ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

Artisan Technology Group
(217) 352-9330 | sales@artisantg.com | artisantg.com

Full-service, independent repair center
with experienced engineers and technicians on staff.

We buy your excess, underutilized, and idle equipment
along with credit for buybacks and trade-ins.

Custom engineering
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

Expert team | Trust guarantee | 100% satisfaction

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *Parker / CTC PC/104* at our website: ***Click HERE***

PowerStation

Model P2 User Guide

CTC Parker Automation
50 W. TechneCenter Drive, Milford, Ohio 45150

Phone: 513-831-2340
Technical Support: 513-248-1714

A3-05425-106

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Copyright and Trademark Notice

Copyright © 2000 by CTC Parker Automation. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, in any form or by any means, mechanical, photocopying, recording or otherwise, without the prior written consent of CTC Parker Automation.

While every precaution has been taken in the preparation of this manual, CTC Parker Automation and the author assume no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. All product and company names are trademarks of their respective companies and licenses.

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 Parker'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 MachineShop License Agreement for additional software warranty information.

Should you have any questions about your application or need technical assistance, please call CTC Parker's 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 Parker's support products and services.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table of Contents

Chapter 1 Manual Overview and Support Services 1

Using this Manual 2

Documentation Components 3

Software Components 3

Getting Started 4

Before You Begin 4

Install the PowerStation 4

Download Applications and Projects 4

Documentation Standards 5

ISO Symbols 5

Customer Support Services 6

Technical Support 6

Training and New Business Development 7

Product Support Program 7

Chapter 2 Introducing the P2 PowerStation 9

Specifications 10

Physical Specifications 10

Environmental Specifications 11

Electrical Specifications 12

Testing Specifications 13

Faceplate Chemical Resistance 13

Available Connectors 14

Serial Ports 15

COM1 pinouts 15

COM2 pinouts 16

Cable diagrams 17

Connecting to a PC 17

Connecting a serial mouse 18

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table of Contents

Connecting to a serial printer 18
VGA Video Port 20
Parallel Port 20
Connecting to a parallel printer 20
Keyboard Port. 21
Ethernet Port 21
Compact Flash 21
Drive Definitions and Memory Map 22
PowerStation Memory Map 22
Memory Guidelines. 23
Adding PC/104 Cards. 23
Design Issues. 23
Using a Touchscreen with Interact 23
Chapter 3 Installing the PowerStation 25
Selecting a Location 26
Class 1, Division 2 Guidelines 26
Environmental Guidelines. 26
Touchscreen considerations 26
Electrical Guidelines 27
Temperature Guidelines 27
Enclosure Guidelines 27
Backlight Accessibility Guidelines 27
AC Power Guidelines 28
Preparing for Installation. 28
Creating the Cutout 28
Preparing to Use an AC Power Supply 29
Installing the PowerStation 30
Mounting the PowerStation 30

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table of Contents

Mounting the AC Power Supply 30

Starting Up the PowerStation 31

Chapter 4 Maintaining and Troubleshooting the PowerStation 33

Cleaning the Touchscreen 34

Using the Compact Flash Card 34

Removing and Replacing the Compact Flash 34

Restoring the System Files using the Flashback Utility 35

Reinstalling the PowerStation Utilities 37

Reinstalling the Shell Software 39

Modifying the AUTOEXEC.BAT File 40

Reconfiguring the Touchscreen Driver 42

Recalibrating the Touchscreen 43

Configuring the Ethernet Interface 46

Performing Internal Maintenance 47

Electrostatic Discharge Precautions 47

Disassembling the PowerStation 48

Replacing DRAM 49

Removing a DRAM module 49

Installing a DRAM module 50

Adding PC/104 Cards 51

Voltage and Current 51

Plug and Play Configuration 51

Address Considerations 52

IRQ Considerations 52

Changing Jumper Settings 53

JP7 Touchscreen address 53

JP6 Touchscreen IRQ jumpers 54

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Table of Contents

COM2 Jumpers 56
Reassembling the PowerStation 57
Resolving Common Problems 57
Resolving Problems when Starting Up 58
Problems with the Touchscreen 64
Problems after Starting Up 64
P2 PowerStation Dimensional Drawings 67
Side View 67
Bottom View 68
Mounting Cutout Dimensions 69
CPU Board Connectors 71
List of Connectors. 71
USB1/USB2 Connector (CN4) 72
External Speaker Connector (CN9) 73
CRT Display Connector CN11 74
Additional CPU Board Jumpers 75
CMOS Backup Select (JP3) 75
Watchdog Timer Configuration (JP4) 76
Index. 77

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 1

Manual Overview and Support Services

Thank you for purchasing a P2 PowerStation. The P2 PowerStation is a rugged, compact PC that is designed to be used as an industrial operator interface.

The P2 PowerStation features a durable touchscreen and two boards that include a parallel port, two serial ports, and an Ethernet port. The 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 PowerStation before operating the unit.

Chapter Contents

Using this Manual 2
Documentation Components 3
Software Components 3
Getting Started 4
Documentation Standards 5
Customer Support Services 6

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Using this Manual

This manual is designed to help you set up and use your P2 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. Please read the information presented in this manual before setting up and using your P2.

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 P2 PowerStation, and the steps necessary to get your P2 up and running. This chapter also describes CTC's customer support services.

Chapter 2 — Introducing the P2 PowerStation: Describes the P2's specifications and the ports available to connect the P2 to other devices and to a power source. This chapter also describes the PowerStation's drive definitions, memory map, and default jumper settings.

Chapter 3 — Installing the PowerStation: Explains how to install the P2 in a control enclosure and how to start up the unit.

Chapter 4 — Maintaining and Troubleshooting the PowerStation: Explains how to maintain the P2 and how to solve problems that may occur in operation.

Appendix A — P2 Dimensional Drawings: Displays dimensional drawings of the P2 that will be useful in mounting the unit.

Appendix B — CPU Board Connectors: Lists all connectors on the CPU Board and briefly describes three that might be useful when setting up your PowerStation.

Appendix C — Additional CPU Board Jumpers: Provides information on jumpers that may be of interest in addition to those covered in the chapters of this User Guide.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Documentation Components

The P2 PowerStation documentation set contains all the information you need to install and use the PowerStation. The P2 PowerStation documentation set is described below.

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

PowerStation Model P2 User Guide—This is the document you are reading. It provides detailed information about the PowerStation and describes how to configure, install, and use the unit. Please read this manual in its entirety before operating the unit.

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

Software Components

CTC Parker pre-loads each P2 PowerStation with the MS-DOS 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 PowerStation Start Disk and the MachineShop Installation CD, shipped with the PowerStation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Getting Started

Now that you have opened the PowerStation package, you are ready to unpack the unit, install it in a permanent location, and download your applications and projects. 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. Back up the CTC software that was pre-installed on your unit using the Windows® File Manager/Explorer or the MS-DOS® Diskcopy command.

Install the PowerStation

When you finish unpacking the PowerStation, you are ready to install the unit in a permanent location. See Chapter 3 of this manual, *Installing the PowerStation*, for complete installation instructions.

Download Applications and Projects

The P2 PowerStation is a runtime-only system, which means that you must develop your applications or projects on a PC and download them to the PowerStation.

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

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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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 should 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.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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 CTC Parker hardware, software, and customer support services.

- Telephone: 513-831-2340
- Fax: 513-831-5042
- E-mail: sales@ctcusa.com or 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 Parker offers a variety of support services designed to meet those needs. CTC Parker offers three types of customer support services: Technical Support, Training and New Business Development, and the Product Support Program.

Technical Support

The 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 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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Training and New Business Development

Our Training and New Business Development 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.

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.

Product Support Program

The 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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 2

Introducing the P2 PowerStation

The P2 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 P2 PowerStation's specifications and available connectors, its drive definitions, memory map, and jumper settings. The chapter also explains design issues concerning PowerStation touchscreens.

.

Chapter Contents

Specifications 10
Available Connectors 14
Drive Definitions and Memory Map 22
Adding PC/104 Cards 23
Design Issues 23

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Specifications

This section describes important specifications for the P2 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
CPUs	Pentium® 166 MHz or Pentium® 266 MHz
Memory	8 MB minimum, 256 MB maximum
Displays	• Monochrome LCD, 640 x 480 VGA, 16 shades of gray (unavailable on Industrial PCs). Brightness: 110 cd/m^2 (NIT). • Color TFT, 640 x 480 VGA, 256 colors. Brightness: 150 cd/m^2 (NIT). • Color STN, 640 x 480 VGA, 256 colors. Brightness: 300 cd/m^2 (NIT).
Storage	8, 16, 32, 48, 96 or 128 MB solid state flash drive (field expandable and replaceable). Actual storage volumes may be higher.
I/O ports	• 1 9-pin RS232 (non-isolated) • 1 9-pin RS232/422/485 (non-isolated) • 1 25-pin IBM parallel • 1 PS/2 keyboard • 1 RJ45 10/100 Base T Ethernet
PC/104 Bus extension	16-bit, +/-5V, +/-12V
Dimensions (H x W x D)	11.0" (280mm) x 13.8" (350mm) x 3.5" (89mm)
Weight	12.6 lbs. (5.6 Kg)

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Environmental Specifications

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

Category	Specifications
Operating temperature	32 to 122°F (0 to 50°C) ambient air temperature at air inlets
Bulb life	• Monochrome LCD - 10,000 hours • Color STN - 25,000 hours • Color TFT - 25,000 hours
Relative humidity	5% to 95% non-condensing
Altitude	-200ft. to 10,000ft. (-60.96m to 3,048m)
Shock rating	• 10g peak, 11ms (operating) • 30g peak, 11ms (non-operating)
Operating vibration	• 1.0g rms from 10 to 500Hz operating
Faceplate designed for	NEMA 4/4X Environment **Note:** 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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Electrical Specifications

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

Category	Specifications
Input voltage	20–36 VDC
Power consumption	42W maximum (54W maximum with PC/104)
Fuse type	3.15A, 250 VAC Littelfuse® 216.315 or equivalent
PC/104 power availability	1.5A@5V, 0.2A@12V; 75mA@-5V, 75mA@-12V

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.

Special note for units with replaceable lithium batteries



There is danger of explosion if the battery is incorrectly replaced. Replace the battery only with the same type of battery or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Testing Specifications

The PowerStation conforms to the testing specifications listed below.

Testing Criteria	Classification
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
European Harmonized EAC Standards	EN50082-2, EN55011
Operating vibration	IEC 68-2-6
Mechanical shock	IEC 68-2-27
Random vibration	MIL-STD-810D

Faceplate Chemical Resistance

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

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

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

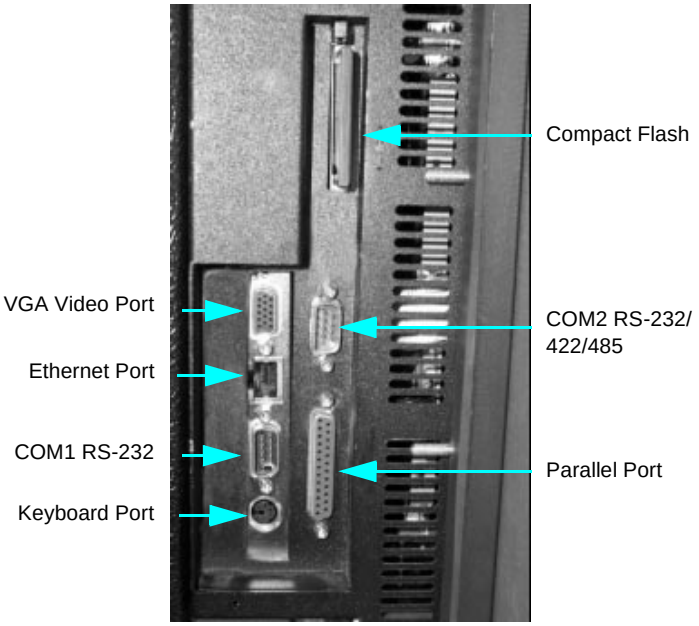
All PowerStation surfaces exposed to the outside of your enclosure are resistive to the following chemicals:

- 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 P2 PowerStation includes many of the same ports found on most PCs. All P2 PowerStations have two serial ports, a VGA video port, a parallel port, a PS/2-style keyboard port, an Ethernet port, and a Compact Flash connector. The following illustration shows the available connectors on a P2.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Serial Ports

The PowerStation has two serial ports that you can use to communicate with external devices. These ports support baud rates of up to 115 Kbaud. The COM1 port supports RS-232, while COM2 supports RS-232, RS-422, and RS-485 communication standards.

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

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

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

RS-422 communications are full-duplex (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. Information on the specific connection required for the Interact or MachineLogic 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 Name
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

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

COM2 pinouts

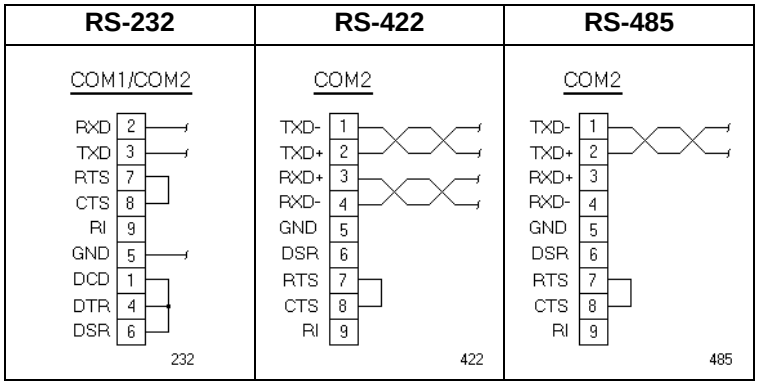
If you need to make a cable for communicating with COM2, the following table shows the pinouts and signal information for this port. COM2 is set to the RS-485 protocol by default. To change COM2 to the RS-232 or RS-422 protocol, you must change the COM2 jumper settings. See *COM2 Jumpers* on page 56 of this manual for information about how to change these settings.

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

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Cable diagrams

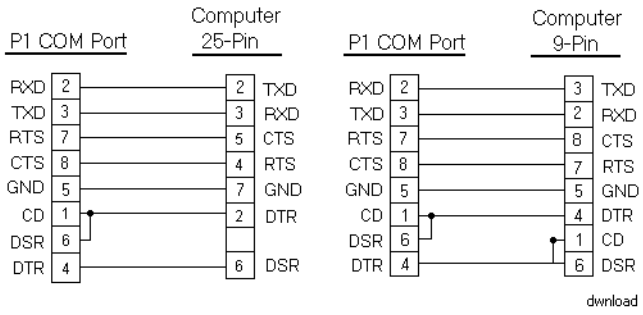
The following illustrations represent the pinouts and cable diagrams required for communicating with COM1 or COM2, using the RS-232 protocol. Also shown are cable diagrams for communicating with COM2, using the RS-422 or RS-485 protocol.



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.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Connecting a serial mouse

If you need to connect a serial mouse to the PowerStation, you must use either COM1 or COM2.

To configure the PowerStation to use a serial mouse, perform the following steps:

1. If you will be using COM2 for your mouse, verify that COM2 is configured for RS-232 communications. See *COM2 Jumpers* on page 56 of this manual for information about how to change the communications protocol for this port.
2. Connect the serial mouse to the port that you configured, and restart the PowerStation.

Connecting to a serial printer

To connect the PowerStation to a serial printer, 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 installs MODE.COM on the PowerStation's Compact Flash card. You will make a backup 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
   ```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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 2 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 whether you want to restart the PowerStation or not.

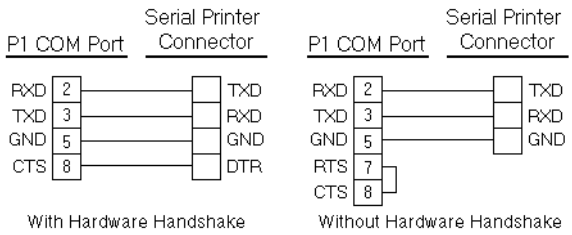
4. Restart the PowerStation.

   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 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.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

VGA Video Port

The PowerStation has a VGA Video port that allows you to use an external SVGA monitor and the flat-panel display simultaneously.

Parallel Port

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

Pin #	Signal Name
1	STROBE
2	DATA 0
3	DATA 1
4	DATA 2
5	DATA 3
6	DATA 4
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 LPT1 using a standard IBM PC parallel cable.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Keyboard Port

The P2 PowerStation's CPU board includes a mini-DIN keyboard port. This port can accept input from keyboards that have a PS/2 connector. This port can also accept input from IBM AT-compatible keyboards, 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 P2 PowerStation.

Ethernet Port

The PowerStation has a fully integrated 10 baseT/100 baseTX Ethernet port connected to the 32-bit PCI Bus. The port allows you to connect the PowerStation to a Local Area Network, motion controller or I/O system. Novell, TCP/IP and all other Ethernet protocols are supported.

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 P2 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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

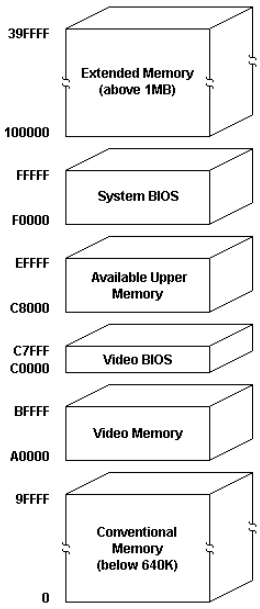
Drive Definitions and Memory Map

The table below provides information about the P2 PowerStation's drive definitions. Following the table is an illustration of the PowerStation's memory map.

Drive Letter	Type	Size	Usage
C	Compact Flash (CF) Card (Read/Write)	8, 16, 32, 48, 96, or 128MB	System boot drive and Project disk. Stores the project, the MachineShop Shell, Interact, MachineLogic, system files, and applications. Download files to this drive.

PowerStation Memory Map

The figure below illustrates how the P2 PowerStation allocates conventional memory and extended memory. The range of address references is listed next to each device.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Memory Guidelines

If you are using Interact or MachineLogic 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	Runtime
System DRAM	8MB system memory runs APM, PTM, and AMM runtime modules and two drivers. Extra modules require more memory.
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.

Adding PC/104 Cards

The P2 PowerStation supports PC/104 expansion cards. These cards perform a variety of functions that are typically done by traditional plug-in expansion cards. However, the advantage of using PC/104 cards is that you can stack several cards together, saving valuable space.

See *Adding PC/104 Cards* on page 51 of this manual for guidelines about adding PC/104 cards to the PowerStation.

Design Issues

You will only need to read this section if your PowerStation is using Interact, CTC Parker's HMI software. If you are not using Interact, you may proceed to Chapter 3, *Installing the PowerStation.*

Using a Touchscreen with Interact

If you are using a touchscreen with Interact, and your application uses PTM Slide input tools, be sure to select the Arrow cursor type using the Interact Settings command in Application Manager. When you select the Arrow cursor type, touching the Slide tool selects the tool, and moving your finger over the touchscreen moves the slide knob.

If you use the Box Cursor type, the slide knob immediately moves to the location where you press the tool. For example, if the knob is currently positioned at 100, and you press the touchscreen at a value of 800, the knob immediately moves to 800 and writes this

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

value to the controller.

Warning Using the Box Cursor with a touchscreen and an application that uses Slide input tools may cause you to inadvertently select input values. If your application requires you to use a cursor, select the Arrow cursor type instead.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 3

Installing the PowerStation

You are now ready to install the P2 PowerStation in a permanent location. This chapter will help you select an appropriate location for the unit. It also provides instructions for creating a cutout for the unit and describes how to install and start up the unit.

Chapter Contents

Selecting a Location 26
Preparing for Installation 28
Installing the PowerStation 30
Starting Up the PowerStation 31

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Selecting a Location

The first step to installing the PowerStation is to select an appropriate location for the unit. This is the most important aspect of installation 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 1, 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. The PowerStations described in this Guide are 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, 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 I, 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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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.

In order to comply with the European Union's Low Voltage Directive for product safety and Underwriters Laboratory's recognition requirements for a suitable fire enclosure, you must mount the PowerStation product in a standard industrial enclosure.

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.

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 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 Accessibility Guidelines

Occasionally, you may need to replace the PowerStation's backlight bulbs. A bulb replacement kit, including instructions for replacing the bulbs, is available from CTC Parker. However, to replace the backlight bulbs, you must be able to remove the PowerStation's back cover and the backlight assembly from the unit. Be sure to design your enclosure with this in mind. Other-

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

wise, you will have to completely remove the PowerStation from its enclosure in order to replace the backlight bulbs.

AC Power Guidelines

If you have purchased the optional AC Power Supply for the PowerStation, you must select a location that provides protection from dust, oil, moisture, and corrosive vapors. If you have a large enough enclosure, you can mount the Power Supply either on the back of the PowerStation or elsewhere 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. This involves creating a cutout for the unit and cleaning 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 the cutout. 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 of the template referred to as the "Panel Cutout Area." To maintain the flatness of the mounting surface, CTC Parker recommends that you **cut** out the Panel 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 *P2 PowerStation Dimensional Drawings* on page 67 of this manual for the depth and port dimensions of your PowerStation. Use these dimensions to customize the mounting of

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

your unit.

Preparing to Use an AC Power Supply

You will only need to read this section if you intend to operate the PowerStation using AC power. If you intend to operate the PowerStation using DC power, you can proceed to *Installing the PowerStation on* page 30 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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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

For your convenience, CTC Parker includes all the necessary mounting hardware with the unit.

To mount the unit, complete the following steps:

1. Gently insert the PowerStation into the cutout.
2. Install a nut on each of the protruding studs on the back of the PowerStation's bezel, and tighten each nut to a torque of 17 inch/pounds.

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

Mounting the AC Power Supply

The AC Power Supply is designed to be mounted using two metal brackets. These brackets are secured to the mounting surface using four screws. For your convenience, CTC Parker provides all necessary hardware for mounting the Power Supply in a special mounting kit.

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 a 90-250VAC 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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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* on page 12 of this manual and *Testing Specifications* on page 13. 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 the PowerStation 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 external AC Power Supply, you must first connect the Power Supply to the DC output on the back of the PowerStation; then, connect the power input to a 90-250VAC power source.

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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Chapter 4

Maintaining and Troubleshooting the PowerStation

The P2 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.

Chapter Contents

Cleaning the Touchscreen 34
Using the Compact Flash Card 34
Reinstalling the PowerStation Utilities 37
Reinstalling the Shell Software 39
Modifying the AUTOEXEC.BAT File 40
Reconfiguring the Touchscreen Driver 42
Recalibrating the Touchscreen 43
Configuring the Ethernet Interface 46
Performing Internal Maintenance 47
Resolving Common Problems 57

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Cleaning the Touchscreen

Occasionally, you may wish to clean the PowerStation's touch-screen. 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 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 polyester surface. The surface is sensitive to scraping, sharp blows, and punctures. Therefore, keep screwdrivers or other sharp objects away from the surface of the touchscreen.

Warning Do **not** clean the unit 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 P2 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 flash card.
3. Remove the CF card by sliding it out of its slot toward you, as shown in the illustration on the next page.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



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.

Restoring the System Files using the Flashback Utility

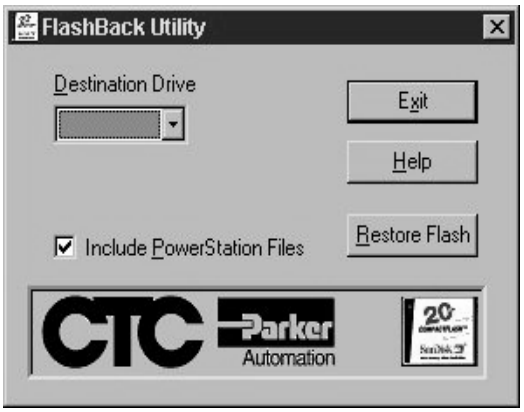
The FlashBack Utility restores the MS-DOS operating system and PowerStation operating files to a Compact Flash card in one, simple operation. These instructions tell you how to start Flash-Back from its location on the MachineShop Installation CD. If you wish, you also can download the utility from the CTC Parker Web site (http://www.ctcusa.com).

To start the FlashBack Utility from the MachineShop Installation CD, follow these steps:

1. Insert the MachineShop Installation CD (version KA-83102 or later) into the CD-ROM drive of your development PC.
2. Use Windows Explorer to locate the file FlashUtil.exe on your CD-ROM drive. (It will be in the Utilities\Flashback directory.)
3. Click **FlashUtil.exe**.

   The FlashBack Utility dialog box will appear as shown below.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



Note If you have a hard drive, you can copy FlashUtil.exe to a directory of your choosing on the hard drive and run the utility from there.

4. Select a Destination Drive.
5. Click Restore Flash.

Note Click the Help button to find complete, online instructions for using the FlashBack Utility.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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 by using the PowerStation Start Disk.

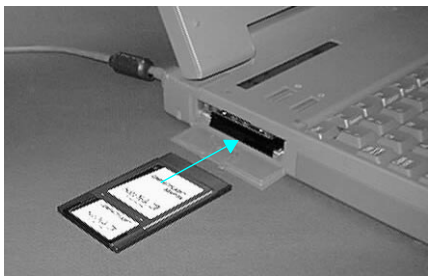
Note The PowerStation Start Disk is part of the Runtime Workstation Disk Set, which you can create from the MachineShop Installation CD shipped with your PowerStation. See the *MachineShop Installation Booklet* for instructions on how to create this disk.

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 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 an additional drive letter for the card (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.
6. At the DOS prompt, type `A:INSTALL A: D:`

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

7. Press Enter to execute this command.

   You will be asked if this installation is for a Model P1 PowerStation.

8. Type `N` for No.

   You will be asked if this installation is for a Model P9.

9. Type `N` for No.

   The system will copy the necessary PowerStation files from the Start Disk and unzip them.

   You will be asked whether you wish to install the standard CTC AUTOEXEC.BAT and CONFIG.SYS files as part of the installation.

   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.

10. We recommend that you type `Y` for Yes.

11. After the AUTOEXEC.BAT and CONFIG.SYS files have been copied onto your system, press any key to continue.

    The PowerStation Utilities installation is complete.

    You will be asked if you want to recalibrate the touchscreen.

12. If your PowerStation has a touchscreen, type `Y` for Yes, and recalibrate the touchscreen (see *Recalibrating the Touchscreen on page 43* for instructions.) If you do not have a touchscreen, type `N` for No.

    At this point, you will be prompted to install the MachineShop Shell. If you have to do this, see *Reinstalling the Shell Software on page 39* for instructions.

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

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

15. Start up the PowerStation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Reinstalling the Shell Software

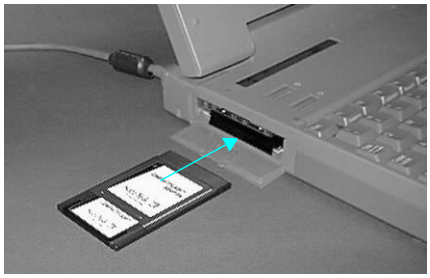
The MachineShop Shell comes pre-installed on your PowerStation's Compact Flash card. If you need to reinstall the Shell, you can do so by using the MachineShop Shell Installation disk.

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 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 an additional drive letter for the card (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 MachineShop Shell Installation disk in your PC's floppy drive.
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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The MachineShop Shell installation is complete.

8. Eject the CF-to-PCMCIA adapter, and remove the CF from the adapter, or remove the CF card from the card reader.
9. Insert the CF into 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 below must appear in the AUTOEXEC.BAT file for the PowerStation to operate properly. The AUTOEXEC.BAT file that CTC Parker supplies includes these lines and is located in the \CTC directory of the PowerStation in a file called AUTOEXEC.CTC.

Make sure that the AUTOEXEC.BAT file on your PowerStation includes the command lines shown in the left-hand column of the table below.

Command line parameters	Description
SET TEMP=C:\DOS SET TOUCH_ADDR=3E8 SET TOUCH_IRQ=11	Sets the IRQ and address for the touchscreen driver.
PATH C: \; C: \DOS; C: \CTC	Sets up the default DOS path.
C:\CTC\IDPWR	Identifies touchscreen, video and network drivers.
IF ERRORLEVEL 3 GOTO ITSAP1 LH C: \CTC\BIOSTSR	Loads special functions if the unit is not a P1.
CD \CTC IF EXIST C: \CTC\MOUSE.INI DEL C: \MOUSE.INI	Required for the Machine-Shop Shell to detect a mouse in some situations.
LH C: \CTC\MOUSE :ITSAP1	If a mouse is connected, installs the mouse and creates a new MOUSE.INI file.
IF NOT ERRORLEVEL 1 GOTO YESVESA LH C: \CTC\VESA :YESVESA	Loads VESA TSR video support, if necessary.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Command line parameters	Description
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	Loads the MachineLogic Control Adapter driver if it is present.
SET TOUCH_PATH=C: \TOUCH CALL %TOUCH_PATH% \TCHINIT.BAT	Initializes the touchscreen drivers.
*SET INTERACT=C: \INTERACT	Sets the Interact path.
*SET INTERACT_FILES=C: \INTER- ACT\APPFILES	Sets the application path for Interact.
*SET INTERACT_STARTUP= C:\STARTUP	Sets up Interact startup variables.
**SET MACHINELOGIC=C: \MACHLOG	Sets up MachineLogic environment variables.
CD \NET LH C: \NET\TCPIP	Loads network drivers -- Novell and/or TCPIP stack.
**IF NOT EXIST C: \MACHLOG /NUL.EXT MD C: \MACHLOG CD \MACHLOG IF NOT EXIST C: \MACHLOG\ MACHLOG.EXE GOTO NOML C: \CTCMLDU IF ERRORLEVEL 1 GOTO NOML C: \MACHLOG\RTXDOS C: \MACHLOG\MACHLOG :NOML	Loads MachineLogic if present and set for startup operation. Determined by MLDU.EXE return value: 0 = enabled; 1 = disabled.
IF NOT EXIST C: \STARTUP\NUL.EXT MD C: \STARTUP CD \STARTUP IF EXIST C: \STARTUP\ AUTOEXEC.BAT CALL C: \STARTUP\AUTOEXEC.BAT	Calls the second AUTOEXECBAT file if the line is contained within a project file.
CD \CTC PSU	Starts the MachineShop Shell.

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

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

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 58 of this manual for more information about the command lines that should appear in the AUTOEXEC.BAT file.

Reconfiguring the Touchscreen Driver

CTC Parker installs the appropriate touchscreen driver for your unit's operating system. However, you may have to reconfigure the touchscreen driver if it becomes corrupted. You will also need to reconfigure if you change the Touchscreen Address or IRQ setting from the system defaults (IRQ=11, ADDR=3E8).

> **Note** If you are using an older PowerStation, your touchscreen configuration procedure and the screens displayed may differ from those described in the following instructions.

To configure the touchscreen driver, complete the following steps:

1. Reboot the PowerStation, and when "Starting MS-DOS..." appears, press the F5 key on your keyboard.
2. At the DOS prompt, type `edit AUTOEXEC.BAT`.
3. In the AUTOEXEC.BAT file, change the Address and/or IRQ setting, and save the file.

   > **Note** The following segment of the AUTOEXEC.BAT file shows the default values for IRQ and Address.

   ```
   PROMPT $p$g
   SET TEMP=C:\DOS
   SET TOUCH_ADDR=3E8
   SET TOUCH_IRQ=11
   PATH C:\;C:\DOS;C:\CTC
   ```

4. Shut off the PowerStation.
5. If necessary, change the jumpers to match the configuration you designated in the AUTOEXEC.BAT file (see *Changing Jumper Settings on page 53* for instructions).
6. Restart the PowerStation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

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.

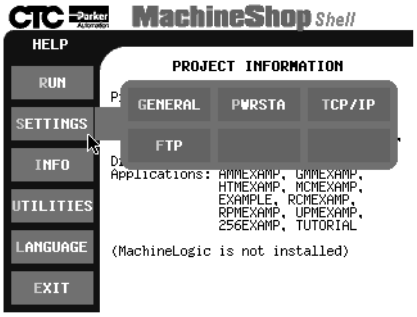
> **Note** If you are using an older PowerStation, your touchscreen calibration procedure and the screens displayed may differ from those described in the following instructions.

The MachineShop Shell comes with a calibration utility that you can use to calibrate the touchscreen in MS-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.

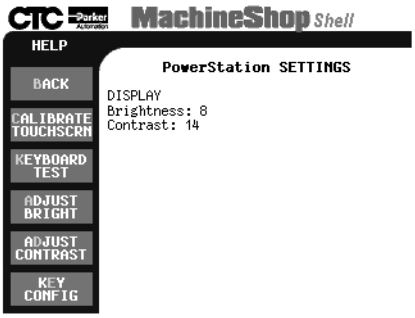
   The Settings submenu will appear as shown below.



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

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

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com



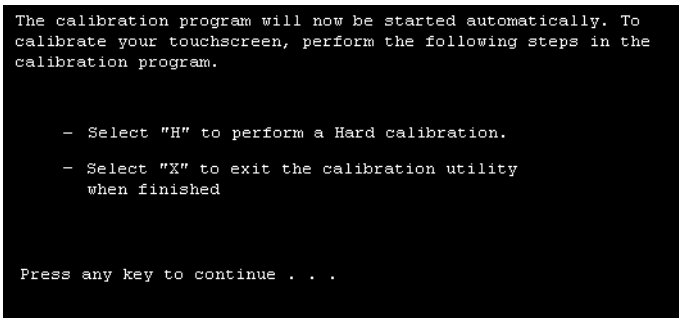
3. On the PowerStation Settings submenu, press the Calibrate Touchscrn button.

   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 Port* on page 21 of this manual for information about connecting a keyboard to the PowerStation.

5. When you have attached a keyboard to the PowerStation, press the Yes button to continue the calibration.

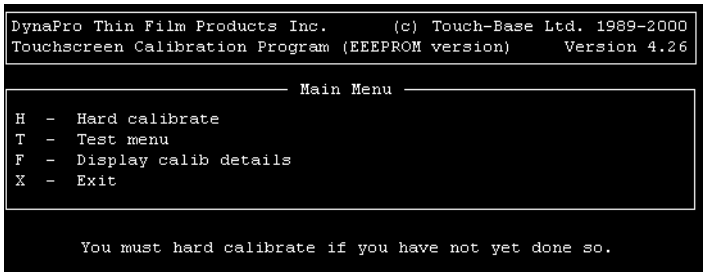
   The following screen will appear.



6. Press any key on the keyboard when you are ready to begin the calibration program.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The following screen will appear.



7. Type H for Hard calibrate.
8. When the next screen appears, follow the instructions on the screen by touching each square as it appears until you hear a beep.
9. When you have finished, press any key.
10. Press X or Esc to exit the calibration utility.

Important After calibrating the touchscreen, enter Interact in Program Mode. Verify that the cursor appears on the screen where you touch. If it does not, recalibrate the touchscreen. The calibration must be accurate to avoid activating a button unintentionally during Run Mode.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Configuring the Ethernet Interface

The \NET directory of the PowerStation's CF card contains a configuration utility and all drivers necessary to configure the Ethernet interface. Backup copies of these files are included on 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.

File Name	Description
NET.BAT	A batch file which determines the type of Ethernet interface (10Base-T NE2000 or 100Base-T Intel 82559) in the PowerStation and load the correct Novell drivers for the installed interface.
NE2000.CFG	A Novell NET.CFG file used by NET.BAT to load NE2000 Ethernet drivers.
PRO100.CFG	A Novell NET.CFG file used by NET.BAT to load Intel 82559 Ethernet drivers.
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.
NE2000.COM	A Novell driver that supports the NE2000 10Base-T Ethernet interface.
PRO100\ E100BODI.COM	A Novell driver that supports the Intel 82559 100Base-T Ethernet Interface.
NETBIOS.EXE	A Novell driver to support NETBIOS protocol, used by Interact to communicate over a network.
AT5CFG.EXE	A configuration utility for setting the I/O address and interrupt of the NE2000 10Base-T Ethernet interface. Use this utility if the 10Base-T Ethernet interface is located on the System Support Card, or for a P2 PowerStation.
RSET8019.EXE	The configuration utility for setting the I/O address and interrupt of the NE2000 10Base-T Ethernet interface. Use this utility if the 10Base-T Ethernet interface is located on the CPU card.
PRO100\ SETUP.EXE	The configuration utility for the Intel 82559 100Base-T Ethernet interface. This is normally not needed, since the 82559 is assigned an I\O address and interrupt by the PCI BIOS.
TCPIP.EXE	TCP/IP protocol driver for the PowerStation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

File Name	Description
TCPIP.INI	Configuration file for the PowerStation TCP/IP driver.

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 helpful information for performing internal maintenance on the 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
- Adding PC/104 cards
- Changing jumper settings
- Reassembling 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 the power from the PowerStation before you remove the back cover. 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.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

- 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 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 power to 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 face-down on a static-dissipative mat in a location free from dirt and moisture and protected against static discharge.
5. Remove the screws securing the back cover.
6. Remove the back cover from the unit.
7. Proceed to the specific procedures you need to perform.
   - See *Replacing DRAM* on page 49
   - See *Changing Jumper Settings* on page 53

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Replacing DRAM

The CPU card provides two 144 pin SODIMM sockets, each of which accepts 8, 16, 32, 64 or 128 MB, 3.3 V power level SODIMMs, available from CTC Parker.

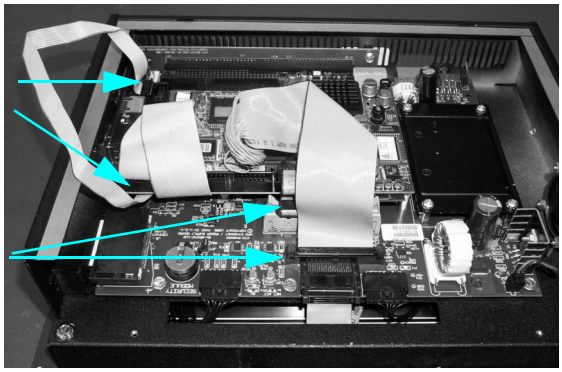
Note The CPU card only supports SDRAM SODIMM modules. EDO SODIMM is not supported.

Removing a DRAM module

The PowerStation's DRAM is located on the back of the CPU card. If you are upgrading your PowerStation's DRAM, you may need to remove the existing DRAM module from the CPU card.

To remove a DRAM module, complete the following steps:

1. Perform the PowerStation disassembly procedure beginning on page 48 of this manual.
2. Remove the screw that secures the CPU card support bracket. This screw is located inside the unit, just above the VGA port.
3. Remove the screws that secure the CPU card to the supply board.
4. Disconnect the four cables shown below. Pay attention to which socket you remove each cable from, so that you can properly reassemble the unit.

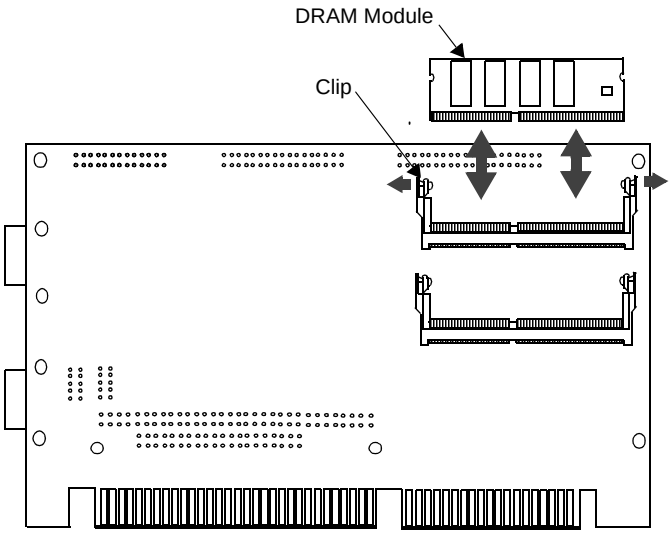


5. Carefully slide the CPU card out of its socket and turn it over. The two DRAM sockets are located on the back of the card.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6. Push outward on the two clips holding the DRAM module in its socket. You may need to use a small screwdriver or the tip of a pen to push on the clips.

   Note If only one DRAM module is required, it can be installed in either socket.



7. Tilt the DRAM module forward, slightly, and slide it up to remove it from the socket.
8. Place the DRAM module in an anti-static bag for storage if you do not plan to reinstall it at this time.

Installing a DRAM module

To install a DRAM module, complete the following steps:

1. Carefully insert the DRAM module into its socket at a 30-degree angle.
2. Gently but firmly push the module into the socket until the metal clips snap into place, securing the module.
3. Visually inspect the DRAM module to ensure that it is fully seated in the socket.
4. Install the CPU card.
5. Reconnect the connectors.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6. Perform the PowerStation reassembly procedure beginning on page 57 of this manual.

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

Adding PC/104 Cards

The P2 PowerStation supports PC/104 expansion cards. When adding PC/104 cards to the PowerStation, keep the following information in mind:

Voltage and Current

The total combination of cards may not exceed the current limits specified for PC/104 cards in the PowerStation. See *Electrical Specifications* on page 12 of this manual for more information about the voltage and current available for expansion cards.

Plug and Play Configuration

If you add a PC/104 card which is not configured for Plug and Play (a Legacy card), the following procedure is recommended to avoid resource conflicts:

1. Turn on the PowerStation, and **before** the system boots, press the Delete key to go to the CMOS Setup Utility.
2. Use the Down Arrow key to tab to PNP/PCI Configuration, and press Enter.
3. When you reach the PNP/PCI Configuration screen, be sure that Resources Controlled By is set to Manual. If necessary, use the Down Arrow key to tab to Resources Controlled By and the Page Up and Page Down keys to change the setting to Manual.
4. Use the Down Arrow key to tab to the IRQ used by the Legacy card, and use the Page Up and Page Down keys to change PCI/ISA PnP to Legacy ISA.
5. Press Esc.
6. Press F10 to reach the Save to CMOS and Exit prompt.
7. Select Y, then Enter, to save to CMOS and exit the CMOS Setup Utility.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Address Considerations

As in most ISA-bus computers, port addresses 300 through 31F are available for adapter functions. Addresses 310 through 317 are reserved for use by the PowerStation. Make sure that any adapter cards you install do not conflict with these addresses.

IRQ Considerations

IRQs 3, 4,5, 7, 9, 10, 11, and 15 are available to adapter devices connected to the ISA-bus. The PowerStation configures these as shown below.

IRQ	Usage	IRQ	Usage
0	Interval timer	8	Real-time clock
1	Keyboard	9	Video
2	Interrupt from controller 2 (cascade)	10	Ethernet (software configured)
3	COM2*	11	Touchscreen*
4	COM1	12	PS/2 mouse (non-releasable)
5	Available	13	INT from co-processor
6	Diskette Controller (FDC)	14	Fixed disk controller (Primary)
7	Available	15	Available

You can use the IRQs that are marked available in this table for any adapter card. You can reconfigure those marked with an asterisk (*) by changing the jumper settings on the PowerStation's Power Supply board or CPU card.

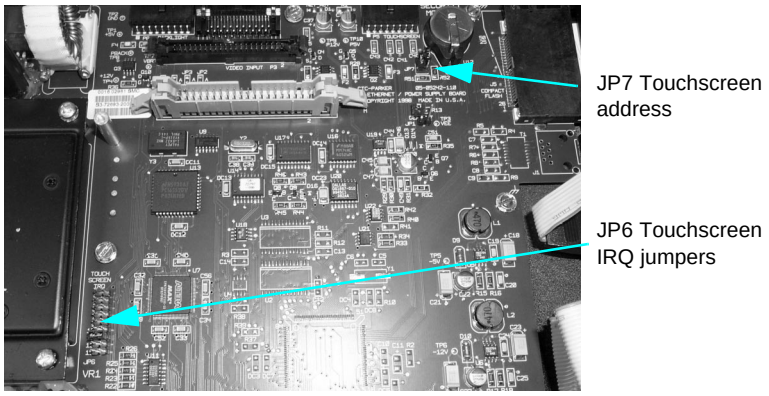
Important Changing jumpers requires that you also modify the PowerStation's operating software. Therefore, you should only change the IRQs on your PowerStation after consulting the CTC Parker Technical Support department. See *Changing Jumper Settings* on page 53 of this manual for information about how to change jumper settings on the PowerStation.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

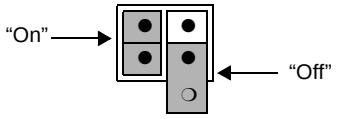
Changing Jumper Settings

The PowerStation has three sets of jumpers, two located on the Power Supply board, as shown below, and one located on the CPU card. You can change these jumper settings if necessary. The first set of jumpers (JP7) allows you to change the touchscreen I/O address. The second set (JP6) allows you to change the touch-screen IRQ. The third set allows you to configure the COM2 serial port on the CPU card.

Note The following illustration shows the Power Supply board with the CPU card removed. See *Removing the CPU card* on page 54 for instructions on how to remove this card.



The following sections describe howto change JP6 and JP7 jumper settings. In this discussion, jumpers set to “on” and “off” will look like those in the illustration below.



Note “Off” jumpers can be completely removed or placed as in the illustration above.

JP7 Touchscreen address

This set of jumpers configures the touchscreen address. It is configured by turning the A and B ports “on” or “off.” Use the following chart to determine the on/off combination for the port to which you would like to configure: COM1, COM2, COM3, or

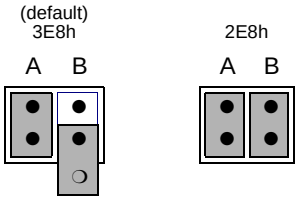
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

COM4.

I/O Address	A	B
COM1 (3F8h)	off	off
COM2 (2F8h)	off	on
COM3 (3E8h)	on	off
COM4 (2E8h)	on	on

To set the touchscreen jumpers to the default I/O address COM3 (3E8h), place the clips as seen below with the A port "on" and the B port "off." Set both jumpers to "on" to map the touchscreen to the COM4 port, also shown below.

Important After changing the jumper settings for the touchscreen I/O address, you must change the AUTOEXEC.BAT file to reflect the new configuration. See *Reconfiguring the Touchscreen Driver* on page 42 for complete instructions.



JP6 Touchscreen IRQ jumpers

This set of jumpers is used to configure the hardware IRQs for the touchscreen. The touchscreen IRQ jumpers are located at the lower left corner of the Power Supply board, just beneath the CPU card. To change these jumpers, you may need to remove the CPU card. This procedure is described below.

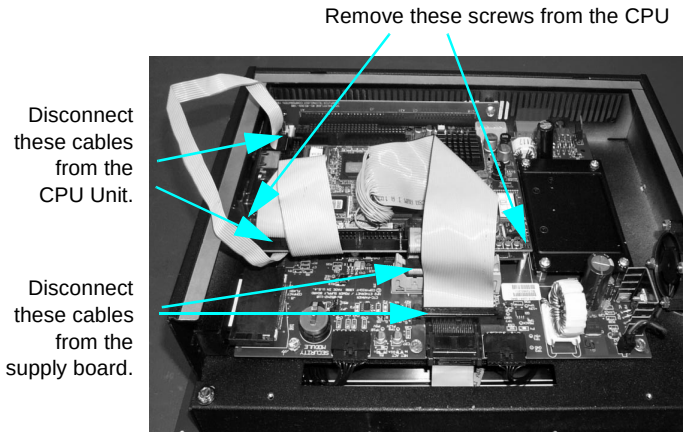
Removing the CPU card

To remove the CPU card, complete the following steps:

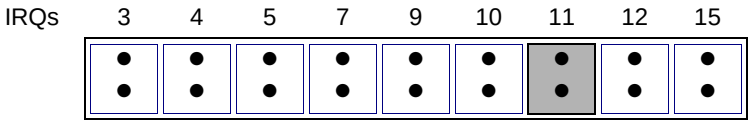
1. Disassemble the PowerStation, following the procedure described beginning on page 48. Then continue with the steps below.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Refer to the illustration below for steps two through 4.



2. Remove the screw that secures the CPU card support bracket. This screw is located inside the unit, just above the VGA port.
3. Remove the screw that secures the CPU card to the Power Supply board.
4. Disconnect the four cables shown above. Pay attention to which socket you remove each cable from, so that you can properly reassemble the unit.
5. Gently, pull the CPU card out of its socket.
6. Change the touchscreen IRQ by moving the clip to the desired jumper. CTC Parker sets the touchscreen IRQ to 11, as shown below.



Important If you change the Touchscreen IRQ, you must update the AUTOEXEC.BAT file to reflect the change. See *Reconfiguring the Touchscreen Driver* on page 42 for more information.

7. Re-install the CPU card by performing steps 1–5 in reverse order.

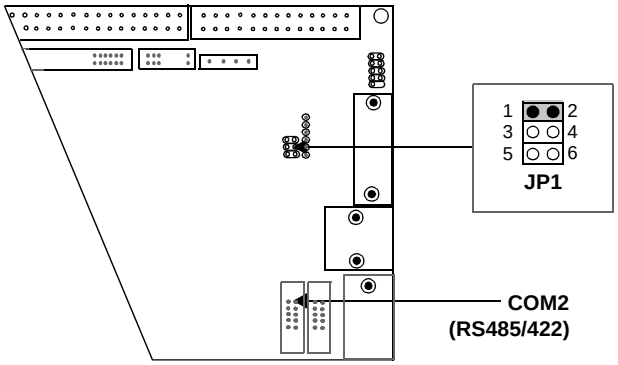
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

COM2 Jumpers

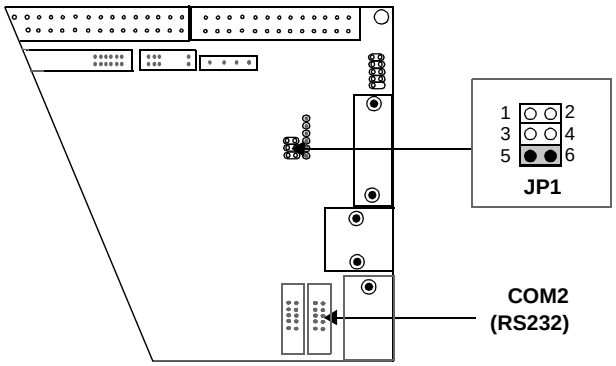
CTC Parker configures the COM2 serial port on the CPU cards for RS-485 communications. However, you can configure this port to communicate using RS-232 or RS-422 by changing the jumper settings on the CPU cards. Refer to the cut-away diagrams of each CPU card that appear below and on the following pages for the exact placement of the jumpers for RS-232, RS-422, and RS-485 configurations.

COM2 Serial Port Configuration Diagrams

RS485 Configuration (default)

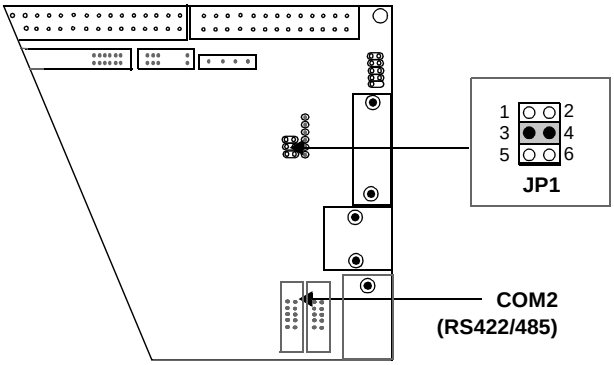


RS232 Configuration



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

RS422 Configuration



Reassembling the PowerStation

This section describes how to reassemble the PowerStation after you have finished performing internal maintenance on the unit.

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 unit, complete the following steps:

1. Replace the back cover and reinstall the screws that secure the cover.
2. Reinstall the unit in its enclosure, if it was previously installed in one.
3. Reconnect power to the unit.
4. 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 P2 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 you cannot solve the problem yourself, or if you encounter a problem that is not documented in this section, contact your CTC Parker equipment supplier or the CTC Parker Technical Support department at (513) 248-1714.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Use the table below to find discussions of specific problems.

Resolving problems when starting up	Page
Resolving AUTOEXEC.BAT and CONFIG.SYS problems	58
The fan does not come on, and the display is blank	62
The fan starts, but the display does not	62
The RAM test fails, or the total memory installed does not match the total contiguous RAM listed on the display following the RAM test	63
Resolving problems with the touchscreen	
After startup, the touchscreen does not work properly, or touchscreen calibration is incorrect	64
After calibrating the touchscreen, it either does not work or does not follow your finger	64
Resolving problems after starting up	
The PowerStation locks up while starting and will not restart	64
The DOS prompt is displayed instead of the MachineShop Shell main menu	65
A serial mouse does not work	65
A keyboard does not work	66
The Ethernet port does not work	66

Resolving Problems when Starting Up

This section describes some possible problems that may occur in the PowerStation during startup and solutions for these problems.

Resolving AUTOEXEC.BAT and CONFIG.SYS problems

Some start up problems are caused by a corrupted or modified AUTOEXEC.BAT or CONFIG.SYS file. 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
SET TOUCH_ADDR=3E8
SET TOUCH_IRQ=11
PATH C:\;C:\DOS;C:\CTC

REM*****************************************************
REM Install PowerStation Special Functions if not running
REM on a P1.
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
REM*****************************************************

C:\CTC\IDPWR -T -S
IF ERRORLEVEL 3 GOTO ITSAP1
LH C:\CTC\BIOSTSR

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

C:\CTC\IDPWR -V -S
IF NOT ERRORLEVEL 1 GOTO YESVESA
LH C:\CTC\VESA
:YESVESA

REM*****************************************************
REM Load the MachineLogic Control Adapter driver if it is
REM 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 variables
REM for MS Shell.
REM*****************************************************
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
SET INTERACT=C:\INTERACT
SET INTERACT_FILES=C:\INTERACT\APPFILES
SET INTERACT_STARTUP=C:\STARTUP
SET MACHINELOGIC=C:\MACHLOG

REM*****************************************************
REM Load NETWORK drivers -- NOVELL and/or TCPIP stack.
REM Remove REM on the CALL statement to load NOVELL
REM network batch file. If used, this must be called
REM BEFORE loading 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 set for
REM boot operation. (determined by MLDU.EXE return value
REM 0 = ENABLED, 1 = REM 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, if it
REM 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
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

The text for CONFIG.CTC appears below:

```
;MS-DOS V6.22, EMM386.EXE V4.49
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) to store
REM all I/O and variable data. Therefore, DOS should be
REM loaded entirely into conventional memory. If Machine
REM Logic is not being used, then DOS should be loaded
REM HIGH into the HMA to conserve conventional memory. To
REM load DOS HIGH use DOS=HIGH,UMB -- otherwise use
REM DOS=LOW,UMB.
REM
REM DOS=HIGH,UMB
DOS=LOW,UMB
REM
REM                !!! NOTE !!!
REM EMM386 can be used to free up more conventional memory
REM for use by MachineLogic and Interact, by allowing TSRs
REM to be loaded high. Just remove the word REM in front
REM of the appropriate command, and adjust the parameters
REM as required for your system's configuration.
REM
REM If EMM386 is used, any upper (UMB) memory used by
REM adapter cards must be excluded with the
REM "X=" parameter, as shown in the example below.  This
REM example is for a MachineLogic Control Adapter at
REM address D800, configured to use 4KB of NVRAM (the
REM factory default). Please adjust the "X=" parameter to
REM match your system configuration.
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS NOVCPI X=D800-D8FF
REM
REM The following settings can be used on a system using
REM the SST Profibus ISA I/O adapter (D000-D7FF), with the
REM MachineLogic Control Adapter configured to provide
REM 32KB of NVRAM (D800-DFFF).
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS NOVCPI X=D000-DFFF
REM
REM On a P1 PowerStation, the range C800 through CFFF must
REM be excluded and the E000-EFFF range must be explicitly
REM included. Use the following command for loading EMM386
REM on a P1.
REM
REM DEVICE=C:\DOS\EMM386.EXE NOEMS NOVCPI X=C800-CFFF
REM X=D800-D8FF I=E000-EFFF
REM
```


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

```
REM IMPORTANT: Always include the NOEMS and NOVCPI
REM switches when using EMM386 with MachineLogic and
REM Interact.
```

If you suspect a problem with either the AUTOEXEC.BAT or the CONFIG.SYS file of the PowerStation, 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 may also choose to reinstall the PowerStation Start disk to correct the problem.

The fan does not come on, and the display is blank

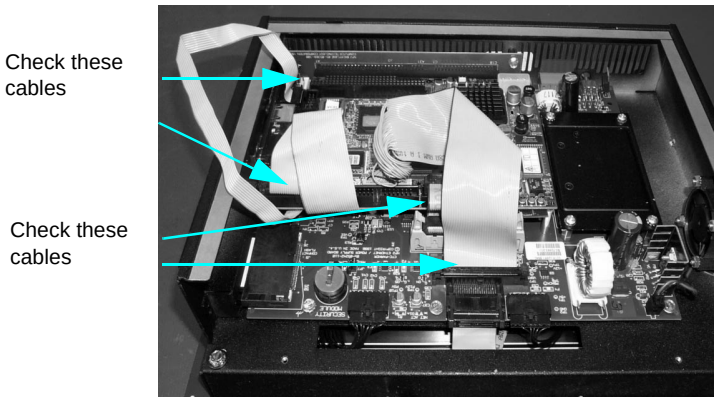
1. Turn off the PowerStation.
2. Make sure that the power cord is properly plugged in. If it is not, make sure that the plug is firmly attached to the unit and the power source.
3. Turn on the PowerStation. If the fan does not come on, continue with step 4.
4. Disconnect the PowerStation from its power source.
5. Remove the PowerStation's back cover.
6. Check the fuse located on the internal power supply. If the fuse is blown, replace it. Use a 3.15A, 250 VAC Littelfuse® 216.315 or its equivalent.
7. Turn on the PowerStation. If the fan does not come on, continue with step 8.
8. Check connector J2 (fan connection) on the CTC Power Supply board to see if the fan is plugged in.
9. Secure the PowerStation's back cover.
10. Connect the PowerStation to its power source.
11. Turn on the PowerStation.

The fan starts, but the display does not

1. Turn off the PowerStation.
2. Disconnect the PowerStation from its power source.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

3. Remove the PowerStation's back cover.
4. Make sure that the cables that connect to the display are properly connected. If they are not, make sure that each connector is firmly seated in its corresponding plug. See the illustration below.



5. Check the installation of the DRAM modules on the CPU board. Make sure that the modules are firmly seated in their sockets and that the socket latches are fully engaged.
6. Make sure that all cards are firmly seated.
7. Secure the PowerStation's back cover.
8. Connect the PowerStation to its power source.
9. Turn on the PowerStation.

The RAM test fails, or the total memory installed does not match the total contiguous RAM listed on the display following the RAM test

1. Turn off the PowerStation.
2. Disconnect the PowerStation from its power source.
3. Remove the PowerStation's back cover.
4. Re-seat the DRAM modules on the CPU board. Make sure that the modules are firmly seated in their sockets and that the socket latches are fully engaged.
5. Secure the PowerStation's back cover.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

6. Connect the PowerStation to its power source.
7. Turn on the PowerStation.

Problems with the Touchscreen

This section lists 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 appears to be operating correctly otherwise, restart the unit.
2. The touchscreen calibration might be in error. See *Recalibrating the Touchscreen* on page 43 of this manual for complete instructions.
3. Check the AUTOEXEC.BAT file. See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 58 of this manual for information about the lines that should appear in the AUTOEXEC.BAT file.
   a. Verify that the following lines appear in the AUTOEXEC.BAT file **before** the lines that load touchscreen driver:

```
IF EXIST C:\CTC\MOUSE.INI DELC:\CTC\MOUSE.INI
LH C:\CTC\MOUSE
```

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

1. Make sure that the touchscreen cable has been properly connected. If the touchscreen cable is damaged, replace the touchscreen. Contact CTC Parker for information about purchasing a replacement.
2. Inspect the touchscreen for broken, loose, or frayed wiring. Secure any loose wiring. If you find broken or frayed wiring, replace the damaged wiring.

Problems after Starting Up

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

The PowerStation locks up while starting and will not restart

1. Turn off the PowerStation.
2. Connect a keyboard.
3. Turn on the PowerStation. When the message “Starting MS-DOS” appears, press the F8 key. This will cause the system to

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

step through the CONFIG.SYS and AUTOEXEC.BAT files line-by-line. If the "Starting MS-DOS" message does not appear, go to step 6.

4. Step through the CONFIG.SYS and AUTOEXEC.BAT files line-by-line until you find the cause of the lockup. Remove or correct the offending line in the CONFIG.SYS or AUTOEXEC.BAT file.
5. Restart the PowerStation to see if the problem has been solved.
6. If the system locks up before the "Starting MS-DOS" message appears, restart the PowerStation, and press the Delete key to enter the BIOS setup program.
7. Select the Standard CMOS Setup option or its equivalent, and restore the system defaults. This will restore the CMOS settings to their factory default configuration. Save these settings and exit the setup program.

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 58 of this manual for information about the command lines that should appear in the AUTOEXEC.BAT file.

A serial mouse does not work

1. Make sure that the mouse is properly connected to the serial port.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

2. If you have connected the mouse to COM2, verify that COM2 is configured for RS-232 communications. See *COM2 Jumpers* on page 56 of this manual for instructions on how to change the communications protocol for this port.
3. Connect the serial mouse to the port you configured, and restart the PowerStation.

See *Connecting a serial mouse* on page 18 for information about how to configure the PowerStation to accept a serial mouse.

A keyboard does not work

1. If you are using a keyboard with a PS/2-style connector, make sure that the keyboard is properly connected to the keyboard port.
2. If you are using an AT-style keyboard, complete the following steps:
   a. Make sure that you have properly connected the keyboard to the supplied PS/2 adapter cable. Make sure that the adapter cable is properly connected to the keyboard port.
   b. Make sure that the keyboard is an AT keyboard, not an XT keyboard.
   c. Try a new adapter cable.
3. 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 lines are present in the AUTOEXEC.BAT file and do **not** have the word "REM" in front of them:

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

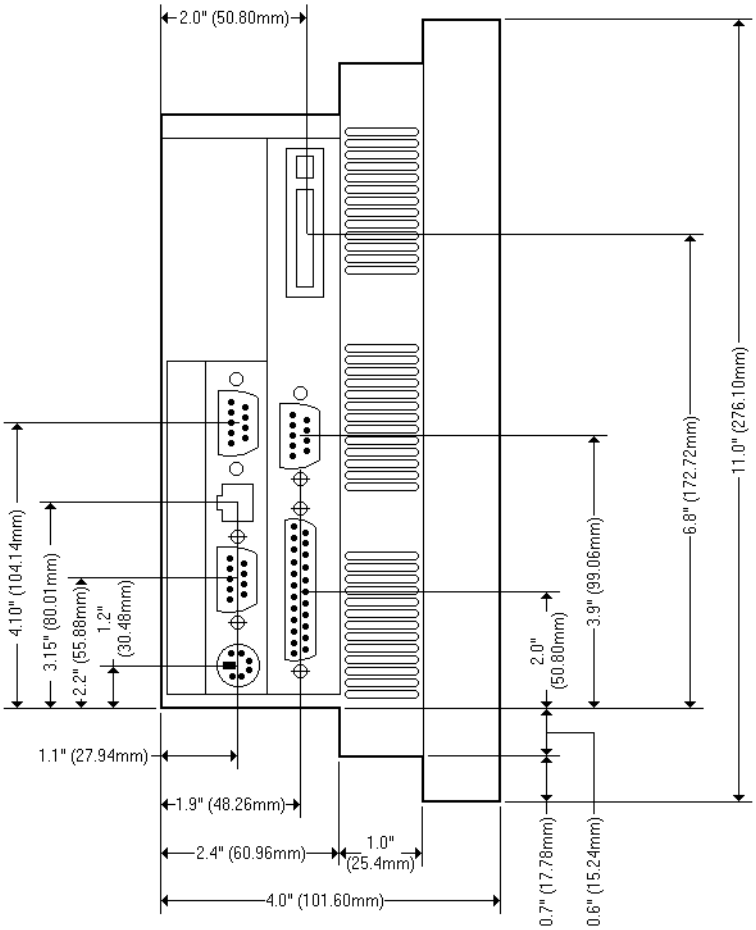
   See *Resolving AUTOEXEC.BAT and CONFIG.SYS problems* on page 58 of this manual for information about the lines that should appear in the AUTOEXEC.BAT file.
3. Make sure that you have properly configured the networking software. See *Configuring the Ethernet Interface* on page 46 of this manual for information about how your networking software can be configured.

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Appendix A

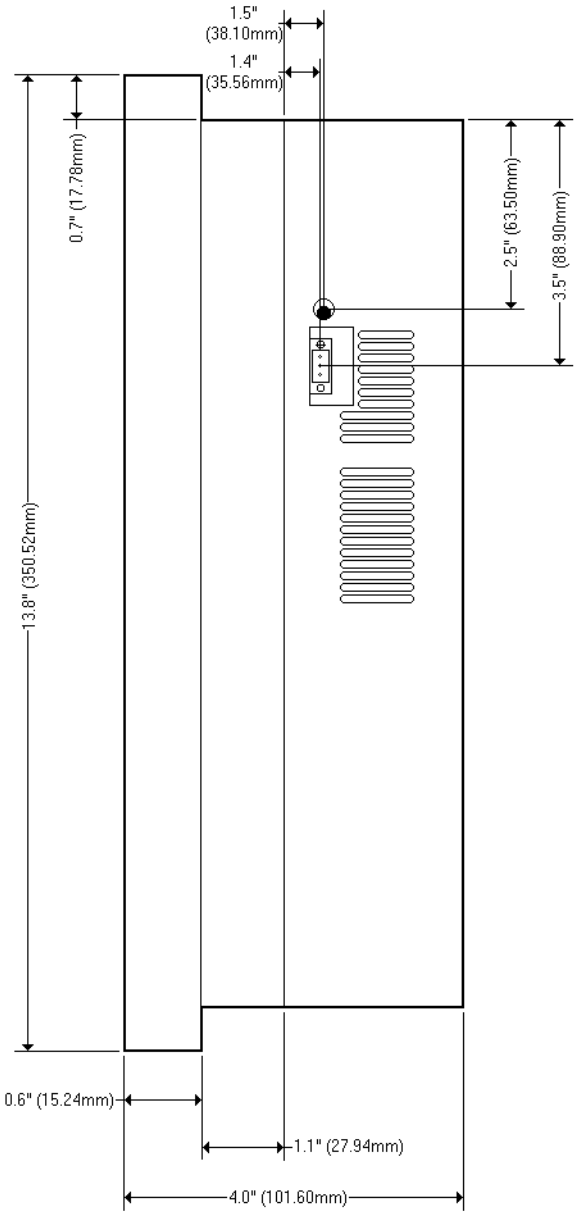
P2 PowerStation Dimensional Drawings

Side View



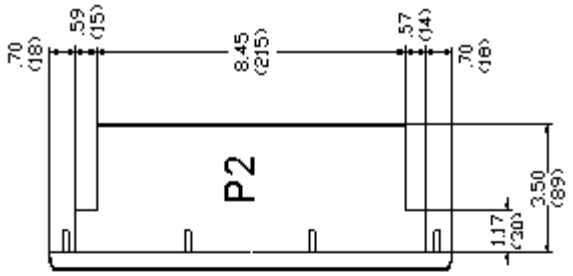
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

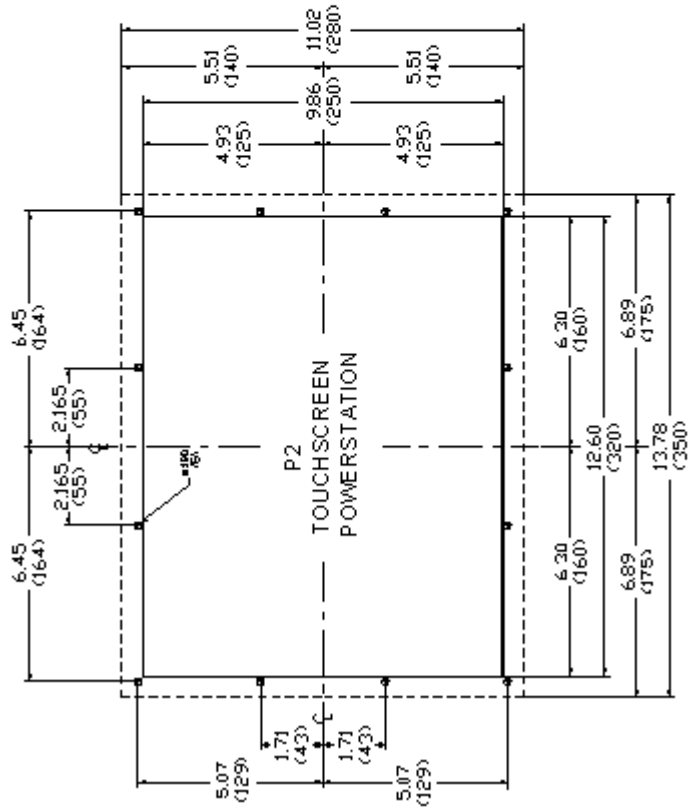
Bottom View



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Mounting Cutout Dimensions





Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Appendix B

CPU Board Connectors

List of Connectors

Number	Function
CN1	FDD connector
CN2	Parallel port connector
CN3	Keyboard lock, LED connector
CN4	USB connector
CN5	LCD 24-bit connector
CN6	LCD 36-bit connector
CN7	LCD invertor connector
CN8	IR connector
CN9	External speaker connector
CN10	Watchdog timer PROG connector
CN11	VGA connector
CN12	PC/104 connector
CN13	Ethernet connector
CN14	COM2 RS-422/485 connector
CN15	COM2 RS-232 connector
CN16	COM1 RS-232 connector
CN17	External keyboard connector
CN18	ATX power connector
CN19	Reserved
CN20	AT power connector
CN21	Keyboard and PS/2 mouse connector
CN22	ISA goldfinger connector
CN23	ISA goldfinger connector
CN24	CompactFlash card connector
CN25	HDD LED
CN26	System reset switch connector
CN27	ATX power button
CN28	IDE connector

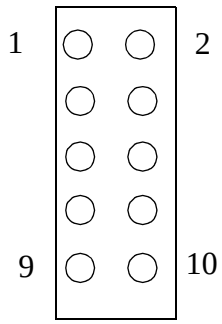
Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

USB1/USB2 Connector (CN4)

The PowerStation CPU card provides two USB (Universal Serial Bus) interfaces, which are accessed through a 10-pin flat-cable connector, CN4. The adapter cable has a 10-pin connector on one end and a USB connector on the bracket.

These two interfaces give complete Plug and Play as well as hot attach/detach for up to 127 external devices. The interfaces are fuse protected, comply with USB specification revision 1.0, and can be disabled in the system BIOS setup.

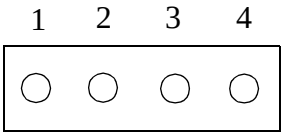
Some systems may auto-detect the USB connector, but it is not supported as a physical, external port on the PowerStation P3, P4 or P5 models. External tang connectors are commercially available. Contact CTC Parker's Sales department at 513-831-2340 for more information.



Pin	USB1 Signals	Pin	USB2 Signals
1	+5 V	2	+5 V
3	UV -	4	UV -
5	UV +	6	UV +
7	GND	8	GND
9	Chassis GND	10	N/C

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

External Speaker Connector (CN9)

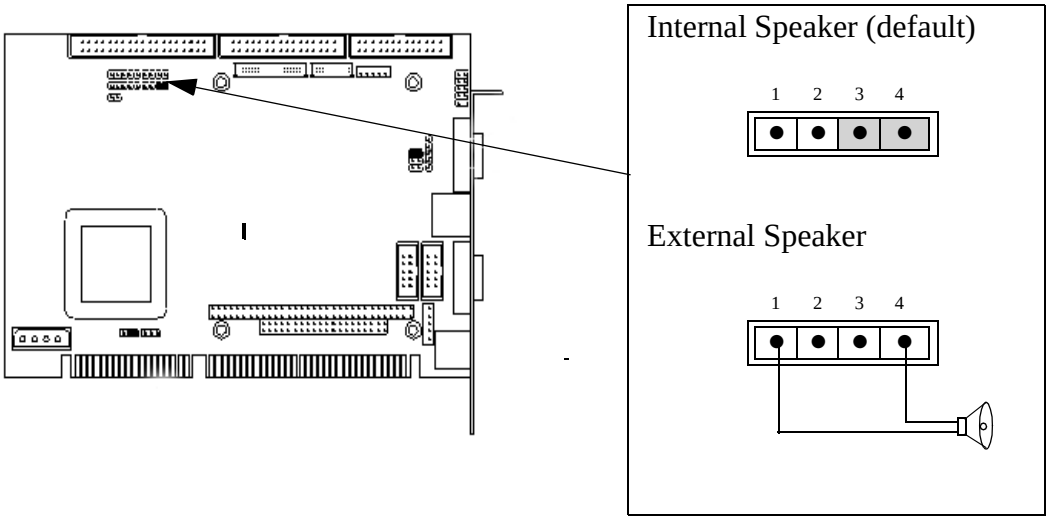


Pin	Signal
1	Vcc
2	N/C
3	Internal speaker
4	External speaker

To use an internal speaker, install a jumper on pins 3 and 4 (default setting). To use an external speaker, attach pins 1 and 4 to an 8 ohm speaker.

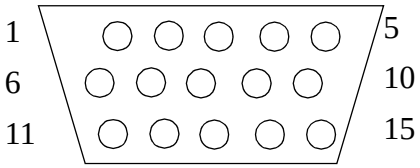
Important The user configurable external speaker output requires the use of a standard 8 ohm impedance speaker. Using a different speaker may damage the speaker, the driving circuitry, or both.

.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

CRT Display Connector CN11



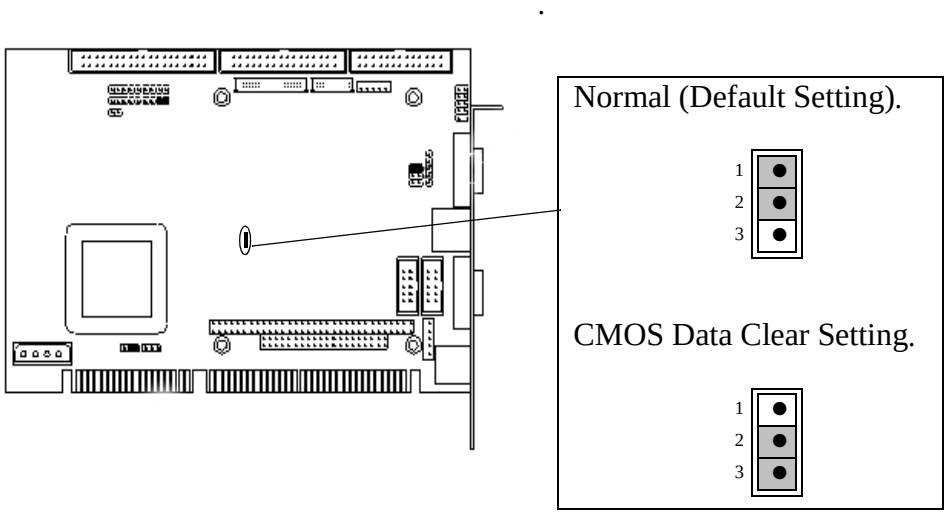
Pin	Signal	Pin	Signal
1	RED	9	N/C
2	GREEN	10	GND
3	BLUE	11	N/C
4	N/C	12	N/C
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	N/C
8	GND		

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Additional CPU Board Jumpers

CMOS Backup Select (JP3)

To avoid damaging the computer, always turn off the power supply before setting “Clear CMOS”. Set jumper pins 2 and 3 for approximately 30 seconds, then set the jumper back to the normal default setting before turning on the power supply.

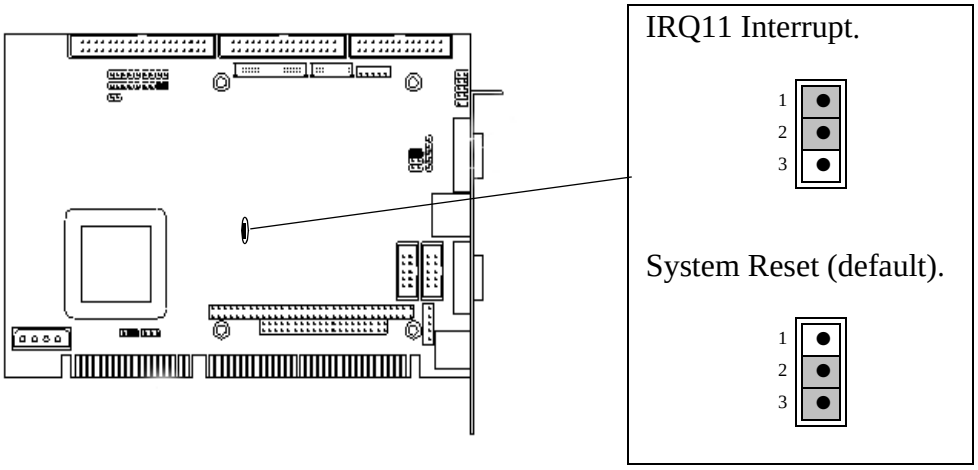


Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Watchdog Timer Configuration (JP4)

To reduce the chance of electro-magnetic pulse interference, a watchdog timer may be set to either generate an interrupt on IRQ11, or shut down the system. The time interval can be set anywhere from 1 to 62 seconds. This jumper is set to the default position at the factory, and must remain that way in order for the PowerStation software to operate properly.

.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Index

A

AC power supply 30
address/IRQ considerations 52
altitude 11
AUTOEXEC.BAT
  command line parameters 40, 58
  troubleshooting 58, 64

B

bulb life 11

C

cable diagrams
  RS-232 17
  RS-422 17
  RS-485 17
chemical resistance (faceplate) 13
Class 1, Division 2 guidelines 26
cleaning the touchscreen 34
Color STN display 10–11
Color TFT display 10–11
COM1 pinouts 15
COM2
  jumpers 56
  pinouts 16
common problems 57
Compact Flash
  reformatting 35
  slot 21
CONFIG.SYS
  command line parameters 61
  troubleshooting 58, 62
connecting a serial mouse 18
connecting to a parallel printer 20
connecting to a PC 17
connecting to a serial printer 18
CPUs 10
Customer Support Services 6

D

data storage methods 10
dimensions 10, 67, 71, 75
display types 10
documentation standards 5
download
  cable 15–16
DRAM
  picture 50
drive definitions 22

E

electrical guidelines 27
electrostatic discharge precautions 47
enclosure guidelines 27
environmental guidelines 26
Ethernet port
  configuring 21, 46
  troubleshooting 66
expansion cards
  See PC/104, cards

F

faceplate
  chemical resistance 13
  cleaning 34
  rating 11
fuse type 12

I

I/O ports 10
input voltage 12
installation
  AC power supply 30
  mounting the unit 30
  preparing to use an AC power supply 29
  selecting a location 26
Interact 7, 15, 22, 23, 34, 41, 45, 46, 47

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Index

IRQs 52

J

jumpers
  COM2 56
  touchscreen IRQs 54

K

keyboard port 21

M

MachineLogic 7, 15, 22, 23, 41
MachineShop 1, 7, 19, 31
  Installation CD 3
  MachineShop Shell 3, 19, 22, 31, 39, 40, 41, 58, 65
  MachineShop Shell Installation disk 39
maintenance
  See PowerStation, internal maintenance
memory
  addresses 22
  guidelines 23
  map 22
  types 10
MODE.COM 18
Monochrome LCD display 10–11
mouse port
  See serial ports, connecting a serial mouse
mouse, serial 18
MS-DOS 3, 4, 37, 39, 64

O

operating
  temperature 11
  vibration 11

P

parallel port
  connecting to a parallel printer 20
  pinouts 20
parallel printer 20
PC/104
  bus extension 10
  modules 23, 51
  power availability 12
physical specifications 10
power consumption 12
power supply (AC) 30
PowerStation
  connectors 14
  dimensions 67, 71, 75
  disassembly 48
  display types 10
  documentation set 3
  drive definitions 22
  installation 25
  internal maintenance 47
  IRQs 52
  memory map 22
  reassembly 57
  release notes 3
  specifications 10
  start up 31
  template 3
  troubleshooting 57
  User Guide 3
printer
  parallel 20
  serial 18
PS/2 port
  See keyboard port

R

relative humidity 11
RS-232 cable diagram 17

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

RS-422 cable diagram 17
RS-485 cable diagram 17

S

serial mouse 18, 66
serial ports
  cable diagrams 17
  COM1 pinouts 15
  COM2 jumpers 56
  COM2 pinouts 16
  connecting a serial mouse 18, 66
  connecting to a PC 17
  connecting to a serial printer 18
serial printer 18
shock rating 11
software CDs 3
specifications
  electrical 12
  environmental 11
  physical 10
  testing 13
start up 31
STN display 10–11

T

temperature
  guidelines 27
  operating 11
TFT display 10–11
touchscreen
  calibrating 43
  cleaning 34
  considerations 26
  drivers 42
  jumpers 54
troubleshooting
  AUTOEXEC.BAT 58, 64
  common problems 57
  CONFIG.SYS 58, 62
  Ethernet port 66
  keyboard 66
  serial mouse 66
  touchscreen 64

U

using this manual 2

W

weight 10

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Index

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP