

Programmable Controller



MELSEC iQ-R series MELSEC *L* series MELSEC **Q** series

Predefined Protocol Support For Positioning
Function Block Library Reference
(ORIENTAL MOTOR CO., LTD.)

SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this reference carefully and pay full attention to safety to handle the product correctly. The precautions given in this reference are concerned with this product only. For the safety precautions for the programmable controller system, refer to the user's manual for the CPU module used and MELSEC iQ-R Module Configuration Manual. In this reference, the safety precautions are classified into two levels: "⚠ WARNING" and "⚠ CAUTION".

 WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
 CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this reference and then keep the reference in a safe place for future reference.

CONDITIONS OF USE FOR THE PRODUCT

- (1) MELSEC programmable controller ("the PRODUCT") shall be used in conditions;
- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
 - ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.
- (2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries. MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER'S, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
- ("Prohibited Application")
- Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
 - Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
 - Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.
- Notwithstanding the above restrictions, Mitsubishi Electric may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi Electric and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi Electric representative in your region.
- (3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for purchasing the Mitsubishi Electric MELSEC iQ-R series, MELSEC-Q series, and MELSEC-L series programmable controllers.

This reference describes function blocks which execute positioning control by connecting the MELSEC iQ-R series, MELSEC-Q series, or MELSEC-L series programmable controller to controllers manufactured by Oriental Motor Co., Ltd.

Before using this product, please read this reference carefully and develop familiarity with the functions and performance of the MELSEC iQ-R series, MELSEC-Q series, and MELSEC-L series programmable controllers to handle the product correctly.

When applying the program examples provided in this reference to an actual system, ensure the applicability and confirm that they will not cause system control problems.

Please make sure that the end users read this reference.

CONTENTS

SAFETY PRECAUTIONS	1
CONDITIONS OF USE FOR THE PRODUCT	2
INTRODUCTION	3
RELEVANT MANUALS	7
TERMS	7
GENERIC TERM AND ABBREVIATION	7
CHAPTER 1 OVERVIEW	8
1.1 FB List	8
1.2 Acquisition Method	8
1.3 System Configuration	9
CPU module	9
Serial communication module	9
Supported models	10
1.4 Assignment of Remote I/O to Motor Driver	10
CHAPTER 2 DETAILS OF THE FB LIBRARY (MELSEC iQ-R SERIES)	11
2.1 M+OriStartHomePositioning_R	11
Overview	11
Labels	11
FB details	12
Performance value	14
Error code	15
2.2 M+OriJogInching_R	16
Overview	16
Labels	16
FB details	18
Performance value	23
Error code	23
2.3 M+OriReadDriveData_R	24
Overview	24
Labels	24
FB details	25
Performance value	27
Error code	28
2.4 M+OriTeachingPosition_R	29
Overview	29
Labels	29
FB details	30
Performance value	32
Error code	33
2.5 M+OriStartPositioning_R	34
Overview	34
Labels	34
FB details	35
Performance value	39
Error code	40
2.6 M+OriMonitoring_R	41

Overview	41
Labels	41
FB details.....	42
Performance value	45
Error code	46
2.7 M+OriServoControl_R.....	47
Overview	47
Labels	47
FB details.....	48
Performance value	52
Error code	52
CHAPTER 3 DETAILS OF THE FB LIBRARY (MELSEC-Q/L SERIES)	53
<hr/>	
3.1 Preparation for Using FB Library.....	53
Importing M+CPU-OriPosiSp_CPRTCL-ST	53
Checking the start I/O number.....	53
3.2 M+CPU-OriPosiSp_StartHomePosi-ST	54
Overview	54
Labels	54
FB details.....	55
Performance value	58
Error code	59
3.3 M+CPU-OriPosiSp_JogInching-ST	60
Overview	60
Labels	60
FB details.....	62
Performance value	68
Error code	68
3.4 M+CPU-OriPosiSp_ReadDriveData-ST	70
Overview	70
Labels	70
FB details.....	71
Performance value	74
Error code	75
3.5 M+CPU-OriPosiSp_Teaching-ST	76
Overview	76
Labels	76
FB details.....	77
Performance value	80
Error code	81
3.6 M+CPU-OriPosiSp_StartPosi-ST	82
Overview	82
Labels	82
FB details.....	83
Performance value	87
Error code	88
3.7 M+CPU-OriPosiSp_Monitoring-ST.....	89
Overview	89
Labels	89
FB details.....	90

	Performance value	93
	Error code	94
3.8	M+CPU-OriPosiSp_ServoControl-ST	95
	Overview	95
	Labels	95
	FB details	96
	Performance value	99
	Error code	100
3.9	M+CPU-OriPosiSp_CPRTCL-ST	101
	Overview	101
	FB details	101

APPENDIX **102**

Appendix 1 Table Information (MELSEC iQ-R Series)	102
Drive data structure (stOriDriveData)	102
Monitoring table structure (stOriMonitoringTable)	103
Appendix 2 Table Information (MELSEC-Q/L Series)	105
Drive data	105
Monitor data	107

INSTRUCTION INDEX **109**

REVISIONS	111
TRADEMARKS	112

RELEVANT MANUALS

Manual name [manual number]	Description	Available form
Predefined Protocol Support For Positioning Function Block Library Reference (ORIENTAL MOTOR CO., LTD.) [BCN-P5999-1371] (this reference)	Specifications, functions, and input/output labels of function blocks for controllers manufactured by Oriental Motor Co., Ltd.	e-Manual PDF

Point

e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- Hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.
- Sample programs can be copied to an engineering tool.

TERMS

Unless otherwise specified, this reference uses the following terms.

Term	Description
Buffer memory	Memory in an intelligent function module to store data such as setting values and monitor values. For CPU modules, it refers to memory to store data such as setting values and monitor values of the Ethernet function, or data used for data communication of the multiple CPU system function.
Device	A memory of a CPU module to store data. Devices such as X, Y, M, D, and others are provided depending on the intended use.
Engineering tool	A tool used for setting up programmable controllers, programming, debugging, and maintenance.
Intelligent function module	A module that has functions other than an input or output, such as an A/D converter module and D/A converter module.
Process CPU	A CPU module that performs process control and sequence control. Process control function blocks and the online module change function can be executed. This module is also used with a redundant function module as a pair and configures a redundant system.

GENERIC TERM AND ABBREVIATION

Unless otherwise specified, this reference uses the following generic terms and abbreviations.

Generic term and abbreviation	Description
Oriental Motor	An abbreviation for Oriental Motor Co., Ltd.

1 OVERVIEW

A function block (FB) in this reference is for connecting the MELSEC iQ-R, MELSEC-Q, or MELSEC-L series programmable controller to Oriental Motor controllers via serial communication (MODBUS) and executing electric actuator positioning control.

1.1 FB List

This section shows the FB list of this reference.

Note that this reference does not describe the FB version information which is indicated such as "_00A" at the end of an FB name.


MELSEC iQ-R series

FB name	Description
M+OriStartHomePositioning_R	To move a motor to the initial position (home position return).
M+OriJogInching_R	To perform JOG or inching operation.
M+OriReadDriveData_R	To read specified drive data.
M+OriTeachingPosition_R	To set a designated position to the position of the specified drive data number.
M+OriStartPositioning_R	To execute positioning operation based on the data of the specified drive data number.
M+OriMonitoring_R	To monitor a current position and alarms, and reset alarms.
M+OriServoControl_R	To request a servo to turn ON or OFF.

MELSEC-Q/L series

FB name	Description
M+CPU-OriPosiSp_StartHomePosi-ST	To move a motor to the initial position (home position return).
M+CPU-OriPosiSp_JogInching-ST	To perform JOG or inching operation.
M+CPU-OriPosiSp_ReadDriveData-ST	To read specified drive data.
M+CPU-OriPosiSp_Teaching-ST	To set a designated position to the position of the specified drive data number.
M+CPU-OriPosiSp_StartPosi-ST	To execute positioning operation based on the data of the specified drive data number.
M+CPU-OriPosiSp_Monitoring-ST	To monitor a current position and alarms, and reset alarms.
M+CPU-OriPosiSp_ServoControl-ST	To request a servo to turn ON or OFF.
M+CPU-OriPosiSp_CPRTCL-ST	To execute an instruction for predefined protocol communication (G_CPRTCL) by using this FB in other MELSEC-Q/L series FBs. Do not use this FB in a user-created program as this is used only in other FBs.

Considerations

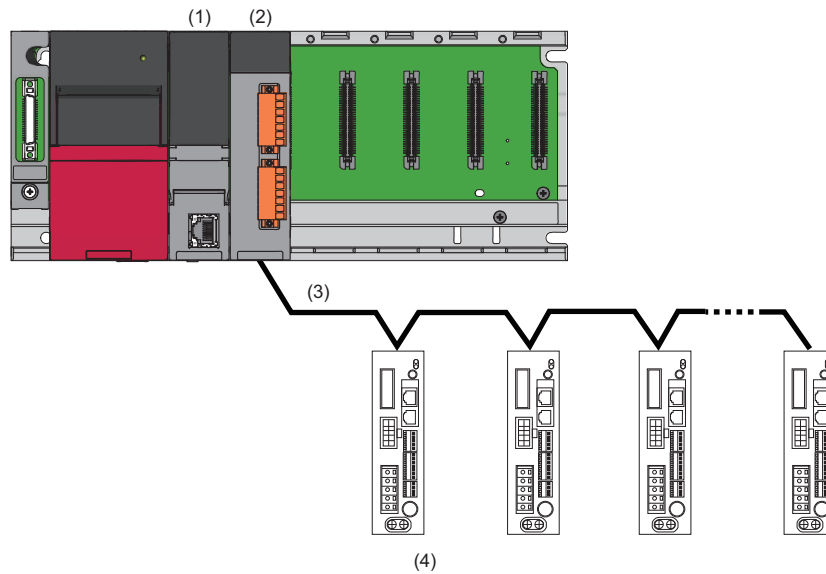
- To use FBs in this reference, it is necessary to write protocol setting data for a predefined protocol in advance by using the predefined protocol information write function of Predefined Protocol Support Tool For Positioning. ( Predefined Protocol Support Tool For Positioning Operating Manual)
- When an execution command of an FB is turned ON, do not use the same channel of a serial communication module to communicate with a motor driver.
- All FBs use serial communication module buffer memories (user setting area); therefore, do not access to the following buffer memories:
Un\G3072 to 5520

1.2 Acquisition Method

Please contact your local Mitsubishi Electric sales office or representative.

1.3 System Configuration

The following shows the system configuration for using the FBs in this reference.



No.	Device name	Description
(1)	MELSEC iQ-R series programmable controller	Use a base unit, a power supply module, and a CPU module.
	MELSEC-Q series programmable controller	
	MELSEC-L series programmable controller	
(2)	Serial communication module	Use a serial communication module which has an RS-422/485 interface(s).
(3)	Serial communication (RS-485 connection)	Connect motor drivers. Maximum number of connectable controllers: 31
(4)	Oriental Motor controller	☞ Page 10 Supported models

For the specifications of modules to be used, refer to the user's manual of each module.

CPU module

Series	Generic term	Model
MELSEC iQ-R	RCPU	R00CPU, R01CPU, R02CPU, R04CPU, R04ENCPU, R08CPU, R08ENCPU, R08PCPU, R16CPU, R16ENCPU, R16PCPU, R32CPU, R32ENCPU, R32PCPU, R120CPU, R120ENCPU, R120PCPU
MELSEC-Q	QCPU	Universal model QCPU Q00UJCPU, Q00UCPU, Q01UCPU, Q02UCPU, Q03UDCPU, Q03UDECPU, Q03UDVCPU, Q04UDHCPU, Q04UDEHCPU, Q04UDVCPU, Q04UDPVCPU, Q06UDHCPU, Q06UDEHCPU, Q06UDVCPU, Q06UDPVCPU, Q10UDHCPU, Q10UDEHCPU, Q13UDHCPU, Q13UDEHCPU, Q13UDVCPU, Q13UDPVCPU, Q20UDHCPU, Q20UDEHCPU, Q26UDHCPU, Q26UDEHCPU, Q26UDVCPU, Q26UDPVCPU, Q50UDEHCPU, Q100UDEHCPU
	Process CPU	Q02PHCPU, Q06PHCPU, Q12PHCPU, Q25PHCPU
MELSEC-L	LCPU	L02SCPU, L02SCPU-P, L02CPU, L02CPU-P, L06CPU, L06CPU-P, L26CPU, L26CPU-P, L26CPU-BT, L26CPU-PBT

Serial communication module

Series	Model	Available channel
MELSEC iQ-R	RJ71C24	CH2
	RJ71C24-R4	CH1, CH2
MELSEC-Q	QJ71C24N*1	CH2
	QJ71C24N-R4*1	CH2
MELSEC-L	LJ71C24	CH2

*1 The first five digits of the serial number are '11062' or higher.

Supported models

Manufacturer	Type	Series	Type and model
ORIENTAL MOTOR CO., LTD.	αSTEP driver	AR	ARD-AD/CD/KD
		AZ	AZD-AD/CD/KD
	Stepper motor driver	RKII	RKSD503-AD/CD RKSD507-AD/CD

1.4 Assignment of Remote I/O to Motor Driver

To use this FB library, set the following parameters for a motor driver and assign a remote I/O to the driver by using PC Software developed by Oriental Motor.

For details on the setting method, refer to the manual of a motor driver to be used.

—: Any value

Type	AR Series and RKII Series			AZ Series	
	I/O function [RS-485] parameter			Remote-I/O function (R-I/O) parameter	
	Signal name	ARD-AD/CD/KD	RKSD503-AD/CD RKSD507-AD/CD	Signal name	AZD-AD/CD/KD
Input signals	NET-IN0	M0	M0	R-IN0	START
	NET-IN1	M1	M1	R-IN1	HOME
	NET-IN2	M2	M2	R-IN2	STOP
	NET-IN3	M3	M3	R-IN3	C-ON
	NET-IN4	M4	M4	R-IN4	FW-JOG
	NET-IN5	M5	M5	R-IN5	RV-JOG
	NET-IN6	START	START	R-IN6	FW-JOG-P
	NET-IN7	HOME	HOME	R-IN7	RV-JOG-P
	NET-IN8	STOP	STOP	R-IN8	—
	NET-IN9	C-ON	AWO	R-IN9	—
	NET-IN10	FWD	FWD	R-IN10	—
	NET-IN11	RVS	RVS	R-IN11	—
	NET-IN12	+JOG	+JOG	R-IN12	—
	NET-IN13	-JOG	-JOG	R-IN13	—
	NET-IN14	—	—	R-IN14	—
NET-IN15	—	—	R-IN15	—	
Output signals	NET-OUT0	HOME-P	HOME-P	R-OUT0	HOME-END
	NET-OUT1	READY	READY	R-OUT1	READY
	NET-OUT2	C-ON_R	AWO_R	R-OUT2	C-ON_R
	NET-OUT3	WNG	WNG	R-OUT3	INFO
	NET-OUT4	ALM	ALM	R-OUT4	ALM-A
	NET-OUT5	MOVE	MOVE	R-OUT5	MOVE
	NET-OUT6	—	—	R-OUT6	—
	NET-OUT7	—	—	R-OUT7	—
	NET-OUT8	—	—	R-OUT8	—
	NET-OUT9	—	—	R-OUT9	—
	NET-OUT10	—	—	R-OUT10	—
	NET-OUT11	—	—	R-OUT11	—
	NET-OUT12	—	—	R-OUT12	—
	NET-OUT13	—	—	R-OUT13	—
	NET-OUT14	—	—	R-OUT14	—
NET-OUT15	—	—	R-OUT15	—	

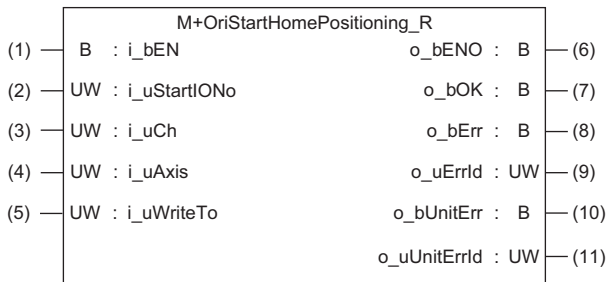
2 DETAILS OF THE FB LIBRARY (MELSEC iQ-R SERIES)

2.1 M+OriStartHomePositioning_R

2

Overview

Moves a motor to the initial position (home position return).



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_uStartIONo	Start I/O No.	Word [unsigned]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	i_uCh	Target channel	Word [unsigned]	1, 2	Specify the channel of a serial communication module.
(4)	i_uAxis	Target axis	Word [unsigned]	1 to 31	Specify an address number (slave address).
(5)	i_uWriteTo	Target controller	Word [unsigned]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2

Output label

No.	Label	Name	Data type	Default value	Description
(6)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(7)	o_bOK	Normal completion	Bit	OFF	The ON state indicates that a home position return is completed.
(8)	o_bErr	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(9)	o_uErrId	Error code	Word [unsigned]	0	The error code of an error occurred in the FB is stored.
(10)	o_bUnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(11)	o_uUnitErrId	Unit error code	Word [unsigned]	0	The error code of an error occurred in the module is stored.

FB details

Available device

Serial communication module

Target module	Firmware version	Engineering tool
RJ71C24	—	GX Works3 Version 1.055H or later
RJ71C24-R4	—	GX Works3 Version 1.055H or later

CPU module

RCPU

Basic specifications

Item	Description
Language	Structured Text
Number of basic steps	2717 steps The number of steps of the FB embedded in a program varies depending on a CPU module used, the input and output definitions, and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Number of points of a label used	<ul style="list-style-type: none">Label: 52 points (Word)Latch label: 0 point (Word) The number of points of a label used that is embedded in a program varies depending on a device specified for an argument and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Index register	Index register: 1 point (Z9)
FB dependence	No dependence
FB compilation method	Subroutine type
FB operation	Pulse execution (multiple scan execution type)

Processing

- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in `i_uStartIONo` (start I/O No.) and `i_uCh` (target channel) respectively.
- Specify the address number (slave address) of the operation target in `i_uAxis` (target axis).
- Specify the series of a target motor driver in `i_uWriteTo` (target controller).
- This FB executes a home position return via MODBUS communication at the rise of `i_bEN` (execution command).
- `o_bOK` (normal completion) is turned ON when a home position return is completed.
- When a value out of the range is set for the start I/O number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target channel, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target axis, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target controller, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in `o_uErrId` (error code).
- When the connected device is not the operation target, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in `o_uErrId` (error code).
- When turning OFF `i_bEN` (execution command) before `o_bOK` (normal completion), `o_bErr` (error completion), or `o_bUnitErr` (unit error completion) is turned ON, `o_bErr` (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in `o_uErrId` (error code) for one scan.
- When turning ON `i_bEN` (execution command) of this FB while executing any of the following FBs, `o_bErr` (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in `o_uErrId` (error code).

M+OriStartHomePositioning_R

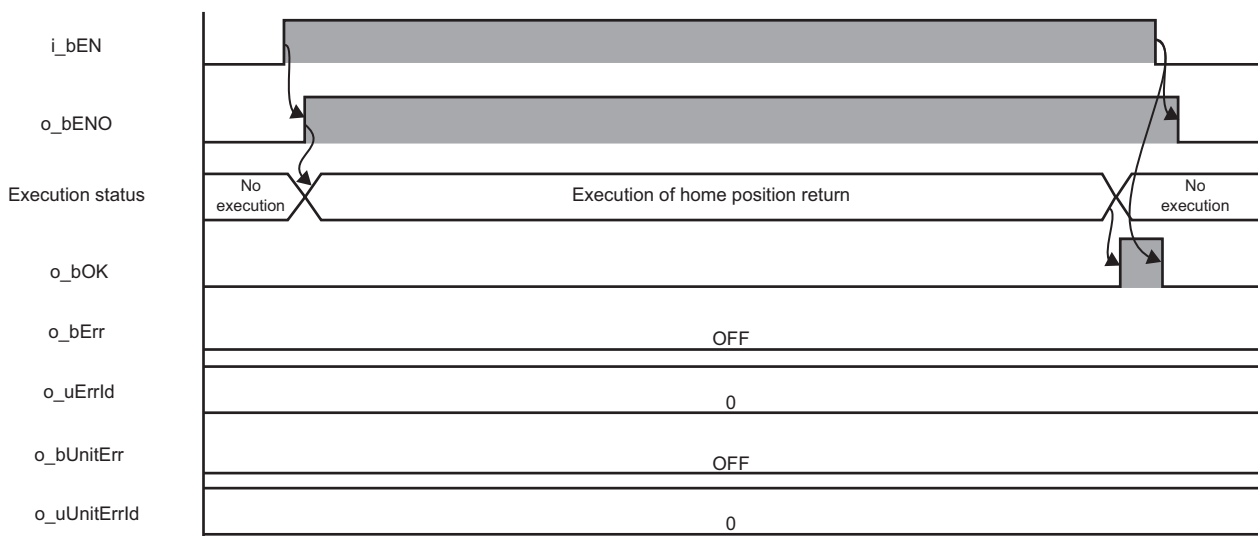
M+OriJogInching_R

M+OriStartPositioning_R

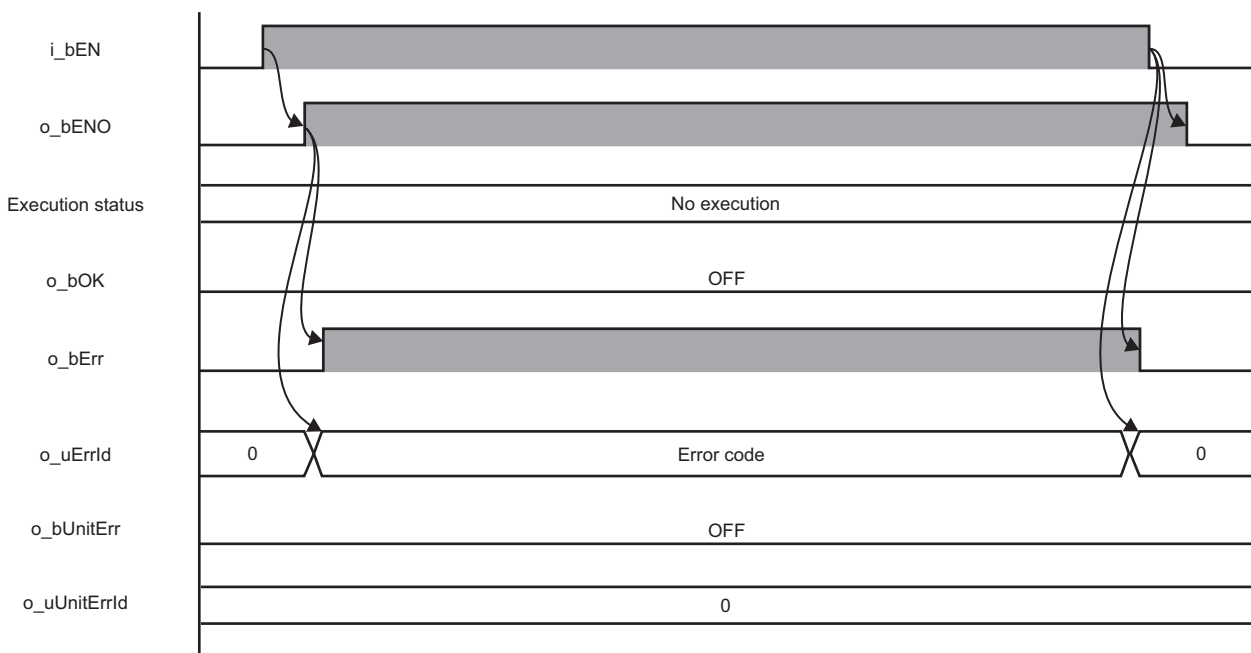
- When an alarm signal of a motor driver is turned ON, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '203H' is stored in o_uErrId (error code). Check the status of the motor driver in M+OriMonitoring_R.
- When turning ON i_bEN (execution command) of this FB while the servo or READY signal of a target motor driver is OFF, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '204H' is stored in o_uErrId (error code).
- When an error occurs while sending/receiving a message to/from the predefined protocol, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. An error code is stored in o_uErrId (error code). For details on the error code, refer to [MELSEC iQ-R Serial Communication Module User's Manual\(Application\)](#).
- When this FB receives an error code due to an error occurred in a motor driver, o_bUnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in o_uUnitErrId (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF i_bEN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the memory/device setting in the CPU parameter so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works3.
- After a home position return is started by using this FB, when turning OFF i_bEN (execution command) before o_bOK (normal completion), o_bErr (error completion), or o_bUnitErr (unit error completion) is turned ON, a motor continues to operate until a home position return is completed.
- This FB uses the CPRTCL instruction. For details, refer to  MELSEC iQ-R Programming Manual (Module Dedicated Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in i_uStartIONo (start I/O No.). If the start input/output number is not assigned to the module, the stop error of the CPU (2820H) occurs.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following parameters (module parameters of a serial communication module) to a module by using GX Works3.

Item		Setting value
Communication protocol setting		Predefined protocol
Communication speed setting		Set the value according to the setting of an electric actuator controller to be used.
Transmission setting	Data bit	8
	Parity bit	Yes
	Odd/even parity	Even
	Stop bit	1
Communication control specification	Echo back enable/prohibit specification	Echo back prohibit

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value


The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Subroutine type
- CPU module: R16CPU
- Serial communication module: RJ71C24-R4
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK
- Initial position: Home position (0.00 mm)

Time required for the processing*1	Maximum scan time	Number of scans required for the processing
1950.000 ms	0.588 ms	5604 scans

*1 The time required from start to end of the processing.

Error code

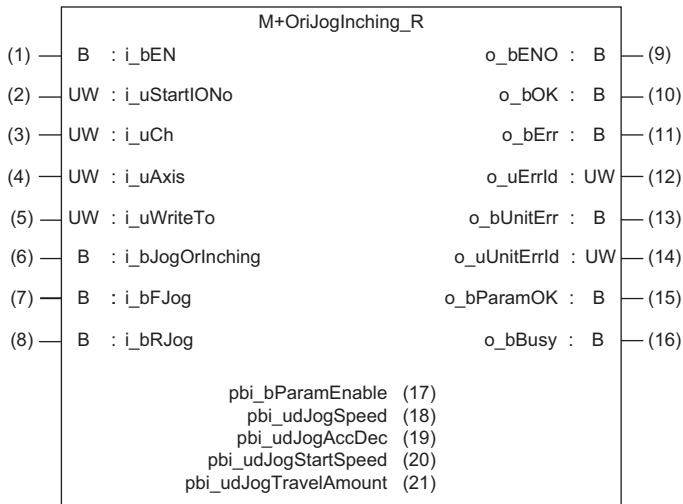
Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 1 or 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF i_bEN (execution command) until o_bOK (normal completion), o_bErr (error completion), or o_bUnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of a motor is executing.	Stop the FB and execute this FB again. Target FB: <ul style="list-style-type: none"> • M+OriStartHomePositioning_R • M+OriJogInching_R • M+OriStartPositioning_R For M+OriJogInching_R, check that o_bParamOK (parameter setting completion flag) is turned ON and o_bBusy (busy signal) is turned OFF.
203H	Emergency stop or major failure is occurring.	Check the status of the motor driver in M+OriMonitoring_R. After checking the status, remove the cause of the error and execute the FB again.
204H	Movement commands are executed while a servo or READY signal is OFF.	Check the status of the motor driver in M+OriMonitoring_R. To turn ON a servo, turn it ON with M+OriServoControl_R.
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  MELSEC iQ-R Serial Communication Module User's Manual(Application)

2.2 M+OriJogInching_R

Overview

Performs JOG or inching operation.

For AR/RKII series, inching operation will be performed even if JOG operation is specified.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_uStartIONo	Start I/O No.	Word [unsigned]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	i_uCh	Target channel	Word [unsigned]	1, 2	Specify the channel of a serial communication module.
(4)	i_uAxis	Target axis	Word [unsigned]	1 to 31	Specify an address number (slave address).
(5)	i_uWriteTo	Target controller	Word [unsigned]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2
(6)	i_bJogOrInching ^{*1}	JOG/Inching replacement	Bit	ON, OFF	ON: Inching operation OFF: JOG operation
(7)	i_bFJog	JOG + command	Bit	ON, OFF	Turn ON this label to perform the forward JOG or inching operation.
(8)	i_bRJog	JOG - command	Bit	ON, OFF	Turn ON this label to perform the reverse JOG or inching operation.

*1 For AR/RKII series, inching operation will be performed regardless of the value.

Output label

No.	Label	Name	Data type	Default value	Description
(9)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(10)	o_bOK	Normal completion	Bit	OFF	The ON state indicates that the JOG operation is started, and the inching operation is completed normally.
(11)	o_bErr	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(12)	o_uErrId	Error code	Word [unsigned]	0	The error code of an error occurred in the FB is stored.
(13)	o_bUnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(14)	o_uUnitErrId	Unit error code	Word [unsigned]	0	The error code of an error occurred in the module is stored.
(15)	o_bParamOK	Parameter setting completion flag	Bit	OFF	The ON state indicates that the initial settings until a motor driver is ready to operate are completed.
(16)	o_bBusy	Busy signal	Bit	OFF	The ON state indicates that a motor driver is operating.

Public variable

No.	Label	Name	Data type	Range	Description
(17)	pbi_bParamEnable	JOG parameter enable	Bit	ON/OFF	ON: Enable JOG parameters OFF: Disable JOG parameters
(18)	pbi_udJogSpeed	JOG operating speed	Double Word [unsigned]	<ul style="list-style-type: none"> • AR Series and RKII Series 1 to 1000000 • AZ Series 1 to 4000000 	Set the operating speed of JOG operation. (Unit: Hz)
(19)	pbi_udJogAccDec	Acceleration/ deceleration rate of JOG	Double Word [unsigned]	<ul style="list-style-type: none"> • AR Series and RKII Series 1 to 1000000 • AZ Series 1 to 100000000 	Set the acceleration/deceleration rate (acceleration/deceleration time) for JOG operation. (Unit: 0.001 ms/kHz or 0.001 s)
(20)	pbi_udJogStartSpeed	JOG starting speed	Double Word [unsigned]	<ul style="list-style-type: none"> • AR Series and RKII Series 0 to 1000000 • AZ Series 1 to 4000000 	Set the starting speed of JOG operation. (Unit: Hz)
(21)	pbi_udJogTravelAmount	JOG travel amount	Double Word [unsigned]	1 to 8388607	Set the travel amount of JOG operation. (Unit: Step)

FB details

Available device

Serial communication module

Target module	Firmware version	Engineering tool
RJ71C24	—	GX Works3 Version 1.055H or later
RJ71C24-R4	—	GX Works3 Version 1.055H or later

CPU module

RCPU

Basic specifications

Item	Description
Language	Structured Text
Number of basic steps	4141 steps The number of steps of the FB embedded in a program varies depending on a CPU module used, the input and output definitions, and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Number of points of a label used	<ul style="list-style-type: none">Label: 76 points (Word)Latch label: 0 point (Word) The number of points of a label used that is embedded in a program varies depending on a device specified for an argument and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Index register	Index register: 1 point (Z9)
FB dependence	No dependence
FB compilation method	Subroutine type
FB operation	Real-time execution

Processing

- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in `i_uStartIONo` (start I/O No.) and `i_uCh` (target channel) respectively.
- Specify the address number (slave address) of the operation target in `i_uAxis` (target axis).
- Specify the series of a target motor driver in `i_uWriteTo` (target controller).
- Set the following variables to set parameters for the JOG or inching operation.

Label	Setting content
<code>pbi_bParamEnable</code>	ON: Enable JOG parameters OFF: Disable JOG parameters
<code>pbi_udJogSpeed</code>	JOG operating speed
<code>pbi_udJogAccDec</code>	Acceleration/deceleration rate of JOG
<code>pbi_udJogStartSpeed</code>	JOG starting speed
<code>pbi_udJogTravelAmount</code>	JOG travel amount


- In this FB, when the JOG or inching operation is ready after writing parameters at the rise of `i_bEN` (execution command), `o_bParamOK` (parameter setting completion flag) is turned ON. (`o_bParamOK` is turned ON even if JOG parameters are disabled (OFF).)
- The inching operation command is executed until the operation is completed by turning ON `i_bJogOrInching` (JOG/Inching replacement) and at the rise of `i_bFJog` (JOG + command) or `i_bRJog` (JOG - command). When the operation is completed, `o_bOK` (normal completion) is turned ON.
- The JOG operation command is executed while `i_bJogOrInching` (JOG/Inching replacement) is turned OFF and `i_bFJog` (JOG + command) or `i_bRJog` (JOG - command) is turned ON. `o_bOK` (normal completion) is turned ON at the start of the operation. When `i_bFJog` (JOG + command) or `i_bRJog` (JOG - command) is turned OFF, the operation decelerates to stop and `o_bOK` (normal completion) is turned OFF.
- `o_bBusy` (busy signal) is turned ON while a motor driver is operating (during the inching or JOG operation).
- When a value out of the range is set for the start I/O number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in `o_uErrId` (error code).

- When a value out of the range is set for the target channel, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in o_uErrId (error code).
- When a value out of the range is set for the target axis, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in o_uErrId (error code).
- When a value out of the range is set for the JOG operating speed or JOG starting speed, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '103H' is stored in o_uErrId (error code).
- When a value out of the range is set for the JOG travel amount, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '104H' is stored in o_uErrId (error code).
- When a value out of the range is set for the acceleration/deceleration rate of JOG, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '107H' is stored in o_uErrId (error code).
- When a value out of the range is set for the target controller, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in o_uErrId (error code).
- When the connected device is not the operation target, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in o_uErrId (error code).
- When turning OFF i_bEN (execution command) before o_bParamOK (parameter setting completion flag) is turned ON, o_bErr (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in o_uErrId (error code) for one scan.
- When turning ON i_bEN (execution command) of this FB while executing any of the following FBs, o_bErr (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in o_uErrId (error code).

M+OriStartHomePositioning_R

M+OriJogInching_R

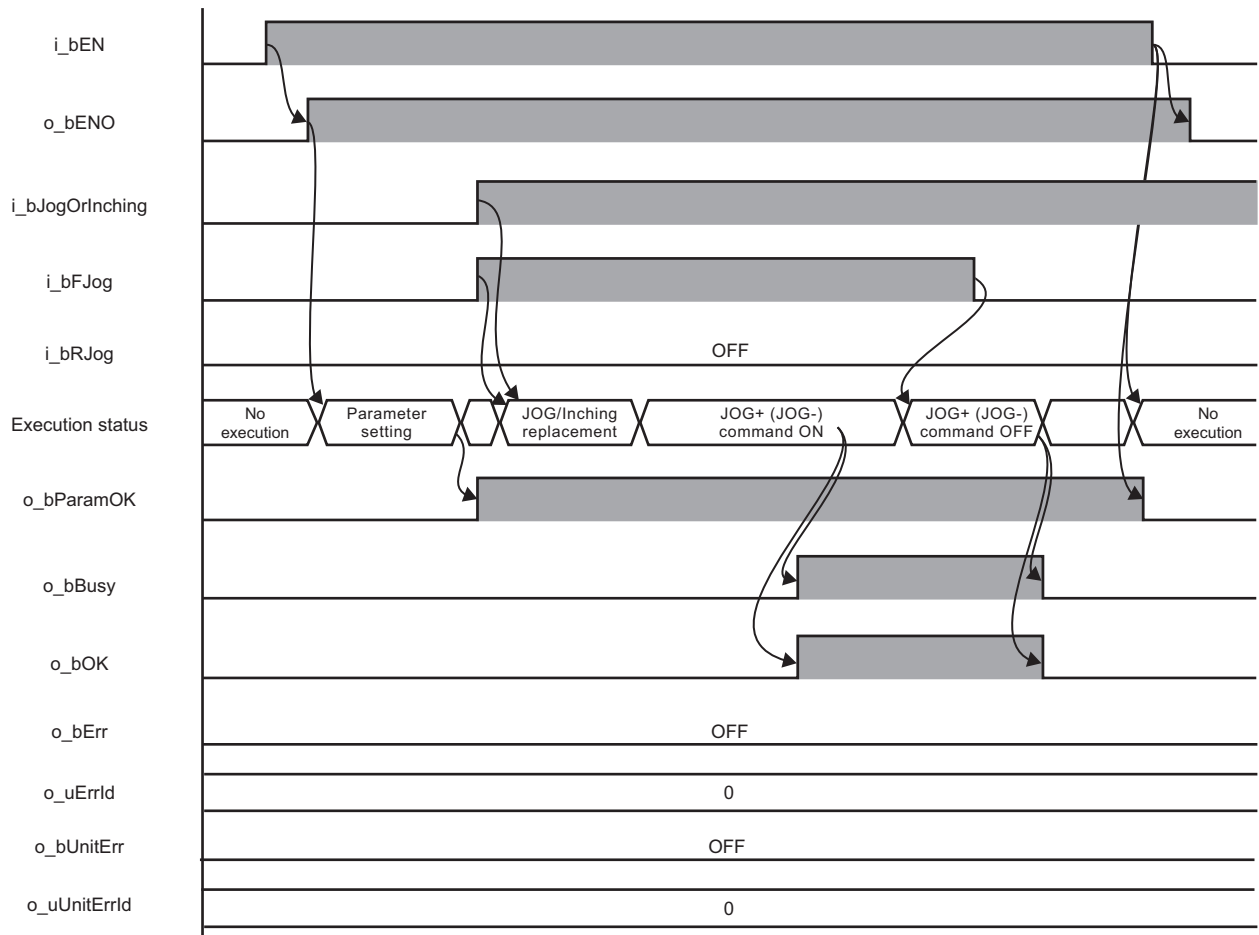
M+OriStartPositioning_R

- When an alarm signal of a motor driver is turned ON, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '203H' is stored in o_uErrId (error code). Check the status of the motor driver in M+OriMonitoring_R.
- When turning ON i_bEN (execution command) of this FB while the servo or READY signal of a target motor driver is OFF, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '204H' is stored in o_uErrId (error code).
- When an error occurs while sending/receiving a message to/from the predefined protocol, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. An error code is stored in o_uErrId (error code). For details on the error code, refer to  MELSEC iQ-R Serial Communication Module User's Manual(Application).
- When this FB receives an error code due to an error occurred in a motor driver, o_bUnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in o_uUnitErrId (unit error code).

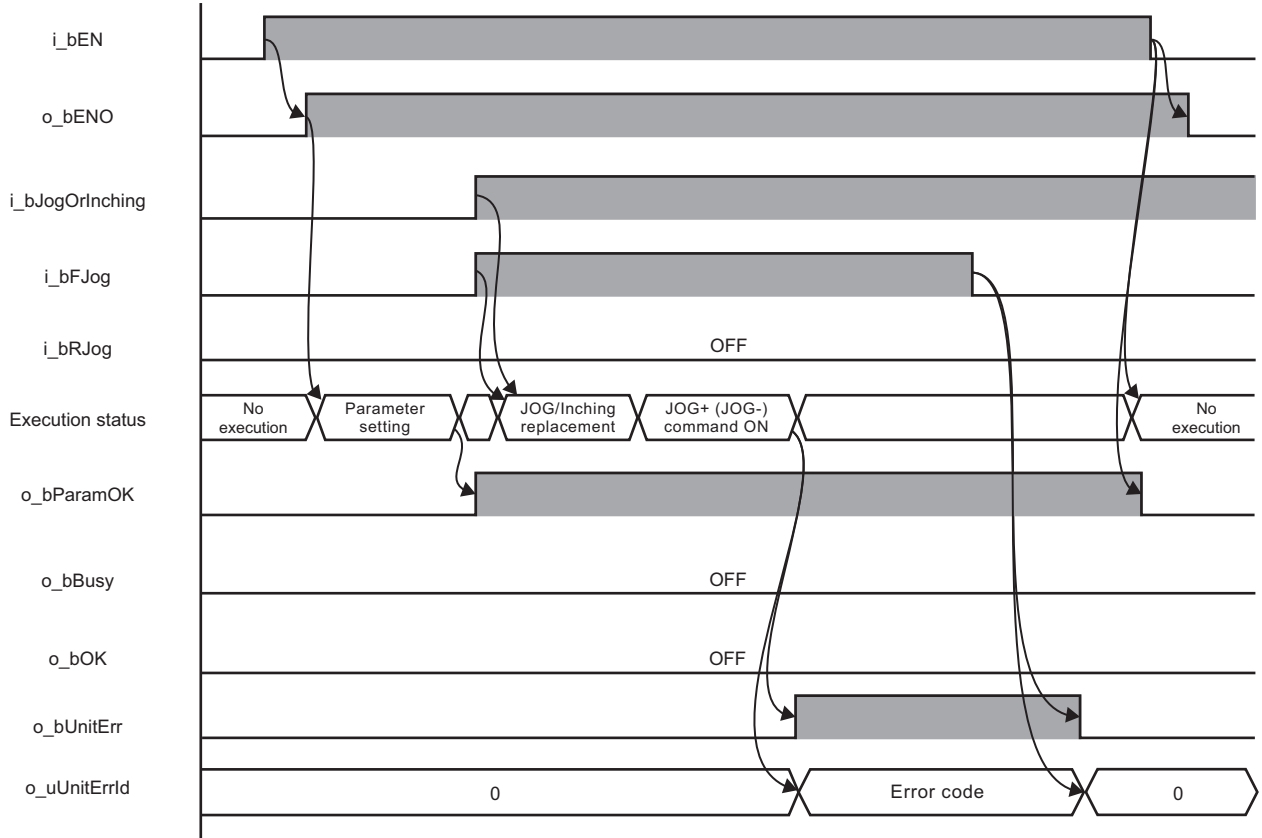
Timing chart of I/O signals

■ In normal completion


- For inching operation




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF i_bEN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the memory/device setting in the CPU parameter so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works3.
- JOG parameters, such as JOG speed, cannot be changed while i_bEN (execution command) is turned ON. To change the parameters, execute the FB again.
- Perform the JOG or inching operation after o_bParamOK (parameter setting completion flag) is turned ON.
- When the motor driver stops at the operation limit value, an error will not occur in this FB.
- When i_bFJog (JOG + command) or i_bRJog (JOG - command) is turned ON before o_bParamOK (parameter setting completion flag) is turned ON, JOG + (-) command is ignored. Turn ON the JOG + (-) command again.
- When turning OFF i_bEN (execution command) while a motor is operating, the motor continues to operate. Prepare a program for the operation of the motor separately in accordance with the required system operation.
- This FB uses the CPRTCL instruction. For details, refer to  MELSEC iQ-R Programming Manual (Module Dedicated Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in i_uStartIONo (start I/O No.). If the start input/output number is not assigned to the module, the stop error of the CPU (2820H) occurs.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following parameters (module parameters of a serial communication module) to a module by using GX Works3.

Item		Setting value
Communication protocol setting		Predefined protocol
Communication speed setting		Set the value according to the setting of an electric actuator controller to be used.
Transmission setting	Data bit	8
	Parity bit	Yes
	Odd/even parity	Even
	Stop bit	1
Communication control specification	Echo back enable/prohibit specification	Echo back prohibit

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value


The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Subroutine type
- CPU module: R16CPU
- Serial communication module: RJ71C24-R4
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK
- JOG speed: 10.00 mm/sec
- Inching amount of movement: 0.10 mm

Measuring range	Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
From when i_bEN (execution command) is turned ON to when o_bParamOK (parameter setting completion flag) is turned ON	36.300 ms	0.473 ms	110 scans
From when i_bFJog (JOG + command) or i_bRJog (JOG - command) is turned ON to when JOG operation starts	37.300 ms	0.485 ms	112 scans
From when i_bFJog (JOG + command) or i_bRJog (JOG - command) is turned ON to when inching movement completes	37.100 ms	0.604 ms	111 scans

*1 The time required from start to end of the processing.

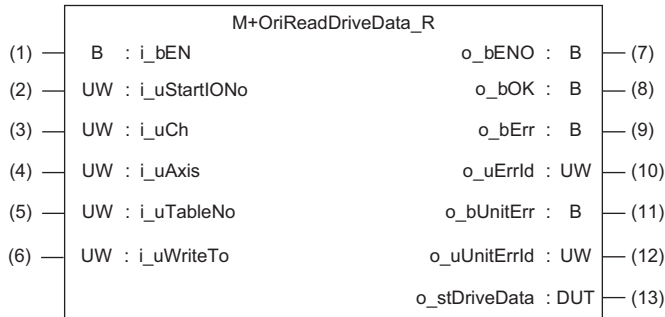
Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 1 or 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
103H	The value set for the JOG operating speed or JOG starting speed is out of the range.	Set a value within the range from 1 to 1000000 for the JOG operating speed and a value within the range from 0 to 1000000 for the JOG starting speed, and execute the FB again.
104H	The value set for the JOG travel amount is out of the range.	Set a value within the range from 1 to 8388607 for the JOG travel amount and execute the FB again.
107H	The value set for the acceleration/deceleration rate of JOG is out of the range.	Set a value within the range from 1 to 1000000 for the acceleration/deceleration rate of JOG and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF i_bEN (execution command) until o_bParamOK (parameter setting completion flag) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of a motor is executing.	Stop the FB and execute this FB again. Target FB: • M+OriStartHomePositioning_R • M+OriJogInching_R • M+OriStartPositioning_R For M+OriJogInching_R, check that o_bParamOK (parameter setting completion flag) is turned ON and o_bBusy (busy signal) is turned OFF.
203H	Emergency stop or major failure is occurring.	Check the status of the motor driver in M+OriMonitoring_R. After checking the status, remove the cause of the error and execute the FB again.
204H	Movement commands are executed while a servo or READY signal is OFF.	Check the status of the motor driver in M+OriMonitoring_R. To turn ON a servo, turn it ON with M+OriServoControl_R.
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  MELSEC iQ-R Serial Communication Module User's Manual(Application)

2.3 M+OriReadDriveData_R

Overview

Reads the specified drive data.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_uStartIONo	Start I/O No.	Word [unsigned]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	i_uCh	Target channel	Word [unsigned]	1, 2	Specify the channel of a serial communication module.
(4)	i_uAxis	Target axis	Word [unsigned]	1 to 31	Specify an address number (slave address).
(5)	i_uTableNo	Drive data No.	Word [unsigned]	0 to 63	Specify the drive data from which the setting value is to be read.
(6)	i_uWriteTo	Target controller	Word [unsigned]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2

Output label

No.	Label	Name	Data type	Default value	Description
(7)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(8)	o_bOK	Normal completion	Bit	OFF	The ON state indicates that reading drive data is completed.
(9)	o_bErr	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(10)	o_uErrId	Error code	Word [unsigned]	0	The error code of an error occurred in the FB is stored.
(11)	o_bUnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(12)	o_uUnitErrId	Unit error code	Word [unsigned]	0	The error code of an error occurred in the module is stored.
(13)	o_stDriveData	Drive data	Structure (stOriDriveData)	—	For details, refer to the following: 📖 Page 102 Drive data structure (stOriDriveData)

FB details

Available device

Serial communication module

Target module	Firmware version	Engineering tool
RJ71C24	—	GX Works3 Version 1.055H or later
RJ71C24-R4	—	GX Works3 Version 1.055H or later

CPU module

RCP

Basic specifications

Item	Description
Language	Structured Text
Number of basic steps	4268 steps The number of steps of the FB embedded in a program varies depending on a CPU module used, the input and output definitions, and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Number of points of a label used	<ul style="list-style-type: none">Label: 104 points (Word)Latch label: 0 point (Word) The number of points of a label used that is embedded in a program varies depending on a device specified for an argument and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Index register	Index register: 1 point (Z9)
FB dependence	No dependence
FB compilation method	Subroutine type
FB operation	Pulse execution (multiple scan execution type)

Processing

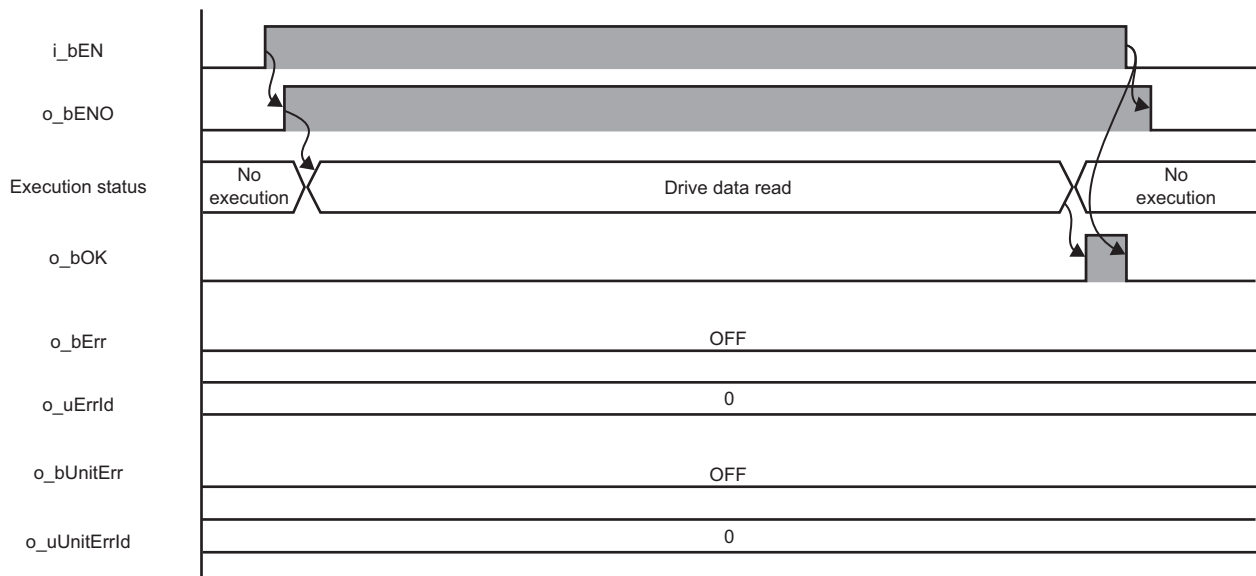
- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in `i_uStartIONo` (start I/O No.) and `i_uCh` (target channel) respectively.
- Specify the address number (slave address) of the operation target in `i_uAxis` (target axis).
- Specify the series of a target motor driver in `i_uWriteTo` (target controller).
- Specify the drive data number of drive data to be read in `i_uTableNo` (drive data No.).
- This FB reads the setting data of the specified drive data number for a motor driver at the rise of `i_bEN` (execution command).
- `o_bOK` (normal completion) is turned ON when reading the setting data of drive data number is completed.
- When a value out of the range is set for the start I/O number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target channel, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target axis, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the drive data number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '105H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target controller, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in `o_uErrId` (error code).
- When the connected device is not the operation target, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in `o_uErrId` (error code).
- When turning OFF `i_bEN` (execution command) before `o_bOK` (normal completion), `o_bErr` (error completion), or `o_bUnitErr` (unit error completion) is turned ON, `o_bErr` (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in `o_uErrId` (error code) for one scan.
- When turning ON `i_bEN` (execution command) of this FB while executing the following FB, `o_bErr` (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in `o_uErrId` (error code).

M+OriReadDriveData_R

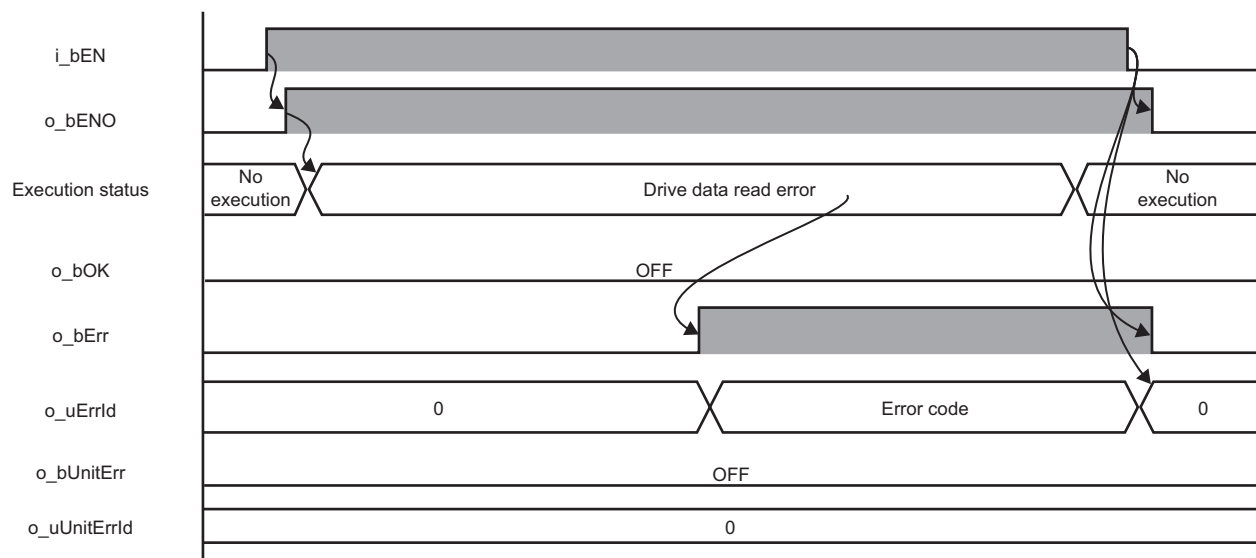
- When an error occurs while sending/receiving a message to/from the predefined protocol, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. An error code is stored in o_uErrId (error code). For details on the error code, refer to [MELSEC iQ-R Serial Communication Module User's Manual\(Application\)](#).
- When this FB receives an error code due to an error occurred in a motor driver, o_bUnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in o_uUnitErrId (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF i_bEN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the memory/device setting in the CPU parameter so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works3.
- This FB uses the CPRTCL instruction. For details, refer to  MELSEC iQ-R Programming Manual (Module Dedicated Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in i_uStartIONo (start I/O No.). If the start input/output number is not assigned to the module, the stop error of the CPU (2820H) occurs.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following parameters (module parameters of a serial communication module) to a module by using GX Works3.

Item		Setting value
Communication protocol setting		Predefined protocol
Communication speed setting		Set the value according to the setting of an electric actuator controller to be used.
Transmission setting	Data bit	8
	Parity bit	Yes
	Odd/even parity	Even
	Stop bit	1
Communication control specification	Echo back enable/prohibit specification	Echo back prohibit

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value


The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Subroutine type
- CPU module: R16CPU
- Serial communication module: RJ71C24-R4
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK

Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
29.300 ms	0.459 ms	90 scans

*1 The time required from start to end of the processing.

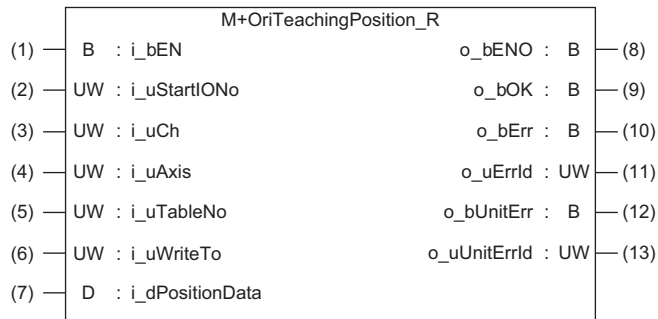
Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 1 or 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
105H	The value set for the drive data number is out of the range.	Set a value within the range from 0 to 63 for the drive data number and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF i_bEN (execution command) until o_bOK (normal completion), o_bErr (error completion), or o_bUnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of this FB is executing.	Stop the FB and execute this FB again. Target FB: • M+OriReadDriveData_R
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  MELSEC iQ-R Serial Communication Module User's Manual(Application)

2.4 M+OriTeachingPosition_R

Overview

Sets the designated position to the position of the specified drive data number.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_uStartIONo	Start I/O No.	Word [unsigned]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	i_uCh	Target channel	Word [unsigned]	1, 2	Specify the channel of a serial communication module.
(4)	i_uAxis	Target axis	Word [unsigned]	1 to 31	Specify an address number (slave address).
(5)	i_uTableNo	Drive data No.	Word [unsigned]	0 to 63	Specify the drive data number of drive data to which the setting value is to be written.
(6)	i_uWriteTo	Target controller	Word [unsigned]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2
(7)	i_dPositionData	Position data	Double Word [signed]	<ul style="list-style-type: none"> • AR Series and RKII Series -8388608 to 8388607 • AZ Series -2147483648 to 2147483647 	Specify the position data to be set.

Output label

No.	Label	Name	Data type	Default value	Description
(8)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(9)	o_bOK	Normal completion	Bit	OFF	The ON state indicates that the drive data setting is completed.
(10)	o_bErr	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(11)	o_uErrId	Error code	Word [unsigned]	0	The error code of an error occurred in the FB is stored.
(12)	o_bUnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(13)	o_uUnitErrId	Unit error code	Word [unsigned]	0	The error code of an error occurred in the module is stored.

FB details

Available device



■ Serial communication module

Target module	Firmware version	Engineering tool
RJ71C24	—	GX Works3 Version 1.055H or later
RJ71C24-R4	—	GX Works3 Version 1.055H or later

■ CPU module


RCPU

Basic specifications

Item	Description
Language	Structured Text
Number of basic steps	2281 steps The number of steps of the FB embedded in a program varies depending on a CPU module used, the input and output definitions, and the option settings of GX Works3. For the option settings of GX Works3, refer to  GX Works3 Operating Manual.
Number of points of a label used	• Label: 52 points (Word) • Latch label: 0 point (Word) The number of points of a label used that is embedded in a program varies depending on a device specified for an argument and the option settings of GX Works3. For the option settings of GX Works3, refer to  GX Works3 Operating Manual.
Index register	Index register: 1 point (Z9)
FB dependence	No dependence
FB compilation method	Subroutine type
FB operation	Pulse execution (multiple scan execution type)

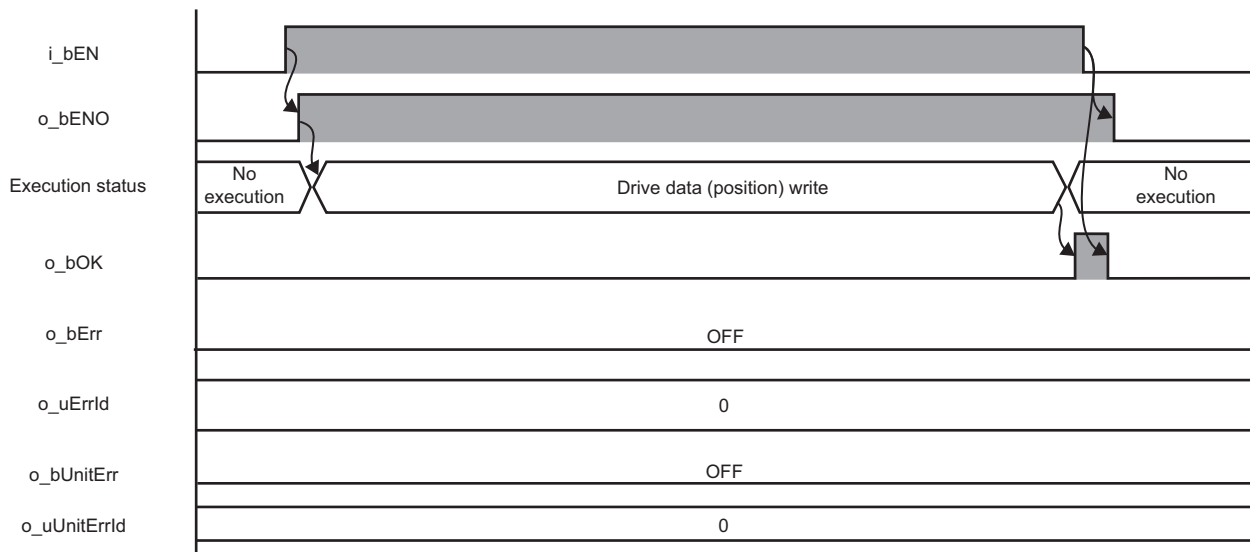
Processing

- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in `i_uStartIONo` (start I/O No.) and `i_uCh` (target channel) respectively.
- Specify the address number (slave address) of the operation target in `i_uAxis` (target axis).
- Specify the series of a target motor driver in `i_uWriteTo` (target controller).
- Specify the drive data number of drive data to be set in `i_uTableNo` (drive data No.).
- Set the position information of the specified drive data number to `i_dPositionData` (position data).
- This FB writes the position information to the position data of the specified drive data number of a motor driver at the rise of `i_bEN` (execution command).
- `o_bOK` (normal completion) is turned ON when writing the setting data of drive data number is completed.
- When a value out of the range is set for the start I/O number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target channel, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target axis, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the drive data number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '105H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the position data, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '106H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target controller, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in `o_uErrId` (error code).
- When the connected device is not the operation target, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in `o_uErrId` (error code).
- When turning OFF `i_bEN` (execution command) before `o_bOK` (normal completion), `o_bErr` (error completion), or `o_bUnitErr` (unit error completion) is turned ON, `o_bErr` (error completion) is turned ON for one scan only and the

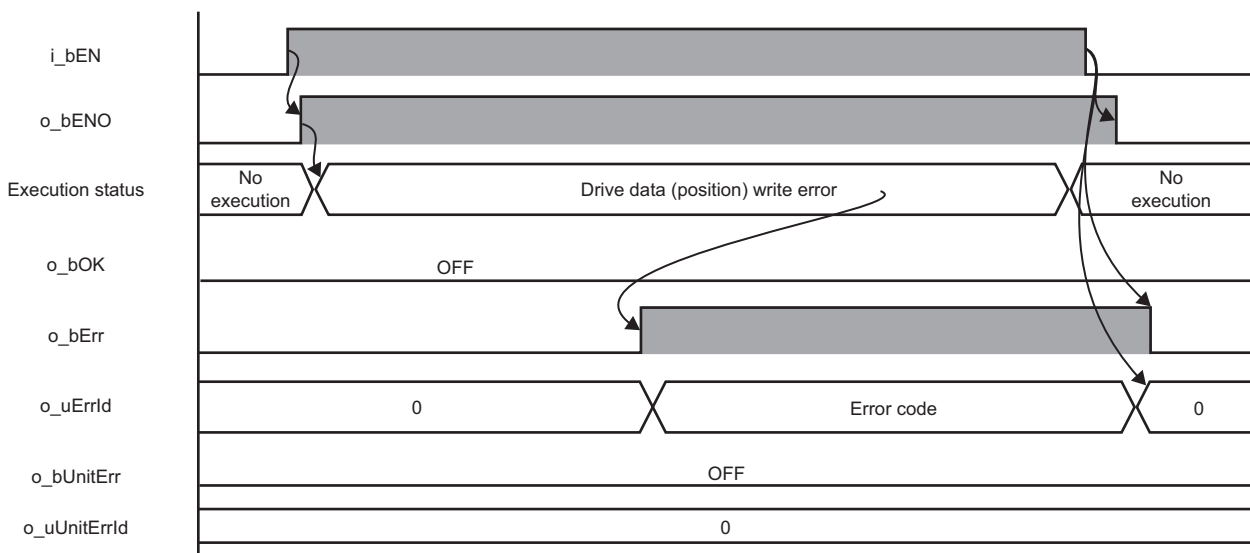
- processing of the FB is interrupted. In addition, the error code '201H' is stored in o_uErrId (error code) for one scan.
- When turning ON i_bEN (execution command) of this FB while executing the following FB, o_bErr (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in o_uErrId (error code). M+OriTeachingPosition_R
 - When an error occurs while sending/receiving a message to/from the predefined protocol, o_bErr (error completion) is turned ON and the processing of the FB is interrupted. An error code is stored in o_uErrId (error code). For details on the error code, refer to  MELSEC iQ-R Serial Communication Module User's Manual(Application).
 - When this FB receives an error code due to an error occurred in a motor driver, o_bUnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in o_uUnitErrId (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB writes data into the non-volatile (NV) memory. The NV memory is limited in the number of times data can be written to it. For details, refer to the manual of the motor driver used.
- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF i_bEN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the memory/device setting in the CPU parameter so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works3.
- This FB uses the CPRTCL instruction. For details, refer to  MELSEC iQ-R Programming Manual (Module Dedicated Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in i_uStartIONo (start I/O No.). If the start input/output number is not assigned to the module, the stop error of the CPU (2820H) occurs.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following parameters (module parameters of a serial communication module) to a module by using GX Works3.

Item		Setting value
Communication protocol setting		Predefined protocol
Communication speed setting		Set the value according to the setting of an electric actuator controller to be used.
Transmission setting	Data bit	8
	Parity bit	Yes
	Odd/even parity	Even
	Stop bit	1
Communication control specification	Echo back enable/prohibit specification	Echo back prohibit

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value


The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Subroutine type
- CPU module: R16CPU
- Serial communication module: RJ71C24-R4
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK

Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
46.600 ms	0.511 ms	150 scans

*1 The time required from start to end of the processing.

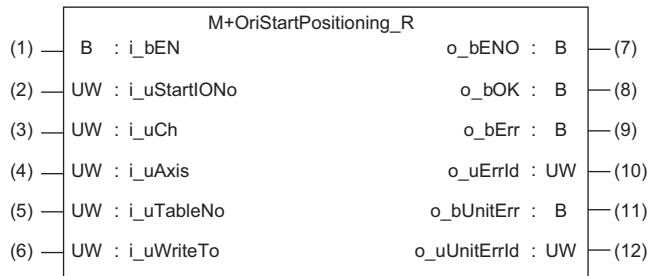
Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 1 or 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
105H	The value set for the drive data number is out of the range.	Set a value within the range from 0 to 63 for the drive data number and execute the FB again.
106H	The value set for the position data is out of the range.	Set a value within the range from -2147483648 to 2147483647 for the position data and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for a writing destination motor driver and execute the FB again.
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF i_bEN (execution command) until o_bOK (normal completion), o_bErr (error completion), or o_bUnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of this FB is executing.	Stop the FB and execute this FB again. Target FB: • M+OriTeachingPosition_R
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  MELSEC iQ-R Serial Communication Module User's Manual(Application)

2.5 M+OriStartPositioning_R

Overview

Executes positioning operation based on the data of the specified drive data number.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_uStartIONo	Start I/O No.	Word [unsigned]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	i_uCh	Target channel	Word [unsigned]	1, 2	Specify the channel of a serial communication module.
(4)	i_uAxis	Target axis	Word [unsigned]	1 to 31	Specify an address number (slave address).
(5)	i_uTableNo	Drive data No.	Word [unsigned]	0 to 63	Specify the drive data number of drive data whose positioning operation is to be executed.
(6)	i_uWriteTo	Target controller	Word [unsigned]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2

Output label

No.	Label	Name	Data type	Default value	Description
(7)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(8)	o_bOK	Normal completion	Bit	OFF	The ON state indicates that positioning operation is completed.
(9)	o_bErr	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(10)	o_uErrId	Error code	Word [unsigned]	0	The error code of an error occurred in the FB is stored.
(11)	o_bUnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(12)	o_uUnitErrId	Unit error code	Word [unsigned]	0	The error code of an error occurred in the module is stored.

FB details

Available device

■ Serial communication module

Target module	Firmware version	Engineering tool
RJ71C24	—	GX Works3 Version 1.055H or later
RJ71C24-R4	—	GX Works3 Version 1.055H or later

■ CPU module

RCPU

Basic specifications

Item	Description
Language	Structured Text
Number of basic steps	2956 steps The number of steps of the FB embedded in a program varies depending on a CPU module used, the input and output definitions, and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Number of points of a label used	<ul style="list-style-type: none">• Label: 56 points (Word)• Latch label: 0 point (Word) The number of points of a label used that is embedded in a program varies depending on a device specified for an argument and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Index register	Index register: 1 point (Z9)
FB dependence	No dependence
FB compilation method	Subroutine type
FB operation	Pulse execution (multiple scan execution type)


Processing

- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in `i_uStartIONo` (start I/O No.) and `i_uCh` (target channel) respectively.
- Specify the address number (slave address) of the operation target in `i_uAxis` (target axis).
- Specify the series of a target motor driver in `i_uWriteTo` (target controller).
- Set the drive data number to be executed in `i_uTableNo` (drive data No.).
- This FB starts the positioning operation of the specified drive data number for a motor driver at the rise of `i_bEN` (execution command).
- `o_bOK` (normal completion) is turned ON when the positioning operation of the drive data number is completed.
- When a value out of the range is set for the start I/O number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target channel, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target axis, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the drive data number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '105H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target controller, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in `o_uErrId` (error code).
- When the connected device is not the operation target, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in `o_uErrId` (error code).
- When turning OFF `i_bEN` (execution command) before `o_bOK` (normal completion), `o_bErr` (error completion), or `o_bUnitErr` (unit error completion) is turned ON, `o_bErr` (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in `o_uErrId` (error code) for one scan.
- When turning ON `i_bEN` (execution command) of this FB while executing any of the following FBs, `o_bErr` (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in `o_uErrId` (error code).

`M+OriStartHomePositioning_R`

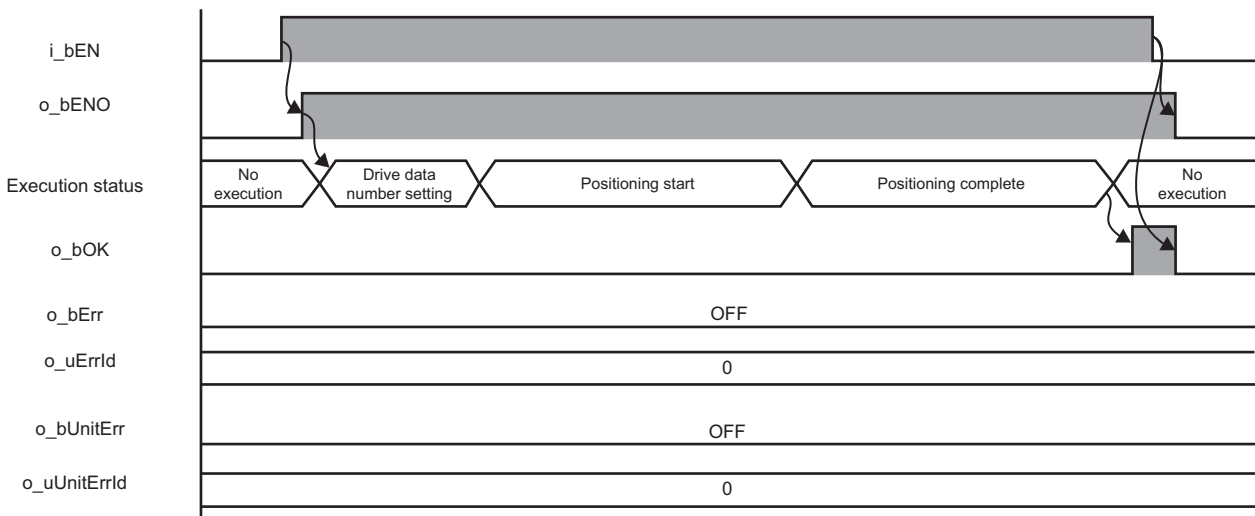
`M+OriJogInching_R`

`M+OriStartPositioning_R`

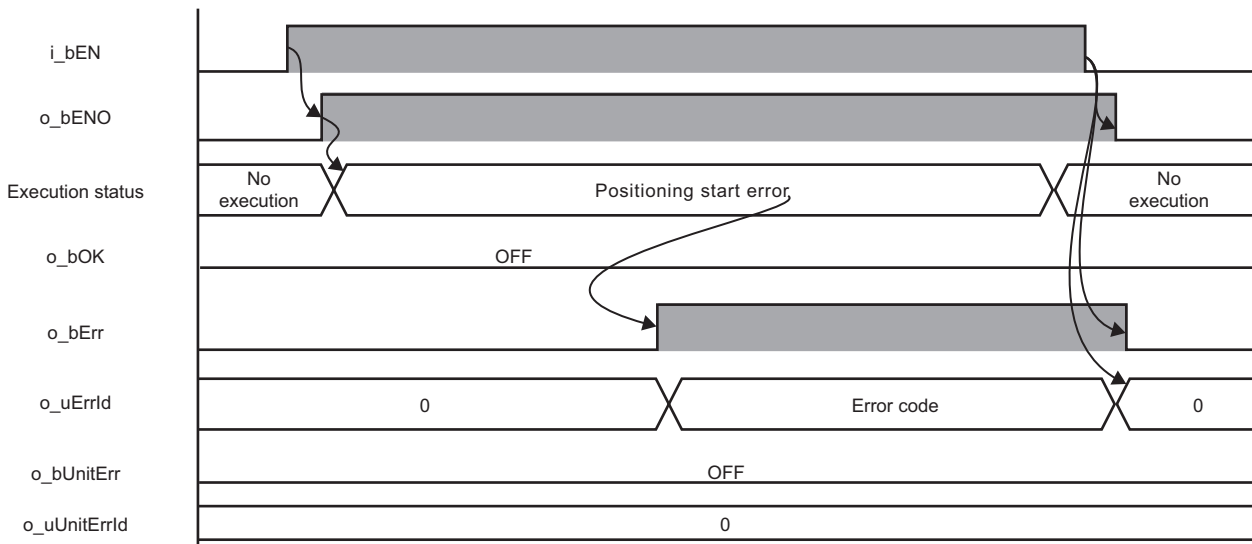
- When an alarm signal of a motor driver is turned ON, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '203H' is stored in `o_uErrId` (error code). Check the status of the motor driver in `M+OriMonitoring_R`.
- When turning ON `i_bEN` (execution command) of this FB while the servo or READY signal of a target motor driver is OFF, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '204H' is stored in `o_uErrId` (error code).
- When an error occurs while sending/receiving a message to/from the predefined protocol, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. An error code is stored in `o_uErrId` (error code). For details on the error code, refer to  MELSEC iQ-R Serial Communication Module User's Manual(Application).
- When this FB receives an error code due to an error occurred in a motor driver, `o_bUnitErr` (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in `o_uUnitErrId` (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF i_bEN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the memory/device setting in the CPU parameter so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works3.
- After positioning operation is started by using this FB, when turning OFF i_bEN (execution command) before o_bOK (normal completion), o_bErr (error completion), or o_bUnitErr (unit error completion) is turned ON, a motor continues to operate until a home position return is completed.
- After turning ON the power, when this FB is operated without executing a home position return, positioning operation is performed automatically after executing the home position return.
- This FB uses the CPRTCL instruction. For details, refer to  MELSEC iQ-R Programming Manual (Module Dedicated Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in i_uStartIONo (start I/O No.). If the start input/output number is not assigned to the module, the stop error of the CPU (2820H) occurs.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following parameters (module parameters of a serial communication module) to a module by using GX Works3.

Item	Setting value	
Communication protocol setting	Predefined protocol	
Communication speed setting	Set the value according to the setting of an electric actuator controller to be used.	
Transmission setting	Data bit	8
	Parity bit	Yes
	Odd/even parity	Even
	Stop bit	1
Communication control specification	Echo back enable/prohibit specification	Echo back prohibit

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value


The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Subroutine type
- CPU module: R16CPU
- Serial communication module: RJ71C24-R4
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK
- Initial position: Home position (0.00 mm)
- Drive data execution setting:
 - Target position: 0.00 mm
 - Speed: 10.00 mm/sec
 - Acceleration: 0.1 G
 - Deceleration: 0.1 G
 - Other setting value: 0

Timing for turning execution command ON	Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
After executing home position return	73.300 ms	0.468 ms	274 scans

*1 The time required from start to end of the processing.

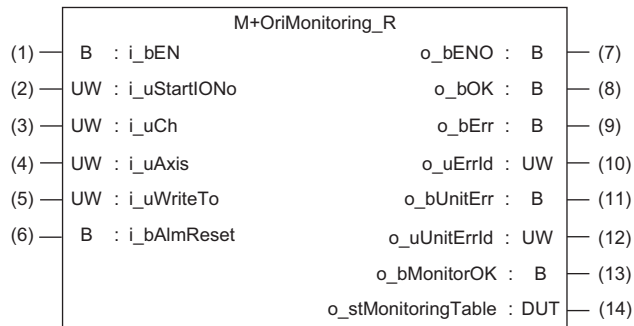
Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 1 or 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
105H	The value set for the drive data number is out of the range.	Set a value within the range from 0 to 63 for the drive data number and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for a writing destination motor driver and execute the FB again.
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF i_bEN (execution command) until o_bOK (normal completion), o_bErr (error completion), or o_bUnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of a motor is executing.	Stop the FB and execute this FB again. Target FB: <ul style="list-style-type: none"> • M+OriStartHomePositioning_R • M+OriJogInching_R • M+OriStartPositioning_R For M+OriJogInching_R, check that o_bParamOK (parameter setting completion flag) is turned ON and o_bBusy (busy signal) is turned OFF.
203H	Emergency stop or major failure is occurring.	Check the status of the motor driver in M+OriMonitoring_R. After checking the status, remove the cause of the error and execute the FB again.
204H	Movement commands are executed while a servo or READY signal is OFF.	Check the status of the motor driver in M+OriMonitoring_R. To turn ON a servo, turn it ON with M+OriServoControl_R.
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  MELSEC iQ-R Serial Communication Module User's Manual(Application)

2.6 M+OriMonitoring_R

Overview

Monitors a current position and alarms, and resets the alarms.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_uStartIONo	Start I/O No.	Word [unsigned]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	i_uCh	Target channel	Word [unsigned]	1, 2	Specify the channel of a serial communication module.
(4)	i_uAxis	Target axis	Word [unsigned]	1 to 31	Specify an address number (slave address).
(5)	i_uWriteTo	Target controller	Word [unsigned]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2
(6)	i_bAlmReset	Reset alarm	Bit	ON, OFF	ON: An alarm is reset. OFF: An alarm does not operate.

Output label

No.	Label	Name	Data type	Default value	Description
(7)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(8)	o_bOK	Normal completion	Bit	OFF	The ON state indicates that an alarm is cleared normally.
(9)	o_bErr	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(10)	o_uErrId	Error code	Word [unsigned]	0	The error code of an error occurred in the FB is stored.
(11)	o_bUnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(12)	o_uUnitErrId	Unit error code	Word [unsigned]	0	The error code of an error occurred in the module is stored.
(13)	o_bMonitorOK	Monitoring status	Bit	OFF	The ON state indicates that a current position and alarms are monitored normally.
(14)	o_stMonitoringTable	Monitoring table	Structure (stOriMonitoringTable)	—	For details, refer to the following: ☞ Page 103 Monitoring table structure (stOriMonitoringTable)

FB details

Available device

■ Serial communication module

Target module	Firmware version	Engineering tool
RJ71C24	—	GX Works3 Version 1.055H or later
RJ71C24-R4	—	GX Works3 Version 1.055H or later

■ CPU module

RCPU

Basic specifications

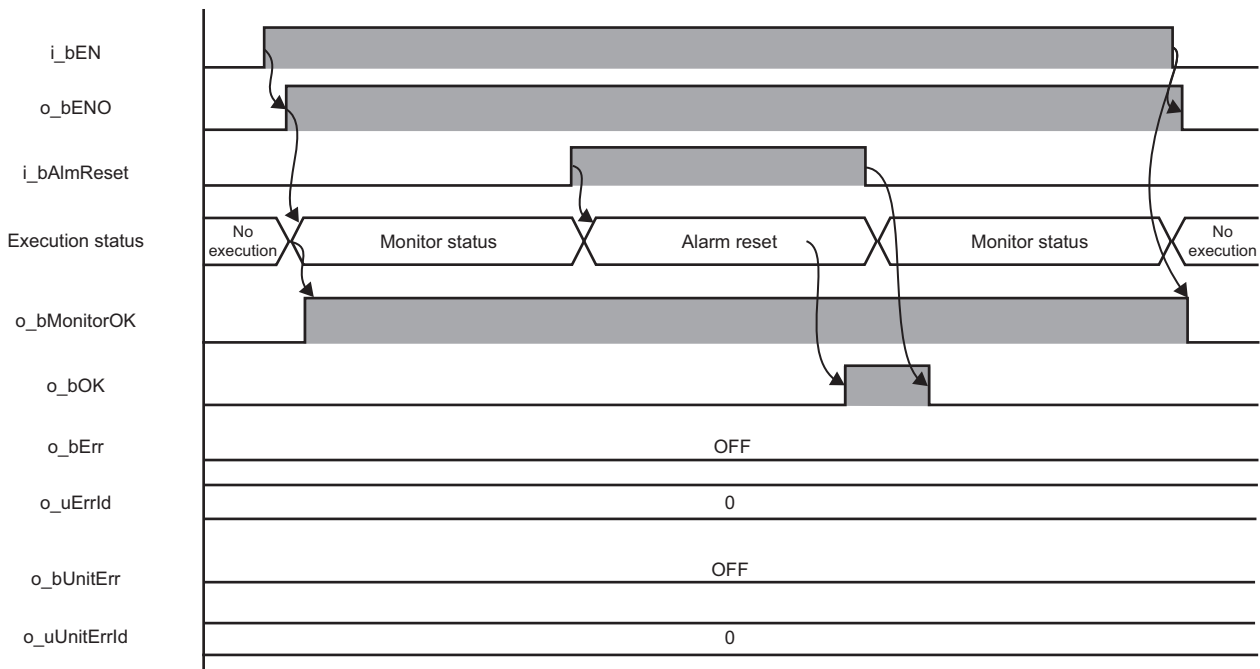
Item	Description
Language	Structured Text
Number of basic steps	5030 steps The number of steps of the FB embedded in a program varies depending on a CPU module used, the input and output definitions, and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Number of points of a label used	<ul style="list-style-type: none">• Label: 96 points (Word)• Latch label: 0 point (Word) The number of points of a label used that is embedded in a program varies depending on a device specified for an argument and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Index register	Index register: 1 point (Z9)
FB dependence	No dependence
FB compilation method	Subroutine type
FB operation	Real-time execution

Processing

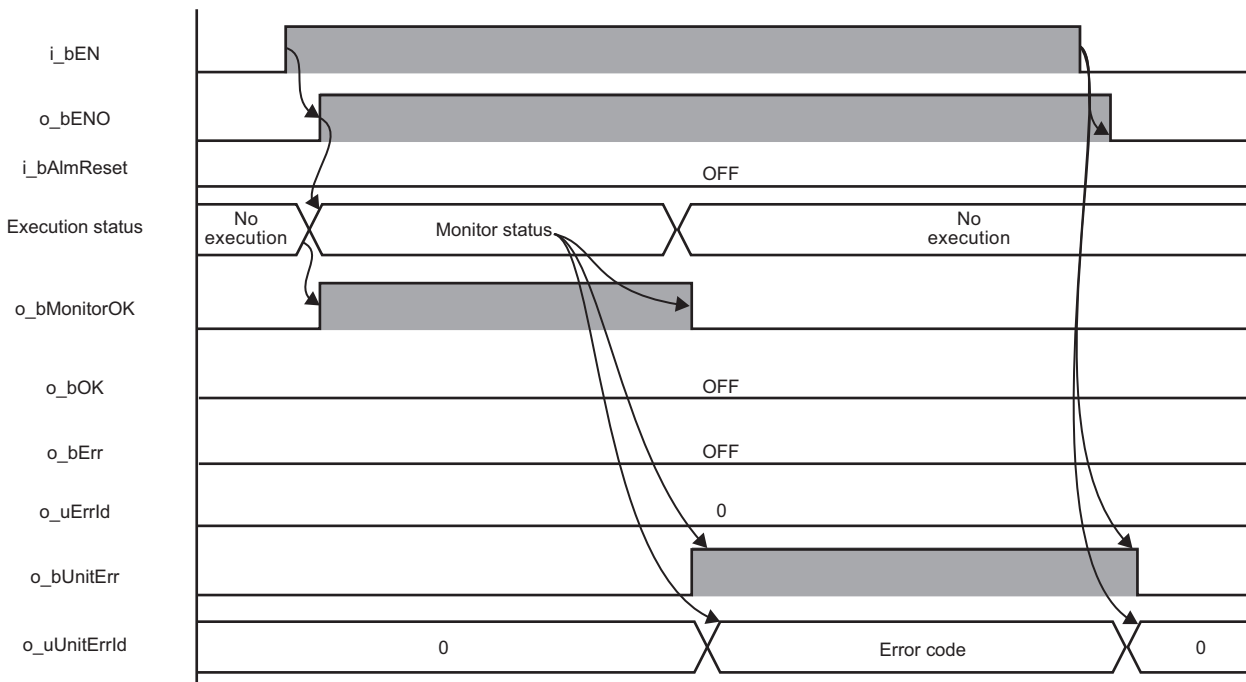
- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in `i_uStartIONo` (start I/O No.) and `i_uCh` (target channel) respectively.
- Specify the address number (slave address) of the operation target in `i_uAxis` (target axis).
- Specify the series of a target motor driver in `i_uWriteTo` (target controller).
- This FB starts monitoring a target axis at the rise of `i_bEN` (execution command). The monitoring data (such as a current position and alarm codes) is stored in `o_stMonitoringTable` (monitoring table).
- `o_bMonitorOK` (monitoring status) is turned ON while monitoring the target axis.
- The alarm is reset by turning ON `i_bEN` (execution command), and then turning ON `i_bAlmReset` (reset alarm) while the alarm is occurring.
- `o_bOK` (normal completion) is turned ON when the alarm reset is completed.
- When a value out of the range is set for the start I/O number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target channel, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target axis, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target controller, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in `o_uErrId` (error code).
- When the connected device is not the operation target, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in `o_uErrId` (error code).
- When turning ON `i_bEN` (execution command) of this FB while executing the following FB, `o_bErr` (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in `o_uErrId` (error code).
`M+OriMonitoring_R`
- When an error occurs while sending/receiving a message to/from the predefined protocol, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. An error code is stored in `o_uErrId` (error code). For details on the error code, refer to  MELSEC iQ-R Serial Communication Module User's Manual(Application).
- When this FB receives an error code due to an error occurred in a motor driver, `o_bUnitErr` (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in `o_uUnitErrId` (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF i_bEN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the memory/device setting in the CPU parameter so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works3.
- This FB uses the CPRTCL instruction. For details, refer to  MELSEC iQ-R Programming Manual (Module Dedicated Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in i_uStartIONo (start I/O No.). If the start input/output number is not assigned to the module, the stop error of the CPU (2820H) occurs.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following parameters (module parameters of a serial communication module) to a module by using GX Works3.

Item		Setting value
Communication protocol setting		Predefined protocol
Communication speed setting		Set the value according to the setting of an electric actuator controller to be used.
Transmission setting	Data bit	8
	Parity bit	Yes
	Odd/even parity	Even
	Stop bit	1
Communication control specification	Echo back enable/prohibit specification	Echo back prohibit

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value


The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Subroutine type
- CPU module: R16CPU
- Serial communication module: RJ71C24-R4
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK

Measuring range	Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
From when i_bEN (execution command) turns ON to when o_bMonitorOK (monitoring status) turns ON	96.500 ms	0.505 ms	293 scans
From when i_bAlmReset (reset alarm) turns ON to when an alarm reset is completed	160.000 ms	0.615 ms	243 scans

*1 The time required from start to end of the processing.

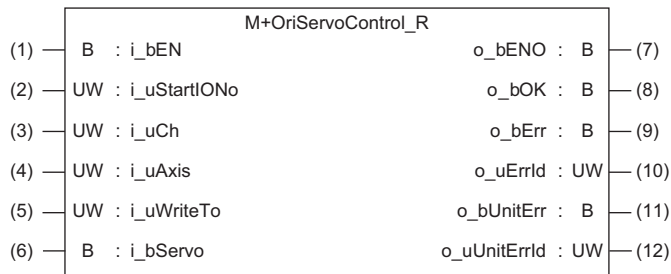
Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 1 or 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
202H	Another FB which may affect the operation of this FB is executing.	Stop the FB and execute this FB again. Target FB: • M+OriMonitoring_R
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  MELSEC iQ-R Serial Communication Module User's Manual(Application)

2.7 M+OriServoControl_R

Overview

Requests a servo to turn ON or OFF.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	i_bEN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	i_uStartIONo	Start I/O No.	Word [unsigned]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	i_uCh	Target channel	Word [unsigned]	1, 2	Specify the channel of a serial communication module.
(4)	i_uAxis	Target axis	Word [unsigned]	1 to 31	Specify an address number (slave address).
(5)	i_uWriteTo	Target controller	Word [unsigned]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2
(6)	i_bServo	Servo ON/OFF replacement	Bit	ON, OFF	ON: Servo ON OFF: Servo OFF

Output label

No.	Label	Name	Data type	Default value	Description
(7)	o_bENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(8)	o_bOK	Normal completion	Bit	OFF	The ON state indicates that the execution of servo ON or OFF command is completed.
(9)	o_bErr	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(10)	o_uErrId	Error code	Word [unsigned]	0	The error code of an error occurred in the FB is stored.
(11)	o_bUnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(12)	o_uUnitErrId	Unit error code	Word [unsigned]	0	The error code of an error occurred in the module is stored.

FB details

Available device

■ Serial communication module

Target module	Firmware version	Engineering tool
RJ71C24	—	GX Works3 Version 1.055H or later
RJ71C24-R4	—	GX Works3 Version 1.055H or later

■ CPU module

RCPU

Basic specifications

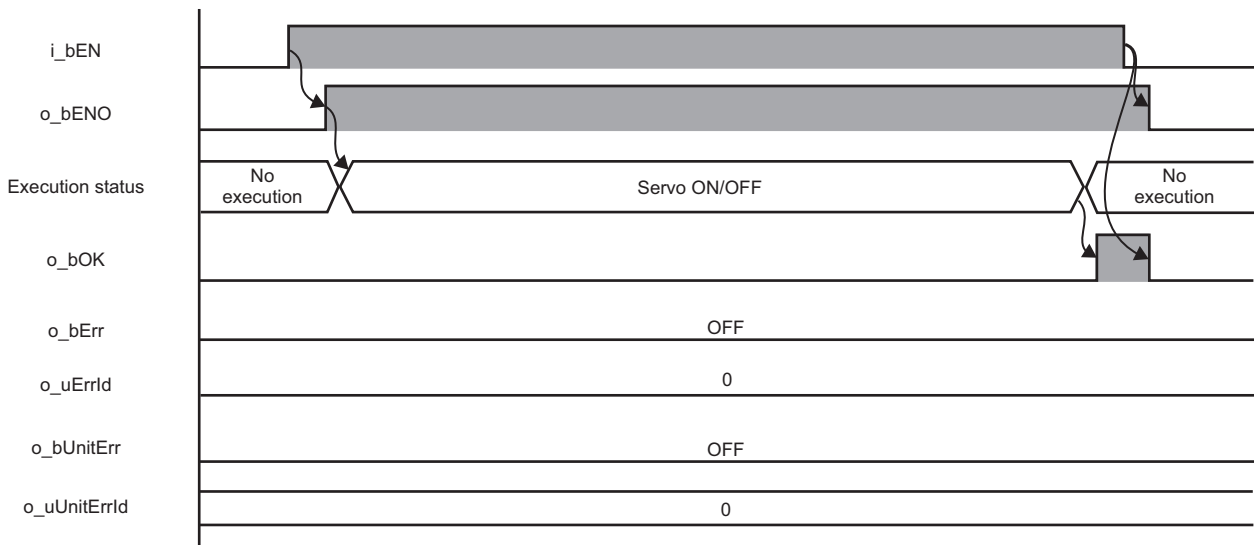
Item	Description
Language	Structured Text
Number of basic steps	2114 steps The number of steps of the FB embedded in a program varies depending on a CPU module used, the input and output definitions, and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Number of points of a label used	<ul style="list-style-type: none">• Label: 52 points (Word)• Latch label: 0 point (Word) The number of points of a label used that is embedded in a program varies depending on a device specified for an argument and the option settings of GX Works3. For the option settings of GX Works3, refer to GX Works3 Operating Manual .
Index register	Index register: 1 point (Z9)
FB dependence	No dependence
FB compilation method	Subroutine type
FB operation	Pulse execution (multiple scan execution type)

Processing

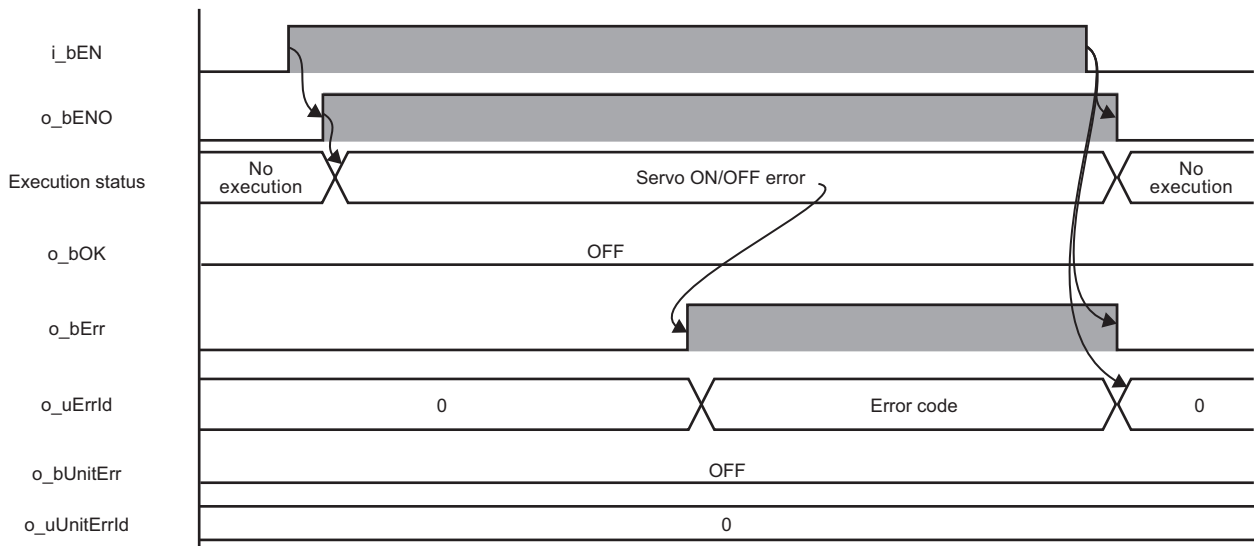
- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in `i_uStartIONo` (start I/O No.) and `i_uCh` (target channel) respectively.
- Specify the address number (slave address) of the operation target in `i_uAxis` (target axis).
- Specify the series of a target motor driver in `i_uWriteTo` (target controller).
- At the rise of `i_bEN` (execution command), this FB requests a servo to turn ON when `i_bServo` (servo ON/OFF replacement) is turned ON, and requests to turn OFF when `i_bServo` is turned OFF.
- At the completion of this FB, `o_bOK` (normal completion) is turned ON.
This does not actually determine the ON status of a servo. Check the status of the servo with `M+OriMonitoring_R`.
( Page 41 `M+OriMonitoring_R`)
- When a value out of the range is set for the start I/O number, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target channel, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target axis, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in `o_uErrId` (error code).
- When a value out of the range is set for the target controller, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in `o_uErrId` (error code).
- When the connected device is not the operation target, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in `o_uErrId` (error code).
- When turning OFF `i_bEN` (execution command) before `o_bOK` (normal completion), `o_bErr` (error completion), or `o_bUnitErr` (unit error completion) is turned ON, `o_bErr` (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in `o_uErrId` (error code) for one scan.
- When turning ON `i_bEN` (execution command) of this FB while executing the following FB, `o_bErr` (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in `o_uErrId` (error code).
`M+OriServoControl_R`
- When an error occurs while sending/receiving a message to/from the predefined protocol, `o_bErr` (error completion) is turned ON and the processing of the FB is interrupted. An error code is stored in `o_uErrId` (error code). For details on the error code, refer to  MELSEC iQ-R Serial Communication Module User's Manual(Application).
- When this FB receives an error code due to an error occurred in a motor driver, `o_bUnitErr` (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in `o_uUnitErrId` (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because i_bEN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF i_bEN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the memory/device setting in the CPU parameter so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works3.
- This FB uses the CPRTCL instruction. For details, refer to  MELSEC iQ-R Programming Manual (Module Dedicated Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in i_uStartIONo (start I/O No.). If the start input/output number is not assigned to the module, the stop error of the CPU (2820H) occurs.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following parameters (module parameters of a serial communication module) to a module by using GX Works3.

Item		Setting value
Communication protocol setting		Predefined protocol
Communication speed setting		Set the value according to the setting of an electric actuator controller to be used.
Transmission setting	Data bit	8
	Parity bit	Yes
	Odd/even parity	Even
	Stop bit	1
Communication control specification	Echo back enable/prohibit specification	Echo back prohibit

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value


The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Subroutine type
- CPU module: R16CPU
- Serial communication module: RJ71C24-R4
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK

i_bServo (Servo ON/OFF replacement)	Time required for the processing*1	Maximum scan time	Number of scans required for the processing
OFF	35.600 ms	0.453 ms	112 scans
ON	35.400 ms	0.454 ms	112 scans

*1 The time required from start to end of the processing.

Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 1 or 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF i_bEN (execution command) until o_bOK (normal completion), o_bErr (error completion), or o_bUnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of this FB is executing.	Stop the FB and execute this FB again. Target FB: • M+OriServoControl_R
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  MELSEC iQ-R Serial Communication Module User's Manual(Application)

3 DETAILS OF THE FB LIBRARY (MELSEC-Q/L SERIES)

3.1 Preparation for Using FB Library

This section explains advance preparation required for using MELSEC-Q/L series FB libraries.

Importing M+CPU-OriPosiSp_CPRTCL-ST

M+CPU-OriPosiSp_CPRTCL-ST is used internally in each FB of the MELSEC-Q/L series FB library.

M+CPU-OriPosiSp_CPRTCL-ST must be imported in a project.

Do not use M+CPU-OriPosiSp_CPRTCL-ST in a user-created program as this FB is used only internally in other FBs. For details on M+CPU-OriPosiSp_CPRTCL-ST, refer to the following:

☞ Page 101 M+CPU-OriPosiSp_CPRTCL-ST

Checking the start I/O number

When the start input/output number of a serial communication module is other than 0000H to 00F0H, add the G_CPRTCL instruction to a program of M+CPU-OriPosiSp_CPRTCL-ST.

For details on M+CPU-OriPosiSp_CPRTCL-ST, refer to the following:

☞ Page 101 M+CPU-OriPosiSp_CPRTCL-ST

Ex.

When the start input/output number to which a serial communication module is mounted is 0FE0H

CASE iw_StartIONo OF

0:

G_CPRTCL(TRUE = FB_EN,H0,iw_Ch,K1,iow_18ControlData,ob_2CompDevice);

1:

G_CPRTCL(TRUE = FB_EN,H1,iw_Ch,K1,iow_18ControlData,ob_2CompDevice);

}

}

15:

G_CPRTCL(TRUE = FB_EN,H0F,iw_Ch,K1,iow_18ControlData,ob_2CompDevice);

254:

G_CPRTCL(TRUE = FB_EN, H0FE, iw_Ch, K1, iow_18ControlData, ob_2CompDevice);

}

}

END_CASE;

Describe a value, in which the start I/O number is divided by 16, in decimal (FEH = K254)

Add the G_CPRTCL instruction whose FEH is specified for the start I/O No.

3.2 M+CPU-OriPosiSp_StartHomePosi-ST

Point

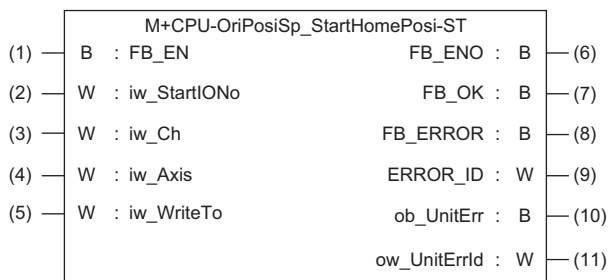
Advanced preparation is required for using this FB. For details, refer to the following:

☞ Page 53 Importing M+CPU-OriPosiSp_CPRTCL-ST

☞ Page 53 Checking the start I/O number

Overview

Moves a motor to the initial position (home position return).



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	FB_EN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	iw_StartIONo	Start I/O No.	Word [signed]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	iw_Ch	Target channel	Word [signed]	2	Specify the channel of a serial communication module.
(4)	iw_Axis	Target axis	Word [signed]	1 to 31	Specify an address number (slave address).
(5)	iw_WriteTo	Target controller	Word [signed]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2

Output label

No.	Label	Name	Data type	Default value	Description
(6)	FB_ENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(7)	FB_OK	Normal completion	Bit	OFF	The ON state indicates that a home position return is completed.
(8)	FB_ERROR	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(9)	ERROR_ID	Error code	Word [signed]	0	The error code of an error occurred in the FB is stored.
(10)	ob_UnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(11)	ow_UnitErrId	Unit error code	Word [signed]	0	The error code of an error occurred in the module is stored.

FB details

Available device

Serial communication module

Target module	Firmware version	Engineering tool
QJ71C24N ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
QJ71C24N-R4 ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
LJ71C24 ^{*1}	—	GX Works2 Version 1.570U or later

*1 Available only in CH2.

CPU module

- QCPU^{*1}
- LCPU

*1 Universal model QCPU and process CPU only

Basic specifications

Item	Description
Language	Structured Text
Number of basic steps	2234 steps The number of steps of the FB which is embedded in a program varies depending on the CPU module being used, input/output definitions, and option settings of GX Works2. For the option settings of GX Works2, refer to the GX Works2 Version 1 Operating Manual (Common) .
Number of points of a label used	<ul style="list-style-type: none"> • Label: 49 points (Word), 27 points (Bit) • Latch label: 0 point (Word), 0 point (Bit) The number of points of a label used which is embedded in a program varies depending on the device specified for an argument and option settings of GX Works2. For the option settings of GX Works2, refer to GX Works2 Version 1 Operating Manual (Common) .
Index register	Index register: 1 point (Z9)
FB dependence	M+CPU-OriPosiSp_StartHomePosi-ST └ M+CPU-OriPosiSp_CPRTCL-ST
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in iw_StartIONo (start I/O No.) and iw_Ch (target channel) respectively.
- Specify the address number (slave address) of the operation target in iw_Axis (target axis).
- Specify the series of a target motor driver in iw_WriteTo (target controller).
- This FB executes a home position return via MODBUS communication at the rise of FB_EN (execution command).
- FB_OK (normal completion) is turned ON when a home position return is completed.
- When a value out of the range is set for the start I/O number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target channel, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target axis, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target controller, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in ERROR_ID (error code).
- When a value set for the start I/O number is not correctly applied in M+CPU-OriPosiSp_CPRTCL-ST, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '110H' is stored in ERROR_ID (error code).
- When the connected device is not the operation target, FB_ERROR (error completion) is turned ON and the processing of



the FB is interrupted. In addition, the error code '200H' is stored in ERROR_ID (error code).

- When turning OFF FB_EN (execution command) before FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON, FB_ERROR (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in ERROR_ID (error code) for one scan.
- When turning ON FB_EN (execution command) of this FB while executing any of the following FBs, FB_ERROR (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in ERROR_ID (error code).

M+CPU-OriPosiSp_StartHomePosi-ST

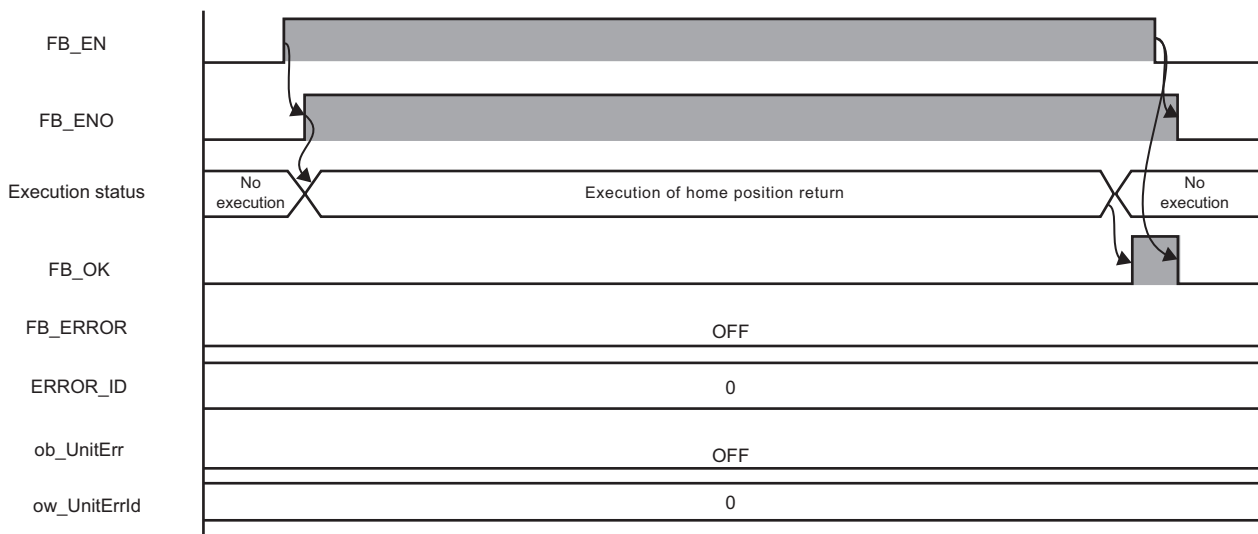
M+CPU-OriPosiSp_JogInching-ST

M+CPU-OriPosiSp_StartPosi-ST

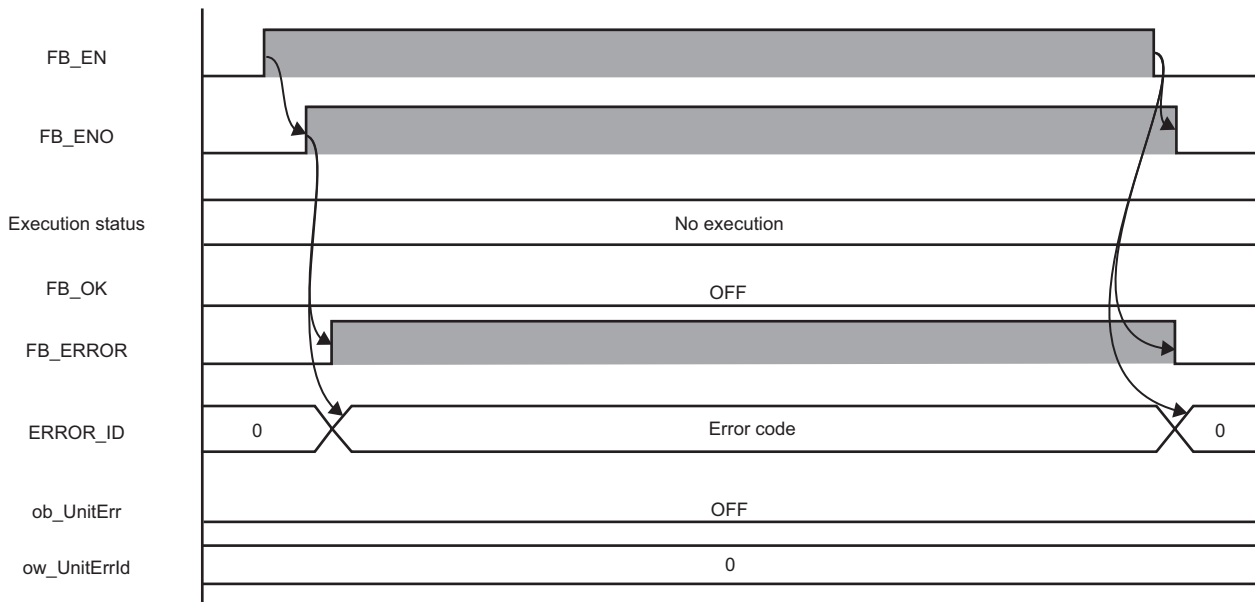
- When an alarm signal of a motor driver is turned ON, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '203H' is stored in ERROR_ID (error code). Check the status of the motor driver in M+CPU-OriPosiSp_Monitoring-ST.
- When turning ON FB_EN (execution command) of this FB while the servo or READY signal of a target motor driver is OFF, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '204H' is stored in ERROR_ID (error code).
- When an error occurs while sending/receiving a message to/from the predefined protocol, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, an error code of a serial communication module is stored in ERROR_ID (error code). For details on the error code, refer to  Q Corresponding Serial Communication Module User's Manual (Basic) or  MELSEC-L Serial Communication Module User's Manual (Basic).
- When this FB receives an error code due to an error occurred in a motor driver, ob_UnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in ow_UnitErrId (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because FB_EN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF FB_EN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the device/label automatic-assign setting so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works2.
- After a home position return is started by using this FB, when turning OFF FB_EN (execution command) before FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON, a motor continues to operate until a home position return is completed.
- This FB uses the G_CPRTCL instruction. For details, refer to  MELSEC-Q/L Structured Programming Manual (Special Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in iw_StartIONo (start I/O No.). If the start input/output number is not assigned to the module, a stop error (2110H) occurs in the CPU module.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following intelligent function module data (parameters of a serial communication module) to a module in GX Works2.

Item		Setting value	
Switch Setting	Transmission setting	Data bit	8
		Parity bit	Yes
		Even/odd parity	Even
		Stop bit	1
	Communication speed setting	Set the value according to the setting of an electric actuator controller to be used.	
	Communication protocol setting	Predefined protocol	
Various Control Specification	Echo back enable/prohibit specification	1: Prohibited	

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning (Q/L) to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value

The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Macro type
- CPU module: Q04UDVCPU
- Serial communication module: QJ71C24N
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK
- Initial position: Home position (0.00 mm)

Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
1770.000 ms	0.763 ms	5473 scans

*1 The time required from start to end of the processing.

Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
110H	The start I/O number of M+CPU-OriPosiSp_CPRTCL-ST is out of the range.	Review the setting. For details, refer to the following: 📖 Page 53 Checking the start I/O number
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF FB_EN (execution command) until FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of a motor is executing.	Stop the FB and execute this FB again. Target FB: <ul style="list-style-type: none"> • M+CPU-OriPosiSp_StartHomePosi-ST • M+CPU-OriPosiSp_JogInching-ST • M+CPU-OriPosiSp_StartPosi-ST For M+CPU-OriPosiSp_JogInching-ST, check that ob_ParamOK (parameter setting completion flag) is turned ON and ob_Busy (busy signal) is turned OFF.
203H	Emergency stop or major failure is occurring.	Check the status of the motor driver in M+CPU-OriPosiSp_Monitoring-ST. After checking the status, remove the cause of the error and execute the FB again.
204H	Movement commands are executed while a servo or READY signal is OFF.	Check the status of the motor driver in M+CPU-OriPosiSp_Monitoring-ST. To turn ON a servo, turn it ON with M+CPU-OriPosiSp_ServoControl-ST.
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following: 📖 Q Corresponding Serial Communication Module User's Manual (Basic) 📖 MELSEC-L Serial Communication Module User's Manual (Basic)

3.3 M+CPU-OriPosiSp_JogInching-ST

Point

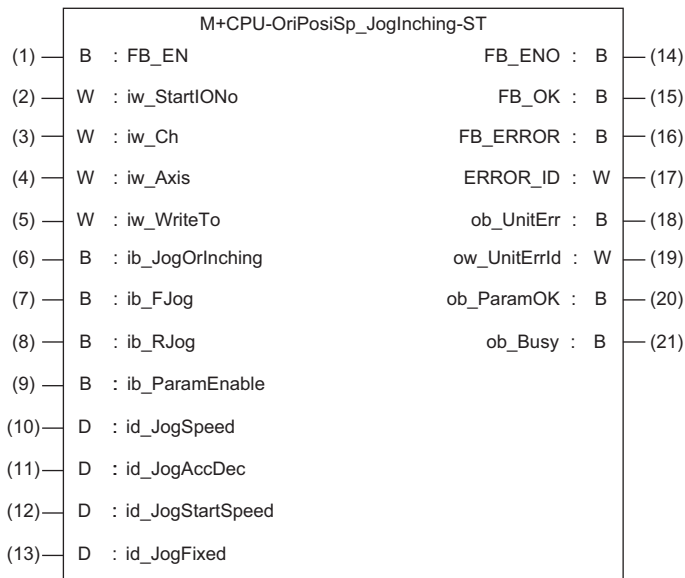
Advanced preparation is required for using this FB. For details, refer to the following:

- ☞ Page 53 Importing M+CPU-OriPosiSp_CPRTCL-ST
- ☞ Page 53 Checking the start I/O number

Overview

Executes JOG or inching operation.

For AR/RKII series, inching operation will be performed even if JOG operation is specified.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	FB_EN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	iw_StartIONo	Start I/O No.	Word [signed]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	iw_Ch	Target channel	Word [signed]	2	Specify the channel of a serial communication module.
(4)	iw_Axis	Target axis	Word [signed]	1 to 31	Specify an address number (slave address).
(5)	iw_WriteTo	Target controller	Word [signed]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2
(6)	ib_JogOrInching ^{*1}	JOG/Inching replacement	Bit	ON, OFF	ON: Inching operation OFF: JOG operation
(7)	ib_FJog	JOG + command	Bit	ON, OFF	Turn ON this label to perform the forward JOG or inching operation.
(8)	ib_RJog	JOG - command	Bit	ON, OFF	Turn ON this label to perform the reverse JOG or inching operation.
(9)	ib_ParamEnable	JOG parameter enable	Bit	ON, OFF	ON: Enable JOG parameters OFF: Disable JOG parameters

No.	Label	Name	Data type	Range	Description
(10)	id_JogSpeed	JOG operating speed	Double Word [signed]	<ul style="list-style-type: none"> • AR Series and RKII Series 1 to 1000000 • AZ Series 1 to 4000000 	Set the operating speed of JOG operation. (Unit: Hz)
(11)	id_JogAccDec	Acceleration/ deceleration rate of JOG	Double Word [signed]	<ul style="list-style-type: none"> • AR Series and RKII Series 1 to 1000000 • AZ Series 1 to 1000000000 	Set the acceleration/deceleration rate (acceleration/deceleration time) for JOG operation. (Unit: 0.001 ms/kHz or 0.001 s)
(12)	id_JogStartSpeed	JOG starting speed	Double Word [signed]	<ul style="list-style-type: none"> • AR Series and RKII Series 0 to 1000000 • AZ Series 1 to 4000000 	Set the starting speed of JOG operation. (Unit: Hz)
(13)	id_JogFixed	JOG travel amount	Double Word [signed]	1 to 8388607	Set the travel amount of JOG operation. (Unit: Step)

*1 For AR/RKII series, inching operation will be performed regardless of the value.

Output label

No.	Label	Name	Data type	Default value	Description
(14)	FB_ENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(15)	FB_OK	Normal completion	Bit	OFF	The ON state indicates that the JOG operation is started, and the inching operation is completed normally.
(16)	FB_ERROR	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(17)	ERROR_ID	Error code	Word [signed]	0	The error code of an error occurred in the FB is stored.
(18)	ob_UnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(19)	ow_UnitErrId	Unit error code	Word [signed]	0	The error code of an error occurred in the module is stored.
(20)	ob_ParamOK	Parameter setting completion flag	Bit	OFF	The ON state indicates that the initial settings until a motor driver is ready to operate are completed.
(21)	ob_Busy	Busy signal	Bit	OFF	The ON state indicates that a motor driver is operating.

FB details

Available device

Serial communication module

Target module	Firmware version	Engineering tool
QJ71C24N ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
QJ71C24N-R4 ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
LJ71C24 ^{*1}	—	GX Works2 Version 1.570U or later



*1 Available only in CH2.

CPU module

- QCPU^{*1}
- LCPU

*1 Universal model QCPU and process CPU only

Basic specifications

Item	Description
Language	Structured Text
Number of basic steps	3215 steps The number of steps of the FB which is embedded in a program varies depending on the CPU module being used, input/output definitions, and option settings of GX Works2. For the option settings of GX Works2, refer to the  GX Works2 Version 1 Operating Manual (Common).
Number of points of a label used	<ul style="list-style-type: none"> • Label: 72 points (Word), 38 point (Bit) • Latch label: 0 point (Word), 0 point (Bit) The number of points of a label used which is embedded in a program varies depending on the device specified for an argument and option settings of GX Works2. For the option settings of GX Works2, refer to  GX Works2 Version 1 Operating Manual (Common).
Index register	Index register: 1 point (Z9)
FB dependence	M+CPU-OriPosiSp_JogInching-ST └─ M+CPU-OriPosiSp_CPRTCL-ST
FB compilation method	Macro type
FB operation	Real-time execution

Processing

- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in iw_StartIONo (start I/O No.) and iw_Ch (target channel) respectively.
- Specify the address number (slave address) of the operation target in iw_Axis (target axis).
- Specify the series of a target motor driver in iw_WriteTo (target controller).
- Set the following labels to set parameters for the JOG or inching operation.



Label	Setting content
ib_ParamEnable	ON: Enable JOG parameters OFF: Disable JOG parameters
id_JogSpeed	JOG operating speed
id_JogAccDec	Acceleration/deceleration rate of JOG
id_JogStartSpeed	JOG starting speed
id_JogFiexd	JOG travel amount

- In this FB, when the JOG or inching operation is ready after writing parameters at the rise of FB_EN (execution command), ob_ParamOK (parameter setting completion flag) is turned ON. (ob_ParamOK is turned ON even if JOG parameters are disabled (OFF).)
- The inching operation command is executed until the operation is completed by turning ON ib_JogOrInching (JOG/Inching replacement) and at the rise of ib_FJog (JOG + command) or ib_RJog (JOG - command). When the operation is completed, FB_OK (normal completion) is turned ON.
- The JOG operation command is executed while ib_JogOrInching (JOG/Inching replacement) is turned OFF and ib_FJog (JOG + command) or ib_RJog (JOG - command) is turned ON. FB_OK (normal completion) is turned ON at the start of the operation. When ib_FJog (JOG + command) or ib_RJog (JOG - command) is turned OFF, the operation decelerates to stop and FB_OK (normal completion) is turned OFF.
- ob_Busy (busy signal) is turned ON while a motor driver is operating (during the inching or JOG operation).
- When a value out of the range is set for the start I/O number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target channel, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target axis, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the JOG operating speed or JOG starting speed, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '103H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the JOG travel amount, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '104H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the acceleration/deceleration rate of JOG, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '107H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target controller, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in ERROR_ID (error code).
- When a value set for the start I/O number is not correctly applied in M+CPU-OriPosiSp_CPRTCL-ST, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '110H' is stored in ERROR_ID (error code).
- When the connected device is not the operation target, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in ERROR_ID (error code).
- When turning OFF FB_EN (execution command) before ob_ParamOK (parameter setting completion flag) is turned ON, FB_ERROR (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in ERROR_ID (error code) for one scan.
- When turning ON FB_EN (execution command) of this FB while executing any of the following FBs, FB_ERROR (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in ERROR_ID (error code).

M+CPU-OriPosiSp_StartHomePosi-ST

M+CPU-OriPosiSp_JogInching-ST

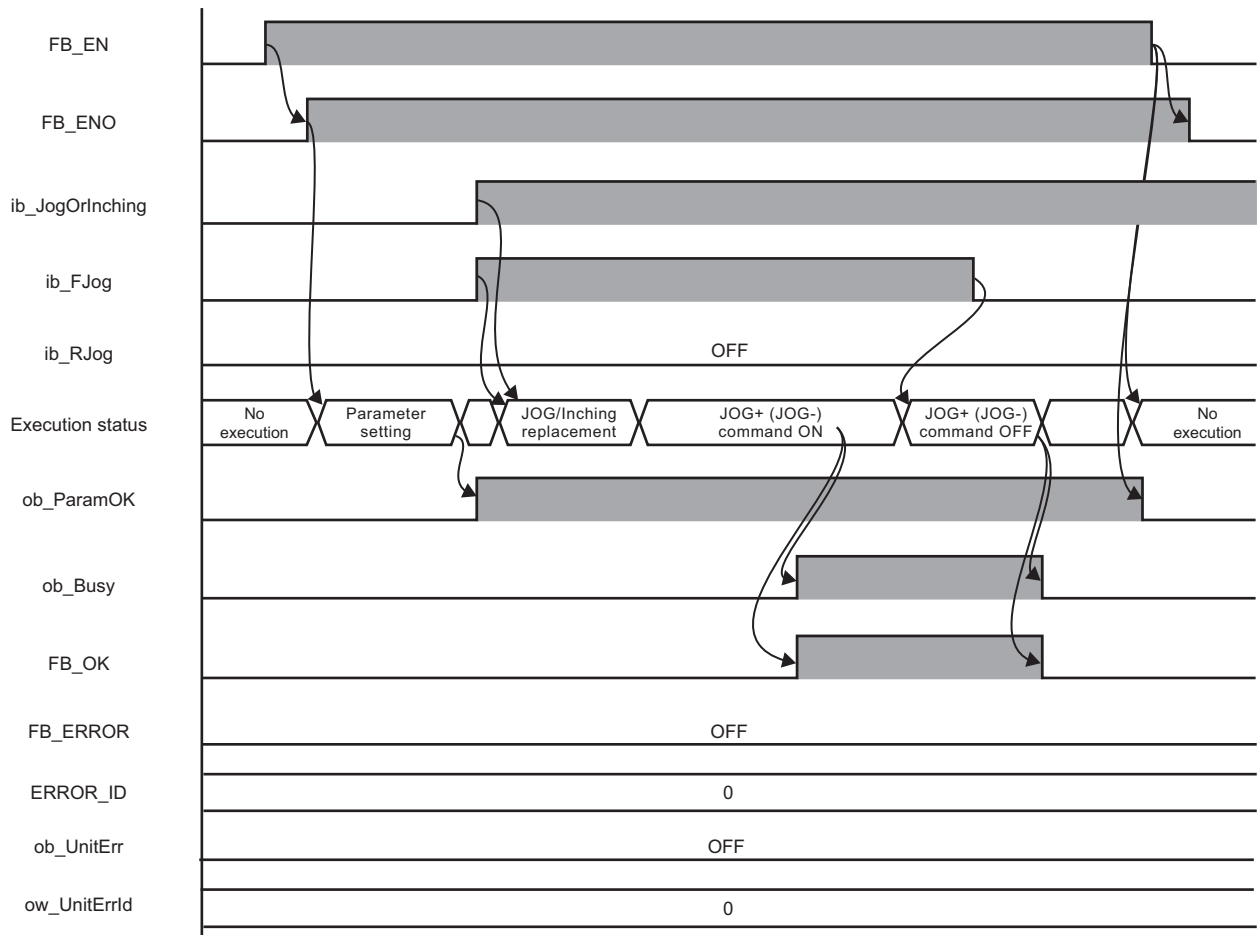
M+CPU-OriPosiSp_StartPosi-ST

- When an alarm signal of a motor driver is turned ON, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '203H' is stored in ERROR_ID (error code). Check the status of the motor driver in M+CPU-OriPosiSp_Monitoring-ST.
- When turning ON FB_EN (execution command) of this FB while the servo or READY signal of a target motor driver is OFF, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '204H' is stored in ERROR_ID (error code).
- When an error occurs while sending/receiving a message to/from the predefined protocol, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, an error code of a serial communication module is stored in ERROR_ID (error code). For details on the error code, refer to  Q Corresponding Serial Communication Module User's Manual (Basic) or  MELSEC-L Serial Communication Module User's Manual (Basic).
- When this FB receives an error code due to an error occurred in a motor driver, ob_UnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in ow_UnitErrId (unit error code).

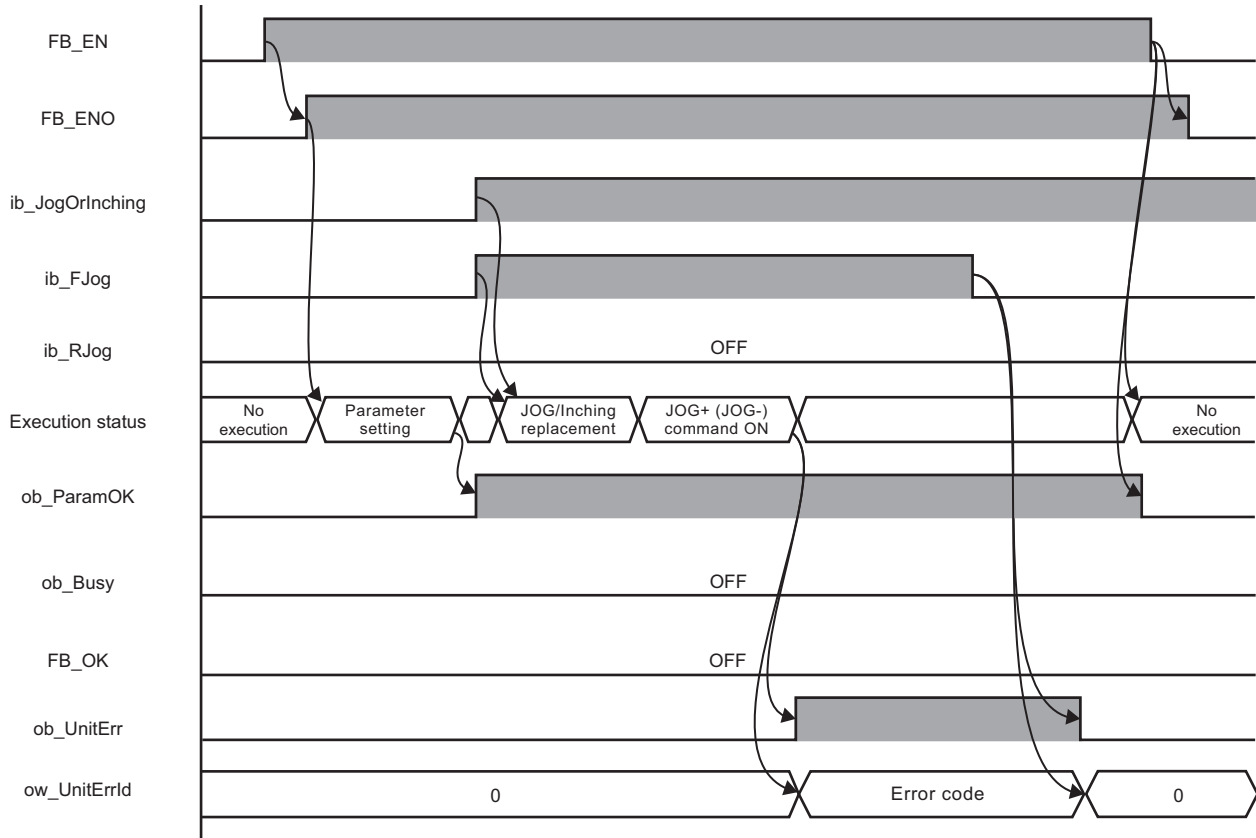
Timing chart of I/O signals

■ In normal completion


- For inching operation




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because FB_EN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF FB_EN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the device/label automatic-assign setting so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works2.
- JOG parameters, such as JOG speed, cannot be changed while FB_EN (execution command) is turned ON. To change the parameters, execute the FB again.
- Perform the JOG or inching operation after ob_ParamOK (parameter setting completion flag) is turned ON.
- When the motor driver stops at the operation limit value, an error will not occur in this FB.
- When turning ON ib_FJog (JOG + command) or ib_RJog (JOG - command) before ob_ParamOK (parameter setting completion flag) is turned ON, JOG + (-) command is ignored. Turn ON the JOG + (-) command again.
- When turning OFF FB_EN (execution command) while a motor is operating, the motor continues to operate. Prepare a program for the operation of the motor separately in accordance with the required system operation.
- This FB uses the G_CPRTCL instruction. For details, refer to  MELSEC-Q/L Structured Programming Manual (Special Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in iw_StartIONo (start I/O No.). If the start input/output number is not assigned to the module, a stop error (2110H) occurs in the CPU module.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following intelligent function module data (parameters of a serial communication module) to a module in GX Works2.

Item		Setting value	
Switch Setting	Transmission setting	Data bit	8
		Parity bit	Yes
		Even/odd parity	Even
		Stop bit	1
	Communication speed setting	Set the value according to the setting of an electric actuator controller to be used.	
	Communication protocol setting	Predefined protocol	
Various Control Specification	Echo back enable/prohibit specification	1: Prohibited	

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning (Q/L) to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value


The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Macro type
- CPU module: Q04UDVCPU
- Serial communication module: QJ71C24N
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK
- JOG operating speed: 10.00 mm/sec
- JOG travel amount: 0.10 mm

Measuring range	Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
From when FB_EN (execution command) is turned ON to when ob_ParamOK (parameter setting completion flag) is turned ON	46.700 ms	0.647 ms	132 scans
From when ib_FJog (JOG + command) or ib_RJog (JOG - command) is turned ON to when JOG operation is started	46.200 ms	0.773 ms	133 scans
From when ib_FJog (JOG + command) or ib_RJog (JOG - command) is turned ON to when inching movement is completed	47.000 ms	0.761 ms	134 scans

*1 The time required from start to end of the processing.

Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
103H	The value set for the JOG operating speed or JOG starting speed is out of the range.	Set a value within the range from 1 to 1000000 for the JOG operating speed and a value within the range from 0 to 1000000 for the JOG starting speed, and execute the FB again.
104H	The value set for the JOG travel amount is out of the range.	Set a value within the range from 1 to 8388607 for the JOG travel amount and execute the FB again.
107H	The value set for the acceleration/deceleration rate of JOG is out of the range.	Set a value within the range from 1 to 1000000 for the acceleration/deceleration rate of JOG and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
110H	The start I/O number of M+CPU-OriPosiSp_CPRCTL-ST is out of the range.	Review the setting. For details, refer to the following:  Page 53 Checking the start I/O number
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF FB_EN (execution command) until ob_ParamOK (parameter setting completion flag) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of a motor is executing.	Stop the FB and execute this FB again. Target FB: • M+CPU-OriPosiSp_StartHomePosi-ST • M+CPU-OriPosiSp_JogInching-ST • M+CPU-OriPosiSp_StartPosi-ST For M+CPU-OriPosiSp_JogInching-ST, check that ob_ParamOK (parameter setting completion flag) is turned ON and ob_Busy (busy signal) is turned OFF.
203H	Emergency stop or major failure is occurring.	Check the status of the motor driver in M+CPU-OriPosiSp_Monitoring-ST. After checking the status, remove the cause of the error and execute the FB again.
204H	Movement commands are executed while a servo or READY signal is OFF.	Check the status of the motor driver in M+CPU-OriPosiSp_Monitoring-ST. To turn ON a servo, turn it ON with M+CPU-OriPosiSp_ServoControl-ST.

Error code	Description	Corrective action
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following: 📖 Q Corresponding Serial Communication Module User's Manual (Basic) 📖 MELSEC-L Serial Communication Module User's Manual (Basic)

3.4 M+CPU-OriPosiSp_ReadDriveData-ST

Point

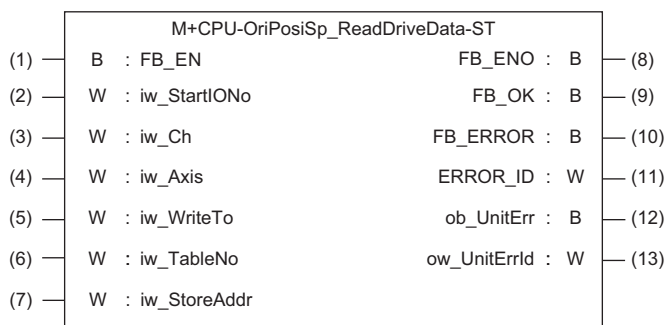
Advanced preparation is required for using this FB. For details, refer to the following:

☞ Page 53 Importing M+CPU-OriPosiSp_CPRTCL-ST

☞ Page 53 Checking the start I/O number

Overview

Reads the specified drive data.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	FB_EN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	iw_StartIONo	Start I/O No.	Word [signed]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	iw_Ch	Target channel	Word [signed]	2	Specify the channel of a serial communication module.
(4)	iw_Axis	Target axis	Word [signed]	1 to 31	Specify an address number (slave address).
(5)	iw_WriteTo	Target controller	Word [signed]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2
(6)	iw_TableNo	Drive data No.	Word [signed]	0 to 63	Specify the drive data number of drive data from which the setting value is to be read.
(7)	iw_StoreAddr	Address to store drive data	Word [signed]	0 to FFFFH	Specify the start number of D device, which stores drive data values, in hexadecimal. For details on the drive data, refer to the following: ☞ Page 105 Drive data

Output label

No.	Label	Name	Data type	Default value	Description
(8)	FB_ENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(9)	FB_OK	Normal completion	Bit	OFF	The ON state indicates that reading drive data is completed.
(10)	FB_ERROR	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(11)	ERROR_ID	Error code	Word [signed]	0	The error code of an error occurred in the FB is stored.
(12)	ob_UnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(13)	ow_UnitErrId	Unit error code	Word [signed]	0	The error code of an error occurred in the module is stored.

FB details

Available device

■ Serial communication module

Target module	Firmware version	Engineering tool
QJ71C24N ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
QJ71C24N-R4 ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
LJ71C24 ^{*1}	—	GX Works2 Version 1.570U or later

*1 Available only in CH2.

■ CPU module

- QCPU^{*1}
- LCPU

*1 Universal model QCPUs and process CPUs only

Basic specifications

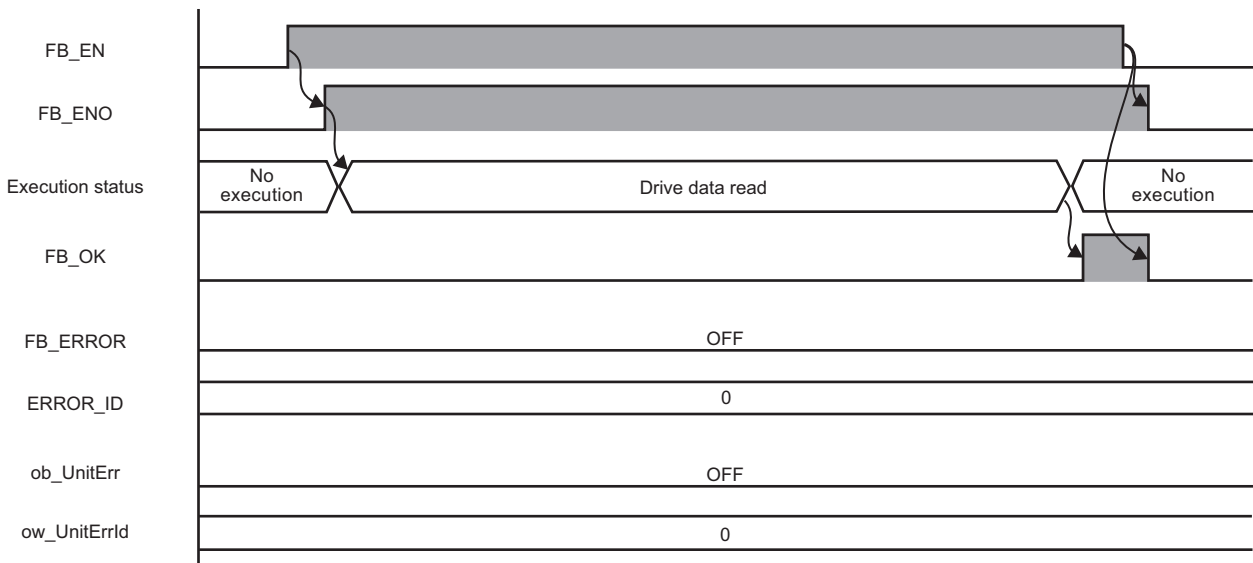
Item	Description
Language	Structured Text
Number of basic steps	3301 steps The number of steps of the FB which is embedded in a program varies depending on the CPU module being used, input/output definitions, and option settings of GX Works2. For the option settings of GX Works2, refer to the GX Works2 Version 1 Operating Manual (Common) .
Number of points of a label used	<ul style="list-style-type: none"> • Label: 78 points (Word), 21 points (Bit) • Latch label: 0 point (Word), 0 point (Bit) The number of points of a label used which is embedded in a program varies depending on the device specified for an argument and option settings of GX Works2. For the option settings of GX Works2, refer to GX Works2 Version 1 Operating Manual (Common) .
Index register	Index register: 2 points (Z9 and Z8)
FB dependence	M+CPU-OriPosiSp_ReadDriveData-ST └─ M+CPU-OriPosiSp_CPRTCL-ST
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

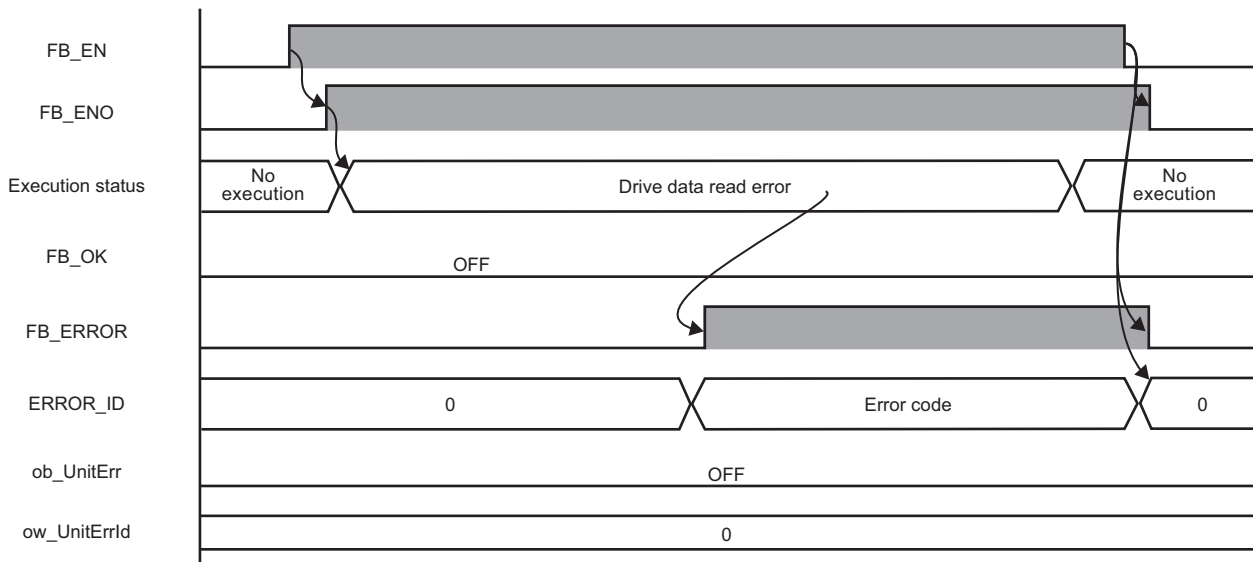
- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in iw_StartIONo (start I/O No.) and iw_Ch (target channel) respectively.
 - Specify the address number (slave address) of the operation target in iw_Axis (target axis).
 - Specify the series of a target motor driver in iw_WriteTo (target controller).
 - Specify the drive data number of drive data to be read in iw_TableNo (drive data No.).
 - Specify the start number of D device, which stores drive data to iw_StoreAddr (address to store drive data).
 - This FB reads the setting data of the specified drive data number for a motor driver at the rise of FB_EN (execution command).
 - FB_OK (normal completion) is turned ON when reading the setting data of drive data number is completed.
 - When a value out of the range is set for the start I/O number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in ERROR_ID (error code).
 - When a value out of the range is set for the target channel, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in ERROR_ID (error code).
 - When a value out of the range is set for the target axis, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in ERROR_ID (error code).
 - When a value out of the range is set for the drive data number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '105H' is stored in ERROR_ID (error code).
 - When a value out of the range is set for the target controller, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in ERROR_ID (error code).
 - When a value set for the start I/O number is not correctly applied in M+CPU-OriPosiSp_CPRTCL-ST, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '110H' is stored in ERROR_ID (error code).
 - When the connected device is not the operation target, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in ERROR_ID (error code).
 - When turning OFF FB_EN (execution command) before FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON, FB_ERROR (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in ERROR_ID (error code) for one scan.
 - When turning ON FB_EN (execution command) of this FB while executing the following FB, FB_ERROR (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in ERROR_ID (error code).
- M+CPU-OriPosiSp_ReadDriveData-ST
- When an error occurs while sending/receiving a message to/from the predefined protocol, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, an error code of a serial communication module is stored in ERROR_ID (error code). For details on the error code, refer to [Q](#) Corresponding Serial Communication Module User's Manual (Basic) or [MELSEC-L](#) Serial Communication Module User's Manual (Basic).
 - When this FB receives an error code due to an error occurred in a motor driver, ob_UnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in ow_UnitErrId (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because FB_EN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF FB_EN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the device/label automatic-assign setting so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works2.
- This FB uses the G_CPRTCL instruction. For details, refer to  MELSEC-Q/L Structured Programming Manual (Special Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in iw_StartIONo (start I/O No.). If the start input/output number is not assigned to the module, a stop error (2110H) occurs in the CPU module.
- This FB uses index registers (Z9 and Z8). Do not use the Z9 and Z8 in an interrupt program.
- Before operating a motor driver, write the following intelligent function module data (parameters of a serial communication module) to a module in GX Works2.

Item		Setting value	
Switch Setting	Transmission setting	Data bit	8
		Parity bit	Yes
		Even/odd parity	Even
		Stop bit	1
	Communication speed setting	Set the value according to the setting of an electric actuator controller to be used.	
	Communication protocol setting	Predefined protocol	
Various Control Specification	Echo back enable/prohibit specification	1: Prohibited	

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning (Q/L) to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value




The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Macro type
- CPU module: Q04UDVCPU
- Serial communication module: QJ71C24N
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK

Time required for the processing*1	Maximum scan time	Number of scans required for the processing
36.600 ms	0.715 ms	100 scans

*1 The time required from start to end of the processing.

Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
105H	The value set for the drive data number is out of the range.	Set a value within the range from 0 to 63 for the drive data number and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
110H	The start I/O number of M+CPU-OriPosiSp_CPRTCL-ST is out of the range.	Review the setting. For details, refer to the following:  Page 53 Checking the start I/O number
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF FB_EN (execution command) until FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of this FB is executing.	Stop the FB and execute this FB again. Target FB: • M+CPU-OriPosiSp_ReadDriveData-ST
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  Q Corresponding Serial Communication Module User's Manual (Basic)  MELSEC-L Serial Communication Module User's Manual (Basic)

3.5 M+CPU-OriPosiSp_Teaching-ST

Point

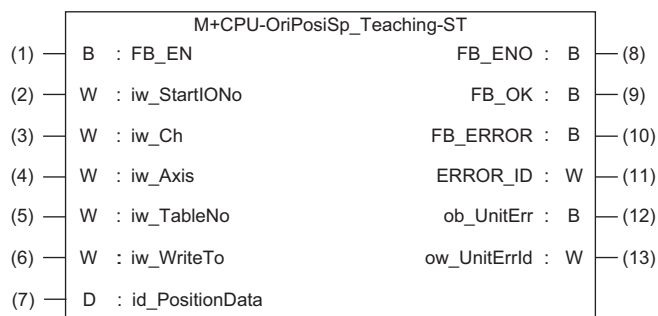
Advanced preparation is required for using this FB. For details, refer to the following:

☞ Page 53 Importing M+CPU-OriPosiSp_CPRTCL-ST

☞ Page 53 Checking the start I/O number

Overview

Sets the designated position to the position of the specified drive data number.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	FB_EN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	iw_StartIONo	Start I/O No.	Word [signed]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	iw_Ch	Target channel	Word [signed]	2	Specify the channel of a serial communication module.
(4)	iw_Axis	Target axis	Word [signed]	1 to 31	Specify an address number (slave address).
(5)	iw_TableNo	Drive data No.	Word [signed]	0 to 63	Specify the drive data number of drive data to which the setting value is to be written.
(6)	iw_WriteTo	Target controller	Word [signed]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2
(7)	id_PositionData	Position data	Double Word [signed]	<ul style="list-style-type: none"> • AR Series and RKII Series -8388608 to 8388607 • AZ Series -2147483648 to 2147483647 	Specify the position data to be set.

Output label

No.	Label	Name	Data type	Default value	Description
(8)	FB_ENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(9)	FB_OK	Normal completion	Bit	OFF	The ON state indicates that the drive data setting is completed.
(10)	FB_ERROR	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(11)	ERROR_ID	Error code	Word [signed]	0	The error code of an error occurred in the FB is stored.
(12)	ob_UnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(13)	ow_UnitErrId	Unit error code	Word [signed]	0	The error code of an error occurred in the module is stored.

FB details

Available device

■ Serial communication module

Target module	Firmware version	Engineering tool
QJ71C24N ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
QJ71C24N-R4 ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
LJ71C24 ^{*1}	—	GX Works2 Version 1.570U or later



*1 Available only in CH2.

■ CPU module

- QCPU^{*1}
- LCPU

*1 Universal model QCPUs and process CPUs only



Basic specifications

Item	Description
Language	Structured Text
Number of basic steps	1928 steps The number of steps of the FB which is embedded in a program varies depending on the CPU module being used, input/output definitions, and option settings of GX Works2. For the option settings of GX Works2, refer to the  GX Works2 Version 1 Operating Manual (Common).
Number of points of a label used	<ul style="list-style-type: none"> • Label: 52 points (Word), 24 points (Bit) • Latch label: 0 point (Word), 0 point (Bit) The number of points of a label used which is embedded in a program varies depending on the device specified for an argument and option settings of GX Works2. For the option settings of GX Works2, refer to  GX Works2 Version 1 Operating Manual (Common).
Index register	Index register: 1 point (Z9)
FB dependence	M+CPU-OriPosiSp_Teaching-ST └─ M+CPU-OriPosiSp_CPRTCL-ST
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

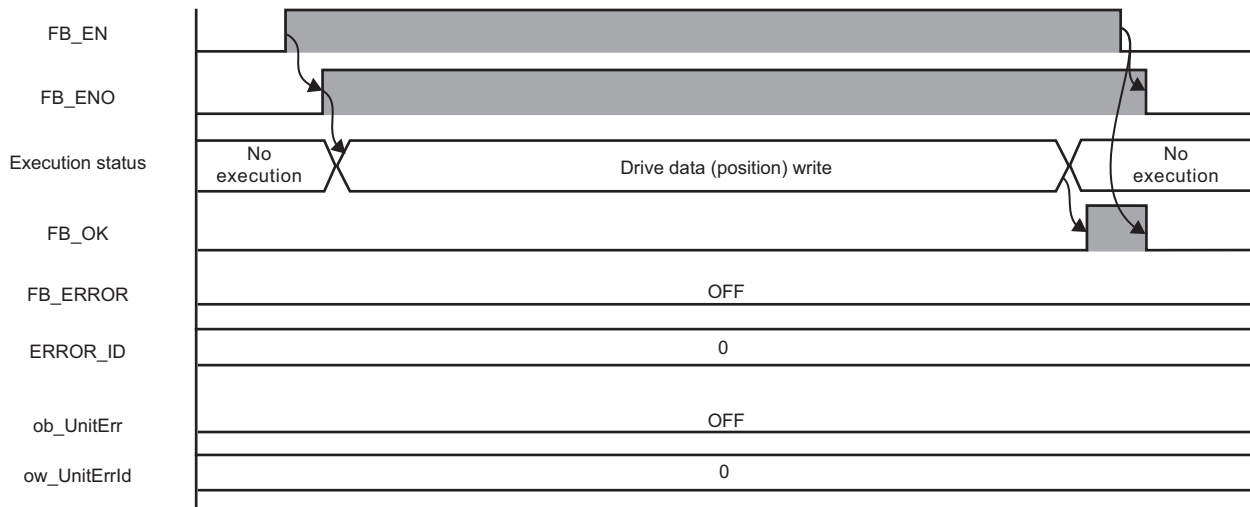
- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in iw_StartIONo (start I/O No.) and iw_Ch (target channel) respectively.
- Specify the address number (slave address) of the operation target in iw_Axis (target axis).
- Specify the series of a target motor driver in iw_WriteTo (target controller).
- Specify the drive data number of drive data to be set in iw_TableNo (drive data No.).
- Set the position information of the specified drive data number to id_PositionData (position data).
- This FB writes the position information of the specified drive data number for a motor driver at the rise of FB_EN (execution command).
- FB_OK (normal completion) is turned ON when writing the setting data of drive data number is completed.
- When a value out of the range is set for the start I/O number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target channel, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target axis, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the drive data number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '105H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the position data, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '106H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target controller, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in ERROR_ID (error code).
- When a value set for the start I/O number is not correctly applied in M+CPU-OriPosiSp_CPRTCL-ST, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '110H' is stored in ERROR_ID (error code).
- When the connected device is not the operation target, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in ERROR_ID (error code).
- When turning OFF FB_EN (execution command) before FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON, FB_ERROR (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in ERROR_ID (error code) for one scan.
- When turning ON FB_EN (execution command) of this FB while executing the following FB, FB_ERROR (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in ERROR_ID (error code).

M+CPU-OriPosiSp_Teaching-ST

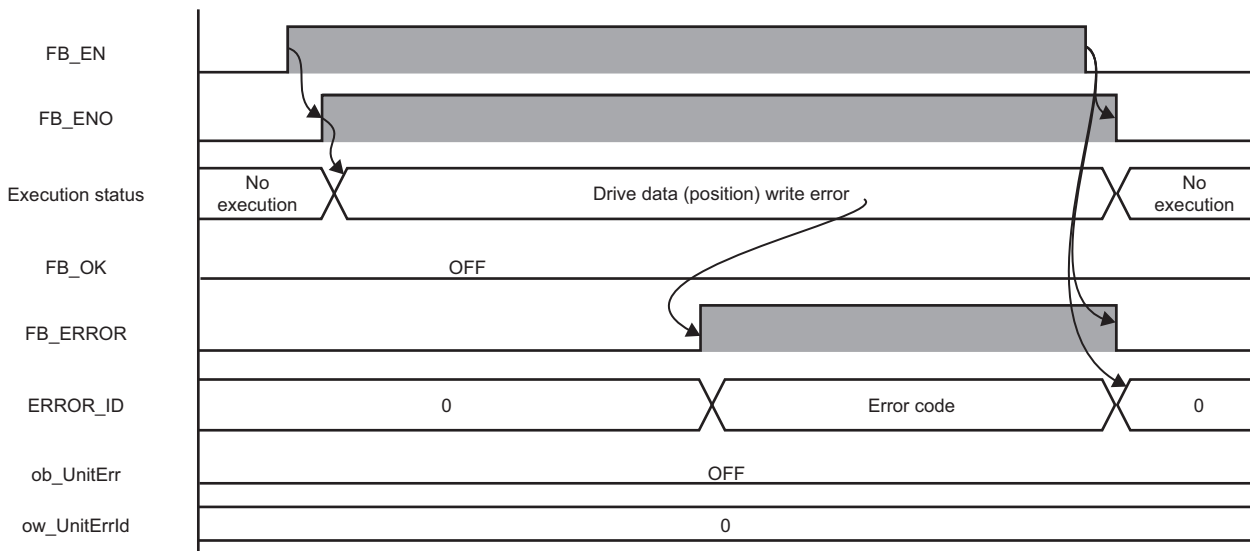
- When an error occurs while sending/receiving a message to/from the predefined protocol, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, an error code of a serial communication module is stored in ERROR_ID (error code). For details on the error code, refer to  Q Corresponding Serial Communication Module User's Manual (Basic) or  MELSEC-L Serial Communication Module User's Manual (Basic).
- When this FB receives an error code due to an error occurred in a motor driver, ob_UnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in ow_UnitErrId (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB writes data into the non-volatile (NV) memory. The NV memory is limited in the number of times data can be written to it. For details, refer to the manual of the motor driver used.
- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because FB_EN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF FB_EN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the device/label automatic-assign setting so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works2.
- This FB uses the G_CPRTCL instruction. For details, refer to  MELSEC-Q/L Structured Programming Manual (Special Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in iw_StartIONo (start I/O No.). If the start input/output number is not assigned to the module, a stop error (2110H) occurs in the CPU module.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following intelligent function module data (parameters of a serial communication module) to a module in GX Works2.

Item		Setting value	
Switch Setting	Transmission setting	Data bit	8
		Parity bit	Yes
		Even/odd parity	Even
		Stop bit	1
	Communication speed setting	Set the value according to the setting of an electric actuator controller to be used.	
	Communication protocol setting	Predefined protocol	
Various Control Specification	Echo back enable/prohibit specification	1: Prohibited	

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning (Q/L) to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value




The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Macro type
- CPU module: Q04UDVCPU
- Serial communication module: QJ71C24N
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK

Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
58.300 ms	0.500 ms	178 scans

*1 The time required from start to end of the processing.

Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
105H	The value set for the drive data number is out of the range.	Set a value within the range from 0 to 63 for the drive data number and execute the FB again.
106H	The value set for the position data is out of the range.	Set a value within the range from -2147483648 to 2147483647 for the position data and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
110H	The start I/O number of M+CPU-OriPosiSp_CPRCTL-ST is out of the range.	Review the setting. For details, refer to the following:  Page 53 Checking the start I/O number
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF FB_EN (execution command) until FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of this FB is executing.	Stop the FB and execute this FB again. Target FB: • M+CPU-OriPosiSp_Teaching-ST
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  Q Corresponding Serial Communication Module User's Manual (Basic)  MELSEC-L Serial Communication Module User's Manual (Basic)

3.6 M+CPU-OriPosiSp_StartPosi-ST

Point

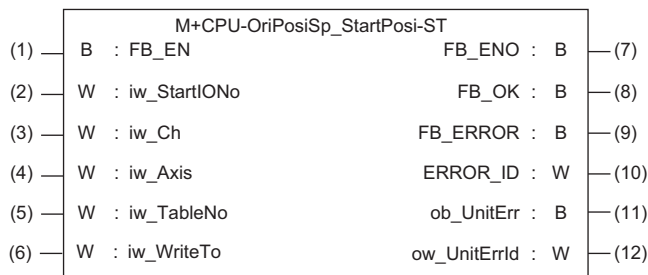
Advanced preparation is required for using this FB. For details, refer to the following:

☞ Page 53 Importing M+CPU-OriPosiSp_CPRTCL-ST

☞ Page 53 Checking the start I/O number

Overview

Executes positioning operation based on the data of the specified drive data number.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	FB_EN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	iw_StartIONo	Start I/O No.	Word [signed]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	iw_Ch	Target channel	Word [signed]	2	Specify the channel of a serial communication module.
(4)	iw_Axis	Target axis	Word [signed]	1 to 31	Specify an address number (slave address).
(5)	iw_TableNo	Drive data No.	Word [signed]	0 to 63	Specify the drive data number of drive data whose positioning operation is to be executed.
(6)	iw_WriteTo	Target controller	Word [signed]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2

Output label

No.	Label	Name	Data type	Default value	Description
(7)	FB_ENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(8)	FB_OK	Normal completion	Bit	OFF	The ON state indicates that positioning operation is completed.
(9)	FB_ERROR	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(10)	ERROR_ID	Error code	Word [signed]	0	The error code of an error occurred in the FB is stored.
(11)	ob_UnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(12)	ow_UnitErrId	Unit error code	Word [signed]	0	The error code of an error occurred in the module is stored.

FB details

Available device

Serial communication module

Target module	Firmware version	Engineering tool
QJ71C24N ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
QJ71C24N-R4 ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
LJ71C24 ^{*1}	—	GX Works2 Version 1.570U or later



*1 Available only in CH2.

CPU module



- QCPU^{*1}
- LCPU

*1 Universal model QCPU and process CPU only

Basic specifications

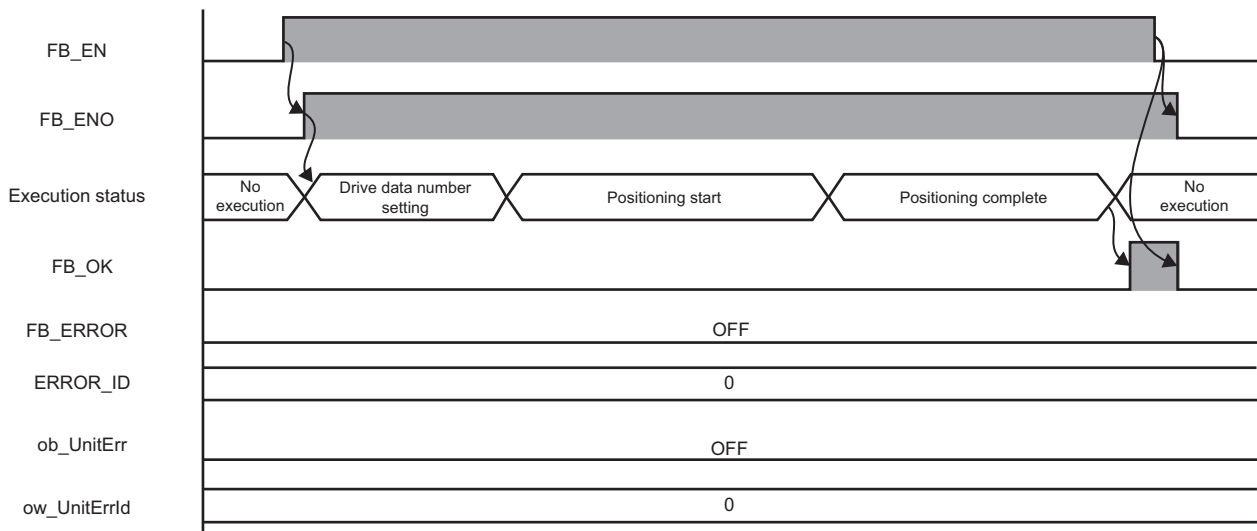
Item	Description
Language	Structured Text
Number of basic steps	2390 steps The number of steps of the FB which is embedded in a program varies depending on the CPU module being used, input/output definitions, and option settings of GX Works2. For the option settings of GX Works2, refer to the  GX Works2 Version 1 Operating Manual (Common).
Number of points of a label used	<ul style="list-style-type: none"> • Label: 56 points (Word), 31 points (Bit) • Latch label: 0 point (Word), 0 point (Bit) The number of points of a label used which is embedded in a program varies depending on the device specified for an argument and option settings of GX Works2. For the option settings of GX Works2, refer to  GX Works2 Version 1 Operating Manual (Common).
Index register	Index register: 1 point (Z9)
FB dependence	M+CPU-OriPosiSp_StartPosi-ST └─ M+CPU-OriPosiSp_CPRTCL-ST
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

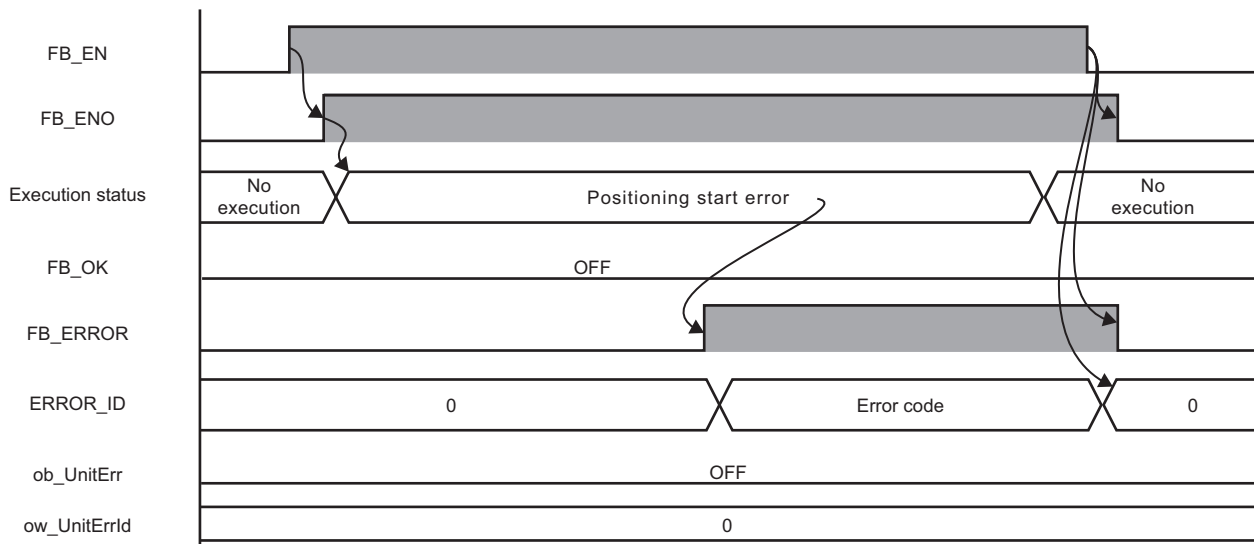
- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in iw_StartIONo (start I/O No.) and iw_Ch (target channel) respectively.
- Specify the address number (slave address) of the operation target in iw_Axis (target axis).
- Specify the series of a target motor driver in iw_WriteTo (target controller).
- Set the drive data number to be executed in iw_TableNo (drive data No.).
- This FB starts the positioning operation of the specified drive data number for a motor driver at the rise of FB_EN (execution command).
- FB_OK (normal completion) is turned ON when positioning operation of drive data number is completed.
- When a value out of the range is set for the start I/O number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target channel, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target axis, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the drive data number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '105H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target controller, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in ERROR_ID (error code).
- When a value set for the start I/O number is not correctly applied in M+CPU-OriPosiSp_CPRTCL-ST, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '110H' is stored in ERROR_ID (error code).
- When the connected device is not the operation target, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in ERROR_ID (error code).
- When turning OFF FB_EN (execution command) before FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON, FB_ERROR (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in ERROR_ID (error code) for one scan.
- When turning ON FB_EN (execution command) of this FB while executing any of the following FBs, FB_ERROR (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in ERROR_ID (error code).
M+CPU-OriPosiSp_StartHomePosi-ST
M+CPU-OriPosiSp_JogInching-ST
M+CPU-OriPosiSp_StartPosi-ST
- When an alarm signal of a motor driver is turned ON, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '203H' is stored in ERROR_ID (error code). Check the status of the motor driver in M+CPU-OriPosiSp_Monitoring-ST.
- When turning ON FB_EN (execution command) of this FB while the servo or READY signal of a target motor driver is OFF, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '204H' is stored in ERROR_ID (error code).
- When an error occurs while sending/receiving a message to/from the predefined protocol, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, an error code of a serial communication module is stored in ERROR_ID (error code). For details on the error code, refer to  Q Corresponding Serial Communication Module User's Manual (Basic) or  MELSEC-L Serial Communication Module User's Manual (Basic).
- When this FB receives an error code due to an error occurred in a motor driver, ob_UnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in ow_UnitErrId (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because FB_EN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF FB_EN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the device/label automatic-assign setting so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works2.
- After positioning operation is started by using this FB, when turning OFF FB_EN (execution command) before FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON, a motor continues to operate until a home position return is completed.
- After turning ON the power, when this FB is operated without executing a home position return, positioning operation is performed automatically after executing the home position return.
- This FB uses the G_CPRTCL instruction. For details, refer to  MELSEC-Q/L Structured Programming Manual (Special Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in iw_StartIONo (start I/O No.). If the start input/output number is not assigned to the module, a stop error (2110H) occurs in the CPU module.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following intelligent function module data (parameters of a serial communication module) to a module in GX Works2.

Item		Setting value	
Switch Setting	Transmission setting	Data bit	8
		Parity bit	Yes
		Even/odd parity	Even
		Stop bit	1
	Communication speed setting	Set the value according to the setting of an electric actuator controller to be used.	
	Communication protocol setting	Predefined protocol	
Various Control Specification	Echo back enable/prohibit specification	1: Prohibited	

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning (Q/L) to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value




The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Macro type
- CPU module: Q04UDVCP
- Serial communication module: QJ71C24N
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK
- Initial position: Home position (0.00 mm)
- Drive data execution setting:
 - Target position: 0.00 mm
 - Speed: 10.00 mm/sec
 - Acceleration: 0.1 G
 - Deceleration: 0.1 G
 - Other setting value: 0

Timing for turning execution command ON	Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
After executing home position return	92.000 ms	0.500 ms	361 scans

*1 The time required from start to end of the processing.

Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
105H	The value set for the drive data number is out of the range.	Set a value within the range from 0 to 63 for the drive data number and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
110H	The start I/O number of M+CPU-OriPosiSp_CPRCL-ST is out of the range.	Review the setting. For details, refer to the following:  Page 53 Checking the start I/O number
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF FB_EN (execution command) until FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of a motor is executing.	Stop the FB and execute this FB again. Target FB: <ul style="list-style-type: none"> • M+CPU-OriPosiSp_StartHomePosi-ST • M+CPU-OriPosiSp_JogInching-ST • M+CPU-OriPosiSp_StartPosi-ST For M+CPU-OriPosiSp_JogInching-ST, check that ob_ParamOK (parameter setting completion flag) is turned ON and ob_Busy (busy signal) is turned OFF.
203H	Emergency stop or major failure is occurring.	Check the status of the motor driver in M+CPU-OriPosiSp_Monitoring-ST. After checking the status, remove the cause of the error and execute the FB again.
204H	Movement commands are executed while a servo or READY signal is OFF.	Check the status of the motor driver in M+CPU-OriPosiSp_Monitoring-ST. To turn ON a servo, turn it ON with M+CPU-OriPosiSp_ServoControl-ST.
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  Q Corresponding Serial Communication Module User's Manual (Basic)  MELSEC-L Serial Communication Module User's Manual (Basic)

3.7 M+CPU-OriPosiSp_Monitoring-ST

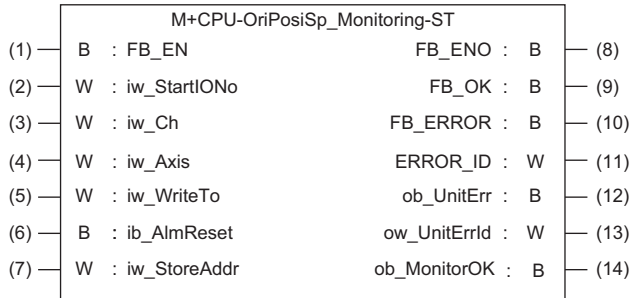


Advanced preparation is required for using this FB. For details, refer to the following:

- ☞ Page 53 Importing M+CPU-OriPosiSp_CPRTCL-ST
- ☞ Page 53 Checking the start I/O number

Overview

Monitors a current position and alarms, and resets the alarms.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	FB_EN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	iw_StartIONo	Start I/O No.	Word [signed]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	iw_Ch	Target channel	Word [signed]	2	Specify the channel of a serial communication module.
(4)	iw_Axis	Target axis	Word [signed]	1 to 31	Specify an address number (slave address).
(5)	iw_WriteTo	Target controller	Word [signed]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2
(6)	ib_AlmReset	Reset alarm	Bit	ON, OFF	ON: An alarm is reset. OFF: An alarm does not operate.
(7)	iw_StoreAddr	Address to store monitor data	Word [signed]	0 to FFFFH	Specify the start number of D device, which stores monitor data values, in hexadecimal. For details on the monitor data, refer to the following: ☞ Page 107 Monitor data

Output label

No.	Label	Name	Data type	Default value	Description
(8)	FB_ENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(9)	FB_OK	Normal completion	Bit	OFF	The ON state indicates that an alarm is cleared normally.
(10)	FB_ERROR	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(11)	ERROR_ID	Error code	Word [signed]	0	The error code of an error occurred in the FB is stored.
(12)	ob_UnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(13)	ow_UnitErrId	Unit error code	Word [signed]	0	The error code of an error occurred in the module is stored.
(14)	ob_MonitorOK	Monitoring status	Bit	OFF	The ON state indicates that a current position and alarms are monitored normally.

FB details

Available device

■ Serial communication module

Target module	Firmware version	Engineering tool
QJ71C24N*1	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
QJ71C24N-R4*1	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
LJ71C24*1	—	GX Works2 Version 1.570U or later



*1 Available only in CH2.

■ CPU module



- QCPU*1
- LCPU

*1 Universal model QCPUs and process CPUs only

Basic specifications

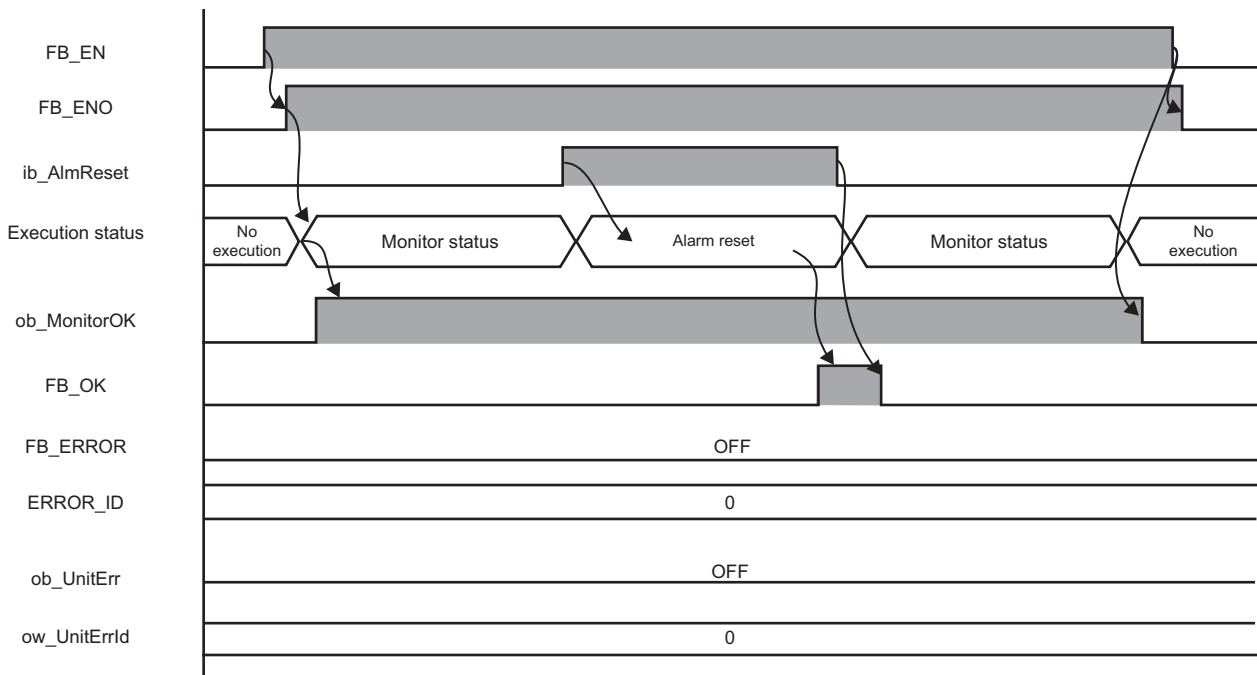
Item	Description
Language	Structured Text
Number of basic steps	3777 steps The number of steps of the FB which is embedded in a program varies depending on the CPU module being used, input/output definitions, and option settings of GX Works2. For the option settings of GX Works2, refer to the  GX Works2 Version 1 Operating Manual (Common).
Number of points of a label used	<ul style="list-style-type: none"> • Label: 73 points (Word), 34 points (Bit) • Latch label: 0 point (Word), 0 point (Bit) The number of points of a label used which is embedded in a program varies depending on the device specified for an argument and option settings of GX Works2. For the option settings of GX Works2, refer to  GX Works2 Version 1 Operating Manual (Common).
Index register	Index register: 2 points (Z9 and Z8)
FB dependence	M+CPU-OriPosiSp_Monitoring-ST └─ M+CPU-OriPosiSp_CPRTCL-ST
FB compilation method	Macro type
FB operation	Real-time execution

Processing

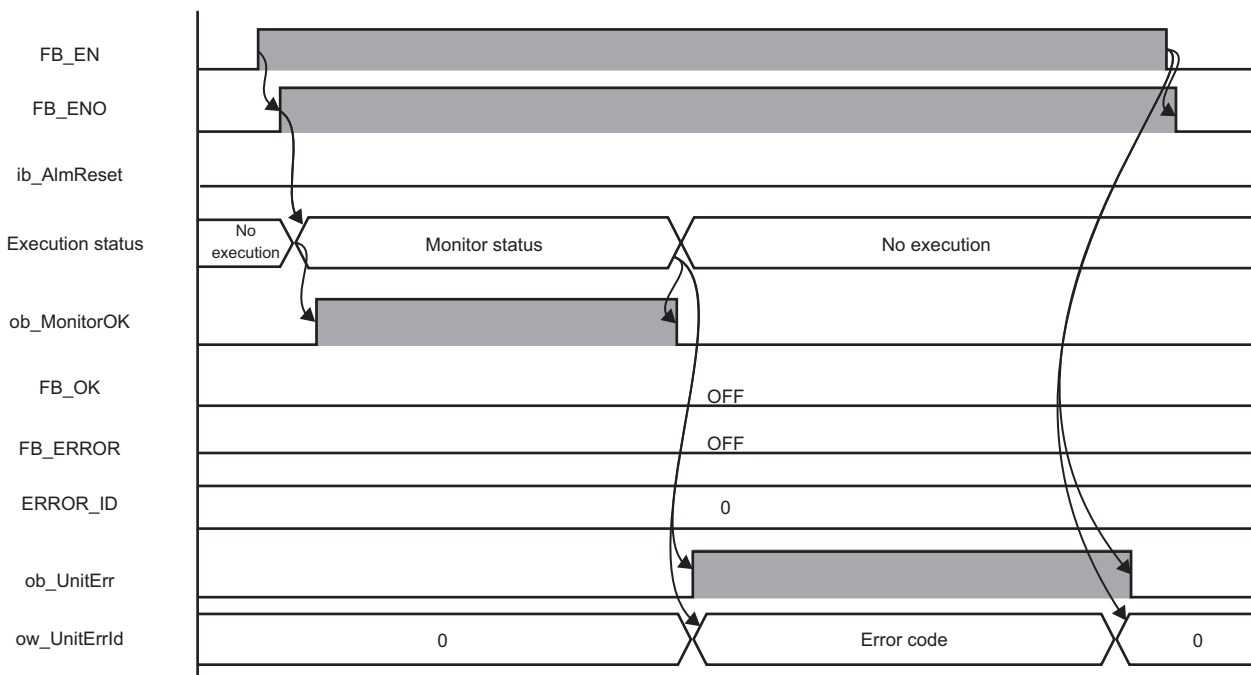
- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in iw_StartIONo (start I/O No.) and iw_Ch (target channel) respectively.
- Specify the address number (slave address) of the operation target in iw_Axis (target axis).
- Specify the series of a target motor driver in iw_WriteTo (target controller).
- Set the start number of D device, which stores monitor data in iw_StoreAddr (address to store monitor data).
- This FB starts monitoring a target axis at the rise of FB_EN (execution command).
Monitor data (such as a current position and alarm codes) is stored in the device specified in iw_StoreAddr (address to store monitor data).
- ob_MonitorOK (monitoring status) is turned ON while monitoring the target axis.
- The alarm is reset by turning ON FB_EN (execution command), and then turning ON ib_AlmReset (reset alarm) while the alarm is occurring.
- FB_OK (normal completion) is turned ON when the alarm reset is completed.
- When a value out of the range is set for the start I/O number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target channel, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target axis, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target controller, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in ERROR_ID (error code).
- When a value set for the start I/O number is not correctly applied in M+CPU-OriPosiSp_CPRTCL-ST, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '110H' is stored in ERROR_ID (error code).
- When the connected device is not the operation target, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in ERROR_ID (error code).
- When turning ON FB_EN (execution command) of this FB while executing the following FB, FB_ERROR (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in ERROR_ID (error code).
M+CPU-OriPosiSp_Monitoring-ST
- When an error occurs while sending/receiving a message to/from the predefined protocol, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, an error code of a serial communication module is stored in ERROR_ID (error code). For details on the error code, refer to  Q Corresponding Serial Communication Module User's Manual (Basic) or  MELSEC-L Serial Communication Module User's Manual (Basic).
- When this FB receives an error code due to an error occurred in a motor driver, ob_UnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in ow_UnitErrId (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because FB_EN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF FB_EN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the device/label automatic-assign setting so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works2.
- This FB uses the G_CPRTCL instruction. For details, refer to  MELSEC-Q/L Structured Programming Manual (Special Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in iw_StartIOno (start I/O No.). If the start input/output number is not assigned to the module, a stop error (2110H) occurs in the CPU module.
- This FB uses index registers (Z9 and Z8). Do not use the Z9 and Z8 in an interrupt program.
- Before operating a motor driver, write the following intelligent function module data (parameters of a serial communication module) to a module in GX Works2.

Item		Setting value	
Switch Setting	Transmission setting	Data bit	8
		Parity bit	Yes
		Even/odd parity	Even
		Stop bit	1
	Communication speed setting	Set the value according to the setting of an electric actuator controller to be used.	
	Communication protocol setting	Predefined protocol	
Various Control Specification	Echo back enable/prohibit specification	1: Prohibited	

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning (Q/L) to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value




The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Macro type
- CPU module: Q04UDVCPU
- Serial communication module: QJ71C24N
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK

Measuring range	Time required for the processing ^{*1}	Maximum scan time	Number of scans required for the processing
From when FB_EN (execution command) is turned ON to when ob_MonitorOK (monitoring status) is turned ON	122.000 ms	0.815 ms	336 scans
From when ib_AlmReset (reset alarm) is turned ON to when an alarm reset is completed	209.000 ms	0.785 ms	314 scans

*1 The time required from start to end of the processing.

Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
110H	The start I/O number of M+CPU-OriPosiSp_CPRCTL-ST is out of the range.	Review the setting. For details, refer to the following:  Page 53 Checking the start I/O number
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
202H	Another FB which may affect the operation of this FB is executing.	Stop the FB and execute this FB again. Target FB: • M+CPU-OriPosiSp_Monitoring-ST
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  Q Corresponding Serial Communication Module User's Manual (Basic)  MELSEC-L Serial Communication Module User's Manual (Basic)

3.8 M+CPU-OriPosiSp_ServoControl-ST

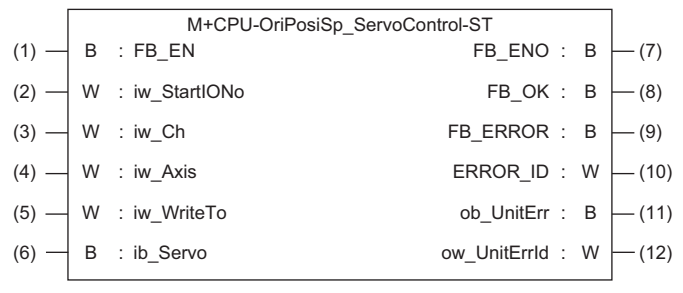


Advanced preparation is required for using this FB. For details, refer to the following:

- ☞ Page 53 Importing M+CPU-OriPosiSp_CPRTCL-ST
- ☞ Page 53 Checking the start I/O number

Overview

Requests a servo to turn ON or OFF.



Labels

Input label

No.	Label	Name	Data type	Range	Description
(1)	FB_EN	Execution command	Bit	ON, OFF	ON: The FB is activated. OFF: The FB is not activated.
(2)	iw_StartIONo	Start I/O No.	Word [signed]	00H to FEH	Specify the value obtained by dividing the start input/output number of a target serial communication module by 16.
(3)	iw_Ch	Target channel	Word [signed]	2	Specify the channel of a serial communication module.
(4)	iw_Axis	Target axis	Word [signed]	1 to 31	Specify an address number (slave address).
(5)	iw_WriteTo	Target controller	Word [signed]	0 to 2	Specify the series of a writing destination motor driver. AR Series: 0 AZ Series: 1 RKII Series: 2
(6)	ib_Servo	Servo ON/OFF replacement	Bit	ON, OFF	ON: Servo ON OFF: Servo OFF

Output label

No.	Label	Name	Data type	Default value	Description
(7)	FB_ENO	Execution status	Bit	OFF	ON: The execution command is ON. OFF: The execution command is OFF.
(8)	FB_OK	Normal completion	Bit	OFF	The ON state indicates that the execution of servo ON or OFF command is completed.
(9)	FB_ERROR	Error completion	Bit	OFF	The ON state indicates that an error has occurred in the FB.
(10)	ERROR_ID	Error code	Word [signed]	0	The error code of an error occurred in the FB is stored.
(11)	ob_UnitErr	Unit error completion	Bit	OFF	The ON state indicates that an error has occurred in the module.
(12)	ow_UnitErrId	Unit error code	Word [signed]	0	The error code of an error occurred in the module is stored.

FB details

Available device

Serial communication module

Target module	Firmware version	Engineering tool
QJ71C24N ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
QJ71C24N-R4 ^{*1}	The first five digits of the serial number are '11062' or higher.	GX Works2 Version 1.570U or later
LJ71C24 ^{*1}	—	GX Works2 Version 1.570U or later

*1 Available only in CH2.

CPU module

- QCPU^{*1}
- LCPU

*1 Universal model QCPU and process CPU only

Basic specifications

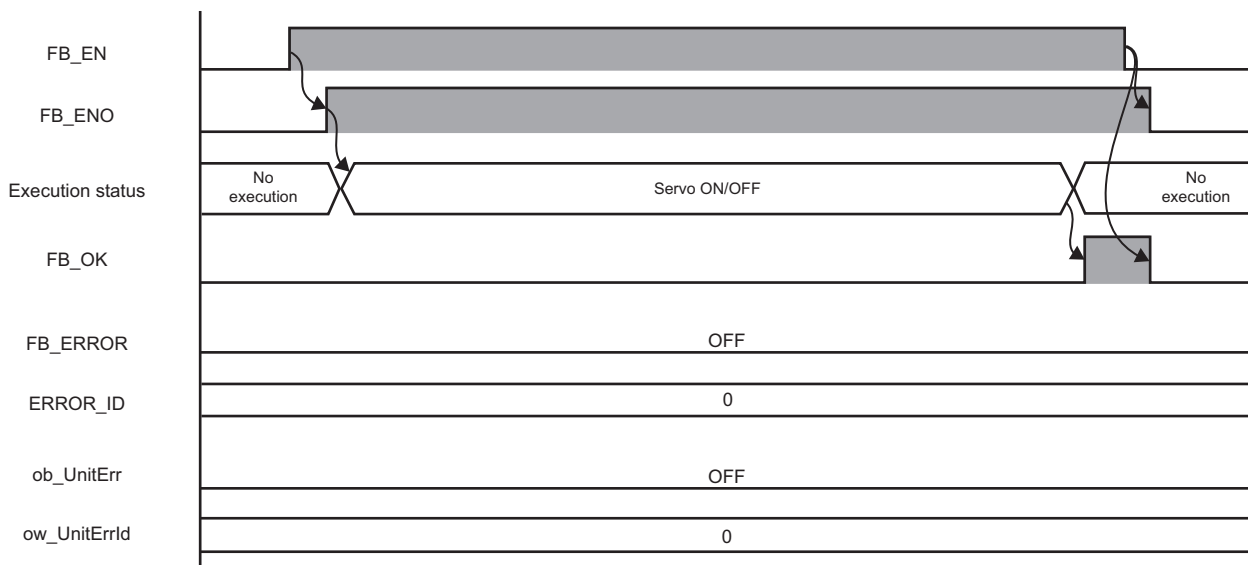
Item	Description
Language	Structured Text
Number of basic steps	1838 steps The number of steps of the FB which is embedded in a program varies depending on the CPU module being used, input/output definitions, and option settings of GX Works2. For the option settings of GX Works2, refer to the GX Works2 Version 1 Operating Manual (Common) .
Number of points of a label used	<ul style="list-style-type: none">• Label: 48 points (Word), 29 points (Bit)• Latch label: 0 point (Word), 0 point (Bit) The number of points of a label used which is embedded in a program varies depending on the device specified for an argument and option settings of GX Works2. For the option settings of GX Works2, refer to GX Works2 Version 1 Operating Manual (Common) .
Index register	Index register: 1 point (Z9)
FB dependence	M+CPU-OriPosiSp_ServoControl-ST └ M+CPU-OriPosiSp_CPRTCL-ST
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)

Processing

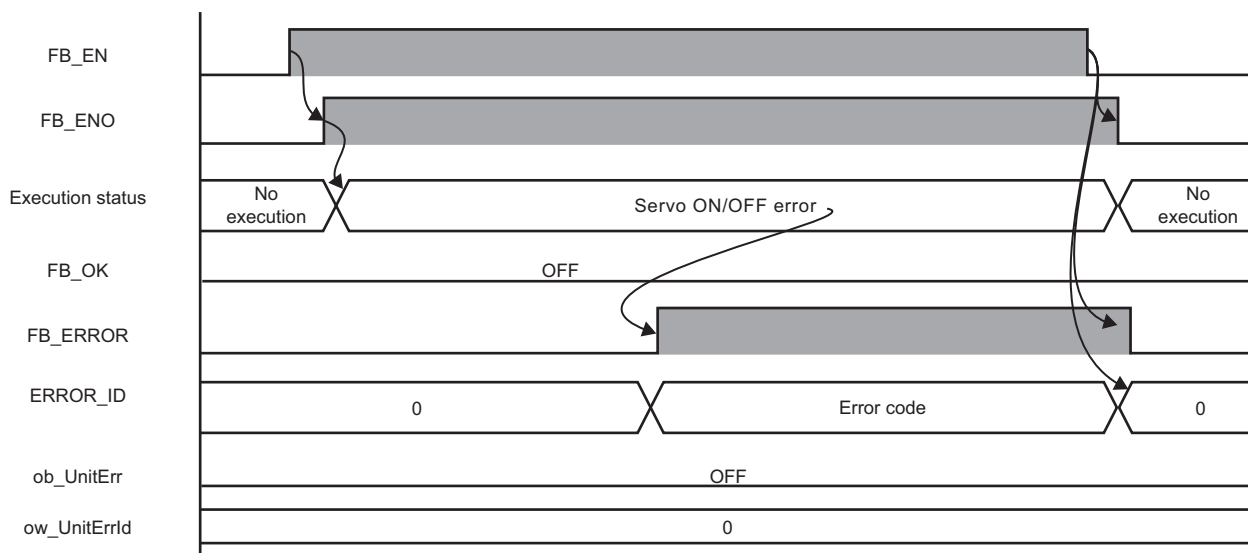
- Specify the start I/O number (a value obtained by dividing the start input/output number by 16) and channel of a serial communication module in iw_StartIONo (start I/O No.) and iw_Ch (target channel) respectively.
- Specify the address number (slave address) of the operation target in iw_Axis (target axis).
- Specify the series of a target motor driver in iw_WriteTo (target controller).
- At the rise of FB_EN (execution command), this FB requests a servo to turn ON when ib_Servo (servo ON/OFF replacement) is turned ON, and requests to turn OFF when ib_Servo is turned OFF.
- At the completion of this FB, FB_OK (normal completion) is turned ON.
This does not actually determine the ON status of a servo. Check the status of the servo with M+CPU-OriPosiSp_Monitoring-ST. (📖 Page 89 M+CPU-OriPosiSp_Monitoring-ST)
- When a value out of the range is set for the start I/O number, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '100H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target channel, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '101H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target axis, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '102H' is stored in ERROR_ID (error code).
- When a value out of the range is set for the target controller, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '108H' is stored in ERROR_ID (error code).
- When a value set for the start I/O number is not correctly applied in M+CPU-OriPosiSp_CPRTCL-ST, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '110H' is stored in ERROR_ID (error code).
- When the connected device is not the operation target, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, the error code '200H' is stored in ERROR_ID (error code).
- When turning OFF FB_EN (execution command) before FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON, FB_ERROR (error completion) is turned ON for one scan only and the processing of the FB is interrupted. In addition, the error code '201H' is stored in ERROR_ID (error code) for one scan.
- When turning ON FB_EN (execution command) of this FB while executing the following FB, FB_ERROR (error completion) is turned ON and the processing of this FB is interrupted. In addition, the error code '202H' is stored in ERROR_ID (error code).
M+CPU-OriPosiSp_ServoControl-ST
- When an error occurs while sending/receiving a message to/from the predefined protocol, FB_ERROR (error completion) is turned ON and the processing of the FB is interrupted. In addition, an error code of a serial communication module is stored in ERROR_ID (error code). For details on the error code, refer to 📖 Q Corresponding Serial Communication Module User's Manual (Basic) or 📖 MELSEC-L Serial Communication Module User's Manual (Basic).
- When this FB receives an error code due to an error occurred in a motor driver, ob_UnitErr (unit error completion) is turned ON and the processing of the FB is interrupted. In addition, the received error code is stored in ow_UnitErrId (unit error code).

Timing chart of I/O signals


■ In normal completion




■ In error completion



Restrictions or precautions

- This FB does not include error recovery processing. Program the error recovery processing separately in accordance with the required system operation.
- This FB cannot be used in an interrupt program.
- Do not use this FB in programs that are executed only once, such as a subroutine program or FOR-NEXT loop, because FB_EN (execution command) cannot be turned OFF and the normal operation cannot be performed. Always use this FB in programs that can turn OFF FB_EN (execution command).
- This FB requires the configuration of the ladder for every input label.
- Change the device/label automatic-assign setting so that the capacity required to use this FB is secured. Otherwise, a compiling error may occur in GX Works2.
- This FB uses the G_CPRTCL instruction. For details, refer to  MELSEC-Q/L Structured Programming Manual (Special Instructions).
- Specify a value obtained by dividing the start input/output number, which is assigned to a serial communication module, by 16 in iw_StartIONo (start I/O No.). If the start input/output number is not assigned to the module, a stop error (2110H) occurs in the CPU module.
- This FB uses the index register Z9. Do not use the Z9 in an interrupt program.
- Before operating a motor driver, write the following intelligent function module data (parameters of a serial communication module) to a module in GX Works2.

Item		Setting value	
Switch Setting	Transmission setting	Data bit	8
		Parity bit	Yes
		Even/odd parity	Even
		Stop bit	1
	Communication speed setting	Set the value according to the setting of an electric actuator controller to be used.	
	Communication protocol setting	Predefined protocol	
Various Control Specification	Echo back enable/prohibit specification	1: Prohibited	

- Use the protocol send/receive setting of Predefined Protocol Support Tool For Positioning (Q/L) to change a communication timeout or the number of retries. ( Predefined Protocol Support Tool For Positioning Operating Manual)

Performance value




The following table lists the performance values of this FB under the following conditions.

- FB compilation method: Macro type
- CPU module: Q04UDVCPU
- Serial communication module: QJ71C24N
- Motor driver: AZD-KD
- Motor: EASM4NXE005AZMK

ib_Servo (Servo ON/OFF replacement)	Time required for the processing*1	Maximum scan time	Number of scans required for the processing
OFF	45.400 ms	0.500 ms	131 scans
ON	45.800 ms	0.500 ms	131 scans

*1 The time required from start to end of the processing.

Error code

Error code	Description	Corrective action
100H	The value set for the start I/O number is out of the range.	Set a value within the range from 00H to FEH for the start I/O number and execute the FB again.
101H	The value set for the target channel is out of the range.	Set 2 for the target channel and execute the FB again.
102H	The value set for the target axis is out of the range.	Set a value within the range from 1 to 31 for the target axis and execute the FB again.
108H	The value set for the target controller is out of the range.	Set a value within the range from 0 to 2 for the target controller and execute the FB again.
110H	The start I/O number of M+CPU-OriPosiSp_CPRCL-ST is out of the range.	Review the setting. For details, refer to the following:  Page 53 Checking the start I/O number
200H	An unsupported device is connected.	Review and correct the connected device and execute the FB again.
201H	The execution command turned OFF during the processing.	Do not turn OFF FB_EN (execution command) until FB_OK (normal completion), FB_ERROR (error completion), or ob_UnitErr (unit error completion) is turned ON. (This error code is output for one scan only.)
202H	Another FB which may affect the operation of this FB is executing.	Stop the FB and execute this FB again. Target FB: • M+CPU-OriPosiSp_ServoControl-ST
Predefined protocol error code	An error code that occurs during communication.	For details, refer to the following:  Q Corresponding Serial Communication Module User's Manual (Basic)  MELSEC-L Serial Communication Module User's Manual (Basic)

3.9 M+CPU-OriPosiSp_CPRTCL-ST

Overview

Executes an instruction for predefined protocol communication (G_CPRTCL) by using this FB in other MELSEC-Q/L series FBs.

FB details

Basic specifications


Item	Description
FB compilation method	Macro type
FB operation	Pulse execution (multiple scan execution type)


Processing

This FB is called from the following FBs and executes an instruction for predefined protocol communication (G_CPRTCL).

- M+CPU-OriPosiSp_StartHomePosi-ST
- M+CPU-OriPosiSp_JogInching-ST
- M+CPU-OriPosiSp_ReadDriveData-ST
- M+CPU-OriPosiSp_Teaching-ST
- M+CPU-OriPosiSp_StartPosi-ST
- M+CPU-OriPosiSp_Monitoring-ST
- M+CPU-OriPosiSp_ServoControl-ST

Restrictions or precautions

- Do not use this FB in a user-created program as this is used only in other FBs.
- This FB uses the G_CPRTCL instruction. For details, refer to  MELSEC-Q/L Structured Programming Manual (Special Instructions).
- When the start input/output number of a serial communication module which executes the G_CPRTCL instruction is other than 00H to F0H, the start input/output number needs to be set after adding the G_CPRTCL instruction to a program. For details, refer to the following:

 Page 53 Checking the start I/O number

APPENDIX

Appendix 1 Table Information (MELSEC iQ-R Series)

Drive data structure (stOriDriveData)

The following shows the list of drive data structure (stOriDriveData).

Label	Name	Data type	Range	Description
dPosition	Target position	Double Word [signed]	<ul style="list-style-type: none"> • AR Series and RKII Series -8388608 to 8388607 • AZ Series -2147483648 to 2147483647 	The target position (travel amount) for positioning operation is stored. (Unit: step)
dSpeed	Speed command	Double Word [signed]	<ul style="list-style-type: none"> • AR Series and RKII Series 0 to 1000000 • AZ Series -4000000 to 4000000 	The speed command for positioning operation is stored. (Unit: Hz)
udUpSpeed	Acceleration	Double Word [Unsigned]/Bit String [32-bit]	1 to 1000000	The acceleration rate (or acceleration time) for positioning operation is stored. (Unit: 0.001 ms/kHz)
udDownSpeed	Deceleration	Double Word [Unsigned]/Bit String [32-bit]	1 to 1000000	The deceleration rate (or deceleration time) for positioning operation is stored. (Unit: 0.001 ms/kHz)
uMotionMethod	Drive method	Word [Unsigned]/Bit String [16-bit]	<ul style="list-style-type: none"> • AR Series and RKII Series 0 to 1 • AZ Series 1 to 22 	The method for specifying the position (travel amount) in positioning operation is stored.
uMotionFunc	Drive function	Word [Unsigned]/Bit String [16-bit]	0 to 3	<ul style="list-style-type: none"> • AR Series and RKII Series The method for executing positioning operation is stored. • AZ Series Not supported
uDwellTime	Dwell time	Word [Unsigned]/Bit String [16-bit]	<ul style="list-style-type: none"> • AR Series and RKII Series 0 to 50000 • AZ Series 0 to 65535 	<ul style="list-style-type: none"> • AR Series and RKII Series The waiting time between the first operation data and second operation data in linked-motion operation 2 is stored. (Unit: 0.001 s) • AZ Series The waiting time generated after operation is completed is stored. (Unit: 0.001 s)
uElecLimit	Pushing current	Word [Unsigned]/Bit String [16-bit]	0 to 1000	<ul style="list-style-type: none"> • AR Series The current rate of push-motion operation is stored. (Unit: 0.1 %) • RKII Series Not supported • AZ Series The motor operating current is stored based on the base current being 100%. A pushing current is stored when push-motion operation is performed. (Unit: 0.1 %)
uFwdPosOp	Next positioning	Word [Unsigned]/Bit String [16-bit]	0 to 1	<ul style="list-style-type: none"> • AR Series and RKII Series Whether to enable or disable next positioning operation is stored. • AZ Series Not supported
uMarge	Merge	Word [Unsigned]/Bit String [16-bit]	0 to 3	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported • AZ Series The mode for merge is stored.

Label	Name	Data type	Range	Description
wMargeTo	Merge to	Word [signed]	-256, -2 to 255	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The merging destination for link operation is stored.
dOffsetArea	Offset area	Double Word [signed]	-2147483648 to 2147483647	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The distance from the center position of the range in which the MAREA output is turned ON to the target position of the positioning operation is stored. In the case of continuous operation, the distance to the operation start position is stored. (Unit: step)
dWithArea	Width area	Double Word [signed]	-1 to 4194303	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The range in which the MAREA output is turned ON is stored. (Unit: step)
uCountLoop	Count loop	Word [Unsigned]/Bit String [16-bit]	0, 2 to 255	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The number of times of loop is stored.
dPositonLoop	Position offset loop	Double Word [signed]	-4194304 to 4194303	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series A value to be offset is stored. (Unit: step)
uEndLoop	End loop	Word [Unsigned]/Bit String [16-bit]	0 to 1	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The drive data number in which loop is completed is stored.
wWeakEvent	Weak point event	Word [signed]	-1 to 31	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The number of the operation I/O event to generate a weak point event is stored.
wStrongEvent	Strong event	Word [signed]	-1 to 31	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The number of the operation I/O event to generate a strong event is stored. If a weak point event and strong event are generated at the same time, the strong event is prioritized.

Monitoring table structure (stOriMonitoringTable)

The following shows the list of monitoring table structure (stOriMonitoringTable).

Label	Name	Data type	Range	Description
uCurrentAlmCode	Current alarm code	Word [Unsigned]/Bit String [16-bit]	0000H to FFFFH	The current alarm code is stored.
udCurrentWngCode	Current warning code	Double Word [Unsigned]/Bit String [32-bit]	00000000H to FFFFFFFFH	<ul style="list-style-type: none"> • AR Series and RKII Series The current warning code is stored. <ul style="list-style-type: none"> • AZ Series The current information code is stored.
uCommErrCode	Current communication error code	Word [Unsigned]/Bit String [16-bit]	0000H to FFFFH	The current communication error code is stored.
uCurrentSctDataNo	Selected data No.	Word [Unsigned]/Bit String [16-bit]	0 to 63	The drive data number currently selected is stored.

Label	Name	Data type	Range	Description
uCurrentDriveDataNo	Running data No.	Word [signed]	-1 to 63	<ul style="list-style-type: none"> • AR Series and RKII Series <p>The drive data number corresponding to the data used in the current positioning operation is stored. While the motor is stopped, the last used drive data number is stored. '-1' is stored until the positioning operation is performed after turning the power ON.</p> <ul style="list-style-type: none"> • AZ Series <p>The drive data number executed in stored data operation or continuous macro operation is stored. In operation not using drive data, '-1' is stored. '-1' is also stored during stop.</p>
dTargetPosition	Target position	Double Word [signed]	-2147483648 to 2147483647	The current target position is stored. (Unit: step)
dTargetSpeed	Target speed	Double Word [signed]	-4000000 to 4000000	The current target speed is stored. (Unit: r/min)
dDetectPosition	Detection position	Double Word [signed]	-2147483648 to 2147483647	<ul style="list-style-type: none"> • AR Series <p>The detection position (the value that updated the data having set with the electronic gear) is stored. (Unit: r/min)</p> <ul style="list-style-type: none"> • AZ Series <p>The current detection position is stored. (Unit: r/min)</p> <ul style="list-style-type: none"> • RKII Series <p>The feedback position (the value that was applied the resolution having set by the electronic gears) is stored.*1 (Unit: r/min)</p>
dDetectSpeed	Detection speed	Double Word [signed]	-2147483648 to 2147483647	<ul style="list-style-type: none"> • AR Series <p>The detection speed is stored. (Unit: r/min)</p> <ul style="list-style-type: none"> • AZ Series <p>The current detection speed is stored. (Unit: r/min)</p> <ul style="list-style-type: none"> • RKII Series <p>Not supported</p>
uRestDwellTime	Remaining dwell time	Word [Unsigned]/Bit String [16-bit]	0 to 65535	<ul style="list-style-type: none"> • AR Series and RKII Series <p>The remaining dwell time used in the linked-motion 2 operation is stored. (Unit: ms)</p> <ul style="list-style-type: none"> • AZ Series <p>The remaining time in the drive-complete delay time or dwell is stored. (Unit: ms)</p>
u2DirectIOSts	Direct I/O status	Word [Unsigned]/Bit String [16-bit] (0..1)*2	0000H to FFFFH	<ul style="list-style-type: none"> • AR Series and RKII Series <p>The each direct I/O signal and electromagnetic brake status is stored.</p> <ul style="list-style-type: none"> • AZ Series <p>The status of direct input and output, extended input, differential output, and virtual input is stored.</p>
u4DriverInSig	Drive input signals	Word [Unsigned]/Bit String [16-bit] (0..3)*2	0000H to FFFFH	Input signals of motor driver remote I/O are stored. For details on input signals, refer to the manual of the motor driver used.
u2DriverOutSig	Drive output signals	Word [Unsigned]/Bit String [16-bit] (0..1)*2	0000H to FFFFH	Output signals of motor driver remote I/O are stored. For details on output signals, refer to the manual of the motor driver used.
wGroupAddress	Group address	Word [signed]	-1, 1 to 31	A group address is stored.

*1 With encoder only

*2 Array

Appendix 2 Table Information (MELSEC-Q/L Series)

Drive data

The following table shows the list of drive data when the start number of D device specified for iw_StoreAddr (address to store drive data) is D0.

Add the value of the start number of D device, which is specified for the drive data starting position, to the following device numbers.

Device	Item	Data type	Range	Description
D0	Target position	Double Word [signed]	<ul style="list-style-type: none"> • AR Series and RKII Series -8388608 to 8388607 • AZ Series -2147483648 to 2147483647 	The target position (travel amount) for positioning operation is stored. (Unit: step)
D2	Speed command	Double Word [signed]	<ul style="list-style-type: none"> • AR Series and RKII Series 0 to 1000000 • AZ Series -4000000 to 4000000 	The speed command for positioning operation is stored. (Unit: Hz)
D4	Acceleration	Double Word [Unsigned]/Bit String [32-bit]	1 to 1000000	The acceleration rate (or acceleration time) for positioning operation is stored. (Unit: 0.001 ms/kHz)
D6	Deceleration	Double Word [Unsigned]/Bit String [32-bit]	1 to 1000000	The deceleration rate (or deceleration time) for positioning operation is stored. (Unit: 0.001 ms/kHz)
D8	Drive method	Word [Unsigned]/Bit String [16-bit]	<ul style="list-style-type: none"> • AR Series and RKII Series 0 to 1 • AZ Series 1 to 22 	The method for specifying the position (travel amount) in positioning operation is stored.
D9	Drive function	Word [Unsigned]/Bit String [16-bit]	0 to 3	<ul style="list-style-type: none"> • AR Series and RKII Series The method for executing positioning operation is stored. • AZ Series Not supported
D10	Dwell time	Word [Unsigned]/Bit String [16-bit]	<ul style="list-style-type: none"> • AR Series and RKII Series 0 to 50000 • AZ Series 0 to 65535 	<ul style="list-style-type: none"> • AR Series and RKII Series The waiting time between the first operation data and second operation data in linked-motion operation 2 is stored. (Unit: 0.001 s) • AZ Series The waiting time generated after operation is completed is stored. (Unit: 0.001 s)
D11	Pushing current	Word [Unsigned]/Bit String [16-bit]	0 to 1000	<ul style="list-style-type: none"> • AR Series The current rate of push-motion operation is stored. (Unit: 0.1 %) • AZ Series The motor operating current is stored based on the base current being 100%. A pushing current is stored when push-motion operation is performed. (Unit: 0.1 %) • RKII Series Not supported
D12	Next positioning	Word [Unsigned]/Bit String [16-bit]	0 to 1	<ul style="list-style-type: none"> • AR Series and RKII Series Whether to enable or disable next positioning operation is stored. • AZ Series Not supported
D13	Merge	Word [Unsigned]/Bit String [16-bit]	0 to 3	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported • AZ Series The mode for merge is stored.
D14	Merge to	Word [signed]	-256, -2 to 255	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported • AZ Series The merging destination for link operation is stored.

Device	Item	Data type	Range	Description
D15	Offset area	Double Word [signed]	-2147483648 to 2147483647	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The distance from the center position of the range in which the MAREA output is turned ON to the target position of the positioning operation is stored. In the case of continuous operation, the distance to the operation start position is stored. (Unit: step)
D17	Width area	Double Word [signed]	-1 to 4194303	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The range in which the MAREA output is turned ON is stored. (Unit: step)
D19	Count loop	Word [Unsigned]/Bit String [16-bit]	0, 2 to 255	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The number of times of loop is stored.
D20	Position offset loop	Double Word [signed]	-4194304 to 4194303	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series A value to be offset is stored. (Unit: step)
D22	End loop	Word [Unsigned]/Bit String [16-bit]	0 to 1	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The drive data number in which loop is completed is stored.
D23	Weak point event	Word [signed]	-1 to 31	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The number of the operation I/O event to generate a weak point event is stored.
D24	Strong event	Word [signed]	-1 to 31	<ul style="list-style-type: none"> • AR Series and RKII Series Not supported <ul style="list-style-type: none"> • AZ Series The number of the operation I/O event to generate a strong event is stored. If a weak point event and strong event are generated at the same time, the strong event is prioritized.

Monitor data

The following table shows the list of monitor data when the start number of D device specified for iw_StoreAddr (address to store monitor data) is D0.

Add the value of the start number of D device, which is specified for monitor data starting position, to the following device numbers.

Device	Item	Data type	Range	Description
D0	Current alarm code	Word [Unsigned]/Bit String [16-bit]	0000H to FFFFH	The current alarm code is stored.
D1	Current warning code	Double Word [Unsigned]/Bit String [32-bit]	00000000H to FFFFFFFFH	<ul style="list-style-type: none"> • AR Series and RKII Series The current warning code is stored. <ul style="list-style-type: none"> • AZ Series The current information code is stored.
D3	Current communication error code	Word [Unsigned]/Bit String [16-bit]	0000H to FFFFH	The current communication error code is stored.
D4	Selected data No.	Word [Unsigned]/Bit String [16-bit]	0 to 63	The drive data number currently selected is stored.
D5	Running data No.	Word [signed]	-1 to 63	<ul style="list-style-type: none"> • AR Series and RKII Series The drive data number corresponding to the data used in the current positioning operation is stored. While the motor is stopped, the last used drive data number is stored. '-1' is stored until the positioning operation is performed after turning the power ON. <ul style="list-style-type: none"> • AZ Series The drive data number executed in stored data operation or continuous macro operation is stored. In operation not using drive data, '-1' is stored. '-1' is also stored during stop.
D6	Target position	Double Word [signed]	-2147483648 to 2147483647	The current target position is stored. (Unit: step)
D8	Target speed	Double Word [signed]	-4000000 to 4000000	The current target speed is stored. (Unit: r/min)
D10	Detection position	Double Word [signed]	-2147483648 to 2147483647	<ul style="list-style-type: none"> • AR Series The detection position (the value that updated the data having set with the electronic gear) is stored. (Unit: r/min) <ul style="list-style-type: none"> • AZ Series The current detection position is stored. When the wrap function is enabled, the value on the wrap coordinate is displayed. (Unit: r/min) <ul style="list-style-type: none"> • RKII Series The feedback position (the value that was applied the resolution having set by the electronic gears) is stored.*1 (Unit: r/min)
D12	Detection speed	Double Word [signed]	-2147483648 to 2147483647	<ul style="list-style-type: none"> • AR Series The detection speed is stored. (Unit: r/min) <ul style="list-style-type: none"> • AZ Series The current detection speed is stored. (Unit: r/min) <ul style="list-style-type: none"> • RKII Series Not supported
D14	Remaining dwell time	Word [Unsigned]/Bit String [16-bit]	0 to 65535	<ul style="list-style-type: none"> • AR Series and RKII Series The remaining dwell time used in the linked-motion 2 operation is stored. (Unit: ms) <ul style="list-style-type: none"> • AZ Series The remaining time in the drive-complete delay time or dwell is stored. (Unit: ms)

Device	Item	Data type	Range	Description
D15	Direct I/O status	Word [Unsigned]/Bit String [16-bit] (0..1) ^{*2}	0000H to FFFFH	<ul style="list-style-type: none"> • AR Series and RKII Series The each direct I/O signal and electromagnetic brake status is stored. <ul style="list-style-type: none"> • AZ Series The status of direct input and output, extended input, differential output, and virtual input is stored.
D17	Drive input signals	Word [Unsigned]/Bit String [16-bit] (0..3) ^{*2}	0000H to FFFFH	Input signals of motor driver remote I/O are stored. For details on input signals, refer to the manual of the motor driver used.
D21	Drive output signals	Word [Unsigned]/Bit String [16-bit] (0..1) ^{*2}	0000H to FFFFH	Output signals of motor driver remote I/O are stored. For details on output signals, refer to the manual of the motor driver used.
D23	Group address	Word [signed]	-1, 1 to 31	A group address is stored.

*1 With encoder only

*2 Array

INSTRUCTION INDEX

M

M+CPU-OriPosiSp_CPRTCL-ST	101
M+CPU-OriPosiSp_JogInching-ST	60
M+CPU-OriPosiSp_Monitoring-ST	89
M+CPU-OriPosiSp_ReadDriveData-ST	70
M+CPU-OriPosiSp_ServoControl-ST	95
M+CPU-OriPosiSp_StartHomePosi-ST	54
M+CPU-OriPosiSp_StartPosi-ST	82
M+CPU-OriPosiSp_Teaching-ST	76
M+OriJogInching_R	16
M+OriMonitoring_R	41
M+OriReadDriveData_R	24
M+OriServoControl_R	47
M+OriStartHomePositioning_R	11
M+OriStartPositioning_R	34
M+OriTeachingPosition_R	29



MEMO

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