

SCARA Robots YRCX Series

YRCX Remote I/O

**DeviceNet
EtherNet/IP
PROFIBUS
PROFINET**

USER'S MANUAL

OMRON

Important information before reading this manual

Introduction	i
Safety Precautions (Always read before starting use)	ii
Warranty	iv

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

1. Profile	1-1
2. Details of input/output signals	1-5
3. Dedicated input/output signal timing chart	1-8
3.1 Servo ON and emergency stop	1-8
3.2 AUTO mode changeover, program reset and program execution	1-9
3.3 Stopping operation by a program stop	1-10

Chapter 2 Remote command

1. Remote command format	2-1
1.1 Remote command specifications	2-1
1.2 Remote status description	2-3
2. Sending and receiving remote commands	2-4
3. Remote command & remote status tables	2-5
4. Remote command description	2-10
4.1 Status reset command	2-10
4.2 Category 1 remote commands	2-11
4.2.1 MOVE command	2-12
PTP designation	2-12
Arch designation	2-15
Linear interpolation	2-18
Circular interpolation	2-21
Direct PTP designation (millimeter units)	2-24
Direct PTP designation (pulse units)	2-27
4.2.2 MOVEI command	2-30
PTP designation	2-30
Linear interpolation	2-33
Direct PTP designation (millimeter units)	2-36
Direct PTP designation (pulse units)	2-39

CONTENTS

YRCX Remote I/O
User's Manual

4.2.3	DRIVE command	2-42
	Point designation	2-42
	Direct designation (millimeter units)	2-45
	Direct designation (pulse units)	2-48
4.2.4	DRIVEI command	2-51
	Point designation	2-51
	Direct designation (millimeter units)	2-54
	Direct designation (pulse units)	2-57
4.2.5	Pallet movement command	2-60
	PTP designation	2-60
	Arch designation	2-63
4.2.6	Jog movement command	2-66
	Pulse unit system jog movement	2-66
	Cartesian coordinate system jog movement	2-69
	Tool coordinate system jog movement	2-72
4.2.7	Inching movement command	2-75
	Pulse unit system inching movement	2-75
	Cartesian coordinate system inching movement	2-78
	Tool coordinate system inching movement	2-81
4.2.8	Inching movement amount setting command	2-84
4.2.9	Point teaching command	2-85
4.2.10	Absolute reset movement command	2-87
4.2.11	Absolute reset command	2-89
4.2.12	Return-to-origin command	2-91
	Return-to-origin in robot units	2-91
	Return-to-origin in axis units	2-93
4.2.13	Servo command	2-95
4.2.14	Manual movement speed change command	2-97
4.2.15	Automatic movement speed change command	2-98
4.2.16	Program movement speed change command	2-99
4.2.17	Shift designation change command	2-100
4.2.18	Hand designation change command	2-101
4.2.19	Arm designation change command	2-102
4.2.20	Motor power command	2-103
4.2.21	MOVET movement command	2-104
	PTP point designation	2-104
	Linear interpolation	2-107
4.2.22	Torque control command information	2-110
	Max. torque command value change command	2-110
4.2.23	PUSH operation command	2-112
	Point designation	2-112
	Direct designation (millimeter units)	2-115

Direct designation (pulse units)	2-118
4.3 Category 2 remote commands	2-121
4.3.1 Point-related command	2-122
Point data definition	2-122
Point data reference	2-124
4.3.2 Point comment-related command	2-126
Point comment data definition	2-126
Point comment data reference	2-128
4.3.3 Pallet-related command	2-130
Pallet data definition	2-130
Pallet data reference	2-131
4.3.4 Shift-related command	2-133
Shift data definition	2-133
Shift data reference	2-135
4.3.5 Hand-related command	2-137
Hand data definition	2-137
Hand data reference	2-139
4.4 Category 3 remote commands	2-141
4.4.1 Static variable-related command	2-142
Assigning a numerical value to a static variable	2-142
Assigning a variable to a static variable	2-144
Arithmetic operation using numerical data on static variable	2-146
Arithmetic operation using variable on static variable	2-148
Static variable value reference	2-150
4.4.2 Parameter-related command	2-152
Assigning a value to a parameter	2-152
Parameter value reference	2-154
4.4.3 Point-related command	2-157
Assigning a point to a parameter	2-157
Point addition/subtraction	2-159
Assigning a pallet point	2-161
4.4.4 Element assignment command	2-163
Assigning to a point element	2-163
Assigning to a shift element	2-165
4.5 Category 4 remote commands	2-167
4.5.1 I/O port commands	2-168
Assigning a numerical value to an I/O port	2-168
I/O port reference	2-170
4.6 Category 5 remote commands	2-172
4.6.1 Execution program designation	2-173
4.6.2 Program execution	2-175
4.6.3 Program reset	2-177

CONTENTS

YRCX Remote I/O
User's Manual

4.6.4	Program execution information reference	2-179
4.7	Category 6 remote commands	2-181
4.7.1	Version information reference	2-182
4.7.2	System configuration referencing	2-184
4.7.3	Servo status reference	2-186
4.7.4	Current position reference	2-188
	Pulse units designation	2-188
	Millimeter units designation	2-190
4.7.5	Task status reference	2-193
4.7.6	Task execution line reference	2-195
4.7.7	Message reference	2-197
4.7.8	Speed status reference	2-199
4.7.9	Arm designation status reference	2-200
4.7.10	Arm status reference	2-201
4.7.11	Return-to-origin status reference	2-202
4.7.12	Current torque value (percentage of max. torque) reference	2-204
4.7.13	In-controller date reference	2-206
4.7.14	In-controller time reference	2-207
4.7.15	Option slot module information referencing	2-208
4.7.16	Inching movement amount referencing	2-210
4.7.17	Remote command latest alarm referencing	2-211
4.7.18	Current torque value (percentage of rated torque) reference	2-213
4.8	Category 7 remote commands	2-215
4.8.1	In-controller date setting operation	2-215
4.8.2	In-controller time setting operation	2-217
4.8.3	Alarm reset command	2-218

Important information before reading this manual

Introduction	i
Safety Precautions (Always read before starting use)	ii
Warranty	iv

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 REQUIREMENTS 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 INAPPROPRIATE MODIFICATION OR REPAIR.

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

1. Profile	1-1
2. Details of input/output signals	1-5
3. Dedicated input/output signal timing chart	1-8
3.1 Servo ON and emergency stop	1-8
3.2 AUTO mode changeover, program reset and program execution	1-9
3.3 Stopping operation by a program stop	1-10

1. Profile

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. Switches OFF when a serious robot controller error occurs.
SO(10)	AUTO mode status output	Turns ON when the AUTO mode is selected. 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. 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. 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. 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. 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. 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. The robot program is executed when this signal is switched from OFF to ON.
SI(14)	Return-to-origin input (incremental type axis)	This signal is intended for axes whose return-to-origin method is the sensor or stroke end method. 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. 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. 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 (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. - When set at "ABS"; 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. - When set at "ABS/ORG"; When there is only an absolute type axis, the return-to-origin is performed for the absolute type axis. The return-to-origin occurs when this signal is switched from OFF to ON. 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. 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
WI1		SIW(1)	Used as the remote command area.
WI2	SID(2)	SIW(2)	General-purpose input
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)	
			Used as the command data area of the remote command.

**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
WO1		SOW(1)	Used as the status area of the remote command.
WO2	SOD(2)	SOW(2)	General-purpose output
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)	
			Used as the error code area of the remote command.
			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.

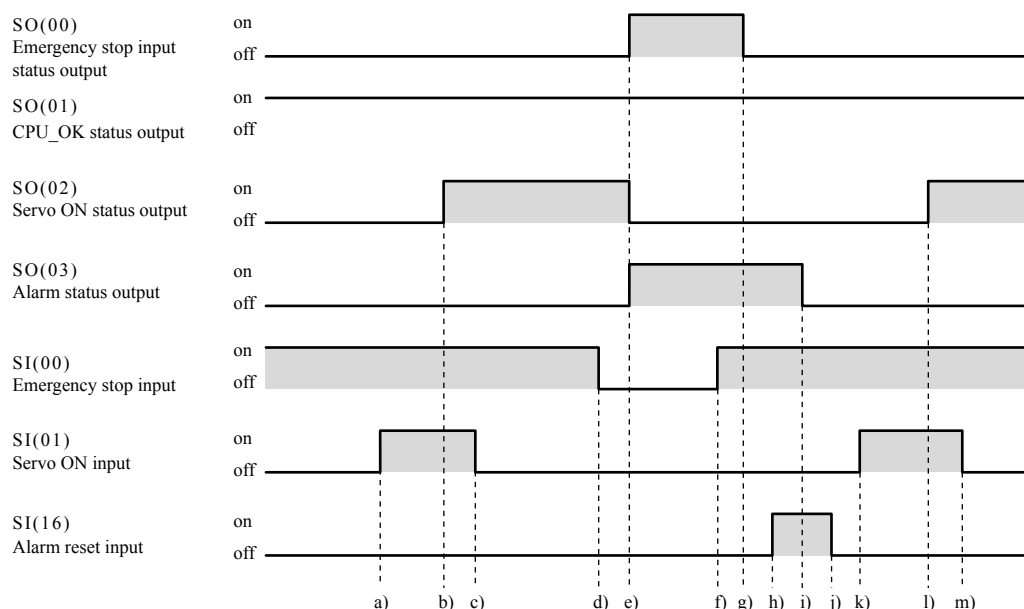
**CAUTION**

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

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

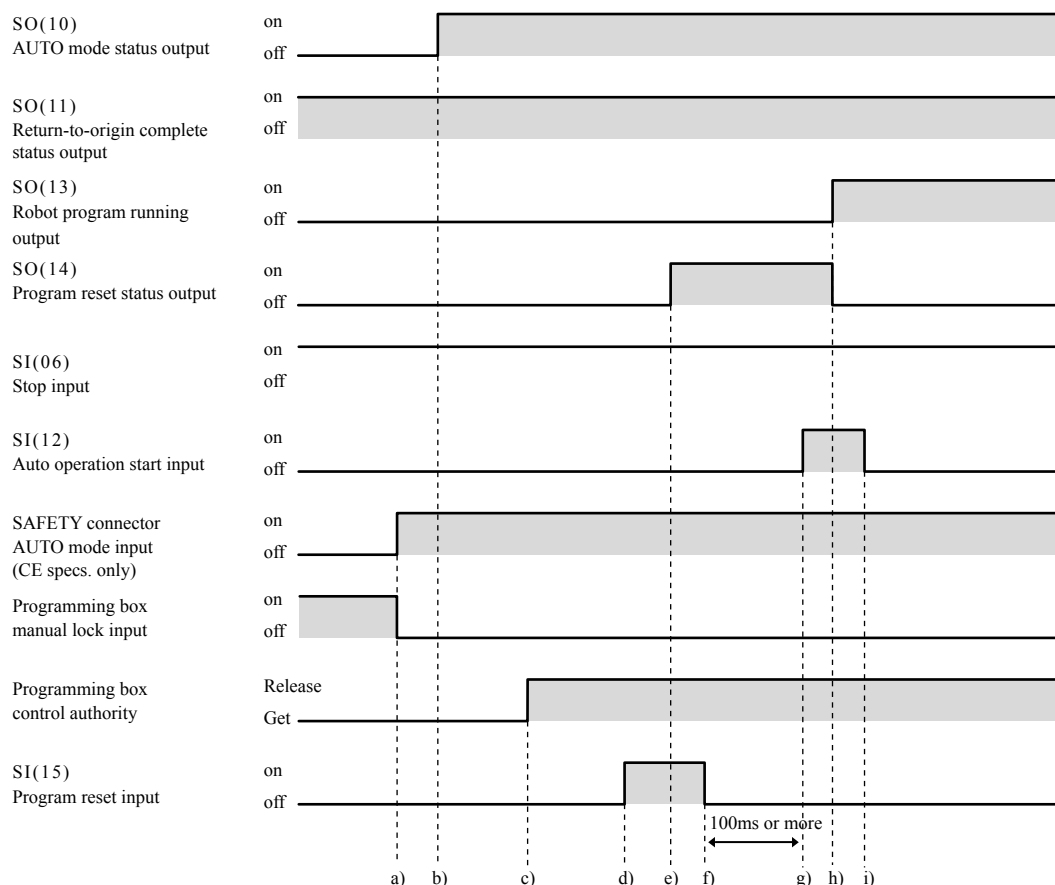
■ Shift to emergency stop

- Emergency stop input OFF is input
- 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

- Emergency stop input ON is input
- Emergency stop input status output OFF is output
- Alarm reset input ON is input
- Alarm status output OFF is output
- The alarm reset input OFF is input occurs after confirming that the alarm status output is OFF
- Servo ON input ON is input
- Servo ON status output ON is output
- 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

- SAFETY connector AUTO mode input ON is input, programming box manual lock input OFF is input
- AUTO mode status output ON is output
- Programming box control authority is CANCEL

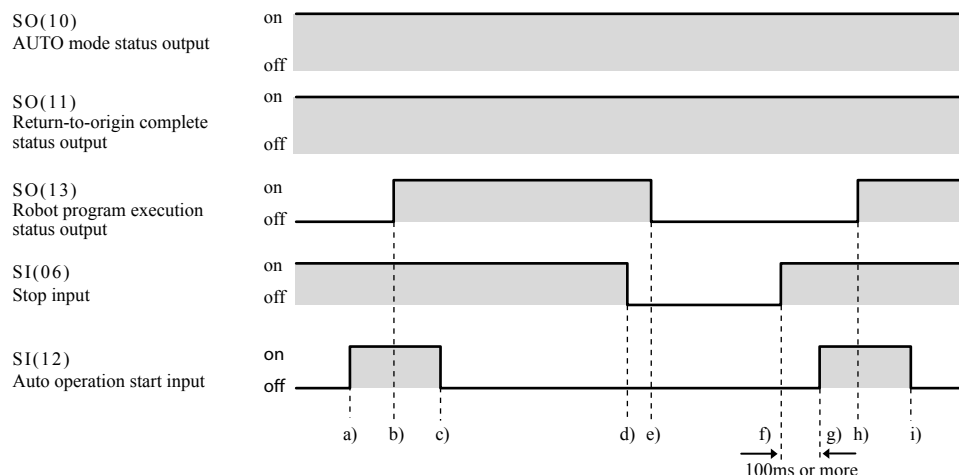
Program reset process

- Program reset input ON is input
- Program reset status output ON is output
- After confirming that the program reset status output is ON, the program reset input OFF is input

Program execution process

- Auto operation start input ON is input
 - Program reset status output OFF is output, robot program running output ON is output
 - 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

- Auto operation start input ON is input
- Robot program running output ON is output
- After confirming that the robot program running output is ON, auto operation start input OFF is input

■ Program stop process using stop input

- Stop input OFF is input
- Robot program running output OFF is output

■ Program execution after stopping program with stop input

- Stop input ON is input
- Auto operation start input ON is input
- Robot program running output ON is output
- 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

1. Remote command format	2-1
1.1 Remote command specifications	2-1
1.2 Remote status description	2-3
2. Sending and receiving remote commands	2-4
3. Remote command & remote status tables	2-5
4. Remote command description	2-10
4.1 Status reset command	2-10
4.2 Category 1 remote commands	2-11
4.2.1 MOVE command	2-12
PTP designation	2-12
Arch designation	2-15
Linear interpolation	2-18
Circular interpolation	2-21
Direct PTP designation (millimeter units)	2-24
Direct PTP designation (pulse units)	2-27
4.2.2 MOVEI command	2-30
PTP designation	2-30
Linear interpolation	2-33
Direct PTP designation (millimeter units)	2-36
Direct PTP designation (pulse units)	2-39
4.2.3 DRIVE command	2-42
Point designation	2-42
Direct designation (millimeter units)	2-45
Direct designation (pulse units)	2-48
4.2.4 DRIVEI command	2-51
Point designation	2-51
Direct designation (millimeter units)	2-54
Direct designation (pulse units)	2-57
4.2.5 Pallet movement command	2-60
PTP designation	2-60
Arch designation	2-63
4.2.6 Jog movement command	2-66
Pulse unit system jog movement	2-66
Cartesian coordinate system jog movement	2-69
Tool coordinate system jog movement	2-72

Chapter 2 Remote command

4.2.7	Inching movement command	2-75
	Pulse unit system inching movement	2-75
	Cartesian coordinate system inching movement	2-78
	Tool coordinate system inching movement	2-81
4.2.8	Inching movement amount setting command	2-84
4.2.9	Point teaching command	2-85
4.2.10	Absolute reset movement command	2-87
4.2.11	Absolute reset command	2-89
4.2.12	Return-to-origin command	2-91
	Return-to-origin in robot units	2-91
	Return-to-origin in axis units	2-93
4.2.13	Servo command	2-95
4.2.14	Manual movement speed change command	2-97
4.2.15	Automatic movement speed change command	2-98
4.2.16	Program movement speed change command	2-99
4.2.17	Shift designation change command	2-100
4.2.18	Hand designation change command	2-101
4.2.19	Arm designation change command	2-102
4.2.20	Motor power command	2-103
4.2.21	MOVET movement command	2-104
	PTP point designation	2-104
	Linear interpolation	2-107
4.2.22	Torque control command information	2-110
	Max. torque command value change command	2-110
4.2.23	PUSH operation command	2-112
	Point designation	2-112
	Direct designation (millimeter units)	2-115
	Direct designation (pulse units)	2-118
4.3	Category 2 remote commands	2-121
4.3.1	Point-related command	2-122
	Point data definition	2-122
	Point data reference	2-124
4.3.2	Point comment-related command	2-126
	Point comment data definition	2-126
	Point comment data reference	2-128
4.3.3	Pallet-related command	2-130
	Pallet data definition	2-130

Chapter 2 Remote command

	Pallet data reference	2-131
4.3.4	Shift-related command	2-133
	Shift data definition	2-133
	Shift data reference	2-135
4.3.5	Hand-related command	2-137
	Hand data definition	2-137
	Hand data reference	2-139
4.4	Category 3 remote commands	2-141
4.4.1	Static variable-related command	2-142
	Assigning a numerical value to a static variable	2-142
	Assigning a variable to a static variable	2-144
	Arithmetic operation using numerical data on static variable	2-146
	Arithmetic operation using variable on static variable	2-148
	Static variable value reference	2-150
4.4.2	Parameter-related command	2-152
	Assigning a value to a parameter	2-152
	Parameter value reference	2-154
4.4.3	Point-related command	2-157
	Assigning a point to a parameter	2-157
	Point addition/subtraction	2-159
	Assigning a pallet point	2-161
4.4.4	Element assignment command	2-163
	Assigning to a point element	2-163
	Assigning to a shift element	2-165
4.5	Category 4 remote commands	2-167
4.5.1	I/O port commands	2-168
	Assigning a numerical value to an I/O port	2-168
	I/O port reference	2-170
4.6	Category 5 remote commands	2-172
4.6.1	Execution program designation	2-173
4.6.2	Program execution	2-175
4.6.3	Program reset	2-177
4.6.4	Program execution information reference	2-179
4.7	Category 6 remote commands	2-181
4.7.1	Version information reference	2-182
4.7.2	System configuration referencing	2-184
4.7.3	Servo status reference	2-186

Chapter 2 Remote command

4.7.4	Current position reference	2-188
	Pulse units designation	2-188
	Millimeter units designation	2-190
4.7.5	Task status reference	2-193
4.7.6	Task execution line reference	2-195
4.7.7	Message reference	2-197
4.7.8	Speed status reference	2-199
4.7.9	Arm designation status reference	2-200
4.7.10	Arm status reference	2-201
4.7.11	Return-to-origin status reference	2-202
4.7.12	Current torque value (percentage of max. torque) reference	2-204
4.7.13	In-controller date reference	2-206
4.7.14	In-controller time reference	2-207
4.7.15	Option slot module information referencing	2-208
4.7.16	Inching movement amount referencing	2-210
4.7.17	Remote command latest alarm referencing	2-211
4.7.18	Current torque value (percentage of rated torque) reference	2-213
4.8	Category 7 remote commands	2-215
4.8.1	In-controller date setting operation	2-215
4.8.2	In-controller time setting operation	2-217
4.8.3	Alarm reset command	2-218

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 W14, enter 0x3231 (hexadecimal)

(character code: "1" = 0x31, "2" = 0x32)

For example, to set 0x01234567 (hexadecimal) (=19,088,743) in the W14 and W15 registers, set 0x0123 (hexadecimal) in W15 and set 0x4567 (hexadecimal) in W14.

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".

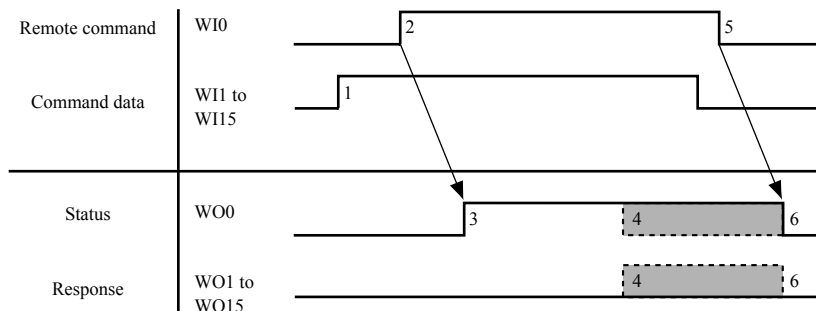


NOTE

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	W10	
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
W00	W01	W02	From W03	
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 (W10)
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 (W10)
1-1	MOVE command	PTP point designation	0xR001
		Arch designation	0xR002
		Linear interpolation	0xR003
		Circular interpolation	0xR004
		Direct PTP designation	Millimeter units
			Pulse units
1-2	MOVEI command	PTP point designation	0xR009
		Linear interpolation	0xR00A
		Direct PTP designation	Millimeter units
			Pulse units
1-3	DRIVE command	Point designation	0xR010
		Direct designation	Millimeter units
			Pulse units
1-4	DRIVEI command	Point designation	0xR014
		Direct designation	Millimeter units
			Pulse units
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
			Pulse units

* "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 (W10)
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 (W10)
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

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

■ Category 4

No.	Command contents			Command code (W10)
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 (W10)
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 (W10)
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 (W10)
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
			Pulse units
1-2	MOVEI command	PTP point designation	0xR009
		Linear interpolation	0xR00A
		Direct PTP designation	Millimeter units
			Pulse units
1-3	DRIVE command	Point designation	0xR010
		Direct designation	Millimeter units
			Pulse units
1-4	DRIVEI command	Point designation	0xR014
		Direct designation	Millimeter units
			Pulse units
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
			Pulse units

* "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	a
		bit 2 – bit 1	bb
		bit 4 – bit 3	(0: Fixed) 0
		bit 5	d
		bit 6	e
		bit 13 – bit 7	(0: Fixed) 0
		bit 14	p
		bit 15	m
WI2	Specified axis to move	bit 0	Axis 1
		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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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.

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
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

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
W10	Command code	bit 11 – bit 0		0xR002
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Point number			0xpppp
W15	Not used			0x0000
W16				
W17				
W18	Arch position data			0xqqqqqqqq
W19				
W110	Arch start position data			0xqqqqqqqq
W111				
W112	Arch end position data			0xqqqqqqqq
W113				
W114	Not used			0x0000
W115				

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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
W10	Command code	bit 11 – bit 0		0xR003
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Point number			0xpppp
W15	Not used			0x0000
to				
W19				
W110	Acceleration designation			0xrrrr
W111	Deceleration designation			0xrrrr
W112	Not used			0x0000
to				
W115				

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
W10	Command code	bit 11 – bit 0		0xR004
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	Not used			0x0000
W13	Specified speed			0xssss
W14	First point number			0xpppp
W15	Second point number			0xpppp
W16	Not used			0x0000
to				
W19				
W110	Acceleration designation			0xrtrr
W111	Deceleration designation			0xrtrr
W112	Not used			0x0000
to				
W115				

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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
W10	Command code	bit 11 – bit 0		0xR006
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Axis-1 data			0xpppppppp
W15				
W16	Axis-2 data			0xpppppppp
W17				
W18	Axis-3 data			0xpppppppp
W19				
W110	Axis-4 data			0xpppppppp
W111				
W112	Reserved			0xpppppppp
W113				
W114	Reserved			0xpppppppp
W115				

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.

ppppppp : 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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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
W10	Command code	bit 11 – bit 0		0xR007
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Axis-1 data			0xpppppppp
W15				
W16	Axis-2 data			0xpppppppp
W17				
W18	Axis-3 data			0xpppppppp
W19				
W110	Axis-4 data			0xpppppppp
W111				
W112	Reserved			0xpppppppp
W113				
W114	Reserved			0xpppppppp
W115				

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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

Values are expressed as shown at right when executed correctly.

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

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
W10	Command code	bit 11 – bit 0		0xR009
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Point number			0xpppp
W15	Not used			0x0000
to				
W19				
W110	Acceleration designation			0xrrrr
W111	Deceleration designation			0xrrrr
W112	Not used			0x0000
to				
W115				

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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.

Axis 1 = 123456

Axis 2 = -123

Other axes = 0

Values are expressed as shown at right.

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

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
W10	Command code	bit 11 – bit 0		0xR00A
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Point number			0xpppp
W15	Not used			0x0000
to				
W19				
W110	Acceleration designation			0xrtrr
W111	Deceleration designation			0xrtrr
W112	Not used			0x0000
to				
W115				

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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	
WI1	Command flag	bit 0	a
		bit 2 – bit 1	bb
		bit 4 – bit 3	cc
		bit 8 – bit 5	xr
		bit 12 – bit 9	yr
		bit 13	0 (0: Fixed)
		bit 14	p (Current position output designation flag (Pulse units))
		bit 15	m (Current position output designation flag (Millimeter units))
WI2	Specified axis to move	bit 0	Axis 1
		bit 1	Axis 2
		bit 2	Axis 3
		bit 3	Axis 4
		bit 4	Reserved
		bit 5	Reserved
		bit 15 – bit 6	0 (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.

ppppppp : 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		
WO5	Axis-1 data	0xbbbbbbbb
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

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	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

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
W10	Command code	bit 11 – bit 0		0xR00F
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Axis-1 data			0xpppppppp
W15				
W16	Axis-2 data			0xpppppppp
W17				
W18	Axis-3 data			0xpppppppp
W19				
W110	Axis-4 data			0xpppppppp
W111				
W112	Reserved			0xpppppppp
W113				
W114	Reserved			0xpppppppp
W115				

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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

Values are expressed as shown at right when executed correctly.

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

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	
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
		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	Axis-2 data	0xbbbbbbbb
WO6		
WO7		
WO8	Axis-3 data	0xbbbbbbbb
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11		
WO12	Reserved	0xbbbbbbbb
WO13	Reserved	0xbbbbbbbb
WO14		
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.

Axis 1 = 123456

Axis 2 = -123

Other axes = 0

Values are expressed as shown at right.

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

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
W10	Command code	bit 11 – bit 0		0xR012
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Movement data			0xpppppppp
W15				
W16	Not used			0x0000
to				
W115				

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		
WO5	Axis-1 data	0xbbbbbbbb
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	Axis-2 data	0xbbbbbbbb
WO6		
WO7		
WO8	Axis-3 data	0xbbbbbbbb
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11		
WO12	Reserved	0xbbbbbbbb
WO13	Reserved	0xbbbbbbbb
WO14		
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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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
		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	Axis-2 data	0xbbbbbbbb
WO6		
WO7		
WO8	Axis-3 data	0xbbbbbbbb
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11		
WO12	Reserved	0xbbbbbbbb
WO13	Reserved	0xbbbbbbbb
WO14		
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
W10	Command code	bit 11 – bit 0		0xR017
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Movement data			0xpppppppp
W15				
W16	Not used			0x0000
to				
W115				

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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		0xwwwv
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)
- www : 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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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.

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
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

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
W10	Command code	bit 11 – bit 0		0xR019
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Pallet number			0xpppp
W15	Work position number			0xwwww
W16	Not used			0x0000
W17				
W18	Arch position data			0xqqqqqqqq
W19				
W110	Arch start position data			0xqqqqqqqq
W111				
W112	Arch end position data			0xqqqqqqqq
W113				
W114	Not used			0x0000
W115				

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)
- www : 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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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.

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	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

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	
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	Axis-2 data	0xbbbbbbbb
WO6		
WO7		
WO8	Axis-3 data	0xbbbbbbbb
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11		
WO12	Reserved	0xbbbbbbbb
WO13	Reserved	0xbbbbbbbb
WO14		
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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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	Axis-2 data	0xbbbbbbbb
WO6		
WO7		
WO8	Axis-3 data	0xbbbbbbbb
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11		
WO12	Reserved	0xbbbbbbbb
WO13	Reserved	0xbbbbbbbb
WO14		
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
WI3 to WI15	Not used			0
				0x0000
				0

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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	Axis-2 data	0xbbbbbbbb
WO6		
WO7		
WO8	Axis-3 data	0xbbbbbbbb
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11		
WO12	Reserved	0xbbbbbbbb
WO13	Reserved	0xbbbbbbbb
WO14		
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.

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
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

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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.

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
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

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.

Values are expressed as shown at right when executed correctly.

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

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
W10	Command code	bit 11 – bit 0		0xR032
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	Not used			0x0000
to				
W115				

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
W00	Status code	0x0200
W01	Not used	0x0000
to		
W015		

Abnormal end

Address	Contents	Value
W00	Status code	0x4000
W01	Alarm group number	0xaabb
W02	Alarm category number	0xccdd
W03	Not used	0x0000
to		
W015		

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
W10	Command code	bit 11 – bit 0		0xR033
	Robot designation	bit 15 – bit 12	Robot number	
W11	Not used			0x0000
W12	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)	
W13	Not used			0x0000
to				
W115				

- 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.

Values are expressed as shown at right when executed correctly.

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

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
W10	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	
W11	Not used			0x0000
W12	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)	
W13	Not used			0x0000
to				
W15				

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
W10	0x0036
W11	0x0000
W12	0x0008
W13	0x0000
to	
W115	

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
W10	Command code	bit 11 – bit 0		0xR03A
	Robot designation	bit 15 – bit 12	Robot number	
W11	Not used			0x0000
W12	Specified speed			0xssss
W13	Not used			0x0000
to				
W115				

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
W10	0x003A
W11	0x0000
W12	0x0050
W13	0x0000
to	
W115	

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
W10	Command code	bit 11 – bit 0		0xR03D
	Robot designation	bit 15 – bit 12	Robot number	
W11	Not used			0x0000
W12	Status of specified arm			0xssss
W13	Not used			0x0000
to				
W115				

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
W10	0x003D
W11	0x0000
W12	0x0000
W13	0x0000
to	
W115	

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	a
		bit 2 – bit 1	Speed designation flag
		bit 4 – bit 3	(0: Fixed)
		bit 5	Acceleration designation flag
		bit 6	Deceleration designation flag
		bit 13 – bit 7	(0: Fixed)
		bit 14	Current position output designation flag (Pulse units)
		bit 15	Current position output designation flag (Millimeter units)
WI2	Specified axis to move	bit 0	Axis 1
		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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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.

Axis 1 = 123456

Axis 2 = -123

Other axes = 0

Values are expressed as shown at right.

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

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
W10	Command code	bit 11 – bit 0		0xR045
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Point number			0xpppp
W15	Not used			0x0000
to				
W19				
W110	Acceleration designation			0xrtrr
W111	Deceleration designation			0xrtrr
W112	Not used			0x0000
to				
W115				

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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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
W10	Command code	bit 11 – bit 0	0xR04B
	Robot designation	bit 15 – bit 12 Robot number	
W11	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
W12	Specified axis to move	bit 0	Axis 1 data-kind="parent" data-rs="7">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)
W13	Specified speed		0xssss
W14	Point number		0xpppp
W15	Not used		0x0000
to			
W17			
W18	Push force designation		0xffff
W19	Push time-period designation		0xjjjj
W110	Not used		0x0000
to			
W115			

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.

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
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

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
W10	Command code	bit 11 – bit 0		0xR04C
	Robot designation	bit 15 – bit 12	Robot number	
W11	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
W12	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)	
W13	Specified speed			0xssss
W14	Movement data			0xpppppppp
W15				
W16	Not used			0x0000
W17				
W18	Push force designation			0xffff
W19	Push time-period designation			0xjjjj
W110	Not used			0x0000
to				
W115				

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.

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
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

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
		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.

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
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

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 (W10)
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.

bbbbbb : 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
to		
WI15		

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

bbb : 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)

Values are expressed as shown at right when executed correctly.

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

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 be 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

Values are expressed as shown at right when executed correctly.

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

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
W10	Command code	0x010D
W11	Not used	0x0000
W12	Shift number	0xssss
W13	Not used	0x0000
to		
W115		

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.

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
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

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
W10	Command code	bit 11 – bit 0		0xR110
	Robot designation	bit 15 – bit 12	Robot number	
W11	Not used			0x0000
W12	Hand number			0xssss
W13	Not used			0x0000
W14	Data 1			0xbbbbbbbb
W15				
W16	Data 2			0xbbbbbbbb
W17				
W18	Data 3			0xbbbbbbbb
W19				
W110	Data 4			0xbbbbbbbb
W111				
W112	Not used			0x0000
to				
W115				

- 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
W00	Status code	0x0200
W01	Not used	0x0000
to		
W015		

Abnormal end

Address	Contents	Value
W00	Status code	0x4000
W01	Alarm group number	0xaaaa
W02	Alarm category number	0xbbbb
W03	Not used	0x0000
to		
W015		

- 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

Values are expressed as shown at right when executed correctly.

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

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
W10	Command code	bit 11 – bit 0		0x0111
	Robot designation	bit 15 – bit 12	Robot number	
W11	Not used			0x0000
W12	Hand number			0xssss
W13	Not used			0x0000
to				
W115				

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.
bbbbbbb : 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.

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
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

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 (W10)
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		
to	Not used	0x0000
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
		Subtraction
		Multiplication
		Division
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)

bbbbbbb : 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
		Subtraction
		Multiplication
		Division
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
W10	Command code	bit 11 – bit 0		0xR220
	Robot designation	bit 15 – bit 12	Robot number	
W11	Not used			0x0000
W12	Parameter number			0xssss
W13	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)	
W14	Numerical data			0xbbbbbbbb
W15				
W16	Not used			0x0000
to				
W115				

- 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
W00	Status code	0x0200
W01	Not used	0x0000
to		
W015		

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
W10	Command code	bit 11 – bit 0		0xR224
	Robot designation	bit 15 – bit 12	Robot number	
W11	Not used			0x0000
W12	Parameter number			0xssss
W13	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)	
W14	Not used			0x0000
to				
W115				

- 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
		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

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
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

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

Values are expressed as shown at right when executed correctly.

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

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
W10	Command code	Addition	0x0234
		Subtraction	0x0235
W11	Not used		0x0000
W12	Point number 1 (Point number at operation destination)		0xssss
W13	Point number 2 (Point number at operation source)		0xssss
W14	Not used		0x0000
to			
W115			

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

Values are expressed as shown at right when executed correctly.

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

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
W10	Command code	0x0238
W11	Not used	0x0000
W12	Point number (Point number at assignment destination)	0xssss
W13	Pallet number	0xaaaa
W14	Work position number	0xbbbb
W15	Not used	0x0000
to		
W115		

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

Values are expressed as shown at right when executed correctly.

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

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
W10	Command code		"Pulse" units input format	0x0240
			"Millimeter" units input format	0x0241
W11	Not used			0x0000
W12	Point number (Point number at assignment destination)			0xssss
W13	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)	
W14	Numerical value			0xbbbbbbbb
W15				
W16	Not used			0x0000
to				
W115				

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
W00	Status code	0x0200
W01	Not used	0x0000
to		
W015		

Abnormal end

Address	Contents	Value
W00	Status code	0x4000
W01	Alarm group number	0xaaaa
W02	Alarm category number	0xbbbb
W03	Not used	0x0000
to		
W015		

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

Values are expressed as shown at right when executed correctly.

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

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

Values are expressed as shown at right when executed correctly.

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

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 (W10)
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
		bit 7 – bit 4	Units of port number
		bit 11 – bit 8	Tens of port number
		bit 15 – bit 12	Specified port type
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 (W10)
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			0xn timer
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.

Values are expressed as shown at right when executed correctly.

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

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
W10	Command code	Program execution	0x0402
		Program step execution	0x0403
		Program skip execution	0x0404
		Program next execution	0x0405
W11	Command flag	bit 2 – bit 0	Designation method selection sss
		bit 15 – bit 3	(0: Fixed) 0
W12	Program number		0xnxxx
W13	Operation task number		0xtttt
W14	Not used		0x0000
W15			
W16			
to	Program name		0xbbbb
W113			
W114			
W115	Not used		0x0000

sss : Specify (by 3 bits) the program selection method.

Value	Meaning
000	All operation-enabled programs (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
W00	Status code	0x0200
W01	Not used	0x0000
to		
W015		

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			0xn timer
WI3	Operation task number			0xt timer
WI4	Not used			0x0000
WI5				
WI6	Program name			0xb timer
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			0xn timer
WI3	Operation task number			0xt timer
WI4	Not used			0x0000
WI5				
WI6	Program name			0xb timer
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	0xb timer
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 software revision in 16 bits.

dddd : Indicates (by 16 bits) the driver FPGA version.

eeff : Shows the controller's driver software version in upper 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 software 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 : Shows the 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	Axis-2 data	0xbbbbbbbb
WO6		
WO7	Axis-3 data	0xbbbbbbbb
WO8		
WO9	Axis-4 data	0xbbbbbbbb
WO10		
WO11	Reserved	0xbbbbbbbb
WO12		
WO13	Reserved	0xbbbbbbbb
WO14		
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		
WO5	Axis-1 data	0xbbbbbbbb
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		

bbbbbbb : 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.

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
W10	0x0506
W11	0x0000
to	
W115	

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.

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
WI0	0x0507
WI1	0x0000
to	
WI15	

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: 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: 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.

Values are expressed as shown at right when executed correctly.

Robot 1, Axis 3: 100

Address	Value
WI0	0x0516
WI1	0x0000
WI2	0x0004
WI3	0x0000
to	
WI15	

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 (W10)
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
W10	Command code	0x0602
W11	Not used	0x0000
W12	Date setting (year)	0xyyyy
W13	Date setting (month)	0xmmmm
W14	Date setting (day)	0xdddd
W15	Not used	0x0000
to		
W115		

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

Values are expressed as shown at right when executed correctly.

Address	Value
WI0	0x0602
WI1	0x0000
WI2	0x000E
WI3	0x0002
WI4	0x0002
WI5	0x0000
to	
WI15	

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.

Cat. No. I234E-EN-01A



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



Authorized Distributor: