PowerStation

EPX Series User Guide

June 2008

Parker Electromechanical
50 W. TechneCenter Drive, Milford, Ohio 45150

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Product Warranty Information

Parker Electromechanical provides top quality products through rigid testing and the highest quality control standards. However, should a problem occur with your hardware, Parker's standard product warranty covers these items for 24 months from the date of shipment from Parker. 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 Interact License Agreement for additional software warranty information.

Should you have any questions about your application or need technical assistance, please call Parker Electromechanical Product Technical Support department at 513-248-1714, 8:00 a.m. to 5:00 p.m., Eastern Time. You may call this same number after hours for emergency assistance. See *Product Technical Support* on page 1-4 for more information about support products and services.

Supported Models

This manual is for use with the following PowerStations:

- Model EPX 8/10/15" PowerStations

Table of Contents

INTRODUCTION

1

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

The EPX PowerStation is available in three display configurations: 8″, 10", and 15". It has an all-in-one PC board with Serial, Ethernet, and USB ports. The EPX PowerStation's PC architecture allows you to run Parker's InteractX HMI software product.

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

Using this Manual

This manual is for use with the EPX PowerStations and is designed to help you set up and use your unit. This manual lists the PowerStation's specifications and describes its replacement and optional components. It also explains how to install the unit, how to maintain the unit in good condition, and how to solve common problems that may occur in operation.

This manual is divided into the following chapters:

Chapter 1 - Introduction: Presents an overview of this manual, the other documentation and software provided with the EPX PowerStation, and the steps necessary to get your PowerStation up and running. This chapter also describes Parker's customer support services.

Chapter 2 - Installing the PowerStation: Explains how to select an installation location, prepare for installation, and finally install the EPX PowerStation.

Chapter 3 - Starting Your PowerStation: Describes 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 4 - Maintaining the PowerStation: Explains how to maintain the EPX PowerStation, including the touchscreen, replacing the Compact Flash, and perform internal maintenance.

Appendix A - PowerStation Specifications: Describes the PowerStation's specifications.

Hardware Versions

There are three display resolutions offered with the EPX PowerStation:

- EPX08T-XXXX-1, TFT, 640x480 (VGA)

- EPX10S-XXXX-1, TFT, 800x600 (SVGA)

- EPX15T-XXXX-1, TFT, 1024x768 (XGA)

All versions are shipped with InteractX HMI runtime software installed on either a hard drive or removeable compact flash card.

Each PowerStation is also shipped with a utilities CD containing drivers and documentation.

Documentation Library

The documentation set for this product contains:

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

EPX Series PowerStation User Guide - This document contains all the information you need to configure, install and use the PowerStation. Please read this manual in its entirety before operating the unit.

You can download Parker Electromechanical product documentation from our web site at www.ctcusa.com. Click on the *Support* link then select *Product Manuals* to find the appropriate manual.

Documentation Standards

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

Text Conventions

Style	Type of Text
Bold	Names of buttons, tabs, menus, menu items, commands, files, keyboard keys, dialog boxes and other important terms.
Italic	Titles of User Guides, chapters, or sections and cross-references.
`Courier font`	Text to be entered from a keyboard.
+	Indicates two or more keyboard keys that must be pressed simultaneously. For example, **Ctrl+Alt+Delete**.
Note	Alternative approaches or issues you should be aware of while using a particular function.
Important	Information that will save time and minimize problems.
Warning	Information that will prevent equipment damage or personal injury.

ISO Symbols

Symbol	Meaning
	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

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

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

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

• Product Technical Support

• Technical Training

Product Technical Support

The Product Technical Support department welcomes any questions 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 PowerStation, be sure to complete the following steps:

• Check any release notes that may have shipped with the unit. These notes provide important information about the PowerStation.

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

• Review *Chapter 4, Maintaining the PowerStation.*

• Visit the Parker Automation - CTC Web site and register for the support forum. You can find the support forum by clicking on the *Support* tab from the Web site's 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, 8:00am to 5:00pm Eastern Standard time.

Technical Training

Parker Electromechanical offers training on all of our products, either at Parker 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 Parker Training: emn_training_ctc@parker.com

You can view a current training schedule on our web site at www.ctcusa.com or www.parkermotion.com.

Getting Started

Now that you have opened the PowerStation, you are ready to unpack the unit, install it in a permanent location, and develop an application for it. Follow the steps below to get started.

1 Unpack the PowerStation and verify that you have received all of the components you ordered.

2 Install the PowerStation in a permanent location. See *Chapter 2, Installing the PowerStation,* for complete installation instructions.

3 Review the available connectors for the PowerStation, see *PowerStation Connectors* on page 3-1, for details.

4 Start up your PowerStation. See *Starting the PowerStation* on page 3-8, for more information.

5 Develop your application and download it to the PowerStation.

INSTALLING THE POWERSTATION

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2

</div>

Once you have unpacked the PowerStation and verified that you have received all of the components you ordered, you are ready to install the PowerStation in a permanent location.

This chapter covers the following topics:

- Selecting a Location
- Preparing for Installation
- Installing the PowerStation
- Installing an Optional AC Power Supply

Selecting a Location

The first step when installing the 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 guidelines to follow when selecting a location for the PowerStation.

Underwriters Laboratories Approval

In order to obtain Underwriters Laboratories (UL) approval for your PowerStation installation, the installation must meet the following criteria:

1   The PowerStation must be mounted in a standard industrial enclosure that provides fire protection.

2   The PowerStation products have been approved for NEMA Type 4/4X (indoor) ratings when mounted in a customer provided enclosure listed Type 4/4X.

Environmental Guidelines

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

Touchscreen Considerations

The EPX PowerStation's touchscreen is designed to meet the NEMA 4/4X rating. However, it is only rated NEMA 4/4X when properly mounted in a NEMA 4/4X enclosure.

The PowerStation's touchscreen is resistant to a variety of chemicals. See *Faceplate Chemical Resistance* on page A-9 for a list of these chemicals. Make sure that the touchscreen is not exposed to chemicals other than those listed in *Faceplate Chemical Resistance*.

Electrical Guidelines

To minimize unwanted electrical interference, select a location away from machinery that produces intense electrical noise (arc welders, for example). 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 A-7 for a list of the 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.

Temperature and Humidity Guidelines

You can safely operate the PowerStation within the temperature range specified in *Environmental Specifications* on page A-6. 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 EPX PowerStation can dissipate approximately 26 watts on an 8" unit with a hard 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.

EPX 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 an additional 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 (95°F), or the PowerStation would surpass its maximum operating temperature.

Do not mount a PowerStation into a sealed enclosure and mistakenly think that due to the 50°C rating of the product, the sealed enclosure can 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 PowerStation. You should allow a minimum of 2 inches between the enclosure and the top, bottom, and sides of the PowerStation to allow access to the cabling and Compact Flash.

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

Refer to the CD that came with the PowerStation for dimensional drawings.

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.

Class I, Division 2 Guidelines

If you purchased a Class I, Division 2-compliant PowerStation, this equipment is suitable for use in Groups A, B, C, and D or non-hazardous locations only. You must follow these guidelines in order to maintain a safe operating environment.

- Make sure that the PowerStation's "ON/OFF" switch is secured in the "ON" position using the supplied bracket.

- All field wiring terminals must be marked to indicate to use copper wire with 60C or 60/75C insulation and a tightening torque of 7.0lbs/in (0.79 N-m).

- For use on a flat surface of a Type 4/4X enclosure (indoor use only) or equivalent.

WARNING!

Explosion Hazard!

- Do not connect or disconnect cables unless the power has been switched off, or the area is known to be non-hazardous. Keyboard, mouse, and USB ports are for system setup and diagnostics *only* and are not intended for permanent connection.

- Class I, Division 2 approval requires power switch restraints in hazardous environments. Nonincendive field wiring for Class I, Groups A, B, C, and D hazardous locations only. Temperature code: T5.

- Substitution of components may impair suitability for Class I, Division 2.

- Turn off power before removing or inserting a Compact Flash card.

Preparing for Installation

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

If you plan to operate the PowerStation using AC power, and you purchased Parker'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 PowerStation* on page 2-7.

Creating the Cutout

Be sure to follow the cutout diagrams in the dimensional drawings precisely. This ensures that the PowerStation is properly sealed in its enclosure. You can find the dimensional drawings on the EPX PowerStation CD shipped with your unit.

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

2   Attach the template securely to the mounting surface.

3   Cut out the area on the template referred to as the *Cutout Area*. To ensure the flatness of the mounting surface, when punching out the mounting hole, maintain proper surface flatness and edge quality.

The cutout dimensions for the EPX PowerStation are shown in the following table:

Model	Cutout Height	Cutout Width
EPX08T	6.08"	8.67"
EPX10S	9.86"	12.60"
EPX15T	12.40"	15.90"

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

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

Installing the PowerStation

Once you have prepared the location for your PowerStation, you are ready to install the unit. To do so, you need to mount the PowerStation to your enclosure using screws and metal clamps in what is called a **bracket assembly**. The bracket assembly contains a mounting clamp with "feet" and a screw.

The mounting clamps secure to the PowerStation using a sliding mechanism. You must slide the feet of the mounting clamp into the appropriate slot on the PowerStation.

For your convenience, all necessary mounting hardware is included with the unit.

Figure 2-1 and 2-2 display the bracket assembly and mounting clamp. Some units mount with a T-style clamp.

Figure 2-1: Bracket Assembly
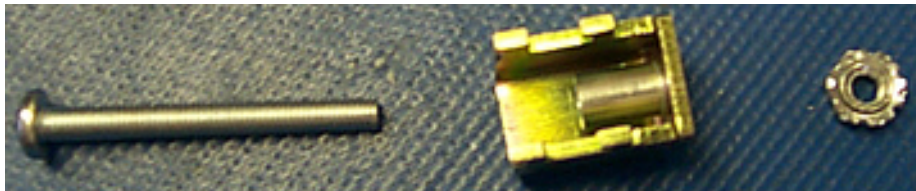
The bracket assembly contains a mounting clamp with "feet" as shown in Figure 2-2. The mounting clamps secure to the PowerStation using a sliding mechanism. You must slide the feet of the mounting clamp into the appropriate slot, refer to the instructions for mounting the PowerStation for details.
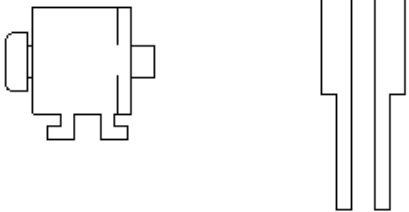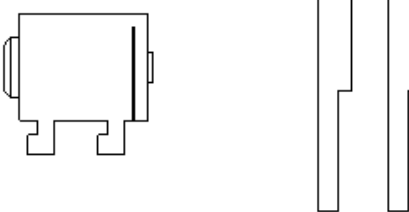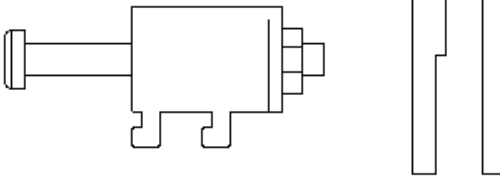
Figure 2-2: Mounting Clamp

Mounting Clamp Feet
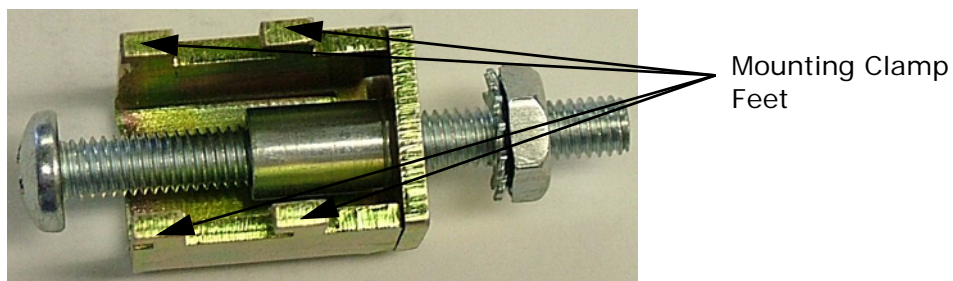
To mount the PowerStation properly, refer to the chart on the next page that corresponds with the display size you are using. General mounting steps are listed below the chart.

Figure 2-3Mounting Chart for EPX PowerStations

display size	# of clamps	clamp style	torque or compression
8"	4		7 in/lbs.
10"	6		50% compression
15"	8		7 in/lbs.

Mounting a PowerStation

1   Slide the PowerStation into the cutout from the front.

2   Attach the mounting clamps, with their screws, to the back of the unit in the spaces provided. Ensure you use all the clamps included in your assessories kit. Refer to the chart, above, to locate the number of clamps in your kit.

3   The clamps secure to the unit using the sliding mechanism shown in the chart and in Figure 2-4.

4   Insert the clamp into the wide end of the slot and slide it to the thin end.

5   Tighten each of the mounting screws against the front of the enclosure. PowerStations with 15″ displays also use a nut with the screw.

6   Depending on your display size, either torque down the screws to the value indicated in the chart, above, or ensure the proper level of compression for the gasket. Also refer to figure 2-4.

Caution: Do not over-tighten the screw/clamp assembly or you may damage the monitor. However, under-tightening may not guarantee a NEMA 4/4x seal.

7   Tighten the screws in a crosswise sequence to ensure a good seal and prevent damage. You may see a small gap between the bezel and the enclosure.

Figure 2-4: Mounting the Clamp

Figure 2-4a: Side View of a 10" PowerStation Mounting Clamp

10″ PowerStation mounting clamp
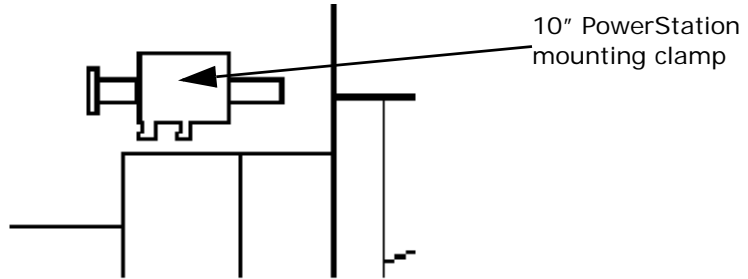
Figure 2-4b: Side View of a 10" PowerStation Mounted in an Enclosure

Compress gasket by 50% for 10″ units

Backshell

Mounting Clamp

Bezel
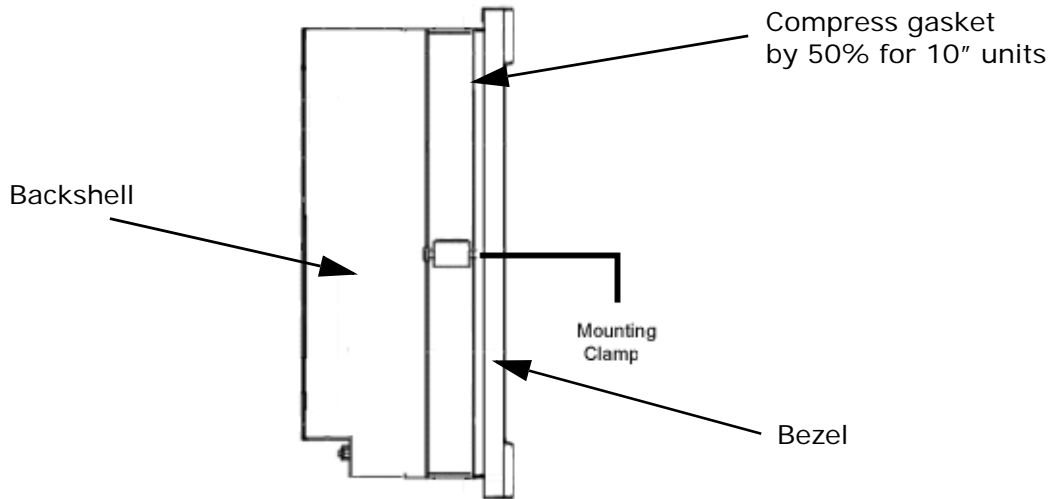
Installing an Optional AC Power Supply

The EPX PowerStation uses only 24 volt DC power. However, you can operate the PowerStation with AC power by using an optional AC Power Supply available from Parker. Use this section only if you intend to operate the EPX PowerStation using AC power. If you plan to use DC power, refer to *Installing the PowerStation* on page 2-7.

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

Preparing a Location for the AC Power Supply

Be sure to 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.

If you purchased Parker's optional AC Power Supply and mounting kit use the template that came with the mounting kit to prepare your location for the power supply. This can be 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 on the side of the enclosure to provide the best convection cooling.

Prepare the Power Supply Mounting Surface

The P1X-PWRAC AC power supply is designed to be mounted using two metal brackets provided in the optional BKT-1000 mounting kit. These brackets are secured to the mounting surface using four screws. To prepare the mounting surface, complete the following steps:

1   Measure the cutout dimensions.
2   Securely attach the power supply template to the mounting surface.
3   Cutout the four 0.17″ (4.3mm) holes as shown on the template.
4   Debur the edges of the cutout area, removing dirt and debris.

Mounting the AC Power Supply

After drilling the holes for the four screws, you can follow the steps below to mount the power supply:

1   Attach the power supply to the mounting surface using the supplied metal brackets.
2   Connect the power cord from the power supply to an AC power source.

Connecting the Power Supply to the Workstation

Once you have mounted the power supply, you are ready to connect it to the workstation.

1   Slide the positive and negative wires into the appropriate slots on the power connector that was shipped with the workstation. See Figure 2-5.

Figure 2-5: Power Connector and Positive/Negative Wires

Power Connector
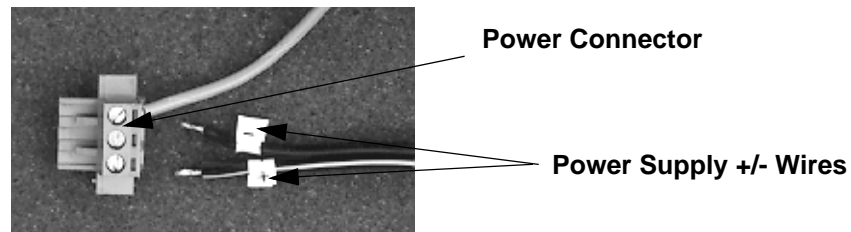
Power Supply +/- Wires

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

3   Connect the power cord from the power supply to an AC power source.

4   Attach the power connector that you prepared in Step 1, to the workstation.

You have successfully connected the power supply to your workstation. You can now operate the workstation using AC power.

Caution: All EPX PowerStations are powered from a 24VDC power source. DO NOT connect AC power to the unit.

STARTING YOUR POWERSTATION

3

This chapter discusses the following topics:

- PowerStation Connectors
- Starting the PowerStation
- Drive Definition and Memory
- Using the BIOS Utility

The EPX PowerStation is shipped with the Documentation and Utilities CD. This CD contains all of the dimensional drawings, software, and drivers needed. If any of the software on your system becomes lost or corrupted, you can reinstall it from this distribution disk.

PowerStation Connectors

All EPX PowerStations have the following connectors:

- 2 serial ports
- 2 PS/2 ports for the keyboard and mouse
- 2 USB ports
- 1 Ethernet port
- 1 Compact Flash connector
- Power switch
- 1 ground stud

See the EPX PowerStation CD for dimensional drawings and a diagram to locate the components.

Serial Ports

The EPX 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 configurable RS-232, RS-422, and RS-485 communication standards.

The communication standard you select for COM2 depends upon the distance between the 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 Parker's MachineShop Suite software, information on the specific connection required for the InteractX OPC drivers you will use is located in the help file associated with the driver.

Pinouts for COM1

If you need to make a cable for communicating with COM1, Table 3-1 shows the pinouts and signal information for this port.

Table 3-1: COM1 Pinouts

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

Dip Switch Settings and Pinouts for COM2

If you need to make a cable for communicating with COM2, Table 3-2, shows the pinouts and signal information for this port.

Table 3-2: COM2 Pinouts

Pin#	RS-232 Communication	RS-422 Communication	RS-485 Communication
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

Caution: Note that RTS and CTS signals are not active in RS-422 and RS-485 configurations.

Once you make a cable for communicating with COM2, you will need to set the COM2 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 EPX PowerStation, as shown in Figure 3-1.

Figure 3-1: COM2 Dip Switch Settings
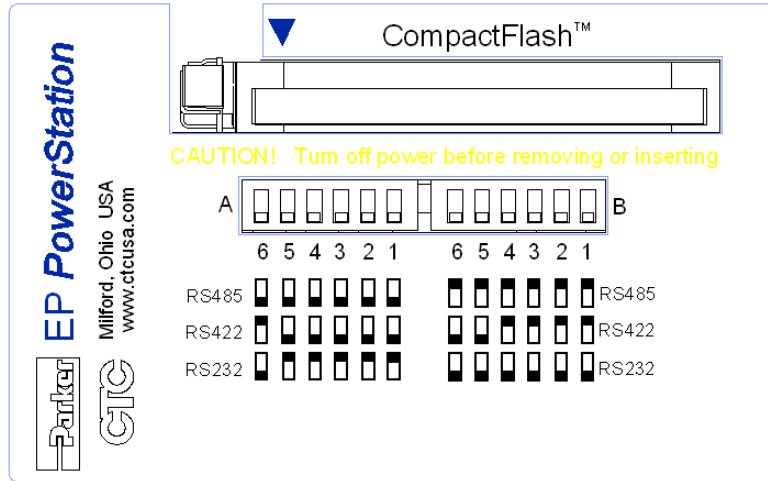
- The white boxes represent the tip of the switch.

- 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 EPX PowerStation and the chart below.

Figure 3-2: DIP Switch
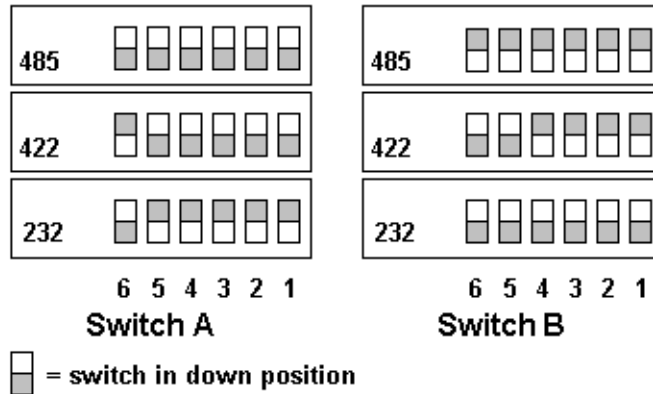
2   Using a pointed instrument such as a pen or pencil, flip the switches to the appropriate settings through the viewing window.

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

Figure 3-3: Connector Pinouts and Cable Wiring

RS-232	RS-422	RS-485

COM1/COM2

RXD	2
TXD	3
RTS	7
CTS	8
RI	9
GND	5
DCD	1
DTR	4
DSR	6

232

COM2

TXD-	1
TXD+	2
RXD+	3
RXD-	4
GND	5
DSR	6
RTS	7
CTS	8
RI	9

422

COM2

TXD-	1
TXD+	2
RXD+	3
RXD-	4
GND	5
DSR	6
RTS	7
CTS	8
RI	9

485

Note: 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 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.

Figure 3-3 Directional Control Jumper
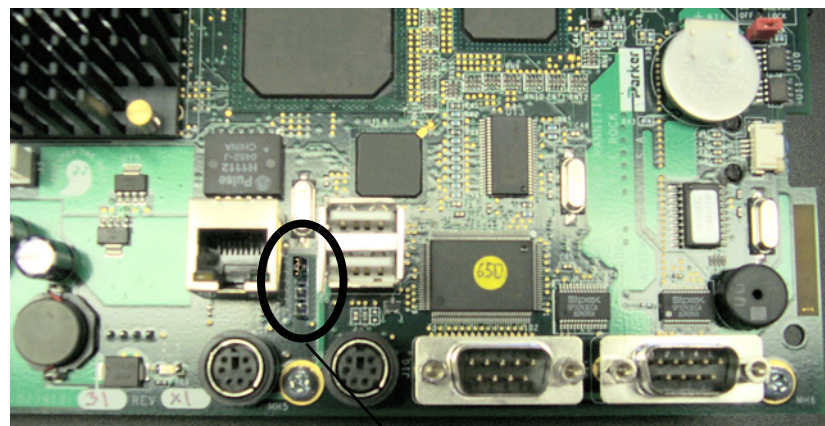
RS485 directional jumper

Settings

= Auto   = RTS
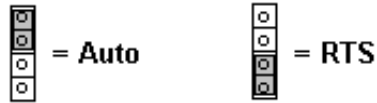
Transferring Files from a PC to the EPX PowerStation

You can transfer files from a PC to the EPX PowerStation in one of three ways, using an Ethernet connection, using a CompactFlash card, or a serial connection. If you plan to use a serial transfer, you will need a null modem cable. To construct your own cables, refer to Figure 3-4, for the appropriate settings, then continue with step 1 below.

Figure 3-4: Serial Transfer Cable Diagram
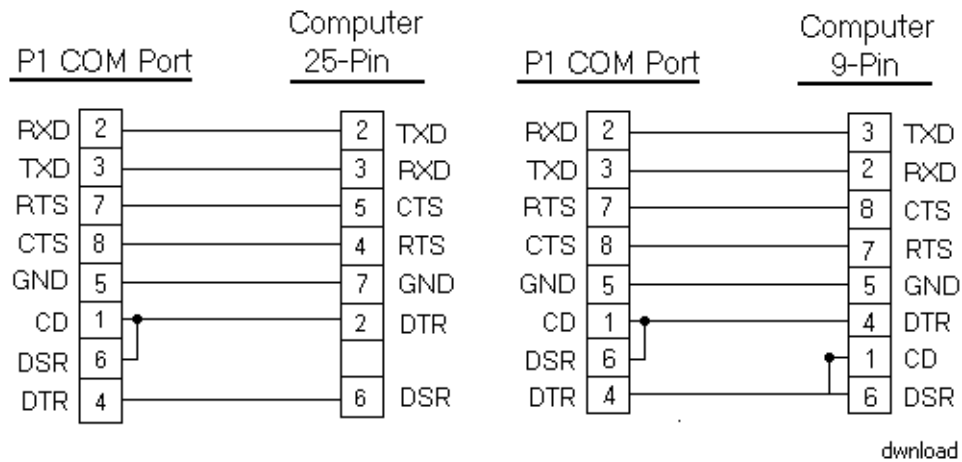
1   Connect a null modem serial cable to an available serial port on your development PC.

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

3   Launch MachineShop Suite on your development PC.

4   Select *File - Open Project* then select the project you wish to transfer.

5   Double-click on the PowerStation icon in within the **Project** workspace.

6   The Transfer Wizard dialog displays. Follow the steps in the wizard.

Keyboard and Mouse

The EPX 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, Parker recommends that you only use a Microsoft PS/2-style mouse, specifically an 802.3 Microsoft-compatible mouse.

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

Ethernet Port

The EPX 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.

Table 3-4: Ethernet Pinouts

Pin#	Signal
1	TX+
2	TX-
3	RX+
4	N/C
5	N/C
6	RX-
7	N/C
8	N/C

CompactFlash

The EPX PowerStation comes with a CompactFlash (CF) card. The CF is used as a removable hard drive that is recognized as drive C and provides non-volatile memory storage. 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.

The CF is the secondary slave drive whether a CD-ROM drive is installed or not. You can use a CF card as the startup drive or as a secondary IDE drive.

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

You should purchase at least one additional CF card to serve as a backup for your primary CF card. It is also useful to own several cards to store different projects. You can purchase additional CF cards through Parker.

Note: Do not remove or insert the CF card when the unit is powered on or data on the card could be corrupted.

Starting the PowerStation

Before connecting power to your unit, make sure that you have read and understood the electrical and testing specifications described in Appendix A, *PowerStation Specifications*. Also, make sure that you follow the guidelines listed below:

- **For permanently connected equipment**, a readily accessible disconnect device must be incorporated in the fixed wiring.
- **For pluggable equipment**, the socket-outlet must be installed near the equipment and should be easily accessible.

Important   Proper installation of the EPX PowerStation 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 only connected to the main supply with a harmonized power cord.

1   Ensure the power ON/OFF switch is in the OFF position.

2   Connect the power cord to a DC voltage source. Voltage input to the unit should be within the range specified in Appendix A, *PowerStation Specifications*.

3   Connect the power cord to the PowerStation and turn on the unit.

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

Drive Definition and Memory

When you purchase the EPX PowerStation, you can specify whether you want an 80GB hard drive, a 160GB 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. Be sure to download your application files to this drive.

Memory Guidelines

There are two memory storage types: DRAM and Compact Flash. The capacity and use of the DRAM is up to 512MB. The capacity and use of the Compact Flash is up to 8.0 GB flash memory.

Using the BIOS Utility

This section discusses some of the more applicable options available in the Phoenix - Award BIOS utility on the EPX PowerStation. There are three instances in which you will need to use the BIOS utility program:

1   You are starting your system for the first time.

2   You have changed the hardware attached to your system.

3   The CMOS memory has lost power and the configuration information has been erased.

Every computer with a motherboard includes a special chip referred to as the BIOS or ROM BIOS (*Read Only Memory Basic Input/Output System).* The BIOS includes instructions to interact with the computer hardware. It also includes a test which ensures that the computer meets requirements to boot up properly. If the computer encounters an error during the test, you either hear a combination of beeps or see an error message on the screen.

Error messages can be fatal or non-fatal. Generally, the system can continue the boot up sequence with a non-fatal error. These are usually displayed on the screen along with the following instructions:

Press <F1> to RESUME

Write down the error message and press the F1 key to continue booting the system.

Refer to the BIOS utility to perform the following functions on your PowerStation:

•   Basic system configuration (date, time, IDE, etc.)
•   Change the values in the chipset registers
•   Specify settings for integrated peripherals, power management, and frequency and voltage control
•   Set the shutdown temperature and load values for minimal operating performance
•   Optimize and load default BIOS settings

Entering Setup

Before changing any of the BIOS settings, shut down the system and connect a keyboard to the PowerStation.

1   Turn on the PowerStation.

2   Press <Del> immediately to allow you to enter the BIOS setup utility. The Phoenix - Award BIOS main menu is displayed.

The main menu allows you to access each of the other submenus in the BIOS utility. The menus that are more likely to be utilized are listed in the table below.

Table 3-5: BIOS Menu Options

Menu Option	Description
Standard CMOS Features	Use this menu for basic system configuration such as setting the date, time, IDE, etc. This is the most commonly used menu of the BIOS utility.
Advanced BIOS Features	Use this menu to set advanced features available on your system such as virus warnings.
Advanced chipset Features	Use this menu to change the values in the chipset registers and optimize your system performance.
Integrated Peripherals	Use this menu to specify your settings for integrated peripherals (primary slave, secondary slave, keyboard, mouse, etc.).

MAINTAINING THE POWERSTATION

4

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

This chapter provides instructions on maintaining your PowerStation:

- Maintaining the Touchscreen
- Replacing the CompactFlash
- Performing Internal Maintenance
- Optional Components
- Accessing the PowerStation Utilities

Maintaining the Touchscreen

This section discusses the basic maintenance of your PowerStation's touchscreen, including:

- Cleaning the Touchscreen
- Calibrating the Touchscreen

Cleaning the Touchscreen

Occasionally, you may need to clean the monitor's screen. Clean the screen using warm, soapy water and a cloth. You can also use any non-abrasive cleaner. See *Faceplate Chemical Resistance* on page A-9, 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 screen surface. The surface is sensitive to scraping, sharp blows, or punctures. Therefore, keep screwdrivers or other sharp objects away from the screen surface.

Warning   Do **not** clean the unit while it is running. Turn off the monitor before cleaning it in order to avoid inadvertently activating the touchscreen.

Calibrating the Touchscreen

The monitor's touchscreen is calibrated before leaving Parker. However, you may need to recalibrate the touchscreen in certain circumstances, such as:

• Moving a CompactFlash card between EPX PowerStations

• After re-imaging the CompactFlash card

• When you use the EPX PowerStation for the first time

• When you replace the touchscreen

• Whenever the cursor does not follow the location where you touch the screen

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** or the Calibrate Touchscreen icon on the desktop. The control panel appears.

2   Follow the on screen instructions for selecting which monitor to calibrate.

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 until prompted to release.The screen guides 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**.

Replacing the CompactFlash

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

1   Turn off the EPX 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 similiar to that shown in Figure 4-1.

Figure 4-1: CompactFlash Ejector.
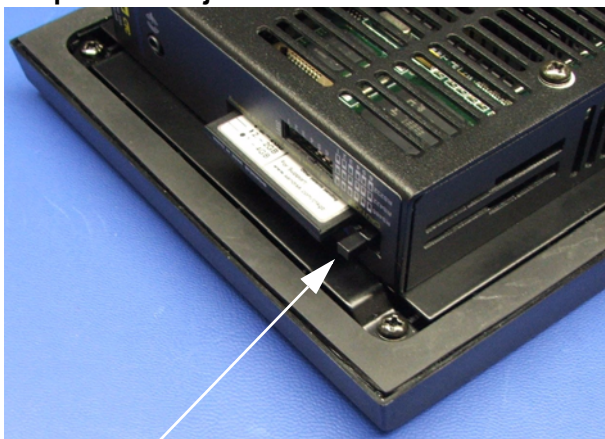
Ejector Button

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!

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

If you need additional storage capacity for the EPX PowerStation, you can purchase additional CompactFlash cards from Parker. Be sure to purchase at least one additional flash card to serve as a backup for your primary card.

Writing to the Compact Flash Card

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

A PC 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 PC through a USB port.

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.

Performing Internal Maintenance

Before doing any internal maintenance, be sure to read and understand the following procedures to prevent injury to yourself and/or damage to the PowerStation.

- Electrostatic Discharge (ESD) Precautions

- Removing the PowerStation from an Enclosure

- Opening the PowerStation

- Closing the PowerStation

- Replacing the Fuse

Important: For safety reasons, the PowerStation should be opened *only* by qualified service personnel.

Electrostatic Discharge (ESD) Precautions

Modern integrated electronic devices, including the PowerStation, are extremely sensitive to electrostatic discharges (ESD) and fields. Before you open the system, be sure to follow these simple precautions to protect you and the PowerStation from harm resulting from ESD.

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

- Always disconnect power from the PowerStation before opening. **Do not** touch any internal components of the PowerStation while the system is on.

- Disconnect power before performing any internal maintenance or troubleshooting. A sudden static discharge as you connect a jumper or touch any internal parts may damage sensitive electronic components.

- Only handle internal components of the PowerStation 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 components on the printed circuit boards.

- Keep any PowerStation part in its anti-static packaging when it is not installed in the unit and place it on a static dissipative mat when you are working on it.

Removing the PowerStation from an Enclosure

To remove the PowerStation from it's enclosure, follow the steps below.

WARNING!

Explosion Hazard!

- Do not connect or disconnect cables unless the power has been switched off, or the area is known to be safe.

1　Turn off the power to the unit.

2　Disconnect the following cables:

- Power Input cable
- Ground cable
- any communication cables
- any keyboard and mouse cables

3　Take off the clamps.

4　Place the PowerStation face down on a static dissipative mat, in a location free from dirt and moisture and protected against static discharge.

Opening the PowerStation

Once you have removed the PowerStation from it's enclosure, you can open it up. Follow the steps below.

1　Remove the CompactFlash card from it's slot by pressing the eject button on the side of the PowerStation, similiar to that shown below.

Figure 4-2: Eject Button

CompactFlash
Card

CompactFlash
Eject Button
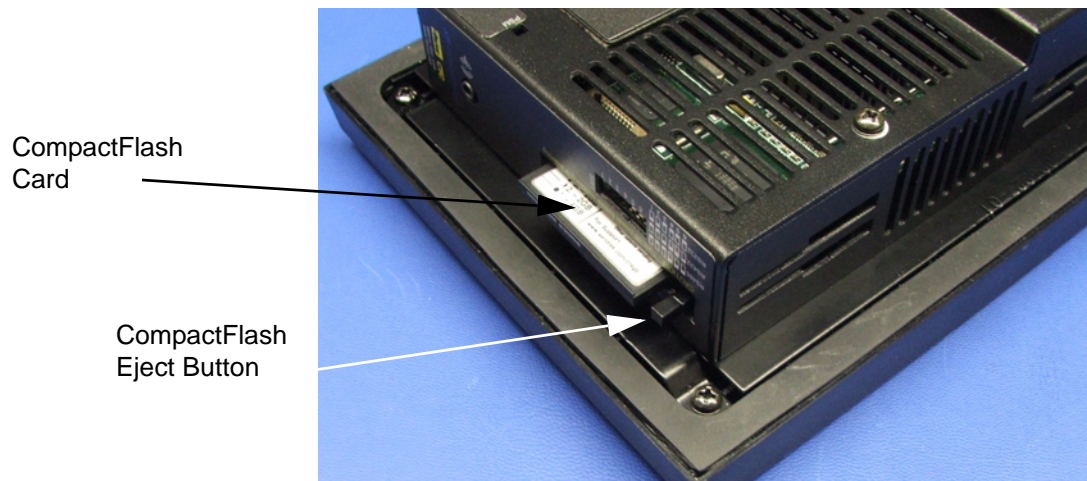
2   Press in the eject button to return it to it's retracted position.

3   Remove the backshell screws on the EPX PowerStation.

4   Lift the backshell off of the PowerStation to expose the board.

You are now ready to perform any internal maintenance necessary.

Closing the PowerStation

1   Replace the backshell on the PowerStation.

2   Remount the PowerStation in the enclosure, refer to *Installing the PowerStation* on page 2-7.

3   Reconnect the following cables:

- •   Power Input cable
- •   Ground cable
- •   any communication cables
- •   any keyboard and mouse cables

4   Turn on the PowerStation.

Replacing the Fuse

The EPX 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. The required fuse is listed below.

- Use a Littlefuse Nano SMF Very Fast-Acting Type fuse. The part number is R451 004.

Caution: Using a fuse that is rated differently than indicated, can cause damage or fire to occur. This is a 4 amp fuse.

To replace the fuse, complete the following steps:

1 Remove the PowerStation from its enclosure then open the PowerStation as discussed on page 4-5.

2 Locate the fuse on the board according to the picture below.

Figure 4-3: Fuse Location)

Fuse Location
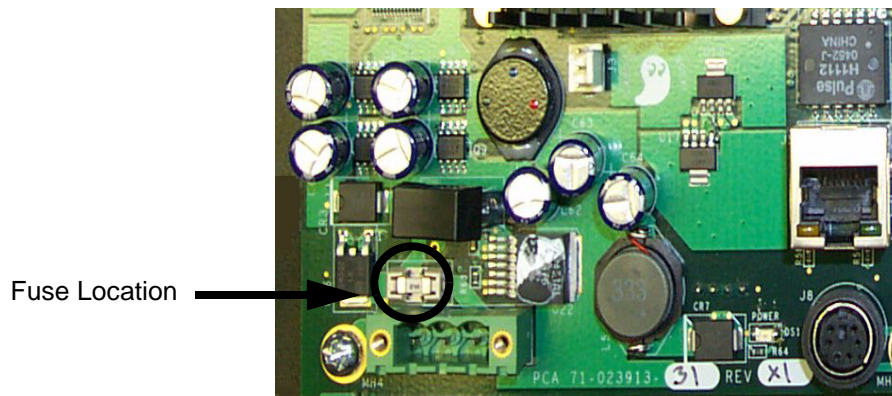
3 Use an ohm meter to see if the fuse is open or closed.

- If open, use a pair of needle nose pliers to lift the fuse from the fuse holder.

- If closed, the fuse is okay and there is no need to replace it.

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

Optional Components

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

AC Power Supply

The EPX 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, P1X-PWRAC, that includes an AC Power Supply and a power cord.

You can also purchase a mounting bracket kit, BKT-1000, for the Power Supply. See *Preparing a Location for the AC Power Supply* on page 2-10 for instructions on how to mount the AC Power Supply.

⚠️ Do not apply AC power directly to the unit or damage could occur.

Accessing the PowerStation Utilities

The EPX PowerStation is shipped with the EPX PowerStation Documentation and Utilities CD. This CD contains all of the dimensional drawings, software, and drivers needed for the EPX PowerStation.

If any of the software on your system becomes lost or corrupted, you can reinstall it from this distribution disk.

POWERSTATION SPECIFICATIONS

A

This appendix outlines important specifications for the PowerStation. It is a good idea to familiarize yourself with the specifications before operating your unit.

- Physical Specifications
- Display Specifications
- Environmental Specifications
- Electrical Specifications
- Testing Specifications
- Faceplate Chemical Resistance

Physical Specifications

Physical specifications include the PowerStation's CPU, memory specifications, display types, storage capacity, and other physical characteristics. These specifications are shown in Table A-1, below.

Table A-1: Physical Specifications

Category	Specifications
Operating System	XP Professional
CPU	• 650MHz Ultra Low Voltage Intel Celeron processor • 256KB L2 Cache • 100MHz Front-side bus
Memory	• 512MB 133MHz SDRAM • 144-pin SODIMM Socket
BIOS	• Award Flash
Storage	One of the following: • 80GB hard drive • 160GB hard drive • 4GB CompactFlash drive • 8GB CompactFlash drive (Supports Type 1 and 2 CompactFlash cards)
Optional Application Storage	Only available if a hard drive was selected as the OS storage device: • 128MB Compact Flash • 1.0GB Compact Flash • 2.0GB Compact Flash • 4.0GB Compact Flash • 8.0GB Compact Flash

I/O Ports	• Two 9-pin serial ports (16550 compatible)
	   • 1 RS232
	   • 1 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 For the 10″: • 11.0″H x 13.8″W x 4.7″D For the 15″: • 13.3″H x 16.8″W x 5.2″D

Category	Specifications
Weight	For the 8″: • 6.0 lbs/2.72 kgs For the 10″: • 11.1 lbs/5.03 kgs For the 15″: • 15.6 lbs/7.09 kgs
Keyboard	• 1 PS/2 miniDIN
Mouse	• 1 PS/2 miniDIN
Touchscreen	• Analog Resistive
Audible	• Piezoelectric Beeper

Display Specifications

Display specifications include the type of monitor, size, resolution, and other display properties. These specifications are shown in the following tables. There is one table for each display size: 8″, 10″, and 15″.

Table A-2: EPX08T Display Specifications

Property	Description
Type	Active Color TFT
Display Diagonal Size	8.0″
Resolution	VGA (640 x 480)
Brightness	380 NITS
Bulb Life	10,000 hours
Viewing Angle	
Left/Right	$65^o/65^o$
Up/Down	$65^o/55^o$

Table A-3: EPX10S Display Specifications

Property	Description
Type	Active Color TFT
Display Diagonal Size	10.4"
Resolution	SVGA (800 x 600)
Brightness	350 NITS
Bulb Life	50,000 hours
Viewing Angle	
Left/Right	$45^o/45^o$
Up/Down	$40^o/70^o$

Table A-4: EPX15T Display Specifications

Property	Description
Type	Active Color TFT
Display Diagonal Size	15.0"
Resolution	XGA (1024 x 768)
Brightness	250 NITS
Bulb Life	50,000 hours

Property	Description
Viewing Angle	
Left/Right	$80^{o}/80^{o}$
Up/Down	$55^{o}/80^{o}$

Environmental Specifications

Even though the EPX 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 EPX 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 Table A-5.

Table A-5: Environmental Specifications Chart

Category	Specifications
Operating Temperature	32 to 122°F (0 to 50°C) ambient (air temp. outside of EPX backshell)
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 Type 4/4X only if it is installed in a NEMA 4/4X rated enclosure.

Electrical Specifications

The EPX 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 EPX 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 EPX PowerStation's electrical specifications appear in Table A-6.

Table A-6: Electrical Specifications Chart

Category	8", and 10" Units	15" Units
Input voltage	24 VDC @ 2A, 48W max (Range: min 18 VDC, 28 VDC max)	24 VDC @ 2A, 48W max (Range: min 18 VDC, 28 VDC max)
Fuse	Littlefuse Nano SMF Slow Blow Type fuse. The part number is R451 004.	Littlefuse Nano SMF Slow Blow Type fuse. The part number is R451 004.
Heat Dissipation	26 Watts maximum with a hard drive	38 Watts maximum with a hard drive

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

Testing Specifications

The EPX PowerStation conforms to the testing specifications listed below. Table A-7, shows the European community immunity and emission standards for electronic equipment: EN61000-6-2 (2001) and EN55011 (A2:2002).

Table A-7: European Community Specifications

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 A-8, shows the mechanical testing specifications.

Table A-8: Mechanical Testing Specifications

Test	Specification
Surge withstanding capacitance	EN61000-4-5
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-810 516.3
Non-operational vibration	1.0 grms/MIL-STD-810F 514.3

Faceplate Chemical Resistance

The touchscreen of the EPX PowerStation is resistant to the chemicals listed in Table A-9.

Table A-9: 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	

Note: Sustained exposure to brake fluid or Gunk[®] brand degreaser can cause damage to monitor materials.

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

Table A-10 External Surfaces Chemical Resistance Chart

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