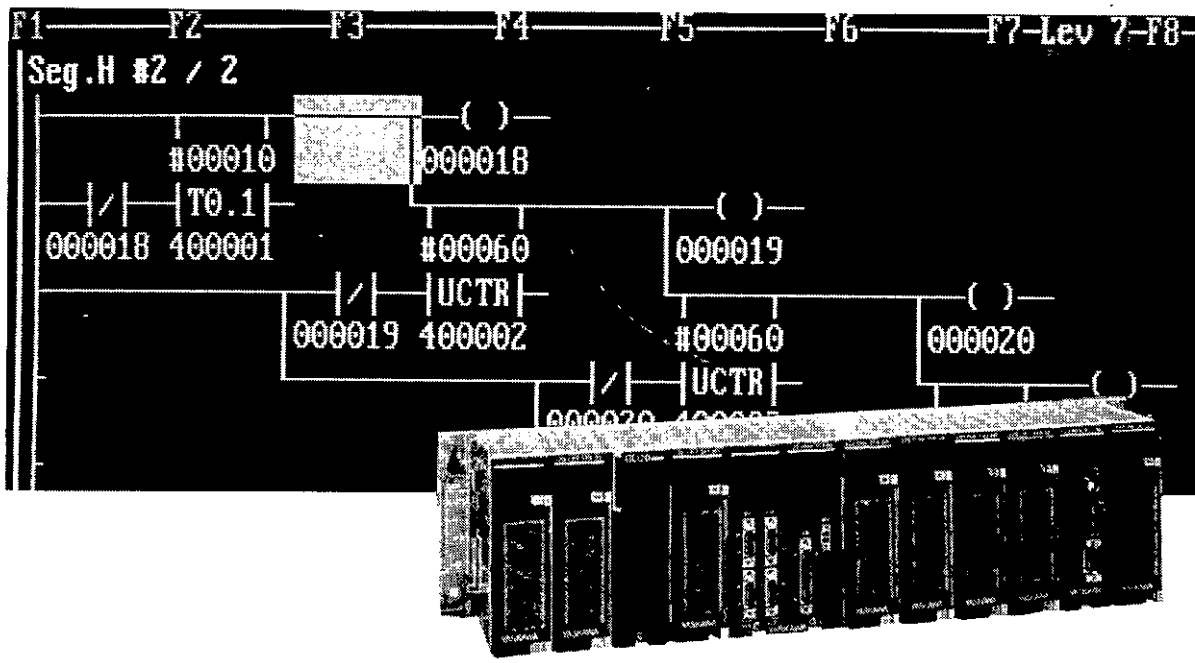
MEMOCON GL120, GL130

MEMOSOFT

USER'S MANUAL



YASKAWA

MANUAL NO. SIEZ-C825-60.10D

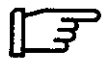
Manual Contents

This manual describes specifications and applications of MEMOSOFT for DOS.

Please read this manual carefully and be sure you understand the information provided before attempting to operate any associated electronic devices or machinery.

Visual Aids

The following aids are used to indicate certain types of information for easier reference.



Indicates references for additional information.

IMPORTANT — Indicates important information that should be memorized.

◀EXAMPLE▶ — Indicates application examples.

Indicates supplemental information.

SUMMARY — Indicates a summary of the important points of explanations.

Note — Indicates inputs, operations, and other information required for correct operation but that will not cause damage to the device.

Indicates definitions of terms used in the manual.

NOTICE

The following conventions are used to indicate precautions in this manual. Failure to heed precautions provided in this manual can result in injury to people or damage to the products.

⚠**WARNING** Indicates precautions that, if not heeded, could possibly result in loss of life or serious injury.

⚠**Caution** Indicates precautions that, if not heeded, could result in relatively serious or minor injury, damage to the product, or faulty operation.

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Introduction and Precautions

1

This chapter introduces this manual and provides precautions for the use of this manual and the product. **You must read this chapter before attempting to read the rest of the manual or using the product.**

1.1 Overview of Manual

- This manual describes how to operate MEMOSOFT Programming Software. Read this manual carefully in order to use MEMOSOFT properly. Also, keep this manual in a safe place so that it can be used whenever necessary.

- Refer to the following manuals for related peripheral devices and modules.

	Manual	Manual number	Contents
CPU Module	MEMOCON GL120, GL130 Hardware User's Manual	SIEZ-C825-20.1	Describes the following for the GL120 and GL130: 1) System configuration 2) System components 3) Functions and specifications 4) Installation and wiring 5) Panel layout and hole dimensions 6) External dimensions
	MEMOCON GL120 CPU10 Module User's Manual	SIEZ-C825-20.1-1	Describes the functions, specifications, and usage of the CPU10 Module.
	MEMOCON GL130 CPU35 Module User's Manual	SIEZ-C825-20.1-3	Describes the functions, specifications, and usage of the CPU35 Module.
	MEMOCON GL120, GL130 Software User's Manual Volume 1	SIEZ-C825-20.11	Describes the following for the GL120 and GL130: 1) Operating principles 2) I/O allocation 3) Overview of instructions 4) Instruction processing times

	Manual	Manual number	Contents
CPU Module	MEMOCON GL120, GL130 Software User's Manual Volume 2	SIEZ-C825-20.12	Describes the programming instructions used to create ladder programs for the GL120 and GL130. The following instructions are described in other manuals. 1) Expansion Math instructions: Software User's Manual (Vol. 3) 2) Process Control Instructions: Software User's Manual (Vol. 4) 3) Communications Instructions COM: COM Instructions User's Manual FBUS: PC Link Module User's Manual MSTR: MEMOBUS PLUS User's Manual 4) Motion Control Instructions (ladder motion instructions) Motion Module MC20 Software User's Manual 5) Motion Language Motion Module MC20 Software User's Manual
	MEMOCON GL120, GL130 Software User's Manual Volume 3	SIEZ-C825-20.13	Describes expansion math instructions (floating point math instructions, etc.) used for the GL120 and GL130.
	MEMOCON GL120, GL130 Software User's Manual Volume 4	SIEZ-C825-20.14	Describes process control instructions used for the GL120 and GL130.
I/O Modules	MEMOCON GL120, GL130 120-Series I/O Modules User's Manual	SIEZ-C825-20.22	Describes the functions, specifications, and usage of the 120-Series Digital I/O Modules.
Special-purpose Modules	MEMOCON GL120, GL130 120-Series High-speed Counter Module User's Manual	SIEZ-C825-20.24	Describes the functions, specifications, and usage of the 120-Series High-speed Counter Module.
	MEMOCON GL120, GL130 Uniwire Interface Module User's Manual	SIEZ-C825-20.26	Describes the functions, specifications, and usage of the 120-Series Uniwire Interface Module.
	MEMOCON GL120, GL130 Pulse Catch and Counter Module User's Manual	SIEZ-C825-20.28	Describes the functions, specifications, and usage of the Pulse Catch and Counter Module.
	MEMOCON GL120, GL130 Distributed I/O Driver Module User's Manual	SIEZ-C825-20.29	Describes the functions, specifications, and usage of the MECHATROLINK Distributed I/O Driver Module .
Motion Module	MEMOCON GL120, GL130 Motion Module MC10 User's Manual	SIEZ-C825-20.41	Describes the functions, specifications, and usage of the One-axis Motion Module MC10.
	MEMOCON GL120, GL130 Motion Module MC20 Hardware User's Manual	SIEZ-C825-20.51	Describes the functions, specifications, and usage of the Four-axis Motion Module MC20.
	MEMOCON GL120, GL130 Motion Module MC20 Software User's Manual	SIEZ-C825-20.52	Describes motion control instructions (ladder motion instructions) and motion program language used for the Four-axis Motion Module MC20.

	Manual	Manual number	Contents
Communications Modules	MEMOCON GL120, GL130 PC Link Module User's Manual	SIEZ–C825–70.4	Describes the functions, specifications, and usage of the PC Link Module for the GL120 and GL130.
	MEMOCON GL120, GL130 MEMOBUS PLUS User's Manual	SIEZ-C825-70.5	Describes the functions, specifications, and usage of the MEMOBUS PLUS.
	MEMOCON GL120, GL130 Coaxial Remote I/O System User's Manual	SIEZ–C825–70.8	Describes the functions, specifications, and usage of the Coaxial Remote I/O System for the GL120 and GL130.
	MEMOCON GL120, GL130 1000/2000-series Coaxial Remote I/O System User's Manual	SIEZ–C825–70.9	Describes the functions, specifications, and usage of the 1000/2000 I/O Coaxial Remote I/O System for the GL120 and GL130.
	MEMOCON GL120, GL130 M-NET Module User's Manual	SIEZ–C825–70.12	Describes the functions, specifications, and usage of the M–NET Module.
	MEMOCON GL120, GL130 MEMOBUS User's Manual	SIEZ–C825–70.13	Describes the functions, specifications, and usage of the MEMOBUS.
	MEMOCON GL120, GL130 COM Instructions User's Manual	SIEZ–C825–70.14	Describes the functions, specifications, and usage of the COM instructions. It also describes the specifications and usage of the MEMOBUS Module.
	MEMOCON GL120, GL130 YENET1600-D Module User's Manual	SIEZ–C825–70.20	Describes the functions, specifications, and usage of the YENET 1600–D Module (supporting 63 nodes).
	MEMOCON GL120, GL130 Ethernet Interface Module User's Manual	SIEZ-C825-70.21	Describes the functions, specifications, parameters settings, wiring, and special instructions for Ethernet Interface Module.
Other	MEMOCON GL120, GL130 Traceback User's Manual	SIEZ-C825-60.10-4	Describes the specifications and applications of Traceback.

- Check thoroughly the conditions on the product such as the specifications and restrictions of the product before using it.

1.2 Precautions

This section outlines general precautions that apply to using this manual and the product. You must read this section first before reading the remainder of the manual.

1.2.1 Applications Precautions

⚠ **Caution** Abide by the following precautions when applying the MEMOSOFT to control the PLC.

- Operations such as RUN, STOP, forced output, and program change during operation must be carried out with care. Operational errors may damage the machine or cause accidents.

- When using a modem, turn the power supply OFF or ON carefully.

  If the power supply of a slave machine is turned ON or OFF while the modem power supply is ON, the modem will output unnecessary signals to the twisted-pair cable for several tens of milliseconds. If any messages are being transmitted at this time, a transmission error will occur. To avoid problems, turn ON the power supply of a slave machine before turning ON the power supply of the modem and turn OFF the power supply of the modem before turning OFF the power supply of the slave machine. Alternatively, turn ON and OFF the power supplies of a slave machine and a modem simultaneously.

- Be sure not to use the single sweep function while the machine is operating.

  Do not use the single sweep for testing purposes, once machinery, processes, or conveyor equipment has begun operating. On completion of decoding, the MEMOCON will stop after output has been sent. Subsequent decoding will not be executed, so all further input signals will be ignored resulting in the likelihood of severe damage to any machine connected to the MEMOCON.

1.2.2 Wiring Precautions

- Insert the interface cables properly.

  Insert the connectors of the various interface cables that are to be connected to the MEMOCON into the communication ports and attach them properly. Improper insertion of interface cables may cause operational errors in the MEMOCON.

1.2.3 Safety Precautions

- MEMOCON was not designed or manufactured for use in devices or systems that concern human lives. Users who intend to use the product described in this manual for special purposes such as devices or systems relating to transportation, medical space aviation, atomic power control, or underwater use must contact Yaskawa Electric Corporation beforehand.

- This product has been manufactured under strict quality control guidelines. However, if this product is to be installed in any location in which a failure of MEMOCON involves a life and death situation or in a facility where failure may cause a serious accident, safety devices MUST be installed to minimize the likelihood of any accident.

- Any illustrations, photographs, or examples used in this manual are provided as examples only and may not apply to all product to which this manual is applicable.

- The products and specifications described in this manual or the content and presentation of the manual may be changed without notice to improve the product and/or the manual. A new version of the manual will be re-released under a revised document number when any changes are made.

- Contact your Yaskawa representative or a Yaskawa office listed on the back of this manual to order a new manual whenever this manual is damaged or lost. Please provide the document number listed on the front cover of this manual when ordering.

- Contact your Yaskawa representative or a Yaskawa office listed on the back of this manual to order new nameplates whenever a nameplate becomes worn or damaged.

- Yaskawa cannot make any quality guarantee for products which have been modified. Yaskawa assumes no responsibility for any injury or damage caused by a modified product.

1.3 Using this Manual

• The structure of this manual is as follows:

Chapter 1: Read this chapter before starting MEMOSOFT.

Chapters 2 and 3: When using MEMOSOFT for the first time, operate MEMOSOFT according to the examples given. These chapters show the basic operations of MEMOSOFT.

Chapter 4 and subsequent chapters: Read these chapters thoroughly once, and then review the necessary sections as required.

• Meaning of Basic Terms

In this manual, the following terms indicate the meanings as described below, unless otherwise specified.

• PLC = Programmable (Logic) Controller

• MC = Motion Module

• GL120 and GL130 = MEMOCON GL120 and/or MEMOCON GL130 Programming Controller

• Description of Technical Terms

The bold technical terms in this manual are briefly explained in the **Glossary** provided at the bottom of the page. An example is shown below.

• Key Operation

The operation examples that are introduced in this manual are designed so that as much as possible they can be entered as described.

Glossary

The following types of terms are described.

• Specific sequence control terms required for explanation of functions.

• Terms that are specific to programmable controllers and electronic devices.

- **Floppy Disk**

The floppy disk containing this software must be stored properly.

1.4 Software Copyright

- Copying the software for purposes other than backup is prohibited.
- Reverse compilation and reverse assembly (reverse engineering) of the software is prohibited.
- It is prohibited to allow third parties to use any part or all of the software without prior consent from the manufacturer. This prohibition applies to transfer, exchange, or lending.
- Use the software on one computer only. A separate copy of the software must be purchased separately to use it on a different computer.

Preparations

2

This chapter describes the preparations required for using MEMOSOFT, including the installation procedure.

2.1 Preparations Required for Using MEMOSOFT

This section describes the preparations required before installing MEMOSOFT.

2.1.1 What is MEMOSOFT?

MEMOSOFT is a programming system that fully supports the MEMOCON GL120, and GL130 Programmable Controllers.

The model is FMSGL-AT3.

The MEMOSOFT consists of a programmer that creates ladder programs and motion programs, and utilities that execute operations such as managing files.

The MEMOSOFT software operates on an IBM or PC/AT-compatible computer running MS-DOS.

Note MS-DOS is a registered trademark of Microsoft Corporation.

2.1.2 Items Required

The following items are required to install MEMOSOFT.

- Personal computer: IBM or PC/AT-compatible
  CPU: 80386 (25 MHz) or better
  Main memory: 640 Kbytes
  Extended memory: 3 Mbytes or more
  Floppy disk drive: One 3.5-inch
  Hard disk: Free area of 10 Mbytes or more.

- MS-DOS version 5.0 or later

2.1.3 System Software

The system software of MEMOSOFT is stored on 3.5-inch floppy disks. This system software is activated from the hard disk after being installed. The system software cannot be run from the floppy disks.

2.2 Installation of MEMOSOFT

This section describes the procedure for installing MEMOSOFT on a hard disk, and the MEMOSOFT startup procedure.

2.2.1 Preparations Required Before Installation

MEMOSOFT is installed automatically by the installation program provided on the system disk. Before starting installation, check whether MS-DOS is installed on the hard disk of the personal computer. If not, install MS-DOS (version 5.0 or later). Refer to the personal computer manual for installation of MS-DOS.

Before installing MEMOSOFT, create a backup copy of the system disks. Use the disk copy function of MS-DOS or some other tool for creating a backup disk. Refer to the manuals for each tool and MS-DOS for details on basic procedures.

2.2.2 Activating the Installation Program

The following procedure assumes that the personal computer is equipped with two drives, one hard disk drive and one floppy disk drive. In this example, MEMOSOFT is installed from drive A: (floppy disk) to drive C: (hard disk).

1) Turn ON the power supply of the personal computer.

2) When MS-DOS is activated, insert the installation disk in drive A.

3) When the prompt **C>** is displayed on the screen, enter **A:** and press the Enter Key. The current drive will be changed to A.

```
C>A:
```

4) Enter **INSTALL** and press the Enter Key.

```
C>A:
A>INSTALL
```

5) An installation program will be activated. Specify the drive in which the installation disk is inserted.

   Since drive A is the default setting, simply press the Enter Key.

```
Enter source drive name:      A
```

6) Specify the drive of the installation location. Enter **C** and press the Enter Key.

```
Enter source drive name:      A

Enter destination drive name: C
```

7) A confirmation message will be displayed. Press the Enter Key at the end.

```
Enter source drive name:      A

Enter destination drive name: C

Start installation MEMOSOFT (GL120/130) from A to C.
Is it OK? (Y/N)Y
```

Installation will be executed.

Installation is controlled by the messages which appear and the answers given to the questions.

1) When the default drive can be used, simply press the Enter Key. Specify a drive and press the Enter Key only when changing the drive.

2) When an incorrect drive has been specified, enter **N** for the confirmation message. The drive can be reset from the start.

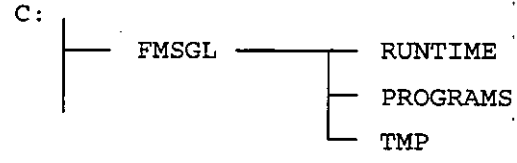
3) When MEMOSOFT has already been installed because of the version upgrading, the following message will be displayed: The files already exists. Do you want to install? (Y/N).

4) According to the version of MEMOSOFT being used, the messages displayed may differ slightly, however the interactive installation can be performed similar to the above examples.

2.2.3 Setting the Computer Environment

• Directory Structure after Installation

The following directories will have been created as a result of installation.



By default, the programs created by MEMOSOFT are stored in the directory \FMSGL\PROGRAMS.

- **CONFIG.SYS**

To activate MEMOSOFT, the environment file (CONFIG.SYS) must be changed from the normal settings as shown below.

a) Include HIMEM.SYS.

b) Include EMM386.EXE.

c) Change the number of files to 30 or more (50 files are recommended).

d) Include ANSI.SYS.

Example of Modifications

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE RAM
FILES=50
DOS=HIGH, UMB
DEVICE=C:\DOS\ANSI.SYS
```

Specify the directory containing ANSI.SYS.

- **Memory Allocation**

To start MEMOSOFT, a usable memory space (conventional memory) of 530 Kbytes or more must be allocated on the personal computer. The currently usable memory space can be displayed on the screen by executing the MS-DOS command CHKDSK (check disk). If MEMOSOFT is started with insufficient usable memory, abnormal functioning may result.

If executing CHKDSK shows that there is not sufficient memory available, remove unnecessary device drivers. Then, after increasing the usable memory, activate MEMOSOFT. Refer to the manual for MS-DOS for further details.

- **Cache Usage Restriction**

Using SMARTDRV (smart driver) or other caches could result in a malfunction, so be sure not to use a cache.

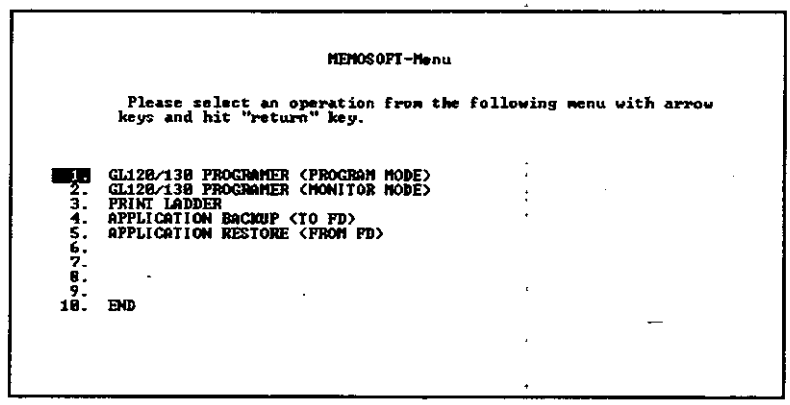
2.2.4 Activating MEMOSOFT

MEMOSOFT is activated by executing the following after changing the current drive to the drive in which the MEMOSOFT has been installed (C drive in this example):

1) Enter **MEMOMENU** and press the Enter Key.

```
C>MEMOMENU
```

2) A menu displaying the MEMOSOFT operations will appear. Select the desired operation using the Up or Down Cursor Key to start.



Note (1) MEMOSOFT will not operate properly when there is insufficient memory available. Make sure to use MEMOSOFT with sufficient memory available as described in section *2.2.3 Setting the Computer Environment.*

(2) Be sure to exit MEMOSOFT by selecting the "Quit" from the initial screen (see *3.5.2 Exiting Procedure*). If MEMOSOFT is interrupted during operation by resetting the computer, for example, the hard disk files may be damaged.

(3) Activate MEMOSOFT from MS-DOS. If MS-DOS prompts are used from Windows to start MEMOSOFT, a malfunction could result.

2.2.5 Installation/Activation from Windows95

1. Outline

The procedures for using MEMOSOFT from Windows95 are described bellow.

1) Installation of MEMOSOFT

2) Setting MEMOSOFT properties using Widows95

2. Installing MEMOSOFT

Install MEMOSOFT software to the personal computers using the following procedures. MEMOSOFT is installed by entering commands with keys from MS-DOS prompt.

A. Activating MS-DOS Prompt

1) Turn ON the power supply of the personal computer.

2) Click the **Start** button.

3) Select **Program-MS-DOS Prompt** from the menu.

MS-DOS prompt will be displayed.

B. Installing MEMOSOFT

The following procedure assumes that the personal computer is equipped with two drives, one hard disk drive and one floppy disk drive. In this example, MEMOSOFT is installed from drive A: (floppy disk) to drive C: (hard disk).

1) Insert the installation disk 1/2 in the floppy disk drive of the computer.

2) When the prompt **C>** is displayed on the screen, enter **A:** and press the Enter Key. The current drive will be changed to A.

```
C>A:
```

3) Enter **INSTALL** and press the Enter Key.

```
C>A:
A>INSTALL
```

An installation program will be activated. Installation is controlled by the messages which appear and the answers given to the questions.

INFO For details of Installation of MEMOSOFT, refer to *2.2.1* to *2.2.3*.

C. Setting the Environment of Windows95

For setting the environment of Windows95 to use MEMOSOFT, activate the MEMOSOFT to display the properties setting window.

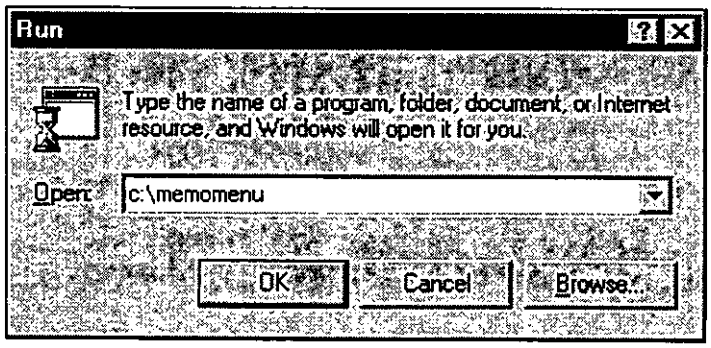
(i) Activating MEMOSOFT

The operating procedure for activating MEMOSOFT is described below. MEMOSOFT has been installed on the C drive in this procedure.

1) Click the **Start** button.

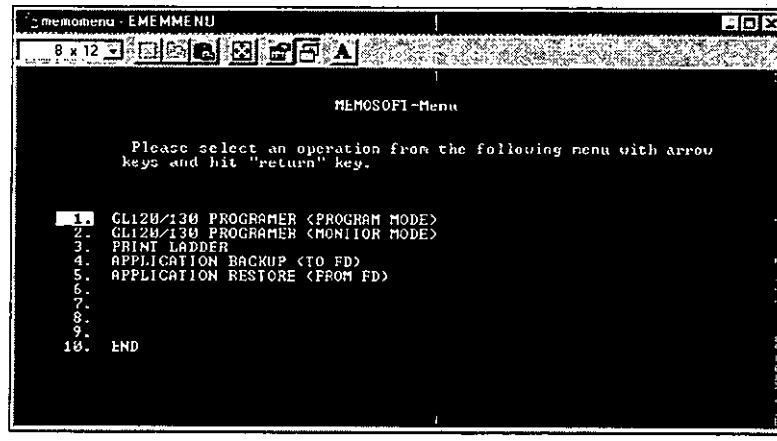
2) Click **Run** from the menu.

3) Enter C: \ MEMOMENU and press the Enter Key.



4) MEMOSOFT Menu Screen will appear.

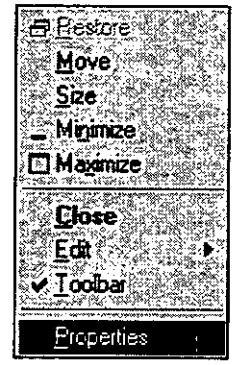
If the window is displayed in full screen mode, press the Alt + Enter Keys to switch to window display mode.



(ii) Setting MEMOSOFT Properties

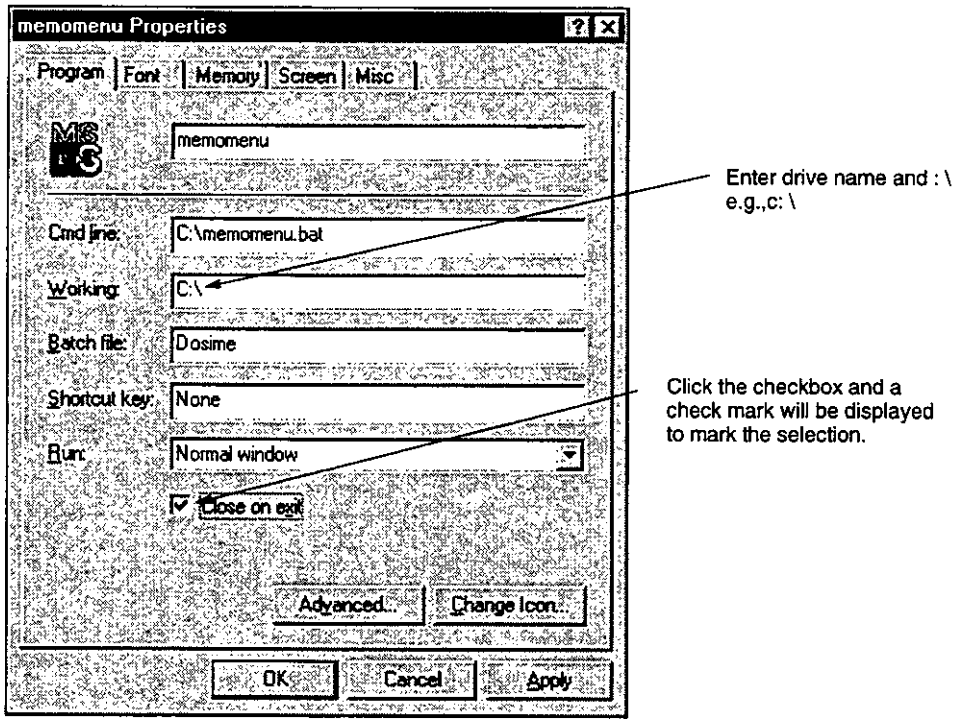
1) Right-click the title bar of the MEMOSOFT Menu Screen.

2) Select **Properties** from the menu.

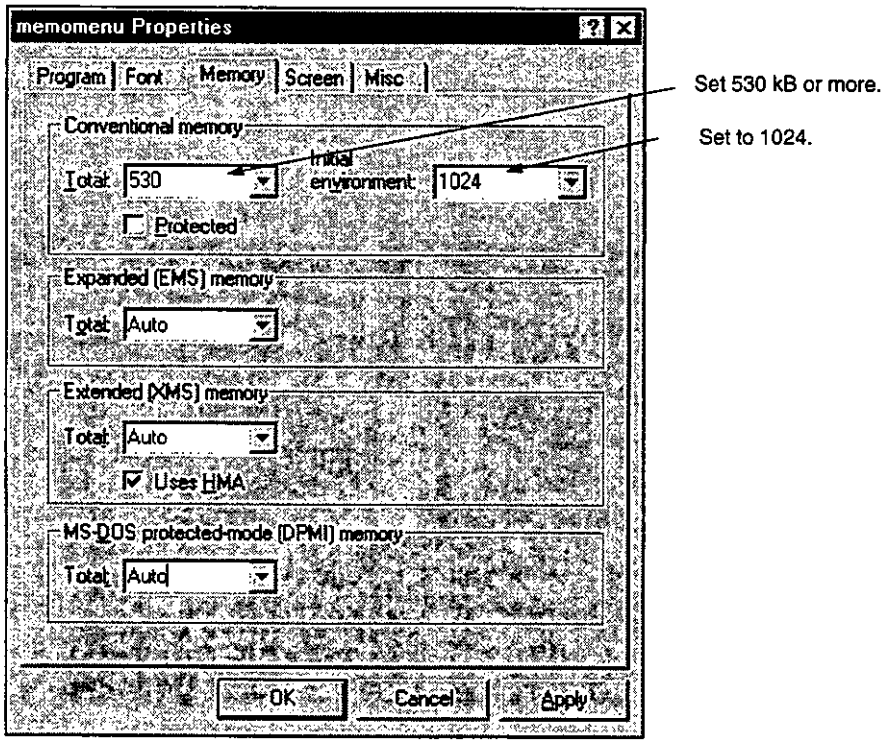


3) Set the properties as follows.

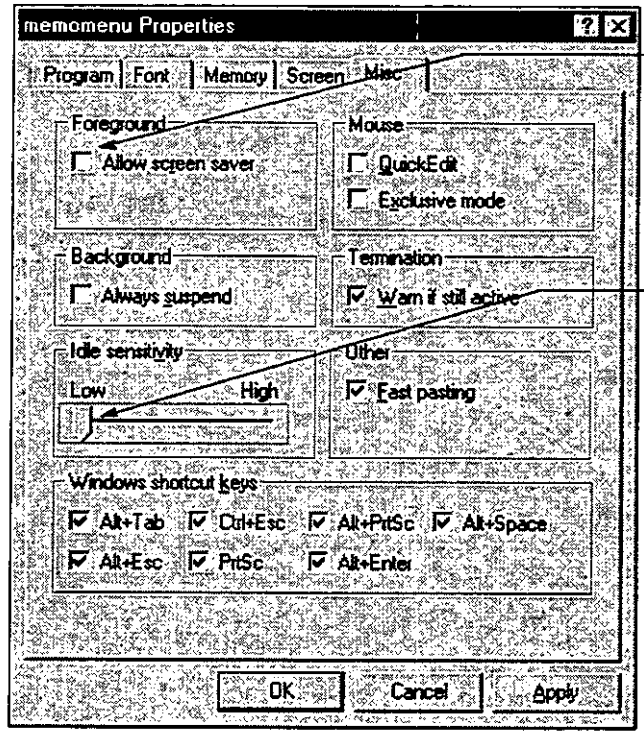
• Program



• Memory



• Others

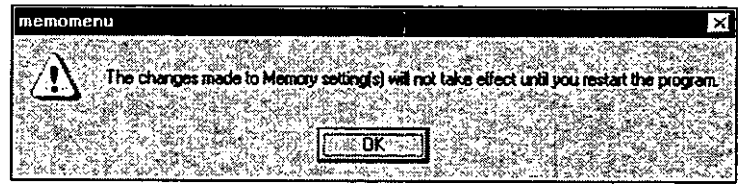


Click the checkbox to clear an option. (If a check mark is already displayed, clicking the check box will erase the mark.)

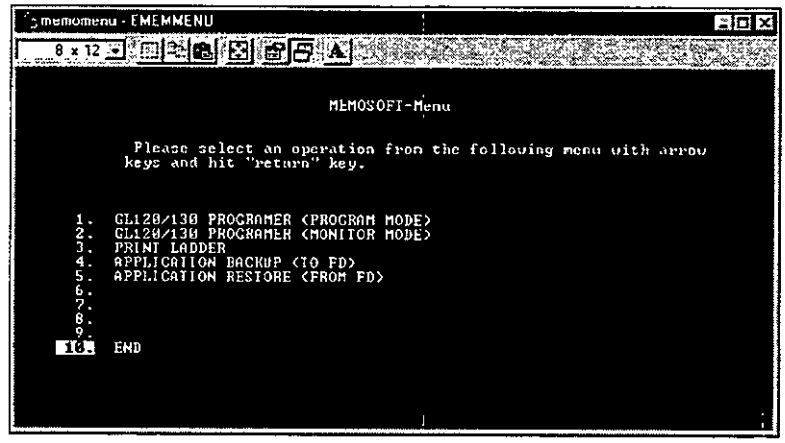
Select the lowest.

4) When all items has been set, click **OK**.

5) The confirmation window will appear. Click **OK**.



6) Select END from the MEMOSOFT Menu Screen to exit MEMOSOFT.



The setting operation of MEMOSOFT properties is now completed. For activation and operation of MEMOSOFT, see item *(i)* on page 2-7.

For more details of the terms used for setting items such as start button or properties, refer to the manuals for Windows95.

D. Windows95 Operating Modes

(i) Operating Modes

MEMOSOFT operates in the following three modes of Windows95.

- MS-DOS prompt displayed in window display mode
- MS-DOS prompt displayed in full screen mode
- MS-DOS function mode (command prompt only)

1) For activating the MEMOSOFT in window display mode or full screen mode, follow the procedures described in item *(i)* on page 2-7. By pressing the Alt + Enter Keys, the mode can be switched between window display mode and full screen mode.

2) For activating the MEMOSOFT from the MS-DOS function mode, follow the procedures below.

   a) Turn ON the power supply of the personal computer.

   b) While Windows95 is starting up, "Starting Windows95" will be displayed in the upper left corner of the screen. In this state, press the F8 Key.

   c) Windows95 Start up Menu will be displayed. Select **Command Prompt Only.**

   d) MS-DOS prompt will be displayed, and MS-DOS function command can be entered. Activate MEMOSOFT from MS-DOS. For the procedures of activating MEMOSOFT from MS-DOS, refer to *2.2.4 Activating MEMOSOFT.*

(ii) Selecting Operating Modes

When the low-speed computer is used to communicate with PLCs, MEMOSOFT display is intermittently interrupted. This status may be caused by multi-tasking of Windows which performs various applications. Having the communications become unstable on Windows is a common problem and not unique to MEMOSOFT.

Perform the following procedures for countermeasures.

(1) Keep the number of simultaneously running applications to a minimum.

This procedure is effective when MS-DOS prompt is displayed in window screen mode. If the applications such as for word processors, spread-sheet are activated, exit them to activate MEMOSOFT only.

(2) Display MS-DOS prompt in full screen mode.

This procedure is effective when communications with PLCs are intermittently interrupted even after performing step (1). Changing between window display mode and full screen mode can be performed by pressing Alt + Enter Keys.

(3) Operate MEMOSOFT in MS-DOS function mode.

This procedure is effective when communications with PLCs are intermittently interrupted even after performing step (1). and (2). For operating procedures, refer to the information on the previous page.

Select the operating mode according to the CPU capacity. Standards for operating modes are described below.

- For Pentium II, 200 MHz : perform the step (1).
- For 80486, 66 MHz : perform the step (3).

E. Shortcuts

Setting the environment of Windows95 to use MEMOSOFT can be performed with the following procedures. Recommended for those who familiar with Windows95 operation.

1) Create a shortcut icon for the "MEMOMENU.BAT" , which is stored in folder C: / of the drive installed MEMOSOFT on the Windows desktop.

2) Right-click the **Shortcut's to MEMOMENU** on desktop and select the **Properties** from the menu.

3) Perform the settings as described in *(ii) Setting MEMOSOFT Properties* on page 2-8.

MEMOSOFT Menu Screen will be displayed with double-click on this shortcut icon on the desktop.

Note (1) Do not use a compressed drive when using MEMOSOFT from Windows95.

(2) Activate MEMOSOFT from MS-DOS or MS-DOS prompt from Windows95. If MS-DOS prompts are used from Windows3.1 to start MEMOSOFT, a malfunction could result.

For details on procedures such as operating Explorer and creating shortcuts, refer to Windows95 manuals.

2.3 Connection with PLC

This section describes the procedure for connecting the personal computer to the PLC, and the types of cables that are used.

The personal computer must be connected to the PLC for online operations.

Two types of communications protocol, MEMOBUS and MEMOBUS PLUS, can be used for the connection.

1) MEMOBUS Protocol

The RS-232C Port of the personal computer is connected to the RS-232C Port of the PLC, such as the GL120, using a special cable. In a system using GL120 and GL130 PLCs, it is possible to connect to the RS-232C ports of various Modules, such as MEMOBUS Modules, as well as the RS-232C port of the CPU Module.

2) MEMOBUS PLUS Protocol

The MEMOBUS PLUS Port on a MEMOBUS PLUS Network Adapter (Model JAMSC-120NOM21110), which is mounted to the expansion slot of the personal computer, is connected to the MEMOBUS PLUS Port of the PLC, such as the GL120, with a special cable. For further details, refer to the *MEMOCON GL120, GL130 MEMOBUS PLUS User's Manual* introduced at the chapter 1 of this manual.

Following table lists the cables which are available for each communications protocol.

Table 2.1 MEMOBUS Protocol Cables

Cable Length	Model
2.5 m	JZMSZ-120W0202-03
15.0 m	JZMSZ-120W0202-15

Table 2.2 MEMOBUS PLUS Protocol Cables

Cable Length	Model
2.5 m	JZMSZ-120W0800-03
15.0 m	JZMSZ-120W0800-15

Note (1) Be sure to turn OFF the power to the PLC and personal computer before connecting the cables.

(2) After inserting the cable, be sure to tighten the screws to secure the connector.

From Start to Exit: Offline

3

This chapter describes the procedures for creating a system configuration and ladder programs using MEMOSOFT offline, i.e., without being connected to a PLC.

3.1 Overview of Operating Procedures

This section describes the procedures for creating ladder programs with MEMOSOFT.

3.1.1 Creating a New Program

To operate the PLC, the required programs and parameters for operation must be created with MEMOSOFT and written to the PLC. This chapter describes the procedures to be followed in creating those programs and parameters on a personal computer without connecting to a PLC. It is also possible to connect to a PLC and write the programs and parameters directly using the procedures described in this chapter, but online operation will not be covered here.

The procedure is given below for creating a new program. In particular, make sure the communications parameters are set correctly, as they are used when writing data to the PLC.

1) Turn ON the power supply to the computer.

2) Activate MEMOSOFT.

3) Create the new files. Select the directory in which the programs are to be stored, and set the communications parameters.

4) Configure the system such as the model of PLC being used.

5) Set I/O allocation (I/O mapping) for the system being used.

6) Edit the ladder and motion programs.

7) Exit MEMOSOFT.

Examples of creating files with these procedures are given from section *3.2 Creating Files* onwards.

3.1.2 Editing an Existing File

Use the following procedures to edit an existing file. See chapter *17 File Operations* for information on filing operations, such as saving to other files.

1) Activate MEMOSOFT.

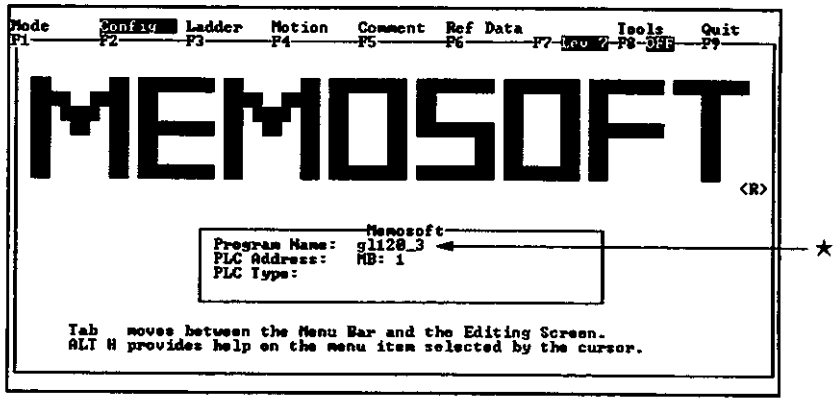
2) Select the program using the Select Program command.

3) Edit the ladder program, motion program, etc.

4) To save to another file, use the Save as... command.

5) Exit MEMOSOFT.

MEMOSOFT records the name of the file last edited. Therefore, there is no need to execute Select Program to edit the same file that has just been modified. The name of the currently selected file is displayed as shown below.



3.2 Creating Files

This section describes the procedures for activating MEMOSOFT and creating new files.

3.2.1 Activating MEMOSOFT

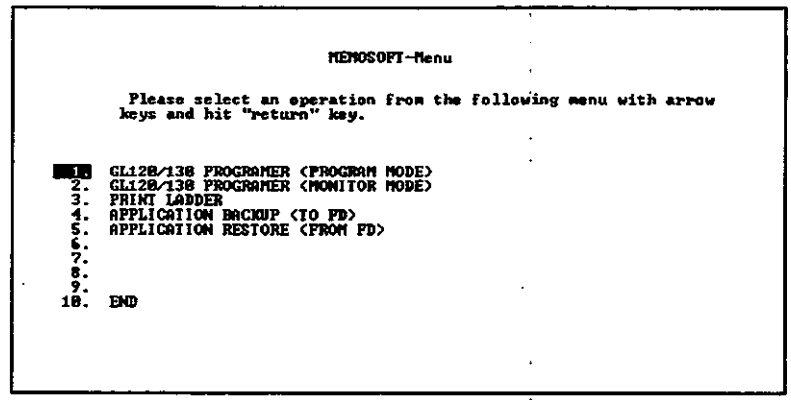
The operating procedure for turning ON the PLC and activating MEMOSOFT is described below. This will prepare the MEMOSOFT for creating programs and parameters. MEMOSOFT is installed on the C drive in this procedure.

1) Turn ON the power supply to the personal computer.

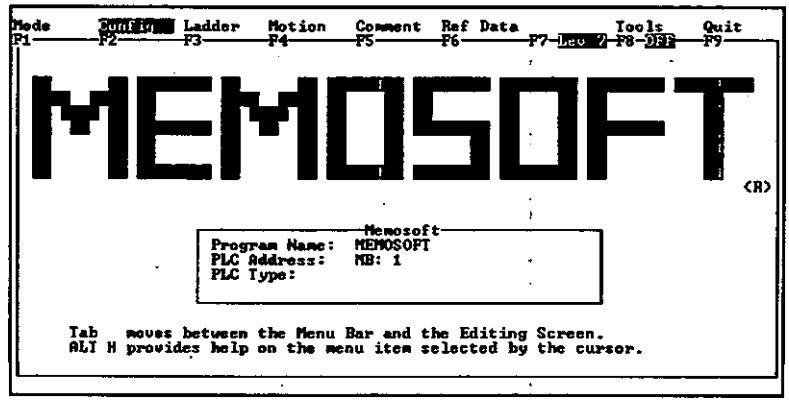
2) Enter **MEMOMENU** and press the Enter Key.

```
C>MEMOMENU
```

3) The menu displaying the MEMOSOFT operations will appear. Select **GL120/130 PROGRAMER (PROGRAM MODE)** using the Cursor Keys and press the Enter Key.



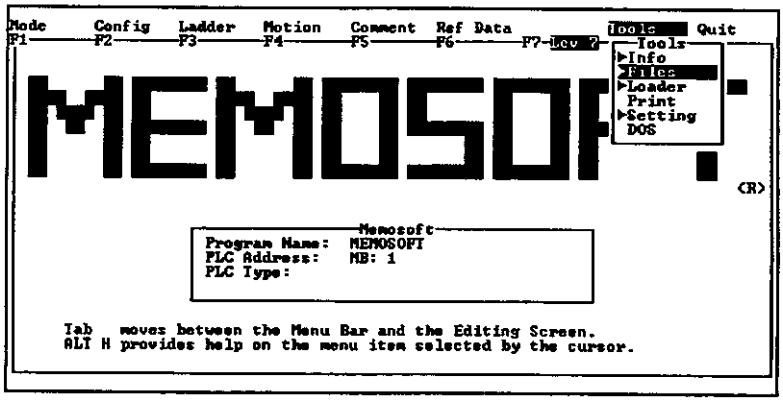
4) The program startup screen will be displayed. Press the Enter Key to display the initial screen as shown below.



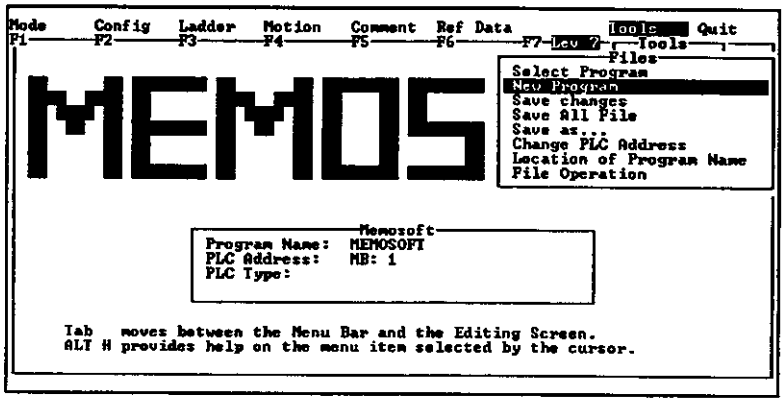
3.2.2 Creating Files

The following procedure describes how to create new programs.

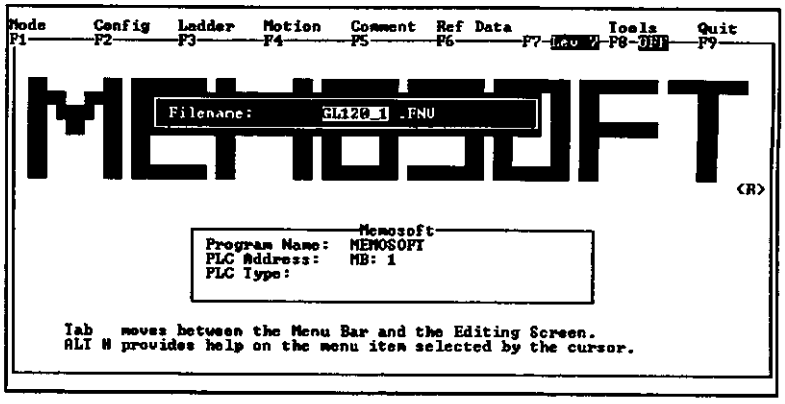
1) Select **Files** from the Tools Menu using the Cursor Keys and press the Enter Key.



2) Select **New Program** from the submenu using the Down Cursor Key and press the Enter Key.

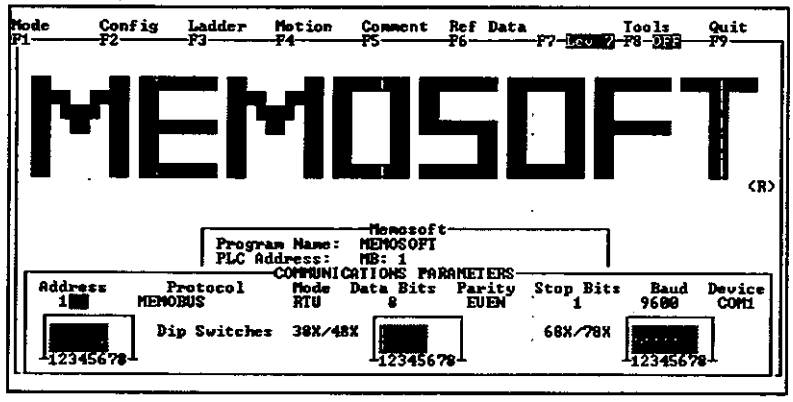


3) The window for entering the file name will be displayed. Enter the file name (**GL120_1** in this example) and press the Enter Key.

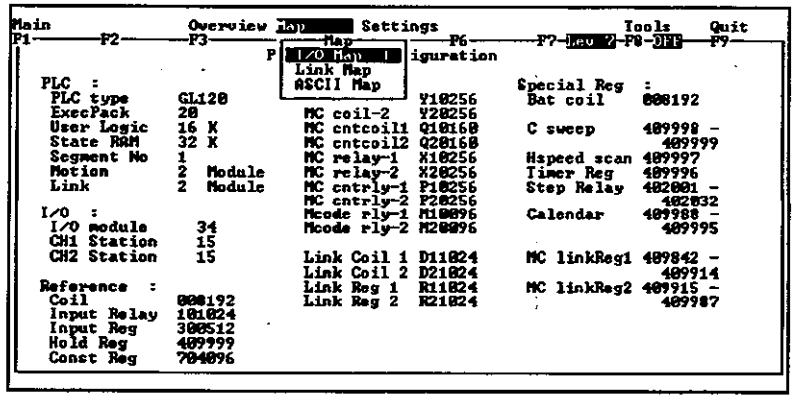


4) The communications parameters setting window will be displayed. Press the Enter Key after specifying each parameter. Specify the PLC address to 1; select the MEMOBUS

protocol; specify RTU Mode; set the data bits to 8, parity to even, the stop bits to 1, the baud rate to 9,600 bps; and select the COM1 port.



The PLC system configuration will be displayed.



INFO Newly-created programs will, by default, communicate with the PLC using the communications parameters set here.

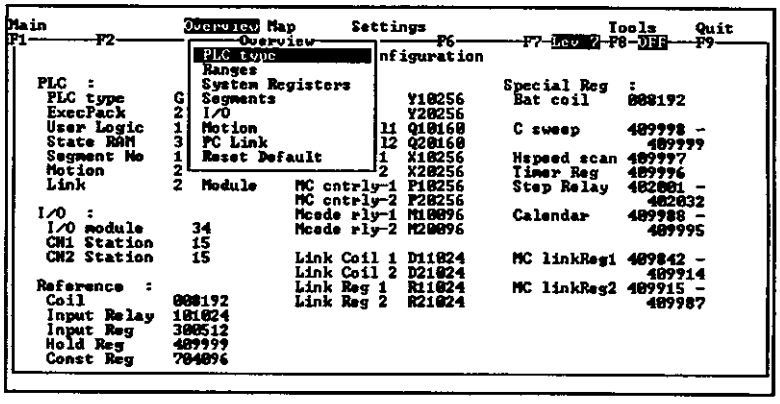
3.3 PLC Configuration

This section describes the procedures for selecting the PLC and setting the I/O map.

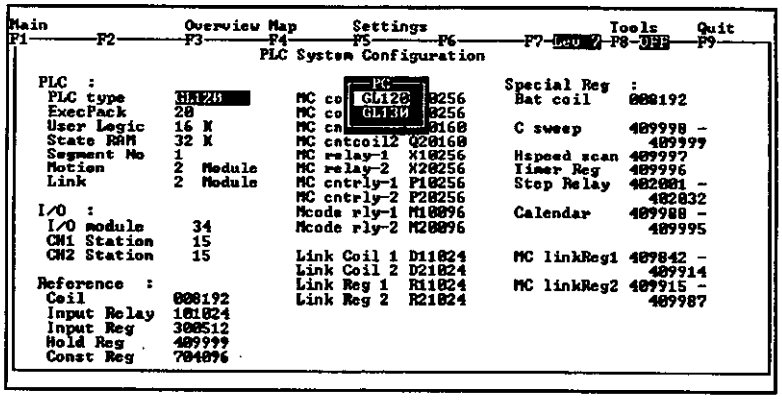
3.3.1 Configuring the System

MEMOSOFT is a programming tool that supports a number of PLCs, including the MEMOCON GL120 and GL130, so select the PLC first.

1) Select **PLC Type** from the Overview Menu using the Cursor Keys and press the Enter Key.



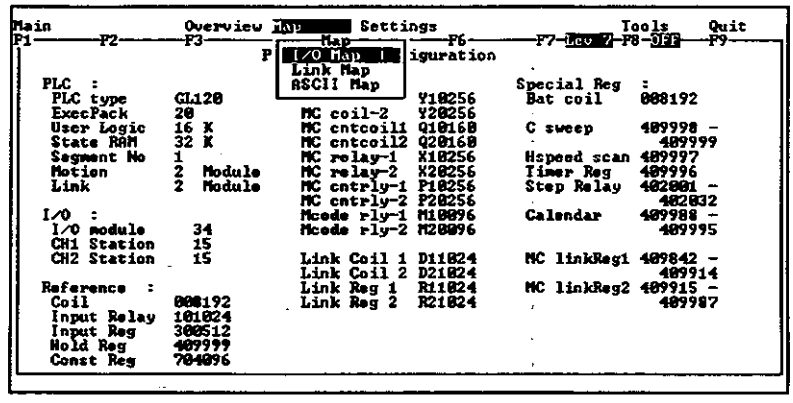
2) The PLC type selection window will be displayed. With the default selection of GL120 displayed, press the Enter Key.



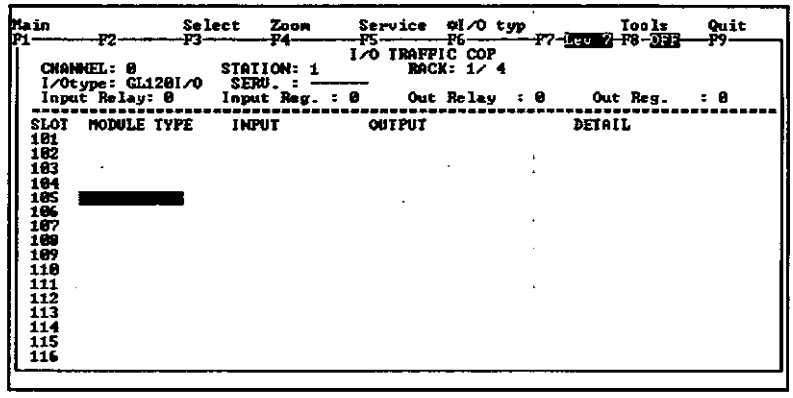
3.3.2 Setting the I/O Map

When the PLC type is selected in the System Configuration screen, default settings for the I/O map are made automatically. Next, modify these default settings. To modify the I/O map, select I/O map from the Map Menu on the System Configuration screen and the I/O Map Screen is displayed.

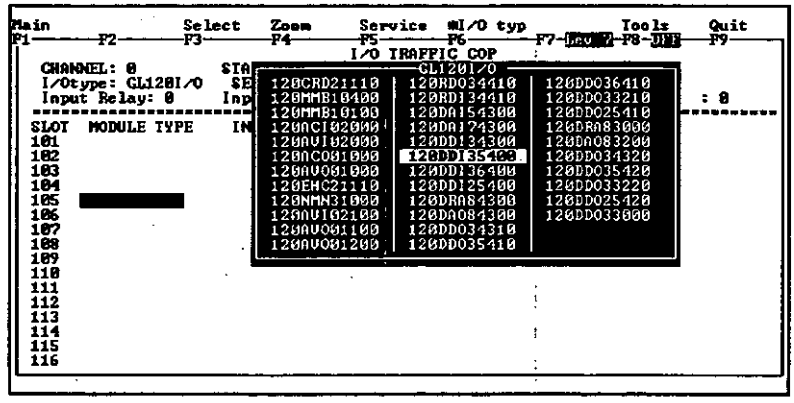
1) Select **I/O Map** from the Map Menu using the Cursor Keys and press the Enter Key.



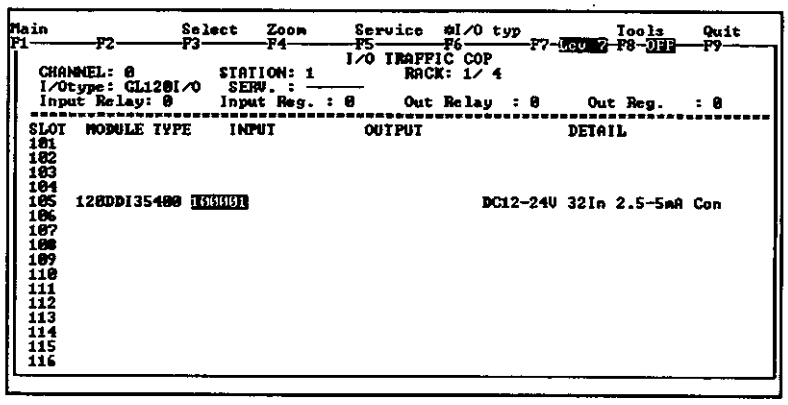
2) The I/O Map Screen will be displayed. Move the cursor to the slot to be selected using the Down Cursor Key.



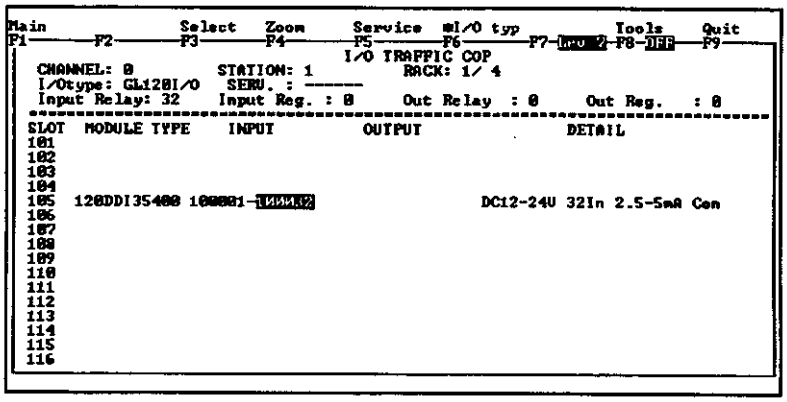
3) Press the **?** Key and a list of the the Modules for which mapping can be performed will be displayed. Move the cursor to the Module for which to perform mapping using the Cursor Keys, and press the Enter Key to make the selection.



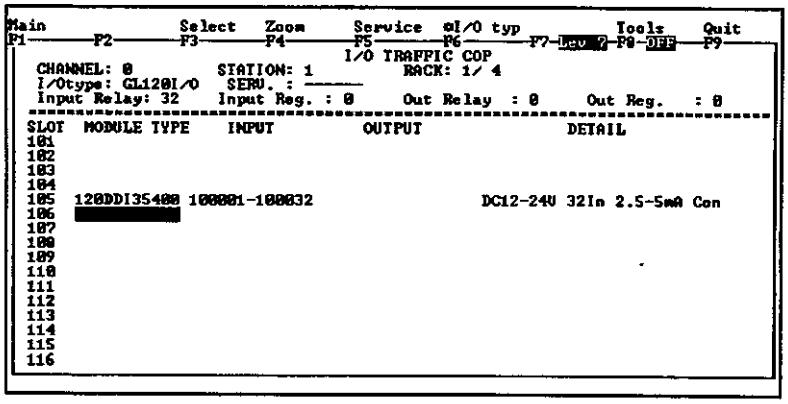
4) Next, enter the starting reference number. In this example, a Digital Input Module has been selected, so an input relay reference number (**100001** in this example) needs to be entered. Enter **100001**, and press the Enter Key.



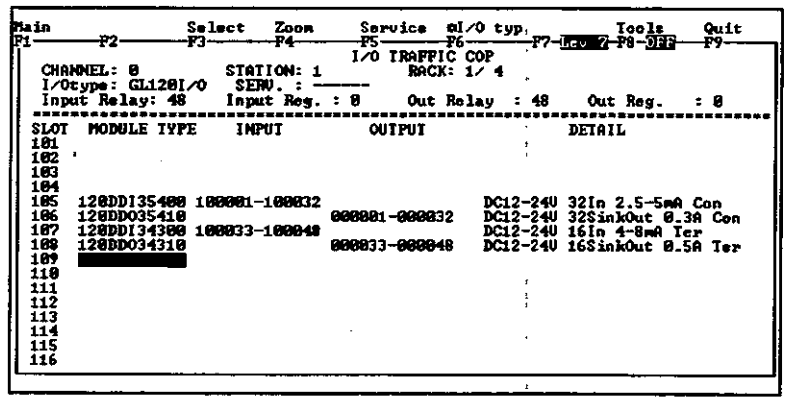
5) Move the cursor to the final reference number. The default setting will be the number calculated by adding the number of I/O points to the starting reference number. If default allocation is okay, press the Enter Key.



The setting will be input and the cursor will move to the next slot.



6) The rest of the I/O maps can be executed using the same procedure.



3.4 Creating Ladder Programs

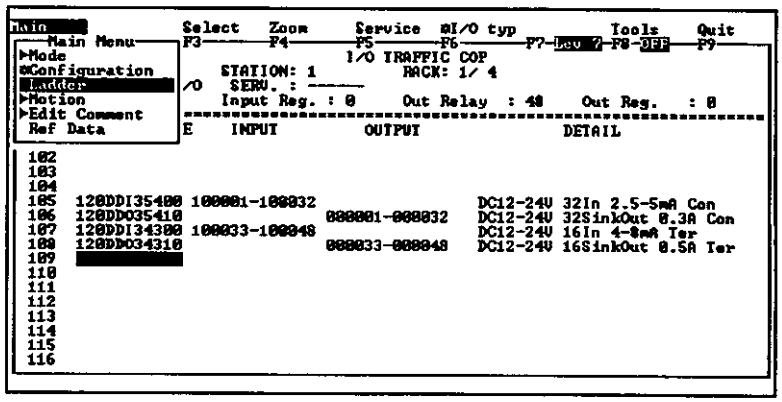
This section describes procedures such as creating segments and ladder programs.

3.4.1 Creating Segments

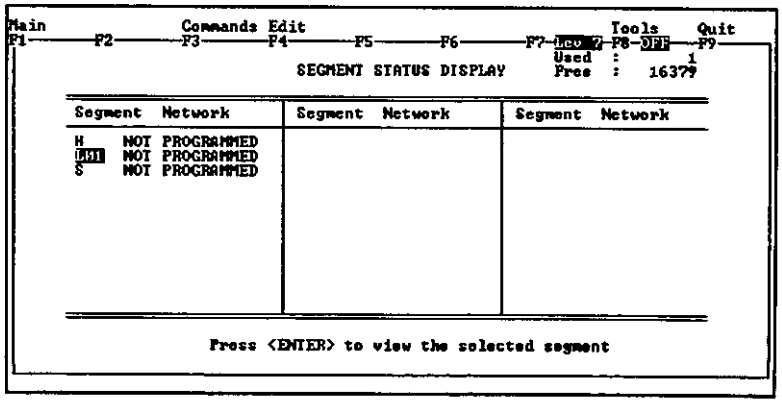
Use the following procedures to create segments.

1) Switch to the menu cursor using the Tab Key.

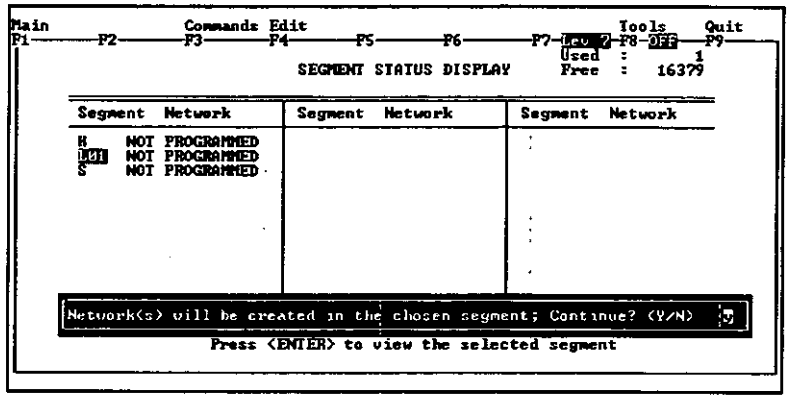
2) Select **Ladder** from the Main Menu using the Cursor Keys and press the Enter Key.



3) The Segment Status Display will appear. Select the segment (**L01** in this example) using the Cursor Keys and press the Enter Key.



4) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



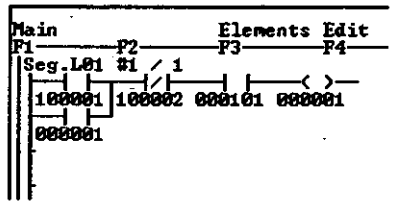
The segment will be created, and network number 1 will be displayed for segment L01.

Note Three kinds of segments are displayed on the Segment Status Display: H (high speed), LXX (normal) and S (subroutine). See section *9.1 Ladder Program Edit Screen* for details.

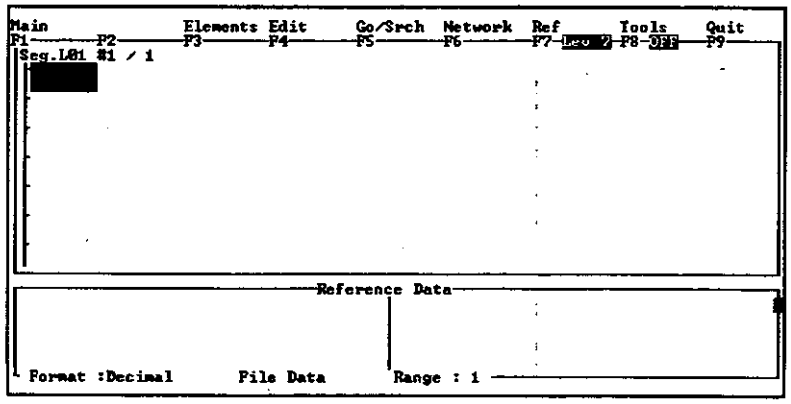
3.4.2 Inputting Relays and Coils

The procedures for inputting relays and coils are described here. The following example is used to describe creating a ladder program.

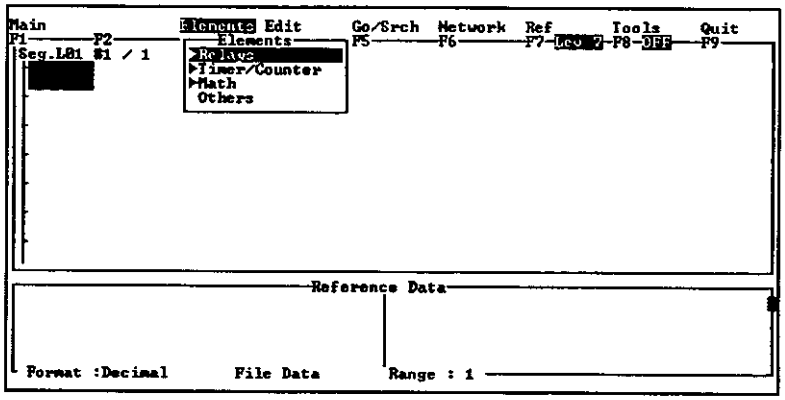
Example



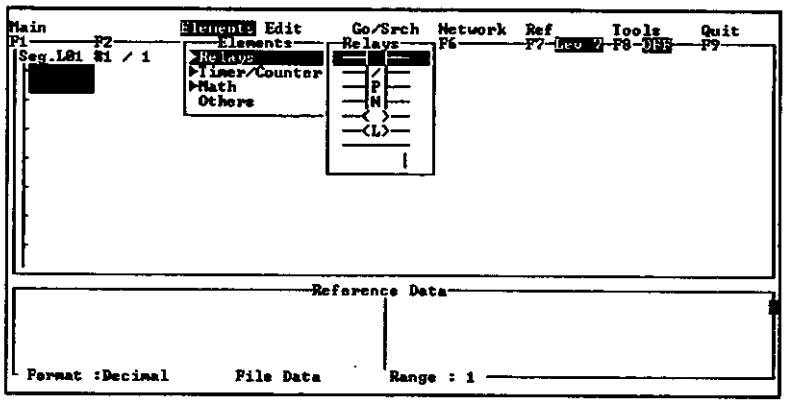
1) Move the cursor to the position to be input using the Cursor Keys, and switch to the menu cursor using the Tab Key.



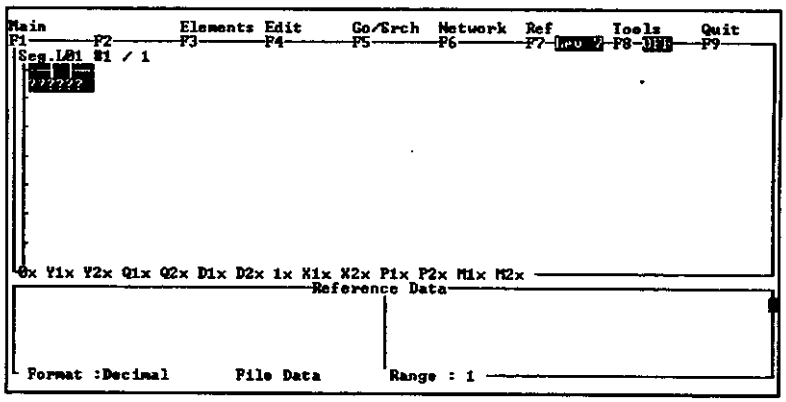
2) Select **Relays** from the Elements Menu using the Cursor Keys and press the Enter Key.



3) A submenu will be displayed. Select an N.O. contact and press the Enter Key.

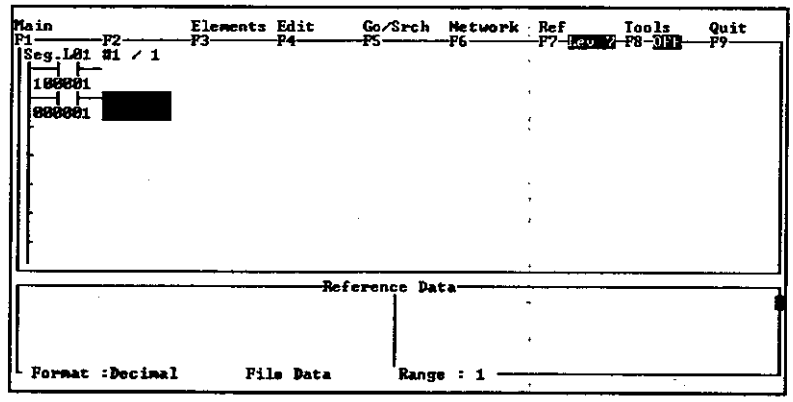


4) An N.O. contact will be input at the cursor position. Next, enter the reference number (**100001** in this example) and press the Enter Key.



The N.O. contact will be input.

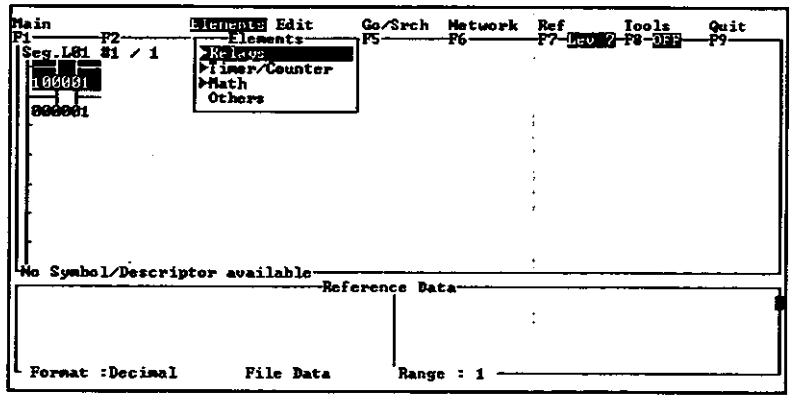
5) In the same way, input an N.O. contact (**000001** in this example).



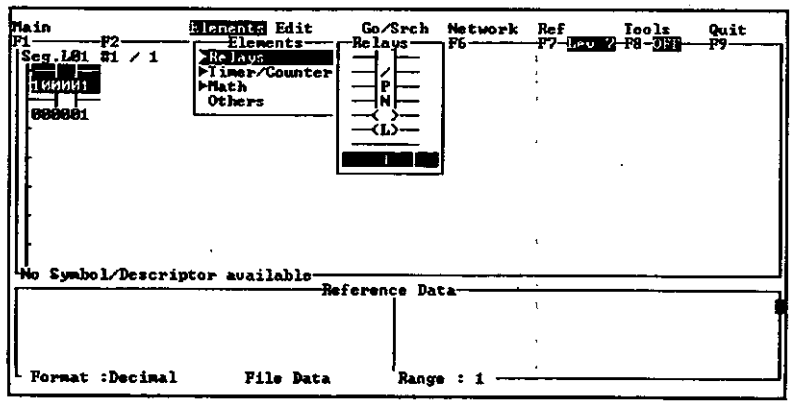
6) Next, a vertical short circuit will be input. Move the cursor to the position to be input using the Cursor Keys.

7) Switch to the menu cursor using the Tab Key.

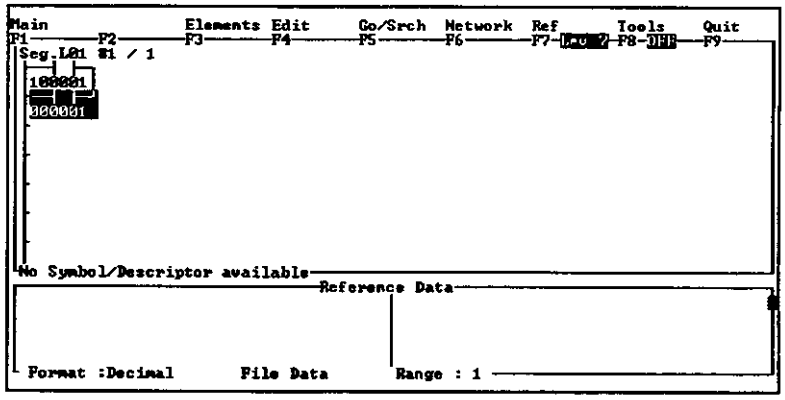
8) Select **Relays** from the Elements Menu using the Cursor Keys and press the Enter Key.



9) A submenu will be displayed. Select the vertical short circuit using the Down Cursor Key and press the Enter Key.



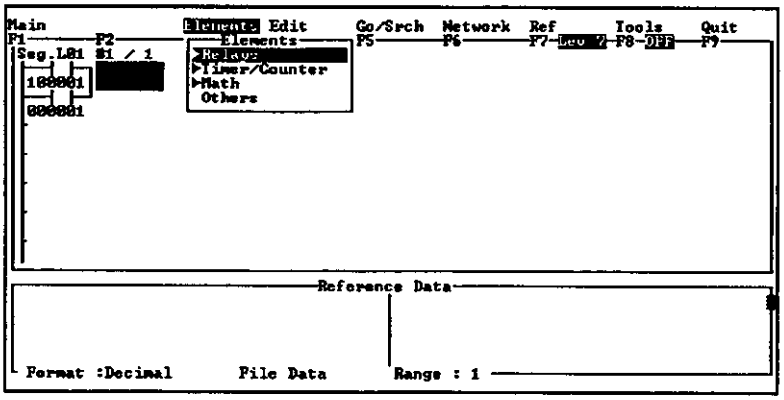
The vertical short circuit will be input.



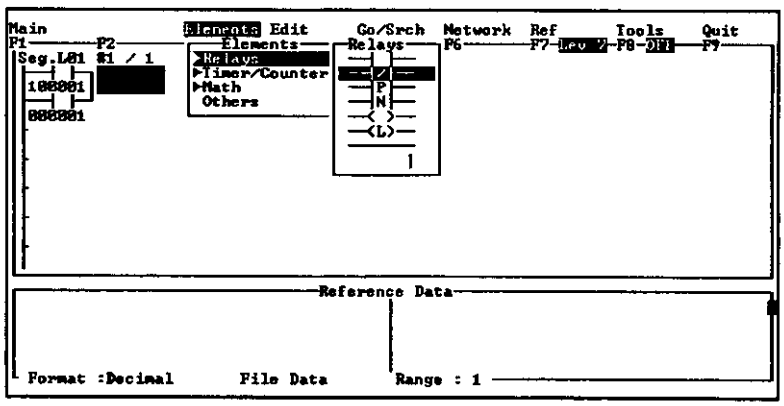
10) An N.C. contact will be input next. Move the cursor to the position to be input using the Cursor Keys.

11) Switch to the menu cursor using the Tab Key

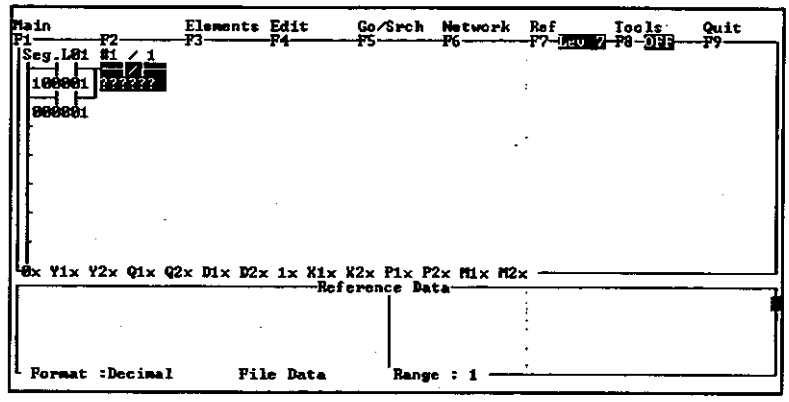
12) Select **Relays** from the Elements Menu using the Cursor Keys and press the Enter Key.



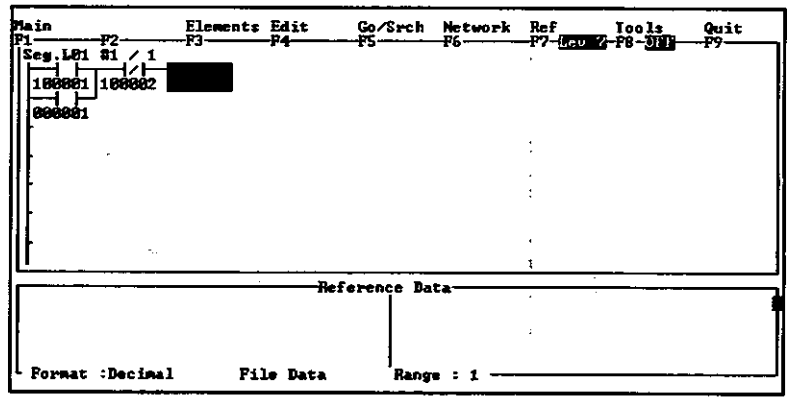
13) A submenu will be displayed. Select the N.C. contact using the Down Cursor Key and press the Enter Key.



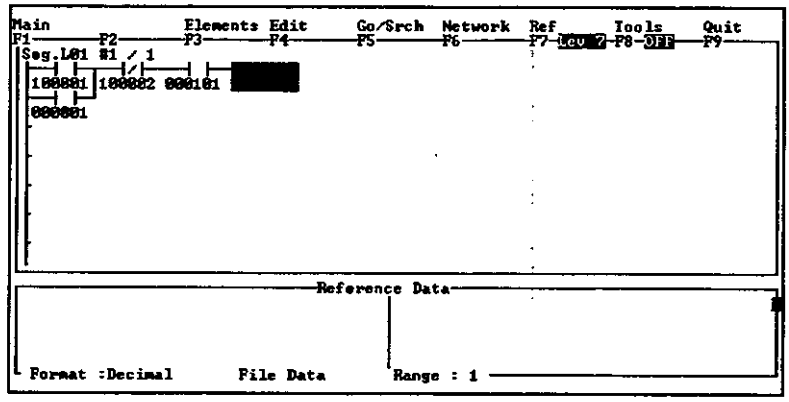
14) An N.C. contact will be input at the cursor position. Next, enter the reference number (**100002** in this example) and press the Enter Key.



The N.C. contact will be input.



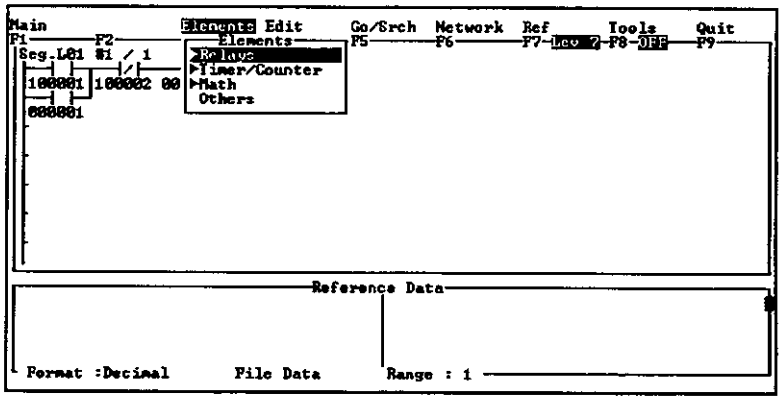
15) Use the same procedure to input an N.O. contact (**000101** in this example.)



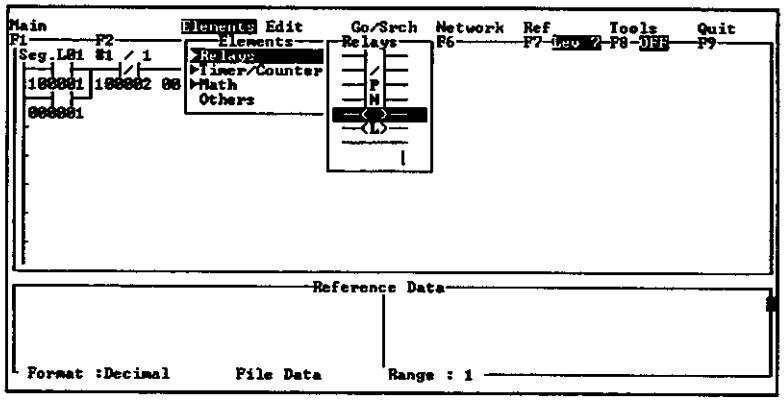
16) Next, a coil will be input. Move the cursor to the position to be input using the Cursor Keys.

17) Switch to the menu cursor using the Tab Key.

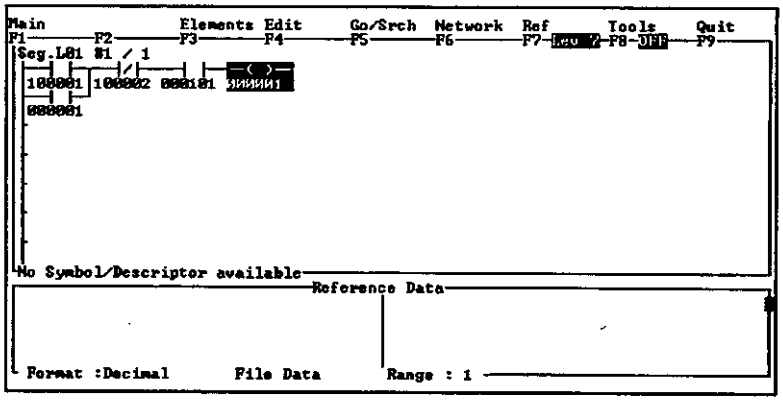
18) Select **Relays** from the Elements Menu using the Cursor Keys and press the Enter Key.



19) A submenu will be displayed. Select the coil using the Down Cursor Key.



20) A coil will be input at the cursor position. Next, enter the reference number (**000001** in this example) and press the Enter Key.

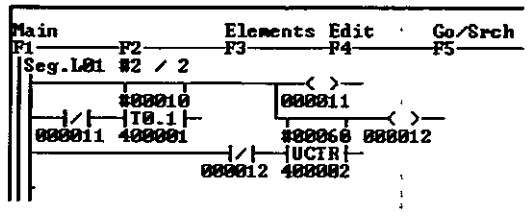


The coil will be input, completing the ladder program editing.

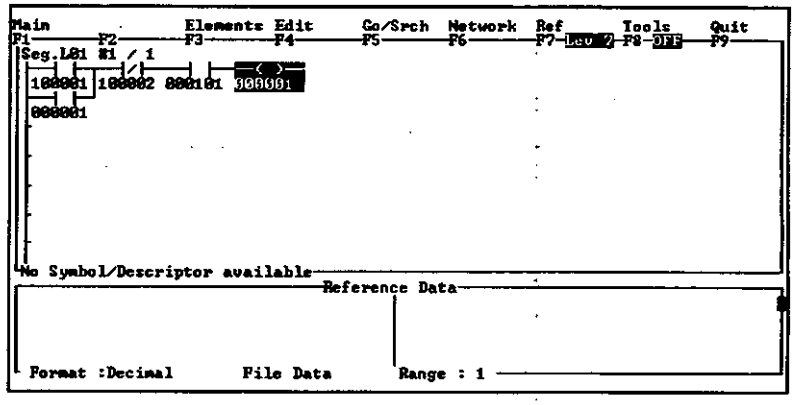
3.4.3 Inputting Timers and Counters

The procedures for Insert After Network and inputting counters and timers are described here. The following example is used to create a clock ladder program.

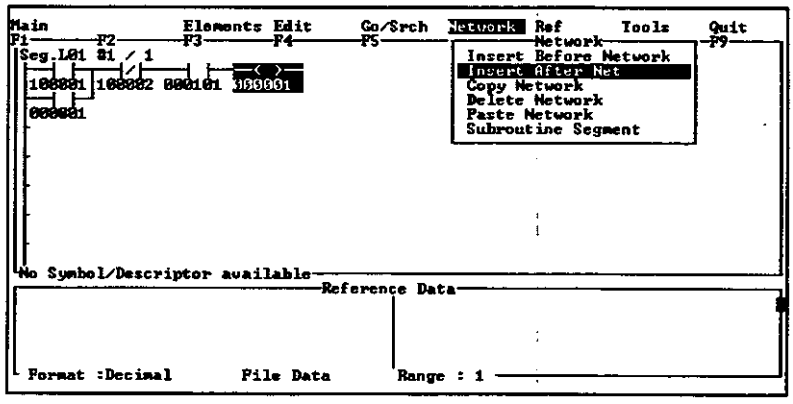
Example



1) A ladder program will be created in network 2. The Insert After Network procedure is used. Switch to the menu cursor using the Tab Key.



2) Select **Insert After Network** from the Network Menu.

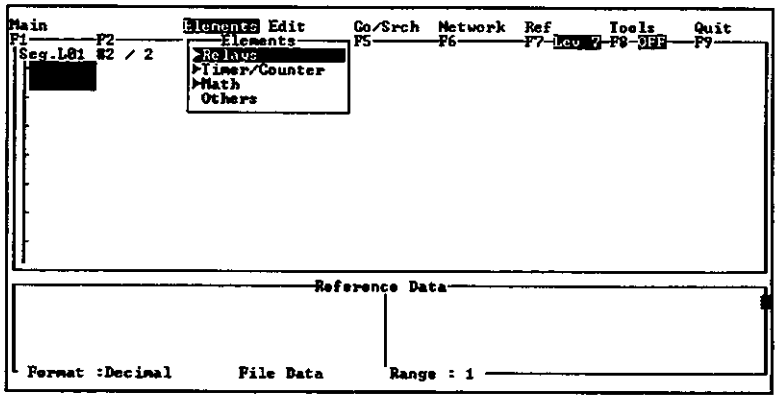


The screen will move to network 2.

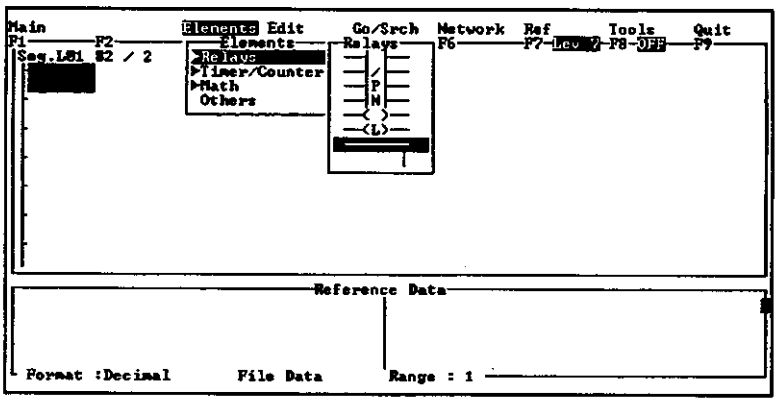
3) A horizontal short circuit will be inserted next. Move the cursor to the position to be inserted using the Cursor Keys.

4) Switch to the menu cursor using the Tab Key.

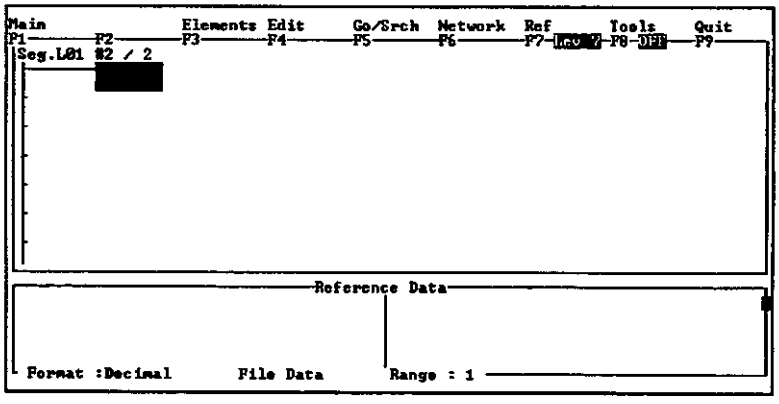
5) Select **Relays** from the Elements Menu using the Cursor Keys and press the Enter Key.



6) A submenu will be displayed. Select the horizontal short circuit using the Down Cursor Key and press the Enter Key.

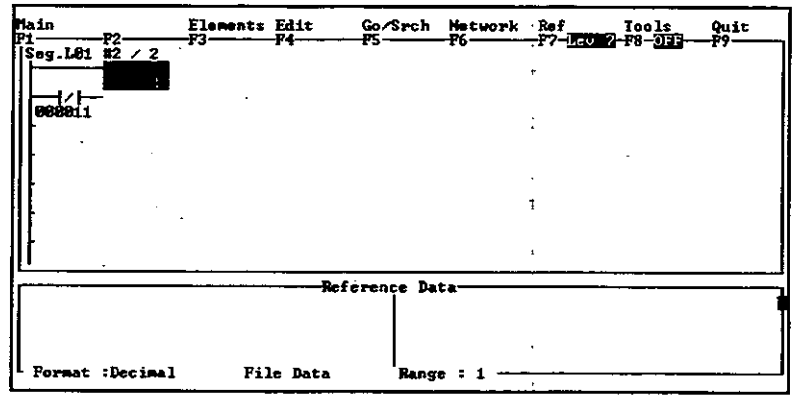


The horizontal short circuit will be input.



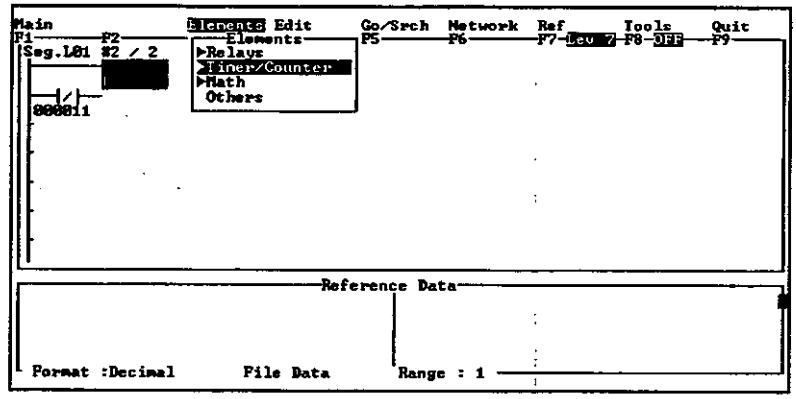
7) Following the same procedure, input an N.C. contact (**000011** in this example.)

8) Next, a 0.1-SECOND TIMER is input. Move the cursor to the position to be input using the Cursor Keys.

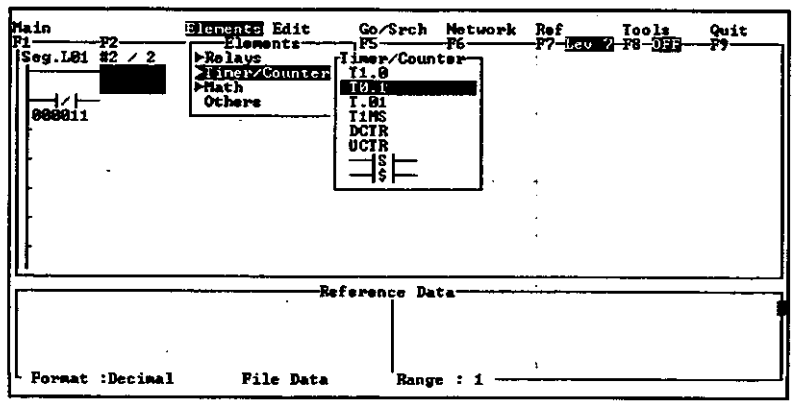


9) Switch to the menu cursor using the Tab Key.

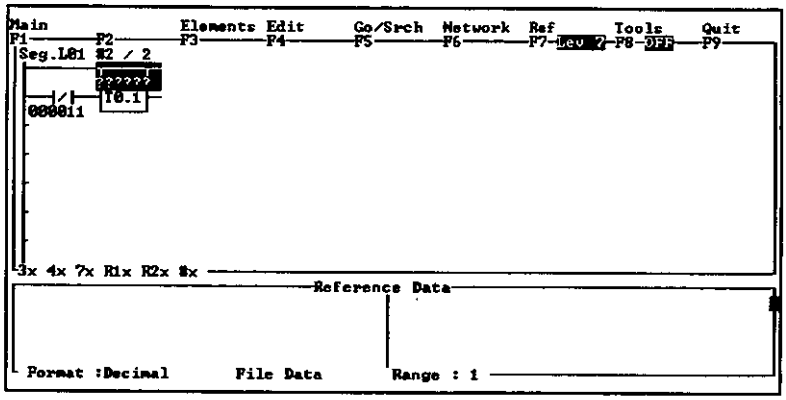
10) Select **Timer/Counter** from the Elements Menu using the Cursor Keys and press the Enter Key.



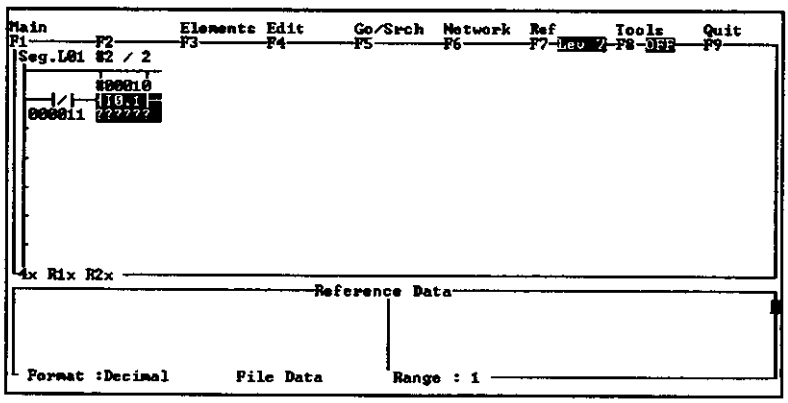
11) A submenu will be displayed. Select T0.1 (i.e., the 0.1-SECOND TIMER) using the Down Cursor Key and press the Enter Key.



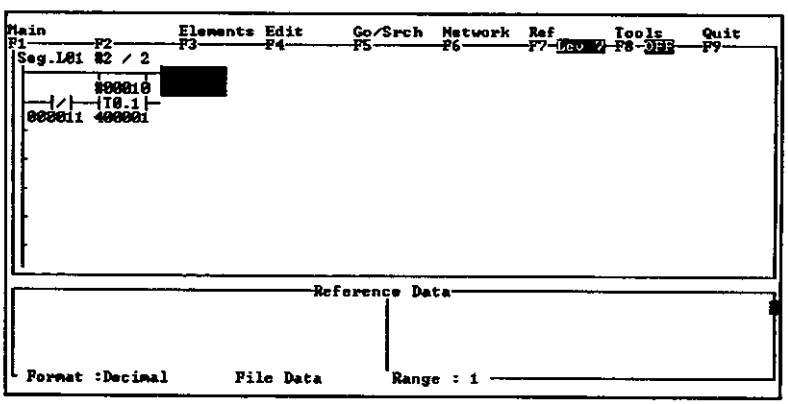
12) The symbol for the 0.1-SECOND TIMER will be displayed. Enter the top element (**10** in this example) and press the Enter Key.



13) Next, enter the bottom element (**400001** in this example) and press the Enter Key.

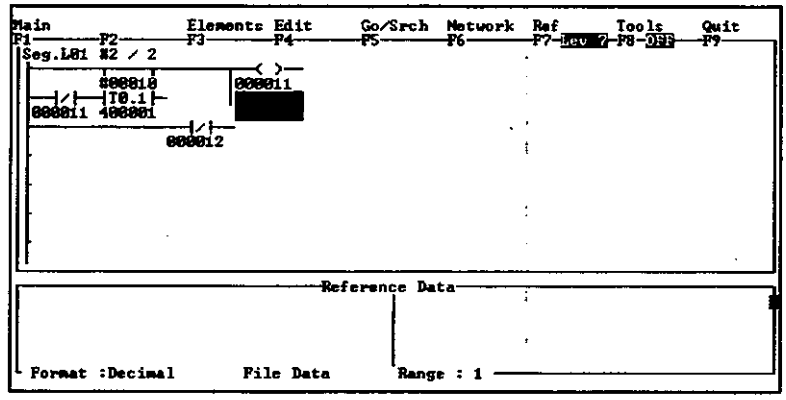


The 0.1-SECOND TIMER will be input.



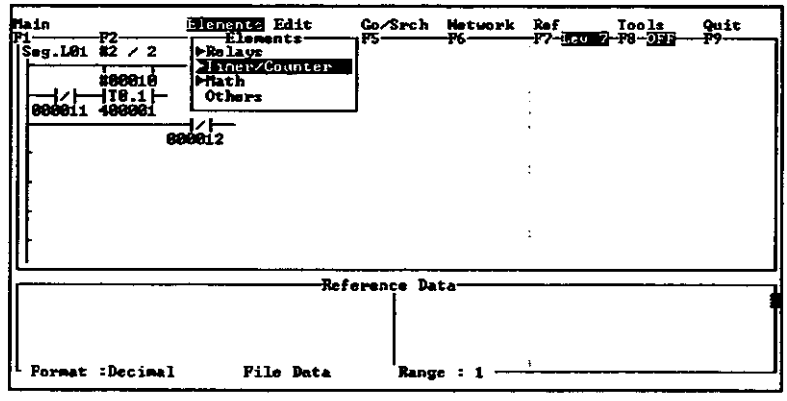
14) Following the same procedure, input a horizontal short circuit, a vertical short circuit, a coil for 000011, and an N.C. contact for 000012.

15) Next, an UP COUNTER is entered. Move the cursor to the position to be input using the Cursor Keys.

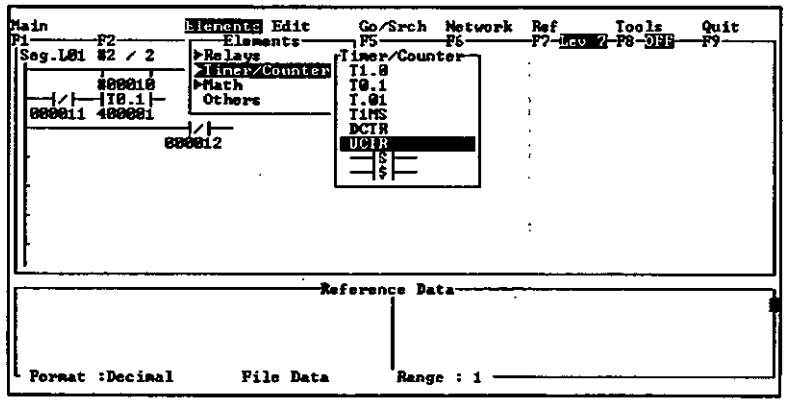


16) Switch to the menu cursor using the Tab Key.

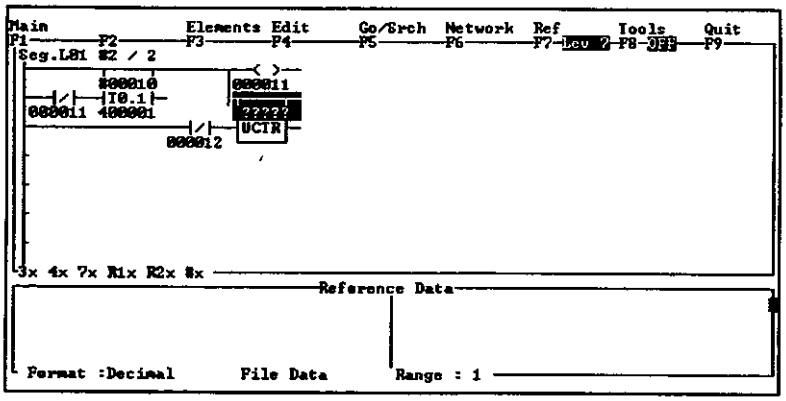
17) Select **Timer/Counter** from the Elements Menu using the Cursor Keys and press the Enter Key.



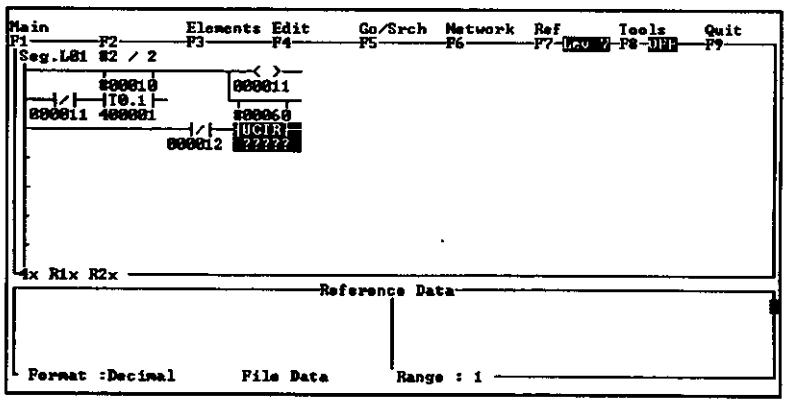
18) A submenu will be displayed. Select **UCTR** (i.e., the UP COUNTER) using the Down Cursor Key and press the Enter Key.



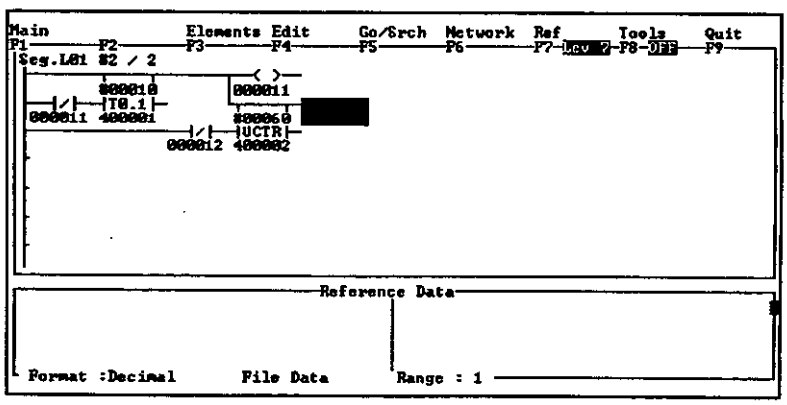
19) The symbol for the UP COUNTER will be displayed. Input the top element (**60** in this example) and press the Enter Key.



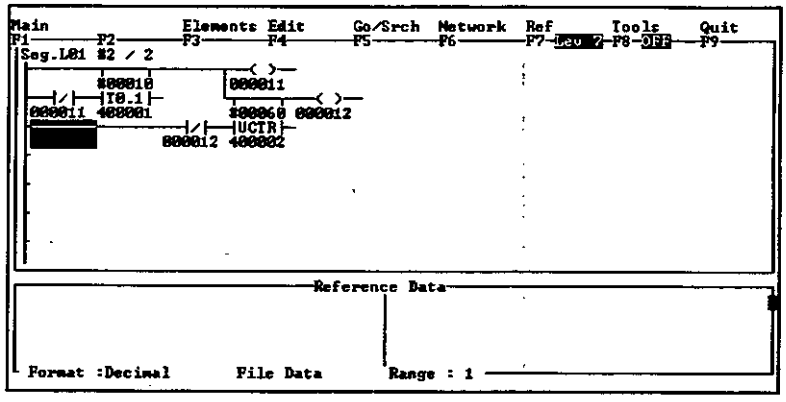
20) Next input the bottom element (**400002** in this example) and press the Enter Key.



The UP COUNTER will be input.



21) Following the same procedure, input a coil for 000012.



The clock ladder program is now complete.

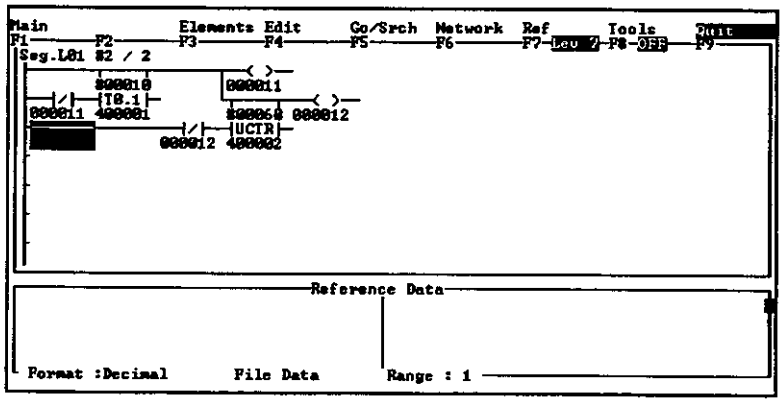
3.5 Exiting MEMOSOFT

This section describes the procedures for exiting MEMOSOFT.

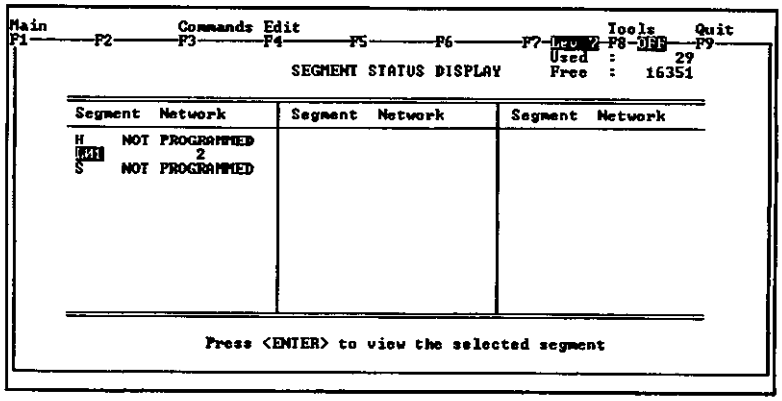
3.5.1 Returning to the Initial Screen

1) Switch to the menu cursor using the Tab Key.

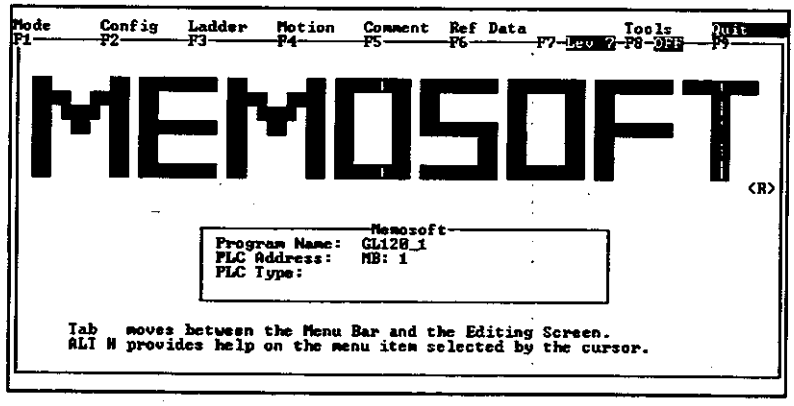
2) Select **Quit** using the Right Cursor Key and press the Enter Key



3) Use the same procedures to exit the next display.



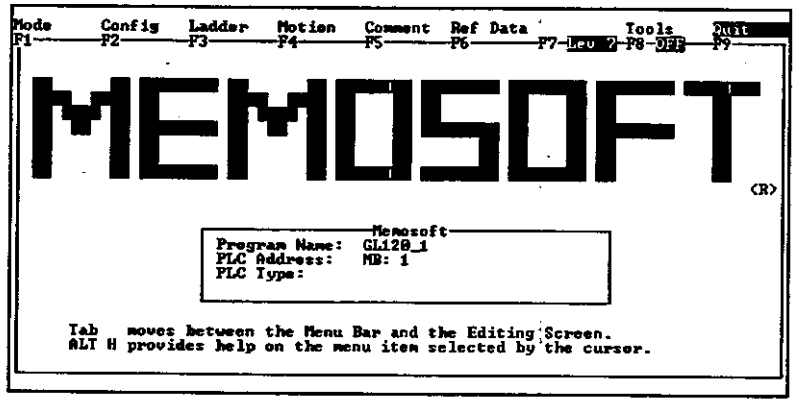
The initial screen will be displayed.



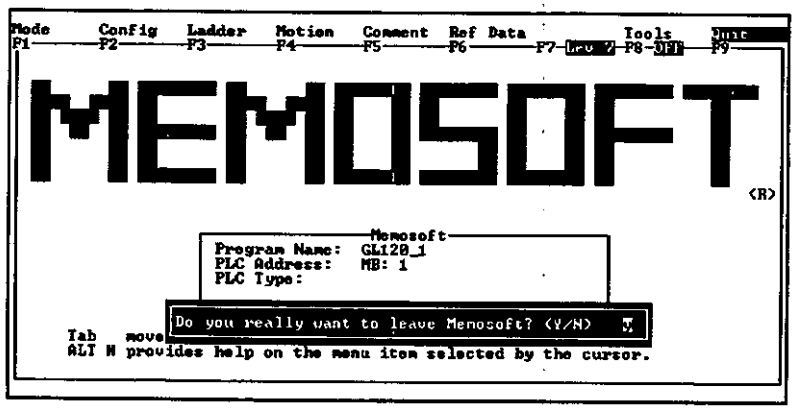
3.5.2 Exiting Procedure

This procedure is used to exit the program.

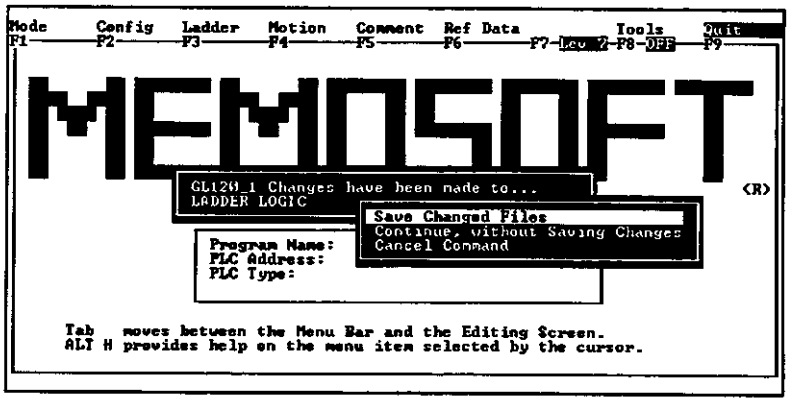
1) Select **Quit** using the Right Cursor Key and press the Enter Key.



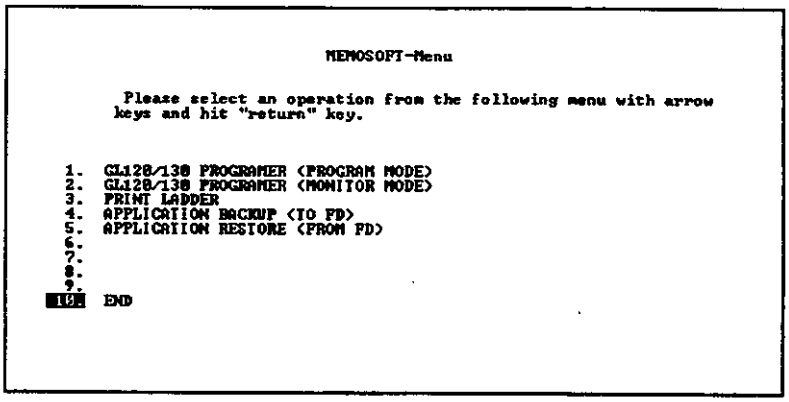
2) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



3) A window will appear asking whether to save the changes. Select **Save Changed Files** and press the Enter Key.



4) The program will be exited and the MEMOSOFT Menu will appear. Select **END** using the Down Cursor Key and press the Enter Key.



MEMOSOFT will be exited.

From Start to Exit: Online

4

This chapter describes the operation procedure for connecting a personal computer to a PLC, taking a ladder program that has been created offline and writing it to the PLC, and then running the program from the PLC.

4.1 Overview of Operating Procedures

This section describes the procedures for connecting the personal computer to a PLC.

4.1.1 Operating Procedures

This chapter describes the procedure used to take a program that has been created on a personal computer, write it to a PLC, and actually run the PLC. There are three phases to this operation.

- Writing the program to the PLC
- Switching to Online Mode
- Monitoring the data

The basic operational procedure is outlined below.

1) Connect the personal computer to the PLC with a special cable.
2) Turn ON the power supply to the personal computer.
3) Activate MEMOSOFT.
4) Write the program created in offline to the PLC.
5) Switch to Online Mode.
6) Display the ladder program and the reference data.
7) Exit MEMOSOFT.

4.1.2 Connecting to the PLC

A special cable is required to connect the personal computer to the PLC. Make sure to have one of the following cables.

Table 4.1 MEMOBUS Protocol Cables

Cable Length	Model
2.5 m	JZMSZ-120W0202-03
15.0 m	JZMSZ-120W0202-15

Table 4.2 MEMOBUS PLUS Protocol Cables

Cable Length	Model
2.5 m	JZMSZ-120W0800-03
15.0 m	JZMSZ-120W0800-15

4.2 Loading the Program onto the PLC

This section describes the procedures for activating MEMOSOFT and writing the program to the PLC.

4.2.1 Activating MEMOSOFT

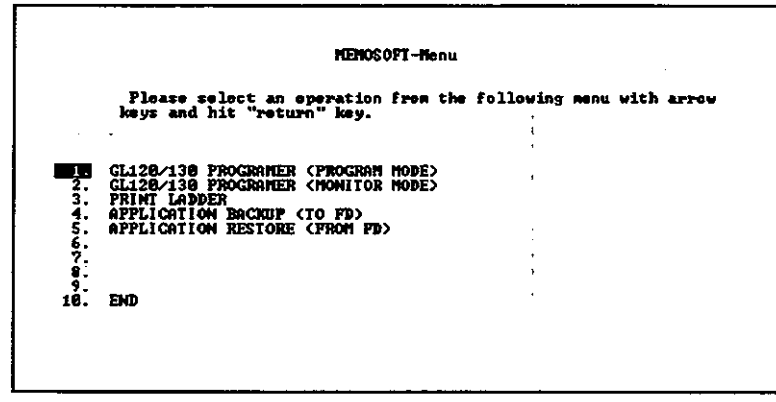
As in Chapter 3, operations begin with turning ON the power to the personal computer.

1) Turn ON the power supply to the personal computer.

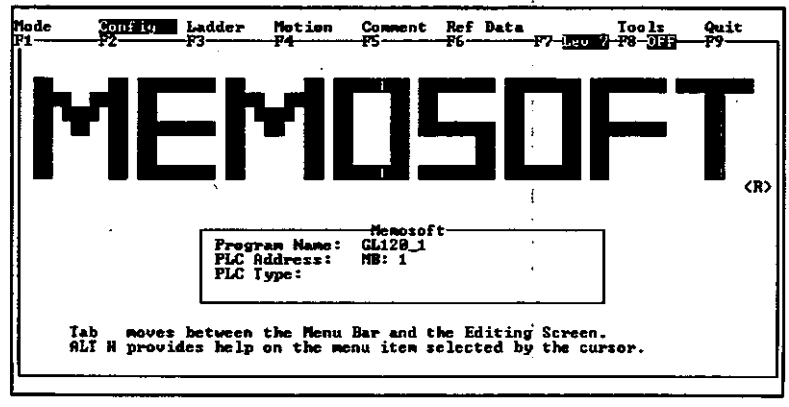
2) Enter **MEMOMENU** and press the Enter Key.

```
C>MEMOMENU
```

3) The MEMOSOFT Menu will be displayed. Select **GL120/130 PROGRAMER (PROGRAM MODE)** using the Cursor Keys and press the Enter Key.



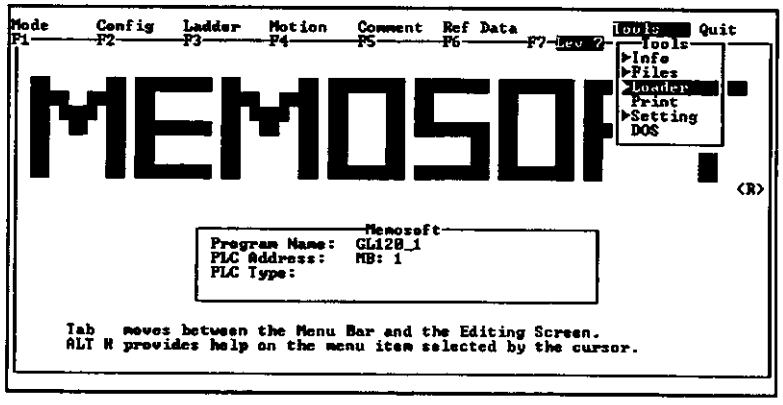
4) The Program Startup Screen will be displayed. Press the Enter Key to display the initial screen as shown below.



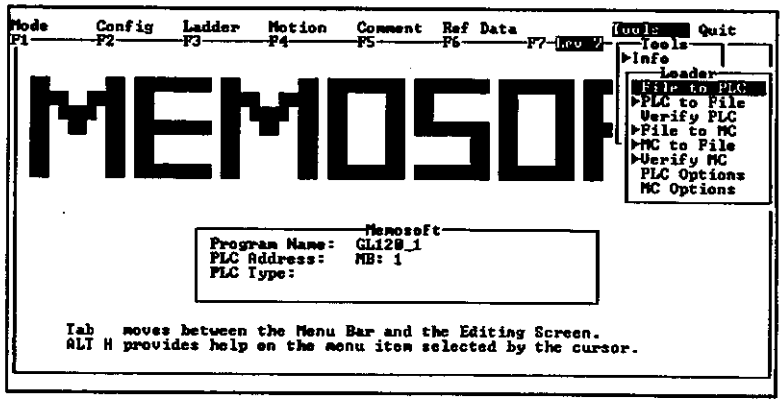
4.2.2 Loading the Program onto the PLC

Use the following procedure to load the program from the personal computer onto the PLC.

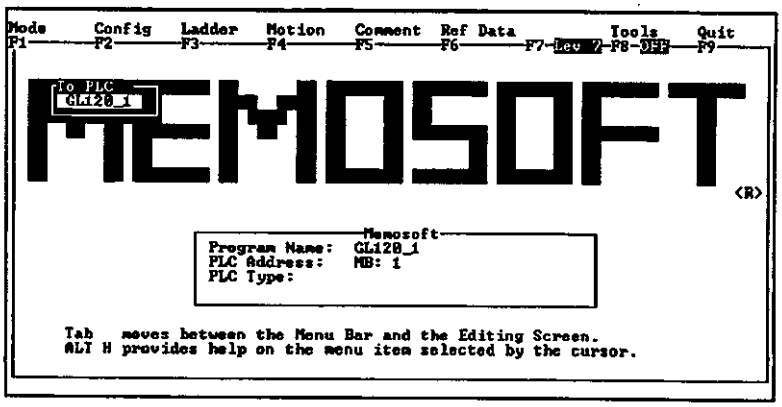
1) Select **Loader** from the Tools Menu using the Cursor Keys and press the Enter Key.



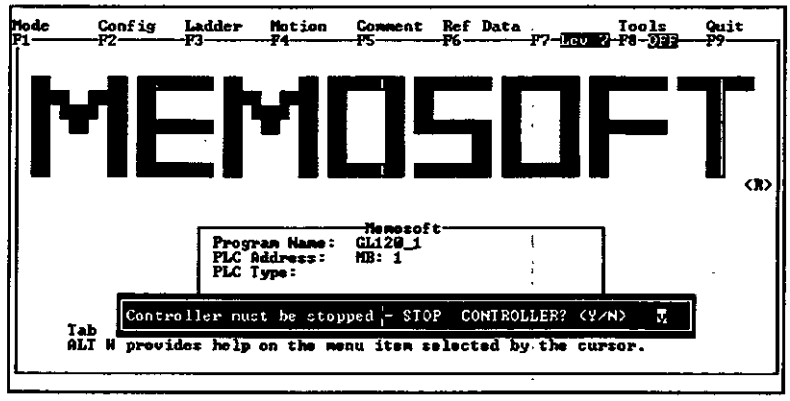
2) A submenu will be displayed. Select **File to PLC** using the Down Cursor Key and press the Enter Key.



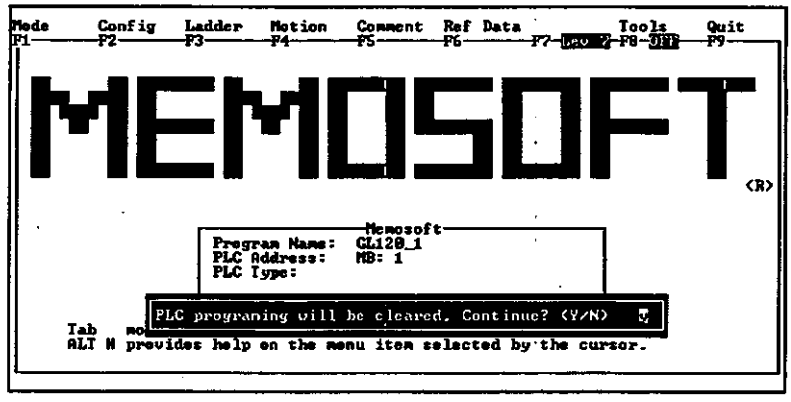
3) A screen will be displayed for selecting the file to be loaded onto the PLC. Select **GL120_1** using the Down Cursor Key and press the Enter Key.



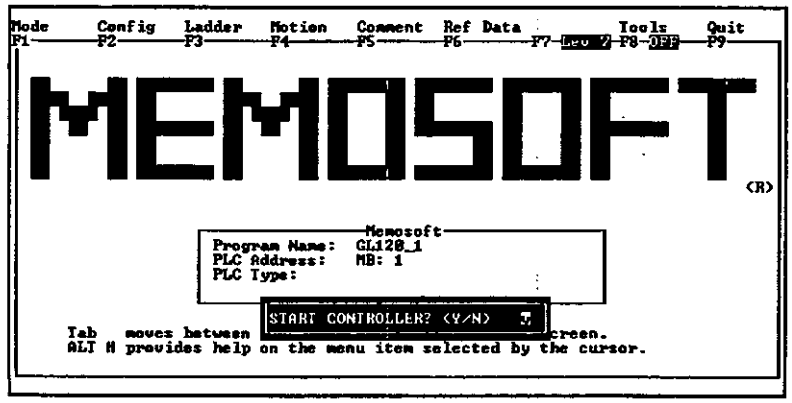
4) If the PLC is in RUN State, a confirmation message will appear asking whether to stop the controller. Enter **Y** and press the Enter Key.



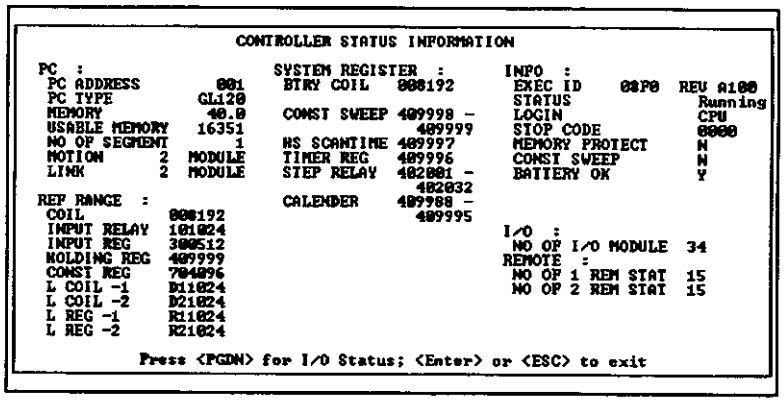
5) A confirmation message will then appear asking whether to clear the programs in the PLC. Enter **Y** and press the Enter Key.



6) The program will be loaded onto the PLC. When the load process has been completed, a confirmation message will appear asking whether to start the PLC. Enter **Y** and press the Enter Key.



Controller status information similar to the following example will be displayed.



The loading operation from the personal computer onto the PLC is now complete.

INFO If the loading operation onto the PLC fails, follow the check procedure given below.

1) Check the personal computer's communications parameters. See section *17.2.6 Changing the PLC Address.*

2) Check the cable connections.

3) Check the PLC's communications parameters. Use the DIP switch to return to the default settings for the communications parameters.

4

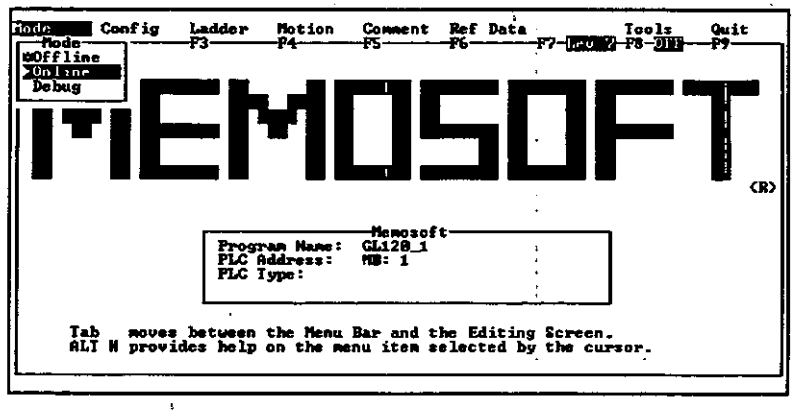
4.3 Going Online

This section describes the procedures for changing to online operation and displaying ladder programs.

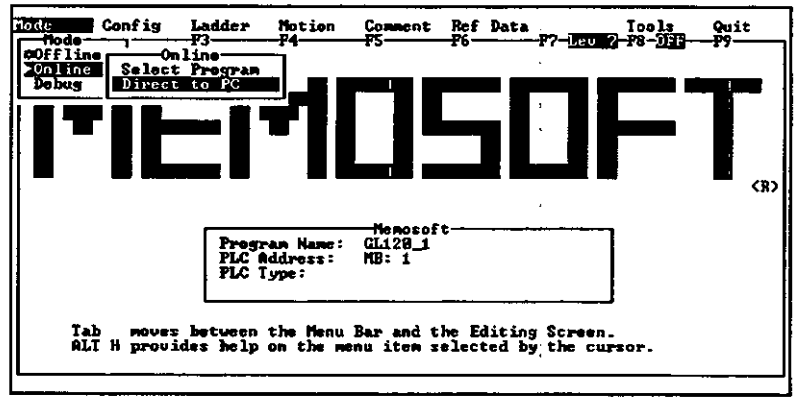
4.3.1 Switching between Online and Offline

The procedure for switching to online operation is described here. Begin the operation from the Initial Screen.

1) Select **Online** from the Mode Menu using the Cursor Keys and press the Enter Key.

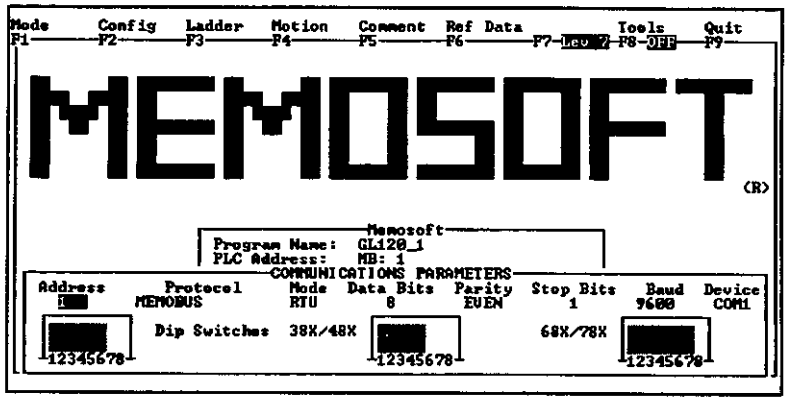


2) A submenu will be displayed. Select **Direct to PC** using the Down Cursor Key and press the Enter Key. If there reference comments are input, use Select Program, and comments and other information will be displayed.

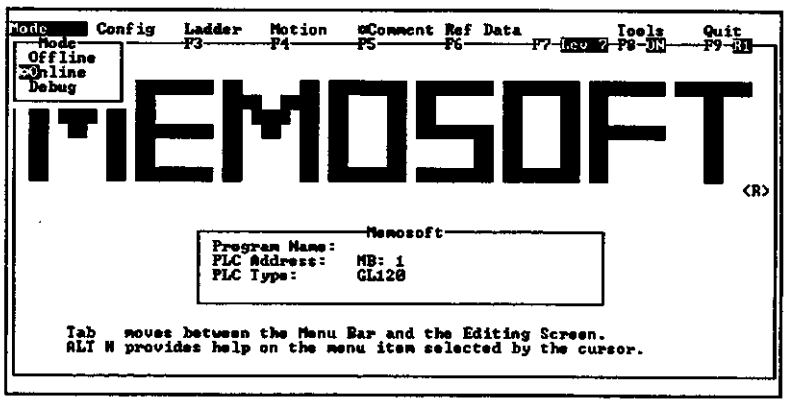


3) The communications parameters setting window will be displayed. Press the Enter Key after specifying each parameter. Set the PLC address to 1; select the MEMOBUS proto-

col and RTU Mode; set the data bits to 8; select even parity; and set the stop bits to 1 and the baud rate to 9,600 bps. If the settings for the PLC communications parameters are different, see chapter *17 File Operations*.

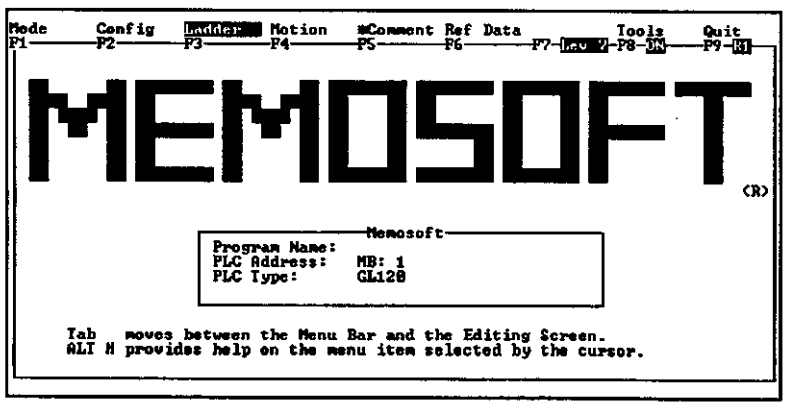


4) The MEMOSOFT should be online with the PLC. Check that the programming mode displayed in the upper right corner of the screen indicates Online Mode.

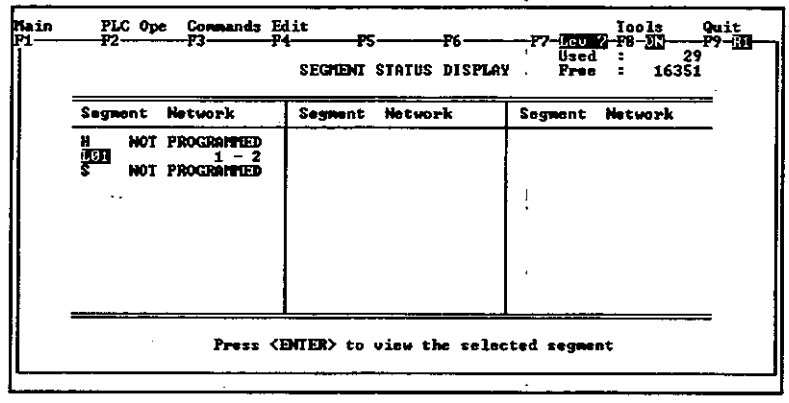


4.3.2 Displaying the Ladder Program

1) Select **Ladder** using the Cursor Keys and press the Enter Key.

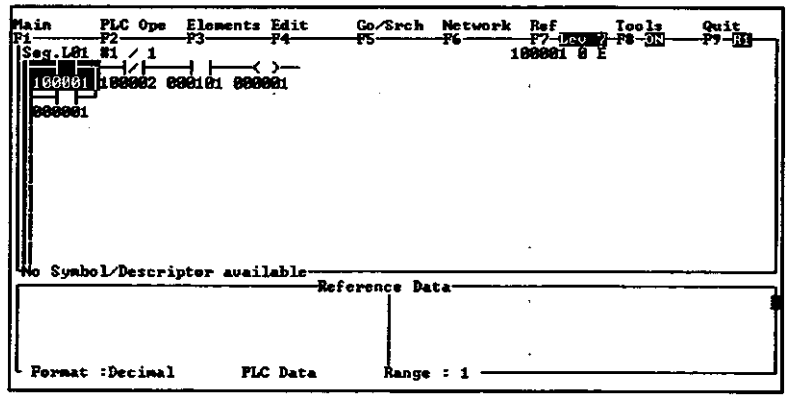


2) The Segment Status Display will appear. Select the segment where the program is stored using the Cursor Keys (**L01** in this example,) and then press the Enter Key.



Note Three kinds of segments are displayed in the Segment Status Display: H (high speed), LXX (normal) and S (subroutine). See section *9.1 Ladder Program Edit Screen* for further details.

The ladder program created in Chapter 3 will be displayed. The status of the reference at the cursor position will be shown in the upper right corner of the screen.



3) Additions can be made to the ladder program using the same procedures as in Offline Mode.

4.4 Displaying Reference Data

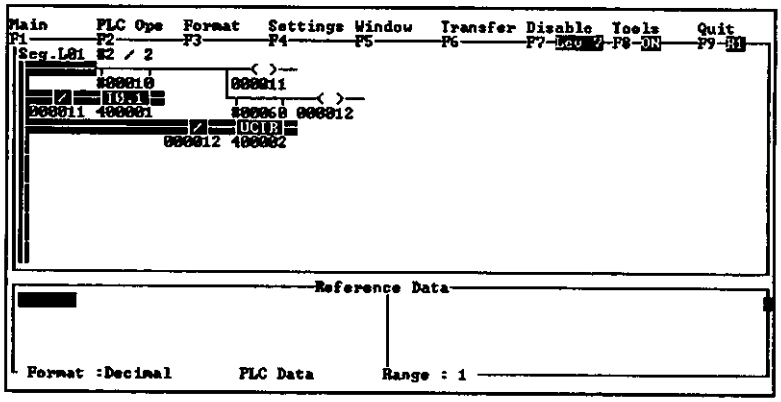
This section describes the operating procedures for displaying reference data and the disabling procedure.

4.4.1 Displaying Reference Data

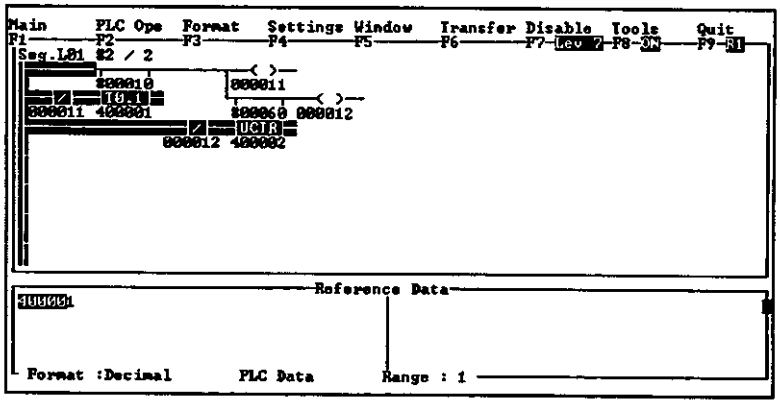
Use the following procedure to display reference data.

1) Move to the clock ladder program in network 2 on the next screen using the Page Down Key.

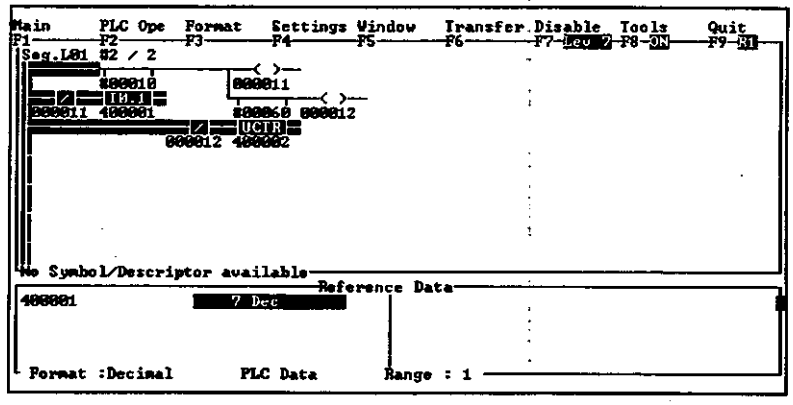
2) Move the cursor into the reference data area by pressing the Down Cursor Key several times.



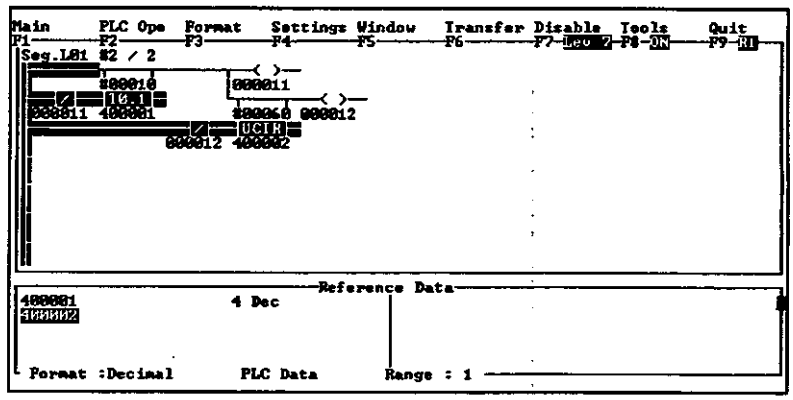
3) Enter the reference number for the 0.1-SECOND TIMER (**400001** in this example) and press the Enter Key.



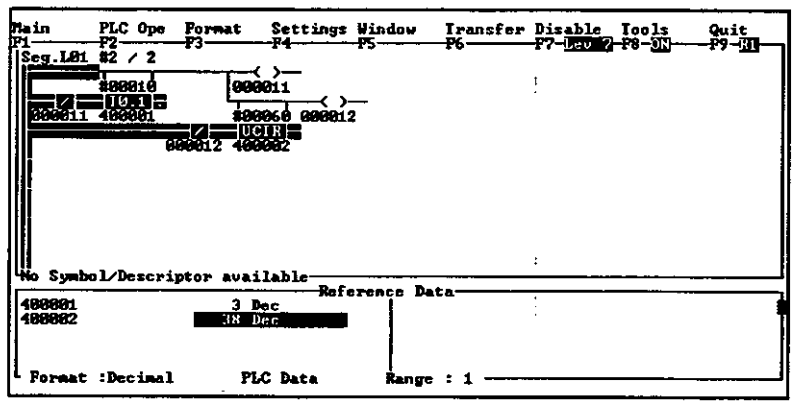
4) The current values and formats for the reference data will be displayed. Confirm that the numerical values for the reference data change repeatedly from 0 through to 10 as the ladder program is solved.



5) Next, enter the reference number for the UP COUNTER (**400002** in this example) and press the Enter Key.



6) The current values and formats for the reference data will be displayed. Confirm that the numerical values for the reference data change repeatedly from 0 through to 60 as the ladder program is solved.

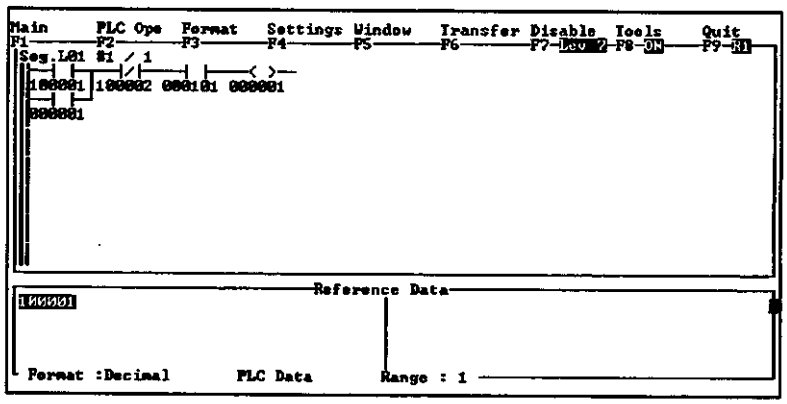


4.4.2 Disabling Procedure

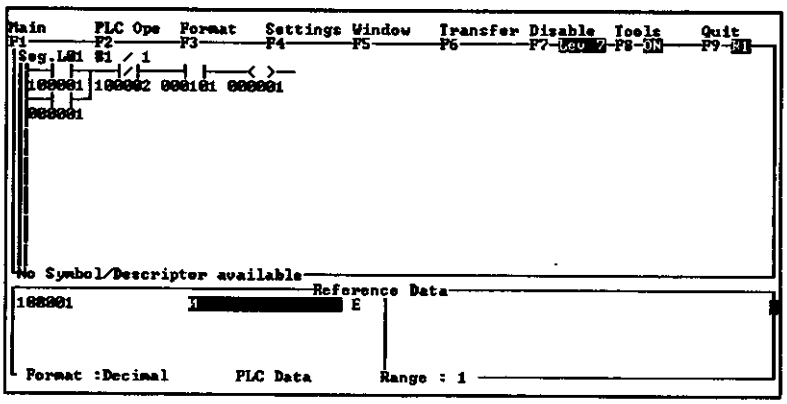
Use the following procedure for disabling.

1) Return to the Network immediately preceding using the Page Up Key.

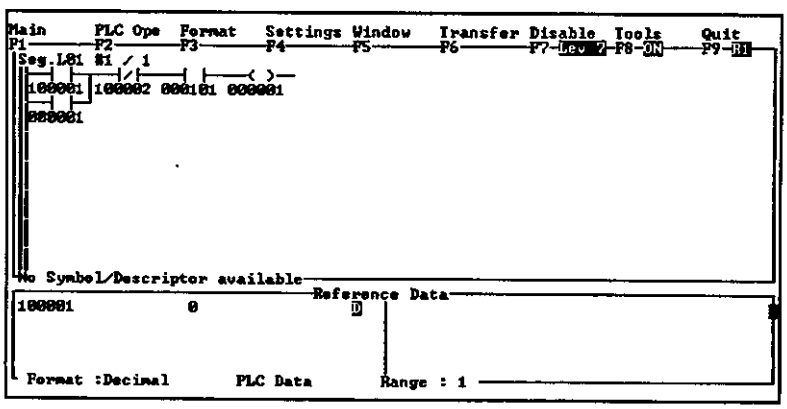
2) Display network 1 of the ladder program. Move the cursor to the reference data area using the Cursor Keys and enter the reference number (**100001** in this example.) Then, press the Enter Key.



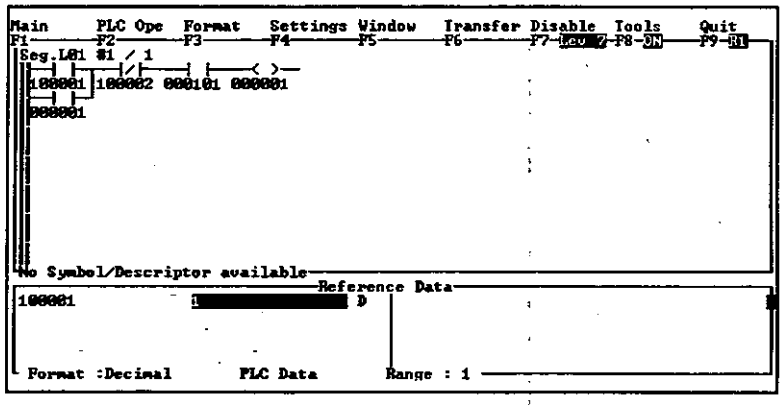
The current value of the reference data will be displayed.



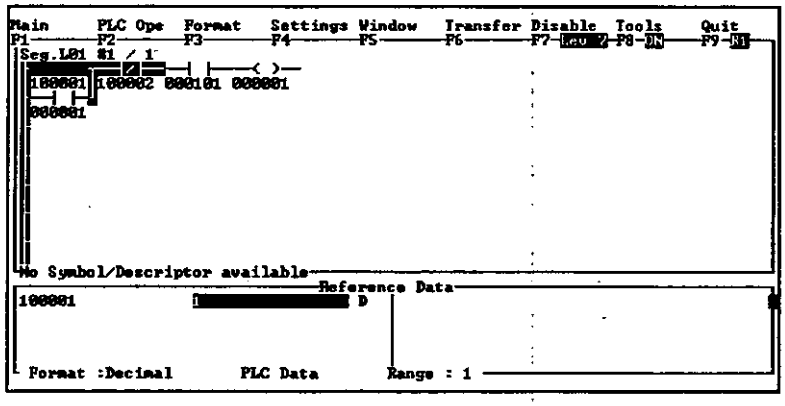
3) Move the cursor to the Enable/Disable (E/D) display area using the Right Cursor Key. Enter **D** to switch to Disable and press the Enter Key.



4) The cursor will move automatically to the location of the reference data. It will be currently set to 0 (OFF). Enter **1** (ON) and press the Enter Key.



5) Confirm that, on the ladder program, the N.O. contact for 100001 is ON.

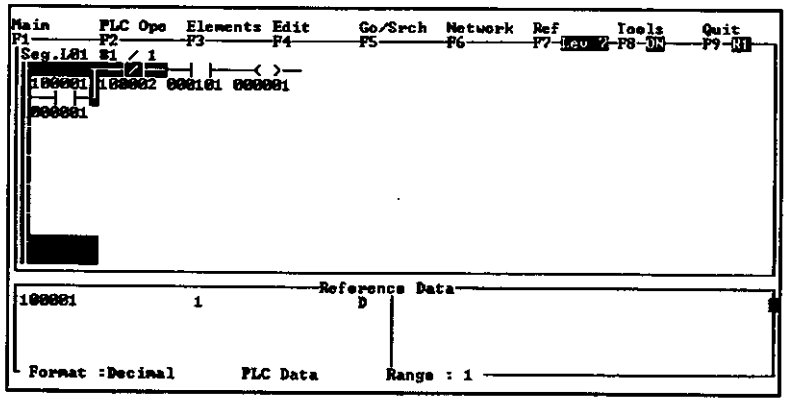


4.5 Exiting MEMOSOFT

This section describes the procedure for exiting MEMOSOFT.

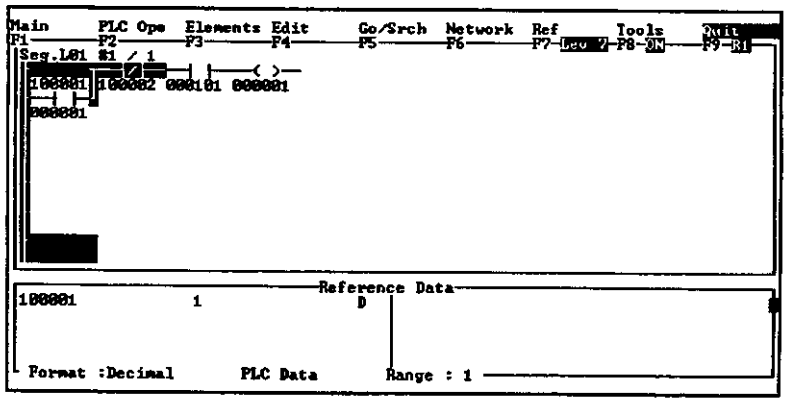
4.5.1 Returning to the Initial Screen

1) Move the cursor to the ladder program area using the Up Cursor Key.

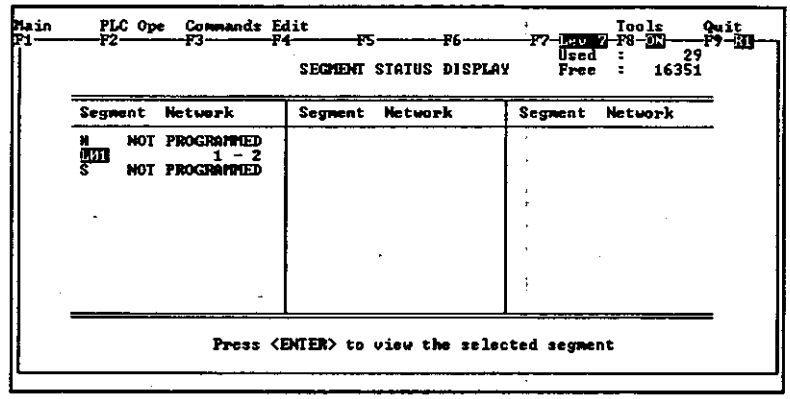


2) Switch to the menu cursor using the Tab Key.

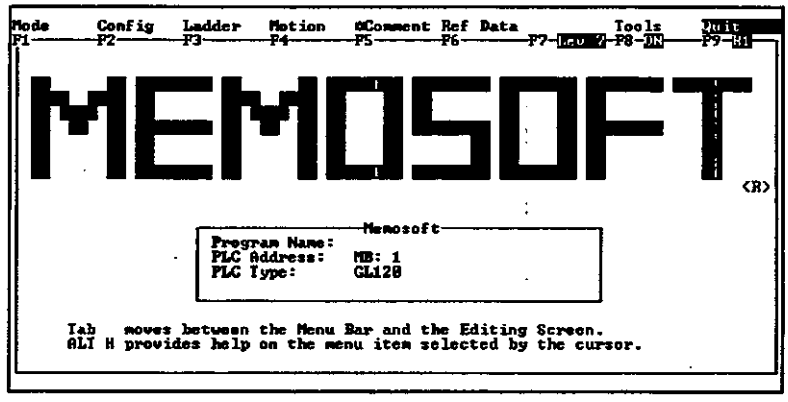
3) Select **Quit** using the Right Cursor Key and press the Enter Key.



4) Exit the Segment Status Display following the same procedure.



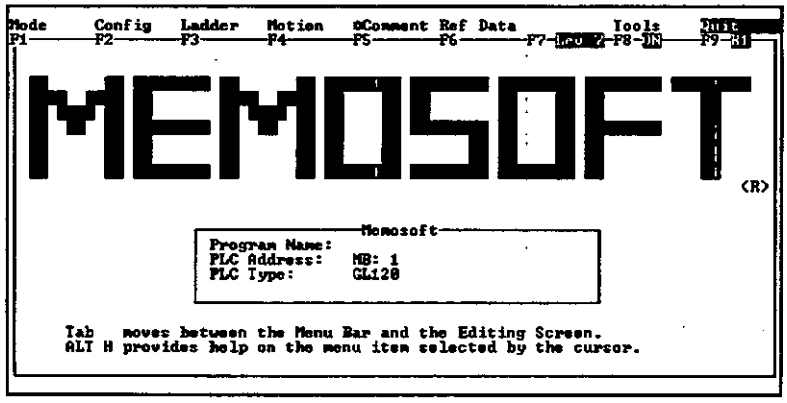
The initial screen will be displayed.



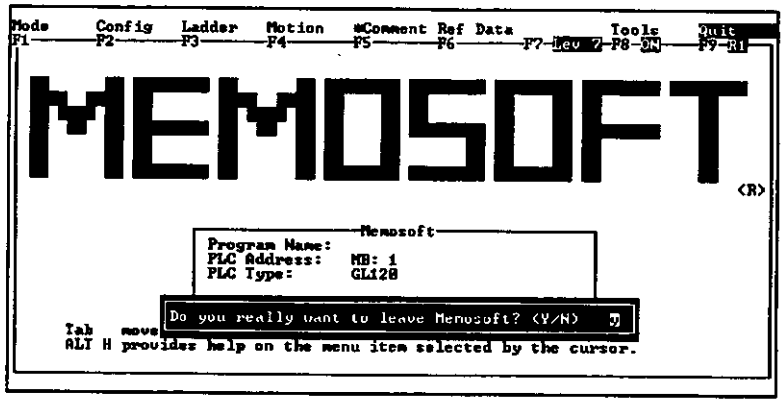
4.5.2 Exiting Procedure

Exit MEMOSOFT using the following procedure.

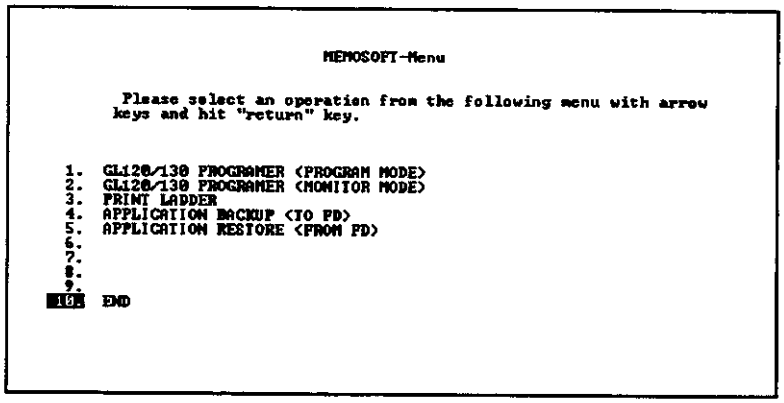
1) Select **Quit** using the Right Cursor Key and press the Enter Key.



2) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



3) The program will end and the MEMOSOFT Menu will be displayed. Select **END** using the Down Cursor Key and press the Enter Key.



MEMOSOFT will be exited.

Basic Operations

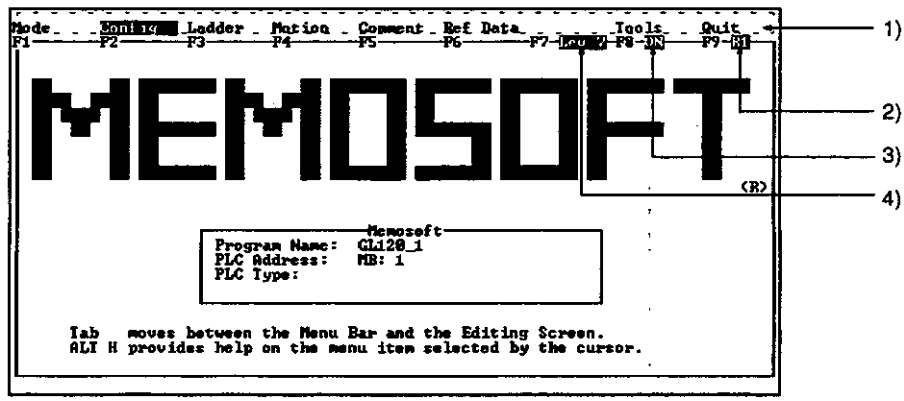
5

This chapter describes the basic procedures for using MEMOSOFT, including the screen configuration and menu operations.

5.1 Screen Configuration

This section describes the screen configuration of MEMOSOFT.

The screen configuration is shown below.



1) Menu Bar

This line displays the menu items that can be selected for the currently displayed screen. See section *5.2 Menu Operation* for menu selection operation.

2) PLC Status and PLC Address

When the programming mode is Online or Debug, the PLC RUN/STOP State and the PLC address are displayed - Rxxx: RUN State; Sxxx: STOP State (xxx indicates the PLC address (1 to 247)).

3) Programming Mode

The current programming mode is displayed - ON: Online Mode; OFF: Offline Mode; DEB: Debug Mode; See section *5.3 Programming Modes* for details on programming modes.

4) User Level

The current user level is displayed. Normally, the user level is set to 7. In Monitor Mode, however, the level is 0.

INFO Monitor Mode only allows data to be read, and not saved. If Monitor Mode is used, it will not be possible to return to the normal mode until MEMOSOFT is exited. To use Monitor Mode, select **GL120/130 PROGRAMER (MONITOR MODE)** from the MEMOSOFT Menu.

5.2 Menu Operations

This section describes the three types of menu operation that can be used in MEMOSOFT.

5.2.1 Using the Cursor

In the following cases, a menu item can be selected using the Up, Down, Left, and Right Cursor Keys.

• When the Cursor is not Used on an Editing Screen

The cursor is not used on the editing screens, and other screens first displayed when the MEMOSOFT is activated. The menu cursor is used on these screens.

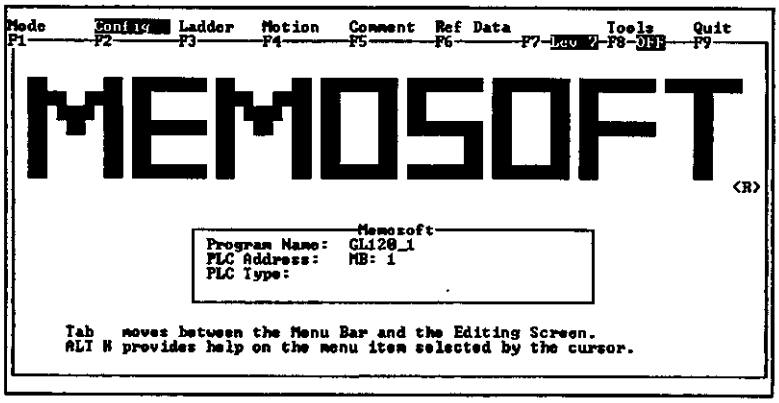
• Switching with the Tab Key

When the Tab Key is pressed during editing in the Ladder Editor Screen, the normal cursor is disabled and the menu cursor is enabled. When the Tab Key is pressed again, the normal cursor is enabled.

When a menu item is selected using the Cursor Keys, the item at the current cursor position is highlighted. When the menus are further expanded, other menus are displayed vertically. This is called pull-down menus. Operation examples using the Cursor Keys are shown below.

1) Initial Screen

When MEMOSOFT is activated and the Enter Key is pressed once, the following screen will be displayed.



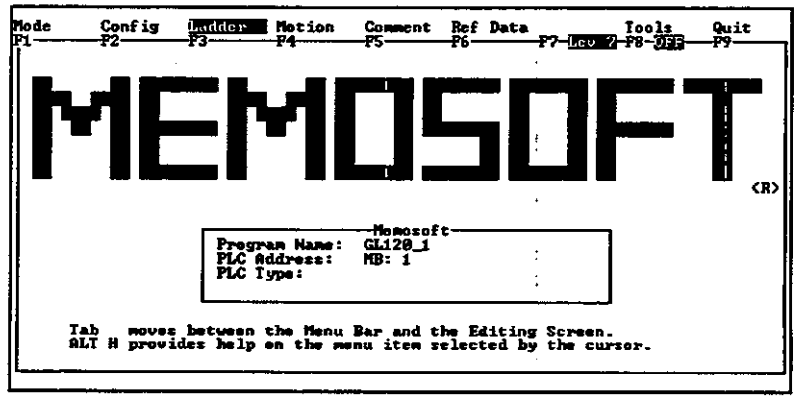
INFO

Depending on the programming mode being used, some items on the menu cannot be selected, and will be displayed as follows:

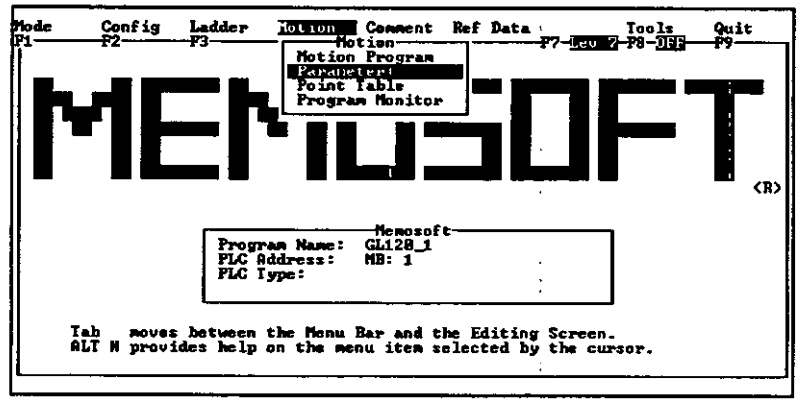
- Color display: The menu items will be displayed in red.
- Monochrome display: A mark will be displayed on the left side of the menu item.

See section *5.3 Programming Modes*,for more details on programming modes.

When the Right Cursor Key is pressed, the menu cursor will move to the right. No pull-down menus are displayed for the Config and Ladder Menus because there are no menus available.



When the Down Cursor Key is pressed at the Motion Menu, the menu cursor will move in the pull-down menus.

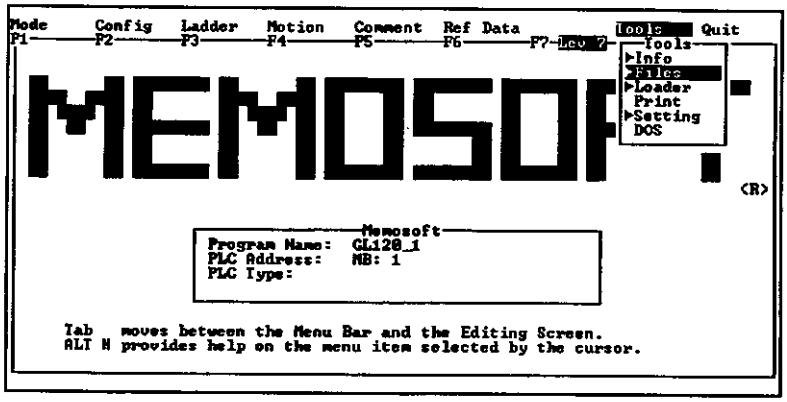


The cursor will move to the right again when the Right Cursor Key is pressed.
After moving the cursor to the item to be selected, press the Enter Key. The operation corresponding to the menu item will be executed.

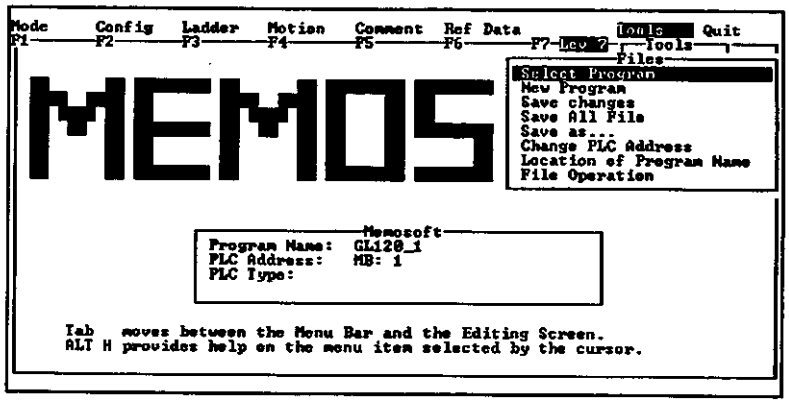
2) When an Item has a Submenu

When an item has a submenu, the item is prefixed by "▶". When the Enter Key is pressed, the submenu will be displayed.

1) Select **Files** from the Tools Menu using the Cursor Keys.

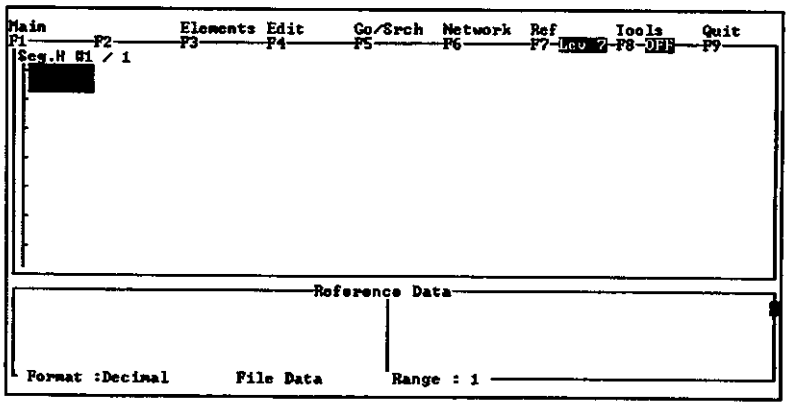


2) Press the Enter Key, and another submenu will be displayed.

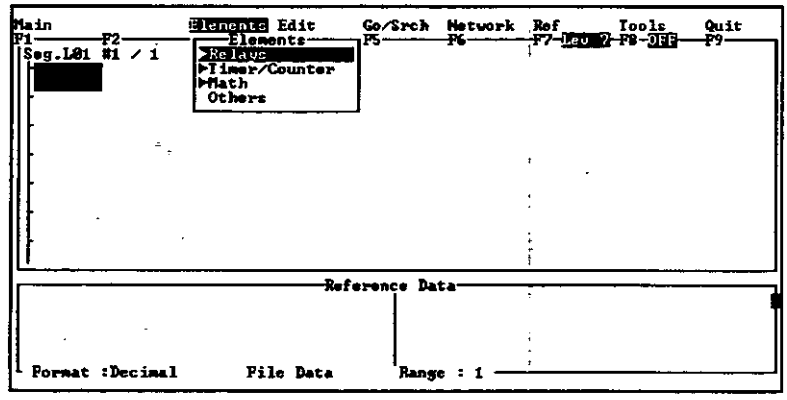


3) When the Cursor is Switched by the Tab Key

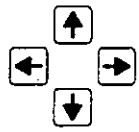
Examples on a ladder editing screen are shown below. In this state, the cursor on the ladder program is enabled. The cursor will move by pressing the Cursor Keys.



When the Tab Key is pressed, the menu cursor is disabled and a pull-down menu is displayed. When the Cursor Keys are pressed subsequently, the menu cursor moves in the submenu.



SUMMARY



Move the normal cursor and menu cursor.

TAB — Switches the mode from the normal cursor to the menu cursor (pull-down menu).

Selects a menu item and displays a submenu.

ESC — Cancels the last entry. When a submenu is displayed, control is returned to the item one level higher.

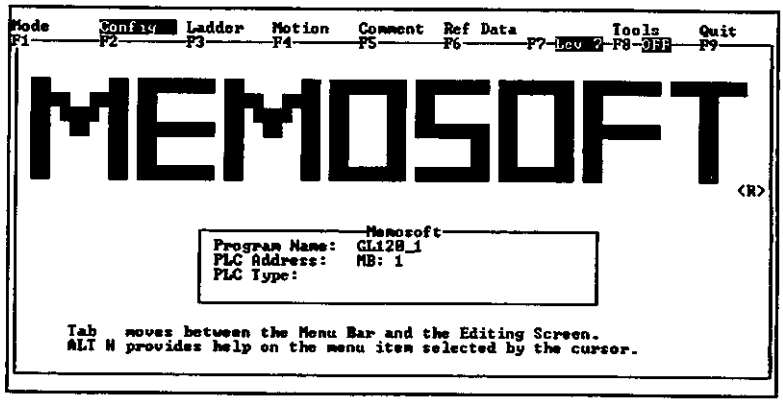
ALT + H — Displays the explanation screen for the current menu item.

5.2.2 Using Function Keys

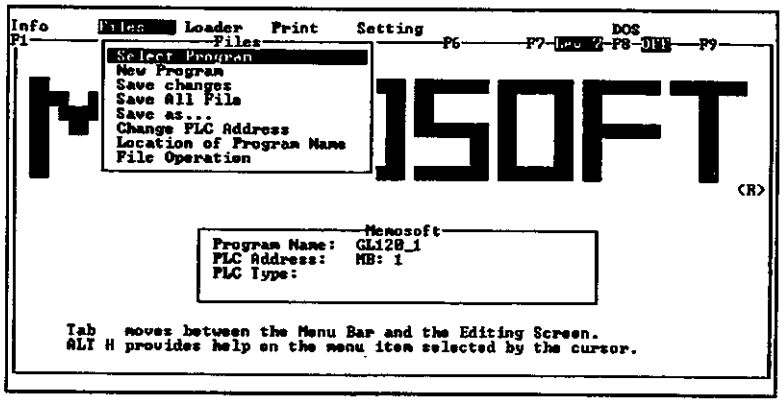
All the items displayed on the menu bar of the screen correspond to the Function Keys indicated on the second line. By pressing the corresponding Function Key, an item can be selected. When a submenu is available, the items on the top line are substituted by the items on the submenu.
An example of selecting the Tools Menu in section 5.2.1 using Function Keys is shown below.

1) Display the initial screen.

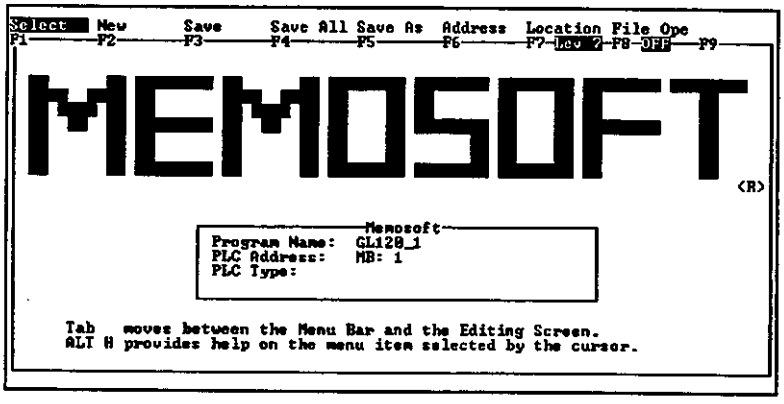
2) Since **Tools** is assigned to Function Key **F8** (check the combination of the item on the first line and FX on the second line), press the F8 Key.



3) The menu bar will switch to the Tools Submenu. Select **Files** from the submenu. Since **Files** is assigned to the F2 Key, press the F2 Key.



The menu bar will switch to the Files Submenu.



SUMMARY

f•1 to f•9	Select a menu. If there is a submenu, the menu display is switched.
SHIFT + f•1 to f•9	Display the explanation screen of the menu.
ESC	Returns control to the previous menu.

5.2.3 Using Quick Keys

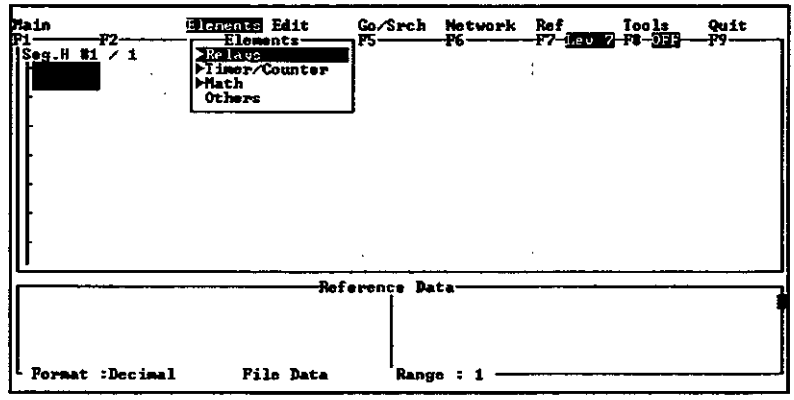
In MEMOSOFT, special keys are assigned to a frequently used menu items. The assignment of quick keys varies according to the editing screen currently being displayed. A list of quick keys that can be used on the current editing screen can be displayed on the screen using **Key Help** at **Info** in **Tools**.

In the following example, entry of an N.C. contact in a ladder program is executed by cursor operation, Function Key operation, and Quick Key operation.

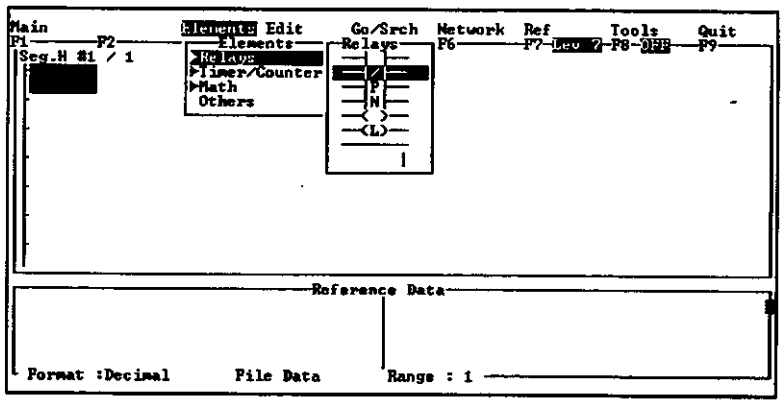
1. Cursor Key Operation

1) Switch to the menu cursor using the Tab Key.

2) Select **Relays** from the Elements Menu using the Cursor Keys, and then press the Enter Key.



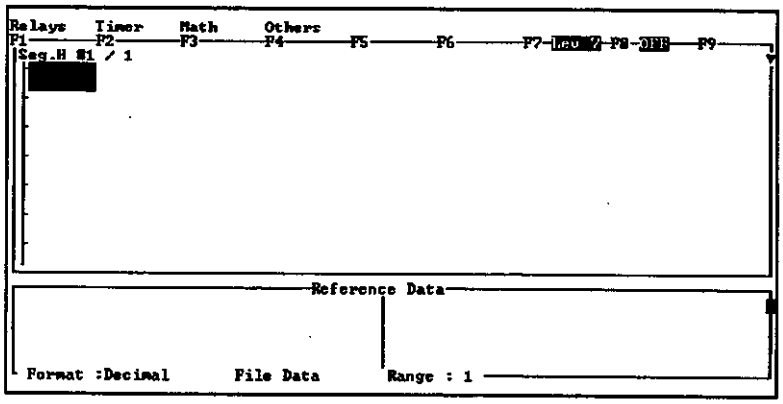
3) A submenu will be displayed. Select an N.C. contact using the Cursor Keys and press the Enter Key.



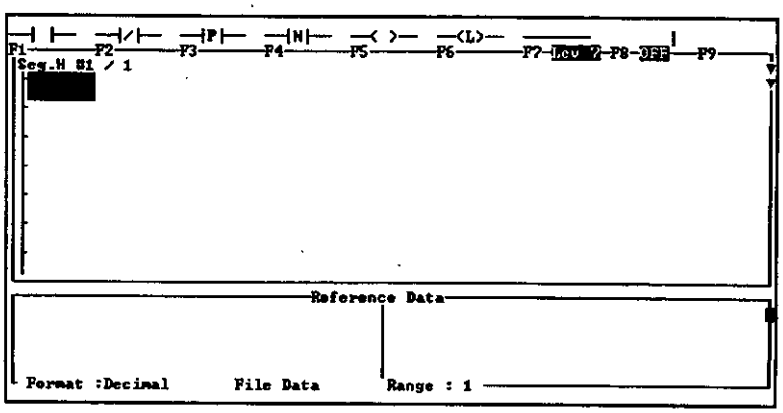
2. Function Key Operation

1) Since the F3 Key is assigned to **Element**, press the F3 Key.

2) The menu will switch to a submenu. Since the F1 Key is assigned to **Relay**, press the F1 Key.

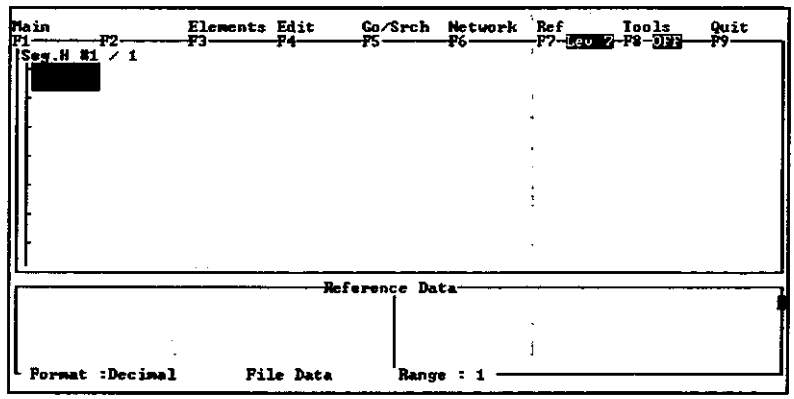


3) The Relay Menu will switch to the submenu. Since the F2 Key is assigned to an N.C. contact, press the F2 Key.



3. Quick Key Operation

An N.C. contact can be entered by the / Key or \ Key. In this example, press the / Key.



SUMMARY Features of these three operation methods are described below.

• Cursor Key Operation

Since menus are displayed in a tree structure, there is no confusion in terms of operation even if the menu structure is not remembered clearly. However, more key entries are required. This method is useful for the users who are not familiar with MEMOSOFT.

• Function Key Operation

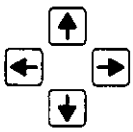
Less key entries are required than Cursor Key operation. However, since menu display changes, there may be some confusion in operation unless the menu structure is clearly understood. This method is suitable for users who are familiar with MEMOSOFT.

• Quick Key Operation

The least key entries are required compared to the other two methods. Although it is not necessary to memorize all the Quick Keys, it is convenient to memorize frequently used Quick Keys, such as relay, coil entries, and copy operation.

5.2.4 Summary of Key Operations

Basic key operations are summarized below.



Move the cursor.

TAB

Switches the editing screen cursor to the menu cursor.

Activates the selected menu item.

f•1 to f•9

Select a menu item.

SHIFT + f•1 ⋮ f•9

Display an item explanation screen.

f•10

Ends the current editing screen. This function is equivalent to selection of End from the menu.

ALT + H

Displays an explanation screen of the menu item or symbol to which the cursor is currently set.

ESC

Basically used to cancel a state as described below.

- **Cancelling Entries**
  If the Esc Key is pressed during entry of the data to which the cursor is set, the entry operation can be cancelled. As a result, the data is reset to that of the start of the entry.

- **Deleting System Messages**
  If the Esc Key is pressed when a message such as an entry error is displayed, the message is deleted.

- **Deleting a Help Screen**
  The Esc Key ends the help screen currently being displayed and returns control to the original editing screen.

- **Changing a Menu**
  If the Esc Key is pressed while a submenu is displayed, the submenu display is cleared and a menu one level higher is displayed.

- **Ending a Screen**
  If the Esc Key is pressed without any operation, the screen currently being displayed is exited.

INS

Switches the Insert/Overwrite Mode in comment editing, etc.

5.3 Programming Modes

This section describes the three programming modes used by MEMOSOFT.

5.3.1 Programming Modes

The following three programming modes are available in MEMOSOFT.

- Offline Mode
- Online Mode
- Debug Mode

The functions of each mode are as described below.

1) Offline Mode

This mode is used for programming on a personal computer only. Programs to be edited are stored on the hard disk or floppy disks of the computer. The MEMOSOFT editing operations can be fully utilized, but PLC operations and monitor functions cannot be used.

2) Online Mode

This mode is used to directly edit programs that are stored in the PLC by connecting the personal computer to the PLC. PLC operations and monitor functions can be used, however some of the program editing operations cannot be used. This mode is classified into the following two submodes depending on whether symbols and comments are displayed.

• PLC Internal Program Selection

Data is displayed from PLC internal programs only. Therefore, symbols and comments are not displayed.

• Program Selection

Data is displayed from PLC internal programs and symbol/comment data stored in the personal computer. Since the symbols are displayed, programs can be monitored more

easily than the PLC internal program selection submode. Symbols and comments can also be edited. Programs cannot be loaded in Online Mode.

3) Debug Mode

This mode is used to directly edit the programs that are stored in the PLC by connecting the personal computer with the PLC. However, program data that is stored in the personal computer can be changed concurrently with PLC internal programs.

When editing is started in this mode, the correspondence between the PLC internal programs and programs in the personal computer is checked. When a ladder program is edited subsequently, the data in the personal computer is also changed when the PLC internal data is changed. Therefore, when a change is made, data in the personal computer can be changed concurrently without having to load data from PLC to the personal computer.

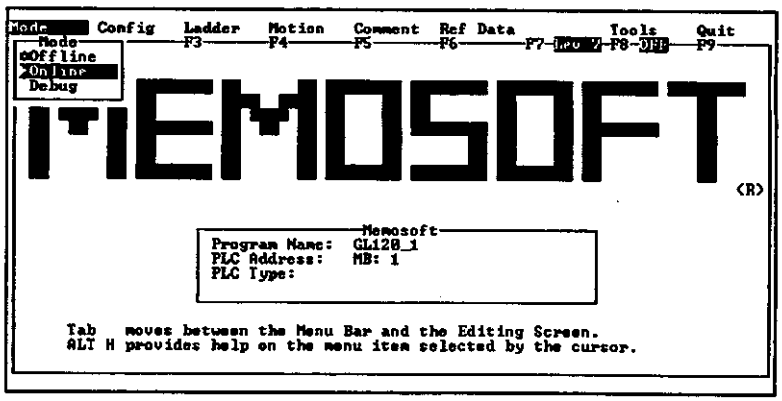
It is possible to select whether the change is to be saved in a personal computer file at the end of debugging.

Note Changes to ladder programs and other operations that change the CPU status cannot be performed while memory protection is ON. To perform these operations, first release memory protection by switching the CPU Module key switch position from P.ON to P.OFF.

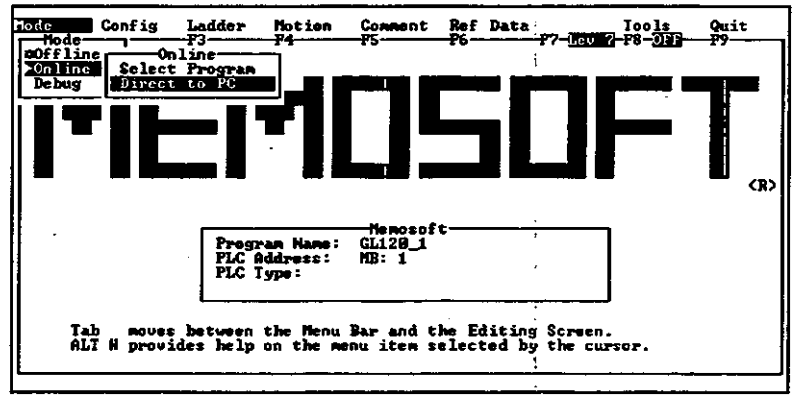
5.3.2 Switching Programming Modes

1. Switching from Offline to Online

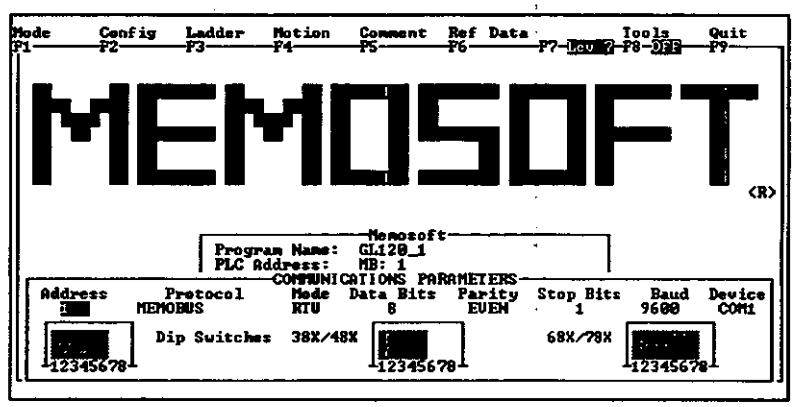
1) Select **Online** from the Mode Menu using the Cursor Keys and press the Enter Key.



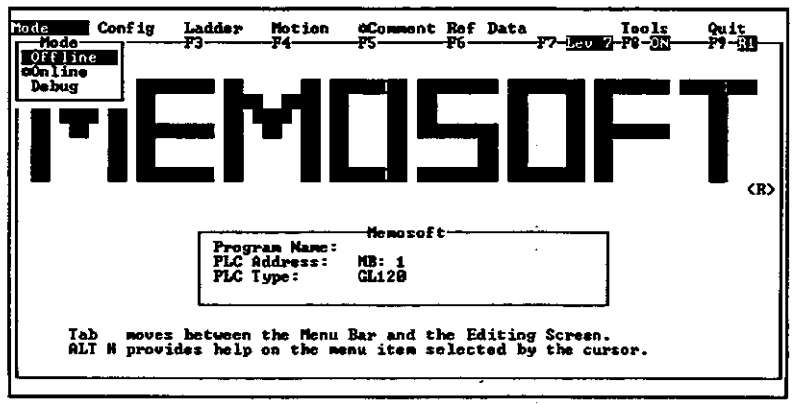
2) A submenu will be displayed. Select **Direct to PLC** using the Cursor Keys and press the Enter Key.



3) A communications parameters setting window will be displayed. When the Enter Key is pressed as indicated by the display, communications parameters are set as follows: (PLC) Address 1; MEMOBUS Protocol; RTU Mode; 8 Data Bits; even Parity; 1 Stop Bit; and a baud rate of 9,600. If different PLC communication parameters are to be set, select them within the selection window using the Cursor Keys. See chapter *17.2 File Operations* for details.



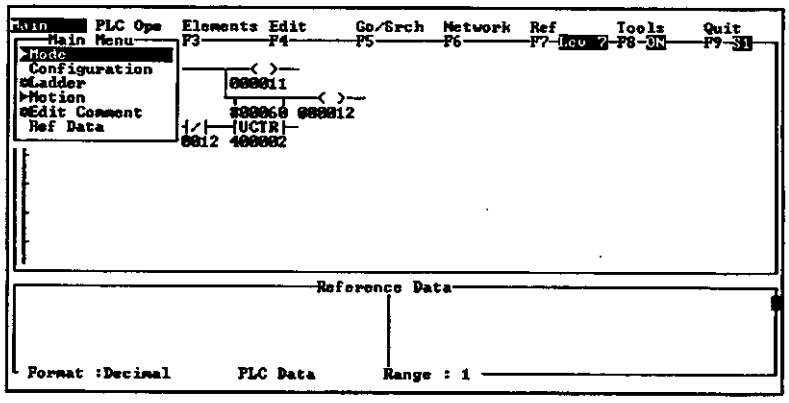
4) The mode will switch to Online Mode. Verify that the programming mode in the top-right corner of the screen indicates Online Mode.



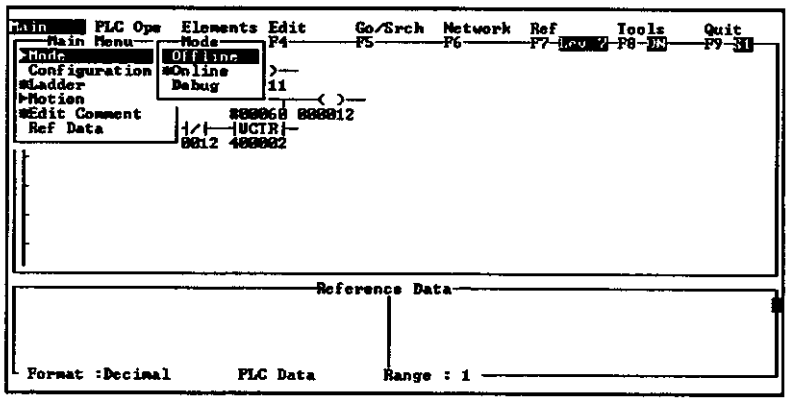
2. Switching from Online to Offline

1) Switch to the menu cursor using the Tab Key.

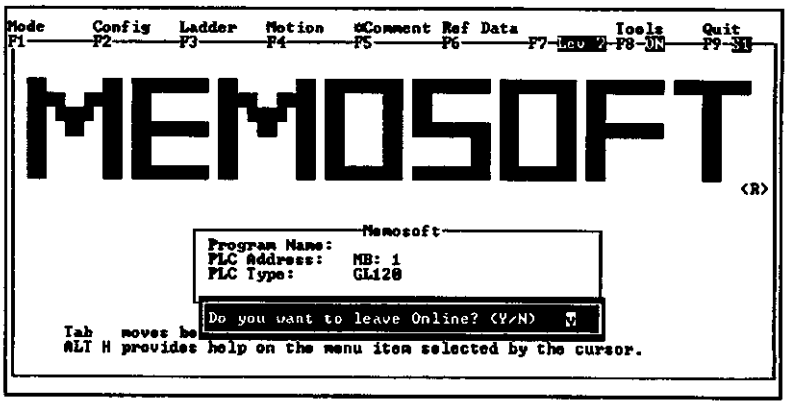
2) Select **Mode** from the Main Menu using the Cursor Keys and press the Enter Key.



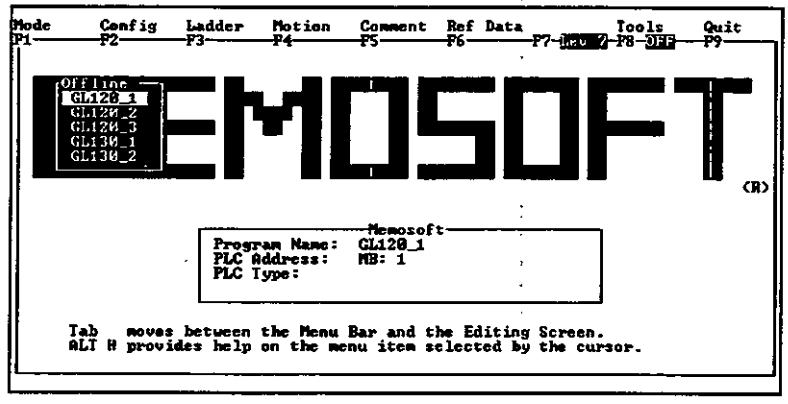
3) A submenu will be displayed. Select **Offline** using the Cursor Keys and press the Enter Key.



4) The initial screen will be displayed and a confirmation message will appear. Enter **Y** and press the Enter Key.



5) Select the name of the file to be edited in Offline Mode using the Cursor Keys and press the Enter Key.



The mode will switch to Offline Mode.

5.4 Environmental Settings

This section describes the environmental settings when editing ladder programs in MEMOSOFT.

Setting Reference Display

Set whether reference numbers are displayed in numeric digits or alphabetic characters. This setting relates to display only and reference numbers of ladder programs can be entered in either numeric digits or alphabetic characters. The correspondence of these references is shown below.

	Numeric Display	Alphabetic Display
Coil	0××××××	O××××××
Input relay	1××××××	I××××××
Input register	3××××××	Z××××××
Holding register	4××××××	W××××××
Constant register	7××××××	K××××××

By default, the display is set to Numeric. By memorizing the first character of alphabetic display, the following abbreviated input can be performed. This can be done regardless of the display.

• Entering a Reference Number of Input Relay

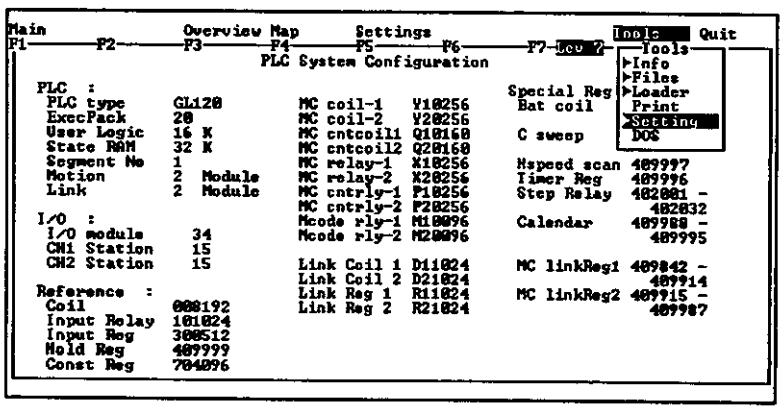
Normal input: Enter 100010
Abbreviated input: Enter I10

• Entering a Reference Number of a Holding Register

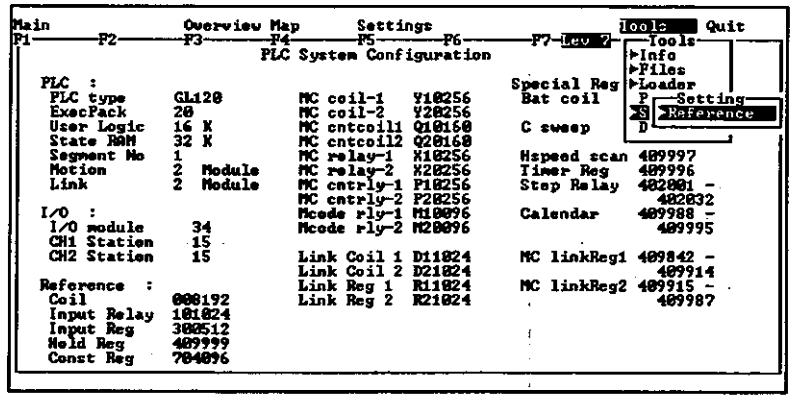
Normal input: Enter 400001
Abbreviated input: Enter W1

Switching operation is shown below.

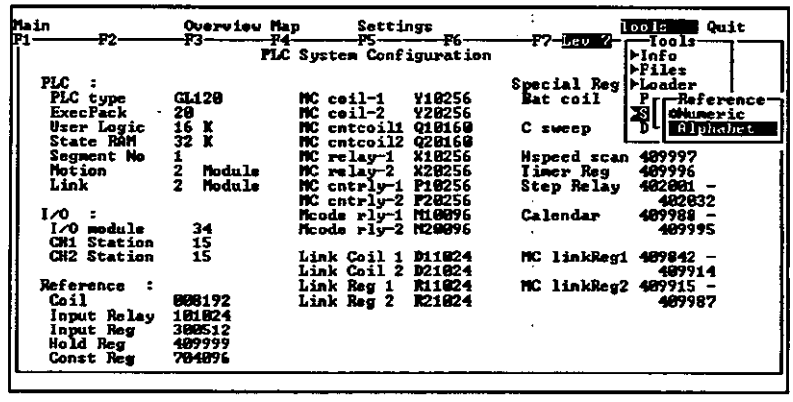
1) Select **Setting** from the Tools Menu using the Cursor Keys and press the Enter Key.



2) A submenu will be displayed. Select **Reference** and press the Enter Key.



3) A selection menu will be displayed. Select **Alphabet**.



The reference number display on the system configuration screen or a ladder program screen will be switched to alphabetic display.

PLC Operations

6

This chapter describes PLC operations such as starting and stopping the PLC, and sweep setting operations.

6.1 Overview of PLC Operations

This section describes the PLC Operation Menu. See section *6.2 PLC Start/Stop* and subsequent sections for each operation procedure.

The PLC Operation Menu is used to start and stop PLC operation and to set operating parameters for the PLC, such as the sweep operation. The following items are available. This menu cannot be displayed in Offline Mode.

1) Start

Start is used to start the PLC. If the PLC is already in RUN State, this item cannot be selected.

2) Stop

Stop is used to stop the PLC. If the PLC is already stopped, this item cannot be selected.

3) Sweep

Sweep enables the sweep operations. The following three sweep operations are available. Only Constant Sweep can be selected while the PLC is stopped.

- Single Sweep: PLC is operated for one scan only.
- HS Single Sweep: A high-speed scan is operated for one scan only.
- Constant Sweep: The scan time is fixed to the specified period.

4) State Display

The ladder program state display method can be set.

- Power flow
- State flow
- No flow

5) PRG Clear

PRG Clear is used to clear the ladder programs that are stored in PLC. This item cannot be selected when the PLC is in RUN State.

6) Set Clock

The data of the calendar in the personal computer is written to the calendar of PLC. This item cannot be selected when the PLC is stopped.

The PLC Operation Menu can be selected when any of the following screens are displayed. However, the items that are displayed varies according to the display screen.

- **System Configuration Display**
  - Start
  - Stop
  - Set Clock
- **Segment List/Segment State Display**
  - Start
  - Stop
  - Sweep
  - State Display
  - PRG Clear
  - Set Clock
- **Ladder Program Display**
  - Start
  - Stop
  - Sweep
  - State Display
- **Reference Data Display**
  - Start

- Stop
- Sweep
- State Display

The following items cannot be selected when the PLC is in any of the specified states.

- **PLC in STOP State**
  - Stop
  - Sweep methods other than a Constant Sweep
  - Set Clock
- **PLC in RUN State**
  - Start
  - PRG Clear

6.2 PLC Start/Stop

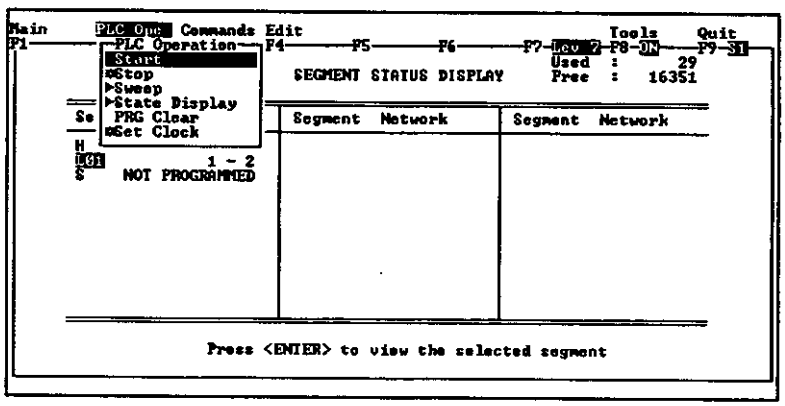
This section describes how to start and stop the PLC from MEMOSOFT.

6.2.1 PLC Start

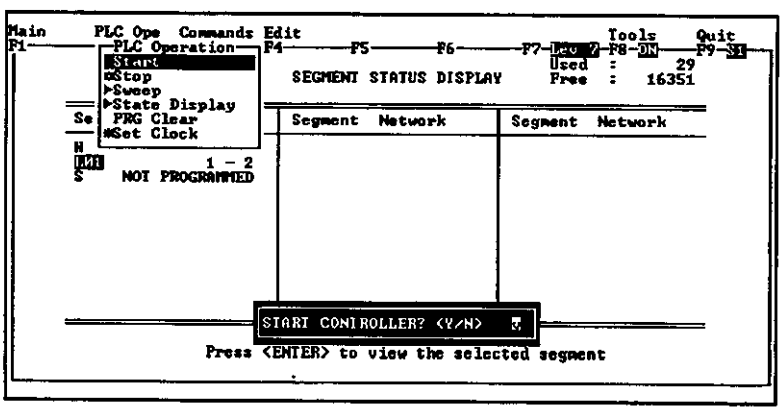
Use the following procedure to start the PLC from MEMOSOFT. In the following example, the GL120 is used.

1) Switch to the menu cursor using the Tab Key.

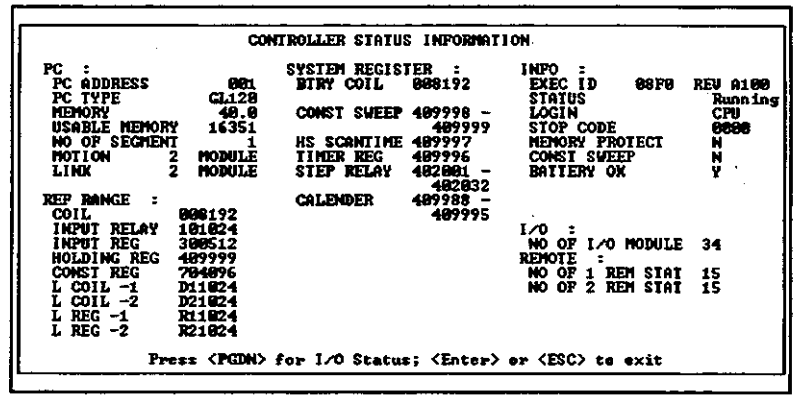
2) Select **Start** from the PLC Operation Menu using the Cursor Keys and press the Enter Key.



3) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



4) The following control status information will be displayed. Verify that the status in the top-right hand corner is displayed as Running. Press the Esc Key or the Enter Key to go back to the original screen.

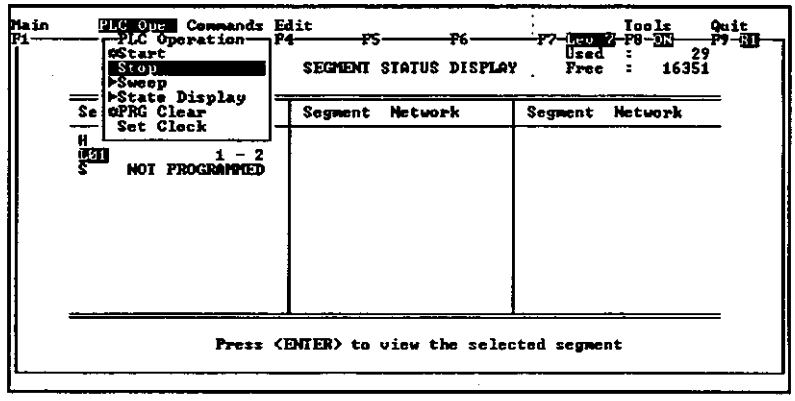


6.2.2 PLC Stop

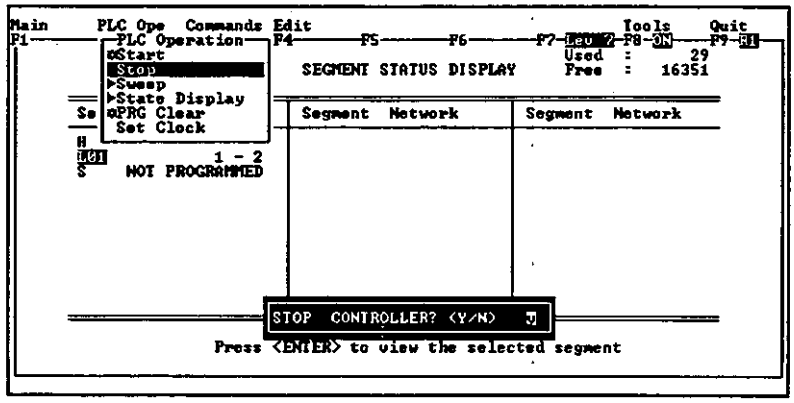
The PLC can be stopped from MEMOSOFT by the following operations:

1) Switch to the menu cursor using the Tab Key.

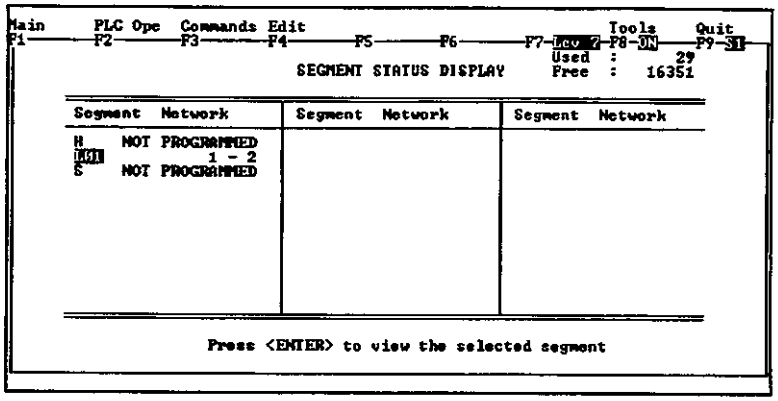
2) Select **Stop** from the PLC Operation Menu using the Cursor Keys and press the Enter Key.



3) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The PLC will stop.



6.3 Sweep Operation

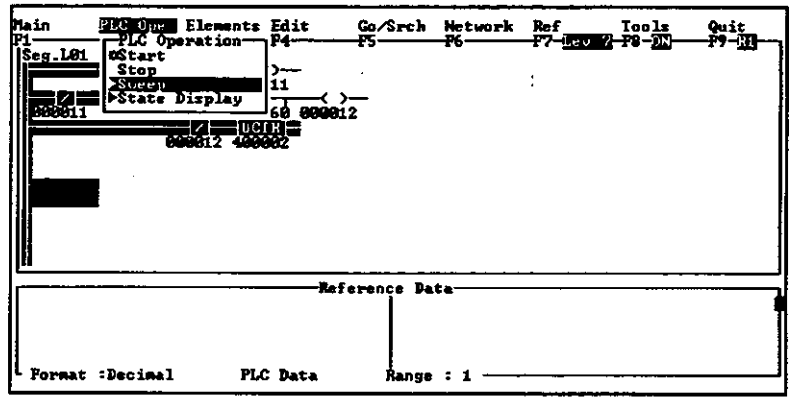
This section describes PLC sweep operations such as Single Sweep and Constant Sweep.

6.3.1 Single Sweep

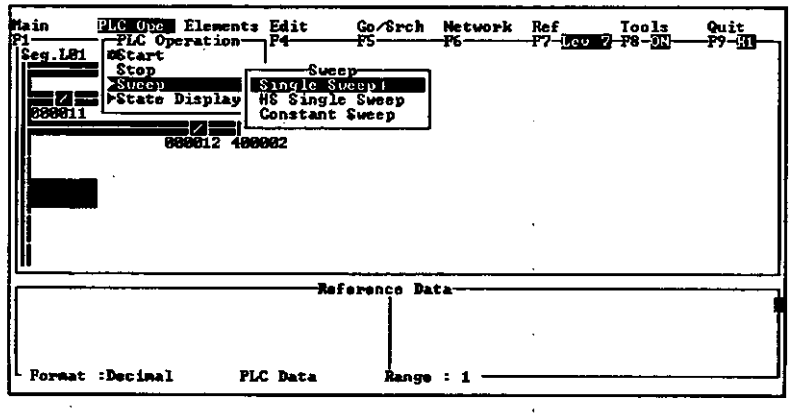
Use the Single Sweep operation for debugging ordinary segments. If Single Sweep is executed while the PLC is in RUN State, normal segments will be executed for each scan. I/O services and ladder program solving are executed for one scan. This operation can be selected only when the PLC is in RUN State.

1) Switch to the menu cursor using the Tab Key.

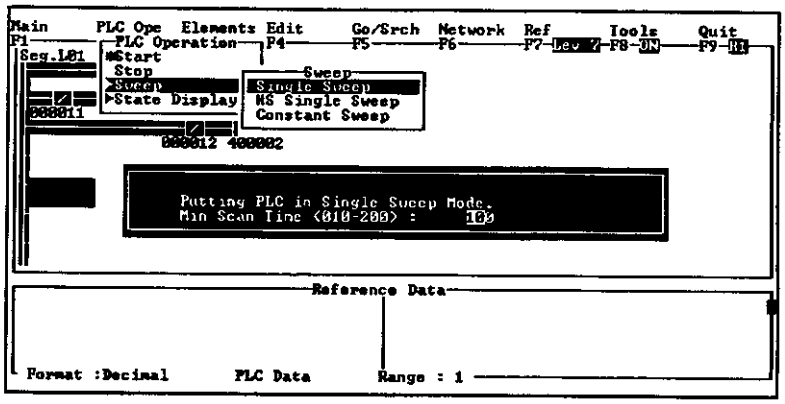
2) Select **Sweep** from the PLC Operation Menu using the Cursor Keys and press the Enter Key.



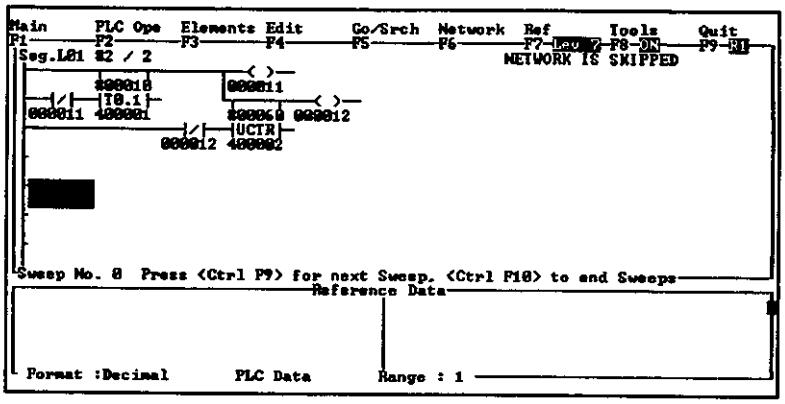
3) A submenu will be displayed. Select **Single Sweep** using the Cursor Keys and press the Enter Key.



4) The minimum scan time setting screen will be displayed. Enter a minimum scan time (**100** in this example) within the specified range.



5) The PLC will stop and a single sweep can be executed. Press the F9 Key while holding down the Ctrl Key to execute normal segments for one scan.



CTRL + f•9 Runs PLC for one scan only.

CTRL + f•10 Ends the Single Sweep Mode.

6

TERMS

Minimum Scan Time

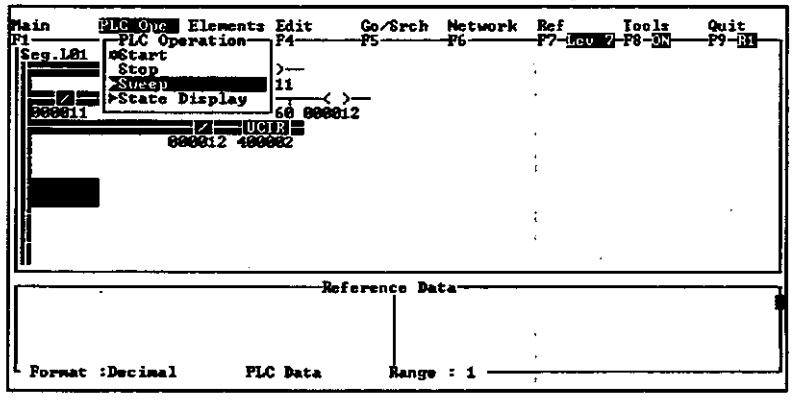
The minimum scan time is the period that is temporarily set as the execution period for one scan. When timers are used in a ladder program, execution is performed as if timer counts up consecutively for this setting. Set a value close to the actual scan time. The value can be set in 10 ms units only.

6.3.2 High-speed Single Sweep

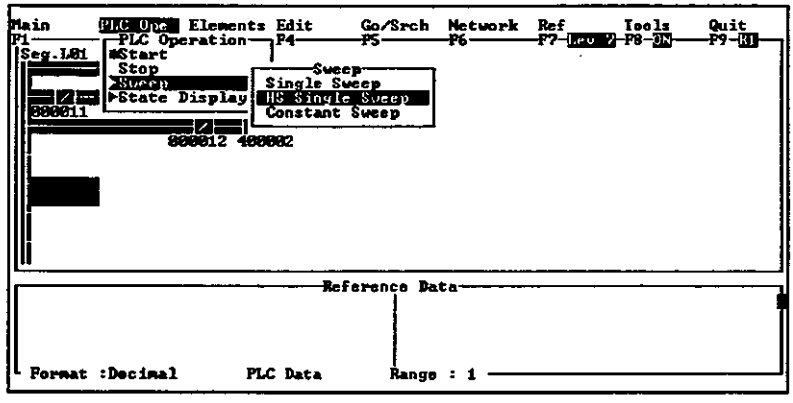
Use the High-speed Single Sweep function for debugging high-speed segment. By executing high-speed single sweeps while the PLC is in RUN State, high-speed segment can be executed for each scan. I/O services and ladder program solving are executed for one scan. Normal segments are not solved. This operation can be selected only when the PLC is in RUN State.

1) Switch to the menu cursor using the Tab Key.

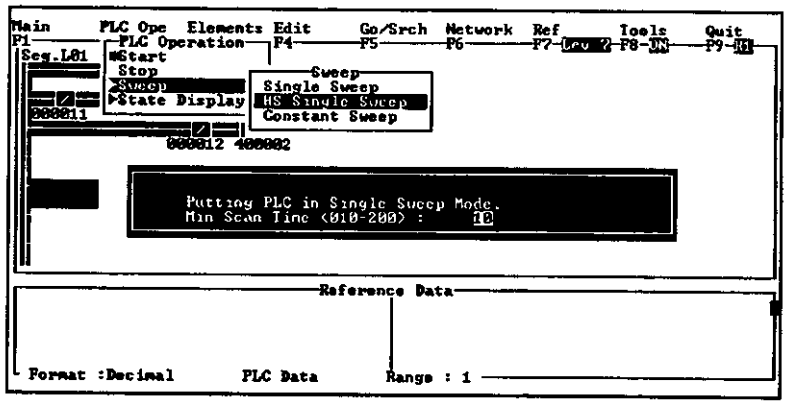
2) Select **Sweep** from the PLC Operation Menu using the Cursor Keys and press the Enter Key.



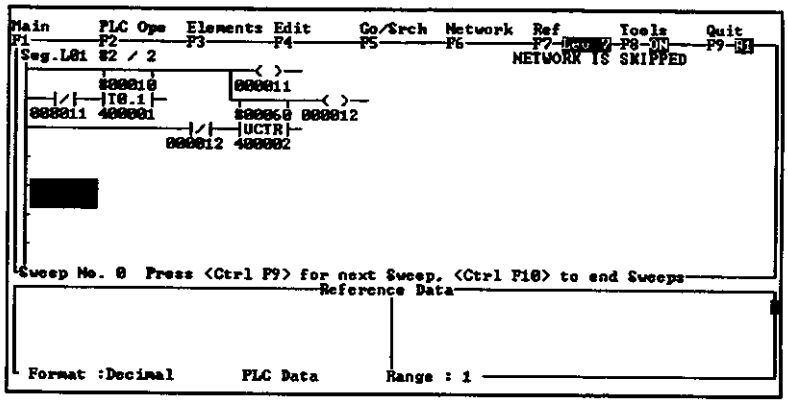
3) A submenu will be displayed. Select **HS Single Sweep** using the Cursor Keys and press the Enter Key.



4) The minimum scan time setting screen will be displayed. Enter a minimum scan time (**10** in this example) within the specified range and press the Enter Key.



5) The PLC will stop and single sweeps can be executed. Press the Ctrl + F9 Keys to execute ordinary segments for one scan.



CTRL + f•9 Runs PLC for one scan only.

CTRL + f•10 Ends the High-speed Single Sweep Mode.

6

TERMS

Minimum Scan Time

The minimum scan time is the period that is temporarily set as the execution period for one scan. When timers are used in a ladder program, execution is performed as if timer counts up time consecutively for this setting. Set a value close to the actual scan time. The value can be set in 10 ms units only.

6.3.3 Constant Sweep

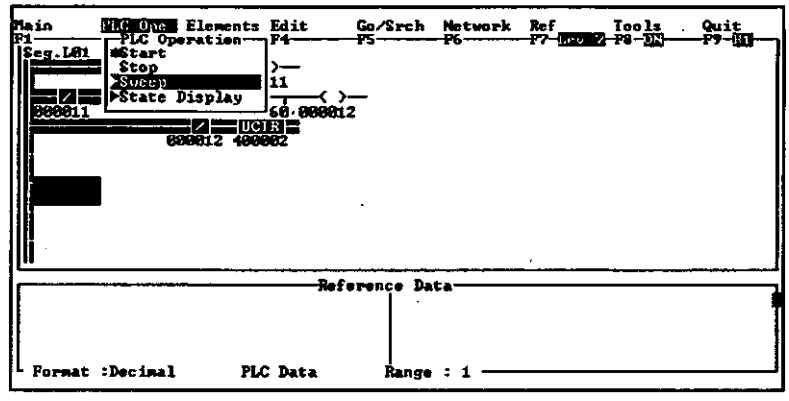
The Constant Sweep function enables operation with a constant scan time by setting a target value for the scan period. The target value must be greater than the actual scan time within the range from 10 to 200 ms in 10 ms units. Constant sweep operation uses the following two registers.

409998: Target value that was set
409999: Time required for actual scan processing
(Unit: ms, however, the value changes every 10 ms)

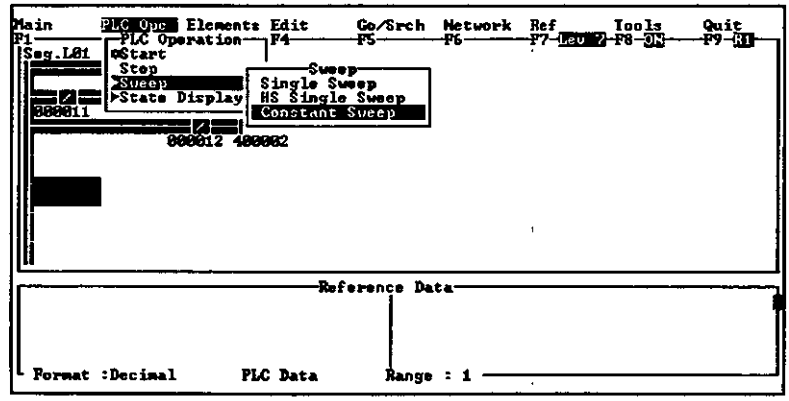
The registers to be used can be changed using the system configuration screen. See chapter *7 Setting System Configuration* for details.

1) Switch to the menu cursor using the Tab Key.

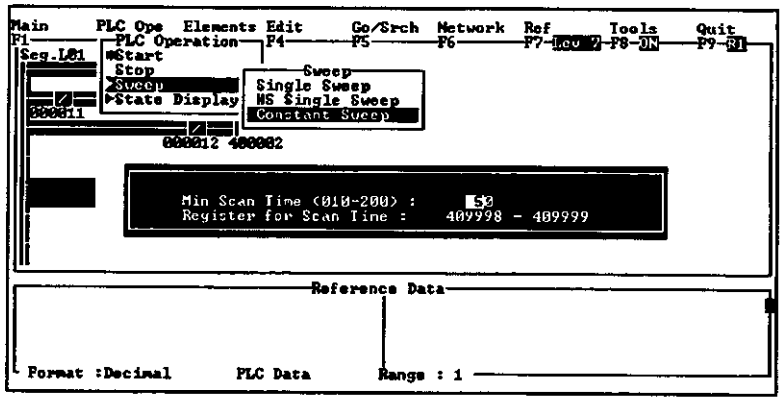
2) Select **Sweep** from the PLC Operation Menu using the Cursor Keys and press the Enter Key.



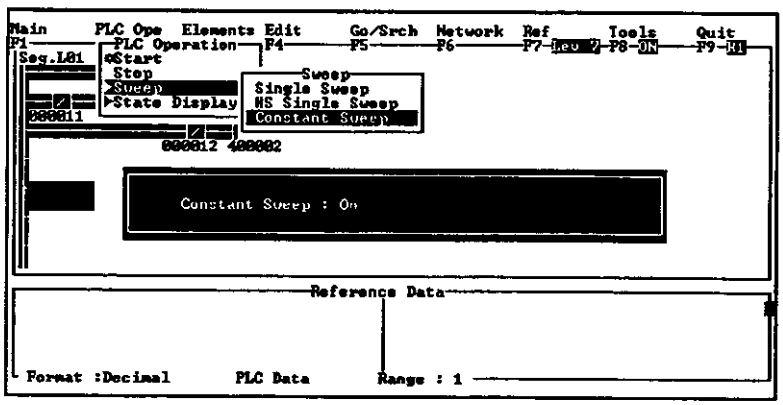
3) A submenu will be displayed. Select **Constant Sweep** using the Cursor Keys and press the Enter Key.



4) Enter a scan time (**50** in this example) set value and press the Enter Key.



5) The constant sweep status will be displayed. Press the Enter Key.



INFO

1) If the target value that was set is less than the actual scan time, the target value will be ignored.

2) To cancel Constant Sweep operation, select **Constant Sweep** again. Constant sweeps can also be set or canceled on the segment scheduler screen of the system configuration. See chapter *7 Setting System Configuration* for details.

3) When both the Constant Sweep and Single Sweep operations are selected at the same time, Single Sweep operation is performed. When Single Sweep operation ends, Constant Sweep operation is performed.

6.4 State Display Change

This section describes changing the operations of state display modes, such as Power Flow and State Flow Modes.

6.4.1 State Display Mode

The following three types of state display are available for monitoring ladder programs on MEMOSOFT.

• Power Flow Display

This mode is set at PLC initialization. The section up to the point at which power is conducted from the power rails is highlighted on the display.

• State Flow Display

All the contacts in the ON state are highlighted on the display regardless of power flow from the power rails. This display is useful for testing operation.

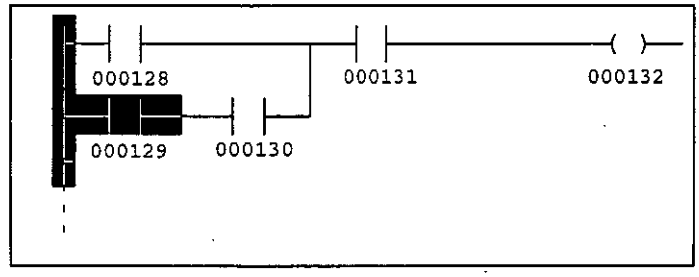
• No Flow Display

ON/OFF displays for contacts are not performed.

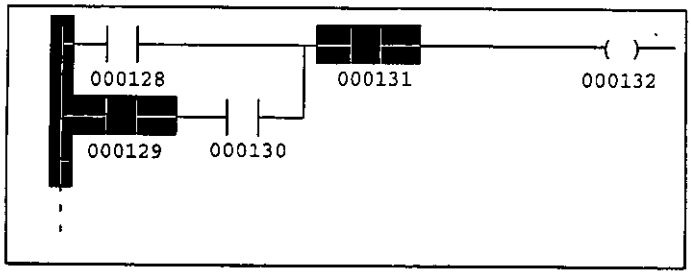
The differences between Power Flow and State Flow are shown below. The coil statuses are as follows:

Reference	Status	Reference	Status
000128	OFF	000130	OFF
000129	ON	000131	ON

• Power Flow



• **State Flow**



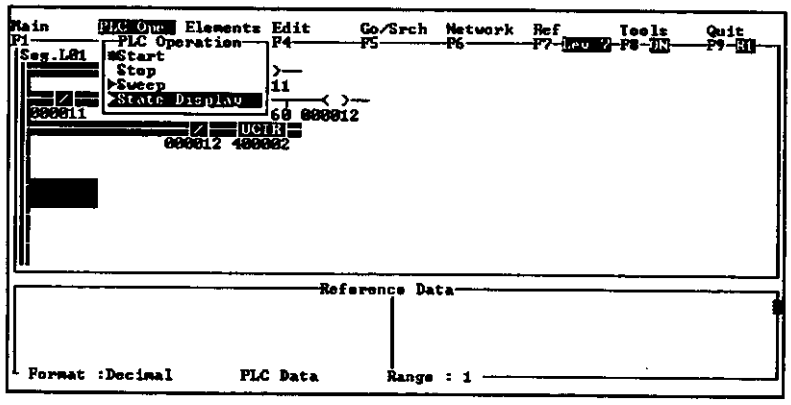
INFO The Power Flow Display is very useful for debugging. The scan time, however, will increase slightly in comparison to that of the State Flow Display or No Flow Display. Select State Flow Display to keep the scan time from fluctuating excessively.

6.4.2 Changing to State Flow

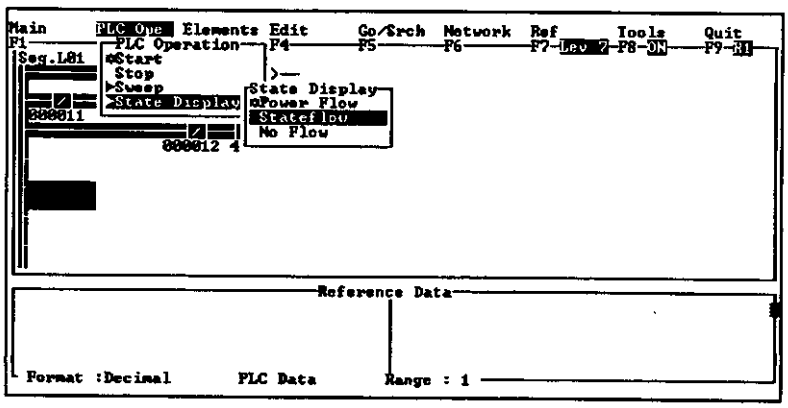
At initialization, the state display is set to the Power Flow Display. This section shows how to change to the State Flow Display using an example.

1) Switch to the menu cursor using the Tab Key.

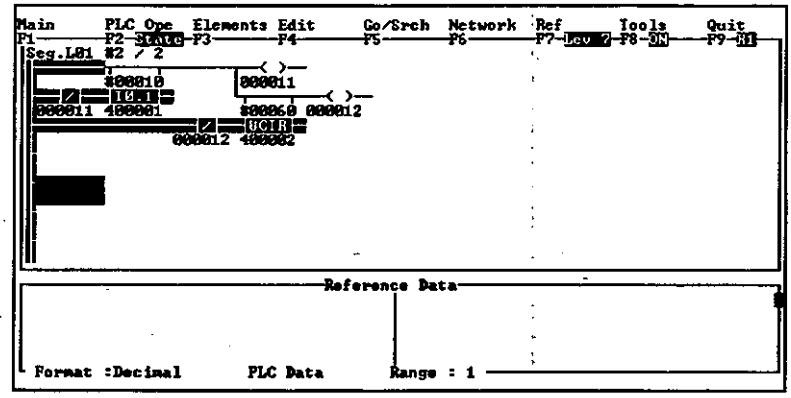
2) Select **State Display** from the PLC Operation Menu using the Cursor Keys and press the Enter Key.



3) A submenu will be displayed. Select **State Flow** using the Cursor Keys and press the Enter Key.



The ladder program state display will be changed to State Flow.



INFO When display is changed to State Flow, "State" will be displayed between F2 and F3 on the second line from the top of the screen.

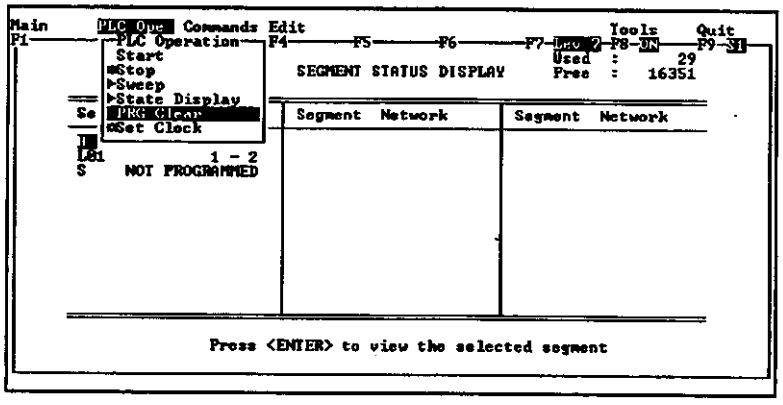
6.5 Program Clear

This section describes the Program Clear operation for ladder programs.

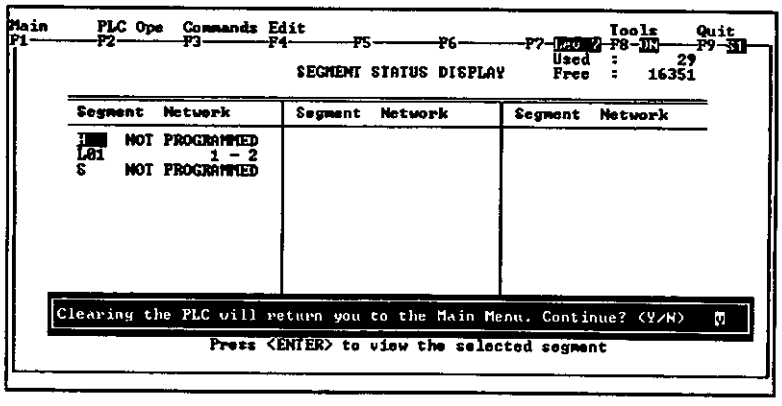
Use this operation to clear the contents of ladder programs and various registers that are stored in the internal memory of the PLC. This operation cannot be selected unless the PLC is stopped. Utmost care is necessary in this operation since the operation clears data from the PLC.

1) Switch to the menu cursor using the Tab Key.

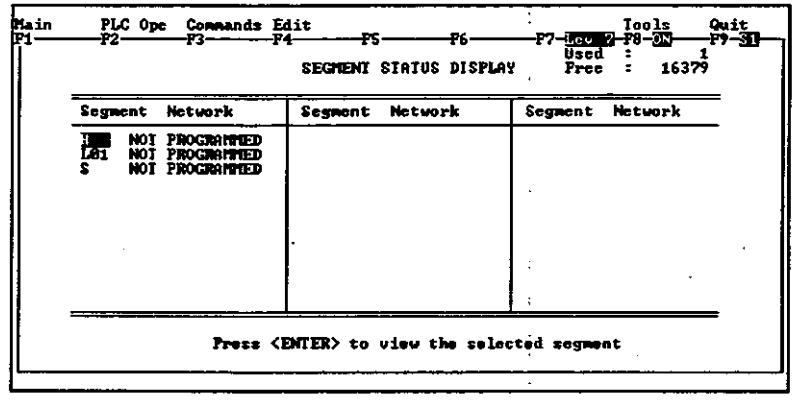
2) Select **PRG Clear** (Program clear) from the PLC Operation Menu using the Cursor Keys and press the Enter Key.



3) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The ladder programs and register data will be cleared.



INFO This function can be selected from the Segment Status Display or Segment List Display Screen.

6.6 Setting Clock

This section describes the procedure for setting the calendar built into the PLC from the calendar data of a personal computer.

6.6.1 Setting the Personal Computer Hardware Clock

This operation enables the calendar data in the personal computer to be stored in the hardware clock of the PLC. Therefore, it is necessary to set the clock in the personal computer accurately using the following procedure. If the clock has been accurately set beforehand, it is not necessary to set it again.

1) To set the date, enter **DATE** and press the Enter Key.

```
C:>DATE
```

2) The date which is currently set will be displayed. In the following example the new date is 1 April, 1997. To enter the new date, enter **04-01-97** and press the Enter Key.

```
C:>DATE
Current date is Mon 03-31-1997
Enter new date (mm-dd-yy):04-01-97
```

The date setting is now complete.

3) Next, set the time. Enter **TIME** and press the Enter Key.

```
C:>TIME
```

4) The time which is currently set will be displayed. In the following example the new time is 1:20 pm. To enter the new time, enter **13:20:00** and press the Enter Key.

```
C:>TIME
Current time is 8:38:30.95p
Enter new time:13:20:00
```

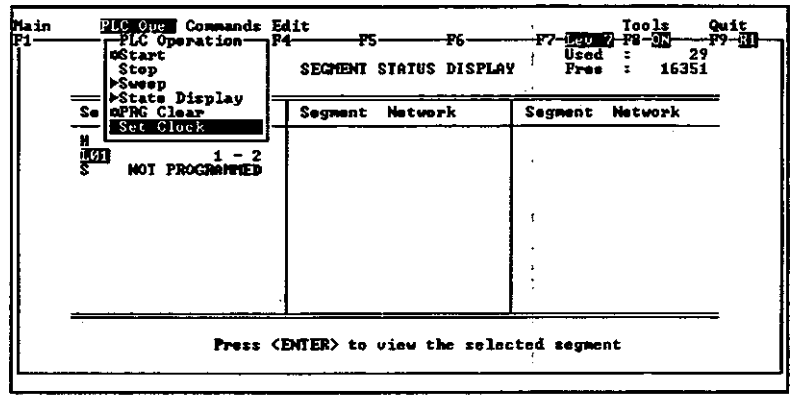
The time setting is now complete.

6.6.2 Setting the PLC Hardware Clock

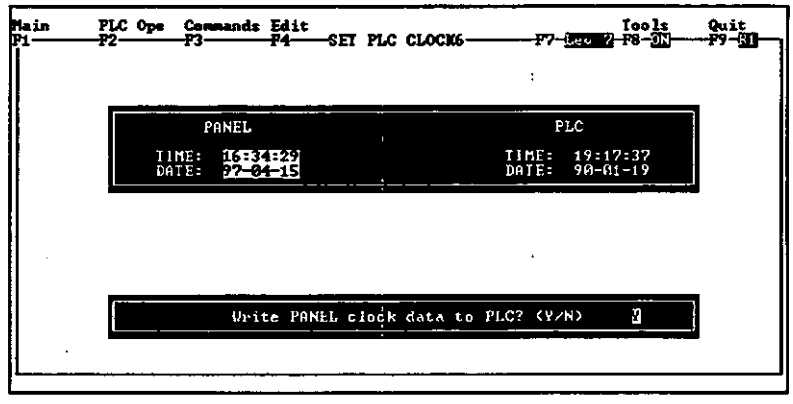
The PLC hardware clock is set when the PLC is in RUN State. If the PLC is stopped, start the PLC.

1) Switch to the menu cursor using the Tab Key.

2) Select **Set Clock** from the PLC Operation Menu using the Cursor Keys and press the Enter Key.



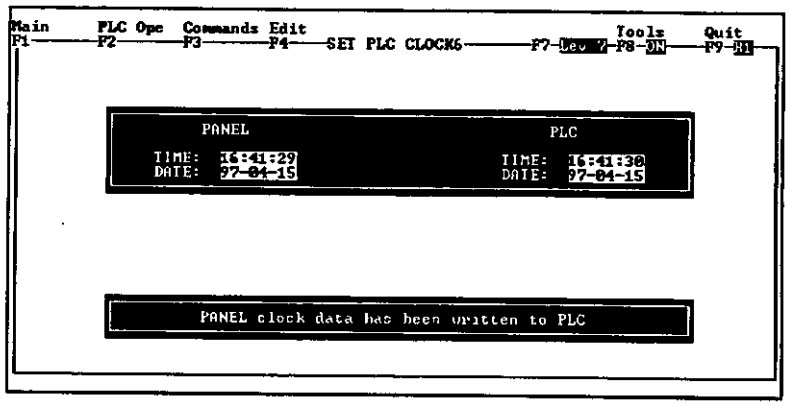
3) The Set PLC Clock Screen will be displayed. Verify the calendar data of the personal computer and press the Enter Key.



Directly Inputting the PLC Hardware Clock Settings

When the **Write PANEL clock data to PLC? (Y/N)** message appears, select **N** to directly input the PLC time and date settings from the keyboard.

4) The calendar data of the personal computer will be stored in the PLC. Press the Esc Key or the Enter Key to reset to normal operation.



Setting System Configuration

7

This chapter describes setting the system configuration and settings, and how to set constant sweep operation.

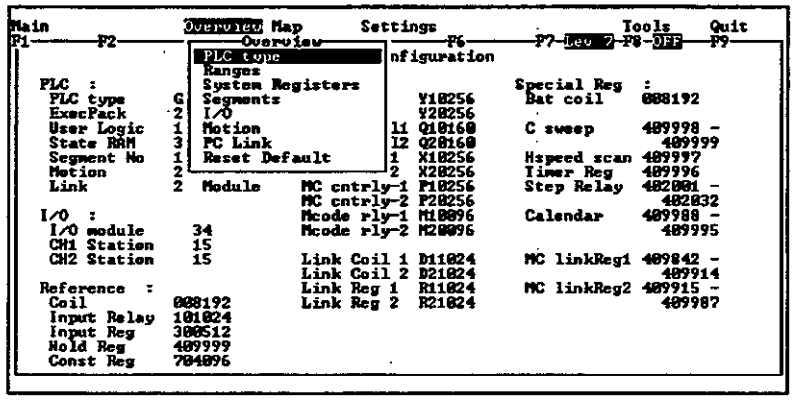
7.1 Setting the System Overview Table

This section describes how to set the system overview table to select the type of PLC and other settings.

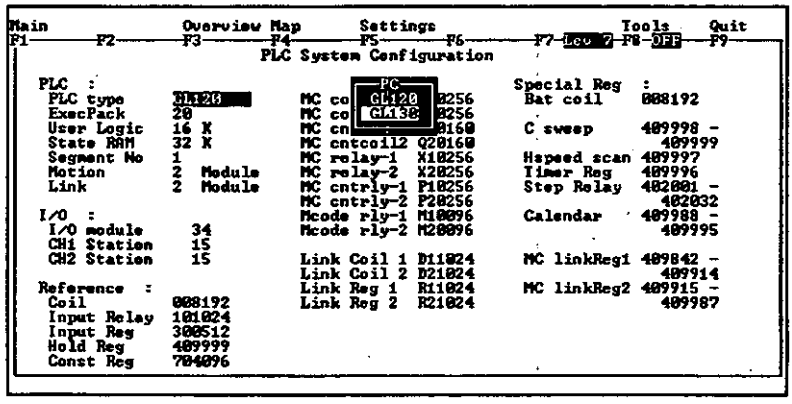
7.1.1 Setting the PLC Type

MEMOSOFT is a programming tool that supports a number of PLCs, such as the MEMOCON GL120 and GL130. Therefore, when a new program is developed, the PLC must be set. The GL120 is set by default. An example of setting to the GL130 is shown below.

1) Select **PLC Type** from the Overview Menu in the PLC System Configuration Screen using the Cursor Keys and press the Enter Key.



2) The PLC type selection window will be displayed. Select **GL130** using the Cursor Keys and press the Enter Key.



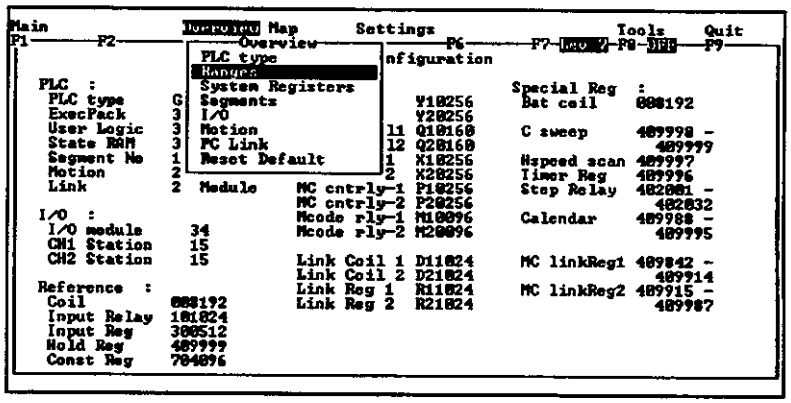
The PLC type will be set to the GL130.

7.1.2 Setting Reference Ranges

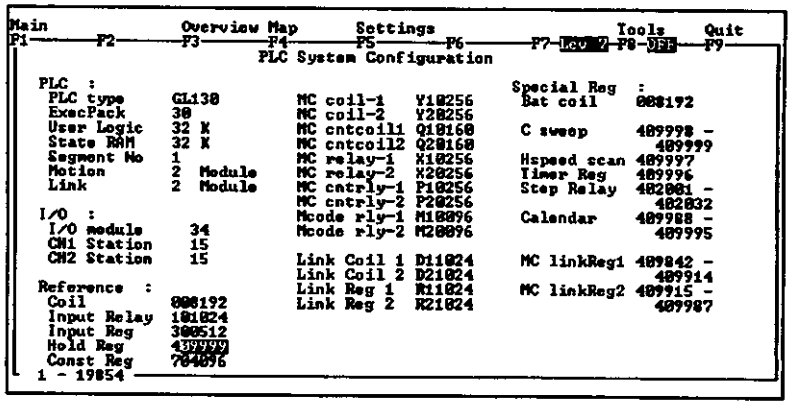
The range of usable reference numbers is initialized according to the type of PLC. These numbers can be set freely from MEMOSOFT within the memory range of the PLC used. For instance, to develop a program that requires a large number of holding registers, extra registers can be moved from constant registers. Usually, the default reference ranges are sufficient for developing programs. Therefore, change the ranges only when registers are insufficient.

The following examples show the operations used to move holding resisters from the constant registers.

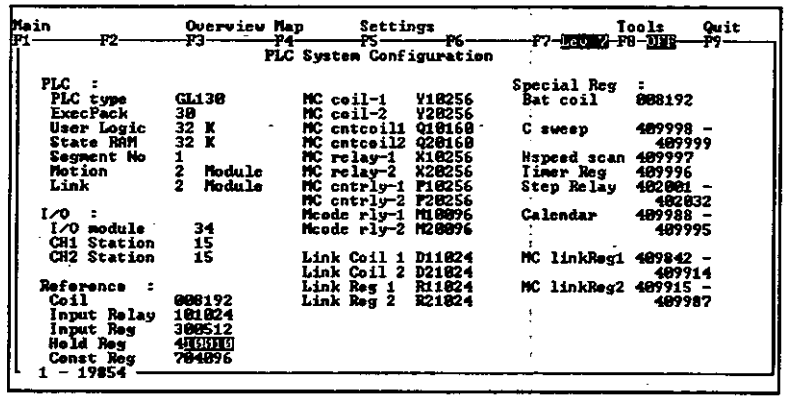
1) Select **Ranges** from the Overview Menu using the Cursor Keys and press the Enter Key.



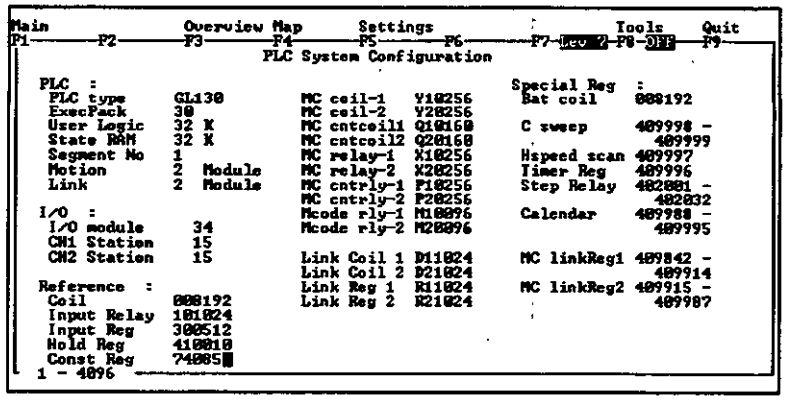
2) The cursor will move to the reference range position. Move the cursor to the **Hold Reg** (Holding Register) position using the Cursor Keys.



3) Set the number of holding registers. The following example will increase the number by 11 registers to 10010. Enter **10010** and press the Enter Key.



4) The cursor will move to the constant registers after the holding registers have been increased. This example is showing the movement of constant registers, so the number of constant registers is reduced by 11 registers from 4096 to 4085. Enter **4085** and press the Enter Key.



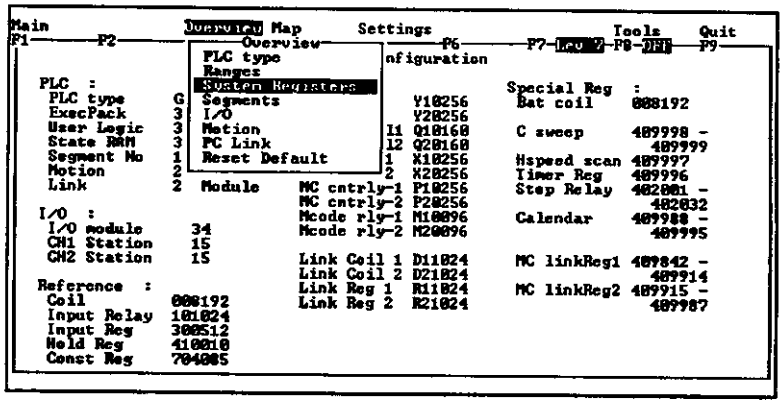
The reference ranges will be changed. If the data that was entered exceeds the setting range, the value will be reset to original value.

INFO The reference ranges that can be set vary according to the PLC type and model. See the related PLC user's manual for details.

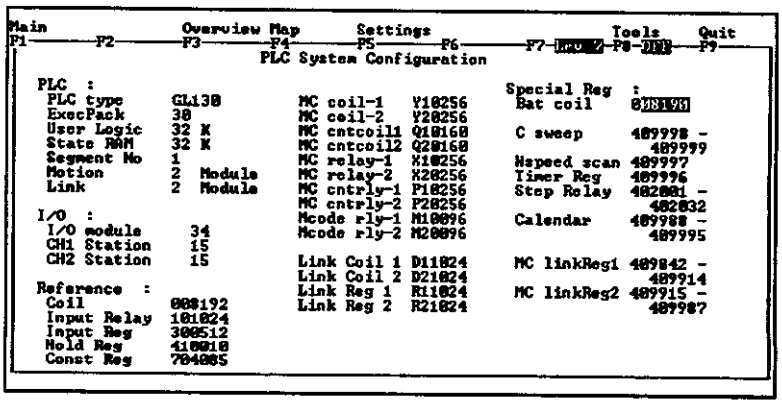
7.1.3 Setting System Registers

System coils and system registers, such as the battery coil and calendar, are assigned to specific reference numbers by default. To change these reference numbers, use the following procedure.

1) Select **System Registers** from the Overview Menu using the Cursor Keys and press the Enter Key.



2) Change the reference number of the battery coil. In this example, enter **8190** and press the Enter Key. If no change is necessary, move the cursor to the next position using the Enter Key or the Cursor Keys.

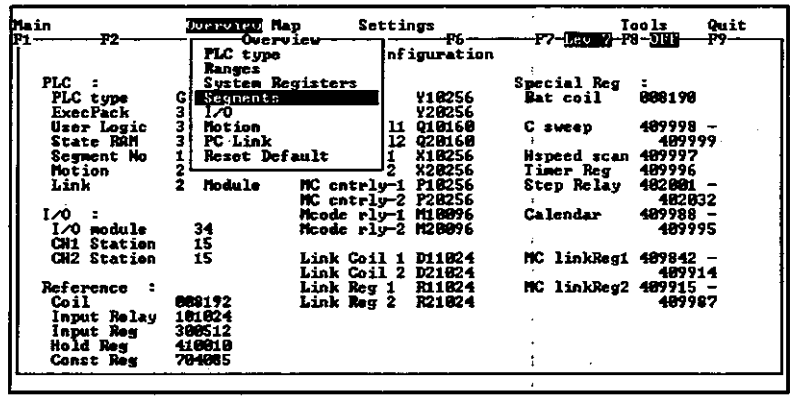


3) Change other registers, such as the timer register, using the same procedure.

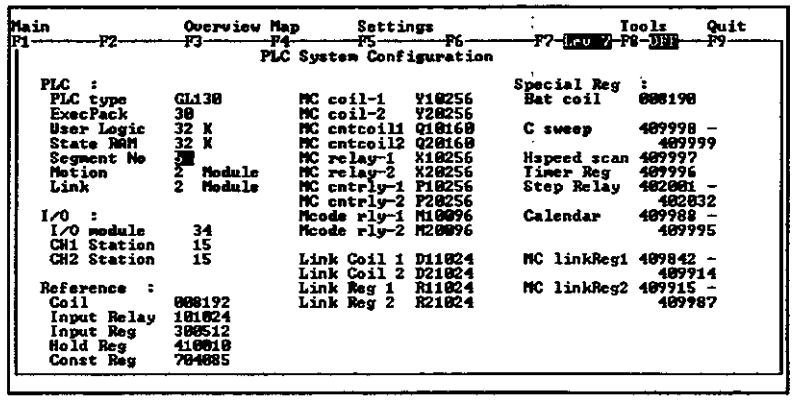
7.1.4 Setting Segments

Use this function to set the number of segments excluding the high-speed segment and subroutine segment. Set the number of normal segments within a range from 1 to 30.

1) Select **Segments** from the Overview Menu using the Cursor Keys and press the Enter Key.



2) The cursor will move to the normal segment setting. In this example, enter **5** as the number of normal segments and press the Enter Key.

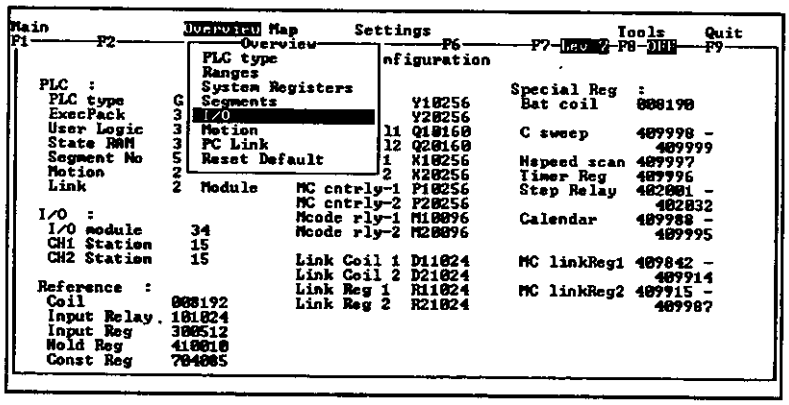


IMPORTANT If the number of normal segments is changed when a network is stored in the segments, the network positions will shift. Therefore, this operation must not be performed after network have been stored.

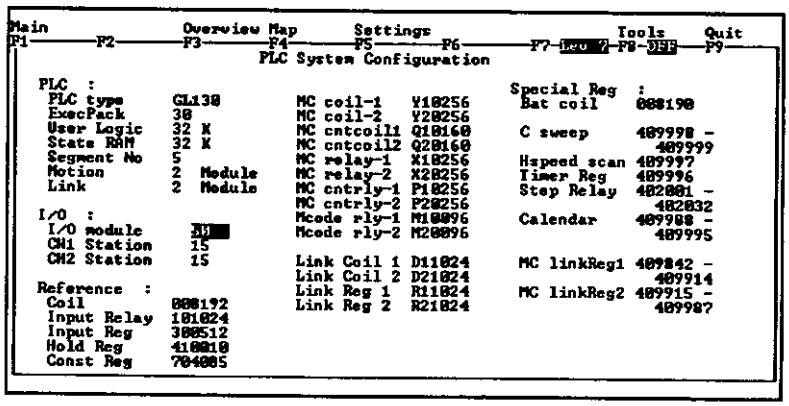
7.1.5 Setting I/O Modules

Set the number of I/O Modules to be used. When using remote stations, also set the number of stations for each channel.

1) Select **I/O** from the Overview Menu using the Cursor Keys and press the Enter Key.



2) The cursor will move to the position for the number of I/O Modules. Set the number of I/O Modules (**50** in this example) using the Cursor Keys and press the Enter Key.



3) Set the number of channels for each station. When no changes are required, simply press the Enter Key.

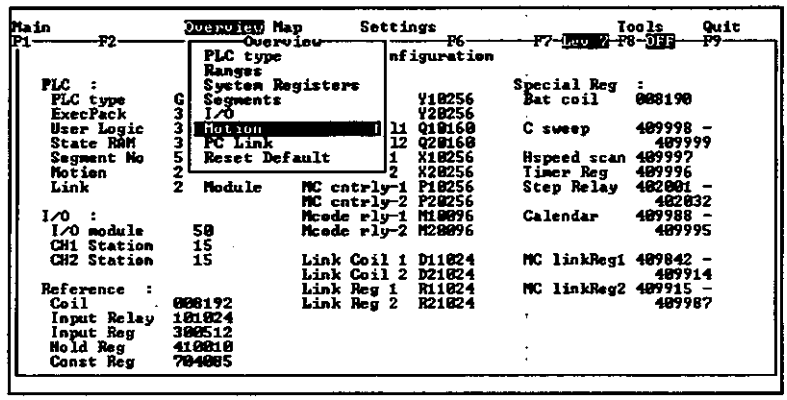
INFO The setting of the number of I/O Modules is not an absolute limit, i.e., the actual number of I/O Modules that can be allocated will be somewhat higher than the set value. The number of I/O Modules can be changed only in Offline Mode. To change the program stored in the PLC, save the program on the personal computer first, change the setting of the number of I/O Modules, and then reload the program from the personal computer to the PLC.

Allocations may become impossible in Online Mode if the set number of I/O Modules is too small. If the set number of I/O Modules is too large, extra time will be required when loading and saving programs. To prevent such problems, always set an appropriate number of I/O Modules.

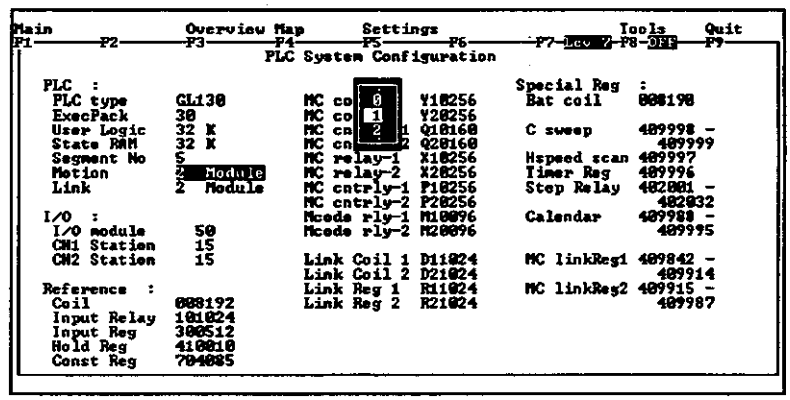
7.1.6 Setting Motion Modules

Set the number of Motion Modules. The number is set to 2 by default.

1) Select **Motion** from the Overview Menu using the Cursor Keys and press the Enter Key.



2) Select the number of Motion Modules to be used (**1** in this example) using the Cursor Keys, and press the Enter Key.

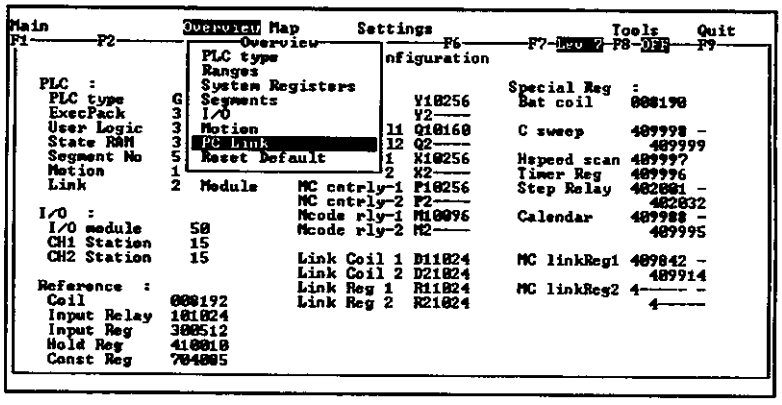


The number of Motion Modules will be changed to 1. The reference number for Motion Module 2 will be displayed as ----.

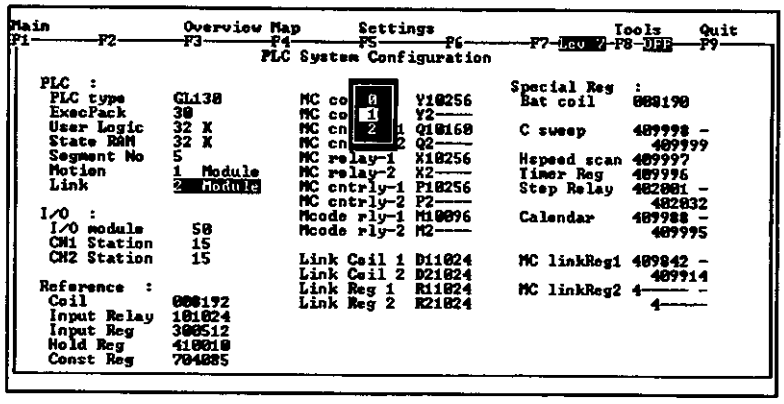
7.1.7 Setting PC Link Modules

Set the number of PC Link Modules. The number is set to 2 by default.

1) Select **PC Link** from the Overview Menu using the Cursor Keys and press the Enter Key.



2) Select the number of PC Link Modules to be used (1 in this example) using the Cursor Keys, and press the Enter Key.

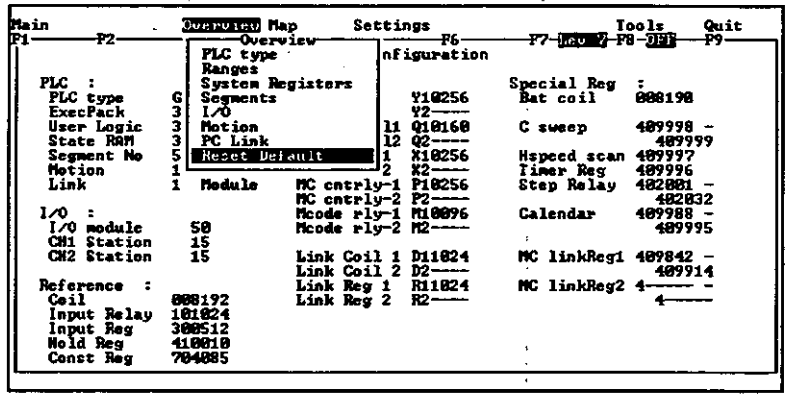


The number of PC Link Modules will be changed to 1. The reference number only for Link Module 1 will be displayed.

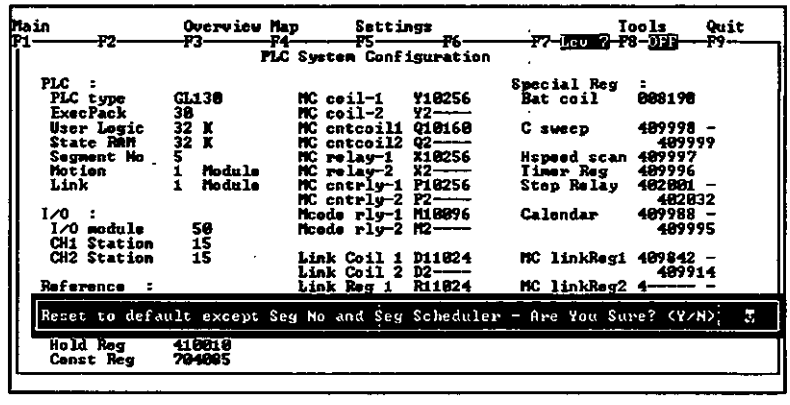
7.1.8 Table Initialization

Initialize the settings of the system configuration. The GL120 is set as the PLC type by default. To use a PLC other than the GL120, perform all the setting operations from and including the PLC type.

1) Select **Reset Default** from the Overview Menu using the Cursor Keys and press the Enter Key.



2) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The system overview will be initialized.

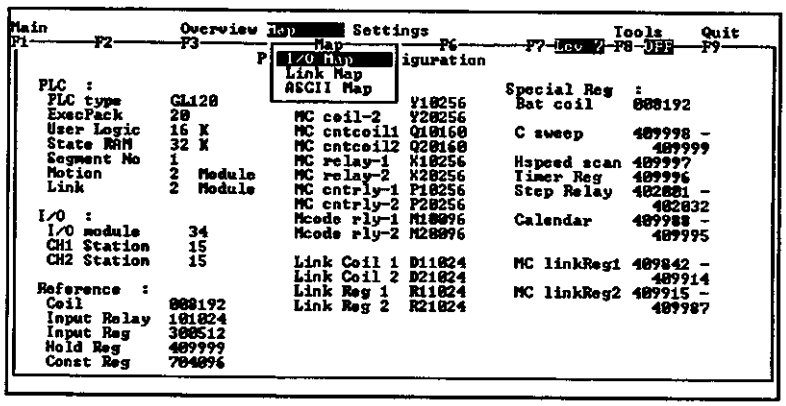
7.2 I/O Maps

This section describes I/O mapping.

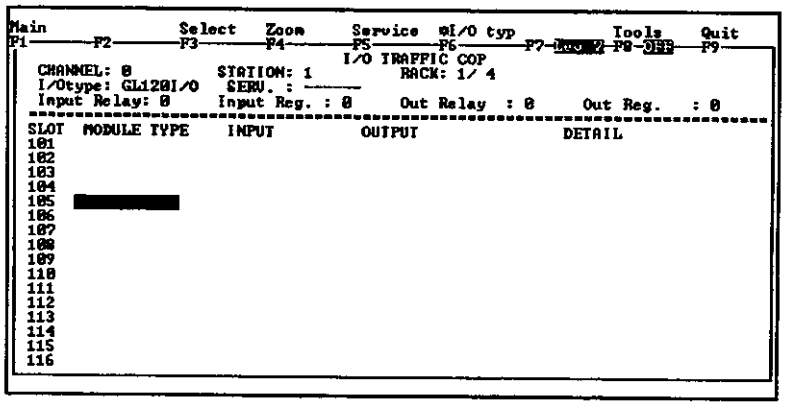
7.2.1 Basic Maps

The I/O Map Screen can be displayed by selecting I/O Map from the Map Menu. Editing operations are not possible when the PLC is in RUN state.

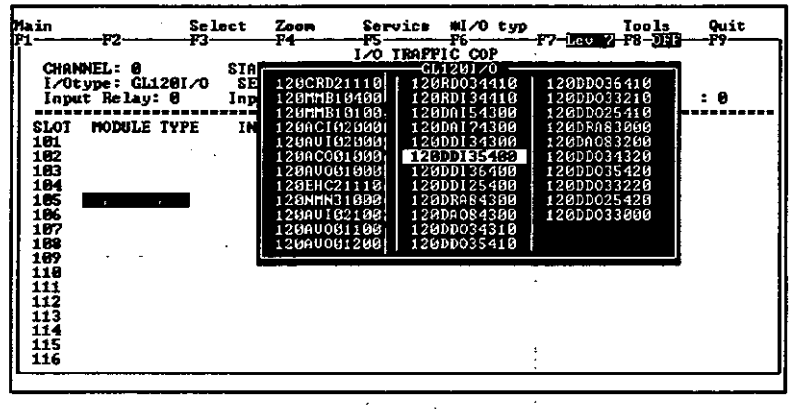
1) Select **I/O Map** from the Map Menu using the Cursor Keys and press the Enter Key.



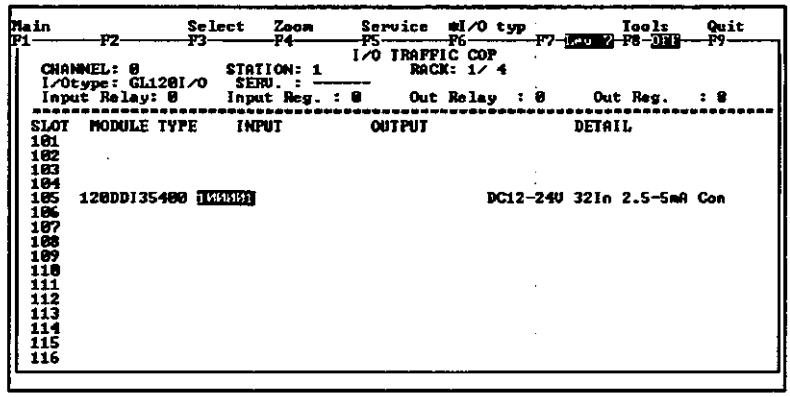
2) The I/O Map Screen will be displayed. Move the cursor to the position of the slot to be mapped using the Cursor Keys.



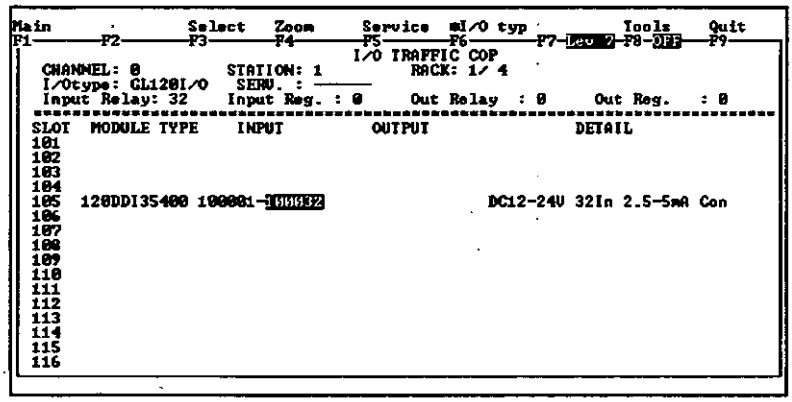
3) When the ? Key is pressed, a list of Module types that can be allocated will be displayed. To select the Module to be mapped, move the cursor to the position of the Module and press the Enter Key.



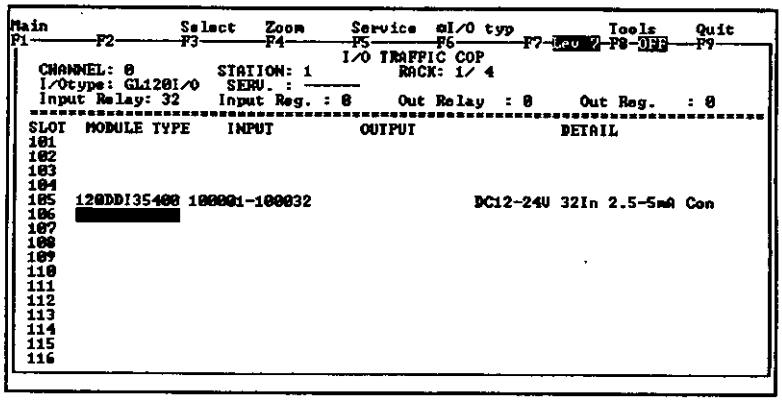
4) Enter the starting reference number. In this example,the reference number of the input relay is **100001** since a Digital Input Module was selected.



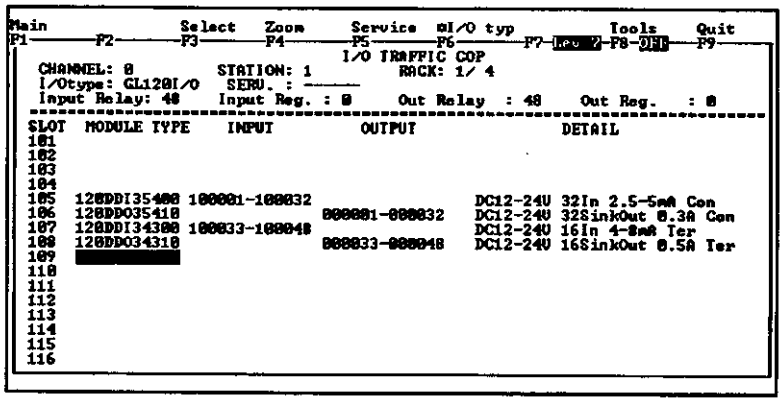
5) The cursor will move to the position of the last reference number. The number determined by adding the number of I/O points to the starting reference number will be set as the default. If the number is correct, simply press the Enter Key.



The setting will be stored and the cursor will move to the next slot.



6) Map other I/O using the same procedure.



INFO

1) Only I/O Modules, Special Purpose Modules, and Motion Modules require I/O mapping. Mapping is not required for Power Supply Modules, CPU Modules, Communications Modules, and Expander Modules.

2) The MC20 Motion Module uses two slots, and mapping is executed for the slot with the higher number. When two MC20 Motion Modules are being used, execute the Module Zoom operation, and set the module numbers. See section *7.2.3 Module Zoom* for details on the Module Zoom operation.

3) When specifying an I/O relay as the reference, specify a value of 16n + 1 (n = 0, 1, 2, ...) as the starting reference number.

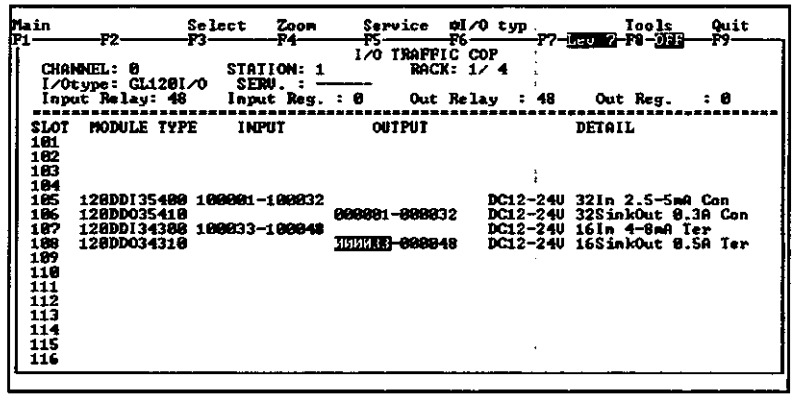
4) If the reference number that was entered has already been assigned, a warning message will be displayed. If the existing reference number can be used, simply press the Enter Key.

5) To change the last reference number set by default, enter a different reference number in the position of the last reference number. When specifying an I/O relay as the reference, specify 8n (n = 1, 2, 3, ...) as the number of I/O points.

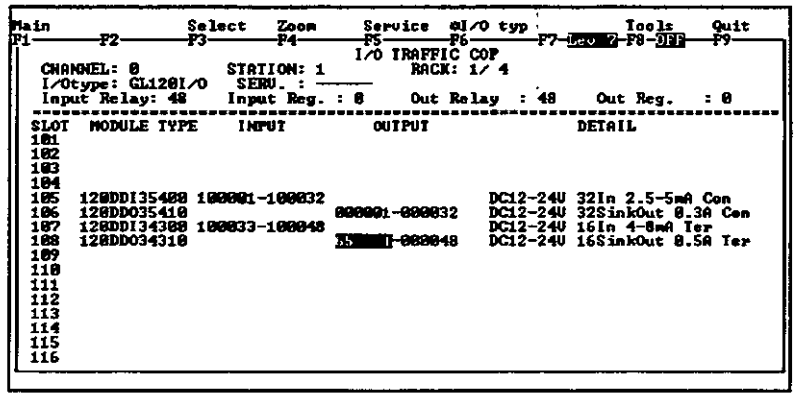
• Changing a Reference Number

Use the following procedure to change a reference number that has been allocated.

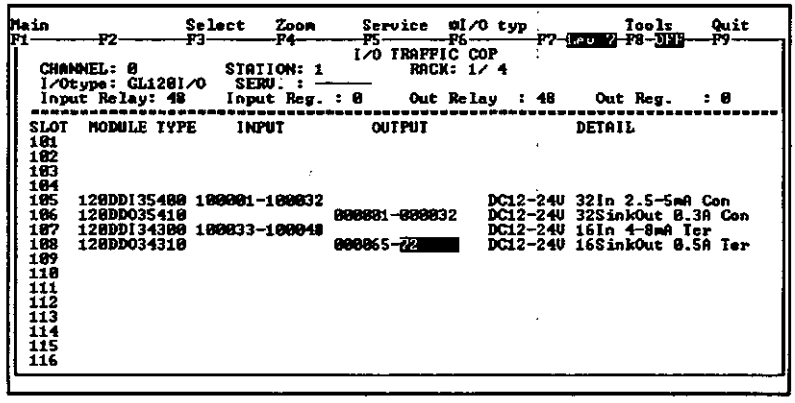
1) Move the cursor to the position of the reference number to be changed using the Cursor Keys.



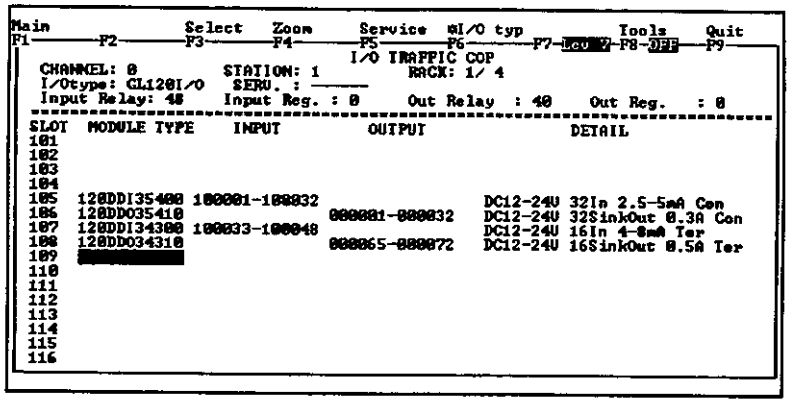
2) Enter the starting reference number (**65** in this example) and press the Enter Key.



3) The cursor will move to the position of the last reference number. The number determined by adding the number of I/O points of the Module to the starting reference number will be set by default. In this example, assign 8 points of a possible 16 points. Enter the last reference number (**72** in this example) and press the Enter Key.



The reference number will be changed.



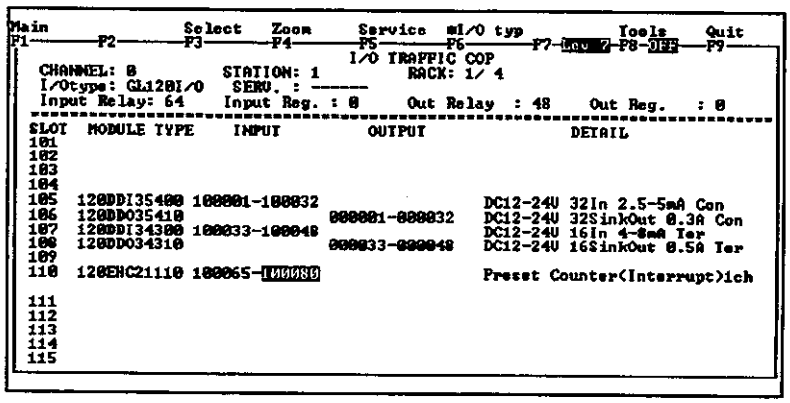
INFO It is also possible to change the last reference number only. Move the cursor to the position of the current last reference number and enter a new last reference number.

• Composite Module Mapping

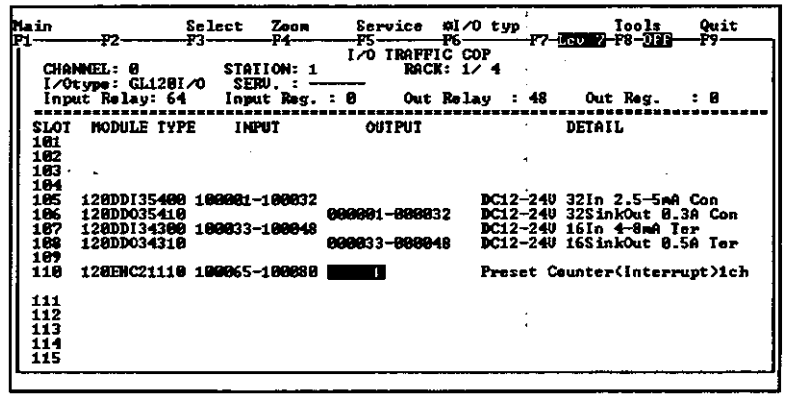
Relays and registers can also be mapped using a 2-line mapping area on the I/O Map Screen. The following example shows the operation.

1) A Counter Module is mapped as an example. Move the cursor to the slot where the Counter Module is to be mapped. Select a Counter Module, and a 2-line mapping area will be displayed and the cursor will move to the relay position. Enter the starting reference number of the input relay (**100065** in this example) and press the Enter Key.

2) The cursor will move to the position of the last reference number. Press the Enter Key if the last reference does not need to be changed.



The settings will be stored, and the cursor will move to the position of the starting reference of the output coil.



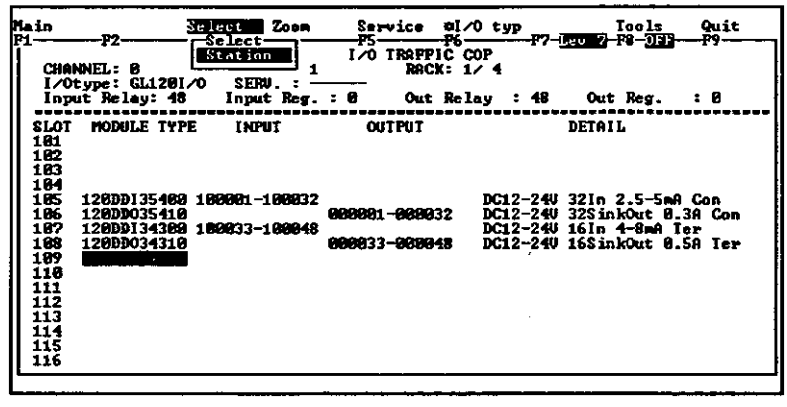
3) Map the output coil, input register, and output register following the same procedure given above.

7.2.2 Switching I/O Map Screens

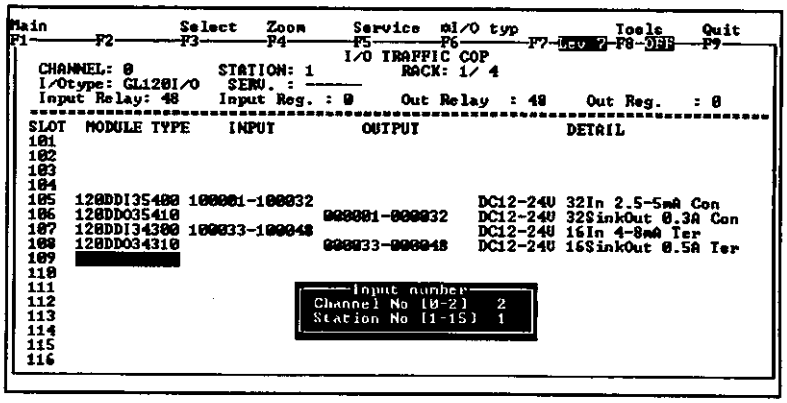
The I/O Map Screen is displayed for each rack. Therefore, to assign I/O for a different rack, the map screen must be switched. The channel number, station number, and rack number currently being edited are displayed on the 4th line from the top of the screen. An example of switching a channel or a station is shown below.

1) Switch to the menu cursor using the Tab Key.

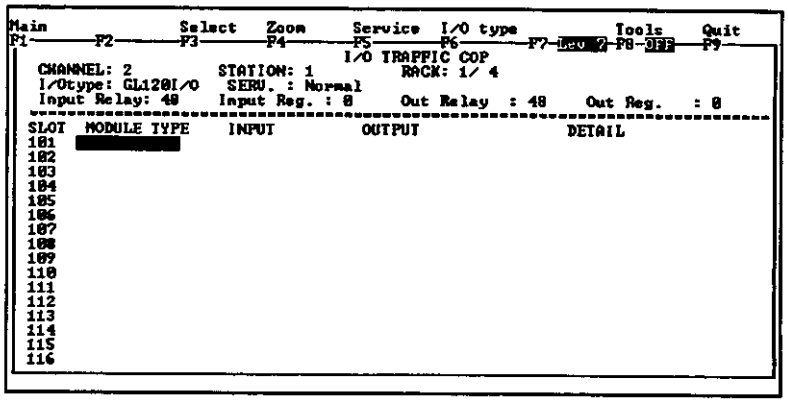
2) Select **Station** from the Select Menu using the Cursor Keys and press the Enter Key.



3) A window for entering a channel number and a station number will be displayed. Enter the channel number (**2** in this example) and press the Enter Key. Enter the station number (**1** in this example) and press the Enter Key.



The I/O Map Screen for channel number 2 and station number 1 will be displayed.



Control can be transferred between racks by the following key operations.

PgUp	The I/O Map Screen of the rack one number lower is displayed. When Rack 1 is displayed, the screen is switched to that of Rack 4.
PgDn	The I/O Map Screen of the rack one number higher is displayed. When Rack 4 is displayed, the screen is switched to that of Rack 1.

Channels and stations can be switched from the menu only.

7.2.3 Module Zoom

This operation displays a screen for setting parameters for I/O Modules. Settings are made for the input data types and scan I/O processing. Always check the settings whenever a Module is assigned. The contents to be set vary according to the Module.

1. Bit Order

I/O processing can be performed by reorganizing data in ascending bit order or descending bit order. Two types of bit order specification are available to do this: MSB and LSB. In MSB, the starting reference number is allocated to the lowest I/O number of the Module. In LSB, the starting reference number is allocated to the highest I/O number of the Module. By default, MSB is set when coils/input relay are used for allocation and LSB is set when registers are used.

Allocating 16 Points from 100001

2. Output Data Type

When a register is specified as the reference number, data I/O can be set as BIN (binary) or BCD. By default, BIN is set.

3. Service Scan

For a Module in the local station, the I/O servicing can be set for each Module. When a high-speed scan is set, I/O servicing is performed synchronized with the high-speed scan. By default, the normal servicing is set. This function is invalid for Modules in remote stations even if it is set.

4. Time-out Output

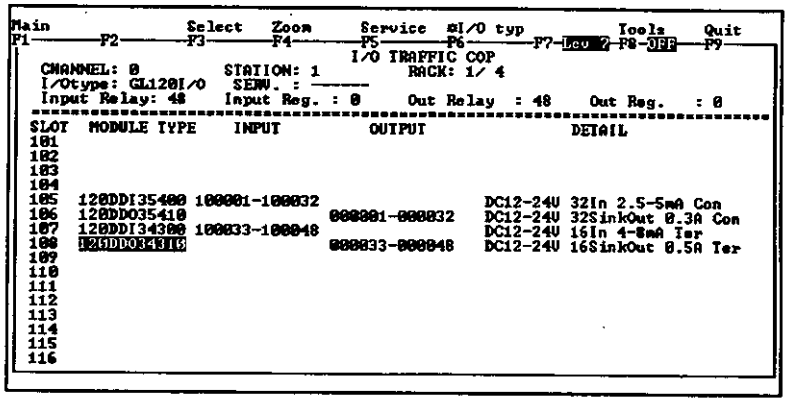
When the state of a CPU Module is changed from the RUN State to the STOP State, output data can be selected. Either the data immediately before the Module was stopped or the data that was preset can be output.

5. Time-out Output Data

When output of set values is selected in for the time-out output, set the data to be output when the CPU Module is stopped. The data here is the image of the PLC reference data. The data is converted, based on the bit order that was set, and is output.

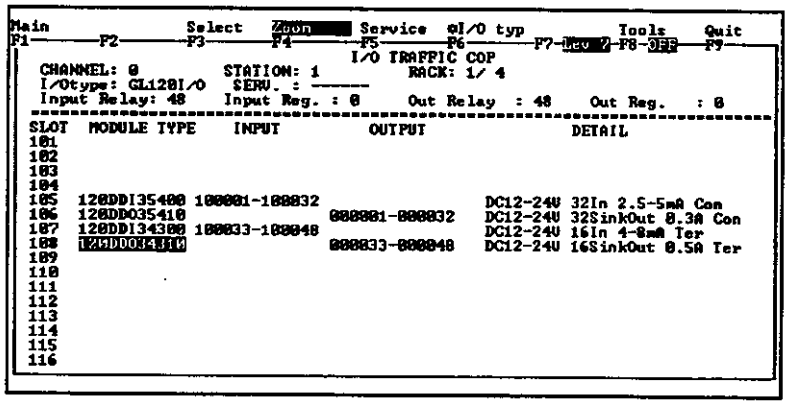
An example of setting the bit order and time-out output data is shown below.

1) Move the cursor to the Module to be set using the Cursor Keys and press the Enter Key.

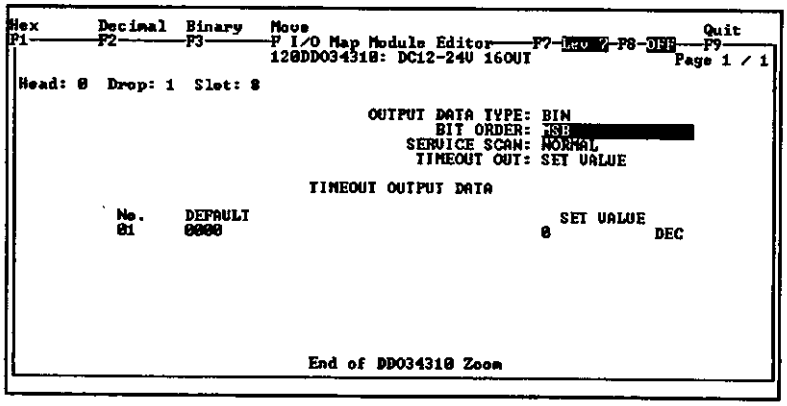


2) Switch to the menu cursor using the Tab Key.

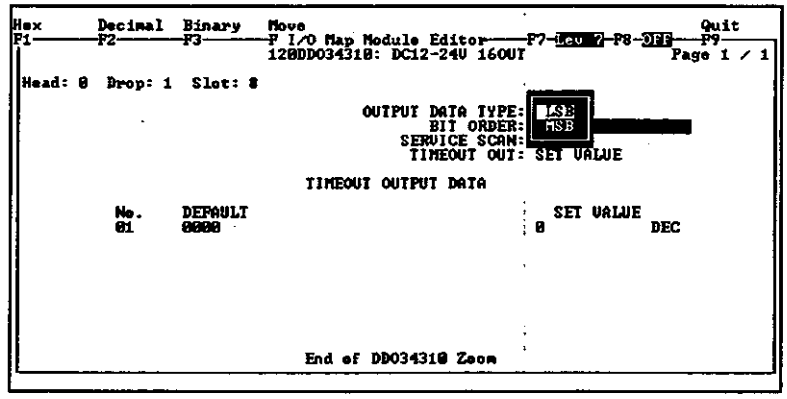
3) Select **Zoom** using the Right Cursor Key and press the Enter Key.



4) A Module Zoom Screen will be displayed. Move the cursor to the bit order position and press the Enter Key.

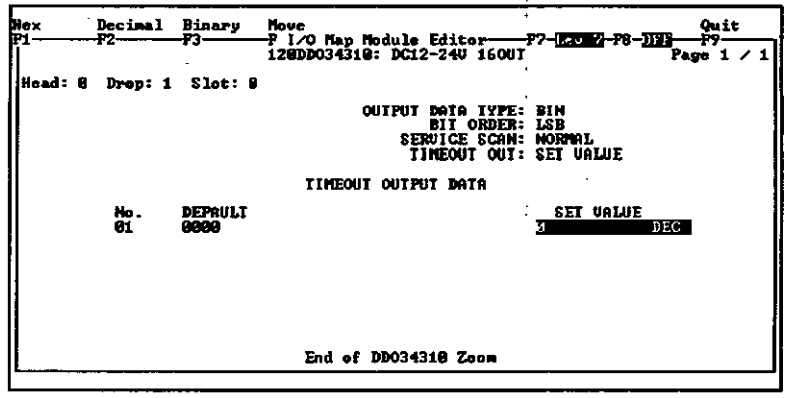


5) A setting selection window will be displayed. Move the cursor to the **LSB** position and press the Enter Key.



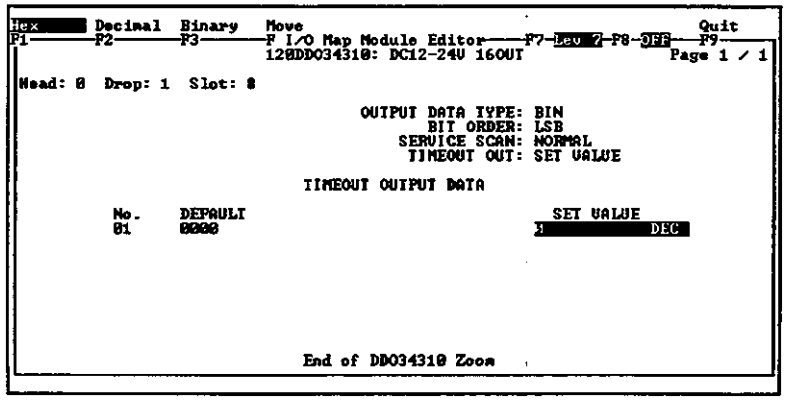
The bit order will be set to LSB.

6) Move the cursor to the set value position.

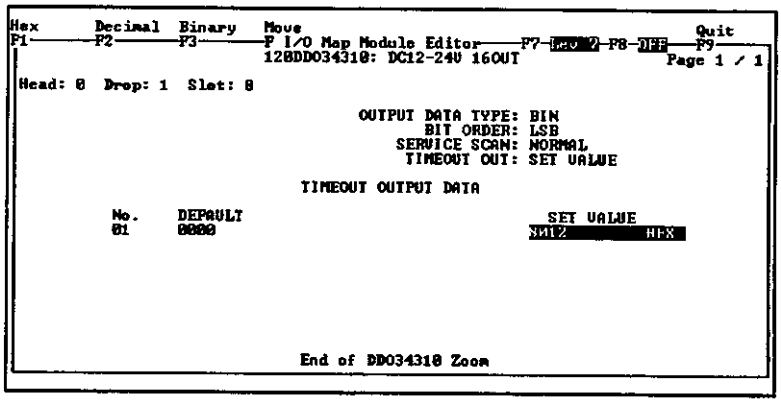


7) Switch to the menu cursor using the Tab Key.

8) To input the set value in hexadecimal format, select **Hex** using the Cursor Keys and press the Enter Key.



9) The input and display of the set value will change to hexadecimal format. Enter a set value in hexadecimal digits (in this example, **8012**) and press the Enter Key.



10) The time-out output is now set. To return control to the I/O Map Screen, select **Quit** from the menu bar or press the Esc Key.

INFO

1) When **Last Data** is set for the time-out output, no time-out output data needs to be set.

2) When time-out output data is set in decimal format, the numeric format does not need to be changed as described above.

3) For 32-point Output Modules, two words of time-out output data must be set.

4) If I/O mapping for a Module by using the Copy operation, copy source data will also be copied. This data must be check using the Zoom operation.

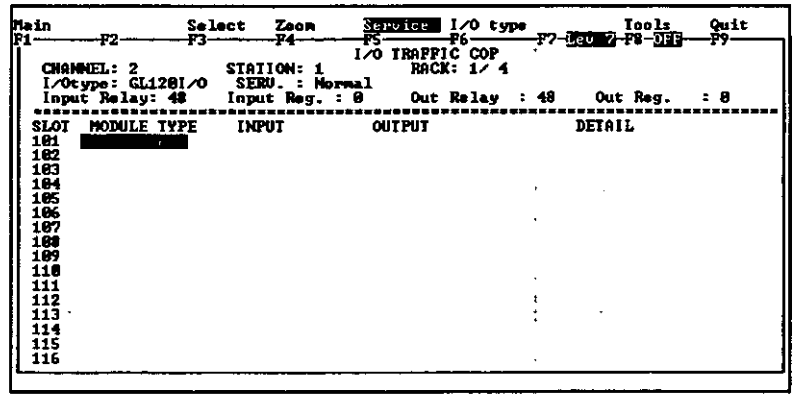
5) When allocation of a reference number is changed from coils to registers or registers to coils, the bit order will not be changed. The Zoom operation must be used to change the bit order.

7.2.4 I/O Service Setting Operation

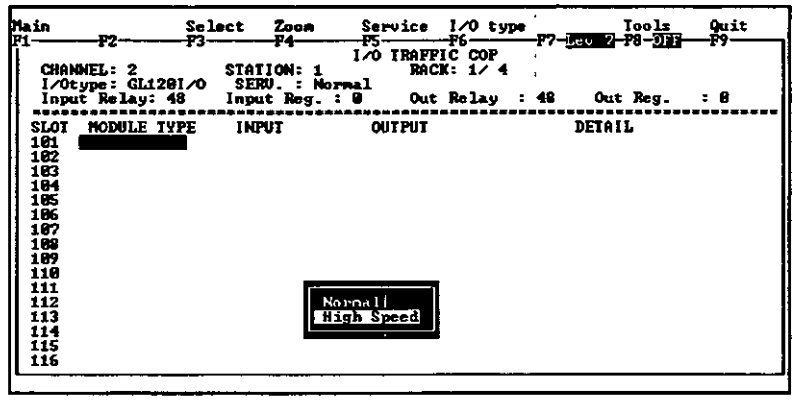
An I/O service cycle can be set for each remote station. By default, a normal cycle is set. For the local station, I/O servicing can be set for each Module. Therefore, servicing for the local station is indicated by a dash (------) and cannot be selected.

1) Switch to the menu cursor using the Tab Key.

2) Select **Service** using the Cursor Keys and press the Enter Key.



3) A selection window will be displayed. Select **High Speed** using the Cursor Keys and press the Enter Key.



The I/O servicing of station 1 of channel 2 will be set to High Speed.

7.3 Other Mapping Operations

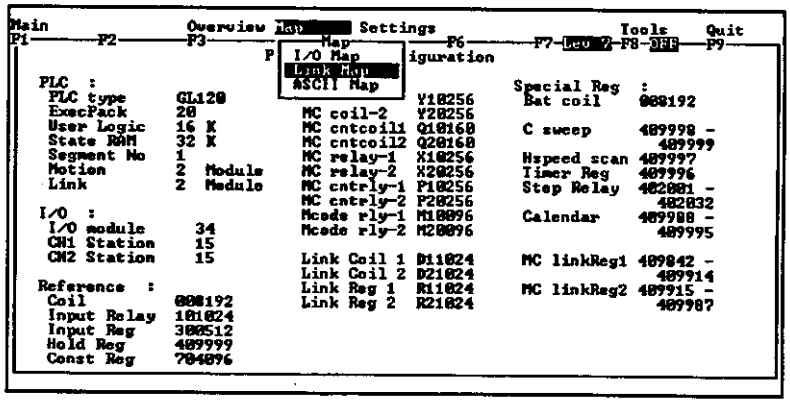
This section describes map operations for PC Link Modules and ASCII Modules that are used by the MEMOCON GL120, GL130 PLCs.

7.3.1 PC Link Map

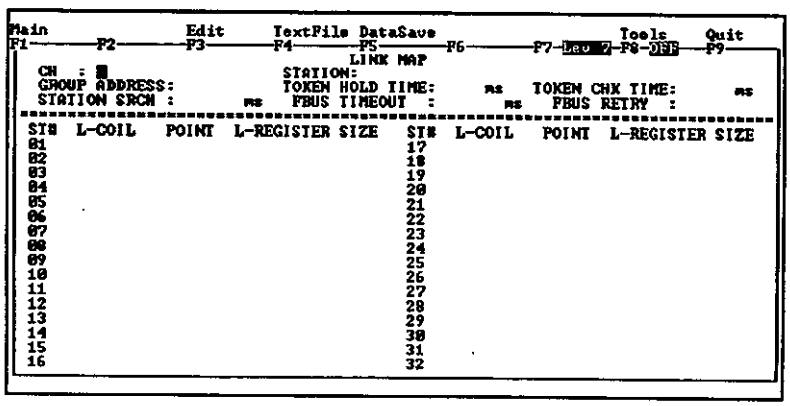
PC Link Modules can be used to reference data from other PLCs connected to the PC Link. To reference this data, a Link Map is required. The link mapping procedure is described below.

1. Displaying the Link Map Screen

Select **Link Map** from the Map Menu using the Cursor Keys and press the Enter Key.



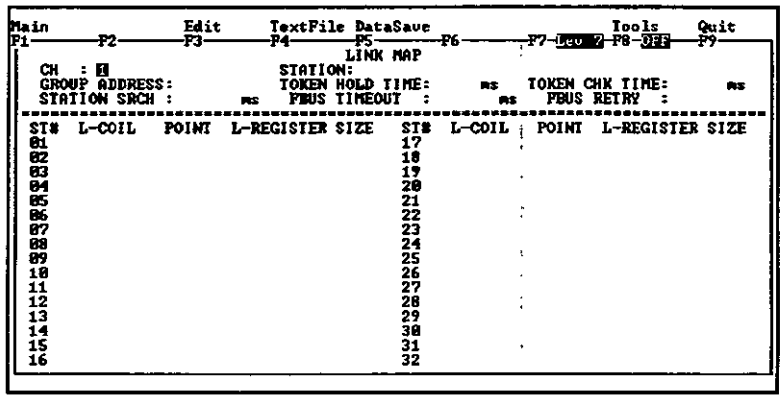
The Link Map Screen will be displayed.



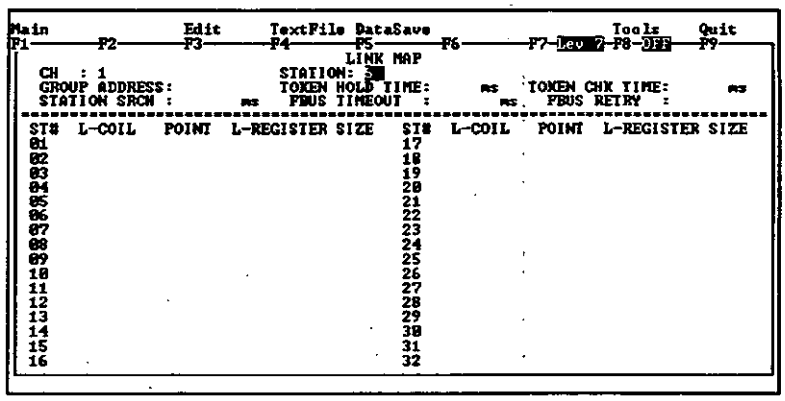
2. Setting PC Link Parameters

Set the channel number, station number, and communications parameters of PC Link Module using the following procedure.

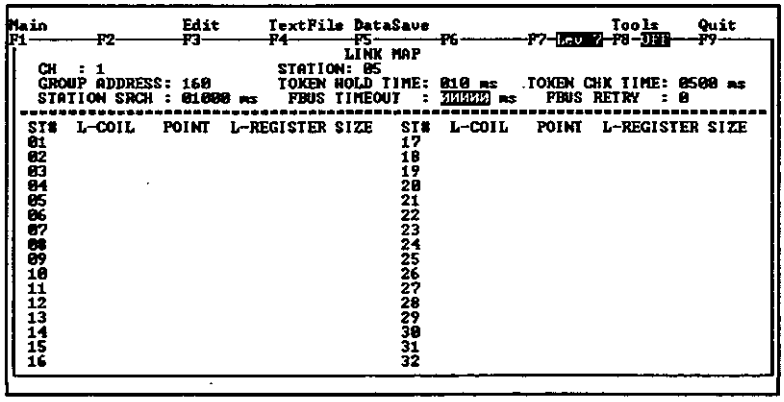
1) Enter the channel number that is set on the DIP switch of the PC Link Module and press the Enter Key.



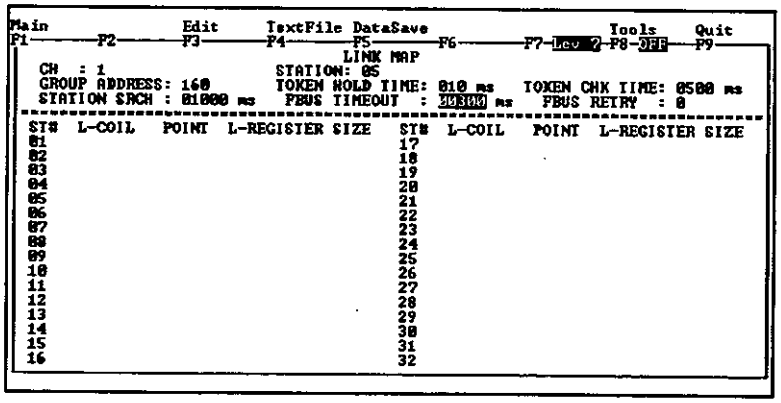
2) Enter the station number that is set on the rotary switch of the PC Link Module and press the Enter Key. In Online Mode, the number will be displayed automatically.



3) The communications parameters of the PC Link Module will be displayed. In Offline Mode, default values will be displayed. As an example, change the FBUS time-out time. Move the cursor to FBUS time-out time using the Cursor Keys.



4) Set the FBUS time-out time to 300 ms by entering **300** and pressing the Enter Key.



5) Set the other communications parameters using the same procedure.

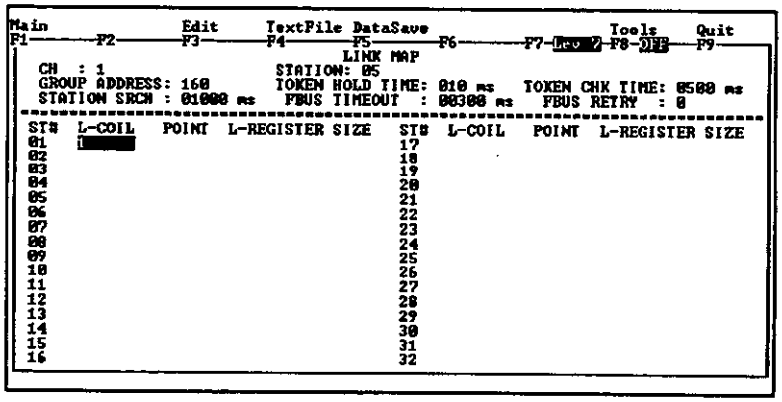
INFO To change a channel, move the cursor to the channel position and enter a channel number and a station number.

3. Link Reference Map Operation

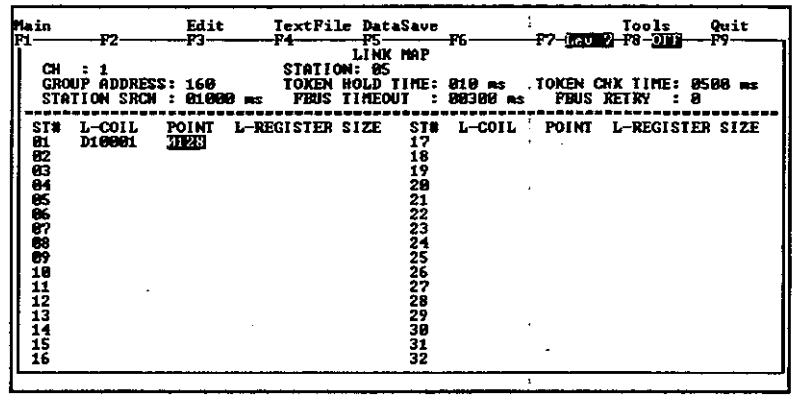
The following procedure provides an example of link coil and link register map operations.

1) Move the cursor to the map area using the Home Key.

2) Allocate the position of station number 1. Enter the lower-place four digits of the link coil number to be allocated. The high-order 0 can be omitted. In this example, enter **1** and press the Enter Key.



3) Specify the number of points. The number of points can be specified in 16-point units. In this example, enter **128** and press the Enter Key.



4) Set link registers using the same procedure.

INFO

1) By pressing the Home Key, the cursor can be moved between the communications parameter area and the link reference map area.

2) Only the lower-place four digits can be entered for a reference number of a link coil or a link register. Leading zeroes can be omitted. For instance, to set D10017 for the link coil, enter **17**.

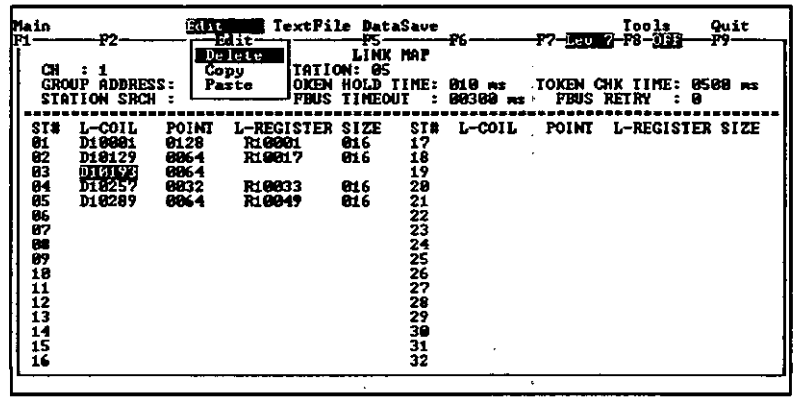
3) For a link coil reference number, specify 16n + 1 (n = 0, 1, 2, ...). For the number of points, specify 16n (n = 1, 2, ...). No restrictions are imposed on link registers.

4. Moving Allocations

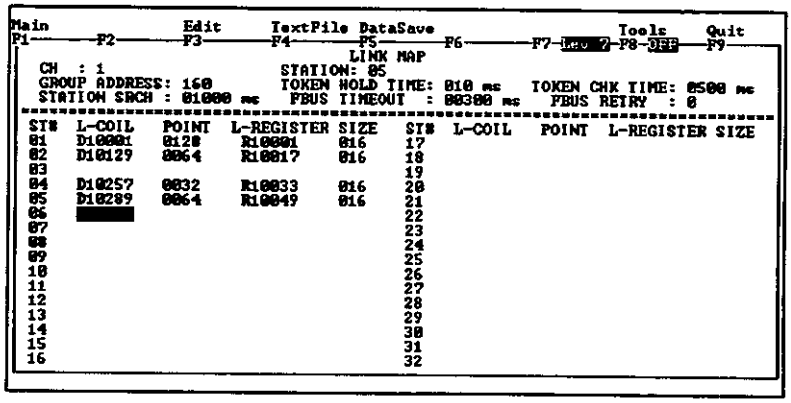
1) Move the cursor to the allocation position to be moved using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Delete** from the Edit Menu using the Cursor Keys and press the Enter Key.

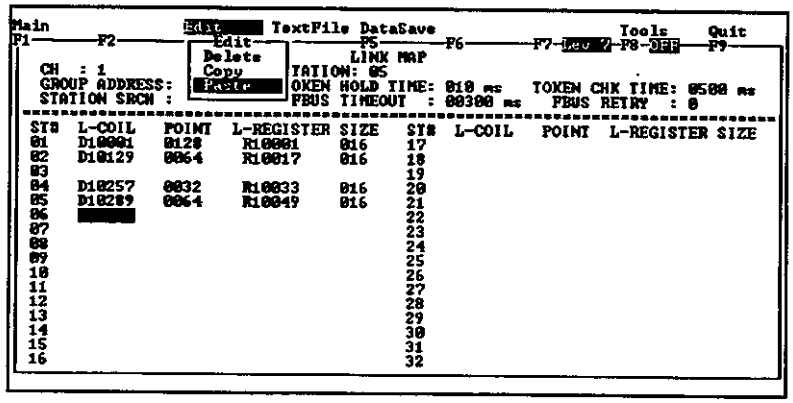


4) The allocation at the cursor position will be deleted. Move the cursor to the position of the target station number using the Cursor Keys.

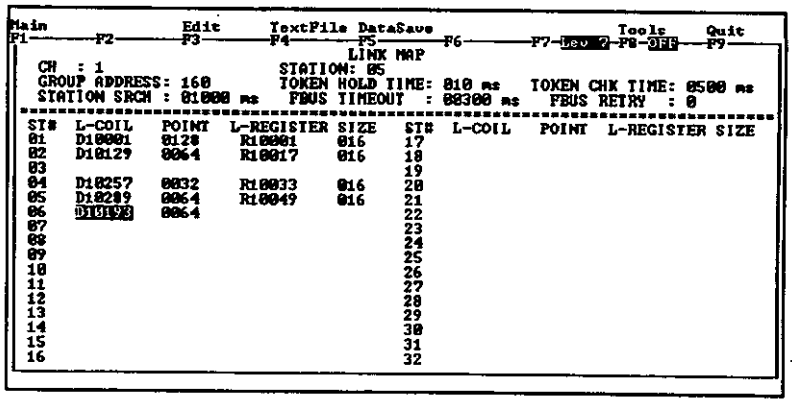


5) Switch to the menu cursor using the Tab Key.

6) Select **Paste** from the Edit Menu using the Cursor Keys and press the Enter Key.



The reference data allocated to the station that has been deleted will be pasted at the cursor position.



5. Text File

The following two text file operations are available.

• Importing

An ASCII file that has been created according to the MEMOSOFT format is read. The data that is read overwrites the link communications parameters and map data tables.

• Exporting

The link communication parameters and map data that have been edited are stored as an ASCII file. The file that has been written can be edited using a commercially available editor. After being edited, the data can be read by MEMOSOFT again.

By writing a map table as a Text File and reading the file using another file, the map table can be utilized. The Text File format is shown below.

```
AAA, BBB, CCCC, DDDDD, EEEEE, F
1, GGGG, HHHH, IIII, JJJ
2, GGGG, HHHH, IIII, JJJ
3, GGGG, HHHH, IIII, JJJ
            :
            :
32, GGGG, HHHH, IIII, JJJ
```

AAA:	Group address	F:	FBUS retry count
BBB:	Token holding time	GGGG:	Lower-order four digits of a link coil
CCCC:	Token monitoring time	HHHH:	Number of points (8-bit units)
DDDDD:	Station search time	IIII:	Lower-order 4 digits of the link register
EEEEE:	FBUS time-out time	JJJ:	Size (8-bit units)

An example of a text file is shown below.

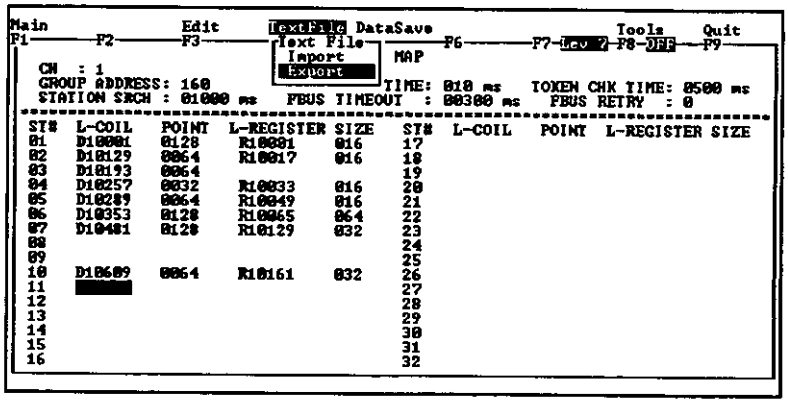
```
160, 010, 0050, 00010, 00003, 0
1, 0001, 0002, 0001, 064
2, 0017, 0004, 0033, 032
3, 0049, 0002, 0049, 064
            :
            :
32, 0993, 0004, 1000, 024
```

When 16 link coils are allocated, the number of points is 2. When one link register is allocated, the size is 2.

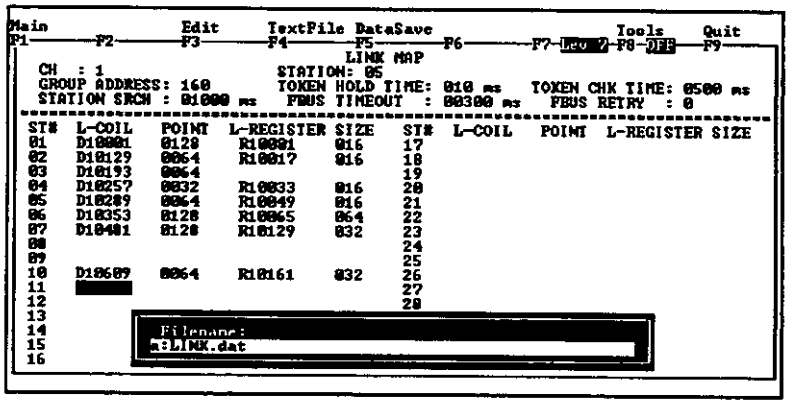
• Exporting operation

1) Switch to the menu cursor using the Tab Key.

2) Select **Export** from the Text File Menu using the Cursor Keys and press the Enter Key.



3) A file setting window will be displayed. Specify the export destination by entering the file name and press the Enter Key.

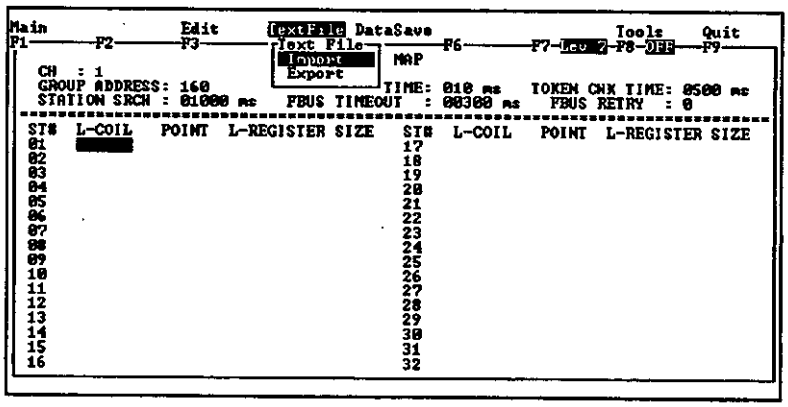


Link data will be written to the specified file.

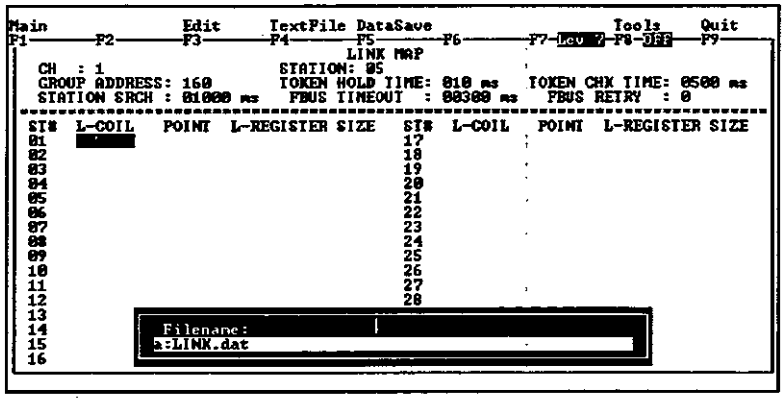
- **Importing operation**

1) Switch to the menu cursor using the Tab Key.

2) Select **Import** from the Text File Menu using the Cursor Keys and press the Enter Key.



3) A file setting window will be displayed. Specify the import source by entering a file name and press the Enter Key.



The specified file will be read as link data.

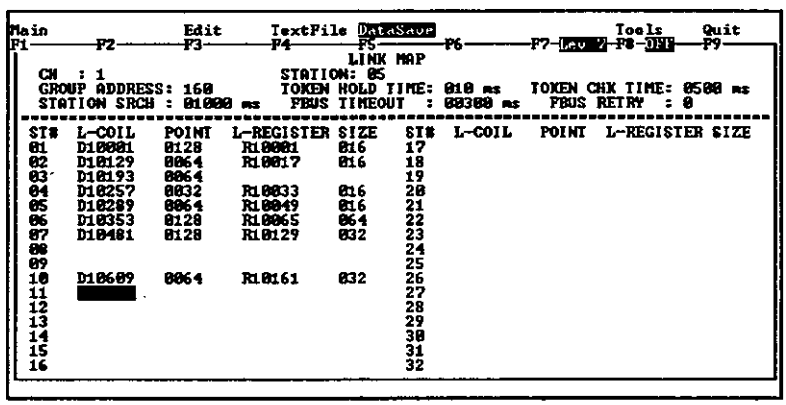
6. Data Save Operation

The Data Save operation writes the current map data to the PLC in Online or Debug Mode. In Offline Mode, the data is written to a file.

Normally, write processing is performed when the link map screen is terminated. Therefore, if this operation is performed, link maps can be written in any state. That is, data can be written to the PLC while a link map screen is being displayed. This operation is useful for debugging.

1) Switch to the menu cursor using the Tab Key.

2) Select **Data Save** using the Cursor Keys and press the Enter Key.



The link map data will be written to the PLC.

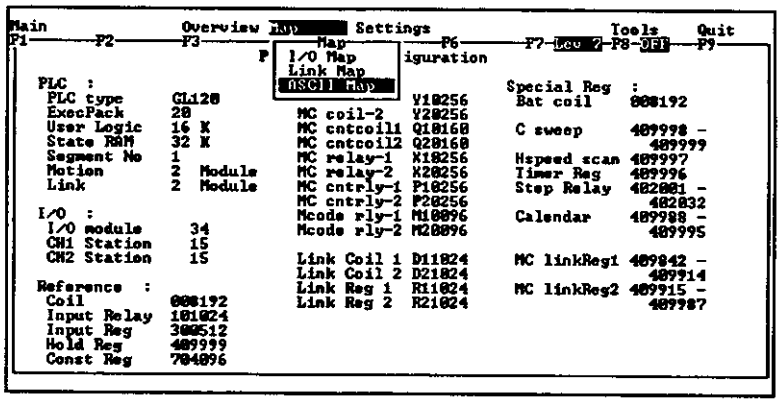
INFO When the drive and directory are not specified, files are read from or saved to \FMSGL.

7.3.2 ASCII Map

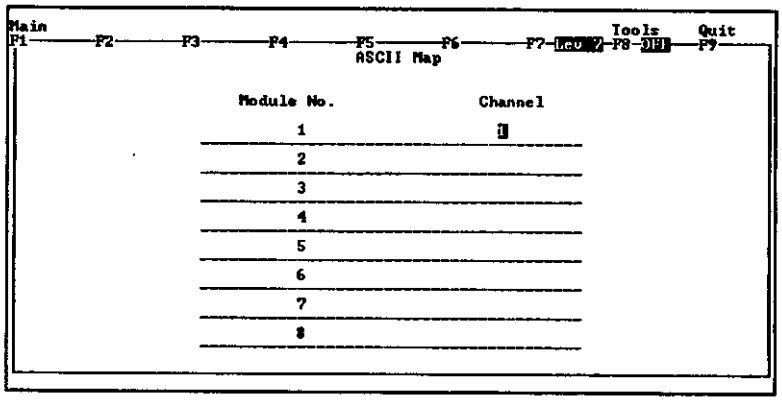
When using an ASCII Module, it is necessary to specify whether the Module is connected to remote channel 1 or 2. The module number is set on the rotary switch of the ASCII Module.

The following procedure provides an example of the setting operation.

1) Select **ASCII Map** from the Map Menu using the Cursor Keys and press the Enter Key.



2) The ASCII Map Screen will be displayed. Set the channel of Module number 1 by entering **1**, and press the Enter Key.



3) Set the subsequent Modules using the same procedure.

7.4 Other Setting Operations

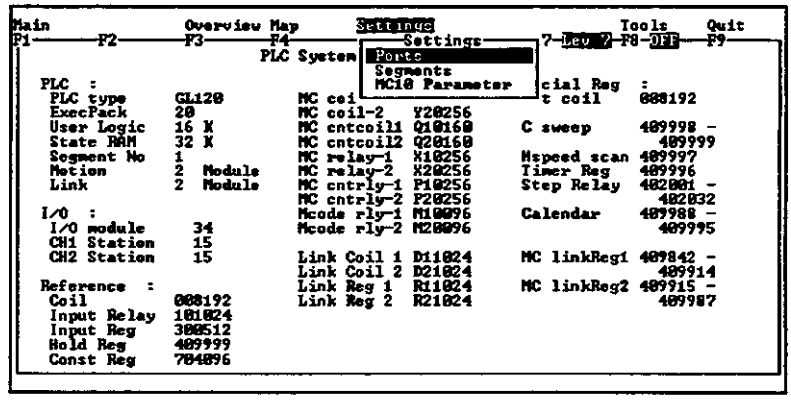
This section describes setting operations for communications parameters, constant sweeps, segments, and MC10 parameters.

7.4.1 Setting Communications Parameters

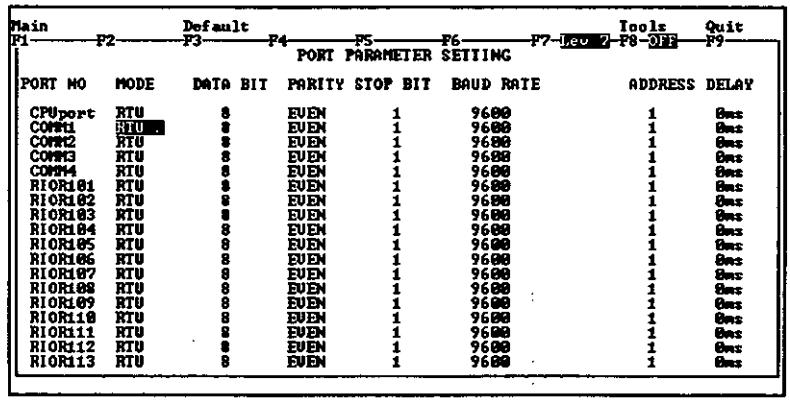
1. Changing Communications Parameters

The following procedure can be used to set the communications port parameters for the PLC. The parameters that are set here are transferred to the PLC by the Load operation, and are actually changed when power is turned ON or the PLC is started. An example for the GL120 is shown below.

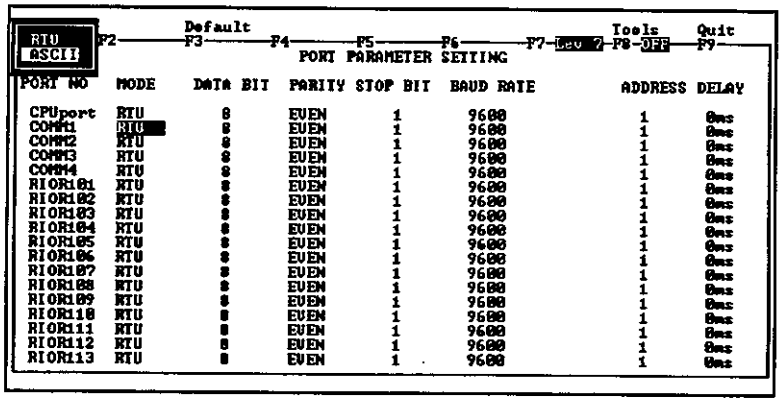
1) Select **Ports** from the Settings Menu using the Cursor Keys and press the Enter Key.



2) The Port Parameter Setting Screen will be displayed. Select the item to be changed using the Cursor Keys.



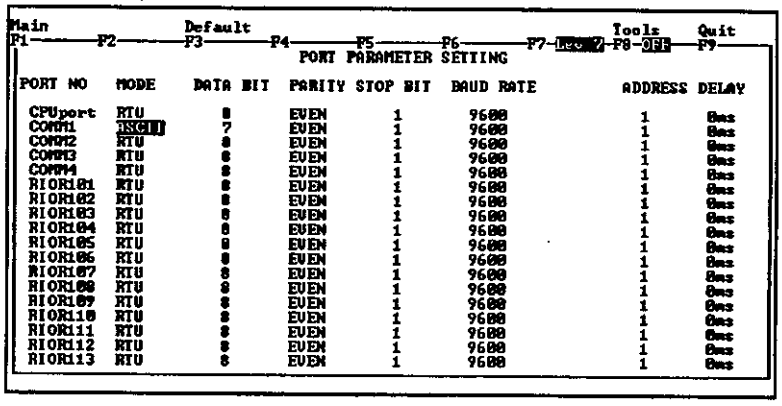
3) After moving the cursor to the position of the item to be changed, press the Enter Key. Data that can be selected will be displayed. After selecting data using the Cursor Keys, press the Enter Key again.



PORT PARAMETER SETTING

PORT NO	MODE	DATA BIT	PARITY	STOP BIT	BAUD RATE	ADDRESS	DELAY
CPUport	RTU	8	EVEN	1	9600	1	0ms
COMM1	RTU	8	EVEN	1	9600	1	0ms
COMM2	RTU	8	EVEN	1	9600	1	0ms
COMM3	RTU	8	EVEN	1	9600	1	0ms
COMM4	RTU	8	EVEN	1	9600	1	0ms
RIOR101	RTU	8	EVEN	1	9600	1	0ms
RIOR102	RTU	8	EVEN	1	9600	1	0ms
RIOR103	RTU	8	EVEN	1	9600	1	0ms
RIOR104	RTU	8	EVEN	1	9600	1	0ms
RIOR105	RTU	8	EVEN	1	9600	1	0ms
RIOR106	RTU	8	EVEN	1	9600	1	0ms
RIOR107	RTU	8	EVEN	1	9600	1	0ms
RIOR108	RTU	8	EVEN	1	9600	1	0ms
RIOR109	RTU	8	EVEN	1	9600	1	0ms
RIOR110	RTU	8	EVEN	1	9600	1	0ms
RIOR111	RTU	8	EVEN	1	9600	1	0ms
RIOR112	RTU	8	EVEN	1	9600	1	0ms
RIOR113	RTU	8	EVEN	1	9600	1	0ms

The communications parameters will be changed.



PORT PARAMETER SETTING

PORT NO	MODE	DATA BIT	PARITY	STOP BIT	BAUD RATE	ADDRESS	DELAY
CPUport	RTU	8	EVEN	1	9600	1	0ms
COMM1	ASCII	7	EVEN	1	9600	1	0ms
COMM2	RTU	8	EVEN	1	9600	1	0ms
COMM3	RTU	8	EVEN	1	9600	1	0ms
COMM4	RTU	8	EVEN	1	9600	1	0ms
RIOR101	RTU	8	EVEN	1	9600	1	0ms
RIOR102	RTU	8	EVEN	1	9600	1	0ms
RIOR103	RTU	8	EVEN	1	9600	1	0ms
RIOR104	RTU	8	EVEN	1	9600	1	0ms
RIOR105	RTU	8	EVEN	1	9600	1	0ms
RIOR106	RTU	8	EVEN	1	9600	1	0ms
RIOR107	RTU	8	EVEN	1	9600	1	0ms
RIOR108	RTU	8	EVEN	1	9600	1	0ms
RIOR109	RTU	8	EVEN	1	9600	1	0ms
RIOR110	RTU	8	EVEN	1	9600	1	0ms
RIOR111	RTU	8	EVEN	1	9600	1	0ms
RIOR112	RTU	8	EVEN	1	9600	1	0ms
RIOR113	RTU	8	EVEN	1	9600	1	0ms

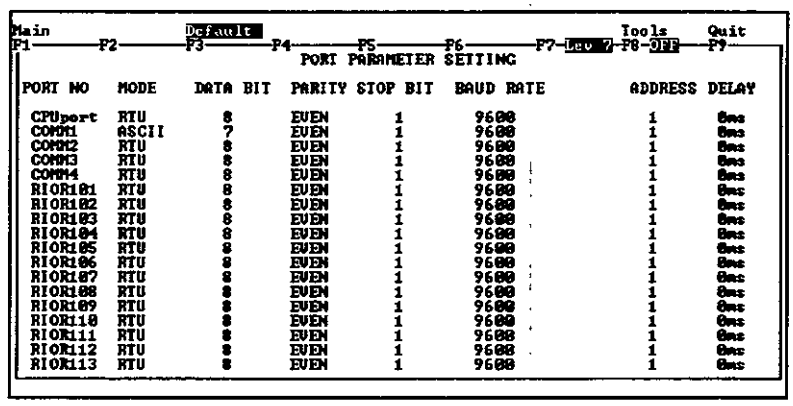
4) For other parameters, move the cursor to the position of the parameter to be changed and press the Enter Key. A selection window will be displayed. Select the data to be set and press the Enter Key again.

2. Initializing Communications Parameters

Use this operation to initialize the settings of communications parameters.

1) Switch to the menu cursor using the Tab Key.

2) Select **Default** using the Cursor Keys and press the Enter Key.

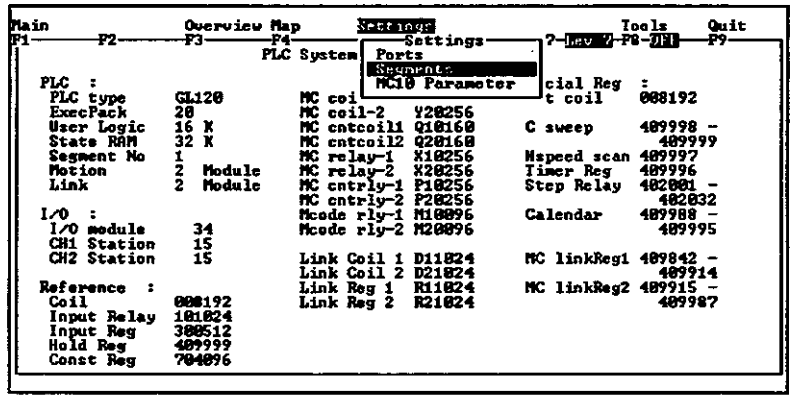


The communications parameters will be initialized.

7.4.2 Setting Constant Sweep

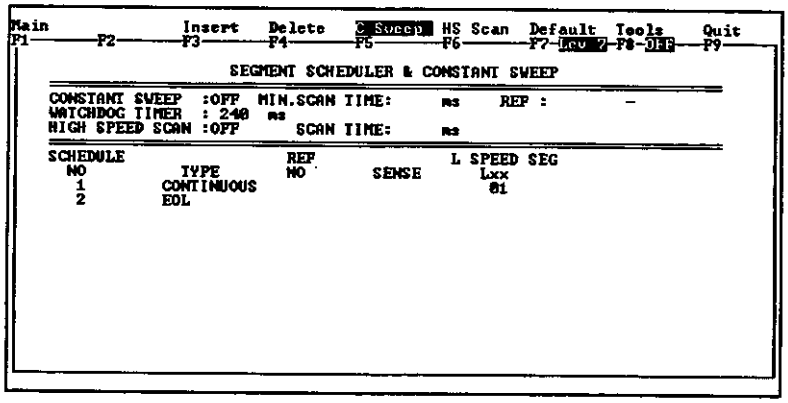
Set the constant sweep as described below. This operation is also possible from the PLC Operation Menu in Online or Debug Mode.

1) Select **Segments** from the Settings Menu using the Cursor Keys and press the Enter Key.



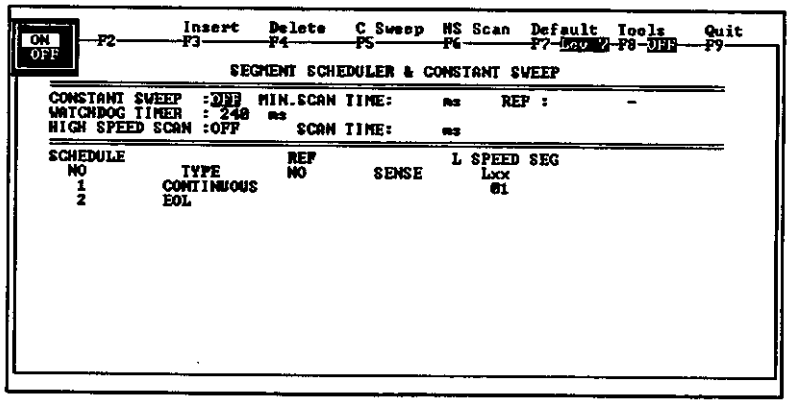
2) The Constant Sweep Screen will be displayed. Switch to the menu cursor using the Tab Key.

3) Select **C Sweep** using the Cursor Keys and press the Enter Key.

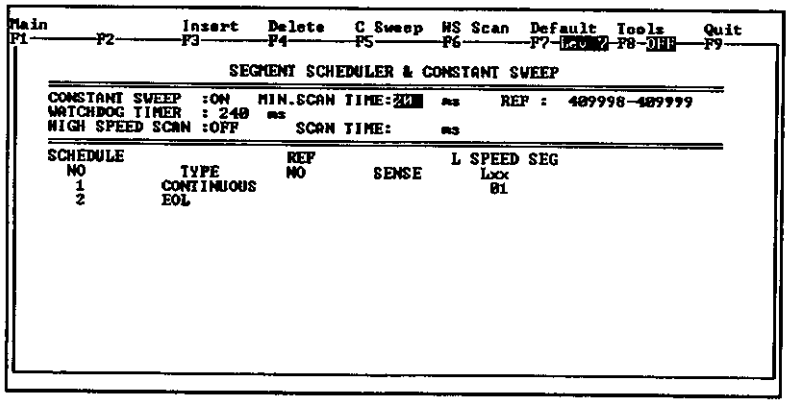


The cursor will move to the position of the constant sweep.

4) When the Enter Key is pressed on the constant sweep position, an ON/OFF Selection window will be displayed. Select **ON** using the Down Cursor Key and press the Enter Key.



5) The cursor will move to the minimum scan time position. Set a minimum scan time (**20** in this example) and press the Enter Key.



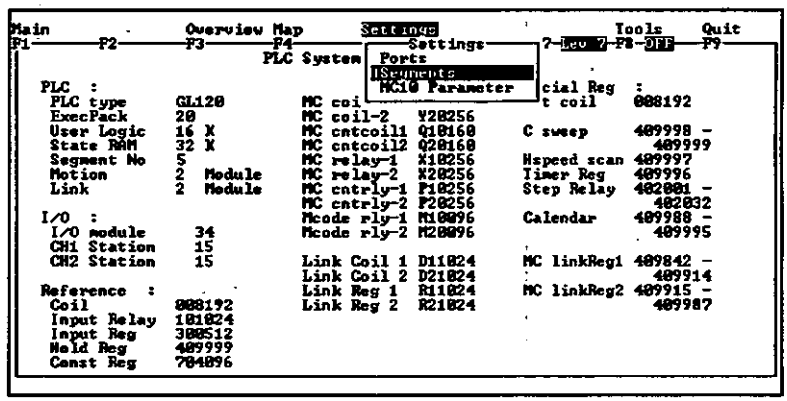
6) To change the constant sweep holding register, move the cursor to the **Reference** position and enter a reference number.

7.4.3 Setting Segments

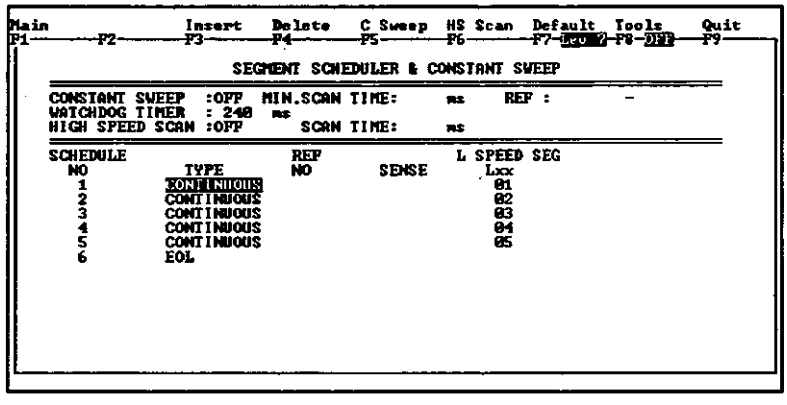
For normal segments, the conditions and order of solving can be set for each segment. These parameters can be set on the Segment Scheduler Screen. An example of setting the segment scheduler is shown below with the normal segment number 5.

1. Displaying the Segment Scheduler Screen

Select **Segments** from the Settings Menu using the Cursor Keys and press the Enter Key.



The Segment Scheduler Screen will be displayed.

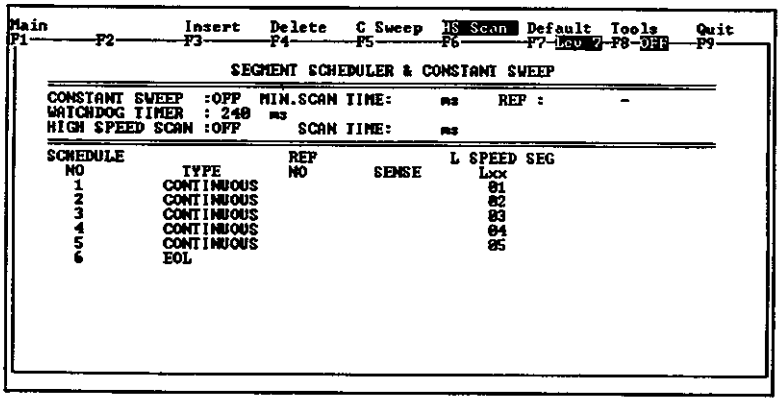


2. Setting High-speed Scan

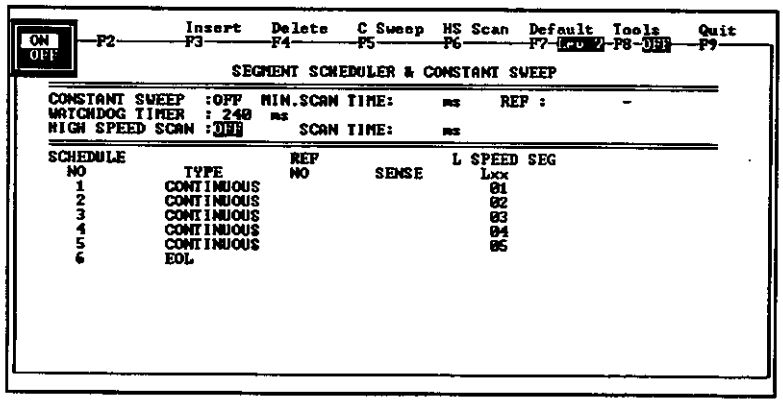
By setting the high-speed scan, the ladder program stored in a high-speed segment is executed for each scan. When high-speed segment are used, this setting is required.

1) Switch to the menu cursor using the Tab Key.

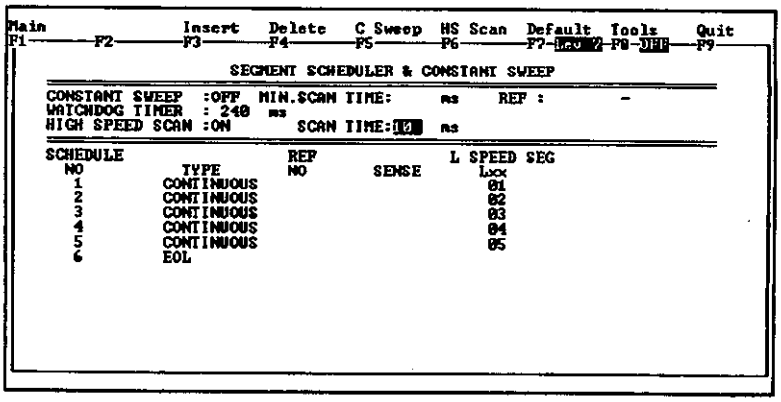
2) Select **HS Scan** using the Cursor Keys and press the Enter Key.



3) The cursor will move to the high-speed scan position. When the Enter Key is pressed, a selection window will be displayed. Select **ON** and press the Enter Key.



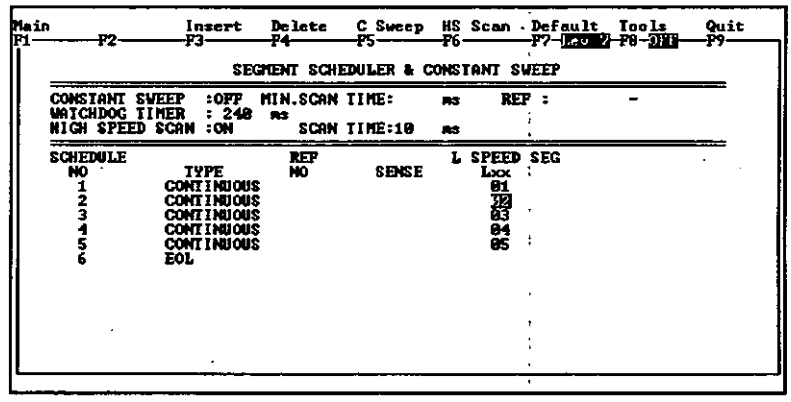
4) The cursor will move to the scan time position. Set a time interval for executing high-speed scan (**10** in this example) and press the Enter Key.



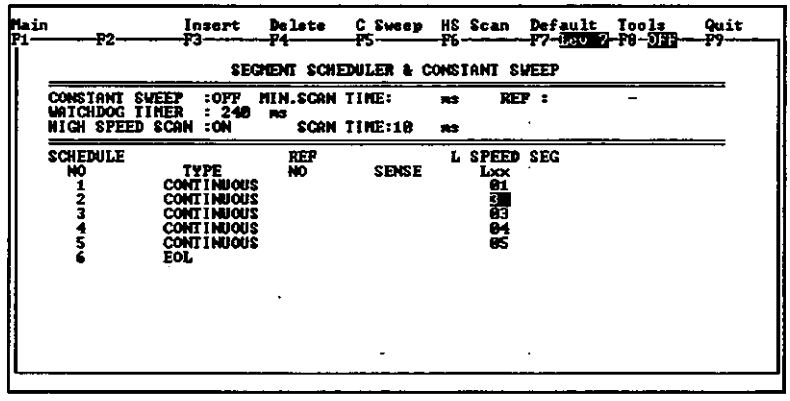
3. Changing Ladder Program Processing Order

The order of solving the program can be set freely for normal segments. Solving can be executed twice in one scan for normal segments depending on the setting. The following example shows how to rearrange the solving order for normal segments 2 and 3.

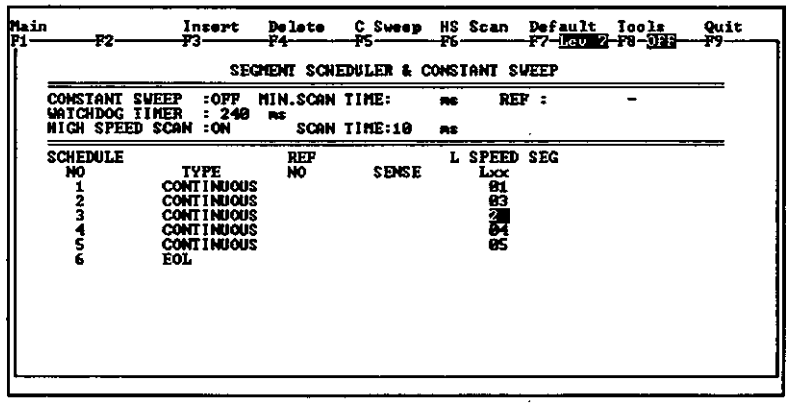
1) Move the cursor to the segment number position of schedule number 2 using the Cursor Keys.



2) Enter the second normal segment number to be solved. In this example set segment number **3** and press the Enter Key.



3) Move the cursor to the segment number position of schedule number 3 using the Cursor Keys. Change the third segment number to be solved to **2** and press the Enter Key.

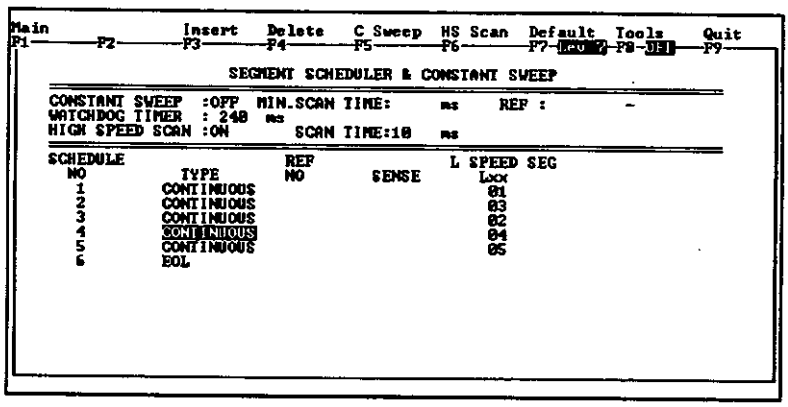


The setting has now been changed so that segment 3 is solved second, and normal segment 2 is solved third.

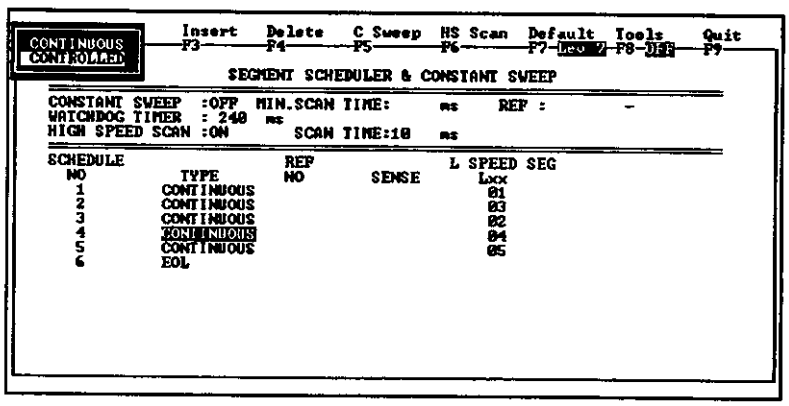
4. Changing Segment Solving to Controlled Segment Solving

It is possible to specify that solving for a normal segment can be restricted to only the scans for which a reference is ON or OFF.

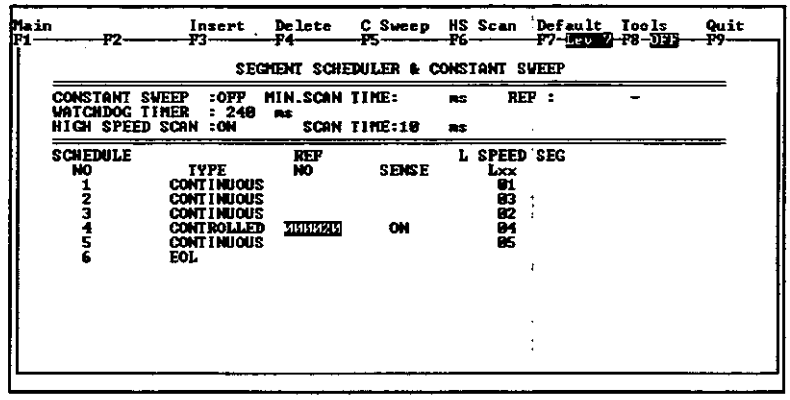
1) Move the cursor to the position of the schedule number that is to be changed to controlled solving using the Cursor Keys.



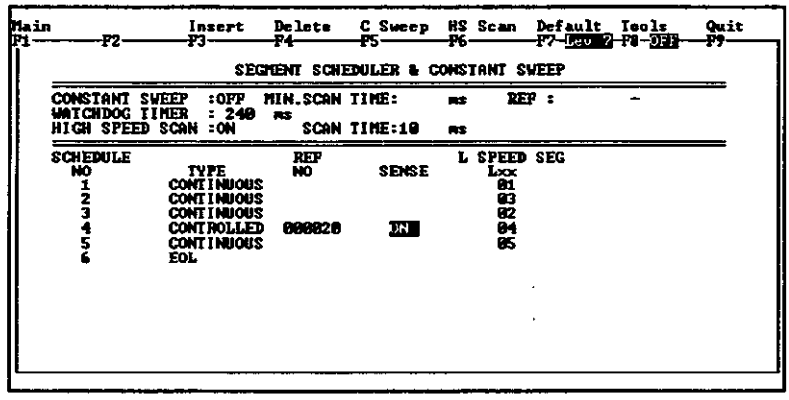
2) When the Enter Key is pressed, a selection window will be displayed. Select **Controlled** using the Down Cursor Key and press the Enter Key.



3) The cursor will move to the reference number position. Enter the reference number to be referenced (**20** in this example) and press the Enter Key.



4) The cursor will move to the sense position. If ON is correct, move the cursor to another position. To change the setting to OFF, press the Enter Key. A selection window will be displayed. In this example, keep the setting as ON.

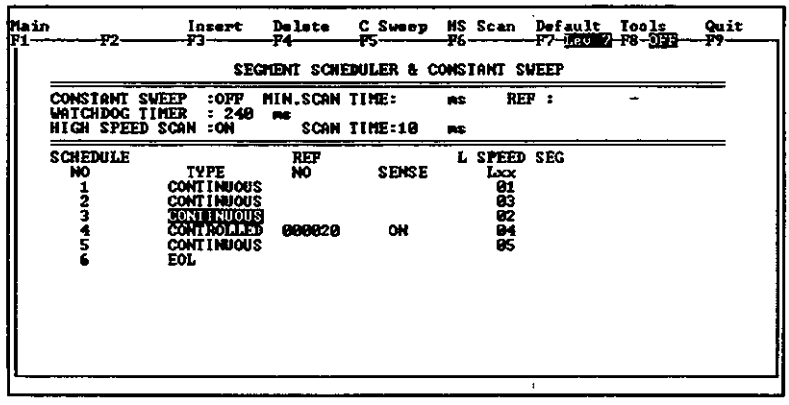


For normal segment 4, solving and processing will not be performed only for the scans in which reference number 20 is ON.

5. Inserting/Deleting Schedules

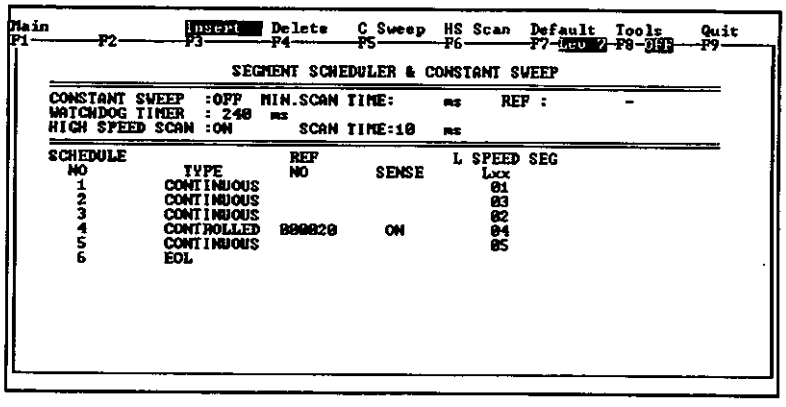
The following example shows how to add one schedule between schedule numbers 2 and 3.

1) Move the cursor to the line of schedule number 3 using the Cursor Keys.

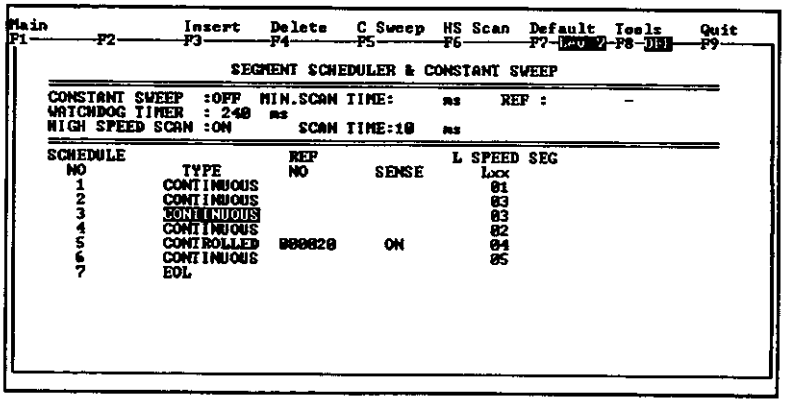


2) Switch to the menu cursor using the Tab Key.

3) Select **Insert** using the Cursor Keys. Then, press the Enter Key.



One schedule will be added between schedule numbers 2 and 3.



INFO

1) When a schedule is inserted, the normal segment number will be duplicated. Therefore, always set a different normal segment number after inserting a schedule.

2) Solving is not performed for normal segments that are not set in the segment scheduler.

3) If the number of segments set exceeds the range of the number of segments set in the overview screen, an error will occur. See section *7.1.4 Setting Segments* when changing the number of segments.

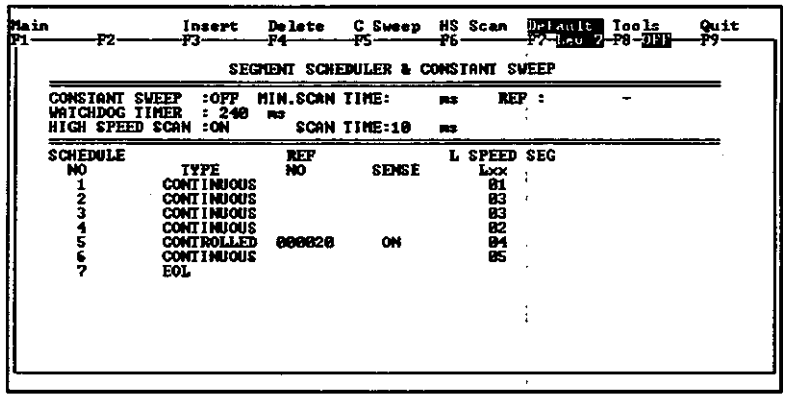
7

6. Initializing a Scheduler

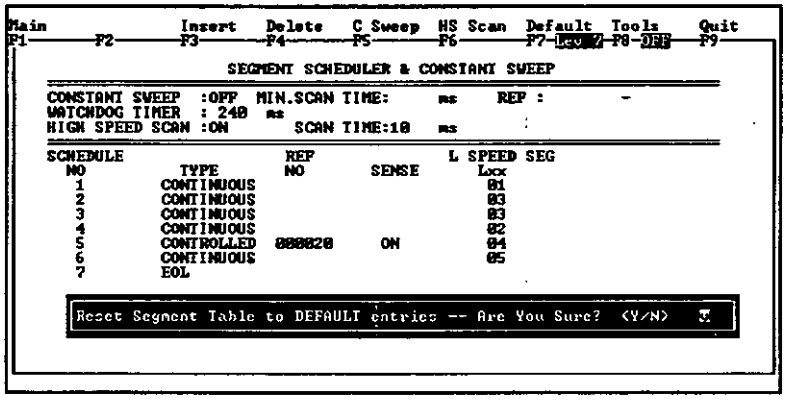
Only the segment scheduler is initialized by this operation. The settings for constant sweeps and the high-speed scan are not initialized.

1) Switch to the menu cursor using the Tab Key.

2) Select **Default** using the Right Cursor Key. Then, press the Enter Key.



3) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



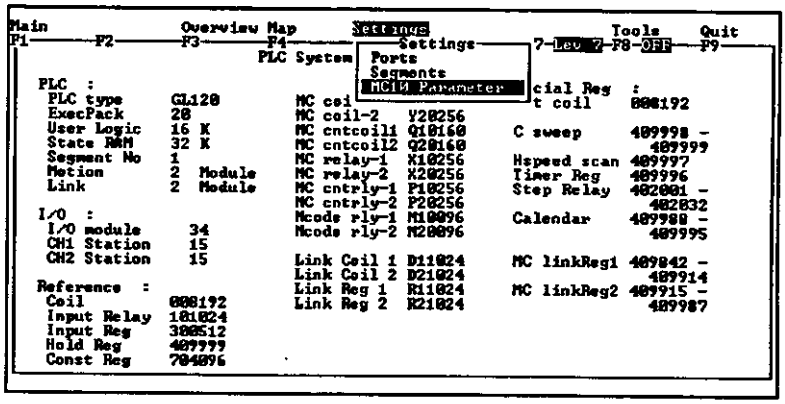
The segment scheduler will be initialized.

7.4.4 Setting MC10 Parameters

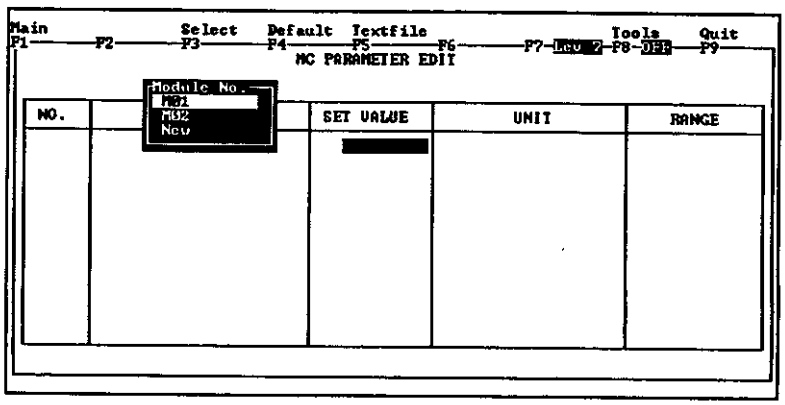
Use this operation to set the MC10 parameters. When using an MC10 Motion Module, it is necessary to set the parameters for each Module using this operation. The MC10 parameter operation can only be executed in Offline Mode.

1. Displaying the MC10 Parameter Edit Screen

1) Select **MC10 Parameter** from the Settings Menu using the Cursor Keys and press the Enter Key.

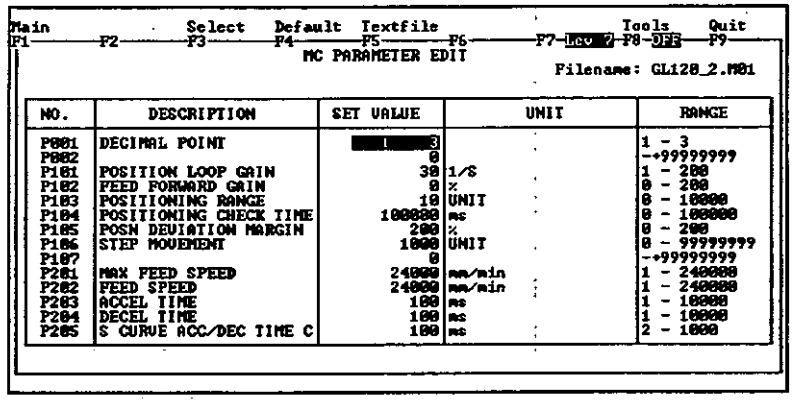


2) The Module number selection window will be displayed. Select the Module number using the Cursor Keys and press the Enter Key.



INFO If the Module has not been previously set, select **New**, and the Module Number Input Screen will be displayed. Enter the desired Module number.

The MC Parameter Edit Screen will be displayed.



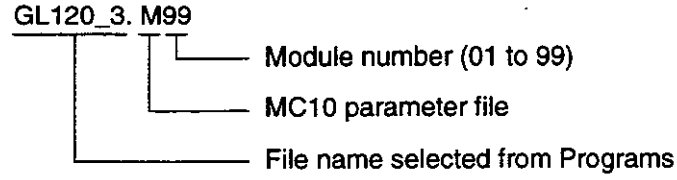
3) Set the parameters for the MC10 Motion Module.

2. MC10 Parameter Edit Screen Operations

The operation procedure of the MC10 Parameter Edit Screen is basically the same as that for other Motion Modules. See chapter *14 Editing Motion Parameters* for further details.

INFO

1) The MC10 parameter data is saved in files for each Module. The file name configuration is as follows:



2) The number of the MC10 Motion Module is set using the rotary switch on the front of the MC10 Motion Module. The Module number cannot be set from MEMOSOFT.

Segment/Network List Operations

8

This chapter describes operations that can be used while a segment list or a network list is displayed.

8.1 Segment List Operations

This section describes basic segment list operations such as switching the segment list display, and displaying the network list.

8.1.1 Overview

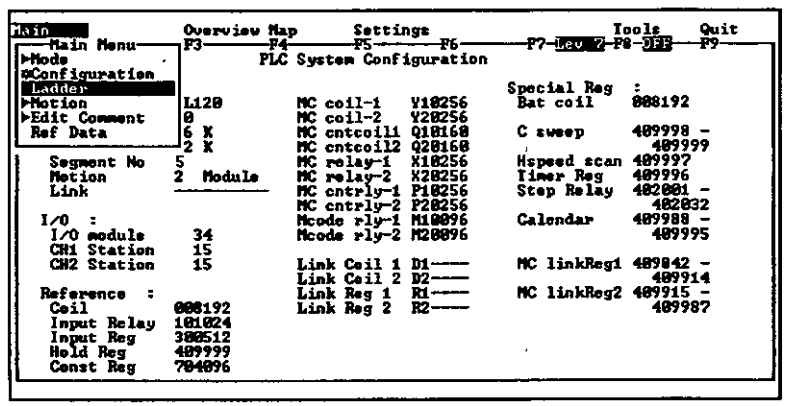
A segment list can be displayed by selecting **Ladder** from the Main Menu or ending the Ladder Editor Screen.

The following operations can be performed while the segment list is displayed.

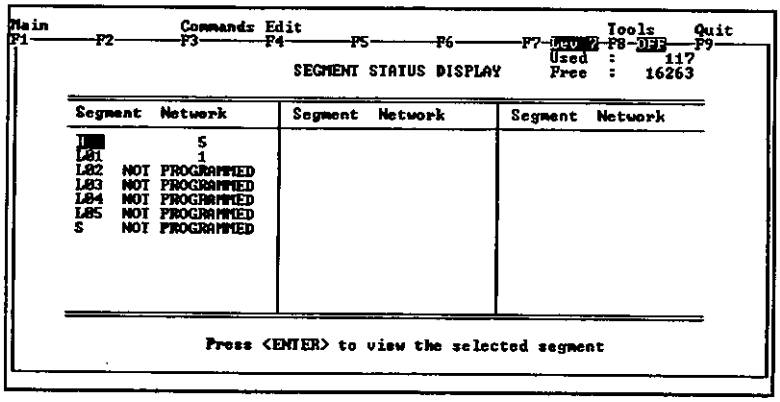
- Transferring control between segments
- Searching and substituting ladder programs
- Clearing network data contained in a segment
- Checking for duplicate coil use
- Displaying a network list
- Switching the display type

An example of displaying a segment list is shown below.

Select **Ladder** from the Main Menu using the Cursor Keys and press the Enter Key.



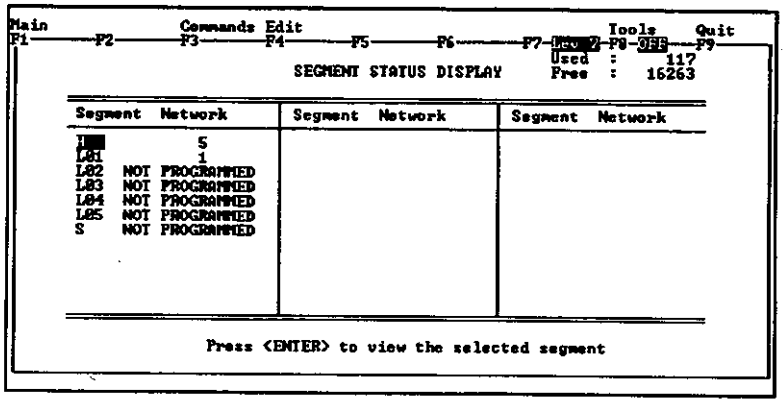
A segment list will be displayed.



The following two types of segment list are available.

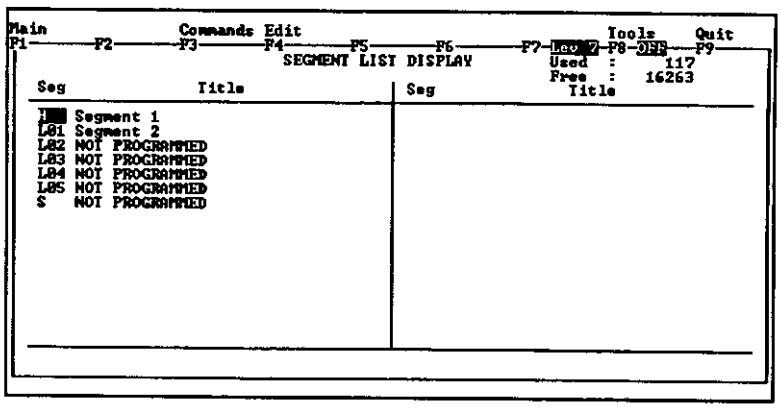
- **Segment Status**

  A list of segments allocated by the segment scheduler (high-speed segments and subroutine segments need not be allocated) and the number of networks stored in each segment are displayed.



- **Segment List**

  A list of segments allocated by the segment scheduler and the title of each segment are displayed.



See section *8.1.3 Edit Switching Operations* for details on switching the display between the two types of segment lists.

1) The amount of used and free memory space for the ladder program is displayed in the upper right corner of the screen. The unit used is the basic memory consumption of elements.

2) When the operations listed below are performed offline, ladder programs can be input regardless of the maximum program size of the PLC. However, always be sure that the maximum program size of the PLC will not be exceeded when loading edited programs to the PLC.

   • Editing ladder programs.

   • Browsing part or all of an existing ladder program.

   • Merging ladder programs.

3) An error message will be displayed when loading a program created offline to a PLC if the size of the program exceeds the maximum program size for the PLC.

4) As indicated above, no restrictions have been placed on the size of ladder programs that can be input offline. This is to allow for easier editing.

8.1.2 Command Operations

1. Search in Program

The Search operation searches for the following information in all the segments and displays the search results on the screen.

• Reference number

• Reference symbol

• Network title

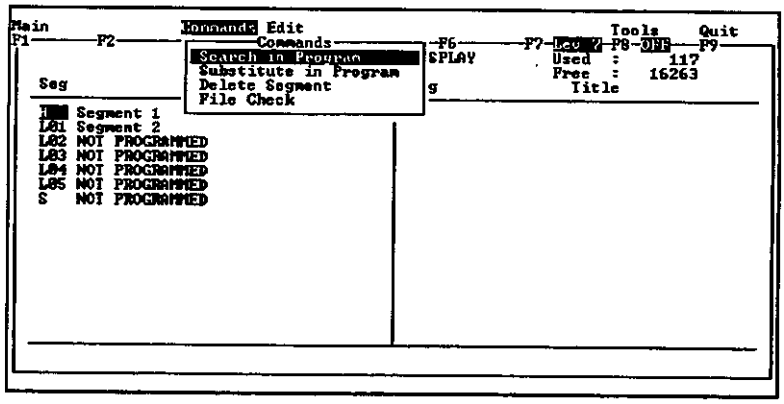
• Segment title

Search results are stored in the \FMSGL directory as a text file. The file name is SEARCH.LOG.

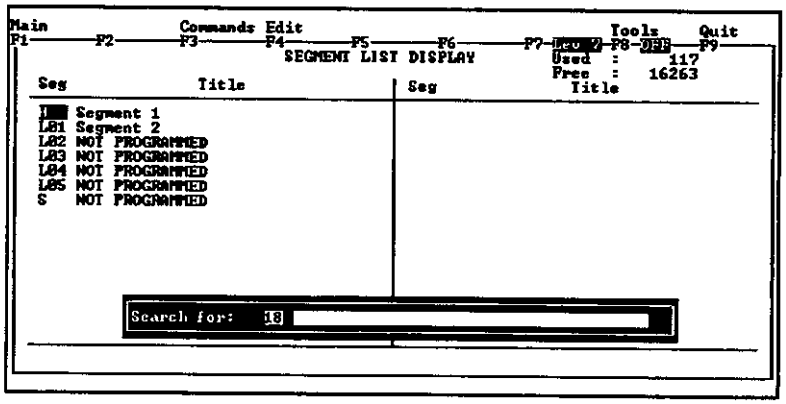
An example of the Search operation for a reference number is shown below.

1) Switch to the menu cursor using the Tab Key.

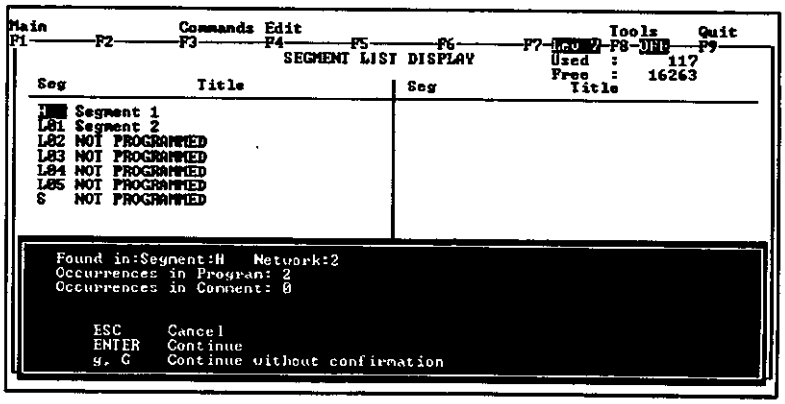
2) Select **Search in Program** from the Commands Menu using the Cursor Keys and press the Enter Key.



3) A search setting window will be displayed. Enter a search pattern (in this example, reference number **18**) and press the Enter Key.



Search results will be displayed.



Use the following keys for the operations.

ESC	Cancels search processing.
↵	Continues search processing. A screen is displayed whenever a search pattern is detected.
G	Continues search processing. Even if a search pattern is detected, the screen is not displayed and search is continued until the end of the program.

2. Substitute in Program

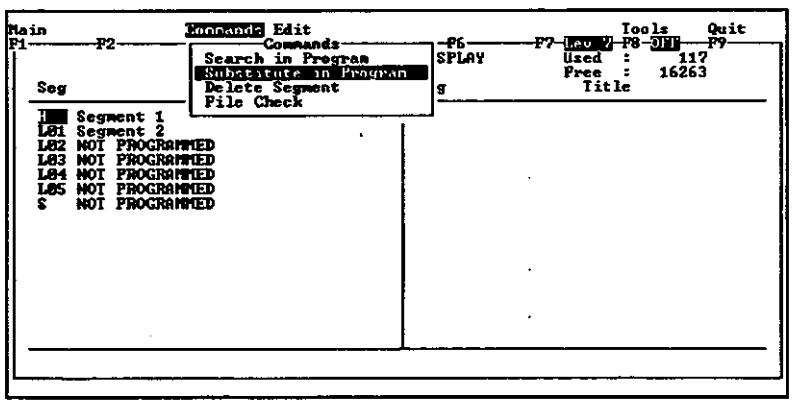
The Substitute operation searches the following data for the information that matches a particular character string, such as the specified reference number, and substitutes the character string with the specified character string.

- Reference number
- Network title
- Segment title

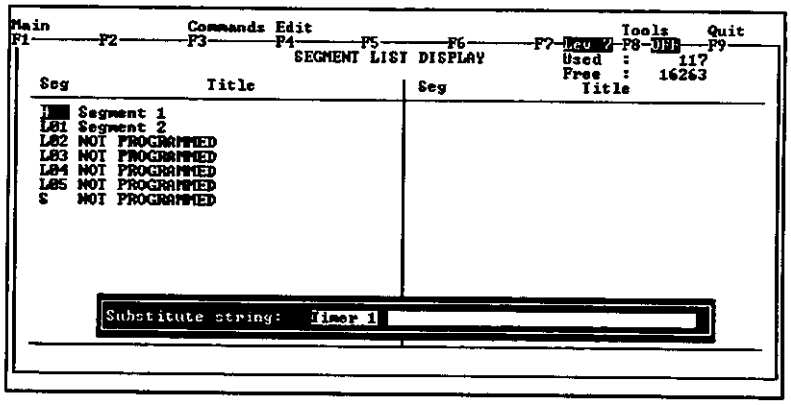
An example of substitution of a network title is shown below.

1) Switch to the menu cursor using the Tab Key.

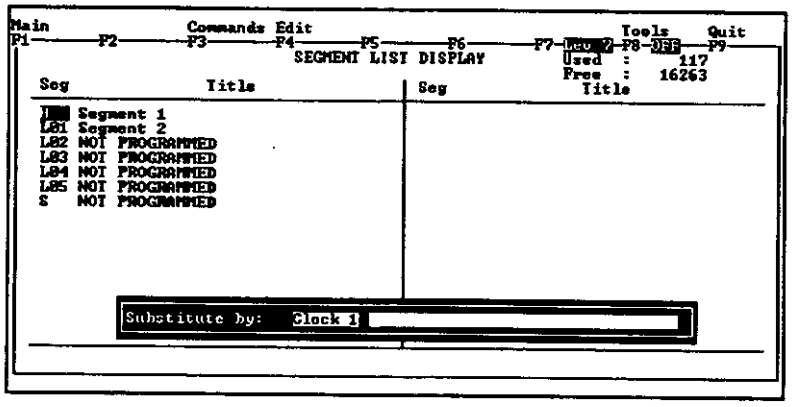
2) Select **Substitute in Program** from the Commands Menu using the Cursor Keys and press the Enter Key.



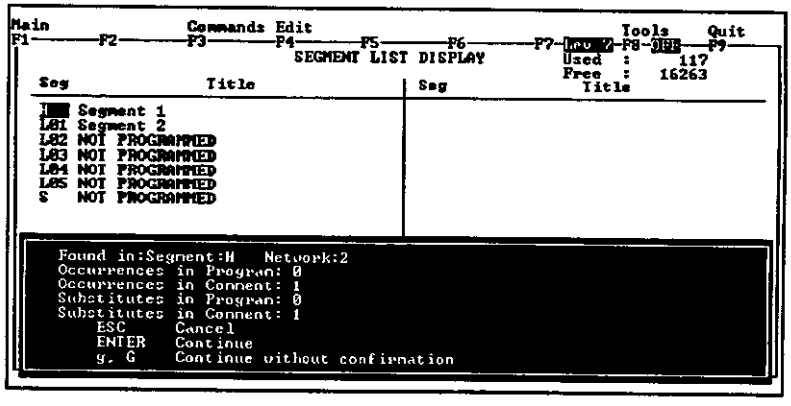
3) A substitution setting window will be displayed. Enter the character string to be substituted (**Timer 1** in this example) and press the Enter Key.



4) Enter the character string to be inserted (**Clock 1** in this example) and press the Enter Key.



The substitution results will be displayed.



Use the following keys for the operations.

ESC	Cancels substitution processing.
↵	Continues substitution processing. The screen is displayed whenever a substitution pattern is detected.
G	Continues substitution processing. However, even if a substitution pattern is detected, the screen is displayed and substitution is continued to the end of the program.

3. Delete Segment

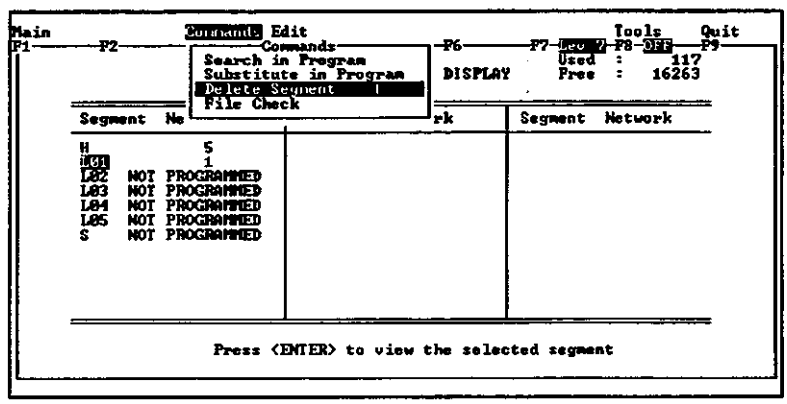
The Delete Segment operation removes network data from a specified segment.

An example of deleting network data from segment L01 is shown below.

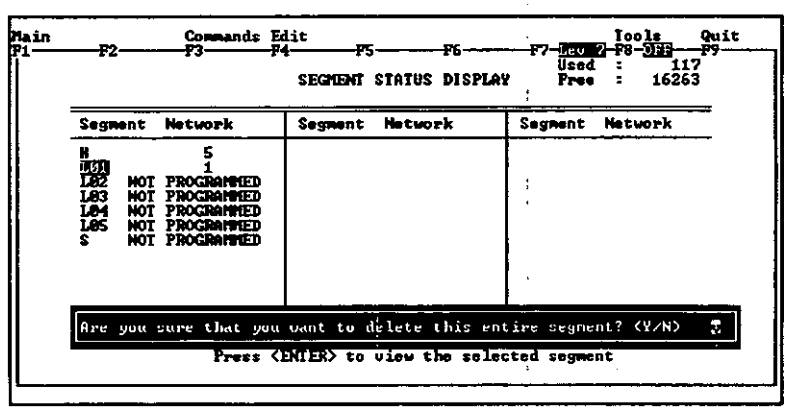
1) Move the cursor to the position of the segment to be deleted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

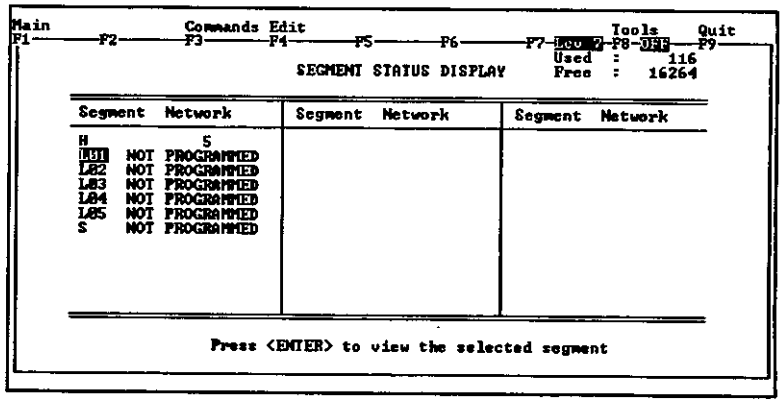
3) Select **Delete Segment** from the Commands Menu using the Cursor Keys and press the Enter Key.



4) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The network data of segment L01 will be deleted.

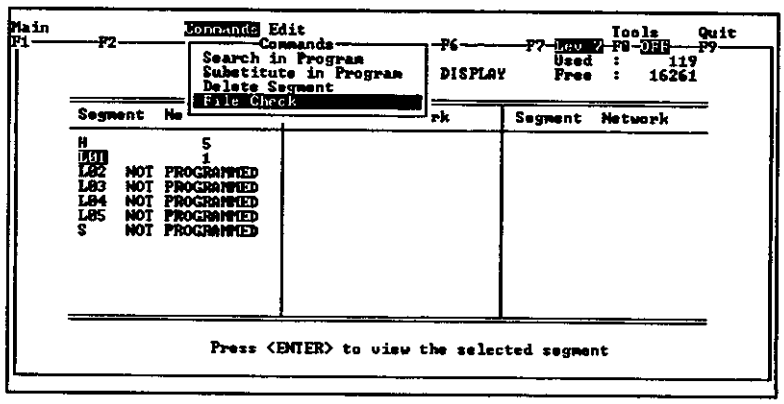


4. File Check

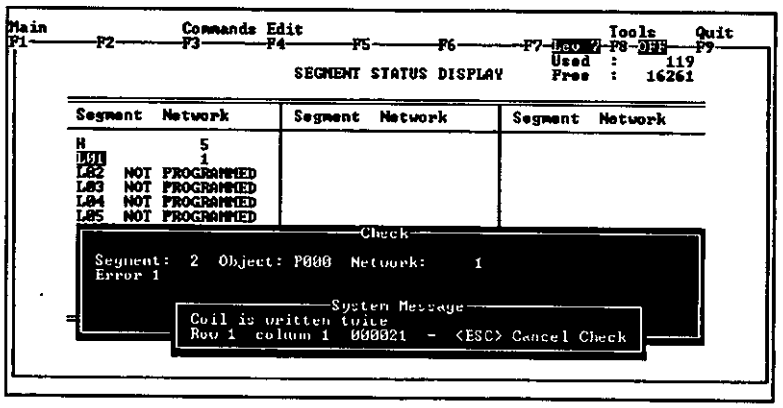
The File Check operation checks whether the program matches the system configuration and if duplicate coils are being used. Search results are stored in the \FMSGL directory as a text file. The file name is MEMOSOFT.ERR.

1) Switch to the menu cursor using the Tab Key.

2) Select **File Check** from the Commands Menu using the Cursor Keys and press the Enter Key.



When the same coil is used more than once, the following messages will be displayed.



Use the following keys for the operations.

ESC	Cancels file check processing.
↵	Continues file check processing. A screen is displayed whenever an error is detected.

INFO

1) When the file check results contains errors, the results cannot be loaded to the PLC. Correct all errors before loading the information.

2) When networks are copied or edited, duplicate coils may be present. Perform a file check after any of these operations.

8.1.3 Edit Switching Operations

The following displays can be accessed through the Segment Status Display.

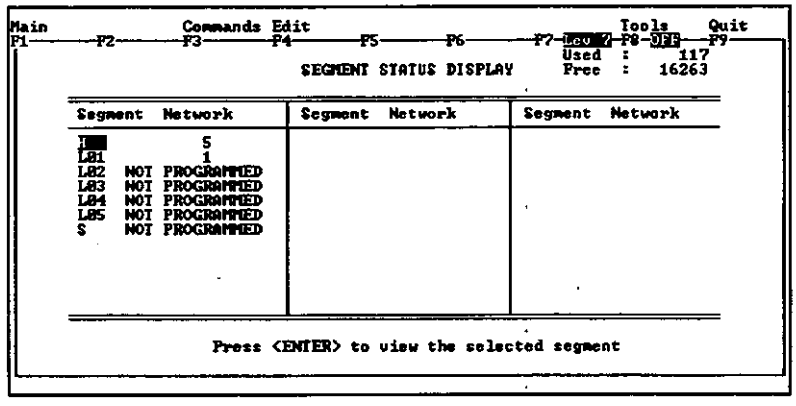
- Ladder Editor Screen
- Network List Display
- Segment List Display

• Switching to the Ladder Editor Screen

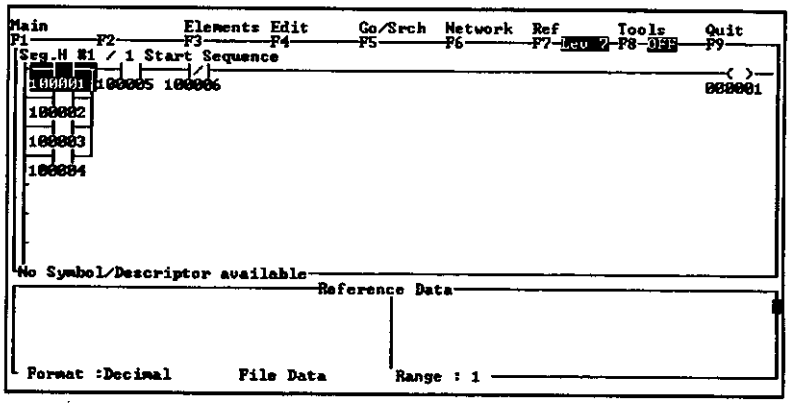
The following two types of operations are available for switching to the Ladder Editor Screen.

1. Using the Enter Key

Move the cursor to the position of the segment to be displayed on the screen using the Cursor Keys and press the Enter Key.

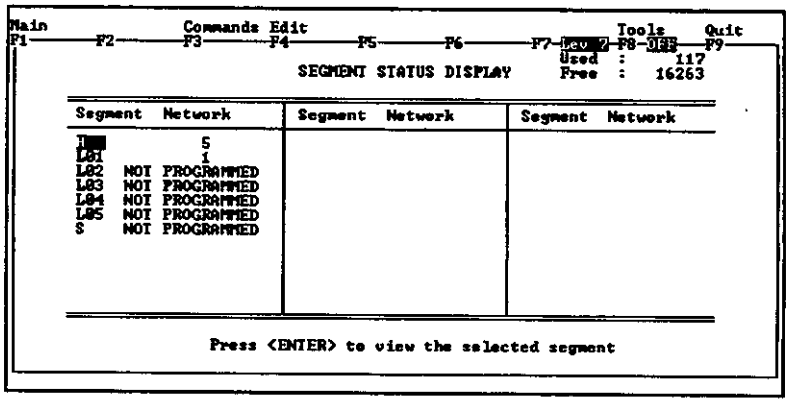


Network 1 of the specified segment will be displayed.

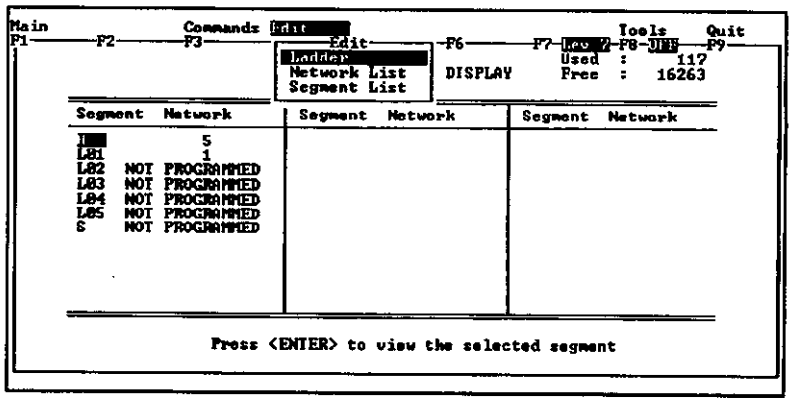


2. Using a Menu

1) Move the cursor to the position of the segment for which ladder editing is to be performed using the Cursor Keys, and switch to the menu cursor using the Tab Key.



2) Select **Ladder** from the Edit Menu using the Cursor Keys and press the Enter Key.



Network 1 of the specified segment will be displayed.

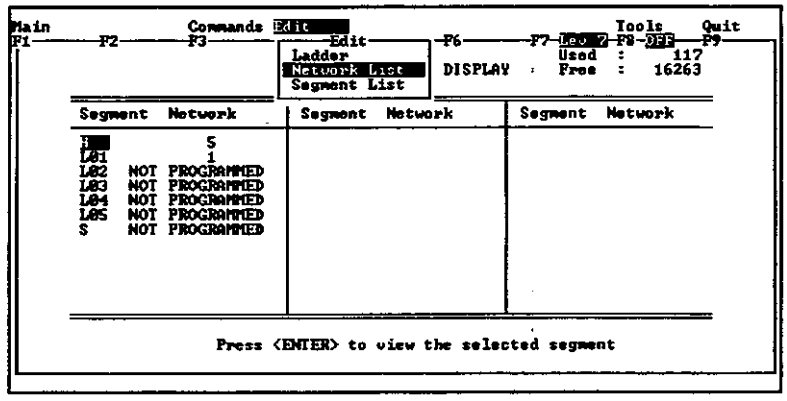
• Displaying a Network List

A list of networks contained in the selected segment can be displayed. See section *8.2 Network List Operations* for details on the operations after displaying a network list.

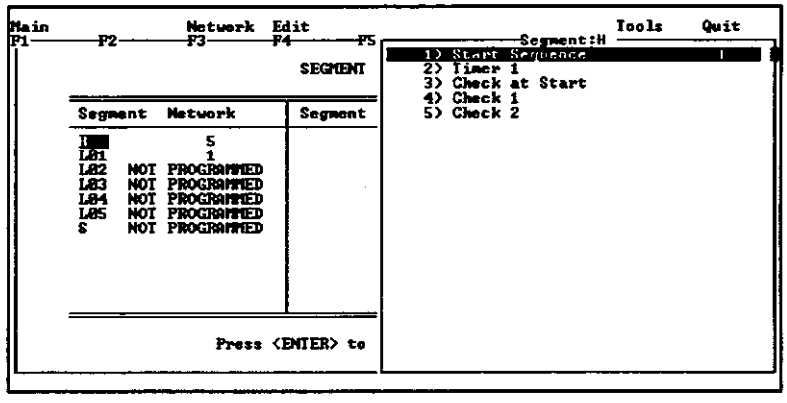
1) Move the cursor to the segment for which network list is to be displayed using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Network List** from the Edit Menu using the Cursor Keys and press the Enter Key.



A network list will be displayed.



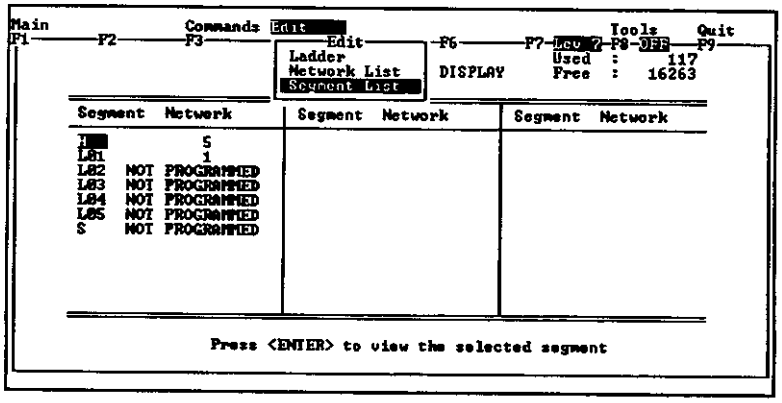
• Switching List Display

When MEMOSOFT is activated and **Ladder** is initially selected, the segment status will be displayed. To switch to the segment list, execute the operation outlined below.

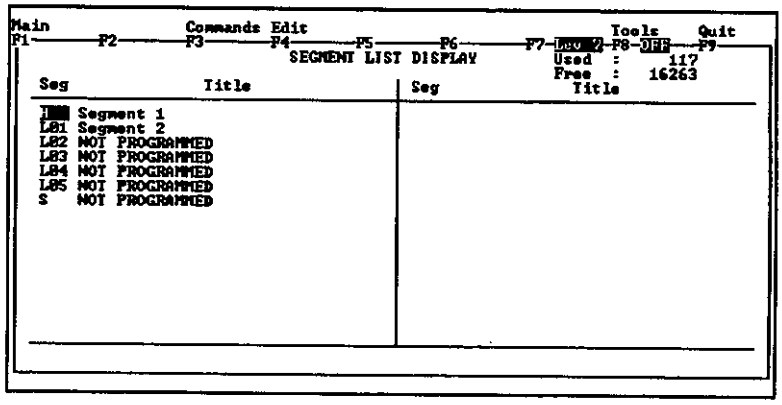
After the display is switched to the Segment List Display Screen, the segment list is displayed until Segment List is selected again. If Segment List is selected again, control will return to the Segment Status Display.

1) Switch to the menu cursor using the Tab Key.

2) Select **Segment List** from the Edit Menu using the Cursor Keys and press the Enter Key.



The display will switch to the Segment List Display Screen.



8.2 Network List Operations

This section describes edit operations performed on individual networks while the network list is displayed.

8.2.1 Overview

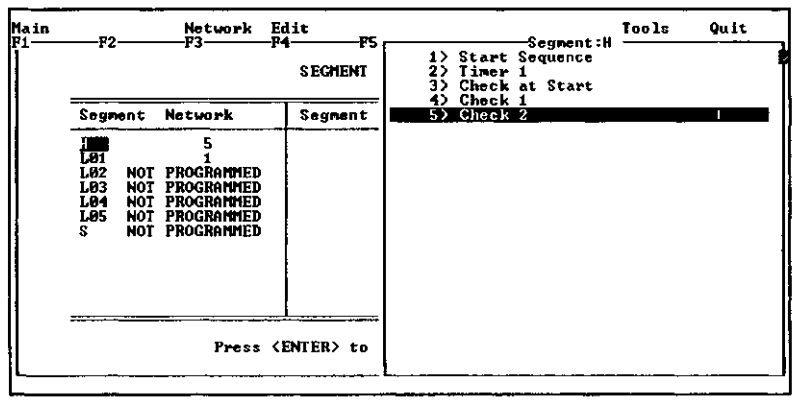
A network list can be displayed by selecting **Network List** from the Edit Menu on the Segment List Display Screen as described in section *8.1 Segment List Operations.*

The following operations can be performed while a network list is displayed.

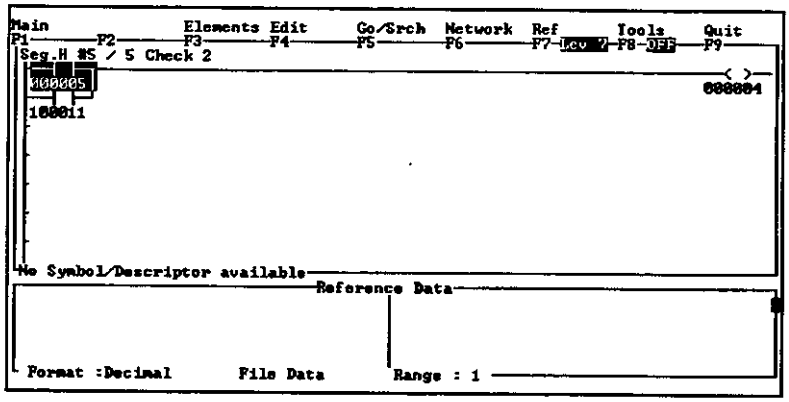
- Transferring control between networks
- Inserting networks
- Copying, deleting, and pasting networks
- Executing the offset operation for networks

An example of simple transfer of control between networks is shown below.

1) Move the cursor to the position of the network to be displayed on the screen using the Cursor Keys.



2) Press the Enter Key. The selected network will be displayed.



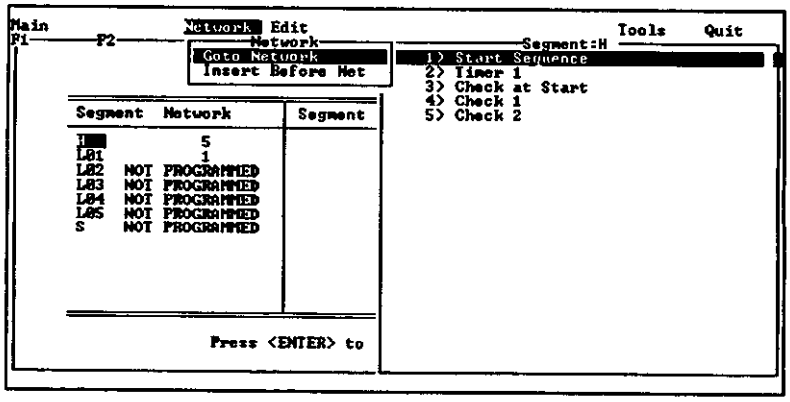
8.2.2 Network Operations

1. Goto Network Operation

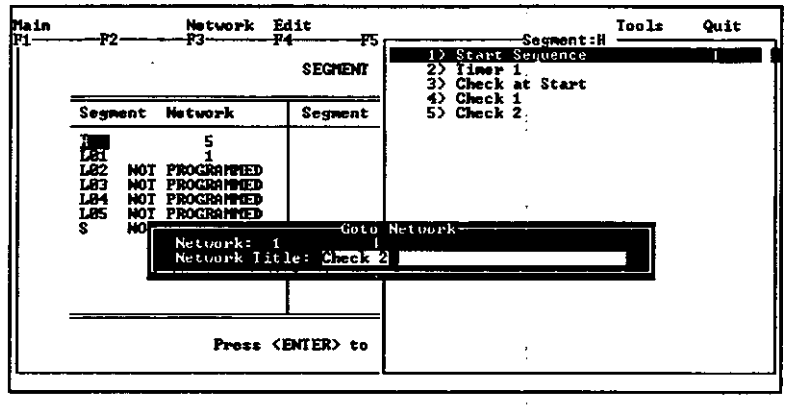
The cursor can be moved to the position of the specified sequenced network number or network title while a network list is displayed.

1) Switch to the menu cursor using the Tab Key.

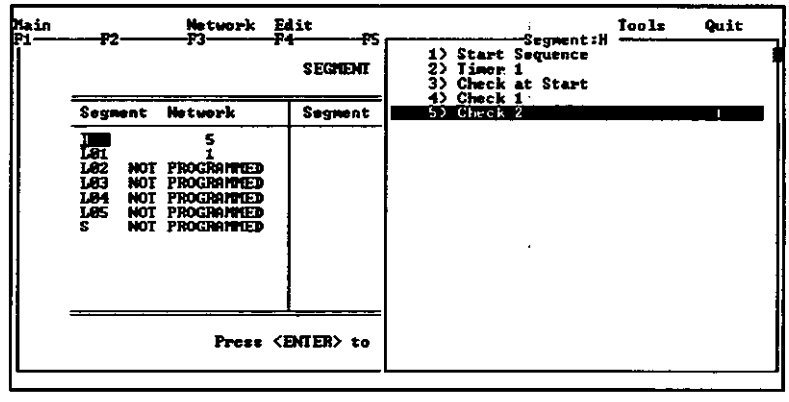
2) Select **Goto Network** from the Network Menu using the Cursor Keys and press the Enter Key.



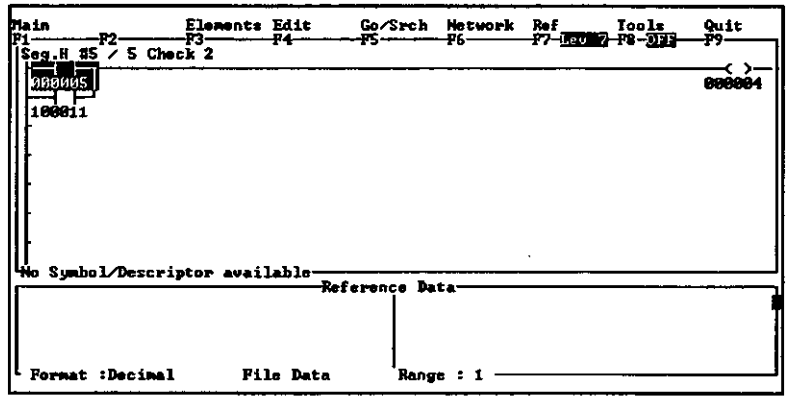
3) A window for specifying the destination network will be displayed. Enter the destination network number or title (**Check 2** in this example) using the Down Cursor Key and press the Enter Key. When a network title is entered, the network number will be ignored.



4) The cursor will move to the position of the network title that was entered. Press the Enter Key.



The network with the network number to which the cursor is currently set will be displayed.



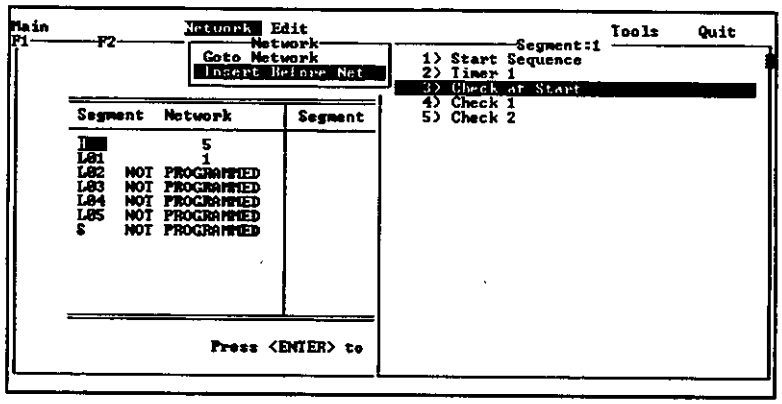
2. Insert Before Network Operation

This operation adds one empty network before the network in which the cursor is currently set.

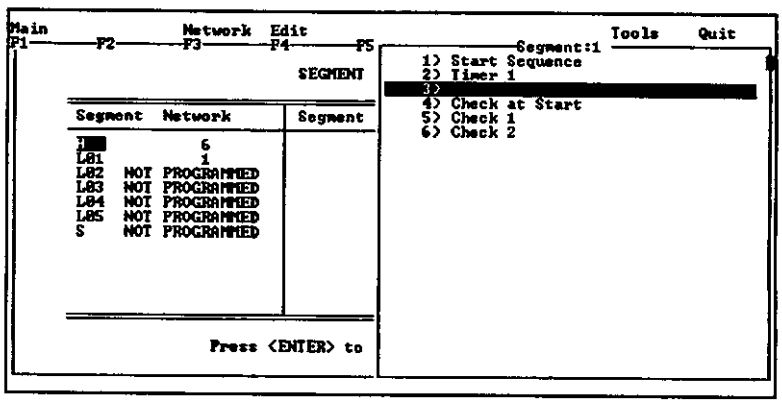
1) Move the cursor to the position in which a network is to be inserted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Insert Before Net** from the Network Menu using the Cursor Keys and press the Enter Key.



An empty network will be added before the network at the current cursor position.



8.2.3 Editing

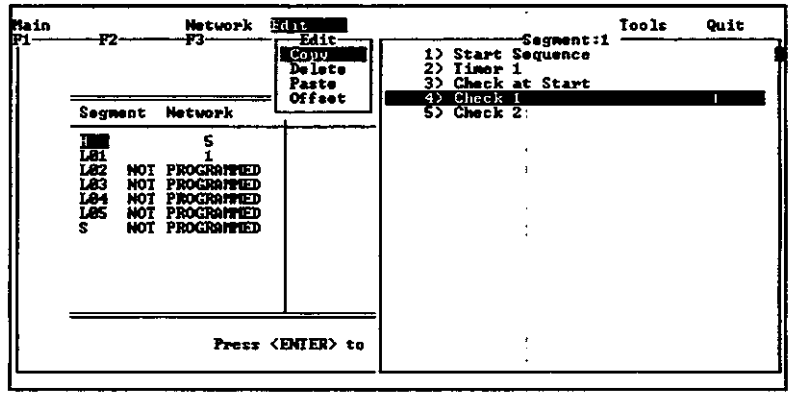
1. Copy

The Copy operation stores network data from the area specified by the cursor. The data stored by the Copy operation can be pasted to another position using **Paste**.

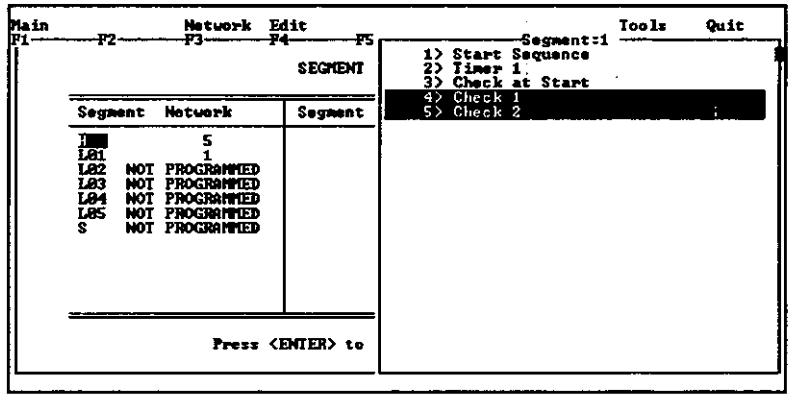
1) Move the cursor to the top or the bottom of the area to be copied using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Copy** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) Specify the range using the Cursor Keys and press the Enter Key.



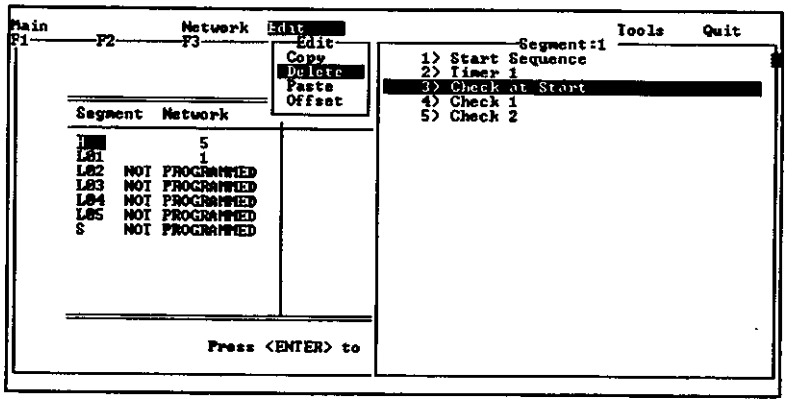
2. Delete

The Delete operation removes and stores the network data of the area specified by the cursor. The deleted data can be pasted to another position using **Paste.** Therefore, this operation is useful not only for deleting networks, but also for moving networks. One network can also be deleted by moving the cursor to the position of the network to be deleted and pressing the Delete Key.

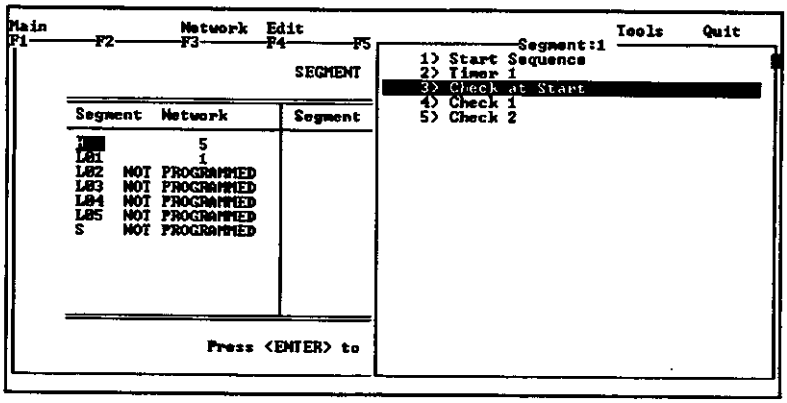
1) Move the cursor to the top or bottom of the area to be deleted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

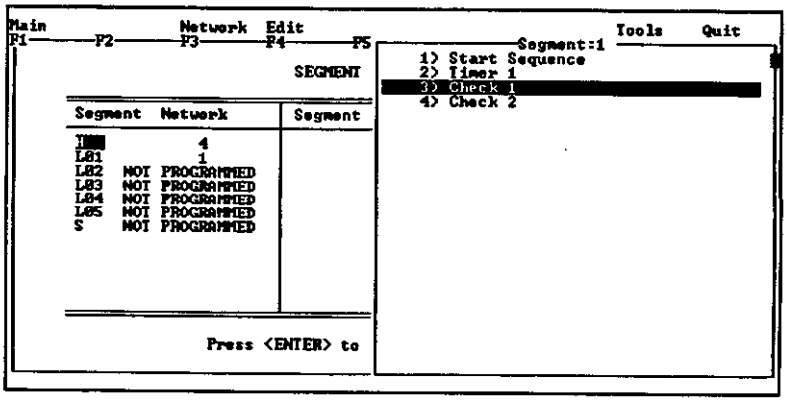
3) Select **Delete** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) Specify the range (in this example, one network) and press the Enter Key.



The specified network will be deleted.



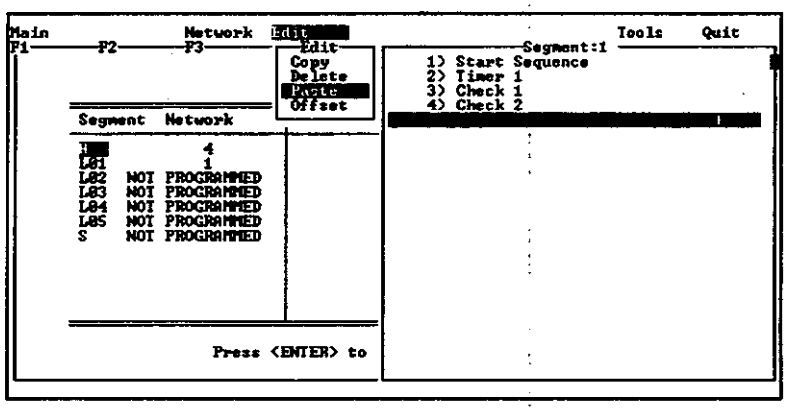
3. Paste

The Paste operation inserts the network data that was stored by **Copy** or **Delete** at the cursor position. In this example, the data stored by **Delete** described above is inserted to another section.

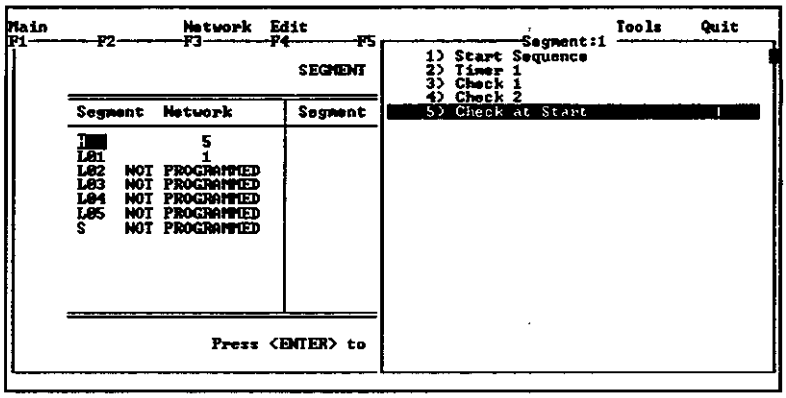
1) Move the cursor to the position at which network data is to be inserted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Paste** from the Edit Menu using the Cursor Keys and press the Enter Key.



The stored network data will be inserted at the cursor position.



4. Offset

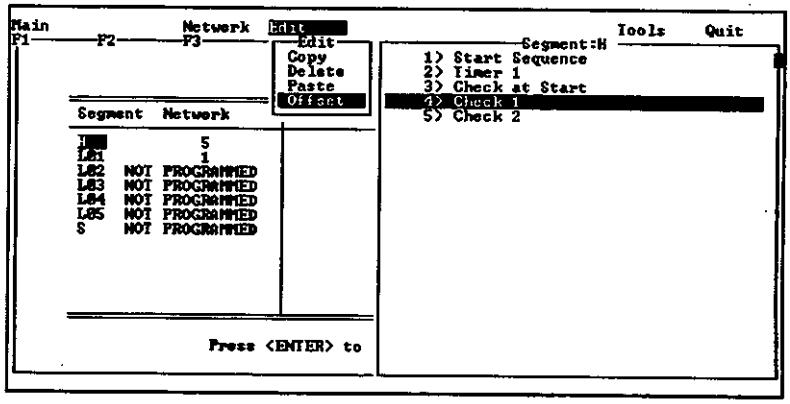
The Offset operation replaces the reference numbers of the specified range with the reference numbers determined by adding a specified offset value. This operation is useful for changing a reference number after copying a ladder program using the Copy operation.

While the Offset operation in the Edit Menu of a ladder program enables substitution within one network only, this Offset operation allows substitution in multiple networks.

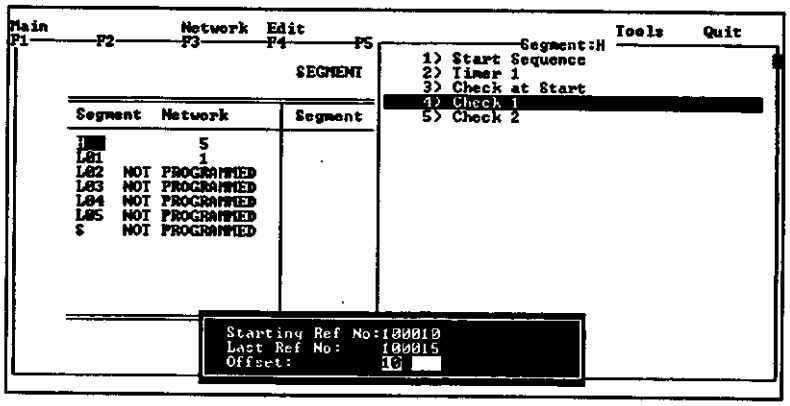
1) Move the cursor to the top or bottom of the network area to be substituted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

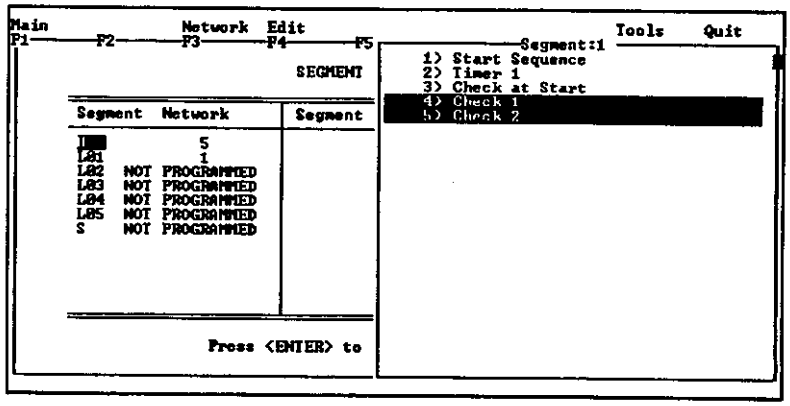
3) Select **Offset** from the Edit Menu using the Cursor Keys and press the Enter Key.



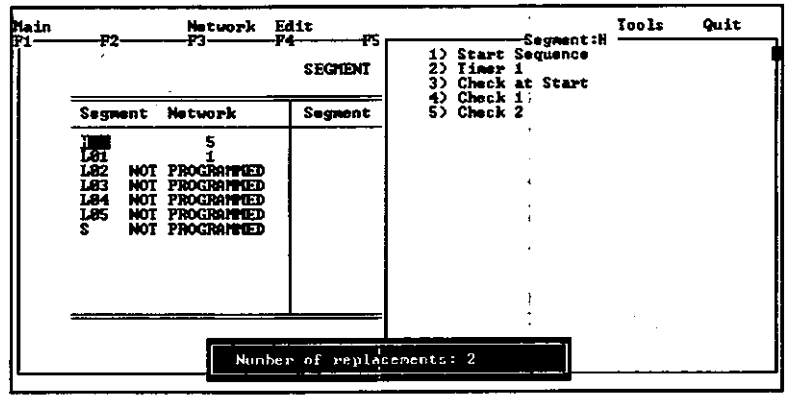
4) An offset setting window will be displayed. Enter the starting and last reference numbers and the offset value (in this example, **100010**, **100015**, and **10** respectively.) Press the Enter Key after entering each value.



5) The cursor will be displayed in reverse video. Specify the area in which to substitute using the Cursor Keys and press the Enter Key.



Substitution will now be executed, and the number of reference numbers that were substituted will be displayed.



INFO

1) This operation cannot be used to substitute for only part of a network. For substitution within a network, select **Offset** from the Edit Menu of the Ladder Editor Screen. See section *9.3 Editing*.

2) Either a positive value or a negative value can be specified for the offset value.

3) When the number determined by adding an offset number to the specified starting or last reference number exceeds the reference range set in the system configuration, an error will occur.

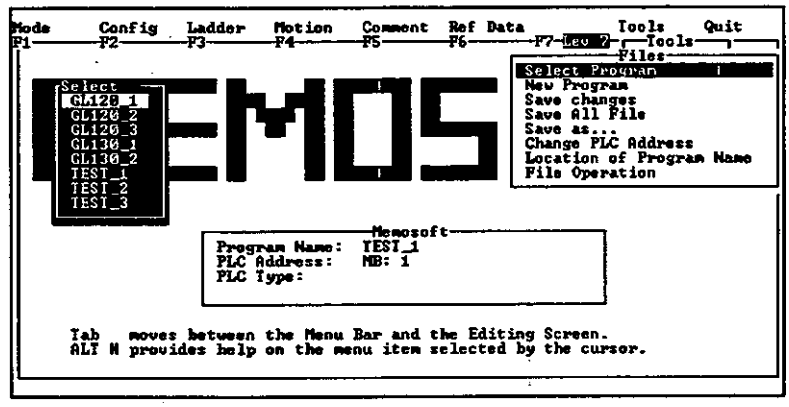
4) If two or more different reference ranges (for instance, **300001** for the starting reference number and **401000** for the last reference number) are set, substitution will not be executed.

8.2.4 Reusing/Referencing Other Programs

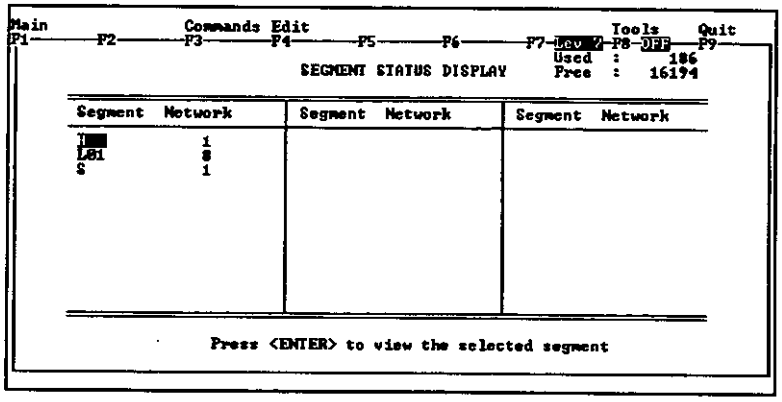
Using the editing operations described in section *8.2.3 Editing*, part or all of a ladder program that has been previously created can be reused or programs can be merged.

An example of how to go to a previously created ladder program is described below.

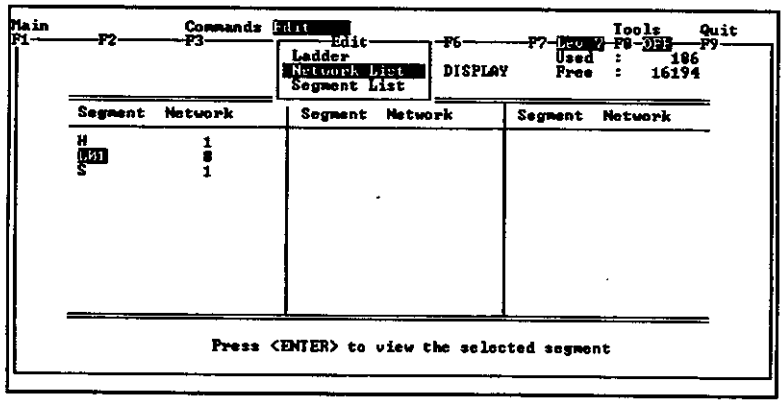
1) Select **Files** from the Tools Menu. Choose **Select Program** and specify the program name from the submenu using the Cursor Keys. Then, press the Enter Key.



2) Select **Ladder** using the Cursor Keys and press the Enter Key. The Segment Status Display Screen will be displayed.



3) Move the cursor to the position of the segment which is to be referred to. Select **Network List** from the Edit Menu using the Cursor Keys and press the Enter Key.

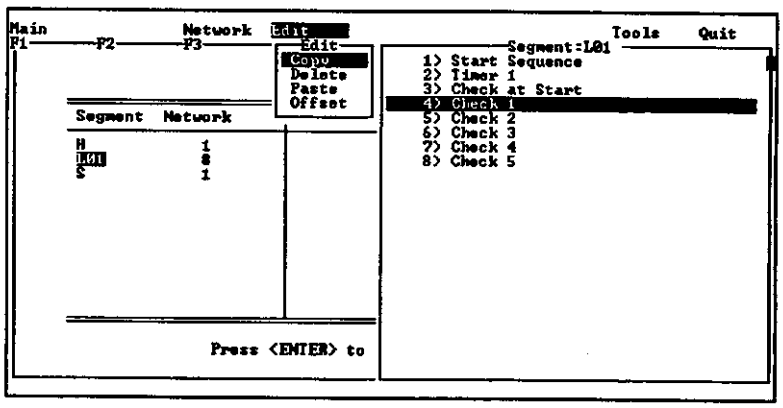


The network list stored in the specified segment will be displayed.

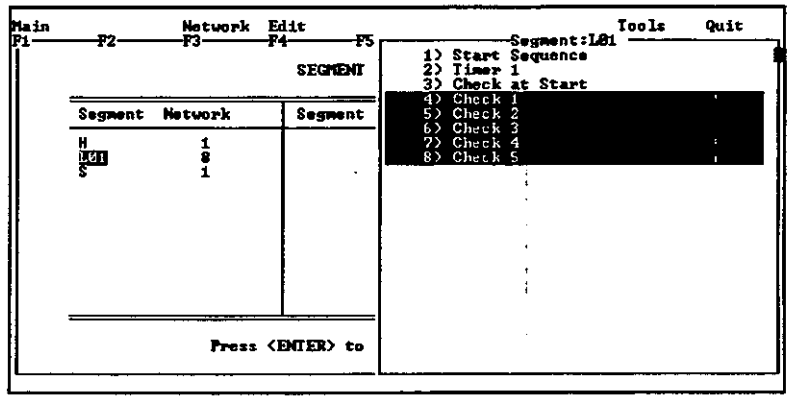
4) Move the cursor to the top or bottom of the network to be referred to using the Cursor Keys.

5) Switch to the menu cursor using the Tab Key.

6) Select **Copy** from the Edit Menu using the Cursor Keys and press the Enter Key.

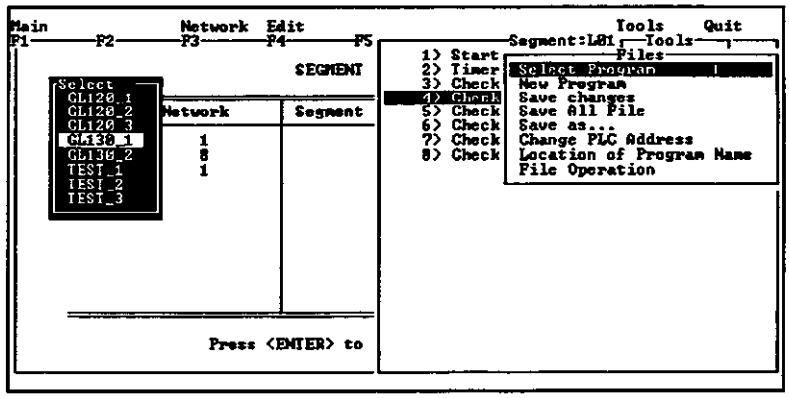


7) Specify the area to be referred to using the Cursor Keys and press the Enter Key.



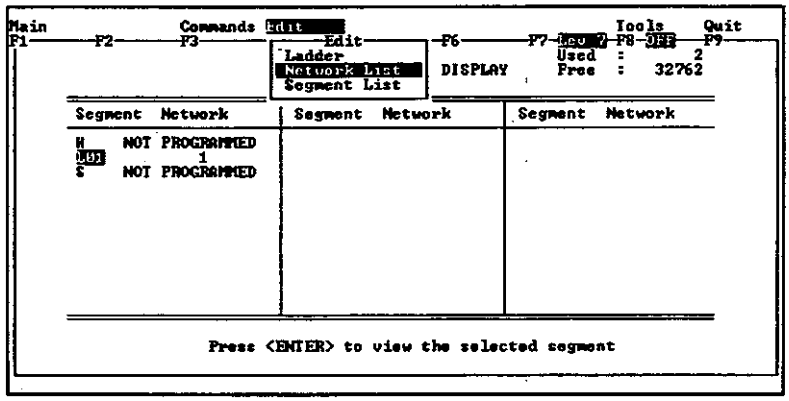
The network will be stored.

8) Select **Files** from the Tools Menu. Choose **Select Program** and specify the program name to be edited from the submenu using the Cursor Keys. Then, press the Enter Key.



The Segment Status Display Screen will be displayed.

9) Move the cursor to the segment to be edited. Select **Network List** from the Edit Menu using the Cursor Keys and press the Enter Key.

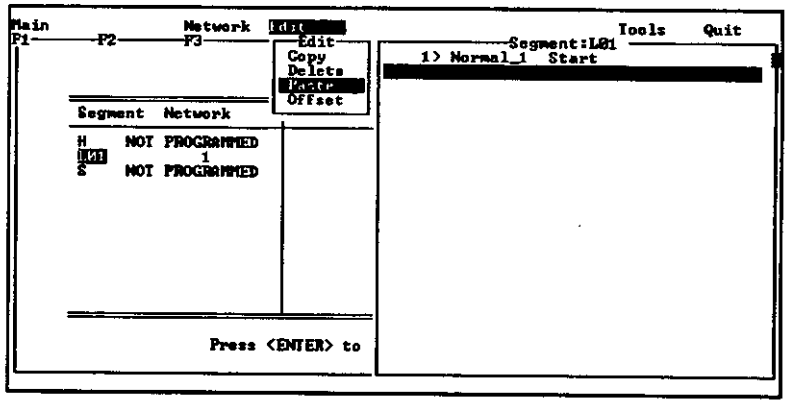


The network data stored in the specified segment will be displayed.

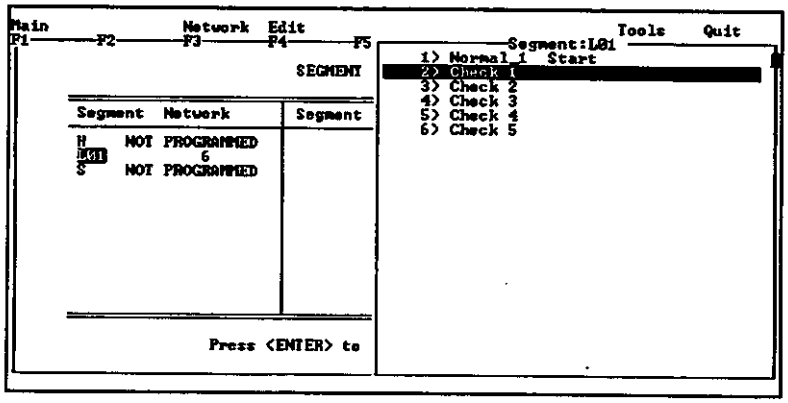
10) Move the cursor to the position in which the program is to be inserted using the Cursor Keys.

11) Switch to the menu cursor using the Tab Key.

12) Select **Paste** from the Edit Menu using the Cursor Keys and press the Enter Key.



The stored network will be inserted at the cursor position.



INFO

1) When the operations listed below are performed offline, ladder programs can be input regardless of the maximum program size of the PLC. However, always be sure that the maximum program size of the PLC will not be exceeded when loading edited programs to the PLC.

- Editing ladder programs.
- Browsing part or all of an existing ladder program.
- Merging ladder programs.

2) An error message will be displayed when loading a program created offline to a PLC if the size of the program exceeds the maximum program size for the PLC.

3) As indicated above, no restrictions have been placed on the size of ladder programs that can be input offline. This is to allow for easier editing.

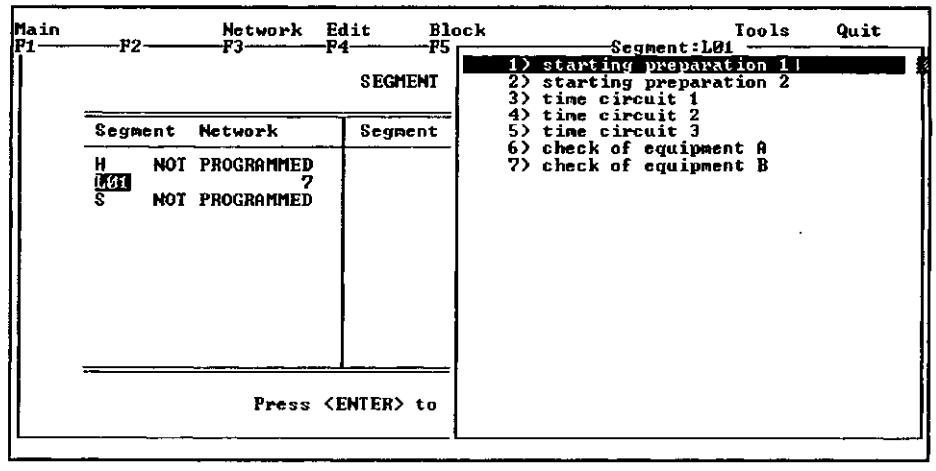
8.2.5 Saving and Merging

The previous section described accessing existing programs and merging programs. This section describes how to save part or all of an existing ladder program as a file in network units. Ladder programs, network titles, and network comments within a network are saved as a merge file (xxxxxxxx.BLK). Network data saved as a file can be merged into another program.

1. Save

The Save operation saves the specified range of network data as a merge file.

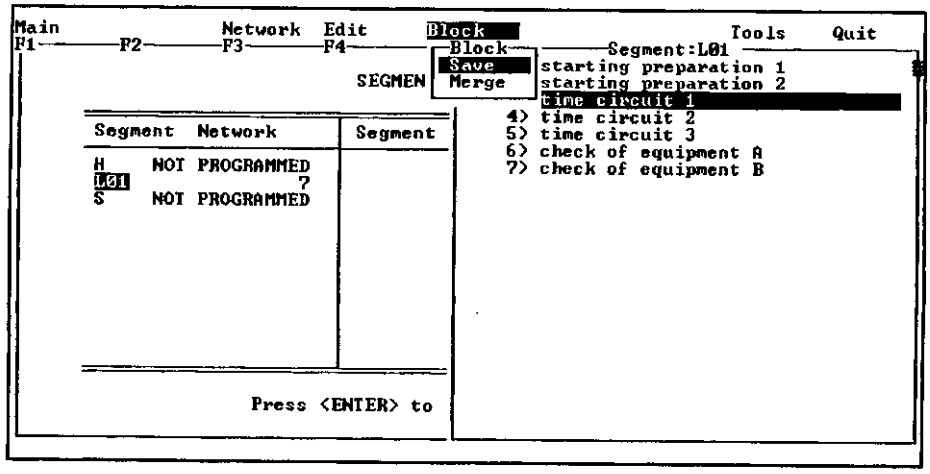
1) Display the network list.



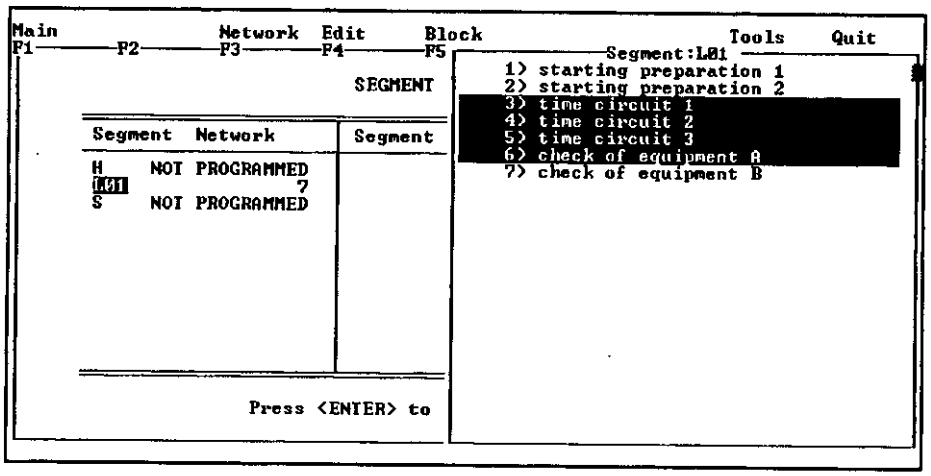
2) Move the cursor to the top or the bottom of the network to be saved using the Cursor Keys.

3) Switch to the menu cursor using the Tab Key.

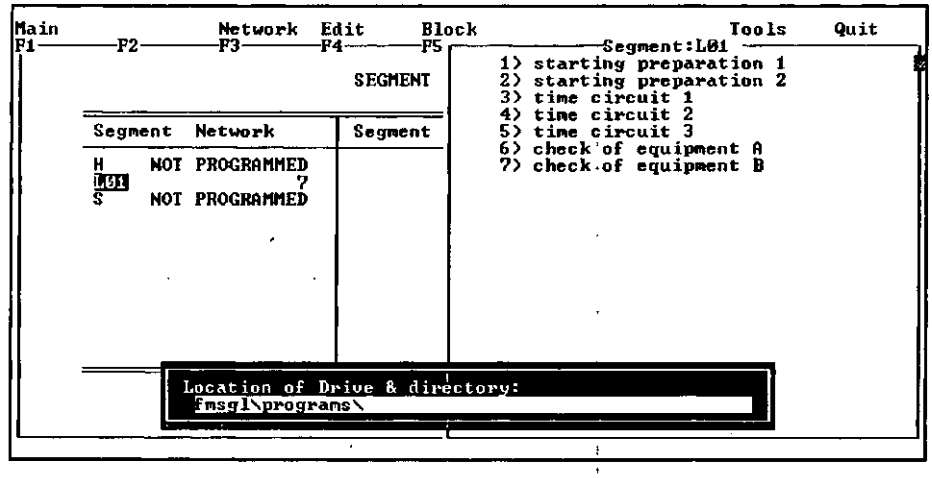
4) Select **Save** from the Block Menu using the Cursor Keys and press the Enter Key.



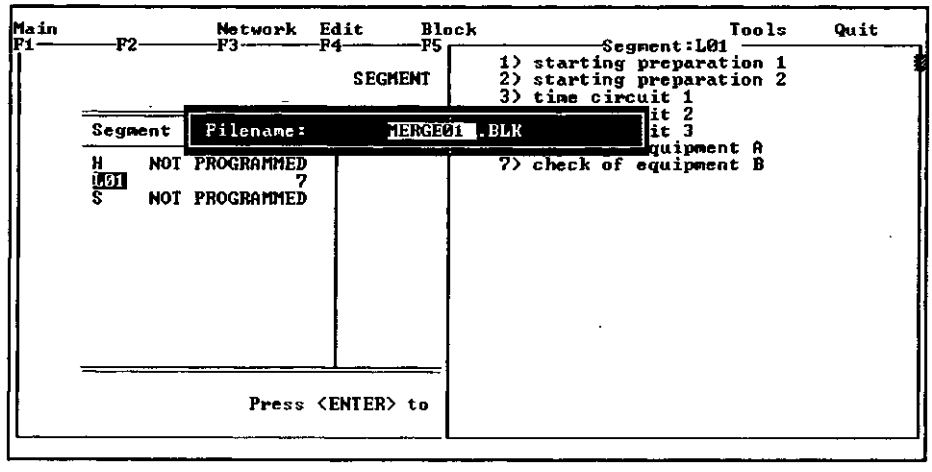
5) Specify the range of segments to be saved using the Cursor Keys and press the Enter Key.



The following window will be displayed to specify the directory in which the merge file is to be saved. Normally, press the Enter Key with the default setting (fmsgl\programs\) displayed.



6) Enter a file name and press the Enter Key.

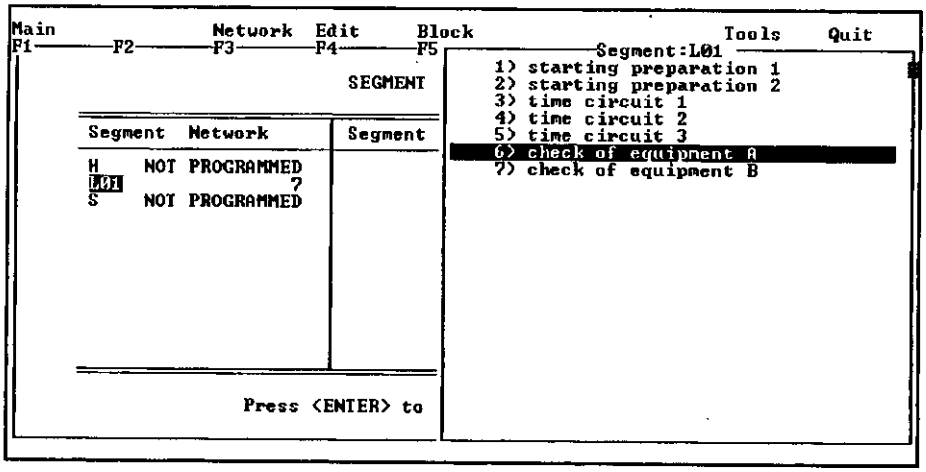


2. Merge

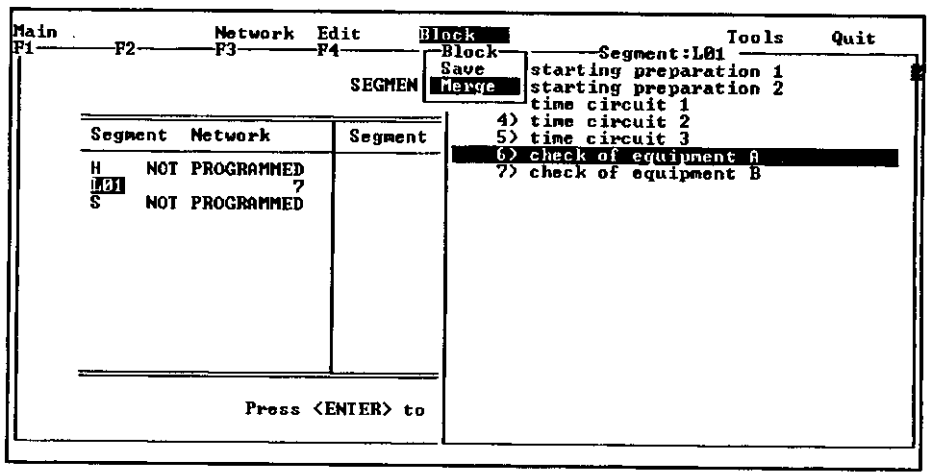
The Merge operation inserts the network data saved as a merge file at the cursor position.

1) Move the cursor to the position at which the network data saved as a merge file is to be inserted using the Cursor Keys.

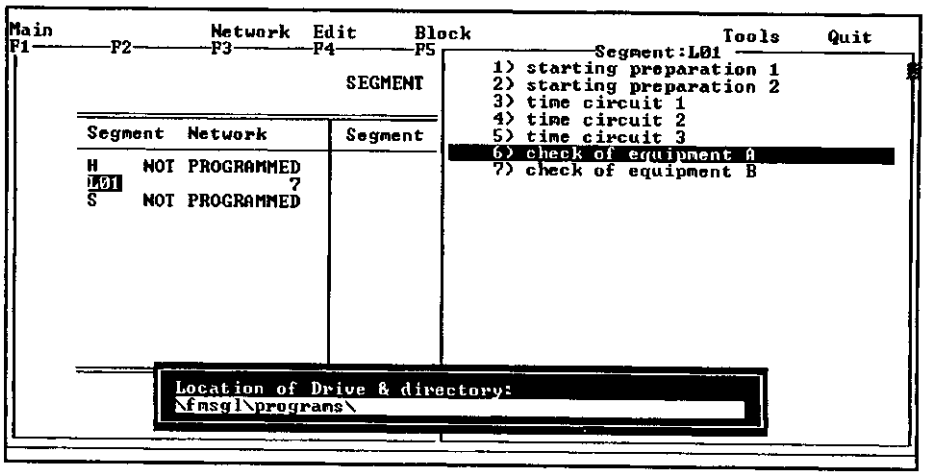
2) Switch to the menu cursor using the Tab Key.



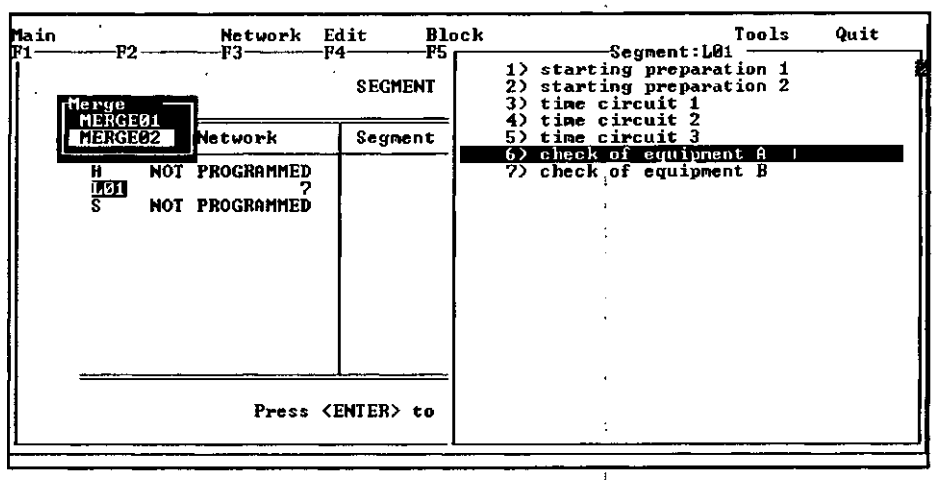
3) Select **Merge** from the Block Menu using the Cursor Keys and press the Enter Key.



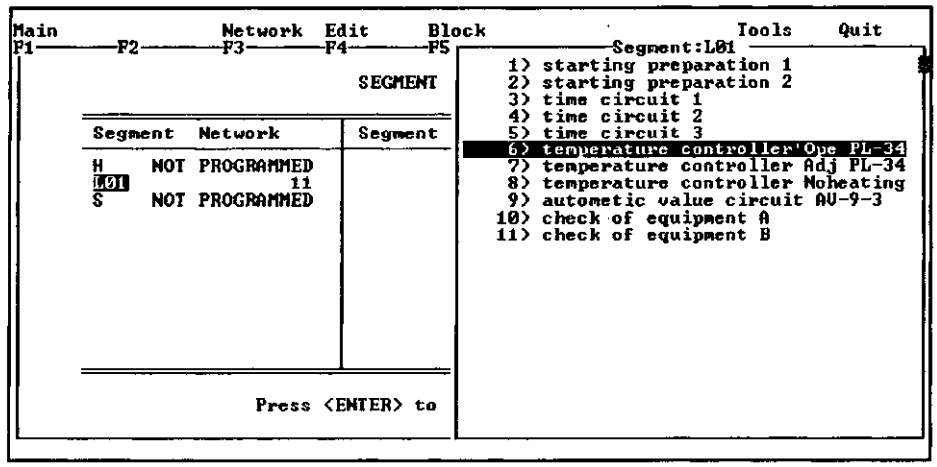
The directory containing merge files will be displayed.



4) Select a merge file using the Cursor Keys and press the Enter Key.



The network data saved as a merge file will be inserted at the cursor position.



IMPORTANT Network data that can be inserted using the Merge operation is restricted to merge files that have been saved using the Save operation in *1. Save*, above.

INFO

1) When the operations listed below are performed offline, ladder programs can be input regardless of the maximum program size of the PLC. However, always be sure that the maximum program size of the PLC will not be exceeded when loading edited programs to the PLC.

   - Editing ladder programs.
   - Browsing part or all of an existing ladder program.
   - Merging ladder programs.

2) An error message will be displayed when loading a program created offline to a PLC if the size of the program exceeds the maximum program size for the PLC.

3) As indicated above, no restrictions have been placed on the size of ladder programs that can be input offline. This is to allow for easier editing.

Editing Ladder Programs

9

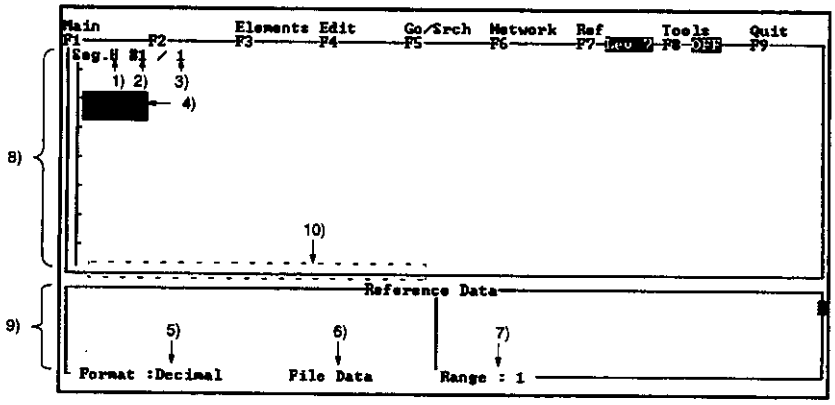
This chapter describes the operation used for creating and editing ladder programs, such as inputting elements.

9.1 Ladder Program Edit Screen

This section describes the configuration of the Ladder Editor Screen and basic key operations.

9.1.1 Edit Screen Configuration

When **Ladder Editor** is selected from the Edit Menu in a segment screen, the following Ladder Editor Screen will be displayed.



1. Segment

The segment type and the segment number are indicated.

H: High-speed segment (executed only when the high-speed scan is enabled) See section *7.4.3 Setting Segments* for details on how to enable a high-speed scan.

LXX: Normal segment and segment number

S: Subroutine segment

2. Network Number

The network number in the segment of the network currently being displayed is shown.

3. Sequence Network Number

The network number sequence from network 1 of segment H of the network currently being displayed is shown. This information indicates the sequential position of the currently displayed network from the top.

4. Cursor

A ladder program can be created by entering elements at the cursor position.

5. Input Format

The input format of reference data is displayed. See chapter *11 Manipulating Reference Data* for details.

6. Display Data Type

Whether the currently displayed reference data is PLC data or file data is displayed.

7. Range

The number of batched display settings of reference data is displayed. See chapter *11 Manipulating Reference Data* for details.

8. Ladder Program Area

In the network configuration, the area consists of 7 rows x 11 columns.

9. Reference Data Area

Reference data can be edited by moving the cursor to this area. See chapter *11 Manipulating Reference Data* for details.

10. Reference Information

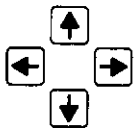
When the cursor is set in the ladder program area, the following reference information is displayed.

- When a reference number is entered, a list of reference types that can be entered at the current cursor position is displayed.

- The symbol and the comment of the reference at the current cursor position are displayed otherwise.

9.1.2 Basic Key Operations

Basic key operations are shown below.

	Move the cursor. When the Cursor Keys are pressed on line 7 of the Ladder Editor Screen, the cursor moves to the reference data area.
HOME	Moves the cursor to line 1 column 1 (top-left) of the network.
END	Moves the cursor to line 7 column 11 (bottom-right) of the network.
PgUp	Displays the previous network.
PgDn	Displays the next network.

9.2 Inputting Elements

This section describes inputting elements such as relays and timers, as well as various operation instructions.

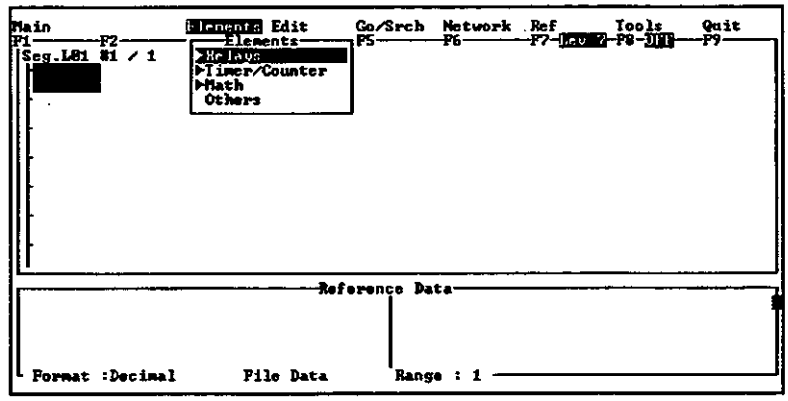
9.2.1 Inputting Relays

The following procedure can be used to input nodes that contain only a signal element, such as relays or coils:

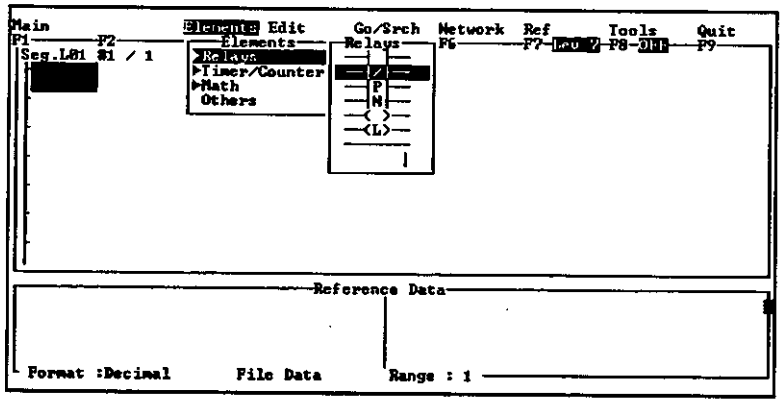
1) Move the cursor to the position where the element is to be entered using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

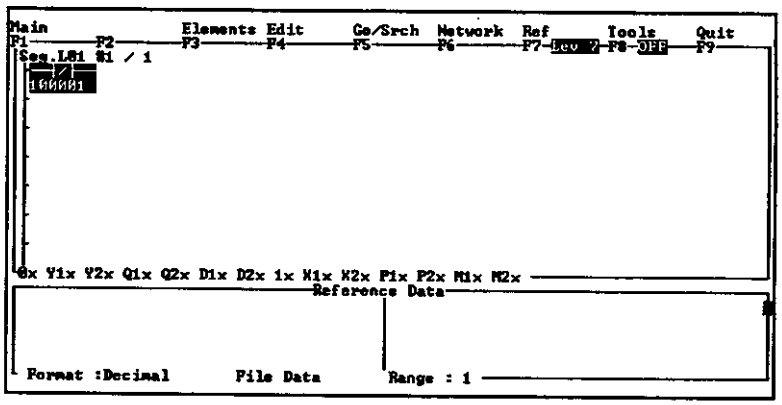
3) Select **Relays** from the Elements Menu using the Cursor Keys, and then press the Enter Key.



4) A submenu will be displayed. Select an N.C. contact using the Cursor Keys and press the Enter Key.



5) An N.C. contact will be stored at the cursor position. Enter a reference number (**100001** in this example) and press the Enter Key.



The N.C. contact will be input. If the Esc Key is pressed after a reference number has been entered and before the Enter Key is pressed, the entire input will be canceled.

Special keys are assigned to frequently used elements, such as relays and coils, so that they can be input using a single key operation. It is convenient to be familiar with these keys.

[^]	or	["]	Inputs an N.O. contact
[/]	or	[\]	Inputs an N.C. contact
[ALT]	+	[P]	Inputs a positive transitional contact
[ALT]	+	[N]	Inputs a negative transitional contact
[(]	or	[[]	Inputs a coil
[ALT]	+	[L]	Inputs a latched coil

9.2.2 Inputting Horizontal/Vertical Short Circuits

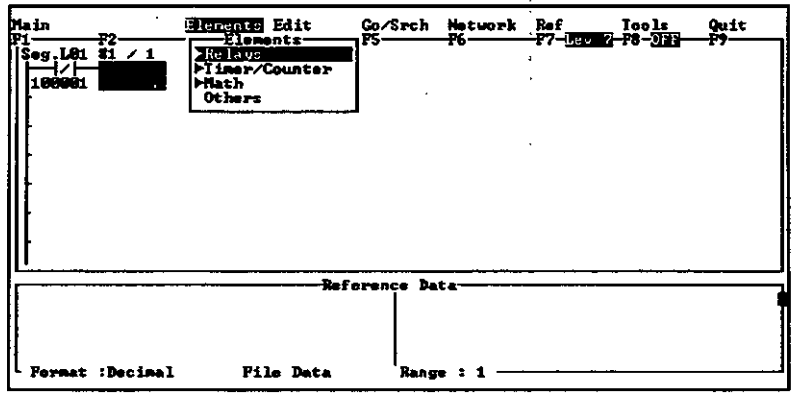
Horizontal short circuits and vertical short circuits do not require a reference number. Enter horizontal short circuits and vertical short circuits as follows:

1. Inputting Horizontal Short Circuits

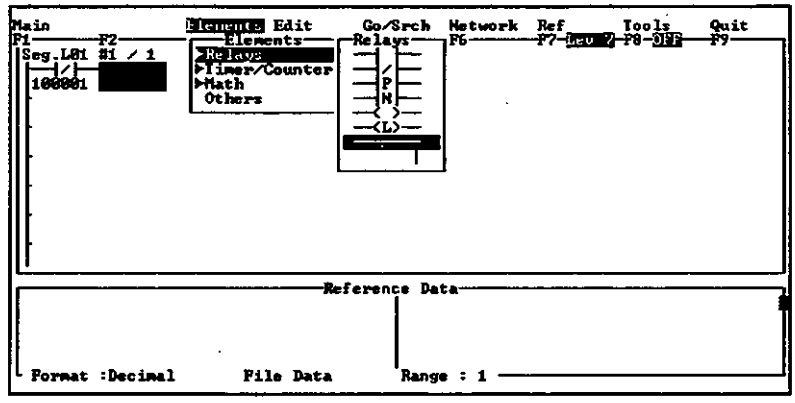
1) Move the cursor to the position at which the horizontal short circuit is to be entered using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

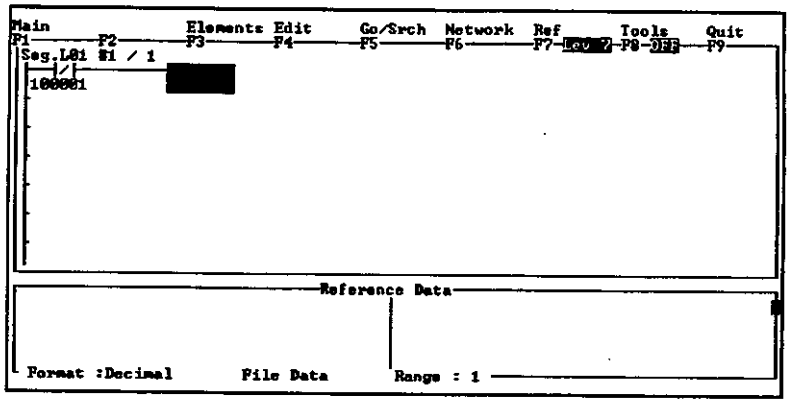
3) Select **Relays** from the Elements Menu using the Cursor Keys and press the Enter Key.



4) A submenu will be displayed. Select the horizontal short circuit using the Down Cursor Key and press the Enter Key.



A horizontal short circuit will be input at the cursor position.

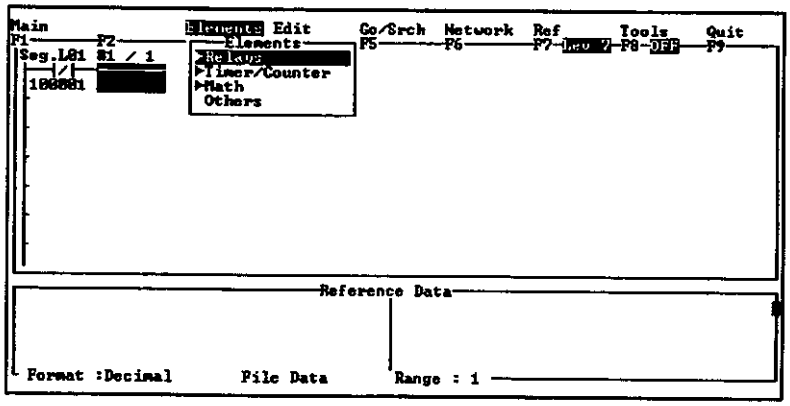


2. Inputting Vertical Short Circuits

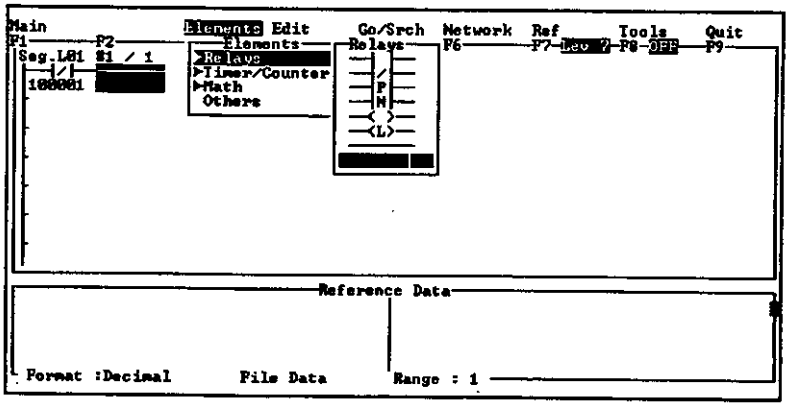
1) Move the cursor to the position at which vertical short circuit is to be input using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

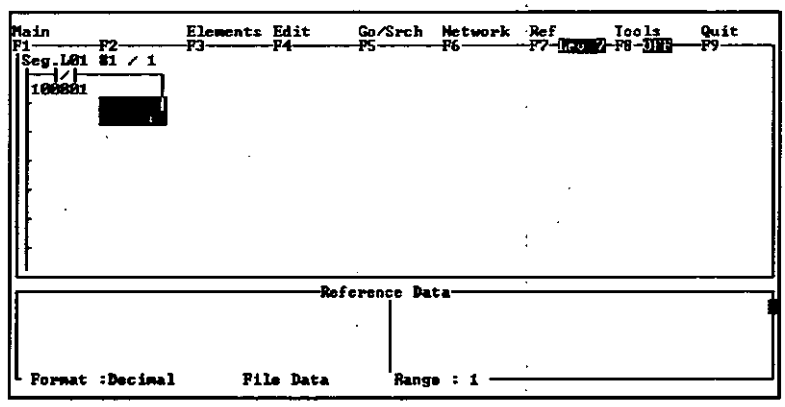
3) Select **Relays** from the Elements Menu using the Cursor Keys and press the Enter Key.



4) A submenu will be displayed. Select the vertical short circuit using the Down Cursor Key and press the Enter Key.



A vertical short circuit will be input at the cursor position.



Special keys are assigned to frequently used elements, such as horizontal short circuits, so that they can be input using single key operation. It is convenient to be familiar with these keys.

[=]	Inputs a horizontal short circuit
[|]	Inputs a vertical short circuit

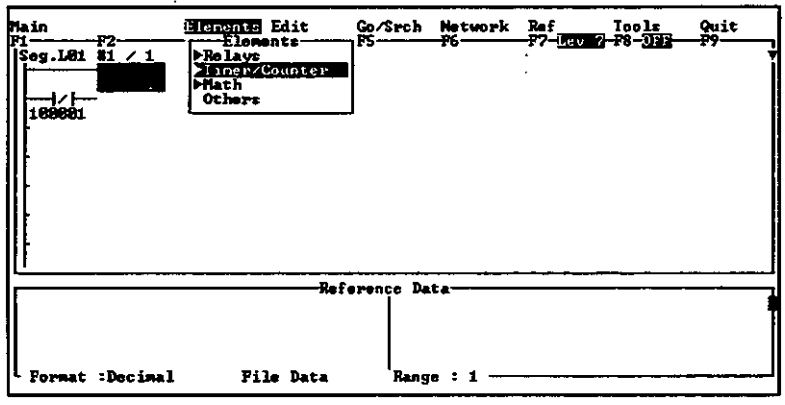
9.2.3 Inputting Timers

A timer or a counter requires two elements. Input the elements as follows:

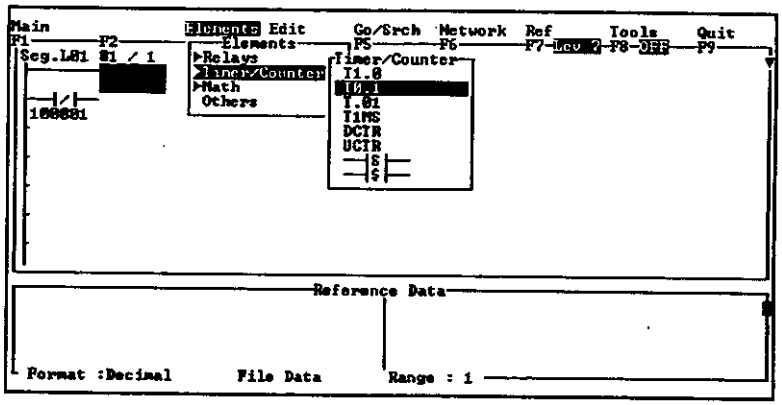
1) Move the cursor to the position at which the input is required using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

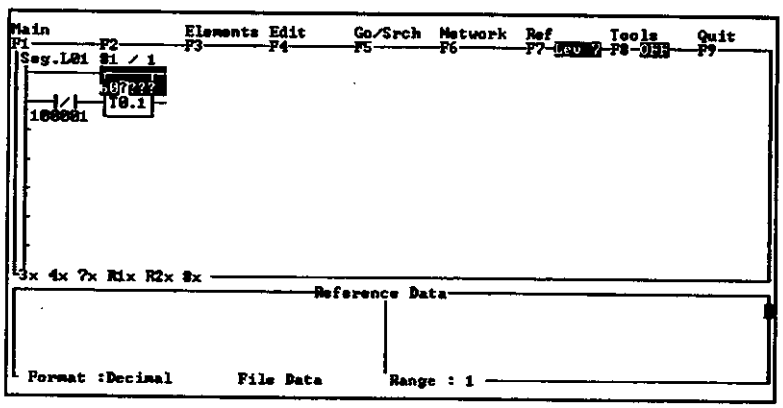
3) Select **Timer/Counter** from the Elements Menu using the Cursor Keys and press the Enter Key.



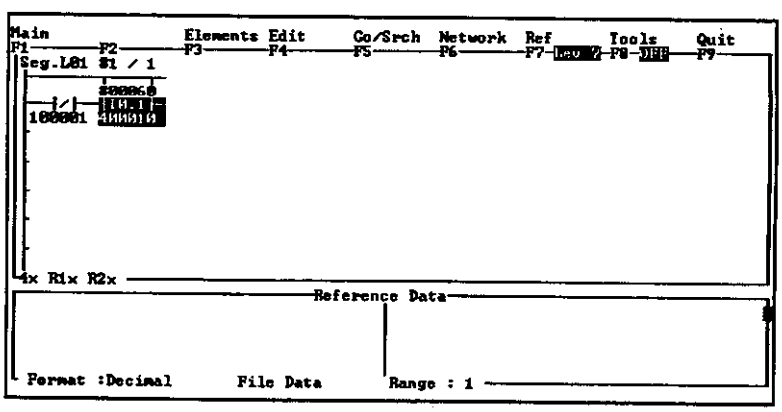
4) A submenu will be displayed. Select T0.1 (i.e., 0.1-SECOND TIMER) using the Down Cursor Key and press the Enter Key.



5) The symbol will be displayed. Input the top element (**60** in this example) and press the Enter Key.



6) Input the bottom element (**400010** in this example) and press the Enter Key.



Input of a 0.1-SECOND TIMER is now complete.

- Timers and counters can also be created by inputting the symbols. For instance, to input a 0.1-SECOND TIMER, enter **T0.1**, and the symbol can be input at the cursor position.

- A constant is prefixed with a hash symbol (#.) For instance, for the constant 60, simply enter **60** and the prefix # will be automatically assigned. When the constant is 10000 and higher, enter **#**, otherwise the constant will be recognized as a reference number. When entering constants like these for elements, make sure to enter the # prefix.

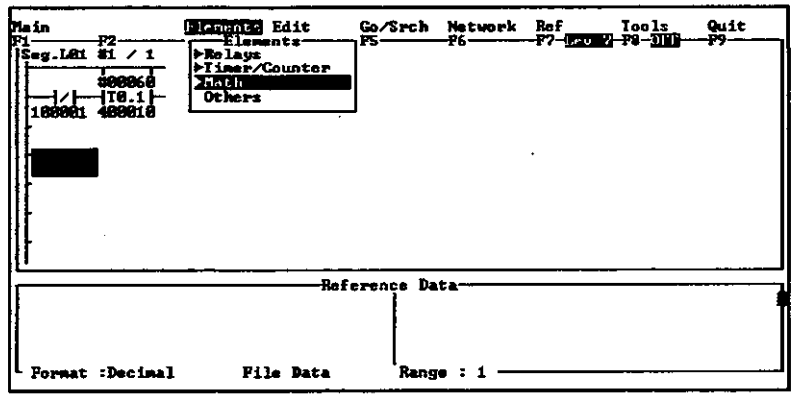
9.2.4 Inputting Math Instructions

Three elements are required for math instructions. An example of inputting nodes that require three elements is shown below.

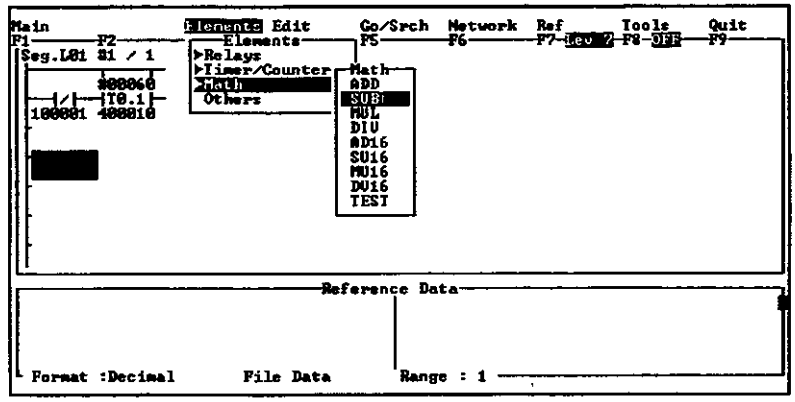
1) Move the cursor to the position where the element is to be input using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

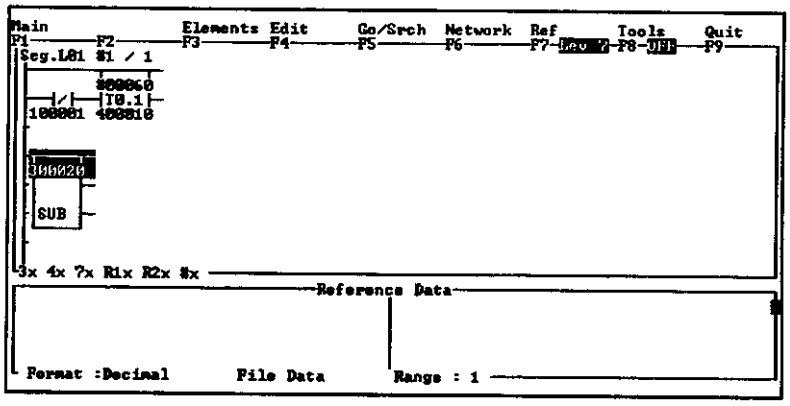
3) Select **Math** from the Elements Menu using the Cursor Keys and press the Enter Key.



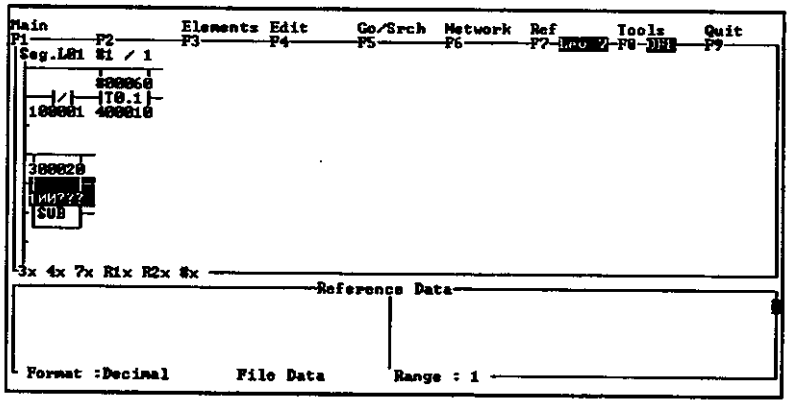
4) A submenu will be displayed. Select **SUB** using the Down Cursor Key and press the Enter Key.



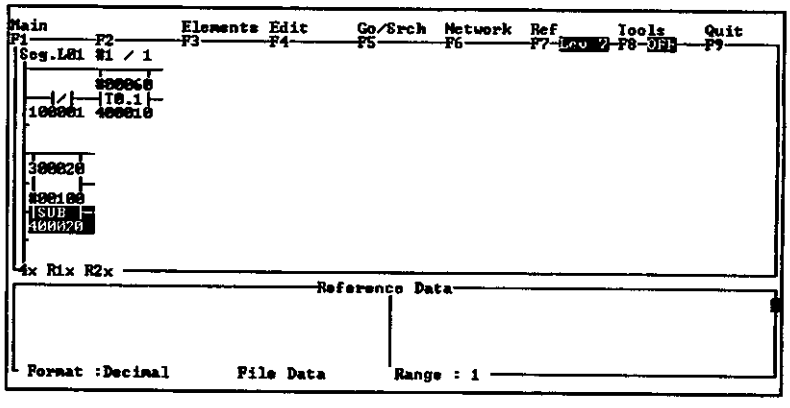
5) The symbol will be displayed. Input the top element (**300020** in this example) and press the Enter Key.



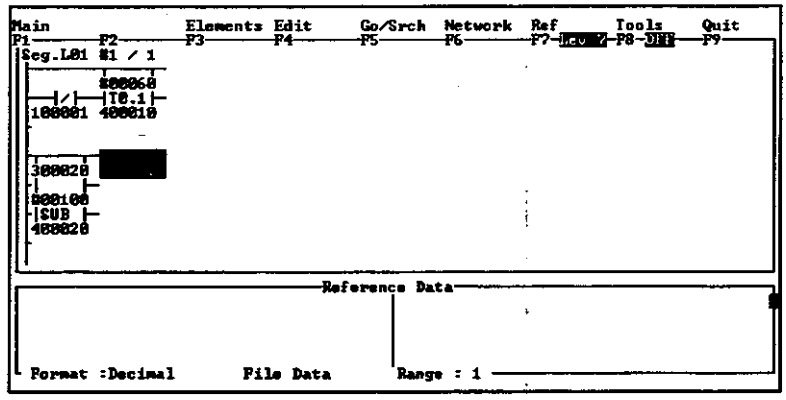
6) Input the middle element (**100** in this example) and press the Enter Key.

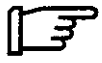


7) Input the bottom element (**400020** in this example) and press the Enter Key.



Input of SUB is now complete.





For math operations, the symbols can also be entered directly. For instance, for an UNSIGNED SINGLE PRECISION DECIMAL ADDITION instruction, enter "ADD" to input the symbol at the cursor position.

9.2.5 Inputting Application Instructions

Application instructions can be basically entered in the same way as for timers and math instructions. For example, the instruction that requires two elements can be entered using the same procedure as for timer input. However, different input procedures are required for the following three groups of instructions.

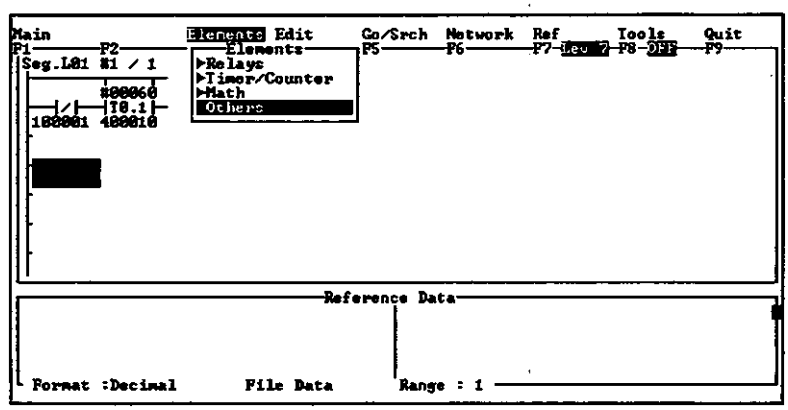
- Extended math instructions (EMTH)
- Motion control instructions (MC)
- Message transmission instructions (FBUS)

An example of inputting an extended math instruction is shown below.

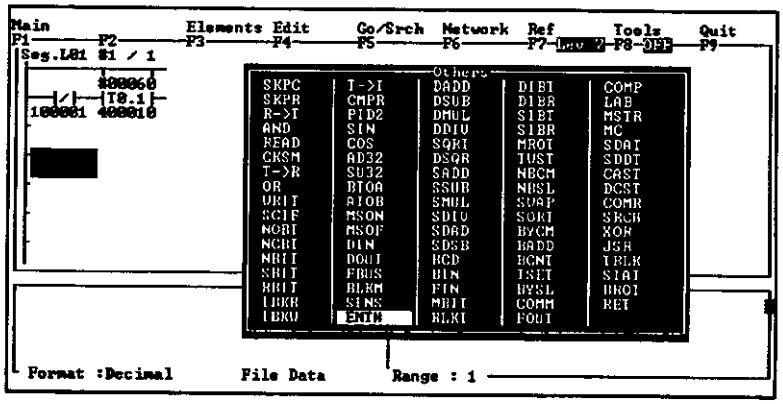
1) Move the cursor to the position at which the element is to be input using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

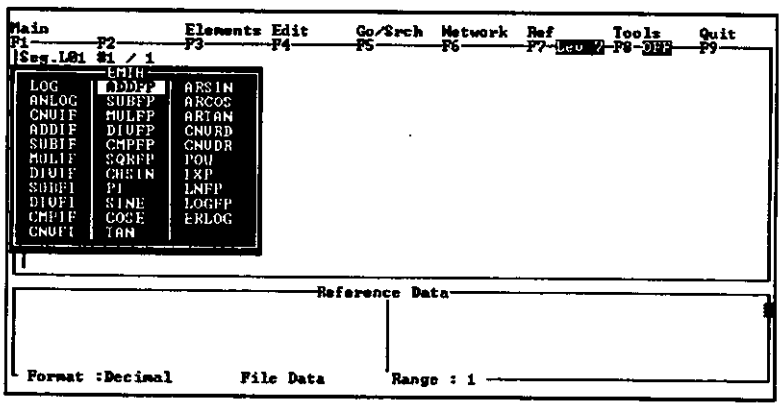
3) Select **Others** from the Elements Menu using the Cursor Keys and press the Enter Key.



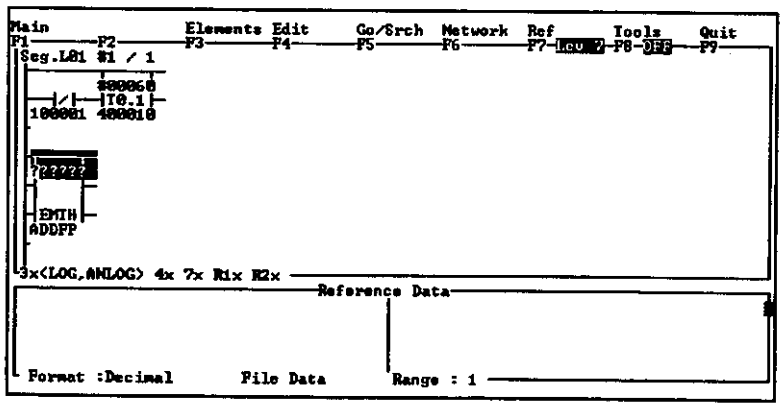
4) A submenu will be displayed. Select **EMTH** using the Cursor Keys and press the Enter Key.



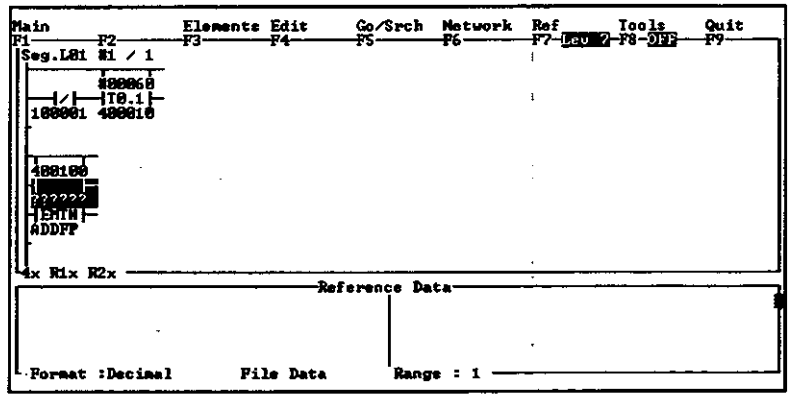
5) An extended math instruction list window will be displayed. In this example, select **ADDFP** using the Cursor Keys and press the Enter Key.



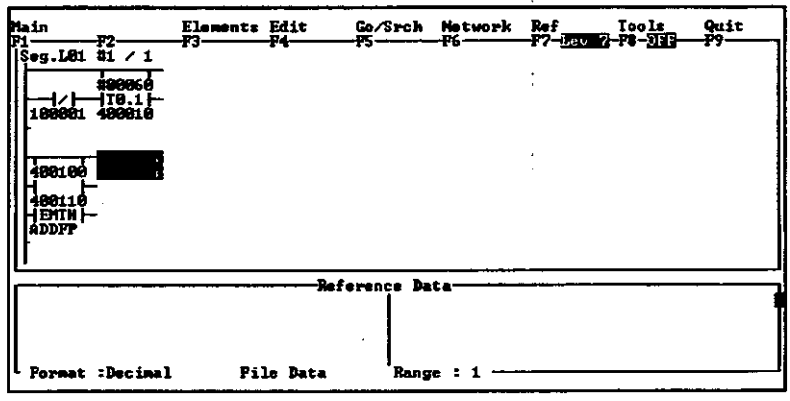
6) The symbol will be displayed. Input the top element (**400100** in this example) and press the Enter Key.



7) Input the middle element (**400110** in this example) and press the Enter Key.



Input of ADDFP is now complete.



- In the same way as for other instructions, application instructions can also be entered directly by inputting the symbols.

- As a method of moving the cursor on an instruction list window, the first letter of a symbol can be entered in addition to the use of the Cursor Keys. For instance, by entering **A**, the cursor can be moved among ADDFP, ANLOG, and ADDIF.

9.2.6 Inputting Stepping Switches

The following two elements can be input for stepping switches.

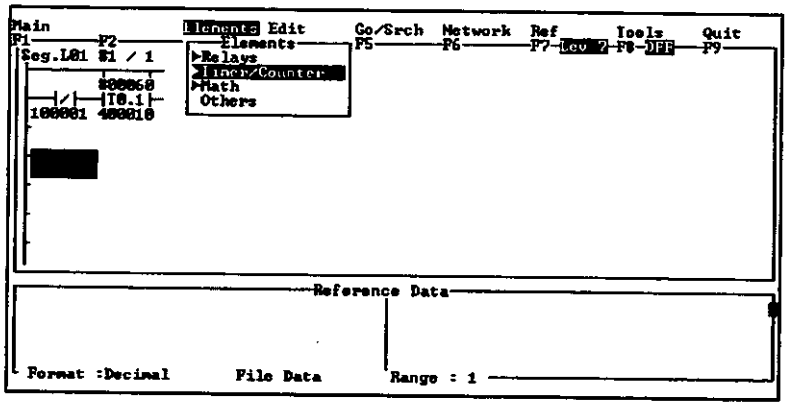
- A stepping switch N.O. contact ——| S |——
- A stepping switch N.C. contact ——| $ |——

An example of inputting an N.O. contact is shown below.

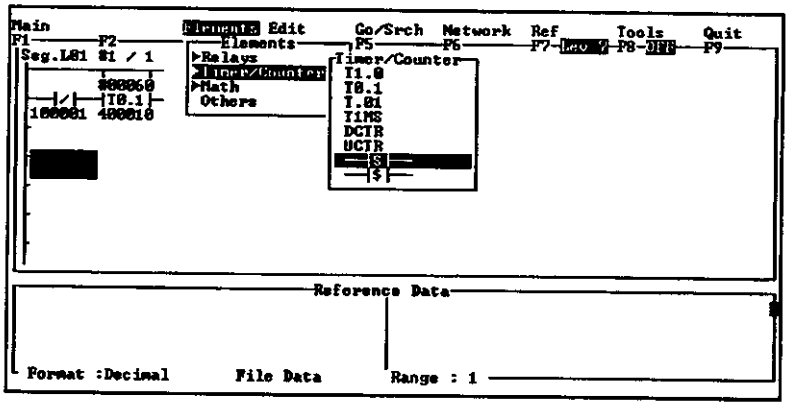
1) Move the cursor to the position where the element is to be input using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

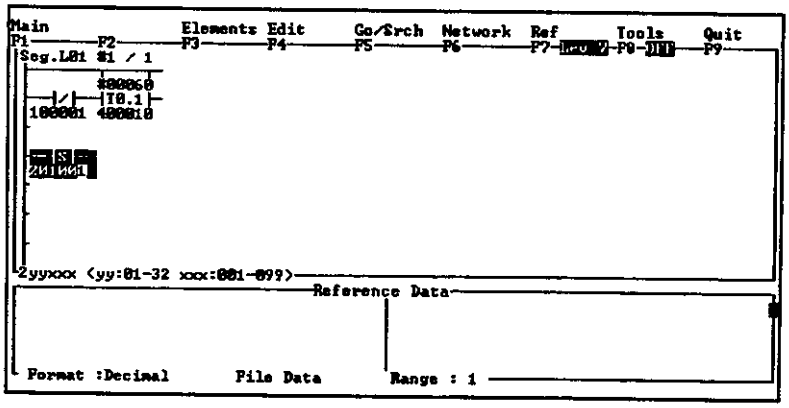
3) Select **Timer/Counter** from the Elements Menu using the Cursor Keys and press the Enter Key.



4) A submenu will be displayed. Select the stepping switch N.O. contact using the Down Cursor Key and press the Enter Key.



5) An N.O. contact of a stepping switch will be stored at the cursor position. Next, enter the reference number (**201001** in this example) and press the Enter Key.



Input of the N.O. contact for a stepping switch is now complete.

In the same way as for other instructions, the stepping switches can also be entered directly by inputting the symbols as follows:

- STPA: N.O. contact for stepping switch
- STPB: N.C. contact for stepping switch

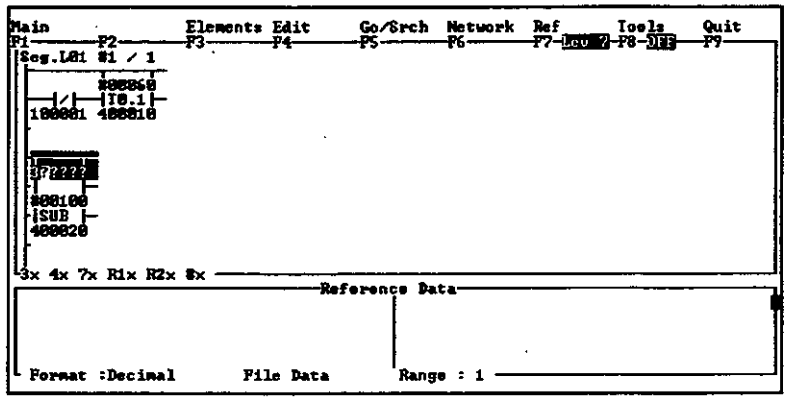
9.2.7 Change/Delete Operations

1. Changing Reference Numbers

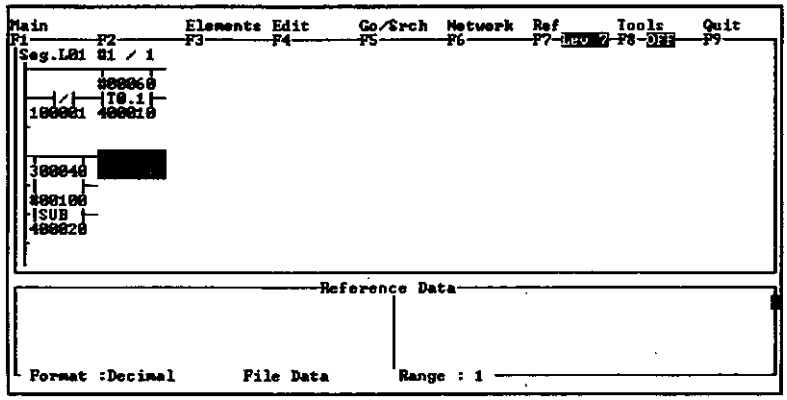
A reference number can be changed by moving the cursor to the position of the reference number to be changed and entering a numeric value directly.

1) Move the cursor to the position of the reference number to be changed using the Cursor Keys.

2) Enter a reference number (**300040** in this example) and press the Enter Key. When one character is entered, the remaining digits will change to question marks (**?**.)



The reference number will be changed.

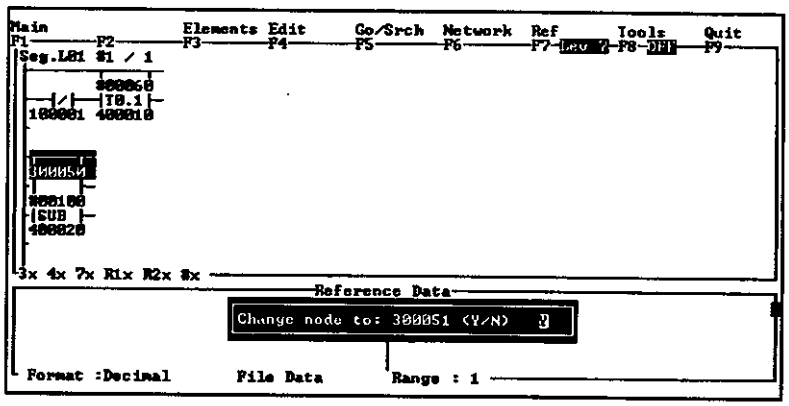


Press the Esc Key to cancel input of the reference number currently being executed. The number will be reset to the original reference number.

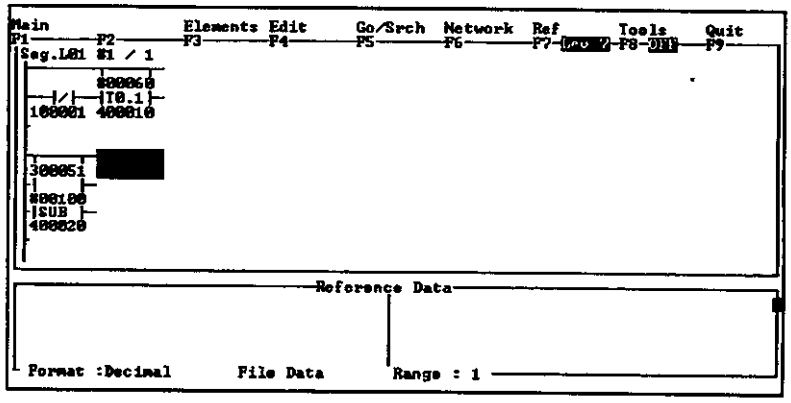
To change a reference numbers to consecutive reference numbers, use the Plus (+) or Minus (–) Key. When the + Key is used, the next reference number after the last reference number that was input will be input. The following example shows an example for when the last reference number that was input is **300050**.

1) Move the cursor to the position of the reference number to be changed using the Cursor Keys.

2) Press the + Key. When the reference number to be changed to is displayed, press the Enter Key.



The reference number will be changed to **300051**.

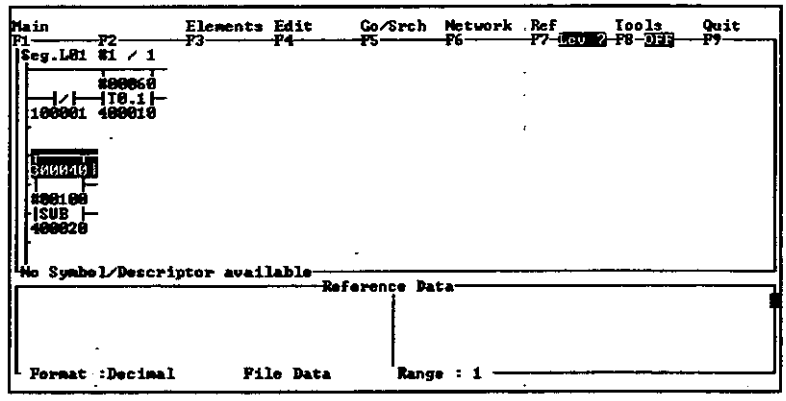


2. Deleting Elements

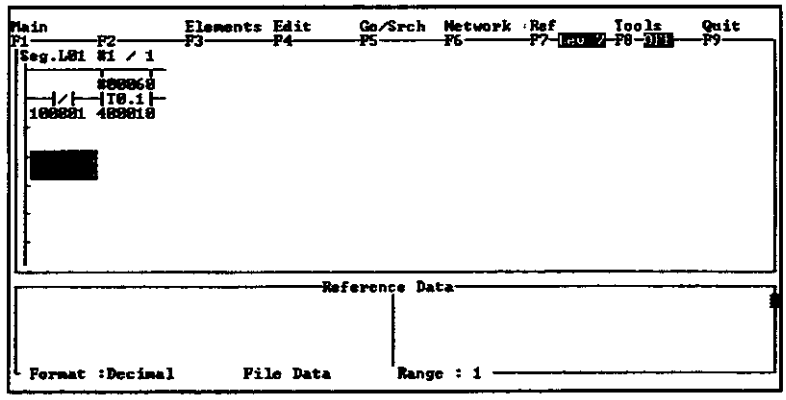
An element can be deleted by moving the cursor to the position of the element to be deleted and pressing the Delete Key. For nodes that require two or more elements, deletion can be executed regardless of whether the cursor is at the top or bottom element.

1) Move the cursor to the position of the element to be deleted using the Cursor Keys.

2) Press the Delete Key.



The element at the cursor position will be deleted. In Online or Debug Mode, a confirmation message will be displayed.



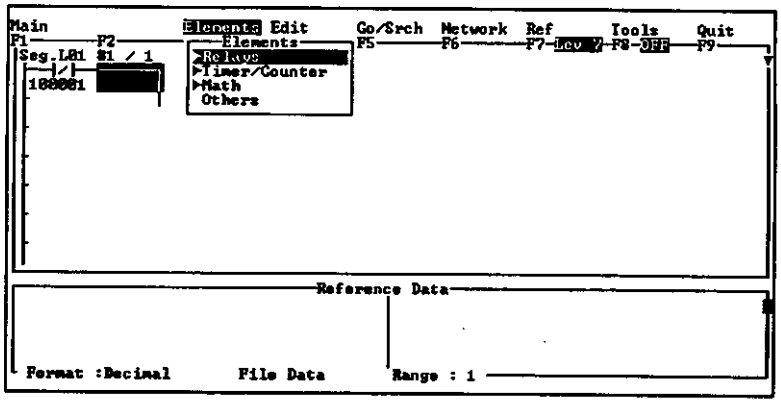
3. Deleting Horizontal and Vertical Short Circuits

To delete a vertical short circuit only while the vertical short circuit is input with other elements, enter the vertical short circuit again. An example of deleting a vertical short circuit only is shown below. The same procedure can be used to delete a horizontal short circuit.

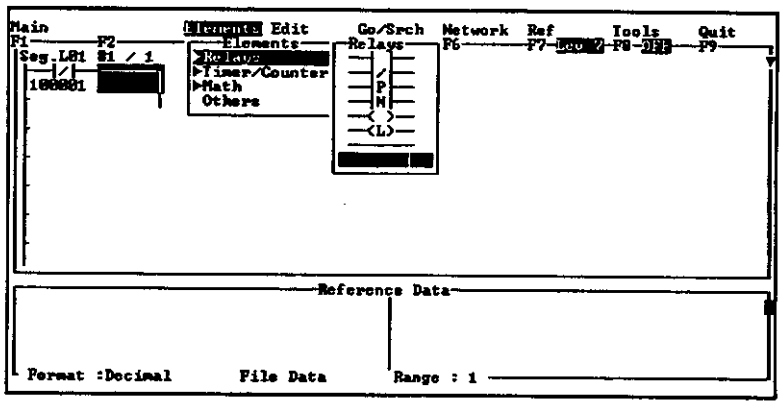
1) Move the cursor to the position of the vertical short circuit to be deleted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

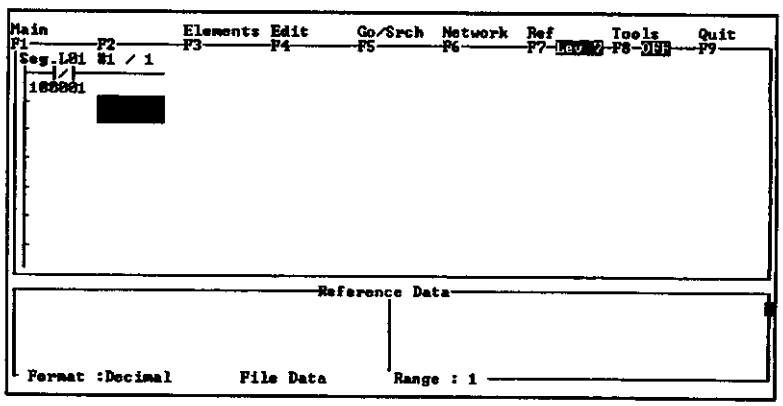
3) Select **Relays** from the Elements Menu using the Cursor Keys and press the Enter Key.



4) A submenu will be displayed. Select the vertical short circuit using the Cursor Keys and press the Enter Key.



Only the vertical short circuit will be deleted.



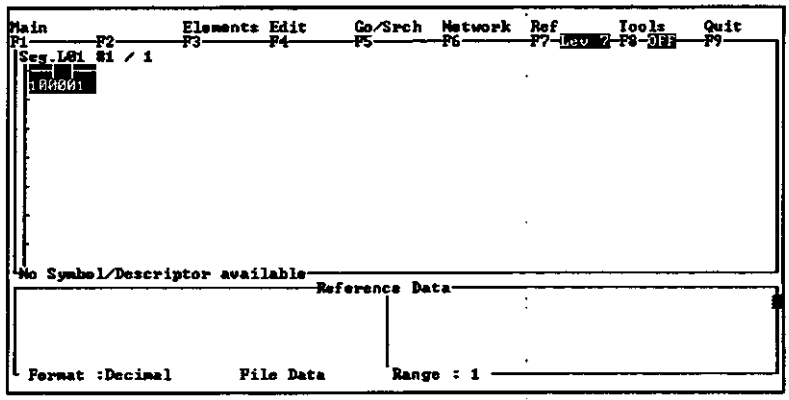
4. Changing Elements

An N.O. contact can be changed to an N.C. contact by moving the cursor to the position of the contact to be changed and inputting the element to which it is to be changed to. The reference number will remain the same. Two examples are shown below.

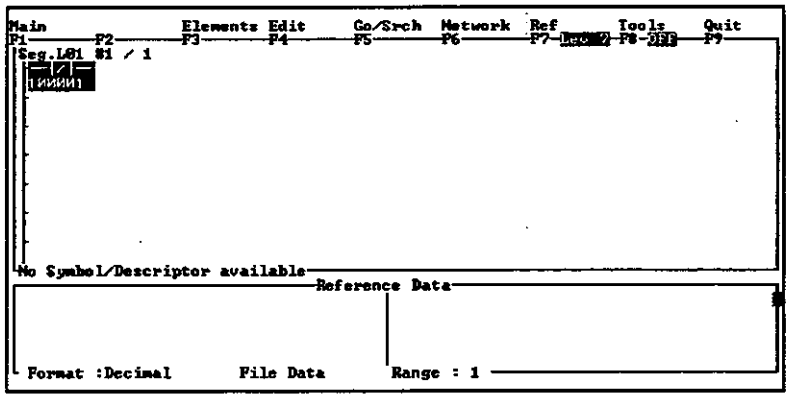
- **Changing an N.O. Contact to an N.C. Contact.**

1) Move the cursor to the position of the N.O. contact that is to be changed using the Cursor Keys.

2) Press the / Key, which is the Quick Key for selecting an N.C. contact.



The specified N.O. contact will be changed to an N.C. contact.

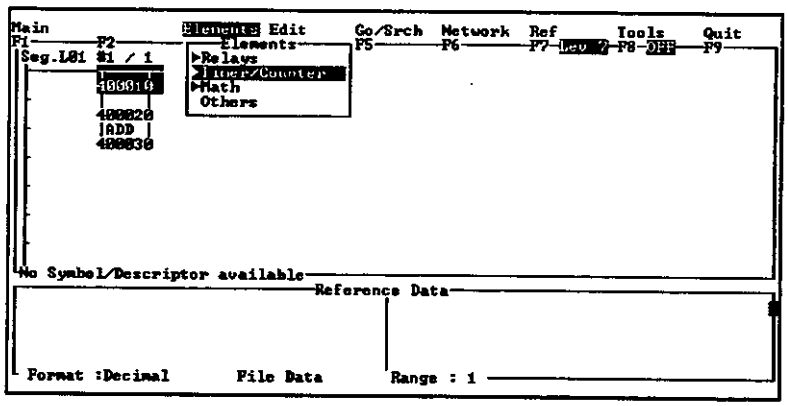


- **Changing an UNSIGNED SINGLE PRECISION DECIMAL ADDITION Instruction to a 0.1-SECOND TIMER.**

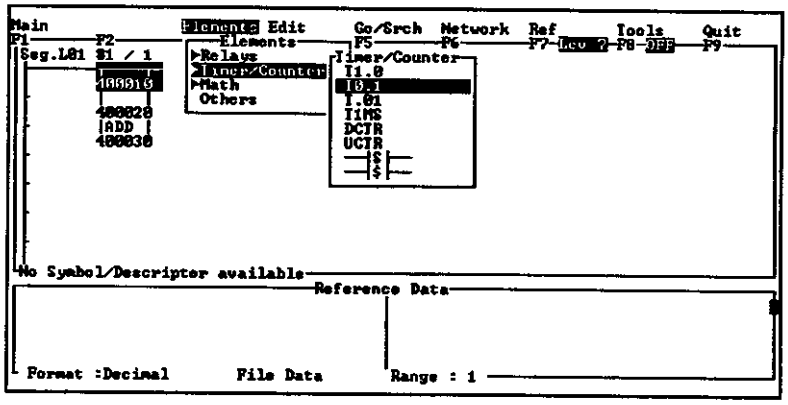
1) Move the cursor to the position of the instruction to be changed.

2) Switch to the menu cursor using the Tab Key.

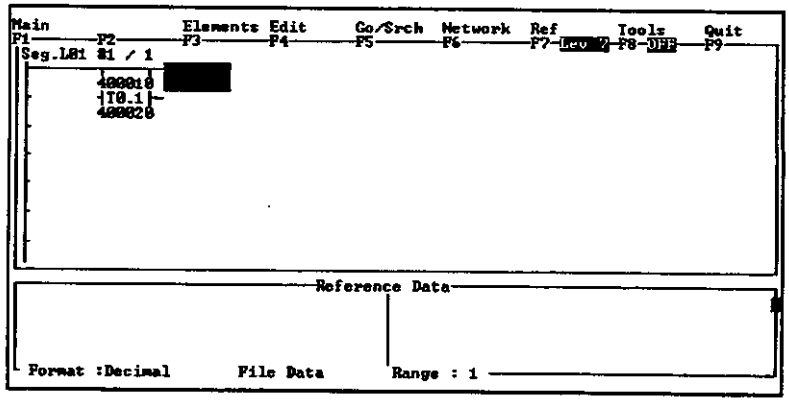
3) Select **Timer/Counter** from the Elements Menu using the Cursor Keys and press the Enter Key.



4) A submenu will be displayed. Select the 0.1-SECOND TIMER using the Down Cursor Key and press the Enter Key.



The element will be changed to a 0.1-SECOND TIMER.



INFO

1) This change operation cannot be used for coils. To change coils, delete the element and then enter a new element.

2) If an instruction that requires two elements is changed to an instruction that requires three elements, the reference numbers before the change will be displayed for the top and middle elements. When no changes are required, no input is required. Enter a reference number for the bottom element only.

3) If an instruction that requires three elements is changed to an instruction that requires two elements, the top and middle reference numbers will be used for the top and bottom elements. When no changes are required, no input is required.

4) If the reference number of the previous element is unsuitable for the element to which it has been changed, the display will change to ??????. In this case, enter a reference number.

9.2.8 Summary

1. Inputting Contacts and Coils

Use the following Quick Keys for inputting contacts and coils.

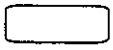
[^]	or	["]	Inputs an N.O. contact
[/]	or	[\]	Inputs an N.C. contact
[ALT]	+	[P]	Inputs a positive transitional contact
[ALT]	+	[N]	Inputs a negative transitional contact
[(]	or	[[]	Inputs a coil
[ALT]	+	[L]	Inputs a latched coil
		[=]	Inputs a horizontal short circuit
		[¦]	Inputs a vertical short circuit

2. Entering Reference Numbers and Constants

- It is not necessary to enter all the six digits of the reference number (00XXXX) of a coil. For example, enter **125** for 000125.

- The prefix # does not need to be input for constants for normal elements. For the constant 60, for example, when **60** is entered, the # will be input automatically at the beginning of the constant. The prefix # must be entered for an element that can contain either a constant or a coil so that the number will not be recognized as a reference number for a coil. Make sure to enter the prefix # when a constant is entered for such an element.

- When entering the same or consecutive reference numbers, the following keys are useful.

	The last reference number that was used is entered as it is.
	A reference number determined by incrementing by 1 the last reference number used is entered.
	A reference number determined by decrementing by 1 the last reference number used is entered.

3. Inputting Math Instructions

- Symbols can be directly entered for timers/counters and math instructions. Use as many symbols as possible to reduce key operations.

- Enter the first character of a symbol on a list display window such as for application instructions and extended math operations to eliminate searching for the instruction.

4. Operations Available in Offline Mode

The following operations are available in Offline Mode.

• Omitting Reference Number Input

After inputting an element such as a relay, press the Enter Key without entering the reference number. The reference number positions will remain as ??????. This operation is useful to enter elements in advance. However, if ?????? remains as the reference number of a relay element when the program is loaded to the PLC, an error will occur. An error does not occur when this operation is used for timer and math instructions, however, set a correct value before loading the program to the PLC.

• Using Duplicate Coils

In Offline Mode, duplicate coils are not checked. Therefore, in the process of program development, duplicate coils are allowed. However, if a duplicate coil is used in the program, on transfer of the program to the PLC, an error will occur. Before loading a program to the PLC, check for duplicate coils by executing File Check.

9.3 Editing

This section describes basic operation procedures on the Edit Menu that are useful when editing ladder programs, such as copying and deleting elements.

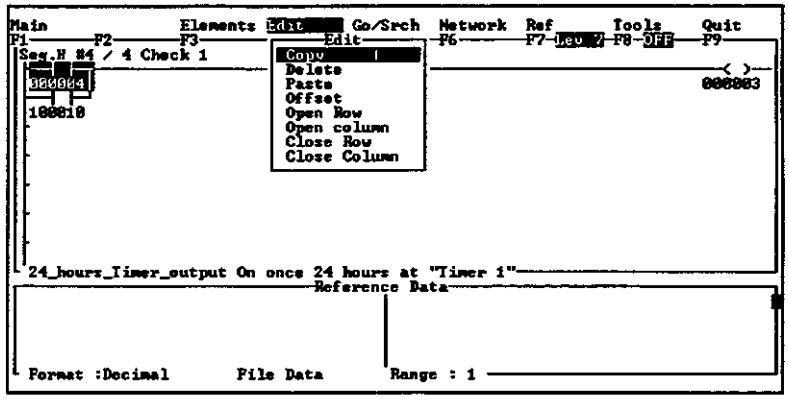
9.3.1 Copy

The Copy operation stores program data from the area specified by the cursor. The data stored by the Copy operation can be pasted to another position using the Paste operation.

1) Move the cursor to the corner of the area to be copied using the Cursor Keys.

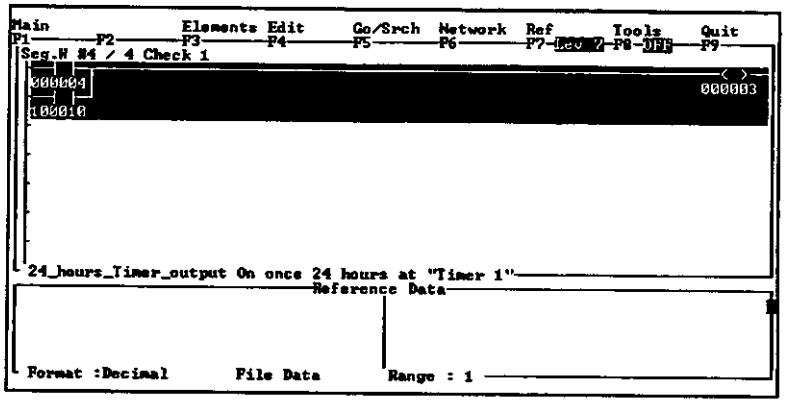
2) Switch to the menu cursor using the Tab Key.

3) Select **Copy** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) The cursor will be displayed in reverse video. Move the cursor and specify the range to be copied using the Cursor Keys.

5) After specifying the range, press the Enter Key. The specified area will be stored.



INFO

1) To copy an instruction that requires two or three elements, all the symbols must be specified. If the instruction is only partially specified, an error will occur and the data will not be copied.

2) The area exceeding one network cannot be copied by this operation. See section *9.5 Network Operations* to copy more than one network.

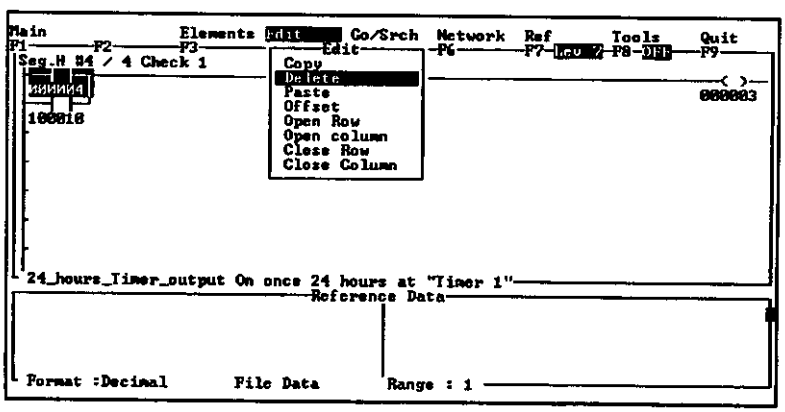
9.3.2 Delete

The Delete operation deletes and stores the program data from the area specified by the cursor. The data that is stored by the Delete operation can be pasted to another position by the Paste operation. Therefore, this operation is useful for moving programs as well as deleting programs. To delete one element, move the cursor to the position of the element to be deleted and press the Delete Key. The element will be deleted and stored.

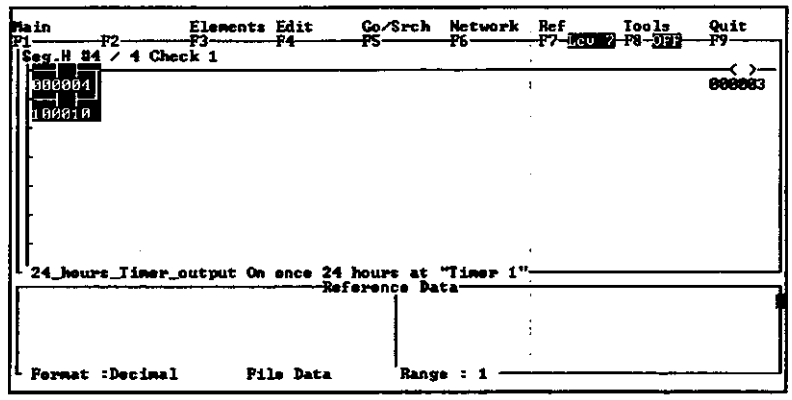
1) Move the cursor to the corner of the area to be deleted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Delete** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) The cursor will be displayed in reverse video. Move the cursor and specify the range to be deleted using the Cursor Keys.



5) After specifying the range, press the Enter Key. The data of the specified range will be deleted.

INFO

1) To delete an instruction that requires two or three elements, the entire instruction must be specified. If only a part of the element is specified, an error will occur and the data will not be deleted.

2) The area exceeding one network cannot be deleted by this operation. See section *9.5 Network Operations* to delete more than one network.

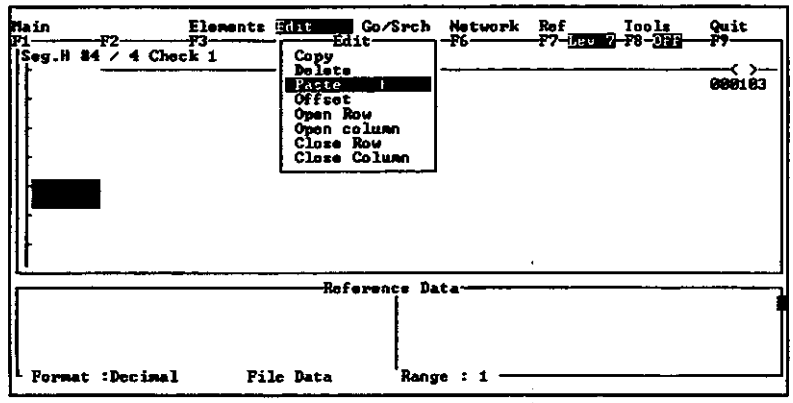
9.3.3 Paste

The Paste operation inserts program that was stored by the Copy or Delete operation at the cursor position data. In this example, data stored by the Delete operation described above is inserted into another section.

1) Move the cursor to the position at which data is to be inserted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Paste** from the Edit Menu using the Cursor Keys and press the Enter Key.



The data that was stored will be inserted at the cursor position.

INFO

1) If the data stored exceeds the range from the cursor position to the end of the network, an error will occur.

2) Only one buffer is available to store and maintain the data specified by Copy or Delete. Therefore, if the Paste operation is executed, the last data stored by Copy or Delete will be inserted. This also applies to deletion with the Delete Key.

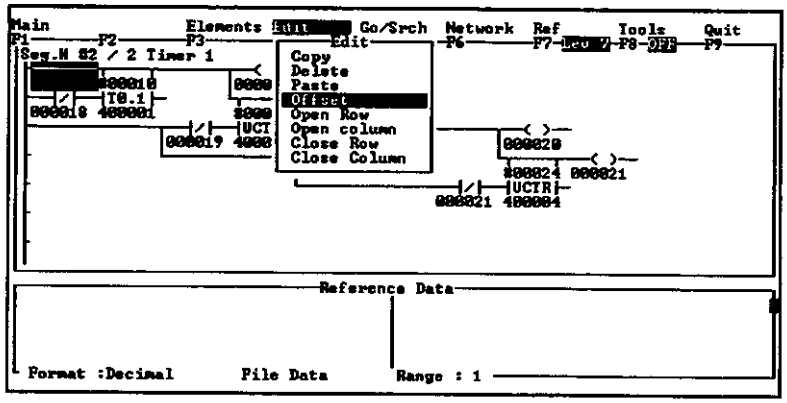
9.3.4 Offset

The Offset operation substitutes the reference numbers of the specified range for the reference numbers determined by adding the specified offset value. This operation is useful for changing a reference number after copying a ladder program using the Copy operation. In the following example, reference numbers of the holding registers of the timer circuit are changed by adding 30 to each.

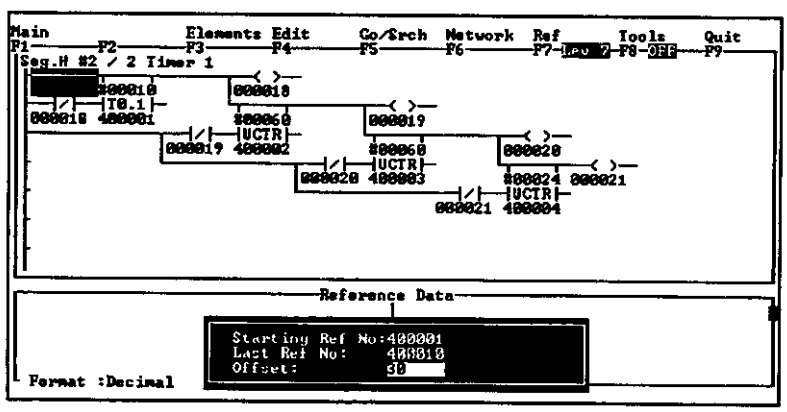
1) Move the cursor to the end of the program area to be substituted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

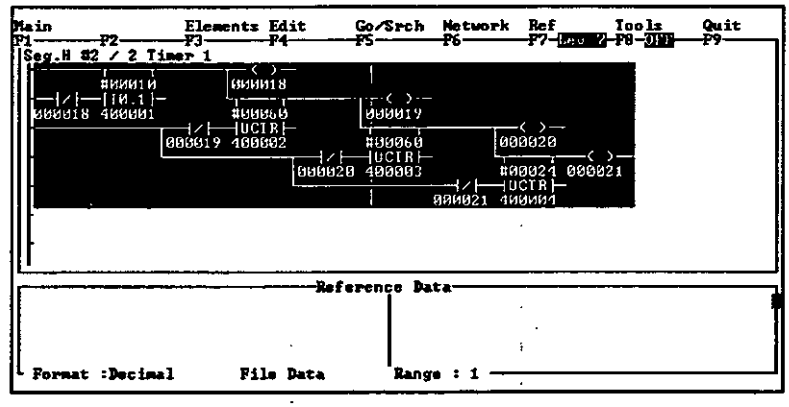
3) Select **Offset** from the Edit Menu using the Cursor Keys and press the Enter Key.



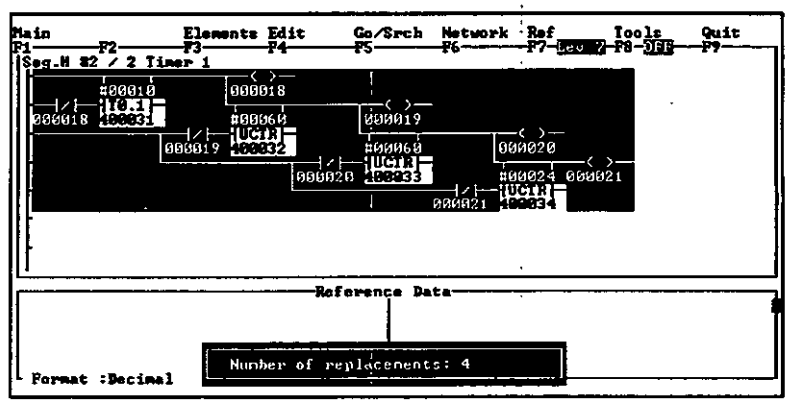
4) An offset setting window will be displayed. Enter the starting and last reference numbers, and the offset value (**400001**, **400010**, **30** in this example) and press the Enter Key.



5) The cursor will be displayed in reverse video. Specify the area to be substituted using the Cursor Keys and press the Enter Key.



Substitution will now be executed, and the number of reference numbers that were substituted will be displayed.



INFO

1) Substitution exceeding one network is not allowed for this operation. For substitution in more than one network, select **Network List** from the Edit Menu. See section *8.2 Network List Operations* for details.

2) Either positive values or negative values can be used for offset values.

3) When the number determined by adding an offset number to the specified starting or last reference number exceeds the reference range set in the system configuration, an error will occur.

4) If two or more different ranges are set (for instance, 300001 for the starting reference number and 401000 for the last reference number), substitution will not be executed.

9.3.5 Open Row/Close Row

1. Open Row

The Open Row operation inserts one blank row in a network. Elements below the position where a row is inserted in the network will be pushed down by one row. Therefore, inser-

tion is impossible when there is not a free row below the insertion position. A row cannot be inserted where there is an element consisting of two rows.

2. Close Row

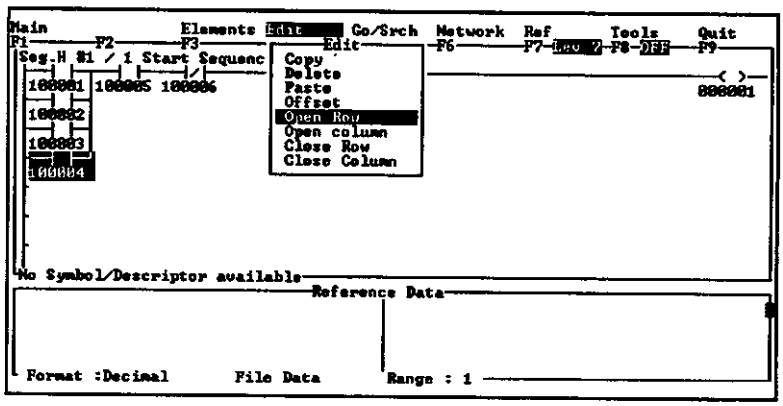
The Close Row operation deletes one specified row from a network. Elements below the position from which the row is deleted will be pushed up. If the row contains an element, the row cannot be deleted.

An example of Open Row is shown below.

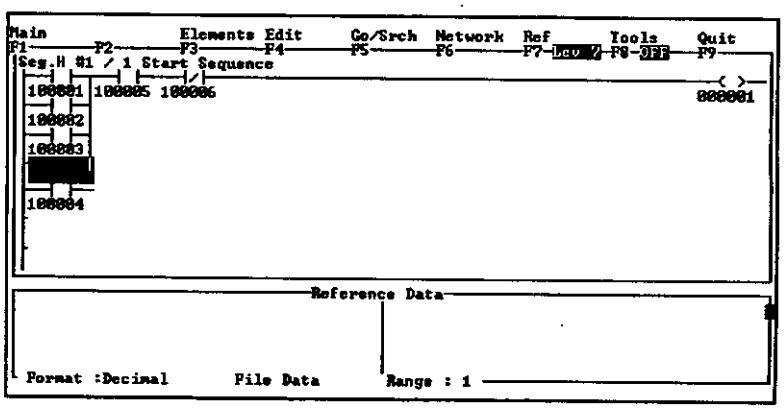
1) Move the cursor to the position at which a row is to be inserted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Open Row** from the Edit Menu using the Cursor Keys and press the Enter Key.



One blank row will be inserted at the cursor line.



9.3.6 Open Column/Close Column

1. Open Column

The Open Column operation inserts a blank column. Elements on the right side of the position at which the column is inserted will move to the right by one column. The right-

most column of the network must be empty and it will be deleted. Therefore, if no free column is available to the right of the insertion position, a column cannot be inserted.

2. Close Column

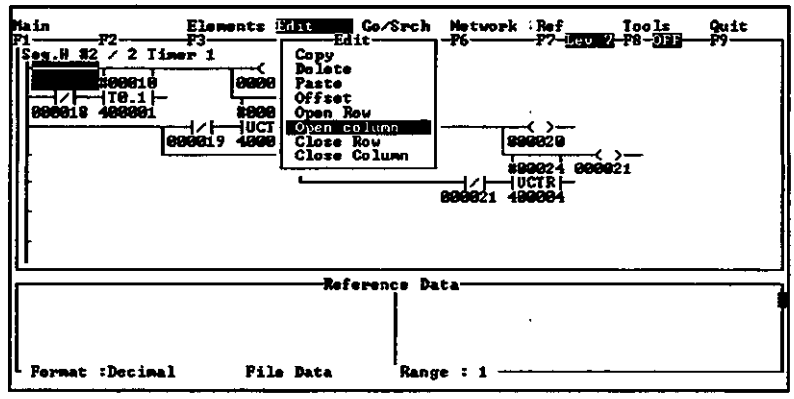
The Close Column operation deletes the specified column. Elements on the right side of the position from which the column is deleted will move to the left by one column. If the specified column contains an element, the column cannot be deleted.

An example of column insertion is shown below.

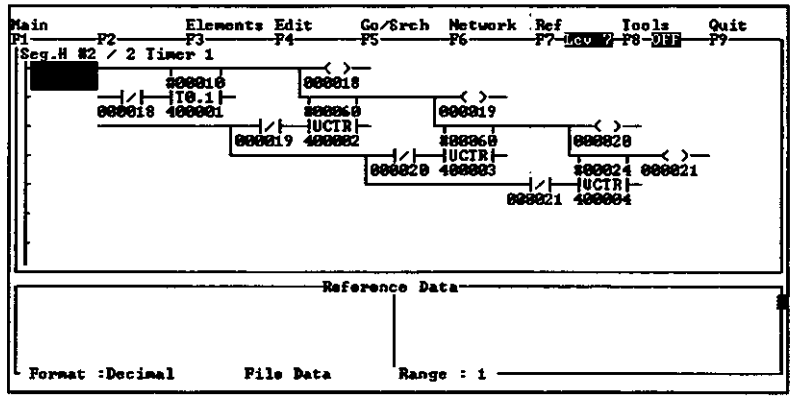
1) Move the cursor to the position at which a column is to be inserted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Open Column** from the Edit Menu using the Cursor Keys and press the Enter Key.



One column will be inserted in the column in which the cursor is positioned.



9.4 Go/Search

This section describes basic operations on the Go/Search Menu, such as moving control between networks and searching for elements and reference numbers.

9.4.1 Moving Control Between Networks

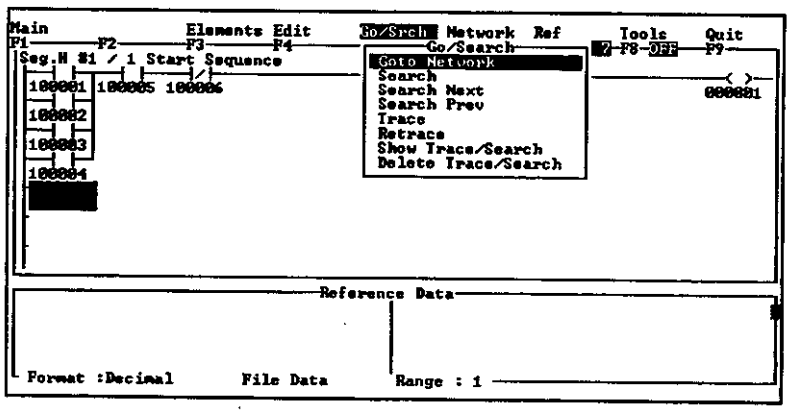
Use the following keys to move control to an adjacent network, the first/last network in the segment, or any other segment when the cursor is set on the Ladder Editor Screen.

PgUp			Moves to the previous network.
PgDn			Moves to the next network.
CTRL	+	HOME	Moves to the first network in the segment.
CTRL	+	END	Moves to the last network in the segment.
CTRL	+	PgUp	Moves to the previous segment.
CTRL	+	PgDn	Moves to the next segment.

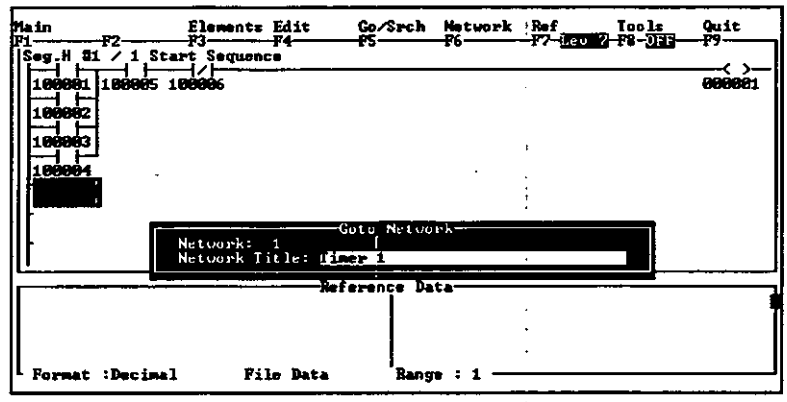
Control can be moved to a network other than adjacent networks using the Goto Network Menu. Specify the destination using the network number or network title. An operation example using a network title is shown below.

1) Switch to the menu cursor using the Tab Key.

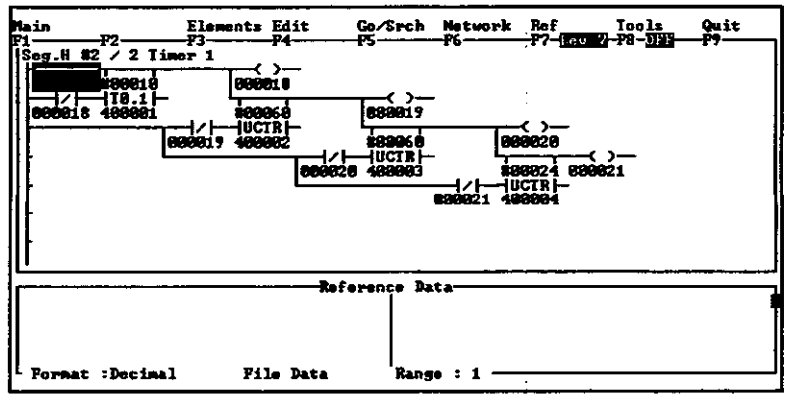
2) Select **Goto Network** from the Go/Search Menu using the Cursor Keys and press the Enter Key.



3) The Goto Network window will be displayed. Move the cursor to the section in which the network title is to be entered using the Cursor Keys. Enter the network title of the network to be moved to (**Timer 1** in this example) and press the Enter Key.



The network corresponding to the network title that was entered will be displayed.



INFO

1) When both a network number and a network title are entered, priority is given to the network title. Therefore, when entering a network title, the network number can be ignored even if it does not correspond with the specified network title.

2) Enter a sequence network number for the network number. When a segment network number is entered (excluding a high-speed segment), a correct search can not be performed.

9.4.2 Search

The Search operation searches for specified constants, reference numbers, or element symbols in ladder programs. The following three search functions are available according to the search start position and direction.

1) Search

The constant, reference number, or element symbol that was entered is searched for. Search starts from sequence number 1 (the high-speed segment network). When matching items are found, the cursor will move to that position. When no matching items are found by the end of the program, an error message will be displayed.

2) Search Next

The constant, reference number, or symbol that was entered at execution of the Search is searched for again in order of ascending network numbers. The search start position varies according to the operation mode as described below.

• Offline Mode

The search starts from the current cursor position.

• Online or Debug Mode

The search starts from the element position reached by the previous search.

3) Search Previous

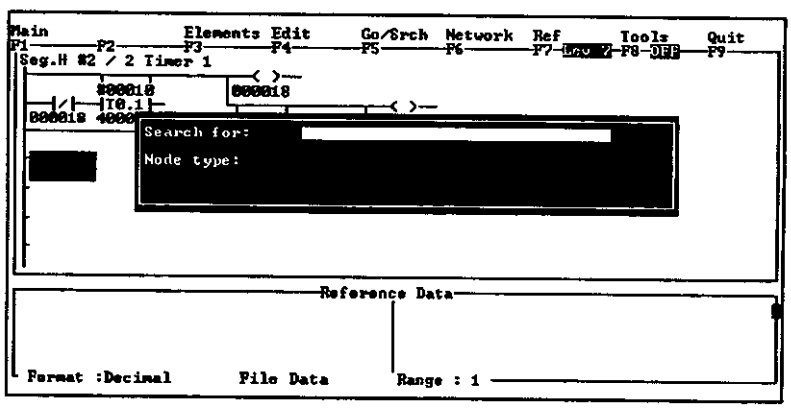
The constant, reference number, or symbol that was entered at execution of the search is searched for again in order of descending network numbers. The search start position is the same as for Search Next.

1. Search

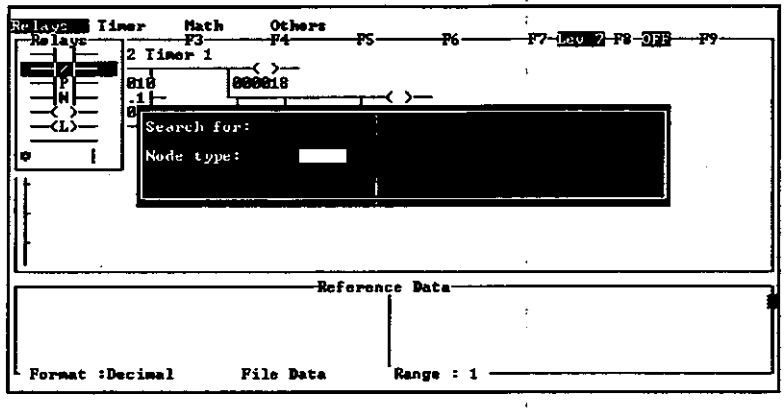
An operation example for an element symbol (an N.C. contact) is shown below.

1) Switch to the menu cursor using the Tab Key.

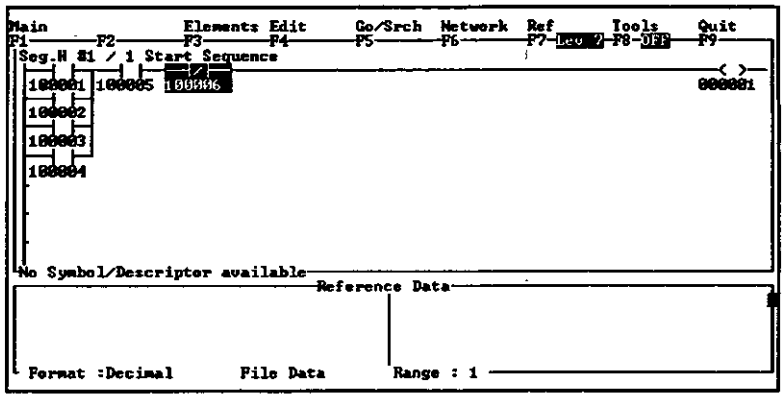
2) Select **Search** from the Go/Search Menu using the Cursor Keys and press the Enter Key. The Search window will be displayed.



3) Move the cursor to the symbol search using the Cursor Keys. The menu bar on the screen will change to an element input menu. Use the Tab Key to display a pull-down menu and select an N.C. contact using the Cursor Keys.



4) Input a symbol and press the Enter Key. A search will start from network number 1 of the segment currently being displayed. When the search is completed, the cursor will move to the position where the symbol is found.

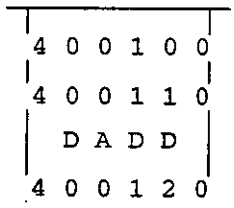


When both numeric data and a symbol are entered, the item that satisfies both conditions will be searched for. For instance, to search for the N.C. contact with reference number 5, enter both the reference number and symbol. In this case, an N.O. contact with reference number 5 will not be searched for.

To search using numeric data, press the Enter Key after entering a numeric value. The cursor will move to the symbol input section. Press the Enter Key again.

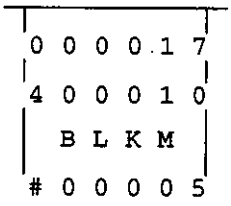
Note When a ladder instruction uses multiple references from the specified reference number, all the references are searched. The search range is restricted for indexed block transfers. These are explained using the following examples.

Example 1



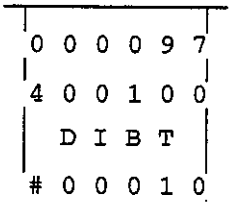
For the UNSIGNED DOUBLE PRECISION DECIMAL ADDITION instruction shown above, holding registers 400100, 400101, 400110, 400111, 400120, and 400121 are searched.

Example 2



For the BLOCK MOVE instruction, coils from 000017 to 000096 and holding registers from 400010 to 400014 are searched.

Example 3



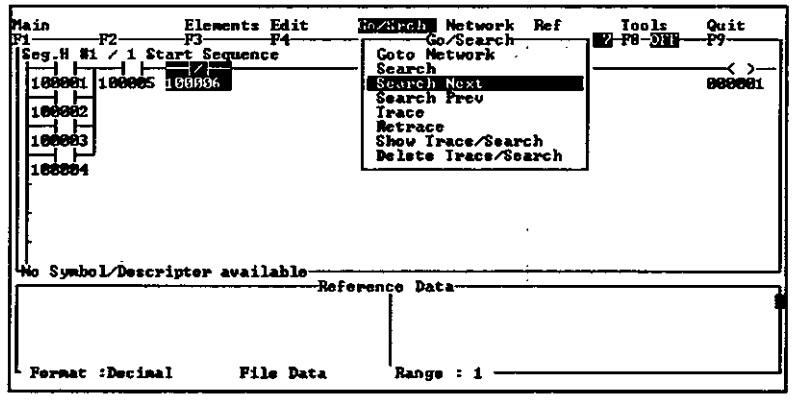
For the DESTINATION INDEXED BLOCK TRANSFER 1 instruction shown above, coils from 000097 to 000256 and holding register 400100 are searched. The registers which are actually storing data are not searched because the reference number of the register in which data is stored is specified by a pointer. There are references that are not searched in four instructions: DIBT, DIBR, SIBT, and SIBR. Caution is necessary when using these instructions.

2. Search Next/Search Previous

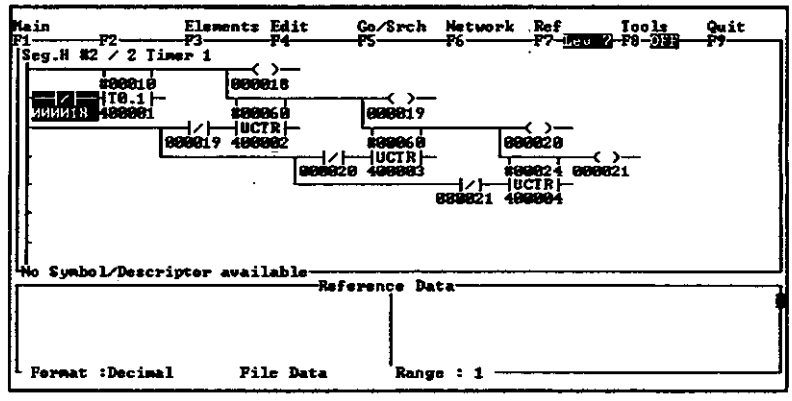
Search Next and Search Previous are useful for searching the constant, reference number, or element symbol that was entered at Search operation once again. An example of Search Next is shown below.

1) Switch to the menu cursor using the Tab Key.

2) Select **Search Next** from the Go/Search Menu using the Cursor Keys and press the Enter Key.



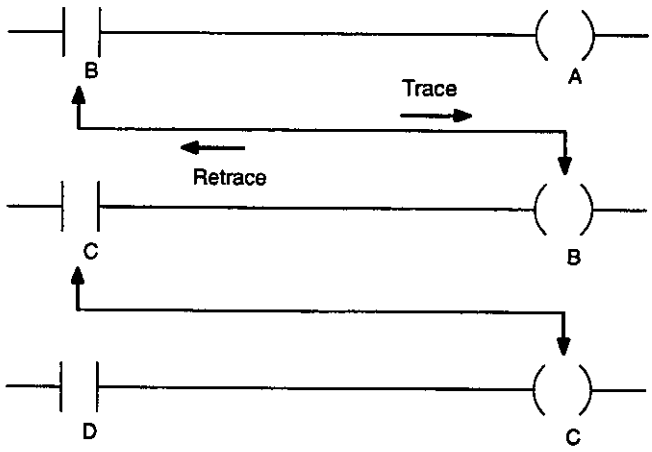
3) The search for an N.C. contact will begin from the current cursor position. When the search is completed, the cursor will move to the position of the N.C. contact that is found.



INFO Search must be executed before Search Next or Search Previous. If Search is not executed first, nothing will be executed for Search Next or Search Previous.

9.4.3 Trace/Retrace

By moving the cursor to any contact currently being displayed on the screen and executing Trace, the coil corresponding to the contact can be searched for. By executing Retrace after executing Trace, the trace can be displayed in the reverse sequence. By using Trace/Retrace, the circuits that cause state transitions of a contact can be searched sequentially as shown below.

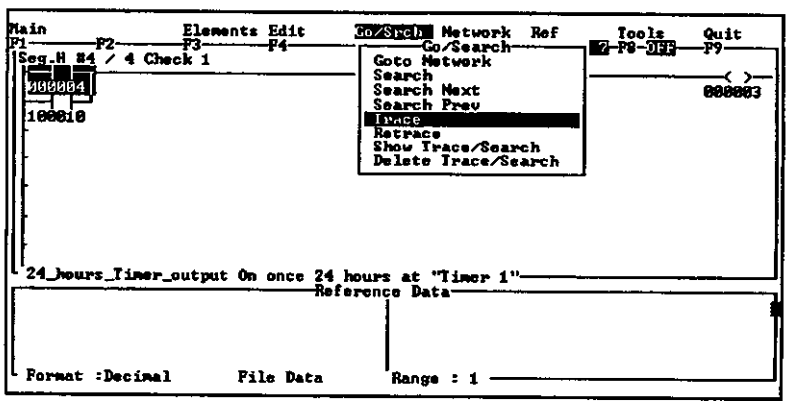


1. Trace

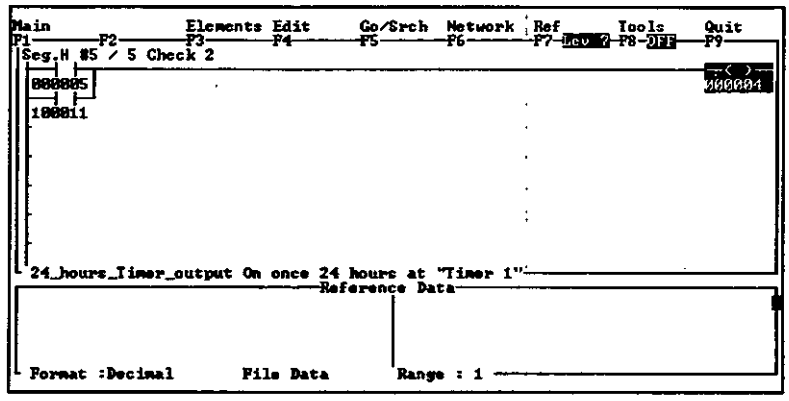
1) Move the cursor to the contact to be traced using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Trace** from the Go/Search Menu using the Cursor Keys and press the Enter Key.



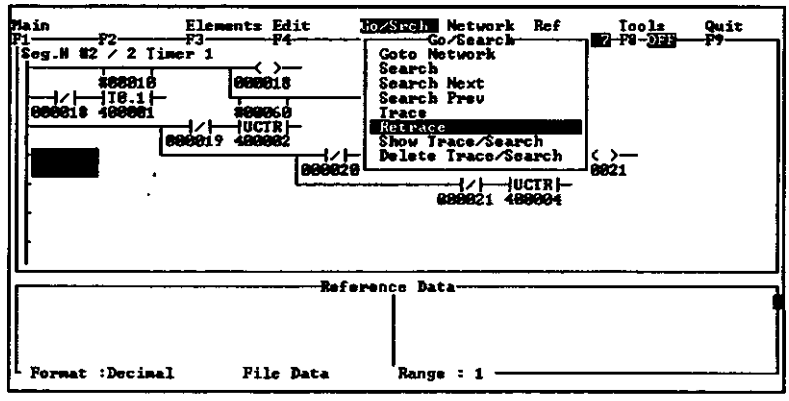
The cursor will move to the coil corresponding to the specified contact.



2. Retrace

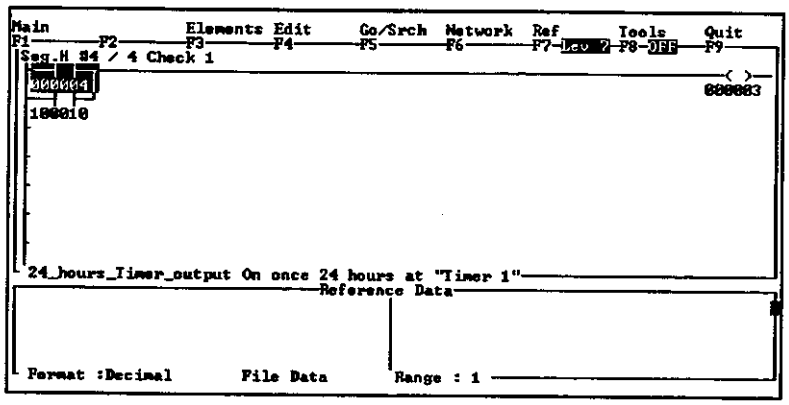
The Retrace operation traces the trace execution results in the reverse sequence. Therefore, when Retrace is executed, the cursor will move to the position of the contact specified in the last Trace that was executed. When Trace is executed again, the cursor will move to the contact of the previous Trace.

Select **Retrace** from the Go/Search Menu using the Cursor Keys and press the Enter Key. The cursor can be set to any position.



INFO When Retrace is executed, the trace list is deleted. See section *9.4.4 Show Trace/Search and Delete Trace/Search* for more details on the trace list.

The cursor will move to the position of the contact specified in the last trace.



9

9.4.4 Show Trace/Search and Delete Trace/Search

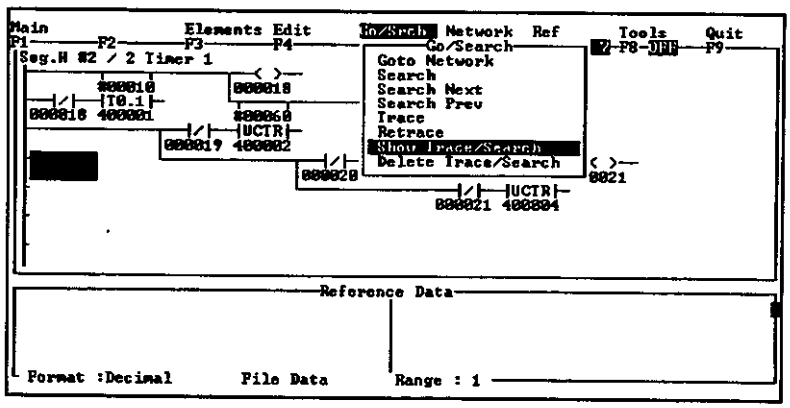
1. Show Trace/Search

The search result obtained by Search or Trace is referred to as a trace list. Up to 20 traced items are stored and can be displayed using the Show Trace/Search operation. The following types of trace lists are displayed.

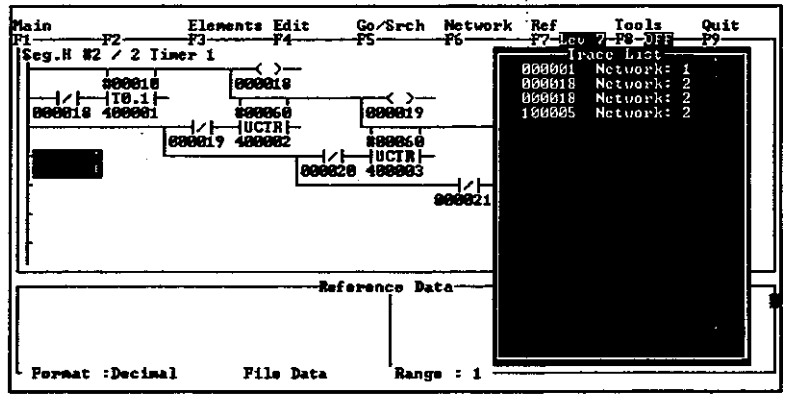
- Reference number to which the cursor is set when Search/Trace is executed.
- Network number that was displayed when Search/Trace was executed.

1) Switch to the menu cursor using the Tab Key.

2) Select **Show Trace/Search** from the Go/Search Menu using the Cursor Keys and press the Enter Key.



The Trace List will be displayed on the right side of the screen.



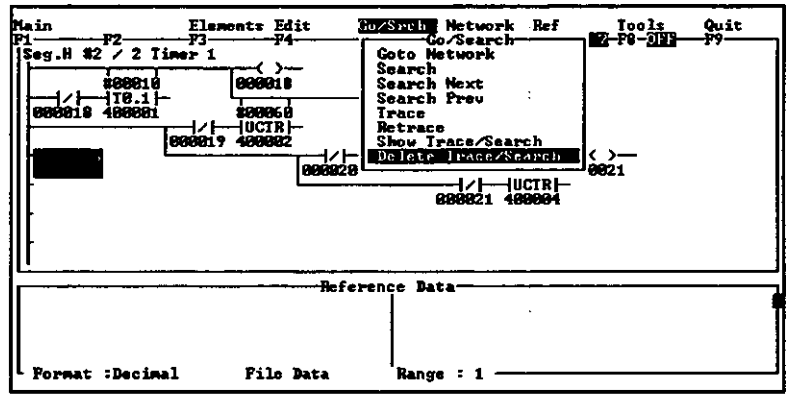
3) Press any Key to clear the Trace List display.

2. Delete Trace/Search

To delete the trace list before starting a new search or trace, use the Delete Trace/Search operation. The previous trace list will be deleted.

1) Switch to the menu cursor using the Tab Key.

2) Select **Delete Trace/Search** from the Go/Search Menu using the Cursor Keys and press the Enter Key.



3) A confirmation message will be displayed. Enter **Y** and press the Enter Key. The previous trace list will be deleted.

9.5 Network Operations

This section describes network editing operations, such as insertion, copying, and deletion of networks.

9.5.1 Insert Before Network/Insert After Network

1. Insert Before Network

An empty network is inserted before the network currently being displayed. The network numbers from the currently displayed network are incremented by one.

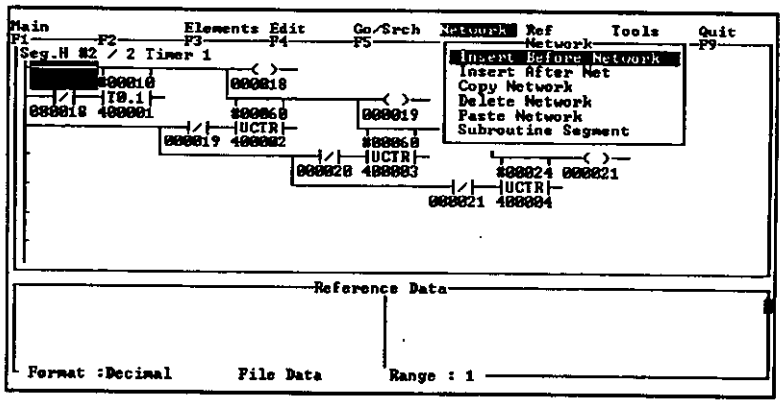
2. Insert After Network

An empty network is inserted following the network currently being displayed. The network numbers of the networks following the currently displayed network are incremented by one.

An example of Insert Before Network is shown below.

1) Switch to the menu cursor using the Tab Key.

2) Select **Insert Before Network** from the Network Menu using the Cursor Keys and press the Enter Key.



An empty network will be inserted in network number 2. The timer circuit in the previous network number 2 will be changed to network number 3, and subsequent network numbers will be incremented by one.

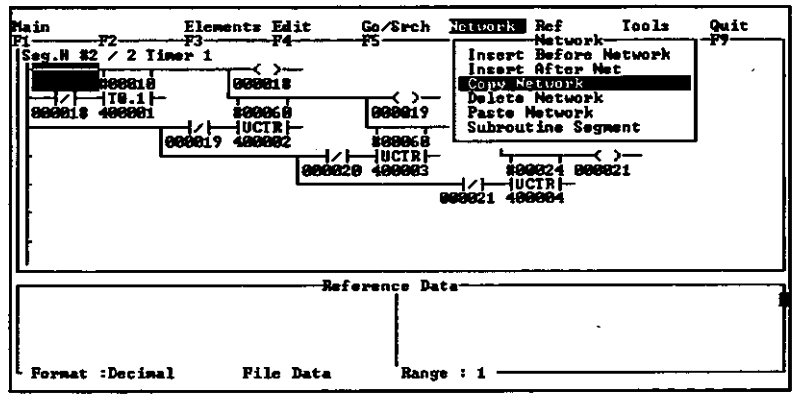
9.5.2 Copy Network

The Copy Network operation stores program data and comment data of the network currently being displayed. The network data stored by the Copy Network operation can be inserted at another position using the Paste Network operation.

Only one network can be stored by the Copy Network operation on the Network Menu. To copy a number of consecutive networks, select **Network List** from the Edit Menu on the Segment Status Screen and execute the Network List operation. See section *8.2 Network List Operations* for details.

1) Switch to the menu cursor using the Tab Key.

2) Select **Copy Network** from the Network Menu using the Cursor Keys and press the Enter Key.



Program data, network title, and comment of the timer circuit will be stored.

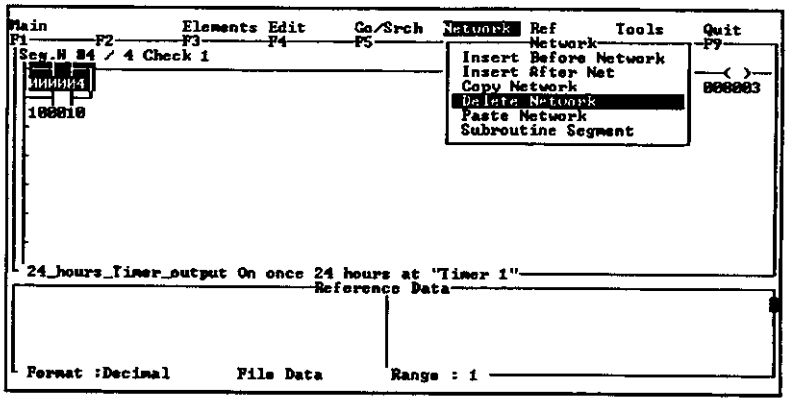
9.5.3 Delete Network

The Delete Network operation deletes and also stores program data and comment data of the network currently being displayed. The data that is stored by the Delete Network operation can be inserted at another position using the Paste Network operation. Therefore, this operation is useful not only for deletion of a network, but also for moving a network.

Only one network can be deleted or stored by the Delete Network operation on the Network Menu. To delete or store a number of consecutive networks, select **Network List** from the Edit Menu on the Segment Status Screen and use the Network List operation. See section *8.2 Network List Operations* for details.

1) Switch to the menu cursor using the Tab Key.

2) Select **Delete Network** from the Network Menu using the Cursor Keys and press the Enter Key.



A confirmation message will be displayed. When Y is entered, the network of Check1 will be deleted and the program data and comment data will be stored.

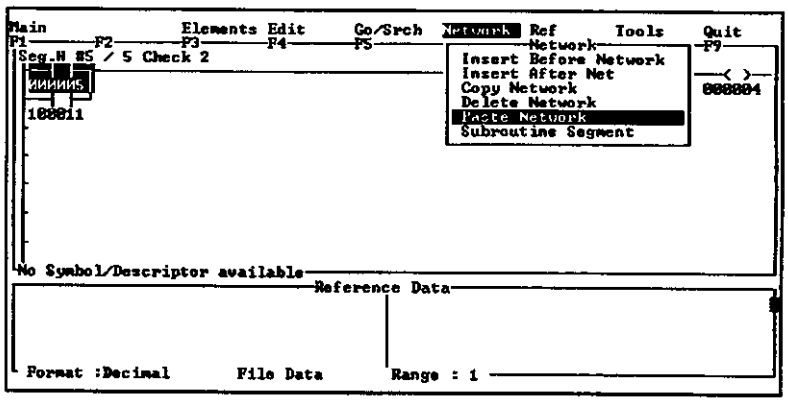
9

9.5.4 Paste Network

The Paste Network operation inserts data of one network stored by the Copy Network operation or the Delete Network operation into the network position currently being displayed. Program numbers of the programs of the subsequent networks are incremented by one.

1) Switch to the menu cursor using the Tab Key.

2) Select **Paste Network** from the Network Menu using the Cursor Keys and press the Enter Key.



The last network data that was stored will be inserted at the position of network number 5. Network numbers of the networks from Check 2 will be incremented by one.

INFO

1) Only one buffer is available to store and maintain the data specified by Copy Network or Delete Network. Therefore, when the Paste Network operation is performed, the data specified in the last Copy Network or Delete Network operation will be inserted.

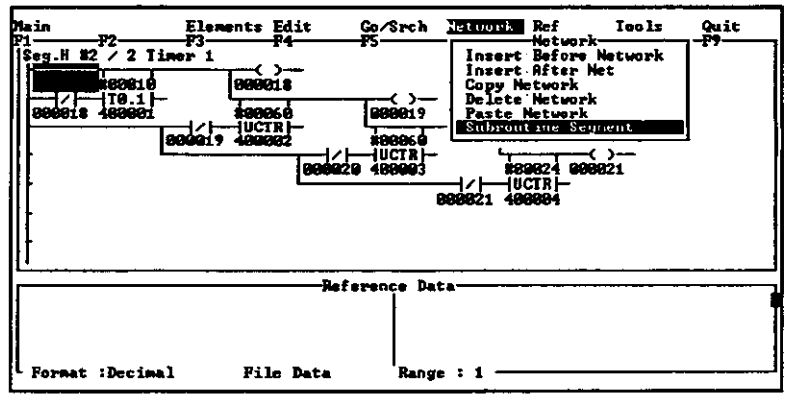
2) The buffer for storing data by the Copy or Delete operation on the Edit Menu is different from the location for storing data by the Copy Network or Delete Network operation on the Network Menu. Therefore, the data inserted by the Paste operation on the Edit Menu and the data inserted by the Paste Network operation on the Network Menu are different.

9.5.5 Moving Control to the Subroutine Segment

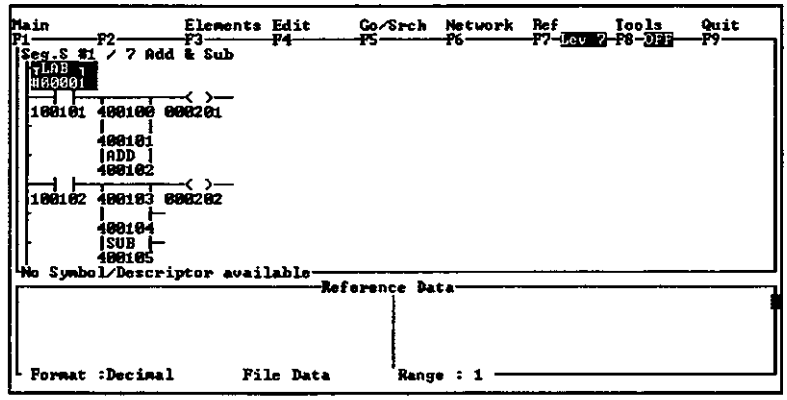
The Subroutine Segment operation moves control from normal segment editing to subroutine segment editing. This operation is useful for editing the subroutine programs used by the ladder program while editing a ladder program.

1) Switch to the menu cursor using the Tab Key.

2) Select **Subroutine Segment** from the Network Menu using the Cursor Keys and press the Enter Key.



Subroutine segment (segment: S) will be displayed.



Program editing of the subroutine segment can also be used in the same way as for other segment editing operations.

9.6 Reference Operations

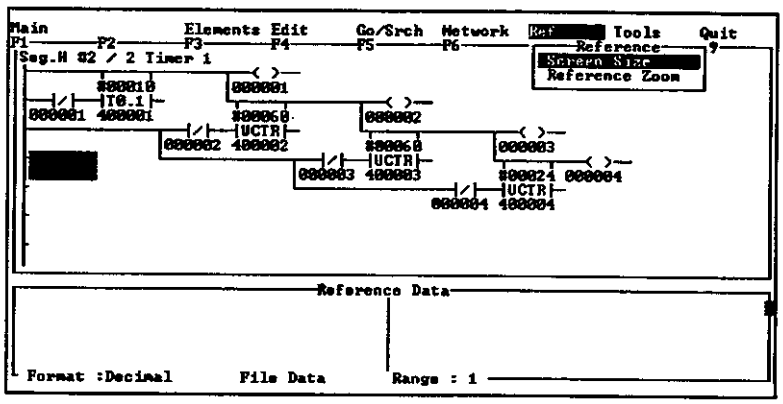
This section describes operation procedures on the Reference Menu, such as the Reference Zoom operation and the Used Reference display.

9.6.1 Changing Screen Size

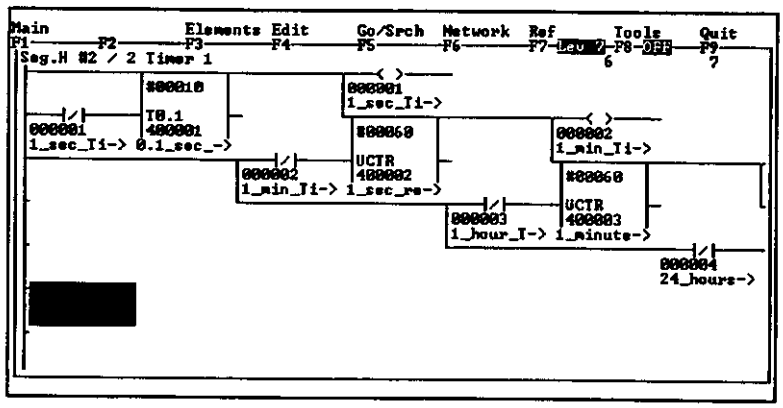
This operation changes the simultaneous display of a ladder program and reference data to a single display of ladder program or reference data on the Ladder Editor Screen. When this operation is executed while the cursor is set to a ladder program, the screen will change to the single display of the ladder program. In this state, reference symbols are also displayed in addition to the program. When this operation is executed again, the screen will change to display the ladder program and reference data simultaneously.

1) Switch to the menu cursor using the Tab Key.

2) Select **Screen Size** from the Reference Menu using the Cursor Keys and press the Enter Key.

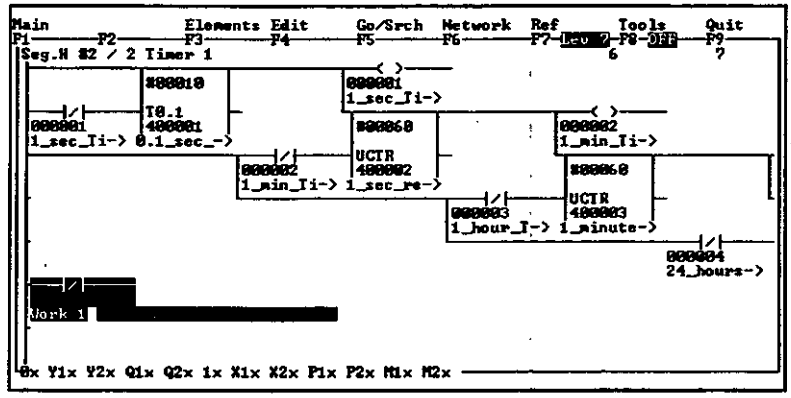


The display will change to the single display of the ladder program.

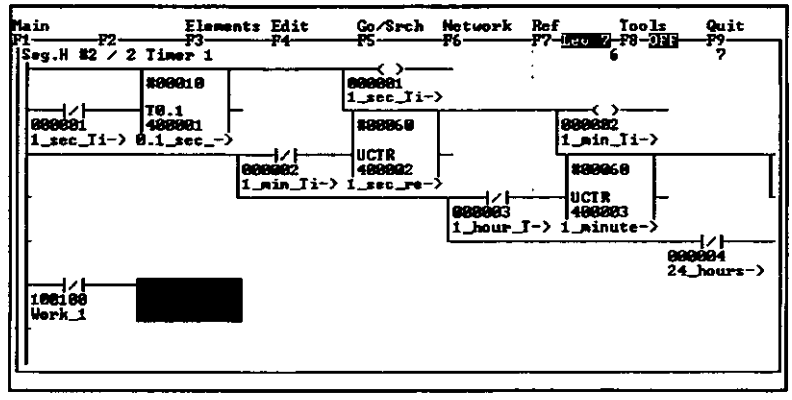


When displaying only the ladder program, a reference number can be entered using the predefined symbol. For example, when the symbol of reference number 100100 is Work 1, enter the reference number as shown below.

Input an N.C. contact. Enter **/** and **Work 1** as the reference number and press the Enter Key.

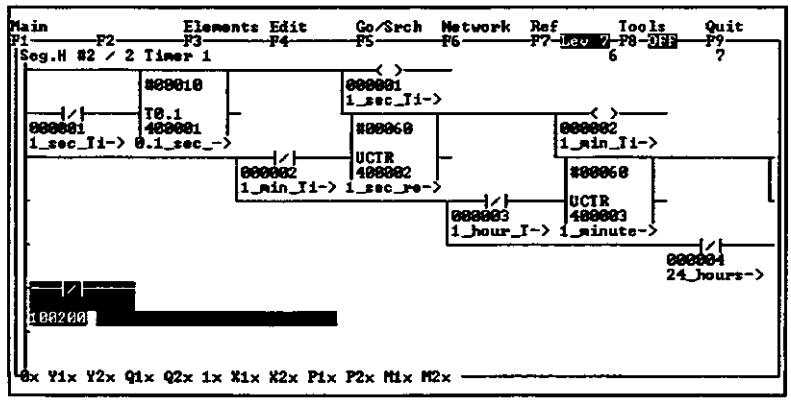


100100 will be entered as the reference number.

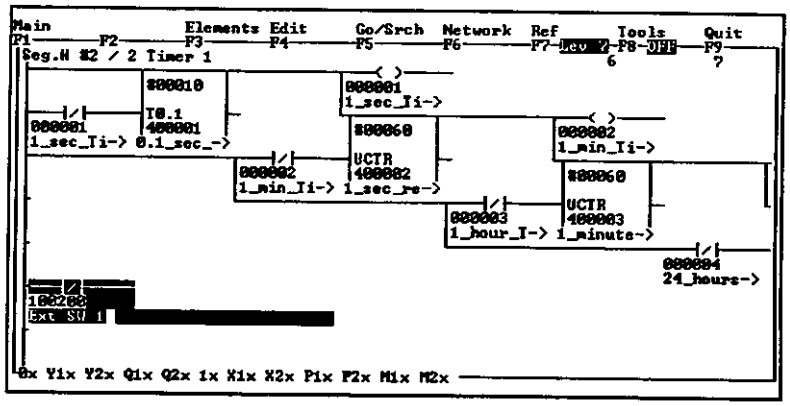


By entering a reference number and a symbol in that sequence, a symbol table can be edited simultaneously.

1) Enter **/** and the reference number (**100200** in this example) and press the Enter Key.



2) Enter the symbol (in this example, **Ext_SW_1** (=external switch 1)) and press the Enter Key.



The symbol that was entered will be registered in the symbol table.

9

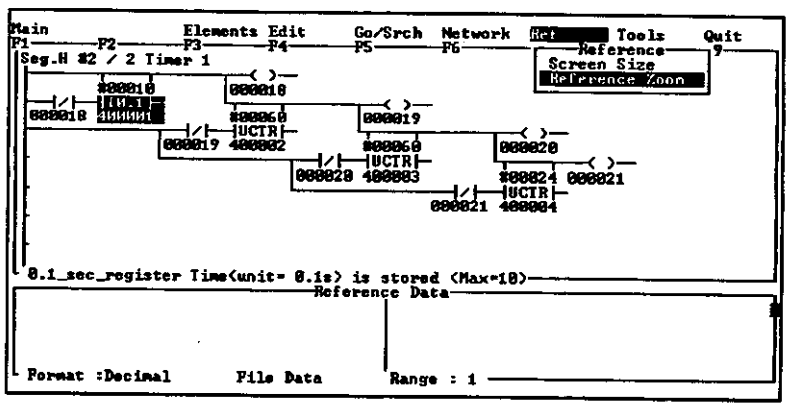
9.6.2 Reference Zoom

The Reference Zoom operation displays the Reference Editor Screen and edits reference symbols, comments, and data values.

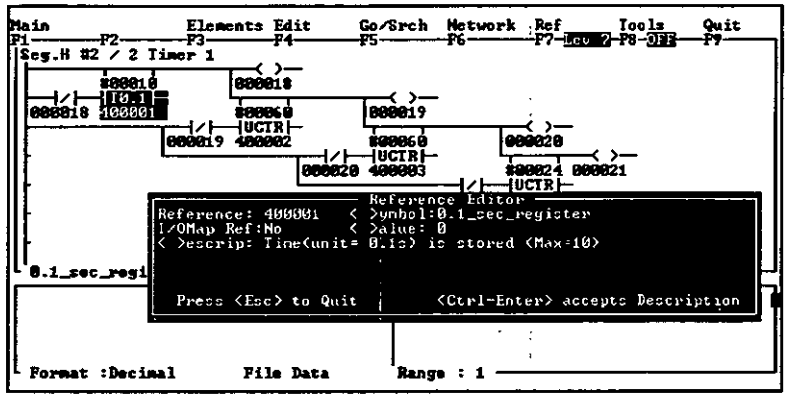
1) Move the cursor to the position of the reference number to be edited.

2) Switch to the menu cursor using the Tab Key.

3) Select **Reference Zoom** from the Reference Menu using the Cursor Keys and press the Enter Key.



The Reference Editor Screen will be displayed.



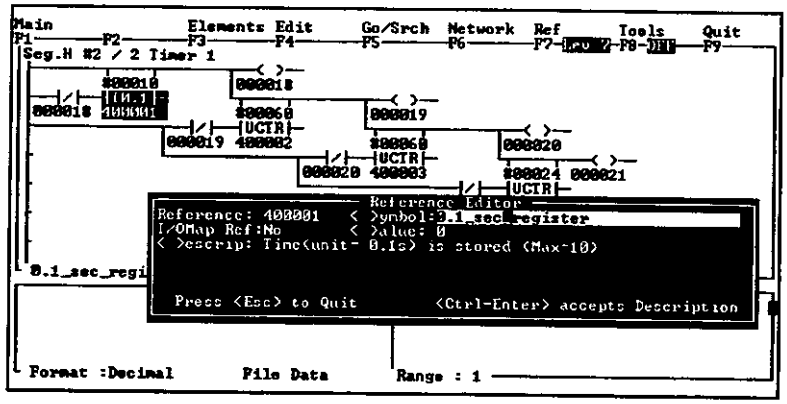
Use the following keys to edit references.

E	Starts Enable and Disable editing.
S	Starts reference symbol editing.
V	Starts reference data editing.
D	Starts reference comment editing.
INS	Toggles the Insert/Overwrite Mode.
↵	Determines input of the data. If the Enter Key is pressed without entering any data, reference editing is exited, saving the changed data.
ESC	Cancels the data input. If the cursor is not displayed, editing is exited without saving the changed data.

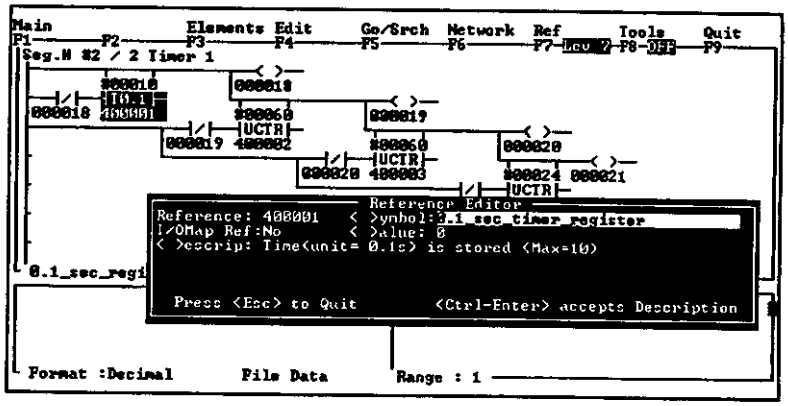
The following example shows how to edit a reference symbol.

1) Enter **S** to start symbol editing.

2) The cursor will move to the symbol position. Move the cursor to the position at which a character is to be inserted using the Cursor Keys.



3) Press the Insert Key to switch to the Insert Mode. Input a character to be inserted and press the Enter Key.



9.6.3 Used Reference Display

In Online Mode or Debug Mode, reference utilization status can be displayed. The references that can be displayed, however, vary according to the mode. This operation is not displayed on the menu in Offline Mode.

- **Online Mode**

OXXXXX: Coil
Y1XXXX: MC coil - 1
Y2XXXX: MC coil - 2
Q1XXXX: MC control coil - 1
Q2XXXX: MC control coil - 2
D1XXXX: Link coil - 1
D2XXXX: Link coil - 2

- **Debug Mode**

OXXXXX: Coil	D1XXXX: Link coil - 1
Y1XXXX: MC coil - 1	D2XXXX: Link coil - 2
Y2XXXX: MC coil - 2	1XXXXX: Input relay
Q1XXXX: MC control coil - 1	3XXXXX: Input register
Q2XXXX: MC control coil - 2	4XXXXX: Holding register

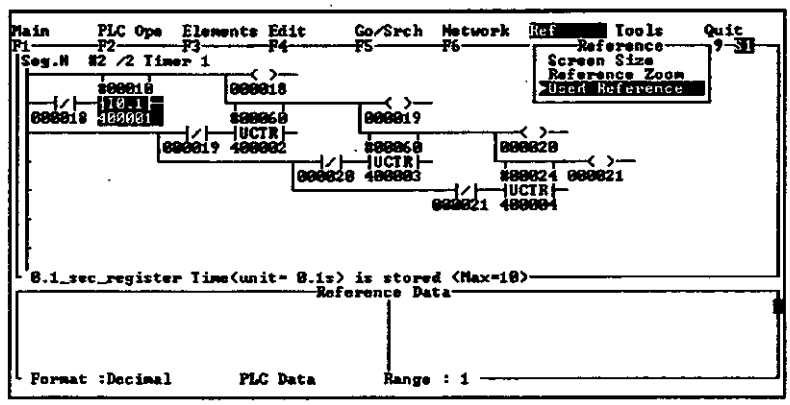
Usage status is displayed as follows:

U:	Used in an I/O map and ladder program (coil.)
B:	Used in an I/O map and ladder program.
H:	Used in an I/O map only.
P:	Used in a ladder program only (coil.)
L:	Used in a ladder program only.
–:	Not used
Blank:	Outside the reference range

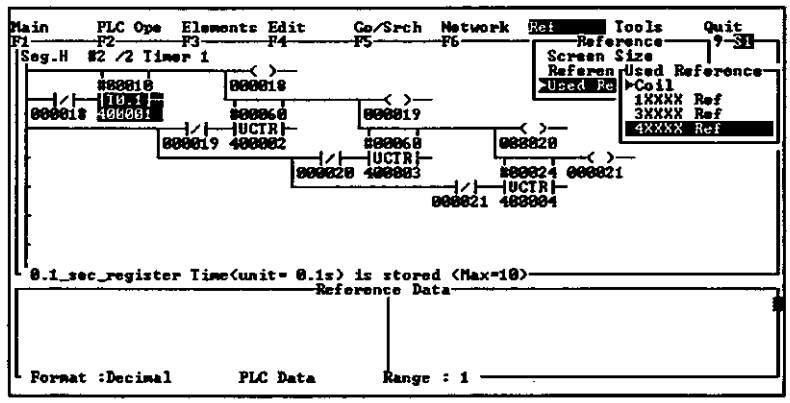
An example of displaying a usage table of holding registers in Debug Mode is shown below.

1) Switch to the menu cursor using the Tab Key.

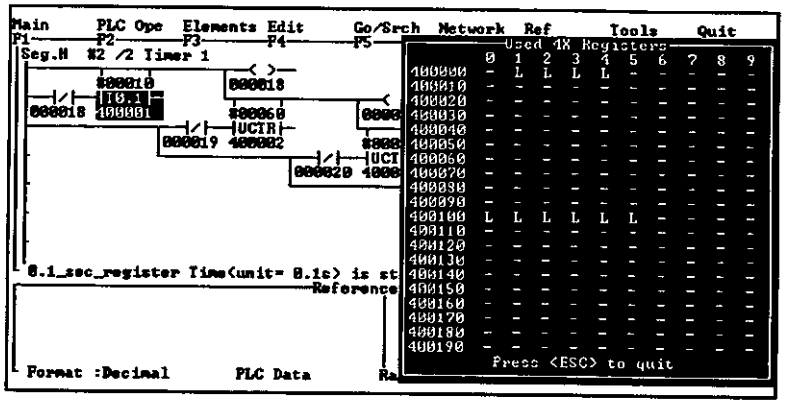
2) Select **Used Reference** from the Reference Menu using the Cursor Keys and press the Enter Key.



3) A submenu will be displayed. Select **4XXXX Ref** using the Cursor Keys and press the Enter Key.



The usage status of the specified holding registers will be displayed.



PgUp	Displays the usage status of the previous reference numbers to the reference numbers currently being displayed.
PgDn	Displays the usage status of the next reference numbers to the reference numbers currently being displayed.
ESC	Exits the display of used references.

Editing Symbols and Comments

10

This chapter describes the comment operation that enables the displaying and editing of reference symbols and comments.

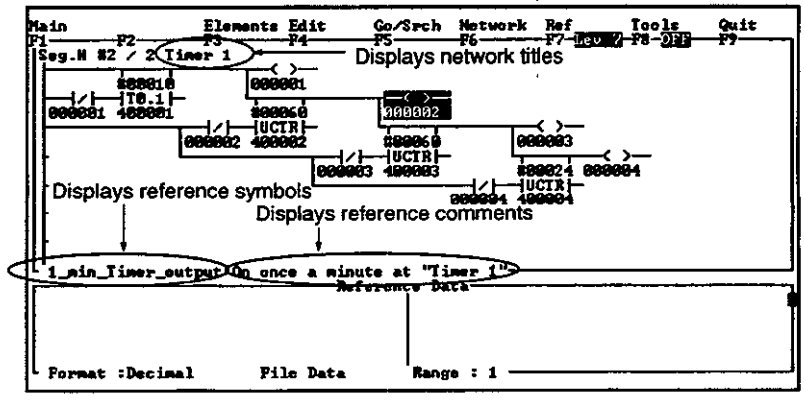
10.1 Overview

This section presents an overview of the MEMOSOFT symbol and comment operations.

10.1.1 Displaying Symbols and Comments

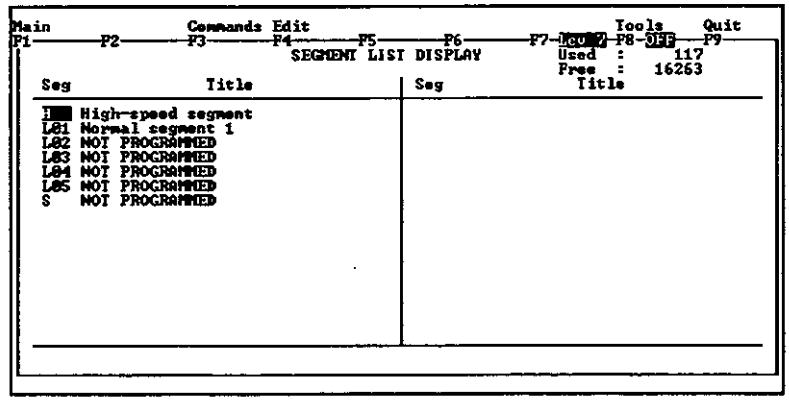
When symbols or comments have been entered, the Ladder Editor Screen is displayed as shown below. No symbols or comments, however, are displayed when **Direct to PLC** is selected from the Online Submenu in the Mode Menu.

1. Reference Symbols, Reference Comments, and Network Titles



The screen displays the symbol and comment for the reference in which the cursor is currently positioned. For the network, the screen displays only the network title. Network comments are displayed on the Network Comment Screen.

2. Segment Titles



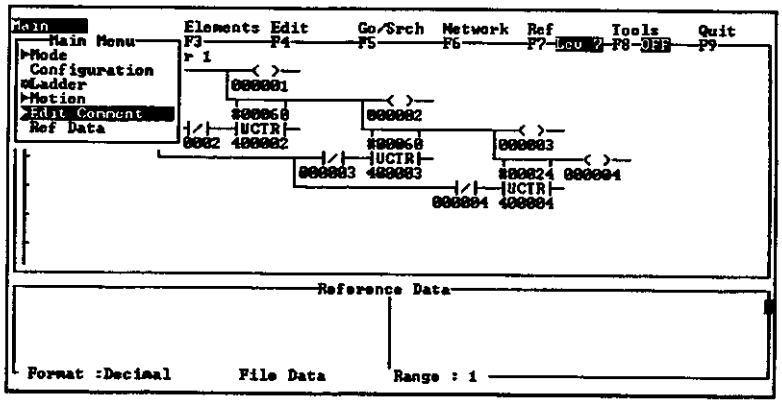
The Segment List Display Screen displays only the segment titles. Segment comments are displayed on the Segment Comment Screen.

10.1.2 Displaying the Edit Comment Screen

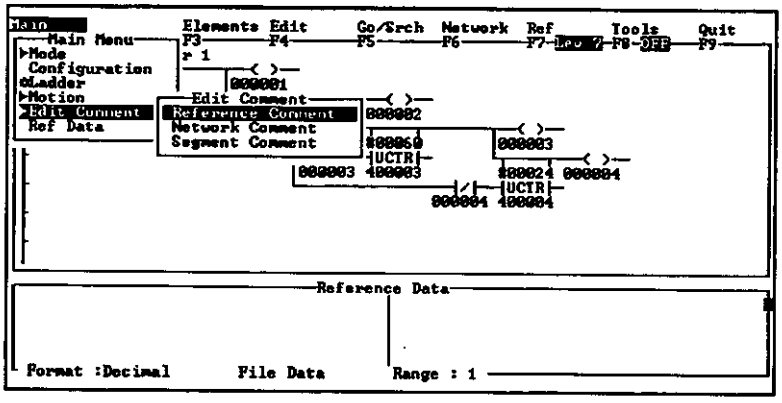
The Comment Submenu is under the Main Menu. Therefore, the Edit Comment Screen can be displayed immediately even when the Ladder Editor Screen, the MC Program Edit Screen, or some other screen is currently displayed. The following example shows how to activate the Edit Comment Screen from the Ladder Editor Screen.

1) Switch to the menu cursor using the the Tab Key.

2) Select **Edit Comment** from the Main Menu using the Cursor Keys and press the Enter Key.



3) Select **Reference Comment** using the Cursor Keys and press the Enter Key.



The Reference Symbol/Comment Screen will be displayed.

10.2 Editing Reference Symbols and Comments

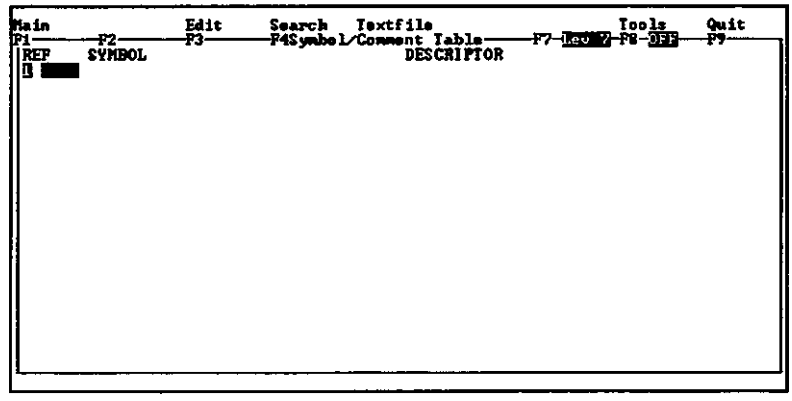
This section describes the basic procedures for editing reference symbols and comments.

10.2.1 Overview

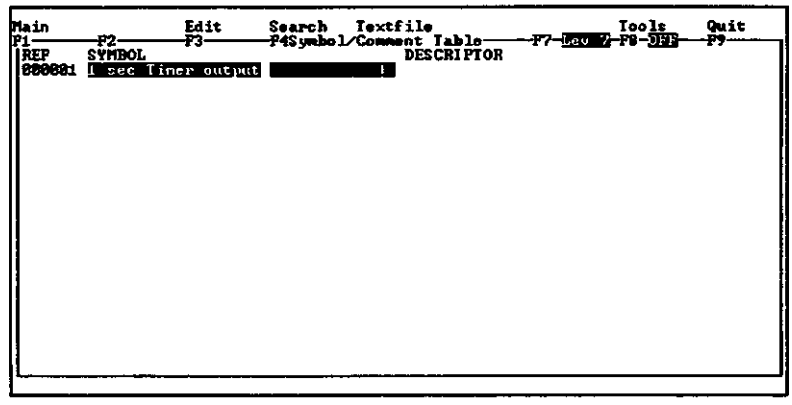
For a reference symbol, up to 32 characters can be entered. For a reference comment, up to 49 characters per line and a maximum of four lines can be entered. Therefore, up to 196 characters can be entered as a reference comment.

The following example shows how to enter a symbol and a comment.

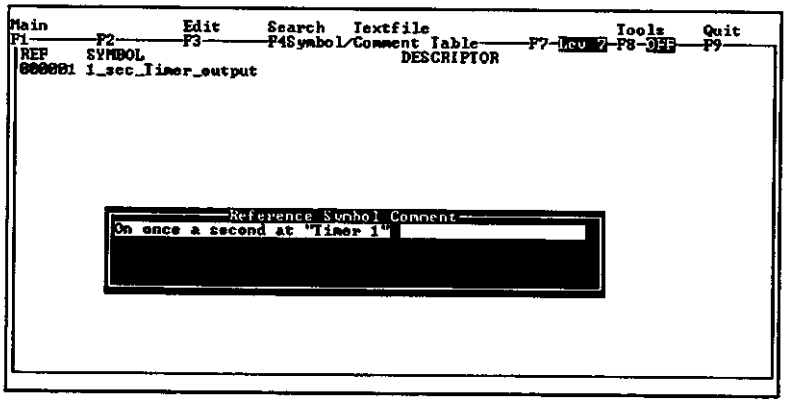
1) Enter **1** as a reference number, then press the Enter Key.



2) The cursor will move to the symbol field. Enter **1_sec_Timer_output** as a symbol, then press the Enter Key.



3) The comment entry window will be displayed. Enter a comment and press the Enter Key.



If the number of comment lines entered is less than four, press the Enter Key for the remaining blank lines.

IMPORTANT

(1) Spaces cannot be inserted in symbols. If a blank in the symbol is required, use the Underline Key "_".

(2) Do not put an asterisk mark (*) at the beginning of the reference symbol.

Use the following keys for Edit Comment operation.

INS	Switches to insert mode. Because the system is normally in overwrite mode, press this key to insert characters. Pressing this key again returns to overwrite mode.
DEL	Deletes the character in which the cursor is currently positioned.
+	When the cursor is positioned in a blank line, automatically enters a reference number one greater than the previous reference number.
-	When the cursor is positioned in a blank line, automatically enters a reference number one smaller than the previous reference number.
	When the cursor is positioned in the comment field, displays the entire comment.
PgDn	Displays the next screen (next 20 reference symbols/comments).
PgUp	Displays the previous screen (previous 20 references/comments).
HOME	Moves the cursor to the beginning of the reference symbol/comment table.
END	Moves the cursor to the end of the reference symbol/comment table.

INFO

1) MEMOSOFT allows symbols and comments to be attached to constants as well as to ordinary references. To do so, enter **#XXXXX** (X: any number) as the reference.

2) To change an existing symbol, move the cursor to the symbol, then enter a new symbol directly.

3) To change an existing comment, move the cursor to the comment and press the Space Key. The entire comment will be displayed, then change the comment.

4) The list screen displays only the first 49 characters of each comment.

10.2.2 Edit

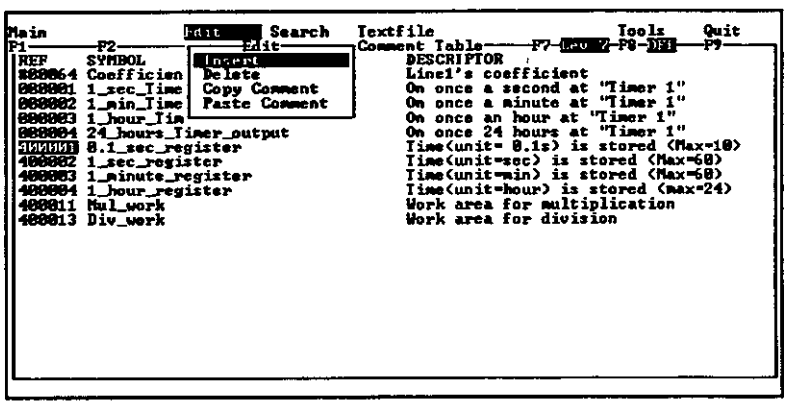
1. Insert

The Insert operation inserts one blank line at the cursor position.

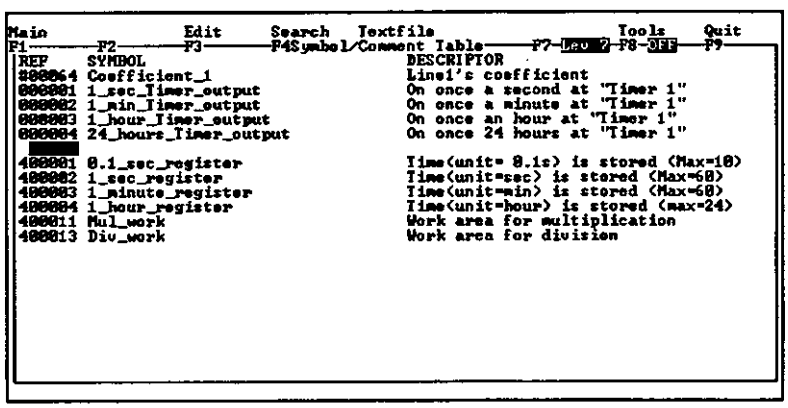
1) Move the cursor to the position in which a blank line is to be inserted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Insert** from the Edit Menu using the Cursor Keys and press the Enter Key.



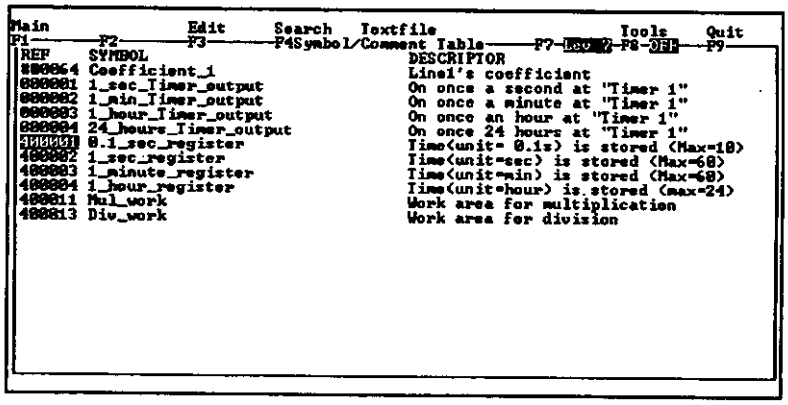
One blank line will be inserted at the cursor position.



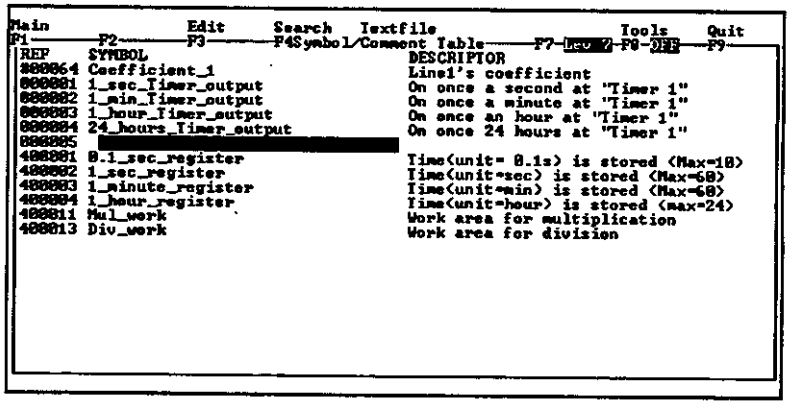
If insert processing is interrupted by pressing the Esc Key, the inserted line will be deleted.

The + and – Keys are useful when inserting consecutive reference comments. The following example shows how to insert a comment in reference number 5.

Move the cursor to the line next to reference number 4 using the Cursor Keys, and then press the + Key.



Reference number 5 will automatically be inserted at the cursor position.



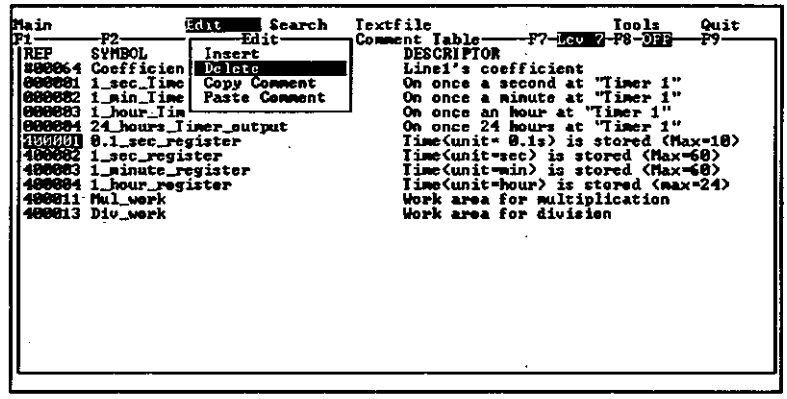
2. Delete

The Delete operation deletes existing reference numbers, symbols, and comments.

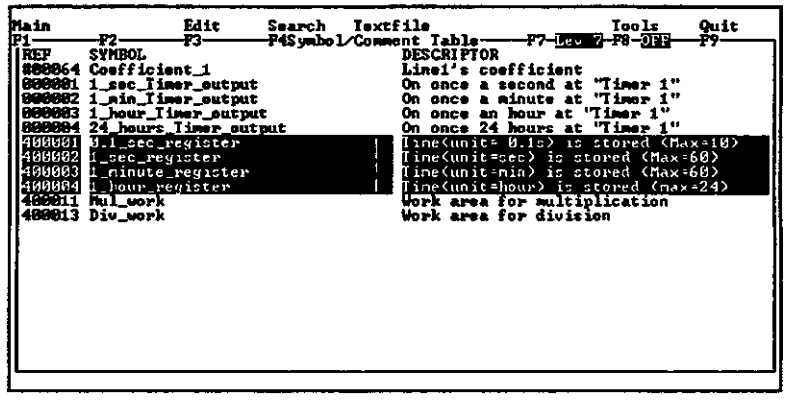
1) Move the cursor to the top (or bottom) of the range of reference numbers, symbols, and comments to be deleted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Delete** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) Specify the range of reference numbers, symbols, and comments to be deleted.



The specified range of reference numbers, symbols, and comments will be deleted.

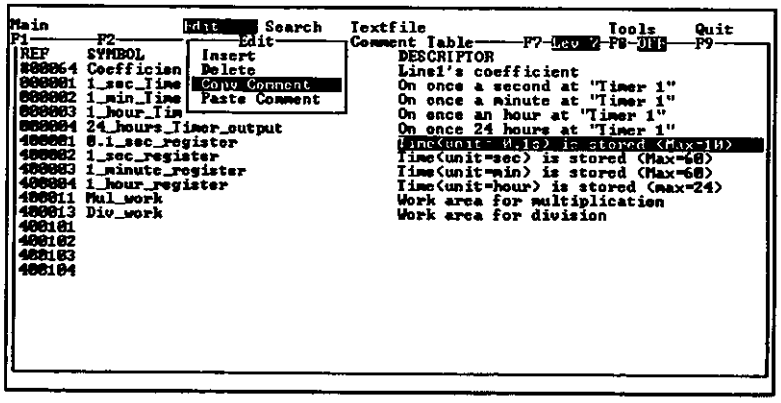
3. Copy Comment

The Copy Comment operation stores comments. When similar comments are to be entered, you can greatly reduce input time by using the Copy Comment and Paste Comment operations.

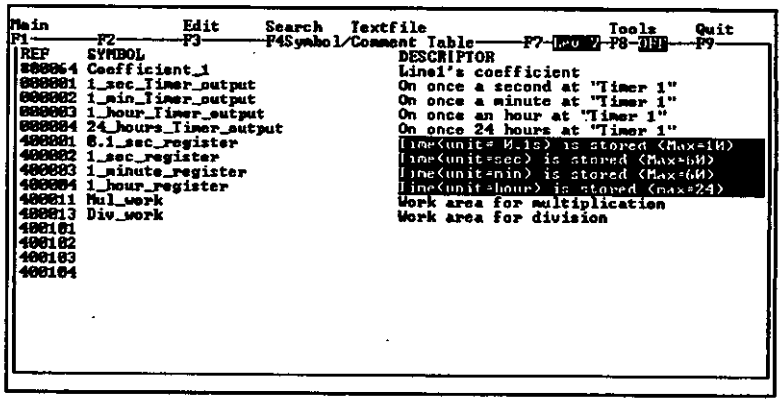
1) Move the cursor to the comment to be copied using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Copy Comment** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) Specify the range of comments to be copied.



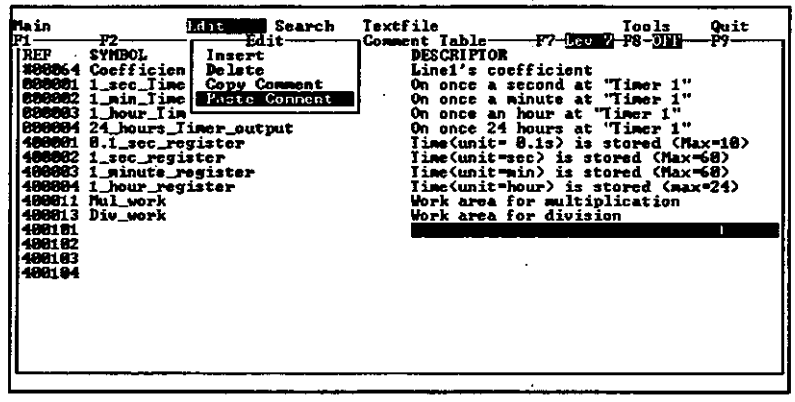
4. Paste Comment

The Paste Comment operation copies the comment data stored by Copy operation to the comment corresponding to the specified reference number.

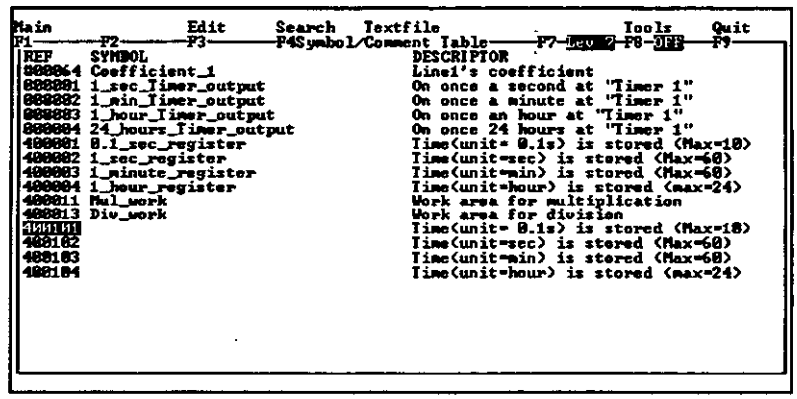
1) Move the cursor to the copy destination using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Then, select **Paste Comment** from the Edit Menu using the Cursor Keys and press the Enter Key.



The stored comment data will be copied to the specified destination.



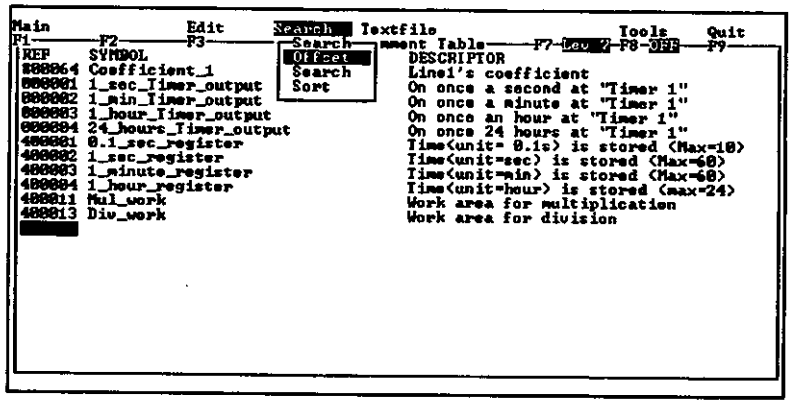
10.2.3 Search

1. Offset

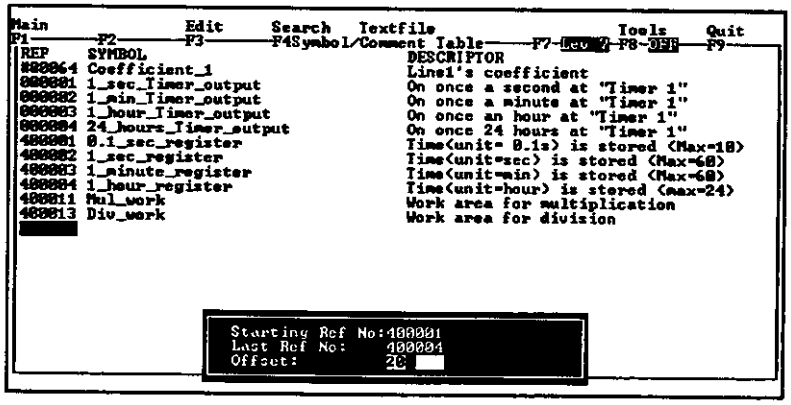
The Offset operation increases the specified reference numbers by the specified offset value. This operation cannot be used for constants.

1) Switch to the menu cursor using the Tab Key.

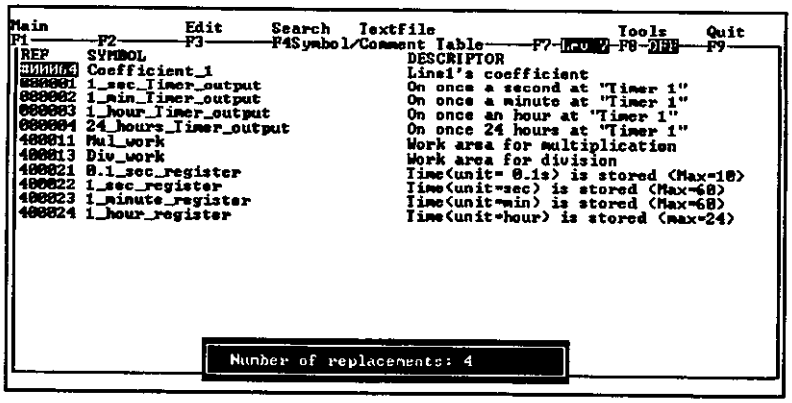
2) Select **Offset** from the Search Menu using the Cursor Keys and press the Enter Key.



3) An offset window will be displayed. Enter the starting and last reference numbers and the offset value (in this example, **400001**, **400004**, and **20**, respectively.) Press the Enter Key after entering each value.



Reference numbers 400001 to 400004 will be increased by 20.

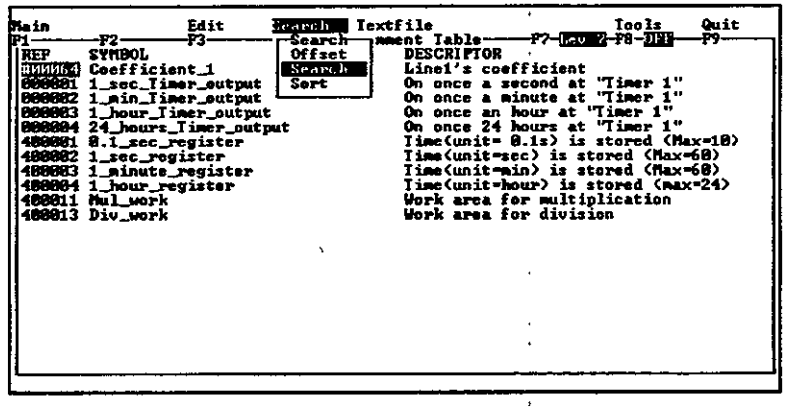


2. Search

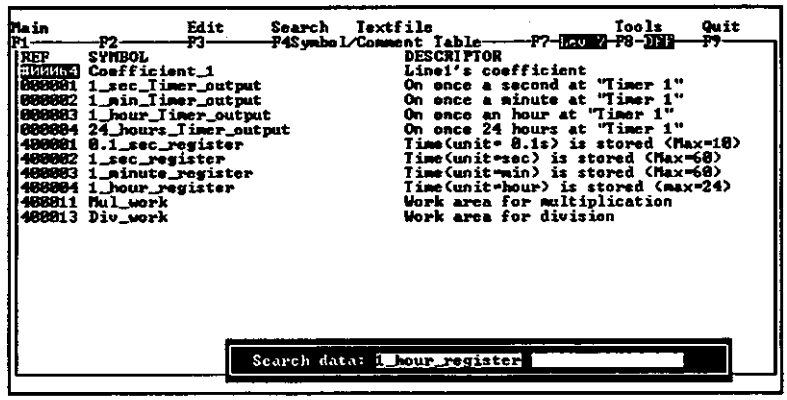
The Search operation searches the specified reference number or symbol in the Symbol/ Comment Table. The following example shows how to search a symbol in the table.

1) Switch to the menu cursor using the Tab Key.

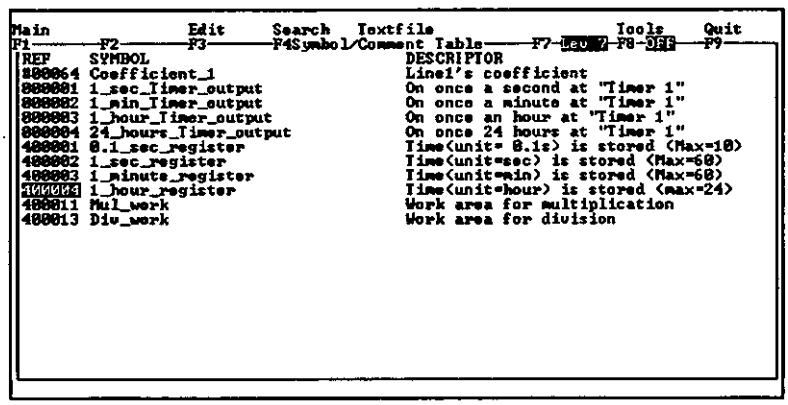
2) Select **Search** from the Search Menu using the Cursor Keys, and press the Enter Key.



3) The window for entering search data will be displayed. In this example, enter **1_hour_register** as a symbol and press the Enter Key.



The cursor will move to the reference number corresponding to the entered symbol.

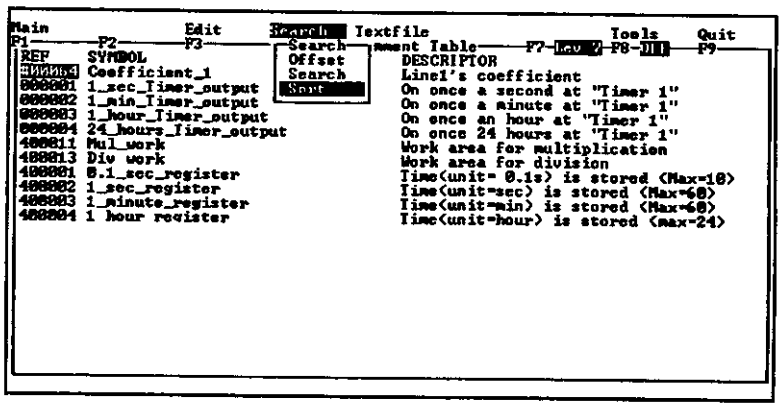


3. Sort

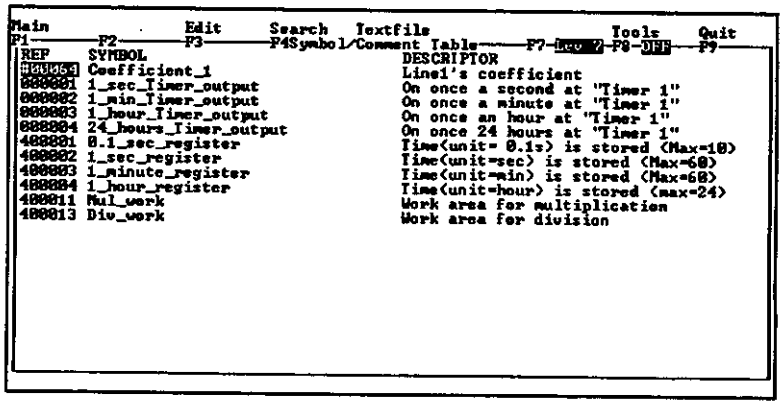
The Sort operation sorts entered reference symbols and comments in ascending order of reference number. It is automatically performed when an edit operation such as editing comments is exited. Therefore, use this operation only when sorting the reference symbols and comments during edit operation.

1) Switch to the menu cursor using the Tab Key.

2) Select **Sort** from the Search Menu using the Cursor Keys and press the Enter Key.



The reference symbols and comments are sorted in ascending order of reference number.



10.2.4 Text File Operations

The Text File function is divided into the following two functions.

- **Text File Importing**

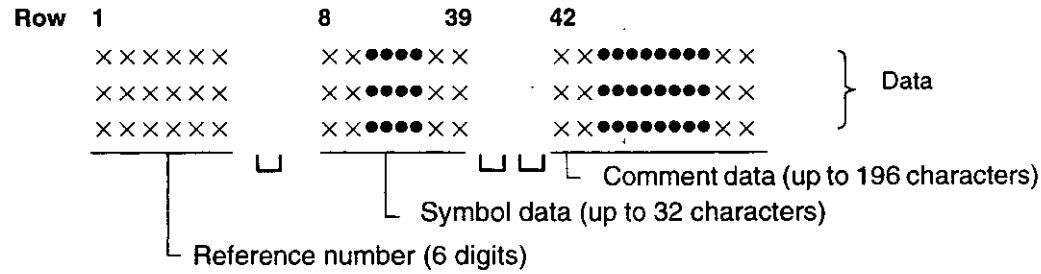
This operation imports text files created in MEMOSOFT format. The imported file data is inserted into the symbol table as symbol/comment data.

- **Text File Exporting**

  This operation stores edited symbol tables as text files. A standard text editors can be used to edit these text files. After editing the text files, they can be imported as symbol tables through MEMOSOFT.

As described above, symbol tables are stored as text files, which can be then imported to other programs. This allows different programs to process the symbol tables.

The text file format is shown below.



- Five-digit reference numbers are converted to 6-digit reference numbers in the text file.
- A blank space exists between a reference number and a symbol.
- Two blank spaces exist between a symbol and a comment.
- Comment data starts with the 42nd character.

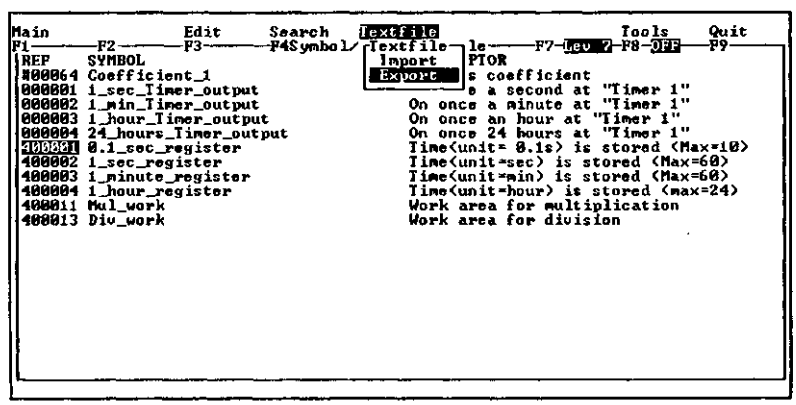
Note (1) Spaces cannot be inserted in symbols. If a blank in the symbol is required, use the Underline Key "_".

(2) Do not put an asterisk mark (*) at the beginning of the reference symbol.

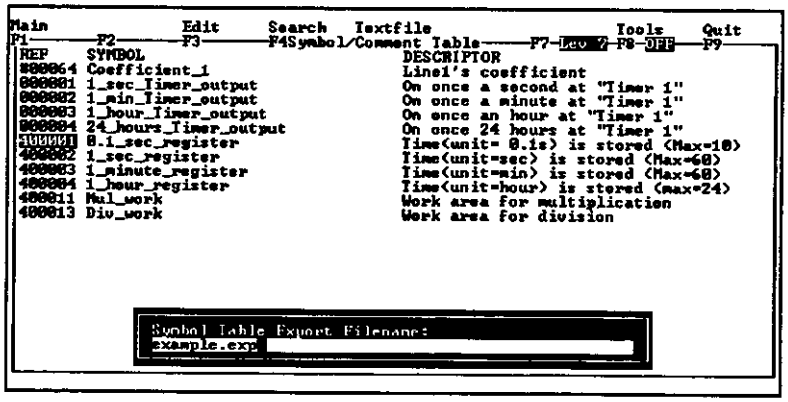
1. Export

1) Switch to the menu cursor using the Tab Key.

2) Select **Export** from the Textfile Menu using the Cursor Keys and press the Enter Key.



3) The window for entering a file name will be displayed. Specify the export destination file name, and then press the Enter Key.

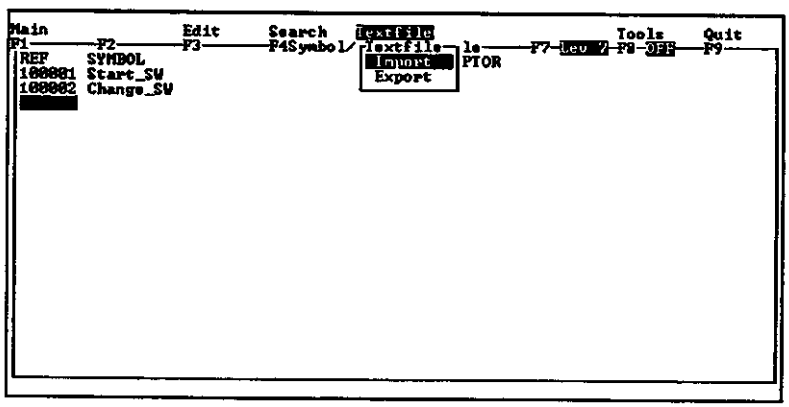


Comment data will be exported to the specified file.

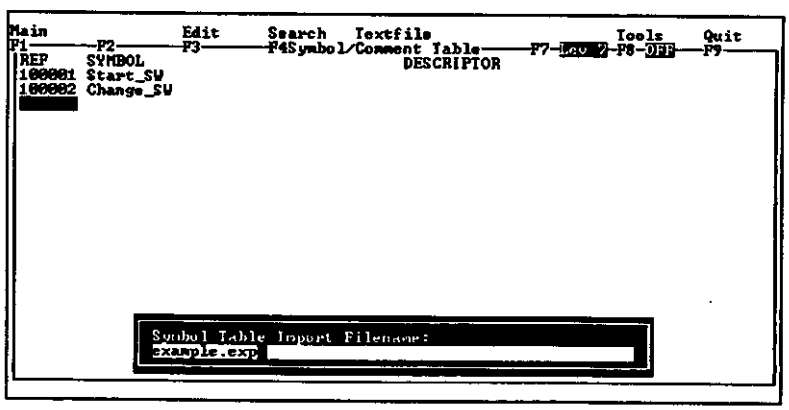
2. Import

1) Switch to the menu cursor using the Tab Key.

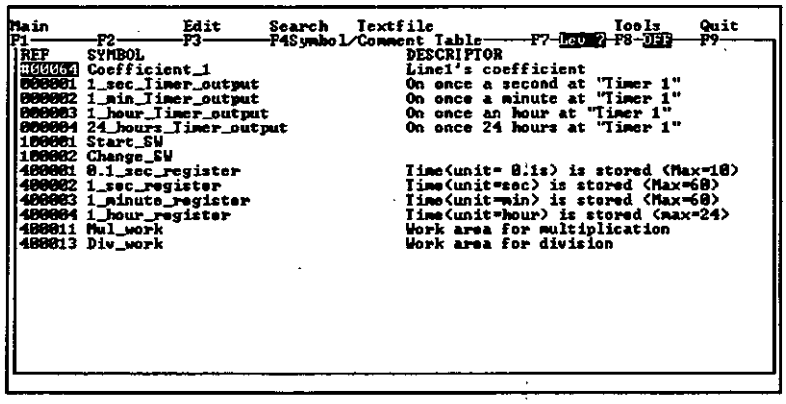
2) Select **Import** from the Textfile Menu using the Cursor Keys and press the Enter Key.



3) The window for entering a file name will be displayed. Specify the import source file name and press the Enter Key.



The text file will be inserted as symbol/comment data.



INFO

1) If the imported data contains the same reference number as an existing reference number in the symbol table currently being edited, the imported data has priority. Therefore, the data in the symbol table will be overwritten.

2) If the imported data contains the same symbol as an existing symbol in the symbol table currently being edited, the symbol in the symbol table has priority. Therefore, the imported symbol data will be ignored.

3) If the drive and the directory are not specified, then read and write operations will be executed using \FMSGL.

10.3 Editing Network Titles and Comments

This section describes the basic procedures for editing network titles and comments.

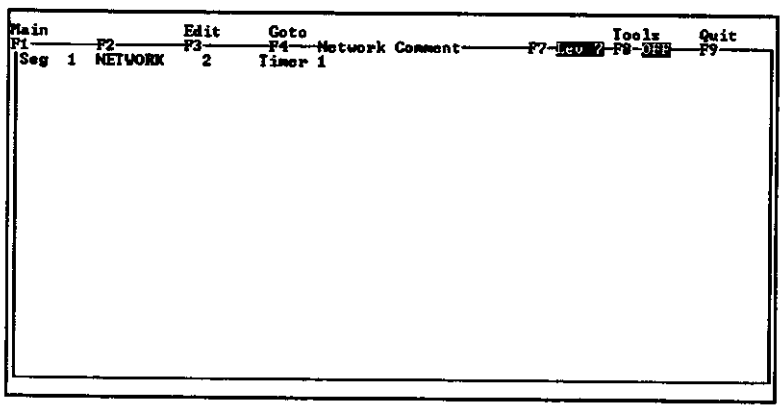
10.3.1 Overview

Up to 32 characters can be entered for a network title. Up to 78 characters per line and up to 20 lines can be entered for a network comment.

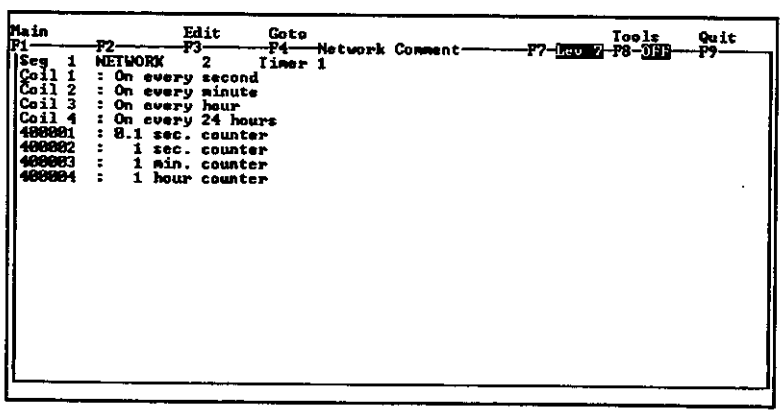
Use the following procedure to enter a network title and comment.

1) Display the Network Comment Screen.

2) Enter **Timer 1** as a network title, then press the Enter Key.



3) The cursor will move to the network comment field. Enter a network comment.



4) Press the Esc Key to exit the Network Comment Screen.

When editing other network comments, select **Goto** from the Network Comment Screen Menu to switch to another Network Comment Screen.

10.3.2 Edit

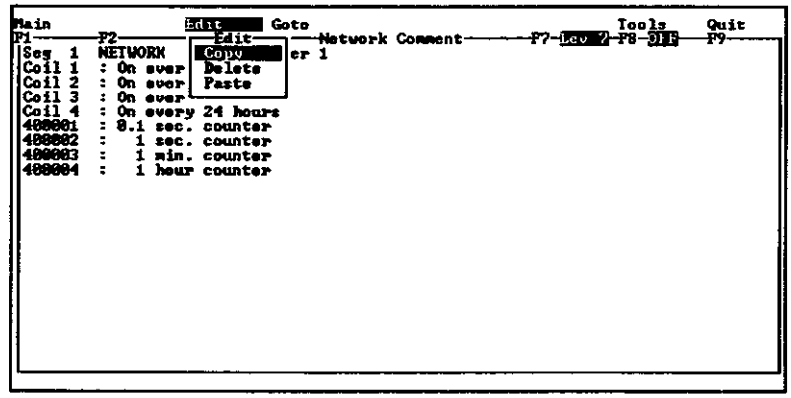
1. Copy

The Copy operation stores the network comments specified with the Cursor Keys. The stored data can be copied to another position or another network comment by using the Paste operation.

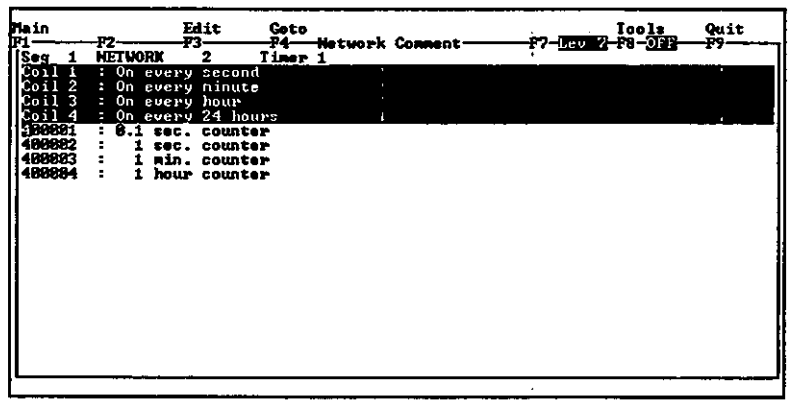
1) Move the cursor to the corner of the area of network comments to be copied using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Copy** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) Specify the area of network comments to be copied using the Cursor Keys, and then press the Enter Key.



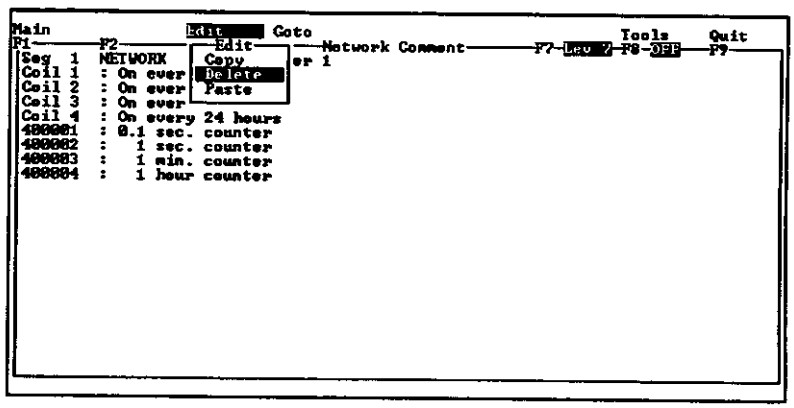
2. Delete

The Delete operation deletes the network comments specified with the Cursor Keys, and simultaneously stores these comments. Therefore, the stored data can be moved to another position or another network comment by using the Paste operation.

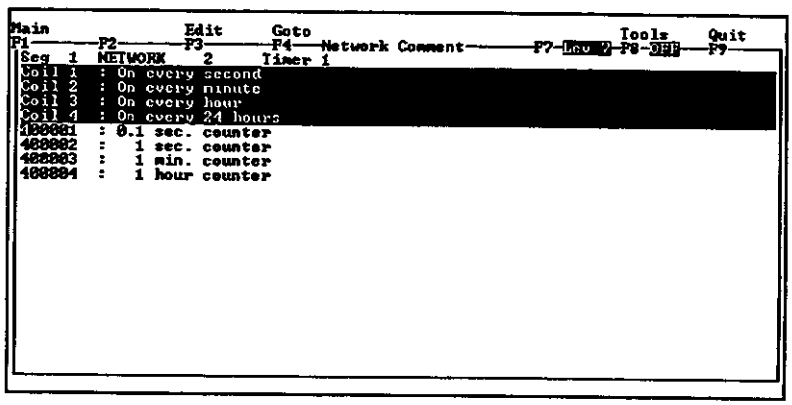
1) Move the cursor to the corner of the area of network comments to be deleted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Delete** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) Specify the range of network comments to be deleted using the Cursor Keys, and then press the Enter Key.



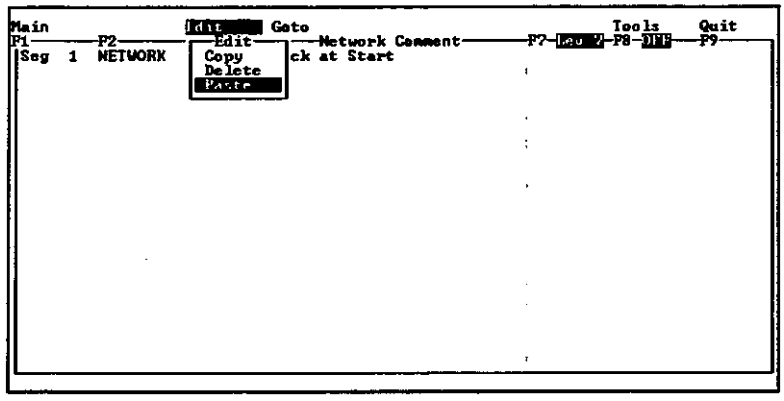
3. Paste

The Paste operation inserts the comment data stored by the Copy or Delete operation into the cursor position. The following example shows how to insert the data stored by the Delete operation explained in 2. into the network comment of network number 3.

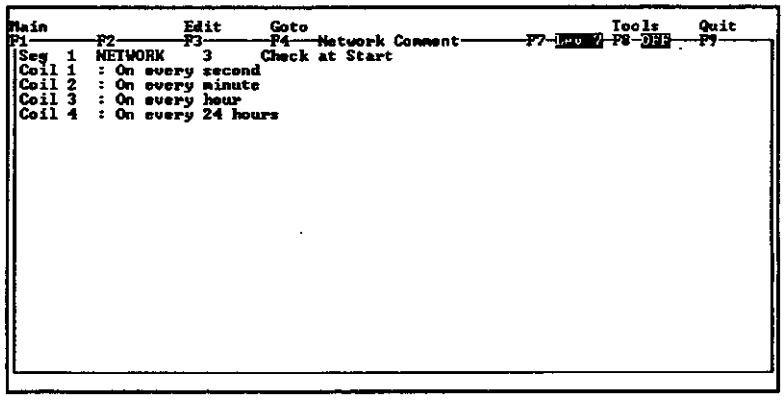
1) Move the cursor to the position in which the stored comment data is to be inserted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Paste** from the Edit Menu using the Cursor Keys and press the Enter Key.



The stored comment data will be inserted at the cursor position.



10.3.3 Moving Control

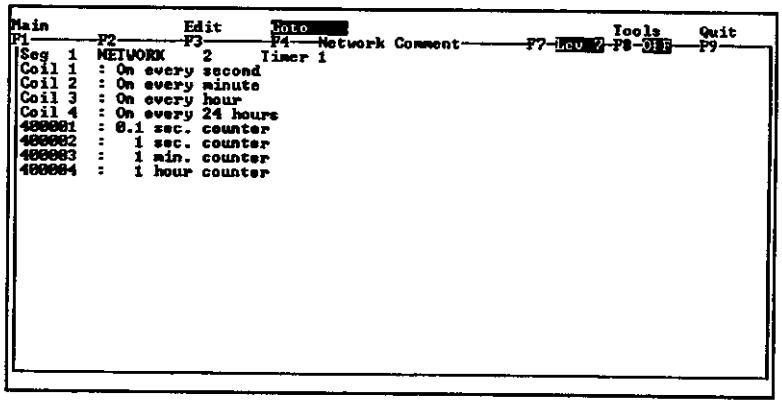
The Moving Control operation moves to the adjacent networks, the first or last network within the segment, or another segment. The following keys can be used when the cursor is positioned on the Network Comment Screen.

PgUp			Moves to the previous network.
PgDn			Moves to the next network.
CTRL	+	HOME	Moves to the first network within the segment.
CTRL	+	END	Moves to the last network within the segment.
CTRL	+	PgUp	Moves to the previous segment.
CTRL	+	PgDn	Moves to the next segment.

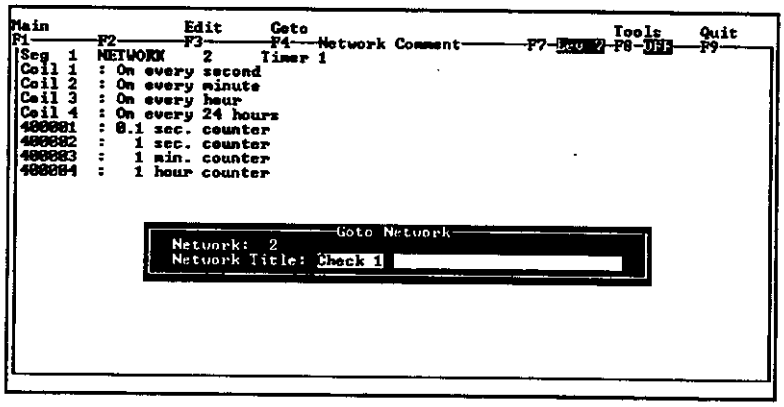
To move to another segment or networks other than the adjacent networks, use the Goto Menu. Specify a network number or a network title as the destination. The following example shows how to specify a network title as the destination.

1) Switch to the menu cursor using the Tab Key.

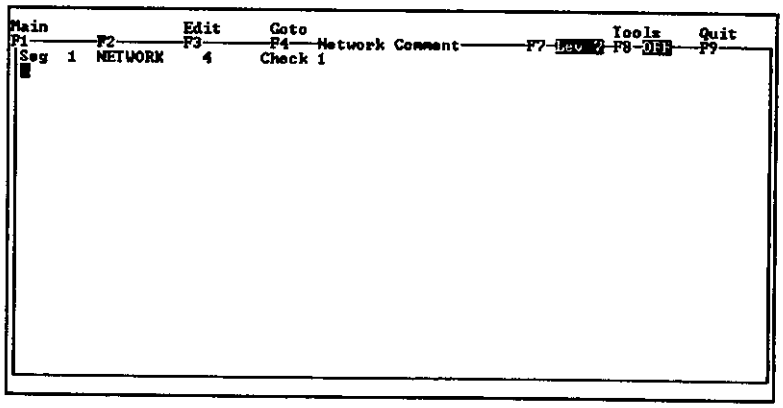
2) Select **Goto** from the Network Comment Screen Menu using the Cursor Keys and press the Enter Key.



3) The Goto window will be displayed. Move the cursor to the network title field using the Cursor Keys. Then, enter the network title of the destination network (**Check 1** in this example) and press the Enter Key.



The Network Comment Screen corresponding to the entered network title will be displayed.



10.4 Editing Segment Titles and Comments

This section describes the basic procedures for editing segment titles and comments.

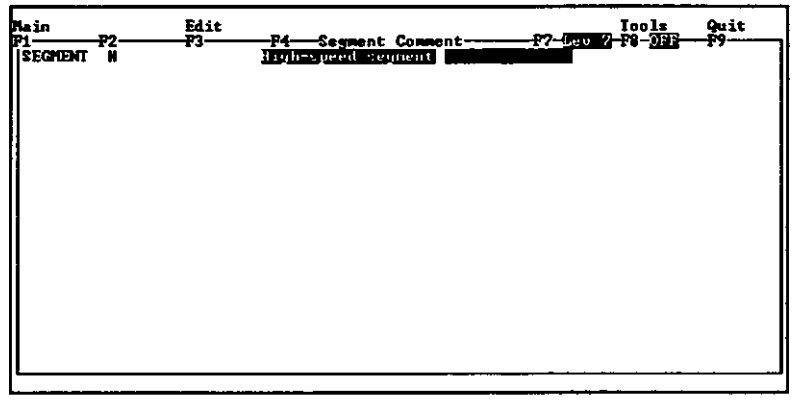
10.4.1 Overview

Up to 32 characters can be entered for a segment title. Up to 78 characters per line and up to 20 lines can be entered for a segment comment.

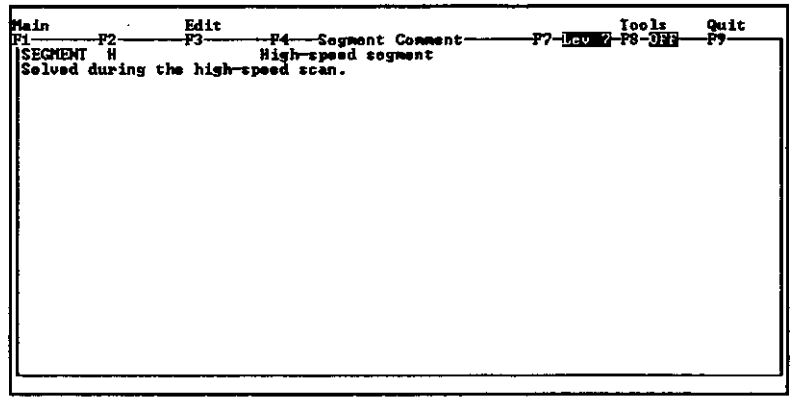
The following example shows how to enter a segment title and comment.

1) Display the Segment Comment Screen.

2) Enter the segment title and press the Enter Key.



3) The cursor will move to the segment comment field. Enter the segment comment.



4) Press the Esc Key to exit the Segment Comment Screen.

To edit other Segment comments, move to another Segment Comment Screen referring section *10.4.3* for details on the Goto operation.

10.4.2 Edit

1. Copy

The Copy operation stores the segment comments specified with the cursor. The stored data can be copied to another position or another segment comment by using the Paste operation.

2. Delete

The Delete operation deletes the segment comments specified by the cursor, and simultaneously stores these comments. Therefore, the stored data can be moved to another position or another segment comment by using the Paste operation.

3. Paste

The Paste operation inserts the comment data stored by the Copy or Delete operation at the cursor position. There is only one buffer, however, where data stored using the Copy or Delete operations is held. Therefore, when the Paste operation is used, the most recent data which has been copied or deleted will be inserted at the specified position.

The three operations described above follow the same procedure as for the Network Comment operation, so see section *10.3.2 Edit* for details.

10.4.3 Moving Control

1) The Moving Control operation moves to the adjacent segments. The following keys can be used when the cursor is positioned on the Segment Comment Screen.

CTRL	+	PgUp	Moves to the previous segment.
CTRL	+	PgDn	Moves to the next segment.

2) It is only possible to move to adjoining segments.

Manipulating Reference Data

11

This chapter describes how to display and edit reference data.

11.1 Reference Data Screen

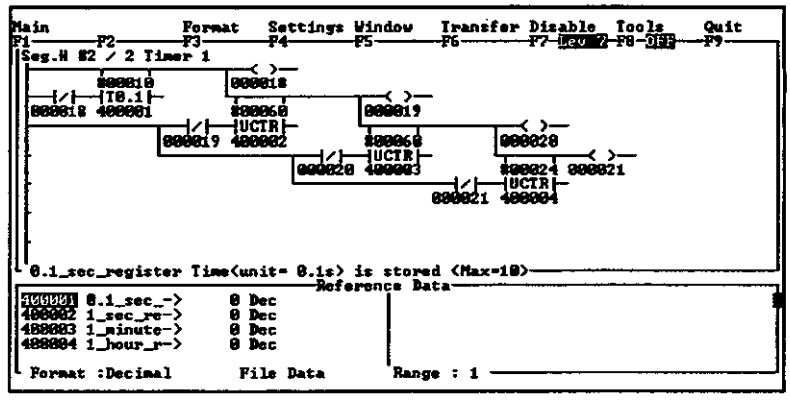
This section describes an overview of reference data edit operations including the reference data screen Configuration and basic operations.

11.1.1 Screen Configuration

Reference data can be displayed in the following two ways.

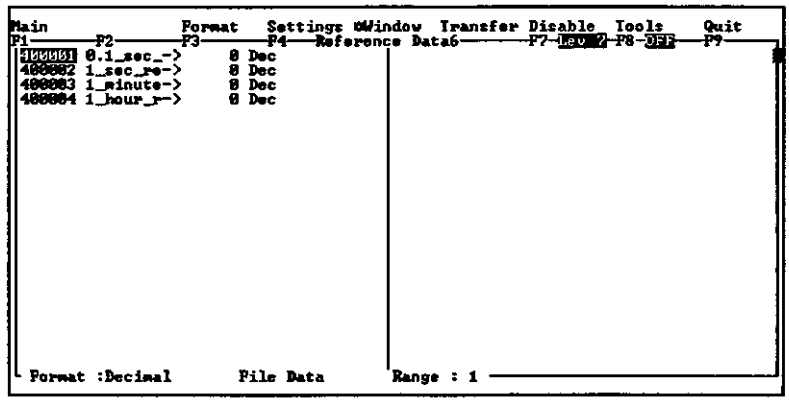
1. Displaying Both Reference Data and Ladder Program

Reference data is automatically displayed by selecting **Ladder** from the Edit Submenu under the Segment Status Display Menu. Move the cursor to the reference data field using the Cursor Keys. Then, edit the reference data.



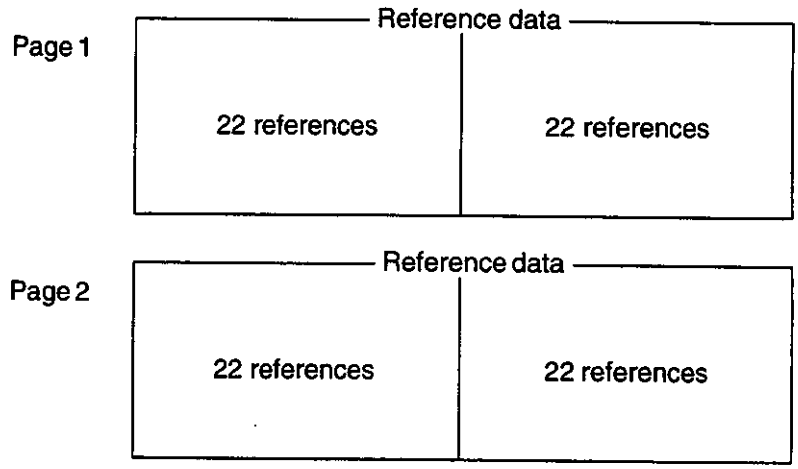
2. Displaying Reference Data Only

Reference data is displayed by selecting **Ref Data** from the Main Menu. It can also be displayed by switching the windows as described in section *11.2.3*.



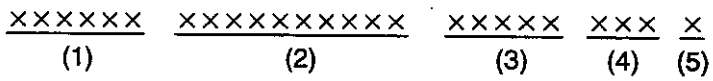
• **Screen Configuration**

The screen for displaying reference data alone consists of two pages as illustrated below. A total of 88 references can be displayed. When reference data is displayed together with the ladder program, however, only 10 references can be displayed.



• **Reference Data Display**

Reference data will be displayed as shown below.



(1) Reference number

(2) Symbol

(3) Reference data (data length varies according to the format)

(4) Format (decimal, hexadecimal, etc.)

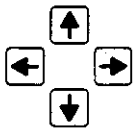
(5) E: Enabled, D: Disabled
(Displayed only for coils and relays)

The reference symbol field can contain up to 10 characters. Therefore, if the symbol length exceeds 10 characters, only the first 10 characters will be displayed. In this case, the symbols are displayed as shown below.

```
400001   ABCDEFGH->   1000  Dec
```

11.1.2 Basic Operations

This section describes basic key operations in the reference data field.



Move the cursor up, down, to the left, and to the right.

PgDn

Moves the cursor from page 1 to page 2. This key is invalid when the cursor is positioned on page 2.

PgUp

Moves the cursor from page 2 to page 1. This key is invalid when the cursor is positioned on page 1.

HOME

Moves the cursor to the top left of page 1.

END

Moves the cursor to the bottom right of page 2.

DEL

Deletes the line on which the cursor is positioned.

Displays the most recently entered or displayed reference number. This is useful when you want to display the same reference data in different formats.

+

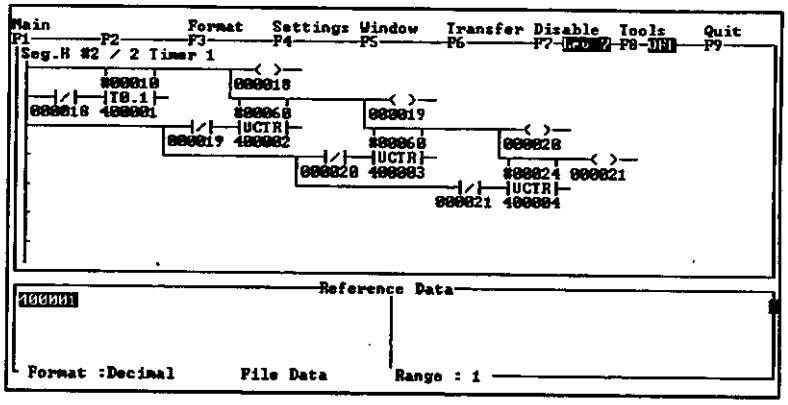
- Displays the next reference number, symbol, and reference data when the cursor is positioned in a reference number field.
- Displays the reference number, symbol, and reference data just after the most recently entered or displayed reference number when the cursor is positioned on a blank line.

−

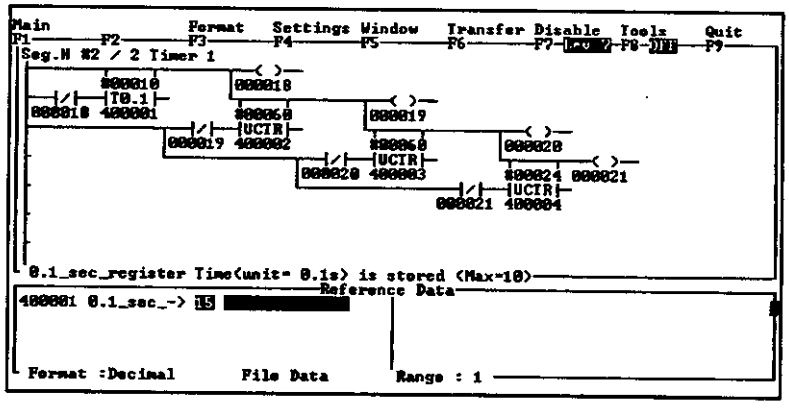
- Displays the previous reference number, symbol, and reference data when the cursor is positioned in a reference number field.
- Displays the reference number, symbol, and reference data just before the most recently entered or displayed reference number when the cursor is positioned on a blank line.

The following example shows how to display and change register data.

1) Enter **400001** as a reference number and press the Enter Key.

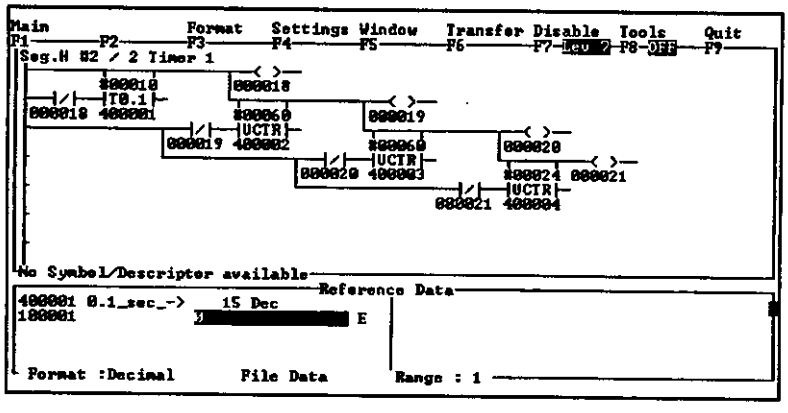


2) The symbol and register data will be displayed, and the cursor will automatically move to the register data field. Enter the new data and press the Enter Key.



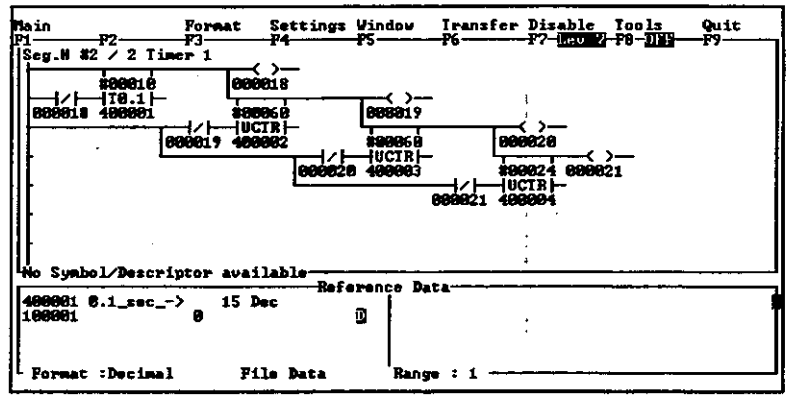
The following example shows how to forcibly turn the input relay ON or OFF.

1) Enter **100001** and press the Enter Key to display the input relay data.

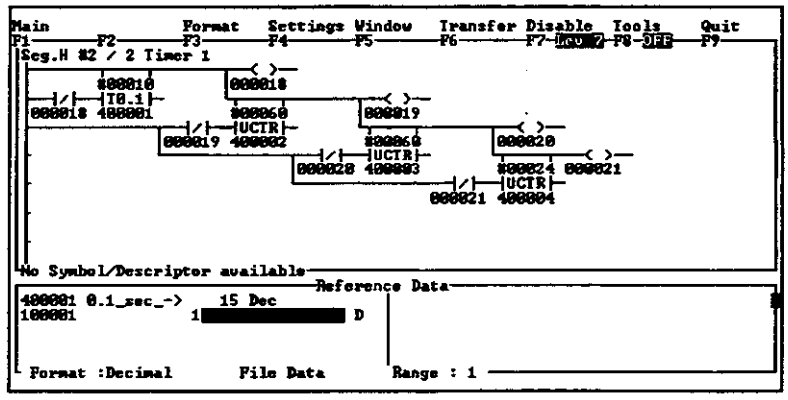


2) Move the cursor to the enabled/disabled status field using the Cursor Keys.

3) Enter **D** and press the Enter Key to switch to disabled status.



4) The cursor will automatically move to the data field. The current setting is 0 (= OFF), so enter **1** (= ON) and press the Enter Key.



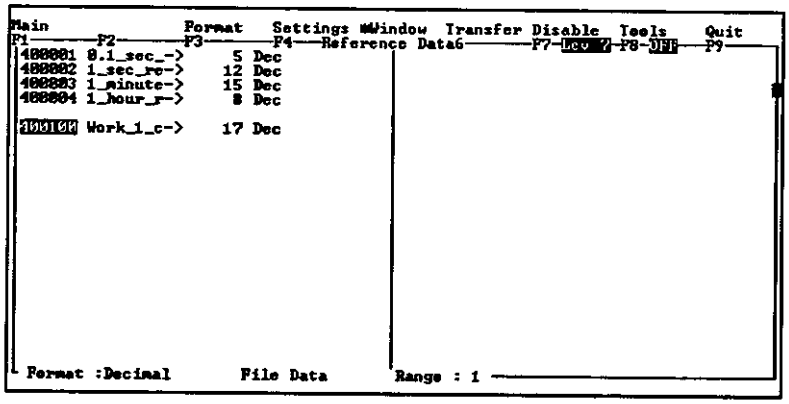
Note If an input relay or coil is set to disabled status in Online or Debug Mode, always return it to enabled status. If the program is run while the input relay or coil is in disabled status, the program will not monitor properly.

The following example shows how to display consecutive reference data starting with the specified reference number. In this example, move the cursor to reference number 400100 and press the + Key to specify the consecutive reference data to be displayed. If the most recently displayed reference number is 400100, pressing the + Key with the cursor positioned in a blank line has the same effect as the above operation. Pressing the – Key displays the previous reference data.

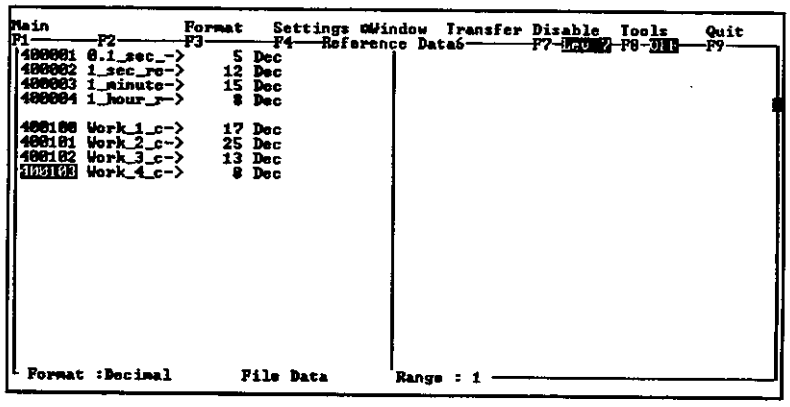
If the number of consecutive references to be displayed is already known, the Range Menu described in section *11.2 Edit* is useful.

1) Move the cursor to the beginning of the consecutive reference numbers to be displayed (**400100** in this example).

2) Press the + Key by the number of consecutive reference numbers to be displayed. In this example, press the + Key three times.



The consecutive references starting with reference number 400100 will be displayed.



11.2 Edit

This section describes how to edit reference data such as switching the reference data display format and using the Disable operation.

11.2.1 Switching the Reference Data Display Format

MEMOSOFT can display reference data in different formats as shown below.

1. Decimal Format

Register data is displayed in decimal between 0 and 65535. Signed data may not be displayed properly. Use this display format for calculation data for instructions like ADD or SUB.

2. Signed Decimal Format

• Two's Complement Format

Signed data stored in two's complement format is displayed in decimal between –32768 and 32767. Unsigned data or signed data in conventional format may not be displayed properly. Use this display format for calculation data for instructions like AD16 or SU16.

• Conventional Format

Signed data stored in conventional format is displayed in decimal between –9999 and 9999. Unsigned data or signed data in two's complement format may not be displayed properly. Use this display format for data for instructions like SADD or SSUB.

3. Double-length Decimal Format

• Consecutive Register Format

Data from two consecutive registers is displayed as double-length decimal data. The display range is between 0 and 4294967295. Data that is not used as double-length data may not be displayed properly. Use this display format for unsigned calculation data for instructions like AD32 or SU32.

• **Conventional Format**

Data stored in two consecutive registers in conventional format is displayed as double-length decimal data. The display range is between 0 and 99999999. Data that is not stored as double-length data in conventional format may not be displayed properly. Use this display format for calculation data for instructions like DADD or DSUB.

4. Signed Double-length Decimal Format

• **Two's Complement Format**

Data stored in two consecutive register is displayed as signed double-length decimal data in two's complement format. The display range is between –2147483648 and 2147483647. Data that is not used as signed double-length data may not be displayed properly. Use this display format for signed calculation data for instructions like AD32 or SU32.

• **Conventional Format**

Data stored in two consecutive registers in conventional format is displayed as signed double-length decimal data. The display range is between –99999999 and 99999999. Data that is not stored as signed double-length data in conventional format may not be displayed properly. Use this display format for calculation data for instructions like SMUL.

5. Hexadecimal Format

Register data is displayed in hexadecimal between 0 and FFFF.

6. Binary Format

Register data is displayed in binary between 0 and 1111111111111111.

7. ASCII Format

Register data is displayed as ASCII characters.

8. Matrix Format

The ON/OFF status of coils or input relays is displayed in consecutive 16-point units. This format is for display only and does not allow editing.

9. Floating-point Format

• Two consecutive register data is displayed as floating-point data. For precision, the number of significant digits is seven, and the exponent is between –38 and 38. For example, 0.000123 is displayed as 1.23E-04. Floating-point data uses two registers.

- Floating-point data will not be properly displayed if other formats are used. Use this display format for the EMTH instruction only.
- Floating-point data display is displayed when the lower-order register of the reference numbers is specified.
- Rounding errors will occur in the display.

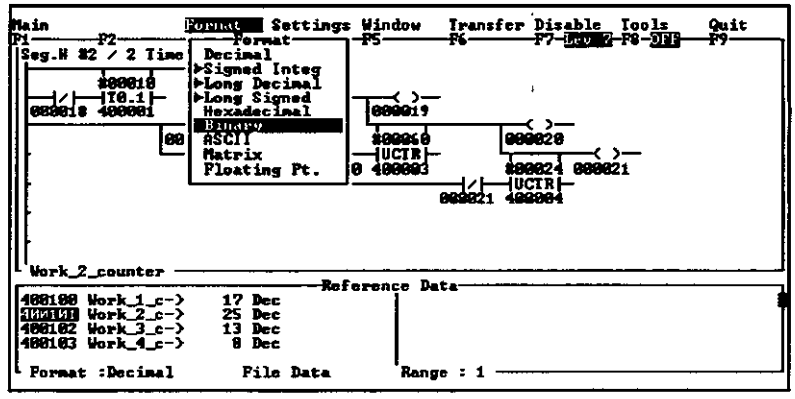
• Switching the Display Format

The following example shows how to switch a decimal display format to a binary display format.

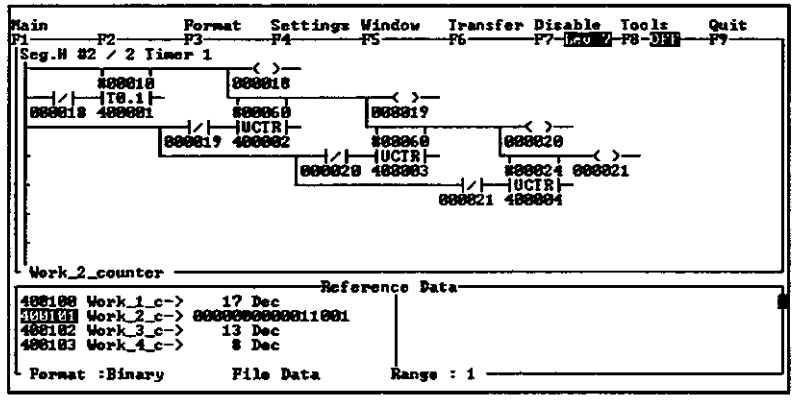
1) Move the cursor to the reference number or reference data for which the display format is to be changed using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Binary** from the Format Menu using the Cursor Keys and press the Enter Key.



The reference data at the cursor position will be switched to binary display format.



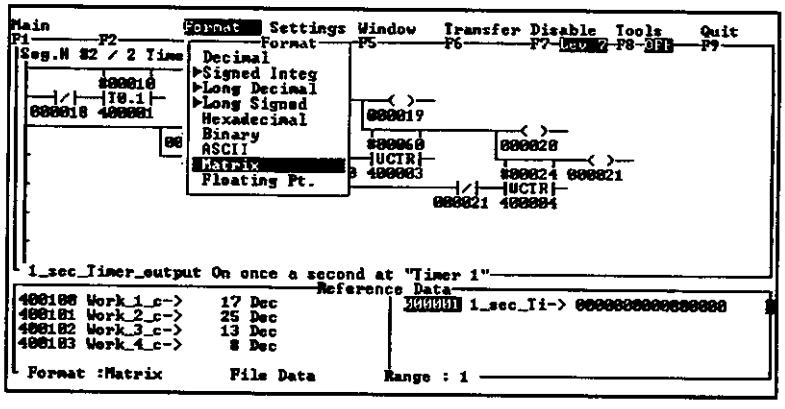
• Matrix Display

The following example shows how to display a coil in matrix format.

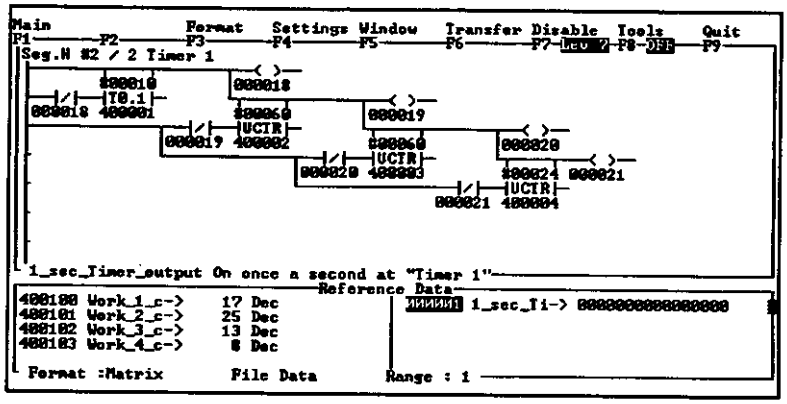
1) Move the cursor to the reference number of the coil for which the display format is to be changed using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

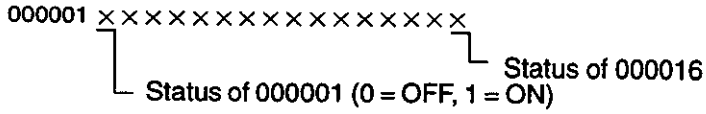
3) Select **Matrix** from the Format Menu using the Cursor Keys and press the Enter Key.



The ON/OFF status of 16 coils will be displayed.



Displayed data is shown as follows:



In this matrix display, data is displayed in 16 points at a time, so the starting number is 16n + 1 (n = 0, 1, 2, ...). If, for example, coil 000020 is switched to matrix display format, the reference number is automatically changed to 000017, and the displayed data is from 000017 to 000032.

• Entering Floating-point Data

The following example shows how to enter floating-point data. Floating-point data is stored in the 754 standard format stipulated by the Institute of Electrical and Electronics Engineers (IEEE). There are two input methods available for this format.

• Direct Data Input

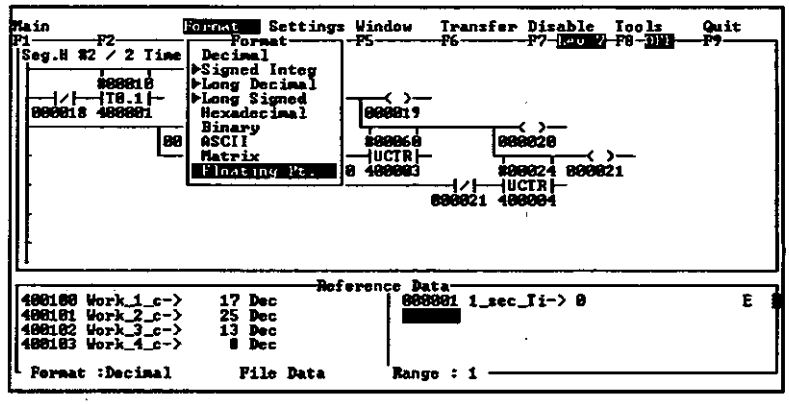
Numerical values are entered directly. However, only 16 digits can be entered.
Example: 0.0000123

• Data Input in Display Format

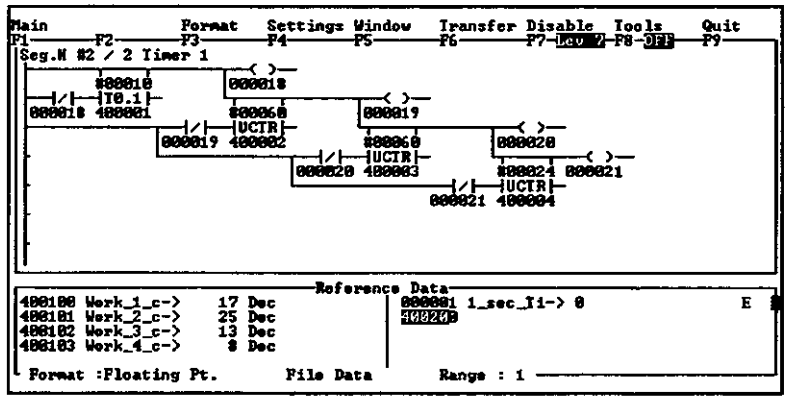
Numerical values are entered in floating-point format.
Example: 1.23E-5

1) Switch to the menu cursor using the Tab Key.

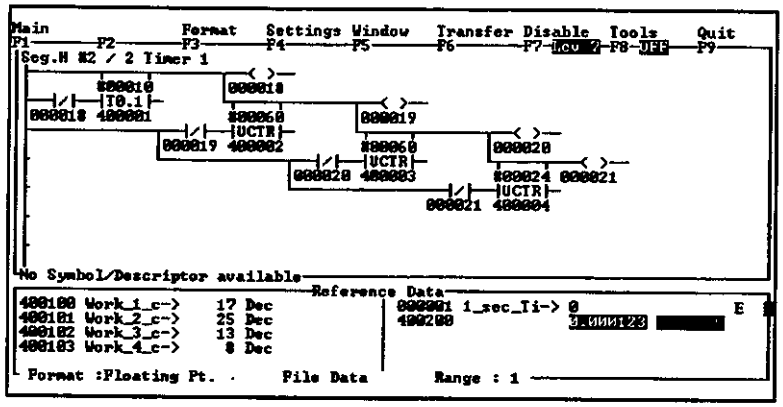
2) Select **Floating Pt.** from the Format Menu using the Cursor Keys and press the Enter Key.



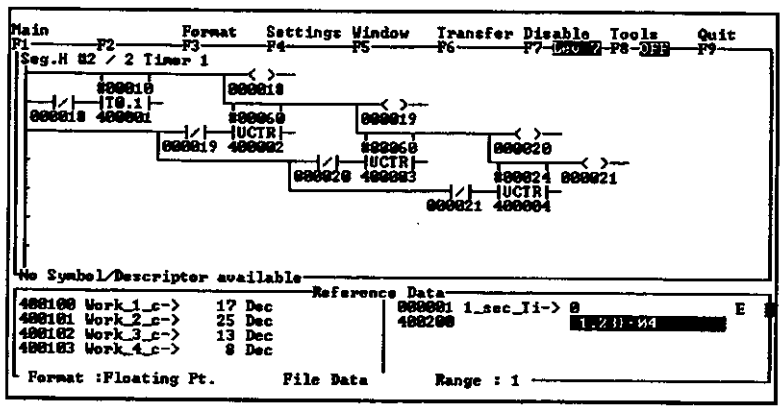
3) Enter **400200** as the reference number and press the Enter Key.



4) Enter **0.000123** as the numerical value and press the Enter Key.



The numerical value will be displayed in floating-point format.

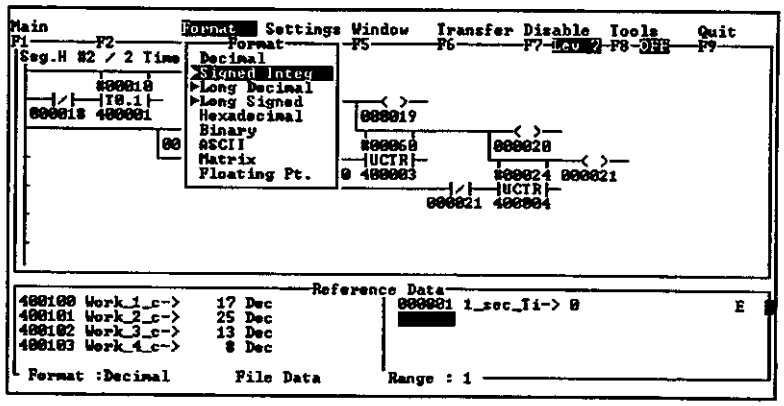


• Entering Signed Decimal Data

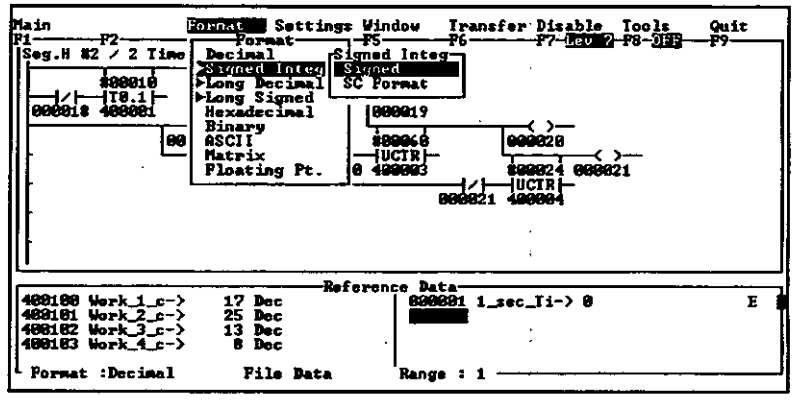
The following example shows how to enter signed decimal data in two's complement format.

1) Switch to the menu cursor using the Tab Key.

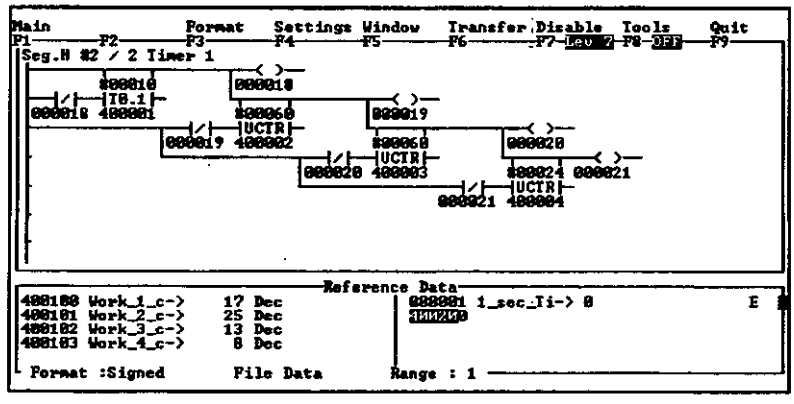
2) Select **Signed Integ** from the Format Menu using the Cursor Keys and press the Enter Key.



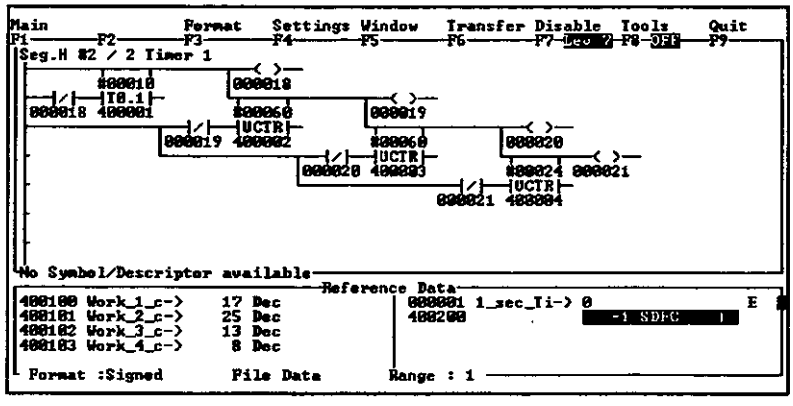
3) A submenu will be displayed. Select **Signed** from the submenu using the Down Cursor Key and press the Enter Key.



4) Enter **400200** as the reference number and press the Enter Key.



5) Enter **–1** as the numerical value and press the Enter Key.



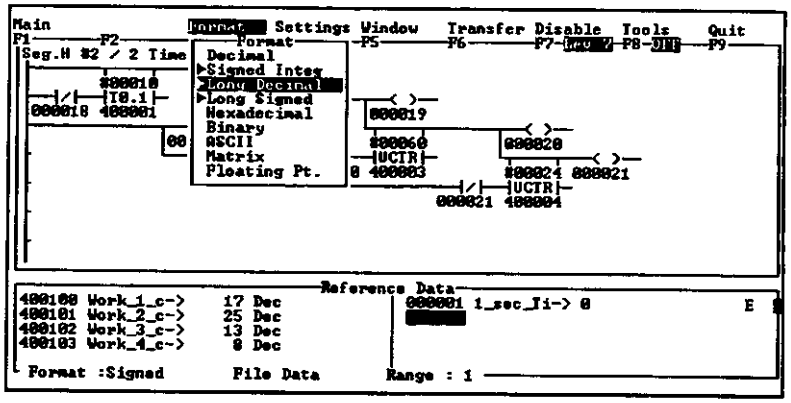
If the entered data is switched to hexadecimal format, "FFFF" will be displayed.

- **Entering Double-length Decimal Data**

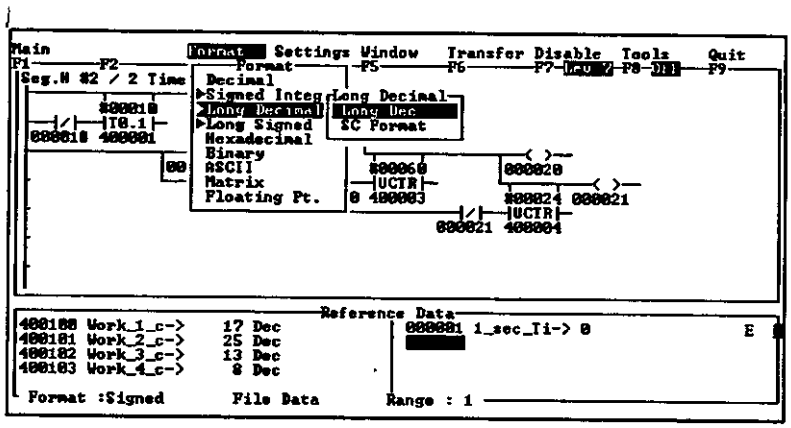
The following example shows how to enter double-length decimal data in consecutive registers.

1) Switch to the menu cursor using the Tab Key.

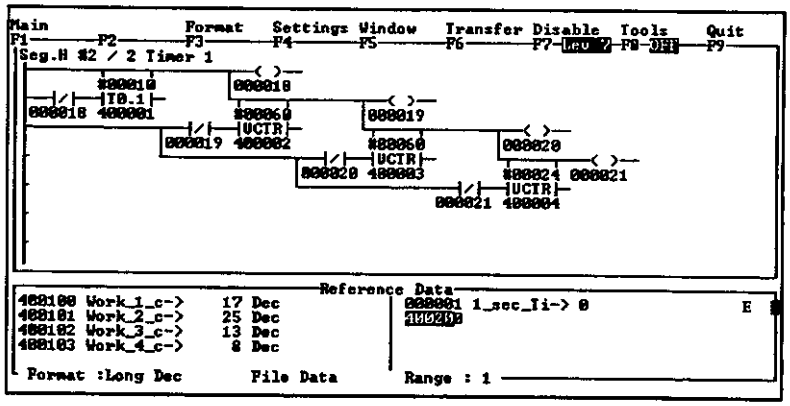
2) Select **Long Decimal** from the Format Menu using the Cursor Keys and press the Enter Key.



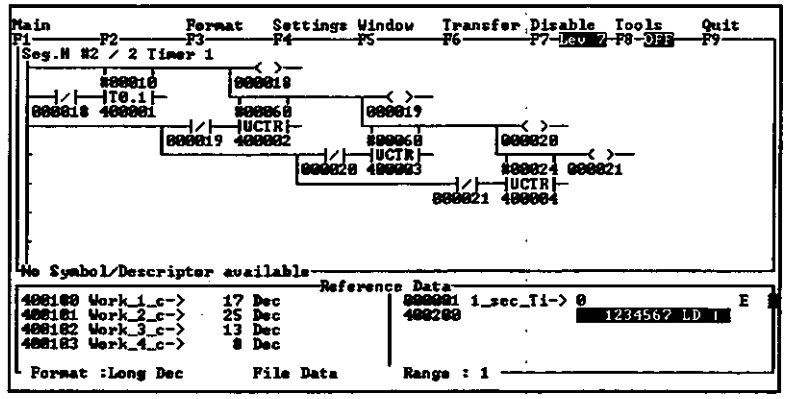
3) A submenu will be displayed. Select **Long Dec** from the submenu using the Down Cursor Key and press the Enter Key.



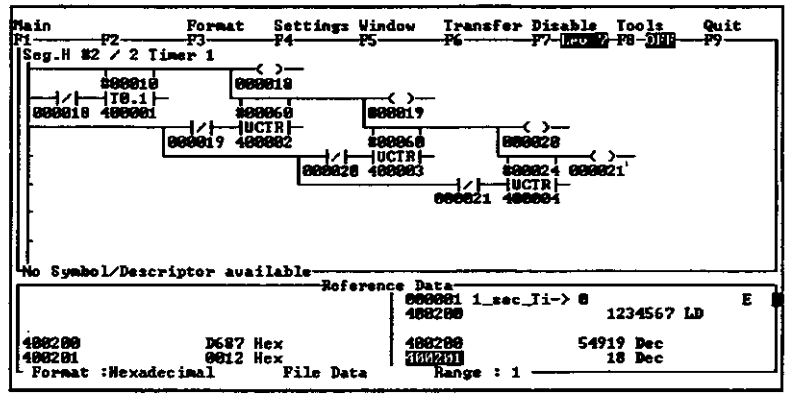
4) Enter **400200** as the reference number and press the Enter Key.



5) Enter **1234567** as the numerical value and press the Enter Key.



If the entered data is split into reference numbers 400200 and 400201, and each reference is displayed in both hexadecimal and decimal formats, the data will be displayed as shown below.



The entered data (**1234567**) is represented as **12D687** in hexadecimal format. The last four-digit part, **D687**, is entered in reference number 400200, and **0012** is entered in reference number 400201. In decimal format, **D687** and **0012** are represented as **54919** and **18**, respectively.

INFO

1) The current format is displayed at the bottom of the screen. Switching the format stores the new format in the memory. The next time the reference data is displayed by entering the reference number, it will be displayed in the new format.

2) If the format is switched before entering a reference number to display reference data, the same result will occur as above.

11.2.2 Settings

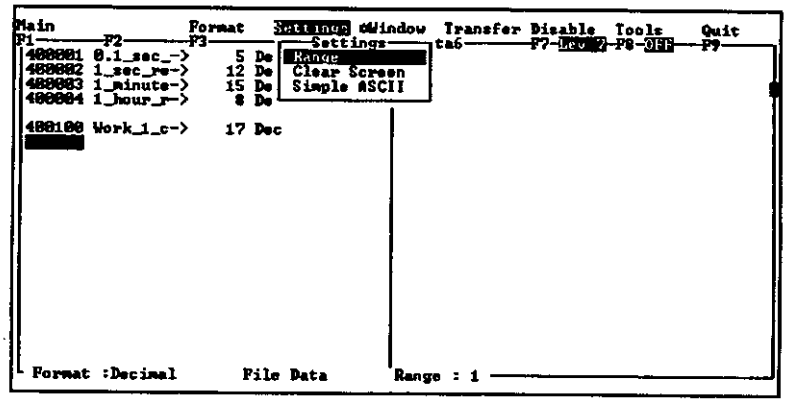
1. Range

The Range operation specifies the number of consecutive reference data to be displayed when a reference number is entered. If, for example, 10 is specified as the number of consec-

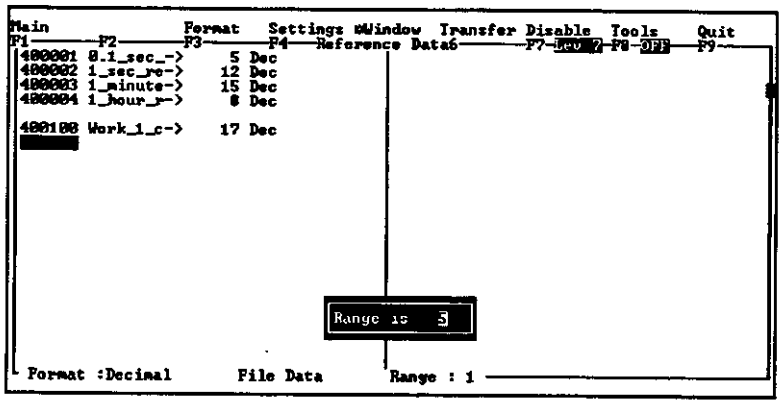
utive data to be displayed and **400001** is entered as a reference number, reference data 400001 to 400010 will be displayed.

1) Switch to the menu cursor using the Tab Key.

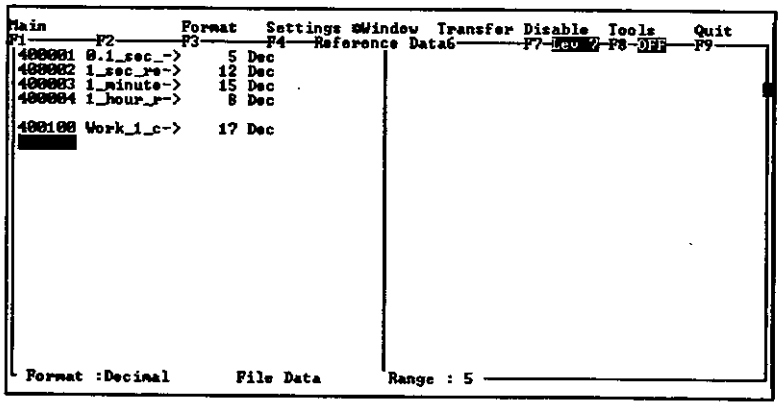
2) Select **Range** from the Settings Menu using the Cursor Keys and press the Enter Key.



3) The range setting window will be displayed. Enter the range (**5** in this example) and press the Enter Key.



The range displayed at the bottom of the screen will switch to 5. From now on, each time a reference number is entered, consecutive five references starting with the reference number will be simultaneously displayed.

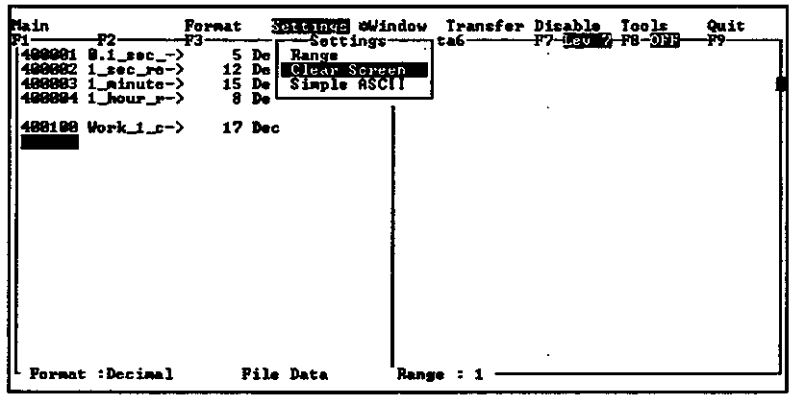


2. Clear Screen

The Clear Screen operation clears the Reference Data Screen.

1) Switch to the menu cursor using the Tab Key.

2) Select **Clear Screen** from the Settings Menu using the Cursor Keys and press the Enter Key.



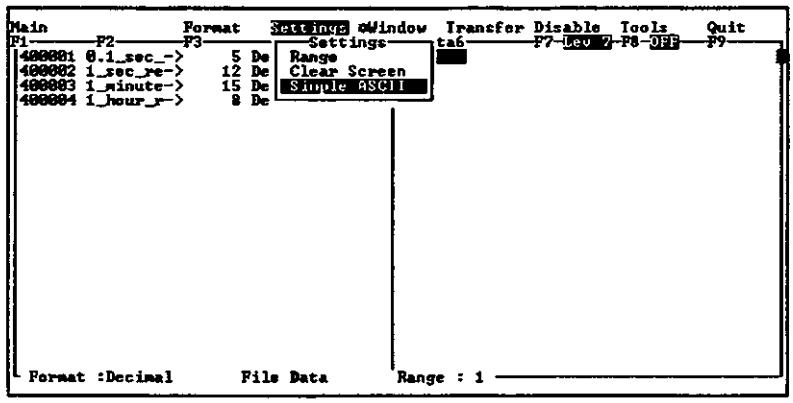
The Reference Data Screen will be cleared.

3. ASCII

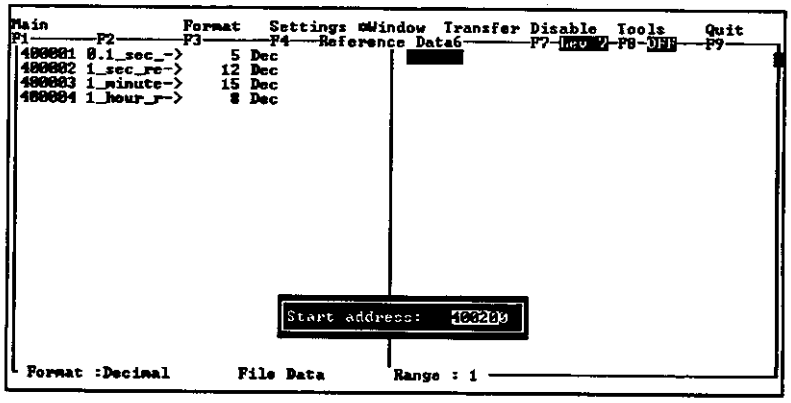
The ASCII operation stores up to 62 ASCII characters in the specified references. The total number of ASCII characters is stored in the starting reference, and the actual ASCII characters are stored in the references following the specified (starting) reference number.

1) Switch to the menu cursor using the Tab Key.

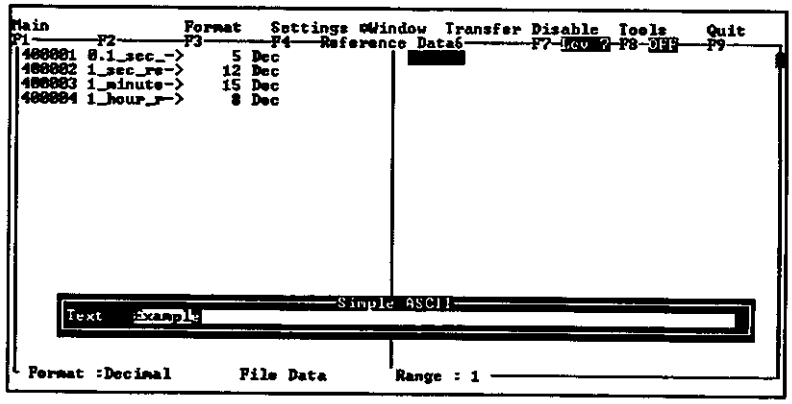
2) Select **Simple ASCII** from the Settings Menu using the Cursor Keys and press the Enter Key.



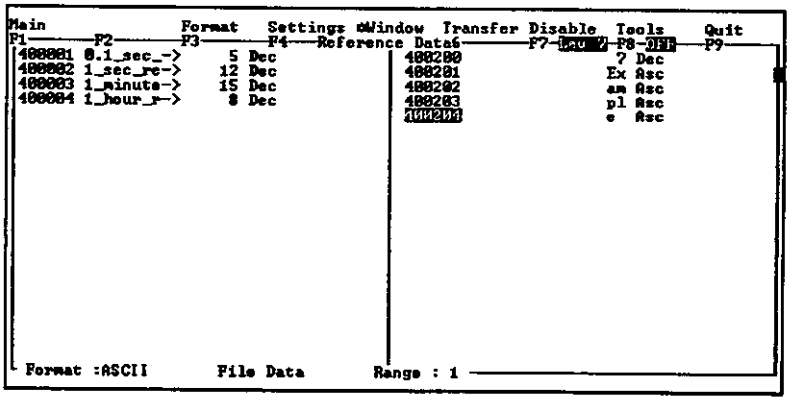
3) The window for setting the starting reference number will be displayed. Enter **400200** as the starting reference number and press the Enter Key.



4) The window for entering ASCII character strings will be displayed. Enter up to 62 characters and press the Enter Key.



The contents of the consecutive registers starting with 400200 will be shown below.



INFO

1) If an odd number of ASCII characters are entered, a space (code: 20h) will be inserted in the lower digit of the last register.

2) The Enter Key is used to confirm data entry, so a return code (CR or LF) cannot be entered in a reference. If a return code is to be entered, change the format to hexadecimal format and enter 0Dh or 0Ah.

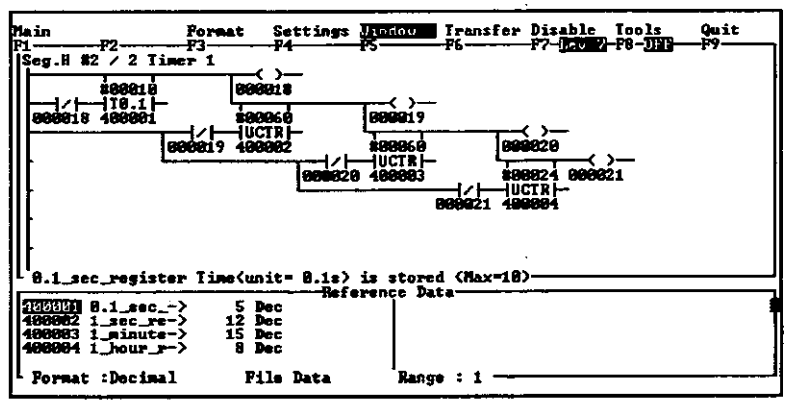
11.2.3 Switching Windows

The Window operation switches the screen between Single Display Mode and Simultaneous Display Mode. In Single Display Mode, only reference data is displayed. In Simultaneous Display Mode, reference data is displayed together with the ladder program.

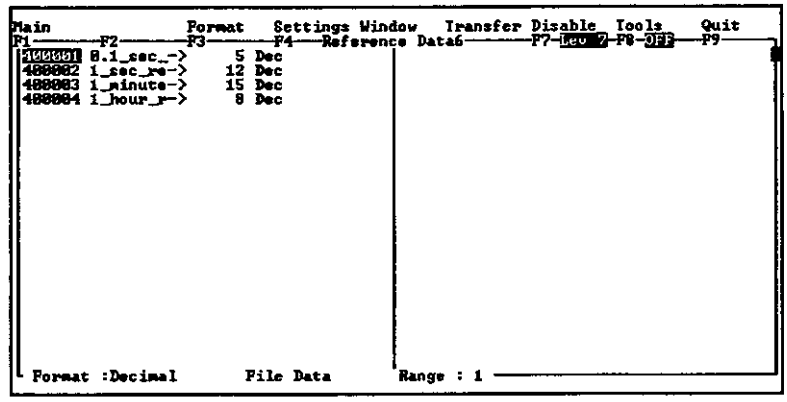
The following example shows how to switch Simultaneous Display Mode to Single Display Mode.

1) Switch to the menu cursor using the Tab Key.

2) Select **Window** using the Cursor Keys and press the Enter Key.



The screen will switch to display reference data only.



11.2.4 File Transfer

1. Reference Data

The Reference Data operation stores reference numbers and reference data as text files and reads text files as reference data. The text file format is as follows:

```
100001   0          E
400001   3
400101   25976
XXXXXX   XXXXX    X
```

Enabled/disabled status display

Reference data (decimal)

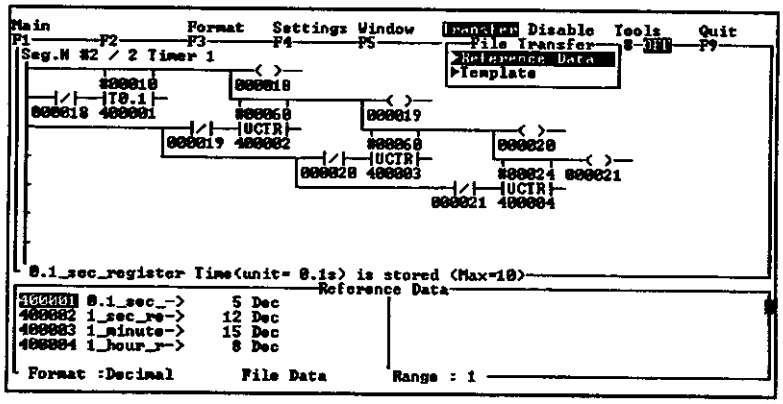
Reference number

Reference data is stored in columns starting with column 8, and the data format is decimal. If the reference is a coil or relay, enabled/disabled status is stored in column 14.

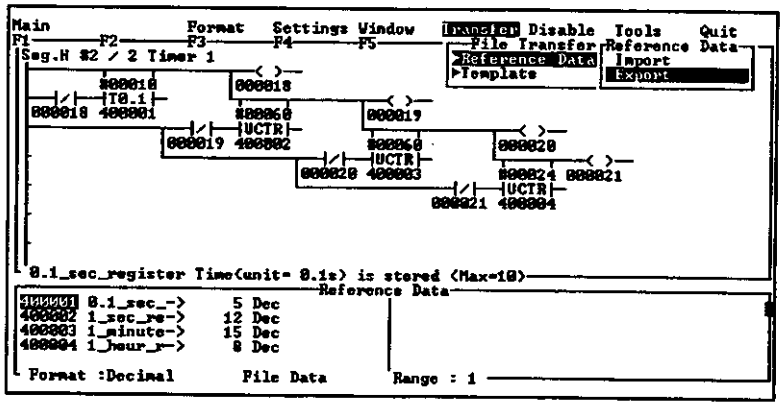
- **Exporting**

1) Switch to the menu cursor using the Tab Key.

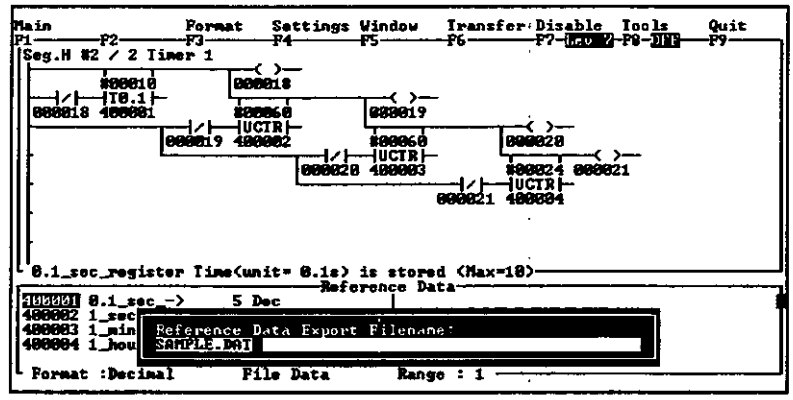
2) Select **Reference Data** from the Transfer Menu using the Cursor Keys and press the Enter Key.



3) A submenu will be displayed. Select **Export** from the submenu using the Down Cursor Key and press the Enter Key.



4) The window for entering a file name will be displayed. Specify a file name and press the Enter Key.

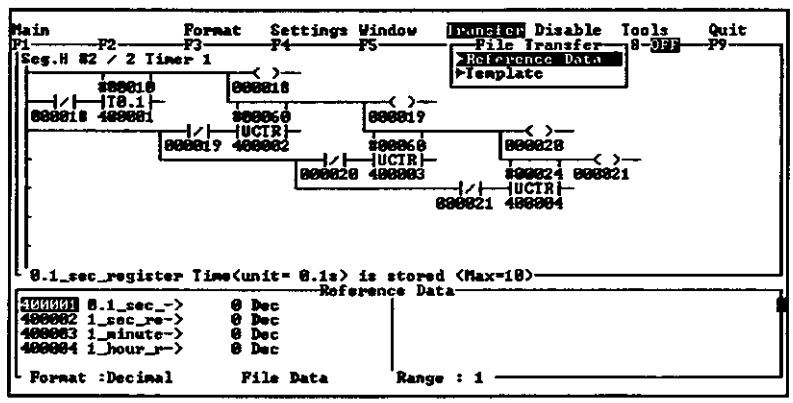


The reference data will be exported to the specified file.

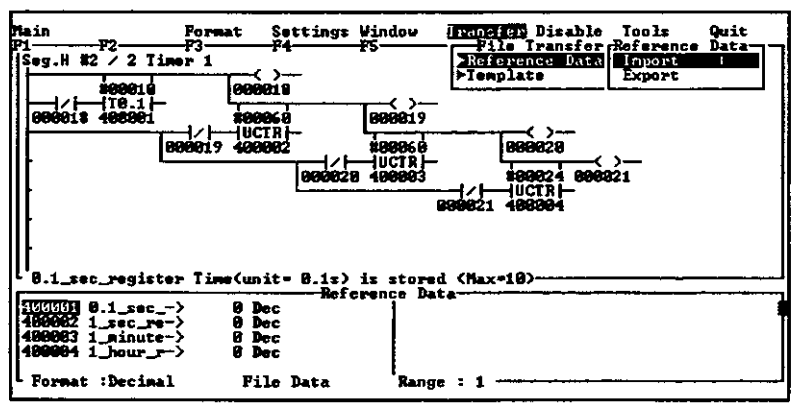
- **Importing**

1) Switch to the menu cursor using the Tab Key.

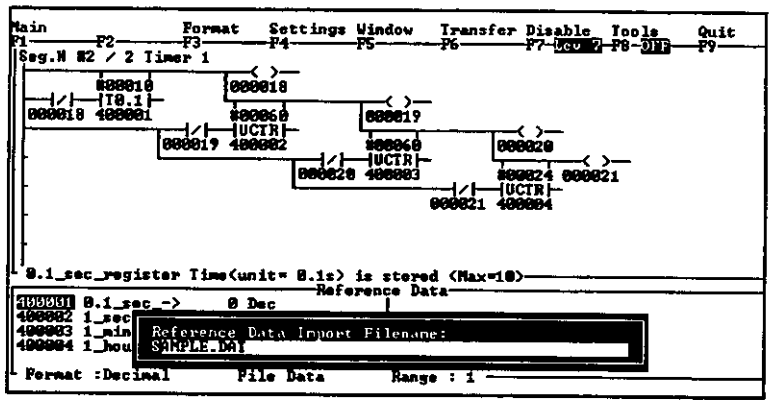
2) Select **Reference Data** from the Transfer Menu using the Cursor Keys and press the Enter Key.



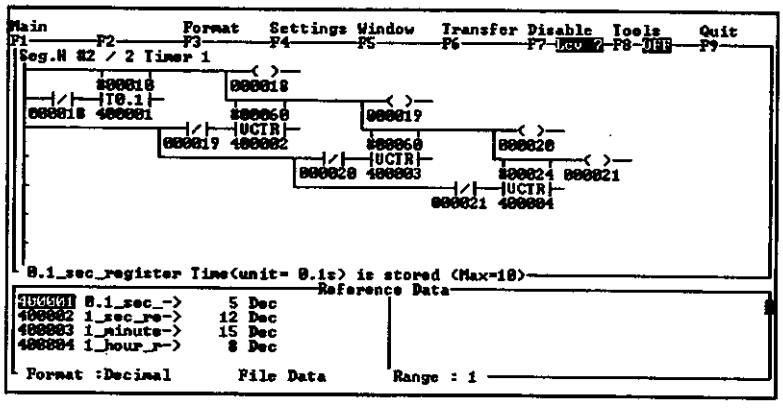
3) A submenu will be displayed. Select **Import** from the submenu and press the Enter Key.



4) The window for entering a file name will be displayed. Specify a file name and press the Enter Key.



The imported data will overwrite the reference data.



INFO

1) The Import operation only reads file data and does not display the reference numbers and reference data contained in the file. Therefore, to view the data, be sure to display the references. Alternatively, the references can be stored and displayed in the template.

2) Unless the drive and directory names are specified, file data is imported to or exported from directory \FMSGL.

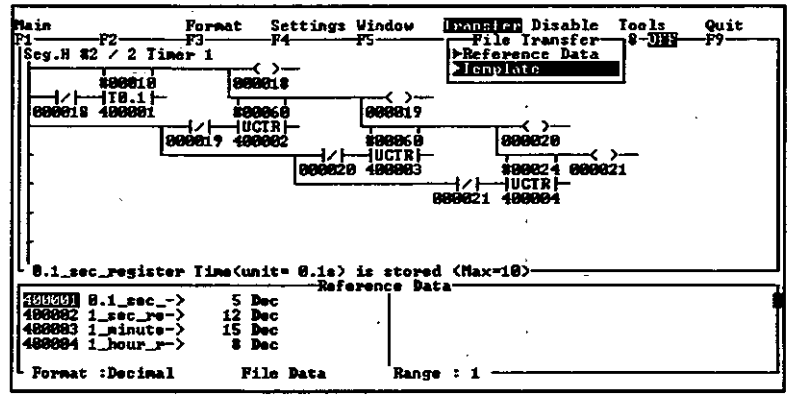
2. Template

The Template operation stores reference numbers and their display formats as a template in a specified file. It cannot store reference data. This operation allows the desired reference data to be instantly displayed simply by importing the stored template during online operation.

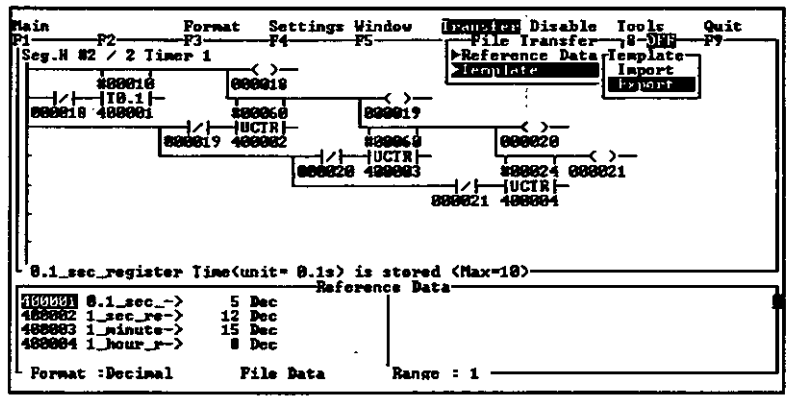
• Exporting

1) Switch to the menu cursor using the Tab Key.

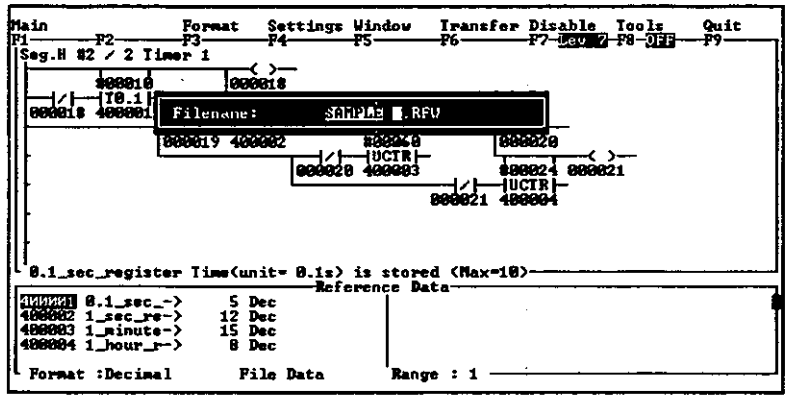
2) Select **Template** from the Transfer Menu using the Cursor Keys and press the Enter Key.



3) A submenu will be displayed. Select **Export** from the submenu using the Cursor Keys and press the Enter Key.



4) The window for entering a file name will be displayed. Specify a file name and press the Enter Key.

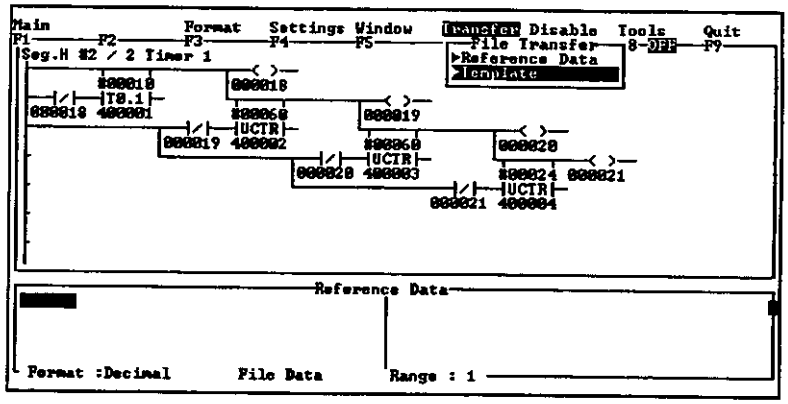


The template information will be written to the specified file.

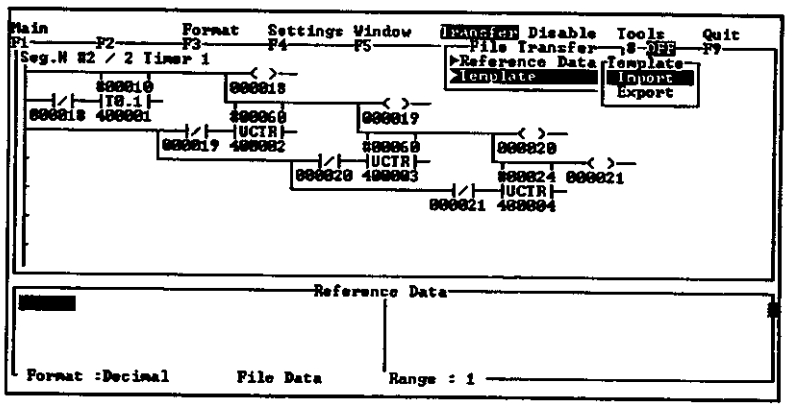
- **Importing**

1) Switch to the menu cursor using the Tab Key.

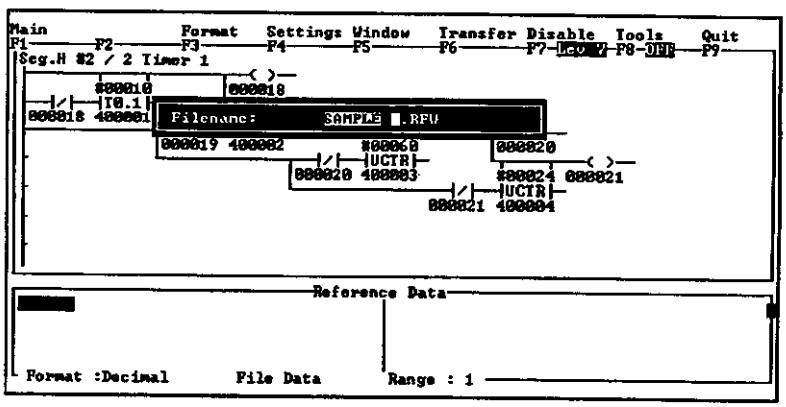
2) Select **Template** from the Transfer Menu using the Cursor Keys and press the Enter Key.



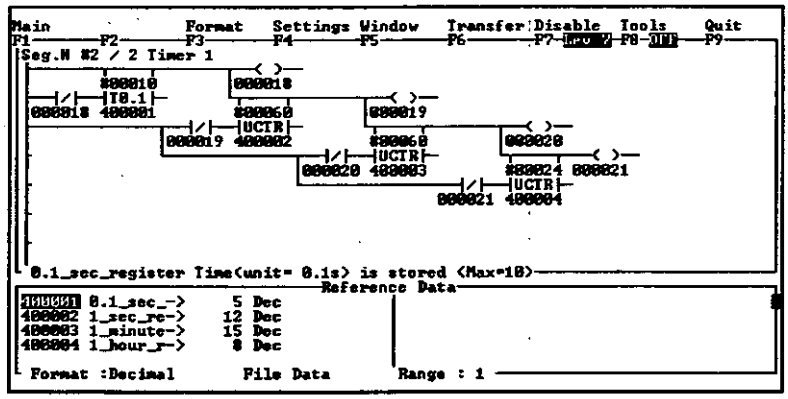
3) A submenu will be displayed. Select **Import** from the submenu and press the Enter Key.



4) The window for entering a file name will be displayed. Specify a file name and press the Enter Key.



The template will be imported, and the current reference data will be displayed in the stored format.



INFO

1) If **?** is entered in the window for entering a file name, a list of currently stored template files will be displayed. A file can be selected by moving the cursor to the file and pressing the Enter Key.

2) \FMSGL\PROGRAMS is the default directory when template files are imported or exported. If a directory other than \FMSGL\PROGRAMS is to be specified as the default, select **Location of Program Name** from the File Menu and change the directory.

3. Debug Mode

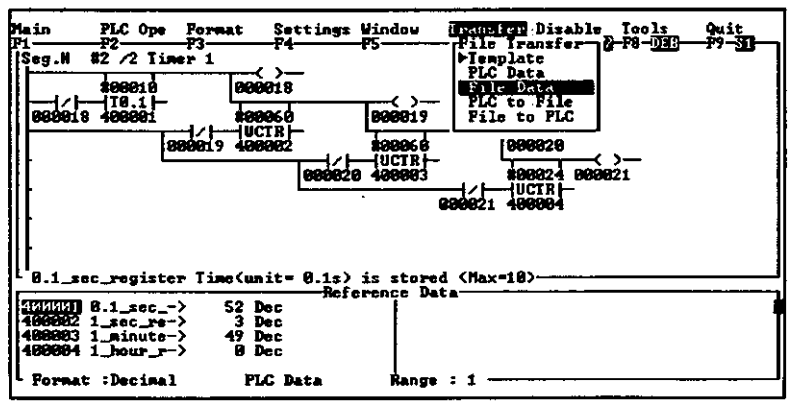
In Debug Mode, it is possible to choose between displaying data from the PLC or data which has been stored in a file. Reference data which is displayed can also be transferred to the personal computer and filed, or filed reference data can be transferred to the PLC.

• Switching Display Data

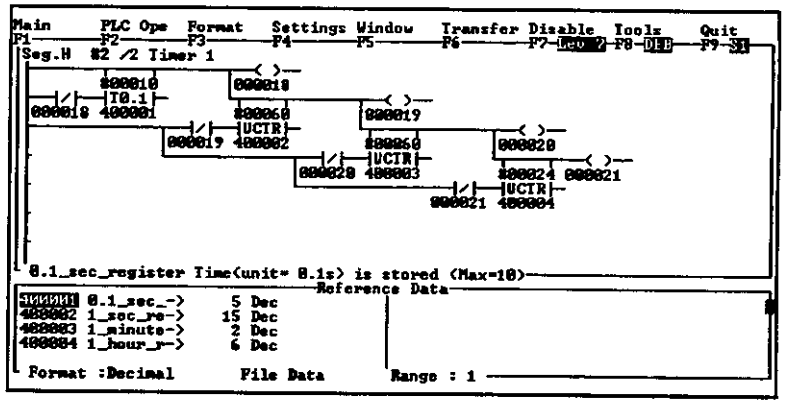
Following is an example showing the procedure used to switch the reference data displayed on the screen from PLC data to data saved in a file.

1) Switch to the menu cursor using the Tab Key.

2) Select **File Data** from the Transfer Menu using the Cursor Keys and press the Enter Key.



The display data will switch to file data.



To switch the display data to PLC data, follow the same procedure described above, but select **PLC Data** from the Transfer Menu.

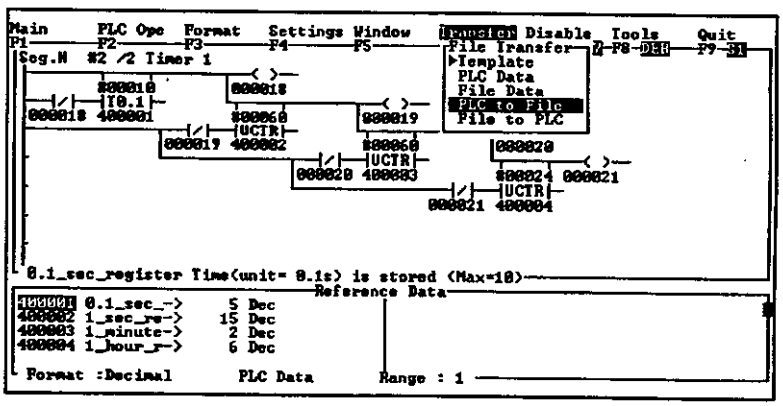
INFO The type of reference data currently being displayed will be indicated on the last line at the bottom of the screen as either PLC data or file data.

• Transferring Files

Following is an example showing the procedure used to transfer the reference data displayed on the screen to the personal computer and save it in a file.

1) Switch to the menu cursor using the Tab Key.

2) Select **PLC to File** from the Transfer Menu using the Cursor Keys and press the Enter Key.



The reference data displayed on the screen will be transferred to the personal computer and saved in a file.

To transfer reference data saved in a file to the PLC, follow the same procedure as above, but select **File to PLC** from the Transfer Menu.

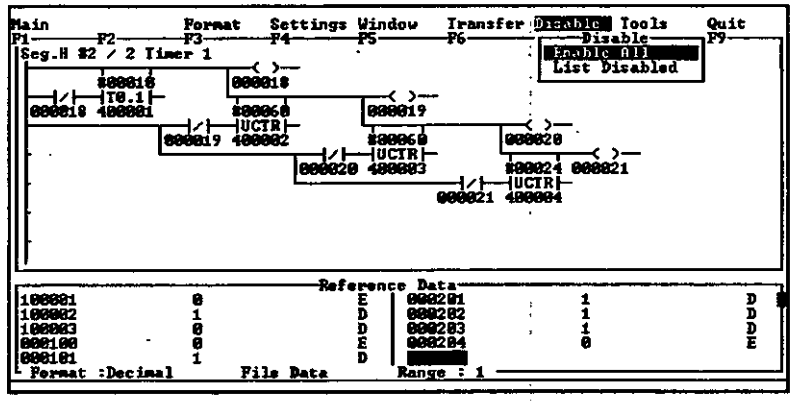
11.2.5 Disable

1. Enable All

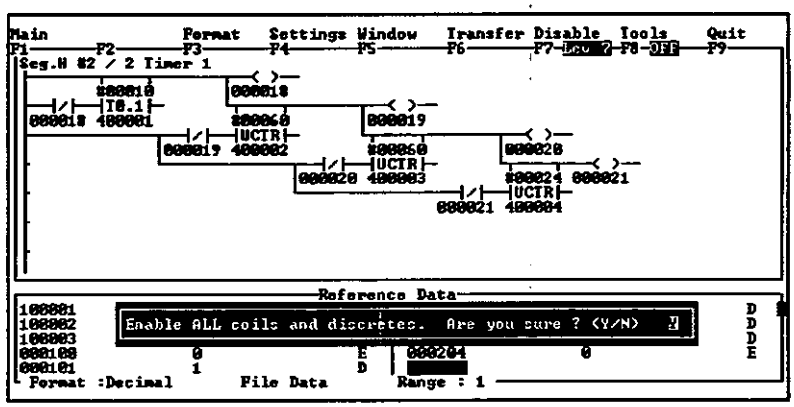
The Enable All operation enables all disabled coils and input relays.

1) Switch to the menu cursor using the Tab Key.

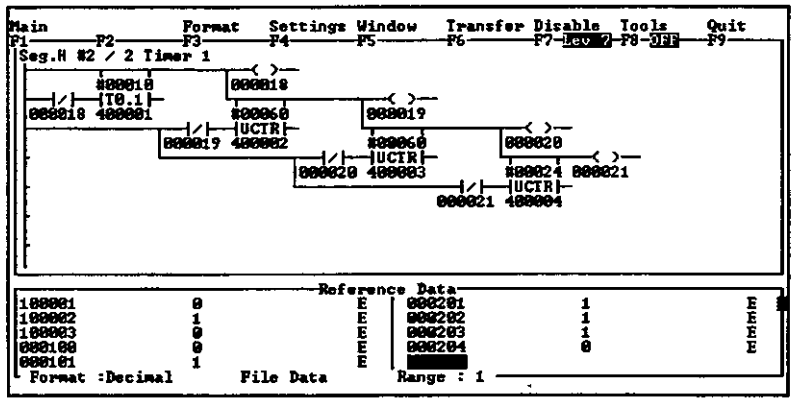
2) Select **Enable All** from the Disable Menu using the Cursor Keys and press the Enter Key.



3) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The currently disabled coils and input relays will all be switched to enabled status.

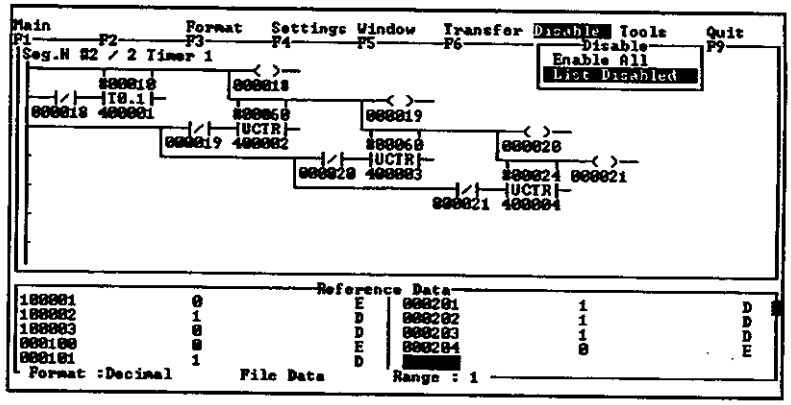


2. List Disabled

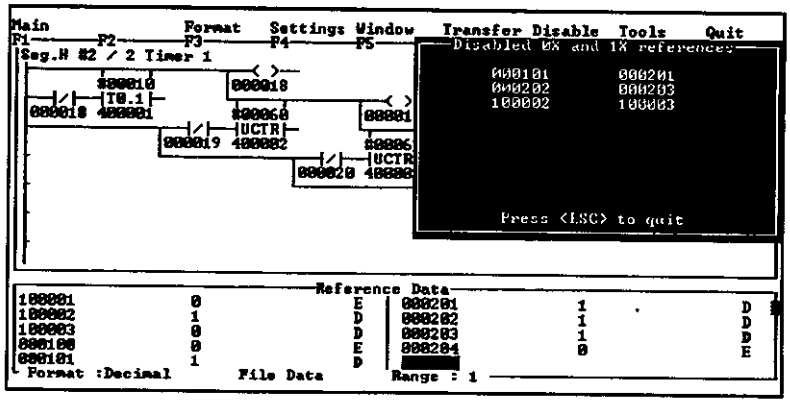
The List Disabled operation lists the reference numbers of currently disabled coils and input relays.

1) Switch to the menu cursor using the Tab Key.

2) Select **List Disabled** from the Disable Menu using the Cursor Keys and press the Enter Key.



The reference numbers of the currently disabled coils and input relays will be displayed.



3) If all of the disabled coils and input relays cannot be shown on one screen, display by using the Page Up and Page Down Keys to switch between screens

Editing Motion Programs: Offline

12

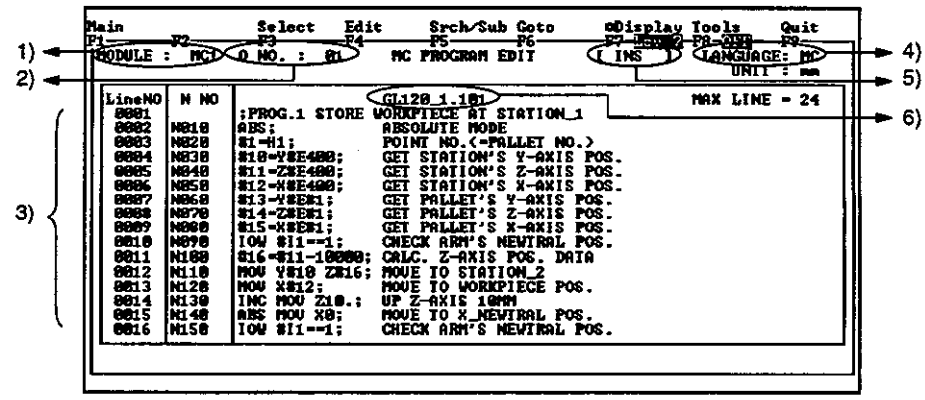
This chapter describes the MC Program Edit Screen and basic editing procedures.

12.1 Overview

This section describes the structure of the MC Program Edit Screen and basic program input procedures.

12.1.1 MC Program Edit Screen

Select **Motion Program** from the Motion Submenu of the Main Menu. The MC Program Edit Screen will be displayed.



1) MC Number

Shows the number of the currently selected Motion Module.

2) O Number

Shows the O number of the currently displayed program.

3) Editing Area

Displays up to 16 lines of program.

4) Language

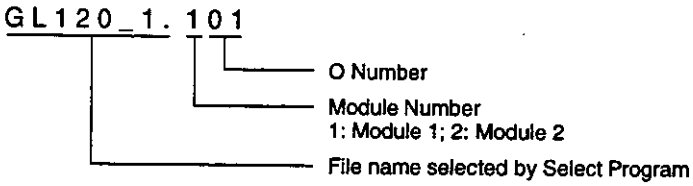
Shows the language (motion language or G) of the currently displayed program.

5) Edit Mode

Shows whether Insert or Overwrite Edit Mode is being used.

6) File Name

Shows the file name of the program currently being displayed. The configuration of file names is as follows:

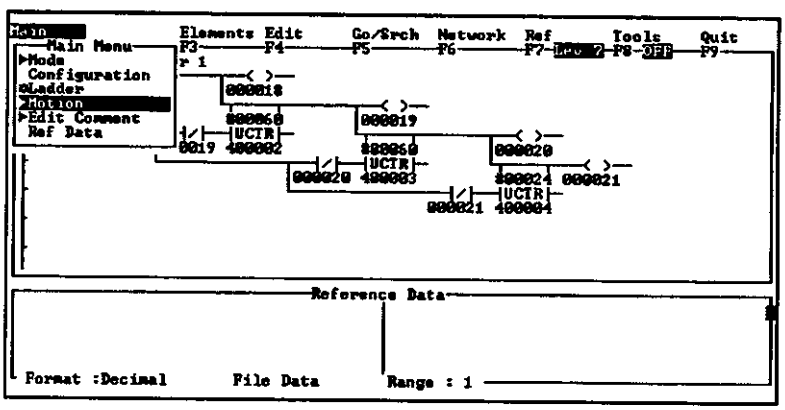


12.1.2 Displaying the MC Program Edit Screen

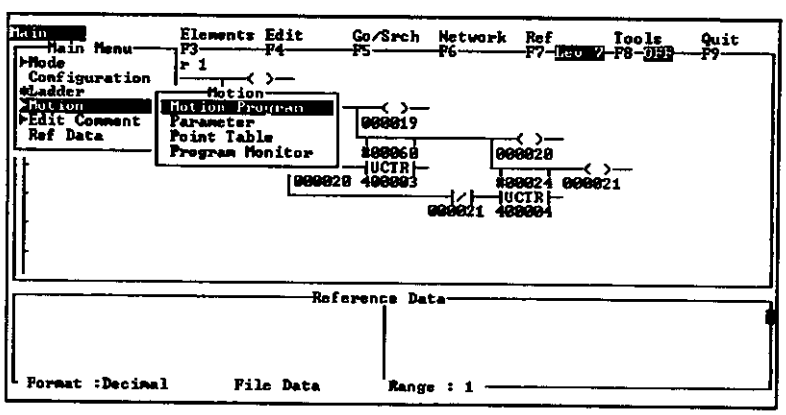
The MC Program Edit Screen is displayed by selecting Motion Program from the Motion Submenu of the Main Menu. The following example shows the procedure used to display the Ladder Editor Screen.

1) Switch to the menu cursor using the Tab Key.

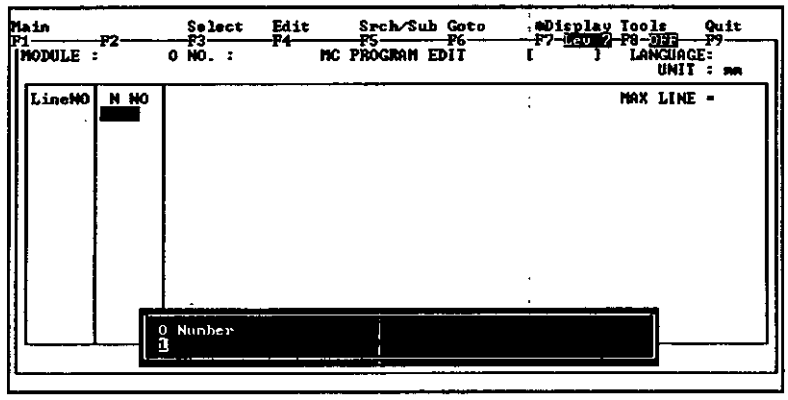
2) Select **Motion** from the Main Menu using the Cursor Keys and press the Enter Key.



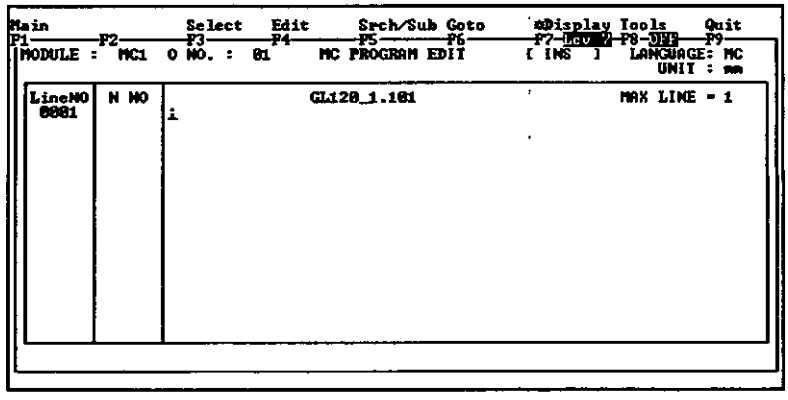
3) A submenu will be displayed. Select **Motion Program** using the Cursor Keys and press the Enter Key.



4) The MC Program Edit Screen will be displayed. If no programs have been created previously, a window will appear asking for an O number. Enter an O number (1 in this example) and press the Enter Key.



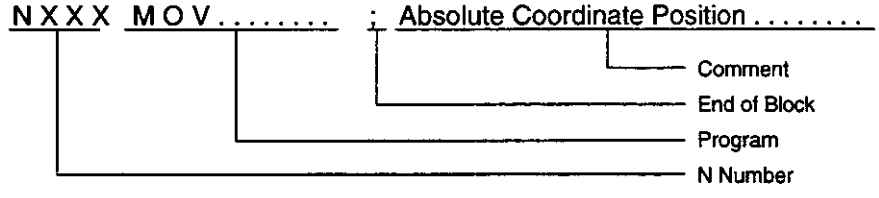
The MC Program Edit Screen for O number 1 will be displayed.



INFO If there are programs that have been previously created, a list will be displayed showing the O numbers they have been saved against. See section *12.2 File Selection Procedures* for more details on the operation procedure.

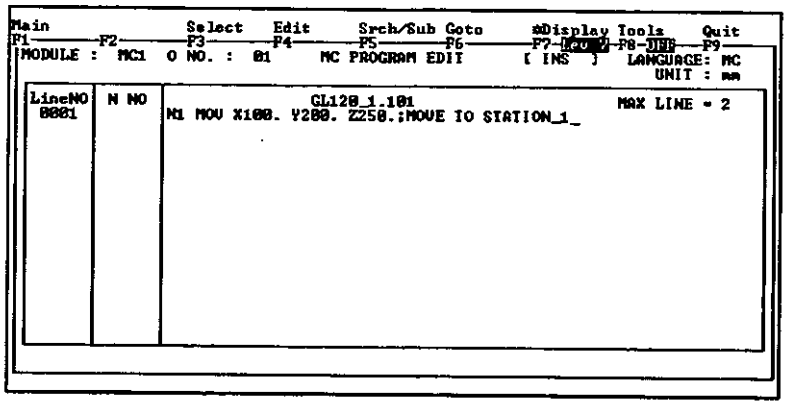
12.1.3 Basic Input Procedures

Program lines consist of the following four elements.

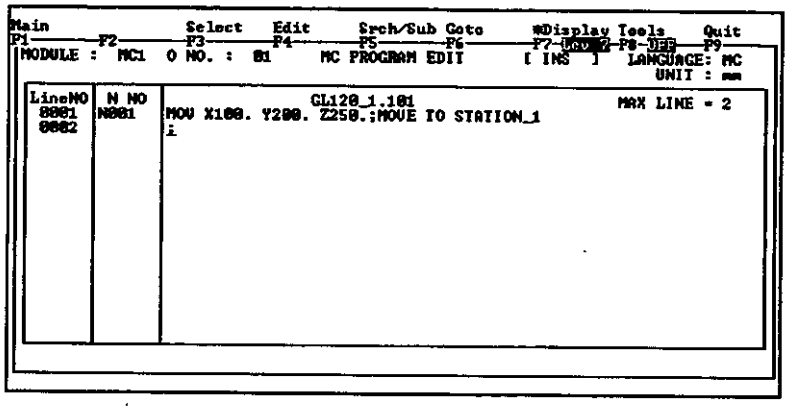


In MEMOSOFT, the Program, End of Block, and Comment combined can be a maximum of 128 characters. The following example shows how to input program.

Enter the N Number, Program, and Comment. Then, press the Enter Key.



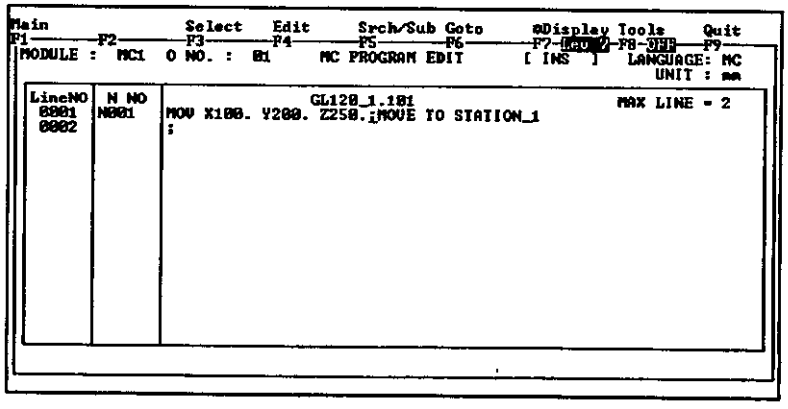
The N number will be placed automatically in the N number column. When the input has been confirmed, the cursor will move to the next line.



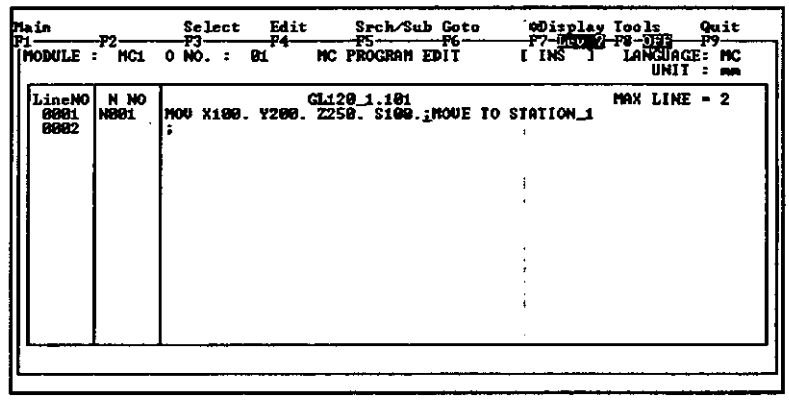
If there is no End of Block (";") in a line, an error occurs, and the input will be cancelled.

• Inserting Characters

1) Check that the Edit Mode is set to Insert Mode. Move the cursor to the point of insertion using the Cursor Keys.



2) Enter the characters to be inserted (**S100** in this example) and press the Enter Key.

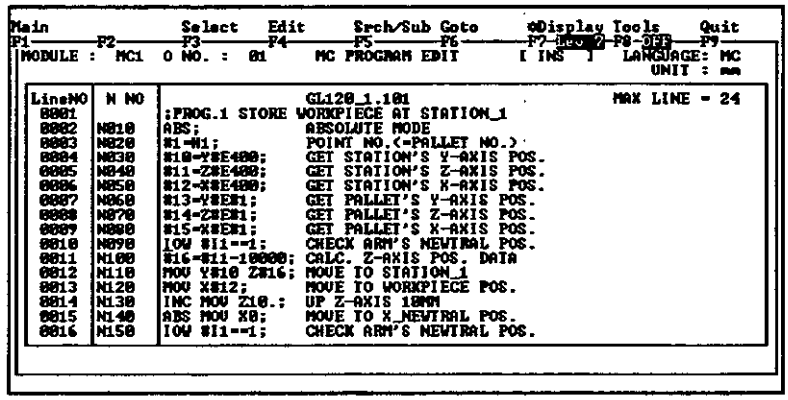


1) If the Edit Mode is not set to Insert Mode, switch it using the Insert Key to toggle between Insert and Overwrite.

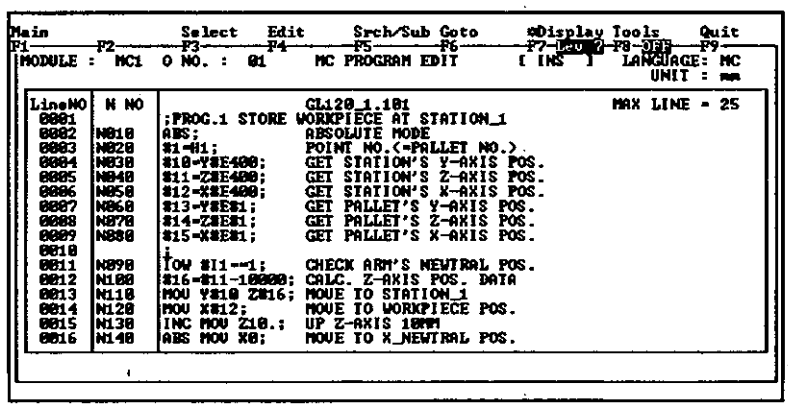
2) If performing an editing operation such as inserting characters in succession, use the Up and Down Cursor Keys instead of the Enter Key to confirm inputs.

- **Inserting a Line**

1) Move the cursor to the position where a line is to be inserted using the Cursor Keys.



2) Press the Alt + Insert Keys. A line will be inserted at the cursor position.

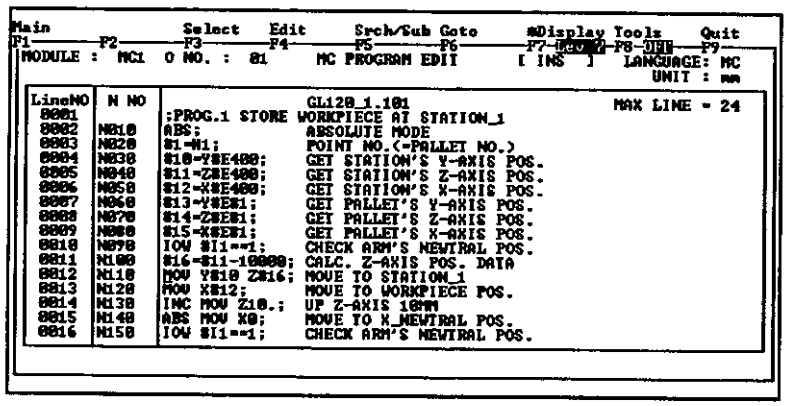


INFO If a line is to be deleted, move the cursor to the line to be deleted, and press the Alt + Delete Keys. If deleting several lines in succession, perform the operation from the Edit Menu. See section *12.2 File Selection Procedures* for more details.

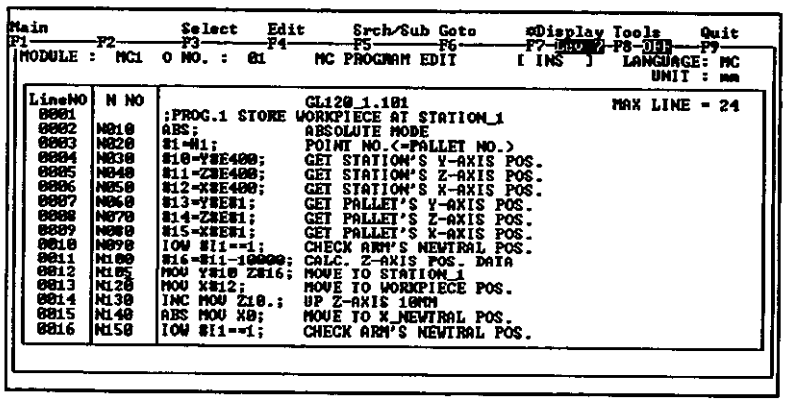
• Editing the N Number

The N number can be entered from the program edit area. Editing procedures such as modifying the N number, however, must be executed by moving the cursor to the position of the N number.

1) Press the Alt + Left Cursor Key.



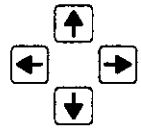
2) The cursor will move to the N number area. Enter the N number (**N105** in this exampl) and press the Enter Key.



INFO After the cursor has been moved to the N number area, it can be moved around within the area itself. To move the cursor back to the program area, press the Alt + Right Cursor Keys.

• **Summary**

Following is a summary of the main keys used in program editing.

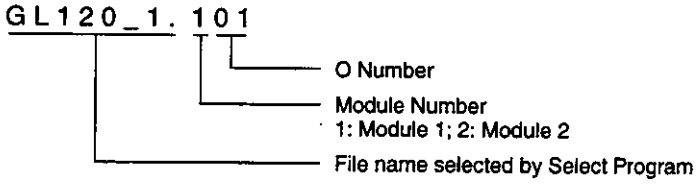
	Move the cursor, except when entering characters. If pressed after characters have been entered, the action confirms the input and the cursor moves to the next line.
	Confirms an input and moves the cursor to the next line. If at this point the line does not contain an End of Block mark, an error will occur.
INS	Toggles between Insert and Overwrite in Edit Mode. The initial setting is Insert.
DEL	Deletes one character at the cursor position.
ALT + INS	Inserts a blank line at the cursor position.
ALT + DEL	Deletes a single line at the cursor position.
ALT + 	Moves the cursor from the program edit area to the N number area.
ALT + 	Moves the cursor from the N number area to the program edit area.
HOME	Moves the cursor to the first line of the program.
END	Moves the cursor to the last line of the program.
PgUp	Scrolls 16 lines towards the start of the program.
PgDn	Scrolls 16 lines towards the end of the program.

12.1.4 Using Commercially Available Editors

MEMOSOFT motion programs are saved in files as text data. As a result, they can be created and edited using commercially available editing programs.

• **File Names for Newly Created Files**

Make sure to use the following structure, as explained in section *12.1.1*, when naming files.



Be sure to save the file in the same directory as the other programs. The initial setting for the directory is \FMSGL\PROGRAMS.

• **Program Format**

Programs are saved in the format shown below. Make sure to use this format when creating programs on a commercially available editor.

File Name: GL120_1.102 (Module: 1, O number: 2).

```
;PROG.2 STORE WORKPIECE AT STATION_2
N010  ABS;              ABSOLUTE MODE
N020  #1=H2;            POINT NO.(=PALLET NO.)
N030  #20=Y#E401;       GET STATION'S Y-AXIS POS.
N040  #21=Z#E401;       GET STATION'S Z-AXIS POS.
N050  #22=X#E401;       GET STATION'S X-AXIS POS.
N060  #13=Y#E#1;        GET PALLET'S Y-AXIS POS.
N070  #14=Z#E#1;        GET PALLET'S Z-AXIS POS.
N080  #15=X#E#1;        GET PALLET'S X-AXIS POS.
N090  IOW #I1==1;       CHECK ARM'S NEUTRAL POS.
N100  #16=#11-10000;    CALC. Z-AXIS POS. DATA
N110  MOV Y#10 Z#16;    MOVE TO STATION_2
N120  MOV X#12;         MOVE TO WORKPIECE POS.
N130  INC MOV Z10;      UP Z-AXIS 10MM
N140  ABS MOV X0;       MOVE TO X_NEUTRAL POS.
N150  IOW #I1==1;       CHECK ARM'S NEUTRAL POS.
```

12.2 File Selection

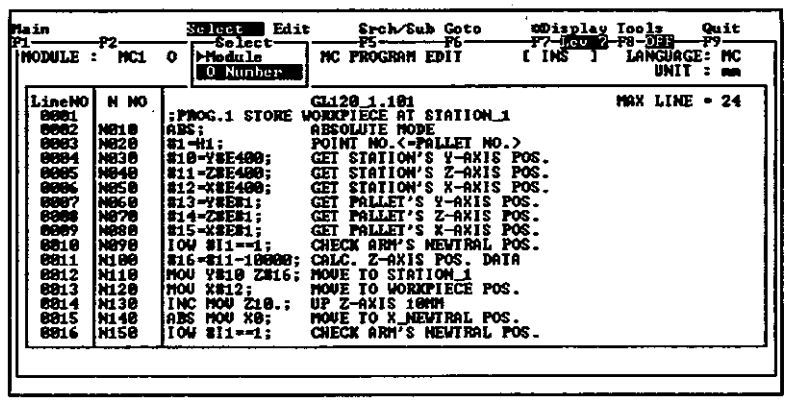
This section describes the selection procedures for motion programs. These procedures enable two files to be edited simultaneously.

12.2.1 O Number Selection

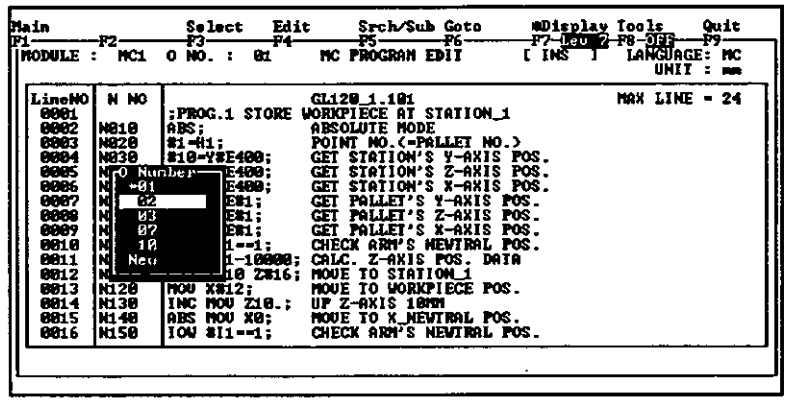
To edit a program other than the one already selected from the MC Program Edit Screen, the display can be switched using the Select operation.

1) Switch to the menu cursor using the Tab Key.

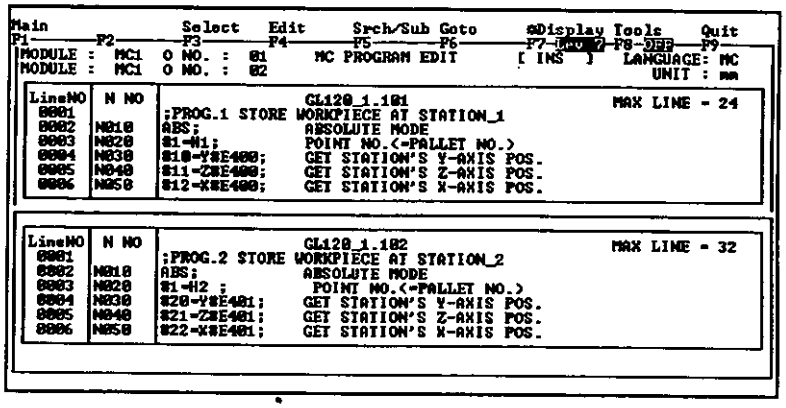
2) Select **O Number** from the Select Menu using the Cursor Keys and press the Enter Key.



3) A list of the O numbers previously created will be displayed. Move the cursor to the position of the O number to be edited using the Cursor Keys, and then press the Enter Key.



The program that was previously being displayed and the newly selected program will be displayed simultaneously.

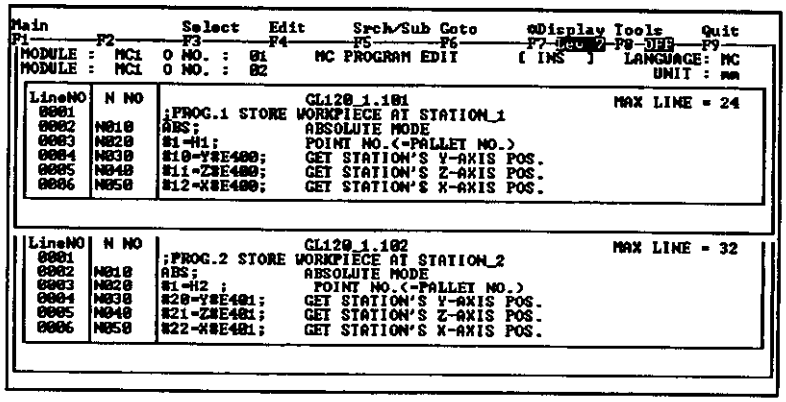


1. Selecting the Edit Screen

The following example shows the procedure used to select one of two programs being displayed simultaneously.

With the cursor in the O number 2 program, press the Alt + J Keys.

The cursor will move to the O number 1 program.

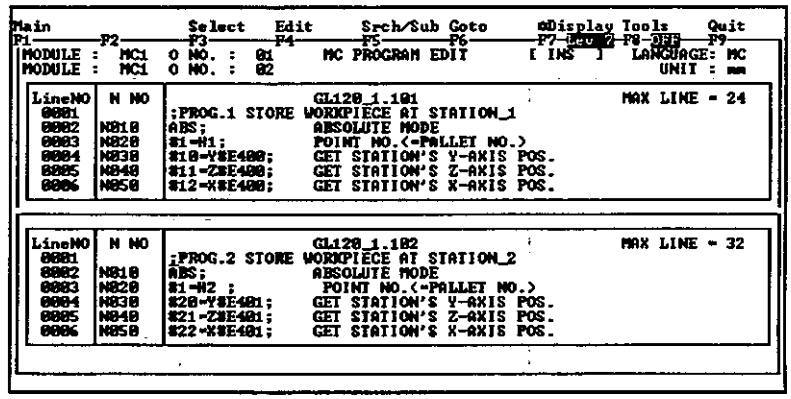


2. Reading Multiple Programs

MEMOSOFT can edit a maximum of two programs at the same time. Therefore, if two programs are already being edited, one of these two programs must be exited first, before a third program can be edited.

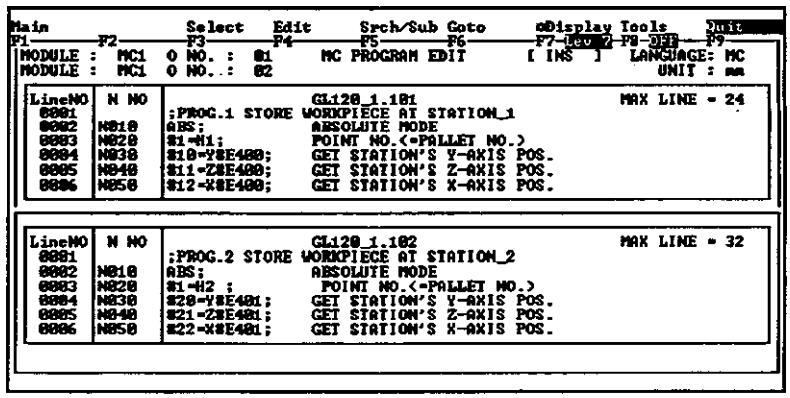
The following example shows the procedure used to switch from editing O numbers 1 and 2, to editing O numbers 1 and 3.

1) Move the cursor to the O number 2 screen by pressing the Alt + J Keys.



2) Switch to the menu cursor using the Tab Key.

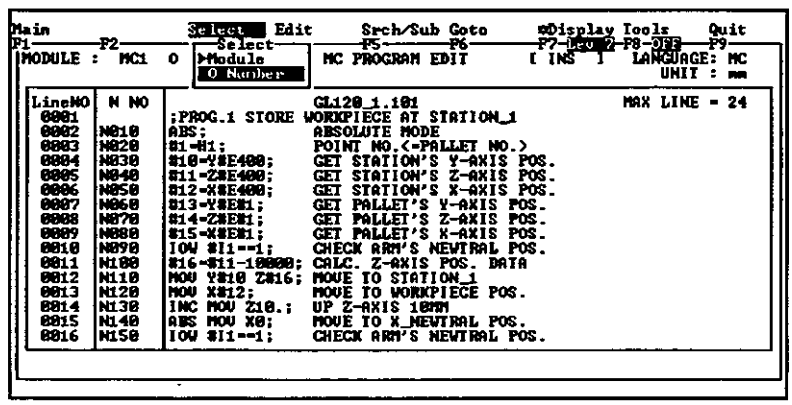
3) Select the Quit Menu using the Cursor Keys. If the program has been changed, a message will appear asking whether to save the changes. To save the changes, enter **Y** and press the Enter Key.



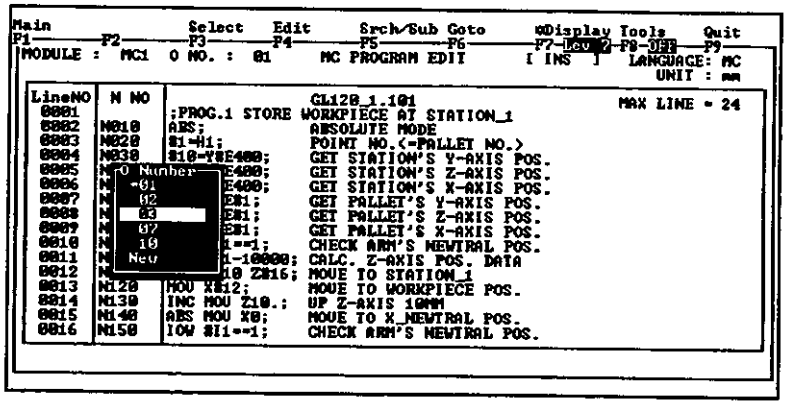
Editing of the O number 2 program is complete.

4) Switch to the menu cursor using the Tab Key.

5) Select **O Number** from the Select Menu using the Cursor Keys and press the Enter Key.



6) A list will be displayed of the O numbers previously created. Move the cursor to the position of 03 using the Cursor Keys and press the Enter Key.



The edit screens for O numbers 1 and 3 will be displayed.

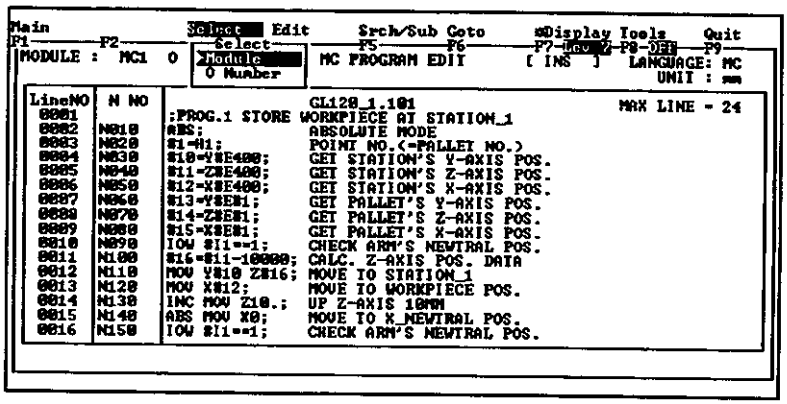
INFO Use the Esc Key to exit an Edit Screen. Move the cursor to the screen to be exited and press the Esc Key.

12.2.2 Selecting a Module

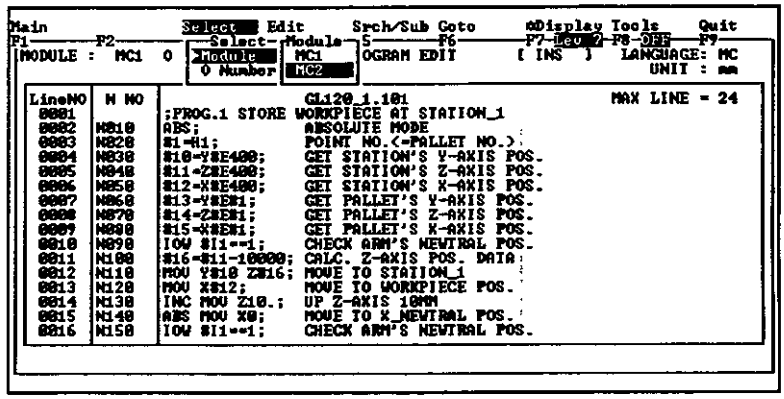
Use the following procedure to switch between Modules.

1) Switch to the menu cursor using the Tab Key.

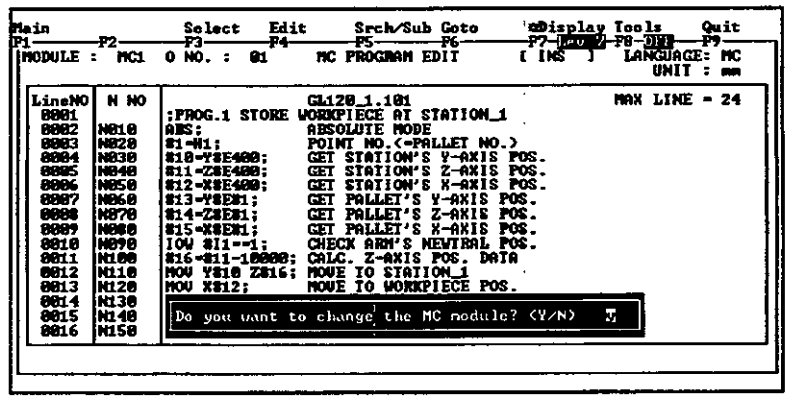
2) Select **Module** from the Select Menu using the Cursor Keys and press the Enter Key.



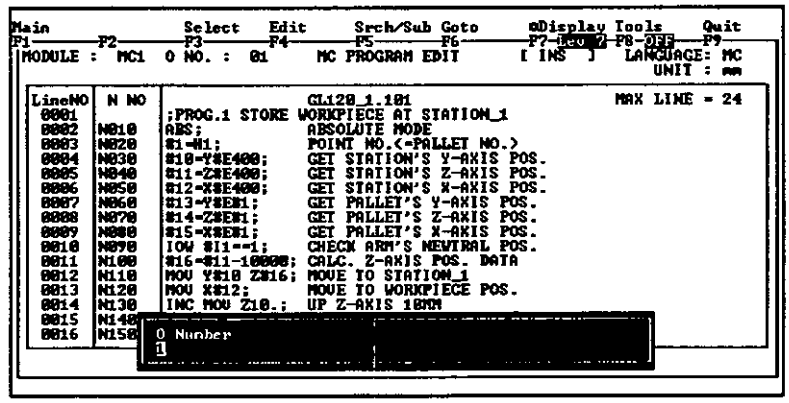
3) A submenu will be displayed. Select **MC2** using the Down Cursor Key and press the Enter Key.



4) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



5) The MC Program Edit Screen for Module 2 will be displayed. If no programs have been previously created, a window will appear asking for an O number. Enter an O number (**1** in this example) and press the Enter Key.



The MC Program Edit Screen for O number 1 of Module 2 will be displayed.

12.3 Editing

This section describes the operations useful for editing, such as copying, and substituting N numbers, in the MC Program Edit Screen.

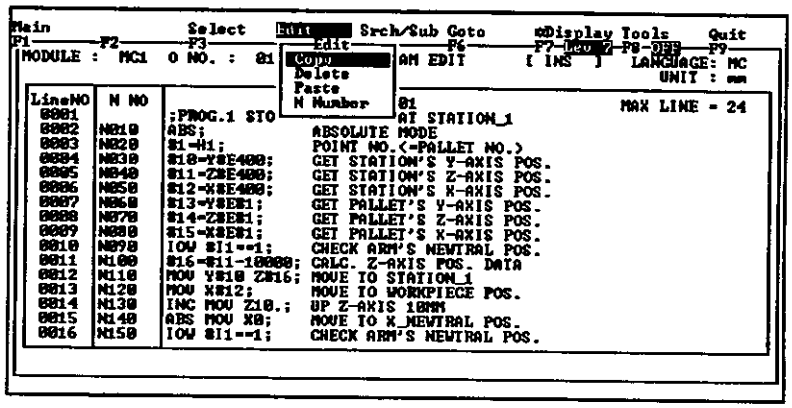
12.3.1 Copy

The Copy operation records the program data specified by the cursor in line units. The N number, the program, and comments are all recorded. Data recorded by the Copy operation can be copied to another position using the Paste operation.

1) Move the cursor to the first or last line of the area to be copied using the Cursor Keys.

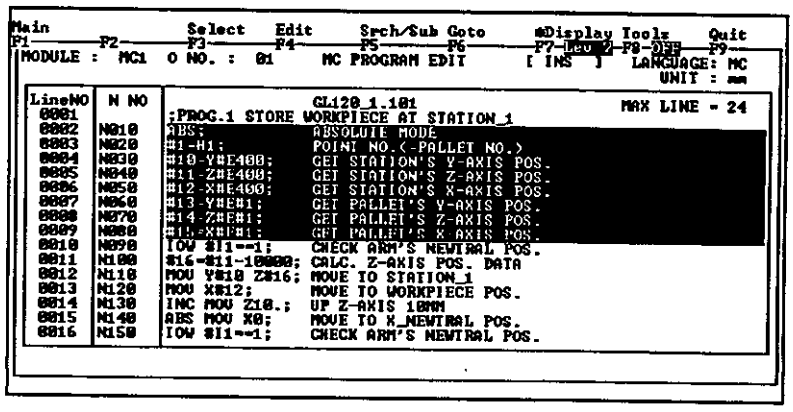
2) Switch to the menu cursor using the Tab Key.

3) Select **Copy** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) The cursor will change to a line unit cursor. Move the cursor to set the area to be copied using the Cursor Keys.

5) Once the area to be copied has been specified, press the Enter Key. The specified data will be recorded.



12.3.2 Delete

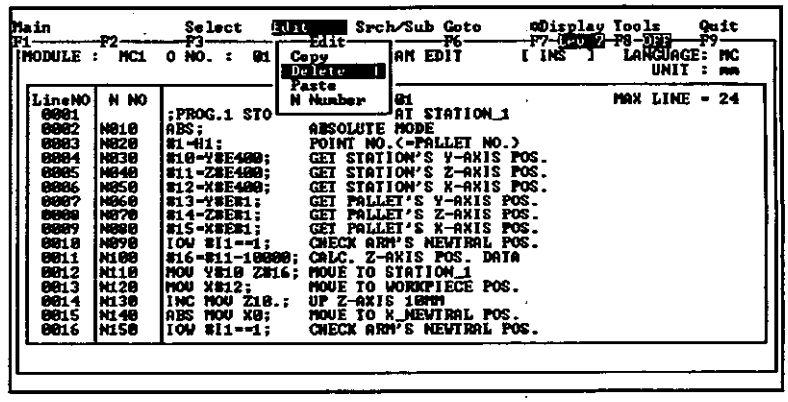
The Delete operation deletes the program data specified by the cursor in line units and records it. The N number, the program, and comments can all be deleted. Data recorded by the Delete operation can be moved to another position using the Paste operation. Therefore, the Delete operation is useful both for deleting programs and for moving them to other positions.

To delete only one line, move the cursor to the target line and, press the Alt + Delete Keys. The line will be both deleted and recorded.

1) Move the cursor to the first or last line of the area to be deleted using the Cursor Keys.

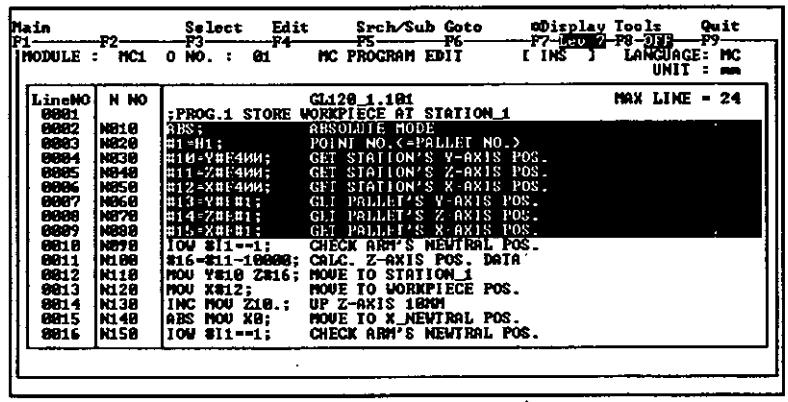
2) Switch to the menu cursor using the Tab Key.

3) Select **Delete** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) The cursor will change to a line unit cursor. Move the cursor to set the area to be deleted using the Cursor Keys.

5) Once the area to be deleted is set, press the Enter Key. The specified data will be deleted.



The programs below the deleted area will shift up to the line where the deletion started from.

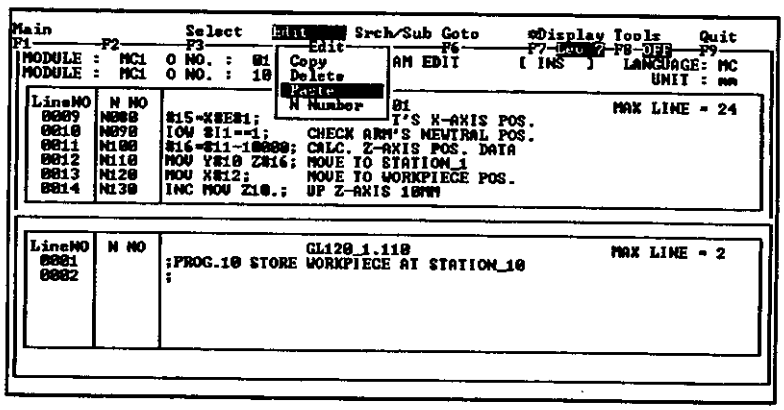
12.3.3 Paste

The Paste operation takes program data that has been stored either by the Copy operation or by the Delete operation and inserts it at the cursor position. The following example shows the procedure used to insert data that has been stored by the Copy operation described in section *12.3.1 Copy* into another O number program.

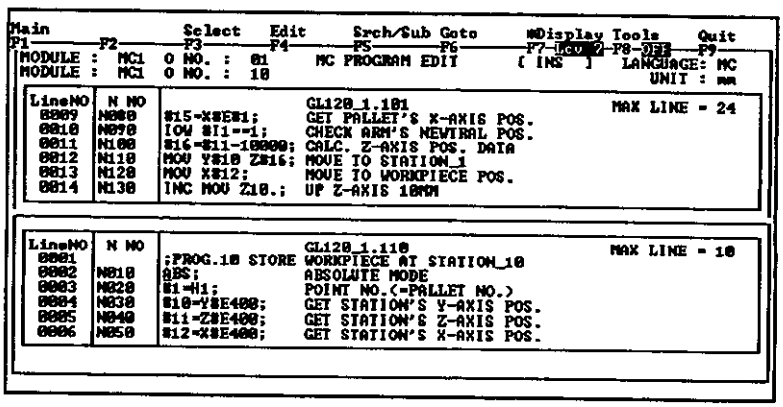
1) Move the cursor to the line to be inserted using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Paste** from the Edit Menu using the Cursor Keys and press the Enter Key.



The stored data will be inserted from the cursor position onwards.



12.3.4 N Number Substitution

The N Number Substitution operation substitutes the N numbers of a specified program by a set number of steps. According to the settings for the start number and the number of steps, only lines which have an N number attached to them can be changed. The N numbers in GOTO statements will also be modified. This procedure applies to the whole of a specified program; a partial substitution of N numbers is not possible.

Before Substitution

```
N010  ABS;
N020  WHILE #10 < 100 DO1;
N025  PMV P1 C#10;
N030  GSB P33;
N040  IF #150 == 1 GOTO 100;
N035  MOV X10. Y10.;
N050  #10=#10+1;
N060  DEND1;
N100  MOV X0. Y0. Z0;
```

After Substitution: Start Number is N100, and Number of Steps is Set to 10.

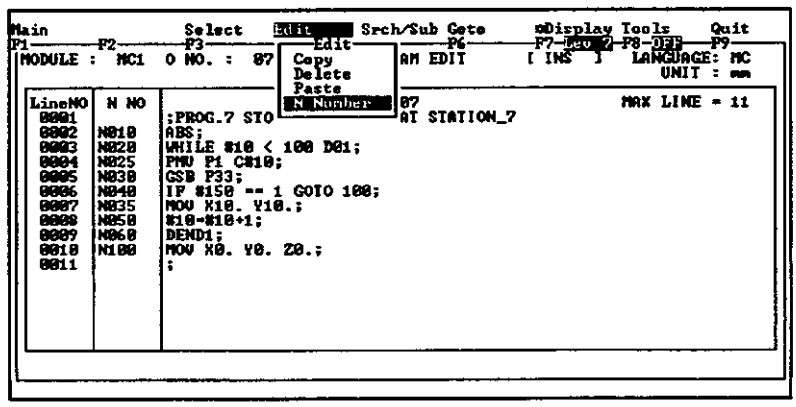
```
N100  ABS;
N110  WHILE #10 < 100 DO1;
N120  PMV P1 C#10;
N130  GSB P33;
N140  IF #150 == 1 GOTO 180;
N150  MOV X10. Y10.;
N160  #10=#10+1;
N170  DEND1
N180  MOV X0. Y0. Z0;
```

Note If the N number specified by the GOTO statement does not exist, the N number cannot be substituted. As a result, other substituted N numbers and the N number specified in the GOTO statement may be duplicated. Take care to avoid this happening.

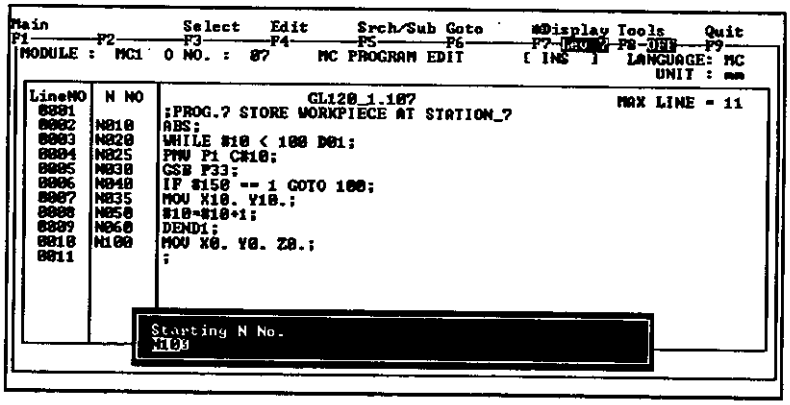
An example of the operation is described below.

1) Switch to the menu cursor using the Tab Key.

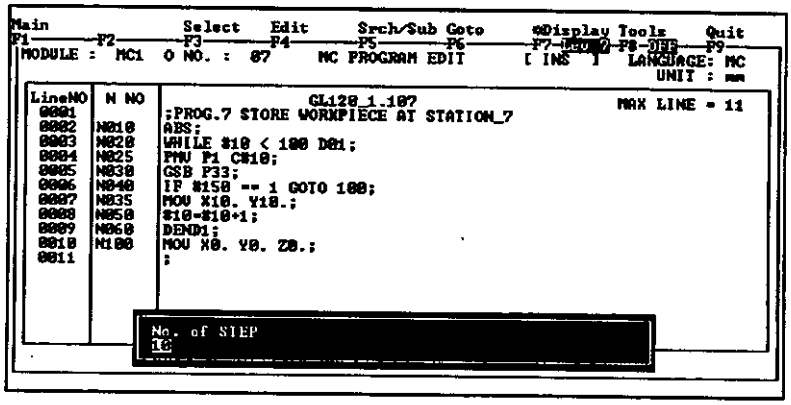
2) Select **N Number** from the Edit Menu using the Cursor Keys and press the Enter Key.



3) A window will be displayed asking for the starting N number. Enter the first N number (**N100** in this example) and press the Enter Key.



4) A window will be displayed asking for the step number. Enter the number of steps for the interval between N numbers (**10** in this example) and press the Enter Key.



The N numbers will be substituted.

INFO

1) The program only operates for lines with N numbers. New N numbers are not placed on lines which had no N numbers before.

2) If two or more identical N numbers have been used, an error will occur. A message will be displayed and the substitution will not be performed.

3) When entering the starting N number, the substitution will proceed normally even if an "N" is not put in front of the number.

12.4 Search and Substitute

This section describes the procedures used to search for and substitute character strings within programs.

12.4.1 Search

The Search operation searches for the character string entered in the currently displayed motion program. There are three kinds of search, depending on the starting point for the search and the search direction.

1) Search All

The specified character string is searched for from the beginning of the program through to the end. When the target character string is found, the cursor will move to the position of the character string. Press the Enter Key to continue searching for the next occurrence. To end the search, press the Esc Key.

2) Search Forward

The specified character string is searched for from the line where the cursor is currently positioned through to the end of the program. When the target character string is found, the cursor will move to the position of the character string. Press the Enter Key to continue searching for the next occurrence. To end the search, press the Esc Key.

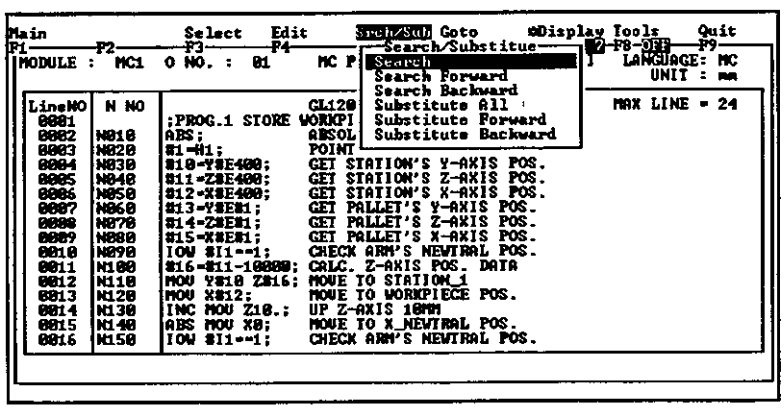
3) Search Backward

The specified character string is searched for from the line where the cursor is currently positioned back towards the beginning of the program. When the target character string is found, the cursor will move to the position of the character string. Press the Enter Key to continue searching for the next occurrence. To end the search, press the Esc Key.

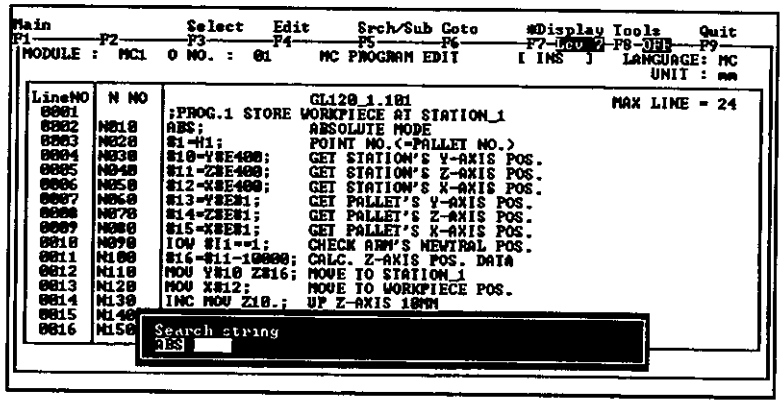
Following is an example showing the Search All operation.

1) Switch to the menu cursor using the Tab Key.

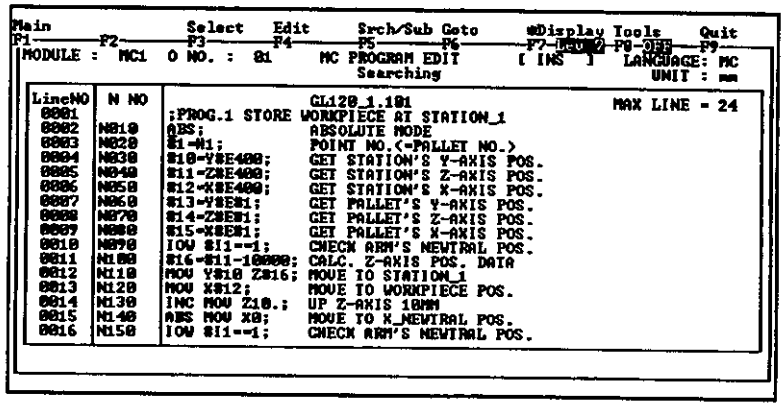
2) Select **Search** from the Search/Substitute Menu using the Cursor Keys and press the Enter Key.



3) A window will be displayed asking for the character string to be searched for. Enter the search string (**ABS** in this example) and press the Enter Key.



The search will begin from the top of the program. If the character string that matches the search string entered is found, the cursor will move to the beginning of that character string.



INFO

1) To continue the search, press the Enter Key. The search will begin again from the current cursor position. To execute another operation, press the Esc Key once to exit the Search operation.

2) The Search operation is case sensitive. When searching for N numbers or instructions, make sure they are entered in uppercase letters. For example, if searching for N number 10, make sure it is entered correctly as "N010".

3) The Search operation can be used for motion programs as well as for comments.

4) A string of up to 8 characters can be searched for.

12.4.2 Substitute

The Substitute operation searches for a specified character string and replaces it with another character string. There are three kinds of substitution, depending on the starting point for the substitution and the direction.

1) Substitute All

The character string is searched for from the beginning of the program through to the end. When the target character string is found, the string will be substituted by the specified character string.

2) Substitute Forward

The character string is searched for from the line where the cursor is currently located, through to the end of the program. When the target character string is found, the string will be substituted by the specified character string.

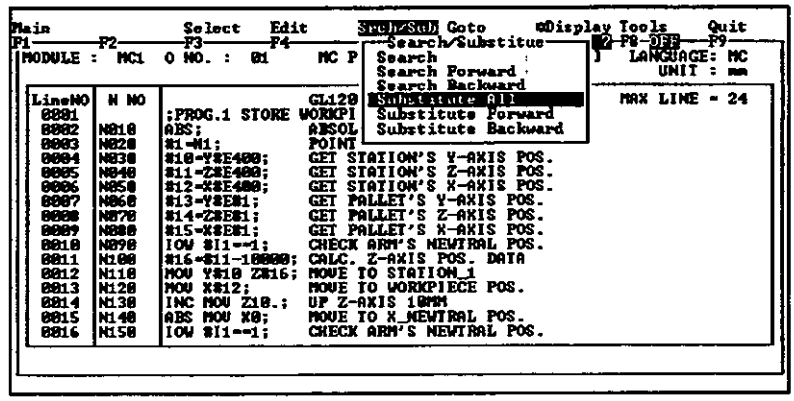
3) Substitute Backward

The character string is searched for from the line where the cursor is currently located, back towards the beginning of the program. When the target character string is found, the string will be substituted by the specified character string.

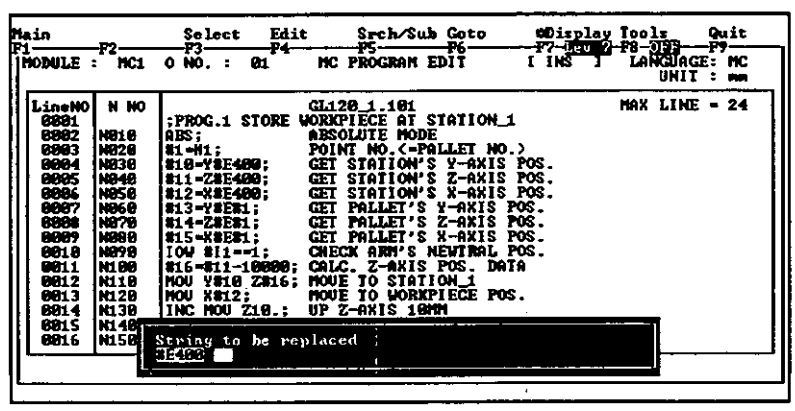
An example for the Substitute All operation is described below.

1) Switch to the menu cursor using the Tab Key.

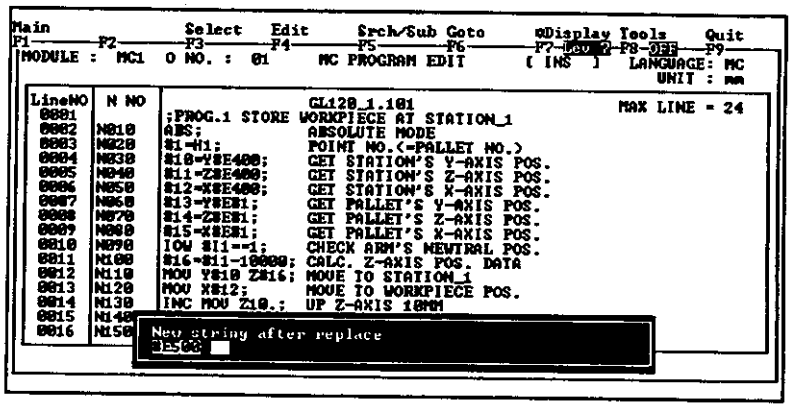
2) Select **Substitute All** from the Search/Substitute Menu using the Cursor Keys and press the Enter Key.



3) A window will be displayed asking for the character string to be substituted. Enter the string to be substituted (**#E400** in this example) and press the Enter Key.



4) Next, a window will be displayed asking for the replacement character string. Enter the new string to be inserted (**#E500** in this example) and press the Enter Key.



Any character string that matches the character string set to be replaced will be substituted with the new character string.

INFO

1) If the character string to be inserted exceeds a maximum of 128 characters, an error will occur.

2) The Substitute operation can be used for motion programs as well as for comments.

12.5 Moving Control

This section describes the procedure used to move to the first line or to the last line of a program.

There are three kinds of operations that move control.

1) Goto Top Line

The cursor moves to the first line of the program currently being edited. This operation is executed by pressing the Home Key.

2) Goto Bottom Line

The cursor moves to the last line of the program currently being edited. This operation is executed by pressing the End Key.

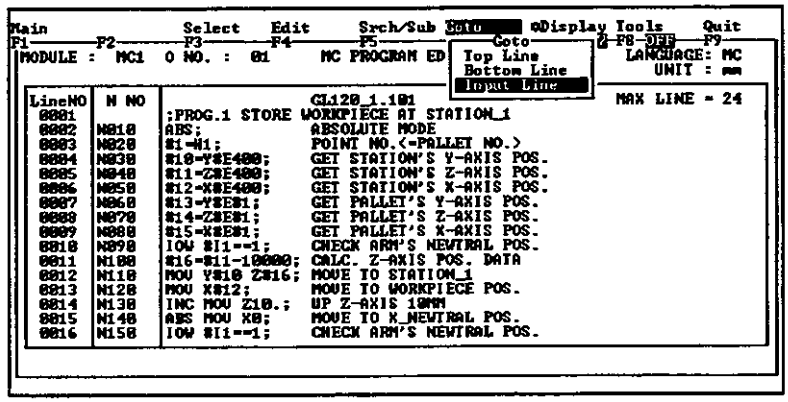
3) Goto Input Line

A window is displayed for entering the number of the target line. The cursor will move to the position of the target line.

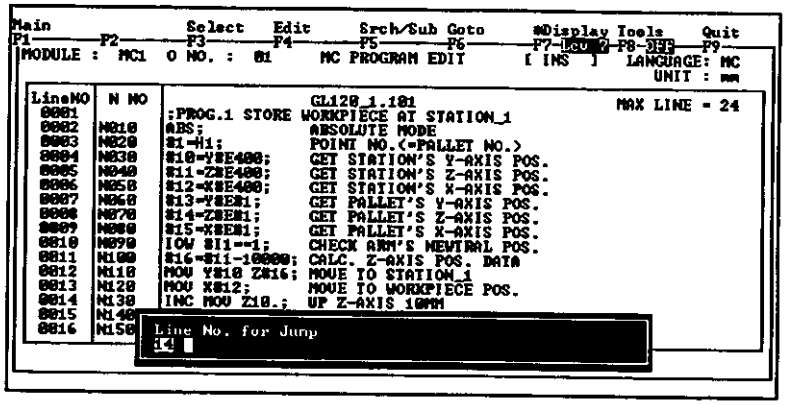
An example for going to a specified line is described below.

1) Switch to the menu cursor using the Tab Key.

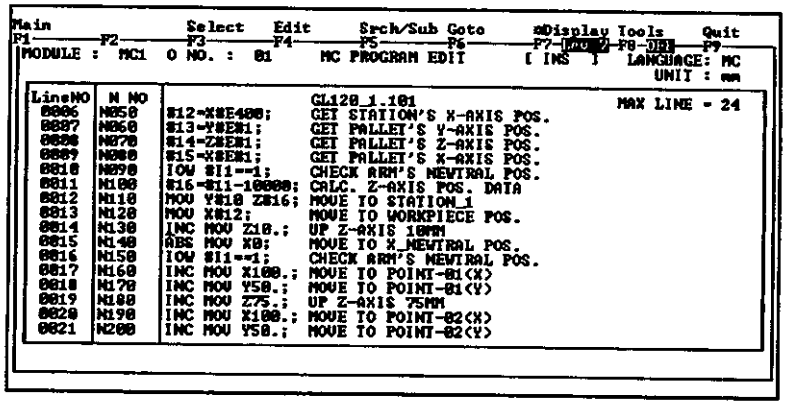
2) Select **Input Line** from the Goto Menu using the Cursor Keys and press the Enter Key.



3) A window will be displayed asking for the line number of the destination. Enter the number (**14** in this example) and press the Enter Key.



The cursor will move to the position of the specified line number.



Editing Motion Programs: Online

13

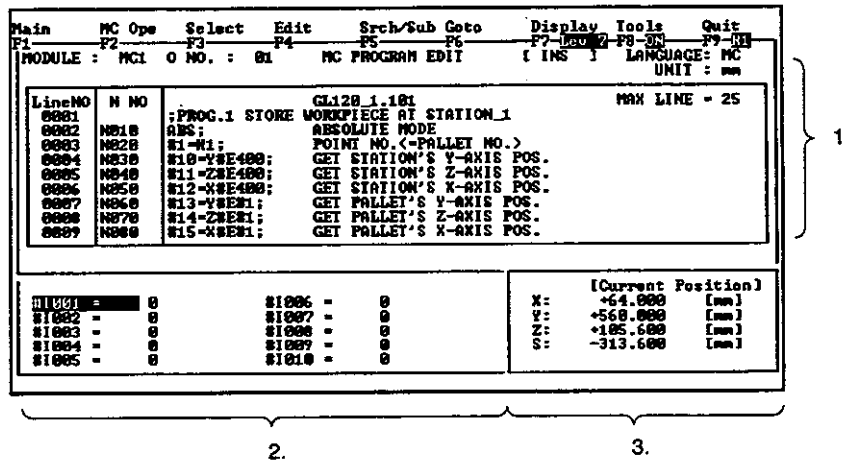
This chapter describes the procedures for using the MC Program Edit Screen and the location display, as well as displaying I/O data in Online Mode.

13.1 MC Program Edit Screen

This section describes the configuration of the screen when editing a motion program in Debug or Online Mode.

13.1.1 Edit Screen Configuration

The MC Program Edit Screen in Debug or Online Mode also displays other information such as the current position. The following example shows the screen in Online Mode.



1. MC Program Edit Area

The selected O number motion program is displayed. This area functions the same way as when in Offline Mode.

2. Variable Display Area

Variable data such as the I/O of the set reference number is displayed. The variables that can be displayed are as follows:

- Input variables
- Output variables
- Link input variables
- Link output variables

- Common variables
- System variables
- H variables

The variables which can have their values changed in this area are output variables, link output variables, common variables, and H variables. For more detailed information on variables, refer to the *Motion Module MC20 Software User's Manual (SIEZ-C825-20.52).*

3. Current Position Display Area

The current position of each axis and error pulse is displayed.

13.1.2 Differences from Offline Mode

The following menus are added in Online and Debug Mode.

• MC Ope (Operation) Menu

In Online or Debug Mode, the MC Ope Menu is displayed when the MC Program Edit Screen, Edit Point Table Screen, or Edit Parameter Screen is displayed. The corresponding Function Key is F2. The Motion Module operations are as follows:

- 1 Block Execute: Executes designated single block programs when the Motion Module is in Online Edit Mode.
- Hold: Holds the operation of 1 Block Execute. If Hold is selected again while the operation is already on hold, 1 Block Execute will resume.
- Abort: Aborts 1 Block Execute.
- Default: Returns the programs, point tables, and parameter data of the selected Module to their default settings.

See section *13.2 MC Operations* for more details on Motion Module Operations.

• Display Menu

Three operations can be performed from the Display Menu.

• Teaching Positions

The values for each axis of the program can be taught for the current position. For more details, see section *13.3 Teaching Positions.*

- **Change Display**

Either the current position or error pulse is displayed. For more details, see section *13.4 Changing the Display.*

- **Variables Display**

I/O or other variable data of the Motion Module is displayed. These variables can also be changed. For more details, see section *13.5 Displaying Variables.*

Other selecting or editing operations are performed using the same procedures as in Offline Mode. In Offline Mode, however, switching Modules is performed by switching edit files, whereas in Online Mode it is executed with the menus.

If two MC20 Motion Modules are being used in Online Mode and Edit Program, Edit Parameter, or Edit Point Table is selected, the Module Selection Window will be displayed. Make sure to select the Module to be edited before continuing the operation.

13.2 Motion Module Operations

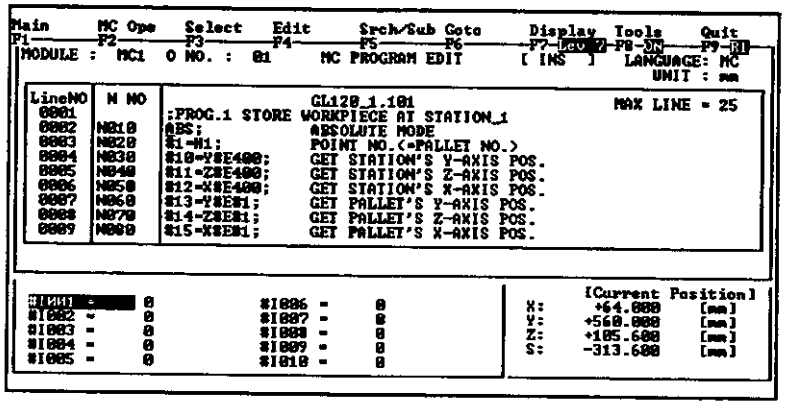
This section describes Motion Module procedures that can be executed in the MC Program Edit Screen.

13.2.1 1 Block Execute

The 1 Block Execute operation can only be performed when the Motion Module specified by the ladder program is in Online Edit Mode. The single block at the cursor position is executed when 1 Block Execute is selected.

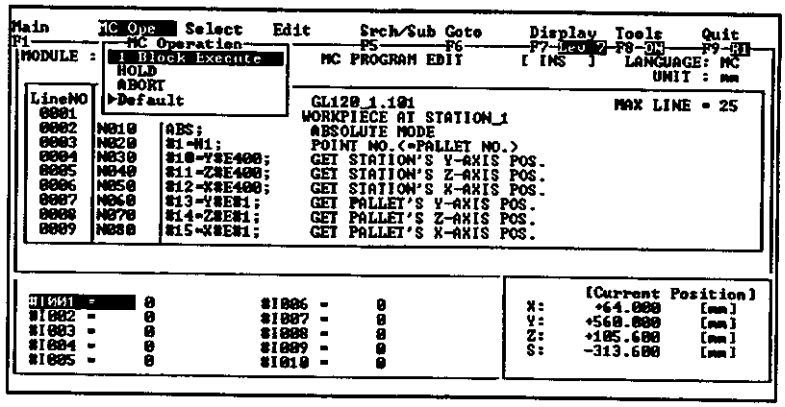
Following is an example of the operation.

1) Move the cursor to the position of the block to be executed using the Down Cursor Key.



2) Switch to the menu cursor using the Tab Key.

3) Select **1 Block Execute** from the MC Operation Menu using the Cursor Keys and press the Enter Key.



The single block where the cursor is positioned will be executed.

INFO 1 Block Execute executes single blocks of programs selected on the screen. Therefore, the program to be executed must be selected and displayed before this operation can be performed.

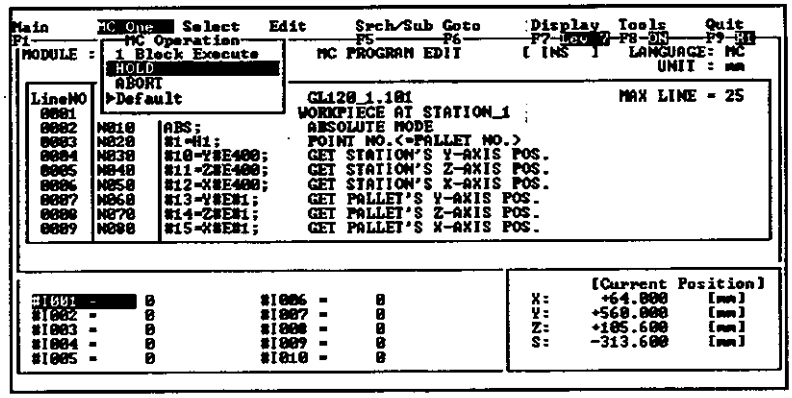
13.2.2 Hold

The Hold operation puts a single block that is being executed on hold. It only functions while a single block is being executed. Use the Hold operation to put the execution of a program on hold. If Hold is selected while the operation is on hold, the hold will be cancelled and the execution of the program will continue to the end.

An example for the Hold operation is described below.

1) Switch to the menu cursor using the Tab Key.

2) Select **Hold** from the MC Operation Menu using the Cursor Keys and press the Enter Key.



3) The operation will be put on hold. To cancel the hold state, select **Hold** a second time.

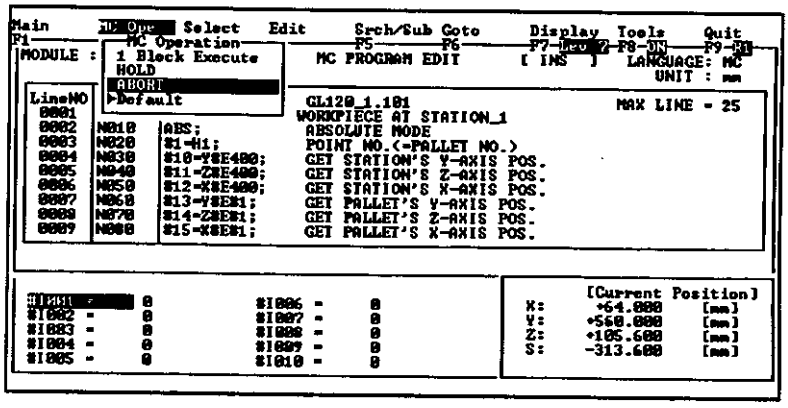
13.2.3 Abort

The Abort operation stops the running of a single block while it is being executed. It only functions while a single block is being executed. Select Abort to cancel the execution of a program.

An example for the Abort operation is described below.

1) Switch to the menu cursor using the Tab Key.

2) Select **Abort** from the MC Operation Menu using the Cursor Keys and press the Enter Key.



The single block execution will be cancelled.

13.2.4 Default

The Default operation returns all the data of a specified Motion Module to its default settings. The Default Menu offers the following options.

- Clear All: Deletes all the programs and sets the point tables and parameters of the selected Motion Module to their default values. This operation can only be executed when the Motion Module is in Edit Mode.

- Program: Deletes all the programs of the selected Motion Module. This operation can only be executed when the Motion Module is in Edit Mode.

- Point Table: Returns all the point tables of the selected Motion Module to their default values. All point table data is returned to zero.

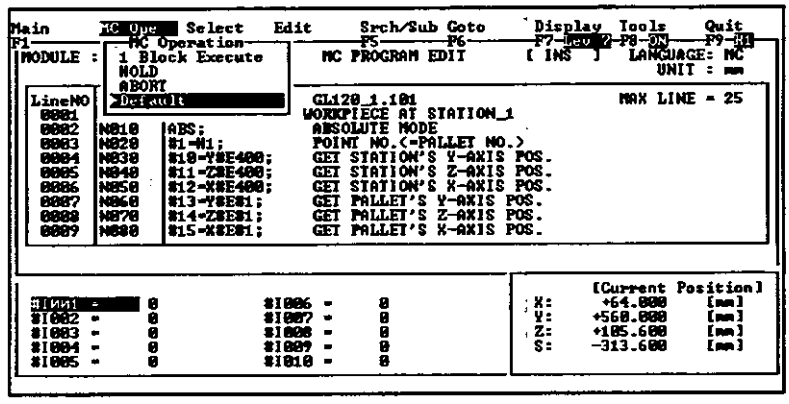
- Parameter: Returns all the parameters of the selected Motion Module to their default values.

INFO A part of the parameter data cannot be replaced by other data unless the Module is reset or unless the power is switched OFF and then switched ON again. The data is not immediately affected by the execution of the Default operation. Refer to the Motion Module user's manual for more details.

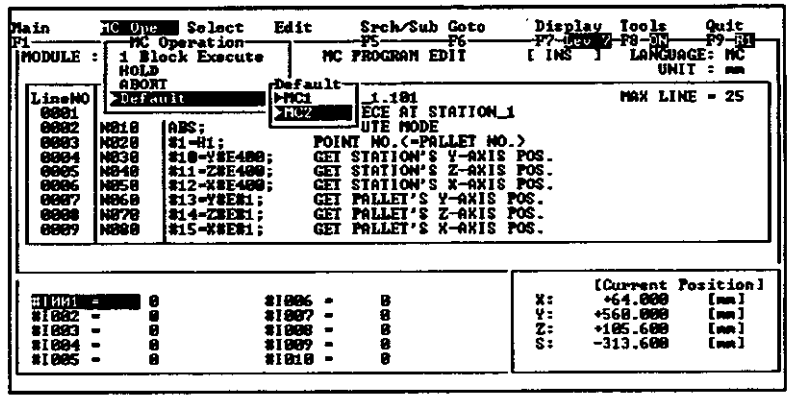
An example for initializing parameters is described below.

1) Switch to the menu cursor using the Tab Key.

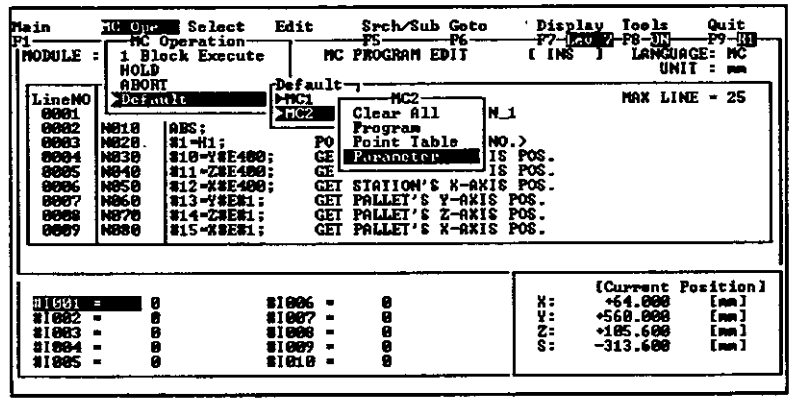
2) Select **Default** from the MC Operation Menu using the Cursor Keys and press the Enter Key.



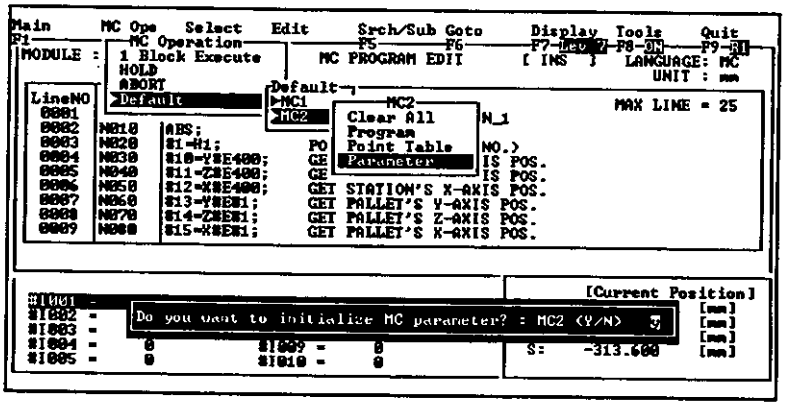
3) The Default Submenu will be displayed. Select **MC2** using the Down Cursor Key and press the Enter Key.



4) A submenu will be displayed. Specify the type of data to be initialized. In this example, select **Parameter** using the Down Cursor Key and press the Enter Key.



5) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The parameters will be set to their default values.

13.3 Teaching Positions

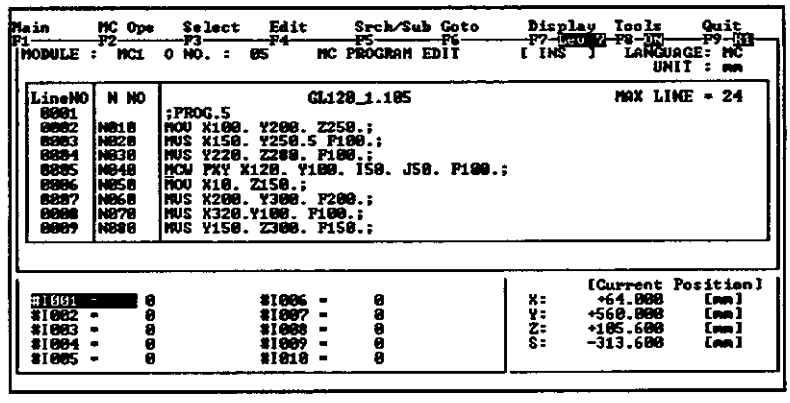
This section describes the operations that can be used to teach coordinates using the MC Program Edit Screen.

13.3.1 Teaching the Current Position

The operation for teaching coordinates is used to write to a program positions that have been set with an operation such as Jog. This time-saving operation allows you to modify a program while being able to see a teach while monitoring the current position.

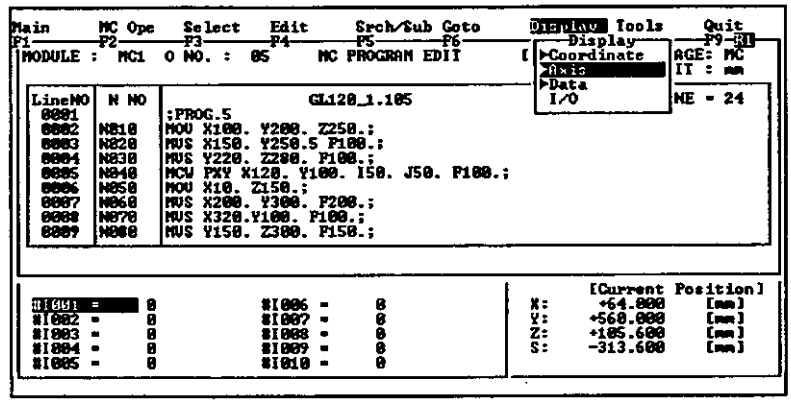
Following is an example showing how to teach a position for the 1 Axis.

1) After a position has been set, move the cursor to the line to be displayed using the Cursor Keys.

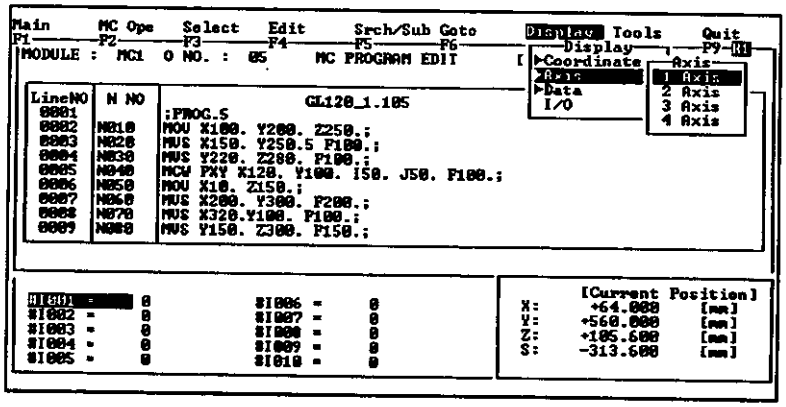


2) Switch to the menu cursor using the Tab Key.

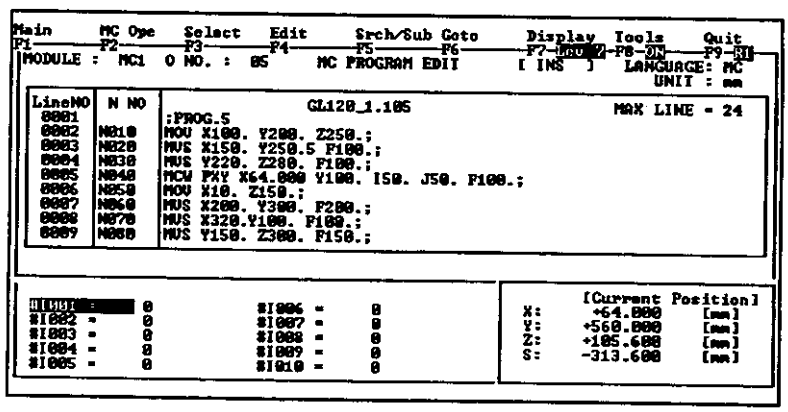
3) Select **Axis** from the Display Menu using the Cursor Keys and press the Enter Key.



4) A submenu will be displayed. Select **1 Axis** using the Down Cursor Key and press the Enter Key.



The 1 Axis data (**X** in this example) for the program at the cursor position changes to the data for the current position.



Use the same procedure to teach the positions for axes 2 to 4.

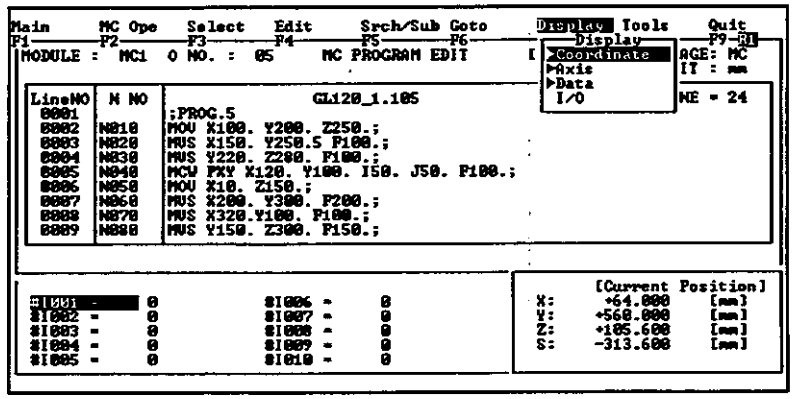
If the specified axis data is not included in the program at the cursor position, an error will occur.

13.3.2 Teaching Arc Focal Point Coordinates

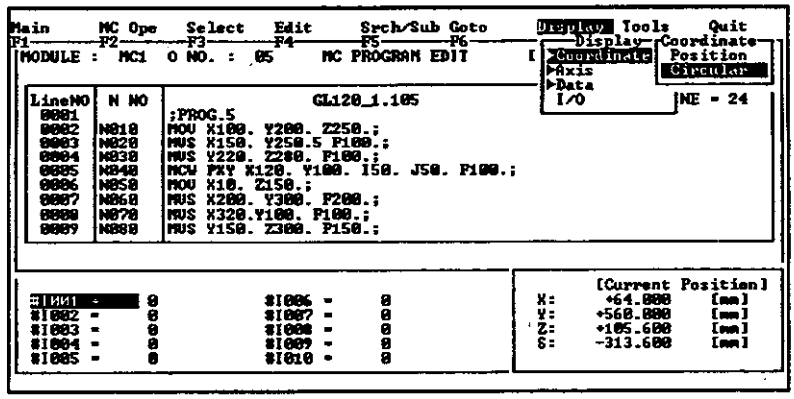
The coordinates for the focal point of an arc can be taught after the coordinate display has been switched to the arc display. Following is an example showing the teaching operation of the focal point coordinates for an arc for the 1 Axis.

1) After setting the position of the arc's focal (center) point, switch to the menu cursor using the Tab Key.

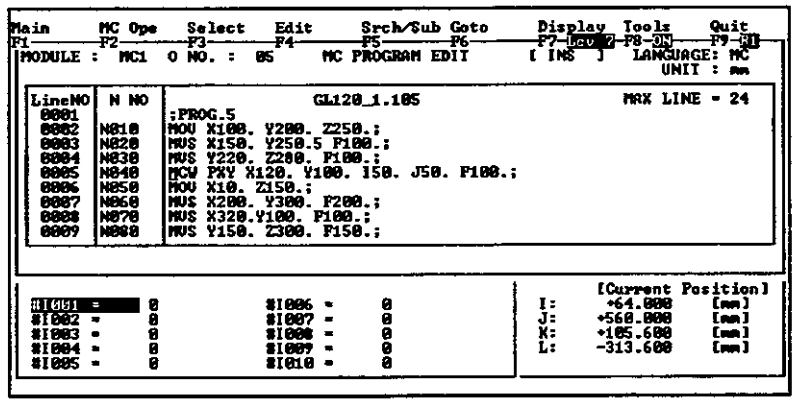
2) Select **Coordinate** from the Display Menu using the Cursor Keys and press the Enter Key.



3) A submenu will be displayed. Select **Circular** using the Down Cursor Key and press the Enter Key.

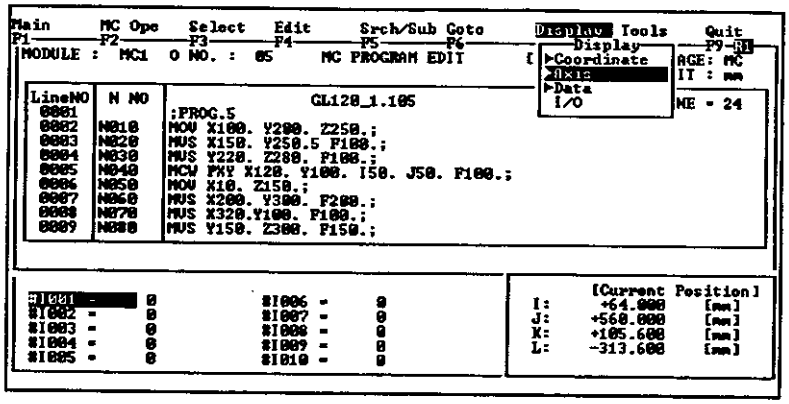


The current position display will switch to a display of the coordinates for the focal point of the arc.

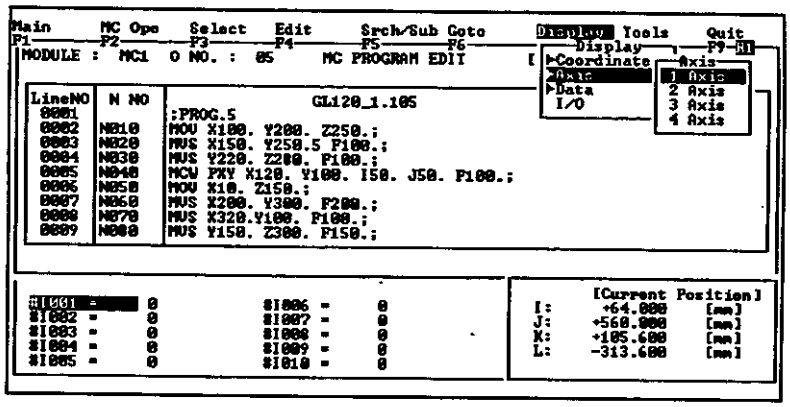


4) Move the cursor at the line of the program for which the coordinates are to be taught, and then switch to the menu cursor using the Tab Key.

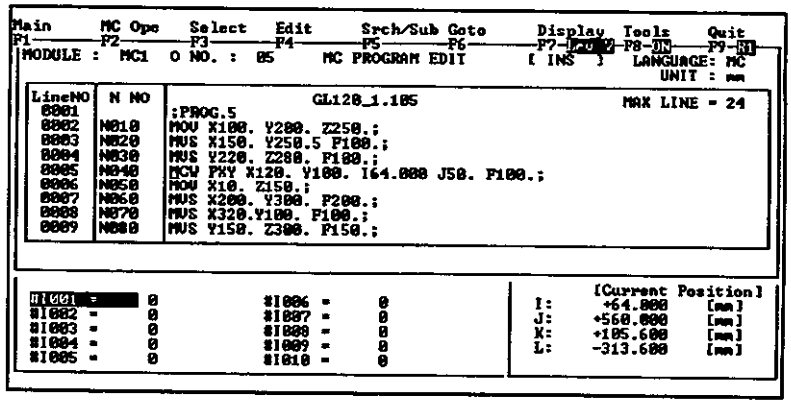
5) Select **Axis** from the Display Menu using the Cursor Keys and press the Enter Key.



6) A submenu will be displayed. Select **1 Axis** using the Down Cursor Key and press the Enter Key.



7) The 1 Axis data at the cursor position (**I** in this example) will change to the data for the current position.



The data for "J" and "K" axes can be set using the same procedure.

INFO

1) If the specified axis data is not included in the program at the cursor position, an error will occur.

2) To display the position for the X and Y axes, change the current position display by selecting the Position menu option. Conversely, to display the position of the focal point coordinates of an arc, change the current position display by selecting the Circular menu option.

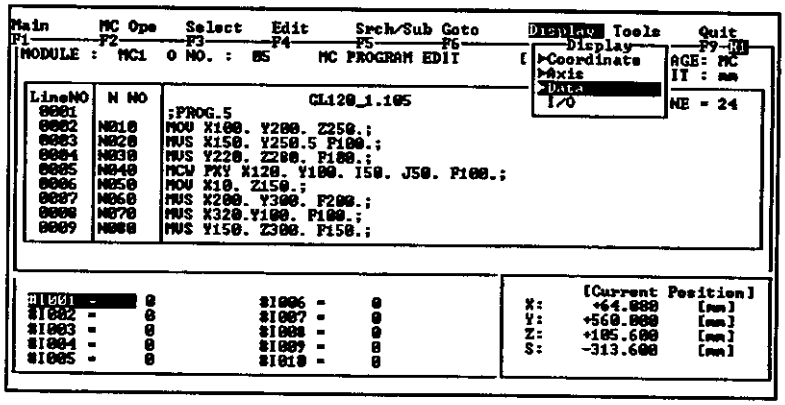
13.4 Changing the Display

This section describes the procedures for switching the display of the current position in the MC Program Edit Screen.

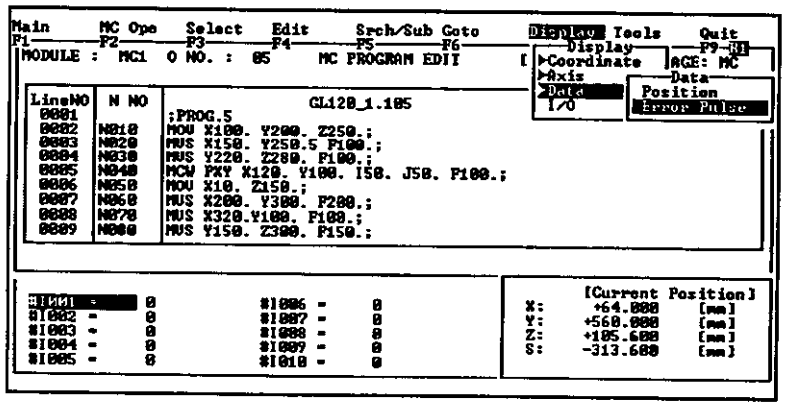
When the MC Program Edit Screen is displayed, the current position is displayed at the current position display. Following is an example showing how to change this display to an error (deviation) pulse display.

1) Switch to the menu cursor using the Tab Key.

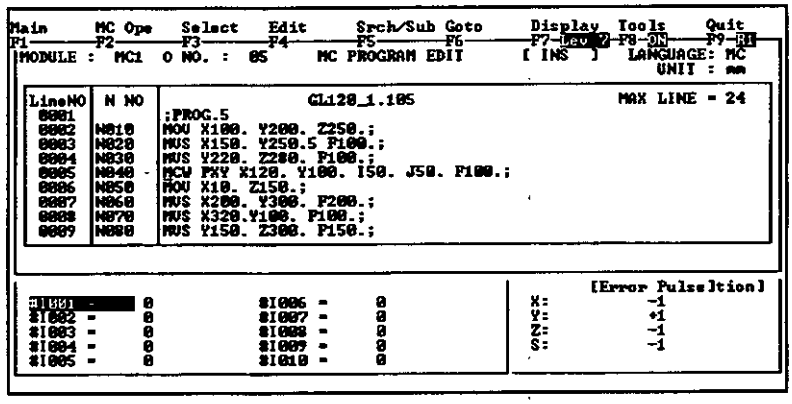
2) Select **Data** from the Display Menu using the Cursor Keys and press the Enter Key.



3) A submenu will be displayed. Select **Error Pulse** using the Down Cursor Key and press the Enter Key.



The current position display will switch to the error pulse display.



13.5 Displaying Variables

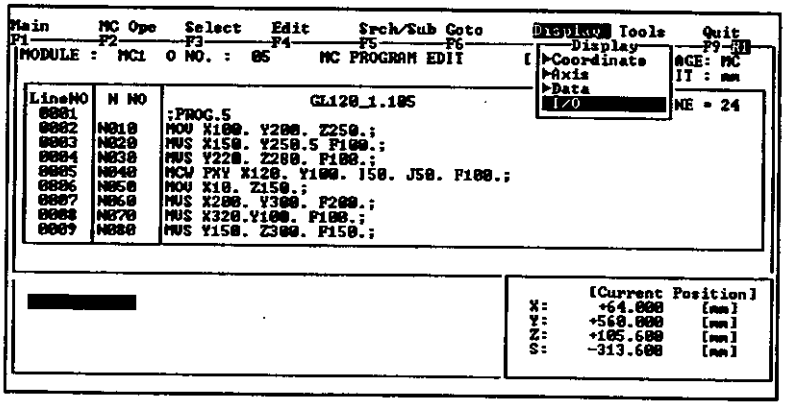
This section describes the procedures used to display and change the data for the Motion Module I/O and other variables.

13.5.1 Displaying References

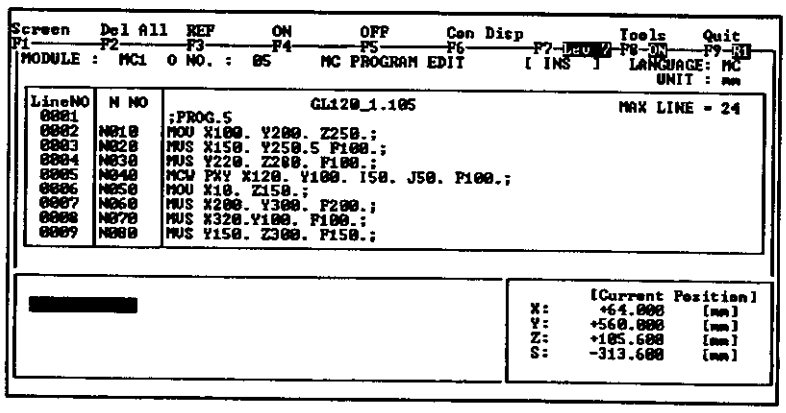
Use the following procedures to display Motion Module I/O and other variables.

1) Switch to the menu cursor using the Tab Key.

2) Select **I/O** from the Display Menu using the Cursor Keys and press the Enter Key.

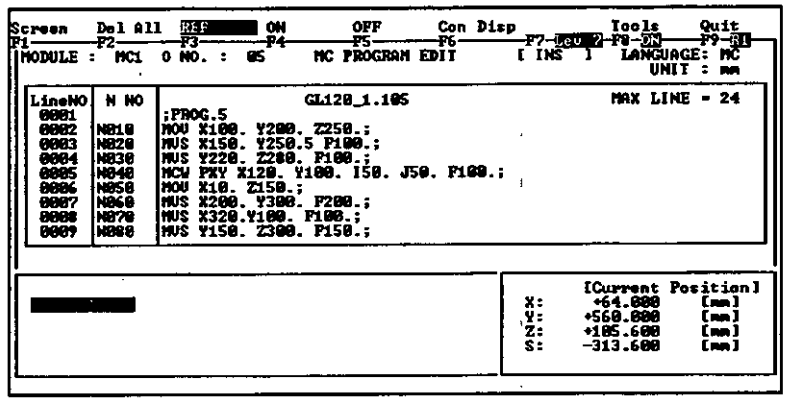


3) Move the cursor to the variable display area. Move the cursor to the data to be displayed using the Cursor Keys.

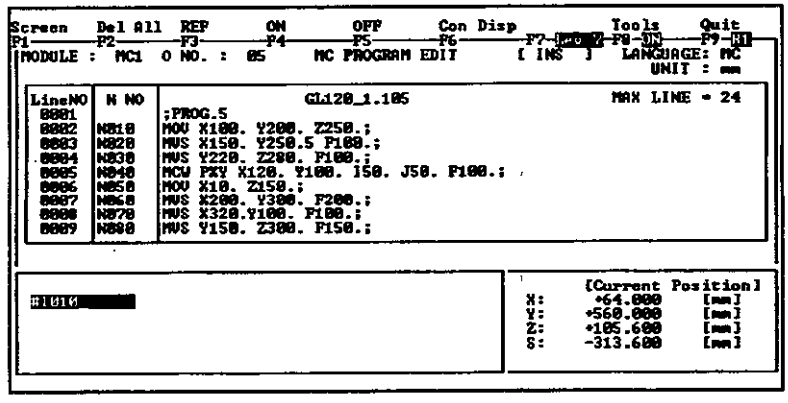


4) Switch to the menu cursor using the Tab Key.

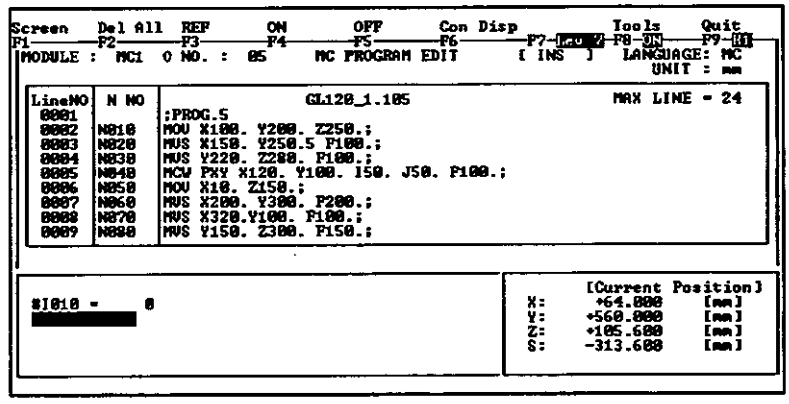
5) Select **REF** using the Right Cursor Key and press the Enter Key.



6) Enter the reference number (**#I010** in this example) and press the Enter Key.



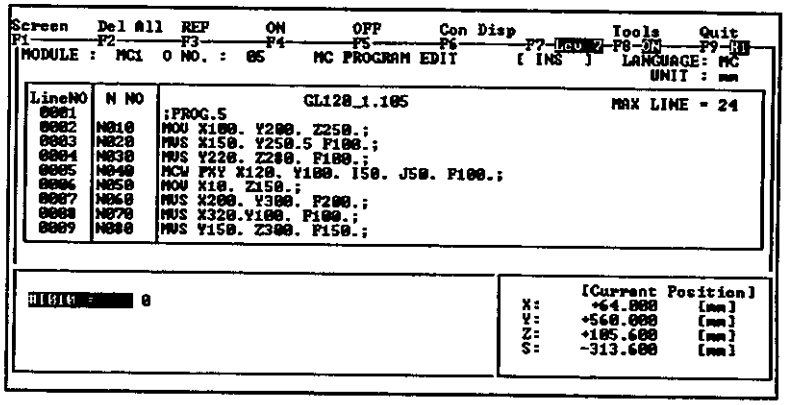
The reference number and data for the variable **#I010** will be displayed.



13.5.2 Continuous Display

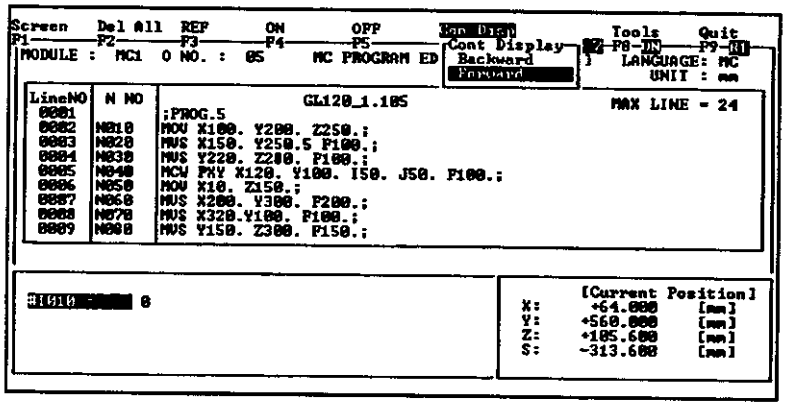
The Continuous Display operation is used to display the reference numbers before and after the one currently being displayed. The following example shows how to display the reference number after the one currently being displayed.

1) Move the cursor to the position of the reference number for continuous display using the Cursor Keys.

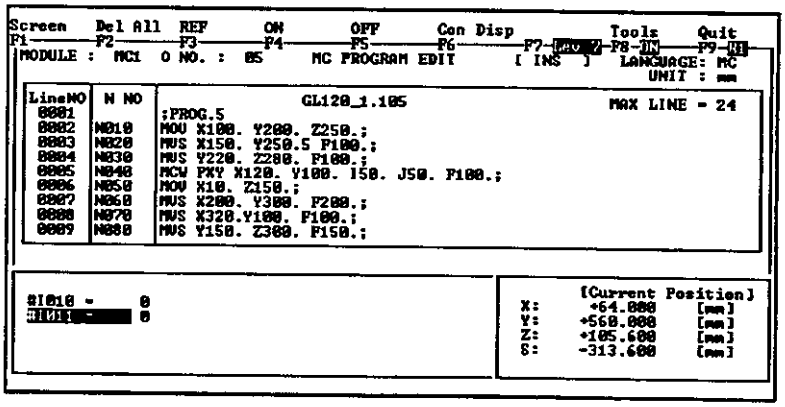


2) Switch to the menu cursor using the Tab Key.

3) Select **Forward** from the Continuous Display Menu using the Cursor Keys and press the Enter Key.



The reference number at the cursor position will be increased by 1, and the original reference and the new reference will be displayed in succession.

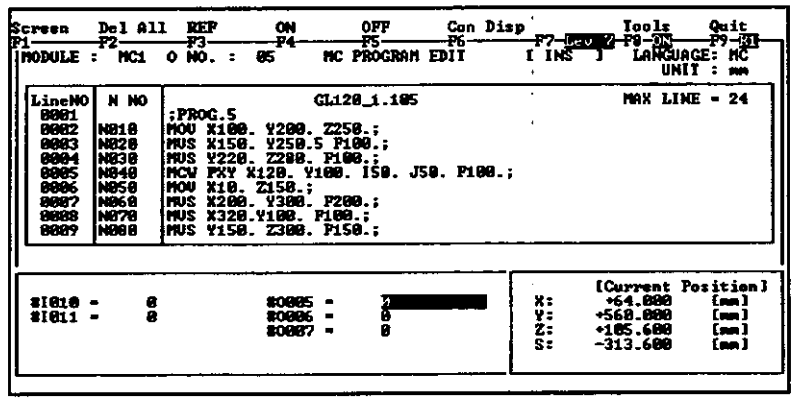


The same procedure can be repeated to display reference numbers in succession.

13.5.3 Changing Data

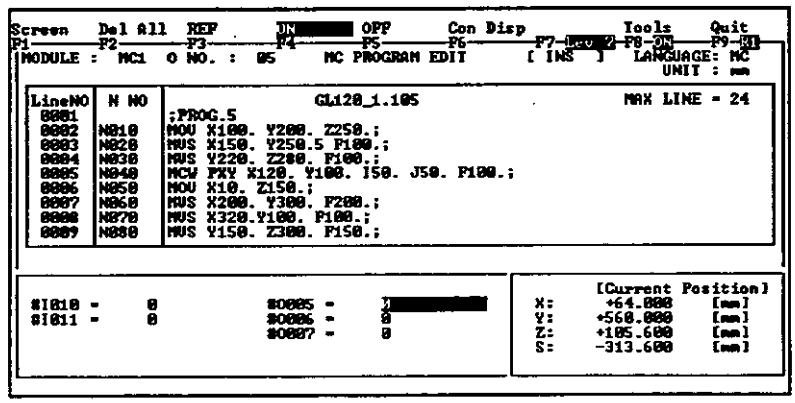
It is possible to change the values of Motion Module I/O output and other variables. The following example shows how to change the data for reference number #O005 from OFF to ON.

1) Move the cursor to the position of the reference number to be changed using the Cursor Keys.

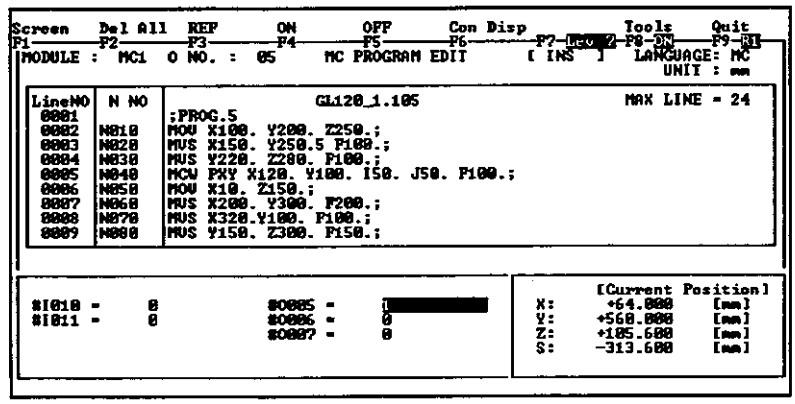


2) Switch to the menu cursor using the Tab Key.

3) Select **ON** using the Right Cursor Key and press the Enter Key.



The data for reference number #O005 is turned ON and the display will change to 1.



INFO The variables that can be changed in this area are the output variables, the link output variables, the common variables, and the H variables. Modifying the value of variables other than the output variables is done by entering the new value directly. For more detailed information on variables, refer to the *Motion Module MC20 Software User's Manual (SIEZ-C825-20.52).*

13.5.4 Switching Screens

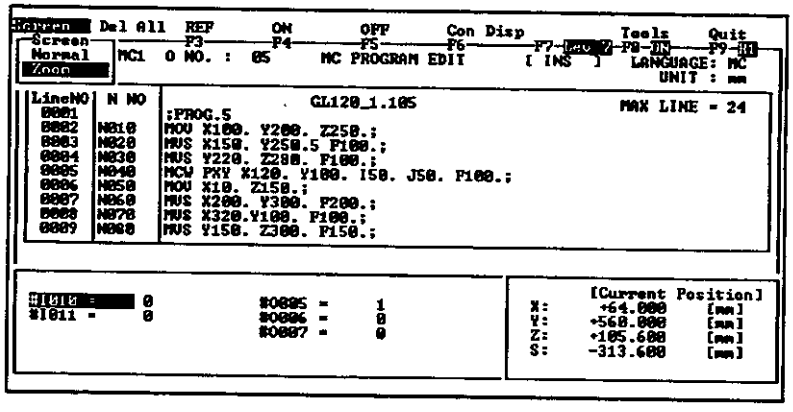
To display a large number of MC variables, the display area can be enlarged. The differences between the two display modes are as follows:

- Normal Mode: Displays motion programs, variables, and current position.
- Zoom Mode: Displays variables and current position.

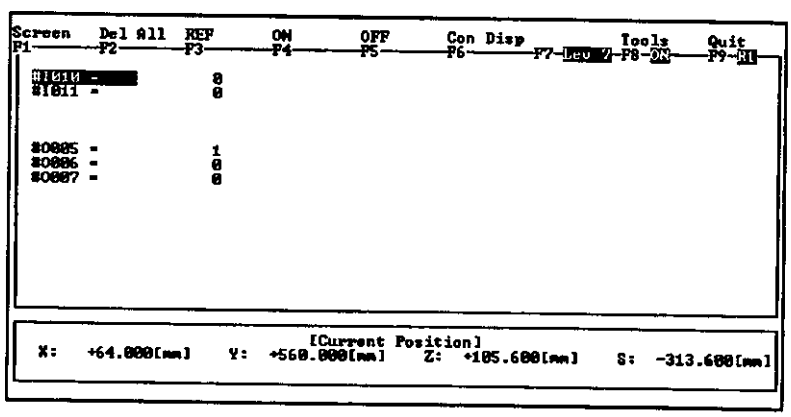
The following example shows how to switch to Zoom Mode.

1) Switch to the menu cursor using the Tab Key.

2) Select **Zoom** from the Screen Menu using the Cursor Keys and press the Enter Key.



The screen will switch to Zoom Mode.

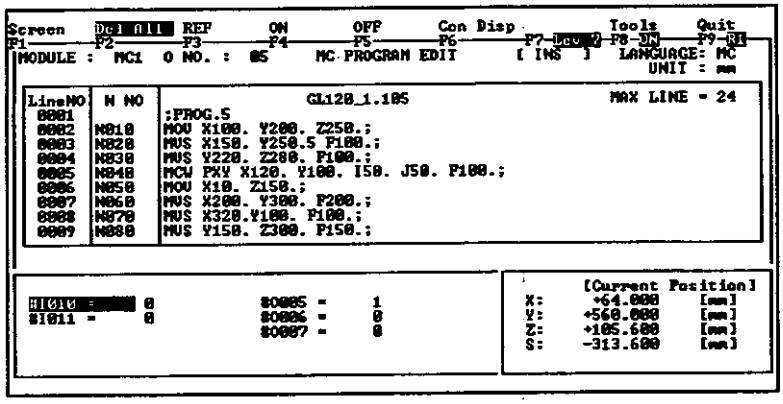


13.5.5 Delete Screen

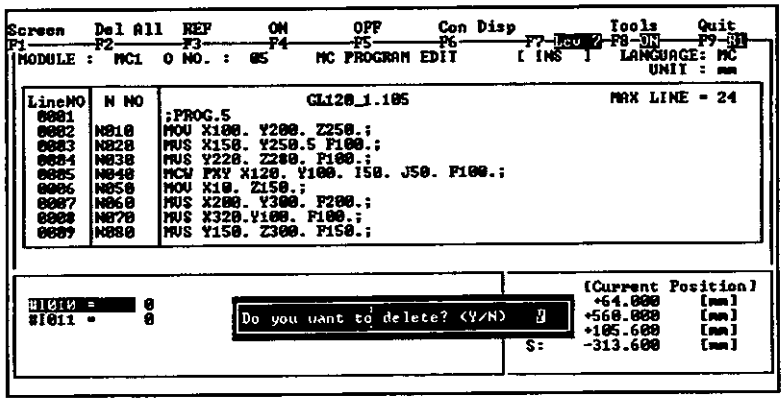
All the currently displayed reference numbers and data can be deleted. Use this operation to refresh the Variables Display Screen.

1) Switch to the menu cursor using the Tab Key.

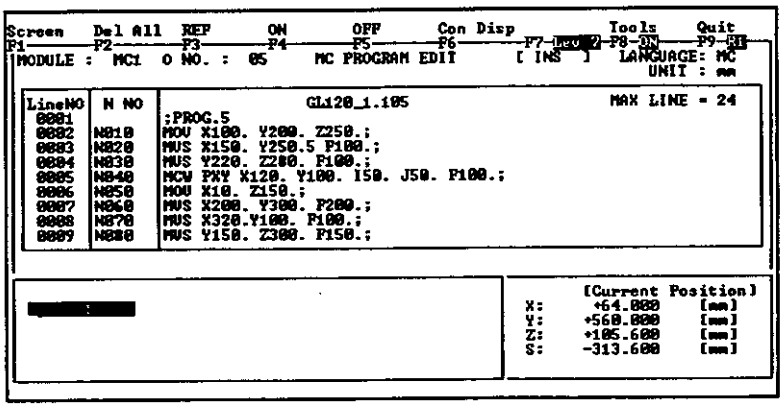
2) Select **Del All** using the Cursor Keys and press the Enter Key.



3) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The Variables Display Screen will be refreshed.



Editing Motion Parameters

14

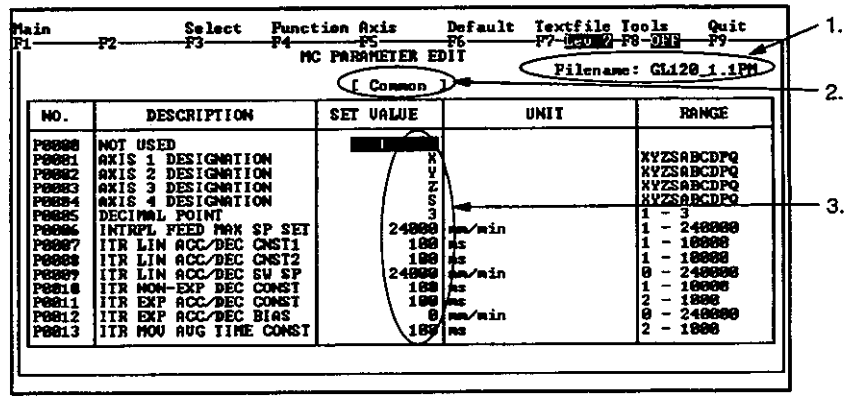
This chapter describes procedures for editing motion parameters, and other motion parameter operations such as writing data to a text file.

14.1 Overview

This section describes the configuration of the screen for editing motion parameters and basic input operations.

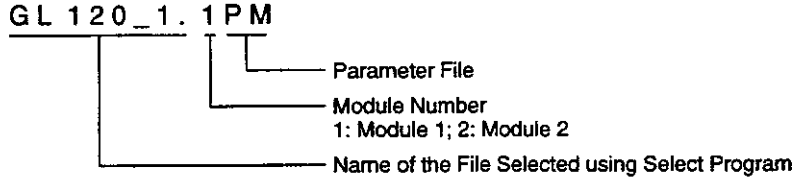
14.1.1 Motion Module Parameter Edit Screen

Select **Parameter** from the Motion Submenu of the Main Menu. The MC Parameter Edit Screen will be displayed.



1. File/Module Name

When operating in Offline Mode, the file name of the currently displayed parameters is shown. The configuration of the file name is as follows:



While in Online or Debug Mode, the currently selected Motion Module is displayed as MC1 or MC2.

2. Parameter Type

The type of parameter currently being displayed is shown. The following five types of parameters can be displayed.

- Common: Parameters common to the Module.
- 1 Axis: Parameters for the first axis.
- 2 Axis: Parameters for the second axis.
- 3 Axis: Parameters for the third axis.
- 4 Axis: Parameters for the fourth axis.

3. Parameter Data

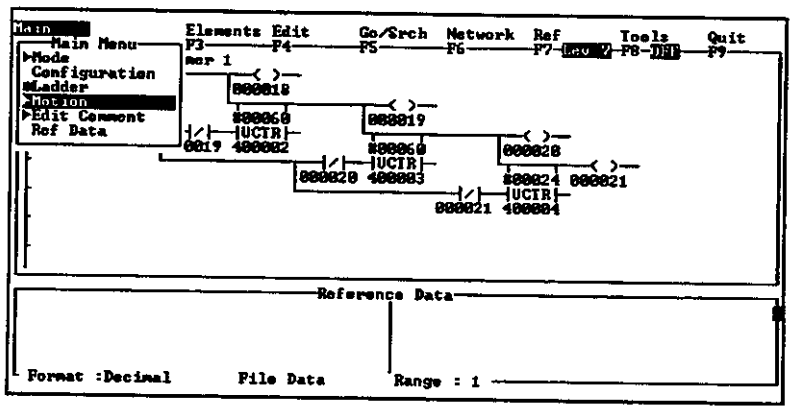
The parameter data that has been entered is displayed.

14.1.2 Displaying the Motion Module Parameter Edit Screen

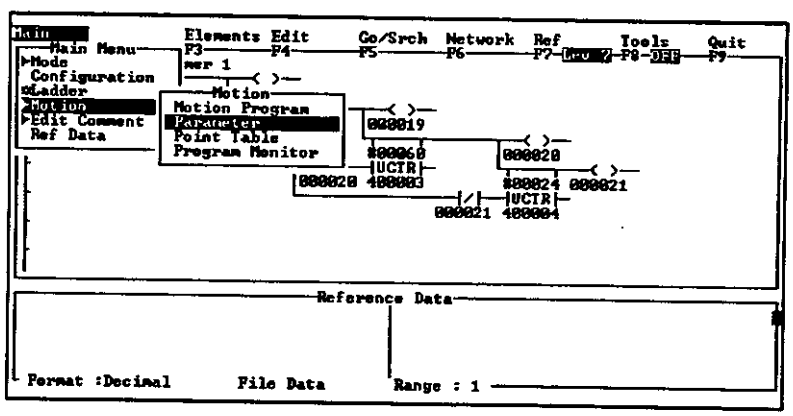
The MC Parameter Edit Screen is displayed by selecting **Parameter** from the Motion Submenu of the Main Menu. The following example shows the procedure used to display the screen from the Ladder Editor Screen.

1) Switch to the menu cursor using the Tab Key.

2) Select **Motion** from the Main Menu using the Cursor Keys and press the Enter Key.



3) Select **Parameter** from the Motion Submenu using the Down Cursor Key and press the Enter Key.



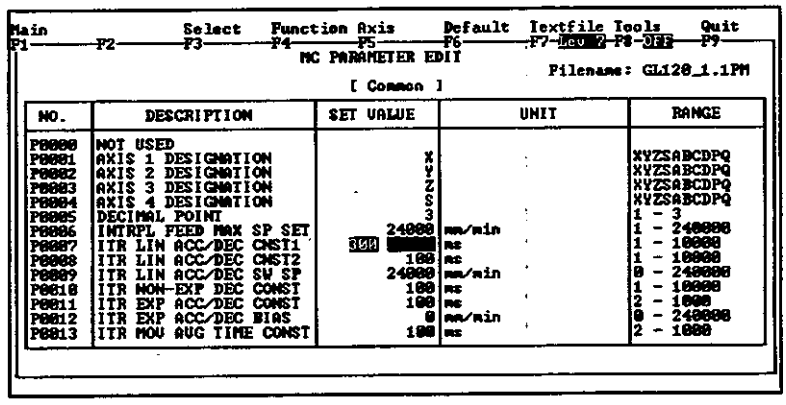
The MC Parameter Edit Screen will be displayed.

14.1.3 Basic Input Procedures

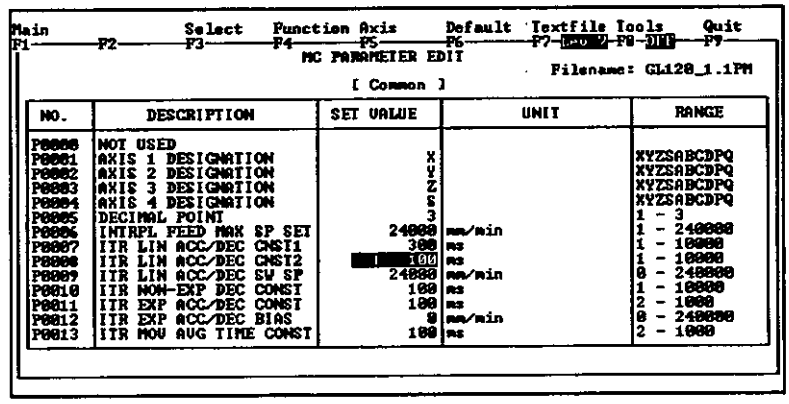
Parameter data is input by moving the cursor to the position of the parameter to be changed and entering the data.

1) Move the cursor to the position of the parameter to be modified using the Cursor Keys.

2) Enter the data (**300** in this example) and press the Enter Key.



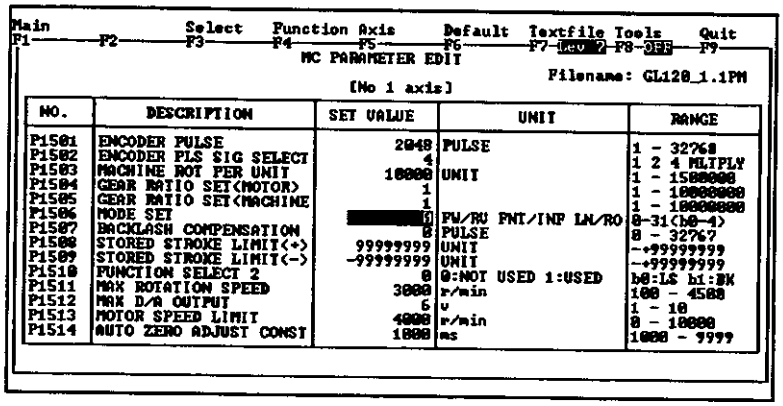
The input will be confirmed and the cursor will move to the next line down.



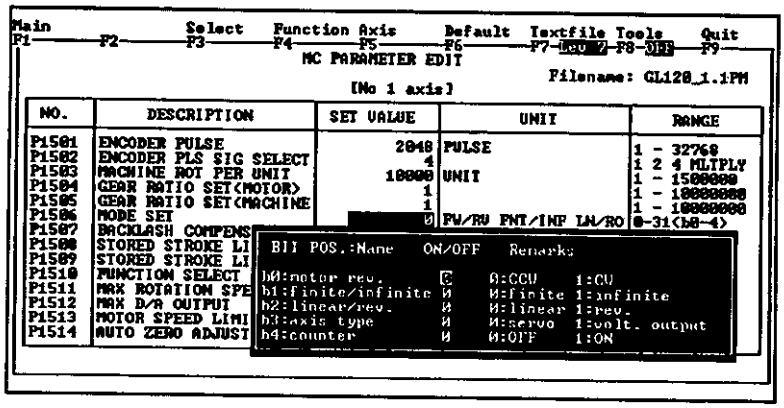
In addition to the Enter Key, the Up and Down Cursor Keys can also be used to confirm the input. For example, after entering the parameter data for P0006 and pressing the Up Cursor Key, the data for P0006 will be changed and the Up Cursor Key will move to the position of P0005.

Bit parameters can be set using the bit setting screen.

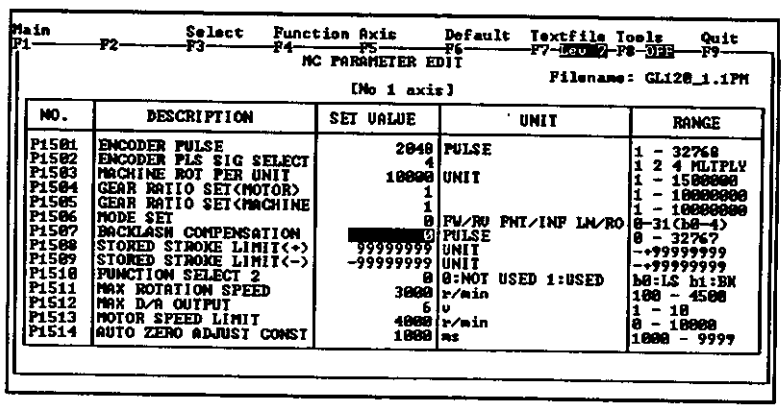
1) Move the cursor to the position of the bit parameter using the Cursor Keys and press the Enter Key.



2) The bit setting window will be displayed. Move the cursor to the position of the parameter to be modified using the Cursor Keys. Enter **0** or **1** and press the Enter Key.

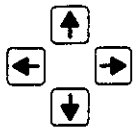


3) Now move the cursor to the last line. Press the Enter Key to confirm the input, and the bit parameter editing will be complete.



INFO When naming axes, two axes cannot be specified by the same name. If, for example, the initial settings are X, Y, Z, and S, and if these are to be changed to S, Z, Y, and X, two S's will occur when X is changed to S, resulting in an error. In such a case, it is better to change all the axes' names to "–" before setting them.

The following is a summary of the keys used to edit parameters.

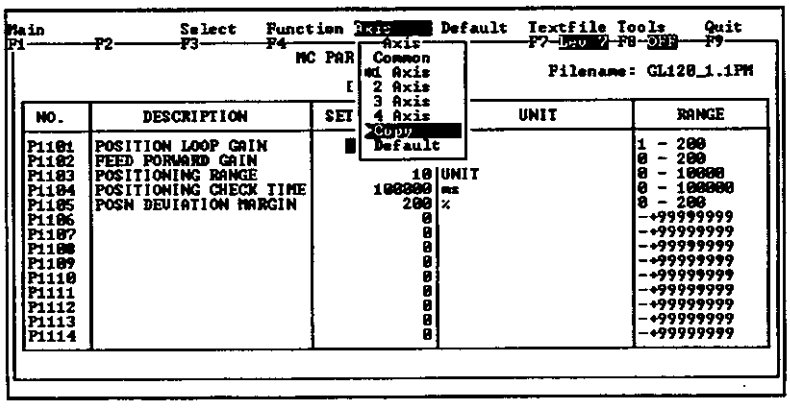
	Move the cursor around when no data has been entered. If the Up and Down Cursor Keys are pressed when numerical values have been entered, the input of the data is confirmed and the cursor moves to the next line.
	Confirms the input of data and moves the cursor to the location of the next parameter one line down. If it is pressed when no data has been entered, the cursor simply moves one line down.
ESC	Cancels input if pressed while data is in the process of being entered. As a result, the previous data before the input is displayed. If this key is pressed when no data has been entered, the program exits parameter editing.
PgUp	Displays the previous 14 lines of data before the currently displayed parameter data.
PgDn	Displays the next 14 lines of data after the currently displayed parameter data.
HOME	Moves the cursor to the top of the currently displayed parameter types. As a result, the common parameters are displayed, from P0000 to P0013, with the cursor at the location of P0000.
END	Moves the cursor to the end of the currently displayed parameter types. As each parameter has a reserved area, parameters that do not basically have to be set are displayed.

14.1.4 Copying Parameter Data

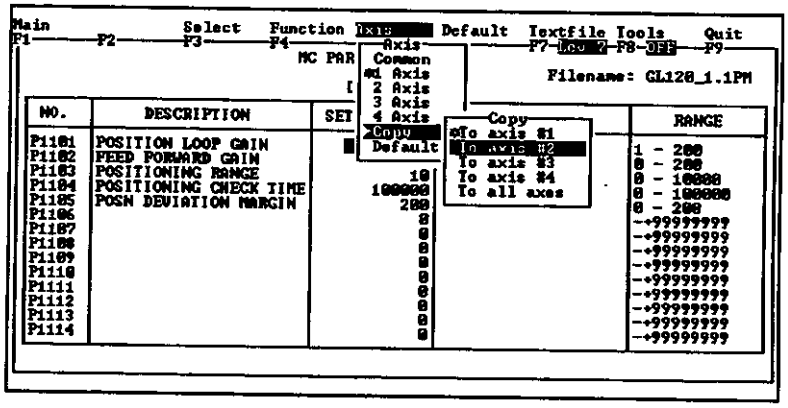
The parameter data for one axis can be copied to another axis. The following example shows how to copy parameter data from the 1 axis to the 2 axis.

1) With the parameter data for the 1 axis displayed, switch to the menu cursor using the Tab Key.

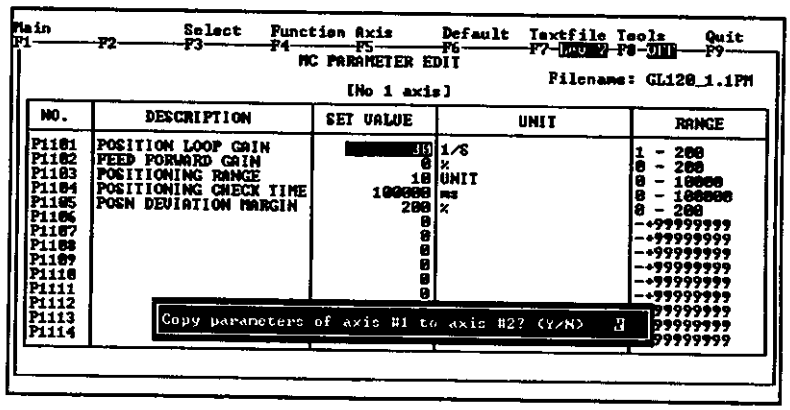
2) Select **Copy** from the Axis Menu using the Cursor Keys and press the Enter Key.



3) A submenu will be displayed for selecting the copy destination. Select **To axis #2** using the Cursor Keys and press the Enter Key.



4) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The parameter data will be copied.

INFO

1) The Copy operation will not work if the common parameter data is displayed. Make sure to switch to the display of the axis set with the data to be copied before performing the Copy operation.

2) See section *14.2 Changing the Display* for details on how to switch to display the axis.

14.2 Changing the Display

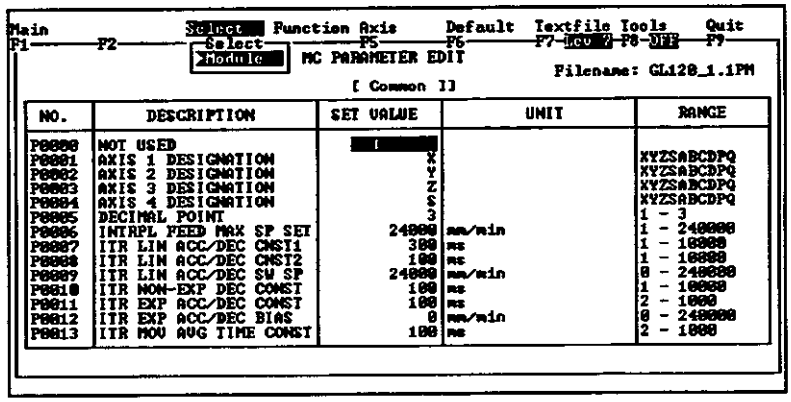
This section describes changing the parameters being displayed, such as switching the Module or the axis.

14.2.1 Changing the Module

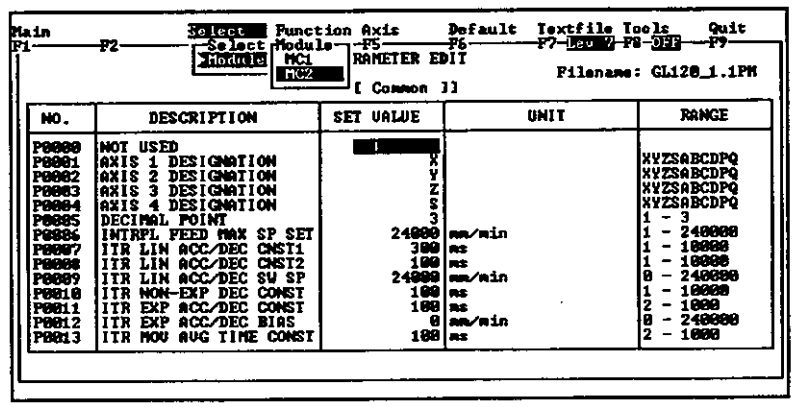
This operation changes the Motion Module. The following example shows the procedure used to switch from Module 1 to Module 2.

1) Switch to the menu cursor using the Tab Key.

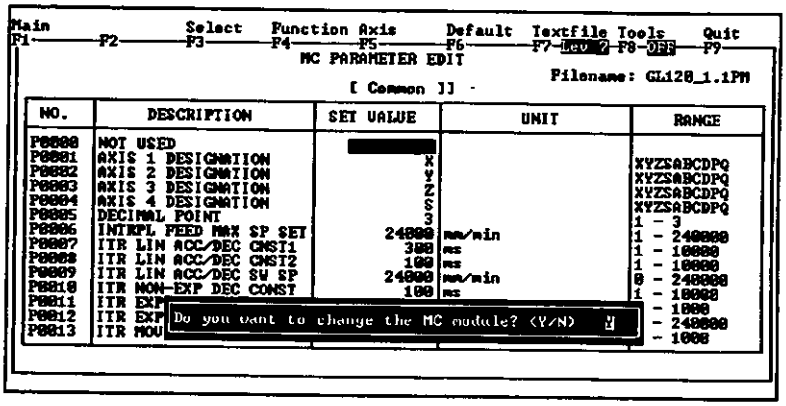
2) Select **Module** from the Select Menu using the Cursor Keys and press the Enter Key.



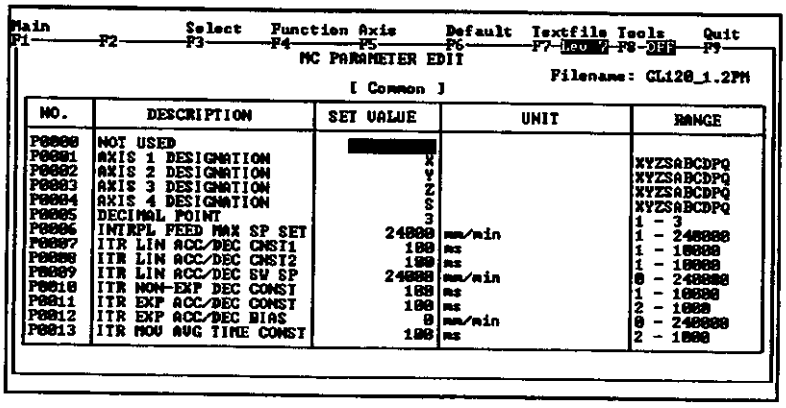
3) A submenu will be displayed. Select **MC2** using the Cursor Keys and press the Enter Key.



4) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The parameter data for Module 2 will be displayed.



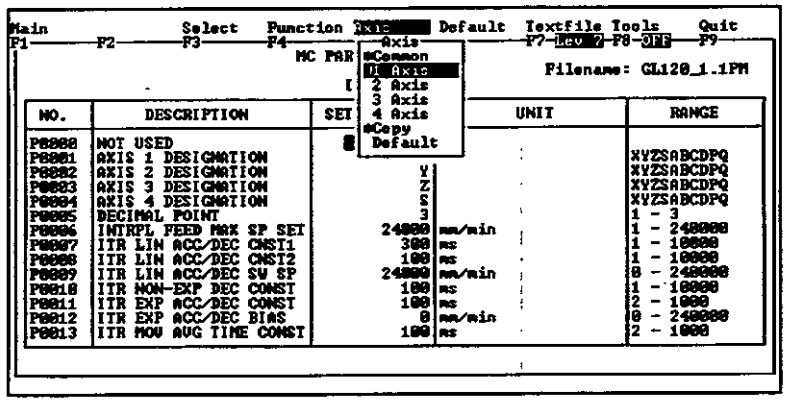
INFO When the changes to the currently displayed parameters have been made, a message will be displayed asking whether to save the edited data. To save the data, enter **Y** and press the Enter Key.

14.2.2 Switching the Axes

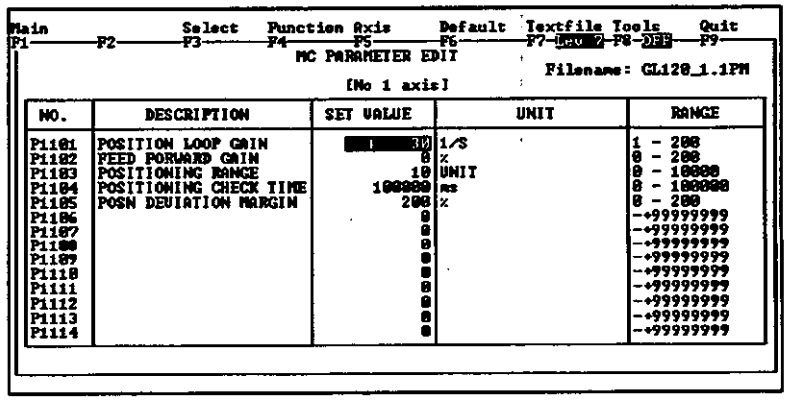
Parameters can be classified into the following groups: Parameters common to all axes and parameters for each of axes 1 to 4. The following example shows how to switch common parameters to parameters for the 1 axis.

1) Switch to the menu cursor using the Tab Key.

2) Select **1 Axis** from the Axis Menu using the Cursor Keys and press the Enter Key.



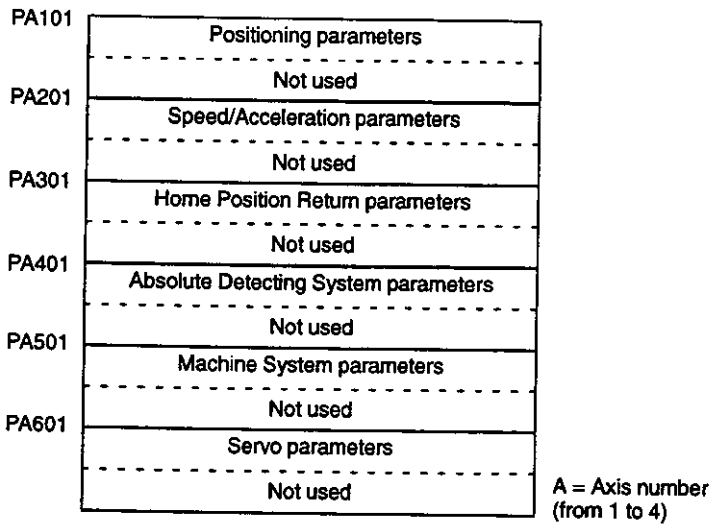
The parameter data for the 1 axis will be displayed.



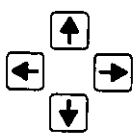
If, for example, **2 Axis** is chosen from the Axis Menu, while displaying the 1 axis parameters, the same parameters as for 1 axis will be displayed. For example, if the parameters for P1201 (velocity, acceleration) on the 1 axis are being displayed, the parameters from P2201 will be displayed for the 2 axis.

14.2.3 Switching Functions

The parameter data for each axis is broken down by function, as shown below.



The following keys can be used to change screens.



Move the cursor around. When the cursor is on the last line, the screen scrolls to the next parameter.

PgUp — Displays the next 14 parameters after the parameters currently shown.

PgDn — Displays the previous 14 parameters before the parameters currently shown.

CTRL + **PgUp** — Displays the next function after the currently displayed function from the first line. For example, if the Homing parameters are currently being displayed, using these keys will change the display to the Absolute Detecting System parameters.

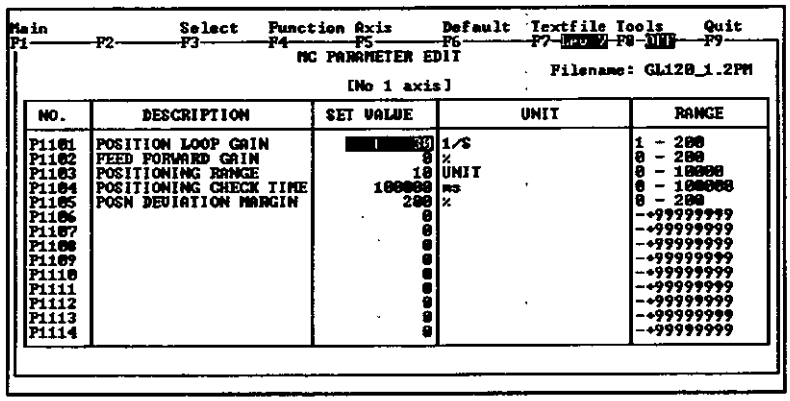
CTRL + **PgDn** — Displays the previous function before the currently displayed function from the first line.

HOME — Displays from the first parameter (PA101) onwards. It can also be used to display the Positioning parameters.

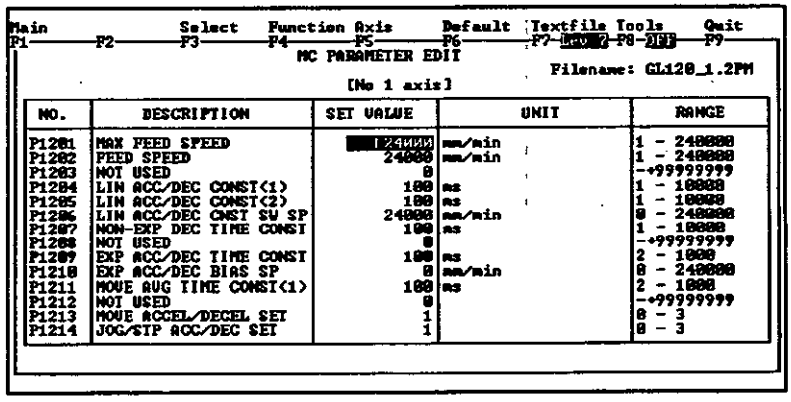
END — Displays the last parameter. Therefore it can also be used to display the Servo parameters.

The following example shows how to use the Ctrl + Page Down Key.

Display the Position parameters for the 1 axis. Press the Ctrl + Page Down Key.



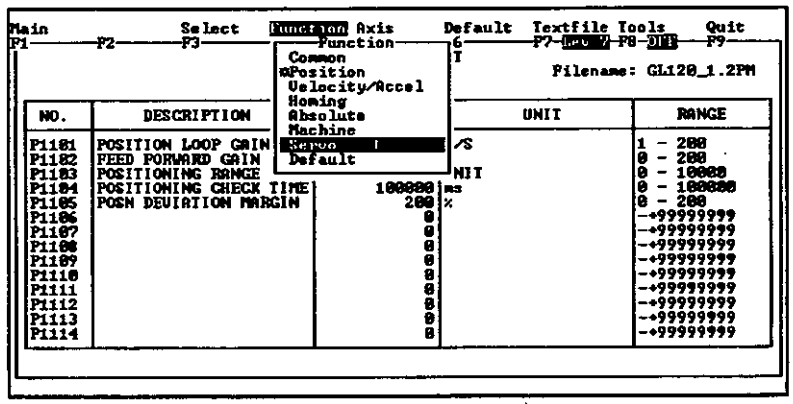
The Speed/Acceleration parameter will be displayed.



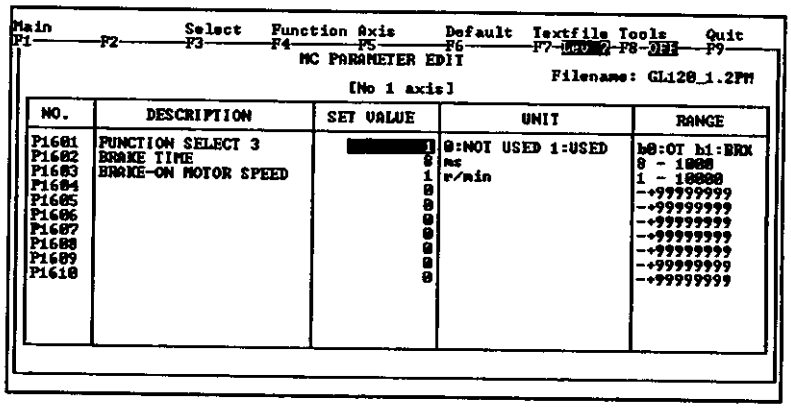
In addition to switching the function using keyboard commands, the function can be switched from the menus. The following example shows how to switch from the Positioning parameters to the Servo parameters.

1) Switch to the menu cursor using the Tab Key.

2) Select **Servo** from the Function Menu using the Cursor Keys and press the Enter Key.



The Servo parameters will be displayed.



14.3 Setting Default Parameters

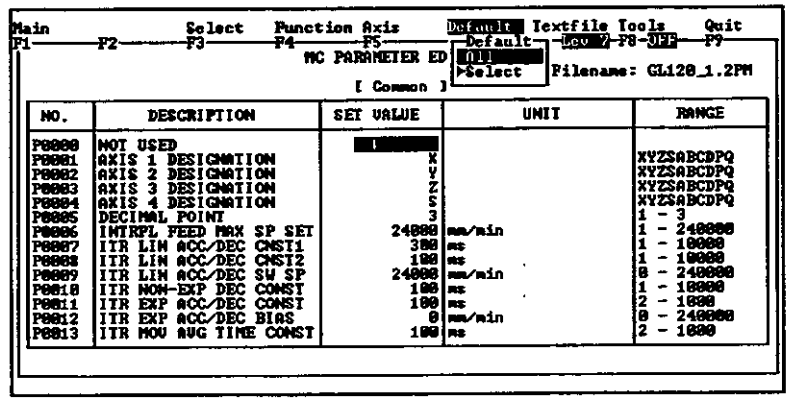
This section describes the procedure for returning parameters to their default settings while in Offline Mode.

14.3.1 Initializing All Parameters

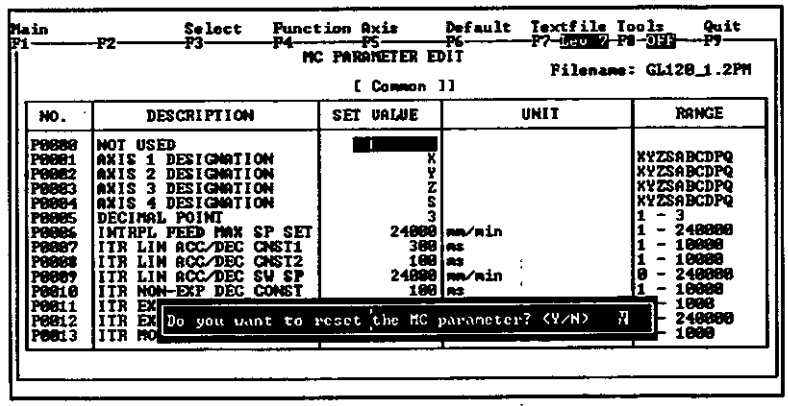
While in Offline Mode, use the following procedure to return the parameters for all the currently selected Modules to their default settings.

1) Switch to the menu cursor using the Tab Key.

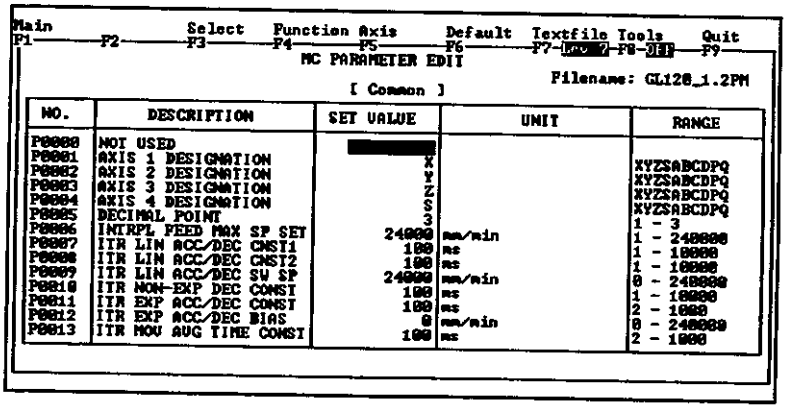
2) Select **All** from the Default Menu using the Cursor Keys and press the Enter Key.



3) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



4) Module 2 is used in this example, so all the parameter data in Module 2 will be returned to the default settings.



NO.	DESCRIPTION	SET VALUE	UNIT	RANGE
P0000	NOT USED			
P0001	AXIS 1 DESIGNATION	X		XYZSABCDPQ
P0002	AXIS 2 DESIGNATION	Y		XYZSABCDPQ
P0003	AXIS 3 DESIGNATION	Z		XYZSABCDPQ
P0004	AXIS 4 DESIGNATION	S		XYZSABCDPQ
P0005	DECIMAL POINT	3		1 - 3
P0006	INTRPL FEED MAX SP SET	24000	mm/min	1 - 240000
P0007	ITR LIN ACC/DEC CNST1	100	ms	1 - 10000
P0008	ITR LIN ACC/DEC CNST2	100	ms	1 - 10000
P0009	ITR LIN ACC/DEC SV SP	24000	mm/min	0 - 240000
P0010	ITR NON-EXP DEC CONST	100	ms	1 - 10000
P0011	ITR EXP ACC/DEC CONST	100	ms	2 - 1000
P0012	ITR EXP ACC/DEC BIAS	0	mm/min	0 - 240000
P0013	ITR MOV AVG TIME CONST	100	ms	2 - 1000

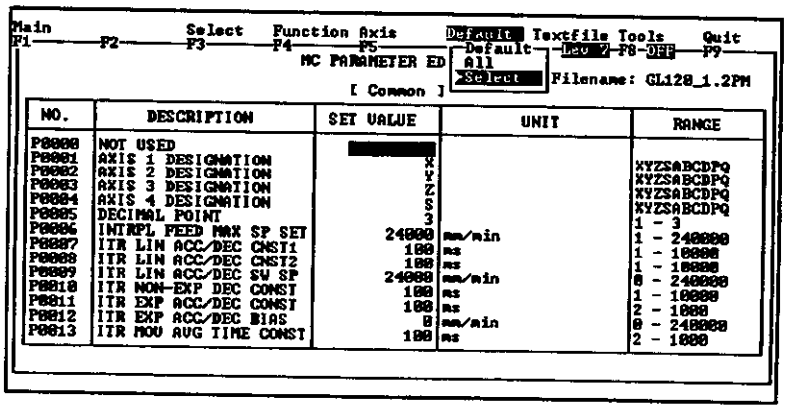
INFO Parameters can also be returned to their default settings while in Offline or Debug Mode using the MC Ope Menu. See section *13.2 Motion Module Operations* for further details.

14.3.2 Initializing Selected Parameters

Each axis can be initialized separately to return the parameters for them to their default settings while in Offline Mode. The example below shows the procedure used to initialize the parameters of a single axis.

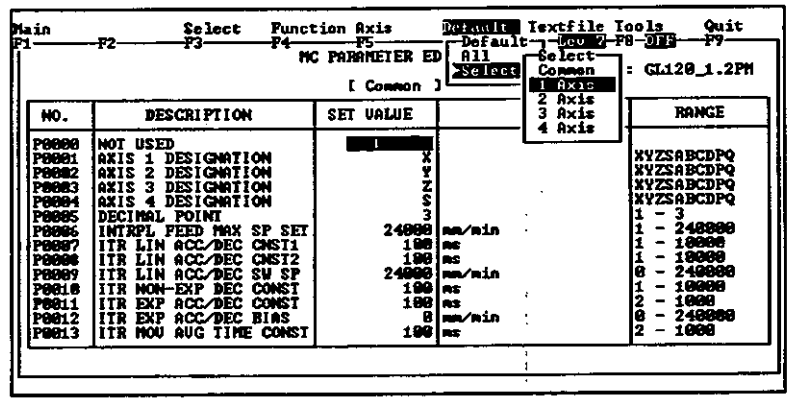
1) Switch to the menu cursor using the Tab Key.

2) Choose **Select** from the Default Menu using the Cursor Keys and press the Enter Key.



NO.	DESCRIPTION	SET VALUE	UNIT	RANGE
P0000	NOT USED			
P0001	AXIS 1 DESIGNATION	X		XYZSABCDPQ
P0002	AXIS 2 DESIGNATION	Y		XYZSABCDPQ
P0003	AXIS 3 DESIGNATION	Z		XYZSABCDPQ
P0004	AXIS 4 DESIGNATION	S		XYZSABCDPQ
P0005	DECIMAL POINT	3		1 - 3
P0006	INTRPL FEED MAX SP SET	24000	mm/min	1 - 240000
P0007	ITR LIN ACC/DEC CNST1	100	ms	1 - 10000
P0008	ITR LIN ACC/DEC CNST2	100	ms	1 - 10000
P0009	ITR LIN ACC/DEC SV SP	24000	mm/min	0 - 240000
P0010	ITR NON-EXP DEC CONST	100	ms	1 - 10000
P0011	ITR EXP ACC/DEC CONST	100	ms	2 - 1000
P0012	ITR EXP ACC/DEC BIAS	0	mm/min	0 - 240000
P0013	ITR MOV AVG TIME CONST	100	ms	2 - 1000

3) A submenu will be displayed. Select **1 Axis** using the Down Cursor Key and press the Enter Key.



Module 2 was selected in this example, so only the Module 2 parameter data for the 1 axis will be initialized.

INFO

1) Initialization of parameters for a single Module and axis is not possible in Offline or Debug Mode.

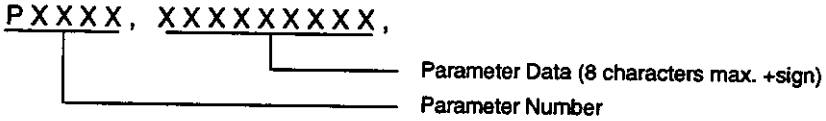
2) Parameters can also be initialized for a single Module and axis by displaying the parameter data for the axis to be initialized, and selecting **Default** from the Axis Menu.

14.4 Text File Operations

This section describes the procedures used to write parameter data to a text file and read a file created on a standard text editor.

14.4.1 Text File Formats

Parameter data created on MEMOSOFT can be saved to a text file. The text file can then be edited on a standard text editor. Conversely, data created on a standard text editor can be read to MEMOSOFT as parameter data. The format of a text file is shown below.



The actual file data is as follows:

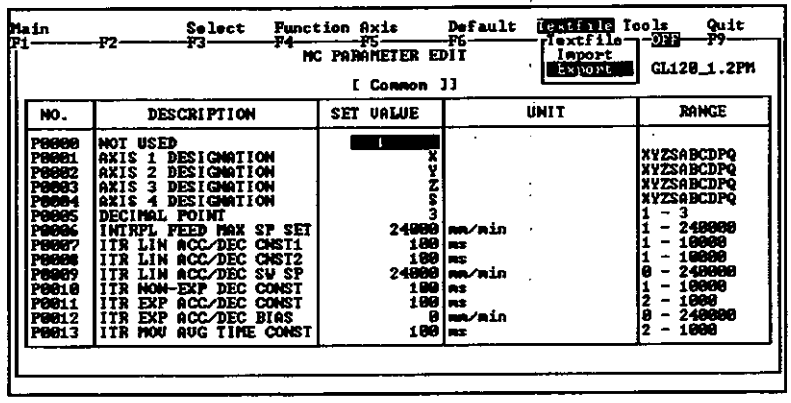
```
P0000,        DEMO,
P0001,           X,
P0002,           Y,
P0003,           Z,
P0004,           S,
P0005,           3,
P0006,       30000,
        :
        :
P4610,           0,
```

14.4.2 Exporting

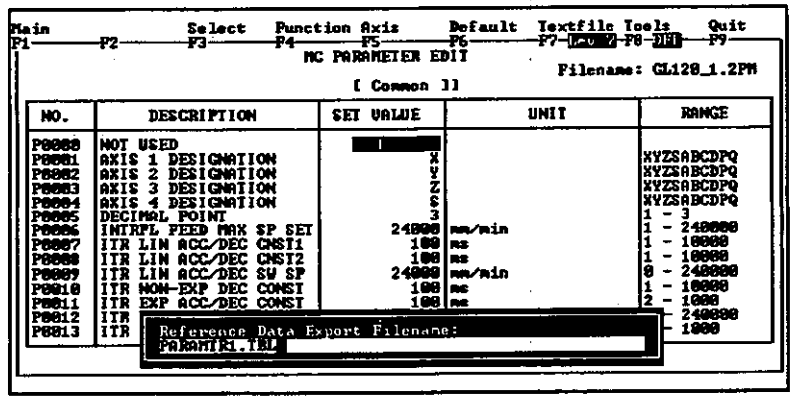
Use the following procedure to write to a text file.

1) Switch to the menu cursor using the Tab Key.

2) Select **Export** from the Textfile Menu using the Cursor Keys and press the Enter Key.



3) A window asking for the file name to be exported will be displayed. Enter the file name (**PARAMTR1.TBL** in this example) and press the Enter Key.



The parameter data will be saved as a text file with the name "PARAMTR1.TBL".

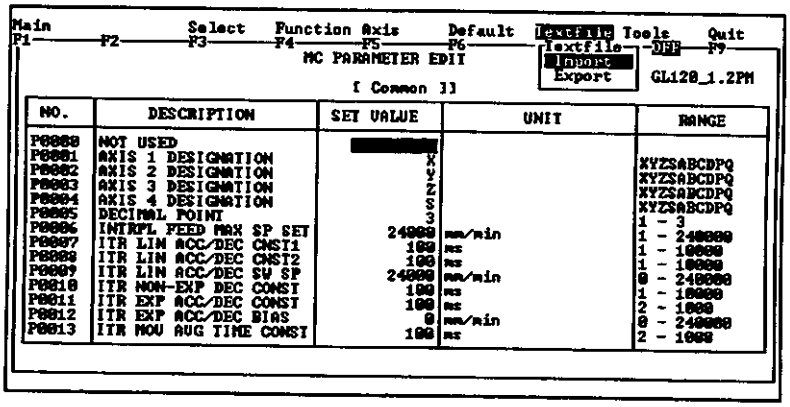
INFO The text file will be saved automatically to the default directory \FMSGL. To save to a different directory, make sure to include the desired directory path name when entering the file name. For example, enter **A:\DATA\PARA.TBL**.

14.4.3 Importing

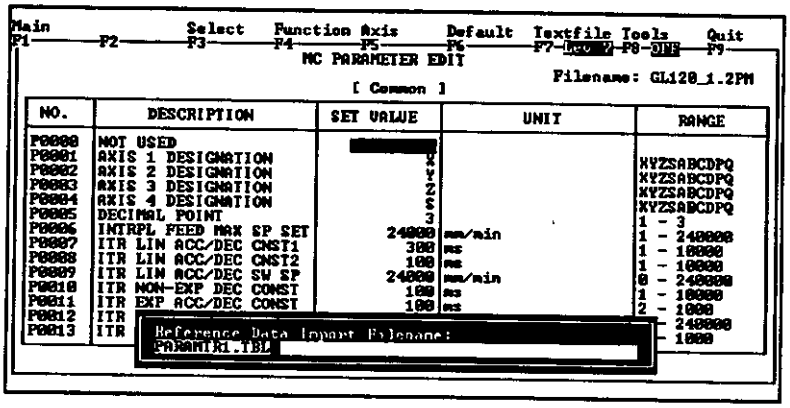
Use the following procedure to read parameter data from a text file.

1) Switch to the menu cursor using the Tab Key.

2) Select **Import** from the Textfile Menu using the Cursor Keys and press the Enter Key.



3) A window asking for the file name to be imported will be displayed. Enter the file name (**PARAMTR1.TBL** in this example) and press the Enter Key.



The data from PARAMTR1.TBL will be read as parameter data.

INFO The directory from which the text file is imported is set to \FMSGL as the default. To import from another directory, make sure to include the directory name when entering the file name. For example, enter **A:\DATA\PARA.TBL**.

Editing Point Tables

15

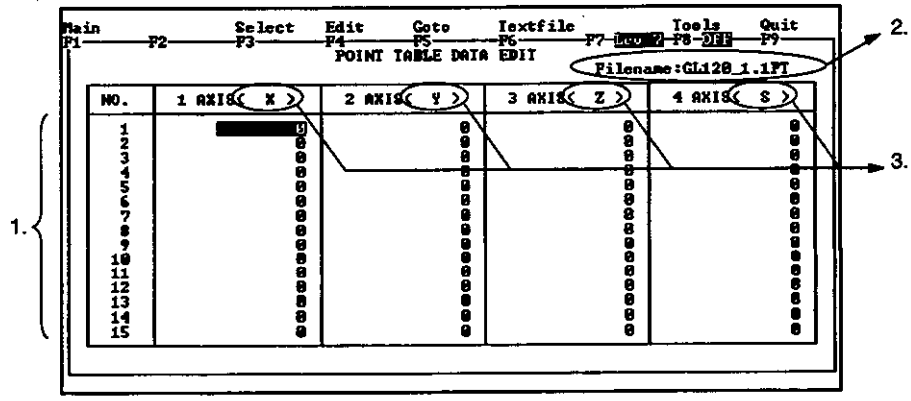
This chapter describes point table procedures such as editing a point table and writing data to a text file.

15.1 Overview

This section describes the configuration of the Point Table Data Edit Screen and basic point data input.

15.1.1 Point Table Data Edit Screen

Select **Point Table** from the Motion Submenu of the Main Menu to display the Point Table Data Edit Screen shown below.

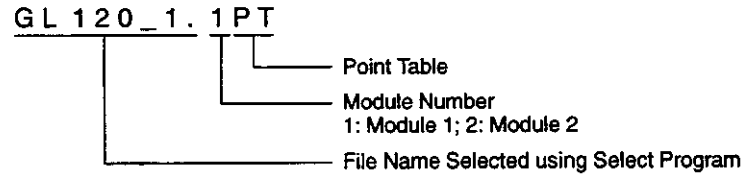


1. Editing Area

A total of 15 consecutive lines of point table data can be displayed at the same time. The cursor is used to display previous data or following data. A point data table of a maximum of 500 lines can be edited.

2. File Name

The file name is shown for the currently displayed point table. The file name configuration is as follows:



3. Axis Name

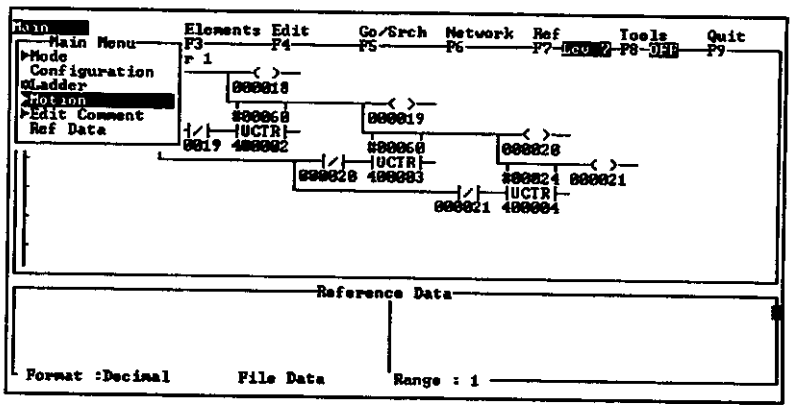
The axis name set in the parameters is displayed. If no setting has been made for the axis, the names will show "–".

15.1.2 Displaying the Point Table Data Edit Screen

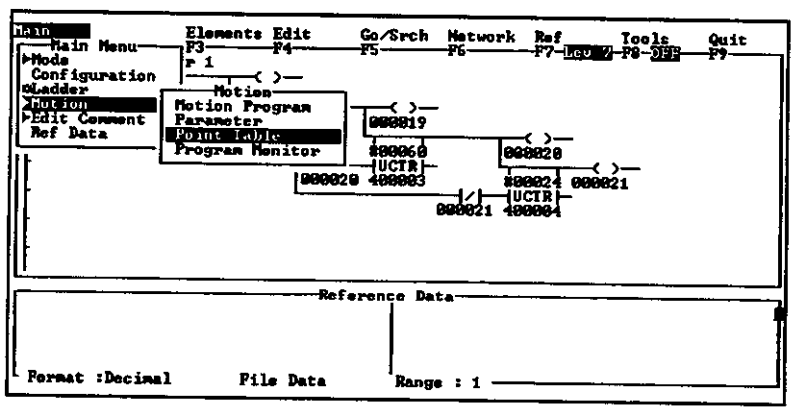
To display the Point Table Data Edit Screen, select **Point Table** from the Motion Submenu of the Main Menu. The example below shows how to start the point table from a Ladder Editor Screen.

1) Switch to the menu cursor using the Tab Key.

2) Select **Motion** from the Main Menu using the Cursor Keys and press the Enter Key.



3) Select **Point Table** from the submenu using the Down Cursor Key and press the Enter Key.



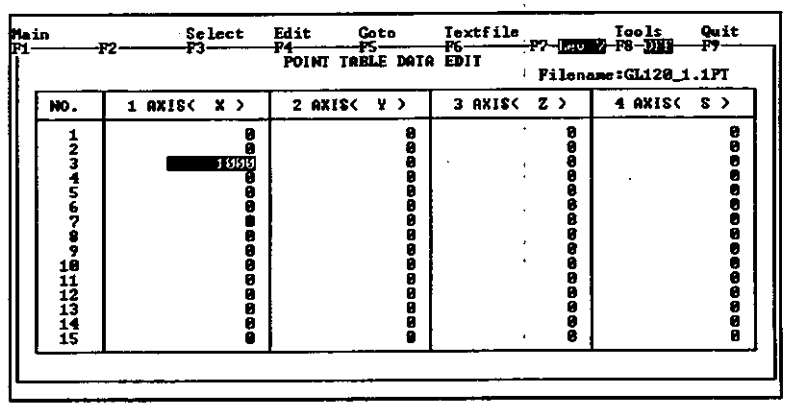
The Point Table Data Edit Screen will be displayed.

15.1.3 Basic Input Procedures

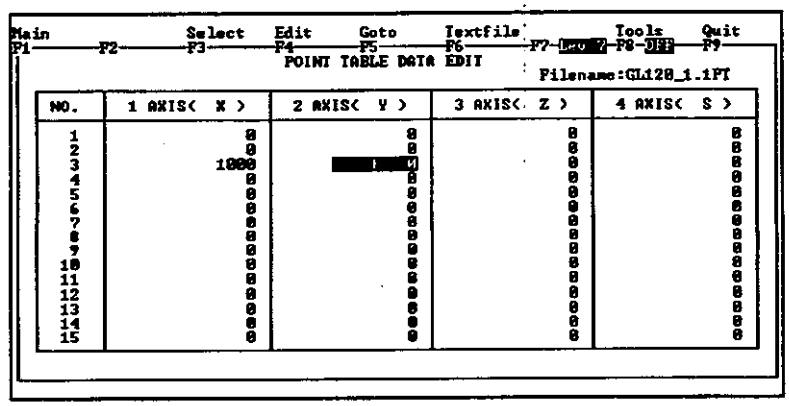
To enter point table data, move the cursor to the input position and enter the numerical values.

1) Move the cursor to the input position using the Cursor Keys.

2) Enter the numerical value (**1000** in this example) and press the Enter Key.



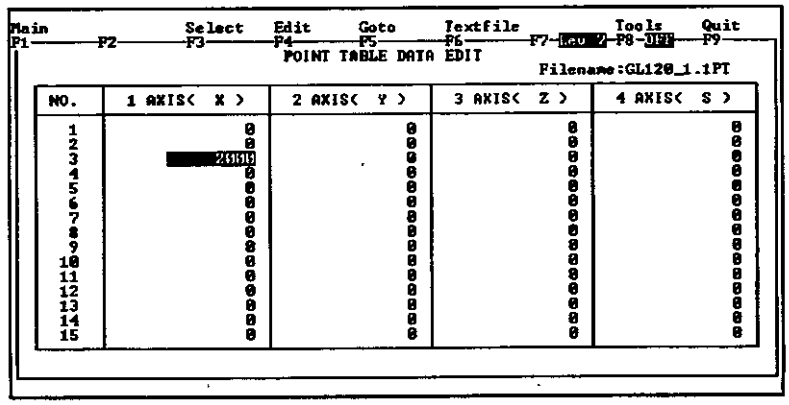
The input will be confirmed and the cursor will move to the right.



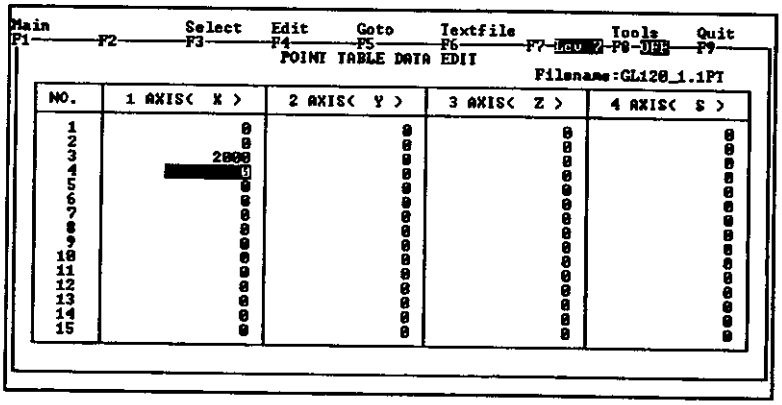
INFO In addition to using the Enter Key to confirm the input, the Up and Down Cursor Keys can also be used. This option is useful when entering point data for the 1 axis, for example. The following example shows how to enter 1 axis data continuously.

1) Move the cursor to the input position using the Cursor Keys.

2) Enter the numerical value (**2000** in this example) and press the Down Cursor Key.

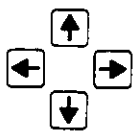


3) The cursor will move down one line. Enter the next numerical value and press the Down Cursor Key.



In this way the numerical values for the same column can be entered continuously.

The following is a summary of the keys used to edit point tables.



Move the cursor around when no numerical values have been entered. If the Up and Down Cursor Keys are pressed when numerical values have been entered, the input of the numerical values will be confirmed and the cursor will move to the next line up or down.

If the Right Cursor Key is pressed at the location of the 4 axis, the cursor moves to the 1 axis on the next line.

If the Left Cursor Key is pressed at the location of the 1 axis, the cursor moves to the 4 axis on the previous line.

Confirms the input of numerical data and moves the cursor to the column on the right. If it is pressed when no data has been entered, the cursor merely moves one column to the right. If it is pressed when the cursor is located at the 4 axis, the cursor moves to the 1 axis on the next line.

ESC

Cancels input if pressed while numerical values are in the process of being entered. The previous numerical values are then displayed. If this key is pressed when no numerical values have been entered, the program exits point table editing.

PgUp

Displays the previous 15 lines of point data before the data currently being displayed.

PgDn

Displays the next 15 lines of point data after the data currently being displayed.

HOME

Moves the cursor to the beginning of the point table (1 axis, number 1.)

END

Moves the cursor to the end of the point table (4 axis, number 500.)

15.2 Editing

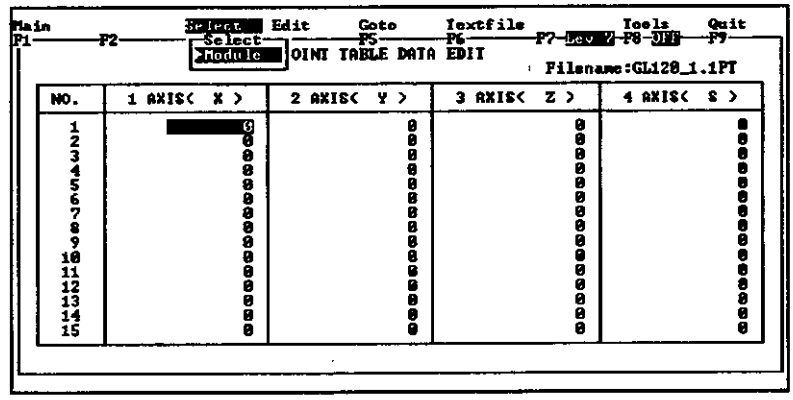
This section describes editing operations useful for editing point tables.

15.2.1 Selecting a Module

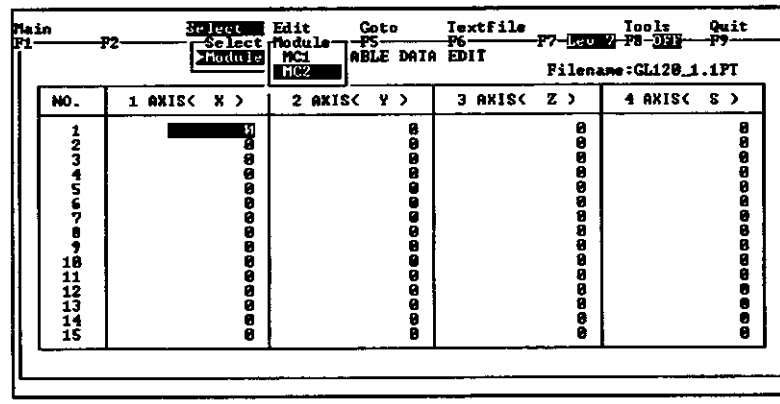
When the Point Table Data Edit Screen is displayed, the point table for MC1 is displayed. The following operation switches the Motion Module to be edited from MC1 to MC2 and back again to MC1.

1) Switch to the menu cursor using the Tab Key.

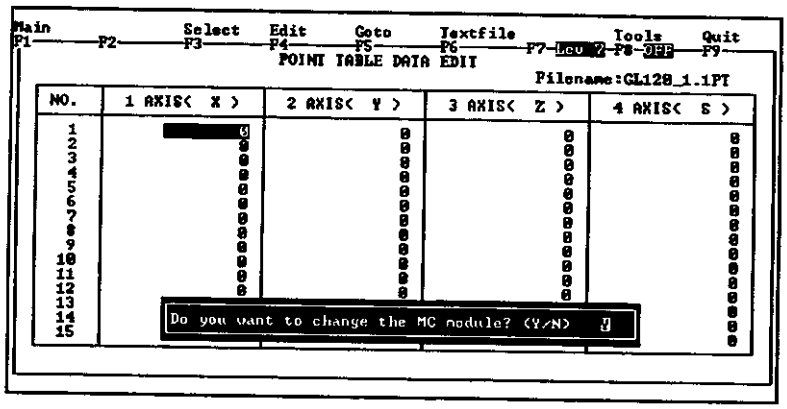
2) Select **Module** from the Select Menu using the Cursor Keys and press the Enter Key.



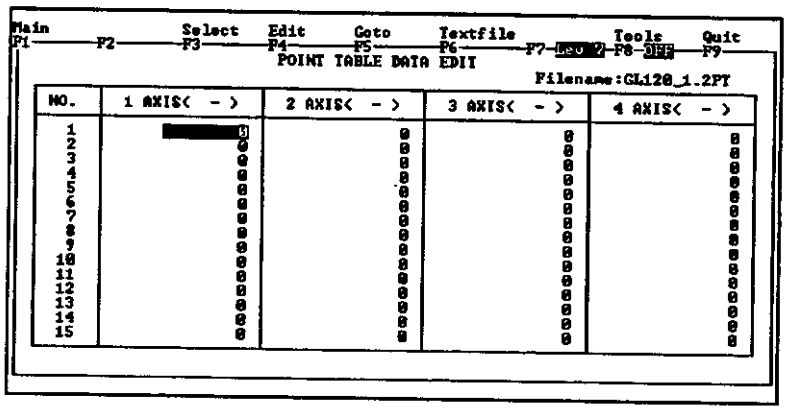
3) A submenu will be displayed. Select **MC2** using the Down Cursor Key and press the Enter Key.



4) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



The point table data for MC2 will be displayed.



INFO When the changes to the currently displayed point table have been made, a confirmation message will be displayed asking whether to save the point table data. To save the data, enter **Y** and press the Enter Key.

15.2.2 Editing Procedures

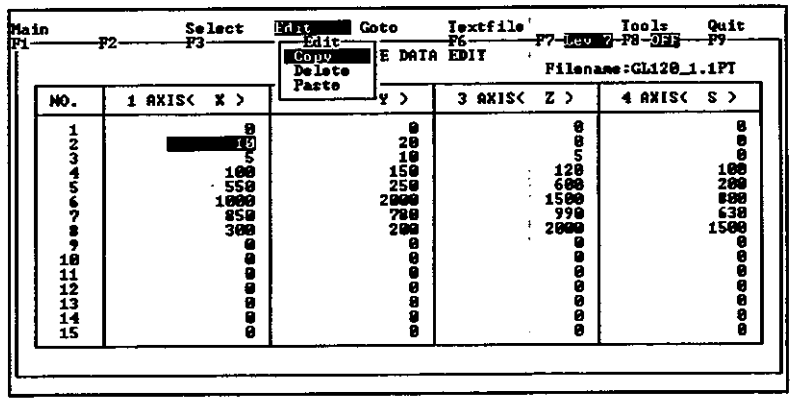
1. Copy

The Copy operation records 4-axis point table data specified as a group. The recorded data can be inserted at another position using the Paste operation.

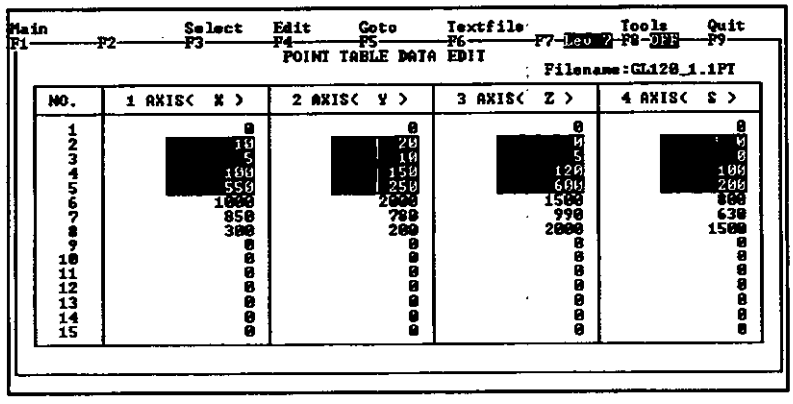
1) Move the cursor either to the end or to the beginning of the area to be copied using the Cursor Keys. It does not matter which column the cursor is in.

2) Switch to the menu cursor using the Tab Key.

3) Select **Copy** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) Specify the area to be copied using the Up or Down Cursor Key and press the Enter Key.



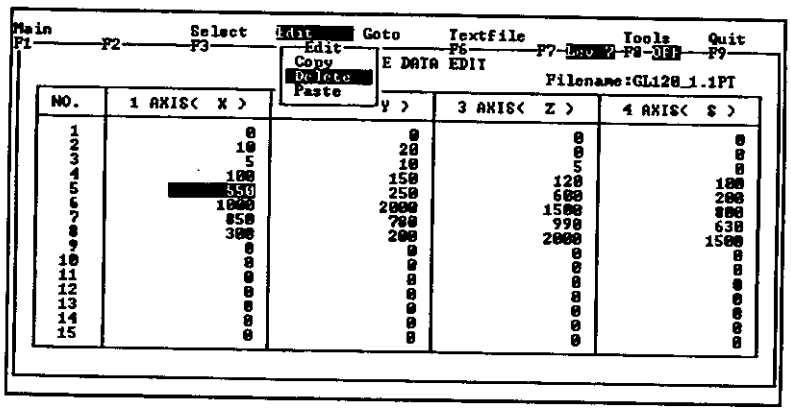
2. Delete

The Delete operation sets the 4-axis point table data specified as a group to 0 and save the data in a buffer. The deleted data can be inserted at another position using the Paste operation.

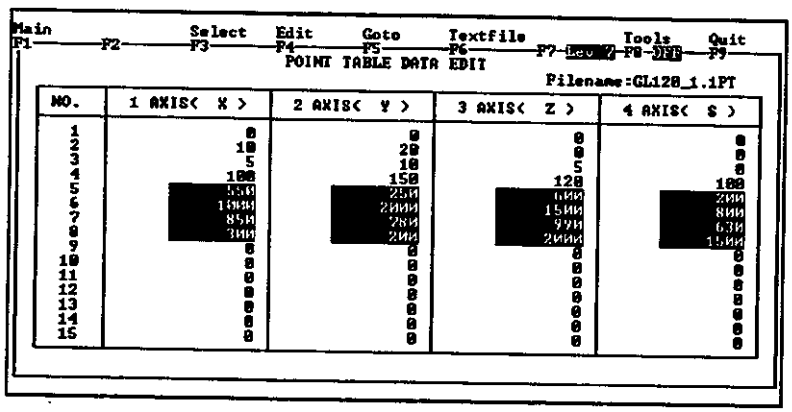
1) Move the cursor either to the end or to the beginning of the area to be deleted using the Cursor Keys. It does not matter which column the cursor is in.

2) Switch to the menu cursor using the Tab Key.

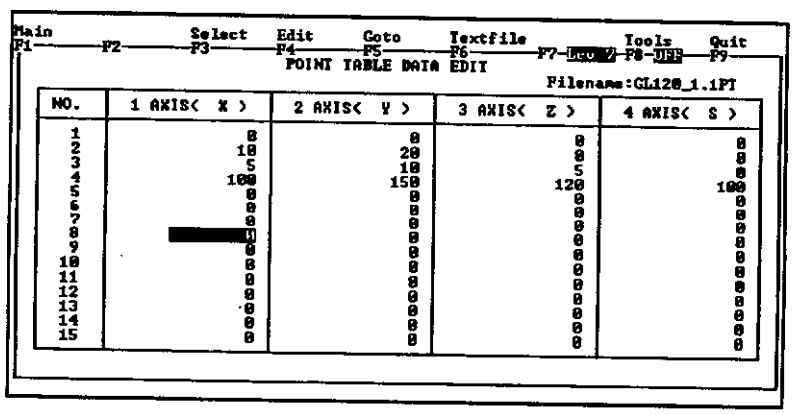
3) Select **Delete** from the Edit Menu using the Cursor Keys and press the Enter Key.



4) Specify the area to be deleted using the Up or Down Cursor Key and press the Enter Key.



The data within the specified area will be set to 0.



The data recorded during the Delete operation can be inserted at another position using the Paste operation in the same way as the data recorded using the Copy operation.

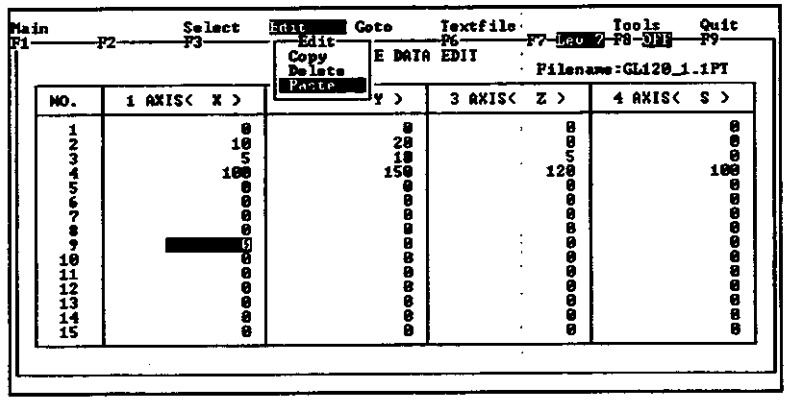
3. Paste

The Paste operation inserts data that has been recorded using the Copy or Delete operation into a specified area. In the following example, the data recorded during the Delete operation in 2. is inserted at another position.

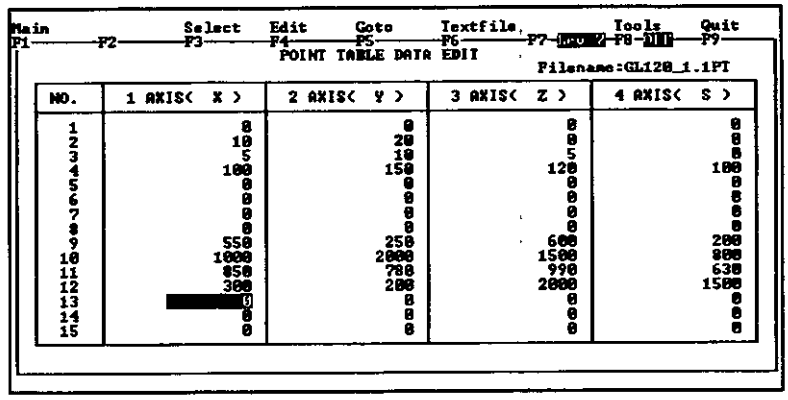
1) Move the cursor to the beginning of the inserted line using the Cursor Keys.

2) Switch to the menu cursor using the Tab Key.

3) Select **Paste** from the Edit Menu using the Cursor Keys and press the Enter Key.



The recorded data will be inserted at the current cursor position.



INFO There is only the one buffer for storing the data recorded during the Copy or Delete operations. As a result, the Paste operation inserts the data recorded during the most recent Copy or Delete operation.

15.2.3 Moving the Cursor

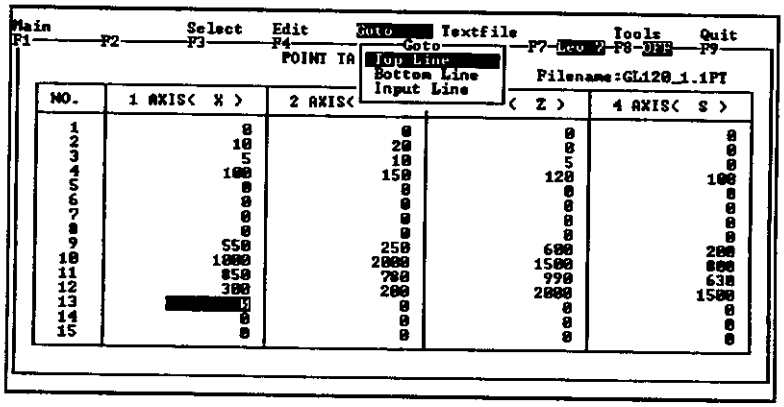
The cursor can be moved to the first line (position number 1,) the last line (position number 500,) or a specified line in between. Special keys have been allocated to move the cursor to the first and last lines.

1. Moving the Cursor to the First or Last Line

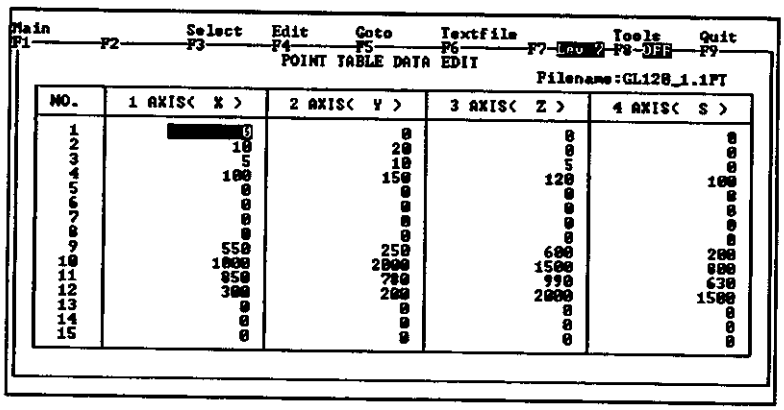
The following example shows how to move the cursor to the first line.

1) Switch to the menu cursor using the Tab Key.

2) Select **Top Line** from the Goto Menu using the Cursor Keys and press the Enter Key.



The cursor will move to the first line.



Use the same procedure to move the cursor to the last line.

Two keys have been allocated for moving the cursor to the beginning and to the end of the point table. Only the one key is needed in both cases. In addition, two other page movement keys are shown below.

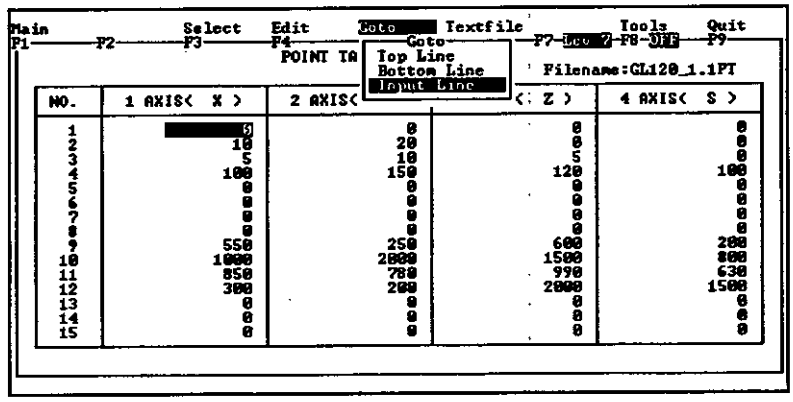
HOME	Moves the cursor to the beginning of the point table (1 axis, number 1.)
END	Moves the cursor to the end of the point table (4 axis, number 500.)
PgUp	Displays the 15 sets of point data immediately preceding the currently displayed data.
PgDn	Displays the 15 sets of point data immediately following the currently displayed data.

2. Moving to a Specified Line

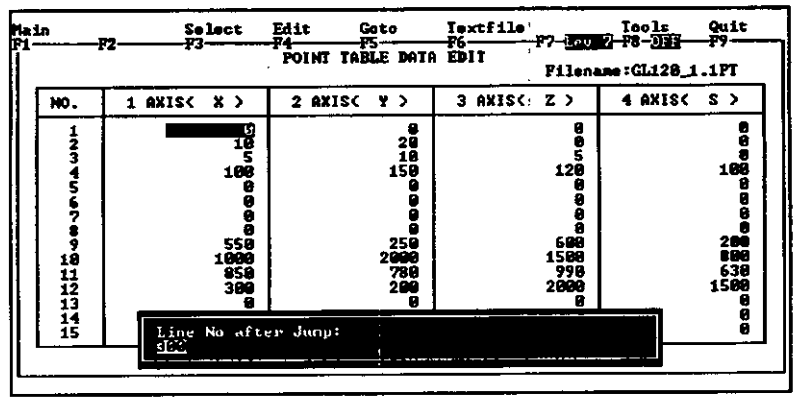
The following example shows how to move to line 300.

1) Switch to the menu cursor using the Tab Key.

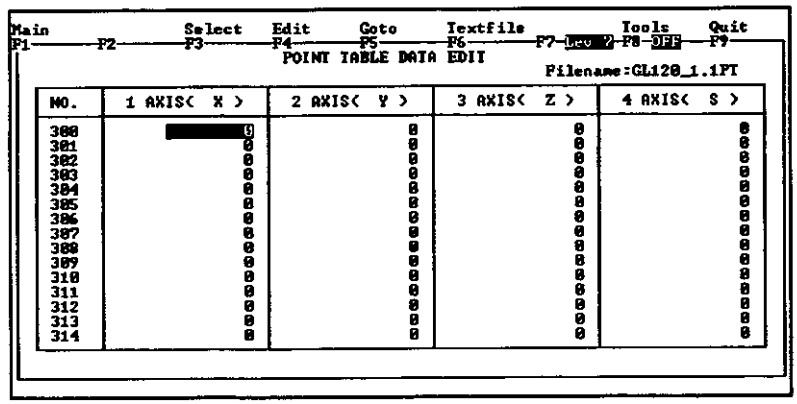
2) Select **Input Line** from the Goto Menu using the Cursor Keys and press the Enter Key.



3) A window will be displayed for entering the specified line. Enter the line number (**300** in this example) and press the Enter Key.



The cursor will move to line 300.

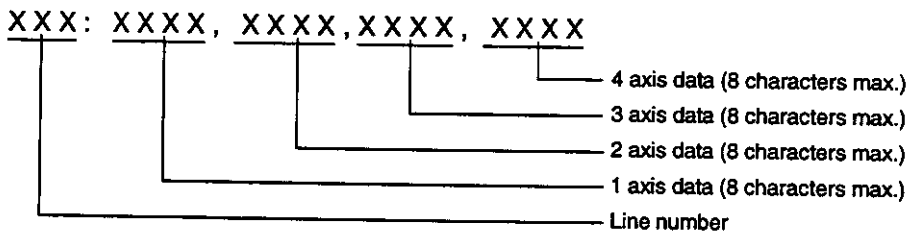


15.3 Filing

This section describes the procedure used to write point table data to a text file and read a file created with a standard text editor.

15.3.1 Text File Formats

Data in point tables created on MEMOSOFT can be saved to other files as text files. The saved text files can be edited on a standard text editor. Conversely, data created on a standard text editor can be imported to MEMOSOFT as point table data. The format of the text file is as follows:



The actual file data is as follows:

```
1: 0, 0, 0, 0
2: 10, 20, 0, 0
3: 5, 10, 5, 0
4: 100, 150, 120, 100
5: 550, 250, 600, 200
6: 1000, 2000, 1500, 800
7: 850, 780, 990, 630
8: 300, 200, 2000, 1500
9: 760, 2030, 1051, 200
10: 1024, 320, 511, 1300
          :
          :
          :
500: 0, 0, 0, 0
```

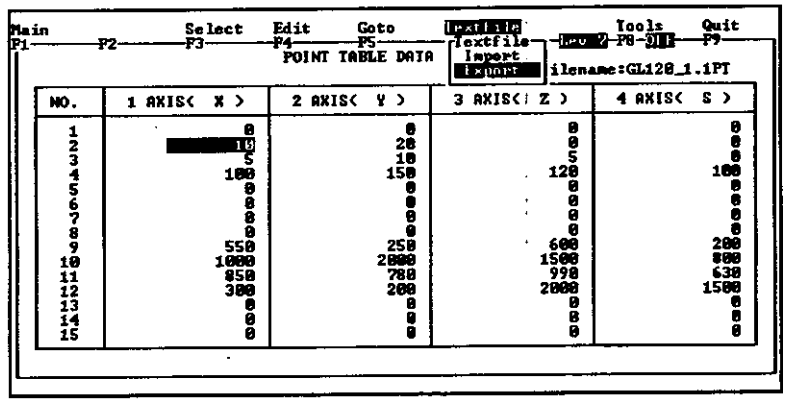
INFO When no drive or directory is specified, the data is read from or written to the default directory \FMSGL.

15.3.2 Exporting

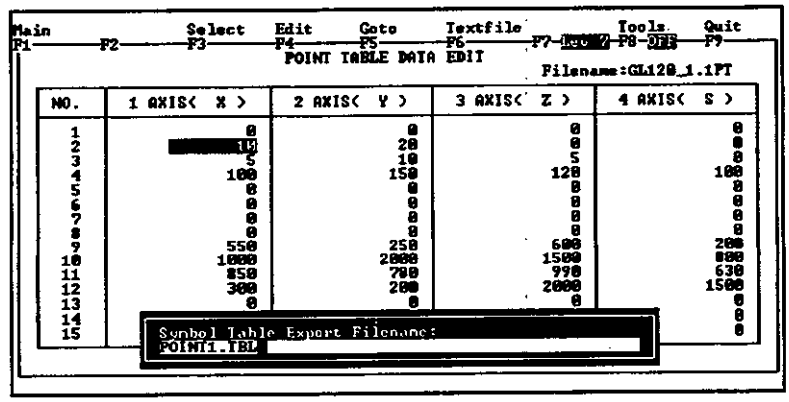
Use the following procedure to write to a text file.

1) Switch to the menu cursor using the Tab Key.

2) Select **Export** from the Textfile Menu using the Cursor Keys and press the Enter Key.



3) A window will be displayed for entering the file name. Enter **POINT1.TBL** and press the Enter Key.



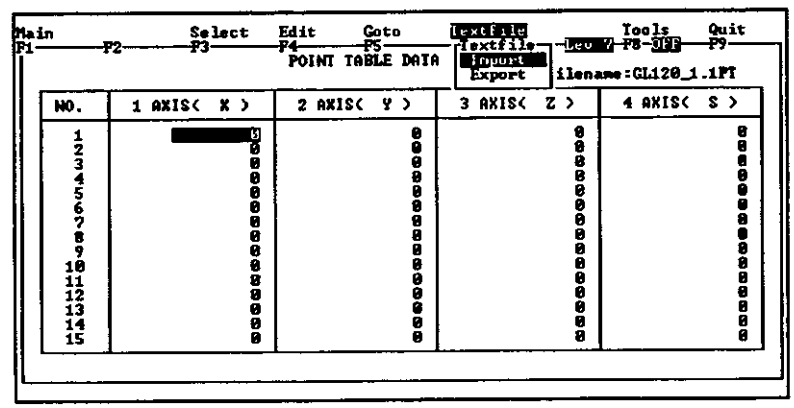
The point table data will be saved under the file name "POINT1.TBL" as a text file.

15.3.3 Importing

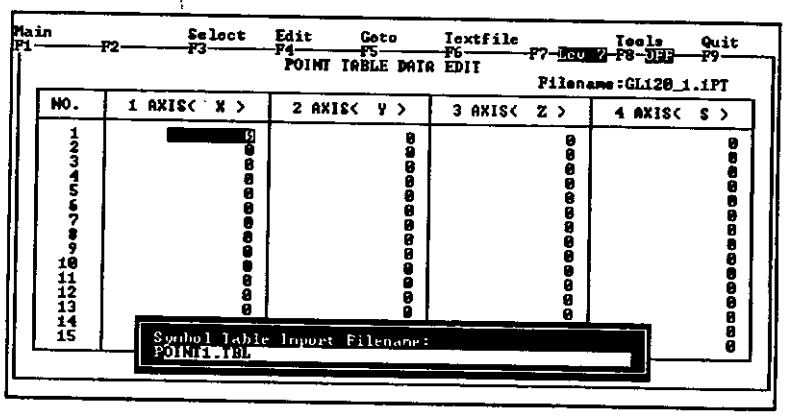
Use the following procedure to read point table data from a text file.

1) Switch to the menu cursor using the Tab Key.

2) Select **Import** from the Textfile Menu using the Cursor Keys and press the Enter Key.



3) A window will be displayed asking for the file name. Enter **POINT1.TBL** and press the Enter Key.



The data from POINT1.TBL will be read as point table data.

Monitor Operations

16

This chapter describes monitor operations such as displaying PLC and Motion Module status.

16.1 Displaying PLC Status

This section describes how to display the PLC status, such as the PLC ladder program update and the error log.

16.1.1 PLC Status

MEMOSOFT allows the following PLC status items to be displayed.

- **Controller Status**

Appears when PLC Status is selected from the Information Submenu of the Tools Menu. It is the same screen as that displayed when Start is selected from the PLC Options Submenu of the Tools Menu.

- **Machine Status**

Displays the PLC status such as the current Sweep Mode setting or memory protect status.

- **Error Code**

Displays up to three types of error codes.

- **CPU Error Log**

Displays a log of the last 20 CPU Module errors. The stopped status, error code, and time of error occurrence are displayed for each error.

- **Power Failure Log**

Displays the times of the last five power failures.

- **I/O Status Table**

Displays the I/O Module status of each rack.

- **I/O Error Counter**

Displays the number of I/O Module errors for each station.

• **Local Module Error History**

Displays the last 20 errors that occurred to the Module installed on the local channel.

• **Remote Station Status**

Displays the status of each remote station.

• **Option Installation Information**

Displays information about installed optional Modules, such as MEMOBUS and PC Link Modules.

• **Optional Module Status**

Displays the status of optional Modules, such as MEMOBUS and PC Link Modules.

• **Optional Module Revision**

Displays the ROM revision history stored in optional Modules, such as MEMOBUS and PC Link Modules.

• **MC20 Motion Module Error History**

Displays the last 20 errors that occurred to the MC20 Motion Module.

• **PC Link Status**

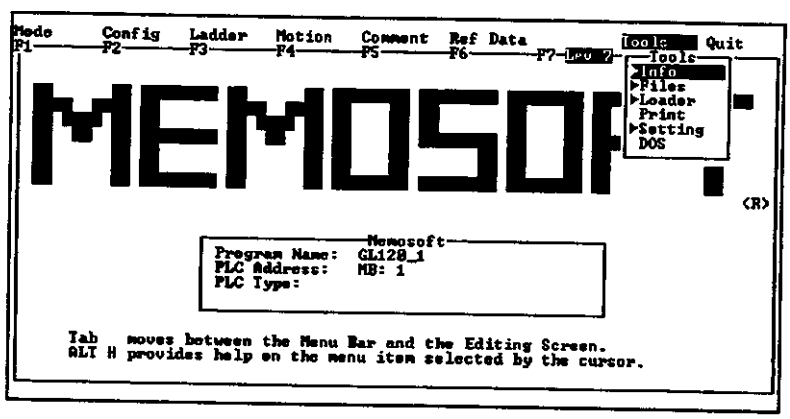
Displays the status of PC Link Modules.

16.1.2 Displaying PLC Status

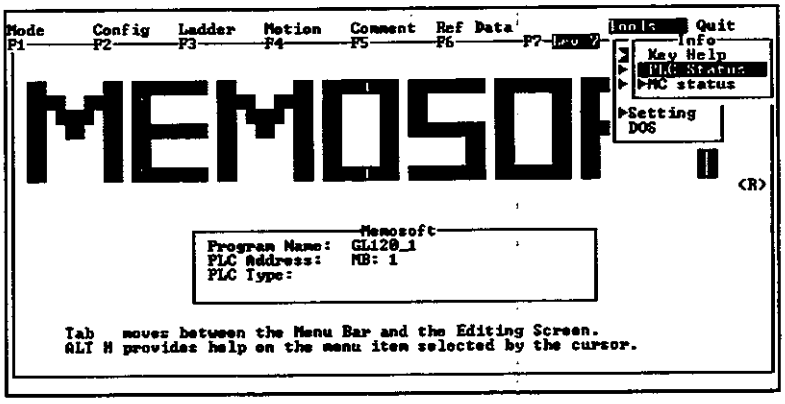
1. Displaying the Controller Status Information Screen

This section describes how to display the Controller Status Information Screen.

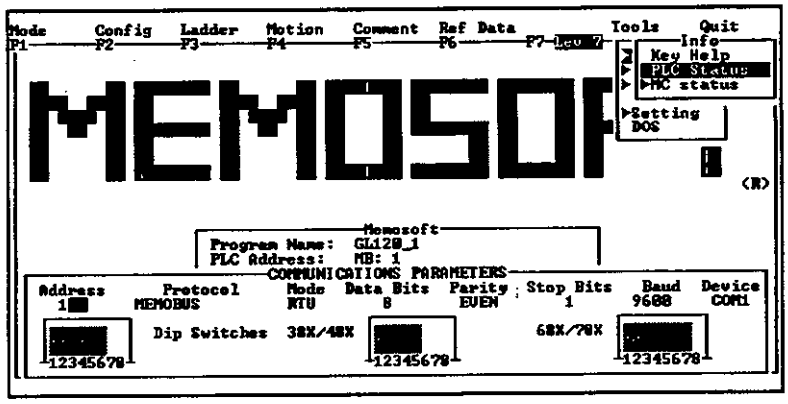
1) Select **Info** from the Tools Menu using the Cursor Keys and press the Enter Key.



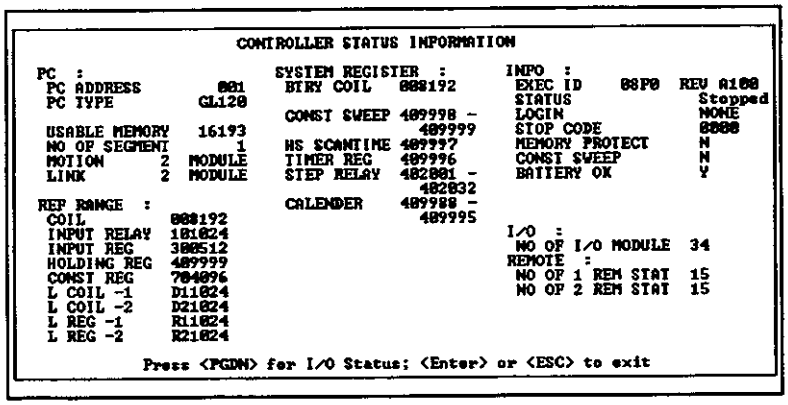
2) A submenu will be displayed. Select **PLC Status** from the Info Submenu using the Down Cursor Key and press the Enter Key.



3) In Offline Mode, the Communications Parameters Setting Screen will be displayed. Enter the communications parameters and press the Enter Key.

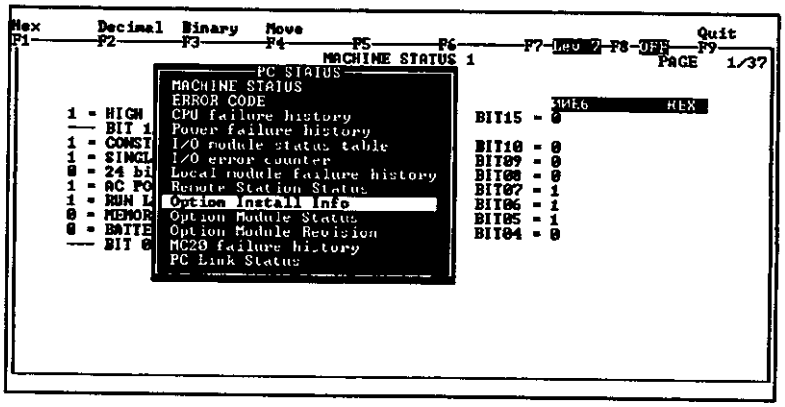


The Controller Status Information Screen will be displayed.

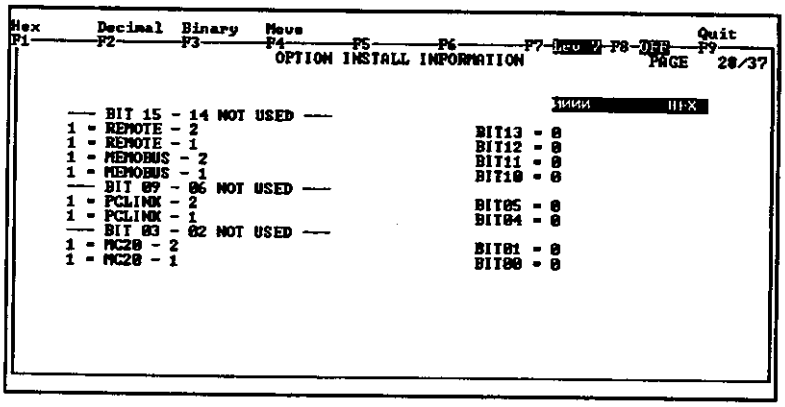


4) To switch to a detailed status display, press the Page Down Key.

5) The PLC Status Menu will be displayed. Move the cursor to the desired item on the menu using the Down Cursor Key (**Option Install Info** in this example), and then press the Enter Key.



The Option Install Information Screen will be displayed.

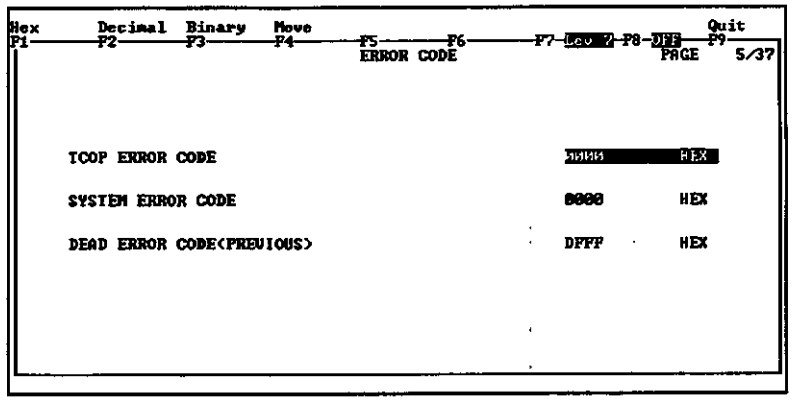


6) To return to the Controller Status Information Screen, select **Quit** from the menu bar or press the Esc Key.

2. Switching the Data Display Format

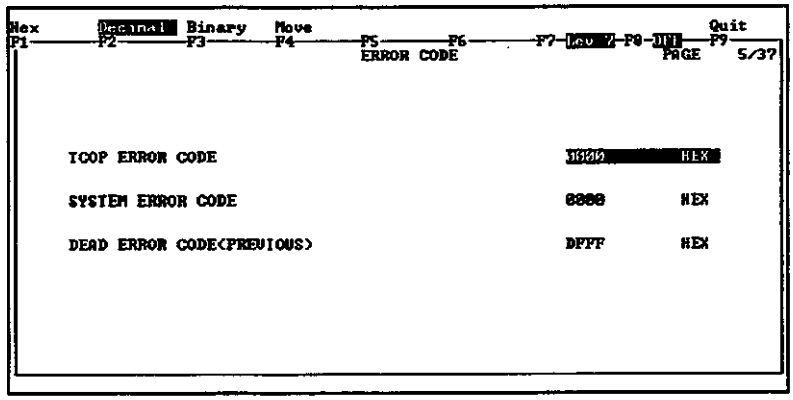
Use the following procedure to switch the status data display format from hexadecimal to decimal.

1) Move the cursor to the position of the data for which the display format is to be switched using the Cursor Keys.

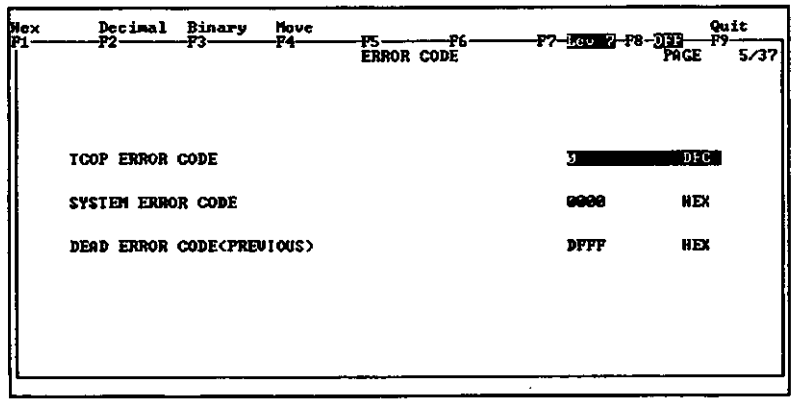


2) Switch to the menu cursor using the Tab Key.

3) Select **Decimal** using the Cursor Keys and press the Enter Key.



The data at the cursor position will be switched to decimal display format.



3. Switching Screens

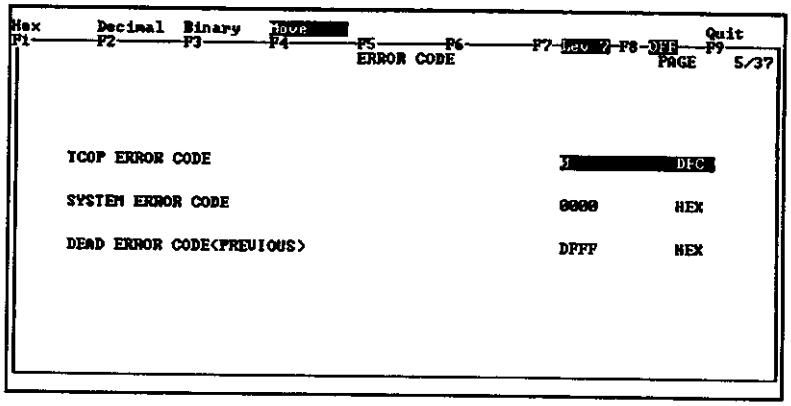
Basically, the screen can be switched by selecting the desired item from the PLC Status Menu. To display the PLC Status, select **Quit** from the menu bar or press the Esc Key. To switch the screens within the selected item, press the Page Down or Page Up Key. To switch, for example, rack 1 to rack 2 within the I/O Status Table, press the Page Down Key.

PgDn	Switches to the screen with the screen number one greater than the current screen number.
PgUp	Switches to the screen with the screen number one smaller than the current screen number.

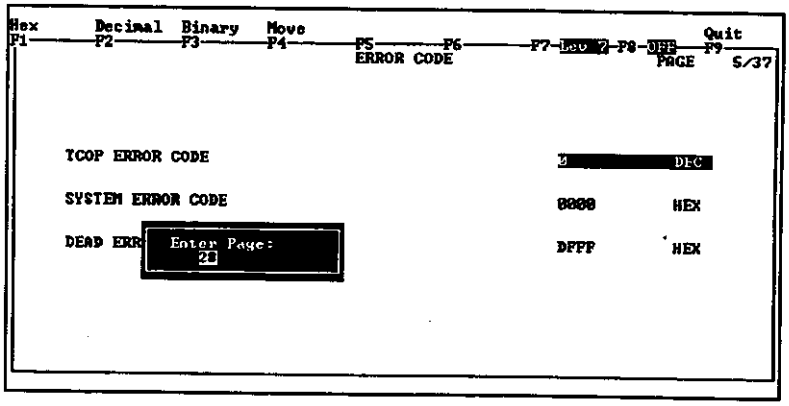
If the screen number of the screen to be displayed is known, the Move Menu can be used to switch to another screen just by specifying the screen number. Use the following procedure to switch to another screen.

1) Switch to the menu cursor using the Tab Key.

2) Select **Move** using the Cursor Keys and press the Enter Key.



3) The window for entering a page number will be displayed. Enter a page number (**28** in this example) and press the Enter Key.



Page number 28 will be displayed.

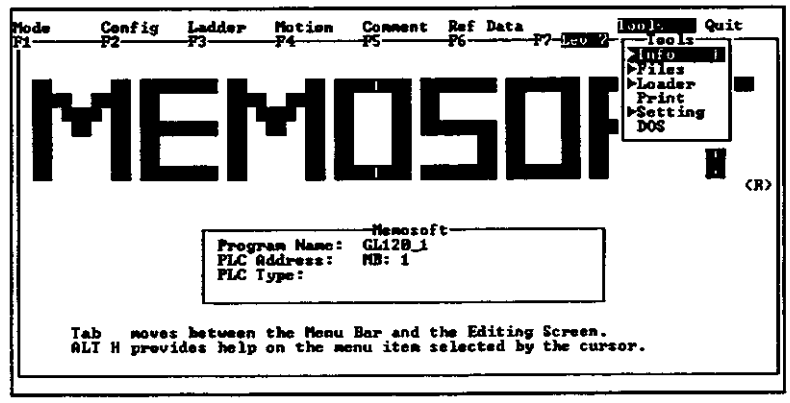
16.2 Motion Module Current Position Monitor Screen

This section describes the procedure used to monitor current values or errors when the Motion Module is installed. This operation cannot be executed for the MC10 Motion Module.

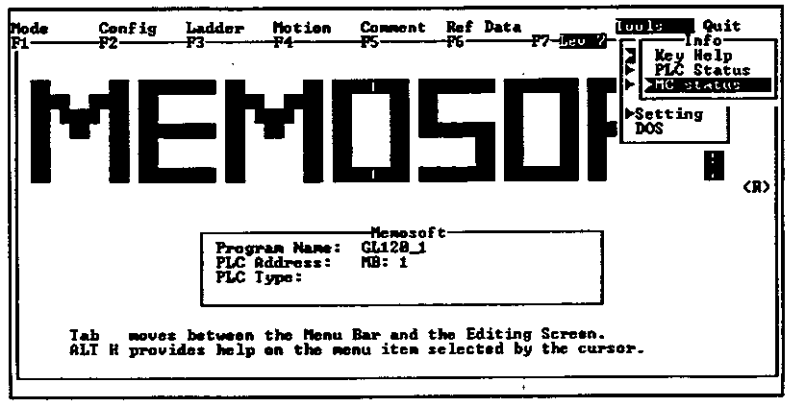
16.2.1 Displaying the Current Position Monitor Screen

If the Motion Module is installed and allocations have been executed, the current position for each axis connected to the Motion Module can be displayed. Use the following procedure to display the Current Position Monitor Screen.

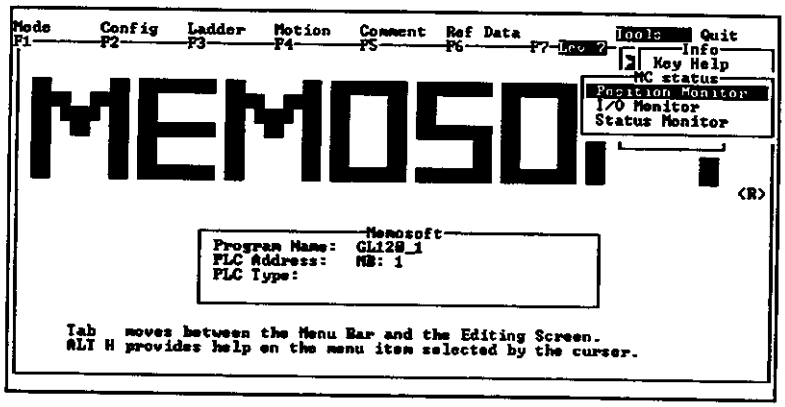
1) Select **Info** from the Tools Menu using the Cursor Keys and press the Enter Key.



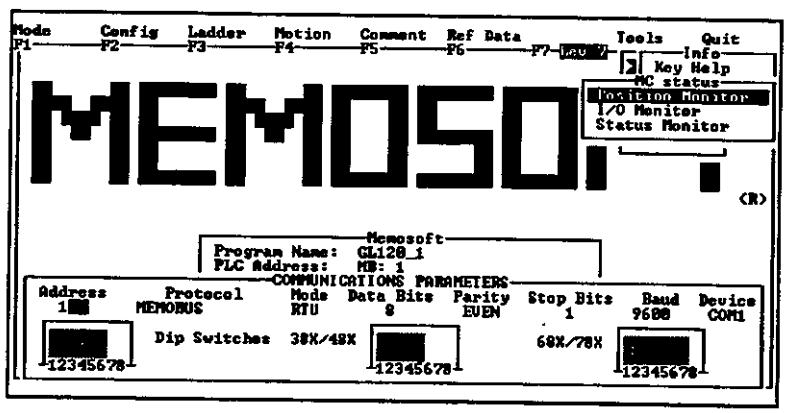
2) A submenu will be displayed. Select **MC Status** using the Down Cursor Key and press the Enter Key.



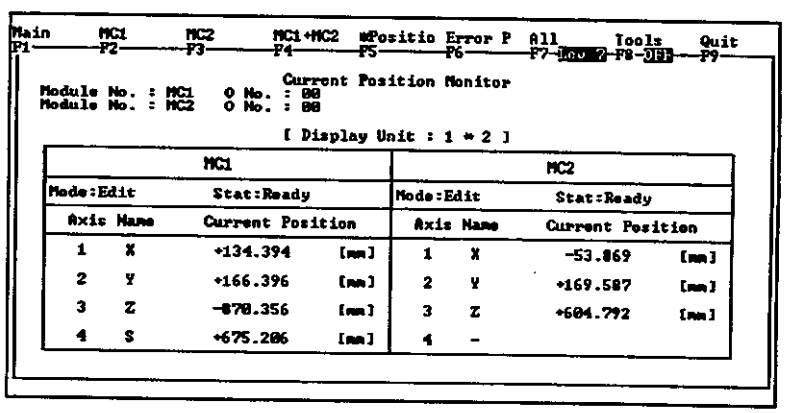
3) The MC Status Submenu will be displayed. Select **Position Monitor** using the Down Cursor Key and press the Enter Key.



4) In Offline Mode, the Communications Parameters Screen will be displayed. Enter the communications parameters and press the Enter Key.



The Current Position Monitor Screen will be displayed.

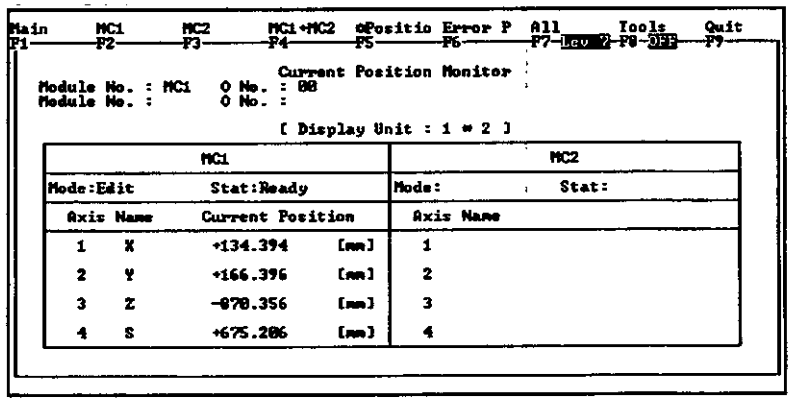


16.2.2 Switching Modules

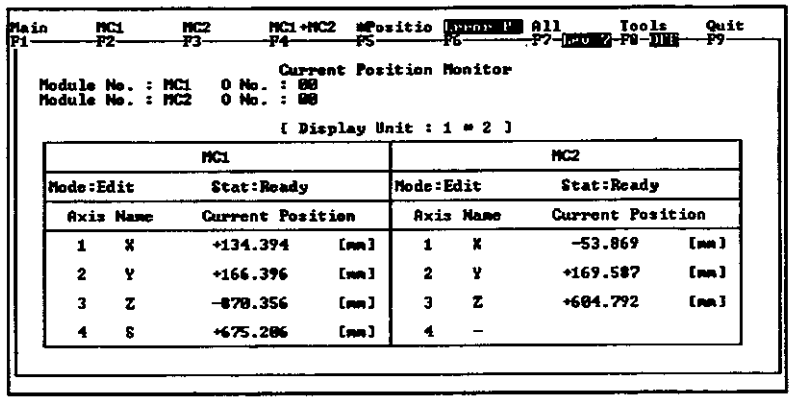
To increase the speed by which display data is refreshed, it is possible to switch to displaying a single Module. Use the following procedure to switch from displaying both MC1 and MC2 to displaying MC1 only.

1) Switch to the menu cursor using the Tab Key.

2) Select **MC1** using the Cursor Keys and press the Enter Key.



The screen will switch to displaying the Current Position Monitor for the MC1 only.

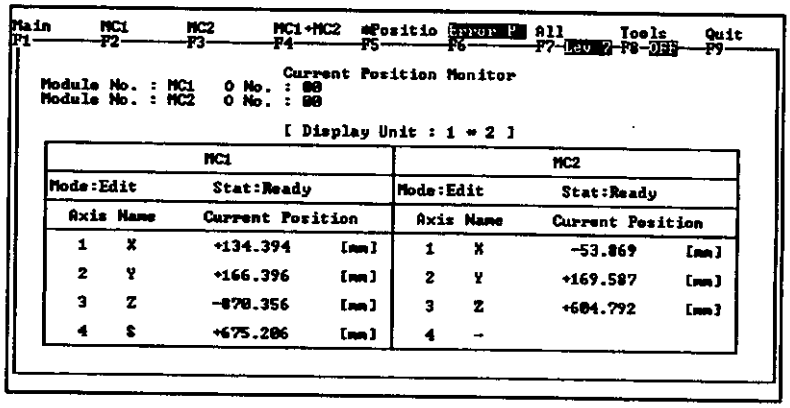


16.2.3 Switching Modes

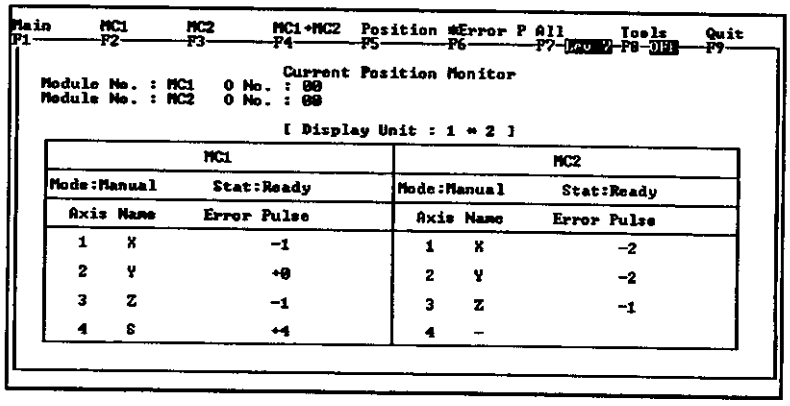
The Current Position Monitor displays in either the Current Position Mode or the Error Pulse Mode for current position commands. When the Current Position Monitor is first displayed, the current position will be displayed. Use the following procedure to switch to the Error Pulse Mode.

1) Switch to the menu cursor using the Tab Key.

2) Select **Error P** using the Cursor Keys and press the Enter Key.



The current position display will switch to the error pulse display.

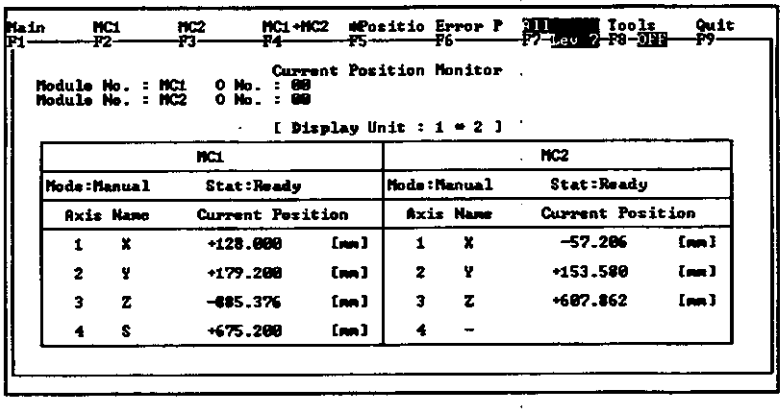


16.2.4 Displaying All Coordinate Values

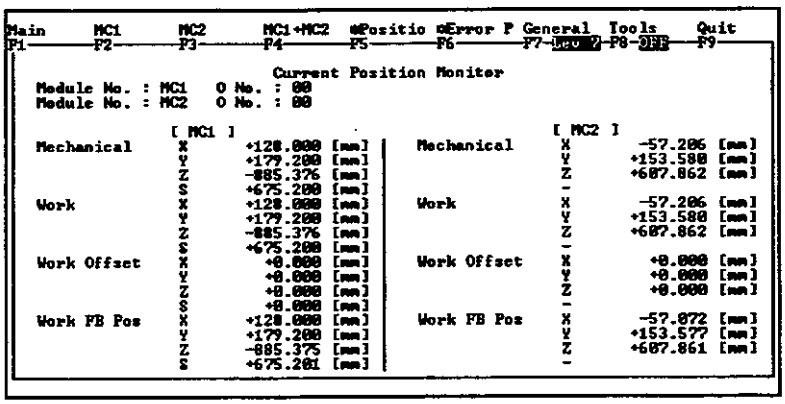
In the Current Position Monitor Screen, there is a choice of displaying the workpiece coordinate system values, or all of the coordinate system values. When the Current Position Monitor is first displayed, the workpiece coordinate system values will be displayed. Use the following procedure to switch to displaying all the coordinate system values.

1) Switch to the menu cursor using the Tab Key.

2) Select **All** using the Cursor Keys and press the Enter Key.



The display will change to show the current position for mechanical, work, work offset, and work feedback position coordinates.



For more details on the the coordinate systems that are display, refer to *MEMOCON GL120, GL130 Motion Module MC20 Software User's Manual (SIEZ-C825-20.52).*

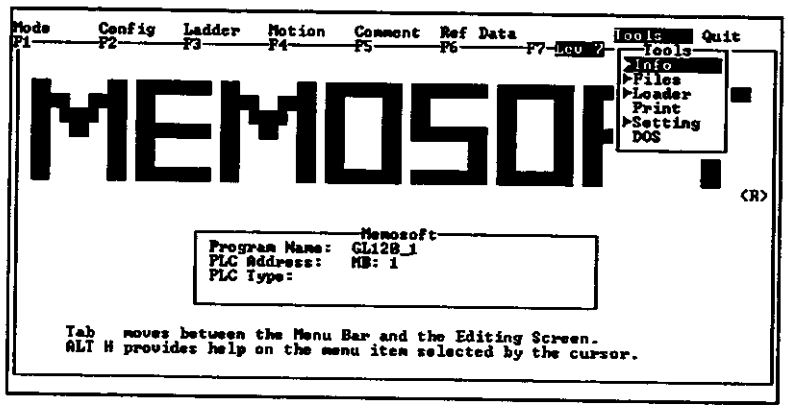
16.3 Motion Module I/O Status Monitor Screen

This section describes the procedure used to monitor the status of the I/O connected to the Motion Module when the Motion Module is installed. This operation cannot be executed for the MC10 Motion Module.

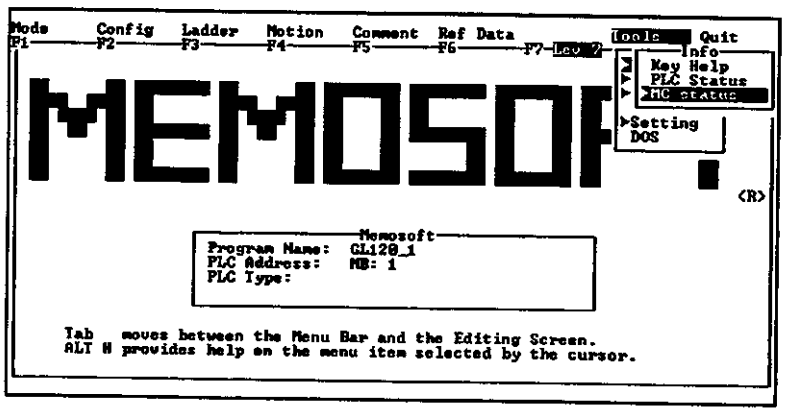
16.3.1 Displaying the I/O Status Monitor Screen

If the Motion Module is installed and allocations have been executed, the I/O data for each axis connected to the Motion Module can be displayed. Use the following procedure to display the I/O Status Monitor Screen.

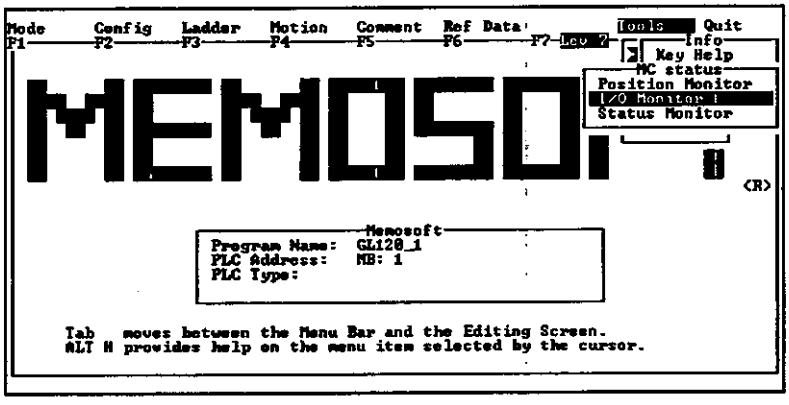
1) Select **Info** from the Tools Menu using the Cursor Keys and press the Enter Key.



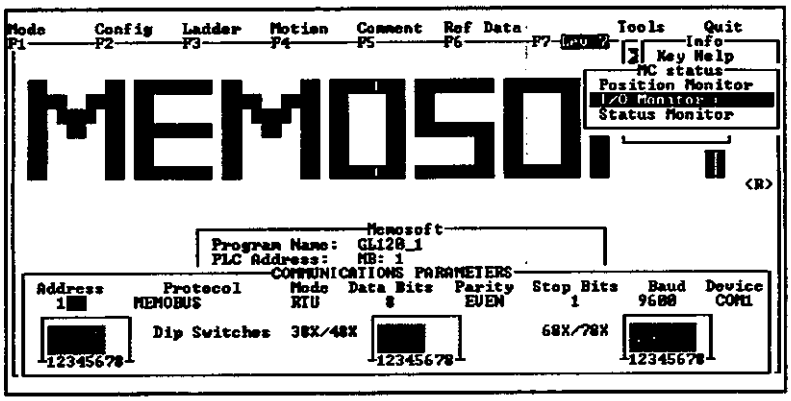
2) A submenu will be displayed. Select **MC Status** from the submenu using the Down Cursor Key and press the Enter Key.



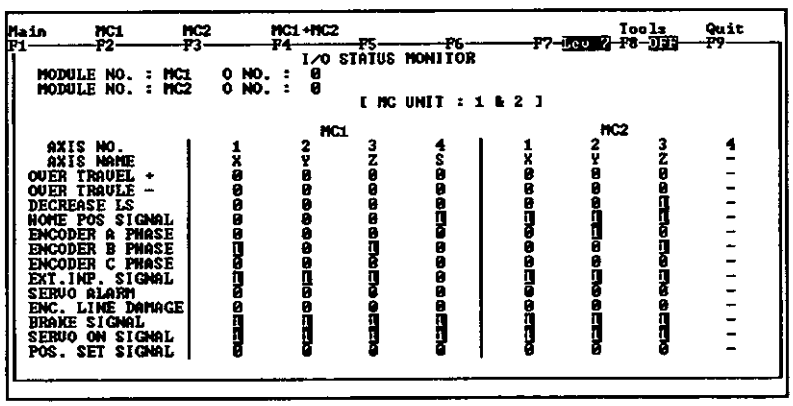
3) The MC Status Submenu will be displayed. Select **I/O Monitor** using the Down Cursor Key and press the Enter Key.



4) In Offline Mode, the Communications Parameters Setting Screen will be displayed. Enter the communications parameters and press the Enter Key.



The I/O Status Monitor Screen will be displayed.

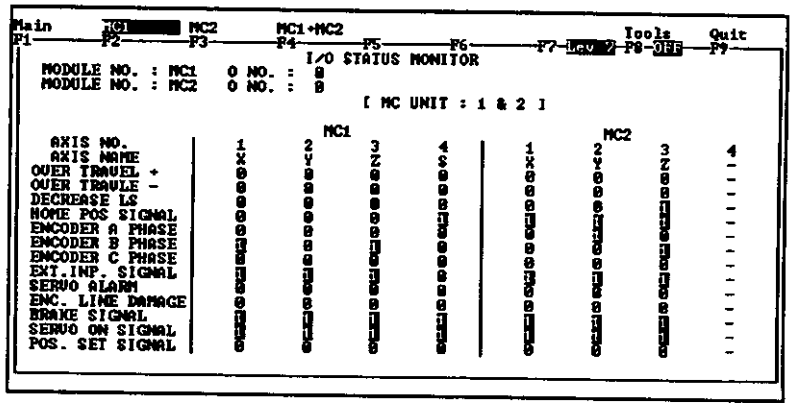


16.3.2 Switching Modules

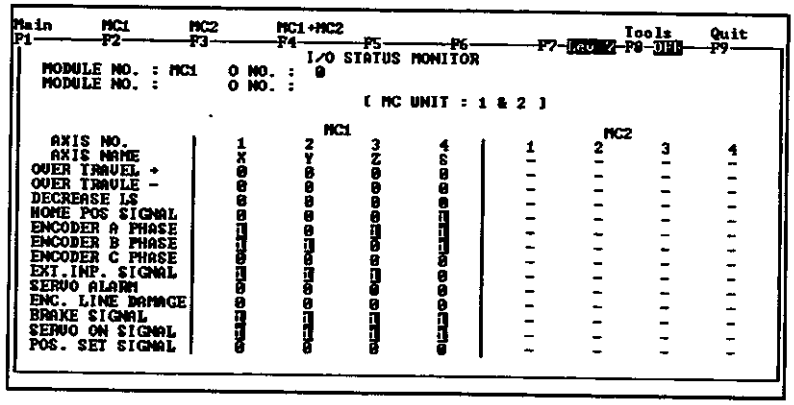
To increase the speed by which display data is refreshed, it is possible to switch to displaying a single Module. Use the following procedure to switch from displaying both MC1 and MC2 to displaying MC1 only.

1) Switch to the menu cursor using the Tab Key.

2) Select **MC1** using the Right Cursor Key and press the Enter Key.



The I/O status will be displayed for MC1 only.



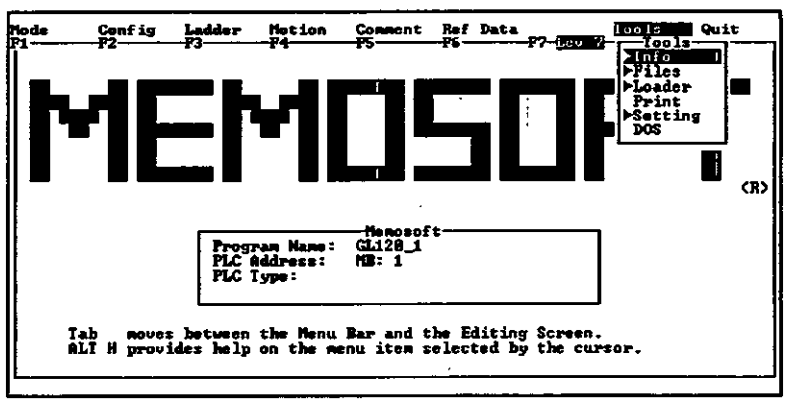
16.4 Motion Module Status Information Monitor Screen

This section describes the procedure used to monitor the Motion Module status when the Motion Module is installed. This operation cannot be executed for the MC10 Motion Module.

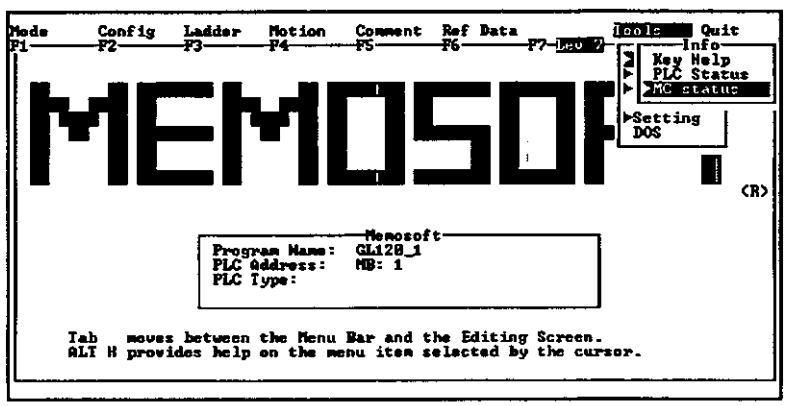
16.4.1 Displaying the Status Information Monitor Screen

If the Motion Module is installed and allocations have been executed, the Motion Module status can be displayed. Use the following procedure to display the Status Information Monitor Screen.

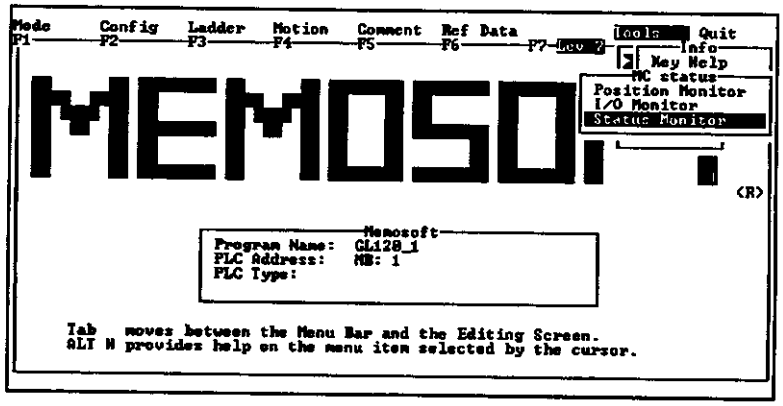
1) Select **Info** from the Tools Menu using the Cursor Keys and press the Enter Key.



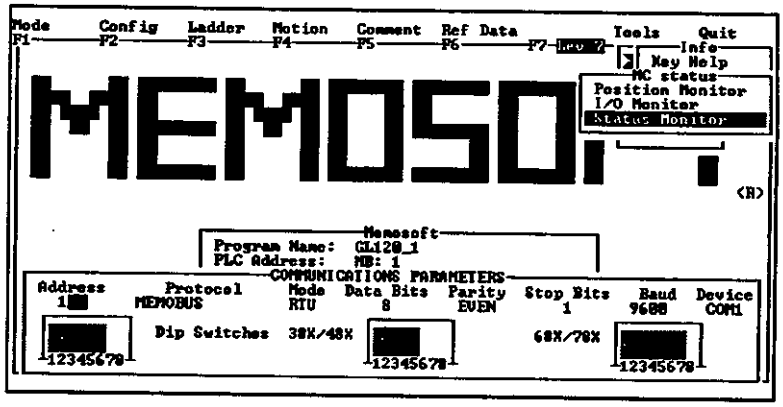
2) A submenu will be displayed. Select **MC Status** from the submenu using the Down Cursor Key and press the Enter Key.



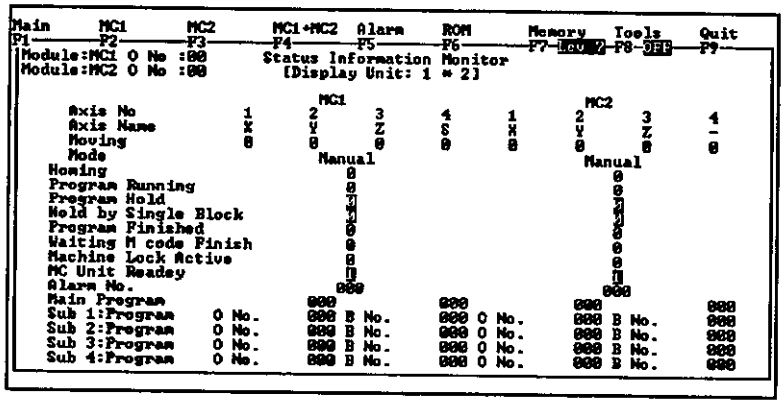
3) The MC Status Submenu will be displayed. Select **Status Monitor** using the Cursor Keys and press the Enter Key.



4) In Offline Mode, the Communications Parameters Setting Screen will be displayed. Enter the communications parameters and press the Enter Key.



The Status Information Monitor Screen will be displayed.

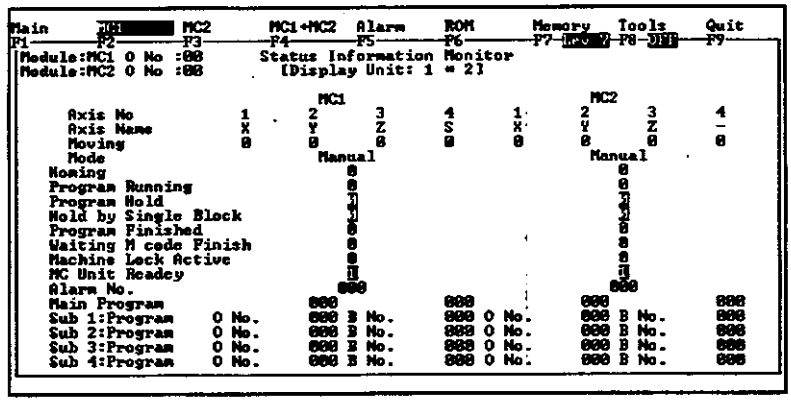


16.4.2 Switching Modules

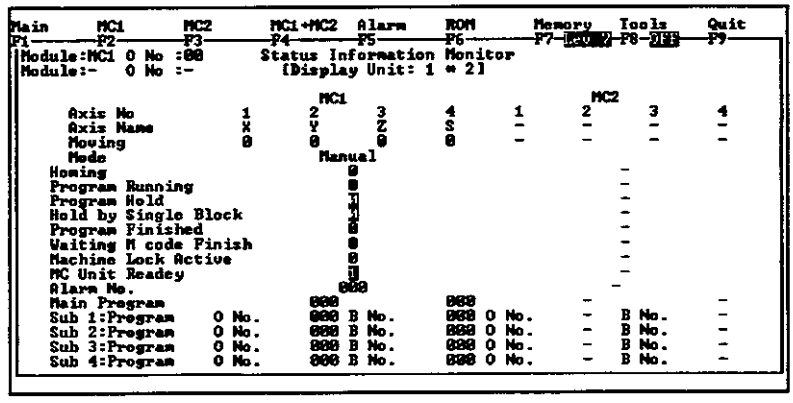
To increase the speed by which display data is refreshed, it is possible to switch to displaying a single Module. Use the following procedure to switch from displaying both MC1 and MC2 to displaying MC1 only.

1) Switch to the menu cursor using the Tab Key.

2) Select **MC1** using the Cursor Keys and press the Enter Key.



The Status Information Monitor Screen will be displayed for MC1 only.



INFO Apart from the status information displayed in the Status Information Monitor Screen, the following information can also be monitored.

- **Alarm Log**

By selecting **Alarm** from the menu bar, a list of the alarm logs will be displayed.

- **ROM Version**

By selecting **ROM** from the menu bar, the ROM version will be displayed.

- **Program Memory Space**

By selecting **Memory** from the menu bar, the total amount of memory, used memory, and free memory will be displayed in bytes.

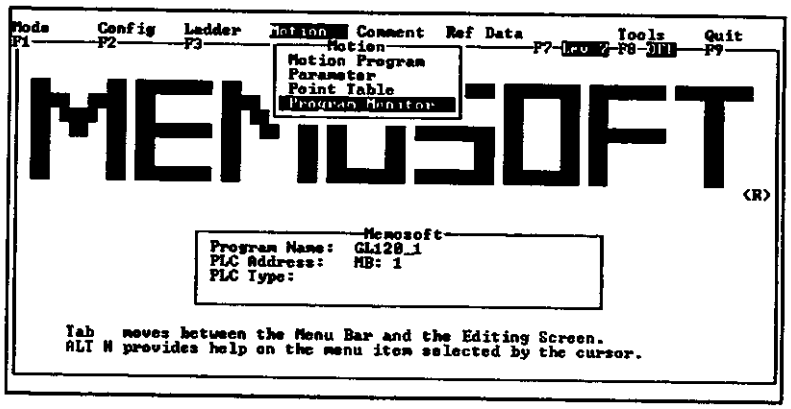
16.5 Motion Module Program Monitor Screen

This section describes the procedure used to monitor the motion program running status when the Motion Module is installed. This operation cannot be executed for the MC10 Motion Module.

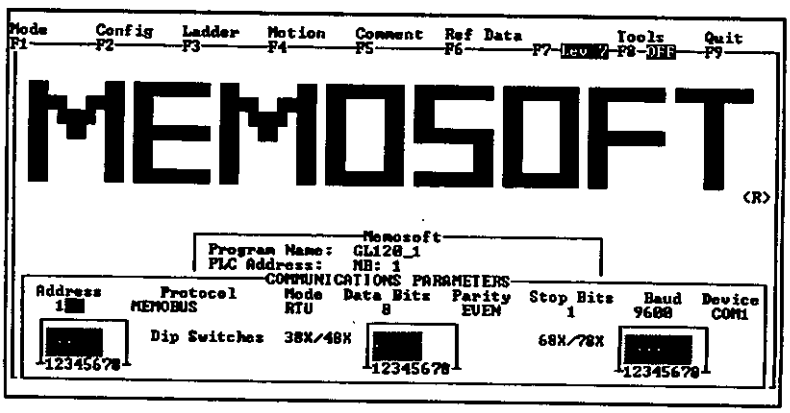
16.5.1 Displaying the Program Monitor Screen

If the Motion Module is installed and the motion program is running, the block currently being executed, the I/O data, and the current position can be displayed. Use the following procedure to display the Program Monitor from the initial screen.

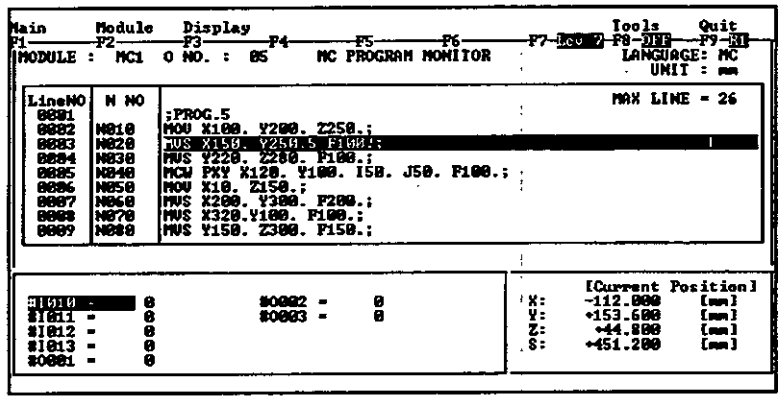
1) Select **Program Monitor** from the Motion Menu using the Cursor Keys and press the Enter Key.



2) In Offline Mode, the Communications Parameters Setting Screen will be displayed. Enter the communications parameters and press the Enter Key.



The MC Program Monitor Screen will be displayed, with the block currently being executed displayed in reverse video.

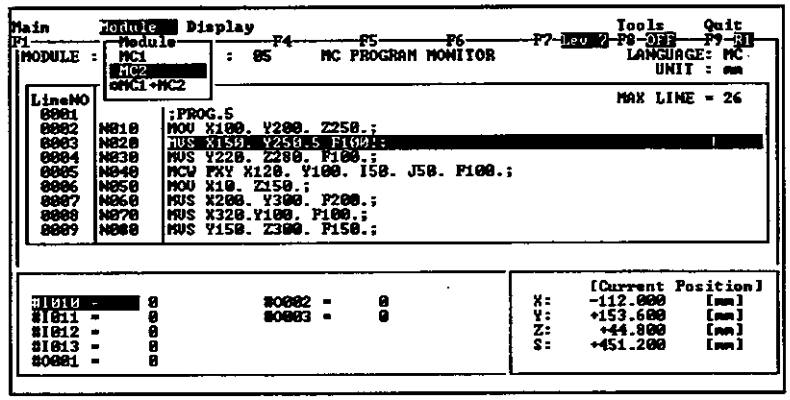


INFO If two MC20 Motion Modules are being used, the Module Selection Window will be displayed before the Program Monitor Screen is displayed. Select the Module to be monitored, and then continue the operation.

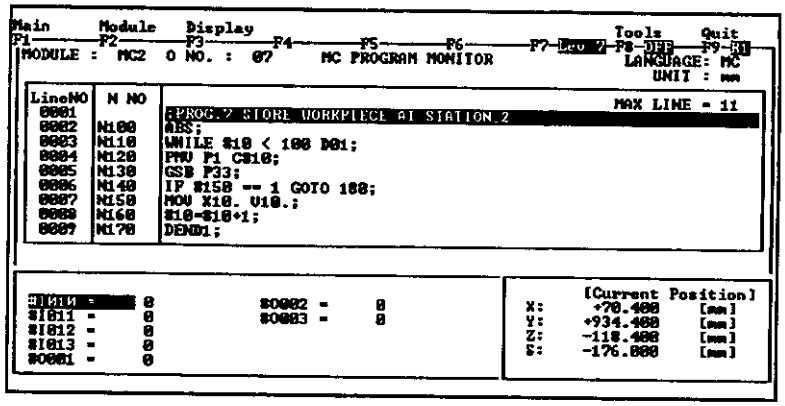
16.5.2 Switching Modules

The target for program monitoring can be switched from MC1 to MC2. Use the following procedure to switch from displaying MC1 to MC2.

Select **MC2** from the Module Menu using the Cursor Keys and press the Enter Key.



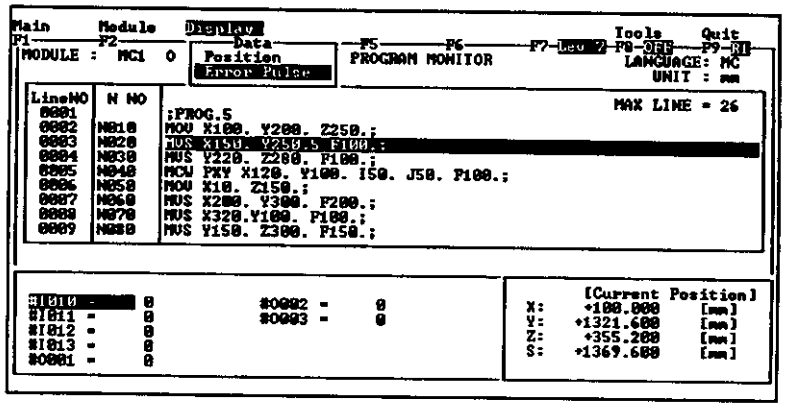
The display will switch to show MC2.



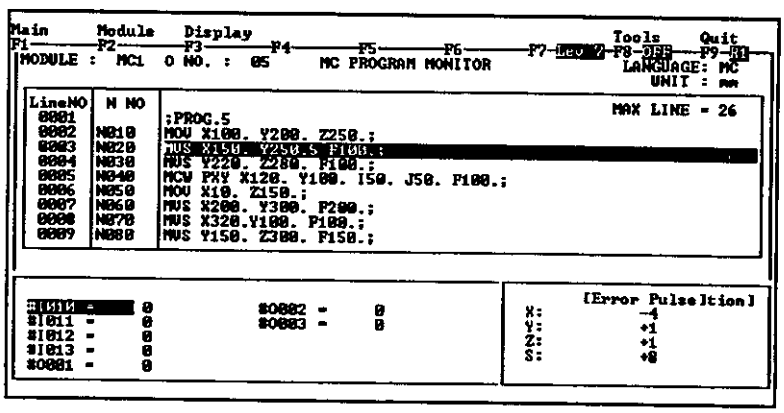
16.5.3 Error Pulse Display

Either the values for the current position or the error pulse can be displayed. When the MC Program Monitor Screen is first displayed, the current position will be displayed. Use the following procedure to switch from the current position display to the error pulse display.

Select **Error Pulse** from the Display Menu using the Cursor Keys and press the Enter Key.



The current position display will switch to show the error pulses.



File Operations

17

This chapter describes operations used to manage program files such as creating new programs and reading programs.

17.1 Overview

This section briefly describes file operations, such as reading or saving programs.

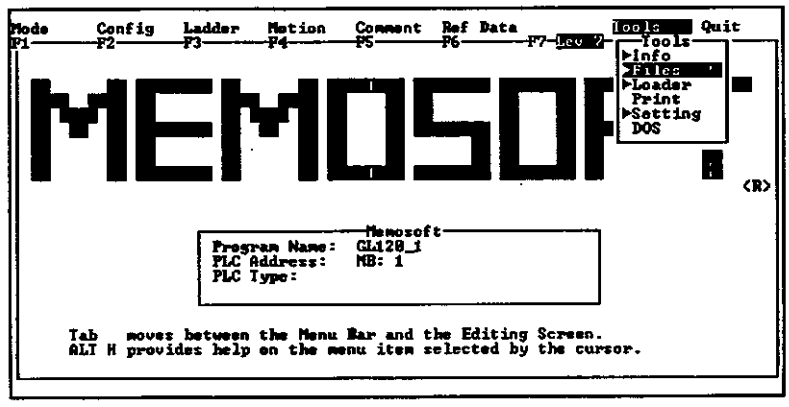
File management refers to operations such as reading or saving programs. A list of operations is provided below:

- Select Program: Selects a program for editing.
- New Program: Creates a new program.
- Save Changes: Saves only files that have been changed.
- Save All Files: Saves all files under edit.
- Save As: Saves the file under edit with a new name.
- Change PLC Address: Sets up communication parameters when a created program is sent to PLC using the loader operation. Setting up these parameters is required unless the default settings are to be used.
- Location of Program Name: Changes the list of programs in the default directory, which is accessed by choosing Select Program.
- File Operation: Executes management operations, such as copying programs that have been created to a floppy disk, deleting programs, and formatting floppy disks.

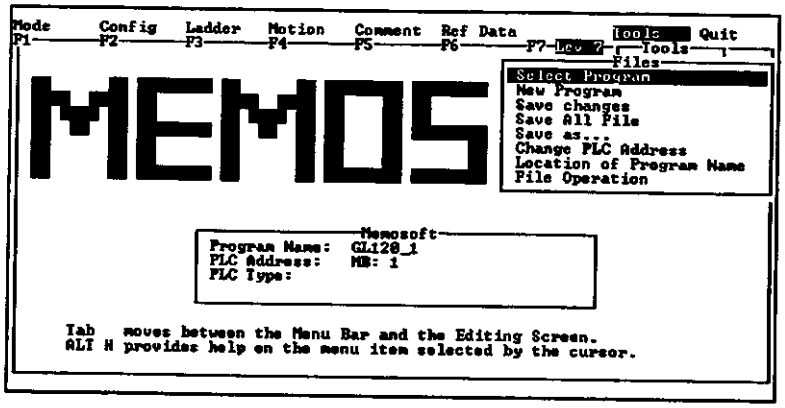
INFO The default directory path for programs when using the Location of Program Name operation is \FMSGL\PROGRAMS.

Use the following procedure to start the **File** Menu.

1) Switch to the menu cursor using the Tab Key.
2) Select **Files** from the Tools Menu using the Cursor Keys and press the Enter Key.



The Files Submenu will be displayed.



17.2 File Operation Details

This section describes the various operations associated with the File Menu.

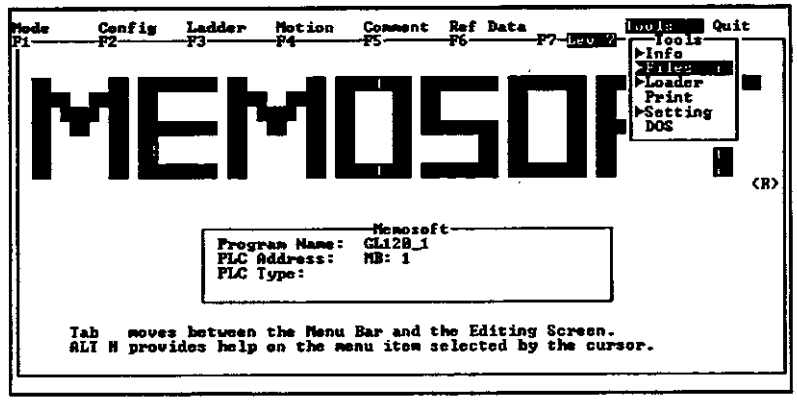
17.2.1 Selecting Program

The Select Program operation is used to read an already created program. The program to be read is stored in the directory \FMSGL\PROGRAMS.

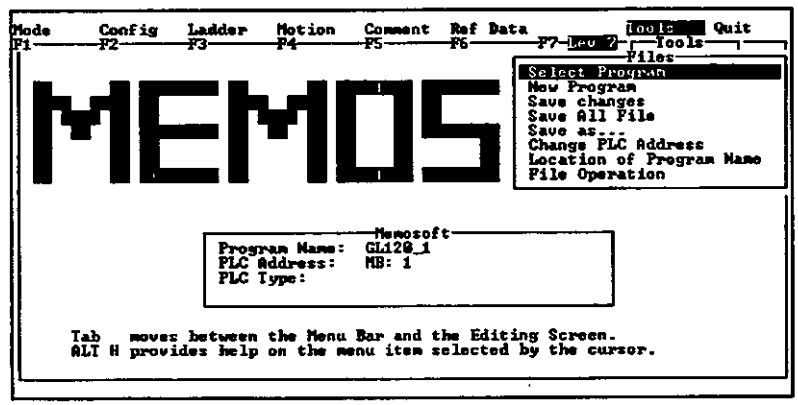
To read a program stored in another directory, use Location of Program Name (see section *17.2.7 Location of Program Name*) to change the drive or directory, and then perform the selection operation.

1) Switch to the menu cursor using the Tab Key.

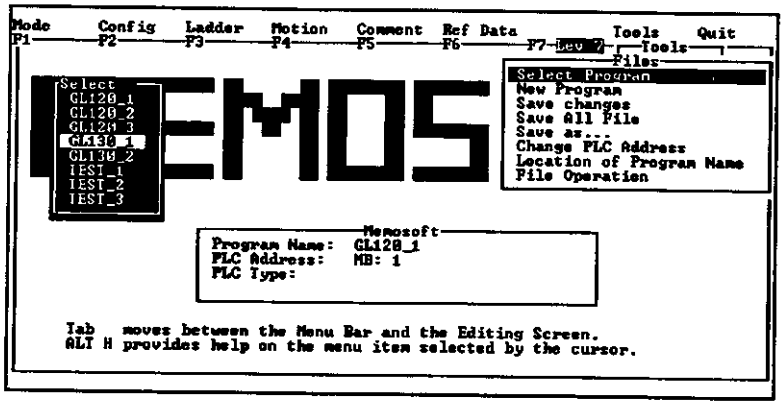
2) Select **Files** from the Tools Menu using the Cursor Keys and press the Enter Key.



3) Choose **Select Program** from the submenu and press the Enter Key.



4) The program selection window will be displayed. Move the cursor using the Cursor Keys to select the program to be read, and press the Enter Key.



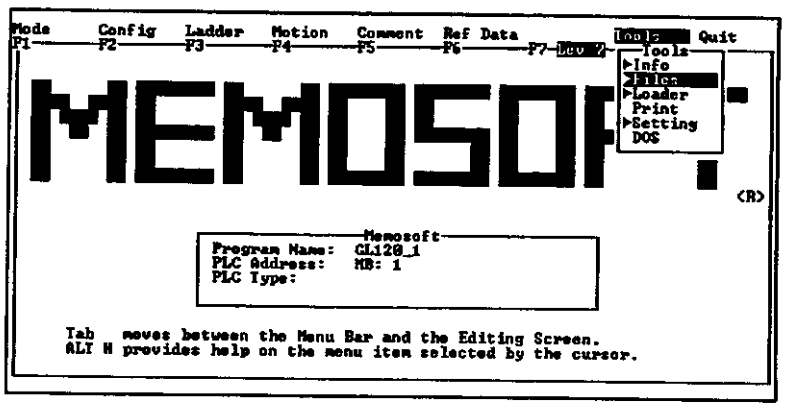
The selected program will be then read to memory.

17.2.2 Creating New Program

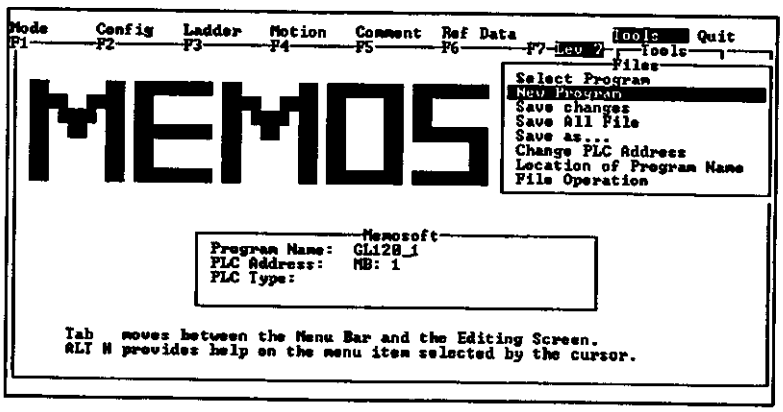
The New Program operation is used for creating a new program.

1) Switch to the menu cursor using the Tab Key.

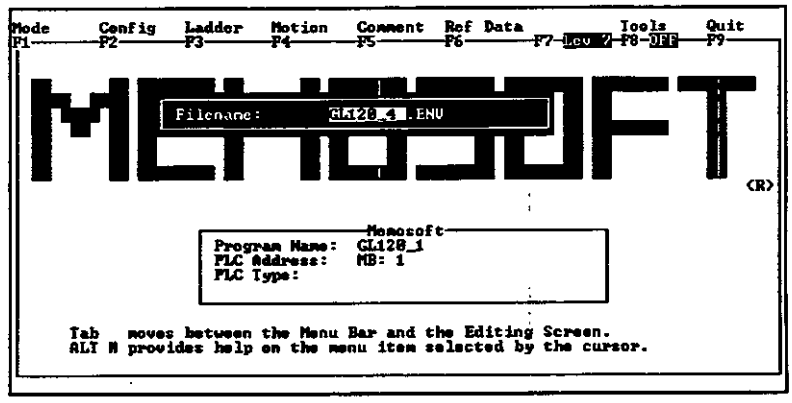
2) Select **Files** from the Tools Menu using the Cursor Keys and press the Enter Key.



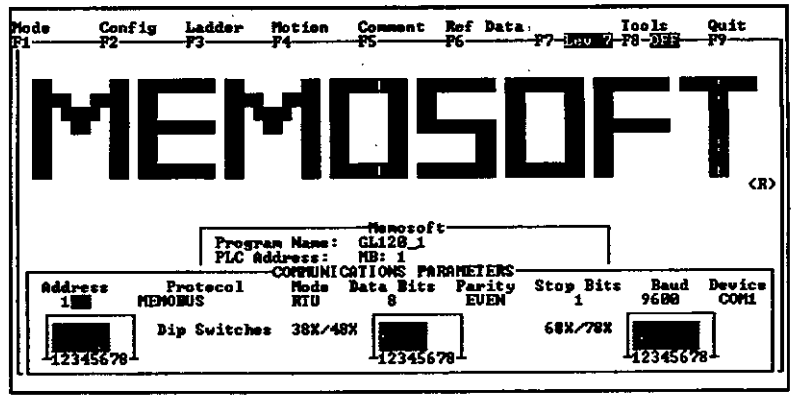
3) Select **New Program** from the submenu and press the Enter Key.



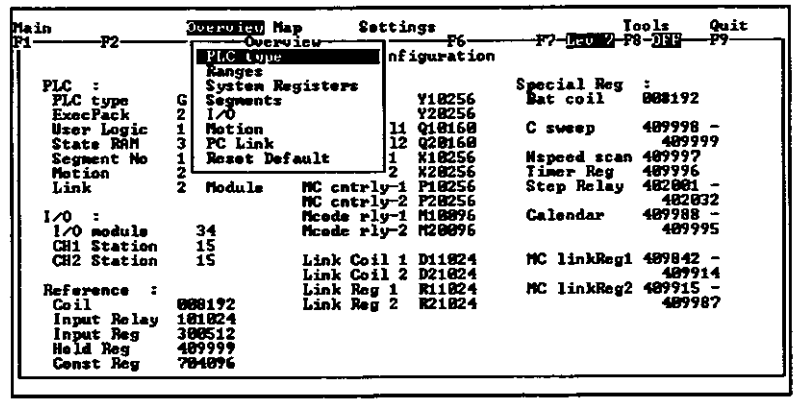
4) The Filename window will be displayed. Enter the desired filename (**GL120_4** in this example) and press the Enter Key.



5) The communications parameters setting window will be displayed. For details on the settings of communications parameters, see *17.2.6 Change PLC Address.* If the PLC address does not need to be changed, leave the settings as they are and press the Enter Key.



6) The PLC System Configuration Screen will be displayed. For details on changing the system configuration, see chapter *7 Setting System Configuration.* If the system configuration does not need to be changed, choose **Quit.**



The Segment Status Display Screen will be displayed.

IMPORTANT

1) Communications parameters set here are used by Select Program or for executing Load when in Online Mode. Make sure to set these parameters correctly to correspond with the parameter settings of the PLC. See *17.2.6 Change PLC Address.* After having once entered the settings, they can be changed again using Change PLC Address Menu.

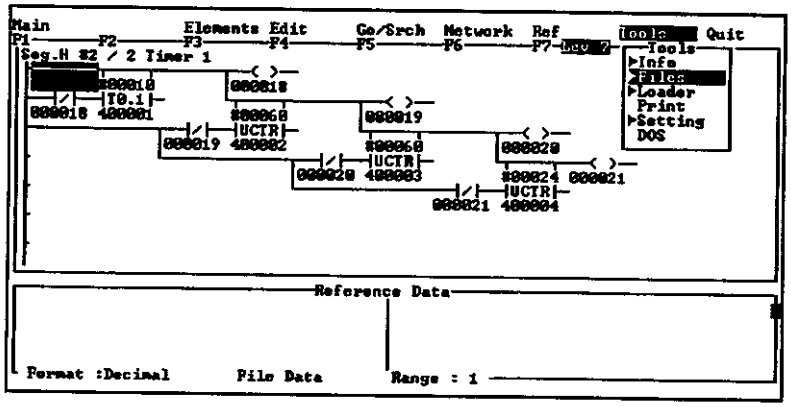
2) Confirmation of system configuration is required before creating a new program. If some settings, such as PLC type, are different, the program cannot be loaded to the PLC. Also, some operations cannot be used when editing the program.

17.2.3 Saving Changes

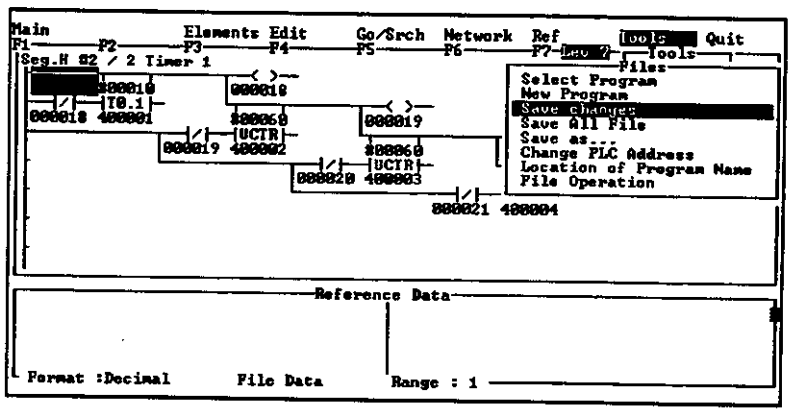
Programs in MEMOSOFT are saved in several files, such as system configuration, ladder program, and motion program. Save changes operation saves and renews only files that have been changed among those program files. If the program size is large, the processing time can be reduced dramatically by performing this operation rather than the Save All Files operation described in section *17.2.4 Save All Files.*

1) Switch to the menu cursor using the Tab Key.

2) Select **Files** from the Tools Menu using the Cursor Keys and press the Enter Key.



3) Select **Save changes** from the submenu and press the Enter Key.



Only the files that have been changed will be affected.

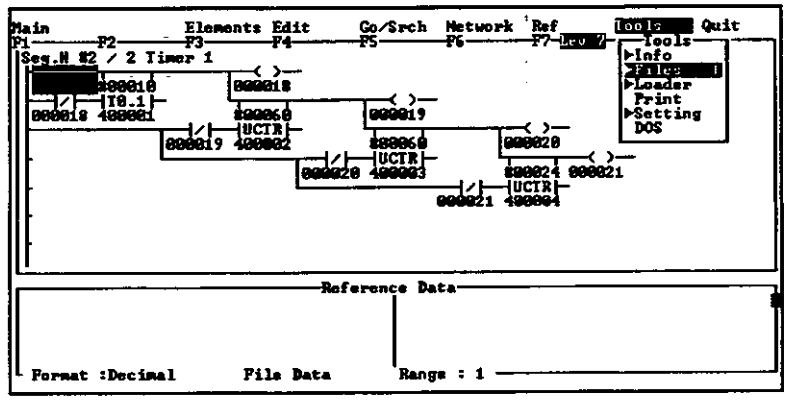
INFO If MEMOSOFT is exited without saving a program that has been changed, a message will ask whether to save the changed program. Be sure to regularly save the program being worked on, especially if the computer is to be left unattended.

17.2.4 Saving All Files

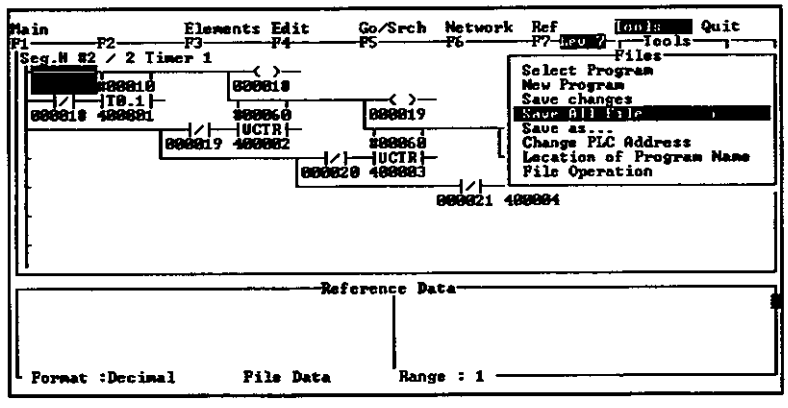
Save All Files operation saves all the files of a program currently being edited. This is convenient when making the creation date uniform for all the files included in one program (for example, when finishing the program). When the program size is large, it is better to perform Save Changes described in section *17.2.3 Save Changes* to reduce the processing time.

1) Switch to the menu cursor using the Tab Key.

2) Select **Files** from the Tools Menu using the Cursor Keys and press the Enter Key.



3) Select **Save All File** from the submenu and press the Enter Key.



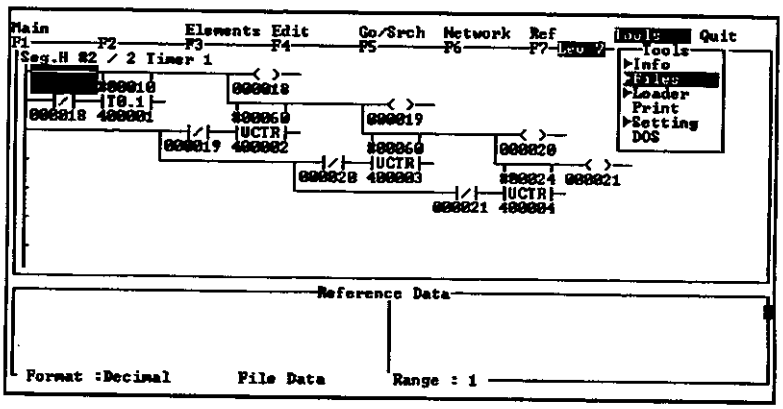
All files associated with those being edited will be saved and renewed.

17.2.5 Saving As Specified File Names

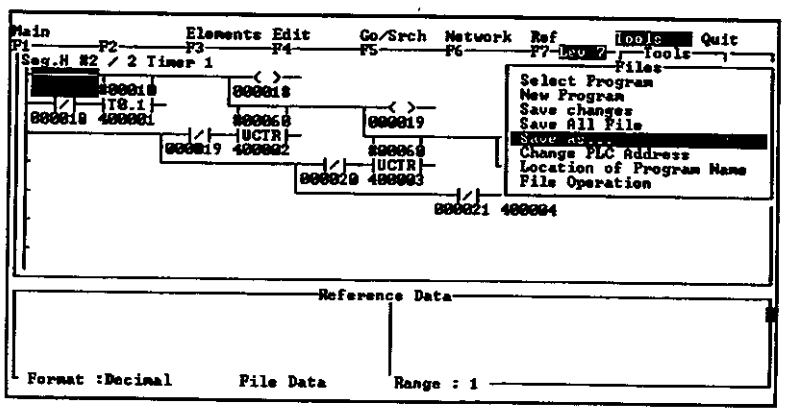
The Save As (saving as specified file names) operation saves the program which is currently being edited under a different program name. It is convenient when creating two similar programs.

1) Switch to the menu cursor using the Tab Key.

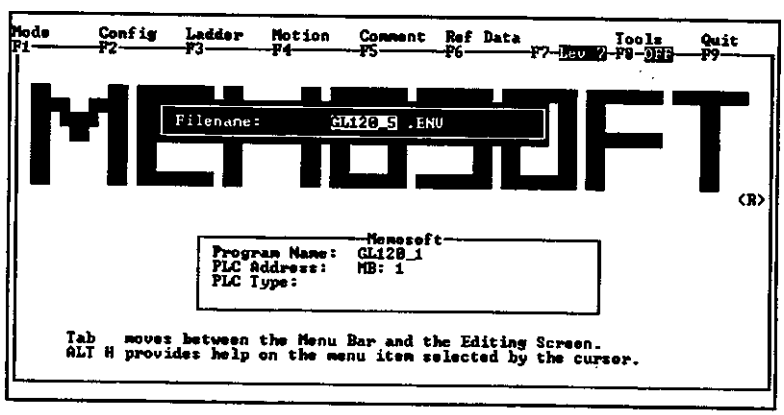
2) Select **Files** from the Tools Menu using the Cursor Keys and press the Enter Key.



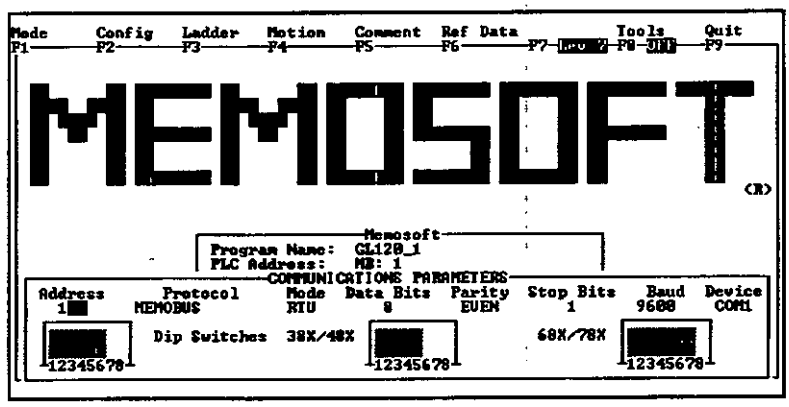
3) Select **Save as...** from the submenu and press the Enter Key.



4) The Filename setting window will be displayed. Enter the new file name and press the Enter Key.



5) The communications parameters setting window will be displayed. For details on setting communications parameters, see *17.2.6 Change PLC Address*. If the PLC address does not need to be changed, leave the settings as they are and press the Enter Key.



The file will be saved with the specified name.

After the Save As operation is finished, the name of the program being edited will change to the name of the program which has been newly saved. To edit the original program which was being edited before the Save As operation took place, import the original program by using the Select Program procedure again.

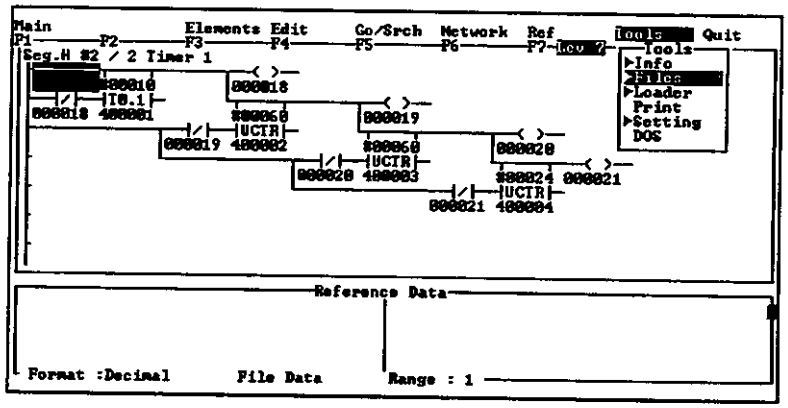
17.2.6 Changing PLC Addresses

The Change PLC Address operation sets up the personal computer for communications with the PLC. The setting parameters are shown below. Parameters for the PLC are set by the system configuration port. See chapter *7 Setting System Configuration* for details.

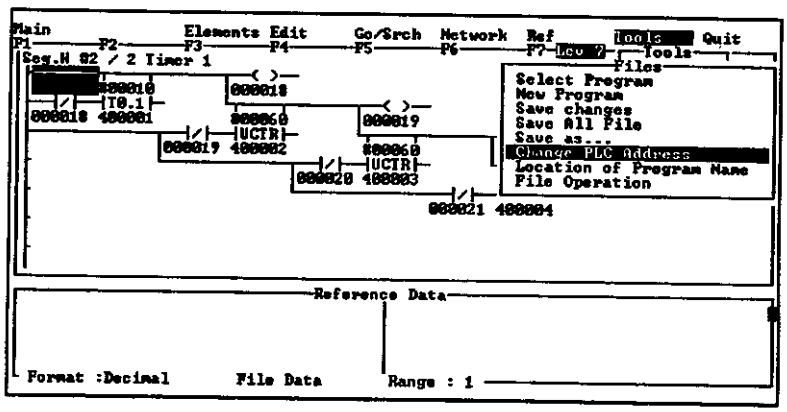
- PLC address: Specify a unique number for each PLC so as to easily identify the PLC required.
- Protocol: Select MEMOBUS, REMOTE MEMOBUS, or MEMOBUS PLUS protocol.
- Mode: Select either RTU or ASCII Mode. For the connection between the personal computer and the PLC, however, only RTU Mode can be used.
- Data Bits: Automatically determines the number of data bits according to the mode.
- Parity: Select odd, even, or none.
- Stop Bits: Select 1 or 2.
- Baud Rate: Select the baud rate within the range of 150 bps minimum to 19,200 bps maximum.
- Port: Select the communications port.

1) Switch to the menu cursor using the Tab Key.

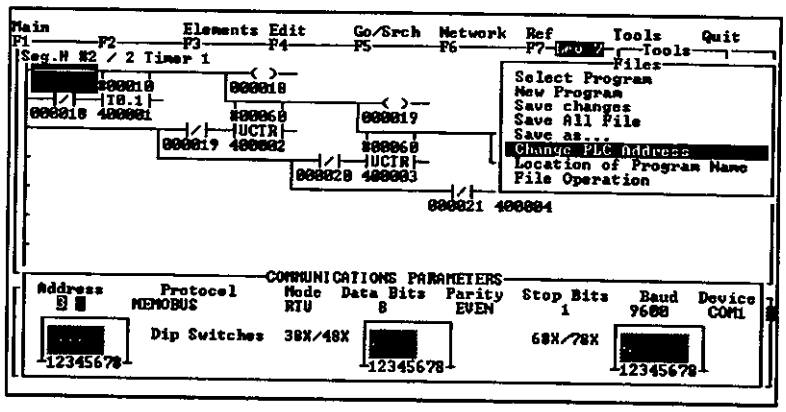
2) Select **Files** from the Tools Menu using the Cursor Keys and press the Enter Key.



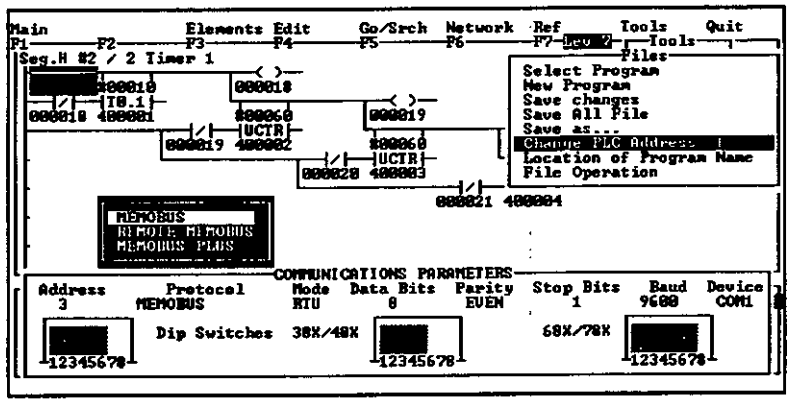
3) Select **Change PLC Address** from the submenu and press the Enter Key.



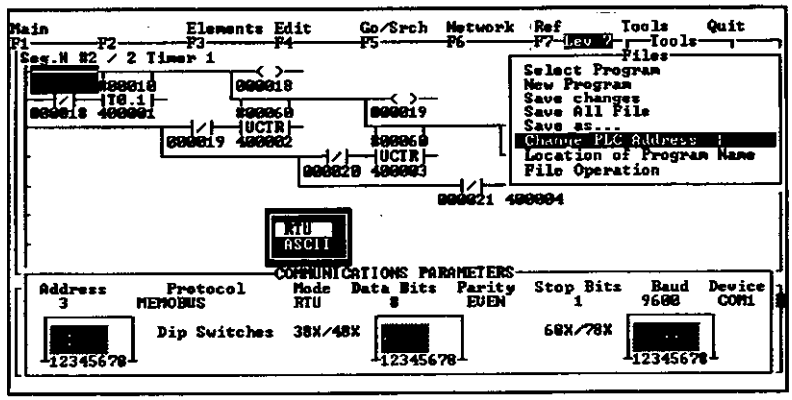
4) The Communications Parameters Setting Screen will be displayed. The cursor will be located at the PLC address, so enter the PLC address (**3** in this example) and press the Enter Key.



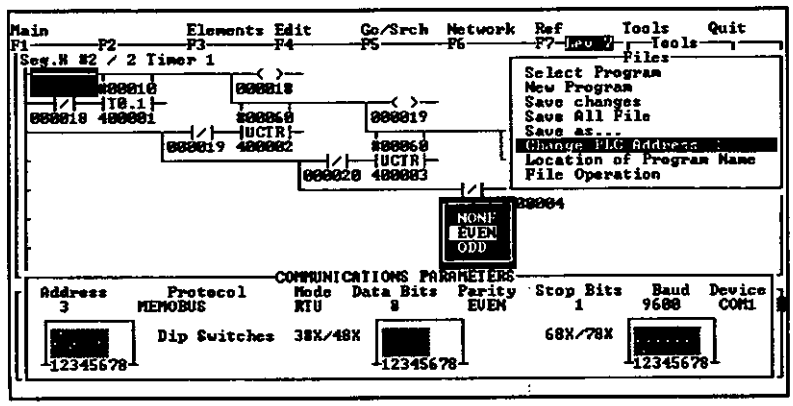
5) The cursor will move to the protocol position. If the current setting as MEMOBUS does not need to be changed, press the Enter Key.



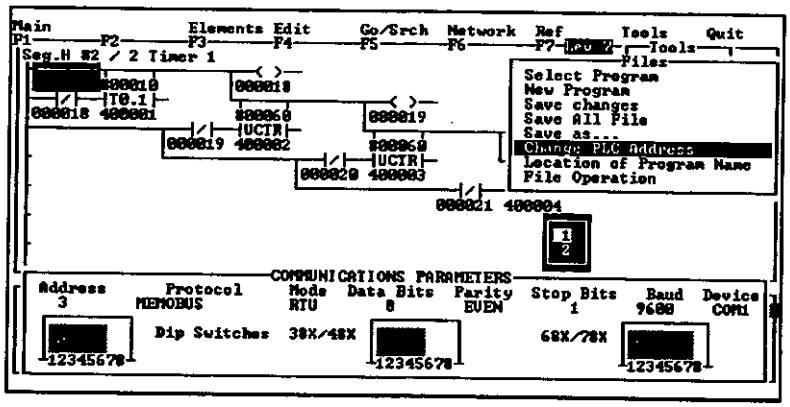
6) The cursor will then move to the mode position. As the personal computer can only communicate with the PLC in RTU Mode, press the Enter Key.



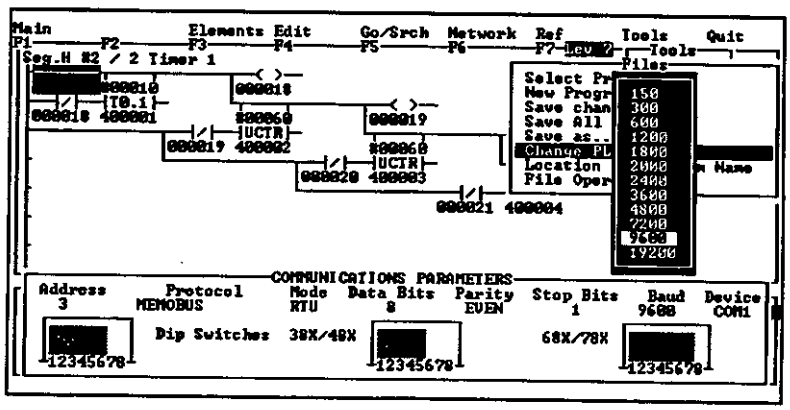
7) The cursor will move to the parity position. Select odd, even, or none by moving the cursor with the Up and Down Cursor Keys, and then press the Enter Key. In this example, even is selected.



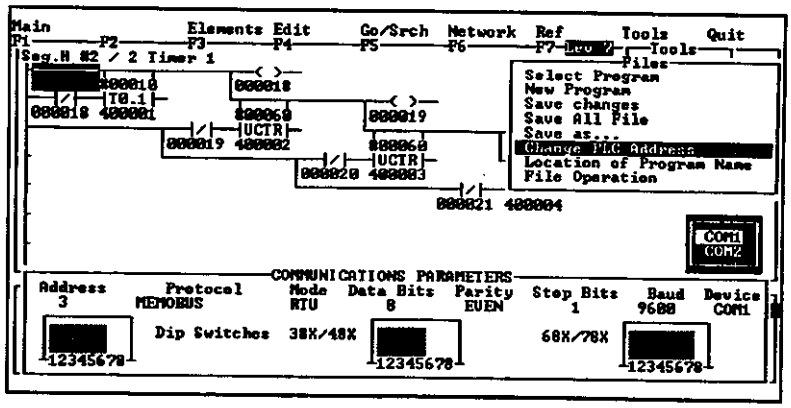
8) The cursor will move to the stop bits position. Select either 1 or 2 by moving the cursor with the Up and Down Cursor Keys, and then press the Enter Key. In this example, 1 is selected.



9) The cursor will move to the baud rate position. Select the baud rate by moving the cursor with the Up and Down Cursor Keys. In this example, the rate is left at 9,600. Then press the Enter Key.



10) The cursor will move to the device position. Select either COM1 or COM2 to specify the communications port by moving the cursor with the Up or Down Cursor Keys. In this example, COM1 is selected. Then, press the Enter Key.



The communications parameters settings are now complete.

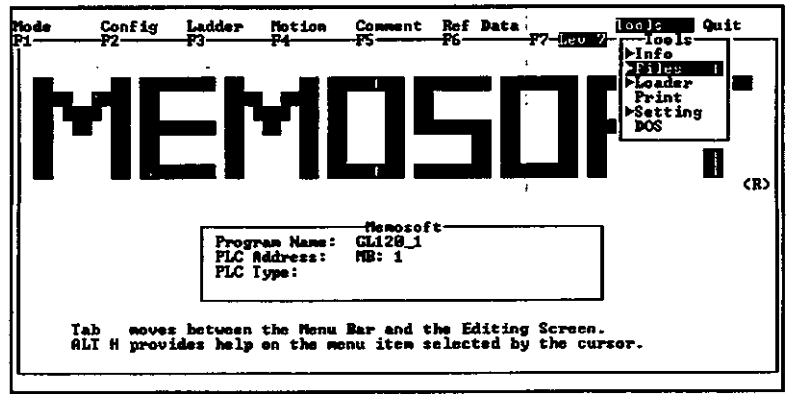
IMPORTANT If the communications parameters of the personal computer (as set by the Change PLC Address operation) do not correspond with the communication parameters of the PLC (as set by the System Configuration Port operation,) communications will not be possible. Basically, do not change parameters, except for the PLC address, after they have been set for the first time.

17.2.7 Location of Program Name

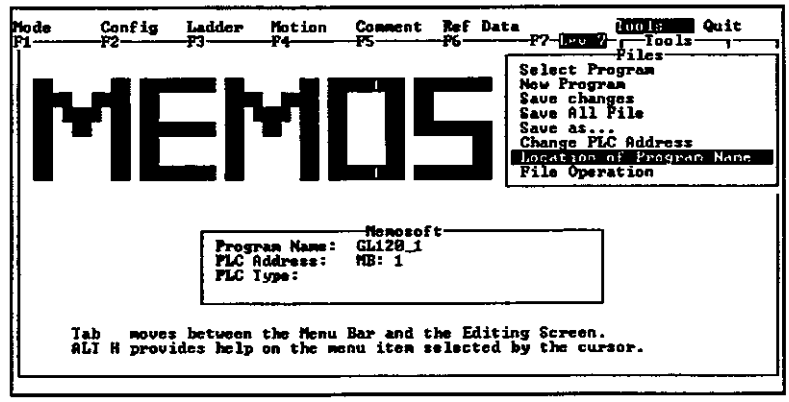
The program path must be changed if a program is to be read from a directory which is different to the initial setting, or from a floppy disk.

1) Switch to the menu cursor using the Tab Key.

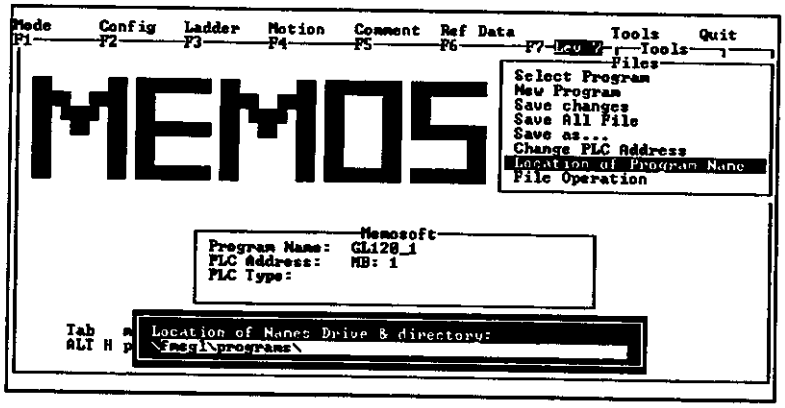
2) Select **Files** from the Tools Menu using the Cursor Keys and press the Enter Key.



3) Select **Location of Program Name** from the submenu and press the Enter Key.



4) A directory setting window will be displayed. The default setting is \FMSGL\PROGRAMS. Enter the new directory name and press the Enter Key.



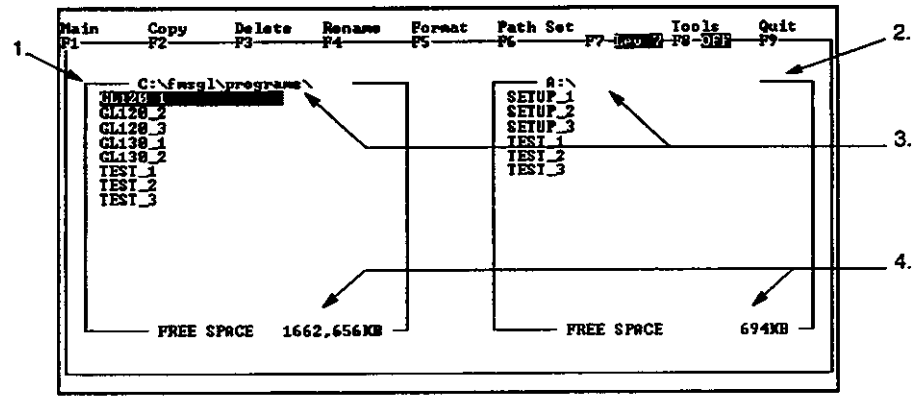
From now on, when **Select Program** is selected, programs in the new directory will be displayed.

17.3 File Operations

This section describes the various operations associated with the File Operation Menu, and the necessary operating procedures.

17.3.1 File Operation Screen

By selecting **File Operation** from the Files Submenu of the Tools Menu, the File Operation Screen shown below will be displayed.



1. Left Program Display Window

Displays the programs to be operated on. The programs in the directory specified as the default in Location of Program Name will be displayed.

2. Right Program Display Window

Displays the programs to be operated on. The programs in the route directory of the floppy disk drive specified as the default will be displayed. If a floppy disk has not been inserted when File Operation is selected, a confirmation message will appear asking to check whether a floppy disk is inserted.

3. Window Title

Displays the drive and directory name for each window being used for the operation.

4. Free Space

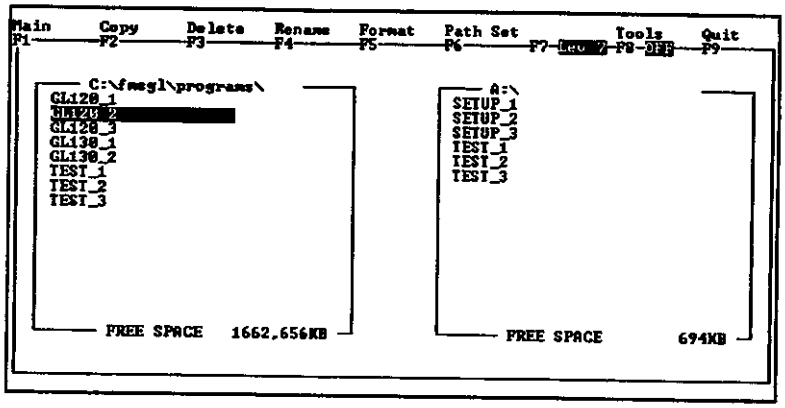
Displays the amount of free memory space available on each disk.

17.3.2 Copying Programs

The File Operation operation can be used to copy programs between the left and right windows in either direction.

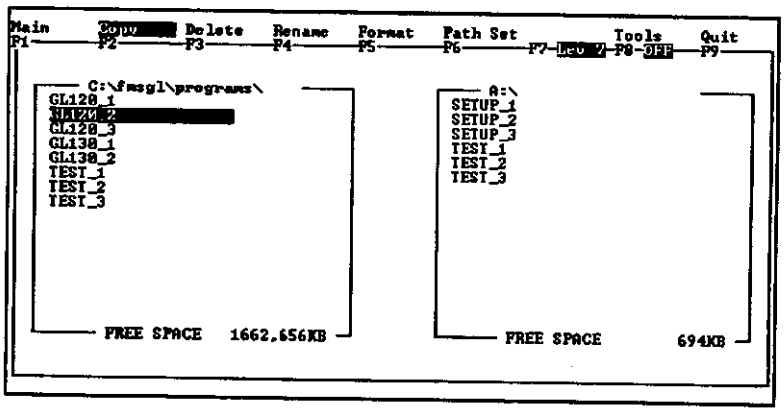
The following example shows the procedure used to copy a program from the left window to the right window.

1) Select the window containing the program to be copied. Then, select the program to be copied (**GL120_2** in this example) using the Cursor Keys.

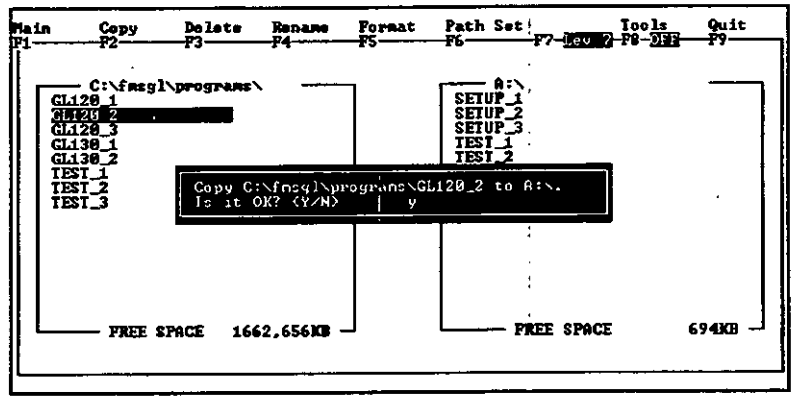


2) Switch to the menu cursor using the Tab Key.

3) Select **Copy** using the Cursor Keys and press the Enter Key.



4) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



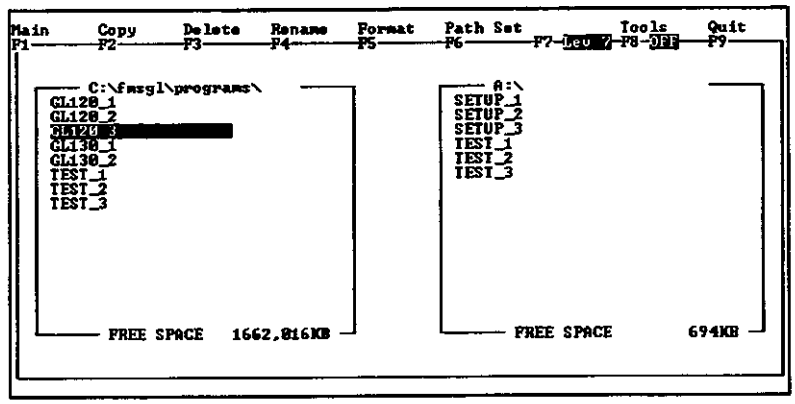
The program will be copied. When the copy operation is complete, a message indicating completion will be displayed.

5) Press the Enter Key. The message will disappear, and the list of programs will be displayed once again.

17.3.3 Deleting Programs

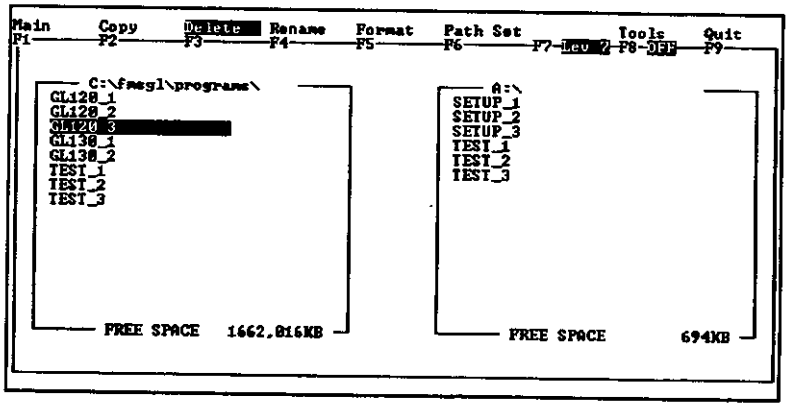
The File Operation operation can be used to delete programs as shown in the following example.

1) Select the window containing the program to be deleted. Then, select the program to be deleted (**GL120_3** in this example) using the Cursor Keys.

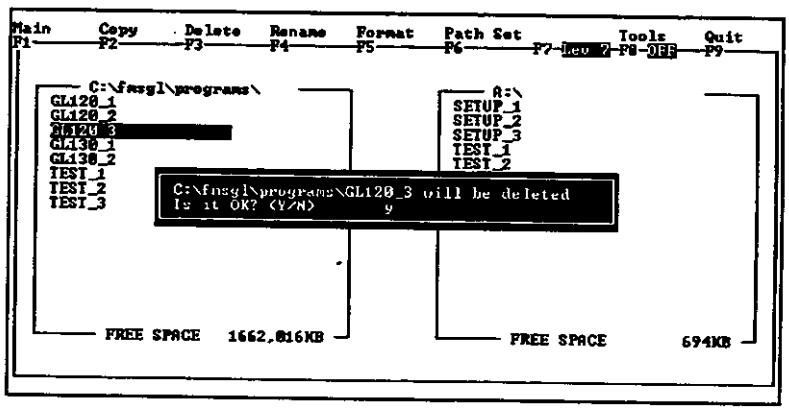


2) Switch to the menu cursor using the Tab Key.

3) Select **Delete** using the Cursor Keys and press the Enter Key.



4) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



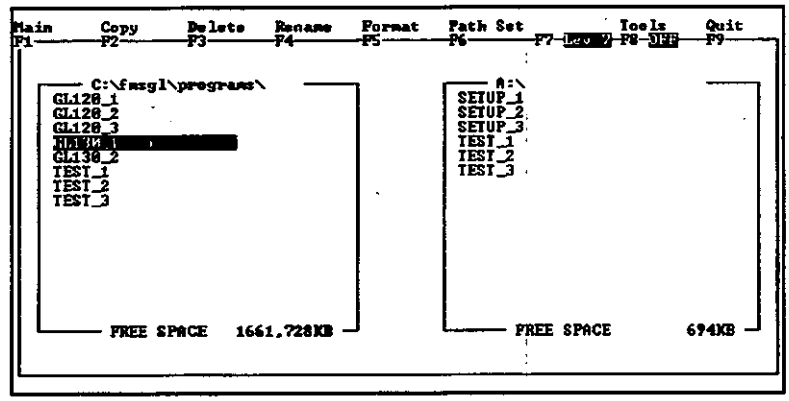
The program will be deleted. When the deletion is complete, a message indicating completion will be displayed.

5) Press the Enter Key. The message will disappear, and the list of programs will be displayed once again.

17.3.4 Renaming Programs

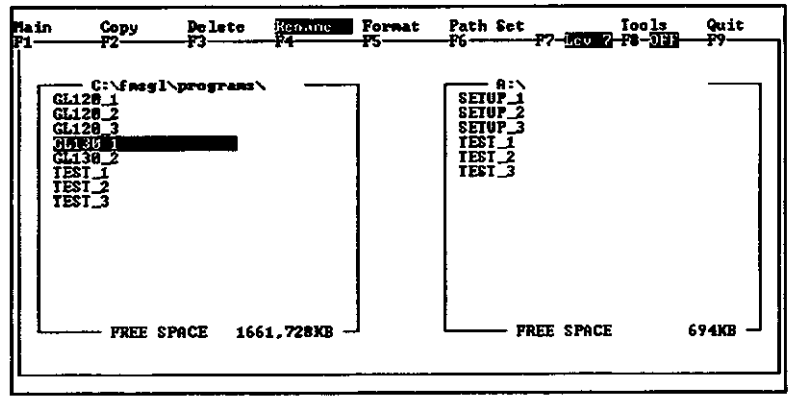
The File Operation operation can be used to rename programs as shown in the following example.

1) Select the window containing the program to be renamed. Then, select the program to be renamed (**GL130_1** in this example) using the Cursor Keys.

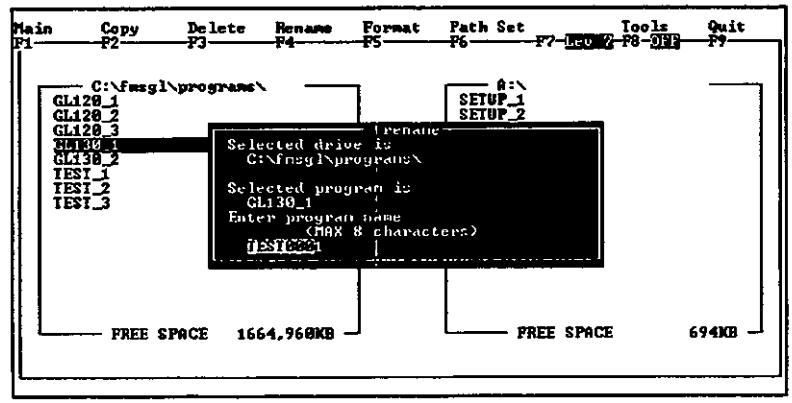


2) Switch to the menu cursor using the Tab Key.

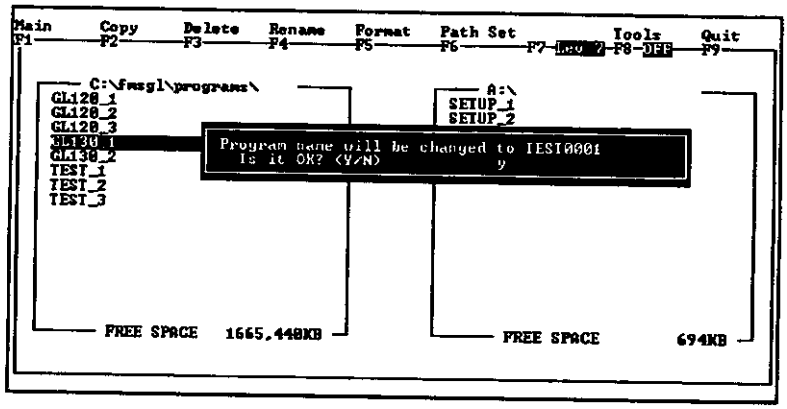
3) Select **Rename** using the Cursor Keys and press the Enter Key.



4) A program renaming window will be displayed. Enter the new program name and press the Enter Key.



5) A confirmation window will be displayed. Enter **Y** and press the Enter Key.



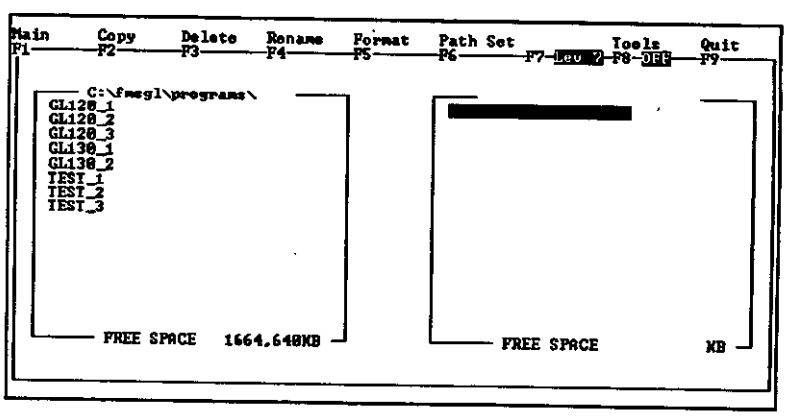
The program will be renamed. When the renaming is complete, a message indicating completion will be displayed.

6) Press the Enter Key. The message will disappear, and the list of programs will be displayed once again.

17.3.5 Formatting Floppy Disks

The File Operation operation can be used to format floppy disks as shown in the following example.

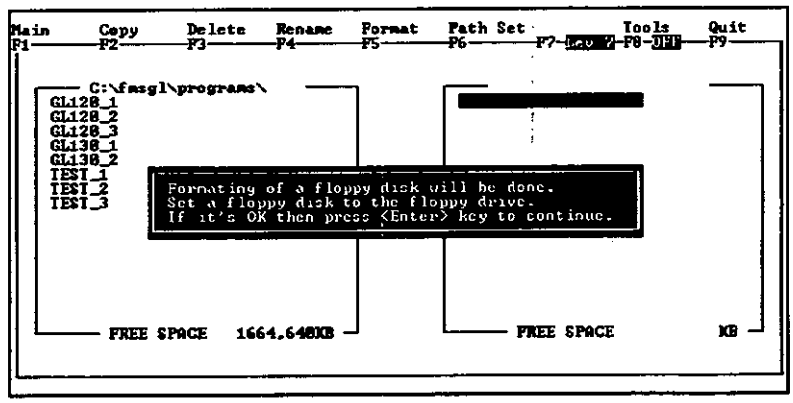
1) Select the window for the floppy disks using the Cursor Keys.



2) Switch to the menu cursor using the Tab Key.

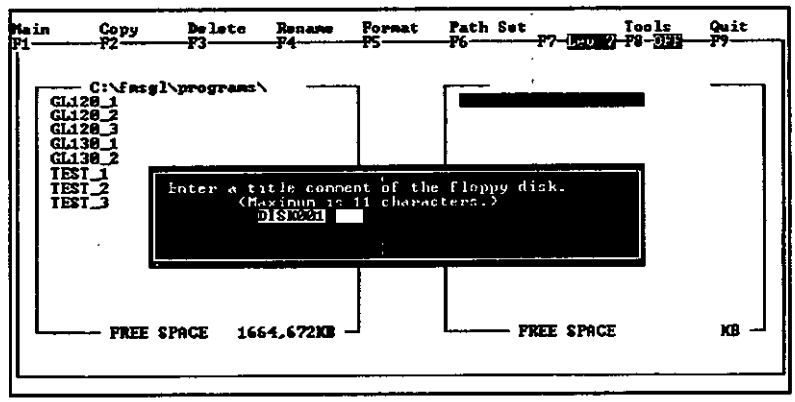
3) Select **Format** using the Cursor Keys and press the Enter Key.

A confirmation message will be displayed asking whether a floppy disk has been inserted.

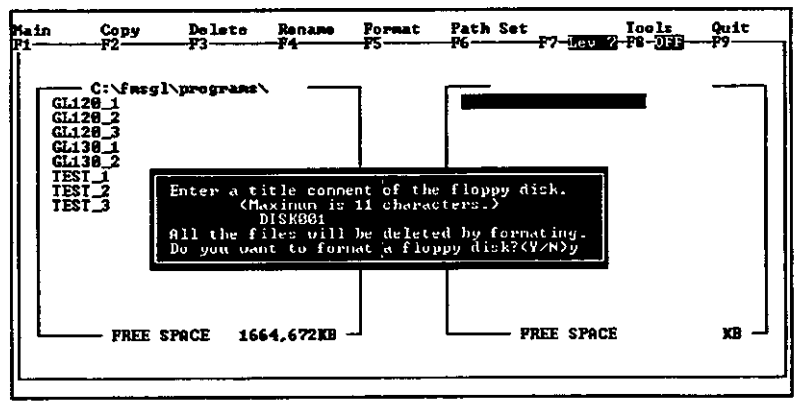


4) Press the Enter Key and a window for entering the title comment of the floppy disk will be displayed.

5) Enter the title name (**DISK001** in this example) and press the Enter Key.



6) A window confirming the format operation will be displayed. Enter **Y** and press the Enter Key.



The floppy disk will be formatted. When the formatting is complete, a message indicating completion will be displayed.

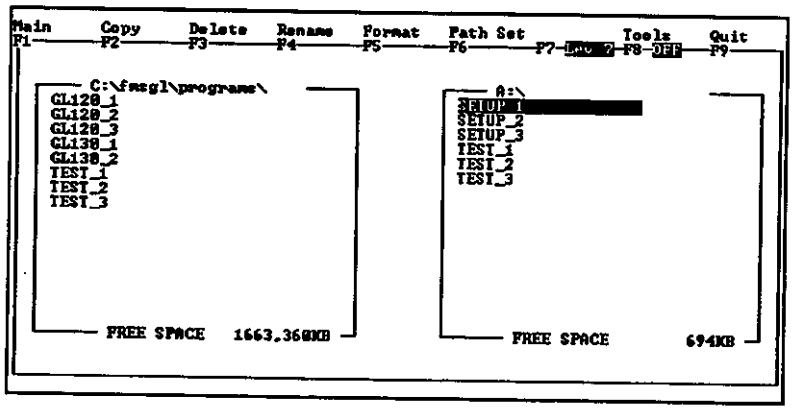
7) Press the Enter Key. The message will disappear, and the list of programs will be displayed once again.

INFO Only floppy disks formatted for 1.44 Mbytes can be used. Reading/writing can be performed for floppy disks formatted for either 1.2 Mbytes or 1.44 Mbytes if 3 modes are supported.

17.3.6 Changing Program Paths

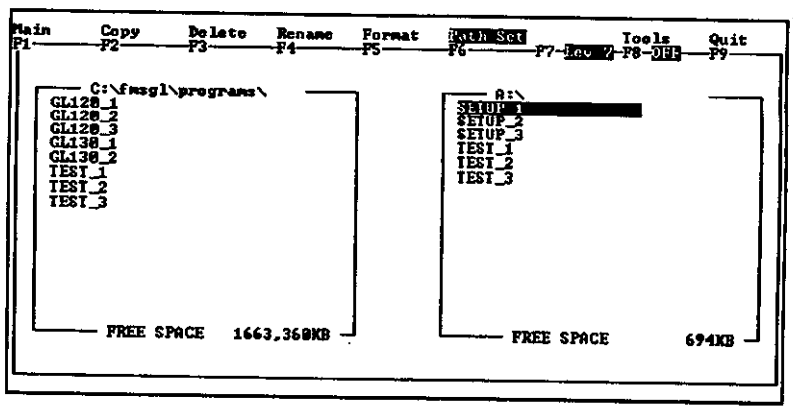
The drive and directory for file operations can be changed. The following example shows how to change a floppy disk file window to a hard disk file window.

1) Select the window for the floppy disk using the Cursor Keys.

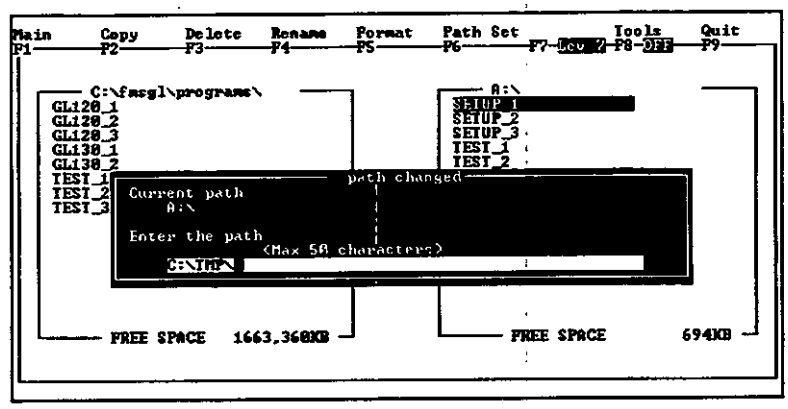


2) Switch to the menu cursor using the Tab Key.

3) Select **Path Set** using the Cursor Keys and press the Enter Key.

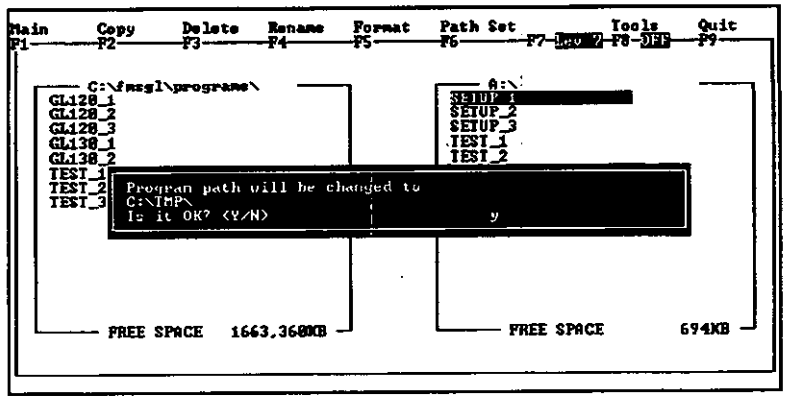


4) A window for entering the new path name will be displayed. Enter the path name (**C:\TMP** in this example) and press the Enter Key.



INFO When changing a path name, always place a backslash (\) at the end of the path name, e.g., C:\TMP\.

5) A confirmation window will be displayed. Enter **Y** and press the Enter Key.



The program path will be changed and the list of programs will be displayed.

Loader Operations

18

This chapter describes operations such as loading programs created in Offline Mode to the PLC or a Motion Module, and saving programs from the PLC to the personal computer.

18.1 PLC Load/Save Operations

This section describes operations procedures for loading programs from the personal computer to the PLC, saving programs from the PLC to the personal computer, and verifying the data between the personal computer and the PLC.

18.1.1 Loading from Personal Computer to PLC

This operation loads a program created in Offline Mode to the PLC CPU Module. The operation can be performed only in Offline Mode. If the PLC is in RUN State, stop the PLC after a confirmation message is displayed by MEMOSOFT. When the PLC is in RUN State, the procedure is as follows:

1) Select the Loader Menu.

2) Stop the PLC after a confirmation message is displayed.

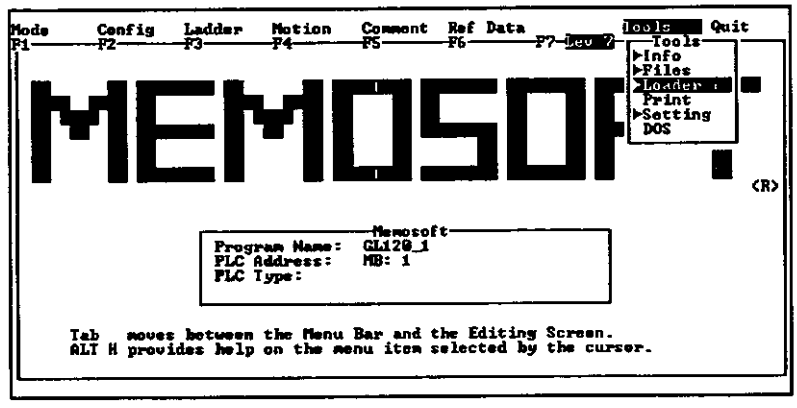
3) Load the program to the PLC.

4) Start the PLC after a confirmation message is displayed.

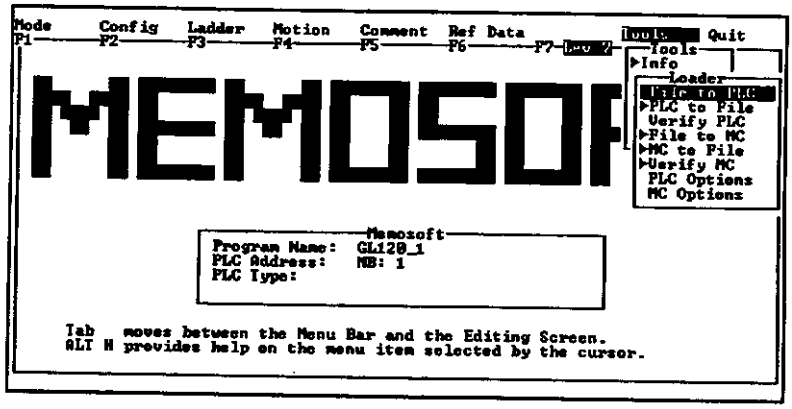
Use the following procedure to perform the load operation.

1) Switch to the menu cursor using the Tab Key.

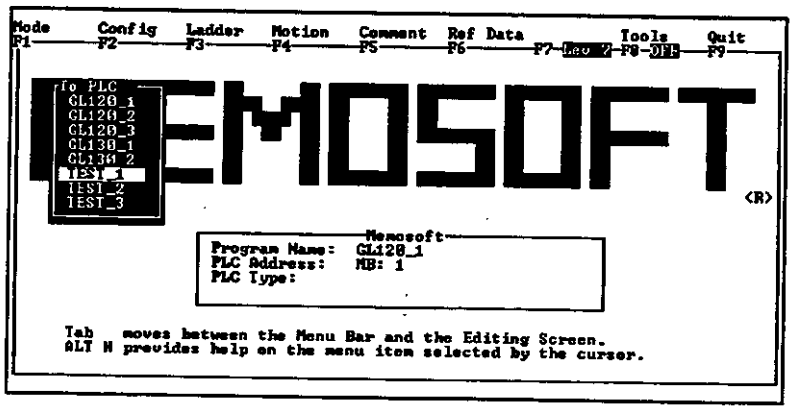
2) Select **Loader** from the Tools Menu using the Cursor Keys and press the Enter Key.



3) Select **File to PLC** from the Loader Submenu using the Down Cursor Key and press the Enter Key.



4) A window for selecting the file to be loaded to the PLC will be displayed. Select the file name to be loaded using the Down Cursor Key and press the Enter Key.



5) The program will be loaded to the PLC. When the load operation is completed, a message will be displayed asking whether to start the PLC. Enter **Y** to start the PLC.

INFO

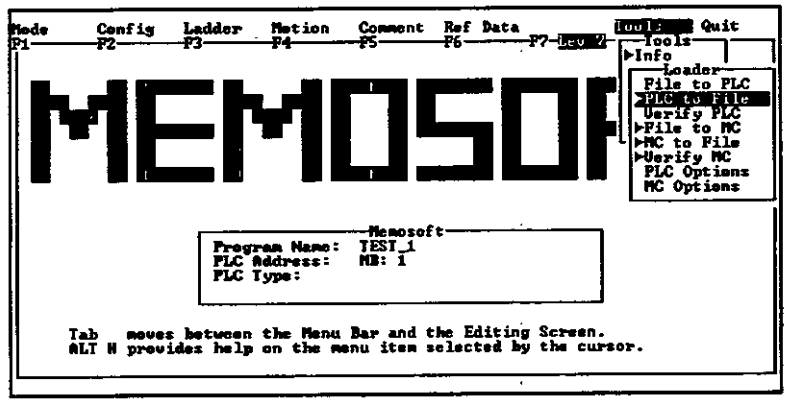
1) The communications parameters used for the load operation are those which were set when the new program was created by the New Program operation. If the communications parameters need to be changed, select the file name to be loaded using the Select Program operation, and then change these parameters using the Change PLC Address operation.

2) If the same coil is used more than once, an error will occur during load execution. In this case, execute File Check on the Segment List Display Screen to correct the duplicated coil.

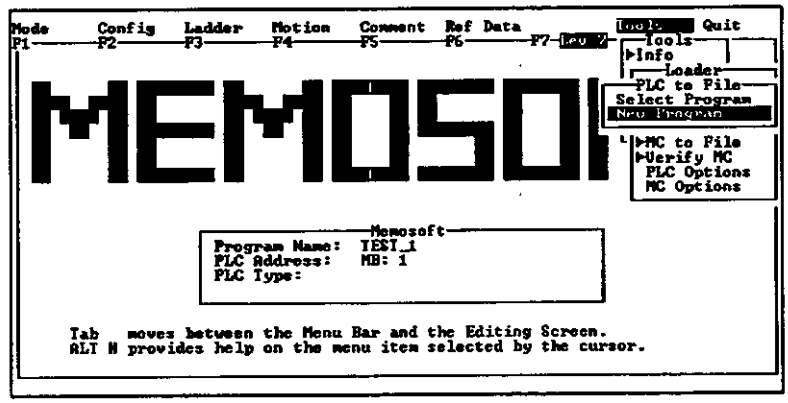
18.1.2 Saving from PLC to Personal Computer

Saving a program stored in the PLC CPU Module to the personal computer can be performed only in Offline Mode. This operation can be performed even if the PLC is in RUN State. The following example shows this operation.

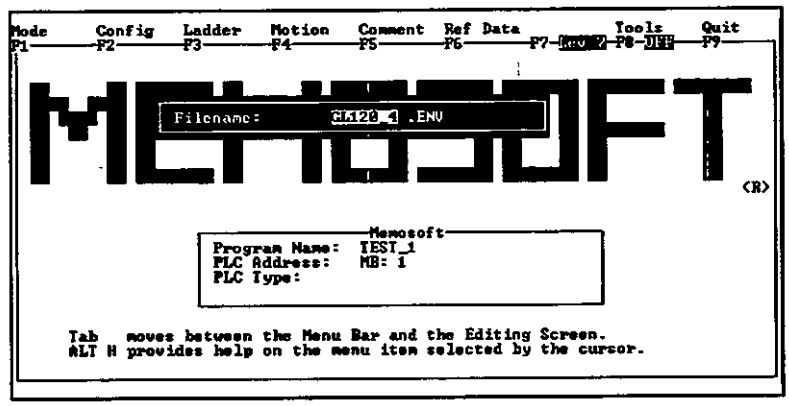
1) Select **PLC to File** from the Loader Submenu of the Tools Menu. Then press the Enter Key.



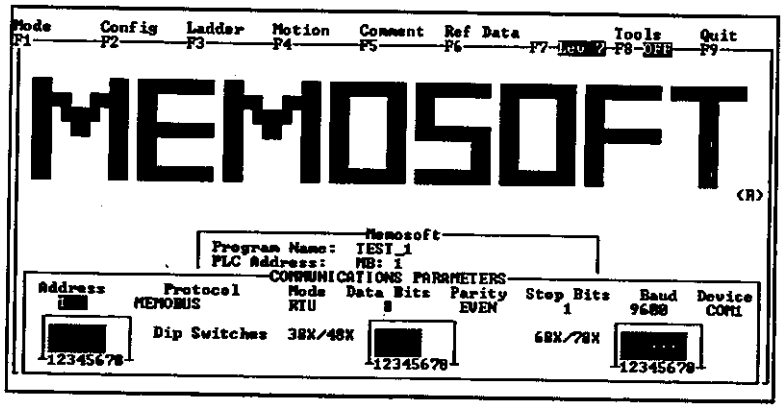
2) A submenu will be displayed. In this example, select **New Program** using the Cursor Keys. To overwrite the new file to a file that already exists, choose **Select Program**.



3) Enter the file name (**GL120_4** in this example) and press the Enter Key.



4) Set the communications parameters.



The file transfer from the PLC to the personal computer will start.

INFO

1) To change the communications parameters, see *17.2.6 Change PLC Address.*

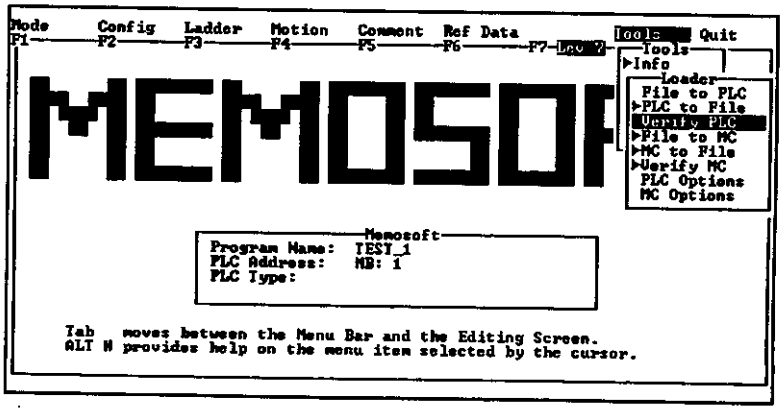
2) When saving a program using the Select Program operation, the parameters which are saved in the selected program are used for the communications parameters with the PLC. To change the communications parameters, load the file and change the parameters using the Change PLC Address operation.

18

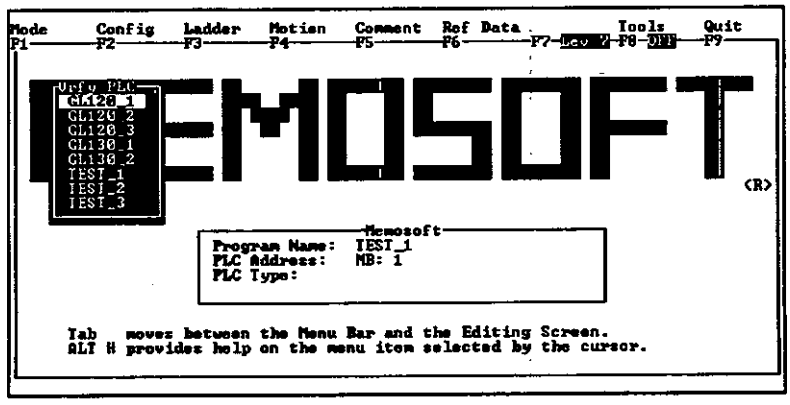
18.1.3 Verifying PLC Data with Personal Computer Data

After executing the load operation from the personal computer to the PLC, or the save operation from the PLC to the personal computer, for confirmation, verify the PLC data with the personal computer data. An example is shown below.

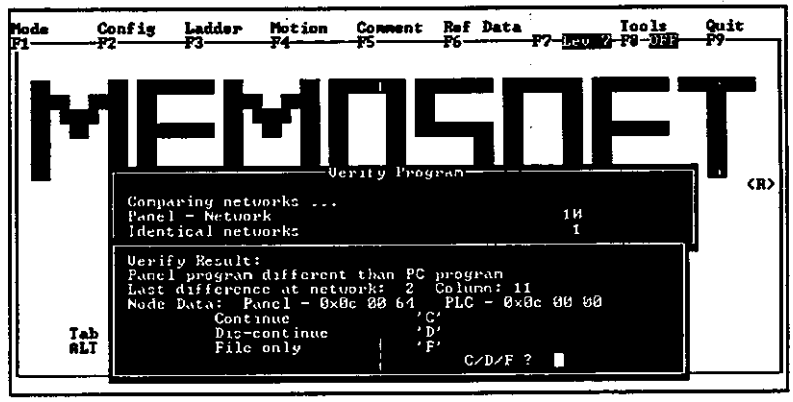
1) Select **Verify PLC** from the Loader Submenu of the Tools Menu using the Cursor Keys. Then press the Enter Key.



2) Select the file name to be verified (**GL120_1** in this example) using the Cursor Keys and press the Enter Key.



If the contents of the selected file do not correspond with the PLC, the following message will be displayed.



3) Continue the procedure according to the messages displayed. The following file will be created to save the verification results.

***.MAP
└── Program name

18.2 Motion Module Load/Save Operations

This section describes the procedure used to load a program from a personal computer to the Motion Module, to save a program from the Motion Module to a personal computer, and to verify the data between the personal computer and the Motion Module.

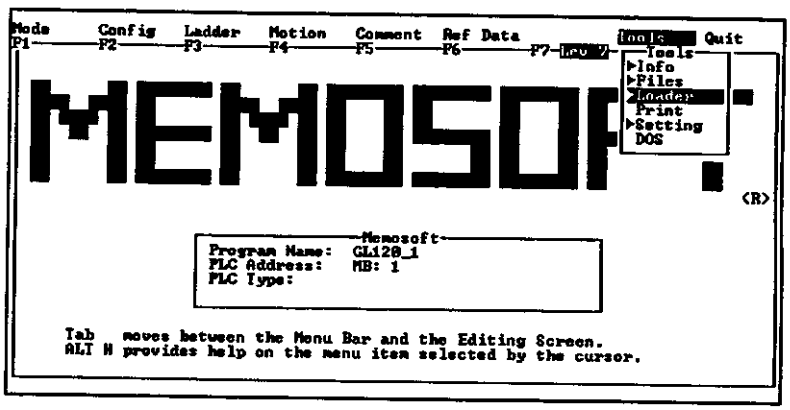
18.2.1 Loading from Personal Computer to Motion Module

This operation loads the motion program, parameters, and point table created in Offline Mode to the Motion Module. The operation can be performed only in Offline Mode. The Motion Module must be in Edit Mode. If the Motion Module has been switched to another mode, such as Manual Mode, make sure to return it to Edit Mode before loading.

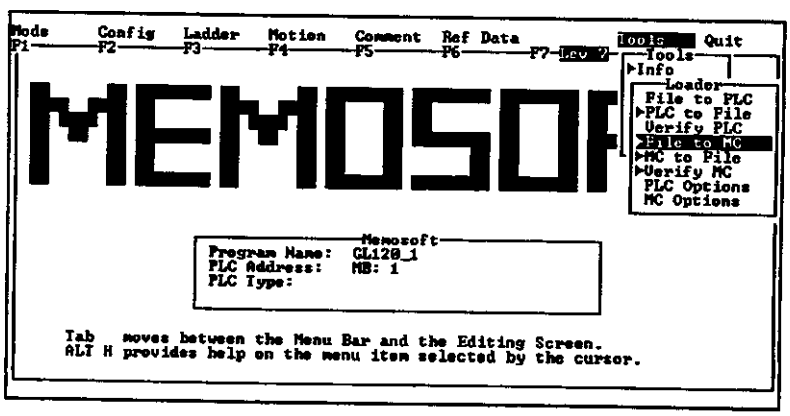
This operation can also be executed with the PLC in RUN State.

The following example shows the load operation.

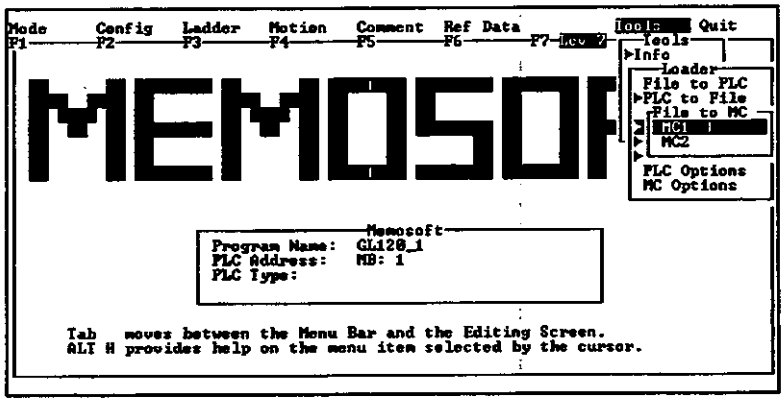
1) Select **Loader** from the Tools Menu using the Cursor Keys and press the Enter Key.



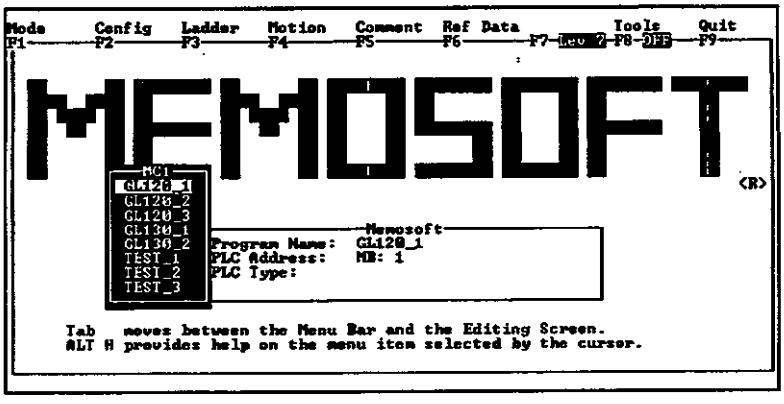
2) Select **File to MC** from the submenu using the Down Cursor Key and press the Enter Key.



3) The MC selection window will be displayed. Select the Module to be loaded from the personal computer (**MC1** in this example) using the Down Cursor Key. Then, press the Enter Key.



4) A window for selecting the file to be loaded to the Motion Module will be displayed. Select the file name to be loaded using the Down Cursor Key and press the Enter Key.



Data relating to MC1 in the specified file will be loaded to MC1.

INFO

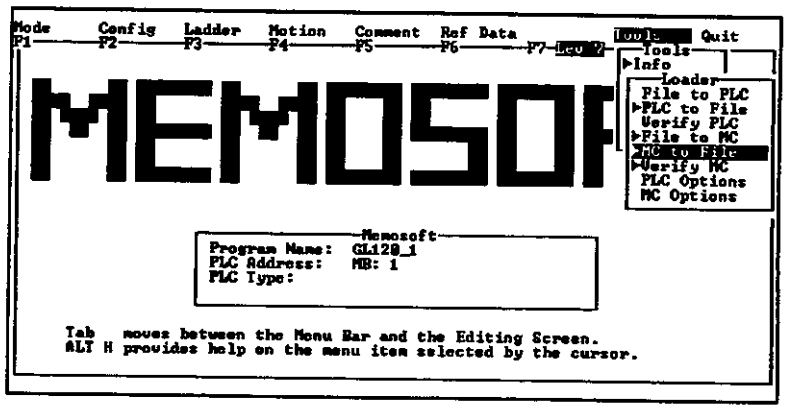
1) The communications parameters used for the load operation are those which were set when a new program was created using the New Program operation. If the communications parameters need to be changed, select the file name to be loaded using the Select Program operation, then change the parameters using the Change PLC Address operation.

2) If the Motion Module is not in Edit Mode, the motion program cannot be loaded, causing an error to occur. If this happens, reload with the Motion Module in Edit Mode.

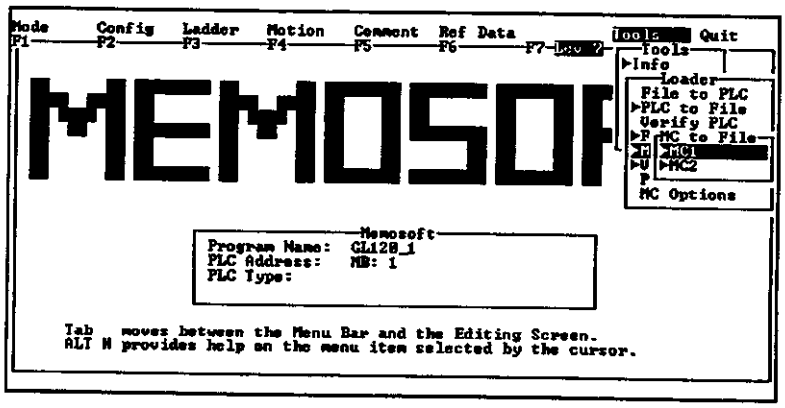
18.2.2 Saving from Motion Module to Personal Computer

This operation is used to save data for the motion program, parameters, and point table that have been stored in the Motion Module to a personal computer. This operation can be performed only in Offline Mode, and it can be executed regardless of the Motion Module Mode. The following example shows how to save to a new file.

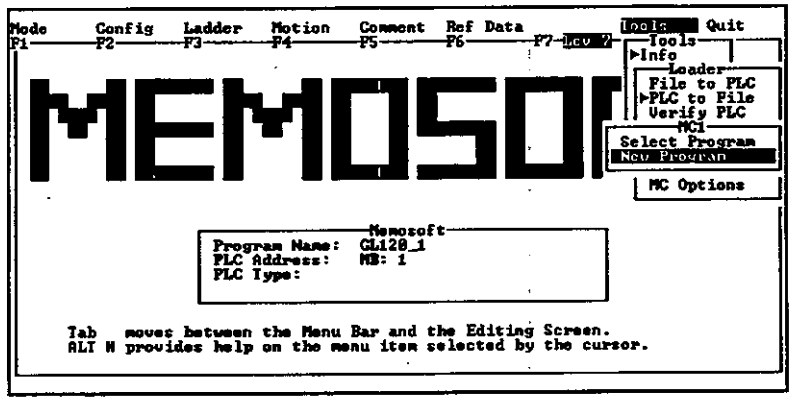
1) Select **MC to File** from the Loader Submenu of the Tools Menu. Then, press the Enter Key.



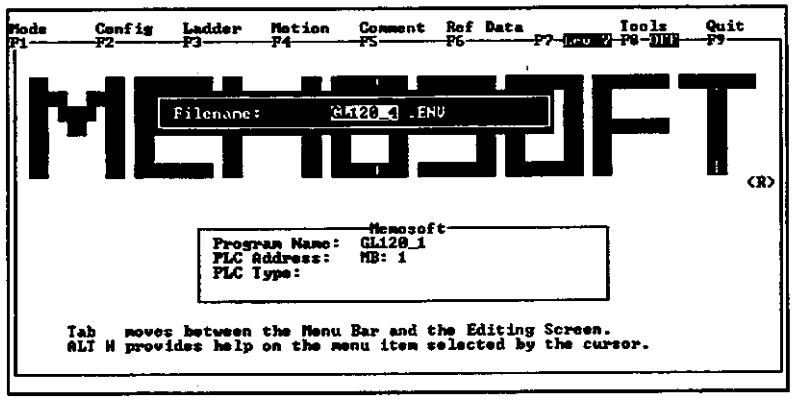
2) The MC selection window will be displayed. Select the Module containing the data to be saved to the personal computer (**MC1** in this example) using the Down Cursor Key. Then, press the Enter Key.



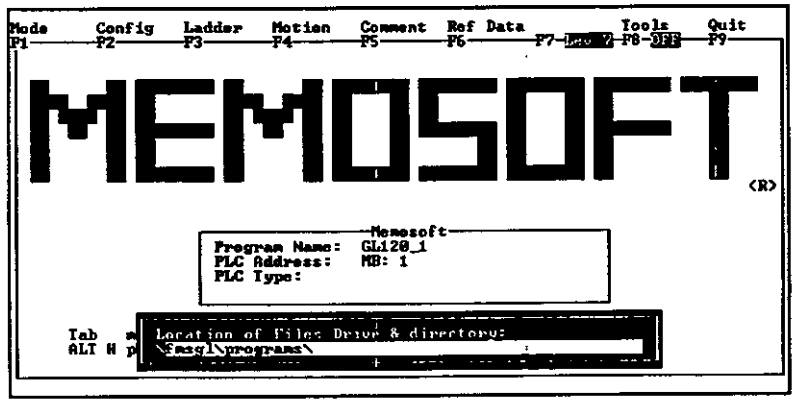
3) A menu for selecting whether to overwrite an existing file, or to create a new file will be displayed. In this example, select **New Program** using the Down Cursor Key and press the Enter Key.



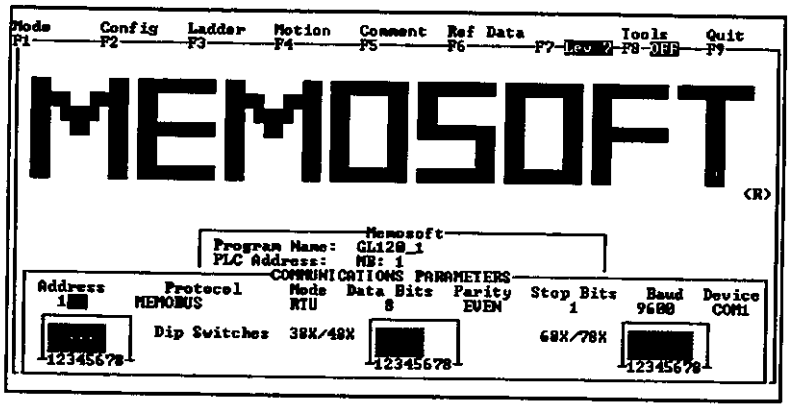
4) A window will be displayed for entering the new file name. Enter the file name (**GL120_4** in this example) and press the Enter Key.



5) Specify the directory in which to save the file and press the Enter Key.



6) Set the communications parameters.



The file saving operation will start.

INFO

1) To change the communications parameters, see *17.2.6 Change PLC Address.*

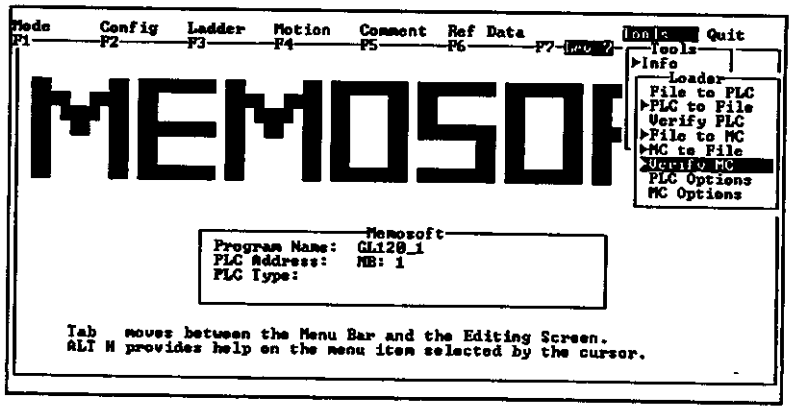
2) If a program is saved using the Select Program operation, the parameters which are saved in the selected program are used for the communications parameters with the PLC. If the communications parameters need to be changed, load the file and change the parameters using the Change PLC Address operation.

18

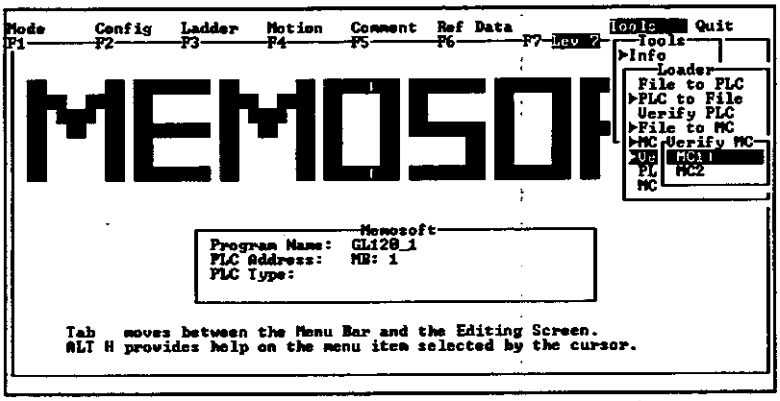
18.2.3 Verifying Motion Module Data with Personal Computer Data

After performing the load operation from the personal computer to the Motion Module or the save operation from the Motion Module to the personal computer, verify the Motion Module data with the personal computer data for confirmation. The following example shows how to verify the data.

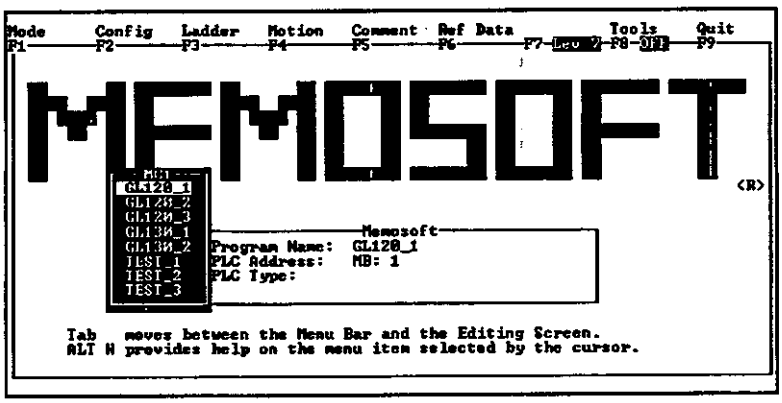
1) Select **Verify MC** from the Loader Submenu of the Tools Menu using the Cursor Keys. Then press the Enter Key.



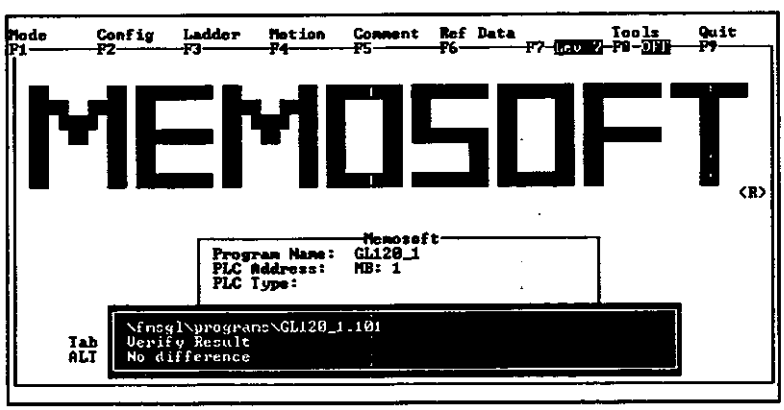
2) The MC selection window will be displayed. Select the Module containing the data to be compared with the personal computer data (**MC1** in this example) using the Cursor Keys. Then press the Enter Key.



3) Select the file name to be verified using the Cursor Keys and press the Enter Key.



Comparing will start. If the comparison detects no difference, the following message will be displayed.



18.3 PLC Options

This section describes how to load/save various types of data separately with the PLC.

18.3.1 PLC Option Operations

The loader operations of the PLC provide operations that can be used to reduce the load/save time by handling only part of the data separately. Following is a list of items that can be loaded or saved separately.

Whole area: Loads/saves all the data of the PLC CPU Module.
This functions in the same way as the normal load/save operation.

No status: Loads/saves data other than the ON/OFF status of a coil or reference data.

System configuration: Loads/saves only the system configuration.

Program: Loads/saves only the ladder program.

Status: Loads/saves only the ON/OFF status of a coil and reference data.

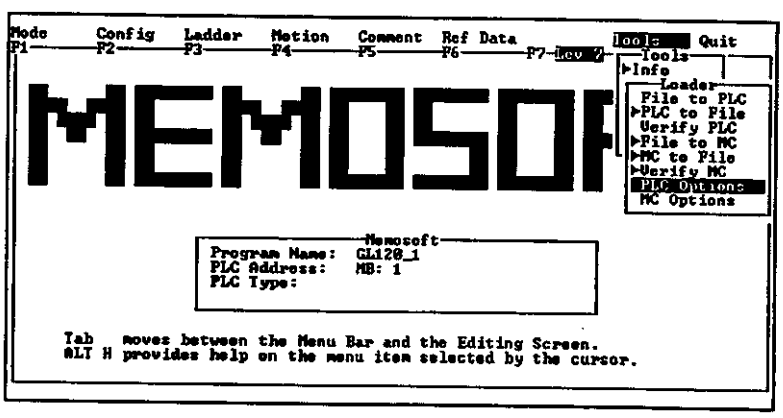
18.3.2 Split Loading to PLC

The following example shows how to load only the system configuration to the PLC.

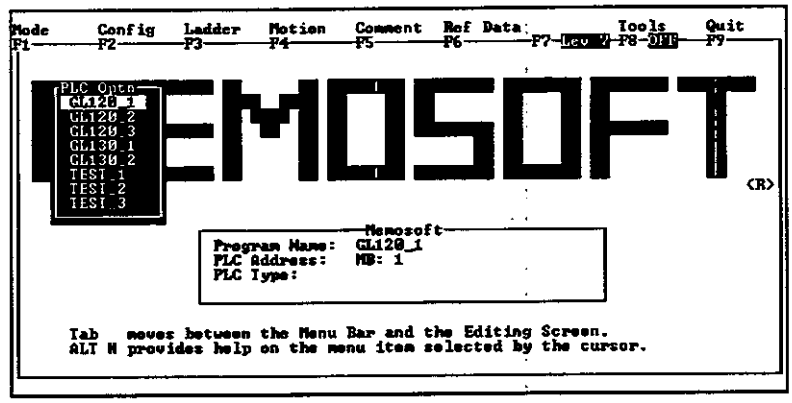
IMPORTANT

When loading only the system configuration to the PLC, the programs and statuses will be cleared. After loading the system configuration, make sure to load the necessary programs and statuses.

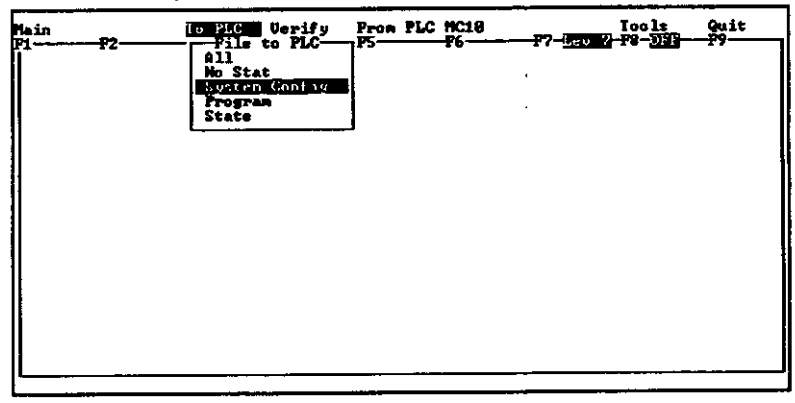
1) Select **PLC Options** from the Loader Submenu of the Tools Menu using the Cursor Keys. Then, press the Enter Key.



2) Select the file name to load to the PLC using the Down Cursor Key. Then, press the Enter Key.



3) The PLC Options Screen will be displayed. Select **System Config** from the To PLC Menu using the Cursor Keys and press the Enter Key.



Only the system configuration will be loaded to the PLC.

INFO

1) The communications parameters used for the load operation are those which were set when a new program was created using the New Program operation. If the communications parameters need to be changed, select the file name to be loaded using the Select Program operation, and then change the parameters using the Change PLC Address operation.

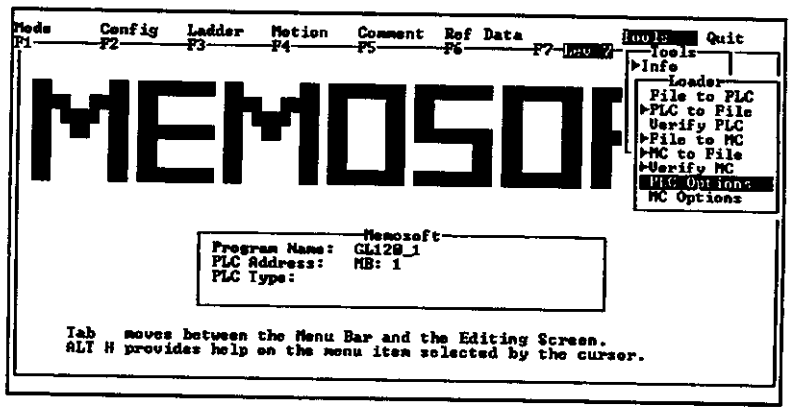
2) Be sure to check that the system configuration between the PLC and the personal computer correspond before loading only a program. If the system configuration does not correspond, load the system configuration first.

3) If the PLC is in RUN State, a confirmation message asking whether to stop the PLC will be displayed. Enter **Y**.

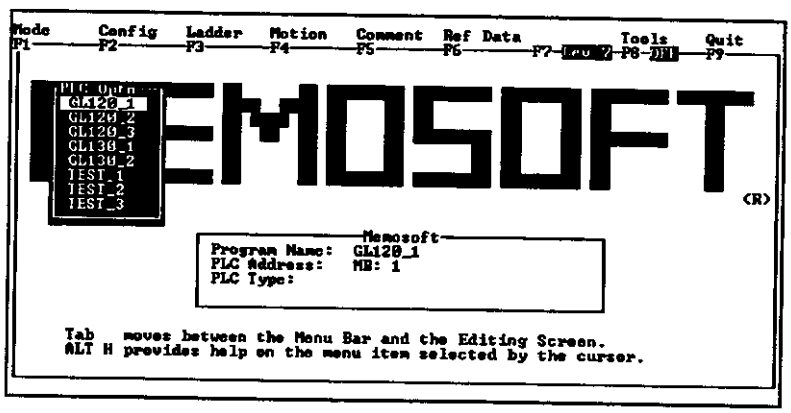
18.3.3 Split Verification with PLC

The following example shows how to verify the ladder program stored in the PLC with the ladder program in the personal computer.

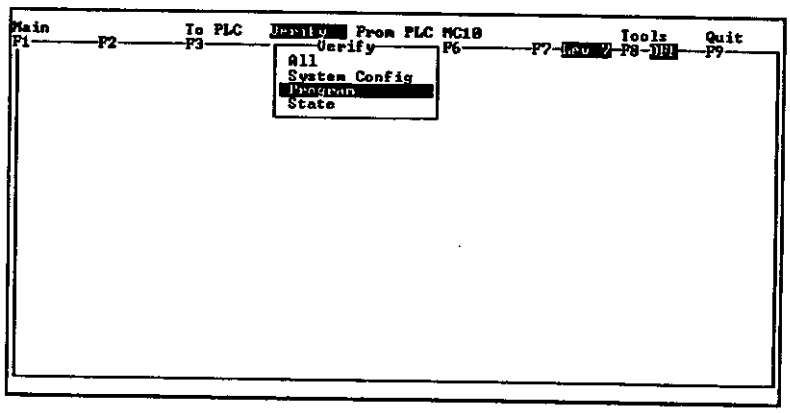
1) Select **PLC Options** from the Loader Submenu of the Tools Menu. Then, press the Enter Key.



2) Select the file name to be verified using the Down Cursor Key and press the Enter Key.



3) The PLC Options Screen will be displayed. Select **Program** from the Verify Menu using the Cursor Keys and press the Enter Key.

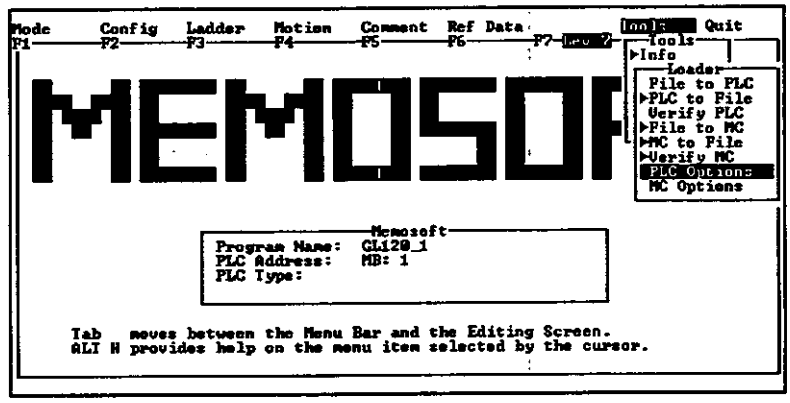


The ladder program in the PLC will be compared with the ladder program in the personal computer.

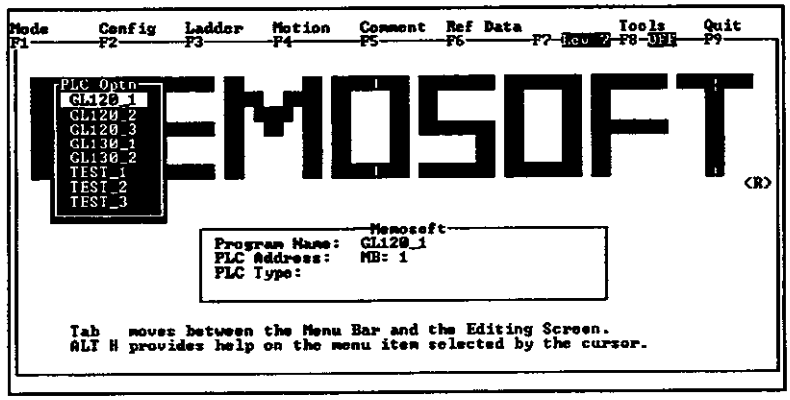
18.3.4 Split Saving from PLC

The following example shows how to save only the ladder program stored in the PLC to the personal computer.

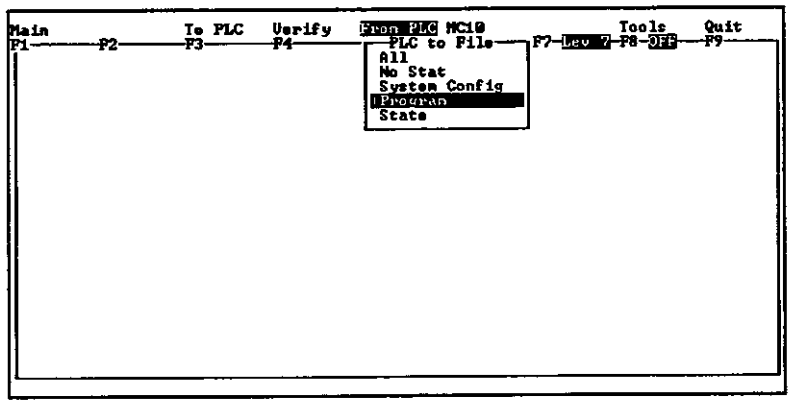
1) Select **PLC Options** from the Loader Submenu of the Tools Menu. Then, press the Enter Key.



2) Select the file name to which the ladder program is to be saved using the Cursor Keys. Then, press the Enter Key.



3) The PLC Options Screen will be displayed. Select **Program** from the From PLC Menu using the Cursor Keys and press the Enter Key.



Only the ladder program will be saved.

18.4 Motion Module Options

This section describes how to load/save various types of data separately with a Motion Module.

18.4.1 Motion Module Option Operations

The loader operations for the Motion Modules provide operations that can be used to reduce the load/save time by handling only part of the data separately. Following is a list of items that can be loaded or saved separately.

All: Loads/saves motion programs, parameters, and point tables.
The functions are the same as for normal load and save operations.

Program: Loads/saves only the motion program. A specific O number can also be specified.

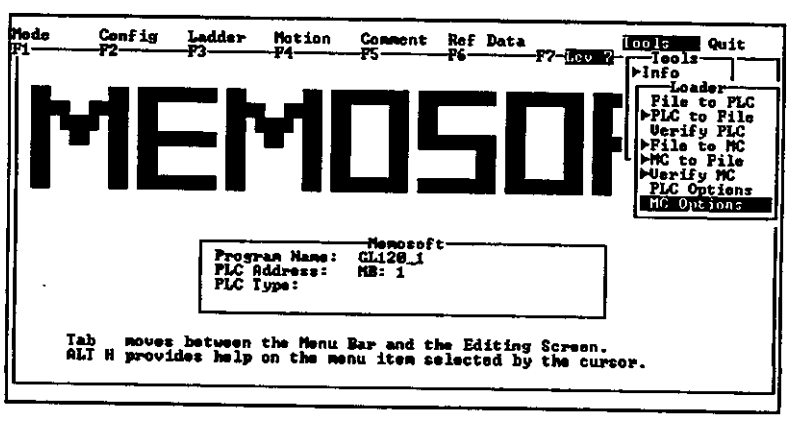
Parameter: Loads/saves only parameter data.

Point Table: Loads/saves only the point table.

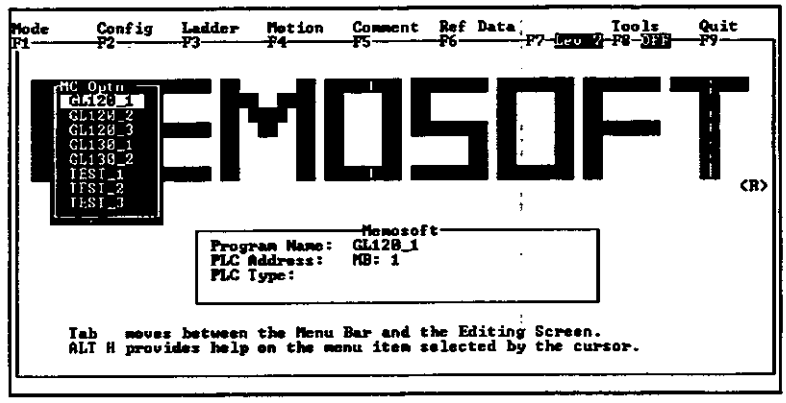
18.4.2 Split Loading to Motion Module

The following example shows how to load only the motion program for O number 1 to MC1.

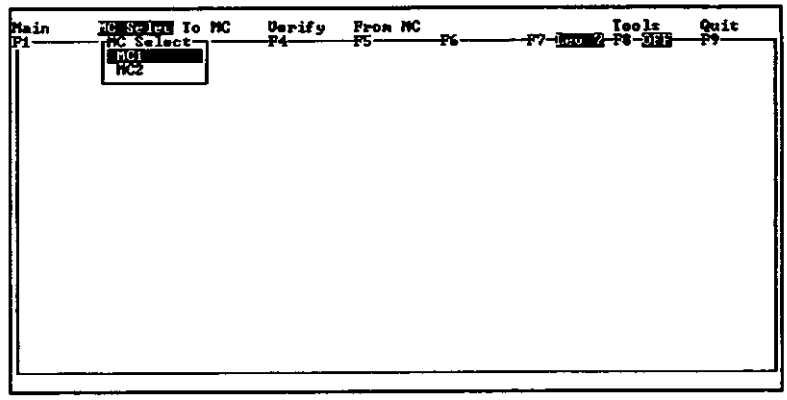
1) Select **MC Options** from the Loader Submenu of the Tools Menu. Then, press the Enter Key.



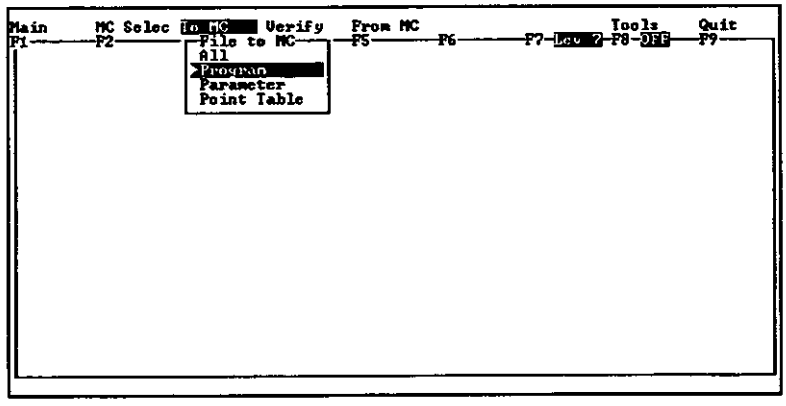
2) Select the file name to be loaded to the Motion Module using the Cursor Keys. Then, press the Enter Key.



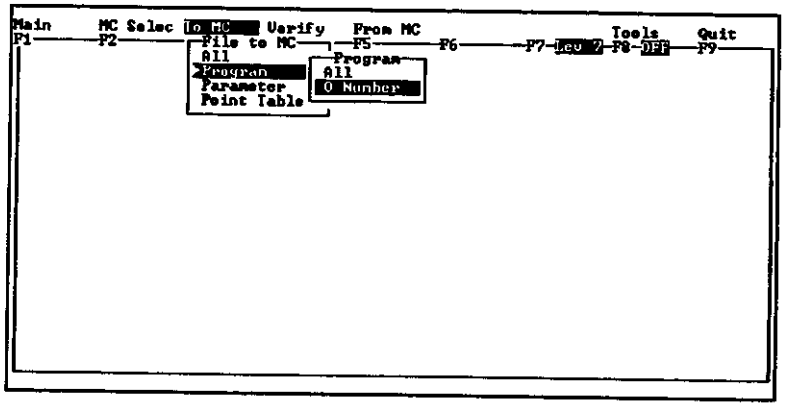
3) The MC Options Screen will be displayed. The Module to which the program is to be loaded must be selected first. Select the Module to be loaded from the MC Select Menu using the Down Cursor Key. Then, press the Enter Key.



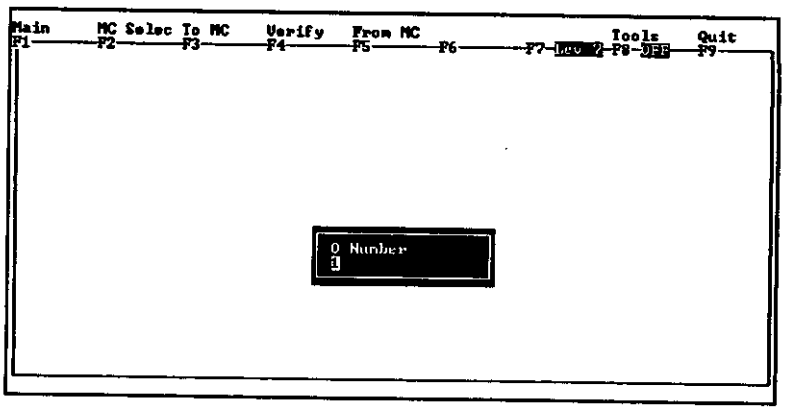
4) Select **Program** from the To MC Menu using the Cursor Keys and press the Enter Key.



5) A submenu will be displayed. Select **O Number** using the Down Cursor Key and press the Enter Key.



6) The window for entering the O number will be displayed. Enter the O number (**1** in this example) to be loaded to the Motion Module (**1** in this example) and press the Enter Key.



Only the motion program for O number 1 will be loaded to MC1.

INFO

1) Make sure to specify the Module from the MC Select Menu before starting to load the program. If the Module is not specified, the program will be loaded to the Module previously set when the MC Options Menu was selected.

2) If a program is to be loaded to MC2 after loading to MC1, switch to the other Module in the MC Select Menu first, and then perform the load operation.

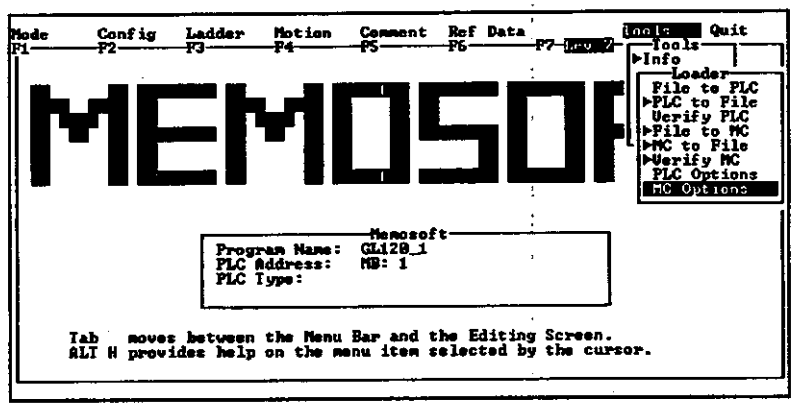
3) The motion program cannot be loaded if the Motion Module is not in Edit Mode. Be sure to return the Motion Module to Edit Mode and then load. Parameters and point tables, however, can be loaded regardless of the mode.

4) The communications parameters used for the load operation are those which were set when a new program was created using the New Program operation. If the communications parameters need to be changed, select the file name to be loaded using the Select Program operation, then change the parameters using the Change PLC Address operation.

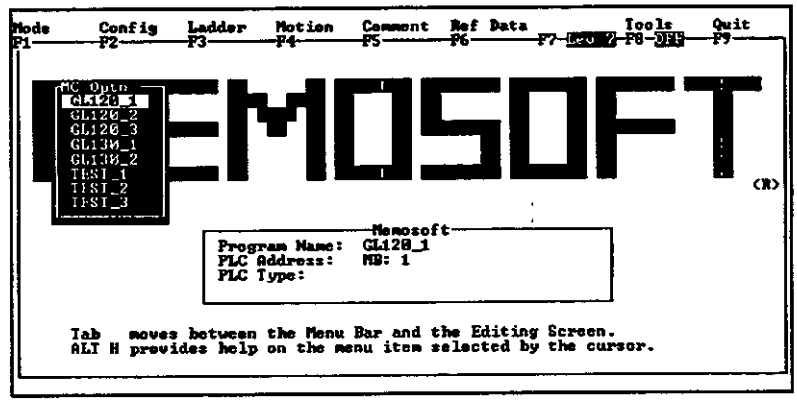
18.4.3 Split Verification with Motion Module

The following example shows how to verify the parameter data stored in the MC2 with the data in the personal computer.

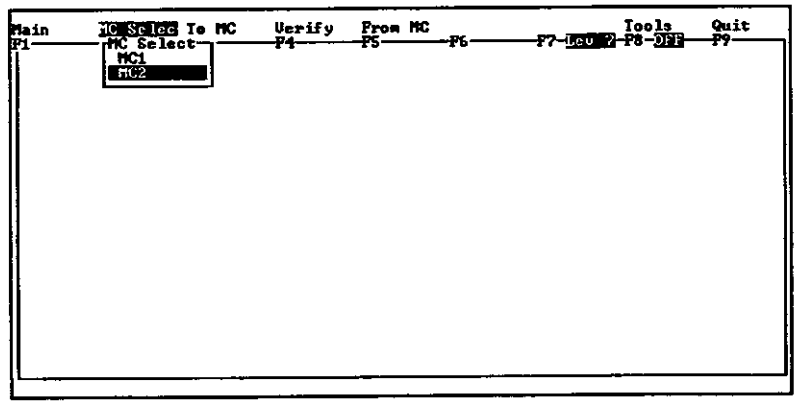
1) Select **MC Options** from the Loader Submenu in the Tools Menu using the Cursor Keys. Then, press the Enter Key.



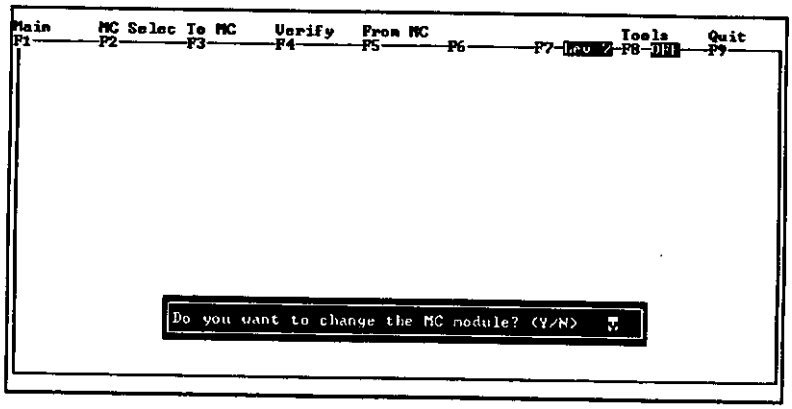
2) Select the file name to be verified with the MC2 parameter data using the Cursor Keys. Then, press the Enter Key.



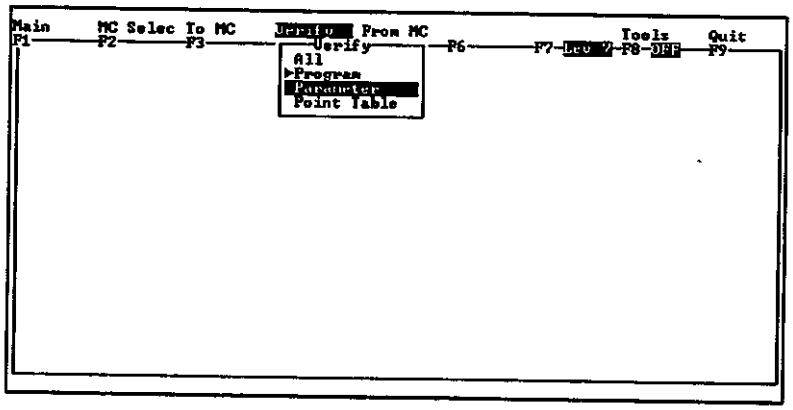
3) The MC Options Screen will be displayed. Select **MC2** from the MC Select Menu using the Cursor Keys and press the Enter Key.



4) A confirmation message will be displayed. Enter **Y** and press the Enter Key.



5) Select **Parameter** from the Verify Menu using the Cursor Keys and press the Enter Key.

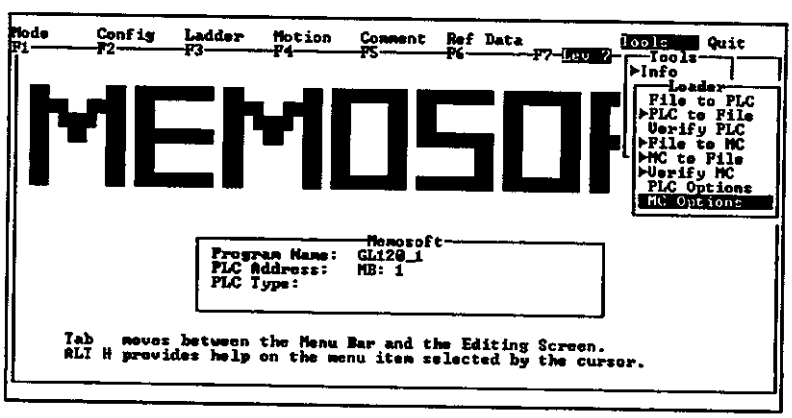


The MC2 parameter data will be verified with the personal computer data.

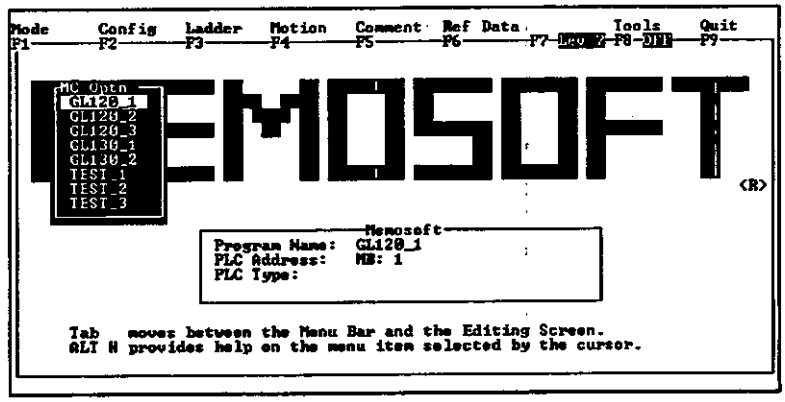
18.4.4 Split Saving from Motion Module

The following example shows how to save only the point table data stored in MC1 to the personal computer.

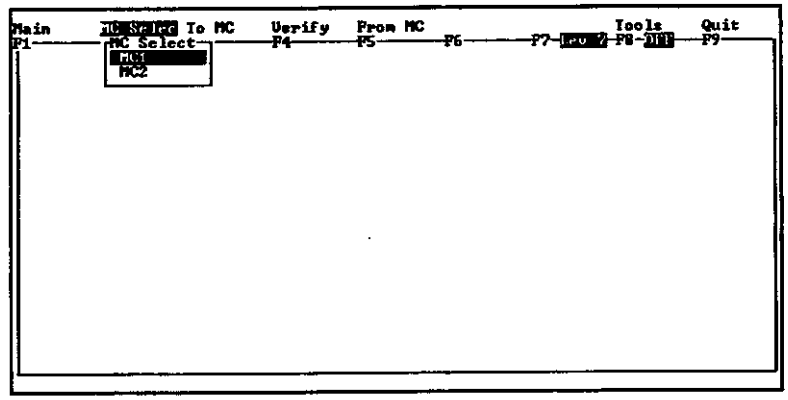
1) Select **MC Options** from the Loader Submenu of the Tools Menu using the Cursor Keys. Then, press the Enter Key.



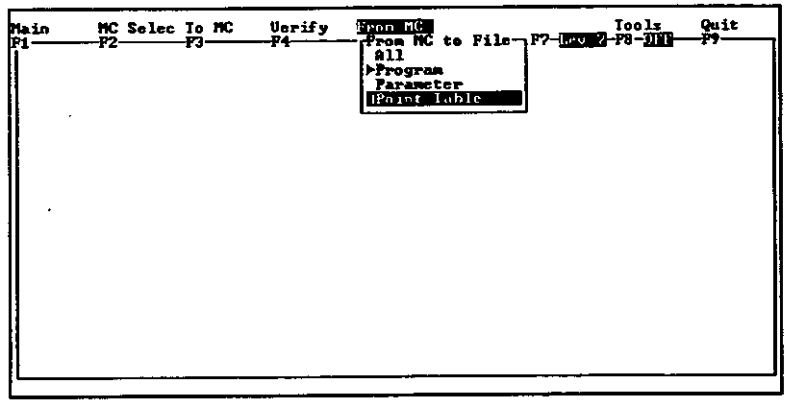
2) Select the file name to which the point table is to be saved using the Cursor Keys and press the Enter Key.



3) Select **MC1** from the MC Select Menu using the Cursor Keys and press the Enter Key.



4) Select **Point Table** from the From MC Menu using the Cursor Keys and press the Enter Key.



Only the point table from MC1 will be saved.

18.5 MC10 Motion Module Load/Save Operations

This section describes how to load a program from the personal computer to an MC10 Motion Module, how to save a program from an MC10 Motion Module to the personal computer, and how to verify the data between the personal computer and an MC10 Motion Module.

18.5.1 Loading to MC10

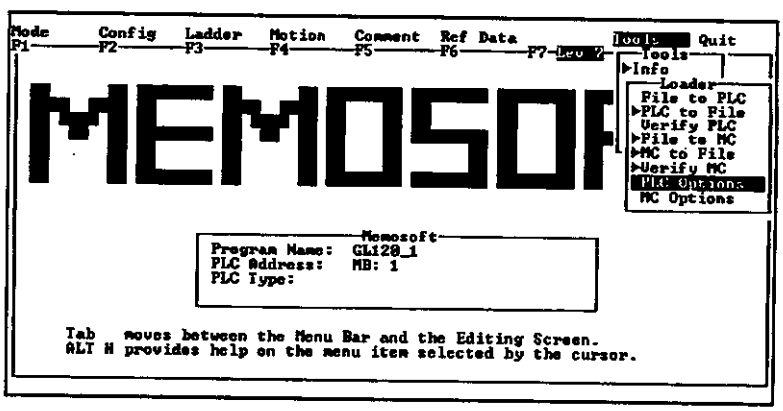
This operation takes the parameters of MC10 that have been created in Offline Mode and saved to the personal computer and loads them to the MC10 Motion Module. Parameters can be transferred either together or separately. The parameters to be loaded are described below according to whether All or Each is selected.

All: Loads all the MC10 parameter file data that has been created.

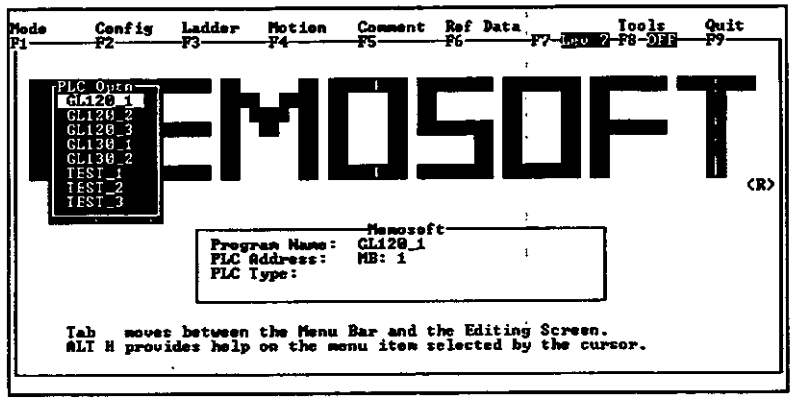
Each: Loads the MC10 parameter file data of a specified Module number.

The following example describes the load operation when **All** is selected.

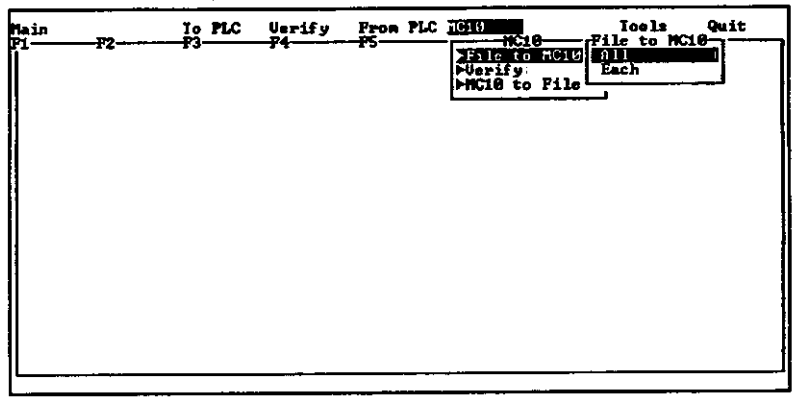
1) Select **PLC Options** from the Loader Submenu of the Tools Menu using the Cursor Keys. Then, press the Enter Key.



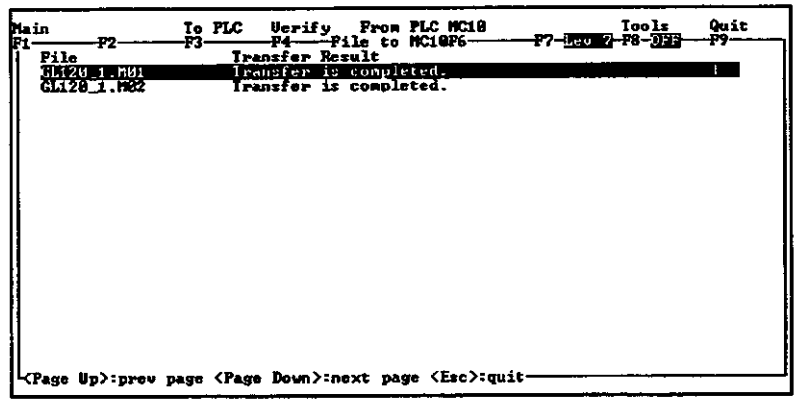
2) Select the file name to be loaded to MC10 using the Cursor Keys. Then, press the Enter Key.



3) The PLC Options Screen will be displayed. Select **All** from the File to MC10 Submenu of the MC10 Menu using the Cursor Keys. Then, press the Enter Key.



The parameter file data will be loaded, and the result will be displayed.



If **All** is selected and a load error occurs during the load operation, processing will not be aborted. Instead, an error message will be displayed for the file in which the error occurred, and then the processing will continue until all parameter file data has been loaded.

18.5.2 Saving from MC10

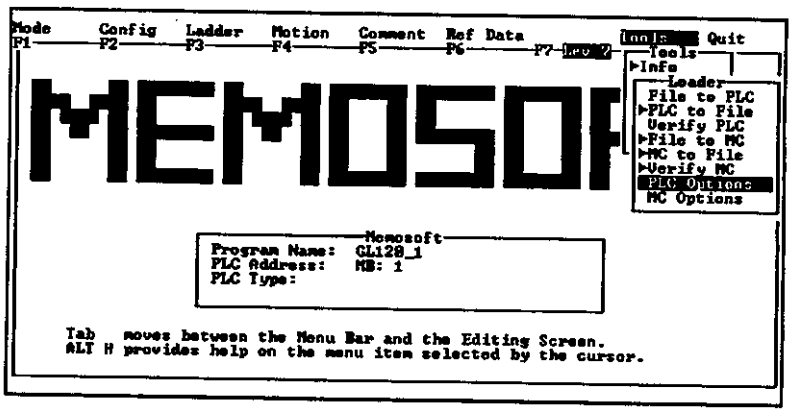
This operation saves parameters stored in the MC10 Motion Module to the personal computer. Parameters can be transferred either altogether or separately. The parameters to be loaded are described below according to whether All or Each is selected.

All: Saves parameters for all mounted MC10 Modules to personal computer files.

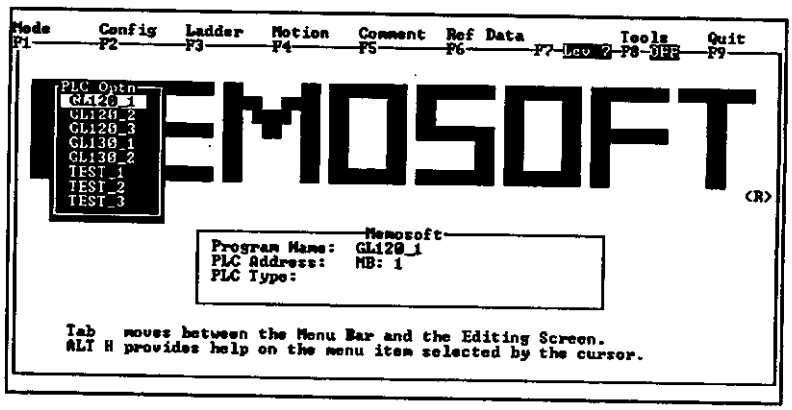
Each: Saves the MC10 parameters of the specified module number to the personal computer files.

The following example describes the save operation when **Each** is selected.

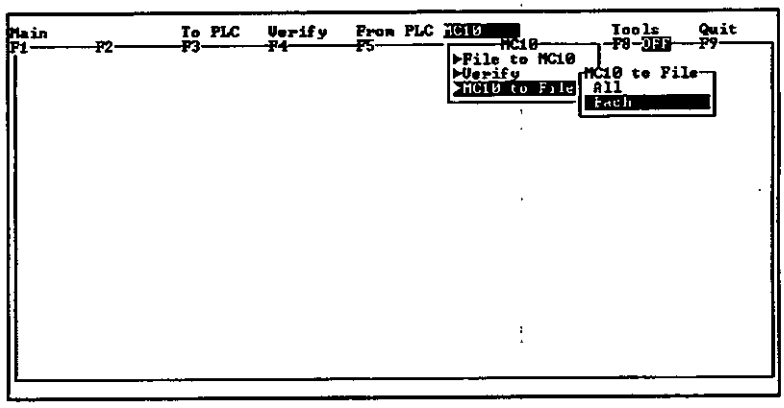
1) Select **PLC Options** from the Loader Submenu of the Tools Menu using the Cursor Keys. Then, press the Enter Key.



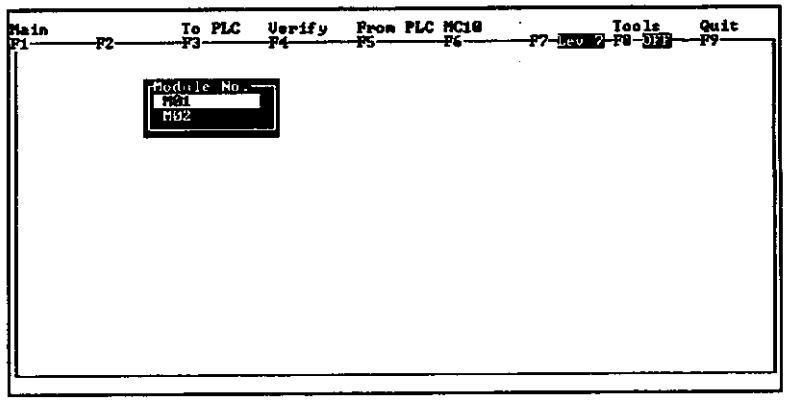
2) Select the file name in which the MC10 parameters are to be saved using the Cursor Keys. Then, press the Enter Key.



3) The PLC Options Screen will be displayed. Select **Each** from the MC10 to File Submenu of the MC10 Menu using the Cursor Keys. Then, press the Enter Key.



4) The Module number selection window for the mounted MC10 will be displayed. Select the Module to be saved using the Cursor Keys and press the Enter Key.



The parameters will start being saved to files.

18.5.3 Verifying MC10 Data

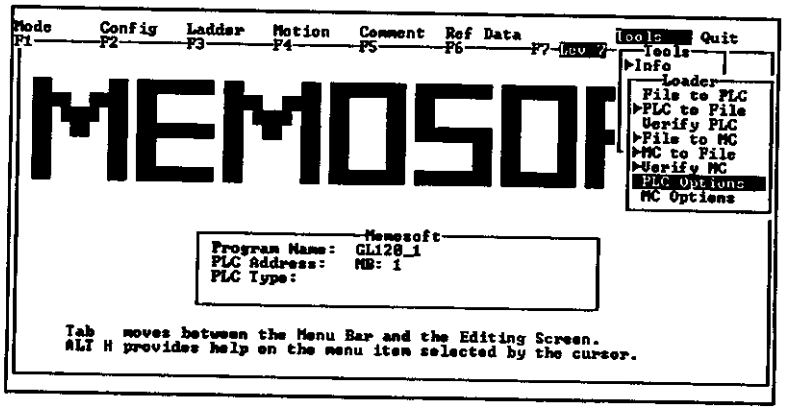
It is important to compare the MC10 parameter data with the personal computer parameter data after loading from the personal computer to MC10, or saving from MC10 to the personal computer. Parameters can be verified either together or separately. The parameters to be verified are described below according to whether All or Each is selected.

All: Compares parameters for all mounted MC10 Modules with the parameter file data stored in the personal computer.

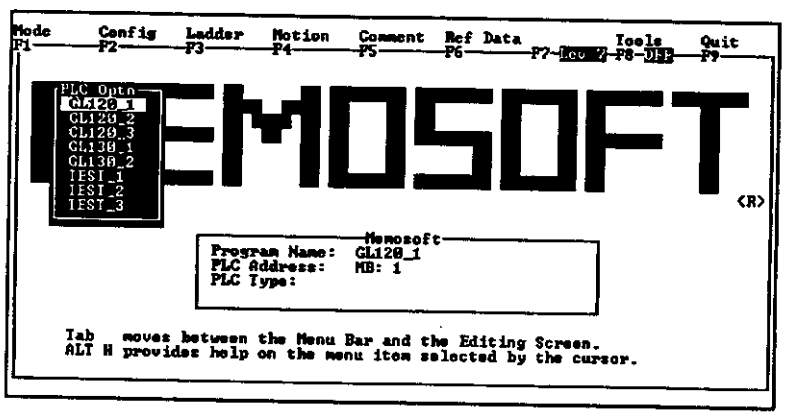
Each: Compares the MC10 parameters of the specified Module number with the personal computer parameters.

The following example describes the verification operation when **All** is selected.

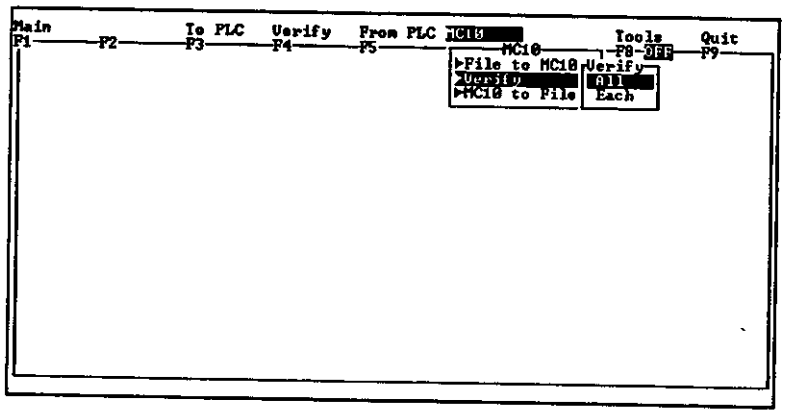
1) Select **PLC Options** from the Loader Submenu of the Tools Menu using the Cursor Keys. Then, press the Enter Key.



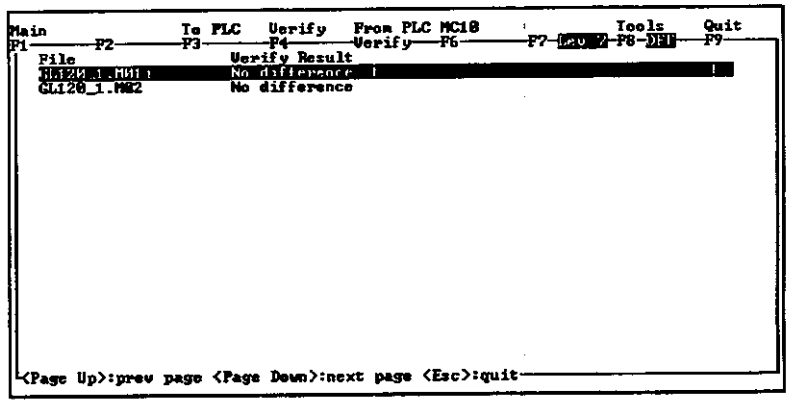
2) Select the file name of the MC10 parameters to be verified using the Cursor Keys. Then, press the Enter Key.



3) The PLC Options Screen will be displayed. Select **All** from the Verify Submenu of the MC10 Menu using the Cursor Keys. Then, press the Enter Key.



The MC10 parameters will be verified, and the result will be displayed.



Utilities

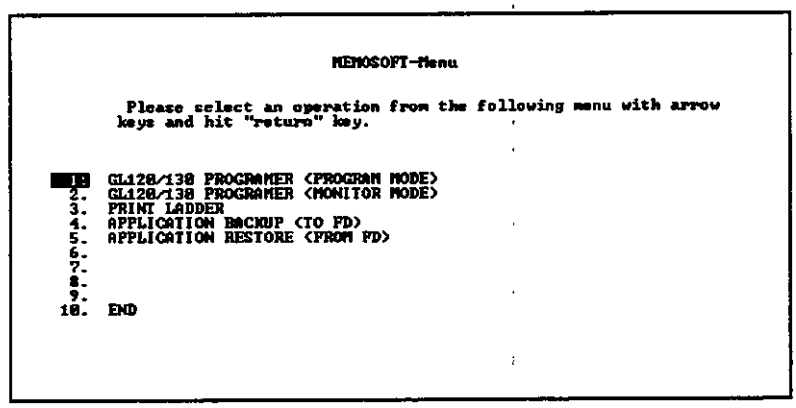
19

This chapter describes operations related to utilities.

19.1 Overview

This section gives an overview of the utilities. See section *19.2 Ladder Printing* onwards for the operating procedures for each utility.

The MEMOSOFT Menu Screen is shown below.
The utilities are activated by selecting them from the MEMOSOFT Menu Screen. See *Chapter 2 Preparations* the method to access the MEMOSOFT Menu Screen.



In addition to the programmer itself, MEMOSOFT also incorporates the following utilities.

• Ladder Printing

The ladder printing utility provides excellent printing quality. In addition to ladder programs, system configuration information, reference data, Motion Module programs, and Motion Module parameters can be printed.

• Batch Backup of Application Files

Compressed versions of the application files that are in a designated directory are saved to a floppy disk. Use this operation to create backup versions of the program files that have been created. The name for a compressed file created on the floppy disk is MS_APL.ZIP.

• Batch Restore of Application Files

Files stored in the compressed format on a floppy disk are decompressed and stored on the hard disk. Use this operation to restore program files from their backup versions. The file that is decompressed and stored on the hard disk is the compressed file on the floppy disk named MS_APL.ZIP.

19.2 Ladder Printing

This section describes the ladder printing utility.

19.2.1 Preparations for Printing

1) Printer

The following printers can be used with the ladder printing utility.

- PC-PR201H (manufactured by NEC Corporation)
- Printers that support PC-PR201H Emulation Mode
- Printers that conform to the ESC/P standard
- Printers that support ESC/P Emulation Mode
- Printers that support HP code (PCL code)

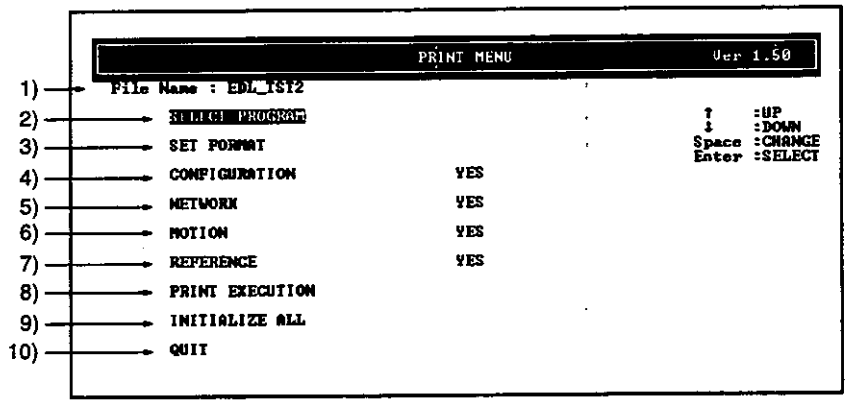
When printing using Emulation Mode, make sure that the printer is switched to Emulation Mode before starting to print.
Select the printer to be used from the Set Format Screen.

2) Paper

There is a choice of paper between A4 portrait, A4 landscape, and letter size.
Select the paper to be used from the Set Format Screen.

19.2.2 Print Menu Screen

The following Print Menu Screen will be displayed when the ladder printing utility is started.



Use the Cursor Keys to move the cursor between the menu items.
Press the Space Key to switch the menu item settings, and press the Enter Key to display the settings screen for each menu item.

1) File Name

Displays the name of the program to be printed. The menu item will be blank immediately after the ladder printing utility has been started because no program has been selected for printing.

2) Select Program

Displays the screen to select the program to be printed.

3) Set Format

Displays the screen to set the printing format.

4) Configuration

Move the cursor to **Configuration** and press the Space Key to switch between **Yes** and **No** selections for printing system configuration information.
If the Enter Key is pressed with **Yes** selected, the Print Settings Screen will be displayed to allow the user to set individual system configuration items.
If the Enter Key is pressed with **No** selected, none of the system configuration items will be printed.

5) Network

Move the cursor to **Network** and press the Space Key to switch between **Yes** and **No** selections for printing network information.
If the Enter Key is pressed with **Yes** selected, the Print Settings Screen will be displayed to allow the user to set network information.
If the Enter Key is pressed with **No** selected, none of the network information will be printed.

6) Motion

Move the cursor to **Motion** and press the Space Key to switch between **Yes** and **No** selections for printing motion information.
If the Enter Key is pressed with **Yes** selected, the Print Settings Screen will be displayed to allow the user to set motion information.
If the Enter Key is pressed with **No** selected, none of the motion information will be printed.

7) Reference

Move the cursor to **Reference** and press the Space Key to switch between **Yes** and **No** selections for printing reference information.
If the Enter Key is pressed with **Yes** selected, the Print Settings Screen will be displayed to allow the user to set reference information.
If the Enter Key is pressed with **No** selected, none of the reference information will be printed.

8) Print Execution

Prints the selected program according to the print settings and exits the ladder printing utility.

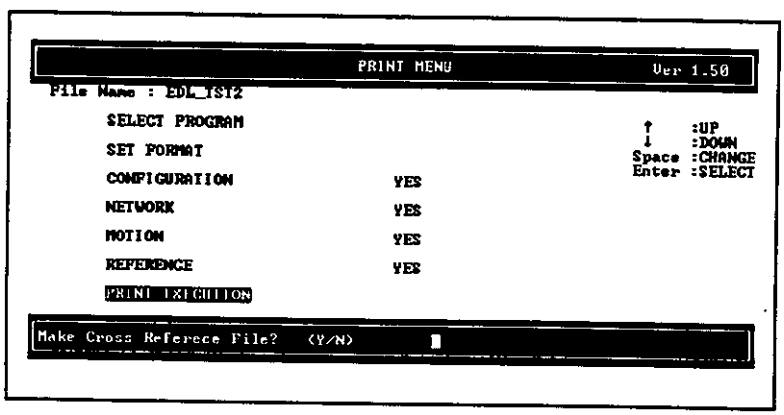
If **Print Execution** is selected without selecting a program, an error message will be displayed and the display will return to the Print Menu Screen. Select a program and then select **Print Execution**.

If **Print Execution** is selected without selecting any print items, such as **Configuration**, **Network**, **Motion**, or **Reference**, an error message will be displayed and the display will return to the Print Menu Screen.

INFO

Creating New Cross Reference Files

1) If **Network** or **Used Table** (under **Reference**) is set for printing and **Print Execution** is selected, a confirmation message will be displayed asking whether to create a new cross reference file (a data file for printing cross references). Before printing, this message will appear at the bottom of the screen, as shown below.
Select **Y** to create a new cross reference file, the data in which will be used for printing.
Select **N** to use data from a previously created cross reference file for printing.



2) One cross reference file is created for each ladder program, and the contents of that file are overwritten whenever a new cross reference file is created.
The printing time will be reduced if **N** is selected. However, if the contents of the existing cross reference file do not match those of the current ladder program, incorrect information will be printed. Select **N** only when the contents of the cross reference file match those of the ladder program.

9) Initialize All

Initializes all settings of menu items 2) to 7) above.

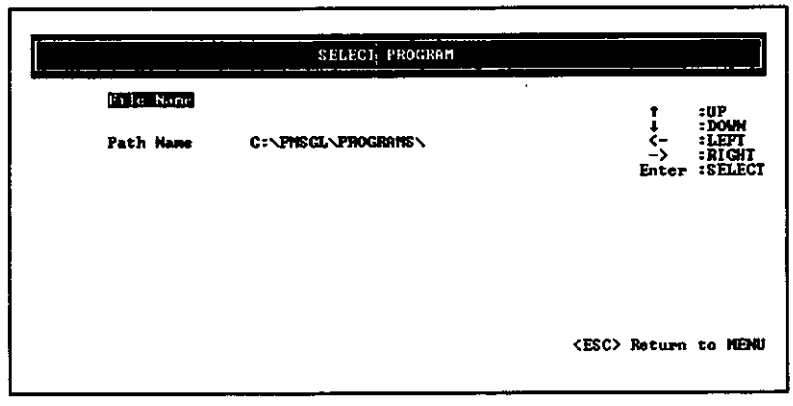
10) Quit

Closes the ladder printing utility without executing printing.

19.2.3 Select Program Screen

Select the **Select Program** option on the Print Menu Screen to display the Select Program Screen shown below.

The Esc Key can be pressed at this screen to return to the Print Menu Screen.



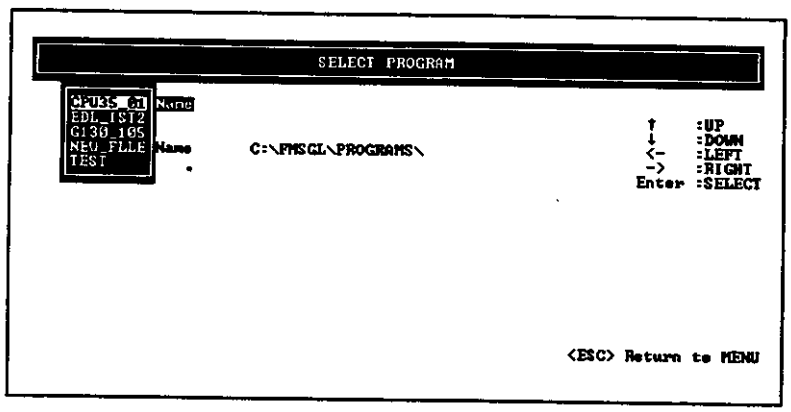
The operations performed in the Select Program Screen are explained below.

1. Selecting a Program

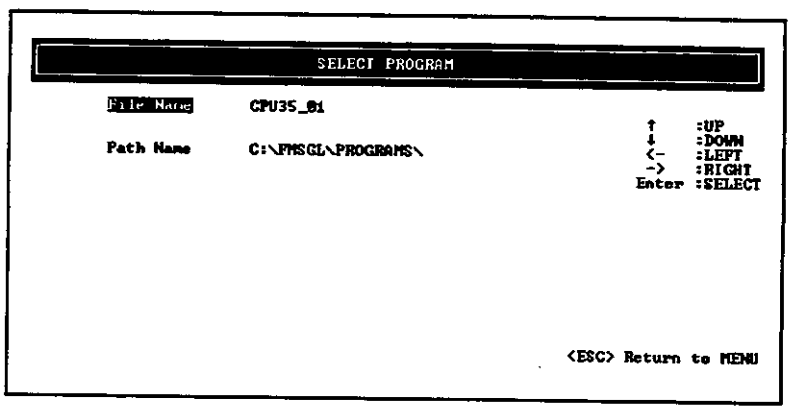
There is no default program selected. Use the following procedure to select the program to be printed.

Move the cursor to **File Name** and press the Enter Key to display a list of the program files located in the specified directory.

Select a program using the Cursor Keys and press the Enter Key.



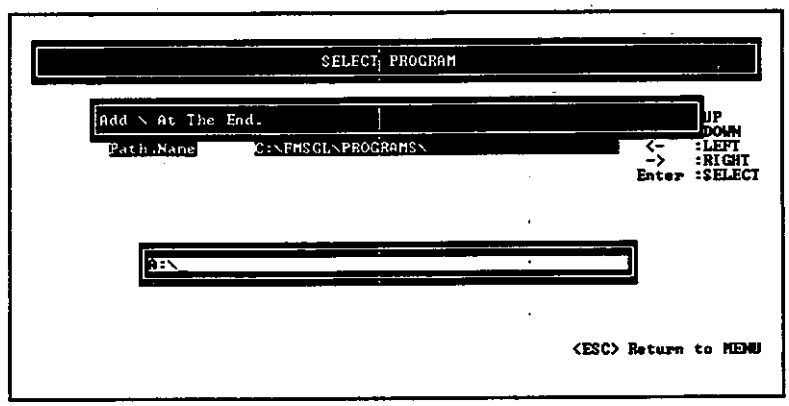
The selected program will be displayed.



2. Changing Directories

The default directory is C:\FMSGL\PROGRAMS\. The procedure for changing the directory from the default is explained below.

Move the cursor to **Path Name** and press the Enter Key to display the Path Name Input Window. In this example, enter **A:** and press the Enter Key.



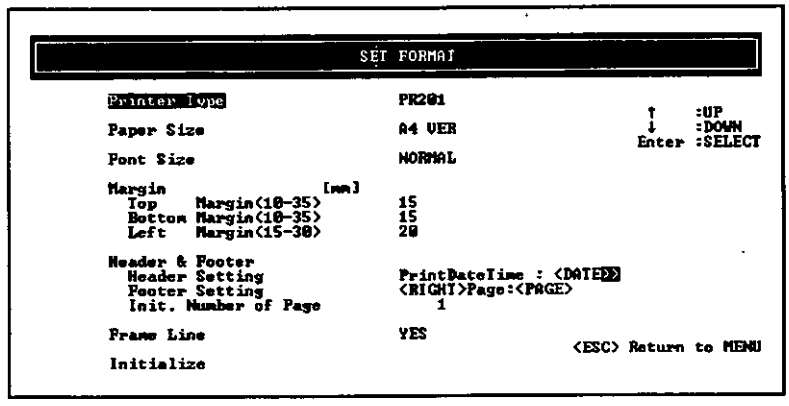
The directory specification will be changed.

INFO Always add a backslash (\) to the end of the path name.

19.2.4 Set Format Screen

Select **Set Format** from the Print Menu Screen to display the Set Format Screen shown below.

The Esc Key can be pressed at this screen to return to the Print Menu Screen.

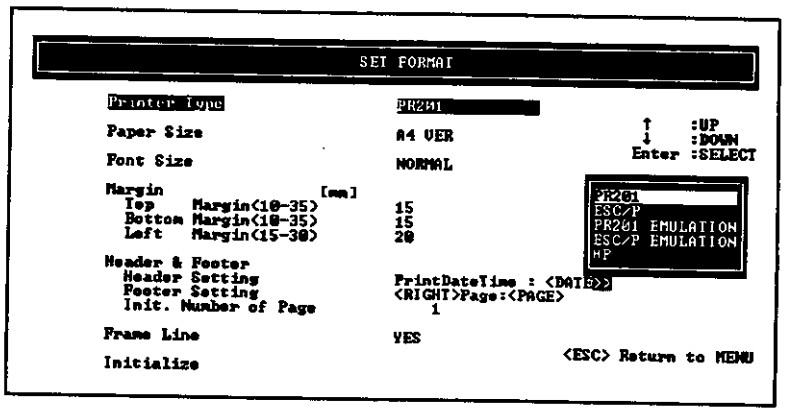


Each item in the Set Format Screen is explained and the setting procedures outlined below.

1. Printer Type

The available printer options are PC-PR201, ESC/P, PC-PR201 Emulation, ESC/P Emulation, and HP.

1) Move the cursor to **Printer Type** and press the Enter Key to display the Printer Selection Window.

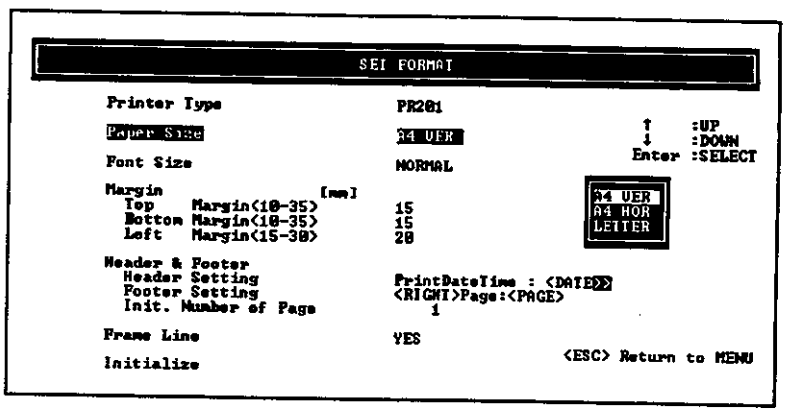


2) Use the Cursor Keys to select the printer and press the Enter Key.

2. Paper Size

The paper size can be set to A4 portrait (**A4 VER**), A4 landscape (**A4 HOR**), or letter size (**LETTER**).

1) Move the cursor to **Paper Size** and press the Enter Key to display the Paper Size Selection Window.



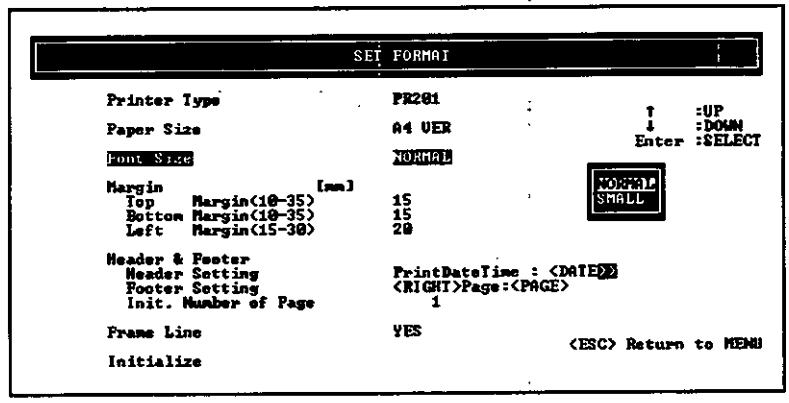
2) Use the Cursor Keys to select the paper size and press the Enter Key.

INFO The margins will return to the default settings when the paper size is changed.

3. Font Size

The font size can be set to normal or small.

1) Move the cursor to **Font Size** and press the Enter Key to display the Font Size Selection Window.



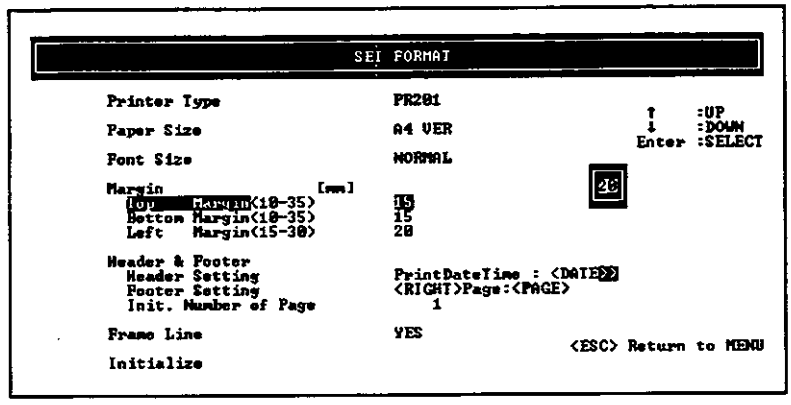
2) Use the Cursor Keys to select the font size and press the Enter Key.

INFO The font size for printing Network data will be small, regardless of the settings made here.

4. Margin

The top, bottom, and left margins can be set. This example shows how to set the top margin.

1) Move the cursor to **Top Margin** and press the Enter Key to display the numeric input window.

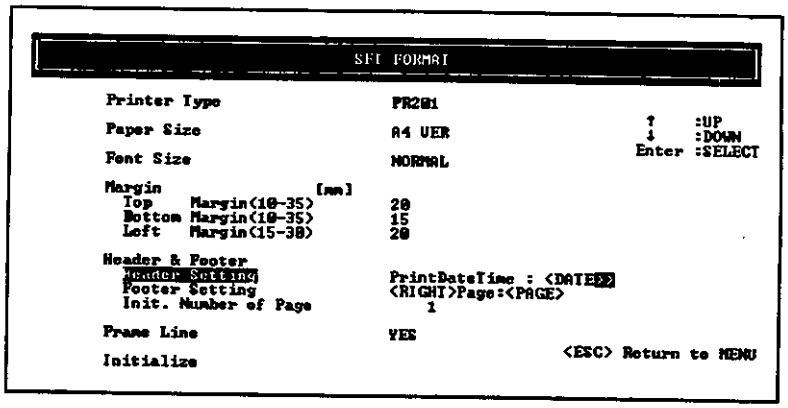


2) Enter the margin in millimeters and press the Enter Key. Set the margin within the range indicated in parentheses.

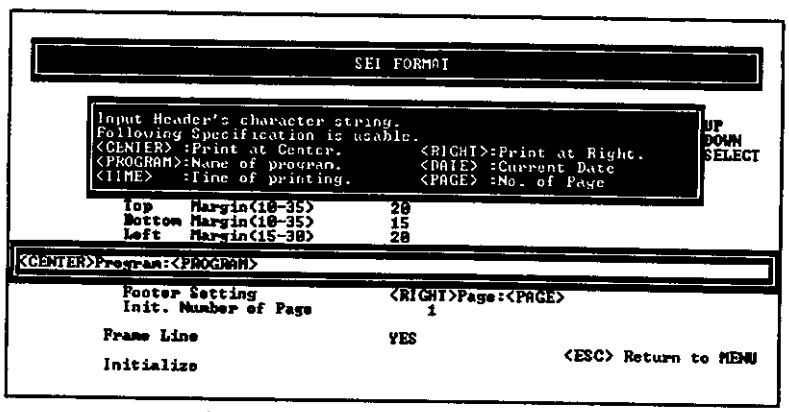
5. Header & Footer

Print items and character strings can be designated for headers and footers, and the position on the page can be specified. This example shows how to make header settings.

1) Move the cursor to **Header Setting** and press the Enter Key to display the header settings window.



2) Enter the character string that will be printed as the header and press the Enter Key.



3) Set the footer in the same way.

Designating Print Items and Position

Header and footer settings are made by specifying the character string to be printed and format parameters (character strings that specify print items). Format parameters designate specific print items and print positions.

1) Print items are information relating to the page being printed that will be printed in place of headers or footers. The print items are shown in the following table.

Format Parameter	Content (Format)	Example
<PROGRAM>	Program name	GL120_1
<DATE>	Date of printing (mm/dd/yy)	10/30/98
<TIME>	Time of printing (hh:mm:ss)	10:54:30
<PAGE>	Page number (5 digits)	–

2) Print position settings designate the position for printing the character string or print items. Add the character string or print item after the position format parameter to specify the position.

Format Parameter	Print Position
<CENTER>	Characters after this parameter will be centered.
<RIGHT>	Characters after this parameter will be right-justified.
<LEFT>	Characters after this parameter will be left-justified.

Example

Header setting: <CENTER>Program:<PROGRAM>

Printing output: Program:OOOO

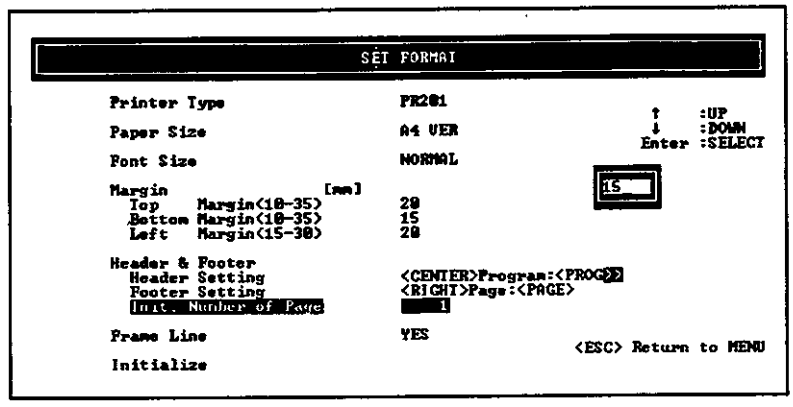
Program name

Note <CENTER>, <PROGRAM>, and other format parameters that designate the items to be printed must be entered in uppercase. There are no restrictions for normal character strings.

6. Init. Number of Page (Initial Page Number)

The initial page number can be set to a number between 1 and 32767.

1) Move the cursor to **Init. Number of Page** and press the Enter Key to display the numeric input window.



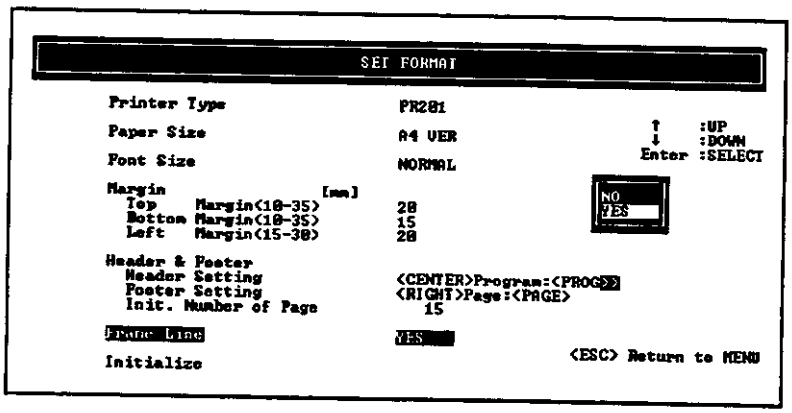
2) Enter the initial page number and press the Enter Key.

INFO The **Init. Number of Page** setting is valid only when <PAGE> has been selected as the header or footer format parameter. Refer to the *5. Header & Footer* earlier in this section for information on header and footer settings.

7. Frame Line

For each print item, a selection can be made whether or not to add a frame around the entire page.

1) Move the cursor to **Frame Line** and press the Enter Key to display the frame selection window.



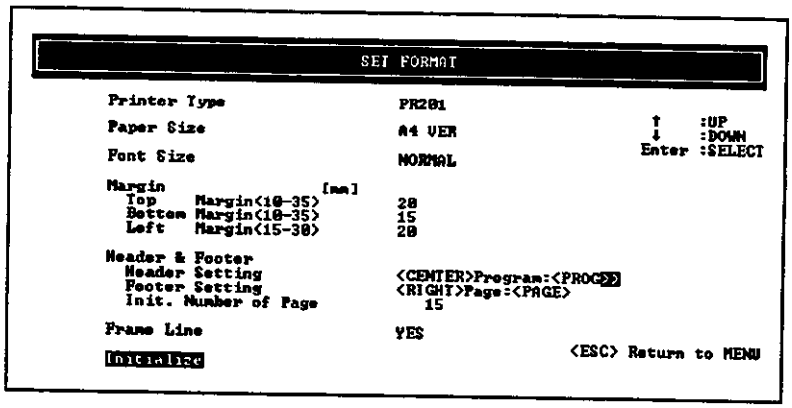
2) Use the Cursor Keys to select either **Yes** or **No** and press the Enter Key.

INFO A frame will be added when printing network information, regardless of the settings made here.

8. Initialize

The settings in the Set Format Screen can be initialized.

Move the cursor to **Initialize** and press the Enter Key.

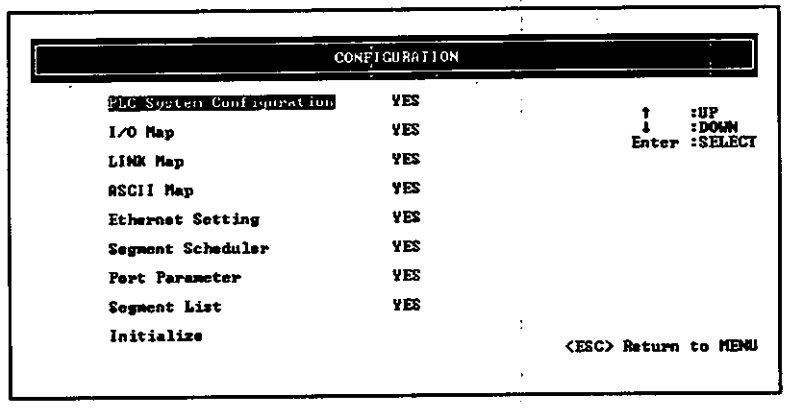


The settings will be initialized.

19.2.5 System Configuration Print Settings Screen

Select **Configuration** from the Print Menu Screen to display the System Configuration Print Settings Screen (Configuration Screen) shown below.

The Esc Key can be pressed at this screen to return to the Print Menu Screen.

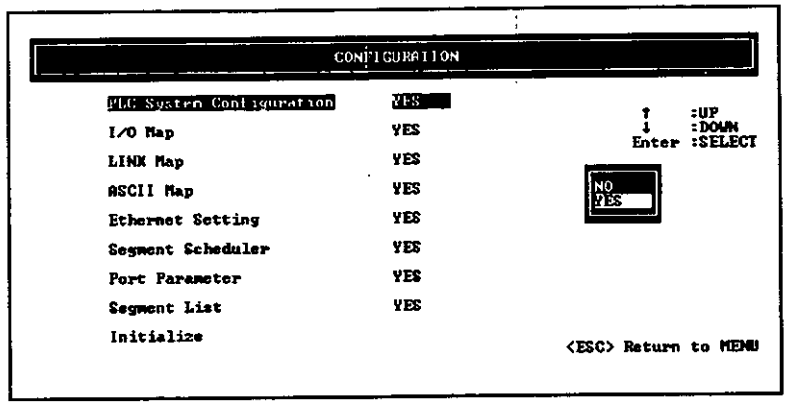


Each item in the Configuration Screen is explained and the setting procedures outlined below.

1. PLC System Configuration

A selection can be made whether or not to print PLC system configuration information.

1) Move the cursor to **PLC System Configuration** and press the Enter Key to display the selection window.

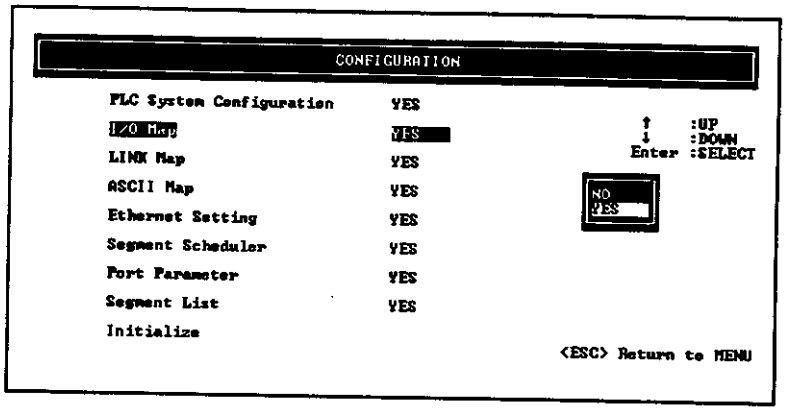


2) Use the Cursor Keys to make the selections and press the Enter Key.

2. I/O Map

A selection can be made whether or not to print I/O Map information.

1) Move the cursor to **I/O Map** and press the Enter Key to display the selection window.

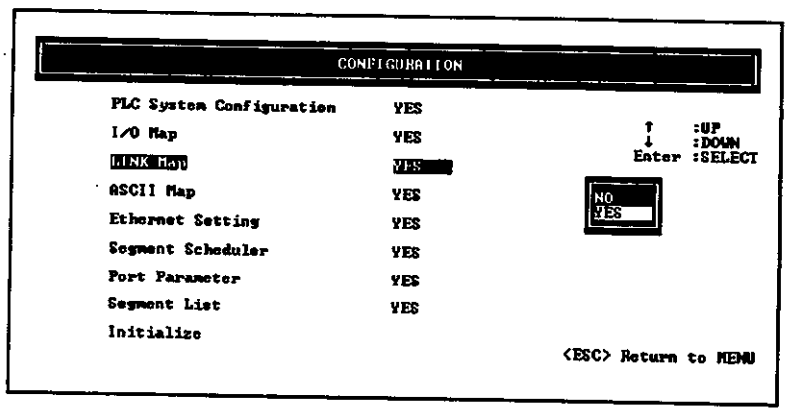


2) Use the Cursor Keys to make the selection and press the Enter Key.

3. LINK Map

A selection can be made whether or not to print Link Map information.

1) Move the cursor to **LINK Map** and press the Enter Key to display the selection window.

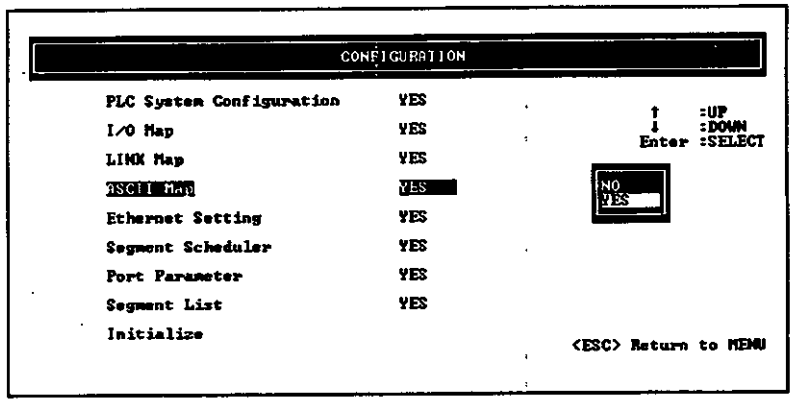


2) Use the Cursor Keys to make the selection and press the Enter Key.

4. ASCII Map

A selection can be made whether or not to print ASCII Map information.

1) Move the cursor to **ASCII Map** and press the Enter Key to display the selection window.

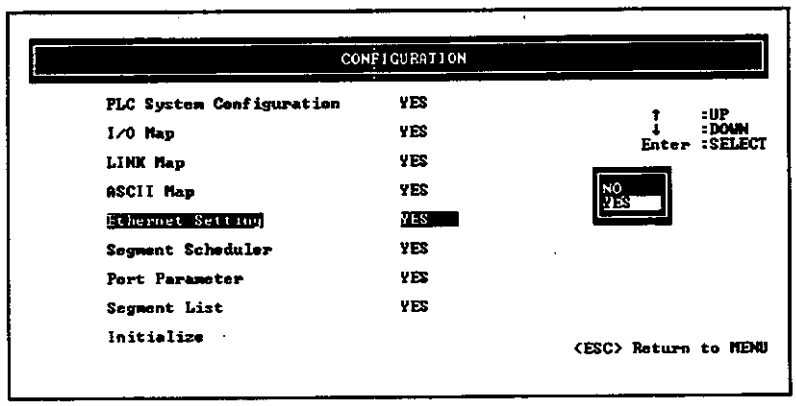


2) Use the Cursor Keys to make the selection and press the Enter Key.

5. Ethernet Setting

A selection can be made whether or not to print Ethernet settings information.

1) Move the cursor to **Ethernet Setting** and press the Enter Key to display the selection window.

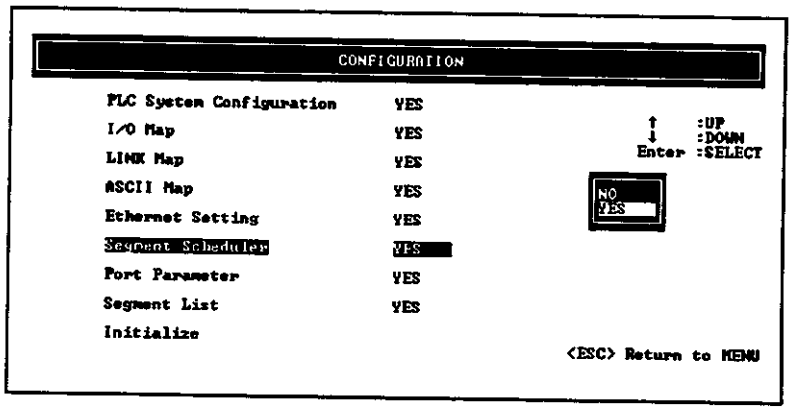


2) Use the Cursor Keys to make the selection and press the Enter Key.

6. Segment Scheduler

A selection can be made whether or not to print Segment Scheduler settings information.

1) Move the cursor to **Segment Scheduler** and press the Enter Key to display the selection window.

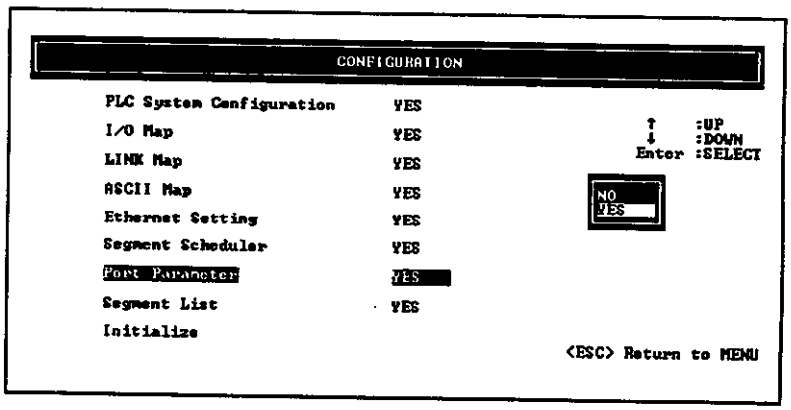


2) Use the Cursor Keys to make the selection and press the Enter Key.

7. Port Parameter

A selection can be made whether or not to print Port Parameter information.

1) Move the cursor to **Port Parameter** and press the Enter Key to display the selection window.

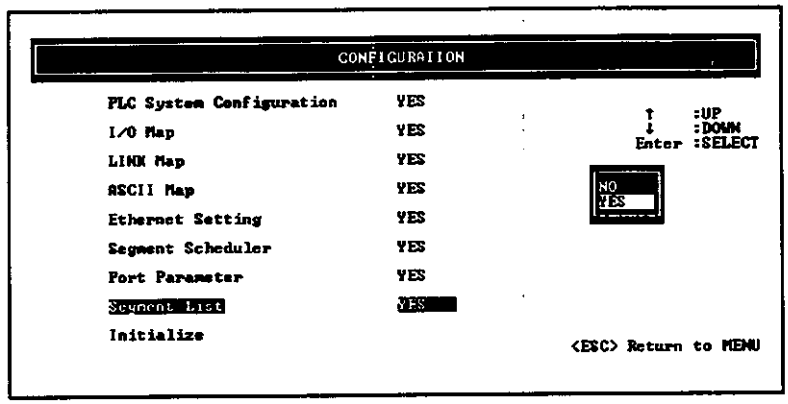


2) Use the Cursor Keys to make the selection and press the Enter Key.

8. Segment List

A selection can be made whether or not to print Segment List information.

1) Move the cursor to **Segment List** and press the Enter Key to display the selection window.

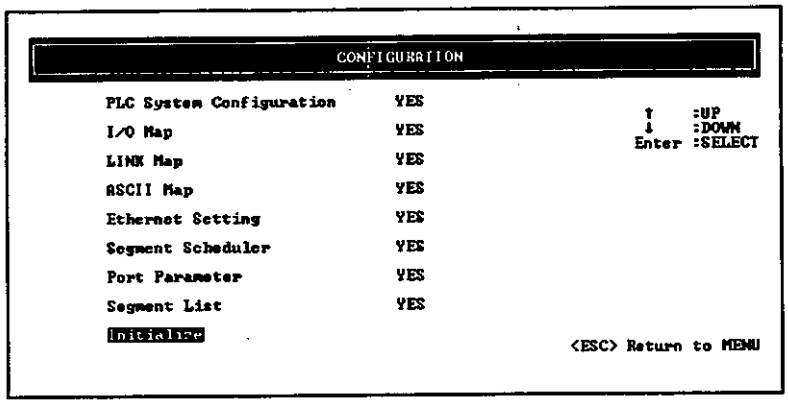


2) Use the Cursor Keys to make the selection and press the Enter Key.

9. Initialize

The settings in the Configuration Screen can be initialized.

Move the cursor to **Initialize** and press the Enter Key

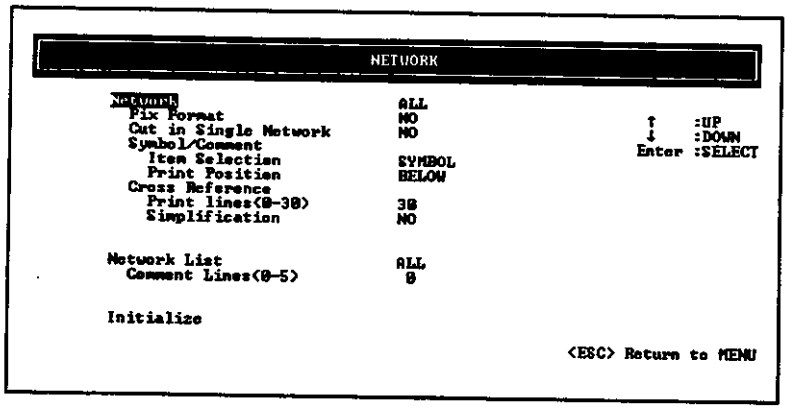


The settings will be initialized.

19.2.6 Network Print Settings Screen

Select **Network** from the Print Menu Screen to display the Network Screen shown below.

The Esc Key can be pressed at this screen to return to the Print Menu Screen.

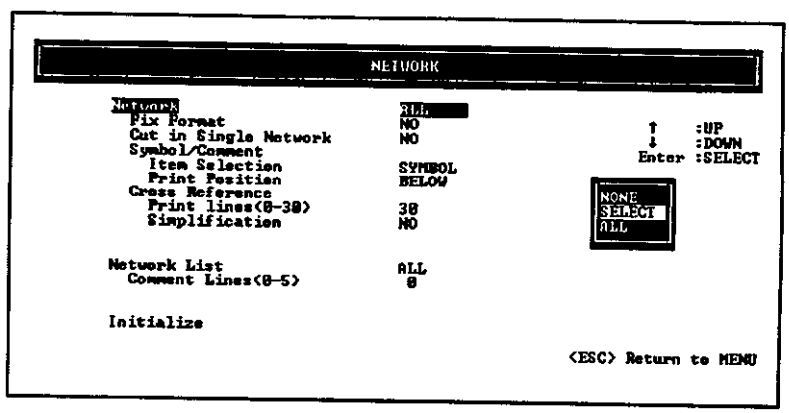


Each item in the Network Screen is explained and the setting procedures outlined below.

1. Network

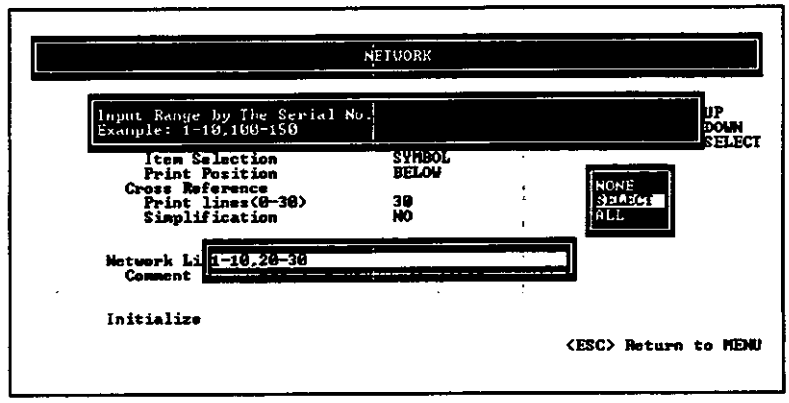
The network information to be printed can be selected using the **None**, **Select**, or **All** options. If **Select** is selected, the network number for the network information to be printed must be designated as the network serial number.

1) Move the cursor to **Network** and press the Enter Key to display the selection window. In this example, select **Select**.



2) Use the Cursor Keys to make the selection and press the Enter Key.

3) Enter the network numbers for the network information to be printed and press the Enter Key.



Only the information for the specified network numbers will be printed.

INFO

1) Networks can be selected by the following methods:

1,3,5:	Specify individual network numbers delimited by commas.
1–10:	Specify a range of consecutive network numbers with a dash.
1,5,10–15:	A combination of both methods can be used. In this example, networks 1 and 5, and 10 to 15 have been selected.

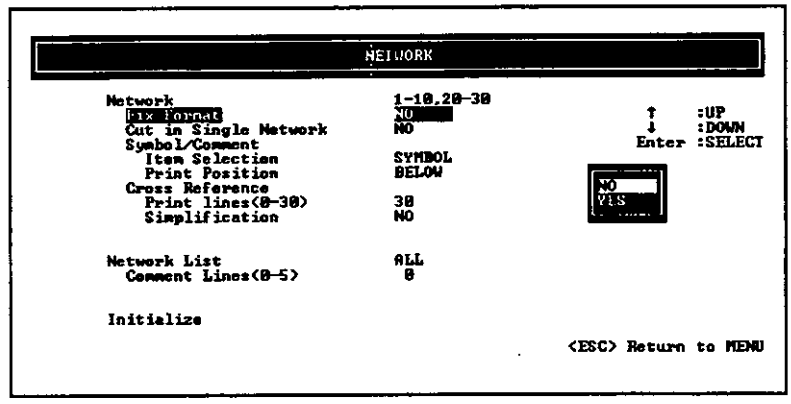
2) Specify network numbers as network serial numbers.

3) Network information will be printed in the small font, regardless of the font size settings. Refer to *3. Font Size* under *19.2.4 Set Format Screen.*

2. Fix Format

A selection can be made whether or not to print network information in fixed lines. If set to print in fixed lines, the network information will be printed at the maximum size, regardless of whether or not there are elements in every line. If set to not print in fixed lines, lines without elements will be omitted.

1) Move the cursor to **Fix Format** and press the Enter Key to display the selection window.

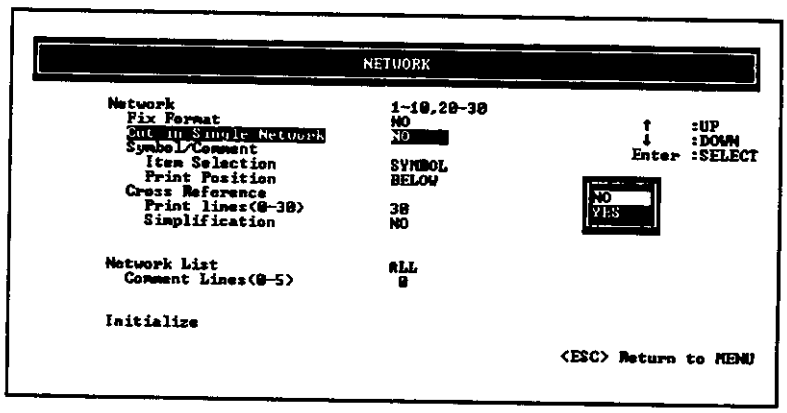


2) Use the Cursor Keys to make the selection and press the Enter Key.

3. Cut in Single Network (Page Break in Single Network)

A selection can be made whether or not to allow page breaks when printing a single network. If set to allow page breaks, a single network may be printed over two pages. If set to not allow page breaks, the whole network will be printed after a page break so that the network is not spread over two pages.

1) Move the cursor to **Cut in Single Network** and press the Enter Key to display the selection window.

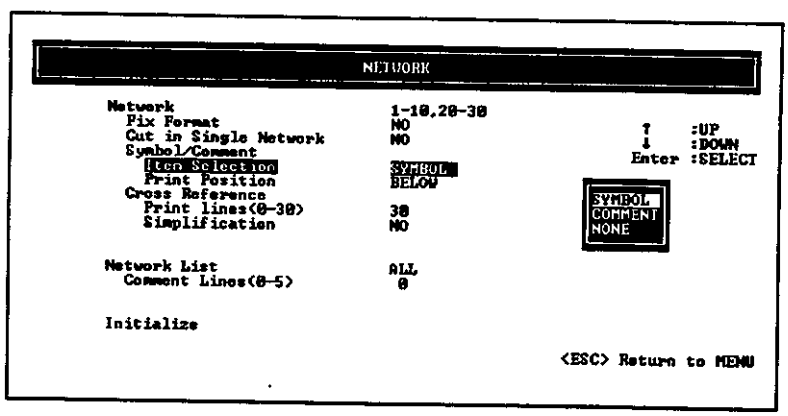


2) Use the Cursor Keys to make the selection and press the Enter Key.

4. Symbol/Comment Item Selection

A selection can be made whether or not to print symbols or comments that have been entered for element reference numbers.
If **Symbol** is selected, symbols will be printed. If **Comment** is selected, comments will be printed. If **None** is selected, neither will be printed.

1) Move the cursor to **Item Selection** and press the Enter Key to display the selection window.

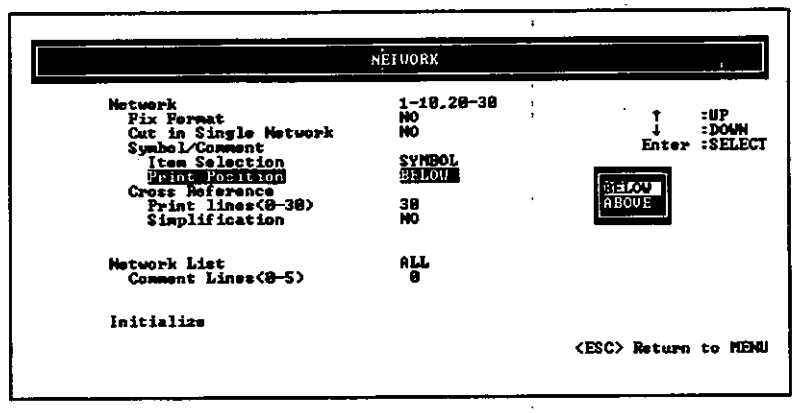


2) Use the Cursor Keys to make the selection and press the Enter Key.

5. Symbol/Comment Print Position

A selection can be made whether to print the symbol or comment selected using **Item Selection** above or below the element.

1) Move the cursor to **Print Position** and press the Enter Key to display the selection window.

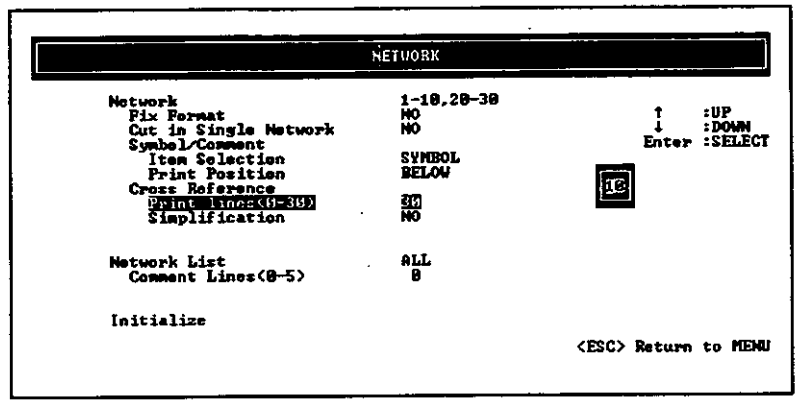


2) Use the Cursor Keys to make the selection and press the Enter Key.

6. Cross Reference Print Lines

The maximum number of lines of cross references to be printed can be set. Set a number within the range specified in parentheses. Cross references will not be printed if the number of lines is set to 0. **Fix Format**, **Paper Size**, and **Margin** settings take preference, however, which may result in fewer lines of cross reference being printed than are set here.

1) Move the cursor to **Print Lines** and press the Enter Key to display the numeric input window.

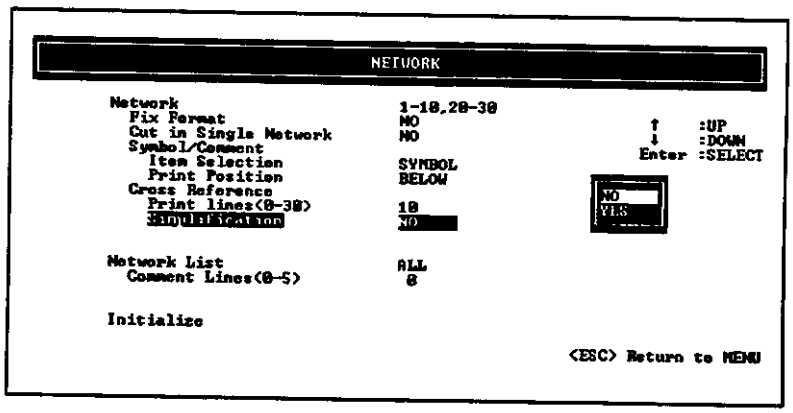


2) Enter a numeric value and press the Enter Key.

7. Cross Reference Simplification

The selection can be made whether or not to simplify cross references when two or more coil reference numbers are used in one network.
Select **Yes** to print a network number #xxxx once only.
Select **No** to print a network number #xxxx as many times as the coil reference number is used.

1) Move the cursor to **Simplification** and press the Enter Key to display the selection window.

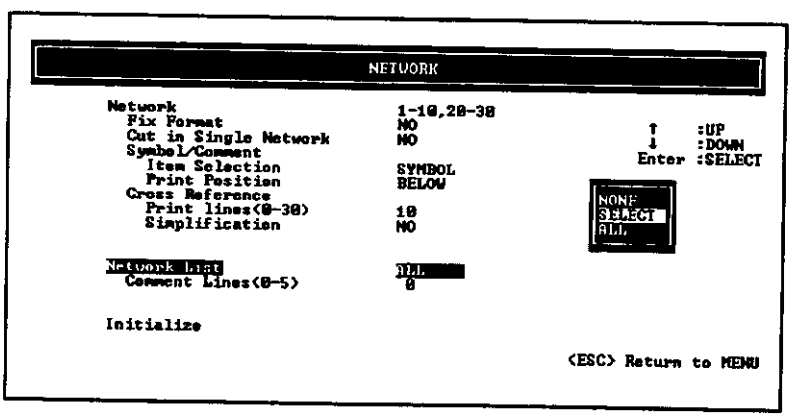


2) Use the Cursor Keys to make the selection and press the Enter Key.

8. Network List

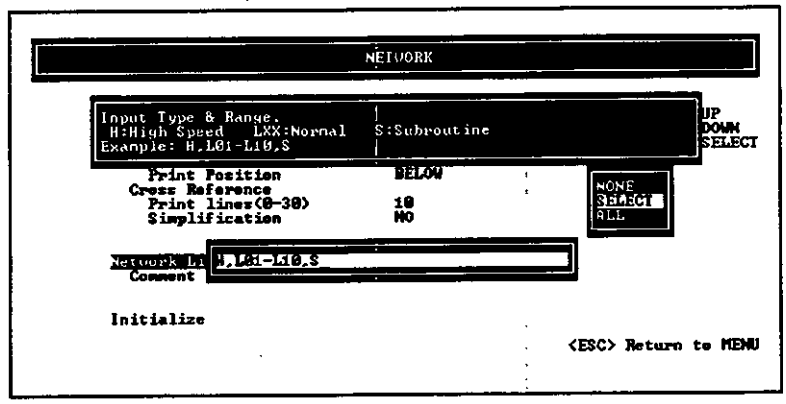
The range of the network list to be printed can be selected from **All**, **Select**, or **None**.
If **Select** is selected, segments to be printed must be specified.

1) Move the cursor to **Network List** and press the Enter Key to display the selection window. In this example, select **Select**.



2) Use the Cursor Keys to make the selection and press the Enter Key.

3) Specify the segments to be printed.



Only the network list for the specified segments will be printed.

INFO

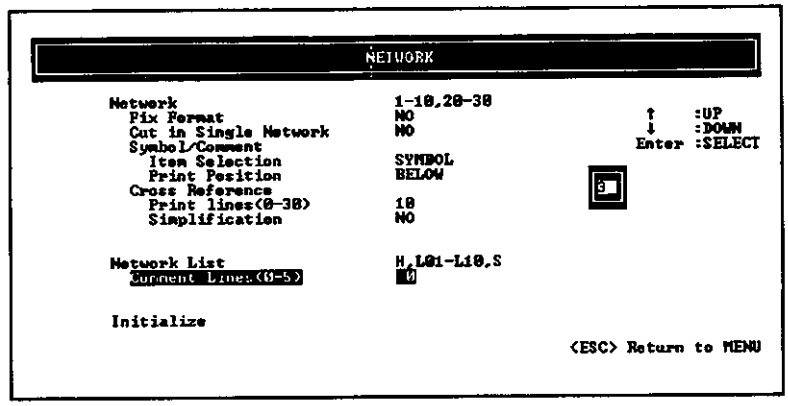
1) Segments can be selected by the following methods:

H,L01,S:	Specify individual segment numbers delimited by commas.
L01–L03:	Specify a range of consecutive segment numbers with a dash.
H,L01–L03:	A combination of both methods can be used. In this example, segments H, and L01 to L03 have been selected.

9. Network List Comment Lines

The maximum number of network comment lines to be printed can be set. If the maximum number of comment lines is set to 0, no network comments will be printed.

1) Move the cursor to **Comment Lines** and press the Enter Key to display the numeric input window.

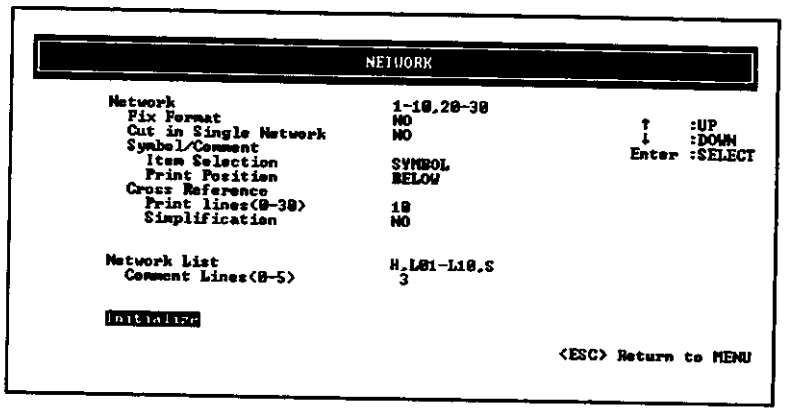


2) Enter a numeral and press the Enter Key. Be sure to enter a number within the range indicated in parentheses.

10.Initialize

The settings in the Network screen can be initialized.

Move the cursor to **Initialize** and press the Enter Key.

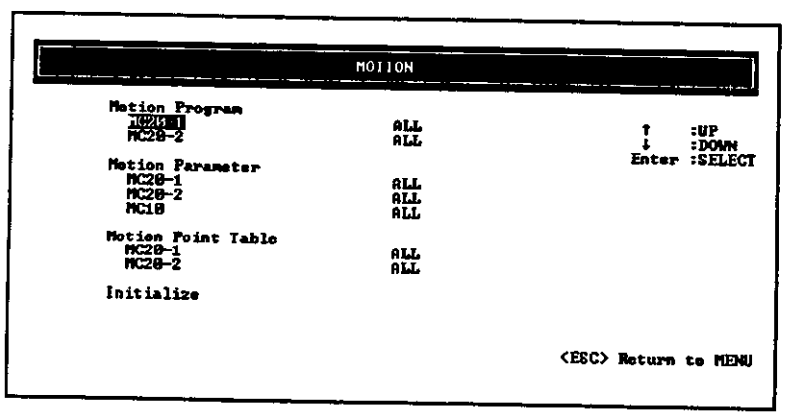


The settings will be initialized.

19.2.7 Motion Print Settings Screen

Select **Motion** from the Print Menu Screen to display the Motion Screen shown below.

The Esc Key can be pressed at this screen to return to the Print Menu Screen.

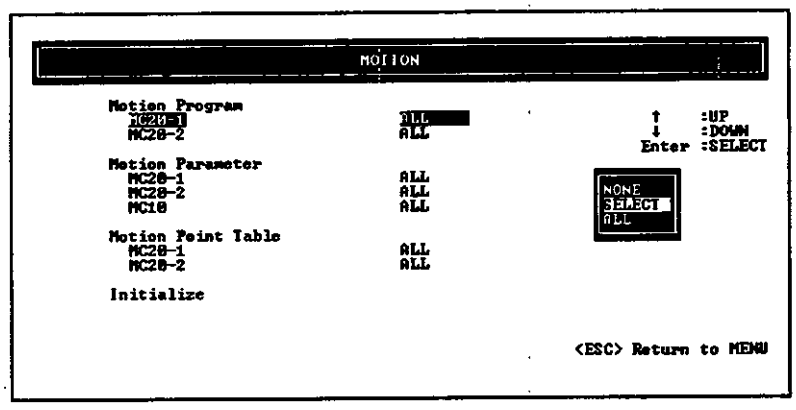


Each item in the Motion Screen is explained and the setting procedures outlined below.

1. Motion Program

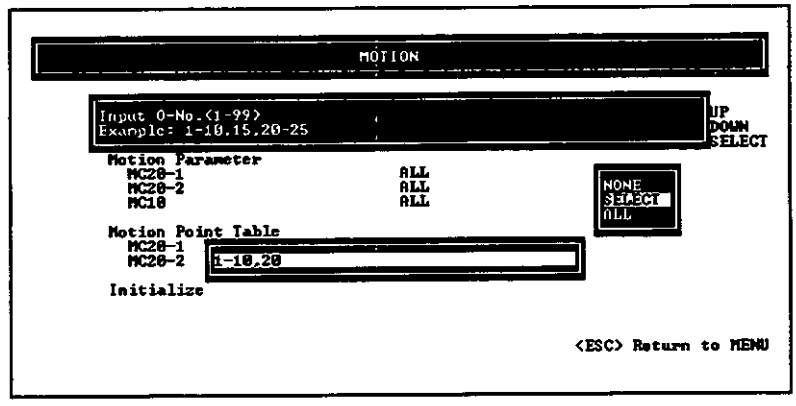
The MC20 Motion Program print range can be selected from **All**, **Select**, or **None**. If **Select** is selected, the O number of the program to be printed must be specified. The following example shows how to set Module 1.

1) Move the cursor to **MC20-1** under **Motion Program** and press the Enter Key to display the selection window.



2) Use the Cursor Keys to make the selection and press the Enter Key.

3) Specify the O numbers of the motion programs to be printed.



The motion programs for the O numbers specified here will be printed.

INFO

1) O numbers can be selected by the following methods:

1,3,5: Specify individual O numbers delimited by commas.
1–10: Specify a range of consecutive O numbers with a dash.
1, 5, 10–15: A combination of both methods can be used. In this example, O numbers 1, 5, and 10 to 15 have been selected.

2) O numbers can be specified between 1 and 99.

2. Motion Parameters

The range of motion parameters to be printed can be specified.

MC20 Module motion parameters can be selected for each Module using the **All**, **Select**, or **None** options. If **Select** is selected, the type of parameter to be printed must be specified. The following types of MC20 parameters are available:

- Common
- Home position return
- Servo I/O
- Positioning
- Absolute position detection
- Speed and acceleration/deceleration
- Machine system/peripheral devices

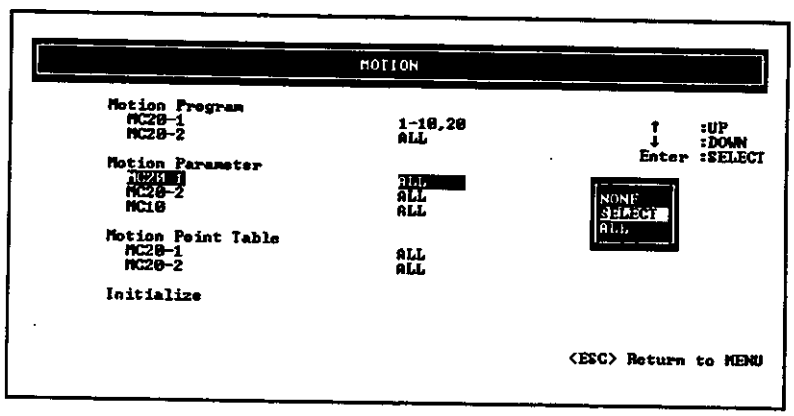
The MC10 Modules to be printed can be selected using the **All**, **Select**, or **None** option.

INFO Parameters for unused axes will not be printed.

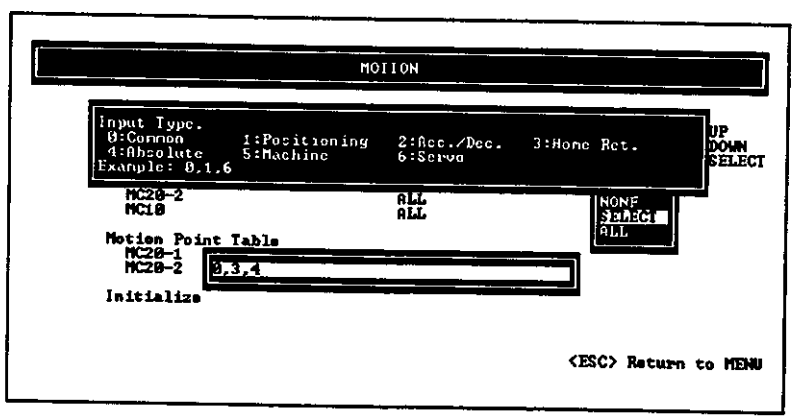
A. Settings for MC20 Modules

In this example, settings will be made for Module 1.

1) Move the cursor to **MC20-1** under **Motion Parameter** and press the Enter Key to display the selection window. In this example, select **Select**.



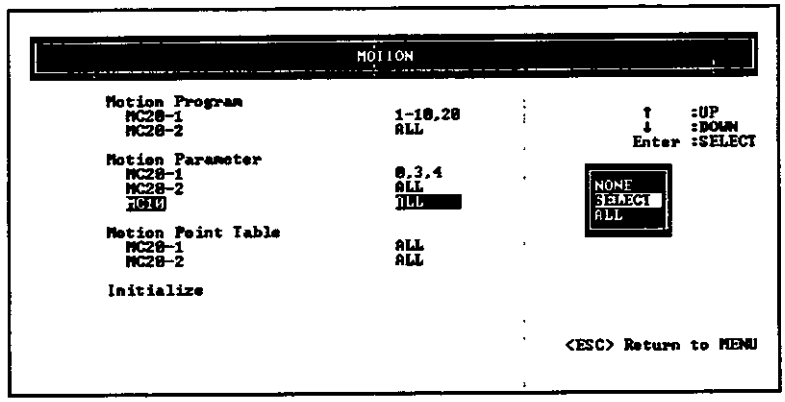
2) The window for specifying the type of motion parameter will be displayed. Specify the parameter type using the number in the hundreds digit of the parameter numbers. (For details, see *INFO* on page 19-28.)



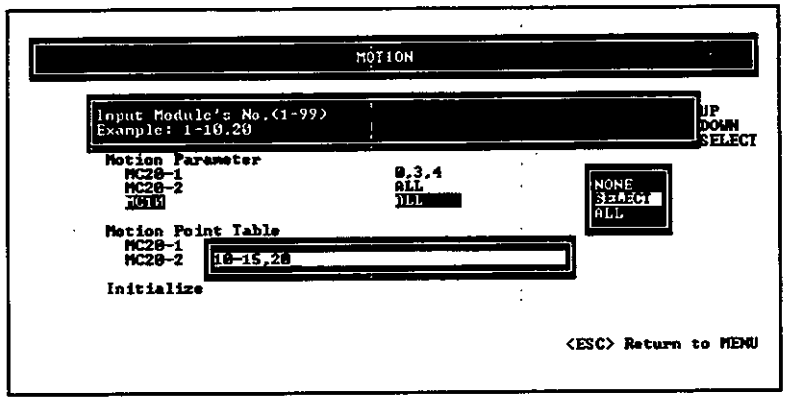
The type of motion parameter specified here will be printed.

B. Settings for MC10 Modules

1) Move the cursor to **MC10** under **Motion Parameter** and press the Enter Key to display the selection window. In this example, select **Select.**



2) The window for specifying the Module will be displayed. Specify the numbers of the Modules to be printed.



The motion parameters for the Module numbers specified here will be printed.

INFO

1) The type of MC20 parameter is specified using the number in the hundreds digit of the parameter numbers. For example "1" from PA101 Position loop gain and "4" from PA402 absolute value selection.

   0: Common parameters
   1: Positioning parameters
   2: Speed and acceleration/deceleration parameters
   3: Home position return parameters
   4: Absolute position detection parameters
   5: Machine system/peripheral devices parameters
   6: Servo external I/O parameters

2) The numbers outlined above are used to specify the types of MC20 parameters.

   0,1,4: Common, positioning, and absolute position detection parameters have been selected.

3) MC10 Modules can be specified using the following methods:

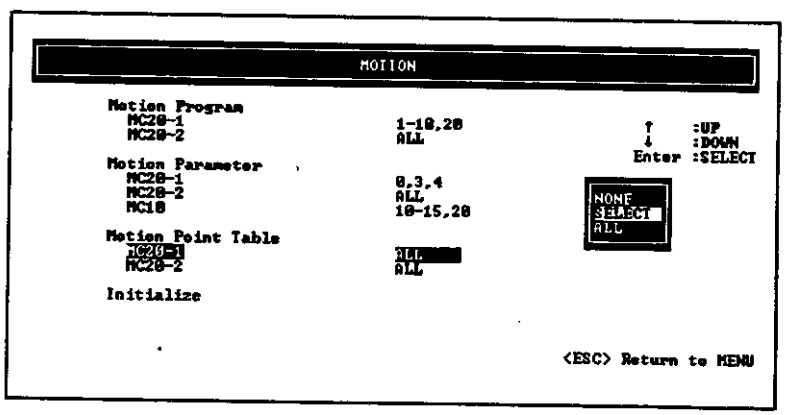
1,3,5:	Specify Module numbers delimited by commas.
1–10:	Specify a range of consecutive Module numbers with a dash.
1,5,10–15:	A combination of both methods can be used. In this example, Module numbers 1, 5, and 10 to 15 have been selected.

4) Specify MC10 Module numbers between 1 and 99.

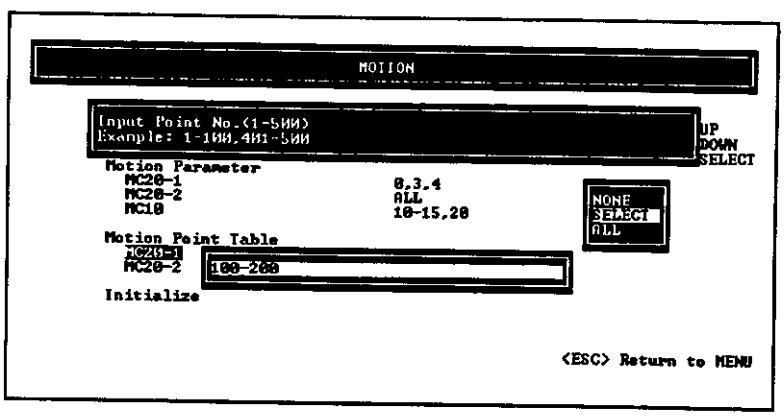
3. Motion Point Table

The print range for MC20 motion point tables can be selected using the **All**, **Select**, or **None** option.
If **Select** is selected, the point numbers of the motion point tables to be printed must be specified. This example shows how to make settings for Module 1.

1) Move the cursor to **MC20-1** under **Motion Point Table** and press the Enter Key to display the selection window. In this example, select **Select**.



2) Use the Cursor Keys to make the selection and press the Enter Key. Specify the point numbers of the motion point tables to be printed.



The motion point tables for the point numbers specified here will be printed.

INFO 1) Point numbers can be specified using the following methods.

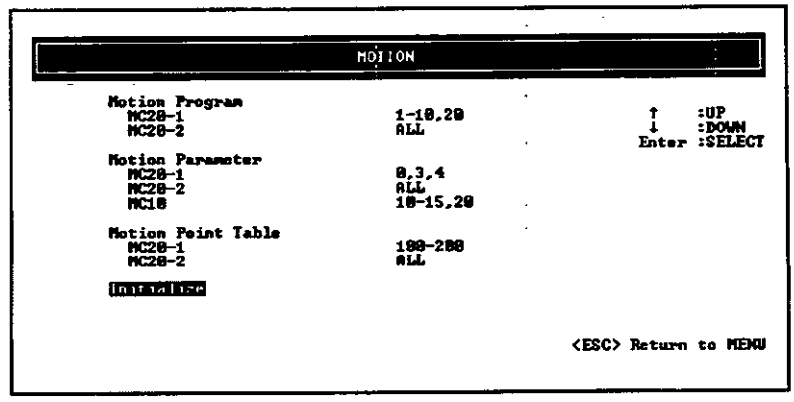
100,300,500:	Specify point numbers delimited by commas.
1–100:	Specify a range of consecutive point numbers with a dash.
1–200,400–500:	A combination of both methods can be used. In this example, point numbers 1 to 200 and 400 to 500 have been selected.

2) Specify point numbers between 1 and 500.

4. Initialize

The settings in the Motion Screen can be initialized.

Move the cursor to **Initialize** and press the Enter Key.

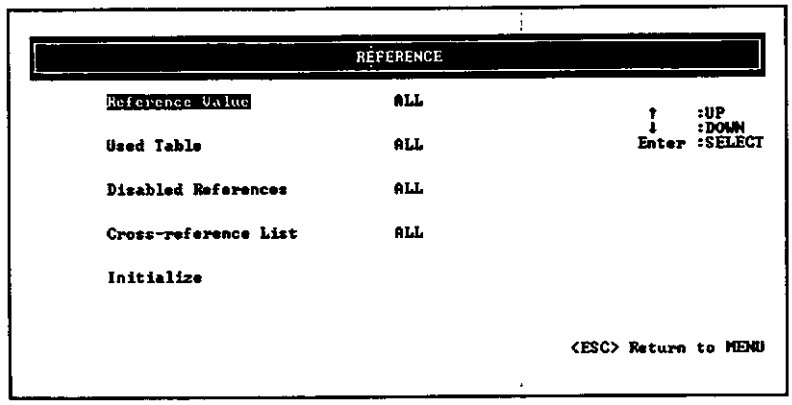


The settings will be initialized.

19.2.8 Reference Print Settings Screen

Select **Reference** from the Print Menu Screen to display the Reference Screen shown below.

The Esc Key can be pressed at this screen to return to the Print Menu Screen.



Each item in the Reference Screen is explained and the setting procedures outlined below.

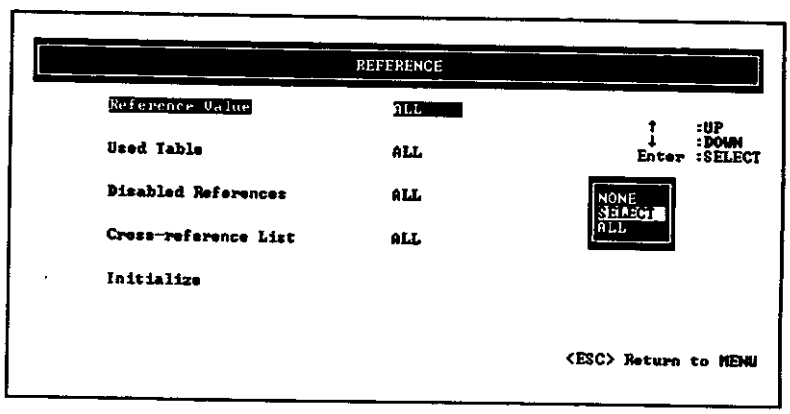
1. Reference Value (Reference Data)

The range of reference data to be printed can be selected using the **All**, **Select**, or **None** option.
If **Select** is selected, the types and ranges of the reference data to be printed must be specified. The following types of reference data can be printed.

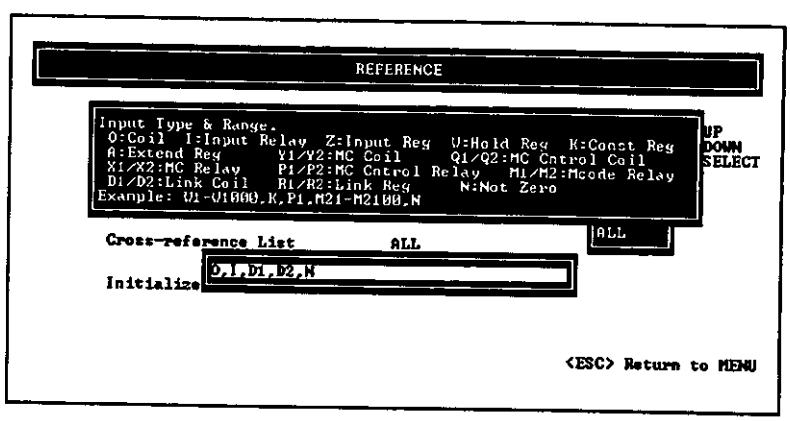
- Coils
- Relays
- Input registers
- Holding registers
- Constant registers
- Expansion registers
- MC coils
- MC control coils
- MC relays
- MC control relays
- M code relays
- Link coils
- Link registers

In addition, reference data can also be specified as "values other than 0."

1) Move the cursor to **Reference Value** and press the Enter Key to display the selection window.



2) Select **Select** and specify the types and ranges of reference data.



The reference data specified here will be printed.

1) The following types of references are specified using one character.

O: Coils	W: Holding registers
I: Relays	K: Constant registers
Z: Input registers	A: Expansion registers

The following types of references are specified using two characters.

Y1/Y2: MC coils 1/2
X1/X2: MC relays 1/2
M1/M2: M code relays 1/2
R1/R2: Link registers 1/2
Q1/Q2: MC control coils 1/2
P1/P2: MC control relays 1/2
D1/D2: Link coils 1/2

Enter **N** to specify non-zero reference data only.

2) After specifying the type of reference in *1)* above, enter reference numbers to specify the range of reference data. Specifying no reference numbers means that all the reference data of the specified reference type will be specified.

O:	Specifies all coils.
I1:	Specifies relay 1 only.
W100–W200:	Specifies holding registers 100 to 200.
R1:	Specifies all references of link register 1.
M21–M250:	Specifies references 1 to 50 of M code relays 2.

3) The type and range of references are designated using a combination of the methods outlined in *1)* and *2)* above.

Z,W, N: All reference data other than 0 in the input and holding registers will be printed.

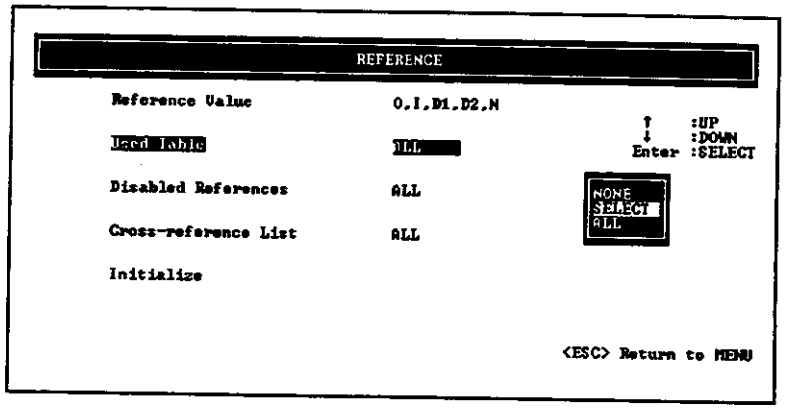
Z,R21–R250: Specifies all input registers and references 1 to 50 of link registers 2.

2. Used Table

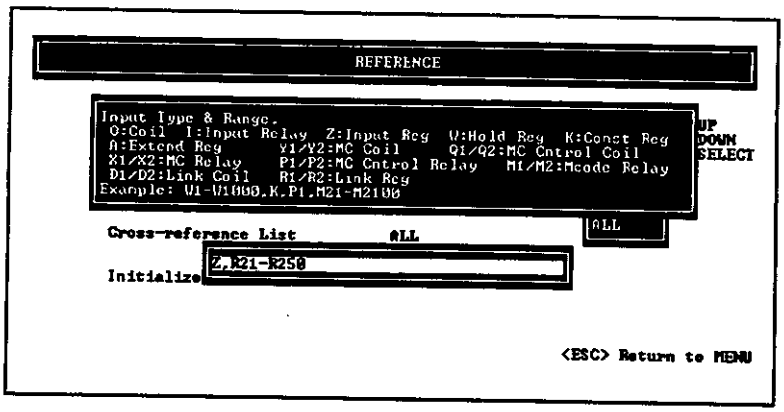
The print range for reference use tables can be selected from **All**, **Select**, or **None**. If **Select** is selected, the types and ranges of references must be specified. Reference use tables for the following types of references can be printed.

- Coils
- Relays
- Input registers
- Holding registers
- Constant registers
- Expansion registers
- MC coils
- MC control coils
- MC relays
- MC control relays
- M code relays
- Link coils
- Link registers

1) Move the cursor to **Used Table** and press the Enter Key to display the selection window.



2) Select **Select** and specify the types and ranges of references for which reference use tables are to be printed.



The reference use tables for the references specified here will be printed.

INFO

1) The following types of references are specified using one character.

O: Coils	W: Holding registers
I: Relays	K: Constant registers
Z: Input registers	A: Expansion registers

The following types of references are specified using two characters.

Y1/Y2: MC coils 1/2
X1/X2: MC relays 1/2
M1/M2: M code relays 1/2
Q1/Q2: MC control coils 1/2
P1/P2: MC control relays 1/2
D1/D2: Link coils 1/2
R1/R2: Link registers 1/2

2) After specifying the type of reference in *1)* above, enter reference numbers to specify the range of reference data. Specifying no reference numbers means that all the reference data of the specified reference type will be specified.

O: Specifies all coils.
I 1: Specifies relay 1 only.
W100–W200: Specifies holding registers 100 to 200.
R1: Specifies all references of link registers 1.
M21–M250: Specifies references 1 to 50 of M code relays 2.

3) The type and range of references are designated using a combination of the methods outlined in *1)* and *2)* above.

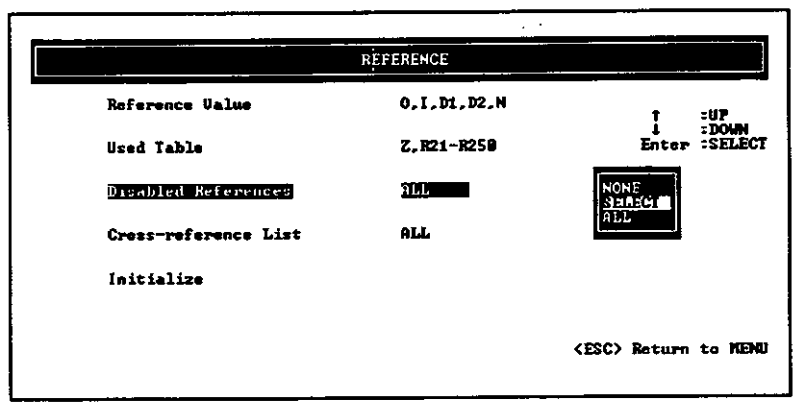
Z, R21–R250: Specifies all input registers and references 1 to 50 of link registers 2.

3. Disabled References

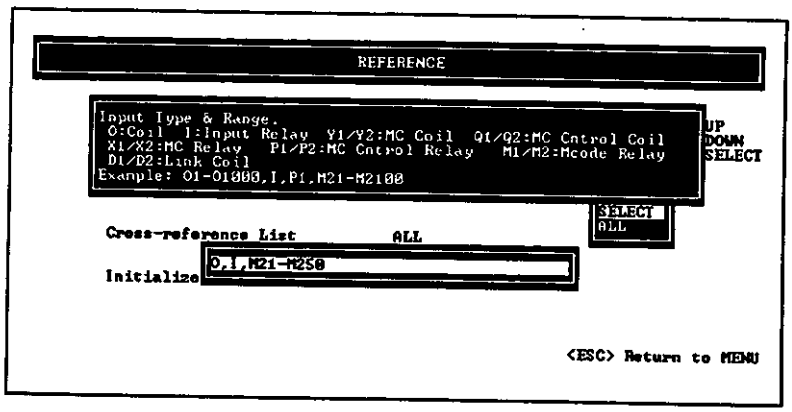
The print range for the list of disabled references can be selected from **All**, **Select**, or **None**. If **Select** is selected, the types and ranges of references must be specified. A list of disabled references for the following types of references can be printed.

- Coils
- Relays
- MC coils
- MC relays
- MC control coils
- MC control relays
- M code relays
- Link coils

1) Move the cursor to **Disabled References** and press the Enter Key to display the selection window.



2) Select **Select** and specify the types and ranges of references for which a list of disabled references is to be printed.



A list of disabled references will be printed for the references specified here.

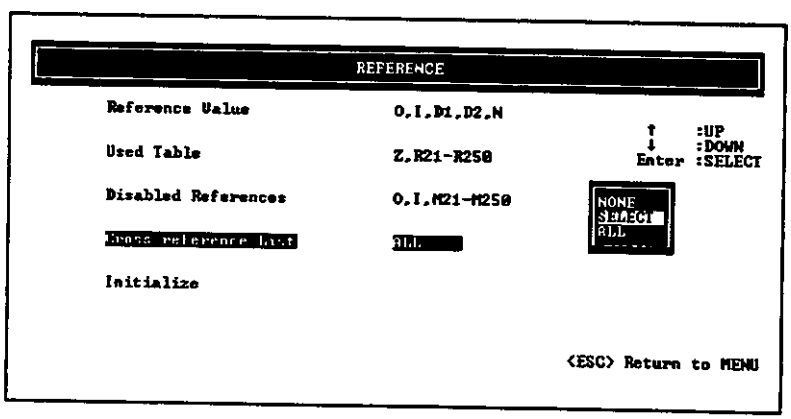
4. Cross-reference Lists

Select **NONE**, **SELECT**, or **ALL** as the printing range of the cross-reference list.

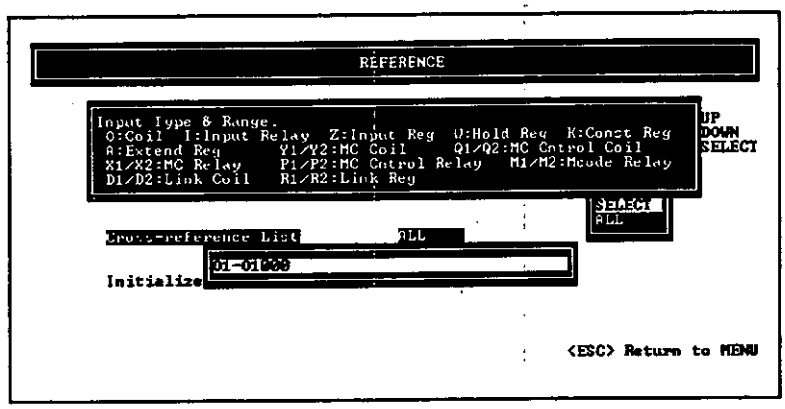
For **SELECT**, specify the types and ranges of references. The following references can be specified on a cross-reference list.

- Coils
- Relays
- Input registers
- Holding registers
- Constant registers
- Expansion registers
- MC coils
- MC control coils
- MC relays
- MC control relays
- M code relays
- Link coils
- Link registers

1) Move the cursor to **Cross-reference List** and press the Enter Key. A window to select the references will be displayed.



2) Select **SELECT** in this example and input the type and range of references to be printed.



A cross-reference list will be printed for the references designated in the above step.

Cross-reference lists are used to print the symbols/comments of references, the numbers of the networks in which the references are used, I/O allocations, and other information on the references. The following items are printed.

1) Symbols/Comments

All the symbols and comments set for the references will be printed.

- Symbol: 32 characters max.
- Comment: 196 characters max.

2) Reference Information

The following four kinds of reference information will be printed.

a) Numbers of networks in which the references are used

b) Ladder instructions in which the references are used

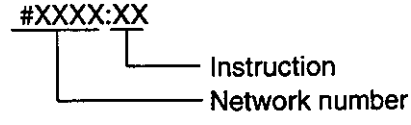
c) Names of system registers

d) Information on the locations of I/O allocations
(Channel, station, rack, and slot numbers)

IMPORTANT

Printing Format

1) Network numbers where the references are used and the instructions will be printed in the following format.



• The following instructions will be printed as shown.

NO:	Normally open contact
NC:	Normally closed contact
PT:	Positive transitional contact
NT:	Negative transitional contact
CO:	Coil
CL:	Latched coil

• Expansion Math Instruction (LOG, ANLOG, etc.) will all be printed as ""EMTH."

• Motion Control Instructions (MOD, JOG, etc.) will all be printed as ""MC."

• FBUS Instructions (MSND, MRCV, SEND, and RECV) will all be printed as ""FBUS"

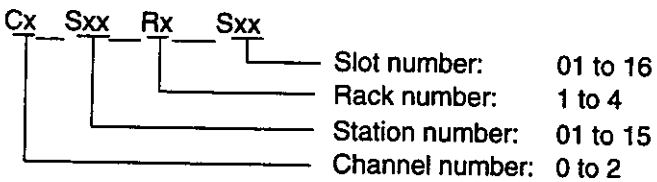
• The specific mnemonics for the instruction will be printed for all other instructions.

• If the same instruction is used more than once in the same network, the number of times the instruction is used in the network will be printed after the instruction mnemonics, as shown below.

Example: #0100:NO (3)

(3) — Number of times instruction is used in the network

2) The locations of I/O allocations for references that have been allocated to I/O will be printed as shown below.



INFO

1) Specify the following references with one character.

O: Coils	I: Relays
Z: Input registers	W: Holding registers
K: Constant registers	A: Expansion registers

Specify the following references with two characters.

Y1/Y2: MC coils 1/2
X1/X2: MC relays 1/2
M1/M2: M code relays 1/2
Q1/Q2: MC control coils 1/2

P1/P2: MC control relays 1/2
D1/D2: Link coils 1/2
R1/R2: Link registers 1/2

2) After specifying the type of reference, specify the range of reference numbers. If the range is not specified, all references of the specified type will be assumed.

O:	Specifies all coils.
I 1:	Specifies relay 1 only.
W100–W200:	Specifies holding registers 100 to 200.
R1:	Specifies all references of link registers 1.
M21–M250:	Specifies references 1 to 50 of M code relays 2.

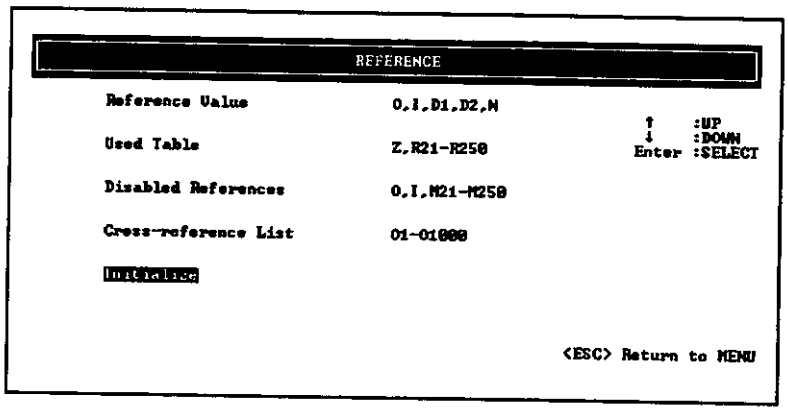
3) The type and range specifications for references can be combined.

Z, R21–R250: Specifies all input register references and link register relays 2, reference numbers 1 to 50.

5. Initialize

The setting in the Reference Screen can be initialized.

Move the cursor to **Initialize** and press the Enter Key.



The settings will be initialized.

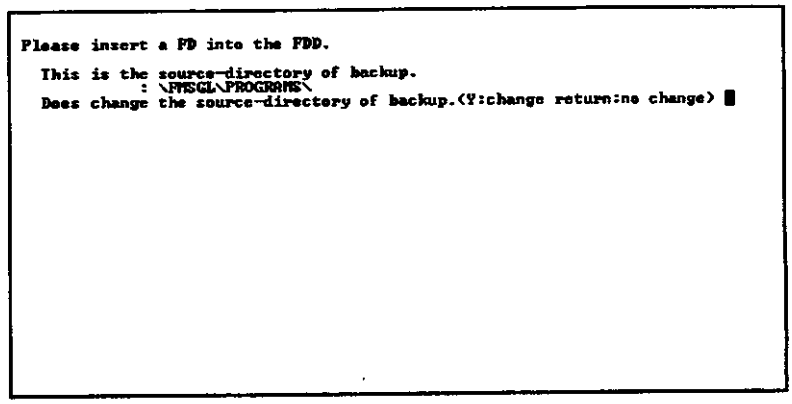
19.3 Batch Backup of Application Files

This section describes using the utility for the batch backup of application files.

The following example shows how to use the utility for the batch backup of application files.

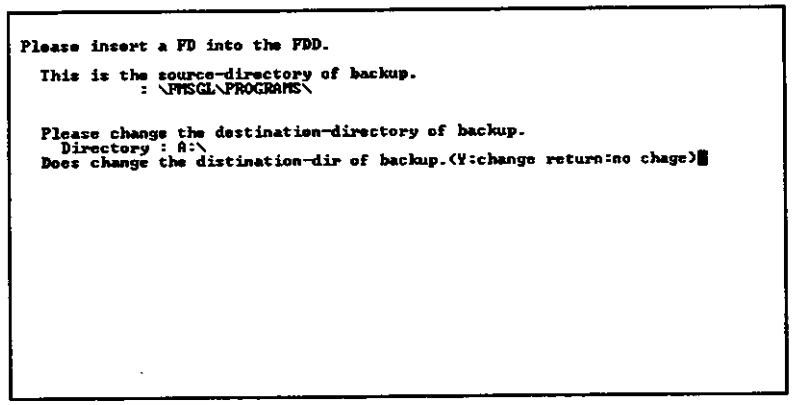
1) When the utility for the batch backup of application files is started, a message will be displayed asking to specify the source directory for the backup. \FMSGL\PROGRAMS\ is set by default.

2) Press the Enter Key to accept the default setting.



A message will be displayed asking to specify the destination directory for the backup. The default directory will be set to A:\.

3) Press the Enter Key again to accept the default setting.



4) A confirmation message will be displayed. Check that the floppy disk is inserted into the floppy disk drive.

5) Press the Enter Key and the backup will start.

A backup file will be created on the floppy disk with the name "MS_APL.ZIP".

1) To select a directory other than the default directory, input the name of the directory, making sure to put a backslash (\) after the name.

2) In this utility, backup is made to a floppy disk. Backup cannot be made to a hard disk.

3) All backup files are created with the file name MS_APL.ZIP. Manage the files by writing the name of each file backed up onto the label of the floppy disk.

4) If an application file is too large to fit on one floppy disk, a compressed file is created which will fit on multiple floppy disks. Insert the floppy disks one after the other into the floppy disk drive as instructed by the messages displayed on the screen.

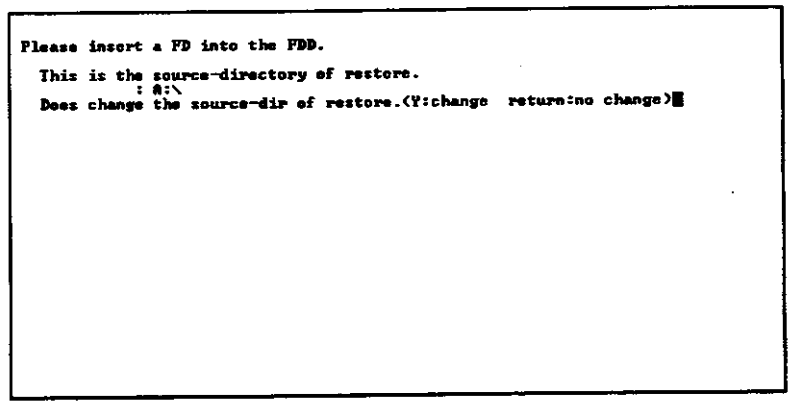
19.4 Batch Restoring of Application Files

This section describes the utility for the batch restoring of application files.

The following example shows how to use the utility for the batch restoring of application files.

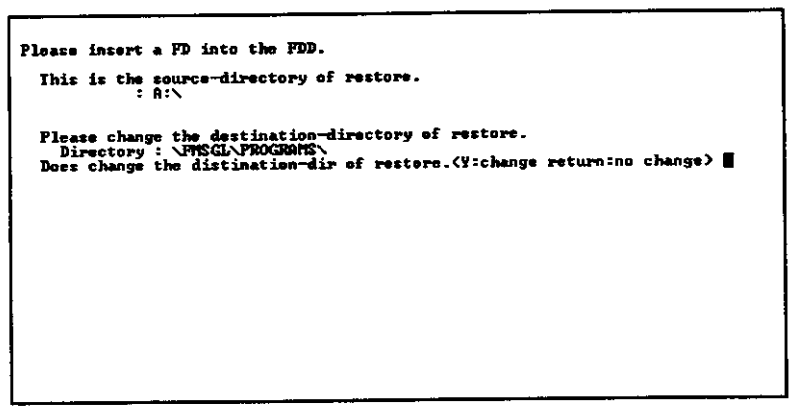
When the operation for the batch restoring of application files is started, a message will be displayed asking to specify the source directory for the restore operation. A:\ is the default setting.

1) Press the Enter Key to accept the default setting.



A message will be displayed asking to specify the destination directory for the restore operation. \FMSGL\PROGRAMS\ is specified as the default setting.

2) Press the Enter Key to accept the default setting.



A confirmation message will be displayed.

3) Press the Enter Key and the restore operation will start.

The file decompression operation will start and a message will be displayed asking confirmation that the floppy disk has been inserted.

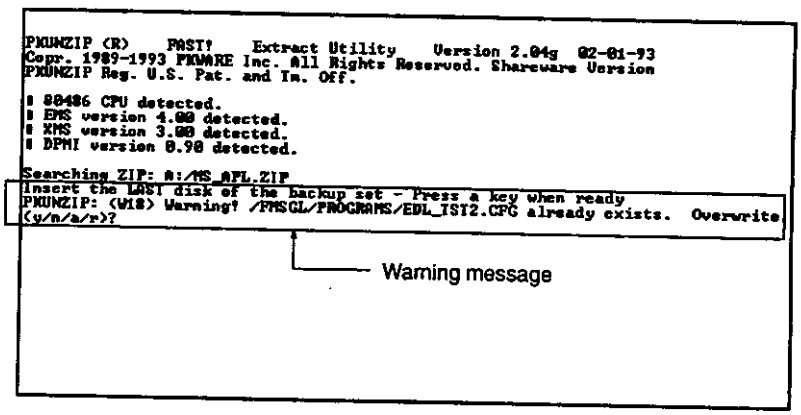
4) Confirm that the floppy disk where the backup file is stored has been inserted in the floppy disk drive and press the Enter Key.

   The compressed file called MS_APL.ZIP, which is stored on the floppy disk, will be restored to its decompressed state.

5) If a file with the same name exists at the restore destination, a warning message will be displayed. Enter one of the following options.

   Y: Overwrite the existing file.
   N: Do not overwrite the existing file.
   A: Overwrite all subsequent files of the same name.
   R: Change the file name.

   If **R** is selected, a message box requesting a new file name will be displayed. Enter the new file name and press the Enter Key.



INFO

1) To select a directory other than the default directory, input the directory name, making sure to put a backslash (\) after the name.

2) This utility can only be used to restore from a floppy disk to a hard disk. Restoring from hard disk is not possible.

3) All restore operations are executed from a compressed file with the name MS_APL.ZIP. Manage the files by writing the name of the program backed up on the label of the floppy disk.

4) If an application file is too large to fit on one floppy disk, a compressed file will be created which will fit on multiple floppy disks. Insert the floppy disks one after the other into the floppy disk drive as instructed by the messages displayed on the screen.

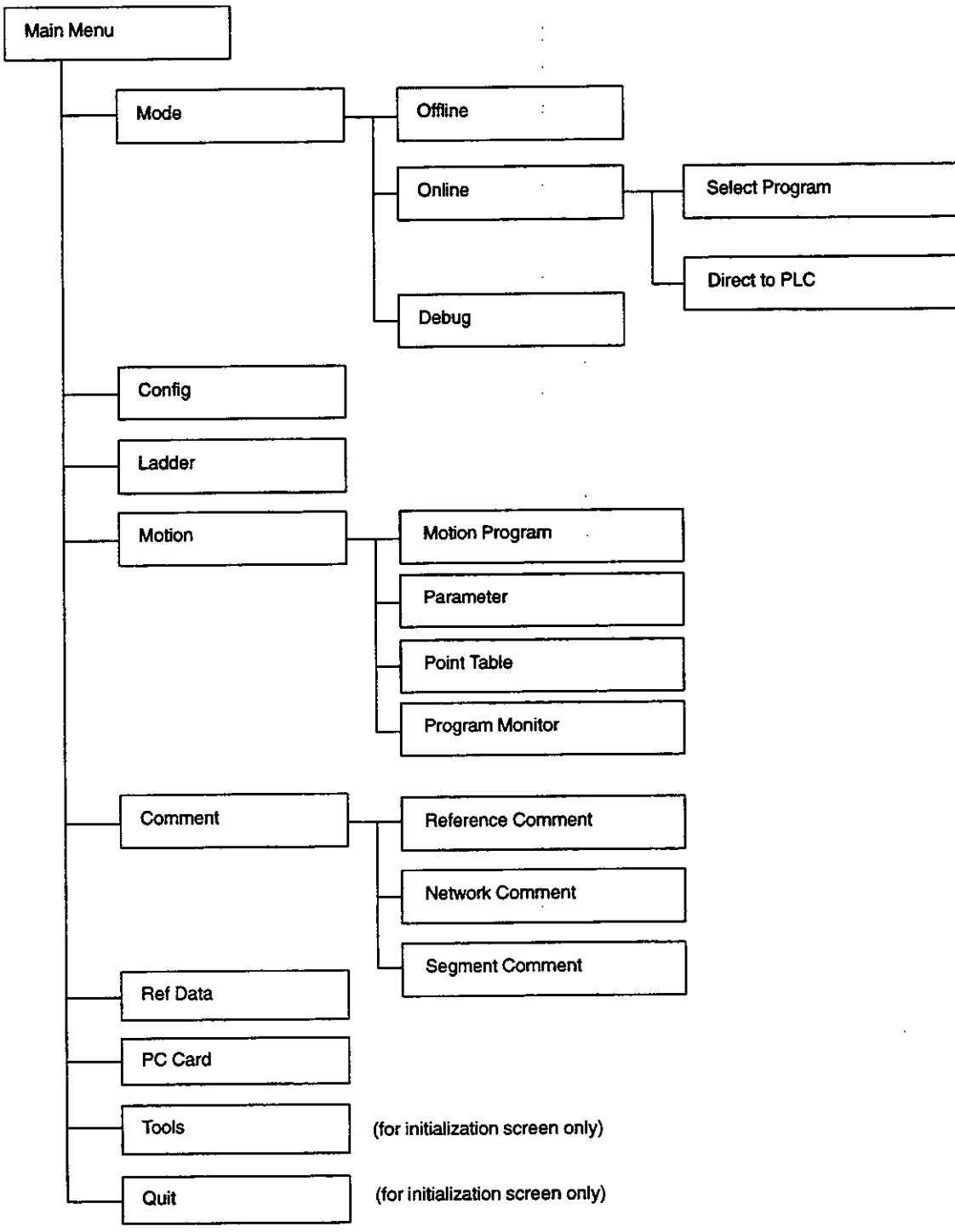
Appendix A

Menu Structure

A

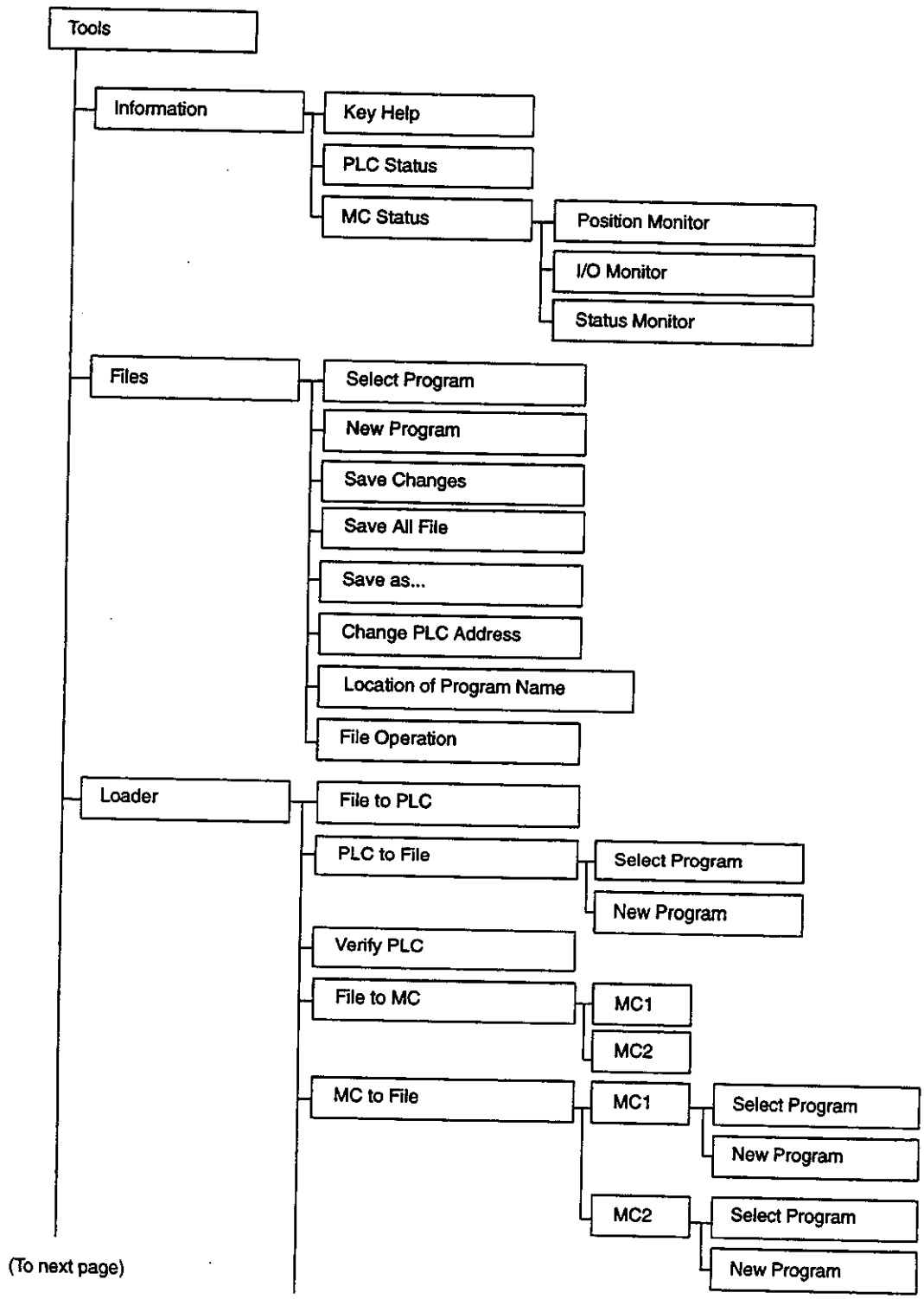
A.1 Main Menu

The Main Menu heading is located in the leftmost menu bar except for the initialization screen. The Function Key F1 is assigned to Main Menu.

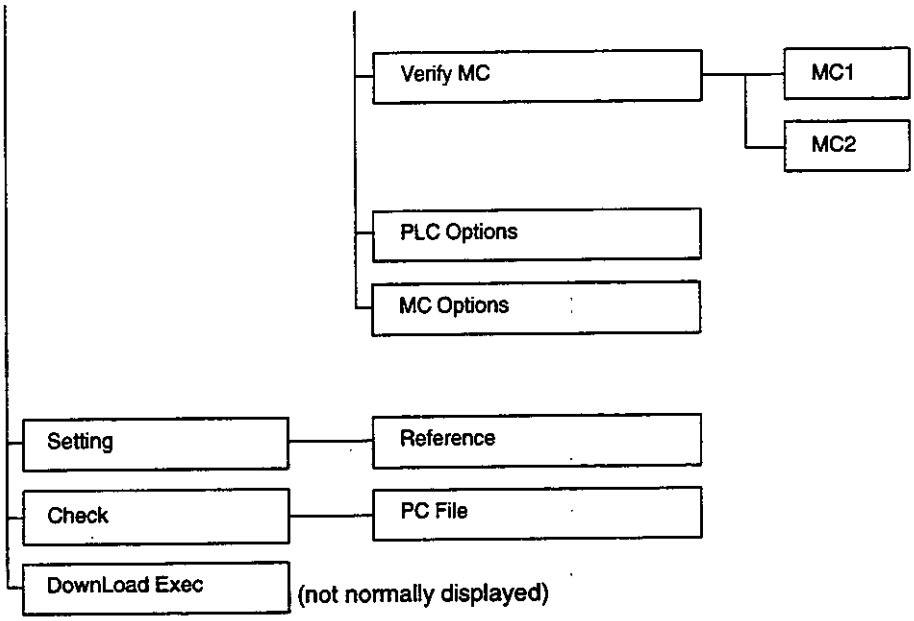


A.2 Tool Menu

The Tools Menu heading is located second from the rightmost menu bar for all screens. The Function Key F8 is assigned to the Tools Menu.

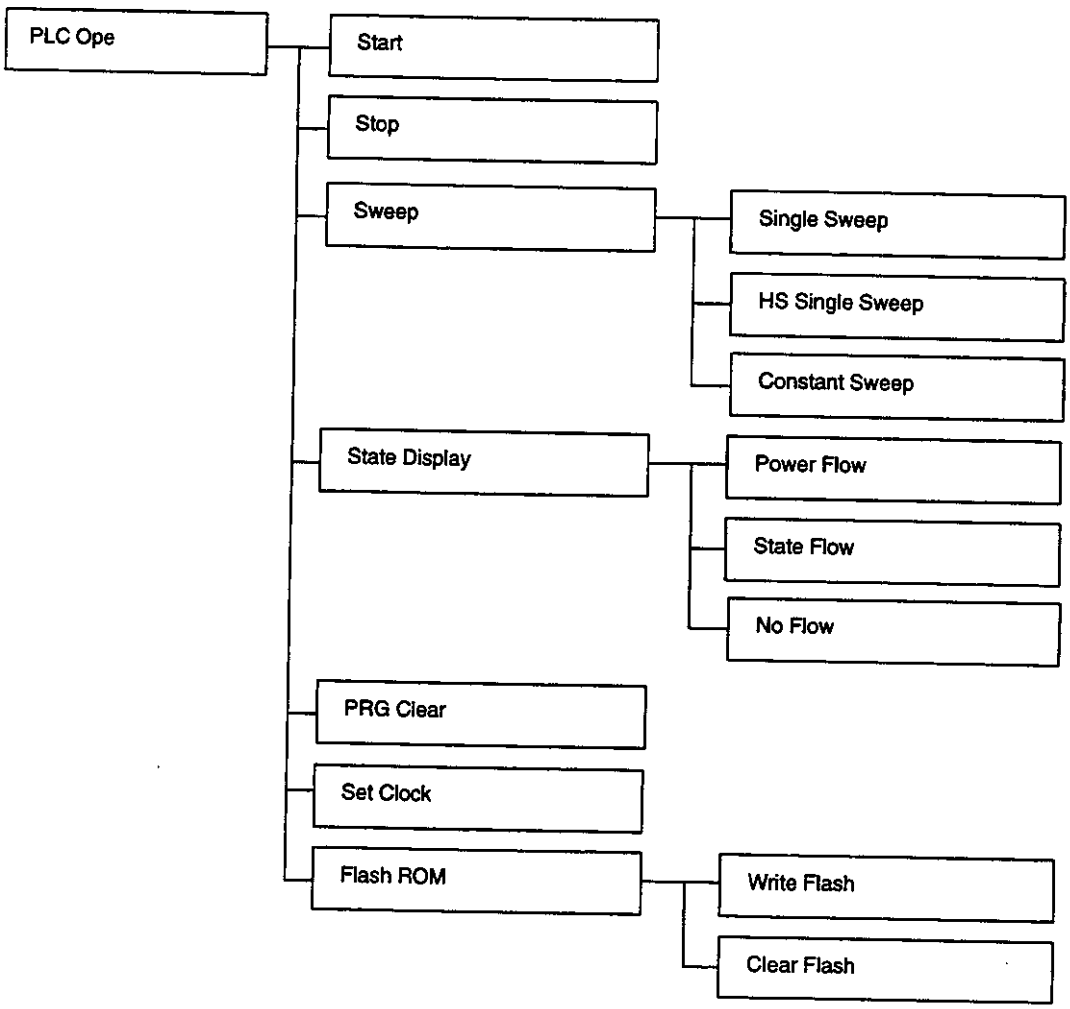


(Continued)


Verify MC
MC1
MC2
PLC Options
MC Options
Setting
Reference
Check
PC File
DownLoad Exec
(not normally displayed)

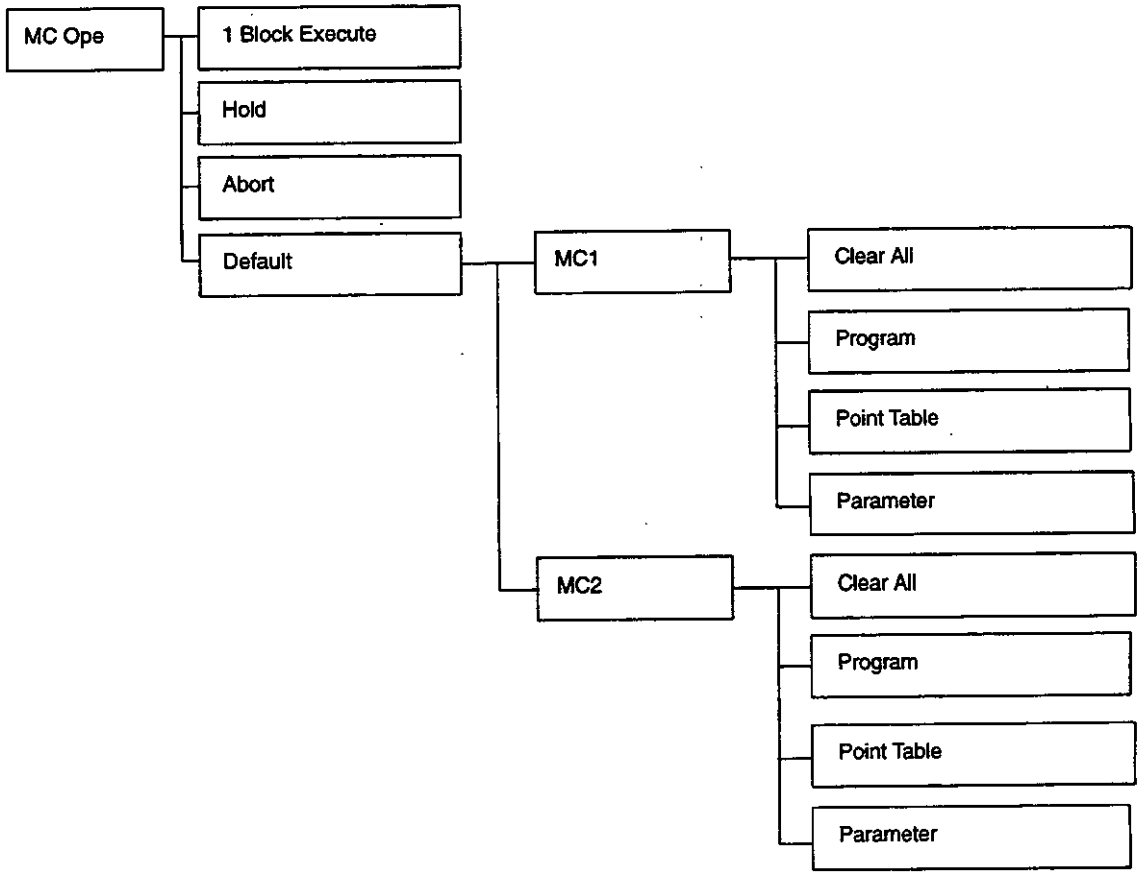
A.3 PLC Operation Menu

This menu is displayed for the Online or Debug Mode. This displayed menu varies with PLC models and display screens.



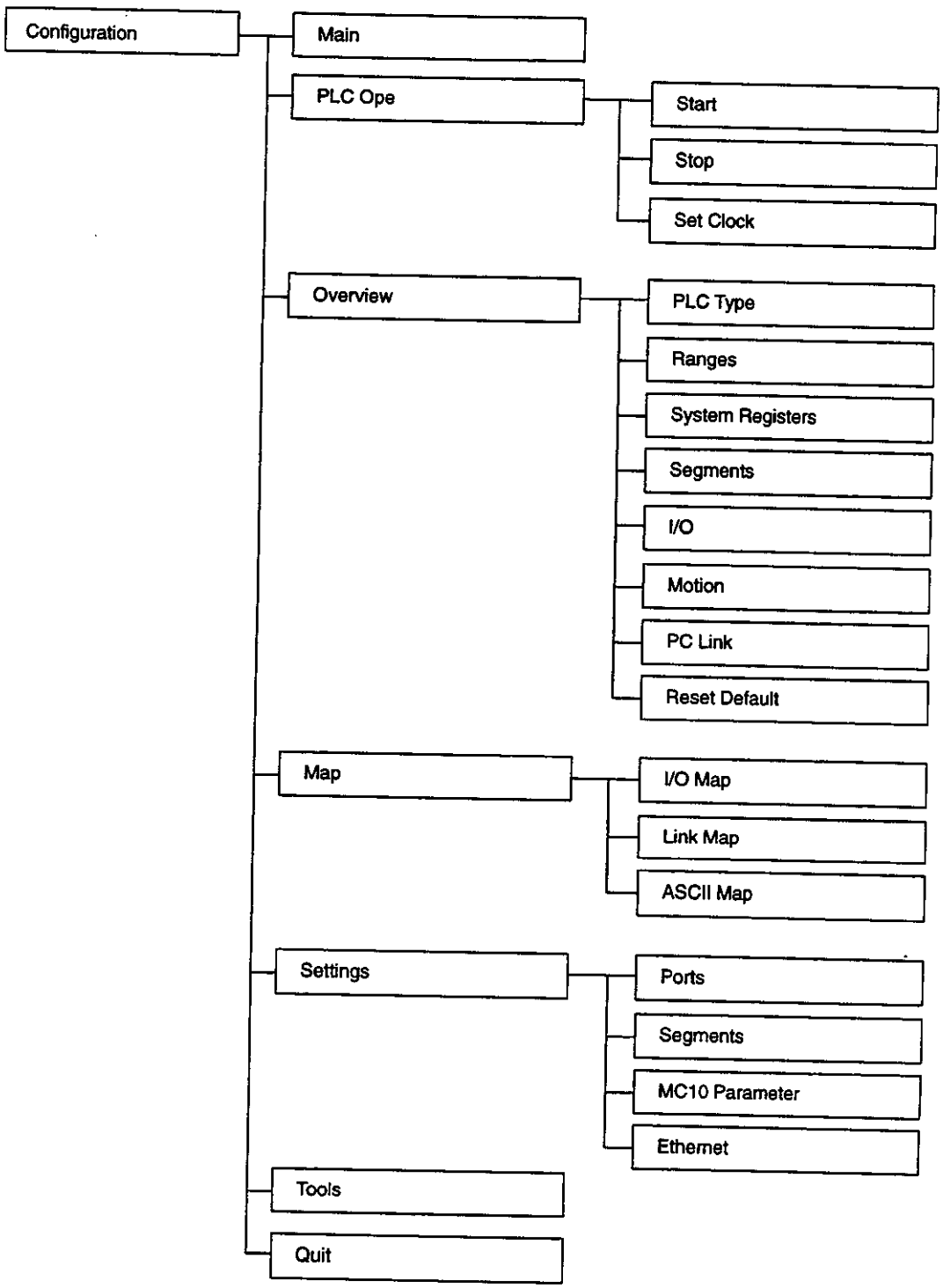
A.4 MC Operation Menu

This menu is displayed second from the leftmost menu bar when the screen related to the Motion Module appears. The Function Key F2 is assigned to this menu. This menu is not displayed for the Offline Mode.

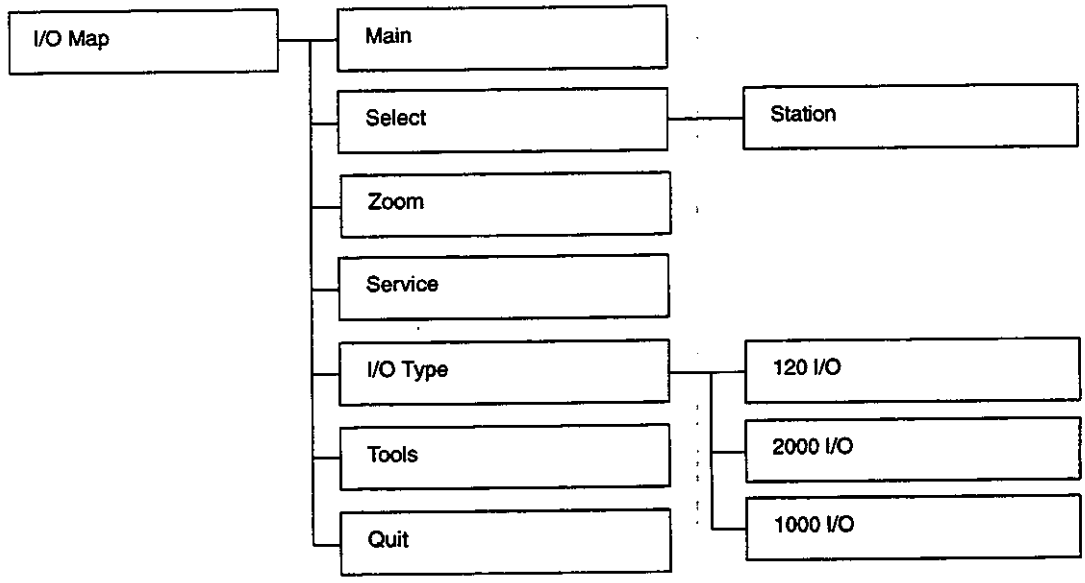


A.5 Configuration Editor Menu

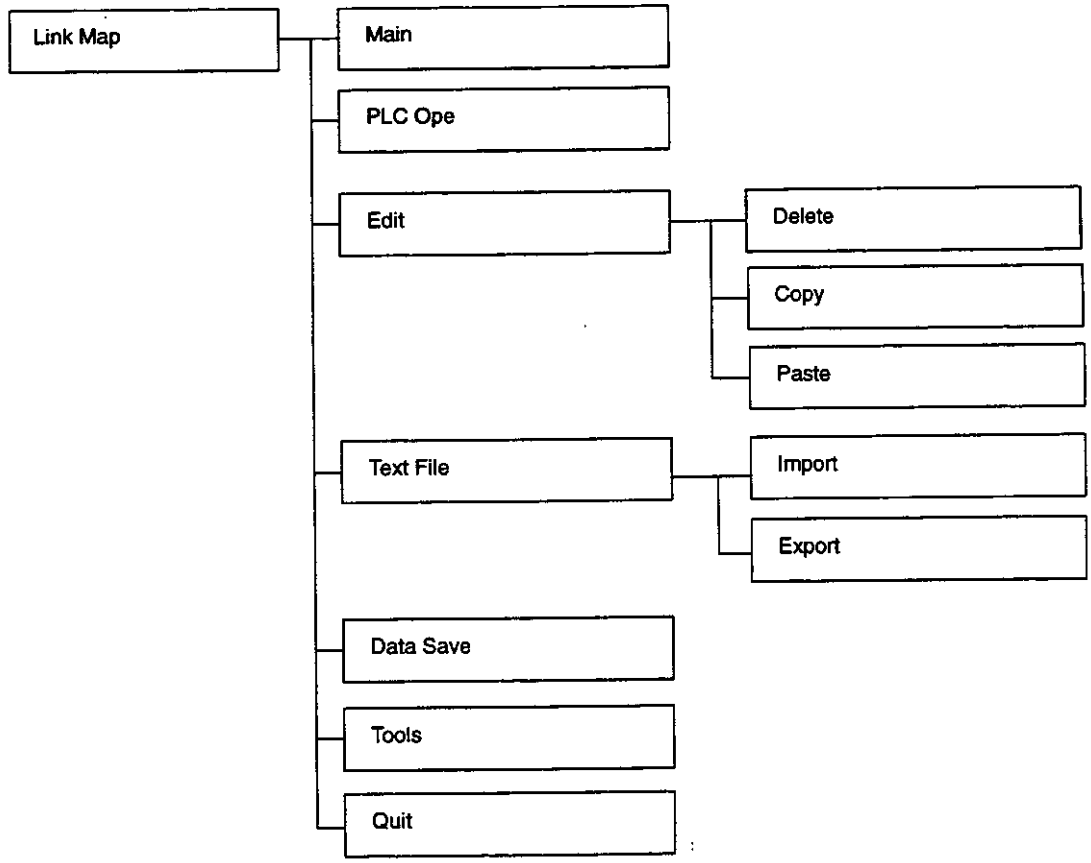
The Configuration Editor Screen is displayed when the Configuration command is selected from the Main Menu.



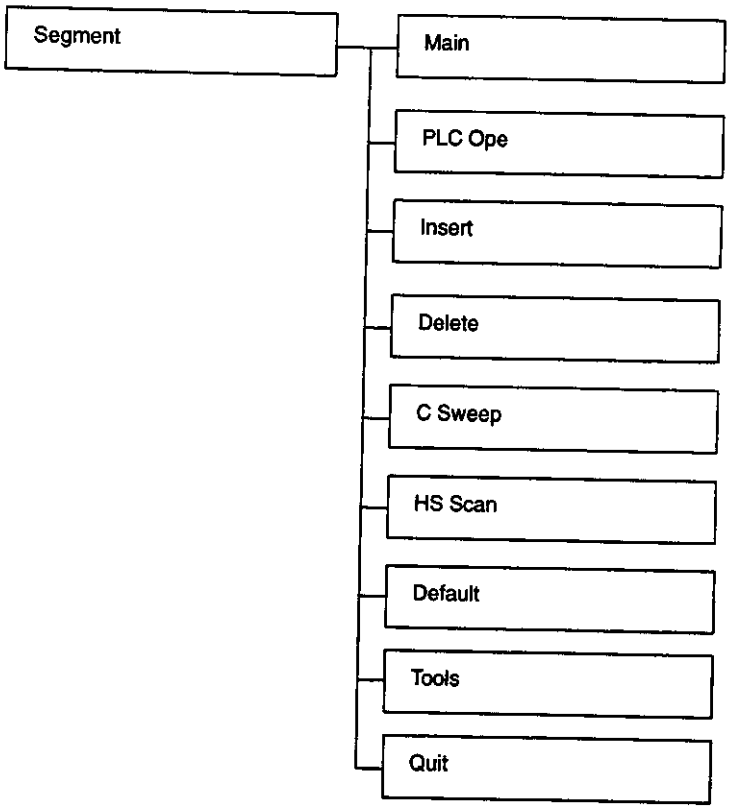
A.5.1 Input/Output Allocation Screen (I/O Map)



A.5.2 Link Allocation Screen (Link Map)

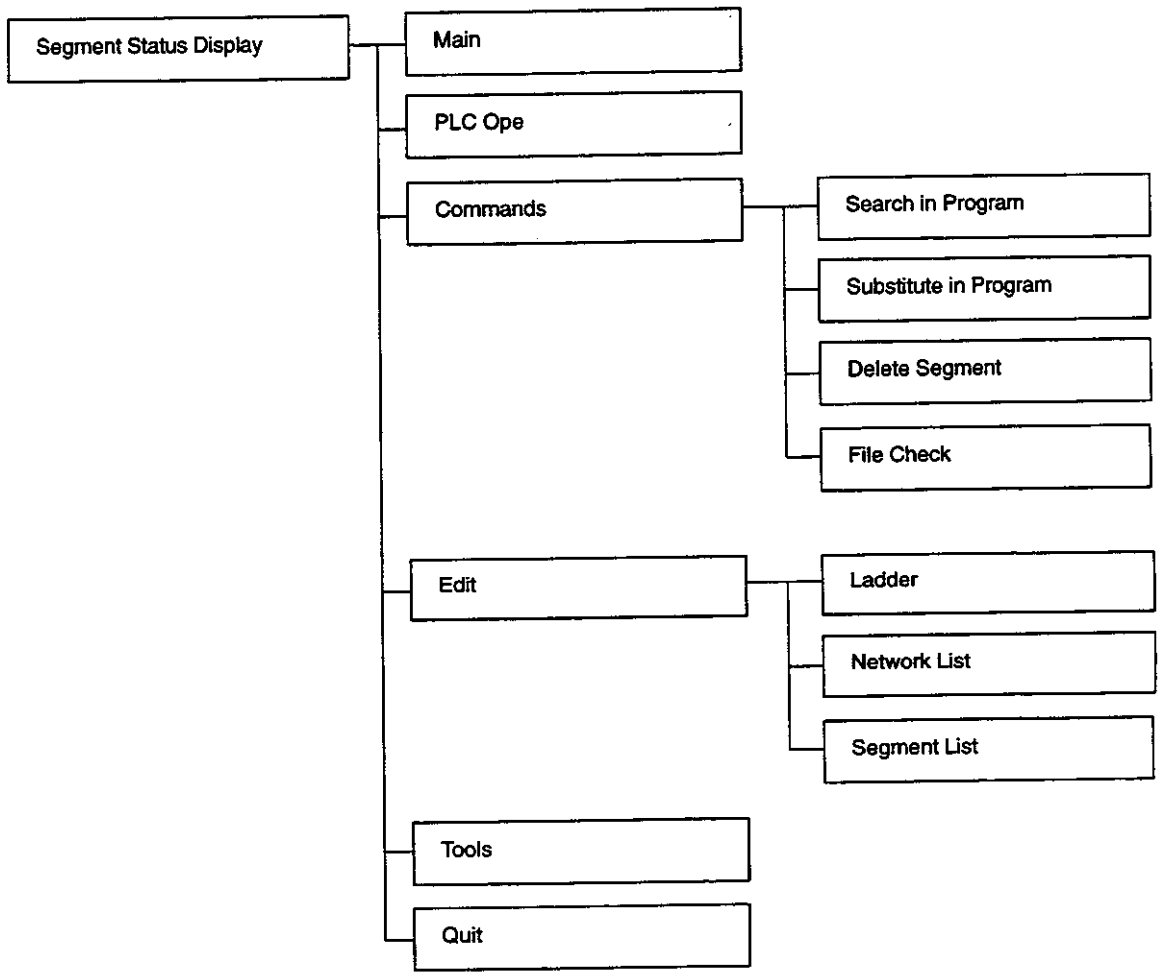


A.5.3 Segment Scheduler Screen

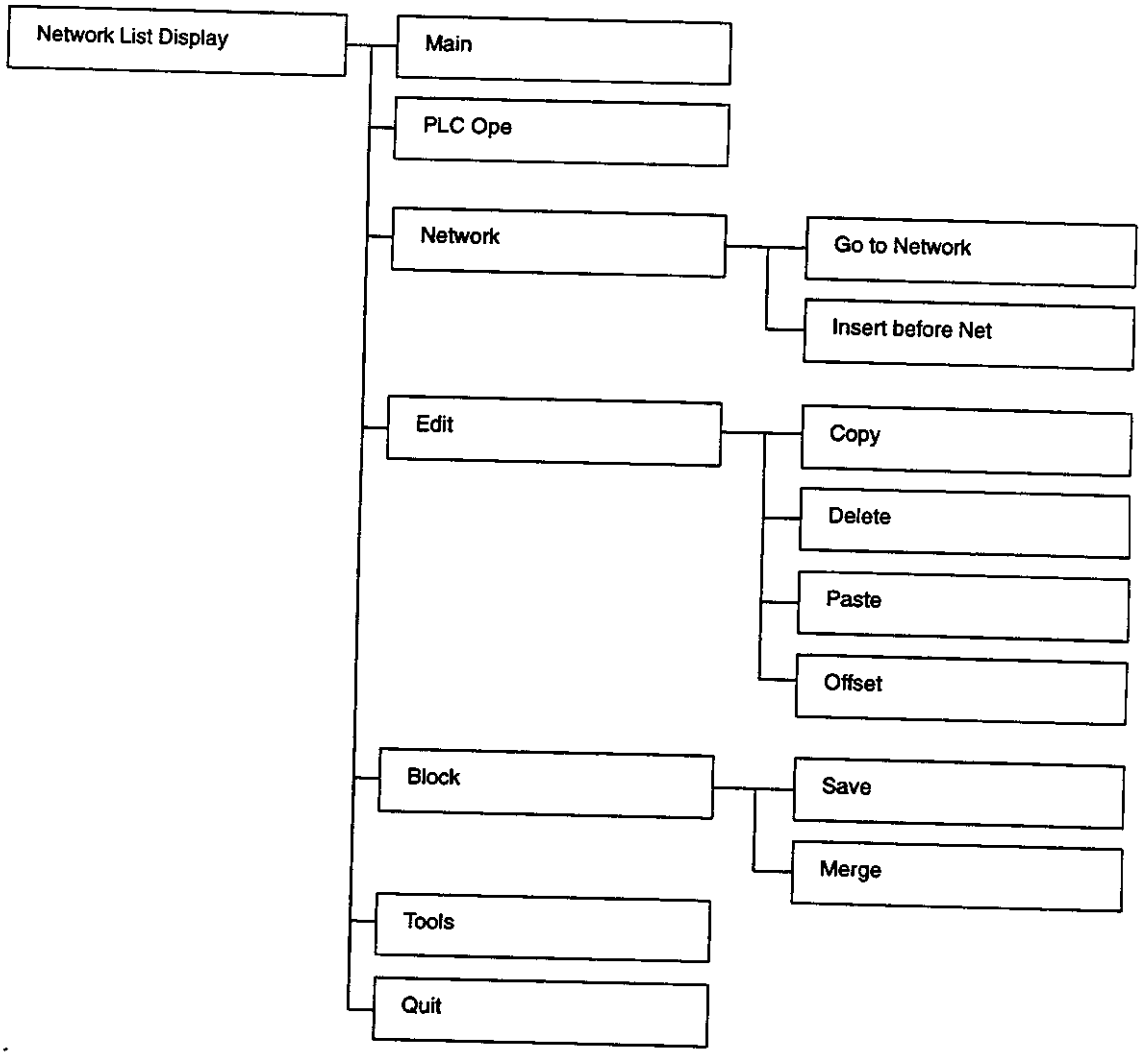


A.6 Segment Status Display Menu

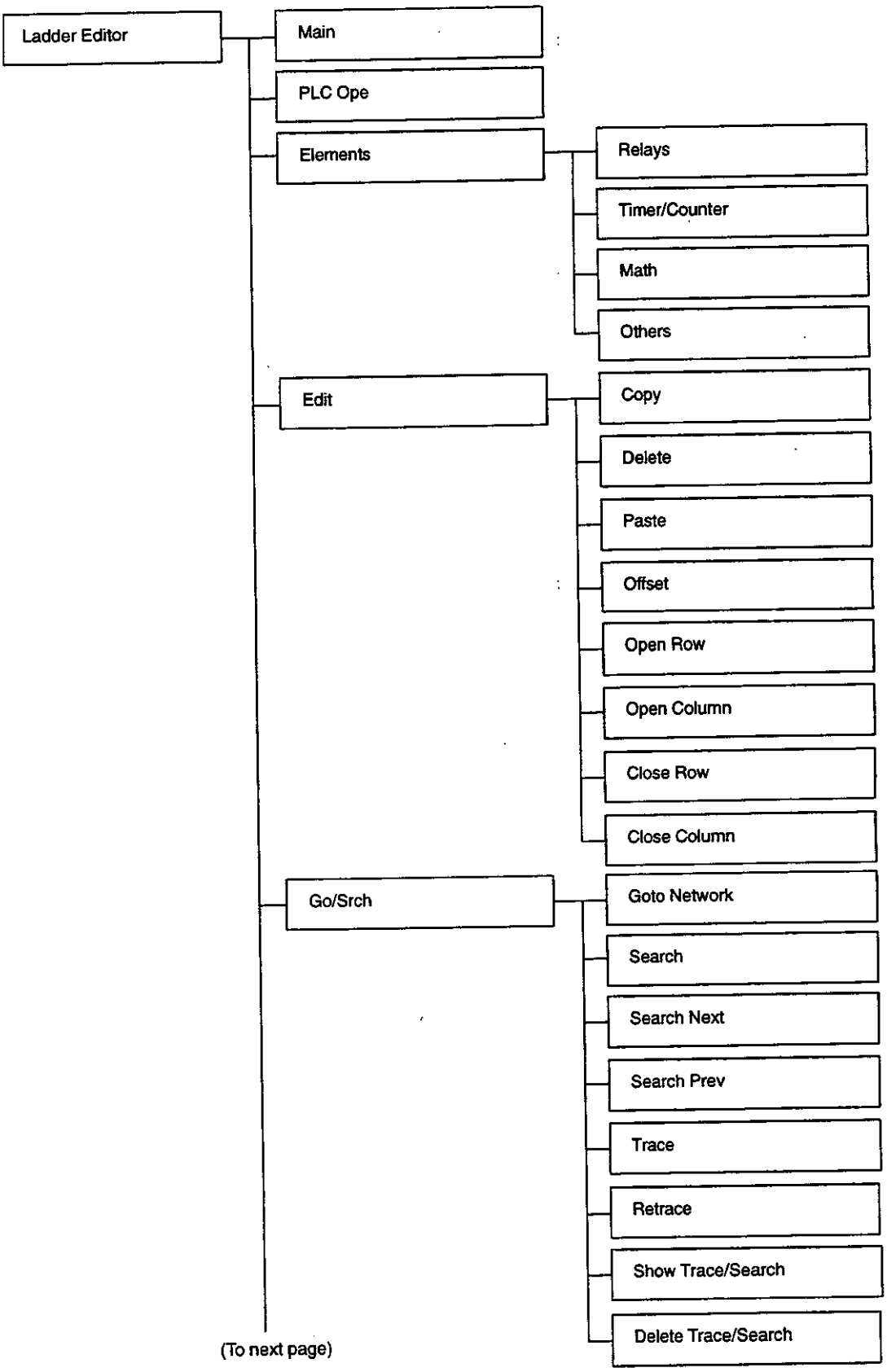
The Segment Status Display Menu appears when the Ladder command is selected from the Main Menu.



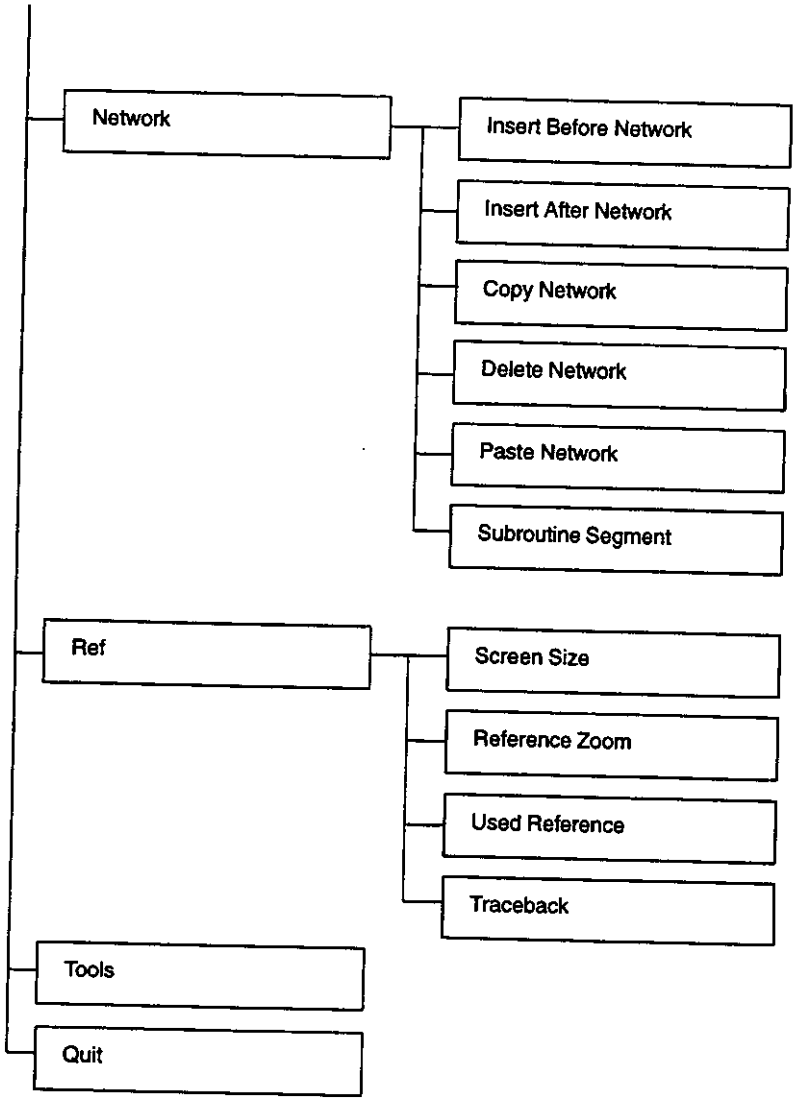
Network List



A.7 Ladder Edit Menu



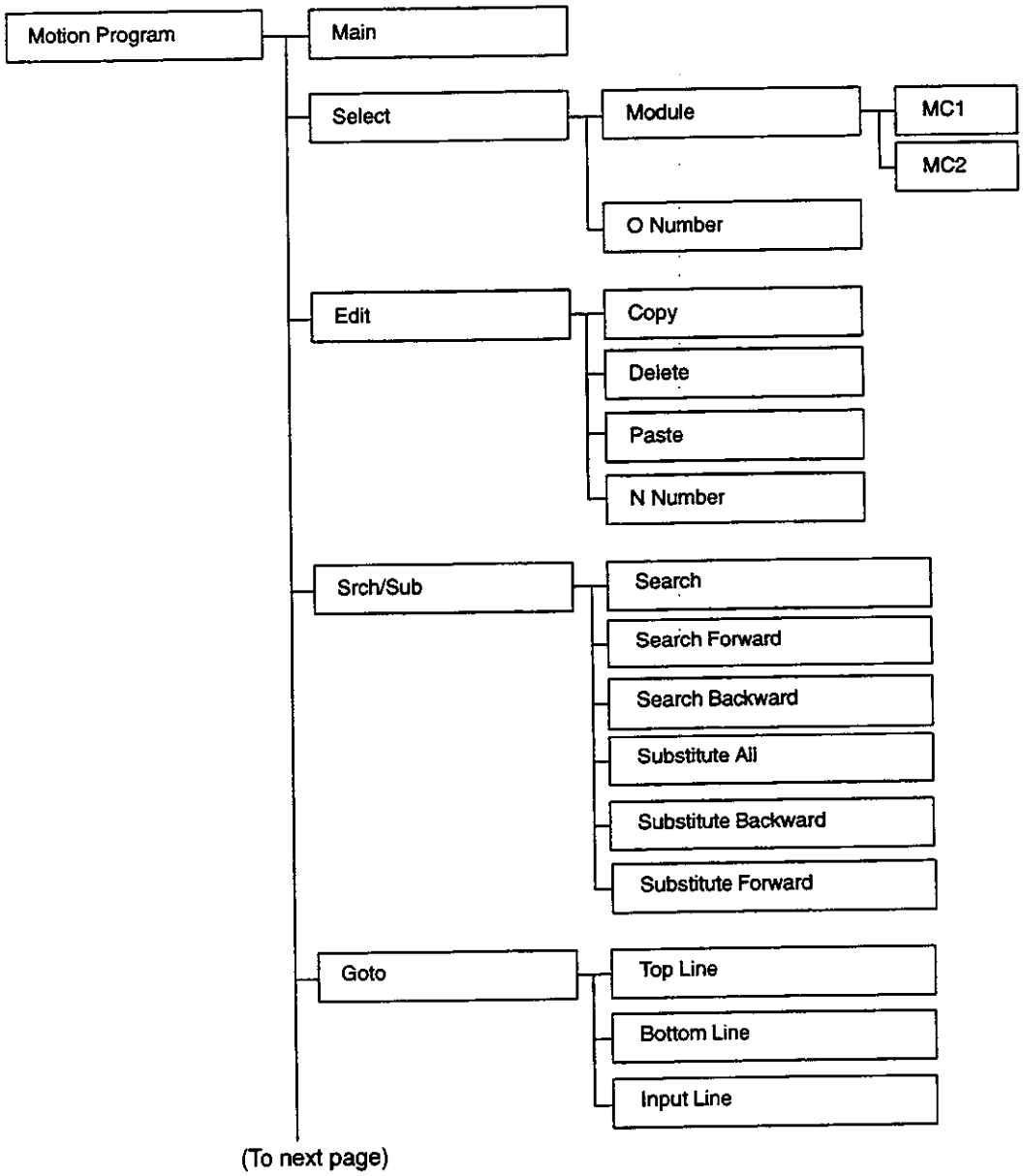
(Continued)



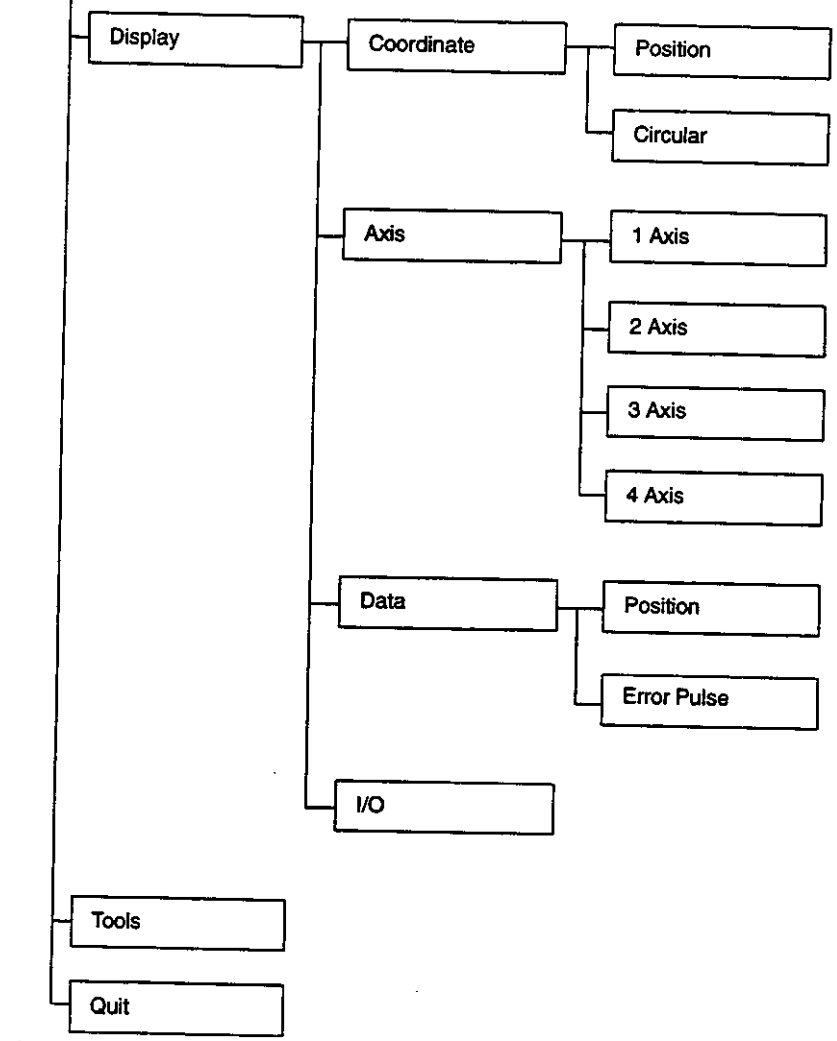
INFO Refer to the following manual for information on the traceback operation.

- Manual Name: MEMOCON GL120, GL130 Traceback User's Manual
- Manual No.: SIEZ-C825-60.10-4

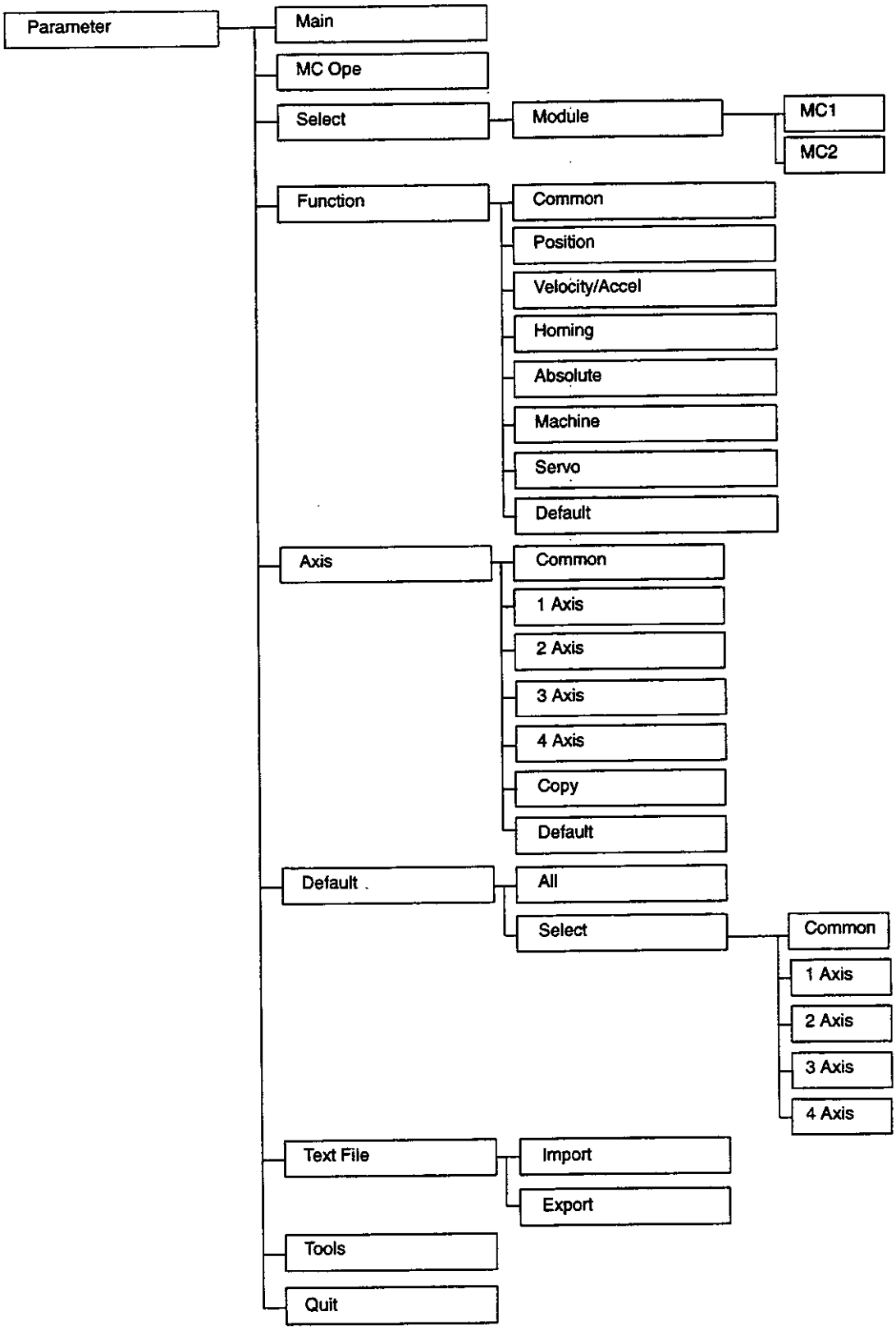
A.8 Motion Program Editor Screen



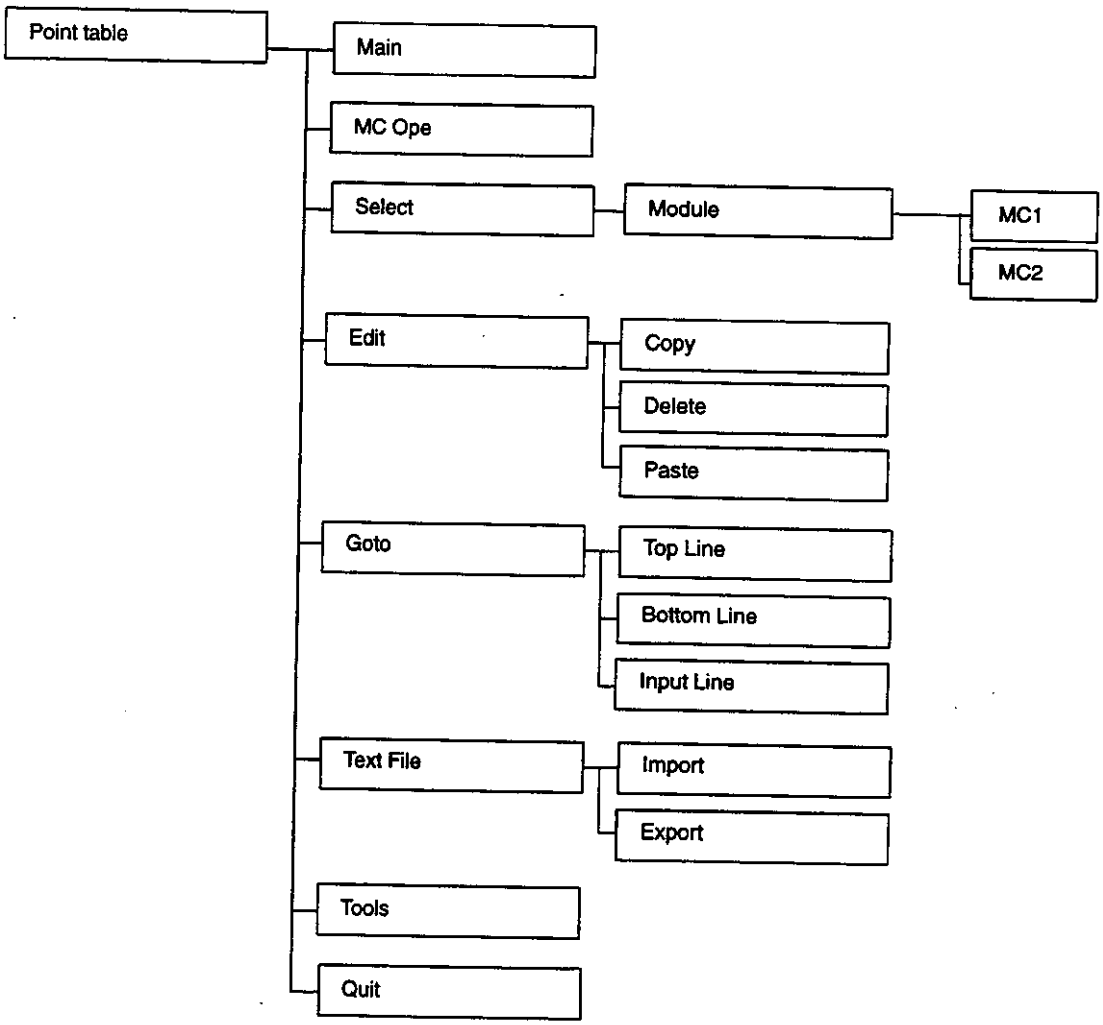
(Continued)


Display
Coordinate
Position
Circular
Axis
1 Axis
2 Axis
3 Axis
4 Axis
Data
Position
Error Pulse
I/O
Tools
Quit

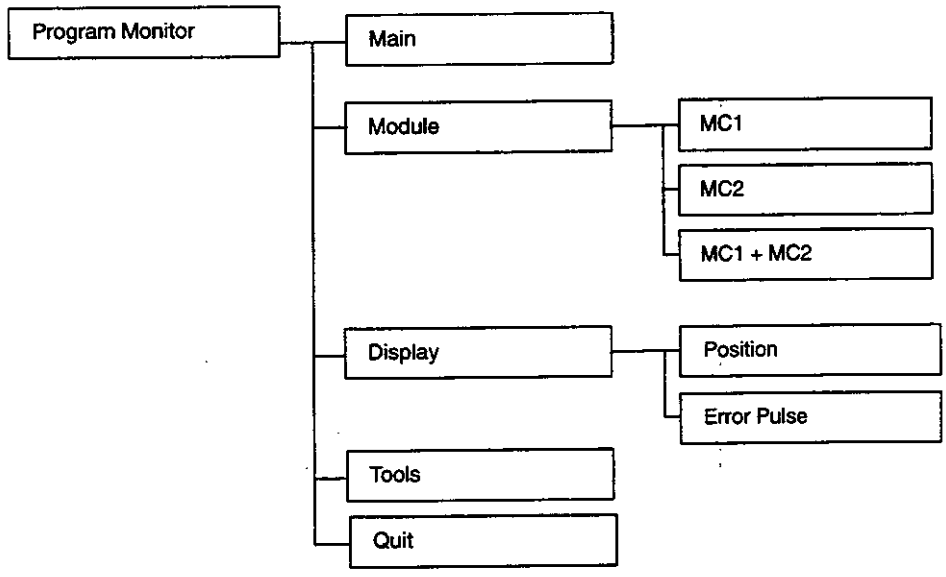
A.9 Parameter Editor Screen



A.10 Point Table Editor Screen

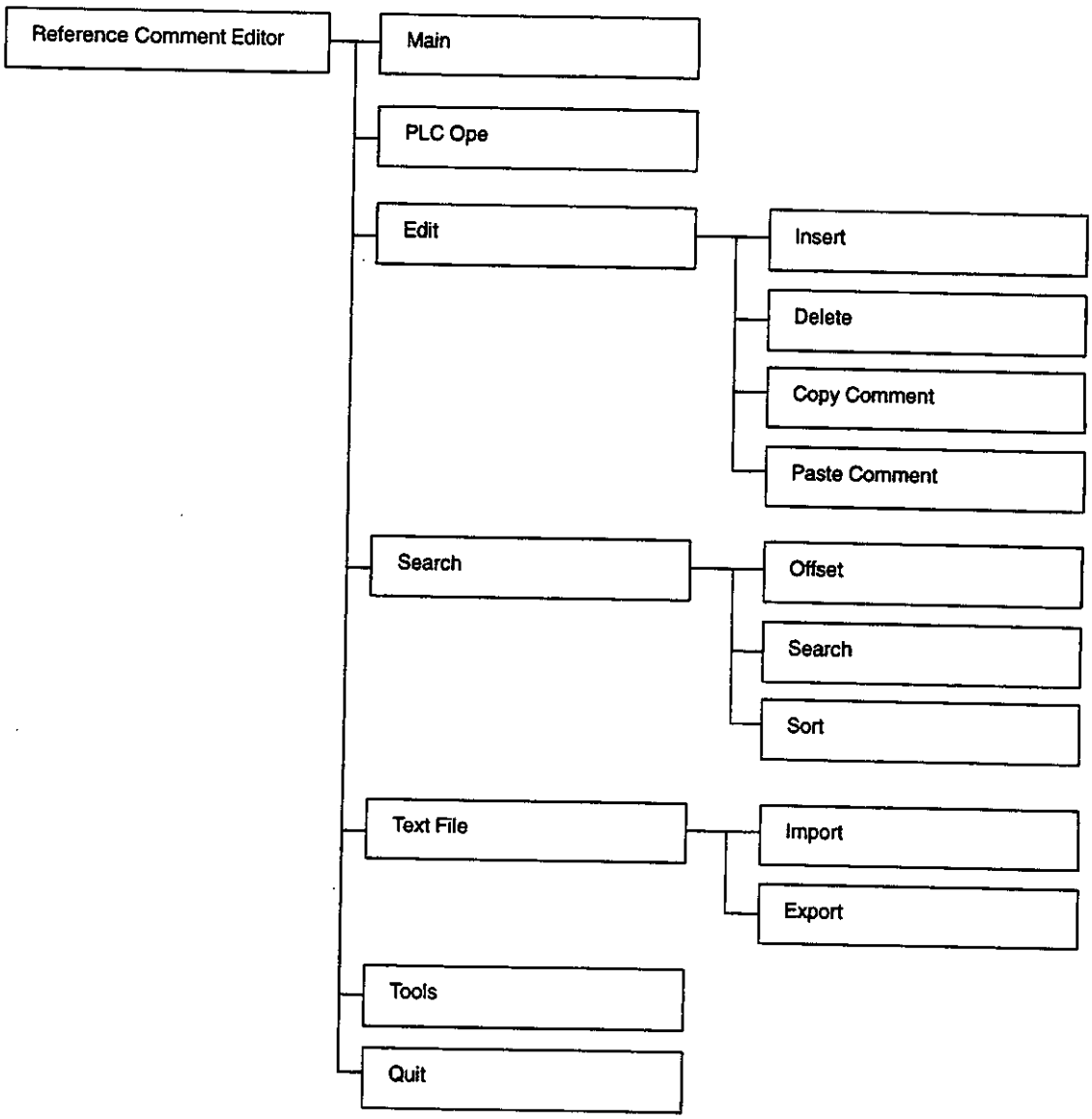


A.11 Program Monitor Screen

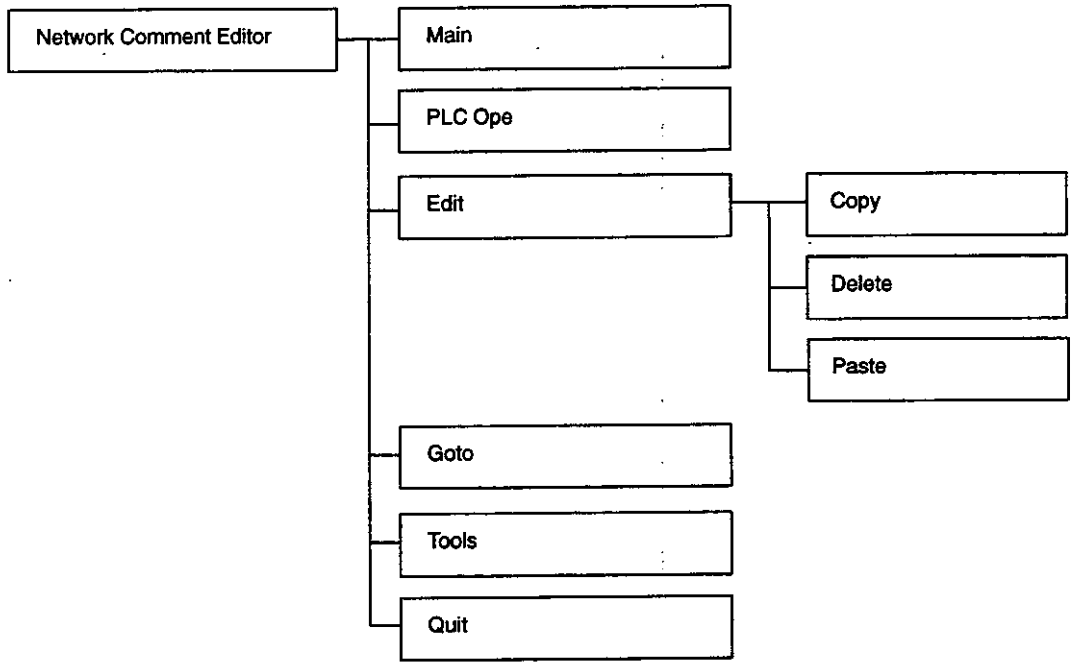


A.12 Comment Editor

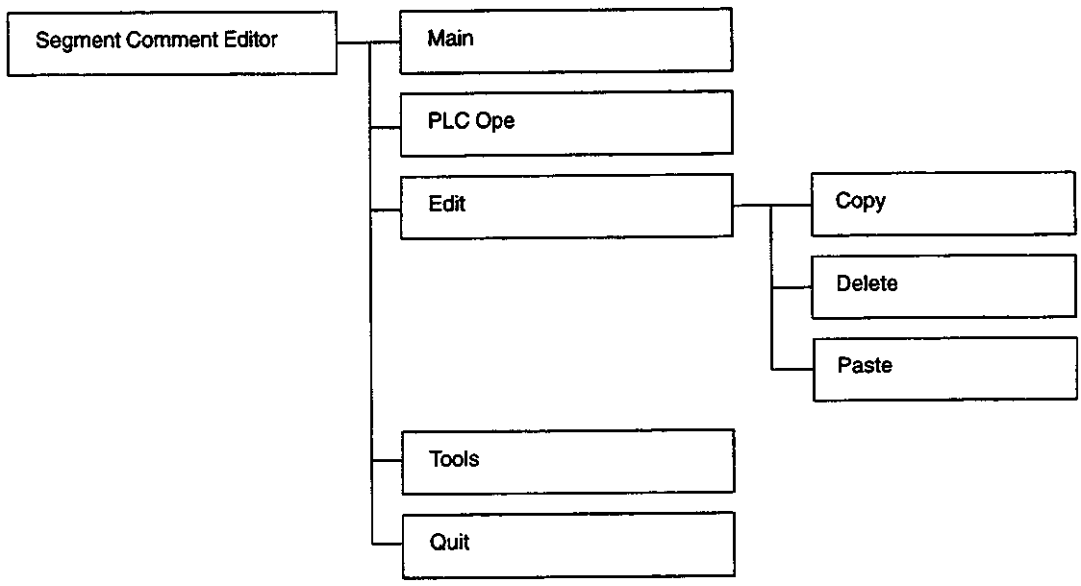
A.12.1 Reference Comment Editor Screen



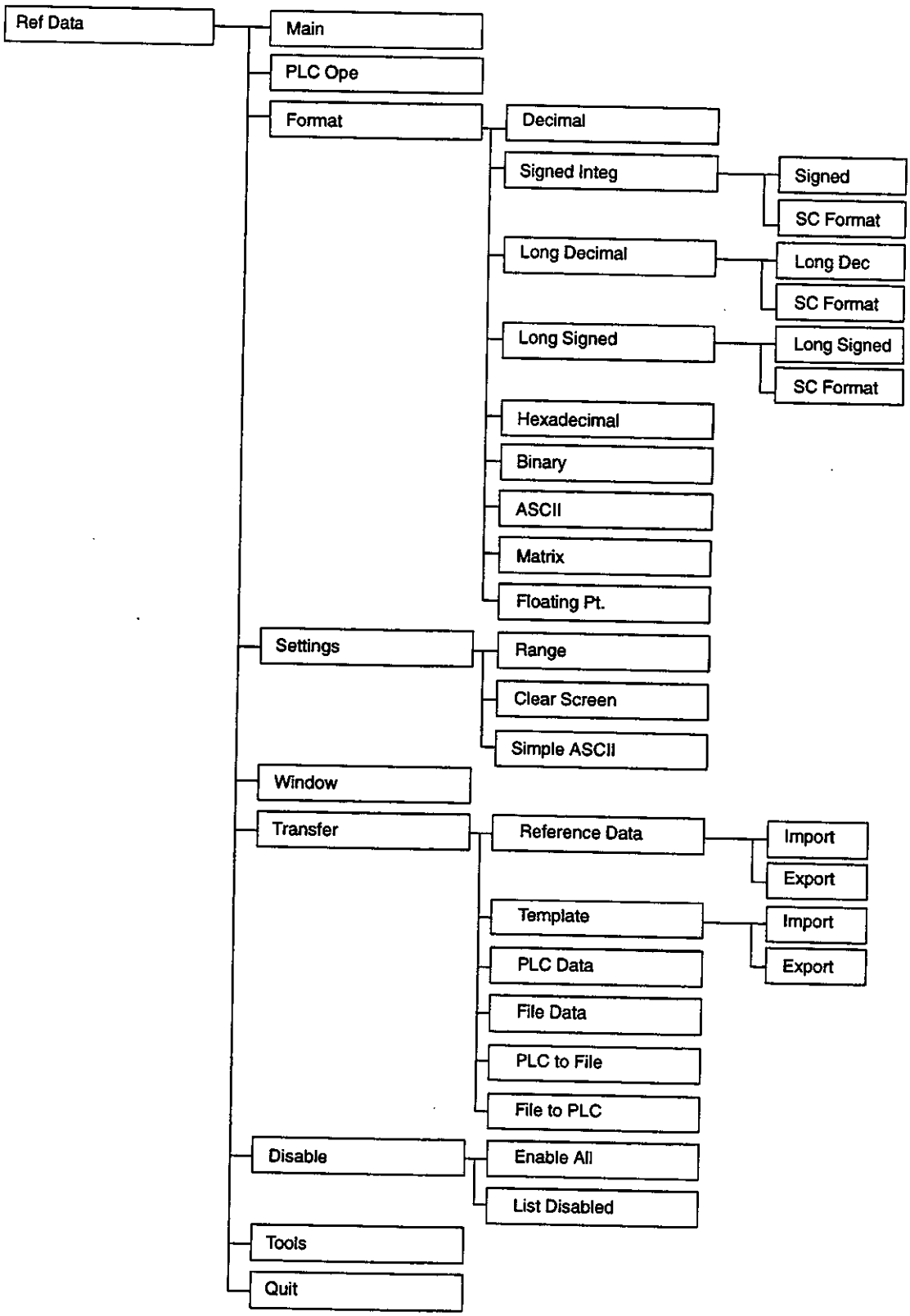
A.12.2 Network Comment Editor Screen



A.12.3 Segment Comment Editor Screen

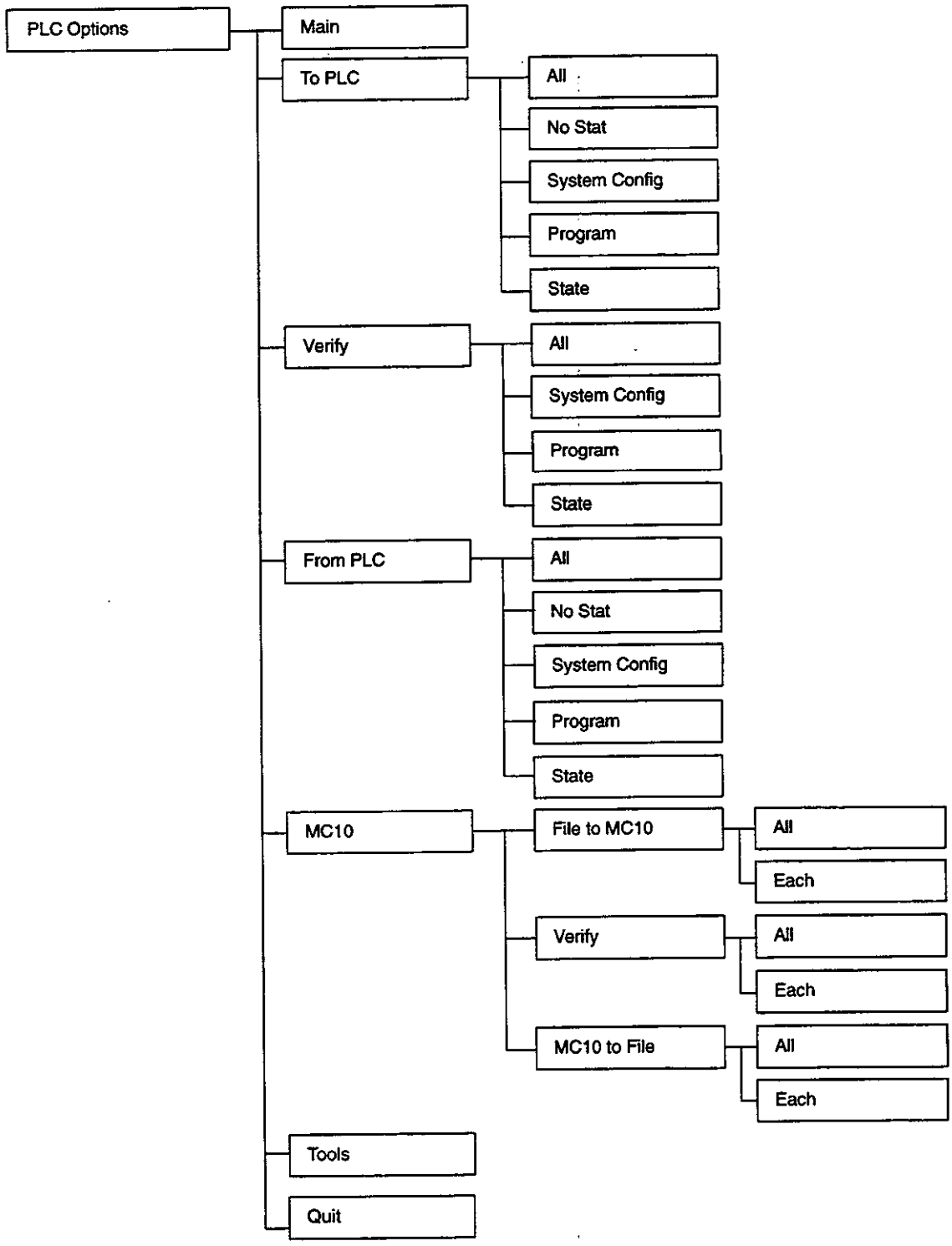


A.13 Data Editor Screen

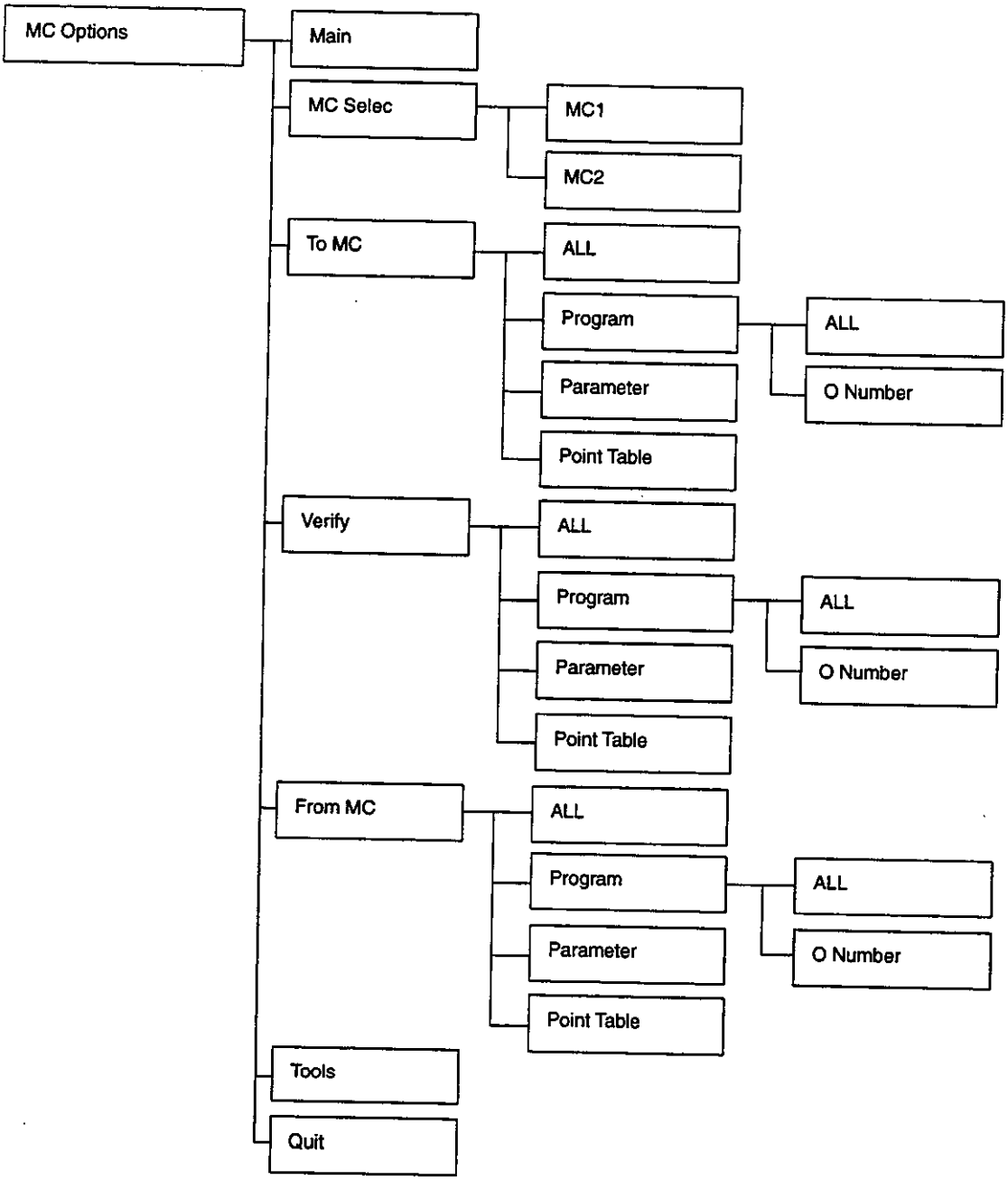


A.14 Loader Screen

- **PLC Options**



• **MC Options**


MC Options
Main
MC Selec
MC1
MC2
To MC
ALL
Program
ALL
O Number
Parameter
Point Table
Verify
ALL
Program
ALL
O Number
Parameter
Point Table
From MC
ALL
Program
ALL
O Number
Parameter
Point Table
Tools
Quit

Appendix B

MEMOSOFT Program Configuration

When using MEMOSOFT to create or edit programs, data is saved in various separate files. The following example shows how a program created as TEST_1 is saved.

Environment setting file	TEST_1.ENV
System configuration	TEST_1.CFG
Ladder program	TEST_1.PRG
Comment (Index)	TEST_1.PCI
Comment (Title)	TEST_1.PCT
Comment (Data)	TEST_1.PCM
Reference (Index)	TEST_1.RFI
Reference (Symbol, comment)	TEST_1.RFS
Reference (Data 1)	TEST_1.RFD
Reference (Data 2)	TEST_1.REF
Motion program	TEST_1.1** (MC1) TEST_1.2** (MC2)
Motion parameters	TEST_1.1PM (MC1) TEST_1.2PM (MC2)
Point table	TEST_1.1PT (MC1) TEST_1.2PT (MC2)
MC10 parameters	TEST_1.M** (MC10**)
Traceback setting data	TEST_1.D01
Traceback data	TEST_1.T01
Verify result	TEST_1.MAP
File table	TEST_1.CUT
Ethernet setting data	TEST_1.ETH
Cross reference file	TEST_1.XRF

See Chapter *12 Editing Motion Programs: Offline* for information on motion program file names.

See Chapter *7 Setting System Configuration* for information on MC10 parameters.

A template file created by editing data is named as follows:
See Chapter *10 Editing Symbols and Comments* for information on template file names.
Template file: TEST_1.RFW

See Chapter *19 Utilities* for information on cross reference files.

Refer to the following manual for information on Traceback.
Manual Name: MEMOCON GL120, GL130 Traceback User's Manual
Manual No.: SIEZ-C825-60.10-4

Refer to the following manual for information on Ethernet.
Manual Name: MEMOCON GL120, GL130 Ethernet Interface Module User's Manual
Manual No.: SIEZ-C825-70.21

Appendix C

MEMOSOFT Communications Error Codes

MEMOSOFT Communications Error Codes

Error Code	Error Message	Cause	Remedy
5	User initiated communications abort	This message appears when the user has intentionally pressed the Ctrl+K Keys to interrupt communications.	Press the Esc Key to clear the error message and continue processing.
12	Bad Panel port-The requested number is out of range	Communications port initialization failed.	Reconnect online. If the message appears again, exit MEMOSOFT and restart the personal computer.
59	Unknown error	The user has tried to log on under REMOTE MEMOBUS mode, when connected to a CPU or MEMOBUS Module.	Set the communications mode to MEMOBUS, and log on again.
120	Bad checksum or response	The user has tried to log on under MEMOBUS mode, when connected to a Remote Receiver or PC Link Module.	Set the communications mode to REMOTE MEMOBUS, and log on again.
		An imperfect contact or noise on the communications cable has caused a communications error.	Check the communications cable connections.
162	Memory protect ON	Memory protection has been turned ON on the front of the CPU Module.	Turn OFF memory protection before performing operations such as changing ladder programs.
163	Memory full	The ladder program memory capacity has been exceeded.	Reduce the program size to within the memory range.
169	Not logged in or a user is logged in on another port	Someone is already logged in from another port.	Exit the MEMOSOFT application that is currently logged in and repeat the login operation.
		The communications cable connection may be bad.	Check the communications cable connection and repeat the login operation.

Error Code	Error Message	Cause	Remedy
181	Illegal data	An attempt was made to batch-save from the CPU Module a program that is not compatible with the version of MEMOSOFT being used. The traceback function is not supported by MEMOSOFT versions prior to Ver. 1.22.	Use the following procedure to update the program Refer to *18-3-4 Split Saving from PLC.* 1. Create a new program on the computer. 2. Use the split saving operation to save the program in the CPU Module to the new program on the computer in the following order: 1) System configuration, 2) Program, and 3) State. 3. Save the new program. 4. Load the new program to the CPU Unit. You should now be able to batch-save the program to the computer.
199	Timeout without a PC response – Review PC Address setup	A response was not received from the CPU Module for a command sent from the MEMOSOFT. Any of the following may be the cause: • Poor communications cable connection • Communications parameter error • Computer port setting error	Check the follow: • Communications Cable Is the cable disconnected or is the connection faulty? • PLC Address and Other Communications Settings Is the PLC address setting the same as the address set on the CPU Module and are other communications settings the same (e.g., the transmission speed)? • If the cable is connected to the COM2 port on the computer, has COM2 been set as the port?

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MEMOCON GL120, GL130
MEMOSOFT
USER'S MANUAL

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MANUAL NO. SIEZ-C825-60.10D

© Printed in Japan October 2002 95-11 <
02-5①

95-81192 95-C82-031