Contents

Chapter 1

Control Station Features

The Control Station is a high performance workstation incorporating the latest Pentium® system architecture. The Control Station is designed primarily as a hardware platform for Human Machine Interface (HMI) and Supervisory Control and Data Acquisition (SCADA) software packages running under Windows NT® operating systems. The Control Stations are available with a 12 inch display, resistive touch screen and keypad, 14 inch display and resistive touch screen, or 18 inch display and resistive touch screen.

Each model in the Control Station range is a fully self contained PC-compatible computer with built-in flat screen display and resistive touch screen, housed in an industrial, IP65 rated front panel mounted unit, weighing less than 16 kg (35.28 lbs). The unit is housed in a rugged metal case to protect the system against dust, water, and damage. The case also provides electromagnetic shielding to EN 55022: 1987 Class A (for emissivity) and EN 50082-1: 1992 (for immunity).

Control Stations are available with autoranging power input unit for 110 or 220 VAC operation.

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.

Note

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

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Features Summary

When you purchase a Control Station system, you receive:

- Control Station industrial computer with Control Station automation software and Microsoft Windows NT operating system software installed. (See "Standard Features" below.)

- Power cord

- Installation hardware

- Control Station automation software licenses and license agreements

- Control Station automation software

- Ethernet driver floppy disk and manual

- Microsoft Windows documentation, software distribution, Certificate of Authenticity and license agreement

Standard Features

Operating system	Windows NT
Control Station automation software	Development and Runtime software
CPU	Pentium, 233 MHz minimum
Hard disk	6.4 GB minimum
Floppy disk drive	3.5 inch, 1.44 Mbyte
RAM	64 MB minimum Control Stations allow you to install a maximum of 256MB of DRAM. Supports both Fast Page and EDO (Extended Data Out)
Display	Color TFT-SVGA
Parallel ports	One LPT1
Serial ports	One RS-232

Optional Features

The following features are optional on all models in the Control Station range. Contact your GE Fanuc distributor for details.

- I/O interface cards

- Hard real-time controller

System I/O

Standard I/O

The standard Control Station provides the following I/O interface channels:

- A single serial interface port provided by the processor motherboard. This COM1 port is accessible at the bottom of the 12 inch station and uses a standard 9-pin D type connector. On the 14 inch (WTC) and 18 inch (WTD) station, the serial interface port is accessible on the right-hand side of the main enclosure.

- A single enhanced parallel port is also provided by the motherboard. This port is accessible at the bottom of the 12 inch display unit and uses a standard 25-pin female D type connector. On the 14 inch display unit, the parallel interface port is accessible on the right-hand side of the main enclosure.

If the end application requires serial or parallel interfaces in addition to those provided by the standard system, a specific ISA I/O card can be installed. A wide selection of ISA cards is available to provide the following functions:

- Dual channel RS232 asynchronous adapter

- Dual channel RS422/485 asynchronous adapter

- Printer port output/input adapter

ISA and PCI Card Expansion

Control Station provides expansion slots to accommodate extra ISA and PCI cards.

- One 16 bit ISA slot — accommodates full length card.

- One shared expansion slot for either PCI or ISA (available).

All 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.

Network Interface

The Control Station includes an Ethernet adapter that provides a RJ-45 connector for unshielded twisted pair cable.

Application Software

Control Stations are supplied with Control Station automation software, which is pre-loaded before shipment of the Control Station.

<table>
<tr><td>

Chapter

2

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Powerup and Software Installation

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</table>

This chapter contains information you need to set up your Control Station's operating system and network communications.

Initial Startup

When you first power up your system, you will need to attach a standard PS2-type keyboard to the external keyboard port on the Control Station. When the system starts up, you will be required to enter the Product ID from the Windows NT Certificate of Authenticity and other data to set up your system.

Also, most configuration activities that you perform on a Control Station system can be more easily completed using a keyboard or may require a keyboard.

Note

The 14 inch (WTC) and 18 inch (WTD) models of the Control Station range, which have no integral keypads, require a PC AT keyboard to configure the application software. Once the configuration is completed, the Control Station can normally be operated by using the built-in touch screen.

On power up, if no keyboard is connected to this Control Station, a keyboard error message is given during the boot up tests. The CPU BIOS is factory configured to ignore this error, allowing the system to continue to boot up. (For details, see Chapter 6.)

For details on power supply input, see Chapter 4.

Powering Up the Control Station Unit

Caution

Do not connect or disconnect external devices, such as a printer or a PS2 mouse, while the unit is powered. Failure to observe this precaution could result in damage to the equipment.

The power switch is located on the side of the Control Station unit next to the input power connector. To power up the unit, set the rocker switch to the | position.

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

Setting Up the Control Station

1. Plug in the keyboard, PS2 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. 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 your Windows NT 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 15 characters to run Control Station automation software. Each computer on a network must have a unique name.

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

Note

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

11. 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.

12. Press ENTER to continue with Windows NT Setup.

13. You will be prompted with 2 messages to enter TCP/IP and subnet mask addresses.

Note

If necessary, consult your network administrator to select appropriate addresses.

14. After completing the network setup, the system will copy files over, finalize its setup, and install both a Y2K update and the Control Station Automation software.

15. Follow the instructions on the screen to install the update and software.

Note

Do not reboot your machine at any time during the installation.. Your machine will automatically reboot when the installation is finished.

Configuring the Control Station to Run on a Microsoft Network

Notes

Before setting up your new Control Station 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, then click Settings and 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. You will need to type your Computer name, Workgroup name, and Computer Description.

Note

Computer names must be less than or equal to fifteen characters to run Control Station automation software. Each computer on a network must have a unique name.

4. To allow sharing,

   A. Go to the Configuration tab and click the File and Print Sharing button. The File and Print Sharing dialog box will appear.

   B. Check the File and Print Sharing options that you want and click OK.

5. To add the TCP/IP protocol,

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

   B. Click the Protocol icon. The Select Network Protocol dialog box will appear.

   C. In the Manufacturer list, select Microsoft. In the Protocol list, select TCP/IP. Click OK.

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

Registering Your Control Station automation software

Before you can start developing projects with your Control Station automation software, you must authorize the software with a program called Product Authorization. If you don't authorize the software, you will only be able to use the Control Station automation software for a four day trial period. If you do not want to develop your control applications on the Control Station, you'll also need to move the Editor portion of the software to another computer (see the Control Station Getting Started manual). Product Authorization will only take a few moments and will allow you to take advantage of any product support for which you qualify. You will need to contact us by telephone, fax, or email as part of the authorization process.

To authorize a copy of Control Station software

1. Have your serial number ready. The serial number can be found on the yellow product information sheet included with the Control Station documentation.

2. Run the Product Authorization program from the Start menu/Programs/FrameworX/Product Authorization. The Products Authorization dialog box appears.

3. Click Software Keys. A dialog box appears containing customer information.

4. Under Utilities, Click Add. The Product Authorization wizard appears.

5. Follow the steps as they appear on the screen. When you've reached Step 4 in the Wizard, either call the number on the screen to receive your new key code or click Print FAX Authorization Page to print a fax sheet which you must fax to us (our fax number will be on the print out). We will then fax you back with the new key code. You can also email us at authorization@total-control.com. Product Authorization is complete once you type in the new key code.

To move the authorization to another computer

You can only run the Control Station automation software on the computer that the Product Authorization was run on. If you want to develop your control projects on a different computer than Control Station, you will need to complete the following steps to move the authorization from one computer to another.

1. Install the Control Station automation software on the computer that the authorization will be moved to. Run the Product Authorization program from the Start menu/Programs/FrameworX/Product Authorization. The Product Authorization dialog box appears.

2. Click Software Keys.

3. There is a site code on the top right hand side of the next screen. Write this code down carefully. You will need it as a Target Site Code for the other computer: this has to be accurate in order for the move to work. Under Utilities click Add. The Product Authorization wizard appears.

4. Click Authorize by disk. You will be asked for an authorization disk. At this point, go to the computer that has the authorization code and run the Product Authorization program.

5. Click Software Keys.

6. Click Move. On the following screen, click Next. Enter the site code that you wrote down from the other computer and click Next. Verify that the site code is correct and click OK.

7. Insert a blank formatted floppy disk into the floppy drive and click Next. The authorization code will be moved to the disk and a dialog box should appear telling you it was successful. Click OK.

8. Insert the floppy disk into the computer you are moving the authorization to. The screen that is asking for a disk should be displayed. Click Next.

9. Click Finish. A screen should appear telling you if the move was successful.

10. Click OK. The authorization has now been moved to the new computer.

Installing Application Software

The Control Station is shipped with the Windows NT operating system and Control Station automation software already installed. If it is necessary to reinstall software, consult the documentation supplied with the software.

Directory Structure

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

Windows NT Systems

`C:\CIMCD\i386`	**Control Station Automation Software CD**
`C:\i386`	**Windows NT CD**
`C:\Backpack`	**Backpack CD drivers**
`C:\TBASE`	**Touch screen drivers**
`C:\i386\DRVLIB.NIC\Intel55`	**Network drivers**
`C:\SP4\i386`	**Service pack 4 drivers**

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\i386\sp4i386`

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 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 Support 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.

External CD-ROM Drive

A driver, BP32DRV, is factory-installed to allow the Micro Solutions Backpack™ External CD-ROM Drive to be used for loading software. To enable this driver, select Devices under Control Panel, select BP32DRV, and change Startup setting to System. Close the Control Panel, shut down, and connect the drive to the parallel port. Restart the system and open Windows NT Explorer. The CD-ROM should appear as D:. When finished, the driver can be set to Disabled again

Touch Screen Driver for Windows

Operation of the touch screen with Windows NT requires the respective Touchbase™ software driver ,T5driver or TNdriver. This software is installed and configured at the factory. We recommend that you do *not* change these settings.

The integral touch screen of the Control Station unit is internally connected to serial port COM2 on the system board. The driver settings can be changed by running the Touchscreen icon in Programs. The touch screen must be set to:

COM Port	= COM2
IRQ	= 3
I/O Address	= 2F8

Shutting Down the Computer

<div style="border:1px solid black; display:inline-block; padding:4px;">Caution</div>

To avoid damaging files, always shut down Windows software before removing power from your Control Station product.

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

Chapter 3	*Hardware Installation*

This chapter describes the procedures for the safe location and securing of the Control Station. The Control Stations have been designed to ensure simple installation.

A single cut-out in the mounting panel is all that is required when mounting the Control Station. No extra mounting holes are needed. Instead 12 spring loaded 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 and how to change the air filter.

Mounting Guidelines

Note

The IP65 rating applies to the front panel of the Control Station only and not to the rear of the unit.

- 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 of the Control Station without distortion to the unit. The mounting clips will support a panel thickness of up to 10mm (0.39 inch).

- All 12 mounting clips must be fitted properly to achieve a good seal between the Control Station 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. Two fans are used to create air flow through the Control Station ensuring that a correct working temperature is maintained. The first of the fans is located within the unit and is used to cool the processor. The second fan is built into the power supply housing and blows air out of this unit.

  Incoming air passes through a filter that removes dust and dirt. The filter should be checked and replaced regularly.

Mounting Procedure

Use the following procedure to mount the Control Station.

1. Cut an opening in the panel to the dimensions shown. The cut-out dimensions of 411 x 346 mm allow a 1.2 mm clearance on each edge of the Control Station. The unit requires a minimum of 200mm depth when mounted.
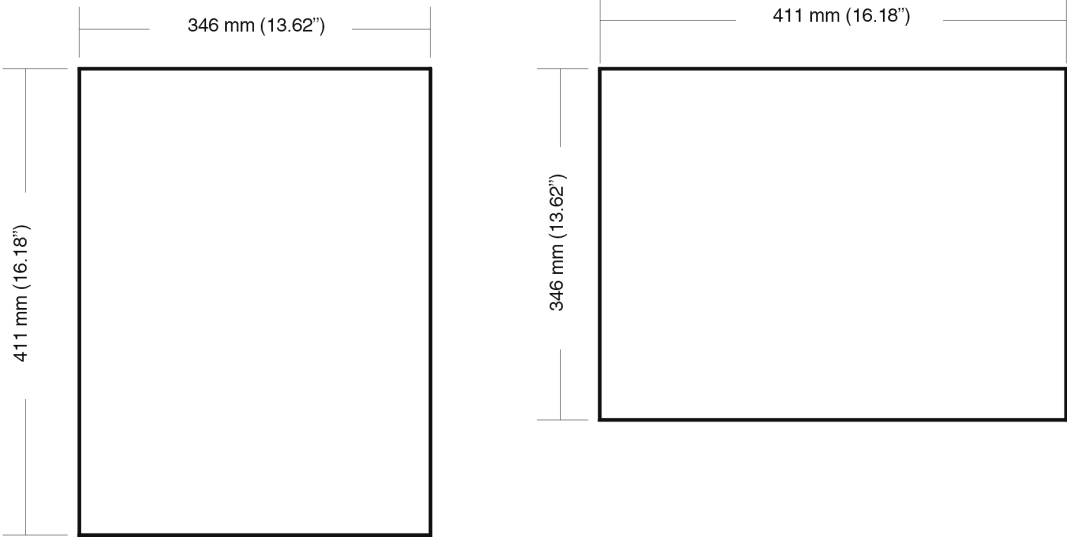
2. Position the Control Station in the cut-out and fit the 12 spring loaded retaining clips into the slots on the Control Station. All 12 clips must be used to produce a good seal.

3. Screw in the tightening screws on each clip so that the spring is compressed by the nut. To ensure a good seal between the Control Station and the mounting panel, 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 Control Station is locked into place.

Spring Loaded
Retaining Clip
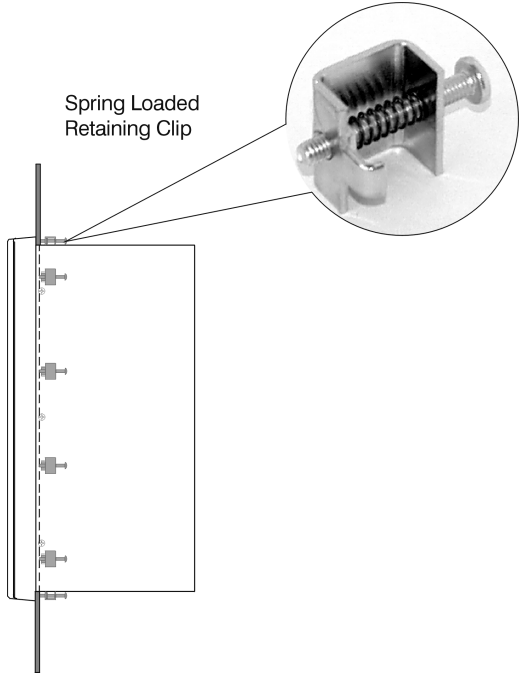
Installing Cards

Note

If you are installing an optional serial card, none of the ports can be configured as COM2, which conflicts with the touch screen.

Control Station provides four expansion slots, two of which are available for installation of user cards.

- One 16 bit ISA slots — accommodate full length cards (Both are available.)

- Two 32 bit PCI slots — accommodate half length cards (Both used for video and ethernet cards.)

- One "shared" expansion slot, which means that it can be used for either PCI or ISA (Available.)

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 a clamping bracket with screws adjustable to the height of the card.

The rear cover of the Control Station must be removed in order to access the ISA and PCI bus cards. Ten screws are used to secure the rear panel to the Display 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 power to the Control Station and disconnect the main power before removing the rear cover from the unit.
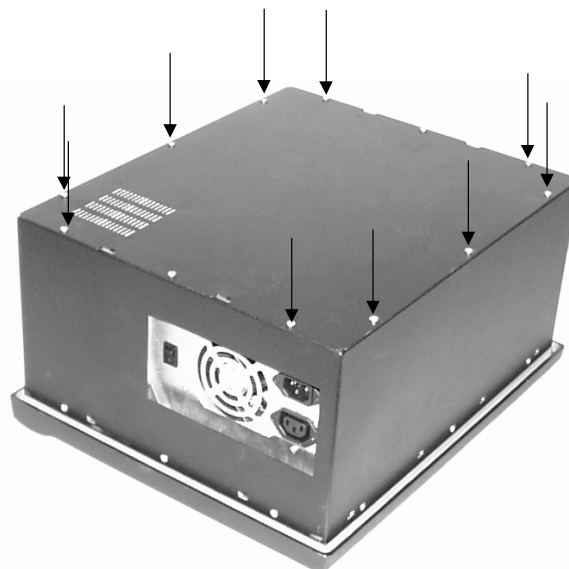
Caution

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 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 antistatic strap and be sure that you are fully grounded. Never touch the card, or any components inside the Control Station, 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.

Card Clamping

A card clamping bracket with blocks adjustable to the height of the card is used in the Control Station.

The clamp can be adjusted for all standard heights of ISA and PCI cards:

- All standard height cards are secured by a card clamping bracket fixed over and above the cards.

- Each Control Station is supplied with card securing blocks and screws as well as a foam strip for the highest standard card. When installing a card in one of the vacant positions, the block must be fitted to the clamping bracket as shown in the figure above.

Using the Card Clamp Bracket

- Take the card clamping bracket (with the necessary blocks at the appropriate height in place), as shown above, fix the clamp into position by aligning the two holes in the folded end of the bracket over the two pins on the inside wall of the main Control Station enclosure.

- Locate the two off holes on the opposite end of the clamp with the two threaded holes on the top of the hard disk drive bracket.

- Secure the bracket using two M3x6mm screws and nuts.

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, otherwise the air flow will not comply with CE requirements.
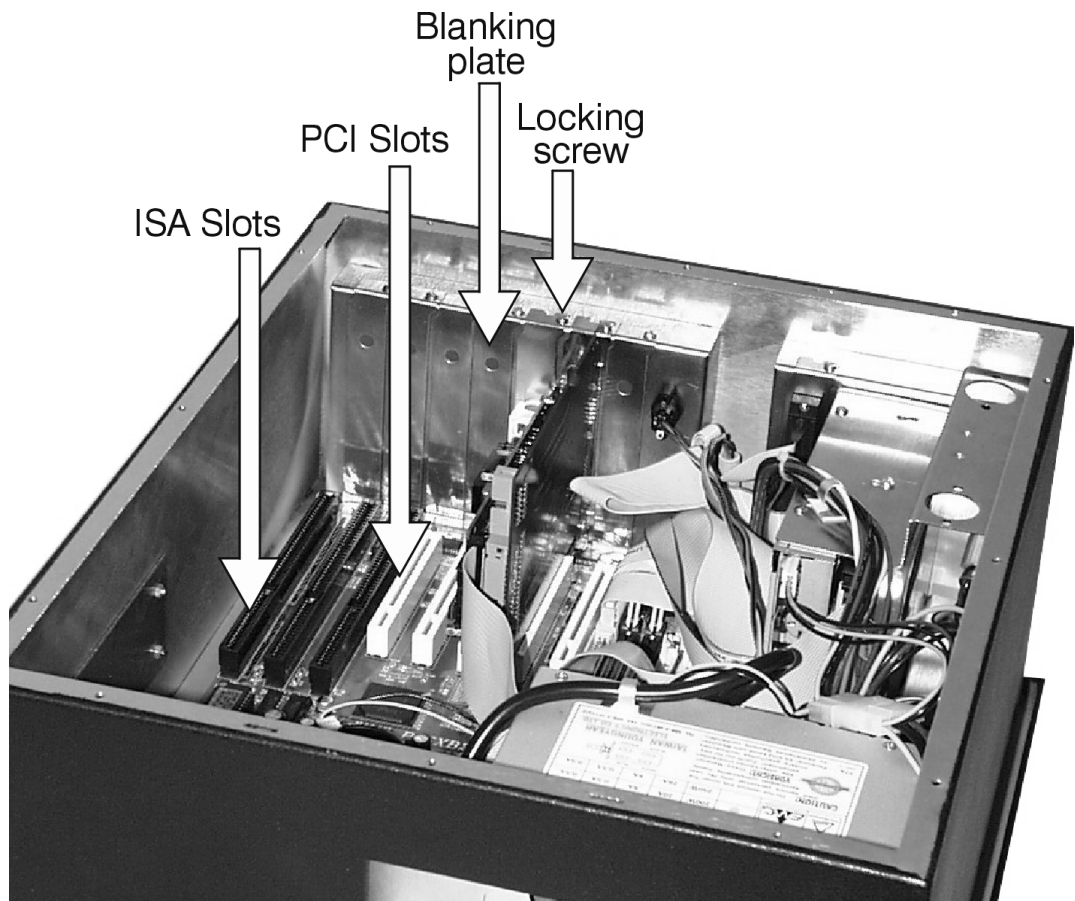
Configuring Expansion Cards (Legacy ISA Only)

```
                          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 machine to lock up. Following these instructions when installing Legacy ISA cards will prevent problems with resource conflicts.

Legacy ISA cards (that is, not Plug and Play) 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 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 Table 2.

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 Table 3-1.

Table 3-1. I/O Port Range Table

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 filter element should be changed every three months, or 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 mounted to the inside of the Control Station's back plate using one nut and washers.

Caution

Power down the Control Station before removing the rear cover.

To change the filter:

1. Unscrew the center nut and remove the filter retaining plate.

2. Remove the filter element and replace it with a new one.

3. Put the filter retaining plate in place and secure it to the backplate by tightening the center securing nut.

Chapter	*Connectors*
4	

This chapter describes the connector layout on the standard Control Station.

Keyboard and data connectors are provided on the proprietary cards fitted to the Control Station. The documentation of the original manufacturers of these cards is supplied with the Control Station:

- Keyboard (CPU card)

- PS2 Mouse Port

- Serial Port COM 1

- Parallel Port, 25-pin (CPU card)

- Network (PCI expansion card)

For details about connectors on proprietary cards you have installed in the Control Station, 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 Control Station when the unit is powered up.

Power Input

Control Stations are available with autoranging 85 to 250 VAC power input. A rocker switch is provided to allow the system to be isolated from the input. The power supply unit and the power switch are recessed within the enclosure to ensure that they do not interfere with the mounting of the Control Station into the panel aperture. The power supply unit houses an integral ventilation fan that provides cooling for the power supply.

For power supply details, refer to specifications in Appendix A. There are no user-servicable fuses in these Control Station units.

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.

These Control Stations are powered by an internal AC power supply unit (PSU). This is an autoranging unit which accepts 85 to 135 and 180 to 250 VAC input ranges. The power supply unit also provides a standard IEC outlet socket.

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

Serial Communication Cables

A 9-pin D type male connector mounted on the side of the Control Station is used for the serial port (COM1).
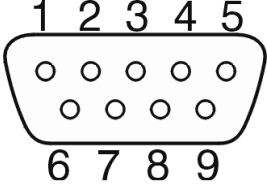
| RS-232C Name	Pin	Assignment
CF	1	DCD (Data Carrier Detect)
BB	2	RX (Receive Data)
BA	3	TX (Transmit Data)
CD	4	DTR (Data Terminal Ready)
AB	5	GND (Signal Ground)
CC	6	DSR (Data Set Ready)
CA	7	RTS (Request to Send)
CB	8	CTS (Clear to Send)
CE	9	RI (Ring Indicator)

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

- The cables must be of the shielded type

- 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.

4
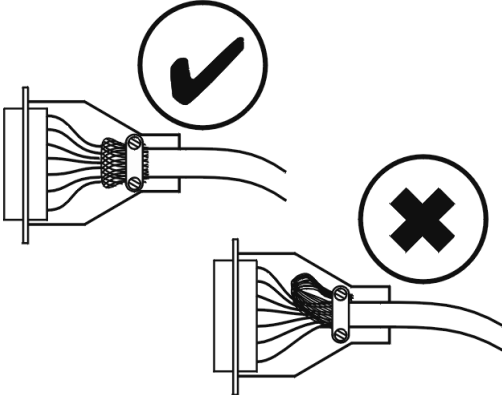
Printer Port LPT1

A 25-pin D type female connector mounted on the side of the Control Station is used for the printer port.
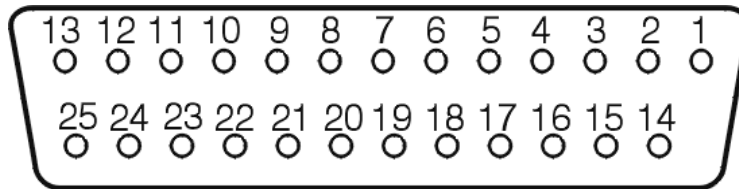
1	Strobe	10	Acknowledge
2	Data Bit 0	11	Busy
3	Data Bit 1	12	Paper End
4	Data Bit 2	13	Select Out
5	Data Bit 3	14	Auto Feed XT
6	Data Bit 4	15	Error
7	Data Bit 5	16	Initialize Printer
8	Data Bit 6	17	Select In (from Printer)
9	Data Bit 7	18 to 25	Ground

Caution

External devices (printer, external disk drive etc.) should not be connected or disconnected from the Control Station when the unit is powered up.

Chapter 5

System Operation

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

- System Peripherals

- Graphic System

- Operator Interfaces

- Control Station automation software

- Communications

System Peripherals

The system contains a 3.5 inch floppy disk drive and an internal hard disk.

Hard Disk Drive

Control Station systems are configured for a single internal hard disk drive for the mass storage of data. The disk drive is a standard unit with EIDE/ATA-2 interface.

Hard disk bay
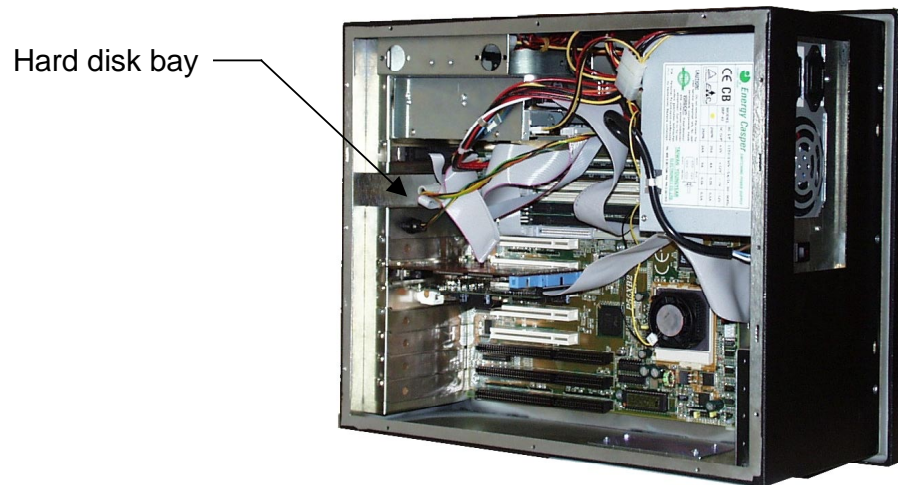
Floppy Disk Drive

The floppy drive is a standard 3.5 inch, 1 inch high unit capable of operating in both low density (720KB unformatted) and high density (1.44MB unformatted) modes.

On the 12 inch Control Station, the floppy drive is positioned on the right-hand side of the underside of the unit. On the 14 inch (WTC) and 18 inch (WTD) model, the drive is located within the unit on the upper right-hand side. In both models, the drive is accessible only from the rear of the mounting panel but can be reached without having to remove any access covers.

Graphic System

Display Types

The following display types are available:

- 12.1 inch color TFT (SVGA resolution)

- 13.8 inch color TFT (XGA resolution).

- 18.1 inch color TFT (SXGA resolution).

All the displays have the following specifications:

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

- Wide angle viewing

All models include:

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

- Control of the backlight to maximize the tube lifetime. (See page 5-9.)

Graphics Controller

A dedicated graphics controller card, which is installed in a PCI expansion slot on the motherboard, provides the interface for the flat panel display.

The following features are supported:

- The graphics controller interfaces to the host CPU using the 32 bit PCI bus and clock synthesizer.

- The graphics card supports TFT flat panel displays.

- The card supports display panel resolutions from VGA (640 x 480) up to XVGA (1024 x 768), color support being from 512 to true color.

- The card supports a digital flat panel interface.

- The card also supports an external CRT interface using 15 pin high density D type connector.

Video
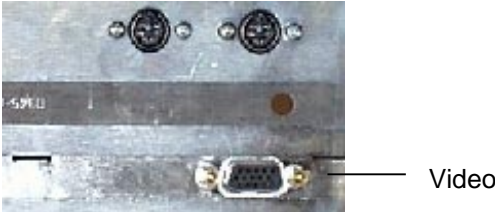
Operator Interfaces

Two interface options are supported by Control Stations:

- Touch Screen only

- Touch Screen and keypad (12 inch WBB model only)

External Keyboard and Mouse

External keyboard and PS2 mouse connectors are located on the side of the system as illustrated below:
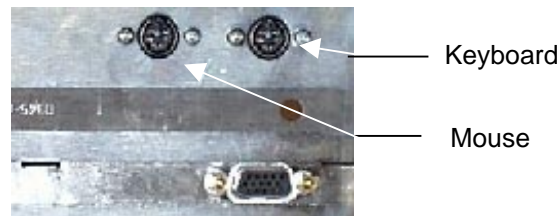
The touch screen and PS2 mouse will work simultaneously if the mouse is Microsoft or IBM PS2 compatible. Because Windows can load only one mouse driver at a time, it is not possible to provide simultaneous support for a mouse that requires its own specific Windows driver.

If you are installing an optional serial card, none of the ports can be configured as COM 2, which conflicts with the touch screen.

Touch Screen

The Control Station range includes a resistive overlay touch screen on the flat panel display.

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

The touch screen is connected internally to the COM 2 serial port, which allows it to function with SCADA software. If you install a card that has settings that conflict with those of the COM 2 serial port, you will need to change the card's configuration.

Touch Screen Driver for Windows

SCADA software which runs under Microsoft Windows is supplied with a driver (Twdriver) to interface with the touch screen surround.

The integral touch surround of the Control Station is internally connected to COM2. Parameters must be set within the driver so that they match the hardware settings. The factory default settings are:

> COM Port = 2
> Address = 2F8 Hex
> Interrupt = 3

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.

Control Functions

Control Station 12-Inch Model

The 12 inch model of Control Station has an integral keypad which is located in the front display subassembly. The keypad returns the same scan codes as a standard PC/AT keyboard, listed in Table 5-1. The internal membrane keys on the integral keypad remain functional when a keyboard is connected to the external PC/AT keyboard interface.

The Control Station also has a Control/Status panel, which is described on page 5-8.
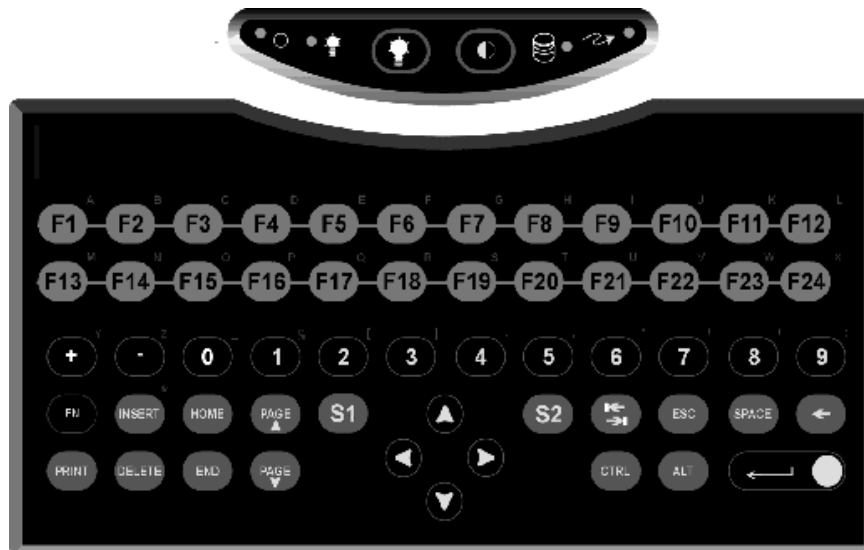
Table 5-1. Membrane Keypad Scan Codes

Control Station Key	Without FN Key		With FN Key on Control Station Held	
	AT Command Without FN Key	**Make Scan Code (Hex) Without FN Key**	**AT Command With FN Key**	**Make Scan Code With FN Key**
F1	F1	3B00	A	1E41
F2	F2	3C00	B	3042
F3	F3	3D00	C	2E43
F4	F4	3E00	D	2044
F5	F5	3F00	E	1245
F6	F6	4000	F	2146
F7	F7	4100	G	2247
F8	F8	4200	H	2348
F9	F9	4300	I	1749
F10	F10	4400	J	244A
F11	F11	8500	K	254B
F12	F12	8600	L	264C
F13	CTRL + F1	5E00	N	314E
F14	CTRL + F2	5F00	O	184F
F15	CTRL + F3	6000	P	1950
F16	CTRL + F4	6100	Q	1051
F17	CTRL + F5	6200	R	1352
F18	CTRL + F6	6300	S	1F53
F19	CTRL + F7	6400	T	1454
F20	CTRL + F8	6500	U	1655
F21	CTRL + F9	6600	V	2F56
F22	CTRL + F10	6700	W	1157
F23	CTRL + F11	8900	X	2D58
F24	CTRL + F12	8A00	Y	1599
-	-	0C2D	+	0D2B
0	0	0B30	_	0C5F
1	1	0231	%	0625
2	2	0332	[	1A5B
3	3	0433	]	1B5D
4	4	0534	.	342E
5	5	0635	,	332C
6	6	0736	"	2822
7	7	0837	\	2B5C
8	8	0938	/	352F
9	9	0A39	:	273A
FN	None (Note 3)	None	None	None
INSERT	Insert	52E0	*	092A

Table 5-1. Membrane Keypad Scan Codes - Continued

Control Station Key	Without FN Key		With FN Key Held	
	AT Command	**Make Scan Code (Hex)**	**AT Command with FN Key held**	**Make Scan Code with FN held**
PAGE↑	Pageup	49E0	None	None
S1	Start Button (WinMenu) Note 1	E02F	M	324D
↑	Up arrow	48E0	None	None
S2	ContextMenu (Note 2)		Z	2C5A
Tab	Tab	0F09	Shift + Tab	0F00
ESCAPE	Escape	011B	None	None
SPACE	Space	3920	None	None
BACKSPACE	Backspace	0E08	None	None
PRINT	Ctrl + P	1910	None	None
DELETE	Delete	53E0	None	None
END	End	4FE0	None	None
PAGE↓	Pagedown	51EO	None	None
←	Left arrow	4BE0	None	None
→	Right arrow	4DE0	None	None
Alt	Alt		None	None
↵	Enter	1C0D	None	None
↓	Down arrow	50E0	None	None
HOME	Home	47E0	None	None

Notes:

1. The **S1** key produces the same scan code as that for a Microsoft Windows 95 compatible keyboard. It performs the same function as selecting the Windows Start icon.

2. The **S2** key produces the same scan code as that for a Microsoft Windows 95 compatible keyboard. It performs the same function as clicking the left mouse button to produce a popup menu.

3. The **FN** key produces no scan codes on its own. It modifies the scan codes produced by the other keys as indicated in the table above.

Control Station 14-Inch (WTC) and 18-Inch (WTD) Models

The 14 inch (WTC) and 18-inch (WTD)models of the Control Station range do not have integral keypads. Operation of the system can be performed using the touch screen facility or by connecting a PC/AT keyboard to the Control Station. The Control Station also has a Control/Status panel, described below.

Control/Status Panel

All models in the Control Station range, with or without an integral keypad, include a control/status panel carrying a range of LEDs. The LEDs and keys on this small membrane panel have the following functions:
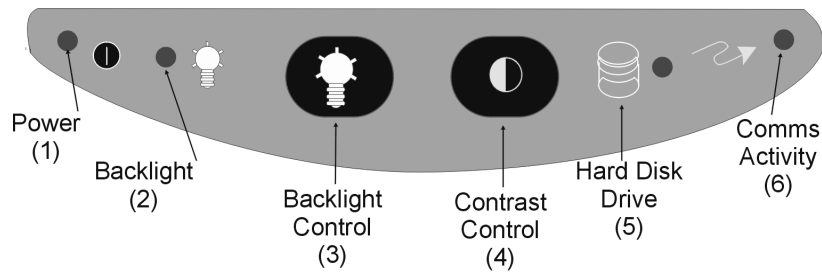
Callout	Type	Function
(1)	LED	Lighted when system power is applied
(2)	LED	Lighted when the Timed backlight mode is selected for the flat panel display
(3)	Switch	Selects the Backlight Mode of operation
(4)	Switch	Controls the flat panel display contrast (only applicable for the STN technology).
(5)	LED	Lighted to indicate IDE drive activity (when hard disk is read from or written to)
(6)	LED	Lighted to indicate communications activity on (a general status indicator which can be used by any additional hardware installed on the system)

Backlight Dimming Control Settings

Control Stations incorporate a backlight dimming control to extend the life of the backlight tube. The dimming control is operated by using the backlight control button located on the control/status panel as with the contrast control.

Default Setting

At power up, the backlight control is set to the default setting. This gives a time out period of 5 minutes that the backlight stays fully on, after which time the backlight will dim.

You can configure the default setting time out period to give a time out period of between 1 to 30 minutes.

Mode Setting

The backlight can be operated in three modes:

Timed Mode - LED on
Full Constant Mode - LED off
Dim Constant Mode - LED off

To step the system through the three modes, apply single presses of the Backlight Control Button.

This is the default mode. In the Timed Mode, you can set the period of time for which the backlight operates at full power. When the time set expires, the backlight display is reduced to Dim and remains at the dim setting until the next interface input using the keypad.

Timed Mode

If the system is powered down, when the unit is powered up again the default settings will be in effect. You must remake any settings for the control of the backlight.

Full Constant Mode

If the Backlight Control Button is pressed once when the system is operating in Timed Mode, the Control Station will then operate in Full Constant Mode. In this mode, the backlight is constantly on.

Dim Constant Mode

Pressing the Backlight Control Button a second time selects the Dim Constant Mode. In this mode the backlight displays constantly on the Dim setting.

Setting the Time Out Period for Timed Mode

You can configure the timeout period so that the backlight stays fully on for a period of between 1 to 30 minutes before dimming.

To set the timeout period:

Press and hold the Backlight Control Button for more than 2 seconds. The backlight control LED will begin to flash.

Each flash of this LED indicates that 1 minute has been added to the time out period. For example, if the LED is allowed to flash three times and the button is then released, the backlight will dim after a period of three minutes has elapsed.

Control Station automation software

For detailed software operating instructions, refer to the Control Station automation software *Getting Started* manual and the online help system.

Communications

For information on the hardware setup for device communications, refer to the Managing I/O section of the online help. For information on a specific driver, click **Help** when configuring it.

Your Control Station 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 NT systems, these settings are changed using the Network application in the Control Panel program group.

Table 2. 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.

Note

On any Control Station product with the HSSB card, only use the TCP/IP protocol. Do not install any other protocols.

Note

For Windows NT systems: If any component is removed and re-installed, the Service Pack will need to be run after installation. Path is:

```
C:\SP4\i386\sp4i386
```

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.

Connect a keyboard and turn on the power. Enter the Setup mode by pressing the DEL key when prompted during the computer power-up sequence. A screen will appear offering several options for changing settings, restoring default settings, and other functions. Follow these instructions to restore the factory configuration.

1. 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.

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

Primary HDD master	AUTO, AUTO
Secondary HDD master and slave	AUTO
Primary HDD slave	AUTO
Drive A	1.44 MB 3.5" drive
Drive B	NONE
Halt on Errors	All Faults **Note:** if the Control Station does not have an integral membrane keyboard, this should be set to "Ignore Keyboard error."

Exit Standard CMOS Setup.

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

4. Select Save and Exit Setup. The startup sequence should begin now.

The system is now configured with factory CMOS settings.

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 Control Station 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 the Support Hotline.

Troubleshooting

Powerup

Symptom	Possible Causes	Solution
Control Station does not power up.	Power not on (PWR indicator is not lit or display completely dark).	Make sure that Control Station is plugged in. Make sure that power source is functioning properly.
Display is blank (PWR indicator is lighted).	See "Display" on page 7-3.	See "Display" on page 7-3.
`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 95 software.	The Control Station will power up normally.
Memory count during powerup self-test is incorrect.	Optional SIMM is installed incorrectly or is incompatible with the Control Station 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 DEL key has been accidentally pressed.	Cycle power again. The Control Station will power up normally.
The Control Station 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 Control Station.
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 or adjust contrast.
Display is blank (PWR indicator is lit).	Screen temperature is outside operating range.	If Control Station is in direct sunlight, move it and allow it to cool.
	Control Station 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.
	Screen saver is active.	Touch the touch screen, or a key on the keypad.

Memory

Symptom	Possible Causes	Solution
Memory count during powerup self-test is incorrect.	Optional SIMM is installed incorrectly or is incompatible with the Control Station 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.

Touch Screen

Note

Operating temperature can affect touch screen calibration. If touch screen operation is slightly off, recalibrate it by running calibration from the Touchscreen application in Programs.

Symptom	Possible Causes	Solution
Cursor does not respond at all to touch.	Touch screen disabled.	Make sure that documented default touch screen settings are selected.
	Touch screen driver accidentally deleted.	Reinstall touch screen driver
	System is busy.	Press CTRL-ALT-DELETE once to view task list.
	If Windows NT has been re-installed without modifying the BOOT.INI file, the NTdetect utility will cause problems with the touch screen.	Modify the BOOT.INI file to include the /NoSerialMouse option. For details, see "Reloading NT on the Hard Disk From CD" in Chapter 2.
	Conflicts with port configuration.	If you are installing an optional serial card, do not configure any port as COM2. COM2 is used by the touch screen.
Cursor moves but does not follow your touch accurately.	Touch screen not calibrated properly.	Run calibration from Touchscreen application in Programs.
Touch screen responds erratically to touch; cursor might not be visible.	Touch screen settings are incorrect.	Refer to settings.

External PS2 Mouse

Symptom	Possible Causes	Solution
Cursor does not respond to mouse movement	Mouse not plugged in.	Power down Control Station. Plug mouse into mouse port on Control Station and reboot.
	The type of mouse is not supported.	Use a PS2 mouse.
	System is busy.	Press CTRL-ALT-DELETE to view task list.
	Mouse not detected.	Restart Control Station product 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 Control Station.	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 Control Station by pressing the DELETE 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 battery has a lifetime of up to 10 years under normal operating conditions. If the battery failed, contact the Support Hotline.

<table>
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Technical Data

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Mechanical Specifications

Front Assembly

This manual covers three variants of the Control Station:

- The **12 inch WBB model** of the Control Station features a display screen with touch screen, and a built in operator keypad.

- The **14 inch WTC & 18 inch WTD models** of the Control Station have larger displays with touch screens, but no integral keypad. The touch screen provides the operator interface for the unit. A PC AT keyboard can be connected for system configuration but is not intended for normal operator interface use.

Both models have a control/status panel located below the display screen. This panel houses the LED displays which indicate power, IDE drive activity, backlight control and contrast.

The entire front panel assembly is engineered to IP65 standards.

Touch Screen

A resistive touch screen is incorporated in front of the flat screen. The screen is designed so that impairment of visibility is reduced to a minimum. The touch screen is bonded to the front metal work using a silicon sealant.

Keypad

Two keypads are used on the 12 inch model, a main keypad and the status control panel. They are manufactured from a chemically resistant polyester. All the keys provide tactile feedback.

Main Chassis

The main chassis is manufactured from sheet steel and houses the motherboard which is mounted securely in a vertical plane. Plug in boards are mounted in either a vertical or horizontal plane perpendicular to the front of the Control Station.

The chassis has been designed to conform to the standards necessary to meet CE approval.

The housing for the card connectors is recessed so that the card interfaces do not protrude beyond the profile of the main housing.

A card clamp device secures cards of standard height. Slots are included for both ISA and PCI cards to be used.

Rear Cover

The rear cover of the unit is fixed to the main chassis so that there are no slots allowing EMF or RFI emissions to escape. The cover can be removed easily without breaking any electrical connections.

Panel Mounting System

Twelve spring-loaded clamps are provided for mounting the Control Station on a panel.

Functional Specifications

CPU and Memory	
Microprocessor Options	Pentium 233 minimum
User Memory	Minimum 64 Mbyte
Operating System	Windows NT
Hard Disk	6.4 Gbyte minimum, IDE standard 3.5 inch mounting
Floppy Drive	Supports 3.5-inch, 1.44Mb PC format floppy disks

PC Backplane	
ISA bus card slots	One card using a full length slot.
Shared slot	One shared expansion slot for either PCI or ISA. Accomodates one full length or one half length card

Display	
Display Variants	12 inch Color TFT – SVGA resolution 14 inch Color TFT – XGA resolution 18 inch Color TFT – SXGA resolution
Active Display Area	12 inch (246 x 184.5 mm) 14 inch (280.6 x 210.7 mm) 18 inch (470 x 434 mm)

Power Requirements	
AC Input	85 to 250VAC, 200W autoranging
Power Rating	85 to 265V, 47 to 63Hz, 20/4A

Ports	
Parallel Port	One: LPT1
Serial Ports	COM1 external RS232 port COM2 wired internally to touch screen
Keyboard Port	PS2 connector
Mouse Port	PS2 connector

Physical	
Dimensions	
Models with 12-inch display	365mm wide x 430mm high x 190mm deep
Models with 14-inch display	430mm high x 366mm high x 190mm deep
Models with 18-inch display	470mm high x 434mm high x 190mm deep
Weight (base unit with no optional cards installed)	
Models with 12-inch display	14.1Kg (31.1lbs)
Models with 14-inch display	15.5Kg (34.2lbs)

WBB Model
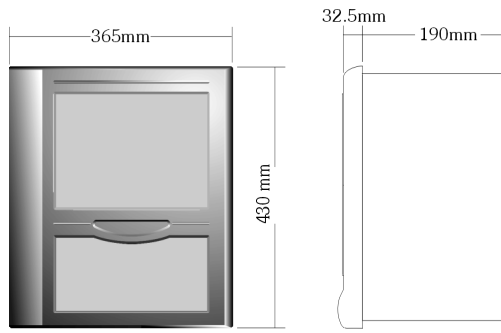
WTC Model
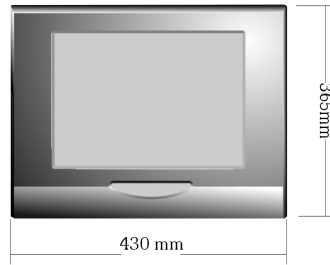
WTD Model
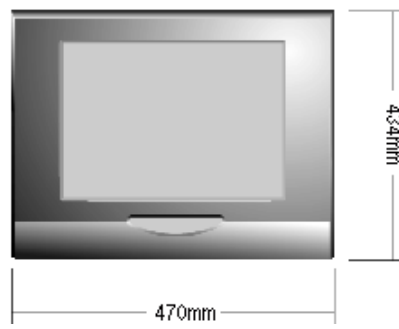
Environmental Specifications

Operating Temperature	0 to 50°C (TFT) display
Storage Temperature	-20° to +60°C
Relative Humidity	5 to 85% non-condensing
Vibration (on all axes)	Frequency range 5Hz to 250Hz.
	Level: 5Hz to 7Hz at 10mm peak to peak. 7Hz to 250Hz at 1g, 5min period, 2 hours per axis. Performed in each of the 3 mutually perpendicular axes.
Drop Test	5G 10mS
EMC	Complies fully with EN55022 Class A Emissions and EN50082/1 Immunity
	EN60950 - Low Voltage Directive
Shock	Acceleration 5g.
	Duration: 10mS. Three shocks in each axis. Performed in each of the mutually perpendicular axes.

Filter Pads	
Dimensions	80mm by 80mm
Material	P15/150B
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 BS2963

Note: Filter pads (reference FP80T) are available from:

PAPST-MOTOREN GmbH & Co KG
Hermann-Papst-Straße 1
78112 St. Georgen/Schwarzwald
Postfach 14 35

Tel: (0 77 24) 81-0
Fax: (0 77 24) 81-309

http://www.papst.de/home.html

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