

# DX100 OPTIONS JARCR-XFB03 BOARD INSTRUCTIONS

FOR M-NET

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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: 156525-1CD  
Revision: 0





## MANDATORY

- This manual explains the JARCR-XFB03 board of the DX100 system and general operations. 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 Instruction 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.

DX100

## 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."



## PROHIBITED

- Do not use or keep the board in the following environmental conditions.
  - Where exposed to direct sunshine
  - Where vibration or impact occurs
  - Where high humidity exists
  - Where a strong magnetic field exists
  - Where much dust exists
  - Where a sudden change in the temperature occurs
  - Where corrosive gases occur
  - Where condensation occurs

Improper usage of the board may damage the board.



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



## WARNING

- Do not touch the inside of the panel for 5 minutes after the power is turned OFF.

The remaining charged voltage in the capacitor may cause an electric shock or an injury.

- Be sure to close the door and install the protection cover while the power is turned ON.

Failure to observe this warning may result in a fire or an electric shock.



## 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 cabinet of the DX100 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 Warning Labels in the DX100 Instructions before operating the manipulator:

- The wiring and mounting must be performed by authorized and qualified personnel.

Failure to observe this caution may result in a fire or an electric shock.

- Make sure that there is no foreign matter such as metal chips on the board.

In case of malfunction, etc. it may result in an injury or damage the board.

- Make sure that there is no damage or deflection of parts on the board.

In case of malfunction, etc. it may result in an injury or damage the board.

- Correctly connect each cable and connector.

Failure to observe this caution may result in a fire or damage the board.

- Set the switches, etc. correctly.

Malfunction, caused by an incorrect setting, may result in an injury or damage the board.

- Never touch the mounting surfaces of the board parts directly with fingers.

The generated static electricity may damage the IC.

- Never touch the soldered surfaces of the board directly with fingers.

Protrusions on the soldered surface may result in an injury.

- No shock to the board.

The shock may damage the board.

## DX100

## Definition of Terms Used Often in This Manual


The MOTOMAN is the YASKAWA industrial robot product.

The MOTOMAN usually consists of the manipulator, 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 the controller	Manipulator cable
JARCR-XFB03 board	XFB03 board

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.



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## 1 Outline

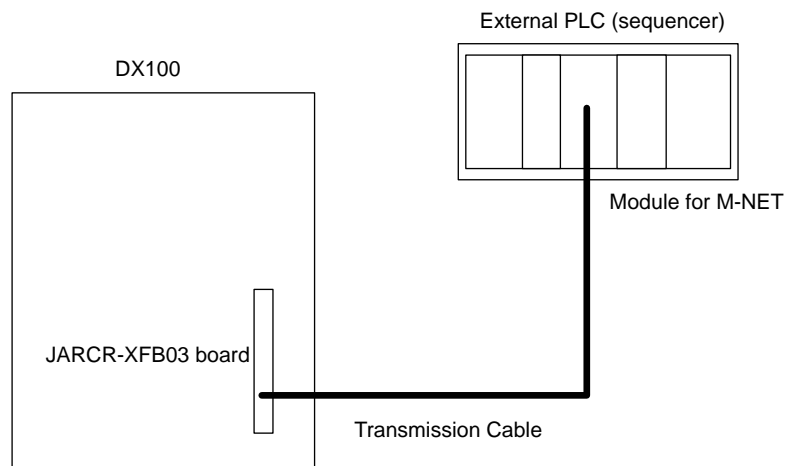
By using the JARCR-XFB03 board (M-NET) for the DX100, the cost for wiring between modules (sequencer, positioning unit, measuring unit, etc.) that configure a system, can be reduced.

This manual explains how to use the JARCR-XFB03 board (hereinafter called the XFB03 board).

### 1.1 Features of System with the XFB03 Board

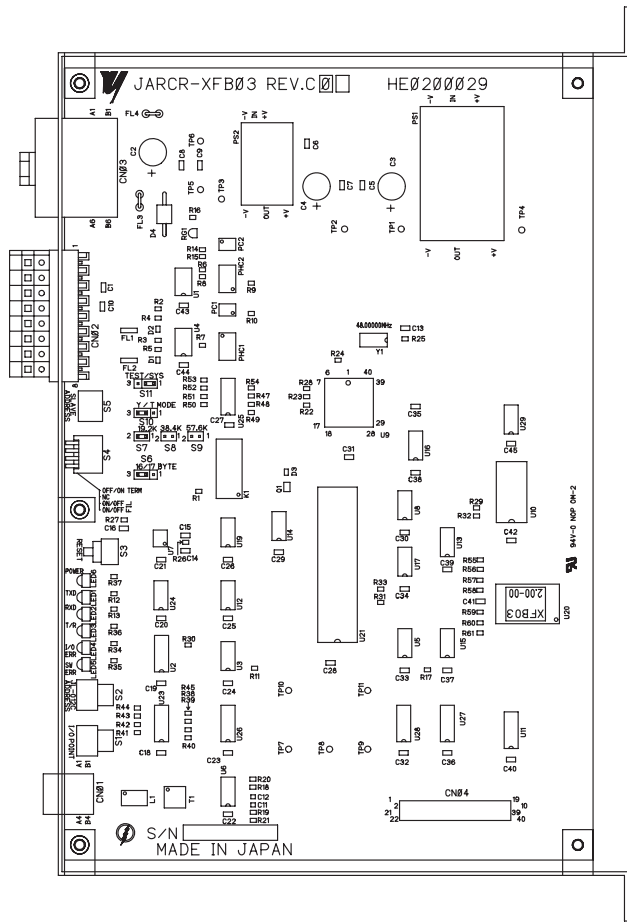
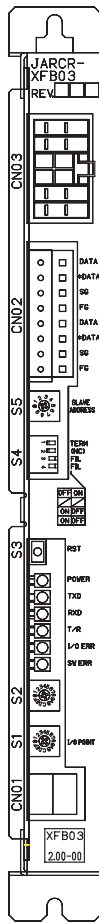
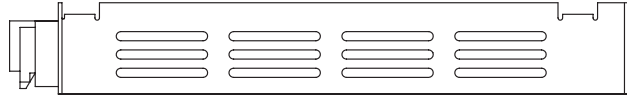
- Wiring between modules requires only one transmission cable.
- The transmission cable can be extended up to 100 m (total length of cables).
- A system can be constructed at lower cost because of minimal wiring.
- Up to 112 transmission I/O points are available (input: 112 points, output: 112 points).
- The XFB03 board is used exclusively for a slave station.

### 1.2 System Configuration Example



## 2 Hardware Specifications

### 2.1 Board External View



## 2.2 Board Specifications

Items	Specifications
Interface to external devices	Interface between modules (M-NET)
Board mounting position	Optional board mounting space in the DX100
Error indicator	LED display
Number of transmission I/O points	Maximum number of I/O points Input: 112 points Output: 112 points Note: The number of input points and the number of output points can not be set individually.

## 2.3 Communication Specifications

Items	Specifications
Communication method	Half-duplex system
Synchronization method	Asynchronous system
Transmission distance	Max. 100 m
Bit configuration	JIS 7-unit system, 10 bits
Parity check	Vertical parity detection (Even parity) Horizontal parity detection (Even parity)
Signal level	EIA standard, in conformity with RS-422
Transmission cable specifications <sup>1)</sup>	JKEV-SB, 0.75 sq × 2 p (Polyethylene insulation sheath cable with pair-type copper braid shielding for measurement)
Transmission speed	19.2/38.4/57.6Kbps
Slave station address <sup>2)</sup>	1 to 7
Transmission mode <sup>3)</sup>	T-mode/Y-mode
Number of transmission I/O points	Maximum number of I/O points Input: 112 points Output: 112 points Note: The number of input points and the number of output points can not be set individually.

1 The transmission cable specifications "JKEV-SB" is a standard of Japan Cable Industry Association.

The following shows the cable name of each manufacturer:

Sumitomo Electric Industries, Ltd.: DPEV-SB

Fujikura Ltd.: IPEV-SB

The Furukawa Electric Co., Ltd.: KPEV-SB

2 The XFB03 board is exclusive-use for a slave station.

3 "Y-mode" can be used only when the master station is a sequencer for YASKAWA M-NET and a communication is performed in "Y-mode".

## 2.4 Connector

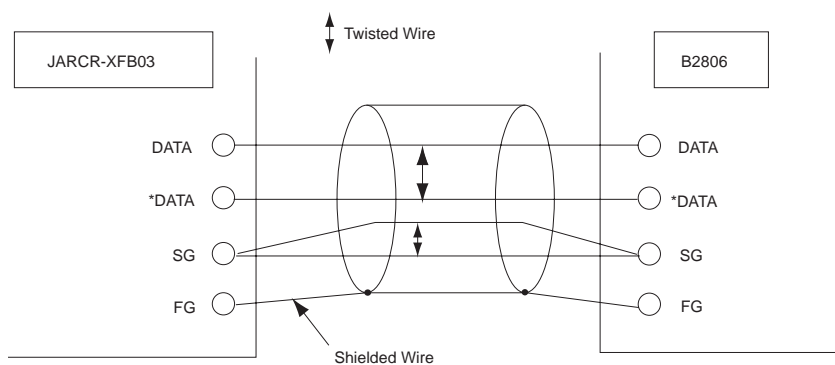
Table 2-1: CN02 (Terminal Stand for Transmission Cable Connection)

Terminal No.	Signal Name	Meaning
1	DATA	RS-422 communication signal (Terminal A)
2	*DATA	RS-422 communication signal (Terminal B)
3	SG	Signal line ground
4	FG	Frame ground (For connecting transmission cable shielded wire)
5	DATA	RS-422 communication signal (Terminal A)
6	*DATA	RS-422 communication signal (Terminal B)
7	SG	Signal line ground
8	FG	Frame ground (For connecting transmission cable shielded wire)

## 2.5 Connection of Transmission Cable

Connect the CN02 (terminal stand) on the XFB03 board and an external sequencer with a transmission cable (refer to *chapter 2.3 "Communication Specifications" at page 2-2*).

The connection example between the XFB03 board and the B2806 (Memocon-SC 2000 series) is shown below.



## 3 Setting the Functions

### 3.1 Function Setting Switches

The section explains the switches that set the functions of the XFB03 board following the instructions. Make the correct settings. For more details about the settings, refer to *chapter 3.2 "Switch Setting Method" at page 3-3*.

#### S1: I/O POINT

Sets the number of transmission I/O points.

(Set value of S1) × 8 is the actual number of I/O points.

The range for the S1 setting is from "1" to "E". (Max. 112 points each for input and output)

Set the number of points to be transferred to the sequencer side.

#### <Example>

When S1 is set to "E", the number of I/O points is as follows.

- Input: 112 points
- Output: 112 points

#### S2: Sets the stations for the XFB03 board on the DX100.

The range for the station setting is from "1" (ST#01) to "D" (ST#13).

Do not set to "0" (ST#00), "E" (ST#14) and "F" (ST#15).

#### S3: RST

Resets the XFB03 board.



Do not use the S3 since it is for maintenance only.

#### S4-1: TERM

Sets the termination resistance.

When the XFB03 board is at the termination of the network, set to "ON: termination resistance provided".

#### S4-3: FIL

Sets a noise filter for the communication line.

If problems occur during communications, noise may be the cause. To reduce the noise, set to "Filter provided". Normally, set S4-3 to "Filter not provided".

### 3 Setting the Functions

#### 3.1 Function Setting Switches

**S4-4:** Same as **S4-3**.

Be sure to set it to the same setting as **S4-3**.

#### **S5:** SLAVE ADDRESS

Sets a slave address.

The XFB03 board is regarded as one of the slave stations by an external sequencer, the master station. Using S5, set a slave address. The setting range of S5 is "1" to "7".

#### **S6:** 16/17 BYTE

Switches the communication modes between 16 and 17 bytes.

##### **Be sure to set to 17 BYTE.**

16 BYTE is not applicable.

If the I/O points of the XFB03 board do not appear on the P.P. although the communication cable and the power cable are connected correctly as indicated in *chapter 5 "I/O Signal Allocation" at page 5-1*, S6 might be set to 16 BYTE. In this case, modify the setting to 17 BYTE.



Do not set to 16 BYTE. When setting to 16 BYTE, the I/O modules are not recognized properly.

#### **S7, 8, and 9:** 19.2 K, 38.4 K, 57.6 K

Sets a transmission baud rate for the M-NET.

Choose from 19.2 kbps, 38.4 kbps, and 57.6 kbps.

#### **S10:** Y/T MODE

Sets the transmission mode for the M-NET.

In the "T-mode", a communication of interface specifications between modules is performed.

The "Y-mode" can be used when the master station is a sequencer for YASKAWA M-NET and communications are performed in the "Y-mode". (Communications are performed according to the YASKAWA specifications.)

For details on the "Y-mode", refer to the instruction manual for the station sequencer.

#### **S11:** TEST/SYS



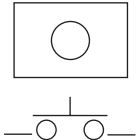
Sets the operation mode of the XFB03 board.





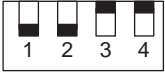


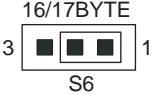
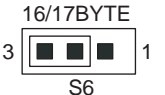
Set S11 to "SYS" (normal mode).

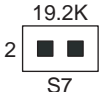
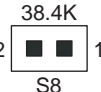

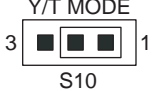
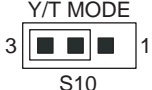
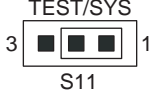

Never set to "TEST" (test mode) since the test mode is for maintenance only.

### 3.2 Switch Setting Method

Switches	Setting Method																
<p>S1</p> <p>Setting of the number of I/O points</p>	<div style="display: flex; align-items: flex-start;">  <div> <p>Sets the number of transmission I/O points. Turn the arrows to the numbers corresponding to the desired number of I/O points. Use a flat tip driver.</p> </div> </div> <p>The following shows the relation between the switch settings and the actual number of I/O points.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">0: Unavailable</td> <td style="width: 50%;">8: 64[72]</td> </tr> <tr> <td>1: 8[16]</td> <td>9: 72[80]</td> </tr> <tr> <td>2: 16[24]</td> <td>A: 80[88]</td> </tr> <tr> <td>3: 24[32]</td> <td>B: 88[96]</td> </tr> <tr> <td>4: 32[40]</td> <td>C: 92[104]</td> </tr> <tr> <td>5: 40[48]</td> <td>D: 104[112]</td> </tr> <tr> <td>6: 48[56]</td> <td>E: <b>112[120] (Default setting)</b></td> </tr> <tr> <td>7: 56[64]</td> <td>F: Unavailable</td> </tr> </table> <p>The value in [ ] is the number of I/O points reserved for the XFB03 board inside the DX100. (The area for the board status is included.)</p>	0: Unavailable	8: 64[72]	1: 8[16]	9: 72[80]	2: 16[24]	A: 80[88]	3: 24[32]	B: 88[96]	4: 32[40]	C: 92[104]	5: 40[48]	D: 104[112]	6: 48[56]	E: <b>112[120] (Default setting)</b>	7: 56[64]	F: Unavailable
0: Unavailable	8: 64[72]																
1: 8[16]	9: 72[80]																
2: 16[24]	A: 80[88]																
3: 24[32]	B: 88[96]																
4: 32[40]	C: 92[104]																
5: 40[48]	D: 104[112]																
6: 48[56]	E: <b>112[120] (Default setting)</b>																
7: 56[64]	F: Unavailable																
<p>S2</p> <p>Setting of the station</p>	<div style="display: flex; align-items: flex-start;">  <div> <p>Sets the station. Turn the arrows to the numbers corresponding to the desired station number. Use a flat tip driver.</p> </div> </div> <p>The following shows the relation between the switch settings and the station.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">0: Unavailable</td> <td style="width: 50%;">8: ST#08</td> </tr> <tr> <td>1: ST#01</td> <td>9: ST#09</td> </tr> <tr> <td>2: ST#02</td> <td>A: ST#10</td> </tr> <tr> <td>3: ST#03</td> <td>B: ST#11</td> </tr> <tr> <td>4: ST#04</td> <td>C: ST#12</td> </tr> <tr> <td>5: <b>ST#05 (Default setting)</b></td> <td>D: ST#13</td> </tr> <tr> <td>6: ST#06</td> <td>E: Unavailable</td> </tr> <tr> <td>7: ST#07</td> <td>F: Unavailable</td> </tr> </table> <p>The value of ST# is the station number display on the programming pendant of the DX100 when setting the I/O modules.</p>	0: Unavailable	8: ST#08	1: ST#01	9: ST#09	2: ST#02	A: ST#10	3: ST#03	B: ST#11	4: ST#04	C: ST#12	5: <b>ST#05 (Default setting)</b>	D: ST#13	6: ST#06	E: Unavailable	7: ST#07	F: Unavailable
0: Unavailable	8: ST#08																
1: ST#01	9: ST#09																
2: ST#02	A: ST#10																
3: ST#03	B: ST#11																
4: ST#04	C: ST#12																
5: <b>ST#05 (Default setting)</b>	D: ST#13																
6: ST#06	E: Unavailable																
7: ST#07	F: Unavailable																
<p>S3</p>	<div style="display: flex; align-items: flex-start;">  <div> <p>The push button S3 resets the XFB03 board. Never use the S3 since it is for maintenance only.</p> </div> </div>																



Switches	Setting Method
<p>S4-1</p> <p>Setting of termination resistance</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">   </div> <div style="width: 50%;"> <p>ON: Termination resistance provided (upper)</p> <p>OFF: Termination resistance not provided (lower) (Default setting)</p> </div> </div> <p>When the XFB03 board is configured at the termination of slave stations, set the S4-1 to "ON: Termination provided".</p>
<p>S4-3 and S4-4</p> <p>Setting of noise filter for communication</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">   </div> <div style="width: 50%;"> <p><b>OFF: Noise filter not provided (upper) (Default setting)</b></p> <p>ON: Noise filter provided (lower)</p> </div> </div> <p>When the XFB03 board is used under the conditions with excessive noise, set the S4-3 and S4-4 to "ON" (Noise filter provided).</p>
<p>S5</p> <p>Setting of slave address</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;">  </div> <div style="width: 80%;"> <p>Sets the slave address of XFB03 board. Turn the arrows to the numbers corresponding to the desired slave address. Use a flat tip driver.</p> <p>The following shows the relation between the switch settings and the slave addresses.</p> <p>0: Unavailable  <b>1: Address 1 (Default setting)</b>                  2: Address 2                  3: Address 3                  4: Address 4                  5: Address 5                  6: Address 6                  7: Address 7                  8: Unavailable                  9: Unavailable</p> </div> </div>
<p>S6</p> <p>Setting of communication bytes</p>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">   </div> <div style="width: 50%;"> <p><b>Short-circuited between 1 and 2: 17-byte mode</b> *Setting indispensable</p> <p>Short-circuited between 2 and 3: 16-byte mode (Default setting) *Setting unavailable</p> <p><b><u>Be sure to set to "17-byte mode".</u></b> Modify the setting to 17-byte mode as the default setting is 16-byte mode.</p> </div> </div>

Switches	Setting Method
<p>S7, S8, S9 *</p> <p>Setting of communication baud rate</p>	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>19.2K</p>  <p>S7</p> </div> <div style="text-align: center;"> <p>38.4K</p>  <p>S8</p> </div> <div style="text-align: center;"> <p>57.6K</p>  <p>S9</p> </div> <div style="margin-left: 20px;"> <p><b>Short-circuited between 1 and 2 of S7: 19.2 kbps (Default setting)</b></p> <p>Short-circuited between 1 and 2 of S8: 38.4 kbps</p> <p>Short-circuited between 1 and 2 of S9: 57.6 kbps</p> </div> </div> <p>Sets a transmission baud rate. *Note: A transmission baud rate is 9.6 Kbps when S7, S8, and S9 are not used for short-circuit applications.</p>
<p>S10</p> <p>Setting of communication mode</p>	<div style="margin-bottom: 20px;"> <p>Y/T MODE</p>  <p>S10</p> <p>Short-circuited between 1 and 2: T-mode</p> </div> <div> <p>Y/T MODE</p>  <p>S10</p> <p><b>Short-circuited between 2 and 3: Y-mode (Default setting)</b></p> </div> <p>"Y-mode" can be used only when the master station is a sequencer for YASKAWA M-NET and a communication is performed in the "Y-mode".</p>
<p>S11</p> <p>Setting of the operation mode</p>	<div style="margin-bottom: 20px;"> <p>TEST/SYS</p>  <p>S11</p> <p><b><u>Short-circuited between 1 and 2: Normal (SYS) mode (Default setting)</u></b> *Setting indispensable</p> </div> <div> <p>TEST/SYS</p>  <p>S11</p> <p>Short-circuited between 2 and 3: Test mode *Setting unavailable</p> </div> <p><b><u>Be sure to set to the "Normal (SYS) mode".</u></b></p>

## 4 Mounting the XFB03 Board



### WARNING

- Before wiring, be sure to turn OFF the power supply and put up a warning sign, such as “DO NOT TURN ON THE POWER.”

Failure to observe this warning may result in an electric shock or an injury.

- Do not touch the inside of the panel for 5 minutes after the power is turned OFF.

The remaining charged voltage in the capacitor may cause an electric shock or an injury.

- Be sure to close the door and install the protection cover while the power is turned ON.

Failure to observe this warning may result in a fire or an electric shock.



### CAUTION

- The wiring and mounting must be performed by authorized and qualified personnel.

Failure to observe this caution may result in a fire or an electric shock.

- Make sure that there is no foreign matter such as metal chips on the board.

In case of malfunction, etc. it may result in an injury or damage the board.

- Make sure that there is no damage or deflection of parts on the board.

In case of malfunction, etc. it may result in an injury or damage the board.

- Correctly connect each cable and connector.

Failure to observe this caution may result in a fire or damage the board.

- Set the switches, etc. correctly.

Malfunction, caused by an incorrect setting, may result in an injury or damage the board.

- Never touch the mounting surfaces of the board parts directly with fingers.

The generated static electricity may damage the IC.

- Never touch the soldered surfaces of the board directly with fingers.

Protrusions on the soldered surface may result in an injury.

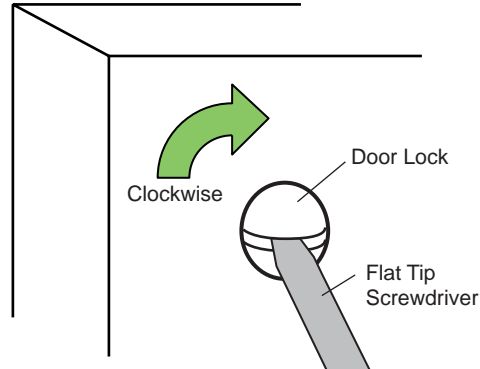
- No shock to the board.

The shock may damage the board.

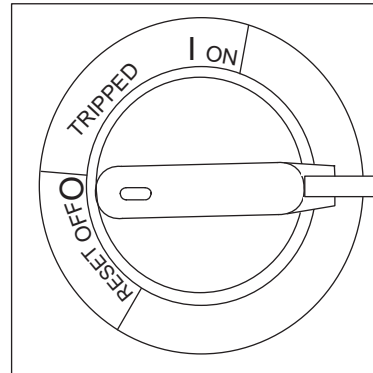
### 4.1 Opening Front Door of the DX100

Mount the XFB03 board in the following manner.

1. Turn the two door locks on the front face of the DX100 clockwise for 90° with a coin or a flat tip screwdriver.



2. With the door locks turned clockwise for 90°, turn the main switch handle to the "OFF" position, and slowly open the door.



### 4.2 Confirming the Switch Settings on the XFB03 Board

1. Be sure that the main power supply is turned OFF.
2. Be sure that the settings of switches on the board are correct.
3. For the switch settings, refer to *chapter 3 "Setting the Functions" at page 3-1*.

### 4.3 Connecting Transmission Cable

1. Connect one end of the transmission cable to the CN02 (terminal stand for transmission cable connection).
2. Connect the other end of the cable to a device used to communicate with the M-NET. For details on connection, refer to *chapter 2 "Hardware Specifications" at page 2-1*.

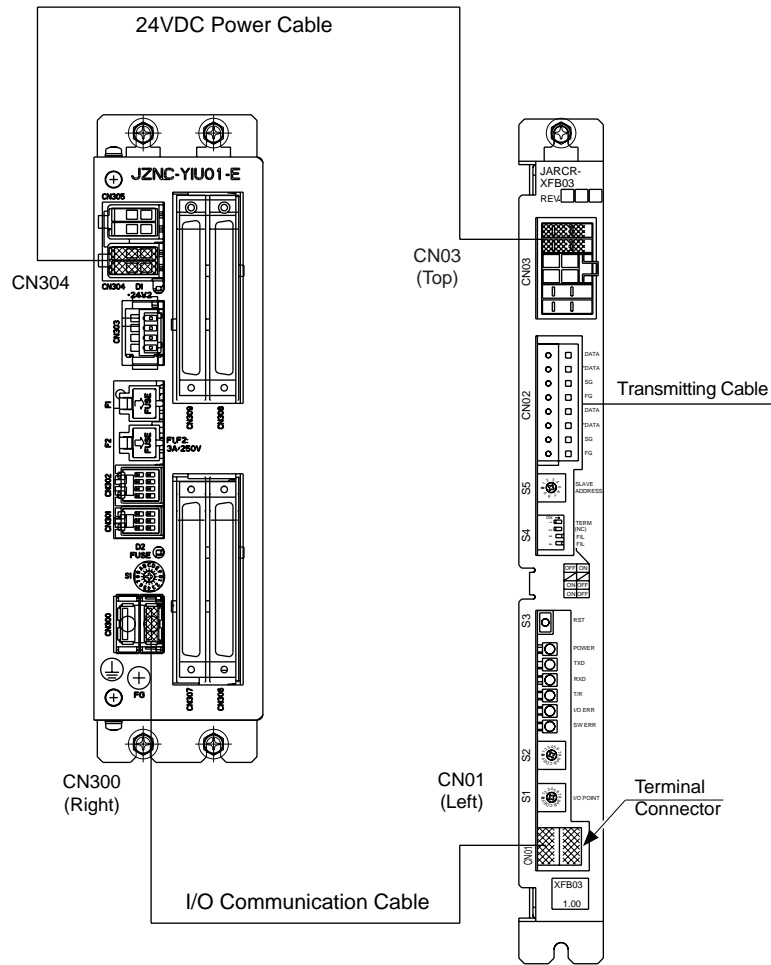
### 4.4 Mounting the XFB03 Board on the DX100

1. Fix the XFB03 board on the DX100 with the board fixing screws securely tightened.

DX100

- 4 Mounting the XFB03 Board
- 4.5 Connecting Each Cable

### 4.5 Connecting Each Cable



4 Mounting the XFB03 Board  
 4.6 Closing the Front Door of the DX100

**NOTE**

A dummy connector is inserted into the CN03 of the 24VDC power supply connector on the XFB03 board.

Do not remove this connector for avoidance of incorrect cable connections. Removing this connector may result in incorrect connection of the 24 VDC power cable to the CN03. This prevents power from being supplied properly to the XFB03 board, and the XFB03 board may not start up.

24V  
 24VU  
 Not used  
 Not used  
 24V  
 24VU

Dummy Connector  
 \* Keep the dummy connector inserted to this position. (Do not remove)

CN03

24 VDC Power Cable Connecting Position

24 VDC Power Cable  
 CN03 (Correct Position)

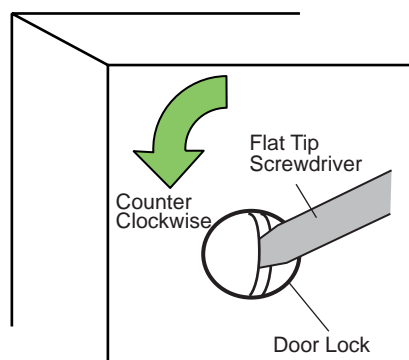
24 VDC Power Cable  
 CN03 (Incorrect Position)

24 VDC Power Cable  
 CN03 (Incorrect Position)

(\*Removing the dummy connector leads to incorrect connection of the power cable. This results in insufficient 24VDC power supply to

**4.6 Closing the Front Door of the DX100**

1. Close the door gently.
2. Turn the two door locks on the front face of the DX100 counterclockwise for 90° with a coin or a flat tip screwdriver.



DX100	5	I/O Signal Allocation
	5.1	I/O Module Setting

## 5 I/O Signal Allocation

### 5.1 I/O Module Setting

In order to use a XFB03 board on the DX100, perform the I/O module setting in the following manner.



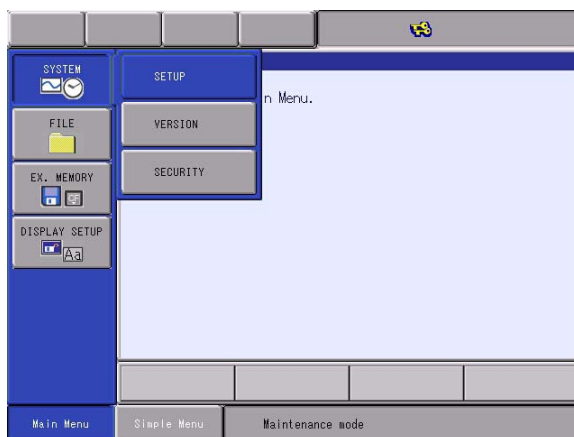
Add an I/O module in the management mode.

In the operation mode and the editing mode, the settings are for reference only.

1. Turn the power supply ON again while pressing [MAIN MENU] simultaneously.
  - The main menu appears.



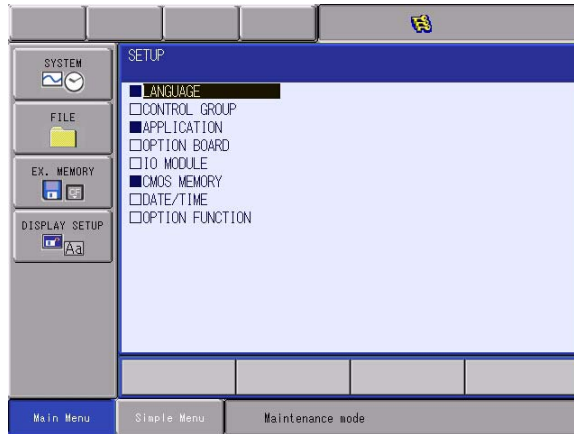
2. Set the Security Mode to the "MANAGEMENT MODE".
3. Select {SYSTEM} under the main menu.
  - The sub menu appears.



5 I/O Signal Allocation  
 5.1 I/O Module Setting

4. Select {SETUP}.

– The SETUP window appears.



5. Select {IO MODULE}.

– The current status of the mounted I/O modules is shown as in the following.



– Press [ENTER] to display the module mounted status for the rest of the stations.





DX100

5 I/O Signal Allocation  
 5.1 I/O Module Setting

6. Confirm the status of the mounted I/O module.

- Only mounted I/O module is displayed. Confirm that each station (ST#) is the same as the I/O module's actual mounting status.
- The following information is shown for each station.

ST#	Station address of I/O module
DI	Number of digital input points <sup>1)</sup>
DO	Number of digital output points <sup>1)</sup>
AI	Number of analog input points <sup>1)</sup>
AO	Number of analog output points <sup>1)</sup>
BOARD	Circuit board type <sup>2)</sup>

1 A hyphen "-" indicates the corresponding I/O module is not mounted.

2 If the system cannot recognize the circuit board type, "\*\*\*\*\*" is shown. No problem will occur as long as the values displayed in DI, DO, AI, and AO are correct.

- The followings are the configurations of boards as examples shown in the above window in the Explanation 5.

ST#05: JARCR-XFB03 board  
 (digital input 120 points, digital output 120 points)

Switch S2: Set to 5.(This value becomes the ST#.)

ST#14: JZNC-YIU01-E unit  
 (digital input 40 points, digital output 40 points)

This unit is fixed to ST#14.

**NOTE**

The following should be taken into consideration when reading the display.

For the XFB03 board, as the number of I/O points reserved for the board status exists other than the number of transmission I/O points set at S1, the number of I/O points shown in the display is the number calculated by "the set value of S1 + 1 (for the board status)".

**<Example>**

When the S1 is set to “5”, the number of I/O points would be recognized as 48, for which the formula is :  $((5+1) \times 8)$ .

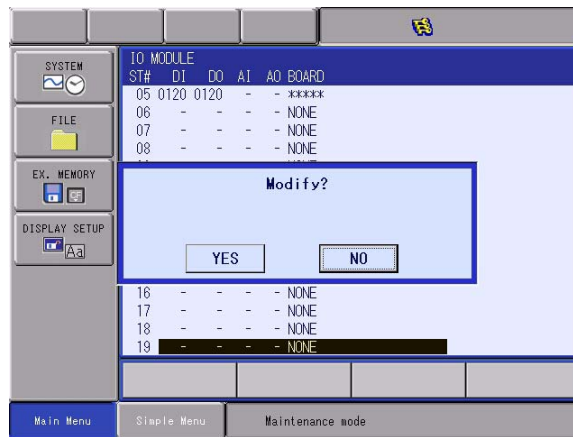
Accordingly, “DI : 048 DO : 048” is displayed.

The relationship between the set value of S1 and the I/O module display is shown below:

S1	Display (I/O point)	
	DI	DO
1	016	016
2	024	024
3	032	032
4	040	040
5	048	048
6	056	056
7	064	064
8	072	072
9	080	080
A	088	088
B	096	096
C	104	104
D	112	112
E	120	120

7. Press [ENTER].

– The confirmation dialog box appears.



DX100

5 I/O Signal Allocation  
5.1 I/O Module Setting

8. Select "YES".

- Press "YES" if the display corresponds to the current mounted status of the I/O modules. The system parameters are automatically set according to the current mounted status of the hardware. The procedures to add I/O modules are completed.



If the display does not indicate the actual mounted status, recheck the cable connection and the switch setting. The following causes are suspected.

- Improper setting of I/O communications

Setting of S6 on the XFB03 board may be improper. XFB03 board would not be recognized properly when this condition is applied.

- Improper or overlapped station settings

One optional board can be selected for each station. When changing the S2 setting, make sure that no stations overlap.

- Improper connection of the 24VDC power cable and the I/O communication cable

The 24VDC cable and the I/O communication cable may not be connected properly. Improper connection of the 24VDC power cable to the right position of CN03 may lead to improper power supplying to the board. Recheck the cable connection referring to the chapter 4.

- I/O module failure

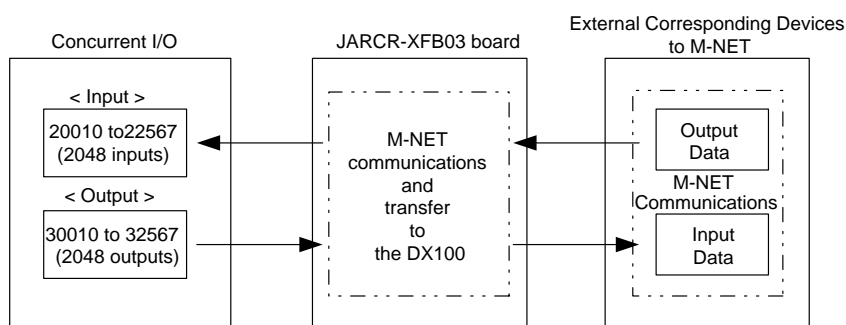
When the above causes do not apply, and the display still does not correspond to the actual mounted status, failure of an I/O module is suspected. Contact your YASKAWA representative.

### 5.2 Transmitting Data

The data to be transferred from the XFB03 board to inside of the DX100 is not only the I/O data from the external device connected to the M-NET, but also the status of the XFB03 board.

Therefore, inside the DX100, 8 points (1 byte) for both input and output are reserved for the status of the XFB03 board beside the area for the digital data. However, the output area can not be used.

The transmission data from the XFB03 board is allocated to the external I/O signals of concurrent I/O.



When only a XFB03 board (input: 40 points, output: 40 points) is mounted as option, the concurrent I/O allocation of each board is as follows.  
(20010 to 20057 are used for the standard I/O of the DX100).

Board	Input	Output
XFB03	20060 to 20067 board status *1	30060 to 30067 cannot be used
	20070 to 20077 input data (1)	30070 to 30077 output data (1)
	20080 to 20087 input data (2)	30080 to 30087 output data (2)
	20090 to 20097 input data (3)	30090 to 30097 output data (3)
	20100 to 20107 input data (4)	30100 to 30107 output data (4)
	20110 to 20117 input data (5)	30110 to 30117 output data (5)

DX100

5 I/O Signal Allocation  
 5.2 Transmitting Data

\*1 [XFB03 Board Status]

The status of the XFB03 board (the first 8 points of the allocation area) is indicated as follows.

The value "xxx" of the allocated input signals in the table indicates the first number of the XFB03 board allocation number. In the table on the previous page, where the allocation numbers were 20060 to 20067, "xxx" would be 006.

Signal	Contents	
2xxx0	Reserved	Do not use since it is reserved for system.
2xxx1	Status of insulation power supply for communication	Indicates DC/DC converter output status on the XFB03 board. Normal: 0 Error: 1
2xxx2	Switch setting status	Indicates the setting status of switches on the XFB03 board. Normal: 0 Error: 1
2xxx3	Communication status	Indicates the communication status of M-NET. Normal: 0 Error: 1
2xxx4	Reserved	Do not use since it is reserved for system.
2xxx5	CPU operation status	Indicates the CPU operation status of the XFB03 board. Normal: 0 Error: 1
2xxx6	Reserved	Do not use since it is reserved for system.
2xxx7	Reserved	Do not use since it is reserved for system.

## 6 Error Indication

### 6.1 LED Indicators

The operation status and/or error occurrence is displayed by LEDs on the XFB03 board.

The LED indicator and its contents are explained below.

LED	Indication	Meanings	Classification
LED1 (TXD)	Green Flashing	• Data are sent.	For monitoring
LED2 (RXD)	Green Flashing	• Data are received.	
LED3 (T/R)	Green Lit	• The operation mode is set to "Normal mode".	
LED6 (POWER)	Unlit	• The insulation power supply (DC/DC converter) malfunctions. • An error occurs in CPU processing.	
LED4 (I/O ERR)	Red Lit	• The number of transmission data does not corresponds to the setting of master station. • An error occurs during transmission.	Error display
LED5 (SW ERR)	Red Lit	• Incorrect switch setting	

### 6.2 Corrective Actions

The corrective actions when a LED is lit or unlit at error occurrence are explained in the following list.

Error Contents	LED		Corrective Actions
Transmission error	LED4 (I/O ERR)	Lit	• Verify if the setting of the master station is the same as the setting of XFB03 board. • Verify the transmission cable connection. • Turn ON the control power supply again.
Incorrect switch setting	LED5 (SW ERR)	Lit	• Verify the switch settings on the board again.
Insulation power supply error	LED6 (POWER)	Unlit	• Replace the XFB03 board.
CPU processing error	LED6 (POWER)	Unlit	• Replace the XFB03 board. • Turn ON the control power supply again.

# DX100 OPTIONS JARCR-XFB03 BOARD INSTRUCTIONS

FOR M-NET

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