

**FA-M3 ToolBox
for Positioning Modules
(for F3NC32/34)**

IM 34M06Q31-01E



Compatible Modules:

Model Code	Model Name
F3NC32-0N	Positioning Module (with Pulse Output)
F3NC34-0N	Positioning Module (with Pulse Output)

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Applicable Product

Range-Free Multi-Controller FA-M3

- Model Code: SF662-MCW
- Model Name: FA-M3 ToolBox for Positioning Modules (for F3NC32/34)

The document number and document model code for this manual are given below. Refer to the document number in all communications; also refer to the document number or the document model code when purchasing additional copies of this manual.

- Document Number: IM 34M06Q31-01E
- Document Model Code: DOCIM

Important

■ About This Manual

- This Manual should be passed on to the end user.
- Before using the controller, read this manual thoroughly to have a clear understanding of the controller.
- This manual explains the functions of this product, but there is no guarantee that they will suit the particular purpose of the user.
- Under absolutely no circumstances may the contents of this manual be transcribed or copied, in part or in whole, without permission.
- The contents of this manual are subject to change without prior notice.
- Every effort has been made to ensure accuracy in the preparation of this manual. However, should any errors or omissions come to the attention of the user, please contact the nearest Yokogawa Electric representative or sales office.

■ Symbols Related to Safety



Danger. This symbol on the product indicates that the operator must follow the instructions laid out in this user's manual to avoid the risk of personnel injuries, fatalities, or damage to the instrument. Where indicated by this symbol, the manual describes what special care the operator must exercise to prevent electrical shock or other dangers that may result in injury or the loss of life.



Protective Ground Terminal. Before using the instrument, be sure to ground this terminal.



Function Ground Terminal. Before using the instrument, be sure to ground this terminal.



Alternating current. Indicates alternating current.



Direct current. Indicates direct current.

The following symbols are used only in the user's manual.



WARNING

Indicates a "Warning".

Draws attention to information essential to prevent hardware damage, software damage or system failure.



CAUTION

Indicates a "Caution".

Draws attention to information essential to the understanding of operation and functions.

TIP

Indicates a "TIP".

Gives information that complements the present topic.

SEE ALSO

Indicates a "SEE ALSO" reference.

Identifies a source to which to refer.

■ Safety Precautions when Using/Maintaining the Product

- For the protection and safe use of the product and the system controlled by it, be sure to follow the instructions and precautions on safety stated in this manual whenever handling the product. Take special note that if you handle the product in a manner other than prescribed in these instructions, the protection feature of the product may be damaged or impaired. In such cases, Yokogawa cannot guarantee the quality, performance, function and safety of the product.
- When installing protection and/or safety circuits such as lightning protection devices and equipment for the product and control system as well as designing or installing separate protection and/or safety circuits for fool-proof design and fail-safe design of processes and lines using the product and the system controlled by it, the user should implement it using devices and equipment, additional to this product.
- If component parts or consumable are to be replaced, be sure to use parts specified by the company.
- This product is not designed or manufactured to be used in critical applications which directly affect or threaten human lives and safety — such as nuclear power equipment, devices using radioactivity, railway facilities, aviation equipment, shipboard equipment, aviation facilities or medical equipment. If so used, it is the user's responsibility to include in the system additional equipment and devices that ensure personnel safety.
- Do not attempt to modify the product.
- In order to prevent electrical shock, turn off all the power sources before connecting wires, etc.
- This product is classified as Class A for use in industrial environments. If used in a residential environment, it may cause electromagnetic interference (EMI). In such situations, it is the user's responsibility to adopt the necessary measures against EMI.

■ Exemption from Responsibility

- Yokogawa Electric Corporation (hereinafter simply referred to as Yokogawa Electric) makes no warranties regarding the product except those stated in the WARRANTY that is provided separately.
- Yokogawa Electric assumes no liability to any party for any loss or damage, direct or indirect, caused by the use or any unpredictable defect of the product.

■ Software Supplied by the Company

- Yokogawa Electric makes no other warranties expressed or implied except as provided in its warranty clause for software supplied by the company.
- Use the software with one computer only.
- You must purchase another copy of the software for use with each additional computer.
- Copying the software for any purposes other than backup is strictly prohibited.
- Store the original media that contain the software in a safe place.
- Reverse engineering, such as decompiling of the software, is strictly prohibited.
- Under absolutely no circumstances may the software supplied by Yokogawa Electric be transferred, exchanged, or sublet or leased, in part or as a whole, for use by any third party without prior permission by Yokogawa Electric.

■ General Requirements for Using the FA-M3 Controller

● Set the product in a location that fulfills the following requirements:

- Where the product will not be exposed to direct sunlight, and where the operating surrounding air temperature is from 0°C to 55°C (32°F to 131°F).

There are modules that must be used in an environment where the operating surrounding air temperature is in a range smaller than 0°C to 55°C (32°F to 131°F). Refer to hardware user's manual or the applicable user's manual. In case of attaching such a module, the entire system's operating surrounding air temperature is limited to the module's individual operating surrounding air temperature.

- Where the relative humidity is from 10 to 90%.
In places where there is a chance of condensation, use a space heater or the like to constantly keep the product warm and prevent condensation.
- For use in Pollution Degree 2 Environment.
- Where there are no corrosive or flammable gases.
- Where the product will not be exposed to mechanical vibration or shock that exceed specifications.
- Where there is no chance the product may be exposed to radioactivity.

● Use the correct types of wire for external wiring:

- USE COPPER CONDUCTORS ONLY.
- Use conductors with temperature ratings greater than 75°C.

● Securely tighten screws:

- Securely tighten module mounting screws and terminal screws to avoid problems such as faulty operation.
- Tighten terminal block screws with the correct tightening torque.
Refer to the hardware user's manual or the applicable user's manual for the appropriate tightening torque.

● Securely lock connecting cables:

- Securely lock the connectors of cables, and check them thoroughly before turning on the power.

● Interlock with emergency-stop circuitry using external relays:

- Equipment incorporating the FA-M3 controller must be furnished with emergency-stop circuitry that uses external relays. This circuitry should be set up to interlock correctly with controller status (stop/run).

● Ground for low impedance:

- For safety reasons, connect the [FG] grounding terminal to a Japanese Industrial Standards (JIS) Class D (earlier called Class 3) Ground^{*1}. For compliance to CE Marking, use braided or other wires that can ensure low impedance even at high frequencies for grounding.

^{*1} Japanese Industrial Standard (JIS) Class D Ground means grounding resistance of 100 Ω max.

● Configure and route cables with noise control considerations:

- Perform installation and wiring that segregates system parts that may likely become noise sources and system parts that are susceptible to noise. Segregation can be achieved by measures such as segregating by distance, installing a filter or segregating the grounding system.

● Configure for CE Marking Conformance:

- For compliance with CE Marking, perform installation and cable routing according to the description on compliance to CE Marking in the "Hardware Manual".

● We recommend that you stock up on maintenance parts:

- We recommend that you stock up on maintenance parts, including spare modules, in advance.
- Preventive maintenance (replacement of the module or its battery) is required for using the module beyond 10 years. For enquiries on battery replacement service (for purchase), contact your nearest Yokogawa Electric representative or sales office. (The module has a built-in lithium battery. Lithium batteries may exhibit decreased voltage, and in rare cases, leakage problems after 10 years.)

● Discharge static electricity before touching the system:

- Because static charge can accumulate in dry conditions, first touch grounded metal to discharge any static electricity before touching the system.

● Wipe off dirt with a soft cloth:

- Gently wipe off dirt on the product's surfaces with a soft cloth.
- If you soak the cloth in water or a neutral detergent, tightly wring it out before wiping the product.
Letting water enter the module interior can cause malfunctions.
- Do not use volatile solvents such as benzene or paint thinner or chemicals for cleaning, as they may cause deformity, discoloration, or malfunctioning.

● Avoid storing the FA-M3 controller in places with high temperature or humidity:

- Since the CPU module has a built-in battery, avoid storage in places with high temperature or humidity.
- Since the service life of the battery is drastically reduced by exposure to high temperatures, take special care (storage surrounding air temperature should be from -20°C to 75°C).
- There is a built-in lithium battery in a CPU module and temperature control module which serves as backup power supply for programs, device information and configuration information. The service life of this battery is more than 10 years in standby mode at room temperature. Take note that the service life of the battery may be shortened when installed or stored at locations of extreme low or high temperatures. Therefore, we recommend that modules with built-in batteries be stored at room temperature.

● Always turn off the power before installing or removing modules:

- Failing to turn off the power supply when installing or removing modules, may result in damage.

- **Do not touch components in the module:**

- In some modules you can remove the right-side cover and install ROM packs or change switch settings. While doing this, do not touch any components on the printed-circuit board, otherwise components may be damaged and modules may fail to work.

- **Do not use unused terminals:**

- Do not connect wires to unused terminals on a terminal block or in a connector. Doing so may adversely affect the functions of the module.

- **Use the following power source:**

- Use only power supply module F3PU□□-□□ in FA-M3 Controller for supplying power input for control circuit connection.
- If using this product as a UL-approved product, for the external power supply, use a limited voltage / current circuit power source or a Class 2 power source.

- **Refer to the user's manual before connecting wires:**

- Refer to the hardware user's manual or the applicable user's manual for the external wiring drawing.
- Refer to "A3.6.5 Connecting Output Devices" in the hardware user's manual before connecting the wiring for the output signal.
- Refer to "A3.5.4 Grounding Procedure" in the hardware user's manual for attaching the grounding wiring.

■ Waste Electrical and Electronic Equipment



Waste Electrical and Electronic Equipment (WEEE), Directive 2002/96/EC
(This directive is only valid in the EU.)

This product complies with the WEEE Directive (2002/96/EC) marking requirement. The following marking indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category

With reference to the equipment types in the WEEE directive Annex 1, this product is classified as a “Monitoring and Control instrumentation” product.

Do not dispose in domestic household waste.

When disposing products in the EU, contact your local Yokogawa Europe B. V. office.

■ How to Discard Batteries

The following description on DIRECTIVE 2006/66/EC (hereinafter referred to as the EU new directive on batteries) is valid only in the European Union.

Some models of this product contain batteries that cannot be removed by the user. Make sure to dispose of the batteries along with the product.

Do not dispose in domestic household waste.

When disposing products in the EU, contact your local Yokogawa Europe B. V. office.

Battery type: Lithium battery



Note: The symbol above means that the battery must be collected separately as specified in Annex II of the EU new directive on batteries.

Introduction

■ Overview of the Manual

This is the user manual for the FA-M3 ToolBox for Positioning Modules (for F3NC32/34) (abbreviated simply as ToolBox in this manual) software. It describes how to set up parameters of the positioning modules and pattern operation, as well as how to perform action tests, action monitoring and debugging.

For enquiries, please contact the nearest Yokogawa Electric representative or sales office.

We recommend using this manual together with the operation manuals of your computer or printer, as required.

■ Structure of the Manual

This manual consists of three parts: A, B and C.

● Part A: Startup Manual

Part A describes how to install the ToolBox software on a personal computer, use the online manual and connect to the FA-M3.

● Part B: Operation Manual

Part B describes how to edit a project with ToolBox. In particular, it describes how to set up the parameters of positioning modules, perform action testing and monitoring of positioning modules, as well as download data to, upload data from or compare data with positioning modules.

● Part C: Reference Guide

Part C lists certain limitations of ToolBox and describes each parameter.

■ How to Read This Manual

Read the "Introduction" and "How to Read This Manual" section of this manual, as well as the "FA-M3 ToolBox Manual" (IM34M06Q30-01E) carefully before attempting to use ToolBox.

The "FA-M3 ToolBox Manual" describes basic operations and general editing functions of ToolBox, applicable to other advanced-function modules. This manual describes how to operate and setup data in ToolBox for Positioning Modules.

The content is structured so that each chapter or section in Part A and Part B can be read independently to understand the detailed specifications of ToolBox.

TIP

The term "ToolBox" as used in this manual, unless otherwise stated, refers to the FA-M3 ToolBox for Positioning Modules, while the term "ToolBox" or "setup tool" as used in the FA-M3 ToolBox Manual refers to FA-M3 ToolBox.

■ Notation

● Notation for Windows Screens and Operation

Items in initial Caps denote symbols, names and window names.

Example: ToolBox, Local Device

Bracketed items denote menu bar items, dialog box fields, commands, and buttons.

Example: Select [File]-[New] from the menu bar.

This means to click [File] on the menu bar, followed by [New] on the pull-down menu.

● Representations in ToolBox Figures and Screens

The screen examples given in this manual essentially assumes a Windows XP operating environment.

Icons and application names may differ in other windows operating environments such as Windows 2000, Windows Vista and Windows 7.

Some figures in this manual may, for reasons of convenience, be emphasized or simplified, or parts of it may be omitted. Some screen images in this manual may differ from actual screens due to differences in the operating machine environment.

● Function Keys and Shortcut Keys

In addition to using a mouse, you can operate the ToolBox menus using function keys and shortcut keys.

See Also

For information on the function and shortcut keys, see:

Section B.1.3, "ToolBox Operation Commands" of the "FA-M3 ToolBox Manual".

■ Other Instruction Manuals

● For information on the Positioning Modules, see:

ToolBox is designed for use with the F3NC32-0N and F3NC34-0N Positioning Modules (with pulse output).

Always have the following Positioning Modules user's guide handy when using the ToolBox software.

Document Name	Document Number
Positioning Modules (with Pulse Output)	IM34M06H56-02E

● For information on functions of sequence CPU modules, see:

Document Name	Document Number
Sequence CPU – Functions (for F3SP28-3N/3S, F3SP38-6N/6S, F3SP53-4H/4S, F3SP58-6H/6S, F3SP59-7S)	IM34M06P13-01E
Sequence CPU – Functions (for F3SP66-4S, F3SP67-6S)	IM34M06P14-01E
Sequence CPU – Network Functions (for F3SP66-4S, F3SP67-6S)	IM34M06P14-02E
Sequence CPU – Functions (for F3SP71-4N/4S, F3SP76-7N/7S)	IM34M06P15-01E
Sequence CPU – Network Functions (for F3SP71-4N/4S, F3SP76-7N/7S)	IM34M06P15-02E
Sequence CPU Modules – Functions (for F3SP21, F3SP25 and F3SP35)	IM34M06P12-02E

● For information on instructions of sequence CPU modules, see:

Document Name	Document Number
Sequence CPU – Instructions	IM34M06P12-03E

● For FA-M3 specifications and configurations*¹, installation and wiring, test run, maintenance, inspection and system-wide module installation restrictions:

*1: For hardware other than power supply modules, base modules, input/output modules, cables and terminal units, refer to the relevant product manuals for detailed specifications.

Document Name	Document Number
Hardware Manual	IM34M06C11-01E

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FA-M3 ToolBox for Positioning Modules (for F3NC32/34)

IM 34M06Q31-01E 5th Edition

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A1 Product Overview

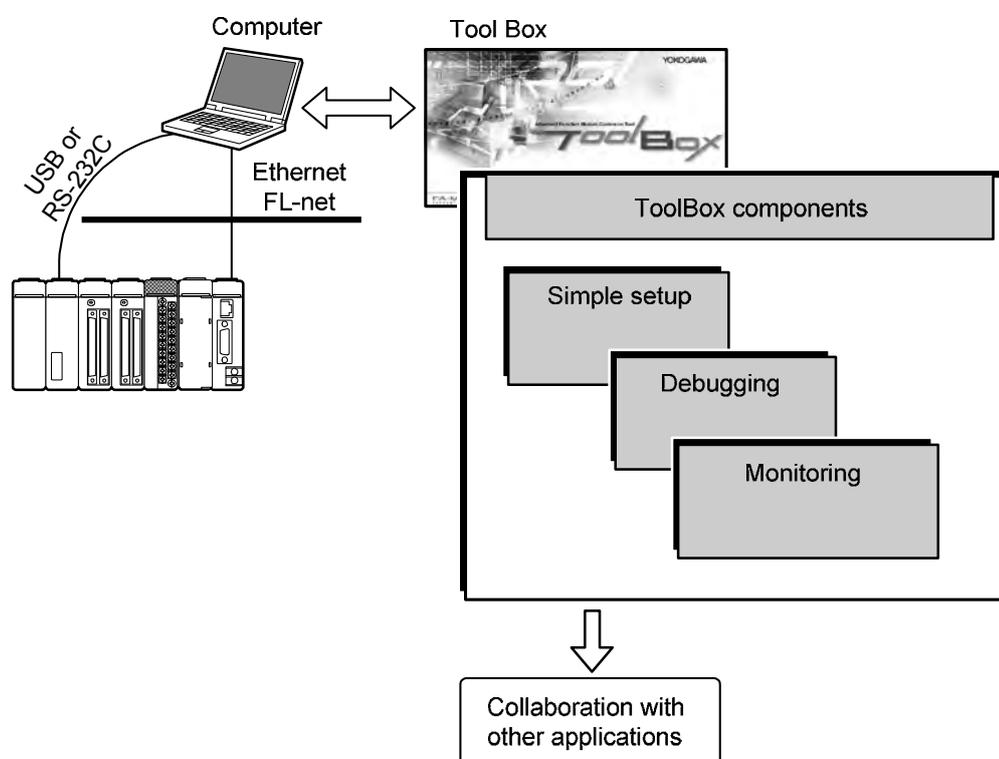
This chapter gives an overview and describes the features of the FA-M3 ToolBox for Positioning Modules (or simply referred to as ToolBox in this manual).

A1.1 Overview and Features

■ Overview of ToolBox

ToolBox is a tool for performing setup of positioning modules (with pulse output) (F3NC32-0N, F3NC34-0N). You can use it to set up or change the parameters of these modules, or to perform action test and monitoring on the modules.

You can run ToolBox and the WideField3 ladder program development tool concurrently.



■ Features of ToolBox

● User-friendly, Easy Setup

ToolBox provides context-sensitive help information for each operation, which makes registration of parameter data of positioning modules an easy job.

● Editing Functions

Pattern data records and position data records of positioning modules can be edited together or separately.

● Debugging Functions

- The jogging action test allows you to move multiple axes concurrently.
- Action test maintains a history of up to five most recently-used data.

● Pattern Monitor Function

The pattern monitor function allows you to monitor pattern data during execution.

● Collaboration with Other Applications

- You can run ToolBox and the ladder programming tool WideField3 concurrently to edit data and communicate with FA-M3.
- Parameters created in ToolBox can be saved in CSV-formatted files to be imported and reused in Microsoft Excel documents.

A1.2 New and Updated Functions

A1.2.1 Differences between ToolBox for Positioning Modules R2 and R1

This subsection describes differences in functions between ToolBox for Positioning Modules R2 and R1.

SEE ALSO

For details of individual functional differences, see sections given in the “See Also” column in Table A1.2.

TIP

To confirm the software version of ToolBox for Positioning Modules R2, select [Help]-[About ToolBox] from the menu bar. A dialog box as shown below appears. Verify that the version is displayed as “R2.xx”.

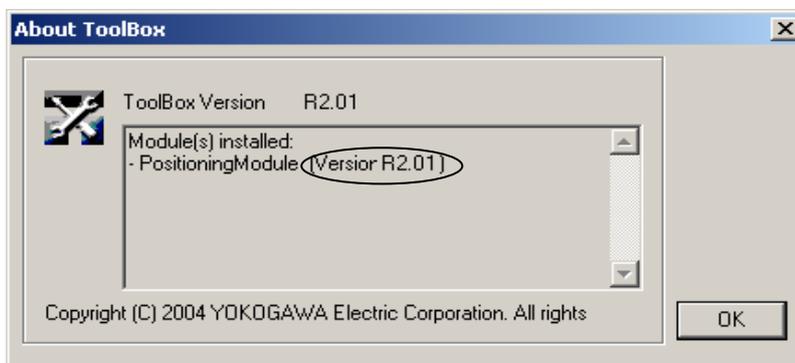


Table A1.2 New and Updated Functions in ToolBox R2

Category	Function Details	Summary	See Also
CPU	New sequence CPU types	Added newly supported sequence CPU types, along with their specific functions.	A2.2 Operating Environment for ToolBox B1.1.1 Screen Layout
Online	USB communication	Allows connection of ToolBox to FA-M3 using USB, with support of all the same functions available when connected using other communications medium.	A2.2 Operating Environment for ToolBox A2.4 Connecting ToolBox and FA-M3 System
Operating environment	Windows Vista support	Windows Vista support is included in the operating environment (for R2.02 and later).	

A1.2.2 Differences between ToolBox for Positioning Modules R3 and R2

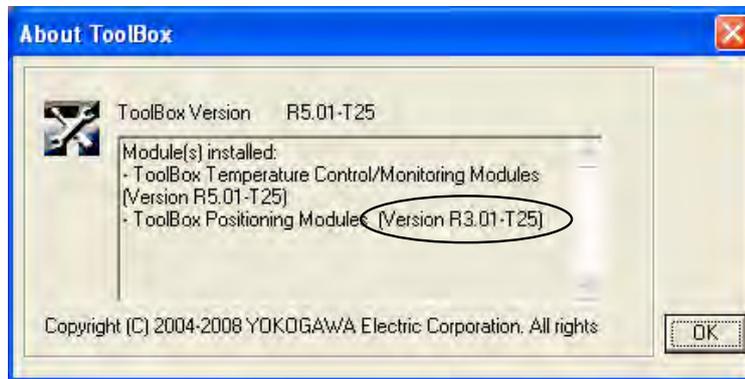
This subsection describes differences in functions between ToolBox for Positioning Modules R3 and R2.

SEE ALSO

For details of individual functional differences, see sections given in the "See Also" column in Table A1.3.

TIP

To confirm the software version of ToolBox for Positioning Modules R3, select [Help]-[About ToolBox] from the menu bar. A dialog box as shown below appears. Verify that the version is displayed as "R3.xx".



A010202_01.VSD

Table A1.3 New and Updated Functions in ToolBox R3

Category	Function Details	Summary	See Also
CPU	Addition of sequence CPU modules	The following sequence CPU modules are added: - F3SP71-4N - F3SP76-7N - F3SP22-0S And, functions specific to the additional modules are supported.	
Operating environment	Windows 7 support	Windows 7 support is included in the operating environment.	
Online	Multiple port connections	Allows for simultaneous operation of multiple ToolBox applications connected online to FA-M3 CPU modules.	

A1.2.3 Differences between ToolBox for Positioning Modules R4 and R3

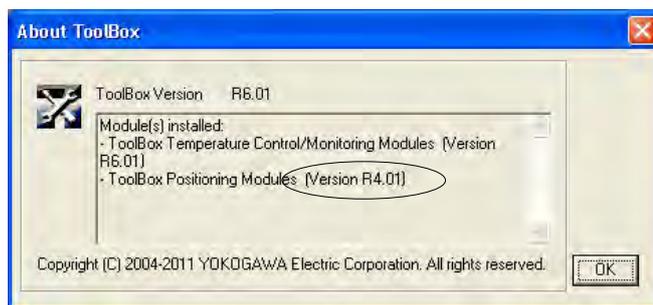
This subsection describes differences in functions between ToolBox for Positioning Modules R4 and R3.

SEE ALSO

For details of individual functional differences, see sections given in the "See Also" column in Table A1.4.

TIP

To confirm the software version of ToolBox for Positioning Modules R4, select [Help]-[About ToolBox] from the menu bar. A dialog box as shown below appears. Verify that the version is displayed as "R4.xx".



A010203_01.VSD

Table A1.4 New and Updated Functions in ToolBox R4

Category	Function Details	Summary	See Also
ToolBoxR4.01			
Entire functions	Language selection	Allows you to select the language mode of Toolbox.	
CPU	Addition of sequence CPU modules	The following sequence CPU modules are added: - F3SP71-4S - F3SP76-7S	
ToolBoxR4.02			
Operating environment	Windows Vista(64bit), Windows 7(64bit) support	Windows Vista (64bit) and Windows 7 (64bit) support is included in the operating environment.	

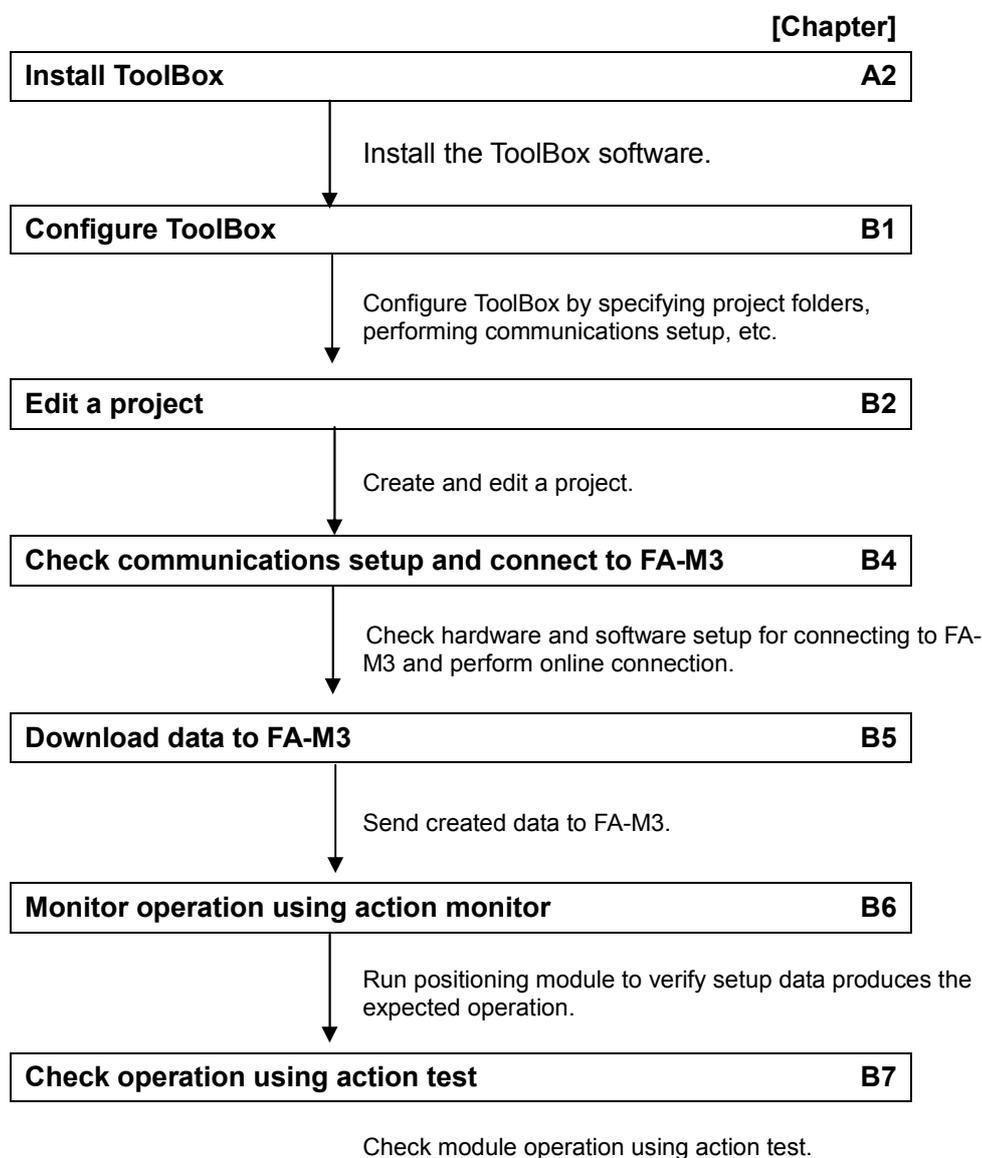
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A2 Preparing ToolBox

This chapter describes how to install, run and stop the FA-M3 ToolBox for Positioning Modules (or simply referred to as ToolBox in this manual).

- Procedure for Using ToolBox → A2.1
- Operating Environment for ToolBox → A2.2
- Installing ToolBox → A2.3
- Connecting ToolBox and FA-M3 System → A2.4

A2.1 Procedure for Using ToolBox



A2.2 Operating Environment for ToolBox

■ Operating Environment

The operating environment for ToolBox is shown below.

Table A2.1 Operating Environment

Item	Specifications
PC	PC/AT compatible
Operating System ^{*1}	Microsoft® Windows® 7 (32bit/64bit) Microsoft® Windows® Vista (32bit/64bit) Microsoft® Windows® XP Microsoft® Windows® 2000 Professional
Required Software	Internet Explorer 5.01 or higher
CPU ^{*2}	Pentium 300MHz or faster, adequate for the operating system to run properly.
Memory ^{*3}	128MB or more, adequate for the operating system to run properly.
Hard Disk Capacity	200MB or more available
Display	1024 × 768 dots or more
Communications ^{*4*5}	RS-232C, Ethernet, FL-net
Printer	Any printer compatible with the operating systems listed above and supports A4 printing
Supported Modules	Positioning Modules (with Pulse Output) F3NC32-0N, F3NC34-0N
Compatible CPU Modules	F3SP05-0P, F3SP08-0P, F3SP08-SP, F3SP21-0N, F3SP25-2N, F3SP35-2N F3SP28-3N, F3SP38-6N, F3SP53-4H, F3SP58-6H F3SP22-0S, F3SP28-3S, F3SP38-6S, F3SP53-4S, F3SP58-6S, F3SP59-7S F3SPV3-4H, F3SPV8-6H, F3FP36-3N F3SP66-4S, F3SP67-6S, F3SP71-4N, F3SP76-7N, F3SP71-4S, F3SP76-7S

*1: ToolBox only supports the 32-bit (x86) version but not the 64-bit (x64) version of the Windows XP operating system.

*2: For FL-net communications, CPU speed must be Pentium III 750 MHz or higher.

*3: For FL-net communications, memory must be 128MB or more.

*4: For FL-net communications, network card must support TCP/IP protocol.
Usable communications conditions vary with CPU type.

*5: Depending on the chipset used by the PC running the ToolBox software, reliable USB connection is not always guaranteed.

A2.3 Installing ToolBox

This section describes how to install ToolBox. Note the following precautions before starting installation.



CAUTION

Log in with system administrator (Administrator) privileges before performing ToolBox setup, maintenance or deletion. These ToolBox operations cannot be performed by a user without Administrator privileges.

In addition, select [Run as administrator] when executing the installer program in Windows Vista/Windows 7. Installation cannot proceed without Administrator privileges.



CAUTION

In Windows Vista/Windows 7, if UAC is enabled, the installer program in the product CD-ROM may be blocked, and cannot be automatically executed.

In this case, select "Setup.exe" in the CD-ROM using Explorer or some other means and start the installer using [Run as administrator].

TIP

The details of the installation procedure may depend on the OS. We describe here how to set up on Windows XP as an example.

1. **Insert the ToolBox CD-ROM into the CD-ROM drive of the personal computer where ToolBox is to be installed.**

⇒ Either screen (1) or (2) will be displayed.
 Screen (1): ToolBox is not installed.
 Screen (2): The Toolbox for Positioning and Monitoring Modules component is already installed.
 Select [Modify] to add components.

TIP

If another ToolBox component is already installed on the PC, the Positioning Modules component is added to the existing ToolBox installation.

In this case, you cannot specify a different installation folder.



Screen (1)

2. Proceed with installation according to the instructions displayed.

SEE ALSO

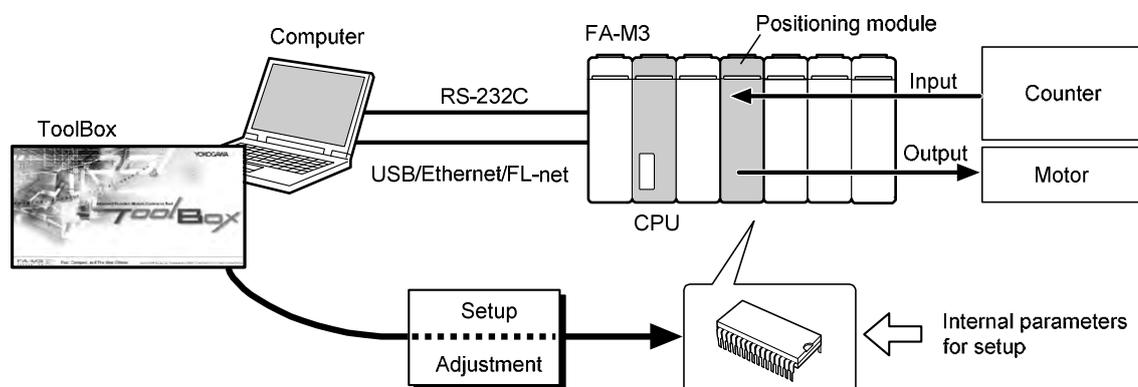
For details on the installation procedure, see Section A2.3, “Installing and Uninstalling ToolBox” of the “FA-M3 ToolBox Manual”.



Screen (2)

A2.4 Connecting ToolBox and FA-M3 System

■ System Environment When Using ToolBox



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B1 Using ToolBox

This chapter describes what a user must know before using the FA-M3 ToolBox for Positioning Modules (or simply referred to as ToolBox in this manual).

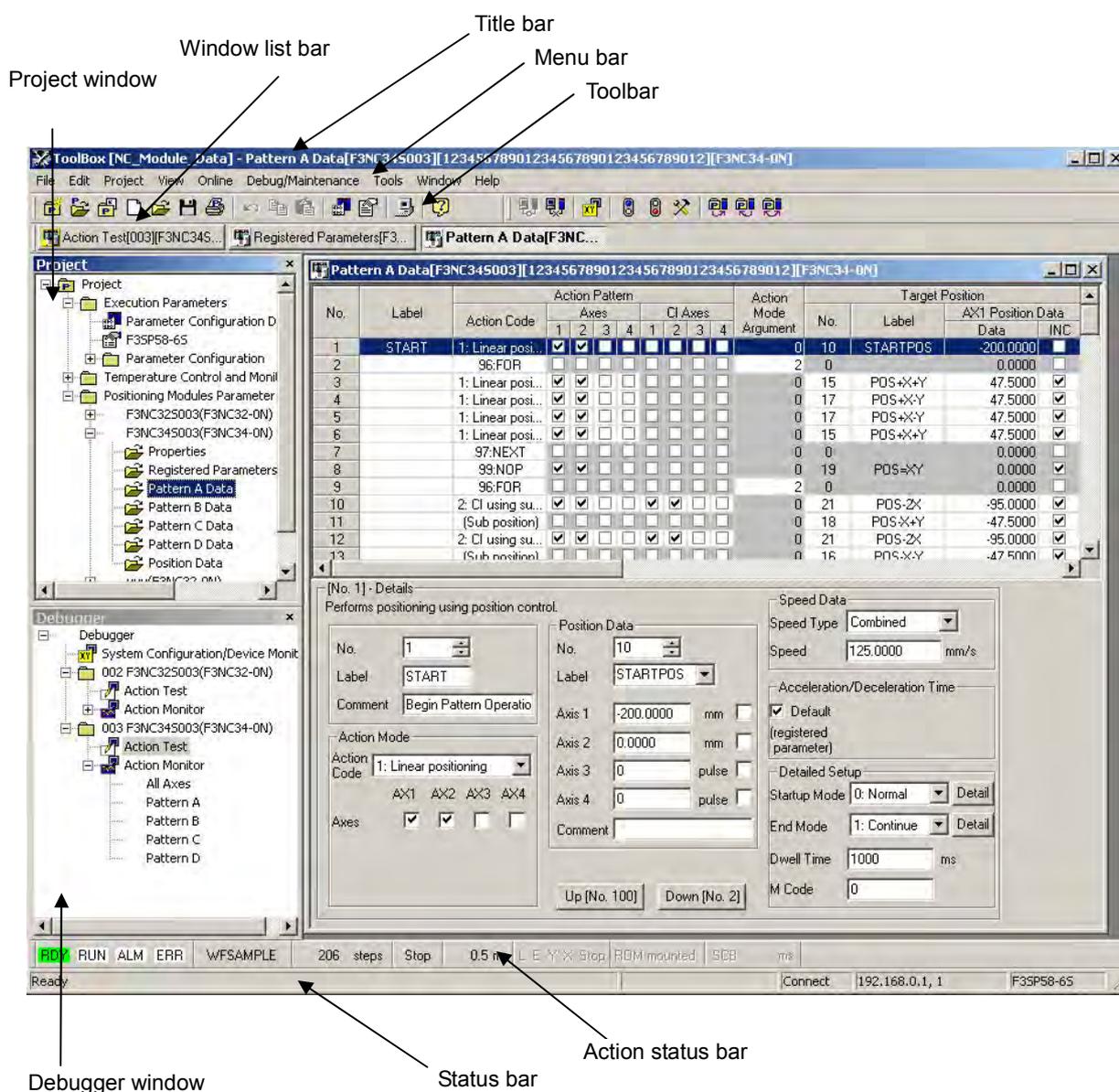
- ToolBox Operation Screen → B1.1
- Configuring ToolBox → B1.2

B1.1 ToolBox Operation Screen

B1.1.1 Screen Layout

The screen layout of ToolBox is shown below.

The screen layout and operation are similar to those of Microsoft Windows.



● **Title Bar**

The title bar shows the name of an open project, an active window, or a file being edited.

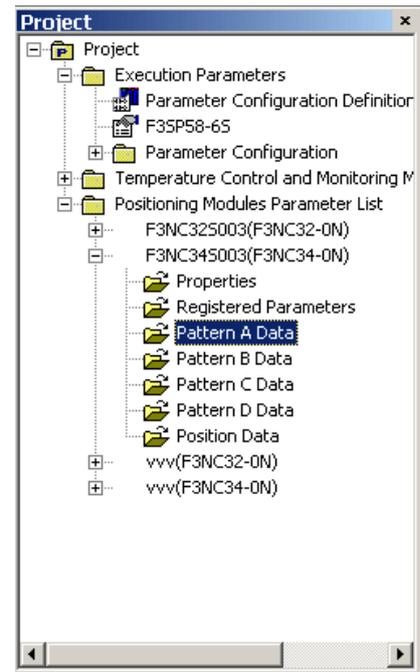
● **Menu Bar**

The menu bar shows the ToolBox main menu. Clicking a menu item displays a pull down menu showing a list of available commands related to that item. Available commands depend on the current CPU operating mode. Unavailable commands are displayed in gray.



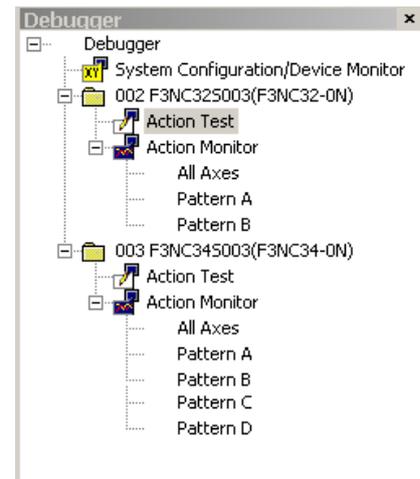
● **Project Window**

The project window shows a list of execution parameters of an open project and a list of registered parameter files of advanced function modules.



● **Debugger Window**

The debugger window shows debug and maintenance information for each registered parameter file.



● Toolbar

The toolbar shows icons of frequently used commands for easier access.



● Window List Bar

The Window List Bar shows icons of open windows in ToolBox.



● Action Status Bar

The action status bar shows the operating status of the FA-M3 system (primarily the CPU module).



CAUTION

The display of the action status bar is not updated when the monitor is suspended or when uploading is being performed using WideField3. To update the display of the action status bar, resume monitoring or wait for uploading to complete.

● Status Bar

The status bar shows the operation status of ToolBox.



SEE ALSO

For details on the information displayed in the menu bar, toolbar, action status bar, and status bar, see: Section B1.1, "ToolBox Operation Screen" of the "FA-M3 ToolBox Manual".

B1.2 Configuring ToolBox

B1.2.1 Setting Up User Environment

The section describes how to define the folder for storing project files, contents of the toolbar, display language, and so on, after installing ToolBox.

SEE ALSO

For details on environment setup, see:
Section B1.4.2, "Environment Setup" of the "FA-M3 ToolBox Manual".

■ Specifying a Project Folder

1. Select [Tools]-[Environment Setup for ToolBox] from the menu bar.

⇒ Screen (1) is displayed.

2. Select the Folder Setup tab.

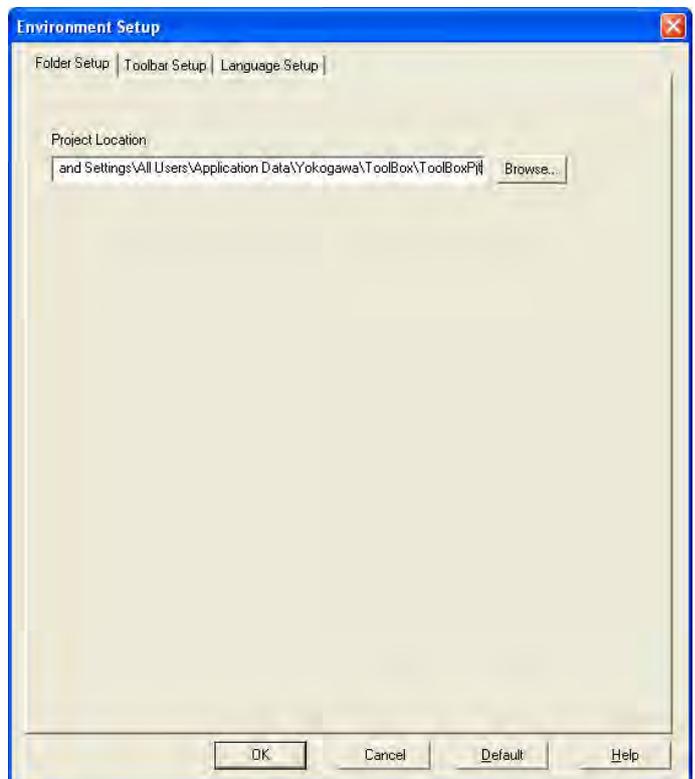
3. If required, specify a different folder for projects and click [OK]. Usually, no change is required.

TIP

Clicking [Default] reverts the screen to default values.

SEE ALSO

- To specify a different project folder, first create the folder using Explorer.
- For details on the default project folder, see: Section B1.4.1, "Folder Configuration" of the "FA-M3 ToolBox Manual".



Screen (1)

B010201_01.VSD

■ Customizing the Toolbar

1. Select the **Toolbar Setup** tab in the **Environment Setup** window.

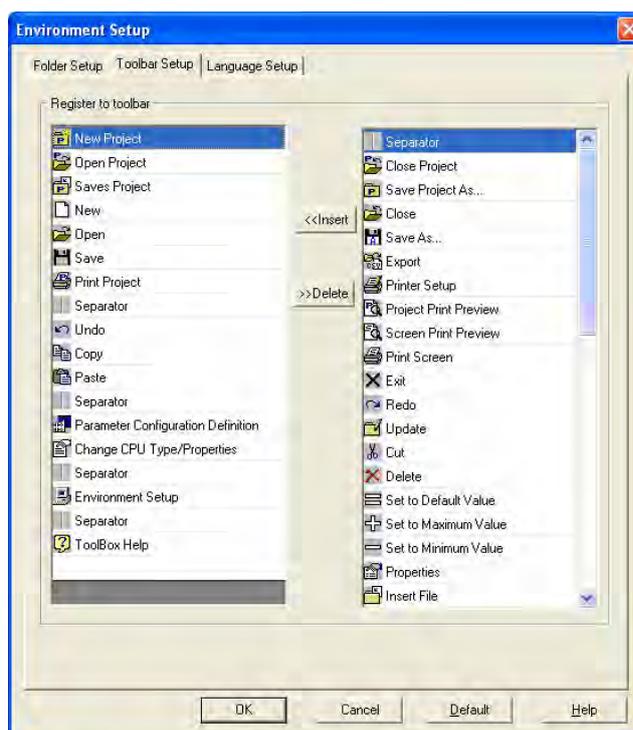
⇒ Screen (2) is displayed.

2. To add an item to the toolbar, highlight the item in the right window, and click **[Insert]**. To remove an item from the toolbar, highlight the item in the left window, and click **[Delete]**.

3. Click **[OK]** to confirm the setup.

TIP

Clicking **[Default]** reverts to the default toolbar setup.



Screen (2)

B010201_02.VSD

■ Selecting the Display Language

1. Select the **Language Setup** tab in the **Environment Setup** window.

⇒ Screen (3) is displayed.

2. Select a language from the **[Select Language]** list for the display language of ToolBox, and click **[OK]**.



Screen (3)

B010201_03.VSD

■ Detailed Setup

You can also specify whether to write to the ROM when downloading, select the items to be displayed on Pattern Data edit screens and define the communication timeout interval.

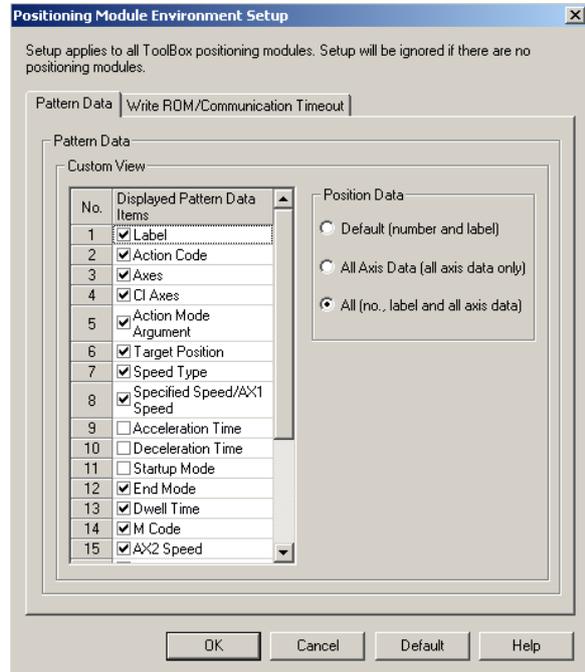
1. Select [Tools]-[Environment Setup for ToolBox Positioning Modules] from the menu bar.

⇒ Screen (4) is displayed.

2. Click the Pattern Data tab.

⇒ Screen (4) is displayed.

3. Select the items to be displayed on Pattern Data edit screens.

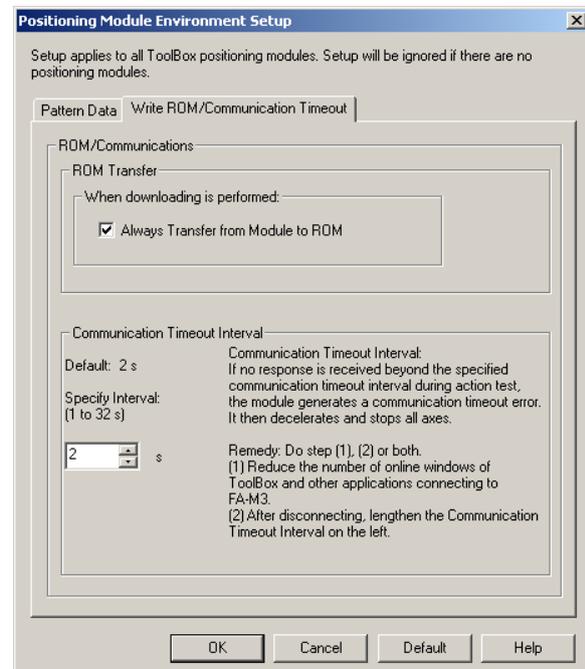


Screen (4)

4. Click the Write ROM/Communication Timeout tab.

⇒ Screen (5) is displayed.

5. Specify whether to write to ROM when downloading and specify the communication timeout interval. Click [OK].



Screen (5)

B2 Editing a Project

This chapter describes how to edit project files.

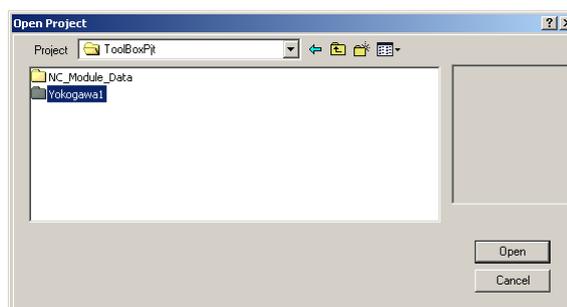
- Selecting a Project → B2.1
- ToolBox Files → B2.2

B2.1 Selecting a Project

This section describes how to select and open a project for editing.

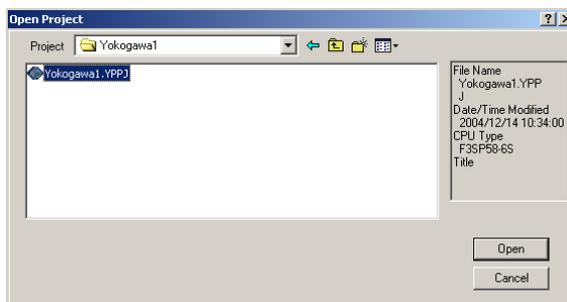
B2.1.1 Opening a Project

1. Run ToolBox.
2. Select [File]-[Open Project] from the menu bar.
⇒ Screen (1) is displayed.



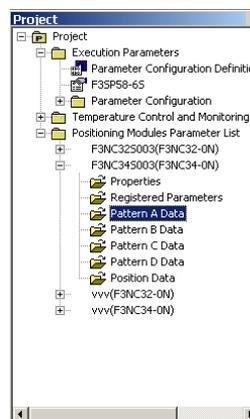
Screen (1)

3. Select a project folder, and either double-click it or click [Open].
⇒ Screen (2) is displayed.



Screen (2)

4. Select a project, and either double-click it or click [Open].
⇒ Screen (3) is displayed.
5. The project is displayed in the Project window.



Screen (3)

B2.2 ToolBox Files

This section describes positioning module files used in ToolBox.

■ List of ToolBox Files

Example file "ABC" is used in the table below for illustration.

Positioning Module Name	File Type	File Extension
F3NC32-0N	Registered Parameters	ABC.YPUP013
	Pattern A Data	ABC.YPPAA013
	Pattern B Data	ABC.YPPAB013
	Position Data	ABC.YPPO 013
F3NC34-0N	Registered Parameters	ABC.YPUP014
	Pattern A Data	ABC.YPPAA014
	Pattern B Data	ABC.YPPAB014
	Pattern C Data	ABC.YPPAC014
	Pattern D Data	ABC.YPPAD014
	Position Data	ABC.YPPO 014

TIP

- Creating a new registered parameter file automatically generates individual pattern data files and a position data file.
- File extensions differ for different FA-M3 advanced function module types.

B3 Creating and Editing Various Types of Data

This chapter describes how to create and edit registered parameters, position data and pattern data.

- Creating and Editing Registered Parameters → B3.1
- Creating and Editing Pattern Data → B3.2
- Creating and Editing Position Data → B3.3

B3.1 Creating and Editing Registered Parameters

B3.1.1 Creating New Registered Parameter File

1. Click [File]-[New] from the menu bar.
⇒ Screen (1) is displayed.
2. Enter data on the displayed screen. Click [OK].

- (a) Enter a file name for storing registered parameter data.
- (b) Select the model of the positioning module.
- (c) Enter a title for registered parameter data.
- (d) Enter the name of each axis. Assigning an appropriate name to each axis enhances readability.
- (e) Defines the number of records for each pattern data table. A data table for storing the specified number of pattern data records is generated. Reducing this value on the Properties dialog deletes extra records.
- (f) Defines the number of position data records to be used. A data table for storing the specified number of position data records is generated. Reducing this value on the Properties dialog deletes extra records.
- (g) Closes Properties dialog and opens Registered Parameters edit screen. All parameter data are displayed with default values. The newly created pattern data file or position data file is added to the Project window.
- (h) Exits without creating registered parameter data.

TIP

- If other modules besides positioning module are installed in ToolBox, a module selection screen will be displayed. Select positioning module to display the above New – Positioning Module screen.
- You should define only the required number of pattern data records and position data records as reducing the data size shortens communication time with positioning modules and improves performance of the PC.

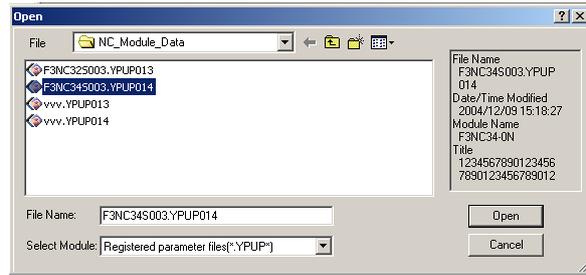
B3.1.2 Opening Registered Parameter File

1. Click [File]-[Open] from the menu bar.

⇒ Screen (2) is displayed.

2. Double-click a registered parameter file to be edited. Alternatively, click a registered parameter file to be edited and then click [Open].

⇒ The Registered Parameters screen is displayed.



Screen (2)

TIP

- You can also open a registered parameter file by selecting and double-clicking the registered parameter data from the Project window.

- Filename extension of registered parameter file

The filename extension of a registered parameter file depends on the positioning module type as shown below.

Positioning Module Type	Registered Parameter Filename Extension
F3NC32-0N	YPUP013
F3NC34-0N	YPUP014

B3.1.3 Registered Parameters Screen Layout

There are 4 Registered Parameters tab screens. We describe here how to perform editing on these screens.

- (1) Basic Parameters
- (2) Automatic Origin Search
- (3) Counter/Encoder
- (4) Pattern Registered Parameters

Displayed from left to right are:

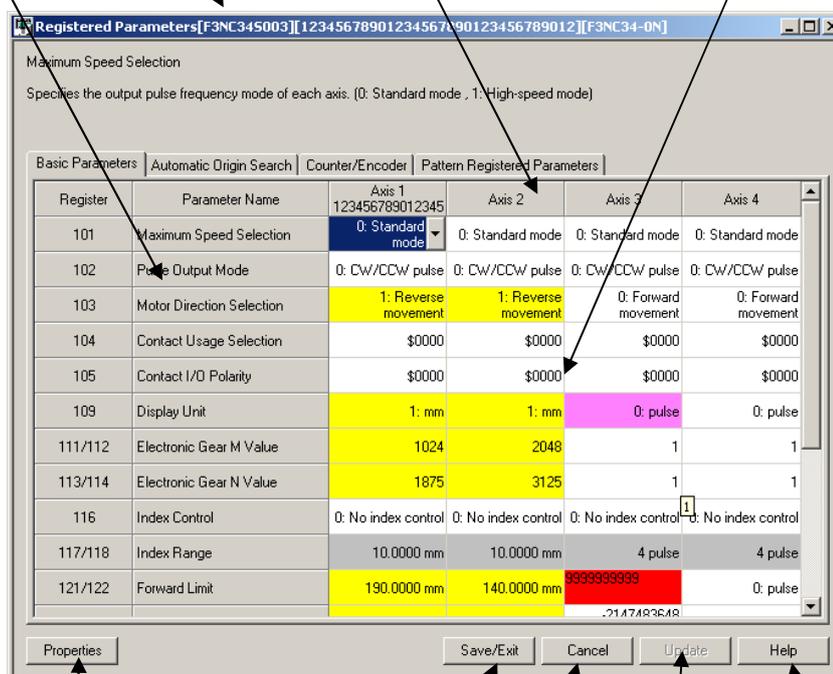
- File name
- Title name
- Module type

Clicking the cell of a parameter displays its description.

Displays number and name of axes. Name of axes can be changed from the Properties screen.

Clicking a cell displays a list box or an input helper screen. The cell containing the cursor is displayed with blue background. A cell is displayed with different background colors to indicate different statuses as follows:

- White : Default value
- Yellow : Modified and confirmed value
- Pink : Modified but unconfirmed value
- Red : Invalid value
- Gray : Disregarded value



Allows you to change title name or enter names of axes.

Closes the screen and exits from editing. Any modified but unconfirmed changes are saved to file.

Saves edited data to file.

Displays help information.

Cancels editing and closes the screen. If there are any modified but unconfirmed changes, a dialog box will appear to confirm whether to save the changes.

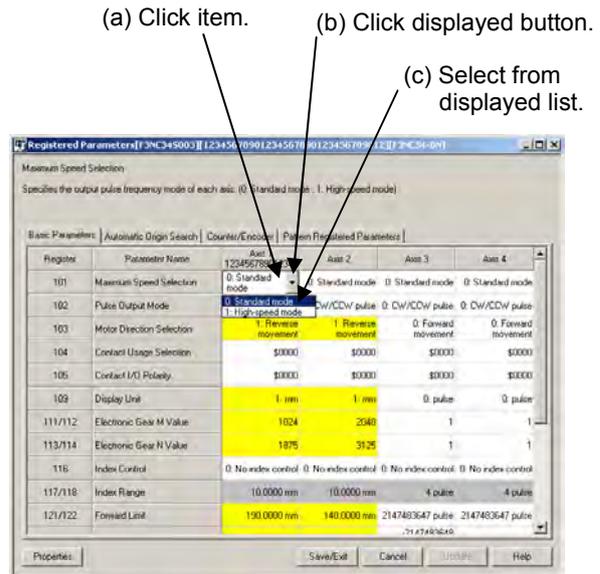
B3.1.4 Editing Registered Parameters

Highlighting a parameter cell shows a button for opening a list box or an input helper screen. This section describes how to use the list box and the parameter input helper screen.

You can also use the [Edit] menu on the menu bar to set a highlighted cell to the default, maximum or minimum value; or hide or show a highlighted column of cells.

■ Using the List Box

1. On a parameter edit screen (1), (a) click an item to be edited.
2. (b) Click the displayed button, and (c) select the required setup value from the displayed list box.

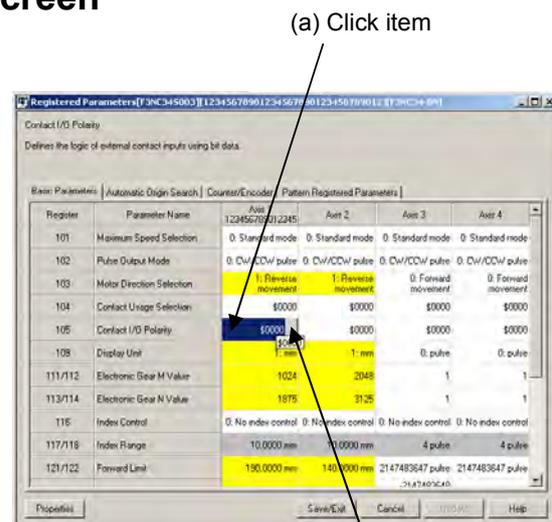


Screen (1)

■ Using the Parameter Input Helper Screen

In the parameter input helper screen, you may directly key in a number, or select a value using the mouse or keyboard.

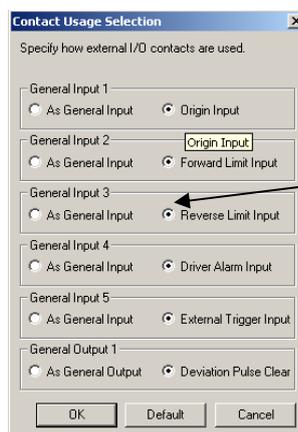
1. On a parameter edit screen (2), (a) click an item to be edited.
 2. (b) Click the displayed button.
- ⇒ A parameter input helper screen will be displayed. The actual screen displayed will depend on the selected parameter.



Screen (2)

3. Perform setup using the displayed input helper screen (3).

- Using mouse:
Click desired radio buttons, and click [OK].
- Using keyboard:
Move to the item to be setup using the [Tab] key, select the desired option using the [←] and [→] keys. When you are done, move to the [OK] button using the [Tab] key, and press the [Enter] key.



Click the radio button to be selected.

Screen (3)

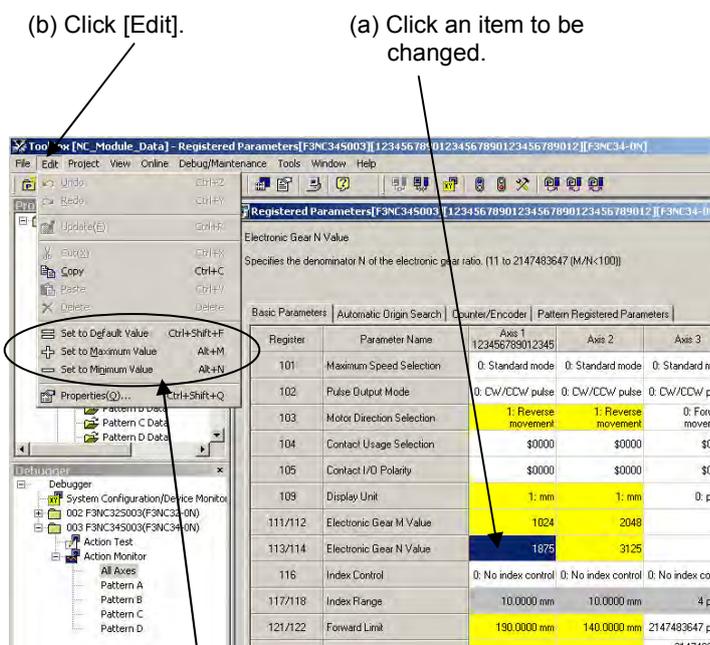
■ Advanced Editing Functions

● Modifying the value of a cell

1. In a parameter edit screen (4), (a) click the cell to be changed.
2. (b) Select [Edit] from the menu bar, and (c) select one of the following commands:
[Set to Default Value]: Changes the setting to the default value.
[Set to Maximum Value]: Changes the setting to the maximum value.
[Set to Minimum Value]: Changes the setting to the minimum value.

TIP

Right-clicking in a Registered Parameters screen also lists this command menu.



Screen (4)

(c) Select a setting to be changed from [Set to Default Value], [Set to Mximum Value], and [Set to Minimum Value].

B3-6

● Hiding/showing a column of cells

1. In a parameter edit screen (5), (a) highlight a column of cells to be hidden by clicking the column title.

2. (b) Select [View] from the menu bar, and (c) select the [Hide] command. In this example, the Axis 2 column will be hidden.

TIP

- To redisplay hidden columns, select [View]-[Show] from the menu bar.
- Right-clicking on a parameter edit screen also displays the same command menu.
- The menu displays [Show] if some columns or cells are hidden. Else it displays [Hide].

(a) Highlight a column of cells by clicking the column title.

(b) Click [View].

Parameter Name	Axis 1	Axis 2	Axis 3
Maximum Speed Selection	0: Standard mode	0: Standard mode	0: Standard mode
402 Pulse Output Mode	0: CW/CCW pulse	0: CW/CCW pulse	0: CW/CCW pulse
403 Motor Direction Selection	1: Reverse movement	1: Reverse movement	0: Forward movement
404 Contact Usage Selection	\$0000	\$0000	\$0000
405 Contact I/O Polarity	\$0000	\$0000	\$0000
409 Display Unit	1: mm	1: mm	0: pulse
411/412 Electronic Gear M Value	1024	2048	1
413/414 Electronic Gear N Value	1875	3125	1
416 Index Control	0: No index control	0: No index control	0: No index control
417/418 Index Flange	10.0000 mm	10.0000 mm	4 pulse
421/422 Forward Limit	190.0000 mm	140.0000 mm	2147483647 pulse

Screen (5)

(c) Click [Hide]

B3.1.5 Relationship between Registered Parameters and Other Data

Registered parameters, pattern data and position data are closely related. The measurement unit and usage of pattern data and position data are determined by registered parameters.

For instance, beware that changing the Display Unit registered parameter value automatically changes the measurement unit and data value of position and pattern data.

Registered Parameters[F3NC345003][12345678901234567890123456789012][F3NC34-0N]

Display Unit
Specifies the measurement unit for displaying position data and speed data used in positioning. (0: pulse, 1: mm, 2: degree)

Register	Parameter Name	Axis 1 123456789012345	Axis 2	Axis 3	Axis 4
101	Maximum Speed Selection	0: Standard mode	0: Standard mode	0: Standard mode	0: Standard mode
102	Pulse Output Mode	0: CW/CCW pulse	0: CW/CCW pulse	0: CW/CCW pulse	0: CW/CCW pulse
103	Motor Direction Selection	1: Reverse movement	1: Reverse movement	0: Forward movement	0: Forward movement
104	Contact Usage Selection	\$0000	\$0000	\$0000	\$0000
105	Contact I/O Polarity	\$0000	\$0000	\$0000	\$0000
109	Display Unit	1: mm	1: mm	0: pulse	0: pulse
111/112	Electronic Gear M Value	1024	2048		1
113/114	Electronic Gear N Value	1875	3125	1	1
116	Index Control	0: No index control	0: No index control	0: No index control	0: No index control
117/118	Index Range	10.0000 mm	10.0000 mm	4 pulse	4 pulse
121/122	Forward Limit	190.0000 mm	140.0000 mm	2147483647 pulse	2147483647 pulse

Changing the display unit also changes position data.

Pattern Data [F3NC345003][12345678901234567890123456789012][F3NC34-0N]

No.	Label	Action Code	Unit	Value	Unit	Value
1	START	START	mm	190.0000	mm	190
2	POS0	POS0	mm	140.0000	mm	140
3	POS1	POS1	mm	140.0000	mm	140
4	POS2	POS2	mm	140.0000	mm	140
5	POS3	POS3	mm	140.0000	mm	140
6	POS4	POS4	mm	140.0000	mm	140
7	POS5	POS5	mm	140.0000	mm	140
8	POS6	POS6	mm	140.0000	mm	140
9						
10	STARTPOS	Delete		0.0000		0
11	POS-A	POS-A	mm	0.0000	mm	0
12	POS-Y	POS-Y	mm	47.5000	mm	400

Position Data [F3NC345003][12345678901234567890123456789012][F3NC34-0N]

No.	Label	Unit	Value	Unit	Value
1	POS0	mm	190.0000	mm	190
2	POS1	mm	140.0000	mm	140
3	POS2	mm	140.0000	mm	140
4	POS3	mm	140.0000	mm	140
5	POS4	mm	140.0000	mm	140
6	POS5	mm	140.0000	mm	140
7	POS6	mm	140.0000	mm	140
8	STARTPOS	Delete			
9	POS-A	mm	0.0000	mm	0
10	POS-Y	mm	47.5000	mm	400

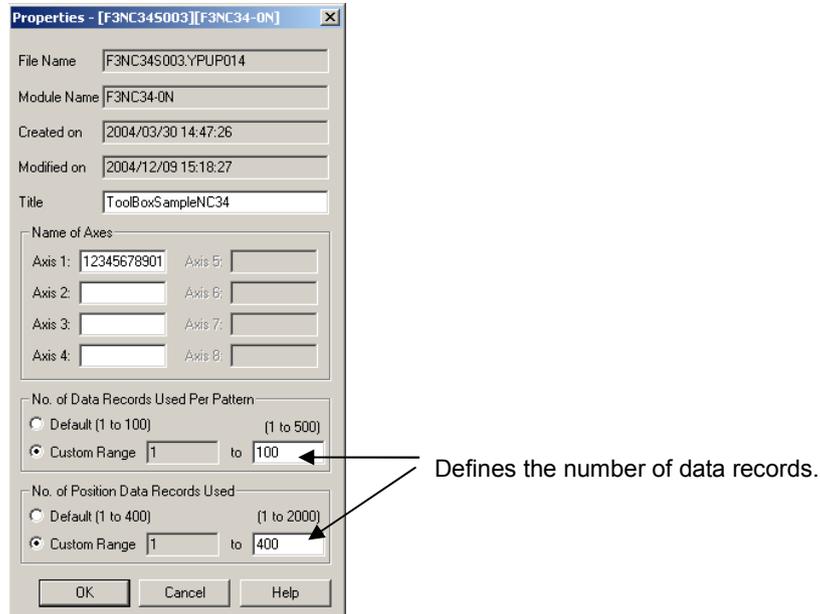
Example about Change in Display Unit

We illustrate how data values change with the Display Unit setting using data of axis 1 as an example.

Setup Item and Value	Value Before Change	Value After Change	Value After Change
Data value	1	0.0001	0.00001
Display Unit registered parameter	Pulse	mm	degree
Axis 1 position data	Pulse	mm	degree
Axis 1 speed	Pulse/s	mm/s	degree/s

B3.2 Creating and Editing Pattern Data

Pattern data and position data are automatically generated when you create registered parameter data. You can change the number of pattern data records using the Properties dialog.



SEE ALSO

For details on individual parameters of pattern data, see the manual entitled "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

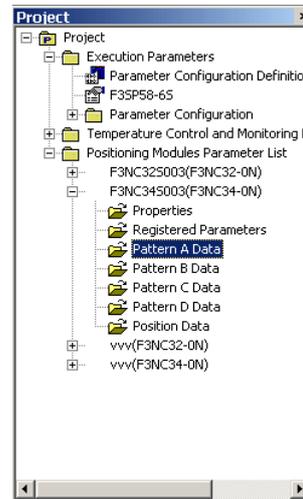
B3.2.1 Opening Pattern Data

1. Double-click the pattern data to be edited in the Project window.

⇒ The Pattern Data edit screen is displayed.

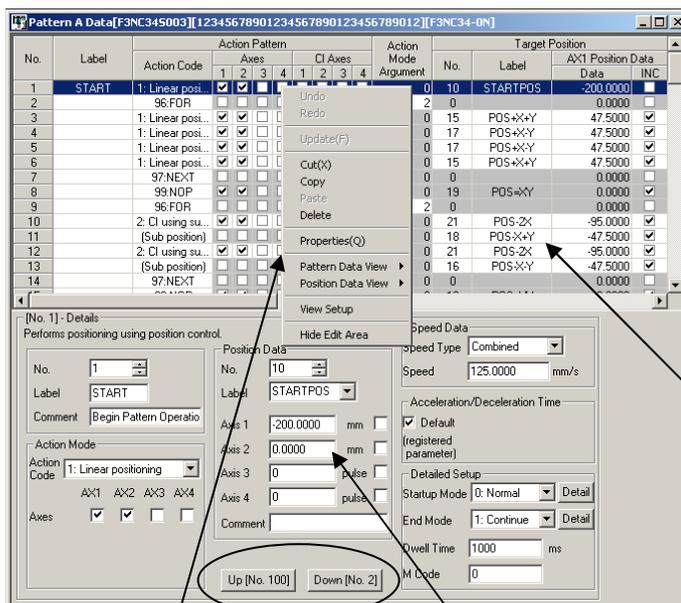
TIP

You can also display the Pattern Data edit screen by moving the cursor to the pattern data to be opened using arrow keys, and then press the [Enter] key.



Screen (1)

B3.2.2 Pattern Data Screen Layout



(a) Data List area
Displays pattern data.
You can edit one record at a time.

(c) Edit area
The screen display of this area depends on the action code selected for a record.

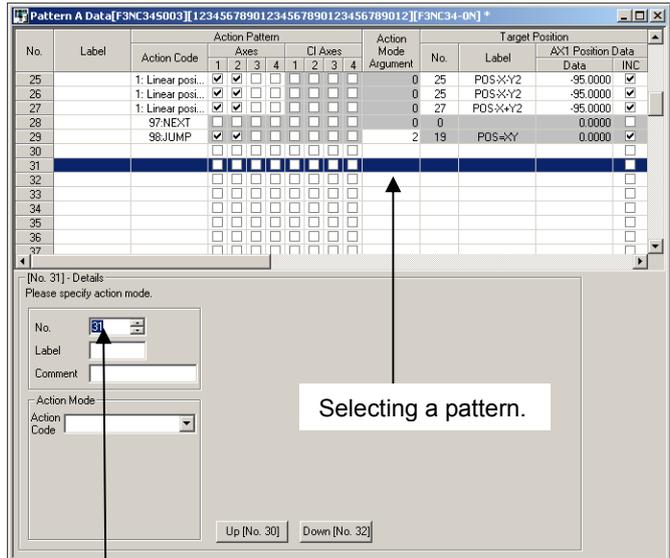
(b) Button group
Moves to the previous or next record.

(d) Right mouse click
Click the right mouse button to display this menu.

No	Item	Display or Setup Description
a	Data List area	Displays pattern data.
b	Button group	Moves to previous or next data record.
c	Edit area	Edits pattern data. Selecting a data item in the Data List area or entering a record number in the [No.] field in the Edit area allows editing of a data record. The display of the Edit area changes with the value selected in the [Action Code] field. Only fields that require setup are displayed. Non-required fields are not displayed.
d	Right mouse click Edit menu Switching views	Displays a menu. You can switch between default view or custom view, which displays only items defined in the environment setup. The menu contains useful commands for editing that applies either on a record or on all data.

B3.2.3 Editing Pattern Data

1. Select a pattern record to be edited in the Data List area. Alternatively, select or enter the number of a record to be edited in the [No.] field in the Edit area.
 ⇒ The selected record in the Data List area is displayed in blue, and its data is displayed in the Edit area.

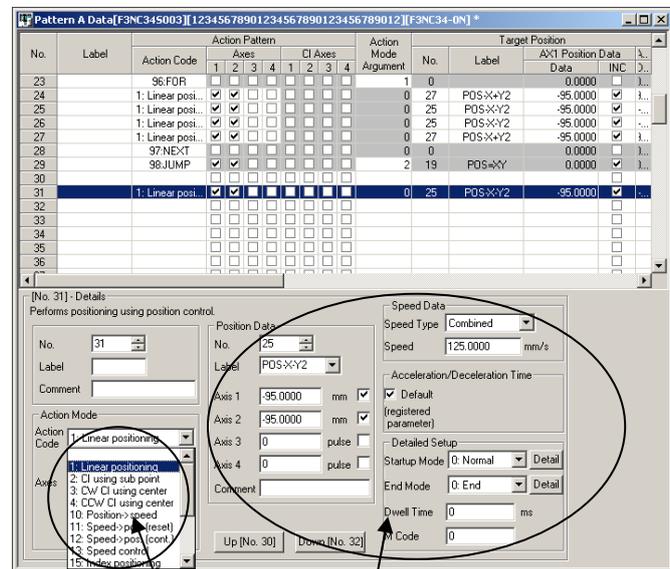


Entering a pattern data number.

2. The display of the Edit area changes with the action selected for each record in the [Action Code] field. If no setup is required for an action type, nothing is displayed.

SEE ALSO

For details on how to edit data for different action types, see:
 Subsection B3.2.6, "Editing Data of Various Action Types".

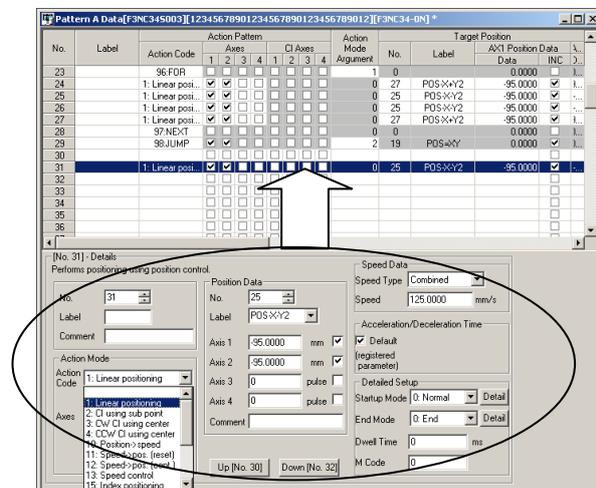


Screen displays changes with selected [Action Code].

3. Edit the pattern data displayed in the Edit area. Edited data is immediately reflected in the Data List area.

SEE ALSO

For details on how to edit data for different action types, see:
 Subsection B3.2.6, "Editing Data of Various Action Types".

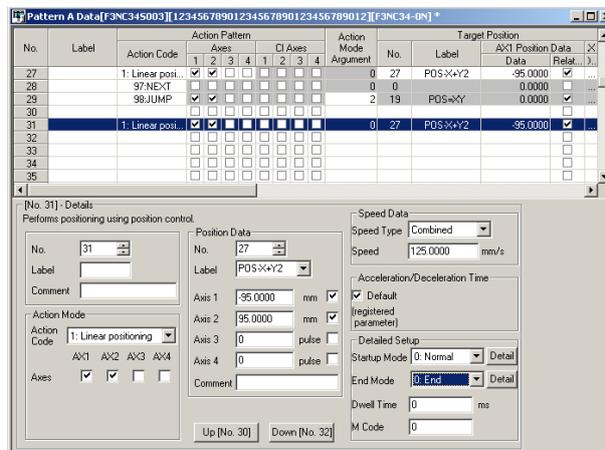


B3.2.4 Drag and Drop

You can drag and drop position data from a Position Data edit screen to a Pattern Data edit screen.

1. Select a pattern record on Pattern Data edit screen (1).

⇒ The selected pattern is displayed in blue, and its data is displayed in the Edit area.

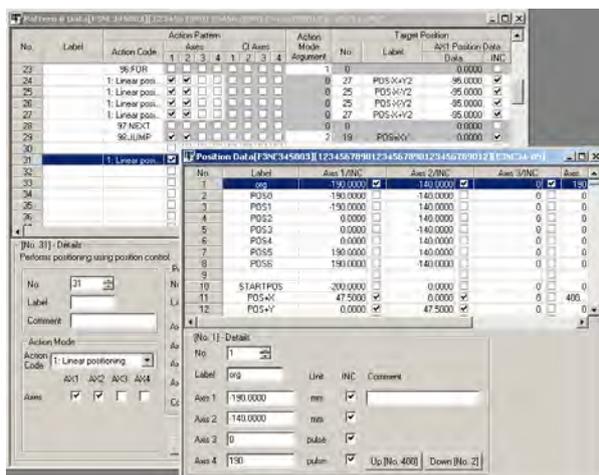


Screen (1)

2. On the Position Data screen (2), select the position data to be inserted, and drag-and-drop it to the Pattern Data window.

TIP

To perform a drag-and-drop operation, depress and hold the left mouse button on an item, drag it to the destination and release the mouse button.



Screen (2)

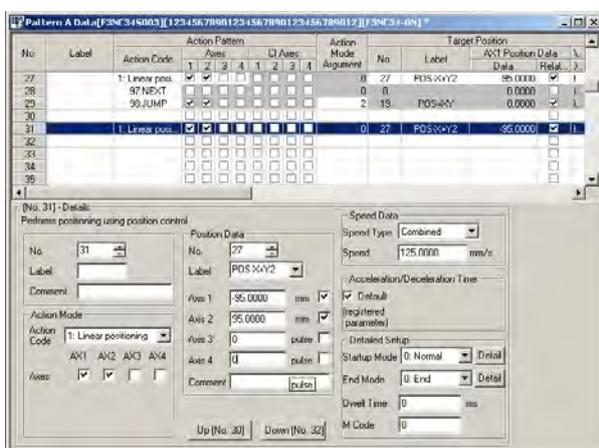
3. The dropped position data is registered in Pattern Data edit screen (3).

⇒ The position data is displayed in both the Edit area and the Data List area.

SEE ALSO

For details on how to edit data for different action types, see:

Subsection B3.2.6, "Editing Data of Various Action Types".



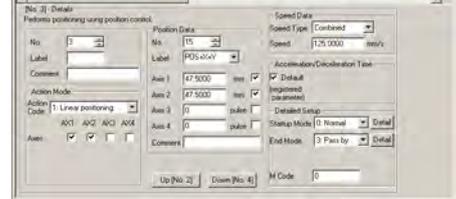
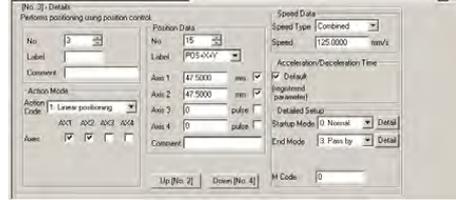
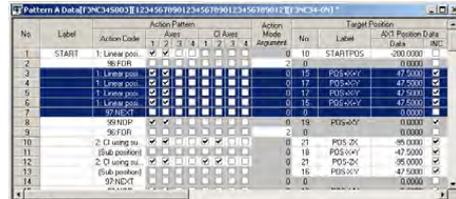
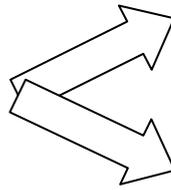
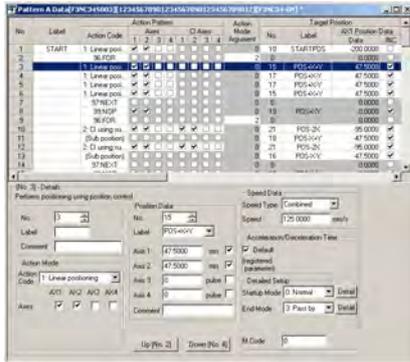
Screen (3)

B3.2.5 Line Range Editing

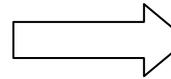
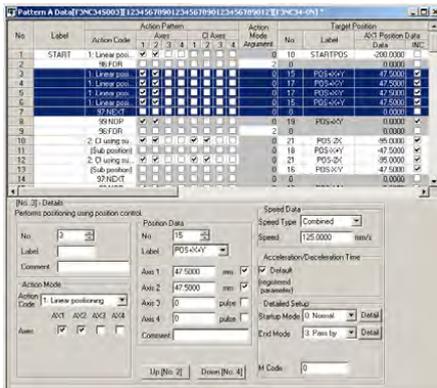
You can perform line range editing by selecting a range of lines in the Data List area.

Only 1-to-N-line operations and N-to-N-line operations are allowed. Edit operations between two line ranges of different sizes are not allowed unless the first range contains only one line.

■ 1-to-N-line operations



■ N-to-N-line operations



■ N-to-M-line operations

Editing operations between two line ranges of different sizes are not allowed unless the first line range contains only one line.

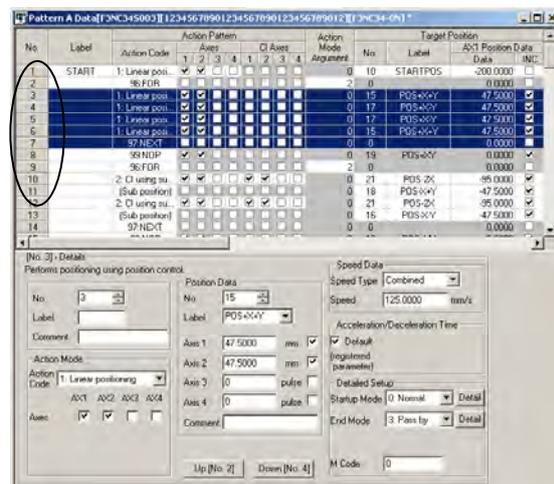
■ Procedure

1. Select a line or a range of lines in the Data List area.

⇒ The color of the selected line(s) changes.

TIP

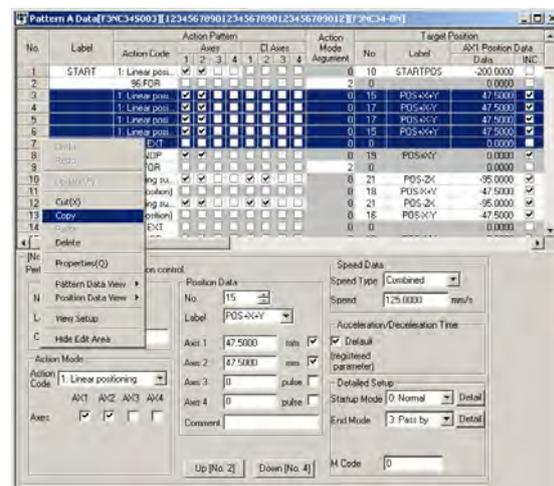
When performing line range edit operations such as copying and pasting, only 1-to-N-line and N-to-N-line operations are allowed. N-to-M-line operations are not allowed unless N is one.



2. Select [Cut] or [Copy] from the Edit menu.

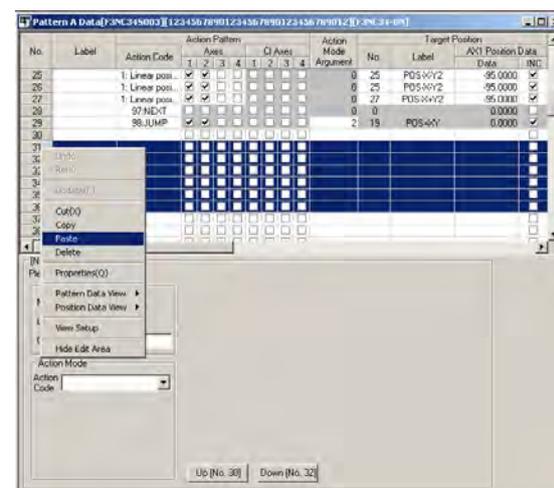
TIP

To display the Edit menu, click the right mouse button.



3. Select the range of destination lines, and select [Paste] from the Edit menu.

⇒ The pasted data is displayed.

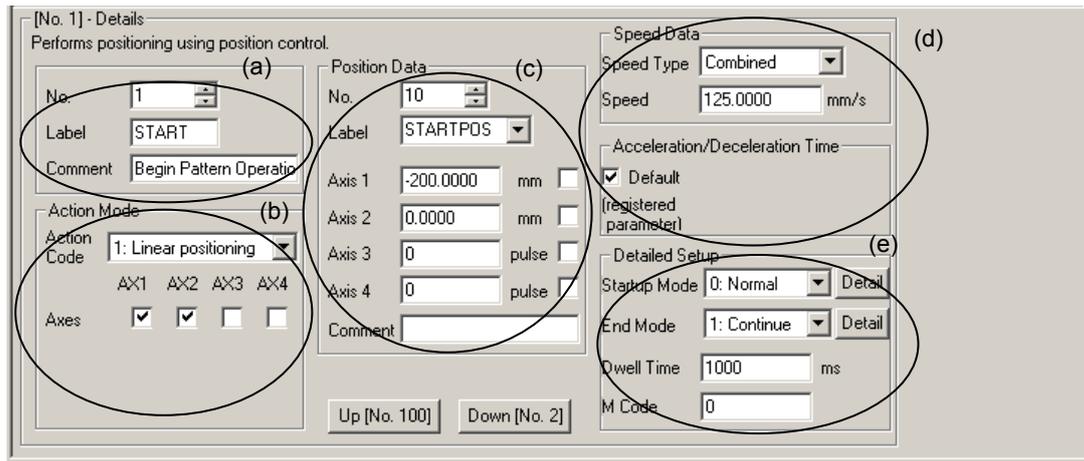


B3.2.6 Editing Data of Various Action Types

The display of the Edit area on the Pattern Data screen changes with the action selected in [Action Code] in the Action Mode group. Parameters that do not require setup are not displayed. If you change the selected action code of an existing pattern, existing data is retained but an error is generated. You should correct the data to remove the error.

■ Screen Layout for Various Action Types

The display of the Edit area changes with the action selected for a pattern. The displayed items are divided into groups (a) to (e).



Action Code	Action	Function
1	Linear positioning	Performs linear interpolated positioning using 1, 2, 3 or 4 axes.
2	CI using sub point	Performs circular interpolated or helical interpolated positioning using a specified sub point.
3	CW CI using center	Performs clockwise circular interpolated or helical interpolated positioning using a specified center point.
4	CCW CI using center	Performs counter-clockwise circular interpolated or helical interpolated positioning using a specified center point.
5	(Sub position)	Specifies a sub position (sub point or center point) for circular interpolated positioning or helical interpolated positioning.
10	Position->speed	Switches from position control mode to speed control mode.
11	Speed->pos. (reset)	Switches from speed control mode to position control mode. (Resets the current position to zero)
12	Speed->pos. (cont.)	Switches from speed control mode to position control mode.
13	Speed control	Performs linear interpolated speed control positioning using 1, 2, 3 or 4 axes. (retaining the current position value)
15	Index positioning	Performs single-axis positioning using index control.
16	Index speed control	Performs single-axis speed control positioning using index control.
20	Contact o/p on/off	Sets output of selected external contacts to ON or OFF.
21	Set current position	Changes the current position.
96	FOR	Executes action pattern records within the FOR-NEXT loop a specified number of iterations.
97	NEXT	Executes action pattern records within the FOR-NEXT loop a specified number of iterations.
98	JUMP	Jumps to a specified action pattern record number.
99	NOP	No operation. Moves to next action pattern record.

SEE ALSO

For details on setup for different action types, see Section 8.1, "Action Pattern Data" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E)

■ Blank (No Action)

A blank [Action Code] field indicates empty data.

All setup data are ignored. Data is also not transferred during downloading.

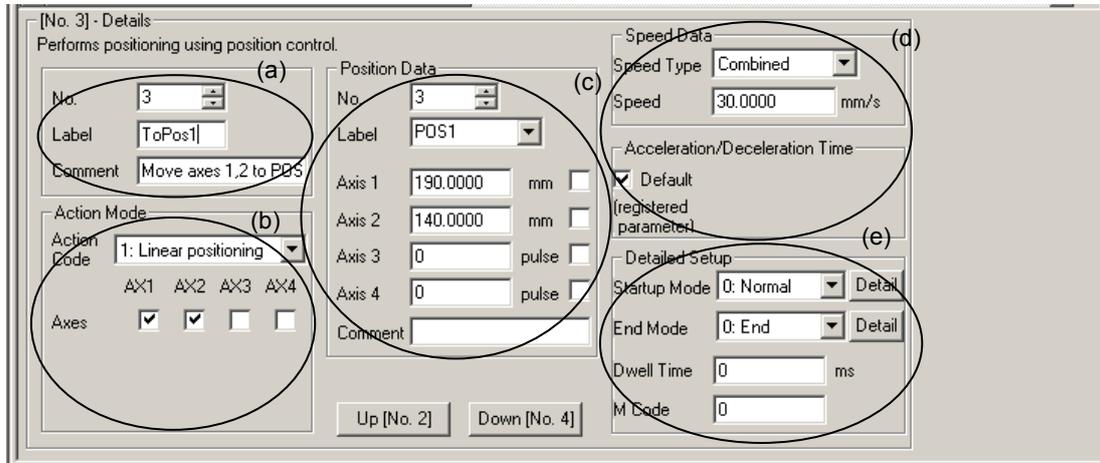
The screenshot shows a window titled "[No. 39] - Details" with the instruction "Please specify action mode." The window contains the following fields:

- No.:** A numeric input field containing the value "39".
- Label:** An empty text input field.
- Comment:** An empty text input field.
- Action Mode:** A section containing an "Action Code" dropdown menu.

At the bottom of the window, there are two buttons: "Up [No. 38]" and "Down [No. 40]".

■ Linear positioning

Selects linear positioning movement. You do not need to set up non-displayed parameters.



No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Action Mode	Action Code: 1: Linear positioning Axes: AX1, AX2, AX3, AX4 You can select from 1 to 4 axes for concurrent movement. Selecting only one axis performs single-axis positioning with optional specified startup speed.
c	Position Data	Position Data No.: 1 to No. of Position Data Records Used defined in properties (2,000 max) The target position can be specified as an absolute position or an incremental position by specifying the position data number. The measurement unit for display can be changed using the Registered Parameters window.
d	Speed Data Acceleration/Deceleration Time	Speed Type: Combined, Axis 1, Axis 2, Axis 3 or Axis 4 Speed: 1 to 2,147,483,647 (position reference unit) The speed type can be specified as a combined-speed or the speed of a movement axis. Acceleration/Deceleration Time can be specified as default or using numerical value input. ACC: -1, 0 to 32,767 (ms) DCC: -1, 0 to 32,767 (ms) Turning on the [Default] checkbox selects the acceleration time and deceleration time defined by the pattern registered parameters if [Speed Type] is specified as combined speed but selects the acceleration time and deceleration time defined by registered parameters of an individual axis if [Speed Type] is specified as the speed of an axis. The acceleration time and deceleration time can also be specified as required by deselecting the [Default] checkbox.
e	Detailed Setup	Startup Mode: 0 to 5 End Mode: 0 to 3 Dwell Time: 0 to 32,767 (ms) M Code: 0 to 32,767 Specify the startup mode, end mode, dwell time and M code.

SEE ALSO

For details on how to perform setup, see Section 8.2.1, "Specifying Linear Interpolation" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ Circular interpolation (CI using sub point, CW CI using center, CCW CI using center)

Selects circular interpolated movement. You do not need to set up non-displayed parameters.

[No. 10] - Details
Performs circular interpolation using specified sub point.

(a) No. 10
Label ToPos2
Comment Move axes 1, 2 to PD

(b) Action Mode
Action Code 2: CI using sub point
Axes AX1 AX2 AX3 AX4
CI Axes
CI Turns 0 turns

(c) Position Data
No. 4
Label POS2
Axis 1 30.0000 mm
Axis 2 140.0000 mm
Axis 3 0 pulse
Axis 4 0 pulse
Comment

(d) Speed Data
Speed Type Combined
Speed 30.0000 mm/s
Acceleration/Deceleration Time
 Default (registered parameter)

(e) Detailed Setup
Startup Mode 0: Normal
End Mode 0: End
Dwell Time 0 ms
M Code 0

Up [No. 9] Down [No. 11]

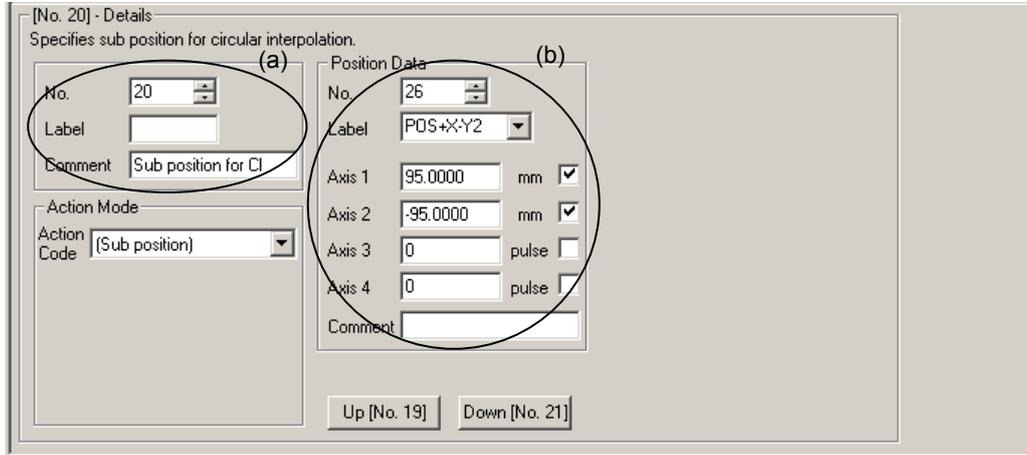
No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Action Mode	Action Code: 2: CI using sub point, 3: CW CI using center, 4: CCW CI using center Axes: AX1, AX2, AX3, AX4 CI Axes: AX1, AX2, AX3, AX4 CI Turns: 0 to 32,767 (turns) You can select from 2 to 4 axes for concurrent movement. You must specify two axes to be used for circular interpolation in [CI Axes]. Setting [CI Turns] to a non-zero integer rotates for the specified number of turns from the starting position before moving to the target position. Setting [CI Turns] to zero moves directly to the target position without making any turns.
c	Position Data	Position Data No.: 1 to No of Position Data Records Used defined in properties (2,000 max.) Enter the target position for circulation interpolation. The measurement unit for display can be changed using the Registered Parameters window.
d	Speed Data Acceleration/Deceleration Time	Speed Type: Combined Speed: 1 to Speed Limit (position reference unit) Specify the speed type and speed. Speed type can only be specified as combined speed. Acceleration/Deceleration Time can be specified as default or using numerical value input. ACC: -1, 0 to 32,767 (ms) DCC: -1, 0 to 32,767 (ms) Turning on the [Default] checkbox selects the acceleration time and deceleration time defined by the pattern registered parameters. The acceleration time and deceleration time can also be specified as required by deselecting the [Default] checkbox.
e	Detailed Setup	Startup Mode: 0 to 5 End Mode: 0 to 3 Dwell Time: 0 to 32,767 (ms) M Code: 0 to 32,767 Specify the startup mode, end mode, dwell time and M code.

SEE ALSO

For details on how to perform setup, see Section 8.2.2, "Specifying Circular Interpolation" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ **Sub position (CI using sub point, CW CI using center, CCW CI using center)**

If the selected action of a pattern record is circular interpolation, the action code of the next pattern data record is automatically selected as '(Sub position)' for circular interpolation. You do not need to set up non-displayed parameters.



No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Position Data	Position Data No.: 1 to No of Position Data Records Used defined in properties (2,000 max.) Specify a sub point for circular interpolation. Only data for the selected axes are used.

SEE ALSO

For details on how to perform setup, see Section 8.2.2, "Specifying Circular Interpolation" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ Position->speed

Selects action to switch from position control to speed control. You do not need to set up non-displayed parameters.

[No. 24] - Details
Switches from position control to speed control.

(a)
No. 24
Label PosToVel
Comment Position->speed for AX

(b)
Action Mode
Action Code 10: Position->speed
AX1 AX2 AX3 AX4
Axes

(c)
Detailed Setup
End Mode 0: End
M Code 0

Up [No. 23] Down [No. 25]

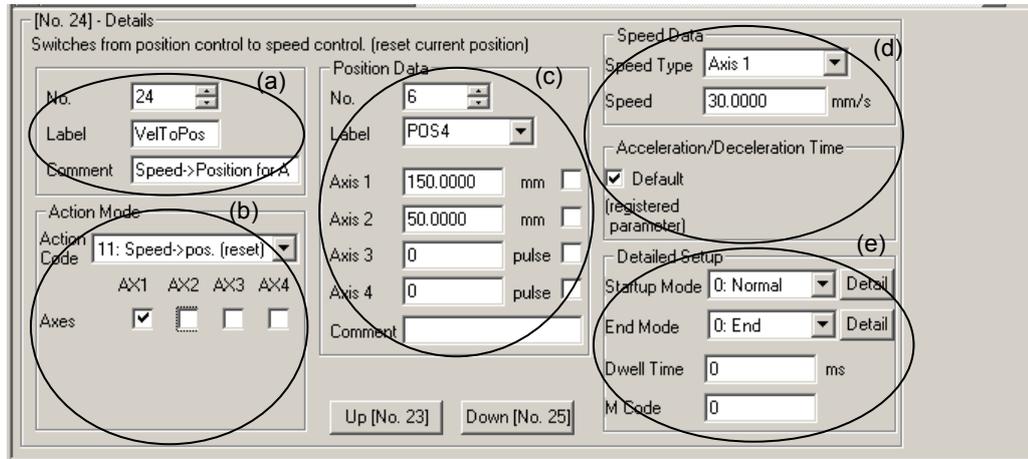
No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Action Mode	Action Code: 10: Position->speed Axes: AX1, AX2, AX3, AX4 Select axes for switching from position control to speed control.
c	Detailed Setup	End Mode: 0 to 1 M Code: 0 to 32,767 Specify the end mode and M code.

SEE ALSO

For details on how to perform setup, see Section 8.3.1, "Specifying Position Control to Speed Control Switchover" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ Speed->pos. (reset)

Selects action to switch from speed control to position control, and reset the current position to zero. You do not need to set up non-displayed parameters.



No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Action Mode	Action Code: 11: Speed->pos. (reset) Axes: AX1, AX2, AX3, AX4 You must select one and only one axis for control switchover in [Axes].
c	Position Data	Position Data No.: 1 to No of Position Data Records Used defined in properties (2,000 max.) Specify the new target position for positioning after switching to position control. The measurement unit for display can be changed using the Registered Parameters window.
d	Speed Data Acceleration/Deceleration Time	Speed Type: Axis 1, Axis 2, Axis 3 or Axis 4 Speed: Startup Speed to Speed Limit (speed reference unit) Acceleration/Deceleration Time can be specified as default or using numerical value input. ACC: -1, 0 to 32,767 (ms) DCC: -1, 0 to 32,767 (ms) Turning on the [Default] checkbox selects the acceleration time and deceleration time defined by the registered parameters of the selected axis. To specify different rates of acceleration and deceleration, turn off the [Default] checkbox, and enter the required acceleration time and deceleration time.
e	Detailed Setup	Startup Mode: 0 to 5 End Mode: 0 to 3 Dwell Time: 0 to 32,767 (ms) M Code: 0 to 32,767 Specify the startup mode, end mode, dwell time and M code.

SEE ALSO

For details on how to perform setup, see Section 8.3.2, "Specifying Speed Control to Position Control Switchover" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ Speed->pos. (cont.)

Selects action to switch from speed control to position control, retaining the current position. You do not need to set up non-displayed parameters.

The screenshot shows a software interface for configuring a speed-to-position control action. It is divided into several sections:

- (a) General:** No. 24, Label 'VelToPos', Comment 'Speed->Position for A'.
- (b) Action Mode:** Action Code '12: Speed->pos. (cont.)', Axes checked for AX1 and AX2.
- (c) Position Data:** No. 6, Label 'POS4', Axis 1: 130.0000 mm, Axis 2: 50.0000 mm, Axis 3: 0 pulse, Axis 4: 0 pulse.
- (d) Speed Data:** Speed Type 'Axis 1', Speed '125.0000 mm/s', Acceleration/Deceleration Time checked for 'Default'.
- (e) Detailed Setup:** Startup Mode '0: Normal', End Mode '0: End', Dwell Time '0 ms', M Code '0'.

No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Action Mode	Action Code: 12: Speed->pos. (cont.) Axes: AX1, AX2, AX3, AX4 You must select one and only one axis for control switchover in [Axes].
c	Position Data	Position Data No.: 1 to No of Position Data Records Used defined in properties (2,000 max.) Specify the new target position for positioning after switching to position control. The measurement unit for display can be changed using the Registered Parameters window.
d	Speed Data Acceleration/Deceleration Time	Speed Type: Axis 1, Axis 2, Axis 3 or Axis 4 Speed: Startup Speed to Speed Limit (speed reference unit) Acceleration/Deceleration Time can be specified as default or using numerical value input. ACC: -1, 0 to 32,767 (ms) DCC: -1, 0 to 32,767 (ms) Turning on the [Default] checkbox selects the acceleration time and deceleration time defined by the registered parameters of the selected axis. To specify different rates of acceleration and deceleration, turn off the [Default] checkbox, and enter the required acceleration time and deceleration time.
e	Detailed Setup	Startup Mode: 0 to 5 End Mode: 0 to 3 Dwell Time: 0 to 32,767 (ms) M Code: 0 to 32,767 Specify the startup mode, end mode, dwell time and M code.

SEE ALSO

For details on how to perform setup, see Section 8.3.2, "Specifying Speed Control to Position Control Switchover" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

Speed control

Selects speed control movement. You do not need to set up non-displayed parameters. An error is generated if the module has not been switched from position control to speed control mode.

No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Action Mode	Action Code: 13: Speed control Axes: AX1, AX2, AX3, AX4 You can select from 1 to 4 axes for concurrent movement. Selecting only one axis performs single-axis speed control movement with startup speed.
c	Speed Data	AX1 Speed, AX2 Speed, AX3 Speed, AX4 Speed: -(Speed Limit) to (Speed Limit) (speed reference unit) Specify the speed for each movement axis. For single-axis speed control movement, the specified speed must not be lower than the startup speed. Specified speed must be non-zero.
d	Acceleration/Deceleration Time	Acceleration/Deceleration Time can be specified as default or using numerical value input. ACC: -1, 0 to 32,767 (ms) DCC: -1, 0 to 32,767 (ms) If you turn on the [Default] checkbox, the module computes the acceleration time and deceleration time of each movement axis using its specified speed, as well as its Default Acceleration Time and Default Deceleration Time axis registered parameters, and then selects the longest acceleration time and deceleration time from the computed values.
e	Detailed Setup	Startup Mode: 0 to 5 End Mode: 0 to 2 Dwell Time: 0 to 32,767 (ms) M Code: 0 to 32,767 Specify the startup mode, end mode, dwell time and M code.

SEE ALSO

For details on how to perform setup, see Section 8.3.3, "Specifying Linear Speed Control Movement" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ Index positioning

Selects index positioning movement.

The screenshot shows a software interface for configuring index positioning. It includes fields for record number, label, comment, action code, axes selection, position data (axis 1-4), speed data (speed type, speed, acceleration/deceleration time), and detailed setup (startup mode, end mode, dwell time, M code). Circled areas (a) through (e) correspond to the table below.

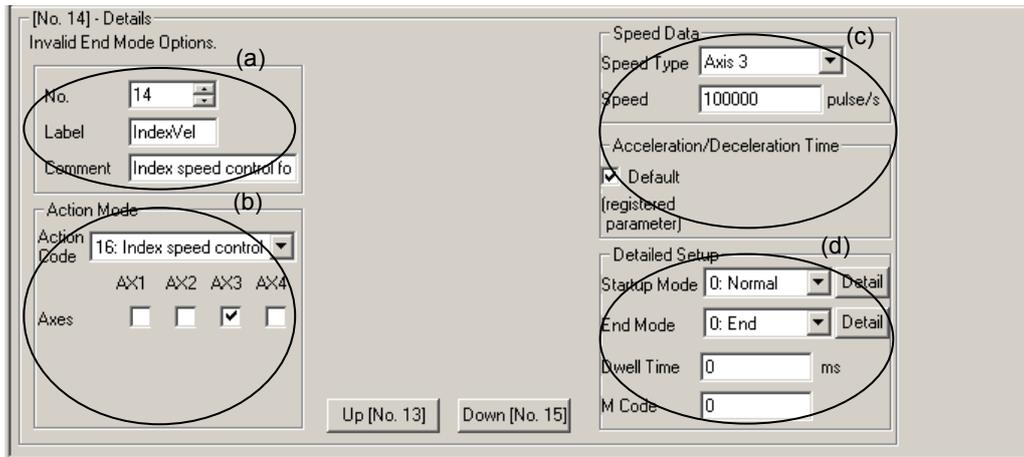
No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Action Mode	Action Code: 15: Index positioning Axes: AX1, AX2, AX3, AX4 You must select one and only one movement axis in [Axes].
c	Position Data	Position Data No.: 1 to No of Position Data Records Used defined in properties (2,000 max.) Enter the target position for index positioning. The measurement unit for display can be changed using the Registered Parameters window.
d	Speed Data Acceleration/Deceleration Time	Speed Type: Axis 1, Axis 2, Axis 3 or Axis 4 Speed: Startup Speed to Speed Limit (speed reference unit) The speed type can only be specified as the speed of a movement axis. Acceleration/Deceleration Time can be specified as default or using numerical value input. ACC: -1, 0 to 32,767 (ms) DCC: -1, 0 to 32,767 (ms) Turning on the [Default] checkbox selects the acceleration time and deceleration time defined by the registered parameters of the selected axes. The acceleration time and deceleration time can also be specified as required by deselecting the [Default] checkbox. Specify the speed type, speed, acceleration time and deceleration time.
e	Detailed Setup	Startup Mode: 0 to 5 End Mode: 0 to 3 Dwell Time: 0 to 32,767 (ms) M Code: 0 to 32,767 Specify the startup mode, end mode, dwell time and M code.

SEE ALSO

For details on how to perform setup, see Section 8.4.1, "Specifying Index Positioning" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ Index speed control

Selects index speed control movement.



No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Action Mode	Action Code: 16: Index speed control Axes: AX1, AX2, AX3, AX4 You must select one and only one movement axis in [Axes]. Select an axis for positioning.
c	Speed Data Acceleration/Deceleration Time	Speed Type: Axis 1, Axis 2, Axis 3 or Axis 4 Speed: -(Speed Limit) to (Speed Limit) (speed reference unit) The speed type can only be specified as the speed of a movement axis. Acceleration/Deceleration Time can be specified as default or using numerical value input. ACC: -1, 0 to 32,767 (ms) DCC: -1, 0 to 32,767 (ms) Turning on the [Default] checkbox selects the acceleration time and deceleration time defined by the registered parameters of the selected axis. The acceleration time and deceleration time can also be specified as required by deselecting the [Default] checkbox. Specify the speed type, speed, acceleration time and deceleration time.
d	Detailed Setup	Startup Mode: 0 to 5 End Mode: 0 to 2 Dwell Time: 0 to 32,767 (ms) M Code: 0 to 32,767 Specify the startup mode, end mode, dwell time and M code.

SEE ALSO

For details on how to perform setup, see Section 8.4.2, "Specifying Index Speed Control Movement" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ Contact o/p on/off

Sets output of externals contacts specified as general input or general output to ON or OFF.

[No. 16] - Details
Sets output of selected contacts to ON or OFF.

(a) No. 16
Label Out
Comment Axis 3 ON/ Axis 2 OFF

(b) Contact Output Data

	Gen. 1	Gen. 2	Gen. 3
	ON OFF	ON OFF	ON OFF
Axis 1	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Axis 2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Axis 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Axis 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(c) Detailed Setup

Startup Mode 0: Normal

End Mode 0: End

M Code 0

Up [No. 15] Down [No. 17]

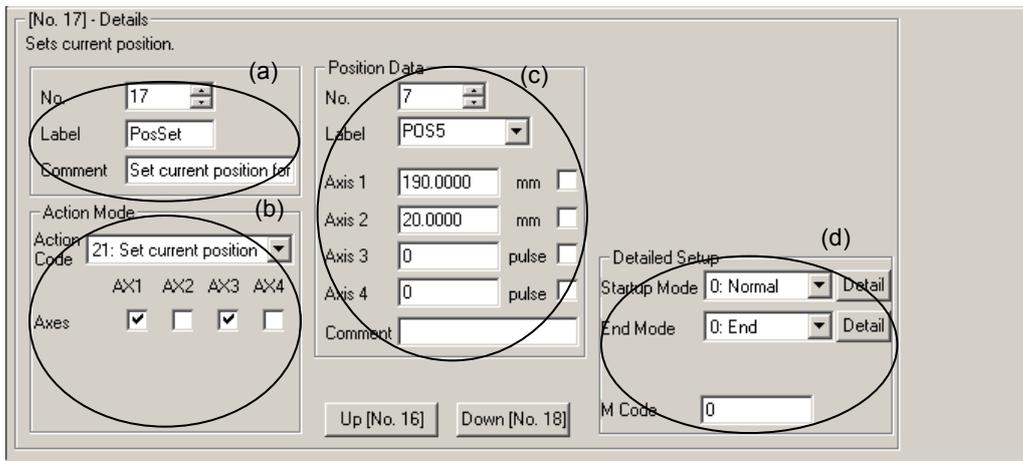
No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Contact Output Data	Axis 1: General 1: ON/OFF, General 2: ON/OFF, General 3: ON/OFF Axis 2: General 1: ON/OFF, General 2: ON/OFF, General 3: ON/OFF Axis 3: General 1: ON/OFF, General 2: ON/OFF, General 3: ON/OFF Axis 4: General 1: ON/OFF, General 2: ON/OFF, General 3: ON/OFF Specify the external contact outputs to be turned on or off. Outputs of unselected contacts will remain unchanged.
c	Detailed Setup	Startup Mode: 0 to 5 End Mode: 0 to 1 M Code: 0 to 32,767 Specify the startup mode, end mode and M code.

SEE ALSO

For details on how to perform setup, see Section 8.5, "Specifying Contact Outputs On/Off" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ Set current position

Changes the current position.



No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	Action Mode	Action Code: 21: Set current position You can select from 1 to 4 axes for changing current position. Select the axes for current position setup.
c	Position Data	Position Data No.: 1 to No of Position Data Records Used defined in properties (2,000 max.) Enter the new current position. The measurement unit for display can be changed using the Registered Parameters window.
d	Detailed Setup	Startup Mode: 0 to 5 End Mode: 0 to 1 M Code: 0 to 32,767 Specify the startup mode, end mode and M code.

SEE ALSO

For details on how to perform setup, see Section 8.6, "Specifying Set Current Position Action" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ FOR-NEXT

Specifies a FOR-NEXT loop.

FOR-NEXT action records must be specified in pairs.

The image displays two screenshots of a software interface for configuring FOR-NEXT loops. The top screenshot, titled "[No. 20] - Details", shows a "FOR-NEXT" section with "Iterations" set to 100 times and a "FOR-NEXT" section with "No." 20, "Label" "ForStart", and "Comment" "Loop 20 to 27". The bottom screenshot, titled "[No. 27] - Details", shows a "FOR-NEXT" section with "No." 27, "Label" "ForEnd", and "Comment" "Next matching 20 FO". Both screenshots include "Up" and "Down" navigation buttons.

No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	FOR-NEXT	Iterations: 0 to 32767 Repeats execution of action pattern records between FOR and NEXT for specified iterations. Specifying 0 or 1 iteration produces the same result. Specify the number of iterations for the FOR-NEXT loop.

SEE ALSO

For details on how to perform setup, see Section 8.7, "Specifying FOR-NEXT Actions" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ JUMP

Performs a JUMP.

No	Item	Description of Displayed Item and Its Setup
a	No. Label Comment	Select a record number. Changing [No.] changes the displayed data. Labels and comments are optional features that can help in identifying a pattern, in place of using the pattern number.
b	JUMP Destination	No.: 1 to No of Pattern Data Records Used defined in properties (500 max.) Specify the destination for a jump. You may specify the jump destination as a pattern data record number or pattern data record label.

SEE ALSO

For details on how to perform setup, see Section 8.8, "Specifying Jump Action" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ NOP

No operation. Moves to next action pattern record.

SEE ALSO

For details on how to perform setup, see Section 8.9, "Specifying NOP Action" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

B3.2.7 Editing Position Data on the Pattern Data Edit Screen

You can edit pattern data, as well as position data in ToolBox.

Position data is part of pattern data, and is used during pattern execution. You can reuse one position data in multiple patterns.

The screenshot displays the 'Pattern A Data' window with a table of action patterns and a detailed view for pattern No. 31. An arrow points from the 'Action Code' '1: Linear posi...' in the table to the 'Position Data' section of the details window. Another arrow points from the 'Position Data' section to a 'ToolBox' window showing a list of position data entries.

No.	Label	Action Code	Action Pattern				CI Axes	Action Mode Argument	Target Position		
			1	2	3	4			No.	Label	AX...
27		1: Linear posi...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		0	27	POS-X+Y2	-95...
28		97.NEXT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		0	0		0.0...
29		98.JUMP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		2	19	POS=>XY	0.0...
30			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
31		1: Linear posi...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		0	27	POS-X+Y2	-95...
32			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
33			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
34			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					
35			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>					

[No. 31] - Details
Performs positioning using position control.

Position Data

No. No.
 Label Label
 Comment

Axis 1 mm
 Axis 2 mm
 Axis 3 pulse
 Axis 4 pulse
 Comment

Speed Data
 Speed Type
 Speed mm/s

Acceleration/Deceleration Time
 Default (registered parameter)

Detailed Setup
 Startup Mode
 End Mode
 M Code

ToolBox

	org	Unit	INC	Comment
1	org	-190.0000	<input checked="" type="checkbox"/>	
2	POS0	-190.0000	<input type="checkbox"/>	
3	POS1	-140.0000	<input type="checkbox"/>	
4	POS2	0.0000	<input type="checkbox"/>	
5	POS3	0.0000	<input type="checkbox"/>	
6	POS4	0.0000	<input type="checkbox"/>	
7	POS5	190.0000	<input type="checkbox"/>	
8	POS6	190.0000	<input type="checkbox"/>	
9				
10	STARTPOS	-200.0000	<input type="checkbox"/>	
11	POS+X	47.5000	<input checked="" type="checkbox"/>	
12	POS+Y	0.0000	<input checked="" type="checkbox"/>	

[No. 1] - Details

No.
 Label Unit INC Comment
 Axis 1 mm
 Axis 2 mm
 Axis 3 pulse
 Axis 4 pulse

Position data in ToolBox are linked.
 Changing position data for an axis also changes associated position data in pattern data.

SEE ALSO

For details on how to perform setup, see Section 8.1, "Action Pattern Data" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

■ Adding New Position Data

To add new position data on the Pattern Data edit screen, use the following procedure.

1. **Select an unused position data number in the [No.] field and enter position data.**

⇒ The entered data is automatically stored to position data.

■ Editing Position Data

You can edit position data while editing pattern data. To do so, select the position data to be edited in the Position Data Edit area and modify the data.



CAUTION

Editing position data that is used in multiple patterns affects all associated pattern data.

B3.3 Creating and Editing Position Data

Pattern data and position data are automatically generated when you create a registered parameter file. You can change the number of position data records used using the Properties dialog.

SEE ALSO

For information on internal registers, see “Positioning Module (with Pulse Output)” user manual (IM34M06H56-02E).

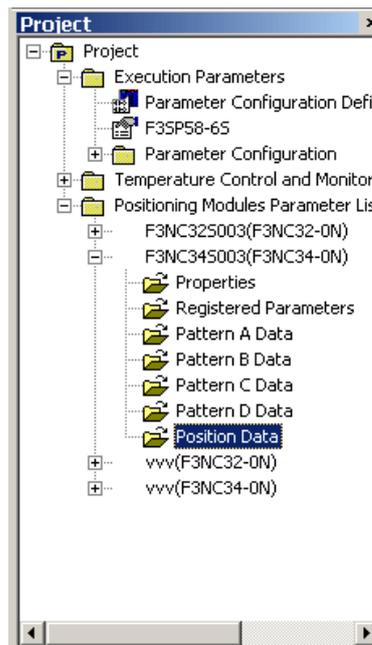
B3.3.1 Opening Position Data

1. Double-click the position data to be edited in the Project window.

⇒ The Position Data edit screen is displayed.

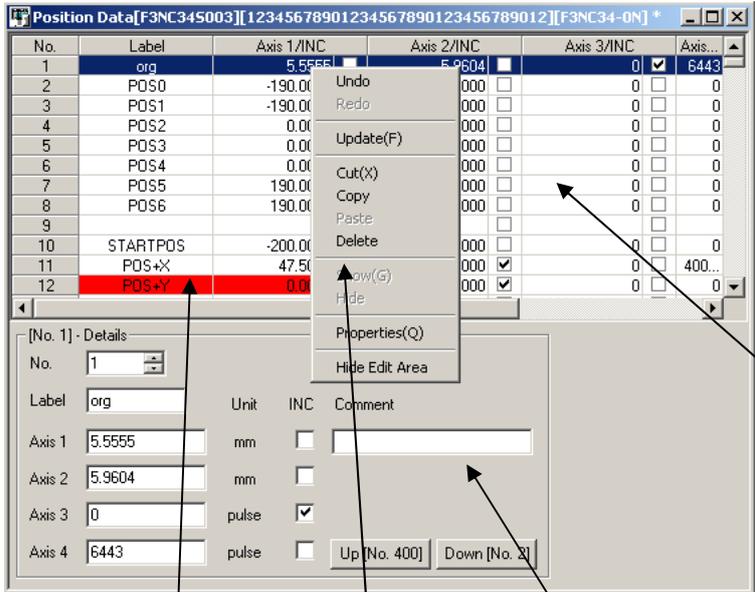
TIP

You can also display the Position Data edit screen by moving the cursor to [Position Data] using arrow keys, and then press the [Enter] key.



Screen (1)

B3.3.2 Position Data Screen Layout



Data List area
Displays position data.
You can edit one line at a time.

Edit area

Right mouse click
Click the right mouse button to display this menu.
You can customize the displayed items using environment setup.

Error data are displayed with red background.

B3.3.3 Editing Position Data

1. Select a position data to be edited in the Data List area.

⇒ The selected line in the Data List area is displayed in blue, and its data is displayed in the Edit area.

TIP

You can also display data to be edited by selecting or entering the number of a position data record in the [No.] field in the Edit area.

Data List area

No.	Label	Axis 1/INC	Axis 2/INC	Axis 3/INC	Axis 4/INC
1	org	-190.0000	-140.0000	0	190
2	POS0	-190.0000	-140.0000	0	0
3	POS1	-190.0000	140.0000	0	0
4	POS2	0.0000	140.0000	0	0
5	POS3	0.0000	-140.0000	0	0
6	POS4	0.0000	140.0000	0	0
7	POS5	190.0000	140.0000	0	0
8	POS6	190.0000	-140.0000	0	0
9					
10	STARTPOS	-200.0000	0.0000	0	0
11	POS+X	47.5000	0.0000	0	400
12	POS+Y	0.0000	47.5000	0	0

[No. 2] - Details

No. 2

Label POS0 Unit INC Comment

Axis 1 -190.0000 mm

Axis 2 -140.0000 mm

Axis 3 0 pulse

Axis 4 0 pulse

Up [No. 1] Down [No. 3]

Screen (1)

Edit area

2. Edit data in the Edit area.

⇒ Edited data is immediately reflected in the Data List area.

TIP

A cell containing invalid data is displayed with red background.

TIP

The range check for the position data of each axis is based on the setup range defined by the registered parameters. A cell containing out of range data is displayed with red background.

No.	Label	Axis 1/INC	Axis 2/INC	Axis 3/INC	Axis 4/INC
1	org	-190.0000	-140.0000	0	190
2	POS0	-190.0000	-140.0000	0	0
3	POS1	-190.0000	140.0000	0	0
4	POS2	0.0000	140.0000	0	0
5	POS3	0.0000	-140.0000	0	0
6	POS4	0.0000	140.0000	0	0
7	POS5	190.0000	140.0000	0	0
8	POS6	190.0000	-140.0000	0	0
9					
10	STARTPOS	-200.0000	0.0000	0	0
11	POS+X	47.5000	0.0000	0	400
12	POS+Y	0.0000	47.5000	0	0

[No. 10] - Details

No. 10

Label STARTPOS Unit INC Comment

Axis 1 -200.0000 mm

Axis 2 -200.0000 mm

Axis 3 0 pulse

Axis 4 0 pulse

Up [No. 9] Down [No. 11]

Screen (2)

B4 Connecting to and Disconnecting from FA-M3

This chapter describes how to connect the PC to the FA-M3, as well as how to perform communications setup.

- Connecting to FA-M3 → B4.1
- Disconnecting from FA-M3 → B4.2
- Considerations for Multi-CPU Configuration → B4.3
- Test Data → B4.4

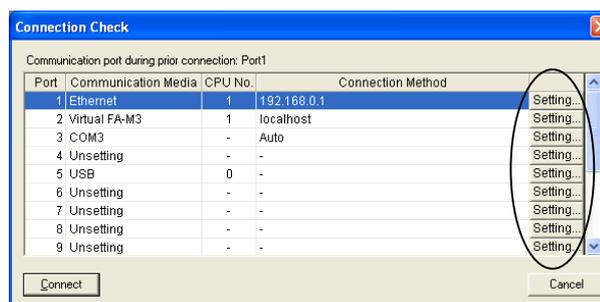
B4.1 Connecting to FA-M3

Before you start connecting online to FA-M3, you must first connect your PC to the CPU module with a cable and set up communication settings according to the mode of connection.

B4.1.1 Checking Communications Setup and Connecting

1. Run ToolBox.
2. Select [Online]-[Connect] from the menu bar.

⇒ The Connection Check dialog box is displayed.



Screen (1)

B040101_01.VSD

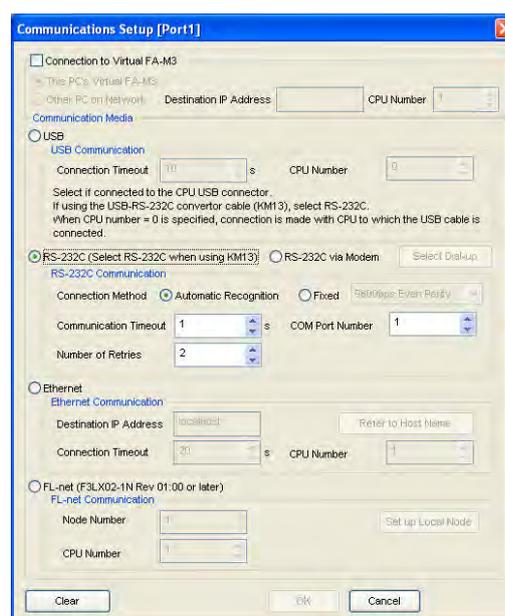
3. Click the [Setting...] button of the communication port to be used for the connection.

⇒ Screen (2) is displayed.

4. Ensure that settings are correct, and click [OK].

SEE ALSO

For details on communications setup, see: Section B3.1, "Communications Setup" of the "FA-M3 ToolBox Manual".

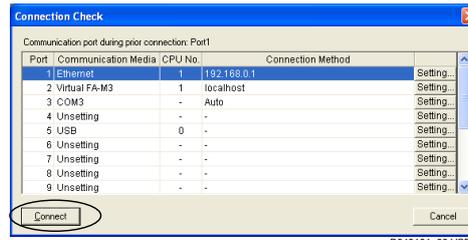


Screen (2)

B040101_02.VSD

5. Click [Connect] on the Connection Check dialog box.

⇒ FA-M3 system and the PC is connected.
The connection status is displayed on the action status bar and the status bar at the bottom of the operation screen.



Screen (3)

B040101_03.VSD

B4.2 Disconnecting from FA-M3

This section describes how to disconnect the CPU module and PC.

B4.2.1 Disconnecting

1. Select [Online]-[Disconnect] from the menu bar.

⇒ Screen (1) will be displayed

TIP

This message may also be displayed when you close an open online screen.



Screen (1)

2. Click [OK].

⇒ FA-M3 and the PC are disconnected from each other.

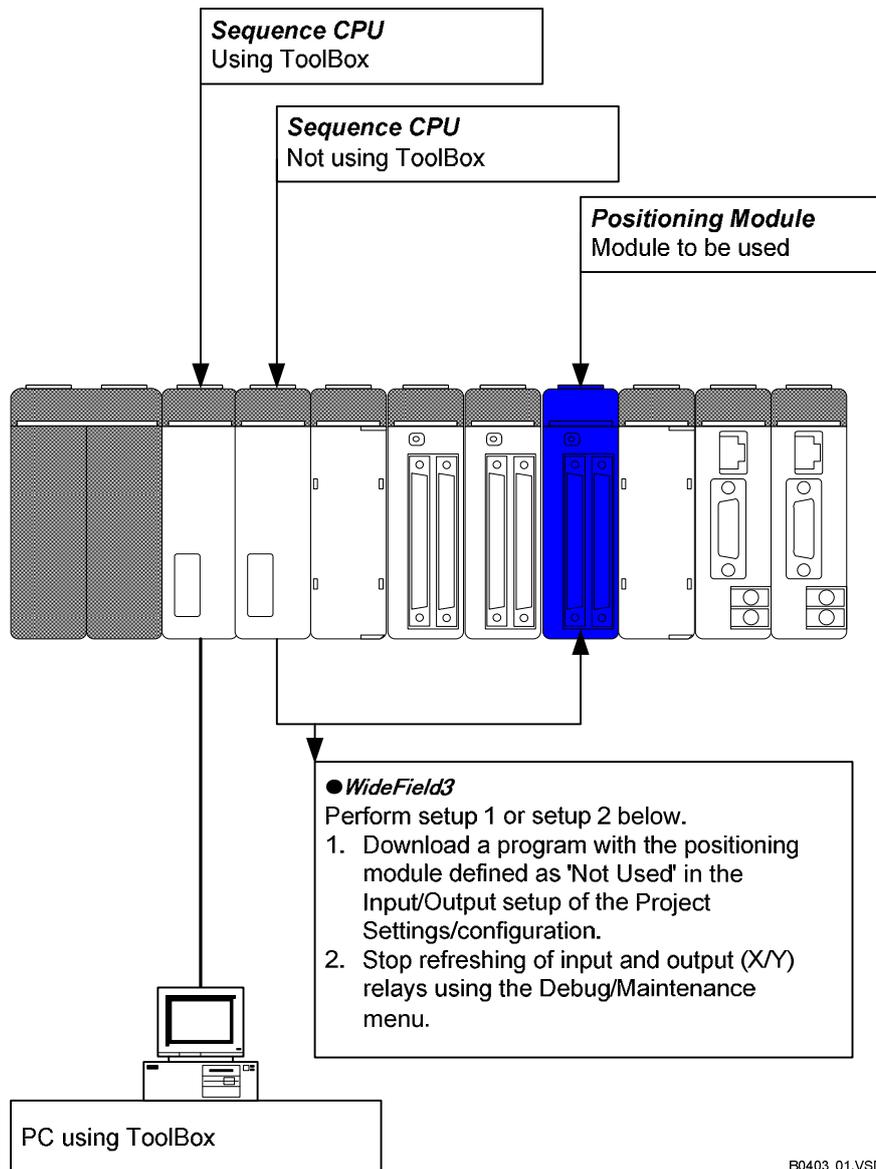


CAUTION

Disconnecting from FA-M3 is not allowed while an Action Test screen is displayed. To disconnect during an action test, you must first close the Action Test screen.

B4.3 Considerations for Multi-CPU Configuration

In a multi-CPU configuration, online processing is not allowed when another CPU not connected to ToolBox is accessing the positioning module. For proper use, a CPU not using ToolBox must either download a program that has the positioning module defined as 'Not used' in the DIO Setup of the project configuration, or stop refreshing of input and output (X/Y) relays.



B0403_01.VSD



CAUTION

When one positioning module is accessed from two or more sequence CPUs, the input/output (X/Y) relay values change with individual CPUs, and ToolBox cannot run normally.

B4.4 Test Data

Before performing action testing or pattern monitoring on a positioning module, you must first select the data to be used in the test.

You can select to use either of two data sets: project data or module data. Project data refers to data stored on the PC while module data refers to data stored in the module.

When using project data, you should first check the file name and date. If data are inconsistent, the motor may not operate as expected.

The screenshot shows a dialog box titled "Data Confirmation[003][F3NC345003][1234567890123456789012...". It contains the following sections:

- File:** File Name: F3NC345003, File Date/Time: 2004/12/09--15:18:27
- Module:** File Name: F3NC345003, File Date/Time: 2004/12/09--15:18:27
- Test Data Selection:**
 - Project Data (do not upload)
 - Module data (upload)
- Uploaded Data:**
 - Save to Temporary File (discard)
 - Overwrite Project Data
- Items To Be Uploaded:**
 - Registered Parameters
 - Position Data
 - Pattern Data
- Buttons:** Start, Cancel

Annotations for the dialog box:

- Points to File Date/Time: This is the date for the data stored on the PC.
- Points to Module File Date/Time: This is the date for the data in the module to be used in the test.
- Points to Project Data: Performs test using data on PC without uploading data.
- Points to Module data: Performs test using data in module after uploading data.
- Points to Save to Temporary File: Uses uploaded data as temporary data for testing, to be discarded after testing completes. If the test data is edited, however, a confirmation dialog will be displayed to confirm whether to save the data.
- Points to Overwrite Project Data: Saves uploaded data in the project. This has the same effect as performing a data upload from the module.
- Points to Registered Parameters, Position Data, Pattern Data: Select data to be uploaded. Registered parameters are always uploaded because they define the data range.
- Points to Start button: Opens Action Test screen based on setup.
- Points to Cancel button: Cancels action test or monitoring.

TIP

The number of data records to be uploaded depends on the number of data items used as defined in the module. If the number of data records does not match the data on the PC, you should upload all data before performing an action test.



CAUTION

A filename on the PC can be up to 255 bytes according to Microsoft Windows specifications but beware that only the first 10 characters of the filename are stored in the module. To check whether data has been changed, compare the displayed file date and module date. The displayed dates refer to the dates of the last edit.

Blank Page

B5 Downloading to Module

This chapter describes how to download registered parameters from a PC to FA-M3.

- Downloading → B5.1
- Downloading Restrictions → B5.2

B5.1 Downloading

B5.1.1 Downloading to Individual Modules

There are two options for downloading to individual modules: download module or download project. The download project option downloads data to all modules according to the parameter configuration definition.

■ Download Module Screen

This section describes the operation of the Download Module screen.

The screenshot shows the 'Download Module' dialog box with the following fields and buttons:

- File:** File Name: F3NC34S003, File Date/Time: 2004/12/17--11:25:17
- Module:** File Name: F3NC34S003, File Date/Time: 2004/12/17--11:25:17
- Items Selection:**
 - Registered Parameters
 - Position Data: 1 to 400 (1 to 400)
 - Pattern Data (1 to 100):

<input checked="" type="checkbox"/> A	1	to	100
<input checked="" type="checkbox"/> B	1	to	100
<input checked="" type="checkbox"/> C	1	to	100
<input checked="" type="checkbox"/> D	1	to	100
- Store to ROM
- Check Parameters
- Buttons:** Download, Cancel

Annotations:

- File name and date/time (points to File Name and File Date/Time)
- Date/time when data was downloaded to the module. Up to 10 characters are stored for the file name. (points to File Date/Time)
- The number of position data records used and downloadable. (points to Position Data range)
- The number of pattern data records used and downloadable. (points to Pattern Data range)
- Starts downloading. (points to Download button)
- Exits without downloading. (points to Cancel button)
- Specifies whether to store downloaded data to the ROM of the positioning module. (points to Store to ROM checkbox)
- Performs validation of parameter data. (points to Check Parameters checkbox)
- Enter the number of pattern data records to be downloaded. The default value is the number of pattern data records used defined in the project properties. (points to Pattern Data range)

■ Downloading to Individual Modules

1. Select [Online]-[Download]-[Module] from the menu bar.

⇒ Screen (1) is displayed.

2. Select module data to be downloaded by clicking in the Select column.

● Color Codes for Availability for Downloading

Modules are color-coded to indicate their availability for downloading as follows:

- White:
Downloading to the module is allowed.
- Red:
Downloading is not allowed because of a mismatch between the I/O configuration and the file structure of the module. Check the file or the connected FA-M3 system for compatibility.
- Yellow:
For positioning modules, this color indicates that downloading to the module is allowed.

TIP

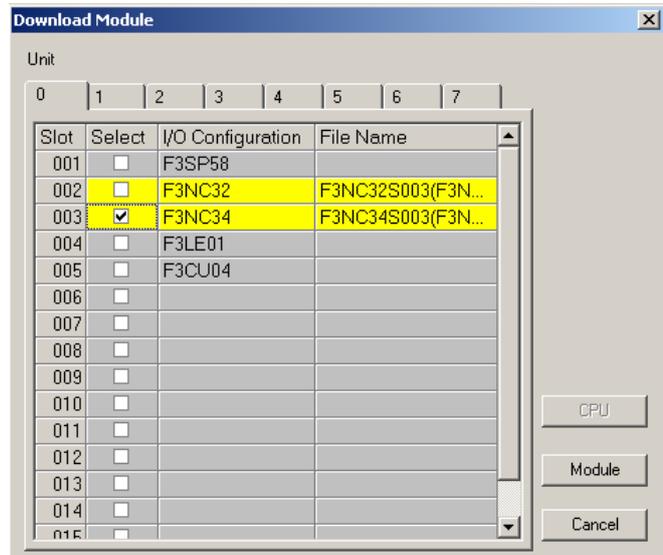
For other types of modules, yellow indicates that the address setup for the CPU module is invalid or not done.

- Gray
Not selectable

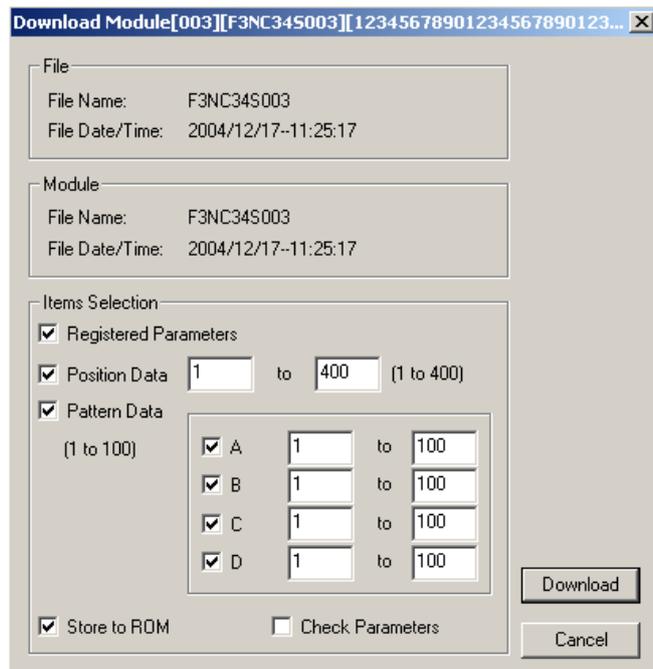
3. Click [Module].

⇒ Screen (2) is displayed.

4. Select the items to be downloaded.



Screen (1)



Screen (2)

5. Click [Download].

⇒ The Download dialog box is displayed during downloading. When download is completed, screen (3) is displayed.

TIP

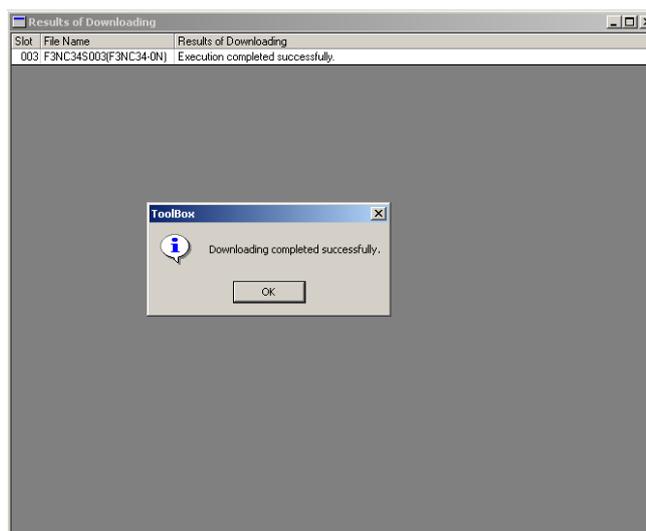
Clicking [Abort] on the Download screen aborts the download process.

6. Click [OK].

⇒ The Results of Downloading window is displayed for verification.

SEE ALSO

- For information on the messages on the results of downloading, see:
Section B5.1.3, "Messages about Results of Downloading".
- For information on how to verify downloaded parameters, see:
Section B4.2, "Verifying Downloaded Registered Parameters" of the "FA-M3 ToolBox Manual".
- The CPU module is switched to Stop mode before downloading.
- When downloading registered parameters to positioning module, the module is switched to Stop mode before downloading.



Screen (3)

**CAUTION**

- Downloading positioning module data to the CPU module using ToolBox is not allowed.
- Downloading to a positioning module is not allowed while an action test or monitor is running.
- Title and names of axes defined in properties are not downloaded to the module.

B5.1.2 Downloading to All Modules of a Project

1. Select **[Online]-[Download]-[Project]** from the menu bar.

⇒ Screen (4) is displayed.

2. Click **[Module]**.

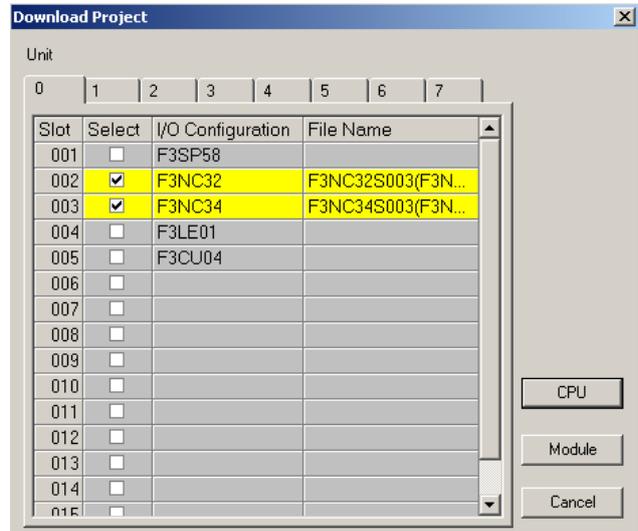
⇒ The Download dialog box is displayed during downloading. When download is completed, screen (5) is displayed.

SEE ALSO

For information on the color codes of modules indicating their availability for downloading, see the description entitled "Color Codes for Availability for Downloading" in Section B5.1.1.

TIP

Clicking **[Abort]** on the Download screen aborts the download process.



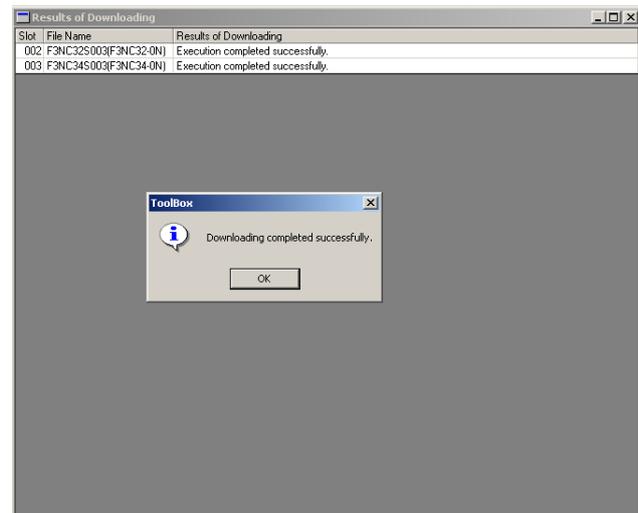
Screen (4)

3. Click **[OK]**.

⇒ The Results of Downloading window is displayed for verification.

SEE ALSO

- For information on messages about results of downloading, see:
Section B5.1.3, "Messages about Results of Downloading".
- For information on how to verify downloaded parameters, see:
Section B4.2, "Verifying Downloaded Registered Parameters" of the "FA-M3 ToolBox Manual".
- The CPU module is switched to Stop mode before downloading.
- When downloading registered parameters to an advanced function module, the module is switched to Stop mode before downloading.



Screen (5)

B5.1.3 Messages about Results of Downloading

The Results of Downloading window may display one or more of the following messages. Read the messages and take appropriate actions, as required.

Table B5.1 List of Messages about Results of Downloading

No.	Message	Description	Remarks
1	Execution completed successfully.	Downloading completed successfully.	
2	Execution was aborted.	The [Abort] button was clicked during downloading, and downloading was aborted.	
3	Failed to write registered parameter.	Error was encountered while writing to module. Registered parameter is invalid.	
4	Position data (NNN): write failure	Error was encountered while writing to module. Position data (NNN) is invalid (e.g. out of valid range).	*1
5	<*> Pattern data (NNN) [***]: write failure	Error was encountered while writing to module. Parameter [***] of record (NNN) of pattern <*> data is invalid.	*2
6	Communication server is busy.	The communication server is busy. WideField3 may be connected online to FA-M3.	
7	Invalid dialog information file	Dialog information file was found to be damaged during online processing. The ToolBox environment file may have been changed by a user.	
8	Memory error	Available memory is insufficient.	
9	Downloading was not allowed because action test or action monitoring was in progress.	Downloading to positioning module is not allowed during online processing. Close all online screens before downloading.	
10	ToolBox connection error encountered. Another ToolBox is connected.	The positioning module selected for downloading is used by another application. Check all usages.	

*1: (NNN) denotes a position data number.

*2: (NNN) denotes a pattern data record number.
[***] denotes a parameter name.

B5.2 Downloading Restrictions

● Operation Status of Positioning Module

- Downloading is not allowed during positioning.

● CPU Operating Mode

- The CPU must be switched to Stop mode before downloading. After downloading completes, switch the CPU module to Run mode manually as required.

● Operation Status of ToolBox

- Downloading is not allowed when an action test or action monitor screen is open. Close all online processing screens before downloading.



● If Operating Mode of CPU Module is in ROM Writer Mode

- Downloading is not allowed if the CPU module is in ROM Writer mode. In this case, the following dialog box will be displayed. You should exit from ROM Writer mode using WideField3 or other means.



B0502_02.VSD

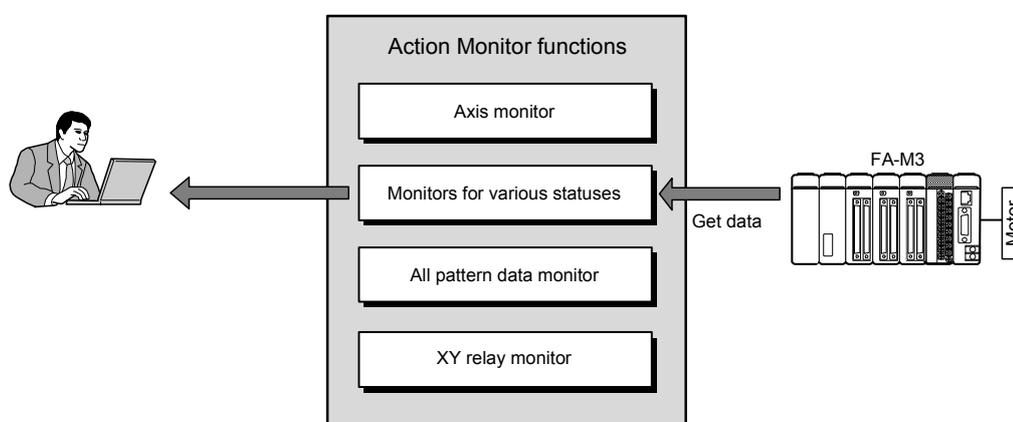
B6 Checking Operation Status Using Action Monitor

This chapter describes how to display Action Monitor screens and how to save displayed data.

- What is Action Monitor? → B6.1
- Using Action Monitor → B6.2
- Using Pattern Monitor → B6.3

B6.1 What is Action Monitor?

Using the Action Monitor, you can read and display status information of positioning modules on a computer screen.



CAUTION

Do not pull out the cable during communication between FA-M3 and ToolBox.

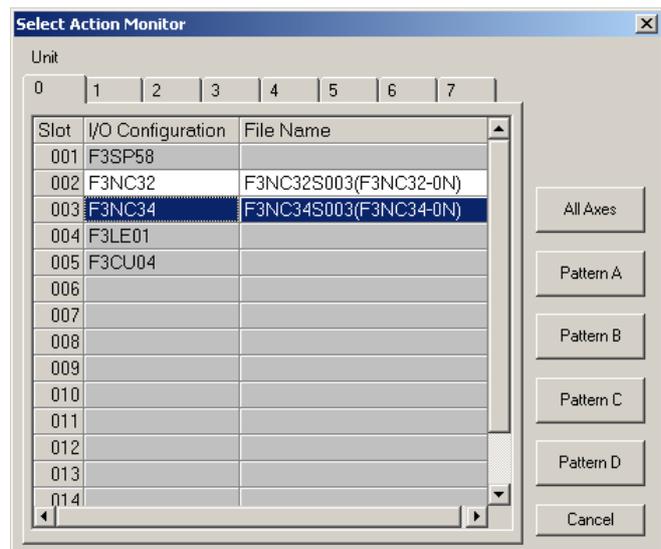
B6.2 Using Action Monitor

B6.2.1 Displaying Action Monitor Screen

1. Run ToolBox, open a project, and connect to FA-M3.
2. Select [Debug/Maintenance]-[Action Monitor...] from the menu bar.
⇒ The Select Action Monitor screen is displayed.
3. In the Select Action Monitor screen, highlight the positioning module to be monitored by clicking the corresponding cell.
⇒ Screen (1) is displayed.
4. From the displayed buttons ([All Axes], [Pattern A], ...), select and click the button for the item to be monitored.
⇒ The Action Monitor screen is displayed.

TIP

As an alternative way to display the Action Monitor screen, you may also double-click Action Monitor under the name of the positioning module to be monitored in the Debugger Window.



Screen (1)

B6.2.2 Axis Monitor Screen

The Axis Monitor screen displays the following information.

Axis Monitor[003][F3NC345003][12345678901234567890123456789012][F3NC34-0N]

Axis 1 pulse Axis 2 pulse Axis 3 pulse Axis 4 pulse

Current Position

Current Speed

Counter Current Position

Counter Current Speed

	Error Detect...	Error Status	Error Description
Axis 1	0	0	
Axis 2	0	0	
Axis 3	0	0	
Axis 4	0	0	

Pos./Speed Status All Axis Status Error Status Pattern Op. Status I/O Relays Help

Help

Error display

I/O relays

Pattern operation status

Error status

Status of individual axes

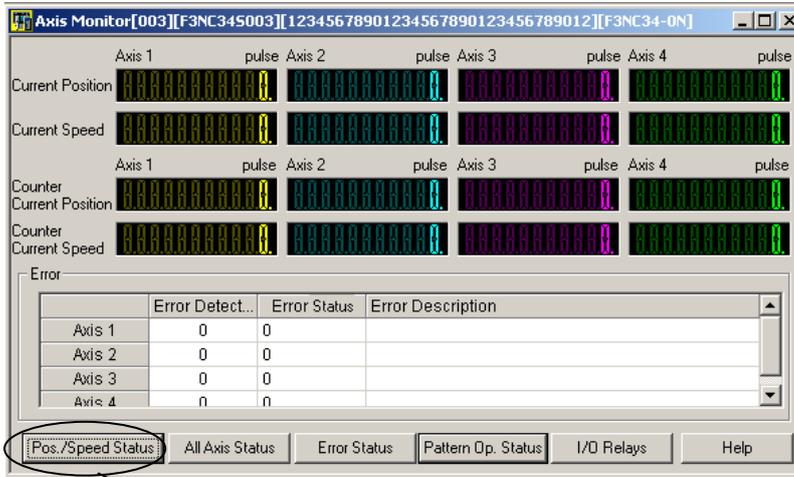
Position/speed status

Operation Monitor 1
Row 1: Current position
Row 2: Current speed

Operation Monitor 2
Row 1: Counter current position
Row 2: Counter current speed

■ Position/Speed Status

Clicking the [Pos./Speed Status] button on the Axis Monitor screen displays the following screen.



Click to display screen below.

	Axis 1	Axis 2	Axis 3	Axis 4
Remaining DCC Time Status	0 ms	0 ms	0 ms	0 ms
Remaining Travel Status	0.0000 mm	0.0000 mm	0 pulse	0 pulse
Current Override Value Status	100 %	100 %	100 %	100 %
Current Position Status	0.0000 mm	0.0000 mm	0 pulse	0 pulse
Target Position Status	0.0000 mm	0.0000 mm	0 pulse	0 pulse
Current Speed Status	0.0000 mm/s	0.0000 mm/s	0 pulse/s	0 pulse/s
Counter Current Position Status	0.0000 mm	0.0000 mm	0 pulse	0 pulse
Counter Current Speed Status	0.0000 mm/s	0.0000 mm/s	0 pulse/s	0 pulse/s
Counter Latched Position Status	0.0000 mm	0.0000 mm	0 pulse	0 pulse
Counter Absolute Data Status	0	0	0	0

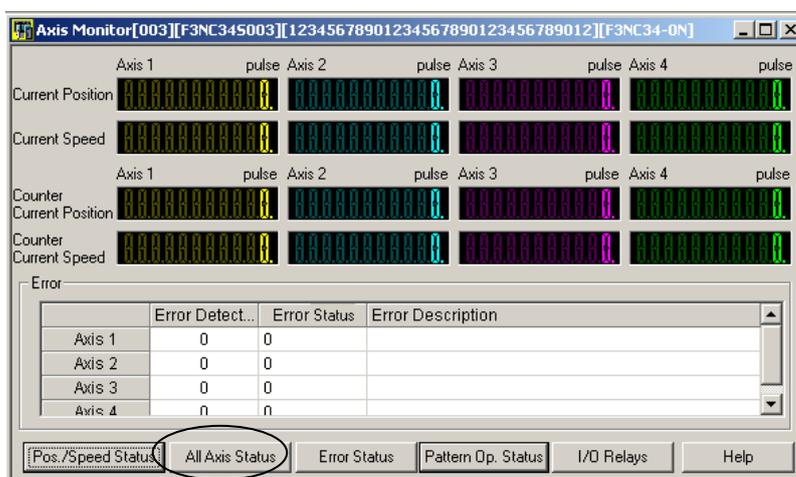
SEE ALSO

For details on the displayed status information, see Subsection C1.4.3, "Axis Statuses"

For further details, see "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

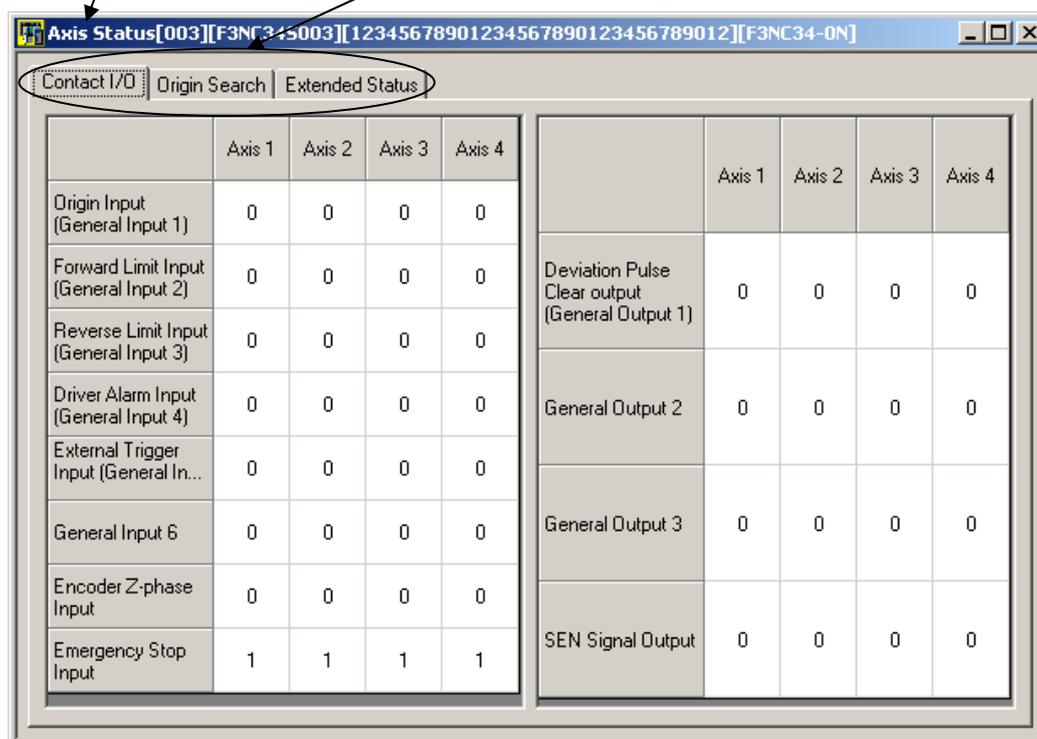
■ All Axis Status

Clicking the [All Axis Status] button on the Axis Monitor screen displays the following screen.



Click to display screen below.

Selecting different tabs changes the displayed items.



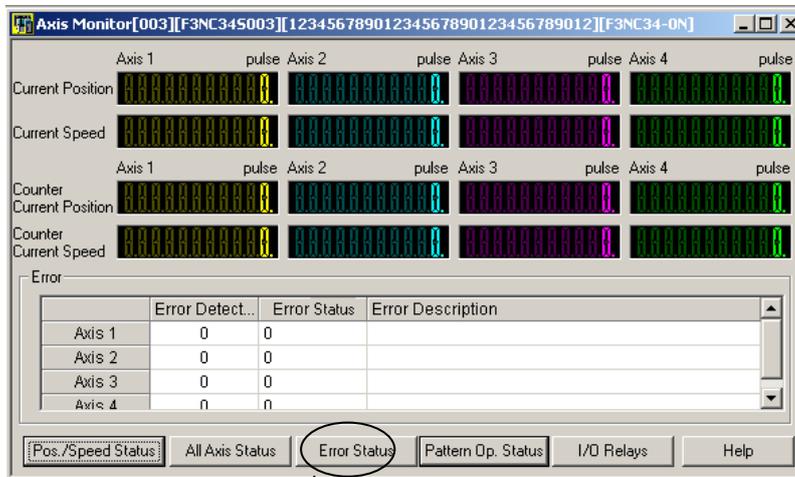
SEE ALSO

For details on the displayed status information, see Subsection C1.4.3, "Axis Statuses"

For further details, see "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

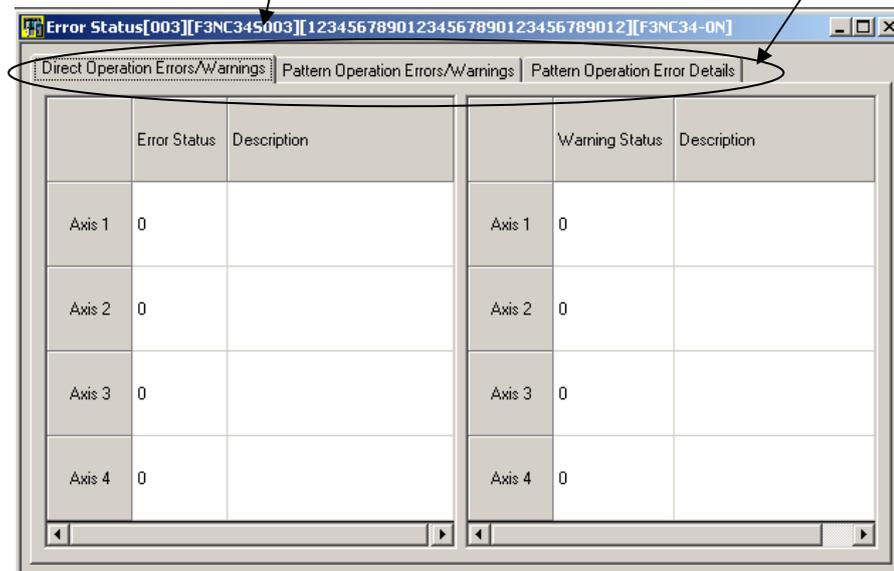
■ Error Status

Clicking the [Error Status] button on the Axis Monitor screen displays the following screen.



Click to display screen below.

Selecting different tabs changes the displayed items.



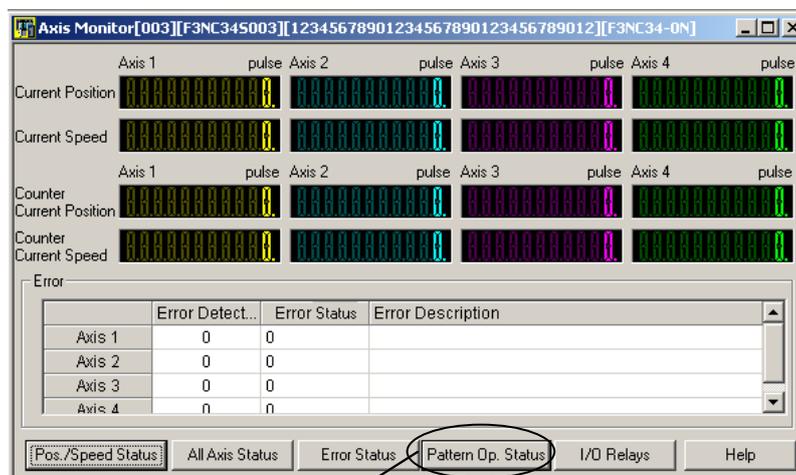
SEE ALSO

For details on the displayed status information, see Subsection C1.4.3, "Axis Statuses"

For further details, see "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

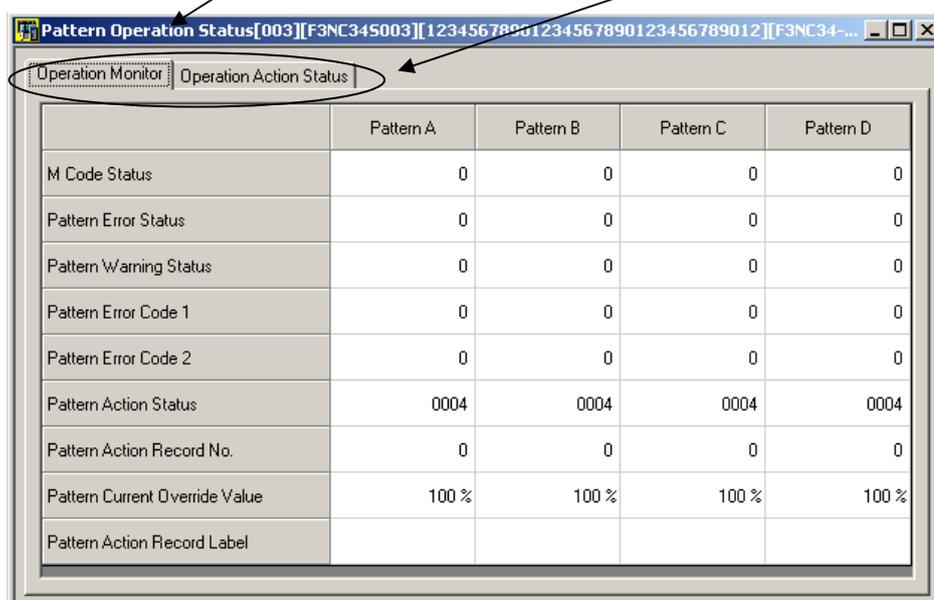
■ Pattern Operation Status

Clicking the [Pattern Op. Status] button on the Axis Monitor screen displays the following screen.



Selecting different tabs changes the displayed items.

Click to display screen below.



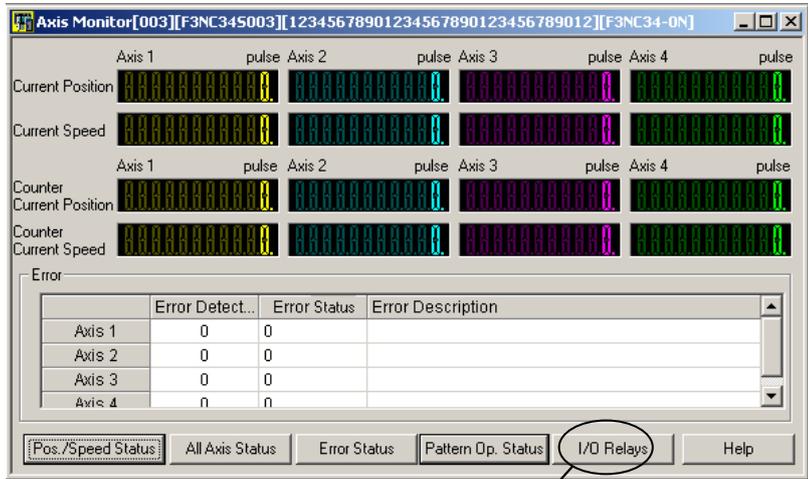
SEE ALSO

For details on the displayed status information, see Subsection C1.4.3, "Axis Statuses"

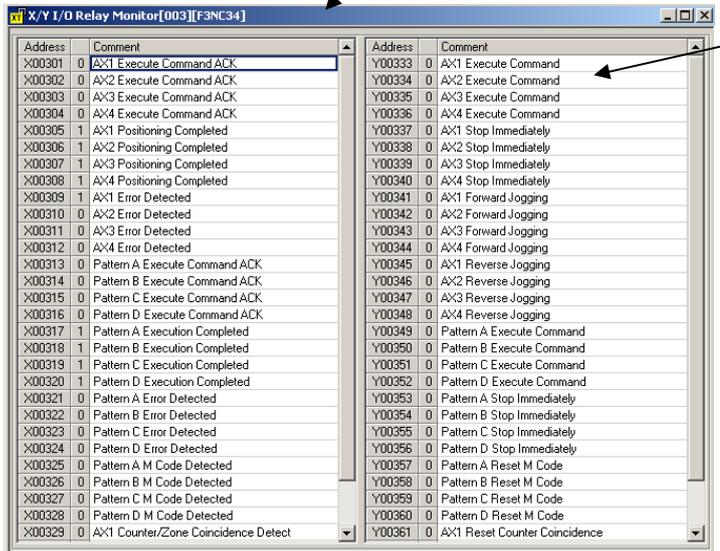
For further details, see "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

I/O Relay Status

Clicking the [I/O Relays] button on the Axis Monitor screen displays the following screen.



Click to display screen below.



Each relay is displayed with comments.

SEE ALSO

For details on I/O relays, see Section C1.1, "List of I/O Relays".

For further details, see "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

B6.3 Using Pattern Monitor

You can use the Pattern Monitor to check data using Pattern Data edit screen, as well as monitor pattern operation. In addition to monitoring the pattern number or label being executed, you can also check data of preceding and following pattern numbers.

Blinks when [Start Monitoring] is selected.

Stops monitoring

The pattern being executed is displayed in blue.

Background color differs from the Pattern edit screen.
Default: yellow

The screenshot displays the 'Pattern A Monitor' window. At the top, a title bar shows the file path: 'Pattern A Monitor[003][F3NC345003][12345678901234567890123456789012][F3NC34-0N]'. Below the title bar is a table with columns for 'No.', 'Label', 'Action Code', 'Action Pattern' (subdivided into 'Axes' and 'Cl Axes'), 'Action Mode Argument', and 'Target Position' (subdivided into 'No.', 'Label', and 'AX1 Posit...').

No.	Label	Action Code	Action Pattern				Action Mode Argument	Target Position		
			1	2	3	4		No.	Label	AX1 Posit...
1	START	1: Linear posi...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	10	STARTPOS	-200.0000
2		96:FOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	0		0.0000
3		1: Linear posi...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	15	POS+X+Y	47.5000
4		1: Linear posi...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	17	POS+X+Y	47.5000
5		1: Linear posi...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	17	POS+X+Y	47.5000
6		1: Linear posi...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	15	POS+X+Y	47.5000

Below the table is a 'Details' panel for '[No. 3]'. It contains several sections:

- Buttons:** 'Start Monitoring' (highlighted in green) and 'Stop Monitoring'.
- Basic Info:** No. 3, Label, and Comment fields.
- Action Mode:** Action Code '1: Linear positioning' and checkboxes for Axes AX1, AX2, AX3, and AX4.
- Position Data:** No. 15, Label 'POS+X+Y', and position values for Axis 1 (47.5000 mm), Axis 2 (47.5000 mm), Axis 3 (0 pulse), and Axis 4 (0 pulse).
- Speed Data:** Speed Type 'Combined' and Speed '125.0000 mm/s'.
- Acceleration/Deceleration Time:** A checked 'Default' checkbox with '(registered parameter)' below it.
- Detailed Setup:** Startup Mode '0: Normal' and End Mode '3: Pass by', both with 'Detail' buttons.
- M Code:** A field containing '0'.

B6.3.1 Opening Pattern Monitor

1. **Double-click the required pattern monitor from the Debugger window.**
⇒ The Pattern Monitor screen is displayed.

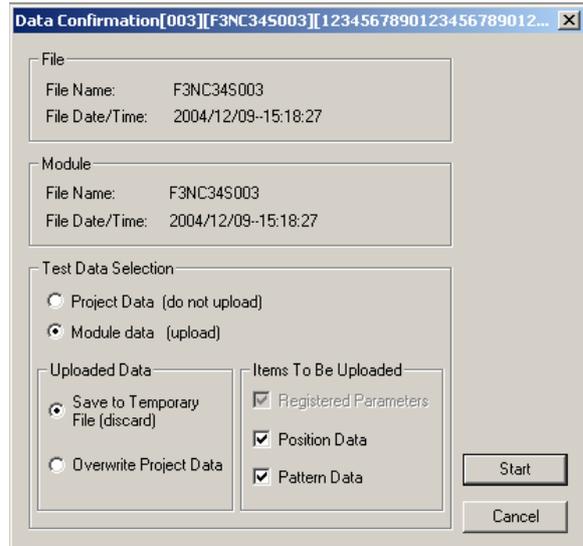
TIP

Test data refers to data to be used in online operations. (Test data is selected when ToolBox is initially connected online to the FA-M3.)

2. **Click [Start].**
⇒ Monitoring begins.

TIP

The data to be monitored is displayed according to the test data selected on the Data Confirmation screen. Test data is selected when ToolBox is initially connected to the FA-M3.



B7 Action Test

This chapter describes how to adjust data downloaded to a positioning module and perform action tests.

- Action Test Flow → B7.1
- Jog → B7.2
- Single Axis Positioning → B7.3
- Linear Interpolation → B7.4
- Circular Interpolation → B7.5
- Helical Interpolation → B7.6
- Index Positioning → B7.7
- Origin Search → B7.8
- Manual Pulse Generator (MPG) → B7.9
- Counter → B7.10
- Pattern → B7.11
- Output/Mode → B7.12
- Teaching → B7.13

B7.1 Action Test Flow

The Action Test function allows you to modify various data of a positioning module online and immediately check its operation.

Only one positioning module can be tested using ToolBox at any one time. Concurrent testing of multiple modules is not allowed.

Data to be used in action tests is known as the test data.

You select the test data before starting the Action Test or Pattern Monitor. You can select either project data or module data as the test data.



CAUTION

Do not disconnect an online connection while an action test is being executed. If an error is encountered in the positioning module, the connected motor may not operate as expected.

Ensure that the test data is appropriate for the module. Otherwise, the positioning module may not operate normally.

Exercise special care when running ladder programs during an action test.



CAUTION

Action tests must be run in position control mode. Running an action test in speed control mode generates an error.

You can use the Output/Mode tab of the Action Test screen to switch the control mode.



CAUTION

The following operations are not allowed during an action test: download, upload, compare, ROM management and change communication speed. You should close all online screens before running an action test.

B7.1.1 Action Test Screen Layout

This section describes the Data Confirmation screen and the Common Action Test screen.

For details on the individual action test screens, refer to the relevant section in this chapter.

■ Data Confirmation

The Data Confirmation screen allows you to select the test data to be used in action tests.

The screenshot shows a dialog box titled "Data Confirmation[002][F3NC32S002][F3NC32-0N]". It contains several sections:

- File:** File Name: F3NC32S002, File Date/Time: 2004/12/13--13:37:30. An arrow points to the File Name field with the annotation: "File name and date/time of PC data for the module to be tested."
- Module:** File Name: F3NC32S003, File Date/Time: 2004/11/02--17:08:18. An arrow points to the File Name field with the annotation: "File name and date/time of data for module to be tested"
- Test Data Selection:**
 - Project Data (do not upload) ← "Action test is to be performed using data on PC. No uploading is performed."
 - Module data (upload) ← "Action test is to be performed using data in module. Data is uploaded before testing."
- Uploaded Data:**
 - Save to Temporary File (discard) ← "Uploaded data is intended for temporary use, to be discarded after action test is completed. If data is modified during testing, however, a dialog will be displayed to confirm whether to save data."
 - Overwrite Project Data ← "Saves uploaded data to the project. This action has the same effect as performing a module upload."
- Items To Be Uploaded:**
 - Registered Parameters ← "Selects item to be uploaded. Registered parameters are always uploaded as they determine the data range."
 - Position Data
 - Pattern Data
- Buttons:**
 - Start → "Opens Action Test screen based on entered data."
 - Cancel → "Aborts action test."

TIP

The number of data uploaded is determined by the number of data used defined in the module. If the specified number of data used does not tally with actual data on the PC, you should upload all data before running an action test.



CAUTION

Do not disconnect an online connection while an action test is running. If an error is encountered in the positioning module, the connected motor may not operate as expected.

Ensure that the test data is appropriate for the module. Otherwise, the positioning module may not operate normally.

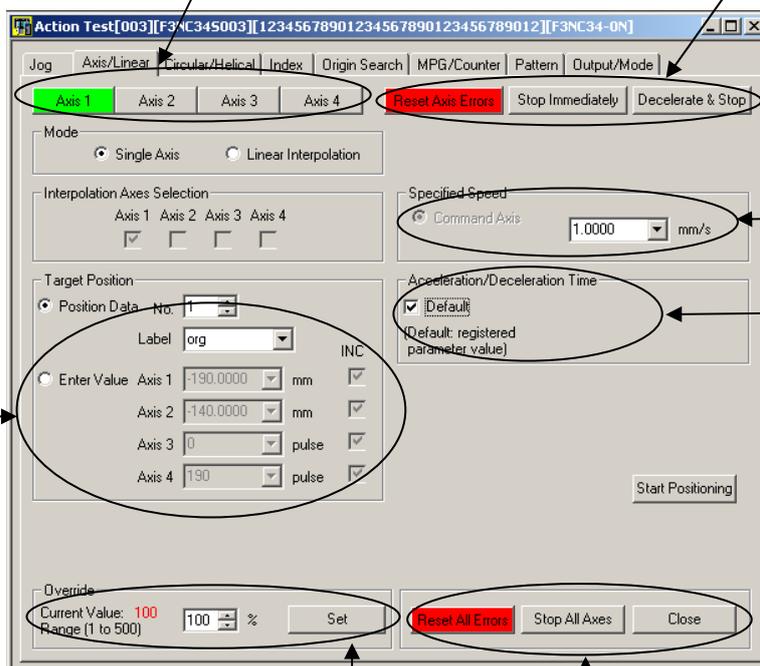
Exercise special care when running ladder programs during an action test.

Common Action Test Screen

The Common Action Test screen contains screen elements that are common to various action test types. The screen elements may be either shown or hidden on individual action test screens.

Test/Movement Axis Selection:
 Select the test axis.
 Changing the test/movement axis resets setup data.

Axis Button Group:
 Reset Axis Errors : Resets errors of test/movement axis. The button changes to red color if an axis error is detected.
 Stop Immediately : Stops test/movement axis immediately.
 Decelerate & Stop : Decelerates and stops test/movement axis.



Specifies target position. You can either use pre-defined position data or enter numeric data directly.

Specifies override value.

Specifies speed.

Specifies rate of acceleration or deceleration. Default values refer to registered parameter values.

All Axes Button Group:
 Reset All Errors : Resets errors of all axes. The button changes to red color if any axis error is detected.
 Stop All Axes : Stops all axes immediately.
 Close : Closes Action Test screen.

B7.1.2 Starting Action Test

1. With FA-M3 connected online, select **[Debug/Maintenance]-[Action Test]** from the menu bar.

⇒ The Module Selection screen is displayed.

SEE ALSO

For details on how to connect online to FA-M3, see:

Section B4.1, "Connecting to FA-M3".

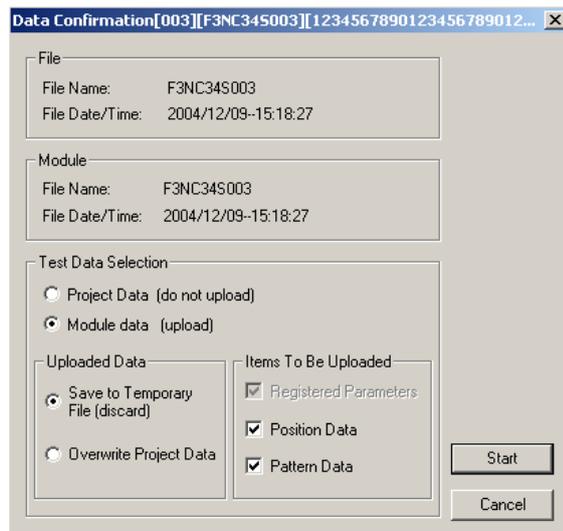
2. Select the positioning module to be tested, and select **[Action Test]**.

⇒ The Data Confirmation screen for action test is displayed.



CAUTION

The Data Confirmation screen allows you to select whether to use data in the positioning module or data in the PC in action tests. If the test data and actual equipment is inconsistent, it may lead to equipment damage or accidents.



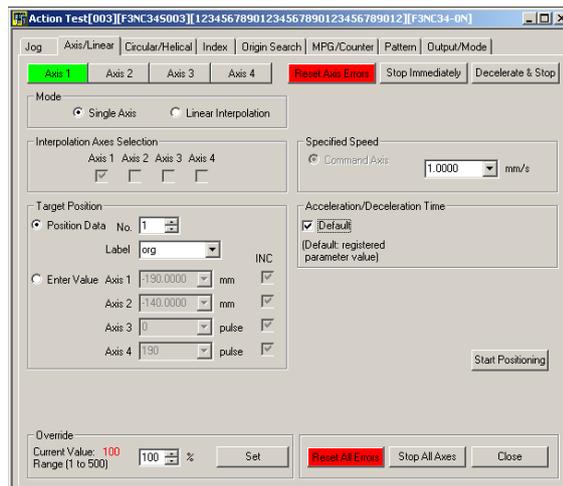
Screen (1)

3. Select **[Start]** on screen (1).

⇒ The Action Test screen is displayed.

TIP

You can also initiate an action test from the Debugger Window with FA-M3 connected online by double-clicking the positioning module to be tested.



Screen (2)

B7.2 Jog

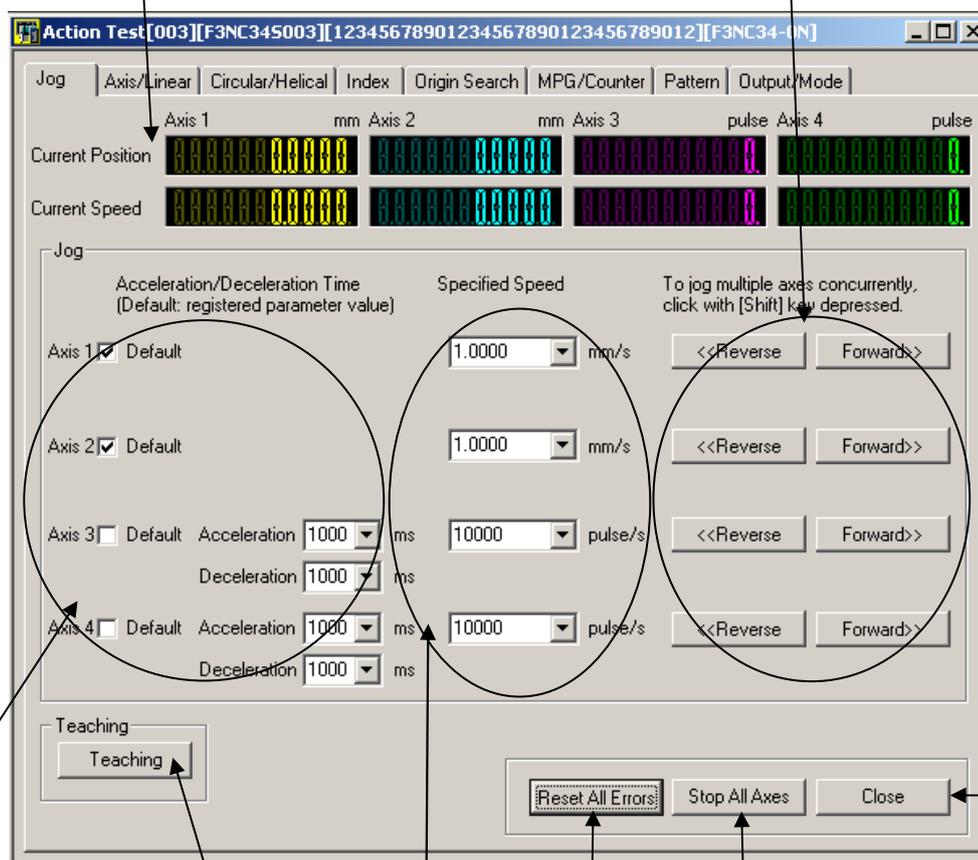
Selecting the [Jog] tab on the Action Test screen displays the Jog screen. Jogging allows you to check wiring, confirm connection and perform teaching. ToolBox allows you concurrent jogging of multiple axes.

B7.2.1 Jog Screen Layout

Select different tabs to switch between action test screens.

Constantly refreshes and displays the current position and speed. Values are displayed according to the Display Unit registered parameter value of the positioning module.

Performs forward or reverse jogging. Performs jogging when the mouse button is clicked or while the space key is depressed. Releasing the space key stops jogging. To jog multiple axes concurrently, click the mouse button with the [Shift] key depressed.



Specify the acceleration and deceleration time. Default values refer to registered parameter values.

Opens the Teaching screen..

Specify the speed. You can select the speed from a list containing up to five historical speeds stored for each axis.

Stops all axes immediately.

This button changes to red color if any axis error is detected. Clicking the button resets all axis errors.

Exits from action test and closes the screen.

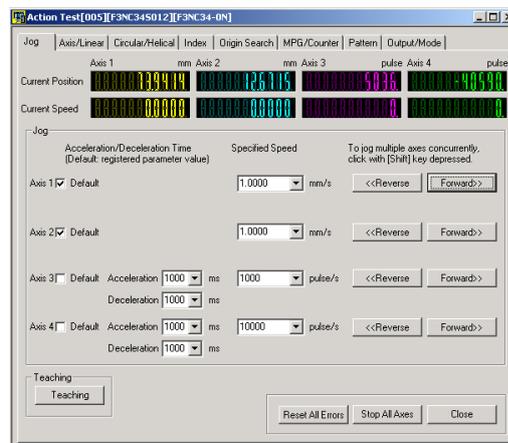
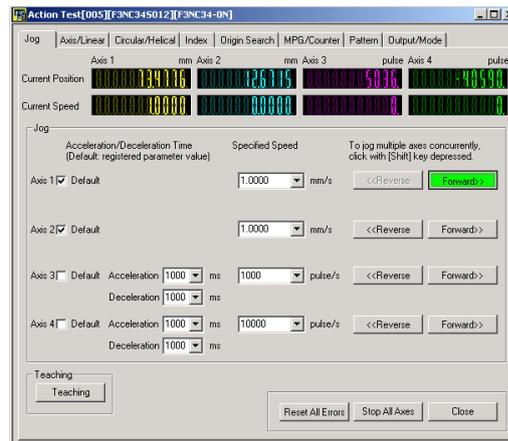
B7.2.2 Single-axis Jog

1. Sets up data for the axis to be tested on the Jog Screen.

2. Select the axis to be tested by clicking the mouse button or pressing the space key.

⇒ The display of the axis being executed changes color.

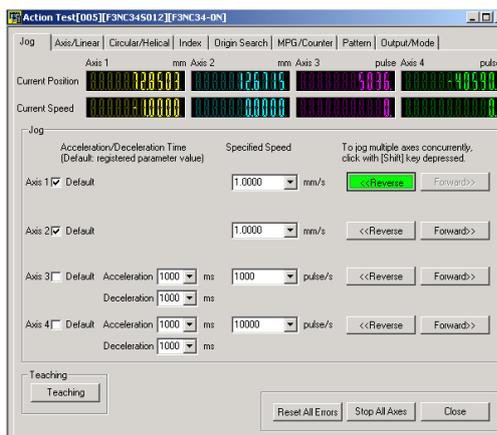
3. Releasing the mouse button or the space key stops the axis.



B7.2.3 Multi-axis Jog

You can jog multiple axes concurrently using the positioning module.

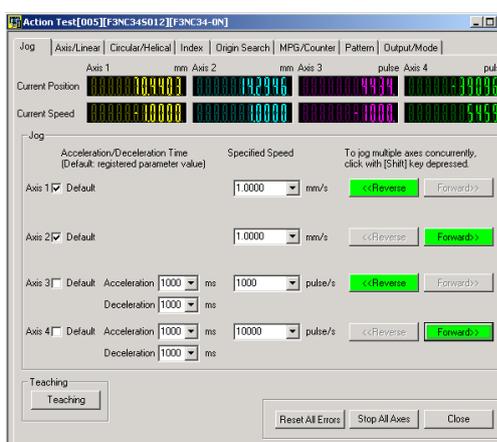
1. Set up data for the axes to be tested on the Jog Screen.
2. Select one axis to be tested by clicking the mouse or pressing the space key on the corresponding button with the [shift] key depressed.



3. With the [shift] key depressed, select other axes to be tested concurrently.
⇒ The display of the axes being executed change color.

TIP

Performing forward jog and reverse jog simultaneously for the same axis is not allowed.

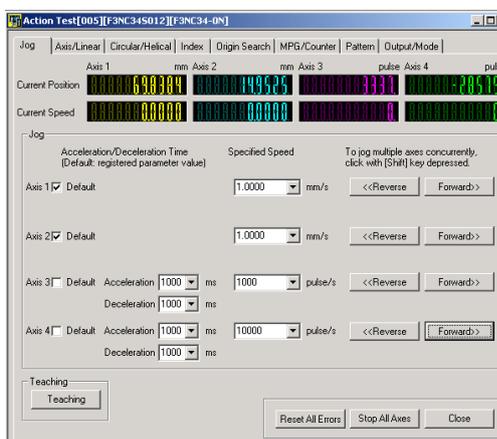


4. Releasing the [shift] key stops all axes.

TIP

To stop one specific axis while testing multiple axes, select the axis again. Clicking a button toggles between starting and stopping execution as follows:

Execute⇒Stop⇒Execute⇒Stop.....
Releasing the [shift] key stops all axes.



B7.3 Single-axis Positioning

Selecting the [Axis/Linear] tab on the Action Test screen displays the action test screen for single-axis positioning.

B7.3.1 Single-axis Screen Layout

Select the test axis. The button for the selected axis changes color.

Select Single-axis test mode. The screen layout changes with the selected mode. Items that do not require setup are either disabled or hidden from the display.

Specify the speed.

Specify the acceleration time and deceleration time.

Performs positioning.

Sets up the override value.

Enter position data number or label if the [Position Data] option is selected.

Enter target position data directly if the [Enter Value] option is selected.

Select this option to enter target position data directly.

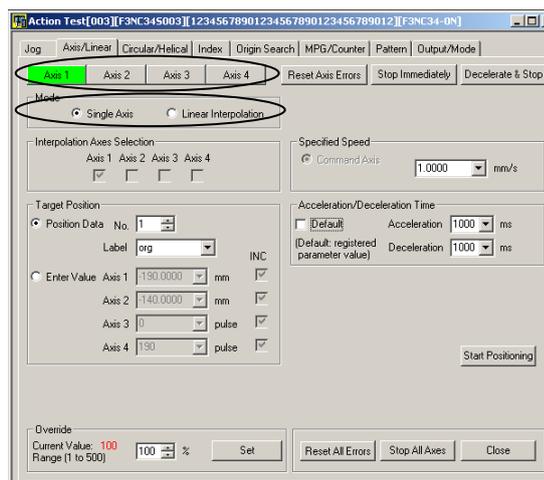
SEE ALSO

For details on how to perform setup, see Section 6.9.1, "Single-axis Positioning" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

B7.3.2 Testing Single-axis Movement

1. Select the axis to be tested as shown in Single-axis Action Test Screen (1). Select [Single Axis] for [Mode].

⇒ The selection button of the selected test axis changes color.

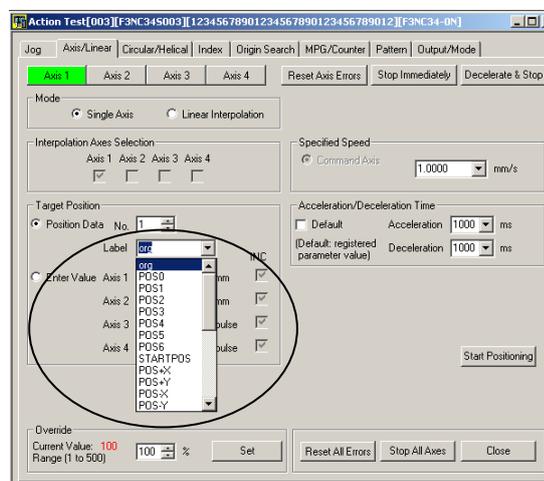


Screen (1)

2. Specify the target position for the test axis. Two options are available for specifying the target position: [Position Data] and [Enter Value].

TIP

- If [Position Data] is selected, data values cannot be changed.
- If [Enter Value] is selected, only the input area for the test axis is displayed in the Target Position List column.
- If the [INC] checkbox is selected, the entered position data value should be incremental from the current position.



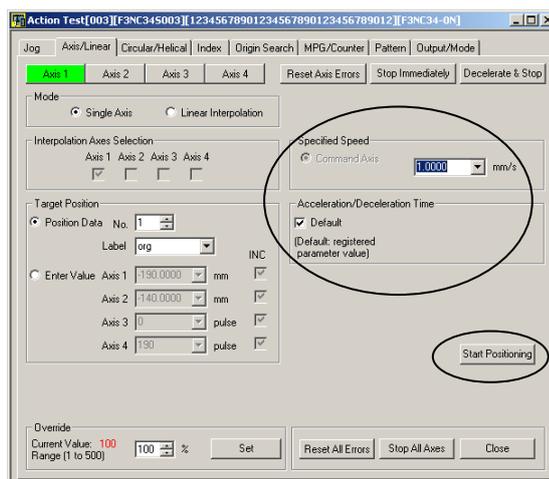
Screen (2)

3. Set up the specified speed, acceleration time and deceleration time, and click [Start Positioning].

⇒ The test axis is moved to the target position.

TIP

- To use acceleration time and deceleration time values defined by registered parameters, turn on the [Default] checkbox.
- If an error is detected after you click [Start Positioning], the error buttons at the bottom of the screen changes to red color. If this happens, check the setup data using the Action Monitor, rectify the problem and re-execute the action test.



Screen (3)

B7.4 Linear Interpolation

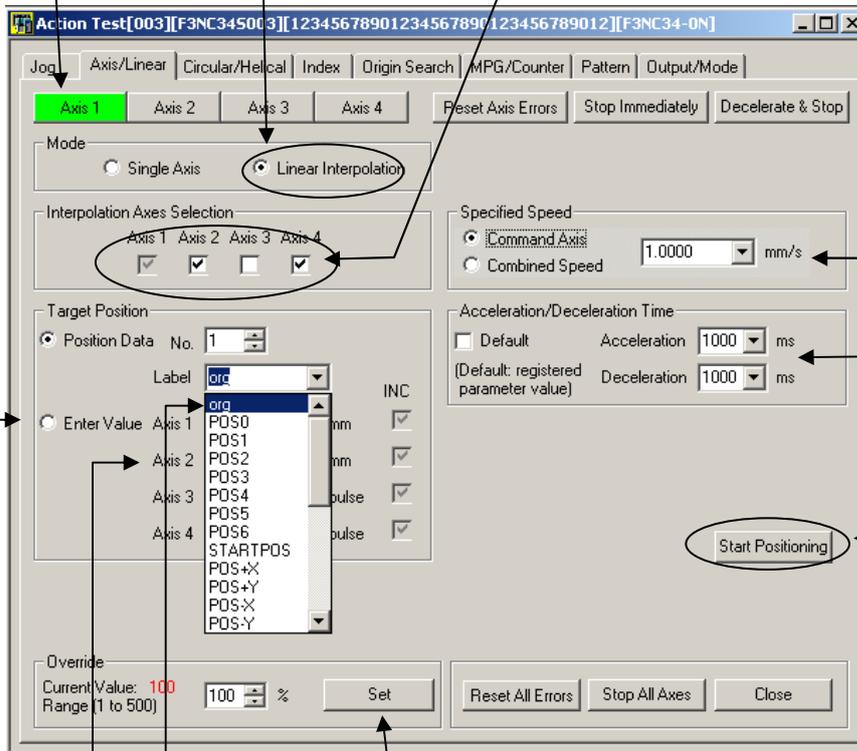
Selecting the [Axis/Linear] tab on the Action Test screen displays the action test screen for linear interpolated positioning.

B7.4.1 Linear Interpolation Screen Layout

Select the test axis. The button for the selected axis changes color.

Select the test mode.
Two test modes are available: [Single Axis] and [Linear Interpolation].
The screen layout changes with the selected mode.

Select the other axes, in addition to the test axis, for linear interpolation.



Specify the speed.

Specify the acceleration time and deceleration time.

Performs positioning.

Sets up the override value.

Enter position data number or label if the [Position Data] option is selected.

Enter target position data directly if the [Enter Value] option is selected.

Select this option to enter target position data directly.

SEE ALSO

For details on how to perform setup, see Section 6.9.2, "Linear Interpolation" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

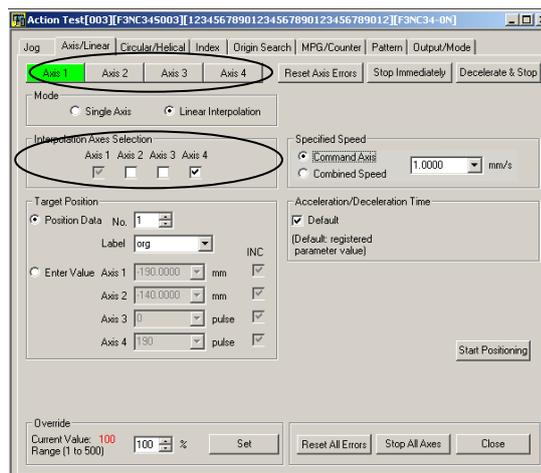
B7.4.2 Testing Linear-interpolated Movement

1. Select the test axis and select [Linear Interpolation] for the [Mode] as shown in Linear Interpolation Action Test Screen (1).

⇒ The test axis is disabled in the Interpolation Axes Selection area.

TIP

Changing the test axis resets all setup data.



Screen (1)

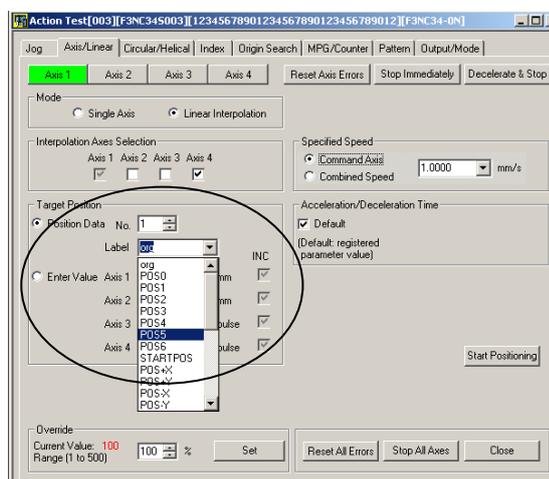
2. Specify the target position.

⇒ Screen (2) is displayed.

TIP

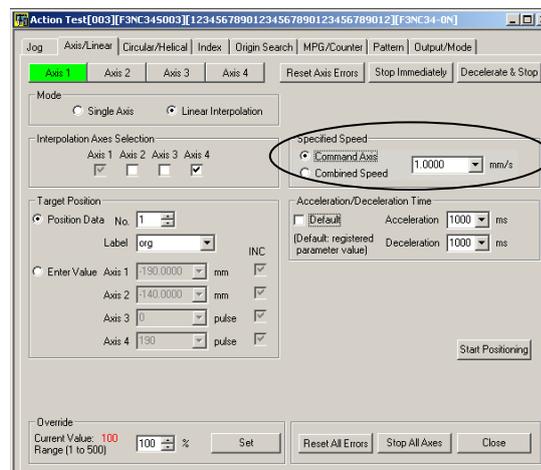
- You can select the [Position Data] option to use pre-defined position data for the target position. Entering a value in [No.] or [Label] in the Target Position group displays the selected position data in the corresponding target position rows.

- If [Position Data] is selected, target position data cannot be changed. To change target position data, select the [Enter Value] option instead.



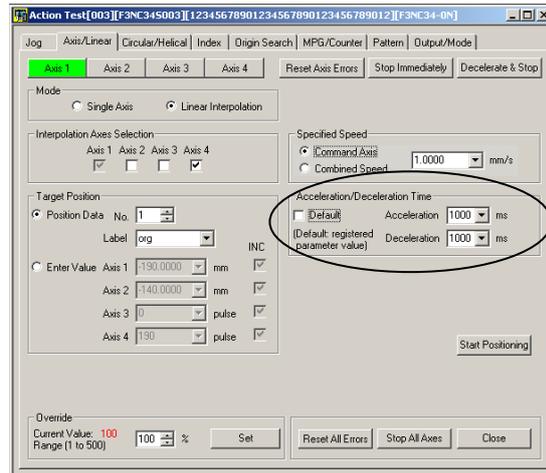
Screen (2)

3. Specify the speed. There are two options for specifying speed: [Command Axis] and [Combined Speed].



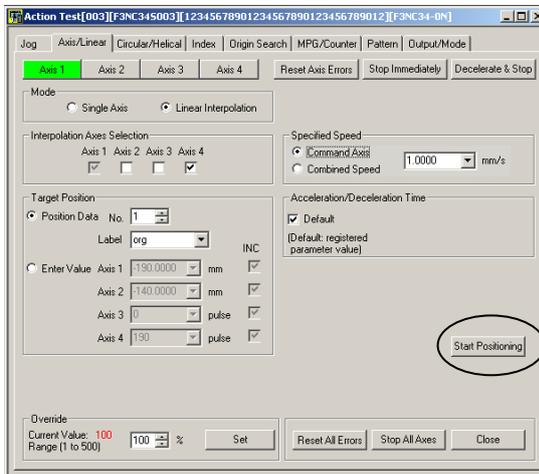
Screen (3)

- Specify the acceleration time and deceleration time. Default values refer to values defined by the registered parameters.



Screen (4)

- Click [Start Positioning] to start execution.



Screen (5)

B7.5 Circular Interpolation

Selecting the [Circular/Helical] tab on the Action Test screen displays the action test screen for circular interpolation.

B7.5.1 Circular Interpolation Screen Layout

Select the test mode.

Three circular interpolation modes are available.

CI Using Sub Point ⇒ Passes through a sub point.

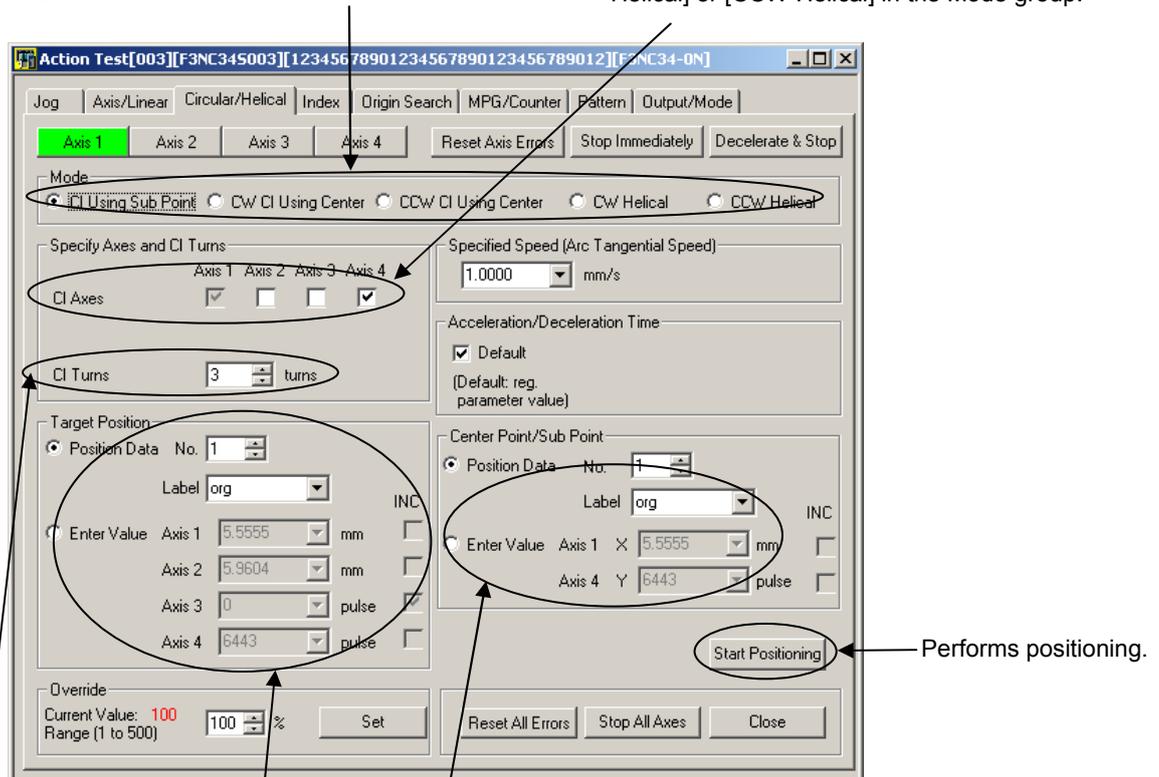
CW CI Using Center ⇒ Moves CW around a center.

CCW CI Using Center ⇒ Moves CCW around a center.

Select the circular interpolation axes.

The action test axis (disabled in display) and the selected axis form the circular interpolation axes.

Circular interpolation is performed with only 2 axes. To move 3 or more axes, select [CW Helical] or [CCW Helical] in the Mode group.



Specify the number of circular interpolation turns.

Specify the target position.

Specify the center point or sub point.

The X and Y axes refer to the circular interpolation axes with X axis denoting the axis having the smaller axis number, and Y axis denoting the axis having the larger axis number.

Start Positioning button performs positioning.

SEE ALSO

For details on how to perform setup, see Section 6.9.3, "Circular Interpolation" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

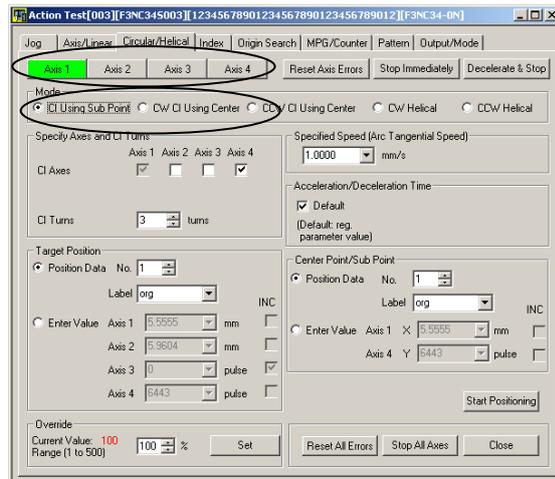
B7.5.2 Testing Circular Interpolation

1. Select the test axis and select the required circular interpolation mode as shown in Circular Interpolation Action Test Screen (1).

⇒ The test axis is selected and disabled in [CI Axes].

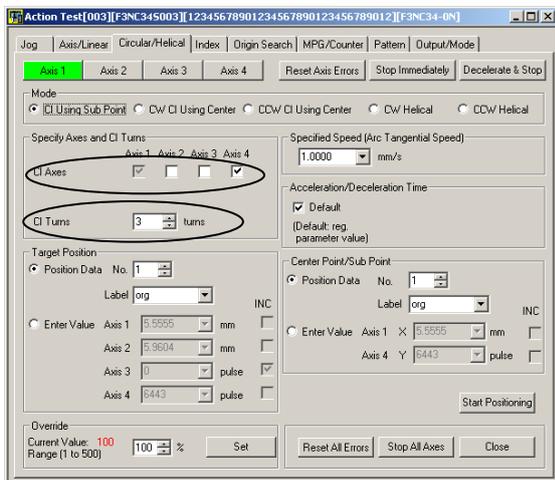
TIP

Changing the test axis resets all setup data.



Screen (1)

2. Specify the circular interpolation axes (CI Axes) and the circular interpolation turns (CI Turns).



Screen (2)

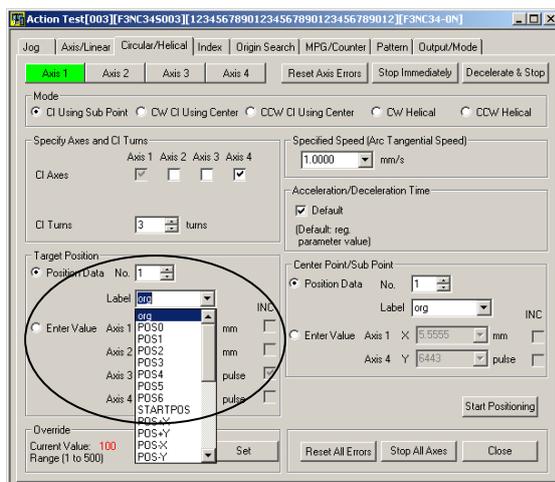
3. Specify the target position.

⇒ Screen (3) is displayed.

TIP

- You can select the [Position Data] option to use pre-defined position data for the target position. Entering a value in [No.] or [Label] in the Target Position screen area displays the selected position data in the Target Position area.

- If [Position Data] is selected, target position data cannot be changed. To change target position data, select the [Enter Value] option instead.



Screen (3)

4. Specify the speed, acceleration time and deceleration time. You can select the speed from a list containing up to five historical speeds stored. To make use of acceleration and deceleration time defined by the registered parameters, turn on the [Default] checkbox.

5. Specify the center point or the sub point. You can make use of pre-defined position data, just as for the target position. The X axis denotes the circular interpolation axis having the smaller number and the Y axis denotes the circular interpolation axis having the larger number.

TIP

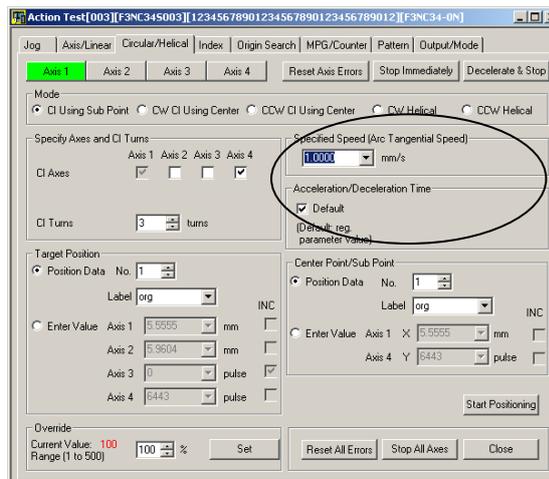
For instance, when performing circular interpolation using axis 1 and axis 4, X axis denotes axis 1 and Y axis denotes axis 4.



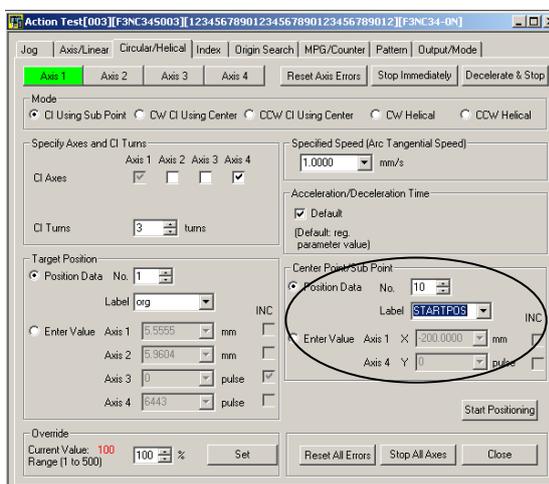
CAUTION

Changing the test axis resets all setup data.

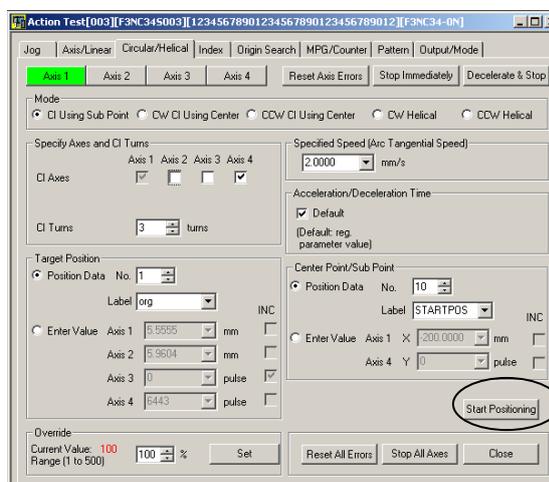
6. Click [Start Positioning] to start execution.



Screen (4)



Screen (5)



Screen (6)

B7.6 Helical Interpolation

Selecting the [Circular/Helical] tab on the Action Test screen displays the action test screen for helical interpolation.

B7.6.1 Helical Screen Layout

Two helical interpolation modes are available: clockwise (CW) or counter-clockwise (CCW).

Specify the circular interpolation axes.

Specify the helical line axis. You cannot select the test axis or circular interpolation axis as the helical line axis.

Specify the number of circular interpolation turns.

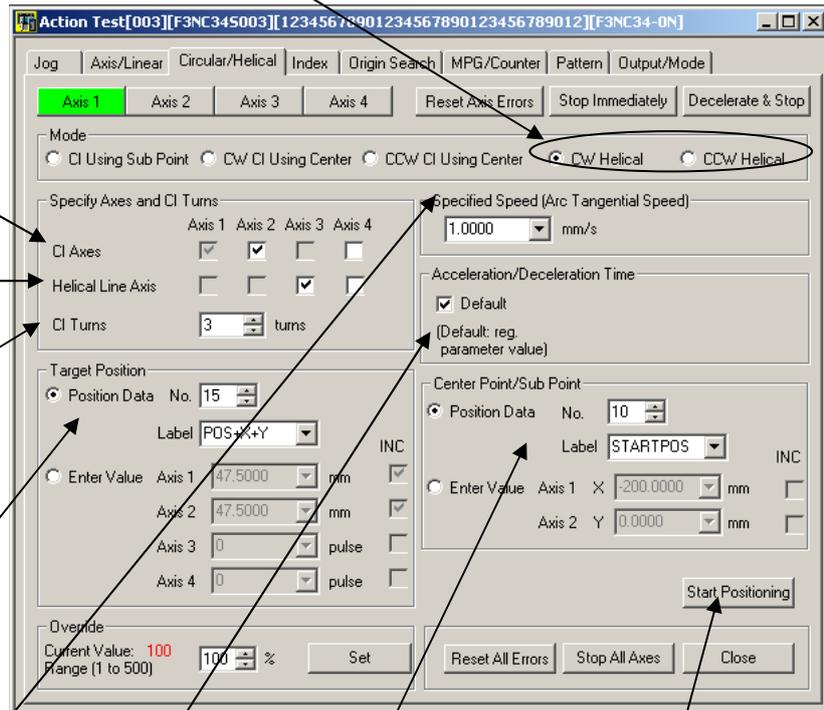
Specify the target position

Specify the speed.

Specify the acceleration time and deceleration time. Default values are registered parameter values.

Specify a sub point.

Performs helical interpolation.



SEE ALSO

For details on how to perform setup, see Section 6.9.4, "Helical Interpolation" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

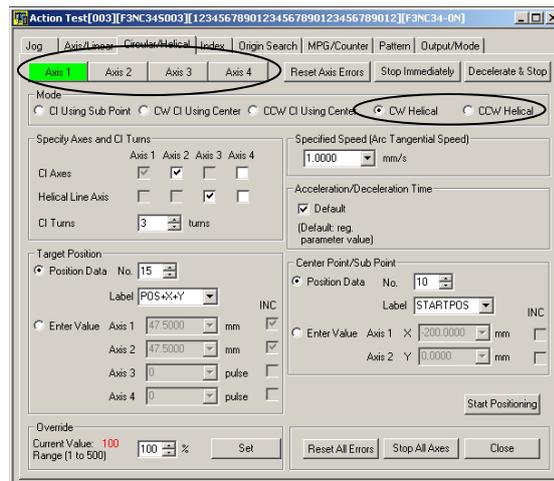
B7.6.2 Testing Helical Interpolation

1. Select the test axis and select the required helical interpolation mode as shown in Helical Interpolation Action Test Screen (1).

⇒ The test axis is selected and disabled in [CI Axes].

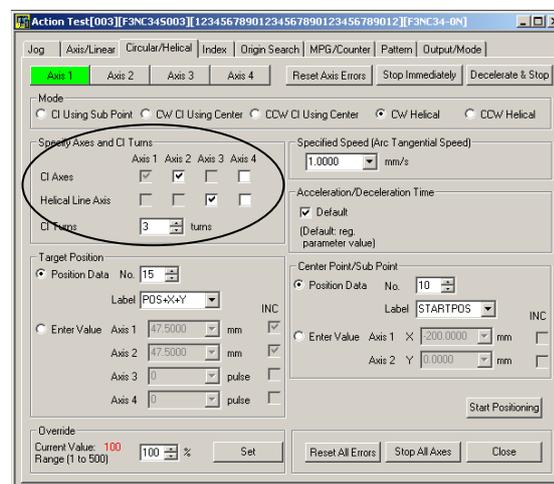
TIP

Changing the test axis resets all setup data.



Screen (1)

2. Specify the circular interpolation axes, helical line axis and the circular interpolation turns. Axes that are disabled in the display are either movement axes or not selectable.



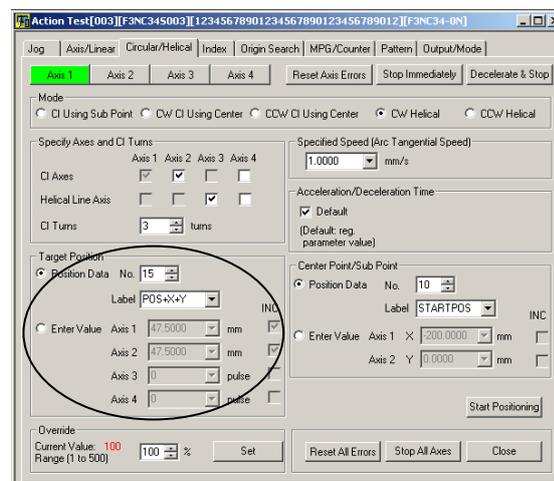
Screen (2)

3. Specify the target position.

TIP

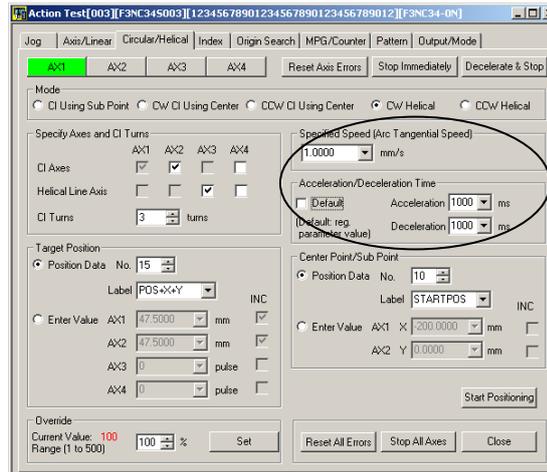
- You can select the [Position Data] option to use pre-defined position data for the target position. Entering a value in [No.] or [Label] in the Target Position screen area displays the selected position data in the Target Position area.

- If [Position Data] is selected, target position data cannot be changed. To change target position data, select the [Enter Value] option instead.



Screen (3)

- Specify the speed, acceleration time and deceleration time. You can select the speed from a list containing up to five historical speeds stored. To make use of acceleration and deceleration time defined by the registered parameters, turn on the [Default] checkbox.



Screen (4)

- Specify the center point or the sub point. You can make use of pre-defined position data, just as for the target position. The X axis denotes the circular interpolation axis having the smaller axis number and the Y axis denotes the circular interpolation axis having the larger axis number.

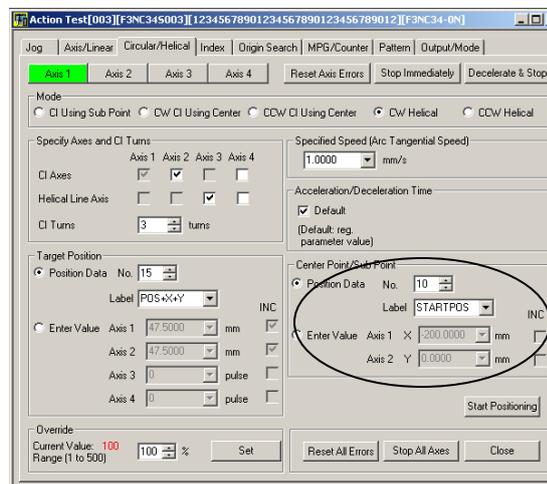
TIP

For instance, when performing circular interpolation using axis 1 and axis 4, X axis denotes axis1 and Y axis denotes axis 4.



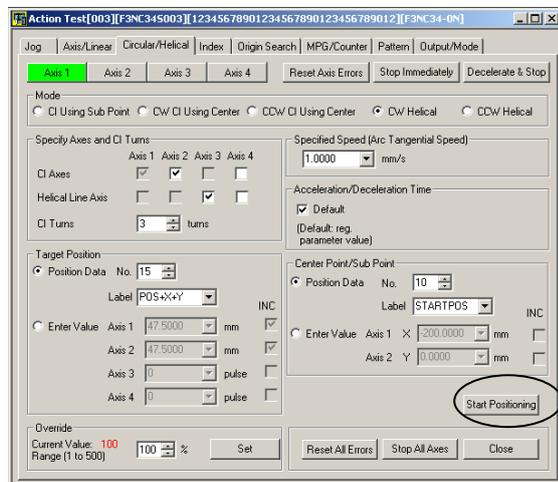
CAUTION

Changing the test axis resets all setup data.



Screen (5)

- Click [Start Positioning] to start execution.



Screen (6)

B7.7 Index Positioning

Selecting the [Index] tab on the Action Test screen displays the Index action test screen. Two control modes are available: index positioning and index speed control.

B7.7.1 Index Screen Layout

Select the test axis.

Axes not set up for index control are disabled and cannot be selected.

Select the mode.

Performs index control positioning using the setup data.

Specify the speed.

Specify the acceleration time and deceleration time.

Specify the target position. You can either make use of pre-defined position data or enter data directly.

SEE ALSO

For details on how to perform setup, see Section 6.11, "Index Control" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

B7.7.2 Testing Index Control Movement

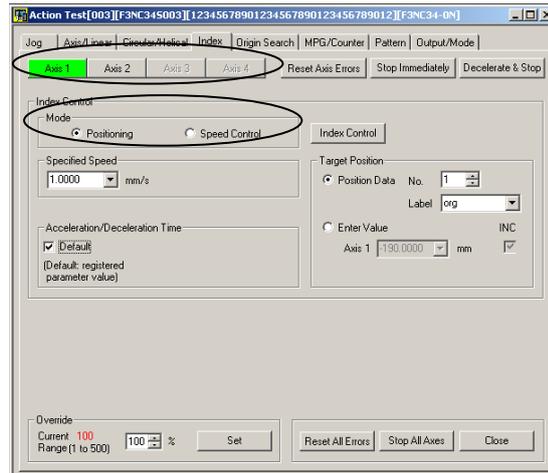
1. Select the test axis and select the required mode as shown in Index Action Test Screen (1).

⇒ The selection button of the selected test axis changes color.

⇒ Screen elements may be either shown or hidden depending on the selected mode.

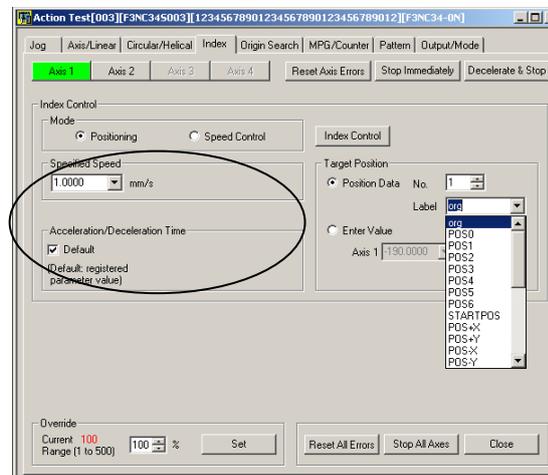
TIP

Non-displayed items do not require setup.



Screen (1)

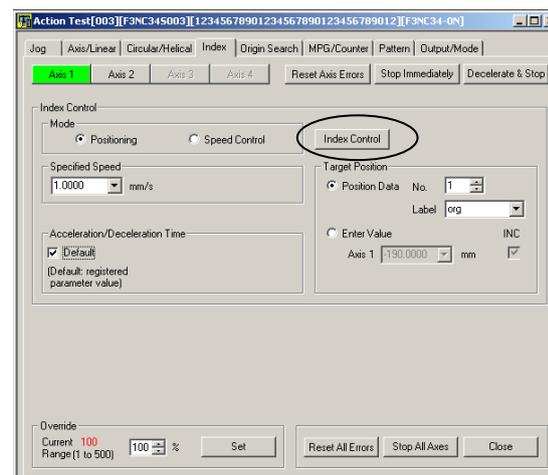
2. Specify the speed, acceleration time, deceleration time and target position.



Screen (2)

3. Select [Index Control].

⇒ Execution begins.



Screen (3)

B7.8 Origin Search

Selecting the [Origin Search] tab on the Action Test screen displays the Origin Search Action Test screen.

Two search modes are available: automatic and manual.

B7.8.1 Origin Search Screen Layout

Select the required origin search mode.

Two options are available:

Automatic: Positioning module performs origin search automatically.

Manual: User sets up parameters and then performs origin search.

Select the axis for origin search.

Sets up parameters for manual origin search. These screen elements are not displayed if Automatic mode is selected.

Specify the current position value.

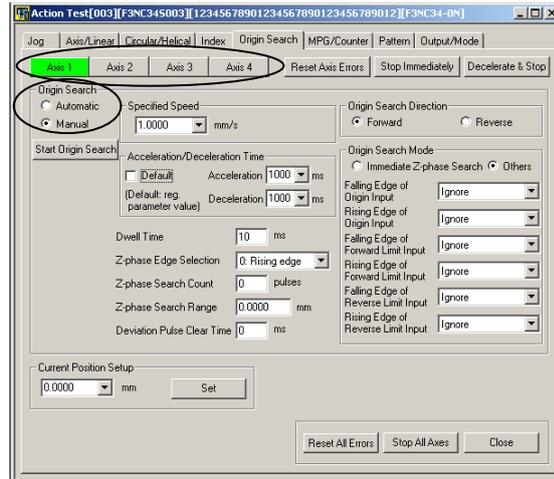


CAUTION

For details on the parameters used in manual origin search mode, see Section 6.7.2, "Manual Origin Search" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

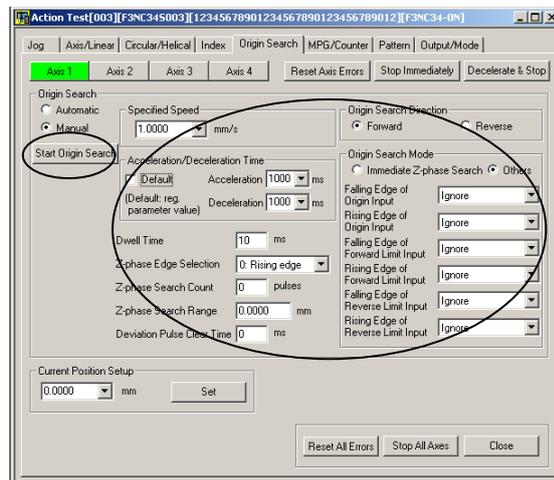
B7.8.2 Performing Origin Search

1. Select the axis for origin search and select the required mode as shown in Origin Search Screen (1).
If you select manual mode, you will need to set up the parameters for origin search.



Screen (1)

2. Set up the parameters, and click [Start Origin Search].
⇒ Origin search begins.



Screen (2)

B7.9 Manual Pulse Generator (MPG)

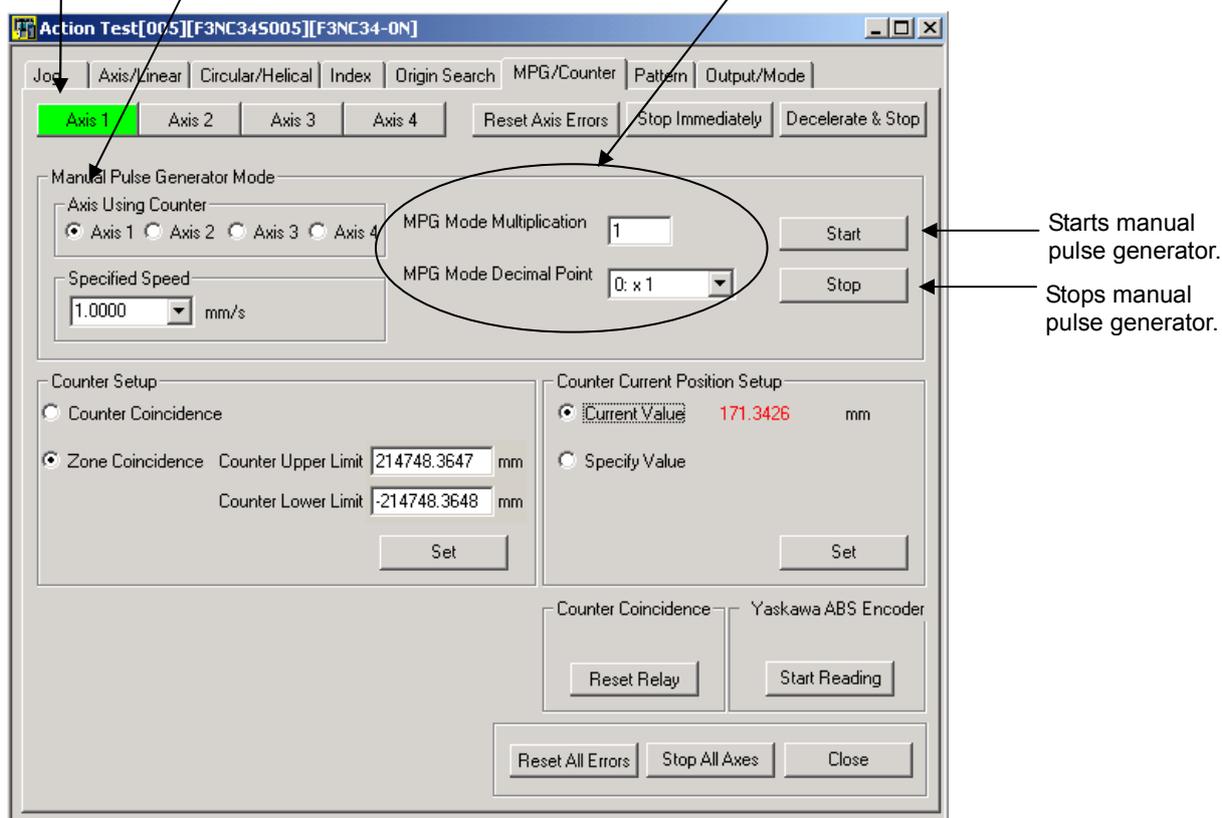
Selecting the [MPG/Counter] tab on the Action Test screen displays the MPG Action Test screen.

B7.9.1 MPG Screen Layout

Select the axis for manual pulse generator.

Select the axis using the counter in Manual Pulse Generator mode

Specify the MPG multiplication and decimal point position.



● Multiplication and Decimal Point

Calculate and set up the multiplication and decimal point for manual pulse generator mode as follows:

Example: If Multiplication is set to 1234
and Decimal Point is set to 2:1/100,
the value is $1234 \times 1/100 = 12.34$

SEE ALSO

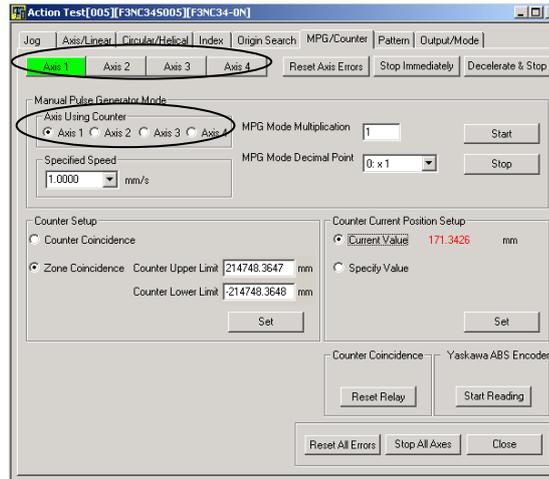
For details on how to set up individual parameters, see Section 6.6.2, "Starting Manual Pulse Generator Mode" and Section 6.6.3, "Stop Manual Pulse Generator Mode" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

B7.9.2 Testing Manual Pulse Generator

1. Select the axis to be tested and the axis using the counter as shown in MPG Screen (1).

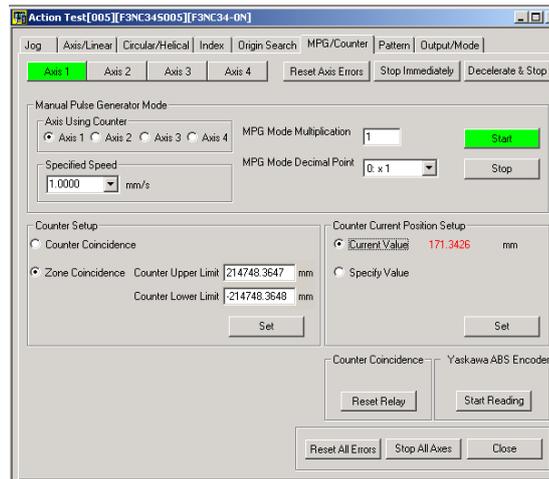
TIP

The Axis Using Counter refers to the counter axis used in the manual pulse generator.



Screen (1)

2. Specify the speed and other parameters for manual pulse generator mode and click [Start].
⇒ Manual pulse generator is executed.



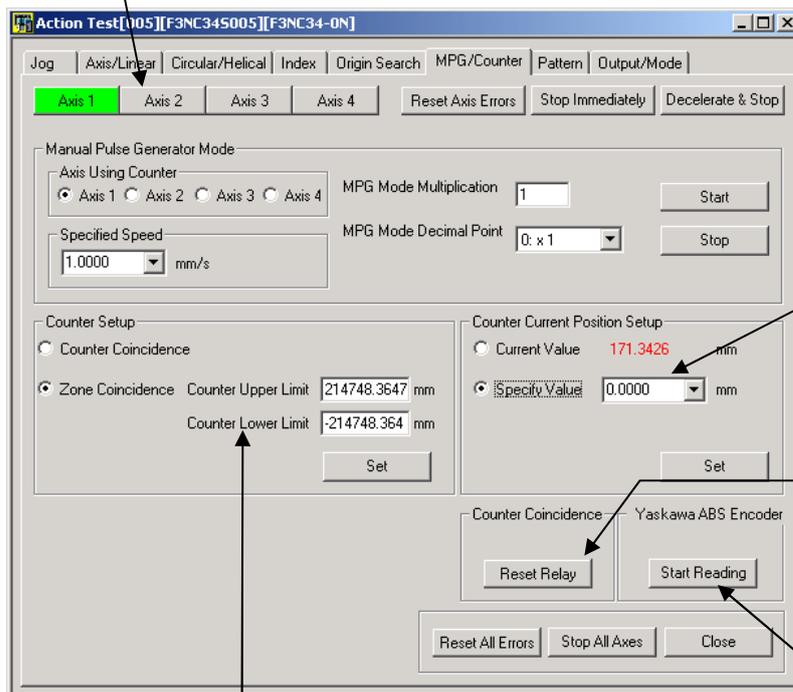
Screen (2)

B7.10 Counter

Selecting the [MPG/Counter] tab on the Action Test screen displays the Counter Action Test screen.

B7.10.1 Counter Screen Layout and Testing Procedure

Select the axis for counter testing.



Set up the current position of the counter. You can select either to use the current position of the module or to enter a value.

Resets the Counter Coincidence relay.

Starts reading absolute encoder manufactured by Yaskawa Electric Corporation.

Set up the counter.

- Counter Coincidence: specify the counter coincidence value.
- Zone Coincidence: specify the upper limit and lower limit.

SEE ALSO

For details on how to set up each parameter, see Section 6.17, "Counter Functions" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

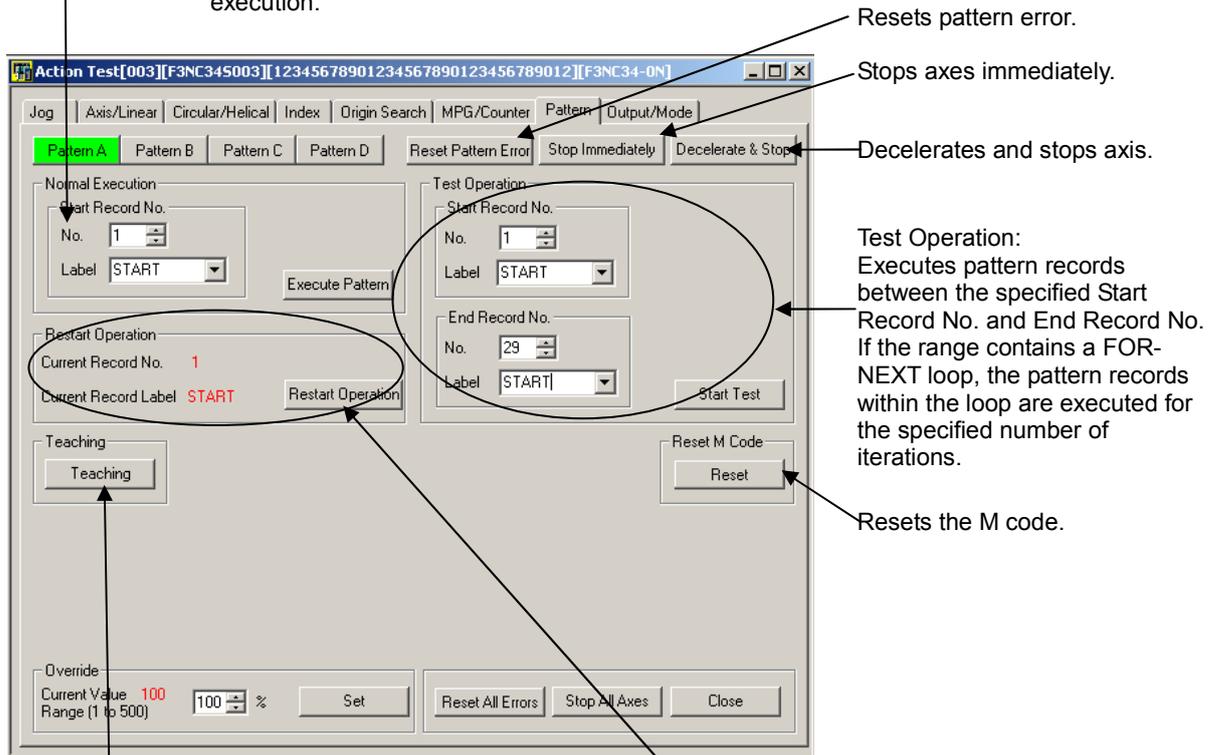
B7.11 Pattern

Selecting the [Pattern] tab on the Action Test screen displays the Pattern Action Test screen.

B7.11.1 Pattern Screen Layout and Testing Procedure

Select the pattern to be tested.

Normal Execution:
 Performs normal pattern execution run.
 Enter a starting pattern number or label and then click [Execute Pattern] to start execution.



Resets pattern error.

Stops axes immediately.

Decelerates and stops axis.

Test Operation:
 Executes pattern records between the specified Start Record No. and End Record No. If the range contains a FOR-NEXT loop, the pattern records within the loop are executed for the specified number of iterations.

Resets the M code.

Opens the Teaching Screen.

Restart Operation:
 This area displays either the number and label of the pattern record currently being executed or the pattern record where execution has stopped. Click [Restart Operation] to execute the displayed pattern.

SEE ALSO

For details on how to set up each parameter, see Chapter 7, "Pattern Operation Programming" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).

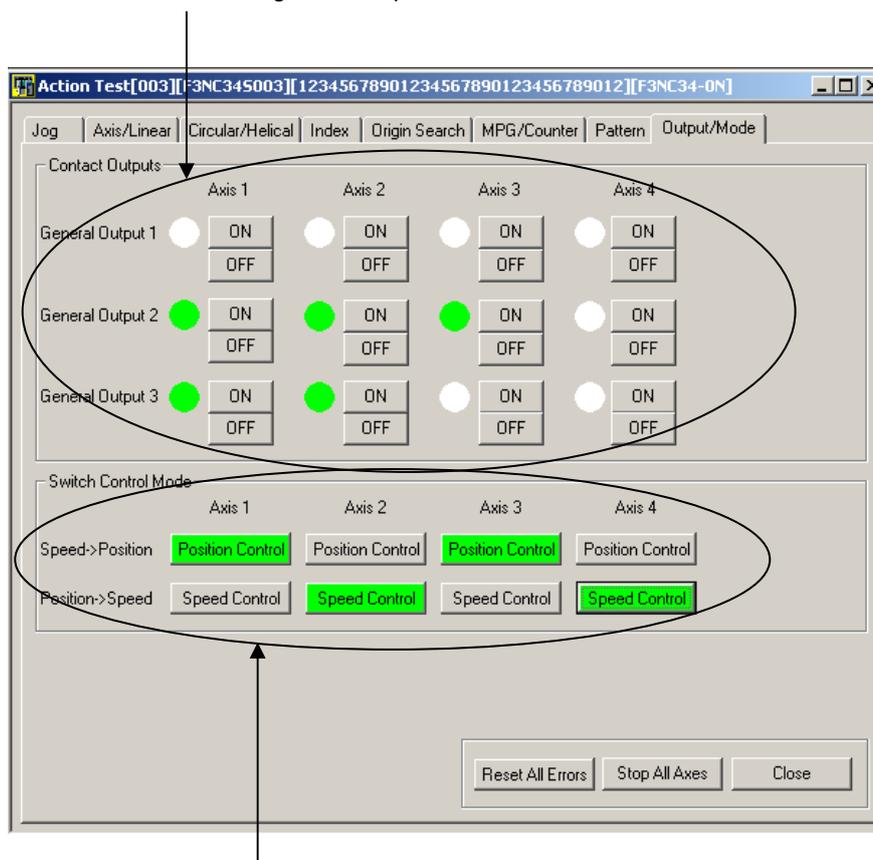
B7.12 Output/Mode

Selecting the [Output/Mode] tab on the Action Test screen displays the action test screen for turning contact outputs on or off and for switching the control mode.

Action tests cannot be executed in speed control mode. If the module has been switched to Speed Control mode during pattern execution or pattern test execution, switch the control mode to Position control before performing action tests.

B7.12.1 Output/Mode Screen Layout and Testing Procedure

Displays the ON(●)/OFF(○) statuses of general outputs of each axis. Also allows a user to turn on or turn off general outputs.



Switches control mode. For each axis, the current mode is indicated by a green button. Press a button to switch an axis between position control and speed control mode.

SEE ALSO

For details on how to set up each parameter, see Section 6.10, "Speed Control" and Section 6.18, "Contact Outputs On/Off" of "Positioning Module (with Pulse Output)" (IM34M06H56-02E).



CAUTION

You can switch from speed control mode to position control mode only in positioning completed state. At this time, the current position is reset to zero.

B7.13 Teaching

Teaching is used to change position data values of a positioning module. You can jog axes, and then write the current position.

B7.13.1 Teaching Screen Layout

Performing ROM transfer saves all module data to ROM.

Select data for teaching.

Select position data for teaching by specifying a position data number or label.

Select axis for writing.

Displays current position and counter current position.

Specify whether to reflect teaching data to project and module ROM after writing to the module. We recommend doing so to ensure data integrity.

Performs teaching according to setup.

Closes screen

Teach target position values by enabling the Specified Value area and entering position data.

The screenshot shows a dialog box titled "Teaching[005][F3NC345012][F3NC34-0N]". It contains the following elements:

- A message at the top: "Performing ROM transfer saves all module data to ROM."
- Fields for "Position Data to be Written": "Pos. Data No." (set to 1) and "Pos. Data Label" (set to circ).
- A "Mode" section with radio buttons: "Current Position" (selected), "Specify Value", and "Counter Curr. Pos.".
- A "Target Position" table with columns: Axis, Write, Current Pos., Unit, Specify Value, and INC.
- A "Save Data" section with checkboxes for "Save File" and "ROM Transfer".
- "Teach" and "Close" buttons at the bottom.

Axis	Write	Current Pos.	Unit	Specify Value	INC
1	<input checked="" type="checkbox"/>	72.0664	mm	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	12.6715	mm	<input type="checkbox"/>	<input type="checkbox"/>
3	<input checked="" type="checkbox"/>	5036	pulse	<input type="checkbox"/>	<input type="checkbox"/>
4	<input checked="" type="checkbox"/>	-40590	pulse	<input type="checkbox"/>	<input type="checkbox"/>



CAUTION

Teaching using ToolBox is allowed only if no axis is positioning and no pattern is being executed.

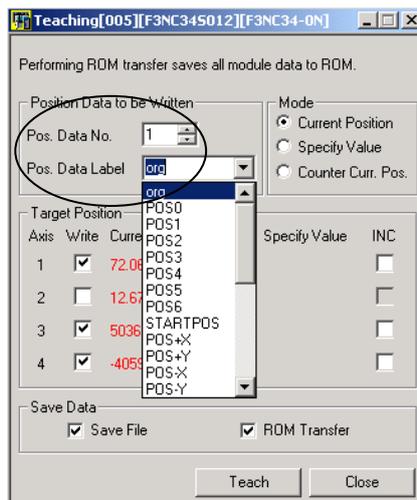
B7.13.2 Teaching

1. Open the Teaching screen (screen (1)) from the Jog or Pattern screen, and select a position data number for writing.

⇒ The position data label is displayed.

TIP

Alternatively, selecting a position data label displays the corresponding position data number.

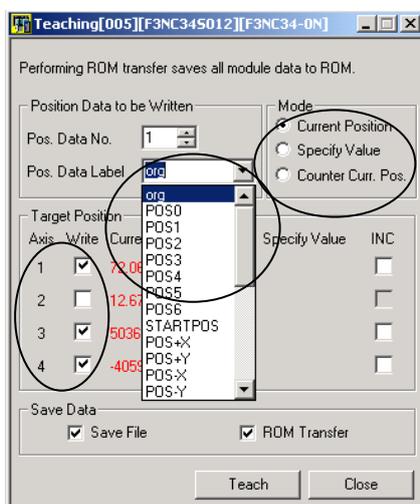


Screen (1)

2. Set up the target position by selecting axes for writing and entering required values.

TIP

The Specify Value data input area may be hidden or shown, depending on the selected mode.



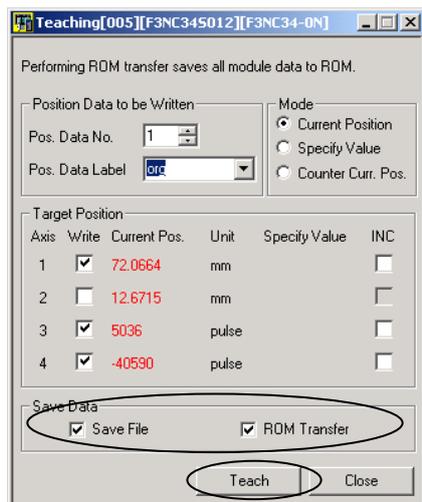
Screen (2)

3. Select the options for data saving, and click [Teach].

⇒ Position data is updated.

TIP

- If test data is to be saved, a dialog is displayed at the end of the test to confirm whether to save data.
- Reflecting data to a project modifies the data on the PC.



Screen (3)

B8 Uploading from Modules

This chapter describes how to upload registered parameters from FA-M3 to a PC.

- Uploading → B8.1
- Uploading Restrictions → B8.2

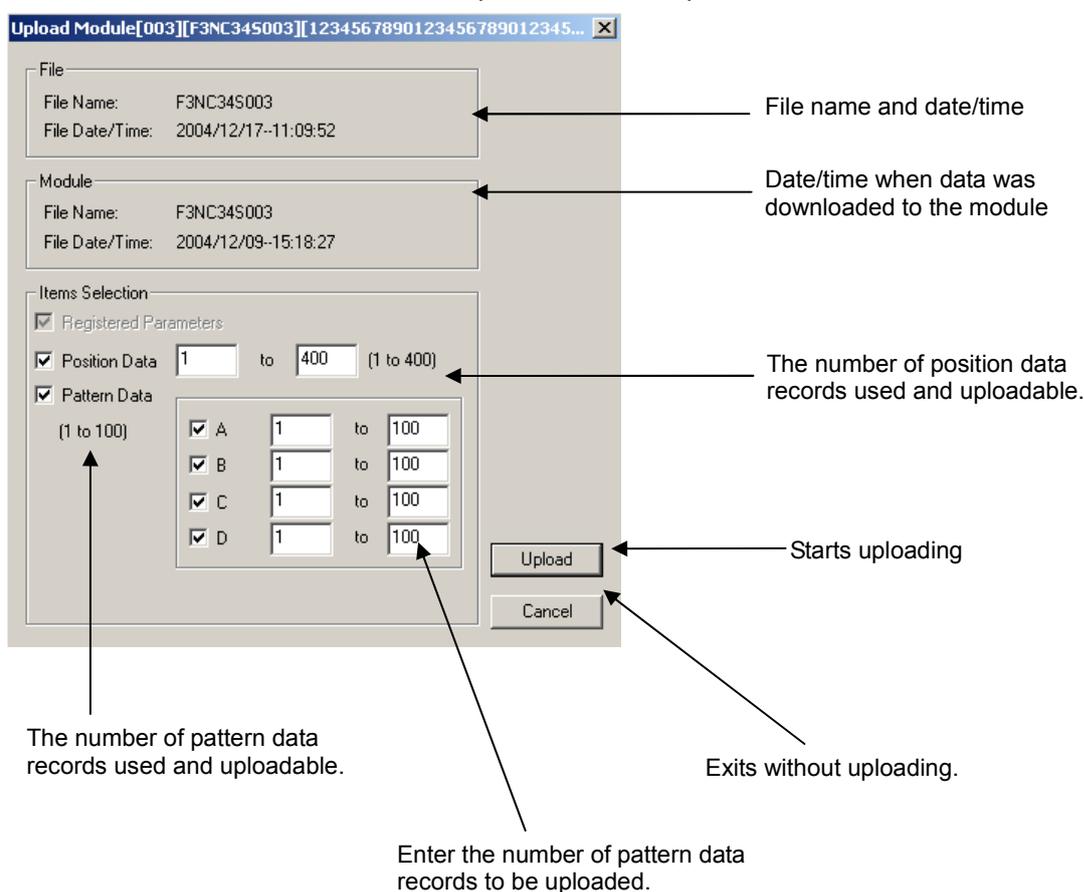
B8.1 Uploading

Before uploading, you must first connect your CPU module and the PC with a cable, and perform environment setup according to the mode of connection.

B8.1.1 Uploading from Individual Modules

■ Upload Module Screen

This section describes the operation of the Upload Module screen.



■ Uploading from Modules

1. Select [Online]-[Upload]-[Module] from the menu bar.

⇒ Screen (1) is displayed.

2. Select module data to be uploaded by clicking in the Select column.

● Color Codes for Availability for Uploading

Modules are color-coded to indicate their availability for uploading as follows:

- White:
Uploading from the module is allowed.
- Red:
Uploading is not allowed because of a mismatch between the I/O configuration and the file configuration of the module. Check the file or the connected FA-M3 system for compatibility.
- Yellow:
Uploading from the CPU module is not allowed because the address setup for the CPU module is invalid or not done. Uploading from the module is allowed.
- Gray
Not selectable.

3. Click [Module].

⇒ Screen (2) is displayed.

TIP

Uploading from CPU is not allowed in ToolBox for Positioning Modules.

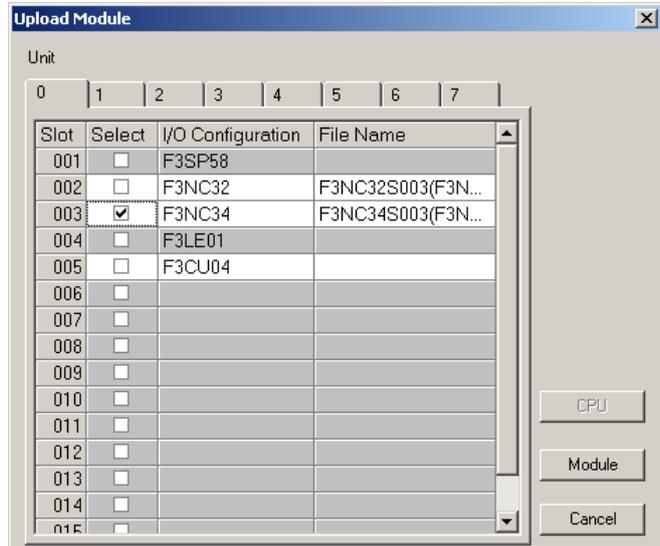
4. Select the items to be uploaded.

5. Click [Upload].

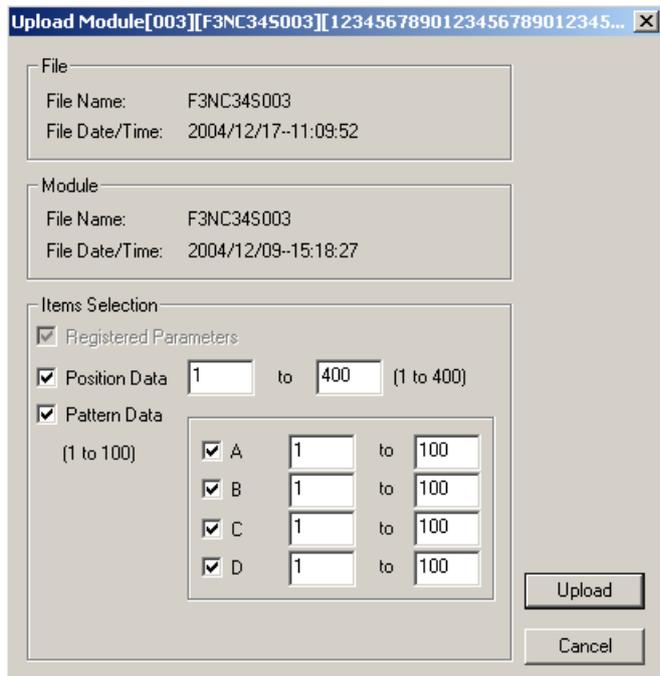
⇒ The Upload dialog box is displayed during uploading. When the upload is completed, it is replaced by screen (3).

TIP

Clicking [Abort] on the Upload screen aborts the upload process.



Screen (1)

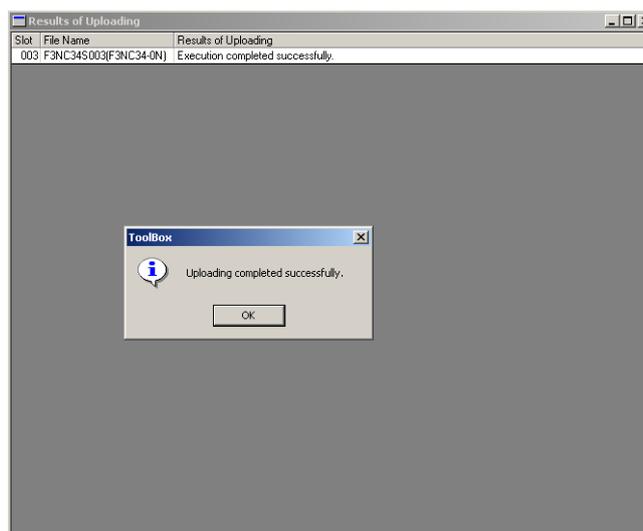


Screen (2)

6. Click [OK].
7. The Results of Uploading window is displayed for verification.

SEE ALSO

- For information on messages about results of uploading, see:
Section B8.1.3, "Messages about Results of Uploading".
- For details on uploading, see:
Section B6.1, "Uploading Registered Parameters" of the "FA-M3 ToolBox Manual".
- All running action monitors are suspended during uploading.



Screen (3)

B8.1.2 Uploading from All Modules of a Project

1. Select [Online]-[Upload]-[Project] from the menu bar.

⇒ Screen (4) is displayed.

2. Click [OK].

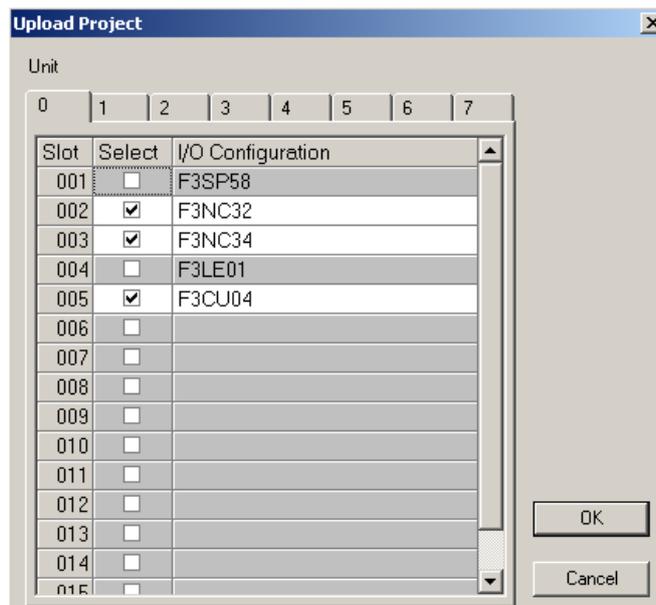
⇒ The Upload dialog box is displayed during uploading. When the upload is completed, it is replaced by screen (5).

SEE ALSO

For information on the color codes of modules indicating their availability for uploading, see the description entitled "Color Codes for Availability for Uploading" in Section B8.1.1.

TIP

Clicking [Abort] on the Upload screen aborts the upload process.



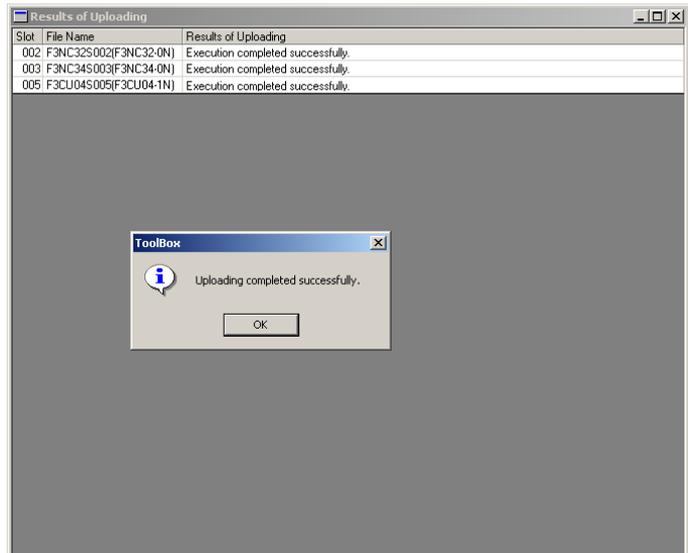
Screen (4)

3. Click [OK].

4. The Results of Uploading window is displayed for verification.

SEE ALSO

- For information on messages about results of uploading, see:
Section B8.1.3, "Messages about Results of Uploading".
- For details on uploading, see:
Section B6.1, "Uploading Registered Parameters" of the "FA-M3 ToolBox Manual".
- All running action monitors are suspended during uploading.



Screen (5)

B8.1.3 Messages about Results of Uploading

The Results of Uploading window may display one or more of the following messages. Read the messages and take appropriate actions, as required.

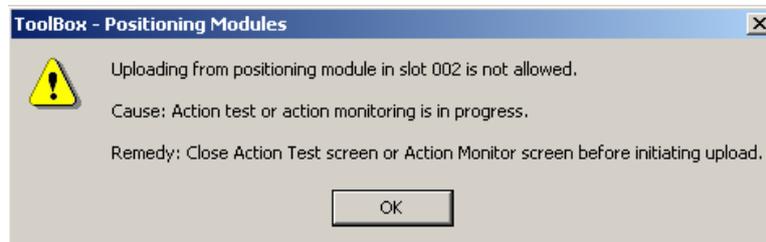
Table B8.1 List of Messages about Results of Uploading

No.	Message	Description
1	Execution completed successfully.	Uploading completed successfully.
2	Execution was aborted.	The [Abort] button was pressed during uploading, and uploading was aborted.
3	Communication server is busy.	The communication server is busy. WideField3 may be connected online to FA-M3.
4	Invalid dialog information file	Dialog information file was found to be damaged during online processing. The ToolBox environment file may have been changed by a user.
5	Memory error	Available memory is insufficient.
6	Uploading was not allowed because action test or action monitoring was in progress.	Uploading from positioning module is not allowed during online processing. Close all online screens before uploading.
7	ToolBox connection error encountered. Another ToolBox is connected.	The positioning module selected for uploading is used by another application. Check all usages.

B8.2 Uploading Restrictions

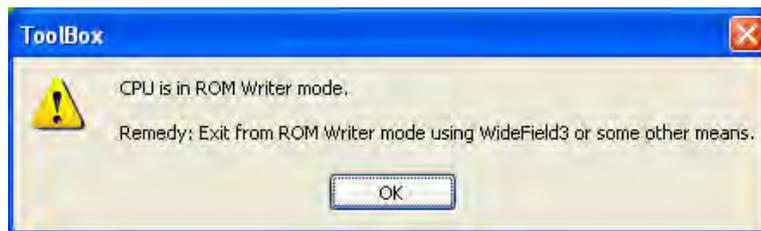
● Operation Status of ToolBox

- Uploading is not allowed when an action test or action monitor screen is open. You should close all online screens before performing uploading.



● If the CPU Module is in ROM Writer Mode

- Uploading is not allowed if the CPU module is in ROM writer mode. In this case, the following dialog box will be displayed. You should exit from ROM Writer mode using WideField3 or other means.



B0802_02.VSD

B9 Printing and Using Created Data

This chapter describes how to print or export created data.

- Printing Created Data → B9.1
- Using Created Data → B9.2
- Reusing Various Data Types → B9.3
- Printing Various Data Types → B9.4

B9.1 Printing Created Data

You can print created project information or registered parameter values. Print pattern data and position data using MS-Excel. Before printing, ensure that a PC running ToolBox is properly configured and connected to a printer.

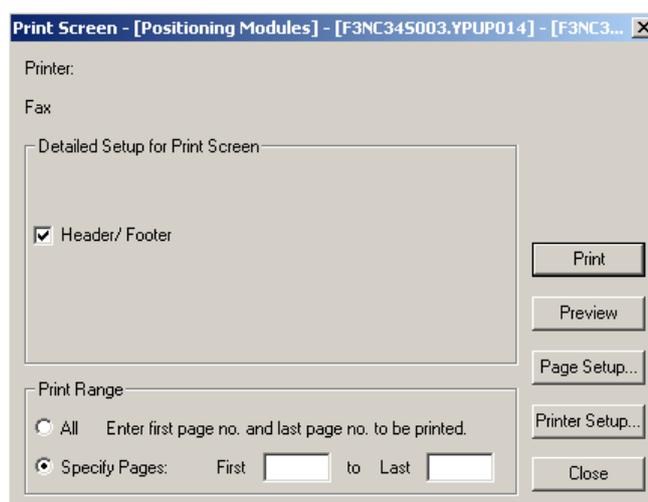
SEE ALSO

For details on how to prepare for printing, see:

Section B7.1, "Printing Created Data" of the "FA-M3 ToolBox Manual".

■ Printing Registered Parameters

1. Run ToolBox, open a project, and open the Registered Parameters screen to be printed.
2. Select [File]-[Print]-[Screen] from the menu bar.
⇒ Screen (1) is displayed.
3. Select the items to be printed.
4. Verify the print setup, and click [Preview] to preview the printout.



Screen (1)

5. Confirm the printer name, and click [Print].

⇒ Parameters are printed (see Printout (2)).

TIP

Each registered parameter is printed as a row in a table. Texts that are too long will be truncated.

```
File Name      : F30C245003.V09014
Title         : 1234567890123456789012345678901234567890123
Created on    : 2004/12/17 11:25:17
User         : F30C245003
No. of Axes   : 4
```

Req.	Parameter Item	Data	Axis 1 1234567890123	Axis 2	Axis 3	Axis 4
*01	Maximum Speed Selection	0: Standard mode, 1: Rig to speed mode	0: Standard m	0: Standard m	0: Standard m	0: Standard m
*02	Pulse Output Mode	0: CH/COH pulse, 1: Temp. selection, 2: Phase 3	0: CH/COH pul	0: CH/COH pul	0: CH/COH pul	0: CH/COH pul
*03	Motor Direction Selection	0: Forward movement pos, 1: Reverse mo	0: Forward mo	0: Forward mo	0: Forward mo	0: Forward mo
*04	Control Term Selection	0:000 to 2015 (bit dat m)	2000	2000	2000	2000
*05	Control X/O P display	0:000 to 2075 (bit dat m)	2000	2000	2000	2000
*09	Display Unit	0: pulse, 1: mm, 2: degre	1: mm	1: mm	0: pulse	0: pulse
*11/12	Electronics Gain H Value	1 to 214783247	1024	1048	1	1
*12/13	Electronics Gain H Value	1 to 214783247 (M/N-C10)	1075	1125	1	1
*14	Index Control	0: No Index control, 1: Index control	0: No Index c	0: No Index c	0: No Index c	0: No Index c
*17/18	Index Range	4 to 214783247	10.0000 mm	10.0000 mm	4 pulse	4 pulse
*21/22	Forward Limit	-214783247 to 214783247	100.0000 mm	140.0000 mm	214783247 pulse	214783247 pulse
*23/24	Reverse Limit	-214783247 to (Forward Limit -1)	-100.0000 mm	-147.0000 mm	-214783245 pulse	-214783245 pulse
*25/26	Speed Limit	1 to 214783247 (depend on mode)	100.0000 mm/s	100.0000 mm/s	1000000 pulse/s	1000000 pulse/s
*28	Acceleration/Deceleration	0: Automatic response, 1: acceleration/decelera	0: Automatic	0: Automatic	0: Automatic	0: Automatic
*29/30	Startup Speed	0 to speed limit	0.0000 mm/s	0.0000 mm/s	0 pulse/s	0 pulse/s
*31	Default Accel. Decel. Time	0 to 32767 (ms) (default)	1000 ms	1000 ms	1000 ms	1000 ms
*32	Default Default Accel. Time	0 to 32767 (ms) (default)	1000 ms	1000 ms	1000 ms	1000 ms
*33/34	DI Speed Tm	0 to 214783247	0.1000 ms	0.1000 ms	1000 ms	1000 ms
*35	Index		1000 ms	1000 ms	1000 ms	1000 ms

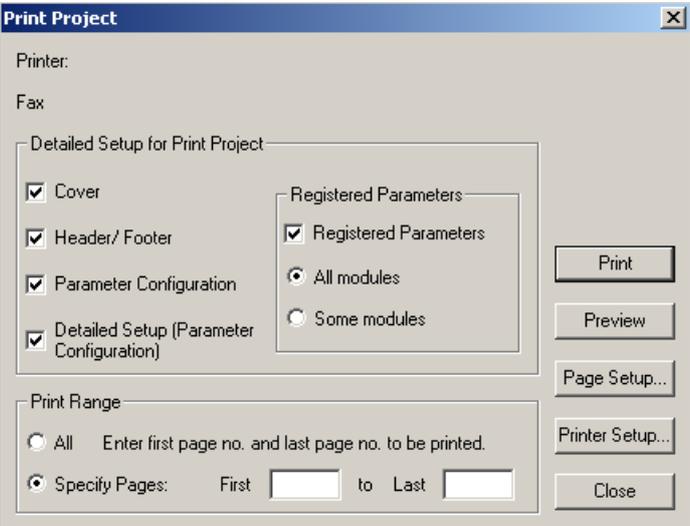
Note: Depending on the unit used, data may differ from actual values.
Note: * is an emphasis no. denotes 1, 4, 1 and 4 for axes 1 to 4 respectively.

Req.	Parameter Item	Data	Axis 1 1234567890123	Axis 2	Axis 3	Axis 4
*30	ACS Mode	0 to 3 (bit data)	0: Use origin	0: Use origin	0: Use origin	0: Use origin
*31	ACS Direction	0: Reverse, 1: Forward	0: Reverse	0: Reverse	0: Reverse	0: Reverse
*32	ACS Default Tm	0 to 32767	0 ms	0 ms	10 ms	10 ms
*33/34	ACS Speed 1	1 to Speed Limit	1.0000 mm/s	1.0000 mm/s	10000 pulse/s	10000 pulse/s
*35/36	ACS Speed 2	1 to ACS Speed 1	0.1000 mm/s	0.1000 mm/s	1000 pulse/s	1000 pulse/s
*37	ACS Acceleration	0 to 32767	1000 ms	1000 ms	1000 ms	1000 ms
*38	ACS Deceleration	0 to 32767	1000 ms	1000 ms	1000 ms	1000 ms

Printout (2)

■ Printing a Project

1. Run ToolBox, and open a project to be printed.
2. Select [File]-[Print]-[Project] from the menu bar.
⇒ Screen (3) is displayed.
3. Select the items to be printed.
4. Verify the print setup, and click [Preview] to preview the printout.



Screen (3)

5. Confirm the printer name, and click [Print].

⇒ Data is printed (see Printout (4)).

TIP

Each registered parameter is printed as a row in a table. Texts that are too long will be truncated.

```

Project Name : HC_H00011_Data
Title :
Created on : 2004/12/17 11:59:04
CPU Type : P3500-65
    
```

File No.	File Name	Title	Type	Date
002	P3HC22003.V00P013		P3HC22-0H	2004/12/17
003	P3HC24003.V00P014	122437520122436782012	P3HC24-0H	2004/12/17

```

File Name : P3HC22003.V00P013
Title :
Created on : 2004/12/17 11:50:15
Model : P3HC22-0H
No. of Axis : 2
    
```

Reg.	Parameter Item	Data	Axis 1	Axis 2
*01	Maximum Speed Selection	0: Standard mode, 1: Rig to speed mode	0: Standard mode	0: Standard mode
*02	Pulse Output Mode	0: CH/CKH pulse, 1: Term. M/direction, 2: Pulse N	0: CH/CKH pulse	0: CH/CKH pulse
*03	Reverse Direction on Selection	0: Forward movement produce pulse CH pulse output, 1	1: Reverse movement produce	1: Reverse movement produce
*04	Control Range Selection	20000 to 20112 (bit use m)	20000	20000
*05	Control Z/O P display	20000 to 20752 (bit use m)	20000	20000
*09	Display Unit	0: pulse, 1: mm, 2: degree	1: mm	1: mm
*13/*32	Electron Gc M/3 Value	1 to 214752547	1024	1024
*13/*34	Electron Gc M/4 Value	1 to 214752547 (M/NCLO 0)	1275	1125
*15	Index Control	0: No index control, 1: Index control	0: No index control	0: No index control
*17/*35	Index Range	4 to 214752547	0.0004 mm	0.0004 mm
*21/*36	Forward Limit	-214752547 to 214752547	100.0000 mm	140.0000 mm
*23/*37	Reverse Limit	-214752548 to (Forward Limit -1)	-200.0000 mm	-147.0000 mm
*25/*38	Speed Limit	1 to 214752547 (depend ing on mode)	100.0000 mm/s	100.0000 mm/s
*28	Acceleration/Deceleration	0: Automatic temporal ms	0: Automatic temporal ms	0: Automatic temporal ms
*29/*39	Startup Speed	0 to speed limit	0.0000 mm/s	0.0000 mm/s
*31	Default Accel. Decel. Time	0 to 32767 (ms) (Default 0)	1000 ms	1000 ms
*32	Default Decel. Decel. Time	0 to 32767 (ms) (Default 0)	1000 ms	1000 ms
*33/*38	CR Speed Tole. Error	0 to 214752547	0.1000 mm	0.1000 mm

Note: Depending on the unit used, data may differ from actual values.
 Note: "*" in register no. denotes 1 and 2 for axis 1 and 2 respectively.
 (Automatic Origin Search)

Reg.	Parameter Item	Data	Axis 1	Axis 2
*50	AOB Mode	0 to 3 (bit data)	0: Use origin switch, do not	0: Use origin switch, do not

Printout (4)

B9.2 Using Created Data

■ Registered Parameters File Data

You can convert and save registered parameter data of a project into a CSV-formatted file, which you can later process using Microsoft Excel (hereinafter abbreviated as Excel) or other application programs to produce various reports on registered parameters.

SEE ALSO

For details on how to save registered parameters to a file, see:
Section B7.2, "Using Created Data" of the "FA-M3 ToolBox Manual".

1. Run ToolBox, and open a project to be printed.
2. Select [File]-[Export] from the menu bar.
3. Select the files to be exported by clicking in the Select column.
4. Click [Export].
5. Enter a file name for storing exported data.

TIP

The full pathname of the CSV file must not be longer than 254 characters.

6. Click [Save].
⇒ Data will be saved as a CSV file.
7. Run Excel.
8. Select [File]-[Open] from the menu bar.
9. Select [All Files] in the Files of Type field. All available files will be listed.
10. Double click the required file. Its content will be displayed (see Sample Content (5)).

	A	B	C
1	Project	NC_Module_Data	
2	CPU Type	F3SP58-6S	
3	Title		
4	Last Modified Date	12/17/2004	
5			
6	File	F3NC34S003	
7	Title	1.23457E+31	
8	Module Type	F3NC34-0N	
9	No. of Axis	4	
10	Name of Axes	1.23457E+15	
11	[Basic Parameters]		
12	[Axis 1]		
13	Register	Comment	Preset Value
14	101	Maximum Speed Selection	0: Standard mode
15	102	Pulse Output Mode	0: CW/CCW pulse
16	103	Motor Direction Selection	1: Reverse movement produces CW pulse output
17	104	Contact Usage Selection	\$0
18	105	Contact I/O Polarity	\$0
19	109	Display Unit	1: mm
20	111/112	Electronic Gear M Value	1024
21	113/114	Electronic Gear N Value	1875
22	116	Index Control	0: No index control
23	117/118	Index Range	10
24	121/122	Forward Limit	190
25	123/124	Reverse Limit	-200
26	125/126	Speed Limit	150
27	128	Acceleration/deceleration Curve	0: Automatic trapezoidal acceleration/deceleration
28	129/130	Startup Speed	0
29	131	Default Acceleration Time	1000
30	132	Default Deceleration Time	1000
31	135/136	Cl Error Tolerance	0.1
32	[Axis 2]		
33	Register	Comment	Preset Value
34	401	Maximum Speed Selection	0: Standard mode
35	402	Pulse Output Mode	0: CW/CCW pulse

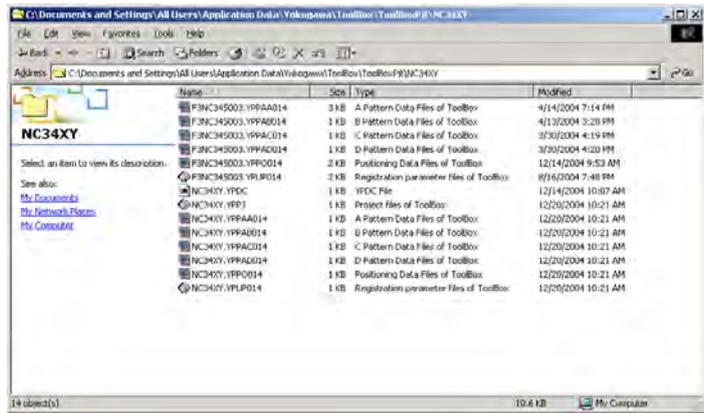
Sample Content (5)

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3. Rename the copied file with the desired new filename.

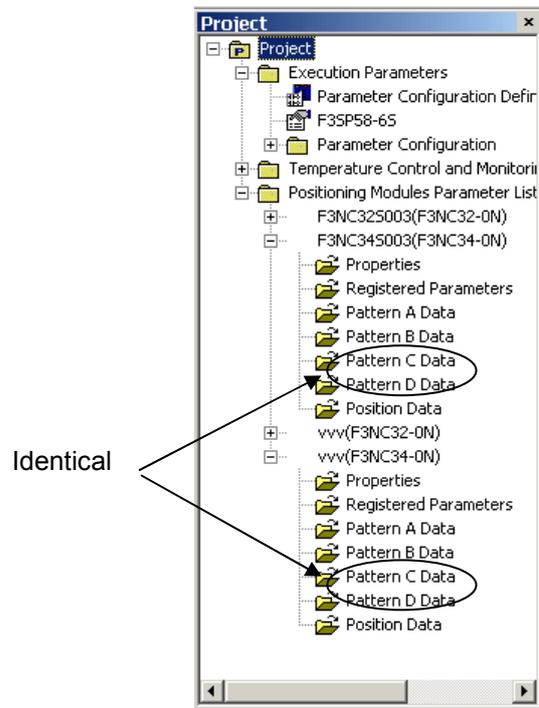
TIP

If a file having the new name already exists, you need to first delete it.



4. Open ToolBox, and then open the project.

⇒ The files are linked.



TIP

You can reuse position data similarly.

C1 Technical Information

This chapter describes registered parameters, pattern data registers, position data registers, and input/output relays.

- List of I/O Relays → C1.1
- List of Parameters and Statuses → C1.2
- Axis Common Statuses → C1.3
- Axis Operation Statuses → C1.4
- Pattern Operation Area → C1.5

C1.1 List of I/O Relays

The positioning module provides 32 input relays and 32 output relays for interfacing with the CPU module of FA-M3. For details on each output relay and input relay, see the relevant sections in this manual.



CAUTION

Never set output relays associated with axis 3, axis 4, pattern C or pattern D on a F3NC32-0N module. Input relays associated with axis 3, axis 4, pattern C or pattern D should be ignored on a F3NC32-0N module.

C1-2

C1.1.1 Input Relays

The following table lists the input relays available in the positioning module.

The module can be made to raise an interrupt to the CPU module when an input relay changes from OFF to ON.

Table C1.1 List of Input Relays

Input Relay No.	Signal Name	Description	Relationship with Other Relays
X□□□01	AX1 Execute Command ACK	Turns on when execution of direct command for axis 1 is successfully completed.	Turning off Y□□□33 turns off this relay.
X□□□02	AX2 Execute Command ACK	Turns on when execution of direct command for axis 2 is successfully completed.	Turning off Y□□□34 turns off this relay.
X□□□03	AX3 Execute Command ACK	Turns on when execution of direct command for axis 3 is successfully completed.	Turning off Y□□□35 turns off this relay.
X□□□04	AX4 Execute Command ACK	Turns on when execution of direct command for axis 4 is successfully completed.	Turning off Y□□□36 turns off this relay.
X□□□05	AX1 Positioning Completed	Turns on when axis 1 is in positioning completed state.	
X□□□06	AX2 Positioning Completed	Turns on when axis 2 is in positioning completed state.	
X□□□07	AX3 Positioning Completed	Turns on when axis 3 is in positioning completed state.	
X□□□08	AX4 Positioning Completed	Turns on when axis 4 is in positioning completed state.	
X□□□09	AX1 Error Detected	Turns on when error is encountered on axis 1.	
X□□□10	AX2 Error Detected	Turns on when error is encountered on axis 2.	
X□□□11	AX3 Error Detected	Turns on when error is encountered on axis 3.	
X□□□12	AX4 Error Detected	Turns on when error is encountered on axis 4.	
X□□□13	Pattern A Execute Command ACK	Turns on when execution of pattern command of pattern A is successfully completed.	Turning off Y□□□49 turns off this relay.
X□□□14	Pattern B Execute Command ACK	Turns on when execution of pattern command of pattern B is successfully completed.	Turning off Y□□□50 turns off this relay.
X□□□15	Pattern C Execute Command ACK	Turns on when execution of pattern command of pattern C is successfully completed.	Turning off Y□□□51 turns off this relay.
X□□□16	Pattern D Execute Command ACK	Turns on when execution of pattern command of pattern D is successfully completed.	Turning off Y□□□52 turns off this relay.

Input Relay No.	Signal Name	Description	Relationship with Other Relays
X□□□17	Pattern A Execution Completed	Turns on when execution of pattern A is successfully completed.	
X□□□18	Pattern B Execution Completed	Turns on when execution of pattern B is successfully completed.	
X□□□19	Pattern C Execution Completed	Turns on when execution of pattern C is successfully completed.	
X□□□20	Pattern D Execution Completed	Turns on when execution of pattern D is successfully completed.	
X□□□21	Pattern A Error Detected	Turns on when error is encountered during pattern A execution.	
X□□□22	Pattern B Error Detected	Turns on when error is encountered during pattern B execution.	
X□□□23	Pattern C Error Detected	Turns on when error is encountered during pattern C execution.	
X□□□24	Pattern D Error Detected	Turns on when error is encountered during pattern D execution.	
X□□□25	Pattern A M Code Detected	Turns on during M Code output of pattern A.	Turning on Y□□□57 turns off this relay.
X□□□26	Pattern B M Code Detected	Turns on during M Code output of pattern B.	Turning on Y□□□58 turns off this relay.
X□□□27	Pattern C M Code Detected	Turns on during M Code output of pattern C.	Turning on Y□□□59 turns off this relay.
X□□□28	Pattern D M Code Detected	Turns on during M Code output of pattern D.	Turning on Y□□□60 turns off this relay.
X□□□29	AX1 Counter/Zone Coincidence Detected	Turns on when counter coincidence or zone coincidence is detected on axis 1.	Turning on Y□□□61 when counter coincidence is detected turns off this relay

X□□□30	AX2 Counter/Zone Coincidence Detected	Turns on when counter coincidence or zone coincidence is detected on axis 2.	Turning on Y□□□62 when counter coincidence is detected turns off this relay
X□□□31	AX3 Counter/Zone Coincidence Detected	Turns on when counter coincidence or zone coincidence is detected on axis 3.	Turning on Y□□□63 when counter coincidence is detected turns off this relay
X□□□32	AX4 Counter/Zone Coincidence Detected	Turns on when counter coincidence or zone coincidence is detected on axis 4.	Turning on Y□□□64 when counter coincidence is detected turns off this relay

Note: □□□ denotes the slot number of the FA-M3 where the positioning module is installed.

C1.1.2 Output Relays

The following table lists the outputs relays available in the positioning module.

Table C1.2 List of Output Relays

Output Relay No.	Signal Name	Description	Relationship with Other Relays
Y□□□33	AX1 Execute Command	Request to execute direct command for axis 1.	Turn this relay off after confirming that X□□□01 has turned on.
Y□□□34	AX2 Execute Command	Request to execute direct command for axis 2.	Turn this relay off after confirming that X□□□02 has turned on.
Y□□□35	AX3 Execute Command	Request to execute direct command for axis 3.	Turn this relay off after confirming that X□□□03 has turned on.
Y□□□36	AX4 Execute Command	Request to execute direct command for axis 4.	Turn this relay off after confirming that X□□□04 has turned on.
Y□□□37	AX1 Stop Immediately	Request to stop axis 1 immediately.	
Y□□□38	AX2 Stop Immediately	Request to stop axis 2 immediately.	
Y□□□39	AX3 Stop Immediately	Request to stop axis 3 immediately.	
Y□□□40	AX4 Stop Immediately	Request to stop axis 4 immediately.	
Y□□□41	AX1 Forward Jog	Request to jog axis 1 forward.	
Y□□□42	AX2 Forward Jog	Request to jog axis 2 forward.	
Y□□□43	AX3 Forward Jog	Request to jog axis 3 forward.	
Y□□□44	AX4 Forward Jog	Request to jog axis 4 forward.	
Y□□□45	AX1 Reverse Jog	Request to jog axis 1 backward.	
Y□□□46	AX2 Reverse Jog	Request to jog axis 2 backward.	
Y□□□47	AX3 Reverse Jog	Request to jog axis 3 backward.	
Y□□□48	AX4 Reverse Jog	Request to jog axis 4 backward.	

Output Relay No.	Signal Name	Description	Relationship with Other Relays
Y□□□49	Pattern A Execute Command	Request to execute pattern command of pattern A.	Turn this relay off after confirming that X□□□13 has turned on.
Y□□□50	Pattern B Execute Command	Request to execute pattern command of pattern B.	Turn this relay off after confirming that X□□□14 has turned on.
Y□□□51	Pattern C Execute Command	Request to execute pattern command of pattern C.	Turn this relay off after confirming that X□□□15 has turned on.
Y□□□52	Pattern D Execute Command	Request to execute pattern command of pattern D.	Turn this relay off after confirming that X□□□16 has turned on.
Y□□□53	Pattern A Stop Immediately	Request to stop pattern A operation immediately.	
Y□□□54	Pattern B Stop Immediately	Request to stop pattern B operation immediately.	
Y□□□55	Pattern C Stop Immediately	Request to stop pattern C operation immediately.	
Y□□□56	Pattern D Stop Immediately	Request to stop pattern D operation immediately.	
Y□□□57	Pattern A Reset M Code	Request to reset M Code Detected relay for pattern A.	Turn this relay off after confirming that X□□□25 has turned off.
Y□□□58	Pattern B Reset M Code	Request to reset M Code Detected relay for pattern B.	Turn this relay off after confirming that X□□□26 has turned off.
Y□□□59	Pattern C Reset M Code	Request to reset M Code Detected relay for pattern C.	Turn this relay off after confirming that X□□□27 has turned off.
Y□□□60	Pattern D Reset M Code	Request to reset M Code Detected relay for pattern D.	Turn this relay off after confirming that X□□□28 has turned off.
Y□□□61	AX1 Reset Counter Coincidence	Request to reset Counter Coincidence Detected relay for axis 1.	Turn this relay off after confirming that X□□□29 has turned off.
Y□□□62	AX2 Reset Counter Coincidence	Request to reset Counter Coincidence Detected relay for axis 2.	Turn this relay off after confirming that X□□□30 has turned off.
Y□□□63	AX3 Reset Counter Coincidence	Request to reset Counter Coincidence Detected relay for axis 3.	Turn this relay off after confirming that X□□□31 has turned off.
Y□□□64	AX4 Reset Counter Coincidence	Request to reset Counter Coincidence Detected relay for axis 4.	Turn this relay off after confirming that X□□□32 has turned off.

Note: □□□ denotes the slot number of the FA-M3 where the positioning module is installed.

C1.2 List of Parameters and Statuses

The positioning module provides parameters and statuses for interfacing with the CPU module of FA-M3.

This section lists all parameters and statuses available in the positioning module. For details on individual parameters, refer to the relevant chapters and sections.

Table C1.3 Layout of Parameter and Status Areas

Data Position No.	Description
0001 to 0100	Axis Common Statuses
0101 to 0200	Axis 1 Registered Parameters
0201 to 0300	Axis 1 Command Parameters
0301 to 0400	Axis 1 Statuses
0401 to 0500	Axis 2 Registered Parameters
0501 to 0600	Axis 2 Command Parameters
0601 to 0700	Axis 2 Statuses
0701 to 0800	Axis 3 Registered Parameters
0801 to 0900	Axis 3 Command Parameters
0901 to 1000	Axis 3 Statuses
1001 to 1100	Axis 4 Registered Parameters
1101 to 1200	Axis 4 Command Parameters
1201 to 1300	Axis 4 Statuses
1301 to 1330	Pattern A Registered Parameters
1331 to 1350	Pattern A Command Parameters
1351 to 1400	Pattern A Statuses
1401 to 1430	Pattern B Registered Parameters
1431 to 1450	Pattern B Command Parameters
1451 to 1500	Pattern B Statuses
1501 to 1530	Pattern C Registered Parameters
1531 to 1550	Pattern C Command Parameters
1551 to 1600	Pattern C Statuses
1601 to 1630	Pattern D Registered Parameters
1631 to 1650	Pattern D Command Parameters
1651 to 1700	Pattern D Statuses
1701 onwards	(System reserved)

C1.3 Axis Common Statuses

This section lists status information common to all axes.

Table C1.4 List of Axis Common Statuses

Data Position No.	Parameter Name	Data Range and Description
0001	Module Information	"F3"
0002	Module Information	"NC"
0003	Module Information	"32" or "34"
0004	Module Information	"0N"
0005	Module Information	" "
0006	Module Information	" "
0007	Module Information	"RV"
0008	Module Information	"□□□" ("□□□" denotes the revision number)
0009	(System reserved)	
0010	(System reserved)	
0011 / 0012	No. of Write Operations to Flash Memory	non-negative integer
0013	No. of Pattern Data Records Used	1 to 500
0014	No. of Position Data Records Used	1 to 2000
0015 to 0100	(System reserved)	

C1.4 Axis Operation Statuses

This area stores parameters and statuses for each axis in separate sub-areas.

C1.4.1 Axis Registered Parameters

Table C1.5 List of Axis Registered Parameters (Basic Parameters)

Data Position No.				Parameter Name	Data Range and Description
Axis 1	Axis 2	Axis 3	Axis 4		
0101	0401	0701	1001	Maximum Speed Selection	0: Standard mode; 1: High-speed mode (Factory setting: 0)
0102	0402	0702	1002	Pulse Output Mode	0: CW/CCW pulse 1: Travel/direction 2: Phase A/B (x4) 3: Phase A/B (x2) 4: Phase A/B (x1) (Factory setting: 0)
0103	0403	0703	1003	Motor Direction Selection	0: Forward movement produces CW pulse output 1: Reverse movement produces CW pulse output (Factory setting: 0)
0104	0404	0704	1004	Contact Usage Selection	\$0000 to \$073F (bit data) (Factory setting: \$0000)
0105	0405	0705	1005	Contact I/O Polarity	\$0000 to \$073F (bit data) (Factory setting: \$0000)
0106 to 0108	0406 to 0408	0706 to 0708	1006 to 1008	(System reserved)	
0109	0409	0709	1009	Display Unit	0: pulse; 1: mm; 2: degree (Factory setting: 0)
0110	0410	0710	1010	(System reserved)	
0111 / 0112	0411 / 0412	0711 / 0712	1011 / 1012	Electronic Gear M Value	1 to 2,147,483,647 (Factory setting: 1)
0113 / 0114	0413 / 0414	0713 / 0714	1013 / 1014	Electronic Gear N Value	1 to 2,147,483,647 (M/N<100) (Factory setting: 1)
0115	0415	0715	1015	(System reserved)	
0116	0416	0716	1016	Index Control	0: No index control 1: Index control (Factory setting: 0)
0117 / 0118	0417 / 0418	0717 / 0718	1017 / 1018	Index Range	4 to 2,147,483,647 (position reference unit) (Factory setting: 4)
0119 to 0120	0419 to 0420	0719 to 0720	1019 to 1020	(System reserved)	
0121 / 0122	0421 / 0422	0721 / 0722	1021 / 1022	Forward Limit	-2,147,483,648 to 2,147,483,647 (position reference unit) (Factory setting: 2,147,483,647)
0123 / 0124	0423 / 0424	0723 / 0724	1023 / 1024	Reverse Limit	-2,147,483,648 to (Forward Limit - 1) (position reference unit) (Factory setting: -2,147,483,648)
0125 / 0126	0425 / 0426	0725 / 0726	1025 / 1026	Speed Limit	1 to 5,000,000 (pulse/s) 1 to 2,147,483,647 (x 10 ⁻⁴ mm/s) 1 to 2,147,483,647 (x 10 ⁻⁵ degree/s) (Valid data range depends on Display Unit) (Factory setting: 1,000,000)
0127	0427	0727	1027	(System reserved)	
0128	0428	0728	1028	Acceleration/deceleration Curve	0: Automatic trapezoidal acceleration/deceleration 1: S-shape acceleration/deceleration (Factory setting: 0)
0129 / 0130	0429 / 0430	0729 / 0730	1029 / 1030	Startup Speed	0 to Speed Limit (speed reference unit) (Factory setting: 0)
0131	0431	0731	1031	Default Acceleration Time	0 to 32,767 (ms) (Default Acceleration Time specified for Speed Limit) (Factory setting: 1,000)
0132	0432	0732	1032	Default Deceleration Time	0 to 32,767 (ms) (Default Deceleration Time specified for Speed Limit) (Factory setting: 1,000)
0133 to 0134	0433 to 0434	0733 to 0734	1033 to 1034	(System reserved)	
0135 / 0136	0435 / 0436	0735 / 0736	1035 / 1036	CI Error Tolerance	0 to 2,147,483,647 (x 10 ⁻⁴ mm/s) (Factory setting: 1,000)
0137 to 0149	0437 to 0449	0737 to 0749	1037 to 1049	(System reserved)	

Table C1.6 List of Axis Registered Parameters (Automatic Origin Search)

Data Position No.				Parameter Name	Data Range and Description
Axis 1	Axis 2	Axis 3	Axis 4		
0150	0450	0750	1050	AOS Mode	\$0000 to \$0003 (bit data) (Factory setting: \$0000)
0151	0451	0751	1051	AOS Direction	0: Reverse; 1: Forward (Factory setting: 0)
0152	0452	0752	1052	AOS Dwell Time	0 to 32,767 (ms) (Factory setting: 10)
0153 / 0154	0453 / 0454	0753 / 0754	1053 / 1054	AOS Speed 1	1 to Speed Limit (speed reference unit) (Factory setting: 10,000)
0155 / 0156	0455 / 0456	0755 / 0756	1055 / 1056	AOS Speed 2	1 to AOS Speed 1 (speed reference unit) (Factory setting: 1,000)
0157	0457	0757	1057	AOS Acceleration Time	0 to 32,767 (ms) (Factory setting: 1,000)
0158	0458	0758	1058	AOS Deceleration Time	0 to 32,767 (ms) (Factory setting: 1,000)
0159	0459	0759	1059	AOS Z-phase Edge Selection	0: Rising edge; 1: Falling edge (Factory setting: 0)
0160	0460	0760	1060	AOS Z-phase Search Count	0 to 32,767 (pulses) (Factory setting: 0)
0161 / 0162	0461 / 0462	0761 / 0762	1061 / 1062	AOS Z-phase Search Range	0 to 2147483647 or 0 to AOS Z-phase Search Count (position reference unit) (Factory setting: 2,147,483,647)
0163	0463	0763	1063	AOS Deviation Pulse Clear Time	0 to 32,767 (ms) (Factory setting: 10)
0164	0464	0764	1064	(System reserved)	
0165 / 0166	0465 / 0466	0765 / 0766	1065 / 1066	AOS Offset	-2,147,483,648 to 2,147,483,647 (position reference unit) (Factory setting: 0)
0167 to 0171	0467 to 0471	0767 to 0771	1067 to 1071	(System reserved)	

Table C1.7 List of Axis Registered Parameters (Counter/Encoder)

Data Position No.				Parameter Name	Data Range and Description
Axis 1	Axis 2	Axis 3	Axis 4		
0172	0472	0772	1072	Counter Type Selection	0: General-purpose incremental 1: Sanyo Denki's Manchester Coding 2: Yaskawa Electric's Serial (Factory setting: 0)
0173	0473	0773	1073	Counter Direction Selection	0: Forward pulse input denotes forward movement 1: Reverse pulse input denotes forward movement (Factory setting: 0)
0174	0474	0774	1074	Counter Multiplication	1: x1; 2: x2; 4: x4 (Factory setting: 4)
0175	0475	0775	1075	Counter Display Unit	0: pulse; 1: mm; 2: degree (Factory setting: 0)
0176	0476	0776	1076	(System reserved)	
0177 / 0178	0477 / 0478	0777 / 0778	1077 / 1078	Counter Electronic Gear M Value	1 to 2,147,483,647 (Factory setting: 1)
0179 / 0180	0479 / 0480	0779 / 0780	1079 / 1080	Counter Electronic Gear N Value	1 to 2,147,483,647 (M/N<100) (Factory setting: 1)
0181	0481	0781	1081	(System reserved)	
0182	0482	0782	1082	Counter Index Control	0: No index control 1: Index control (Factory setting: 1)
0183 / 0184	0483 / 0484	0783 / 0784	1083 / 1084	Counter Index Range	0; 4 to 2,147,483,647 (counter position reference unit) (Factory setting: 0)
0185 / 0186	0485 / 0486	0785 / 0786	1085 / 1086	ABS Encoder Offset	0 to 2,147,483,647 (counter position reference unit) (Factory setting: 0)
0187 / 0188	0487 / 0488	0787 / 0788	1087 / 1088	ABS Encoder Pulses Per Rev.	-2,147,483,648 to 2,147,483,647 (pulse) (Factory setting: 32,768)
0189	0489	0789	1089	ABS Encoder Bit Length	17 to 28 (bits) (Factory setting: 28)
0190	0490	0790	1090	Counter Usage Selection	0: Counter coincidence 1: Zone coincidence (Factory setting: 0)
0191 / 0192	0491 / 0492	0791 / 0792	1091 / 1092	Counter Coincidence Value	-2,147,483,648 to 2,147,483,647 (counter position reference unit) (Factory setting: 0)

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0193 / 0194	0493 / 0494	0793 / 0794	1093 / 1094	Counter Upper Limit	-2,147,483,648 to 2,147,483,647 (counter position reference unit) (Factory setting: 2,147,483,647)
0195 / 0196	0495 / 0496	0795 / 0796	1095 / 1096	Counter Lower Limit	-2147483648 to Counter Upper Limit (counter position reference unit) (Factory setting: -2,147,483,648)

C1.4.2 Axis Command Parameters

Table C1.8 List of Axis Command Parameters

Data Position No.				Parameter Name	Data Range and Description
Axis 1	Axis 2	Axis 3	Axis 4		
0201	0501	0801	1101	Direct Command Code	0 to 32,767
0202	0502	0802	1102	Command Options	\$0000 to \$FFFF (meaning depends on Direct Command Code)
0203	0503	0803	1103	Startup Condition	0: Normal startup; Non-zero: Startup condition code
0204	0504	0804	1104	End Condition	0: Normal end; Non-zero: End condition code
0205	0505	0805	1105	(System reserved)	
0206	0506	0806	1106	Target Position Mode	0: Using ABS position 1: Using INC position 2: Using position data no.
0207 / 0208	0507 / 0508	0807 / 0808	1107 / 1108	Target Position	-2,147,483,648 to 2,147,483,647 (position reference unit) or position data no. (1 to No. of Position Data Records Used)
0209 to 0210	0509 to 0510	0809 to 0810	1109 to 1110	(System reserved)	
0211 / 0212	0511 / 0512	0811 / 0812	1111 / 1112	Specified Speed	1 to Speed Limit (speed reference unit) or -(Speed Limit) to (Speed Limit) (speed reference unit)
0213	0513	0813	1113	Acceleration Time	-1: Default acceleration; 0 to 32,767 (ms)
0214	0514	0814	1114	Deceleration Time	-1: Default deceleration; 0 to 32,767 (ms)
0215	0515	0815	1115	Dwell Time	0 to 32,767 (ms)
0216	0516	0816	1116	Preset Override Value	1 to 500 (%)
0217 to 0218	0517 to 0518	0817 to 0818	1117 to 1118	(System reserved)	
0219	0519	0819	1119	CI Turns	0 to 32,767 (turns)
0220	0520	0820	1120	CI Sub Position Mode	0: Using ABS position 1: Using INC position 2: Using position data no.
0221 / 0222	0521 / 0522	0821 / 0822	1121 / 1122	CI Sub Position	-2,147,483,648 to 2,147,483,647 (position reference unit) Or, position data no. (1 to 2,000)
0223	0523	0823	1123	Contact Output Setting	\$0000 to \$0707 (bit data)
0224	0524	0824	1124	MPG Mode Multiplication	-32,768 to 32,767
0225	0525	0825	1125	MPG Mode Decimal Point	0: x 1; 1: x 1/10; 2: x 1/100; 3: x 1/1,000; 4: x 1/10,000
0226 to 0227	0526 to 0527	0826 to 0827	1126 to 1127	(System reserved)	
0228	0528	0828	1128	Origin Search Direction	0: Reverse; 1: Forward
0229	0529	0829	1129	Z-phase Edge Selection	0: Rising edge; 1: Falling edge
0230	0530	0830	1130	Z-phase Search Count	0 to 32,767 (pulses)
0231 / 0232	0531 / 0532	0831 / 0832	1131 / 1132	Z-phase Search Range	0 to 2147483647 or 0 to Z-phase Search Count (position reference unit)
0233	0533	0833	1133	Deviation Pulse Clear Time	0 to 32,767 (ms)
0234	0534	0834	1134	(System reserved)	
0235 / 0236	0535 / 0536	0835 / 0836	1135 / 1136	Counter Coincidence Value	-2,147,483,648 to 2,147,483,647 (counter position reference unit)
0237 / 0238	0537 / 0538	0837 / 0838	1137 / 1138	Counter Upper Limit	-2,147,483,648 to 2,147,483,647 (counter position reference unit)
0239 / 0240	0539 / 0540	0839 / 0840	1139 / 1140	Counter Lower Limit	-2,147,483,648 to Counter Upper Limit (counter position reference unit)
0241 to 0300	0541 to 0600	0841 to 0900	1141 to 1200	(System reserved)	

C1.4.3 Axis Statuses

Table C1.9 List of Axis Statuses

Data Position No.				Status Name	Data Range and Description
Axis 1	Axis 2	Axis 3	Axis 4		
0301	0601	0901	1201	Error Status	Error code when error occurs
0302	0602	0902	1202	Warning Status	Warning code when warning occurs
0303	0603	0903	1203	Extended Status 1	Action information such as axis or pattern where action was initiated
0304	0604	0904	1204	Extended Status 2	Movement information such as whether axis is accelerating, decelerating or changing speed.
0305	0605	0905	1205	Origin Search Status	Status related to origin search
0306	0606	0906	1206	(System reserved)	
0307	0607	0907	1207	Contact Input Status	State of contact inputs (bit data)
0308	0608	0908	1208	Contact Output Status	State of contact outputs (bit data)
0309	0609	0909	1209	(System reserved)	
0310	0610	0910	1210	Remaining DCC Time Status	-1: Accelerating or moving at constant speed 0: At rest 1 to 32,767: Remaining deceleration time (ms)
0311 / 0312	0611 / 0612	0911 / 0912	1211 / 1212	Remaining Travel Status	Remaining travel to target position 0 to 2,147,483,647 (position reference unit)
0313	0613	0913	1213	Current Override Value Status	1 to 500 (%)
0314	0614	0914	1214	(System reserved)	
0315 / 0316	0615 / 0616	0915 / 0916	1215 / 1216	Current Position Status	-2,147,483,648 to 2,147,483,647 (position reference unit)
0317 / 0318	0617 / 0618	0917 / 0918	1217 / 1218	Target Position Status	-2,147,483,648 to 2,147,483,647 (position reference unit)
0319 / 0320	0619 / 0620	0919 / 0920	1219 / 1220	Current Speed Status	-5,000,000 to 5,000,000 (pulse/s) -2,147,483,648 to 2,147,483,647 ($\times 10^{-4}$ mm/s) -2,147,483,648 to 2,147,483,647 ($\times 10^{-5}$ degree/s) (Data range depends on Display Unit)
0321 / 0322	0621 / 0622	0921 / 0922	1221 / 1222	Counter Current Position Status	-2,147,483,648 to 2,147,483,647 (Counter position reference unit)
0323 / 0324	0623 / 0624	0923 / 0924	1223 / 1224	Counter Current Speed Status	-5,000,000 to 5,000,000 (pulse/s) -2,147,483,648 to 2,147,483,647 ($\times 10^{-4}$ mm/s) -2,147,483,648 to 2,147,483,647 ($\times 10^{-5}$ degree/s) (Data range depends on Display Unit)
0325 / 0326	0625 / 0626	0925 / 0926	1225 / 1226	Counter Latched Position Status	-2,147,483,648 to 2,147,483,647 (Counter position reference unit)
0327 / 0328	0627 / 0628	0927 / 0928	1227 / 1228	Counter Absolute Data Status	Received raw absolute data (when Counter Type Selection is Sanyo Denki's Manchester Coding) Absolute position status (when Counter Type Selection is Yaskawa Electric's Serial)
0329 to 0400	0629 to 0700	0929 to 1000	1229 to 1300	(System reserved)	

C1.5 Pattern Operation Area

C1.5.1 Pattern Registered Parameters

Table C1.10 List of Pattern Registered Parameters

Data Position No.				Parameter Name	Data Range and Description
Pattern A	Pattern B	Pattern C	Pattern D		
1301 / 1302	1401 / 1402	1501 / 1502	1601 / 1602	Pattern Combined-speed Limit	1 to 2,147,483,647 (x 10 ⁻⁴ mm/s) (Factory setting: 1,000,000)
1303	1403	1503	1603	Pattern Combined-speed ACC Time	0 to 32,767 (ms) (Default acceleration time specified for Pattern Combined-speed Limit) (Factory setting: 1,000)
1304	1404	1504	1604	Pattern Combined-speed DCC Time	0 to 32,767 (ms) (Default deceleration time specified for Pattern Combined-speed Limit) (Factory setting: 1,000)
1305 to 1330	1405 to 1430	1505 to 1530	1605 to 1630	(System reserved)	

C1.5.2 Pattern Command Parameters

Table C1.11 List of Pattern Command Parameters

Data Position No.				Parameter Name	Data Range and Description
Pattern A	Pattern B	Pattern C	Pattern D		
1331	1431	1531	1631	Pattern Command Code	0 to 32,767
1332	1432	1532	1632	(System reserved)	Do not write any non-zero value.
1333	1433	1533	1633	Pattern Preset Override Value	1 to 500 (%)
1334	1434	1534	1634	Pattern Start Record No.	1 to No. of Pattern Data Records Used
1335 to 1338	1435 to 1438	1535 to 1538	1635 to 1638	(System reserved)	
1339	1439	1539	1639	Pattern End Record No.	1 to No. of Pattern Data Records Used
1340 to 1350	1440 to 1450	1540 to 1550	1640 to 1650	(System reserved)	

C1.5.3 Pattern Operation Statuses

Table C1.12 List of Pattern Operation Statuses

Data Position No.				Status Name	Data Range and Description
Pattern A	Pattern B	Pattern C	Pattern D		
1351	1451	1551	1651	M Code Status	0 to 32,767
1352	1452	1552	1652	Pattern Error Status	Error code when error occurs
1353	1453	1553	1653	Pattern Warning Status	Warning code when warning occurs
1354	1454	1554	1654	Pattern Error Code 1	Detailed error code 1 when error occurs
1355	1455	1555	1655	Pattern Error Code 2	Detailed error code 2 when error occurs
1356	1456	1556	1656	Pattern Action Status	Movement information for pattern operation
1357	1457	1557	1657	Pattern Action Record No.	1 to 500
1358	1458	1558	1658	Pattern Current Override Value	1 to 500 (%)
1359 to 1362	1459 to 1462	1559 to 1562	1659 to 1662	Pattern Action Record Label	Label corresponding to Pattern Action Record No.
1363 to 1400	1463 to 1500	1563 to 1600	1663 to 1700	(System reserved)	

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