FS100 OPTIONS INSTRUCTIONS
FOR JOB EDIT FUNCTION DURING PLAYBACK

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

MOTOMAN INSTRUCTIONS
MOTOMAN-□□□ INSTRUCTIONS
FS100 INSTRUCTIONS
FS100 OPERATOR’S MANUAL
FS100 MAINTENANCE MANUAL

Part Number: 159652-1CD
Revision: 0
MANDATORY

• This manual explains the job edit function during playback of the FS100 system. Read this manual carefully and be sure to understand its contents before handling the FS100.

• General items related to safety are listed in the Chapter 1: Safety of the FS100 Instructions. To ensure correct and safe operation, carefully read the FS100 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 FS100.

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.

**NOTE**

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 button on the programming pendant is 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 button does not function.

Fig. : Emergency Stop Button

• In the case of not using the programming pendant, be sure to supply the emergency stop button on the equipment. Then before operating the manipulator, check to be sure that the servo power is turned OFF by pressing the emergency stop button. Connect the external emergency stop button to the 5-6 pin and 16-17 pin of the robot system signal connector (CN2).

• Upon shipment of the FS100, this signal is connected by a jumper cable in the dummy connector. To use the signal, make sure to supply a new connector, and then input it.

If the signal is input with the jumper cable connected, it does not function, which may result in personal injury or equipment damage.

• 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 Button

• Observe the following precautions when performing teaching operations within the manipulator’s operating range:
  – 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.
Definition of Terms Used Often in This Manual

The MOTOMAN is the YASKAWA industrial robot product.

The MOTOMAN usually consists of the manipulator, the FS100 controller, manipulator cables, the FS100 programming pendant (optional), and the FS100 programming pendant dummy connector (optional).

In this manual, the equipment is designated as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS100 controller</td>
<td>FS100</td>
</tr>
<tr>
<td>FS100 programming pendant</td>
<td>Programming pendant</td>
</tr>
<tr>
<td>Cable between the manipulator and controller</td>
<td>Manipulator Cable</td>
</tr>
<tr>
<td>FS100 programming pendant dummy connector</td>
<td>Programming pendant dummy connector</td>
</tr>
</tbody>
</table>
Descriptions of the programming pendant keys, 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>Character Keys: The keys which have characters printed on them are denoted with [], ex. [ENTER]</td>
</tr>
</tbody>
</table>
| 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                 | "Axis Keys" and "Numeric Keys" are generic names for the keys for axis operation and number input. |
| Numeric Keys              |                                                                                     |
| 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.

**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.
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   1.1  Function ....................................................................................................................... 1-1
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1 Job Edit Function During Playback Operation

1.1 Function

Jobs can be edited during the playback operation, including during the play mode.

<Editable> user job
<Not Editable> macro job and system job

1.2 Job Edit During Playback Operation

1.2.1 Basic Operation

Job editing procedures during the playback operation is described below.

1. During the playback operation, select {JOB} under the main menu, then select {SELECT JOB} under the sub menu.

   - JOB LIST window appears.

2. Select {EDITING} under the {JOB} pull-down menu.
3. From JOB LIST, select the job to be edited.

– The selected job will be registered in “PLAY EDIT JOB LIST” window under the sub menu.

4. Edit the selected job.

– Edit the job selected in the above step in the same manner as in the teach mode.

– Regarding restrictions on editing, refer to chapter 1.2.2 “Editing” at page 1-5.
5. Select {WRITING} under the {JOB} pull-down menu to reflect the edited data.

- If the job to be written is listed in "JOB LIST", a confirmation dialog "Overwrite?" appears. Select (YES) to reflect the edited data. Refer to “SUPPLEMENT” in the following page.

- If the job with the same name is not listed in "JOB LIST", the job to be written will be added to “JOB LIST”. Refer to “SUPPLEMENT” in the following page.
If data is reflected during the playback operation, the message "Requesting playback edit JOB writing" appears, and the status becomes to request writing. To write the job, execute the instruction "LATESTJOB" in the write request status or write the job after completing the playback operation. If data is reflected in the play mode but not during the playback operation, the job will be written immediately.

However, if the job to be written is being executed (including jobs in the call stack), "Error 5240: Cannot write in the JOB in execution." appears, and the edited data will not be reflected.

If a job in the call stack is written in the play mode but not during the playback operation, "Error 5241: Cannot write in the JOB in JOB STACK." appears, and the edited data will not be reflected.

If data is reflected during teaching operation, the job will be written immediately.
1.2.2 Editing

The data of the selected job (see the step 4 of chapter 1.2.1 “Basic Operation” at page 1-2) can be edited in the same manner as the normal teach mode.

However, the functions that are affected by the manipulator motions are restricted as follows:

- Position teaching cannot be edited.
- The pull-down menu during editing is restricted as shown in fig. 1-1 “Pull-down Menu (EDIT) * when the cursor is on the line No.” to fig. 1-4 “Pull-down Menu (UTILITY)” at page 1-6.

Fig. 1-1: Pull-down Menu (EDIT) * when the cursor is on the line No.

Fig. 1-2: Pull-down Menu (EDIT) * when the cursor is on the instructions.
In addition to the job edit operation described above, {CREATE NEW JOB}, {RENAME JOB}, {COPY JOB}, and {DELETE JOB} under the {JOB} pull-down menu are also available.

All of the above operations are performed for the jobs listed in “PLAY EDIT JOB LIST”.

To reflect the edited data in the job listed in JOB LIST, “WRITING” operation must be performed.

When deleting a job, only the jobs listed in “PLAY EDIT JOB LIST” can be deleted. The jobs in “JOB LIST” will not be deleted.

The above {WRITING}, {DELETE JOB}, {RENAME JOB}, and {COPY JOB} can be done in the same manner on the “PLAY EDIT JOB LIST” window.
1.2.3 Editing Multiple Jobs

The procedure to delete or write multiple jobs at once on the PLAY EDIT JOB LIST window is described below.

- **Deleting Multiple Jobs**

  1. Select {JOB} under the main menu, then select {PLAY EDIT JOB LIST} under the sub menu.

  2. Select the job to be deleted by pressing [SHIFT] + [SELECT].
     - “●” appears on the left of the selected job.
3. Select {DELETE JOB} in the {JOB} pull-down menu.
   - A confirmation dialog box appears for each selected job. Select {YES} to delete the job from the PLAY EDIT JOB LIST window.

### Writing to Multiple Jobs

1. Select {JOB} under the main menu, then select {PLAY EDIT JOB LIST} under the sub menu.

2. Select the job to be written by pressing [SHIFT] + [SELECT].
   - "●" appears on the left of the selected job.
3. Select {WRITING} in the {JOB} pull-down menu.

- If the job to be written is listed in JOB LIST, a confirmation dialog “Overwrite?” appears. Select {YES} to reflect the edited data. If {NO} is selected, the edited data will not be reflected. To cancel the writing, press [CANCEL] while the confirmation dialog is appearing.

If the job with the same name is not listed in “JOB LIST”, the job to be written will be added to “JOB LIST”. Refer to the “SUPPLEMENT” below.

If data is reflected during the playback operation, the message “Requesting playback edit JOB writing” appears, and the status becomes to request writing. To write the job, execute the instruction “LATESTJOB” in the write request status or write the job after completing the playback operation. If data is reflected in the play mode but not during the playback operation, the job will be written immediately.

However, if the job to be written is being executed (including jobs in the call stack), “Error 5240: Cannot write in the JOB in execution.” appears, and the edited data will not be reflected.

If a job in the call stack is written in the play mode but not during the playback operation, “Error 5241: Cannot write in the JOB in JOB STACK.” appears, and the edited data will not be reflected.

If data is reflected during teaching operation, the job will be written immediately.
1.2.4 Canceling Write Request

The procedure to cancel the write request is described below.

**Canceling Write Request**

1. Select {JOB} under the main menu, then select {PLAY EDIT JOB LIST} under the sub menu, or select {JOB} under the main menu, then select {JOB EDIT (PLAY)} under the sub menu.

2. Select {WRITING CANCEL} under the {JOB} pull-down menu.
1 Job Edit Function During Playback Operation

FS100

1.2 Job Edit During Playback Operation

CAUTION

• When the mode switch is changed to the teach mode during job editing

Even if the mode switch is changed to the teach mode without reflecting or canceling the edited data, the changed data will be saved. In this case, select {JOB} under the main menu, then select {SELECT JOB} under the sub menu or {PLAY EDIT JOB LIST} to edit data in the same manner as in the play mode. However, position teaching cannot be done.

Regarding the job edited in the play mode, even after the mode is changed to the teach mode, the edited data will not be reflected if {WRITING} is not done.

• Writing a job

{WRITING} operates differently depending on the status of the robot.

Select {JOB}, then select {WRITING} to reflect the edited data in the job. The data is reflected as described below depending on whether the job is being executed or not.

1. When the job is NOT being executed: The data is reflected immediately.
2. When the job is being executed: The data is reflected when the instruction “LATESTJOB” is executed or when the job execution is completed.

“Requesting playback edit JOB writing” appears while waiting for the reflected operation (during a write request).

• The executing job cannot be written even by the instruction “LATESTJOB”.

• If a power failure occurs during a write request, the write request will be canceled upon restarting, and the job will not be reflected.

• During a file transfer

{WRITING} cannot be done during file transfer (i.e. external memory operation or data transmission).

In addition, a file cannot be transferred during a write request.

• During a write request

Editing is inhibited during a write request (while “Requesting playback edit JOB writing” appears).

To edit data, wait for the writing to be completed or cancel the write request.
FS100 OPTIONS
INSTRUCTIONS
FOR JOB EDIT FUNCTION DURING PLAY MODE

HEAD OFFICE
2-1 Kurosakishiroishi, Yahatanishi-ku, Kitakyushu 806-0004 Japan
Phone +81-93-645-7745 Fax +81-93-645-7746

YASKAWA America Inc. MOTOMAN Robotics Division
805 Liberty Lane, West Carrollton, OH 45449, U.S.A.
Phone +1-937-847-6200 Fax +1-937-847-6277

YASKAWA Nordic AB
Verkstadsgatan 2, PO Box 504, SE-385 25 Torsås, Sweden
Phone +46-480-417-800 Fax +46-486-414-10

YASKAWA Europe GmbH Robotics Div.
Kammerfeldstr. 1, 80591 Allershausen, Germany
Phone +49-8166-90-0 Fax +49-8166-90-103

YASKAWA Electric Korea Co., Ltd
9F, KYOBO Securities Bldg., 26-4, Yeoldo-Dong Yeoungeungpo-ku,Seoul, KOREA
Phone +82-2-784-7844 Fax +82-2-784-8495

YASKAWA Electric (Singapore) PTE Ltd.
151 Lorong Chuan, #04-02A, New Tech Park, Singapore 556741
Phone +65-6282-3003 Fax +65-6289-3003

YASKAWA Electric (Thailand) Co., Ltd.
252/246, 4th Floor, Muang Thai-Phatra Office Tower II Rachadaphisek Road, Huaykwang Bangkok, 10320 Thailand
Phone +66-2-693-2200 Fax +66-2-693-4200

Shougang MOTOMAN Robot Co. Ltd.
No.7, Yongchang-North Road, Beijing E&T Development Area, China 100176
Phone +86-10-6788-0548 Fax +86-10-6788-0548-813

YASKAWA ELECTRIC (SHANGHAI) Co., Ltd.
No.18Xizhang Zhong Road, 17F, Harbour Ring Plaza, Shanghai 200001, CHINA
Phone +86-21-5385-0655 Fax +86-21-5385-2770

YASKAWA Robotics India Ltd.
#426, Udyog Vihar, Phase- IV, Gurgaon, Haryana, India
Phone +91-124-475-8500 Fax +91-124-414-8016

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