MACRO MANAGER
PENDANT APPLICATION
Instructions

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

MOTOMAN INSTRUCTIONS

The Controller operator’s manual above corresponds to a specific usage. Be sure to use the appropriate manual.

Part Number: 162160-1CD
Revision: 1
MANDATORY

General items related to safety are listed in Section 2 of the Controller Manual. To ensure correct and safe operation, carefully read the Controller Manual before reading this manual.

CAUTION

- 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 a 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 products warranty.
Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the Macro Manager Pendant Application.

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."

- **CAUTION**
  - Perform the following inspection procedures prior to conducting positioner teaching. If problems are found, repair them immediately and be sure that all other necessary processing has been performed.
    - Check for problems in positioner movement.
    - Check for damage to insulation and sheathing of external wires.
  - Always return the Programming Pendant to the hook on the cabinet of the Controller after use.
  - The Programming Pendant can be damaged if it is left in the work area, on the floor, or near fixtures.
  - Read and understand the Explanation of Warning Labels in the Controller Manual before operating the Macro Manager Pendant Application.
**Definition of Terms Used Often in This Manual**

The positioner usually consists of the Controller, the Programming Pendant, and supply 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>Controller</td>
<td>Controller</td>
</tr>
<tr>
<td>Programming Pendant</td>
<td>Programming Pendant</td>
</tr>
<tr>
<td>Cable between the positioner and the Controller</td>
<td>Power cables</td>
</tr>
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1 Introduction

1.1 About This Document

This manual is intended for personnel who have received operator training from Yaskawa and who are familiar with the operation of this particular Yaskawa system.

**NOTE**

This manual documents a standard Yaskawa system. If your system is custom or modified, please use this manual in conjunction with the drawings, schematics, and parts listing (Bill of Material) for your specific system. The drawings, schematics, and parts listing are included in the documentation package supplied with the Yaskawa system.

1.2 System Requirements

To run the software, the following hardware and software are required:

**1.2.1 Controller**

- Software version that supports the Customer Pendant Application function

**1.2.2 Other**

- Pendant memory device: CF Card or USB Memory
- Management mode password
1.3 What need does Macro Manager Achieve?

Macro Manager Pendant Application for the Controller is a tool that allows the user to modify Macro job settings and positions without having to change each individual macro instruction call. Conditional statements can be constructed to determine what situations get updated. Currently, every time a macro is used, the settings and positions specified by that macro are stored locally within the job where the macro is used. In many cases, various jobs will use the same macro settings.

Any time a setting needs to be changed, an operator must manually change all the individual instances or reteach the individual points. In the case of the touch-sensing macros, robot positions are programmed via macros in hundreds of instances. Any time a laser sensor (AccuFast) or a torch neck is replaced (traditional wire touch), the location of the laser or the TCP of the wire can be offset and all individual search commands would need to be retaught.

1.4 Implementation

Using Macro Manager, the user can select from the loaded macros and then modify the settings contained in the selected macro. Settings may be individual constants (KB, KI, KD, KR), or positions (relative or pulse). Macro Manager will then search all jobs loaded on the Controller and present a list of jobs where the specified macro is used. The user may then specify which jobs to update (from 1 thru all) and the new values to enter into the selected jobs. In the case of positional data, Macro Manager will construct a simple hidden job using the selected data to perform conversions between pulse and relative to allow the Controller to calculate new positions.

When an AccuFast laser sensor is installed, a calibration routine is used to determine the relative position of the original AccuFast sensor. The relative position of the AccuFast sensor is stored as a TCP. If the AccuFast sensor must be replaced the calibration routine is used again to determine the relative position of the new AccuFast sensor. The relative position of the new AccuFast sensor is stored as a new TCP. Macro Manager uses these two TCPs to calculate new positions and appropriately modify the reference positions recorded as arguments in a macro.

IT IS HIGHLY RECOMMENDED TO BACKUP ALL USER JOBS AND MACROS before using Macro Manager. See Chapter 7 of the Controller Operator’s Manual for information needed to perform backups.

1.5 Reference Documentation

For additional information on individual components of the Yaskawa Motoman Macro Manager Pendant Application system, refer to the following documentation that is included with the system:

- Motoman Manipulator Manual
- Motoman Controller Manual
- Motoman Maintenance Manual
- Motoman Operator’s Manual for General
- Motoman Concurrent I/O Manual
- Motoman INFORM User’s Manual
1.6 Customer Support Information

If assistance is needed with the Macro Manager Pendant Application please contact Yaskawa Motoman Customer Support at the following 24-hour telephone number:

(937) 847-3200

For routine technical inquiries, contact Yaskawa Motoman Customer Support at the following e-mail address:

techsupport@motoman.com

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

Please use e-mail for routine inquiries only. If there is an urgent or emergency need for service, replacement parts, or information, contact Yaskawa Motoman Customer Support at the telephone number shown above.

Please have the following information ready before you call:

<table>
<thead>
<tr>
<th>• System</th>
<th>Macro Manager Pendant Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Robots</td>
<td></td>
</tr>
<tr>
<td>• Positioner</td>
<td></td>
</tr>
<tr>
<td>• Primary Application</td>
<td></td>
</tr>
<tr>
<td>• Controller</td>
<td></td>
</tr>
<tr>
<td>• Software Version</td>
<td>Access this information on the Programming Pendant's LCD display screen by selecting {MAIN MENU} - {SYSTEM INFO} - {VERSION}</td>
</tr>
<tr>
<td>• Robot Serial Number</td>
<td>Located on the robot data plate</td>
</tr>
<tr>
<td>• Robot Sales Order Number</td>
<td>Located on the Controller data plate</td>
</tr>
</tbody>
</table>
2 Operation

Macro Manager will be changing jobs stored in the Controller, therefore before using, BACKUP all Jobs and Macros.

2.1 Memory required for operation

Macro Manager functions by repeatedly saving, editing, and loading jobs to/from the Controller. A Compact Flash (CF) card or USB Memory stick will be required for Macro Manager to run. Macro Manager will automatically detect which is in place when it is first invoked, and will check the corresponding radio button. If neither is in place, a warning message will be displayed and all controls will be locked. Insert either a CF card or USB Memory and select the appropriate radio button to proceed.

2.2 Management Security level required

Management Security level is required for Macro Manager. If not, the controls will lock, and a warning message will be displayed.

2.3 Modify macro-command variables

Macro Manager has two main modes of operation.

- Changing the “constant variables” (KB, KI, KD, KR).
- Changing the positions.

2.3.1 Modifying macro-command variables

1. Place pendant in management mode, by referring to the Controller manual.

2. From the Main screen select {APPLICATION} then {Macro Manager}. 
2 Operation
2.3 Modify macro-command variables

3. Select {Modify macro-argument variables} from the “Select Operation” pull down menu.

4. Select {Search for macros containing variables} button.
5. Select the desired macro.

6. Press {Select Macro} Macro Manager will search for all jobs that use the macro selected and displays them in the “Select from Jobs” list box.

7. Move the job(s) to update from the “Select from Jobs” list box to the “Selected Jobs” list box by pressing the {>>} button.

8. In the table at the bottom of the page, select {Apply} for the Macro variable(s) to change.
2. Operation
2.3 Modify macro-command variables

9. Verify a dialog box displays prompting to “Enter NEW VALUE for Macro Argument.”

10. Enter a new numeric argument, and select {OK}.

11. Verify the new value appears in the list view box at the lower part of the screen.

12. To change additional values repeat step 8 through step 11.

13. Select the {Apply} button to change the indicated macro arguments in the “Selected Jobs”.

14. Note progress bar appears indicating the approximate amount of time required to complete the process.
2.3 Modify macro-command variables

15. When complete, the progress bar changes to “Complete”, and the {Apply} button changes to {<<Back} and select {Exit}.

NOTE: Select the {<<Back} button to go back to the previous screen and resume from there (perhaps selecting a different macro), or select {Exit} if finished.

2.3.2 Modifying macro-argument positions

1. From the “Startup” screen Select (Modify macro-argument positions) from the “Select Operation” pull down.

2. Select {Search for macros containing positions}.

3. The “Currently Loaded Macros” list box populates with macros that have position arguments.
4. Macro Manager requires an available P-Variable initialized as pulse. The P-Variable specified must be initialized for use prior to operation of Macro Manager. Any data stored in the variable will be overwritten.

![Macro Manager](image)

**NOTE**
Macro Manager requires the P-Variable be available and initialized as a pulse.

5. Enter the P-Variable number and press (OK).
2.3 Modify macro-command variables

2.3.2.1 Specifying Original and Modified Tools

The next operation involves selecting jobs to be modified.

1. Click on the left most {Enter} of one of the macro positions, and observe the “Enter Original and Modified Tool Numbers” dialog box.

2. Enter the tool file number containing the original device’s relative TCP in the “Orig Tool #” field.

3. Enter the tool file number containing the newly updated device’s relative TCP in the “Mod’d Tool #” field.

**NOTE**

The list view box on the bottom of the screen has a position to enter two numbers. These are, respectively, the Original Tool number, and the Modified Tool number corresponding to the calibration routines “before” and “after” locations.
It is possible to update macro positions conditionally, if the macro call meets certain condition(s) pertaining to the macro-command variables. If the "Use Condition" check box is checked, a conditional statement will appear where the user can choose a macro-command value to check, as the following illustrations show.
4. Once “Orig Tool#” and “Mod’d Tool #” along with any additional conditions have been specified, select {OK}, and confirm as the selection appears in the list view box on the previous screen.
2 Operation
2.3 Modify macro-command variables

Check the {Apply to All Positions} checkbox if the difference in (and condition) tool offsets should be applied to all the macro-command positions.

Select (OK) and observe the entries appear for all macro-command positions.

5. Select (Apply), and the selected macro-command positions update the selected jobs.
2.3 Modify macro-command variables

- If a job is unable to be completed, it will be listed in a list box entitled “The following jobs were not converted due to errors.” It will be written to a log file on the CF card or the USB memory card in the pendant.
  - It will be called \MacDir\MacroErrorFile.txt
  - This file is deleted the next time the Macro Manager is started if it exists in memory.
  - The file may be opened on a PC where it may be viewed with any text editor, such as "NotePad".
  - In most cases, these uncompleted jobs will need to be manually updated by the user.

- If the “Use Condition” check box is checked, a conditional statement will appear where the user can choose the particular macro-command variable to check, and macro position.
## Revision History

<table>
<thead>
<tr>
<th>Date</th>
<th>CEN / ECN</th>
<th>Revision No.</th>
<th>Reason For Revision</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/12/2014</td>
<td>14-1219M</td>
<td>1</td>
<td>Removed reference of DX100 throughout manual.</td>
<td>JFC</td>
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</table>
Specifications are subject to change without notice for ongoing product modifications and improvements.