Cat. No. I234E-EN-01A

SCARA Robots
YRCX Series

# YRCX Remote I/O

**DeviceNet**
**EtherNet/IP**
**PROFIBUS**
**PROFINET**

# USER'S MANUAL

OMRON

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# Important information before reading this manual

# Introduction

The Omron network interface unit documentation consists of a User's Manual that is specific to each network unit and which describes the specifications and communication settings of that unit, and a Remote I/O Manual which describes the remote I/O specifications that are common to all network units.

For details on specifications and communication settings for network units, refer to the relevant user's manual.
For details on communication functionality between the controller and the host control device, such as remote I/O and remote commands, refer to this remote I/O manual.
For details on the functions of the robot controller unit, refer to the following manuals.

YRCX Operator's Manual ..... for operation of the controller unit
YRCX User's Manual ..... for specifications and settings of the controller unit
YRCX Programming Manual ..... for the programming language used by Omron robot controllers

# Safety Precautions (Always read before starting use)

Before using this product, be sure to read this manual carefully as well as the robot controller user's manual and programming manual. Take sufficient precautions to ensure safety and handle the product correctly.
The cautions given in this manual are related to this product. Refer to the robot controller user's manual for details on the cautions to be taken with the robot controller system using this product.
The safety precautions are ranked as "WARNING" and "CAUTION" in this manual.

**WARNING**

FAILURE TO FOLLOW WARNING INSTRUCTIONS COULD RESULT IN SERIOUS INJURY OR DEATH TO THE OPERATOR OR PERSON SERVICING THE PRODUCT.

**CAUTION**

Failure to follow CAUTION instructions may result in injury to the operator or person servicing product, or damage to the product or peripheral equipment.

**NOTE**

The key points in the operation are explained simply and clearly.

Note that some items described as "CAUTION" may lead to serious results depending on the situation. In any case, important information that must be observed is explained.
Store this manual where it can be easily referred to, and make sure that it is delivered to the end user.

## ■ Precautions for design

**WARNING**

- FOR INFORMATION ABOUT THE STATUS OF THE NETWORK SYSTEM AND ROBOT CONTROLLER IN THE EVENT THAT A COMMUNICATION PROBLEM OCCURS IN THE NETWORK SYSTEM, REFER TO THE MANUAL OF THE HOST CONTROL DEVICE AS WELL AS TO THIS DOCUMENT. CONFIGURE AN INTERLOCK CIRCUIT IN THE SEQUENCE PROGRAM SO THAT THE SYSTEM, INCLUDING THE ROBOT CONTROLLER, WILL WORK SAFELY USING THE COMMUNICATION STATUS INFORMATION.
- THE SAFETY CONNECTOR HAS AN EMERGENCY STOP TERMINAL TO TRIGGER EMERGENCY STOP OF THE ROBOT CONTROLLER. BY USING THIS TERMINAL, PREPARE A PHYSICAL INTERLOCK CIRCUIT SO THAT THE SYSTEM INCLUDING THE ROBOT CONTROLLER WILL WORK SAFELY.

**CAUTION**

The control line and communication cable must not be bound with or placed near the main circuit or power line. Separate these by at least 100mm. Failure to observe this could lead to malfunctions caused by noise.

## ■ Precautions for installation

**WARNING**

- ALWAYS CRIMP, PRESS-FIT OR SOLDER THE CONNECTOR WIRING WITH THE MAKER-DESIGNATED TOOL, AND SECURELY FIX THE CONNECTOR TO THE MODULE.
- ALWAYS SHUT OFF ALL PHASES OF THE POWER SUPPLY EXTERNALLY BEFORE STARTING INSTALLATION OR WIRING WORK. FAILURE TO SHUT OFF ALL PHASES COULD LEAD TO ELECTRIC SHOCKS OR PRODUCT DAMAGE.

**CAUTION**

- Use the robot controller in locations that support the environmental conditions specified in this manual. Operation outside the specified environmental range may cause electric shocks, fire, malfunction or product damage or deterioration.
- Do not directly touch the conductive portions or electronic components of a network module.
- Never directly touch the controller's interior areas.
- Accurately connect each connection cable connector to the mounting section.
  Failure to observe this could lead to malfunctions caused by a connection fault.

**WARNING**

ALWAYS SHUT OFF ALL PHASES OF THE POWER SUPPLY EXTERNALLY BEFORE STARTING INSTALLATION OR WIRING WORK. FAILURE TO SHUT OFF ALL PHASES COULD LEAD TO ELECTRIC SHOCKS OR PRODUCT DAMAGE.

**CAUTION**

- Make sure that foreign matter, such as cutting chips or wire scraps, do not enter the robot controller.
- Communication cables that contact network modules must be kept inside a duct or secured by clamps. Failure to place the cable in a duct or secure it by a clamp could damage the cable or module by shifting, movement or unintentional pulling the cable, or cause malfunction by poor contact condition.
- When disconnecting a connector from the network module, grasp the connector rather than pulling on the cable. Pulling on the cable could damage the cable and module, possibly causing a poor contact condition which could result in malfunctions.

## ■ Precautions for starting and maintenance

**WARNING**

- DO NOT TOUCH THE TERMINALS WHILE THE POWER IS ON. FAILURE TO OBSERVE THIS COULD LEAD TO MALFUNCTIONS.
- ALWAYS SHUT OFF ALL PHASES OF THE POWER SUPPLY EXTERNALLY BEFORE PERFORMING CLEANING OR WIRING WORK. FAILURE TO SHUT OFF ALL PHASES COULD LEAD TO ELECTRIC SHOCKS, PRODUCT DAMAGE OR MALFUNCTIONS.
- NEVER DISASSEMBLE OR MODIFY ANY OF THE ROBOT CONTROLLER MODULES.
  FAILURE TO OBSERVE THIS COULD LEAD TO TROUBLE, MALFUNCTIONS, INJURIES OR FIRES.

**CAUTION**

Power must be supplied to the robot controller only after supplying power to the host control device. The robot controller will enter an error state if communication is not established within a certain length of time after the controller starts.

## ■ Precautions for disposal

**CAUTION**

Dispose of this product as industrial waste.

# Warranty

The OMRON robot and/or related product you have purchased are warranted against the defects or malfunctions as described below.

## ■ Warranty description

If a failure or breakdown occurs due to defects in materials or workmanship in the genuine parts constituting this OMRON robot and/or related product within the warranty period, then OMRON shall supply free of charge the necessary replacement/repair parts.

## ■ Warranty period

The warranty period ends 24 months after the date of manufacturing as shown on the products.

## ■ Exceptions to the warranty

This warranty will not apply in the following cases:

1. Fatigue arising due to the passage of time, natural wear and tear occurring during operation (natural fading of painted or planted surfaces, deterioration of parts subject to wear, etc.)
2. Minor natural phenomena that do not affect the capabilities of the robot and/or related product (noise from computers, motors, etc.)
3. Programs, point data and other internal data were changed or created by the user.

Failures resulting from the following causes are not covered by warranty.

1. Damage due to earthquakes, storms, floods, thunderbolt, fire or any other natural or man-made disaster.
2. Troubles caused by procedures prohibited in this manual.
3. Modifications to the robot and/or related product not approved by OMRON or OMRON sales representative.
4. Use of any other than genuine parts and specified grease and lubricant.
5. Incorrect or inadequate maintenance and inspection.
6. Repairs by other than authorized dealers.

**WARRANTY**

**OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.**

**OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NONINFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUERIMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.**

**LIMITATIONS OF LIABILITY**

**OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.**

**In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.**

**IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE OR INAPPROPIATE MODIFICATION OR REPAIR.**

# Chapter 1 Remote Input/Output (Bit Input/Output)

## ■ Remote Input/Output (Bit Input/Output)

### 1. DeviceNet (When I/O size is set to "Normal") / EtherNet/IP

| Slave → Master | | | | Master → Slave | | | |
|---|---|---|---|---|---|---|---|
| Address | bit | Signal name | Meaning | Address | bit | Signal name | Meaning |
| m + 16 | 0 | SO(00) | Emergency stop status output | n + 16 | 0 | SI(00) | Emergency stop input |
| | 1 | SO(01) | CPU_OK status output | | 1 | SI(01) | Servo ON input |
| | 2 | SO(02) | Servo ON status output | | 2 | | Reserved area. *1 |
| | 3 | SO(03) | Alarm status output | | 3 | | |
| | 4 | SO(04) | MP RDY status output | | 4 | | |
| | 5 | | Reserved area. *1 | | 5 | | |
| | 6 | | | | 6 | SI(06) | Stop input |
| | 7 | | | | 7 | | Reserved area. *1 |
| | 8 | SO(10) | AUTO mode status output | | 8 | SI(10) | Sequence control input |
| | 9 | SO(11) | Return-to-origin complete status output | | 9 | | Reserved area. *1 |
| | 10 | SO(12) | Sequence program execution status output | | 10 | SI(12) | Auto operation start input |
| | 11 | SO(13) | Robot program running output | | 11 | | Reserved area. *1 |
| | 12 | SO(14) | Program reset status output | | 12 | SI(14) | Return-to-origin input (incremental type axis) |
| | 13 | SO(15) | Warning output | | 13 | SI(15) | Program reset input |
| | 14 | | Reserved area. *1 | | 14 | SI(16) | Alarm reset input |
| | 15 | | | | 15 | SI(17) | Return-to-origin input (absolute type axis) |
| m + 17 | 0 - 7 | SO(20) to SO(27) | General-purpose output | n + 17 | 0 - 7 | SI(20) to SI(27) | General-purpose input |
| | 8 - 15 | SO(30) to SO(37) | | | 8 - 15 | SI(30) to SI(37) | |
| m + 18 | 0 - 7 | SO(40) to SO(47) | General-purpose output | n + 18 | 0 - 7 | SI(40) to SI(47) | General-purpose input |
| | 8 - 15 | SO(50) to SO(57) | | | 8 - 15 | SI(50) to SI(57) | |
| m + 19 | 0 - 7 | SO(60) to SO(67) | General-purpose output | n + 19 | 0 - 7 | SI(60) to SI(67) | General-purpose input |
| | 8 - 15 | SO(70) to SO(77) | General-purpose output | | 8 - 15 | SI(70) to SI(77) | General-purpose input |
| m + 20 | 0 - 7 | SO(100) to SO(107) | General-purpose output | n + 20 | 0 - 7 | SI(100) to SI(107) | General-purpose input |
| | 8 - 15 | SO(110) to SO(117) | General-purpose output | | 8 - 15 | SI(110) to SI(117) | General-purpose input |
| m + 21 | 0 - 7 | SO(120) to SO(127) | General-purpose output | n + 21 | 0 - 7 | SI(120) to SI(127) | General-purpose input |
| | 8 - 15 | SO(130) to SO(137) | General-purpose output | | 8 - 15 | SI(130) to SI(137) | General-purpose input |
| m + 22 | 0 - 7 | SO(140) to SO(147) | General-purpose output | n + 22 | 0 - 7 | SI(140) to SI(147) | General-purpose input |
| | 8 - 15 | SO(150) to SO(157) | General-purpose output | | 8 - 15 | SI(150) to SI(157) | General-purpose input |
| m + 23 | 0 - 15 | | Reserved area. *1 | n + 23 | 0 - 15 | | Reserved area. *1 |

m : Start address of the input area assigned to the master module
n : Start address of the output area assigned to the master module

*1: Reserved area. Do not use.

## 2. DeviceNet (When I/O size is set to "Compact")

| Slave → Master | | | | Master → Slave | | | |
|---|---|---|---|---|---|---|---|
| Address | bit | Signal name | Meaning | Address | bit | Signal name | Meaning |
| m | 0 | SO(00) | Emergency stop status output | n | 0 | SI(00) | Emergency stop input |
| | 1 | SO(01) | CPU_OK status output | | 1 | SI(01) | Servo ON input |
| | 2 | SO(02) | Servo ON status output | | 2 | | Reserved area. *1 |
| | 3 | SO(03) | Alarm status output | | 3 | | |
| | 4 | SO(04) | MP RDY status output | | 4 | | |
| | 5 | | Reserved area. *1 | | 5 | | |
| | 6 | | | | 6 | SI(06) | Stop input |
| | 7 | | | | 7 | | Reserved area. *1 |
| | 8 | SO(10) | AUTO mode status output | | 8 | SI(10) | Sequence control input |
| | 9 | SO(11) | Return-to-origin complete status output | | 9 | | Reserved area. *1 |
| | 10 | SO(12) | Sequence program execution status output | | 10 | SI(12) | Auto operation start input |
| | 11 | SO(13) | Robot program running output | | 11 | | Reserved area. *1 |
| | 12 | SO(14) | Program reset status output | | 12 | SI(14) | Return-to-origin input (incremental type axis) |
| | 13 | SO(15) | Warning output | | 13 | SI(15) | Program reset input |
| | 14 | | Reserved area. *1 | | 14 | SI(16) | Alarm reset input |
| | 15 | | | | 15 | SI(17) | Return-to-origin input (absolute type axis) |
| m + 1 | 0 - 7 | SO(20) to SO(27) | General-purpose output | n + 1 | 0 - 7 | SI(20) to SI(27) | General-purpose input |
| | 8 - 15 | SO(30) to SO(37) | | | 8 - 15 | SI(30) to SI(37) | |

m : Start address of the input area assigned to the master module
n Start address of the output area assigned to the master module

*1: Reserved area. Do not use.

## 3. PROFIBUS / PROFINET

| Slave → Master | | | | Master → Slave | | | |
|---|---|---|---|---|---|---|---|
| Address | bit | Signal name | Meaning | Address | bit | Signal name | Meaning |
| Im + 32 | 0 | SO(00) | Emergency stop status output | Qn + 32 | 0 | SI(00) | Emergency stop input |
| | 1 | SO(01) | CPU_OK status output | | 1 | SI(01) | Servo ON input |
| | 2 | SO(02) | Servo ON status output | | 2 | | Reserved area. *1 |
| | 3 | SO(03) | Alarm status output | | 3 | | |
| | 4 | SO(04) | MP RDY status output | | 4 | | |
| | 5 | | Reserved area. *1 | | 5 | | |
| | 6 | | | | 6 | SI(06) | Stop input |
| | 7 | | | | 7 | | Reserved area. *1 |
| Im + 33 | 0 | SO(10) | AUTO mode status output | Qn + 33 | 0 | SI(10) | Sequence control input |
| | 1 | SO(11) | Return-to-origin complete status output | | 1 | | Reserved area. *1 |
| | 2 | SO(12) | Sequence program execution status output | | 2 | SI(12) | Auto operation start input |
| | 3 | SO(13) | Robot program running output | | 3 | | Reserved area. *1 |
| | 4 | SO(14) | Program reset status output | | 4 | SI(14) | Return-to-origin input (incremental type axis) |
| | 5 | SO(15) | Warning output | | 5 | SI(15) | Program reset input |
| | 6 | | Reserved area. *1 | | 6 | SI(16) | Alarm reset input |
| | 7 | | | | 7 | SI(17) | Return-to-origin input * (absolute type axis) |
| Im + 34 | 0 - 7 | SO(20) to SO(27) | General-purpose output | Qn + 34 | 0 - 7 | SI(20) to SI(27) | General-purpose input |
| Im + 35 | 0 – 7 | SO(30) to SO(37) | | Qn + 35 | 0 - 7 | SI(30) to SI(37) | |
| Im + 36 | 0 - 7 | SO(40) to SO(47) | General-purpose output | Qn + 36 | 0 – 7 | SI(40) to SI(47) | General-purpose input |
| Im + 37 | 0 - 7 | SO(50) to SO(57) | | Qn + 37 | 0 - 7 | SI(50) to SI(57) | |
| Im + 38 | 0 – 7 | SO(60) to SO(67) | General-purpose output | Qn + 38 | 0 – 7 | SI(60) to SI(67) | General-purpose input |
| Im + 39 | 0 - 7 | SO(70) to SO(77) | General-purpose output | Qn + 39 | 0 - 7 | SI(70) to SI(77) | General-purpose input |
| Im + 40 | 0 - 7 | SO(100) to SO(107) | General-purpose output | Qn + 40 | 0 - 7 | SI(100) to SI(107) | General-purpose input |
| Im + 41 | 0 - 7 | SO(110) to SO(117) | General-purpose output | Qn + 41 | 0 - 7 | SI(110) to SI(117) | General-purpose input |
| Im + 42 | 0 - 7 | SO(120) to SO(127) | General-purpose output | Qn + 42 | 0 - 7 | SI(120) to SI(127) | General-purpose input |
| Im + 43 | 0 - 7 | SO(130) to SO(137) | General-purpose output | Qn + 43 | 0 - 7 | SI(130) to SI(137) | General-purpose input |
| Im + 44 | 0 – 7 | SO(140) to SO(147) | General-purpose output | Qn + 44 | 0 - 7 | SI(140) to SI(147) | General-purpose input |
| Im + 45 | 0 - 7 | SO(150) to SO(157) | General-purpose output | Qn + 45 | 0 - 7 | SI(150) to SI(157) | General-purpose input |
| Im + 46 | 0 - 7 | | Reserved area. *1 | Qn + 46 | 0 - 7 | | Reserved area. *1 |
| Im + 47 | 0 - 7 | | Reserved area. *1 | Qn + 47 | 0 - 7 | | Reserved area. *1 |

I : Input address
Q : Output address
m, n : Start address assigned by hardware configuration

* Used to perform a return-to-origin at dedicated "absolute type axis" or at both "absolute & incremental type axis", depending on the parameter (DI17) setting.

*1: Reserved area. Do not use.

**WARNING**

ALTHOUGH EMERGENCY STOP SI (00) HAS THE FUNCTION OF TURNING THE SERVO OFF AND STOPPING THE ROBOT, WHEN USING THE EMERGENCY STOP INPUT SI (00) FOR PURPOSES OF SAFETY, DO NOT USE IT BY ITSELF. IN ORDER TO STOP (SERVO OFF) THE ROBOT FOR PURPOSES OF SAFETY, BE SURE TO PROVIDE A HARD-WIRED SAFETY CIRCUIT USING THE EMERGENCY STOP CONTACT OF THE SAFETY CONNECTOR, AND ALSO TURN OFF THE EMERGENCY STOP INPUT OF THE DEVICENET SERIAL I/O UNIT.

## ■ Remote registers (word input/output)

### 1. Master module output → Controller input

| Address | Signal name | | | Assigned address | |
|---|---|---|---|---|---|
| | | | | DeviceNet EtherNet/IP | PROFIBUS PROFINET |
| WI0 | | SIW(0) | Dedicated input | n | Qn |
| WI1 | | SIW(1) | | n + 1 | Qn + 2 |
| WI2 | SID(2) | SIW(2) | General-purpose input | n + 2 | Qn + 4 |
| WI3 | | SIW(3) | | n + 3 | Qn + 6 |
| WI4 | SID(4) | SIW(4) | | n + 4 | Qn + 8 |
| WI5 | | SIW(5) | | n + 5 | Qn + 10 |
| WI6 | SID(6) | SIW(6) | | n + 6 | Qn + 12 |
| WI7 | | SIW(7) | | n + 7 | Qn + 14 |
| WI8 | SID(8) | SIW(8) | | n + 8 | Qn + 16 |
| WI9 | | SIW(9) | | n + 9 | Qn + 18 |
| WI10 | SID(10) | SIW(10) | | n + 10 | Qn + 20 |
| WI11 | | SIW(11) | | n + 11 | Qn + 22 |
| WI12 | SID(12) | SIW(12) | | n + 12 | Qn + 24 |
| WI13 | | SIW(13) | | n + 13 | Qn + 26 |
| WI14 | SID(14) | SIW(14) | | n + 14 | Qn + 28 |
| WI15 | | SIW(15) | | n + 15 | Qn + 30 |

### 2. Controller output → Master module input

| Address | Signal name | | | Assigned address | |
|---|---|---|---|---|---|
| | | | | DeviceNet EtherNet/IP | PROFIBUS PROFINET |
| WO0 | | SOW(0) | Dedicated output | m | Im |
| WO1 | | SOW(1) | | m + 1 | Im + 2 |
| WO2 | SOD(2) | SOW(2) | General-purpose output | m + 2 | Im + 4 |
| WO3 | | SOW(3) | | m + 3 | Im + 6 |
| WO4 | SOD(4) | SOW(4) | | m + 4 | Im + 8 |
| WO5 | | SOW(5) | | m + 5 | Im + 10 |
| WO6 | SOD(6) | SOW(6) | | m + 6 | Im + 12 |
| WO7 | | SOW(7) | | m + 7 | Im + 14 |
| WO8 | SOD(8) | SOW(8) | | m + 8 | Im + 16 |
| WO9 | | SOW(9) | | m + 9 | Im + 18 |
| WO10 | SOD(10) | SOW(10) | | m + 10 | Im + 20 |
| WO11 | | SOW(11) | | m + 11 | Im + 22 |
| WO12 | SOD(12) | SOW(12) | | m + 12 | Im + 24 |
| WO13 | | SOW(13) | | m + 13 | Im + 26 |
| WO14 | SOD(14) | SOW(14) | | m + 14 | Im + 28 |
| WO15 | | SOW(15) | | m + 15 | Im + 30 |

DeviceNet, EtherNet/IP
m : Start address of the input area assigned to the master module
n : Start address of the output area assigned to the master module
PROFIBUS, PROFINET
I : Input address
Q : Output address
m, n : Start address assigned by hardware configuration

# 2. Details of input/output signals

## ■ Remote input (Bit output)

| Signal name | Meaning | Description |
|---|---|---|
| SO(00) | Emergency stop status output | Turns ON when the robot controller is in the emergency stop state. |
| SO(01) | CPU_OK status output | Turns ON when the robot controller is in the normal state. |
| SO(02) | Servo ON status output | Turns ON when the motor power of the robot controller is ON. |
| SO(03) | Alarm status output | Switches ON when a serious robot controller error occurs. |
| SO(04) | MP RDY status output | Switches ON when the main power is supplied from the robot controller, and when servo ON operation is enabled by the servo ON input signal.<br>Switches OFF when a serious robot controller error occurs. |
| SO(10) | AUTO mode status output | Turns ON when the AUTO mode is selected.<br>Turns OFF when other mode is selected. |
| SO(11) | Return-to-origin complete status output | Turns ON when the robot has completed the return-to-origin. |
| SO(12) | Sequence program execution status output | Turns ON while the sequence program is being executed. |
| SO(13) | Robot program running output | Turns ON while the robot program is being executed. |
| SO(14) | Program reset status output | Turns ON when the robot program is reset.<br>Turns OFF when the robot program starts. |
| SO(15) | Warning output | Switches ON when a robot controller warning status occurs. |
| SO(20) to SO(27) | General-purpose output | General-purpose output turns ON/OFF when the value is assigned to the SO port, or SET/RESET command or OUT command is executed. |
| to | to | |
| SO(150) to SO(157) | General-purpose output | |

n : Start address of the output area assigned to the master module

**NOTE**

- When the area check output function is used, the area check outputs can be assigned to SO(20) to SO(157).
- If a DeviceNet serial I/O unit is being used and the I/O size has been set to Compact, the general-purpose output will be only SO(20) to SO(37).

## ■ Remote output (Bit input)

| Signal name | Meaning | Description |
|---|---|---|
| SI(00) | Emergency stop input | Turns OFF to put the controller in the emergency stop state.<br>Keeps turned ON during normal operation. |
| SI(01) | Servo ON input | Turns ON to cancel the emergency stop state and put the robot servomotor in the ON state. The servo ON is executed when this signal is switched from OFF to ON.<br>It is necessary that the emergency stop input SI(00) is in the ON state and all emergency stop states (emergency stop terminal in the SAFETY connector, etc.) on the robot controller are cancelled. |
| SI(06) | Stop input | Turns OFF to stop the robot program currently being executed.<br>To execute the program, keep this signal turned ON. |
| SI(10) | Sequence control input | Turns ON to execute the sequence program in the robot controller.<br>The sequence program is executed when this signal is in the ON state. |
| SI(12) | Auto operation start input | Turns ON to execute the robot program.<br>The robot program is executed when this signal is switched from OFF to ON. |
| SI(14) | Return-to-origin input<br>(incremental type axis) | This signal is intended for axes whose return-to-origin method is the sensor or stroke end method.<br>Turns ON to perform the return-to-origin of the incremental type axis or semi-absolute type axis. When this signal is switched from OFF to ON, the incremental type axis performs the return-to-origin and the semi-absolute type axis performs the absolute search operation. |
| SI(15) | Program reset input | Turns ON to reset the robot program.<br>The program is reset when this signal is switched from OFF to ON. |
| SI(16) | Alarm reset input | Turns ON to perform an alarm reset.<br>The alarm reset occurs when this signal is switched from OFF to ON. If the alarms are not reset by this signal, it is necessary to turn the power on again. |
| SI(17) | Return-to-origin input<br>(absolute type axis) | Used to perform a return-to-origin at dedicated "absolute type axis" or at both "absolute / incremental type axis", depending on the parameter (DI17 mode) setting.<br>• When set at "ABS";<br>Turns ON to perform a return-to-origin for an absolute type axis. The return-to-origin occurs when this signal is switched from OFF to ON. The axis whose return-to-origin method is the mark method does not perform the return-to-origin. Additionally, if the axis whose return-to-origin method is the mark method does not complete the return-to-origin, the return-to-origin is not executed by using the dedicated input.<br>• When set at "ABS/ORG";<br>When there is only an absolute type axis, the return-to-origin is performed for the absolute type axis.<br>The return-to-origin occurs when this signal is switched from OFF to ON.<br>When there are only incremental and semi-absolute type axes, the return-to-origin is performed for those two axis types. When this signal is switched from OFF to ON, the incremental type axis performs a return-to-origin and the semi-absolute type axis performs an absolute search operation.<br>If there are both absolute type and incremental or semi-absolute type of axes, first return-to-origin is performed for the absolute type axis, and then second return-to-origin is performed for the incremental type and semi-absolute type axes. |
| SI(20) to SI(27) | General-purpose input | Refers to the SI port value, executes the WAIT command, and uses the ON/OFF state of the general-purpose input. |
| to | to | |
| SI(150) to SI(157) | General-purpose input | |

n : Start address of the output area assigned to the master module

**NOTE**

- When the YRCX is used with a robot whose axis configuration includes the absolute type, incremental type, and semi-absolute type axes and SI(17) is used for " both the absolute and incremental axes return-to-origin", the return-to-origin is performed for the absolute type axis each time the return-to-origin is performed for the incremental type or semi-absolute type axis.

Therefore, when the robot axis configuration includes the absolute type, incremental type, and semi-absolute type axes, it is recommended to perform the absolute type axis return-to-origin with SI(17) and incremental type axis return-to-origin with SI(14).

## ■ Address (word input/output)

### 1. Master module output → Controller input

| Address | Signal name | | | Description |
|---|---|---|---|---|
| WI0 | | SIW(0) | Dedicated input | Used as the remote command area. |
| WI1 | | SIW(1) | | Used as the command data area of the remote command. |
| WI2 | SID(2) | SIW(2) | General-purpose input | Used to input the word or double word data from the SIW or SID board or used as the command data area of the remote command. |
| WI3 | | SIW(3) | | |
| WI4 | SID(4) | SIW(4) | | |
| WI5 | | SIW(5) | | |
| WI6 | SID(6) | SIW(6) | | |
| WI7 | | SIW(7) | | |
| WI8 | SID(8) | SIW(8) | | |
| WI9 | | SIW(9) | | |
| WI10 | SID(10) | SIW(10) | | |
| WI11 | | SIW(11) | | |
| WI12 | SID(12) | SIW(12) | | |
| WI13 | | SIW(13) | | |
| WI14 | SID(14) | SIW(14) | | |
| WI15 | | SIW(15) | | |

**CAUTION**

When using a DeviceNet serial I/O unit and the I/O size is set to compact, it is not possible to use the SID and SIW word input.

### 2. Controller output → Master module input

| Address | Signal name | | | Description |
|---|---|---|---|---|
| WO0 | | SOW(0) | Dedicated output | Used as the status area of the remote command. |
| WO1 | | SOW(1) | | Used as the error code area of the remote command. |
| WO2 | SOD(2) | SOW(2) | General-purpose output | Used to output the word or double word data from the SOW or SOD board or used as the response area of the remote command. |
| WO3 | | SOW(3) | | |
| WO4 | SOD(4) | SOW(4) | | |
| WO5 | | SOW(5) | | |
| WO6 | SOD(6) | SOW(6) | | |
| WO7 | | SOW(7) | | |
| WO8 | SOD(8) | SOW(8) | | |
| WO9 | | SOW(9) | | |
| WO10 | SOD(10) | SOW(10) | | |
| WO11 | | SOW(11) | | |
| WO12 | SOD(12) | SOW(12) | | |
| WO13 | | SOW(13) | | |
| WO14 | SOD(14) | SOW(14) | | |
| WO15 | | SOW(15) | | |

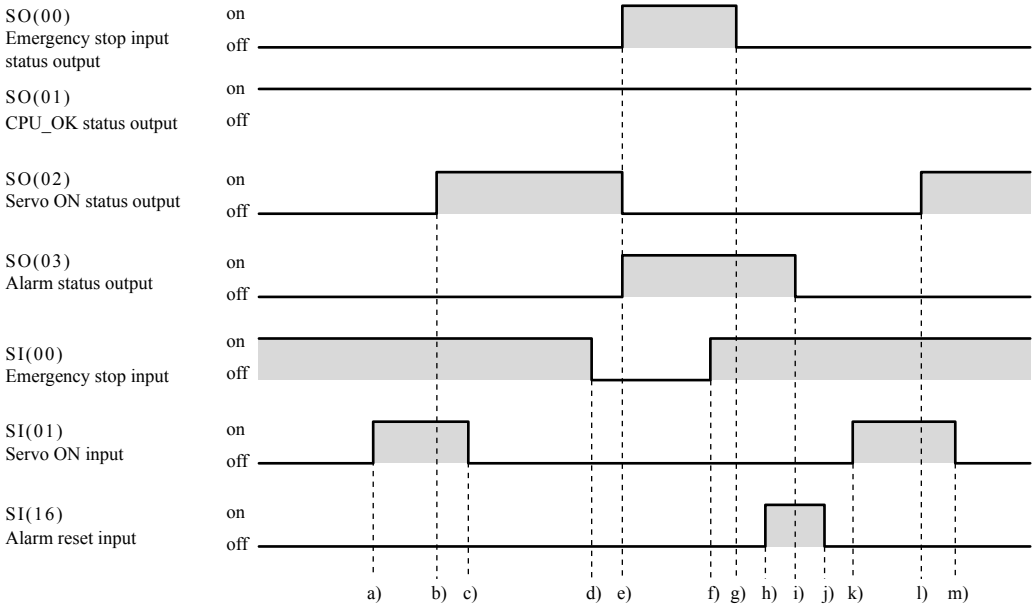
**CAUTION**

When using a DeviceNet serial I/O unit and the I/O size is set to compact, it is not possible to use the SOD and SOW word input.

# 3. Dedicated input/output signal timing chart

## 3.1 Servo ON and emergency stop

After the power is turned on, the robot controller always starts operation in the servo-off state.
The timing chart for servo ON processing after turning the power on is shown below.




**CAUTION**

- Provide an interval of 100ms or more when turning the dedicated input from the master module to the controller ON/OFF. If the interval is too short, the dedicated input may not be recognized. (This also applies to the interval for the same dedicated inputs or different dedicated inputs.)
- Use this also if there is a dedicated output in response to the dedicated input from the master module to the controller.

### ■ Initial servo ON process after power ON

a) Servo ON input ON is input
b) If it is not in the emergency stop state, output servo ON status ON is output
c) After confirming that servo ON status output is ON, servo ON input OFF is input

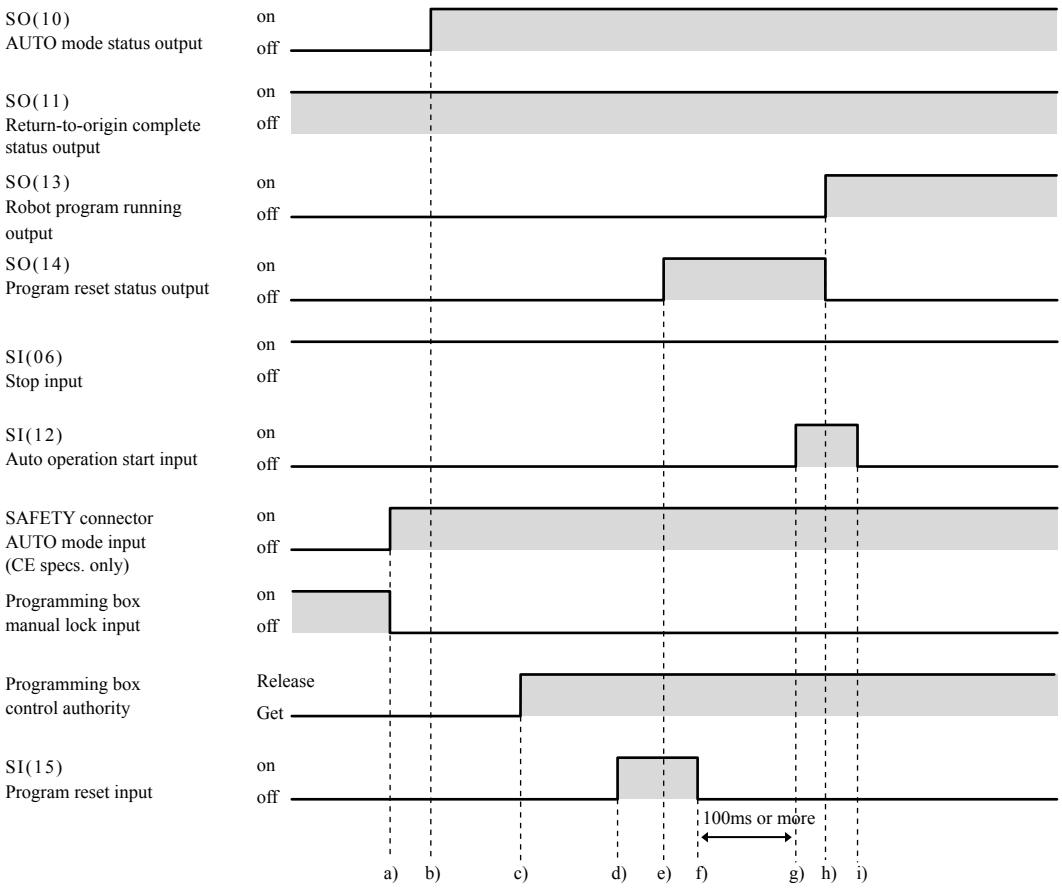
### ■ Shift to emergency stop

d) Emergency stop input OFF is input
e) Emergency stop input status ON and alarm status output ON are output
Servo ON status output OFF is output

### ■ Servo ON process from emergency stop status

f) Emergency stop input ON is input
g) Emergency stop input status output OFF is output
h) Alarm reset input ON is input
i) Alarm status output OFF is output
j) The alarm reset input OFF is input occurs after confirming that the alarm status output is OFF
k) Servo ON input ON is input
l) Servo ON status output ON is output
m) After confirming that servo ON status output is ON, servo ON input OFF is input

## 3.2 AUTO mode changeover, program reset and program execution




**CAUTION**

- Provide an interval of 100ms or more when turning the dedicated input from the master module to the controller ON/OFF. If the interval is too short, the dedicated input may not be recognized. (This also applies to the interval for the same dedicated inputs or different dedicated inputs.)
- Use this also if there is a dedicated output in response to the dedicated input from the master module to the controller.

### AUTO mode changeover process

a) SAFETY connector AUTO mode input ON is input, programming box manual lock input OFF is input

b) AUTO mode status output ON is output

c) Programming box control authority is CANCEL

### Program reset process

d) Program reset input ON is input

e) Program reset status output ON is output

f) After confirming that the program reset status output is ON, the program reset input OFF is input

### Program execution process

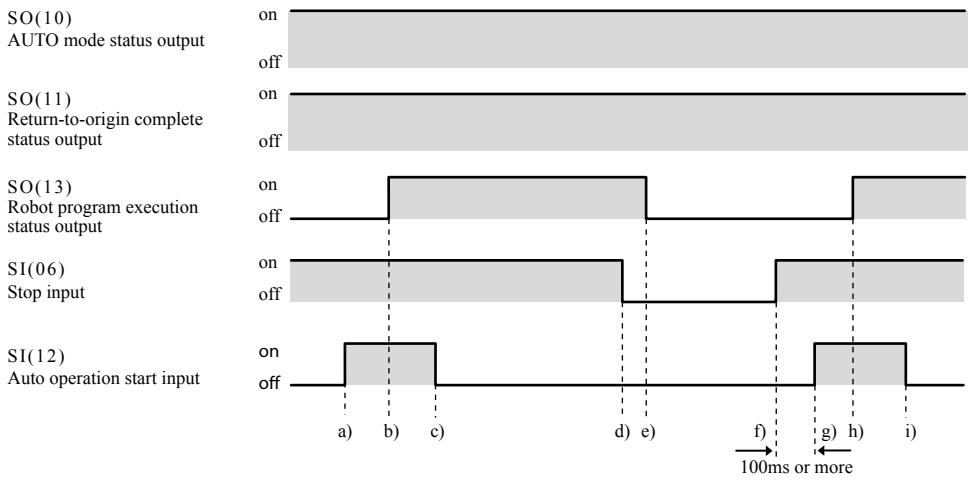
g) Auto operation start input ON is input

h) Program reset status output OFF is output, robot program running output ON is output

i) After confirming that the robot program running output is ON, auto operation start input OFF is input

* The program cannot be executed if the emergency stop and stop input are OFF.

## 3.3 Stopping operation by a program stop




**CAUTION**

- Provide an interval of 100ms or more when turning the dedicated input from the master module to the controller ON/OFF. If the interval is too short, the dedicated input may not be recognized. (This also applies to the interval for the same dedicated inputs or different dedicated inputs.)
- Use this also if there is a dedicated output in response to the dedicated input from the master module to the controller.

### ■ Program execution process

a) Auto operation start input ON is input

b) Robot program running output ON is output

c) After confirming that the robot program running output is ON, auto operation start input OFF is input

### ■ Program stop process using stop input

d) Stop input OFF is input

e) Robot program running output OFF is output

### ■ Program execution after stopping program with stop input

f) Stop input ON is input

g) Auto operation start input ON is input

h) Robot program running output ON is output

i) After confirming that the robot program running output is ON, auto start input OFF is input

* The program also stops at transitions to an emergency stop status. At this point, the alarm status output ON is output, and servo ON status output OFF is output. To re-execute the program, an alarm reset and servo ON processing are required.

# Chapter 2 Remote command

# Chapter 2 Remote command

# Chapter 2 Remote command

# Chapter 2 Remote command

# 1. Remote command format

If a DeviceNet serial I/O unit is installed, it is possible to use the remote registers of the serial I/O unit to issue commands directly from the master module.

**CAUTION**

When using a DeviceNet serial I/O unit and the I/O size is also set to compact, remote commands cannot be used.

## 1.1 Remote command specifications

Functions such as shown below are assigned to each address.

### ■ Master module output → Controller input

| Remote command | | Assigned address | |
|---|---|---|---|
| Address | Contents | DeviceNet EtherNet/IP | PROFIBUS PROFINET |
| WI0 | Execute command | n | Qn |
| WI1 | Command data | n + 1 | Qn + 2 |
| WI2 | | n + 2 | Qn + 4 |
| WI3 | | n + 3 | Qn + 6 |
| to | | to | to |
| WI15 | | n + 15 | Qn + 30 |

### ■ Controller output → Master module input

| Remote command | | | Assigned address | |
|---|---|---|---|---|
| Address | Contents | | DeviceNet EtherNet/IP | PROFIBUS PROFINET |
| WO0 | Status | | m | Im |
| | Normal end | Abnormal end | | |
| WO1 | | Alarm group number | m + 1 | Im + 2 |
| WO2 | | Alarm category number | m + 2 | Im + 4 |
| WO3 | | Not used | m + 3 | Im + 6 |
| to | | | to | to |
| WO15 | | | m + 15 | Im + 30 |

DeviceNet, EtherNet/IP
- m : Start address of the input area assigned to the master module
- n : Start address of the output area assigned to the master module

PROFIBUS, PROFINET
- I : Input address
- Q : Output address
- m, n : Start address assigned by hardware configuration

**NOTE**

Remote commands must be held until the status changes to a normal end (0x0200) or an abnormal end (0x4000). If a remote command is changed before the status changes to an end, the status of the executed remote command will not be reflected.

Remote commands are executed by assigning the command codes to the "WI0", and command data to the WI1 to WI15. When the controller receives the remote command, it starts the processing and sends the status (results) and other information to the master module by way of the "WO0" and WO1 to WO15. When the remote command ends, assign the status reset command (0x0000 (hexadecimal) ) to the "WI0" to clear the status. The remote command can be executed when in command ready status (0x0000 (hexadecimal) ).

Command data which adds to remote commands differs according to the particular remote command. For details, Refer to "4. Remote command description" in this guide. Command data must always be entered before trying to set the remote command.

Contents of the remote command response sent as the remote command results differ according to the particular remote command. For details, Refer to "4. Remote command description" in this guide.

Data is set in binary code. When setting two pieces of 8-bit data such as character code data, set the upper bit data into the higher address. If the data size is greater than 16 bits, set the upper bit data into the higher address. (little endian)
For example, to set "12" in WI4, enter 0x3231 (hexadecimal)
(character code: "1" = 0x31, "2" = 0x32)
For example, to set 0x01234567 (hexadecimal) (=19,088,743) in the WI4 and WI5 registers, set 0x0123 (hexadecimal) in WI5 and set 0x4567 (hexadecimal) in WI4.

The status code is sent to "WO0" when the remote command ends correctly.

When the remote command ends incorrectly, an alarm group number is sent to WO1 and alarm category number is sent to WO2 as a response. See the troubleshooting section of the robot controller user's manual for description of the alarm group number and alarm category number.
For example, when 0x0002 (hexadecimal) was set in WO1 and 0x014E (hexadecimal) was set in WO2, this shows that a "soft limit over" alarm has occurred.

## 1.2 Remote status description

The controller starts processing when the remote command is received and sends the status (results) to the master module by way of "WO0".

### Remote status list

| Status contents | | | | Meaning |
|---|---|---|---|---|
| WO0 | WO1 | WO2 | From WO3 | |
| 0x0000 | 0x0000 | | | Command ready status |
| 0x0100 | 0x0000 | | | Command run status |
| 0x0200 | Response data | | | Normal end status |
| 0x4000 | Alarm group number | Alarm category number | 0x0000 | Abnormal end status |

**NOTE**

Remote commands must be held until the status changes to a normal end (0x0200) or an abnormal end (0x4000). If a remote command is changed before the status changes to an end, the status of the executed remote command will not be reflected.

### Code 0x0000 ..... Command ready status

Indicates a state where remote command is not being executed and a new remote command can be received. Remote status must always be set to command ready status (0x0000) in order to execute a remote command. To change the remote status to command ready status (0x0000), execute the status reset command (0x0000).

### Code 0x0100 ..... Command run status

Indicates a state where the controller has received a remote command and is in command run status.
In some cases the command run status (0x0100) might not be sent to the master module due to problems caused by a short remote command execution time versus the controller scan time (5 ms).

### Code 0x0200 .....Normal end status

Indicates a state where the remote command was executed correctly.
Category 5 (key operation command) indicates command was received as a key operation command. The actual key operation sometimes might be in progress.

### Code 0x4000 .....Abnormal end status

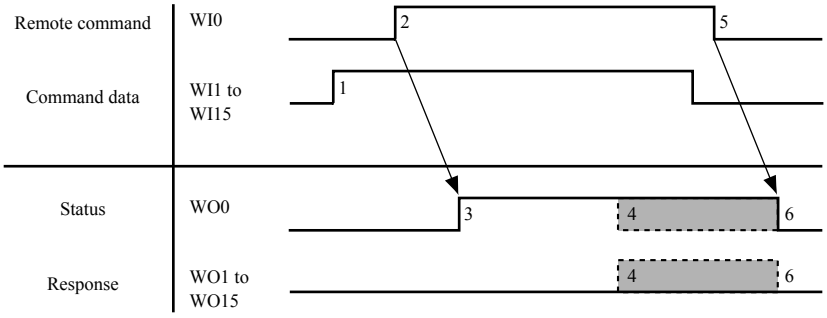
Indicates that the remote command ended abnormally.
In this case, WO1 is set to the alarm group number relating to the cause of the abnormal end, and WO2 is set to the alarm type number.
For example if a remote command ended abnormally because of emergency stop input, the alarm message is "12.600: Emergency stop on". This "12.600" indicates alarm group number "12" and alarm category number "600".
This means that WO1 is set to alarm group number "0x000C", and WO2 is set to alarm category number "0x0258".

**NOTE**

For details on alarm group numbers and alarm category numbers, refer to the troubleshooting section of the controller manual.

# 2. Sending and receiving remote commands

## Sending and receiving remote commands




**NOTE**

Remote commands must be held until the status changes to a normal end (0x0200) or an abnormal end (0x4000). If a remote command is changed before the status changes to an end, the status of the executed remote command will not be reflected.

1. Command data setting
2. Remote command setting
3. Status shifts to command run status (0x0100).
   (If the command is quickly executed, status may sometimes shift to normal end status (0x0200) without changing to command run status (0x0100).)
4. Shifts to response change and normal end status (0x0200) or to abnormal end status (0x4000).
5. Status reset command (0x0000) setting
6. Status and response shift to command ready status.

Example: Typical send/receive when executing a PTP movement command (all axes, program speed 50%) to point 19 is shown below.

1. To execute the PTP movement command for the designated point, enter the value in the registers shown below.
   WI1 : command flag (0x0004 = speed setting)
   WI3 : speed setting (0x0032 = 50%)
   WI4 : point setting (0x0013 = point 19)
2. Enter the PTP movement command (0x0001) for the designated point into the "WI0".
3. The robot controller receives the remote command and starts executing it if the command code and command data can be executed. Status now shifts to command run status (0x0100). The robot moves to the position designated as point 19 at the program speed (50% of normal speed). If execution is not possible, the status changes to abnormal end (0x4000), and simultaneously WO1 and WO2 are changed to the alarm code.
4. When finished executing the remote command, status changes to normal end status (0x0200). Response information is changed at the same time if present.
5. The current remote command has now finished, then set the status reset command (0x0000) in "WI0" in order to issue the next command.
6. The status and response shift to command ready status (0x0000).

# 3. Remote command & remote status tables

Remote commands and remote status codes are shown in hexadecimal notation.

## ■ Remote Command

| Command contents | | Meaning |
|---|---|---|
| Category | WI0 | |
| Special | 0x0000 | Status reset command |
| 1 | 0xR0nn | Movement command and associated command |
| 2 | 0xR1nn | Definition and reference command |
| 3 | 0xR2nn | Arithmetic command |
| 4 | 0x03nn | I/O port command |
| 5 | 0x04nn | Program operation setting command |
| 6 | 0xR5nn | Data handling command |
| 7 | 0x06nn | Utility mode setting operation command |

* nn is determined by the particular remote command.
* "R" indicates the number of the robot in question (0~4).

## ■ Remote Status

| Status contents | | | | Meaning |
|---|---|---|---|---|
| WO0 | WO1 | WO2 | From WO3 | |
| 0x0000 | 0x0000 | | | Command ready status |
| 0x0100 | 0x0000 or response data | | | Command run status |
| 0x0200 | Response data | | | Normal end status |
| 0x4000 | Alarm group number | Alarm category number | 0x0000 | Abnormal end status |

## Remote command restrictions:

- All remote commands are disabled when dedicated inputs have been disabled by a safety setting.
- Only the following remote commands are enabled when the programming box has control authority.

| Command contents | Command code (WI0) |
|---|---|
| Status reset command | 0x0000 |
| Point data reference | 0x0101 |
| Point comment data reference | 0x0105 |
| Pallet data reference | 0x0109 |
| Shift data reference | 0x010D |
| Hand data reference | 0x0111 |
| Static variable referencing | 0x0214 |
| Parameter referencing | 0xR224 |
| Input/output port referencing | 0x0304 |
| Version information reference | 0x0501 |
| System configuration referencing | 0xR502 |
| Servo status reference | 0xR503 |
| Current position reference (pulse units) | 0xR505 |
| Current position reference (millimeter units) | 0xR506 |
| Task status reference | 0x0507 |
| Task execution reference | 0x0508 |
| Message reference | 0x0509 |
| Speed status reference | 0xR50A |
| Arm designation status reference | 0xR50B |
| Arm status reference | 0xR50C |
| Return-to-origin status reference | 0xR50F |
| Current torque value (percentage of max. torque) reference | 0xR510 |
| In-controller date reference | 0x0511 |
| In-controller time reference | 0x0512 |
| Option slot module information referencing | 0x0513 |
| Inching movement amount referencing | 0xR514 |
| Remote command latest alarm referencing | 0x0515 |
| Current torque value (percentage of rated torque) reference | 0x0516 |

* "R" indicates the number of the robot in question (0~4).

**NOTE**

For details regarding safety settings and programming box control authority, refer to the robot controller user's manual.

## Category 1

| No. | Command contents | | | Command code (WI0) |
|---|---|---|---|---|
| 1-1 | MOVE command | PTP point designation | | 0xR001 |
| | | Arch designation | | 0xR002 |
| | | Linear interpolation | | 0xR003 |
| | | Circular interpolation | | 0xR004 |
| | | Direct PTP designation | Millimeter units | 0xR006 |
| | | | Pulse units | 0xR007 |
| 1-2 | MOVEI command | PTP point designation | | 0xR009 |
| | | Linear interpolation | | 0xR00A |
| | | Direct PTP designation | Millimeter units | 0xR00E |
| | | | Pulse units | 0xR00F |
| 1-3 | DRIVE command | Point designation | | 0xR010 |
| | | Direct designation | Millimeter units | 0xR012 |
| | | | Pulse units | 0xR013 |
| 1-4 | DRIVEI command | Point designation | | 0xR014 |
| | | Direct designation | Millimeter units | 0xR016 |
| | | | Pulse units | 0xR017 |
| 1-5 | Pallet command | PTP designation | | 0xR018 |
| | | Arch designation | | 0xR019 |
| 1-6 | Jog movement command | Pulse units | | 0xR020 |
| | | Cartesian coordinate system units | | 0xR021 |
| | | Tool coordinate system | | 0xR022 |
| 1-7 | Inching movement command | Pulse units | | 0xR024 |
| | | Cartesian coordinate system units | | 0xR025 |
| | | Tool coordinate system | | 0xR026 |
| 1-8 | Inching movement amount setting command | | | 0xR027 |
| 1-9 | Point teaching command | | | 0xR028 |
| 1-10 | Absolute reset movement command | | | 0xR030 |
| 1-11 | Absolute reset command | | | 0xR031 |
| 1-12 | Return-to-origin command | Robot units | | 0xR032 |
| | | Axis units | | 0xR033 |
| 1-13 | Servo command | On designation | | 0xR034 |
| | | Off designation | | 0xR035 |
| | | Free designation | | 0xR036 |
| 1-14 | Manual movement speed change command | | | 0xR038 |
| 1-15 | Automatic movement speed change command | | | 0xR039 |
| 1-16 | Program movement speed change command | | | 0xR03A |
| 1-17 | Shift designation change command | | | 0xR03B |
| 1-18 | Hand designation change command | | | 0xR03C |
| 1-19 | Arm designation change command | | | 0xR03D |
| 1-20 | Motor power command | OFF | | 0x0041 |
| | | ON | | 0x0042 |
| | | PWR | | 0x0043 |
| 1-21 | MOVET command | PTP point designation | | 0xR044 |
| | | Linear interpolation | | 0xR045 |
| 1-22 | Max. torque command value change command | | | 0xR048 |
| 1-23 | PUSH operation command | Point designation | | 0xR04B |
| | | Direct designation | Millimeter units | 0xR04C |
| | | | Pulse units | 0xR04D |

* "R" indicates the number of the robot in question (0~4).
* The 1-3 DRIVE movement command, the 1-4 DRIVEI movement command, and the 1-23 PUSH operation command are valid only for 1 axis unit.

## Category 2

| No. | Command contents | | Command code (WI0) |
|---|---|---|---|
| 2-1 | Point-related command | Point data definition | 0x0100 |
| | | Point data reference | 0x0101 |
| 2-2 | Point comment-related command | Point comment data definition | 0x0104 |
| | | Point comment data reference | 0x0105 |
| 2-3 | Pallet-related command | Pallet data definition | 0x0108 |
| | | Pallet data reference | 0x0109 |
| 2-4 | Shift-related command | Shift data definition | 0x010C |
| | | Shift data reference | 0x010D |
| 2-5 | Hand-related command | Hand data definition | 0xR110 |
| | | Hand data reference | 0x0111 |

* "R" indicates the number of the robot in question (0~4).

## Category 3

| No. | Command contents | | | Command code (WI0) |
|---|---|---|---|---|
| 3-1 | Static variable-related commands | Assignment | Value | 0x0200 |
| | | | Variable | 0x0201 |
| | | Addition | Value | 0x0204 |
| | | | Variable | 0x0205 |
| | | Subtraction | Value | 0x0208 |
| | | | Variable | 0x0209 |
| | | Multiplication | Value | 0x020C |
| | | | Variable | 0x020D |
| | | Division | Value | 0x0210 |
| | | | Variable | 0x0211 |
| | | Reference | Variable | 0x0214 |
| 3-2 | Parameter-related command | Assignment | | 0xR220 |
| | | Reference | | 0xR224 |
| 3-3 | Point-related command | Point assignment | | 0x0230 |
| | | Addition | | 0x0234 |
| | | Subtraction | | 0x0235 |
| | | Pallet point assignment | | 0x0238 |
| | | Point element assignmen | Pulse units input format | 0x0240 |
| | | | Millimeter units input format | 0x0241 |
| | | Shift element assignment | Millimeter units input format | 0x0245 |

* "R" indicates the number of the robot in question (0~4).

## Category 4

| No. | Command contents | | | Command code (WI0) |
|---|---|---|---|---|
| 4-1 | I/O port-related commands | Assignment | Port units | 0x0300 |
| | | | Bit units | 0x0301 |
| | | Reference | Port units | 0x0304 |

## Category 5

| No. | Command contents | | Command code (WI0) |
|---|---|---|---|
| 5-1 | Execution program designation | | 0x0401 |
| 5-2 | Program execution | Program execution | 0x0402 |
| | | Program step execution | 0x0403 |
| | | Program skip execution | 0x0404 |
| | | Program next execution | 0x0405 |
| 5-3 | Program reset | | 0x0406 |
| 5-4 | Program execution information reference | | 0x0408 |

## Category 6

| No. | Command contents | | Command code (WI0) |
|---|---|---|---|
| 6-1 | Version information reference | | 0x0501 |
| 6-2 | System configuration referencing | | 0xR502 |
| 6-3 | Servo status reference | | 0xR503 |
| 6-4 | Current position reference | Pulse units | 0xR505 |
| | | Millimeter units | 0xR506 |
| 6-5 | Task status reference | | 0x0507 |
| 6-6 | Task execution reference | | 0x0508 |
| 6-7 | Message reference | | 0x0509 |
| 6-8 | Speed status reference | | 0xR50A |
| 6-9 | Arm designation status reference | | 0xR50B |
| 6-10 | Arm status reference | | 0xR50C |
| 6-11 | Return-to-origin status reference | | 0xR50F |
| 6-12 | Current torque value (percentage of max. torque) reference | | 0xR510 |
| 6-13 | In-controller date reference | | 0x0511 |
| 6-14 | In-controller time reference | | 0x0512 |
| 6-15 | Option slot module information referencing | | 0x0513 |
| 6-16 | Inching movement amount referencing | | 0xR514 |
| 6-17 | Remote command latest alarm referencing | | 0x0515 |
| 6-18 | Current torque value (percentage of rated torque) reference | | 0x0516 |

* "R" indicates the number of the robot in question (0~4).

## Category 7

| No. | Command contents | Command code (WI0) |
|---|---|---|
| 7-1 | In-controller date setting operation | 0x0602 |
| 7-2 | In-controller time setting operation | 0x0603 |
| 7-3 | Alarm reset command | 0x0604 |

# 4. Remote command description

## 4.1 Status reset command

This command is executed to set the status to command ready status (0x0000).
Remote commands cannot be executed unless in command ready status (0x0000). Therefore, this command must be executed to execute the next remote command after executing the remote command.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0000 |
| WI1 | Not used | 0x0000 |
| to | | |
| WI15 | | |

### ■ Status

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0000 |
| WO1 | Response | |
| to | | |
| WO15 | | |

## 4.2 Category 1 remote commands

These are remote commands mainly for movement commands.

| No. | Command contents | | | Command code (WI0) |
|---|---|---|---|---|
| 1-1 | MOVE command | PTP point designation | | 0xR001 |
| | | Arch designation | | 0xR002 |
| | | Linear interpolation | | 0xR003 |
| | | Circular interpolation | | 0xR004 |
| | | Direct PTP designation | Millimeter units | 0xR006 |
| | | | Pulse units | 0xR007 |
| 1-2 | MOVEI command | PTP point designation | | 0xR009 |
| | | Linear interpolation | | 0xR00A |
| | | Direct PTP designation | Millimeter units | 0xR00E |
| | | | Pulse units | 0xR00F |
| 1-3 | DRIVE command | Point designation | | 0xR010 |
| | | Direct designation | Millimeter units | 0xR012 |
| | | | Pulse units | 0xR013 |
| 1-4 | DRIVEI command | Point designation | | 0xR014 |
| | | Direct designation | Millimeter units | 0xR016 |
| | | | Pulse units | 0xR017 |
| 1-5 | Pallet command | PTP designation | | 0xR018 |
| | | Arch designation | | 0xR019 |
| 1-6 | Jog movement command | Pulse units | | 0xR020 |
| | | Cartesian coordinate system units | | 0xR021 |
| | | Tool coordinate system | | 0xR022 |
| 1-7 | Inching movement command | Pulse units | | 0xR024 |
| | | Cartesian coordinate system units | | 0xR025 |
| | | Tool coordinate system | | 0xR026 |
| 1-8 | Inching movement amount setting command | | | 0xR027 |
| 1-9 | Point teaching command | | | 0xR028 |
| 1-10 | Absolute reset movement command | | | 0xR030 |
| 1-11 | Absolute reset command | | | 0xR031 |
| 1-12 | Return-to-origin command | Robot units | | 0xR032 |
| | | Axis units | | 0xR033 |
| 1-13 | Servo command | On designation | | 0xR034 |
| | | Off designation | | 0xR035 |
| | | Free designation | | 0xR036 |
| 1-14 | Manual movement speed change command | | | 0xR038 |
| 1-15 | Automatic movement speed change command | | | 0xR039 |
| 1-16 | Program movement speed change command | | | 0xR03A |
| 1-17 | Shift designation change command | | | 0xR03B |
| 1-18 | Hand designation change command | | | 0xR03C |
| 1-19 | Arm designation change command | | | 0xR03D |
| 1-20 | Motor power command | OFF | | 0x0042 |
| | | ON | | 0x0043 |
| | | PWR | | 0xR044 |
| 1-21 | MOVET command | PTP point designation | | 0xR044 |
| | | Linear interpolation | | 0xR045 |
| 1-22 | Max. torque command value change command | | | 0xR048 |
| 1-23 | PUSH operation command | Point designation | | 0xR04B |
| | | Direct designation | Millimeter units | 0xR04C |
| | | | Pulse units | 0xR04D |

* "R" indicates the number of the robot in question (0~4).
* The 1-3 DRIVE movement command, the 1-4 DRIVEI movement command, and the 1-23 PUSH operation command are valid only for 1 axis unit.

### 4.2.1 MOVE command

Execute this command group to move the robot to an absolute position.

#### ● PTP designation

This command moves the robot to a target position in PTP motion by specifying the point number.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR001 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 4 – bit 3 | (0: Fixed) | 0 |
| | | bit 5 | Acceleration designation flag | d |
| | | bit 6 | Deceleration designation flag | e |
| | | bit 13 – bit 7 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point numbe | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| to | | | | |
| WI9 | | | | |
| WI10 | Acceleration designation | | | 0xrrrr |
| WI11 | Deceleration designation | | | 0xrrrr |
| WI12 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit whether all axes are designated.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

d : Specify in 1 bit whether to set acceleration.

| Value | Meaning |
|---|---|
| 0 | Acceleration is not specified. |
| 1 | Acceleration is specified. |

e : Specify in 1 bit whether to set deceleration.

| Value | Meaning |
|---|---|
| 0 | Deceleration is not specified. |
| 1 | Deceleration is specified. |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits. Valid when axis designation flag is 1.

ssss : Specify the speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

rrrr : Specify the acceleration and deceleration in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVE command with PTP designation as shown at right, when moving all axes of the Robot 1 to point number 100 at 50% speed and with the current position being output in pulse units.

| Address | Value |
|---|---|
| WI0 | 0x0001 |
| WI1 | 0x4004 |
| WI2 | 0x0000 |
| WI3 | 0x0032 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when the axis current positions are as follows:

Axis 1 = 123456

Axis 2 = -123

Other axes = 0

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0xE240 |
| WO5 | 0x0001 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Arch designation

This command moves the robot to a target position in arch motion by specifying the point number, arch axis and arch data.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR002 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 3 | (0: Fixed) | 0 |
| | | bit 4 | Arch data unit flag | d |
| | | bit 13 – bit 5 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0xuutt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 7 – bit 6 | (0: Fixed) | |
| | Arch designation axis | bit 8 | Axis 1 | |
| | | bit 9 | Axis 2 | |
| | | bit 10 | Axis 3 | |
| | | bit 11 | Axis 4 | |
| | | bit 12 | Reserved | |
| | | bit 13 | Reserved | |
| | | bit 15 – bit 14 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point number | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| WI6 | | | | |
| WI7 | | | | |
| WI8 | Arch position data | | | 0xqqqqqqqq |
| WI9 | | | | |
| WI10 | Arch start position data | | | 0xqqqqqqqq |
| WI11 | | | | |
| WI12 | Arch end position data | | | 0xqqqqqqqq |
| WI13 | | | | |
| WI14 | Not used | | | 0x0000 |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit how to designate axis.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

d : Specify the arch data units in 1 bit.

| Value | Meaning |
|---|---|
| 0 | Pulse units |
| 1 | Millimeter units |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

uu : Specify the arch motion axis in bit pattern using upper 8 bits.
**Specified arch axis is one axis only.**

ssss : Specify the speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

qqqqqqqq : Specify the arch position data and the arch start or end position data in 32 bits. (little endian)
Data should be integers when units are in pulses.
Data should be integers (x1000) when units are in millimeters.

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVE command with arch designation as shown at right, when moving all axes of the Robot 1 to point number 100 at 50% speed by way of a Z-axis arch position of 1.000mm, and with the current position being output in millimeter units.

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 5.000

Axis 4 = 9.023

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0002 |
| WI1 | 0x8014 |
| WI2 | 0x0400 |
| WI3 | 0x0032 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x03E8 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0x233F |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Linear interpolation

This command moves the robot to a target position by linear interpolation by specifying the point number.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR003 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (0: Fixed) | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 4 – bit 3 | (0: Fixed) | 0 |
| | | bit 5 | Acceleration designation flag | d |
| | | bit 6 | Deceleration designation flag | e |
| | | bit 13 – bit 7 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point number | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| to | | | | |
| WI9 | | | | |
| WI10 | Acceleration designation | | | 0xrrrr |
| WI11 | Deceleration designation | | | 0xrrrr |
| WI12 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit how to designate axis.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |
| 11 | Speed is specified in mm/s. | 1 to 1000 |

d : Specify in 1 bit whether to set acceleration.

| Value | Meaning |
|---|---|
| 0 | Acceleration is not specified. |
| 1 | Acceleration is specified. |

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

e : Specify in 1 bit whether to set deceleration.

| Value | Meaning |
|---|---|
| 0 | Deceleration is not specified. |
| 1 | Deceleration is specified. |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

ssss : Specify the speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

rrrr : Specify the acceleration and deceleration in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVE command with linear interpolation as shown at right, when moving all axes of the Robot 1 to point number 100 at a speed of 200 mm/s and at 50% acceleration, and with the current position being output in millimeters.

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 5.000

Axis 4 = 9.023

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0003 |
| WI1 | 0x8026 |
| WI2 | 0x0000 |
| WI3 | 0x00C8 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0032 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0x233F |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Circular interpolation

This command moves the robot to a target position by circular interpolation by specifying two point numbers.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR004 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (0: Fixed) | 0 |
| | | bit 2 − bit 1 | Speed designation flag | bb |
| | | bit 4 − bit 3 | (0: Fixed) | 0 |
| | | bit 5 | Acceleration designation flag | d |
| | | bit 6 | Deceleration designation flag | e |
| | | bit 13 – bit 7 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Not used | | | 0x0000 |
| WI3 | Specified speed | | | 0xssss |
| WI4 | First point number | | | 0xpppp |
| WI5 | Second point number | | | 0xpppp |
| WI6 | Not used | | | 0x0000 |
| to | | | | |
| WI9 | | | | |
| WI10 | Acceleration designation | | | 0xrrrr |
| WI11 | Deceleration designation | | | 0xrrrr |
| WI12 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |
| 11 | Speed is specified in mm/s. | 1 to 1000 |

d : Specify in 1 bit whether to set acceleration.

| Value | Meaning |
|---|---|
| 0 | Acceleration is not specified. |
| 1 | Acceleration is specified. |

e : Specifies in 1 bit whether to set deceleration.

| Value | Meaning |
|---|---|
| 0 | Deceleration is not specified. |
| 1 | Deceleration is specified. |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

ssss : Specify the speed in 16 bits.

pppp : Specify the first and second point numbers in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

rrrr : Specify the acceleration and deceleration in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVE command with circular interpolation as shown at right, when moving all axes of the Robot 1 to point numbers 100 and 101 at 20% speed and 50% deceleration, and with the current position being output in millimeters.

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 5.000

Axis 4 = 9.023

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0004 |
| WI1 | 0x8044 |
| WI2 | 0x0000 |
| WI3 | 0x0014 |
| WI4 | 0x0064 |
| WI5 | 0x0065 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0032 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0x233F |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct PTP designation (millimeter units)

This command moves the robot to a target position in PTP motion by directly specifying the data in millimeters.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR006 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 4 – bit 3 | Hand system | cc |
| | | bit 8 – bit 5 | Reserved | xr |
| | | bit 12 – bit 9 | Reserved | yr |
| | | bit 13 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Axis-1 data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Axis-2 data | | | 0xpppppppp |
| WI7 | | | | |
| WI8 | Axis-3 data | | | 0xpppppppp |
| WI9 | | | | |
| WI10 | Axis-4 data | | | 0xpppppppp |
| WI11 | | | | |
| WI12 | Reserved | | | 0xpppppppp |
| WI13 | | | | |
| WI14 | Reserved | | | 0xpppppppp |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit whether all axes are designated.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

cc : Specify the hand system in 2 bits.

| Value | Meaning |
|---|---|
| 01 | Specifies a right-handed system. |
| 10 | Specifies a left-handed system. |
| Other | No hand system is specified. |

xr / yr : Reserved. Any setting value for these setting items will be processed as "0".

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

ssss : Specify the speed in 16 bits.

pppppppp : Specify the target position data for each axis in 32 bits. (little endian)
Data should be integers (x1000) in millimeter units.

**CAUTION**

- Even if movement is specified only for axis 4 on a SCARA robot, the 1 and 2 axes also move simultaneously to the target position.

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVE command with direct PTP designation (millimeter units) as shown at right, when moving all axes of the Robot 1 to the following points at 50% speed, and with the current position being output in millimeters.

Axis 1 = 10.000

Axis 2 = -20.000

Axis 3 = 5.000

Axis 4 = -18.000

| Address | Value |
|---|---|
| WI0 | 0x0006 |
| WI1 | 0x8004 |
| WI2 | 0x0000 |
| WI3 | 0x0032 |
| WI4 | 0x2710 |
| WI5 | 0x0000 |
| WI6 | 0xB1E0 |
| WI7 | 0xFFFF |
| WI8 | 0x1388 |
| WI9 | 0x0000 |
| WI10 | 0xB9B0 |
| WI11 | 0xFFFF |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x2710 |
| WO5 | 0x0000 |
| WO6 | 0xB1E0 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0xB9B0 |
| WO11 | 0xFFFF |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct PTP designation (pulse units)

This command moves the robot to a target position in PTP motion by directly specifying the data in pulses.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR007 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 13 – bit 3 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Axis-1 data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Axis-2 data | | | 0xpppppppp |
| WI7 | | | | |
| WI8 | Axis-3 data | | | 0xpppppppp |
| WI9 | | | | |
| WI10 | Axis-4 data | | | 0xpppppppp |
| WI11 | | | | |
| WI12 | Reserved | | | 0xpppppppp |
| WI13 | | | | |
| WI14 | Reserved | | | 0xpppppppp |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit whether all axes are designated.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

ssss : Specify the speed in 16 bits.

pppppppp : Specify the target position data for each axis in 32 bits. (little endian)
Data should be integers in pulse units.

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVE command with direct designation PTP (pulse units) as shown at right, when moving all axes of the Robot 1 to the following points at 50% speed, and with the current position being output in pulses.

Axis 1 = 100000

Axis 2 = -200000

Axis 3 = 50000

Axis 4 = -180000

| Address | Value |
|---|---|
| WI0 | 0x0007 |
| WI1 | 0x4004 |
| WI2 | 0x0000 |
| WI3 | 0x0032 |
| WI4 | 0x86A0 |
| WI5 | 0x0001 |
| WI6 | 0xF2C0 |
| WI7 | 0xFFFC |
| WI8 | 0xC350 |
| WI9 | 0x0000 |
| WI10 | 0x40E0 |
| WI11 | 0xFFFD |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x86A0 |
| WO5 | 0x0001 |
| WO6 | 0xF2C0 |
| WO7 | 0xFFFC |
| WO8 | 0xC350 |
| WO9 | 0x0000 |
| WO10 | 0x40E0 |
| WO11 | 0xFFFD |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.2.2 MOVEI command

Execute this command group to move the robot to a relative position.

### ● PTP designation

This command moves the robot a specified distance in PTP motion by specifying the point number.

**NOTE**

- If the MOVEI command is interrupted and then re-executed, the resumed motion that occurs either to the original target position or to a new target position referenced to the current position can be selected by the "MOVEI/DRIVEI start position" setting of controller parameters.
- The other parameters default "MOVEI/DRIVEI start position" setting is Keep (motion to the original target position when MOVEI is interrupted and then re-executed).

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR009 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 14 – bit 3 | (0: Fixed) | 0 |
| | | bit 5 | Acceleration designation flag | d |
| | | bit 6 | Deceleration designation flag | e |
| | | bit 13 – bit 7 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point number | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| to | | | | |
| WI9 | | | | |
| WI10 | Acceleration designation | | | 0xrrrr |
| WI11 | Deceleration designation | | | 0xrrrr |
| WI12 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit whether all axes are designated.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

d : Specify in 1 bit whether to set acceleration.

| Value | Meaning |
|---|---|
| 0 | Acceleration is not specified. |
| 1 | Acceleration is specified. |

e : Specifies in 1 bit whether to set deceleration.

| Value | Meaning |
|---|---|
| 0 | Deceleration is not specified. |
| 1 | Deceleration is specified. |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

ssss : Specify the movement speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

rrrr : Specify the acceleration and deceleration in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVEI command with PTP designation as shown at right, when moving all axes of the Robot 1 a distance specified by point number 100 at 50% speed, and with the current position being output in pulses.

| Address | Value |
|---|---|
| WI0 | 0x0009 |
| WI1 | 0x4004 |
| WI2 | 0x0000 |
| WI3 | 0x0032 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Axis 1 = 123456

Axis 2 = -123

Other axes = 0

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0xE240 |
| WO5 | 0x0001 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Linear interpolation

This command moves the robot a specified distance in linear interpolation motion by specifying the point number.

**NOTE**

- If the MOVEI command is interrupted and then re-executed, the resumed motion that occurs either to the original target position or to a new target position referenced to the current position can be selected by the "MOVEI/DRIVEI start position" setting of controller parameters.
- The other parameters default "MOVEI/DRIVEI start position" setting is Keep (motion to the original target position when MOVEI is interrupted and then re-executed).

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR00A |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 4 – bit 3 | (0: Fixed) | 0 |
| | | bit 5 | Acceleration designation flag | d |
| | | bit 6 | Deceleration designation flag | e |
| | | bit 13 – bit 7 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point number | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| to | | | | |
| WI9 | | | | |
| WI10 | Acceleration designation | | | 0xrrrr |
| WI11 | Deceleration designation | | | 0xrrrr |
| WI12 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit how to designate axis.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |
| 11 | Speed is specified in mm/s. | 1 to 1000 |

d : Specify in 1 bit whether to set acceleration.

| Value | Meaning |
|---|---|
| 0 | Acceleration is not specified. |
| 1 | Acceleration is specified. |

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

e : Specify in 1 bit whether to set deceleration.

| Value | Meaning |
|---|---|
| 0 | Deceleration is not specified. |
| 1 | Deceleration is specified. |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

uu : Specify the arch motion axis in bit pattern using upper 8 bits.
**Specified arch axis is one axis only.**

ssss : Specify the speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

rrrr : Specify the acceleration and deceleration in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVEI command with linear interpolation as shown at right, when moving all axes of the Robot 1 the distance specified by point number 100 at a speed of 200 mm/s and at 50% acceleration, and with the current position being output in millimeters.

| Address | Value |
|---|---|
| WI0 | 0x000A |
| WI1 | 0x8026 |
| WI2 | 0x0000 |
| WI3 | 0x00C8 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0032 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 5.000

Axis 4 = 9.023

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0x233F |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct PTP designation (millimeter units)

This command moves the robot a specified distance in PTP motion by directly specifying the data in millimeters.

**NOTE**

- If the MOVEI command is interrupted and then re-executed, the resumed motion that occurs either to the original target position or to a new target position referenced to the current position can be selected by the "MOVEI/DRIVEI start position" setting of controller parameters.
- The other parameters default "MOVEI/DRIVEI start position" setting is Keep (motion to the original target position when MOVEI is interrupted and then re-executed).

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR00E |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 4 – bit 3 | Hand system | cc |
| | | bit 8 – bit 5 | Reserved | xr |
| | | bit 12 – bit 9 | Reserved | yr |
| | | bit 13 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Axis-1 data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Axis-2 data | | | 0xpppppppp |
| WI7 | | | | |
| WI8 | Axis-3 data | | | 0xpppppppp |
| WI9 | | | | |
| WI10 | Axis-4 data | | | 0xpppppppp |
| WI11 | | | | |
| WI12 | Reserved | | | 0xpppppppp |
| WI13 | | | | |
| WI14 | Reserved | | | 0xpppppppp |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit whether all axes are designated.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

cc : Specify the hand system in 2 bits.

| Value | Meaning |
|---|---|
| 01 | Specifies a right-handed system. |
| 10 | Specifies a left-handed system. |
| Other | No hand system is specified. |

xr / yr : Reserved. Any setting value for these setting items will be processed as "0".

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

ssss : Specify the speed in 16 bits.

pppppppp : Specify the target movement distance data for each axis in 32 bits. (little endian)
Data should be integers (x1000) in millimeter units.

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVEI command with direct PTP designation (millimeter units) as shown at right, when moving all axes of the Robot 1 a distance specified by the following points from "0.000" mm positions at 50% speed, and with the current position being output in millimeters.

Axis 1 = 10.000

Axis 2 = -20.000

Axis 3 = 5.000

Axis 4 = -18.000

| Address | Value |
|---|---|
| WI0 | 0x000E |
| WI1 | 0x8004 |
| WI2 | 0x0000 |
| WI3 | 0x0032 |
| WI4 | 0x2710 |
| WI5 | 0x0000 |
| WI6 | 0xB1E0 |
| WI7 | 0xFFFF |
| WI8 | 0x1388 |
| WI9 | 0x0000 |
| WI10 | 0xB9B0 |
| WI11 | 0xFFFF |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 5.000

Axis 4 = 9.023

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x2710 |
| WO5 | 0x0000 |
| WO6 | 0xB1E0 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0xB9B0 |
| WO11 | 0xFFFF |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct PTP designation (pulse units)

This command moves the robot a specified distance in PTP motion by directly specifying the data in pulses.

**NOTE**

- If the MOVEI command is interrupted and then re-executed, the resumed motion that occurs either to the original target position or to a new target position referenced to the current position can be selected by the "MOVEI/DRIVEI start position" setting of controller parameters.
- The other parameters default "MOVEI/DRIVEI start position" setting is Keep (motion to the original target position when MOVEI is interrupted and then re-executed).

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR00F |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 13 – bit 3 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Axis-1 data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Axis-2 data | | | 0xpppppppp |
| WI7 | | | | |
| WI8 | Axis-3 data | | | 0xpppppppp |
| WI9 | | | | |
| WI10 | Axis-4 data | | | 0xpppppppp |
| WI11 | | | | |
| WI12 | Reserved | | | 0xpppppppp |
| WI13 | | | | |
| WI14 | Reserved | | | 0xpppppppp |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit whether all axes are designated.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

ssss : Specify the speed in 16 bits.

pppppppp : Specify the target movement distance data for each axis in 32 bits. (little endian)
Data should be integers in pulse units.

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVEI command with direct PTP designation (pulse units) as shown at right, when moving all axes of the Robot 1 a distance specified by the following points from "0" pulse positions at 50% speed, and with the current position being output.

Axis 1 = 100000

Axis 2 = -200000

Axis 3 = 50000

Axis 4 = -180000

| Address | Value |
|---|---|
| WI0 | 0x000F |
| WI1 | 0x4004 |
| WI2 | 0x0000 |
| WI3 | 0x0032 |
| WI4 | 0x86A0 |
| WI5 | 0x0001 |
| WI6 | 0xF2C0 |
| WI7 | 0xFFFC |
| WI8 | 0xC350 |
| WI9 | 0x0000 |
| WI10 | 0x40E0 |
| WI11 | 0xFFFD |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x86A0 |
| WO5 | 0x0001 |
| WO6 | 0xF2C0 |
| WO7 | 0xFFFC |
| WO8 | 0xC350 |
| WO9 | 0x0000 |
| WO10 | 0x40E0 |
| WO11 | 0xFFFD |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

### 4.2.3 DRIVE command

Execute this command group to move the specified axis of the robot to an absolute position. Valid only for a single axis.

#### ● Point designation

This command moves the specified axis of the robot to a target position in PTP motion by specifying the point number.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR010 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (1:Fixed) | 1 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 13 – bit 3 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point number | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Only one axis can be specified.

ssss : Specify the movement speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the DRIVE command with point designation as shown at right, to move axis 3 of the Robot 1 to point number 100 at 50% speed and with the current position being output in pulses units.

| Address | Value |
|---|---|
| WI0 | 0x0010 |
| WI1 | 0x4005 |
| WI2 | 0x0004 |
| WI3 | 0x0032 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Axis 1 = 123456

Axis 2 = -123

Other axes = 0

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0xE240 |
| WO5 | 0x0001 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct designation (millimeter units)

This command moves the specified axis of the robot to a target position in PTP motion by directly specifying the data in millimeters.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR012 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (1: Fixed) | 1 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 13 – bit 3 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Movement data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Only one axis can be specified.

ssss : Specify the movement speed in 16 bits.

pppppppp : Specify target position data for specified axis in 32 bits. (little endian)
Data should be integers (x 1000) in millimeter units.

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the DRIVE command with direct designation (millimeter units) as shown at right, to move axis 3 of the Robot 1 to a position of "5.000" mm at 50% speed, and with the current position being output in millimeters.

Axis 1 = 10.000

Axis 2 = -20.000

Axis 3 = 5.000

Axis 4 = -18.000

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0012 |
| WI1 | 0x8005 |
| WI2 | 0x0004 |
| WI3 | 0x0032 |
| WI4 | 0x1388 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x2710 |
| WO5 | 0x0000 |
| WO6 | 0xB1E0 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0xB9B0 |
| WO11 | 0xFFFF |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct designation (pulse units)

This command moves the specified axis of the robot to a target position in PTP motion by directly specifying the data in pulses.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR013 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (1: Fixed) | 1 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 13 – bit 3 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Movement data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Only one axis can be specified.

ssss : Specify the movement speed in 16 bits.

pppppppp : Specify the target position data for specified axis in 32 bits. (little endian)
Data should be integers in pulse units.

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the DRIVE command with direct designation (pulse units) as shown at right, to move axis 3 of the Robot 1 to a position of "5000" pulses at 50% speed, and with the current position being output in pulses.

Axis 1 = 10000

Axis 2 = -20000

Axis 3 = 5000

Axis 4 = -18000

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0013 |
| WI1 | 0x4005 |
| WI2 | 0x0004 |
| WI3 | 0x0032 |
| WI4 | 0x1388 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x2710 |
| WO5 | 0x0000 |
| WO6 | 0xB1E0 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0xB9B0 |
| WO11 | 0xFFFF |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.2.4 DRIVEI command

Execute this command group to move the specified axis of the robot to a relative position. Valid only for a single axis.

### ● Point designation

This command moves the specified axis of the robot in PTP motion a distance by specifying the point number.

**NOTE**

- If the DRIVEI command is interrupted and then re-executed, the resumed motion that occurs either to the original target position or to a new target position referenced to the current position can be selected by the "MOVEI/DRIVEI start position" setting of controller parameters.
- The other parameters default "MOVEI/DRIVEI start position" setting is Keep (motion to the original target position when DRIVEI is interrupted and then re-executed).

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR014 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (1: Fixed) | 1 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 13 – bit 3 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point number | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Only one axis can be specified.

ssss : Specify the movement speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the DRIVEI command with point designation as shown at right, to move axis 3 of the Robot 1 a distance specified by point number 100 at 50% speed, and with the current position being output in pulses.

Axis 1 = 123456

Axis 2 = -123

Other axes = 0

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0014 |
| WI1 | 0x4005 |
| WI2 | 0x0004 |
| WI3 | 0x0032 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0xE240 |
| WO5 | 0x0001 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct designation (millimeter units)

This command moves the specified axis of the robot in PTP motion a distance by directly specifying the data in millimeters.

**NOTE**

- If the DRIVEI command is interrupted and then re-executed, the resumed motion that occurs either to the original target position or to a new target position referenced to the current position can be selected by the "MOVEI/DRIVEI start position" setting of controller parameters.
- The other parameters default "MOVEI/DRIVEI start position" setting is Keep (motion to the original target position when DRIVEI is interrupted and then re-executed).

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR016 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (1: Fixed) | 1 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 13 – bit 3 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Movement data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Only one axis can be specified.

ssss : Specify the speed in 16 bits.

pppppppp : Specify the target movement distance data for specified axis in 32 bits. (little endian)
Data should be integers (x1000) in millimeter units.

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the DRIVEI command with direct designation (millimeter units) as shown at right, to move axis 3 a distance equal to "5.000"mm from "0.000" mm position at 50% speed, and with the current position being output in millimeters.

Axis 1 = 10.000

Axis 2 = -20.000

Axis 3 = 5.000

Axis 4 = -18.000

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0016 |
| WI1 | 0x8005 |
| WI2 | 0x0004 |
| WI3 | 0x0032 |
| WI4 | 0x1388 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x2710 |
| WO5 | 0x0000 |
| WO6 | 0xB1E0 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0xB9B0 |
| WO11 | 0xFFFF |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct designation (pulse units)

This command moves the specified axis of the robot in PTP motion a distance by directly specifying the data in pulses.

**NOTE**

- If the DRIVEI command is interrupted and then re-executed, the resumed motion that occurs either to the original target position or to a new target position referenced to the current position can be selected by the "MOVEI/DRIVEI start position" setting of other parameters. For details, refer to the controller user's manual.
- The other parameters default "MOVEI/DRIVEI start position" setting is Keep (motion to the original target position when DRIVEI is interrupted and then re-executed).

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR017 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (1: Fixed) | 1 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 13 – bit 3 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Movement data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Only one axis can be specified.

ssss : Specify the movement speed in 16 bits.

pppppppp : Specify the target movement distance data for specified axis in 32 bits. (little endian)
Data should be integers in pulse units.

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the DRIVEI command with direct designation (pulse units) as shown at right, to move axis 3 a distance equal to "5000" pulses from "0" pulse position at 50% speed, and with the current position being output in pulses.

Axis 1 = 10000

Axis 2 = -20000

Axis 3 = 5000

Axis 4 = -18000

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0017 |
| WI1 | 0x4005 |
| WI2 | 0x0004 |
| WI3 | 0x0032 |
| WI4 | 0x1388 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x2710 |
| WO5 | 0x0000 |
| WO6 | 0xB1E0 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0xB9B0 |
| WO11 | 0xFFFF |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.2.5 Pallet movement command

Execute this command group to move the robot to work positions on a pallet.

### ● PTP designation

This command moves the robot to a target position in PTP motion by specifying the pallet number and work position number.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR018 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (0: Fixed) | 0 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 4 – bit 3 | (0: Fixed) | 0 |
| | | bit 5 | Acceleration designation flag | d |
| | | bit 6 | Deceleration designation flag | e |
| | | bit 13 – bit 7 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Not used | | | 0x0000 |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Pallet number | | | 0xpppp |
| WI5 | Work position number | | | 0xwwww |
| WI6 | Not used | | | 0x0000 |
| to | | | | |
| WI9 | | | | |
| WI10 | Acceleration designation | | | 0xrrrr |
| WI11 | Deceleration designation | | | 0xrrrr |
| WI12 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

d : Specify in 1 bit whether to set acceleration.

| Value | Meaning |
|---|---|
| 0 | Acceleration is not specified. |
| 1 | Acceleration is specified. |

e : Specify in 1 bit whether to set deceleration.

| Value | Meaning |
|---|---|
| 0 | Deceleration is not specified. |
| 1 | Deceleration is specified. |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

ssss : Specify the movement speed in 16 bits.

pppp : Specify the pallet number in 16 bits.
Specified range: 0 (=0x0000) to 39 (=0x0027)

wwww : Specify the work position number in 16 bits.
Specified range: 1 (=0x0001) to 32767 (=0x7FFF)

rrrr : Specify the acceleration and deceleration in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the PMOVE command with PTP designation as shown at right, when moving the Robot 1 to work position number 21 on pallet number 1 at 70% speed, and with the current position being output in millimeters.

| Address | Value |
|---|---|
| WI0 | 0x0018 |
| WI1 | 0x8004 |
| WI2 | 0x0000 |
| WI3 | 0x0046 |
| WI4 | 0x0001 |
| WI5 | 0x0015 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 2.000

Other axes = 0.000

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x07D0 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Arch designation

This command moves the robot to a target position in arch motion by specifying the pallet number, work position number, arch axis and arch data.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR019 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (0: Fixed) | 0 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 3 | (0: Fixed) | 0 |
| | | bit 4 | Arch data unit flag | d |
| | | bit 13 – bit 5 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Arch designation axis | bit 7 – bit 0 | (0: Fixed) | 0xuu00 |
| | | bit 8 | Axis 1 | |
| | | bit 9 | Axis 2 | |
| | | bit 10 | Axis 3 | |
| | | bit 11 | Axis 4 | |
| | | bit 12 | Reserved | |
| | | bit 13 | Reserved | |
| | | bit 15 – bit 14 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Pallet number | | | 0xpppp |
| WI5 | Work position number | | | 0xwwww |
| WI6 | Not used | | | 0x0000 |
| WI7 | | | | |
| WI8 | Arch position data | | | 0xqqqqqqqq |
| WI9 | | | | |
| WI10 | Arch start position data | | | 0xqqqqqqqq |
| WI11 | | | | |
| WI12 | Arch end position data | | | 0xqqqqqqqq |
| WI13 | | | | |
| WI14 | Not used | | | 0x0000 |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

d : Specify the arch data units in 1 bit.

| Value | Meaning |
|---|---|
| 0 | Pulse units |
| 1 | Millimeter units |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

uu : Specify the arch motion axis in bit pattern using upper 8 bits.
**Specified arch axis is one axis only.**

ssss : Specify the speed in 16 bits.

pppp : Specify the pallet number in 16 bits.
Specified range: 0 (=0x0000) to 39 (=0x0027)

wwww : Specify the work position number in 16 bits.
Specified range: 1 (=0x0001) to 32767 (=0x7FFF)

qqqqqqqq : Specify the arch position data and the arch start or end position data in 32 bits. (little endian)
Data should be integers when units are in pulses.
Data should be integers (x1000) when units are in millimeters.

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the PMOVE command with arch designation as shown at right, when moving the Robot 1 to work position number 32 on pallet number 10 at 70% speed by way of a Z-axis arch position of 1.000mm, and with the current position being output in millimeters.

| Address | Value |
|---|---|
| WI0 | 0x0019 |
| WI1 | 0x8014 |
| WI2 | 0x0400 |
| WI3 | 0x0046 |
| WI4 | 0x000A |
| WI5 | 0x0020 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x03E8 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 5.000

Axis 4 = 9.023

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0x233F |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.2.6 Jog movement command

### ● Pulse unit system jog movement

Execute this command to move the robot in jog mode. It performs PTP movement in axis units.
The movement speed is determined by the manual movement speed.

To stop the jog command, set the dedicated input of the stop signal (SI06) to OFF.
Abnormal end status (0x4000) appears as the status code and the alarm code indicates that the robot has stopped by the stop input (WO1: 0x000C, WO2: 0x0190).
After confirming that movement has stopped, set the dedicated input of the interlock signal to ON.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR020 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 13 – bit 0 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Axis to move and direction | bit 0 | Axis 1 | tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 6 | (0: Fixed) | 0 |
| | | bit 7 | Direction | d |
| | | bit 15 – bit 8 | (0: Fixed) | 0 |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in 0 to 5 bits.
Only one axis can be specified.

d : Specify the movement direction in 1 bit.

| Value | Meaning |
|---|---|
| 0 | + direction |
| 1 | – direction |

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end (When jog movement is stopped by a stop input)

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0x000C |
| WO2 | Alarm category number | 0x0190 |
| WO3 | Not used | 0x0000 |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

**Abnormal end (other cases)**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the pulse unit system jog command as shown at right, to move axis 1 of the Robot 1 in the minus (-) direction, and with the current position being output in pulses.

| Address | Value |
|---|---|
| WI0 | 0x0020 |
| WI1 | 0x4000 |
| WI2 | 0x0081 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right, after robot movement with the jog command is stopped by the stop signal with:

Axis 1 = 12345

Axis 2 = -123

Axis 3 = 2000

Other axes = 0

| Address | Value |
|---|---|
| WO0 | 0x4000 |
| WO1 | 0x000C |
| WO2 | 0x0190 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x07D0 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Cartesian coordinate system jog movement

Execute this command to move the robot in jog mode. It performs linear interpolation movement of Cartesian coordinates. The movement speed is determined by the manual movement speed.

To stop the jog command, set the dedicated input of the stop signal (SI06) to OFF.
Abnormal end status (0x4000) appears as the status code and the alarm code indicates that the robot has stopped by the stop input (WO1: 0x000C, WO2: 0x0190).
After confirming that movement has stopped, set the dedicated input of the interlock signal to ON.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR021 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 13 – bit 0 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Axis to move and direction | bit 0 | Axis 1 | tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 6 | (0: Fixed) | 0 |
| | | bit 7 | Direction | d |
| | | bit 15 – bit 8 | (0: Fixed) | 0 |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in 0 to 5 bits.
Only one axis can be specified.

d : Specify the movement direction in 1 bit.

| Value | Meaning |
|---|---|
| 0 | + direction |
| 1 | – direction |

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end (When jog movement is stopped by a stop input)

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0x000C |
| WO2 | Alarm category number | 0x0190 |
| WO3 | Not used | 0x0000 |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

**Abnormal end (other cases)**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the Cartesian coordinate system jog movement as shown at right, to move axis 1 of the Robot 1 in the minus (-) direction, and with the current position being output in millimeters.

| Address | Value |
|---|---|
| WI0 | 0x0021 |
| WI1 | 0x8000 |
| WI2 | 0x0081 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right, after robot movement with the jog command is stopped by the stop signal with:

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 2.000

Other axes = 0.000

| Address | Value |
|---|---|
| WO0 | 0x4000 |
| WO1 | 0x000C |
| WO2 | 0x0190 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x07D0 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Tool coordinate system jog movement

Execute this command to move the robot in jog mode. It performs linear interpolation movement of the tool coordinate system's Cartesian coordinates.
The movement speed is determined by the manual movement speed.

To stop the jog command, set the dedicated input of the stop signal (SI06) to OFF.
Abnormal end status (0x4000) appears as the status code and the alarm code indicates that the robot has stopped by the stop input (WO1: 0x000C, WO2: 0x0190).
After confirming that movement has stopped, set the dedicated input of the interlock signal to ON.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR022 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 13 – bit 0 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Axis to move and direction | bit 0 | Axis 1 | tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 6 | (0: Fixed) | 0 |
| | | bit 7 | Direction | d |
| | | bit 15 – bit 8 | (0: Fixed) | 0 |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in 0 to 5 bits.
Only one axis can be specified.

d : Specify the movement direction in 1 bit.

| Value | Meaning |
|---|---|
| 0 | + direction |
| 1 | − direction |

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end (When jog movement is stopped by a stop input)

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0x000C |
| WO2 | Alarm category number | 0x0190 |
| WO3 | Not used | 0x0000 |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

**Abnormal end (other cases)**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the tool coordinate system jog movement as shown at right, to move axis 1 of the Robot 1 in the minus (-) direction, and with the current position being output in millimeters.

| Address | Value |
|---|---|
| WI0 | 0x0022 |
| WI1 | 0x8000 |
| WI2 | 0x0081 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right, after robot movement with the jog command is stopped by the stop signal with:

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 2.000

Other axes = 0.000

| Address | Value |
|---|---|
| WO0 | 0x4000 |
| WO1 | 0x000C |
| WO2 | 0x0190 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x07D0 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.2.7 Inching movement command

### ● Pulse unit system inching movement

Execute this command to move the robot by inching.
Inching movement distance is determined by the inching amount setting command.
It performs movement according to the pulse amount specified for the movement axis.
A movement amount setting of "100" results in a movement amount of 100 pulses.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR024 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 13 – bit 0 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Axis to move and direction | bit 0 | Axis 1 | tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 6 | (0: Fixed) | 0 |
| | | bit 7 | Direction | d |
| | | bit 15 – bit 8 | (0: Fixed) | 0 |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in 0 to 5 bits.
Only one axis can be specified.

d : Specify the movement direction in 1 bit.

| Value | Meaning |
|---|---|
| 0 | + direction |
| 1 | - direction |

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the pulse unit system inching command as shown at right, to move axis 2 of the Robot 1 in the plus (+) direction, and with the current position being output in pulses. An inching amount setting of "50" results in a movement amount of 50 pulses.

| Address | Value |
|---|---|
| WI0 | 0x0024 |
| WI1 | 0x4000 |
| WI2 | 0x0002 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right, after executing the pulse unit system inching command and then stopping point movement with:

Axis 1 = 12345

Axis 2 = -123

Axis 3 = 2000

Other axes = 0

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x07D0 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Cartesian coordinate system inching movement

Execute this command to move the robot by inching. Inching movement distance is determined by the inching amount setting command.
It performs linear interpolation movement in accordance with the specified movement amount, using Cartesian coordinates.
A movement amount setting of "100" results in a movement amount of 0.1mm.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR025 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 13 – bit 0 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Axis to move and direction | bit 0 | Axis 1 | tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 6 | (0: Fixed) | 0 |
| | | bit 7 | Direction | d |
| | | bit 15 – bit 8 | (0: Fixed) | 0 |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in 0 to 5 bits.
Only one axis can be specified.

d : Specify the movement direction in 1 bit.

| Value | Meaning |
|---|---|
| 0 | + direction |
| 1 | - direction |

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the Cartesian coordinate system inching command as shown at right, to move axis 2 of the Robot 1 in the plus (+) direction, and with the current position being output in millimeters. An inching amount setting of "50" results in a movement amount of 0.050mm.

| Address | Value |
|---|---|
| WI0 | 0x0025 |
| WI1 | 0x8000 |
| WI2 | 0x0002 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right, after executing the Cartesian coordinate system inching command and then stopping point movement with:

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 2.000

Other axes = 0.000

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x07D0 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Tool coordinate system inching movement

Execute this command to move the robot by inching.
Inching movement distance is determined by the inching amount setting command.
It performs linear interpolation movement in accordance to the movement amount specified for the movement axis, using the tool coordinate system's Cartesian coordinates.
A movement amount setting of "100" results in a movement amount of 0.1mm.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR026 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 13 – bit 0 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Axis to move and direction | bit 0 | Axis 1 | tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 6 | (0: Fixed) | 0 |
| | | bit 7 | Direction | d |
| | | bit 15 – bit 8 | (0: Fixed) | 0 |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in 0 to 5 bits.
Only one axis can be specified.

d : Specify the movement direction in 1 bit.

| Value | Meaning |
|---|---|
| 0 | + direction |
| 1 | - direction |

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the tool coordinate system inching command as shown at right, to move axis 2 of the Robot 1 in the plus (+) direction, and with the current position being output in millimeters. An inching amount setting of "50" results in a movement amount of 0.050mm.

| Address | Value |
|---|---|
| WI0 | 0x0026 |
| WI1 | 0x8000 |
| WI2 | 0x0002 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right, after executing the tool coordinate system inching command and then stopping point movement with:

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 2.000

Other axes = 0.000

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x07D0 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.2.8 Inching movement amount setting command

This command sets the movement amount for inching movement operations.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR027 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Inching movement amount | | | 0xdddd |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

dddd : Sets the movement amount. 1 (=0x0001) to 10000 (=0x2710)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the inching movement amount setting command to specify an inching movement amount of "100" for the Robot 1.

| Address | Value |
|---|---|
| WI0 | 0x0027 |
| WI1 | 0x0000 |
| WI2 | 0x0064 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.9 Point teaching command

Execute this command to teach the current robot position to the specified point number.
Point data units of this command are linked to the controller's point display unit.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR028 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Point number | | | 0xpppp |
| WI3 | Point unit | | | 0xaaaa |
| WI4 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

pppp : Specify the point number in 16 bits.
Specified range: 0 (= 0x0000) to 29999 (=0x752F)

aaaa : Specifies the point unit system.

| Value | Meaning |
|---|---|
| 0 | Pulse units |
| 1 | Millimeter units |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the point teaching command as shown at right, to teach the Robot 1 current position to point number 4000 in pulse units.

| Address | Value |
|---|---|
| WI0 | 0x0028 |
| WI1 | 0x0000 |
| WI2 | 0x0FA0 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.10 Absolute reset movement command

When absolute reset of the specified axis uses the mark method, this command moves the axis to the nearest position where absolute reset can be executed. Positions capable of absolute reset are located at every 1/4 rotation of the motor.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR030 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Specified axis to move | bit 0 | Axis 1 | tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 6 | (0: Fixed) | 0 |
| | | bit 7 | Direction | d |
| | | bit 15−bit 8 | (0: Fixed) | 0 |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

tt : Specify the axis to perform the return-to-origin in 0 to 5 bits.
Only one axis can be specified.

d : Specify the movement direction in 1 bit.

| Value | Meaning |
|---|---|
| 0 | + direction |
| 1 | - direction |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the absolute reset movement command as shown at right to move Axis 2 of the Robot 1 in the minus (-) direction to a position capable of absolute reset.

| Address | Value |
|---|---|
| WI0 | 0x0030 |
| WI1 | 0x0000 |
| WI2 | 0x0082 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.11 Absolute reset command

Execute this command to perform absolute reset at a mark type axis. The specified axis must be at a position where an absolute reset is possible. This command can be used only for a mark type axis.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR031 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

tt : Specify the axis to perform absolute reset in 0 to 5 bits.
Only one axis can be specified.
An error occurs if no axis has been specified.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to perform absolute reset on axis 2 of the Robot 1.

| Address | Value |
|---|---|
| WI0 | 0x0031 |
| WI1 | 0x0000 |
| WI2 | 0x0002 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.12 Return-to-origin command

### ● Return-to-origin in robot units

This command executes return-to-origin in robot units.
When this command is executed on an incremental and absolute type axes, the axis moves to its origin.
When executed on a semi-absolute type axis, an absolute search is performed on that axis.
If no particular robot has been specified, a return-to-origin will be performed at all robots.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR032 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (0: Fixed) | 0 |
| | | bit 1 | Incremental type axis designation flag | a |
| | | bit 2 | Absolute type axis designation flag | b |
| | | bit 3 | "Return-to-origin incomplete" axis designation flag | c |
| | | bit 15 – bit 4 | (0: Fixed) | 0 |
| WI2 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If no particular robot number has been specified (=0), the operation is performed at all robots.

a, b, c : Specifies the details (in 1 bit) of the axis performed the return-to-origin.

| Value | Meaning |
|---|---|
| 0 | Details absent |
| 1 | Details present |

* Only one designation can be enabled. If no details at all a, b, c value, a return-to-origin will be performed at all axes.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaabb |
| WO2 | Alarm category number | 0xccdd |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to perform return-to-origin on all axes of the Robot 1.

| Address | Value |
|---|---|
| WI0 | 0x0032 |
| WI1 | 0x0000 |
| WI2 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## ● Return-to-origin in axis units

This command executes return-to-origin in axis units.
When this command is executed on an incremental and absolute type axes, the axis moves to its origin.
When executed on a semi-absolute mode axis, an absolute search is performed on that axis.
If no particular robot is specified, a return-to-origin will be performed at the specified axis of Robot 1.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR033 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

tt : Specify the axis to perform the return-to-origin in 0 to 5 bits.
Only one axis can be specified.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaabb |
| WO2 | Alarm category number | 0xccdd |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to perform return-to-origin on axis 1 of the Robot 1.

| Address | Value |
|---|---|
| WI0 | 0x0033 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.13 Servo command

Execute this command group to operate the robot servo status.

**Servo ON :**

Execute this command to turn the servo on at a specified axis. All the robot servos are turned on if no axis is specified.

**Servo OFF :**

Execute this command to turn the servo off at a specified axis. All the robot servos are turned off if no axis is specified.

**Servo Free :**

Execute this command to turn off the mechanical brake and dynamic brake after turning off the servo of a specified axis. All the robot servos are turned free if no axis is specified.

### ■ Command

| Address | Contents | | | | Value |
|---|---|---|---|---|---|
| WI0 | Command code | Servo ON | bit 11 – bit 0 | | 0xR034 |
| | Robot designation | | bit 16 – bit 12 | Robot number | |
| | Command code | Servo OFF | bit 11 – bit 0 | | 0xR035 |
| | Robot designation | | bit 16 – bit 12 | Robot number | |
| | Command code | Servo Free | bit 11 – bit 0 | | 0xR036 |
| | Robot designation | | bit 16 – bit 12 | Robot number | |
| WI1 | Not used | | | | 0x0000 |
| WI2 | Specified axis | bit 0 | Axis 1 | | 0x00tt |
| | | bit 1 | Axis 2 | | |
| | | bit 2 | Axis 3 | | |
| | | bit 3 | Axis 4 | | |
| | | bit 4 | Reserved | | |
| | | bit 5 | Reserved | | |
| | | bit 15 – bit 6 | (0: Fixed) | | |
| WI3 | Not used | | | | 0x0000 |
| to | | | | | |
| WI15 | | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

tt : Specify the axis to occur servo control in 0 to 5 bits.
All axes are processed if no axis is specified.
Only one axis can be specified.

### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the servo command as shown at right, to free the servo status at axis 4 of the Robot 1.

| Address | Value |
|---|---|
| WI0 | 0x0036 |
| WI1 | 0x0000 |
| WI2 | 0x0008 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.14 Manual movement speed change command

Execute this command to change the robot's manual movement speed.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR038 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Specified speed | | | 0xssss |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

ssss : Specify the manual movement speed in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use the manual movement speed change command as shown at right, to set the manual movement speed of the Robot 1 to 20%.

| Address | Value |
|---|---|
| WI0 | 0x0038 |
| WI1 | 0x0000 |
| WI2 | 0x0014 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.15 Automatic movement speed change command

Execute this command to change the robot's automatic movement speed.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR039 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Specified speed | | | 0xssss |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

ssss : Specify the automatic movement speed in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use the automatic movement speed change command as shown at right, to set the automatic movement speed of the Robot 1 to 80%.

| Address | Value |
|---|---|
| WI0 | 0x0039 |
| WI1 | 0x0000 |
| WI2 | 0x0050 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.16 Program movement speed change command

Execute this command to change the program movement speed.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR03A |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Specified speed | | | 0xssss |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

ssss : Specify the program speed in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use the program movement speed change command as shown at right, to set the program movement speed for the Robot 1 to 80%.

| Address | Value |
|---|---|
| WI0 | 0x003A |
| WI1 | 0x0000 |
| WI2 | 0x0050 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.17 Shift designation change command

Execute this command to change the selected shift to a specified shift number.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR03B |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Specified shift number | | | 0xssss |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

ssss : Specify the shift number in 16 bits.
Specified range: 0 (=0x0000) to 39 (=0x0027)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use the shift designation change command as shown at right, to set the shift number of the Robot 1 to shift 4.

| Address | Value |
|---|---|
| WI0 | 0x003B |
| WI1 | 0x0000 |
| WI2 | 0x0004 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.18 Hand designation change command

Execute this command to change the selected hand to a specified hand number.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR03C |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Specified hand number | | | 0xssss |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

ssss : Specify the hand number in 16 bits.
Specified range: 0 (=0x0000) to 31 (=0x001F)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use the hand designation change command as shown at right, to set the hand number of the Robot 1 to hand 1.

| Address | Value |
|---|---|
| WI0 | 0x003C |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.19 Arm designation change command

Execute this command to change the arm designation status.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR03D |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Status of specified arm | | | 0xssss |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

ssss : Specify the arm designation status in 16 bits.

| Value | Meaning |
|---|---|
| 0x0000 | Right-handed system |
| 0x0001 | Left-handed system |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the arm designation change command as shown at right, to set the arm designation status of the Robot 1 to the right-handed system.

| Address | Value |
|---|---|
| WI0 | 0x003D |
| WI1 | 0x0000 |
| WI2 | 0x0000 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.20 Motor power command

Execute this command to turn the motor power ON/OFF. All the system servos are also turned ON/OFF at this time. Axis designations are not possible with this command.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | OFF | bit 15 – bit 0 | 0x0041 |
| | Command code | ON | bit 15 – bit 0 | 0x0042 |
| | Command code | PWR | bit 15 – bit 0 | 0x0043 |
| WI1 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

OFF : Turns the motor power OFF. All system servos are also turned OFF at this time, and the dynamic brake is applied and locked at axes which are equipped with a brake.

ON : Turns the motor power ON. All system servos are also turned ON at this time.

PWR : Turns only the motor power ON.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the motor power command to turn the system power and the servos ON.

| Address | Value |
|---|---|
| WI0 | 0x0042 |
| WI1 | 0x0000 |
| WI2 | 0x0000 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.2.21 MOVET movement command

Execute this command group to allow the robot to move to an absolute position in the tool coordinates.

### ● PTP point designation

This command designates a point number which allows the robot to perform PTP movement to a target position in the tool coordinates.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR044 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 4 – bit 3 | (0: Fixed) | 0 |
| | | bit 5 | Acceleration designation flag | d |
| | | bit 6 | Deceleration designation flag | e |
| | | bit 13 – bit 7 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point number | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| to | | | | |
| WI9 | | | | |
| WI10 | Acceleration designation | | | 0xrrrr |
| WI11 | Deceleration designation | | | 0xrrrr |
| WI12 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit whether all axes are designated.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

d : Specify in 1 bit whether to set acceleration.

| Value | Meaning |
|---|---|
| 0 | Acceleration is not specified. |
| 1 | Acceleration is specified. |

e : Specifies in 1 bit whether to set deceleration.

| Value | Meaning |
|---|---|
| 0 | Deceleration is not specified. |
| 1 | Deceleration is specified. |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

ssss : Specify the movement speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

rrrr : Specify the acceleration and deceleration in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVET command with PTP designation as shown at right, when moving all the axes of the Robot 1 to point number 100 at 50% speed, and with the current position being output in pulses.

| Address | Value |
|---|---|
| WI0 | 0x0044 |
| WI1 | 0x4004 |
| WI2 | 0x0000 |
| WI3 | 0x0032 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Axis 1 = 123456

Axis 2 = -123

Other axes = 0

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0xE240 |
| WO5 | 0x0001 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Linear interpolation

This command designates a point number which allows the robot to perform linear interpolation movement to a target position in the tool coordinates.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR045 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Axis designation flag | a |
| | | bit 2 − bit 1 | Speed designation flag | bb |
| | | bit 4 − bit 3 | (0: Fixed) | 0 |
| | | bit 5 | Acceleration designation flag | d |
| | | bit 6 | Deceleration designation flag | e |
| | | bit 13 – bit 7 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point number | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| to | | | | |
| WI9 | | | | |
| WI10 | Acceleration designation | | | 0xrrrr |
| WI11 | Deceleration designation | | | 0xrrrr |
| WI12 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : Specify in 1 bit whether all axes are designated.

| Value | Meaning |
|---|---|
| 0 | All axes are specified. |
| 1 | One or more axes are specified. |

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |
| 11 | Speed is specified in mm/s. | 1 to 1000 |

d : Specify in 1 bit whether to set acceleration.

| Value | Meaning |
|---|---|
| 0 | Acceleration is not specified. |
| 1 | Acceleration is specified. |

e : Specifies in 1 bit whether to set deceleration.

| Value | Meaning |
|---|---|
| 0 | Deceleration is not specified. |
| 1 | Deceleration is specified. |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Specify the axis to move in bit pattern using lower 8 bits.
Valid when axis designation flag is 1.

ssss : Specify the movement speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

rrrr : Specify the acceleration and deceleration in 16 bits.
Specified range: 1 (=0x0001) to 100 (=0x0064)

## ■ Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the MOVET command with linear interpolation as shown at right, when moving all axes of the Robot 1 to point number 100 at a speed of 200 mm/s and at 50% acceleration, and with the current position being output in millimeters.

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 5.000

Axis 4 = 9.023

Values are expressed as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0045 |
| WI1 | 0x8026 |
| WI2 | 0x0000 |
| WI3 | 0x00C8 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0032 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0x233F |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.2.22 Torque control command information

### ● Max. torque command value change command

This command changes the maximum torque command value at a specified axis. The changed torque becomes effective at the next movement command (MOVE or DRIVE, etc.). The parameter value is not changed by this command.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR048 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Torque designation axis | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Designated torque | | | 0xdddd |
| WI4 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

tt : Specifies (by lower 8 bits) the axis where the torque value is to be changed.
Only one axis can be specified.

dddd : Specifies (by 16 bits) the designated torque value.
Specified range: 1 (=0x0001) to 100 (=0x0064)

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the max. torque command value change command to change the max. torque command value for Axis 1 of the Robot 1 to 50%.

| Address | Value |
|---|---|
| WI0 | 0x0048 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0032 |
| WI4 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

### 4.2.23 PUSH operation command

Execute this command group to perform a push operation at the specified robot axis.
This command can only be executed for one axis.

#### ● Point designation

This command designates a point number which allows the specified robot axis to perform a PTP operation to a target position.

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR04B |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (1: Fixed) | 1 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 6 – bit 3 | (0: Fixed) | 0 |
| | | bit 7 | Push force designation flag | h |
| | | bit 8 | Push time-period designation flag | i |
| | | bit 13 – bit 9 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Point number | | | 0xpppp |
| WI5 | Not used | | | 0x0000 |
| to | | | | |
| WI7 | | | | |
| WI8 | Push force designation | | | 0xffff |
| WI9 | Push time-period designation | | | 0xjjjj |
| WI10 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

h : Enables/disables (by 1 bit) the push force designation.

| Value | Meaning |
|---|---|
| 0 | Push force designation absent |
| 1 | Push force designation present |

i : Enables/disables (by 1 bit) the push time-period designation.

| Value | Meaning |
|---|---|
| 0 | Push time-period designation absent |
| 1 | Push time-period designation present |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Designates (by lower 8 bits) the axis to be moved.
Valid when axis designation flag is 1.

ssss : Specify the movement speed in 16 bits.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

ffff : Designates (by 16 bits) the push force (units: %).
Specified range: -1000 (=0xFC18) to 1000 (=0x03E8)
* A value within the rated torque range of -1000% to 1000% can be specified.

jjjj : Designates (by 16 bits) the push time-period (units: ms).
Specified range: 1 (=0x0001) to 32767 (=0x7FFF)

## Status

### Normal end

| Address | Contents | | | Value |
|---|---|---|---|---|
| WO0 | Status code | | | 0x0200 |
| WO1 | Not used | | | 0x0000 |
| WO2 | | | | |
| WO3 | PUSH command completion conditions | bit 0 | Push completion result | p |
| | | bit 15 – bit 1 | (0: Fixed) | 0 |
| WO4 | Axis-1 data | | | 0xbbbbbbbb |
| WO5 | | | | |
| WO6 | Axis-2 data | | | 0xbbbbbbbb |
| WO7 | | | | |
| WO8 | Axis-3 data | | | 0xbbbbbbbb |
| WO9 | | | | |
| WO10 | Axis-4 data | | | 0xbbbbbbbb |
| WO11 | | | | |
| WO12 | Reserved | | | 0xbbbbbbbb |
| WO13 | | | | |
| WO14 | Reserved | | | 0xbbbbbbbb |
| WO15 | | | | |

p : Indicates the push completion result.
0: Push ended in a status other than time-out.
1: Push completed at time-out (push completed).

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the PUSH operation command to move Axis 3 of the Robot 1 to point 100 at 50% speed with a push force of 100, a push time-period of 100, and with the current position being output in millimeters.

| Address | Value |
|---|---|
| WI0 | 0x004B |
| WI1 | 0x8185 |
| WI2 | 0x0004 |
| WI3 | 0x0032 |
| WI4 | 0x0064 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0032 |
| WI9 | 0x0032 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when the push operation ends normally at time-out, with the axis current positions as follows:

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 2.000

Other axes = 0.000

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0001 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x07D0 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct designation (millimeter units)

This command moves the specified axis of the robot to a target position in PTP motion by directly specifying the data in millimeters.

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR04C |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (1: Fixed) | 1 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 6 – bit 3 | (0: Fixed) | 0 |
| | | bit 7 | Push force designation flag | h |
| | | bit 8 | Push time-period designation flag | i |
| | | bit 13 – bit 9 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Movement data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Not used | | | 0x0000 |
| WI7 | | | | |
| WI8 | Push force designation | | | 0xffff |
| WI9 | Push time-period designation | | | 0xjjjj |
| WI10 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

h : Enables/disables (by 1 bit) the push force designation.

| Value | Meaning |
|---|---|
| 0 | Push force designation absent |
| 1 | Push force designation present |

i : Enables/disables (by 1 bit) the push time-period designation.

| Value | Meaning |
|---|---|
| 0 | Push time-period designation absent |
| 1 | Push time-period designation present |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Designates (by lower 8 bits) the axis to be moved.
Valid when axis designation flag is 1.

ssss : Specify the movement speed in 16 bits.

pppppppp : Specify the target movement distance data for each axis in 32 bits. (little endian)
Data should be integers (x 1000) in millimeter units.

ffff : Designates (by 16 bits) the push force (units: %).
Specified range: -1000 (=0xFC18) to 1000 (=0x03E8)
* A value within the rated torque range of -1000% to 1000% can be specified.

jjjj : Designates (by 16 bits) the push time-period (units: ms).
Specified range: 1 (=0x0001) to 32767 (=0x7FFF)

## Status

### Normal end

| Address | Contents | | | Value |
|---|---|---|---|---|
| WO0 | Status code | | | 0x0200 |
| WO1 | Not used | | | 0x0000 |
| WO2 | | | | |
| WO3 | PUSH command completion conditions | bit 0 | Push completion result | p |
| | | bit 15 – bit 1 | (0: Fixed) | 0 |
| WO4 | Axis-1 data | | | 0xbbbbbbbb |
| WO5 | | | | |
| WO6 | Axis-2 data | | | 0xbbbbbbbb |
| WO7 | | | | |
| WO8 | Axis-3 data | | | 0xbbbbbbbb |
| WO9 | | | | |
| WO10 | Axis-4 data | | | 0xbbbbbbbb |
| WO11 | | | | |
| WO12 | Reserved | | | 0xbbbbbbbb |
| WO13 | | | | |
| WO14 | Reserved | | | 0xbbbbbbbb |
| WO15 | | | | |

p : Indicates the push completion result.
0: Push ended in a status other than time-out.
1: Push completed at time-out (push completed).

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the PUSH operation command as shown at right, to move Axis 3 of the Robot 1 to position 100.00 at 50% speed with a push force of 100, a push time-period of 100, and with the current position being output in millimeters.

| Address | Value |
|---|---|
| WI0 | 0x004C |
| WI1 | 0x8185 |
| WI2 | 0x0004 |
| WI3 | 0x0032 |
| WI4 | 0x2710 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0032 |
| WI9 | 0x0032 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when the push operation ends normally at time-out, with the axis current positions as follows:

Axis 1 = 12.345

Axis 2 = -0.123

Axis 3 = 9.000

Other axes = 0.000

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0001 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x2328 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Direct designation (pulse units)

This command moves the specified axis of the robot to a target position in PTP motion by directly specifying the data in pulses.

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR04D |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | (1: Fixed) | 1 |
| | | bit 2 – bit 1 | Speed designation flag | bb |
| | | bit 6 – bit 3 | (0: Fixed) | 0 |
| | | bit 7 | Push force designation flag | h |
| | | bit 8 | Push time-period designation flag | i |
| | | bit 13 – bit 9 | (0: Fixed) | 0 |
| | | bit 14 | Current position output designation flag (Pulse units) | p |
| | | bit 15 | Current position output designation flag (Millimeter units) | m |
| WI2 | Specified axis to move | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Specified speed | | | 0xssss |
| WI4 | Movement data | | | 0xpppppppp |
| WI5 | | | | |
| WI6 | Not used | | | 0x0000 |
| WI7 | | | | |
| WI8 | Push force designation | | | 0xffff |
| WI9 | Push time-period designation | | | 0xjjjj |
| WI10 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

bb : Specify the speed setting method in 2 bits.
When specifying the robot speed directly, the desired speed is entered as a percentage of the robot's max. speed. (The 0.01% to 100.00% setting is assigned by a setting value multiplied by 100.)

| Value | Meaning | Reference range |
|---|---|---|
| 00 | Speed is not specified. | - |
| 01 | Direct speed is specified. | 1 to 10000 |
| 10 | Speed is set in %. | 1 to 100 |

h : Enables/disables (by 1 bit) the push force designation.

| Value | Meaning |
|---|---|
| 0 | Push force designation absent |
| 1 | Push force designation present |

i : Enables/disables (by 1 bit) the push time-period designation.

| Value | Meaning |
|---|---|
| 0 | Push time-period designation absent |
| 1 | Push time-period designation present |

p, m : Specify in 1 bit whether to output current position.

| Value | Meaning |
|---|---|
| 0 | No output. |
| 1 | Output. |

* The "pulse units" and "millimeter units" current position output designation flags cannot be designated at the same time. Doing so will result in the "4.202 Input format error".

tt : Designates (by lower 8 bits) the axis to be moved.
Valid when axis designation flag is 1.

ssss : Specify the movement speed in 16 bits.

pppppppp : Specify the target movement distance data for each axis in 32 bits. (little endian)
Data should be integers in pulse units.

ffff : Designates (by 16 bits) the push force (units: %).
Specified range: -1000 (=0xFC18) to 1000 (=0x03E8)
* A value within the rated torque range of -1000% to 1000% can be specified.

jjjj : Designates (by 16 bits) the push time-period (units: ms).
Specified range: 1 (=0x0001) to 32767 (=0x7FFF)

## Status

### Normal end

| Address | Contents | | | Value |
|---|---|---|---|---|
| WO0 | Status code | | | 0x0200 |
| WO1 | Not used | | | 0x0000 |
| WO2 | | | | |
| WO3 | PUSH command completion conditions | bit 0 | Push completion result | p |
| | | bit 15 – bit 1 | (0: Fixed) | 0 |
| WO4 | Axis-1 data | | | 0xbbbbbbbb |
| WO5 | | | | |
| WO6 | Axis-2 data | | | 0xbbbbbbbb |
| WO7 | | | | |
| WO8 | Axis-3 data | | | 0xbbbbbbbb |
| WO9 | | | | |
| WO10 | Axis-4 data | | | 0xbbbbbbbb |
| WO11 | | | | |
| WO12 | Reserved | | | 0xbbbbbbbb |
| WO13 | | | | |
| WO14 | Reserved | | | 0xbbbbbbbb |
| WO15 | | | | |

p : Indicates the push completion result.
0: Push ended in a status other than time-out.
1: Push completed at time-out (push completed).

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers when point display units are in pulses.
Data is shown in integers (x1000) when point display units are in millimeters.
The point units system conforms to the unit system which has been specified for the current position output flag.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify the PUSH operation command as shown at right, to move Axis 3 of the Robot 1 to position 10000 at 50% speed with a push force of 100, a push time-period of 100, and with the current position being output in pulses.

| Address | Value |
|---|---|
| WI0 | 0x004D |
| WI1 | 0x4185 |
| WI2 | 0x0004 |
| WI3 | 0x0032 |
| WI4 | 0x2710 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0032 |
| WI9 | 0x0032 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when the push operation ends normally at time-out, with the axis current positions as follows:

Axis 1 = 12345

Axis 2 = -123

Axis 3 = 9000

Other axes = 0

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0001 |
| WO4 | 0x3039 |
| WO5 | 0x0000 |
| WO6 | 0xFF85 |
| WO7 | 0xFFFF |
| WO8 | 0x2328 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.3 Category 2 remote commands

Category 2 remote commands are used to define or obtain point data.
A command list is given below.

| No. | Command contents | | Command code (WI0) |
|---|---|---|---|
| 2-1 | Point-related commands | Point data definition | 0x0100 |
| | | Point data reference | 0x0101 |
| 2-2 | Point comment-related commands | Point comment data definition | 0x0104 |
| | | Point comment data reference | 0x0105 |
| 2-3 | Pallet-related command | Pallet data definition | 0x0108 |
| | | Pallet data reference | 0x0109 |
| 2-4 | Shift-related command | Shift data definition | 0x010C |
| | | Shift data reference | 0x010D |
| 2-5 | Hand-related command | Hand data definition | 0xR110 |
| | | Hand data reference | 0xR111 |

### 4.3.1 Point-related command

Execute this command to define or obtain point data.

#### ● Point data definition

This command defines point data by specifying the point number and position data on each axis.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | | | 0x0100 |
| WI1 | Command flag | bit 0 | Point unit | u |
| | | bit 2 − bit 1 | Hand system | tt |
| | | bit 6 − bit 3 | Reserved | xr |
| | | bit 10 − bit 7 | Reserved | yr |
| | | bit 15 − bit 11 | (0: Fixed) | 0 |
| WI2 | Point number | | | 0xssss |
| WI3 | Not used | | | 0x0000 |
| WI4 | Axis-1 data | | | 0xbbbbbbbb |
| WI5 | | | | |
| WI6 | Axis-2 data | | | 0xbbbbbbbb |
| WI7 | | | | |
| WI8 | Axis-3 data | | | 0xbbbbbbbb |
| WI9 | | | | |
| WI10 | Axis-4 data | | | 0xbbbbbbbb |
| WI11 | | | | |
| WI12 | Reserved | | | 0xbbbbbbbb |
| WI13 | | | | |
| WI14 | Reserved | | | 0xbbbbbbbb |
| WI15 | | | | |

u : Specify the point data unit in 1 bit.

| Value | Meaning |
|---|---|
| 0 | Pulse units |
| 1 | Millimeter units |

tt : Specify in 2 bits the hand system to be defined. Units are in millimeters.

| Value | Meaning |
|---|---|
| 01 | Right-handed system is defined. |
| 10 | Left-handed system is defined. |
| Other | No hand system is defined. |

ssss : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

bbbbbbbb : Specify the point data in 32 bits. (little endian)
Data should be integers when units are in pulses.
Data should be integers (x1000) when units are in millimeters.

## Status

### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the point data definition command as shown at right, to create the following point data in pulse units.

Point number = 100

Axis 1 = 10000

Axis 2 = -20000

Axis 3 = 5000

Axis 4 = -18000

| Address | Value |
|---|---|
| WI0 | 0x0100 |
| WI1 | 0x0000 |
| WI2 | 0x0064 |
| WI3 | 0x0000 |
| WI4 | 0x2710 |
| WI5 | 0x0000 |
| WI6 | 0xB1E0 |
| WI7 | 0xFFFF |
| WI8 | 0x1388 |
| WI9 | 0x0000 |
| WI10 | 0xB9B0 |
| WI11 | 0xFFFF |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Point data reference

Use this command to find and obtain point data by specifying the point number.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0101 |
| WI1 | Not used | 0x0000 |
| WI2 | Point number | 0xssss |
| WI3 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

### ■ Status

#### Normal end

| Address | Contents | | | Value |
|---|---|---|---|---|
| WO0 | Status code | | | 0x0200 |
| WO1 | Not used | | | 0x0000 |
| WO2 | Point number | | | 0xssss |
| WO3 | Point flag | bit 0 | Point unit | u |
| | | bit 2 − bit 1 | Hand system | tt |
| | | bit 6 − bit 3 | Reserved | xr |
| | | bit 10 − bit 7 | Reserved | yr |
| | | bit 15 − bit 11 | (0: Fixed) | 0 |
| WO4 | Axis-1 data | | | 0xbbbbbbbb |
| WO5 | | | | |
| WO6 | Axis-2 data | | | 0xbbbbbbbb |
| WO7 | | | | |
| WO8 | Axis-3 data | | | 0xbbbbbbbb |
| WO9 | | | | |
| WO10 | Axis-4 data | | | 0xbbbbbbbb |
| WO11 | | | | |
| WO12 | Reserved | | | 0xbbbbbbbb |
| WO13 | | | | |
| WO14 | Reserved | | | 0xbbbbbbbb |
| WO15 | | | | |

ssss : Shows the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

u : Shows the point data unit in 1 bit.

| Value | Meaning |
|---|---|
| 0 | Pulse units |
| 1 | Millimeter units |

tt : Shows in 2 bits the hand system to define point data. Units are in millimeters.

| Value | Meaning |
|---|---|
| 00 | No hand system is defined. |
| 01 | Right-handed system is defined. |
| 10 | Left-handed system is defined. |

bbbbbbb : Shows the point data in 32 bits. (little endian)
Data is shown in integers when units are in pulses.
Data is shown in integers (x1000) when units are in millimeters.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the point data reference command as shown at right, to search and obtain point data at point number 50.

| Address | Value |
|---|---|
| WI0 | 0x0101 |
| WI1 | 0x0000 |
| WI2 | 0x0032 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly to obtain the following point data.

Point number = 50

Axis 1 = 10.000

Axis 2 = -20.000

Axis 3 = 5.000

Axis 4 = -18.000

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0032 |
| WO3 | 0x0001 |
| WO4 | 0x2710 |
| WO5 | 0x0000 |
| WO6 | 0xB1E0 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0xB9B0 |
| WO11 | 0xFFFF |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.3.2 Point comment-related command

Execute this command to define or obtain point comment data.

### ● Point comment data definition

Use this command to define point comment data by specifying the point number and point comment data.

#### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0104 |
| WI1 | Not used | 0x0000 |
| WI2 | Point number | 0xssss |
| WI3 | Not used | 0x0000 |
| WI4 | Comment data | 0xbbbb |
| WI5 | | 0xbbbb |
| WI6 | | 0xbbbb |
| WI7 | | 0xbbbb |
| WI8 | | 0xbbbb |
| WI9 | | 0xbbbb |
| WI10 | | 0xbbbb |
| WI11 | | 0xbbbb |
| WI12 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

bb : Specify 1 byte comment data in 8 bits. (little endian)
Specified range: " "(=0x20) to "~ "(=0x7E)

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the point comment data definition command as shown at right, to create the following point comment data.

Point number = 100

Comment data = "WAIT ORG"

(character code : "W" = 0x57
"A" = 0x41
" I " = 0x49
"T" = 0x54
" " = 0x20
"O" = 0x4F
"R" = 0x52
"G" = 0x47)

| Address | Value |
|---|---|
| WI0 | 0x0104 |
| WI1 | 0x0000 |
| WI2 | 0x0064 |
| WI3 | 0x0000 |
| WI4 | 0x4157 |
| WI5 | 0x5449 |
| WI6 | 0x4F20 |
| WI7 | 0x4752 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Point comment data reference

Use this command to search and obtain point comment data by specifying the point number.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0105 |
| WI1 | Not used | 0x0000 |
| WI2 | Point number | 0xssss |
| WI3 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Point number | 0xssss |
| WO3 | Not used | 0x0000 |
| WO4 | Comment data | 0xbbbb |
| WO5 | | 0xbbbb |
| WO6 | | 0xbbbb |
| WO7 | | 0xbbbb |
| WO8 | | 0xbbbb |
| WO9 | | 0xbbbb |
| WO10 | | 0xbbbb |
| WO11 | | 0xbbbb |
| WO12 | Not used | 0x0000 |
| to | | |
| WO15 | | |

ssss : Shows the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

bb : Shows the 1 byte comment data in 8 bits. (little endian)

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the point comment data reference command as shown at right, to obtain point comment data at point number 50.

| Address | Value |
|---|---|
| WI0 | 0x0105 |
| WI1 | 0x0000 |
| WI2 | 0x0032 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly to obtain the following point data.

Point number = 50

Comment data = "WAIT ORG"

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0032 |
| WO3 | 0x0000 |
| WO4 | 0x4157 |
| WO5 | 0x5449 |
| WO6 | 0x4F20 |
| WO7 | 0x4752 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

### 4.3.3 Pallet-related command

Execute this command to define or obtain pallet data.

#### ● Pallet data definition

This command defines the pallet data by specifying the pallet number, the number of pallets (Nx, Ny, Nz), and the first point number.

**NOTE**

Point data used for pallet movement is determined by the pallet number. Refer to the YRCX robot controller user's manual or YRCX robot programming manual for detailed information.

#### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0108 |
| WI1 | Not used | 0x0000 |
| WI2 | Pallet number | 0xssss |
| WI3 | Number of pallets in X direction (Nx) | 0xaaaa |
| WI4 | Number of pallets in Y direction (Ny) | 0xaaaa |
| WI5 | Number of pallets in Z direction (Nz) | 0xaaaa |
| WI6 | First point number | 0xpppp |
| WI7 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify the pallet number in 16 bits.
Pallet number specified range: 0 (=0x0000) to 39 (=0x0027)

aaaa : Specify the number of pallets (positive integer) in 16 bits.
Specified range: 0 (=0x0000) to 32767 (=0x7FFF)
The value of "Nx*Ny*Nz" should be within a 1 to 32767 range.

pppp : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29995 (=0x752B)
The pallet definition coordinate data is saved at the point data area for 5 points, beginning with the data for the specified point.

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the pallet data definition command as shown at right, to create the following pallet.

Pallet number = 10

Nx = 10

Ny = 15

Nz = 1

First point number = 100

| Address | Value |
|---|---|
| WI0 | 0x0108 |
| WI1 | 0x0000 |
| WI2 | 0x000A |
| WI3 | 0x000A |
| WI4 | 0x000F |
| WI5 | 0x0001 |
| WI6 | 0x0064 |
| WI7 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| to | |
| WO15 | |

## ● Pallet data reference

Use this command to obtain pallet data by specifying the pallet number.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0109 |
| WI1 | Not used | 0x0000 |
| WI2 | Pallet number | 0xssss |
| WI3 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify the pallet number in 16 bits.
Specified range: 0 (=0x0000) to 39 (=0x0027)

### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Pallet number | 0xssss |
| WO3 | Number of pallets in X direction (Nx) | 0xaaaa |
| WO4 | Number of pallets in Y direction (Ny) | 0xaaaa |
| WO5 | Number of pallets in Z direction (Nz) | 0xaaaa |
| WO6 | First point number | 0xpppp |
| WO7 | Not used | 0x0000 |
| to | | |
| WO15 | | |

ssss : Shows the pallet number in 16 bits.

aaaa : Shows the number of pallets in 16 bits.

pppp : Indicates the first point number in 16 bits.

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the pallet data reference command as shown at right, to obtain pallet data at pallet number 10.

| Address | Value |
|---|---|
| WI0 | 0x0109 |
| WI1 | 0x0000 |
| WI2 | 0x000A |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly to obtain the following pallet data.

Pallet number = 10

Nx = 10

Ny = 15

Nz = 1

First point number = 100

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x000A |
| WO3 | 0x000A |
| WO4 | 0x000F |
| WO5 | 0x0001 |
| WO6 | 0x0064 |
| WO7 | 0x0000 |
| to | |
| WO15 | |

## 4.3.4 Shift-related command

Execute this command to define or obtain shift data.

### ● Shift data definition

Use this command to define shift data by specifying the shift number and shift data.

#### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x010C |
| WI1 | Not used | 0x0000 |
| WI2 | Shift number | 0xssss |
| WI3 | Not used | 0x0000 |
| WI4 | Axis-1 data | 0xbbbbbbbb |
| WI5 | | |
| WI6 | Axis-2 data | 0xbbbbbbbb |
| WI7 | | |
| WI8 | Axis-3 data | 0xbbbbbbbb |
| WI9 | | |
| WI10 | Axis-4 data | 0xbbbbbbbb |
| WI11 | | |
| WI12 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify the shift number in 16 bits.
Specified range: 0 (=0x0000) to 39 (=0x0027)

bbbbbbbb : Specify the shift data in 32 bits. (little endian)
Data should by integers (x1000).

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the shift data definition command as shown at right, to create the following shift data.

Shift number = 5

Axis 1 = 10.000

Axis 2 = -20.000

Axis 3 = 5.000

Axis 4 = -18.000

| Address | Value |
|---|---|
| WI0 | 0x010C |
| WI1 | 0x0000 |
| WI2 | 0x0005 |
| WI3 | 0x0000 |
| WI4 | 0x2710 |
| WI5 | 0x0000 |
| WI6 | 0xB1E0 |
| WI7 | 0xFFFF |
| WI8 | 0x1388 |
| WI9 | 0x0000 |
| WI10 | 0xB9B0 |
| WI11 | 0xFFFF |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Shift data reference

Use this command to search and obtain shift data by specifying the shift number.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x010D |
| WI1 | Not used | 0x0000 |
| WI2 | Shift number | 0xssss |
| WI3 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify the shift number in 16 bits.
Specified range: 0 (=0x0000) to 39 (=0x0027)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Shift number | 0xssss |
| WO3 | Not used | 0x0000 |
| WO4 | Data 1 | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Data 2 | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Data 3 | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Data 4 | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Not used | 0x0000 |
| to | | |
| WO15 | | |

ssss : Shows the shift number in 16 bits.

bbbbbbbb : Shows the shift data in 32 bits. (little endian)
Data is show in integers (x1000).

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the shift data reference command as shown at right, to obtain shift data at shift number 5.

| Address | Value |
|---|---|
| WI0 | 0x010D |
| WI1 | 0x0000 |
| WI2 | 0x0005 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly to obtain the following shift data.

Shift number = 5

Axis 1 = 10.000

Axis 2 = -20.000

Axis 3 = 5.000

Axis 4 = -18.000

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0005 |
| WO3 | 0x0000 |
| WO4 | 0x2710 |
| WO5 | 0x0000 |
| WO6 | 0xB1E0 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0xB9B0 |
| WO11 | 0xFFFF |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.3.5 Hand-related command

Execute this command to define or obtain hand data.

### ● Hand data definition

Use this command to define hand data by specifying the hand number and each data.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR110 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Hand number | | | 0xssss |
| WI3 | Not used | | | 0x0000 |
| WI4 | Data 1 | | | 0xbbbbbbbb |
| WI5 | | | | |
| WI6 | Data 2 | | | 0xbbbbbbbb |
| WI7 | | | | |
| WI8 | Data 3 | | | 0xbbbbbbbb |
| WI9 | | | | |
| WI10 | Data 4 | | | 0xbbbbbbbb |
| WI11 | | | | |
| WI12 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

ssss : Specify the hand number in 16 bits.
Hand number setting range : 0 (0x0000) to 31 (=0x001F)

bbbbbbbb : When data 4 is 0:
Data 1 : Specify the integer in 32 bits. (little endian)
Data 2 and 3 : Specify the integer (x1000) in 32 bits. (little endian)
Data 4 : When hand is installed to R-axis =1, other cases =0

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the hand data definition command as shown at right, to create hand data for a Cartesian robot.

Hand number = 1

Data 1 = 10.000

Data 2 = -2.000

Data 3 = 5.000

Data 4 = 0

| Address | Value |
|---|---|
| WI0 | 0x0110 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| WI4 | 0x2710 |
| WI5 | 0x0000 |
| WI6 | 0xF830 |
| WI7 | 0xFFFF |
| WI8 | 0x1388 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## ● Hand data reference

Use this command to obtain hand data by specifying the hand number.

### ■ Commands

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0x0111 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Hand number | | | 0xssss |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

ssss : Specify the hand number in 16 bits.
Hand number setting range : 0 (0x0000) to 31 (=0x001F)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Hand number | 0xssss |
| WO3 | Not used | 0xrrrr |
| WO4 | Data 1 | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Data 2 | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Data 3 | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Data 4 | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Not used | 0x0000 |
| to | | |
| WO15 | | |

ssss : Shows the hand number in 16 bits.
rrrr : Indicates the robot number in 16 bits.
bbbbbbbb : When data 4 is 0.
Data 1 : Shows the integer in 32 bits. (little endian)
Data 2 and 3 : Shows the integer (x1000) in 32 bits. (little endian)
Data 4 : When hand is installed to R-axis =1, other cases =0

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use the hand data reference command as shown at right, to obtain hand data.

| Address | Value |
|---|---|
| WI0 | 0x0111 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly to obtain the following hand data.

Hand number = 1

Data 1 = 10.000

Data 2 = -2.000

Data 3 = 5.000

Data 4 = 0

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0001 |
| WO3 | 0x0001 |
| WO4 | 0x2710 |
| WO5 | 0x0000 |
| WO6 | 0xF830 |
| WO7 | 0xFFFF |
| WO8 | 0x1388 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.4 Category 3 remote commands

Category 3 remote commands are arithmetic commands. A command list is given below.

| No. | Command contents | | | Command code (WI0) |
|---|---|---|---|---|
| 3-1 | Static variable-related commands | Assignment | Value | 0x0200 |
| | | | Variable | 0x0201 |
| | | Addition | Value | 0x0204 |
| | | | Variable | 0x0205 |
| | | Subtraction | Value | 0x0208 |
| | | | Variable | 0x0209 |
| | | Multiplication | Value | 0x020C |
| | | | Variable | 0x020D |
| | | Division | Value | 0x0210 |
| | | | Variable | 0x0211 |
| | | Reference | Variable | 0x0214 |
| 3-2 | Parameter-related command | Assignment | | 0xR220 |
| | | Reference | | 0xR224 |
| 3-3 | Point-related command | Point assignment | | 0x0230 |
| | | Addition | | 0x0234 |
| | | Subtraction | | 0x0235 |
| | | Pallet point assignment | | 0x0238 |
| | | Point element assignment | Pulse units input format | 0x0240 |
| | | | Millimeter units input format | 0x0241 |
| | | Shift element assignment | Millimeter units input format | 0x0245 |

## 4.4.1 Static variable-related command

Execute this command to assign a numerical value to a static variable for four arithmetic operations or reference.

### ● Assigning a numerical value to a static variable

This command assigns a numerical value to a static variable (SGIn or SGRn) by specifying the destination variable number and the numerical value.

Variable number 1 = numerical value

**CAUTION**

- A real number is assigned when a real variable was used.
- Due to cancellation of significant digits when using real number data for assignment reference, the assigned data might sometimes differ from the reference data.

#### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0200 |
| WI1 | Not used | 0x0000 |
| WI2 | Variable number 1 (Variable number at assignment destination) | 0xssss |
| WI3 | Not used | 0x0000 |
| WI4 | Numerical data | 0xbbbbbbbb |
| WI5 | | |
| WI6 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify variable number 1 in 16 bits.
Specified range for integer variable : 0 (0x0000) to 31 (=0x001F)
Specified range for real variable : 256 (=0x0100) to 287 (=0x011F)

| Integer variable | Variable number | Real variable | Variable number |
|---|---|---|---|
| SGI0 | 0 (=0x0000) | SGR0 | 256 (=0x0100) |
| SGI1 | 1 (=0x0001) | SGR1 | 257 (=0x0101) |
| : | : | : | : |
| SGI31 | 31 (=0x001F) | SGR31 | 287 (=0x011F) |

bbbbbbbb : Specify the integer in 32 bits. (little endian)
Specify a signed integer value when assigning to an integer variable.
Specify a single-precision real number when assigning to a real variable.

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to assign numerical data to variable number 1.

Variable number 1 = 1

Numerical data = 10000

| Address | Value |
|---|---|
| WI0 | 0x0200 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| WI4 | 0x2710 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## ● Assigning a variable to a static variable

This command assigns a numerical value to a static variable (SGIn or SGRn) by designating the source variable number and destination variable number.

Variable number 1 = Variable number 2

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0201 |
| WI1 | Not used | 0x0000 |
| WI2 | Variable number 1 (Variable number at assignment destination) | 0xssss |
| WI3 | Not used | 0x0000 |
| WI4 | Variable number 2 (Variable number at assignment source) | 0xssss |
| WI5 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify variable numbers 1 and 2 in 16 bits.
Specified range for integer variable : 0 (0x0000) to 31 (=0x001F)
Specified range for real variable : 256 (=0x0100) to 287 (=0x011F)

| Integer variable | Variable number | Real variable | Variable number |
|---|---|---|---|
| SGI0 | 0 (=0x0000) | SGR0 | 256 (=0x0100) |
| SGI1 | 1 (=0x0001) | SGR1 | 257 (=0x0101) |
| : | : | : | : |
| SGI31 | 31 (=0x001F) | SGR31 | 287 (=0x011F) |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to assign numerical data of variable number 2 to variable number 1.

Variable number 1 = 1

Variable number 2 = 2

| Address | Value |
|---|---|
| WI0 | 0x0201 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| WI4 | 0x0002 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Arithmetic operation using numerical data on static variable

This command performs four arithmetic operations by specifying variable number 1 and a numerical value. Results are stored in a static variable (SGIn or SGRn) specified by variable number 1.

Variable number 1 = Variable number 1 (operator) numerical value

### ■ Command

| Address | Contents | | Value |
|---|---|---|---|
| WI0 | Command code | Addition | 0x0204 |
| | | Subtraction | 0x0208 |
| | | Multiplication | 0x020C |
| | | Division | 0x0210 |
| WI1 | Not used | | 0x0000 |
| WI2 | Variable number 1 (Variable number at addition destination) | | 0xssss |
| WI3 | Not used | | 0x0000 |
| WI4 | Numerical data | | 0xbbbbbbbb |
| WI5 | | | |
| WI6 | Not used | | 0x0000 |
| to | | | |
| WI15 | | | |

ssss : Specify variable number 1 in 16 bits.
Specified range for integer variable : 0 (0x0000) to 31 (=0x001F)
Specified range for real variable : 256 (=0x0100) to 287 (=0x011F)

| Integer variable | Variable number | Real variable | Variable number |
|---|---|---|---|
| SGI0 | 0 (=0x0000) | SGR0 | 256 (=0x0100) |
| SGI1 | 1 (=0x0001) | SGR1 | 257 (=0x0101) |
| : | : | : | : |
| SGI31 | 31 (=0x001F) | SGR31 | 287 (=0x011F) |

bbbbbbbb : Specify the integer in 32 bits. (little endian)
Specify a signed integer value when assigning to an integer variable.
Specify a single-precision real number when assigning to a real variable.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use this command to assign numerical data to a static variable as shown at right.

Variable number 1 = 1

Numerical data = 10000

| Address | Value |
|---|---|
| WI0 | 0x0204 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| WI4 | 0x2710 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Arithmetic operation using variable on static variable

This command performs four arithmetic operations by specifying variable numbers 1 and 2. Results are stored in a static variable (SGIn or SGRn) specified by variable number 1.

Variable number 1 = Variable number 1 (operator) variable number 2

### ■ Command

| Address | Contents | | Value |
|---|---|---|---|
| WI0 | Command code | Addition | 0x0205 |
| | | Subtraction | 0x0209 |
| | | Multiplication | 0x020D |
| | | Division | 0x0211 |
| WI1 | Not used | | 0x0000 |
| WI2 | Variable number 1 (Variable number at arithmetic operation destination) | | 0xssss |
| WI3 | Not used | | 0x0000 |
| WI4 | Variable number 2 (Variable number at arithmetic operation source) | | 0xssss |
| WI5 | Not used | | 0x0000 |
| to | | | |
| WI15 | | | |

ssss : Specify variable numbers 1 and 2 in 16 bits.
Specified range for integer variable : 0 (0x0000) to 31 (=0x001F)
Specified range for real variable : 256 (=0x0100) to 287 (=0x011F)

| Integer variable | Variable number | Real variable | Variable number |
|---|---|---|---|
| SGI0 | 0 (=0x0000) | SGR0 | 256 (=0x0100) |
| SGI1 | 1 (=0x0001) | SGR1 | 257 (=0x0101) |
| : | : | : | : |
| SGI31 | 31 (=0x001F) | SGR31 | 287 (=0x011F) |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this arithmetic operation command to multiply static variables as shown at right.

Variable number 1 = 1

Variable number 2 = 2

| Address | Value |
|---|---|
| WI0 | 0x020D |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| WI4 | 0x0002 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Static variable value reference

Use this command to search and obtain the value stored in a static variable (SGIn or SGRn) by specifying the variable number.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0214 |
| WI1 | Not used | 0x0000 |
| WI2 | Variable number | 0xssss |
| WI3 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify variable number in 16 bits.
Specified range for integer variable : 0 (0x0000) to 31 (=0x001F)
Specified range for real variable : 256 (=0x0100) to 287 (=0x011F)

| Integer variable | Variable number | Real variable | Variable number |
|---|---|---|---|
| SGI0 | 0 (=0x0000) | SGR0 | 256 (=0x0100) |
| SGI1 | 1 (=0x0001) | SGR1 | 257 (=0x0101) |
| : | : | : | : |
| SGI31 | 31 (=0x001F) | SGR31 | 287 (=0x011F) |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Variable number | 0xssss |
| WO3 | Not used | 0x0000 |
| WO4 | Value of variable | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Not used | 0x0000 |
| to | | |
| WO15 | | |

ssss : Specify variable number in 16 bits.
Specified range for integer variable : 0 (0x0000) to 31 (=0x001F)
Specified range for real variable : 256 (=0x0100) to 287 (=0x011F)

bbbbbbbb : Shows the numerical value in 32 bits. (little endian)
Specify a signed integer value when assigning to an integer variable.
Specify a single-precision real number when assigning to a real variable.

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to obtain the numerical value of variable number 5.

| Address | Value |
|---|---|
| WI0 | 0x0214 |
| WI1 | 0x0000 |
| WI2 | 0x0005 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly to obtain the following variable.

Variable number = 5

Value = 50

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0005 |
| WO3 | 0x0000 |
| WO4 | 0x0032 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.4.2 Parameter-related command

Execute this command to assign a value to a parameter or obtain a parameter.

### ● Assigning a value to a parameter

This command assigns a numerical value to a specified parameter by specifying the parameter number, axis and numerical value.

| Robot parameter | | Parameter number | Assignment range |
|---|---|---|---|
| WEIGHT | Robot payload (kg) | 1 (=0x0001) | 0 to maximum payload |
| WEIGHTG | Robot payload (g) | 2 (=0x0002) | 0 to maximum payload |

| Axis parameter | | Parameter number | Assignment range |
|---|---|---|---|
| ACCEL | Acceleration coefficient | 257 (=0x0101) | 1 to 100 |
| DECEL | Deceleration ratio | 258 (=0x0102) | 1 to 100 |
| TOLE | Tolerance (pulses) | 259 (=0x0103) | 1 to 16384 |
| OUTPOS | OUT effective position (pulses) | 260 (=0x0104) | 1 to 9999999 |
| AXWGHT | Axis payload (kg) | 262 (=0x0106) | 0 to maximum payload |
| ARCHP1 | Arch start position (pulse) | 264 (=0x0108) | 1 to 9999999 |
| ARCHP2 | Arch end position (pulse) | 265 (=0x0109) | 1 to 9999999 |
| PSHFRC | Push force | 266 (=0x010A) | -1000 to 1000 |
| PSHTIME | Push time-period | 267 (=0x010B) | 1 to 32767 |
| PSHMTD | Push method | 268 (=0x010C) | 0: DISABLE, 1: ENABLE |
| PSHJGSP | Push judgment speed ratio | 269 (=0x010D) | 0: DISABLE, 1 to 100 |
| PSHSPD | Push speed ratio | 270 (=0x010E) | 1 to 100 |

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR220 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Parameter number | | | 0xssss |
| WI3 | Specified axis | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 − bit 6 | (0: Fixed) | |
| WI4 | Numerical data | | | 0xbbbbbbbb |
| WI5 | | | | |
| WI6 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

ssss : Specify the parameter number in 16 bits.

tt : Specify the axis number in bit pattern using lower 8 bits.
Only one axis can be specified.
Specify "0" for robot parameters.

bbbbbbbb : Specify the integer in 32 bits. (little endian)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to assign a numerical value to the tolerance for Axis 3 of the Robot 1.

Parameter number = 259

Specified axis = 3

Numerical data = 1000

| Address | Value |
|---|---|
| WI0 | 0x0220 |
| WI1 | 0x0000 |
| WI2 | 0x0103 |
| WI3 | 0x0004 |
| WI4 | 0x03E8 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## ● Parameter value reference

Use this command to search and obtain parameter setting data by specifying the parameter number.

| Robot parameter | | Parameter number | Reference range |
|---|---|---|---|
| WEIGHT | Robot payload (kg) | 1 (=0x0001) | 0 to maximum payload |
| WEIGHTG | Robot payload (g) | 2 (=0x0002) | 0 to maximum payload |

| Axis parameter | | Parameter number | Reference range |
|---|---|---|---|
| ACCEL | Acceleration coefficient | 257 (=0x0101) | 1 to 100 |
| DECEL | Deceleration ratio | 258 (=0x0102) | 1 to 100 |
| TOLE | Tolerance (pulses) | 259 (=0x0103) | 1 to 16384 |
| OUTPOS | OUT effective position (pulses) | 260 (=0x0104) | 1 to 9999999 |
| AXWGHT | Axis payload (kg) | 262 (=0x0106) | 0 to maximum payload |
| ARCHP1 | Arch start position (pulse) | 264 (=0x0108) | 1 to 9999999 |
| ARCHP2 | Arch end position (pulse) | 265 (=0x0109) | 1 to 9999999 |
| PSHFRC | Push force | 266 (=0x010A) | -1000 to 1000 |
| PSHTIME | Push time-period | 267 (=0x010B) | 1 to 32767 |
| PSHMTD | Push method | 268 (=0x010C) | 0: DISABLE, 1: ENABLE |
| PSHJGSP | Push judgment speed ratio | 269 (=0x010D) | 0: DISABLE, 1 to 100 |
| PSHSPD | Push speed ratio | 270 (=0x010E) | 1 to 100 |

## ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR224 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Parameter number | | | 0xssss |
| WI3 | Specified axis | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI4 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

ssss : Specify the parameter number in 16 bits.

tt : Specify the axis number in bit pattern using lower 8 bits.
Only one axis can be specified.
Specify "0" for robot parameters.

## Status

### Normal end

| Address | Contents | | | Value |
|---|---|---|---|---|
| WO0 | Status code | | | 0x0200 |
| WO1 | Not used | | | 0x0000 |
| WO2 | Parameter number | | | 0xssss |
| WO3 | Specified axis | bit 0 | Axis 1 | 0x00tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 − bit 6 | (0: Fixed) | |
| WO4 | Numerical data | | | 0xbbbbbbbb |
| WO5 | | | | |
| WO6 | Not used | | | 0x0000 |
| to | | | | |
| WO15 | | | | |

ssss : Specify the parameter number in 16 bits.

tt : Specify the axis number in bit pattern using lower 8 bits.
Only one axis can be specified.
Specify "0" for robot parameters.

bbbbbbbb : Specify the integer in 32 bits. (little endian)

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to obtain the OUT effective position of axis 1 of the Robot 1.

Parameter number = 260

Specified axis = 1

| Address | Value |
|---|---|
| WI0 | 0x0224 |
| WI1 | 0x0000 |
| WI2 | 0x0104 |
| WI3 | 0x0001 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly to obtain the following parameter.

Parameter number = 260

Specified axis = 1

Numerical data = 131071

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0104 |
| WO3 | 0x0001 |
| WO4 | 0xFFFF |
| WO5 | 0x0001 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

### 4.4.3 Point-related command

Execute this command to assign a point to a parameter or obtain a parameter.

#### ● Assigning a point to a parameter

This command assigns a numerical value to a specified parameter by specifying the parameter number, axis and numerical value.

Point number 1 = Point number 2

#### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0230 |
| WI1 | Not used | 0x0000 |
| WI2 | Point number 1 (Point number at assignment destination) | 0xssss |
| WI3 | Point number 2 (Point number at assignment source) | 0xssss |
| WI4 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify the point number in 16 bits.
Specified range: 0 (= 0x0000) to 29999 (=0x752F)

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to assign a point to the specified point.

Point number 1 = 1

Point number 2 = 100

| Address | Value |
|---|---|
| WI0 | 0x0230 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0064 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Point addition/subtraction

This command adds and subtracts points by specifying point number 1 and point number 2.

Point number 1 = Point number 1 (operator) point number 2

### ■ Command

| Address | Contents | | Value |
|---|---|---|---|
| WI0 | Command code | Addition | 0x0234 |
| | | Subtraction | 0x0235 |
| WI1 | Not used | | 0x0000 |
| WI2 | Point number 1 (Point number at operation destination) | | 0xssss |
| WI3 | Point number 2 (Point number at operation source) | | 0xssss |
| WI4 | Not used | | 0x0000 |
| to | | | |
| WI15 | | | |

ssss : Specify the point number in 16 bits.
Specified range: 0 (= 0x0000) to 29999 (=0x752F)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use the point addition command as shown at right, to add point number 2 to point number 1.

Point number 1 = 1

Point number 2 = 100

| Address | Value |
|---|---|
| WI0 | 0x0234 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0064 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Assigning a pallet point

This command assigns a pallet point to the destination point number by specifying a pallet number and work position number.

Pallet point number = Pallet point (pallet number, work position number)

**NOTE**

- The target pallet must be defined.
- The maximum value of work position number is determined by the target pallet definition.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0238 |
| WI1 | Not used | 0x0000 |
| WI2 | Point number (Point number at assignment destination) | 0xssss |
| WI3 | Pallet number | 0xaaaa |
| WI4 | Work position number | 0xbbbb |
| WI5 | Not used | 0x0000 |
| to | | |
| WI15 | | |

ssss : Specify the point number in 16 bits.
Specified range: 0 (=0x0000) to 29999 (=0x752F)

aaaa : Specify the pallet number in 16 bits.
Specified range: 0 (=0x0000) to 39 (=0x0027)

bbbb : Specify the work position number in 16 bits.
Specified range: 1 (=0x0001) to 32767 (=0x7FFF)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to assign a pallet point to the following point.

Point number = 100

Pallet number = 2

Work position number = 133

| Address | Value |
|---|---|
| WI0 | 0x0238 |
| WI1 | 0x0000 |
| WI2 | 0x0064 |
| WI3 | 0x0002 |
| WI4 | 0x0085 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.4.4 Element assignment command

Execute this command to assign a number to a point or shift element.

### ● Assigning to a point element

This command assigns a numerical value to a point element by specifying the point number, data number and numerical value.

LOC [data number] (point number) = numerical value

**NOTE**

When 1000 is specified in the "pulse" units input format as a numerical value, 1000 is assigned.
When 1000 is specified in the "millimeter" units input format as a numerical value, 1.000 is assigned.
Use the proper input format according to the point data format of the assignment destination.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | | "Pulse" units input format | 0x0240 |
| | | | "Millimeter" units input format | 0x0241 |
| WI1 | Not used | | | 0x0000 |
| WI2 | Point number (Point number at assignment destination) | | | 0xssss |
| WI3 | Data number designation | bit 0 | Data 1 | 0x00tt |
| | | bit 1 | Data 2 | |
| | | bit 2 | Data 3 | |
| | | bit 3 | Data 4 | |
| | | bit 4 | Data 5 | |
| | | bit 5 | Data 6 | |
| | | bit 15 − bit 6 | (0: Fixed) | |
| WI4 | Numerical value | | | 0xbbbbbbbb |
| WI5 | | | | |
| WI6 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

ssss : Specify the point number in 16 bits.
Specified range: 0 (0x0000) to 29999 (=0x752F)

tt : Specify the data number in bit pattern using lower 6 bits.

bbbbbbbb : Specify the integer in 32 bits. (little endian)
Specify data in integers when using "pulse" units input format.
Specify data in integers (x1000) when using "millimeter" units input format.

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to assign a numerical value to part of the following point.

Point number = 1

Data number designation = 4

Numerical value = 1.000

| Address | Value |
|---|---|
| WI0 | 0x0241 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0008 |
| WI4 | 0x03E8 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Assigning to a shift element

This command assigns a numerical value to a shift element by specifying the shift number, data number and numerical value.

LOC [data number] (shift number) = numerical value

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | | | 0x0245 |
| WI1 | Not used | | | 0x0000 |
| WI2 | Shift number (Shift number at assignment destination) | | | 0xssss |
| WI3 | Data number designation | bit 0 | Data 1 | 0x00tt |
| | | bit 1 | Data 2 | |
| | | bit 2 | Data 3 | |
| | | bit 3 | Data 4 | |
| | | bit 15 − bit 4 | (0: Fixed) | |
| WI4 | Numerical value | | | 0xbbbbbbbb |
| WI5 | | | | |
| WI6 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

ssss : Specify the shift number in 16 bits.
Specified range: 0 (0x0000) to 39 (=0x0027)

tt : Specify the data number in bit pattern using lower 4 bits.

bbbbbbbb : Specify the integer (x1000) in 32 bits. (little endian)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to assign a real number value to part of the following shift.

Shift number = 1

Data number designation = 2

Numerical value = 1.000

| Address | Value |
|---|---|
| WI0 | 0x0245 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0002 |
| WI4 | 0x03E8 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.5 Category 4 remote commands

Category 4 remote commands are I/O port commands. A command list is given below.

| No. | Command contents | | | Command code (WI0) |
|---|---|---|---|---|
| 4-1 | I/O port command | Assignment | port units | 0x0300 |
| | | Assignment | bit units | 0x0301 |
| | | Reference | port units | 0x0304 |

## 4.5.1 I/O port commands

Use these commands to assign a value to an I/O port or obtain the contents of a specified I/O port.

### ● Assigning a numerical value to an I/O port

This command assigns a bit pattern to a port number by specifying the destination port number and bit pattern.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | | Port units | 0x0300 |
| | | | Bit units | 0x0301 |
| WI1 | Not used | | | 0x0000 |
| WI2 | Port number | bit 3 − bit 0 | Bit number | g |
| | | bit 7 − bit 4 | Units of port number | r |
| | | bit 11 − bit 8 | Tens of port number | q |
| | | bit 15 − bit 12 | Specified port type | p |
| WI3 | Assignment bit pattern | | | 0x00bb |
| WI4 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

g : Specify the bit number in 4 bits.
Specified range: 0 to 7

r, q : Specify the place of each port number in 4 bits.

p : Specify the port type in 4 bits.
When in port units, specify 0 in the bit number.

| Designated port type | Bit pattern | Specified range of port number |
|---|---|---|
| DO | 0001 | 2 to 7,10 to 17,20 to 27 |
| MO | 0010 | 2 to 7,10 to 17,20 to 27 |
| LO | 0011 | 0 to 1 |
| TO | 0100 | 0 |
| SO | 0110 | 2 to 7,10 to 17,20 to 27 |

bb : Specify the bit pattern in 8 bits.
When in bit units, use 0 or 1 to specify the bit pattern.

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to output a numerical value to the following output port.

Output port = DO12 ()

Numerical data = 7

| Address | Value |
|---|---|
| WI0 | 0x0300 |
| WI1 | 0x0000 |
| WI2 | 0x1120 |
| WI3 | 0x0007 |
| WI4 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| to | |
| WO15 | |

Example:

Use this command as shown at right, to output a numerical value to the following output port.

Output port = DO (21)

Numerical data = 1

| Address | Value |
|---|---|
| WI0 | 0x0301 |
| WI1 | 0x0000 |
| WI2 | 0x1021 |
| WI3 | 0x0001 |
| WI4 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| to | |
| WO15 | |

## ● I/O port reference

Use this command to obtain the contents of a port number by specifying the port number.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | | Port units | 0x0304 |
| WI1 | Not used | | | 0x0000 |
| WI2 | Port number | bit 3 − bit 0 | (0: Fixed) | 0 |
| | | bit 7 − bit 4 | Units of port number | r |
| | | bit 11 − bit 8 | Tens of port number | q |
| | | bit 15 − bit 12 | Specified port type | p |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

r, q : Specify the place of each port number in 4 bits.

p : Specify the port type in 4 bits.

| Designated port type | Bit pattern | Specified range of port number |
|---|---|---|
| DI | 0000 | 0 to 7,10 to 17,20 to 27 |
| DO | 0001 | 0 to 7,10 to 17,20 to 27 |
| MO | 0010 | 0 to 7,10 to 17,20 to 27 |
| LO | 0011 | 0 to 1 |
| TO | 0100 | 0 |
| SI | 0101 | 0 to 7,10 to 17,20 to 27 |
| SO | 0110 | 0 to 7,10 to 17,20 to 27 |

### ■ Status

#### Normal end

| Address | Contents | | | Value |
|---|---|---|---|---|
| WO0 | Status code | | | 0x0200 |
| WO1 | Not used | | | 0x0000 |
| WO2 | Port number | bit 3 − bit 0 | Not used | 0 |
| | | bit 7 − bit 4 | Units of port number | r |
| | | bit 11 − bit 8 | Tens of port number | q |
| | | bit 15 − bit 12 | Specified port type | p |
| WO3 | Bit pattern | | | 0x00bb |
| WO4 | Not used | | | 0x0000 |
| to | | | | |
| WO15 | | | | |

r, q : Shows the place of each port number in 4 bits.

p : Shows the port type in 4 bits.

bb : Shows the bit pattern in 8 bits.
When in bit units, 0 or 1 is used to show the bit pattern.

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to obtain the following port data.

Output port = DO12 ()

| Address | Value |
|---|---|
| WI0 | 0x0304 |
| WI1 | 0x0000 |
| WI2 | 0x1120 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Output port = DO12 ()

Numerical data = 7

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x1120 |
| WO3 | 0x0007 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

Example:

Use this command as shown at right, to output a numerical value to the following port data.

Input port = DI2 ()

| Address | Value |
|---|---|
| WI0 | 0x0304 |
| WI1 | 0x0000 |
| WI2 | 0x0020 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Input port = DI2 ()

Numerical data = 127

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0020 |
| WO3 | 0x007F |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.6 Category 5 remote commands

Category 5 remote commands are program operation setting commands. A command list is given below.

| No. | Command contents | | Command code (WI0) |
|---|---|---|---|
| 5-1 | Execution program designation | | 0x0401 |
| 5-2 | Program execution | Program execution | 0x0402 |
| | | Program step execution | 0x0403 |
| | | Program skip execution | 0x0404 |
| | | Program next execution | 0x0405 |
| 5-3 | Program reset | | 0x0406 |
| 5-4 | Program execution information reference | | 0x0408 |

* Check the robot program running status output signal (SO13) to verify a program execution command has been run.

* Check the program reset status output signal (SO14) to verify the program reset command has been run.

## 4.6.1 Execution program designation

Use this command to register in a task in order to execute a robot program.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | | | 0x0401 |
| WI1 | Command flag | bit 2 – bit 0 | Designation method selection | sss |
| | | bit 15 – bit 3 | (0: Fixed) | 0 |
| WI2 | Program number | | | 0xnnnn |
| WI3 | Registered task number | | | 0xtttt |
| WI4 | Task priority ranking | | | 0xpppp |
| WI5 | Not used | | | 0x00000 |
| WI6 | Program name | | | 0xbbbb |
| to | | | | |
| WI13 | | | | |
| WI14 | Not used | | | 0x0000 |
| WI15 | | | | |

sss : Specify (by 3 bits) the program selection method.

| Value | Meaning |
|---|---|
| 001 | Program number |
| 100 | Program name |
| Other | Designation method error |

nnnn : Specify (by 16 bits) the program number.
1 (=0x0001) to 100 (=0x0064)

tttt : Specifies (by 16 bits) the task number where the program is registered.
If "0" is specified as the task number, the program is registered at the lowest vacant task number.
0 (=0x0000) to 16 (=0x0010)

pppp : Specifies (by 16 bits) the task priority ranking.
1 (=0x0001) to 64 (=0x0040)

bb : Specify the 1-byte program name in 8 bits. (little endian)
Specify a program name with letters (uppercase), numbers and underscores ( _ ).
When the program name is shorter than **16 characters**, use a space.
(For programs with more than 16 characters, a search for the entered character string occurs.
When multiple programs exist with different names subsequent to the 16th character, the lowest of those program numbers is registered.)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to specify program number 1, task number 1, and a priority ranking of 47.

| Address | Value |
|---|---|
| WI0 | 0x0401 |
| WI1 | 0x0001 |
| WI2 | 0x0001 |
| WI3 | 0x0001 |
| WI4 | 0x002F |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.6.2 Program execution

These commands execute robot program operations.

| Command | Meaning |
|---|---|
| Program execution | Starts automatic operation of a robot program. Performs the same processing as the RUN key on the programming box and auto operation start input (SI12). Use the program in-progress status output signal (SO13) to verify the program is in progress. |
| Program step execution | Executes one line in the robot program. Enters the subroutine when a GOSUB statement is used. Performs the same processing as STEP execution which is performed from the programming box. |
| Program skip execution | Skips one line in the program. Performs the same processing as SKIP execution which is performed from the programming box. |
| Program next execution | Executes one line in the robot program. Executes the entire subroutine when a GOSUB statement is used. Performs the same processing as NEXT execution which is performed from the programming box. |

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | Program execution | | 0x0402 |
| | | Program step execution | | 0x0403 |
| | | Program skip execution | | 0x0404 |
| | | Program next execution | | 0x0405 |
| WI1 | Command flag | bit 2 – bit 0 | Designation method selection | sss |
| | | bit 15 – bit 3 | (0: Fixed) | 0 |
| WI2 | Program number | | | 0xnnnn |
| WI3 | Operation task number | | | 0xtttt |
| WI4 | Not used | | | 0x0000 |
| WI5 | | | | |
| WI6 | Program name | | | 0xbbbb |
| to | | | | |
| WI13 | | | | |
| WI14 | Not used | | | 0x0000 |
| WI15 | | | | |

sss : Specify (by 3 bits) the program selection method.

| Value | Meaning |
|---|---|
| 000 | All operation-enabled programs<br>(enabled only when using the program RUN command) |
| 001 | Program number |
| 010 | Operation task number |
| 100 | Program name |
| Other | Designation method error |

nnnn : Specify (by 16 bits) the program number.
1 (=0x0001) to 100 (=0x0064)

tttt : Specifies (by 16 bits) the task number which operates the program.
1 (=0x0001) to 16 (=0x0010)

bb : Specify the 1-byte program name in 8 bits. (little endian)
Specify a program name with letters (uppercase), numbers and underscores ( _ ).
When the program name is shorter than **16 characters**, use a space.
(For programs with more than 16 characters, a search for the entered character string occurs.
When multiple programs exist with different names subsequent to the 16th character, the lowest of those program numbers is registered.)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use these commands to execute Program 1 as Task 1 as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0402 |
| WI1 | 0x0001 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.6.3 Program reset

This command resets the robot program.
Check the program reset status output signal (SO14) to verify all the programs have been reset.
Check the program execution line reference command to see if "1" is indicated there to verify individual programs has been reset.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | | | 0x0406 |
| WI1 | Command flag | bit 2 – bit 0 | Designation method selection | sss |
| | | bit 15 – bit 3 | (0: Fixed) | 0 |
| WI2 | Program number | | | 0xnnnn |
| WI3 | Operation task number | | | 0xtttt |
| WI4 | Not used | | | 0x0000 |
| WI5 | | | | |
| WI6 | Program name | | | 0xbbbb |
| to | | | | |
| WI13 | | | | |
| WI14 | Not used | | | 0x0000 |
| WI15 | | | | |

sss : Specify (by 3 bits) the program selection method.

| Value | Meaning |
|---|---|
| 000 | All operation-enabled programs |
| 001 | Program number |
| 010 | Operation task number |
| 100 | Program name |
| Other | Designation method error |

nnnn : Specify (by 16 bits) the program number.
1 (=0x0001) to 100 (=0x0064)

tttt : Specifies (by 16 bits) the task number which resets the program.
1 (=0x0001) to 16 (=0x0010)

bb : Specify the 1-byte program name in 8 bits. (little endian)
Specify a program name with letters (uppercase), numbers and underscores ( _ ).
When the program name is shorter than **16 characters**, use a space.
(For programs with more than 16 characters, a search for the entered character string occurs.
When multiple programs exist with different names subsequent to the 16th character, the lowest of those program numbers is registered.)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use this command to reset the program named "ABC_DE" as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0406 |
| WI1 | 0x0100 |
| WI2 | 0x0000 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x4241 |
| WI7 | 0x5F43 |
| WI8 | 0x4544 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

### 4.6.4 Program execution information reference

Execute this command to acquire information on program execution, when the robot program is stopped.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | | | 0x0408 |
| WI1 | Command flag | bit 2 – bit 0 | Designation method selection | sss |
| | | bit 15 – bit 3 | (0: Fixed) | 0 |
| WI2 | Program number | | | 0xnnnn |
| WI3 | Operation task number | | | 0xtttt |
| WI4 | Not used | | | 0x0000 |
| WI5 | | | | |
| WI6 | Program name | | | 0xbbbb |
| to | | | | |
| WI13 | | | | |
| WI14 | Not used | | | 0x0000 |
| WI15 | | | | |

sss : Specify (by 3 bits) the program selection method.

| Value | Meaning |
|---|---|
| 001 | Program number |
| 010 | Operation task number |
| 100 | Program name |
| Other | Designation method error |

nnnn : Specify (by 16 bits) the program number.
1 (=0x0001) to 100 (=0x0064)

tttt : Specifies (by 16 bits) the task number.
1 (=0x0001) to 16 (=0x0010)

bb : Specify the 1-byte program name in 8 bits. (little endian)
Specify a program name with letters (uppercase), numbers and underscores ( _ ).
When the program name is shorter than **16 characters**, use a space.
(For programs with more than 16 characters, a search for the entered character string occurs.
When multiple programs exist with different names subsequent to the 16th character, the lowest of those program numbers is registered.)

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Program number | 0xpppp |
| WO3 | Operation task number | 0xtttt |
| WO4 | Execution line number | 0xllll |
| WO5 | Task priority ranking | 0xpppp |
| WO6 | Program name | 0xbbbb |
| to | | |
| WO13 | | |
| WO14 | Not used | 0x0000 |
| WO15 | | |

pppp : Indicates the program number. 1 (=0x0001) to 100 (=0x0064)

tttt : Indicates the operation task number. 1 (=0x0001) to 16 (=0x0010)

llll : Indicates the current program's execution line number (1~). A value + 10000 is shown when COMMON program is running.

pppp : Indicates the current task priority rankings 1 (=0x0001) to 64 (=0x0040).

bb : Shows the 1-byte program name in 8 bits. (little endian).
Program names are shown with letters (uppercase), numbers and underscores ( _ ).
Spaces are used to fill out the last part of program names which have fewer than 16 characters.

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command to acquire program execution information as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0408 |
| WI1 | 0x0001 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| WI6 | 0x0000 |
| WI7 | 0x0000 |
| WI8 | 0x0000 |
| WI9 | 0x0000 |
| WI10 | 0x0000 |
| WI11 | 0x0000 |
| WI12 | 0x0000 |
| WI13 | 0x0000 |
| WI14 | 0x0000 |
| WI15 | 0x0000 |

Values are expressed as shown at right when executed correctly to switch to the following program task.

Program number = 1

Program name= "ABCDEFGH"

Task number = 2

Execution number = 101

Task priority = 32

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0001 |
| WO3 | 0x0002 |
| WO4 | 0x0065 |
| WO5 | 0x0020 |
| WO6 | 0x4241 |
| WO7 | 0x4443 |
| WO8 | 0x4645 |
| WO9 | 0x4847 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.7 Category 6 remote commands

Category 6 remote commands are data handling commands.
A command list is given below.

| No. | Command contents | | Command code (WI0) |
|---|---|---|---|
| 6-1 | Version information reference | | 0x0501 |
| 6-2 | Controller configuration reference | | 0xR502 |
| 6-3 | Servo status reference | | 0xR503 |
| 6-4 | Current position reference | Pulse units | 0xR505 |
| | | Millimeter units | 0xR506 |
| 6-5 | Task status reference | | 0x0507 |
| 6-6 | Task execution reference | | 0x0508 |
| 6-7 | Message reference | | 0x0509 |
| 6-8 | Speed status reference | | 0xR50A |
| 6-9 | Arm designation status reference | | 0xR50B |
| 6-10 | Arch arm status reference | | 0xR50C |
| 6-11 | Return-to-origin status reference | | 0xR50F |
| 6-12 | Current torque value (percentage of max. torque) reference | | 0xR510 |
| 6-13 | In-controller date reference | | 0x0511 |
| 6-14 | In-controller time reference | | 0x0512 |
| 6-15 | Option slot module information referencing | | 0x0513 |
| 6-16 | Inching movement amount referencing | | 0xR514 |
| 6-17 | Remote command latest alarm referencing | | 0x0515 |
| 6-18 | Current torque value (percentage of rated torque) reference | | 0x0516 |

* "R" indicates the number of the robot in question (0~4).

## 4.7.1 Version information reference

This command displays the software version used in the controller.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0501 |
| WI1 | Not used | 0x0000 |
| to | | |
| WI15 | | |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Host software version | 0xaabb |
| WO3 | Host software revision | 0xcccc |
| WO4 | Driver FPGA version | 0xdddd |
| WO5 | Axis-1 driver software version | 0xeeff |
| WO6 | Axis-2 driver software version | 0xeeff |
| WO7 | Axis-3 driver software version | 0xeeff |
| WO8 | Axis-4 driver software version | 0xeeff |
| WO9 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aabb : Shows the controller's host software version in upper 8 bits and lower 8 bits.
cccc : Shows the controller's host softwar revision in 16 bits.
dddd : Indicates (by 16 bits) the driver FPGA version.
eeff : Shows the controller's driver software version in uper 8 bits and lower 8 bits.

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use this command to obtain a software version as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0501 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Host software version : V1.08

Host software revision : R0048

Driver FPGA version : V1.001

Axis-1 driver software version : V1.01

Axis-2 driver software version : V1.01

Axis-3 driver softwre version : V1.01

Axis-4 driver software version : V1.01

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0108 |
| WO3 | 0x0030 |
| WO4 | 0x1001 |
| WO5 | 0x0101 |
| WO6 | 0x0101 |
| WO7 | 0x0101 |
| WO8 | 0x0101 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.7.2 System configuration referencing

This command acquires the configuration of the specified robot.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR502 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Robot number | 0xaaaa |
| WO3 | Not used | 0x0000 |
| WO4 | Axis-1 robot number | 0xaaaa |
| WO5 | Axis-2 robot number | 0xaaaa |
| WO6 | Axis-3 robot number | 0xaaaa |
| WO7 | Axis-4 robot number | 0xaaaa |
| WO8 | Reserved | 0xaaaa |
| WO9 | Reserved | 0xaaaa |
| WO10 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Showsthe robot number.

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use the system configuration reference command as shown at right, to obtain the configuration of the Robot 1.

| Address | Value |
|---|---|
| WI0 | 0x0502 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Robot number : 2000 (R6YXGL250)

Axis-1 robot number : 2000 (R6YXGL250)

Axis-2 robot number : 2000 (R6YXGL250)

Axis-3 robot number : 2000 (R6YXGL250)

Axis-4 robot number : 2000 (R6YXGL250)

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x07D0 |
| WO3 | 0x0000 |
| WO4 | 0x07D0 |
| WO5 | 0x07D0 |
| WO6 | 0x07D0 |
| WO7 | 0x07D0 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

### 4.7.3 Servo status reference

Execute this command to acquire information on servo status.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR503 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Axis-1 information | 0xaaaa |
| WO3 | Axis-2 information | 0xaaaa |
| WO4 | Axis-3 information | 0xaaaa |
| WO5 | Axis-4 information | 0xaaaa |
| WO6 | Reserved | 0xaaaa |
| WO7 | Reserved | 0xaaaa |
| WO8 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Shows the servo status of each axis.

| Value | Contents | |
|---|---|---|
| 0 | Servo OFF + mechanical brake ON | (Brake) |
| 1 | Servo ON | (Servo) |
| 2 | Servo OFF + mechanical brake OFF | (Free) |
| 9 | No axis | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command to acquire a servo status as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0503 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Axis 1 : 1 (Servo ON)

Axis 2 : 1 (Servo ON)

Axis 3 : 2 (Servo Free)

Axis 4 : 1 (Servo ON)

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0001 |
| WO3 | 0x0001 |
| WO4 | 0x0002 |
| WO5 | 0x0001 |
| WO6 | 0x0009 |
| WO7 | 0x0009 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.7.4 Current position reference

### ● Pulse units designation

Use this command to obtain the robot current position data in pulse units.

#### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR505 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Continuous output mode | a |
| | | bit15 – bit 1 | Not used | 0 |
| WI2 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : ENABLES/DISABLES the continuous output mode.

| Value | Meaning |
|---|---|
| 0 | DISABLE |
| 1 | ENABLE |

When enabled, a stop occurs at the status initializing command (=0x0000).

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers.

### Continuous output mode

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0100 |
| WO1 | Not used | 0x0000 |
| WO2 | | |
| WO3 | | |
| WO4 | Axis-1 data | 0xbbbbbbbb |
| WO5 | | |
| WO6 | Axis-2 data | 0xbbbbbbbb |
| WO7 | | |
| WO8 | Axis-3 data | 0xbbbbbbbb |
| WO9 | | |
| WO10 | Axis-4 data | 0xbbbbbbbb |
| WO11 | | |
| WO12 | Reserved | 0xbbbbbbbb |
| WO13 | | |
| WO14 | Reserved | 0xbbbbbbbb |
| WO15 | | |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers.

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to obtain the Robot 1 current position data in pulse units designation.

| Address | Value |
|---|---|
| WI0 | 0x0505 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Axis 1 = 20001

Axis 3 = -12345

Other axes = 0

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x4E21 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0xCFC7 |
| WO9 | 0xFFFF |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## ● Millimeter units designation

Use this command to obtain the robot current position data in millimeter units.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR506 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Command flag | bit 0 | Continuous output mode | a |
| | | bit 15 – bit 1 | Not used | 0 |
| WI2 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

a : ENABLES/DISABLES the continuous output mode.

| Value | Meaning |
|---|---|
| 0 | DISABLE |
| 1 | ENABLE |

When enabled, a stop occurs at the status initializing command (=0x0000).

### ■ Status

#### Normal end

| Address | Contents | | | Value |
|---|---|---|---|---|
| WO0 | Status code | | | 0x0200 |
| WO1 | Not used | | | 0x0000 |
| WO2 | | | | |
| WO3 | Point flag | bit 0 | Not used | 0 |
| | | bit 2 − bit 1 | Hand system | tt |
| | | bit 6 − bit 3 | Reserved | xr |
| | | bit 10 − bit 7 | Reserved | yr |
| | | bit 15 − bit 11 | Not used | 0 |
| WO4 | Axis-1 data | | | 0xbbbbbbbb |
| WO5 | | | | |
| WO6 | Axis-2 data | | | 0xbbbbbbbb |
| WO7 | | | | |
| WO8 | Axis-3 data | | | 0xbbbbbbbb |
| WO9 | | | | |
| WO10 | Axis-4 data | | | 0xbbbbbbbb |
| WO11 | | | | |
| WO12 | Reserved | | | 0xbbbbbbbb |
| WO13 | | | | |
| WO14 | Reserved | | | 0xbbbbbbbb |
| WO15 | | | | |

tt : Shows in 2 bits the hand system.

| Value | Meaning |
|---|---|
| 01 | Right-handed is specified. |
| 10 | Left-handed is specified. |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers (x1000).

### Continuous output mode

| Address | Contents | | | Value |
|---|---|---|---|---|
| WO0 | Status code | | | 0x0100 |
| WO1 | Not used | | | 0x0000 |
| WO2 | | | | |
| WO3 | Point flag | bit 0 | Not used | 0 |
| | | bit 2 − bit 1 | Hand system | tt |
| | | bit 6 − bit 3 | Reserved | xr |
| | | bit 10 − bit 7 | Reserved | yr |
| | | bit 15 − bit 11 | Not used | 0 |
| WO4 | Axis-1 data | | | 0xbbbbbbbb |
| WO5 | | | | |
| WO6 | Axis-2 data | | | 0xbbbbbbbb |
| WO7 | | | | |
| WO8 | Axis-3 data | | | 0xbbbbbbbb |
| WO9 | | | | |
| WO10 | Axis-4 data | | | 0xbbbbbbbb |
| WO11 | | | | |
| WO12 | Reserved | | | 0xbbbbbbbb |
| WO13 | | | | |
| WO14 | Reserved | | | 0xbbbbbbbb |
| WO15 | | | | |

tt : Shows in 2 bits the hand system.

| Value | Meaning |
|---|---|
| 01 | Right-handed is specified. |
| 10 | Left-handed is specified. |

bbbbbbbb : Shows the current position output data in 32 bits. (little endian)
Data is shown in integers (x1000).

### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to obtain the Robot 1 current position data in millimeter units.

| Address | Value |
|---|---|
| WI0 | 0x0506 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly to obtain the following positions in millimeter units.

Axis 1 = 20.001

Axis 3 = -12.345

Other axes = 0.000

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0001 |
| WO4 | 0x4E21 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0xCFC7 |
| WO9 | 0xFFFF |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.7.5 Task status reference

Execute this command to acquire task execution status.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0507 |
| WI1 | Not used | 0x0000 |
| WI2 | Status acquisition task range designation | 0xaaaa |
| WI3 | Not used | 0x0000 |
| to | | |
| WI15 | | |

aaaa : Specifies the status acquisition task range.

| Value | Meaning |
|---|---|
| 0 | Tasks 1 to 8 |
| 1 | Tasks 9 to 16 |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Execution status of task 1 (9) | 0xaaaa |
| WO3 | Execution status of task 2 (10) | 0xaaaa |
| WO4 | Execution status of task 3 (11) | 0xaaaa |
| WO5 | Execution status of task 4 (12) | 0xaaaa |
| WO6 | Execution status of task 5 (13) | 0xaaaa |
| WO7 | Execution status of task 6 (14) | 0xaaaa |
| WO8 | Execution status of task 7 (15) | 0xaaaa |
| WO9 | Execution status of task 8 (16) | 0xaaaa |
| WO10 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Shows the execution status of each task.

| Value | Meaning |
|---|---|
| 0 | Stop status |
| 1 | Execution status |
| 2 | Suspend status |
| 3 | Standby status |
| 9 | No task |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to obtain the execution status of tasks 1~8.

| Address | Value |
|---|---|
| WI0 | 0x0507 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Task 1 : 1 (Execution status)

Task 2 : 1 (Execution status)

Task 3 : 9 (no task)

Task 4 : 9 (no task)

Task 5 : 2 (Suspend status)

Task 6 : 9 (no task)

Task 7 : 9 (no task)

Task 8 : 9 (no task)

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0001 |
| WO3 | 0x0001 |
| WO4 | 0x0009 |
| WO5 | 0x0009 |
| WO6 | 0x0002 |
| WO7 | 0x0009 |
| WO8 | 0x0009 |
| WO9 | 0x0009 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.7.6 Task execution line reference

Execute this command to acquire information on task execution line.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0508 |
| WI1 | Not used | 0x0000 |
| WI2 | Execution line acquisition task range designation | 0xaaaa |
| WI3 | Not used | 0x0000 |
| to | | |
| WI15 | | |

aaaa : Specifies the status acquisition task range.

| Value | Meaning |
|---|---|
| 0 | Tasks 1 to 8 |
| 1 | Tasks 9 to 16 |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Execution line of task 1 (9) | 0xaaaa |
| WO3 | Execution line of task 2 (10) | 0xaaaa |
| WO4 | Execution line of task 3 (11) | 0xaaaa |
| WO5 | Execution line of task 4 (12) | 0xaaaa |
| WO6 | Execution line of task 5 (13) | 0xaaaa |
| WO7 | Execution line of task 6 (14) | 0xaaaa |
| WO8 | Execution line of task 7 (15) | 0xaaaa |
| WO9 | Execution line of task 8 (16) | 0xaaaa |
| WO10 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Shows the execution line of each task.
When no task exists, the value is 0.

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to obtain the execution lines of tasks 1~8.

| Address | Value |
|---|---|
| WI0 | 0x0508 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Task 1 : Execution on first line

Task 2 : Execution on 19th line

Task 3 : no task

Task 4 : no task

Task 5 : Execution on 99th line

Task 6 : no task

Task 7 : no task

Task 8 : no task

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0001 |
| WO3 | 0x0013 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0063 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| WO9 | 0x0000 |
| WO10 | 0x0000 |
| WO11 | 0x0000 |
| WO12 | 0x0000 |
| WO13 | 0x0000 |
| WO14 | 0x0000 |
| WO15 | 0x0000 |

## 4.7.7 Message reference

Execute this command to acquire alarm message information.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0509 |
| WI1 | Not used | 0x0000 |
| WI2 | Alarm acquisition number | 0xaaaa |
| WI3 | Not used | 0x0000 |
| to | | |
| WI15 | | |

aaaa : Specifies the alarm acquisition number.

| Value | Contents |
|---|---|
| 1 to 500 | Message number saved in the alarm history |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Additional information 1 | 0xccdd |
| WO4 | Additional information 2 | 0xeeff |
| WO5 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

ccdd : Indicates additional information 1 for the alarm occurrence location.

| cc: Category No. | Contents |
|---|---|
| 00 | Robot ID |
| 01 | Controller ID |
| 02 | Task number |

| dd: number | Contents |
|---|---|
| 00 | No type (for task No. only) |
| From 01 | Robot No. or controller No. |

eeff : Indicates additional information 2 for the alarm occurrence location.

| ee: Category No. | Contents |
|---|---|
| 00 | All robots or all controllers |
| 01 | Axis number ID |
| 02 | Motor number ID |
| 03 | Option slot number ID |
| 04 | Program task number ID |

| ff : number | Contents |
|---|---|
| 00 | No number |
| From 01 | One of the following numbers is used:<br>Motor number, axis number, option slot number, program task number |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to acquire the 10th message in the alarm history.

| Address | Value |
|---|---|
| WI0 | 0x0509 |
| WI1 | 0x0000 |
| WI2 | 0x000A |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.
(12.551: C1O1 EtherNet/IP link error)

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x000C |
| WO2 | 0x0227 |
| WO3 | 0x0101 |
| WO4 | 0x0301 |
| WO5 | 0x0000 |
| to | |
| WO15 | |

## 4.7.8 Speed status reference

Execute this command to acquire information on current speed status.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR50A |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

### ■ Status

#### Normal end

| Address | Contents | | Value |
|---|---|---|---|
| WO0 | Status code | | 0x0200 |
| WO1 | Not used | | 0x0000 |
| WO2 | Speed of specified robot | AUTO mode speed | 0xaaaa |
| WO3 | | MANUAL mode speed | 0xaaaa |
| WO4 | | Program movement speed | 0xaaaa |
| WO5 | Not used | | 0x0000 |
| to | | | |
| WO15 | | | |

aaaa : Shows the speed setting (1 to 100).
Shows "0" when no robot axis is specified.

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use the speed status reference command as shown at right, to acquire the speed status of the Robot 1.

| Address | Value |
|---|---|
| WI0 | 0x050A |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Robot 1's auto movement speed : 50%
Robot 1's manual movement speed : 50%
Robot 1's program movement speed : 50%

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0032 |
| WO3 | 0x0032 |
| WO4 | 0x0032 |
| WO5 | 0x0000 |
| to | |
| WO15 | |

## 4.7.9 Arm designation status reference

Execute this command to acquire information on currently designated arm.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR50B |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Status of specified robot | 0xaaaa |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Shows the arm designation status.
Shows "0" when no robot axis is specified.

| Value | Meaning |
|---|---|
| 0 | Right-handed system status |
| 1 | Left-handed system status |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to acquire the status of Robot 1's currently specified arm.

| Address | Value |
|---|---|
| WI0 | 0x050B |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Robot 1 : 1 (Left-handed system status)

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0001 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.7.10 Arm status reference

Execute this command to acquire information on arm.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR50C |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Main robot status | 0xaaaa |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Shows the arm designation status.
Shows "0" when no robot axis is specified.

| Value | Meaning |
|---|---|
| 0 | Right-handed system status |
| 1 | Left-handed system status |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command as shown at right, to acquire the status of arm.

| Address | Value |
|---|---|
| WI0 | 0x050C |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Robot 1 : 1 (Left-handed system status)

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0001 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.7.11 Return-to-origin status reference

Execute this command to acquire information on the return-to-origin status.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR50F |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Motor type designation | | bit 2 – bit 0 | mmm |
| | | | bit 15 – bit 3 | 0 |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), the return-to-origin status is acquired for the entire system.

mmm : Specifies the motor type.
This command is enabled only when the robot number is other than "0".

| Bit Pattern | Corresponding Axis |
|---|---|
| 001 | Incremental type axis |
| 010 | Absolute type axis |
| Other than shown above | All axis types |

### ■ Status

#### Normal end (When the robot designation is "0")

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Entire system's return-to-origin status | 0xaaaa |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Show the return-to-origin status for the entire system.

| Value | Meaning |
|---|---|
| 0 | Return-to-origin incomplete |
| 1 | Return-to-origin complete |

#### Normal end (When the robot designation is "0")

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Axis-1 information | 0xaaaa |
| WO3 | Axis-2 information | 0xaaaa |
| WO4 | Axis-3 information | 0xaaaa |
| WO5 | Axis-4 information | 0xaaaa |
| WO6 | Reserved | 0xaaaa |
| WO7 | Reserved | 0xaaaa |
| WO8 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Shows the return-to-origin status of each axis.

| Value | Meaning |
|---|---|
| 0 | Return-to-origin incomplete |
| 1 | Return-to-origin complete |
| 9 | Not applicable |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command to obtain the return-to-origin status of all the Robot 1 axes as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x150F |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Axis 1 : 1 (Return-to-origin complete)

Axis 2 : 1 (Return-to-origin complete)

Axis 3 : 0 (Return-to-origin incomplete)

Axis 4 : 1 (Return-to-origin complete)

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0001 |
| WO3 | 0x0001 |
| WO4 | 0x0000 |
| WO5 | 0x0001 |
| WO6 | 0x0009 |
| WO7 | 0x0009 |
| WO8 | 0x0000 |
| to | |
| WO15 | |

## 4.7.12 Current torque value (percentage of max. torque) reference

This command is used to obtain the current torque value of the specified axis relative to its maximum torque value.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR510 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Axis for which the current torque value is obtained | bit 0 | Axis 1 | tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

tt : The axis to be referenced is specified from bits 0 to 5.
If not specified, the information is acquired for all axes.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Axis 1 current torque value | 0xaaaa |
| WO3 | Axis 2 current torque value | 0xaaaa |
| WO4 | Axis 3 current torque value | 0xaaaa |
| WO5 | Axis 4 current torque value | 0xaaaa |
| WO6 | Reserved | 0xaaaa |
| WO7 | Reserved | 0xaaaa |
| WO8 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the current torque value (-100 to 100).
The value is "0" for axes which are not connected.
The value represents the ratio of the current torque value to the maximum torque value. Plus/minus signs indicate the direction.

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify a command as shown at right to use the current torque value (percentage of max. torque) acquisition command to obtain the current torque value for Axis No.3 of Robot 1.

| Address | Value |
|---|---|
| WI0 | 0x0510 |
| WI1 | 0x0000 |
| WI2 | 0x0004 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Robot 1, Axis 3: 20

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0014 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| to | |
| WO15 | |

## 4.7.13 In-controller date reference

Execute this command to acquire the date inside the controller.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0511 |
| WI1 | Not used | 0x0000 |
| to | | |
| WI15 | | |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Date (Year) | 0xyyyy |
| WO3 | Date (Month) | 0xmmmm |
| WO4 | Date (Day) | 0xdddd |
| WO5 | Not used | 0x0000 |
| to | | |
| WO15 | | |

yyyy : Shows the year. (Lower two digits of Christian year) 0 (=0x00) to 63 (=0x99)
mmmm : Shows the month. 1 (=0x01) to 12 (=0x0C)
dddd : Shows the day. 1 (=0x01) to 31 (=0x1F)

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use this command to obtain the controller's internal date as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0511 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Date (Year) : 14
Date (Month) : 1
Date (Day) : 1

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x000E |
| WO3 | 0x0001 |
| WO4 | 0x0001 |
| WO5 | 0x0000 |
| to | |
| WO15 | |

## 4.7.14 In-controller time reference

Execute this command to acquire the time inside the controller.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0512 |
| WI1 | Not used | 0x0000 |
| to | | |
| WI15 | | |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Time (Hour) | 0xhhhh |
| WO3 | Time (Minute) | 0xmmmm |
| WO4 | Time (Second) | 0xssss |
| WO5 | Not used | 0x0000 |
| to | | |
| WO15 | | |

hhhh : Shows the hour. 0 (=0x00) to 23 (=0x17)

mmmm : Shows the minute. 0 (=0x00) to 59 (=0x3B)

ssss : Shows the second. 0 (=0x00) to 59 (=0x3B)

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command to obtain the controller's internal time as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0512 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Time (Hour) : 10

Time (Minute) : 59

Time (Second) : 59

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x000A |
| WO3 | 0x003B |
| WO4 | 0x003B |
| WO5 | 0x0000 |
| to | |
| WO15 | |

## 4.7.15 Option slot module information referencing

Execute this command to acquire module information in the controller's optional slot.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0513 |
| WI1 | Not used | 0x0000 |
| WI2 | Controller designation | 0xaaaa |
| WI3 | Not used | 0x0000 |
| to | | |
| WI15 | | |

aaaa : Specifies the No. of the controller which is to acquire information.

| Value | Meaning |
|---|---|
| 1 to 4 | Controller No. |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Unit number of option slot No. 1 | 0xaaaa |
| WO3 | Unit number of option slot No. 2 | 0xaaaa |
| WO4 | Unit number of option slot No. 3 | 0xaaaa |
| WO5 | Unit number of option slot No. 4 | 0xaaaa |
| WO6 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the option slot's module number.

| Value | Meaning |
|---|---|
| 0x0000 | None |
| 0x0100 | DIO unit (NPN specs. dedicated input) |
| 0x0101 | DIO unit (NPN specs. general-purpose input) |
| 0x0200 | DIO unit (PNP specs. dedicated input) |
| 0x0201 | DIO unit (PNP specs. general-purpose input) |
| 0x0301 | PROFIBUS unit |
| 0x0400 | DeviceNet unit |
| 0x0401 | EtherNet/IP unit |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command to obtain information regarding the option slot module at Controller 1 as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0513 |
| WI1 | 0x0000 |
| WI2 | 0x0001 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Option slot 1 : 0x0401
(EtherNet/IP unit)

Option slot 2 : 0x0101
(DIO unit (NPN specs. general-purpose input)

Option slot 3 : 0x0000 (None)

Option slot 4 : 0x0000 (None)

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0401 |
| WO3 | 0x0101 |
| WO4 | 0x0000 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| to | |
| WO15 | |

## 4.7.16 Inching movement amount referencing

Execute this command to acquire the movement amount during inching movement operations.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR514 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Inching movement | 0xdddd |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

dddd : Indicates the movement amount. 1 (=0x0001) to 10000 (=0x2710)

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command to obtain the inching movement amount of the Robot 1 as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0514 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Robot 1 inching movement amount: 100

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0064 |
| WO3 | 0x0000 |
| to | |
| WO15 | |

## 4.7.17 Remote command latest alarm referencing

This command refers the most recent alarm information which occurred during remote command execution.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0515 |
| WI1 | Not used | 0x0000 |
| to | | |
| WI15 | | |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Additional information 1 | 0xccdd |
| WO4 | Additional information 2 | 0xeeff |
| WO5 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

ccdd : Indicates additional information 1 for the alarm occurrence location.

| cc: Category No. | Contents |
|---|---|
| 00 | Robot ID |
| 01 | Controller ID |
| 02 | Task number |

| dd: number | Contents |
|---|---|
| 00 | No type (for task No. only) |
| From 01 | Robot No. or controller No. |

eeff : Indicates additional information 2 for the alarm occurrence location.

| ee: Category No. | Contents |
|---|---|
| 00 | All robots or all controllers |
| 01 | Axis number ID |
| 02 | Motor number ID |
| 03 | Option slot number ID |
| 04 | Program task number ID |

| ff : number | Contents |
|---|---|
| 00 | No number |
| From 01 | One of the following numbers is used:<br>Motor number, axis number, option slot number, program task number |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command to obtain the latest alarm as shown at right.

| Address | Value |
|---|---|
| WI0 | 0x0515 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

(2:334 : R1A1 : Over soft limit)

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0002 |
| WO2 | 0x014E |
| WO3 | 0x0001 |
| WO4 | 0x0101 |
| WO5 | 0x0000 |
| to | |
| WO15 | |

## 4.7.18 Current torque value (percentage of rated torque) reference

This command is used to obtain the current torque value of the specified axis relative to its rated torque value.

### ■ Command

| Address | Contents | | | Value |
|---|---|---|---|---|
| WI0 | Command code | bit 11 – bit 0 | | 0xR516 |
| | Robot designation | bit 15 – bit 12 | Robot number | |
| WI1 | Not used | | | 0x0000 |
| WI2 | Axis for which the current torque value is obtained | bit 0 | Axis 1 | tt |
| | | bit 1 | Axis 2 | |
| | | bit 2 | Axis 3 | |
| | | bit 3 | Axis 4 | |
| | | bit 4 | Reserved | |
| | | bit 5 | Reserved | |
| | | bit 15 – bit 6 | (0: Fixed) | |
| WI3 | Not used | | | 0x0000 |
| to | | | | |
| WI15 | | | | |

R : Designates the robot number (0~4).
If "0" is set (no robot number designated), Robot 1 will be selected.

tt : The axis to be referenced is specified from bits 0 to 5.
If not specified, the information is acquired for all axes.

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| WO2 | Axis 1 current torque value | 0xaaaa |
| WO3 | Axis 2 current torque value | 0xaaaa |
| WO4 | Axis 3 current torque value | 0xaaaa |
| WO5 | Axis 4 current torque value | 0xaaaa |
| WO6 | Reserved | 0xaaaa |
| WO7 | Reserved | 0xaaaa |
| WO8 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the current torque value (-1000 to 1000).
The value is "0" for axes which are not connected.
The value represents the ratio of the current torque value to the rated torque value. Plus/minus signs indicate the direction.

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Specify a command as shown at right to use the current torque value (percentage of rated torque) acquisition command to obtain the current torque value for Axis No.3 of Robot 1.

| Address | Value |
|---|---|
| WI0 | 0x0516 |
| WI1 | 0x0000 |
| WI2 | 0x0004 |
| WI3 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

Robot 1, Axis 3: 100

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0064 |
| WO5 | 0x0000 |
| WO6 | 0x0000 |
| WO7 | 0x0000 |
| WO8 | 0x0000 |
| to | |
| WO15 | |

## 4.8 Category 7 remote commands

Category 7 remote commands are used to set the utility mode.
A command list is given below.

| No. | Command contents | Command code (WI0) |
|---|---|---|
| 7-1 | In-controller date setting operation | 0x0602 |
| 7-2 | In-controller time setting operation | 0x0603 |
| 7-3 | Alarm reset command | 0x0604 |

### 4.8.1 In-controller date setting operation

This command sets the date inside the controller.

#### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0602 |
| WI1 | Not used | 0x0000 |
| WI2 | Date setting (year) | 0xyyyy |
| WI3 | Date setting (month) | 0xmmmm |
| WI4 | Date setting (day) | 0xdddd |
| WI5 | Not used | 0x0000 |
| to | | |
| WI15 | | |

yyyy : Shows the year. (Lower two digits of Christian year) 0 (=0x00) to 63 (=0x99)
mmmm : Shows the month. 1 (=0x01) to 12 (=0x0C)
dddd : Shows the day. 1 (=0x01) to 31 (=0x1F)

#### ■ Status

**Normal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

**Abnormal end**

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use this command to set the controller's internal date as shown below.

Date (Year) : 14

Date (Month) : 2

Date (Day) : 2

| Address | Value |
|---|---|
| WI0 | 0x0602 |
| WI1 | 0x0000 |
| WI2 | 0x000E |
| WI3 | 0x0002 |
| WI4 | 0x0002 |
| WI5 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.8.2 In-controller time setting operation

This command sets the time inside the controller.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0603 |
| WI1 | Not used | 0x0000 |
| WI2 | Time setting (hour) | 0xhhhh |
| WI3 | Time setting (minute) | 0xmmmm |
| WI4 | Time setting (second) | 0xssss |
| WI5 | Not used | 0x0000 |
| to | | |
| WI15 | | |

hhhh : Shows the hour. 0 (=0x00) to 23 (=0x17)
mmmm : Shows the minute. 0 (=0x00) to 59 (=0x3B)
ssss : Shows the second. 0 (=0x00) to 59 (=0x3B)

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number
bbbb : Indicates the alarm category number

Example:

Use this command to set the controller's internal time as shown below.

Time (Hour) : 8
Time (Minute) : 45
Time (Second) : 0

| Address | Value |
|---|---|
| WI0 | 0x0603 |
| WI1 | 0x0000 |
| WI2 | 0x0008 |
| WI3 | 0x002D |
| WI4 | 0x0000 |
| WI5 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

## 4.8.3 Alarm reset command

This command resets the controller's internal alarm.

### ■ Command

| Address | Contents | Value |
|---|---|---|
| WI0 | Command code | 0x0604 |
| WI1 | Not used | 0x0000 |
| to | | |
| WI15 | | |

### ■ Status

#### Normal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x0200 |
| WO1 | Not used | 0x0000 |
| to | | |
| WO15 | | |

#### Abnormal end

| Address | Contents | Value |
|---|---|---|
| WO0 | Status code | 0x4000 |
| WO1 | Alarm group number | 0xaaaa |
| WO2 | Alarm category number | 0xbbbb |
| WO3 | Not used | 0x0000 |
| to | | |
| WO15 | | |

aaaa : Indicates the alarm group number

bbbb : Indicates the alarm category number

Example:

Use this command to reset the controller's internal alarm as shown at right.

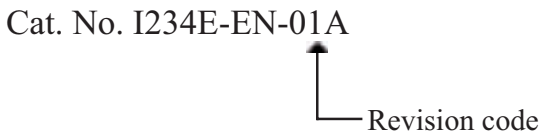
| Address | Value |
|---|---|
| WI0 | 0x0604 |
| WI1 | 0x0000 |
| to | |
| WI15 | |

Values are expressed as shown at right when executed correctly.

| Address | Value |
|---|---|
| WO0 | 0x0200 |
| WO1 | 0x0000 |
| WO2 | 0x0000 |
| WO3 | 0x0000 |
| WO4 | 0x0000 |
| to | |
| WO15 | |

**Revision history**

A manual revision code appears as a suffix to the catalog number on the front cover manual.




The following table outlines the changes made to the manual during each revision.

| Revision code | Date | Description |
|---|---|---|
| 01 | May 2016 | First edition |
| 01A | April 2020 | The WEIGHTG command was added to the 'Parameter-related command' section |

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