

BNP-B2196\* (ENG)

# **MITSUBISHI CNC**

# **MELDASMAGIC 64**

## **UTILITY INSTRUCTION MANUAL**

ADVANCED AND EVER ADVANCING  
**MITSUBISHI ELECTRIC**

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of the respective companies.

## **Introduction**

This instruction manual is the operation manual for the maintenance and development support tools used in the MELDASMAGIC Series.

The operating methods, etc., for the tools stored on the "UTILITY Disk" are described.

Read this manual thoroughly before developing the ladder program or using the NC device.

To safely use the MELDASMAGIC Series, thoroughly study the "Precautions for Safety" on the next page.

## Precautions for Safety

Always read the specifications issued by the machine maker, this manual, related manuals and enclosed documents before starting installation, operation, programming, maintenance or inspections to ensure correct use. Thoroughly understand the basics, safety information and precautions of this numerical controller before using the unit.

The safety precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this manual.



**DANGER**

When there is a great risk that the user could be subject to fatalities or serious injuries if handling is mistaken.



**WARNING**

When the user could be subject to fatalities or serious injuries if handling is mistaken.



**CAUTION**

When the user could be subject to injuries or when physical damage could occur if handling is mistaken.

Note that even if the item is ranked as " **CAUTION**", incorrect handling could lead to serious results. Important information is described in all cases, so please observe the items.



**DANGER**

Not applicable in this manual.







**WARNING**

Not applicable in this manual.



**CAUTION**

Items related to product and manual

-  For items described as "Restrictions" or "Usable State" in this manual, the instruction manual issued by the machine maker takes precedence over this manual.
-  Items not described in this manual must be interpreted as "not possible".
-  This manual is written on the assumption that all option functions are added.
-  Refer to the specifications issued by the machine maker before starting use. Some screens and functions may differ or may not be usable depending on the NC version.

# Contents

<b>1. MELDASMAGIC Utility .....</b>	<b>1-1</b>
<b>2. File Transfer Tool ~ magictrs ~ .....</b>	<b>2-1</b>
2.1 Function .....	2-1
2.2 Operation methods .....	2-1
2.2.1 Starting the tool .....	2-1
2.2.2 Back up of NC data and recovery using back up file (Copy function) .....	2-1
2.2.3 Displaying file information (File information display function) .....	2-3
2.2.4 Deleting files (File deletion function) .....	2-4
2.2.5 Changing the file name (File rename function) .....	2-4
2.2.6 Quitting the tool .....	2-4
<b>3. MELDASMAGIC Option List Output Tool ~ optlst32 ~ .....</b>	<b>3-1</b>
3.1 Function .....	3-1
3.2 Operation methods .....	3-1
3.2.1 Starting the tool .....	3-1
3.2.2 Saving the option list .....	3-2
3.2.3 Quitting the tool .....	3-2
3.2.4 Changing the display language .....	3-3
3.2.5 Changing the NC that displays the options .....	3-3
<b>4. PLC Switch Conversion Tool ~ cnvPLCSW ~ .....</b>	<b>4-1</b>
4.1 Function .....	4-1
4.2 Operation methods .....	4-2
4.2.1 Starting the tool .....	4-2
4.2.2 Reading and converting the message data .....	4-2
4.2.3 Saving the PLC switch name data .....	4-3
4.2.4 Quitting the tool .....	4-4
4.3 PLC switch name file .....	4-5
<b>5. Personal Computer PLC Development Software (PLC4B) Output File Conversion Tool ~ CNV4BMM ~ .....</b>	<b>5-1</b>
5.1 Function .....	5-1
5.2 CNV4BMM arguments .....	5-2
5.3 Operation methods .....	5-2
5.3.1 Converting file from other MELDAS Series into MELDASMAGIC file .....	5-2
5.3.2 Converting file handled by MELDASMAGIC into format for other MELDAS Series .....	5-3
5.4 Other functions of CNV4BMM .....	5-3
<b>6. Emergency Stop Force Release Tool ~ ext_emg ~ .....</b>	<b>6-1</b>
6.1 Function .....	6-1
6.2 Operation method .....	6-1

## 1. MELDASMAGIC Utility

This manual is the instruction manual for the MELDASMAGIC Series Maintenance and Development Support Tool. The method for operating the tool stored in the "UTILITY Disk", etc. are described. Refer to the "Setup Instruction Manual" for the tool installation method.

The software below is stored on the "UTILITY Disk".

\meltools ..... MELDASMAGIC support tool directory  
|-win ..... Windows tool directory  
|-dos ..... Windows tool directory

The tools that run under the Windows environment are stored in the \meltools\win directory, and the tools that run under the DOS environment are stored in the \meltools\dos directory.

**The tool types stored on the "UTILITY Disk" are all dedicated for PC-AT compatible models.**

The tools stored in each directory are as described below.

- (1) magictrs.exe ..... File transfer tool (for parameter backup) [\meltools\win]  
This tool is used to congregate the various parameters, machining programs and machine information (registers), etc., set in the NC memory into a file and copy the file from the NC to a personal computer (back up) or to copy from a personal computer to the NC (recovery of backed up data). This tool is used to back up the NC data set by the machine maker or by the user, etc.
- (2) optlst32.exe ..... Option list output tool [\meltools\win]  
This tool is used to display a list of the software options in the MELDASMAGIC Series. Use this tool to confirm the software options of the NC device that has been purchased.
- (3) cnvplcsw.exe ..... PLC switch conversion tool [\meltools\win]  
This tool is used to create a PLC switch name file (text file) used by the MELDASMAGIC MMI PLC switch window using the MELDAS Series PLC onboard message data. By using this tool, the PLC switch name data in the message data developed with the MELDAS 50 Series or MELDAS 500 Series can be used with the MELDASMAGIC Series.
- (4) cnv4bmm.exe ..... PLC switch conversion tool [\meltools\dos]  
This tool is used to convert the ladder file created by the personal computer PLC development software (PLC4B) into a usable format for the MELDASMAGIC. By using this tool, ladder data developed with the MELDAS 50 Series and MELDAS 500 Series can be used with the MELDASMAGIC Series.

The tool below is not included with the "UTILITY Disk" but is offered by Mitsubishi.

chgcx.exe ..... Ladder conversion tool  
Because the MELDASMAGIC64 Series ladder commands differ from the MELDASMAGIC50, MELDAS50, MELDAS500 Series, it is necessary to convert those commands when the ladder program is read into the MELDASMAGIC64 from the MELDASMAGIC50, MELDAS50, or MELDAS500 Series. Use the ladder conversion tool "chgcx" to convert the ladder commands.

## 2. File Transfer Tool ~ magictrs ~

### 2.1 Function

The file transfer tool magictrs is used to congregate the various parameters, machining programs and machine information (registers), etc., set in the NC memory into a file and copy the file from the NC to a personal computer (back up) or to copy from a personal computer to the NC (recovery of backed up data).

This tool is used to back up the NC data set by the machine maker or by the user, etc.

This tool runs on Microsoft Windows 95.

### 2.2 Operation methods

#### 2.2.1 Starting the tool

The tool is started up with the following procedures.

- (1) Select [P]rograms-[M]ELDASMAGIC-[F]ile Transfer] of the Windows [Start] button, and then start "magictrs.exe". (It is necessary to register this start method in the start button. Install following the Setup Instruction Manual.)

The window shown in Fig. 2-1 will appear when the tool is started.

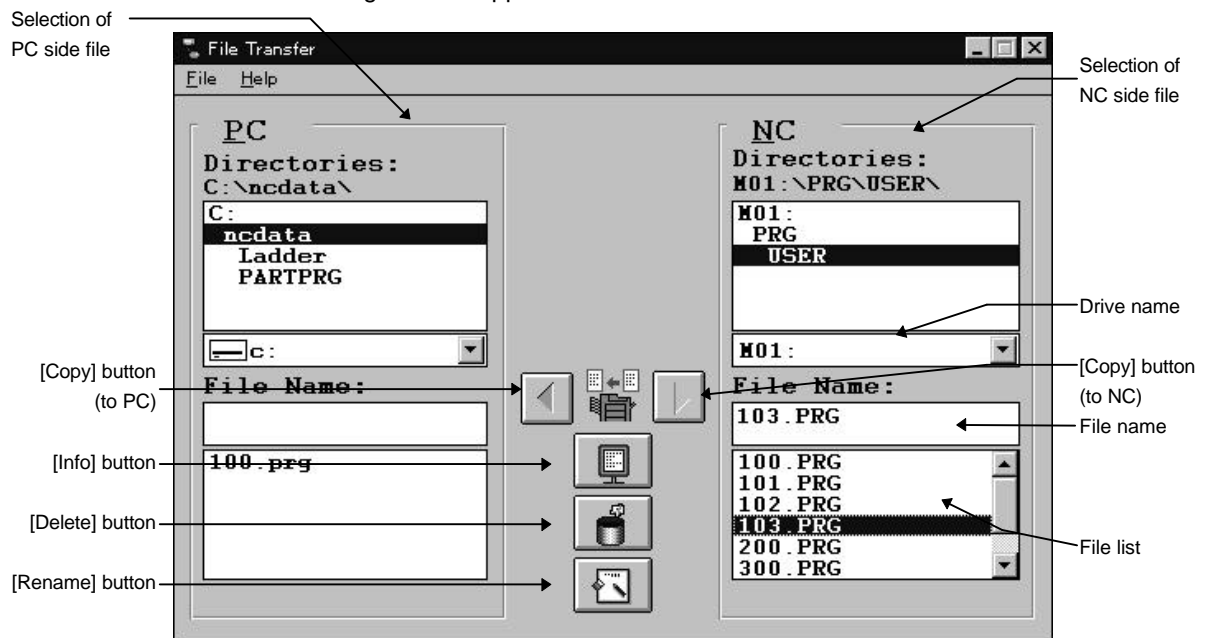


Fig. 2-1 File transfer tool

#### 2.2.2 Back up of NC data and recovery using back up file (Copy function)

The various NC data can be input/output as files by using the copy function.


##### Copying of various NC data to PC (making a backup)

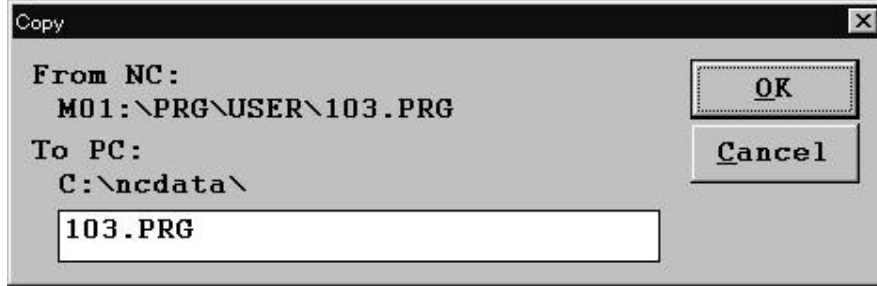
- (1) Select the drive and directory (PC side) in which the data is to be saved.
- (2) Select the NC side drive and directory, and select the file to be backed up. Refer to Table 2-1 for the relation of the file and directory to be backed up.

##### - Example -

- When backing up the parameters, "\PRM" is selected for the directory and "PARAMET.BIN" for the file.
- When backing up the ladder program, "\LAD" is selected for the directory and "USERPLC.LAD" for the file.

Either one or multiple files can be designated.  
Refer to the supplement below when selecting multiple files.

- (3) Click on the [Copy] button , or click on the [File] - [Copy] commands.  
A window confirming the copy operation will appear.



**Fig. 2-2 File copy confirmation window**

- (4) When the [OK] button is clicked on, the copying will start.

**Table 2-1 Relation of NC side directory and files**

NC side directory name	File name	Details
\PRG\USER	0000.PRG	Machining program
\PRG\FIX	0000.PRG	Fixed cycle subprogram
\PRG\MDI	MDI.PRG	MDI program
\PRM	PARAMET.BIN	Parameter
\PRM	FILESYS.BIN	
\PRM	ALL.PRM	Parameter
\LAD	USERPLC.LAD	Ladder program
\REG	RREG.REG	R register
\REG	TREG.REG	T register
\REG	CREG.REG	C register
\DAT	WORK.OFS	Workpiece offset
\DAT	TOOL.OFS	Tool offset
\DAT	COMMON.VAR	Common variables (#100~, #500~)

**Supplement: Selection of multiple files**

Multiple files can be selected by designating a range or by selecting the files one by one.

When designating the range, if the first file is clicked and selected, and then another file is selected while holding down the [Shift] key, all files between the file selected first and the file selected next will be selected.


When selecting the files one by one, click on the file to be selected while holding down the [Ctrl] key.



**Returning data copied into PC (backed up data) to NC**

- (1) Before returning the backed up data to the NC, press the emergency stop button. Temporarily stop the PLC ladder before returning the ladder program, PLC timer, PLC counter, R register, T register, and C register to the NC.
- (2) Select the drive and directory (NC side) to which the data is to be returned. Refer to Table 2-1 for the directories to which the backed up file is returned.


**- Example -**

- When returning the parameters, "\PRM" is selected for the directory.
  - When returning the ladder program, "\LAD" is selected for the directory.
- (3) Select the PC side drive and directory, and then select the backup file. Either one or multiple files can be selected. Refer to the supplement on the previous page for how to select multiple files.
  - (4) Click on the [Copy] button  , or click on the [File] - [Copy] commands. A window confirming the copy operation will appear.
  - (5) When the [OK] button is clicked on, the copying will start.
  - (6) When the parameters, ladder program and registers have been returned to the NC, turn the personal computer power ON again.

**2.2.3 Displaying file information (File information display function)**

The file size and comment of the files in the NC memory, and the file size and date of creation of the files on the PC side will be displayed.

- (1) Select the file for which the information is to be displayed from the file list. A file on either the NC side or PC side can be selected. Note that only one file can be selected.

- (2) Click on the [Info] button  , or click on the [File] - [Information] commands. A window displaying the file information will open. (The details displayed will differ for PC side files and NC side files.)

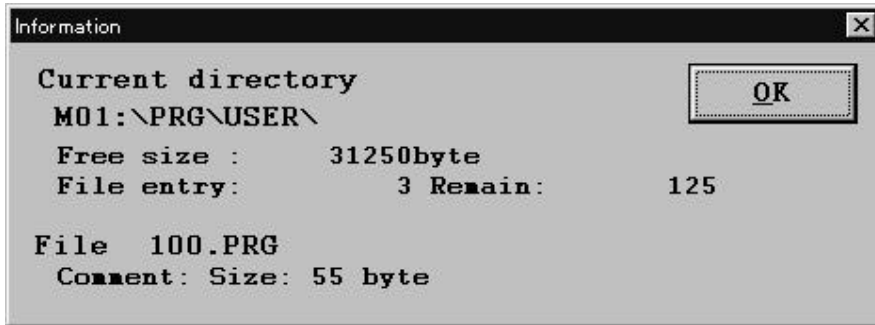


Fig. 2-3 File information window (PC side)

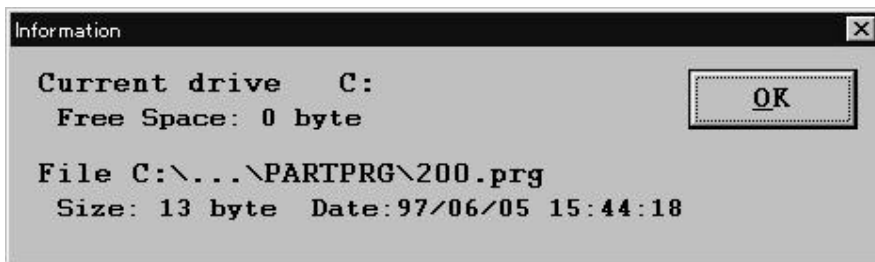



Fig. 2-4 File information window (NC side)

### 2.2.4 Deleting files (File deletion function)

Files in the NC memory or files on the PC side can be deleted.

- (1) Select the file to be deleted from the file list. (Multiple files can be selected.)



- (2) Click on the [Delete] button , or click on the [File] - [Delete] commands.
- (3) A window confirming the deletion operation will open, so confirm the file to be deleted, and then click on the [OK] button.

The file will be deleted with the above step.

Note that the file that has been deleted cannot be recovered. Always confirm the file before clicking on the [OK] button.

The confirmation is made with the [Delete file(s):] column in the following confirmation window. All designated file names will appear in the [Delete file(s):] column. If many files have been designated and they do not fit on one screen, click on the [Delete file(s):] column, and press the ← or → key. The display will scroll horizontally allowing the files to be confirmed.

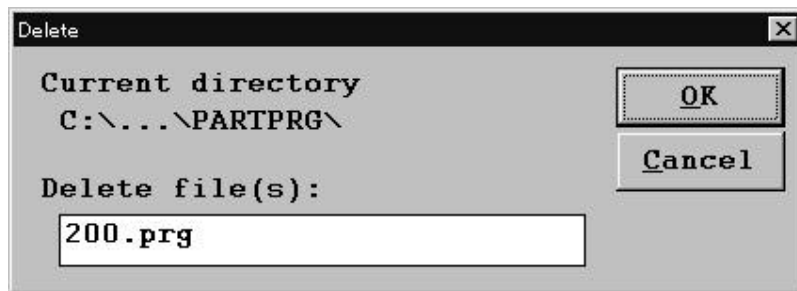



Fig. 2-5 File deletion confirmation window

### 2.2.5 Changing the file name (File rename function)

The file name can be changed (renamed).

- (1) Select the file for which the name is to be changed from the file list.



- (2) Click on the [Rename] button , or click on the [File] - [Rename] commands.
- (3) A window for setting the new file name will open, so set the new file name in [To] column, and then click on the [OK] button.

The file name will be changed with the above step.

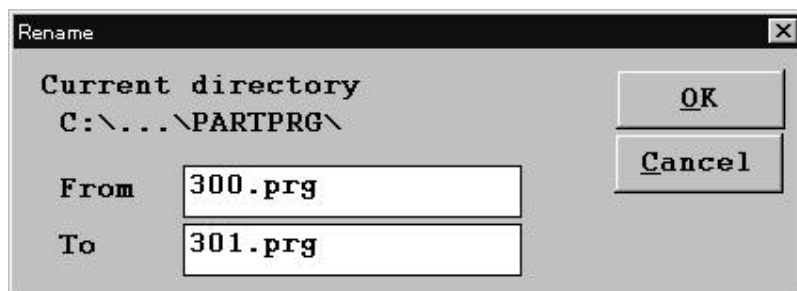


Fig. 2-6 File rename window

### 2.2.6 Quitting the tool

- (1) The tool will be quit when the [File] - [Exit] commands are clicked on.

### 3. MELDASMAGIC Option List Output Tool ~ optlst32 ~

#### 3.1 Function

This tool is used to display a list of the software options in the MELDASMAGIC 64 Series. Use this tool to confirm the software options of the NC device that has been purchased. This tool runs on Microsoft Windows 95.

The list of option specifications displayed with this tool can be saved as a text file.

#### 3.2 Operation methods

##### 3.2.1 Starting the tool

The tool is started up with the following procedures.

- (1) Select [Programs]-[MELDASMAGIC]-[Option List] of the Windows [Start] button, and then start "optlst32.exe".

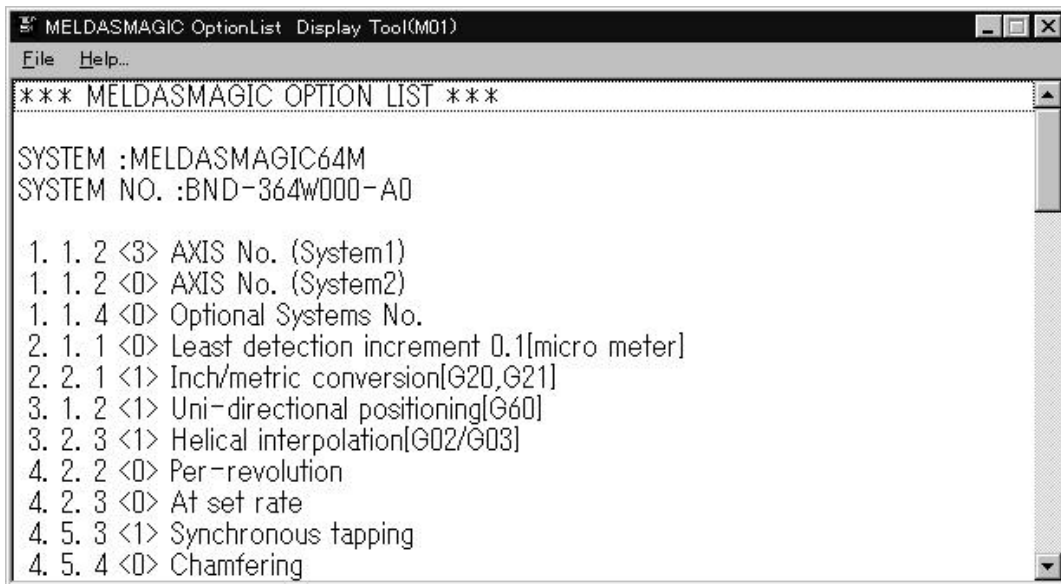


Fig. 3-1 Option list display screen

The option specifications list is displayed as shown in Fig. 3-1. Valid options have a "1" entered in the < > after the specification No.

Scroll up and down the [Option List] using the scroll bar on the right side of the window.

### 3.2.2 Saving the option list

The option list can be saved in a file with the text format.  
When saving with the text format, the option list can be referred to with the Notepad, etc.

The list is saved in a file with the following procedures.

- (1) Click on [File] - [Save] on the option list screen.



- (2) The option list file save screen will display.

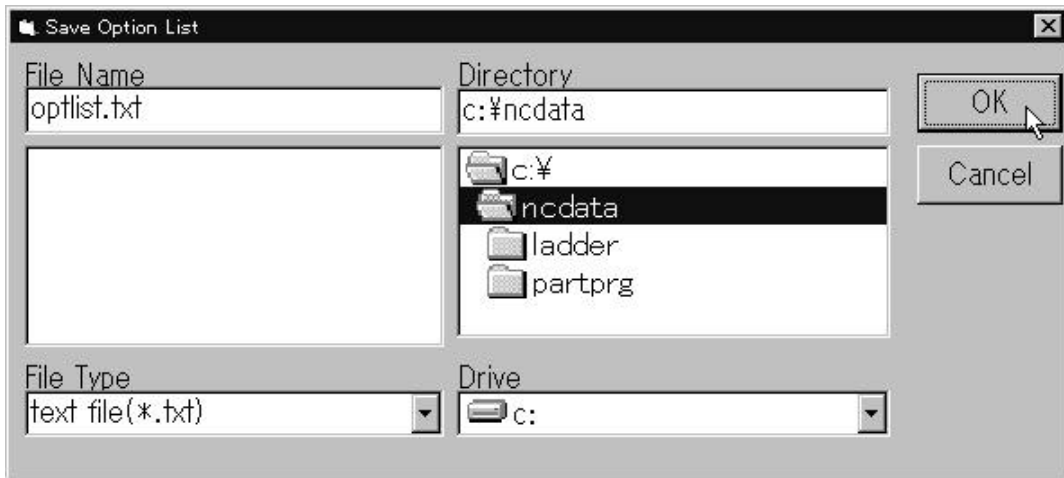


Fig. 3-2 Option list file save screen

- (3) Designate the directory to be saved, and then input the file name. When the [OK] button is clicked on, the file is saved.

### 3.2.3 Quitting the tool

- (1) The tool will be quit when [File] - [Exit] are clicked on



### 3.2.4 Changing the display language

This tool has a function that allows the language (English, Japanese) displayed on the screen to be changed.

When the tool is started, the Windows language information will be read and the display language will be automatically selected.

Change the language in the tool menu. To get to the language change menu, click on [File]-[Environment...]-[Language..], and then select either [English] or [Japanese].



Fig. 3-3 Language changeover screen

### 3.2.5 Changing the NC that displays the options

When more than one NC Card is installed on the personal computer, the NC referring to the options can be changed by the following procedure.

Designate [File]-[Environment...]-[NC Card Select]. The dialog box for selecting the NC will appear. Select the NC that checks the options from the drop-down menu.



Fig. 3-4 NC Card selection menu

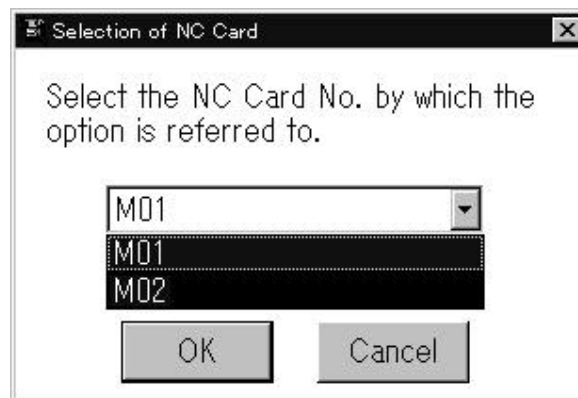


Fig. 3-5 NC Card selection screen

## 4. PLC Switch Conversion Tool ~ cnvPLCSW ~

### 4.1 Function

This tool is an application used to create a PLC switch name file (text file) used by the MELDASMAGIC MMI PLC switch window using the MELDASMAGIC PLC onboard message data.

By using this tool, the PLC switch name data in the message data developed with the MELDAS 50 Series or MELDAS 500 Series can be used with the MELDASMAGIC Series.

This tool runs on Microsoft Windows 95.

The following three types of message data can be handled with "cnvPLCSW".

- (1) File created by copying \LAD\USERPLC.LAD in NC Card to PC.
- (2) File obtained by converting USERPLC.LAD with tool CNV4BMM. (Refer to chapter 4 of this manual for details on CNV4BMM.)
- (3) Message file or link file created with PLC4B.

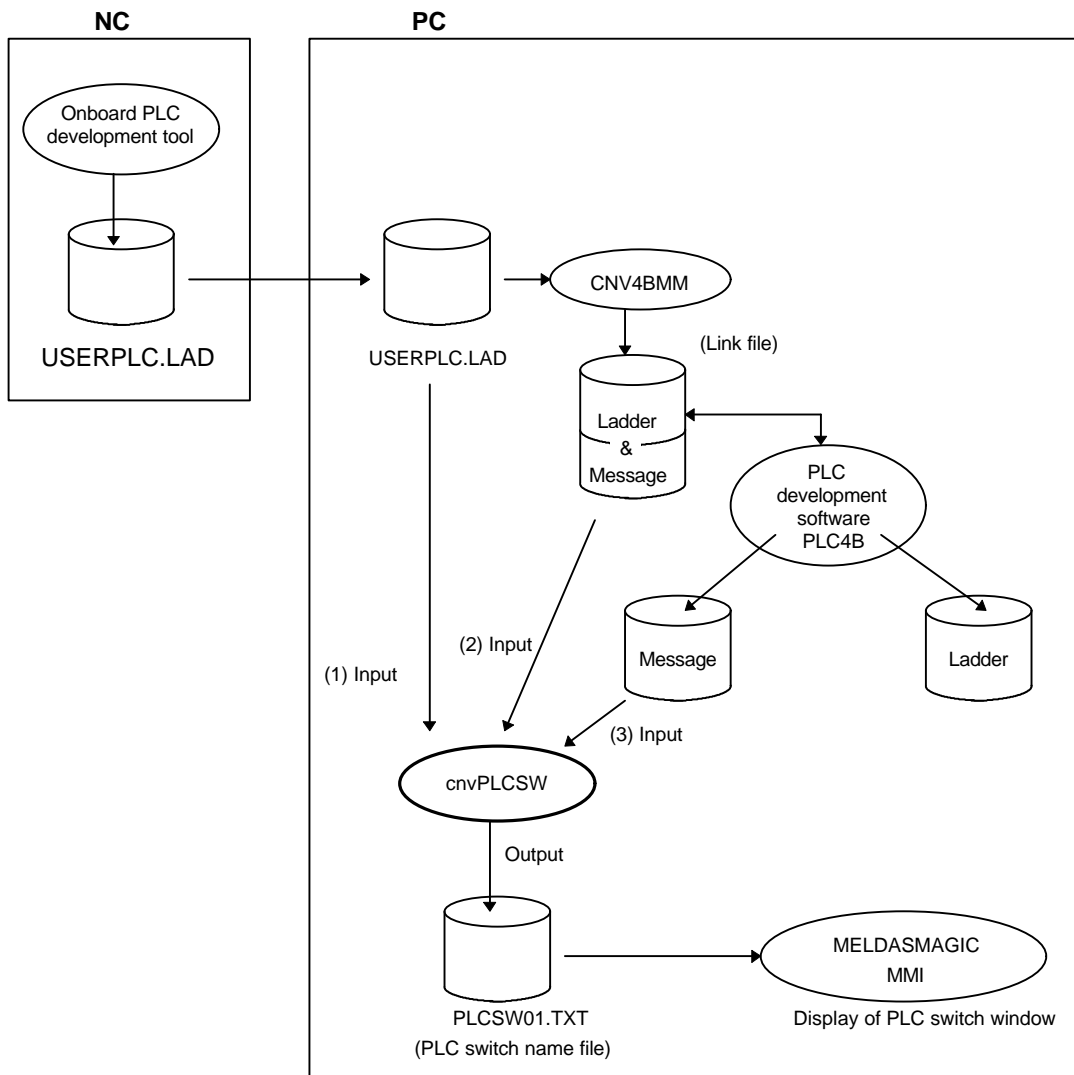


Fig. 4-1 Outline of cnvPLCSW

## 4.2 Operation methods

### 4.2.1 Starting the tool

- (1) Select [P]rograms-[M]ELDASMAGIC-[P]LC Switch Conversion] of the Windows [Start] button, and then start "cnvplcsw.exe".

The PLC conversion switch tool window (Fig. 4-2) will display.

The number at Lang. No. indicates the language No. of the PLC switch name data displayed in the Message: column. By pressing the [▲] and [▼] buttons on the right side, the number can be changed between 0 and 7, and the corresponding language name data will display.

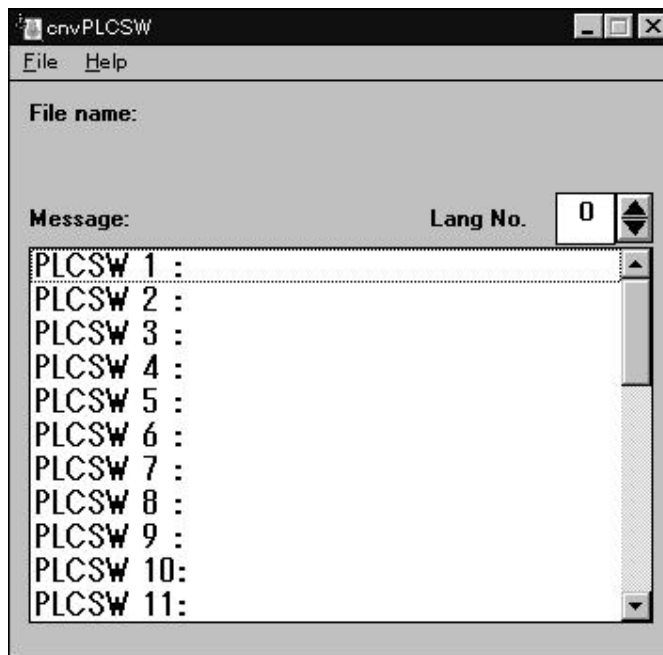


Fig. 4-2 PLC switch conversion window

### 4.2.2 Reading and converting the message data

- (1) Click on the [F]ile - [O]pen commands.  
The File open window (Fig. 4-3) will open.

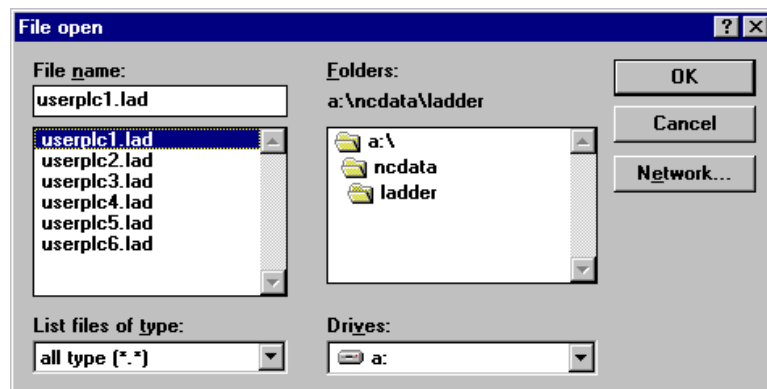


Fig. 4-3 File open window

- (2) Select the conversion source file in the File open window, and then click on the [OK] button. The conversion source file will be read in, and the PLC switch name data will display in the window (Fig. 4-4).

**Caution:**

- NC characteristic special fonts (-[,]-,<,>-, etc.) will not be converted correctly. Edit the text file that has been converted and saved and change these characters to substitute characters.
- This tool will lead out the PLC switch name data for a maximum of eight languages from the message data. If there is not enough name data for eight countries, only the item will be created.

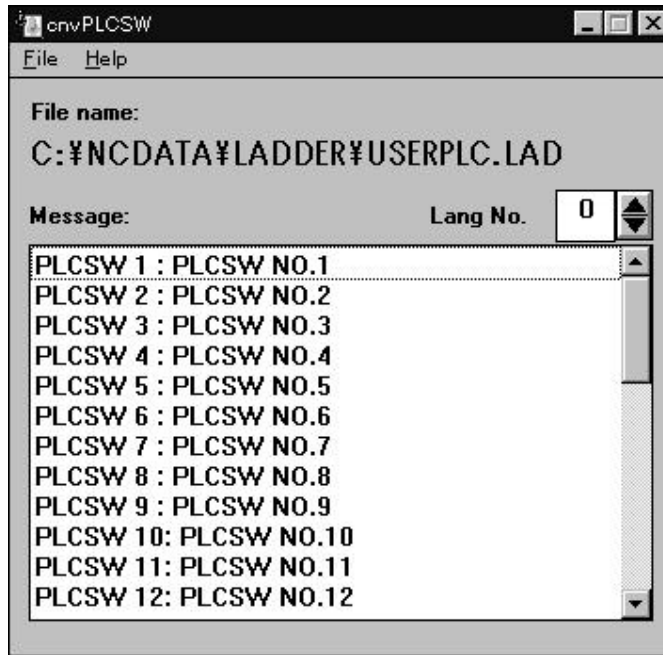


Fig. 4-4 PLC switch conversion window

4.2.3 Saving the PLC switch name data

- (1) Click on the [File] - [Save] commands. The File save window (Fig. 4-5) will open.

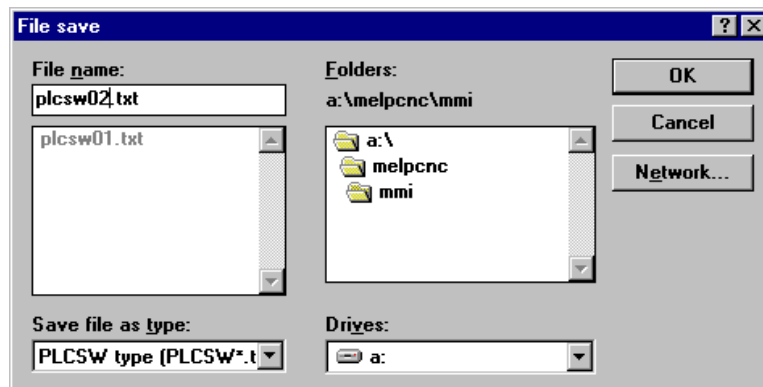


Fig. 4-5 File save window



- (2) Set the name of the file where the converted PLC switch name data is to be saved, and then click on the [OK] button.  
Set the file name as PLCSW???.TXT. Designate the NC Card No. (hexadecimal, 2 digits) that uses the saved PLC switch name in ???. (The NC Card No. indicates the ?? value for [Machine??] in melcfg.ini under the Windows directory created when MELDASMAGIC MMI is installed.)

**(Example)** PLCSW01.TXT (File for NC Card No. is 01)

The PLC switch name data will be saved in the set file.

#### 4.2.4 Quitting the tool

- (1) The tool will be quit when [File]- [Exit] are clicked on.
- (2) After quitting the tool, copy the file in which the PLC switch names were saved into the same directory (under \melpcnc\mml) as the MELDASMAGIC MMI execution file.  
The MELDASMAGIC MMI PLC switch window will display using the PLC switch name saved in the file. (Fig. 4-6)  
To change the displayed details, edit the PLC switch name file. Use an editor or memo pad on hand when editing the file. (Refer to the next chapter for details on the PLC switch name file format.)

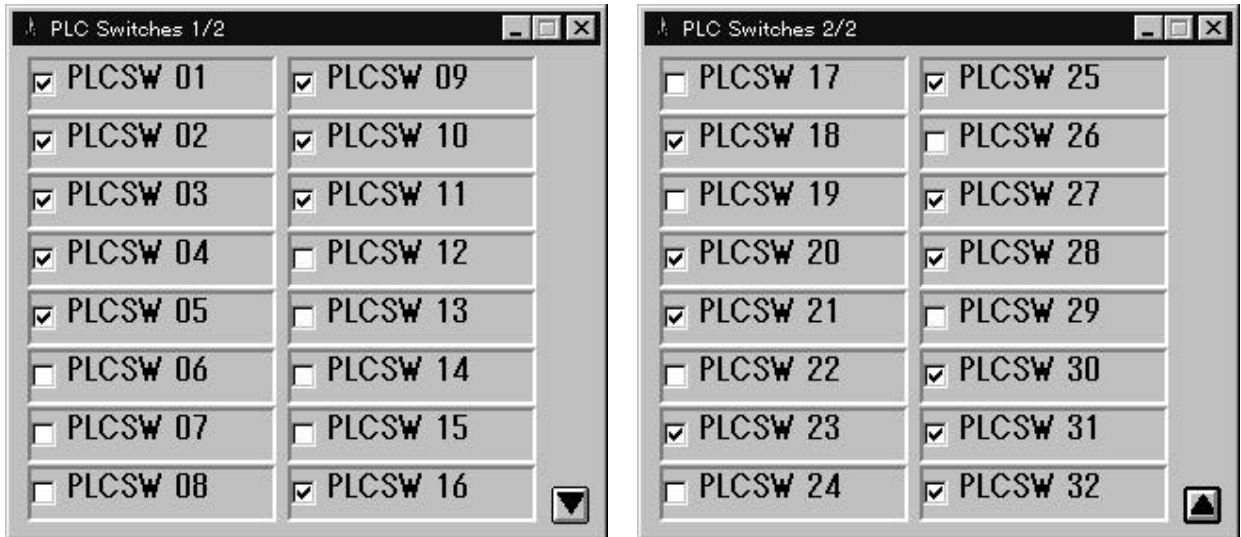


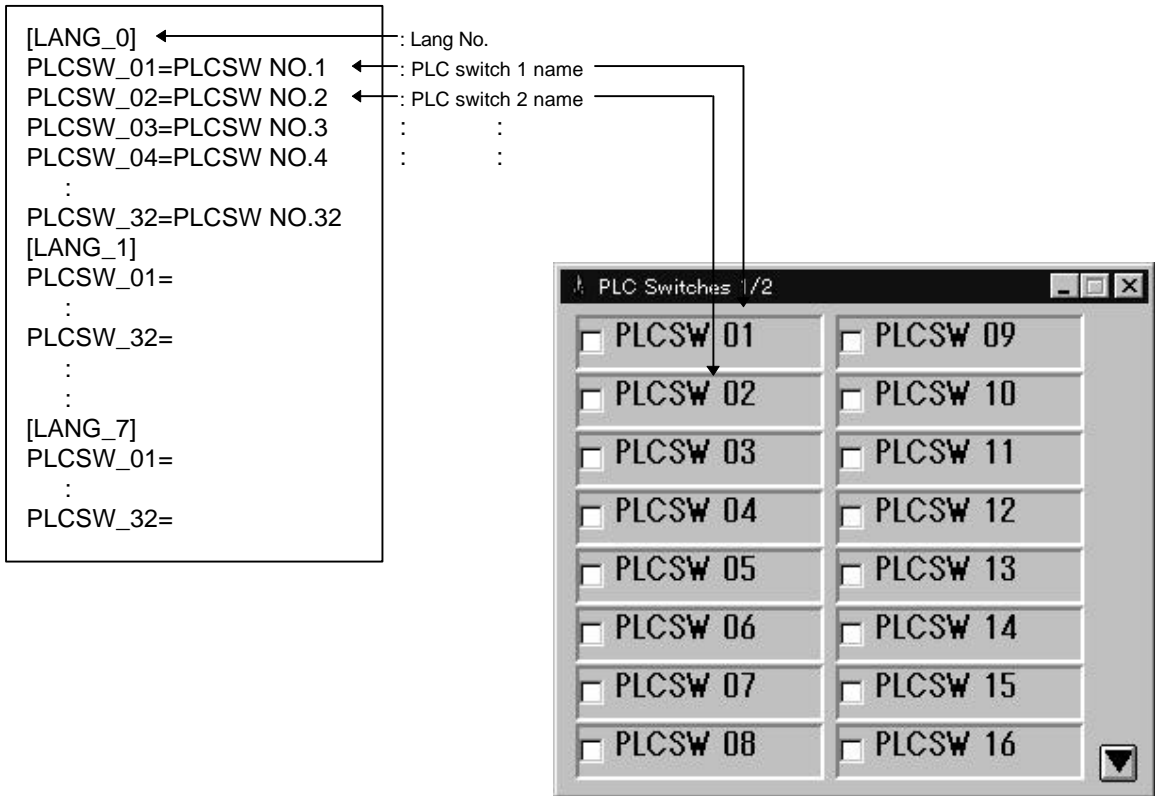
Fig. 4-6 MELDASMAGIC MMI PLC switch window

### 4.3 PLC switch name file

The PLC switch name file created with cnvPLCSW will be described in this section.

- The PLC switch names displayed on the MELDASMAGIC MMI PLC switch window are written into the PLC switch name file.
- The file name uses the PLCSW???.TXT format with ?? designating the corresponding NC Card No. The NC Card No. indicates the ?? value for [Machine??] in melcfg.ini under the Windows directory created when MELDASMAGIC MMI is installed.
- Up to 32 names can be defined per language (max. eight languages). The language used with the PLC switch window is designated with the R2926 register (0 to 7).
- The PLCSW???.TXT file can be rewritten with an editor, etc. However, in this case, the maximum number of characters and file format must be observed.
- Up to 128 characters can be set for each PLC switch name. However, one Japanese character (2-byte character) is handled as two characters.

**[File format]**



## 5. Personal Computer PLC Development Software (PLC4B) Output File Conversion Tool ~ CNV4BMM ~

### 5.1 Function

This tool is an application used to convert the ladder file created with the personal computer PLC development software (PLC4B) into a format that can be directly handled by the MELDASMAGIC, or vice versa.

By using this tool, ladder data developed with the MELDAS 50 Series or MELDAS 500 Series can be used with the MELDASMAGIC Series. (Refer to the section "File Transfer Tool" for details on inputting files converted with this tool into the MELDASMAGIC.)

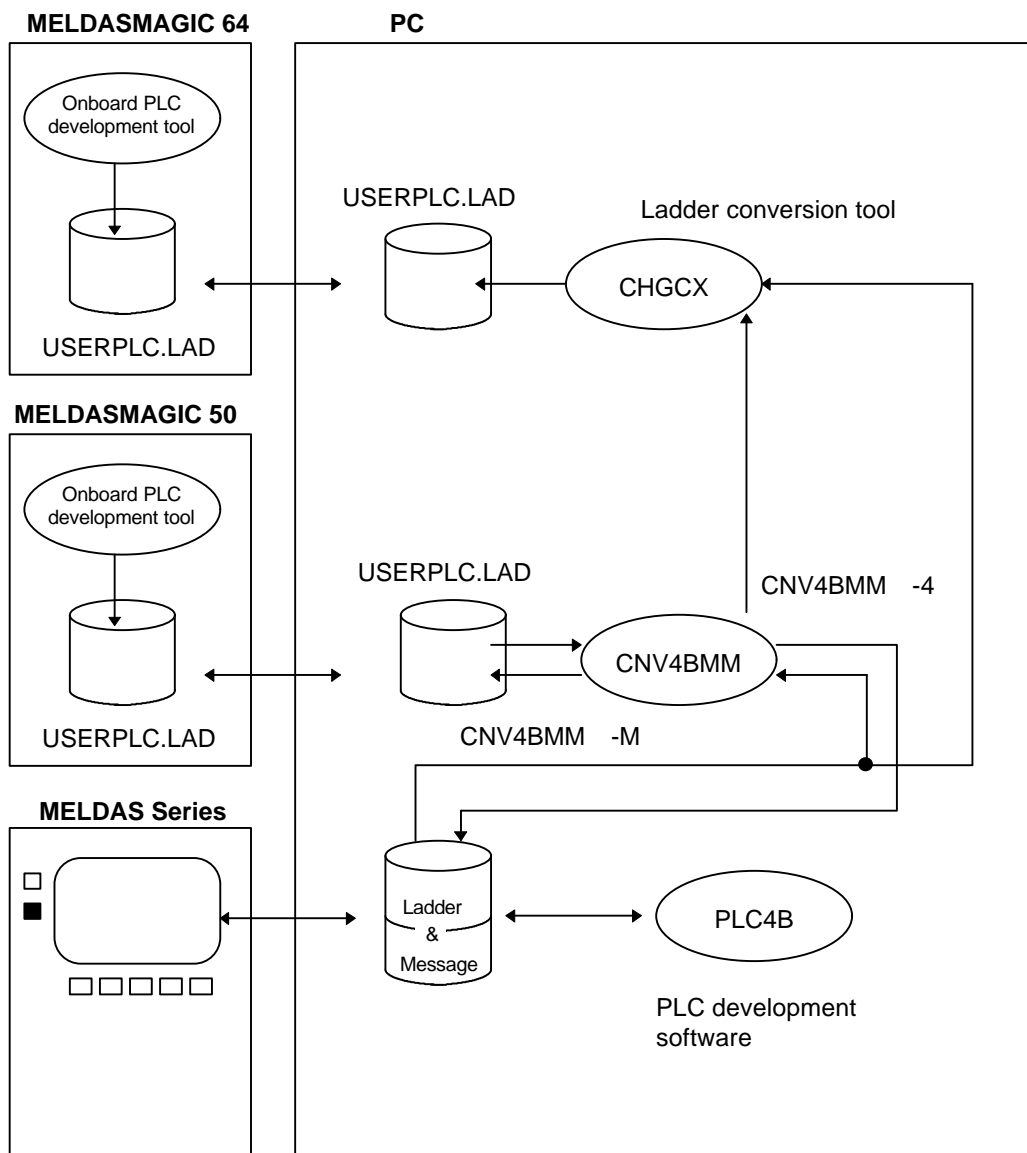


Fig. 5-1 Outline of cnv4bmm

**Supplement:** The PLC development software (PLC4B) for the PC-AT compatible machine (English version) and PC-9800 Series (Japanese version) are available. However, the conversion tool CNV4BMM is dedicated for the PC-AT compatible machine, and will not run on the PC-9800 Series. When using the PC-9800 Series, load the "ladder & message" data into the PC-AT compatible machine using a floppy disk, etc.

## 5.2 CNV4BMM arguments

The CNV4BMM has several arguments described below.

Arguments are assigned to the CNV4BMM with the following format.

CNV4BMM [-option] input\_file [output\_file]

In input\_file, designate the name of the file input to the CNV4BMM, or in other words, the conversion source file.

In output\_file, designate the name of the file where the data output from the CNV4BMM, or in other words, the converted data is saved. If this argument is omitted, the save file name will be "USERPLC.LAD".

The following designations are possible with -option.

- m: Convert from PLC4B format to MELDASMAGIC format
- 4 : Convert from MELDASMAGIC format to PLC4B format
- a : Automatically judge the format, and convert between PLC4B format and MELDASMAGIC format

If the above option designations are omitted, -a will be selected.

## 5.3 Operation methods

The following section will describe the operations for converting file formats with the files that can be handled by MELDASMAGIC Series named as "USERPLC.LAD" and the PLC4B format files named as "MELLINK".

It will be assumed that the tool CNV4BMM.EXE is in C:\MELTOOLS\DOS\.

### 5.3.1 Converting file from other MELDAS Series into MELDASMAGIC file (Converting PLC4B output file into MELDASMAGIC file.)

**Caution** Because the MELDASMAGIC64 ladder commands differ from the MELDASMAGIC50, MELDAS50, MELDAS500 Series, it is necessary to convert the ladder commands with the Conversion tool "CHGCX" as shown in Fig. 5-1 when the ladder program is read into the MELDASMAGIC64 from the MELDASMAGIC50, MELDAS50, or MELDAS500 Series. Refer to the Ladder Development Tool instruction manual for information on "CHGCX".

- (1) Start the MS-DOS prompt.

[Start] menu [Programs]-[MS-DOS Prompt]

- (2) Move to the drive and directory where the PLC4B format file "MELLINK" is located.

› CD C:\LADDATA (Example operation when "MELLINK" exists in \LADDATA of drive C:.)

- (3) Type the following command, and then press the [ENTER] key.

› C:\MELTOOLS\DOS\CNV4BMM -M MELLINK USERPLC.LAD

- (4) With the above command, the PLC4B format file "MELLINK" will be converted into the MELDASMAGIC format, and the file "USERPLC.LAD" will be created. Refer to the chapter 5 "File Transfer Tool" for details on inputting "USERPLC.LAD" into MELDASMAGIC.

### 5.3.2 Converting file handled by MELDASMAGIC into format for other MELDAS Series

(Converting MELDASMAGIC file into PLC4B file)

**Caution** Because the MELDASMAGIC64 ladder commands differ from the MELDASMAGIC50, MELDAS50, MELDAS500 Series, it is possible to read the ladder commands from the MELDASMAGIC50, MELDAS50, or MELDAS500 Series into the MELDASMAGIC64, as shown in Fig. 5-1. Note that the reverse is unsupported.

- (1) Start the MS-DOS prompt.
- (2) Type the following command, and then press the [ENTER] key.

```
› CNV4BMM - 4USERPLC.LAD MELLINK
```

- (3) With the above command, the MELDASMAGIC format file "USERPLC.LAD" will be converted into the PLC4B format, and the file "MELLINK" will be created.

### 5.4 Other functions of CNV4BMM

In addition to the above function, the CNV4BMM has functions that display the usage method.

If CNV4BMM is started without designating any arguments, the usage methods will display as shown below.

```
[CNV4BMM]    PLC4B format File Converter ver. A0
              Convert PLC4B format File into MELDASMAGIC format File.
Usage: CNV4BMM [-option] input_file [output_file]
option : [-m | -4 | -a]
        -m    : convert PLC4B format into MELDASMAGIC format
        -4    : convert MELDASMAGIC format into PLC4B format
        -a    : automatically convert into another format (default)
input_file : input file name
output_file : output file name
              If no output file name ordered it use "USERPLC.LAD".
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```

- Caution:**
- This tool does not consider the No. of input/output points or register functions that differ according to the model. After converting the ladder data, rewrite the data to match the input/output devices and register actions according to each model.
  - The maximum size of the ladder data that can be handled by the MELDASMAGIC 50 Series is 4K steps. The maximum size of the ladder data that can be handled by the MELDASMAGIC64 Series is 16K steps. Make sure that the ladder data created with the conventional models (50 Series, 500 Series) does not exceed this size.

## 6. Emergency Stop Force Release Tool ~ ext\_emg ~

### 6.1 Function

This tool invalidates the detection of an external emergency stop signal by the software. Use in situations such as when operating the software with the NC Card unit.

**⚠ Caution** The following operations will invalidate the external emergency stop function (emergency stop function by the hardware).  
**Never carry out these operations with the machine connected.**

### 6.2 Operation method

- (1) Start the MELDASMAGIC Monitor, and then set "1" in "#1168 test" in the parameter screen.  
By this operation, operation without the remote I/O card becomes possible.
- (2) Start ext\_emg.exe, and then check the checkbox marked "M01" or similarly.  
The "M01" display differs depending on the device driver installation method. Check the checkbox of the relevant NC Card No.

The external emergency stop function has now been force released.  
To validate the external emergency stop function again, start ext\_emg.exe, and then remove the check from the checkbox.

This setting is held as long as the NC Card memory is not cleared.

## Revision History

Sub-No.	Date of revision	Revision details
*	July 1997	First edition created.

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