CKD

ABSODEX PC
Setting Software

AX-Tools

INSTRUCTION MANUAL

Read this instruction manual thoroughly before using the product.
Among all, carefully read the descriptions related to safety.
Keep this instruction manual handy for use at any time.

2023-09-21 SM-A63470-A/2

Introduction

This document is an instruction manual for AX-Tools (Ver. 3).
For AX-Tools earlier than version 3, refer to the instruction manual for earlier than Ver. 3.
This document provides basic information on how to install and use AX-Tools (Ver. 3) to make full use of its performance. Read this manual carefully for proper use. Keep this instruction manual in a safe place not to be lost.

Specifications and appearance described in this instruction manual are subject to change without notice.

We do not guarantee the contents, accuracy, and safety of the information provided with this software, or marketability or applicability of the information for special purposes.
CKD Corporation shall be exempt from any losses caused by this software.

For Safe Use

To ensure the safe use of our products, it is important to properly select, use, handle, and maintain the products.
Be sure to observe the warnings and cautions described in this instruction manual to ensure the safety of the device.
Although various safety measures have been implemented for this product, mishandling by you may result in accidents. To avoid such accidents, be sure to read this instruction manual thoroughly and fully understand its contents before use.

Precautions are divided into three categories: "DANGER," "WARNING," and "CAUTION" to clearly indicate the degree of harm, the magnitude of damage, and the likelihood of occurrence.

DANGER	If mishandled, there is an imminent risk of death or serious injury.
WARNING	If mishandled, there is a possibility of death or serious injury.
CAUTION	If mishandled, there is a possibility of personal injury or property damage.

Note that even the matters described under "CAUTION" may lead to serious consequences in some circumstances.
Be sure to follow all precautions as they contain important information.

The following icon provides general precautions and usage tips.

- Indicates general precautions and usage tips.

Contents

1. Product Overview

1.1. Operating environment

The following environment is required to operate this software.

OS	Windows® 10
Display	Recommended resolution 1920 x 1080 (HDTV) or higher Minimum resolution 1280 x 800 (WXGA)
USB port	Compliant with USB 2.0 standard

- Windows is a registered trademark of the Microsoft Corporation, registered in the US, Japan and other countries.
- Other company and product names used in this document are trademarks or registered trademarks of the respective companies.
- AX-Tools can be used in both 32-bit and 64-bit versions of the above operating system.
- AX-Tools works in a Windows 10 desktop environment.

1.2. AX-Tools compatible models

Depending on the version of AX-Tools, some drivers may not be connected, or some features may not be available. Be sure to use the latest AX-Tools. The driver to use and the corresponding AX-Tools version are listed below.

Driver	AX-Tools version
AXD-S, AXD-H, TS, TH, MU, XS type	Ver.3.*.*.*

1.3. License agreement

CKD Corporation owns all the rights to this software (including programs, data, text, images, manuals, etc.). You need to agree the following terms to use the software.

- This software may not be reproduced or modified, nor be transferred, sold, rent, or distributed to third parties.
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- Manuals and other printed materials may not be duplicated.
- CKD Corporation may terminate this license agreement if you violate this agreement. In such a case, you may not use the software at all.
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- CKD Corporation shall be exempt from any losses caused by this software.
- This software is subject to change without prior notice.

1.4. Precautions for use

CAUTION

Do not put Windows into sleep mode (standby) while AX-Tools is active.
- This can cause a communication error when returning from sleep mode.

Do not attach/detach the USB cable or turn the driver power on/off during transmission/reception with the driver.
- The driver or AX-Tools may malfunction.

Do not run multiple AX-Tools instances on one PC at the same time.
- This may cause a communication error, and the driver or actuator may operate unexpectedly.

Exit AX-Tools when attaching/detaching connectors or turning the power on/off.

If a communication error occurs, check the USB communication cable connection (for example, check for broken wires).

When using this software, terminate other communication software.
- This software cannot be used simultaneously with other communication software that uses the USB communication interface.

Use the USB communication cable when communicating with the driver.
- Refer to the instruction manual of the corresponding actuator or driver for connection with the USB communication cable.

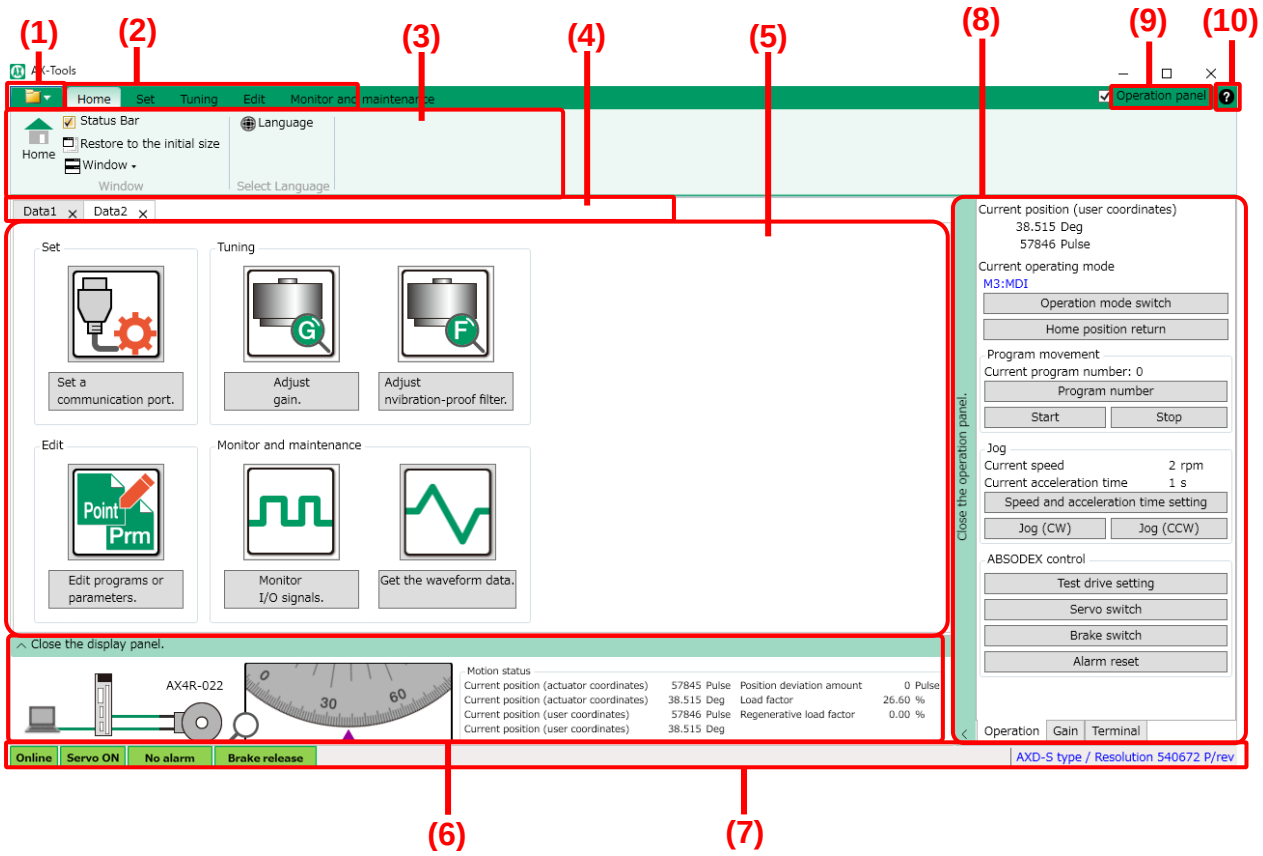
AX-Tools is setting software for the following drivers:
- TS, TH, MU, and XS types
- AXD-S and AXD-H types

Some functions are restricted for discontinued models (GS, GH, S, H, and C types and older types of drivers).

This software cannot be used with NXD series drivers.

1.5. AX-Tools screen configuration

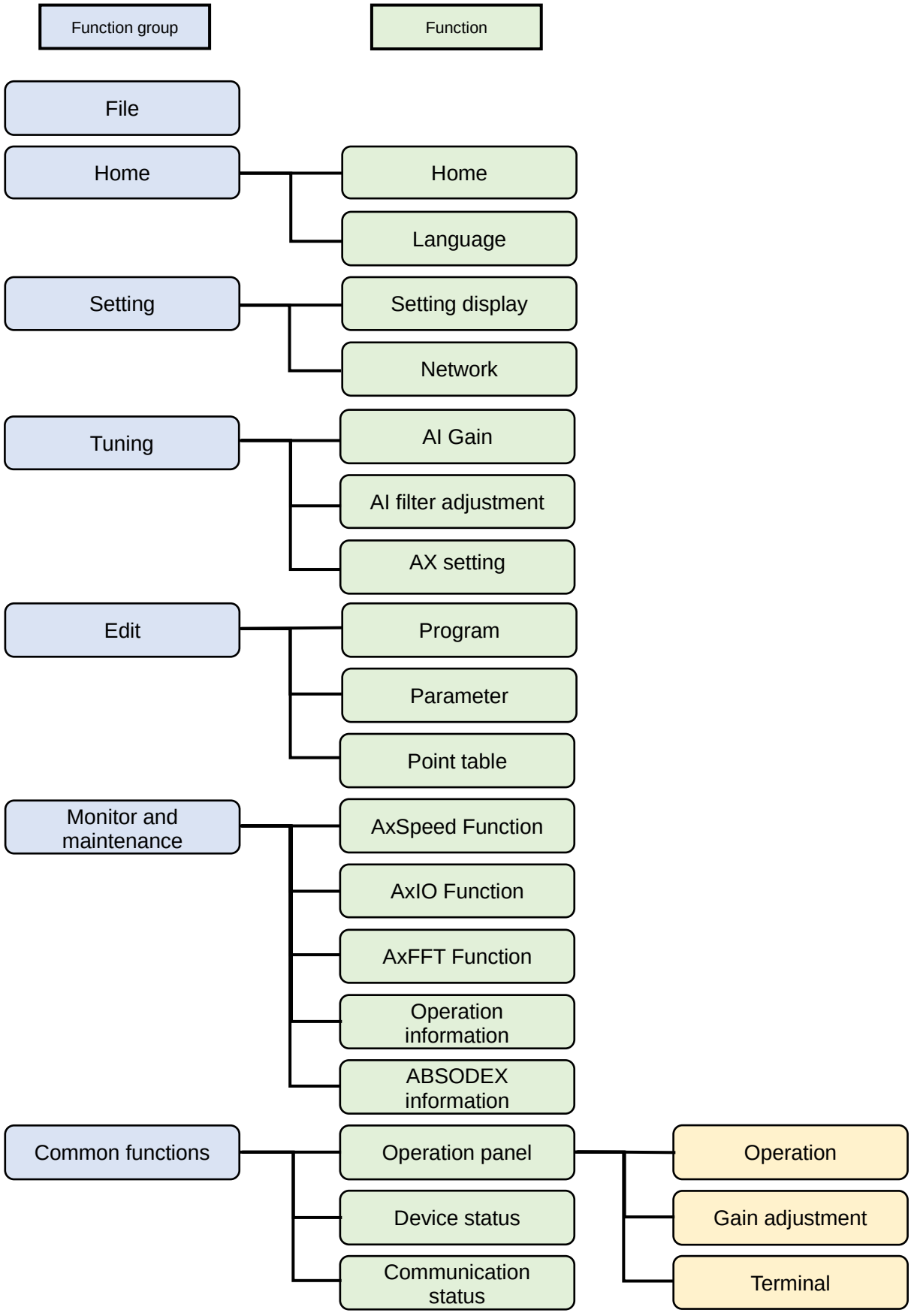
AX-Tools screen consists of the following elements.



No.	Name	Description
(1)	**File tab**	Execute file operations.
(2)	**Ribbon tab**	Display the AX-Tools function groups, which can be selected to switch the ribbon menu.
(3)	**Ribbon menu**	Display the operation buttons for the function group.
(4)	**Window tab**	This tab allows you to select an operation target. If there are multiple windows, multiple tabs are displayed. This tab is not displayed if there is only one tab.
(5)	**View**	The selected function can be used.
(6)	**Display panel**	Display the status of the PC, driver, and actuator.
(7)	**Communication status bar**	Display the communication status of the driver.
(8)	**Operation panel**	Actuator operation can be checked when online. Switches between three tabs: "Operation," "Gain," and "Terminal."
(9)	**Operation panel check box**	Open or close the operation panel.
(10)	**Help button**	Display the software version of AX-Tools.

1.6. Application configuration

The application is configured as follows.



1.7. AX-Tools operation mode

The available functions and views according to the AX-Tools operation mode are as follows.

Function/view		Operation mode			Remarks
		Online	Offline	Actuator not connected	
Home	Home	○	○	○	-
	Language	○	○	○	-
Setting	Setting display	○	×	○	-
	Network	○	×	○	-
Tuning	AI Gain	○	×	×	-
	AI filter adjustment	○	×	×	-
	AX setting	○	×	○	-
	ABSODEX initialization	○	×	○	-
Edit	Program	○	△	○	Programs cannot be read, written, or compared offline.
	Parameter	○	△	○	Parameters cannot be read, written, or compared offline.
	Point table	○	△	○	Point tables cannot be read, written, or compared offline.
	Home position offset	○	×	○	-
	Change driver type	○	○	○	-
	Editorial data clearance	○	○	○	-
	Editorial data usage	○	○	○	-
	ABSODEX initialization	○	×	○	-
Monitor and maintenance	AxSpeed Function	○	△	○	Speed waveforms cannot be read offline.
	AxIO Function	○	△	△	I/O signals cannot be monitored offline or when the actuator is not connected.
	AxFFT Function	○	△	△	FFT waveforms cannot be read offline or when the actuator is not connected.

* ○: All functions can be used. △: Some functions can be used. ×: All functions cannot be used.

Function/view		Operation mode			Remarks
		Online	Offline	Actuator not connected	
Monitor and maintenance	Operation information	○	×	○	-
	ABSODEX information	○	×	○	-
Common functions	Operation panel	○	×	△	Cannot be operated offline. Terminal can be used even if the actuator is not connected.
	Display panel	○	△	○	When offline, the connection status is displayed in gray, and the operation status becomes "***."
	Communication status	○	△	○	When offline, only "Offline" is displayed.
	Version information	○	○	○	-

* ○: All functions can be used. △: Some functions can be used. ×: All functions cannot be used.

2. Installation

2.1. Getting the installer

Get the AX-Tools installer from our website (https://www.ckd.co.jp/).

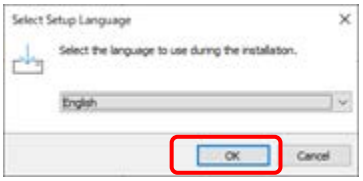
2.2. Installing AX-Tools

CAUTION

To prevent errors, terminate all programs before starting installation.

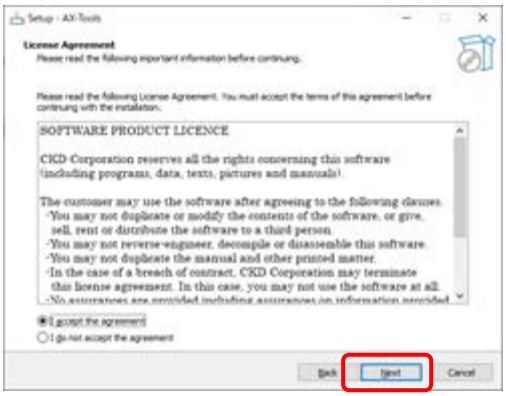
1. Double-click "setup.exe" to start the installer.

2. Select a language and select [OK].

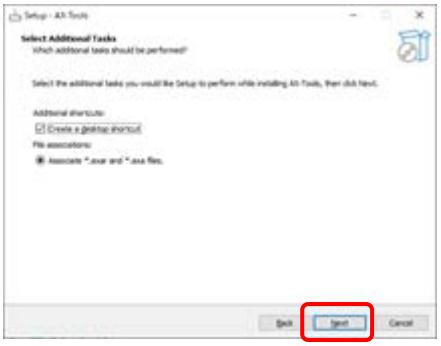


3. Agree the license agreement.

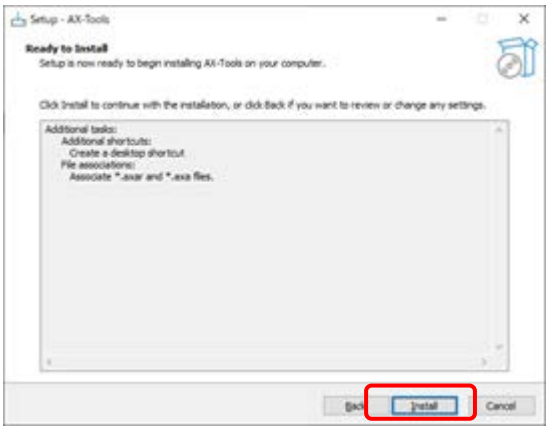
Select "I accept the agreement" and then select [Next].



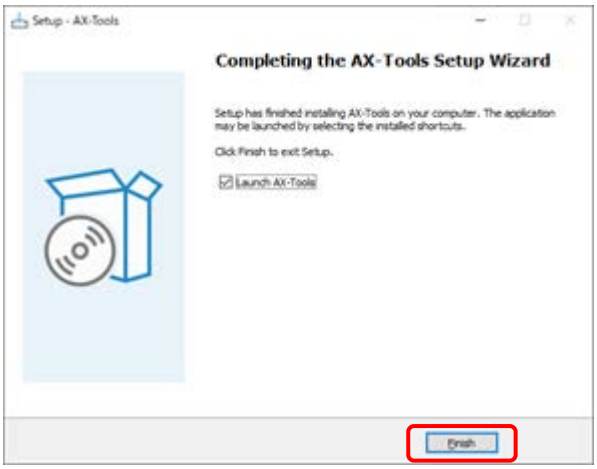
4. Select [Next] in "Select Additional Tasks."



5. The "Ready to Install" dialog is displayed. Select [Install] to start the installation.



6. After the installation is complete, the installation completion dialog appears. Select [Finish] to close the dialog.



3. Usage

CAUTION

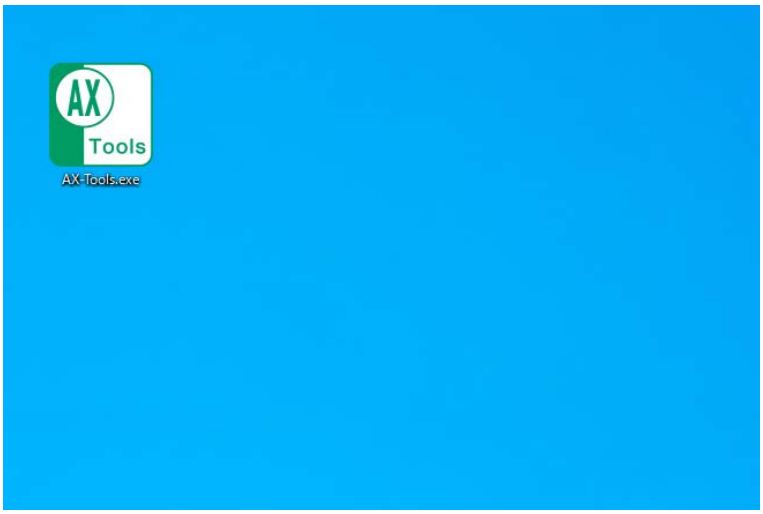
Be careful that there is no interfere with the machine, keep away from the moving part of the actuator, and confirm safety.

When making adjustments using AX-Tools, read the product's instruction manual carefully and use it correctly.
- The actuator may move unexpectedly in the adjustment stage.

3.1. Start-up and exit

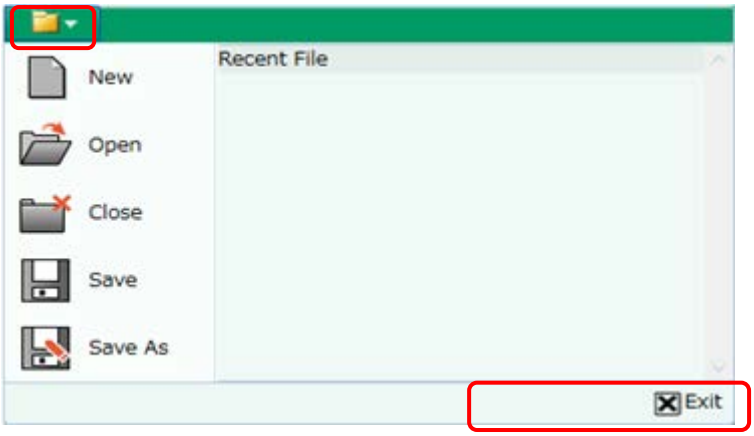
3.1.1. Start-up

To start AX-Tools, double-click AX-Tools.exe.
The [New] dialog appears. For details about the [New] dialog, refer to "3.2.2 New."



3.1.2. Exit

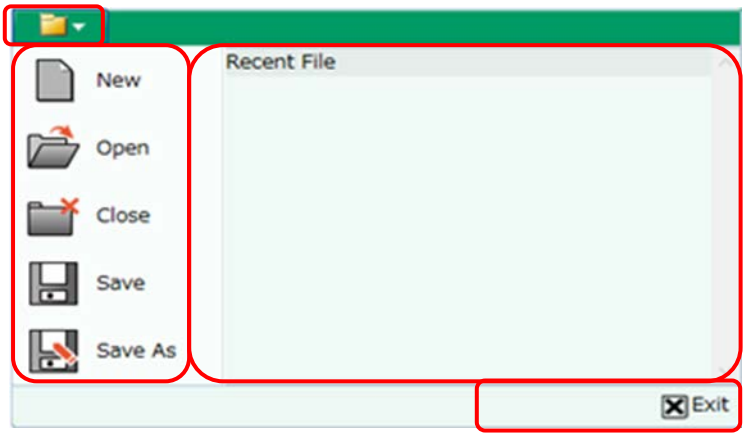
To exit AX-Tools, click the [x] button in the window. Alternatively, open the [File] tab and click the [Exit] button.



3.2. [File] tab

3.2.1. Overview of the [File] tab

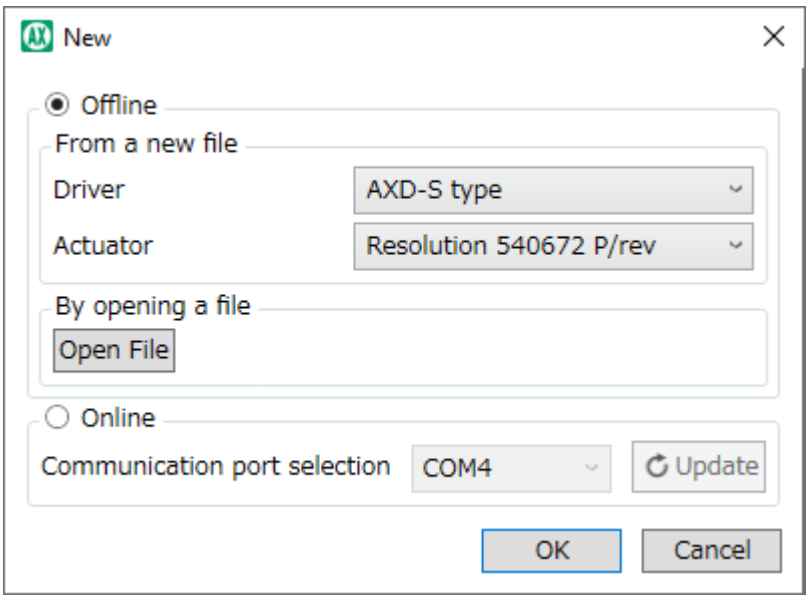
You can create a new file, open a file, close a file, save a file, and save as a file.
When the [File] tab is selected, the following menu appears.



Name	Description	Reference
New	Display the [New] dialog.	3.2.2
Open	Open an existing file.	3.2.3
Close	Close the active window tab.	3.2.3
Save	Save the file being edited.	3.2.4
Save As	Save the file being edited with a new name.	3.2.4
Recent File	Display up to 10 new and most recently used files (*.axa and *.axar formats). Select a file to open it.	—
Exit	End AX-Tools.	3.2.4

3.2.2. New

The [New] dialog box appears when you start AX-Tools or select the [New] button from the File tab.

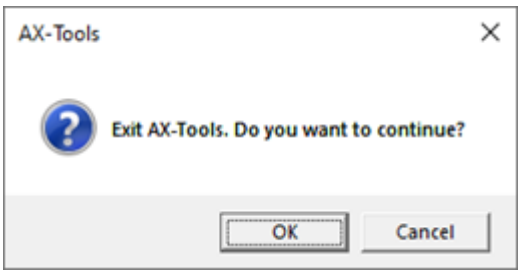


■ Offline

<From a new file>

Actuator is displayed only when "AXD-S type" or "AXD-H type" is selected for the driver type.

Select the relevant items and click the [OK] button to start AX-Tools without connecting to the driver.
If you click the [Cancel] button, the [New] dialog is canceled. If there are no other window tabs being edited, a confirmation message "Exit AX-Tools. Do you want to continue?" is displayed. If there are other window tabs being edited, the [New] dialog closes.



Name	Description
[OK] button	End AX-Tools.
[Cancel] button	Return to the [New] dialog.

<By opening a file>
If you click the [Open] button, the file selection dialog is displayed. The [New] dialog closes when a file is opened. If no file is selected in the file selection dialog, the [New] dialog remains open.

■ Online

[Communication port] displays the available COM ports. If no COM port is available, "-" is displayed. Click the [Update] button to update the available COM ports.

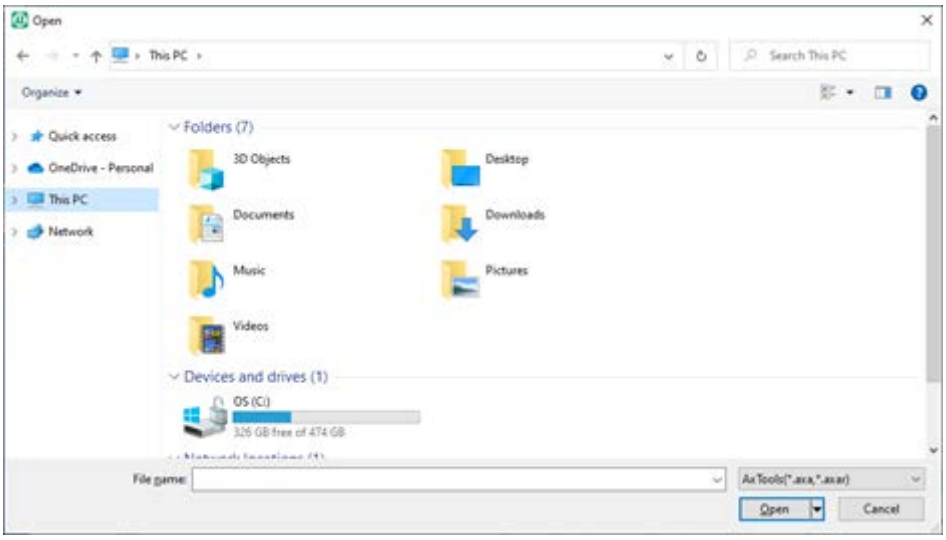
Select the COM port and click the [OK] button to start AX-Tools connected to the driver. If you click the [Cancel] button, the [New] dialog is canceled. If there are no other window tabs being edited, AX-Tools ends. If there are other window tabs being edited, the [New] dialog closes.

The COM port to which the driver (AX series, etc.) is connected can be checked by "Ports (COM & LPT)" in Device Manager, a standard function of Windows OS. Select the COM port described as "USB Serial Device" or "CDC USB Driver."

3.2.3. Open and close

<Open>

The file selection dialog appears, and when you open a file, AX-Tools starts with the [Home] tab selected.



Selectable file extensions are ".axar," ".axa," ".axw," ".axs," ".axf," ".axi," and ".txt."

* About the file extension

For information about data saved in ".axar" or ".axa" format files, refer to "3.2.4 Save and exit."
The ".axar" format files cannot be opened with AX-Tools earlier than Ver. 3.00.

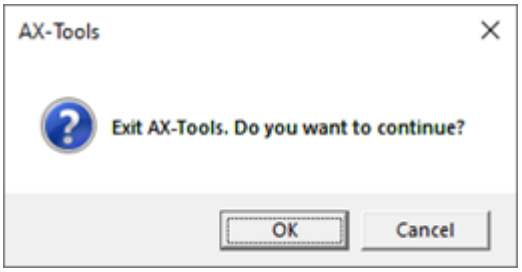
* About the extension ".txt"

This is the file format of the file that the information of the NC program data is saved.
The character code form is ANSI (Shift_JIS).

<Close>

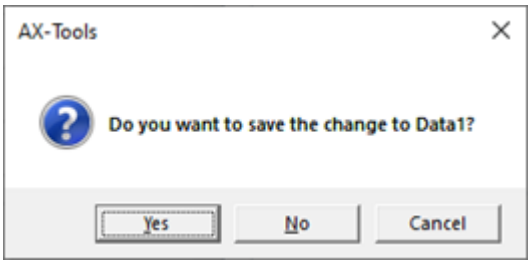
Close the active window tab. If there is only one window tab, AX-Tools exits after closing the window tab. For exiting AX-Tools, refer to "3.2.4 Save and exit."

If there is only one window tab, a confirmation message "Exit AX-Tools. Do you want to continue?" is displayed.



Name	Description
[OK] button	If the data is being edited, a confirmation message appears. If the data is not being edited, AX-Tools ends.
[Cancel] button	Close the dialog.

If you are editing a "program," "parameter," "point table," "AxSpeed," "AxFFT," or "AxIO" data, a confirmation message "Do you want to save your changes to Data1?" appears. The window tab name (file name) is assigned to Data1.



Name	Description
[Yes] button	After executing [Save] or [Save As] the file, close the window tab.
[No] button	Close the window tab without saving the file.
[Cancel] button	Close the dialog.

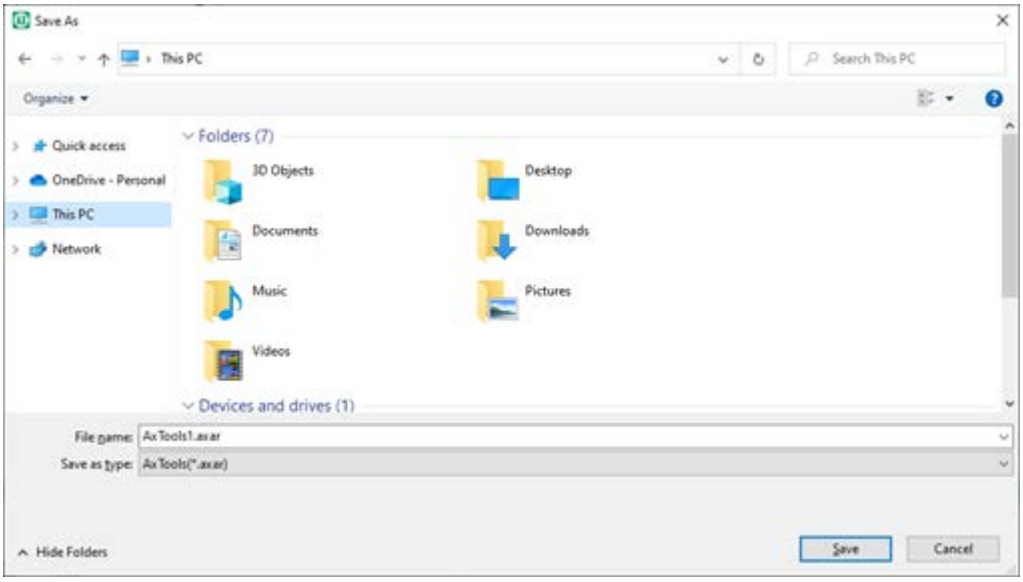
3.2.4. Save and exit

<Save>

Save the file being edited. For a newly created file, a save dialog the same as the "Save As" dialog is displayed.
Files with ".axar" or ".axa" extension store "program," "parameter," "point table," "AxSpeed," "AxFFT," "AxIO," and "ABSODEX information" data.

<Save As>

Put a name to the file being edited and save it. The following dialog appears.



Enter a file name and click the [Save] button.
The extension you can specify depends on the driver.

Driver	Extension
AXD-S and AXD-H types	".axar," ".txt"
Other than the above	".axa," ".axw," ".axs," ".axf," ".axi," ".txt"

* About the file extension
The standard extensions are ".axar" and ".axa."
A file in the ".axar" or ".axa," format contains the information of all the AX-Tools functions.
A file in the ".axw," ".axs," ".axf," or ".axi" format contains information of the function corresponding to the selected extension only.

* About the extension ".txt"
Use this extension to save the NC program data.
The extension ".txt" can be specified only on the [Edit] tab.

* About the extension ".axa"
If the NC program data is saved using the extension ".axa" after AI Gain adjustment, the information that the AI Gain adjustment result is incorporated is saved.

<Exit>

All window tabs close, and AX-Tools exits.

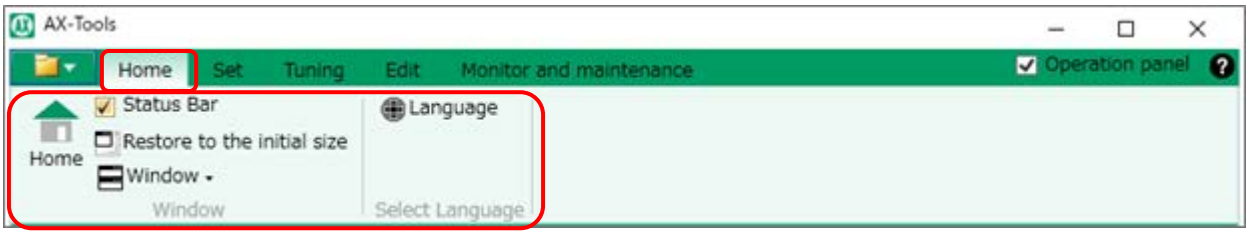
For information about closing window tabs, refer to "3.2.3 Open and close."

3.3. [Home] tab

3.3.1. Overview of the [Home] tab

Perform window operations, function switching, or language switching.

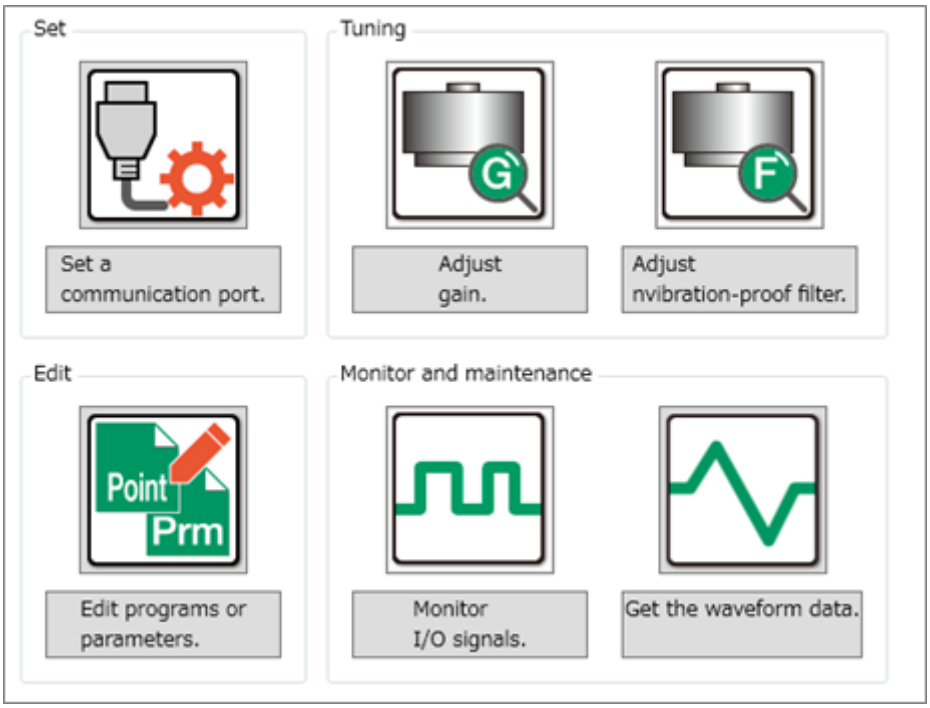
When the [Home] tab is selected, the following ribbon menu appears.



Name	Description	Reference
Home	Launch the "Home" view.	3.3.2
Status bar	Show or hide the status bar. If checked, the status bar is displayed. If unchecked, the status bar is hidden.	—
Restore to the initial size	Restore the AX-Tools window size to the default.	—
Window	Toggle the display when multiple window tabs are open.	3.3.3
Language	Switch the language to display. The selected language will be enabled after restarting.	3.3.4

3.3.2. Home

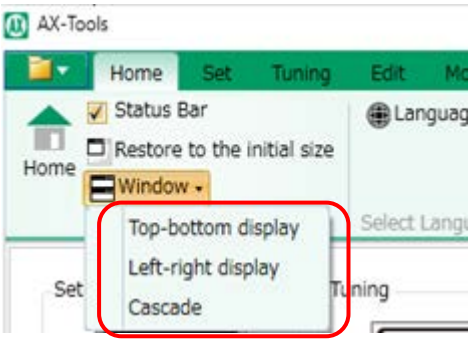
Click the [Home] button to launch the following view.



Name	Description
Set a communication port	Clicking the icon or button switches to the [Setting] tab and launches the "Setting display" view.
Adjust gain	Clicking the icon or button switches to the [Tuning] tab and launches the "AxSpeed" view. The operation panel changes to the [Tuning] tab.
Adjust vibration-proof filter	Clicking the icon or button switches to the [Tuning] tab and launches the "AxFFT" view.
Edit programs or parameters	Clicking the icon or button switches to the [Edit] tab and launches the "Program" view.
Monitor I/O signals	Clicking the icon or button switches to the [Monitor and maintenance] tab and launches the "AxIO" view.
Get the waveform data	Clicking the icon or button switches to the [Monitor and maintenance] tab and launches the "AxSpeed" view. The operation panel changes to the [Operation] tab.

3.3.3. Window

Display method of open window tabs is changed when there is more than one window tab being edited.

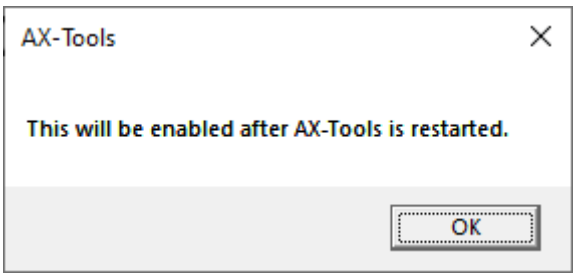


Name	Description
Top-bottom display	Display the selected window tab at the bottom.
Left-right display	Display the selected window tab on the right.
Cascade	Display all window tabs in a stack. This is the default display.

3.3.4. Language

Clicking the [Language] button launches the "Language" view. Setting is possible even offline.

Clicking the [Setting] button after selecting the language to use, the following message is displayed.



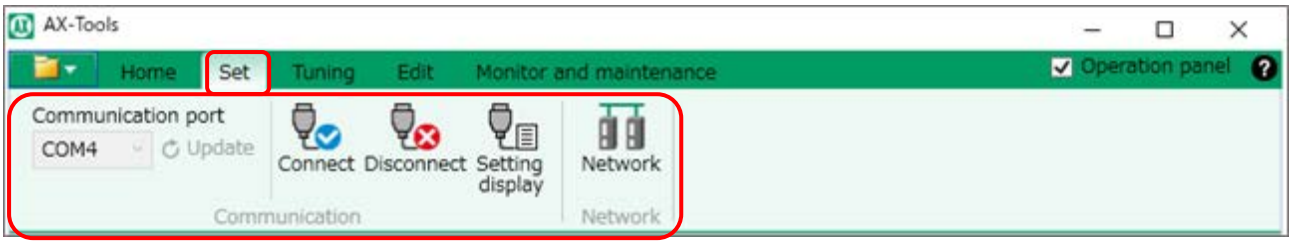
The selected language is enabled after AX-Tools restarts.

3.4. [Setting] tab

3.4.1. Overview of the [Setting] tab

Provide communication setting and display.

When the [Setting] tab is selected, the following ribbon menu appears.



Name	Description	Reference
Communication port	Select a communication port and update the communication port when online.	3.4.2
Connect	Connect to the port selected in [Communication port].	3.4.3
Disconnect	Release the selected port in [Communication port].	3.4.4
Setting display	Launch the "Setting display" view.	3.4.5
Network	Provide CC-Link, PROFIBUS, DeviceNet, EtherCAT, or EtherNet/IP setting.	3.4.6

3.4.2. Communication port

Available communication ports are displayed. If no communication port is available, "-" is displayed. If you click the [Communication port] dropdown list, you can select the communication port to connect from among the communication ports that can be connected to the driver.

Clicking the [Update] button updates the information about the available communication ports.

3.4.3. Connect

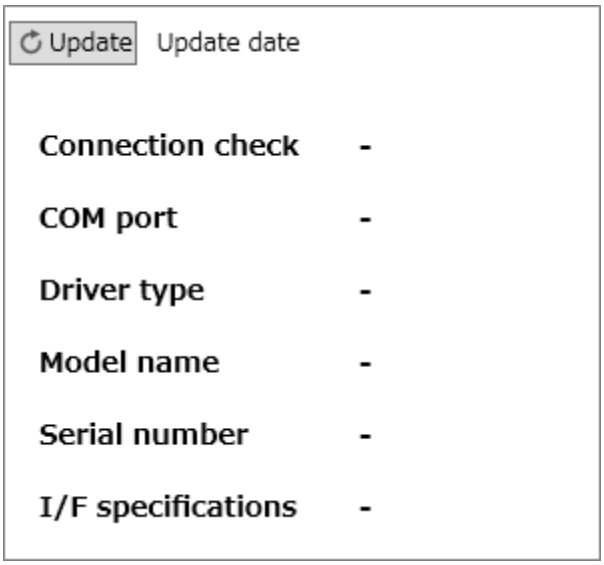
If you click the [Connect] button, the selected communication port is connected to the driver.
If the connection (open) fails, a message "Communication port could not open." is displayed.
If a disconnection occurs unintentionally during connection (other than when you click the [Disconnect] button), the connection will be reconnected automatically when the driver is recognized on the currently selected communication port.
However, if the driver is connected with a different port, you must click the [Disconnect] button, select the communication port again, and then click the [Connect] button.

3.4.4. Disconnect

If you click the [Disconnect] button, the currently connected communication port is closed (released).

3.4.5. Setting display

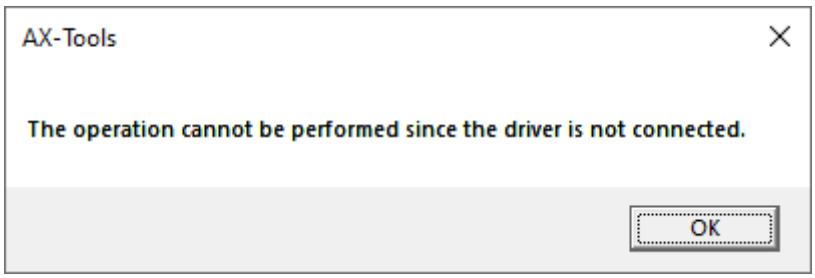
Clicking the [Setting display] button launches the "Setting display" view.



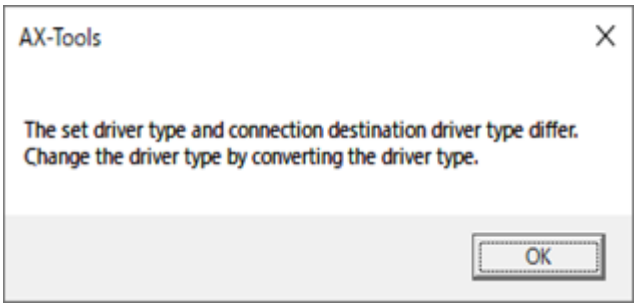
If you click the [Update] button, the setting information is updated. The following information is updated.

Name	Description
Update date	Display the date and time of the PC when the [Update] button was clicked.
Connection check	Display the connection status with the driver. When the connection is established, "OK" is displayed. When the connection is not established, "-" is displayed.
COM port	The COM port being connected is displayed. When the ABSODEX is not connected, "-" is displayed.
Driver type	The driver type of the ABSODEX being connected is displayed. When the ABSODEX is not connected, "-" is displayed.
Model name	The model name of the ABSODEX being connected is displayed. When the ABSODEX is not connected, "-" is displayed.
Serial number	Display the serial number of the driver. When the ABSODEX is not connected, "-" is displayed.
I/F specifications	The I/F specifications of the ABSODEX being connected is displayed. "Parallel I/O," "Parallel I/O (NPN)," "Parallel I/O (PNP)," "CC-Link," "PROFIBUS," "DeviceNet," "EtherCAT," or "EtherNet/IP" is displayed. Otherwise, "N/A" is displayed. When the ABSODEX is not connected, "-" is displayed.

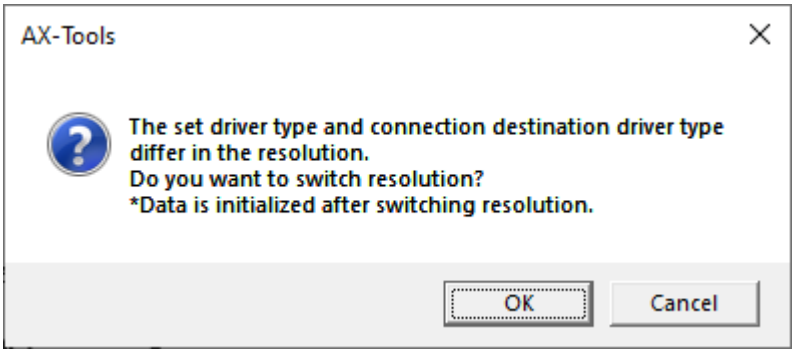
* If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.



* If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.



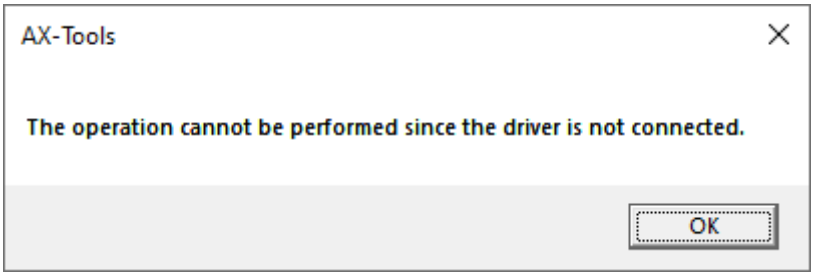
* If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? *Data is initialized after switching resolution." is displayed.



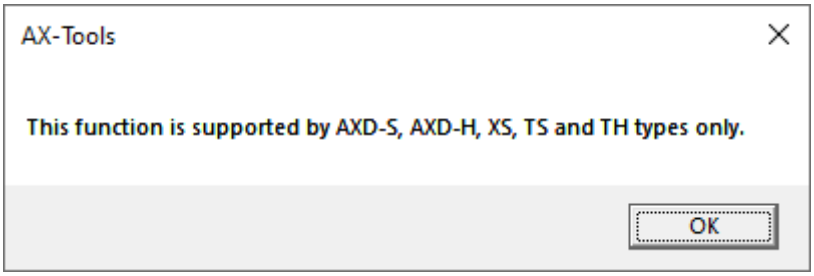
3.4.6. Network

If you click the [Network] button, the interface specification setting dialog is displayed. The displayed dialog depends on the interface specification of the connected driver.

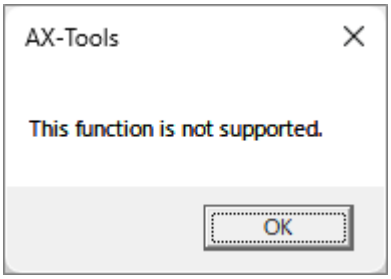
If the driver is not connected, the following message is displayed.



If the driver cannot use this function, the following message is displayed.

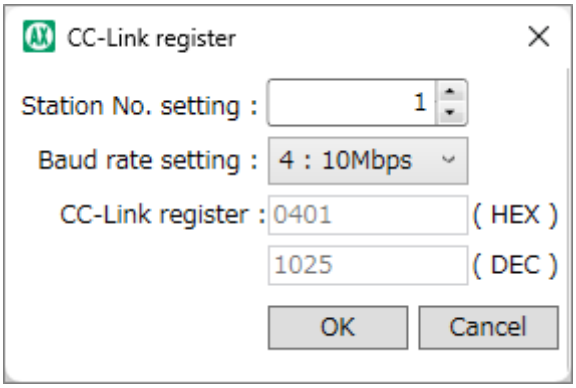


If the interface specification does not support this function, the following message is displayed.



■ CC-Link setting

Configure the CC-Link settings. If the interface specification of the connected driver is "CC-Link," the following dialog is displayed when you click the [Network] button.

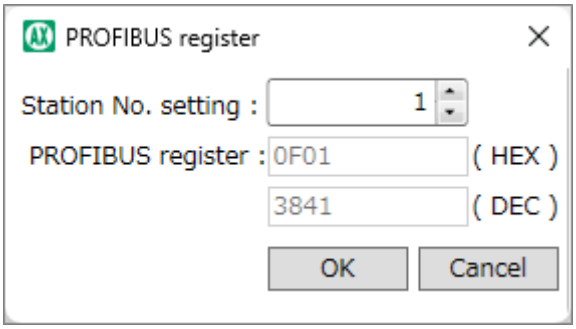


Name	Description
Station No. setting	Set a station number. The initial value is taken from the driver. Note 1
Baud rate setting	Set the baud rate. Choose from "0: 156kbps," "1: 625kbps," "2: 2.5Mbps, "3: 5Mbps," or "4: 10Mbps." The initial value is taken from the driver. Note 2
CC-Link register (HEX)	The value is automatically displayed in hexadecimal according to the station number and baud rate setting values.
CC-Link register (DEC)	Display the value of the CC-Link register (HEX) converted to a decimal number.
[OK] button	Close the dialog and apply the value of the CC-Link register (DEC) to the driver. Note 3, Note 4, Note 5, Note 6 The dialog is displayed again after applying the value.
[Cancel] button	Close the dialog.

Note 1: If the value obtained from the driver is out of range, a message "The station number setting value is invalid. Set it within the range of 1 to 63." is displayed.
Note 2: If the value obtained from the driver is out of range, a message "The baud rate setting value is invalid. Set it within the range of 0 to 4." is displayed.
Note 3: If the driver is not connected, the message "The operation cannot be performed since the driver is not connected." is displayed.
Note 4: For drivers that cannot use this function, a message "Only AXD-S, AXD-H, MU, XS, TS, and TH types can be used." is displayed.
Note 5: If the interface specification of the connected driver is other than "CC-Link," a message "Unable to execute because the network specification is different." is displayed.
Note 6: If application to the driver is successful, a message "CC-Link register setting completed" is displayed. If failed, a message "CC-Link register setting failed." is displayed.

■ PROFIBUS setting

Configure the PROFIBUS settings. If the interface specification of the connected driver is "PROFIBUS," the following dialog is displayed when you click the [Network] button.

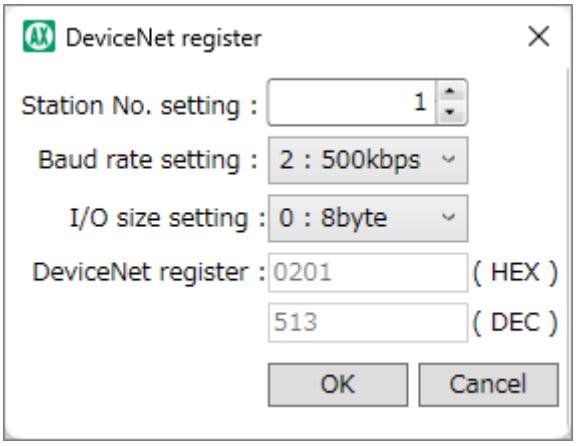


Name	Description
Station No. setting	Set a station number. The initial value is taken from the driver. Note 1
Baud rate setting	The baud rate setting field is hidden. The value is fixed to "F." Note 2
PROFIBUS register (HEX)	The value is automatically displayed in hexadecimal according to the station number and baud rate setting values.
PROFIBUS register (DEC)	Display the value of the PROFIBUS register (HEX) converted to a decimal number.
[OK] button	Close the dialog and apply the value of the PROFIBUS register (DEC) to the driver. Note 3, Note 4, Note 5, Note 6 The dialog is displayed again after applying the value.
[Cancel] button	Close the dialog.

Note 1: If the value obtained from the driver is out of range, a message "The station number setting value is invalid. Set it within the range of 0 to 125." is displayed.
Note 2: If the value obtained from the driver is out of range, a message "The baud rate setting value is invalid. Set it within the range of 0 to 15." is displayed.
Note 3: If the driver is not connected, the message "The operation cannot be performed since the driver is not connected." is displayed.
Note 4: For drivers that cannot use this function, a message "Only AXD-S, AXD-H, MU, XS, TS, and TH types can be used." is displayed.
Note 5: If the interface specification of the connected driver is other than "PROFIBUS," a message "Unable to execute because the network specification is different." is displayed.
Note 6: If application to the driver is successful, a message "PROFIBUS register setting completed" is displayed. If failed, a message "PROFIBUS register setting failed." is displayed.

■ DeviceNet setting

Configure the DeviceNet settings. If the interface specification of the connected driver is "DeviceNet," the following dialog is displayed when you click the [Network] button.

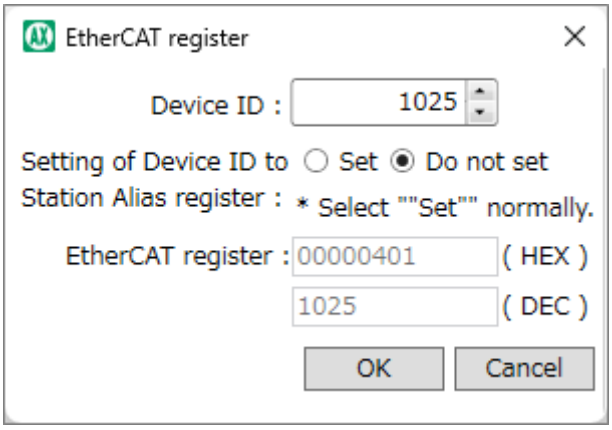


Name	Description
Station No. setting	Set a station number. The initial value is taken from the driver. Note 1
Baud rate setting	Set the baud rate. Choose from "0: 125kbps," "1: 250kbps," or "2: 500kbps." The initial value is taken from the driver. Note 2
I/O size setting	Set the I/O size. Choose from "0: 8byte" or "1: 3byte." The initial value is taken from the driver. Note 3
DeviceNet register (HEX)	The value is automatically displayed in hexadecimal according to the station number, baud rate, and I/O size setting values.
DeviceNet register (DEC)	Display the value of the DeviceNet register (HEX) converted to a decimal number.
[OK] button	Close the dialog and apply the value of the DeviceNet register (DEC) to the driver. Note 4, Note 5, Note 6, Note 7 The dialog is displayed again after applying the value.
[Cancel] button	Close the dialog.

Note 1: If the value obtained from the driver is out of range, a message "The station number setting value is invalid. Set it within the range of 0 to 63." is displayed.
Note 2: If the value obtained from the driver is out of range, a message "The baud rate setting value is invalid. Set it within the range of 0 to 2." is displayed.
Note 3: If the value obtained from the driver is out of range, a message "The IO size setting value is invalid. Set it within the range of 0 to 1." is displayed.
Note 4: If the driver is not connected, the message "The operation cannot be performed since the driver is not connected." is displayed.
Note 5: For drivers that cannot use this function, a message "Only AXD-S, AXD-H, MU, XS, TS, and TH types can be used." is displayed.
Note 6: If the interface specification of the connected driver is other than "DeviceNet," a message "Unable to execute because the network specification is different." is displayed.
Note 7: If application to the driver is successful, a message "DeviceNet register setting completed" is displayed. If failed, a message "DeviceNet register setting failed." is displayed.

■ EtherCAT setting

Configure the EtherCAT settings. If the interface specification of the connected driver is "EtherCAT," the following dialog is displayed when you click the [Network] button.

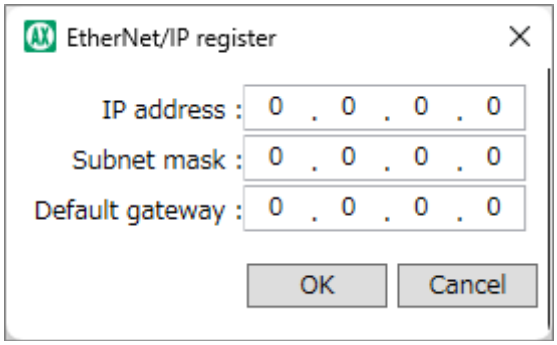


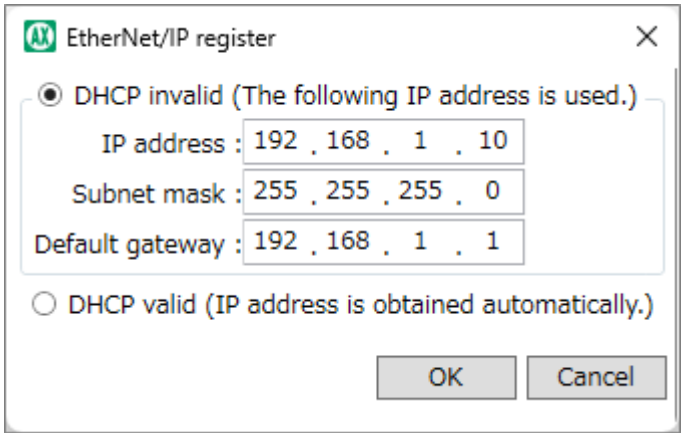
Name	Description
Device ID	Set the device ID. The initial value is taken from the driver. Note 1
Setting of Device ID to Station Alias register	Choose "Set" or "Do not set." The initial value is taken from the driver.
EtherCAT register (HEX)	The value is automatically displayed in hexadecimal according to the device ID value and the setting of device ID to Station Alias register value.
EtherCAT register (DEC)	Display the value of the EtherCAT register (HEX) converted to a decimal number.
[OK] button	Close the dialog and apply the value of the EtherCAT register (DEC) to the driver. Note 2, Note 3, Note 4, Note 5 The dialog is displayed again after applying the value.
[Cancel] button	Close the dialog.

Note 1: If the value obtained from the driver is out of range, a message "The device ID setting value is invalid. Set it within the range of 0 to 65535." is displayed.
Note 2: If the driver is not connected, the message "The operation cannot be performed since the driver is not connected." is displayed.
Note 3: For drivers that cannot use this function, a message "Only MU, XS, TS, and TH types can be used." is displayed.
Note 4: If the interface specification of the connected driver is other than "EtherCAT," a message "Unable to execute because the network specification is different." is displayed.
Note 5: If application to the driver is successful, a message "EtherCAT register setting completed" is displayed. If failed, a message "EtherCAT register setting failed." is displayed.

■ EtherNet/IP setting

Configure the EtherNet/IP settings.
If the interface specification of the connected driver is "EtherNet/IP," either of the following dialogs is displayed when you click the [Network] button.





Name	Description
IP address	Set the IP address. The initial value is taken from the driver. Note 1
Subnet mask	Set the subnet mask. The initial value is taken from the driver. Note 2
Default gateway	Set the default gateway. The initial value is taken from the driver. Note 3
DHCP valid/invalid	Select "DHCP valid" or "DHCP invalid." The initial value is taken from the driver. Note 4 This is displayed only when the driver is "AXD-H type" or "AXD-S type."
[OK] button	The values set for "IP address," "Subnet mask," "Default gateway," and "DHCP valid/invalid" are applied to the driver. Note 5, Note 6, Note 7, Note 8 The dialog is displayed again after applying the value.
[Cancel] button	Close the dialog.

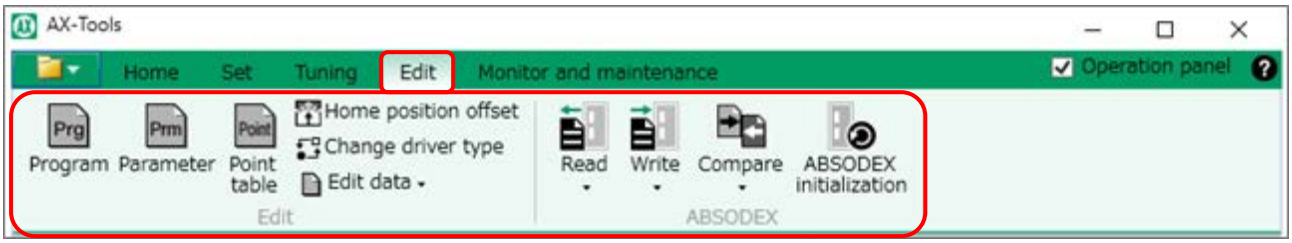
Note 1: If the value obtained from the driver is out of range, a message "The IP address setting value is invalid. Set it within the range of 0.0.0.0 to 255.255.255.255." is displayed.
Note 2: If the value obtained from the driver is out of range, a message "The subnet mask setting value is invalid. Set it within the range of 0.0.0.0 to 255.255.255.255." is displayed.
Note 3: If the value obtained from the driver is out of range, a message "The default gateway setting value is invalid. Set it within the range of 0.0.0.0 to 255.255.255.255." is displayed.
Note 4: If the value obtained from the driver is out of range, a message "The DHCP setting value is invalid. Set it within the range of 0 to 1." is displayed.
Note 5: If the driver is not connected, the message "The operation cannot be performed since the driver is not connected." is displayed.
Note 6: For drivers that cannot use this function, a message "Only AXD-S, AXD-H, MU, XS, TS, and TH types can be used." is displayed.
Note 7: If the interface specification of the connected driver is other than "EtherNet/IP," a message "Unable to execute because the network specification is different." is displayed.
Note 8: If application to the driver is successful, a message "EtherNet/IP register setting completed" is displayed. If failed, a message "EtherNet/IP register setting failed." is displayed.

3.5. [Edit] tab

3.5.1. Overview of the [Edit] tab

Read, write, compare, edit, and initialize programs, parameters, and point tables.

When the [Edit] tab is selected, the following ribbon menu appears.



Name	Description	Reference
Program	Launch the "Program" view.	3.5.2
Parameter	Launch the "Parameter" view.	3.5.3
Point table	Launch the "Point table" view.	3.5.4
Home position offset	Configure the home position offset amount setting.	3.5.5
Change driver type	Launch the "Change driver type" view.	3.5.6
Edit data	Clear the editorial data or check the editorial data usage.	3.5.7
Read	Read the parameter, program, and point table data from the driver.	3.5.8
Write	Write the edited parameter, program, and point table data to the driver.	3.5.9
Compare	Compare the edit data with the driver data in parameter, program, and point table.	3.5.10
ABSODEX initialization	Restore the data written to the driver to the factory default state.	3.5.11

3.5.2. Program

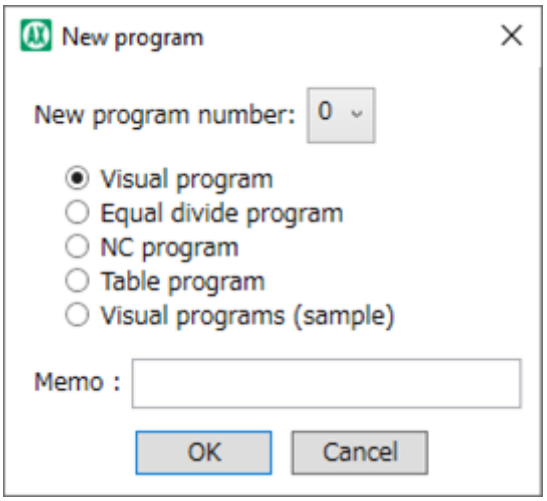
Clicking the [Program] button launches the "Program" view.

Name	Description
Program number	Select the program to be edited by its number. Note 1 Only program numbers that have already been created can be selected.
[New] button	Create a new program.
[Change] button	Change the program number being edited to a new number.
[Copy] button	Copy and register the program to be editing on another number.
[NC conversion] button	Convert the program being edited to NC program.
[Delete] button	Delete the program being edited.
Edit mode	Display the type of program being edited (visual program, equal divide program, NC program, and table program).
Memo	Display the memo at the time of program creation.

Note 1: When you switch programs to be edited, a confirmation message "Since the number of blocks of the visual program has exceeded 90, the program "0" that is being edited is deleted from 91 onwards. Is that okay?" is displayed if all of the following conditions are met.
- The program being edited is a "visual program."
- The number of blocks of the visual program exceeds 90.

■ New

If you click the [New] button, the following dialog is displayed.



Name	Description
New program number	Select the program number to be newly created.
Program type	Select the program type to be newly created.
Memo	Enter a memo for the program to be newly created.
[OK] button	Create a new program. Note 1, Note 2 Selecting the [Visual program] button for the program type launches the "Visual program" view. Selecting the [Equal divide program] button launches the "Equal divide program" view. Selecting the [NC program] button launches the "NC program" view. Selecting the [Table program] button launches the "Table program" view. Selecting the [Visual program (sample)] button displays the sample program selection dialog.
[Cancel] button	Close the dialog.

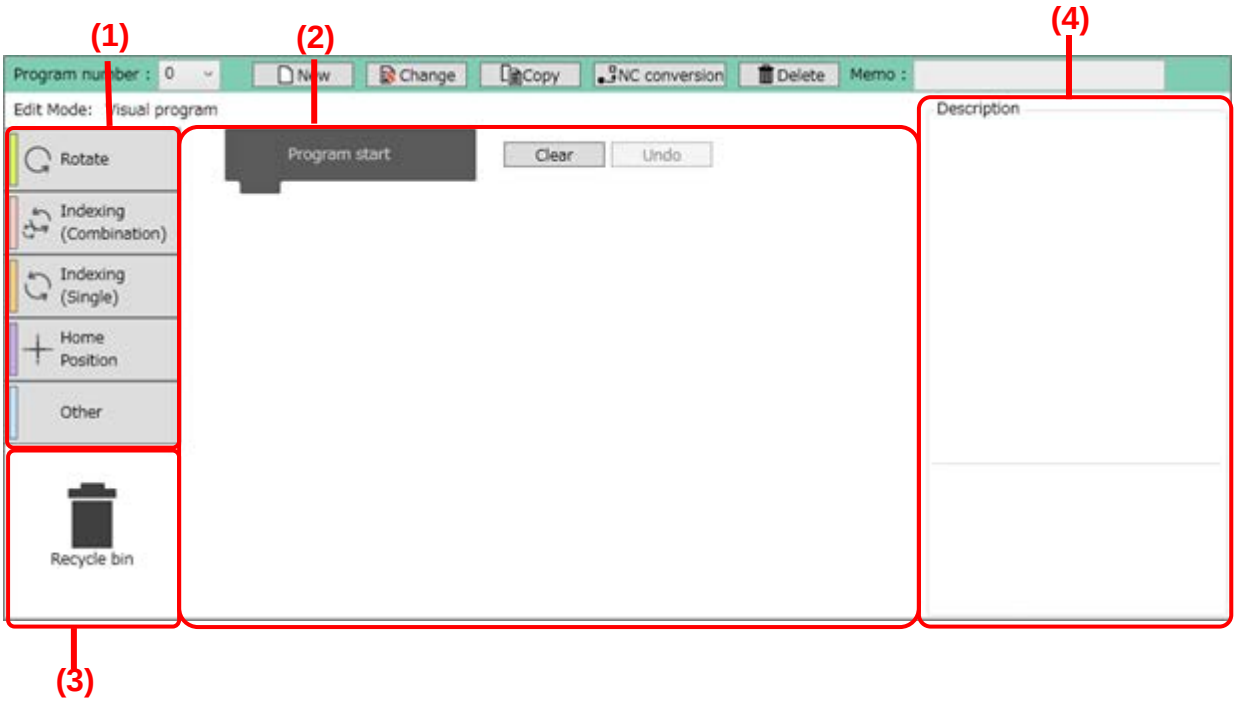
Note 1: A confirmation message "Since the number of blocks of the visual program has exceeded 90, the program "0" that is being edited is deleted from 91 onwards. Is that okay?" is displayed if all of the following conditions are met.
- The program being edited is a "visual program."
- The number of blocks of the visual program exceeds 90.
- A program number different from the program being edited is selected in "New program number."

Note 2: If you select a registered program number in "New program number," a confirmation message "This number is already registered, are you sure?" is displayed.

<Visual program>

If you select the [View program] in the [New] dialog, the following view is launched. The edit mode is "Visual program."

Select a block from the block selection area and edit the NC program in the flow creation area.
For details, refer to "4.3 List of codes (visual program)."

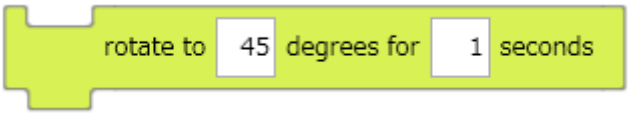


No.	Name	Description
(1)	**Block selection area**	This area allows you to select the block to create.
(2)	**Flow creation area**	This area allows you to create the flow. Create a program by dragging and dropping a block from the "Block selection area" to the "Flow creation area."
(3)	**Recycle bin**	Delete a block by dragging and dropping it from the "Flow creation area" to the "Recycle bin."
(4)	**Block description area**	This area displays the description of the selected block.

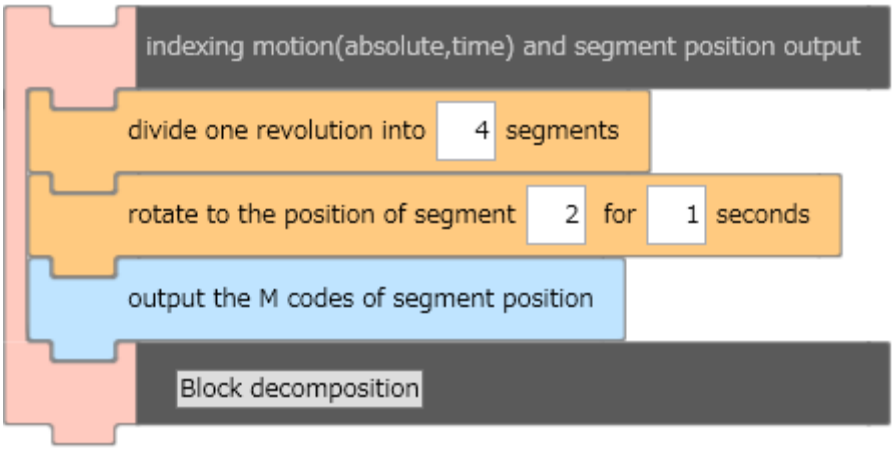
A block can be a loop block, a single block, or a combination block.

A loop block is a block that can contain blocks inside.

A single block is a block with only one row.

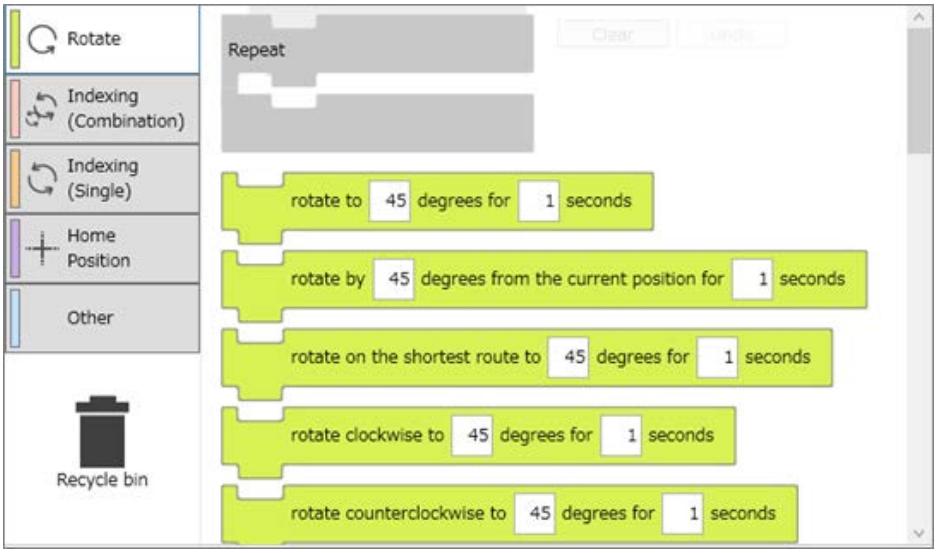


A combination block is a block that combines multiple blocks.



Name	Description
[Block decomposition] button	Decompose a combination block into single blocks. You cannot turn decomposed single blocks back to a combination block.

■ Block selection area



Name	Description
[Rotate] button	Display the single block and combination block corresponding to "Rotate."
[Indexing (Combination)] button	Display the combination block corresponding to "Indexing (Combination)."
[Indexing (Single)] button	Display the single block corresponding to "Indexing (Single)."
[Home Position] button	Display the single block and combination block corresponding to the "Home Position."
[Other] button	Display other single blocks.

The table below shows how to move a block from the "Block selection area" to the "Flow creation area."

Operation	Description	Mouse operation	Key operation
Moving blocks	Create a block by moving the block in the "Block selection area" to the "Flow creation area." Note 1	Drag & drop	—
Canceling block move	Cancel the creation of a block in the "Block selection area" in the "Flow creation area."	Drop outside the flow creation area	[Esc] key while drag-ging
Moving a loop block	Only one loop block can be placed in the "Flow creation area." You cannot place a second one.	—	—

Note 1: If the number of blocks in the "Flow creation area" is 100 at the time of block selection, a message "The maximum number of blocks is 100. You cannot place more than 100 blocks." is displayed.

■ Flow creation area

The "Flow creation area" can contain up to 100 blocks.
If the number of blocks exceeds 90, the excess blocks are displayed in a light color in a red frame.

Name	Description
Program start	A block representing the flow start position. Always displayed.
[Clear] button	Delete all blocks in the flow creation area. Note 1
[Undo] button	Return the editing state of the visual program to the previous state.

Note 1: If a block exists in the "Flow creation area," a confirmation message "All blocks will be deleted, are you sure?" is displayed.

The table below shows the operations that can be performed in the "Flow creation area."

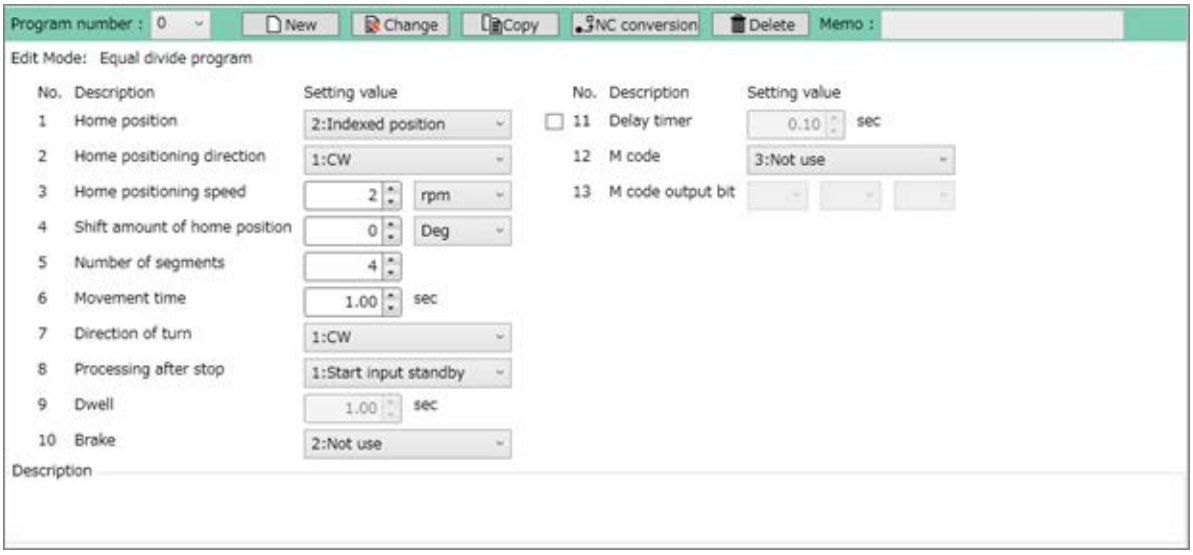
Operation	Description	Mouse operation	Key operation
Selecting a block	Select a block.	Left-click	—
Selecting multiple blocks	With a block selected, you can select multiple blocks by [Shift] key + left-click. You can also select multiple blocks with a line displayed by dragging in the "Flow creation area."	[Shift] key + Left-click	
Moving blocks	Change the flow order. If a loop block is selected, it moves with the blocks in the loop. If only the blocks in a loop are selected, only the selected blocks are moved.	Drag & drop	—
Copying blocks	Copy selected blocks.	—	[Ctrl] + [C] key
Pasting blocks	Paste the copied blocks at the end of the flow. Paste can be performed multiple times. Note 1	—	[Ctrl] + [V] key
Deleting blocks	Delete selected blocks. If a loop block is selected, it deletes with the blocks in the loop.	Drag & drop to [Recycle bin]	[Delete] key

Note 1: If the number of blocks after pasting exceeds 100, a message "The maximum number of blocks is 100. Blocks exceeding 100 were deleted." is displayed.

<Equal divide program>

Use this procedure to edit equal divide programs.

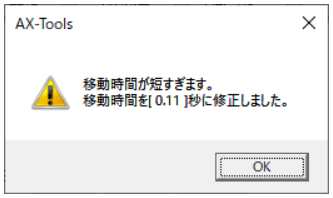
If you select the [Equal divide program] in the [New] dialog, the following view is launched. The edit mode is "Equal divide program."



No.	Name	Description
1	**Home position**	Set the home position. Choose from "1: Rotate once and home position" or "2: Indexed position."
2	**Home positioning direction**	Set the home positioning direction. Choose from "1: CW," "2: CCW," or "3: Near Head." Note 1
3	**Home positioning speed**	If a check box is displayed, the home positioning speed is set only when the check box is selected. The check box is displayed when "1: Rotate once and home position" is selected in No. 1. If "1: Rotate once and home position" is selected in No. 1, the unit can be selected from "rpm." If "2: Indexed position" is selected in No. 1, the unit can be selected from "rpm" or "sec."
4	**Shift amount of home position**	Set the shift amount of home position only when "2: Indexed position" is selected in No. 1. For the unit, choose from "Degree" or "Pulse."
5	**Number of segments**	Set the number or segments. Note 2
6	**Movement time**	Set the movement time. Note 2
7	**Direction of turn**	Set the direction of turn. Choose from "1: CW" or "2: CCW."
8	**Processing after stop**	Set the processing after stop. Choose from "1: Start input standby" or "2: Dwell."
9	**Dwell**	Set Dwell only when "2: Dwell" is selected in No. 8.
10	**Brake**	Set the brake. Choose from "1: Use" or "2: Not use."

Note 1: When "1: Rotate once and home position" is selected for Home position, "3: Near Head" cannot be selected.

Note 2: The timing is checked when input of the number of segments and time has been completed. When movement time is too short, the following message is displayed, and the movement time is automatically corrected.



No.	Name	Description
11	**Delay timer**	Set the delay timer only when the check box is selected.
12	**M code**	Set the M code. Choose from "1: M code," "2: Division position output," or "3: Not use."
13	**M code output bit**	Set the M code output bit only when "1: M code" is selected in No. 12.
—	**Description**	Display the description for the selected item.

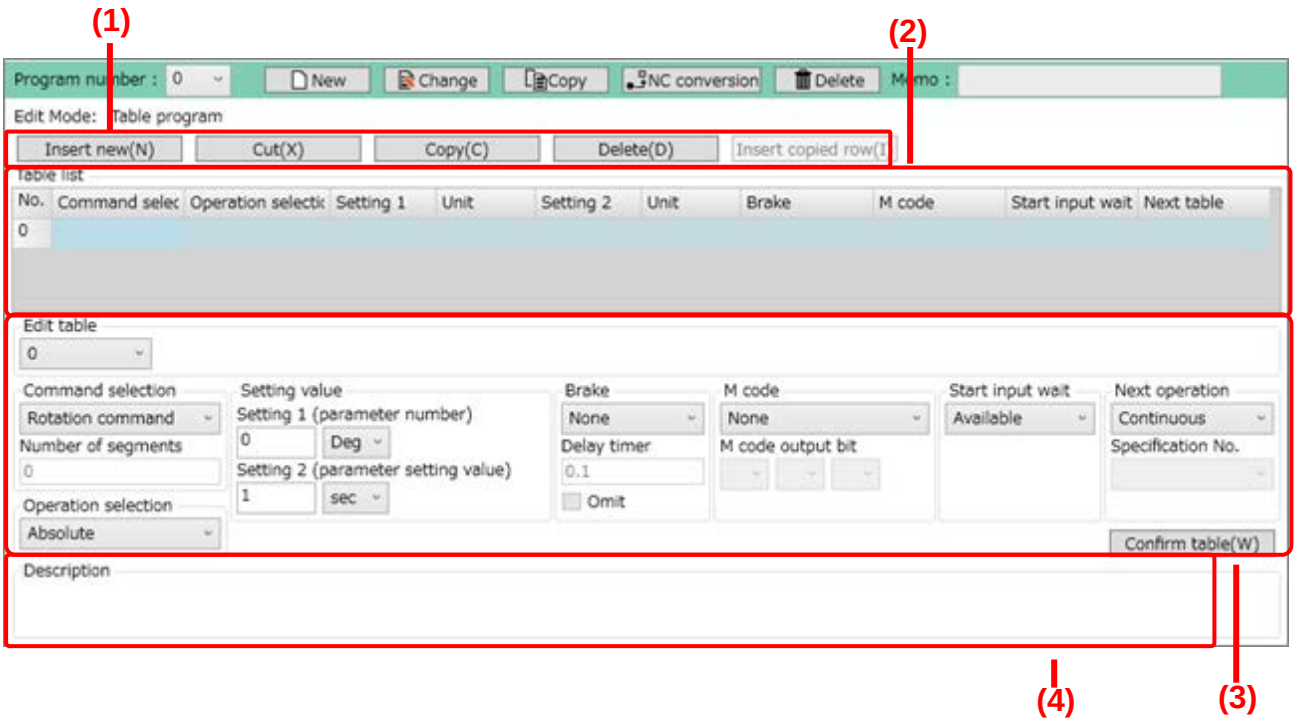
<NC program>
Editing is made with NC code.
If you select the [NC program] in the [New] dialog, the following view is launched. The edit mode is "NC program."

Input the letter from the keyboard and edit NC program.
For details, refer to "4.2 List of codes."

You can enter 100 lines maximum. If the number of lines exceeds 100, a message "The maximum number of lines is 100. You cannot enter more than 100 lines." is displayed.

<Table program>

Use this procedure to edit programs with the table method.
If you select the [Table program] in the [New] dialog, the following view is launched.
The edit mode is "Table program."



No.	Name	Description
(1)	**Operation button**	This button is used to edit the table list.
(2)	**Table list**	The contents set in the table is displayed.
(3)	**Edit table**	Set the row currently selected in table list.
(4)	**Description**	Display the description for the item selected in edit table.

■ Operation button

Name	Description
[Insert new] button	Insert a new row into the table list. After a new row is inserted, the [Insert new] button changes to the [Undo insertion] button. Clicking [Undo insertion] deletes the inserted row.
[Cut] button	Delete the selected row in the table list. The [Insert copied row] button is enabled.
[Copy] button	Copy the selected row in the table list. The [Insert copied row] button is enabled.
[Delete] button	Delete the selected row in the table list.
[Insert copied row] button	Insert a copied or cut row into the destination row in the table list.

■ Table list

If a table number is specified in "No. specification" in "Next operation," and the table number referencing destination for "Next operation" no longer exists due to a deletion or similar operation, "#REF!" is displayed.

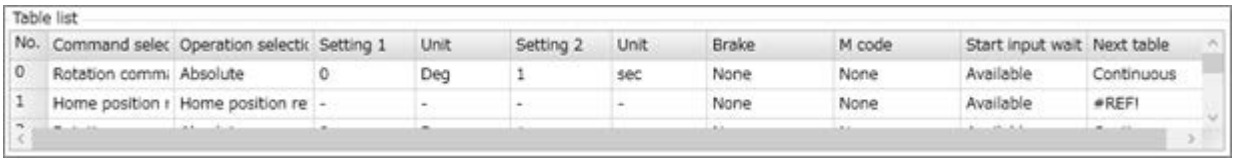


Table list

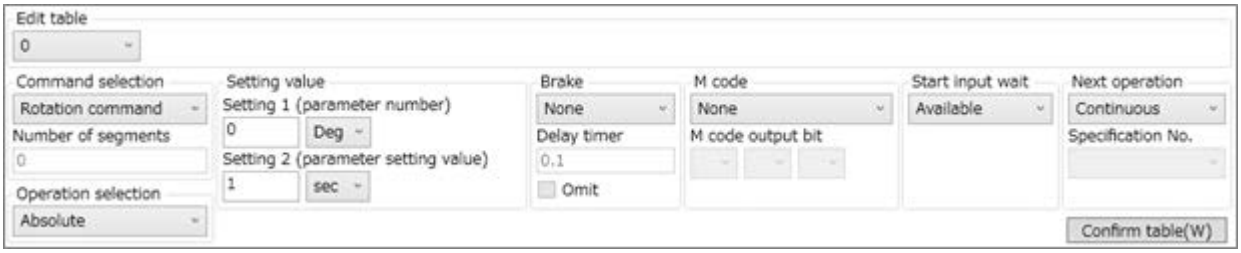
No.	Command selec	Operation selecti	Setting 1	Unit	Setting 2	Unit	Brake	M code	Start input wait	Next table
0	Rotation comm	Absolute	0	Deg	1	sec	None	None	Available	Continuous
1	Home position r	Home position re	-	-	-	-	None	None	Available	#REF!

When "#REF!" is displayed, select the row on which "#REF!" appears and select the table number where the "No. specification" for "Next operation" is located.

"#REF!" occurs in the following situations:

- If a table number for a referencing destination is deleted or cut, the referencing origin encounters a "#REF!."
- If a table number for a referencing origin is cut, a "#REF!" occurs in the row where a copied row is inserted.
- If a table number for a referencing origin is copied, a "#REF!" occurs in the row where a copied row is inserted. The copy origin's "Next operation" remains the same.

■ Edit table



Name	Description
Table No.	The currently selected table list number is displayed. Changing the list number selects the table list number with the new number.
Command selection	Select a command to be set. Choose from "Rotation command," "Number of segments command," "Home position return command," "Coordinate system setting," or "Other command."
Operation selection	Select the operation for the command selected in Command selection.
Setting value	Set a setting value for operation.
Brake	Set a brake operation. Delay timer can be used only if "Operation" is selected.
M code	Set the M code processing. The M code output bit can be used only when "M code" is selected.
Start input wait	Specify whether there is a start input wait.
Next operation	Set the table number to be processed next. When "Continuous" is selected, the table number in the next row is processed. When "No. specification" is selected, the table number selected in "Specification No." is processed.
[Confirm table] button	Confirm the current settings in Edit table and apply the settings to the table list.

The tables below show the values that can be set in table editing.

• Available settings when "Select command" is selected in Command selection

Command selection "Rotation command"				
Operation selection	**Setting value 1**	**Unit**	**Setting value 2**	**Unit**
Absolute	Enter a setting value.	"Degree" "Pulse"	Enter a setting value.	"sec" "rpm"
Absolute (shortest route)				
Absolute (CW)				
Absolute (CCW)				
Incremental				
Incremental (1 rotation)				
Continuous rotation	Enter a rotation speed.	"rpm"	Enter an acceleration / deceleration time.	"sec"

Command selection "Rotation command"				
Operation selection	**Brake**	**M code**	**Start input wait**	**Next operation**
Absolute	"None" "Operation"	"None" "M code"	"Exist" "None"	"Continuous" "No. specification"
Absolute (shortest route)				
Absolute (CW)				
Absolute (CCW)				
Incremental				
Incremental (1 rotation)				
Continuous rotation				

- Available settings when "Number of segments command" is selected in Command selection

Command selection "Number of segments command"				
Operation selection	**Setting value 1**	**Unit**	**Setting value 2**	**Unit**
Absolute	Enter a setting value.	"Number of segments"	Enter a setting value.	"sec" "rpm"
Absolute (shortest route)				
Absolute (CW)				
Absolute (CCW)				
Incremental				
Incremental (1 rotation)				
Continuous rotation	Enter a rotation speed.	"rpm"	Enter an acceleration / deceleration time.	"sec"

Command selection "Number of segments command"				
Operation selection	**Brake**	**M code**	**Start input wait**	**Next operation**
Absolute	"None" "Operation"	"None" "Division position output" "M code"	"Exist" "None"	"Continuous" "No. specification"
Absolute (shortest route)				
Absolute (CW)				
Absolute (CCW)				
Incremental				
Incremental (1 rotation)				
Continuous rotation				

• Available settings when "Home position return command" is selected in Command selection

Command selection "Home position return command"				
Operation selection	**Setting value 1**	**Unit**	**Setting value 2**	**Unit**
Home position return (shortest route)	Enter a rotation speed.	"rpm"	Enter an acceleration / deceleration time.	"sec"
Home position return (CW)				
Home position return (CCW)				

Command selection "Home position return command"				
Operation selection	**Brake**	**M code**	**Start input wait**	**Next operation**
Home position return (shortest route)	"None" "Operation"	"None" "M code"	"Exist" "None"	"Continuous" "No. specification"
Home position return (CW)				
Home position return (CCW)				

• Available settings when "Coordinate system setting" is selected in Command selection

Command selection Coordinate system setting				
Operation selection	**Setting value 1**	**Unit**	**Setting value 2**	**Unit**
Current position setting	Enter a setting value.	"Degree" "Pulse"	Setting disabled	Setting disabled
Home position shift				

Command selection Coordinate system setting				
Operation selection	**Brake**	**M code**	**Start input wait**	**Next operation**
Current position setting	Setting disabled	"None" "M code"	"Exist" "None"	"Continuous" "No. specification"
Home position shift				

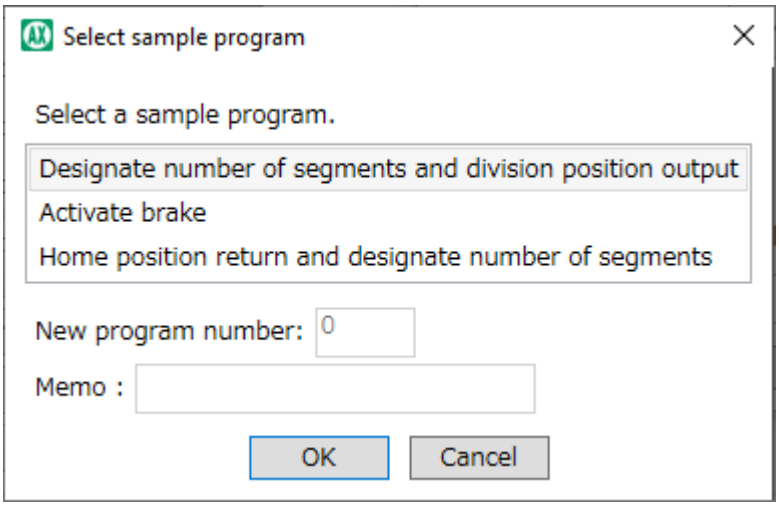
• Available settings when "Other command" is selected in Command selection

Command selection "Other command"				
Operation selection	**Setting value 1**	**Unit**	**Setting value 2**	**Unit**
Pulse string input	Setting disabled	Setting disabled	Setting disabled	Setting disabled
Change gain magnification	Enter a setting value.	"%"		
Change parameter	Enter a parameter number.	Setting disabled	Enter a setting value.	
Dwell	Enter a setting value.	"sec"	Setting disabled	
Brake operation only	Setting disabled	Setting disabled		
Brake release only				
M code output only				
Division position output only				

Command selection "Other command"				
Operation selection	**Brake**	**M code**	**Start input wait**	**Next operation**
Pulse string input	"None" "Operation"	"None" "M code"	"Exist" "None"	"Continuous" "No. specification"
Change gain magnification	Setting disabled			
Change parameter				
Dwell				
Brake operation only				
Brake release only				
M code output only		"M code"		
Division position output only		"Division position output"		

<Visual program (sample)>

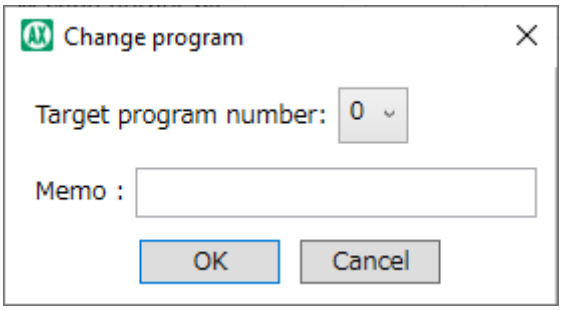
If you select the [Visual program (sample)] in the [New] dialog, the following dialog appears.



Name	Description
List of sample programs	Display a list of sample programs that can be created.
New program number	Display the program number selected in the [New] dialog.
Memo	Display the memo entered in the [New] dialog.
[OK] button	Close all dialogs and newly create a selected sample program. For details, refer to "Visual program."
[Cancel] button	Close the dialog and return to the [New] dialog.

■ Change

If you click the [Change] button, the following dialog is displayed.

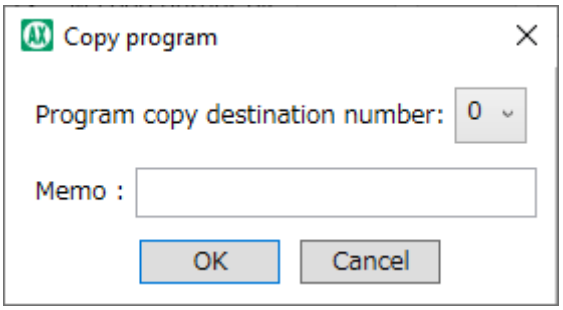


Name	Description
Target program number	Select a new program number.
Memo	Enter a memo for the program.
[OK] button	The program number is changed to the number selected in "Target program number." Note 1
[Cancel] button	Close the dialog.

Note 1: If you select a registered program number in "Target program number," a confirmation message "This number is already registered, are you sure?" is displayed.

■ Copy

If you click the [Copy] button, the following dialog is displayed.



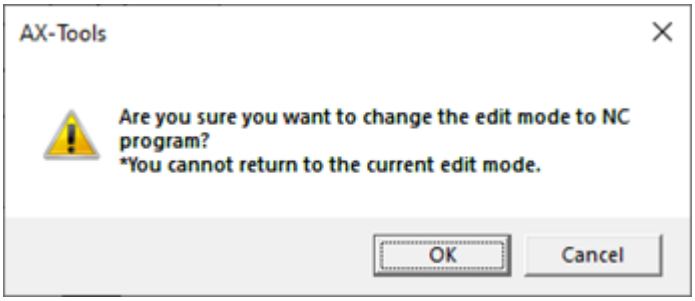
Name	Description
Program copy destination number	Select the program number of copy destination.
Memo	Enter a memo for the program.
[OK] button	Copy the program being edited and registers it to the number selected in "Program copy destination number." Note 1, Note 2
[Cancel] button	Close the dialog.

Note 1: A confirmation message "Since the number of blocks of the visual program has exceeded 90, the program "0" that is being edited is deleted from 91 onwards. Is that okay?" is displayed if all of the following conditions are met.
- The program being edited is a "visual program."
- The number of blocks of the visual program exceeds 90.

Note 2: If you select a registered program number in "Program copy destination number," a confirmation message "This number is already registered, are you sure?" is displayed.

■ NC conversion

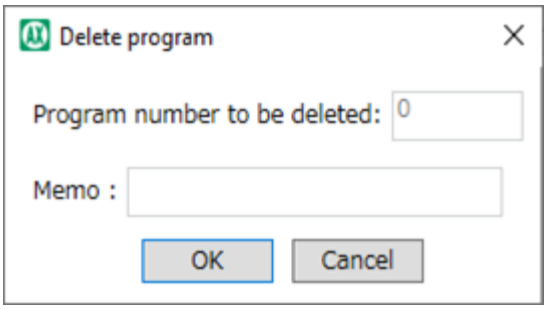
If you click the [NC conversion] button, the following dialog is displayed.



Name	Description
[OK] button	Convert the program being edited to NC program. Convert only the selected program number. *After you select OK, you cannot return to the program in the editing mode.
[Cancel] button	Return to the program being edited.

■ Delete

If you click the [Delete] button, the following dialog is displayed.



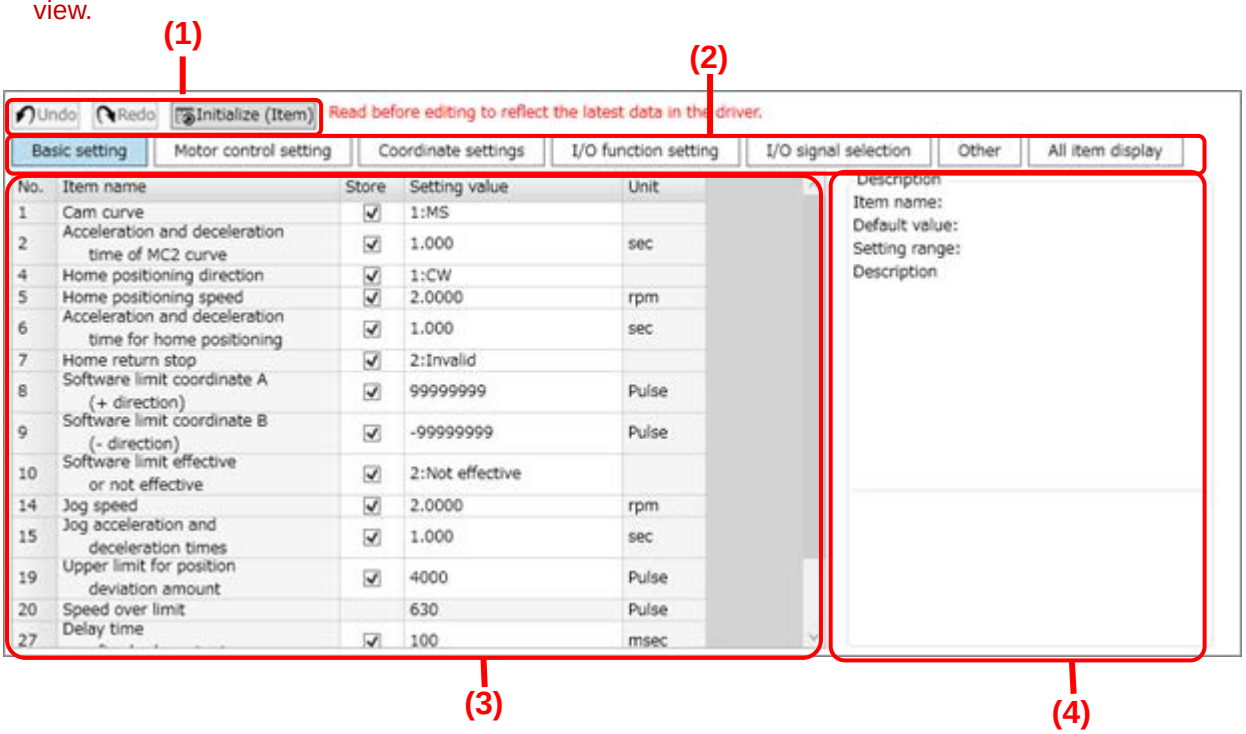
Name	Description
Program number to be deleted	Display the program number being edited.
Memo	Display the memo of the program being edited.
[OK] button	Delete the program being edited. Note 1
[Cancel] button	Close the dialog.

Note 1: A confirmation message "Program number '0' will be deleted, are you sure?" is displayed.

3.5.3. Parameter

Clicking the [Parameter] button launches the "Parameter" view.
For the initial value and setting range of the parameter, refer to the corresponding driver's instruction manual.

* Before editing, be sure to run "Read" to import the parameters stored in the driver into the "Parameter" view.



* Depending on the driver type, some parameters may not be displayed.

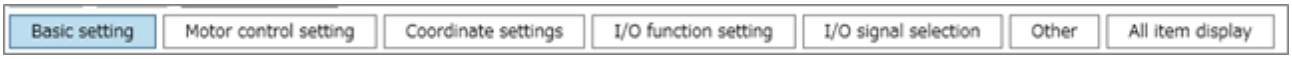
No.	Name	Description
(1)	**Operation button**	This button is used to edit the parameter list.
(2)	**Display group switching**	These buttons switch the display item group in the parameter list.
(3)	**Parameter list**	This is a list of parameters.
(4)	**Description**	Display a description of the item selected in the parameter list.

■ Operation button

Name	Description
[Undo] button	Restore the parameter list cells to values before editing. You can only restore to the previous editing. The [Undo] button is enabled when you edit a cell in the parameter list. Restoring to the unedited value disables the [Undo] button.
[Redo] button	Restore the selected parameter list cell to the value after editing. If you use the [Undo] button to restore to the unedited value, the [Redo] button is enabled. Restoring to the edited value disables the [Redo] button.
[Initialize (Item)] button	Restore the setting of the selected item in the parameter list to the initial value.

■ Display group switching

Switch the display group for the parameter. Display the parameters of the selected group in the parameter list. Some groups do not allow you to edit parameters, so select each setting screen to edit.



Name	Description
Basic setting	Display parameters related to the basic items.
Motor control setting	Display parameters related to motor control.
Coordinate settings	Display parameters related to coordinate items.
I/O function setting	Display parameters related to I/O functions.
I/O signal selection	Display parameters related to I/O signals.
Other	Display parameters other than the above categories.
All item display	Display all items in the parameter list.

■ Parameter list

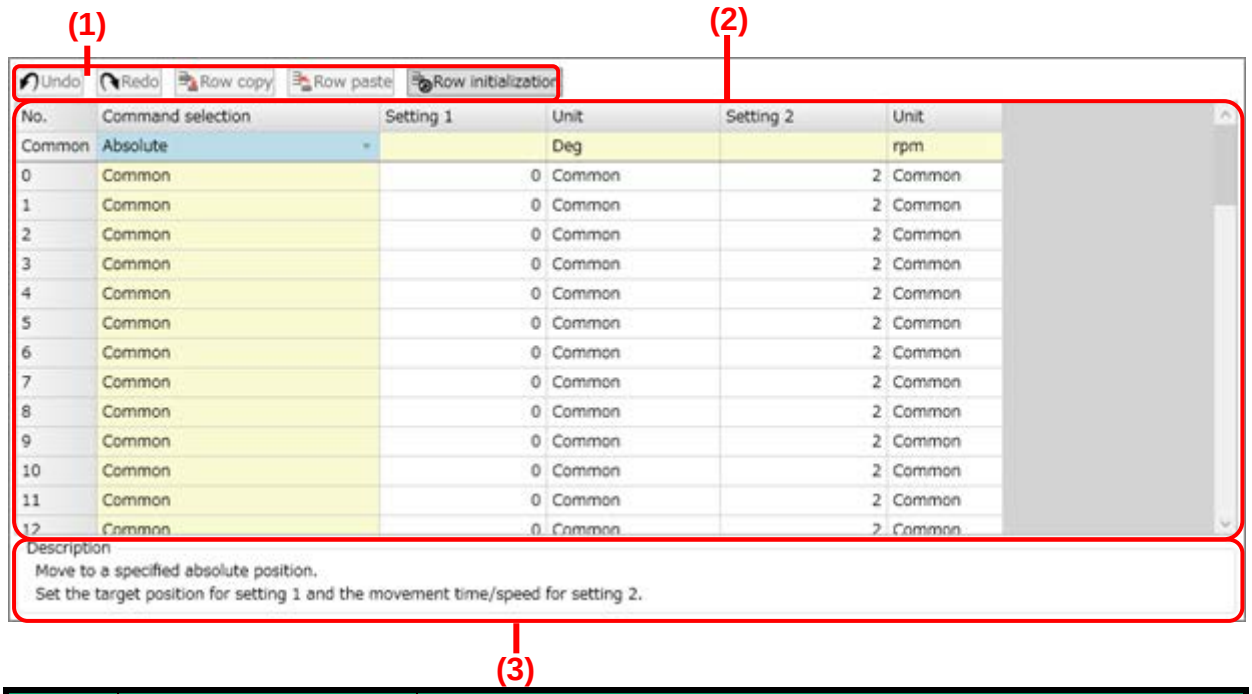
Name	Description
No.	Display the parameter number.
Item name	Display the item name of the parameter.
Store	Set whether parameters are stored in the driver.
Setting value	Set the setting value of the item.
Unit	Display the unit for the item name.

■ Description

Display the item name, setting range, and supplementary information for the selected item in the parameter list.

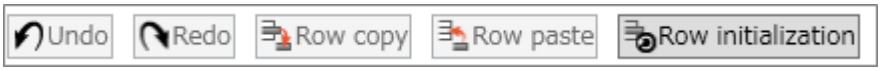
3.5.4. Point table

Clicking the [Point table] button launches the "Point table" view.



No.	Name	Description
(1)	**Operation button**	This button is used to edit the point table list.
(2)	**Point table list**	This is a list of point tables.
(3)	**Description**	Display a description of the item selected in the point table list.

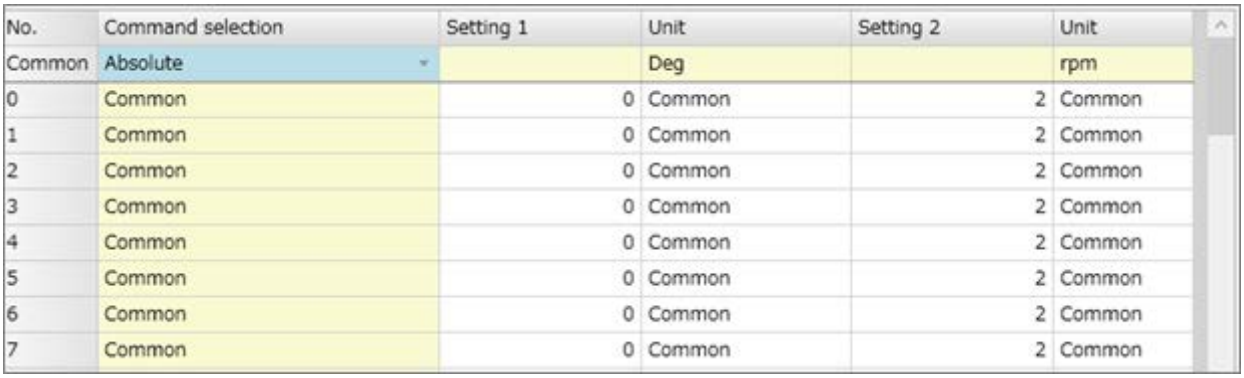
■ Operation button



Name	Description
[Undo] button	Restore the point table list cells to values before editing. You can only restore to the previous editing. The [Undo] button is enabled when you edit a cell in the point table list. Restoring to the unedited value disables the [Undo] button.
[Redo] button	Restore the selected point table list cell to the value after editing. If you use the [Undo] button to restore to the unedited value, the [Redo] button is enabled. Restoring to the edited value disables the [Redo] button.
[Row copy] button	Copy the settings of the selected point table row. The copied data is retained until the window tab is closed, and multiple rows can be copied. When the common row is selected, the [Row copy] button is disabled.
[Row paste] button	Paste as much information as the number of rows copied, starting from the selected point table row. If the number of rows in the destination is less than the number of rows copied, only the number of rows in the destination is pasted. You cannot paste information for the number of copied rows more than the paste destination. When the common row is selected, the [Row paste] button is disabled.
[Row initialization] button	Restore the setting of the selected row in the point table list to the initial value.

■ Point table list

The matrix of the selected cells is highlighted.
The first line always displays a common row.



No.	Command selection	Setting 1	Unit	Setting 2	Unit
Common	Absolute		Deg		rpm
0	Common	0	Common	2	Common
1	Common	0	Common	2	Common
2	Common	0	Common	2	Common
3	Common	0	Common	2	Common
4	Common	0	Common	2	Common
5	Common	0	Common	2	Common
6	Common	0	Common	2	Common
7	Common	0	Common	2	Common

Name	Description
Command selection	Select a command to be set.
Setting value	Enter the setting for the operation.
Unit	Enter the unit of the setting value.

- Items that can be set in Common table

Command selection	Setting value 1	Unit of setting value 1	Setting value 2	Unit of setting value 2
Absolute *	Setting disabled	[Degree] * [Pulse] [Number of segments]	Setting disabled	[rpm] * [sec]
Absolute (shortest route)				
Absolute (CW)				
Absolute (CCW)				
Incremental				
Incremental (1 rotation)				

* Initial setting

• Items that can be set in Tables No. 0 to No. 63

Command selection	Setting value 1	Unit of setting value 1	Setting value 2	Unit of setting value 2
Common *	Enter a setting value.	[Common] * [Degree] [Pulse] [Number of segments]	Enter a setting value.	[Common] * [rpm] [sec]
Absolute				
Absolute (shortest route)				
Absolute (CW)				
Absolute (CCW)				
Incremental				
Incremental (1 rotation)				
Home positioning	Setting disabled	Setting disabled	Setting disabled	Setting disabled
Designate number of segments	Enter a setting value.			
Change gain magnification				
Activate brake	Setting disabled			
Release brake				

* Initial setting

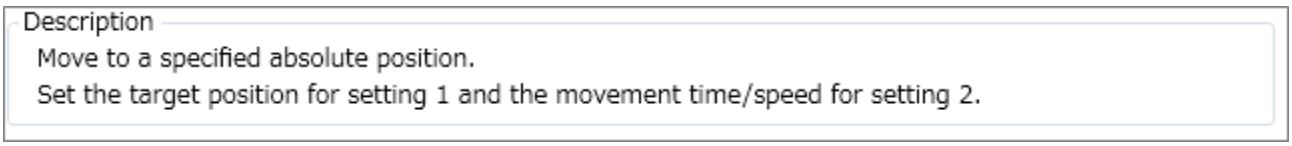
• Range of the table editing settings

Command selection	Unit	Minimum	Maximum	Initial value
Common **Absolute** **Absolute (shortest route)** **Absolute (CW)** **Absolute (CCW)** **Incremental** **Incremental (1 rotation)**	Common	Value of unit selected in the common table		
	Degree	-360.000	360.000	0
	Pulse	-4194304, -2097152, or -540672 *	4194304, 2097152, or 540672 *	
	Number of segments	1	255	1
	rpm	0.01 or 0.11 *	140.00, 240.00, or 300.00 *	2
	Sec.	0.01	100.00	
Designate number of segments	-	1	255	1
Change gain magnification	-	0, 50 to 200		0

* The setting range differs depending on the driver type.

■ Description

Display a description of the item selected in the point table list.



3.5.5. Home position offset

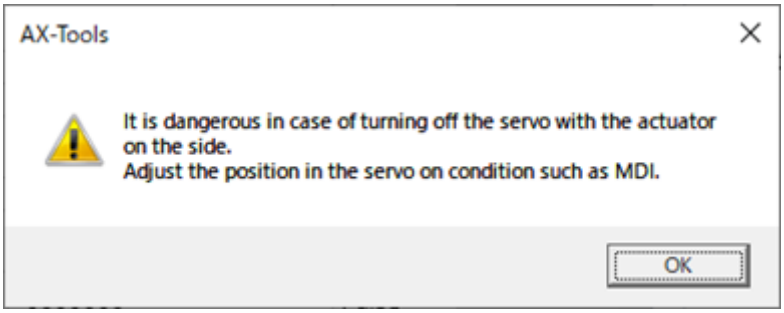
CAUTION

Turning off the servo with the actuator on the sides may cause the weight of the load to rotate the output shaft to cause a danger.
Do not use "To set the offset amount by rotating the motor manually," but use "To set the current position as the offset amount" after adjusting the position in the servo-on status.

Configure the home position offset amount setting.

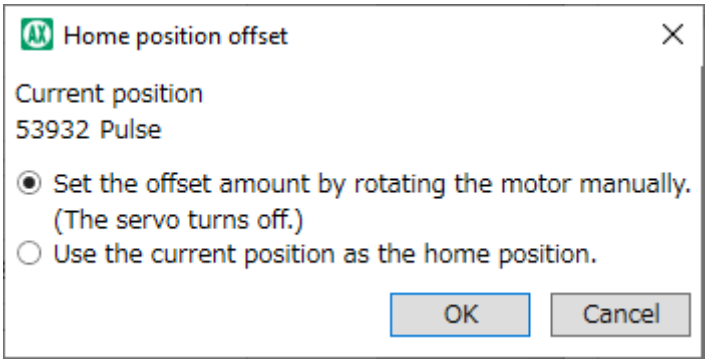
■ **To set the offset amount by rotating the motor manually**

1. Clicking the [Home position offset] button displays a caution message.



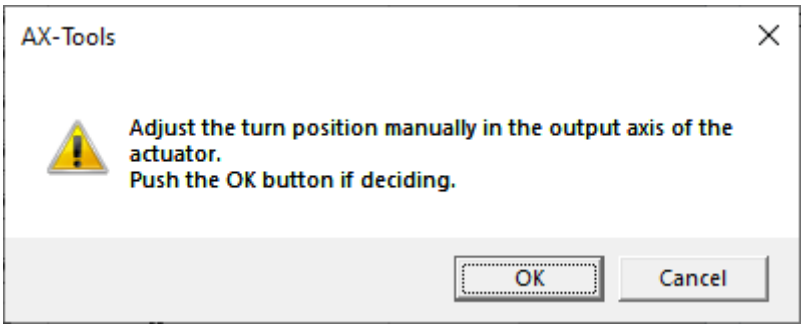
2. Click the [OK] button. The following dialog appears.

Select "Set the offset amount by rotating the motor manually."



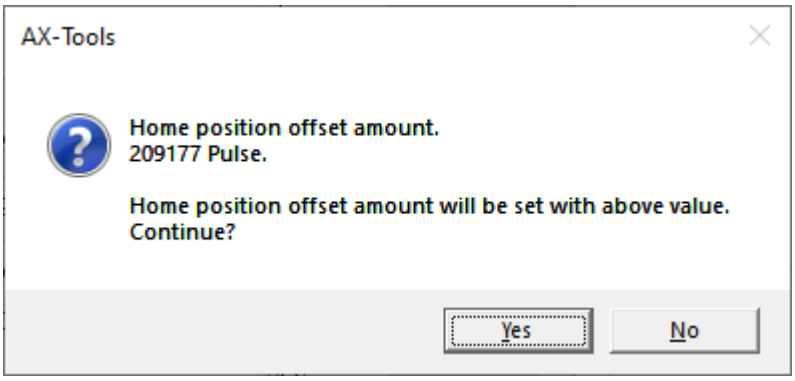
3. Click the [OK] button. The following dialog appears.

(The [Cancel] button stops the setting processing.)



4. Click the [OK] button after adjusting the position manually.

(The [Cancel] button stops the setting processing, but in the case of servo OFF, processing of "6" is performed.)
The following dialog appears.

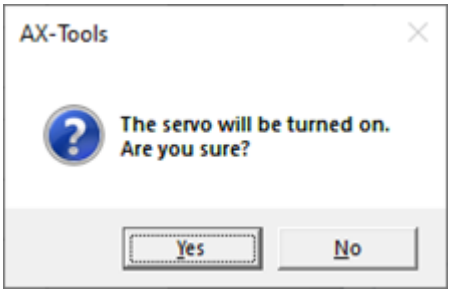


5. Clicking the [Yes(Y)] button applies the setting.

(Clicking the [No(N)] button returns the step back to "3".)

* The amount of home position offset to have turned on once again to or to have been set to it after returning in home position becomes effective.

6. If the servo is OFF, the following dialog appears.



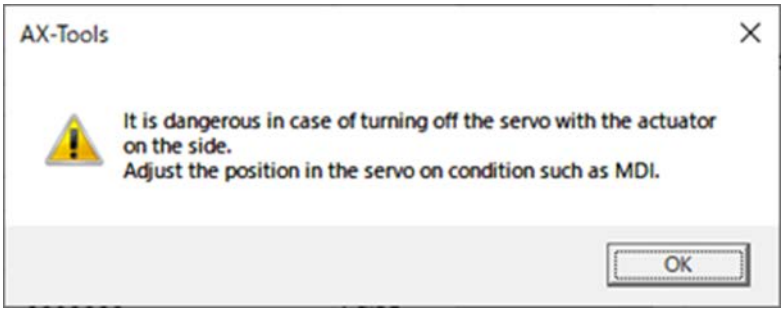
Click the [Yes(Y)] button to turn ON the servo.
Click the [No(N)] button to leave the servo OFF.

■ To set the current position as the offset amount

* After adjusting the position in the servo-on status, execute the operation.

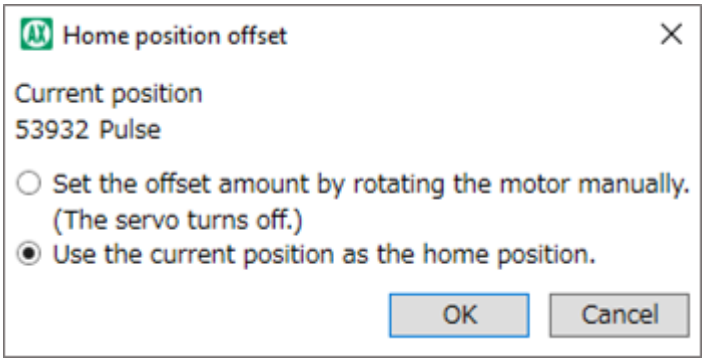
1. Drive to the position where to be set in the servo-on status.

2. Clicking the [Home position offset] button displays a caution message.

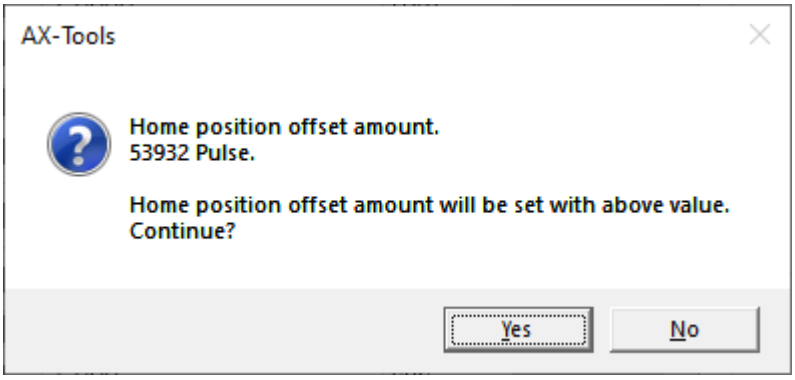


3. Click the [OK] button. The following dialog appears.

Select "Use the current position as the home position."



4. Click the [OK] button. The following dialog appears.



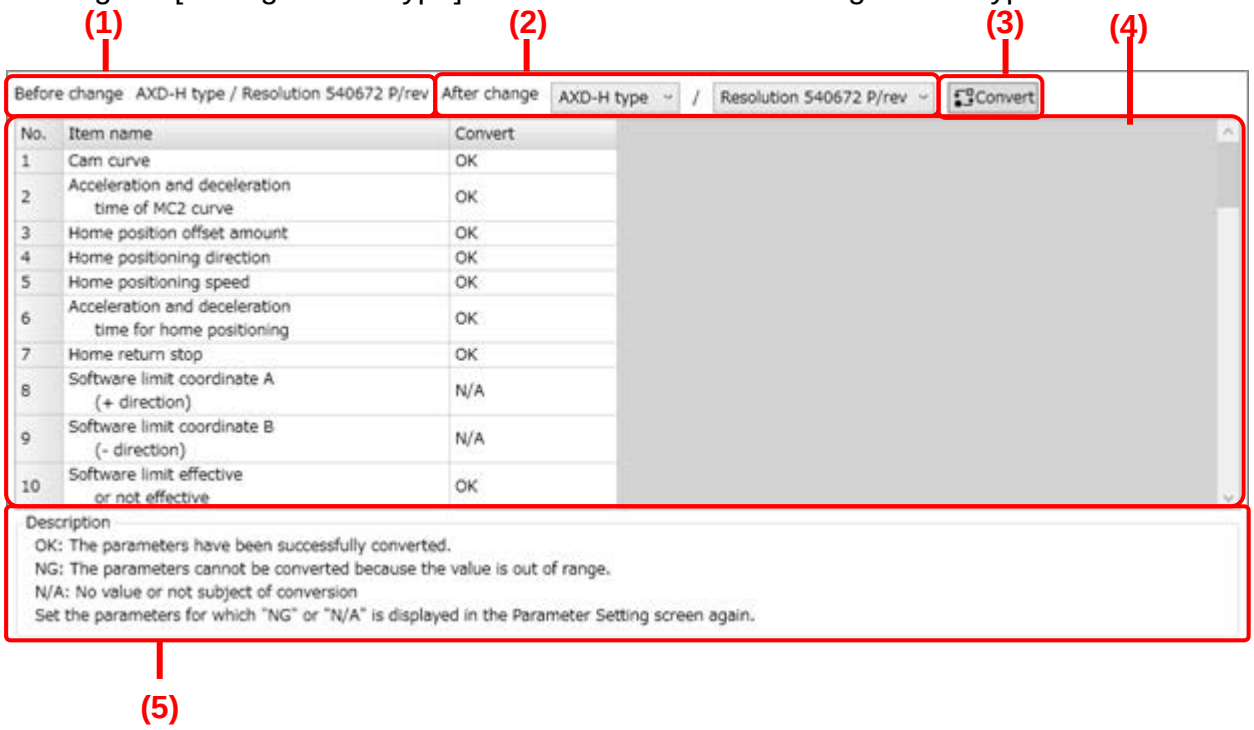
5. Clicking the [Yes(Y)] button applies the setting.

(Clicking the [No(N)] button discards changes in the setting.)

* The amount of home position offset to have turned on once again to or to have been set to it after returning in home position becomes effective.

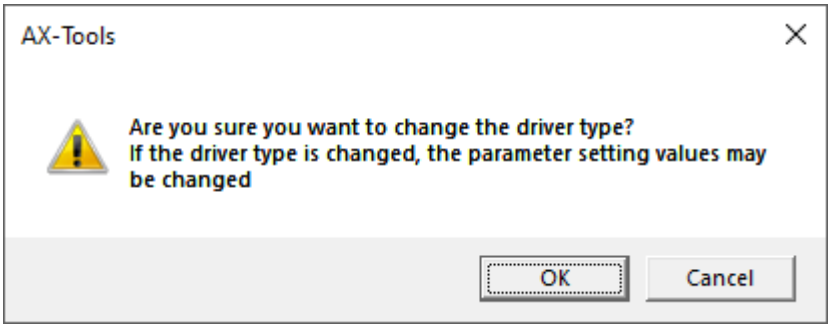
3.5.6. Change driver type

Clicking the [Change driver type] button launches the "Change driver type" view.



No.	Name	Description
(1)	**Before change**	The current driver type and actuator are displayed. Actuator is displayed only when the driver type is "AXD-H type" or "AXD-S type."
(2)	**After chamge**	Select the driver type and actuator to change. Actuator is displayed only when the driver type is "AXD-H type" or "AXD-S type." Driver types "AXD-S type," "AXD-H type," "TS type," "TH type," "MU type," and "XS type" can be selected.
(3)	**[Convert] button**	Convert the driver type.
(4)	**Conversion result list**	Display the list of parameter conversion results. * For parameters with NG or N/A as the conversion result, configure the settings in "Parameter." For details, refer to "3.5.3 Parameter."
(5)	**Description**	Display the description of the conversion column of the conversion result list.

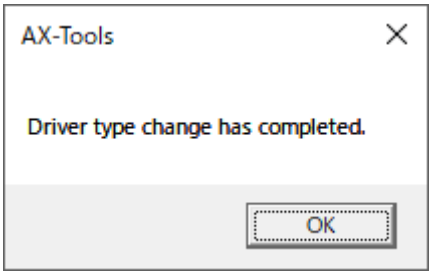
Clicking the [Convert] button displays a confirmation message.



Name	Description
[OK] button	Convert the parameters of the selected window tab to the parameters of the driver type selected in "After changes," and clears the editorial data except for "Program," "Point Table," and "Parameter."
[Cancel] button	Return to the conversion setting being edited.

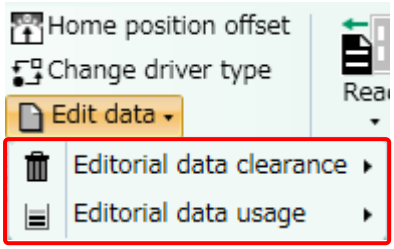
* If you select the same driver type before and after conversion, no conversion is performed.

Click the [OK] button after the conversion is complete.



3.5.7. Edit data

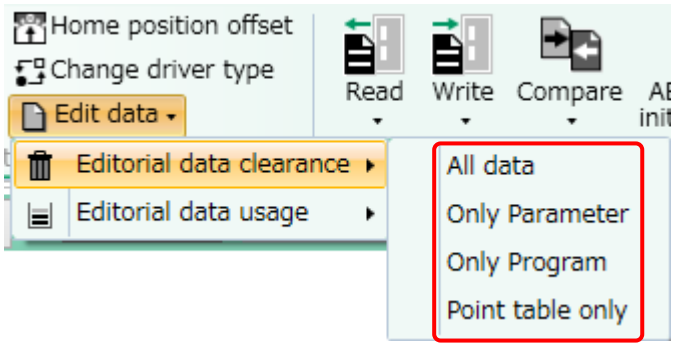
Clicking the [Edit data] button displays the edit data submenu.



Name	Description
Editorial data clearance	Clear the editorial data. Choose from "All data," "Only Parameter," "Only Program," or "Point table only."
Editorial data usage	Display the Editorial data usage dialog. You can select "Only Program."

■ Editorial data clearance

Clicking the [Editorial data clearance] button displays the editorial data clearance submenu.

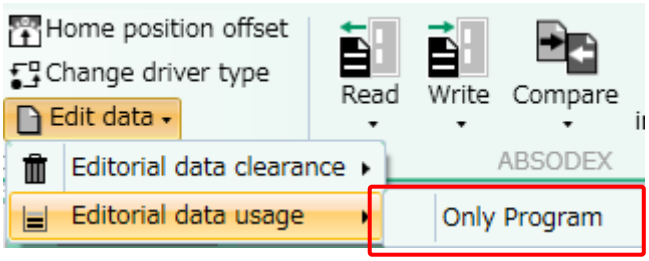


Name	Description
All data	Restore the parameter, program, or point table being edited to its initial value.
Only Parameter	Restore the parameter being edited to its initial value.
Only Program	Restore the program being edited to its initial value.
Point table only	Restore the point table being edited to its initial value.

* A confirmation message "Editing data will be lost. Continue?" is displayed.

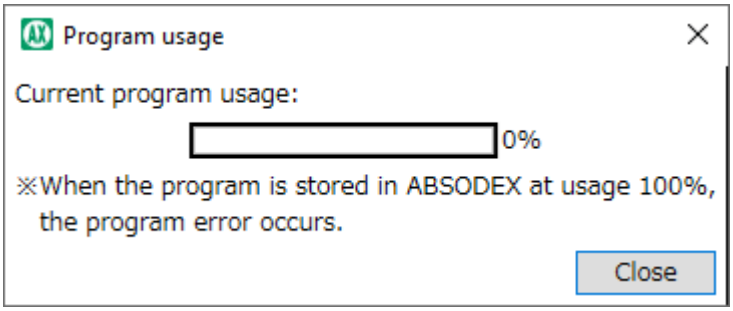
■ Editorial data usage

Clicking the [Editorial data usage] button displays the editorial data usage submenu.



Name	Description
Only Program	A dialog box that indicates the usage of the program being edited appears.

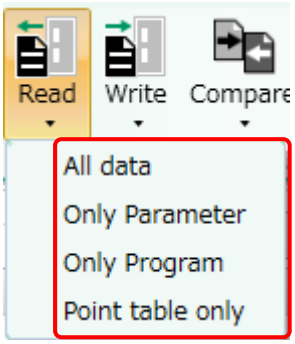
If you click the [Only Program] button, the following dialog is displayed.



Name	Description
Current program usage	Display the usage of the program being edited.
[Close] button	Close the dialog.

3.5.8. Read

Read the driver data and set it to the view

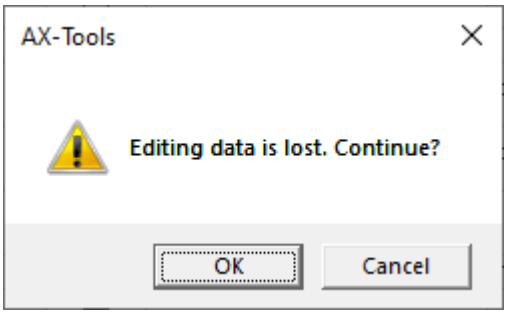


Name	Description
All data	Read the parameter, program, or point table from the connected driver into edit data.
Only Parameter	Read the parameter from the connected driver into edit data.
Only Program	Read the program from the connected driver into edit data.
Point table only	Read the point table from the connected driver into edit data.

* If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
* If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.

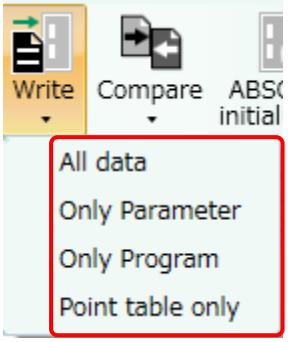
If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

If data is being edited, a confirmation message appears.



3.5.9. Write

Write the parameter, program, and point table data being edited to the driver.

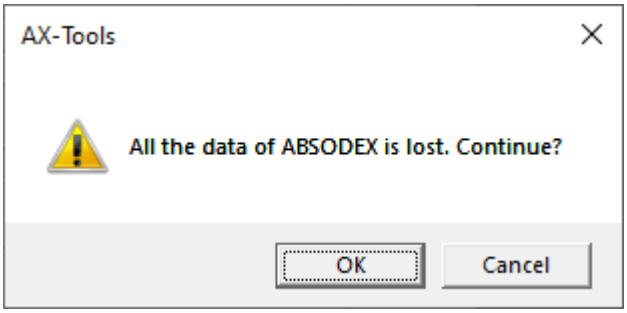


Name	Description
All data	Write the parameter, program, and point table data being edited to the driver.
Only Parameter	Write the parameter being edited to the driver.
Only Program	Write the program being edited to the driver. Note 1
Point table only	Write the point table being edited to the driver. Note 1

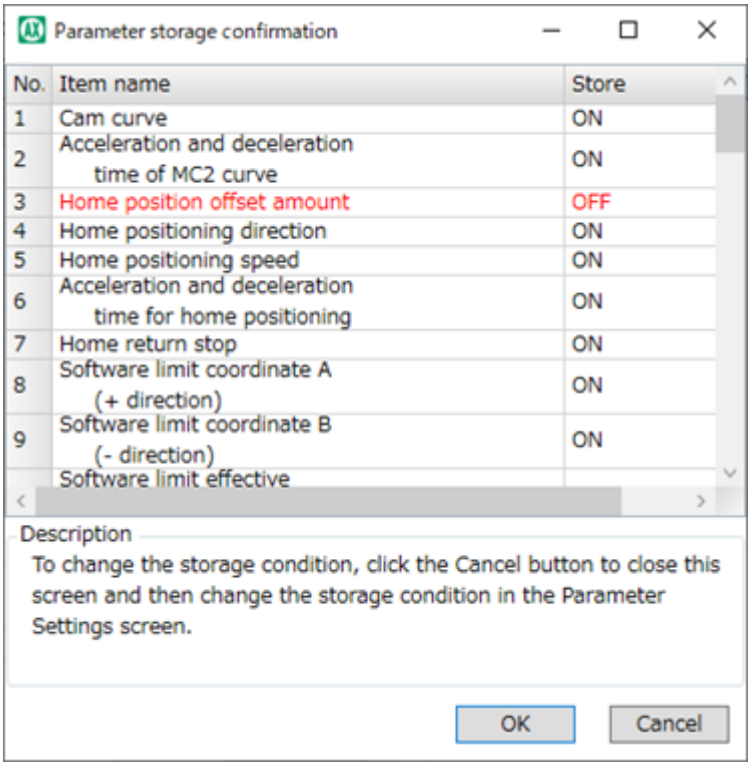
Note 1: If not editing is made, the menu is not enabled.

* If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
* If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
  If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.
* When writing parameter data, PRM83 will not write in the case of servo OFF.
  A message "PRM83 did not write due to servo OFF." is displayed.

A confirmation message appears before writing data to the driver.



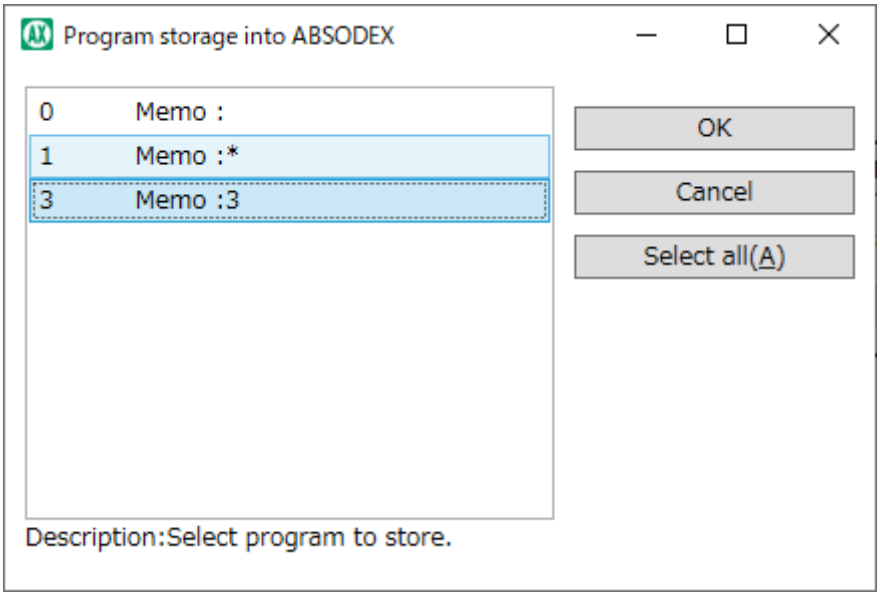
- Before the parameter is stored, a dialog that confirms the storage target is displayed.
  Click the [OK] button to perform storage.
  If you click the [Cancel] button, no parameter is stored.



Name	Description
No.	Display the parameter number.
Item name	Display the item name of the parameter.
Store	Display whether the parameter is stored in the driver. ON: The parameter is stored in the driver. OFF: The parameter is not stored in the driver.

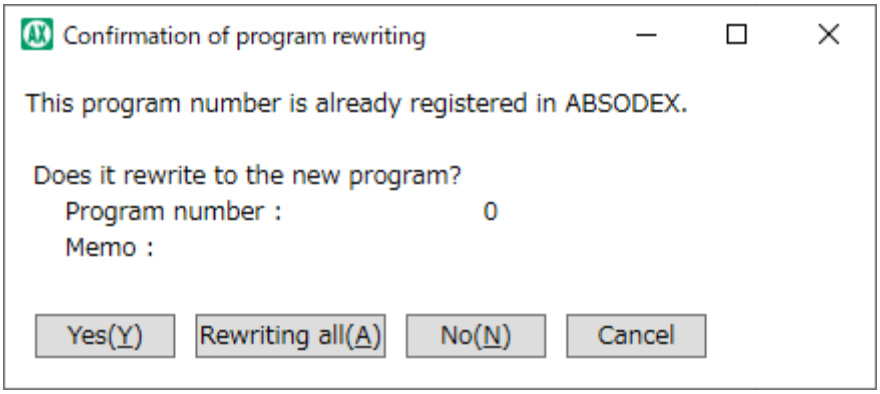
* Parameter storage ON/OFF settings can be changed in "Parameter."
For details, refer to "3.5.3 Parameter."

- The following dialog is displayed before storing program.



Select the program to store and click the [OK] button.
To select all the programs, click the [Select all (A)] button.

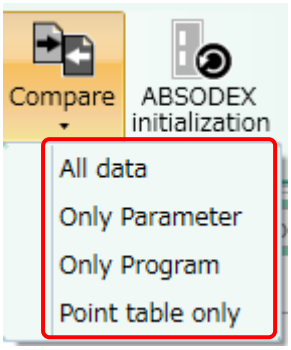
- When the program number to store is already used in the driver, the following confirmation dialog is displayed.



- To rewrite the program, select the [Yes(Y)] button.
  The program number displayed is rewritten. When [Rewriting all(A)] is selected, all the selected programs are rewritten without opening this dialog box.
- If you do not want to rewrite, select the [No(N)] button. The program displayed is not rewritten.
- When stopping
  Selecting the [Cancel] button cancels the storage of the selected programs. The data before canceling is stored in the driver.

3.5.10. Compare

Use this command to compare the editorial data with the driver data and display the results in the view.

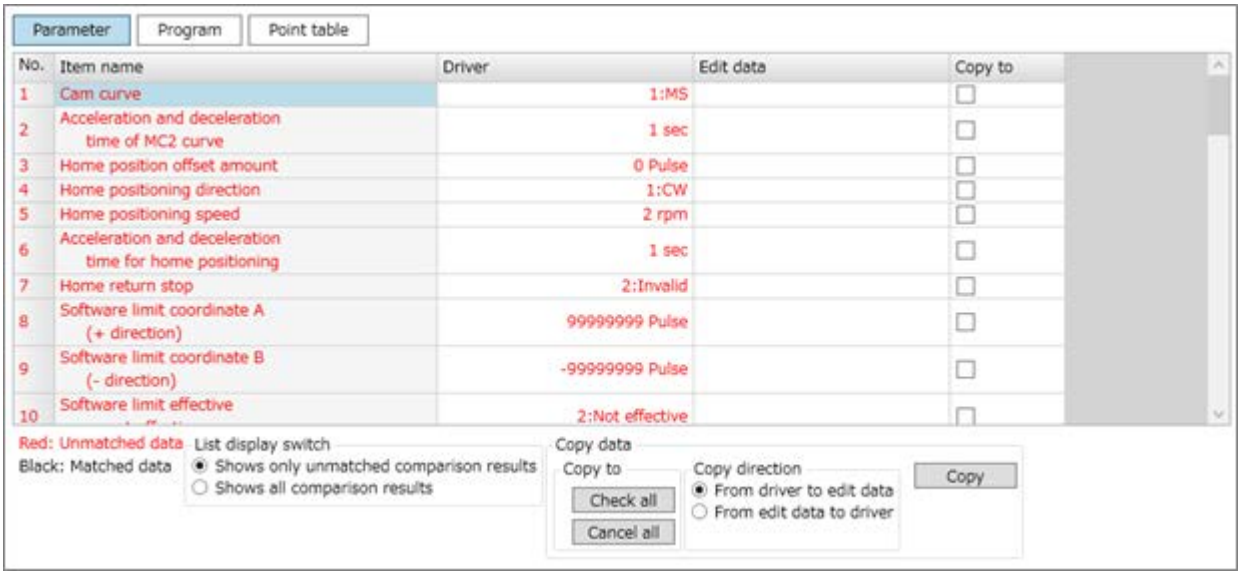


Name	Description
All data	Compare the editorial data with the driver data in Parameter, Program, and Point table. The comparison results are displayed in the view. Note 1, Note 2, Note 3, Note 4
Only Parameter	Compare the editorial data with the driver data in Parameter. The comparison results are displayed in the view. Note 1
Only Program	Compare the editorial data with the driver data in Program. The comparison results are displayed in the view. Note 2
Point table only	Compare the editorial data with the driver data in Point table. The comparison results are displayed in the view. Note 3, Note 4

Note 1: If acquiring the parameter from the driver fails, a message "Failed to read the parameter." is displayed.
Note 2: If acquiring the program from the driver fails, a message "Failed to read the program." is displayed.
Note 3: If acquiring the point table from the driver fails, a message "Failed to read the point table." is displayed.
Note 4: If the connected driver does not support the point table, a message "The driver does not support point tables." is displayed.

* If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
* If the connected driver type is different from the driver type of the selected window tab, a message "The comparison was not performed because of driver type mismatch." is displayed.
* If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.
* For drivers that cannot use this function, a message "This function is not supported." is displayed.

■ All data

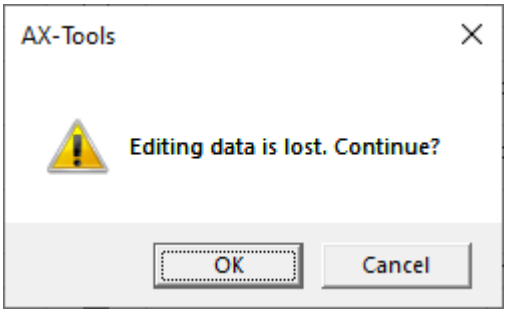


Name	Description
[Parameter] button	Displays the comparison results of the parameter.
[Program] button	Displays the comparison results of the program.
[Point table] button	Displays the comparison results of the point table.
List display switch	Switch the data displayed in the comparison result list by selecting the radio button. If you select the [Shows only unmatched comparison results] button, only the data judged to be unmatched is displayed. If you select the [Shows all comparison results] button, all compared data is displayed. The mismatch data is displayed in red, and the matched data is in black.
Copy to	Switch the check statuses of the check boxes in the "Copy to" column of the comparison result list. If you select the [Check all] button, check all the check boxes in the "Copy to" column. If you select the [Cancel all] button, uncheck all the check boxes in the "Copy to" column.
Copy direction	Specifies the copy direction of data.
[Copy] button	Copy the data selected in the "Copy to" column in the direction specified in "Copy direction." For details, refer to "Copy."

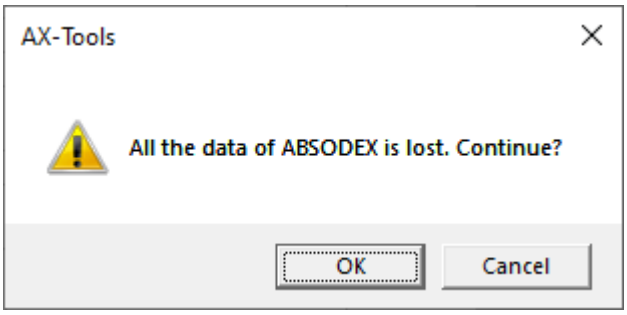
Copy

If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.

When "From driver to edit data" is selected in "Copy direction," the following confirmation message is displayed.



When "From edit data to driver" is selected in "Copy direction," the following confirmation message is displayed.

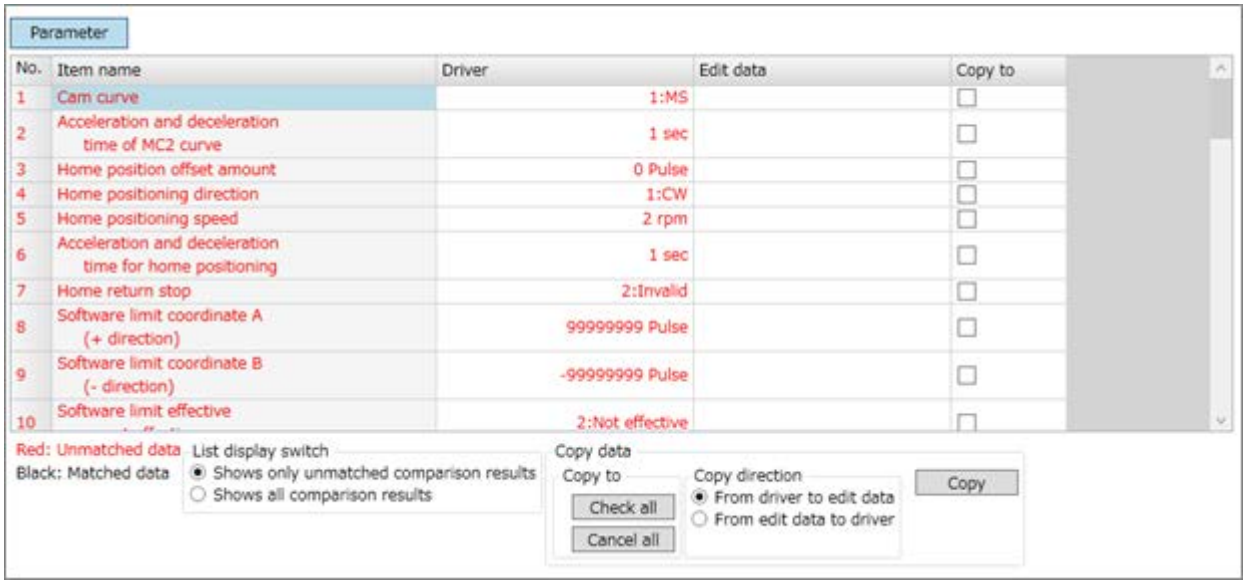


When copying data from a parameter or point table, a message is displayed if any of the following conditions apply.

- If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
- If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

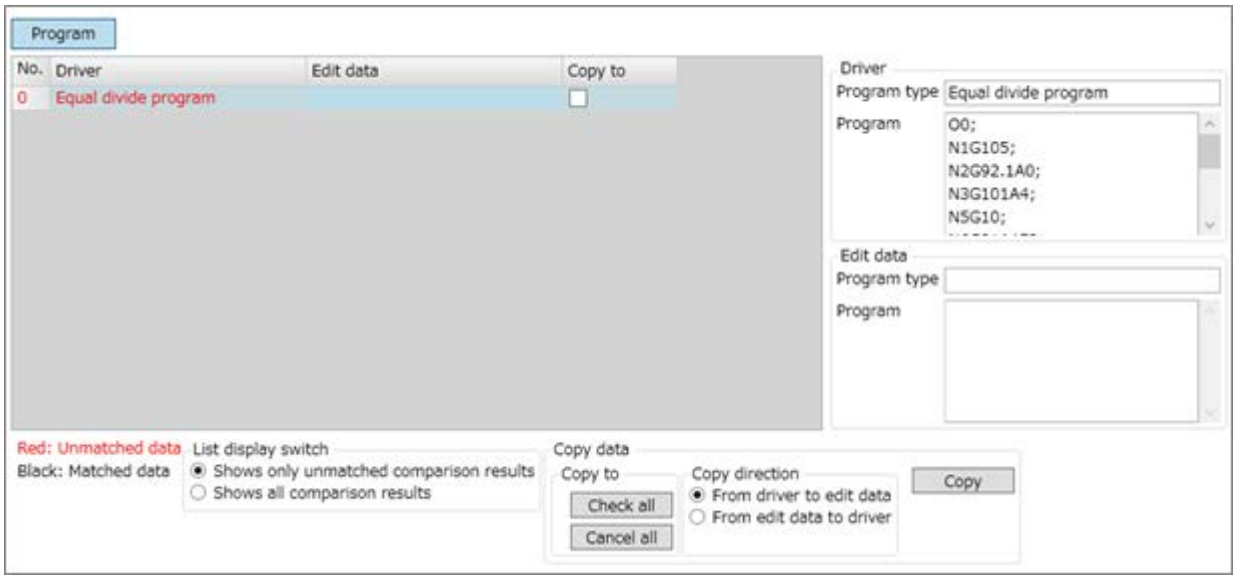
When copying parameter data, PRM83 will not write in the case of servo OFF.
A message "PRM83 did not write due to servo OFF." is displayed.

■ Only Parameter



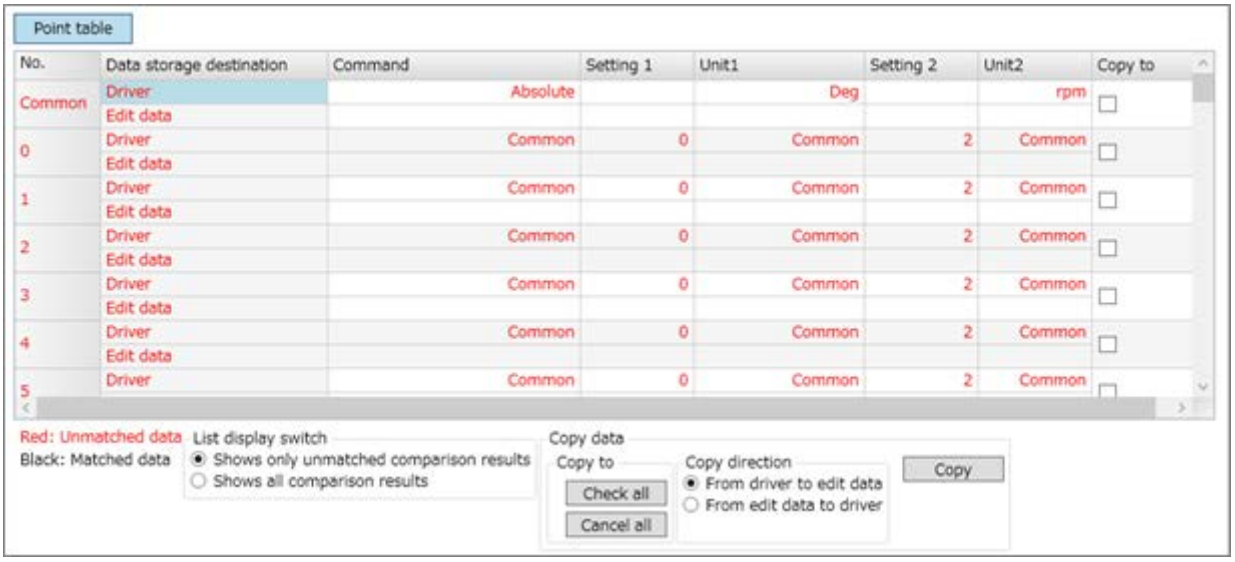
For operation details, refer to "All data."

■ Only Program



For operation details, refer to "All data."

■ Point table only



For operation details, refer to "All data."

3.5.11. ABSODEX initialization

CAUTION

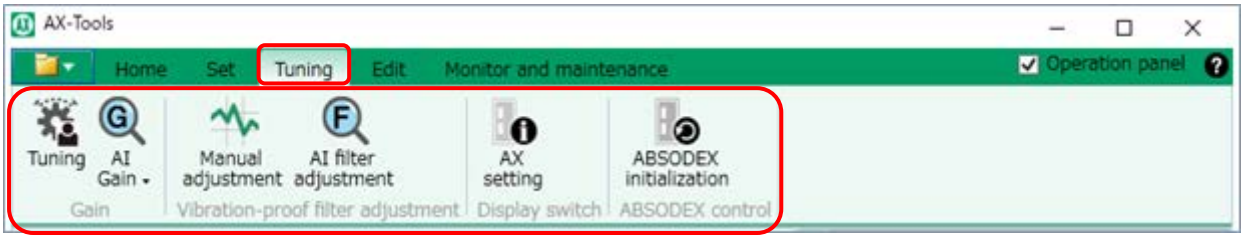
When software reset is executed, check the input state of the signal from the upper device to the driver in advance.

Restore the data written to the driver to the factory default state.
If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
Before initializing the data, a confirmation message "Your ABSODEX will be set to the factory shipment status. Continue?" is displayed.
If initialization is successful, a message "Your ABSODEX was reset to the factory shipment status." is displayed. If failed, a message "Initialization failed." is displayed.

3.6. [Tuning] tab

3.6.1. Overview of the [Tuning] tab

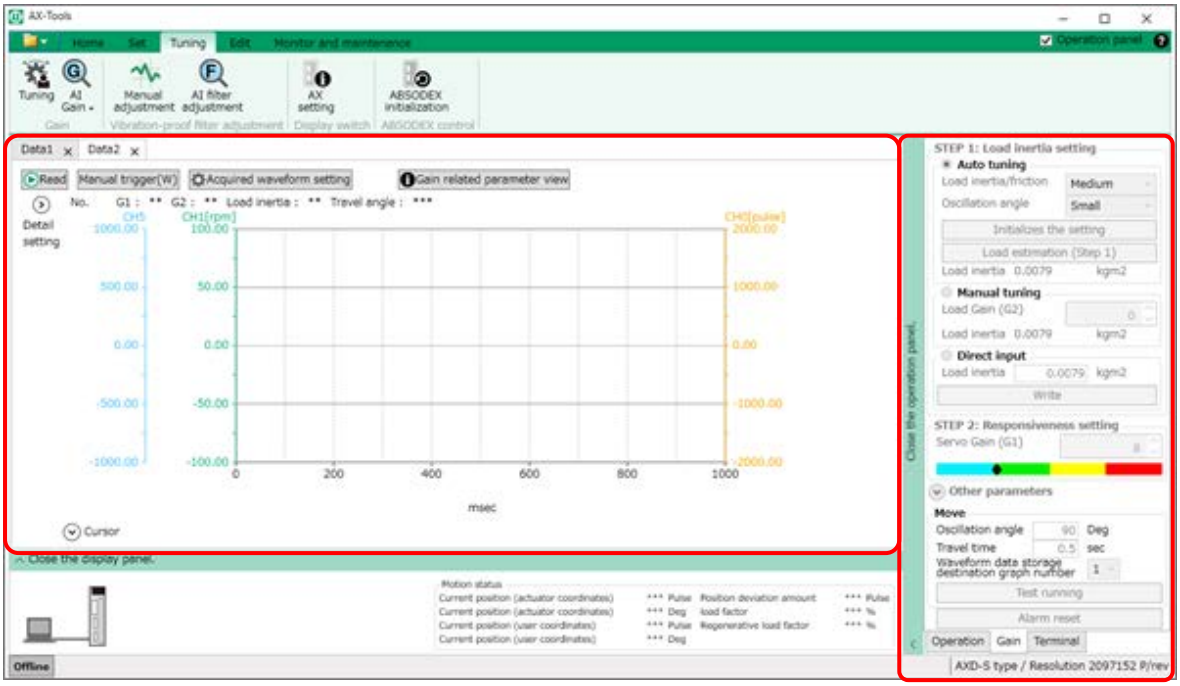
AI gain adjustment, AI filter adjustment, AX setting, and ABSODEX initialization can be performed.
When the [Tuning] tab is selected, the following ribbon menu appears.



Name	Description	Reference
Tuning	Switch to the "AxSpeed" view. The operation panel changes to the [Tuning] tab.	3.6.2
AI Gain	Switch to the "AxSpeed" view and display the AI gain adjustment dialog.	3.6.3
Manual adjustment	Switch to the "AxFFT" view and display the filter setting dialog.	3.6.4
AI filter adjustment	Switch to the "AxFFT" view and display the AI filter adjustment dialog.	3.6.5
AX setting	Switch to the "AX setting" view.	3.6.6
ABSODEX initialization	Restore the data written to the driver to the factory default state.	3.6.7

3.6.2. Tuning

Clicking the [Tuning] button switches to the "AxSpeed" view. The operation panel changes to the [Gain] tab.



3.6.3. AI Gain

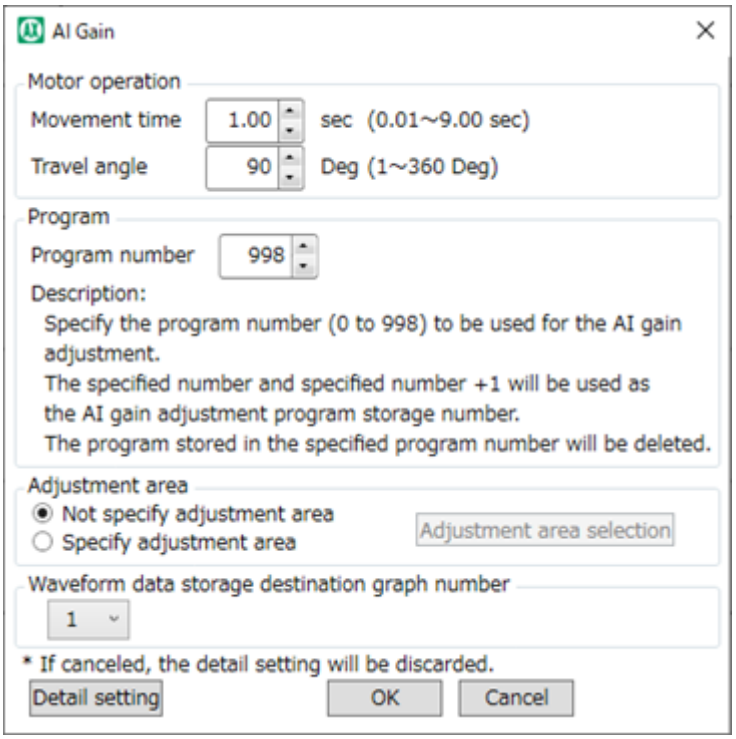
Clicking the [AI Gain] button displays the AI Gain submenu.

Name	Description
AI Gain	Adjust the gain of ABSODEX.
Point table display	Display the point table of AI gain adjustment.

■ AI Gain

The motor is operated, and the proper PID gain parameter is set based on the operation result.
Clicking the [AI Gain] button displays the AI Gain dialog. (Note 1, Note 2, Note 3)
The available drivers are "TS type," "TH type," "MU type," and "XS type."

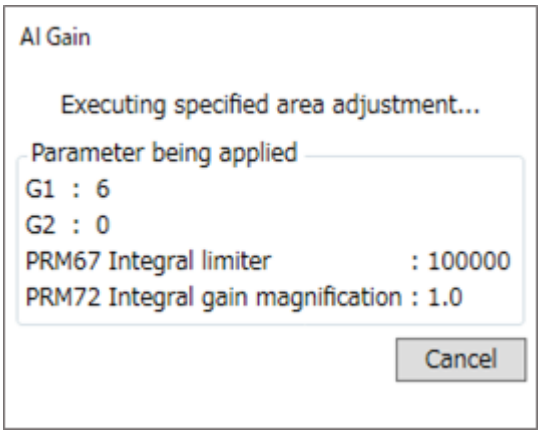
AI Gain dialog



Name	Description
Motor operation	Set the motor movement time and travel angle at the AI gain adjustment. An NC program for the AI gain adjustment with the specified movement time and travel angle is created automatically.
Program number	Specify the storage-destination program number of the NC program created with the movement time and travel angle specified in [Motor operation]. For the AI gain adjustment, two program numbers are used: the specified program number and the specified number + 1. Note 4, Note 5 Example: When "998" is specified in "Program number", "998" and "999" are used.
Adjustment area	Select [Specify adjustment area] or [Not specify adjustment area] while AI Gain adjustment is running. • Not specify adjustment area: The adjustment area range is not specified. AI Gain adjustment is executed with the execution mode specified in the [Detail setting] dialog. • Specify adjustment area: Click the [Adjustment area selection] button to specify the adjustment area range. AI gain adjustment is performed only for the specified adjustment area.
Waveform data storage destination graph number	Specify the graph-storage destination number after the AI gain adjustment completion.
[Detail setting] button	Clicking this button displays the [Detail setting] dialog box for the AI gain adjustment.
[OK] button	Clicking this button starts the AI gain adjustment. Note 6
[Cancel] button	Clicking this button cancels the execution of the AI gain adjustment.

Note 1: If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
Note 2: If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
Note 3: If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.
Note 4: If an NC program is already stored in the specified number, the NC program is overwritten with the NC program for the AI gain adjustment.
Note 5: After the AI gain adjustment is completed, the stored NC program for the AI gain adjustment is deleted.
Note 6: A confirmation message "Confirm that the CN3 connector is not connected." is displayed.

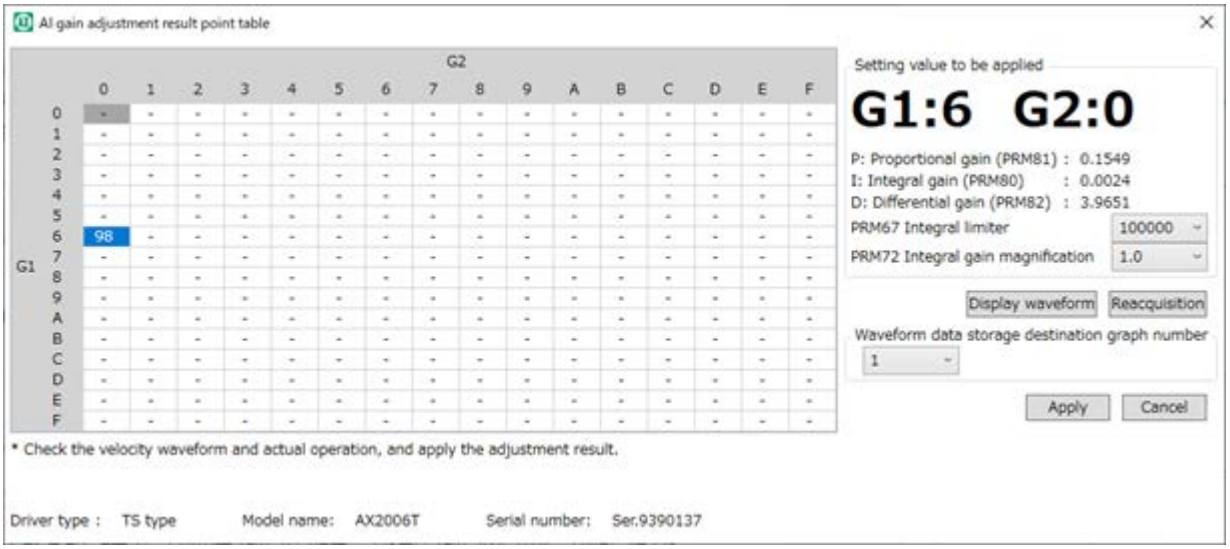
Progress dialog



Name	Description
G1	The currently applied G1 value is displayed.
G2	The currently applied G2 value is displayed.
PRM67 Integral limiter	The currently applied setting value of PRM67 is displayed.
PRM72 Integral gain magnification	The currently applied setting value of PRM72 is displayed.
[Cancel] button	Clicking this button terminates the execution of the AI gain adjustment. The settings are discarded and the status before the adjustment is restored.

During the AI gain adjustment, the graph is updated according to the applied parameters.
The displayed graph displays the G1, G2, and PID gain parameter values applied.

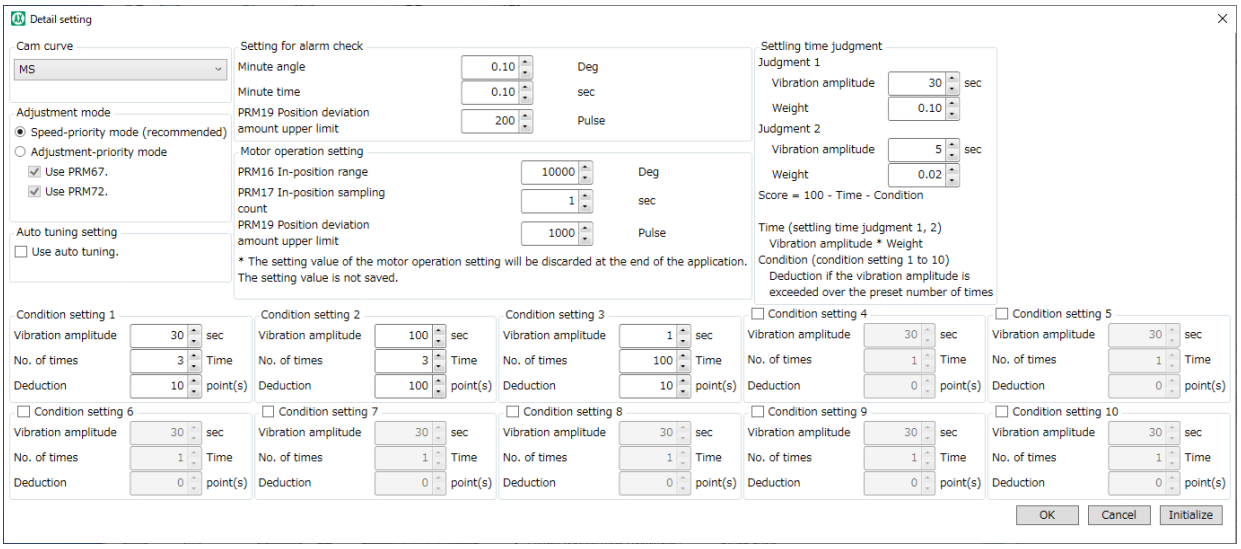
When the AI gain adjustment is completed, the [AI gain adjustment result point table] dialog is displayed, and this dialog box indicates the adjustment result.
Select the PID gain parameter to be applied to the driver based on the displayed result.
You can also acquire waveforms on unsearched spots and acquire again the searched waveforms.



Click the [Apply] button to apply the setting displayed in "Setting value to be applied" to the driver.
For details of the [AI gain adjustment result point table] dialog, refer to "Point table display."

[Detail setting] dialog

Use this dialog only to change the adjustment mode or judgment condition.



Name	Description
Cam curve	Select a cum curve to be applied during the AI gain adjustment. "MS," "MT," and "TR" can be selected. After the AI gain adjustment is completed, the setting value of the applied cum curve is discarded and the setting value of the driver before the adjustment is restored. The setting in the [Detail setting] dialog is saved. The previous setting is displayed at the next application start.
Adjustment mode	Select an execution mode of the AI gain adjustment. The setting in the [Detail setting] dialog is saved. The previous setting is displayed at the next application start. • Speed-priority mode (recommended): The speed of the adjustment time is prioritized, and the AI gain adjustment is executed. The time required for the adjustment is reduced. • Adjustment-priority mode: The number of searching times is increased, and the AI gain adjustment is executed. The time required for the adjustment is increased. When the [Use PRM67] button is selected, the value of "PRM67 Integral limiter" is changed during the adjustment. When the [Use PRM72] button is selected, the value of "PRM72 Integral gain magnification" is changed during the adjustment. When neither [Use PRM67] nor [Use PRM72] is selected, the adjustment is executed with the preset fixed values of PRM67 and 72.

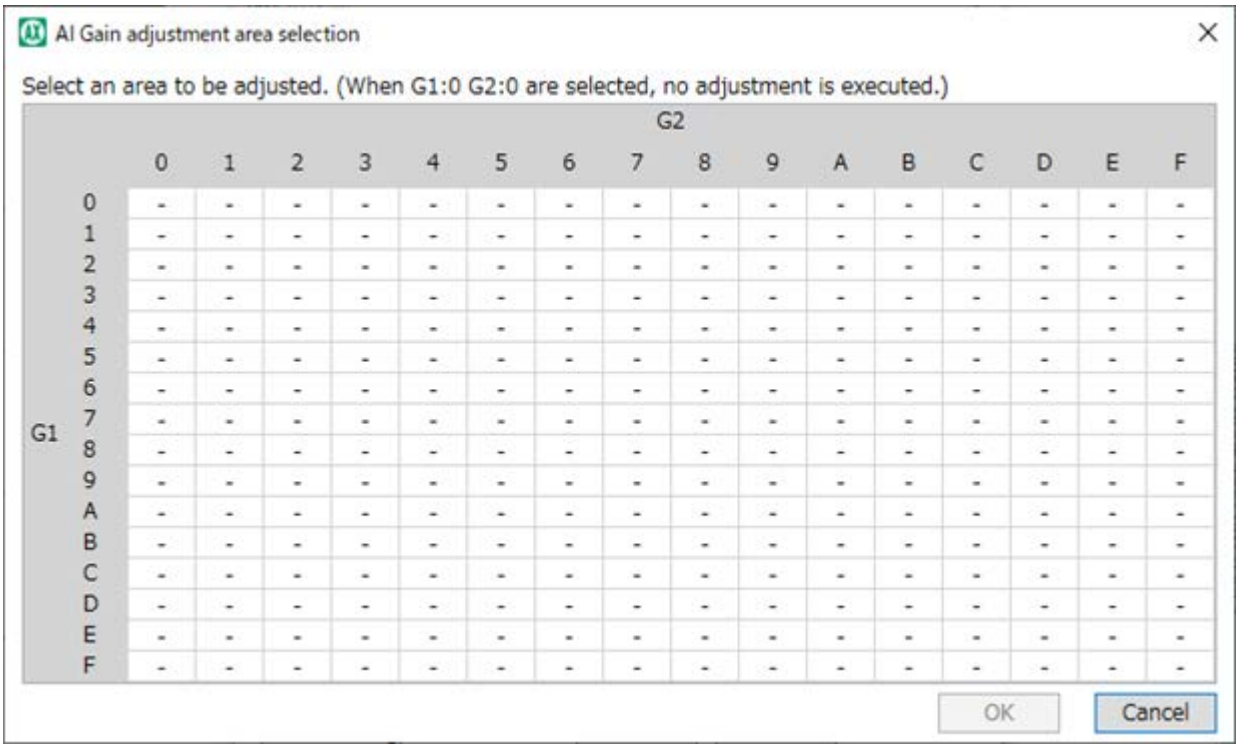
Name	Description
Auto tuning setting	When [Use auto tuning] is selected, the auto tuning is executed before the adjustment. Based on the result of the auto tuning, the G1 value and G2 value with which the AI gain adjustment is started are determined. Note 1 The setting in the [Detail setting] dialog is saved. The previous setting is displayed at the next application start.
Setting for alarm check	Perform a setting for the alarm check during the AI gain adjustment. An NC program for the alarm check with the specified minute time and minute angle is created automatically. After the AI gain adjustment is completed, the NC program created is deleted. After the AI gain adjustment is completed, the setting value of applied PRM19 is discarded and the setting value of the driver before the adjustment is restored. The setting in the [Detail setting] dialog will be discarded when the application is terminated. The default value is displayed at the next application start.
Motor operation setting	Specify the parameter setting value to be used for the AI gain adjustment. The specified setting value is stored in the driver and used during the AI gain adjustment. After the AI gain adjustment is completed, the setting value of each parameter is discarded and the setting value of the driver before the adjustment is restored. The setting in the [Detail setting] dialog will be discarded when the application is terminated. The default value is displayed at the next application start.
Settling time judgment	Specify the score reduction method for the settling time, which is the time required for the settlement. Specify two judgment conditions: [Judgment 1] and [Judgment 2]. The setting in the [Detail setting] dialog is saved. The previous setting is displayed at the next application start. • Vibration amplitude: Settling time until the vibration falls within the specified vibration amplitude. • Weight: Coefficient multiplied with the settling time specified in vibration amplitude. Example: If the settling time is 100 msec and the weight is 0.1, 100 * 0.1 = 10. Thus, deduction will be 10 points.
Condition setting 1 to 10	Specify the score reduction method of the score calculation method. The setting in the [Detail setting] dialog is saved. The previous setting is displayed at the next application start. • Vibration amplitude and No. of times: Specify the vibration amplitude and number of times that are regarded as vibration. If the set vibration amplitude and the set number of times are exceeded, the score is reduced. • Deduction: Specify the deduction point applied when the conditions specified in [Vibration amplitude] and [No. of times] are satisfied.
[OK] button	Clicking this button confirms the setting and returns to the [AI Gain] dialog.
[Cancel] button	Clicking this button discards the setting and returns to the [AI Gain] dialog.
[Initialize] button	Clicking this button restores the default values of the [Detail setting] dialog.

Note 1: Auto tuning function is available for "TS type," "MU type," and "XS type" drivers. Auto tuning function is not available for "TH type."

The score is based on the point deduction system from 100. It is calculated by the following formula.
Score = 100 - Deduction point calculated from settling time judgment - Deduction point calculated from condition setting

AI Gain adjustment area selection dialog

Use this dialog only when an adjustment area is specified.



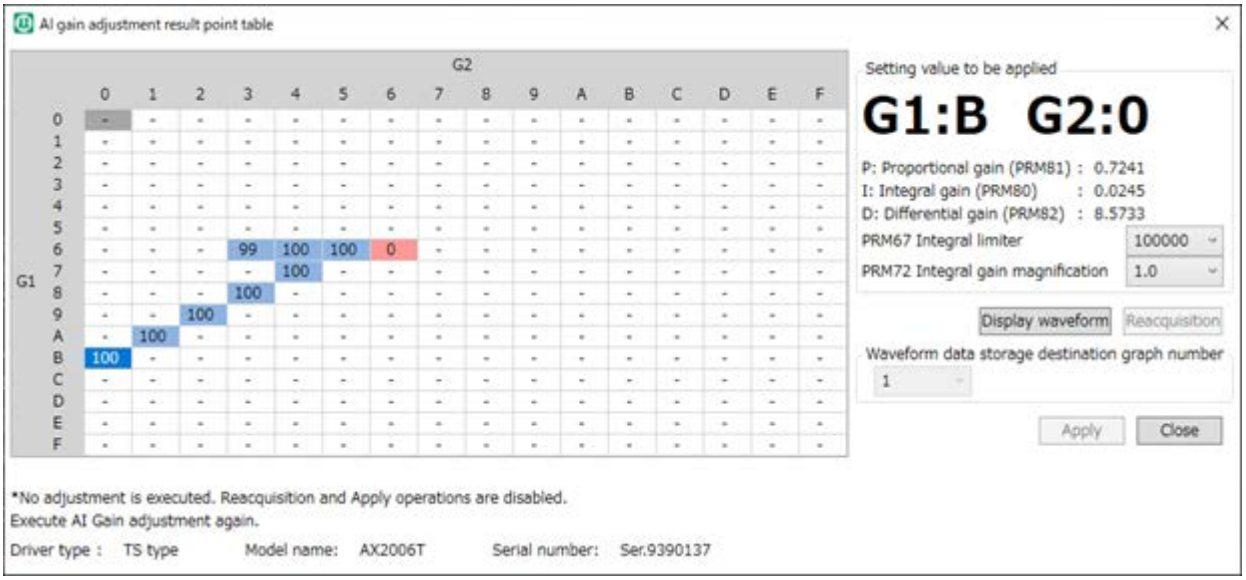
Name	Description
Adjustment area selection table	Select the area to adjust the AI Gain with the mouse or keyboard. Note 1 • Selection with the mouse Select the adjusted area by clicking the left mouse button. Multiple areas can be selected by the drag & drop operation of the mouse. With the [Ctrl] key, a separated area can be selected or cancelled. • Selection with the keyboard With the keyboard, only the adjustment area specification can be executed. Multiple areas can be selected with [Shift] + arrow keys.
[OK] button	Reserve the selected areas and return to the AI gain adjustment dialog. Note 2, Note 3
[Cancel] button	Return the selected area to the state before the dialog is displayed and return to the AI gain adjustment dialog.

Note 1: G1G2 = 00 can be selected but this area is excluded from the adjustment target at AI gain adjustment.
Note 2: This command is valid only when one or more areas other than G1G2 = 00 are selected in the adjustment area selection table.
Note 3: The period reserving the selected areas is valid only while the application is activated. When the application is ended, the information of selected areas is discarded.

■ Point table display

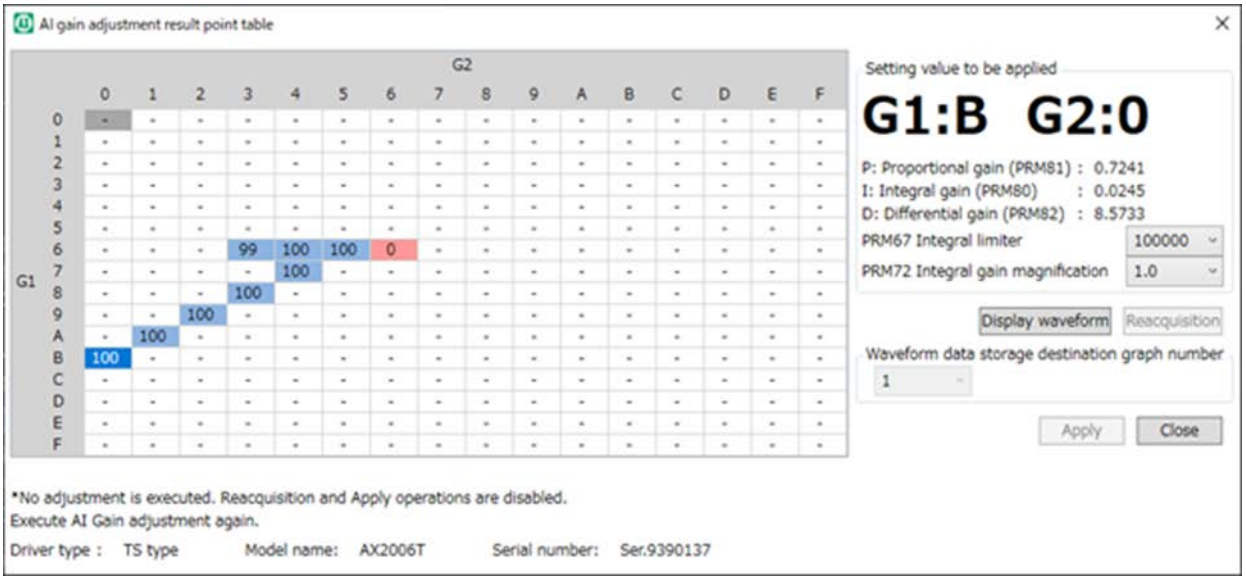
A dialog with available different function is displayed in accordance with the execution status of AI Gain adjustment as follows.
Clicking the [Point table display] button displays the following dialog and switches to the "AxSpeed" view.

• When AI Gain adjustment has been executed



• When the file saving the AI Gain adjustment execution result is opened

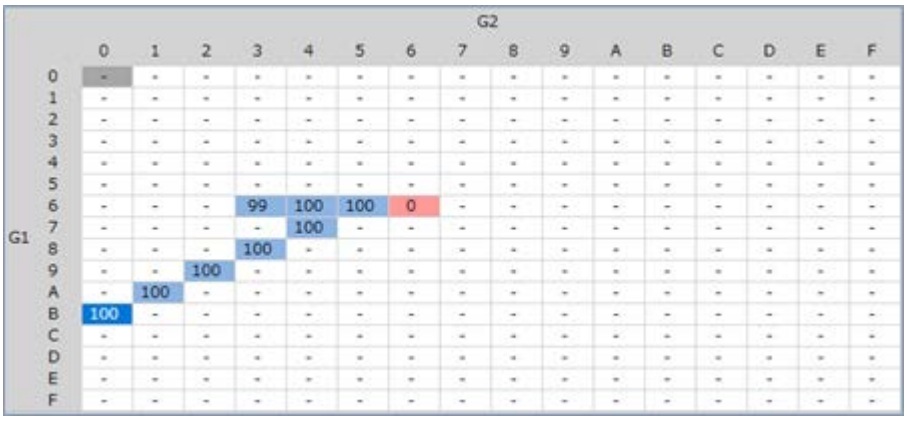
* The [Reacquisition] and [Apply] buttons are disabled.



Name	Description
G1, G2	The G1 value and G2 value currently selected are displayed. (The displayed values correspond to the G1 value and G2 value of the manual gain setting.)
PID parameter	The PID parameters of G1 and G2 on the currently selected position are displayed.
PRM67 Integral limiter	The setting value of PRM67 Integral limiter applied to the currently displayed adjustment result point table is displayed. Changing the setting value switches the display of the adjustment result point table.
PRM72 Integral gain magnification	The setting value of PRM72 Integral gain magnification applied to the currently displayed adjustment result point table is displayed. Changing the setting value switches the display of the adjustment result point table.
Waveform data storage destination graph number	Clicking the [Apply] button saves the currently selected G1 and G2 graph in the specified graph storage destination number.
Driver type, Model name, and Serial number	The driver type, model name, and serial number at the AI gain adjustment are displayed.
[Display waveform] button	Switch to the "AxSpeed" view.
[Reacquisition] button	After selecting the reacquisition-target G1 and G2, click the [Reacquisition] button. When reacquisition is performed, the motor operation is executed with "Setting value to be applied" of the selected G1 and G2 and the setting at the AI gain adjustment and a waveform is acquired.
[Apply] button	Clicking this button applies the setting displayed in "Setting value to be applied" to the driver.
[Close] button	Reserving the gain adjustment result, end the AI Gain adjustment function. The setting displayed in "Setting value to be applied" is not applied to the driver. Note 1

Note 1: When the file saving the AI Gain adjustment execution result is opened, the function is changed to the [Close] button.

Adjustment result point table



G1 \ G2	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	99	100	100	0	-	-	-	-	-	-	-	-	-
7	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-
A	-	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

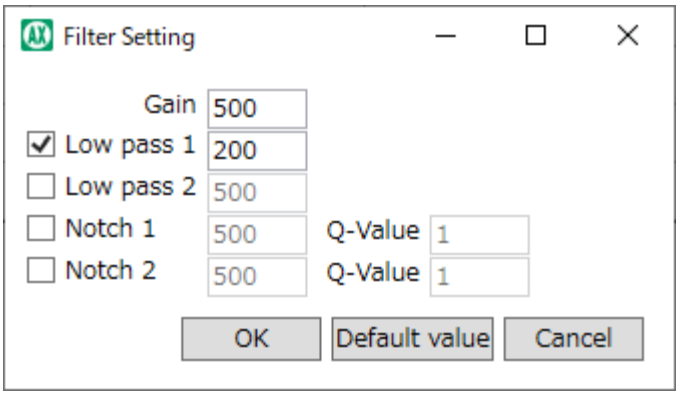
- Score of the AI gain adjustment result
  The score is calculated based on the motor operation with the applied parameter and the acquired waveform.
  The maximum score is 100.

  The spot of the recommended best score is indicated in rich blue.
  The spot for which no waveform is acquired is indicated with "-."
  The spot outside the AI gain adjustment is indicated in dark gray.

- Selecting cells in a table
  The waveform graph is updated based on the result of execution with the selected G1 and G2 settings.
  "Setting value to be applied," which is located on the right side of the window, is updated based on the selected G1 and G2 position.

3.6.4. Manual adjustment

Change the settings of the driver digital filter.
Clicking the [Manual adjustment] button displays the following setting dialog and switches to the "AxFFT" view. (Note 1, Note 2, Note 3)



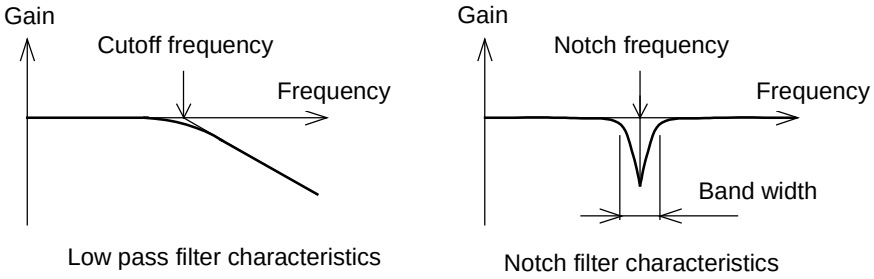
Place a check mark in the check box to validate the corresponding filter.

Name	Description
Gain	Display or set the gain value. This sets the amplitude of the generated random number. Leave the default value 500 unchanged in regular cases.
Low pass 1	Display or set the value of Low pass 1.
Low pass 2	Display or set the value of Low pass 2.
Notch 1	Display or set the value of Notch 1.
Notch 2	Display or set the value of Notch 2.
Q-Value	Display or set the value of Q-Value. There is no need to change the Q-Value in most cases. The larger the value, the narrower the band width. The smaller the value, the wider the band width. The default value is "1."
[OK] button	Store the filter setting value in the driver.
[Default value] button	The parameter default values are set.
[Cancel] button	Cancel the manual adjustment. The filter setting values are not stored.

Note 1: If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
Note 2: If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
Note 3: If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

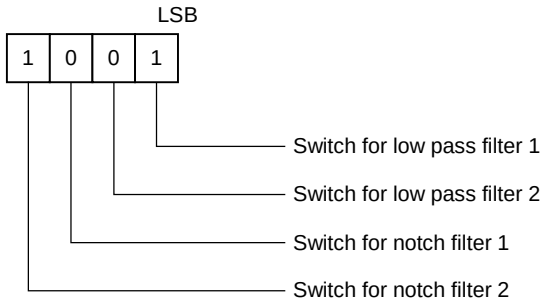
■ Characteristics of filter

The low pass filter attenuates the signal in the high frequency area. The notch filter attenuates signals at specific frequencies.



■ Filter switch

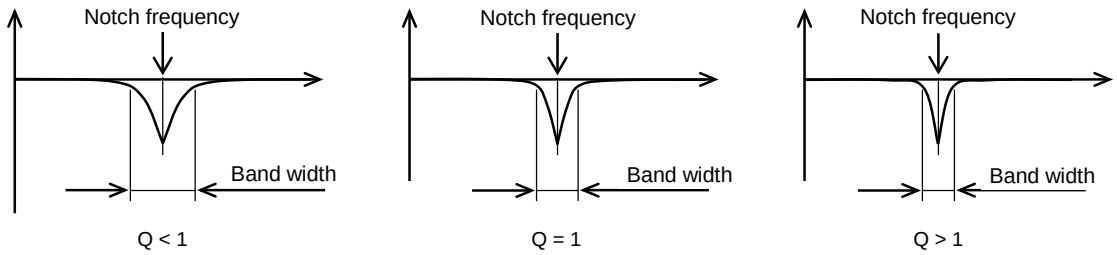
Use parameter 66 (filter switch) to designate whether or not to use four filters.
Each bit of the switch corresponds to a specific filter. "1" at the bit indicates a valid filter. "0" indicates an invalid filter.



<Switch setting example>
PRM66 = 9 (= 1001): Use low pass filter 1 and notch filter 2.
PRM66 = 3 (= 0011): Use low pass filter 1 and low pass filter 2.

■ Q value of notch filter

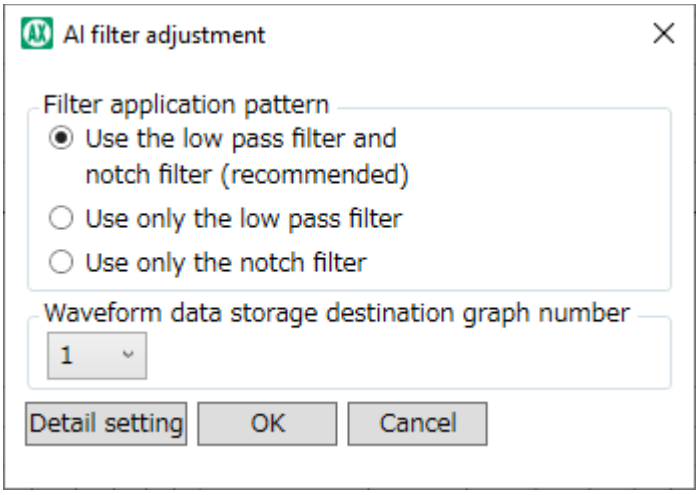
Use parameters 70 and 71 to specify the band width Q of the notch filter.



3.6.5. AI filter adjustment

Clicking the [AI filter adjustment] button displays the "AI filter adjustment" dialog. (Note 1, Note 2, Note 3)
Available drivers are "AXD-S type," "AXD-H type," "TS type," "TH type," "MU type," and "XS type."

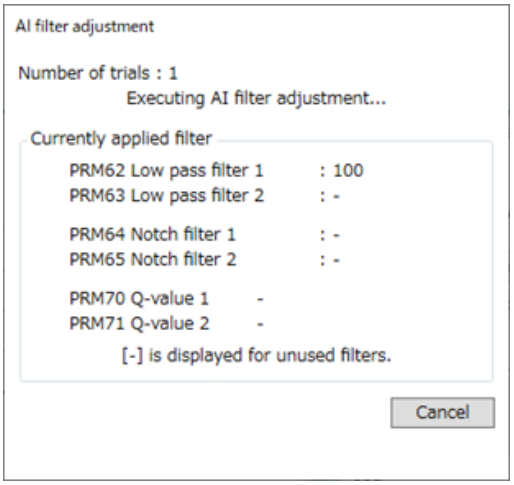
■ AI filter adjustment dialog



Name	Description
Filter application pattern	Specify the filter application pattern.
Waveform data storage destination graph number	Specify the graph-storage destination number after the AI filter adjustment completion.
[Detail setting] button	Clicking this button displays the [Detail setting] dialog for the AI filter adjustment. For details, refer to "[Detail setting] dialog."
[OK] button	Clicking this button starts the AI filter adjustment. The progress dialog is displayed while the AI filter adjustment is in progress. For details, refer to "Progress dialog."
[Cancel] button	Clicking this button cancels the execution of the AI filter adjustment.

Note 1: If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
Note 2: If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
Note 3: If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

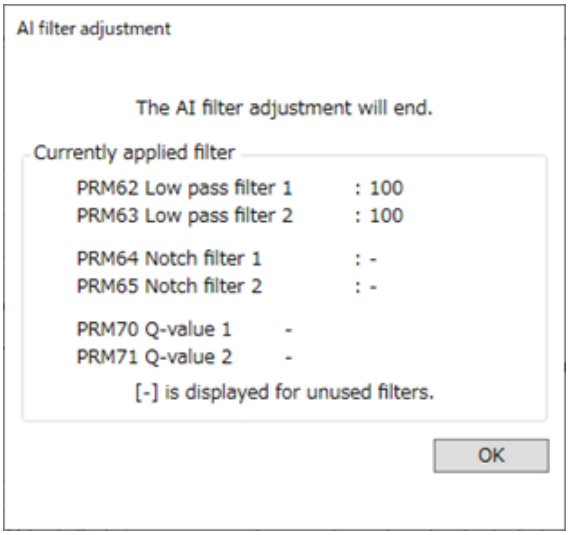
■ Progress dialog



Name	Description
Number of trials	The current number of tries of the AI filter adjustment is displayed.
PRM62 Low pass filter 1	The setting value of the low pass filter 1 is displayed.
PRM63 Low pass filter 2	The setting value of the low pass filter 2 is displayed.
PRM64 Notch filter 1	The setting value of the notch filter 1 is displayed.
PRM65 Notch filter 2	The setting value of the notch filter 2 is displayed.
PRM70 Q-value 1	The value set as the Q-value of the notch filter 1 is displayed.
PRM71 Q-value 2	The value set as the Q-value of the notch filter 2 is displayed.
[Cancel] button	Clicking this button cancels the execution of the AI filter adjustment. The setting of the applied filter displayed in the dialog is discarded. The digital filter setting before the adjustment is restored.

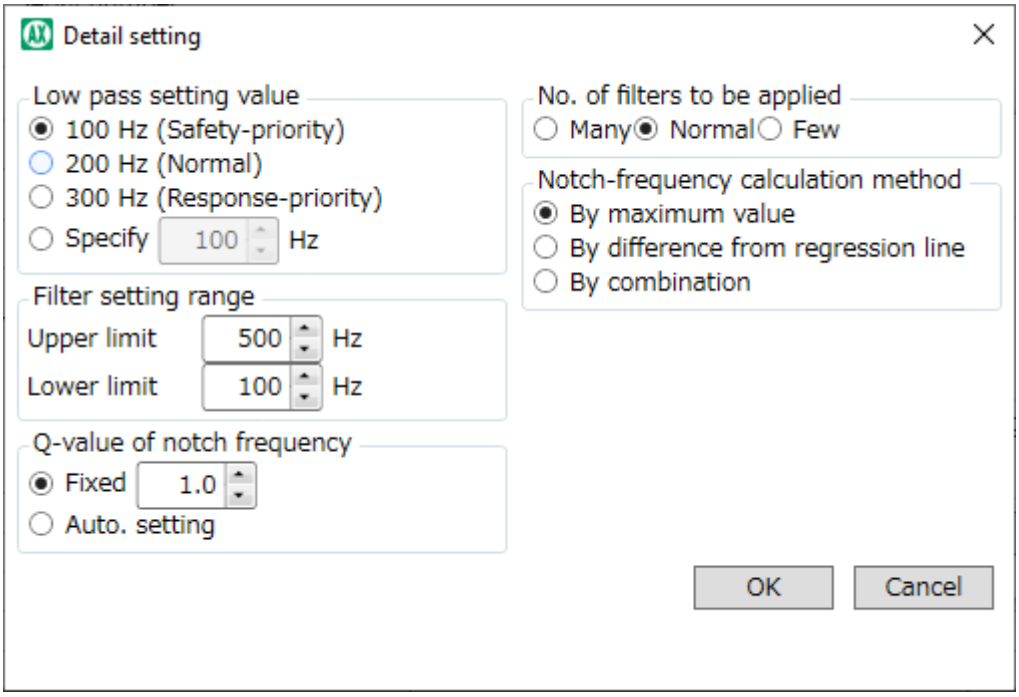
* The unused digital filter is indicated as "-."

When the AI filter adjustment is completed, the progress dialog box indicates "The AI filter adjustment will end." As the AI filter adjustment result, the set digital filter setting is displayed.



"-" is displayed for the digital filter for which no setting is made.
The graph is displayed with the applied digital filter.
Clicking the [OK] button terminates the AI filter adjustment.

■ [Detail setting] dialog



Name	Description
Low pass setting value	Specify the setting value of the low pass filter. 100 Hz (Safety-priority): Select this item to set the low pass filter to 100 Hz. Because the range for which the low pass filter is set is wide, the response will be degraded but the stability will be improved. 200 Hz (Normal): Select this item to set the low pass filter to 200 Hz. 300 Hz (Response-priority): Select this item to set the low pass filter to 300 Hz. Because the range for which the low pass filter is set is narrow, the response will be improved but the stability will be degraded. Specification: Specify any setting value of the low pass filter.
Filter setting range	Specify the setting range of the notch filter. Upper limit: Specify the upper limit of the frequency area for which the notch filter is set. The notch filter is not set for the frequency area exceeding the specified setting value. Lower limit: Specify the lower limit of the frequency area for which the notch filter is set. The notch filter is not set for the frequency area falling below the specified setting value.
Q-value of notch frequency	Specify the setting method of the band width Q-value for the notch filter. Fixed: The Q-value is set at the specified setting value. Auto. setting: The Q-value calculated from a resonance position and resonance range is set.
Number of filters to be applied	Specify the number of applied digital filters. Changing the condition judged as the resonance varies the number of applied digital filters. Many: The condition judged as the resonance becomes strict, and the number of applied digital filters increases. Normal: The condition judged as the resonance becomes normal, and the number of applied digital filters becomes normal. Few: The condition judged as the resonance becomes moderate, and the number of applied digital filters decreases.

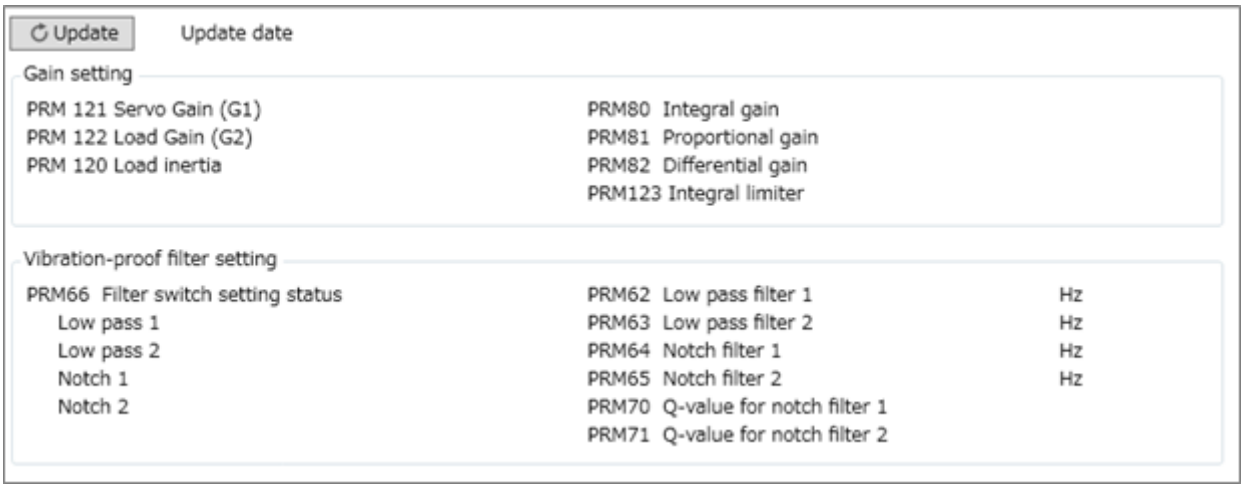
* The setting in the [Detail setting] window will be discarded at the end of the application. The default value is displayed at the next application start.

Name	Description
Notch-frequency calculation method	Specify the calculation method for the setting value of the notch filter. By maximum value: Select this item to set the position at which the dB value is the maximum as the setting value of the notch filter. By difference from regression line: Select this item to set the position that is farthest from the regression line as the setting value of the notch filter. By combination: Select this item to combine the maximum value and the difference from regression line. When the dB value is less than 0 dB, the difference from the regression line is used. When the dB value is 0 dB or more, the maximum value is used.
[OK] button	Clicking this button confirms the setting and returns the screen to the [AI filter adjustment] dialog box.
[Cancel] button	Clicking this button discards the setting and returns the screen to the [AI filter adjustment] dialog box.

* The setting in the [Detail setting] window will be discarded at the end of the application. The default value is displayed at the next application start.

3.6.6. AX setting

Clicking the [AX setting] button launches the "AX setting" view.



If you click the [Update] button, the gain setting and vibration-proof filter setting of the connected driver are displayed.

Name	Description
Update date	Display the date and time of the PC when the [Update] button was clicked.
Gain setting	Display the parameters values related to gain. "Unadjusted," "Manual," "Auto," or "-" are displayed in "Gain adjustment" according to the status of gain adjustment. * "Gain adjustment" is not displayed if no setting state is applicable.
Vibration-proof filter setting	Display the parameters values related to vibration-proof filter. If all the vibration-proof filter settings are the default values, "Unadjusted" is displayed in "Vibration-proof filter." * If the setting values are other than the default values, "Vibration-proof filter" is not displayed.

* If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
* If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
  If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

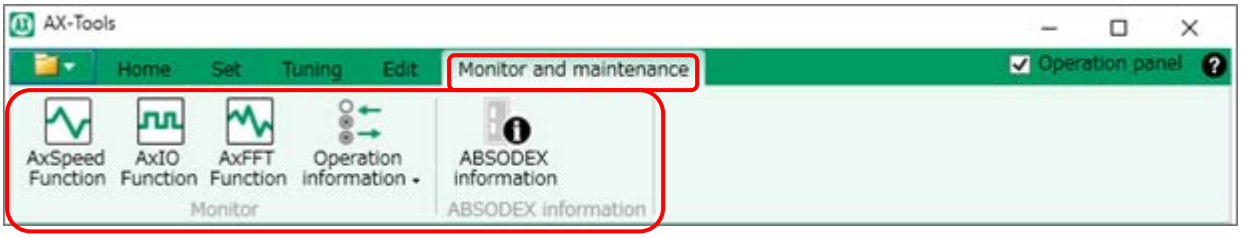
3.6.7. ABSODEX initialization

This is the same as the [ABSODEX initialization] on the [Edit] tab. For details, refer to "3.5.11 ABSODEX initialization."

3.7. [Monitor and maintenance] tab

3.7.1. Overview of the [Monitor and maintenance] tab

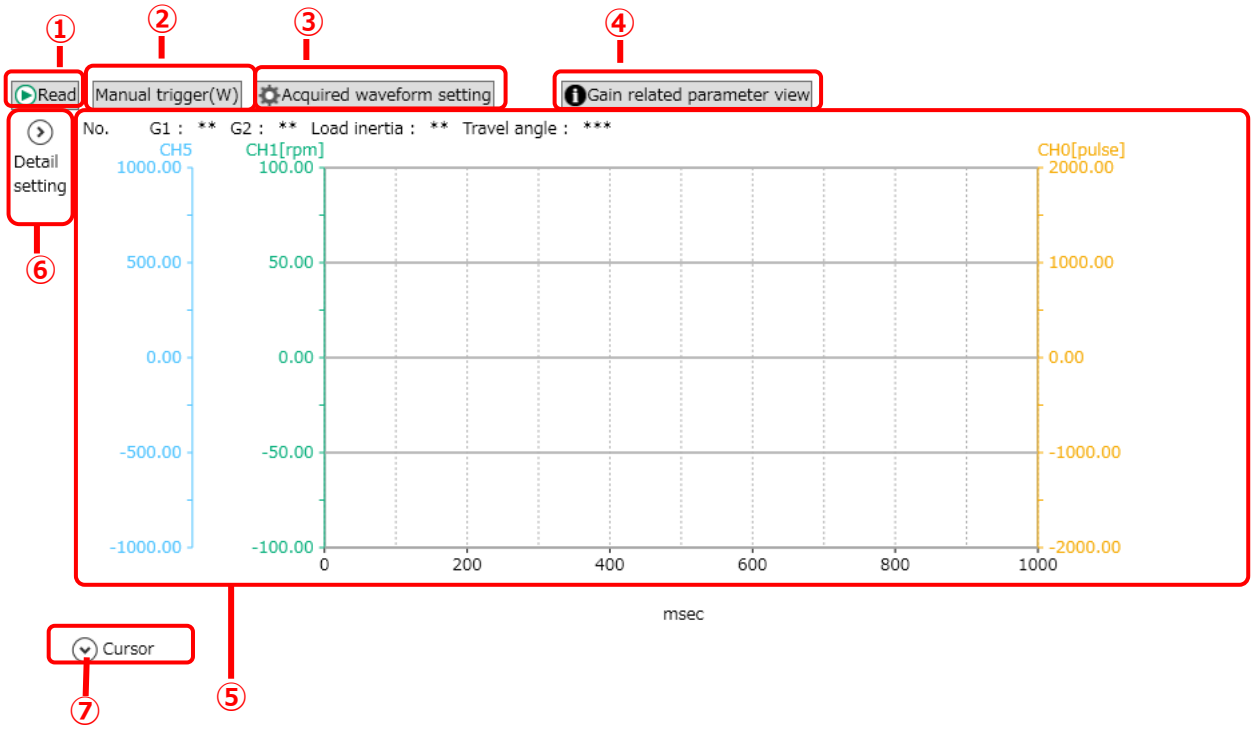
Display AxSpeed, AxIO, AxFFT, operation display, or ABSODEX information.
When the [Monitor and maintenance] tab is selected, the following ribbon menu appears.



Name	Description	Reference
AxSpeed Function	Launch the "AxSpeed" view.	3.7.2
AxIO Function	Launch the "AxIO" view.	3.7.3
AxFFT Function	Launch the "AxFFT" view.	3.7.4
Operation information	Launch the "I/O operation display" or "Network status display" view.	3.7.5
ABSODEX information	Launch the "ABSODEX information" view.	3.7.6

3.7.2. AxSpeed Function

This is the function to acquire the latest travel command and display the waveform.
Clicking the [AxSpeed Function] button launches the following "AxSpeed" view.



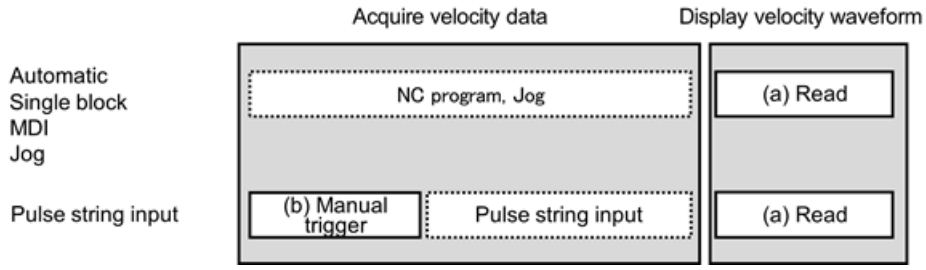
No.	Name	Description
(1)	[Read] button	Start waveform acquisition. Note 1, Note 2, Note 3
(2)	[Manual trigger] button	When the actuator is activated in the pulse string input mode, the speed data is acquired, and the speed waveform view becomes enabled. Note 1, Note 2, Note 3 The speed data is acquired which starts when the [Manual trigger] button is clicked and has the data length set in "Acquired waveform setting."
(3)	[Acquired waveform setting] button	Set the length of data (i.e., time to acquire data). Note 1, Note 2, Note 3 Because the number of data items does not change, the time between data items is proportional to the data length.
(4)	[Gain related parameter view] button	Display gain details.
(5)	Graph	Display the speed waveform graph.
(6)	[Detail setting] button	Clicking the [Detail setting] button opens or closes the graph display setting pane. For details, refer to "Detail setting".
(7)	[Cursor] button	Clicking the [Cursor] button opens or closes the cursor display setting pane. For details, refer to "Cursor."

Note 1: If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
Note 2: If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
Note 3: If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

Clicking the [Read] button displays the following message on the graph.

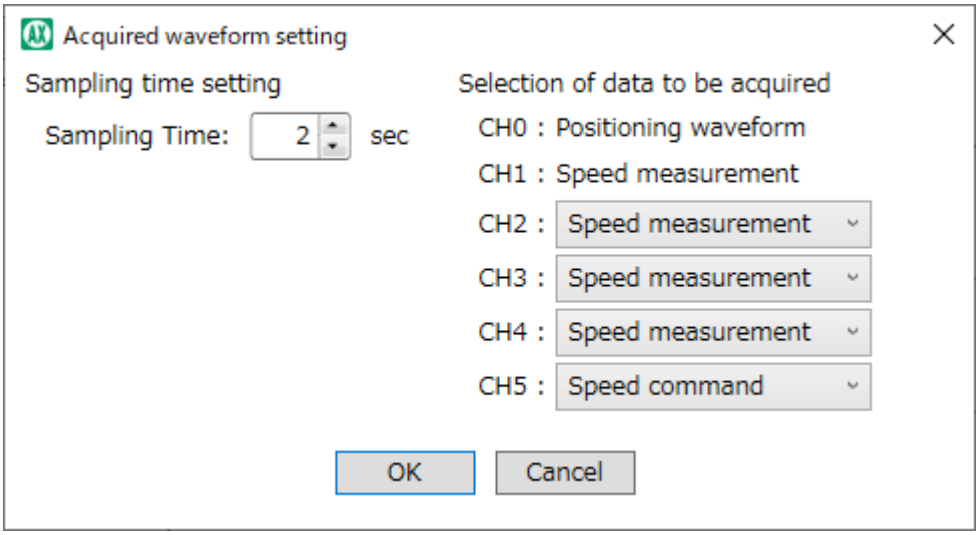
Clicking the [Manual trigger] button displays the following message on the graph.

■ Operation related function image diagram



■ Acquired waveform setting

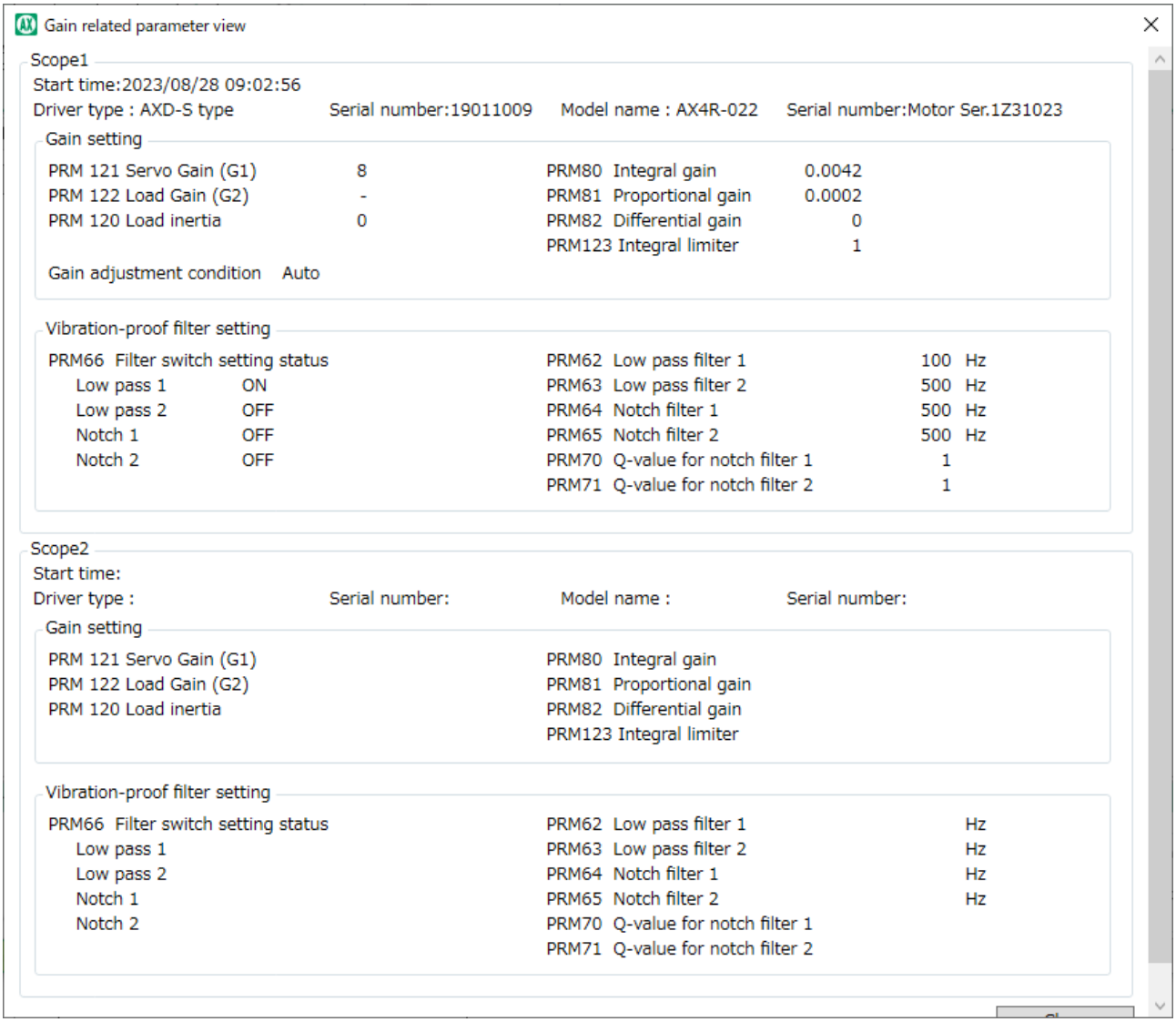
If you click the [Acquired waveform setting] button while connected to the driver, the following dialog is displayed.



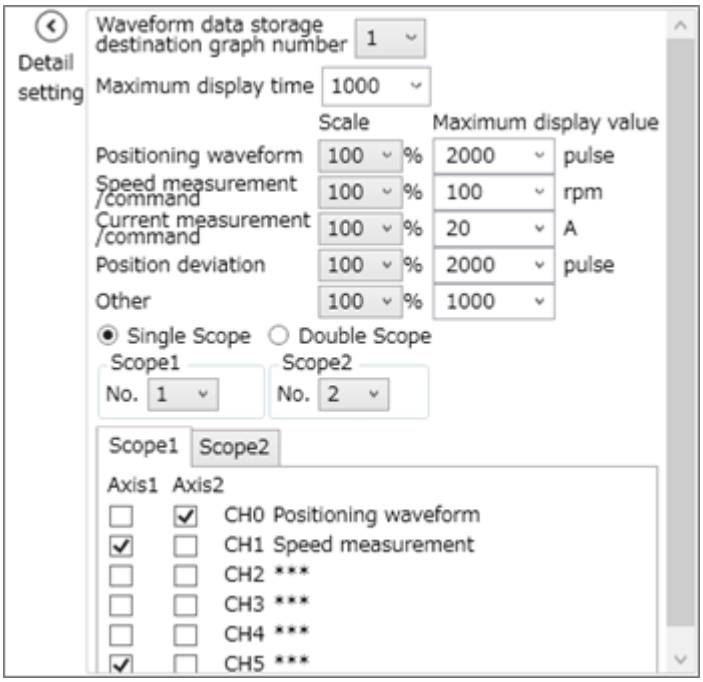
Name	Description
Sampling time setting	Specify the number of the graph in which the waveform data is stored. The setting range is 1 to 10 (seconds).
Selection of data to be acquired	CH0: Positioning waveform CH1: Speed measurement The following options are available for CH2 to CH5. • Speed measurement • Speed command • Current measurement • Current command • Position deviation
[OK] button	Confirm the settings.
[Cancel] button	Discard the settings.

■ Gain related parameter view

The available drivers are "AXD-S type" and "AXD-H type."
If you click the [Gain related parameter view] button, the following dialog is displayed.

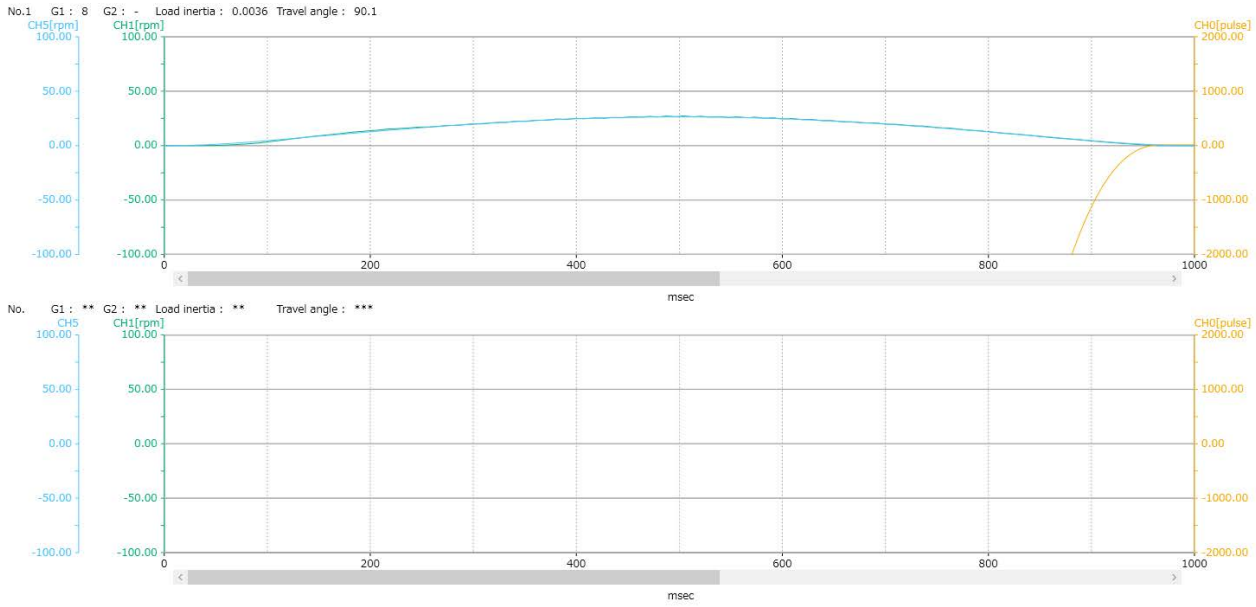


■ Detail setting



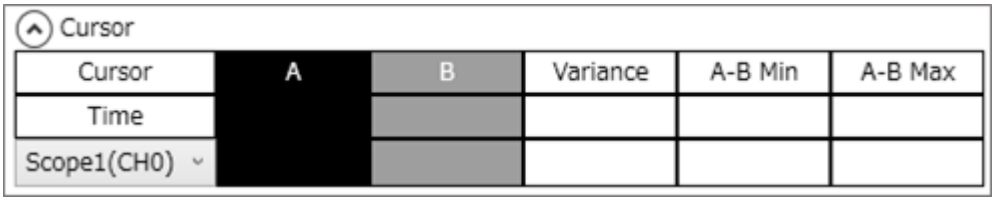
Name	Description
Waveform data storage destination graph number	Select the number of the graph in which the waveform data is stored.
Maximum display time	Set the maximum value displayed for the horizontal axis (time).
Positioning waveform	Set the scale and maximum display value for the vertical axis (displacement, pulse). For scale, the smaller the number, the larger waveform displayed.
Speed measurement/command	Set the scale and maximum display value for the vertical axis (speed, rpm). For scale, the smaller the number, the larger waveform displayed.
Current measurement/command	Set the scale and maximum display value for the vertical axis (current, A). For scale, the smaller the number, the larger waveform displayed.
Single Scope/Double Scope	If you select Single Scope, only one graph (Scope1 only) is displayed. If you select Double Scope, two graphs (Scope1 and Scope2) are displayed at the same time.
Scope1 No.	If Single Scope is selected, this is the graph displayed. If Double Scope is selected, this specifies the graph number displayed in the upper area.
Scope2 No.	If Double Scope is selected, this specifies the graph number displayed in the lower area.
Scope1, Scope2 Axis1, Axis2	Specify the channels to be displayed in Scope1 and Scope2. The number of channels to be selected for each axis is up to two. * Each channel setting is specified in [Acquired waveform setting].

• When Double Scope is set



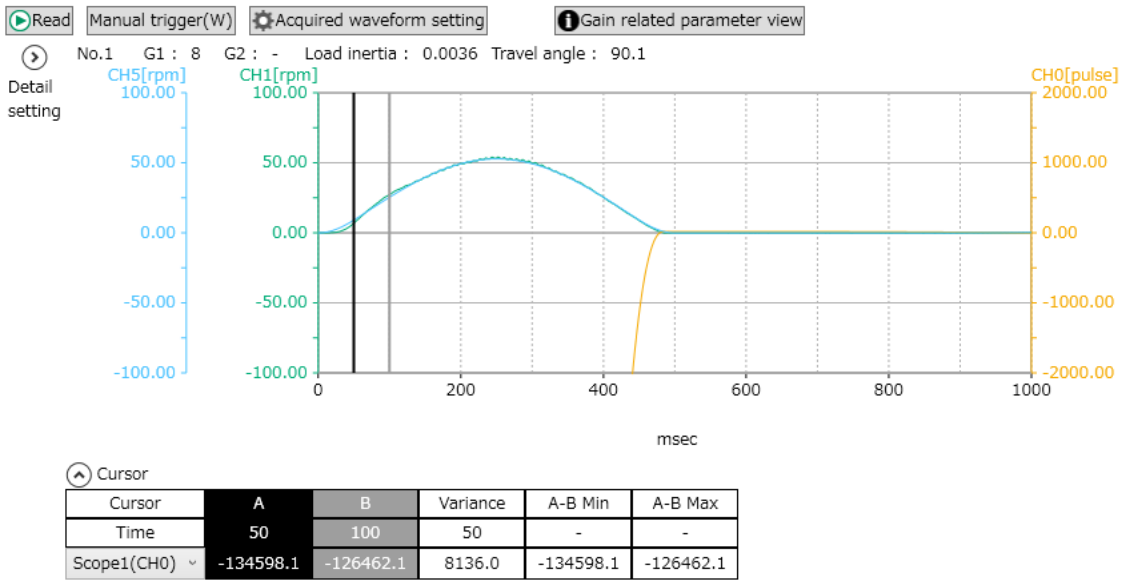
The horizontal scroll bars move simultaneously.

■ Cursor



Name	Description
[A] button	Clicking the [A] button shows or hides cursor A. Display the value of the display position of cursor A. If the waveform is not displayed, this cannot be selected.
[B] button	Clicking the [B] button shows or hides cursor B. Display the value of the display position of cursor B. If the waveform is not displayed, this cannot be selected.
Variance	When cursor A and cursor B are displayed, the variance between the value of cursor A and the value of cursor B is displayed.
A-B Min	Display the minimum value between cursor A and cursor B. "-" is displayed for Time row.
A-B Max	Display the maximum value between cursor A and cursor B. "-" is displayed for Time row.

• When cursors A and B are set



Cursor

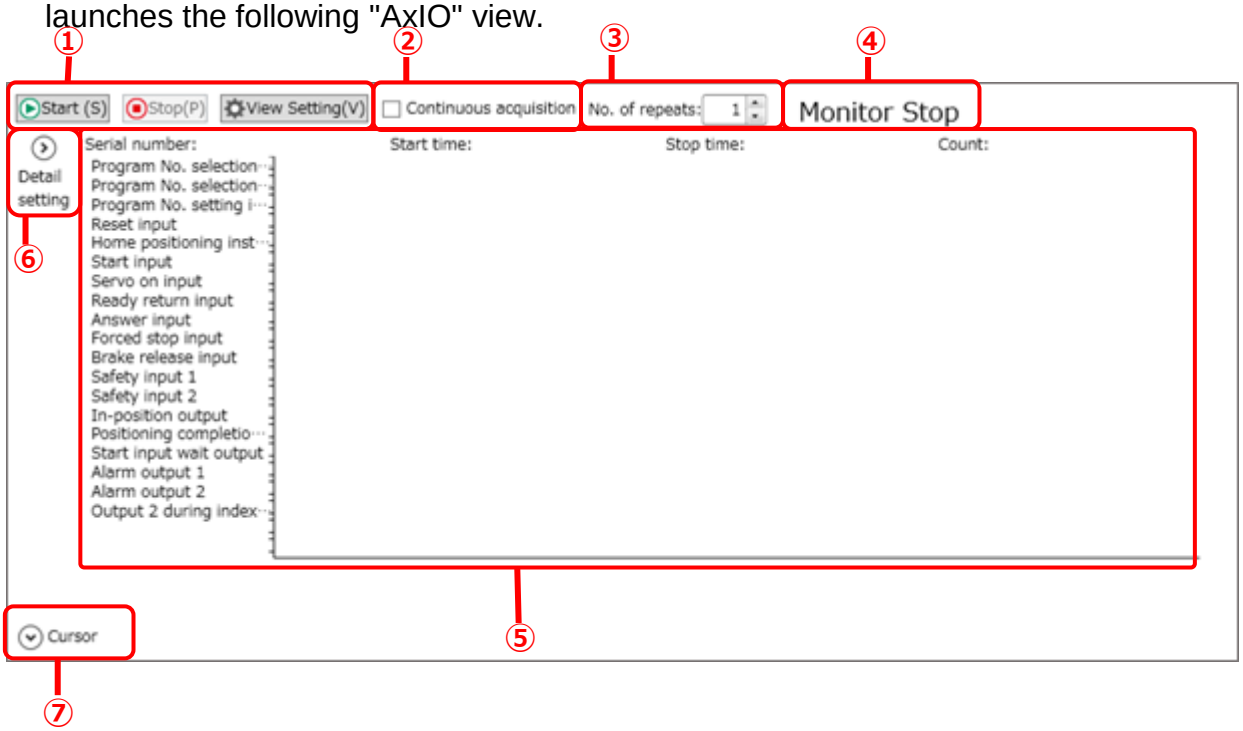
Cursor	A	B	Variance	A-B Min	A-B Max
Time	50	100	50	-	-
Scope1(CH0)	-134598.1	-126462.1	8136.0	-134598.1	-126462.1

The position of the cursor displayed on the graph can be adjusted by drag and drop.

* This cannot be used for Scope2 graphs.

3.7.3. AxIO Function

This function displays the I/O status of the driver. Clicking the [AxIO Function] button launches the following "AxIO" view.



No.	Name	Description
(1)	**Operation button**	Start/stop the I/O status acquisition. Set the view of the I/O status.
(2)	**Continuous acquisition**	Continue to acquire data repeatedly until you stop it manually.
(3)	**Number of repeats**	Up to 30000 pieces of data are stored each time, while the data is reset upon each switching. The function is automatically stopped when the designated count is reached.
(4)	**Monitor status**	Display the current monitor status.
(5)	**Graph**	Display the I/O status graphically.
(6)	**[Detail setting] button**	Clicking the [Detail setting] button opens or closes the graph display setting pane. For details, refer to "Detail setting."
(7)	**[Cursor] button**	Clicking the [Cursor] button opens or closes the cursor display setting pane. For details, refer to "Cursor."

■ Operation button

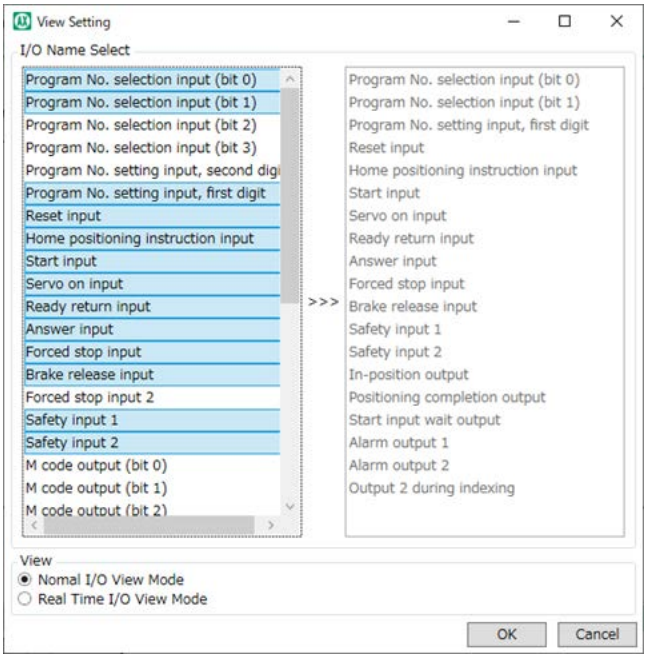
Name	Description
[Start] button	Start the I/O information acquisition. Note 1, Note 2, Note 3
[Stop] button	Stop the I/O information acquisition.
[View Setting] button	Set the view of the graph. For details, refer to "View Setting."

Note 1: If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.

Note 2: If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.

Note 3: If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

■ View Setting

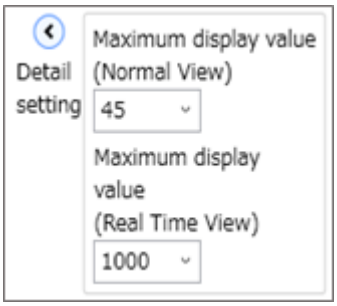


Name	Description
I/O Name Select	Select the I/Os displayed in the graph, from the box on the left side. Up to 21 items can be displayed at a time. * The I/O data names differ depending on the driver type and parameter settings.
View	Select the "Normal I/O View Mode" to display signal switching at a certain interval without relations to the signal length. Select "Real I/O View Mode" to display according to the signal length.
[OK] button	Confirm the display settings.
[Cancel] button	Discard the display settings.

■ Monitor status

If operation information is acquired, "Monitoring" is displayed. If operation information is not acquired, "Monitor Stop" is displayed.

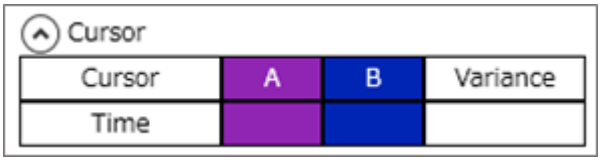
■ Detail setting



Name	Description
Maximum display value (Nomal View interval)	Set the maximum display value for the horizontal axis (time) in the Nomal I/O View Mode display.
Maximum display value (Real Time View interval)	Set the maximum display value for the horizontal axis (time) in the Real I/O View Mode display.

■ Cursor

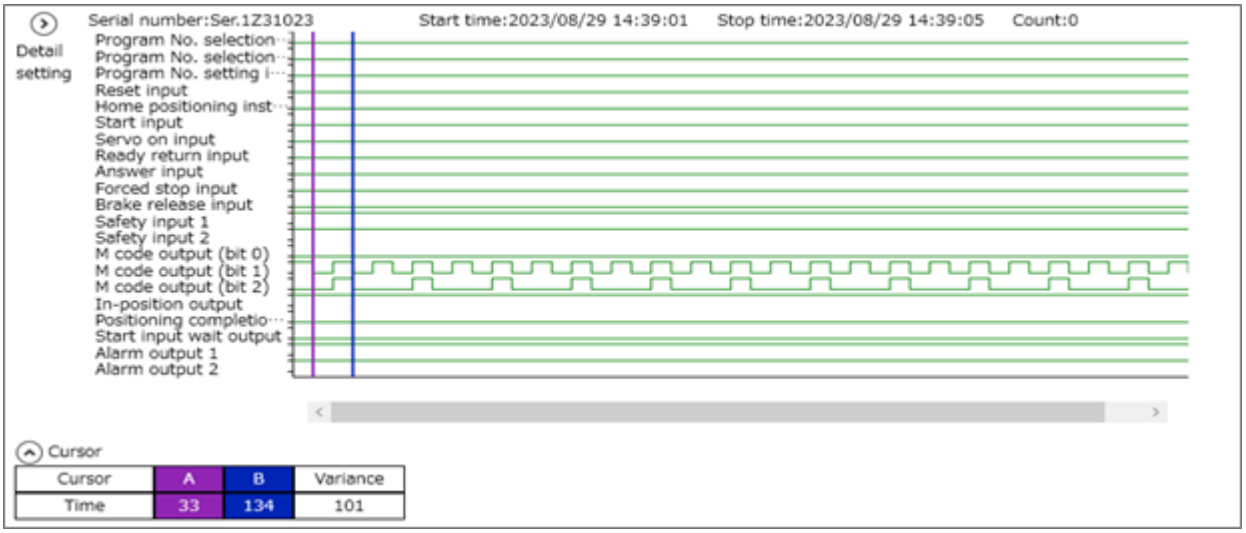
Clicking the [Cursor] button shows or hides this pane.



Name	Description
[A] button	Clicking the [A] button shows or hides cursor A. Display the value of the display position of cursor A. If the waveform is not displayed, this cannot be selected.
[B] button	Clicking the [B] button shows or hides cursor B. Display the value of the display position of cursor B. If the waveform is not displayed, this cannot be selected.
Variance	When cursor A and cursor B are displayed, the variance between the value of cursor A and the value of cursor B is displayed.

* When you change the View Setting, the cursor is cleared.

• When cursors A and B are set



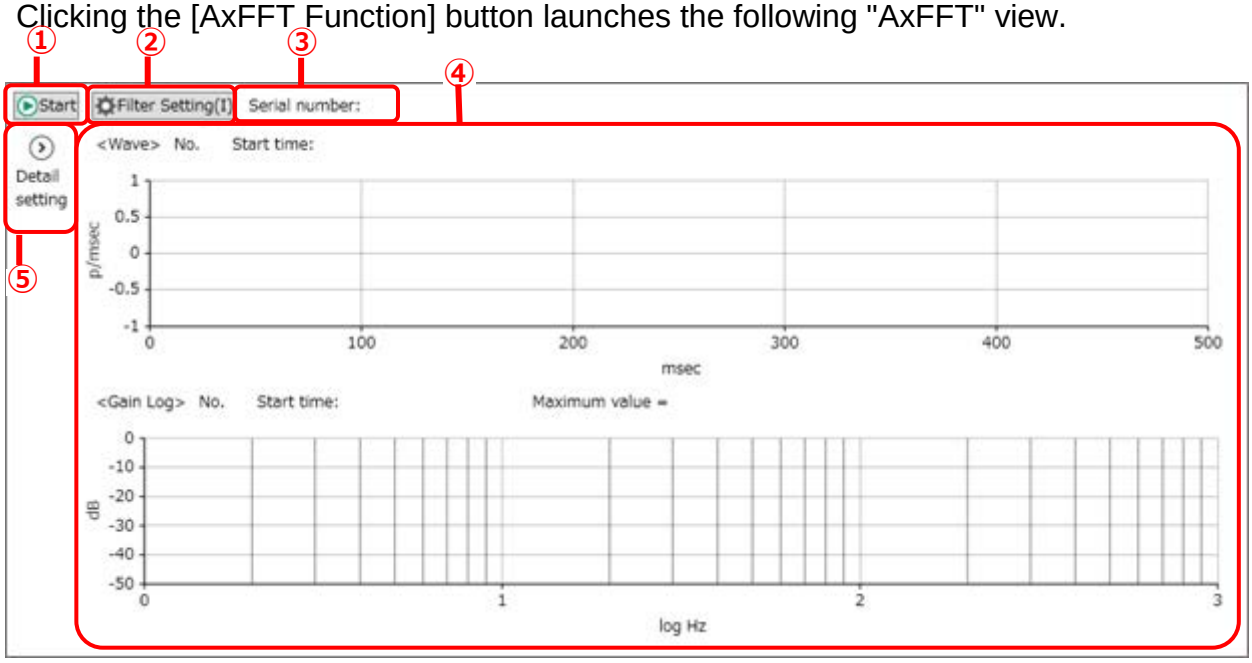
The position of the cursor displayed on the graph can be adjusted by drag and drop.

3.7.4. AxFFT Function

CAUTION

Before starting tuning of the ABSODEX with this software, be sure to read the instruction manual to be familiar with correct operation methods.
The actuator may show unexpected actions in the adjustment stage. Avoid mechanical interference and keep away from moving parts.

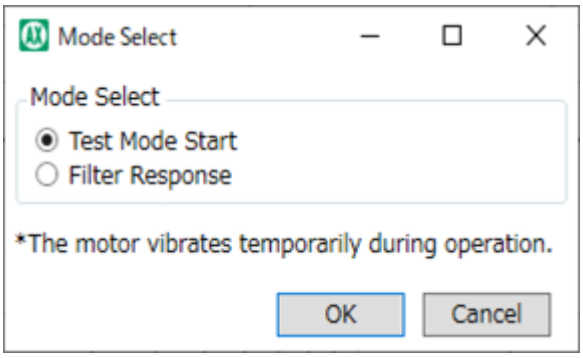
The ABSODEX is susceptible to resonance with the load unit if the rigidity of the load unit connected with the ABSODEX is too small. If this occurs, use a digital filter embedded in the ABSODEX driver to suppress resonance to a certain degree. This function is to set this digital filter.
Clicking the [AxFFT Function] button launches the following "AxFFT" view.



No.	Name	Description
(1)	**[Start] button**	The ABSODEX is driven with a random number generation function embedded in the driver, and the motion data obtained in the procedure is subjected to FFT calculation. Note 1, Note 2, Note 3
(2)	**[Filter Setting] button**	Change the setting values of the digital filter. For details, refer to "3.6.4 Manual adjustment." Note 1, Note 2, Note 3
(2)	**Serial number**	Display the serial number.
(4)	**Graph**	Display the FFT graph.
(5)	**[Detail setting] button**	Clicking the [Detail setting] button opens or closes the graph display setting pane. For details, refer to "Detail setting."

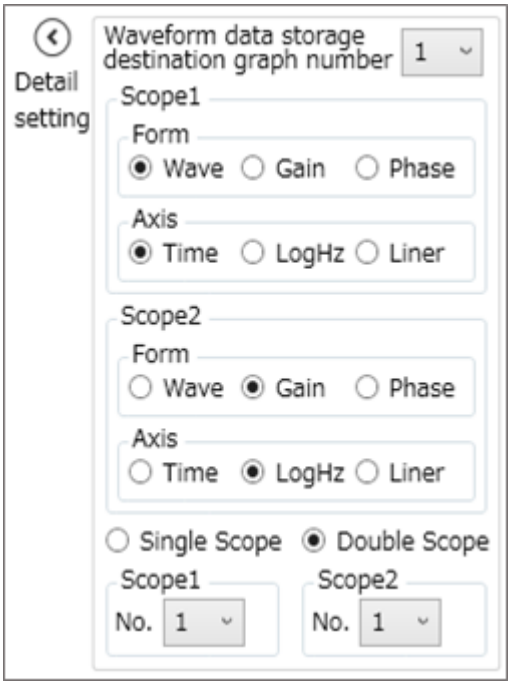
Note 1: If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
Note 2: If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
Note 3: If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

If you click the [Start] button, the following dialog is displayed.



Use [Test Mode Start] to observe the response of the actuator. Use "Filter Response" to observe the response of the filter. Select either one, and click the [OK] button.

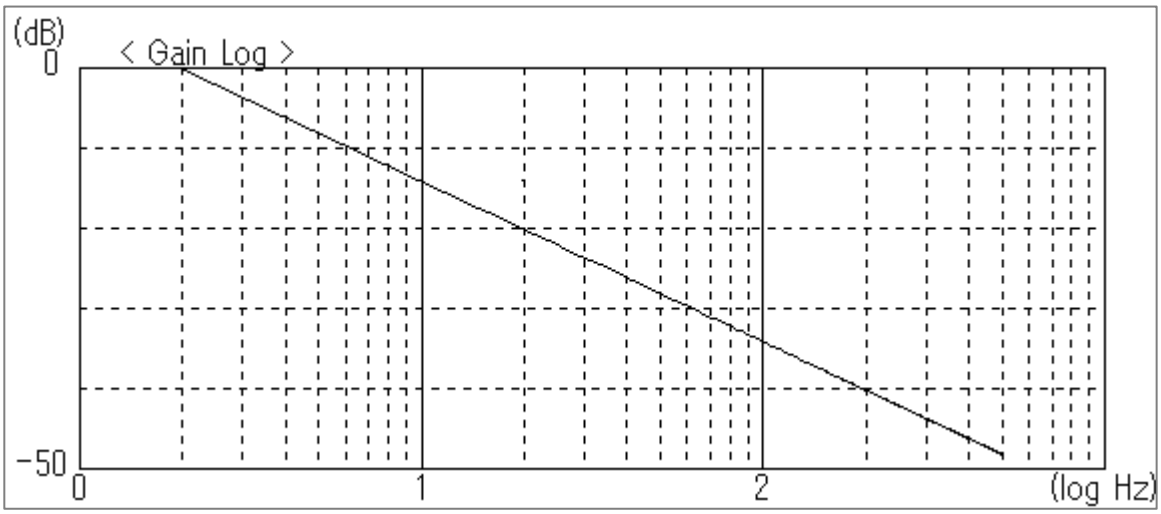
■ Detail setting



Name	Description
Waveform data storage destination graph number	Select the number of the graph in which the waveform data is stored.
Form	Select the displayed waveform. Select "Wave" to display the FFT-unprocessed waveform data. Select "Gain" or "Phase" to display the FFT-processed gain or phase.
Axies	Select a horizontal axis setting.
Single Scope	Display only one graph.
Double Scope	Display two graphs simultaneously.
Scope1 No.	Specify the graph number of the graph to be displayed when Single Scope is selected or the graph to be displayed in the upper area when Double Scope is selected.
Scope2 No.	If Double Scope is selected, this specifies the graph number displayed in the lower area.

■ Damping method

The waveform of the actuator gain obtained in [Monitor Mode] is a straight line with the right side down at an inclination of -20 dB/dec as shown in the graph below, in the theoretical case.



If there is resonance, projection or swelling is observed near the resonance frequencies in this gain waveform.
It is the objective of damping adjustment to cut the projection with a filter to realize an ideal gain waveform. However, deviation from the completely ideal waveform is frequently observed. At the last stage, observe the actual motions and finish adjustment upon confirmation of absence of resonance.

• Damping procedure

1. **Check that the bolts of the ABSODEX and mechanical units are tight.**
2. **Check that the equipment is free from interference during rotation of the ABSODEX.**
3. **Measure the waveform of the response from the actuator in [Monitor Mode].**
4. **Check for projections in the gain waveform to read the resonance frequencies.**

5. Provide low pass filters and notch filters to suppress the gain at the resonance point.

6. Check if resonance is suppressed. If suppression is insufficient, repeat the procedure from step 3.

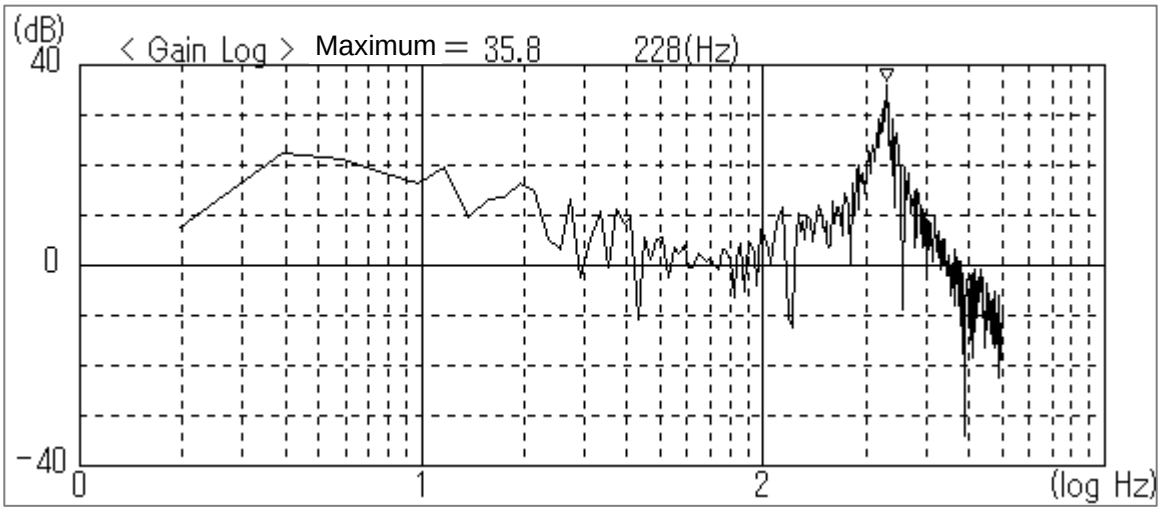
- If alarm 1 is caused in [Monitor Mode], reduce the "Gain" value of "Filter Setting."
  Or increase the upper limit value of position deviation (parameter 19) to suppress the alarm.
- If oscillation is likely to occur after [Monitor Mode] is started, start [Monitor Mode] in the servo-off state to suppress oscillation.
  (After [Monitor Mode] is finished, the original operation mode before execution of [Monitor Mode] is restarted.)

- Cautionary item

  If resonance is caused, install a dummy inertial body, improve the rigidity, or take other measures to the mechanical system in principle.
  Take these measures before using the damping software.
  If a low frequency is set at the low pass filter (80 Hz or below), the ABSODEX may operate unstably.
  Specify 80 Hz or a larger frequency (100 Hz or larger recommended) whenever possible.

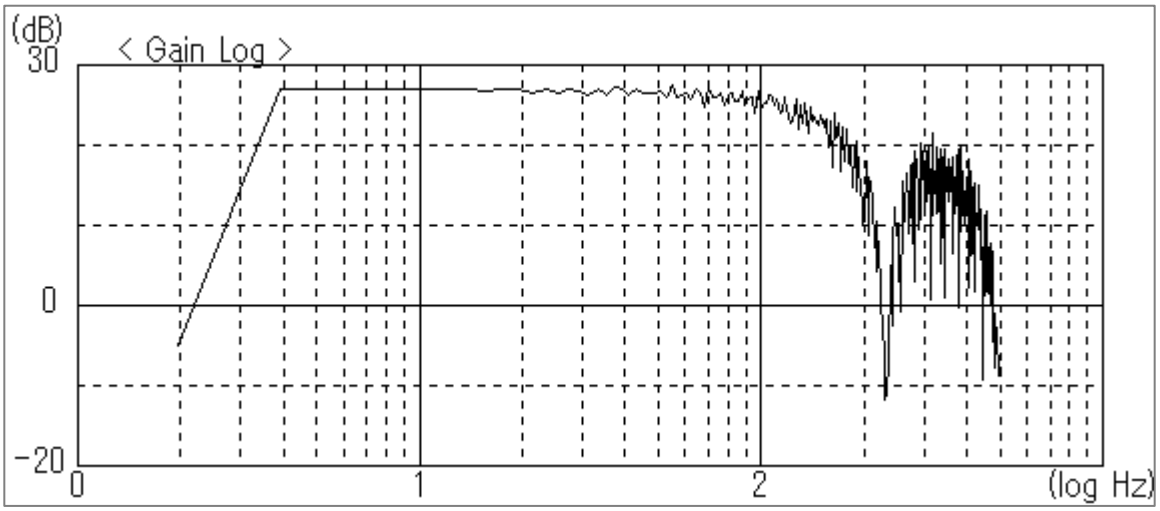
- Examples of damping adjustment

  When the waveform of the response from the actuator is measured in [Monitor Mode], and the graph shown below is displayed

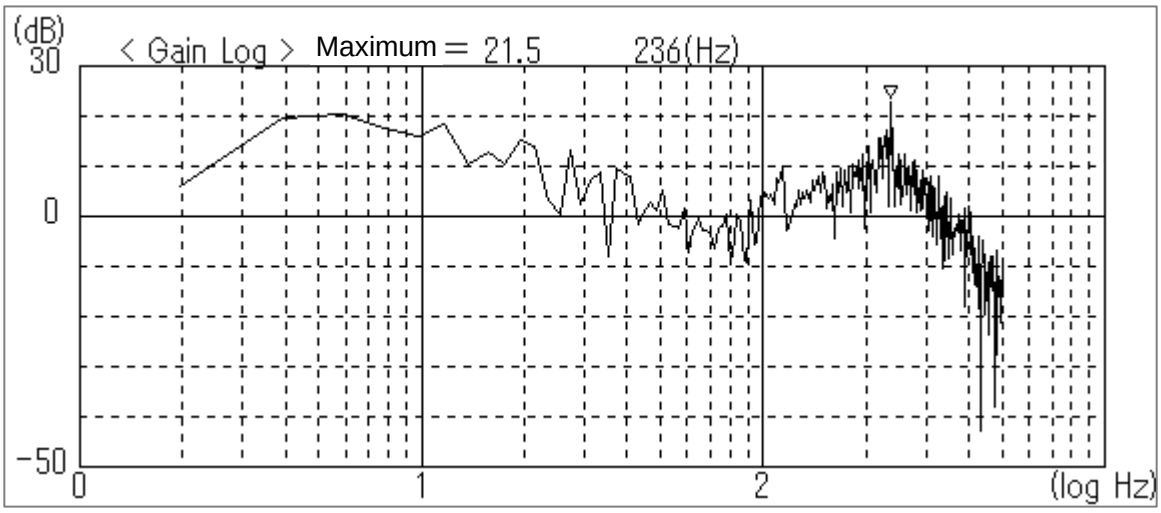


Because resonance is observed at about 228 Hz, specify "228" for notch filter 1 to reduce the gain of the resonance point.

Select [Filter Response] to observe the response of the filter. The graph shown below is displayed.



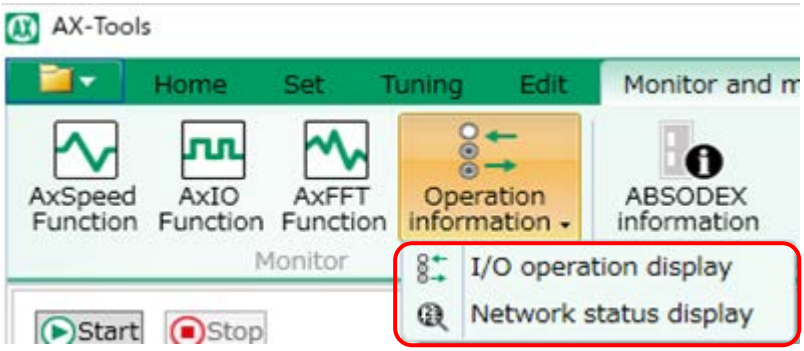
Because the low pass filter is set at 200 Hz, the right side of the graph line declines after "200 Hz."
The notch filter causes a drop at about "228 Hz."
This filter causes the [Monitor Mode] graph to change in the following way.



A gain of about "35 dB" at about "228 Hz" in the first graph is reduced to about "21 dB."
Thus, the filter damps the resonance point for adjustment.

3.7.5. Operation information

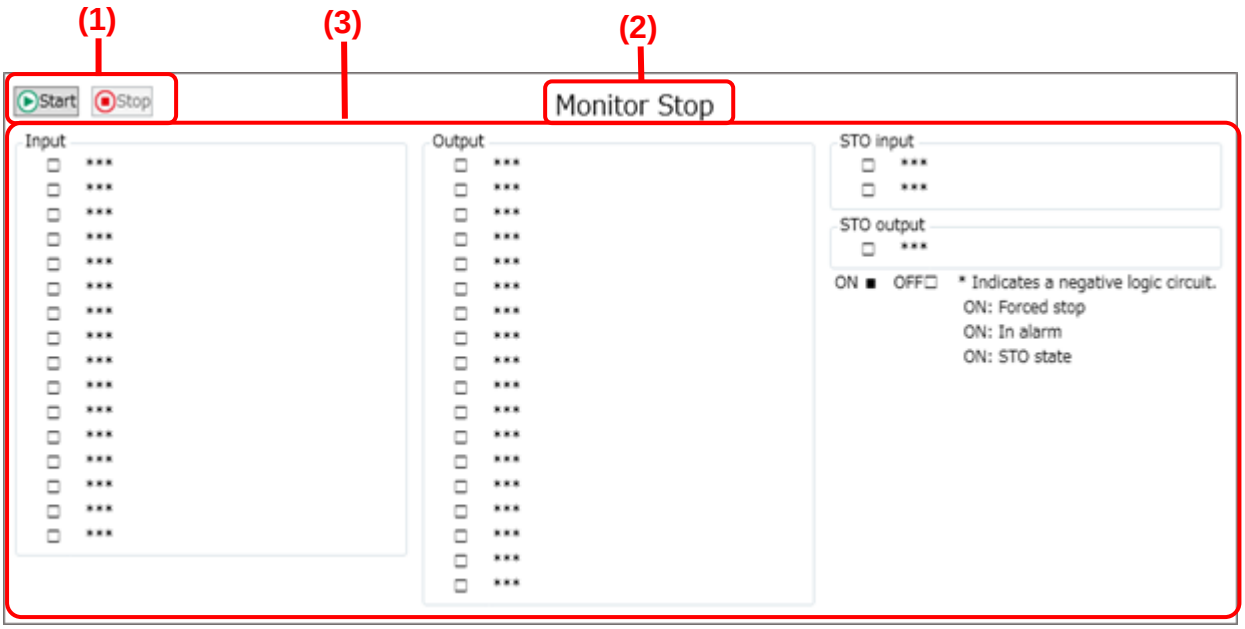
Clicking the [Operation information] button displays the operation information submenu.



Name	Description
I/O operation display	Display the I/O information related to actuator operation between the PLC and driver.
Network status display	Display the I/O information related to the network status.

■ I/O operation display

Clicking the [I/O operation display] button on the "Operation information" submenu launches the "I/O operation display" view.



No.	Name	Description
(1)	**Operation button**	Start/stop the I/O information acquisition.
(2)	**Monitor status**	Display the current monitor status.
(3)	**Operation information list**	Display the I/O information.

<Operation button>

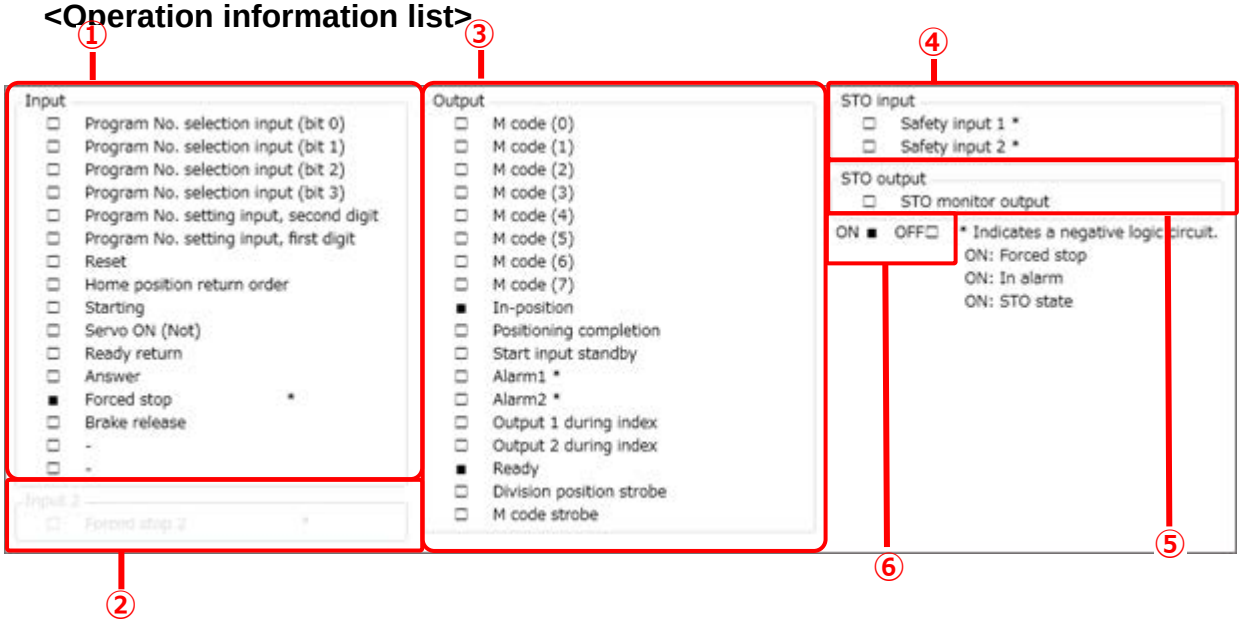
Name	Description
[Start] button	Start the I/O information acquisition. Note 1, Note 2, Note 3
[Stop] button	Stop the I/O information acquisition.

Note 1: If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
Note 2: If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
Note 3: If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

<Monitor status>

If operation information is acquired, "Monitoring" is displayed. If operation information is not acquired, "Monitor Stop" is displayed.

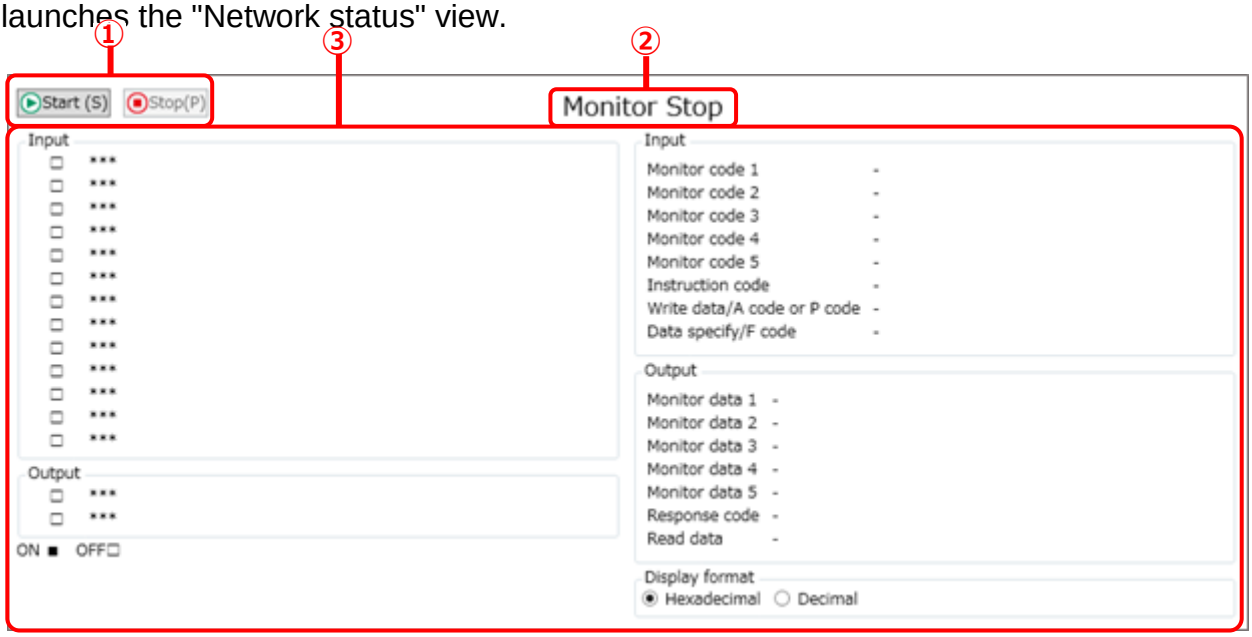
<Operation information list>



No.	Name	Description
(1)	**Input**	Display the current ON/OFF status of the input signal.
(2)	**Input 2**	Display the ON/OFF status of forced stop 2. This is displayed when the driver is "TS type," "TH type," "MU type," "XS type," "AXD-S type," or "AXD-H type."
(3)	**Output**	Display the current ON/OFF status of the output signal.
(4)	**STO input**	Display the current ON/OFF status of the STO input signal. This is displayed when the driver is "AXD-S type" or "AXD-H type."
(5)	**STO output**	Display the current ON/OFF status of the STO output signal. This is displayed when the driver is "AXD-S type" or "AXD-H type."
(6)	**Legend**	Display the legend for ON and OFF.

■ Network status display

Clicking the [Network status display] button on the "Operation information" submenu launches the "Network status" view.



No.	Name	Description
(1)	**Operation button**	Start/stop the network status information acquisition.
(2)	**Monitor status**	Display the current monitor status.
(3)	**Network status information**	Display the network status information.

<Operation button>

Name	Description
[Start] button	Start the network status information acquisition. Note 1, Note 2, Note 3
[Stop] button	Stop the network status information acquisition.

Note 1: If the driver is not connected, the message "The operation cannot be performed since the driver is not connected." is displayed.

Note 2: If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.

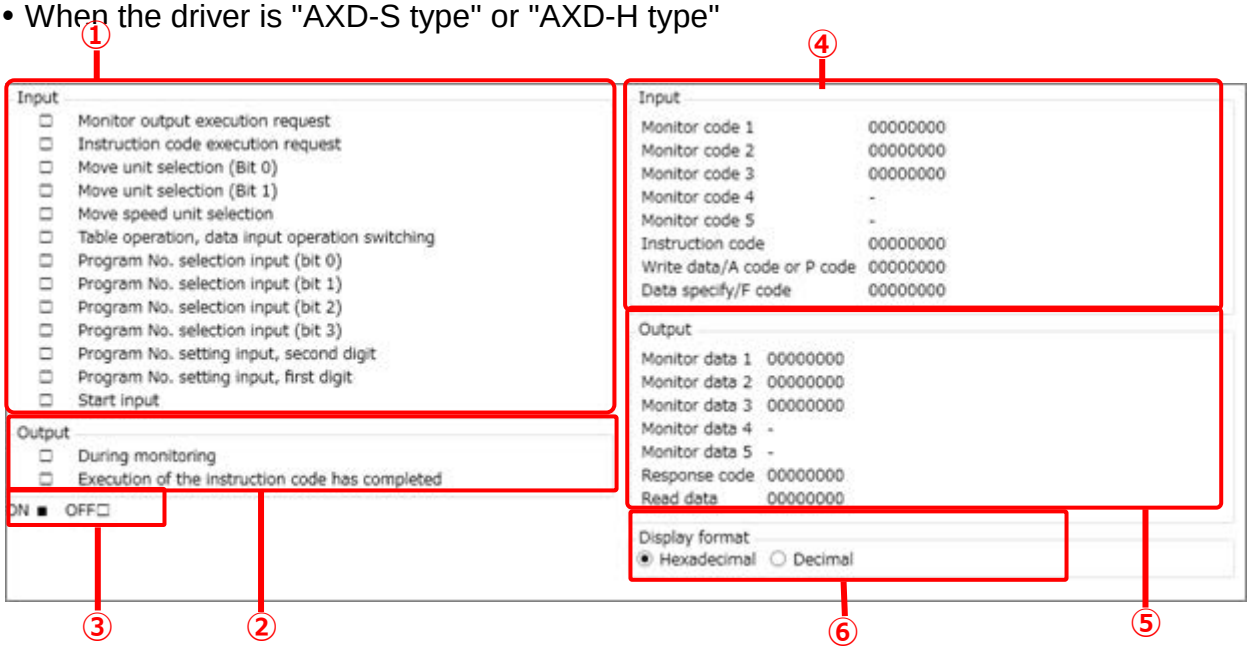
Note 3: If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

<Monitor status>

If operation information is acquired, "Monitoring" is displayed. If operation information is not acquired, "Monitor Stop" is displayed.

<Network status information>

• When the driver is "AXD-S type" or "AXD-H type"



No.	Name	Description
(1)	**Input**	Display the current ON/OFF status of the input signal.
(2)	**Output**	Display the current ON/OFF status of the output signal.
(3)	**Legend**	Display the legend for ON and OFF.
(4)	**Input**	Display the current input status of the numerical data.
(5)	**Output**	Display the current output status of the numerical data.
(6)	**Display format**	Select whether to display numerical data in hexadecimal or decimal format.

* This is not available if the I/F specification is not "CC-Link," "EtherCAT," or "EtherNet/IP."

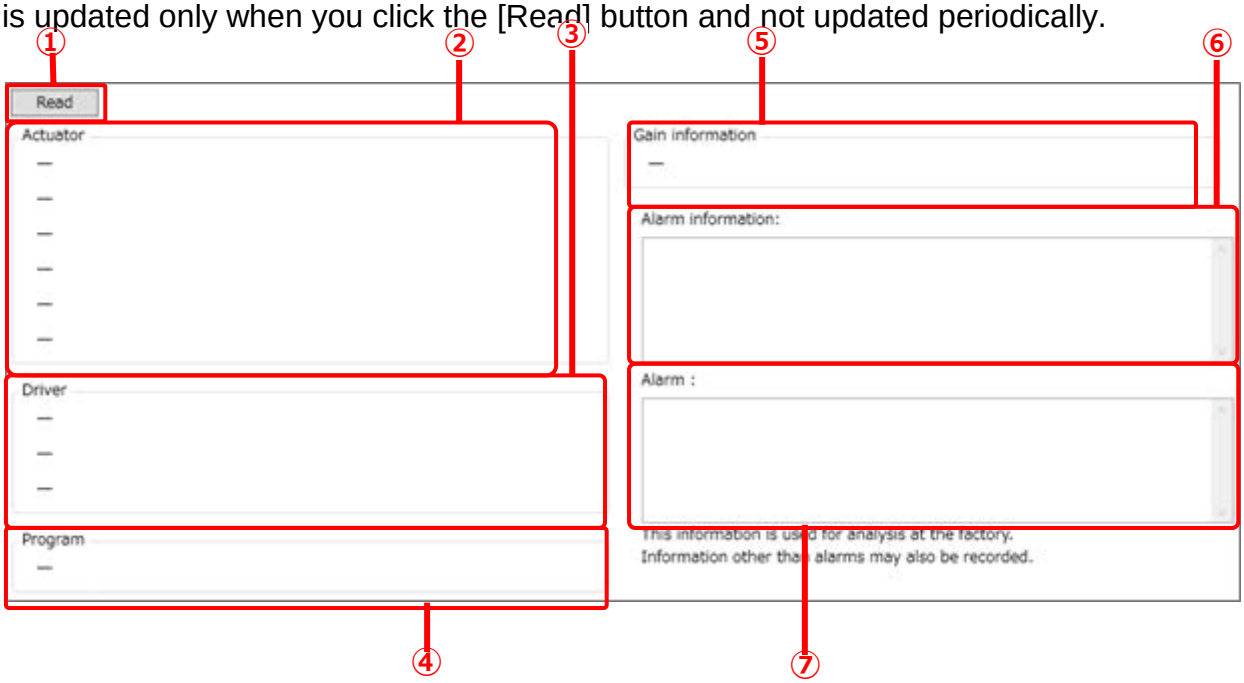
• When the driver is "TS type," "TH type," "MU type," or "XS type"

Name	Description
Station No.	Display the current station number.
Occupied stations	Display the current number of occupied stations.
Transmission speed	Display the current transmission speed.
Error information	Display the current error information.

* This is not available if the I/F specification is not "CC-Link."

3.7.6. ABSODEX information

Display the actuator and driver information.
Clicking [ABSODEX information] launches the [ABSODEX information] view. The data is updated only when you click the [Read] button and not updated periodically.



No.	Name	Description
(1)	**Operation button**	Acquire the ABSODEX information from the driver.
(2)	**Actuator**	Display the information related to the actuator.
(3)	**Driver**	Display the information related to the driver.
(4)	**Program**	Display the information related to the program.
(5)	**Gain information**	Display the information related to the gain. Note 1
(6)	**Alarm information**	Display the information related to alarm.
(7)	**Alarm**	Display the alarm history.

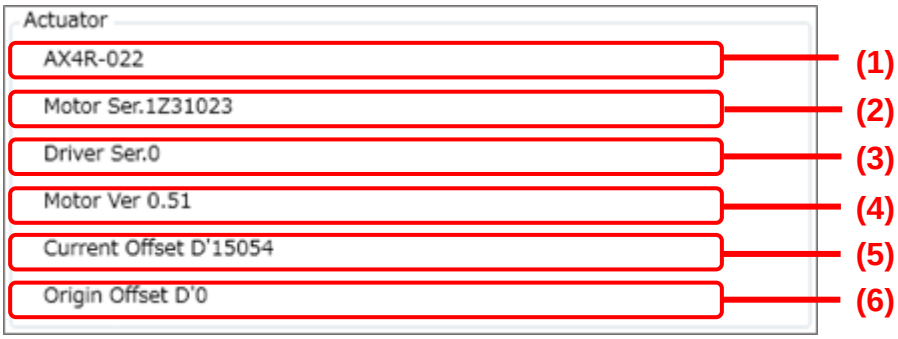
Note 1: This is displayed when the driver is not "AXD-S type" or "AXD-H type."

■ Operation button

Name	Description
[Read] button	Acquire the ABSODEX information from the driver. Note 1, Note 2, Note 3

Note 1: If the driver is not connected, a message "The operation cannot be performed since the driver is not connected." is displayed.
Note 2: If the connected driver type is different from the driver type of the selected window tab, a message "The set driver type and connection destination driver type differ. Change the driver type by converting the driver type." is displayed.
Note 3: If the connected driver type and the driver type of the selected window tab are the same, but the resolutions are different, a message "The set driver type and connection destination driver type differ in the resolution. Do you want to switch resolution? * Data is initialized after switching resolution." is displayed.

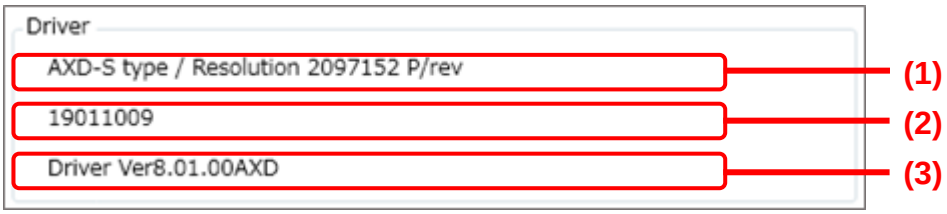
■ Actuator



No.	Name	Description
(1)	**Model name**	Display the "model name" of the connected actuator.
(2)	**Motor serial number**	Display the "motor serial number" of the connected actuator.
(3)	**Driver serial number**	Display the "driver serial number" of the connected actuator.
(4)	**Motor base software version**	Display the "motor base software version" of the connected actuator.
(5)	**Current offset**	Display the "current offset" of the connected actuator.
(6)	**Machine origin offset**	Display the "machine origin offset" of the connected actuator.

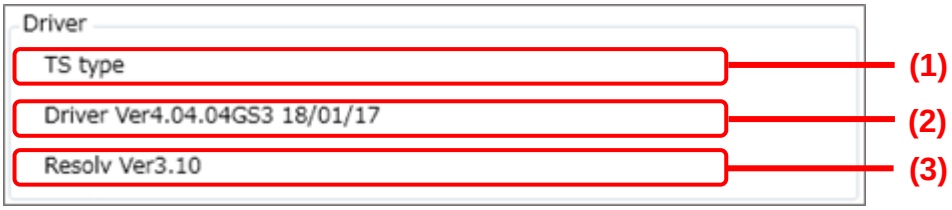
■ Driver

Display of "AXD-S type" and "AXD-H type"



No.	Name	Description
(1)	**Driver type**	Display the "driver type" of the connected driver.
(2)	**Driver serial number**	Display the "driver serial number" of the connected driver.
(3)	**Driver software version**	Display the "driver software version" of the connected driver.

Display of other driver types



No.	Name	Description
(1)	**Driver type**	Display the "driver type" of the connected driver.
(2)	**Driver software version**	Display the "driver software version" of the connected driver.
(3)	**Communication base software version**	Display the "communication base software version" of the connected driver.

■ Program

Name	Description
Program	Display the program number written to the driver.

■ Gain information

Name	Description
Gain information	Display the setting status of Gain 1 and Gain 2 of the actuator.

■ Alarm information

Name	Description
Alarm information	Displays the current alarm status.

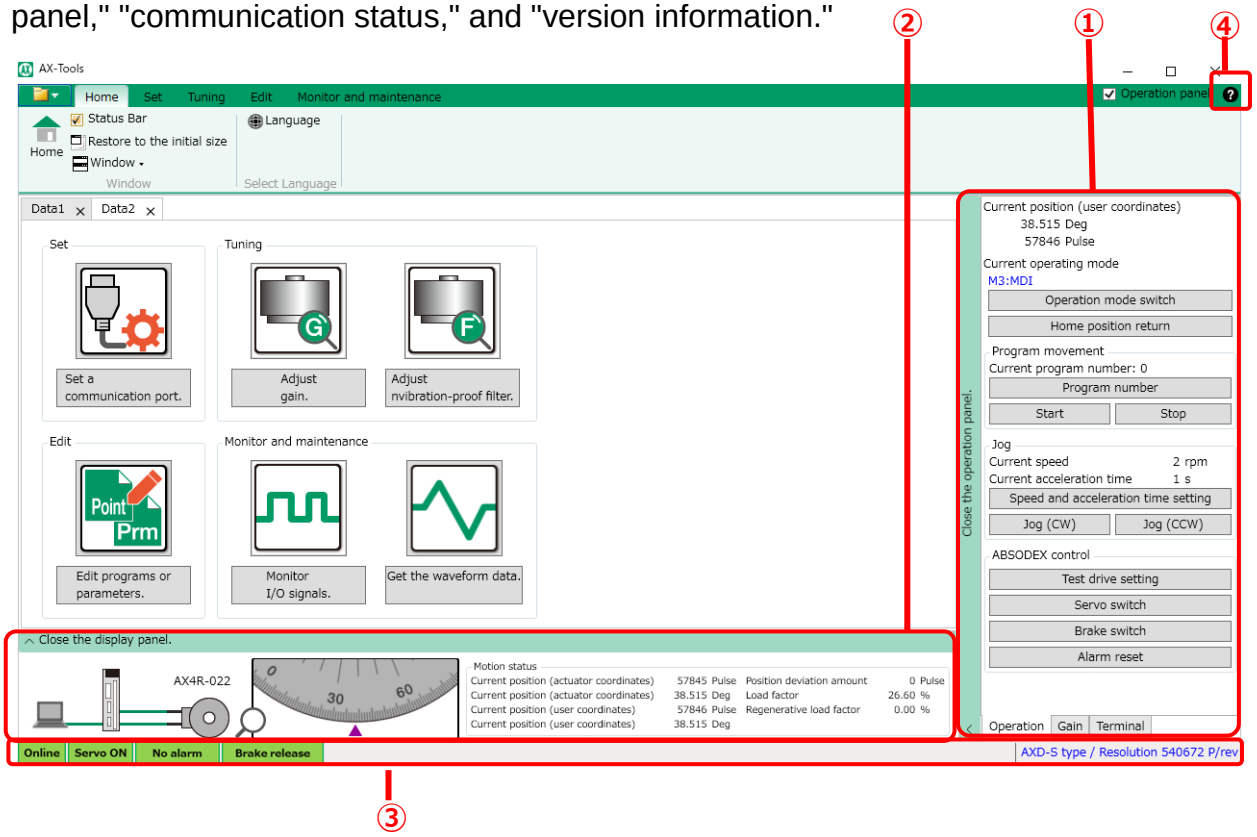
■ Alarm

Name	Description
Alarm	Displays the history of important alarms that occurred in the past.

3.8. Common functions

3.8.1. Overview of common functions

Functions displayed separately from the views launched by selecting ribbon tabs are called common functions. Common functions include "operation panel," "display panel," "communication status," and "version information."

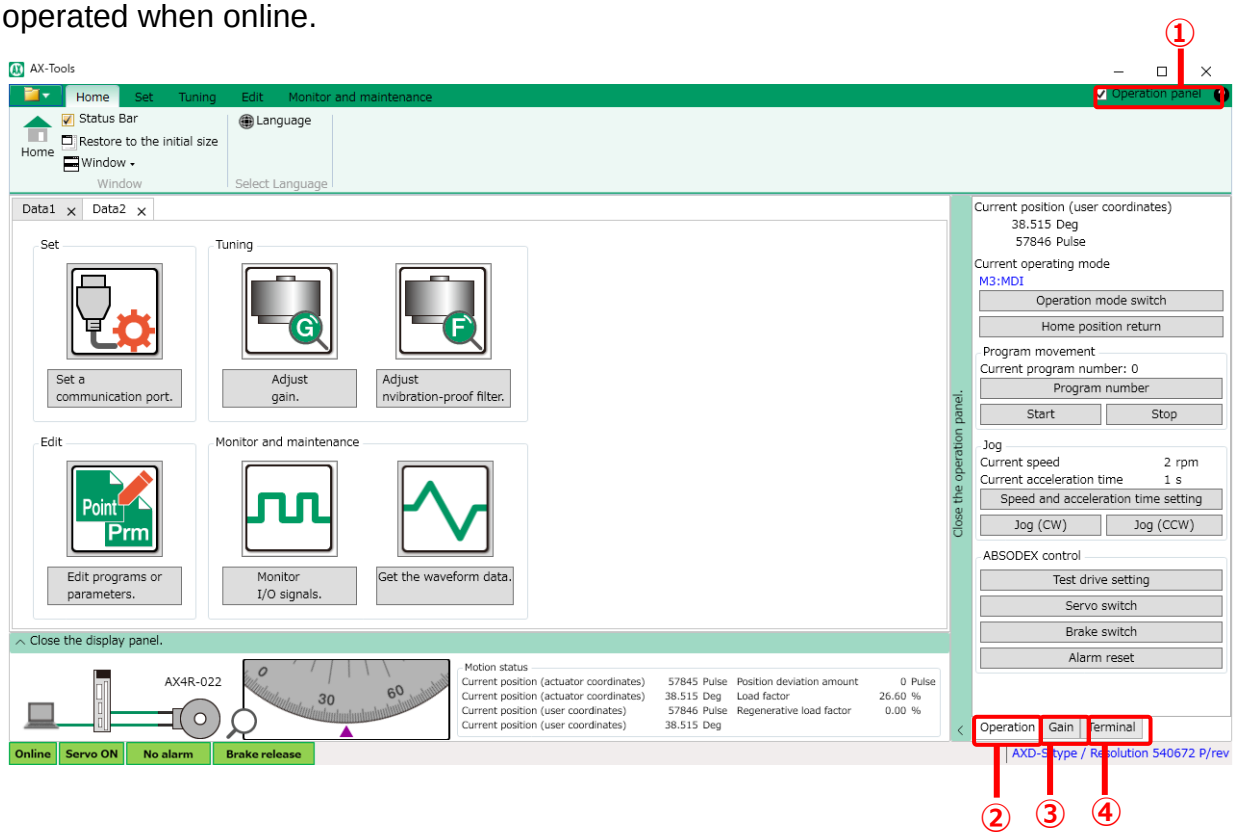


No.	Name	Description	Reference
(1)	**Operation panel**	Check the electric actuator operation when online. Switches between three tabs: "Operation," "Gain," and "Terminal."	3.8.1
(2)	**Display panel**	Display the status of the PC, driver, and actuator.	3.8.2
(3)	**Communication status bar**	Display the communication status of the driver and the model name of the actuator.	3.8.3
(4)	**Help button**	Display the AX-Tools software version information.	3.8.4

3.8.2. Operation panel

AX-Tools starts with the operation panel open. Communication with the driver is performed, and the actuator operation is checked by jog or program operation.

The operation panel closes when you click the [Close the operation panel] area, and then the display changes to [Open the control panel]. Clicking the [Open the control panel] area opens the operation panel. The same operations are possible with the [Operation panel] check box.
The operation panel has the "Operation" tab, "Gain" tab, and "Terminal" that can be operated when online.



No.	Name	Description
(1)	**Operation panel check box**	Open or close the operation panel.
(2)	**"Operation" tab**	Perform operations on the actuator.
(3)	**"Gain" tab**	Adjust the actuator gain.
(4)	**"Terminal" tab**	Send/receive commands to/from the ABSODEX.

■ Operation

Name	Description
Current position (user coordinates)	Display the current position (user coordinates) in numerical values. Note 1
Current operating mode	Display the current operating mode. Note 1
[Operation mode switch] button	Display the "Operation mode switch" dialog. Select and set the operation mode.
[Home position return] button	Return to the home position. Note 2, Note 3
Current program number	Display the currently set program number. Note 1
[Program number] button	Display the program number selection dialog. Select and set the program number to start. Note 4
[Start] button	Start the currently set program. Note 2, Note 3, Note 4
[Stop] button	Stop the operating program. Note 2, Note 3, Note 4
Current speed	Display the currently set jog speed. Note 1
Current acceleration time	Display the currently set jog acceleration time. Note 1
[Speed and acceleration time setting] button	Display the speed and acceleration time setting dialog. Set the speed and acceleration time.

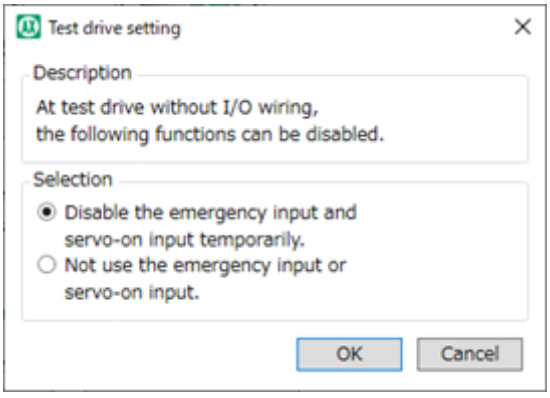
Note 1: "***" is displayed when offline and while monitoring such as waveform acquisition.
Note 2: If the servo is OFF, a message "Servo is OFF. Turn the servo ON." is displayed.
Note 3: If an alarm is issued, a message "An alarm has occurred. Cancel the alarm." is displayed.
Note 4: If the operating mode is not "M1 (Automatic)" or "M2 (Single block)," a message "Select the automatic operation mode or single block mode." is displayed.

Name	Description
[Jog (CW)] button	The moving part of the actuator moves in the CW direction while you click and hold the button. You cannot click this button for a certain period of time until the jog operation is complete. Note 3, Note 5
[Jog (CCW)] button	The moving part of the actuator moves in the CCW direction while you click and hold the button. You cannot click this button for a certain period of time until the jog operation is complete. Note 3, Note 5
[Test drive setting] button	The test drive setting dialog appears.
[Servo switch] button	Switch the servo status from ON to OFF or from OFF to ON. If the servo is OFF, a confirmation message "Servo is turned ON. Are you sure?" is displayed. A confirmation message appears again before turning the servo ON. If the servo is ON, a confirmation message "Servo is turned OFF. Are you sure?" is displayed.
[Brake switch] button	Display the brake operation switch dialog appears. Note 2 Select and set the brake operation. Note 3
[Alarm reset] button	Reset the alarm.

Note 2: If the servo is OFF, a message "Servo is OFF. Turn the servo ON." is displayed.
Note 3: If an alarm is issued, a message "An alarm has occurred. Cancel the alarm." is displayed.
Note 5: If the operating mode is not "M4 (Jog)," a message "Unable to execute because the operation mode is not jog." is displayed.

Test drive setting

If you click the [Test drive setting] button, the following setting dialog is displayed. Perform a setting for test drive without I/O wiring.



If you select "Disable the emergency input and servo-on input temporarily," the setting takes effect temporarily. * The setting disappears when the power is turned on again.
If you select "Not use the emergency input or servo-on input," the setting takes effect after the power is turned on again.
Cycle the power after setting with the [OK] button.

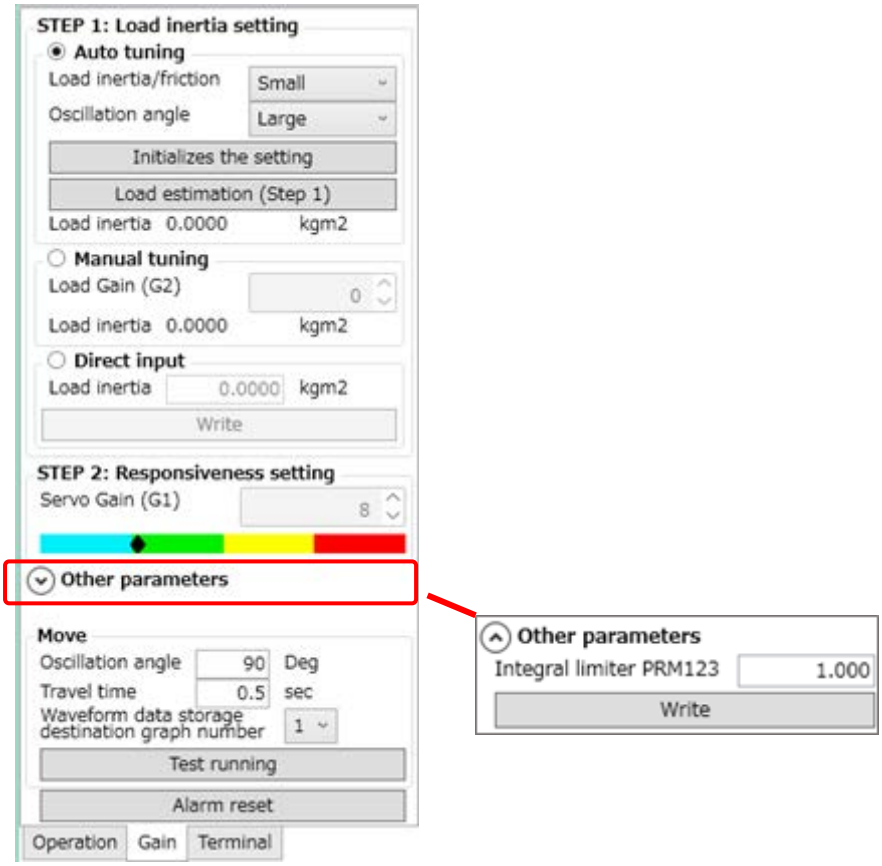
■ Tuning

CAUTION

If the auto tuning is performed, the result of the AI gain adjustment is deleted.

Perform the tuning of ABSODEX.
Available drivers are "AXD-S type," "AXD-H type," "TS type," "XS type," "MU type," "S type," and "GS type."
The displayed setting items differ depending on the driver type.

Display of "AXD-S type" and "AXD-H type"



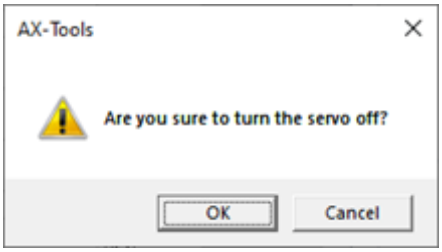
[Auto tuning]

Name	Description
Load inertia/friction	Set the load inertia/friction.
Oscillation angle	Set the oscillation angle.
[Initializes the setting] button	Restores the edited settings to the default values of "Load inertia/friction" and "Oscillation angle."
[Load estimation (Step 1)] button	Start auto tuning. Note 1
Load inertia	Display the value of load inertia.

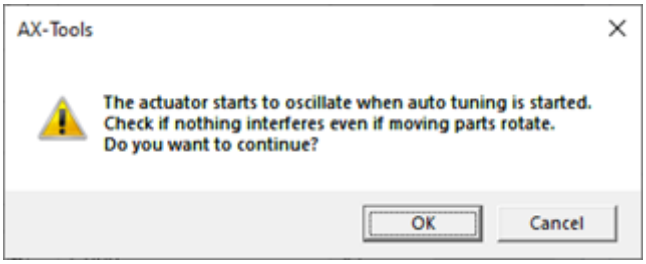
Note 1: If auto tuning cannot be set, a message "PRM122 could not be set to '-1.' Auto tuning cannot be performed." is displayed.

• [Load estimation (Step 1)] button

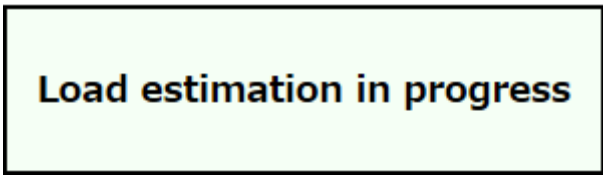
Clicking the [Load estimation (Step 1)] button performs the servo-off confirmation. If there is no problem, click the [OK] button.



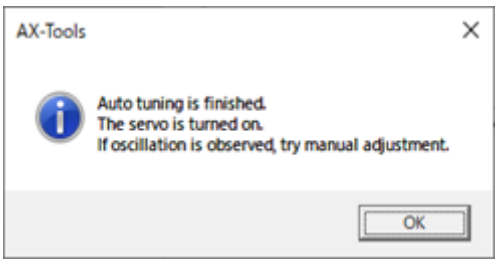
There is a confirmation before the actuator starts to oscillate. If there is no problem, click the [OK] button.



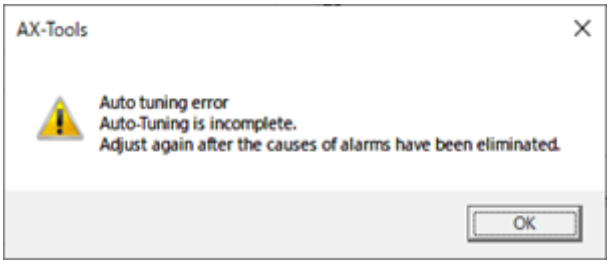
The following dialog is displayed while load estimation is being performed.



When the oscillation of actuator stops, auto tuning is considered completed. The following dialog appears. Click the [OK] button to finish.



* If an alarm is issued during auto tuning, the following dialog is displayed.



[Manual tuning]

Name	Description
Load Gain (G2)	Set the load gain (G2).
Load inertia	Display the value of load inertia.

[Direct input]

Name	Description
Load inertia	Display and set the value of load inertia.
[Write] button	Write the load inertia value to the driver.

[Responsiveness setting]

Name	Description
Servo Gain (G1)	Use the Up/Down buttons to change the servo gain value and write it to the driver.

[Other parameters]

Clicking [Other parameters] opens or closes the setting area.

Name	Description
Adjustment value I PRM127	Display and set the adjustment value I.
Adjustment value P PRM128	Display and set the adjustment value P.
[Write] button	Write the setting values of other parameters to the driver.

[Move]

Name	Description
Oscillation angle	Specify the oscillation angle for the test running.
Travel time	Specify the travel time for one block of the test running.
Waveform data storage destination graph number	Specify the graph-storage destination number after the test running completion.
[Test running] button	The test running is performed, and the speed waveform is acquired. Make fine adjustments while observing the results in the speed waveform displayed.

[Alarm reset] button

This is the same as the [Alarm reset] button of Operation. For details, refer to "Operation."

Display of "MU type"

Same as "AXD-S type" and "AXD-H type."

[Auto tuning]

Name	Description
Servo Gain	Display and set the servo gain value.
Friction load	Set the friction load.
Oscillation angle	Set the oscillation angle.
[Initializes the setting] button	Restores the edited settings to the default values of "Servo Gain," "Friction load," and "Oscillation angle."
[Load estimation (Step 1)] button	Start auto tuning. This is the same as the [Load estimation (Step 1)] button of "AXD-S type" and "AXD-H type." Note 1
[Gain change (Step 2)] button	Write the "Servo Gain" value to the driver. Note 2, Note 3, Note 4

Note 1: If gain G1 and G2 cannot be set to "0-0" for the driver of "MU type," a message "Gain G1 and G2 could not be set to '0-0.' Auto tuning cannot be performed." is displayed.
If G1 and G2 are not "0-0" for "TS type," "XS type," "S type," and "GS type" drivers, a message "Set rotary switches G1 and G2 on the driver panel to "0-0," and then try again." is displayed.
Note 2: If the servo gain setting is 0, a message "Servo Gain of 0 cannot be written." is displayed.
Note 3: If auto tuning is not performed, a message "This function is available after auto tuning. Perform auto tuning." is displayed.
Note 4: If the servo is off, a message "Semi-auto tuning cannot be performed in the servo-off mode. Switch to another mode before executing." is displayed.

[Manual tuning]

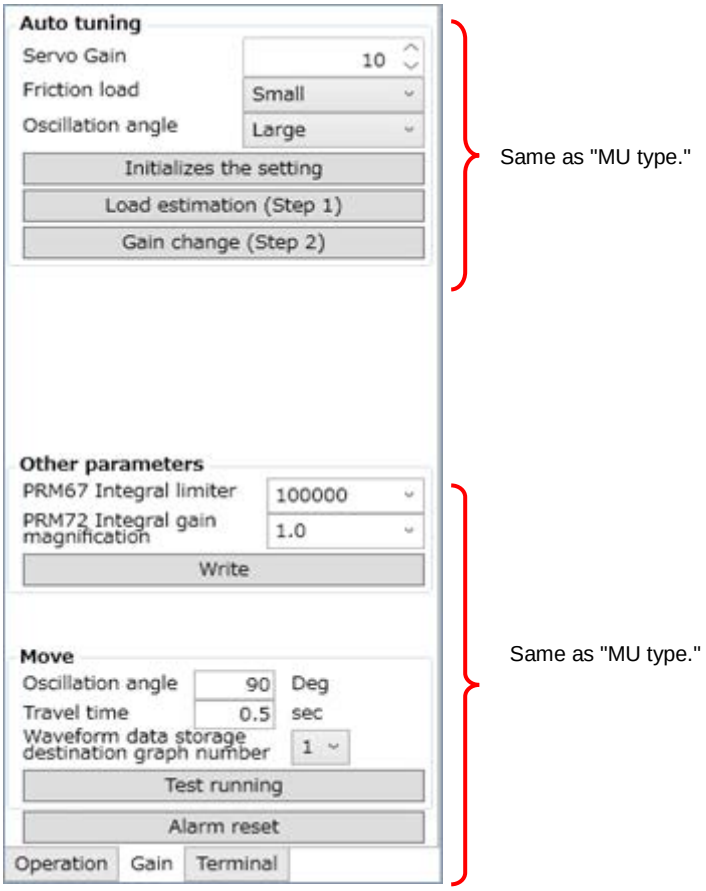
Name	Description
Gain 1 (response)	Display and set the value of Gain 1 (response).
Gain 2 (load inertia moment)	Display and set the value of Gain 2 (load inertia moment).
[Write] button	Write the setting values of Gain 1 (response) and Gain 2 (load inertia moment) to the driver. Note 1

Note 1: If the operation mode is "M6 (Pulse string input mode)," a message "Gain G1 and G2 cannot be changed in the pulse string input mode." is displayed.

[Other parameters]

Name	Description
PRM67 Integral limiter	Display and set the value of PRM67 Integral limiter.
PRM72 Integral gain magnification	Display and set the value of PRM72 Integral gain magnification.
[Write] button	Write the setting values of PRM67 Integral limiter and PRM72 Integral gain magnification to the driver.

Display of "TS type," "XS type," "S type," and "GS type"



Same as "MU type."

Same as "MU type."

For setting items, refer to "Display of 'MU type'."

■ Terminal

Send/receive commands to/from the ABSODEX

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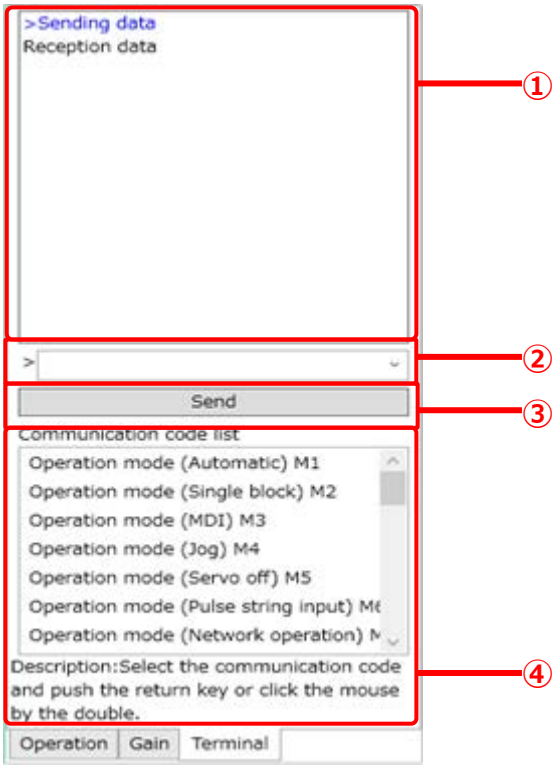
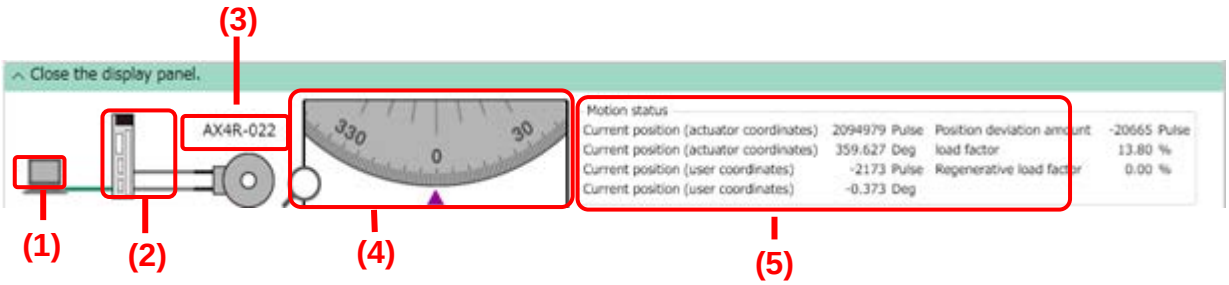


No.	Name	Description
(1)	**Sending/ reception history**	Display the commands sent and data received. Display the sent data after ">." Reception data is displayed in line under it. In case of an error, "*" is displayed. Up to 20 items are displayed in the history.
(2)	**Command entry field**	Enter the communication command to send. You can select an item from the sent command history. Up to 20 items are displayed in the history. When the cursor is located in this field, pressing Enter sends the entered command to the driver, similar to the [Send] button.
(3)	**[Send] button**	Send the entered communication command to the driver.
(4)	**Communication code list**	Display a list of communication codes. Select a code and double-click it or press Enter to enter the code in the command entry field.

3.8.3. Display panel

Display images of the connection status of the computer, driver, and actuator.

If the display panel is open, "Close the display panel" appears in the open/close area.
If the display panel is closed, "Open the display panel" appears in the open/close area.



No.	Name	Description
(1)	**PC-driver connection status**	If the driver is connected to the PC, this will be displayed in green. If it is not connected, this will be displayed in gray.
(2)	**Driver-actuator connection status**	If the driver is connected to the actuator and the servo is on, this will be displayed in green. If there is no connection, this will not be displayed.
(3)	**Actuator information**	Display the "model name" of the actuator.
(4)	**Actuator movement status**	Displays the current position of the actuator as an image. Even if the actual size of the actuator changes, the image size of the actuator remains constant.
(5)	**Motion status**	"Current position," "Position deviation amount," "Load factor," and "Regenerative load factor" among the actuator operation states are displayed. If the driver is other than "AXD-S Type" or "AXD-H Type," "Actuator temperature increase" is displayed instead of "Load factor." "Regenerative load factor" is displayed when the driver is "AXD-S Type" or "AXD-H Type."

3.8.4. Communication status

The communication status is updated periodically. Note that, when "AI Gain" and "AI filter adjustment" on the [Tuning] tab and "AxSpeed Function," "AxFFT Function," and "AxIO Function" on the [Monitor and maintenance] tab are being processed, all items other than "Port connection status" will be blank and will not be updated periodically. The details of communication status are as follows.

When connected to the driver

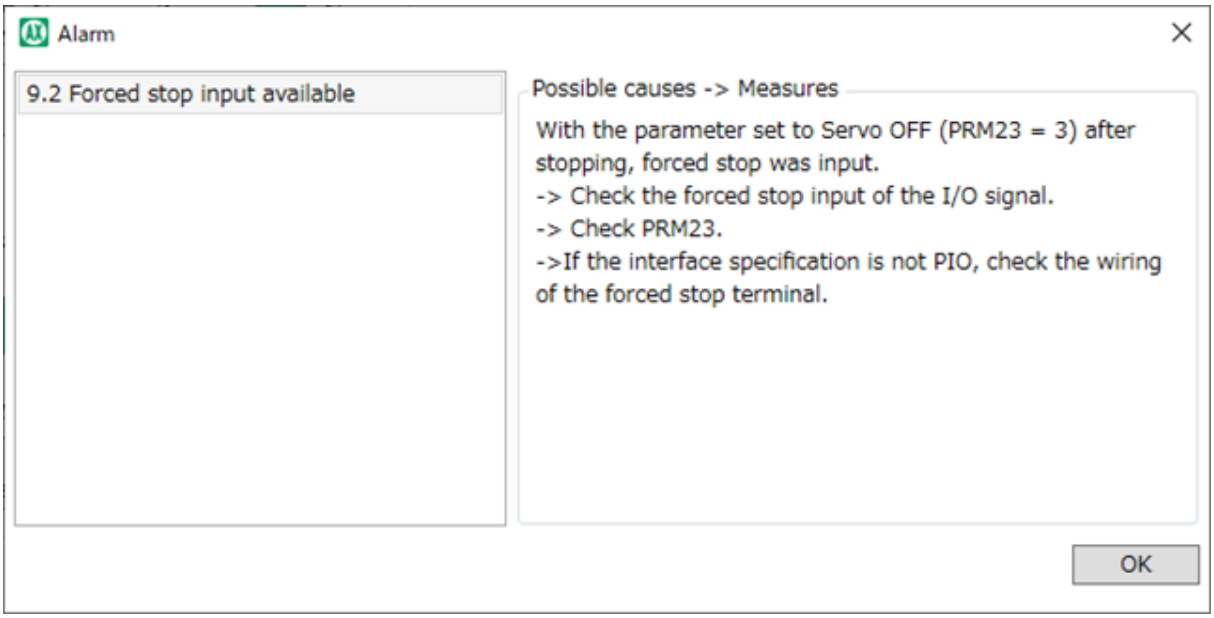
(1) (2) (3) (4) (5)

When not connected to the driver

(1) (5)

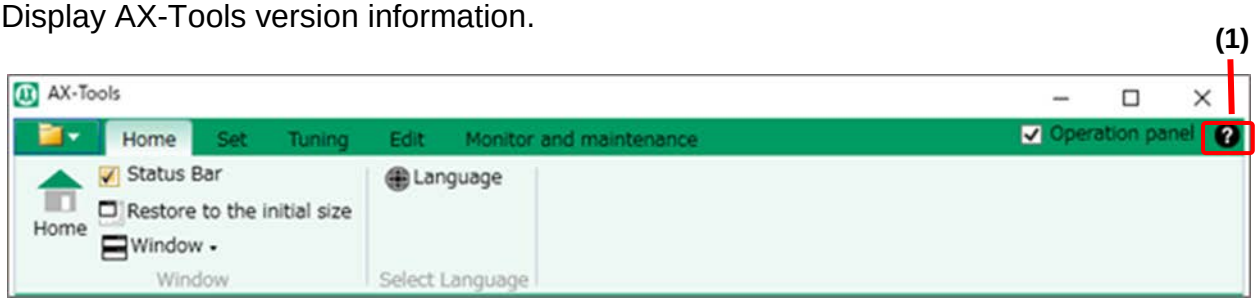
No.	Name	Description
(1)	**Port connection status**	When the port is open and connected to the driver, it becomes online and displays "Online." When the port is closed, it becomes offline and displays "Offline." 
(2)	**Servo ON/OFF status**	If the connection is online and the servo is on, "Servo ON" is displayed. If the servo is off, "Servo OFF" is displayed. If the connection is offline, this will not be displayed. 
(3)	**No alarm/Alarm issued**	If an alarm is issued online, "Alarm issued" is displayed. If no alarm is issued, "No alarm" is displayed. If the connection is offline, this will not be displayed. If an alarm is issued, the [Detail] button is displayed. Clicking the [Detail] button displays the alarm information dialog. 
(4)	**Brake status**	If the brake is activated online, "Activate brake" is displayed. If the brake is not activated, "Brake release" is displayed. If the connection is offline, this will not be displayed. 
(5)	**Driver type**	If the driver type connected online is the same as the driver type in the selected window tab, this is displayed in blue. If not, this is displayed in red. If the connection is offline, the driver type selected when creating a new one is displayed in black. If the driver is "AXD-S Type" or "AXD-H Type," the actuator is also displayed.

- Alarm information dialog



3.8.5. Version information

Click the [Help] button at the right end of the ribbon to display the About dialog.
Display AX-Tools version information.



No.	Name	Description
(1)	**[Help] button**	Clicking this button displays the About dialog.

3.9. Cause of the trouble and handling method

If there is any failure in communication between AX-Tools and the connected driver, inspect according to the table below.

Trouble	Cause	Handling method
The COM port is not displayed.	The driver power is not ON.	Turn on the power to the driver and press the Update button of the port.
	Communication cable is disconnected.	Connect the communication cable and press the Update button of the port.
A message "A communication error occurred." is displayed.	The driver is not responding correctly to the command from AX-Tools.	Make sure that there is no problem with the USB cable connection.
		Make sure that the driver power is ON.
A message "A timeout error occurred." is displayed.	Normal operation results have not been obtained from the driver in response to the command from AX-Tools after a certain period of time.	Make sure that no alarm has issued.

4. Reference Information

4.1. List of shortcut keys

Function	Item		Description	Shortcut	Key tip
File	—		Make the File menu selected.	—	Alt -> F
	New		Display the [New] dialog.	Ctrl + N	Alt -> F -> N
	Open		Open an existing file.	Ctrl + O	Alt -> F -> O
	Close		Close the active window tab.	—	Alt -> F -> C
	Save		Save the file being edited.	Ctrl + S	Alt -> F -> S
	Save As		Save the file being edited with a new name.	—	Alt -> F -> A
	Recent File		Display recently-used files.	—	—
	Exit		End AX-Tools.	—	Alt -> F -> X
Home	Home		Launch the "Home" view.	—	Alt -> H -> H
	Status bar		Open or close the status bar.	—	Alt -> H -> T
	Restore to the initial size		Restore the window size to the initial state.	—	Alt -> H -> R
	Window	Top-bottom display	Display multiple window tabs vertically.	—	Alt -> H -> WA -> O
		Left-right display	Display multiple window tabs horizontally.	—	Alt -> H -> WA -> V
		Cascade	Display multiple window tabs in a stack.	—	Alt -> H -> WA -> C
	Language		Launch the "Language" view.	—	Alt -> H -> L
Setting	Update		Update the available communication port information.	—	Alt -> S -> U
	Connect		Connect the available communication port and driver.	—	Alt -> S -> C
	Disconnect		Releases the connected communication port.	—	Alt -> S -> D

Function	Item			Description	Shortcut	Key tip
Setting	**Setting display**			Launch the "Setting display" view.	—	Alt -> S -> V
	Network			Display the network setting dialog.	—	Alt -> S -> F
Tuning	**Tuning**			Launch the "AxSpeed" view. The operation panel changes to the [Tuning] tab.	—	Alt -> T -> GU
	AI Gain	**AI Gain**		Launch the "AxSpeed"" view and display the [AI Gain] dialog.	—	Alt -> T -> GT -> GT
		Point table display		Launch the "AxSpeed" view and display the AI gain adjustment result point table dialog.	—	Alt -> T -> GT -> GP
	Manual adjustment			Launch the "AxFFT" view and display the Filter Setting dialog.	—	Alt -> T -> FU
	AI filter adjustment			Launch the "AxFFT" view and display the AI filter adjustment dialog.	—	Alt -> T -> FT
	AX setting			Launch the "AX setting" view.	—	Alt -> T -> XS
	ABSODEX initialization			Restore the data written to the driver to the factory default state.	—	Alt -> T -> L
Edit	**Program**	**—**		Launch the "Program" view.	—	Alt -> E -> P
		Table program	**Insert new**	Insert a new row into the table list.	Alt + N	—
			Cut	Cut the selected row in the table list.	Alt + X	—
			Copy	Copy the selected row in the table list.	Alt + C	—
			Delete	Delete the selected row in the table list.	Alt + D	—
			Insert copied row	Insert a copied or cut row into the destination row in the table list.	Alt + I	—
			Confirm table	Confirm the contents being set in Edit table.	Alt + W	—
	Parameter			Launch the "Parameter" view.	—	Alt -> E -> A
	Point table			Launch the "Point table" view.	—	Alt -> E -> O
	Home position offset			Display the Home position offset dialog.	—	Alt -> E -> F
	Change driver type			Launch the "Change driver type" view.	—	Alt -> E -> Y

Function	Item			Description	Shortcut	Key tip
Edit	Edit data	Editorial data clearance	All data	Restore the parameter, program, or point table being edited to its initial value.	—	Alt -> E -> E -> C -> A
			Only Parameter	Restore the parameter being edited to its initial value.	—	Alt -> E -> E -> C -> R
			Only Program	Restore the program being edited to its initial value.	—	Alt -> E -> E -> C -> O
			Point table only	Restore the point table being edited to its initial value.	—	Alt -> E -> E -> C -> P
		Editorial data usage	Only Program	Display the program usage dialog.	—	Alt -> E -> E -> D -> O
	Read	All data		Read the parameter, program, and point table from the driver.	—	Alt -> E -> G -> A
		Only Parameter		Read the parameter only from the driver.	—	Alt -> E -> G -> R
		Only Program		Read the program only from the driver.	—	Alt -> E -> G -> O
		Point table only		Read the point table only from the driver.	—	Alt -> E -> G -> P
	Write	All data		Write the parameter, program, and point table to the driver.	—	Alt -> E -> S -> A
		Only Parameter		Write the parameter only to the driver.	—	Alt -> E -> S -> R
		Only Program		Write the program only to the driver.	—	Alt -> E -> S -> O
		Point table only		Write the point table only to the driver.	—	Alt -> E -> S -> P
	Compare	All data		Compare the editorial data with the driver data in parameter, program, and point table.	—	Alt -> E -> J -> A
		Only Parameter		Compare the editorial data with the driver data in parameter.	—	Alt -> E -> J -> R
		Only Program		Compare the editorial data with the driver data in program.	—	Alt -> E -> J -> O
		Point table only		Compare the editorial data with the driver data in point table.	—	Alt -> E -> J -> P
	ABSODEX initialization			Restore the data written to the driver to the factory default state.	—	Alt -> E -> L

Function	Item		Description	Shortcut	Key tip
Monitor and maintain	AxSpeed Function	—	Launch the "AxSpeed" view.	—	Alt -> M -> S
		Manual trigger	Acquire the speed data.	Alt + W	—
		Acquired waveform setting	Set the length of data (i.e., time to acquire data).	—	—
		Sampling time setting		ALT + I	
		Gain related parameter view	Display gain details.	—	—
	AxIO Function	—	Launch the "AxIO" view.	—	Alt -> M -> O
		Start	Start the I/O information acquisition.	Alt + S	—
		Stop	Stop the I/O information acquisition.	Alt + P	—
		View Setting	Set the view of the graph.	Alt + V	—
	AxFFT Function	—	Launch the "AxFFT" view.	—	Alt -> M -> F
		Filter Setting	Change the setting values of the digital filter.	Alt + I	—
	Operation information	I/O operation display	Launch the "I/O operation display" view.	—	Alt -> M -> IO -> I
		Network status display	Launch the "Network status display" view.	—	Alt -> M -> IO -> N
	ABSODEX information		Launch the "ABSODEX information" view.	—	Alt -> M -> IN

4.2. List of codes

4.2.1. NC code

Code	Function		Setting range	Remarks
O	Program number		0 to 999	0 to 255 can be selected from I/O. "O" is automatically added.
N	Sequence number		0 to 999	Can be omitted.
G	Preparation function		0 to 999	Refer to "4.2.2 G code."
A	Instruction to move coordinate axis	G90, G91, G91.1	±9999999	Unit: pulse
			±6658.380	Unit: angle
			±4716	Unit: Number of indexes
		G90.1, G90.2, G90.3	±540672	Unit: pulse
			±360.000	Unit: angle
			1 to Designated number of segments	Unit: Number of indexes
	Designation of segment numbers		1 to 255	
	Continuous rotation speed		±300.00 Note 1	Unit: rpm
F	Designation of speed		0.01 to 300.00 Note 1	Unit: rpm
			0.01 to 100.00	Unit: sec
M	Auxiliary function		0 to 99	Refer to "4.2.3 M code."
P	Dwell		0.01 to 99.99	Unit: sec G40P□□. □□
	Designation of sub-program number		0 to 999	Specify the program number. M98P□□□
	Gain magnification		0, 50 to 200	Unit: % G12P□□□ 0% input will set servo-off.
	Acceleration and deceleration for continuous rotation		0.01 to 50	Unit: sec G08P□□□ G09P□□□
	Parameter data setting		Range defined by parameters	Unit: the unit defined by each parameter G79S□□P□□□
L	Numbers of repetition		1 to 999	Repeat the block as specified.
J	Jump		0 to 999	"J0" causes a return to the top of the program.
S	Parameter data setting		1 to 99	Specify the parameter number. G79S□□P□□□

Note 1: The minimum rotation speed of the actuator is 0.11 rpm. The maximum rotation speed varies according to the model.

* The setting range differs depending on the driver.

4.2.2. G code

Group	Code	Function	Description
A *	**G01**	Positioning	To position at "A" with speed "F." <Input Method> G01A□□F□□; (Note) "A□□" command can make positioning without "G01."
	G07	Continuous rotation	Continuously rotates at speed "A." The unit of A is rpm. + = CW, - = CCW rotation. <Input Method> G07A±□□; (Note) Select less than 80 rpm for "G07" continuous rotation.
	G28	Home positioning	Perform the home positioning operation.
	G72	Pulse string input	Operate in accordance with the pulse string input from CN3. The program stop input or start input will terminate the execution of "G72."
	G92	Coordinate system setting	Set or change the coordinate system. Like "G92A0," with the code A suffixed to G code, the coordinate system is set so that the current position is the value to follow "A."
	G92.1	Coordinate system setting	To set the home position of "G92" user coordinate at power-on is the value which follows "A."
B	**G04**	Dwell	Delay to shift to the next block. <Input Method> G04P□□. □□;
	G08	Acceleration time for continuous rotation	Acceleration takes place for the time specified by "P" for continuous rotation. <Input Method> G08P0.5; acceleration time 0.5 sec.
	G09	Deceleration time for continuous rotation	Deceleration takes place for the time specified by "P" for continuous rotation. <Input Method> G09P0.5; deceleration time 0.5 sec.
	G12	Change gain magnification	Change the magnification for the gain determined by Gain 1 and Gain 2. <Input Method> G12P100; 100% G12P0; cause servo-off at 0%.
	G79	Parameter data setting	Substitute the parameter number with "S" for the value of "P." <Input Method> G79S1P2; To substitute the parameter 1 for "2."

* The asterisk (*) indicates the power-on setting.

Group	Code	Function	Description
C	G101	Designate number of segments	One rotation is equally segmented to set "A" unit to index number "G106." <Input Method> G101A10; One rotation = 10 segments G01A1; Unit of "A" is index number (Note) Do not specify "G101" in the same block as the A-group.
*	G104	Designation of pulses	Unit of "A" is pulse.
	G105	Designation of angles	Unit of "A" is angle.
	G106	Designation of index	Unit of "A" is numbers of index. If not set by "G101," program error will occur.
D	G10	Designation of rotation number	Unit of "F" is rpm. Moving speed is specified by the maximum rotation number.
*	G11	Designation of time	Unit of "F" is second. Specify the movement time.
E	G90	Absolute dimension	The value of "A" to be made absolute value from the home position of coordinates.
*	G90.1	One rotation Absolute dimension	The actuator moves in the nearer direction with the value "A" as the one (1) rotation absolute value from the coordinate home position. The user coordinate after completion of positioning is adjusted within -180° to 179.999°. The specified range of "A" is within ±360°. Specifying 180° will cause the actuator to rotate CCW.
	G90.2	CW rotation Absolute dimension	The actuator moves in the CW direction with the value "A" as the one (1) rotation absolute value from the coordinate home position. The user coordinate after completion of positioning is adjusted within -180° to 179.999°. The specified range of "A" is within ±360°. (The actuator motions between 0 to 360° in the CW direction.)
	G90.3	CCW rotation Absolute dimension	The actuator moves in the CCW direction with the value "A" as the one (1) rotation absolute value from the coordinate home position. The user coordinate after completion of positioning is adjusted within -180° to 179.999°. The specified range of "A" is within ±360°. (The actuator motions between 0 to 360° in the CCW direction.)
	G91	Incremental dimension	The value of "A" is the incremental value from the current position. Designate the direction of rotation, using the sign attached to the value following "A." A positive value (without a sign) indicates clockwise rotation, while a negative value (-) indicates counterclockwise rotation.
	G91.1	One rotation Incremental dimension	The value of "A" is the incremental value from the current position. Designate the direction of rotation, using the sign attached to the value following "A." A positive value (without a sign) indicates clockwise rotation, while a negative value (-) indicates counterclockwise rotation. The user coordinate after completion of positioning is adjusted within -180° to 179.999°.

* The asterisk (*) indicates the power-on setting.

4.2.3. M code

Group	Code	Function	Description
A	**M00**	Program Stop	After completion of the current block, the program stops. When the start signal is input again, program execution starts with the next block.
	M30	End of program	The program terminates to return the head block of the program.
B	**M98**	Sub-program call	Executes sub-program. <Input Method> M98P□□□ ←sub-program number Nest is feasible up to four times.
	M99	End of sub-program	Indicate the end of sub-program. After executing the block containing "M99," the main program is resumed.
C	**M68**	Activate brake	De-energize the valve for the brake and do not make servo system integral control.
	M69	Release brake	Energize the valve for the brake and makes servo system integral control.
D	**M20 to M27**	I/O Output	M signal in bit corresponding to the first digit is output to CN3, and M code strobe output (bit 0 to 7) will turn ON simultaneously. Three (3) M codes can be written in the same block and can be output simultaneously.
E	**M70**	Segment position output	When "G101" is used, the M code output corresponding to the indexing position (bits 0 to 7: binary format) and the segment position strobe output are simultaneously output at CN3. The segment position for n segmentation is expressed 1 to n.

4.3. List of codes (visual program)

The following blocks can be used in a visual program.
Blocks are displayed in the block classification indicated by "○."

NC classi-fication	Block name	Block classification					NC code
		Rotation	Index (combination)	Index (single)	Home position	Other	
J	Repeat	○	○	○	○	○	J10;
G90	Rotate to [45] degrees for [1] second	○	—	—	—	—	G105G11G90A45F1;
	Rotate to [1000] pulses for [1] second	○	—	—	—	—	G104G11G90A1000F1;
	Rotate to [45] degrees at [10] rpm	○	—	—	—	—	G105G10G90A45F10;
	Rotate to [1000] pulses at [10] rpm	○	—	—	—	—	G104G10G90A1000F10;
	Rotate to the position of segment [2] for [1] second	—	—	○	—	—	G106G11G90A2F1;
	Rotate to the position of segment [2] at [10] rpm	—	—	○	—	—	G106G10G90A2F10;
G90.1	Rotate on the shortest route to [45] degrees for [1] second	○	—	—	—	—	G105G11G90.1A45F1;
	Rotate on the shortest route to [1000] pulses for [1] second	○	—	—	—	—	G104G11G90.1A1000F1;
	Rotate on the shortest route to [45] degrees at [10] rpm	○	—	—	—	—	G105G10G90.1A45F10;
	Rotate on the shortest route to [1000] pulses at [10] rpm	○	—	—	—	—	G104G10G90.1A1000F10;
	Rotate on the shortest route to the position of segment [2] for [1] second	—	—	○	—	—	G106G11G90.1A2F1;
	Rotate on the shortest route to the position of segment [2] at [10] rpm	—	—	○	—	—	G106G10G90.1A2F10;

* Values in brackets [ ] in the block name are the initial values.

NC classification	Block name	Block classification					NC code
		Rotation	Index (combination)	Index (single)	Home position	Other	
G90.2	Rotate clockwise to [45] degrees for [1] second	○	—	—	—	—	G105G11G90.2A45F1;
	Rotate clockwise to [1000] pulses for [1] second	○	—	—	—	—	G104G11G90.2A1000F1;
	Rotate clockwise to [45] degrees at [10] rpm	○	—	—	—	—	G105G10G90.2A45F10;
	Rotate clockwise to [1000] pulses at [10] rpm	○	—	—	—	—	G104G10G90.2A1000F10;
	Rotate clockwise to the position of segment [2] for [1] second	—	—	○	—	—	G106G11G90.2A2F1;
	Rotate clockwise to the position of segment [2] at [10] rpm	—	—	○	—	—	G106G10G90.2A2F10;
G90.3	Rotate counterclockwise to [45] degrees for [1] second	○	—	—	—	—	G105G11G90.3A45F1;
	Rotate counterclockwise to [1000] pulses for [1] second	○	—	—	—	—	G104G11G90.3A1000F1;
	Rotate counterclockwise to [45] degrees at [10] rpm	○	—	—	—	—	G105G10G90.3A45F10;
	Rotate counterclockwise to [1000] pulses at [10] rpm	○	—	—	—	—	G104G10G90.3A1000F10;
	Rotate counterclockwise to the position of segment [2] for [1] second	—	—	○	—	—	G106G11G90.3A2F1;
	Rotate counterclockwise to the position of segment [2] at [10] rpm	—	—	○	—	—	G106G10G90.3A2F10;
G91.1	Rotate [45] degrees from the current position for [1] second	○	—	—	—	—	G105G11G91.1A45F1;
	Rotate [1000] pulses from the current position for [1] second	○	—	—	—	—	G104G11G91.1A1000F1;
	Rotate [45] degrees from the current position at [10] rpm	○	—	—	—	—	G105G10G91.1A45F10;
	Rotate [1000] pulses from the current position at [10] rpm	○	—	—	—	—	G104G10G91.1A1000F10;
	Rotate [2] segments from the current position for [1] second	—	—	○	—	—	G106G11G91.1A2F1;
	Rotate [2] segments from the current position at [10] rpm	—	—	○	—	—	G106G10G91.1A2F10;
	Return to the position of segment for [1] second	—	—	○	—	—	G106G11G91.1A0F1;

* Values in brackets [ ] in the block name are the initial values.

NC classi-fication	Block name	Block classification					NC code
		Rotation	Index (combination)	Index (single)	Home position	Other	
G101	Divide one revolution into [4] segments	—	—	○	—	—	G101A4;
G7	Rotate continuously at [20] rpm	○	—	—	—	—	G7A20;
G28	Return to home position	—	—	—	○	—	G28;
G92	Change the current position to [0] degrees	—	—	—	○	—	G105G92A0;
	Change the current position to [0] pulses	—	—	—	○	—	G104G92A0;
G92.1	Shift the home position by [0] degrees	—	—	—	○	—	G105G92.1A0;
	Shift the home position by [0] pulses	—	—	—	○	—	G104G92.1A0;
M0	Wait for start input	—	—	—	—	○	M0;
G4	Wait for [0.1] seconds	—	—	—	—	○	G4P0.1;
M68	Activate the brake	—	—	—	—	○	M68;
M69	Release the brake	—	—	—	—	○	M69;
M20-27	Output M code of bit [0]	—	—	—	—	○	M20;
	Output M code of bit [0][1]	—	—	—	—	○	M20M21;
	Output M code of bit [0][1][2]	—	—	—	—	○	M20M21M22;
M70	Output M code for the segment position	—	—	—	—	○	M70;
G8	Set the acceleration time for continuous rotation to [0.5] seconds	—	—	—	—	○	G8P0.5;
G9	Set the deceleration time for continuous rotation to [0.5] seconds	—	—	—	—	○	G9P0.5;
G72	Accept pulse string input	—	—	—	—	○	G72;
G12	Set the gain magnification to [100]%	—	—	—	—	○	G12P100;
G79	Set parameter [1] to value [2].	—	—	—	—	○	G79S1P2;

* Values in brackets [ ] in the block name are the initial values.