YRC1000 OPTIONS
INSTRUCTIONS
FOR TEACHING POINT ADJUSTMENT FUNCTION
WITH PROGRAMMING PENDANT

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

MOTOMAN INSTRUCTIONS
MOTOMAN-□□□ INSTRUCTIONS
YRC1000 INSTRUCTIONS
YRC1000 OPERATOR'S MANUAL (GENERAL) (SUBJECT SPECIFIC)
YRC1000 MAINTENANCE MANUAL
YRC1000 ALARM CODES (MAJOR ALARMS) (MINOR ALARMS)

The YRC1000 operator's manual above corresponds to specific usage. Be sure to use the appropriate manual.
The YRC1000 operator's manual above consists of "GENERAL" and "SUBJECT SPECIFIC".
The YRC1000 alarm codes above consists of "MAJOR ALARMS" and "MINOR ALARMS".

Please have the following information available when contacting Yaskawa Customer Support:
• System
• Primary Application
• Software Version (Located on Programming Pendant by selecting:
  {Main Menu} - {System Info} - {Version})
• Robot Serial Number (Located on robot data plate)
• Robot Sales Order Number (Located on controller data plate)
**DANGER**

- This manual explains the teaching point adjustment function of the YRC1000 system. Read this manual carefully and be sure to understand its contents before handling the YRC1000. Any matter not described in this manual must be regarded as “prohibited” or “improper”.
- General information related to safety are described in “Chapter 1. Safety” of the YRC1000 INSTRUCTIONS. To ensure correct and safe operation, carefully read “Chapter 1. Safety” of the YRC1000 INSTRUCTIONS.

**CAUTION**

- In some drawings in this manual, the protective covers or shields are removed to show details. Make sure to install all the covers and shields in place before operating this product.
- YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids the product warranty.

**NOTICE**

- 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.
Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the YRC1000.

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

**DANGER**
Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Safety Signs identified by the signal word DANGER should be used sparingly and only for those situations presenting the most serious hazards.

**WARNING**
Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury. Hazards identified by the signal word WARNING present a lesser degree of risk of injury or death than those identified by the signal word DANGER.

**CAUTION**
Indicates a hazardous situation, which if not avoided, could result in minor or moderate injury. It may also be used without the safety alert symbol as an alternative to “NOTICE”.

**NOTICE**
NOTICE is the preferred signal word to address practices not related to personal injury. The safety alert symbol should not be used with this signal word. As an alternative to “NOTICE”, the word “CAUTION” without the safety alert symbol may be used to indicate a message not related to personal injury.

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 “DANGER”, “WARNING” and “CAUTION”.
Before operating the manipulator, make sure the servo power is turned OFF by performing the following operations. When the servo power is turned OFF, the SERVO ON LED on the programming pendant is turned OFF.

- Press the emergency stop buttons on the front door of the YRC1000, on the programming pendant, on the external control device, etc.
- Disconnect the safety plug of the safety fence. (when in the play mode or in the remote mode).

If operation of the manipulator cannot be stopped in an emergency, personal injury and/or equipment damage may result.

Fig. : Emergency Stop Button

Before releasing the emergency stop, make sure to remove the obstacle or error caused the emergency stop, if any, and then turn the servo power ON. Failure to observe this instruction may cause unintended movement of the manipulator, which may result in personal injury.

Fig. : Release of Emergency Stop

Observe the following precautions when performing a teaching operation within the manipulator's operating range:

- Be sure to perform lockout by putting a lockout device on the safety fence when going into the area enclosed by the safety fence. In addition, the operator of the teaching operation must display the sign that the operation is being performed so that no other person closes the safety fence.
- View the manipulator from the front whenever possible.
- Always follow the predetermined operating procedure.
- Always keep in mind emergency response measures against the manipulator's unexpected movement toward a person.
- Ensure a safe place to retreat in case of emergency.

Failure to observe this instruction may cause improper or unintended movement of the manipulator, which may result in personal injury.

Confirm that no person is present in the manipulator's operating range and that the operator is in a safe location before:

- Turning ON the YRC1000 power
- Moving the manipulator by using the programming pendant
- Running the system in the check mode
- Performing automatic operations

Personal injury may result if a person enters the manipulator's operating range during operation. Immediately press an emergency stop button whenever there is a problem. The emergency stop buttons are located on the front panel of the YRC1000 and on the right of the programming pendant.

Read and understand the Explanation of the Warning Labels before operating the manipulator.
**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.

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>YRC1000 controller</td>
<td>YRC1000</td>
</tr>
<tr>
<td>YRC1000 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>
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 /Symbol Keys: The keys which have characters or its symbol printed on them are denoted with [ ]. ex. [ENTER]</td>
</tr>
<tr>
<td>Axis Keys /Numeric Keys</td>
<td>[Axis Key] and [Numeric Key] are generic names for the keys for axis operation and number input.</td>
</tr>
<tr>
<td>Keys pressed simultaneously</td>
<td>When two keys are to be pressed simultaneously, the keys are shown with a “+” 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 [SELECT] 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.
Contents

1 Outline ............................................................................................................................................ 1-1

2 How to Adjust the Teaching Point................................................................................................... 2-1

3 Position Adjustment Display ........................................................................................................... 3-1
   3.1 For Robot Axes (including Base Axes).............................................................................. 3-1
   3.2 For Station Axes ................................................................................................................ 3-3

4 Parameters ..................................................................................................................................... 4-1
This manual describes how to modify the position data of the teaching point by entering numeric data with the Programming Pendant to adjust the teaching point without moving the manipulator.

This teaching point adjustment function with the Programming Pendant enables simplified offline teaching by using CAD data and fine adjustment of the position data in any coordinate system.
2 How to Adjust the Teaching Point

1. In the JOB CONTENT display, select {POS ADJUSTMENT} under {UTILITY}.
   – When {POS ADJUSTMENT} is selected from the pull-down menu, POSITION ADJUSTMENT display appears.

2. Move the cursor to the numeric value to be modified, and enter any position data. Then press [ENTER].

3. When [ENTER] is pressed again, an hourglass wait cursor is displayed and the entered position data can be reflected in the job.
4. Select {COMPLETE} or press [CANCEL] on the programming pendant to end the position adjustment function.

– The display returns to the JOB CONTENT display.

![Image of programming pendant with position adjustment settings]

**NOTE**

- After a numeric value is entered and [ENTER] is pressed, the YRC1000 checks the soft limit, the axis interference, etc. for the new position data. If the entered value is out of the P-point maximum envelope of the manipulator, the message “Step exceeding operation range is made” appears. Also, “/OV” appears for the STEP of the JOB CONTENT display.

- While adjusting the teaching point, test runs and FWD/BWD key operations are disabled.

- After having modified the numeric value of the position data, always perform the FWD/BWD key operations to confirm that the teaching point is adjusted correctly.

- Unable to edit a edit-lock line or a line setting as a comment. The following errors occurs when attempt to edit.
  1011: This line is setting as edit-lock.
  1012: This line is setting as a comment.
(Refer to the “Chap.3.7.6 Commenting Out a Line” and “Chap.3.7.7 Prohibiting Editing Line-by-Line” in “YRC1000 GENERAL OPERATOR’S MANUAL (RE-CSO-A051)” for more details.)
3 Position Adjustment Display

The contents of the POSITION ADJUSTMENT display depend on the control group and the coordinate system whose teaching point is to be adjusted.

3.1 For Robot Axes (including Base Axes)

Fig. : For a Cartesian Coordinate System

STM

①STEP
Indicates the step number whose teaching point is to be adjusted.
The step number of the job for which “POS ADJUSTMENT” is selected is displayed as the initial value.
Enter a step number by using the [Numeric Key] to view the position data of the step.

②R1
Displays the teaching point of the manipulator.
Modify the values in absolute values by using the [Numeric Key].

③B1
Displays the teaching point of the existing base axes.
Modify the values in absolute values by using the [Numeric Key].
3 Position Adjustment Display
3.1 For Robot Axes (including Base Axes)

**COORD (Initial setting: BASE)**
Displays the coordinates needed to adjust the teaching point.
A “BASE”, “ROBOT”, “USER# (*)”, “MASTER TOOL”, or “PULSE” coordinate can be selected. A “MASTER TOOL” coordinate can be selected only for a coordinated job.
For relative jobs, the teaching coordinate used to convert the standard job into the relative job is selected.

**TOOL**
Displays the taught tool.
The tool can be changed by selecting a tool number from 0 to 63 by using the [Numeric Key].

**TYPE (Initial setting: OFF)**
Sets the display of TYPE to “ON/OFF”.
Every time [SELECT] is pressed, the display switches between “OFF” and “ON”.

**State of TYPE**
Displays the state of TYPE when the TYPE is set to “ON” and allows modification of the state of TYPE.

**Icon for the [PAGE] key**
Appears when the job axis configuration includes more than one control group.
Press [PAGE] on the programming pendant to turn the pages for each control group in the following order:
“R1” → “R2” → “R3” → “S1” → …
The contents of the position adjustment display for station axes are different from those for the robot axes. Refer to chapter 3.2 “For Station Axes”.

**{COMPLETE}**
Select {COMPLETE}, and the display returns to the JOB CONTENT display.
Pressing [CANCEL] on the programming pendant also ends the POSITION ADJUSTMENT function.

**NOTE**
- A parameter setting is required to select “PULSE” as the coordinate type. Contact your YASKAWA representative for more information.
- The parameter S3C1110 must be set to “1” to change the coordinates of the relative job.
- The parameter S2C431 must be set to “1” to change the taught tool.
- If the parameter S2C430 for specifying the relative job conversion method is set to “1” (TYPE REGARD), the TYPE cannot be changed.
- For the parameter settings, refer to chapter 4 “Parameters”.
3.2 For Station Axes

Fig. : For a Cartesian Coordinate System

STEP
Indicates the step number whose teaching point is to be adjusted. The step number of the job for which “POS ADJUSTMENT” is selected is displayed as the initial value. Enter a step number by using the [Numeric Key] to view the position data of the step.

S1
Displays the teaching point of the station. Modify the values in absolute values by using the [Numeric Key].

NOTE
The position data of each station axis is displayed in the units defined in the system configuration (“mm” or “degree”: Parameters S2C264 and S2C265 to S2C288). For the parameter settings, refer to chapter 4 “Parameters”.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Setting Range/Units</th>
<th>Initial Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2C430</td>
<td>Relative job conversion method specification</td>
<td>0: STEP REGARD</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: TYPE REGARD</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2: STEP REGARD (R-axis minimum)</td>
<td></td>
</tr>
<tr>
<td>S2C431</td>
<td>Tool number selection</td>
<td>0: Not possible, 1: Possible</td>
<td>0</td>
</tr>
<tr>
<td>S3C1110</td>
<td>Selection of coordinates for adjusting the teaching point of the relative job</td>
<td>0: Not possible, 1: Possible</td>
<td>0</td>
</tr>
<tr>
<td>S2C264</td>
<td>Station axis current value display</td>
<td>0: Disabled, 1: Enabled</td>
<td>0</td>
</tr>
<tr>
<td>S2C265</td>
<td>The units of the position data of Station axis 1 (S1)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C266</td>
<td>The units of the position data of Station axis 2 (S2)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C267</td>
<td>The units of the position data of Station axis 3 (S3)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C268</td>
<td>The units of the position data of Station axis 4 (S4)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C269</td>
<td>The units of the position data of Station axis 5 (S5)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C270</td>
<td>The units of the position data of Station axis 6 (S6)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C271</td>
<td>The units of the position data of Station axis 7 (S7)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C272</td>
<td>The units of the position data of Station axis 8 (S8)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C273</td>
<td>The units of the position data of Station axis 9 (S9)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C274</td>
<td>The units of the position data of Station axis 10 (S10)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C275</td>
<td>The units of the position data of Station axis 11 (S11)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C276</td>
<td>The units of the position data of Station axis 12 (S12)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C277</td>
<td>The units of the position data of Station axis 12 (S13)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C278</td>
<td>The units of the position data of Station axis 12 (S14)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C279</td>
<td>The units of the position data of Station axis 12 (S15)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C280</td>
<td>The units of the position data of Station axis 12 (S16)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C281</td>
<td>The units of the position data of Station axis 12 (S17)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C282</td>
<td>The units of the position data of Station axis 12 (S18)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C283</td>
<td>The units of the position data of Station axis 12 (S19)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C284</td>
<td>The units of the position data of Station axis 12 (S20)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
</tbody>
</table>
### Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Setting</th>
<th>Setting Range/Units</th>
<th>Initial Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2C285</td>
<td>The units of the position data of Station axis 12 (S21)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C286</td>
<td>The units of the position data of Station axis 12 (S22)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C287</td>
<td>The units of the position data of Station axis 12 (S23)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
<tr>
<td>S2C288</td>
<td>The units of the position data of Station axis 12 (S24)</td>
<td>Bit specification (0: angle, 1: distance)</td>
<td>0</td>
</tr>
</tbody>
</table>
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Specifications are subject to change without notice for ongoing product modifications and improvements.

YASKAWA

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