

# **PowerStation**

## **Model P1 User Guide**

**CTC Parker Automation**  
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A3-05087-105

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## Product Warranty Information

CTC Parker Automation 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 15 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 Interact 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. You may call this same number after hours for emergency assistance. See *Customer Support Services* on page 6 of this manual for more information about CTC's support products and services.

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# Manual Overview and Support Services

Thank you for purchasing the P1 PowerStation. The P1 PowerStation is a rugged, compact PC that is designed to be used as an industrial operator interface.

The P1 PowerStation features a durable, 5.7” touchscreen display in either STN color LCD or Mono LCD. It also has an all-in-one PC board with a parallel port, two serial ports, and an Ethernet port. The P1 PowerStation’s PC architecture allows you to run CTC Parker’s MachineShop software.

Please take time to review this manual and the other documentation included with the P1 PowerStation before operating the unit.

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## Using this Manual

This manual is designed to help you set up and use your P1 PowerStation. The 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 — Manual Overview and Support Services:**

Presents an overview of this manual, the other documentation and software provided with the P1 PowerStation, and the steps necessary to get your P1 up and running. This chapter also describes CTC's customer support services.

**Chapter 2 — Introducing the P1 PowerStation:**

Describes the P1's specifications and the ports available to connect the P1 to other devices and to a power source. This chapter also describes the PowerStation's drive definitions and memory map and the unit's replacement and optional components.

**Chapter 3 — Installing the PowerStation:** Explains how to install the P1 in a control enclosure and how to start up the unit.

**Chapter 4 — Maintaining and Troubleshooting the PowerStation:** Explains how to maintain the P1 and how to solve problems that may occur in operation.

**Appendix A — P1 PowerStation Dimensional Drawings:** Displays dimensional drawings of the P1 that will be useful in mounting the unit.



## Documentation Components

The P1 PowerStation documentation set contains all the information you need to configure, install, and use the P1 PowerStation. The P1 PowerStation documentation set is described below.

**Release Notes** - This document is provided whenever there is important information about the P1 PowerStation that does not appear in this manual. Be sure to read any available release notes before installing or operating the unit.

**PowerStation Model P1 User Guide** - This is the document you are reading. It provides detailed information about the P1 PowerStation and describes how to configure, install, and use the unit. Please read this manual in its entirety before operating the unit.

**CPU Manual** - This is the manual provided by the manufacturer of the CPU board found in your PowerStation. Please familiarize yourself with this manual before operating the unit.

**P1 PowerStation Template** - This document is a full-size template of the P1 PowerStation that you can use to prepare the location where you want to install the unit.

## Software Components

CTC Parker pre-loads each P1 PowerStation with the MS-DOS<sup>®</sup> 6.22 operating system, the MachineShop Shell, and necessary utilities so that you can run the PowerStation immediately upon its arrival at your facility. CTC Parker also provides backup copies of PowerStation and MachineShop software on the MachineShop Installation CD shipped with the PowerStation.

## Getting Started

Now that you have opened the PowerStation package, you are ready to unpack the unit, develop an application, and install the P1 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 PowerStation, please complete the following steps:

1. Unpack the PowerStation, and verify that you have received all the components you ordered.
2. Fill out the product registration card, and return it to CTC Parker. When you register your unit, you will receive a trial membership in CTC Parker's Product Support Program, which provides complimentary telephone technical support, information on product updates, and service bulletins.
3. Backup the CTC software that was pre-installed on your unit using the Windows<sup>®</sup> File Manager/Explorer or the MS-DOS Diskcopy command.

### Install 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 in this manual, *Installing the PowerStation*, for complete installation instructions.

### Download Applications and Project

The P1 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 Parker welcomes your thoughts and suggestions on our products and services. You can contact CTC Parker by telephone, email, or fax. You can also visit CTC Parker on the World Wide Web to learn the latest about our hardware, software, and customer support services.

- Telephone: 513-831-2340
- Fax: 513-831-5042
- E-mail: [sales@ctcusa.com](mailto:sales@ctcusa.com) or [support@ctcusa.com](mailto:support@ctcusa.com)
- World Wide Web: <http://www.ctcusa.com>

CTC Parker 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 three types of customer support services: Customer Technical Support, Technical Support Products, and the Product Support Program.

## 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 any customer, whether you are an end user, original equipment manufacturer (OEM), system integrator, or distributor.

If you have a question about the 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 and Troubleshooting the PowerStation*.

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. You can call this same number after hours for emergency assistance.

**Technical Support Products**

Our Technical Support Products department provides service in two areas: training and consulting. CTC Parker offers training on all our products, either at CTC Parker in our state-of-the-art training center or at your site. You can learn how to write custom interfaces, develop specialized applications, and implement your complete operator interface application. You can contact the Training Coordinator by phone at 1-800-233-3329 or by email at [training@ctcusa.com](mailto:training@ctcusa.com).

CTC Parker offers consulting services through our Professional Consulting Services (PCS) group. Our PCS group can build your application from the ground up by writing custom communications drivers or by designing special modules to perform functions unique to your application. Our team of specialists is flexible, so they can create a project development schedule that meets your needs. You can contact the PCS Coordinator by phone at 1-800-233-3329 or by email at [pcs@ctcusa.com](mailto:pcs@ctcusa.com).

**Product Support Program**

Our Product Support Program (PSP) is designed to keep you up-to-date with the current versions of CTC Parker software. The PSP consists of a renewable, one-year membership that provides you with free upgrades, utilities, automatic notification of software updates, and other valuable tools for MachineShop, Interact, and MachineLogic. Single-user, site, and corporate licenses are available. The PSP is an easy, cost-effective way to automatically receive the most recent CTC Parker software and associated utilities. You can contact the PSP Coordinator by phone at 1-800-233-3329 or by email at [psp@ctcusa.com](mailto:psp@ctcusa.com).



# Introducing the P1 PowerStation

The P1 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 PowerStation's specifications and available connectors, its drive definitions and memory map, and its PC/104 adapter. The chapter also describes the PowerStation's replacement and optional components.

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## Specifications

This section describes important specifications for the P1 PowerStation. Please familiarize yourself with these specifications before operating the unit.

### Physical Specifications

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

| Category                  | Specifications   |
|---------------------------|--|
| CPU                       | ALi M6117C, 40MHz 80386SX  |
| Memory                    | 4, 8, or 16 72-pin SIMM  |
| Displays                  | <ul style="list-style-type: none"> <li>• Monochrome LCD, 320x240 1/4 VGA, 16 shades of gray</li> <li>• Color STN, 320x240 1/4 VGA, 256 colors</li> </ul>   |
| BIOS                      | AMI 128KB Flash memory   |
| Storage                   | 8, 10, 20, 40MB solid state flash drive (field expandable and replaceable). Actual storage volumes may be higher.  |
| I/O ports                 | <ul style="list-style-type: none"> <li>• 1 9-pin RS232 (16C550 compatible)</li> <li>• 1 9-pin RS232/422/485 (16C550 compatible)</li> <li>• 1 25-pin IBM parallel</li> <li>• 1 PS/2 keyboard/mouse</li> <li>• 1 RJ45 Ethernet (Novell NE-2000 compatible, on-board 10Base-T interface)</li> </ul> |
| PC/104 Bus extension      | Supports 8-bit, PC/104 subset; 16-bit mode only; +5V, +12V only  |
| PC/104 Adapter dimensions | 4.1" (104mm) x 4.4" (112mm) x 1.25" (32mm)   |
| Dimensions H x W x D      | 7.80" (198mm) x 5.60" (142mm) x 3.20" (81mm)   |
| Weight                    | 2.54 lbs. (1.15Kg)   |



**Important** For the Color STN display, you must set the Display Color to Color on the Run Mode Display tab in the Interact Settings dialog box.

For the Monochrome display, you must set the Display Color to Gray on the Run Mode Display tab in the Interact Settings dialog box.

## Environmental Specifications

The P1 PowerStation conforms to the environmental specifications listed in the table below.

| Category               | Specifications  |
|------------------------|---|
| Operating temperature  | 32 to 113°F (0 to 45°C) ambient (air temp. at case)   |
| Storage temperature    | -4 to 140°F (-20 to 60°C)   |
| Relative humidity      | 0% to 95% non-condensing  |
| Shock rating           | <ul style="list-style-type: none"> <li>• 10g peak; 11ms (operating)</li> <li>• 30g peak; 30ms (non-operating)</li> </ul>    |
| Operating vibration    | <ul style="list-style-type: none"> <li>• 10 to 18 Hz: 1.5mm</li> <li>• 18 to 500 Hz: 1.0g</li> </ul>                        |
| Faceplate designed for | NEMA 4/4X Environment<br><b>Note:</b> The PowerStation is only rated NEMA 4 if it is installed in a NEMA 4-rated enclosure. |

**Important** 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 PowerStation is operating inside an enclosure at temperature levels above its rated ambient temperature, you must cool the enclosure.

**Electrical Specifications**

The PowerStation's electrical specifications appear in the table below.

| Category       | Specifications    |
|----------------|-------------------|
| Output rating  | 25W               |
| Input voltage  | 18-30VDC          |
| Output voltage | +5V@4A, +12V@0.5A |

**Important** The 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 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.

**Testing Specifications**

The PowerStation conforms to the testing specifications listed below.

| Test                           | Specification      |
|--------------------------------|--------------------|
| Showering arc                  | NEMA showering arc |
| Surge withstanding capacitance | IEEE 472-1974      |
| ESD requirements               | IEC 801-2          |
| Operating temperature          | IEC 68-2-1         |
| Electrical fast transient      | IEC 801-4          |
| Operating vibration            | IEC 68-2-6         |
| Mechanical shock               | IEC 68-2-27        |
| Random vibration               | MIL-STD-8100       |

**Faceplate Chemical Resistance**

The touchscreen of the PowerStation can resist the chemicals listed in the table below with no visible effect.

| <b>Touchscreen Chemical Resistance</b> |                       |                     |
|--|-----------------------|---------------------|
| 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                |                     |

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

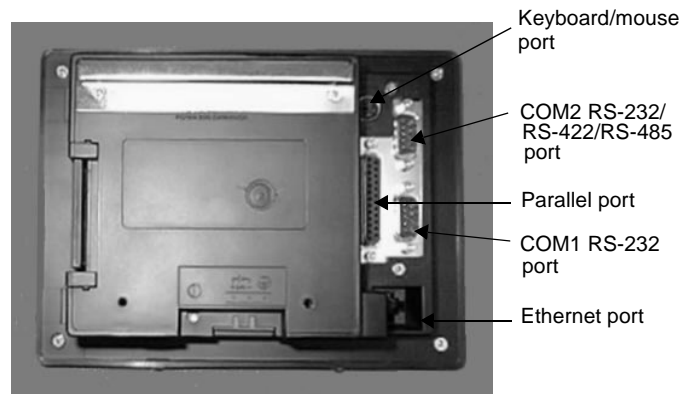
- Commercial glass cleaners
- Ammonia (10% dilute solution)
- Motor oil
- Hydraulic fluid
- Diesel fuel
- Gasoline (leaded, unleaded)
- Silicone based lubricant

- Alcohol (ethyl, methyl)
- Automatic transmission fluid

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

## Available Connectors

The P1 PowerStation includes many of the same ports found on most PCs. All P1 PowerStations have two serial ports, a parallel port, a PS/2 keyboard/mouse port, an Ethernet port, and a Compact Flash connector. The following illustration shows most of the available connectors on a P1.



## Serial Ports

The 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-232C, while COM2 supports RS-232C, 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-C 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-C. These standards increase the maximum cable length to 4,000 feet (1,200 meters).

RS-422 communications are full-duplex (can send and receive simultaneously), while RS-485 communications are half-duplex (can only send or receive at one time).

For either configuration, be careful not to connect any wires to unused connector pins. If you are using CTC Parker's MachineShop software, information on the specific connection required for the Interact or Machine-Logic drivers you will use is located in the Help file associated with the driver.

### COM1 pinouts

If you need to make a cable for communicating with COM1, the following table 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                       |

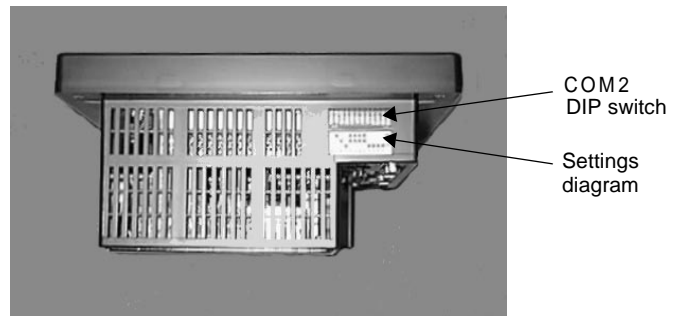
### COM2 pinouts

If you need to make a cable for communicating with COM2, the following table shows the pinouts and signal information for this port. COM2 is set to the RS-485 protocol by default. To change COM2 to the RS-232-C or RS-422 protocol, you must change the COM2 DIP switch settings.

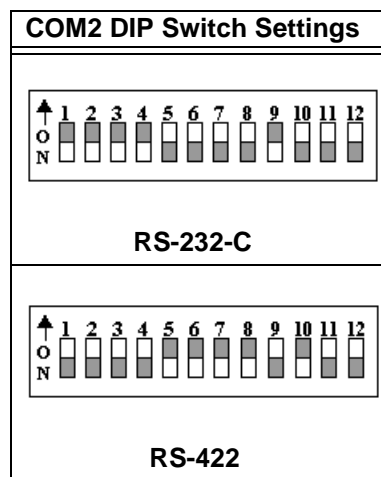
| Pin# | RS-232-C Signal          | RS-422 Signal            | RS-485 Signal            |
|------|--------------------------|--------------------------|--------------------------|
| 1    | DCD, data carrier detect | TXD-, transmitted data - | TXD-, transmitted data - |
| 2    | RXD, received data       | 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                       |

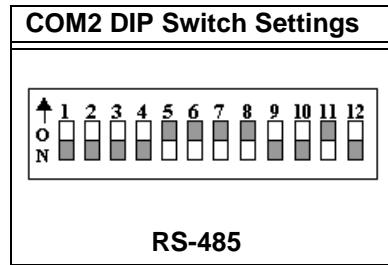
### COM2 DIP switch settings

If you need to make a cable for communicating with COM2, you also need to set the DIP switch settings for this port. The DIP switch for COM 2 is located on the top of the PowerStation Unit, as shown below.



The following diagram shows the settings for this port. A similar diagram is located on the PowerStation itself next to the DIP switch. COM2 is set to the RS-485 protocol by default. To change COM2 to the RS-232-C or RS-422 protocol, you must change the COM2 DIP switch settings.





**Cable diagrams**

The following illustrations represent the pinouts and cable diagrams required for communicating with COM1 or COM2 using the RS-232-C protocol. Also shown are cable diagrams for communicating with COM2 using the RS-422 or RS-485 protocol.

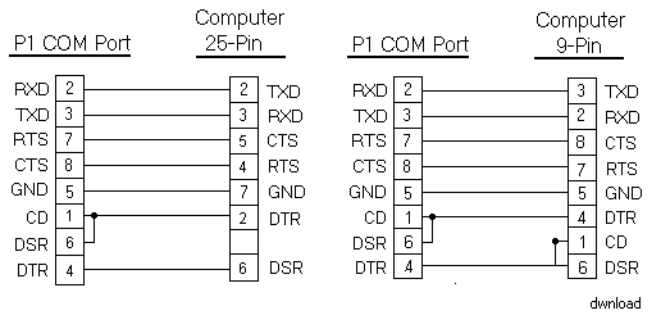
| RS-232-C   | RS-422  | RS-485  |
|--|---|---|
| <p>COM1/COM2</p> <p style="text-align: right;">232</p> | <p>COM2</p> <p style="text-align: right;">422</p> | <p>COM2</p> <p style="text-align: right;">485</p> |

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



## Connecting to a PC

To transfer files from a PC to the PowerStation, connect a serial cable with a null modem to an available serial port on the PC. Connect the other end of the cable to the serial port on the PowerStation. If you need to construct your own cables, refer to the illustrations below.



## Connecting a serial mouse

If you need to connect a serial mouse to the PowerStation, you must follow the procedures defined in this section. However, CTC does not recommend using a serial mouse for the following reasons:

- A serial mouse will occupy one of your serial ports that could be used for downloading or data logging.
- You cannot use a serial mouse and the touchscreen simultaneously. The PowerStation will only load the driver for the device that is listed first in the AUTOEXEC.BAT file.
- The serial port that you use must be configured for RS-232-C communications. If you use COM2, you may need to reconfigure this port to use the RS-232-C protocol.

**Important** Do not use a serial mouse with a serial-to-PS/2 port adapter.

**If you still find it necessary to use a serial mouse, follow these steps to configure the PowerStation to accept a serial mouse:**

1. On the MachineShop Shell menu, press Exit to enter MS-DOS mode.
2. Run MS-DOS Edit to edit the PowerStation's AUTOEXEC.BAT file.
3. Add the following line to AUTOEXEC.BAT before the lines that load the touchscreen driver:

```
C:\MOUSE.COM /Cx
```

**Important** You must specify the location on the PowerStation where you copied MOUSE.COM. You must also specify the serial port number because MOUSE.COM will always find the PS/2-connected touchscreen controller before the serial-connected mouse, causing both devices to work improperly.

4. Save the AUTOEXEC.BAT file.
5. Exit MS-DOS Edit and MachineShop.
6. Restart the PowerStation. When the MachineShop Shell Main Menu appears, press Settings.
7. Press Download Enable.
8. Disable downloading to the port that you are using for the serial mouse.
9. Connect the serial mouse to the port that you configured.
10. Restart the PowerStation.

### Connecting to a serial printer

To connect a serial printer to the PowerStation, you must change the mode settings for one of the serial ports to match those of your printer. The easiest way to change these settings is to use MODE.COM. MODE.COM can modify the following options:

**baud:** 110, 150, 300, 600, 1200, 2400, 4800, 9600

**parity:** N - none, O - odd, E - even

**databits:** either 7 or 8

**stopbits:** either 1 or 2

CTC Parker includes MODE.COM on the PowerStation's Compact Flash card. You will make a back-up copy of the file when you create the Powerstation Start Disk from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create this disk.

#### To use MODE.COM, complete the following steps:

1. From the Windows desktop, open the Startup directory within Interact project:

```
C:\Machshop\Projects\Interact\*Project Name*\Startup\
```

2. Within the Startup folder, create a new AUTOEXEC.BAT file with the following line:

```
MODE COM#:baud,parity,databits,stopbits
```

3. Launch the MachineShop Toolbar, and download the project that contains AUTOEXEC.BAT and MODE.COM from your development system to the PowerStation.

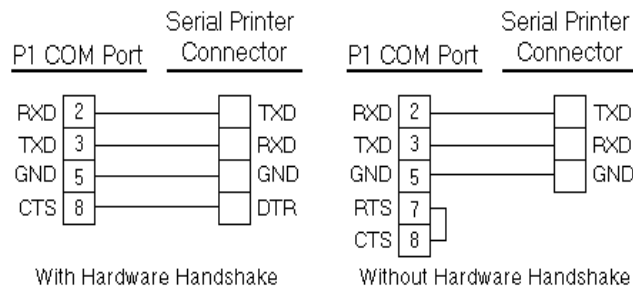
During the download, MachineShop transfers the AUTOEXEC.BAT file you created in step 3 and MODE.COM into the \STARTUP directory specified by the INTERACT\_STARTUP environment variable. This environment variable resides in the PowerStation's AUTOEXEC.BAT file.

When MachineShop finishes the download, you will be asked if you want to restart the PowerStation. When you restart, MODE.COM will configure the COM port to the required baud rate. For example, if you are communicating at 9600, NONE, 8, and 1, use:

```
MODE COM1 : 9600 , N , 8 , 1
```

**Note** To print to a port that is configured for downloading, you must disable downloading for that port and restart the PowerStation. Restarting the PowerStation allows MODE.COM to reset the communication settings for that port. Use the Download Enable command on the Settings menu of the MachineShop Shell to disable downloading.

- Use the following diagram as a reference when connecting a serial printer to the PowerStation.



**Parallel Port**

The PowerStation parallel port (LPT1) pinout is identical to the standard IBM parallel printer port. The LPT1 connector pinout is shown below.

| Pin # | Signal Name |
|-------|-------------|
| 1     | STROBE      |
| 2     | DATA 0      |
| 3     | DATA 1      |
| 4     | DATA 2      |
| 5     | DATA 3      |
| 6     | DATA 4      |

| Pin # | Signal Name    |
|-------|----------------|
| 7     | DATA 5         |
| 8     | DATA 6         |
| 9     | DATA 7         |
| 10    | - ACKNOWLEDGE  |
| 11    | BUSY           |
| 12    | PAPER EMPTY    |
| 13    | + SELECT       |
| 14    | - AUTO FEED    |
| 15    | - ERROR        |
| 16    | - INIT PRINTER |
| 17    | - SELECT INPUT |
| 18-25 | GROUND         |

### Connecting to a parallel printer

The PowerStation can interface with any parallel printer designed for use with IBM PC-compatible computers. Connect a printer to the port marked LPT using a standard IBM PC parallel cable.

### Keyboard/Mouse Port

The 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. Connect the keyboard to the PowerStation using the supplied keyboard adapter cable.

**Note** PC/XT keyboards will not function with the P1 PowerStation.

### Connecting a PS/2 mouse

If you prefer to use a mouse instead of the touchscreen, CTC Parker recommends that you only use a Microsoft PS/2-style mouse with the supplied keyboard adapter cable. This adapter cable allows you to connect a PS/2 mouse and a keyboard to the PowerStation simultaneously.

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

### Ethernet Port

The PowerStation has an Ethernet RJ-45 port that allows you to connect the PowerStation to a Local Area Network. This port is software compatible with the NE-2000 protocol and supports all major network operating systems. Consult the manual that came with your network software for setup options.

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

### Compact Flash

The PowerStation comes with a Compact Flash (CF) card that is like a removable hard drive. It provides non-volatile memory storage. A CF card is often used as a supplement to, or a replacement for, a hard drive because the CF is well-suited for environments in which the PowerStation may be vibrated or shaken. The CF card is recognized as drive C. Although the CF is removable, it cannot be removed while the PowerStation is running because it is used as an IDE drive.

CTC Parker 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 Parker.

## Drive Definitions and Memory Map

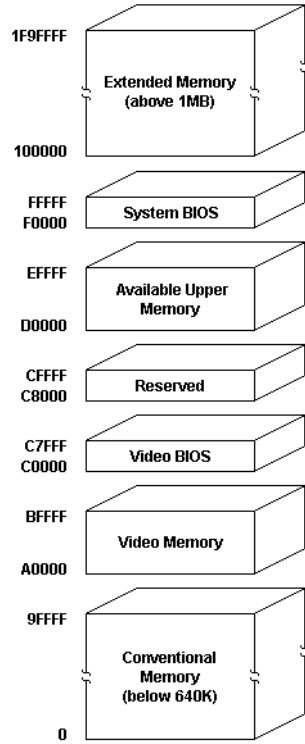
The table below provides information about the P1 PowerStation's drive definitions. Following the table is an illustration of the PowerStation's memory map.

| Drive Letter | Type                                 | Size                 | Use  |
|--------------|--------------------------------------|----------------------|--|
| C            | Compact Flash (CF) Card (Read/Write) | 8, 10, 20, and 40MB* | System start drive and Project disk. Stores the project, system files, Machine-Shop, and applications. Download files to this drive. |

\* Actual storage volumes may be higher.

**P1 PowerStation  
Memory Map**

The figure below illustrates how the P1 PowerStation allocates conventional memory and extended memory. The range of address references is listed next to each device.





**Memory Guidelines**

If you are using MachineShop to develop your HMI applications, refer to the memory guidelines listed below when you develop projects. The following table lists guidelines concerning the capacity and use of memory for runtime and development systems.

| Memory Type   | Capacity and Use   |
|---------------|--|
| System DRAM   | 4MB standard; upgradable to 16. 4MB will run APM, PTM runtime modules and two drivers.   |
| Compact Flash | 8MB flash memory can store APM, PTM, AMM, plus four additional runtime modules, two drivers, and approximately thirty screens. Extra modules require more storage (four modules/MB). Up to 1MB is needed to store MachineLogic applications. |

**PC/104 Adapter**

The PowerStation comes equipped with a PC/104 adapter, which allows you to connect PC/104 I/O cards to the back of the unit for communicating with the ISA bus. See *Installing a PC/104 Card* on page 68 of this manual for complete instructions on how to install one of these cards on your PowerStation.

## Replacement Components

The P1 PowerStation is designed to be a simple yet reliable unit to maintain. However, if you need to purchase replacement components for the PowerStation, CTC Parker carries a complete line of replacement components.

### Compact Flash Card

If you need additional storage capacity for the P1 PowerStation, you can purchase additional Compact Flash cards from CTC Parker. CTC Parker 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 of this manual for instructions on how to replace and reformat CF cards.

### DRAM

If you need to upgrade or replace the P1 PowerStation's DRAM, CTC Parker carries replacement DRAM (SIMM) modules. The P1 PowerStation comes with a 4MB 72-pin SIMM, but you can replace that module with either an 8MB or 16MB, 72-pin SIMM for greater capacity. See *Replacing DRAM* on page 64 of this manual for instructions on how to perform this procedure. If you have mounted the PowerStation in an enclosure, you will need to remove the unit before you can add or replace DRAM.

### Touchscreen

Occasionally, you will need to replace the PowerStation's touchscreen, depending upon the environment in which you are operating the P1. CTC Parker carries replacement touchscreens that you can easily install without removing the unit from its enclosure. See *Replacing the Touchscreen* on page 65 of this manual for complete instructions.

### Backlight Bulb

The PowerStation's backlight bulb has an average life expectancy of 10,000 hours. CTC Parker carries replacement bulbs that you can easily install without removing the unit from its enclosure. See *Replacing the Backlight Bulb* on page 66 of this manual for complete instructions.

## Optional Components

CTC Parker carries two optional components that you may wish to purchase for the PowerStation: an AC Power Supply and PC/104 cards.

### AC Power Supply

The P1 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 also can purchase mounting brackets for the Power Supply. See *Preparing to Use an AC Power Supply* on page 35 of this manual for instructions on how to mount the AC Power Supply.

### PC/104 Cards

The P1 PowerStation has been outfitted with a PC/104 adapter for communicating with 8-bit and 16-bit PC/104 cards. These cards are available from CTC Parker, as well as from other companies. See *Installing a PC/104 Card* on page 68 of this manual for instructions on how to install one of these cards on your PowerStation.



# Installing the PowerStation

You are now ready to install the P1 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.

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## Selecting a Location

The first step in 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 some guidelines that you should follow when selecting a location for the PowerStation.

### Class I, Division 2 Guidelines

If you purchased a Class I, Division 2-compliant PowerStation, you must always follow these guidelines to maintain a safe operating environment:

1. Suitable for use in Class I, Division 2, Groups A, B, C, and D hazardous locations only.
2. **Warning: Explosion Hazard**—Do not disconnect equipment, or replace or insert cards unless power has been switched off, or the area is known to be non-hazardous.
3. **Warning: Explosion Hazard**—Substitution of components may impair suitability for Class 1, Division 2.
4. Make sure that the PowerStation's power cord is always secured to the unit using the supplied L-bracket.
5. When performing field wiring, always use copper wire with 60C or 60/75C insulation and a tightening torque of 7.0 lb/in. (0.79 N-m).

### Environmental Guidelines

The environment is the area where the 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 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 PowerStation's touchscreen is resistant to a variety of chemicals. See *Faceplate Chemical Resistance* on page 13 of this manual for a list of these chemicals. Make sure that the touchscreen is exposed only to the chemicals on this list.

**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.

**Important** 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.

See *Electrical Specifications* on page 12 of this manual for a list of the PowerStation's electrical specifications. Make sure that your power source is completely 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 Guidelines**

You can safely operate the PowerStation within the temperature range specified in the *Environmental Specifications* section on page 11 of this manual. However, if you are using a protective enclosure, remember that the temperature within an enclosure is generally higher than the external temperature. If the PowerStation is operating inside an enclosure at temperature levels above its rated ambient temperature, you must cool the enclosure.

**Enclosure Guidelines**

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

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

**Backlight and  
Touchscreen  
Accessibility  
Guidelines**

Occasionally, you may need to replace the PowerStation's backlight bulb or touchscreen. The PowerStation is designed to allow you to replace both of these parts while the unit is mounted. However, to do so, you will have to mount the unit so that the area surrounding the PowerStation's faceplate is completely unobstructed.

See *Replacing the Backlight Bulb* on page 66 of this manual for instructions on how to replace the backlight bulb and *Replacing the Touchscreen* on page 65 of this manual for instructions on how to replace the touchscreen. You can use these instructions as an aid in deciding how to design the PowerStation's enclosure so that you can easily perform both procedures.

**AC Power  
Guidelines**

You will need to read this section only if you intend to operate the PowerStation using AC power. If you intend to operate the PowerStation using DC power, proceed to *Preparing for Installation* on page 35 of this manual.

The P1 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 have purchased the optional AC Power Supply, you must select a location for it that provides protection from dust, oil, moisture, and corrosive vapors. If you have a large enough enclosure, you can mount the Power Supply in the enclosure with the unit.



## Preparing for Installation

Once you have selected a location for the PowerStation, you can begin preparing it to accept the unit. Before installing the PowerStation, you will need to create a cutout for the unit and clean the area of any dirt or debris that might come in contact with the unit. Also, if you plan to operate the unit using AC power, and you have purchased CTC's optional AC Power Supply, you may want to prepare a location for the Power Supply. Procedures for creating the cutout and preparing to use an AC Power Supply are described below.

### Creating the Cutout

The PowerStation comes with a template that is designed to simplify the task of creating a cutout for the unit. Be sure to follow the drill hole and cutout dimensions on the template precisely so that the PowerStation will properly seal in its enclosure.

**To create a cutout for the PowerStation, complete the following steps:**

1. Attach the template securely to the mounting surface.
2. Cut out the shaded area on the template referred to as the "Panel Cutout Area." To maintain the flatness of the mounting surface, CTC recommends that you **cut** out the Cutout Area rather than punch it out.
3. Drill the appropriate number of 0.23-inch diameter mounting holes as seen on the template. Once again, be careful to protect the flatness of the surface.
4. Debur the edges of the cutout area and the drill holes.
5. Ensure that the mounting surface has remained flat and that the panel surface is clean and free of foreign materials.
6. See *P1 PowerStation Dimensional Drawings* on page 83 of this manual for the depth and port dimensions of your PowerStation. Use these dimensions to customize the mounting of your unit.

### Preparing to Use an AC Power Supply

You will need to read this section only if you intend to operate the PowerStation using AC power. If you plan to use DC power, proceed to *Installing the PowerStation* on page 37 of this manual.

If you plan to operate the PowerStation with AC power, and you have purchased CTC's optional AC Power Supply and the AC Power Supply Mounting Kit, you will receive with the Mounting Kit a template that you can use to prepare a location for the Power Supply. That location can be inside or outside the enclosure where the PowerStation is installed.

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

**To prepare the Power Supply mounting surface, complete the following steps:**

1. Securely attach the template to the mounting surface.
2. Drill and debur four 0.17" (4.3mm) holes.

## Installing the PowerStation

Once you have prepared the location for the 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 PowerStation

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

#### 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.
2. Connect the ground cable from the power connector to an earth ground.
3. Slide the gasket around the outside of the PowerStation case, positioning it flush against the back of the faceplate.
4. Gently insert the PowerStation into the cutout.
5. Prepare the mounting hardware that was supplied with the unit. Begin by threading each of the supplied metal clips with a screw. Snap each of the clips onto the outside of the unit.
6. Attach the power connector that you prepared in steps 1 and 2 to the back of the unit.
7. Tighten each of the mounting screws.

**Important** The unit must fit flush against the enclosure. Tighten the nuts in a crosswise sequence to ensure a good seal and to prevent damage to the unit.

### Mounting the AC Power Supply

You will need to read this section only if you intend to operate the PowerStation using AC power. If you intend to operate the PowerStation using DC power, you can proceed to *Starting Up the PowerStation* on page 39 of this manual.

The AC Power Supply is designed to be mounted using two metal brackets found in the AC Power Supply Mounting Kit. These brackets are secured to the mounting surface using four screws.

**To mount the Power Supply, 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.
2. Connect the ground cable from the power connector to an earth ground.
3. Attach the Power Supply to the mounting surface, using the supplied metal brackets.
4. Connect the power cord from the Power Supply to an AC power source.
5. Secure the power cable to the Power Supply using the supplied L-shaped metal bracket and nut.
6. Attach the power connector that you prepared in steps 1 and 2 to the back of the PowerStation.

## Starting Up the PowerStation



Once the 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 *Electrical Specifications* and *Testing Specifications* on page 12 of this manual. Also, be sure to 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 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. Make sure that the PowerStation is turned off.
2. Connect the power cord to your voltage source. Voltage input to the unit should be within the range specified in *Electrical Specifications* on page 12 of this manual.

**Note** If you are using an AC Power Supply, you must first connect the Power Supply to the power connector on the back of the PowerStation.

3. Connect the power cord plug to the PowerStation.
4. Turn the PowerStation on.

The fan should come on, followed immediately by the display. The PowerStation will automatically load the MachineShop Shell.

You are now ready to download a project to the PowerStation. If you are using MachineShop software, refer to the *MachineShop Getting Started Guide* for information about how to download projects to the PowerStation.



# Maintaining and Troubleshooting the PowerStation

The P1 PowerStation has been designed to provide years of trouble-free operation even in the harshest environments. However, occasionally, you may need to perform routine maintenance on some of the PowerStation's components.

This chapter provides instructions on PowerStation maintenance, as well as steps for troubleshooting problems that may occur in operation.

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## Cleaning the TouchScreen

Occasionally, you may wish to clean the PowerStation's touchscreen. Clean the touchscreen using warm, soapy water and a cloth. You may also use any non-abrasive cleaner. See *Faceplate Chemical Resistance* on page 13 of this manual 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** Do **not** clean the touchscreen while Interact is in Run mode. Clean the unit while power is removed to keep from inadvertently activating an Interact device (button, slide, etc.).

## Using the Compact Flash Card

The P1 PowerStation uses a removable Compact Flash (CF) card for storage purposes. You can remove the CF card, update the application files on it from a PC, and then reinstall the CF card in the PowerStation.

CTC Parker 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 Parker.

The remainder of this section explains how to remove and replace the CF card and how to reformat the Compact Flash.



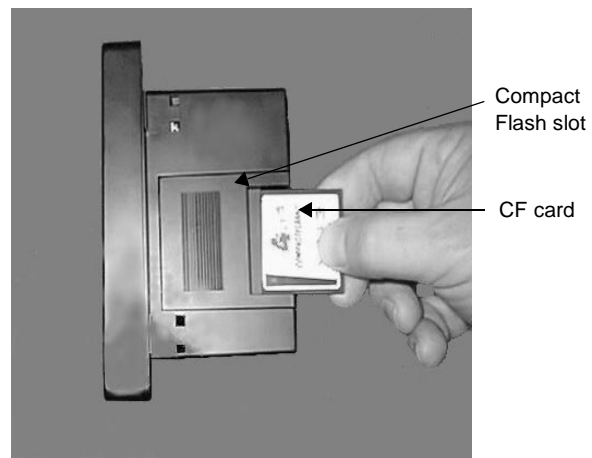
### Removing and Replacing the Compact Flash

To remove and replace the Compact Flash card, complete the following steps:

1. Turn off the PowerStation.

**Important** Make sure that the PowerStation is turned off when inserting or removing the CF card.

2. Face the back left-hand side of the unit, and grasp the CF card.
3. Remove the CF card by sliding it out of its slot toward you, as shown below.



4. When you are ready, reinstall the CF card by carefully inserting the card into the slot and pushing it into the slot until the card is securely seated.

### Reformatting the Compact Flash

This section explains the procedure to create a bootable Compact Flash card for the PowerStation from a “blank” CF card. This procedure may be necessary to replace deleted or corrupted critical files on the card or to prepare a new card for use.

**Note** This procedure will work correctly under only MS-DOS 6.22, Windows 95, or Windows 98. Do not run this utility under Windows NT.

The procedure requires the following items:

- PC with a Type II PCMCIA slot and 3.5" floppy drive, or a CF card reader. The PC should be running MS-DOS 6.22, Windows 95, or Windows 98.
- CF-to-PCMCIA adapter (for use with PCMCIA slot only)
- MS-DOS 6.22 and Utilities Installation Disk (KA-72953)
- Powerstation Start Disk
- MachineShop Shell Installation Disk

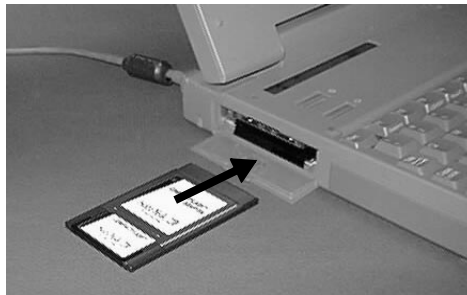
**Note** The PowerStation Start Disk and MachineShop Shell Installation Disk make up the Runtime Workstation Disk Set, which you can create from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create these disks.

**To reformat the CF, complete the following steps:**

1. Turn off the PowerStation.

**Important** Make sure that the PowerStation is turned off when inserting or removing the CF card.

2. Remove the CF card from the PowerStation's flash card slot, as described in the preceding section.
3. Insert the CF card into the PC's PCMCIA slot, using the CF-to-PCMCIA adapter as shown below, or into a CF card reader.



The computer should recognize and configure the card as an ATA card, assigning it an additional drive letter (e.g., D)

**Note** In this example, drive D represents the PCMCIA card or card reader; however, your system may assign a different drive letter to either of these devices.

4. Enter MS-DOS mode.
5. At the DOS prompt, type `FORMAT D:`
6. Press Enter to execute this command.
7. Insert the MS-DOS 6.22 and Utilities Disk into the PC's floppy drive.

**Important** If you are performing the install procedure in a DOS window under Windows 95 or 98, you must execute the command `LOCK D:` before entering the `INSTALL` command shown below. After MS-DOS installation is complete, execute the `UNLOCK D:` command.

8. At the DOS prompt, type `A: Install A: D:`
9. Press Enter to execute this command.

This will install the MS-DOS 6.22 system files, utilities, and necessary drivers onto drive D (or the drive assigned to the CF card).

**Note** You will have two choices when installing DOS: a small installation or a large one. A small installation will install approximately 5 files in the DOS directory. A large installation will install approximately 1MB of files in the DOS directory.

10. Eject the MS-DOS 6.22 Disk from the PowerStation's floppy drive, and insert the PowerStation Start Disk.
11. Insert the Powerstation Start Disk into the PC's floppy drive.
12. At the DOS prompt, type `A: INSTALL A: D:`

13. Press Enter to execute this command.

You will be asked whether you wish to install the standard CTC AUTOEXEC.BAT and CONFIG.SYS files as part of the installation. CTC recommends that you type Y for Yes.

If you answer Yes, the existing AUTOEXEC.BAT and CONFIG.SYS files will be renamed as AUTOEXEC.OLD and CONFIG.OLD. If you answer No, the factory-default files will be copied as AUTOEXEC.CTC and CONFIG.CTC in the root directory of drive D, and you will need to manually update your existing AUTOEXEC.BAT and CONFIG.SYS files later.

14. After the AUTOEXEC.BAT and CONFIG.SYS files have been copied onto your system, press any key to continue. You will be asked if this installation is for a model P1 PowerStation. Type Y for Yes.

The PowerStation Start installation is complete.

15. Eject the Powerstation Start Disk from the PC's floppy drive, and insert the Machineshop Shell Installation Disk.

16. At the DOS prompt, type `A: INSTALL A: D:`

You will be asked if you would like to continue with the installation.

17. Type Y for Yes in order to continue.

The MachineShop Shell installation is complete.

18. Eject the CF-to-PCMCIA adapter, and remove the CF card from the adapter, or remove the CF card from the card reader.

The CF card is now ready to use in the PowerStation.

**Important** Always make sure that the PowerStation is turned off when inserting or removing the CF card.

19. Insert the CF card into the PowerStation's flash card slot.

20. Start up the PowerStation.

The PowerStation will automatically load the MachineShop Shell.

21. Recalibrate the touchscreen. See *Recalibrating the Touchscreen* on page 54 of this manual for complete instructions.

## Reinstalling the PowerStation Utilities

The PowerStation utilities come pre-installed on your PowerStation's Compact Flash card. If you need to reinstall these utilities, you can do so using the Powerstation Start Disk.

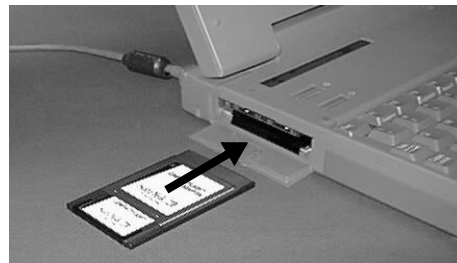
**Note** The PowerStation Start Disk is part of the Runtime Workstation Disk Set, which you can create from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create this disk.

**To reinstall the PowerStation utilities, complete the following steps:**

1. Turn off the PowerStation.

**Important** Make sure that the PowerStation is turned off when inserting or removing the CF card.

2. Remove the CF card from the PowerStation's flash as described in *Removing and Replacing the Compact Flash* on page 43.
3. Insert the CF card into the PC's PCMCIA slot, using the CF-to-PCMCIA adapter as shown below, or into a CF card reader.



The computer should recognize and configure the card as an ATA card, assigning it an additional drive letter (e.g., D)

**Note** In this example, drive D represents the PCMCIA card or card reader; however, your system may assign a different drive letter to either of these devices.

4. Enter MS-DOS mode.
5. Insert the Powerstation Start Disk into the PC's floppy drive.

**Important** If you are performing the install procedure in a DOS window under Windows 95 or 98, you must execute the command `LOCK D:` before entering the `INSTALL` command shown below. After MS-DOS installation is complete, execute the `UNLOCK D:` command.

6. At the DOS prompt, type `A: INSTALL A: D:`
7. Press Enter to execute this command.

This will install the MS-DOS 6.22 system files and utilities and necessary drivers onto the CF card. You will be asked whether you wish to install the standard CTC `AUTOEXEC.BAT` and `CONFIG.SYS` files as part of the installation. CTC recommends that you type `Y` for Yes.

If you answer Yes, the existing `AUTOEXEC.BAT` and `CONFIG.SYS` files will be renamed as `AUTOEXEC.OLD` and `CONFIG.OLD`. If you answer No, the factory-default files will be copied as `AUTOEXEC.CTC` and `CONFIG.CTC` in the root directory of drive D, and you will need to manually update your existing `AUTOEXEC.BAT` and `CONFIG.SYS` files later.

8. After the AUTOEXEC.BAT and CONFIG.SYS files have been copied onto your system, press any key to continue. You will be asked if this installation is for a model P1 PowerStation. Type Y for Yes.

The PowerStation Start installation is complete.

9. Eject the CF-to-PCMCIA adapter, and remove the CF card from the adapter, or remove the CF card from the card reader.

The CF card is now ready to use in the PowerStation.

**Important** Always make sure that the PowerStation is turned off when inserting or removing the CF card.

10. Insert the CF card into the PowerStation's flash card slot.
11. Start up the PowerStation.

## Reinstalling the Shell Software

The MachineShop Shell comes pre-installed on your PowerStation's Compact Flash card. If you need to reinstall the Shell, you can do so by using the MachineShop Shell Installation Disk.

**Note** The MachineShop Shell Installation Disk is part of the Runtime Workstation Disk Set, which you can create from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create this disk.

**To install the Shell software, complete the following steps:**

1. Turn off the PowerStation.

**Important** Make sure that the PowerStation is turned off when inserting or removing the CF card.

2. Remove the CF card from the PowerStation's flash card slot, as described in *Removing and Replacing the Compact Flash* on page 43.
3. Insert the CF card into the PC's PCMCIA slot, using the CF-to-PCMCIA adapter as shown below, or into a CF card reader.



The computer should recognize and configure the card as an ATA card, assigning it an additional drive letter (e.g., D)

**Note** In this example, drive D represents the PCMCIA card or card reader. Your system may assign a different drive letter to either of these devices.



4. Enter MS-DOS mode.
  5. Insert the Machinshop Shell Installation Disk.
  6. At the DOS prompt, type `INSTALL A:\ D:\`  
You will be asked if you would like to continue with the installation.
  7. Type `Y` for Yes in order to continue.  
The MachineShop Shell installation is complete.
  8. Eject the CF-to-PCMCIA adapter, and remove the CF card from the adapter, or remove the CF card from the card reader.  
The CF card is now ready to use in the PowerStation.
- Important** Always make sure that the PowerStation is turned off when inserting or removing the CF card.
9. Insert the CF card into the PowerStation's flash card slot.
  10. Start up the PowerStation.  
The PowerStation will automatically load the MachineShop Shell.

## Modifying the AUTOEXEC.BAT File

The lines shown in the following table must appear in the PowerStation's AUTOEXEC.BAT file for the unit to operate properly. The AUTOEXEC.BAT file that CTC Parker supplies includes these lines and is located in the \CTC directory on the PowerStation's Flash card in a file called AUTOEXEC.CTC.

Please make sure that the AUTOEXEC.BAT file on your PowerStation's CF card includes the command lines shown in the left-hand column of the table below.

| Command line parameters   | Description   |
|---|---|
| PATH C: \; C: \DOS; C: \CTC   | Sets up the default DOS path.   |
| C: \TOUCH\NIDTOUCH -S<br>IF ERRORLEVEL 3 GOTO ITSAP1<br>LH C: \CTC\BIOSTSR  | Loads special functions if the unit is not a P1.                              |
| CD \CTC<br>IF EXIST C: \CTC\MOUSE.INI DEL<br>C: \MOUSE.INI  | Required for the MachineShop Shell to detect a mouse in some situations.      |
| LH C: \CTC\MOUSE<br><br>:ITSAP1   | If a mouse is connected, installs the mouse and creates a new MOUSE.INI file. |
| C: \CTC\ISVESA<br>IF NOT ERRORLEVEL 1 GOTO<br>YESVESA<br>LH C: \CTC\VESA<br>:YESVESA  | Loads VESA TSR video support, if necessary.                                   |
| IF NOT EXIST C: \MACHLOG<br>\NUL.EXT MD C: \MACHLOG<br>CD \MACHLOG<br>IF NOT EXIST C: \CTC\MLCA.EXE<br>GOTO NOMLCA<br>CD \CTC<br>LH C: \CTC\MLCA<br><br>:NOMLCA | Loads the MachineLogic Control Adapter driver if it is present.               |
| SET TOUCH_PATH=C: \TOUCH<br>CALL %TOUCH_PATH% \TCH<br>INIT.BAT  | Initializes the touch-screen drivers.   |
| *SET INTERACT=C: \INTERACT  | Sets the Interact path.   |
| *SET INTERACT_FILES=C:<br>\INTERACT\APPFILS   | Sets the application path for Interact.                                       |
| *SET INTERACT_STARTUP=<br>C: \STARTUP   | Sets up Interact start-up variables.  |

| Command line parameters  | Description  |
|--|--|
| **SET MACHINELOGIC=C:<br>MACHLOG   | Sets up MachineLogic environment variables.  |
| CD \NET<br>LH C: \NET\TCPIP  | Loads network drivers --Novell and/or TCPIP stack.   |
| **IF NOT EXIST C: \MACHLOG<br>NUL.EXT MD C: \MACHLOG<br>CD \MACHLOG<br>IF NOT EXIST C: \MACHLOG<br>MACHLOG.EXE GO TO NOML<br>C: \CTC\MLDU<br>IF ERRORLEVEL 1 GOTO NOML<br>C: \MACHLOG\RTXDOS<br>C: \MACHLOG\MACHLOG<br><br>:NOML | Loads MachineLogic if present and set for startup operation. Determined by MLDU.EXE return value: 0 = enabled; 1 = disabled. |
| IF NOT EXIST C: \START-<br>UP\NUL.EXT MD C: \STARTUP<br>CD \STARTUP<br>IF EXIST C: \STARTUP\<br>AUTOEXEC.BAT CALL C:<br>\STARTUP\AUTOEXEC.BAT  | Calls the second AUTOEXECBAT file if the line is contained within a project file.  |
| CD \CTC<br>PSU   | Starts the Machine-Shop Shell.   |

\* Denotes a command line that is unnecessary on units without Interact.

\*\* Denotes a command line that is unnecessary on units without MachineLogic

See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 72 of this manual for more information about the command lines that should appear in the AUTOEXEC.BAT file.

## Recalibrating the Touchscreen

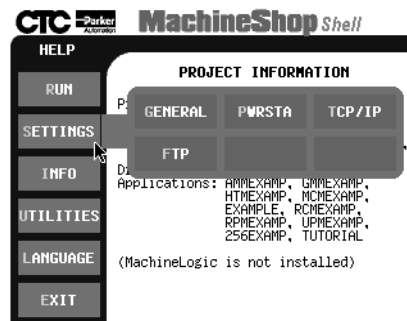
The PowerStation's touchscreen is calibrated before leaving CTC Parker. However, you may need to recalibrate the touchscreen when you begin using the PowerStation for the first time or whenever the cursor location and the location on the screen where the user touches do not match.

The MachineShop Shell comes with a calibration utility that you can use to calibrate the touchscreen in DOS mode. The calibration utility requires a keyboard and involves calibrating the touchscreen for text and for graphics.

**To calibrate the touchscreen, complete the following steps:**

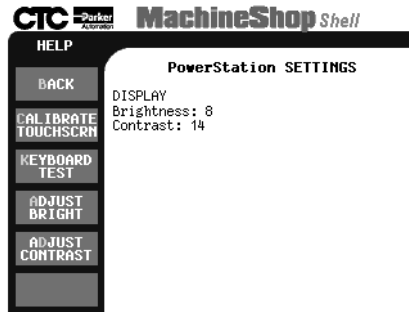
1. On the MachineShop Shell Main Menu, press the Settings button.

The Settings submenu will appear as shown below.



2. On the Settings submenu, press the PWRSTA button.

The PowerStation Settings menu will appear as shown at the top of the next page.



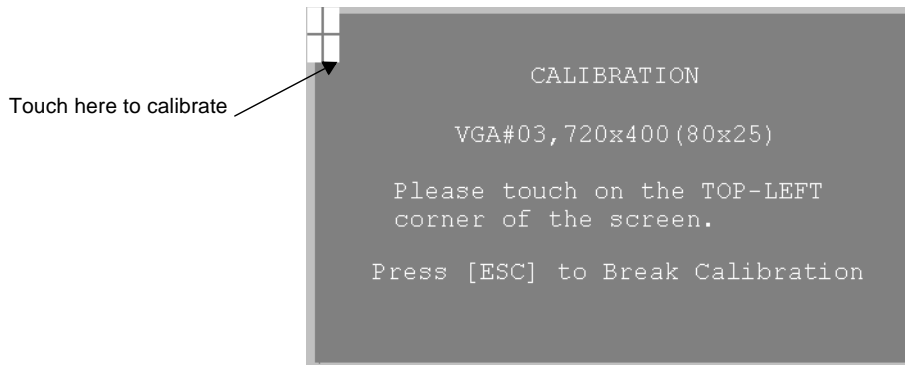
3. Press the Calibrate Touchscreen button.

You will be prompted that a keyboard is needed to calibrate the touchscreen. Then you will be asked if you want to continue.
4. If necessary, install a keyboard on the PowerStation. See *Keyboard/Mouse Port* on page 23 of this manual for information about connecting a keyboard to the PowerStation.
5. When you have connected a keyboard to the PowerStation, press the Yes button to continue the calibration.

The calibration main menu will appear.
6. Verify that the Button Mode is set to Drag drop mode. If it is not, use the up/down arrow keys to highlight the words 'Button Mode,' and use the left/right arrow keys to display the Drag drop mode option.
7. Use the up/down arrow keys to highlight the word "Calibration."
8. Use the left/right arrow keys to display the VGA#03,720x400(80x25) option, and press Enter.

The calibration screen will appear.
9. Use an object with a blunt tip to touch the intersection formed between the cursor and the center of the screen. Using your finger will not provide accurate results.

The PowerStation will beep when you touch the correct point. The graphic below demonstrates where to touch the screen.



10. Repeat step 9 for each corner of the screen.  
The calibration utility will automatically advance the cursor to each corner.
11. When you are finished, press the Esc key to return to the calibration main menu.
12. Use the left/right arrow keys to display the VGA#12,640x480(80x30) option, and press Enter.  
The calibration screen will appear.
13. Complete step 9 for each corner of the screen.  
The calibration utility will automatically advance the cursor to each corner.
14. When you are finished, press the Esc key to return to the calibration main menu.  
  
**Note** Steps 12-13 are for 256 color calibration to be used with color displays only. If you do not have a color display, please skip to step 15.
15. Use the left/right arrow keys to display the VGA#101,640x480,256c option and press Enter.  
The calibration screen will appear.

16. Complete step 9 for each corner of the screen.

The calibration utility will automatically advance the cursor to each corner.

17. When you are finished, press the Esc key to return to the calibration main menu.

18. Use the up/down arrow keys to highlight the words "Save & Exit."

19. Press the Enter key to save the calibration settings and return to the Shell MAIN MENU.

The calibration utility will save the calibration settings in a file called ATSMOUSE.INI.

## Configuring the Ethernet Interface

The \NET directory of the PowerStation's Compact Flash contains a configuration utility and all drivers necessary to configure the Ethernet interface on the PowerStation. Backup copies of these files are included on the MachineShop Shell Installation Disk. A list of the files appears below.

**Note** The MachineShop Shell Installation Disk is part of the Runtime Workstation Disk Set, which you can create from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create this disk.

| File Name   | Description   |
|-------------|---|
| AT5CFG.EXE  | A configuration utility you can use to change the interrupt and address of the Ethernet interface.  |
| NET.BAT     | A sample batch file you can use to run NetBIOS.   |
| NET.CFG     | Stores the interrupts and memory for the network drivers. The default PowerStation configuration reserves the following interrupts and I/O addresses. You cannot use these for the Ethernet interface. <ul style="list-style-type: none"> <li>• COM1: Int 4, I/O 3F8</li> <li>• COM2: Int 3, I/O 2F8</li> <li>• Touchscreen: Int 11, I/O 3E8</li> </ul> CTC Parker recommends that you use the following interrupt and I/O address setting for the Ethernet interface: Int 10, I/O 280. |
| NETX.EXE    | The Novell Netware shell program that makes the final connection with the server.   |
| *LSL.COM    | A Novell driver that enables the workstation to communicate with different protocols.   |
| *IPXODI.COM | A Novell driver that supports the IPX protocol and other protocols over the same network.   |
| *NE2000.COM | A Novell driver that supports the NE2000 protocol. It allows the PowerStation to communicate over a local area network.   |



| File Name    | Description  |
|--------------|--|
| *NETBIOS.EXE | Used by Interact to communicate over a network.          |
| RSET8019.EXE | Configures interrupts and I/O addresses for the network. |
| TCPIP.EXE    | Used by the PowerStation for TCP/IP communications.      |
| TCPIP.INI    | Stores settings for TCP/IP communications.               |

\* Denotes files that can be downloaded from Novell's FTP site.

Interact will also communicate over any network or operating system that supports NetBIOS protocols. Examples include Lantastic, TCP/IP, Microsoft, and IBM.

If you need assistance with NetBIOS and networking, consult your network administrator or a certified network technician.

## Performing Internal Maintenance

This section includes instructions for performing internal maintenance on the P1 PowerStation. To prevent injury to yourself or damage to the PowerStation, be sure to read and understand the procedures described in this section before performing them. This section will show you how to perform the following operations:

- Disassembling the PowerStation
- Replacing DRAM
- Replacing the touchscreen
- Replacing the backlight bulb
- Installing a PC/104 card
- Reassembling the PowerStation

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

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



### 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 PowerStation, be sure to follow these simple precautions to protect you and the PowerStation from harm resulting from ESD.

- To avoid electric shock, always disconnect power from the PowerStation before opening or disassembling the unit. Do not touch any components of the CPU card or other cards while the PowerStation is on.
- Disconnect power before making any hardware configuration changes. The sudden rush of power as you connect a jumper or install a card 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 connectors.
- Keep any card or DRAM module in its anti-static packaging when it is not installed in the PowerStation and place it on a static dissipative mat when you are working on it.

### Disassembling the PowerStation

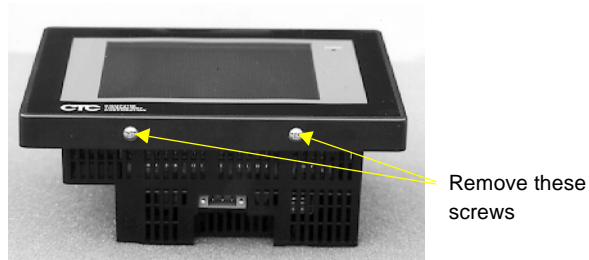
If you have read and understand the ESD safety precautions, you are ready to disassemble the PowerStation.

**Important** As you begin to disassemble the unit, you will encounter several different screw sizes. When you reassemble the PowerStation, be sure to replace the same size screw in the same location as the one that was removed. Failure to do so could damage the unit.

#### To disassemble the unit, complete the following steps:

1. Turn off the PowerStation.
2. Disconnect the unit from the power source.
3. Remove the unit from its enclosure, if it is installed in one.
4. Place the unit on its back on a static dissipative mat in a location free from dirt and moisture and protected against static discharge.

- Remove the two screws securing the touchscreen to the backshell as shown below.

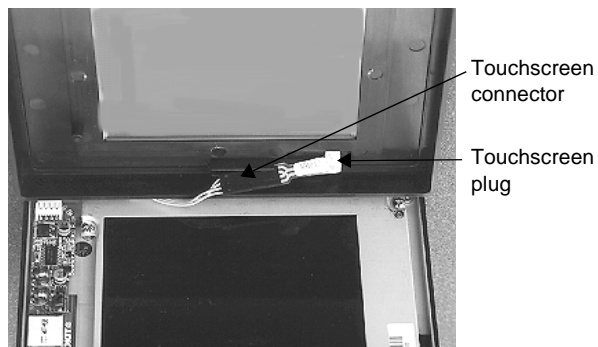


- Carefully, lift the bottom of the touchscreen approximately two inches while disengaging the tabs that secure the touchscreen to the top of the unit.

**Important** When removing the touchscreen from the unit, keep the touchscreen parallel to the unit in order to prevent damage to the touchscreen cable.

- Separate the touchscreen plug from the touchscreen connector, as shown in the illustration below.

**Note** The touchscreen plug is attached to the unit, and the touchscreen connector is attached to the touchscreen.



- Place the touchscreen face-down on a clean surface to avoid scratching the LCD display.

**Note** If you are replacing the touchscreen or the backlight bulb, you do not need to remove the back cover. You may skip the remaining steps in this procedure. For instructions on how to replace the touchscreen, see page 65. For instructions on how to replace the backlight bulb, see page 66.

- Remove the CF card by grasping its left side and sliding it out of the slot towards you.
- Remove the five short screws and one long screw securing the back cover to the faceplate as shown below.



- Lift the back cover off the faceplate, and lay it aside. Disassembly is complete.
- Proceed to the specific replacement or installation procedures you need to perform.
  - See *Replacing DRAM* on page 64
  - See *Replacing the Touchscreen* on page 65
  - See *Replacing the Backlight Bulb* on page 66
  - See *Installing a PC/104 Card* on page 68

## Replacing DRAM

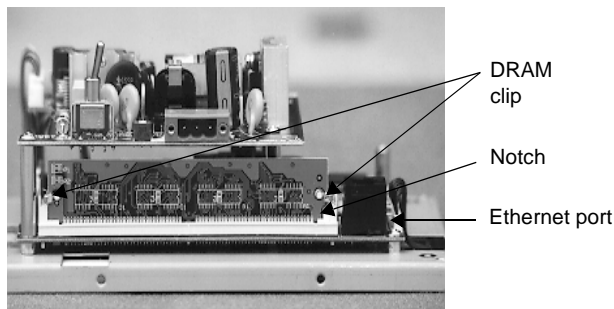
All PowerStations use DRAM that is comparable to that found in most PCs. The size and quantity of DRAM varies depending upon the PowerStation model and the CPU card it uses. However, you can use the same procedure to add or replace DRAM on all models. Refer to the CPU manual that came with your PowerStation for more information about the size and quantity of DRAM your unit can support.

### Removing a DRAM Module

The PowerStation's DRAM is located on the CPU card. To upgrade your PowerStation's DRAM, you may have to remove the existing DRAM module, or SIMM, from the CPU card.

**To remove a DRAM module, complete the following steps:**

1. Perform the PowerStation disassembly procedure beginning on page 61 of this manual.
2. With the back cover removed, locate the SIMM, which is below the power switch as shown below.



3. Push outward on the two clips holding the SIMM in its socket. As you push on the clips, the SIMM will move outward. It may be necessary to use a small screwdriver or the tip of a pen to push on the clips.
4. Lift the SIMM out of its socket at an angle.
5. Place the SIMM in an anti-static bag for storage if you do not plan to reinstall the SIMM at this time.

## Installing a DRAM module

**To install a DRAM module, complete the following steps:**

1. Place the new SIMM in the DRAM socket at an angle. The notch in the SIMM should be facing the ethernet port, as shown in the figure above.
2. Press the SIMM into the socket until the metal clips snap into place, securing the SIMM. The tabs on the socket must fit into the holes in the SIMM.
3. Perform the PowerStation reassembly procedure beginning on page 69 of this manual.

This completes the DRAM installation in your PowerStation. The PowerStation will automatically recognize the additional memory.

## Replacing the Touchscreen

Occasionally, you may need to replace the P1 PowerStation's touchscreen, depending upon the environment in which you are operating the unit. Although the PowerStation's touchscreen can be replaced without removing the unit from its enclosure, it is much easier to replace the touchscreen if you remove the unit from the enclosure.

**To replace the touchscreen, complete the following steps:**

1. Unpack the replacement touchscreen and examine it for damage or defects.
2. To remove the old touchscreen, perform steps 1 through 8 of the PowerStation disassembly procedure beginning on page 61 of this manual.

**Note** If you are replacing the touchscreen without removing the unit from its enclosure, skip steps 3 and 4 of the disassembly procedure.

3. To install the new touchscreen, perform steps 6 through 13 of the PowerStation reassembly procedure beginning on page 69 of this manual.

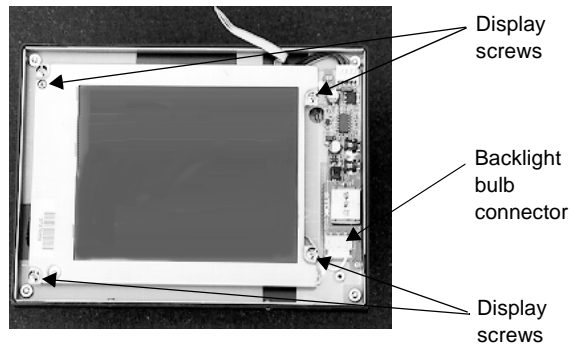
**Note** If you are installing the new touchscreen without removing the unit from its enclosure, skip step 11 of the reassembly procedure.

### Replacing the Backlight Bulb

Backlight bulb life is determined by the number of hours that the bulb is in continuous use. The P1 PowerStation's backlight bulb has an average life expectancy of 10,000 hours, or 416 days (24 hours/day). The bulb is designed to be replaced without removing the unit from its enclosure.

**To replace the backlight bulb, complete the following steps:**

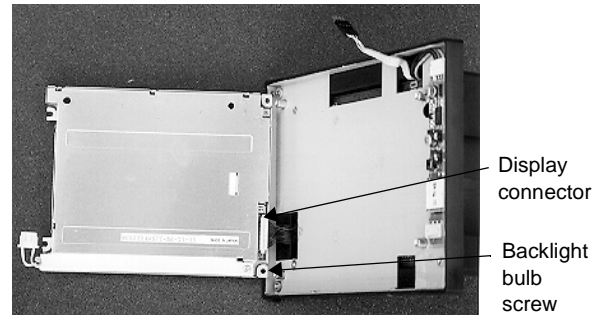
1. Unpack the replacement backlight bulb, and examine it for damage or defects.
2. To remove the touchscreen, perform steps 1 through 8 of the PowerStation disassembly procedure beginning on page 61 of this manual.
3. Remove the four screws that secure the display, as shown below.



4. Disconnect the backlight connector cable from the board.



- Carefully, lift the screen to reveal the display connector as shown below.



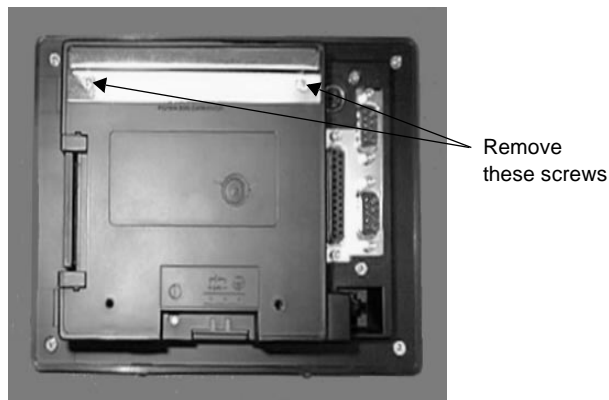
- Disconnect the display connector by gently pulling on the connector.
- Remove the screw securing the backlight bulb to the display.
- Lift the bulb out of the display channel.
- Install the replacement backlight bulb in the display channel, and replace the screw removed in step 7. The bulb only fits if placed with its cable to the left.
- Insert the display cable into the display connector. The red wire should be at the top of the cable, and the cable socket should be facing up.
- Place the display over the standoffs. Be sure to wrap the backlight bulb cable around the lower right standoff. This will ensure that the bulb connector has enough room to connect to its mate.
- Connect the backlight cable to the backlight board. The colored wire will be to your left.
- Install the four screws removed in step 3.
- To reinstall the touchscreen, perform steps 6 through 13 of the PowerStation reassembly procedure beginning on page 69.

### Installing a PC/104 Card

The PowerStation comes equipped with a PC/104 adapter, which allows you to connect PC/104 I/O cards to the back of the unit for communication with the ISA bus.

**To install a PC/104 card, complete the following steps:**

1. Turn off the PowerStation.
2. Disconnect the PowerStation from its power source.
3. Copy the PowerStation serial number from the back cover label onto the label on the back of the PC/104 card cover that is included with the PC/104 adapter kit.
4. Remove the two screws that secure the PC/104 adapter cover, as shown below.



5. Install a new PC/104 adapter cover onto the back cover of the PowerStation, using the screws that you removed in step 4.
6. Install standoffs in the lower two corners of the back cover. The standoffs are included with the PC/104 adapter kit.
7. Place a PC/104 card in the adapter.
8. Align the PC/104 card cover over the PC/104 card. There are three detachable sides of the PC/104 card cover. Snap off the side necessary for the PC/104 card connector to show through.

9. Fasten the PC/104 card cover to the back cover, using the screws provided with the PC/104 adapter kit.

Perform any cable connections or further setup required for the PC/104 card before re-installing the PowerStation in its enclosure.

### Reassembling the PowerStation

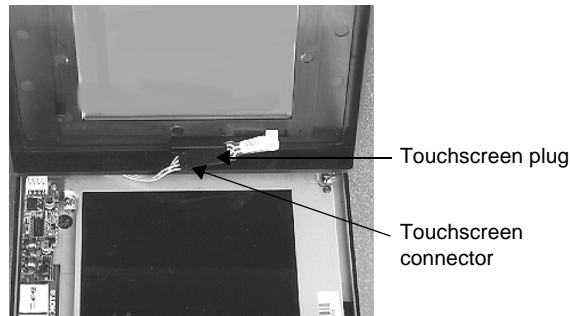
This section describes how to reassemble the PowerStation after you have finished performing internal maintenance on the unit. The first five steps describe how to reinstall the back cover; steps 6 through 13 describe how to reinstall the touchscreen.

**Important** When you reassemble the PowerStation, be sure to replace the same size screw in the same location as the one that was removed. Failure to do so could damage the unit.

#### To reassemble the PowerStation, complete the following steps:

1. Place the back cover over the unit. Make sure the touchscreen cable does not become pinched between the back cover and the unit.
2. Press the back cover down firmly.
3. Replace the five short screws and one long screw that you removed when you removed the back cover. The long screw is installed between the COM1 port (the bottom serial port) and the Ethernet port. If necessary, see the illustration on page 63 of this manual to determine the location of these screws.
4. Install the CF card by aligning the tabs with the slots in the back cover and pressing the card firmly into place.
5. Turn the unit over to install the touchscreen.

6. Locate pin 1 on the touchscreen plug and align it with pin 1 of the touchscreen connector. The illustration below shows where the touchscreen plug and touchscreen connector are located. A “1” identifies pin 1 on the touchscreen plug.



7. Connect the touchscreen plug to the touchscreen connector.
8. Insert the touchscreen cable into the groove on the back of the touchscreen. This ensures that the touchscreen cable will not become pinched between the touchscreen and the display.
9. Place the touchscreen on the display. Be sure that the touchscreen snaps onto the tab on top of the unit.
10. Secure the touchscreen to the back cover by replacing the two screws removed in step 5 of the PowerStation disassembly procedure on page 61 of this manual.
11. Install the unit in its protective enclosure.
12. Reconnect power to the unit.
13. Start up the PowerStation.

## Resolving Common Problems

This section provides some basic troubleshooting steps to help you identify and correct problems you may have with the PowerStation. Each problem is described, followed by one or more possible solutions. Begin with the first solution and continue until you have solved the problem or tried all of the solutions.

If the problem persists, look through the other problems listed in this section to determine if additional symptoms exist that might require action. If you cannot solve the problem, or if you encounter a problem that is not documented in this section, contact your CTC Parker equipment supplier or CTC Parker Product Technical Support department at (513) 248-1714.

Use the table below to find discussions of specific problems.

| <b>Resolving problems when starting up</b>   | <b>Page</b> |
|--|-------------|
| Resolving AUTOEXEC.BAT and CONFIG.SYS problems   | 72          |
| The startup sequence halts with the AMIBIOS screen displayed                                   | 76          |
| The PowerStation makes a chirping sound  | 76          |
| The LED Power indicator on the front of the unit does not light                                | 77          |
| <b>Resolving problems with the touchscreen</b>   |             |
| After startup, the touchscreen does not work properly, or touchscreen calibration is incorrect | 78          |
| After calibrating the touchscreen, it either does not work or does not follow your finger      | 78          |
| <b>Resolving problems after starting up</b>  |             |
| The screen appears to be blank or very dim   | 79          |
| The DOS prompt is displayed instead of the MachineShop Shell                                   | 79          |
| A PS/2 mouse does not work   | 80          |
| A serial mouse does not work   | 80          |
| A keyboard does not work   | 80          |
| The Ethernet port does not work  | 80          |

## Resolving Problems when Starting Up

Some of the most common problems that users encounter with PCs occur when they start up their systems. This section describes some problems that may occur in the PowerStation during startup and solutions for these problems.

### Resolving AUTOEXEC.BAT and CONFIG.SYS problems

Some startup problems are caused by a corrupted or modified AUTOEXEC.BAT or CONFIG.SYS file. CTC Parker includes backup copies of these files in the \CTC directory on your PowerStation's Compact Flash disk and on the PowerStation Start Disk. These files are AUTOEXEC.CTC and CONFIG.CTC. The text for AUTOEXEC.CTC appears below:

```
@ECHO OFF
REM*****
REM PowerStation Autoexec.bat file
REM Copyright (c)1999 CTC Parker Automation
REM*****

PROMPT $p$g
SET TEMP=C:\DOS
PATH C:\;C:\DOS;C:\CTC

REM*****
REM Install PowerStation Special Functions if not
REM running REM on a Pl.
REM*****

C:\TOUCH\IDTOUCH -S
IF ERRORLEVEL 3 GOTO ITSAP1
LH C:\CTC\BIOSTSR

REM*****
REM If an external mouse is connected, MOUSE will
REM install REM successfully and create a new
REM MOUSE.INI file.
REM*****
*****

CD \CTC
IF EXIST C:\CTC\MOUSE.INI DEL C:\CTC\MOUSE.INI
LH C:\CTC\MOUSE

:ITSAP1
```

```

REM*****
REM Load VESA TSR if not already supported by the
REM video system.
REM*****

C:\CTC\ISVESA
IF NOT ERRORLEVEL 1 GOTO YESVESA
LH C:\CTC\VESA
:YESVESA

REM*****
REM Load the MachineLogic Control Adapter driver
REM if it is present.
REM*****

IF NOT EXIST C:\MACHLOG\NUL.EXT MD C:\MACHLOG
CD \MACHLOG
IF NOT EXIST C:\CTC\MLCA.EXE GOTO NOMLCA
CD \CTC
LH C:\CTC\MLCA

:NOMLCA

REM*****
REM Initialize touchscreen drivers.
REM*****

SET TOUCH_PATH=C:\TOUCH
CALL %TOUCH_PATH%\TCHINIT.BAT

REM*****
REM Set up Interact and MachineLogic environment
REM variables REM for MS Shell.
REM*****

SET INTERACT=C:\INTERACT
SET INTERACT_FILES=C:\INTERACT\APPFILS
SET INTERACT_STARTUP=C:\STARTUP
SET MACHINELOGIC=C:\MACHLOG

REM*****
REM Load NETWORK drivers -- NOVELL and/or TCPIP
REM stack.
REM Remove REM on the CALL statement to load NOVELL
REM network batch file.
REM If used, this must be called BEFORE loading
REM the TCPIP REM stack.
REM*****

CD \NET
REM CALL C:\NET\NET.BAT

```

```

LH C:\NET\TCPIP

REM*****
REM Load MachineLogic if ML kernel present, and
REM set for boot operation.
REM (determined by MLDU.EXE return value 0 = REM
ENABLED, 1 = DISABLED)
REM*****

IF NOT EXIST C:\MACHLOG\NUL.EXT MD C:\MACHLOG
CD \MACHLOG
IF NOT EXIST C:\MACHLOG\MACHLOG.EXE GOTO NOML
C:\CTC\MLDU
IF ERRORLEVEL 1 GOTO NOML

C:\MACHLOG\RTXDOS
C:\MACHLOG\MACHLOG

:NOML

REM*****
REM Call AUTOEXEC.BAT file contained in project,
REM if it exists.
REM*****

IF NOT EXIST C:\STARTUP\NUL.EXT MD C:\STARTUP
CD \STARTUP
IF EXIST C:\STARTUP\AUTOEXEC.BAT CALL
C:\STARTUP\AUTOEXEC.BAT

REM*****
REM Start the MachineShop Shell.
REM*****

CD \CTC
PSU

```

**The text for CONFIG.CTC appears below:**

```

;MS-DOS V6.22
SHELL=C:\COMMAND.COM /E:1024 /P
FILES=30
BUFFERS=30
STACKS=9,256
DEVICE=C:\DOS\HIMEM.SYS
REM
REM MachineLogic uses the High Memory Area (HMA)
REM to store REM all I/O and variable data.
REM Therefore, DOS should be loaded entirely into
REM conventional memory. If MachineLogic is not
REM being used, then DOS should be loaded HIGH into

```



```
REM the HMA to conserve conventional memory. To
REM load DOS HIGH use DOS=HIGH,UMB -- otherwise
REM use DOS=LOW,UMB.
REM
REM DOS=HIGH,UMB
DOS=LOW,UMB
REM
REM                                     !!! NOTE !!!
REM EEM386 can be used to free up more conventional
REM memory for use by MachineLogic and Interact,
REM by allowing TSRs to be loaded high. Just remove
REM the word REM in front of the appropriate
REM command, and adjust the parameters as required
REM for your system's configuration.
REM
REM If EMM386 is used, any upper (UMB) memory used
REM by adapter cards must be excluded with the "X="
REM parameter, as shown in the example below. This
REM example is for a MachineLogic Control Adapter
REM at address D800, configured to use 4KB of NVRAM
REM (the factory default). Please adjust the "X="
REM parameter to match your system configuration.
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS NOVCPI X=D800-
REM D8FF
REM
REM The following settings can be used on a system
REM using the SST Profibus ISA I/O adapter (D000-
REM D7FF), with the MachineLogic Control Adapter
REM configured to provide 32KB of NVRAM (D800-
REM DFFF)
REM
REM DEVICE =C: \DOS\EMM386.EXE NOEMS NOVCPI
REM X=D000-DFFF
REM
REM On a P1 PowerStation, the range C800 through
REM CFFF must be excluded and the E-000-EFFF range
REM must be explicitly included. Use the following
REM command for loading EMM386 on a P1.
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS NOVCPI X=C800-
REM CFFF X=D800-D8FF I=E000-EFFF
REM IMPORTANT: always include the NOEMS and NOVCPI
REM switches when using EMM386 with MachineLogic
REM and Interact.
```

If you suspect a problem with either the PowerStation's AUTOEXEC.BAT or CONFIG.SYS file, use the DOS Copy command to create a backup copy of your current

file and overwrite the suspect file with the appropriate backup file. For example, if the AUTOEXEC.BAT file becomes suspect, type the following commands at the DOS prompt:

```
copy autoexec.bat autoexec.old
copy \ctc\autoexec.ctc autoexec.bat
```

You cannot edit the AUTOEXEC.BAT or CONFIG.SYS on the PowerStation, but you can do so on your development PC by pressing Exit on the MachineShop Shell menu, entering MS-DOS mode, and running MS-DOS Edit.

**Important** You cannot load the touchscreen driver and a serial mouse driver such as MOUSE.COM simultaneously. The PowerStation will only load the driver that is specified first in the AUTOEXEC.BAT file.

#### The startup sequence halts with the AMIBIOS screen displayed

1. Check for a loose CF card, and restart the PowerStation.

#### During startup, the PowerStation makes a chirping sound

1. The touchscreen driver is not loading. Check the AUTOEXEC.BAT file. See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 72 of this manual for information about the command lines that should appear in the AUTOEXEC.BAT file.
  - a. Verify that the touchscreen drivers are being loaded. Look for the following lines in the AUTOEXEC.BAT file:

```
SET TCHPATH=C:\ATS
C:\ATS\ATSMOUSE
```
  - b. Verify that a serial mouse driver such as MOUSE.COM is not being loaded before the touchscreen driver. Look for the following line in the AUTOEXEC.BAT file:

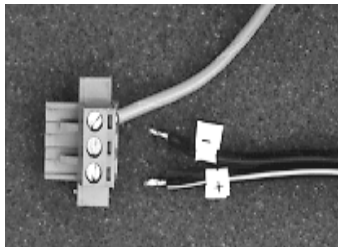
```
C:\MOUSE.COM
```

Make sure that it comes **after** this line:

```
SET TCHPATH=C:\ATS
```

**The LED Power indicator on the front of the unit does not light**

1. Check to see whether the power switch is in the On position, and the PowerStation is operating correctly.
  - a. If the PowerStation appears to be operating properly, the LED indicator may be defective. Contact your CTC Parker equipment supplier or CTC's Product Technical Support department for assistance.
  - b. If the PowerStation does not appear to be operating properly, restart the PowerStation.
  - c. If you are using AC power, check the AC Power Supply. Make sure that all connections are secure.
  - d. Check the AC LED. If the AC LED is not lit, either the AC power line is bad, or the AC is defective.
  - e. Check the AC power line to determine whether the AC voltage is good.
2. If you are using DC power, check the DC power line to determine whether the DC voltage is between 18 and 30VDC. A voltage of 24VDC is ideal.
3. Check the power connector to determine whether the leads are properly connected and not reversed (the positive line should be connected to the negative terminal). The ground lead must also be properly connected.



4. Check the PC/104 adapter, if one is installed. Remove the adapter, and restart the unit. If the LED comes on, the PC/104 card was bad. Replace the PC/104 card.

### Resolving Problems with the Touchscreen

This section describes some problems that may occur with the touchscreen and solutions to these problems.

#### **After startup, the touchscreen does not work properly, or touchscreen calibration is incorrect**

1. If the PowerStation is operating correctly otherwise, restart the unit.
2. The touchscreen calibration might be in error. See *Recalibrating the Touchscreen* on page 54 of this manual for instructions on how to calibrate the touchscreen.
3. Check the AUTOEXEC.BAT file. See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 72 of this manual for information about the command lines that should appear in the AUTOEXEC.BAT file.

- a. Verify that the touchscreen drivers are being loaded. Look for the following lines in the AUTOEXEC.BAT file:

```
SET TCHPATH=C:\ATS  
C:\ATS\ATSMOUSE
```

- b. Verify that a serial mouse driver such as MOUSE.COM is not being loaded before the touchscreen driver. Look for the following line in the AUTOEXEC.BAT file:

```
C:\MOUSE.COM
```

#### **After calibrating the touchscreen, it either does not work or does not follow your finger**

1. Make sure that a serial mouse is not connected to the unit. The touchscreen will not work with a serial mouse.
2. Make sure that you are using a Microsoft PS/2 mouse and the supplied Y adapter cable to connect the mouse to the keyboard port.

3. Check the touchscreen cable.
  - a. Make sure that the touchscreen cable has been properly connected. Pin1 of the touchscreen plug must be aligned with Pin1 of the touchscreen connector.
  - b. Inspect the touchscreen cable for loose, broken, or frayed wiring. Secure any loose wiring. If you find broken or frayed wiring, replace the damaged wiring.
4. Replace the touchscreen, following the procedure beginning on page 65 of this manual.

### Resolving Problems after Starting Up

This section describes some problems that may occur after startup and solutions to these problems.

#### The screen appears to be blank or very dim

1. Check to see if the power switch is in the On position, and the LED Power indicator on the front of the PowerStation is lit.
  - a. If the PowerStation is operating properly, adjust the contrast of the display by adjusting the potentiometer on the back of the unit, next to the power switch.
  - b. If the PowerStation is not operating properly, restart the unit.
2. Replace the backlight, following the procedure beginning on page 66 of this manual.

#### The DOS prompt is displayed instead of the MachineShop Shell main menu

1. If the PowerStation appears to be operating correctly otherwise, restart the unit.
2. Make sure that the MachineShop Shell software is being loaded. Verify that the following lines appear in the AUTOEXEC.BAT file and do **not** have the word "REM" in front of them:

```
CD \CTC  
PSU
```

3. The AUTOEXEC.BAT file may be corrupted or may have been modified. See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 72 of this manual for information about the command lines that should appear in the AUTOEXEC.BAT file.

**A PS/2 mouse does not work**

1. Make sure that you are using a Microsoft PS/2 mouse. Some PS/2-style mice that claim to be Microsoft compatible will not work correctly with the PowerStation. Do not use a serial mouse with a serial-to-PS/2 port adapter.
2. Make sure that the mouse is plugged into the Y cable attached to the keyboard port. Do not plug the mouse directly into the keyboard port.

**A serial mouse does not work**

1. See *Connecting a serial mouse* on page 19 of this manual for instructions on how to configure the PowerStation to accept a serial mouse.

**A keyboard does not work**

1. Make sure that the keyboard is plugged into the Y cable attached to the keyboard port.
2. Make sure that the keyboard is an AT-style keyboard, not an XT-style.
3. Try using a new Y adapter cable.
4. Try using a new keyboard.

**The Ethernet port does not work**

1. Make sure that the Ethernet cable is plugged in.
2. Make sure that the networking software is being loaded. Verify that the following line appears in the AUTOEXEC.BAT file and does **not** have the word "REM" in front of it:

```
C:\NET\NET.BAT
```

See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 72 for information about the command lines that should appear in the AUTOEXEC.BAT file.

3. Make sure that you have properly configured the networking software. See *Configuring the Ethernet Interface* on page 58 of this manual for a list of the drivers that configure your Ethernet interface.

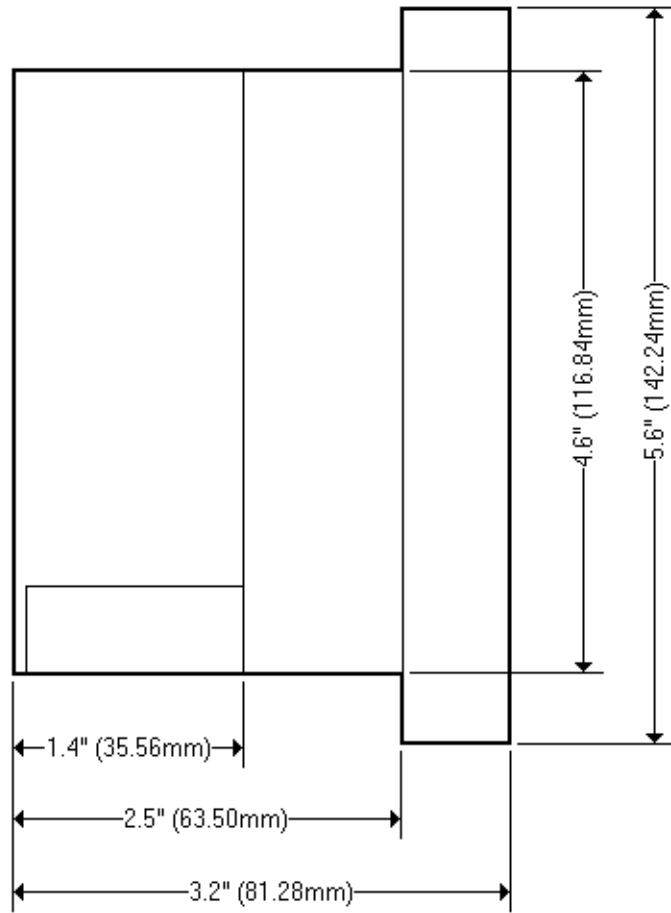




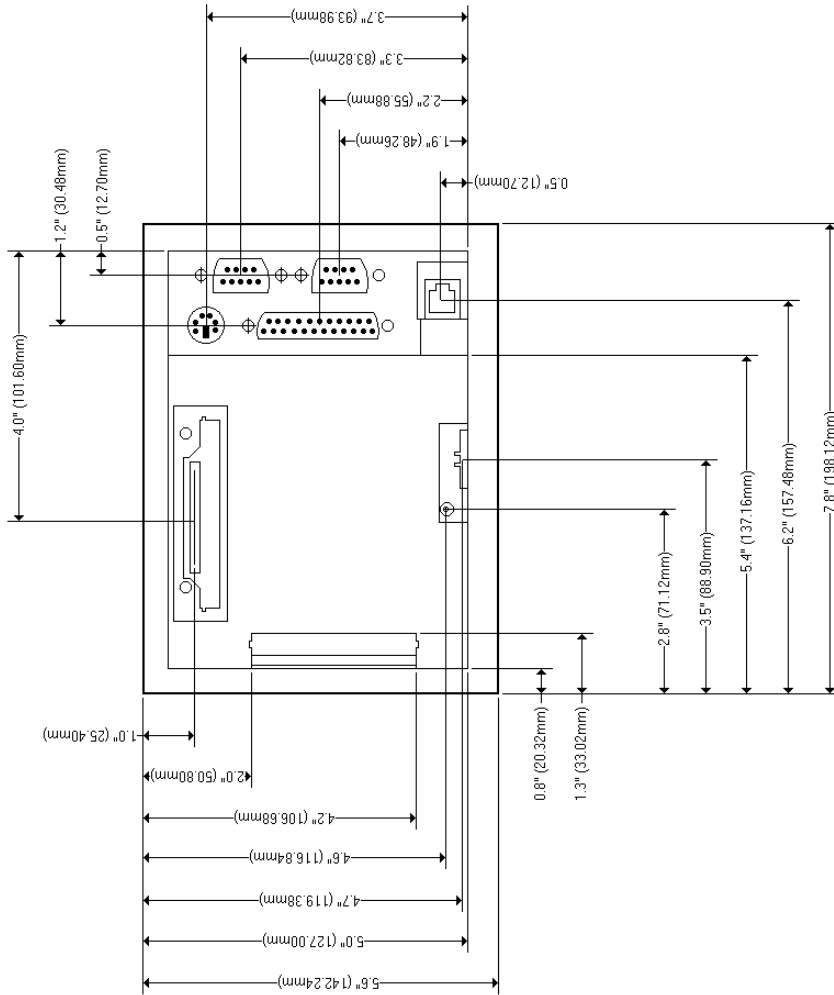
---

# P1 PowerStation Dimensional Drawings

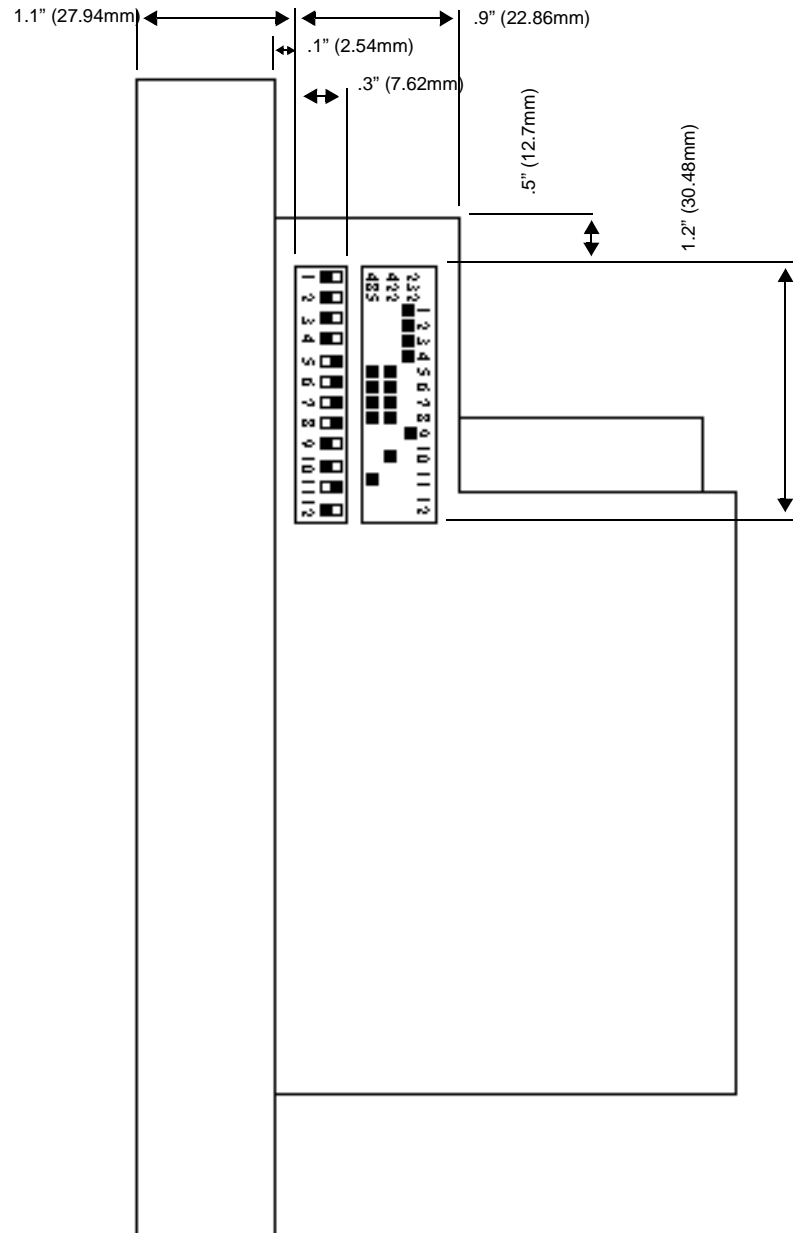
## P1 Side View



## P1 Back View



## P1 Top View





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