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 (for each purpose)
DX200 MAINTENANCE MANUAL

Part Number: 174077-1CD
Revision: 1
MANDATORY

- This manual explains the explosion-proof programming pendant of the DX200 system. Read this manual carefully and be sure to understand its contents before handling the DX200.
- General items related to safety are listed in Chapter 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 installation, operation, maintenance, or inspection of the DX200.

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”.

DANGER

- Maintenance and inspection must be performed by specified personnel.
  Failure to observe this caution may result in electric shock or injury.
- For disassembly or repair, contact your Yaskawa representative.
- Do not remove the motor, and do not release the brake.
  Failure to observe these safety precautions may result in death or serious injury from unexpected turning of the manipulator's arm.
WARNING

• Before operating the manipulator, check that servo power is turned OFF pressing the emergency stop buttons. 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:
  – 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.
  – 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 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 P-point maximum envelope of the manipulator during operation. Always press an emergency stop button immediately if there is a problem.
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 the manipulator cables.

In this manual, the equipment is designated as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DX200 controller</td>
<td>DX200</td>
</tr>
<tr>
<td>DX200 programming pendant</td>
<td>Programming pendant</td>
</tr>
<tr>
<td>Cable between the manipulator and the controller</td>
<td>Manipulator cable</td>
</tr>
</tbody>
</table>

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 DX200 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 DX200 Instructions before operating the manipulator.
Description of the Operation Procedure

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

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Pendant</td>
<td></td>
</tr>
<tr>
<td>Character Keys</td>
<td>The keys which have characters printed on them are denoted with [ ]. ex. [ENTER]</td>
</tr>
<tr>
<td>Symbol Keys</td>
<td>The keys which have a symbol printed on them are not denoted with [ ] but depicted with a small picture. ex. page key</td>
</tr>
<tr>
<td>Axis Keys</td>
<td>&quot;Axis Keys&quot; are generic names for the keys for axis operation.</td>
</tr>
<tr>
<td>Keys pressed simultaneously</td>
<td>When two keys are to be pressed simultaneously, the keys are shown with a &quot;+&quot; sign between them, ex. [SHIFT] + [COORD]</td>
</tr>
<tr>
<td>Displays</td>
<td>The menu displayed in the programming pendant is denoted with { }. ex. {JOB}</td>
</tr>
</tbody>
</table>

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.
Safeguarding Tips

All operators, programmers, maintenance personnel, supervisors, and anyone working near the system must become familiar with the operation of this equipment. All personnel involved with the operation of the equipment must understand potential dangers of operation. General safeguarding tips are as follows:

- Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation of this equipment, the operator's manuals, the system equipment, and options and accessories should be permitted to operate this equipment.
- Improper connections can damage the equipment. All connections must be made within the standard voltage and current ratings of the equipment.
- The system must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.
- In accordance with ANSI/RIA R15.06-2012, section 4.2.5, Sources of Energy, use lockout/tagout procedures during equipment maintenance. Refer also to Section 1910.147 (29CFR, Part 1910), Occupational Safety and Health Standards for General Industry (OSHA).

Mechanical Safety Devices

The safe operation of this equipment is ultimately the user's responsibility. The conditions under which the equipment will be operated safely should be reviewed by the user. The user must be aware of the various national codes, ANSI/RIA R15.06-2012 safety standards, and other local codes that may pertain to the installation and use of this equipment.

Additional safety measures for personnel and equipment may be required depending on system installation, operation, and/or location. The following safety equipment is provided as standard:

- Safety barriers
- Door interlocks
- Emergency stop palm buttons located on operator station

Check all safety equipment frequently for proper operation. Repair or replace any non-functioning safety equipment immediately.
Programming, Operation, and Maintenance Safety

All operators, programmers, maintenance personnel, supervisors, and anyone working near the system must become familiar with the operation of this equipment. Improper operation can result in personal injury and/or damage to the equipment. Only trained personnel familiar with the operation, manuals, electrical design, and equipment interconnections of this equipment should be permitted to program, or maintain the system. All personnel involved with the operation of the equipment must understand potential dangers of operation.

- Inspect the equipment to be sure no potentially hazardous conditions exist. Be sure the area is clean and free of water, oil, debris, etc.
- Be sure that all safeguards are in place. Check all safety equipment for proper operation. Repair or replace any non-functioning safety equipment immediately.
- Check the E-Stop button on the operator station for proper operation before programming. The equipment must be placed in Emergency Stop (E-Stop) mode whenever it is not in use.
- Back up all programs and jobs onto suitable media before program changes are made. To avoid loss of information, programs, or jobs, a backup must always be made before any service procedures are done and before any changes are made to options, accessories, or equipment.
- Any modifications to the controller unit can cause severe personal injury or death, as well as damage to the robot! Do not make any modifications to the controller unit. Making any changes without the written permission from Yaskawa will void the warranty.
- Some operations require a standard passwords and some require special passwords.
- The equipment allows modifications of the software for maximum performance. Care must be taken when making these modifications. All modifications made to the software will change the way the equipment operates and can cause severe personal injury or death, as well as damage parts of the system. Double check all modifications under every mode of operation to ensure that the changes have not created hazards or dangerous situations.
- This equipment has multiple sources of electrical supply. Electrical interconnections are made between the controller and other equipment. Disconnect and lockout/tagout all electrical circuits before making any modifications or connections.
- Do not perform any maintenance procedures before reading and understanding the proper procedures in the appropriate manual.
- Use proper replacement parts.
- Improper connections can damage the equipment. All connections must be made within the standard voltage and current ratings of the equipment.
**Maintenance Safety**

Turn the power OFF and disconnect and lockout/tagout all electrical circuits before making any modifications or connections.

Perform only the maintenance described in this manual. Maintenance other than specified in this manual should be performed only by Yaskawa-trained, qualified personnel.

**Summary of Warning Information**

This manual is provided to help users establish safe conditions for operating the equipment. Specific considerations and precautions are also described in the manual, but appear in the form of Dangers, Warnings, Cautions, and Notes.

It is important that users operate the equipment in accordance with this instruction manual and any additional information which may be provided by Yaskawa. Address any questions regarding the safe and proper operation of the equipment to Yaskawa Customer Support.
Customer Support Information

If you need assistance with any aspect of your Explosion-Proof Programming Pendant 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:

technicalsupport@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: Explosion-Proof Programming Pendant

• 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
# Table of Contents

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  1.1 Key Description.................................................................................................................. 1-2  
  1.2 Programming Pendant Keys.............................................................................................. 1-3  
  1.3 Main Menu Screen............................................................................................................. 1-9  
  1.4 External Memory.............................................................................................................. 1-10  
  1.5 Error Display of Explosion-proof Programming Pendant................................................. 1-11  
  1.6 Functional Limitation of Explosion-proof Programming Pendant...................................... 1-13  
  1.7 Function Key Display....................................................................................................... 1-14
1 Programming Pendant Overview

The programming pendant is equipped with the keys and buttons used to conduct manipulator teaching operations and to edit jobs.
1.1 Key Description

- **Character Keys**
  
  The keys which have characters printed on them are denoted with [ ].

  ```
  ENTER
  ```

  is shown as [ENTER] and

  ```
  TEACH LOCK
  ```

  is shown as [TEACH LOCK].

- **Symbol Keys**

  The keys which have a symbol printed on them are not denoted with [ ] but depicted with a small picture, with the exception of the cursor key, which is not shown with a picture.

  ```
  Cursor
  ```

  : Emergency Stop Button

- **Axis Keys**

  The keys pictured in the following are referred to as the axis keys when described.

- **Keys Pressed Simultaneously**

  When two keys are to be pressed simultaneously, the keys are shown with a “+” sign between them, such as [SHIFT] + [COORD].
## 1.2 Programming Pendant Keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
</table>
| **E.STOP Button** | Turns **OFF** the servo power.  
• When the servo power is turned OFF, the SERVO ON icon on the programming pendant and the SERVO ON lamp on the playback panel will extinguish.  
• An emergency stop message is displayed on the screen. |
| **Enable Switch** | Turns **ON** the servo power.  
• When the Enable switch is lightly squeezed while the SERVO ON icon is flashing and Teach Lock is ON, the power is turned ON.  
• And when this switch is released or firmly squeezed while the power is turned ON, the power turns OFF. |
| [TEACH LOCK]     | **Sets to Teach Lock.** When the Teach Lock is set, the TEACH LOCK icon appears on the programming pendant.  
When you set Teach Lock, start operation is disabled and mode changes are locked out until TEACH LOCK is turned OFF. |
| **Cursor**       | Moves the cursor in the direction of the arrow.  
• The size of the cursor and the range/place where the cursor can move will vary depending on the display.  
• If the UP cursor button is pressed when the cursor is on the first line, the cursor will move to the last line of the job. Conversely, if the cursor is on the last line of the job and the DOWN cursor button is pressed, the cursor will jump to the first line of the job.  
When [SHIFT] is pressed simultaneously:  
[SHIFT] + UP  
Goes back to the previous page.  
[SHIFT] + DOWN  
Goes to the next page.  
[SHIFT] + RIGHT  
Scrolls the instruction area of the job content or playback display to the right.  
[SHIFT] + LEFT  
Scrolls the instruction area of the job content or playback display to the left. |
| **[SELECT]**     | Selects menu items such as main menu, pull down menu, etc. |

Explosion-Proof Programming Pendant
1 Programming Pendant Overview

1.2 Programming Pendant Keys

**[MAIN MENU]**

Displays the main menu.

When [SHIFT] is pressed simultaneously:

[SHIFT] + [MAIN MENU]

When any display appears, the screen changes in the order of the display, sub-menu and main menu.

**[AREA]**

Moves the cursor between “Menu Area” and “General Purpose Display Area”.

When [SHIFT] is pressed simultaneously:

[SHIFT] + [AREA]

The language can be switched when the bilingual function is valid. (Bilingual function is optional.)

**[PAGE]**

Displays the next page.

When [SHIFT] is pressed simultaneously, the previous page is displayed.

The page can be changed when the page icon appears in the status area.

**[DIRECT OPEN]**

Displays the content related to the current line.

- To display the content of a CALL job or condition file, move the cursor to the next line and press [DIRECT OPEN]. The file will be displayed for the selected line.

Example:

For a CALL instruction, the content of the called job will be displayed.

For a work instruction, the content of the condition file will be displayed.

For Input/output instructions, the input/output condition will be displayed.

**[COORD]**

Select the operation coordinate system when the manipulator is operated manually.

- Five coordinate systems (joint, rectangular, cylinder, tool and user) can be used.

  Each time this key is pressed, the coordinate system is switched in the following order:

  "JOINT"→"WLD/CYL"→"TOOL"→"USER"

  - The selected coordinate system is displayed on the status display area.

When [SHIFT] is pressed simultaneously:

[SHIFT] + [COORD]

The coordinate number can be changed when the "TOOL" or "USER" coordinate system is selected.
Sets the speed for manual operation. This speed is also valid for operations with [FWD] and [BWD].

- There are four speed levels (slow, medium, fast, and inching). Each time [MANUAL SPEED] is pressed, manual speed changes in the following order. The selected speed is displayed on the status area.

Each time [MANUAL SPEED] is pressed:

"INCH" → "SLOW" → "MED" → "FST"

Each time [SHIFT] + [MANUAL SPEED] is pressed simultaneously:

"FST" → "MED" → "SLOW" → "INCH"

Changes the speed of axis operation when the axis button is pressed. The speed of the manipulator will change to high regardless of the programmed speed while this key is pressed.

- The speed for [HIGH SPEED] is specified in advance.
- Note that only one axis can be operated at high speed. High-speed operation of multiple axes is not possible.

Selects the interpolation type for playback operation.
The selected interpolation type is shown in the status display area on the screen.

- Each time this key is pressed, the interpolation type changes in the following order:
  "MOVJ" → "MOVL" → "MOVC" → "MOVS"

When [SHIFT] is pressed simultaneously:

The interpolation mode changes in the following order:

"STANDARD" → "EXTERNAL REFERENCE POINT" → "CONVEYOR"

Interpolation type can be changed in any mode.

* These modes are purchased options.

Changes the control group to be operated.

- Pressing this key switches the axis operation control group to the group which is currently not a target to be operated among the control groups which are registered in the currently selected jobs. When there is only one control group which is registered in the currently selected jobs, the control group is not switched.

When [SHIFT] is pressed simultaneously:

- Pressing these keys switches the axis operation control group to the group which is currently not a target to be operated among the control groups which are not registered in the currently selected jobs. When there is no control group which is not registered in the currently selected jobs, the control group is not switched.
# Programming Pendant Overview

## 1.2 Programming Pendant Keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Axis Key** | Moves specified axes on manipulator.  
  - The manipulator axes only move while the key is held down.  
  - Multiple axes can be operated simultaneously by pressing two or more keys at the same time.  |
| **[TEST START]** | Moves the manipulator through to check the path of taught steps in a continuous motion when [TEST START] and [INTERLOCK] are simultaneously pressed.  
  - The manipulator operates according to the currently selected operation cycle: "AUTO", "1CYCLE", or "STEP".  
  - If the taught speed exceeds the maximum teaching speed, the operation proceeds at the maximum teaching speed.  
  - When [INTERLOCK] is pressed simultaneously:  
    - [INTERLOCK] + [TEST START]  
      - The manipulator operates at the taught speed.  
      - Operation stops immediately when [TEST START] is released. |
| **[FWD]** | Moves the manipulator through the taught steps while this key is pressed.  
  - Only move instructions are executed.  
  - When [INTERLOCK] is pressed simultaneously:  
    - [INTERLOCK] + [FWD]  
      - All instructions except move instructions are executed. |
| **[BWD]** | Moves the manipulator through the taught steps in the reverse direction while this key is pressed.  
  - Only move instructions are executed. |
| **[INFORM LIST]** | Displays instruction lists of commands available for job editing. |
| **[CANCEL]** | Cancels data input and resets errors. |
## Programming Pendant Overview

### 1.2 Programming Pendant Keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[EDIT]</td>
<td>By pressing this key, the following functions are available:&lt;br&gt;• Insert (when the INS icon is displayed on the P.P.)&lt;br&gt;• Modify (when the ALT icon is displayed on the P.P.)&lt;br&gt;• Delete (when the DEL icon is displayed on the P.P.)&lt;br&gt;Registers instructions, data, current position of the manipulator, etc.&lt;br&gt;• When [ENTER] is pressed, the instruction or data displayed in the input buffer line moves to the cursor position to complete a registration, insertion, or modification.</td>
</tr>
<tr>
<td>[ENTER]</td>
<td>Changes the functions of the other keys by pressing together.&lt;br&gt;**&lt;Can be used with the following keys:&gt;*&lt;br&gt;• [MAIN MENU] , [COORD] , [MOTION TYPE] , [SHORTCUT] , [PAGE] , [AREA] , [MANUAL SPEED] , [CONTROL AXIS] , [AUX MENU]</td>
</tr>
<tr>
<td>[SHIFT]</td>
<td>Changes the functions of the other keys by pressing together.&lt;br&gt;**&lt;Can be used with the following keys:&gt;*&lt;br&gt;• [TEST START] , [FWD]</td>
</tr>
<tr>
<td>[INTERLOCK]</td>
<td>Enables the servo power supply to be turned ON.&lt;br&gt;Press this button to enable the servo power supply to be turned ON if the servo power supply is shut OFF by the emergency stop or overrun signal.&lt;br&gt;When this button is pressed:&lt;br&gt;• In the play mode, the servo power supply is turned ON if the safeguarding is securely closed.&lt;br&gt;• In the teach mode, the SERVO ON icon flashes and the servo power supply is turned ON when the Enable switch is ON.&lt;br&gt;The SERVO ON icon is lit while the servo power is ON.</td>
</tr>
<tr>
<td>[SERVO ON READY]</td>
<td>&lt;Teach Mode&gt; Used to output a permission signal to prohibit painting of a spray signal. To turn OFF the permission signal, press this key again. &lt;br&gt;<strong>&lt;Play Mode&gt;</strong> Used to stop outputting a spray signal while the spray signal is being output by the SPYON instruction. To start outputting the spray signal, press this key again.</td>
</tr>
<tr>
<td>[PAINT ON/OFF]</td>
<td>Registers instructions, data, current position of the manipulator, etc.&lt;br&gt;• When [ENTER] is pressed, the instruction or data displayed in the input buffer line moves to the cursor position to complete a registration, insertion, or modification.</td>
</tr>
<tr>
<td>SHORT CUT</td>
<td>Displays the reserved display.</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------------</td>
</tr>
<tr>
<td></td>
<td>During operation the display, which is registered because it is often seen, can be called up by pressing this key. The screen goes back to the previous display by pressing this key again.</td>
</tr>
</tbody>
</table>

| NOTE | • If another display is selected while a reserved display is on the screen, the reserved display call is automatically cancelled. |
|      | • A display only used in the security mode cannot be shown in another mode. |
|      | • A display which is only used in the teach mode cannot be shown in the play mode, and vice-versa. |

<table>
<thead>
<tr>
<th>SHIFT + [SHORT CUT]</th>
<th>When [SHIFT] is pressed simultaneously:</th>
</tr>
</thead>
<tbody>
<tr>
<td>[SHIFT] [SHORT CUT]</td>
<td>The shown display is registered as the reserved display.</td>
</tr>
</tbody>
</table>

| NOTE | • The reserved display call function cannot be used for some displays (for example, the character input temporary display, external storage screen etc.). |

<table>
<thead>
<tr>
<th>AUX MENU</th>
<th>When [SHIFT] is pressed simultaneously, the function key display appears.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>If [AUX MENU] is pressed while the function key display is on the screen, the function key display is closed.</td>
</tr>
</tbody>
</table>

| NOTE | The function key display can be used with the system software version DN2.46.00-00 or later. |
|      | For details of the operation, refer to section 1.7 "Function Key Display". |
1.3 Main Menu Screen

Main menu screen of the explosion-proof specification programming pendant is displayed as follows.

![Main Menu Screen]

!Turn on servo power
1.4 External Memory

For the explosion-proof programming pendant, a USB port is prepared on the front door of the DX200. (Refer to the figure below.)

*Fig. 1-1: USB Port*

Removing the USB memory or disconnecting the control power supply while writing data to the USB memory/reading data from the USB memory may cause data corruption in the USB memory.

Please **DO NOT** remove the USB memory or disconnect the control power supply while

• the remaining bytes indication is switching to the file list window after the data of the external memory device is saved, loaded, or verified, and the hourglass icon disappears.

• the screen is switching to the file list window after the data of the external memory device is deleted.

• the folder list is being updated after a folder is created to or deleted from a folder of the external memory.

• the message “Under running auto backup” is being displayed.

• CMOS.BIN is being saved with the message “Saving system data. Don’t turn the power OFF” displayed.

• CMOS.BIN is being loaded with the message “Loading system data. Don’t turn the power OFF” displayed.

The device recognition processing is performed when a USB memory is inserted. Therefore, inserting or removing the USB memory while the robot is under operation may affect the robot movement (cycle time).

**Do not insert or remove the USB memory while the robot is under operation.**
1 Programming Pendant Overview

1.5 Error Display of Explosion-proof Programming Pendant

When the explosion-proof programming pendant detects an error, "Not Connect (Abnormal Code)" or "T.P ALARM Abnormal Code" is displayed. The contents of each error are as follows:

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Abnormal Code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Connect</td>
<td>20</td>
<td>The commands from the controller cannot be received for a period of time. Check the connection condition with the controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This is also displayed when the connection with the controller using the explosion-proof programming pendant switching function is disconnected. In this case, it is not an error.</td>
</tr>
<tr>
<td>5010</td>
<td></td>
<td>An overrun error of RS422 communication is detected. Communication may not be performed correctly because of the connection condition or influence of noise. Check the connection condition with the controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This may be also displayed when the connection with the controller using the explosion-proof programming pendant switching function is disconnected. In this case, it is not an error.</td>
</tr>
<tr>
<td>5011</td>
<td></td>
<td>A framing error of RS422 communication is detected. Communication may not be performed correctly because of the connection condition or influence of noise. Check the connection condition with the controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This may be also displayed when the connection with the controller using the explosion-proof programming pendant switching function is disconnected. In this case, it is not an error.</td>
</tr>
<tr>
<td>5012</td>
<td></td>
<td>A parity error of RS422 communication is detected. Communication may not be performed correctly because of the connection condition or influence of noise. Check the connection condition with the controller.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>This may be also displayed when the connection with the controller using the explosion-proof programming pendant switching function is disconnected. In this case, it is not an error.</td>
</tr>
</tbody>
</table>
### Error Message Abnormal Code Contents

<table>
<thead>
<tr>
<th>Error Message</th>
<th>Abnormal Code</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>T.P ALARM</td>
<td>1</td>
<td>An undefined command is received from the controller. Save CMOS.BIN, and contact your YASKAWA representative to report the data and the conditions when it occurs (operation procedure etc.).</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>An exception processing occurs in the explosion-proof programming pendant processing.</td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>The hardware of explosion-proof programming pendant may not perform correctly because of the influence of noise or may have a failure.</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>Replace the explosion-proof programming pendant, or contact your YASKAWA representative to report the conditions when it occurs (operation procedure etc.).</td>
</tr>
<tr>
<td></td>
<td>33</td>
<td>An error occurs in processing the commands received from the controller. Save CMOS.BIN, and contact your YASKAWA representative to report the data and the conditions when it occurs (operation procedure etc.).</td>
</tr>
<tr>
<td></td>
<td>5000</td>
<td>An error occurs in processing the commands received from the controller. Save CMOS.BIN, and contact your YASKAWA representative to report the data and the conditions when it occurs (operation procedure etc.).</td>
</tr>
<tr>
<td></td>
<td>5001</td>
<td>The command received from the controller has an error. Communication may not be performed correctly because of the connection condition or influence of noise. Check the connection condition with the controller. If it occurs again, save CMOS.BIN, and contact your YASKAWA representative to report the data and the conditions when it occurs (operation procedure etc.).</td>
</tr>
</tbody>
</table>
1.6 Functional Limitation of Explosion-proof Programming Pendant

The following functions are not available with the explosion-proof programming pendant because of the hardware restriction.

- Ladder Editor (OPTION)
- Interface Panel (OPTION)
- Pendant Oscilloscope (OPTION)
- Online Manual function (OPTION)
- OPERATION AREA MONITOR of Functional Safety (OPTION)
- Programing Pendant Customization (OPTION)
- Zeroing (OPTION)
- GRAPH DISPLAY of Preventive Maintenance Function for the Speed Reducer
- Simple Menu
- Multi Window
- Jog Key Allocation
- Key Allocation (This function can be used with the system software version DN2.46.00-00 or later.)
- Setting the Instruction Displaying Color on the Job Window
- Alarm Detail Displaying
1.7 Function Key Display

The key operation by using the explosion-proof programming pendant can be used with the system software version DN2.46.00-00 or later. Operating methods are shown as follows.

1. Press [SHIFT] + [AUX MENU].

   | JOB | EDIT | DISPLAY | UTILITY | R2 |
---|-----|------|---------|---------|----|
| FUNCTION KEY | | | | | |
| 7:SYNC/O SINGLE | 8:SPRAY ON | 9:SPRAY OFF |
| 4:SNOW | 5:PAINT ON/OFF | 6:PAINT CONDITION |
| 1:TIMER | 2: | 3: |
| 0:REFP | .: | -: |

   M0U1 UJ=0.78
   +M0U1 UJ=0.78

The function key display appears on the current display screen.

2. Move the cursor to the button to be operated, and then press [SELECT] (independently) or [INTERLOCK] + [SELECT] (simultaneously).

   (Ex.) When the independent/coordinated control function is enabled, move the cursor to {7} and press [SELECT].

   | JOB | EDIT | DISPLAY | UTILITY | R1 |
---|-----|------|---------|---------|----|
| FUNCTION KEY | | | | | |
| 7:SYNC/O SINGLE | 8:SPRAY ON | 9:SPRAY OFF |
| 4:SNOW | 5:PAINT ON/OFF | 6:PAINT CONDITION |
| 1:TIMER | 2: | 3: |
| 0:REFP | .: | -: |

   M0U1 UJ=0.78
   +M0U1 UJ=0.78

   S

   This could be the interlocking state, and the status appears in the bottom right of the screen.

3. Press [AUX MENU] to close the function key display.
DX200 OPTIONS INSTRUCTIONS
SUPPLEMENTARY FOR EXPLOSION-PROOF PROGRAMMING PENDANT

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Specifications are subject to change without notice for ongoing product modifications and improvements.

YASKAWA

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