

# DX100 OPTIONS INSTRUCTIONS

FOR PROGRAM UPLOAD FUNCTION

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Upon receipt of the product and prior to initial operation, read these instructions thoroughly and retain for future reference.

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## MOTOMAN INSTRUCTIONS

- MOTOMAN-□□□ INSTRUCTIONS
- DX100 INSTRUCTIONS
- DX100 OPERATOR'S MANUAL
- DX100 MAINTENANCE MANUAL

The DX100 operator's manuals above correspond to specific usage.  
Be sure to use the appropriate manual.

Part Number: 158178-1CD

Revision: 0



## MANDATORY

- This manual explains the details on program upload functions of the DX100. Read this manual carefully and be sure to understand its contents before handling the DX100.
- General items related to safety are listed in Chapter 1: Safety of the DX100 Instructions. To ensure correct and safe operation, carefully read the DX100 Instructions before reading this manual.



## CAUTION

- Some drawings in this manual are shown with the protective covers or shields removed for clarity. Be sure all covers and shields are replaced before operating this product.
- The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.
- YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications. If such modification is made, the manual number will also be revised.
- If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. The representatives are listed on the back cover. Be sure to tell the representative the manual number listed on the front cover.
- YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids your product's warranty.

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## Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the DX100.

In this manual, the Notes for Safe Operation are classified as “WARNING,” “CAUTION,” “MANDATORY,” or “PROHIBITED.”



### WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.



### CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to personnel and damage to equipment. It may also be used to alert against unsafe practices.



### MANDATORY

Always be sure to follow explicitly the items listed under this heading.



### PROHIBITED

Must never be performed.

Even items described as “CAUTION” may result in a serious accident in some situations. At any rate, be sure to follow these important items



To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as “CAUTION” and “WARNING.”



## WARNING

- Before operating the manipulator, check that servo power is turned OFF pressing the emergency stop buttons on the front door of the DX100 and the programming pendant. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.

Injury or damage to machinery may result if the emergency stop circuit cannot stop the manipulator during an emergency. The manipulator should not be used if the emergency stop buttons do not function.

*Fig. : Emergency Stop Button*



- Once the emergency stop button is released, clear the cell of all items which could interfere with the operation of the manipulator. Then turn the servo power ON.

Injury may result from unintentional or unexpected manipulator motion.

*Fig. : Release of Emergency Stop*



- Observe the following precautions when performing teaching operations within the P-point maximum envelope of the manipulator:
  - View the manipulator from the front whenever possible.
  - Always follow the predetermined operating procedure.
  - Keep in mind the emergency response measures against the manipulator's unexpected motion toward you.
  - Ensure that you have a safe place to retreat in case of emergency.

Improper or unintended manipulator operation may result in injury.

- Confirm that no person is present in the P-point maximum envelope of the manipulator and that you are in a safe location before:
  - Turning ON the power for the DX100.
  - Moving the manipulator with the programming pendant.
  - Running the system in the check mode.
  - Performing automatic operations.

Injury may result if anyone enters the P-point maximum envelope of the manipulator during operation. Always press an emergency stop button immediately if there is a problem.

The emergency stop buttons are located on the right of front door of the DX100 and the programming pendant.



## CAUTION

- Perform the following inspection procedures prior to conducting manipulator teaching. If problems are found, repair them immediately, and be sure that all other necessary processing has been performed.
  - Check for problems in manipulator movement.
  - Check for damage to insulation and sheathing of external wires.
- Always return the programming pendant to the hook on the DX100 cabinet after use.

The programming pendant can be damaged if it is left in the P-point maximum envelope of the manipulator, on the floor, or near fixtures.

- Read and understand the Explanation of Warning Labels in the DX100 Instructions before operating the manipulator.

## Definition of Terms Used Often in This Manual

The MOTOMAN manipulator is the YASKAWA industrial robot product.


The manipulator usually consists of the controller, the programming pendant, and supply cables.

In this manual, the equipment is designated as follows.

Equipment	Manual Designation
DX100 Controller	DX100
DX100 Programming Pendant	Programming Pendant
Cable between the manipulator and DX100	Manipulator Cable

## DX100

Descriptions of the programming pendant keys, buttons, and displays are shown as follows:

Equipment		Manual Designation
Programming Pendant	Character Keys	The keys which have characters printed on them are denoted with [ ]. ex. [ENTER]
	Symbol Keys	The keys which have a symbol printed on them are not denoted with [ ] but depicted with a small picture. ex. page key  The cursor key is an exception, and a picture is not shown.
	Axis Keys Numeric Keys	"Axis Keys" and "Numeric Keys" are generic names for the keys for axis operation and number input.
	Keys pressed simultaneously	When two keys are to be pressed simultaneously, the keys are shown with a "+" sign between them, ex. [SHIFT]+[COORD]
	Displays	The menu displayed in the programming pendant is denoted with { }. ex. {JOB}

## Description of the Operation Procedure

In the explanation of the operation procedure, the expression "Select •••" means that the cursor is moved to the object item and the SELECT key is pressed, or that the item is directly selected by touching the screen.

## Registered Trademarks

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or brand names for each company of corporation. The indications of (R) and TM are omitted.

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DX100	1	Program Upload Function
	1.1	When the System Program is Required

## 1 Program Upload Function

The system program of the DX100 can be saved into the compact flash inserted to the programming pendant using this program upload function.

This enables restoring the system easily and quickly, even in the case of a failure in the compact flash of the main CPU board (YCP01), by writing the system program and the batch data of the DX100 saved previously.

### 1.1 When the System Program is Required

The system program has been stored in the compact flash removable from YCP01 in the DX100. This enables using the compact flash without interruption even if YCP01 is replaced for its failure.

However, in the case of a compact flash failure, the existing system program needs to be written into the new one. This function enables saving the existing system program to write it into the new one from the DX100 for the case like this.

### 1.2 Applicable Version

This function is applicable from standard version DS1.53-00..



## CAUTION

Prepare two compact flashes for the restoration of the DX100.

- For saving the system program  
(It is used for writing the program when restoration)

This is for saving the system program from the DX100 by the program uploading operation. This compact flash can also be used for writing the batch data. Please prepare our recommended compact flash. For more details on recommended compact flashes, refer to "9.1.2 Device" in "DX100 INSTRUCTIONS".

- For YCP01

This compact flash is to be inserted to YCP01. Prepare the one inserted to the YCP01, which was shipped as a spare-part, or the one shipped exclusively for YCP01 (it needs a special treatment for start-up, and thus our standard recommended compact flashes are unavailable).



## 2 Program Upload Procedure

Upload the program as shown below.

### 2.1 Preparation of Compact Flash

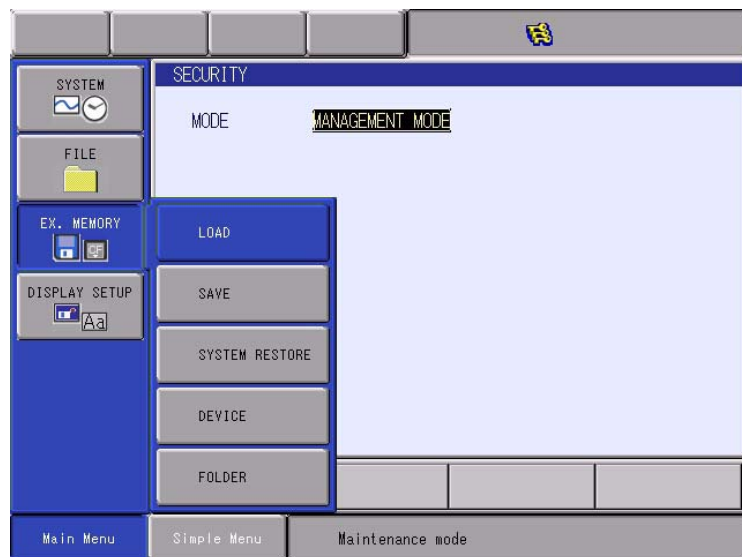
Prepare the compact flash with sufficient capacity (100MByte or more) for saving the system program and perform the following procedures.

1. Connect the compact flash to a PC.
2. Use Explorer, etc. to delete all the data in the compact flash.
3. Remove the compact flash from the PC and insert it to the compact flash slot on the programming pendant.

#### 2.1.1 Uploading

Upload the program as shown below.

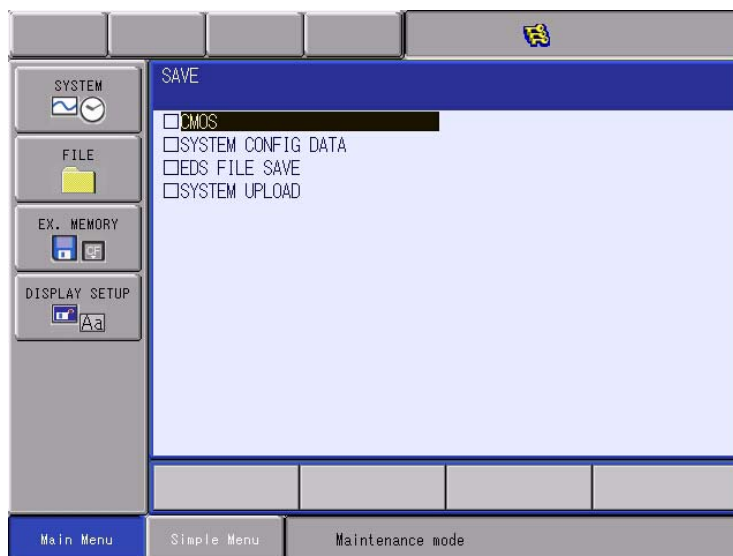
1. Turn ON the DX100 while pressing down the [MAIN MENU].
  - The maintenance mode starts.
2. Set the security mode to the management mode
3. Select {EX. MEMORY} under the main menu.
  - The sub menu appears.



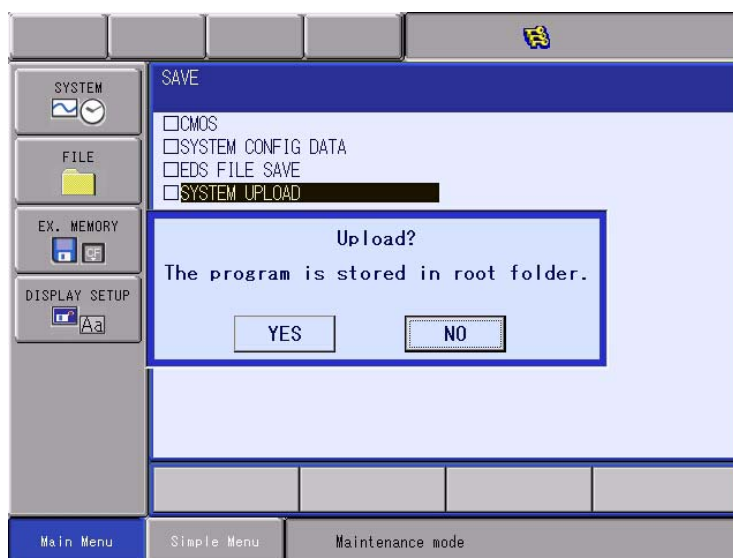
## 2 Program Upload Procedure

### 2.1 Preparation of Compact Flash

4. Select {SAVE}.
  - The save window appears.



5. Select {SYSTEM UPLOAD}.
  - The confirmation dialog box appears.



6. Select {YES}.
  - Program upload starts.
  - When the message “Program uploading. Don't turn the power off.” on the human interface display area disappears, uploading is completed.

For the case of restoration, be sure to retain the compact flash with the uploaded program after above mentioned procedures.

### 3 Restoration Procedure 1 (Writing the Program)

First, check whether the compact flash of the main CPU board (YCP01) needs replacing. If needed, replace the compact flash and perform the procedures mentioned in *chapter 3 "Restoration Procedure 1 (Writing the Program)"* and *chapter 4 "Restoration Procedure 2 (Loading the Batch Data)"* at page 4-1.



#### CAUTION

After the compact flash of YCP01 is replaced, the DX100 and the robot cannot be operated correctly unless the correct system program is written-in and the batch data is loaded or initialized in the maintenance mode. To ensure correct and safe operation, please take notice of this matter before operation.

#### 3.1 Determining Failure of Compact Flash

If all of the following conditions are met, the compact flash is diagnosed as out of order.

- Power is correctly supplied to each board in the DX100.
- The programming pendant and YCP01 are correctly connected.
- The programming pendant remains displaying the initial window (an image of a robot on the screen) even one minute after the DX100 is turned ON and the 7SEG LEDs of the interface board (YIF01) remain lit.
- Nothing is changed regarding the conditions above after YCP01 is replaced.

For the conditions above, perform the following.

#### 3.2 Preparation of Compact Flash for YCP01

Prepare the compact flash for YCP01.

Prepare the one inserted to the YCP01, which was shipped as a spare-part, or the one shipped exclusively for YCP01 (it needs a special treatment for start-up, and thus our standard recommended compact flashes are unavailable).

Insert this compact flash to YCP01.

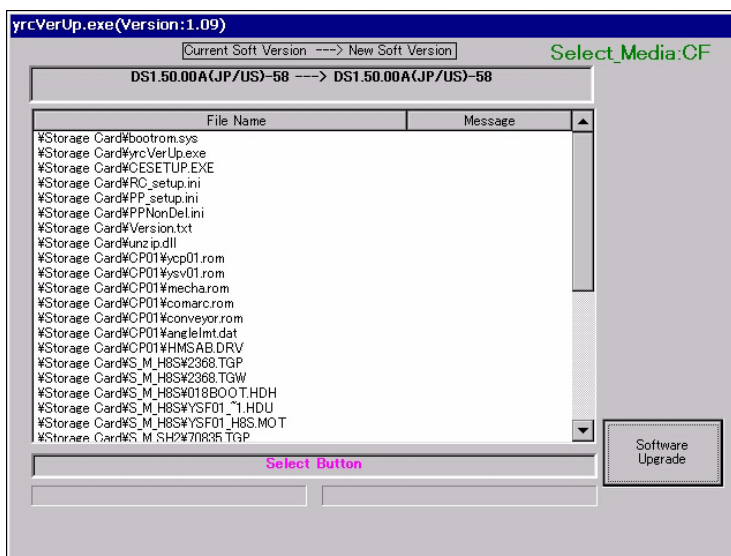
#### 3.3 Preparation of Compact Flash for Wiring the Program

Insert the compact flash uploaded in *chapter 2 "Program Upload Procedure"* at page 2-1 to the compact flash slot on the programming pendant.

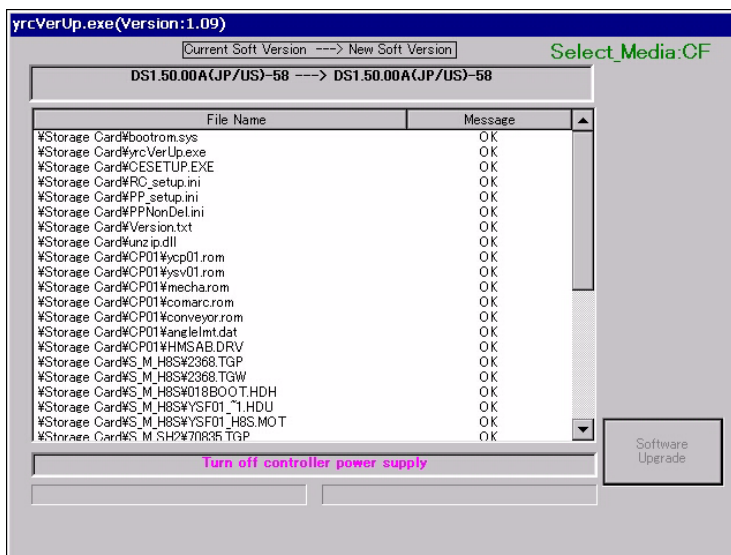
### 3.4 Writing the System Program

Write the system program as shown below.

- Turn ON the DX100 while pressing down the [INTERLOCK] + [8] + [SELECT].
  - The upgrade tool starts.



- Select {Software Upgrade}.
  - Start upgrade.
  - When the message “Turn off controller power supply” appears at the bottom of the window, upgrade is completed.



## 4 Restoration Procedure 2 (Loading the Batch Data)

After finish writing of the system program, load the batch data previously saved (saved when the compact flash was correctly operating). The batch data include "CMOS.BIN", "CMOSBK.BIN" (or "CMOSBK???.BIN: ?? represents a number") and "ALCMS1E.HEX". Write any of these data into the compact flash, insert it to the compact flash slot on the programming pendant, and then perform the following.

Use our recommended compact flash (the compact flash for saving the system program is also available).



### CAUTION

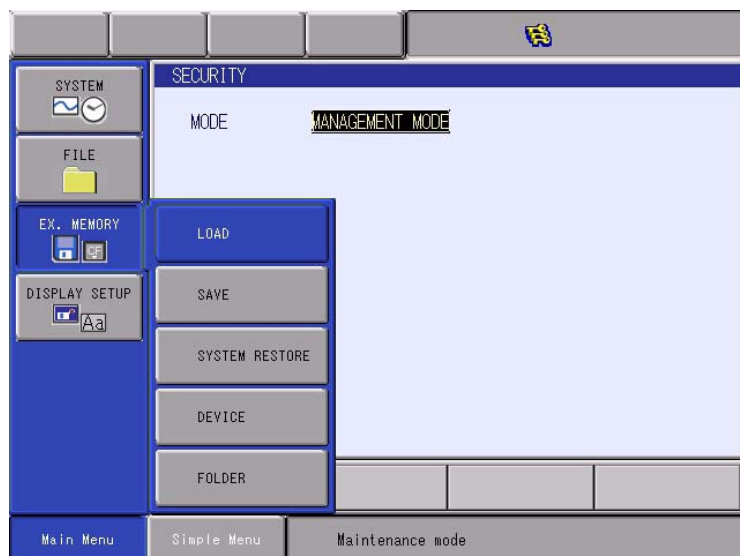
Before operation, please understand well that the data in the DX100 is replaced with the batch data in the compact flash when loading the batch data.

Check that the data wrote into the DX100 is the same as before after restoring the system. In addition, call the master job and check that the current position of the robot is safe before starting the robot.

### 4.1 When the Batch Data is "CMOS.BIN"

When the batch data is "CMOS.BIN", write the data as shown below.

1. Turn ON the DX100 while pressing down the [MAIN MENU].
  - The maintenance mode starts.
2. Set the security mode to the management mode
3. Select {EX. MEMORY} under the main menu.
  - The sub menu appears.

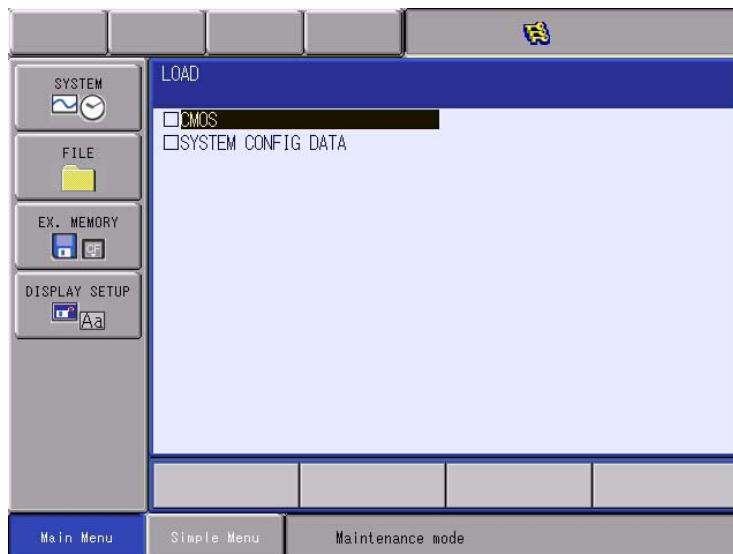


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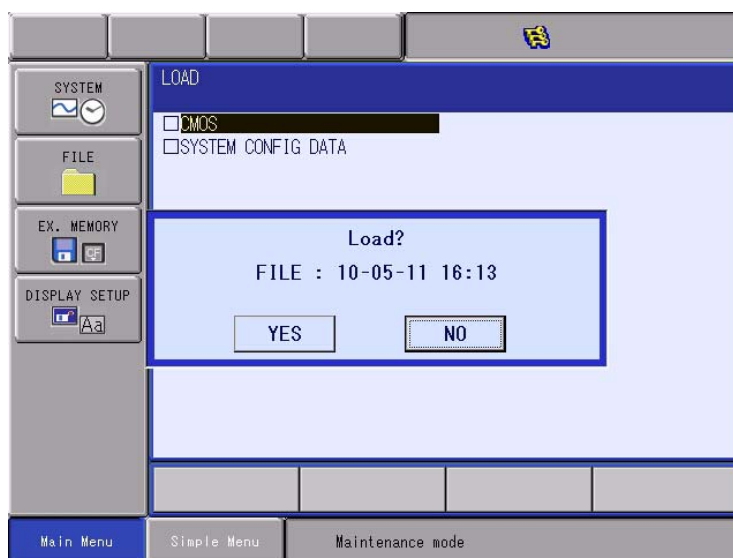
#### 4 Restoration Procedure 2 (Loading the Batch Data)

##### 4.1 When the Batch Data is "CMOS.BIN"

4. Select {LOAD}.
  - The load window appears.



5. Select {CMOS}.
  - The confirmation dialog box appears.



6. Select {YES}.
  - Loading starts and internal data of the DX100 is updated by CMOS.BIN file in the compact flash.
  - When the message "Loading system data. Don't turn the power off." on the human interface display area disappears, loading is completed.

## 4.2 When the Batch Data is "CMOSBK.BIN"

When the batch data is "CMOSBK.BIN (or "CMOSBK???.BIN: ?? represents a number)", write the data as shown below.

1. Turn ON the DX100 while pressing down the [MAIN MENU].
  - The maintenance mode starts.
2. Set the security mode to the management mode.
3. Select {EX. MEMORY} under the main menu.
  - The sub menu appears.
4. Select {SYSTEM RESTORATION}.
  - The backup file list window appears.



5. Select a date of a file to be backed-up.
  - The confirmation dialogue box to confirm whether the board has been replaced or not appears.

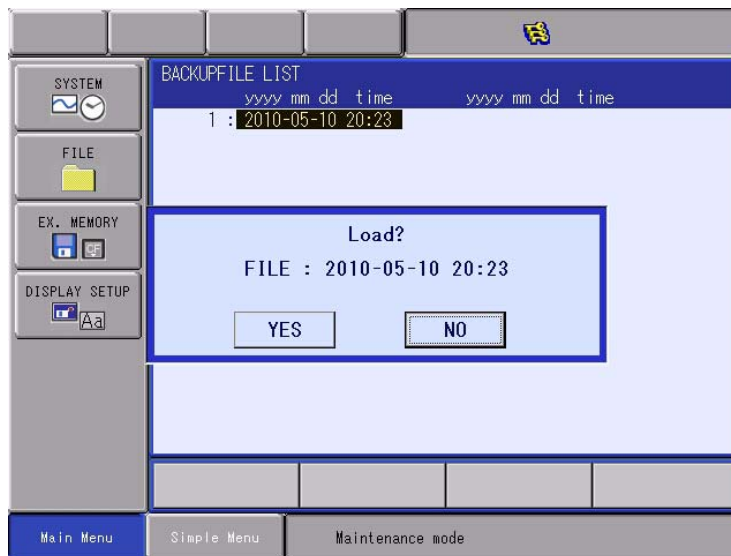


- Select {YES} to initializes "SYS MONITORING TIME".
- Select {NO} to keep "SYS MONITORING TIME" unchanged.

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- 4 Restoration Procedure 2 (Loading the Batch Data)
- 4.3 When the Batch Data is "ALCMS1E.HEX"

6. Select {YES} or {NO}.
  - The confirmation dialog box for execution appears.



7. Select {YES}.
  - Internal data of the DX100 is updated by CMOS.BIN file in the compact flash.
  - When the message "Loading system data. Don't turn the power off." on the human interface display area disappears, loading is completed.

#### 4.3 When the Batch Data is "ALCMS1E.HEX"

When the batch data is "ALCMS1E.HEX", customers cannot write-in the data. In this case, contact your YASKAWA representative.



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DX100	5	In Case of the Compact Flash Failure
	5.1	Preparation of Compact flash for YCP01

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## 5 In Case of the Compact Flash Failure

Prepare as follows for the compact flash failure.



### CAUTION

Please be prepared for the compact flash failure for the quick and easy restoration of the DX100.

### 5.1 Preparation of Compact flash for YCP01

Prepare the compact flash for YCP01.

Prepare the one inserted to the YCP01, which was shipped as a spare-part, or the one shipped exclusively for YCP01 (it needs a special treatment for start-up, and thus our standard recommended compact flashes are unavailable).

### 5.2 Program Upload

Save the system program of the DX100 into the compact flash following the procedures mentioned in *chapter 2 "Program Upload Procedure" at page 2-1*. Be sure to retain the compact flash for system restoration.

### 5.3 Backup the Batch Data

Backup the batch data by following the procedures mentioned in "9.2 Backup by CMOS.BIN" or "9.3 Automatic Backup Function" in "DX100 INSTRUCTIONS". Be sure to retain backed-UP data.

# DX100 OPTIONS INSTRUCTIONS

FOR PROGRAM UPLOAD FUNCTION

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