

DX200

MotoFit Function

Startup Instructions

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

MOTOMAN INSTRUCTIONS

MOTOMAN-□□□ INSTRUCTIONS
DX200 INSTRUCTIONS
DX200 OPERATOR'S MANUAL
DX200 MAINTENANCE MANUAL

The DX200 operator's manuals above correspond to specific usage.
Be sure to use the appropriate manual.

Part Number: 177012-1CD
Revision: 0

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MANDATORY

- This manual explains startup procedures of the MotoFit Startup function. Read this manual carefully and be sure to understand its contents before using the MotoFit function.
- General items related to safety are listed in Section 1: Safety of the DX200 INSTRUCTIONS. To ensure correct and safe operation, carefully read the DX200 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.

We suggest that you obtain and review a copy of the ANSI/RIA National Safety Standard for Industrial Robots and Robot Systems (ANSI/RIA R15.06-2012). You can obtain this document from the Robotic Industries Association (RIA) at the following address:

Robotic Industries Association
900 Victors Way
P.O. Box 3724
Ann Arbor, Michigan 48106
TEL: (734) 994-6088
FAX: (734) 994-3338
www.roboticsonline.com

Ultimately, well-trained personnel are the best safeguard against accidents and damage that can result from improper operation of the equipment. The customer is responsible for providing adequately trained personnel to operate, program, and maintain the equipment. **NEVER ALLOW UNTRAINED PERSONNEL TO OPERATE, PROGRAM, OR REPAIR THE EQUIPMENT!**

We recommend approved Yaskawa training courses for all personnel involved with the operation, programming, or repair of the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Notes for Safe Operation

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

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



DANGER

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



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 “DANGER”, “WARNING” and “CAUTION”.



WARNING

- **Before operating the manipulator, check that servo power is turned off when the emergency stop buttons on the front door of the DX200 and programing pendant are pressed. When the servo power is turned off, the SERVO ON LED on the programing 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.

Figure 1: 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.

Figure 2: Release of Emergency Stop Button



- **Observe the following precautions when performing teaching operations within the P-point maximum envelope of the manipulator:**
 - **Be sure to use a lockout device to the safeguarding when going inside. Also, display the sign that the operation is being performed inside the safeguarding and make sure no one closes the safeguarding.**
 - **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 power for the DX200.**
 - **Moving the manipulator with the programming pendant.**
 - **Running the system in the check mode.**
 - **Performing automatic operations.**

Injury may result if anyone enters the working envelope of the manipulator during operation. Always press an emergency stop button immediately if there are problems.

The emergency stop button is located on the right of the front door of the DX200 and programing 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 its specified position after use.

If the programming pendant is inadvertently left on the manipulator, on a fixture, or on the floor, the angularities of the floor may activate the Enable Switch, and the servo power could be turned ON as a consequence. Also, when the manipulator starts its operation, the manipulator or a tool could collide with the inadvertently left programming pendant during manipulator movement, possibly causing injury or equipment damage.

- Read and understand the Explanation of Warning Labels in the DX200 Instructions before using the MotoFit Function.

Definition of Terms Used In this Manual

The MOTOMAN manipulator is the YASKAWA industrial robot product.

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

In this manual, the equipment is designated as follows.

Equipment	Manual Designation
DX200 Controller	DX200
DX200 Programming Pendant	Programming Pendant
Cable between the manipulator and the controller	Manipulator cable

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 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 key  +COORD key 
	Mode Key	Three kinds of modes that can be selected by the mode key are denoted as follows: REMOTE, PLAY, or TEACH
	Button	Three buttons on the upper side of the programming pendant are denoted as follows: HOLD button START button EMERGENCY STOP button
	Displays	The menu displayed in the programming pendant is denoted with { }. ex. {JOB}
PC Keyboard	The name of the key is denoted ex. Ctrl key on the keyboard	

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 Trademark

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

Explanation of Warning Labels


DANGER

- The label described below is attached to the manipulator.**
 Observe the precautions on the warning labels.
 Failure to observe this caution may result in injury or damage to equipment.

Figure 3: Warning Labels



⚠ WARNING

Moving parts
may cause
injury



⚠ WARNING

Do not enter
robot
work area.

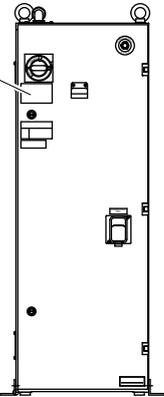
- The following warning labels are attached to DX100.**
 Observe the precautions on the warning labels.
 Failure to observe this warning may result in injury or damage to equipment.

Figure 4: Location of Warning Labels

⚠ WARNING

⚡

High Voltage
Do not ope the cover.



⚠ WARNING

⚡

May cause
electric shock.
Ground the earth
terminal based on
local and national
electric code.

⚠ WARNING

⚡

High Voltage
Do not open the door
with power ON.

Customer Support Information

If you need assistance with any aspect of your MotoFit Startup system, please contact YASKAWA Customer Support at the following 24-hour telephone number:

(937) 847-3200

For **routine** technical inquiries, you can also contact YASKAWA Customer Support at the following e-mail address:

techsupport@motoman.com

When using e-mail to contact YASKAWA Customer Support, please provide a detailed description of your issue, along with complete contact information. Please allow approximately 24 to 36 hours for a response to your inquiry.



Please use e-mail for **routine** inquiries only. If you have an urgent or emergency need for service, replacement parts, or information, you must contact YASKAWA Customer Support at the telephone number shown above.

Please have the following information ready before you call Customer Support:

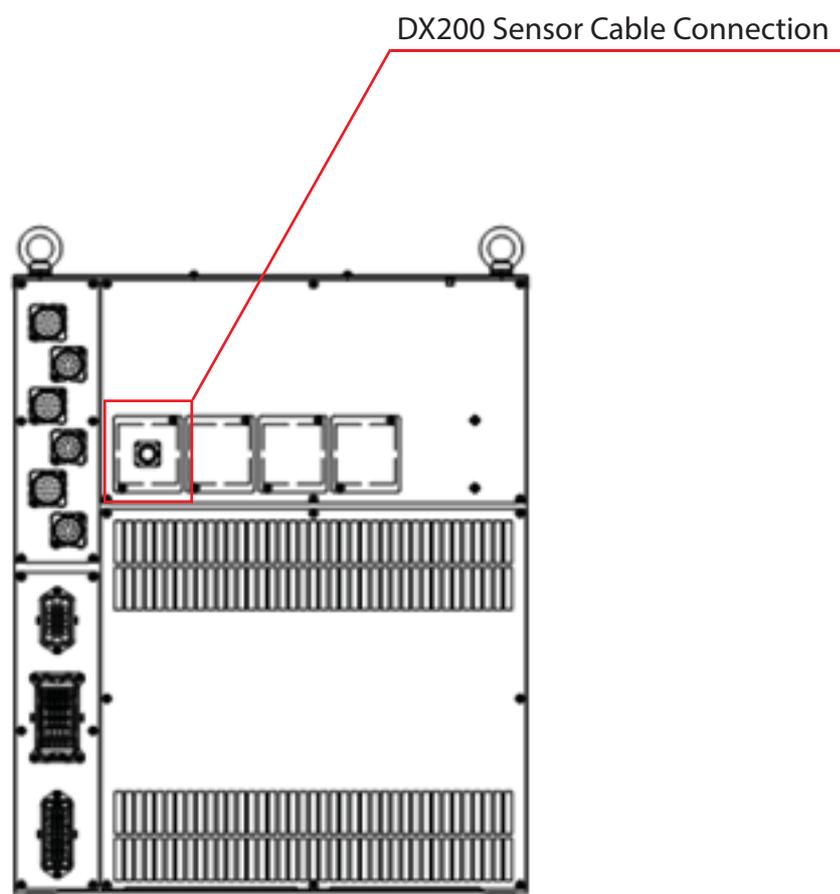
- | | |
|----------------------------|--|
| • System | MotoFit Startup |
| • Robots | _____ |
| • Primary Application | _____ |
| • Controller | DX200 |
| • Software Version | Access this information on the Programming Pendant's LCD display screen by selecting {MAIN MENU} - {SYSTEM INFO} - {VERSION} |
| • Robot Serial Number | Located on the robot data plate |
| • Robot Sales Order Number | Located on the DX200 controller data plate |

1 Introduction

The procedures explained in this instruction must be performed at the startup of MotoFit function.

2 Mounting the Force Sensor

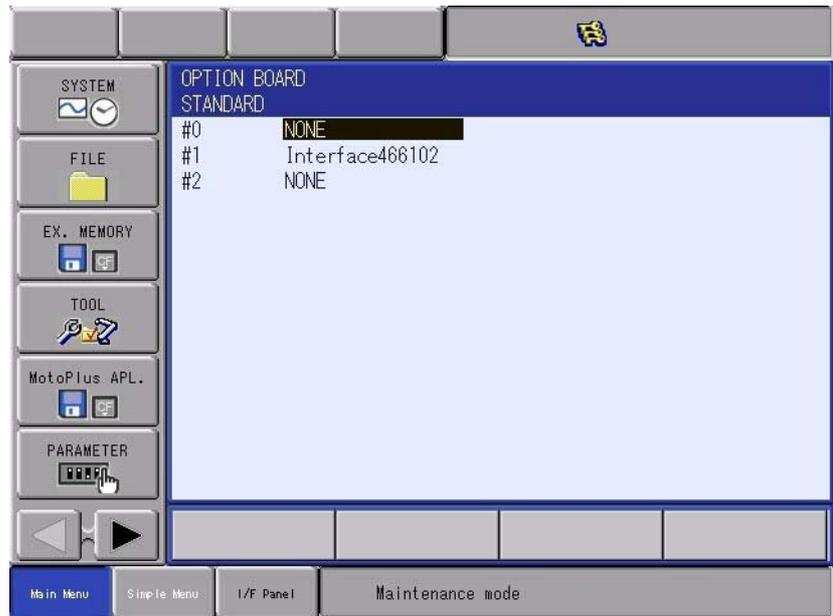
1. Turn OFF the DX200 controller.
2. Connect the sensor cable (DX200 side) to the DX200 and connect the sensor cable (manipulator side).



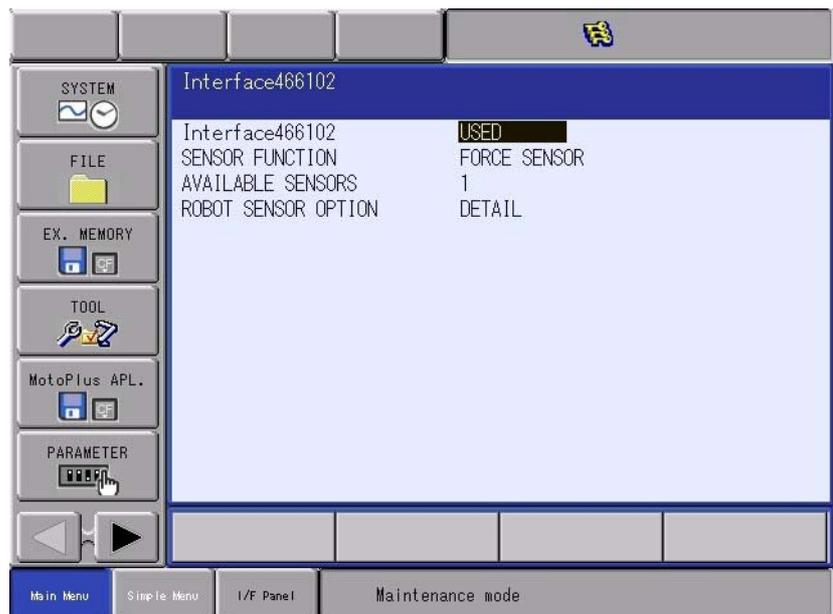
3. Mount the force sensor on the connector of the sensor cable.

3 Enable the Port Allocation of the Force Sensor Communication Board

1. Start up the DX200 in the maintenance mode, and set the mode to management mode.
2. Select in the following order: { SYSTEM}, {SETUP}, {OPTION BOARD}. Move the cursor to "Interface466102" and press [SELECT] to open the Interface466102 setting window.



3. On the Interface466102 setting window, after confirming "USED" is shown, move the cursor to "DETAIL" and press [ENTER] to open the ROBOT SENSOR OPTION setting window.



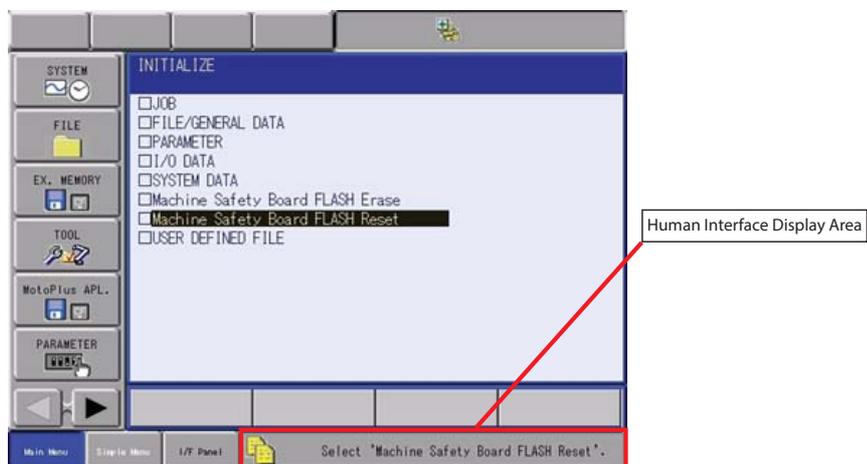
4. Modify the setting of "FORCE SEONSOR" for R1 from "-" (invalid) to "O" (valid).



5. After pressing [ENTER], the confirmation dialog is shown. Select {YES} and press [ENTER].



6. When the message "Select 'Machine Safety Board FLASH Reset'" is shown in the human interface display area, set the mode to the safety mode and select in the following order: {FILE}, {INITIALIZE}, "Machine Safety Board FLASH Reset".



7. After pressing [ENTER], the confirmation dialog is shown. Select {YES} and press [ENTER].



8. The enabling procedure for the port is completed. Turn OFF the DX200 and move on to next chapter.

4 Parameter Setting of the MotoFit Function

Start up the DX200 in the normal mode. Set the mode to management mode and select in the following order: {Parameter}, {S1E}. Set the parameters.

- **Robot model: MH5S II, MH5LS II**

Make sure the set value is correct for each parameter as shown in the following table

Parameter No.	Set Value
S1E005	1
S1E013	8500
S1E016	0
S1E025	2000
S1E026	2000
S1E027	2000
S1E028	40
S1E029	40
S1E030	40
S1E031	0
S1E032	1000
S1E056	18000

- **Robot model: MH12, MH24**

Make sure the set value is correct for each parameter as shown in the following table.

Parameter No.	Set Value
S1E005	2
S1E013	20000
S1E016	0
S1E025	8000
S1E026	8000
S1E027	8000
S1E028	80
S1E029	80
S1E030	80
S1E031	939
S1E032	61
S1E056	20000

The parameter setting is completed. Turn ON the DX200 to restart.

Create the MotoFit JOB by referring to "FS100/DX200 OPTIONS INSTRUCTIONS for MotoFit".

DX200

MotoFit Function

Startup Instructions

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