

Motoman XRC Controller

Concurrent I/O Editor User's Manual

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Section 1

INTRODUCTION

The Motoman Concurrent I/O Editor software is designed to graphically display ladder programs as signal connection diagrams. Concurrent I/O Editor supports editing by drag and drop operation making creating and editing ladder programs much easier.

1.1 About this Document

This manual provides general and detailed information about the safe and effective use of Motoman Concurrent I/O Editor software.

1.2 Reference to Other Documentation

For additional information refer to the following:

- Concurrent I/O Parameters Manual (P/N 142102-1)
- Operator's Manual for General Purpose (P/N 142099-1)
- Operator's Manual for Handling (P/N 142100-1)
- Operator's Manual for Spot Welding (P/N 142101-1)
- Operator's Manual for Arc Welding (P/N 142098-1)
- Vendor manuals for system components not manufactured by Motoman.

1.3 Customer Service Information

If you are in need of technical assistance, contact the Motoman service staff at (937) 847-3200. Please have the following information ready before you call:

- Concurrent I/O Editor version
- Operating system (Windows NT®)
- System configuration (hard disk capacity, memory, software, etc.)
- Description of difficulty (take note of any error messages)

NOTES

Section 2

SAFETY

2.1 Introduction

It is the purchaser's responsibility to ensure that all local, county, state, and national codes, regulations, rules, or laws relating to safety and safe operating conditions for each installation are met and followed.

We suggest that you obtain and review a copy of the ANSI/RIA National Safety Standard for Industrial Robots and Robot Systems. This information can be obtained from the Robotic Industries Association by requesting ANSI/RIA R15.06. The address is as follows:

Robotic Industries Association

900 Victors Way

P.O. Box 3724

Ann Arbor, Michigan 48106

TEL: (734) 994-6088

FAX: (734) 994-3338

Ultimately, the best safeguard is trained personnel. The user is responsible for providing personnel who are adequately trained to operate, program, and maintain the robot cell.

The robot must not be operated by personnel who have not been trained!

We recommend that all personnel who intend to operate, program, repair, or use the robot system be trained in an approved Motoman training course and become familiar with the proper operation of the system.

This safety section addresses the following:

- Standard Conventions (Section 2.2)
- General Safeguarding Tips (Section 2.3)
- Mechanical Safety Devices (Section 2.4)
- Installation Safety (Section 2.5)
- Programming Safety (Section 2.6)
- Operation Safety (Section 2.7)
- Maintenance Safety (Section 2.8)

2.2

Standard Conventions This manual includes information essential to the safety of personnel and equipment. As you read through this manual, be alert to the four signal words:

- DANGER
- WARNING
- CAUTION
- NOTE

Pay particular attention to the information provided under these headings which are defined below (in descending order of severity).



DANGER!

Information appearing under the DANGER caption concerns the protection of personnel from the immediate and imminent hazards that, if not avoided, will result in immediate, serious personal injury or loss of life in addition to equipment damage.



WARNING!

Information appearing under the WARNING caption concerns the protection of personnel and equipment from potential hazards that can result in personal injury or loss of life in addition to equipment damage.



CAUTION!

Information appearing under the CAUTION caption concerns the protection of personnel and equipment, software, and data from hazards that can result in minor personal injury or equipment damage.

NOTE: Information appearing in a NOTE caption provides additional information which is helpful in understanding the item being explained.

2.3 General Safeguarding Tips

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. General safeguarding tips are as follows:

- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation of this robot, the operator's manuals, the system equipment, and options and accessories should be permitted to operate this robot system.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the robot cell.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).
- The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
- In accordance with ANSI/RIA R15.06, section 6.13.4 and 6.13.5, use lockout/tagout procedures during equipment maintenance. Refer also to Section 1910.147 (29CFR, Part 1910), Occupational Safety and Health Standards for General Industry (OSHA).

2.4 Mechanical Safety Devices

The safe operation of the robot, positioner, auxiliary equipment, and system is ultimately the user's responsibility. The conditions under which the equipment will be operated safely should be reviewed by the user. The user must be aware of the various national codes, ANSI/RIA R15.06 safety standards, and other local codes that may pertain to the installation and use of industrial equipment. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. The following safety measures are available:

- Safety fences and barriers
- Light curtains
- Door interlocks
- Safety mats
- Floor markings
- Warning lights

Check all safety equipment frequently for proper operation. Repair or replace any non-functioning safety equipment immediately.

2.5 ***Installation Safety***

Safe installation is essential for protection of people and equipment. The following suggestions are intended to supplement, but not replace, existing federal, local, and state laws and regulations. Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. Installation tips are as follows:

- Be sure that only qualified personnel familiar with national codes, local codes, and ANSI/RIA R15.06 safety standards are permitted to install the equipment.
- Identify the work envelope of each robot with floor markings, signs, and barriers.
- Position all controllers outside the robot work envelope.
- Whenever possible, install safety fences to protect against unauthorized entry into the work envelope.
- Eliminate areas where personnel might get trapped between a moving robot and other equipment (pinch points).
- Provide sufficient room inside the workcell to permit safe teaching and maintenance procedures.

2.6 ***Programming Safety***

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Programming tips are as follows:

- Any modifications to PART 1 of the MRC controller PLC can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to PART 1. Making any changes without the written permission of Motoman will **VOID YOUR WARRANTY!**
- Some operations require standard passwords and some require special passwords. Special passwords are for Motoman use only. **YOUR WARRANTY WILL BE VOID** if you use these special passwords.
- Back up all programs and jobs onto a floppy disk whenever program changes are made. To avoid loss of information, programs, or jobs, a backup must always be made before any service procedures are done and before any changes are made to options, accessories, or equipment.
- The concurrent I/O (Input and Output) function allows the customer to modify the internal ladder inputs and outputs for maximum robot performance. Great care must be taken when making these modifications. Double-check all modifications under every mode of robot operation to ensure that you have not created hazards or dangerous situations that may damage the robot or other parts of the system.

-
- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to operate the system.
 - Inspect the robot and work envelope to be sure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
 - Be sure that all safeguards are in place.
 - Check the E-STOP button on the teach pendant for proper operation before programming.
 - Carry the teach pendant with you when you enter the workcell.
 - Be sure that only the person holding the teach pendant enters the workcell.
 - Test any new or modified program at low speed for at least one full cycle.

2.7 Operation Safety

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Operation tips are as follows:

- Be sure that only trained personnel familiar with the operation of this robot, the operator's manuals, the system equipment, and options and accessories are permitted to operate this robot system.
- Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Inspect the robot and work envelope to ensure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Ensure that all safeguards are in place.
- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to operate the system.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the cell.
- The robot must be placed in Emergency Stop (E-STOP) mode whenever not in use.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller, external servo box, and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- All modifications made to the controller will change the way the robot operates and can cause severe personal injury or death, as well as damage the robot. This includes controller parameters, ladder parts 1 and 2, and I/O (Input and Output) modifications. Check and test all changes at slow speed.

2.8 Maintenance Safety

All operators, programmers, plant and tooling engineers, maintenance personnel, supervisors, and anyone working near the robot must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. Maintenance tips are as follows:

- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this robot should be permitted to operate the system.
- Back up all your programs and jobs onto a floppy disk whenever program changes are made. A backup must always be made before any servicing or changes are made to options, accessories, or equipment to avoid loss of information, programs, or jobs.
- Do not enter the robot cell while it is in automatic operation. Programmers must have the teach pendant when they enter the cell.
- The robot must be placed in Emergency Stop (E-STOP) mode whenever it is not in use.
- Be sure all safeguards are in place.
- Use proper replacement parts.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller, external servo box, and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- All modifications made to the controller will change the way the robot operates and can cause severe personal injury or death, as well as damage the robot. This includes controller parameters, ladder parts 1 and 2, and I/O (Input and Output) modifications. Check and test all changes at slow speed.
- Improper connections can damage the robot. All connections must be made within the standard voltage and current ratings of the robot I/O (Inputs and Outputs).

Section 3

INTRODUCTION TO CONCURRENT I/O EDITOR

3.1 Hardware Requirements for Concurrent I/O Editor

Concurrent I/O Editor operates with the configurations shown below.

Table 3-1 Hardware Requirements for Concurrent I/O Editor

OS	Microsoft Windows 95 /98 /NT4.0
Required Memory	16 Mbytes or more
CPU	Pentium or Pentium compatible processor
Hardware Disk Capacity for Installation	20 Mbytes or more
Disk Drive	Hard disk drive and CD-ROM drive
Display	Supported by MS-Windows
Mouse	Supported by MS-Windows
Robot Controller	YASNAC XRC
Hardware Lock Key	Used under single user registration. If a conversion adapter is required, refer to Section 3.2, "Hardware Lock Key" for details.

- NOTE:*
- A personal computer and OS are not included with this software.
 - For XRC ladders, refer to the XRC Concurrent I/O and Parameter manual (P/N 142102-1)

3.2 Hardware Lock Key

The hardware security key supplied with Concurrent I/O Editor must be installed on your computer or the software will not function. The hardware key attaches to the computer's parallel port connector. This port is commonly used to connect printers and other peripheral devices to your computer. To attach the hardware key, proceed as follows:

1. Turn power off from PC.
2. Disconnect any printer currently connected to your computer's parallel port.
3. Carefully insert the hardware key into the parallel connector. If the key does not fit, do not force it. The key should fit snugly but does not require significant force to insert.

NOTE: Consult the documentation that came with your PC if you are unsure which connector is the parallel port.

-
4. Connect your printer cable to the free end of the hardware key. The key will not interfere with the operation of your printer.

Proper use of the hardware key is extremely important! Performing tape backups, file transfers, I/O control, or using parallel communication cables between devices with the key installed may permanently damage the key.

Observe the following guidelines to protect your hardware key:

Remove the hardware key from the computer if the parallel port is used for any operation other than printing. The key may not operate properly if attached to anything other than a parallel port (e.g. SCSI adapter).

It is highly recommended that the key(s) be insured for the full value of the software package. Lost or stolen keys cannot be replaced. If the key is lost, users will have no alternative but to purchase a new copy of the software. If the key is accidentally damaged, return it to Motoman for replacement. There is a charge for key replacement.



WARNING!

- ***Do not install or remove the hardware key while the computer is powered ON. "Hotswapping" the hardware key during power on may result in damage to the key.***
- ***Do not use the hardware key in-series with bi-directional communications (printers) or damage may occur.***

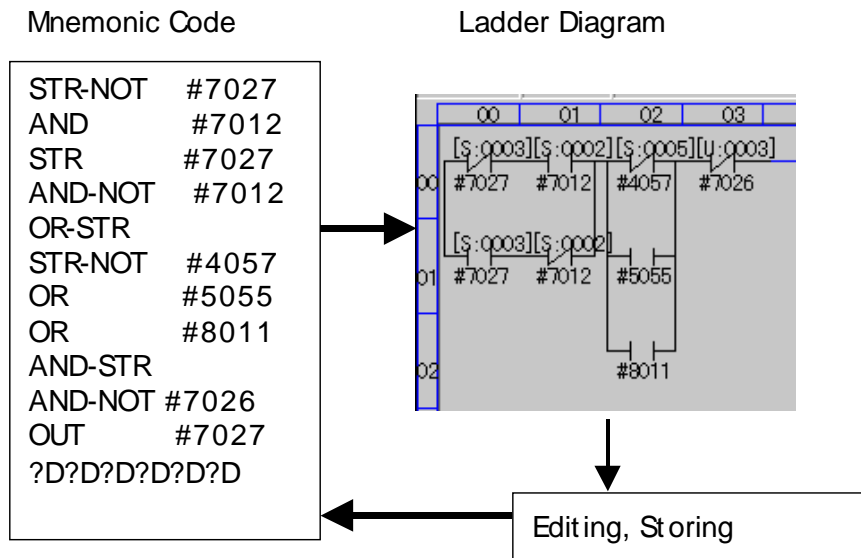
3.3 Concurrent I/O Editor

3.3.1 What is Concurrent I/O Editor?

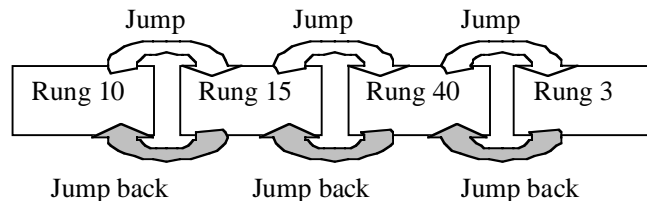
The robot controller (YASNAC XRC) has a concurrent I/O function that processes I/O related control independently from the manipulator, and in parallel with the manipulator operation. Concurrent I/O Editor is used to graphically display ladder programs with the above function as a signal connection diagram, or to edit commands by drag and drop operation using the mouse.

3.3.2 Features of Concurrent I/O Editor

- Ladder mnemonic code can be edited with an image of a ladder diagram.



- With the “ladder preview” display, the entire ladder program can be easily previewed.
- Simple drag and drop operation can edit connections between ladder Instructions.
- Cross-reference function is enriched.
- Information such as relay number use state or the place where an arbitrary relay number is used can be referenced easily.
- History jump function is available.
- This function records the history of jumping to other rungs, and easily returns to the previous rung before jumping.



- Printing function is enriched.

Cross-reference information can also be printed, as well as ladder diagrams. This function is very useful when a created ladder is stored as reference material.

3.4 Terms

The following terms are frequently used in this manual.

Table 3-1 Terms

Terms	Description
Set Value	Value set to ladder parts such as relay numbers, register numbers or constants
Rung	One line indicates one section divided with OUT codes in a ladder mnemonic. Normally, there is one OUT part per rung (excluding when GRP parts are used).
Current Ladder File	The ladder file containing the ladder diagram which the editor displays on the left side window of the main dialog box.
Current Ladder	The ladder diagram being edited and displayed on the left side window of the main dialog box.
Current Rung	The rung available for editing, which is shown on the right side window of the main dialog box
Current Section	The section of the ladder diagram being edited and displayed on the left side window of the main dialog box.
Relay List	Table of all the possible relay numbers, indicating for each one, the numbers of the rungs containing the relay, whether it is normally open, normally closed, and the rung comment or relay label associated with the relay
Register List	Table of the register numbers used in the Current Ladder, indicating for each one, which instruction uses the register, which rung contains the instruction, and the comment associated with each register.
Comment	A 32 character long string associated with a relay or register, only displayed in the Relay List, or Register List.
Label	A 16 character long string associated with a relay; displayed below each relay symbol on the ladder diagram if the View>Relay Labels toggle is turned on
Relay State Table	A table listing all possible relay numbers and specifying if each number is used in the user section of the ladder, the system section of the ladder, or both.
Label File	A text file containing all the relay labels, register labels, relay (and rung) comments, and register comments.
Header Information	Initial values of system variables, listed at the beginning of the Ladder File.
Ladder File	The text file containing the mnemonic instructions which define a Concurrent I/O ladder.
Rung Comment	The relay comment associated with the output relay of a rung.
Edit Window	The right hand side window of the main dialog box, the window in which drag and drop editing features are applied to the current rung.
Ladder Window	The left hand side window of the main dialog box, the window that displays the entire Current Section of the Current Ladder.
Instruction	A relay or operation indicated by a symbol on a rung in the ladder diagram.

Section 4

CONCURRENT I/O EDITOR BASIC DISPLAY

The following shows the “basic” display of Concurrent I/O Editor. The “basic” display is divided into two displays: “ladder preview” display and “ladder editing” display. Editing is available as referring to the ladder diagram before and after the ladder diagram in the editing row.

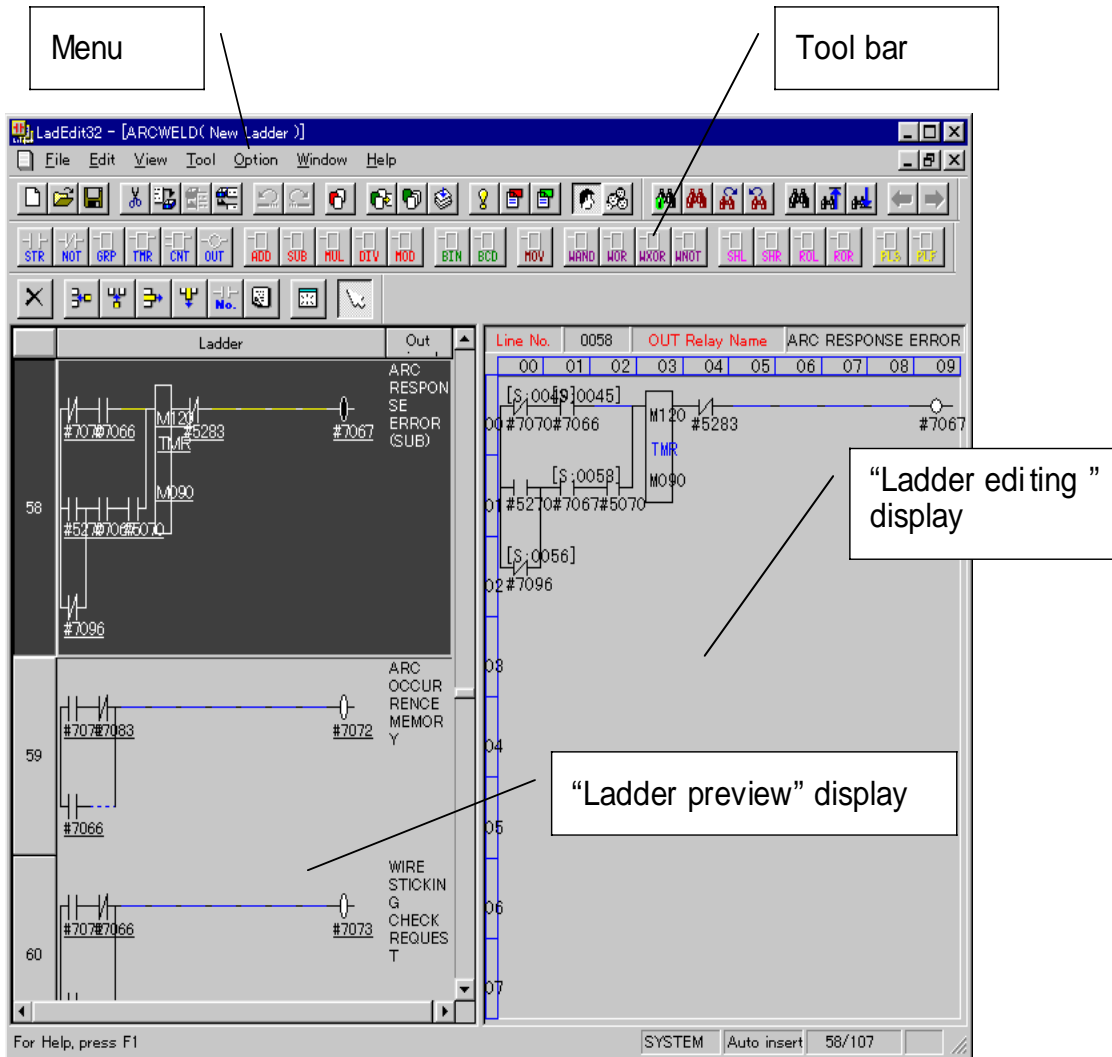


Figure 4-1 Basic Display

NOTES

Section 5

FLOWCHART OF BASIC EDITING

The following shows the basic flowchart of ladder editing.

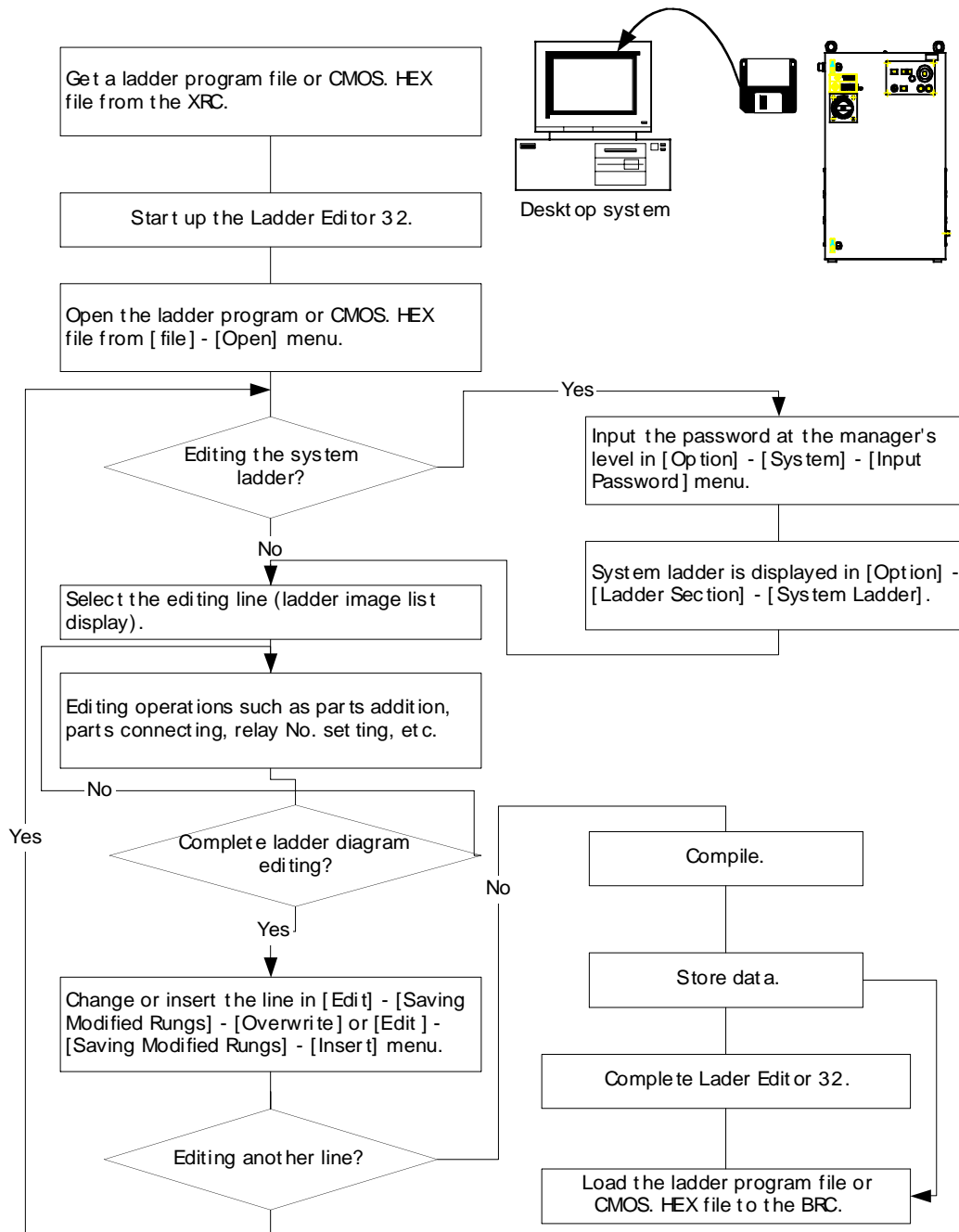


Figure 5-1 Ladder Editing Operation Flow

NOTES

Section 6

STARTING AND ENDING CONCURRENT I/O EDITOR

6.1 How to Start

To start up Concurrent I/O Editor, open the [Start] menu in the Windows tool bars, and select "Concurrent I/O Editor" from [Program] – [Motoman] – [Concurrent I/O Editor]. When Concurrent I/O Editor starts normally, the display in Figure 6-1*Figure* will appear.

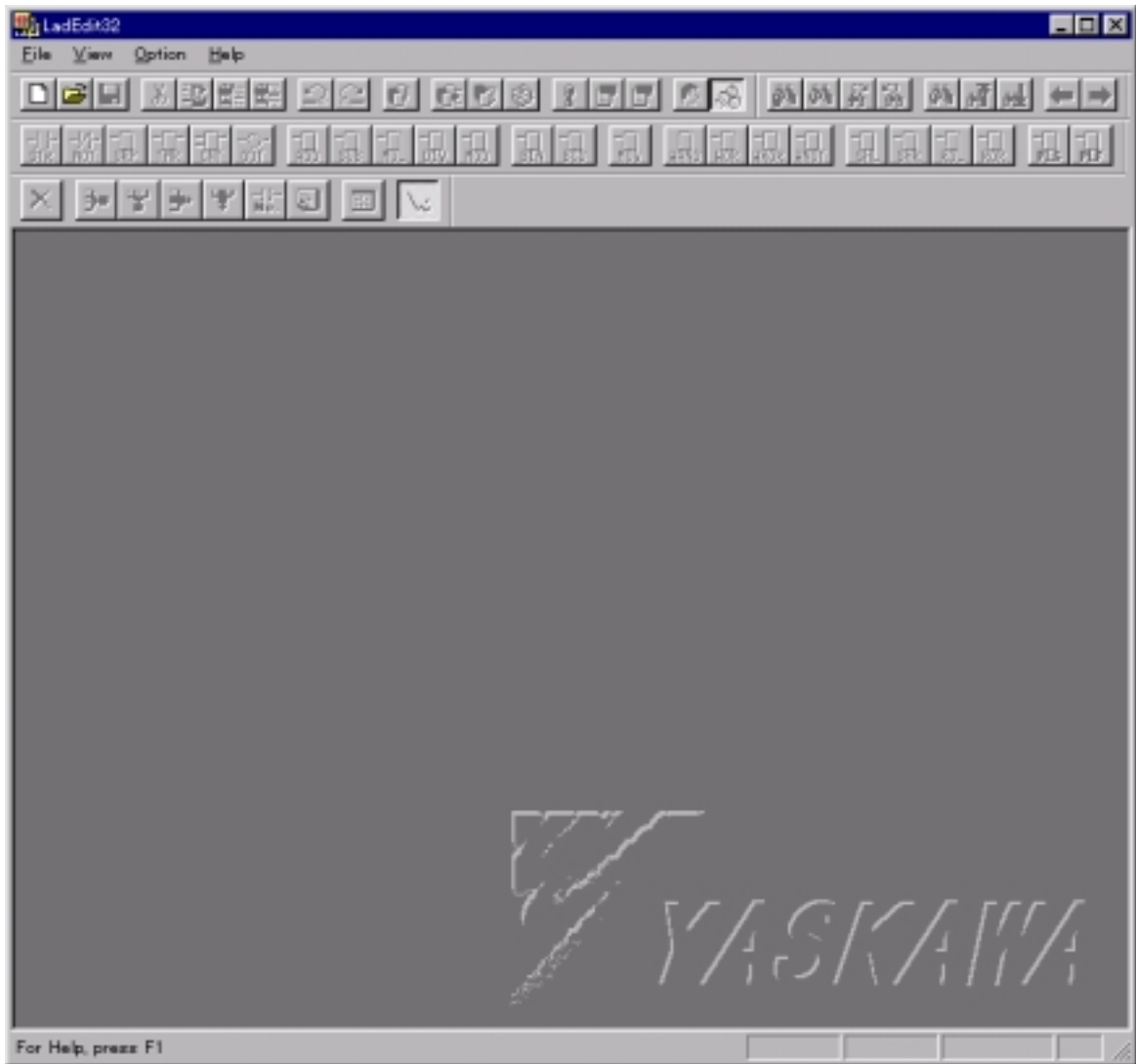


Figure 6-1 Startup Display

6.2 How to End

Select [File] – [Exit] in the main Concurrent I/O Editor menu to close Concurrent I/O Editor.

NOTES

Section 7

READING AND STORING EDITED LADDER FILES

7.1 Reading Ladder Data

To perform ladder editing, read in the ladder program to be edited by Concurrent I/O Editor. The following two types of files can be edited by Concurrent I/O Editor:

- Ladder program file (text file)
- CMOS file (binary file)

7.1.1 How to Read Ladder Data

1. Select [File] – [Open] menu (or  button). The [Open] dialog box appears.

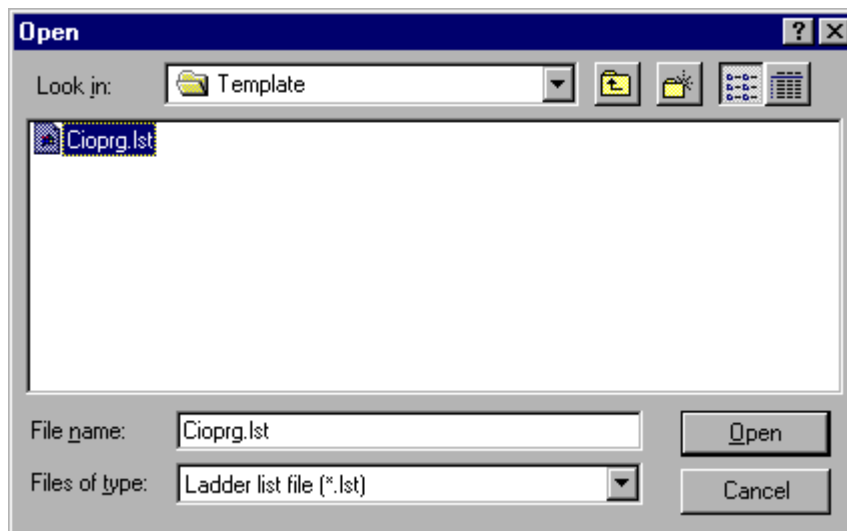


Figure 7-1 [Open] Dialog Box

2. To read in a ladder program file, select the ladder program file and click the [Open] button.
3. To read in a CMOS file, select “CMOS file (*.HEX)” from [Files of type] combo box in [Open] dialog box in Figure 7-1. When the list of CMOS. HEX files appears, select the CMOS file to be edited, and click the [Open] button.

7.2 Reading Several Ladder Files

The Concurrent I/O Editor is an MDI (Multi Document Interface) application capable of reading several ladder program files simultaneously. To select the ladder program to be edited, select the file name displayed in the [Window] menu, or select the window with the targeted ladder program among overlapping windows by selecting [Window] - [Cascade].

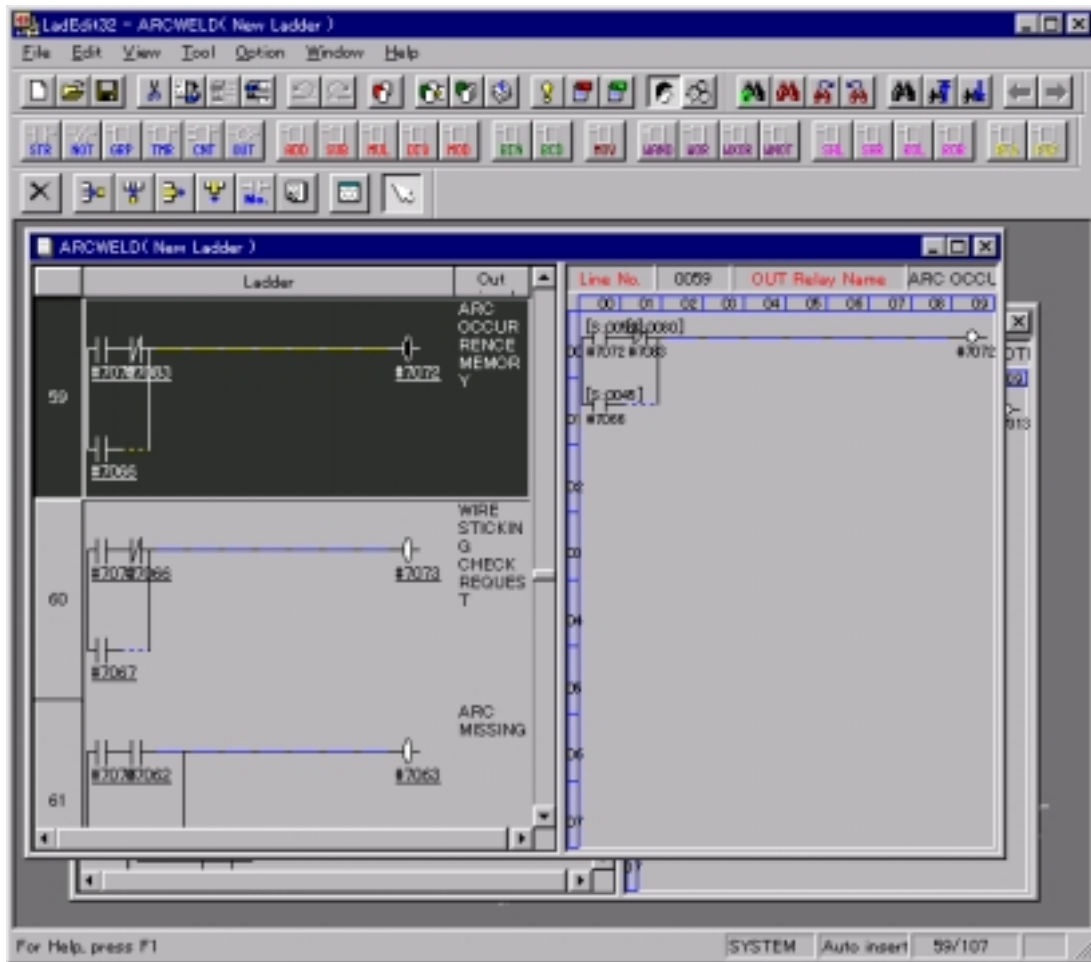


Figure 7-2 Overlapping Editing Windows

7.3 ***Saving Edited Data***

When ladder editing is completed, save the information in a file. **Before saving, be sure to check the ladder if ladder data was edited.** Data may not be stored completely if you do not check the ladder before saving.

7.3.1 ***How to Save Edited Data***

1. Select [File] – [Save] to store the overwritten data on an existing file.
2. Selecting [File] – [Save As] displays the [Save As] dialog box. Set an arbitrary file name to the data to be stored.

To store the file, the following three types of file forms are available, depending on the method used to read in a file.

Storing when a Ladder Program File (CIOPRG.LST) is Open

When a ladder program file is read in, only a ladder program file (text file) can be stored in an output file form.

Storing when a CMOS File (CMOS.HEX) is Open

When a CMOS file is read in, the data can be stored in the two types of file forms, a ladder program file (text file) and a CMOS file (binary file), as an output file.

Storing a Ladder Program that is Being Edited

A ladder program being edited cannot be stored if it has a detected error, even if checked. The ladder program being edited can be stored as a rough draft. For details, refer to Section 22.3, “Storing Work in Progress.”

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Section 8

CREATING A LADDER DIAGRAM

To create a new ladder program, use the standard ladder program as the base for editing. The standard ladder program is supplied as a template.

8.1 How to Create a Ladder Diagram

1. Selecting [File] – [New] displays the dialog box shown in Figure 8-1Figure .

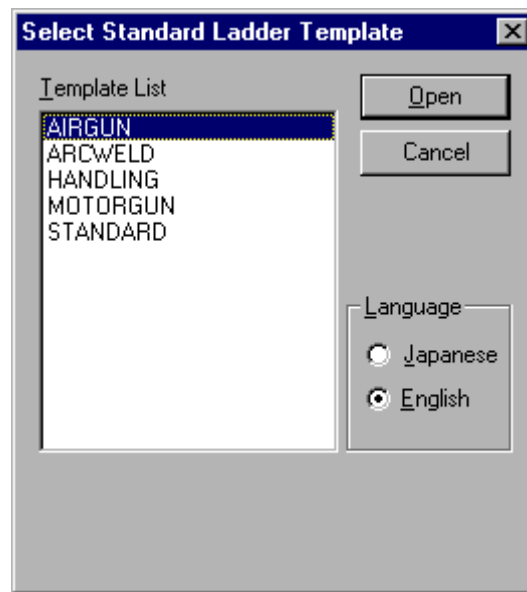


Figure 8-1 [Select standard ladder template] Dialog Box

2. Select the template to be used and click the [Open] button.

NOTES

Section 9

EDITING A LADDER DIAGRAM

NOTE: The Concurrent I/O Editor software application is limited to compiling a total of 10 instructions in series on any line, (rung), of ladder code. Any additional instructions will be rejected by the software as an error. The software will not allow you to compile and save the program, even though the XRC Robot Controller will accept and execute more instructions in series. Additionally, there is a limit to the number of parallel, or branched instructions, to a total of five. Again, the XRC may be using and compiling more branched instructions than the software application allows.

9.1 Ladder Instructions Specifications

The Concurrent I/O Editor supports the new ladder codes employed for the XRC. For details on ladder instructions, refer to the [Ladder Instructions Specifications] of [Help] menu. All ladder diagrams are edited in the “Basic” Display, as shown in Figure 4-1.

9.2 Selecting a Ladder Edited Rung

A ladder diagram is edited in the “ladder editing” display, and the rung to be displayed in the “ladder editing” display is selected in the “ladder preview” display, as shown in Figure 9-1. In the “ladder preview” display, images of the ladder diagrams of all the rungs can be viewed set in the current ladder section (either system or user section).

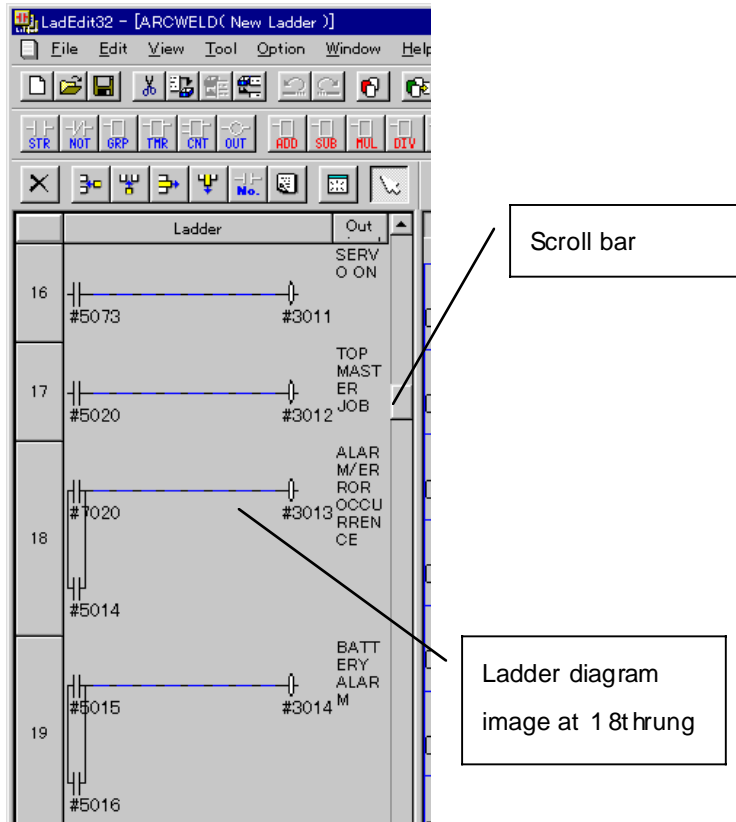


Figure 9-1 Ladder Preview Display

To refer to the ladder diagram of a rung that is not displayed on the display, use the scroll bar.

In the “ladder preview” display, left-click the mouse to select the rung to be edited. The “ladder editing” display with the ladder diagram of the selected rung appears.

9.3 Adding New Ladder Instructions

New ladder instructions can be added when editing a ladder diagram. Add ladder instructions in the following manner.

9.3.1 How to Add New Ladder Instructions

1. Enter the instruction addition mode (select instructions to be added):

Selecting [Tools] – [Add Instructions] displays the list of ladder instructions to be added. Select the ladder instructions, or select the instructions to be added from the ladder instructions tool bar.

Example – Adding the ladder instructions of the NC contact

Select [Tools] – [Add Instructions] – [STR-NOT], or tool bar .

2. Set new instructions on the matrix to be added in the “ladder editing” display:

When the ladder instructions to be added are determined, the mouse form changes in the “ladder editing” display. The selected ladder instructions appear at the side of the mouse pointer. Left-click on the matrix location where the ladder instructions are to be added.

“????” may appear for the added ladder instructions. This is because the relay number or register number is not set for these ladder instructions. This is not an error. Set the relay number or register number, refer to Section 9.6, “Setting Relay number, Register number and Constants.”

9.4 Deleting Ladder Instructions

Delete the ladder instructions in the following manner.

9.4.1 How to Delete Ladder Instructions

1. Enter the instruction deletion mode:

Select [Tools] – [Edit Instructions] – [Delete Instructions], or select from the Edit Toolbar (refer to Figure 4-1).

2. Select the ladder instructions to be deleted in the “ladder editing” display:

Left-click on the matrix location where the ladder instructions are to be deleted in the “ladder editing” display.

9.5 **Connecting and Disconnecting Lines between Ladder Instructions**

Ladder instructions on a certain matrix are connected to ladder instructions on another matrix with a line. The connection method of the line determines the ladder process. The following paragraph describes how to connect and disconnect the line between ladder instructions.

9.5.1 **Connecting with a Line**

Connect ladder instructions with a line in the following manner:

1. **Left-click** the mouse on the first ladder instruction.
2. While pressing the mouse, drag the mouse to the second ladder instruction.
3. Release the **left button** at the second ladder instruction.

Two instructions are connected by a drag and drop operation.

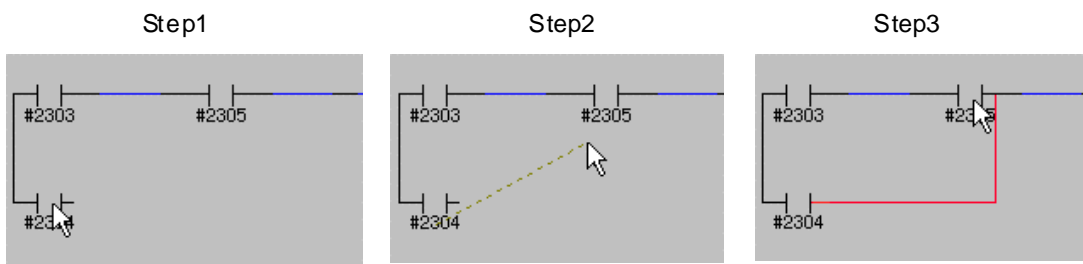


Figure 9-2 Line Connection Process

Ladder Instructions Connection Terminals

Ladder instructions have IN and OUT terminals. A connecting line connects the IN and OUT terminals. A drop and drag operation determines which are IN and which are OUT terminals and connects them automatically. However, when two connection ladder instructions are placed vertically, as shown in Figure 9-3, the user must decide to connect the IN or OUT side.

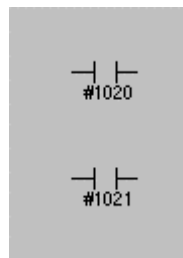


Figure 9-3 Vertically Placed Instructions

In Figure 9-4, the mouse pointer is dragged from the center of a ladder instruction and dropped on the IN side of the other instruction, to make the connecting line on the IN side. Dropping on the IN side creates a line that connects to the IN side of the other ladder instruction. On the other hand, dropping on the OUT side creates a line that connects to the other OUT side.

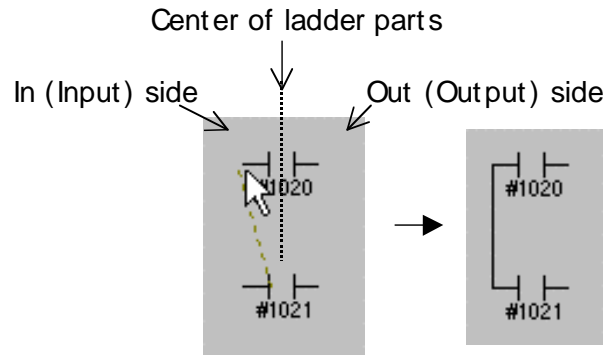


Figure 9-4 Connection on IN Side

9.5.2 Disconnecting Two Instructions

Erase the line between ladder instructions to disconnect them in the following manner:

1. Right-click the mouse on the first ladder instruction.
2. While pressing the mouse, drag the mouse to the second ladder instruction.
3. Release the **right button** at the second ladder instruction.

Two instructions are disconnected by a right-click, drag and drop operation.

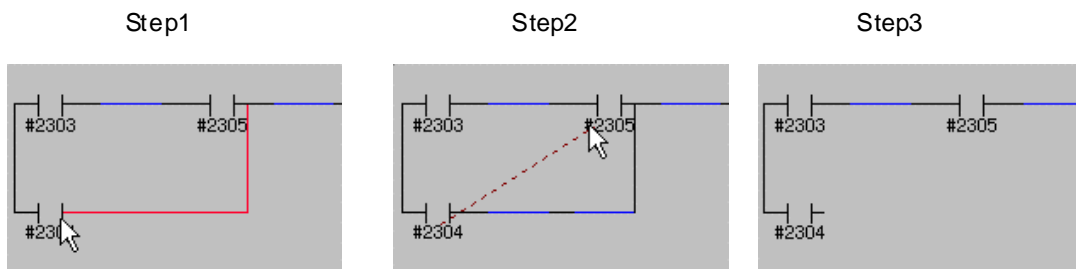



Figure 9-5 Disconnection Process

9.6 **Setting Relay No., Register No. and Constants**

Relay number, register number and constants can be set for each ladder instruction. Set these values in the following manner.

9.6.1 **How to Set Relay No., Register No., and Constants**

1. Enter the set value input mode:

Select [Tools] – [Edit Instructions] – [Edit Instruction Parameters], or select  from the Edit Toolbar (refer to Figure 4-1).

2. Select the ladder instructions to which the set values are input in the “ladder editing” display:

Left-click on the ladder instructions in the “ladder editing” display. The “set value input” dialog box appears.

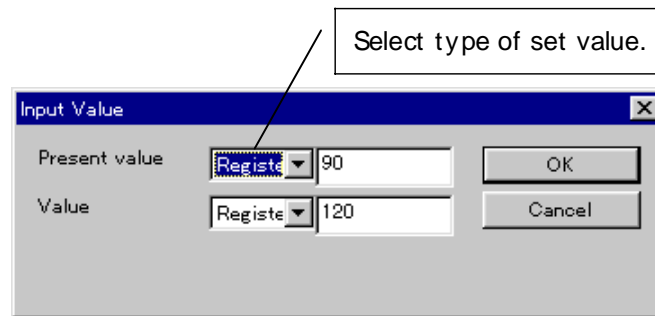


Figure 9-6 [Input Value] Dialog Box

NOTE: The number of setting items in the [Input Value] dialog box differs depending on the ladder instructions.

3. Input the set values:

Select the type of the set value in the combo box of the [Input Value] dialog box, and then input a value suitable for the type of the set value. Click [OK] to set the values.

Setting Values Using a Pop-up Menu

Set values can also be set using a pop-up menu. The pop-up menu appears by right-clicking the mouse.

1. Right-click on the ladder instructions to which the set values are input, and select the pop-up menu:

Right-click the mouse on the ladder instructions to which the set values are input in the “ladder editing” display, and the pop-up menu appears. Select the [Edit instruction parameters], and the [Input Value] dialog box appears.

2. Input the set values:


Input the set values in the [Input Value] dialog box.

9.7 Inputting Relay No. and Register No. Names

Names can be set for the relay numbers and register Nos.. When editing name, a new name can be input or name information read from the external name file can be edited. Set the name for a relay number or a register number in the following manner.

9.7.1 How to Input Relay No. and Register No. Names

1. Enter name input mode:

Select [Tools] – [Edit Instructions] – [Edit Labels and Comments], or select  from the Edit Toolbar (refer to Figure 4-1).

2. Select the ladder instructions where the number of the name to be selected is set:

Left-click the mouse on the ladder instructions where the number of the name to be selected is set in the “ladder editing” display. The [Input name] dialog box appears.

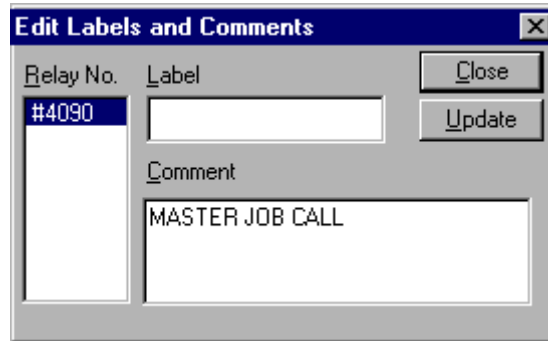


Figure 9-7 [Input name] Dialog Box

The relay number or register number appears in the number selection list box as shown below.

Relay No. : #xxxx, W#xxxx

Register No. : Mxxx

NOTE: Some ladder instructions have several relay numbers or register numbers. In this case, several numbers appear in the number selection list box.

Verify that the targeted relay numbers or register numbers appear and are selected in the relay number selection list box.

3. Set the Descriptions:

Two types of descriptions, a label and a comment can be used. They are treated as follows with Concurrent I/O Editor.

Label: Appears below the relay number or register number in the “ladder editing” display (refer to Section 22.5, “Toggling Label Display”).

Comment: While you may assign a comment to any relay or register instruction, Concurrent I/O Editor displays comments for output relays only. The comments for output relays are shown in the Edit Window in the space labeled “Rung Comment,” and in the Preview Window in the column labeled “Rung Comment.”

4. When settings are complete, click the [Update] button. This button records the setting information.

Setting Names Using a Pop-up Menu

Names can be also set in the following manner using the pop-up menu.

1. Select the ladder instructions where the relay number or register number of the name to be edited is set:

Right-click the mouse on the ladder instructions where the relay number or register number of the name to be edited is set in the “ladder editing” display. The pop-up menu appears. Select [Input Name]. The [Input name] dialog box appears.

2. Edit the name:

Edit the displayed name for a relay number or register number in the [Input name] dialog box.

9.8 ***Inserting Edited Matrix Columns and Rows***

Usually new ladder instructions are inserted in blank positions of the editing matrix. Sometimes the desired position for an instruction is already occupied, as shown in Figure 9-8. In this case, you must insert a column or row in order to add the instruction to the rung.

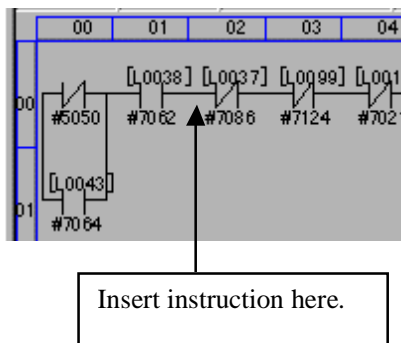



Figure 9-8 No Space in Matrix

9.8.1 Inserting a Column

Insert a column in the following manner.

1. Enter the column insertion mode:
Select [Tools] – [Edit Instructions] – [Edit Entire Column] – [Insert Column(s)].
Or select  from the edit tool bar (refer to Figure 4-1).
2. Left click the column to the right of the new column's desired position.

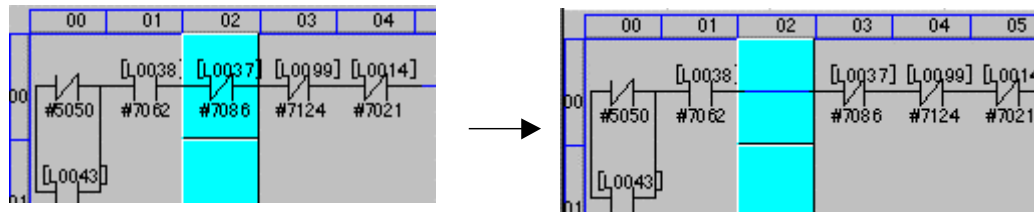


Figure 9-9 Result of Column Insertion

Column Insertion Restriction

The editing matrix has a maximum of 10 columns. During a column insertion, the columns to the right of the insertion point shift one position to the right. Once, a column containing an instruction shifts to the 9th position, then you cannot insert columns. You must delete a column, before inserting another column.

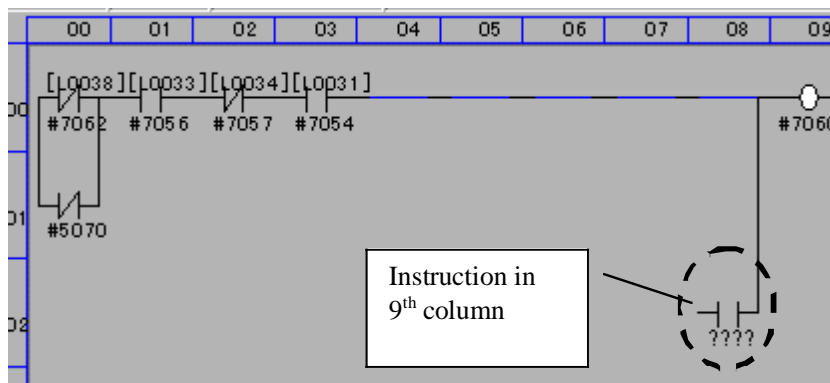


Figure 9-10 Maximum Column Insertion

9.8.2 Inserting a Row in the Edit Matrix

Insert a row in the following manner.

1. Enter the row insertion mode:

Select [Tool] – [Edit Instructions] – [Edit Entire Row] – [Insert Row(s)].

Or select  from the Instruction Tool Bar.

2. Left click the row below where a row is to be inserted.

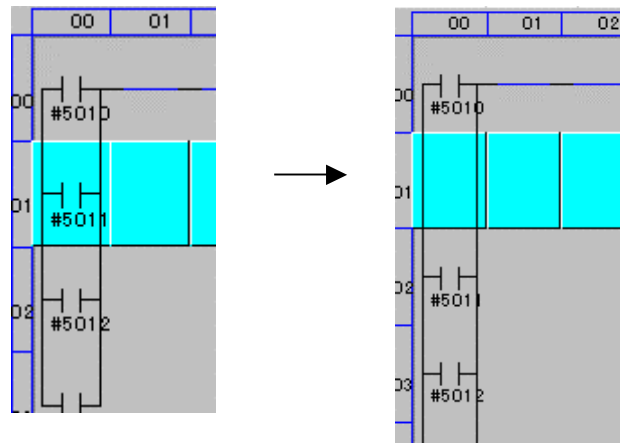


Figure 9-11 Result of Row Insertion

Row Insertion Restriction

The editing matrix has a maximum of 8 rows. During a row insertion, the rows below the insertion point shift one position down. Once a row containing an instruction shifts to the 8th position, no more rows can be inserted. You must delete a row before inserting another row.

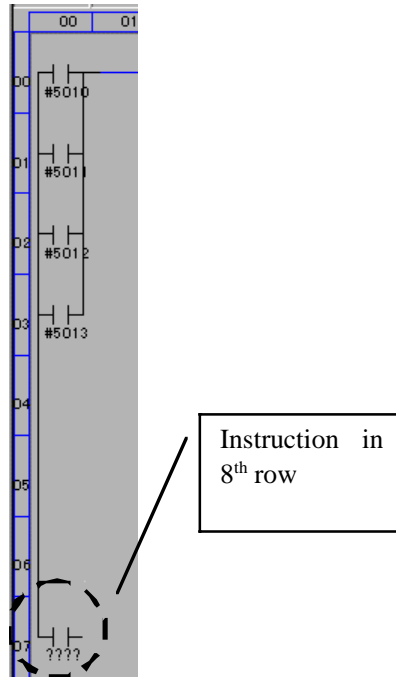



Figure 9-12 Disabled Row Insertion

9.9 Deleting Columns and Rows from the Editing Matrix

9.9.1 Deleting a Column

Delete a column in the following manner.

1. Enter the column deletion mode:
 Select [Tools] – [Edit Instructions] – [Edit Entire Column] – [Delete Column(s)].
 Or select  from the Instruction Tool Bar.
2. Left-click the column to be deleted.

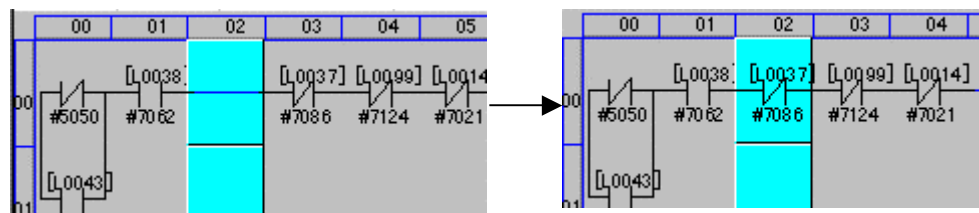



Figure 9-13 Result of Column Deletion

This action shifts the remaining columns to the left.

NOTE: Deleting a column deletes all the ladder instructions it contains.

9.9.2 Deleting a Row

Delete a row in the following manner.

1. Enter row deletion mode.
Select [Tool] – [Edit Instructions] – [Edit Entire Row] – [Delete row(s)].
Or select  from the Instruction Tool Bar.
2. Left-click the row to be deleted.

This action shifts all the remaining rows up.

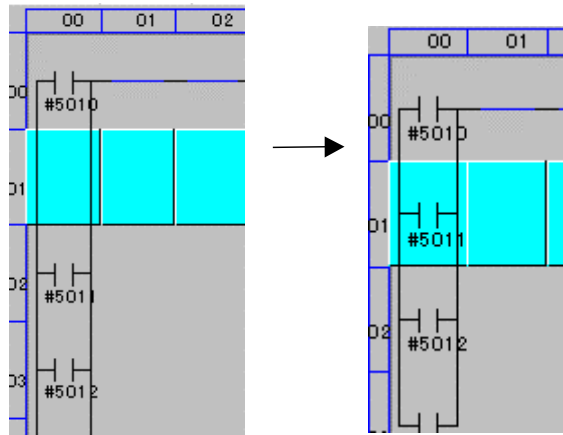



Figure 9-14 Result of Row Deletion

NOTE: Deleting a row deletes all the ladder instructions it contains.

9.9.3 Clear the Current Rung

The contents of the “ladder editing” display can be cleared when editing. This function is useful when the current display is to be re-edited from the beginning.

Select [Edit] – [Clear Current Rung]. Or select  from the Edit Toolbar (refer to Figure 4-1).

NOTES

Section 10

INSERTING A NEW RUNG

A new rung can be inserted anywhere in the ladder. Change the default instructions placed in the new rung to the correct ladder information. The new rung is inserted below the current rung shown in the ladder edit display.

Select [Edit] – [Insert New Rung], or select  from the main tool bar (refer to Figure 4-1).

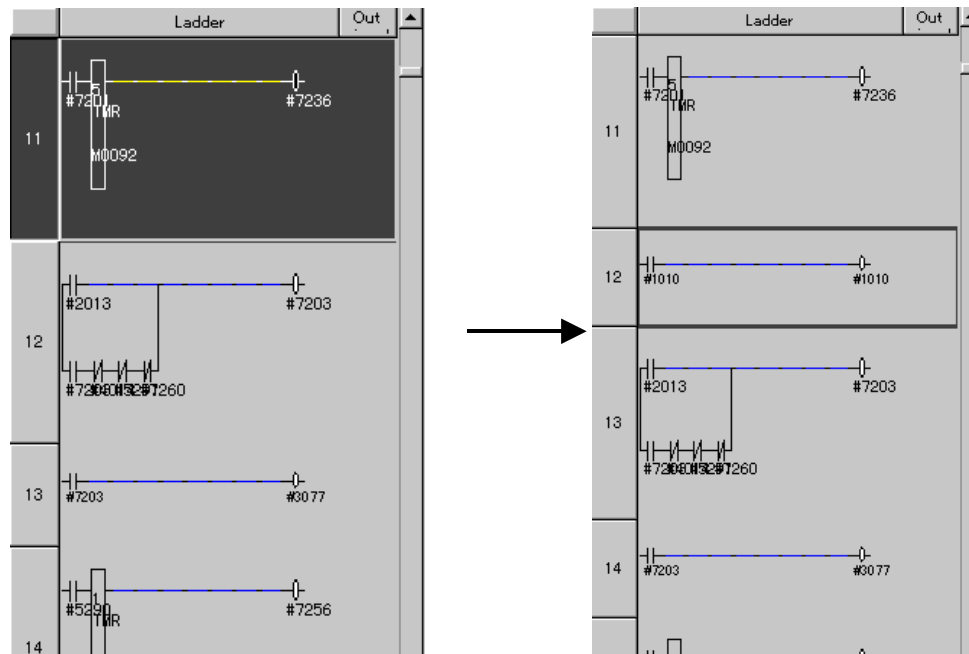


Figure 10-1 Inserting a New Rung

NOTES

Section 11

SAVING EDITED RUNGS

Be sure to select [Overwrite] or [Insert] for the contents edited in the “ladder editing” display before editing another rung. Without this operation, the contents edited immediately before will be deleted. Concurrent I/O Editor checks the ladder information that is being currently edited when a new “current rung” is chosen. If the [Overwrite] or [Insert] is not selected, an editing confirmation message appears (refer to Section 22.4, “Auto Save Current Rung Function,” for automatic updating).

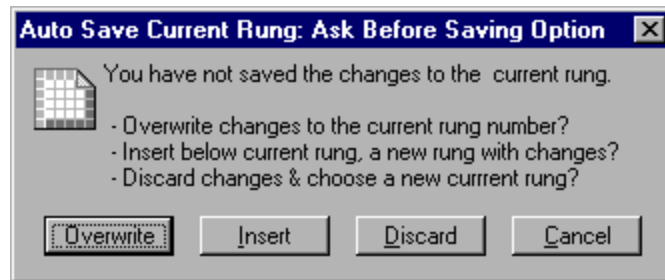



Figure 11-1 [Confirmation] Dialog Box

Normally, the operator uses the menu or tool button to perform [Overwrite] or [Insert].


11.1 Changing an Edited Ladder Rung

Overwrite the contents edited in the “ladder editing” display on the rung currently being edited, in the following manner.

Select [Edit] – [Save Current Rung] – [Overwrite], or select  from the main tool bar (refer to Figure 4-1).

11.2 Inserting an Edited Ladder Rung

Insert the contents edited in the “ladder editing” display into the next rung of the rung currently being edited, in the following manner. Therefore, the ladder data after the inserting rung will be shifted backward.

Select [Edit] – [Save Current Rung] – [Insert], or select  from the main tool bar (refer to Figure 4-1).


NOTES

Section 12

CUTTING, COPYING AND PASTING RUNGS

12.1 Cutting a Ladder Diagram Rung


Cut the rung selected in the “ladder preview” display. The ladder information of the cut rung can be pasted to another place in the ladder by pressing [Paste Rung] or [Insert Cut\Copied Rung].

Select the rung to be cut in the “ladder preview” display, and select [Edit] – [Cut Rung]. Or select  from the main tool bar (refer to Figure 4-1).

NOTE: To select several rungs simultaneously, hold down the [SHIFT] or [CTRL] key when selecting rungs.

12.2 Copy a Ladder Diagram Rung


Copy the rung selected in the “ladder preview” display. The ladder information of the copied rung can be pasted to another place in the ladder by pressing [Paste Rung] or [Insert Cut\Copied Rung].

Select the rung to be copied in the “ladder preview” display. Then select [Edit] – [Copy Rung]. Or select  from the main tool bar (refer to Figure 4-1).

NOTE: To select several rungs simultaneously, hold down the [SHIFT] or [CTRL] key when selecting rungs.

12.3 Pasting a Ladder Diagram Rung


Paste the cut or copied contents of a rung over an existing rung in the Current Ladder. When several ladder list files are open simultaneously, the cut or copied contents can be pasted onto a rung in another ladder list file.

Select the rung to be overwritten in the “ladder preview” display, and select [Edit] – [Paste Rung]. Or select  from the main tool bar (refer to Figure 4-1).

NOTE: This function is disabled if several rungs were cut or copied by pressing [Cut Rung] or [Copy Rung] in the operation immediately before. After selecting only one rung and pressing [Cut Rung] or [Copy Rung], try pasting again.

12.4 Inserting and Pasting a Ladder Diagram Rung

Insert the cut or copied contents of the rung into a new rung below the Current Rung. Therefore, the ladder data after the inserting/pasting rung will be shifted backward. When several ladder list files are open simultaneously, the ladder diagram can be inserted and pasted onto another ladder list file.

Select a rung in the “ladder preview” display. Then select [Edit] – [Insert Cut\Copied Rung]. Or select  from the main tool bar (refer to Figure 4-1).

NOTES


Section 13

CHECKING LADDER CONTENTS

Be sure to check the ladder information of each rung after editing. [Check the Ladder] performs final checking such as the relay number overlapping check, etc. to load the information to the controller.

NOTES: • *Without this operation, the edited data cannot be correctly stored.*

• *Because [Check the Ladder] processes the system section and the user section of the ladder program, it is unnecessary to change to a system ladder or a user ladder.*

Select [Tools] – [Check the Ladder], or select  from the main tool bar (refer to Figure 4-1).

NOTES

Section 14

PRINTING

14.1 Printing a Ladder Diagram

Print an image of a ladder diagram. For each rung, the image also lists the numbers of all rungs in both user and system sections that use the same relays.

Select [File] – [Print] – [Ladder Diagram] – [System Section (or User Section)].

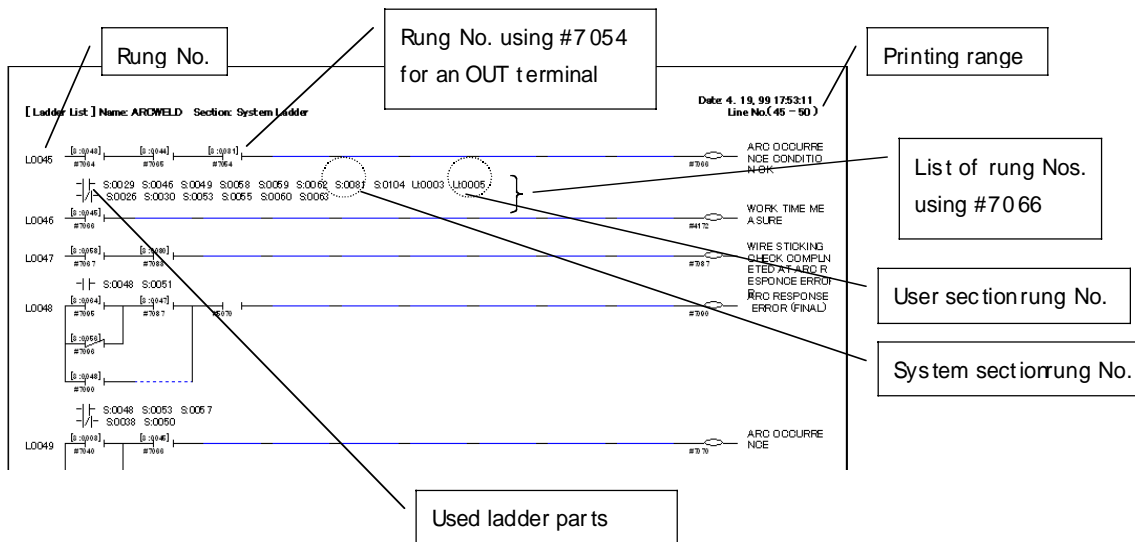


Figure 14-1 Ladder Image Printing

14.2 Printing List of Used Relay Nos.

Print the list of used relay numbers and the rung numbers referring to each relay number as a list. List information of the reference rungs appears as the system section and user section together.

Select [File] – [Print] – [Relay List] – [System Section (or User Section)].

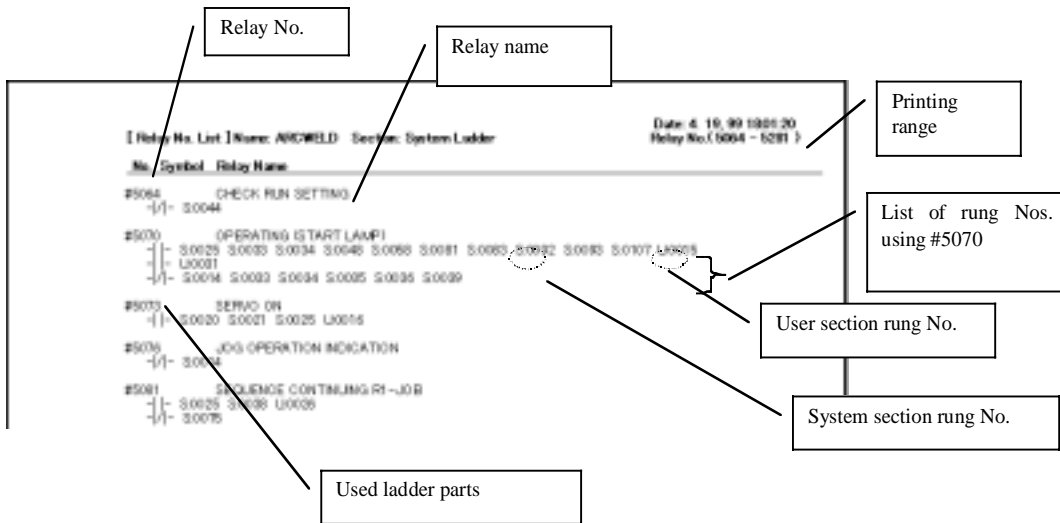


Figure 14-2 Printing Relay List

14.3 Printing Register List

Print the list of used register numbers and rung numbers referring to each register number in a list. List information of the reference rungs appears as the system section and user section together.

Select [File] – [Print] – [Register List] – [System Section (or User Section)].

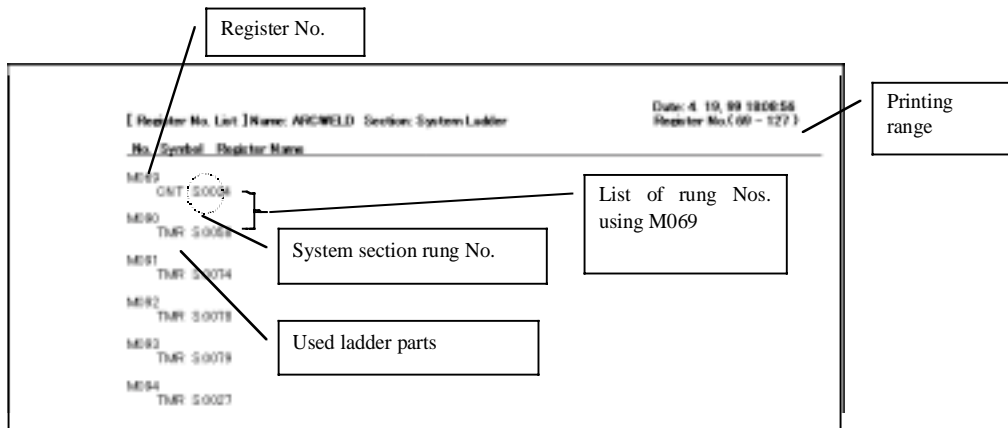


Figure 14-3 Printing Register List

14.4 Printing Relay No. State Table

Print the relay number use state in the “matrix” display.

Select [File] – [Print] – [Relay State Table].

Relay numbers for the system section and user section appear together, indicated by the following symbols.

S: Relay numbers used in a system section

U: Relay numbers used in a user section

B: Relay numbers used in both system and user sections

A relay number in a matrix is regarded as YYYY + X when the vertical is “YYYY” and the horizontal axis value is “X.”

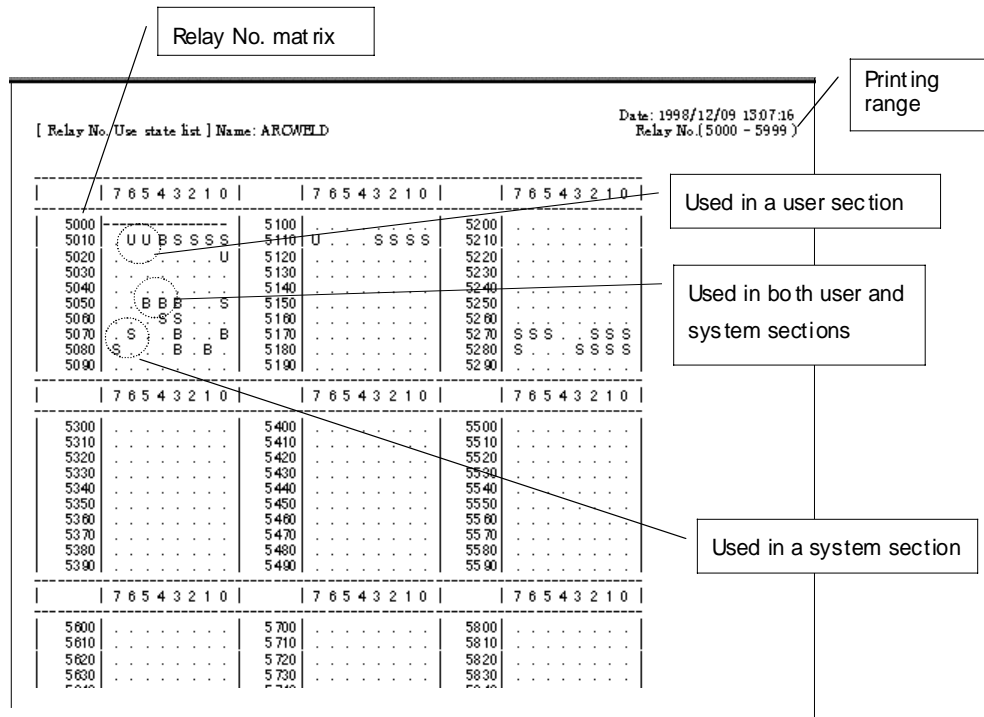


Figure 14-4 Printing Relay State Table

14.5 Printing Alarms and Messages

Select [File] – [Print] – [Alarms and Messages].

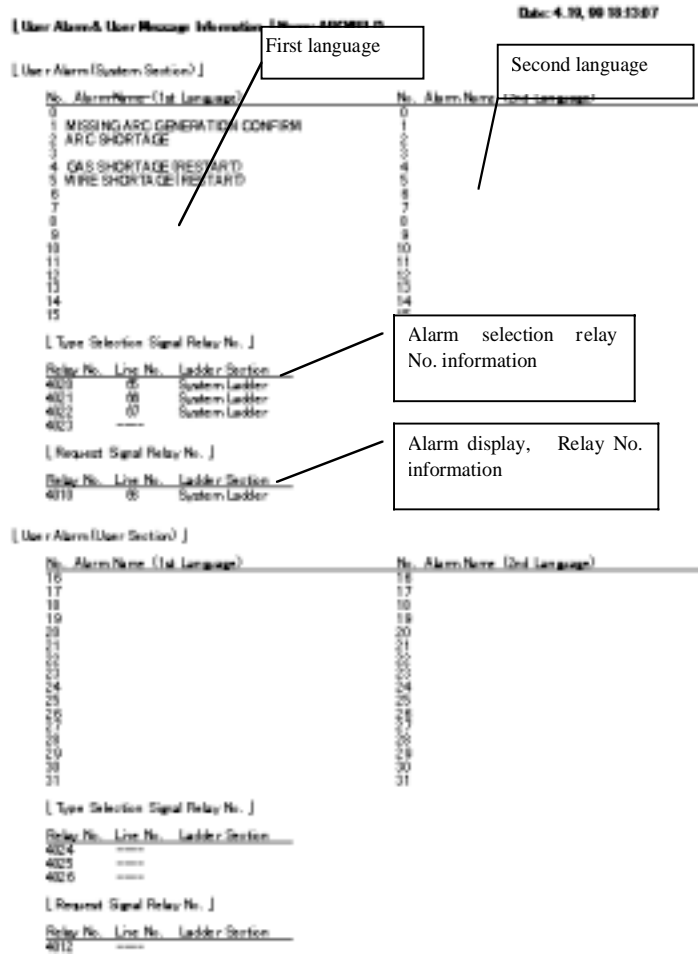


Figure 14-5 Printing Alarm List

[User Message (System Section)]

No. Message (1st Language)	No. Message (2nd Language)
0	0
1 WIRE STICKING	1
2 GAS SHORTAGE	2
3 WIRE SHORTAGE	3
4 RESTARTING FOR ARC	4
5 RESTARTING FOR GAS	5
6 RESTARTING FOR WIRE	6
7 END OF ARC RESTARTING	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15

[Type Selection Signal Relay No.]

Relay No.	Line No.	Ladder Section
4000	70	System Ladder
4001	71	System Ladder
4002	72	System Ladder
4003	---	---

[Request Signal Relay No.]

Relay No.	Line No.	Ladder Section
4011	73	System Ladder

[User Message (User Section)]

No. Message (1st Language)	No. Message (2nd Language)
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31

[Type Selection Signal Relay No.]

Relay No.	Line No.	Ladder Section
4004	---	---
4005	---	---
4006	---	---

[Request Signal Relay No.]

Relay No.	Line No.	Ladder Section
4013	---	---

Figure 14-6 Printing Message List

The following describes the items of printed information. Alarms and messages can be printed. Since each display item is the same, this paragraph describes printing of the alarm list as an example.

Alarm System Section and User Section

Alarms can be defined in both the user and system sections of a ladder. The listing identifies each group of alarms by the heading:

[Alarm (USER SECTION)]

or

[Alarm (SYSTEM SECTION)]

Alarm Selection Relay No. Information

Relay number information is displayed to help select an unused alarm. For example, a system section alarm is specified by turning the following four relays ON/OFF.

4020, 4021, 4022, 4023

When printing, this information appears as the following word.

Type Selection Signal Relay No.

When each relay number is actually used in a code, the rung number appears.

Alarm Display Relay No. Information

Relay number information becomes a trigger to help display an alarm appears. For example, in the system section the relay number that becomes a display trigger is **4010**. When printing, this information appears with the following word.

Request Signal Relay No.

When each relay number is actually used in a code, the rung number appears.

Section 15

HEADER INFORMATION

15.1 Ladder Name and System Register Editing

Edit the ladder program names and system registers.

Select [Edit] – [Header Information], or select  from the main tool bar (refer to Figure 4-1).

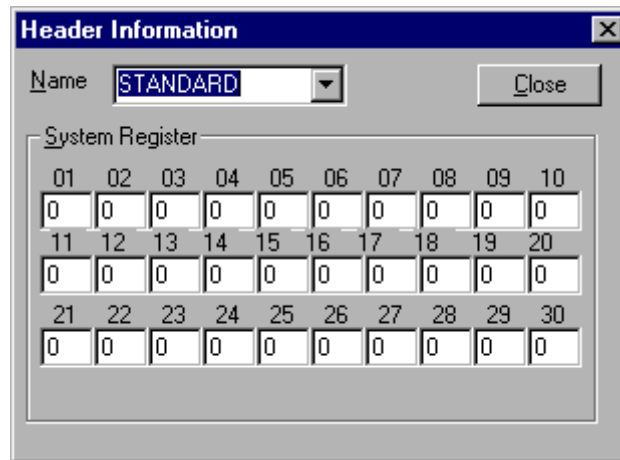


Figure 15-1 [Header Information] Dialog Box

[Name] combo box

Selects a ladder name. Normally, select one from the list in the combo box. A name can be entered directly. **However, an improper name interrupts the loading to the controller.**

System registers


Sets the number of system registers.

NOTES

Section 16

ALARM AND MESSAGE INFORMATION

Edit the alarms and messages of the current section of the ladder.

Select [Edit] – [Messages and Alarms], or select  from the main tool bar (refer to Figure 4-1).

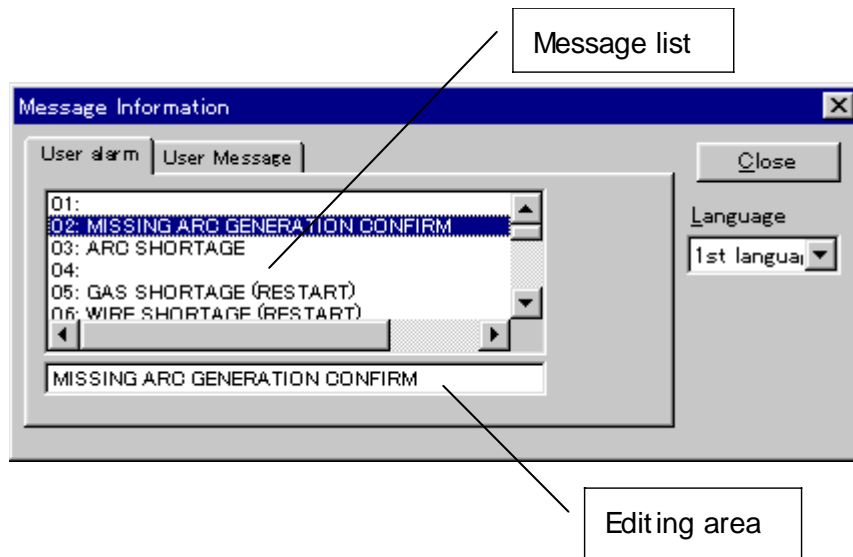


Figure 16-1 [Message Information] Dialog Box

Click the tag to select the alarm and message.

Language combo box

Each message has a first and a second languages. Select your desired language from the language combo box.

Editing area

Click the message to be edited in the message list, and the same message appears in the editing area. Edit the message in this area. When editing is completed, press the [Change] button.

16.1 Alarm and Message in System Section

If the user account level does not reach the management level, only the information in the user section appears in the message list. To display or edit the information in the system section, change the user account level (refer to Section 17.2, “Inputting Password” or Section 23, “User Information Management”).

NOTES



Section 17

SWITCHING BETWEEN USER SECTION AND SYSTEM SECTION

End-users of this product must have permission to access the System Portion of the XRC Concurrent I/O Ladder Program. Permission to access the System Portion of the XRC Concurrent I/O Ladder is granted with the release of a proprietary password, which is usually reserved for MINC Integrator Partners, or Motoman and Yaskawa employees, on a need to know basis. Contact your Motoman representative at 1-800-847-3200 for assistance obtaining permission to access all of the XRC Concurrent I/O Ladder program.

17.1 User Section and System Section

A ladder program has a system section and a user section. If the user has a user account that can edit the system section, the user can switch between the system section and the user section for editing in the following manner.

Select [Options] – [Current Ladder Section] – [System Section (or User Section)], or select  (or ) from the main tool bar (refer to Figure 4-1).

Since the user account is set to the lowest level as default when a ladder program or CMOS file is read in, the menu command [System Section] is normally disabled. Input the password as described in “16.2 Inputting Password” to enable the command.

17.2 Inputting Password

The current user account level can be changed by inputting the password.

1. Select [Options] – [Access Control] – [Enter Password...].

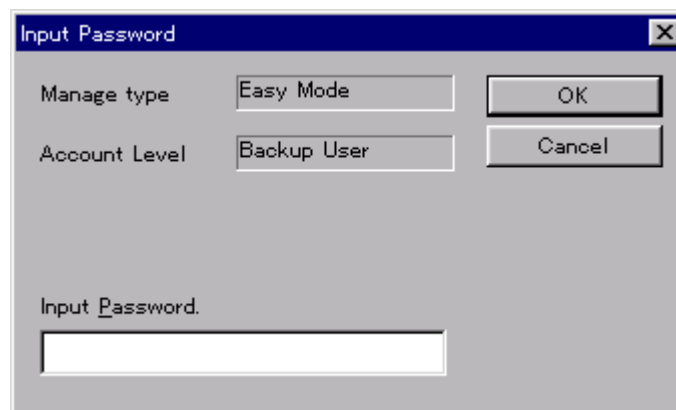


Figure 17-1 [Input Password] Dialog Box

NOTE: [Account Level] indicates the current user account level.

2. Input the password to [Input Password]. The input password always appears with an asterisk (*). After the password input is completed, click the [OK] button.

NOTES

Section 18

LABEL FILE

18.1 What is Label File?

Label file is a name information file to add a name to a relay number or register number used in the ladder program.

18.2 Reading Label File

Label file is read in at either one of the following times.

- When a ladder program file or CMOS file is open
- When a name file is read in from the menu

Label files are read in automatically or manually in the case of _ or _ respectively.

Prepare the label file in the same file as the ladder program file or the CMOS file. (It is not necessary to prepare a label file.)

Reading Label File Automatically (With Label File)

When reading in a ladder program file or a CMOS file, Concurrent I/O Editor automatically reads in the label file, too. The label file automatically read in is determined by the ladder name of the ladder program used as a keyword (refer to Section 15.1, “Ladder Name and System Register Editing”).

Example

Ladder program name : ARCWELD

Read in file name : ARCWELD.NAM

Reading Label File Automatically (Without Label File)

If the desired label file is not available when automatically reading the label file, Concurrent I/O Editor performs the operation in the following manner.

1. Selects a file suitable for the desired ladder program from the label template file prepared in default.
2. Copies the selected template file to the same directory as the ladder program file.
3. Reads in the copied template file as a label file.

In this case, Ladder Edit 32 refers to the ladder names to be read in to select the template file.

However, when the user changes the ladder name of the ladder program file, Concurrent I/O Editor may not find any file name that coincides with the ladder label template file. In such a case, the [Select label template] dialog box (Figure 18-1) appears.

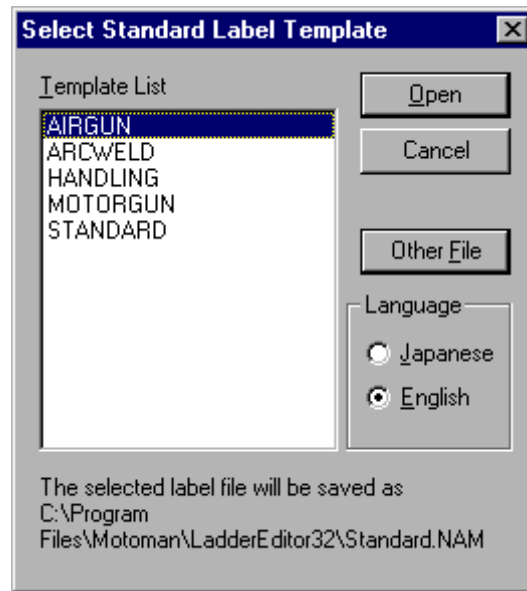
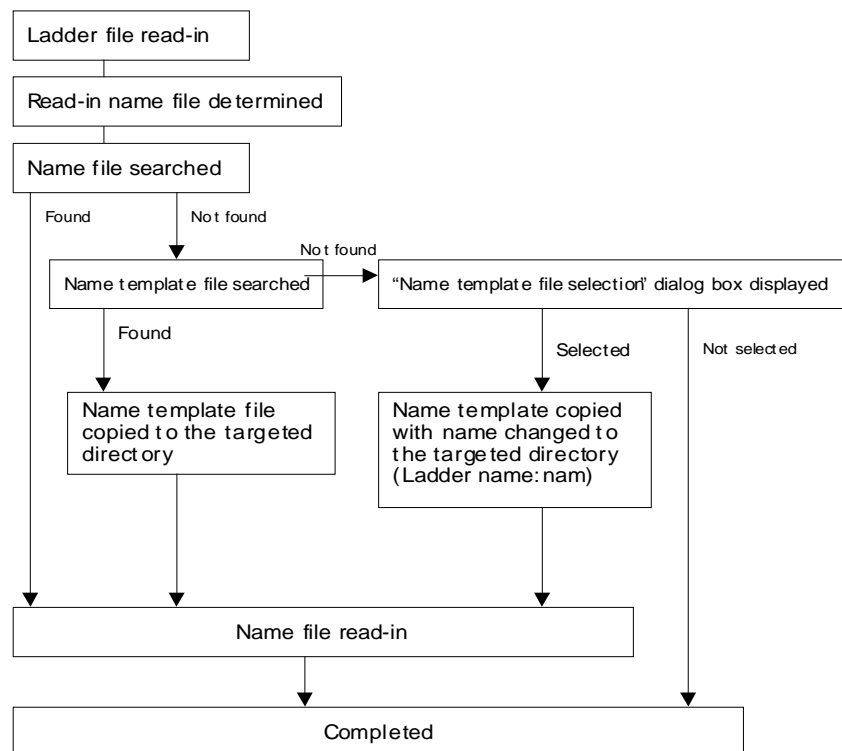


Figure 18-1 [Select Label Template] Dialog Box

Select the template suitable for the desired ladder program. Clicking the [Cancel] button stops the automatic reading of the label file.

The following shows the simple flowchart of the automatic reading.



18.3 Storing Label File

Store the edited label information by one of the following two methods.

- Stores it manually.
- Stores it automatically.

18.3.1 How to Store it Manually

1. Select [File] – [Save Relay Label File...]. When the [Save As] dialog box appears, input an arbitrary name for the label file to store it. Normally, the file name is stored in the following format.

Example

Ladder name. NAM

NOTE: For the ladder names, refer to Section 15, Header Information.

18.3.2 How to Store it Automatically

1. Setting the option stores the label file automatically.

18.4 Label Template File

Label template file is installed automatically when Concurrent I/O Editor is setup. The following folder is created in the folder where the Concurrent I/O Editor execution module exists, and the label template file is stored in this folder: "TEMPLATE."

NOTES

Section 19

RELAY LABELS and RUNG COMMENTS

The relay name list display function and register name list display function can display the name list for all relay numbers and register Nos.. All the data of the read-in name files can be cross referenced. This “list display” dialog box has the editing function. The name information of an arbitrary relay or register number can be edited.

Select [Edit] – [Relay Labels and Rung Comments]. The [Relay Labels and Rung Comments] dialog box appears, as shown in Figure 19-1. (Some machines take time to display it.)

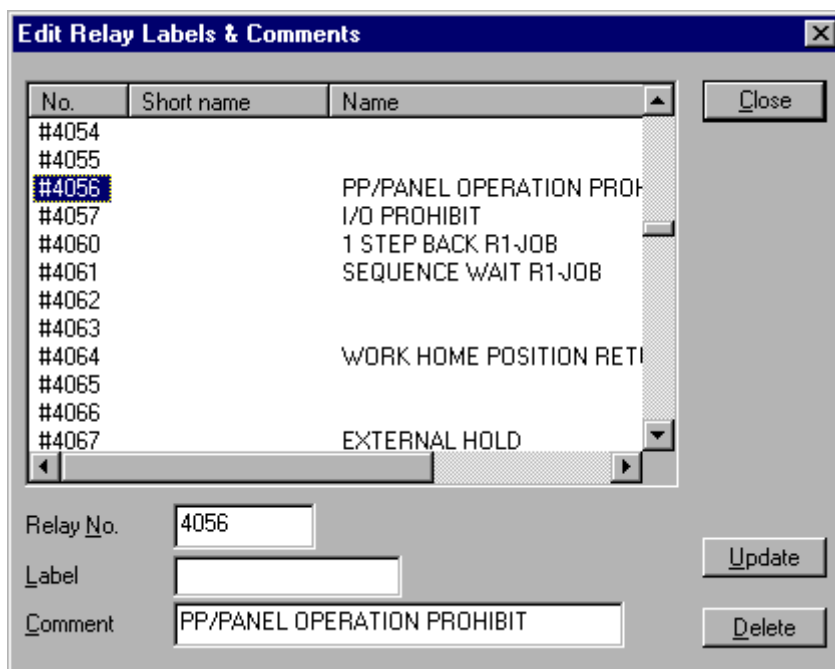


Figure 19-1 [Relay Labels and Rung Comments] Dialog Box

By selecting any desired relay number from the list, the currently set data appears in the [Relay No.], [Label] and [Comment] text boxes. Edit the data here. After editing, click the [Update] button to register the edited data.

If the [Label] and the [Comment] are similar for two or more relay numbers, change only the [Relay No.], and then click the [Update] button. The previously entered text remains. Because the names are similar, change only the characters that are different. The entire name does not have to be re-entered.

Select [Edit] – [Register Labels]. The [Register Labels] dialog box appears as in Figure 19-2. (Some machines take time to display it.)

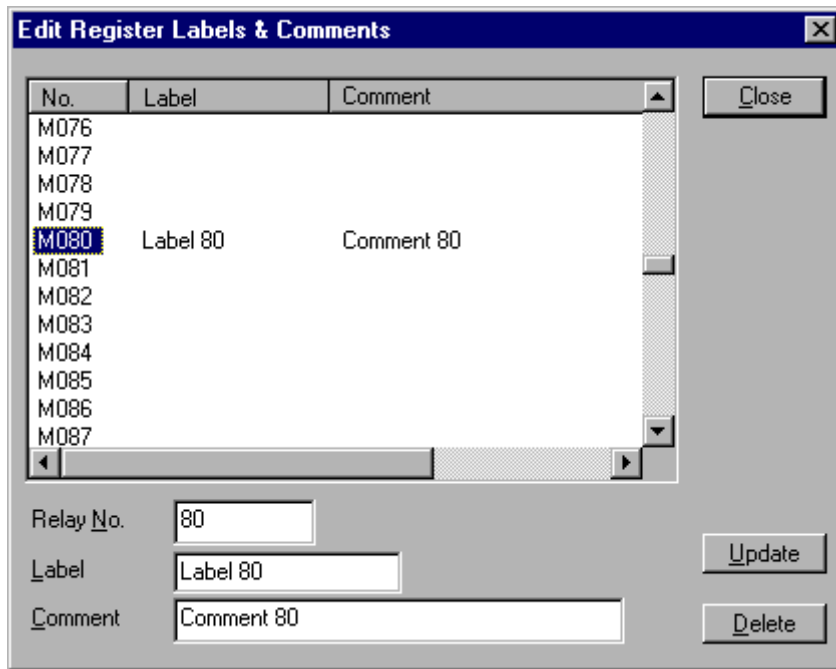


Figure 19-2 [Register Labels] Dialog Box


Editing procedure is the same as that of “Relay Labels and Rung Comments” Display. Normally, edit a relay or register name by opening the [Input name] dialog box on the ladder diagram. However, relay numbers or register numbers not used for ladder diagrams cannot be less of edited. These lists can be used to edit the names for all the relay or register numbers regardless whether or not they are used on the ladder diagram.

Section 20

NAVIGATION FUNCTIONS

20.1 Go to Rung

This function jumps to the specified rung No..

1. Select [Edit] – [Go to Rung], or select  (black) from the navigation tool bar (refer to Figure 4-1).

When the dialog box shown in Figure 20-1 appears, enter the desired rung number and click the [OK] button.

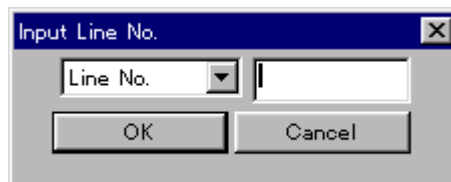



Figure 20-1 Go To Rung Dialog Box

20.2 Instructions Set Value Navigation

This function searches for values such as relay numbers, register numbers, and constants set to the ladder instructions, and then jumps to the rung with the set values.

1. Select [Edit] – [Find Input Relays, Registers, or Constants]– [Specify Parameter...], or select  (brown) from the navigation tool bar (refer to Figure 4-1).
2. When the dialog shown in Figure 20-2 appears, enter the type of the value and the set value to be searched and click the [OK] button.

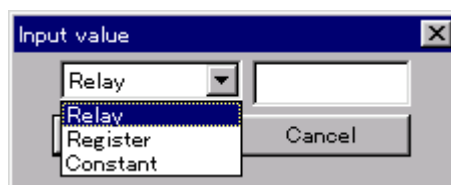




Figure 20-2 Set Value Searching Dialog Box

Previous/Next Navigation

Previous search and next search functions can be used for searching for instructions set values only.

For Previous search, select [Edit] – [Find Input Relays, Registers, or Constants] – [Backward], or select  (brown) from the navigation tool bar (refer to Figure 4-1).

For next search, select [Edit] – [Find Input Relays, Registers, or Constants] – [Forward], or select  (brown) from the navigation tool bar.

Backward Search

Backward search is a function to search for the set value in front of the current rung (in the direction of smaller rung No.).

Forward Search


Next search is a function to search for the set value behind the current rung (in the direction of greater rung No.).

Unless new set values are entered by pressing [Edit]-[Find Input Relays, Registers, or Constants]-[Specify Parameter], the set values to be searched for do not change.

This function can be used to easily know where and how the set values are used.

20.3 Output Relay Search

The Find Output Relays function searches only for the relay number set to the OUT instructions of the ladder instructions and jumps there. Other ladder instructions can not be searched for.

1. Select [Edit] – [Find Output Relays...]. Or select  from the navigation tool bar (refer to Figure 4-1).
2. When the dialog box shown in Figure 20-3 appears, input the relay number to be searched for and click the [OK] button.

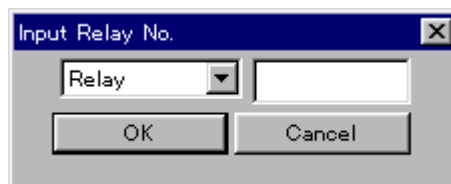


Figure 20-3 Find Output Relays Dialog Box



This function can be used to analyze the conditions in which the relay used in the rung turns ON retroactively.

20.4 **History Jump**

The history jump function stores the sequence of past moves to rungs and easily returns to the previous jump source.

This function does not exist as a menu item; Only available as a tool bar button.

How to Operate

Select  or  from the navigation tool bar (refer to Figure 4-1).

These buttons allow you to move backwards or forwards through the sequence of past rung selections. Normally, this function is disabled. When jumps are performed, this function becomes enabled.

Application

When searching with one of the “Find” commands, move to a new rung. After editing or analysis, this history jump function can easily return to the previous rung.

NOTES

Section 21

CROSS REFERENCE FUNCTIONS

21.1 Instruction Use Table

The Instruction Use Table displays which rung and for which ladder instruction the specified set value is used.

1. Select [Tools] – [Instruction Use Table...]. The dialog box shown in Figure 21-1 appears.

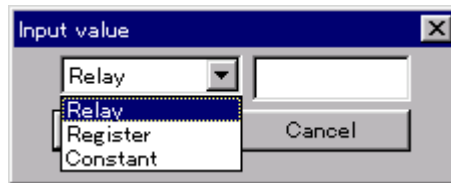


Figure 21-1 [Enter Relay, Register, or Constant] Dialog Box

2. After inputting the targeted set value type and the value, click the [OK] button. The [Instruction Use Table] appears.

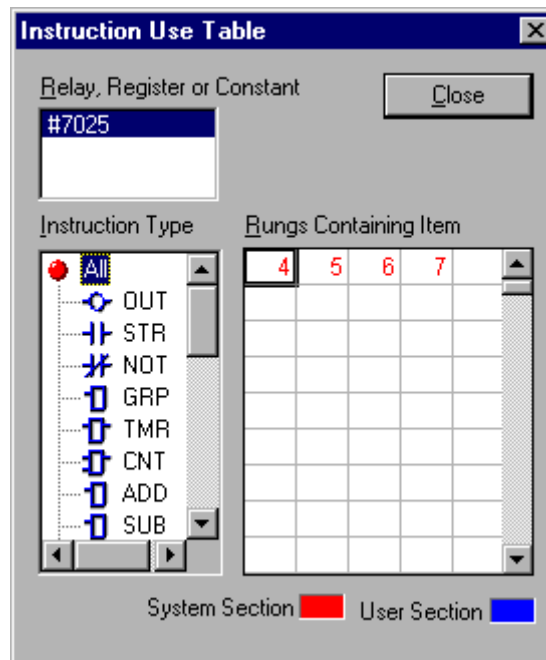


Figure 21-2 [Instruction Use Table] Dialog Box

[Relay, Register, or Constant] List Box

The list contains the set values to be searched for. Normally, there is only one item. However, since more than two items may appear occasionally, select one.

21.2 Relay Use Table

This function displays which relay numbers are used or not used in the ladder program that is being edited.

Select [Tools] – [Relay Use Table]. The dialog box shown in Figure 21-4 appears.

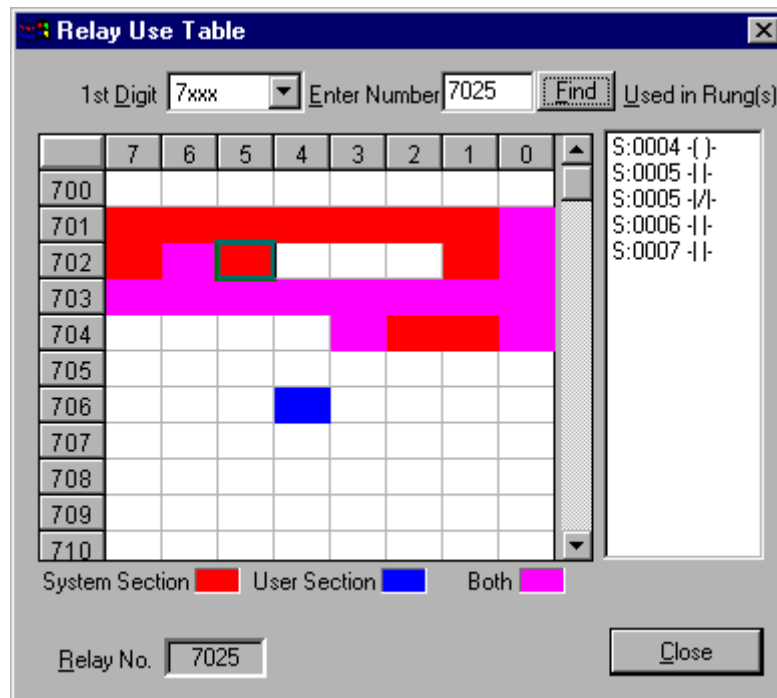


Figure 21-4 [Relay Use Table] Dialog Box

Use State Display Matrix

Relay numbers used are displayed in the following colors:

- Red : Used in a system section.
- Blue : Used in a user section.
- Purple : Used in both system and user sections.

In the matrix, the vertical axis displays the 10th or higher digits of the relay numbers in units of 10, while the horizontal axis displays the 1st digit of the relay Nos.. Therefore, in the case of the use state display matrix in Figure 21-4, the left top matrix is the relay number 7007.

Clicking the colored matrix displays the rung numbers (containing that relay) in the [Used In Rungs] list box.

[1st Digit] Combo box

The use state appears in the “use state display matrix” in units of 1000. Select the group of 1000’s in the [1st Digit] combo box.

[Enter Number] Input Box

Inputting the relay number in this input box and clicking the [Find] button displays the specified relay number in the matrix display.

[Used In Rungs] List Box

In this list box, the rung information referring to the relay number selected in the “use state display matrix” appears in the format shown in Figure 21-5.

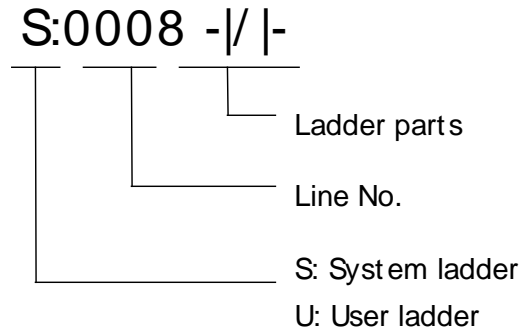


Figure 21-5 Format of [Used in Rungs] List Box

Application

When various relay numbers are to be added or changed, this function is useful to use any unused relay Nos..

Moving to a Rung Using the Relay Use Table

As shown in Figure 21-6, double-clicking a rung number in the Used In Rungs list box makes that rung the current rung.

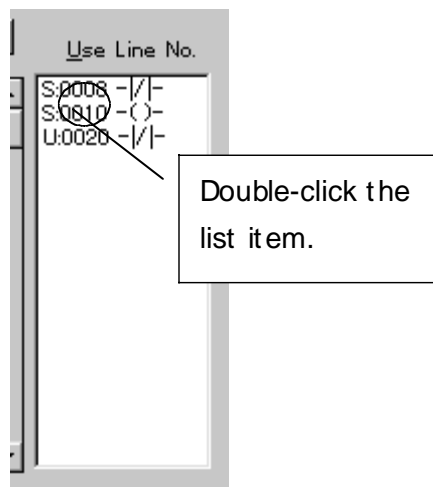


Figure 21-6 Used In Rungs List Box of Relay Use Table

Even if a rung jump is performed by double-clicking an item, the [Relay Use Table] dialog box does not disappear. Another jump to another rung can be performed.

Section 22

OTHER SETTINGS

22.1 Setting Color

Set the colors of the information displayed in the “ladder editing” display.

1. Select [Options] – [Color Scheme]. The dialog box shown in Figure 22-1 appears.

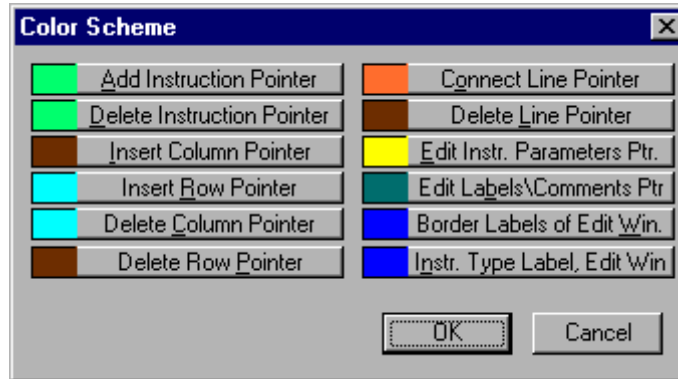


Figure 22-1 [Color] Dialog Box

2. Select each item. The dialog box shown in Figure 22-2 appears. Select and set any desired color.



Figure 22-2 [Color] Dialog Box

22.2 Setting Font

Set the character font in the “ladder editing” display. Fonts can be set individually for the editing display and the preview display.

1. Select [Options] – [Font] – [Edit Window...], or [Options] – [Font] – [Preview Windows...]. The dialog box shown in Figure 22-3 appears.

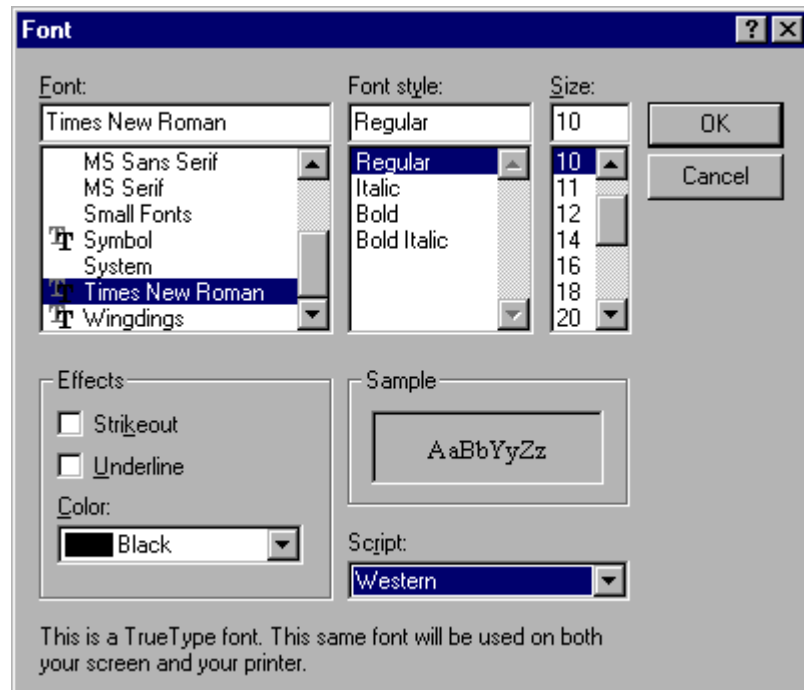


Figure 22-3 [Font] Dialog Box

2. Select any desired font name, the font style and size. Then click the [OK] button.

22.3 Storing Work in Progress

Concurrent I/O Editor saves only the ladder programs that pass “Check the Ladder” syntax tests. However, the procedure may be interrupted temporarily during editing. To store a ladder program that has not been checked, it can be stored as a rough draft.

1. Select [File] – [Save as Rough Draft].
2. When the [Save File] dialog box appears, use an arbitrary file name to store it.

NOTE: Even if the reading source is a CMOS file, a rough draft can only output a text file as a ladder program file.

22.4 Auto Save Current Rung Function

If an attempt to move to another rung is made without selecting [Edit] – [Save Current Rung] - [Overwrite] or [Insert] when the data has been edited in the “ladder editing” display, either the [Ask Before Saving] dialog box appears or the rung is updated automatically.

For automatic updating, select either [Overwrite Current Rung] or [Insert New Rung].

Displaying the [Ask Before Saving] dialog box

Select [Option] – [Auto Save Current Rung] – [Ask Before Saving] to place checkmark in the box.

Updating automatically

Select [Option] – [Auto Save Current Rung] – [Ask Before Saving] to remove the checkmark. When the checkmark is removed, select either [Option] – [Auto Save Current Rung] – [Overwrite Current Rung] or [Option] – [Auto Save Current Rung] – [Insert New Rung] .

22.5 Toggling Label Display

A label can appear along with the relay number or register number corresponding to it in the “ladder editing” display.

Select [View] – [Relay Labels] to place checkmark in the box.

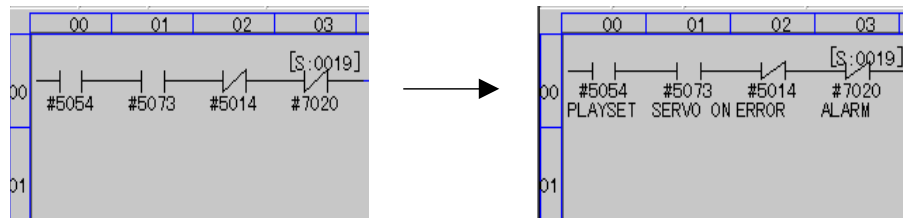
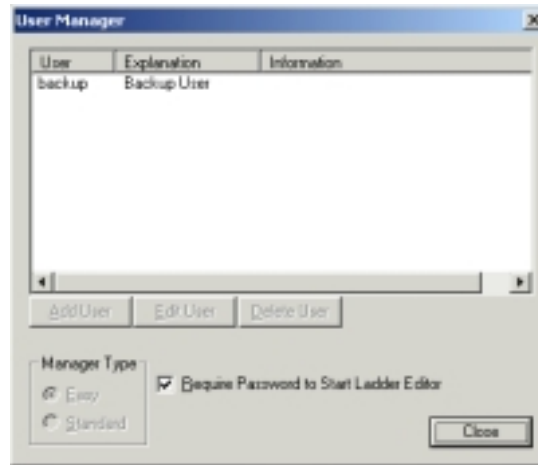


Figure 22-4 Label Display

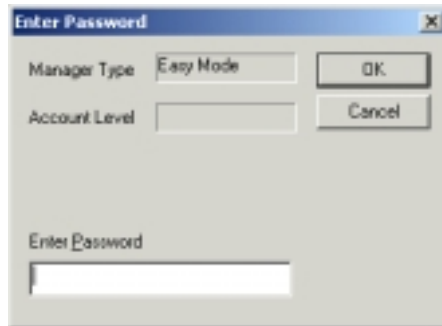
22.6 Password Protection

Password protection can be applied to Concurrent I/O Editor.

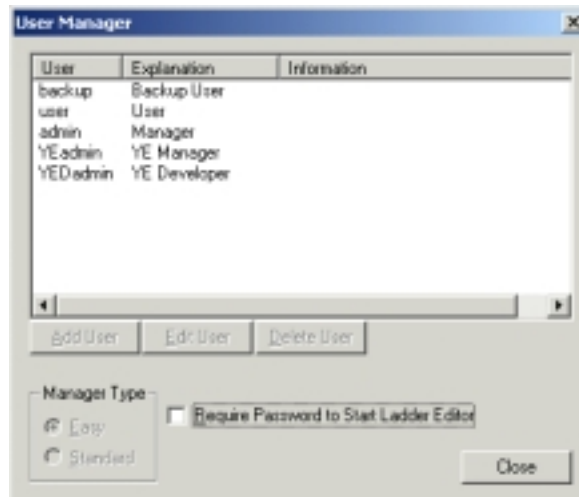
Select [Options] – [Access Control] - [User Manager] and check the Require Password to Start Ladder Editor to Start Ladder Editor option.



When Concurrent I/O Editor is closed and reopened, you are prompted to enter your password before Concurrent I/O Editor is run.



There are five possible user levels requiring a password, as shown below.



Section 23

USER INFORMATION MANAGEMENT

This application manages the user account to specify the users. Some data is only handled by users at the upper account level. To handle such data, a password is required for logging-in.

The users shown in Table 23-1 are registered as a default. Normally, a password is assigned to each user.

Table 23-1 Default User List

Name	User Name
Manager	admin
Operat or	user
Back-up operat or	backup

Concurrent I/O Editor does not allow any users other than default users to be set. However, whether the password is input or not when the application starts up can be set.

Select [Options] – [Access Control] – [User Manager...]. The dialog box shown in Figure 23-1 appears.



Figure 23-1 [User Manager] Dialog Box

How to Manage




With Concurrent I/O Editor, the [Manage type] cannot be changed. It always functions as [Easy].











Require Password to Start Ladder Editor Check Box















Placing a checkmark in this check box can display the input dialog box for the password during the next startup of Concurrent I/O Editor.






















APPENDIX A

Description of Menu

Menu	Command	Subcommand		Shortcut	Function			
File					–			
	New			N, Ctrl+N	Creates a new ladder by modifying a standard ladder.\nNew.			
	Open			O, Ctrl+O	Opens an existing ladder file. \nOpen			
	Close			C	Closes the current ladder and label files. Prompts to save if files are not saved. \nClose			
	Save			S, Ctrl+S	Overwrites file with current ladder file. "Check the Ladder" must be performed first. \nSave			
	Save As			A	Saves the job file under a new name. "Check the Ladder" must be performed first.			
	Save As Rough Draft			D	Stores without a "Check the Ladder". Auto Save Current Rung" option cannot be "Ask Before Saving.			
	Open Relay Label File...			R	Reads a text file (*.NAM), assigns relay labels and relay-rung comments to current ladder file.			
	Save Relay Label File...			L	Stores the relay label information in a file with an *.NAM extension			
	Save As Text Files				T			
		Ladder Diagram			D			
			User Section			U	Writes to a text file, the Ladder Diagram for the user section of the Current Ladder.	
			System Section			S	Writes to a text file, the Ladder Diagram for the system section of the Current Ladder	
		Relay List				R		
			User Section			U	Writes to a text file, the Relay List for the user section of the current ladder.	
			System Section			S	Writes to a text file, the Relay List for the system section of the current ladder.	
		Register List				L		
			User Section			U	Writes to a text file, the Register List for the user section of the current ladder.	
			System Section			S	Writes to a text file, the Register List for the system section of the current ladder.	
		Relay State Table...				S	Writes to a text file, the relay state table.	
Alarms and Messages					A	Writes to a text file, alarms and messages of the user and system sections.		
Print					P			
	Ladder Diagram				D			
		User Section				U, Ctrl+P	Makes a hardcopy of the ladder diagram for the user section of the Current Ladder.	
		System Section				S	Makes a hardcopy of the ladder diagram for the system section of the Current Ladder.	
	Relay List					R	–	
		User Section				U	Makes a hardcopy of the Relay List for the user section of the Current Ladder.	
		System Section				S	Makes a hardcopy of the Relay List for the system section of the Current Ladder.	
	Register List					L	–	
		User Section				U	Makes a hardcopy of the Register List for the user section of the Current Ladder.	
		System Section				S	Makes a hardcopy of the Register List for the system section of the Current Ladder.	

Menu	Command	Subcommand		Shortcut	Function	
		Relay State Table...		S	Prints the relay state table.	
		Alarms and Messages		A	Prints alarms and messages.	
	Print Preview			V		
		Ladder Diagram		D		
		User Section		U	Displays and prints the ladder diagram for the user section of the current ladder.	
		System Section		S	Displays and prints the ladder diagram for the system section of the current ladder.	
		Relay List		R	–	
		User Section		U	Displays and prints the relay list for the user section of the current ladder.	
		System Section		S	Displays and prints the relay list for the system section of the current ladder.	
		Register List		L	–	
		User Section		U	Displays and prints the register list for the user section of the current ladder.	
		System Section		S	Displays and prints the register list for the system section of the current ladder.	
		Relay State Table...		S	Displays and prints the relay state table.	
		Alarms and Messages		A	Displays and prints alarms and messages.	
	Print Setup			E	Displays printer settings including printer options, paper size, and orientation.	
	Exit			X	Closes Ladder Editor 32.	
Edit				E	–	
	Undo			U, Ctrl+Z	Cancels the effects of the last operation. \nUndo	
	Redo			R, Ctrl+Y	Repeats the last operation. \nRedo	
	Insert New Rung			N, Ctrl+E	Left - Click on a rung to insert a new one below it. The new rung contains default instructions. \nInsert New Rung.	
	Cut Rung			T, Ctrl+X	Left – Click on a rung to store it for an overwrite or insert operation, then delete it from the ladder. \nCut Rung	
	Copy Rung			C, Ctrl+C	Left – Click on a rung to store it for an overwrite or insert operation. \nCopy Rung	
	Paste Rung			P, Ctrl+V	Left – Click on a rung to paste the contents of [Cut] or [Copy] its place. Lose original. \nPaste Rung	
	Insert Cut\Copied Rung			I, Ctrl+I	Left – Click on a rung to paste the contents of [Cut] or [Copy] in a new rung below it. Shift down other rungs. \nInsert Cut or Copied Rung	
	Save Current Rung			S	–	
		Overwrite		O	Overwrites the current rung with the currently edited ladder diagram information. \nOverwrite Modified Rungs..	
		Insert		I	Inserts new rung below current rung, overwrites new rung with currently edited ladder diagram info. \nInsert Modified Rungs.	
	Clear Current Rung			A	Deletes all instructions in the current rung. \nClear Current Rung.	
	Find Input Relays, Registers, or Constants			D	–	




















Menu	Command	Subcommand		Shortcut	Function	
		Specify Parameter...		S, Ctrl+R	Input the number of Relay, Register or Constant that you wish to find. \nFind a Relay, Register or Constant.	
		Backward		B, Ctrl+B	Finds the previous instance of an input relay, register, or constant. \nFind Relays Backward.	
		Forward		F, Ctrl+F	Finds the next instance of an input relay, register, or constant. \nFind Relays Forward.	
	Find Output Relays...			O	Specify an output relay number in order to move to the rung containing it. \nFind Output Relays.	
	Go to Rung...			G	Specify a rung number to make it the current rung. \nGo to Rung	
	Go to Previous Rung			E, Up Arrow	Selects the previous rung	
	Go to Next Rung			X, Down Arrow	Selects the next rung.	
	Go to First Rung			F, Ctrl+Home	Makes the first rung of the ladder, the current rung. \nJump to First Rung	
	Go to Last Rung			L, Ctrl+End	Makes the last rung of the ladder, the current rung. \nJump to Last Rung	
	Header Information..			H	Displays and permits editing of header information. \nEdit Header Info	
	Messages and Alarms			M	Displays and permits editing of message and alarm information. \nEdit Messages and Alarms	
	Relay Labels and Rung Comments			Y	Displays and permits editing of relay labels and rung comments.	
	Register Labels			B	Displays and permits editing of register labels and comments.	
View				V	-	
	Main Toolbar			M	Toggles main toolbar display	
	Navigation Toolbar			N	Toggles navigation toolbar display	
	Instruction Toolbar			I	Toggles Instruction toolbar display	
	Edit Toolbar			E	Toggles edit toolbar display	
	Status Bar			S	Toggles Status toolbar display	
	Relay Labels			R	Toggles relay labels display shown in edit window.	
Tools					-	
	Check the Ladder			C, Alt+C	Checks for syntax errors in the current ladder. \nCheck the Ladder	
	Edit Instructions			E	-	
	Delete Instructions			D, Ctrl+D	Click on an instruction of the current rung to remove it permanently from the rung. \nDelete Instructions	
	Edit Entire Row			R	-	
	Insert Row(s)			I	Click on a row to insert an empty row above it. Shift down all existing rows below the new row. \nInsert Rows(s)	
	Delete Row(s)			D	Click on a row to delete it. Shift up all existing rows below it. \nDelete Row(s)	
	Edit Entire Column			C		
	Insert Column(s)			I	Click on a column to insert an empty column to the left of it. Shift right all existing columns. \nInsert Column(s)	

Menu	Command	Subcommand		Shortcut	Function	
		Delete Column(s)		D	Click on a column to delete the column. Shift all existing columns to the left. \nDelete Column(s).	
		Edit Instruction Parameters		I	Click on an instruction to change values of its variables. \nEdit Instruction Parameters.	
		Edit Labels and Comments		L	Click on a relay to modify the address' label and the rung's comment. \nEdit Labels and Comments.	
		Quit the Editing Functions		Q, Ctrl+Q	Exits from any of the Ladder Editor functions that add/delete instructions, rows, columns, etc.. \nQuit Edit Functions	
Add Instructions				A	-	
		STR		Shift +S	Inserts STORE to start a rung or store the intermediate result of a logical operation. \nNormally Open Relay.	
		STR-NOT		Shift +N	Inserts STORE NOT to start a rung or store the intermediate result of a logical operation. \nNormally Closed Relay	
		GRP		Shift +G	Inserts GSTR and GOUT to transfer 8 bit data word from 1 st relay to 2 nd relay. \nGroup Store – Group Output.	
		TMR		Shift +T	Inserts ON DELAY TIMER, subtracts 0.1 sec. Counts from “set value” & stores result. \nTimer.	
		CNT		Shift + C	Inserts COUNTER, waits until sum reaches “set value”, then turns output ON. \nCounter	
		OUT		Shift + O	Inserts OUTPUT relay to end a rung. Relay may be external or internal. \nOutput Relay	
		ADD		Shift + A	Inserts ADD to sum contents of S1 and S2, then store result in D, when input turns ON. \nSum	
		SUB		Shift + U	Inserts SUB to subtract S2 from S1, then store result in D, when input turns ON. \nSubtract	
		MUL		Shift + M	Inserts MUL to multiply contents of S1 and S2, then store product in D, when input turns ON. \nMultiply	
		DIV		Shift + V	Inserts DIV to divide S1 by S2, then store quotient in D, when input turns ON. \nDivide	
		MOD		Shift + D	Inserts MOD to divide S1 by S2, then store modulus of quotient in D, when input turns ON. \nModulus	
		BIN		I	Inserts BIN to read Binary Code Decimal value in S & store it as a Binary value in D. \nConvert BCD to Binary	
		BCD		B	Inserts BCD to read Binary value in S & store it as a Binary Code Decimal value in D. \nConvert Binary to BCD	
		MOV		M	Inserts MOV to read contents of register S & store it in register D, when input turns ON. \nMove Data from Register to Register	
		WAND		W	Inserts WAND to do bitwise, logical AND on binary no. in S1 & S2, & store the resulting binary in D. \nBitwise Logical AND	
		WOR		O	Inserts WOR to do bitwise, logical OR on binary no. in S1 & S2, & store the resulting binary in D. \nBitwise Logical OR	
	WXOR		X	Inserts WOR to do bitwise, exclusive OR on binary no. in S1 & S2, & store the resulting binary in D. \nBitwise Exclusive OR		









Menu	Command	Subcommand		Shortcut	Function	
		WNOT		N	Inserts WNOT to logically negate each bit of the binary no. in S1 & store the resulting binary in D. \nBitwise Negation	
		SHL		L	Inserts SHL to shift to the left by Shift Count places, the bits in the word in S, put 0 in lowest bit. \nShift Bits Left	
		SHR		H	Inserts SHR to shift to the right by Shift Count places, the bits in the word in S, put 0 in highest bit. \nShift Bits Right	
		ROL		Shift + R	Inserts ROL to shift to the left by Shift Count places, the bits in S, highest bit moves to lowest bit. \nRotate Bits Left	
		ROR		R	Inserts ROR to shift to the right by Shift Count places, the bits in S, lowest bit moves to highest bit. \nRotate Bits Right	
		PLS		P	Inserts PLS to output one scanning pulse when the input changes from OFF to ON. \nLeading Edge Triggered Pulse	
		PLF		F	Inserts PLF to output one scanning pulse when the input changes from ON to OFF. \nFalling Edge Triggered Pulse	
	Instruction Use Table...			I	Lists rungs containing a specific relay, or constant. Filter results by instruction type. \nInstruction Use Table	
	Relay Use Table			R	Displays for all relay numbers: ladder section, rung no., and whether normally open or closed.	
	Output Relay Use Table...			O	Displays for output relays: ladder section and rung number containing the output relay.	
Options				O	-	
	Access Control			A	-	
		Enter Password		E	Displays dialog box used to input a password and to view current access level.	
		User Manager...		U	Displays dialog box for editing user types and toggling startup password requirement.	
	Current Ladder Section			C	-	
		User		U	Makes the user section of the current ladder the current section. \nEdit User Section	
		System		S	Makes the system section of the current ladder the current section. Restricted access \nEdit System Section	
	Color Scheme			S	Allows changing colors of pointers and labels displayed in the edit window..	
	Font			F	-	
		Edit Window...		E	Allows changing font used to display labels and numbers in the edit window.	
		Preview Windows...		P	Allows changing font used to display labels and numbers in the preview windows.	
	Auto Save Current Rung			R		
		Ask Before Saving		A	Displays dialog box offering update options when choosing new current rung.	
		Overwrite Current Rung		O	Replaces modified current rung in original position in ladder.	
		Insert New Rung		I	Places modified current rung below original position. Shifts other rungs down.	
	File Management			M		

Menu	Command	Subcommand		Shortcut	Function	
Window				W	–	
	Cascade			C	Arranges windows so they overlap.	
	Tile			T	Arranges windows as non-overlapping tiles.	
	Arrange Icons			A	Arranges icons of minimized windows at the bottom of the main window.	
Help				H	–	
	Help Topics			T	Opens Help. \nHelp Topics	?
	Search Keyword			S	Searches online help for a keyword.	
	Using Help			U	Displays instructions about how to use Help.	
	About			A	Displays program information, version number and copyright.	










APPENDIX B
Description of Tool Bars
 v **Main Tool Bar**

Button	Function	Selection
	Creates a new ladder by modifying a standard ladder. \nNew.	[File] - [New]
	Opens an existing ladder file. \nOpen	[File] - [Open]
	Overwrites file with current ladder file. "Check the Ladder" must be performed first. \nSave	[File] - [Save]
	Left - Click on a rung to store it for an overwrite or insert operation, then delete it from the ladder. \nCut Rung	[Edit] - [Cut Rung]
	Left - Click on a rung to store it for an overwrite or insert operation. \nCopy Rung	[Edit] - [Copy Rung]
	Left - Click on a rung to paste the contents of [Cut] or [Copy] its place. Lose original. \nPaste Rung	[Edit] - [Paste Rung]
	Left - Click on a rung to paste the contents of [Cut] or [Copy] in a new rung below it. Shift down other rungs. \nInsert Cut or Copied Rung	[Edit] - [Insert Cut\Copied Rung]
	Cancels the effects of the last operation. \nUndo	[Edit] - [Undo]
	Repeats the last operation. \nRedo	[Edit] - [Redo]
	Left - Click on a rung to insert a new one below it. The new rung contains default instructions. \nInsert New Rung.	[Edit] - [Insert new rung]
	Overwrites the current rung with the currently edited ladder diagram information. \nOverwrite Modified Rungs..	[Edit] - [Save Current Rung] - [Overwrite]
	Inserts new rung below current rung, overwrites new rung with currently edited ladder diagram info. \nInsert Modified Rungs.	[Edit] - [Save Current Rung] - [Insert]
	Checks for syntax errors in the current ladder. \nCheck the Ladder	[Tools] - [Check the Ladder]
	Lists rungs containing a specific relay, or constant. Filter results by instruction type. \nInstruction Use Table	[Edit] - [Instruction Use Table]
	Displays and permits editing of header information. \nEdit Header Info.	[Edit] - [Header Information]
	Displays and permits editing of message and alarm information. \nEdit Messages and Alarms	[Edit] - [Messages and Alarms]
	Makes the user section of the current ladder the current section. \nEdit User Section	[Options] - [Current Ladder Section] - [User]
	Makes the system section of the current ladder the current section. Restricted access \nEdit System Section	[Options] - [Current Ladder Section] - [System]
	Opens Help. \nHelp Topics	[Help] - [Help Topics]

v Edit ToolBar

Button	Function	Selection
	Click on an instruction of the current rung to remove it permanently from the rung. \nDelete Instructions	[Tools] - [Edit Instructions] - [Delete Instructions]
	Click on a row to insert an empty row above it. Shift down all existing rows below the new row. \nInsert Rows(s)	[Tools] - [Edit Instructions] - [Edit Entire Row] - [Insert Row(s)]
	Click on a row to delete it. Shift up all existing rows below it. \nDelete Row(s)	[Tools] - [Edit Instructions] - [Edit Entire Row] - [Delete Row(s)]
	Click on a column to insert an empty column to the left of it. Shift right all existing columns. \nInsert Column(s)	[Tools] - [Edit Instructions] - [Edit Entire Column] - [Insert Column(s)]
	Click on a column to delete the column. Shift all existing columns to the left. \nDelete Column(s).	[Tools] - [Edit Instructions] - [Edit Entire Column] - [Delete Column(s)]
	Click on an instruction to change values of its variables. \nEdit Instruction Parameters.	[Tools] - [Edit Instructions] - [Edit Instruction Parameters]
	Click on a relay to modify the address' label and the rung's comment. \nEdit Labels and Comments.	[Tools] - [Edit Instructions] - [Edit Labels and Comments]
	Deletes all instructions in the current rung. \nClear Current Rung.	[Edit] - [Clear Current Rung]

v Navigation Tool Bar

Button	Function	Selection
	Specify an output relay number in order to move to the rung containing it. \nFind Output Relays.	[Edit] - [Find Output Relays...]
	Input the number of Relay, Register or Constant that you wish to find. \nFind a Relay, Register or Constant.	[Edit] - [Find Input Relays, Registers, or Constants] [Specify Parameter]
	Finds the previous instance of an input relay, register, or constant. \nFind Relays Backward.	[Edit] - [Find Input Relays, Registers, or Constants] [Backward]
	Finds the next instance of an input relay, register, or constant. \nFind Relays Forward.	[Edit] - [Find Input Relays, Registers, or Constants] [Forward]
	Specify a rung number to make it the current rung. \nGo to Rung	[Edit] - [Go to Rung...]
	Makes the first rung of the ladder, the current rung. \nJump to First Rung	[Edit] - [Go to First Rung]
	Makes the last rung of the ladder, the current rung. \nJump to Last Rung	[Edit] - [Jump End line]
	Jumps backward in the jump history.	
	Jumps forward in the jump history.	

v **Instruction Tool Bar**

Button	Function	Selection
	Inserts STORE to start a rung or store the intermediate result of a logical operation. \nNormally Open Relay.	[Tools] - [Add Instructions] - [STR]
	Inserts STORE NOT to start a rung or store the intermediate result of a logical operation. \nNormally Closed Relay	[Tools] - [Add Instructions] - [STR-NOT]
	Inserts GSTR and GOUT to transfer 8 bit data word from 1 st relay to 2 nd relay. \nGroup Store – Group Output.	[Tools] - [Add Instructions] - [GRP]
	Inserts ON DELAY TIMER, subtracts 0.1 sec. Counts from “set value” & stores result. \nTimer.	[Tools] - [Add Instructions] - [TMR]
	Inserts COUNTER, waits until sum reaches “set value”, then turns output ON. \nCounter	[Tools] - [Add Instructions] - [CNT]
	Inserts OUTPUT relay to end a rung. Relay may be external or internal. \nOutput Relay	[Tools] - [Add Instructions] - [OUT]
	Inserts ADD to sum contents of S1 and S2, then store result in D, when input turns ON. \nSum	[Tools] - [Add Instructions] - [ADD]
	Inserts SUB to subtract S2 from S1, then store result in D, when input turns ON. \nSubtract	[Tools] - [Add Instructions] - [SUB]
	Inserts MUL to multiply contents of S1 and S2, then store product in D, when input turns ON. \nMultiply	[Tools] - [Add Instructions] - [MUL]
	Inserts DIV to divide S1 by S2, then store quotient in D, when input turns ON. \nDivide	[Tools] - [Add Instructions] - [DIV]
	Inserts MOD to divide S1 by S2, then store modulus of quotient in D, when input turns ON. \nModulus	[Tools] - [Add Instructions] - [MOD]
	Inserts BIN to read Binary Code Decimal value in S & store it as a Binary value in D. \nConvert BCD to Binary	[Tools] - [Add Instructions] - [BIN]
	Inserts BCD to read Binary value in S & store it as a Binary Code Decimal value in D. \nConvert Binary to BCD	[Tools] - [Add Instructions] - [BCD]
	Inserts MOV to read contents of register S & store it in register D, when input turns ON. \nMove Data from Register to Register	[Tools] - [Add Instructions] - [MOV]
	Inserts WAND to do bitwise, logical AND on binary no. in S1 & S2, & store the resulting binary in D. \nBitwise Logical AND	[Tools] - [Add Instructions] - [WAND]
	Inserts WOR to do bitwise, logical OR on binary no. in S1 & S2, & store the resulting binary in D. \nBitwise Logical OR	[Tools] - [Add Instructions] - [WOR]
	Inserts WOR to do bitwise, exclusive OR on binary no. in S1 & S2, & store the resulting binary in D. \nBitwise Exclusive OR	[Tools] - [Add Instructions] - [WXOR]
	Inserts WNOT to logically negate each bit of the binary no. in S1 & store the resulting binary in D. \nBitwise Negation	[Tools] - [Add Instructions] - [WNOT]
	Inserts SHL to shift to the left by Shift Count places, the bits in the word in S, put 0 in lowest bit. \nShift Bits Left	[Tools] - [Add Instructions] - [SHL]
	Inserts SHR to shift to the right by Shift Count places, the bits in the word in S, put 0 in highest bit. \nShift Bits Right	[Tools] - [Add Instructions] - [SHR]
	Inserts ROL to shift to the left by Shift Count places, the bits in S, highest bit moves to lowest bit. \nRotate Bits Left	[Tools] - [Add Instructions] - [ROL]
	Inserts ROR to shift to the right by Shift Count places, the bits in S, lowest bit moves to highest bit. \nRotate Bits Right.	[Tools] - [Add Instructions] - [ROR]
	Inserts PLS to output one scanning pulse when the input changes from OFF to ON. \nLeading Edge Triggered Pulse	[Tools] - [Add Instructions] - [PLS]
	Inserts PLF to output one scanning pulse when the input changes from ON to OFF. \nFalling Edge Triggered Pulse	[Tools] - [Parts] - [PLF]

Name File Format

The following shows the format of a name file.

```
//TYPE:ARCWELD : Ladder name
///0240 : Relay block No.
sssssss,LLLLLLL : Name of 0240
AAAAA,BBBBBBB : Name of 0241
,
, _ For eight items
,
,
,
,
IN192,IN192(FAN Alarm) : Name of 0247
///1240 : Next relay block No.
```

```
,
,
,
,
Arestart, arc off restart processing memory reset: 1
restart, restart processing reset: 1
Inching, inching: 1
Retract, retract: 1
```

```
-
-
//REGISTER: : Specify register name section
M069=sssssss,LLLLLLLLL : Register name
M090=,ARC ANS ERROR (PRE-SENT VALUE)
M091=,STICK-ING CHECK (PRE-SENT VALUE)
M092=,NO STICK-ING CHECK (PRE-SENT VALUE)
```

```
-
-
_Relay Name:_
Short name : Within 8 characters
Long name : Within 60 characters
```

```
_Register Name:_
M000 = Short name, long name
Short name : Within 8 characters
Long name : Within 60 characters
“M” must be added to the first character in the name.
```

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