PowerStation

EP Series User Guide

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Product Warranty Information

Parker Automation - CTC provides top quality products through rigid testing and the highest quality control standards. However, should a problem occur with your hardware or with the software protection key, CTC's standard product warranty covers these items for 24 months from the date of shipment from CTC. Exceptions appear below:

- PowerStation backlight bulbs have a 90-day warranty.

- Third-party products, such as bus cards, carry the manufacturer's specified warranty.

- For all displays, image retention (burn-in) is not covered by warranty.

- Software revisions that occur within 60 days after purchase are available under warranty upon request. Please review the InteractX License Agreement for additional software warranty information.

Should you have any questions about your application or need technical assistance, please call CTC's Product Technical Support department at 513-248-1714, 8:00 a.m. to 5:00 p.m., Eastern Time. See *Customer Support Services* on page 5 of this manual for more information about CTC's support products and services.

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Chapter 1

Manual Overview and Support Services

Thank you for purchasing an EP PowerStation. The EP PowerStation is a rugged, compact PC that is designed to be used as an industrial operator interface.

The EP PowerStation has an all-in-one PC board with Serial, Ethernet, and USB ports. The EP PowerStation's PC architecture allows you to run CTC's InteractX software.

Please take time to review this manual and the other documentation included with the EP PowerStation before operating the unit.

Chapter Contents

Using this Manual

This manual is designed to help you set up and use your EP PowerStation. The manual lists the PowerStation's specifications and describes its replacement and optional components. It also explains how to install the unit and how to maintain the unit in good condition.

This manual is divided into the following chapters:

Chapter 1 — Manual Overview and Support Services: Presents an overview of this manual, the other documentation and software provided with the EP PowerStation, and the steps necessary to get your PowerStation up and running. This chapter also describes CTC's customer support services.

Chapter 2 — Introducing the EP PowerStation: Describes the EP PowerStation's specifications and the ports available to connect the PowerStation to other devices and to a power source. This chapter also describes the PowerStation's drive definitions and the unit's replacement and optional components.

Chapter 3 — Installing the EP PowerStation: Explains how to install the EP PowerStation in a control enclosure and how to start up the unit.

Chapter 4 — Maintaining the EP PowerStation: Explains how to install replacement parts and how to maintain the EP PowerStation.

Documentation Components

The EP PowerStation documentation set contains all the information you need to configure, install, and use the EP PowerStation. The EP PowerStation documentation set is described below.

Release Notes - This document is provided whenever there is important information about the EP PowerStation that does not appear in this manual. Be sure to read any available release notes before installing or operating the unit.

PowerStation EP Series User Guide - This is the document you are reading. It provides detailed information about the EP PowerStation and describes how to configure, install, and use the unit. Please read this manual in its entirety before operating the unit.

Software Components

CTC pre-loads each EP PowerStation with the Windows XP operating system and necessary utilities so that you can run the PowerStation immediately upon its arrival at your facility. If you ordered InteractX with your system, the software will also be pre-loaded.

Getting Started

Now that you have opened the EP PowerStation package, you are ready to unpack the unit, develop an application, and install the PowerStation in a permanent location. This section provides an overview of these activities. Additional information is available in the remaining chapters of this manual.

Before You Begin

Before you begin operating the EP PowerStation, please verify that you have received all the components you ordered.

Installing the PowerStation

When you finish unpacking the PowerStation and developing an application, you are ready to install the unit in a permanent location. See *Chapter 3 Installing the EP PowerStation on page 25* for complete installation instructions.

Downloading Applications and Projects

The EP PowerStation is a runtime-only system, which means that you must develop your applications and projects on a development PC and download the application to the PowerStation.

Note   Throughout this manual, all references to "development PC" or "development system" refer to the computer you use to develop applications.

See the documentation that came with your development software for information about how to develop your applications or projects and download them to the PowerStation.

Documentation Standards

As you read this manual, you will notice that it uses the following documentation standards:

1. Important terms are shown in **bold**.

2. Text to be entered from the keyboard is shown in `Courier` font.

3. Buttons, menu titles, and keyboard keys are shown in Initial Caps.

4. Indented paragraphs denote one of the following:

   • **Note** - Describes alternative approaches or issues you should be aware of while using a particular function.

   • **Important** - Contains information that you need to pay particular attention to while reading. Follow this information to save development time and minimize problems.

   • **Warning** - Contains information on safety issues. Follow this

information to prevent equipment damage or personal injury.

ISO Symbols

This symbol is the International Standards Organization (ISO) symbol for Caution (ISO 3864 No. B.3.1). This symbol denotes information that could affect operation of the PowerStation if the information is not properly followed.

This symbol is the ISO symbol for Caution—risk of electrical shock (ISO 3864 No B.3.6). This symbol denotes information that could cause personal injury from electrical shock or damage to equipment if the information is not properly followed.

Customer Support Services

CTC welcomes your thoughts and suggestions on our products and services. You can contact CTC by telephone, email, or fax. You can also visit CTC on the World Wide Web to learn the latest about our hardware, software, and customer support services.

- Main Telephone: 513-831-2340
- Technical Support: 513-248-1714
- Fax: 513-831-5042
- E-mail CTC Sales: emn_sales_ctc@parker.com
- E-mail CTC Support: emn_support_ctc@parker.com
- E-mail CTC Training: emn_training_ctc@parker.com
- World Wide Web: http://www.ctcusa.com

CTC recognizes that every customer and every application has different support needs, so CTC offers a variety of support services designed to meet these needs. CTC offers two types of customer support services:

- Product Technical Support
- Technical Training

Product Technical Support

The Product Technical Support department welcomes any question that might arise as you develop or run your applications. We offer complimentary support for all customers, including end users, original equipment manufacturers (OEM), system integrators, or distributors.

If you have a question about the EP PowerStation, be sure to complete the following steps:

1. Check any release notes shipped with the unit. These notes provide

important information about the PowerStation.

2. Consult the PowerStation documentation and other printed materials included with the PowerStation.

3. Review Chapter 4 of this manual, *Maintaining the EP PowerStation* on page 37

4. Visit the CTC Web site at the below URL and register for the support forum. You may find the support forum by clicking on the Support tab from the Web sites home page.

   http://www.ctcusa.com

If you cannot find a solution using one of the above sources, contact our Product Technical Support department at 513-248-1714, 8:00 a.m. to 5:00 p.m., Eastern Time.

Technical Training   CTC offers training on all of our products, either at CTC in our state-of-the-art training facility, or at your site.

You can contact the Training Coordinator by telephone or e-mail:

   • Telephone: 1-800-233-3329

   • E-mail CTC Training: emn_training_ctc@parker.com

You can view a current technical training schedule at our Web site, http://www.ctcusa.com

Introducing the EP PowerStation

The EP PowerStation is designed to give you an operator interface solution that is powerful, cost-effective, and very easy to use.

In this chapter, you will learn about the EP PowerStation's specifications, available connectors, and its drive definitions and memory. The chapter also describes the PowerStation's replacement and optional components.

Chapter Contents

Specifications

This section describes important specifications for the EP PowerStation. Please familiarize yourself with these specifications before operating the unit.

Display Specifications

Display specifications include the type of monitor, size, resolution, and other display properties. These specifications are shown in the following table.

EP08T 8" Color

Property	EP08T Description
Type	Active Color TFT
Display Diagonal Size	8.0"
Resolution	VGA (640 x 480)
Brightness	380 NITS
Bulb Life	10,000 hours
Adjustments	n/a

Table 2-1: 8" Color Display

Physical Specifications

Physical specifications include the PowerStation's CPU, memory specifications, display types, storage capacity, and other physical characteristics. These specifications are shown in Physical Specifications.

Category	Specifications
Operating System	XP Professional
CPU	• 650 MHz Ultra Low Voltage Intel Celeron processor • 256KB L2 Cache • 100 MHz Front-side bus

Table 2-2: Physical Specifications

Category	Specifications
Memory	512MB PC100 SDRAM 144 Pin SODIMM Socket
BIOS	Award Flash
OS Storage	One of the following: • 40GB hard drive • 80GB hard drive • 4.0GB Compact Flash drive
Optional Application Storage	Only available if a hard drive was selected as the OS storage device: • 32MB Compact Flash • 128MB Compact Flash • 1.0GB Compact Flash • 2.0GB Compact Flash • 4.0GB Compact Flash

I/O Ports	• Two 9-pin serial ports (16550 compatible)
	  • 1 9-pin RS232
	  • 1 9-pin RS232/422/485 (configurable)
	• One RJ45 Ethernet connector; Intel 82551ER 10/100 Base-T controller
	• Two USB 1.1 ports

Dimensions H x W x D	For the 8": • 7.6"H x 10.2"W x 3.8"D (overall depth)
Weight	For the 8": • 6 lbs
Keyboard	1 PS/2 miniDIN
Mouse	1 PS/2 miniDIN
Touchscreen	Analog Resistive
Audible	Piezoelectric Beeper

Table 2-2: Physical Specifications

Environmental Specifications

Even though the EP PowerStation is built to withstand harsh environments, limit the PowerStation's exposure to adverse conditions such as dust, oil, moisture, and corrosive vapors to minimize maintenance and repair costs.

Remember that the temperature within a protective enclosure is generally higher than the external temperature. Thus, if the EP

PowerStation is operating inside an enclosure at temperature levels above its rated ambient temperature, you must cool the enclosure.The PowerStation conforms to the environmental specifications listed in the Environmental Specifications Chart.

Category	Specifications
Operating Temperature	32 to 122°F (0 to 50°C) ambient (air temp. outside of EP back-shell)
Storage Temperature	-4 to 140°F (-20 to 60°C)
Relative Humidity	0% to 95% non-condensing
Shock Rating	• 10g peak; 11ms (operating) • 30g peak; 11ms (non-operating)
Operating Vibration	• 5-500Hz: 0.5 grms random
Faceplate Design	Tested for UL Type 4/4X Environment **Warning:** The PowerStation is rated NEMA 4 only if it is installed in a NEMA 4-rated enclosure.

Table 2-3: Environmental Specifications Chart

Electrical Specifications

The EP PowerStation's power supply automatically detects the input voltage level and adjusts accordingly. However, always use reliable sources of power, and isolate all communication cables from AC power lines to enhance noise immunity.

If possible, locate the EP PowerStation away from machinery that produces intense electrical noise (arc welders, etc.). Otherwise, isolate the input power to the PowerStation from the equipment generating electrical noise.

The EP PowerStation's electrical specifications appear in Electrical

Specifications Chart.

Category	Specifications
Input voltage	24 VDC @ 2A max pending UL approval. (Range: min 18 VDC, max 28 VDC)
Heat Dissipation	For the 8": • 26 W with a hard drive

Table 2-4: Electrical Specifications Chart

Caution Do not apply AC power to the unit or damage may occur.

Testing Specifications
The EP PowerStation conforms to the testing specifications listed in tables below.

European Community Immunity and Emission Standards for Electronic Equipment EN61000-6-2 (2001) and EN55011 (A2:2002)

Test	Specification
ESD immunity	EN61000-4-2
RF immunity	EN61000-4-3
Electrical fast transient/burst	EN61000-4-4
Surge immunity	EN61000-4-5
RF common mode immunity	EN61000-4-6
Power frequency magnetic field immunity	EN61000-4-8
Voltage dip and interrupt immunity	EN61000-4-11
Conducted & radiated emissions	EN55011

Table 2-5: European Community Specifications

Mechanical Testing Specifications

Test	Specification
Surge withstanding capacitance	EN61000-4-5

Table 2-6: Mechanical Testing Specifications

Test	Specification
ESD requirements	EN61000-4-2
Electrical fast transient	EN61000-4-4
Operating vibration	0.5 grms/MIL-STD-810F 514.3
Mechanical shock	IEC-68-2-27/MIL-STD-810F 514.3
Non-operational vibration	1.0 grms/MIL-STD-810F 514.3

Table 2-6: Mechanical Testing Specifications

Faceplate Chemical Resistance

The touchscreen of the EP PowerStation is resistant to the chemicals listed in Chemical Resistance Chart.

Touchscreen Chemical Resistance		
Acetone	Sulfuric Acid 10%	Motor oil
MEK	Hydrochloric Acid 10%	Gasoline
Toluene	Acetic Acid 10%	Machine oil
Methylene Chloride	Phosphoric Acid	Salad oil
Isopropyl Alcohol	Sodium Hydroxide 10%	Silicone
Xylene	Carbon Tetrachloride	Silicone grease G31
Hexane	Potassium Hydroxide	Kerosene
Butyl Cellosolve	Ammonia Water 10%	Gas oil
Cyclohexanone	Sodium Chloride 26%	Silicone oil
Trichloroethylene	Zinc Chloride 81%	Engine oil
Ethanol	Cottonseed Oil	Cleanser
Methanol	Glycerin	
Nitric Acid 10%	Grease	

Table 2-7: Chemical Resistance Chart

Important Sustained exposure to brake fluid or Gunk® brand degreaser can cause damage to monitor materials.

All EP PowerStation surfaces exposed outside your enclosure are resistive to the following chemicals:

- Commercial glass cleaners
- Motor oil
- Ammonia (10% dilute solution)
- Diesel fuel
- Gasoline (leaded, unleaded)
- Silicone based lubricant
- Alcohol (ethyl, methyl)
- Automatic transmission fluid
- Hydraulic fluid

Available Connectors

All EP PowerStations have two serial ports, two PS/2 keyboard/mouse ports, an Ethernet port, two USB ports, and a Compact Flash connector. See the EP PowerStation CD for dimensional drawings and a diagram to locate the components.

Serial Ports

The EP PowerStation has two serial ports that you can use to communicate with external devices at baud rates of up to 115 Kbaud.

The COM1 port supports RS-232, while COM2 supports RS-232, RS-422, and RS-485 communication standards.

The communication standard you select for COM2 depends upon the distance between the EP PowerStation and the controller, as well as the communication standards that the controller supports. Use a standard DB9 connector for communicating with this port.

> **Note**   If you are using RS-232 communications, the length of the serial cable should not exceed 50 feet (15 meters).

RS-422 and RS-485 communications offer greater noise immunity than RS-232. These standards increase the maximum cable length to 4,000 feet (1,200 meters).

RS-422 communications are full-duplex (send and receive simultaneously), while RS-485 communications are half-duplex (send or receive).

For either configuration, be careful not to connect any wires to unused connector pins. If you are using CTC's MachineShop Suite software, information on the specific connection required for the InteractX OPC drivers you will use is located in the Help system associated with the driver.

Settings and Pinouts for COM1 and COM2

If you need to make a cable for communicating with COM1, COM1 Pinouts shows the pinouts and signal information for this port.

Pin#	Signal
1	DCD, data carrier detect
2	RXD, received data
3	TXD, transmitted data
4	DTR, data terminal ready
5	Signal ground
6	DSR
7	RTS, request to send
8	CTS, clear to send
9	RI

Table 2-8: COM1 Pinouts

If you need to make a cable for communicating with COM2, COM2 Pinouts shows the pinouts and signal information for this port.

Pin#	RS-232 Signal	RS-422 Signal	RS-485 Signal
1	DCD, data carrier detect	TXD-, transmitted data -	TXD-, transmitted data -
2	RXD, received data	TXD+, transmitted data +	TXD+, transmitted data +
3	TXD, transmitted data	RXD+, received data +	RXD+, received data +
4	DTR, data terminal ready	RXD-, received data -	RXD-, received data -
5	Signal ground	Signal ground	Signal ground
6	DSR, data set ready	DSR, data set ready	DSR, data set ready
7	RTS, request to send	RTS, request to send	RTS, request to send
8	CTS, clear to send	CTS, clear to send	CTS, clear to send
9	RI	RI	RI

Table 2-9: COM2 Pinouts

If you need to make a cable for communicating with COM2, you may need to set the DIP switch settings.

COM2 is set to the RS-485 protocol by default. To change COM2 to the RS-232 or RS-422 protocol, you must change the COM2 DIP switch settings.

The DIP switch for COM2 is located on the side of the EP

PowerStation Unit, as shown in *Figure 2-1*.

Dip Switch Settings
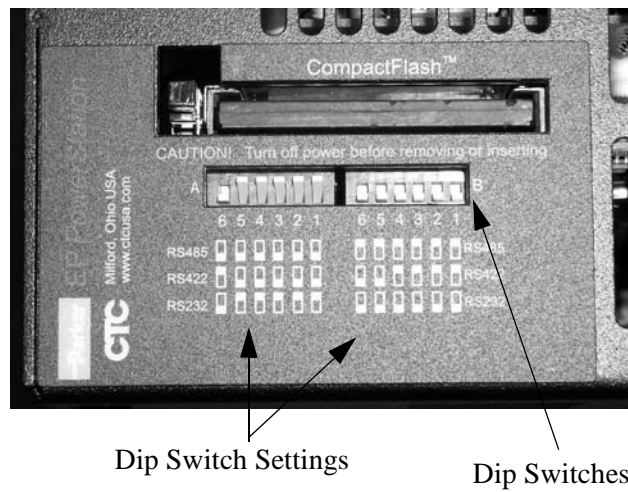
Dip Switches

Figure 2-1COM2 Dip Switch Cutout and Settings

Figure 2-2 displays the settings for the COM2 port. A similar diagram is located on the side of the EP PowerStation next to the DIP switch cutout.

Switch A

Switch B

= switch in down position
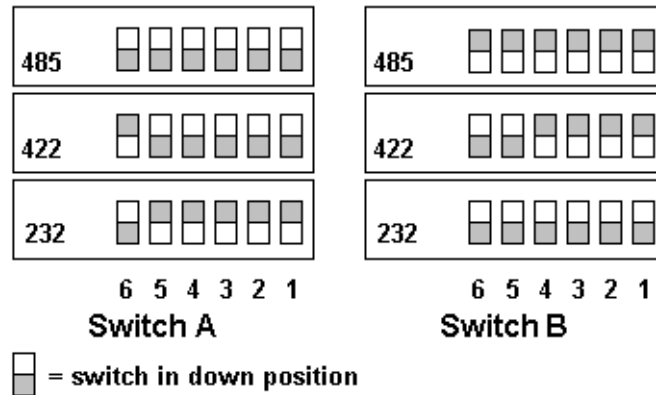
Figure 2-2Dip Switch Settings

• The gray boxes represent the tip of the switch.

- The upper half of the switch is the ON position, and the lower half of the switch is the OFF position.

To change the DIP switch settings, complete the following steps:

1. Choose the appropriate DIP switch settings from the diagram displayed on the side of the EP PowerStation or from *Figure 2-2*.

2. Using a pointed instrument such as a pen or pencil, flip the switches to the appropriate settings through the viewing window.

Figure 2-3 displays the pinouts and cable settings required for communicating with COM1 or COM2 using the RS-232, RS-422 or the RS-485 protocol.

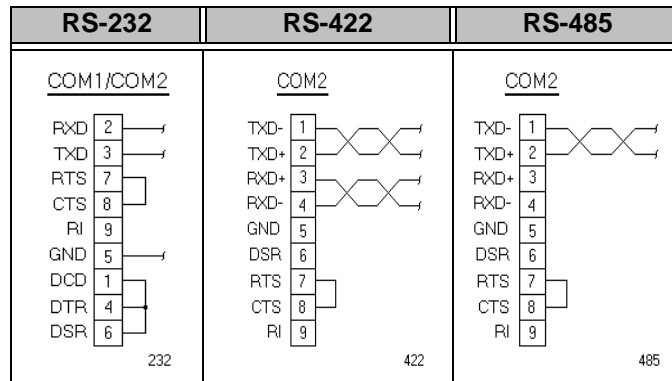
RS-232	**RS-422**	**RS-485**
COM1/COM2	COM2	COM2
RXD 2	TXD- 1	TXD- 1
TXD 3	TXD+ 2	TXD+ 2
RTS 7	RXD+ 3	RXD+ 3
CTS 8	RXD- 4	RXD- 4
RI 9	GND 5	GND 5
GND 5	DSR 6	DSR 6
DCD 1	RTS 7	RTS 7
DTR 4	CTS 8	CTS 8
DSR 6	RI 9	RI 9
232	422	485

 Figure 2-3Pinouts and Cable Settings

Important   Be careful not to connect any wires to unused connector pins.

RS-485 Directional Control

Many device drivers use the RTS signal to switch between receive and transmit mode. Some third party communication drivers expect the directional control to be automatic. Although most drivers will communicate fine in "Auto" mode, the directional control jumper allows the configuration of this port. The default setting of this jumper is "Auto".

The directional control jumper is located on the motherboard as shown

below. Refer to both figures below for the setting of this jumper.
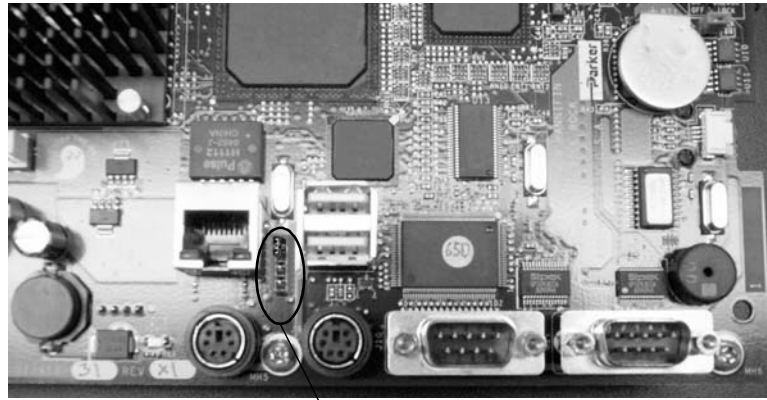
RS485 directional jumper


Figure 2-4Directional Control Jumper

Transferring Files from a PC to the EP PowerStation

You can transfer files from a PC to the EP PowerStation in one of three ways—through the Ethernet, the Compact Flash, or a Serial Transfer. If you plan to use a Serial Transfer, you will need a null modem cable. To construct your own cables, refer to *Figure 2-5* for the appropriate

settings. Then continue with step 1 below:
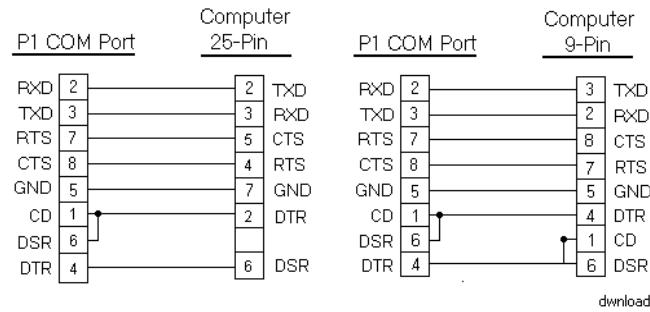
Figure 2-5 Serial Transfer Cable Diagram

1. Connect a null modem serial cable to an available serial port on the IBM-PC.

2. Connect the other end of the cable to the serial port on the EP PowerStation.

Keyboard/Mouse Port

The EP PowerStation's CPU board includes a keyboard port that accepts any IBM AT-compatible keyboard, including 84-key standard keyboards and 101-key enhanced keyboards.

Connecting a PS/2 Mouse

If you prefer to use a mouse instead of the touchscreen, CTC recommends that you only use a Microsoft PS/2-style mouse, specifically an 802.3 Microsoft-compatible mouse.

CTC has found that some Microsoft-compatible PS/2 mice do not work correctly with the EP PowerStation. In addition, connecting any mouse directly to the keyboard port will cause the mouse to malfunction.

Ethernet Port

The EP PowerStation has an Ethernet RJ45 port with an Intel 82551ER 10/100 Mbps base-T controller that allows you to connect the PowerStation to a Local Area Network.

See Ethernet Pinouts.

Pin#	Signal
1	TX+

Table 2-10: Ethernet Pinouts

2	TX-
3	RX+
4	N/C
5	N/C
6	RX-
7	N/C
8	N/C

Table 2-10: Ethernet Pinouts

Compact Flash   The EP PowerStation comes with a Compact Flash (CF) card. The CF is used as a removable hard drive that is recognized as drive C and provides non-volatile memory storage. A CF is frequently used to supplement or replace a hard drive because of its durability. The CF is well-suited for rugged environments where the PowerStation may vibrate or shake. Although the CF is removable, it is used as an IDE drive, which means you cannot remove it while the PowerStation is switched on.

CTC recommends that you purchase at least one additional CF card to serve as a backup for your primary CF card. You may decide to own several cards to store different projects. You can purchase additional CF cards through CTC.

> **Caution**   Do not remove or insert the CF card when the unit is powered on or data on the card could be corrupted.

Drive Definition and Memory

When you purchase the EP PowerStation, you can specify whether you want a 40GB hard drive, 80GB hard drive, or a compact flash drive. If you order a hard drive with your system, an optional compact flash drive may be purchased for application storage. The optional compact flash drive comes in several storage capacity sizes.

If you choose a system with only a hard drive or only a compact flash drive, this drive is the system start drive and Project disk. If you choose a combination system, the hard drive will be the system start drive and Project disk. It stores the project, system files, MachineShop Suite, and applications. Download files to this drive.

Memory Guidelines

If you are using MachineShop Suite to develop your HMI applications, refer to these memory guidelines when you develop projects.

The capacity and use of the System SDRAM is 512MB. The capacity and use of the compact flash is also up to 4.0GB flash memory.

Replacement Components

The EP PowerStation is designed to be a simple yet reliable unit to maintain. However, if you need to purchase replacement components for the PowerStation, CTC carries a complete line of replacement components.

Compact Flash Card

If you need additional storage capacity for the EP PowerStation, you can purchase additional Compact Flash cards from CTC. CTC recommends that you purchase at least one additional flash card to serve as a backup for your primary CF. See *Using the Compact Flash Card on page 42* for instructions on how to replace and reformat CF cards.

SDRAM

If you need to replace the EP PowerStation's SDRAM, CTC carries replacement SDRAM (SODIMM). The EP PowerStation comes with a 512MB 144-pin SODIMM for SDRAM. To replace the SDRAM, see *Replacing the SDRAM* on page 45.

> **Note** A maximum of 32MB of the SDRAM is used for video memory. The amount of memory reported is the size of the SDRAM minus up to 32M. For example, if you have the maximum of 512MB of SDRAM, only 480MB might be reported.

Replaceable Fuse

The EP PowerStation has a protective fuse that can be replaced by qualified personnel. See *Replacing the Fuse* on page 49 for complete instructions.

Optional Components

CTC has an optional component that you may want to purchase for the EP PowerStation—an AC Power Supply.

AC Power Supply

The EP PowerStation uses DC power to save space and limit the amount of heat generated by the unit. However, if you require the PowerStation to use AC power, you can purchase an AC Power Supply kit that includes an AC Power Supply and a power cord.

You can also purchase mounting brackets for the Power Supply. See *Preparing a Location for the AC Power Supply* on page 30 for instructions on how to mount the AC Power Supply.

> **Caution**   Do not apply AC power to the unit or damage could occur.

Installing the EP PowerStation

You are now ready to install the EP PowerStation in a permanent location. This chapter will help you select an appropriate location for the unit. It also provides instructions for creating a cutout for the unit, and describes how to install and start up the unit.

Chapter Contents

Selecting a Location

The first step when installing the EP PowerStation is to select an appropriate location for the unit. This is the most important aspect of the installation process because the location you select can affect the PowerStation's performance, ease-of-use, and life-expectancy. This section provides some guidelines that you should follow when selecting a location for the PowerStation.

Environmental Guidelines

The environment is the area where the EP PowerStation will be located. In general, you should select a place that limits the unit's exposure to adverse conditions such as dust, oil, moisture, and corrosive vapors.

Touchscreen Considerations

The EP PowerStation's touchscreen is designed to meet the NEMA 4 rating. You should mount the PowerStation in an enclosure that supports this rating in order to provide further protection.

The EP PowerStation's touchscreen is resistant to a variety of chemicals. See *Faceplate Chemical Resistance on page 13* for a list of these chemicals. Make sure that the touchscreen is not exposed to chemicals other than those listed in *Faceplate Chemical Resistance* on page 13.

Electrical Guidelines

To minimize unwanted electrical interference, select a location away from machinery that produces intense electrical noise. If you cannot do this, isolate input power to the unit and separate all data communication cables used with the unit from AC power lines.

All serial communication cables should be 100% shielded with the shield tied to chassis ground at one end of the cable only.

See *Electrical Specifications on page 11* for a list of the EP PowerStation's electrical specifications. Make sure that your power source is compatible with the PowerStation before starting the unit.

Field Terminal Wiring Requirements

In order to comply with UL 508 and 1604 requirements, use copper wire with 60C or 60/75C insulation and a tightening torque of 7.0 lb/in. (0.79 N-m) when connecting field terminal wiring to the PowerStation.

PowerStation Thermal Guidelines

You can safely operate the EP PowerStation within the temperature range specified in *Environmental Specifications* on page 10. However, if you are using a protective enclosure, remember that the temperature within an enclosure is generally higher than the external temperature. Read these guidelines to fully understand temperature implications.

The EP PowerStation can dissipate approximately 26 watts on an 8" unit with a CF drive.

Heat builds up rapidly in enclosed environments, compromising the performance and life span of electrical equipment.If the PowerStation is operating inside an enclosure at temperature levels above its rated ambient temperature, you must cool the enclosure.

This section will alleviate any possible confusion regarding were the specified maximum ambient operating temperature should be measured for our products. This information will assist you in preparing the installation location for our products.

CTC PowerStation's have been tested for use in 50°C ambient, still air locations. This means that when installed, the ambient air surrounding the backside of the PowerStation is not expected to exceed 50°C. An example of this type of installation would be a PowerStation mounted in a small, sealed industrial enclosure.

The most commonly overlooked aspect of this type of installation is that heat generated by the device becomes trapped inside the enclosure and increases the ambient temperature surrounding the PowerStation. This increase in temperature can sometimes exceed 15°C or more.

Although the thermal dynamics are not always linear, a temperature rise of 15°C would imply that the environment outside the sealed enclosure could not exceed 35°C, or the PowerStation would surpass its maximum operating temperature. A maximum temperature of 35°C (95°F) is far shy of the typical summer operating temperature environment that some industrial installations demand.

Many customers mount a PowerStation into a sealed enclosure and mistakenly think that due to the 50°C rating of the product, they can allow the sealed enclosure to operate in a 50°C ambient environment without considering the affects of the internal heat build up.

Since elevated operating temperatures can have negative affect on the life of electronics, it is wise to consider the internal thermal rise. Passive venting for thermal convection, internal air circulation fans,

filtered exhaust fans with filtered inlets, air conditioners, and other products are available in the market to assist in reducing the heat build up in the industrial enclosure.

There are many attractive NEMA Type 12, dust-tight fan/filter assemblies available today in which the filter can be inexpensively replaced or cleaned as part of a periodic maintenance schedule. Or in some cases, simply increasing the size of the enclosure, and thus the outside surface area for example, can have a significant, positive affect on the installation's thermal response.

Points to consider when performing a site review are:

1. What is the expected maximum outside ambient temperature that the industrial enclosure will experience?

2. Are there additional heat-generating components inside the enclosure?

3. What is the size of the enclosure? Larger enclosures dissipate more thermal energy than smaller ones.

4. In what kind of environment will the enclosure be installed - clean, water-tight, dust-tight? Can the enclosure be convection cooled or is active cooling required?

In summary, it is a wise investment to thermally plan the installation by anticipating, and eliminating, the heat build up inside a sealed enclosure. Not only will this extend the life of the electronics, but it will also reduce costly equipment downtime.

Enclosure Guidelines

Select an enclosure that is large enough to allow free airflow in and around the unit. You should allow a minimum of 2 inches between the enclosure and the top, bottom, and sides of the EP PowerStation to allow access to the cabling and compact flash.

Also, make sure that the surface of the enclosure on which the EP PowerStation is mounted is flat and free of raised or depressed areas.

Radiated Emissions Guidelines

This PowerStation has been tested to comply with international electromagnetic and emission standards. To reduce radiated emissions, ensure that there is a good earth connection to the PowerStation, which can be accomplished by utilizing the grounding stud located on the rear chassis of the product.This connection must be made with the shortest possible, heavy gage wire or braided cable. Low-resistance (<0.5 ohms) continuity should be verified with an

ohmmeter for proper grounding. In addition, all communication cables should be shielded and grounded on only one end.

AC Power Guidelines

You will need to read the AC Power Guidelines only if you intend to operate the EP PowerStation using AC power. If you intend to operate the PowerStation using DC power, skip to *Preparing for Installation* on page 30.

The EP PowerStation ordinarily uses DC power. However, you can operate the PowerStation with AC power by using an optional AC Power Supply available from CTC. If you purchased the optional AC Power Supply, you must select a location that provides protection from dust, oil, moisture, and corrosive vapors. If your enclosure is large enough, you can mount the Power Supply in the enclosure with the unit.

Caution Do not apply AC power to the unit or damage may occur.

Preparing for Installation

Once you select a location for the EP PowerStation, you will need to create a cutout for the unit.

If you plan to operate the EP PowerStation using AC power, and you purchased CTC's optional AC Power Supply, you will need to prepare a location for the Power Supply also.

Procedures for creating the cutout and preparing a location for the AC Power Supply are described below. If you already have an appropriate cutout and are using DC power, continue with *Installing the EP PowerStation* on page 32.

Creating the Cutout

Use the dimensions in the table below to create the cutout for the unit. Be sure to follow the cutout dimensions precisely so that the PowerStation will properly seal in its enclosure.

Create a Cutout

To create the cutout, complete the following steps:

1. Measure the cutout dimensions as shown in the table below.

2. Cut out the marked area. To maintain the flatness of the mounting surface, CTC recommends that if you punch out the mounting hole, as you should maintain proper surface flatness and edge quality.:

EP Model	Cutout Height	Cutout Width
EP08T	6.08"	8.67"

Table 3-1 Cutout Dimensions

3. Debur the edges of the cutout area, removing dirt and debris that might come in contact with the unit.

4. More information is available on the CD that comes with the EP PowerStation. Be sure to refer to the dimensional drawings found on the CD when creating your cutout.

Preparing a Location for the AC Power Supply

You will need to read *Preparing a Location for the AC Power Supply* only if you intend to operate the EP PowerStation using AC power. If you plan to use DC power, proceed to *Installing the EP PowerStation* on page 32.

If you plan to operate the EP PowerStation with AC power, and you purchased CTC's optional AC Power Supply and the mounting kit, use

the template that came with the mounting kit to prepare a location for the power supply. You can prepare a location for the power supply inside or outside the enclosure where the PowerStation is installed.

> **Note** If you decide to mount the Power Supply in an enclosure, mount it on the bottom or the side of the enclosure to provide the best convection cooling.

Prepare the Power Supply Mounting Surface

To prepare the mounting surface, complete the following steps:

1. Securely attach the power supply template to the mounting surface.

2. Drill and debur four 0.17" (4.3mm) holes.

Installing the EP PowerStation

Once you prepared the location for the EP PowerStation, you can install the unit. Installation will involve mounting the PowerStation and if you are using CTC's optional AC Power Supply, mounting the power supply. Both procedures are described below.

Mounting the EP PowerStation

The EP PowerStation is designed to be mounted using screws. These screws are secured to the unit with metal clamps. For your convenience, CTC includes all necessary mounting hardware with the unit.

Mount the PowerStation

> **Note** Necessary mounting clamps and screws are shipped with your system.

To mount the unit, complete the following steps:

1. Prepare the power source for the unit by sliding the positive and negative wires into the appropriate slots on the power connector. See *Figure 3-1*.
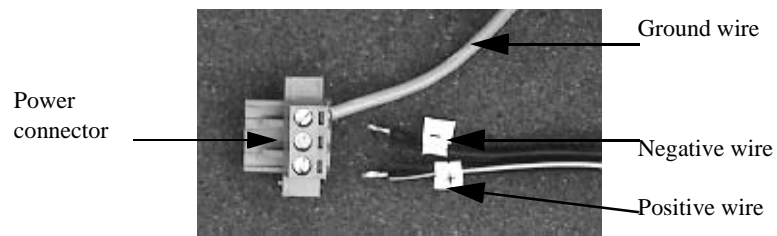
Figure 3-1 Power Connector and Positive/Negative wires

2. Connect the ground cable from the power connector to an earth ground.

3. Gently insert the EP PowerStation into the cutout from the front.

4. Attach the mounting clamps, with their screws, to the back of the unit in the spaces provided.

> **Note** The clamps secure to the unit using CTC's sliding mechanism. Insert the clamp in the wide end of the slot and slide it to the thin end. See the diagrams on the following pages.

> **Caution** Be aware that, in the following procedures, over-tightening the screw/clamp assemblies may damage the PowerStation. Under-tightening may not guarantee a NEMA 4 seal.

- **For 8" units:**

    a. Attach 4 mounting clamps, with their screws, to the back of the unit in the spaces provided. You will place 2 clamps at the top and bottom of the unit.
    b. Slide the feet of the mounting clip into the slot, then slide the clip over to properly mount the unit.
    c. Tighten each of the mounting screws against the front of the enclosure.
    d. Torque them down to **7 in/lbs**.
    e. Tighten the screws in a crosswise sequence to ensure a good seal and prevent damage. Tightening the bracket assembly may not ensure that the gasket seal is totally depressed by the bezel. You may see a small gap between the bezel and the enclosure.

Clamp shape and location on the 8" unit:
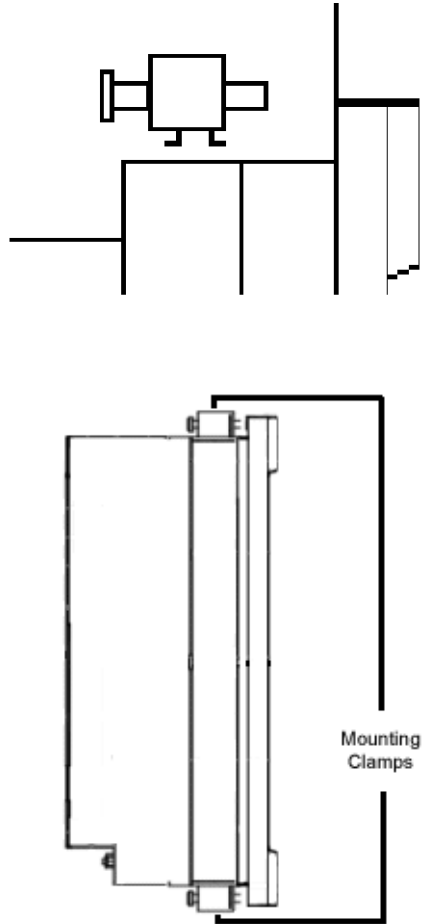
Figure 3-2 Clamp Locations - 8" Unit

5. Attach the power connector that you prepared in steps 1 and 2 to the back of the unit.

Starting Up the EP PowerStation

Once the EP PowerStation has been mounted, you are ready to start up the unit. This procedure is described below.

Before connecting a power cord to your unit, make sure that you have read and understood *Environmental Specifications* on page 10 and the *Testing Specifications* on page 11 of this manual. Also, be sure to follow the guidelines listed below:

• For **permanently connected equipment**, incorporate a readily accessible disconnect device in the fixed wiring.

Important   Proper installation of this PowerStation model for use in European Union countries requires the use of a harmonized power cord (the power cord must be identified with the <HAR> symbol). Make sure that the PowerStation is connected to the main supply only with a harmonized power cord.

1. Ensure the power on/off switch is in the off position.

2. Connect the power cord to your voltage source. Voltage input to the unit should be within the range specified in the *Environmental Specifications* on page 10.

    Note   Input voltage to the unit must be DC only.

3. Connect the power cord plug to the EP PowerStation.

4. Turn the EP PowerStation on.

You are now ready to download a project to the EP PowerStation.

Maintaining the EP PowerStation

The EP PowerStation is designed to provide years of trouble-free operation even in the harshest environments. However, you may occasionally need to perform routine maintenance on some of the PowerStation's components.

This chapter provides instructions on EP PowerStation maintenance.

Chapter Contents

Installing and Replacing Parts

This section includes instructions for performing internal maintenance on the EP PowerStation. To prevent injury to yourself or damage to the PowerStation, you will need to carefully read and understand the procedures described in this section.

Before you begin, this section describes electrostatic discharge (ESD) precautions that you should take whenever you work inside the EP PowerStation.

Warning For safety reasons, only qualified service personnel should open the PowerStation.

Electrostatic Discharge Precautions

Modern integrated electronic devices, especially CPUs and memory chips, are extremely sensitive to electrostatic discharges (ESD) and fields. Before you disassemble the EP PowerStation, follow these simple precautions to protect you and the PowerStation from harmful ESD.

- To avoid electric shock, always disconnect power from the PowerStation before opening or disassembling the unit. **Do not** touch any components on the CPU card or other cards while the PowerStation is on.

- Disconnect power before making any hardware configuration changes. A sudden static discharge as you connect a jumper or touch any internal parts may damage sensitive electronic components.

- Only handle internal components in an ESD-safe location, using appropriate grounding methods.

- Wear a grounding wrist strap for continuous protection.

- Always ground yourself to remove any static charge before you touch the CPU card.

- Be particularly careful not to touch the chip connections.

- Keep any card or SDRAM module in its anti-static packaging when it is not installed in the PowerStation. Place it on a static dissipative mat when you are working on it.

Once you read and understand the ESD safety precautions, you are ready to continue with the appropriate instructions.

BIOS Setup

If you want to change any of the BIOS settings, shut down the system and connect a keyboard to the PowerStation. Reboot the system and press the DEL key while the system splash screen appears to display the BIOS utility.

The EP PowerStation allows you to set the disk boot priority to a variety of different drives including a USB drive.

The system will try to boot from the First Boot Device, then the Second Boot Device, and finally the Third Boot Device as listed in the BIOS Setup utility. Assign a device to each boot device in the order you desire.

Resetting Disk Boot Priority

To reset the disk boot priority, complete the following steps:

1. Turn on the PowerStation and press the DEL key when the system splash screen displays.

   The BIOS Setup utility main screen displays.

2. Select Advanced BIOS Features.

3. Scroll down the list of options and select either First Boot Device, Second Boot Device, or Third Boot Device depending on which device you wish to configure.

   A list of all the available boot options displays.

4. Scroll down the list and select the device the system will use to boot up.

   For example, if you wish to boot to a USB device you can select from 1 of 4 USB devices. You may select USB-FDD, USB-ZIP, USB-CDROM, or USB-HDD.

5. Once you select your boot device, press Enter.

6. Save any changes and exit the BIOS Setup utility. Your system will boot to the selected device.

Maintaining the Touchscreen

The touchscreen for the EP PowerStation is durable and able to operate smoothly in harsh environments where strong chemicals exist.

However, from time to time you may need to perform general maintenance on the touchscreen. This section provides step by step instructions on how to complete the following tasks:

Cleaning the Touchscreen

Occasionally, you may wish to clean the EP PowerStation's touchscreen. Clean the touchscreen using warm, soapy water and a cloth. You may also use a **non-abrasive** cleaner. See *Faceplate Chemical Resistance* on page 13 for a list of substances the screen can resist with no visible effect.

Do not use any harsh material or powder, such as steel wool or abrasive cleansers, to clean the touchscreen surface. The surface is sensitive to scraping, sharp blows, and punctures. Therefore, keep screwdrivers or other sharp objects away from the touchscreen surface.

Warning Clean the unit when it is switched off to avoid inadvertently activating an HMI device (button, slide, etc.).

Calibrating the Touchscreen

The EP PowerStation's touchscreen is calibrated before leaving CTC. However, you may need to calibrate the touchscreen for one of several reasons:

• when you use the PowerStation for the first time

• when you replace the touchscreen

• when the position of the cursor does not match the location where the user touches the screen

Calibrating the Touchscreen Driver

The EP PowerStation is shipped with the Hampshire TSHARC touchscreen driver installed and configured.

You may have to calibrate the touchscreen driver if it becomes corrupted, if you reinstall it, or if you wish to change the touchscreen jumper settings in your computer.

This section explains how to calibrate the Hampshire touchscreen driver under Windows XP Professional.

To calibrate the touchscreen driver, complete the following steps:

1. Select Start - Programs - Hampshire TSHARC Control Panel.

The control panel appears.

2. Follow the on-screen instructions for selecting which monitor to calibrate. If you just have one monitor, select 1.

3. Select the Calibrate tab.

4. Click the center of where the arrows are pointing.

   The Calibration screen appears.

5. Touch the target where it appears on the screen, hold your finger there momentarily, and then release.

   The screen will guide you through the Touch - Hold - Release process.

6. Repeat the process three more times in the other three corners of the screen.

   A test screen appears.

7. Move your finger across the monitor. The target should move with your finger. If so, the calibration was successful.

8. Select Accept.

9. On the control panel, select Apply and then select OK.

   Note   If the touchscreen still does not appear calibrated, and the cursor moves vertically when your finger moves horizontally on the screen or vice versa, the touchscreen cable may not be connected to the motherboard properly. Call a CTC customer service representative.

Using the Compact Flash Card

The EP PowerStation uses a removable Compact Flash (CF) card for storage purposes or it can be used as a hard drive. You can remove the CF card, update the application files on the CF card from a PC, and then reinstall the CF card in the PowerStation.

CTC recommends that you purchase at least one additional CF card to serve as a backup for your primary CF card. You may wish to have several cards to store different projects. You can purchase additional CF cards from CTC.

The EP PowerStation supports Type 1 or Type 2 CF cards.

The external CF is located at the left side of the unit. The CF is the secondary master drive when a hard drive is installed. With no hard drive installed it is the primary master drive.

Using CF cards

A CF card is like a removable hard drive and provides non-volatile storage memory. A CF card is often used as a supplement to, or a replacement for, a hard drive because a CF card is well suited to environments in which the unit may be vibrated or shaken.

> **Note**   You also can use a hard drive with no CF card at all.

You can use a CF card as the startup drive or as a secondary IDE drive.

Uses for the CF card are as follows:

- Operating system
- Development and runtime software
- May use with hard drive

Replacing the Compact Flash

At some point, you will probably need to remove the CF card from the EP PowerStation flash socket for one reason or another. To do so, complete the following steps:

1. Turn off the EP PowerStation.

> **Caution**   The PowerStation must be turned off when inserting or removing the CF card to avoid corrupting data.

2. Locate the ejector next to the CF socket.
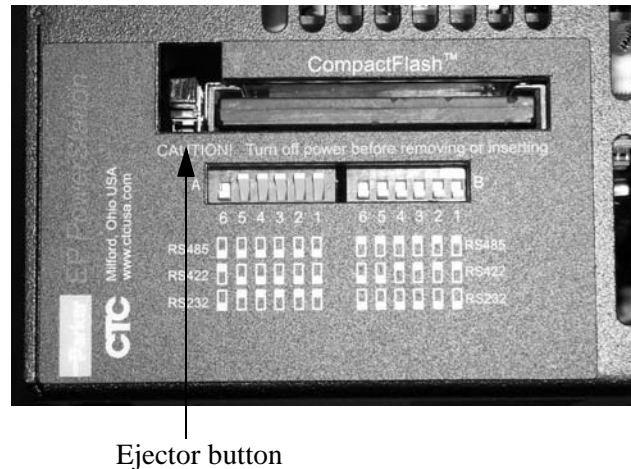
Ejector button

Figure 4-1 Compact Flash Ejector

3. Push the ejector button two times, once to extend the button, then
    again to pop out the CF card.

4. Remove the CF card.

5. Carefully insert the new card with the connector on the card
    aligning with the pins inside the socket.

6. Push the CF card into the slot until the card is securely seated in
    the socket. Do not force!

Important   The Compact Flash has an arrow near one edge that always
lines up with a matching arrow on the label of the EP
PowerStation. Insert the Compact Flash so the arrows line up
and the card seats properly. **Do not** force the Compact Flash in
the wrong way.

Reinstalling the   The EP PowerStation is shipped with the operating system and
PowerStation   software, which is installed on the Compact Flash card that comes
Utilities   with your system.

Backup copies of your software are provided on the EP PowerStation
CD that ships with your system. If any of the software on your system
becomes lost or corrupted, you can reinstall it from this distribution
disk.

Writing to the Compact Flash Card

To write to the Compact Flash card, you will need one of the following:

- A personal computer running Windows with a CD-ROM drive and a SanDisk ImageMate or any Compact Flash card PC reader/writer. A SanDisk ImageMate is a Compact Flash reader/writer that connects to the personal computer through a USB port. You can order a SanDisk ImageMate (model number IMG-2000) from your local Parker distributor.

- A laptop computer running Windows with a CD-ROM drive and a PCMCIA-to-Compact Flash adapter. The PCMCIA-to-Compact Flash adapter lets you read from or write to a Compact Flash card through your laptop's PCMCIA slot. You can order a PCMCIA-to-Compact Flash adapter (model number FLH-ADPT-2000) from your local Parker distributor.

Replacing the SDRAM

To replace the SDRAM, complete the following steps. This procedure requires opening up the back of the unit. Be sure to follow the standard Electro-Static Discharge (ESD) precautions.

Before you begin, turn off the power to the unit. Disconnect all cables. Eject the Compact Flash card. Take off the mounting clamps and finally, place the unit face down on an ESD mat.

1. Remove the fastening screws from the back cover of the unit. Set screws aside.
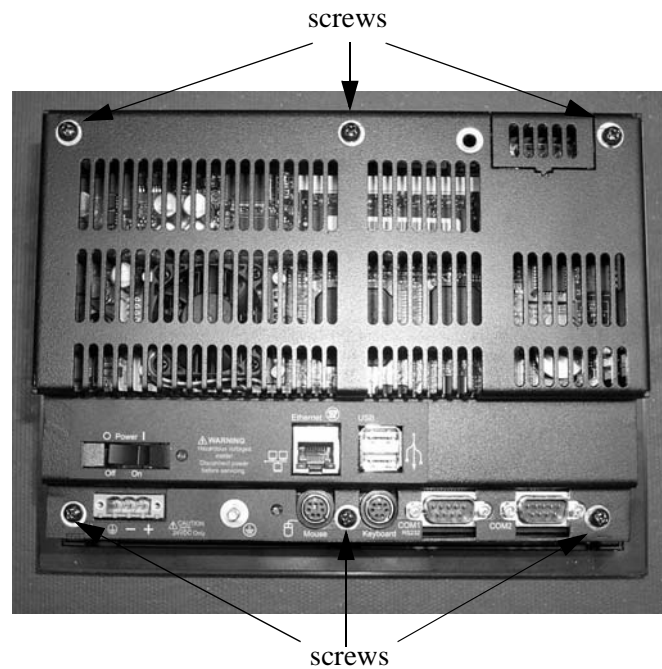
screws

screws

Figure 4-2 Backshell Screw Location

2. Locate the existing DRAM module on the CPU board as shown

below.

DRAM module
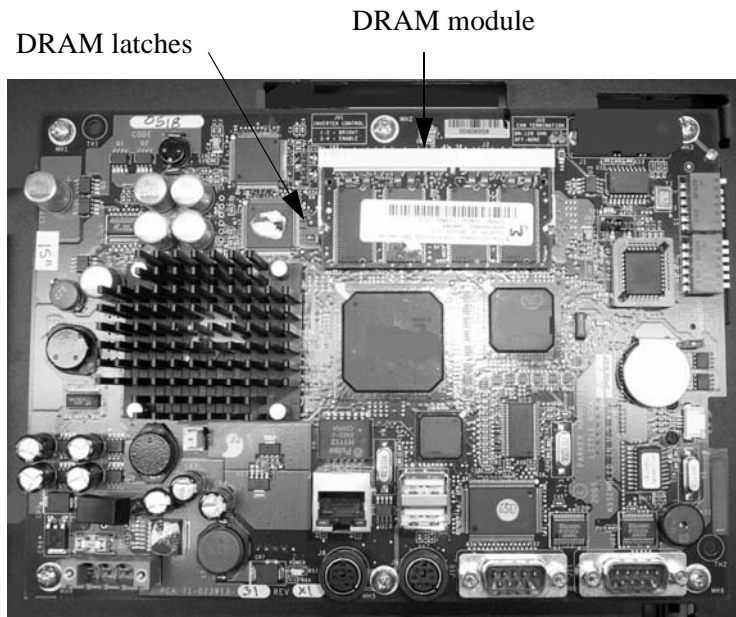
DRAM latches

Figure 4-3 DRAM Location

3. Push outward on the socket latches holding the module in its
    socket. As you push on the latches, the module will move upward.

4. Lift the module out of its socket.

5. With the replacement module in hand, locate the memory module
    socket. Refer to the figure above.

6. Line up the notch in the side of the module with the tab inside the
    socket.
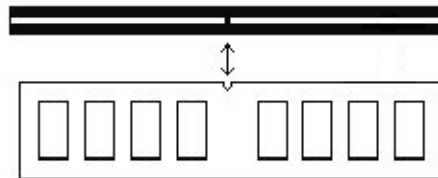
Figure 4-4 DRAM Socket Notch

7. Press the module into the socket, then press down on the module

until the socket latches snap into place.

Important Make sure that the DRAM module is firmly seated in its socket and that the socket latches are fully engaged. Otherwise, the PowerStation will not start, or the RAM listed in the display at boot will not match the total memory of the PowerStation.

The maximum total DRAM in an EP Series PowerStation cannot exceed 512MB.

8. Place the back cover on the unit and reattach the cover.

9. Reconnect the power cable and any other disconnected cables to the unit.

10. Reconnect the unit to the power source.

Your DRAM installation is complete. The PowerStation will automatically recognize the installed memory the next time you power it up.

Important If the PowerStation does not recognize the additional memory you installed, make sure that the DRAM module is firmly seated in its socket and that the socket latches are fully engaged.

Drivers

The EP PowerStation Documentation and Utilities CD contains all the drivers you can install for use with the EP PowerStation.

To install or reinstall a driver, simply locate the driver you want on the CD and double-click it. It will guide you through the installation. If you need help, see the readme files.

As a reminder, the EP PowerStation uses the Hampshire touchscreen driver.

Replacing the Fuse

The EP PowerStation has a protective fuse that you can replace by opening up the back cover. An ohm meter is required to see whether the fuse is open or closed.

To replace the fuse, complete the following steps:

1. Turn off the EP PowerStation.

2. Disconnect the PowerStation from its power source.

3. Remove the back cover of the unit.

4. Locate the fuse on the board according to the picture below.
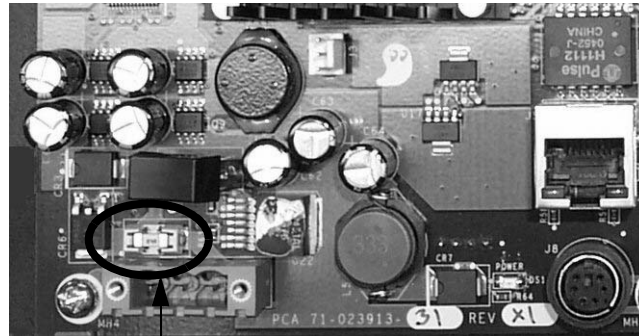
fuse location

Figure 4-5 Fuse Location

5. Use an ohm meter to see if the fuse is open or closed.

    a. If open, use a pair of needle nose pliers to lift the fuse from the fuse holder.
    b. If closed, the fuse is okay and there is no need to replace it.

6. To replace the fuse, use a Littelfuse Nano SMF Very Fast-Acting Type fuse. The part number is R451 004.

    Note This is a 4 amp fuse.

    Caution Using a fuse that is rated differently than indicated here can cause damage or fire to occur.

7. Insert the new fuse into the fuse holder and reassemble the unit.

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