



# Operation Manual

Product Name

***Controller Setting Software  
(For 4-axis Step Motor Controller)***

MODEL/ Series/ Product Number

**JXC-W1  
(JXC#3 Series)**

**SMC Corporation**

<b>1. Safety Instructions .....</b>	<b>3</b>
<b>2. Product Specifications .....</b>	<b>5</b>
2.1 Features of the Setting software .....	5
2.2 Applicable PC.....	5
2.3 Applicable controller .....	5
<b>3. Start-up.....</b>	<b>6</b>
3.1 Preparation .....	6
(1) Software installation .....	6
(2) Installation and wiring .....	6
3.2. Start-up .....	6
(1) Supply of power.....	6
(2) Start-up of the Controller setting software.....	6
(3) Alarm check.....	8
<b>4. Setting Software Functions .....</b>	<b>9</b>
4.1 Various windows.....	9
(1) Main window.....	9
(2) Status window.....	16
(3) Teaching window .....	19
(4) Parameter window .....	22
(5) Step Data window .....	23
(7) Test Drive window .....	26
4.2. Parameter setting.....	28
(1) Exclusive parameter setting for the connected actuator .....	28
(2) Change of controller and actuator settings.....	31
(3) Change of the parameter protect setting .....	32
4.3 Step data setting .....	33
(1) Step data setting.....	33
(2) Saving or Loading the Step data.....	35
4.4 Monitor function.....	36
4.5 Teaching .....	36
4.6 Test Drive .....	39
(1) Test Drive.....	39
(2) JOG, Inching, and Return to origin in the Teaching window.....	40
(3) Single step operation in Step Data window .....	41

4.7 Forced output function .....	42
(1) Parallel I/O forced output.....	42
4.8. Alarm detection.....	43
(1) Alarm group distinction .....	43
(2) Parallel I/O signal output when an Alarm is generated .....	43
(3) Alarms and countermeasures.....	44



# JXC\*3 Series/Controller Setting Software

## 1. Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1), and other safety regulations.

\*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems.

ISO 4413: Hydraulic fluid power -- General rules relating to systems.

IEC 60204-1: Safety of machinery -- Electrical equipment of machines .(Part 1: General requirements)

ISO 10218-1992: Manipulating industrial robots -Safety.

etc.



### Caution

**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



### Warning

**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



### Danger

**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

## Warning

### 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### 2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions:

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



# JXC\*3 Series/Controller Setting Software

## 1. Safety Instructions

### Caution

#### **1. The product is provided for use in manufacturing industries.**

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and provide specifications or a contract, if necessary.

If anything is unclear, contact your nearest sales branch.

### **Limited warranty and Disclaimer/Compliance Requirements**

The product used is subject to the following “Limited Warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

#### **Limited warranty and Disclaimer**

**1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2)**

**Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.**

**2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.**

**This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.**

**3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.**

**\*2) Vacuum pads are excluded from this 1 year warranty.**

**A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.**

**Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.**

#### **Compliance Requirements**

**1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.**

**2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.**

## 2. Product Specifications

The 4-axis step motor controller controls the electrical actuator operation using a predefined set of step data, which combines all operation commands such as position and speed, and will start the operation after step data is entered into the controller using external equipment.

This setting software is for inputting and changing the setting of the controller using a PC.

### 2.1 Features of the Setting software

The main functions of the controller setting software are shown below:

- Parameter setting

It is possible to set the exclusive parameter of the each connected actuator to the controller.

It is possible to set and change the parameters of the controller itself.

- Step data setting

It is possible to set and change the step data which combines all operation commands to the actuator (up to 4 axes).

It is possible to operate the actuator by the contents set, by defining the step data number and providing a command for each operation.

- Teaching

It is possible to set a target position for a positioning operation using the jog operation (Jog teaching) or using the manual operation (Direct teaching).

- Monitor

It is possible to monitor the operating conditions such as the current position and speed, input and output signal conditions, and alarm conditions for each actuator.

- Test drive

It is possible to test the step data set in a specified order.

- Alarm detection function

It is possible to check the details of the alarm when the alarm is generated.

If the alarm is generated, the history is stored in the controller. (Maximum 16 records from the previous alarm.)



### Caution

**When it actually sets up or when failure are found, it is also necessary to refer to the manual of the actuator and the controller.**

**Keep “this manual” and “the manual of the actuator and the controller” accessible for reference.**

### 2.2 Applicable PC

Prepare the PC according to the following operating environment.

OS <small>Note 1</small>	Windows ®7 (32bit / 64bit) Microsoft .NET Framework 2.0 is necessary.
	Windows® 8.1 (32bit / 64bit) Microsoft .NET Framework 3.5 is necessary.
Hard disk space	50 MB or more
Communication interface	USB port (USB1.1 or USB 2.0)

Note 1: If Microsoft.NET Framework is not installed during the installation, install Microsoft.NET Framework.

### 2.3 Applicable controller

This setting software is suitable for use with the JXC\*3 series 4-Axis Step Motor Controller.

## 3. Start-up

### 3.1 Preparation

Prepare a USB cable.

The USB cable is included in the controller setting kit (JXC-W1).

Or, it is possible to purchase the USB cable as a separate item (Part No.: JXC-W1-2).



USB cable

When using this product for the first time, perform items (1) and (2) as follows:

#### (1) Software installation

Install the controller setting software (JXC Controller) and driver software to the PC, according to instructions in the Installation Manual (No. SFOD-OMT0008) supplied with the CD-ROM.

#### (2) Installation and wiring

Perform installation and wiring of the controller according to the Controller Operation Manual (No. SFOD-OMT0010).

## 3.2. Start-up

### (1) Supply of power

Supply power for the main control and the motor control, and then supply power for the motor drive.

LED description	Color	Status
PWR	Green	ON: Power supply is ON. OFF: Power supply is OFF.
RUN	Green	ON: Normal operation Flashing: During operation by the setting software OFF: Operation stopped
USB	Green	ON: USB is connected. OFF: USB is not connected.
ALM	Red	ON: Alarm is generated. OFF: No alarm is generated.




Make sure that the PWR LED is ON green.

If the green PWR LED is not ON, check the power supply wiring and the power supply voltage.

### (2) Start-up of the Controller setting software

Once the controller setting software has been installed on the PC, select "SMC / JXC Controller" from "Start / All programs" to start-up the setting software.

A short-cut icon  will be created on the desk top if the controller setting software is installed using the default settings. The setting software starts by selecting this short-cut.

When the setting software starts, the communication between the controller and the PC is confirmed.

When the controller can communicate with the PC normally, the following window will be displayed.

However, when the setting software is started for the first time, this window will not appear.

When power is supplied for the first time, the title window will be displayed.

After setting the controller parameters and the connected actuator the following window will be displayed.



When "Yes" is selected, the following title window will be displayed while the step data and parameters are uploaded (read) from the controller.

In addition, when left-clicking while displaying the following window, it will disappear, and then, it shifts to the next step.

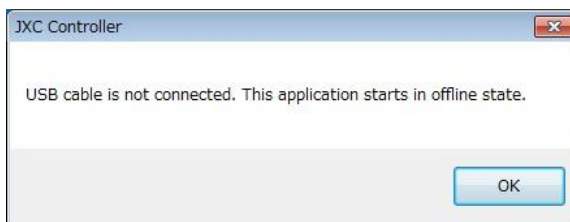
When "No" is selected, the following window will be displayed without uploading (reading) the step data or parameters from the controller.



Title window

When the PC cannot communicate with the controller, the following window will be displayed.

By selecting "OK", the title window will be displayed.



In this case, the communication between the controller and the PC is not established. Please confirm the following points again.

- a) Check that power is supplied to the connected controller at the correct voltage.
- b) Check that the controller and the PC are connected to each other via the USB cable.
- c) Check that the USB driver is installed correctly.

### Caution

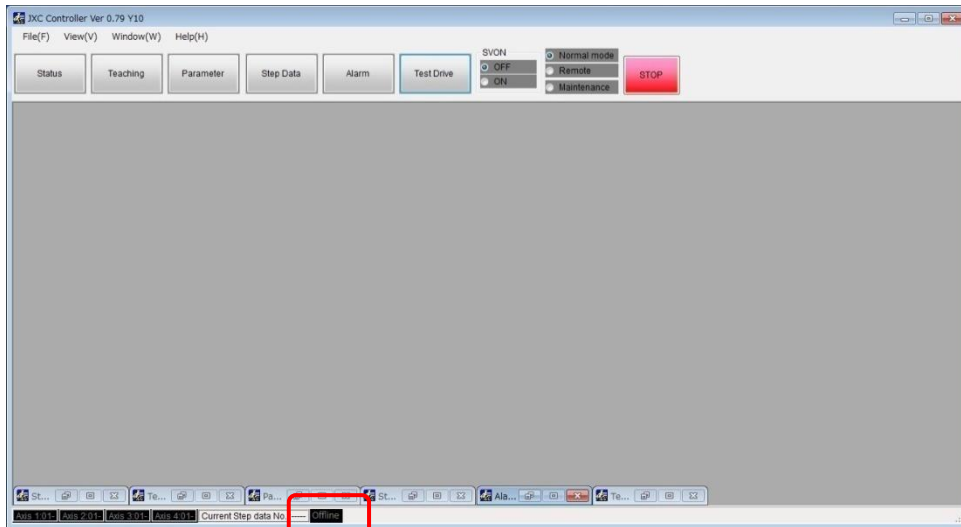
If this software starts up without uploading the parameters, or in the off-line state, the contents shown in the status window and the teaching window will not be correct.

Make sure to upload the parameters when referring to the status window or when operating the actuator.

Otherwise, it may cause injury; or damage to the actuator or the user's system.

After the title window is displayed, the following main window will be displayed.





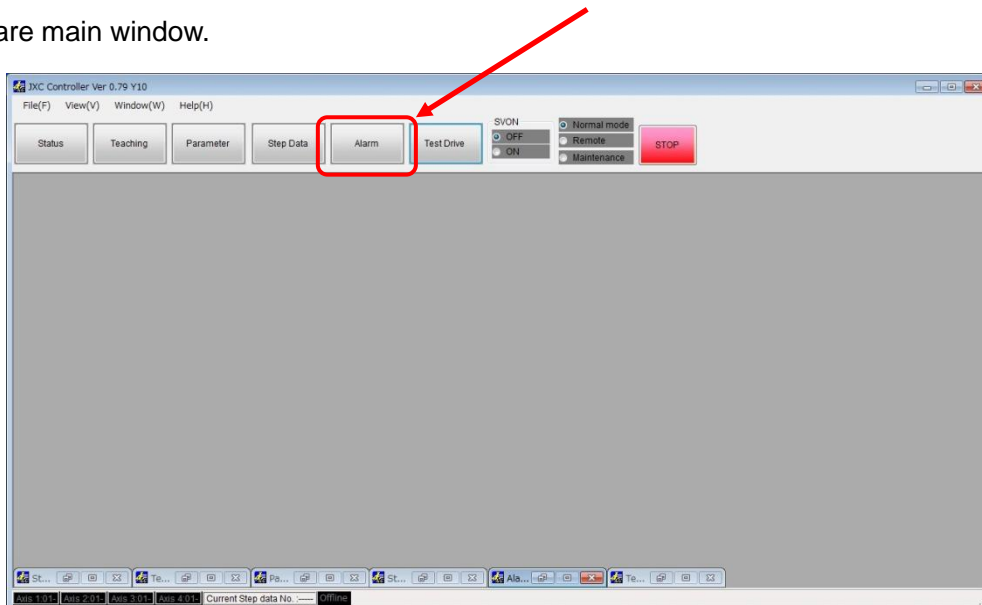
The communication status between the controller and the PC is displayed at the bottom of the main window.

Indication	Explanation
Offline	Communication is not established.
Online	Communication is established.

Even if the communication status shows the off-line state, it will change to the on-line state (green) automatically when the communication is correctly established.

### (3) Alarm check

When an alarm is generated in the controller, the “Alarm” button flashes red at the top of the setting software main window.



It is possible to check the details of the alarm generated by selecting the “Alarm” button.

Refer to section "4.8 (3) Alarms and countermeasures" for details of the alarms and countermeasures, and reset the alarm.

## 4. Setting Software Functions

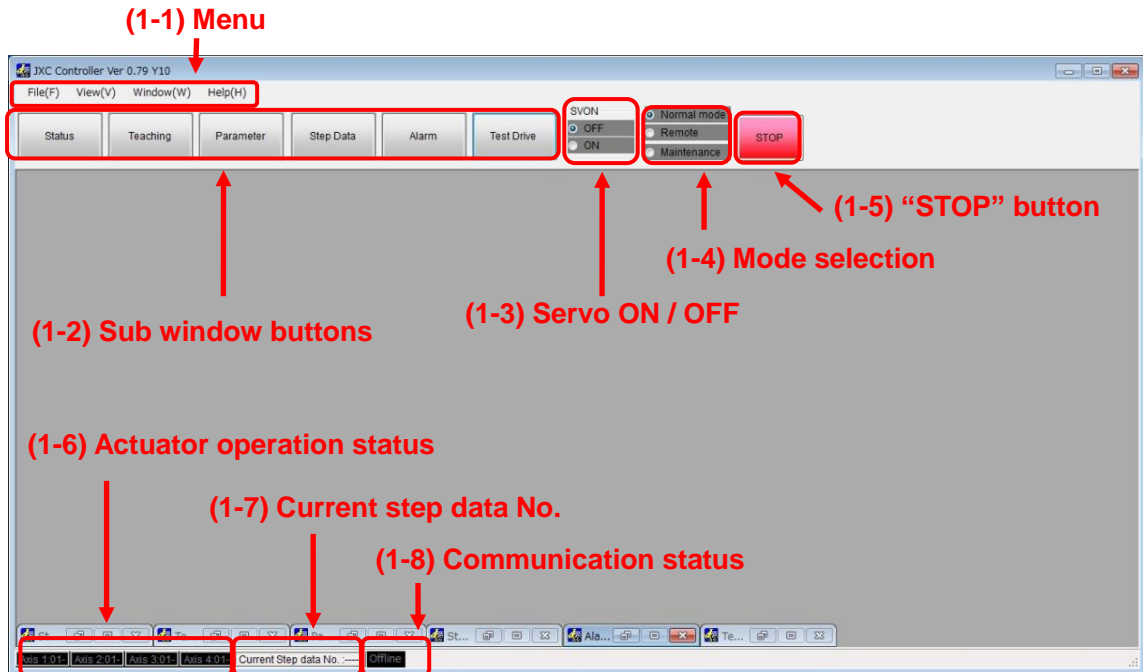
### 4.1 Various windows

#### (1) Main window

It is possible to control the all functions in this window.

e.g. Display/Non-display of other windows , selection of modes, servo ON/OFF commands, and operation stop commands.

Details of each function are explained in section (1-1) to (1-8) below:



#### (1-1) Menu

Menu is used to display each kind of window, printing, etc.

There are four commands: "File", "View", "Window" and "Help".

#### (1-1-1) File (F)

This is used to print the screen, save the alarm, and close the setting software.

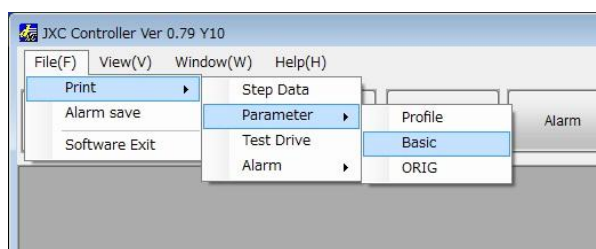
There are three commands: "Print", "Alarm save" and "Software Exit".

#### (1-1-1-1) Print

This selects the object to be printed.

#### [How to print]

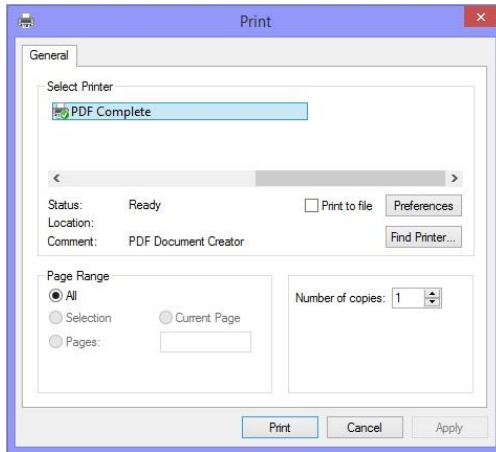
a) Select the object to be printed from "Step Data", "Parameter", "Test Drive" or "Alarm".



Items	Descriptions
Step Data	Step data in which "Movement mode" is set will be printed. Step data in which "Movement mode" is not set will not be printed.
Parameter	Parameters are printed.
Test Drive	The line in which "Step No." is set will be printed. The line in which "Step No." is not set will not be printed.
Alarm	The alarm currently generated and the alarm history for each axis are selected and printed.

b) Select the "Properties" of the printer.

Set the details for printing such as sheet size and number of copies.



When the setting is completed, select "Print".

The print preview is displayed as shown below to check the contents to be printed before actual printing. (The preview screen shown below is an example of printing Step Data).

Step No	Axis	Movement mode	Speed	Position	Acceleration	Deceleration	Pushing Selection	Area 1
0	Axis 1	ABS	100 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
	Axis 2	ABS	100 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
	Axis 3		1 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
	Axis 4		1 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
1	Axis 1	ABS	100 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
	Axis 2	ABS	100 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
	Axis 3		1 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
	Axis 4		1 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
2	Axis 1	LIN-A	100 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]		0.00 [mm]
	Axis 2	LIN-A		0.00 [mm]				0.00 [mm]
	Axis 3			0.00 [mm]				0.00 [mm]
	Axis 4			0.00 [mm]				0.00 [mm]
3	Axis 1	ABS	500 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
	Axis 2	ABS	500 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
	Axis 3	ABS	500 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]
	Axis 4		500 [mm/s]	0.00 [mm]	3000 [mm/s <sup>2</sup> ]	3000 [mm/s <sup>2</sup> ]	0 [%]	0.00 [mm]

Printing is started by selecting the print  button on the upper left of the print preview screen.

### (1-1-1-2) Alarm save

The alarm status is saved into a CSV file.

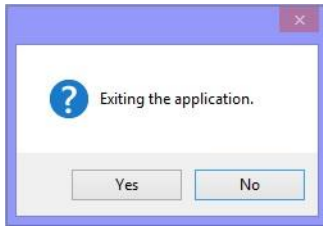
The alarm currently generated and the alarm histories for each axis are saved together.

### (1-1-1-3) Software Exit

Completing the setting software.

#### [How to complete]

a) When “Software Exit” is selected, the following confirmation window will be displayed.



b) When “Yes” is selected, the software setting will be closed.

### (1-1-2) View (V)

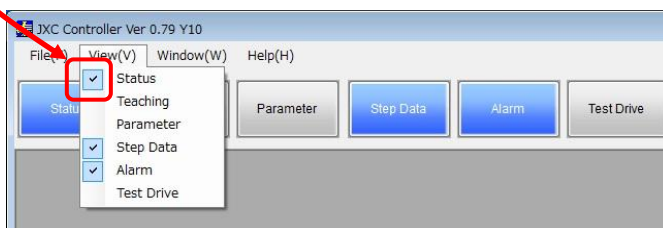
When View (V) is selected, a sub window is displayed.

It is possible to control Display/Non-display of sub window such as “Status”, “Teaching”, “Parameter”, “Step Data”, “Alarm” and “Test Drive”.

#### [How to display the sub window]

Select the check box of the sub windows to be displayed.

The selected windows will then be displayed.

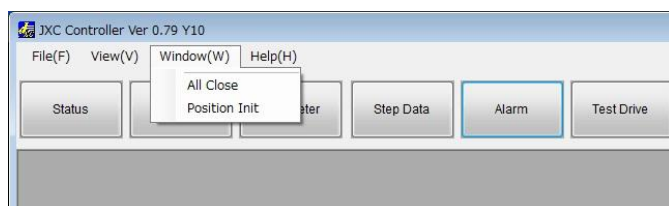


The available sub windows and the descriptions are shown in the table below.

Item	Description
Status	It is possible to monitor the current position of the connected axis, speed, and input/output signals. Refer to section "4.1 (2) Status window" for details.
Teaching	It is possible to monitor the current position of the connected axis, and to operate the JOG and inching of each axis. Refer to section "4.1 (3) Teaching window" for details. (Available only in the on-line state, not available in the off-line state).
Parameter	It is possible to set the parameter of the controller and the connected axis, and to write the parameter to the controller, and to read the parameter from the controller. Refer to section "4.1 (4) Parameter window" for details.
Step Data	It is possible to set the step data, and to write the step data to the controller, and to read the step data from the controller. Refer to section "4.1 (5) Step Data window" for details.
Alarm	It is possible to display and reset the alarm currently generated. Also, it is possible to display the alarm history for each axis. Refer to section "4.1 (6) Alarm window" for details.
Test Drive	It is possible to test the step data setting in a specified order. Refer to section "4.1 (7) Test Drive window" for details.

### (1-1-3) Window (W)

When Window is selected, a sub window will be displayed. There are two commands available: “All Close” and “Position Init”.



These commands and the descriptions are shown below.

Item	Description
All Close	All of the displayed sub windows will be closed.
Position Init	The upper left corner of all the displayed sub windows are aligned with the upper left corner of the display area of the main window.

### (1-1-4) Help (H)

Select “Help” to confirm the version of the setting software. It is possible to change the display language. There are three commands: “Version”, “Language” and “Password”.

#### (1-1-4-1) Version

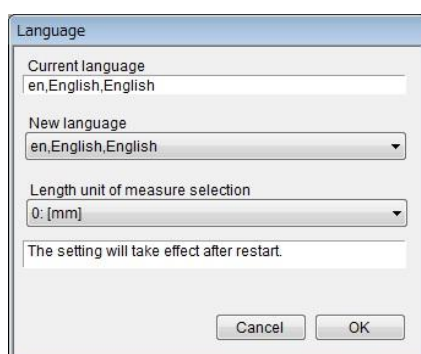
The following title window is displayed to show the version information.



Item	Description
Application version	Version of this setting software.
Controller version	Firmware version of the connected controller. [ "-----" will be indicated when no controller is connected. ]

#### (1-1-4-2) Language

It is possible to change the language and units for this application (The changes are made effective after restarting the setting software).



Items	Descriptions
Current language	The current language setting is indicated.
New language	The language to be changed is selected. “ja, Japanese, 日本語”: The language is changed to Japanese. “en, English, 英語”: The language is changed to English.
Length unit of measure selection	The unit of length is selected. “0: (mm)”: The unit is set to "mm". “1: (inch)”: The unit is set to "inch".

#### (1-1-4-3) Password

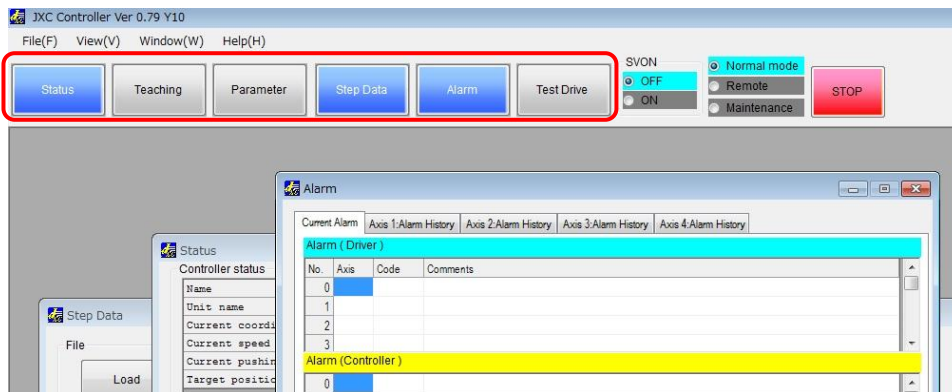
For production use only (not available for users).

### (1-2) Sub window buttons

The sub window buttons offer the same functions as the View (V) menu.



By selecting the sub window buttons, it is possible to display the sub window such as “Status”, “Teaching”, “Parameter”, “Step Data”, “Alarm” and “Test Drive”.

The displayed sub window buttons will turn blue.



### (1-3) SVON

It is possible to set the all connected axes to be the status of servo ON/OFF.

Items	Descriptions	
SVON: OFF		All axes are the status of servo OFF.
SVON: ON		All axes are the status of servo ON.

### (1-4) Mode selection

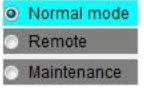
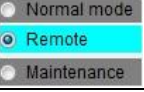
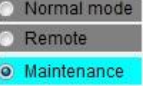
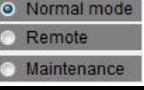
It is possible to select the operation mode according to the purpose of use of the setting software.

When power is first supplied, this will be set to **Normal mode as default**.

When this setting software is closed, the operation mode will switch to Normal mode automatically.

#### (1-4-1) Mode descriptions

There are three modes of operation as shown below:

Operation mode	Descriptions	
<b>Normal mode</b>		It is possible to monitor the normal operating status by operating the connected axes using the connected external equipment.
<b>Remote</b>		It is possible to test Test Drive, JOG and Inching, in the setting software.
<b>Maintenance</b>		It is possible to output forcibly the output signal of the controller, and monitor the input/output signal condition of the controller. Note that, in the maintenance mode, even if the input signal is ON or OFF, the command from the input is not performed.
(Off-line)		Offline is indicated by no buttons highlighted. This means communication between the controller and PC is not established.

## (1-4-2) Operation mode details

The available contents of each operation mode are shown in the table below.

Description	Normal mode	Remote	Maintenance
Wiring, setting and reading of step data and controller parameters.	✓	✓	✓
Monitoring of operation and parallel I/O input/output signals.	✓	✓	✓
Alarm check.	✓	✓	✓
Enable the operation of parallel I/O input signals.	✓	✗	✗
Enable the operation of setting software commands (Drive test is available)	✗	✓	✗
Forcible output of the parallel I/O output signals	✗	✗	✓
Output the controller status to the parallel I/O output signals.	✓	✓	✗

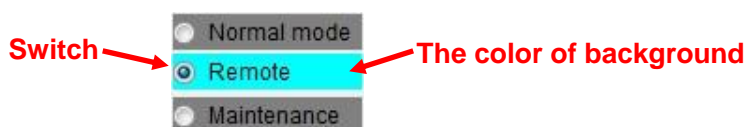
✓: Possible    ✗: Impossible

### [How to change the mode]

a) Select the operation mode to be changed.

The switch of the selected operation mode becomes a solid light and the color of the background will change to light blue.

(The following figure shows an example for when Remote mode is selected.)



b) Before changing the operation mode

When changing the operation mode, the following safety confirmation windows will be displayed.

When the parallel I/O enable/disable status is switched depending on the change to the operation mode, the actuator operation may stop suddenly, immediately after switching the status.

Please confirm the safety thoroughly before selecting "OK".



Confirmation window when changing to normal mode



Confirmation window when changing to remote mode



Confirmation window when changing to maintenance mode

### ⚠ Caution

**Do not change the operation mode while the actuator is operating.**

**Make sure that the actuator operation stops before changing the operation mode.**

Otherwise, this may cause an unexpected malfunction.

### ⚠ Caution

**Do not touch the actuator when in operation.**

**Please take a measure so that the controller stop (ENGx) terminal can be shut off immediately while the actuator is operating or a test run is performing. (Refer to the controller Operation Manual [Document No. SFOD-OMT009] for the EMGx input terminal and the wiring).**


Otherwise, this may cause injury and/or an accident.

**(1-5) STOP button**

When the “STOP” button at the top of the main window is selected while the actuator is operating, all of the connected actuators will stop by reducing the speed.

However, the operation is not stopped when the “Stop” button is selected in the cases shown in the following “Caution”.



 <b>Caution</b>
<p><b>Please take appropriate measures so that the controller stop (ENGx) terminal can be turned off immediately during the test. (Refer to the controller Operation Manual [Document No. SFOD-OMT009] for the EMGx input terminal and the wiring).</b></p> <p>The operation is not stopped when the “Stop” button is selected in the following cases.</p> <ul style="list-style-type: none"> <li>-The actuator is stopping during the pushing operation. (In this case, the pushing status is not released when the “Stop” button is selected.)</li> <li>-The actuator is stopping during the positioning operation due to an obstacle.</li> <li>-The actuator is operating at slow speed as the positioning is interfered.</li> <li>-The actuator is performing a Return to origin operation.</li> </ul> <p>It may cause injury; or breakage of the actuator or user's system.</p>

**(1-6) Actuator operation status**

The names of the connected axes and the operation status will be indicated at the bottom of the main window display.

The displayed names will have been specified in the parameters (profile).

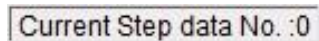
The color of the background shows the operation status of each axis.



Color of background	Descriptions
Black	Actuator is stopped.
Yellowish green	Actuator is operating.

**(1-7) Current step data**

The current step data number or the step data number which was previously used is indicated at the bottom of the main window display.



**(1-8) Communication status**

The communication status between the controller and the PC is indicated at the bottom of the main window display.

Indication	Descriptions
Offline	Communication is not established.
Online	Communication is established.

Even if the communication status shows the off-line state, it will change to the on-line state (yellowish green) automatically when communication is correctly established.



## (2) Status window

It is possible to monitor the current position of the connected axes, speed, and input/output signals. The details of each indication are explained in (2-1) to (2-3) below.

(2-1) Status of the connected actuators

The screenshot shows a 'Status' window with the following sections:

- Controller status:** A table with columns for Axis 1, Axis 2, Axis 3, and Axis 4. Rows include Name, Unit name, Current coordinate, Current speed, Current pushing force, and Target position.
- (2-2) I/O type:** A section with a 'Parallel IO (NPN)' label and a grid of buttons for BUSY1-4, AREA1-4, INP1-4, and \*ALARM1-4.
- (2-3) Status of input and output signals:** A section with 'Input signal' and 'Output signal' sub-sections, each containing a grid of buttons for various signals (IN0-10, OUT0-8) and control buttons (SETUP, HOLD, DRIVE, RESET, SVON, BUSY, AREA, SETON, INP, SVRE, \*ESTOP, \*ALARM).

### (2-1) Status of the connected actuators

The status of the connected actuators is indicated. The contents to be indicated are as follows:

Items	Descriptions
Unit name	The Axis names which have been specified in the parameters (profile) are indicated.
Current coordinate	The current position is indicated.
Current speed	The current speed is indicated.
Current pushing force	The current pushing force is indicated.
Target position	The position specified in the step data which has instructed the operation is indicated.

### (2-2) I/O type

The I/O type of the controller is indicated. The contents to be indicated are as follows:

Item	Description
Parallel I/O (NPN)	NPN type controller
Parallel I/O (PNP)	PNP type controller
Parallel I/O is not connected	The communication between the controller and PC is not established.

### (2-3) Status of Input and Output signals

The status of the input and output signals of each or all axes is indicated.

#### (2-3-1) Output signal of each axis

The output signals of each axis are indicated as follows:

Output signal name	Description
BUSY1 - BUSY4	The BUSY output signal status of each axis is indicated. Blue: ON Grey: OFF
AREA1 - AREA4	The AREA output signal status of each axis is indicated. Blue: ON Grey: OFF
INP1 - INP4	The INP output signal status of each axis is indicated. Blue: ON Grey: OFF
*ALARM1 - *ALARM4	The ALARM output signal (negative logic) status of each axis is indicated. Red: OFF (Alarm generated) Grey: ON (No alarm)

\*ALARM is displayed in negative logic.

#### (2-3-2) Output signal of all axes

The output signals of all axes are indicated as follows:

Output signal name	Description
OUT0 - OUT10	The OUT0 - OUT10 output signal status is indicated. Blue: ON Grey: OFF The Step data No. converted from OUT0-OUT10 is indicated at the bottom of the Status window. <u>However, the alarm group is indicated with a numerical value when an alarm is being generated.</u> The alarm groups indicated by numerical values are described as follows: "2": Alarm group B "4": Alarm group C "8": Alarm group D "0": Alarm group E Display/Non-display of OUT9 and OUT10 are switched depending on the set maximum number of step data in the parameter (profile). Maximum number of step data is 512: OUT9 and OUT10 are <u>not displayed</u> . Maximum number of step data is 2048: OUT9 and OUT10 are <u>displayed</u> .
BUSY	The BUSY output signal status is indicated. Blue: ON Grey: OFF The BUSY status will be displayed or not displayed depending on the set maximum number of steps in the parameter (profile). Maximum number of step data is 512: BUSY is <u>displayed</u> . Maximum number of step data is 2048: BUSY is <u>not displayed</u> .
AREA	The AREA output signal status is indicated. Blue: ON Grey: OFF The AREA output will be displayed or not displayed depending on the set maximum number of steps in the parameter (profile). Maximum number of step data is 512: AREA is <u>displayed</u> . Maximum number of step data is 2048: AREA is <u>not displayed</u> .
SETON	The SETON output signal status is indicated. Blue: ON Grey: OFF
INP	The INP output signal status is indicated. Blue: ON Grey: OFF
SVRE	The SVRE output signal status is indicated. Blue: ON Grey: OFF

Output signal name	Description
*ALARM	The ALARM output signal (negative logic) status is indicated. Red: OFF (Alarm generated) Grey: ON (No alarm)
*ESTOP	The ESTOP output signal (negative logic) status is indicated. Red: OFF (Stopped by EMGx) Grey: OFF (Stop released by EMGx)

\*ALARM" and "\*ESTOP" are displayed in negative logic.

### (2-3-3) Input signal of all axes

The indications of the input signal of all axes are as follows:

Input signal name	Description
IN0 - IN10	The IN0 - IN10 input signal status is indicated. Blue: ON Grey: OFF Step data number is indicated according to the IN0-IN10 input signal status.
SETUP	The SETUP input signal status is indicated. Blue: ON Grey: OFF
HOLD	The HOLD input signal status is indicated. Blue: ON Grey: OFF
DRIVE	The DRIVE input signal status is indicated. Blue: ON Grey: OFF
RESET	The RESET input signal status is indicated. Blue: ON Grey: OFF
SVON	The SVON input signal status is indicated. Blue: ON Grey: OFF

### **(3) Teaching window**

The teaching window can only be displayed in **Remote mode**. (It is not available in other modes).

It is possible to operate “JOG”, “Inching”, and “Return to Origin” for the connected axis.

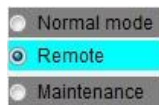
The details of each function are explained in (3-1) to (3-3) below.

#### **(3-1) JOG**

The JOG operation will move the actuator in the specified direction at the specified speed by selecting the operation command “+/-” button. The operation will stop when the operation command “+/-” button is released.

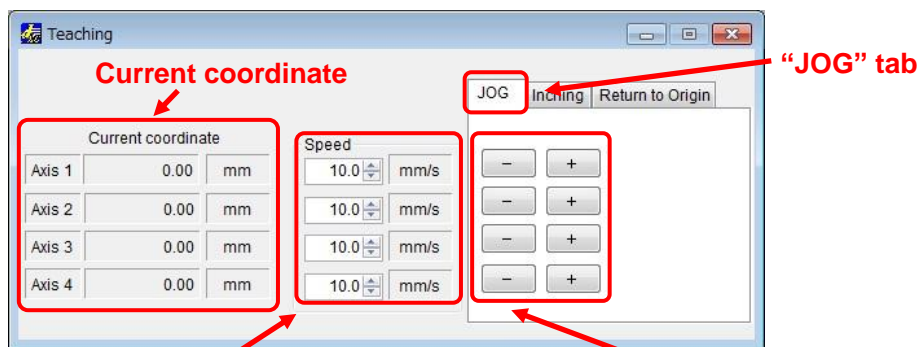
#### **[How to JOG]**

a) Change the mode to **Remote mode** in the main window.



b) From the main window select View (V), select the Teaching window and select the “JOG” tab.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Teaching window.



c) Specify the Speed.

d) The applicable actuator will operate at the specified speed while the “+/-” buttons for each axis are being selected.

The operation will stop when the “+/-” buttons are released.

+ : Movement in the positive direction

- : Movement in the negative direction

e) After completing the movement, it is possible to check the position of each axis in the “Current coordinate” area.

### **! Caution**

**The movement direction (positive/negative) is specified depending on the actuator type.**

**Make sure to refer to the actuator Operation Manual before performing the JOG operation to confirm the movement direction.**

Otherwise, it may cause injury or damage to the user's system.

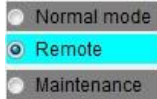
### (3-2) Inching

Inching is an operation to move the actuator in a specified direction at the speed and distance specified in “Speed” and “Moving”.

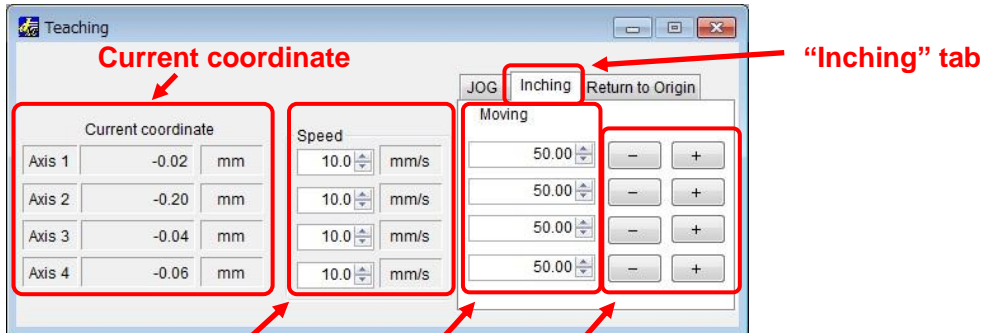
It is possible to stop the actuator during operation by selecting the “Stop” button on the main window, or turning off the “EMGx” input.

#### [How to operate Inching]

a) Change the mode to **Remote mode** in the main window.



b) From the main window, select View(V), then select the Teaching window and select the “Inching” tab. Refer to section "4.1 (1-1-2) View(V)" for how to display the Teaching window.



c) Specify the “Speed”.

d) Specify the “Moving (distance)”.

e) By selecting the “+/-” buttons for each axis, the applicable actuator will operate at the specified speed and moves for the distance specified in the Moving column.

- + : Movement in the positive direction
- : Movement in the negative direction

It is possible to stop the actuator by selecting the “STOP” button on the main window.

**The operation is not stopped when the “Stop” button is selected in the following cases.**

**-The actuator is stopping during the pushing operation.**

**(In this case, the pushing status is not released when the “Stop” button is selected.)**

**-The actuator is stopping during the positioning operation due to an obstacle.**

**-The actuator is operating at slow speed as the positioning is interfered.**

**-The actuator is performing a Return to origin operation.**

If it is necessary to stop the actuator during inching operation, turn off the EMGx input to each axis.

f) After completing the movement, it is possible to check the position of each axis in the Current coordinate area.

### ⚠ Caution

**The movement direction (positive/negative) is specified depending on the actuator type.**

**Make sure to refer to the actuator Operation Manual before performing Inching to confirm the movement direction.**

Otherwise, it may cause injury or damage to the user's system.

### (3-3) Return to Origin

The Return to origin command will return each axis or all axes simultaneously to the origin position.

**The actuator cannot be stopped during performing a Return to origin operation, even when the “Stop” button on the main window is selected.**

If it is necessary to stop the actuator during performing a Return to origin operation, turn off the EMGx input to each axis.

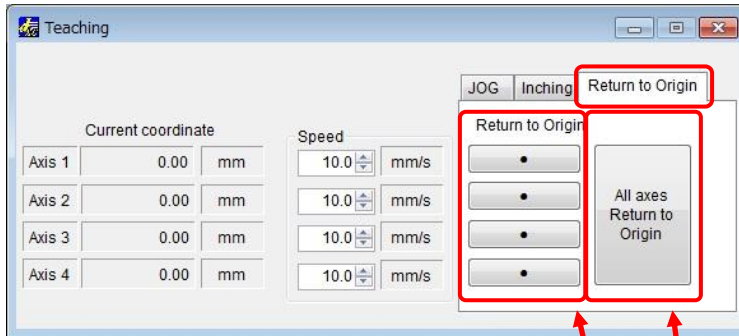
#### [How to Return to Origin]

a) Change the mode to **Remote mode** in the main window.

- Normal mode
- Remote
- Maintenance

b) From the main window select View (V), then select the Teaching window and select “Return to Origin” tab.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Teaching window.



c) How to command a Return to Origin operation.

c-1) To perform a Return to Origin for each axis

Select the “•” button for the axis to be operated.

c-2) To perform a Return to Origin for all axes

Select the “All axes Return to Origin” button.

d) The Return to Origin operation is completed when SETON is turned on. (It is possible to monitor SETON signal output in the Status window).

### ⚠ Caution

**The actuator cannot be stopped during a Return to origin operation, even when the “Stop” button on the main window is selected.**

**Take measures so that the controller stop (ENGx) terminal can be turned off immediately during a Return to Origin. (Refer to the controller Operation Manual [Document No. SFOD-OMT0010] for details of the EMGx input terminal and the wiring).**

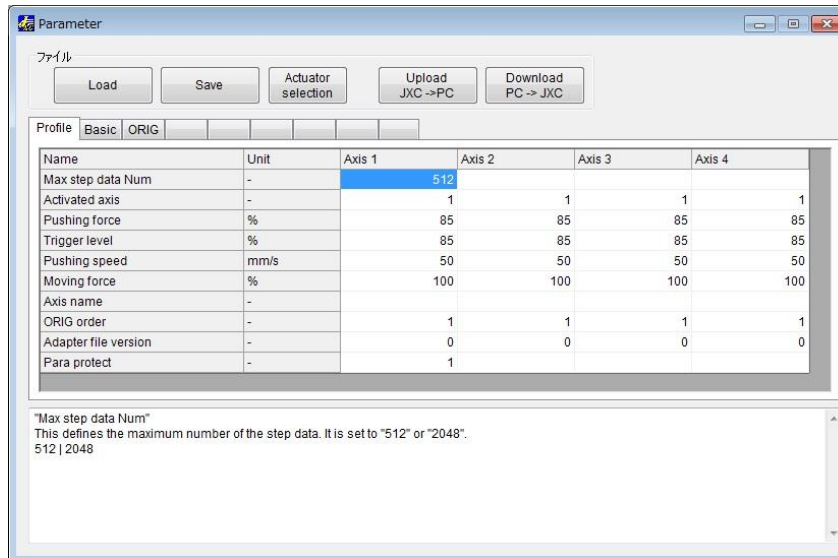
Otherwise, this may cause injury and/or an accident.

#### (4) Parameter window

In the Parameter window, it is possible to set the parameters of the connected actuators and the controller. Also the parameters are possible to be written to the controller and be read from the controller.

Table (4-1) lists the button functions available in the Parameter window.

Refer to section "4.2 Parameter setting" for the exclusive parameter setting for each actuator and how to change the parameters.



#### (4-1) Parameter window functions

Name	Description
Load	The parameters are read from a specified file and displayed in the setting software.
Save	The parameters displayed on the setting software are saved to a specified file.
Actuator selection	Another window is appeared. The connected actuators are selected, then the exclusive parameters of the actuators are displayed in the setting software. Refer to section "4.2 Parameter setting" for how to set the parameter.
Upload JXC→PC	All parameters are read from the controller and displayed in the setting software. <b><u>Available only in the on-line state.</u></b> (Not available in the off-line state).
Download PC→JXC	The parameters displayed in the setting software are written to the controller. <b><u>Available only in the on-line state.</u></b> (Not available in the off-line state).

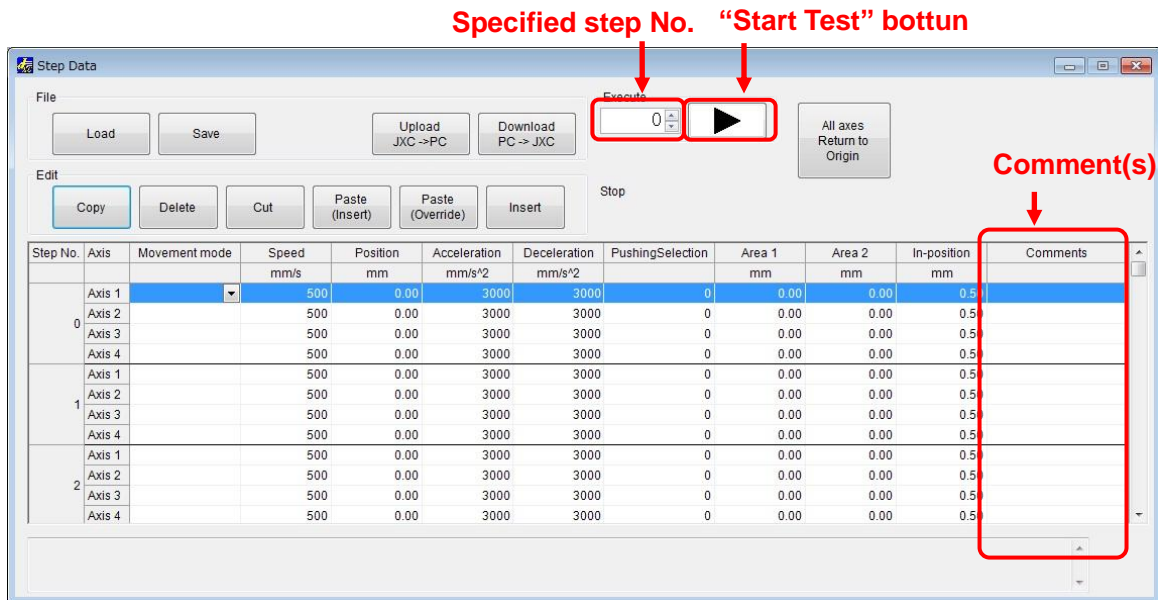
## (5) Step Data window

In the Step Data window, it is possible to set the step data. Also the Step Data is possible to be written to the controller and be read from the controller.

Table (5-1) lists the button functions available in the Step Data window.

Refer to section "4.3 Step Data setting" for how to edit the step data.

Refer to section "4.6 Test Drive" for how to perform a test operation using the specified step data number in the Step Data window.



(5-1) Step Data window functions

Name	Function
Load	The step data are read from a specified file and displayed in the setting software.
Save	All step data displayed in the setting software are saved to a specified file.
Upload JXC→PC	The step data are read from the controller and displayed in the setting software. <b>Available only in the on-line state.</b> (Not available in the off-line state.)
Download PC→JXC	All step data displayed in the setting software are written to the controller. <b>Available only in the on-line state.</b> (Not available in the off-line state.)
Copy	The selected step data are copied to the clip board.
Delete	The selected step data are deleted.
Cut	The selected step data are cut.
Paste (Insert)	The step data copied are inserted in the selected line of the step data window.
Paste (Overwrite)	The step data copied are overwritten from the selected line of the step data window.
Insert	A blank line is inserted in the selected step data.
Specified step No.	The step data number is specified to be used for the test operation. <b>Available only in Remote mode.</b> (Not available in Normal mode or Maintenance mode.)
Start Test “▶”	The test operation of the step data number specified in "Specified step No." is started. <b>Available only in Remote mode.</b> (Not available in Normal mode or Maintenance mode.)
All axes Return to Origin	The Return to origin operation for all available axes is performed. <b>Available only in Remote mode.</b> (Not available in Normal mode or Maintenance mode.)



## (6) Alarm window

The alarm currently generated is displayed.

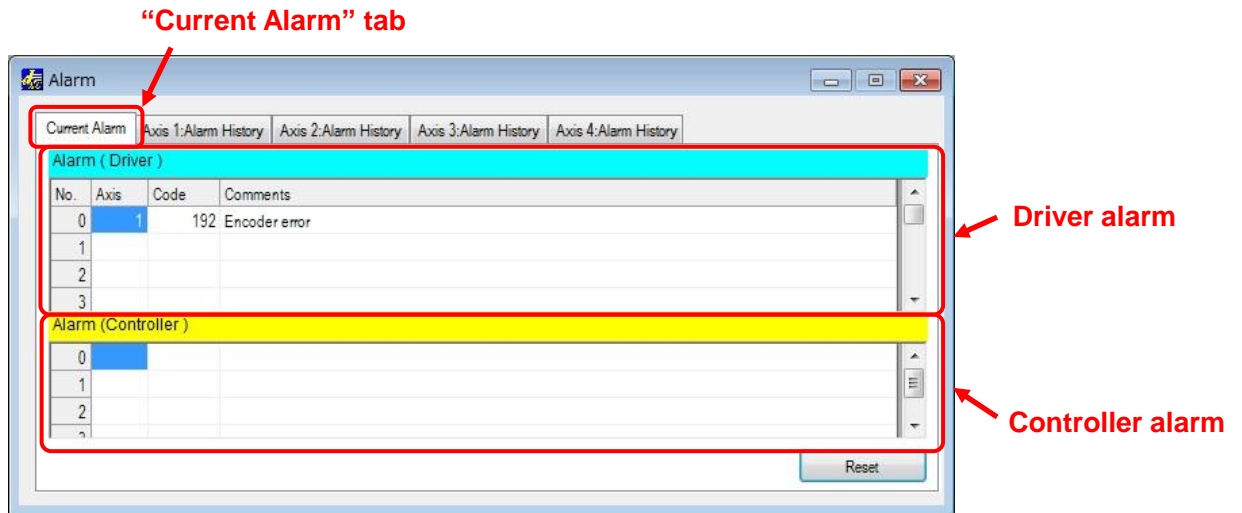
It is possible to reset the current alarm.

It is possible to check the Alarm history for each axis.

### (6-1) Current Alarm

It is possible to display the Current alarm by selecting the “Current Alarm” tab in the Alarm window.

The current alarm list is displayed.



The driver alarm and the controller alarm are displayed in separated frames.

If there is no indication in the Current Alarm, no alarm is currently generated.

The driver alarm is recorded in the Alarm History.

**However, the controller alarm is NOT recorded in the Alarm History.**

The descriptions of the items in the Current Alarm in the Alarm window are listed below.

Item	Description
No.	The number of the alarm which is currently generated. When alarms are generated, they are displayed by axis. The smallest number is the most recently generated alarm.
Axis	The axis number in which the alarms are generated.
Code	Current alarm code. Refer to section "4.8 (3) Alarms and countermeasures" for details.
Comments	Contents of the current alarm. Refer to section "4.8 (3) Alarms and countermeasures" for details.
Reset Button	When the alarms are generated, it is possible to reset by selecting the <u>“Reset” button</u> . However, some alarms can only be reset when the power is turned off and on again. Refer to section "4.8 (3) Alarms and countermeasures" for details. <b><u>Available only in Remote mode.</u></b>

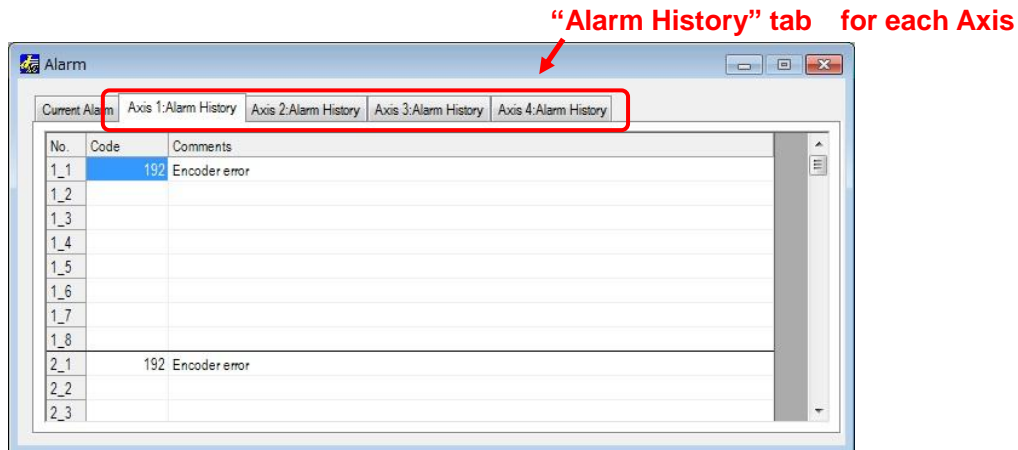
## (6-2) Alarm History

It is possible to display the Alarm history for each axis by selecting the appropriate “Axis x: Alarm History” tab in the Alarm window.

Select the tab for the axis to be displayed.

**Only the driver alarms which have been generated** for each axis are displayed.

**The controller alarms are NOT recorded or displayed in Alarm History.**



The descriptions of the items in the Alarm History in Alarm window are shown below.

Item	Description
No.	The alarm number indicated in chronological order. No. 1_1 is the most recently generated alarm.
Code	Code of the alarms which have been generated. Refer to section "4.8 (3) Alarms and countermeasures" for details.
Comments	Contents of the alarms which have been generated. Refer to section "4.8 (3) Alarms and countermeasures" for details.

### **Caution**

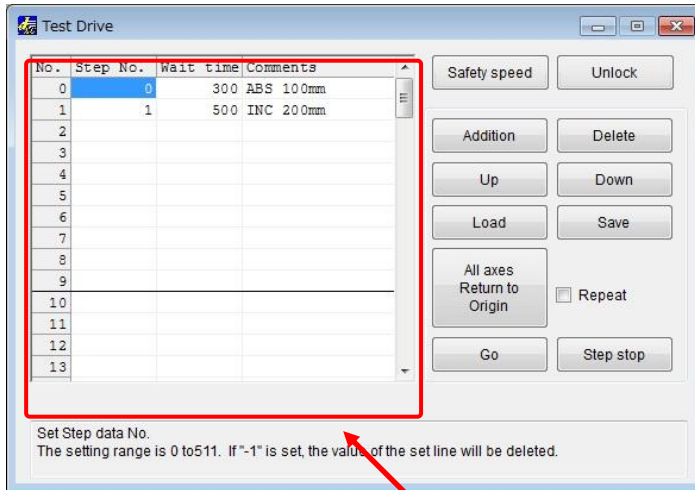
The controller alarms are NOT recorded or displayed in the Alarm History.

Details of Controller alarms:

- DRIVE is ON when SVRE is OFF (Code: 098)
- DRIVE is ON when SETON is OFF (Code: 099)
- Failed to achieve position in set time limit (Code: 149)
- Parameter is not registered (Code: 901)
- Step data is not registered (Code: 902)
- System Error (Code: 910)
- SDRAM Error (Code: 911)
- FROM Error (Code: 912)
- Modbus Error (Code: 913)
- Module Error (Code: 914)

## (7) Test Drive window

In Test Drive window, it is possible to test the set step data in a specified order.



The descriptions of the items in the "Test drive list" are listed below.

Item	Description
No.	The item number of the test list.
Step No.	The Step data number to be tested. It is possible to delete the contents of the line by entering "-1".
Wait time	The wait time after the actuator has been operated with the step data. Units are msec. The setting range is 0 to 32767 msec.
Comments	It is possible to enter the comments about the test. (Half-width comma ", " cannot be used.)

The functions of the buttons in the Test Drive window are listed below.

Name	Description
Safety speed	The speed in the test drive operation is restricted. <b>Available only in Remote mode.</b>
Unlock	The locks of all axes are released. This is only available in <b>Remote mode</b> and can be used only when SVRE is OFF (The Servo is OFF).
Delete	The selected line in the test drive list is deleted.
Addition	A new line in the test drive list is added.
Up	The selected line in the test drive list is moved up by one line. (The line above is replaced).
Down	The selected line in the test drive list is moved down by one line. (The line below is replaced).
Load	The test drive list is read from a file.
Save	The test drive list is saved to a specified file.
All axes return to Origin	Return to origin is performed for all of the activated axes. <b>Available only in Remote mode.</b>
Repeat	The test operation of the test drive list is performed repeatedly when the check box of the "Repeat" is selected. <b>Available only in Remote mode.</b>

Go	<p>The set step data are performed from the top of the test drive list in turn. However, the lines on the list where step number is not input into are ignored.</p> <p>When all the BUSY output of the activated axes turns OFF, the step data which is testing is completed.</p> <p>Then, the next step data in the list is performed after the operation is stopped for the set Wait time.</p> <p><b><u>Available only in Remote mode.</u></b></p>
Step Stop	<p>Stops the test drive after the step data operating is completed.</p> <p><b><u>Available only in Remote mode.</u></b></p>

## 4.2. Parameter setting

The parameters should be set when using the controller for the first time, or after changing the connected actuator, or after changing the setting of the controller or connected actuator.

The setting methods are shown below.

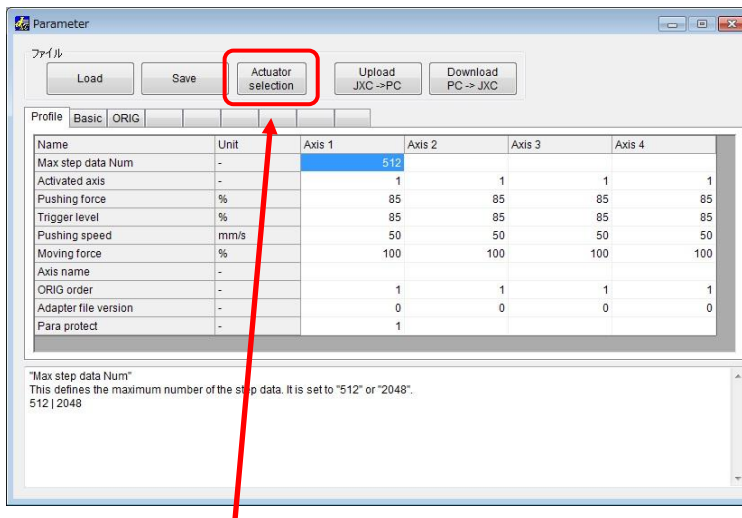
### (1) Exclusive parameter setting for the connected actuator

This setting is necessary when the controller is used for the first time and when the connected actuator is changed.

#### a) Display of Parameter window and Actuator selection window

From the View (V) menu in the main window, select the Parameter window.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Parameter window.



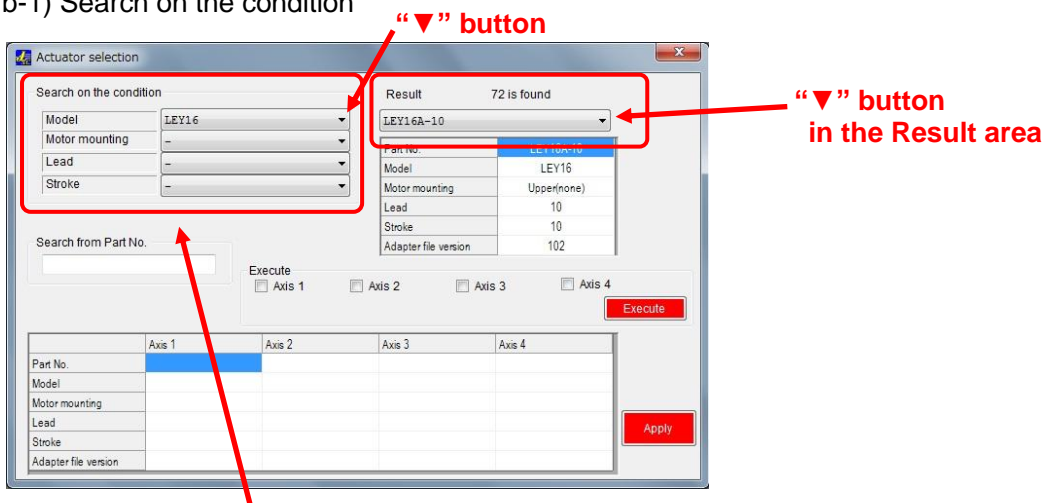
Select the "Actuator selection" button.

The Actuator selection window will be displayed.

#### b) Actuator selection

Search for the connected actuator using the Search on the condition or Search from Part No.

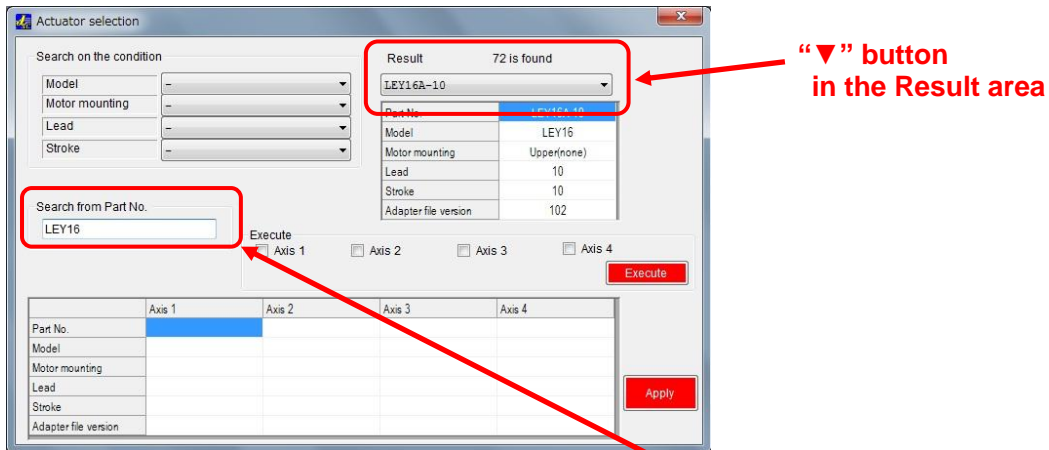
##### b-1) Search on the condition



Select the "conditions" of the actuator to be connected for the Model, Motor mounting, Lead, and Stroke as much as possible.

A list of Part numbers of the actuators matching the conditions will be displayed by selecting the "▼" button in the Result area. Select the actuator to be connected from the Result.

b-2) Search from Part no.



Enter a part of or the entire actuator part number in the Search from Part No. area.

A list of Part numbers of the actuators matching the conditions will be displayed by selecting the “▼” button in the Result area.

Select the actuator to be connected from the Result.

If the actuator part number is already known, it is possible to enter the part number and stroke. (When the LER series is used, enter the part number including the rotation angle).

e.g. 1) For LEY16RA-100BML, enter "LEY16RA-100".

e.g. 2) For LERH30K-3L, enter "LERH30K-3".

When there is no result even when the stroke has been entered, the possible causes are as follows:

- No applicable stroke

Enter the part number without the stroke and select the model with the stroke which is closest and longer than the actuator used.

e.g.) For LEY16RA-75, enter "LEY16RA" and select LEY16RA-100.

- For LEFSH (High precision type)

Enter "LEFS" to search without the High precision specification.

e.g.) For LEFSH25RH-300, enter "LEFS25RH-300" and select LEFS25RH-300.

- For clean type (11-) or secondary battery (25A-) type actuator

Search without entering 11- or 25A-, and select the actuator for which the part number after 11- or 25A- matches.

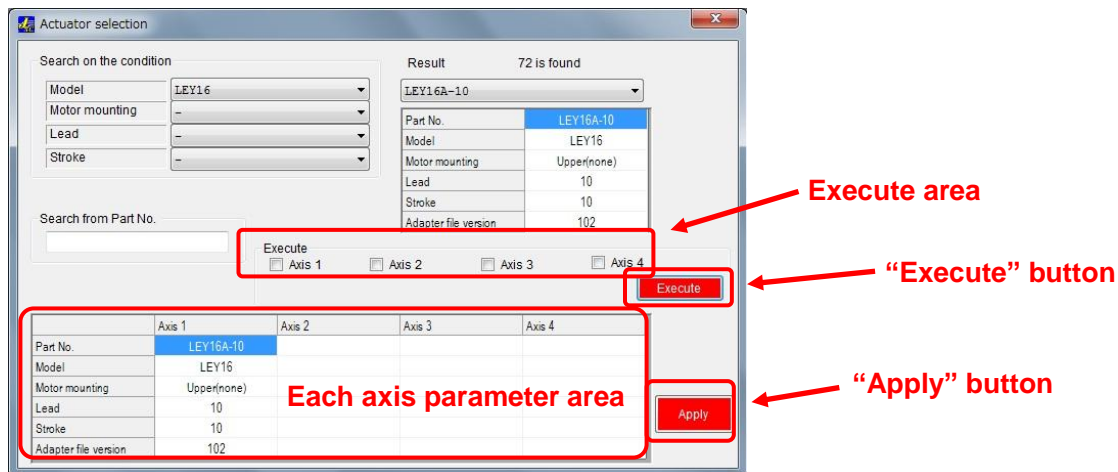
e.g.) For 11-LEFSH16A-100BR, enter "LEFS16A-100" and select LEFS16A-100.

**⚠ Caution**

**When the parameter is selected for stroke which is longer than that of the actuator to be used, the Position entered in the step data must not exceed the actual actuator stroke range.**

When there is no part number result, please contact SMC.

### c) Parameter display



Select the check box for the required Axis in the “Execute area” for which parameters are to be entered (It is possible to select one or more Axes).

Select the “Execute” button.

The parameters are displayed in the appropriate axes frames in the each axis parameter area.

Repeat steps b) and c) above to enter parameters for all Axes.

**Note that the values entered here are only for display, and are not written to the controller.**

Select the “Apply” button when all of the parameters have been entered.

The parameters are copied to the table in the Parameter window.

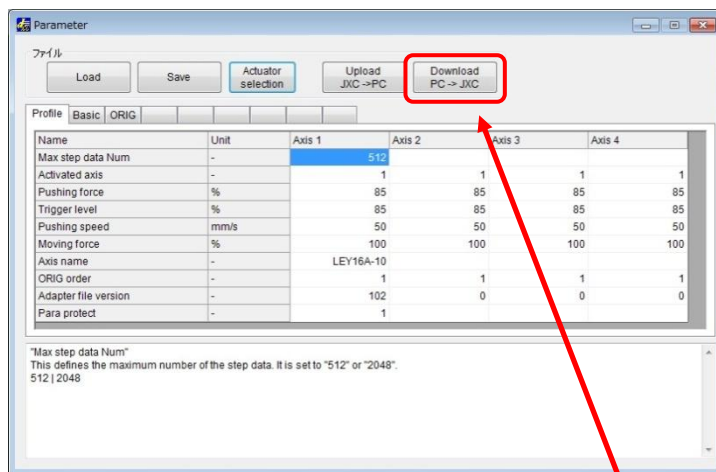
**Note that the parameters copied here are only for display, and are not written to the controller.**

## ⚠ Caution

When the “Apply” button is selected, the parameters are NOT written to the controller.

Make sure to download the parameters by following the procedure "d) Parameter writing to the controller" shown below to write the parameters to the controller.

### d) Writing Parameters to the controller



To write the parameters to the controller, select the “Download” button in the Parameter window.

The Parameters displayed in the Parameter window will be written to the controller.

### e) Completion

Writing is completed when the progress bar disappears.

**Turn off the power supply and turn on again to make the written parameter effective.**

## (2) Change of controller and actuator settings

### a) Parameter window

From the View (V) menu in the main window, select the Parameter window.

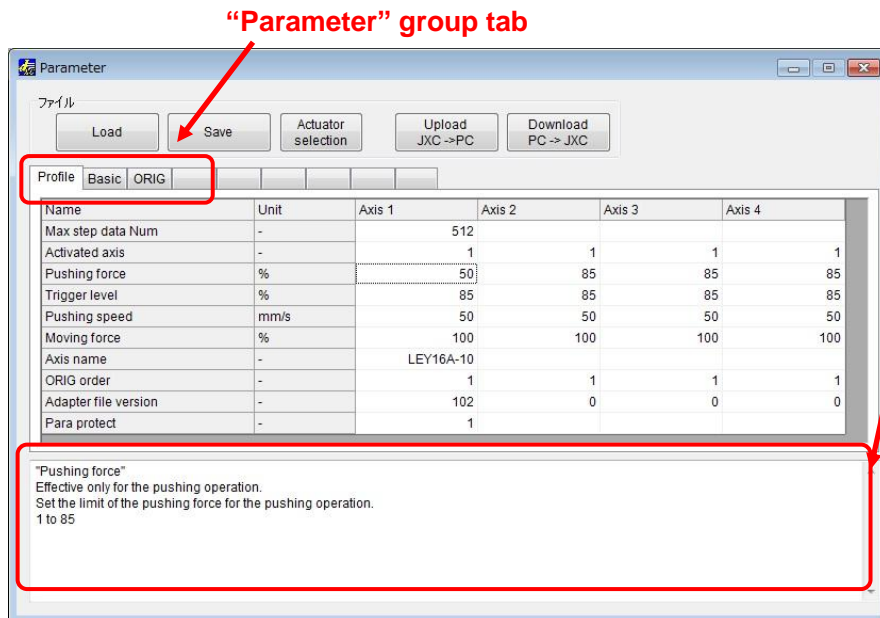
Refer to section "4.1 (1-1-2) View (V)" for how to display the Parameter window.

### b) Parameter change

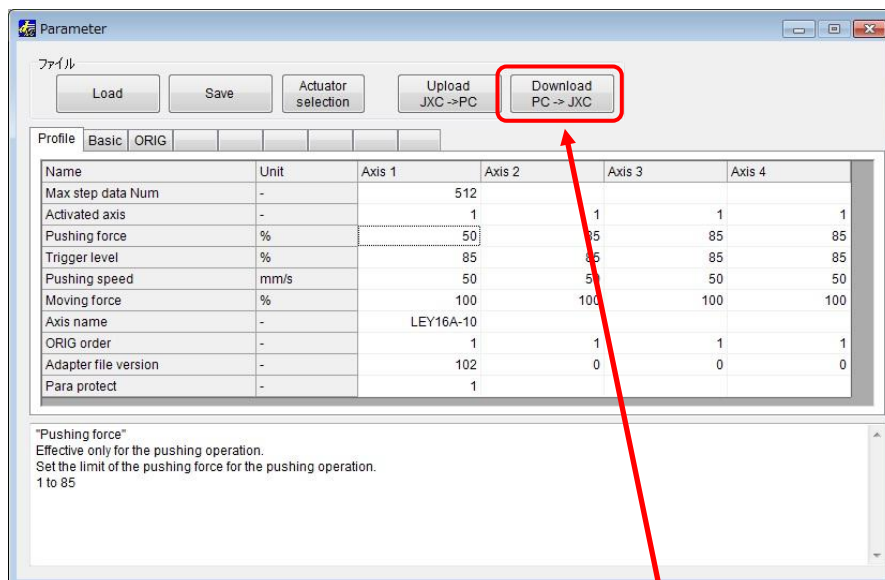
Select the tab for the Parameter group to be changed to display the applicable parameter group.

Change the parameter to be used.

The input range and the details of the parameter setting are shown in the "comment area" for reference.



### d) Writing Parameters to the controller



To write the parameters to the controller, select the "Download" button in the Parameter window.

The Parameters displayed in the Parameter window will be written to the controller.

### e) Completion

Writing is completed when the progress bar disappears.

**Turn off the power supply and turn on again to make the written parameter effective.**



### (3) Change of the parameter protect setting

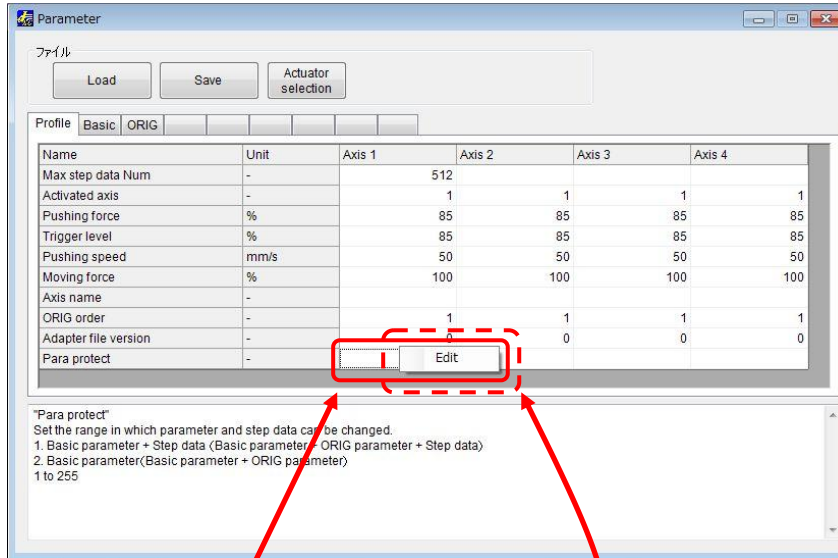
After the parameters and step data are set, it protects from changing the parameters and step data by "Para protect" from third person.

- a) Display the Parameter window and select "Profile" parameter group

From the View (V) menu in the main window, select the Parameter window.

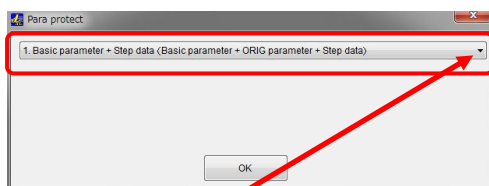
Refer to section "4.1 (1-1-2) View (V)" for how to display the Parameter window.

Then, select the "Profile" tab to display the profile parameter group.



- b) Right-click the cell of the "Para protect" setting.

When "Edit" is displayed, select it to display the parameter protect window shown below.



- c) Select "▼" button in the parameter protect window to display the list of data that it is possible to change.

Select the protecting level from this list, and select "OK".

- d) Write Parameters to the controller

To write the parameters to the controller, select the "Download" button in the Parameter window.

The Parameters displayed in the Parameter window will be written to the controller.

- e) Completion

Writing is completed when the progress bar disappeared.

**Turn off the power supply and turn on again to make the written parameter effective.**

## 4.3 Step data setting

The controller performs operations by selecting the positioning data, called step data, which has been pre-defined in the controller using external equipment such as a PLC.

**(Step data: A set of operation information such as operation method, position, and speed.)**

### (1) Step data setting

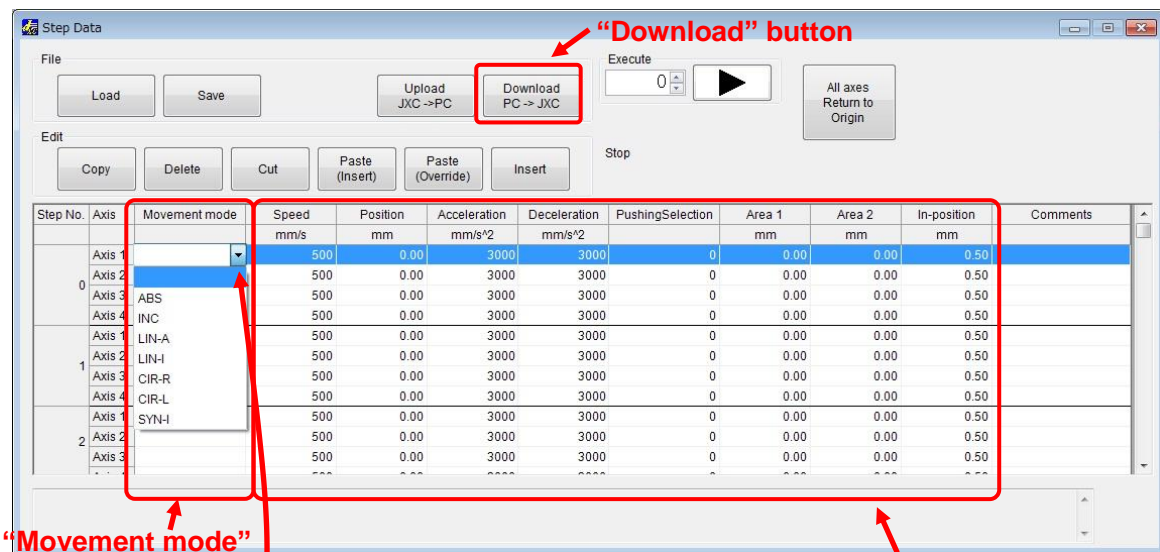
It is possible to set the step data using the following two methods (See 1-1 and 1-2).

#### (1-1) Setting using the Step Data window

##### (a) Step Data window

From the View (V) menu in the main window, select the Step Data window.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Step Data window.



##### b) Movement mode selection

Select the "▼" button in the movement mode column for the axis of the step number to be set.

Select the required movement mode from the list.

**Only one movement mode can be selected for one step data.**

If multiple movement modes are selected, the movement mode cell for the applicable step data will turn red, indicating an input error. Please select one movement mode.

##### c) Input numerical data for each item

Enter the required numerical data according to the selected movement mode.

If numerical data outside of the input range is entered, for example, the Rotation centre is set to (0,0) for circular interpolation movement, the applicable cell will turn red to indicate an input error.

Refer to the controller Operation Manual (No. SFOD-OMT0010) for setting the appropriate step data values.

##### d) Writing Step data to the controller

Select the "Download" button in the Step data window.

Step data writing to the controller will begin.

##### e) Completion

Writing is completed when the progress bar disappeared.

**Turn off the power supply and turn on again to make the written parameter effective.**

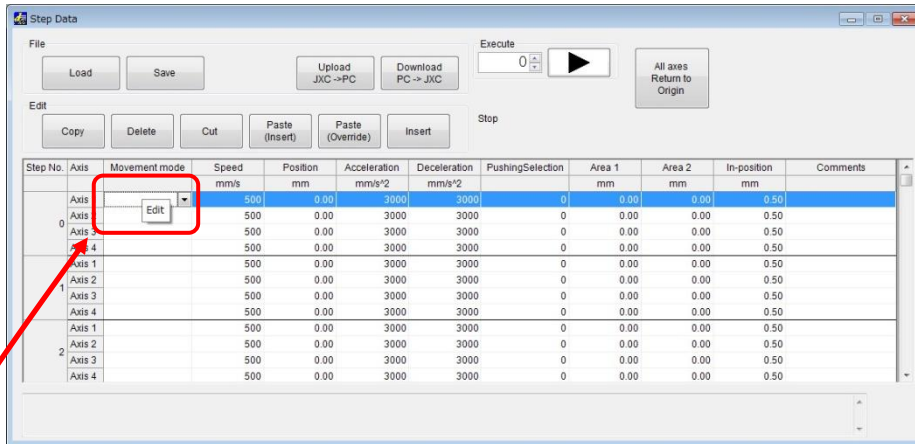
**(1-2) Setting using the Edit window**

a) Step Data window display

From the View (V) menu in the main window, select the Step Data window.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Step Data window.

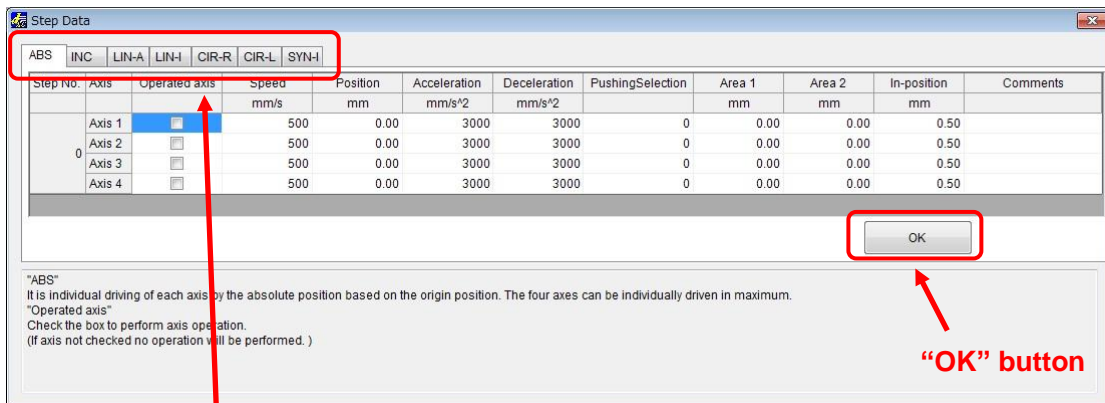
b) Edit window display



Right-click the cell of the movement mode for the axis to be set, for the applicable step number, in the Step data window.

When "Edit" is displayed, select it.

The step data edit window shown below will be displayed.



**"OK" button**

c) Movement mode tab selection

Select the Movement mode tab to be set from the range available.

d) Enter the numerical data for each item according to the movement mode used.

When the required values have been entered, and the set values are as required, select the "OK" button.

Refer to the controller Operation Manual (Document No. SFOD-OMT0010) for the items and details settings required.

To input the current position using the Teaching function, refer to section "4.5 Teaching".

When the value out of the range is entered, for example, the Rotation centre is set to (0,0) for circular interpolation movement, the applicable cell will turn red to indicate an input error.

Refer to the controller Operation Manual (No. SFOD-OMT0010) to set the appropriate values.

e) Writing Step data to the controller

Select the Download button in the Step Data window after setting the necessary step data.

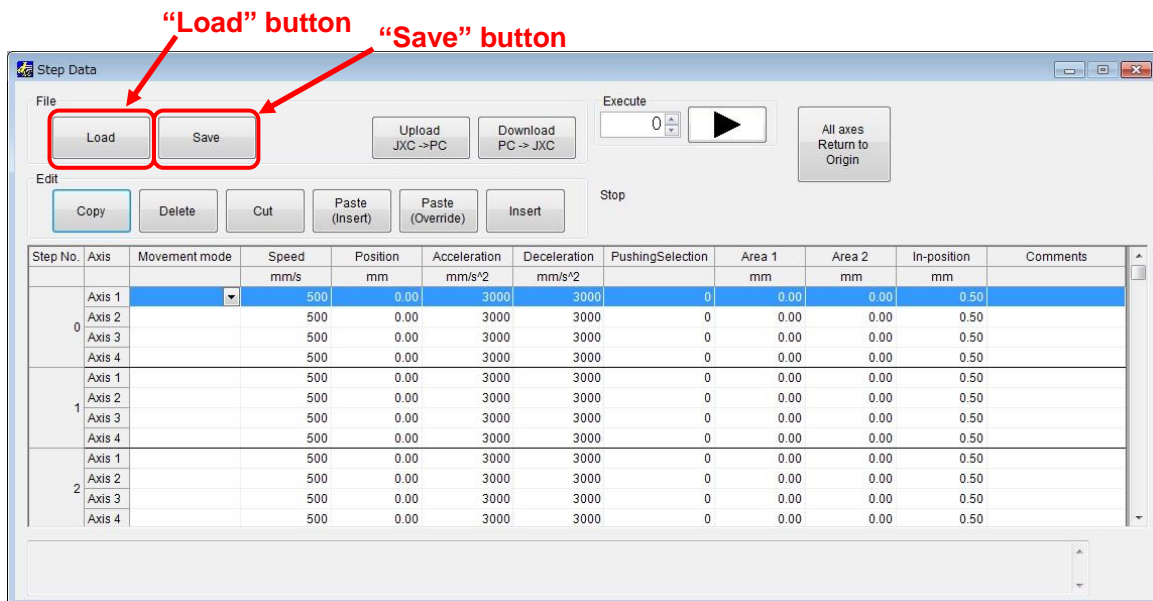
Step data writing to the controller will begin.

## f) Completion

Writing is completed when the progress bar disappeared.

**Turn off the power supply and turn on again to make the written parameter effective.**

## (2) Saving or Loading the Step data



### (2-1) Saving the Step data

It is possible to save the data displayed in the Step Data window to a specified file.

#### a) Save the Step data to a file

Select the “Save” button in the Step Data window

#### b) Specify the file

Select the file in which the step data is to be saved and select the “Save” button.

#### c) Completion

The data displayed in the Step Data window will be saved to the specified file.

### (2-2) Loading the Step data

It is possible to read the saved step data and to display in the setting software.

#### a) Step data file loading

Select the “Load” button in the Step Data window.

#### b) Specify the file

Select the saved step data file (Filename extension: .datj) and select the “Open” button.

#### c) Completion

The details of the selected step data will be displayed in the Step Data window.

## 4.4 Monitor function

It is possible to monitor the operating conditions of the connected actuator and the input/output signal of the controller in the Status window.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Status window.

Refer to section "4.2 (2) Status window" for details of the items displayed in the Status window.

## 4.5 Teaching

It is possible to set the current position to a target position after the actuator is operated, when setting the step data, or when selecting the ABS or LIN-A for the Movement mode.

There are three Teaching methods as shown below.

It is possible to select the method as required.

### 1) JOG Teaching

### 2) Inch Teaching

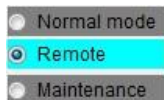
### 3) Direct Teaching

Details are shown below.

### [How to operate Teaching]

#### a) Change to Remote mode

Change the mode to Remote mode in the main window.



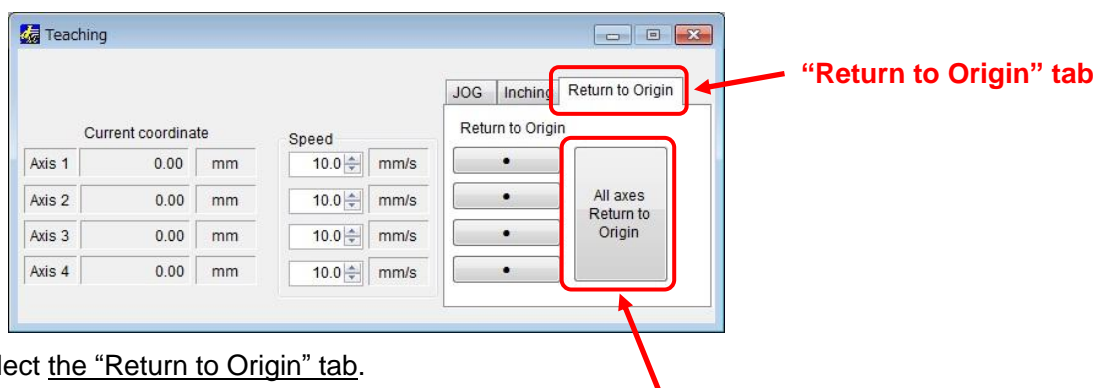
Confirm that the servo is ON. (Confirm the SVRE is ON in the status window.)

#### b) Teaching window

From the View (V) menu in the main window, select the Teaching window.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Teaching window.

#### c) Return to origin



Select the "Return to Origin" tab.

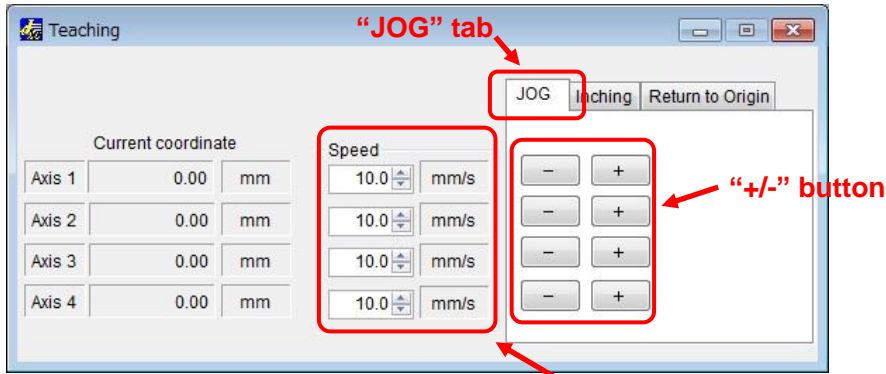
After thoroughly confirming the safety, select the "All axes Return to Origin" button to command the Return to origin.

#### d) Teaching

It is possible to perform Teaching using three methods, JOG, Inching, or Direct (Manual movement).

It is possible to select the method as required.

### d-1) JOG Teaching

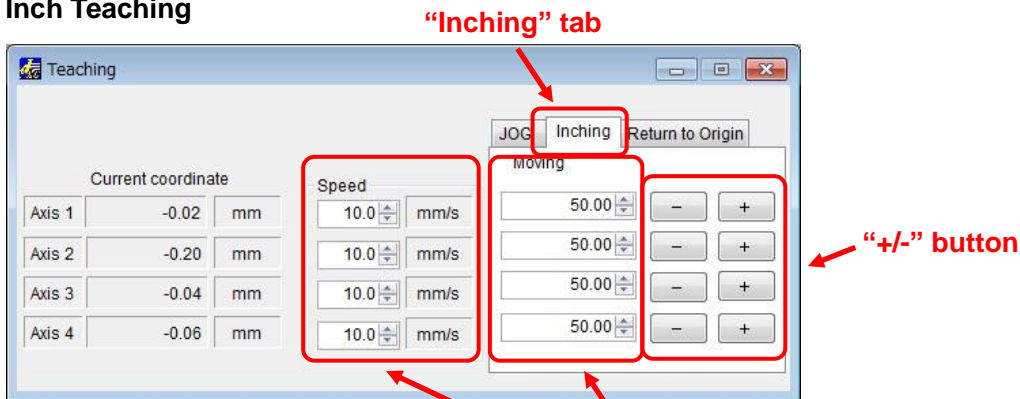


Select the JOG tab.

Set the movement speed of the axis for teaching in the "Speed" column.

Press the "+/—" buttons of the axis for teaching to move the position in the "+" (positive)" or "-" (negative)" direction as long as the button is pressed.

### d-2) Inch Teaching



Select the "Inching" tab.

Set the movement speed of the axis for teaching in the "Speed" column.

Set the movement distance of the axis for teaching in the "Moving" column.

Press the "+/—" buttons of the axis for teaching to move the position in the "+" (positive)" or "-" (negative)" direction according to the setting.

### d-3) Direct Teaching

Turn OFF the SVON in the main window.



The servo will be turned OFF (Motor power supply is turned off), and then, the motor shaft is released. As the actuator can be operated by hand, move it to the required position.

When the Direct Teaching is completed, return the SVON in the main window to ON.

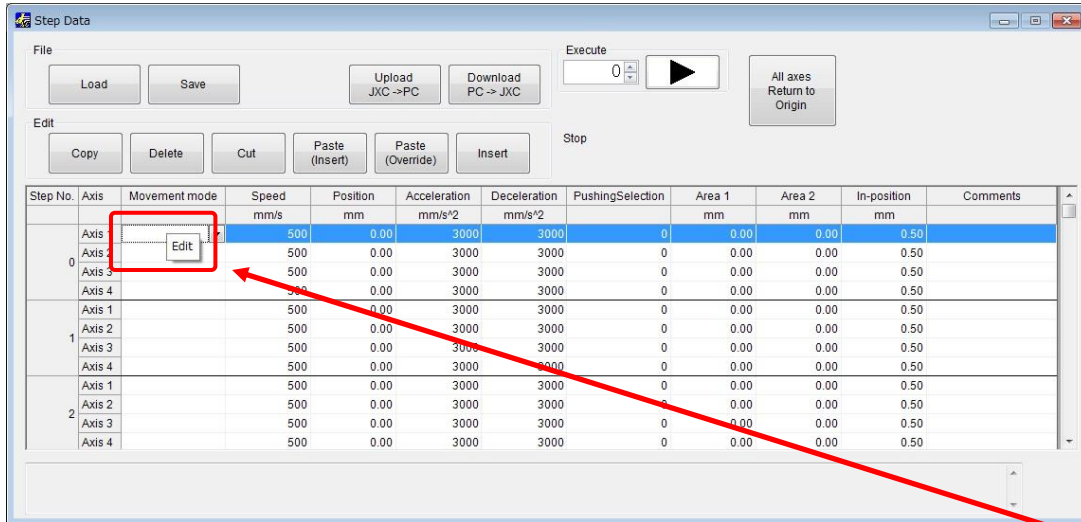
## ⚠ Caution

- 1) Some actuators cannot be operated by hand even when the servo is turned OFF. It depends on the actuator type and the lead.
- 2) Direct Teaching cannot be performed on an actuator with lock as the lock is held even when the servo is turned OFF. To perform the Direct Teaching for the actuator with lock, release the lock with the LK RLS terminal of the motor control power supply connector (CI) after thoroughly confirming safety.

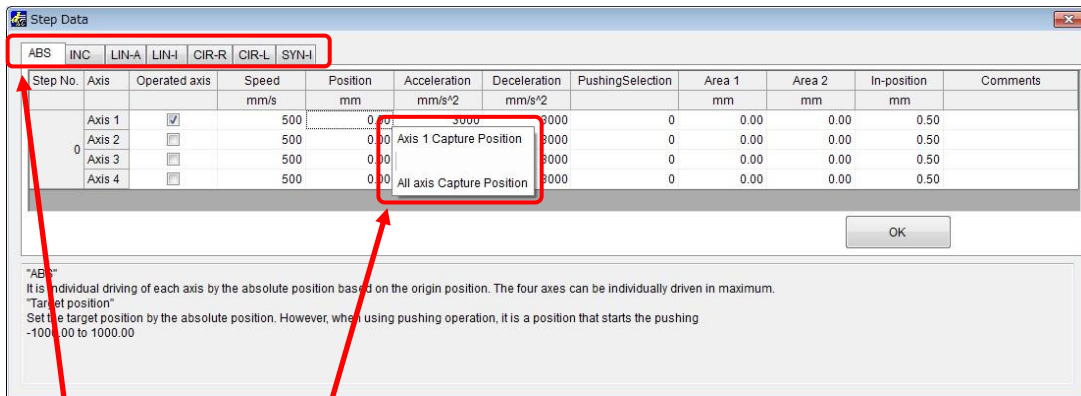
### e) Position reading

From the View (V) menu in the main window, select the Step Data window.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Step Data window.



Right-click the item in the Movement mode column of the Step No. to be changed, and select Edit. The step data edit window shown below will be displayed.



Select the ABS or LIN-A tab for the movement mode and right-click the item in the Axis Position column to be read.

Select "Axis x Capture Position" or "All axes Capture Position".

The current position of the selected axis will be displayed in the Position column in the edit window.

### Caution

**Do not disconnect the USB cable during Teaching.**

If disconnected, the actuator will stop suddenly and the servo will be turned OFF.

This may cause damage to the actuator or the user's system.

## 4.6 Test Drive

There are three test drive methods available as shown below.

### 1) Test Drive

It is possible to perform the test operation according to the set data by entering the step data number, order, and wait time for the test in the drive test list.

### 2) JOG, Inching, and Return to Origin functions in Teaching

It is possible to test JOG, Inching, and Return to Origin functions in each axis.

### 3) Single step operation in the Step Data window

It is possible to perform the test operation for one single specified step data.

Details for each method are shown below.

#### (1) Test Drive

##### a) Test Drive window display

From the View (V) menu in the main window, select the Test Drive window.

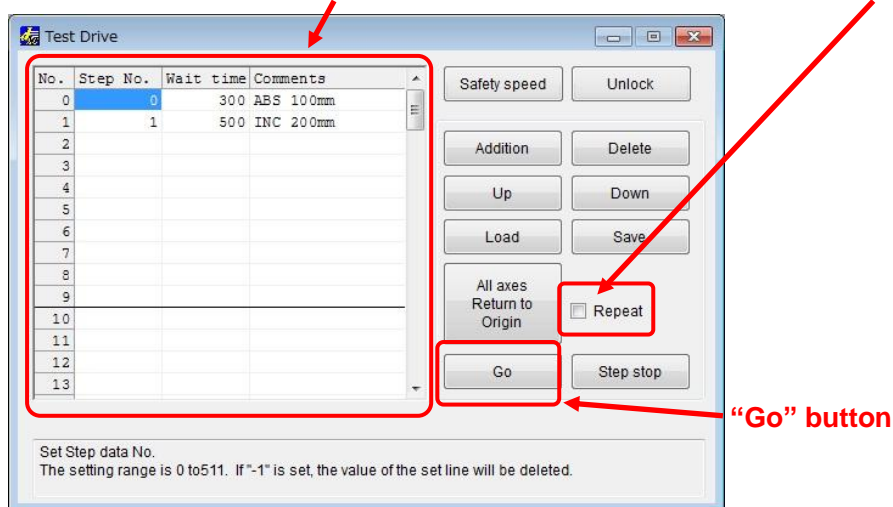
Refer to section "4.1 (1-1-2) View (V)" for how to display the Test Drive window.

##### b) The Test drive list setting

Set the step data number in the Test drive list in the required order of operation. Set the Wait time as required. Refer to section "4.1 (7) Test Drive window" for details.

[ The Wait time is the time delay until the next specified step data is conducted after the step data is completed. The units are [msec], and the setting range is 0 to 32767 [msec]. ]

When repeating the test in the "Test drive list", select the check box of the "Repeat".



##### b-1) Save the Test drive list

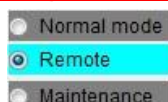
It is possible to save the Test drive list entered to a specified file name by selecting the "Save" button.

##### b-2) Load the Test drive list

It is possible to display a previous the Test drive list saved in the past by selecting the "Load" button.

##### c) Change to Remote mode

**Change the mode to Remote mode** in the main window.



Confirm that the servo is ON. (Confirm that the SVRE is ON in the Status window.)



d) Start the Test drive

When the "Go" button is selected, the Test drive using the step data in line No. 0 of the drive test list is conducted, then the contents of the next step data are conducted.

e) Stop

When the "Step stop" button is selected, the Test drive is stopped after completing the operation of the current step data.

It is possible to use the "Stop" button in the main window only when the actuator is operating, in which case the operation of the actuator is decelerated and stopped. Then, the test drive will be canceled.

The "Stop" button is invalid when the actuator is stopped during a pushing operation; when the actuator is stopped during positioning due to an obstacle; when the actuator operates at slow speed as the positioning is interfered; or when the actuator is performing the Return to origin operation.

When the EMGx input terminal is turned OFF, the servo is turned OFF after the operation of the actuator is decelerated and stopped, then the test drive will be canceled.

**Caution**

Please take appropriate measures so that the controller stop (ENGx) terminal can be turned off immediately during the test. (Refer to the controller Operation Manual [Document No. SFOD-OMT010] for the EMGx input terminal and the wiring).

The operation is not stopped when the "Stop" button is selected in the following cases.

- The actuator is stopping during the pushing operation. (In this case, the pushing status is not released when the "Stop" button is selected.)
- The actuator is stopping during the positioning operation due to an obstacle.
- The actuator is operating at slow speed as the positioning is interfered.
- The actuator is performing a Return to origin operation.

It may cause injury; or breakage of the actuator or user's system.

**(2) JOG, Inching, and Return to origin in the Teaching window**

a) Teaching window display

From the View (V) menu in the main window, select the Teaching window.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Teaching window.

b) Perform a test operation

Perform a test operation after selecting JOG, Inching, or Return to Origin.

Refer to section "4.5 Teaching".

c) Stop

JOG: When the "+/-" button is released, the actuator operation will be decelerated and stopped.

When the EMGx input terminal is turned OFF, the servo is turned OFF immediately after the actuator is decelerated and stopped, then, the JOG operation will stop.

Inching: When the actuator is operating, the operation will be decelerated and stopped by selecting the "Stop" button in the main window.

When the EMGx input terminal is turned OFF, the servo is turned OFF immediately after the actuator is decelerated and stopped, then, the Inching operation will stop.

The "Stop" button is invalid when the actuator is stopped during a pushing operation; when the actuator is stopped during positioning due to an obstacle; when the actuator operates at slow speed as the positioning is interfered; or when the actuator is performing the Return to origin operation.

Return to Origin: Only the EMGx input terminal is valid.

When it is turned OFF, the servo is turned OFF immediately after the actuator is decelerated and stopped, then, the Return to Origin will stop.

**Caution**

Please take appropriate measures so that the controller stop (ENGx) terminal can be turned off immediately during the test. (Refer to the controller Operation Manual [Document No. SFOD-OMT009] for the EMGx input terminal and the wiring).

The operation is not stopped when the "Stop" button is selected in the following cases.

- The actuator is stopping during the pushing operation. (In this case, the pushing status is not released when the "Stop" button is selected.)
- The actuator is stopping during the positioning operation due to an obstacle.
- The actuator is operating at slow speed as the positioning is interfered.
- The actuator is performing a Return to origin operation.

It may cause injury; or damage to the actuator or the user's system.

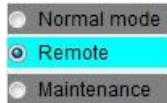
### (3) Single step operation in Step Data window

#### a) Step Data window

From the View (V) menu in the main window, select the Step Data window.  
Refer to section "4.1 (1-1-2) View (V)" for how to display the Step Data window.

#### b) Change to Remote mode

**Change the mode to Remote mode** in the main window.



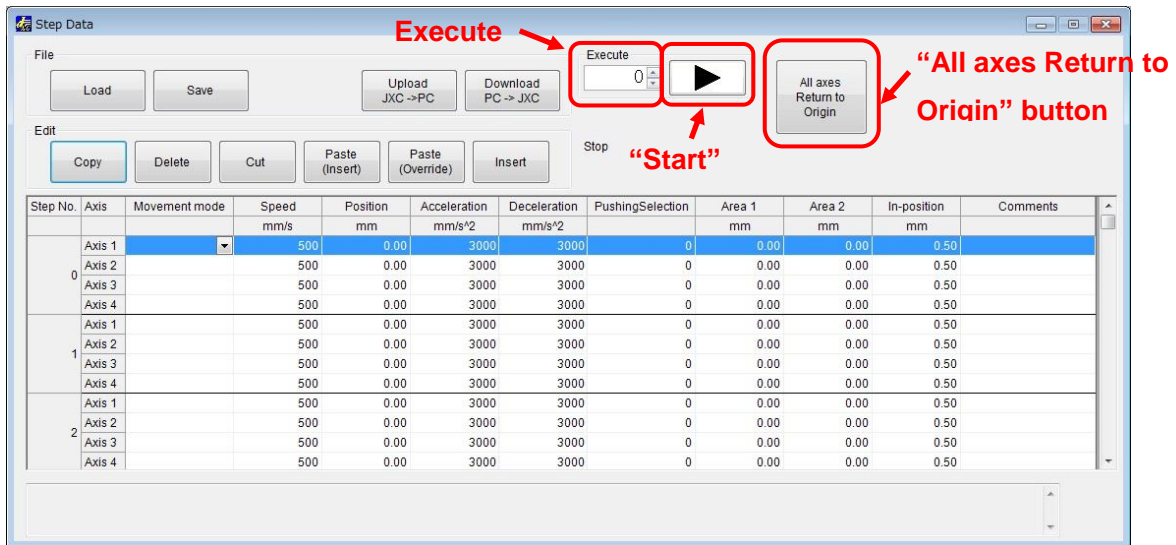
Confirm that SVRE is ON. (Confirm that SVRE is ON in the Status window).

#### c) Return to Origin

After thoroughly confirming safety, select the "All axes Return to Origin" button to command the Return to origin.

#### d) Step data No. setting

Specify the step data number to be used for the test operation in the Execute area.



#### d) Start the test

When the "▶" start button is selected, the operation of the specified step data number will begin.

#### e) Stop

The test stops when operation of the specified step data number is completed.

When the actuator is operating, the operation can be decelerated and stopped by selecting the "Stop" button in the main window.

**When the EMGx input terminal is turned OFF, the servo is turned OFF after the actuator is decelerated and stopped, then the Inching operation will be canceled.**

The "Stop" button is invalid when the actuator is stopped during a pushing operation; when the actuator is stopped during positioning due to an obstacle; when the actuator operates at slow speed as the positioning is interfered; or when the actuator is performing the Return to origin operation.

### ⚠ Caution

**Please take appropriate measures so that the controller stop (ENGx) terminal can be turned off immediately during the test. (Refer to the controller Operation Manual [Document No. SFOD-OMT009] for the EMGx input terminal and the wiring).**

The operation is not stopped when the "Stop" button is selected in the following cases.

- The actuator is stopping during the pushing operation.  
(In this case, the pushing status is not released when the "Stop" button is selected.)
- The actuator is stopping during the positioning operation due to an obstacle.
- The actuator is operating at slow speed as the positioning is interfered.
- The actuator is performing a Return to origin operation.

It may cause injury; or damage to the actuator or the user's system.

### ⚠ Caution

**Do not disconnect the USB cable during the test operation.**

If disconnected, the actuator will stop suddenly and the servo will be turned OFF.  
This may cause damage to the actuator or the user's system.

## 4.7 Forced output function

The Forced output function can only be used **in maintenance mode**.

It is possible to turn ON or OFF the output terminal of the parallel I/O.

Using this forced output function, it is possible to check that the parallel I/O wiring and the PLC program are correct.

Details of the forced output of the parallel I/O are shown below.

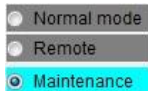
### (1) Parallel I/O forced output

#### a) Step Data window

Select the View (V) of the main window and select the Status window.

Refer to section "4.1 (1-1-2) View (V)" for how to display the Status window.

#### b) Change to Maintenance mode



**Change the mode to Maintenance mode** in the main window.

#### c) Command of output ON / OFF

Select the output signal button to be forced ON or OFF.

The conditions of the output signal buttons are shown below.

ON: Blue

OFF: Grey

Name	Axis 1	Axis 2	Axis 3	Axis 4
Unit name	01-	01-	01-	01-
Current coordinate	0.00 [mm]	0.00 [mm]	0.00 [mm]	0.00 [mm]
Current speed	0 [mm/s]	0 [mm/s]	0 [mm/s]	0 [mm/s]
Current pushing force	0 [%]	0 [%]	0 [%]	0 [%]
Target position	0.00 [mm]	0.00 [mm]	0.00 [mm]	0.00 [mm]

Parallel IO (NPN)

Input signal	Output signal
IN10	OUT7
IN9	OUT6
IN8	OUT5
IN7	OUT4
IN6	OUT3
IN5	OUT2
IN4	OUT1
IN3	OUT0
IN2	
IN1	
IN0	

Step No. = 0

Step No./Alarm Group = 6

Buttons: SETUP, HOLD, DRIVE, RESET, SVON, BUSY, AREA, SETON, INP, SVRE, \*ESTOP, \*ALARM

#### d) Completion

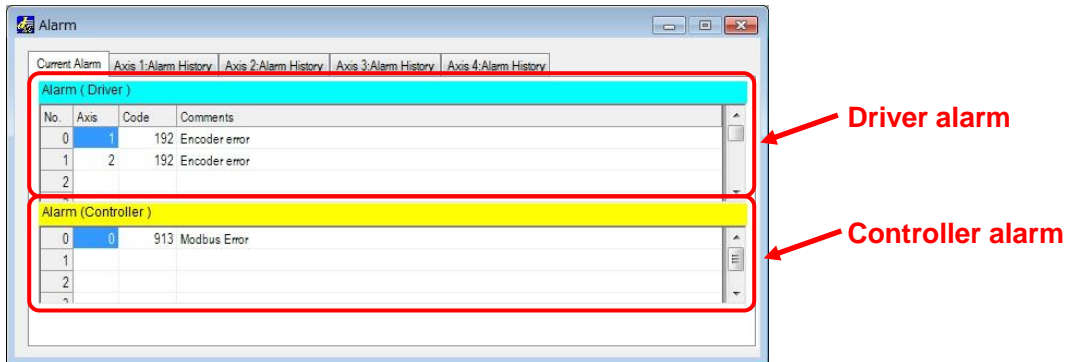
The forced output will be released when the mode is changed, and then, the parallel output status of the controller will return to the status before the forced output.

## 4.8. Alarm detection

The controller generates an alarm when an error is detected.

The alarms are classified into groups of the **controller alarm** and the **driver alarm**.

A driver alarm is recorded in the Alarm History, but **the controller alarm is NOT recorded**.



The following section, (1) describes how to distinguish an alarm group; (2) describes the parallel I/O signal output conditions and how to reset the alarms; and (3) lists the details of the alarms and their countermeasures.

### (1) Alarm group distinction

When an alarm is generated the controller outputs the signals to distinguish the alarm group.

The alarms are classified into four groups, and the alarm groups are output with the OUT0-3 signals.

The table below lists the combination of the alarm group and the signal output.

Alarm group	Signal output				
	*ALARM	OUT0	OUT1	OUT2	OUT3
Alarm group B	OFF	OFF	ON	OFF	OFF
Alarm group C	OFF	OFF	OFF	ON	OFF
Alarm group D	OFF	OFF	OFF	OFF	ON
Alarm group E	OFF	OFF	OFF	OFF	OFF

\*ALARM is displayed in negative logic.

### (2) Parallel I/O signal output when an Alarm is generated

When an alarm is generated, SVRE or SETON is output according to the contents of the alarm as listed below.

The table below also lists how to restart the operation.

Alarm group	Signal output		How to restart
	SVRE	SETON	
Alarm group B	No change	No change	Input RESET
Alarm group C	No change	No change	Input RESET
Alarm group D	OFF	No change	Input RESET
Alarm group E	OFF	OFF	Power supply for control is turned off and supply again

### (3) Alarms and countermeasures

#### (3-1) Controller alarm

Name of the controller setting software (code)	Group	How to reset the alarm	Alarms and countermeasures
DRIVE is ON when SVRE is OFF (0-098)	C	Input RESET	<p><b>&lt; Details &gt;</b> An alarm is generated when the Return to origin operation, the Drive operation, or the JOG operation is commanded while the servo is OFF.</p> <p><b>&lt;Countermeasure&gt;</b> Command operation while the servo is ON (SVRE output is ON).</p>
DRIVE is ON when SETON is OFF (0-099)	C	Input RESET	<p><b>&lt; Details &gt;</b> An alarm is generated when the Return to origin operation, the Drive operation or the JOG operation is commanded before performing the Return to origin.</p> <p><b>&lt;Countermeasure&gt;</b> Start operation after completion of the Return to origin.</p>
Failed to achieve set position in set time limit (0-149)	D	Input RESET SVON	<p><b>&lt; Details &gt;</b> The time to reach the target position is greater than the specified time.</p> <p><b>&lt;Countermeasure&gt;</b> Remove the obstructions while the actuator moves. Also, make sure that the load, speed, acceleration and deceleration are within the range of the actuator.</p>
Parameter is not registered (0-901)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> An alarm is generated when the step data is executed without parameter settings.</p> <p><b>&lt;Countermeasure&gt;</b> Download an appropriate parameter to the controller.</p>
Step data is not registered (0-902)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> An alarm is generated when the step data is executed without step data setting.</p> <p><b>&lt;Countermeasure&gt;</b> Download the step data to the controller.</p>
System Error (0-910)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> System error occurred. There is a possibility of damage to the controller or a malfunction due to noise.</p> <p><b>&lt;Countermeasure&gt;</b> If the alarm is still generated when the power is reapplied, please contact SMC.</p>
SDRAM Error (0-911)	E	Turn off the main control and motor control power supplies.	<p><b>&lt;Descriptions&gt;</b> Abnormality concerning SDRAM is confirmed.</p> <p><b>&lt;Countermeasure&gt;</b> Please contact SMC.</p>
FROM Error (0-912)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> Abnormality concerning FROM is confirmed.</p> <p><b>&lt;Countermeasure&gt;</b> Please contact SMC.</p>
Modbus Error (0-913)	E	Shut down the main control and motor control power supply.	<p><b>&lt;Descriptions&gt;</b> An alarm is generated when an abnormality is found in the Modbus communication to the controller. There is a possibility that the motor control power supply is OFF or a malfunction occurred due to noise.</p> <p><b>&lt;Countermeasure&gt;</b> If the alarm is still generated when the power is reapplied again, please contact SMC.</p>
Module Error (0-914)	E	Shut down the main control and motor control power supply.	<p><b>&lt; Details &gt;</b> An alarm is generated when an abnormality is found in internal circuit. There is a possibility of damage to the controller or a malfunction due to noise.</p> <p><b>&lt;Countermeasure&gt;</b> If the alarm is still generated when the power is reapplied, please contact SMC.</p>

### (3-2) Driver alarm

Name of the controller setting software (code)	Group	How to reset the alarm	Alarms and countermeasures
Step data value is wrong (1-048)	B	Input RESET	<p><b>&lt; Details &gt;</b>            The step data and parameter are incorrect for the following conditions.            [Settable range]            (1) Pushing force <math>\geq</math> "Trigger level"            (2) Pushing force of profile parameter <math>&gt; 0</math>            (3) Speed <math>\geq</math> Pushing speed <math>\geq</math> Minimum speed of the actuator            (4) Pushing speed <math>\leq</math> Maximum pushing speed of the actuator            (5) Pushing force <math>\geq</math> Minimum pushing force of actuator            (6) The Basic parameter "Max pushing force" <math>\geq</math> Minimum pushing force of the actuator            (7) The Basic parameter "Max pushing force" <math>&gt;</math> "Trigger level".</p> <p><b>&lt;Countermeasure&gt;</b>            Modify the step data, and basic or profile parameter settings</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>⚠ Caution</b></p> <p>Please refer to the actuator manual or the catalogue for the max/min pushing force/speed for the actuator.</p> </div>
Parameter value is wrong (1-049)	B	Input RESET	<p><b>&lt; Details &gt;</b>            The parameter is incorrect for the following conditions.            [Settable range]            (1) Stroke(-) <math>&lt;</math> Stroke (+)            (2) Parameter "Max pushing force" <math>&lt;</math> Maximum pushing force of the actuator</p> <p><b>&lt;Countermeasure&gt;</b>            Modify the basic parameter settings.</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>⚠ Caution</b></p> <p>Please refer to the actuator manual or the catalogue for the max/min pushing force/speed for the actuator.</p> </div>
Set stroke is outside stroke limit (1-052)	B	Input RESET	<p><b>&lt; Details &gt;</b>            An alarm is generated when an operation exceeds the basic parameter "Stroke (+)", "Stroke (-)". (Including JOG operation after a Return to origin)</p> <p><b>&lt;Countermeasure&gt;</b>            Make sure that the actuator moving distance specified in the step data is within the range in the basic parameters "Stroke (+)" and "Stroke (-)".</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>⚠ Caution</b></p> <p>If the step data operation method is a "relative movement", note the location where the operation starts and the distance moved.            If the location is outside the stroke range when power is supplied, this alarm will be generated. Move the table (or rod) to within the stroke range, and supply power.</p> </div>
Return to ORIG did not complete within the set time (1-097)	C	Input RESET	<p><b>&lt; Details &gt;</b>            The Return to origin was not completed within the set time.</p> <p><b>&lt;Countermeasure&gt;</b></p> <ul style="list-style-type: none"> <li>- If the ORIG mode is "0: Pushing Return to origin", the controller parameter "model" and the actual actuator model may not match. Check the parameters. Also, the motor shaft may be loose. Please refer to the actuator operation manual.</li> <li>- If the ORIG mode is "2, 3: Return to origin with sensor", check that the sensor mounting and the cable connection of the sensor are correct.</li> </ul>

Name of the controller setting software (code)	Group	How to reset the alarm	Alarms and countermeasures																			
DRIVE is ON when SVRE is OFF (1-098)	C	Input RESET	<p><b>&lt; Details &gt;</b> An alarm is generated when the Return to origin instruction is made when the servo is OFF.</p> <p><b>&lt;Countermeasure&gt;</b> Start the operation when the servo motor is ON (SVRE output is ON).</p>																			
ORIG switch direction (1-103)	C	Input RESET	<p><b>&lt; Details &gt;</b> The origin sensor does not respond correctly when a Return to origin operation is performed with the origin sensor. An Alarm is generated depending on the set value of the Return to origin parameter.</p> <table border="1" data-bbox="603 564 1409 1507"> <thead> <tr> <th colspan="2" data-bbox="603 564 970 629">Return to Origin parameter Set value</th> <th data-bbox="970 564 1409 629" rowspan="2">Alarm conditions</th> </tr> <tr> <th data-bbox="603 629 778 696">Return to Origin mode</th> <th data-bbox="778 629 970 696">Origin sensor type</th> </tr> </thead> <tbody> <tr> <td data-bbox="603 696 778 976" rowspan="3">0: Pushing Return to origin</td> <td data-bbox="778 696 970 741">0: No sensor</td> <td data-bbox="970 696 1409 741">(No alarm will be generated)</td> </tr> <tr> <td data-bbox="778 741 970 853">1: Sensor A contact</td> <td data-bbox="970 741 1409 853">The end position is detected when the sensor has been off since the Return to origin operation started.</td> </tr> <tr> <td data-bbox="778 853 970 976">2: Sensor B contact</td> <td data-bbox="970 853 1409 976">The end position is detected when the sensor has been on since the Return to origin operation started.</td> </tr> <tr> <td data-bbox="603 976 778 1507" rowspan="3">2,3:Sensor Return to origin</td> <td data-bbox="778 976 970 1032">0: No sensor</td> <td data-bbox="970 976 1409 1032">Immediately after inputting a command to the Return to origin.</td> </tr> <tr> <td data-bbox="778 1032 970 1267">1: Sensor A contact</td> <td data-bbox="970 1032 1409 1267">The end position is detected when the sensor has been off since the Return to origin operation started, or the end position is detected after the sensor ON is detected and before the Return to origin operation is completed.</td> </tr> <tr> <td data-bbox="778 1267 970 1507">2: Sensor B contact</td> <td data-bbox="970 1267 1409 1507">The end position is detected when the sensor has been on since the Return to origin operation started, or the end position is detected after the sensor OFF is detected and before the Return to origin operation is completed.</td> </tr> </tbody> </table> <p><b>&lt;Countermeasure&gt;</b> -If the "ORIG mode" is "0: Return to origin by pushing force" Set the "Origin sensor type" to 0. - If the ORIG mode is "2 or 3: Return to origin with sensor" Set the "Origin sensor type" in accordance with the sensor specifications. Also, check that the sensor mounting and the cable connection of the sensor are correct.</p>	Return to Origin parameter Set value		Alarm conditions	Return to Origin mode	Origin sensor type	0: Pushing Return to origin	0: No sensor	(No alarm will be generated)	1: Sensor A contact	The end position is detected when the sensor has been off since the Return to origin operation started.	2: Sensor B contact	The end position is detected when the sensor has been on since the Return to origin operation started.	2,3:Sensor Return to origin	0: No sensor	Immediately after inputting a command to the Return to origin.	1: Sensor A contact	The end position is detected when the sensor has been off since the Return to origin operation started, or the end position is detected after the sensor ON is detected and before the Return to origin operation is completed.	2: Sensor B contact	The end position is detected when the sensor has been on since the Return to origin operation started, or the end position is detected after the sensor OFF is detected and before the Return to origin operation is completed.
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Speed exceeded set value (1-144)	D	Input RESET SVON	<p><b>&lt; Details &gt;</b> The motor speed has exceeded the specified value, due to an external force, etc.</p> <p><b>&lt;Countermeasure&gt;</b> Make improvements such that the motor speed will not exceed the maximum speed of the actuator.</p> <table border="1" data-bbox="603 1928 1355 2029"> <tr> <td data-bbox="603 1928 1355 1962" style="text-align: center;"><b>⚠ Caution</b></td> </tr> <tr> <td data-bbox="603 1962 1355 2029">Please refer to the actuator manual or the catalogue for the maximum speed of the actuator.</td> </tr> </table>	<b>⚠ Caution</b>	Please refer to the actuator manual or the catalogue for the maximum speed of the actuator.																	
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Name of the controller setting software (code)	Group	How to reset the alarm	Alarms and countermeasures
The motor drive power supply voltage is outside set range (1-145)	D	Input RESET SVON	<p><b>&lt; Details &gt;</b> The motor drive power supply (M24V) voltage outside the specified range is detected. The controller will check the lower limit of the motor power supply voltage only when the servo turns ON.</p> <p><b>&lt;Countermeasure&gt;</b> Check the voltage supplied to the motor drive power supply (M24V).</p> <div data-bbox="603 421 1366 555" style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>⚠ Caution</b></p> <p>If the power supply is a type with “inrushcurrent protection”, a voltage drop may cause an alarm during acceleration/ deceleration.</p> </div> <p><b>&lt; Details &gt;</b> The alarm may be caused by regenerative power depending on the method of operation of the actuator.</p> <p><b>&lt;Countermeasure&gt;</b> Check if the operating condition of the actuator is within the specification range.</p> <div data-bbox="603 757 1366 869" style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>⚠ Caution</b></p> <p>Refer to the actuator manual or the catalogue for the method of operation of the actuator.</p> </div>
Controller temperature exceeded set range (1-146)	D	Input RESET SVON	<p><b>&lt; Details &gt;</b> The temperature of the controller is too high.</p> <p><b>&lt;Countermeasure&gt;</b> Make improvements so that the temperature around the controller is kept appropriate.</p>
Controller supply voltage is outside set range (1-147)	D	Input RESET SVON	<p><b>&lt; Details &gt;</b> The motor control power supply voltage outside of the specified range is detected.</p> <p><b>&lt;Countermeasure&gt;</b> Check the motor control power supply voltage connected to the controller.</p> <div data-bbox="603 1249 1366 1451" style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>⚠ Caution</b></p> <p>If a single power supply is used for both the motor control power and the motor drive power, or the power supply is an “inrushcurrent protection type”, a voltage drop may occur during acceleration/deceleration, which will generate an alarm.</p> </div> <p><b>&lt; Details &gt;</b> The alarm may be caused by regenerative power depending on the method of operation of the actuator.</p> <p><b>&lt;Countermeasure&gt;</b> Check if the operating condition of the actuator is within the specification range.</p> <div data-bbox="603 1664 1366 1765" style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"><b>⚠ Caution</b></p> <p>Please refer to the actuator manual or the catalogue for the method of operation of the actuator.</p> </div>
Current limit is exceeded (1-148)	D	Input RESETSV ON	<p><b>&lt; Details &gt;</b> The total sum per unit time of output current has exceeded the specified value.</p> <p><b>&lt;Countermeasure&gt;</b> Remove the obstructions while the actuator moves. Also, make sure that the load, speed, acceleration and deceleration are within the specifications of the actuator.</p>



Name of the controller setting software (code)	Group	How to reset the alarm	Descriptions and countermeasures
Encoder error (1-192)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> An Abnormality occurred in communication with the encoder.</p> <p><b>&lt;Countermeasure&gt;</b> Check the actuator cable connection.</p>
Unable to find motor phase within the set time. (1-193)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> Positioning of the polarity is not completed properly.  <span style="font-size: 2em; vertical-align: middle;">{</span> When the servo motor is turned on (SVON is ON) for the first time after the power is supplied, the actuator needs to move a little to find the motor phase.If this actuator movement is prevented, an alarm will be generated. <span style="font-size: 2em; vertical-align: middle;">}</span></p> <p><b>&lt;Countermeasure&gt;</b> Remove the obstructions while the actuator moves and then turn on the servo motor (SVON is ON).</p>
Output current limit exceeded set value (1-194)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> The Output current in the power supply circuit is abnormally high.</p> <p><b>&lt;Countermeasure&gt;</b> Check if the actuator cable or connector is short-circuited. In addition, make sure that the actuator is compatible with the parameter set to the controller.</p>
Current sensor abnormality has occurred (1-195)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> An abnormality with the current sensors is detected, which is recognized when the controller is initialized.</p> <p><b>&lt;Countermeasure&gt;</b> Confirm the combination of the controller and the actuator is correct. If the alarm is still generated when the power is reapplied, please contact SMC.</p>
Position error overflowed (1-196)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> The Position deviation counter in the controller has overflowed.</p> <p><b>&lt;Countermeasure&gt;</b> Remove the obstructions while the actuator moves. Also, make sure that the load, speed, acceleration and deceleration are within the specifications of the actuator.</p>
Memory abnormality has occurred (1-197)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> Abnormality concerning EEPROM is confirmed.</p> <p><b>&lt;Countermeasure&gt;</b> Please contact SMC. (The write limit of the EEPROM is approximately 100,000 times)</p>
CPU error (1-198)	E	Turn off the main control and motor control power supplies.	<p><b>&lt; Details &gt;</b> The CPU is not operating correctly.  <span style="font-size: 2em; vertical-align: middle;">{</span> It is possible that the CPU or surrounding circuits have failed, or the CPU is malfunctioning due to electrical noise. <span style="font-size: 2em; vertical-align: middle;">}</span></p> <p><b>&lt;Countermeasure&gt;</b> If the alarm is still generated when the power is reapplied, please contact SMC.</p>

#### Revision history

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.  
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