

DX100 OPTIONS INSTRUCTIONS

FOR MANUAL BRAKE RELEASE FUNCTION

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

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: 156239-1CD

Revision: 3



MANDATORY

- This manual explains the manual brake release function of DX100. Read this manual carefully and be sure to understand its contents before handling the DX100.
- General items related to safety are listed in the Section 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.

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 when the emergency stop buttons on the front door of the DX100 and programming pendant are pressed. 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 P-point maximum envelope of the manipulator:
 - View the manipulator from the front whenever possible.
 - Always follow the predetermined operating procedure.
 - 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 DX100 power.
 - 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 the 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 manipulator's work area, on the floor, or near fixtures.

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

Definition of Terms Used Often in This Manual

The MOTOMAN is the YASKAWA industrial robot product.


The MOTOMAN consists of the manipulator, the controller, the programming pendant, and manipulator 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 the controller	Manipulator Cable

DX100

Descriptions of the programming pendant, 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 Number Keys	"Axis Keys" and "Number 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.

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DX100

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- 1 Manual Brake Release Function
 - 1.1 Operating Conditions of Manual Brake Release
-

1 Manual Brake Release Function

The manual brake release function allows forcible release of each motor brakes of the manipulator and external axes by programming pendant operation.

The following operating conditions have to be met before performing the manual brake release function since this function releases brakes by software, which is different from the conventional brake release by hardware.

The manual brake release is an optional function set by parameter.

1.1 Operating Conditions of Manual Brake Release

1. DX100 Status
The DX100 has to be launched correctly ^{*1}.
2. Mode: Mode switch on the programming pendant
The function can be used in all modes: Remote / Play / Teach.
3. Security Mode
The function can be used in all modes: Operation / Editing / Management.
4. Others
 - Servo power is OFF
 - Emergency stop is OFF (programming pendant, DX100, external signals)
 - Power supply unit circuit board is JANCD-YBK01-2E
If the circuit board JANCD-YBK01-1E is used for any of the axes in the control group of manipulator, base, or station, the manual brake release function is not available for the group with an axis using JANCD-YBK01-1E.

1 Manual Brake Release Function
 1.1 Operating Conditions of Manual Brake Release

*1 Basically, the manual brake release function is available even at alarm occurrence.

However, the manual brake release function cannot be used if the communication failure between each boards (YCP01, EAXA01, YIF01, YSU01) occurs due to board failure, etc.

<Example>

The manual brake release cannot be performed at occurrence of the alarm 1204 as shown in the following window, since the communication with the board YIF01 becomes unavailable.

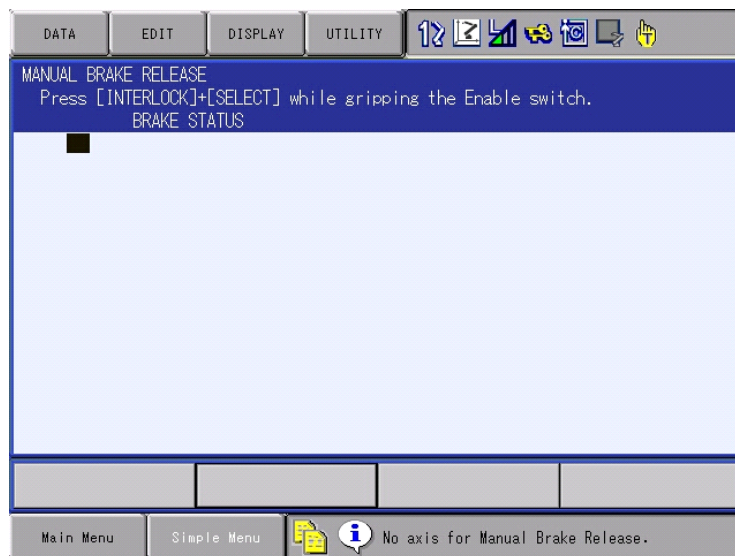
In this case, reset IO modules in Maintenance mode, i.e. separate the board, then perform the manual brake release.

Fig. 1-1: Alarm Window



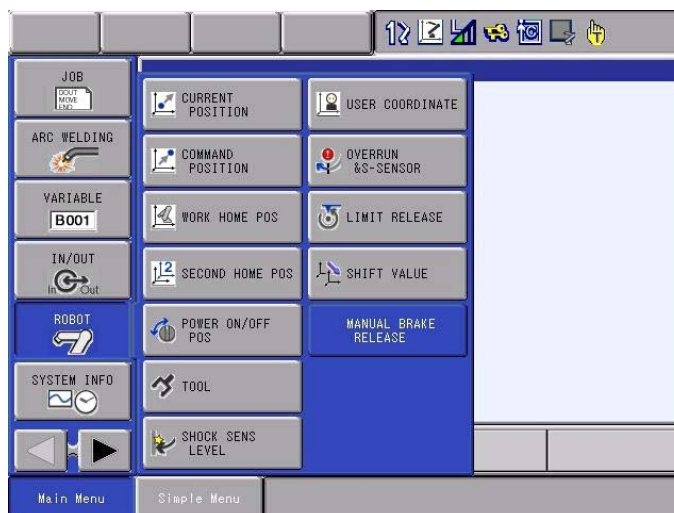
If the power supply unit circuit board is JANCD-YBK01-1E and [MANUAL BRAKE RELEASE] menu is selected, the message "No axis for Manual Brake Release" is displayed as shown below.

Fig. 1-2: Brake Release Window

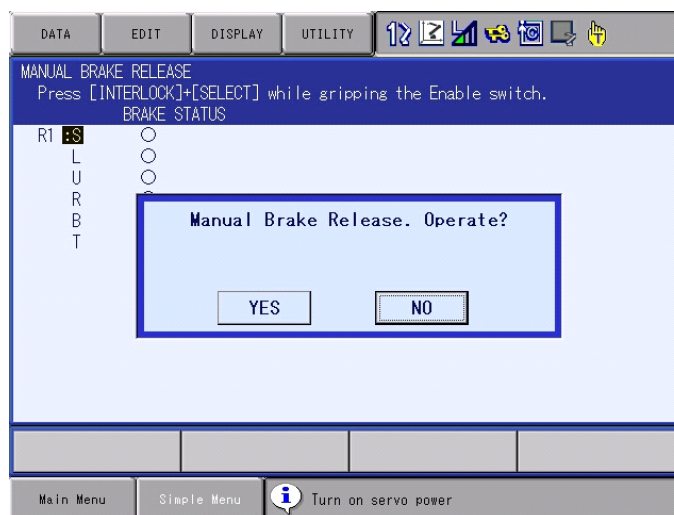


2 Manual Brake Release Operation

1. Select [ROBOT] under the main menu, then select [MANUAL BRAKE RELEASE] under the submenu.
 - [MANUAL BRAKE RELEASE] is shown under the submenu of the main menu [ROBOT].



2. Select "YES".
 - To avoid careless operation mistake, a warning message appears when [MANUAL BRAKE RELEASE] menu is selected.
 - Select "YES" to display [MANUAL BRAKE RELEASE] window.
 - Select "NO" to return to the main menu.




2 Manual Brake Release Operation

3. Move a cursor to the axis of which the brake is to be released.

– The brake is released by following the operation: Move a cursor to the axis of which the brake is to be released and press [INTERLOCK] + [SELECT] while gripping Enable switch. Then the brake status is shown.

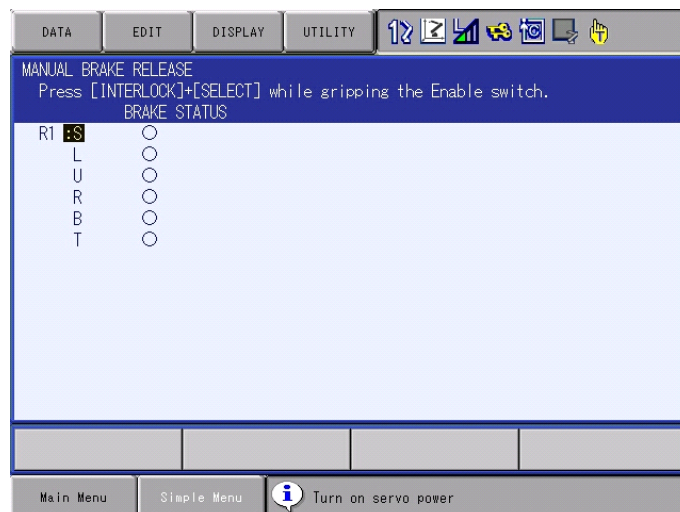
– The brake is locked under one of the following conditions:

- When [SELECT] is released.

Also, see the following  CAUTION

- When the emergency stop button on the programming pendant, DX100 or external device is pressed.
- When Enable switch is released or gripped further.
- When the window is switched from the Manual Brake Release window to another window.

Fig. 2-1: Manual Brake Release Window



Brake Status: ○: Brake locked ●: Brake released

4. Press [INTERLOCK] + [SELECT] while gripping Enable switch.



CAUTION

- Brake can be released by pressing [INTERLOCK] + [SELECT] while gripping Enable switch. Note that the brake remains released even though [INTERLOCK] is released at this time.

3 Warning Message Display

If the manual brake release is performed under the following conditions, the warning message appears in the message area bottom right of the window as shown in *fig. 1-2 "Brake Release Window" at page 1-2*.

In this case, the brake release cannot be performed.

- Servo power is turned ON.
- Emergency stop button on the programming pendant is pressed.
- Emergency stop button on DX100 is pressed.
- External emergency stop signal is input.

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FOR MANUAL BRAKE RELEASE FUNCTION

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