alt F7	6E00	q	1071	Q	1051
F18	Ctrl Alt F8	6F00	r	1372	R	1352
F19	Ctrl Alt F9	7000	s	1F73	S	1F53
F20	Ctrl Alt F10	7100	t	1474	T	1454
F21	Ctrl Alt F11	8B00	u	1675	U	1655
F22	Ctrl Alt F12	8C00	v	2F76	V	2F56
F23	Left shift F11	8700	w	1177	W	1157
F24	Left shift F12	8800	x	2D78	X	2D58
F25	Ctrl F11	8900	y	1579	Y	1559
F26	Ctrl F12	8A00	z	2C7A	Z	2C5A
L1 (2)	Left shift F1	5400	Left shift F1	5400	Left shift F1	5400
L2	Left shift F2	5500	Left shift F2	5500	Left shift F2	5500
L3	Left shift F3	5600	Left shift F3	5600	Left shift F3	5600
L4	Left shift F4	5700	Left shift F4	5700	Left shift F4	5700
L5	Left shift F5	5800	Left shift F5	5800	Left shift F5	5800
L6	Left shift F6	5900	Left shift F6	5900	Left shift F6	5900
L7	Left shift F7	5A00	Left shift F7	5A00	Left shift F7	5A00
L8	Left shift F8	5B00	Left shift F8	5B00	Left shift F8	5B00
R1 (2)	Ctrl F1	5E00	Ctrl F1	5E00	Ctrl F1	5E00
R2	Ctrl F2	5F00	Ctrl F2	5F00	Ctrl F2	5F00
R3	Ctrl F3	6000	Ctrl F3	6000	Ctrl F3	6000
R4	Ctrl F4	6100	Ctrl F4	6100	Ctrl F4	6100
R5	Ctrl F5	6200	Ctrl F5	6200	Ctrl F5	6200
R6	Ctrl F6	6300	Ctrl F6	6300	Ctrl F6	6300
R7	Ctrl F7	6400	Ctrl F7	6400	Ctrl F7	6400
R8	Ctrl F8	6500	Ctrl F8	6500	Ctrl F8	6500

Table 5-1. Notes:

1. The SHIFT key produces no scan codes on its own, but modifies the scan codes produced by the other keys as indicated in the table above.
2. The white, unmarked soft keys located on both sides of the display are listed as L1-L8 (left side) and R1-R8 (right side) above.

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Control and Status LEDs

The Panel C industrial computer includes five status LEDs, located in a vertical column above the arrow keys on the lower right-hand side of the unit. The five LEDs have the following functions, in order from top to bottom:

Table 5-2. Indicators

Symbol	*Name*	*Function*
FN	Function Key	Indicates the function key is active.
	Shift	Indicates the Shift lock is enabled..
	HDD/Error	This is a tri-color LED. Red indicates a BIOS detected error. Green is the normal IDE drive activity indicator. During an error the HDD/Error LED will be Amber.
	Power	Indicates system power (lighted when power is applied).
	Compact Flash	Indicates Compact Flash card is inserted.

Touch Screen

The Panel C includes a resistive overlay touch screen on the flat panel display.

The touch screen has a resolution of 1024 x 1024 touch points (independent of screen size) and provides an efficient and reliable method of entering information. The screen responds to the touch of your finger with or without a glove.

The touch screen is connected internally to the COM3 serial port. If you install a card that has settings that conflict with those of the COM3 serial port, you will need to change the card's configuration.

Touch Screen Driver for Windows

The integral touch screen of the Panel C is internally connected to COM3. Parameters must be set within the driver so that they match the hardware settings. The factory default settings are:

COM Port = 3
Address = 3F8 Hex
Interrupt = Com3 IRQ 9

These parameters are written into the system registry file by the driver setup utility. The driver is installed, configured and calibrated at the time of manufacture.

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Communications

Your industrial computer has been configured with networking components that enable you to establish new networks or connect to existing networks easily. If you intend to use Microsoft NetBEUI, TCP/IP, or Direct Cable Connection, some minimal setup changes are required before you can use the system for network applications. In Windows operating systems, these settings are changed using the Network application in the Control Panel program group.

Table 5-3. Installed Network Components

Network Component	*Comments*
PCI Network Adapter	Automatically configured in system
TCP/IP	Default settings must be changed before connecting to an existing network. Contact your network administrator for appropriate settings.
NetBEUI	Default settings must be changed before connecting to an existing network. Contact your network administrator for appropriate settings.
System Identification	Computer Name: Each system is uniquely identified by its serial number and can be renamed before adding it to an existing network Workgroup: The default workgroup is **Workgroup**. This should be renamed before adding it to an existing network.

Caution

The IP Address must be changed to a unique address. If it is not changed, conflicts could occur on your network.

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Chapter 6 BIOS Settings

It is normally not necessary to change the hardware configuration settings in the CMOS memory. If settings become corrupted, follow the procedures here to reload the factory configuration.

1. Power down the computer, connect a keyboard and turn on the power. Enter the Setup mode by pressing the F2 key when prompted during the computer power-up sequence. The main BIOS setup utility screen will appear offering several options for changing settings.
2. In the EXIT menu - Load BIOS defaults.
3. In the ADVANCED menu, select Installed OS. Change to “Other.”
4. Arrow to IO Device Configuration. Press ENTER.
5. Make the following menu selections:

USB	Disable
Audio	Disable
COM: A (COM1 on side)	3F8 / IRQ 4
COM: B (COM2, touch screen)	2F8 / IRQ3
COM: C (COM3 on side)	3E8 / IRQ 9
COM: D (COM4 on front)	2E8 / IRQ11
LPT:A (LPT1 on front)	ECP / 378 / IRQ7 / DMA3
LPT:B (LPT2 on side)	ECP / 278 / IRQ5/ DMA0

6. To save your changes, press ESC. In the Exit menu, select Exit Saving Changes.

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Chapter 7 Diagnostics and Troubleshooting

This chapter consists of “Self-Test Diagnostics,” “Troubleshooting,” and “Corrective Actions.” “Self-Test Diagnostics,” describes how to respond to errors that could be detected by the automatic self test that is performed each time the Panel C industrial computer powers up. “Troubleshooting” contains tables of symptoms, their possible causes, and recommended corrective actions. “Corrective Actions” contains detailed procedures that are too lengthy to include in the Troubleshooting tables.

Self-Test Diagnostics

The computer automatically performs self-test diagnostics each time it is powered up. The self-test consists of a series of checks that verify correct performance of the computer hardware. When the self-test is being performed, you will see the message XXXX KB OK displayed on the screen, where XXXX is a number that increases until it matches the amount of usable memory.

System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will see an error message on the screen. There are two kinds of errors: fatal and non-fatal. If a non-fatal error occurs, the system can usually continue the boot up sequence. Non-fatal error messages usually appear on the screen with the following instruction:

```
press <F1> to RESUME
```

Write down the message and press the F1 key to continue the bootup sequence.

System Configuration Verification

These routines check the current system configuration against the values stored in the CMOS memory. If they don’t match, the program will generate an error message. To correct this condition, you will need to run the BIOS setup program and correct the configuration information in memory.

There are three situations in which you might need to change the CMOS settings:

1. You are starting your system for the first time.
2. You have changed the hardware attached to your system.
3. The CMOS memory had lost power and the configuration information has been erased. If this has happened, call GE Fanuc’s Support Hotline at 1-800-800-433-2682.

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Troubleshooting

Powerup

Symptom	*Possible Causes*	*Solution*
Computer does not power up.	Power not on (PWR indicator is not lit or display completely dark).	Make sure that computer is plugged in. Make sure that power source is functioning properly.
Display is blank (PWR indicator is lighted).	See “Display” topic in this Chapter	See “Display” topic in this Chapter
Non-System disk or disk error message displayed.	Disk in floppy disk drive.	Remove floppy disk and then reboot or cycle power .
Safe Recovery Error message displayed.	Occurs on initial power up if the unit is accidentally turned off without first shutting down the Windows software.	The computer will power up normally.
Memory count during powerup self-test is incorrect.	Optional DIMM is installed incorrectly or is incompatible with the Panel C industrial computer CPU.	Make sure that the appropriate memory is installed correctly.
CMOS checksum error — Defaults loaded **CMOS battery failed** message displayed.	CMOS battery failure.	Replace the battery. For more information, see “CMOS Checksum Error” topic in this chapter.
A screen appears just after powerup, or just after reset, which has the title “CMOS Setup Utility.”	The F2 key has been accidentally pressed.	Cycle power again. The computer will power up normally.
The computer has reset even though the power was not interrupted.	The CTRL-ALT-DEL keys were pressed twice at the same time.	This should never be done, unless you are attempting to reset the computer.
A:> appears instead of software.	A system floppy disk is inserted.	Remove disk and cycle power.

Display

Symptom	*Possible Causes*	*Solution*
Characters are dim.	Computer screen is in direct light.	Change lighting.
Display is blank (PWR indicator is lit).	Screen temperature is outside operating range.	If computer is in direct sunlight, move it and allow it to cool.
	Computer is set up for invalid video mode.	Reboot. Select VGA Mode
	Screen saver is active.	Touch a key on the keypad.

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Memory

Symptom	*Possible Causes*	*Solution*
Memory count during powerup self-test is incorrect.	Optional DIMM is installed incorrectly or is incompatible with the Panel C industrial computer CPU.	Make sure that the appropriate memory is installed correctly.
`Out of Memory` message is displayed or insufficient memory error occurs during operation.	System ran out of memory for the application.	Check the memory requirements for the application. (Refer to the application documentation.) Install additional memory.
	Too many terminate and stay resident (TSR) programs running.	Modify the startup folder to use only those TSR applications that are really needed.

External PS/2 Mouse

Symptom	*Possible Causes*	*Solution*
Cursor does not respond to mouse movement	Mouse not plugged in.	Power down computer. Plug mouse into mouse port on computer and reboot.
	The type of mouse is not supported.	Use a PS/2 mouse.
	System is busy.	Press CTRL-ALT-DELETE to view task list.
	Mouse not detected.	Restart computer with external mouse connected.

Keyboard

Symptom	*Possible Causes*	*Solution*
External keyboard locks up	The type of keyboard is not supported.	Use PS/2 compatible keyboard
	Keyboard not plugged into keyboard port on the computer.	Plug keyboard in. (Power down computer first.)
	System is busy.	Press CTRL-ALT-DELETE to view task list.

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Communications

PLC/PC Connection

Symptom	*Possible Causes*	*Solution*
PANEL C does not communicate with a PLC that has been autoconfigured (AUTOCONFIG/DEFAULT/I/O error).	The system is attempting to communicate with a 90-30 PLC using the SNP driver and a PANEL C project.	1. With the PLC powered up and connected to the Display Station, establish communication between the Display Station and PLC via the 90-30 SNP driver. 2. Using a Hand-Held Programmer, toggle the Default I/O (Enable or Disable) configuration parameter for the CPU. Communications between the computer and the PLC will be stopped. (Communications are stopped when you toggle from Enable to Disable, or vice versa.) 3. Power cycle the PLC.
Communications between the host computer and the controller are unsuccessful.	COM port not configured in system.	Verify that the COM port is configured in the system.
	Cabling between computer and controller.	Verify that the cable between the computer and the controller is correctly wired.
	Baud rate and parity configured incorrectly.	Verify that the baud rate and parity on the computer are consistent with those on the controller.
	Wrong address.	Verify that the slave address is correct.

CNC/PC Communications

Symptom	*Possible Causes*	*Solution*
Communications between the host computer and the CNC are unsuccessful.	If an ISA interface HSSB card, the I/O address may be in conflict with other devices	Check PC for conflicting I/O addresses
	HSSB switch setting may be incorrect.	Check that the switch is set to 0, 1 or 2.
	The HSSB driver is not installed	Check Windows event log for errors that the HSSB driver (MMCNCD) is not installed
	The HSSB option may not be active in the CNC	Verify that the option and correct CNC Executive Software is installed in the CNC
	The cable connecting the CNC and the PC may not be attached	Verify that the green LED on the HSSB board is on.

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Network Communications

Symptom	*Possible Causes*	*Solution*
Conflicts on network.	IP Address not unique.	Change the IP address to a unique address. (Contact your system administrator if this or other settings need to be changed.)

Printing

Symptom	*Possible Causes*	*Solution*
Printer will not turn on.	Cables not connected properly. Printer power cord not plugged in.	Ensure that the cables are properly connected and that the power cord is connected to the electrical outlet.
Printer will not print.	Printer is not turned on.	Turn on the printer
	Printer is not online.	Set the printer to online.
	The device drivers for your application are not installed.	Install the correct printer drivers for your application in Windows.
	Printer that is set up for a network is not connected to the network.	Connect the printer to the network.
	Printer cable is too long, unshielded, or defective.	Replace the cable.
Printer is offline.	Paper tray is empty.	Fill the paper tray with paper. Set printer to online.
Printer prints garbled information.	Correct printer drivers not installed.	Install the correct printer driver.
	Cable is not connected properly.	Ensure that the printer cable is connected properly to the computer.
	Problem specific to printer.	Run a printer self-test. Refer to the documentation provided with your printer for instructions. If the self-test fails, the problem is printer-specific. The printing section of the software documentation and in Windows online Help may also be helpful.

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CMOS Checksum Error

If the CMOS battery has failed, the following error messages will be displayed on the screen:

```
CMOS checksum error - Defaults loaded

CMOS battery failed
```

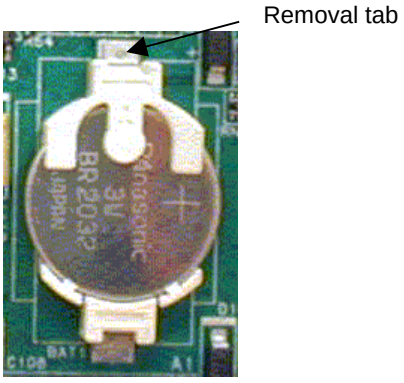
To replace the battery:

The Panel C uses a Panasonic 3V battery, part number BR2032 or Duracell part no 2032. Only replace the battery with this type.

Warning

Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in fire

1. To remove the battery, press down on the removal tab (shown in one of the socket pictures). The side of the battery opposite the removal tab will eject from the retainer clip, allowing the battery to be removed from the socket.



2. To install the replacement battery, position the battery with its '+' side on top and slide the battery into the socket at a slight angle under the removal tab. Press the battery down to snap it in place.

Note: The socket will not allow the battery to be inserted incorrectly ('+' side down).

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Chapter 8

Technical Data

Monitor System

Display	TFT LC-Color Touch Display
Diagonal	383.5 mm (15.1")
Resolution (Pixel)	XGA (1024 x 768)
VGA controller	Integrated 3-D Graphics Controller with 4M Video Memory
Colors	256K
Brightness	200 cd/m²

Note: Back-lighting systems are consumable parts and are therefore not covered by the warranty.

Industrial PC

CPU	FCPGA-Socket for Intel processor
Processor	1.0 Ghz
RAM	128 MB / 256 MB SDRAM (1 DIMM Slot)
Storage	Hard disk min. 20 Minimum GB (3.5" UDMA) Optional External 3.5" Floppy disk Optional External 5.25" CD-ROM
Ports	COM1/2 (RS232) LPT1 Keyboard PS/2 Mouse PS/2 3 USB Front Access Compact Flash External Floppy Drive Port External CD-ROM Drive Port (IDE)
Network	10/100BaseT (RJ45, 10/100Mbit full duplex)
Slots	Two PCI
Power supply	115/230VAC, 50/60Hz, 10.0/5.0 Amps (Accepts 90-264VAC input)
Power consumption	120 watts maximum

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Appendix

A

Product Agency Approvals, Standards, and General Specifications

Agency Approvals

Description	Agency Standard or Marking	Comments
N.A. Safety for Industrial Control Equipment	c UL us LISTED	Certification by Underwriter's Laboratories to UL508 standard and equivalent CSA C22.2 No 142 - M1987standard
N.A. Safety for Hazardous Locations Class I, Div. 2, Groups A, B, C, D	c UL us LISTED	Certification by Underwriter's Laboratories to UL1604 standard and equivalent CSA C22.2 No 213-M1987 standard
Low Voltage Directive European Safety for Industrial Control Equipment	CE	Self-Declaration in accordance with European Directives; Refer to Declaration of Conformity found at www.gefanuc.com
Electromagnetic Compatibility Directive European EMC for Industrial Control Equipment	CE	Certification by Competent Body in accordance with European Directives; Refer to Declaration of Conformity found at www.gefanuc.com

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Government Regulations

U.S., Canadian, Australian, and European regulations are intended to prevent equipment form interfering with approved transmissions or with the operation of other equipment through the AC power source.

The Panel C has been tested and found to meet or exceed the requirements of U.S. (47 CFR 15), Canadian (ICES-003), Australian (AS/NZS 3548), and European (EN55022) regulations for Class A digital devices when installed in accordance with the guidelines noted in the appropriate product section. These various regulations share commonality in content and test levels with that of CISPR 22 and based on this commonality testing to the each individual standard was deemed inappropriate.

The FCC requires the following note to be published according to FCC guidelines:

Note: This equipment generates, uses, and can radiate radio frequency energy and, if not installed in accordance with this instruction manual, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules, which are designed to provide reasonable protection against harmful interference when operated in a commercial environment. 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.

Industry Canada requires the following note to be published:

Note: This Class A digital apparatus complies with Canadian ICES-003.

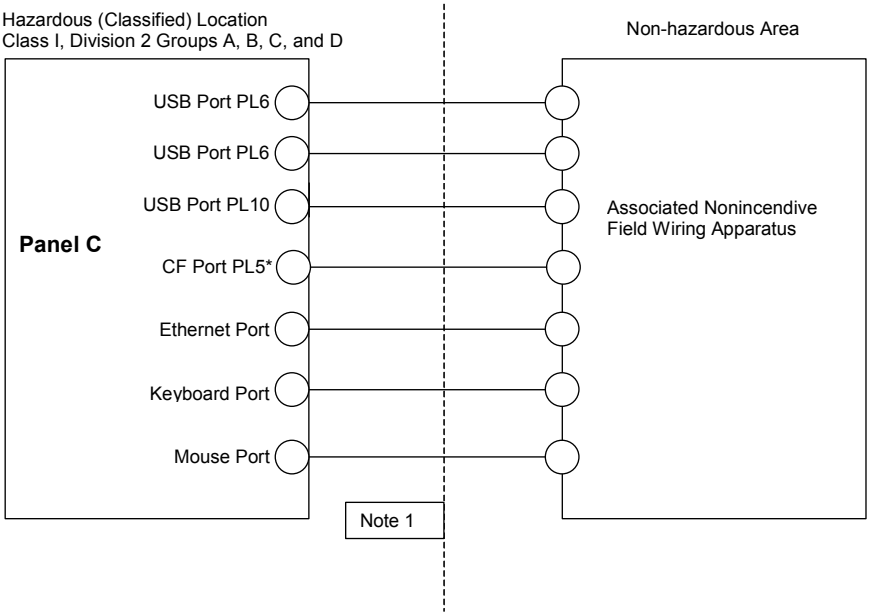
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General Specifications

GENERAL SPECIFICATIONS	Standard(s)	Conditions
ISOLATION		
Dielectric Withstand	**UL 508, UL 840, IEC 664**	1.5KV DC (input power to secondary outputs)
ENVIRONMENTAL		
Vibration	**IEC 68-2-6**	10–57 Hz, 0.012" displacement peak–peak 57–500 Hz, 1.0g acceleration
Shock	**IEC 68-2-27**	15g, 11ms, sinusoidal
Operating Temperature		0°C to 50°C
Storage Temperature		-20°C to +60°C
Humidity		5% to 95% RH (non-condensing)
Enclosure Protection	**NEMA 250**	NEMA Type 4, 4x and 12 when mounted in panel
EMC EMISSIONS		***[applies to CE Marked units]***
Radiated, Conducted	**CISPR 11/EN 55011** **CISPR 22/EN 55022** **47 CFR 15**	"Industrial Scientific & Medical Equipment" (Group 1, Class A) "Information Technology Equipment" (Class A) referred to as FCC part 15, "Radio Devices" (Class A)
Harmonics	**EN 61000-3-2**	Class D
EMC IMMUNITY		***[applies to CE Marked units]***
Electrostatic Discharge	**EN 61000-4-2**	±8KV Air, ±4KV Contact
RF Susceptibility	**EN 61000-4-3**	$10V_{rms}$ /m, 80Mhz to 1000Mhz, 80% AM, 1KHz sine wave
	ENV 50140/ ENV 50204	$10V_{rms}$ /m, 900 ± 5Mhz, 100% PM, 200Hz square wave
Fast Transient Burst	**EN 61000-4-4**	±2KV: AC Input Port ±1KV: Signal Ports
Surge Withstand	**EN 61000-4-5**	±2KV (12Ω) CM, ±1kV (2Ω) DM: AC Input Port ±1kV (2Ω) CM: Signal Ports (shielded)
	ANSI C37.90A	+2.5KV CM & DM: AC Input Port +2.5KV CM: Signal Ports (shielded)
Conducted RF	**EN 61000-4-6**	$10V_{rms}$, 0.15 to 80Mhz, 80%AM: AC Input & Signal Ports
Input Dips & Variation	**EN 61000-4-11**	AC Input Dips: 30 & 100% Nominal (10ms) AC Input Variation: ±10% Nominal (10s)
Voltage Flicker	**EN 61000-3-3**	D_t < 3.3%, D_c < 3.3%, D_{max} < 4.0%, P_{st} < 1.0: AC Input Port

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Nonincendive Field Wiring (Control Drawing #DR00)



*See note 5 for details.

Notes:

1. Nonincendive Circuit Parameters:

   Model Panel C

Vmax = 5VDC	Voc = 5VDC
Imax = 500mA	Isc = 500mA
Ci = 34.2µF	Ca = 1000µF
Li = 0mH	La = 5mH

2. Selected Associated Nonincendive Field Wiring Apparatus shall satisfy the following:

Associated Nonincendive Field Wiring Apparatus		***Model Panel C***
Voc	≤	Vmax
Isc	≤	Imax
C a	≥	Ci + C cable
La	≥	Ci + C cable
Vmax	≥	Voc
Imax	≥	Isc
Ci + Ccable	≤	Ca
Li + Lcable	≤	La

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3. If the electrical parameters of the cable are unknown, the following values may be used:

   Capacitance – 60pF/ft

   Inductive – 0.20µH/ft

4. Nonincendive Field Wiring must be installed in accordance with Article 501.4(B)(3) of the National Electrical Code ANSI/NFPA 70.

5. Compact flash port

   Pins 9, 13, 24–26 ,32 ,34–38 ,40–43, 45, 46(VCC) to pins 1, 8, 10–12, 14–17, 31, 33, 39, 50 (gnd)

   Voc = 3.3 VDC

   Isc = 75mA

   Ca =0.017µF

   La =0.3mH

   Pins 2–7, 18–23, 27–31, 44, 47–49(data lines) to pins 1, 8, 10–12, 14-17, 31, 33, 39, 50 (gnd)

   Voc = 3.3VDC

   Isc = 75mA

   Ca =0.017µF

   La =0.3mH

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