# MachineShop™

## Shell Runtime Guide

*CTC Parker Automation*
*50 W. TechneCenter Drive, Milford, Ohio 45150*
*Phone: 513-831-2340*
*Technical Support: 513-248-1714*

A3-05727-104

## Copyright and Trademark Notice



## Product Warranty Information

CTC Parker Automation provides top quality products through rigid testing and the highest quality control standards. However, should a problem occur with your hardware or with the software protection key, CTC's standard product warranty covers these items for 15 months from the date of shipment from CTC. Exceptions appear below:

- PowerStation backlight bulbs have a 90-day warranty.
- Third-party products, such as bus cards, carry the manufacturer's specified warranty.
- For all displays, image retention (burn-in) is not covered by warranty.
- Software revisions that occur within 60 days after purchase are available under warranty upon request. Please review the MachineShop License Agreement for additional software warranty information.

Should you have any questions about your application or need technical assistance, please call CTC'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 5 of this manual for more information about CTC's support products and services.

# Table of Contents

# Table of Contents

# Table of Contents

# Table of Contents

Chapter 1

# Manual Overview and Support Services

Welcome to the MachineShop Shell. The MachineShop Shell is a software program that runs on the runtime workstation. It is used to configure many of the unit's hardware and software settings and to receive Interact and MachineLogic files downloaded from a development system. It also handles certain project-related tasks including backup and restore operations.

## Chapter Contents

## Using This Manual

The MachineShop Shell Runtime User Guide describes the MachineShop Shell user interface and provides instructions on how to monitor and configure system settings from the Shell.

**Chapter 1 - Manual Overview and Support:** Presents an overview of the documentation that is provided with the MachineShop Shell. This chapter also discusses the support services provided by CTC-Parker.

**Chapter 2 - Introducing the MachineShop Shell:** Describes how to navigate in the MachineShop Shell, how to get online help, and introduces you to the user interface.

**Chapter 3 - System Administrator Functions:** Provides instructional information on using the MachineShop Shell to perform administrator functions such as selecting the startup program, creating and restoring backups, and adding language files to the runtime workstation. The runtime workstation is the PC or CTC-Parker PowerStation on which the Shell is running.

**Chapter 4 - Maintaining the PowerStation:** Provides instructions for recalibrating the touchscreen, performing a keyboard test, adjusting the brightness and contrast levels of the PowerStation display, and configuring the Shift and Select keys on P5 PowerStations.

**Chapter 5 - Preparing for Transfers:** Describes how to set up the runtime workstation for transfers with a development system running the MachineShop Toolbar. These connections include the Direct Serial, serial PPP, LAN, and Ethernet Point to Point.

**Chapter 6 - MachineLogic:** Describes how to use the MachineLogic option to configure settings for MachineLogic PC Control (MLPC) and for the MachineLogic Slot Card (MLSC). It also provides instructions for starting and stopping the MachineLogic runtime kernel and resetting both the Watchdog timer and the Slot Card itself.

**Appendix A - Configuration Files:** Provides the text of the files that are required for MachineShop Shell and the MachineLogic runtime system.

**Appendix B - Installing the MachineShop Shell** -

Describes how to install the MachineShop Shell on a non-CTC-Parker workstation. A non-CTC-Parker workstation is any runtime PC, other than a PowerStation, on which you are running the Shell.

## Documentation Standards

As you read this manual, you will notice that the following documentation standards have been followed.

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 needs particular attention while reading the text. Follow this information to save development time and/or 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 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 not properly followed.

# Customer Support Services

CTC welcomes your thoughts and suggestions on our products and services. You can contact CTC by telephone, email, or fax. You can also visit CTC on the World Wide Web to learn the latest about CTC 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 recognizes that every customer and every application has different support needs, so CTC offers a variety of support services designed to meet those needs. CTC 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), or system integrator.

**If you have a question about MachineShop Shell, be sure to complete the following steps:**

1. Consult the appropriate documentation included with the MachineShop Shell.
2. Check the online help. The MachineShop Shell has extensive online help facilities that cover all aspects of the product.

If you cannot find a solution using one of the above sources, contact CTC's Product Technical Support department at 513-248-1714, 8:00 a.m. to 5:00 p.m., EST. You may call this same number after hours for emergency assistance.

### Training and New Business Development

Our Training and New Business Development department provides service in two areas: training and consulting. CTC offers training on all our products either at CTC 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, machine control 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 Application Engineering Services group. Whether you need help writing a program for MachineLogic™ PC-based Logic control, developing screens for Interact HMI or connecting our products to other devices, CTC's Application Engineering Group will advise and work with your people to provide the right solution. You can contact Application Engineering Services by phone at 1-800-233-3329 or by email at appeng@ctcusa.com.

### Product Support Program

The Product Support Program (PSP) is designed to keep you up-to-date with the current version of MachineShop 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. Single-user, site, and corporate licenses are available. The PSP is an easy, cost-effective way to automatically receive the most recent Interact software and the associated utilities. You can contact the PSP Coordinator by phone at 1-800-233-3329 or by email at psp@ctcusa.com.

Chapter 2

# Introducing MachineShop Shell

The MachineShop Shell (referred to as “the Shell” throughout this manual) is the primary user interface for runtime workstations. The Shell was developed in conjunction with MachineShop to provide essential communication functions between a development system running the MachineShop Toolbar and a runtime workstation running the Shell. These communication functions include downloading and uploading files and projects and creating and restoring remote backups. The Shell also provides support functions for configuring and maintaining the runtime workstation.

This chapter introduces you to the MachineShop Shell and its components. It also includes information about getting around the user interface and how to get help.

## Chapter Contents

## Shell Basics

The MachineShop Shell interfaces with the PowerStation, or other runtime workstation, and its installed components (hardware and software). The Shell displays detailed information about the workstation and allows you to monitor and configure many of the workstation's hardware and software settings.

The purpose of the Shell is to simplify navigation and configuration of the workstation from a central source. It is designed to reduce the number of steps to perform a task and to minimize the complexity of the system.

The Shell must be able to download MachineShop projects from your development system to the runtime workstation on which the Shell is running.

### Navigating the Shell

You can navigate and make selections within the MachineShop Shell by using the touchscreen, or an attached mouse or keyboard.

#### Using the Touchscreen

When using the touchscreen, press on a selection area (such as a button) to make a selection. Throughout this documentation it is assumed you are using the touchscreen to navigate the Shell and to make selections.

#### Using the Mouse

To use a mouse, move the cursor over a selection area or button, and click to make the selection.

#### Using a Keyboard

To make a selection with a keyboard, press the key on the keyboard that corresponds to the hot key, or highlighted letter, on a displayed menu button. This will select and activate the selection at the same time. For instance, to select the **E**XIT button on the main menu, press the **E** key on the keyboard.

Some submenu options do not have hot keys. In these cases you can use ENTER to select the option and ESC to cancel the option.

You can also use the TAB and arrow keys to move the cursor on the screen to a selection area or button. Press the TAB key to cycle the cursor forward through the screen. To reverse the direction of the cursor, press SHIFT+TAB. Press ENTER when the cursor is over a selection to make the selection.

### Moving between screens

Screens that are longer than one page will display a set of small up and down arrows in the upper right section of the Shell screen in the Title Area. These arrows scroll to information that cannot fit inside the standard display area.

**To scroll to another screen, complete one of the following steps:**

- Press the arrow on the touchscreen.
- Move the cursor over an arrow and click the mouse button.
- Press the PAGE UP and PAGE DOWN buttons on the keyboard.

Whenever information is displayed in an additional screen or whenever you access a menu other than the main menu, a BACK button will display below the Help button. Press this button or press B on a keyboard to go back to the previous screen.

**To exit or cancel a selection, complete one of the following steps:**

- Press the touchscreen on an area outside the displayed menu.
- Press the ESC key on the keyboard.

## Shell Keypads

Menu options that require input values will automatically display an onscreen pop-up keypad.

**To use the keypad, complete the following steps:**

1. Enter values by selecting the keypad number on the screen.

2. Do one of the following:
   - Select ENTER to input the displayed value.
   - Select BACKSPACE to clear the last number displayed in the keypad pop-up.
   - Select ESC to cancel the keypad selection and exit the keypad screen.

### System Control Status

During certain remote operations, the development station used to manage the runtime workstation will temporarily disable operation of the Shell. Examples of remote operations include file transfers, project backup and restore, and system information checks.

When a remote operation occurs, a status screen will display on the runtime workstation. This screen will continue to display until the operation is finished or aborted.

### Getting Help

To obtain online help on a selection, press the F1 function key, or press the HELP button above the main menu. A page of text is displayed in the display area of the screen.

To exit a Help screen and return to the previous screen, select the BACK button located below the Help button.

## Shell User Interface

The MachineShop Shell screen appears in the center of the screen and is capable of displaying up to 256 colors, depending on the installed video system. The Main Menu of the MachineShop Shell is displayed below:


The screen is organized into five major components:

- Title Area - The Title Area is an open line across the top of the screen that can display a company name or logo.
- Help Button - The Help Button is located on the left side of the screen above the Main Menu. It allows you to obtain context-sensitive help for a displayed menu or submenu.
- Menu Buttons - There are six vertically aligned menu buttons on the left side of the screen below the Help button. The selections that these buttons offer changes as you navigate through the Shell.
- Submenu - The Submenu is a group of horizontal buttons that typically appear when you press a menu button on the Main Menu. These submenus give you additional workstation information and configuration options.

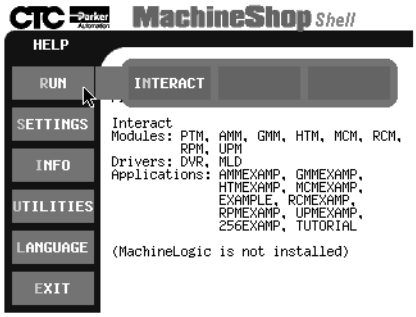
- Display Area - The Display Area is the section of screen located to the right of the menu buttons. The Display Area displays information pertaining to the menu and submenu options as well as the Help. This information changes as the menu buttons change, according to the user's selections.

## Shell Main Menu

The menu buttons on the Main Menu are the primary method for navigating through the Shell options. This section provides a description of each menu button on the Shell Main Menu.

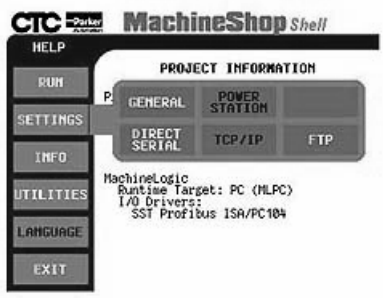
### Run

The Run menu button allows you to execute Interact directly from the Shell. When the Interact runtime session is completed, you are returned to the Shell. An example of the Run submenu is shown below.



### Settings

The Settings menu button allows you to view and edit various Shell and PowerStation configuration options. An example of the Settings submenu is shown below:




- **General** - This option displays current configuration settings and allows you to modify general runtime settings including whether Interact or the Shell will launch on start up, enabling MachineLogic at start up, selecting the display type for non-CTC workstations, and setting the workstation's internal time and date.
- **PowerStation** - This option displays current PowerStation settings. It also allows you to calibrate the touchscreen, perform a keyboard test, adjust the brightness and contrast levels of the screen (if available), and program the Shift and Select keys on a P5 PowerStation.

  **Note** The PowerStation option will be displayed only if the Shell is running on a PowerStation.

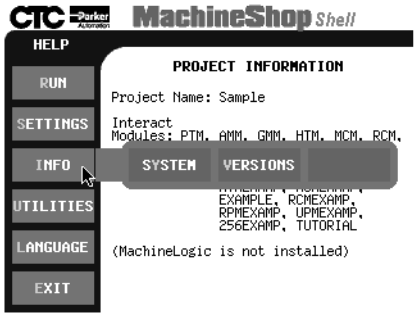
- **Direct Serial** - Direct Serial communication supports communication between a development system and a runtime workstation that are connected to each other by a null modem serial cable. This option lets you transfer MachineShop project files to the runtime workstation.
- **TCP/IP -** This option is used to display and configure the TCP/IP settings (IP address, host name, etc.)

for the runtime workstation. You may configure up to three TCP/IP connections.

- **FTP** - This option is used to display and configure the File Transfer Protocol (FTP) settings for the runtime workstation. You can optionally assign a user name and password in order to perform project transfers using FTP.

### Info

The Info menu button allows you to view information about the current hardware and software installed on the unit. An example of the Info submenu is shown below.

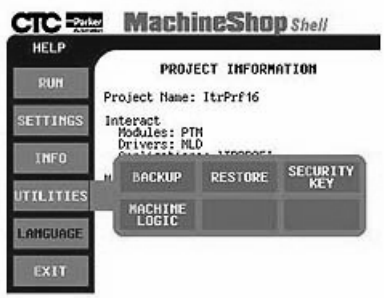



- **System** - This option displays information about the processor, the amount of available conventional and extended memory, the logical drive assignment, and the port address assignments for all printer and serial ports in the workstation.
- **Versions** - This option displays version numbers for the Interact Application Manager, Modules, and Drivers. It also displays the version number for MachineLogic, support software, and workstation software.

### Utilities

The Utilities menu button allows you to manage projects and to configure various hardware and software components including the Interact Security Key and MachineLogic. An example of the Utilities submenu is shown

below.




**Note** The Backup option is only available if a project has been downloaded to the runtime workstation. The MachineLogic option is only available if MachineLogic is included in the downloaded project.

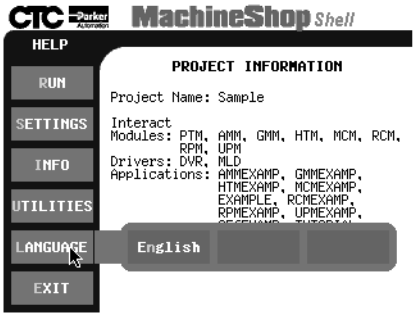
- **Backup** - This option allows you to archive the current project to a selected path. Backups are automatically compressed using the zip compression method. It also allows you to configure or edit the project backup path(s).
- **Restore** - This option allows you to restore an archived backup project from a selected path. When you restore a project, the archived project is automatically decompressed and loaded on the unit. It also allows you to configure and edit the project restore path(s).
- **Security Key** - This option displays software security key information and lists the enabled software components installed on the runtime workstation. It also allows you to enable and transfer key options between Security Keys.
- **MachineLogic** - This option displays information about MachineLogic. This includes the runtime target (MLPC or MLSC), system and I/O device errors, and tasks included in the MachineLogic project. It

also allows you to configure the MLCA and the MLSC, depending on which you have installed.

**Note** For more information about the MLPC (MachineLogic PC Control) with the MLCA (MachineLogic Control Adapter), and the MLSC (MachineLogic Slot Card), see Chapter 6.

### Language

The Language menu button lets you to select the language used by Shell to display text and online help files. An example of the Language submenu is shown below.




**Note** Only languages with language files detected by the Shell will display in the menu.

### Exit

Select the Exit menu button to exit MachineShop Shell and return to DOS. Before exiting the Shell, a submenu appears asking you if you really wish to exit the Shell. To cancel the Exit selection, press No or select an area outside of the submenu.

Chapter 3

# System Administrator Functions

The MachineShop Shell lets you configure various features for using the runtime workstation with Interact and MachineLogic. This chapter will show you how to use MachineShop Shell to perform project-related tasks including backup and restore operations as well as other system administrator functions. It contains both descriptive information and step-by-step instructions.

## Chapter Contents

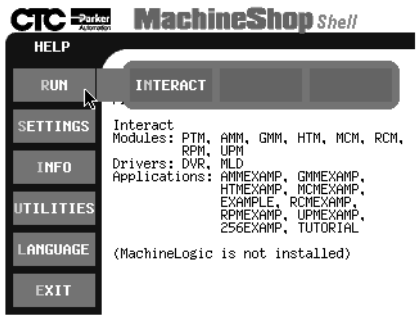
## Launch Interact from the Shell

You may launch Interact directly from the Shell. When the Interact runtime session is completed, you are returned to the Shell.

**To launch Interact from the Shell, complete the following steps:**

1. Select the **RUN** button from the Main Menu.

   The Run submenu appears.




2. Select the **INTERACT** button.

   **Note** You may also configure Interact to automatically load when the runtime workstation is started. See the following topic, Startup Program, for details.

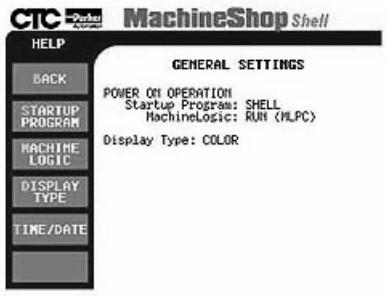
## Startup Program

You may select whether Interact or the Shell will run after you power on the runtime workstation. You may change the startup program at anytime, but the change will not take effect until you reboot the runtime workstation.

**To configure the Startup Program, complete the following steps:**

1. Select the **GENERAL** button from the Settings submenu.

   The General Settings screen appears. Note that if you have the MLSC installed, the MachineLogic entry says MLSC rather than MLPC.




2. Select the **STARTUP PROGRAM** button.

   The submenu appears.

3. Select one of the following buttons:
   - **INTERACT** - Interact is automatically loaded without interaction from the user when you reboot the runtime workstation. When you exit Interact, the Shell Main Menu is displayed. This selection is useful if a power cycle should occur because the runtime workstation would automatically run Interact when the power is restored.
   - **SHELL** - The Shell is loaded and the Shell Main Menu is displayed when you reboot the runtime workstation.

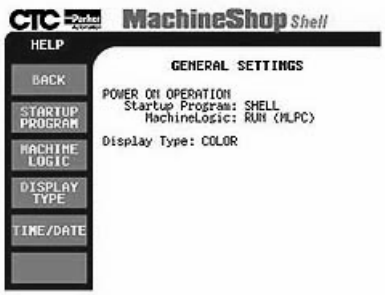
## Enabling MachineLogic

Normally you want MachineLogic to run when you reboot the runtime workstation. Sometimes, however, such as when you are troubleshooting, you do not want MachineLogic to run. Use this menu option to control how MachineLogic behaves when the runtime workstation is rebooted.

**To enable and disable MachineLogic when you reboot the runtime workstation, complete the following steps:**

1. Select the **GENERAL** button from the Settings submenu.

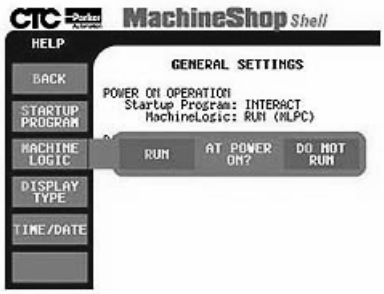
   The General Settings screen appears. Note that if you have the MLSC installed, the MachineLogic entry says MLSC rather than MLPC.



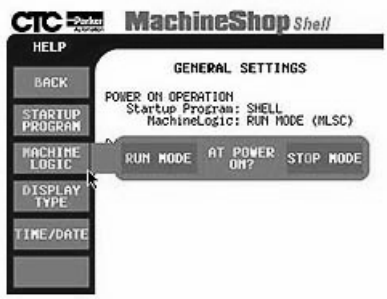

2. Select the **MACHINELOGIC** button.

   The MachineLogic submenu appears. If you have the

MLPC (MachineLogic PC Control) installed, the submenu looks like the following:




If you have the MLSC (MachineLogic Slot Card) installed, the submenu looks like the following:.




3. For the MLPC, select one of the following buttons:
   - **RUN** - The MachineLogic runtime kernel is automatically loaded (warm start) and executed when you reboot the run-time system.
   - **DO NOT RUN** - The MachineLogic runtime kernel is NOT loaded and is NOT executed when you reboot the runtime workstation.

   **Note** The Shell modifies the MACHLOG.INI file based on the selection. See *Appendix A* for details on the MACHLOG.INI file.

For the MLSC, select one of the following buttons:

- **RUN MODE** - The MachineLogic runtime kernel enters run mode when you reboot the runtime workstation.
- **STOP MODE** - The MachineLogic runtime kernel enters stop mode when you reboot the runtime workstation.

**Notes** The MLSC always runs whenever you power on the runtime workstation. You select whether it enters run mode or stop mode.

The Shell modifies the MLSC itself. An INI file is not required.

## Configure the Display Type

The Shell allows you to select the type of display (color, monochrome LCD, or EL) for the runtime workstation. This is helpful when you need to adjust the colors on your display. The default setting is color.

> **Note** The Display Type option is only available for non-CTC workstations.

**To configure the display type, complete the following steps:**

1. Select the **DISPLAY TYPE** button from the General Settings menu.

   The Display Type submenu appears. Note that if you have the MLSC installed, the MachineLogic entry says MLSC rather than MLPC.


2. Select one of the following buttons:
   - **COLOR -** supports 16-color VGA or 256-color Super VGA
   - **MONO** - supports 16-shade (Black & White) Monochrome
   - **EL -** supports 16-shade Electroluminescent Monochrome

# Set System Time and Date

The MachineShop Shell allows you to reset the runtime workstation time and date.

## Setting the Time

**To reset the runtime workstation time, complete the following steps:**

1. Select the **TIME/DATE** button from the General Settings menu.

   The Time/Date submenu appears.


2. Select the **TIME** button.

   The Time keypad appears with the Current Time displayed.


**Note** Time is recorded as hours, minutes, and seconds in 24-hour style. For example, the time shown in the illustration above, 15:46:49, is 3:46:49 p.m.

3. If you want to reset the system time, use the keypad to enter the new time in the blank field. Enter hours, minutes, and seconds, separating each element with a colon. Remember to use 24-hour style.


**Note** You needn't use zeroes in single-digit entries. For example, you can enter 02:05:05 as **2:5:5**. Use the **BACK** button to erase any part of your entry. You can exit to the General Settings menu at any time by selecting **ESC** on the keypad, or by pressing the **Esc** key on your keyboard.

4. When you have entered the new time setting, select **ENTER** on the touchscreen, or press the **Enter** key on your keyboard.

### Setting the Date

**To reset the runtime workstation date, complete the following steps:**

1. Select the **TIME/DATE** button from the General Settings menu.

The Time/Date submenu appears.


2. Select the **DATE** button.

   The Date keypad appears with the Present Date displayed.

3. If you want to reset the system date, use the keypad to enter the new date in the blank field. Enter the month, day, and year, separating each element by a slash (/).


**Note** You needn't use zeroes in single-digit entries. For example, you can enter the date used in the example above, March 1, 2001, as **3/1/01**. You need only use the last two digits for year 2000 dates and higher. Use the **BACK** button to erase any part of your entry. You can exit to the General Settings menu by selecting **ESC** on the keypad, or by pressing the **Esc** key on your keyboard.

4. When you have entered the new date setting, select **ENTER** on the touchscreen, or press the **Enter** key on your keyboard.

## Create and Restore Backups

A backup contains all of the necessary files for one particular project on one particular runtime workstation. To save space, these files are compressed into a collection of files with predefined names. Projects are compressed into a subdirectory with the same name as the project. Below is an example of the backup directory structure.

```
<Backup Path>\
    <Project Name>\
     $app$.zip
     $itr$.zip
     $ml$.zip
     $ml-app$.zip
     $ms$.zip
     control.xxx
```

By backing up your project, you can later restore the entire project to the runtime workstation. When the project is restored, all of the files in the compressed project are automatically extracted.

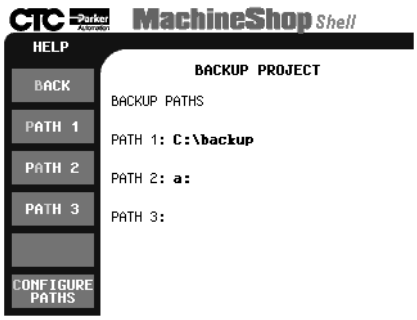
### Creating a Backup

You may select one of three pre-configured paths as the subdirectory location for performing the backup.

**To back up a project loaded on the workstation, complete the following step:**

1. Select the **BACKUP** button from the Utilities submenu.

   The Backup Projects screen appears:

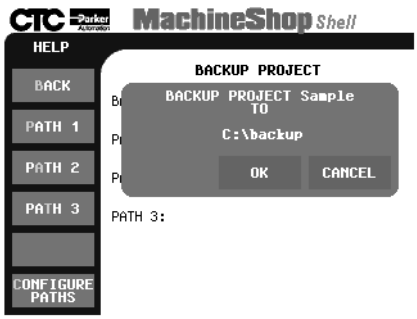


The paths are shown in the display area. These paths are configured under the “Configure Paths” option.

**Note** If you have not configured a backup path, or need to edit a path, see *Configuring a Project Backup Path* on page 30 for instructions.

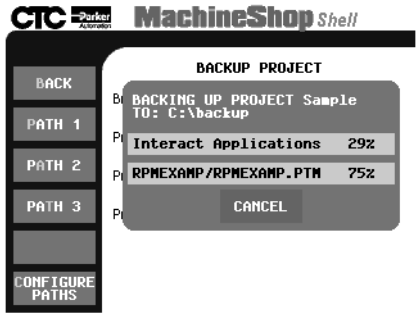
2. Select one of the **PATH** buttons from the Backup menu.

   A confirmation pop-up appears.




3. Select the **OK** button to begin the backup of the project in the subdirectory path.

The status screen appears.




**Note** If you have the MLSC installed, you should copy the project files from the MLSC to the workstation prior to performing the backup. This is because the files on the MLSC may be different than those on the runtime workstation. To copy the project files, select **MachineLogic** from the **Utilities** menu, select **Project Files**, and then select **Copy From Slot Card**.

4. You may abort the backup operation at anytime by selecting the **CANCEL** button from the status screen.

   **Note** If a problem occurs during the backup, an error message will be displayed on the screen.

5. Select the **OK** button when the backup operation has finished.

### Configuring a Project Backup Path

Before you backup the loaded project from the runtime workstation, you may need to configure or edit the backup path. The backup path is the subdirectory where the compressed project is stored.

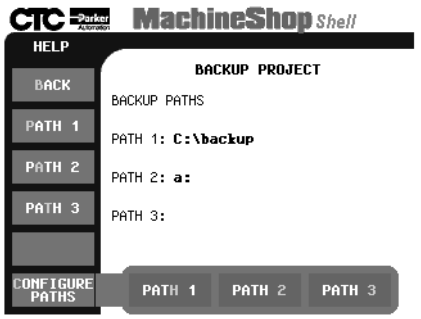
You may configure up to three paths.

**Note** A keyboard is required to input a path setting. Only valid DOS characters can be used for a path setting. The [DELETE], [HOME], [END], [BACKSPACE], [LEFT ARROW] and [RIGHT ARROW] keys are supported for editing the path.

**To configure a project backup path, complete the following steps:**

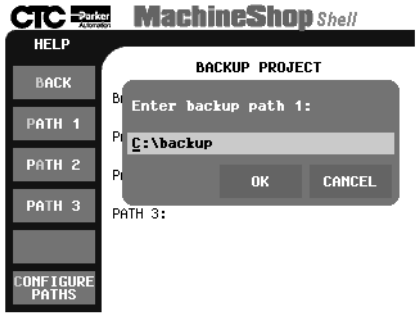
1. Select the **CONFIGURE PATHS** button from the Backup menu.

   The Configure Path submenu appears.




2. Select one of the PATH submenu buttons (1,2, or 3).

   The backup path entry screen appears.




3. Enter the backup path using an attached keyboard.

4. Select the **OK** button to accept the path configuration.

   **Note** A backup path cannot be verified until an actual backup is performed. If there is a problem during the backup operation, an error message will be displayed on the screen.

## Restoring a Project

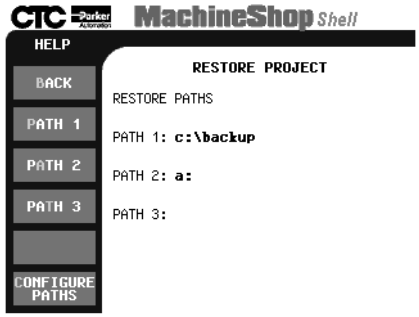
When a project is restored, the project files are retrieved from the compressed backup and loaded into the runtime workstation.

You may select one of three pre-configured paths as the subdirectory for performing the restoration.

**To restore a project, complete the following step:**

1. Select the **RESTORE** button from the Utilities submenu.

   The Restore Project screen appears.




   The paths are shown in the display area. These paths are configured under the Configured Paths option.

   **Note** If you have not configured a restoration path, or need to edit a path, see *Configuring a Restoration Path* on page 34 for instructions.

2. Select one of the **PATH** buttons.

   A menu of compressed projects for the selected path

appears.


3. Select the project to restore from the menu.

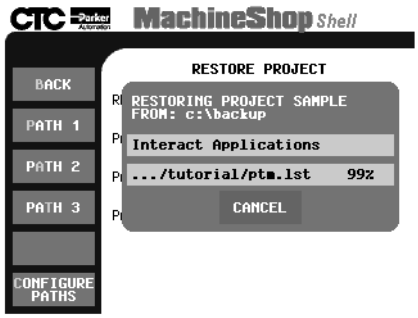
   A confirmation pop-up appears.

4. Select the **OK** button to begin the restoration from the displayed path.

   **Note** If you have a project loaded on the workstation, a pop-up will appear to notify you that your current project will be erased. Select OK to continue the restoration.

   **Note** If you have the MLSC installed, restoring a project extracts the project files to the runtime workstation but **does not** transfer them to the MLSC. After performing a restore you should then copy the project files to the MLSC. To copy the files, select **MachineLogic** from the **Utilities** menu, select **Project Files**, and then select **Copy To Slot Card**.

A status screen appears.




5. You may abort the restore operation at any time by selecting the **CANCEL** button from the status screen.

   **Note** If you abort the restore operation, there will be no project loaded on the workstation.

   On success, a pop-up appears asking if you wish to reboot the workstation.

6. Select the **YES** button to allow changes to take effect.

### Configuring a Restoration Path

Before you restore projects files to the runtime workstation, you may need to configure or edit a restoration path. This is the subdirectory where the archived project is stored. You may configure up to three restoration paths.

**Note** A keyboard is required to input a path setting. Only valid DOS characters can be used for a path setting. The [DELETE], [HOME], [END], [BACKSPACE], [LEFT ARROW] and [RIGHT ARROW] keys are supported for editing the path.

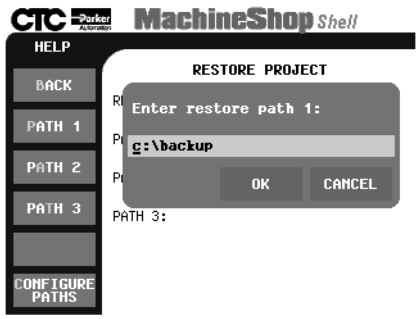
**To configure a restoration path, complete the following steps:**

1. Select the **CONFIGURE PATHS** button from the Restore menu.

   The Configuration Paths submenu appears.

2. Select one of the PATH submenu buttons (1,2, or 3).

   The restore path entry screen appears.




3. Enter the restore path using an attached keyboard.
4. Select the **OK** button to accept the configuration path.

   **Note** A restoration path cannot be verified until an actual restoration is performed. If there is a problem during the operation, an error message will display.

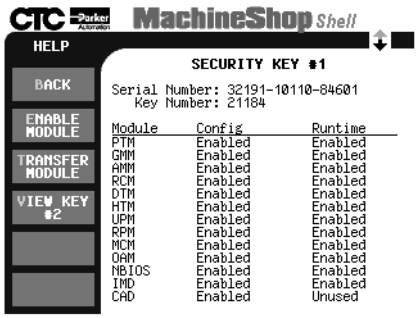
## Security Keys

The Shell allows you to program your Security Key. You may enable individual key options or transfer security key options between keys. The Shell also displays security key information (Serial Number and Key Number) and installed module information for the security key(s) attached to the workstation.

**To display security key information, complete the following step:**

- Select the **SECURITY KEY** button from the Utilities submenu.

  The Security Key screen appears.




The Shell automatically scans and detects if a security key is attached to the workstation. If a key is detected, the display area shows the serial and key number, the Interact modules, and the features that are enabled in the Runtime Key. The display area also lists the module's acronym followed by its status: Runtime, Config, or Transferred.

**Note** If you have a second security key, you can view security key information and installed module information for that security key by selecting the VIEW KEY #2 option from the Security Key screen.

**Note** On PA PowerStations, Enable Module is the only available option.

### Enable Software Options

When you order additional software, you will receive a Module Enable Code Certificate listing enable codes for each software option purchased. These enable codes are used to activate the respective software options on the Security Key.

**To enable software options, complete the following steps:**

1. Select the **ENABLE** button from the Security Key menu.

   The pop-up keypad appears.

2. Enter a valid 8-digit code for the selected module on the keypad.

3. Select the **ENTER** key to accept the code.

If the code is valid, the module will be enabled and the status will be updated in the display area. If the enable code is invalid, an error message will be displayed.

### Transfer Enabled Options Between Keys

Enabled software options may be transferred from one key to another. You must have two keys in order to transfer enabled options and you may not transfer a module to another key that has the same module enabled.

> **Note** Once an option has been transferred, it may be moved to its original key only.

**To transfer options from one security key to another, complete the following steps:**

1. Select the **TRANSFER MODULE** button from the Security Key menu.

The Transfer Module submenu appears.


2. Select one of the following buttons:

   - **FROM KEY #1**- Transfers an enabled module from the first key to a second attached security key.
   - **TO KEY #1**- Transfers an enabled module from the second key to the first security key attached to the runtime workstation.

   The menu of available modules appears.


3. Select a module you want to transfer from the list of available modules.

Use the Next button on the menu to view additional modules.

The Transfer Type submenu appears.


4. Select one of the following buttons:
   - **CONFIG -** Transfers the configuration component of the Interact module.
   - **RUNTIME** - Transfers the runtime component of the Interact module.
   - **DEVELOPMENT** - Transfers both the configuration and runtime components of the Interact module.

If there are any problems with the module selection or transfer, an error message will be displayed.

## Add Language Files

You may choose the language used by the Shell to display screen text and online help. The language availability depends on the installed language files that are detected by the Shell.

The text for the Shell is stored in two files: PSU.TXT and PSU.HLP. The PSU.TXT file contains the menus and screen text, and the PSU.HLP file contains the help text.

**To add your own language file to the workstation, complete the following steps:**

1. Enter MS-DOS mode.
2. Copy the screen text file (PSU.TXT) and the online help file (PSU.HLP) to PSULANG.XXX and PSUHELP.XXX respectively.

   XXX is an arbitrary extension. It is helpful to use an extension that indicates the language.
3. Open the PSULANG file.

   An example of a PSULANG file is shown below.

```
<Application>
        <Name>Teflon</Name>
        <Comment>The Non-Stick Shell</Comment>
        <Version>EX-83073-100f</Version>
        <Language>French</Language>
</Application>
<Strings>
        <Text ID="1001">ERROR: Insufficient graphical capability.</Text>
        <Text ID="1002">ERROR: Unable to setup graphics mode.</Text>
        <Text ID="1003">ERROR: Could not find a valid mouse driver.</Text>
        <Text ID="1004">ERROR: Mouse initialization failed.</Text>
        <Text ID="1005">ERROR: Application initialization failed.</Text>
        <Text ID="1006">ERROR: Invalid filename.</Text>
        <Text ID="1007">ERROR: Memory allocation failure.</Text>
        <Text ID="1008">ERROR: XML parser general failure.</Text>
        <Text ID="1009">ERROR: Invalid Arguments.</Text>
        <Text ID="1010">ERROR: Cannot open file.</Text>
        <Text ID="1011">ERROR: Error while reading from file.</Text>
        <Text ID="1012">ERROR: Invalid XML format encountered.</Text>
```

4. Enter the language that the file contains at the Language parameter (in the Application section).

   For example, if the language is French then the parameter would be as follows:

   <LANGUAGE>FRENCH</LANGUAGE>
5. Translate the text located between each XML Text start-tag and the corresponding XML Text end-tag.

   For example, translate the following string:

```
<Text ID="1688">Note enough keys found for
transfer.</Text>
```

where <Text ID="1688"> is the XML start-tag and </Text> is the XML end-tag.

If the language is French, the string looks like the following:

```
<Text ID="1688">Pas assez de clés ont trouvé pour
le transfert.</Text>
```

6. Save the changes and close the file.

   The Language submenu will display the new language when the Shell is loaded.

7. Open the PSUHELP file and repeat steps 4 - 6.

8. Start the Shell and select the language from the Language submenu.

   All screen text and online help will be displayed in the selected language.

   **Note** The Shell will load the first occurrence of the language files if duplicate language names are found.

Chapter 4

# Maintaining the PowerStation

This chapter will show you how to use MachineShop Shell to calibrate the touchscreen, perform a keyboard test, adjust the brightness and contrast levels of the PowerStation display, and configure the Shift and Select keys on a P5 PowerStation.

If you are not running the Shell on a PowerStation, you may skip this chapter.

## Chapter Contents

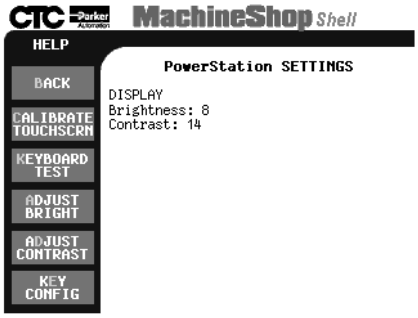
## Calibrate the Touchscreen

The PowerStation's touchscreen is calibrated prior to being shipped from CTC. 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.

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

1. Select the **POWERSTATION** button from the Settings submenu.

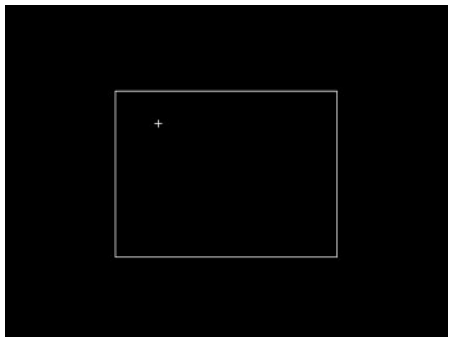
   The PowerStation Settings screen appears.




2. Select the **CALIBRATE TOUCHSCRN** button.

   The calibration routine will run automatically.

3. Use your finger to touch the + on the screen.



4. Repeat the previous step two more times. Each time you touch the + you will hear a faint beep to indicate that the touch has been accepted.

   After the third time, your touchscreen will be calibrated.

**Important** If you calibrated the touchscreen and the cursor moves vertically when your finger moves horizontally on the screen or vice versa, the touchscreen cable may not be connected to the motherboard properly. Call a CTC customer support representative.

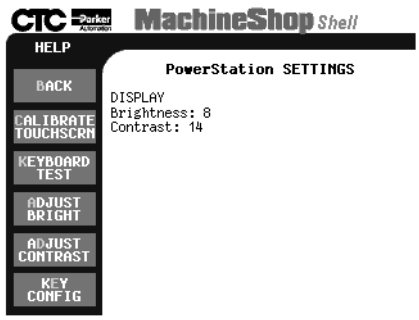
## Perform a Keyboard Test

You may test the keyboard connected to the PowerStation by selecting the Keyboard Test option from the PowerStation Settings menu.

**To test the keyboard, complete the following steps:**

1. Select the **PWRSTA** button from the Settings submenu.

   The PowerStation Settings screen appears.




2. Select the **KEYBOARD TEST** button.

The Keyboard Test screen appears.


3. Press any key on the keyboard.

   The PowerStation will display the text string in the Key Press field. Confirm that the text string matches the pressed key.

4. To exit the keyboard test, select the **ESC** button or press the **ESC** key twice.

## Adjust the Brightness Level

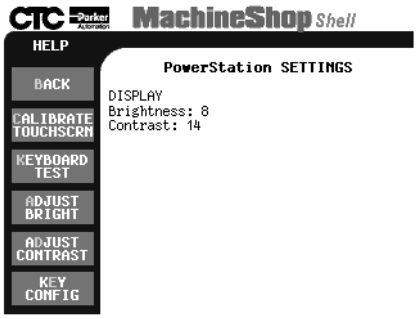
You may manually change the brightness level of the PowerStation touchscreen display. You can either Decrease or Increase the screen brightness.

**Note** This option is not available for all PowerStations or touchscreen displays.

**To adjust the brightness level of your display, complete the following steps:**

1. Select the **PWRSTA** button from the Settings submenu.

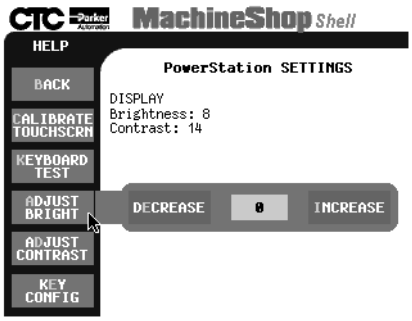
   The PowerStation Settings screen appears.




2. Select the **ADJUST BRIGHT** button.

   **Note** This option may not be available depending on the PowerStation or display type.

The Adjust Brightness submenu appears.




3. Select one of the following buttons:
   - **DECREASE** - decreases the screen brightness
   - **INCREASE** - increases the screen brightness

Each click on a selection will increase or decrease the brightness setting by one.

## Adjust the Contrast Level

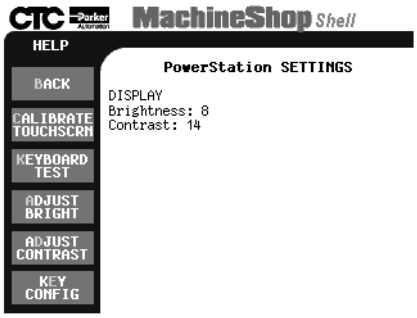
You may manually change the contrast level of the PowerStation touchscreen display. You can either Decrease or Increase the screen contrast.

> **Note** This option is not available for all PowerStations or touchscreen displays.

**To adjust the contrast level of your display, complete the following steps:**

1. Select the **PWRSTA** button from the Settings submenu.

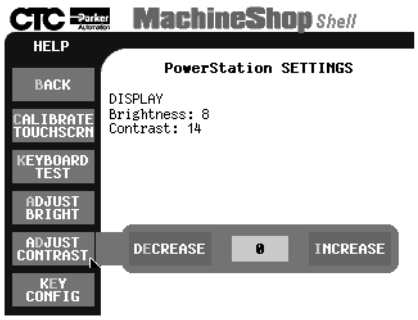
The PowerStation Settings screen appears.




2. Select the **ADJUST CONTRAST** button.

   **Note** This option may not be available depending on the PowerStation or display type.

   The Adjust Contrast submenu appears.



3. Select one of the following buttons:
   - **DECREASE** - decreases the screen contrast
   - **INCREASE** - increases the screen contrast

Each click on a selection will increase or decrease the contrast setting by one.

## Configure the Shift Key

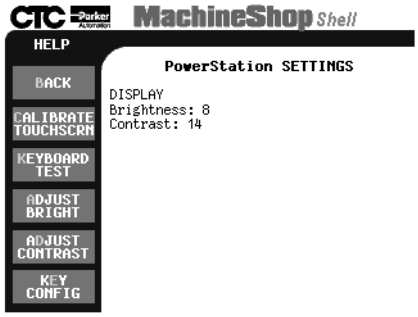
You may manually change the configuration of the Shift key, located on the faceplate of the P5 PowerStation.

> **Note** This option is only available for P5 PowerStations.

**To configure the Shift key on your P5 PowerStation, complete the following steps:**

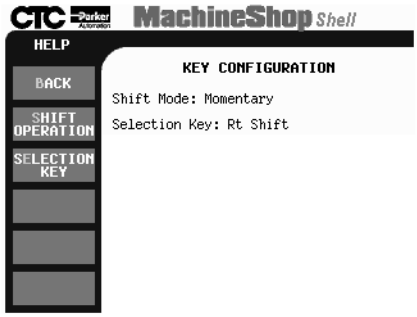
1. Select the **PWRSTA** button from the Settings submenu.

   The PowerStation Settings screen appears.



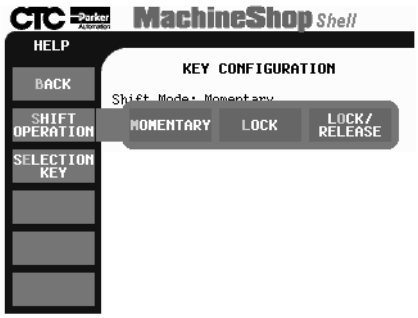

2. Select the **KEY CONFIG** button.

The Key Configuration screen appears.




3. Select **SHIFT OPERATION**.

   The Shift Operation submenu appears.




4. Select one of the following buttons:

- **MOMENTARY** - When you press and hold the Shift key, you have access only to the F21-F40 function keys. When you release the Shift key, you automatically regain access to F1 through F20.
- **LOCK** - When you press the Shift key, it locks, allowing access only to the F21 through F40 function keys. To regain access to F1 through F20, you must press the Shift key again to release the lock.
- **LOCK/RELEASE** - When you press the Shift key, it locks, allowing access to F21 through F40, only

until you press and release any other key.

**Note** An indicator on the faceplate is lit whenever the Shift key is activated or in the locked mode.

## Configure the Select Key

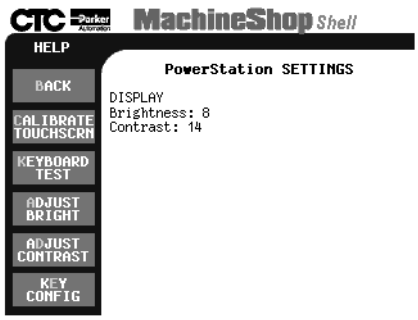
You may configure the Select key that appears on the faceplate of the P5 PowerStation, so that while you are in Interact, it acts as the key of your choice.

**Note** This option is only available for P5 PowerStations.

**To change the configuration of the Select key on your P5 PowerStation, complete the following steps:**

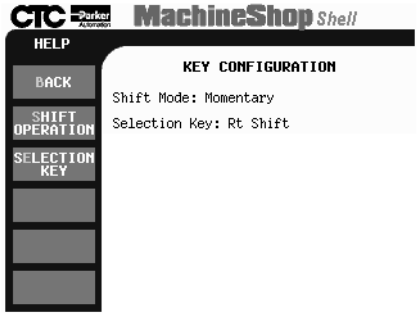
1. Select the **PWRSTA** button from the Settings submenu.

   The PowerStation Settings screen appears.



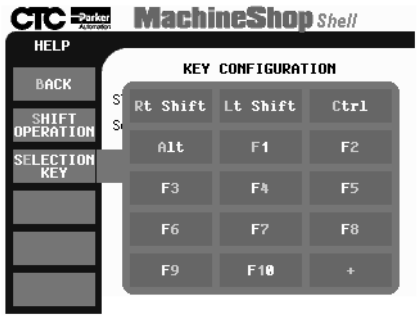

2. Select the **KEY CONFIG** button.

The Key Configuration screen appears.




3. Select the **SELECTION KEY** button.

   The Selection Key submenu appears.




4. Choose a keyboard key from the submenu. The Select key on the P5 PowerStation faceplate will act like the key you have chosen, while you are in Interact. The following selections are available: Right Shift (default), Left Shift, Ctrl, Alt, F1 through F10, and Keypad +.

Chapter 5

# Preparing for Transfers

The Shell is used by the runtime workstation to receive Interact and MachineLogic files transferred from a development system running the MachineShop Toolbar. This chapter describes how to prepare the Shell for file transfers. It includes setting up a Direct Serial, serial PPP, LAN, and an Ethernet point to point connection.

This chapter also includes instructions on how to download projects to the runtime workstation and create remote backups using the MachineShop Toolbar. For a more complete discussion on MachineShop, refer to the *MachineShop Getting Started Guide*.

## Chapter Contents

## Configure the TCP/IP Settings

MachineShop (the Shell and Toolbar) uses the industry standard TCP/IP protocol to communicate over Ethernet, serial PPP, and internet connections.

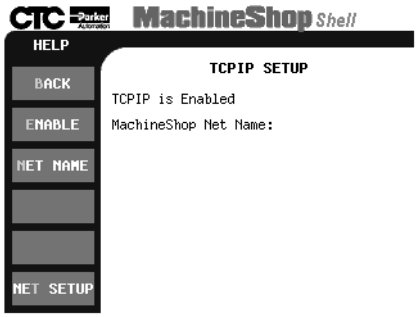
Use the TCP/IP settings to configure the various Ethernet ports (or connections) in the runtime workstation. You can use these connections to communicate with the development system and for other purposes such as communicating with I/O.

The TCP/IP settings include the IP address, IP mask, host name, port address, IRQ, and baud rate for serial PPP connections. These settings must be configured before you can transfer files between the runtime and development systems.

**To access the TCP/IP settings, complete the following step:**

1. Select the **TCP/IP** button from the Settings submenu.

   The TCP/IP Setup screen appears.




**Note** Changes made to the TCP/IP Settings are written to the TCPIP.INI file located in the NET directory. Changes do not take effect until the runtime workstation reboots. A confirmation message will display when you exit the TCP/IP Setup screen asking if you wish to reboot the runtime workstation.

### Enabling TCP/IP

TCP/IP must be enabled (loaded into memory) on the runtime workstation in order for communication to occur.

**To enable and/or disable the TCP/IP network, complete the following steps:**

1. Select the **ENABLE** button from the TCP/IP Setup menu.

   The Enable TCP/IP submenu appears.


2. Select one of the following buttons:
   - **YES** - changes the TCPIP.INI file and loads the TCP/IP stack into memory at startup.
   - **NO** - changes the TCPIP.INI setting so that TCP/IP networking is disabled.

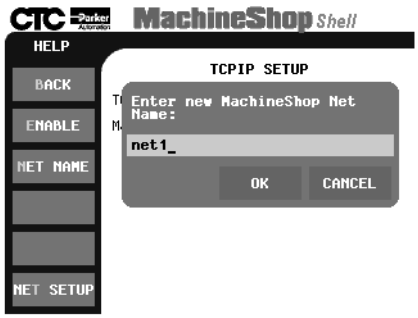
### Configure a MachineShop Net Name

The MachineShop Net Name is used by MachineShop and the development systems to identify the runtime workstations on a network. Once you assign a Net Name to your runtime workstation, the Net Name is periodically broadcast over the network using the network's DHCP capabilities. The development system receives this broadcast and identifies the runtime workstation by its IP address, which is included in the Net Name broadcast.

**To configure the MachineShop Net Name, complete the following steps:**

1. Select the **NET NAME** button from the TCP/IP Setup menu.

The MachineShop Net Name entry screen appears.




2. Enter a name in the entry screen.

   The name has a limit of eight characters and should be unique to a network.

3. Select the **OK** button to accept the new name.

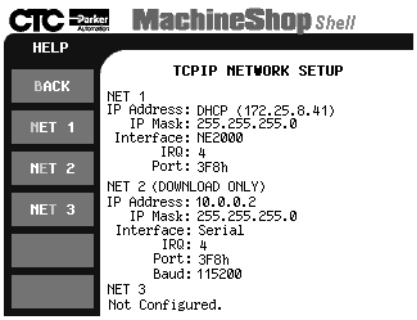
## Configure the Connection

The Net Setup option from the TCP/IP Setup menu is used to define and configure the network connection.

**To configure the network connection settings, complete the following step:**

1. Select the **NET SETTINGS** button from the TCP/IP Setup menu.

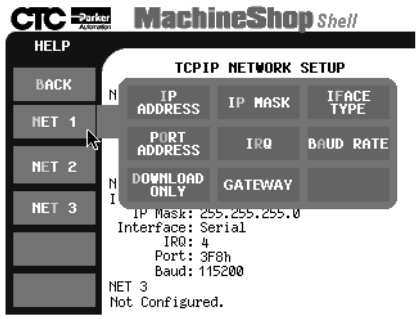
   The TCP/IP Network Setup screen appears.



The display area of the screen shows the current network connection settings. Specific settings for each connection are based on the installed Network Interface Cards.

2. Select one of the **NET** buttons (1, 2, or 3) from the Network Setup menu. You can select any of the buttons for your connection. For example you do not have to select Net 1 for your first connection.

   The Net submenu appears.




**Note** Options on the Net submenu vary according to your interface type. If your interface type does not support a particular option, it is unavailable for selection (grayed out) on the submenu.

### Select the Interface Type

Use the IFACE TYPE option from the Net submenu to select the communication interface for your network. The IFACE TYPE must match the installed network interface card for the selected NET connection.

**To select the Interface Type for a connection, complete the following steps:**

1. Select the **IFACE TYPE** button from the Net submenu.

   The Interface Type submenu appears.

2. Select one of the following buttons:

- **DISABLE** - disables the connection
- **I82557** - select this option if you have a Pentium-based runtime workstation. For use with all CTC-Parker PowerStations except the P1.
- **3C509** - select this option if you are using a 3COM 3C509 ISA Ethernet card
- **NE2000** - select this option if you are using a NE2000 compatible network interface card. For use with a P1 PowerStation.
- **Serial PPP** - select this option if you are using a serial port
- **ODI** - select this option if you are using NetBIOS networking with Interact's NBIOS driver
- **PACKET** - select this option if you are using a packet driver with your network interface card.

  **Note** Be sure to edit AUTOEXEC.BAT to launch the packet driver itself. You must specify a software interrupt for the packet driver. The software interrupt value you specify in the TCP/IP settings must match the value you use in AUTOEXEC.BAT.

  **Note** For the PA PowerStations, the only available IFACE TYPEs are ODI and I82557.

- **MLSC** - When the MachineLogic Slot Card is detected on your runtime workstation, this option is automatically selected for you.

The Interface Type submenu closes and you return to the TCP/IP Network Setup screen.

### Enter an IP Address

Use the IP ADDRESS option from the Net submenu to configure the IP Address for the connection. The IP Address is a unique address that identifies the runtime workstation to the network (using the TCP/IP protocol). It consists of two parts: a network number and a host number.

Check with your local network administrator to determine a valid IP Address to be used on your local network.

**To configure the IP Address, complete the following steps:**

1. Select the **IP ADDRESS** button from the Net submenu.

   The IP Address entry pop-up appears.

2. Enter a valid IP Address in the entry field.

   An IP Address is a series of four numbers with a value of each number between 0 and 255 separated by periods (for example, 10.0.0.2).

   Enter 0.0.0.0 if your network has Dynamic Host Configuration Protocol (DHCP) support. DHCP dynamically assigns IP addresses to workstations as needed.

   **Note** You can enter the number by using your keyboard or by using the on-screen keypad.

3. Click the **OK** button to accept the value.

The pop-up closes and you return to the TCP/IP Network Setup screen.

### Enter an IP Mask

Use the IP MASK option from the Net submenu to configure the IP Mask for the connection. The IP Mask is a locally-defined subset of IP Addresses used to identify a smaller group within a network. Each network must have a mask even if there are no subnets on the network. The mask is applied to the IP Address in every message in order to separate the network number and the host number.

The IP Mask uses the same format as an IP Address. Check with your network administrator to obtain a valid IP Mask for your local network.

**To configure the IP Mask, complete the following steps:**

1. Select the **IP MASK** button from the Net submenu.

   The IP Mask entry pop-up appears.

2. Enter a valid IP Mask value in the entry field.

   An IP Mask is a series of four numbers with a value between 0 and 255, separated by periods (for example, 255.255.255.0). The first number is always 255.

3. Click the **OK** button to accept the value.

The pop-up closes and you return to the TCP/IP Network Setup screen.

### Specify the Port Address

Use the PORT ADDRESS option from the Net submenu to configure the I/O Port Address for the selected network connection.

**To specify the Port Address for the network interface or COM port, complete the following steps:**

1. Select the **PORT ADDRESS** button from the Net submenu.

   The pop-up keypad appears.

2. Enter a valid I/O Port Address for the selected connection.

   For serial ports, COM1=3F8, COM2=2F8, COM3=3E8, and COM4=2E8

   10Base-T Ethernet Port=280

3. Select the **ENTER** button to accept the value.

The pop-up keypad closes and you return to the TCP/IP Network Setup screen.

### Select the Baud Rate

Use the BAUD RATE option from the Net submenu to select the communication speed used by the COM port to transfer data. This must match the baud rate set in the dial-up properties for the specific connection.

**To select the baud rate for the serial PPP connection, complete the following steps:**

1. Select the **NET** button from the TCP/IP Network Setup menu.

   The Network Connection submenu appears.

2. Select the **BAUD RATE** button.

   A list of transfer speeds appears.

3. Select the transfer speed from the list.

   This must match the baud rate set in the dial-up properties for the specific connection.

The list of transfer speeds closes and you return to the TCP/IP Network Setup screen.

> **Note** If you have reliability problems using the selected baud rate, try selecting a slower baud rate.

### Set the Hardware IRQ

Use the IRQ / INTERRUPT option from the Net submenu to set the hardware IRQ used by the network interface or COM port. The assigned IRQ number must match the hardware jumper settings for proper operation of the port.

**To configure the IRQ for the connection, complete the following steps:**

1. Select the **IRQ / INTERRUPT** button from the Net submenu.

   The Select Network Interface IRQ pop-up appears.

2. Select the keypad number on the screen to enter the IRQ value.

   The value set on the keypad must match the value configured on the installed hardware card or COM port.

   For serial ports, COM1=4, COM2=3, COM3 and COM4=variable setting

   PowerStation 10Base-T Ethernet Port=10

The pop-up keypad closes and you return to the TCP/IP Network Setup screen.

### Set the Software Interrupt

Use the IRQ / INTERRUPT option from the Net submenu to set the software interrupt used by the network interface or COM port. The assigned interrupt number must match the hardware jumper settings for proper operation of the port.

**To configure the interrupt for the connection, complete the following steps:**

1. Select the **IRQ / INTERRUPT** button from the Net submenu.

   The Select Network Interface IRQ pop-up appears.

2. Select the keypad number on the screen to enter the IRQ value.

   The value set on the keypad must match the value configured on the installed hardware card or COM port.

   For serial ports, COM1=4, COM2=3, COM3 and COM4=variable setting

   PowerStation 10Base-T Ethernet Port=10

The pop-up keypad closes and you return to the TCP/IP Network Setup screen.

### Set to Download Only

The Download Only option applies only to serial connections and is used to keep the port from initializing until the Shell is loaded. This allows other programs (such as Interact) to use the selected connection once you exit the Shell. If you do not enable Download Only for the connection, TCP/IP will communicate over the network interface or COM port even when the Shell is not loaded.

Because other programs (such as Interact and MachineLogic) may use the serial port hardware, you may need to indicate that the serial port cannot be assigned exclusively

to the TCP/IP PPP connection. If you are using the serial port for Interact or MachineLogic, then you must enable Download Only. If the serial port is to be used exclusively as a PPP connection, then disable Download Only.

You can toggle between enabling and disabling the Download Only option.

**To enable/disable Download Only, complete the following step:**

- Select the **DOWNLOAD ONLY** button from the Net submenu.

## Entering an Internet IP Address

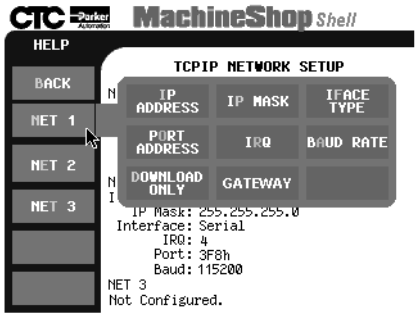
The MachineShop Shell allows you to configure your TCP/IP settings so that you can transfer projects over the Internet. You can assign an Internet address by using the **Gateway** option in your TCP/IP Network settings.

> **Note** If your runtime workstation is using a Dynamic Host Configuration Protocol (DHCP) address assigned by your server, MachineShop will ignore a Gateway IP address. You can only use a Gateway address if your workstation uses a static IP address.

**To assign a Gateway IP address, complete the following steps:**

1. From the TCP/IP Network Setup screen, select **NET 1**.

   The Net submenu appears.




**Note** The Shell check Net1 first, Net2 second, and Net3 last. The first Gateway it finds is the one it uses.

2. Select the **GATEWAY** button.

   The Gateway dialog box appears.

3. Enter the Gateway IP address in the space provided.

   **Note** See your network administrator for a valid IP address.

4. Select the **OK** button to accept the new address.

## Restrict Access to Files

The FTP option from the Settings menu allows you restrict access to the files on the runtime workstation. FTP, or File Transfer Protocol, is the method by which you transfer project files from a development system on a network to a runtime workstation on the same network.

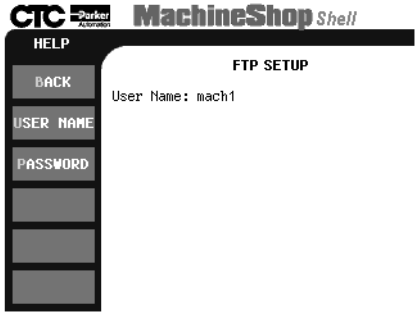
The FTP settings include a User Name and Password and are required to perform project transfers. The User Name is used to identify the name of the user that will transfer files to or from the workstation. The Password allows users access to the download capabilities of the workstation.

By default, these settings are blank. If you would like to restrict access to the files on the workstation, simply enter an FTP User Name and Password.

**To add an FTP user name and password, complete the following steps:**

1. Select the **FTP** button from the Settings menu.

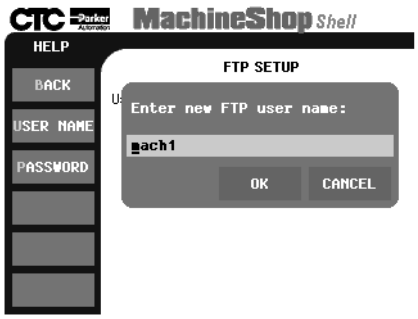
   The FTP Setup screen appears.




   The display area of the screen shows the current FTP User Name.

2. Select the **USER NAME** button from the FTP Setup menu to enter a user name.

   The FTP user name entry screen appears.

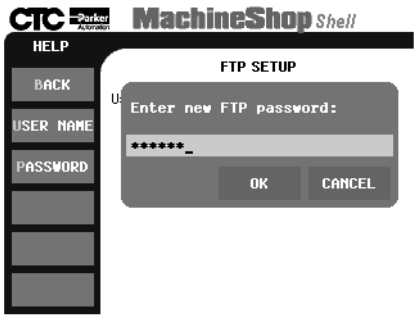



3. Enter a user name in the entry field.

   The user name has a limit of ten characters.

4. Select the **OK** button to accept the value.
5. Select the **PASSWORD** button from the FTP Setup menu to enter a password.

The FTP password entry screen appears.




**Note** If you have an existing password, you will be asked to enter the old password first. If you forget your password, open the PSU.CFG file and delete the password entry. You must then enter a new password.

6. Enter the password in the entry field.

   The Password has a limit of 20 characters and is case sensitive.

7. Select the **OK** button to accept the value.

   A confirmation pop-up appears.

8. Enter the password again to confirm the new password.

## Direct Serial Connection

A Direct Serial connection is one in which a serial port on the development system is connected to a serial port on the runtime workstation using a null modem cable. Direct Serial is not a network connection, so it does not require any network setup in either the development system or in the runtime workstation.

This option lets you transfer MachineShop project files to the runtime workstation. You can download and upload complete project files, or you can download and upload only the updated files you have changed.

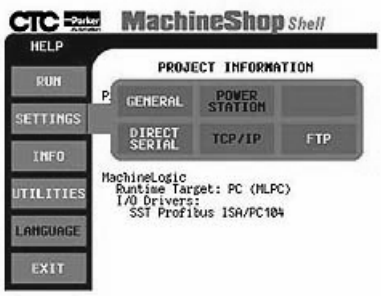
How fast the transfer occurs can vary. The MachineShop Toolbar determines the BAUD rate when you start the transfer.

**Notes** Changes made to the Direct Serial configuration are written to the PSU.CFG file (*see Appendix A*). These changes take effect after you reboot the runtime workstation.

The Direct Serial connection does not support password protection.

**To access the Direct Serial settings, complete the following steps:**

1. Select the **Settings** menu.




2. Select **Direct Serial**.

The Direct Serial Settings screen appears.


## Assigning a Port

Configure the Direct Serial connection by assigning it to a port on your workstation. You can select either the COM1 or COM2 port for your transfer.

**To select a port, complete the following steps:**

1. Select the **Settings** menu.
2. Select **Direct Serial**.
3. From the Port submenu, select either the **COM1** port

or the **COM2** port.


**Note** The Shell verifies that the port address and IRQ associated with the selected port is not already assigned to another setting within the Shell. If a conflict is detected, a pop-up appears giving you the option of continuing (in which the Shell removes the conflicting setting) or of trying another COM port.

## Disabling the Direct Serial Connection

Disable the Direct Serial connection when the COM port is used for another purpose. This causes the Shell to ignore Direct Serial connections from the MachineShop Toolbar.

**Note** The Direct Serial COM port acts just like PPP connections with **Download Only** selected. That is, the COM port can be used by other programs but when the Shell is running, the COM port is used by the Shell. When the Shell terminates, it returns the COM port to whatever was using it.

**To disable the Direct Serial connection:**

1. Select the **Settings** menu.
2. Select **Direct Serial**.

3. From the Port submenu, select **Disable**...

## LAN Connection

This section describes the steps you need to complete to prepare the runtime workstation for file transfers using a LAN connection. For detailed descriptions on how to configure the settings, see the *Configure the TCP/IP Settings* section in this chapter.

**To configure the Shell for a LAN connection, complete the following steps:**

1. Select the **TCP/IP** button from the Settings menu to configure the TCP/IP settings.
2. If TCP/IP hasn't been enabled, select the **ENABLE** button from the TCP/IP Setup menu.
3. If a MachineShop Net Name hasn't been configured for the runtime workstation, select the **NET NAME** button from the TCP/IP Setup menu and then enter a name.
4. Select the **NET SETUP** button from the TCP/IP Setup menu to configure the network interface.
5. Select one of the **NET** buttons (1, 2, or 3) from the Network Setup menu.
6. Select the **IFACE TYPE** button from the Net submenu and then select your interface type.

   Your selection depends on the network interface card installed in the runtime workstation. For the 10Base-T port, use NE2000.
7. Select the **IP ADDRESS** button from the Net submenu and then enter the IP Address.

   Check with your local network administrator to determine a valid IP Address.

   If your network has Dynamic Host Configuration (DHCP) support, enter 0.0.0.0 as the IP Address. DHCP dynamically assigns IP addresses to workstations as needed.
8. Select the **IP MASK** button from the Net submenu, and then enter the IP Mask.

   Check with your local network administrator to deter-

mine a valid IP Mask.

9. If your interface type supports the Port Address and IRQ / Interrupt options, enter a value for each.
10. Exit the Net Setup menu.
11. Exit the TCP/IP Setup menu and reboot the workstation.

    Changes do not take effect until the runtime workstation reboots.
12. If you wish to restrict access to the files on the runtime workstation, enter a FTP user name and password. To do this, select the **FTP** button from the Settings menu.
13. Connect the Ethernet cable to the Ethernet port of the runtime workstation.

You are now ready to transfer files from the development system (running MachineShop) to the Shell. See the *Transfer Project Files* section in this chapter for details.

## Serial PPP Connection

This section describes the steps you need to complete to prepare the runtime workstation for file transfers using a serial PPP connection. For detailed descriptions on how to configure the settings, see the *Configure the TCP/IP Settings* section in this chapter.

> **Note** The COM1 port on the runtime workstation is used only for downloading and debugging MachineLogic projects.

**To configure the Shell for a Serial PPP connection, complete the following steps:**

1. Select the **TCP/IP** button from the Settings menu to configure the TCP/IP settings.
2. If TCP/IP hasn't been enabled, select the **ENABLE** button from the TCP/IP Setup menu.
3. If a MachineShop Net Name hasn't been configured for the runtime workstations, select the **NET NAME** button from the TCP/IP Setup menu and then enter a name.
4. Select the **NET SETUP** button from the TCP/IP Setup menu to configure the network interface.
5. Select one of the **NET** buttons (1, 2, or 3) from the Network Setup menu.
6. Select the **IFACE TYPE** button from the Net submenu and then select Serial as the interface type.
7. Select the **IP ADDRESS** button from the Net submenu and then enter the IP Address.
8. Select the **IP MASK** button from the Net submenu and then enter the IP Mask.
9. Select the **PORT ADDRESS** button from the Net submenu and then define the COM port.

   COM1=3F8, COM2=2F8, COM3=3E8, COM4=2E8
10. Select the **BAUD RATE** button from the Net submenu and then select the baud rate.

    This must match the baud rate set in the MachineShop

Toolbar.

11. Select the **IRQ / INTERRUPT** button from the Net submenu and then enter the hardware IRQ or software interrupt for the COM port.

    COM1=4, COM2=3, COM3 and COM4=variable setting

12. Select the **DOWNLOAD ONLY** button from the Net submenu to keep the port from initializing until the Shell is loaded.
13. Exit the Net Setup menu.
14. Exit the TCP/IP Setup menu and reboot the workstation.

    Changes do not take effect until the runtime workstation reboots.

15. If you wish to restrict access to the files on the runtime workstation, enter a FTP user name and password. To do this, select the **FTP** button from the Settings menu.
16. Connect the serial cable to the appropriate serial port of the runtime workstation.

You are now ready to transfer files from the development system (running MachineShop) to the Shell. See the *Transfer Project Files* section in this chapter for details.

### Serial PPP Cable

You can use any standard Windows RAS null modem cable, you can construct your own cable, or you can purchase a cable from CTC-Parker. If you decide to construct you own cable, refer to the following table for cable pinouts.

| 9-pin | 25-pin | | 25-pin | 9-pin | Description |
|---|---|---|---|---|---|
| pin 5 | pin 7 | <----------> | pin 7 | pin 5 | Ground-Ground |
| pin 3 | pin 2 | <----------> | pin 3 | pin 2 | Xmit-Rcv |
| pin 7 | pin 4 | <----------> | pin 5 | pin 8 | RTS-CTS |
| pin 6, 1 | pin 6, 8 | <----------> | pin 20 | pin 4 | DSR, CD-DTR |
| pin 2 | pin 3 | <----------> | pin 2 | pin 3 | Xmit-Rcv |

| 9-pin | 25-pin | | 25-pin | 9-pin | Description |
|---|---|---|---|---|---|
| pin 8 | pin 5 | <----------> | pin 4 | pin 7 | CTS-RTS |
| pin 4 | pin 20 | <----------> | pin 6, 8 | pin 1, 6 | DTR-DSR, CD |

## Ethernet Point to Point Connection

This section describes the steps you need to complete to prepare the runtime workstation for file transfers using an Ethernet point to point connection. For detailed descriptions on how to configure the settings, see the *Configure the TCP/IP Settings* section in this chapter.

**To configure the Shell for an Ethernet point to point connection, complete the following steps:**

1. Select the **TCP/IP** button from the Settings menu to configure the TCP/IP settings.
2. If TCP/IP hasn't been enabled, select the **ENABLE** button from the TCP/IP Setup menu.
3. If a MachineShop Net Name hasn't been configured for the runtime workstation, select the **NET NAME** button from the TCP/IP Setup menu and then enter a name.
4. Select the **NET SETUP** button from the TCP/IP Setup menu to configure the network interface.
5. Select one of the **NET** buttons (1, 2, or 3) from the Network Setup menu.
6. Select the **IFACE TYPE** button from the Net submenu and then select an option such as the I82557, 3C509, or NE2000 as the interface type.

   Your selection depends on the network interface card installed in the runtime workstation. For the 10Base-T port, use NE2000.
7. Select the **IP ADDRESS** button from the Net submenu and then enter the IP Address.
8. Select the **IP MASK** button from the Net submenu and then enter the IP Mask.
9. If your interface type supports the Port Address and IRQ / Interrupt options, enter a value for each.
10. Exit the Net Setup menu.
11. Exit the TCP/IP Setup menu and reboot the workstation.

    Changes do not take effect until the runtime worksta-

tion reboots.

12. If you wish to restrict access to the files on the runtime workstation, enter a FTP user name and password. To do this, select the **FTP** button from the Settings menu.
13. Connect the runtime workstation to the Ethernet connector using a cross-over 10Base-T cable.

You are now ready to transfer files from the development system (running MachineShop) to the Shell. See the *Transfer Project Files* section in this chapter for details.

## Transfer Project Files

Once you have set up the Shell on the runtime workstation, project files on the development system may be transferred to the runtime workstation using the MachineShop Toolbar.

This section describes how to use the MachineShop Toolbar to download and upload an active project from the development system to the runtime workstation. It also includes the steps for creating a remote backup. For a complete discussion on MachineShop, refer to the *MachineShop Getting Started Guide* or the MachineShop online help.

**Important** Project files can only be transferred to the runtime workstation when the MachineShop Shell Main Menu is displayed on the screen.

### Adding a Connection

Before you can transfer files to the runtime workstation, you must create a transfer connection on the development system. A connection refers to the method used to transfer files to or from a runtime workstation. The types of transfer connections available are MachineShop Net, Interact IPM, Direct Serial, and disk transfer.

In this example, we will add a MachineShop Direct Serial connection. This type of connection lets your development system communicate to the runtime workstation using a null modem serial cable.

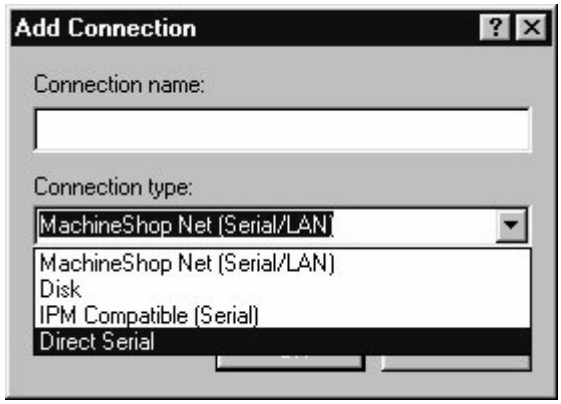
For instructions on the other transfer connections, refer to the *MachineShop Getting Started Guide*.

**Note** If you are using an Ethernet point to point connection, you will also need to configure the TCP/IP properties using the Network option in the Windows Control Panel. Refer to the *MachineShop Getting Started Guide* for instructions.

**To add a MachineShop Direct Serial connection on the development system, complete the following steps:**

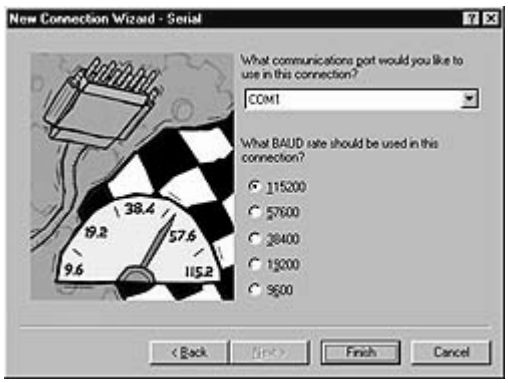
1. Open MachineShop.
2. Select the **Add Connection** command from the Transfer Menu or click the **Add Connection** button on the toolbar.

The New Connection dialog box appears.




3. Enter a name for this connection.
4. Select Direct Serial as the connection type.
5. Click the **OK** button to accept these choices.

   The New Connection Wizard - Step 1 screen appears.




6. Select the COM port and baud rate you want to use in this connection.
7. Click **Finish** to create the connection.

## Downloading Files

Once a connection is created, you may download the files needed to create or update the runtime workstation. The MachineShop Toolbar includes a Transfer Wizard that steps you through the process of selecting a connection and downloading files to a runtime workstation.

**To download files to the runtime workstation, complete the following steps:**

1. Open the project you wish to download in MachineShop.
2. Select the **Transfer Wizard** command from the Transfer menu.

   The Transfer Wizard appears.
3. Check the **Download to Runtime** box and then click on Next.
4. Follow the instructions provided by the Transfer Wizard to finish downloading the project. For more information, refer to the *MachineShop Getting Started Guide*.

   **Note** If you have the MLSC installed, you may want the project files to also be transferred to the MLSC. You can set this to happen automatically as part of the download from the Toolbar using a selection in the Transfer Wizard. Or you can set the Toolbar to download to the runtime workstation and then, after the transfer is complete, download the project from the runtime workstation to the MLSC itself. For more information, see the **Project Files** section in Chapter 6.

## Uploading Files

You may also upload a file or project to the development system using the Transfer Wizard. The process of uploading a project is very similar to downloading a

project.

**Important** If you have the MLSC installed, you may want to retrieve the files from the MLSC before uploading them to the Toolbar. You can set this to happen automatically as part of the upload from the Shell by using the Transfer Wizard. Or you can manually perform an additional step before step 1 below to upload the project from the MLSC to the runtime workstation. For more information, see the **Project Files** section in Chapter 6.

**To upload files to the development system, complete the following steps:**

1. Select the **Transfer Wizard** command from the Transfer menu.

   The Transfer Wizard appears.

2. Check the **Upload from Runtime** box and then click on Next.

3. Follow the instructions provided by the Transfer Wizard to finish uploading the project. For more information, refer to the *MachineShop Getting Started Guide*.

### Remote Backup

MachineShop provides a Backup Wizard to guide you through the process of backing up a project running on a runtime workstation to a selected target. The target can be a variety of storage devices including diskette, Compact Flash, hard drive, or network.

**To create a backup of a project on a runtime workstation, complete the following steps:**

**Note** If you have the MLSC installed, you should perform an additional step before step 1 below to make sure you are backing up the most current files. You should first copy the project from the MLSC. For more information, see the **Project Files** section in Chapter 6.

1. Select the **Connection** you want to use from the Select Connection box on the MachineShop toolbar.

2. Select the **Create Backup** command from the Tools menu.

   The Create Backup submenu appears.

3. Select the **Remote System** command from the Create Backup submenu.

   The Backup Wizard appears.

4. Follow the instructions provided by the Backup Wizard to finish backing up the project.

### Remote Restore

MachineShop also allows you to restore a project backup to the runtime system. This is done using the Restore Wizard. The Restore Wizard will automatically decompress the backup project and load it on the runtime workstation.

**To restore a project backup to a runtime workstation, complete the following steps:**

1. Select the **Connection** you plan to use from the Select Connection box on the MachineShop toolbar.
2. Select the **Restore Backup** command from the Tools menu.

   The Restore Backup submenu appears.

3. Select the **Remote System** command from the Restore Backup submenu.

   The Restore Wizard appears.

4. Follow the instructions provided by the Restore Wizard to finish backing up the project.

   **Note** If you have the MLSC installed, you must perform an additional step after the restore is complete to download the project from the runtime workstation to the MLSC itself. For more information, see the **Project Files** section in Chapter 6.

Chapter 6

# MachineLogic

The MachineLogic option in the Shell allows you to view information about MachineLogic. This includes the state of the runtime kernel, I/O device errors, and the tasks included in the project. It also is used to configure the settings for MachineLogic PC Control (MLPC) and the MachineLogic Slot Card (MLSC).

If the current project does not include MachineLogic, you may skip this chapter.

## Chapter Contents

## Access MachineLogic

**To access the MachineLogic option, complete the following step:**

- Select the **MACHINELOGIC** button from the Utilities submenu.

  The MachineLogic screen appears. Note that if you have the MLSC installed, the Runtime Target says MLSC rather than MLPC.


The display area of the screen shows whether you have the MLPC or the MLSC installed as well as the current mode of the MachineLogic runtime. It also displays system status, project name, and error information. If an error condition occurs, the error number and the corresponding message will be displayed on the screen.

## Start and Stop MachineLogic

From the MachineLogic menu, you may start and stop the MachineLogic runtime kernel.

### Stopping MachineLogic

**To stop MachineLogic from executing, complete the following steps:**

1. Select the **STOP** button from the MachineLogic menu.

The Stop submenu appears for confirmation.


2. Select one of the following buttons:
   - **YES** - directs the Shell to stop the execution of MachineLogic
   - **NO** - directs the Shell to continue the execution of MachineLogic and to return to the MachineLogic main menu.

Once MachineLogic stops, the display area of the MachineLogic screen is updated to show that MachineLogic is NOT running.

## Starting MachineLogic

There are three types of start modes: Cold, Warm, and Hot. The start modes determine how data is initialized and tasks are activated in the MachineLogic project.

**To start MachineLogic, complete the following steps:**

1. Select the **START** button from the MachineLogic menu.

   The Start submenu appears. Note that if you have the MLSC installed, the runtime target says MLSC rather

than MLPC.


2. Select one of the following start buttons:
   - **COLD** - initializes all data to the default value and activates all user tasks. Resets all memory including retentive memory.
   - **WARM** - initializes non-retentive data and activates all user tasks. Resets all memory except for retentive memory.
   - **HOT** - does not initialize data but does activate all user tasks. Keeps all memory settings. This option is not available if you download a new project or if you have just started the project.

After making the selection, the MachineLogic runtime kernel is started and the display area is updated to show that MachineLogic is running.

## Reset

From this menu button you can reset two options: the watchdog and the slot card. If you have the MLPC installed, the watchdog hardware timer resides on the MachineLogic Control Adapter (MLCA). If you have the MLSC installed, the watchdog timer resides on the MLSC itself.

### Watchdog

If the watchdog timer exceeds the alarm threshold, the Reset button flashes in red and the WATCHDOG button is enabled and flashing. You must manually reset the

watchdog timer by selecting the WATCHDOG button.

For more information on watchdogs, see the Watchdog section on page 98.

**Note** This option is only available when the Watchdog feature is enabled and the timer has exceeded the alarm threshold.

### Slot Card

This option is available when the Shell detects the MLSC installed on your runtime workstation. Select this option to reset the Slot Card itself. Both the Slot Card and the runtime workstation are rebooted.

**To reset the watchdog timer, or to reset the Slot Card, complete the following step:**

- Select the **RESET** button from the MachineLogic menu.

The Reset button is disabled.

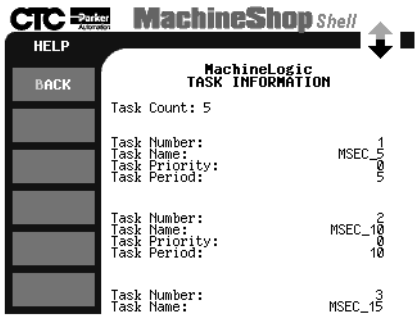
## View Task Information

You may view information about the MachineLogic tasks included in the installed project. The information includes a count of tasks and details such as task name, priority, and period for each task in the project.

**To display task information for the MachineLogic project, complete the following step:**

- Select the **TASK INFO** button from the MachineLogic menu.

The Task Information screen appears.



## Configuring the MLPC

MLPC (MachineLogic PC Control) is the group term for the MachineLogic software working in conjunction with the MachineLogic Control Adapter (MLCA). The MLCA is a hardware card installed inside your runtime workstation that is used by MachineLogic. The MLCA contains the retained memory, the Master Control Relay (MCR), and devices for interfacing to I/O systems.

**Note** Your runtime workstation has either the MLCA or the MLSC installed. If you have the MLSC, see the next section, *Configuring the MLSC*.

This section describes how to view and modify the current MLPC settings. This includes the retentive memory size and address, port address, hardware interrupt request, the watchdog and power fail status, and the UCS communication card settings.

**Note** Changes made to the MLCA are written to either the MCLA.INI file or the MACHLOG.INI file. See *Appendix A* for details on these files.

These changes do not take effect until the workstation reboots. A confirmation message will display when you exit the Hardware Settings screen asking if you wish to reboot the workstation.

**To view the current MLPC settings, complete the following steps:**

1. Select the **NEXT** button from the MachineLogic

menu.


2. Select the **HARDWARE SETTINGS** button from the MachineLogic menu.

   The MachineLogic Hardware Settings screen appears.


**Retentive Memory**

The Retentive Memory defines the non-volatile shared memory (NVSRAM) in kilobytes from 4k to 32K, incrementing in values 4k, 8k, 16k, and 32k.

It also defines the base memory segment for the NVSRAM. The base memory segment must be defined at an address that is evenly divisible by the memory size and allows the entire memory window to fit within certain

ranges based on the model of a PowerStation.

**Note** These settings should match the resource configured Data Area for the MachineLogic project. See the *MachineLogic Getting Started Guide* for more information.

**To configure the Retentive Memory for the MLCA, complete the following steps:**

1. Select the **RETENTIVE MEMORY** button from the Hardware Settings menu.

   The Retentive Memory submenu appears.


2. Select one of the following buttons.

   - **MEMORY SIZE** - defines the non-volatile shared memory (NVSRAM) in kilobytes. A value of 0 will disable the NVSRAM. The default value of the Retentive Memory Size is 4K.
   - **MEMORY ADDRESS** - defines the base memory segment for the NVSRAM. The default value of the Retentive Memory Address is 0xD800.

   The pop-up keypad appears.

3. Enter a valid memory size or memory address for the Control Adapter.

4. Select the **ENTER** button to accept the values.

**Note** These changes are stored in the MLCA.INI file. Changes do not take effect until the workstation reboots.

### Port Address

The Port Address defines the I/O port address parameter, ranging from 0x200 to 0xFFF8 in multiples of eight. The default value of the Port Address is 0x710.

**To configure the Port Address of the MLCA, complete the following steps:**

1. Select the **PORT ADDRESS** button from the Hardware Settings menu.

   The pop-up keypad appears.

2. Enter a valid port address for the Control Adapter.
3. Press the **ENTER** button to accept the value.

**Note** This change is stored in the MLCA.INI file. Changes do not take effect until the workstation reboots.

### Interrupt Request

The Interrupt Request defines the assigned IRQ on the Control Adapter. Valid IRQ numbers are 3, 4, 5, 7, 10, 11, 12, or 15 (as long as the number does not conflict with any other PC IRQ assignments).

The default value of the Interrupt Request is 5 for the MLCA.

**To configure the Interrupt Request for the MLCA, complete the following steps:**

1. Select the **INTERRUPT REQUEST** button from the Hardware Settings menu.

   The pop-up keypad appears.

2. Enter a valid interrupt request number for the Control Adapter.

   This value defines the IRQ used by the card. Set the IRQ to zero (0) if the Powerfail and Watchdog functions are disabled on the Control Adapter card.

3. Press the **ENTER** button to accept the value.

**Note** This change is stored in the MLCA.INI file. Changes do not take effect until the workstation reboots.

## Power Fail

The Power Fail feature is designed to protect the runtime workstation in the event of an uncontrolled power loss. The power fail detection circuit on the MLCA monitors the system voltage. When the +5 Volts supply drops below 4.75 Volts, it will generate an interrupt to shutdown the I/O and de-energize the MCR. This relay can be used as an external indicator as part of an emergency stop circuit.

**To enable/disable the Power Fail feature, complete the following steps:**

1. Select the **POWER FAIL** button from the Hardware Settings menu.

   The Power Fail submenu appears.


2. Select one of the following buttons:
   - **ENABLE** - activates power fail detection on the MachineLogic Control Adapter
   - **DISABLE** - deactivates power fail detection on the MachineLogic Control Adapter

**Note** This change is stored in the MACHLOG.INI file. Changes do not take effect until the workstation is rebooted.

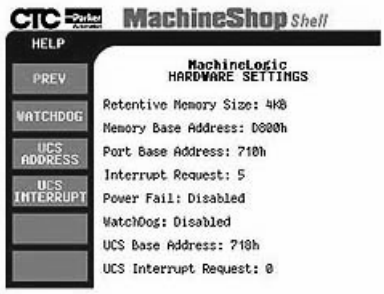
## Watchdog

The Watchdog hardware timer notifies the user of a system failure (hardware or software) that affects the running of MachineLogic. The control software periodically sends a signal to the watchdog telling it everything is running fine. If the watchdog does not receive a signal within a set amount of time, it enters a tripped condition. When this occurs, the MCR is opened. Your application can use the MCR to react to the tripped condition.

The Shell also reacts to the tripped condition. The RESET button flashes in red and the WATCHDOG button on the Reset submenu is enabled and flashing. You must manually reset the watchdog timer by selecting the WATCHDOG button.

**To enable/disable the watchdog timer feature, complete the following steps:**

1. Select the **NEXT** button from the Hardware Settings menu.




2. Select the **WATCHDOG** button.

The Watchdog submenu appears.


3. Select one of the following buttons:
   - **ENABLE** - activates the watchdog timer on the MLCA
   - **DISABLE** - deactivates the watchdog timer on the MLCA

**Note** This change is stored in the MACHLOG.INI file. Changes do not take effect until the workstation is rebooted.

### UCS Address

The UCS Base Address defines the I/O port address parameter, ranging from 0x200 to 0xFFF8 in multiples of eight. The default value of the UCS Base Address is 0x718.

**To configure the base address for the UCS interface card, complete the following steps:**

1. Select the **NEXT** button from the Hardware Settings menu.
2. Select the **UCS ADDRESS** button.

   The pop-up keypad appears.
3. Enter a valid address for the UCS card.
4. Press the **ENTER** button to accept the address value.

**Note** This change is stored in the MLCA.INI file. Changes do not take effect until the workstation reboots.

### UCS Interrupt

The hardware interrupt for the UCS interface card can be any of the following: 3, 4, 5, 7, 10, 11, 12, or 15 as long as it does not conflict with any other IRQ assignments made by the PC. The default value of the UCS hardware interrupt is IRQ=0 (disabled).

**To configure the hardware interrupt for the UCS interface card, complete the following steps:**

1. Select the **NEXT** button from the Hardware Settings menu.
2. Select the **UCS INTERRUPT** button from the Hardware Settings menu.

   The pop-up keypad appears.
3. Enter a valid IRQ number for the interrupt.

   Set the IRQ parameter to zero (0) if no interrupt is used.
4. Press the **ENTER** button to accept the interrupt value.

   **Note** This change is stored in the MLCA.INI file. Changes do not take effect until the workstation reboots.

## Configuring the MLSC

The MLSC (MachineLogic Slot Card) is a hardware card installed inside your runtime workstation. The MLSC has its own processor on the card itself where MachineLogic resides. Unlike the MLCA, the MLSC does not have to share a processor on the runtime workstation to execute tasks. The MLSC also has an Ethernet port built on the card itself.

**Note** Your runtime workstation has either the MLSC or the MLCA installed. If you have the MLCA, see the preceding section, *Configuring the MLPC*.

This section describes how to view and modify the current MLSC settings. This includes the watchdog status, power fail status, and Ethernet I/O settings.

**Note** Changes made to the MLSC are written to the card itself. No INI file is required.

These changes do not take effect until the MLSC is rebooted. A confirmation message will display when you exit the Hardware Settings screen asking if you want to reboot the workstation.

**To view the current MLSC settings, complete the following steps:**

1. Select the **NEXT** button from the MachineLogic menu.


2. Select the **HARDWARE SETTINGS** button.

   The MachineLogic Hardware Settings screen

appears.


## Power Fail

The Power Fail feature is designed to protect the system in the event of an uncontrolled power loss. The power fail detection circuit on the MLSC monitors the system voltage. When the +5 Volts supply drops below 4.75 Volts, it will generate an interrupt to shutdown the I/O and de-energize the MCR. This relay can be used as an external indicator as part of an emergency stop circuit.

**To enable/disable the Power Fail feature, complete the following steps:**

1. Select the **POWER FAIL** button from the Hardware Settings menu.

   The Power Fail submenu appears.


2. Select one of the following buttons:
   - **ENABLE** - activates power fail detection on the

MachineLogic Slot Card

- **DISABLE** - deactivates power fail detection on the MachineLogic Slot Card

**Note** Changes do not take effect until the workstation is rebooted.

### Watchdog

The Watchdog hardware timer notifies the user of a system failure (hardware or software) that affects the running of MachineLogic. The control software periodically sends a signal to the watchdog telling it everything is running fine. If the watchdog does not receive a signal within a set amount of time, it enters a tripped condition. When this occurs, the MCR is opened. Your application can use the MCR to react to the tripped condition.

The Shell also reacts to the tripped condition. The RESET button flashes in red and the WATCHDOG button on the Reset submenu is enabled and flashing. You must manually reset the watchdog timer by selecting the WATCHDOG button.

**To enable/disable the watchdog timer feature, complete the following steps:**

1. Select the **WATCHDOG** button from the Hardware Settings menu.

   The Watchdog submenu appears.


2. Select one of the following buttons:

   - **ENABLE** - activates the watchdog timer on the MLSC

- **DISABLE** - deactivates the watchdog timer on the MLSC

**Note** Changes do not take effect until the workstation is rebooted.

## Ethernet I/O

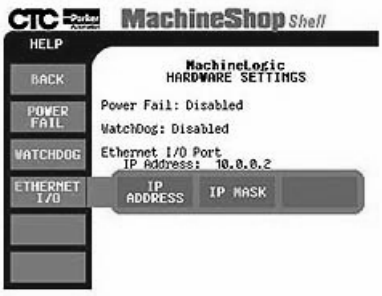
The MLSC has an Ethernet port on the card itself. This port is meant to connect to I/O racks or other devices that the MLSC controls. A network administrator should determine the IP address and the IP mask for the Ethernet port so the MLSC can communicate across your network.

**Important** We recommend that you use the MLSC Ethernet port on a separate Ethernet network than the one your runtime workstation is connected to. In other words, your I/O Ethernet network should be separate from your company Ethernet network.

**To set the IP address and the IP mask, complete the following steps:**

1. Select the **ETHERNET I/O** button from the Hardware Settings menu.

   The Ethernet I/O submenu appears.




2. Select one of the following buttons:

   - **IP ADDRESS** - Enter a new IP address using your workstation's keyboard. Valid ranges are 0.0.0.1 through 255.255.255.255. The default value is 10.0.0.2.
   - **IP MASK** - Enter a new IP mask using your

workstation's keyboard. Valid ranges are 255.0.0.0 through 255.255.255.254. The default value is 255.255.255.0.

## Project Files (MLSC Only)

The Project Files option lets you transfer your MachineLogic projects to and from the MLSC. Because the MLSC has its own processor, it can execute MachineLogic tasks on its own. But to do so you must first transfer your MachineLogic project from the development system to your runtime workstation (*see Chapter 5*). Once you have accomplished this transfer, copy the project to the MLSC.

Likewise, you can copy your project from the MLSC back to the development system.

**To copy your project to and from the MLSC, complete the following steps:**

1. Select the **NEXT** button from the MachineLogic menu.


2. Select the **PROJECT FILES** button.

   The Project Files submenu appears.

3. Select one of the following buttons:
   - **COPY TO SLOT CARD** - Select OK. A message displays saying that files are being transferred and that you should wait. If the transfer is successful, you are prompted to reboot so the transfer can take effect. If the transfer fails, an error dialog displays.
   - **COPY FROM SLOT CARD** - Select OK. A message displays saying that files are being transferred and that you should wait. If the transfer fails, an error dialog displays.

# Appendix A

# Configuration Files

This appendix provides the text of the files that are required for the runtime system. The following configuration files apply to the MLPC only.

## MLCA.INI

The text of the MLCA.INI appears below:

```
[ControlAdapter]
MemBaseSeg=0xD800
MemSize=4                       ;Set in Kbytes (0, 4, 8, 16, or 32)
IOBase=0x710
IRQ=5                           ;(3, 4, 5, 7, 10, 11, 12, or 15)

[UCS]
UCSBase=0x718
UCSIrq=0
```

The parameters for MLCA.INI are described in the table below.

| Parameter | Description |
|---|---|
| [ControlAdapter] | Memory sizes and locations for the control adapter |
| MemBaseSeg=0xD800 | Defines the base memory segment for the non-volatile shared memory (NVSRAM).<br>The base memory segment must be defined at an address that is evenly divisible by the memory size and allows the entire memory window to fit within the following ranges:<br>• P1 PowerStations: 0xD000 to 0xEFFF<br>• 386 P2 and all 5x86 PowerStations: 0xC800 to 0xEFFF<br>• Pentium PowerStations: 0xC800 to 0xDFFF<br>For example, 0xD000, 0xD100, 0xD200, etc. are valid base memory segments for a 4 kilobyte memory size. |
| MemSize=4 | Defines the size of the NVSRAM in kilobytes from 4k to 32k, incrementing by the following values: 4k, 8k, 16k, and 32k. A value of 0 disables the NVSRAM. |
| IOBase=0x710 | Defines the I/O port address ranging from 200 to FFF8 in multiples of eight. |

| Parameter | Description |
|---|---|
| IRQ=5 | Defines the hardware interrupt. The IRQ you select can be any of the following: 3, 4, 5, 7, 10, 11, 12, or 15 as long as it does not conflict with any other IRQ assignments made by the PC. Set to 0 if Powerfail and Watchdog are disabled. |
| [UCS] | Parameters for UCS interface |
| UCSBase=0x718 | Defines the I/O port address ranging from 200 to FFF8 in multiples of eight. |
| UCSIrq=0 | Defines the hardware interrupt. The IRQ you select can be any of the following: 3, 4, 5, 7, 10, 11, 12, or 15 as long as it does not conflict with any other IRQ assignments made by the PC. Set to 0 if no interrupt is used. |

# MACHLOG.INI

The text of the MACHLOG.INI file appears below.

**Note** You can also configure these parameters from the Memory and Ports dialog box on the MachineShop Toolbar.

```
[COM]
Port = 1
Baud = 19200

[LIMITS]
Program = 50          ;Set in Kbytes
Inputs = 1024         ;Set in bytes on a quad boundary
Outputs = 1024        ;Set in bytes on a quad bounder

[CONTROLADAPTER]
PowerFail=ENABLED
Watchdog=ENABLED

[KEYBOARD]
CtrlAltDel=DISABLED;Key sequence is ignored if disabled.

[MACHINELOGICBOOTOPTION]
PowerOnOperation=ENABLED
```

The parameters for MACHLOG.INI are described in the table below:

| Parameter | Description |
|---|---|
| [Comm] | Communication parameters for downloading and uploading |
| Port=1 | Defines the COM port for communicating with MachineLogic. |
| Baud=19200 | Defines the baud rate for communicating with MachineLogic. |
| [Limits] | Memory limits for control program |
| Program=50 | Defines the amount of memory in kilobytes from 1k to 60k reserved for the control program. |
| Inputs=1024 | Defines the amount of memory in bytes reserved for inputs to the control program. This value can range from 4 bytes to 8192 bytes. |
| Outputs=1024 | Defines the amount of memory in bytes reserved for outputs from the control program. This value can range from 4 bytes to 8192 bytes. |
| [ControlCard] | Parameters for control adapter |
| Powerfail=Disabled | Controls whether or not the MachineLogic Control Adapter powerfail detection is enabled or disabled. |
| Watchdog=Disabled | Controls whether or not the MachineLogic Control Adapter watchdog timer is enabled or disabled. |
| [Keyboard] | Parameters for keyboard |
| CtrlAltDel=Enabled | Controls whether or not the Ctrl+Alt+Del key combination for rebooting the machine is enabled or disabled. |
| [MachineLogicBootOption] | Parameters for start up |
| PowerOnOperation=Enabled | Controls whether or not MachineLogic will start after the workstation is powered on. |

# PSU.CFG

The text of the PSU.CFG file appears below:

```
<data>
		<application>
			<version></version>
		</application>
		<configuration>
			<poweron runitr="NO"></poweron>
			<lastlanguage>English</lastlanguage>
			<optiondata>0</optiondata>
			<displaytype>0</displaytype>
			<DirectSerial COM="0" FifoTrigger="1"/>
		</configuration>
		<backup>
			<path1></path1>
			<path2></path2>
			<path3></path3>
		</backup>
		<restore>
			<path1></path1>
			<path2></path2>
			<path3></path3>
		</restore>
		<ftp>
			<username></username>
			<password></password>
		</ftp>
		<P5Settings>
			<shiftmode>0</shiftmode>
			<selectionkey>0</selectionkey>
		</P5Settings>
</data>
```

# Appendix B

# Installing the MachineShop Shell

This appendix describes the steps to install the MachineShop Shell on a non-CTC workstation. The steps include the following:

1. Install the MachineShop Shell software from the MachineShop Shell Installation disk.
2. Copy the NET directory and the contents of CTC directory from the PowerStation Start disk to your PC.
3. Modify the workstation's AUTOEXEC.BAT file.

**Note** The MachineShop Shell Installation disk and the PowerStation Start disk are part of the Runtime Workstation disk set. For instructions on how to create the Runtime Workstation disk set, see the *MachineShop Installation Booklet*. For instructions on how to install the MachineShop Shell on a PowerStation, see your *PowerStation User Guide.*

## Install the MachineShop Shell Software

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

1. Insert the MachineShop Shell Installation disk into drive A.
2. Enter MS-DOS mode and change to drive A by typing `A:`
3. At the DOS prompt, type `Install A: C:.`
4. Press Enter to execute this command.

   You will be asked if you want to continue with the installation.
5. Type `Y` for Yes in order to continue.
6. After the installation is complete, remove the MachineShop Shell Installation disk from drive A and then reboot your system.

## Copy Files to the Non-CTC Workstation

After the installation is complete, you must copy the NET directory and the contents of the CTC directory from the PowerStation Start disk to the non-CTC workstation.

**To copy the files to the non-CTC workstation, complete the following steps:**

1. Insert the PowerStation Start disk into drive A.

2. Copy the A:\NET directory to C:\NET.
3. Copy the contents of the A:\CTC directory into the C:\CTC directory.

# Modify the AUTOEXEC.BAT file

You should modify your workstation's AUTOEXEC.BAT file so that MachineLogic operates properly. Modify the AUTOEXEC.BAT according to whether you have the MachineLogic Control Adapter (MLCA) or the MachineLogic Slot Card (MLSC) installed.

## MLCA

If you have the MLCA installed, you may add these lines to the end of your AUTOEXEC.BAT file.

```
REM
*********************************************************************
REM Add the CTC folder to the system's PATH.
REM
*********************************************************************

PATH %PATH%;C:\CTC

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

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

:NOMLCA

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

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 network batch file.
REM If used, this must be called BEFORE loading the TCPIP 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 boot operation.
REM (determined by MLDU.EXE return value 0 = ENABLED, 1 = DISABLED)
REM
*********************************************************************

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

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

:NOML

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

CD \CTC
PSU
```

## MLSC

If you have the MLSC installed, you may add these lines to the end of your AUTOEXEC.BAT file.

```
@ECHO OFF
REM
*********************************************************************
REM Add the CTC folder to the system's PATH
REM
```

```
*********************************************************************

PATH %PATH%;C:\CTC

REM
*********************************************************************
REM Set up Interact environment variables for MS Shell.
REM
*********************************************************************
SET INTERACT=C:\INTERACT
SET INTERACT_FILES=C:\INTERACT\APPFILES
SET INTERACT_STARTUP=C:\STARTUP

REM
*********************************************************************
REM If an external mouse is connected, MOUSE will install successfully
REM 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


REM
*********************************************************************
REM Check for the presence of a MachineLogic Slot Card (MLSC).
REM Set up MachineLogic environment variables for MS Shell.
REM
*********************************************************************
SET MACHINELOGIC=C:\MACHLOG
IF NOT EXIST C:\MACHLOG\NUL.EXT MD C:\MACHLOG
IF NOT EXIST C:\CTC\TST4MLSC.EXE GOTO NO_MLSC
TST4MLSC C:\NET\TCPIP.INI 0x7E MLSC 0xD000
IF ERRORLEVEL 2 GOTO BAD_MLSC
IF ERRORLEVEL 1 GOTO GOOD_MLSC
GOTO NO_MLSC

:GOOD_MLSC
REM *** MLSC Present and has IP - launch packet driver
SET MLSC=GOOD
C:\NET\MLSC_PKT 0x7E 0xD000
GOTO DO_TOUCH

:BAD_MLSC
REM *** MLSC Present but doesn't have IP or may not be functioning prop-
erly
SET MLSC=BAD
GOTO DO_TOUCH

:NO_MLSC
```

```
REM *** No MLSC, may or may not have MLPC (find out later)
SET MLSC=NONE
REM
*********************************************************************
REM Load the MachineLogic Control Adapter driver if it is present.
REM
*********************************************************************
CD \MACHLOG
IF NOT EXIST C:\CTC\MLCA.EXE GOTO NOMLCA
CD \CTC
LH C:\CTC\MLCA

:NOMLCA
REM
*********************************************************************
REM Launch packet drivers here.
REM If you are using the PACKET Interface for any of your networks,
REM launch the packet drivers here.
REM
*********************************************************************

REM
*********************************************************************
REM Load NETWORK drivers -- NOVELL
REM Remove REM on the CALL statement to load NOVELL network batch file.
REM If used, this must be called BEFORE loading the TCPIP stack.
REM
*********************************************************************
CD \NET
REM CALL C:\NET\NET.BAT

REM
*********************************************************************
REM Load TCP/IP Stack
REM If MLSC is present always load TCPIP.
REM If no MLSC, check for MLPC.
REM
*********************************************************************
IF %MLSC% == NONE GOTO :MLPC_TCP
GOTO TCPNOML

:MLPC_TCP
REM
*********************************************************************
REM If MachineLogic is set for boot operation (MLDU.EXE returns 0),
REM TCP/IP must be run with the -NORTC option, to prevent interference
REM with MachineLogic!  MachineLogic will install TCP/IP as a task.
REM
*********************************************************************
C:\CTC\MLDU
IF ERRORLEVEL 1 GOTO TCPNOML
```

```
LH C:\NET\TCPIP -NORTC
GOTO TCPCONT

:TCPNOML
LH C:\NET\TCPIP

:TCPCONT

REM
*********************************************************************
REM Load MachineLogic if ML kernel present, and set for boot operation.
REM (determined by MLDU.EXE return value 0 = ENABLED, 1 = DISABLED)
REM
*********************************************************************
IF %MLSC% == NONE GOTO MAYBE_MLPC
GOTO NO_MLPC

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

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

:NO_MLPC
REM
*********************************************************************
REM Call AUTOEXEC.BAT file contained in project, if it exists.
REM
*********************************************************************
IF NOT EXIST C:\STARTUP\NUL.EXT MD C:\STARTUP
CD \STARTUP
IF EXIST C:\STARTUP\AUTOEXEC.BAT CALL C:\STARTUP\AUTOEXEC.BAT

REM
*********************************************************************
REM Start the MachineShop Shell.
REM
*********************************************************************
CD \CTC
PSU
```

## Numerics



## A



## B



## C



## D



## E

# Index

# Index