ROCKWELL SOFTWARE™

RSLogix 5™

Programming for the PLC-5®
Family of Processors

Getting Results Guide

Doc ID 9399-RL53GR-JAN01

Preface

Purpose of this document

This Getting Results book provides you with information on how to install and navigate the RSLogix 5 software. This guide includes troubleshooting information and tips on how to use RSLogix 5 effectively. It also explains how to acess and navigate the online help

Intended audience

We assume that you are a control engineer familiar with:

- IBM-compliant personal computers
- Microsoft® Windows® NT 4.0 operating system
- Allen-Bradley Company's PLC-5® programmable controllers
- RSLinx™ communications software

Document conventions

This manual uses the following typographical conventions:

- **[Bold]** characters in brackets represent keystrokes used to execute a function. When more than one key is to be pressed at a time, the keys are separated by a plus sign. For example, **[Ctrl + v]** means hold down the **[Ctrl]** key and press the **[v]** key.
- **Bold** characters represent menu choices.
- `TEXT IN THIS FONT` represents characters that you should type.

Online help

If you need help while using RSLogix 5, use any of the following methods:

- choose Help from the menu bar.
- click the Help button on any RSLogix 5 dialog.
- press **[F1]** on any instruction, dialog box, or window view.

For more information about the online help refer to *RSLogix 5 online help* on page 77.

Training

Rockwell Software offers both classroom training and a computer-based training program for RSLogix 5 software. For more information see *RSLogix 5 training* on page 80.

Commonly used terms

The following table defines terms commonly used in this book.

This term:	Represents this concept:
activation files	Hidden files in the root directory that allow the software to run. The software checks for these files before you have access to offline or online programming.
archive	Backups of project files. Can be used for version control.
back up	To make a copy of the current file before replacing that file with an updated version.
download	Restore a specified file to a specified processor. For example, when you download the current project file, you copy the file to a specified processor so the processor can begin running that file.
library	A file into which you store or from which you retrieve portions of ladder logic.
mnemonic	A term, usually an abbreviation that is easy to remember. PLC-5 instructions are typically represented by a 3-letter mnemonic.
project	All of the files that make up the PLC-5 logic program including the documentation files.
upload	Access a PLC-5 processor and save a copy of the project.
verification	An analysis of the ladder program files that results in the display of any programming errors.
zone	Portion of the ladder logic identified by a marker indicating the edited state of the file.

Contents

Chapter 8

More about monitoring data 61

Chapter 9

Saving and loading processor memory in PC5 libraries 69

Chapter 10

Getting the information you need 77

1 Installing and activating RSLogix 5

Introduction

This chapter explains how to install, activate, and start RSLogix 5 software. This chapter includes information on the following:

- installation methods
- activation overview and methods
- installation and activation procedure
- updating an existing installation
- starting procedures
- troubleshooting installation and activation

After installing the software, we recommend that you read the Release Notes. The Release Notes may contain more up-to-date information than was available when this document was published. To view the Release Notes, start the RSLogix 5 software; then, choose **Help > Release Notes**.

> **Important**   When installing RSLogix 5 software, you must have the Windows NT or Windows 2000 system administrator privilege and your user account must be a member of the local administrator user group. For more information, contact your system administrator.

System requirements

To use RSLogix 5 software effectively, your personal computer must meet the following hardware and software requirements.

Hardware requirements

The personal computer must have at least:

- an Intel Pentium®, Pentium-compatible, or greater microprocessor
- 64 MB RAM (128 recommended with PLC-5/60 and -5/80 processors)

- 43 MB of free Hard Disk Space (or more based on application requirements)
- a CD-ROM drive
- a 3.5-inch, 1.4 MB disk drive (required only for activation, therefore, it is not required on client machines in a client-server installation)
- 16-color VGA Graphics Adapter 640 x 480 or greater resolution (256-color 800 x 600 optimal)
- any Windows-compatible pointing device

We recommend a 500-MHz Pentium computer with 128 MB RAM or greater for optimal performance.

Software requirements

- The operating system must be Microsoft Windows 95, Windows 98, Windows 2000 or Microsoft Windows NT v.4.0.
- RSLogix 5 relies on RSLinx™ for communication with A-B processors. One copy of the RSLinx Lite software is included with the RSLogix 5 software.

Installation types

The RSLogix 5 software supports the following methods of installation:

- standalone workstation
- network

Standalone workstation

In a standalone workstation installation, you can install one or more Rockwell Software products to a single personal computer. Select the required Rockwell Software product and each required component for installation.

Network

The network installation allows multiple users to run one or more Rockwell Software products from a central network location. During the network installation, a system administrator installs one or more Rockwell Software products to a network location. Common application files, which are not specific to the operating system, are stored at this network location. These application files are then available to users of the network.

Important	The Setup program creates the following subdirectory on the user-defined network location path:
	x:\Program Files\Rockwell Software\RSLogix 5
	This subdirectory contains all of the application files required to run the product.

Activation

All Rockwell Software products are copy-protected, allowing only a computer with access to an activation key the ability to run the software. The activation key is located in an activation file, which is originally located on the Master disk supplied with the product. The activation file contains one activation key per product. Each activation key contains one or more licenses, depending on the number of copies of the product you have purchased.

Tip	Store your Master disk in a safe place. If your activation becomes damaged, the Master disk may be the only means to run your software in an emergency.

During installation, follow the instructions that appear on the screen to move the activation file from the Master disk to the root directory of the drive on which you're installing the software.

Important	Do not install activation on RAID or mirrored drives. You could lose the activation.

When you launch a Rockwell Software product, the software first checks your local hard drives, then network hard drives, and finally local floppy drives for activation. If the system fails to detect either the activation file or the Master disk, RSLogix 5 does not run.

> **Tip**
>
> Systems attached to extensive networks can take quite a while to search for activation files on all available drives. You can use the CHECKDRIVES environment variable to specify and/or limit the drives your software checks for activation files and to specify the order in which they are checked. Refer to the activation utilities online help file, COPYPROT.HLP. See page 6 for information on accessing the help.

Activation methods

Rockwell Software products support the following methods of activation:

- hard drive
- diskette drive
- network drive

Hard drive

The activation key resides on your computer's hard disk. Use this method if you will typically use RSLogix 5 on only one computer. This is the default method if you activate RSLogix 5 during installation. To run RSLogix 5 on a different computer, move the activation key back to the Master disk, and then to the hard drive of the new computer.

Diskette drive

The activation key resides on a floppy disk (Master disk). Use this method if you will typically use RSLogix 5 on more than one computer - for example, if you want to run RSLogix 5 on a desktop computer at some times and a portable computer at others.

Network drive

The activation keys reside on a network drive. Use this method if you have purchased multiple licenses of the software and want several users to be able to activate the software simultaneously over a network. Refer to the online help for instructions on moving activation to a network drive (see page 6 to access online help).

Running the activation utilities

The utilities for moving and resetting activation are called EvMove and Reset, respectively. Reset is used when an activation file has been damaged. The files EVMOVE.EXE and RESET.EXE are located on your Master Disk and on your hard drive (typically in C:\PROGRAM FILES\ROCKWELL SOFTWARE\RSUTIL). One way to run these programs is with **Start > Run**. Another method is to select **Start > Programs > Rockwell Software > Utilities > Move Activation** or **Reset Activation**.

Protecting your activation files

Caution	Certain anti-virus software packages, such as Norton Anti-virus, can corrupt the activation files. Configure your anti-virus software to avoid checking the files EVRSI.SYS, ICOM.SYS, EVICOM.SYS and 386SWAP.PAR.

To avoid damaging your activation files, do not perform the following operations with activation files on the hard drive.

- Restore from backup
- Upgrade the operating system
- Reinstall the same version of DOS
- Uninstall DOS
- Compress or uncompress the hard drive
- Turn off Windows for Workgroups 32-bit file access. If activation files were moved to a hard drive with 32-bit file access on, turning off 32-bit file access results in activation files being lost. (You can turn on 32-bit disk access and 32-bit file access in Windows for Workgroups without harming the activation file.)

Before running any type of utility that may modify the structure or organization of the hard drive, remove activation from the hard drive:

1. Use the Move Activation utility (EvMove) to move activation files from the hard drive to an activation disk. Run EVMOVE.EXE from your Master Disk or your hard drive (typically located in C:\PROGRAM FILES\ROCKWELL SOFTWARE\RSUTIL).
2. Perform the hard disk operation.

3. Move the activation files back to the hard drive.

> **Caution**
>
> You must use the move utility, EvMove, to move activation files. Attempts to copy, move or e-mail an activation file by other means will damage the file.

Getting help on activation

The online help (COPYPROT.HLP) provides more extensive information on activation. You can access online help:

- from the Help button on one of the EvMove or Reset dialog boxes.
- from within RSLogix 5. Select **Help > Copy Protection Help**.
- without running either RSLogix 5 or the activation utilities. Find and run the file COPYPROT.HLP on either your Master disk or your hard disk.

Installing RSLinx Lite software

If you have RSLinx 2.10 or later installed, you do not need to install RSLinx Lite.

RSLinx Lite provides communication between the programmable controller and a personal computer.

To install RSLinx Lite software:

1. Insert the RSLogix 5 CD into the CD-ROM drive..

If autorun is:	Then:
enabled	The CD-ROM menu appears. Select **Install RSLinx Lite** and proceed to step 2.
disabled	Perform the following steps: **a.** Click **Start**, then click **Run**. The Run dialog box appears. **b.** In the Open field, type `x:\autorun`, where x is the letter of the drive containing the RSLogix 5 CD-ROM. **c.** Click **OK**. The CD-ROM menu appears. Select **Install RSLinx Lite** and proceed to step 2.

2. Follow the directions that appear on the screen.

3. When the installation is complete either click **Exit** on the CD-ROM menu or install RSLogix 5. See *Installing and activating RSLogix 5 software* on page 7.

Installing and activating RSLogix 5 software

Tip	While installing RSLogix 5 software, you will have the opportunity to specify a directory. The suggested default directory is:
	x:\Program Files\Rockwell Software\RSLogix 5 English (or RSLogix 5 Pro English)
	We recommend that you use the default directory whenever possible.
	In procedures that appear throughout this document, we assume that you used the default name. If you did not use the default name, substitute the actual name you specified for the default name shown.

Security Server users: If you intend to use Security Server with RSLogix 5, you must install it from the CD-ROM menu in the same fashion as RSLinx Lite and RSLogix 5. Carefully read the warnings that appear on the screen before continuing with Security Server installation!

To install and activate RSLogix 5 software, perform the following steps:

1. Insert the RSLogix 5 CD-ROM into the CD-ROM drive.

If autorun is:	Then:
enabled	The CD-ROM menu appears. Select **Install RSLogix 5** (or RSLogix 5 Pro depending on which you purchased) and proceed to step 2.
disabled	Perform the following steps: **a.** Click **Start**, then click **Run**. The Run dialog box appears. **b.** In the Open field, type `x:\autorun`, where x is the letter of the drive containing the RSLogix 5 CD-ROM. **c.** Click **OK**. The CD-ROM menu appears. Select **Install RSLogix 5** and proceed to step 2.

2. Follow the instructions that appear on the screen.

   Serial number. When asked for the serial number, you can find this information on the box your software came in.

Changing the directory. The default installation directory is C:\Program Files\Rockwell Software\RSLogix 5 English. If you wish to install the software to a different location, you must choose the **Custom** setup type. Click **Change** to change the drive or directory. Installed features default to those of the Complete setup. For additional help with the Custom setup, click the Help button.

Activation. When prompted to install activation, insert the Master disk into the 3.5-inch disk drive. Follow the instructions that appear on the screen to move the activation file from the Master disk to the install directory.

3. When you are finished installing and activating the software, remove the RSLogix 5 CD-ROM and the RSLogix 5 Master disk from the drives. Store them in a safe place.

Important   If this is a network installation, the system administrator should notify all users of the dedicated location where all of the Rockwell Software files have been installed.

Updating an existing installation

Perform the following steps to update an existing installation:

1. Use Control Panel to uninstall RSLogix 5. (Select **Start>Settings>Control Panel** and double-click **Add/Remove Programs**.) Follow the instructions that appear in the InstallShield Wizard. Existing project files are not removed.

2. Insert the RSLogix 5 CD-ROM into the CD-ROM drive.

If autorun is:	Then:
enabled	The CD-ROM menu appears. Select **Install RSLogix 5** (or RSLogix 5 Pro depending on which you purchased) and proceed to step 2.
disabled	Perform the following steps: **a.** Click **Start**, then click **Run**. The Run dialog box appears. **b.** In the Open field, type `x:\autorun`, where x is the letter of the drive containing the RSLogix 5 CD-ROM. **c.** Click **OK**. The CD-ROM menu appears. Select **Install RSLogix 5** and proceed to step 3.

3. Follow the instructions that appear on the screen.

Tip	If activation was previously installed, it is not necessary to move the activation. If activation was not previously installed, insert the RSLogix 5 Master disk into the 3.5-inch disk drive and follow the instructions that appear on the screen.

Starting RSLogix 5 software

To start RSLogix 5 software:

As a:	Do the following:
Standalone workstation user	Click **Start**, and then select **Programs > Rockwell Software > RSLogix 5 English** (folder) **> RSLogix 5 English** (executable) from the Start menu. (Menu items will say RSLogix 5 Pro English if you purchased the Professional version.)
Network user	Double-click the product executable file, RSLgx5.exe, located in the drive and directory specified by your system administrator.

We assume that you used the default names for the directory and program group. If you did not use the default names, substitute the actual names that you specified for the default names shown.

Troubleshooting

If RSLogix 5 does not start up or run properly or if you encounter problems with activation, refer to the following sections as a troubleshooting aid.

Installation

If RSLogix 5 does not start up or run properly, ask yourself the following questions.

Does my computer have enough memory?
Running RSLogix 5 requires a minimum of 64 MB of RAM.

Is the RSLogix 5 software activated?

If, upon attempting to run RSLogix 5, you see a message indicating that activation for RSLogix 5 is missing, you will need to move activation to your local hard drive. Put the RSLogix 5 Master Disk in the floppy drive. Click **Start**, then **Run**. In the Open field type **x:\evmove**, where *x* is the letter of the drive containing the Master disk. For more information on moving activation refer to the online help in the EvMove utility.

Activation

The following are some common activation questions and their respective answers.

My activation files were damaged. What should I do?

If you have lost the activation because the activation file is damaged, you need to reset activation. Call Rockwell Software Technical Support or refer to the Reset Codes instructions on the Rockwell Software Technical Support web page. The phone number and web address are listed on the inside front cover of this manual. If you cannot obtain a reset code immediately, follow the instructions below to use the Master disk to activate the software as a temporary solution.

To use the Master disk to activate the software:

1. Set the KEYDISK environment variable to TRUE. For more information on the KEYDISK environment variable, please refer to the online help.

2. Insert your Master disk into the 3.5-inch disk drive.

3. Run your software as usual. Your software will find the activation on the Master disk.

I accidentally deleted the software directory on my hard disk. Do I need to call Rockwell Software for replacement activation files?

No. Deleting the program files does not delete your activation. The activation files are not stored in the program directory; they are located in the root directory. Your activation files won't be lost unless you format the hard disk, tamper with hidden files in the root directory, or perform certain other hard disk operations (see *Protecting your activation files* on page 5).

To get the software running again, simply reinstall the software, but do not move the activation when given the opportunity.

Why can't I move activation to a floppy disk on a Windows NT system?

It has to do with a disk modification that NT does not allow. If you have access to a Windows 95 or 98 machine, you can create a disk that will work under NT. Format a floppy disk and move any activation file to it under Windows 95 or 98. (You can move the activation back off the disk if you want to keep it where it was.) Now take that disk to your Windows NT machine and move the activation to it.

2 Getting started with RSLogix 5

Overview of RSLogix 5

The RSLogix 5 software is a 32-bit Windows® ladder logic programming package for the PLC-5 family of processors. Operating in the Microsoft® Windows 95, 98, 2000, and Windows NT™ environments, RSLogix 5 is compatible with programs created with WINtelligent Logic 5, PLC-5 A.I. (Advanced Interface) Series, and 6200 Series PLC-5 programming software products.

RSLogix 5 software functionality includes:

- a free-form ladder editor that lets you concentrate on the application logic instead of proper syntax as you write your program

- a powerful project verifier that you use to build a list of errors you can navigate to make corrections at your convenience

- drag-and-drop editing to quickly move data table elements from one data file to another, rungs from one subroutine or project to another, or instructions from rung to rung within a project

- search and replace to quickly change occurrences of a particular address or symbol

- a point-and-click interface (project tree) that lets you access all the folders and files contained in your project

- a custom data monitor to view separate data elements together and observe interactions

- a histogram function to monitor a data table bit or word as either text or a graphical timing chart

- SFC and Structured text editors, based on IEC 1131-3 standards, that share the same simple drag-and-drop editing found in the common ladder logic editor

- PC5 libraries for storing and retrieving portions of ladder logic for use across any of Rockwell Software's PLC-5 programming software products

Navigating RSLogix 5

RSLogix 5 includes the screen elements described below.

Instruction toolbar

Add-in toolbar

Menu bar

Standard (Main) toolbar

Online bar

Project tree

Results window

Status bar
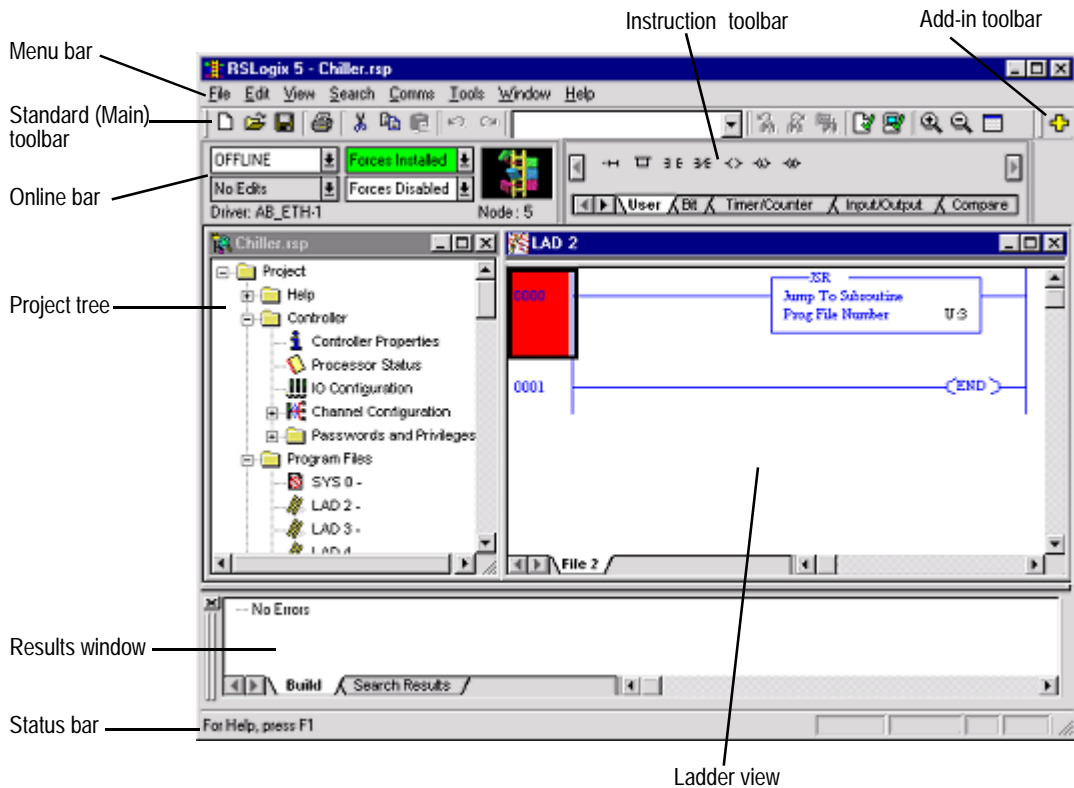
Ladder view

- **ladder view.** In this part of the application window you can view several program files at the same time. This is where you edit your ladder logic.

- **results window.** Displays the results of a Find All search or a verification procedure. You can hide this window view or drag it from the application window and place it anywhere on your screen.

- **menu bar.** Select functionality from the menus that appear as you click each selection on this bar.

- **standard toolbar.** The standard toolbar (also referred to as the main toolbar) contains many functions that you will use repeatedly as you develop and test your logic program. If you want to know what any of the icons represent, RSLogix 5 can tell you. Just move your cursor to the icon. A floating tooltip window will appear and tell you what the icon is used for.

- **online bar.** Learn the operational mode and see whether you have online edits or forces installed at a glance. You can even view the driver and node number.

- **instruction toolbar.** Displays instruction mnemonics in tabbed categories. When you click on a category tab the instruction toolbar just above it changes to show that category of instructions. Click an instruction to put it in your ladder program.

- **add-in toolbar.** In RSLogix 5 Professional only. Use this toolbar to quickly access add-in software such as RSWire I/O Builder.

- **status bar.** Look here for ongoing status information or prompts, as you use the software.

- **project tree.** Displays all the folders and files contained in your project.

This symbol (-) means that the folder's contents are already visible. Click the symbol to collapse the folder and hide its contents.

This symbol (+) means that the folder's contents are not visible. Click the symbol to expand the folder and reveal its contents.
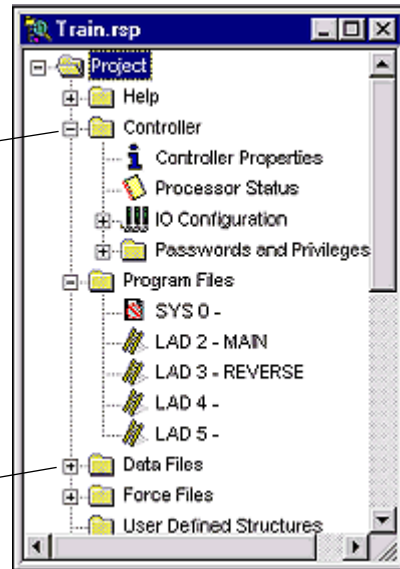
If you right-click most items in the tree you will see a menu specific to the item selected. For example, if you right-click on a program file, you see options to rename, open, hide, or reveal properties of the program file, among other things.

Opening multiple program files

To open a program file, simply double-click the file in the project tree. To open additional files, double-click each file that you want to open in the project tree. A tab for each open program file appears at the bottom of the ladder view.

Click a tab to view the file.

To close a file, right-click its tab and select **Remove**.
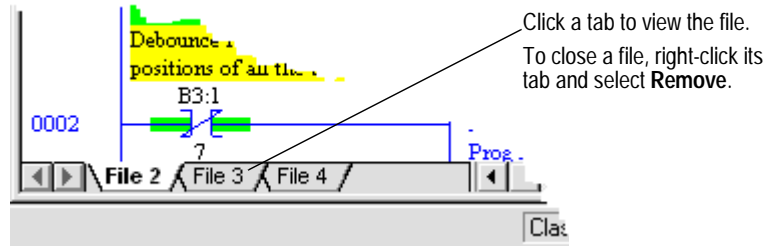
Splitting the viewing window

To open multiple files within the same project, you can split the viewing window.

1. Position the cursor on the split bar in the ladder view window. The pointer turns into a double bar with two arrows.

Cursor
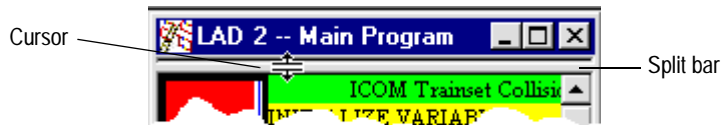
Split bar

2. Click and drag the split bar down to show two different viewing panes of the program file.

3. With focus in either pane, double-click the program file in the project tree that you want to view. The second file is opened on a tab in that pane.

   Viewing two program files at once in this way makes drag and drop between them easier. You can also display different sections of the same file in each pane to facilitate moving or copying items within the same file.

Opening multiple program windows

Another method of viewing multiple program files is to open a separate window for each.

1. In the project tree right-click on the program file you want to open.

2. Select **New Window**.

3. Repeat this process for any additional program files you wish to view simultaneously.

To close a program window, click its close button.

You cannot view program files from different projects with only a single instance of the RSLogix 5 application software running on your computer. You must open more than one instance of RSLogix 5 to work on multiple projects at the same time. Once you have the projects opened, however, you can drag and drop instructions and data between them.

Quick Start steps for development

The following steps explain how to get up and programming quickly with RSLogix 5 as soon as you install it.

Step 1 • Configure system communications

Do this before you begin a new project. The settings you establish with this step will remain with the project and will be applied when you attempt to download any logic program. (Normally, system communications is not related to your project. Creating a new project is a special instance. Since no other communications are set up, system comms are copied to controller comms, which does stay with your project. For more information about the difference between system and controller communications, see Chapter 3, *More about configuring communications* on page 29.)

Select **Tools > Options**. Click the System Communications tab on the System Options window, to give it focus. From this tab set your driver, node, and reply timeout.

Make your driver and node selections here.

If you have previously set up communications with a network node in RSLogix 5, you can select from a list of previously configured drivers and nodes.
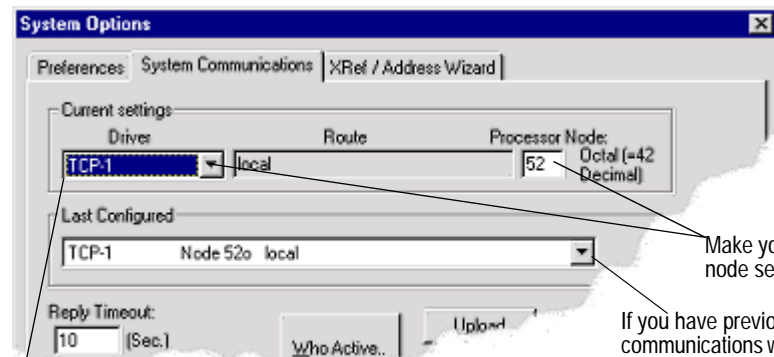
A driver must already have been configured in RSLinx or RSLinx Lite. If not, do so before performing this step. Refer to the online help in RSLinx for more information on configuring drivers. (Select **driver configuration** in the RSLinx help index).

You can also access the Who Active feature available in RSLinx. This utility displays all available stations/nodes on your communication networks. This can help if you are unsure of the node number of a particular device on the network.

Step 2 • Create a new project or open an existing project

RSLogix 5 is based on projects. A project is the complete set of files associated with your program logic.

New Project

To create a new project:

1. Select **File > New**.

2. Provide information about your processor on the Select Processor Type dialog. If you already set up communications as in Quick Start Step 1, this information appears on the dialog. If not, specify the communications settings here. Click OK.

RSLogix 5 creates and displays the project tree control for your new project. This project tree is your access point to program, data table, and database files. See page 15 for more information about the project tree.

Existing Project

To open an existing project:

1. Select **File > Open**.

2. Click the file you want to open and click **Open**. If the file you want to open does not appear on the list:

   ▪ Use the **Look in** list to navigate to a different directory.

   ▪ Use the **Files of type** list to display files with an extension other than .RSP, .X5, .PC5, or .AF5.

RSLogix 5 can open projects and documentation files that were developed using any Rockwell Software DOS-based (PLC-5 A.I. Series or 6200 Series PLC-5) or Windows-based (RSLogix 5 or WINtelligent Logic 5) programming software. If you experience a problem however, there are special considerations that may affect retrieval of your database files. For more information about opening projects created using other Rockwell Software PLC-5 programming software products, refer to Chapter 4, *Opening A.I. and 6200 project files in RSLogix 5* on page 31.

Tip	For clarification of the different file types and their extensions, click the **Help** button on the Open/Import PLC5 Program dialog.

Step 3 • Add the chassis and I/O

To add a chassis:

1. From the Controller folder in the project tree, double-click the IO Configuration icon. The I/O Configuration - Chassis Table dialog appears.

2. Right-click inside the I/O Configuration dialog and select **Add Chassis**. The Edit Chassis Properties dialog box appears, with the Chassis tab selected.

3. Select the chassis type by clicking one of the option buttons. A list is displayed showing the available chassis.

4. Select the desired chassis from the list.

5. If you've selected a Flex I/O chassis, enter the number of slots in the **Number of slots** field. Enter a value from 1 to 8.

6. Document the DIP switch settings by selecting the configuration settings in the pulldown list boxes in the DIP Switches section of the dialog box.

7. Click OK to accept your choices and close the dialog box.

Some modules may require configuration after they have been added. See Chapter 5, *Hardware configuration* on page 35 for more information about hardware configuration.

By default the first chassis listed in a new project is the 1771-A1B four slot. You can change this by right-clicking on the chassis and selecting **Properties**.

To add modules to the chassis, right-click the chassis and select **Display Chassis**. The smaller dialog shown here appears.

On the **Chassis** dialog, right-click in the cell for the slot to which you wish to add a module and select Insert Module.

ControlNet users: For ControlNet™ processors controlling I/O via ControlNet, the chassis and modules must first be mapped in RSNetWorx™ before they will appear in the chassis table to be configured. Also, the associated .XC file (created by RSNetWorx) and the ControlNet node number of the processor must be entered in Controller Properties in the Project Tree.

Step 4 • Create program and data table files

The project tree is your point-of-entry for creating new files or accessing existing files. To create a new file, right-click the program or data file icon and then select **New**. A dialog appears for you to provide information about the file. For more information, refer to the online help.

Right-click and select New to create a new program or data file.

⊞ 🗀 Program Files

⊞ 🗀 Data Files

Data files are also created automatically as you assign new addresses in your ladder program.
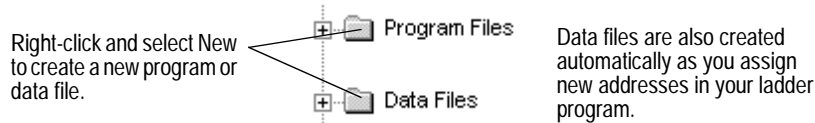
A program file may contain controller information (SYS 0), the main ladder program (LAD 2), or a subroutine program.

Data table files contain the status information associated with external I/O and all other instructions you use in your main and subroutine ladder program files. In addition, these files store information concerning controller operation. You can also use data table files to store look-up tables if needed.

Step 5 • Enter a logic program

When you open a program file by double-clicking its icon in the project tree, the ladder file opens in the right half of the RSLogix 5 window. Usually program file #2, the main program file, is opened when you open a project. If you have not begun to enter any ladder logic, only the end rung will show.

To enter ladder logic to a new program:

New Rung icon

1. Click on the end rung and then select the new rung icon on the User tab of the instruction toolbar.

2. To place an instruction on a rung, click its icon on the instruction toolbar.

If there are too many instructions on the toolbar to see all at once, use these arrows to scroll.

◄ ⊣⊢ ⊐ ∃ Ε ∃/Ε <> <0> <0> ►

◄ ► \ User ⋀ Bit ⋀ Timer/Counter ⋀ Input/Output ⋀ Compare

Use these arrows to scroll through the tabs.

Each of these tabs displays a different category of instructions in the toolbar.
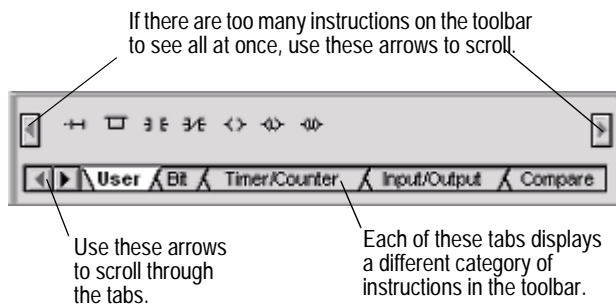
You can place several instructions on a rung in sequence by clicking the icons one after another. RSLogix 5 places instructions from left to right.

3. Assign an address to each instruction. Double-click an instruction, type the address in the empty field that appears above the instruction, then press the Enter key. With RSLogix 5 you can also drag and drop addresses from a data table file onto instructions in your ladder logic.

4. Continue adding rungs, remembering to save your file periodically with **File > Save**.

RSLogix 5 supports a file-based editor. This means that you can:

- create and/or edit multiple rungs at a time
- enter addresses before you actually create data table files for your I/O
- enter symbols before you have assigned addresses for them in the database
- enter instructions without having to provide addresses until just before file validation occurs

For more detailed information about entering ladder logic including information about shortcuts, branching, addressing, and performing program edits online, refer to Chapter 6, *More about entering ladder logic* on page 41.

Step 6 • Add documentation to your logic instructions

You can use several methods to add symbols and descriptions to addresses in the database.

- Add a symbol directly to an addressed instruction in the ladder logic. Double-click the address, type the symbol in the address edit field, and press the Enter key.

  You can enter a symbol in this manner before an address has been assigned, then later use the database editor to assign an address. (Database editor is an encompassing term for the various database editing dialogs that appear when you click one of the icons under Database in the project tree.)

- Right-click an instruction address or rung number in the ladder logic and select **Edit Symbol** or **Edit Description** for an address or **Edit Comment** or **Edit Title** for a rung.

- Modify an address's symbol and description in the data file. Double-click the data file in the project tree, click on an address in the table. The bottom of the dialog contains fields where you can enter the documentation for the address.

- Modify (add, delete, change) the database using the database editor. This is the preferred method for deleting project documentation. All documentation (including instruction comments and group names and descriptions) can be edited with this method. Double-click an icon in the database folder located in the project tree. Another method of accessing the database editor is to right-click an address in the ladder logic and select **Goto DataBase**.

- Copy symbols and descriptions from the ladder display between RSLogix 5 and RSLogix 500 or between instances of RSLogix 5 by using cut, copy, and paste options or by dragging and dropping the symbol or description from one application to another. (A dialog will appear if there is a database collision.) Any errors or inconsistencies between data types will be flagged when the program is verified. You cannot copy and paste to other applications within the database editor, only from within the ladder view.

- Use Microsoft Excel to edit the database. Select **Tools > Database > Edit Using Excel**.

For information about database import and export options refer to Chapter 7, *Importing or exporting the documentation database* on page 53.

Step 7 • Verify the program logic

When you are ready to build your project, you can validate a single program file or you can validate your entire project. Select **Edit > Verify File** or **Verify Project**.

After you initiate a verification, the Verify Results output window displays and gives you information about mistakes or omissions that may have occurred as you wrote your program logic.

Double-click an error message to go directly to the relevant location in the code.

To hide this window when finished, select **View > Results**.
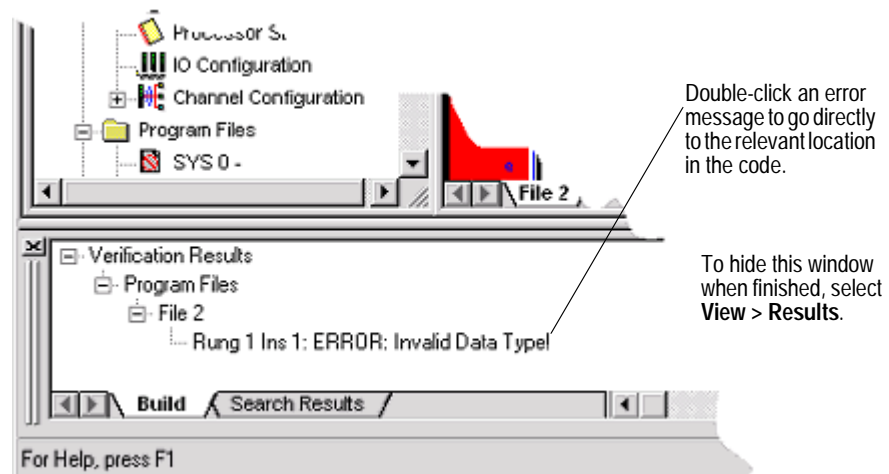
Step 8 • Configure the communication channels

Enhanced (New Platform), Protected (Secure), Ethernet, and ControlNet PLC-5 processors have communication channels that must be configured. (For Soft Controllers, configure the PLC-5 I/O, Remote I/O scan list, and SLC 500 I/O. Double-click the appropriate icons under IO Configuration in the project tree.)

To configure communication channels:

H⌁ Channel Configuration **1.** Double-click the Channel Configuration icon in the Controller folder in the Project tree.

2. Edit the properties on the dialog and click **OK**.

Use the Channel 0 tab to configure settings for RS232/422/423.

Use the Channel 1A - 2B tabs for DH+, Scanner, Adapter, or Inactive I/O channel mode.

Use the Channel 2 tab (not shown) for Ethernet or Local I/O Extension channels.
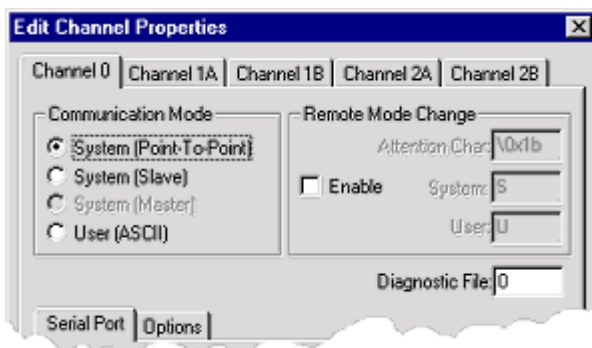
Use the Channel 3A tab (not shown) when using a VME or Ethernet sidecar coprocessor.

For more information about the parameters on the dialog, click the Help button or press F1.

Step 9 • Download and go online

Tip	If you are developing the program offline, for example on a laptop remote from the site, and later plan to download and run the program on a specific processor (node) via a determined protocol, you may want to override system communication settings made in *Step 1 • Configure system communications* on page 17. Double-click Controller Properties in the project tree, click theController Communications tab, and set the communication settings. Settings made on this dialog will override any driver and node settings established in Step 1, and should be completed before performing this step.

To download and go online:

1. Select **Comms > Download** to download the current offline program into the controller.

2. RSLogix 5 automatically verifies the project. If no errors are found, the download continues. If errors are found, you must correct them and initiate the download again (with Comms > Download).

3. After downloading, RSLogix5 will ask if you want to go online. Click Yes to go online.

Cick here to change the processor mode or go offline.

REMOTE PROG	No Forces
No Edits	Forces Disabled
Driver: TCP-1	Node : 52o
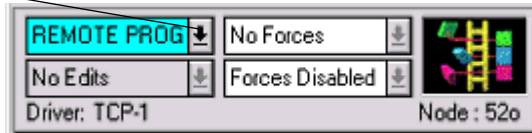
If you want to download only specific program and data files, force data, or channel configuration data, select **Comms > Partial Download**. This allows you to maintain certain parts of your PLC-5 program, while overwriting other parts.

Step 10 • Monitor data files

You can use RSLogix 5 to watch what is happening in your data table files. This procedure is called monitoring data table files.

When you are monitoring data table files, you can:

- define how your data file selection grid will display
- change values in the data table
- change the display radix
- show which addresses are used in your ladder logic
- switch between files
- quickly jump to another address in another data table file
- cross reference data

To monitor data, simply open a data file (double-click it) in the project tree. You can have multiple data table files opened for monitoring at the same time. To cascade or tile all the windows opened in your RSLogix project, select an option from **Window > Arrange**.

Data changes made offline only affect the disk file unless the program is restored to the processor.

Data changes made online only affect the processor file unless the program is saved or uploaded while online to update the disk file.

For information about how you can perform a cross reference, force I/O, or create and monitor lists of related addresses instead of accessing the data table files, refer to Chapter 8, *More about monitoring data* on page 61. Also, you can use histograms to monitor a data table bit or word as either text or a graphical timing chart. More information about histograms can be also be found in Chapter 8.

Step 11 • Search and replace instructions

The Find option allows you to quickly locate instructions, addresses, and symbols in ladder program files. You can even search for edit zones within your logic program. If you want to automatically replace instructions and addresses with different ones, you can use the Replace option. You can use wildcards in your find and replace operations.

To search (and replace):

1. Select **Search > Find** or **Search > Replace**.

2. Specify the instruction you want to locate in the Find What field. You can type any of the following:

   - the mnemonic (such as XIC or TON)

   - the address (such as B3/4)

   - a combination of both mnemonic and address (XIC B3/4)

   - a combination of mnemonic and symbol (XIC REPEAT)

3. If replacing, type what you want the instruction replaced with in the Replace With field.

4. Set remaining parameters on the dialog if desired (such as the search direction) and click **Find Next** or **Replace**. For more information about the options and buttons on the dialog, click **Help**.

An alternative method for searching is to click inside this box and type the numeric or symbolic address or the instruction mnemonic you want searched.
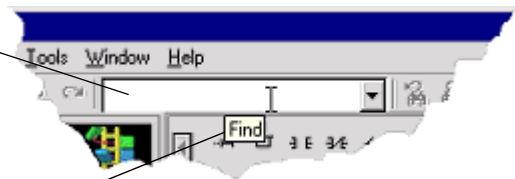
This is a tooltip. To see the function of an item on the toolbar, point to it without clicking.

Step 12 • Print a report

You can obtain a printout of various elements of your project, such as program files, data table files, and processor information.

To print a report:

1. Select **File > Report Options**. The Report Options dialog displays a tree on the left with the elements of a report that you can configure (such as, which program files to print, title, header, fonts, colors, etc.). The right side of dialog displays the controls for you to set.

2. Use the checkboxes to mark everything you want included in the report.

3. Click **Page Setup** to set the paper size, margins, and orientation.

4. In the tree, click an element to configure that element's settings. For example, when you click Program Files in the tree, the options on the dialog allow you to select which program files you would like to print and even ranges of rungs.

   If you are including a title page, header, and footer, be sure to click each of these elements in the tree to set them up.

5. Click **Print Preview** to see how the report will appear. You can scale up the image to make the information appear larger on the printed page or scale down the image so that, in cases where many instructions are on a rung of logic, all the instructions can fit on the printed page.

6. If the report appears as you expected, click **Print** to print the report. Otherwise, click **Options** to return to the Report Options dialog and make changes.

   If you wish to save report settings for future use, click **Save/Load** at the bottom of the Report Options dialog. Notice that the Report Options Setup Load/Save dialog that appears has an Import and an Export button allowing you to import and export report formats for use with other projects.

Quick Start steps for maintenance

The steps below will help you get online quickly for maintenance tasks, like, for example, changing some contacts.

Tip	RSLogix 5 now provides a feature for going online more quickly called Online Now. System communications must be configured. Select **Comms > Online Now**. If the offline program file is different from that in the processor, the processor file is uploaded automatically. The database is not loaded and x-ref is disabled. More information is available in the online help.

Step 1 • Establish communications with the processor

This step assumes that a driver has been configured in RSLinx or RSLinx Lite. If not, do so before performing this step. Refer to the online help in RSLinx for more information on configuring drivers. (Select **driver configuration** in the RSLinx help index).

1. Select **Comms> Who Active Go Online**.

2. Use the tree structure in the left pane to navigate to the network on which the processor resides.

3. Click the processor in the right pane to select it.

Step 2 • Go online

1. Click the **Online** button.

2. The system checks for a project on your computer that matches the processor program. One of three things will happen:

   - A perfect match is found. In this case, RSLogix 5 goes online with no further action required on your part.

   - An imperfect match is found for one or more projects with the target processor name. In this case, select the desired project file from the list and click the **Upload Logic, Merge with Existing File's Comment/Symbol DB** button.

   - No match is found. In this case, click the **Create New File** button.

3 More about configuring communications

System communications vs. controller communications

You can set communication parameters via system communications or controller communications. The function of each is different.

- Use system communications (**Comms > System Comms**) to indicate the communication configuration for the processor that you want to connect to. This method of communication is not related to your project. In fact, typically you supply these parameters even before beginning work with a project. For example, you may want to upload an existing project from a processor and then modify that project in some way for use on another processor.

- Use controller communications (accessed by double-clicking the Controller Properties icon in the project tree and then selecting the **Controller Communications** tab) if you want the driver and node settings that you enter to stay with the project. Often this is the case when you use a laptop computer and develop a project offline. You will want the driver and node information that you supply for use with your project to override system communication parameters when you later download the project to a specific processor.

In the controller communication dialog there is a drop-down list box that shows you the previous communication configurations that were used. You can look this list over to see if the driver and node of the processor you want to communicate with is listed. If you see it in the list, just click it to re-establish the parameters.

Who Active

The Who Active function shows you what stations are connected on your PLC communication network. You can use this information for selecting stations to upload from, download to, or monitor online. You can also display statistics about how your communications are performing.

When you use RSLogix 5 to display a Who Active dialog, RSLogix 5 calls RSLinx and activates the Who Active (RSWho) function. If RSLinx is not installed on your computer, RSLogix 5 calls the RSLinx Lite communication driver that is included in the RSLogix 5 software.

You can access Who Active from either system or controller communications. In fact, the Communications dialog displayed with **Comms > System Comms** is the Who Active screen. If you check the **Apply to Project** box, the settings are applied to controller communications even though accessed from system communications.

Chapter

4

Opening A.I. and 6200 project files in RSLogix 5

Introduction

RSLogix 5 can open projects and documentation files that were developed using any RSI DOS-based (PLC-5 A.I. Series or 6200 Series PLC-5) or Windows-based (RSLogix 5 or WINtelligent Logic 5) programming software. If you experience a problem however, there are special considerations that may affect retrieval of your database files.

Opening a Project File

If the procedure below does not satisfactorily open the ladder logic file and its accompanying database files, read and follow the special considerations for PLC-5 A.I. Series software and 6200 Series PLC-5 programming software discussed in this chapter.

1. Select **File > Open**.

2. Use the **Look In** box to navigate to the location of the project file.

3. In the **Files of Type** field, select the type of project. RSLogix 5 supports .RSP, .X5, .AF5 and .PC5 library files, as well as backup files.

4. Click the project file you want to open, and click **Open**.

Special Considerations

Retrieve the PLC-5 A.I. Series documentation database

When you open an X5 project created using PLC-5 A.I. Series programming software, RSLogix 5 automatically imports the documentation database making it available to the X5 file. If however, for some reason, the documentation database cannot be accessed or fails to accompany the project, you can attach the documentation using the method below.

Make sure your have followed the procedure above for opening a project before proceeding with the following steps.

1. With the project opened, select **Tools > Database > Native Import**.

2. Select AI for the **Import input format**.

3. Select which types of data to import and specify what to do in case of collisions with existing data records. Press the F1 key if you need help on the dialog.

4. Click **OK**.

5. Find the .DSC file for your project; click it to select it.

6. Click **Open**. The data you specified will be imported into the current project.

Open a 6200 Series PLC-5 Project

When you attempt to open an AF5 project created using DOS-based 6200 Series PLC-5 programming software, RSLogix 5 does two things. It automatically launches an internal conversion utility that converts the AF5 file into an X5-format file. Then it imports the documentation database making it available to the X5 file.

Sometimes, due to the complexity of your project or the software version used to create it, you may experience a problem with this process. You may find that RSLogix 5:

- cannot retrieve the database documentation associated with the file (corrupt database message)

- has problems opening the AF5 project file

If this happens follow the procedure below to open the 6200 Series PLC-5 project file including the documentation database.

1. Using the 6200 Series DOS programming software, save the 6200 Series PLC-5 project file as an X5 file.

2. In RSLogix 5, select **File > Open**.

3. Use the **Look In** box to navigate to the location of the project file.

4. In the **Files of Type** field, select PLC5 Programs(*.X5).

5. Click the project file you want to open, and click **Open**. (The documentation will not follow. It must be imported as described next.)

6. Select **Tools > Database > Native Import**.

7. Select AB 6200 for the **Import input format**.

8. Make sure **Import ALL** is selected.

9. Click **OK**.

10. Use the **Look in** box to navigate to the location of the 6200 Series PLC-5 database files (OP$ extension). Click the database file, then click **Open**.

5 Hardware configuration

Introduction

This chapter provides information on configuring your chassis and I/O modules in RSLogix 5.

The chassis table

The chassis table is the starting point for adding, deleting, or configuring chassis, processors, adapters and I/O modules. To display this window double-click the I/O Configuration icon in the project tree.

Use the right mouse button menus to perform tasks in the Chassis Table.

The chassis table contains information about the current configuration of your I/O chassis, including:

- the chassis type
- the processor (or adapter) for the chassis
- whether the chassis is inhibited or reset
- the rack addressing mode for the chassis
- the rack, group, and slots encompassed by the chassis
- whether the chassis is set to use complementary I/O

For clarity, you can limit your view of the chassis table to only show rows having directly to do with I/O—that is, the chassis and I/O scanner rows. To do this, clear the **Show Non-I/O Rows** checkbox at the top of the chassis table.

Adding and configuring a chassis

By default each processor in your project is associated with one I/O chassis. You can add additional chassis to a processor to expand the number of I/O modules that processor can address. Adding a chassis consists of selecting the type of chassis you are using for your project and documenting the chassis DIP switch settings.

ControlNet users: For ControlNet™ channels, first use RSNetworx™ to insert, delete and modify chassis and modules. Then use RSLogix 5 to configure the modules.

To add and configure a chassis:

1. From the Controller folder in the Project tree, double-click the I/O Configuration icon. The I/O Configuration - Chassis Table dialog appears.

To change or redefine a chassis, right-click on it and select **Properties**.

To stop an I/O chassis from being scanned, check **Inh**.

To reset scanning of all I/O in the chassis, check **Res**.

2. Right-click in the Chassis Table and select **Add Chassis**. The Edit Chassis Properties dialog box appears, with the Chassis tab selected.

3. Select the chassis type by clicking one of the option buttons. A list is displayed showing the available chassis.

4. Select the desired chassis from the list.

5. If you've selected a Flex I/O chassis, enter the number of slots in the **Number of slots** field. Enter a value from 1 to 8.

6. Document the DIP switch settings by selecting the configuration settings in the pulldown list boxes in the DIP Switches section of the dialog box.

7. Click **Apply** to accept your choices and leave the dialog box open or click **OK** to accept your choices and close the dialog box.

Configuring a PLC or I/O adapter

Each I/O chassis has an I/O adapter. The adapter is either a PLC-5 processor, configured when you begin a project, or an I/O adapter. Select chassis DIP switch settings, add or change the type of adapter, or establish configuration settings for the adapter in any chassis by double-clicking on the processor or adapter in the Chassis Table (or right-clicking and selecting **Properties**).

For a PLC-5:

Indicate the dip switch settings of the chassis.

For an I/O adapter:

Select the I/O adapter type from this llist.

Make your selections for the scanner PLC and scanner channel here.

Indicate the dip switch settings of the chassis
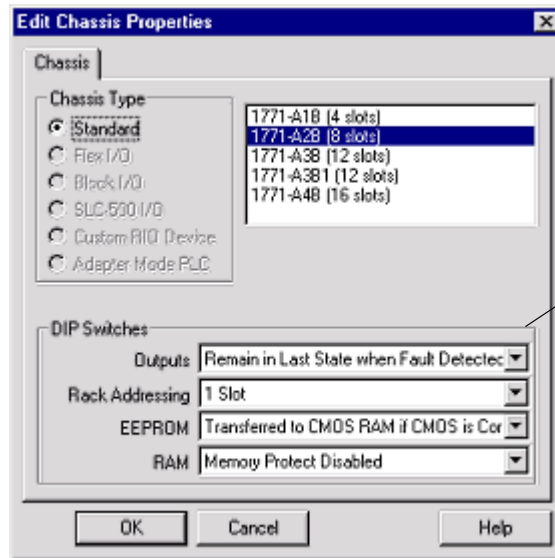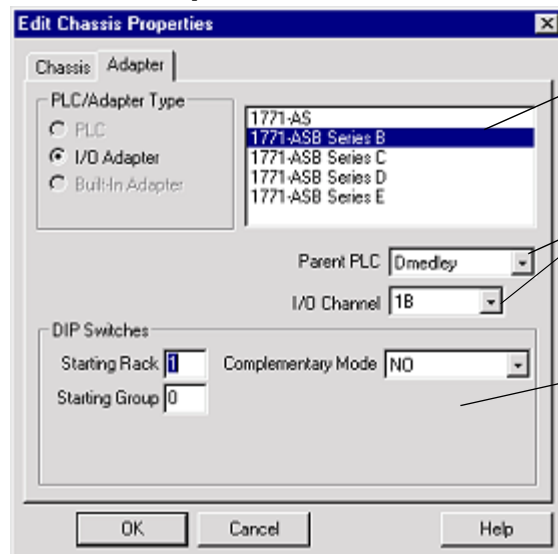
Adding IO modules

To add a module to a chassis:

1. Double-click the I/O Configuration icon in the project tree to open the Chassis table.
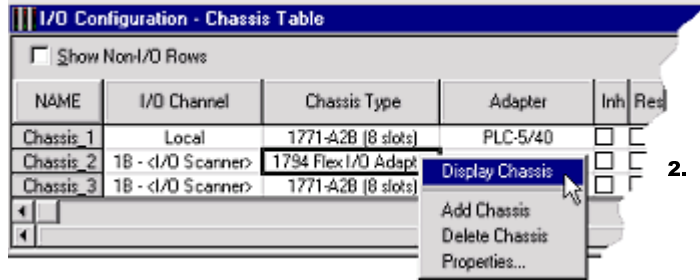
2. Right-click the chassis and select **Display Chassis**.

3. Right-click the cell for the slot you wish to add a module to and select Insert Module.
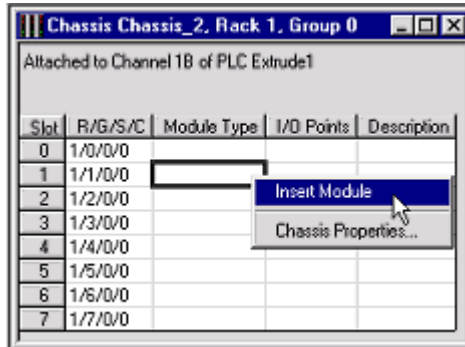
4. Select the module type and the specific module. Click OK.
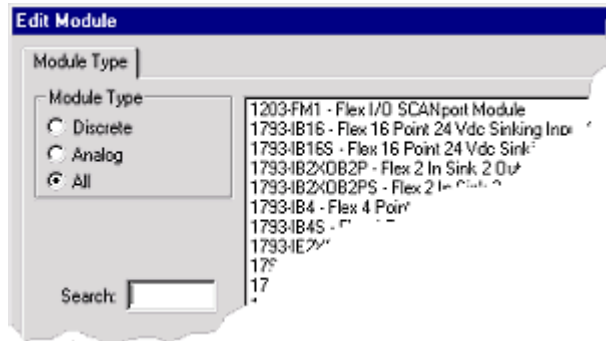
Using the method above, you can add, delete, or edit modules as well as create descriptions for each one. Some modules require configuration after they are added.

Remember that you can always press **[F1]** for help about any task you are attempting as you progress through the dialogs while you use RSLogix 5.

Configuring IO

To configure an I/O module:

1. Double-click the IO Configuration icon in the project tree.

2. Right-click the chassis containing the module you want to configure and select **Display Chassis**.

3. Right-click the module that you want to configure and select **Display Module**. The module configuration window varies from module to module and configuration is different for discrete and analog modules. Press **[F1]** to display help on that particular module.

   - **Discrete**. These modules require no configuration, but symbols, descriptions, values, and forcing can be assigned to individual I/O points. Click **Close** when finished editing.

   - **Analog**. Most analog modules require configuration. These configurable analog I/O modules are known as "intelligent block-transfer" modules. In addition to defining block transfer read/write pairs, configuration parameters must be defined, such as scaling, alarm limits, or other types of items particular to the specific type of module.

   The first time you edit a particular analog I/O module, the Enter Module Addresses dialog appears. Enter addresses or click **Auto-Pick** to have RSLogix 5 automatically select the addresses required for the module, and then click **Done**. (Auto-Pick is not available for ControlNet modules.) That module's configuration window appears. Make your changes, click **Accept Edits**, then click **Close**.

   If you want to edit addresses in the future, right-click in the spreadsheet portion of the module's configuration dialog and select **Edit Variable Addresses**.

Tip	Most analog modules require block transfer rungs. RSLogix 5 can automatically generate these rungs for you. On that module's configuration dialog, click the **Insert Ladder Rungs** button.

Chapter

6

More about entering ladder logic

Introduction

This chapter provides information that you can use to make editing your ladder logic easier.

Tip	Shortcut methods exist for most editing functions within RSLogix 5. A list of hot keys (keyboard shortcuts) that enable you to maneuver the software without a mouse can be found in a help file that you can print out. To access this file click the Help folder in the project tree, and then double click on Using the Keyboard.
	A.I Series dot commands are now supported by RSLogix 5. To access AI Command Portal Emulation, press **[Alt .]**. Type the letters of the dot command (such as EI to insert a rung) and press **[Enter]**. For more information see *Dot commands* on page 45.

Backing up your work

Remember to back up your work as you develop your ladder logic programs. RSLogix 5 uses two types of backup functions that you can access at any time, and provides you with an auto-recovery file in the case of a power failure. All of these files contain the entire description database associated with the project.

- **Auto-Backup** files are created automatically each time you save a project. To preset how many backups should be retained for any project, select **Tools > Options** and click the **Preferences** tab. Enter a number in the **Number of Backups** field.

  Auto-backup files (saved as .RSP files) have the letters BAK and a series of numbers (000 to 999) appended to the filename. For example, an auto-backup created for project TEST.RSP might be identified as TEST_BAK000.RSP, and a more recent backup might be identified as TEST_BAK001.RSP.

- **Compressed Format Backup** files are typically generated for archiving or giving to another user. Compressed format backup files include the .RSP and all database files for the project compressed into a single .RP1 file. Any auto-backup files that may be included in the project folder are not included in the compressed backup. To generate a compressed-format backup file, select **File > Backup Project**.

To restore an auto-backup file or a compressed format backup file, simply select **File > Open** and open the .RSP backup file or the .RP1 file.

Crash recovery

If you experience a power interruption, RSLogix 5 provides you with a recent backup file containing current edits.

RSLogix 5 automatically background saves your project while you are working with it. (Go to **Tools > Options**, **Preferences** tab to set the interval at which these AutoSaves occur.) This auto-generated recovery file (internal RSP file) is only available to you the next time you open a project if you have a system crash or your power is interrupted. When attempting to open a project after a power failure RSLogix 5 prompts you with two options.

- You can open the latest AutoSave version of the file. This retains all edits (with the exception of pending database edits) made up until the time of the last AutoSave before power failed. Once you save this file it becomes your working version.

- You can revert to the last saved version of the file. This means that any editing you may have done between the time you last saved the file and the time of the system crash will be lost.

Important	You must have saved or closed the file you are working on at least one time for the auto-recovery process to work. Therefore, it is good practice to save the file immediately after beginning a new project. This ensures that your auto-recovery process can begin properly.
	The AutoSave feature of RSLogix does not affect the database, and any pending changes to the database will not be retained using AutoSave.

Shortcuts for ladder editing

RSLogix 5 provides several methods for rapidly entering instructions: Quick Key Mapping, ASCII editing, and A.I. Series style dot commands.

Quick Key Mapping

To make your programming tasks faster, RSLogix 5 lets you map any available alphabetic key (A-Z) on your computer keyboard to a ladder logic programming instruction.

To assign quick keys:

1. Select **View > Properties** (make sure you have a program file window opened and active or you will not be able to select Properties from the View menu). Click the **Quick Key Mapping** tab.

2. Double-click _Free anywhere in the Instruction column. (Or double-click an assigned instruction to change it.)

3. Click the arrow to open the list box.

4. Click the instruction you want to assign.
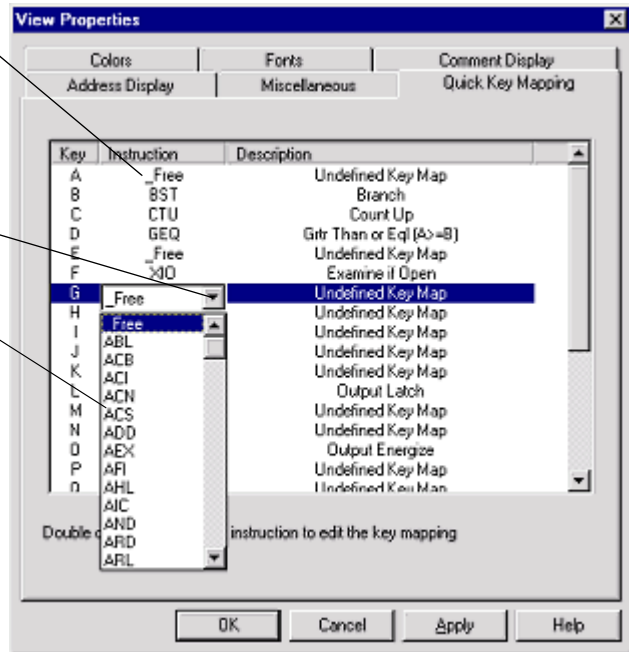
To use Quick Keys:

1. Click a rung number in the ladder window to insert your logic rungs before.

2. Select **Edit > Quick Key Mode**, or instead press **[Ctrl-E]** on your keyboard. This inserts an empty rung into your program and places the software in Quick Key Mode. Assigned keys are listed at the top of the Ladder View.

3. Type the alphabetic quick keys that you have assigned to instructions. The instructions will be placed on the rung in the order that you type their quick key assignments.

4. To exit Quick Key Mode, go to the **Edit** menu and deselect **Quick Key Mode**, or press **[Ctrl-E]** again.

ASCII editing

ASCII Editing is a function of RSLogix 5 that lets you modify instructions using ASCII instruction mnemonics instead of having to modify instructions using the ladder editor.

To edit a rung:

1. Select any instruction on the rung or the rung number and press **[/]**. Make sure you press the forward slash key rather than the backslash. You can also double-click the rung number to open the ASCII box.

2. An ASCII editing box opens. For a rung that already contains logic, the existing ASCII instructions appear in the box so you can edit them. As you type an instruction, a syntax guide appears to help you with the parameters.

Cursor

XIC B3/10 BSL #B3:18

BSL *File* **Control** *Bit Address Length*

Syntax guide

The parameter you need to enter next (or are entering) is highlighted in bold.
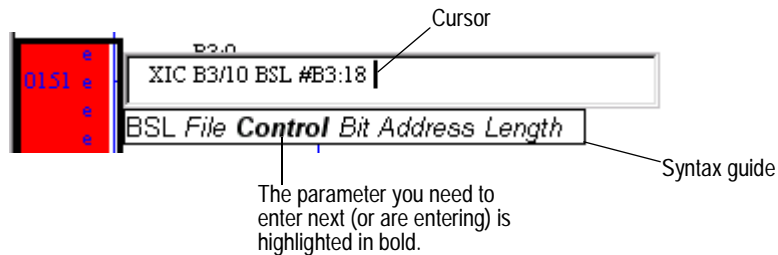
3. Press **[Enter]** to accept your edits or you can press **[Esc]** to discard them.

Example ASCII rung

A sample rung is shown below in both graphical and ASCII format with lines showing which ASCII mnemonic corresponds to which part of the graphical rung.

BST XIC I:003/13 NXB XIO T4:20/DN BND XIO B3/33 TON T4:20 0.01 500 412

BST = branch start
NXB = next branch
BND = branch end
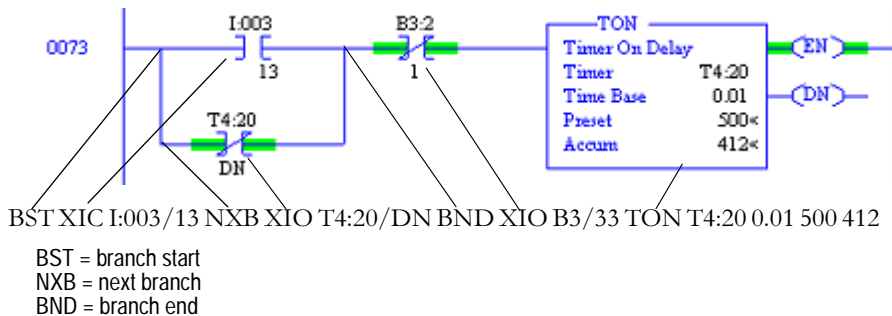
Dot commands

In A.I. Series software dot commands provided a very rapid means of not only editing ladder logic, but also accessing various functions of the software such as Advanced Diagnostics search or Who Active. RSLogix 5 emulates the A.I. Series Command Portal.

To use dot commands in RSLogix 5:

1. Press **[Alt-.]**, that is, hold down the Alt key and press the period.

2. Type in the shortcut command. For example, type EI (Edit Insert) to insert a rung.

Tip

You can combine dot commands with ASCII editing to rapidly enter ladder logic. Press **[Alt - .]**, type EI, EA, or ER to insert, append, or replace a rung, type a forward slash (/) without a space before it, type the ASCII rung, and press **[Enter]**. For example, EI/XIC I:001/1 OTE O:002/5.

---

3. Press **[Enter]**.

For a list of dot commands refer to the online help. Select **Help > Contents**. Click the **Index** tab and type dot commands. Click **Display**.

Other shortcuts and tips

Remember to use the right mouse button to access functionality whenever possible. The right mouse button provides you with context menus that list editing options. Keyboard users can press **[Shift + F10]** to access a right mouse menu.

Remember that you can press **[F1]** (or click the Help button when available) on any instruction, or within any window to access help. For more information about online help see Chapter 10, *Getting the information you need* on page 77.

Selecting multiple rungs

You can select multiple rungs by holding down the Ctrl key and clicking the left mouse button on every rung you want to select. You can also select a range of rungs by holding down the Shift key and clicking the beginning rung and ending rung.

Jumping to a rung

You can jump to any rung in your project by selecting **Search > Goto**. You can go to a rung in the current program file or you can go to a rung in another program file within the same project. You can also press **[Ctrl + G]** to access the Goto Rung dialog.

Keyboard shortcuts

A list of hot keys (keyboard shortcuts) that enable you to maneuver the software without a mouse can be found in a help file that you can print out. To access this file, expand the **Help** folder in the project tree, and then double-click on **Using The Keyboard**.

Addressing

You can use several different methods to address instructions. You can enter an address by:

- manually typing it in
- dragging addresses from data files
- using copy and paste from program to program

Tip	You can drag-and-drop rungs, branches, instructions, and addresses from file to file or from the database to a file. To drag-and-drop, position the mouse pointer over a file element, click and hold down the left mouse button and drag the element to another location, and then release the mouse button. Red boxes indicate valid locations; these turn green when properly selected.

Branching

Add a branch

Click this button on the instruction toolbar to place a branch in your ladder logic. If your cursor is on an instruction, the branch is placed immediately to the right of the instruction. If your cursor is on the rung number, the branch is placed first on the rung.

Move a branch

Click on the upper left corner of a branch and drag to move the entire branch structure to another location in your ladder logic program. Valid release points will be visible on the ladder display.
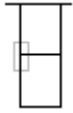
Expand a branch

Click the right leg of the branch, then drag the leg to the right or left. Valid release points will be visible on the ladder display.
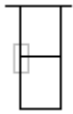
Nested branches

Place the cursor at the upper left corner of a branch leg, right-click, and select **Append New Branch** to place another branch structure within the original branch structure.

Parallel branches

Place the cursor at the bottom left corner of a branch leg, right-click, and select **Extend Branch Up** or **Extend Branch Down**.

Copy branch leg

Click on the left edge of the branch leg you want to copy. In the picture at the left, this is the center leg. Right-click and select **Copy**. Finally right-click on a rung or instruction in your logic and select **Paste** to insert the rung leg.

Copy entire branch structure

Select the right leg of the branch structure, right-click and select **Copy**. Finally click on a rung or instruction in your logic and select **Paste** from the right mouse menu to insert the rung structure.

Delete a branch

Place the cursor at any location on the branch and click the right mouse button. Select **Delete**. If you cut or delete a branch, all instructions on the branch are also deleted.

Undo operation

The undo button reverses your last action. You can use this button to walk through (and undo) your previous actions one at a time. RSLogix 5 remembers up to 200 previous actions.

If you want to undo a move operation, you must click undo twice. This is because RSLogix 5 considers a move a series of two actions (copy and cut). You have to let RSLogix know that you want both the copy and the cut undone. If you click undo only one time when trying to undo a move, the move appears to be a copy, and you will see the moved element appear at both locations.

Online editing

The online editing function lets you monitor and correct your ladder program when your programming terminal is connected to a PLC-5 processor. Online editing functions consist of inserting, replacing, and deleting rungs in an existing ladder program while online with the processor.

While multiple terminals may be simultaneously connected to the same processor, only one programming device at a time can perform online edits of the program. The response of other terminals to a processor edit depends on the processor type and firmware revision. For all Classic and older New Platform PLC-5 processors, the other terminals will be forced offline and must upload the entire program again. For later New Platform revisions, the other terminals will remain online while the changed program file is automatically uploaded in the background.

Within your logic program RSLogix 5 places edit zone markers in the margin to the left of the left rail. These letters signify edit zones and they indicate the type of ladder program edit.

Lower case zone markers indicate edits that exist only in the computer memory. Upper case zone markers indicate edits that exist in the processor memory. After successfully assembling the edited rungs, the zone markers disappear.

Tip	You can search for zone markers in your project the same way you might search for an instruction or an address. Select **Search > Find**. Click **Rung Zones** and select the type of edit zone you want to search for.

Lower-case zone markers

e   (Offline and online) These rungs are currently under edit within the computer RAM. If you are working offline, after a successful program verification the lower-case e will disappear and the edits will be incorporated into the program. If you are working online, after accepting the rung, the lower-case e will be replaced by an upper-case I indicating that the rung is now in the controller's memory and will be inserted into the program file.

i   (Online) These rungs are to be inserted into the program. Rungs marked with a lower-case i currently exist in the computer memory and will not be entered into the controller until the rung is accepted. After the rung is accepted, the lower-case i is replaced by an upper-case I.

r   (Online) These rungs are to be replaced in the ladder program. Rungs marked with a lower-case r currently exist in the computer memory and will not be entered into the controller until the rung is accepted. An r marked rung is always preceded by an e marked rung.   After the rung is accepted, the lower-case r will be replaced by an upper-case R.

d   (Online) These rungs are to be deleted from the ladder program. Rungs marked with a lower-case d indicate a deletion reflected in the computer memory. This deletion will not be reflected in the controller until the rung is accepted, at which time it will be replaced by an upper-case D.
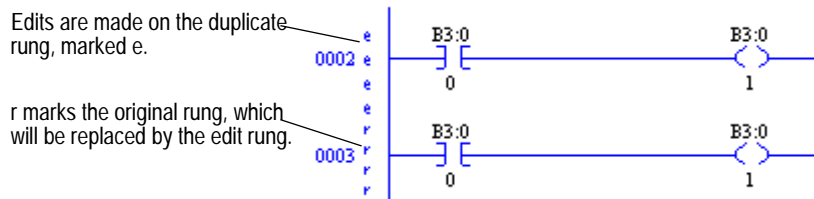
Upper-case zone markers

I   (Online) These rungs have been inserted in the controller's logic program. You can test the edits by selecting **Edit > Online Edits > Test Edits** to see how the rung works in the online ladder program. Click **Assemble Edits** to finalize the rung insertion and complete the editing process. (The Test Edits and Assemble Edits functions are also available by right-clicking on the rung number.)

R   (Online) These rungs have been replaced in the controller's logic program. Rungs marked with an upper-case R continue to function in the program until you select **Test Edits** to see how the new rung works in the online program. Select **Assemble Edits** to finalize the replacement and complete the editing process.

D   (Online) These rungs have been deleted in the controller's logic program. Rungs marked with an upper-case D continue to function in the program until you select **Test Edits** to see how the program functions without the rungs in the online program. Select **Assemble Edits** to finalize the deletion and complete the editing process.

Online editing example

This example replaces an XIC instruction with an XIO instruction with the same address while online.

1. Select the rung in the program that requires editing and then select **Edit > Rung Edits > Start Rung Edits** or double-click the rung number. A duplicate of the selected rung (preceded by the **e** edit zone marker) is shown in your program, with the original rung marked with **r**. See the example below.

Edits are made on the duplicate rung, marked e.

r marks the original rung, which will be replaced by the edit rung.

2. Make the edits to the rung. The lower-case edit markers do not change since they represent changes that only exist in the computer memory; these changes are not yet a part of the online program in the controller. (At this step you can select **Cancel Rung Edits** to cancel the edits you have made to the rung.)

3. Select **Edits > Rung Edits > Accept Rung** (or right-click the rung number and select **Accept Rung Edits**). This changes the edit zone markers and places both rungs in the controller memory.

The upper-case I represents the rung that has been inserted into the online program.

```
      I
      I
      I     B3:0                              B3:0
0002  I  ──┤/├──                            ──( )──
      I      0                                 1
```

The upper-case R represents the online rung that is to be replaced. At this time the R rung is still operating in the program.

```
      R
      R     B3:0                              B3:0
0003  R  ──┤ ├──                            ──( )──
      R      0                                 1
```
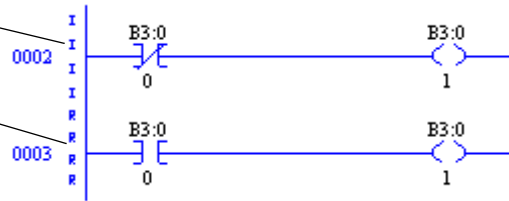
At this point you can still right-click the I-marked rung and select **Cancel Edits** to cancel the accepted **I**-marked rung and retain the originally programmed **R**-marked rung instead.

4. Select **Test Edits**. The **I**-marked rung takes precedence. The program in the controller will operate with the inserted rung, and the **R**-marked rung will be ignored.

5. Select **Assemble Edits**. All edit zone markers disappear and the edits are incorporated into the online program. There is no Undo option after online edits have been assembled.

Going from online to offline with rungs under edit removes the online edits in RAM. Make sure you have accepted edits before going offline if you want any changes retained in the processor.

Online editing restrictions

During an online editing session you cannot:

- resize data table files
- create or delete program files
- change program file protection

Configuring MCP (Main Control Programs)

As many as 16 MCPs can run simultaneously. MCPs may be any mix of ladder files, SFC files, or structured text files.

To configure MCPs:

1. Double-click the S2 data file icon in the project tree.

2. Click the MCP tab. Specify which program files will function as MCPs by typing their file numbers in the Program File column(s).

3. Click in the checkboxes to indicate whether each MCP is to be enabled or disabled, and whether you want to skip the I/O scan at the end of the MCP's execution.

> **Caution**
>
> When an MCP is disabled, outputs remain in the state that they were in during the last scan (that is, all actions remain active). Make sure that you consider any outputs that might be controlled within that MCP before disabling it; otherwise injury to personnel or damage to equipment may result.

You can view scan time data for executing main control programs on the Scan Times tab of the S2 status file.

Configuring Interrupts

STI (Selectable Timed Interrupt)

A Selectable Timed Interrupt (STI) causes the processor to periodically interrupt program execution to run an STI program once to completion. Afterwards, the processor resumes executing the original program file from the point where it was interrupted.

Select a program file for the STI by double-clicking the Processor Status icon in the Controller folder in the project tree. Then click the STI tab (you may need to use the arrow buttons to see more tabs) and enter the information needed to define the STI. Press the Help button if you need more information.

PII (Processor Input Interrupt)

A Processor Input Interrupt (PII) specifies when an event-driven input causes the processor to interrupt program execution and run a PII program once to completion. After the PII executes, the processor resumes executing the program file from the point where it was interrupted.

Select a program file for the PII by double-clicking the Processor Status icon in the Controller folder in the project tree. Then click the PII tab (you may need to use the arrow buttons to see more tabs) and enter the information needed to define the PII. Press the Help button if you need more information.

Using the structured text editor

Structured text is only supported on Enhanced (New Platform) PLC-5® series C, revision C and later processors.

Structured text is an English–like set of instructions and mnemonics that you can use to perform most of the same tasks that you already perform with ladder logic. The structured text language resembles BASIC and is based on the International Electrotechnical Commission (IEC) 1131–3 standard for programmable controller software.

Use structured text as an alternative to, or in conjunction with, ladder logic or Sequential Function Charts (SFCs). Structured text supports complex expressions and both logical and symbolic addressing. Use structured text or ladder logic to program MCPs, subroutines, or actions and/or transitions in SFCs, depending on which type of programming best suits your application and how much memory you have available.

To learn more about creating structured text files, click the **Help** menu in RSLogix 5, select **Contents**, and then double-click the Structured Text Editor book in the **Contents** tab.

Using the sequential function chart (SFC) editor

Sequential Function Chart (SFC) programming is a method of programming complex control systems at a more highly structured level. An SFC program is an overview of the control system, in which the basic building blocks are entire program files. Each program file is created using familiar ladder logic. The SFC approach coordinates large, complicated programming tasks into smaller, more manageable tasks.

To learn more about creating sequential function chart files, click the **Help** menu in RSLogix 5, select **Contents**, and then double-click the Sequential Function Chart (SFC) Editor book in the **Contents** tab.

Chapter

7 Importing or exporting the documentation database

Introduction

The import and export utilities are available from the Tools menu by clicking Database. Use the import functionality in RSLogix 5 when you want to apply documentation that already exists to a project you are currently developing in RSLogix 5. Use the export functionality in RSLogix 5 to make the database documentation that is part of your current RSLogix 5 project available to other projects.

Import database

You can apply documentation to newly created logic files by importing existing database documentation. The existing documentation might come from:

- projects developed using Rockwell Software's DOS-based PLC-5 A.I. Series or 6200 Series programming software
- another project developed using RSLogix 5
- a spreadsheet application, like Microsoft Excel™ (saved as a .CSV file)
- an ASCII text file

Sometimes when you import a documentation database, there may be conflicting entries in the import file and the database. This is called a collision. Before you begin any import you can select if you want the imported database instance or the current database instance discarded if collisions occur.

PLC-5 A.I. Series project documentation database

To import a PLC-5 A.I. Series database:

1. Select **Tools > Database > Native Import**.
2. Click **AI**.

3. Select which database components to import.

- address symbols and descriptions (.DSC files)
- page titles and rung descriptions (.RPD files)

4. Select an option for handling collisions and click OK.

5. Locate and select the database file you want to import and click **Open**.

If you have a database that was exported from PLC-5 A.I. Series software, you may need to follow the instructions for importing a CSV or ASCII file, depending on what selections were made when exporting from A.I. If exported in .CSV, then follow the instructions for importing a .CSV file on page 55. If exported in .EAS format, follow the instructions for importing an ASCII file on page 55.

6200 Series PLC-5 project documentation database

To import a 6200 Series database:

1. Select **Tools > Database > Native Import**.

2. Click **AB 6200**.

3. Select which database components to import.

- address symbols and descriptions
- instruction comments
- page titles and rung descriptions

4. Select an option for handling collisions and click OK.

5. Locate and select the database file you want to import and click **Open**.

   By default the file type selected for import is .OP$. The .OP$ file is the database control file. It references individual database files (for example the symbol/description file or the page title/rung description file) that reside in the same directory as the .OP$ file. After an import completes, RSLogix 5 creates a log file that informs you which database files successfully imported and which database files contained errors and could not successfully be imported.

RSLogix 5 documentation database

To import an RSLogix 5 database:

1. Select **Tools > Database > Native Import**.

2. Click **RSLogix 5**.

3. Select which database components to import.

- address symbols and descriptions

- instruction comments
- page titles and rung descriptions
- symbol groups

4. Select an option for handling collisions and click OK.

5. Locate and select the database file you want to import and click **Open**.

    By default the file type selected for import is .CTD. The .CTD file is the database control file. It references individual database files (for example the symbol/description file or the page title/rung description file) that reside in the same directory as the .CTD file. After an import completes, RSLogix 5 creates a log file that informs you which database files successfully imported and which database files contained errors and could not successfully be imported. For a complete list of RSLogix 5 file extensions for individual database documentation refer to the online help and search "file extensions."

CSV (Comma Separated Values) file

You may wish to import files created with a spreadsheet application such as Microsoft Excel or files exported from PLC-5 A.I. Series software in .CSV format.

To import a CSV file:

1. Select **Tools > Database > ASCII Import**.

2. Click **CSV**.

3. Select which database components to import.
    - address symbols and descriptions
    - instruction comments
    - symbol groups

4. Select an option for handling collisions and click OK.

5. Locate and select the database file you want to import and click **Open**.

For an example of a .CSV file, refer to the online help and search the index for "CSV format for database import/export."

ASCII delimited text file

You can import documentation files that were created using RSLogix 5 software or PLC-5 A.I. Series software and exported and saved as ASCII delimited files (.EAS in A.I.). ASCII delimited means that the fields for each RSLogix 5 database record are enclosed in quote marks and separated by commas.

To import an ASCII database file:

1. Select **Tools > Database > ASCII Import**.

2. Click **RSLogix 5**.

3. Select which database components to import.

    - address symbols and descriptions (.EAS files)

    - instruction comments (.EIC files)

    - page titles and rung descriptions (.ERP files)

    - symbol groups (.ESG files)

4. Select an option for handling collisions and click OK.

5. Locate and select the database file you want to import and click **Open**.

    Any file extension may be used for an ASCII delimited text file. You can look for and select any file extension, not just those listed above.

An example of each of the above files, with an explanation of the data fields contained within the file, can be found under *RSLogix 5 ASCII delimited text file examples* beginning on page 57.

Export database

Use the export functionality in RSLogix 5 to make the database documentation that is part of your current RSLogix 5 project available to other projects.

To export a database:

1. Select **Tools > Database > ASCII Export**.

2. Click the tab for the desired output format: **RSLogix 5**, **A.I.**, **AB 6200**, or **CSV** (comma separated value).

3. Select which database components to export and specify the filename(s). Click **Help** for more information about any of the options on the dialog.

4. When exporting the documentation database to A.I. or AB 6200 formats the symbols, descriptions, and instruction comments may be truncated due to size restrictions imposed by the PLC-5 A.I. and 6200 Series databases. This may result in conflicts in the exported data. So, unless you have accounted for differences between description lengths in RSLogix 5 and PLC-5 A.I. Series programming software and planned your description text accordingly, select **Treat Source Description as 1 80-character line**.

After it has been exported, you can edit the ASCII file with a text editor, or load the file into another database.

RSLogix 5 ASCII delimited text file examples

The examples in this section show how the documentation would be represented in an exported ASCII text file using the RSLogix 5 output format.

Each field in a line of ASCII text is enclosed by quotes and separated by a comma. Empty fields are represented with quotes with nothing between them.

Address symbols and descriptions (.EAS files)
"B3/0","0","SYMBOL","description","","","","","0","","","0","GROUP_NAME"

ASCII Field #	Maximum Length	Contents
1	39 characters	Address
2	N/A	Scope (0=global, 2-255=local program file number
3	20 characters	Symbol
4	20 characters	Description line 1
5	20 characters	Description line 2
6	20 characters	Description line 3
7	20 characters	Description line 4
8	20 characters	Description line 5
9	12 characters	Device code (always 0 for addresses that are not real I/O)
10	9 characters	Device description above
11	9 characters	Device description below
12	N/A	Disable cross-reference flag (0=enabled, 1=disabled)
13	20 characters	Symbol group name

Page title and rung descriptions (.ERP files)
"RUNG000002-000002","page title","rung comment\"

ASCII Field #	Maximum Length	Contents
1	39 characters	Data table address or rung identifier
2	80 characters	Page title
3	64K	Rung description

Instruction comments (.EIC files)

"B3/0","XIC","instruction comment","","","",""

ASCII Field #	Maximum Length	Contents
1	39 characters	Address
2	3 characters	Instruction type
3	20 characters	Comment line 1
4	20 characters	Comment line 2
5	20 characters	Comment line 3
6	20 characters	Comment line 4
7	20 characters	Comment line 5

Symbol groups (.ESG files)

"GROUP_NAME","description"

ASCII Field #	Maximum Length	Contents
1	20 characters	Symbol group name
2	80 characters	Symbol group description

A.I. ASCII delimited text file examples

These examples show how a line might appear in an ASCII text file exported using the A.I. output format. Each field in a line of ASCII text is enclosed by quotes and separated by a comma.

Address symbols and descriptions (.EAS files)

"B3/0","0","SYMBOL","description","","","","","0","","","0"

The field breakdown of A.I. ASCII delimited text is the same as shown for RSLogix 5 ASCII output format, except the symbol and description fields are limited to 15 characters and there is no symbol group field.

Page title and rung descriptions (.ERP files)

"RUNG002-0002","page title","rung comment\"

The field breakdown of A.I. ASCII delimited text is the same as shown for RSLogix 5 ASCII output format.

AB 6200 ASCII delimited text file

AB 6200 documentation database files saved to ASCII text format contain keywords. Keywords tell the software whether the information immediately following the keyword is a rung comment, an instruction comment, an address comment, or a symbol. Some examples are shown below.

SYM B3/0 SYMBOL

SYM O:17/03 UPLOAD

AC B3/0 "description"

AC I:21/03 "AIR STOP CLOSED LIMIT SWITCH\"

IC XIC N7:10/0 "Surge Tank High Level Alarm"

RC CTD C5:0 " (carriage return)

This is an example of a rung comment with quotation\ marks

and carriage returns at the beginning and end.

" (carriage return)

Key Words

The key words used in AB 6200 documentation database files are:

SYM – symbol

AC – address comment (description)

IC – instruction comment

RC – rung comment

FCN – SFC name

FCI – SFC comment

IOS – I/O module symbol

IOA – I/O module address comment

IOC – I/O module configuration information

CSV (Comma Separated Values) format

Search "CSV format for database import/export" in the RSLogix 5 online help index for complete details.

8 More about monitoring data

Introduction

In addition to allowing you to view changing data by opening multiple data table windows, RSLogix 5 provides you with several customized methods for monitoring data.

- Cross Reference
- Forces
- Custom Data Monitor
- Recipe Monitor
- Custom Graphical Monitor
- Histograms
- Trending

The custom data monitor (CDM) file lets you compose lists of addresses that you monitor frequently, or lists of addresses with interrelated functionality, so that you can view, document, protect, or even force the changing data values from a single source file.

When you are online, you can use histograms and trends to see how your program is behaving over time, by examining bits as the program runs in the PLC-5 processor. A trend logs the data for more than one address (typically related) over a period of time. Contrast this with a histogram which logs the data contained in a single address over a period of time.

Cross Reference

A Cross Reference Report lists all logical addresses in your project and gives the location of every occurrence of each address. The report includes the following data: address, symbol, instruction mnemonic, file # (and name), and rung #. You can sort the Cross Reference Report by symbol or by address.
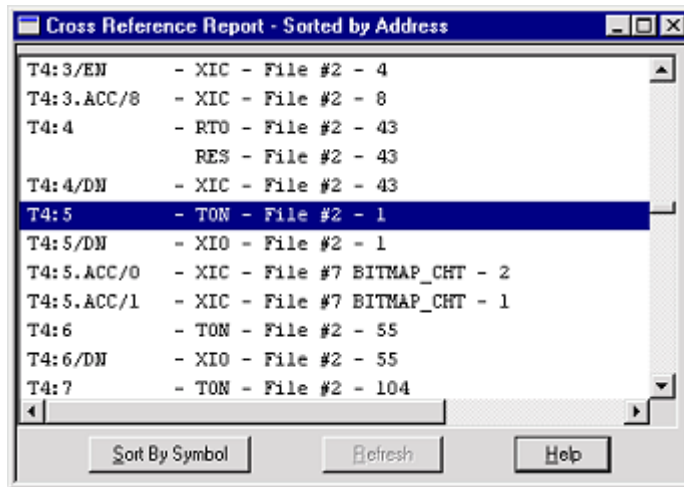
Display a Cross Reference Report in one of two ways:

- Double-click the Cross Reference icon in the project tree (in the Data Files folder).

- Right-click an address in your ladder logic and select **Cross Reference**. The same report displays, but the address you had selected is highlighted.

As an alternative to a Cross Reference Report, you can choose to display cross reference information right on the ladder view. To use this feature, select **View > Properties**, and click the **Address Display** tab. Make sure either or both checkboxes are checked in the **Cross Reference Display** area of the dialog.

Tip	You can disable cross references to get online faster. Select **Tools > Options**. Click the **XRef/Address Wizard** tab and uncheck the **Enable Cross Reference Online** box.

Forces

Caution	All force functions can result in sudden machine movement, possibly injuring personnel or equipment. USE EXTREME CAUTION WHEN USING FORCES!

To monitor forces, double-click the input or output force file in the project tree.

You can also use the Forces dialog to install and enable or disable forces while you are monitoring your file offline, or in any processor mode while monitoring your file online. Use the right-click menu on a bit in the Forces dialog to force the bit on or off. For more information about forcing, refer to the online help.

Custom Data Monitor (CDM)

The Custom Data Monitor function can be used to monitor bit addresses and word addresses.

Addresses in a custom data monitor list can come from any data table file. They do not have to be from the same data table file.

Features of the custom data monitor include:

- CDM lists can contain any type of address. If you enter the address of a structure, such as a timer, you can expand it to show all of its members.
- CDM lists can contain ASCII comments to help you clarify bit or word listings, or annotate the CDM file.
- You can define up to 256 (CDM) lists per project (0-255, inclusive).
- The CDM name is limited to 20 characters.
- The CDM description is limited to 59 characters.
- You can click and drag addresses from the data tables and the ladder logic to the CDM.
- You can use the **[Ctrl]** and **[Shift]** accelerator keys to drag more than one address at a time from the data tables.
- You can edit address descriptions from the CDM.

To access the Custom Data Monitor feature, double-click the CDM file icon located in the project tree.

Custom Data Monitors — To create a new CDM file, right-click the Custom Data Monitors folder and select **New**.

CDM 0 - <Untitled> — By default an untitled CDM file (#0) is included in your project. Rename this file when you add your addresses.
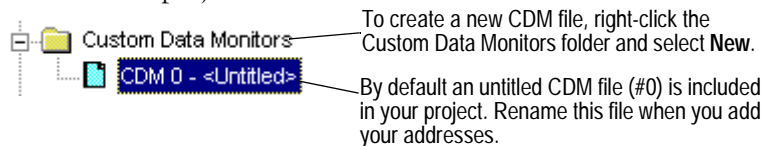
To insert additional addresses or symbols in the monitor list press **[Insert]**. A new row will open and you can type in or drag an address from your ladder program or data table into the empty Address slot. The current value of that address is listed in the Value column to the right of the address. If a description has been assigned to that address, it is also displayed.
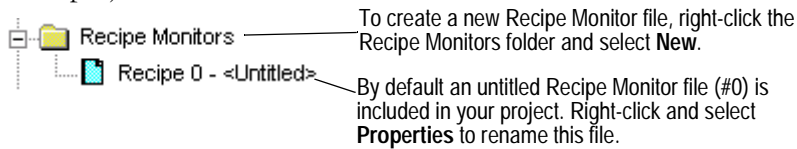
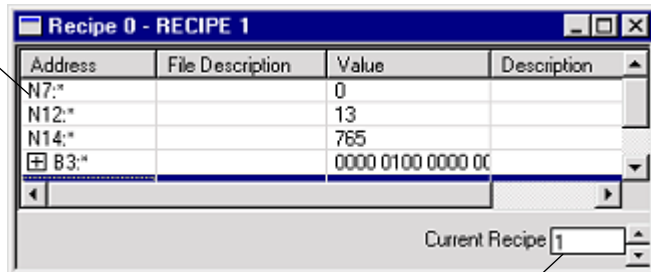For more information about using Custom Data Monitor, press **[F1]** while the CDM window is active.

Recipe Monitor

The Recipe Monitor is a variation of the Custom Data Monitor. The Recipe Monitor is used specifically for monitoring groups of related indirect addresses with a common index.

Many PLC projects contain data tables in which each element is relevant for a different mode of operation. When these data tables are grouped such that element 1 of each file corresponds to mode 1 of the assembly line used to make product 1, this is referred to as a "recipe". The easiest way to keep track of recipes is to use a common reference address with indirect addresses to each of the related data files. The Recipe Monitor provides an easy and intuitive interface for this type of application.

To access the Recipe Monitor feature, double-click the Recipe file icon located in the project tree.

To create a new Recipe Monitor file, right-click the Recipe Monitors folder and select **New**.

By default an untitled Recipe Monitor file (#0) is included in your project. Right-click and select **Properties** to rename this file.

Drag a data file from the project tree to the Recipe Monitor. Note that an asterisk (*) represents the indexed part of the address.

If you type in or drag an address from the ladder, be sure to use an asterisk to indicate the indexed part.

Set the index value.

For more information on the Recipe Monitor press **[F1]** while the Recipe window is active.

Custom Graphical Monitor

The Custom Graphical Monitor provides the data monitoring of a Custom Data Monitor, but in an easy to interpret graphical representation. The Custom Graphical Monitor is a form on which you can place ActiveX controls for buttons, sliders, gauges, and charts as well as text and imported images. As is typical of ActiveX controls, you place and configure controls with the form in Design mode and switch to Run mode to activate the controls.

To access the Custom Graphical Monitor feature, double-click the CGI file icon located in the project tree.

To create a new Custom Graphical Monitor file, right-click the Custom Graphical Monitors folder and select **New**.

By default an untitled Custom Graphical Monitor file (#0) is included in your project. Right-click and select **Properties** to rename this file.

Click here to toggle between Run and Design mode.

Drag an address from the ladder or data table to a control.

Click one of these buttons to add text, buttons, sliders, gauges, images, or graphs to the form.

Displays the current mode.

Right-click a control and select Properties to change colors, define ranges, and set other options.

Histograms

Use the histogram functionality in RSLogix 5 to get information about how an address's data value changes over time.

You must be online with the PLC-5 processor to access the histogram function. Select **Comms > Histogram** to display the Histogram dialog.

Enter the address you want to track.

Select a time base for the histogram (in seconds).
If you don't see data values changing, the time base may be inappropriate for the address you are monitoring.

Histogram

Timing Chart
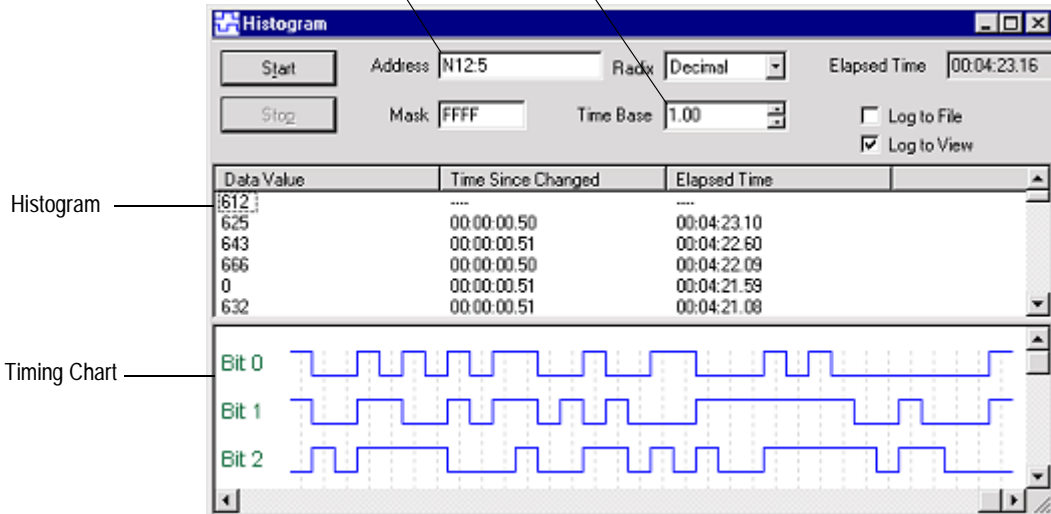
By clicking **Start** on this dialog, the histogram function sends a message to the PLC-5 processor to begin logging data. Each time the address value changes, the processor stores the value for the address in a histogram buffer, logging both the new value and the time interval between value changes. This data is represented in the top portion of the histogram display window.

If you frequently log certain data, you can save the configuration and simply load it without having to enter new parameters each time. Use **Save Config** and **Load Config**, accessible from the right mouse menu, for this functionality.

Trends

A trend logs the data for more than one address (typically related) over a period of time. Contrast this with a histogram which logs the data contained in a single address over a period of time.

This option provides the features of the RSTrendX Viewer plus remote trending capability. The RSTrendX Viewer is an ActiveX control for displaying process data in a trend or strip chart recorder format. It is based on the Viewer display in the RSTrend Data Acquisition and Trending software.

To create a trend chart:

1. Right-click the Trends folder in the project tree and select New.

2. Type a name for your trend chart in the Trend Name field. Then click OK to create an empty chart. The name can be up to 80 characters in length. An icon for the new chart appears under the Trends folder in the project tree. Whenever you want to open the trend chart double-click the icon. Trends are saved with the project. Logged data is not retained.

You can create a trend configuration while offline or online. You must be online to trend data.

The following example shows a Trend for a timer T4:9.

Drag addresses, rungs or symbols to the chart from the data tables, ladder logic, Address/Symbol editor, or Address/Symbol picker.
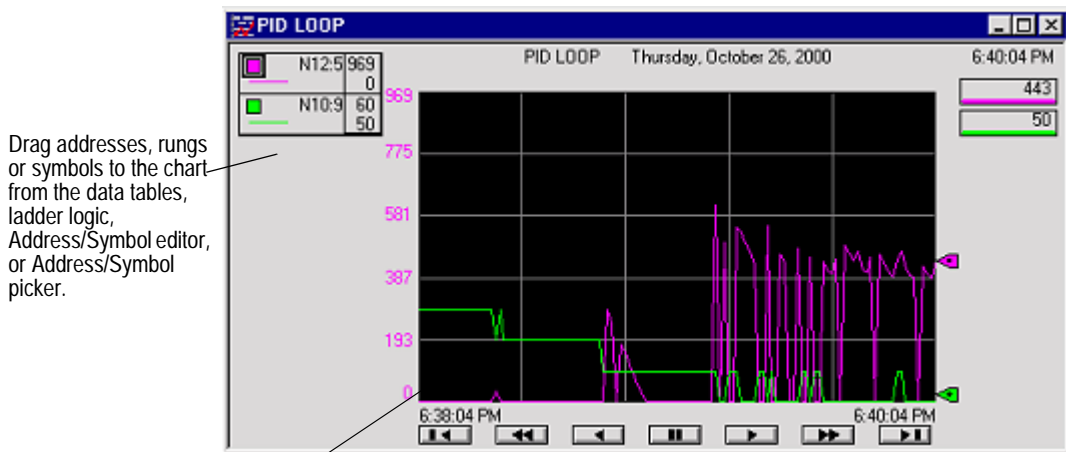
Right-click on the graph and select **Chart Properties** to configure the chart.

The legend at the left side of the display window contains:

- A colored box representing the pen color. The color can be changed by double-clicking on the box and then selecting a new color from the available color chart.

- The symbol name identifying the pen. In the display above, no symbol was defined for any of the addresses so the address is displayed instead.

- The engineering units if they are defined. N/A means this is currently not available (not defined) for the selected pen.

Tip

To access the TrendX help file for more detailed information, right-click on the chart and select **Chart Properties**. Click **Help**. This opens the TrendX help topic for the Properties General tab. Click the **Help Topics** button to browse the TrendX help table of contents or index.

Chapter

9 Saving and loading processor memory in PC5 libraries

Introduction

PC5 library files are ASCII text files of the processor memory that contain the ladder logic, SFC files, structured text, data table files, and force tables. By exporting (saving to file) and importing (loading into a new project) these PC5 files, you can reuse existing work. PC5 files can be opened in any ASCII text editor and modified for use in your projects.

Things to remember about library files

- Only verified project data can be saved to a .PC5 file.

- Exported PC5 libraries can contain symbols that are 20 characters in length. When importing a PC5 library to PLC-5 A.I. Series, symbols will be truncated to 15 characters. For example, the symbol name UNLOAD_STRING_INDEX would be truncated as UNLOAD_STRING_I.

- Graphics characters are not allowed.

- If importing into PLC-5 A.I. Series or 6200 Series software, the name of the .PC5 file is limited to eight characters. If importing into 6200 Series software, use only A-Z, 0-9, or the underscore character.

- The file extension of the ASCII processor memory file must be PC5.

- You cannot import or export a CAR (custom application routine) file.

- If you are using passwords and privileges, the privilege configuration information is encrypted in the exported file to help make unauthorized access difficult.

- The text editor you use with an ASCII text file must produce only printable ASCII characters, with no control characters or hidden characters.

Exporting libraries

You can save entire projects or partial libraries.

To save a library:

1. If you want to save a partial library, select the rungs you want to save. For a full save, skip this step.

2. Either right-click the rungs and select **Copy to PC5 Library**, or select **Edit > Copy To File**.

3. Supply the path and filename, and click **Save**.

4. Select the options you want for the export on the Export PC5 Format dialog and click **OK**.

Select whether you want to save the entire library or just part of it. To save part of it, you must have selected the rungs you want to save in Step 1.

Checking Annotate Library places additional information in the PC5 file about the rungs' position in the original program. This information is used for troubleshooting a library file, and can help you if you intend to manually edit the PC5 file in a text editor.

If you type a description here, it will appear at the bottom of the Open/Import dialog when you import the library.

Importing libraries

Importing a .PC5 library allows you to reuse existing work by loading portions of ladder logic that were previously exported, into the current file that you have opened on your computer. Importing a .PC5 library converts the processor memory file, previously exported as a .PC5 ASCII file, to the RSLogix 5 .RSP format.

To import a library:

1. Open the project into which you want to load the library. If you are loading a complete program image into an existing project, data table values in the library will overwrite values in the base program, and incoming rungs will be appended to existing program files.

2. If you are loading a partial library, select the rung in your program that you want the library rungs to precede. The library rungs will always be placed before the rung you select. Data table values from the library will overwrite existing data table values for those addresses already present in the base project.

3. Select **Edit > Paste From file**. (Or right-click a rung and select **Paste From PC5 Library**.)

4. On the Open/Import dialog, select the file you want to import and click **Open**.

5. On the Import PC5 Format dialog you are asked to make some choices about how you want some of the imported files treated with regard to any existing documentation and addressing in the current file.

6. Choose an Address Load Mode for the library and click **OK**. Click Help for more information. See the diagram below for information on the Indexed mode.

Choose the **Indexed** mode and then click **Edit Index** if you want to display a Fixup table from which you can adjust the addresses in the imported library so that there are no conflicts with the addresses in the base program.
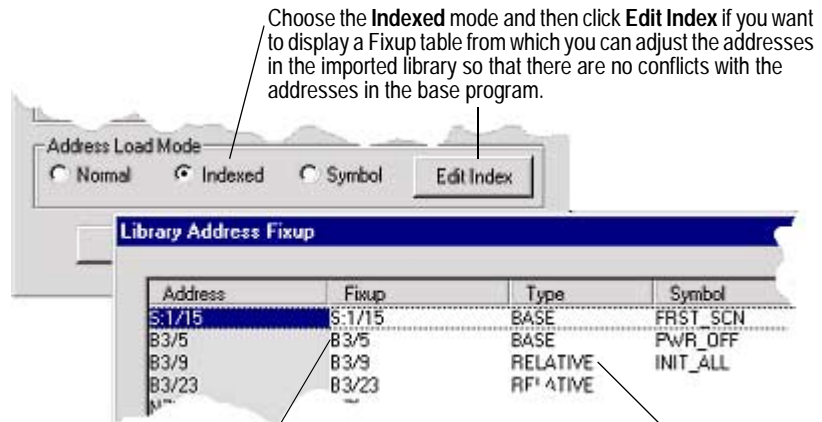
If you change base address B3/5 to B3/10 (in the Fixup column) and press **[Enter]**, the addresses relative to B3/5 change accordingly. Each relative address is offset by the change applied to the base address. In this example, relative address B3/9 would change to B3/14, and so on. Relative addresses include all addresses in the list in the same data file up to the next base address. The address column continues to display addresses as they were before you made any changes.

To change the address type, double-click it and select either Global, Relative, or Base. An address set to Global is not affected by indexing to a previous base address.

Sample PC5 file

The following sample file is not a complete file. It has been condensed to show a sampling of each section. Read the section *Creating or editing a PC5 ASCII text file* on page 74 for more information about each section of the library file and information on comments (text enclosed between percent signs %).

The section identifiers in the left margin are not a part of the file, they have been included so that you can more easily identify each of the sections in the PC5 library file.

Program Header START PLC5_40VL SERIES_C REV_C COMPLETE

Data Table DATA O:177
% O:000 % 0X0000 0X0000 0X0010 0X0000 0X0140 0X0000 0X0003 0X0000
% O:010 % 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000
% O:020 % 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000
% O:030 % 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000

DATA I:037
% I:000 % 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000
% I:010 % 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000
% I:020 % 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000
% I:030 % 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000 0X0000
..
.
.

Project Name PROJECT "ICOM5DM7"
    2 "MAIN_LADDR"
    3 "PID_SUB_RT"
    4 "SUB_RT_2"
    6 "SUB_RT_4"
    7 "BITMAP_CHT"
    8 "TREND"
    9 "WHEELPROG"
   10 "WINVIEW"

Program Files LADDER 2

% Rung: 0 %

SOR XIC B3/0 XIC I:002/1 OTE O:004/0 EOR

% TITLE/RUNG DESCRIPTION ATTACHED TO:RUNG

TITLE:Start Up Diagnostic Check

RUNG DESCRIPTION:

Sample Rung Description

Rung Descriptions can be up to 64K bytes per rung, with 200 lines displayed

The first rung description might explain the program or give useful information

%

% Rung: 1 %

SOR BST XIC I:003/4 NXB XIO T4:5/DN BND XIC B3/10 TON T4:5 1.0 450 315 EOR

% Rung: 2 %

SOR XIO T4:9/DN XIC B3/96 TON T4:9 0.01 150 17 EOR

% Rung: 3 %

SOR LIM 1 T4:9.ACC 40 OTE B3/0 EOR

% Rung: 4 %

SOR XIC T4:3/EN XIC I:003/0 OTE B3/65 EOR

% Rung: 5 %

SOR XIC B3/28 BST OTE B3/88 NXB OTE O:004/6 BND EOR

% Rung: 6 %

SOR BST XIC B3/33 NXB XIO T4:0/DN BND TON T4:0 0.01 500 473 EOR

.

.

.

Force Table FORCE FO:177

% ON   OFF %

0X0000 0X0000 % FO:000 %

0X0000 0X0000 % FO:001 %

0X0000 0X0000 % FO:002 %

0X0000 0X0000 % FO:003 %

0X0000 0X0000 % FO:004 %

0X0000 0X0000 % FO:005 %

0X0000 0X0000 % FO:006 %

0X0000 0X0000 % FO:007 %

0X0000 0X0000 % FO:010 %

0X0000 0X0000 % FO:011 %

0X0000 0X0000 % FO:012 %

0X0000 0X0000 % FO:013 %

0X0000 0X0000 % FO:014 %

```
0X0000 0X0000 % FO:015 %
0X0000 0X0000 % FO:016 %
.
.
.
```

Channel Config   `CONFIG $4:2:-1`

```
CONFIG $4:0:347
% $4:0:0 %
    -1      -1  26688   7175  18954   7717     -1     -1  26688   7175
% $4:0:10 %
 18954   7717     -1     -1  26688   7175  18954   7717     -1     -1
% $4:0:20 %
 26688   7175  18954   7717      0      0      0      0      0      0
% $4:0:30 %
     0      0      0      0      0      0      0      0      0      0
% $4:0:40 %
     0      0      0      0      0      0      0      0      0      0
% $4:0:50 %
     0      0      0      0      0      0      0      0      0      0
.
.
.
```

Creating or editing a PC5 ASCII text file

A PC5 library file contains six sections: program header, data table, project name, program files, force table, and channel configuration.

Specifying the program header

The first section of a PC5 file is the program header. The program header is a single line that contains:

- the processor type

- the processor series

- the processor revision

When you perform an export, the program header line contains the word COMPLETE or PARTIAL. This indicates whether the library contents include a complete program file or whether a partial library was saved. Every ASCII file must have a program header section, even if all the remaining sections are empty.

The following program header identifies the processor as a PLC-5/15 series B revision A and specifies the library as a complete processor memory file.

START PLC5_15 SERIES_B REV_A COMPLETE

Specifying the data table

The second section of a PC5 file defines the data table. The data table is the list of data table files that the processor uses. Files are defined by:

- the word DATA (upper or lower case)
- a letter indicating the file type
- the file number
- the last address defined in the file

Use a separate section for each data table file.

The following data table entry specifies binary file 3 containing 8 words (0-7). The values on the line following the data table entry specify the data values.

```
DATA B3:7
      0     1     2     3     4     5     6     7
```

Specifying the project name

The third section defines the project name and program file names. The project name is always stored in program file 0.

The following entry specifies DRILL1 as the project name of a processor memory file and MAIN_LADDR as the name of program file 2. The project name and program names must be enclosed in quotes and can contain up to 8 characters (A-Z, 0-9, underscore_and blank spaces).

```
PROJECT "DRILL1"
    2  "MAIN_LADDR"
```

Specifying the program files

The fourth section defines the program files. Each program file can contain sequential function charts, ladder, or structured text programs. Each program file can have zero or more rungs. Each element and branch in a rung is represented by a mnemonic along with required data or address information.

The following entry defines ladder program file 3. The word LADDER (upper or lower case) starts the section with the program file number following. Each line that starts with an SOR instruction indicates the start of a rung of ladder logic; the EOR instruction indicates the end of a rung.

LADDER 3
SOR XIO I:030/3 XIC I:030/4 TON T4:10 1.0 32000 0 EOR
SOR XIC I:030/3 MOV T4:10.ACC T4:10.PRE EOR

Specifying the force table

The fifth section defines the force table. The force table defines inputs and outputs which are forced into an on or off state. If this section is not included no forces are applied.

The following force table shows the force status for output address O:057. The force table is twice the size of the input/output image table.

The force file below is commented. Placing comments, enclosed by percent signs (%), is for your reference only. They are not imported into the processor or database.

FORCE FO:057
% ON   OFF %
0X0000 0X0000 % FO:000 %
0X0000 0X0000 % FO:001 %
0X0000 0X0000 % FO:002 %

Specifying the channel configuration

The sixth section defines channel configuration data. This section contains channel configuration information as well as password and privilege and control net information. The lengths of each configuration section are variable depending on the configuration of the channel (i.e. channel zero will have more information than a DH+ channel).

CONFIG $4:1:411

-1	-1	8224	8224	8224	8224	-1	-1	8224	8224
8224	8224	-1	-1	8224	8224	8224	8224	-1	-1
8224	8224	8224	8224	257	257	-1	0	0	0
0	0	0	0	0	0	0	0	0	0

Annotating the PC5 file

You can place comments in the PC5 ASCII text file. Comments (text enclosed by percent signs %) are for your reference only. They are not imported into the processor or database.

Chapter

10 Getting the information you need

Introduction

Use this chapter to review the sources of additional information on RSLogix 5 software, including online help, RSLogix 5 training, and technical support.

You can find out more information about RSLogix 5 software by consulting:

- RSLogix 5 online help
- RSLogix 5 training
- Technical support services

RSLogix 5 online help

RSLogix 5 online help provides overviews, a description of the fields on every dialog box, and step-by-step procedures for working with all of the features of RSLogix 5. To open online help while running RSLogix 5 you can:

- click the Help button on any window
- press **[F1]** while the cursor is on any instruction, dialog box, or window view
- select **Help > Contents**
- expand the Help folder in the project tree and then double-click on any informative file listed (except for User Application Help which is only available if you have defined it) to launch a help file.

Using the Contents, Index, and Find tabs

To display the tabbed help dialog:

- select **Help > Contents** and click the appropriate tab or
- expand the **Help** folder in the project tree, double-click **Contents**, and click the appropriate tab

Contents

Help Topics: RSLogix 5 Programming Software

Contents | Index | Find

Click a topic, and then click Display. Or click another tab, such as Index.

- Overview
- File handling
- Protection options and administrative tasks
- Display environment
- Ladder editor
  - General information and shortcuts
  - Logical addresses
  - Branching
  - Quick key mapping
  - Verifying ladder programs and files
  - Online editing
  - Procedures
- Documentation
- I/O Configuration
- Processor Configuration

Close | Print... | Cancel

To expand the outline, double-click a closed book.

To collapse the outline, double-click an open book.

To go to a topic, double-click a page.

Double-click the Procedures book to see a list of all the tasks you can accomplish related to a specific function of the software.

Tip

To print a group of help topics, select a book from the Contents tab, and then click the Print button. All of the individual topics in that book will print.

Index

The index tab provides a list of guide words or subjects just like the index of a book. This is a quick way to find information about a specific topic. Follow the directions on the Index tab.

Find

If you don't see what you are looking for in the contents or index, you can search the entire help file for all occurrences of a word. Follow the directions on the dialog to find a word.

The first time you click the Find tab you will see a message about building a word list. Follow the directions on the screen. The default selection is generally sufficient. For more information refer to Microsoft's online help (**Start > Help**).

Instruction set help

Click any instruction in your project and press **[F1]** for help on that instruction. To pick an instruction from a list instead, select **Help > PLC5 Instruction Help**. From this topic you can also search for an instruction by category.

Sample instructions are shown in the help with parameters entered so you can more easily determine what information (bit address, constant, etc.) you must supply.

Keyboard shortcuts

A list of hot keys (keyboard shortcuts) that enable you to maneuver the software without a mouse can be found in a help file that you can print out. To access this file, select **Help > Using The Keyboard**. To print any of the keyboard help topics, just click the Print button at the top of the window.

Some of these keyboard shortcuts (sometimes called Ctrl-key accelerators) are standard to the Windows operating system and work across all Windows-based products. Other shortcuts will only work with the RSLogix 5 and 500 products.

User Application Help

The User Application Help feature allows you to add your own reference source (document, web page, etc.) to the RSLogix 5 project. You can use whatever format you want for the source as long as the computer running RSLogix 5 can open and read that source. For example, you could use a Microsoft Word doc file, provided that you had Word on your computer. Or you could use an HTML file provided that you had a browser that could read the file.

Your User Application Help file is saved with the project in RSLogix 5. You can specify one User Application Help file per project.

To set up your User Application Help file:

1. Create the source file for your User Application Help.

2. From the project tree in RSLogix 5, right-click **User Application Help** (under the **Help** folder) and select **Properties**. The User Application Help dialog appears.

3. Enter the path and file name, or the URL for your source file and click OK.

To specify a different source file, go back to the Properties dialog and enter the new path and name.

To display the User Application Help file, double-click on **User Application Help** (under the Help folder in the project tree).

Printing a popup help topic

To print the contents of a popup window, right-click in the popup and select **Print Topic**.
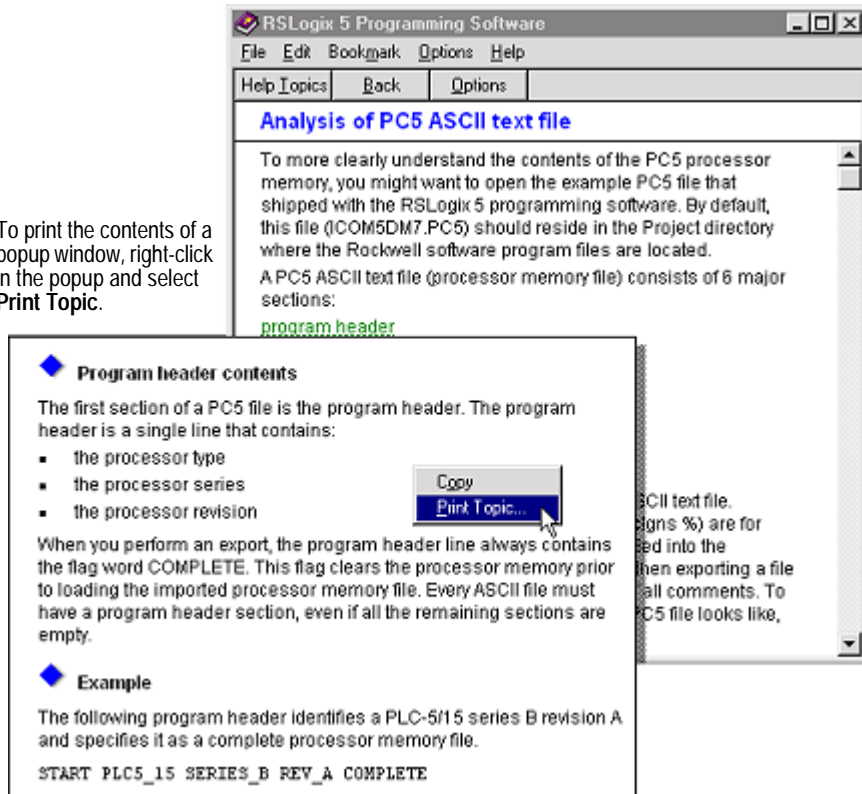
Learning more about using online help

To learn tips and tricks for getting the most out of the help system, select **Help > Using Help**.

RSLogix 5 training

Rockwell Software offers both classroom and computer-based training for RSLogix 5.

Classroom training

One of the best ways to increase your proficiency at using Rockwell Software products is to attend a Rockwell Software training program. Our training programs can help you master the basics and show you how to unleash the full potential of our software.

We offer a wide range of training programs, from regularly scheduled classes conducted at Rockwell Software facilities, to custom-tailored classes conducted at your enterprise. The size of each class is kept small intentionally to maximize student engagement.

For more information about our training programs:

- visit our web site at **www.software.rockwell.com/Training/**
- view the Support and Training help file either from Help on the menu bar or from the Help folder in the project tree.
- contact the Rockwell Software Training Coordinator at **877-724-7864**.

Interactive training

A computer-based training program for RSLogix 5 is available for purchase. Contact your distributor to order RSTrainer 2000 for RSLogix 5. A demo of the training program is included on the RSLogix 5 CD-ROM. To run the demo, insert the RSLogix 5 CD-ROM into the CD-ROM drive. When the menu appears, select **Try RSTrainer 2000 for RSLogix 5**.

If the CD-ROM does not autorun, open the **Start** menu and select **Run**. Type `x:\autoplay` (where x is your CD-ROM drive), and click OK. Select **Try RSTrainer 2000 for RSLogix 5** from the menu.

Technical support services

If you cannot find answers to your questions in the *Getting Results with RSLogix 5* publication or in the online help, you can call Rockwell Software technical support.

Telephone—**440-646-7800**

Fax—**440-646-7801**

World Wide Web—**www.software.rockwell.com/support**

Support staff are available Monday to Friday 8 AM to 5 PM EST, CST, MST, and PST, except during U.S. holidays.

When you call

When you call, you should be at the computer running the Rockwell Software product and be prepared to provide the following information:

- product serial number on the Activation disk labels (You can find the serial number online. On the RSLogix 5 menu, click Help, and then click About.)
- product version number
- hardware you are using

- Microsoft Windows operating system and service pack you are using
- exact wording of any messages that appear on the screen
- description of what happened, and what you were doing when the problem occurred
- description of how you tried to solve the problem.

Index