## FA-M3 ToolBox

for Positioning Modules
(for F3YP22/24/28)

**Compatible Modules:**

<table>
<thead>
<tr>
<th>Model Code</th>
<th>Model Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>F3YP22-0P</td>
<td>Positioning Module (with Multi-channel Pulse Output)</td>
</tr>
<tr>
<td>F3YP24-0P</td>
<td>Positioning Module (with Multi-channel Pulse Output)</td>
</tr>
<tr>
<td>F3YP28-0P</td>
<td>Positioning Module (with Multi-channel Pulse Output)</td>
</tr>
</tbody>
</table>
Applicable Product

Range-Free Multi-Controller FA-M3
- Model Code: SF663-MCW
- Model Name: FA-M3 ToolBox for Positioning Modules (for F3YP22/24/28)

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 34M06Q31-03E
- 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](image)

**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](image)

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

![Function Ground Terminal](image)

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

![Alternating current](image)

**Alternating current.** Indicates alternating current.

![Direct current](image)

**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).
  - Where 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. 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) is required for using the module beyond 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 benzine 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 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 F3YP22/24/28) (abbreviated simply as ToolBox in this manual) software. It describes how to set up parameters of the positioning modules, 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” (IM 34M06Q30-01E) 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 F3YP22-0P, F3YP24-0P and F3YP28-0P Positioning Modules (with Multi-channel Pulse Output).
  Always have the following Positioning Modules user’s manual handy when using the ToolBox software.

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Document Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positioning Modules (with Multi-channel Pulse Output)</td>
<td>IM 34M06H55-04E</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Document Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequence CPU – Functions (for F3SP28-3N/3S, F3SP38-6N/6S, F3SP53-4H/4S, F3SP58-6H/6S, F3SP59-7S)</td>
<td>IM 34M06P13-01E</td>
</tr>
<tr>
<td>Sequence CPU – Functions (for F3SP66-4S, F3SP67-6S)</td>
<td>IM 34M06P14-01E</td>
</tr>
<tr>
<td>Sequence CPU – Network Functions (for F3SP66-4S, F3SP67-6S)</td>
<td>IM 34M06P14-02E</td>
</tr>
<tr>
<td>Sequence CPU – Functions (for F3SP71-4N/4S, F3SP76-7N/7S)</td>
<td>IM 34M06P15-01E</td>
</tr>
<tr>
<td>Sequence CPU – Network Functions (for F3SP71-4N/4S, F3SP76-7N/7S)</td>
<td>IM 34M06P15-02E</td>
</tr>
<tr>
<td>Sequence CPU Modules – Functions (for F3SP21, F3SP25 and F3SP35)</td>
<td>IM 34M06P12-02E</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Document Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequence CPU – Instructions</td>
<td>IM 34M06P12-03E</td>
</tr>
</tbody>
</table>

- 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.

<table>
<thead>
<tr>
<th>Document Name</th>
<th>Document Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware Manual</td>
<td>IM 34M06C11-01E</td>
</tr>
</tbody>
</table>
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A1 Product Overview

This chapter gives an overview and describes the features of the FA-M3 ToolBox for Positioning Modules for F3YP22/24/28 (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 multi-channel pulse output) (F3YP22-0P, F3YP24-0P and F3YP28-0P). 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**
  Position data records of positioning modules can be edited.

- **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.

- **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

No functions have been added or updated.
A2 Preparing ToolBox

This chapter describes how to install, run and stop the FA-M3 ToolBox for Positioning Modules for F3YP22/24/28 (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

Install ToolBox

Install the ToolBox software.

Configure ToolBox

Configure ToolBox by specifying project folders, performing communications setup, etc.

Edit a project

Create and edit a project.

Check communications setup and connect to FA-M3

Check hardware and software setup for connecting to FA-M3 and perform online connection.

Download data to FA-M3

Send created data to FA-M3.

Monitor operation using action monitor

Run positioning module to verify setup data produces the expected operation.

Check operation using action test

Check module operation using action test.
### A2.2 Operating Environment for ToolBox

#### Operating Environment

The operating environment for ToolBox is shown below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC</td>
<td>PC/AT compatible</td>
</tr>
<tr>
<td>Operating System</td>
<td>Microsoft® Windows® 7 (32bit/64bit)</td>
</tr>
<tr>
<td></td>
<td>Microsoft® Windows® Vista (32bit/64bit)</td>
</tr>
<tr>
<td></td>
<td>Microsoft® Windows® XP</td>
</tr>
<tr>
<td></td>
<td>Microsoft® Windows® 2000 Professional</td>
</tr>
<tr>
<td>Required Software</td>
<td>Internet Explorer 5.01 or higher</td>
</tr>
<tr>
<td>CPU</td>
<td>Pentium 300MHz or faster, adequate for the operating system to run properly.</td>
</tr>
<tr>
<td>Memory</td>
<td>128MB or more, adequate for the operating system to run properly.</td>
</tr>
<tr>
<td>Hard Disk Capacity</td>
<td>200MB or more available</td>
</tr>
<tr>
<td>Display</td>
<td>1024 × 768 dots or more</td>
</tr>
<tr>
<td>Communications</td>
<td>RS-232C, Ethernet, FL-net</td>
</tr>
<tr>
<td>Printer</td>
<td>Any printer compatible with the operating systems listed above and supports A4 printing</td>
</tr>
<tr>
<td>Supported Modules</td>
<td>Positioning Modules (with Multi-channel Pulse Output)</td>
</tr>
<tr>
<td></td>
<td>F3YP22-0P, F3YP24-0P, F3YP28-0P</td>
</tr>
<tr>
<td>Compatible CPU Modules</td>
<td>F3SP05-0P, F3SP08-0P, F3SP08-SP, F3SP21-0N, F3SP25-2N, F3SP35-2N, F3SP22-0S, F3SP28-3S, F3SP38-6S, F3SP53-4H, F3SP58-6H, F3SP59-7S, F3SPV3-4H, F3SPV8-6H, F3FP36-3N, F3SP66-4S, F3SP67-6S, F3SP71-4N, F3SP76-7N, F3SP71-4S, F3SP76-7S</td>
</tr>
</tbody>
</table>

*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 component for Toolbox Positioning Modules (for F3YP22/24/28) is already installed. Select [Modify] to add components.

**TIP**

If another ToolBox component is already installed on the PC, the component for Positioning Modules (for F3YP22/24/28) is added to the existing ToolBox installation. In this case, you cannot specify a different installation folder.
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.”
### A2.4 Connecting ToolBox and FA-M3 System

#### System Environment When Using ToolBox

- **ToolBox**
  - RS-232C
  - USB/Ethernet/FL-net

- **FA-M3**
  - CPU
  - Positioning module

- **Computer**
- **Input**
  - Counter
- **Output**
  - Motor

- **Setup Adjustment**
- Internal parameters for setup
B1 Using ToolBox

This chapter describes what a user must know before using the FA-M3 ToolBox for Positioning Modules for F3YP22/24/28 (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".
**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.

---

**Selecting the Display Language**

   ⇒ Screen (3) is displayed.

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

You can also specify whether to write to the ROM when downloading and specify the communication timeout interval.

1. Select [Tools]-[Environment Setup for ToolBox Positioning Modules (for F3YP22/24/28)] from the menu bar.
   ⇒ Screen (4) is displayed.

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

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

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.
This section describes positioning module files used in ToolBox.

# List of ToolBox Files

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

<table>
<thead>
<tr>
<th>Positioning Module Name</th>
<th>File Type</th>
<th>File Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>F3YP22-0P</td>
<td>Registered Parameters</td>
<td>ABC.YPUP201</td>
</tr>
<tr>
<td></td>
<td>Position Data</td>
<td>ABC.YPPO 201</td>
</tr>
<tr>
<td>F3YP24-0P</td>
<td>Registered Parameters</td>
<td>ABC.YPUP202</td>
</tr>
<tr>
<td></td>
<td>Position Data</td>
<td>ABC.YPPO 202</td>
</tr>
<tr>
<td>F3YP28-0P</td>
<td>Registered Parameters</td>
<td>ABC.YPUP203</td>
</tr>
<tr>
<td></td>
<td>Position Data</td>
<td>ABC.YPPO 203</td>
</tr>
</tbody>
</table>

**TIP**
- Creating a new registered parameter file automatically generates a position data file.
- File extensions differ for different FA-M3 advanced function module types.
Creating and Editing Various Types of Data

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

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

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) Closes Properties dialog and opens Registered Parameters edit screen.
       All parameter data are displayed with default values. The newly created position data file is added to the Project window.

   (f) 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 (for F3YP22/24/28) to display the above New – Positioning Module screen.
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.

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.

<table>
<thead>
<tr>
<th>Positioning Module Type</th>
<th>Registered Parameter Filename Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>F3YP22-0P</td>
<td>YPUP201</td>
</tr>
<tr>
<td>F3YP24-0P</td>
<td>YPUP202</td>
</tr>
<tr>
<td>F3YP28-0P</td>
<td>YPUP203</td>
</tr>
</tbody>
</table>
B3.1.3 Registered Parameters Screen Layout

There are 3 Registered Parameters tab screens. We describe here how to perform editing on these screens.

1. **Axis Parameters**
2. **Counter Registered Parameters**
3. **Counter Control Parameters**

**TIP**
For the F3YP28-0P module, axis parameters are displayed in two separate tabs for each of axes 1 to 4 and 5 to 8.
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 registered 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.

■ 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 registered 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.
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.

## Advanced Editing Functions

### Modifying the value of a cell

1. In a registered 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.
Hiding/showing a column of cells

1. In a registered 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 registered parameter edit screen also displays the same command menu.
- The menu displays [Show] if some columns or cells are hidden. Else it displays [Hide].

Converting the unit of the speed

1. In the registered parameter edit screen (6), (a) click the [Convert Speed] button.

2. (b) or (c): Enter the speed value in the Convert Speed screen to allow the value to be automatically converted and displayed.

3. Copy the converted speed value.

4. Paste the copied speed value to the parameter field in the registered parameter edit screen.

5. In the Convert Speed screen, click the [Close] button to close the screen.
B3.1.5 Relationship between Registered Parameters and Position Data Record

Registered parameters and position data record are closely related. The measurement unit of position data record is determined by registered parameters.

Although changing the unit of registered parameter values results in the change in the measurement unit of position data, the data value remains the same as before the unit change. Beware that the value will not be changed when you change the unit.
B3.2 Creating and Editing Position Data Record

Position data record is automatically generated when you create a registered parameter file.

SEE ALSO
For information on internal registers, see “Positioning Modules (with Multi-channel Pulse Output)” user’s manual (IM 34M06H55-04E).

B3.2.1 Opening Position Data Record

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

⇒ The Position Data Record edit screen is displayed.
B3.2.2 Position Data Record Screen Layout

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

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

Edit area

Error data are displayed with red background.
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.

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.
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.

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".
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)](image_url)
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**
   A message may also be displayed when you close an open online screen.

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.

**Sequence CPU**
Using ToolBox

**Sequence CPU**
Not using ToolBox

**Positioning Module**
Module to be used

- **WideField3**
  1. Download a program with the positioning module defined as 'Not Used' in the Input/Output setup of the Project Settings/configuration.
  2. Stop refreshing of input and output (X/Y) relays using the Debug/Maintenance menu.

---

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 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.

**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.

---

**Data Confirmation**

- **File**
  - File Name: FXP28
  - File: 2012/12/25-16:34:22

- **Module**
  - File Name: FXP28
  - File: 2012/12/25-16:34:22

**Test Data Selection**

- Project Data (do not upload)
- Module Data (Upload)

**Uploaded Data**

- Save to Temporary File (Discard)
- Overwrite Project Data

**Name To Be Uploaded**

- Registered Parameters
- Position Data Record

**Actions**

- Start
- Cancel

- This is the date for the data stored on the PC.
- This is the date for the data in the module to be used in the test.
- Performs test using data on PC without uploading data.
- Performs test using data in module after uploading data.
- Opens Action Test screen based on setup.
- Cancels action test or monitoring.

---

**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.**

**Select data to be uploaded. Registered parameters are always uploaded because they define the data range.**

**Saves uploaded data in the project. This has the same effect as performing a data upload from the module.**

---

**Select Data to be uploaded.**

- Registered Parameters
- Position Data Record

---

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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.

- File name and date/time
- Date/time when data was downloaded to the module. Up to 10 characters are stored for the file name.
- Starts downloading.
- Exits without downloading.
- Performs validation of parameter data.
- Specifies whether to store downloaded data to the ROM of the positioning module.
## 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.
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.

**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.

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

*1: (NNN) denotes a position data number.
## B5.1.4 Messages about Results of Comparison

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

### Table B5.2  List of Messages about Results of Comparison

<table>
<thead>
<tr>
<th>No.</th>
<th>Message</th>
<th>Description</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Execution completed successfully.</td>
<td>Comparison was completed successfully.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Execution was aborted.</td>
<td>The [ Abort ] button was clicked during comparison, and comparison was aborted.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Failed to read the NNN parameter (9999).</td>
<td>An error was encountered while reading the NNN parameter.</td>
<td>*1</td>
</tr>
<tr>
<td>4</td>
<td>The NNN parameter values (9999) do not match.</td>
<td>The value for the NNN parameter on ToolBox is different from the one for the NNN parameter on the module.</td>
<td>*1</td>
</tr>
<tr>
<td>5</td>
<td>Invalid module format.</td>
<td>The positioning module configuration on ToolBox is different from the one on FA-M3.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Communication server is busy.</td>
<td>The communication server is busy. WideField3 may be connected online to FA-M3.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Invalid dialog information file</td>
<td>Dialog information file was found to be damaged during online processing. The ToolBox environment file may have been changed by a user.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Memory error</td>
<td>Available memory is insufficient.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Comparison was not allowed because action test or action monitoring was in progress.</td>
<td>Comparison is not allowed during online processing of the positioning module. Close all online screens before comparison.</td>
<td></td>
</tr>
</tbody>
</table>

*1: NNN denotes one of the axis, counter registered, or counter control parameter.  
9999 denotes the register number of the NNN parameter in which there was an error.  
For details on the register number, see the chapter C1, "Technical Information."  
The following message is displayed if there would be an error during comparison of the positioning tool.  
The counter registered parameter values (801/802) do not match.

### SEE ALSO

For details on the comparison operation, see:  
Section B4.2, "Verifying Downloaded Registered Parameters" of the "FA-M3 ToolBox Manual".
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.
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

B6.1 What is Action Monitor?

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

![Diagram of Action Monitor functions]

- Axis monitor
- Monitors for various statuses
- XY relay monitor

**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. Click the [All Axes] button.
   ⇒ 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.
B6.2.2 Axis Monitor Screen
The Axis Monitor screen displays the following information.

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

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

Error display
Help

Counter status
I/O relays
Status of individual axes
Position/speed status
Error status
### Position/Speed Status

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

![Axis Monitor Screen](image)

**SEE ALSO**

For details on the displayed status information, see Subsection C1.4.3, "Axis Statuses". For further details, see "Positioning Modules (with Multi-channel Pulse Output) user's manual" (IM 34M06H55-04E).

**CAUTION**

On the screens for the Action Test function, the speed is always displayed in [pulse/s]. If the speed reference unit is set to \((1/65536)\) pulse/ms for the positioning module, the following expression is used to convert the unit to [pulse/s] and then the truncated whole number is displayed on the Current Speed monitor.

\[
\text{Value displayed on Current Speed monitor} = \frac{\text{Current value in module}}{65536} \times 1000
\]

Therefore, if the current speed in the module is 1 to 65 \((1/65536)\) pulse/ms, 0 [pulse/s] is displayed as the current speed.
All Axis Status

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

SEE ALSO
For details on the displayed status information, see Subsection C1.4.3, "Axis Statuses"
For further details, see "Positioning Modules (with Multi-channel Pulse Output) user's manual" (IM 34M06H55-04E).
Error Status

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

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 Modules (with Multi-channel Pulse Output) user's manual" (IM 34M06H55-04E).
Counter Status

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

SEE ALSO
For details on the displayed status information, see Subsection C1.5.3, "Counter Statuses"
For further details, see "Positioning Modules (with Multi-channel Pulse Output) user's manual" (IM 34M06H55-04E).
I/O Relay Status

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

SEE ALSO
For details on I/O relays, see Section C1.1, "List of I/O Relays".
For further details, see "Positioning Modules (with Multi-channel Pulse Output) user’s manual" (IM 34M06H55-04E).
This chapter describes how to adjust data downloaded to a positioning module and perform action tests.

- **Action Test Flow** → B7.1
- **Jog** → B7.2
- **Position Control** → B7.3
- **Origin Search** → B7.4
- **Manual Pulse Generator (MPG)** → B7.5
- **Counter** → B7.6

**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 Action 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**

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.

On the screens for the Action Test function, the speed is always displayed in [pulse/s]. If the speed reference unit is set to [(1/65536)pulse/ms] for the positioning module, the following expression is used to convert the unit to [(1/65536)pulse/ms], and then the truncated whole number is written to the positioning module:

\[
\text{Value written to the module} = \frac{\text{Input value} \times 65536}{1000}
\]

Do not perform an action test on multiple positioning modules at the same time.
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.

---

**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.

Specifies rate of acceleration or deceleration.
- Specifies target speed.

Displays the dialog box that allows the unit of the speed to be converted into [pulse/s] or [(1/65536)pulse/ms].

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 override value.

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.

Default values refer to registered parameter values.
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.

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.
B7.2 Jog

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

B7.2.1 Jog Screen Layout

Select different tabs to switch between action test screens.

Perform 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.

Constantly refreshes and displays the current position and speed. The speed is always displayed in [pulse/s].

Opens the Convert Speed screen.

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

Stops all axes immediately.

Exits from action test and closes the screen.

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

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

Selecting the [Position Control] tab on the Action Test screen displays the action test screen for position control.

B7.3.1 Position Control Screen Layout

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

- Specify target speed.
- Specify startup speed.
- Specify the acceleration time and deceleration time.
- Performs positioning.
- Sets up the override value.
- Enter target position data directly if the [Enter Value] option is selected.

SEE ALSO
For details on how to perform setup, see Section 8.8 "Positioning Operation" of "Positioning Modules (with Multi-channel Pulse Output) user’s manual" (IM 34M06H55-04E).
B7.3.2 Testing Position Control Movement

1. Select the axis to be tested as shown in Position Control Screen (1).
   ⇒ The selection button of the selected test axis changes color.

2. Specify the target position for the test axis. Two options are available for specifying the target position: [Position Data Record] and [Enter Value].
   TIP
   - If [Position Data Record] is selected, data values cannot be changed.
   - If the [INC] checkbox is selected, the entered position data value should be incremental from the current position.

3. Set up the target speed, acceleration and deceleration settings, and click [Start Positioning].
   ⇒ The test axis is moved to the target position.
   TIP
   - If [Position Data Record] is selected, target speed and acceleration/deceleration settings cannot be changed.
   - To use acceleration/deceleration settings 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.
B7.4 Origin Search

Two search modes are available: automatic and manual.

B7.4.1 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.

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

Performs positioning.

Specify the current position value.

For details on the parameters used in manual origin search mode, see Section 8.6.1, "Manual Origin Search" of "Positioning Modules (with Multi-channel Pulse Output) user’s manual" (IM 34M06H55-04E).
B7.4.2 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.

2. Set up the parameters, and click [Start Origin Search].
⇒ Origin search begins.
B7.5 Manual Pulse Generator (MPG)

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

B7.5.1 MPG Screen Layout

Select the axis for manual pulse generator.

Enter the values for the manual pulse generator.

Starts up manual pulse generator.

Stops manual pulse generator.

SEE ALSO

For details on how to set up individual parameters, see Section 8.5.2, "Manual Pulse Generator Mode" of "Positioning Modules (with Multi-channel Pulse Output) user’s manual" (IM 34M06H55-04E).
B7.5.2 Testing Manual Pulse Generator

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

2. Specify the target speed and other parameters for manual pulse generator mode and click [Startup].
   ⇒ Manual pulse generator is executed.
B7.6 Counter

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

B7.6.1 Counter Screen Layout and Testing Procedure

Select the axis for counter testing.

Set up the current position of the counter. You can specify the value to set up the current value.

Allow you to set the counter contact output to [Forced ON] or [Forced OFF].

Disable or enable the software counter.

Select a counter control command and execute it.

SEE ALSO

For details on how to set up each parameter, see Chapter 9, "Counter Programs" of "Positioning Modules (with Multi-channel Pulse Output) user's manual" (IM 34M06H55-04E).
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.

![Upload Module Screen Diagram](image)

- **File name and date/time**
- **Date/time when data was downloaded to the module**
- **Starts uploading**
- **Exits without uploading.**
- **Uploading from Modules**

   ⇒ 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.
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.

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

3. Select the items to be printed.

4. Verify the print setup, and click [Preview] to preview the printout.
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.

### 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.
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.

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)).
This section describes how to reuse position data record.

**Reusing Position Data Record**

1. Open Explorer, and select the position data file to be reused.
   - **TIP**
     The file extension is in the form of "abc. YPPO201", "abc. YPPO202" or "abc. YPPO203". "abc" denotes the filename.

2. Copy and then paste the position data file to the folder to be reused.
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.
B9.4 Printing Various Data Types

- Printing Position Data

**CAUTION**

Before printing a position data file using Excel, we recommend that you make a copy of the file in case inadvertent damage to the file makes it inaccessible to ToolBox.

1. **Open Explorer, and select the position data file to be printed.**

   **TIP**

   The file extension is in the form of "abc.YPPO201", "abc.YPPO202" or "abc.YPPO203". "abc" denotes the filename.

2. **Copy the position data file, and change its filename extension to "CSV".**

   **CAUTION**

   Do not modify the original position data file.

3. **Open the renamed position data file in Excel to display its contents.**

4. **Select [Print] from Excel's menu bar to print the data.**
This chapter describes registered parameters, 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
- Counter Statuses → 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.

⚠️ CAUTION

- For the F3YP22-0P module, NEVER set the output relays for axes 3 to 8; moreover, input relays for axes 3 to 8 have no meaning.
- For the F3YP24-0P module, NEVER set the output relays for axes 5 to 8; moreover, input relays for axes 5 to 8 have no meaning.
## 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. Note that "□□□□" in the table represents the number of the FA-M3 slot where the positioning module is installed.

### Table C1.1 List of Input Relays

<table>
<thead>
<tr>
<th>Input Relay No.</th>
<th>Signal</th>
<th>Description</th>
<th>Relationship with Other Relays</th>
</tr>
</thead>
<tbody>
<tr>
<td>X□□□□1</td>
<td>AX1 Execute Command ACK</td>
<td>Turns on when command execution for axis 1 is successfully completed.</td>
<td>Turning off Y□□□□□□33 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□2</td>
<td>AX2 Execute Command ACK</td>
<td>Turns on when command execution for axis 2 is successfully completed.</td>
<td>Turning off Y□□□□□□34 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□3</td>
<td>AX3 Execute Command ACK</td>
<td>Turns on when command execution for axis 3 is successfully completed.</td>
<td>Turning off Y□□□□□□35 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□4</td>
<td>AX4 Execute Command ACK</td>
<td>Turns on when command execution for axis 4 is successfully completed.</td>
<td>Turning off Y□□□□□□36 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□5</td>
<td>AX5 Execute Command ACK</td>
<td>Turns on when command execution for axis 5 is successfully completed.</td>
<td>Turning off Y□□□□□□37 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□6</td>
<td>AX6 Execute Command ACK</td>
<td>Turns on when command execution for axis 6 is successfully completed.</td>
<td>Turning off Y□□□□□□38 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□7</td>
<td>AX7 Execute Command ACK</td>
<td>Turns on when command execution for axis 7 is successfully completed.</td>
<td>Turning off Y□□□□□□39 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□8</td>
<td>AX8 Execute Command ACK</td>
<td>Turns on when command execution for axis 8 is successfully completed.</td>
<td>Turning off Y□□□□□□40 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□9</td>
<td>AX1 Stop Immediately ACK</td>
<td>Turns on when a Stop Immediately command for axis 1 is successfully completed.</td>
<td>Turning off Y□□□□□□41 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□10</td>
<td>AX2 Stop Immediately ACK</td>
<td>Turns on when a Stop Immediately command for axis 2 is successfully completed.</td>
<td>Turning off Y□□□□□□42 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□11</td>
<td>AX3 Stop Immediately ACK</td>
<td>Turns on when a Stop Immediately command for axis 3 is successfully completed.</td>
<td>Turning off Y□□□□□□43 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□12</td>
<td>AX4 Stop Immediately ACK</td>
<td>Turns on when a Stop Immediately command for axis 4 is successfully completed.</td>
<td>Turning off Y□□□□□□44 turns off this relay.</td>
</tr>
<tr>
<td>X□□□□13</td>
<td>AX5 Stop Immediately ACK</td>
<td>Turns on when a Stop Immediately command for axis 5 is successfully completed.</td>
<td>Turning off Y□□□□□□45 turns off this relay.</td>
</tr>
<tr>
<td></td>
<td>/Counter Input Relay 1</td>
<td>/Turns on the flag assigned to the counter relay 1.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□14</td>
<td>AX6 Stop Immediately ACK</td>
<td>Turns on when a Stop Immediately command for axis 6 is successfully completed.</td>
<td>Turning off Y□□□□□□46 turns off this relay.</td>
</tr>
<tr>
<td></td>
<td>/Counter Input Relay 2</td>
<td>/Turns on the flag assigned to the counter relay 2.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□15</td>
<td>AX7 Stop Immediately ACK</td>
<td>Turns on when a Stop Immediately command for axis 7 is successfully completed.</td>
<td>Turning off Y□□□□□□47 turns off this relay.</td>
</tr>
<tr>
<td></td>
<td>/Counter Input Relay 3</td>
<td>/Turns on the flag assigned to the counter relay 3.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□16</td>
<td>AX8 Stop Immediately ACK</td>
<td>Turns on when a Stop Immediately command for axis 8 is successfully completed.</td>
<td>Turning off Y□□□□□□48 turns off this relay.</td>
</tr>
<tr>
<td></td>
<td>/Counter Input Relay 4</td>
<td>/Turns on the flag assigned to the counter relay 4.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□17</td>
<td>AX1 Error Detected</td>
<td>Turns on when an error occurs on axis 1.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□18</td>
<td>AX2 Error Detected</td>
<td>Turns on when an error occurs on axis 2.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□19</td>
<td>AX3 Error Detected</td>
<td>Turns on when an error occurs on axis 3.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□20</td>
<td>AX4 Error Detected</td>
<td>Turns on when an error occurs on axis 4.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□21</td>
<td>AX5 Error Detected</td>
<td>Turns on when an error occurs on axis 5.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□22</td>
<td>AX6 Error Detected</td>
<td>Turns on when an error occurs on axis 6.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□23</td>
<td>AX7 Error Detected</td>
<td>Turns on when an error occurs on axis 7.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□24</td>
<td>AX8 Error Detected</td>
<td>Turns on when an error occurs on axis 8.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□25</td>
<td>AX1 Positioning Completed</td>
<td>Turns on when a positioning operation for axis 1 is completed.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□26</td>
<td>AX2 Positioning Completed</td>
<td>Turns on when a positioning operation for axis 2 is completed.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□27</td>
<td>AX3 Positioning Completed</td>
<td>Turns on when a positioning operation for axis 3 is completed.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□28</td>
<td>AX4 Positioning Completed</td>
<td>Turns on when a positioning operation for axis 4 is completed.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□29</td>
<td>AX5 Positioning Completed</td>
<td>Turns on when a positioning operation for axis 5 is completed.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□30</td>
<td>AX6 Positioning Completed</td>
<td>Turns on when a positioning operation for axis 6 is completed.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□31</td>
<td>AX7 Positioning Completed</td>
<td>Turns on when a positioning operation for axis 7 is completed.</td>
<td>-</td>
</tr>
<tr>
<td>X□□□□32</td>
<td>AX8 Positioning Completed</td>
<td>Turns on when a positioning operation for axis 8 is completed.</td>
<td>-</td>
</tr>
</tbody>
</table>

*1: For the F3YP22-0P and F3YP24-0P modules, these input relays work as the counter input relays 1 to 4. For the F3YP28-0P module, you can select whether to use them as the Stop Immediately ACK relays for positioning functions or as the counter input relays 1 to 4.
### C1.1.2 Output Relays

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

Note that "" in the table represents the number of the FA-M3 slot where the positioning module is installed.

<table>
<thead>
<tr>
<th>Output Relay No.</th>
<th>Signal Description</th>
<th>Relationship with Other Relays</th>
</tr>
</thead>
<tbody>
<tr>
<td>AX1 Execute Command</td>
<td>Request to execute a command for axis 1</td>
<td>Turn this relay off after confirming that X0001 has turned on.</td>
</tr>
<tr>
<td>AX2 Execute Command</td>
<td>Request to execute a command for axis 2</td>
<td>Turn this relay off after confirming that X0002 has turned on.</td>
</tr>
<tr>
<td>AX3 Execute Command</td>
<td>Request to execute a command for axis 3</td>
<td>Turn this relay off after confirming that X0003 has turned on.</td>
</tr>
<tr>
<td>AX4 Execute Command</td>
<td>Request to execute a command for axis 4</td>
<td>Turn this relay off after confirming that X0004 has turned on.</td>
</tr>
<tr>
<td>AX5 Execute Command</td>
<td>Request to execute a command for axis 5</td>
<td>Turn this relay off after confirming that X0005 has turned on.</td>
</tr>
<tr>
<td>AX6 Execute Command</td>
<td>Request to execute a command for axis 6</td>
<td>Turn this relay off after confirming that X0006 has turned on.</td>
</tr>
<tr>
<td>AX7 Execute Command</td>
<td>Request to execute a command for axis 7</td>
<td>Turn this relay off after confirming that X0007 has turned on.</td>
</tr>
<tr>
<td>AX8 Execute Command</td>
<td>Request to execute a command for axis 8</td>
<td>Turn this relay off after confirming that X0008 has turned on.</td>
</tr>
<tr>
<td>AX1 Stop Immediately</td>
<td>Request to stop axis 1 immediately</td>
<td>Turn this relay off after confirming that X0009 has turned on.</td>
</tr>
<tr>
<td>AX2 Stop Immediately</td>
<td>Request to stop axis 2 immediately</td>
<td>Turn this relay off after confirming that X0010 has turned on.</td>
</tr>
<tr>
<td>AX3 Stop Immediately</td>
<td>Request to stop axis 3 immediately</td>
<td>Turn this relay off after confirming that X0011 has turned on.</td>
</tr>
<tr>
<td>AX4 Stop Immediately</td>
<td>Request to stop axis 4 immediately</td>
<td>Turn this relay off after confirming that X0012 has turned on.</td>
</tr>
<tr>
<td>AX5 Stop Immediately</td>
<td>Request to stop axis 5 immediately</td>
<td>Turn this relay off after confirming that X0013 has turned on.</td>
</tr>
<tr>
<td>AX6 Stop Immediately</td>
<td>Request to stop axis 6 immediately</td>
<td>Turn this relay off after confirming that X0014 has turned on.</td>
</tr>
<tr>
<td>AX7 Stop Immediately</td>
<td>Request to stop axis 7 immediately</td>
<td>Turn this relay off after confirming that X0015 has turned on.</td>
</tr>
<tr>
<td>AX8 Stop Immediately</td>
<td>Request to stop axis 8 immediately</td>
<td>Turn this relay off after confirming that X0016 has turned on.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output Relay No.</th>
<th>Signal Description</th>
<th>Relationship with Other Relays</th>
</tr>
</thead>
<tbody>
<tr>
<td>AX1 Forward Jog</td>
<td>Forward jog request for axis 1</td>
<td></td>
</tr>
<tr>
<td>AX2 Forward Jog</td>
<td>Forward jog request for axis 2</td>
<td></td>
</tr>
<tr>
<td>AX3 Forward Jog</td>
<td>Forward jog request for axis 3</td>
<td></td>
</tr>
<tr>
<td>AX4 Forward Jog</td>
<td>Forward jog request for axis 4</td>
<td></td>
</tr>
<tr>
<td>AX5 Forward Jog</td>
<td>Forward jog request for axis 5</td>
<td></td>
</tr>
<tr>
<td>AX6 Forward Jog</td>
<td>Forward jog request for axis 6</td>
<td></td>
</tr>
<tr>
<td>AX7 Forward Jog</td>
<td>Forward jog request for axis 7</td>
<td></td>
</tr>
<tr>
<td>AX8 Forward Jog</td>
<td>Forward jog request for axis 8</td>
<td></td>
</tr>
<tr>
<td>AX1 Reverse Jog</td>
<td>Reverse jog request for axis 1</td>
<td></td>
</tr>
<tr>
<td>AX2 Reverse Jog</td>
<td>Reverse jog request for axis 2</td>
<td></td>
</tr>
<tr>
<td>AX3 Reverse Jog</td>
<td>Reverse jog request for axis 3</td>
<td></td>
</tr>
<tr>
<td>AX4 Reverse Jog</td>
<td>Reverse jog request for axis 4</td>
<td></td>
</tr>
<tr>
<td>AX5 Reverse Jog</td>
<td>Reverse jog request for axis 5</td>
<td></td>
</tr>
<tr>
<td>AX6 Reverse Jog</td>
<td>Reverse jog request for axis 6</td>
<td></td>
</tr>
<tr>
<td>AX7 Reverse Jog</td>
<td>Reverse jog request for axis 7</td>
<td></td>
</tr>
<tr>
<td>AX8 Reverse Jog</td>
<td>Reverse jog request for axis 8</td>
<td></td>
</tr>
</tbody>
</table>
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>
<thead>
<tr>
<th>Data Position No. (Word Basis)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001 to 0040</td>
<td>AX1 Registered Parameters</td>
</tr>
<tr>
<td>0041 to 0080</td>
<td>AX1 Command Parameters</td>
</tr>
<tr>
<td>0081 to 0100</td>
<td>AX1 Status</td>
</tr>
<tr>
<td>0101 to 0140</td>
<td>AX2 Registered Parameters</td>
</tr>
<tr>
<td>0141 to 0180</td>
<td>AX2 Command Parameters</td>
</tr>
<tr>
<td>0181 to 0200</td>
<td>AX2 Status</td>
</tr>
<tr>
<td>0201 to 0240</td>
<td>AX3 Registered Parameters</td>
</tr>
<tr>
<td>0241 to 0280</td>
<td>AX3 Command Parameters</td>
</tr>
<tr>
<td>0281 to 0300</td>
<td>AX3 Status</td>
</tr>
<tr>
<td>0301 to 0340</td>
<td>AX4 Registered Parameters</td>
</tr>
<tr>
<td>0341 to 0380</td>
<td>AX4 Command Parameters</td>
</tr>
<tr>
<td>0381 to 0400</td>
<td>AX4 Status</td>
</tr>
<tr>
<td>0401 to 0440</td>
<td>AX5 Registered Parameters</td>
</tr>
<tr>
<td>0441 to 0480</td>
<td>AX5 Command Parameters</td>
</tr>
<tr>
<td>0481 to 0500</td>
<td>AX5 Status</td>
</tr>
<tr>
<td>0501 to 0540</td>
<td>AX6 Registered Parameters</td>
</tr>
<tr>
<td>0541 to 0580</td>
<td>AX6 Command Parameters</td>
</tr>
<tr>
<td>0581 to 0600</td>
<td>AX6 Status</td>
</tr>
<tr>
<td>0601 to 0640</td>
<td>AX7 Registered Parameters</td>
</tr>
<tr>
<td>0641 to 0680</td>
<td>AX7 Command Parameters</td>
</tr>
<tr>
<td>0681 to 0700</td>
<td>AX7 Status</td>
</tr>
<tr>
<td>0701 to 0740</td>
<td>AX8 Registered Parameters</td>
</tr>
<tr>
<td>0741 to 0780</td>
<td>AX8 Command Parameters</td>
</tr>
<tr>
<td>0781 to 0800</td>
<td>AX8 Status</td>
</tr>
<tr>
<td>0801 to 0980</td>
<td>Counter Parameters and Statuses</td>
</tr>
<tr>
<td>0981 to 1000</td>
<td>Common Statuses for All Axes</td>
</tr>
<tr>
<td>1001 to 1100</td>
<td>AX1 Position Data Record</td>
</tr>
<tr>
<td>1101 to 1200</td>
<td>AX2 Position Data Record</td>
</tr>
<tr>
<td>1201 to 1300</td>
<td>AX3 Position Data Record</td>
</tr>
<tr>
<td>1301 to 1400</td>
<td>AX4 Position Data Record</td>
</tr>
<tr>
<td>1401 to 1500</td>
<td>AX5 Position Data Record</td>
</tr>
<tr>
<td>1501 to 1600</td>
<td>AX6 Position Data Record</td>
</tr>
<tr>
<td>1601 to 1700</td>
<td>AX7 Position Data Record</td>
</tr>
<tr>
<td>1701 to 1800</td>
<td>AX8 Position Data Record</td>
</tr>
<tr>
<td>1801 to</td>
<td>(System reserved)</td>
</tr>
</tbody>
</table>
This section lists status information common to all axes.

### Table C1.4  List of Axis Common Statuses

<table>
<thead>
<tr>
<th>Data Position No.</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0981</td>
<td>Module Information</td>
<td>&quot;F3&quot;</td>
</tr>
<tr>
<td>0982</td>
<td>Module Information</td>
<td>&quot;YP&quot;</td>
</tr>
<tr>
<td>0983</td>
<td>Module Information</td>
<td>&quot;22&quot;, &quot;24&quot;, or &quot;28&quot;</td>
</tr>
<tr>
<td>0984</td>
<td>Module Information</td>
<td>&quot;0P&quot;</td>
</tr>
<tr>
<td>0985</td>
<td>Module Information</td>
<td>&quot; &quot;</td>
</tr>
<tr>
<td>0986</td>
<td>Module Information</td>
<td>&quot; &quot;</td>
</tr>
<tr>
<td>0987</td>
<td>Module Information</td>
<td>&quot;RV&quot;</td>
</tr>
<tr>
<td>0988</td>
<td>Module Information</td>
<td>&quot;DD&quot; (&quot;DD&quot; represents a revision data.)</td>
</tr>
<tr>
<td>0989</td>
<td>(System reserved)</td>
<td></td>
</tr>
<tr>
<td>0990</td>
<td>Pulse Output External 24V</td>
<td>0: Off</td>
</tr>
<tr>
<td></td>
<td>Power Source</td>
<td>1: On</td>
</tr>
<tr>
<td>0991-992</td>
<td>No. of Write Operations to Flash Memory</td>
<td>Value starts from 0 [times]</td>
</tr>
<tr>
<td>0993-1000</td>
<td>(System reserved)</td>
<td></td>
</tr>
</tbody>
</table>
# 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)

<table>
<thead>
<tr>
<th>Data Position No. (Word Basis)</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| *01                             | Speed Mode Selection      | Bit 0: Maximum speed selection  
0: Standard mode, 1: High-speed mode  
Bit 1: Command speed unit selection  
0: (1/65536) pulse/ms, 1: pulse/s  
Bit 2: Acceleration/deceleration time unit selection  
0: ms, 1: 0.01 ms (10 us)  
[Factory default: 0] |
| *02                             | 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 default: 0] |
| *03                             | Motor Direction Selection | 0: Forward movement produces CW pulse output  
1: Reverse movement produces CW pulse output  
[Factory default: 0] |
| *04                             | Contact Input Setting     | $0000 or greater (bit data for each contact)  
(Settings for NO contact, NC contact, and filter)  
[Factory default: 0] |
| *05/06                          | Forward Limit             | -2,147,483,648 to 2,147,483,647 [pulses]  
[Factory default: 2,147,483,647] |
| *07/08                          | Reverse Limit             | -2,147,483,648 to (Forward Limit -1) [pulses]  
[Factory default: -2,147,483,648] |
| *09/10                          | Speed Limit               | 1 to 7,996,000 [pulse/s]  
1 to 524,025,856 [(1/65536) pulse/ms]  
(The unit varies depending on the setting of the command speed unit selection of the Speed Mode Selection. The upper limit is restricted by the maximum speed selection and the pulse output mode.)  
[Factory default: 32,751,616 [(1/65536) pulse/ms]] |
| *11                             | AOS Mode                  | 0: Use origin switch  
1: Do not use origin switch (limit switch)  
[Factory default: 0] |
| *12                             | AOS Direction             | 0: Reverse, 1: Forward  
[Factory default: 0] |
| *13/14                          | AOS Speed 1               | 1 to Speed Limit [command speed unit*1]  
[Factory default: 655360 [(1/65536) pulse/ms]] |
| *15/16                          | AOS Speed 2               | 1 to AOS Speed 1 [command speed unit*1]  
[Factory default: 655360 [(1/65536) pulse/ms]] |
| *17/18                          | AOS Startup Speed         | 0 to AOS Speed 2 [command speed unit*1]  
[Factory default: 0 [(1/65536) pulse/ms]] |
| *19                             | AOS Acceleration Time     | 0 to 32767 [acceleration/deceleration time unit*2]  
[Factory default: 1000 [ms]] |
| *20                             | AOS Deceleration Time     | 0 to 32767 [acceleration/deceleration time unit*2]  
[Factory default: 1000 [ms]] |
| *21                             | AOS Z-phase Edge Selection| 0: Rising edge, 1: Falling edge  
[Factory default: 0] |
| *22                             | AOS Z-phase Search Count  | 0 to 32767 [pulses]  
[Factory default: 0] |
| *23/24                          | AOS Z-phase Search Range  | 0 to 2,147,483,647/AOS Z-phase Search Count [pulses]  
[Factory default: 2,147,483,647] |
| *25                             | AOS Deviation Pulse Clear Time | 0 to 32767 [ms]  
[Factory default: 1000] |
| *26/27                          | AOS Offset                | -2,147,483,648 to 2,147,483,647 [pulses]  
[Factory default: 0] |
| *28                             | (System reserved)         | Do not set a value other than 0.  
[Factory default: 0] |
| *29                             | Unlimited Rotation Setting| 0: Detect an overflow error during jogging or MPG mode  
1: Do not detect an overflow error during jogging or MPG mode  
[Factory default: 0] |
| *30  | Z-phase Setting       | 0: Do not use Z-phase filter  
1: Use at frequency of 1 Mpps or less  
2: Use at frequency of 500 Kpps or less.  
3: Use at frequency of 100 Kpps or less.  
[Factory default: 0] |
|------|----------------------|----------------------------------------------------------------------------------|
| *31  | Deviation Pulse Clear Setting | 0: Automatic output (the output is performed according to the deviation pulse clear time during manual origin search or automatic origin search.)  
1: Program output (the output is performed in any timing by a program.)  
[Factory default: 0] |
| *32  | (System reserved)    | Do not set a value other than 0.  
[Factory default: 0] |
| *33/34 | Acceleration Setting | 0 to 2,147,483,647 [command speed unit]  
[Factory default: 32751 [(1/65536) pulse/ms/ms]] |
| *35/36 | Deceleration Setting | 0 to 2,147,483,647 [command speed unit]  
[Factory default: 32751 [(1/65536) pulse/ms/ms]] |
| *37/38 | (System reserved)    | Do not set a value other than 0.  
[Factory default: 0] |
| *39  | Pulse Output External Power Source Detection Setting | 0: Do not detect errors on external power source for pulse output  
1: Detect errors on external power source for pulse output  
(Only the setting for axis 1 is valid. The setting for axis 1 is applied also to axes 2 to 8.)  
[Factory default: 0] |
| *40  | (System reserved)    | Do not set a value other than 0.  
[Factory default: 0] |

The symbol '*' represents the value of (axis number -1). The values for axis 1 to axis 8 are 0 to 7, respectively.

*1: The command speed unit is the unit selected for the command speed unit selection of the Speed Mode Selection registered parameter.

*2: The acceleration/deceleration time unit is the unit selected for the acceleration/deceleration time unit selection of the Speed Mode Selection registered parameter.
## C1.4.2 Axis Command Parameters

### Table C1.6 List of Axis Command Parameters

<table>
<thead>
<tr>
<th>Data Position No. (Word Basis)</th>
<th>Parameter Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*41</td>
<td>Command Code 0 to 32,767</td>
</tr>
<tr>
<td>*42</td>
<td>Target Position Mode /Position Data Record No. In direct operation: 0: Using ABS position, 1: Using INC position. In position data record operation: 1 to 10 [Position data record number]</td>
</tr>
<tr>
<td>*43/*44</td>
<td>Target Position Reverse limit to forward limit [pulses]</td>
</tr>
<tr>
<td>*45</td>
<td>Accel/Decel Mode 0: Trapezoidal acceleration/deceleration (With startup speed), 1: S-shape acceleration/deceleration</td>
</tr>
<tr>
<td>*46/*47</td>
<td>Target Speed In position control mode: 1 to Speed Limit [command speed unit∗1], In speed control mode: -1(Speed Limit) to Speed Limit [command speed unit∗1]</td>
</tr>
<tr>
<td>*48</td>
<td>Acceleration Time 0 to 32,767 [acceleration/deceleration time unit∗1], -1: Default acceleration</td>
</tr>
<tr>
<td>*49</td>
<td>Deceleration Time 0 to 32,767 [acceleration/deceleration time unit∗1], -1: Default deceleration</td>
</tr>
<tr>
<td>*50/*51</td>
<td>Startup Speed 0 to target speed [command speed unit∗1] (valid only for trapezoidal acceleration/deceleration)</td>
</tr>
<tr>
<td>*52</td>
<td>Origin Search Mode $0000 to $0FFF (Specify details as bit data.)</td>
</tr>
<tr>
<td>*53</td>
<td>Origin Search Direction 0: Reverse, 1: Forward</td>
</tr>
<tr>
<td>*54</td>
<td>Z-phase Edge Selection 0: Rising edge, 1: Falling edge</td>
</tr>
<tr>
<td>*55</td>
<td>Z-phase Search Count 0 to 32,767 [pulses]</td>
</tr>
<tr>
<td>*56/*57</td>
<td>Z-phase Search Range 0 to 2,147,483,647/Z-phase Search Count [pulses]</td>
</tr>
<tr>
<td>*58</td>
<td>Deviation Pulse Clear Time 0 to 32,767 [ms]</td>
</tr>
<tr>
<td>*59</td>
<td>(System reserved) Do not set a value other than 0.</td>
</tr>
<tr>
<td>*60</td>
<td>Manual Pulse Generator M Value -32,768 to 32,767</td>
</tr>
<tr>
<td>*61</td>
<td>Manual Pulse Generator N Value 1 to 32,767</td>
</tr>
<tr>
<td>*62</td>
<td>Manual Pulse Generator Filter 0 to 10,000 [ms]</td>
</tr>
<tr>
<td>*63</td>
<td>Trigger Setting 0: Software trigger 1: Contact input trigger 2: Counter status trigger 3: Counter zone coincidence trigger 4: Positioning Completed input relay trigger</td>
</tr>
<tr>
<td>*64</td>
<td>Trigger Axis Setting 0, 1 to 8 axes (If set to 0, an axis from which the command is issued is used.)</td>
</tr>
<tr>
<td>*65</td>
<td>Trigger Contact Setting 0: Reverse limit input 1: Forward limit input 2: Origin input</td>
</tr>
<tr>
<td>*66</td>
<td>Counter Status Trigger Setting $0000 or greater (bit data)</td>
</tr>
<tr>
<td>*67</td>
<td>Counter Zone Coincidence Trigger Setting $0000 or greater (bit data)</td>
</tr>
<tr>
<td>*68</td>
<td>(System reserved) Do not set a value other than 0.</td>
</tr>
<tr>
<td>*69</td>
<td>Preset Override Value 1 to 500 [%]</td>
</tr>
<tr>
<td>*70 to *76</td>
<td>(System reserved) Do not set a value other than 0.</td>
</tr>
<tr>
<td>*77∗2</td>
<td>Software Trigger Request 1: A software trigger is activated by writing &quot;1&quot; during a software trigger wait state.</td>
</tr>
<tr>
<td>*78∗2</td>
<td>Deviation Pulse Clear Request 0: Deviation pulse clear signal Off 1: Deviation pulse clear signal On (Valid only when program output is selected for the Deviation Pulse Clear Setting registered parameter.)</td>
</tr>
<tr>
<td>*79 to *80</td>
<td>(System reserved) Do not set a value other than 0.</td>
</tr>
</tbody>
</table>

The symbol "∗" represents the value of (axis number-1). The values for axis 1 to axis 8 are 0 to 7, respectively.

*1: The command speed unit is the unit selected for the command speed unit selection of the Speed Mode Selection registered parameter.

*2: The acceleration/deceleration time unit is the unit selected for the acceleration/deceleration time unit selection of the Speed Mode Selection registered parameter.

*3: Unlike other parameters, Software Trigger Request and Deviation Pulse Clear Request are not the parameters to be set when a command is executed, but are used to start a specific operation immediately when a value is set to them.
### C1.4.3 Axis Statuses

#### Table C1.7 List of Axis Statuses

<table>
<thead>
<tr>
<th>Data Position No. (Word Basis)</th>
<th>Status Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>*81/*82</td>
<td>Target Position Status</td>
<td>-2,147,483,648 to 2,147,483,647 [pulses]</td>
</tr>
<tr>
<td>*83/*84</td>
<td>Current Position Status</td>
<td>-2,147,483,648 to 2,147,483,647 [pulses]</td>
</tr>
<tr>
<td>*85/*86</td>
<td>Current Speed Status</td>
<td>-(Speed Limit) to Speed Limit [command speed unit]</td>
</tr>
<tr>
<td>*87</td>
<td>Contact Input Status</td>
<td>States of contact inputs (bit data)</td>
</tr>
<tr>
<td>*88</td>
<td>Error Status</td>
<td>Error information when an error occurs</td>
</tr>
<tr>
<td>*89</td>
<td>Warning Status</td>
<td>Warning information when a warning is raised</td>
</tr>
<tr>
<td>*90</td>
<td>Origin Search Status</td>
<td>Status related to an origin search operation</td>
</tr>
<tr>
<td>*91</td>
<td>Extended Status</td>
<td>Operation status such as accelerating, decelerating, and changing speed (bit data)</td>
</tr>
<tr>
<td>*92/*93</td>
<td>No. of Write Operations to Flash Memory</td>
<td>Value starts from 0 [times]</td>
</tr>
<tr>
<td>*94</td>
<td>Current Override Value Status</td>
<td>1 to 500 [%]</td>
</tr>
</tbody>
</table>

The symbol *"* represents the value of (axis number -1). The values for axis 1 to axis 8 are 0 to 7, respectively.

*1: The command speed unit is the unit selected for the command speed unit selection of the Speed Mode Selection registered parameter.

#### Table C1.8 List of Axis Statuses (Data Position Numbers for Long-word Access)

<table>
<thead>
<tr>
<th>Axis</th>
<th>Status</th>
<th>Data Position No. (Word Basis)</th>
<th>Data Position No. (Long-word Basis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Target Position Status</td>
<td>081/082</td>
<td>041</td>
</tr>
<tr>
<td>1</td>
<td>Current Position Status</td>
<td>083/084</td>
<td>042</td>
</tr>
<tr>
<td>1</td>
<td>Current Speed Status</td>
<td>085/086</td>
<td>043</td>
</tr>
<tr>
<td>2</td>
<td>Target Position Status</td>
<td>181/182</td>
<td>091</td>
</tr>
<tr>
<td>2</td>
<td>Current Position Status</td>
<td>183/184</td>
<td>092</td>
</tr>
<tr>
<td>2</td>
<td>Current Speed Status</td>
<td>185/186</td>
<td>093</td>
</tr>
<tr>
<td>3</td>
<td>Target Position Status</td>
<td>281/282</td>
<td>141</td>
</tr>
<tr>
<td>3</td>
<td>Current Position Status</td>
<td>283/284</td>
<td>142</td>
</tr>
<tr>
<td>3</td>
<td>Current Speed Status</td>
<td>285/286</td>
<td>143</td>
</tr>
<tr>
<td>4</td>
<td>Target Position Status</td>
<td>381/382</td>
<td>191</td>
</tr>
<tr>
<td>4</td>
<td>Current Position Status</td>
<td>383/384</td>
<td>192</td>
</tr>
<tr>
<td>4</td>
<td>Current Speed Status</td>
<td>385/386</td>
<td>193</td>
</tr>
<tr>
<td>5</td>
<td>Target Position Status</td>
<td>481/482</td>
<td>241</td>
</tr>
<tr>
<td>5</td>
<td>Current Position Status</td>
<td>483/484</td>
<td>242</td>
</tr>
<tr>
<td>5</td>
<td>Current Speed Status</td>
<td>485/486</td>
<td>243</td>
</tr>
<tr>
<td>6</td>
<td>Target Position Status</td>
<td>581/582</td>
<td>291</td>
</tr>
<tr>
<td>6</td>
<td>Current Position Status</td>
<td>583/584</td>
<td>292</td>
</tr>
<tr>
<td>6</td>
<td>Current Speed Status</td>
<td>585/586</td>
<td>293</td>
</tr>
<tr>
<td>7</td>
<td>Target Position Status</td>
<td>681/682</td>
<td>341</td>
</tr>
<tr>
<td>7</td>
<td>Current Position Status</td>
<td>683/684</td>
<td>342</td>
</tr>
<tr>
<td>7</td>
<td>Current Speed Status</td>
<td>685/686</td>
<td>343</td>
</tr>
<tr>
<td>8</td>
<td>Target Position Status</td>
<td>781/782</td>
<td>391</td>
</tr>
<tr>
<td>8</td>
<td>Current Position Status</td>
<td>783/784</td>
<td>392</td>
</tr>
<tr>
<td>8</td>
<td>Current Speed Status</td>
<td>785/786</td>
<td>393</td>
</tr>
</tbody>
</table>
## C1.5 Counter Statuses

This area stores counter parameters and statuses.

### C1.5.1 Counter Registered Parameters

<table>
<thead>
<tr>
<th>Data Position No. (Word Basis)</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>801/802</td>
<td>Counter Count Mode Setting</td>
<td>0: Phase A/B (x1) 1: Phase A/B (x2) 2: Phase A/B (x4) 3: CW/CCW pulse 4: Travel/direction reverse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>803/804</td>
<td>Counter Filter Setting</td>
<td>0: Do not use filter 1: Use at frequency of 1 M pulse/s or less. 2: Use at frequency of 500 K pulse/s or less. 3: Use at frequency of 100 K pulse/s or less.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>805/806</td>
<td>Counter Action Mode Setting</td>
<td>0: Linear Counter (Coded 32 bit fixed) 1: Ring Counter (0 to the Preset Ring Counter Value) 2: Ring Counter (Coded 32 bit fixed)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>807/808</td>
<td>Preset Ring Counter Value</td>
<td>1 to 2,147,483,647 [pulses] (This parameter is valid only when Counter Action Mode Setting is &quot;1: Ring counter&quot;. Set the number of counts per revolution -1.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 2,147,483,647)</td>
</tr>
<tr>
<td>809/810</td>
<td>Counter Contact Input Setting</td>
<td>$00000000 or greater (bit data for each contact) (Settings for NO contact, NC contact, and filter)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>811/812</td>
<td>Counter Z-phase Input Setting</td>
<td>$00000000 or greater (bit data) (This parameter specifies a filter and also the Z-phase input for an axis used as a counter Z-phase input.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>813/814</td>
<td>Counter Contact Z-phase Input Function Layout</td>
<td>$00000000 or greater (bit data) (This parameter assigns the counter enable, counter preset, and counter latch functions to the contact inputs and Z-phase input.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>815/816</td>
<td>Counter Contact Output 1 Layout</td>
<td>$00000000 or greater (bit data) (This parameter specifies a status to be assigned to the counter contact output 1.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>817/818</td>
<td>Counter Contact Output 2 Layout</td>
<td>$00000000 or greater (bit data) (This parameter specifies a status to be assigned to the counter contact output 2.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>819/820</td>
<td>Counter Coincidence Direction Setting</td>
<td>$00000000 or greater (bit data) (This parameter specifies the method of counter coincidence detection.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>821/822</td>
<td>Counter Input Relay Setting</td>
<td>0: Counter Input Relay Not In Use 1: Counter Input Relay In Use (For F3YP28-0P, X☐☐13 to X☐☐16 are used as Stop Immediately ACK relays.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>823/824</td>
<td>Counter Input Relay 1 Layout</td>
<td>$00000000 or greater (bit data) (This parameter specifies a status to be assigned to the counter input relay 1.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>825/826</td>
<td>Counter Input Relay 2 Layout</td>
<td>$000000000 or greater (bit data) (This parameter specifies a status to be assigned to the counter input relay 2.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>827/828</td>
<td>Counter Input Relay 3 Layout</td>
<td>$00000000 or greater (bit data) (This parameter specifies a status to be assigned to the counter input relay 3.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>829/830</td>
<td>Counter Input Relay 4 Layout</td>
<td>$00000000 or greater (bit data) (This parameter specifies a status to be assigned to the counter input relay 4.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
<tr>
<td>831/832</td>
<td>(System reserved)</td>
<td>Do not set a value other than 0.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Factory default: 0)</td>
</tr>
</tbody>
</table>
# C1.5.2 Counter Control Parameters

Table C1.10  List of Counter Control Parameters

<table>
<thead>
<tr>
<th>Data Position No. (Word Basis)</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>847/848</td>
<td>Counter Registered Parameters Request</td>
<td>Requests to register the counter registered parameters. Writing &quot;1&quot; to this parameter performs the request to register the counter registered parameters. Reading this parameter returns &quot;0&quot; for normal termination or returns the error code if an error occurs.</td>
</tr>
<tr>
<td>849/850</td>
<td>Counter Control Command Request</td>
<td>Executes a counter control command corresponding to the command code written to this parameter.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: Counter Coincidence Detection 1 Latch Clear Request</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2: Counter Coincidence Detection 2 Latch Clear Request</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3: Overflow/Underflow Error Detection Latch Clear Request</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4: External Counter Latch Occurrence 1 Detection Latch Clear Request</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5: External Counter Latch Occurrence 2 Detection Latch Clear Request</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11: Counter Preset Request</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12: CNT Latched Request 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13: CNT Latched Request 2</td>
</tr>
<tr>
<td>851/852</td>
<td>Counter Enable Control</td>
<td>$00000000 or greater (bit data)</td>
</tr>
<tr>
<td>853/854</td>
<td>Counter Contact Output 1 Control</td>
<td>$00000000 or greater (bit data)</td>
</tr>
<tr>
<td>855/856</td>
<td>Counter Contact Output 2 Control</td>
<td>$00000000 or greater (bit data)</td>
</tr>
<tr>
<td>857/858</td>
<td>Counter Preset Value</td>
<td>-2,147,483,648 to 2,147,483,647 [pulses]</td>
</tr>
<tr>
<td>859/860</td>
<td>Preset Counter Coincidence Value 1</td>
<td>-2,147,483,648 to 2,147,483,647 [pulses]</td>
</tr>
<tr>
<td>861/862</td>
<td>Preset Counter Coincidence Value 2</td>
<td>-2,147,483,648 to 2,147,483,647 [pulses]</td>
</tr>
<tr>
<td>863/864</td>
<td>(System reserved)</td>
<td>Do not set a value other than 0.</td>
</tr>
<tr>
<td>865/866</td>
<td>Counter Zone 1 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>867/868</td>
<td>Counter Zone 1 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>869/870</td>
<td>Counter Zone 2 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>871/872</td>
<td>Counter Zone 2 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>873/874</td>
<td>Counter Zone 3 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>875/876</td>
<td>Counter Zone 3 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>877/878</td>
<td>Counter Zone 4 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>879/880</td>
<td>Counter Zone 4 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>881/882</td>
<td>Counter Zone 5 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>883/884</td>
<td>Counter Zone 5 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>885/886</td>
<td>Counter Zone 6 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>887/888</td>
<td>Counter Zone 6 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>889/890</td>
<td>Counter Zone 7 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>891/892</td>
<td>Counter Zone 7 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>893/894</td>
<td>Counter Zone 8 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>895/896</td>
<td>Counter Zone 8 Upper Limit</td>
<td>-2,147,483,648 to 2,147,483,647 [pulses]</td>
</tr>
<tr>
<td>897/898</td>
<td>Counter Zone 9 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>899/900</td>
<td>Counter Zone 9 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>901/902</td>
<td>Counter Zone 10 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>903/904</td>
<td>Counter Zone 10 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>905/906</td>
<td>Counter Zone 11 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>907/908</td>
<td>Counter Zone 11 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>909/910</td>
<td>Counter Zone 12 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>911/912</td>
<td>Counter Zone 12 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>913/914</td>
<td>Counter Zone 13 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>915/916</td>
<td>Counter Zone 13 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>917/918</td>
<td>Counter Zone 14 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>919/920</td>
<td>Counter Zone 14 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>921/922</td>
<td>Counter Zone 15 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>923/924</td>
<td>Counter Zone 15 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>925/926</td>
<td>Counter Zone 16 Lower Limit</td>
<td></td>
</tr>
<tr>
<td>927/928</td>
<td>Counter Zone 16 Upper Limit</td>
<td></td>
</tr>
<tr>
<td>929 to 950</td>
<td>(System reserved)</td>
<td>Do not set a value other than 0.</td>
</tr>
</tbody>
</table>
### C1.5.3 Counter Statuses

**Table C1.11 List of Counter Statuses**

<table>
<thead>
<tr>
<th>Data Position No. (Word Basis)</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>833/834</td>
<td>Counter Bit Status</td>
<td>Operation information (bit data) including counter coincidence detection, high-speed contact input/output, zone coincidence detection</td>
</tr>
<tr>
<td>835/836</td>
<td>Counter Current Position Status</td>
<td>-2,147,483,648 to 2,147,483,647 [pulses]</td>
</tr>
<tr>
<td>837/838</td>
<td>CNT Latched Position 1 Status</td>
<td>-2,147,483,648 to 2,147,483,647 [pulses]</td>
</tr>
<tr>
<td>839/840</td>
<td>CNT Latched Position 2 Status</td>
<td>-2,147,483,648 to 2,147,483,647 [pulses]</td>
</tr>
<tr>
<td>841/842</td>
<td>Counter Speed Status</td>
<td>-8,000,000 to 8,000,000 [pulse/s]</td>
</tr>
<tr>
<td>843 to 846</td>
<td>(System reserved)</td>
<td></td>
</tr>
</tbody>
</table>
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