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Industrial Computer Models WTA/WTB/WTE

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Industrial Computer Models WTA/WTB/WTE

GE Fanuc Automation

Industrial Computers

Models WTA/WTB/WTE

User's Guide

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.

GE Fanuc Automation makes no representation or warranty, expressed, implied, or statutory with respect to, and assumes no responsibility for the accuracy, completeness, sufficiency, or usefulness of the information contained herein. No warranties of merchantability or fitness for purpose shall apply.

Contents of This Manual

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

Model WTE	10.4 inch, LCD, Industrial computer with PC/104 expansion.
Model WTA	10.4 inch, Industrial computer with PCI/ISA expansion.
Model WTB	12.1 inch, LCD, Industrial computer with PCI/ISA expansion.

Class I, Division 2 Requirements

- 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 nonhazardous locations only.

- Keyboard and mouse are to be used for initial programming only and not to be left connected.

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 nonhazardous.

WARNING

Explosion Hazard — Do not replace equipment unless power has been switched off or the area is known to be nonhazardous.

Technical Support

If you have a technical problem with your industrial computer that cannot be resolved by referring to the product documentation or online Help, you can contact us by calling 1-800-GEFANUC (1-800-433-2682).

To help us assist you as quickly as possible, keep the following information handy:

- The product name, serial number, and version number.

- The brand and model of any hardware in your system.

- Operating system and version number.

- The steps you performed prior to encountering the problem.

Contents

Contents

Chapter	*Product Features*
1	

The WTE, WTA, and WTB model industrial computers are high performance workstations designed primarily for use as a hardware platform for PC-Based Control and Human Machine Interface (HMI) software packages running under the Windows NT® operating system.

Each model in this industrial computer family is a self-contained PC compatible computer, with a built-in flat screen display. A rugged metal case protects the system against dust, water, and other damage. Input device and serial ports are located on the side of the unit.

The industrial computer is available with autoranging main power input unit for 115 or 230 VAC operation.

The unit is supplied completely assembled and requires only mounting and connecting. Before powering up your system for the first time, familiarize yourself with the procedures contained in Chapter 2, which guide you through the setup of the operating system and network communications.

Feature Summary

When you purchase a WTE, WTA, or WTB industrial computer, you receive:

- An industrial computer

- Microsoft Windows NT operating system software (installed), documentation, Certificate of Authenticity and license agreement

- Optional HMI or Control software (installed), licenses and license agreements.

- Mounting Clips.

- Ethernet driver floppy disk and manual.

- Field Image Recovery disk for image recovery

Standard Features

Model	Specifications
WTE	10.4" standard model with Windows NT and PC/104 expansion.
WTA	10.4" standard model with Windows NT and PCI/ISA expansion.
WTB	12.1" standard model with Windows NT and PCI/ISA expansion
Automation software	HMI or Control (various pkgs available)
CPU	Pentium, 233 MHz minimum (standard), AMD-K6/2 350 MHz (upgrade)
Hard disk	6 GB minimum
RAM	64 MB minimum (standard), 128 MB (upgrade)
Display	WTE and WTA models: .4" Active Matrix Color TFT – VGA (640 x 480)
	WTB model: .1" Active Matrix Color TFT – SVGA (800 x 600)
Parallel ports	One (LPT1)
Serial ports	Two RS-232
Additional ports	Two USB (WTA and WTB only)

Application Software

Model 2050 industrial computers can be preloaded with CIMPLICITY HMI or FrameWorX software.

Network Interface

The industrial computer includes an on-board 10/100BaseT Ethernet adapter that provides an RJ-45 connector for unshielded twisted pair cable.

System I/O

Standard I/O

A side access panel houses all of the I/O interface connections. The industrial computer provides the following I/O interface channels:

Model WTE

- Two serial interface ports using standard 9-pin D type connectors

- One parallel port (can be used for CD-ROM drive)

Model WTA/WTB

- Two serial interface ports using standard 9-pin D type connectors

- Two USB ports

- One parallel port (can be used for CD-ROM drive)

- Floppy Disk Drive port

ISA Card Expansion (models WTA and WTB)

Industrial computer models WTA and WTB have expansion slots for ISA and/or PCI cards. See below for ordering information on I/O interface cards available from GE Fanuc:

- IC693PIF301   GE Fanuc Series 90-30 I/O ISA card

- IC693PIF400   GE Fanuc Hi Performance Series 90-30 I/O ISA card

- PC752PBM000   Profibus DP Master Interface Module (ISA)

- PC752DVM000   DeviceNet Master Interface Module (ISA)

- PC752MOD000   Modicon 800 Series and Quantum I/O (ISA)

- PC752KTX000   Allen-Bradley I/O KTXD Card (ISA)

Note: There is a maximum power limit of 55 Watts for all expansion slots on the WTA/WTB models.

A wide variety of ISA and PCI cards are also available from 3rd party sources.

PC/104 Card Expansion (model WTE only)

Industrial computer model WTE has PC/104 expansion capabilities. See below for ordering information on I/O interface cards available from GE Fanuc:

- IC752GEN100   PC/104 Genius I/O card

- IC752PBI100   PC/104 Profibus I/O card

Note: There is a maximum power limit of 55 Watts for the PC/104 expansion on the WTE.

| Chapter 2 | *Powerup and Software Installation* |

This chapter contains information about powering your industrial computer on and off, setting up your operating system and network communications, and registering your automation software.

Initial Startup

Most configuration activities that you perform on an industrial computer are more easily completed using a keyboard, or may require a keyboard.

When you first power up your system, you will need to attach a standard PS/2-type keyboard to the external keyboard port on the industrial computer. When the system starts, you will be required to enter the Product ID from the Windows NT Certificate of Authenticity, as well as other data.

For details on power supply input, see Chapter 4.

Powering Up the Your Industrial Computer

| Warning |

Do not connect or disconnect the power cord from the industrial computer while the cord is attached to a power source. Doing so may result in personal injury or damage to equipment.

During power up, the processor will run its normal diagnostic checks and indicate the presence of any errors with a screen prompt or warning beeps.

The following picture shows the location of the power cable.

WTA model shown

Setting Up the Industrial Computer

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

<div align="center">

Caution

</div>

Before connecting or disconnecting the keyboard or mouse, remove power from the industrial computer.

Note: The keyboard and mouse are to be used for initial programming only and not to be left connected.

1. Plug in the keyboard, PS/2 mouse (if available), and power cord.

2. Power on the unit.

3. Read the license agreement

4. TAB to your choice and press ENTER.

5. Type your name.

6. Press TAB then type your company name.

7. Press ENTER.

8. Enter the Windows NT Authentication number found on your Windows NT manual. You will need to use the TAB key to move to each number field. If correct press ENTER.

<div align="center">

Note

</div>

Computer names must be less than or equal to 10 characters to run CIMPLICITY HMI software. Each computer on a network must have a unique name.

9. Enter a Computer name. This name should be unique among computers on the same network. Press ENTER.

10. You will be prompted for a user name and password.

    - To use the auto-logon feature, type **admin** as both the user name and 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.

11. Press ENTER to continue with Windows NT Setup.

12. Click Finish.

<div align="center">

Note

</div>

With Windows NT, it is highly recommended that you create an Emergency Repair Disk after you complete the setup of your system. From the Start menu choose Run and then locate Rdisk.exe. You must update the repair disk anytime you make a change to your computer hardware or software.

Configuring the Industrial Computer to Run on a Microsoft Network

Note

Before setting up your new industrial computer for the network, you should consult with your network administrator. Duplicate TCP/IP addresses and duplicate computer names on the same network cause network problems.

1. Click the Start ▦ button, choose Settings, and then Control Panel.

2. In the Control Panel window, double-click the Network icon. The Network dialog box will appear.

3. In the Network dialog box, click the Identification tab, and enter your Computer name, Workgroup or Domain name, and Computer Description.

Note

Computer names must be less than or equal to 10 characters to run CIMPLICITY HMI software. Each computer on a network must have a unique name.

4. To add the TCP/IP protocol:

    A. Go to the Protocols tab and click the Add button. The Select Network Protocol dialog box will appear.

    B. From the Protocol list, select TCP/IP and click OK.

    C. Click the Properties button. The Microsoft TCP/IP Properties dialog box appears.

    D. Choose "Obtain an IP Address from DHCP Server" or enter a unique IP Address and Subnet Mask

    E. Click OK twice.

You will be prompted to restart your computer so that the changes can take effect.

Login Recommendations

If you enter **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 CIMPLICITY when you run the CIMPLICITY Demo or any other CIMPLICITY project that includes a user named Administrator. All CIMPLICITY projects are configured with an Administrator user by default.

Registering Your CIMPLICITY HMI software

If you have purchased a model WTA/WTB or WTE with the CIMPLICITY software, often the licenses have been loaded for CIMPLICITY HMI Base, Trending, TCP/IP Communications, and Series 90 SNP Communications. If you purchase additional product options to run on the Display Station, it is necessary to contact GE Fanuc to update the system licensing.

To authorize a copy of CIMPLICITY HMI software

1. Click Start, Programs, CIMPLICITY, HMI, Registration.

2. Click Next for new User.

3. Read the license agreement and select yes if you agree.

4. Fill in the User Information.

5. Click Next.

6. Open your CIMPLICITY software box and find your license packs. Open each license pack and type the serial numbers in the fields provided.

7. Call the CIMPLICITY phone number that appears on the screen

Faxes and phone calls will be processed between 8 AM and 5 PM Eastern time, Monday through Friday, except for regularly scheduled holidays. Faxes and calls received after hours, on weekends, or on holidays will be processed as soon as possible on the following business day

When you phone, please be prepared to provide GE Fanuc with the following information:
- Your User information
- CIMPLICITY serial numbers
- The System Key Code generated during the registration procedure.

Note

When it is installed without the authorization code, you can run the software as a fully functional system in two-hour increments.

Your CIMPLICITY software can also be registered over the Internet. Contact "Software Registration" at www.gefanuc.com/cimplicity.

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, are listed below.

`C:\i386`	**Windows NT CD**
`C:\TBASE`	**Touch screen drivers**
`C:\i386\DRVLIB.NIC\Intel 55`	**Network drivers**
`C:\SP4\i386`	**Service pack 4 for Windows NT drivers**
`C:\LS120`	**Imation Superdisk Backpack drivers***
	*refer to IC752FDD100 for part ordering

Note

If you reload any Windows NT component requiring files, such as network driver, you must reload service pack 4. To do this, type:

C:\SP4\UPDATE

Reloading NT on the Hard Disk From CD

To reload Windows NT you should follow the instructions in the Windows NT manual from Microsoft. After completing the installation, the BOOT.INI file must be modified to ensure that the touch screen works correctly.

Edit the BOOT.INI file and add the /noserialmice:com2 option to the end of each entry in the [operating systems] section of BOOT.INI.

If you have concerns about performing this step call the GE Fanuc hotline for assistance.

Note

You must use version TNDriver 1.26 or higher of the touch screen driver to avoid a system crash during boot up.

You may need to set up the display driver in the event of a reload. Go to Control Panel>Display>Settings and set Colors to 65536, Resolution to 800x600, Refresh to 60 Hz and Display type to Chips and Technologies 65550.

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 software (CIMPLICITY, FrameWorX) 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, a standard PS/2-type keyboard will need to be connected to the external keyboard port.

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 any questions about this procedure, please contact 1-800-GE FANUC (1-800-433-2682).

® MS-DOS is a registered trademark of Microsoft Corporation.

Shutting Down the Computer

> **Caution**
>
> **To avoid damaging files, always shut down Windows software before removing power from your industrial computer.**

To shut down Windows NT software, select **Shut Down** from the Start menu.

Hardware Installation

This chapter contains procedures for mounting the industrial computer, which has been designed for simple installation.

A single cut-out is required to mount the industrial computer. Eight spring-loaded clips are supplied, and are used to secure the unit to the enclosure.

This chapter also describes how to install a PC/104 card (model WTE), install PCI/ISA cards (models WTA and WTB), change the fuse (Model WTE), and change the air filter (all models).

Mounting Guidelines

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

Warning

</div>

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, or D, or nonhazardous locations only.

Notes

The industrial computer is to be installed within an enclosure with access only by service personnel.

- In an industrial environment, the enclosure into which the unit is mounted should provide protection from dust, dirt and water.

- The enclosure into which the unit is mounted should be capable of supporting the weight of the industrial computer without distortion to the enclosure. The mounting clips will support an enclosure thickness of up to 10mm (0.39 inch).

- All eight mounting clips must be fitted properly to achieve a good seal between the industrial computer and the enclosure 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. Two fans are used to create air flow through the industrial computer, ensuring that a correct working temperature is maintained.

  Incoming air passes through a filter that removes dust and dirt. The filter should be checked and replaced regularly. For details, see page 3-7.

Mounting Procedure

Use the following procedure to mount the industrial computer:

1. Cut an opening in the enclosure to the dimensions shown. The cut-out allows a 1.2mm clearance on each edge of the front of the industrial computer. Ensure the depth of the unit is accounted for when mounted.

Models WTA/WTE - 321.6 mm (12.66")

WTB - 362.5 mm (14.27")

Models WTA/WTE - 256.8 mm (10.11")

WTB - 341.4 mm (13.44")

Model	Depth
WTA	164.1 mm (6.46")
WTB	164.1 mm (6.46")
WTE	95.5 mm (3.76")
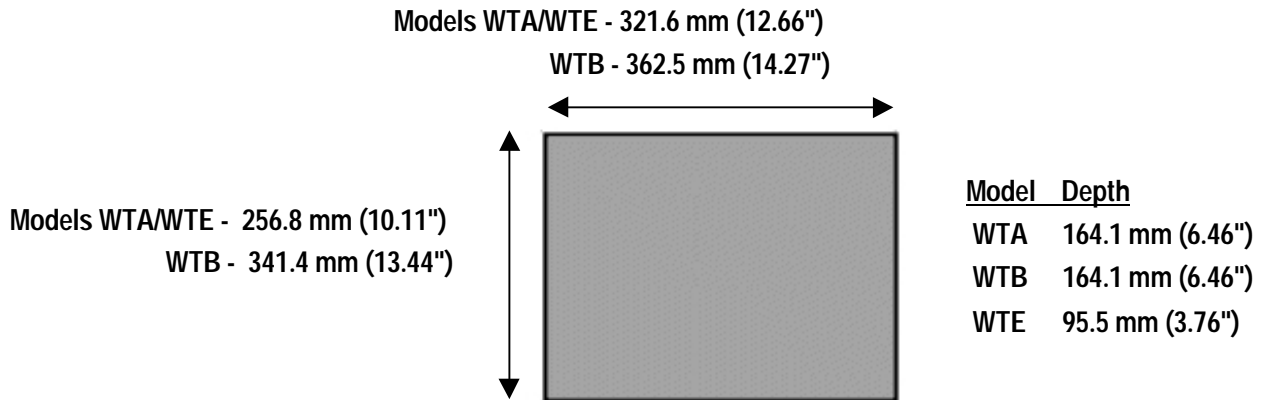
2. Detach the rear housing from the front of the industrial computer following the instructions in the section entitled "Operating the Field Detachable Rear Housing." (page 3-3) Position the front of the industrial computer in the cut-out and fit the eight spring loaded retaining clips into the slots on the industrial computer. All eight clips must be used to produce a good seal.

**Spring-loaded
Retaining Clip**
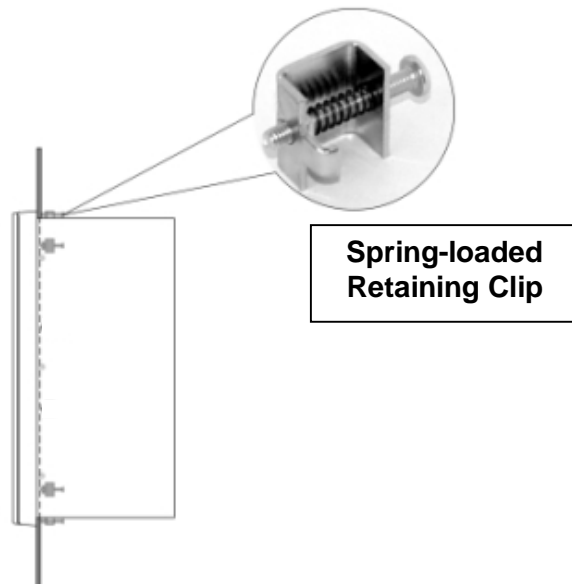
3. Tighten the screws on each clip so that the spring is compressed by the nut. To ensure a good seal between the industrial computer and the enclosure, the clips must be tightened evenly. (Tighten each of the clips in turn, a little at a time.)

4. When the springs are fully compressed, no further tightening of the clips is necessary. The industrial computer is locked into place.

5. Reattach the rear of the industrial computer to the mounted front following the instructions under "Reattaching the Rear Housing."

Operating the Field Detachable Rear Housing (All Models)

The industrial computer is equipped with a field detachable rear housing to facilitate the mobility of the CPU unit. This feature allows you to detach and completely separate the CPU from the touch-screen for installation or maintenance needs.

> **Warning**
>
> **Power down the industrial computer and remove the power cord from the power source before detaching or reattaching the rear housing.**

Detaching the Rear Housing

1. Push the silver clamps located in the middle of both sides of the rear housing towards the front of the industrial computer.

2. Unlatch the now loosened retaining clamps from the front housing.

3. Pull the rear housing apart from the front housing by pulling straight back on the rear housing.

Retaining Clamp →
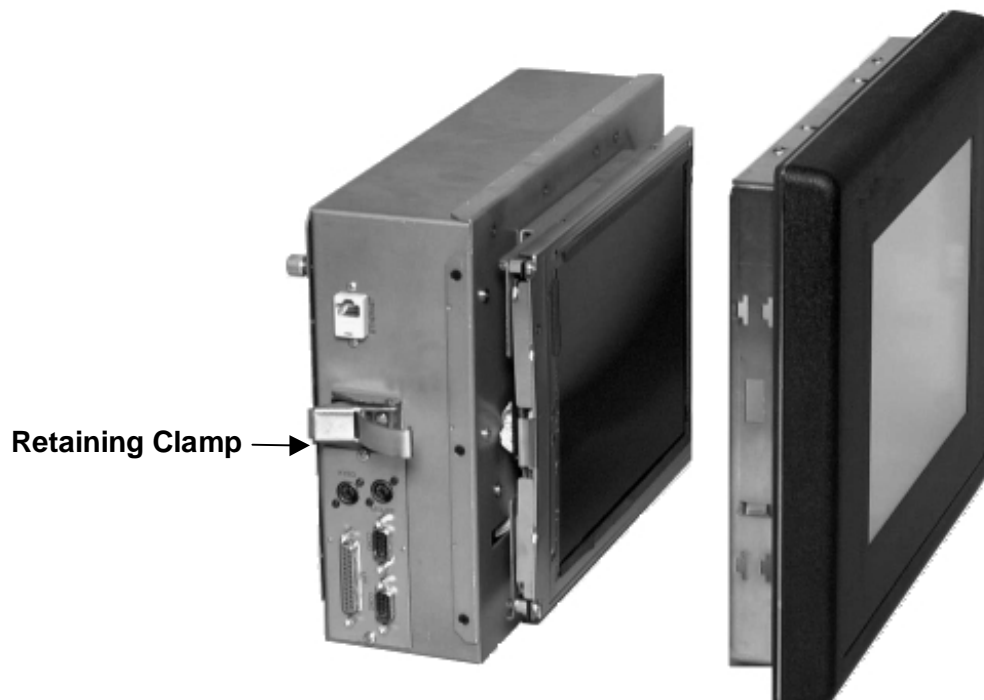
Reattaching the Rear Housing

1. Line up the rear housing with the front housing. Take special care to ensure that there is no dust inside the front housing. Any foreign material caught between the front and rear housing will become magnified during operation.

2. Insert the rear housing into the front housing, making sure that the touch screen nodes are lined up correctly.

> ### Caution
>
> **Failure to line up the rear housing with the front of the industrial computer may cause damage to the touch screen during reattachment.**

3. Fasten the retaining clamps of the rear housing to the corresponding slots in the front housing.

4. Pull the clamps back towards the rear of the unit, securing the rear housing to the front of the industrial computer.

Installing Expansion Cards

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

- The card is packaged in a static-safe bag which 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 anti-static strap and be sure that you are fully grounded. Never touch the card or any components inside the industrial computer unless you are wearing an anti-static strap.

- Any surface the unprotected card is placed on should be static-safe, facilitated by anti-static mats, if possible.

- Extra caution should be taken in cold, dry weather, when static charges can easily build up.

Installing a PC/104 Card (model WTE only)

The PC/104 expansion slot within the system allows the card to be clamped into place using a clamping bracket with screws adjustable to the height of the card.

> **Note:** Remove the rear housing from the industrial computer before removing the PC/104 plate screws. Otherwise, the internal mounting bar will fall into the unit.

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

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Warning
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</div>

To avoid a risk of electric shock, turn off power to the industrial computer and disconnect the main power source before removing the rear cover from the unit. To disconnect the unit from the main power source, remove the power cord.

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

Back-plate screw

Rear housing Back-plate

PC/104
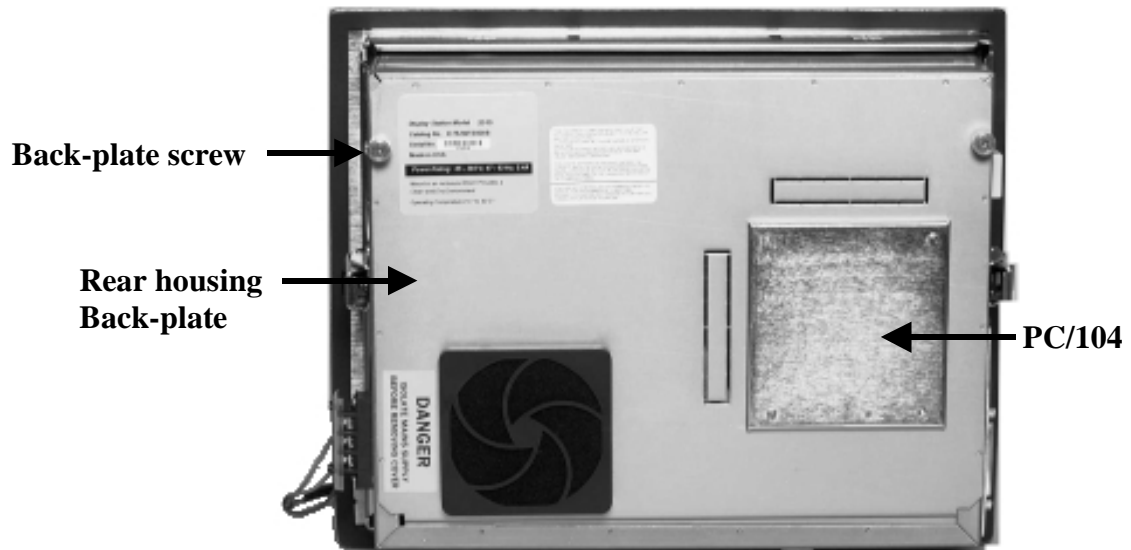
Rear View of Industrial Computer Model WTE

An empty slot must have a blanking plate fitted, or the air flow will not comply with agency requirements. The blanking plate can be removed in order to install a new card.

PC/104 Mounting Slots
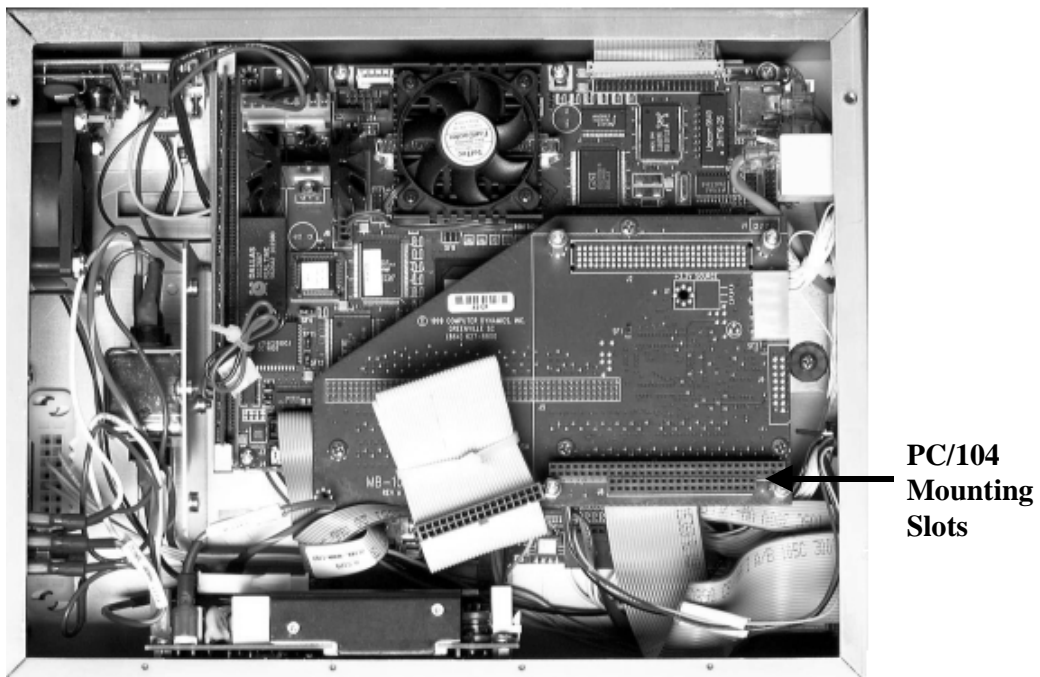
Internal View of Industrial Computer Model WTE

Installing ISA/PCI Expansion Cards (Models WTA, WTB)

The industrial computer provides two dual-purpose ISA/PCI expansion slots (1 & 2) and one dedicated ISA slot (3). All slots fit half-size adapter cards (slot 1 – 8" max, slot 2 – 9.5" max, slot 3 - 10" max). If your expansion card is a legacy ISA type, follow the instructions on page 3-8, then proceed with installation.

All of the expansion slots within the system allow the card to be clamped into place using a clamping bracket with screws adjustable to the height of the card.

The rear cover of the industrial computer must be removed to access the PCI or ISA bus cards. Five screws are used to secure the rear panel to the unit. When these screws are removed the backplate will slide upwards and can then be lifted clear of the main unit.
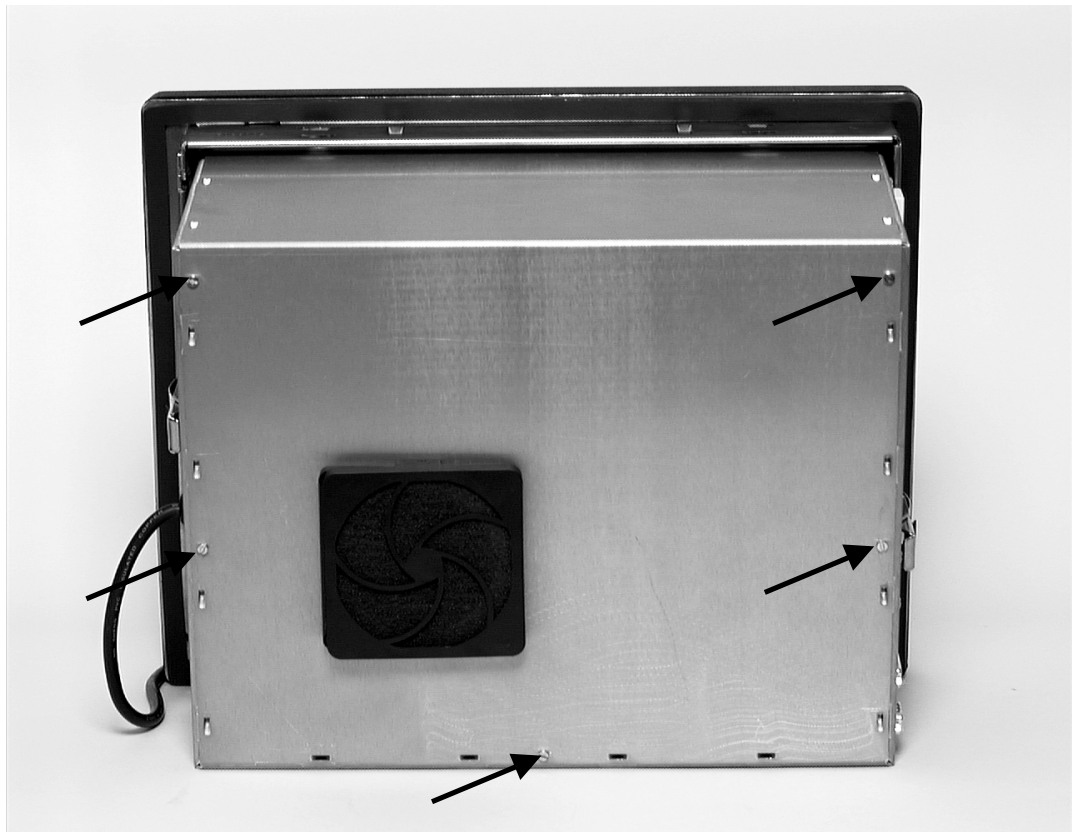
Warning

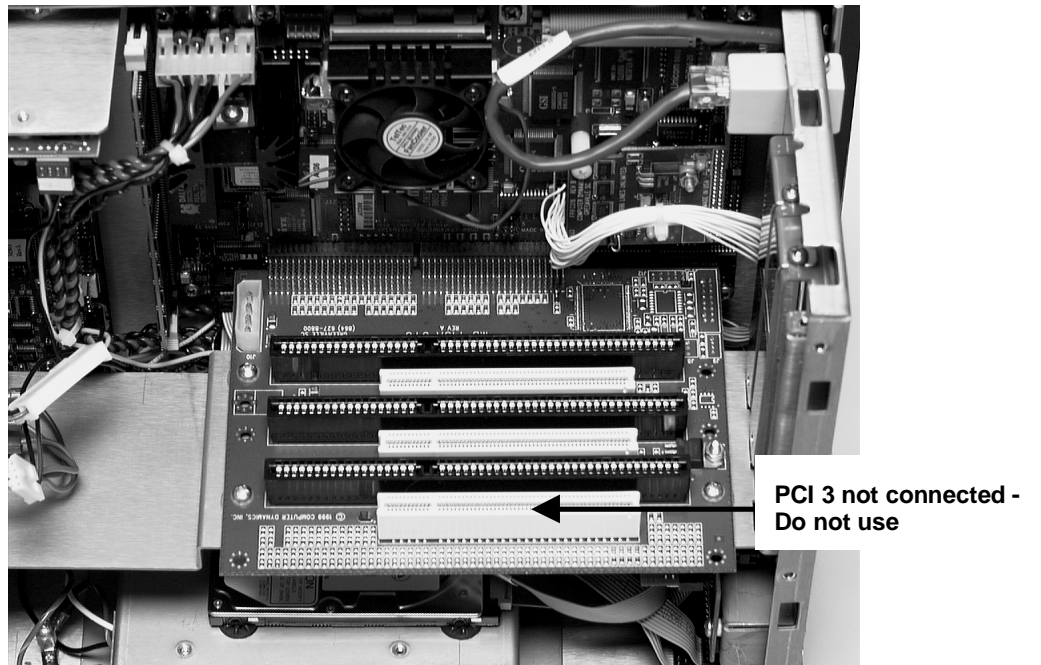**To avoid a risk of electric shock, turn off the power to the industrial computer and disconnect the main power source before removing the rear cover from the unit. To disconnect the unit from the main power source, remove the power cord.**

Rear View of Industrial Computer Model WTA, Panel Mounting Screw Locations

Internal View of Industrial Computer Model WTA

Expansion Slots in Industrial Computer Model WTA

Configuring Expansion Cards (Legacy ISA Only)

Note: 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 machine to lock up. Following these instructions when installing legacy ISA cards will prevent problems with resource conflict.

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 settings.

Caution

Before connecting or disconnecting the keyboard or mouse, remove power from the industrial computer.

Note: The keyboard and mouse are to be used for initial programming only and not to be left connected.

1. Connect a keyboard, turn on the system power, and press DEL when prompted to enter the BIOS setup program.

2. Select PNP/PCI CONFIGURATION.

3. If the card requires one or more interrupts, go to an IRQ that currently reads "PNP PCI/ISA" and change it to "Legacy ISA" by pressing PAGE DOWN. Do *not* use an IRQ that already reads "Legacy ISA".

4. If the card requires memory space, enter the address and amount where "Memory Used" appears. Press ESC to exit this screen, and F10 to save and exit Setup. When the screen goes blank, turn off the power.

5. If the card has jumpers or DIP switches, set them so that they match the IRQ and memory addresses set in the BIOS Setup.

6.   Set the I/O port settings of the card (if any) so that they fall within the ranges labeled "Available" in the table below.

7. If the card is set up using a configuration program, proceed with installation, then 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 table below.

I/O Port Ranges	
000-1FF	Reserved
200-27F	Available
280-2FF	Reserved
300-377	Available
378-3DF	Reserved
3E0-3EF	Available
3F0-3FF	Reserved

Changing the Air Filter Element

The air filter element should be changed or cleaned every three months -- sooner in dusty environments. If the air filter is not changed at suitable intervals, or if a non-approved filter is used, the unit may overheat. For details of approved filter elements, refer to "Environmental Specifications" in Appendix A.

The filter element is located on the outside of unit, on the rear housing back-plate.

Caution

Power down the industrial computer before replacing the air filter.

1. Pull the plastic cover from the air filter at the back of the industrial computer.

2. Replace the old filter with the new filter.

3. Snap the cover back onto the back plate of the industrial computer.

Air Filter and Cover
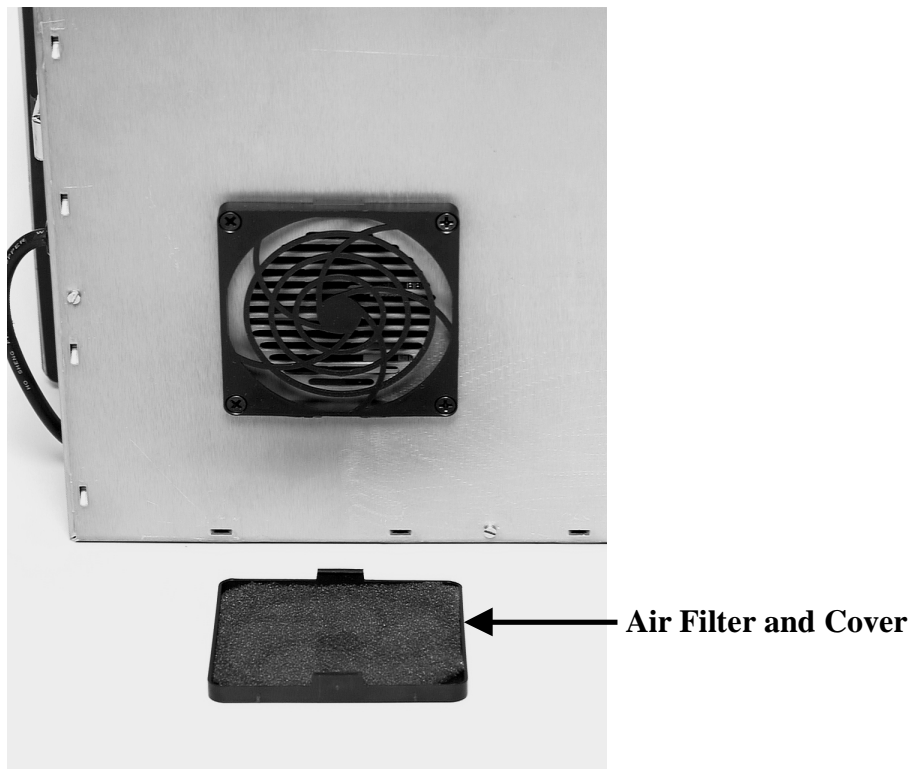
Changing the Fuse

Models WTA and WTB have no serviceable fuses. The following applies only to model WTE. Only trained personnel should change the fuse.

<div align="center">

Warning

</div>

Before changing the fuse, turn off power to the industrial computer and disconnect the main power before removing the rear cover from the unit. To disconnect the unit from the main power source, remove the power cord.

To remove the fuse:

1. Locate the fuse on the side of the rear housing, next to the power cord.

2. Turn the fuse counter clockwise to release it.

To replace the fuse:

1. Insert a new fuse completely into the socket. (2A 250 VAC)

2. Push and turn the fuse clockwise to lock it in place.

Fuse Housing
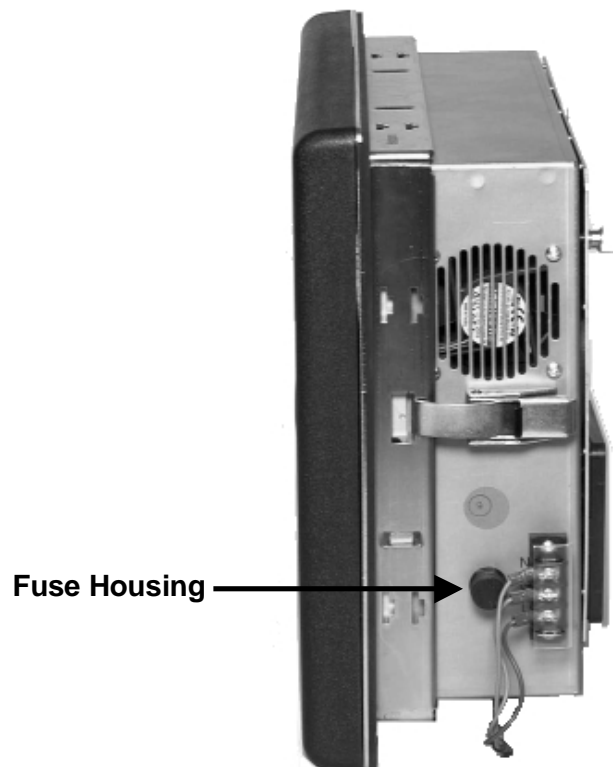
Side View of Industrial Computer Model WTE

Connectors

This chapter describes the connector layout on the industrial computer. All external data connections are sourced from the CPU motherboard and associated modules provided with the industrial computer: no expansion slots are used.

All models provide the following user input device connections:

- PS/2 Keyboard port

- PS/2 Mouse port

System I/O

All models provide the following I/O interface channels:

- Two serial interface ports (COM 2 and COM 3) that use standard 9 pin D type connectors.

- A 25-pin enhanced parallel port (LPT1), which can be used to connect a CD ROM drive.

- Ethernet 10/100BaseT on an RJ45 connector.

Models WTA and WTB also provide the following data ports:

- Two USB ports

- Floppy Drive port

If the end application requires serial or parallel interfaces in addition to those provided by the standard system, you can install a specific PC/104, ISA or PCI adapter card. A wide selection of cards that provide the additional connectivity are available. See Chapter 1.

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

> | Caution |
> | :---: |
>
> **External devices (printer, external disk drive, etc.) should *not* be connected or disconnected from the industrial computer while the unit is powered up.**

Ethernet

User Adapter Card

Blanking Plates

+5 VDC, +12 VDC

Floppy Drive Port

IDE connector (do not use if present)

Printer port (LPT1)

Serial Ports

1. Mouse Port

2. Keyboard Port

USB Ports (2)
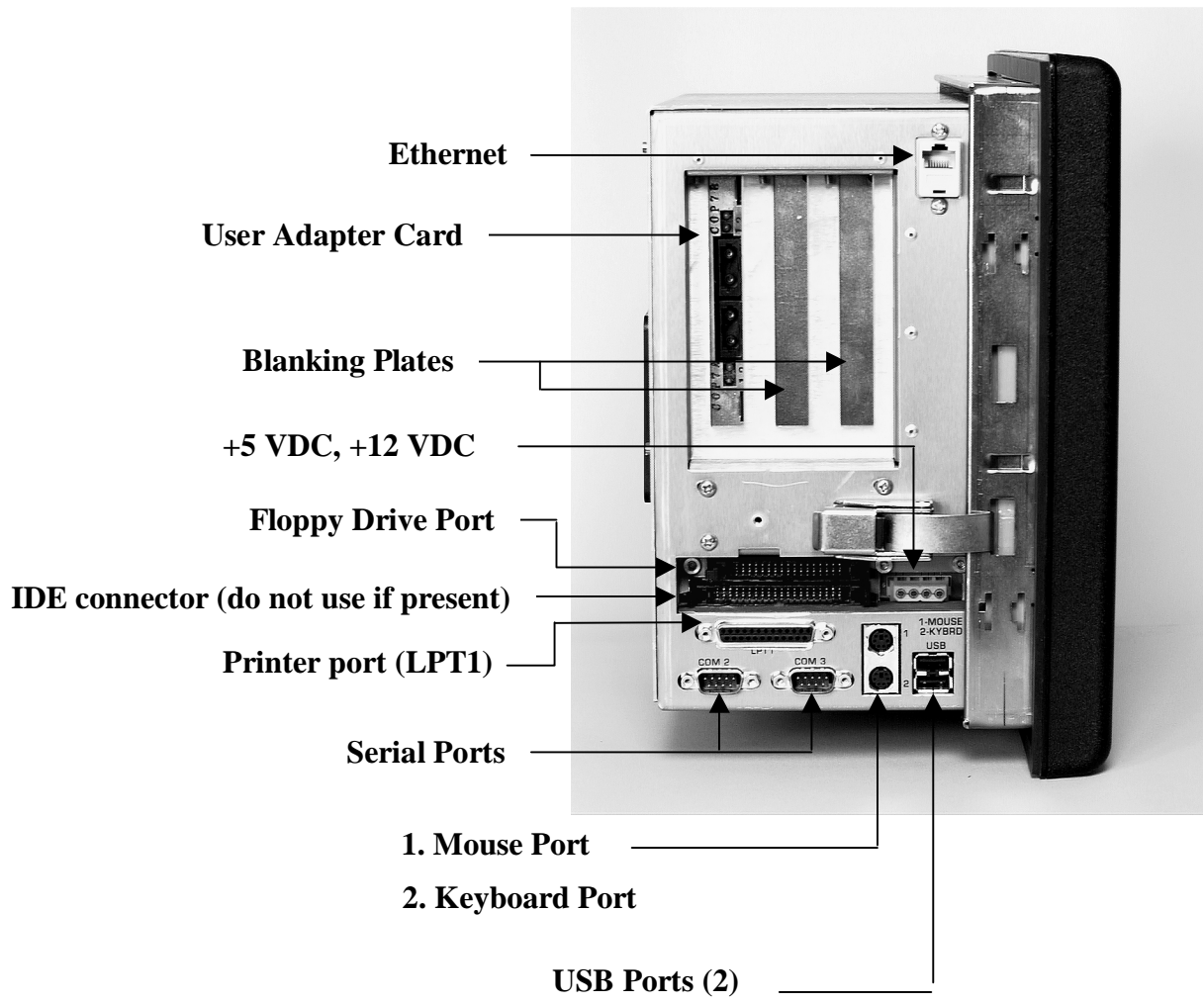
Port Side View of Industrial Computer Model WTA

AC Power Input

The industrial computer is powered by an internal, autoranging AC power supply unit that accepts 115 to 230 VAC input ranges.

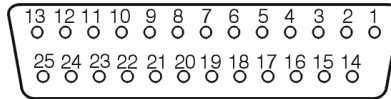For power supply details, refer to specifications in Appendix A.

DC Power Output

A standard Molex type connector provides +5 VDC and +12 VDC to power an external floppy drive and/or CD ROM drive. This power supply should not be used for any other purpose.

For power supply details, refer to specifications in Appendix A.

Printer Port LPT1

A 25 pin D type female connector mounted on the side access panel of the industrial computer is used for the printer port.

```
13 12 11 10  9  8  7  6  5  4  3  2  1
 O  O  O  O  O  O  O  O  O  O  O  O  O
  25 24 23 22 21 20 19 18 17 16 15 14
   O  O  O  O  O  O  O  O  O  O  O  O
```

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

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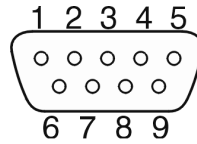
RS-232C Name	PIN	Assignment
CF	1	DCD (Data Carrier Detect)
BB	2	RX (Receive Data)
BA	3	TX (Transmit Data)
CD	4	DTR (Data Terminal Ready)
AB	5	GND (Signal Ground)
CC	6	DSR (Data Set Ready)
CA	7	RTS (Request to Send)
CB	8	CTS (Clear to Send)
CE	9	RI (Ring Indicator)

To ensure that the installation meets the EMC radiation specification, the serial cables must comply with the following requirements:

- The cables must be shielded

- The D type connector covers must provide EMC shielding (e.g. Metallized plastic or die cast metal covers)

- The cables must be terminated with 360 degree termination of the shield, as illustrated below:
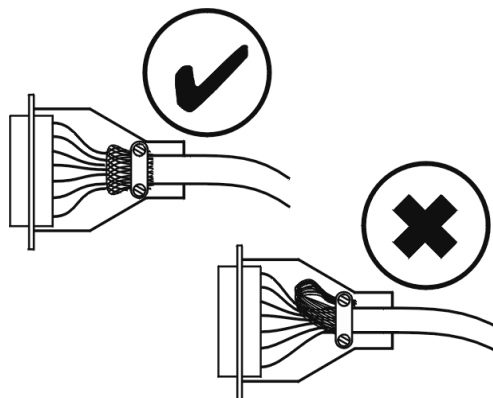
| Chapter | *System Operation* |
| 5 | |

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

- System Peripherals

- Graphics Controller

- Operator Interfaces

System Peripherals

<div style="border:1px solid black; display:inline-block;">

WARNING

</div>

Explosion Hazard — Substitution of components may impair suitability for Class 1 Division 2.

Hard Disk Drive

The industrial computer has an internal system hard drive for the mass storage of data. The drive is a standard unit with EIDE/ATA-2 interface.

Graphics Controller

A dedicated graphics controller card, attached to the motherboard, provides the interface for the flat panel display.

The following features are supported:

- Display panel resolutions of VGA (640 x 480) with 256 color support.

- An external CRT interface (not included) using a 15 pin high density D type connector, and cable (not included).

Display Types

All models of the industrial computer have a color TFT screen. The flat screen display has the following features:

- High Luminance (equal to or greater than 200cd/m2).

- Wide angle viewing.

- A built-in backlight with a long life backlight tube (equal to or greater than 25,000 hrs).

Models WTA and WTE are 10.4" with VGA resolution (640x480).

Model WTB is 12.1" with SVGA resolution (800 x 600).

Operator Interfaces

> **Caution**
>
> **Before connecting or disconnecting the keyboard or mouse, remove power from the industrial computer.**

Note: The keyboard and mouse are to be used for initial programming only and not to be left connected.

External Keyboard and Mouse

An external keyboard and mouse (both using PS/2 connectors) can be attached to connectors on the side of the unit.

The touch screen and PS/2 mouse will work simultaneously if the mouse is Microsoft or IBM PS/2 compatible. Because Microsoft Windows can load only one mouse driver at a time, it is not possible to provide simultaneous support for a mouse that requires its own specific Windows driver.

If you are installing an optional serial card, none of the ports can be configured as COM 1, which conflicts with the touch screen.

Touch Screen

The industrial computer includes a resistive overlay touch screen on the flat panel display.

The touch screen has a touch-resolution of 1024 x 1024 touch points 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 COM 1 serial port, which allows it to function with Automation software. If you install a card that has settings that conflict with the COM 1 serial port, you will need to change the card's configuration.

Touch Screen Driver for Windows

The touch screen is internally connected to COM1. Parameters must be set within the driver so that they match the hardware settings. The factory default settings are:

COM Port	= 1
Interrupt	= 4
I/O Address	= 3F8

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.

Chapter 6

BIOS Settings

It is normally unnecessary to change the hardware configuration settings in the CMOS memory. If these settings become corrupt, use the following procedures to reload the factory configuration:

1. Connect a keyboard to the unit and turn on the power.

2. During the computer power-up sequence, press the F2 key, when prompted, to enter Setup mode. A screen will appear offering several options for changing settings, restoring default settings, and other functions.

3. Select the Load Setup Defaults option. Then, select the Save CMOS settings option. You will be prompted to exit. *Do not* exit at this time.

4. Go into Standard CMOS Setup and make the following selections:

	Type	**Mode**
Primary HDD master	AUTO	AUTO
Primary HDD slave	AUTO	AUTO
Secondary HDD master	AUTO	AUTO
Secondary HDD slave	AUTO	AUTO
Drive A	NONE	
Drive B	NONE	

5. Exit Standard CMOS Setup.

6. Go into Integrated Peripherals Setup. Set parallel port to ECP+EPP.

7. Select Save and then Exit Setup. The startup sequence should begin.

The system is now configured with factory CMOS settings.

Chapter 7

Diagnostics and Troubleshooting

This chapter contains *Self-Test Diagnostics*, *Troubleshooting*, and *Corrective Actions*.

- *Self-Test Diagnostics* describes how to respond to errors that may be detected by the automatic self test that is performed each time the industrial computer powers up.

- *Troubleshooting* contains tables of symptoms, 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 start-up 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 that might warrant changing 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 the Support Hotline.

See Chapter 6, *BIOS Settings*, for information on restoring factory CMOS configuration.

Troubleshooting

Powerup

Symptom	Possible Causes	Solution
Display is blank.	See "Display" on page 7-4.	See "Display" on page 7-4.
Safe Recovery Error message displayed.	Occurs on initial power up if the unit is accidentally turned off without first shutting down the Windows NT software.	The industrial computer will power up normally.
Memory count during powerup self-test is incorrect.	Optional DIMM is installed incorrectly or is incompatible with the 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.	Note: This battery has a lifetime of up to 10 years under normal operating conditions. For more information, see "CMOS Checksum Error" on page 7-6.
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 industrial computer will power up normally.
The industrial computer 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 industrial computer.

Display

Symptom	Possible Causes	Solution
Characters are dim.	Computer screen is in direct light.	Change lighting or adjust contrast.
Display is blank.	Screen temperature is outside operating range.	If the industrial computer is in direct sunlight, move it and allow it to cool.
	The industrial computer is set up for invalid video mode.	Reboot, then select VGA Mode. If Windows is now displayed, go into Control Panel, Display Settings, and change settings to the correct video driver and mode. Contact the Support Hotline for more information.
	Rear housing is not completely secured to front of the industrial computer.	Reattach rear housing to front of the industrial computer, making sure that the two separate parts are lined up correctly. Follow the instructions in chapter 3.
	Screen saver is active.	Touch the screen.

Memory

Symptom	Possible Causes	Solution
Memory count during powerup self-test is incorrect.	Optional DIMM is installed incorrectly or is incompatible with the 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 the industrial computer. Plug mouse into mouse port on Control Station 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 the industrial computer with external mouse connected.

Keyboard

Symptom	Possible Causes	Solution
External keyboard locks up	The type of keyboard is not supported.	Use a Key Tronic keyboard. (Most keyboards will work. However, we recommend a keyboard manufactured by Key Tronic.)
	Keyboard not plugged into keyboard port on the industrial computer.	Plug keyboard in.
	System is busy.	Press Ctrl-Alt-Delete to view task list.

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.

Corrective Actions

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
```

If you see the above message, you can still operate the industrial computer by pressing the F2 key and manually setting up the system. (You will need to set up the computer each time the system is powered up). For setup parameters, refer to "BIOS Settings."

This Lithium battery has a lifetime of up to 10 years under normal operating conditions. Lithium battery replacement should be done by a factory-trained service person or the unit should be returned to GE Fanuc for servicing.

If the battery failed, contact the GE Fanuc *Technical Service Hotline*. North American customers should call toll-free at **1-800-GE FANUC (1-800-433-2682)**. International customers should dial direct: **804-978-6036**.

Appendix	*Technical Data*
A	

Mechanical Specifications

Front Assembly

The industrial computer provides a display screen and a built-in operator keypad and access panel.

Main Chassis

The main chassis is manufactured from aluminum and houses the motherboard, which is mounted securely in a vertical plane, parallel to the front of the Display Station.

The chassis has been designed to conform to the standards necessary to meet UL and CE approvals.

Models WTA and WTB: The housing for the card connector is recessed so that the card interface does not protrude beyond the profile of the main housing.

Rear Cover

The rear cover of the unit is fixed to the main chassis so that EMC emissions are minimized. The cover can be removed easily without breaking any electrical connections.

Panel Mounting System

Eight spring-loaded clamps are provided for mounting the Display Station to a panel.

Field Detachable Rear Housing

The Display Station is equipped with detachable rear housing to facilitate the maintenance and installation of the unit in the field.

Functional Specifications

CPU and Memory	
Microprocessor	Pentium 233MHz minimum*
User Memory	Minimum 64Mbyte*
Operating System	Windows NT
Hard Disk	6.0 GByte minimum*, IDE standard 2.5 inch mounting

PC Backplane	WTA	WTB	WTE
Expansion Slots	2 shared PCI/ISA and 1 dedicated ISA	2 shared PCI/ISA and 1 dedicated ISA	1 PC/104
Total current available	By default, the system motherboard in the system should be required to provide less than 2 amps of +5 VDC, less than 1 amp of +12 VDC, and less than .5 amp of -12 VDC. An auxiliary power connector on the backplanes can increase the amount of power available to the I/O boards if required.		

Display	WTE	WTA	WTB
Display Variants	10.4 inch Color TFT – VGA (640 x 480)	10.4 inch Color TFT – VGA (640 x 480)	12.1 inch Color TFT – SVGA (800 x 600)
Active Display Area	10.4"	10.4"	12.1"

Power Requirements	
AC Models	
AC Input	85 to 265 VAC, 100W autoranging
Power Rating	47 to 63Hz; 12/4A
DC Model	
DC Input	18 to 36 VDC (24 VDC nominal), 3A max

Compliance
UL and C-UL approved. File number E157515.
Class I, Div. 2 Groups A, B, C, D Hazardous Locations.

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* Contact your local distributor for details.

Ports	
Parallel Port	One: LPT1
Serial Ports	COM1 internal RS232 port
	COM2 external RS232 port
	COM3 external RS232 port
Keyboard Port	PS/2
Mouse Port	PS/2

Physical			
	Model WTA	**Model WTB**	**Model WTE**
Main Enclosure Dimensions	W:317mm (12.47") H:252mm (9.92") D:164mm (6.46")	W:358mm (14.09") H:337mm (13.25") D:164mm (6.46")	W:325mm (12.79") H:252mm (9.92") D:95.5mm (3.76")
Front Panel Dimensions	D:32mm (1.32") Extends 11.5 mm (0.45") beyond main enclosure on all sides.	D:29mm (1.14") Extends 9.7 mm (0.38") beyond main enclosure on all sides.	D:32mm (1.32") Extends 11.5 mm (0.45") beyond main enclosure on all sides.
Weight (base unit with no optional cards installed)	6.8 Kg (15lbs)	9.1 Kg (2 lbs)	5.9 Kg (13lbs)

Environmental Specifications

Operating Temperature	0 to 45°C
Storage Temperature	-20° to 60°C
Relative Humidity	5 to 90% non-condensing

Filter Pads

Dimensions	80mm by 80mm (3.15" by 3.15")
Material	Polyurethane foam.
Performance Requirements	Retain 75% by weight of dust particles down to 5-10 microns in size
	Withstand temperatures to 100° C
	Provide flame resistance to BS5588 and DIN 53438

Note: Filter pads (reference Globe Motors part FFM3145) are available from:

Allied Electronics
Tel: 1-800-433-5700

http://www.alliedelec.com

http://www.globemotors.com

Powering Up the Display Station, 2-1
Powerup
    troubleshooting, 7-3
Printing
    troubleshooting, 7-5
authorization See product authorization

R

Rear housing
    detaching, 3-3
    mechanical specifications, A-1
    operation, 3-3
Recovery, image, 2-7
Registering your CIMPLICITY HMI software,
    2-5
Reset
    accidental, 7-3

S

Self-test diagnostics, 7-2
Serial Mouse
    troubleshooting, 7-4
Setting Up the Display Station, 2-3, 3-9, 5-3
Settings
    BIOS, 6-1
Shutting down the computer, 2-7
Specifications
    environmental, A-4
    mechanical, A-1
Standard features, 1-2
System Configuration Verification, 7-2
System I/O, 1-3
System Test and Initialization, 7-2

T

Temperature
    effect on contrast setting, 7-4
Touch screen, 5-3
    driver for Windows, 5-3
Troubleshooting, 7-3
    display, 7-4
    keyboard, 7-5
    memory, 7-4
    powerup, 7-3
    printing, 7-5
    serial mouse, 7-4
TSRs, 7-4

W

Warning, audible, 2-1
WTA model

    dimensions, A-3
    features, 1-2
    I/O, 1-3
    ISA card housing, A-1
    ISA expansion, 1-3
WTE model
    dimensions, A-3
    features, 1-2
    I/O, 1-3
    PC104 expansion, 1-4