YRC1000 OPTIONS INSTRUCTIONS
FOR SPOT MONITOR FUNCTION

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)

Part Number: 182144-1CD
Revision: 0
DANGER

• This manual explains the spot monitor of the YRC1000 system. Read this manual carefully and be sure to understand its contents before handling the YRC1000. Any matter, including operation, usage, measures, and an item to use, 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, protective covers or shields are removed to show details. Make sure that all the covers or shields are installed 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.

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.

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></td>
</tr>
<tr>
<td>Character Keys /Symbol Keys</td>
<td>The keys which have characters or symbols printed on them are denoted with [ ].</td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>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 &quot;+&quot;</td>
</tr>
<tr>
<td></td>
<td>sign between them, ex. [SHIFT]+[COORD]</td>
</tr>
<tr>
<td>Displays</td>
<td>The menu displayed in the programming pendant is denoted with { }.</td>
</tr>
<tr>
<td></td>
<td>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.
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The spot monitor function allows to store the history of welding results in the YRC1000 for the motor gun and the air gun usages. Approximately 200 welding-point data can be stored in the YRC1000. Also, the data stored in the robot can be sent to SD cards or PCs.

**NOTE**

In order to use this function, use the power source which has the integrated timer function.
2 Storing Welding Result

When a spot welding instruction (SPOT instruction, SVSPOT instruction, or SVSPOTMOV instruction) is executed, the YRC1000 receives the welding result from the power source every time the instruction is executed. The result is stored in the YRC1000 with the robot's information. The following is an example data stored for every welding point:

**Information about the robot**
1. Date and time when the instruction is executed
2. Job name
3. Job line number
4. Job step number
5. Gun number
6. Gun pressure data file number (Omitted when an air gun is used.)
7. Gun axis position when the welding condition signal is output (Pulse) (Omitted when an air gun is used.)
8. Gun axis position when the welding complete signal is input (Pulse) (Omitted when an air gun is used.)

**Information about the power source (Example)**
9. Welding condition number
10. Fault code
11. Number of welding operation
12. #1 secondary current
13. #1 line voltage
14. #2 secondary current
15. #2 line voltage
16. Allowance rate
17. Resistance value
18. Target amount of heat
19. Input amount of heat

The storable number of data depends on the type of the power source. The welding result is stored every time the welding instruction is executed. When the number of data exceeds the storable number of data, the new data overwrites the oldest data. When the results are written in the whole area, the specific output #51615 turns ON.
The storable number of data can be output to the register. (Refer to chapter 7 “Parameters”.)

NOTE: The information about the power source depends on its type.
3 Displaying Welding Results

1. Selecting {Main Menu} → {SPOT WELDING} → {SPOT MONITOR} displays the window of welding result list.

   - (List window)
   - Stored "FAULT CODE"s and "DATE"s of the executed weldings are displayed in reverse chronological order from the top.
   - In the frame at the bottom of the list, "JOB NAME", "LINE NO.", and "WELD COND. (welding condition)" of the data selected with the cursor are displayed. When moving the cursor, the displayed information in the frame changes according to the movement.

2. When placing the cursor on the "No." area in the list window and then pressing [SELECT], it enables numerical value inputting and the welding result of the specific number can be displayed.

   - (Detailed window)
   - When placing the cursor on the "FAULT CODE" and "DATE" area in the list window and then pressing [SELECT], the detailed window is displayed.
   - When pressing [CANCEL], the window returns to the list window.

   - In the detailed window, all the information of the stored data is displayed.
   - Pressing [PAGE] displays the welding result of the next data.
4 Initializing Welding Result

In the list window, pressing (DATA) of the menu area displays (DATA CLEAR). (Only in the management mode or higher)

Selecting (DATA CLEAR) initializes all the welding results stored in the YRC1000.

When the welding results are initialized, the specific output #51615 turns OFF.
5 Saving Welding Results to External Memory Devices

For storing the welding results to the external memory devices, press (Main Menu) → (EX. MEMORY) → (SAVE) → (FILE/GENERAL DATA) → (SPOT MONITOR DATA).

– The file can be stored in the CSV format.

### NOTE

The welding result file cannot be loaded.

Using the data transmission function enables to send the data to the host computer.

For details, refer to "YRC1000 OPTIONS INSTRUCTIONS FOR DATA TRANSMISSION FUNCTION" (HW1484044).
6 Specific Input/Output

(Specific input)
Initialization of the welding results (#41230)
Turning ON this signal enables to execute the initialization of all welding results.

(Specific output)
Welding results (#51615)
When this signal is OFF, it means the number of welding results have not reached the maximum storable number yet.
When this signal is ON, it means the number of welding results have reached the maximum storable number.
7 Parameters

AxP67: Output the storable number of welding results.

Outputs the storable number of welding results to the register of the concurrent I/O program.

AxP67 = 0: Any data is not output to the register.

AxP67 = x: The storable number of welding results is output to the register x.