

## PC Software PC Software for X-SEL XSEL2 Edition

IA-101-N IA-101-X-MW-JS

**Instruction Manual** 

First Edition

IAI Corporation

#### Please Read Before Use

Thank you for purchasing our product.

This instruction manual explains the handling methods, structure and maintenance of this product, providing the information you need in order to use the product safely.

Before using the product, be sure to read this manual and fully understand the contents explained herein to ensure safe use of the product.

Please downloaded the user's manual from our website.

You can download it free of charge. User registration is required for the first time downloading.

URL : www.iai-robot.co.jp/data\_dl/CAD\_MANUAL/

When using the product, print out of the necessary portions of the relevant manual, or please display it on your computer, tablet terminal, etc. so that you can check it immediately.

After reading the instruction manual, keep it in a convenient place so that whoever is handling the product can refer to it quickly when necessary.

#### [Important]

- This instruction manual is an original document dedicated for this product.
- This product cannot be used in ways not shown in this instruction manual. IAI shall not be liable for any result whatsoever arising from the use of the product in any other way than what is noted in the manual.
- The information contained in this instruction manual is subject to change without notice for the purpose of product improvement.
- If any issues arise regarding the information contained in this instruction manual, contact our customer center or the nearest sales office.
- Use or reproduction of this instruction manual in full or in part without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the text are registered trademarks.

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## Safety Guide

"Safety Guide" has been written to use the machine safely and so prevent personal injury or property damage beforehand. Make sure to read it before the operation of this product.

## **Safety Precautions for Our Products**

The common safety precautions for the use of any of our robots in each operation.

| No. | Operation<br>Description | Description  |
|-----|--------------------------|--|
| 1   | Model<br>Selection       | <ul> <li>This product has not been planned and designed for the application where high level of safety is required, so the guarantee of the protection of human life is impossible.</li> <li>Accordingly, do not use it in any of the following applications.</li> <li>1) Medical equipment used to maintain, control or otherwise affect human life or physical health.</li> <li>2) Mechanisms and machinery designed for the purpose of moving or transporting people (For vehicle, railway facility or air navigation facility)</li> <li>3) Important safety parts of machinery (Safety device, etc.)</li> <li>Do not use the product outside the specifications.</li> <li>Failure to do so may considerably shorten the life of the product.</li> <li>Do not use it in any of the following environments.</li> <li>1) Location where there is any inflammable gas, inflammable object or explosive</li> <li>2) Place with potential exposure to radiation</li> <li>3) Location with the ambient temperature or relative humidity exceeding the specification range</li> <li>4) Location where condensation occurs due to abrupt temperature changes</li> <li>6) Location exposed to significant amount of dust, salt or iron powder</li> <li>8) Location subject to direct vibration or impact</li> <li>For an actuator used in vertical orientation, select a model which is equipped with a brake. If selecting a model with no brake, the moving part may drop when the power is turned OFF and may cause an accident such as an injury or damage on the work piece.</li> </ul> |

| No. | Operation<br>Description    | Description  |
|-----|-----------------------------|--|
| 2   | Transportation              | <ul> <li>When carrying a heavy object, do the work with two or more persons or utilize equipment such as crane.</li> <li>When the work is carried out with 2 or more persons, make it clear who is to be the "leader" and who to be the "follower(s)" and communicate well with each other to ensure the safety of the workers.</li> <li>When in transportation, consider well about the positions to hold, weight and weight balance and pay special attention to the carried object so it would not get hit or dropped.</li> <li>Transport it using an appropriate transportation measure. The actuators available for transportation with a crane have eyebolts attached or there are tapped holes to attach bolts. Follow the instructions in the instruction manual for each model.</li> <li>Do not step or sit on the package.</li> <li>Do not put any heavy thing that can deform the package, on it.</li> <li>When using a crane capable of 1t or more of weight, have an operator who has qualifications for crane operation and sling work.</li> <li>When using a crane or equivalent equipments, make sure not to hang a load that weighs more than the equipment's capability limit.</li> <li>Use a hook that is suitable for the load. Consider the safety factor of the hook in such factors as shear strength.</li> <li>Do not get on the load that is hung on a crane.</li> <li>Do not stand under the load that is hung up with a crane.</li> </ul> |
| 3   | Storage and<br>Preservation | <ul> <li>The storage and preservation environment conforms to the installation environment. However, especially give consideration to the prevention of condensation.</li> <li>Store the products with a consideration not to fall them over or drop due to an act of God such as earthquake.</li> </ul>   |
| 4   | Installation and<br>Start   | <ul> <li>(1) Installation of Robot Main Body and Controller, etc.</li> <li>Make sure to securely hold and fix the product (including the work part). A fall, drop or abnormal motion of the product may cause a damage or injury. Also, be equipped for a fall-over or drop due to an act of God such as earthquake.</li> <li>Do not get on or put anything on the product. Failure to do so may cause an accidental fall, injury or damage to the product due to a drop of anything, malfunction of the product, performance degradation, or shortening of its life.</li> <li>When using the product in any of the places specified below, provide a sufficient shield.</li> <li>1) Location where electric noise is generated</li> <li>2) Location where high electrical or magnetic field is present</li> <li>3) Location where the product may come in contact with water, oil or chemical droplets</li> </ul>   |

| No. | Operation<br>Description  | Description   |
|-----|---------------------------|---|
| 4   | Installation and<br>Start | <ul> <li>(2) Cable Wiring</li> <li>Use our company's genuine cables for connecting between the actuator and controller, and for the teaching tool.</li> <li>Do not scratch on the cable. Do not bend it forcibly. Do not pull it. Do not coil it around. Do not insert it. Do not put any heavy thing on it. Failure to do so may cause a fire, electric shock or malfunction due to leakage or continuity error.</li> <li>Perform the wiring for the product, after turning OFF the power to the unit, so that there is no wiring error.</li> <li>When the direct current power (+24V) is connected, take the great care of the directions of positive and negative poles. If the connection direction is not correct, it might cause a fire, product breakdown or malfunction.</li> <li>Connect the cable connector securely so that there is no disconnection or looseness. Failure to do so may cause a fire, electric shock or malfunction of the product.</li> <li>Never cut and/or reconnect the cables supplied with the product for the purpose of extending or shortening the cable length. Failure to do so may cause the product to malfunction or cause fire.</li> </ul>     |
|     |                           | <ul> <li>(3) Grounding</li> <li>The grounding operation should be performed to prevent an electric shock or electrostatic charge, enhance the noise-resistance ability and control the unnecessary electromagnetic radiation.</li> <li>For the ground terminal (PE) on the AC power cable of the controller and the grounding plate in the control panel, make sure for grounding work. For security grounding, it is necessary to select an appropriate wire thickness suitable for the load. Perform wiring that satisfies the specifications (electrical equipment standards and criteria). For detail, follow the description in [an instruction manual of each controller or controller built-in actuator].</li> <li>Conduct functional grounding on the FG terminal for a controller supplying 24V DC or a controller built-in type actuator. In order to minimize influence to mechanical operation given by electromagnetic interference (noise) to an electrical device or insulation failure, conduct grounding on a terminal or a conductor that is electrically stable. The reference impedance should be Type D (Former Class 3, ground resistance 100Ω or less).</li> </ul> |

| No. | Operation<br>Description  | Description  |
|-----|---------------------------|--|
| 4   | Installation and<br>Start | <ul> <li>(4) Safety Measures</li> <li>When the work is carried out with 2 or more persons, make it clear who is to be the "leader" and who to be the "follower(s)" and communicate well with each other to ensure the safety of the workers.</li> <li>When the product is under operation or in the ready mode, take the safety measures (such as the installation of safety and protection fence) so that nobody can enter the area within the robot's movable range. When the robot under operation is touched, it may result in death or serious injury.</li> <li>Make sure to install the emergency stop circuit so that the unit can be stopped immediately in an emergency during the unit operation.</li> <li>Take the safety measure not to start up the unit only with the power turning ON. Failure to do so may start up the machine suddenly and cause an injury or damage to the product.</li> <li>Take the safety measure not to start up the machine only with the emergency stop cancellation or recovery after the power failure. Failure to do so may result in an electric shock or injury due to unexpected power input.</li> <li>When the installation or adjustment operation is to be performed, give clear warnings such as "Under Operation; Do not turn ON the power!" etc. Sudden power input may cause an electric shock or injury.</li> <li>Take the measure so that the work part is not dropped in power failure or emergency stop.</li> <li>Wear protection gloves, goggle or safety shoes, as necessary, to secure safety.</li> <li>Do not insert a finger or object in the openings in the product. Failure to do so may cause an injury, electric shock, damage to the product or fire.</li> <li>When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.</li> </ul> |
| 5   | Teaching                  | <ul> <li>When the work is carried out with 2 or more persons, make it clear who is to be the "leader" and who to be the "follower(s)" and communicate well with each other to ensure the safety of the workers.</li> <li>Perform the teaching operation from outside the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the "Stipulations for the Operation" and make sure that all the workers acknowledge and understand them well.</li> <li>When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency.</li> <li>When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly.</li> <li>Place a sign "Under Operation" at the position easy to see.</li> <li>When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.</li> <li>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</li> </ul>   |

| No. | Operation<br>Description | Description   |
|-----|--------------------------|---|
| 6   | Trial Operation          | <ul> <li>When the work is carried out with 2 or more persons, make it clear who is to be the "leader" and who to be the "follower(s)" and communicate well with each other to ensure the safety of the workers.</li> <li>After the teaching or programming operation, perform the check operation one step by one step and then shift to the automatic operation.</li> <li>When the check operation is to be performed inside the safety protection fence, perform the check operation using the previously specified work procedure like the teaching operation.</li> <li>Make sure to perform the programmed operation check at the safety speed. Failure to do so may result in an accident due to unexpected motion caused by a program error, etc.</li> <li>Do not touch the terminal block or any of the various setting switches in the power ON mode. Failure to do so may result in an electric shock or malfunction.</li> </ul> |
| 7   | Automatic<br>Operation   | <ul> <li>Check before starting the automatic operation or rebooting after operation stop that there is nobody in the safety protection fence.</li> <li>Before starting automatic operation, make sure that all peripheral equipment is in an automatic-operation-ready state and there is no alarm indication.</li> <li>Make sure to operate automatic operation start from outside of the safety protection fence.</li> <li>In the case that there is any abnormal heating, smoke, offensive smell, or abnormal noise in the product, immediately stop the machine and turn OFF the power switch. Failure to do so may result in a fire or damage to the product.</li> <li>When a power failure occurs, turn OFF the power switch. Failure to do so may cause an injury or damage to the product, due to a sudden motion of the product in the recovery operation from the power failure.</li> </ul>                                     |

| No. | Operation<br>Description      | Description  |
|-----|-------------------------------|--|
| 8   | Maintenance<br>and Inspection | <ul> <li>When the work is carried out with 2 or more persons, make it clear who is to be the "leader" and who to be the "follower(s)" and communicate well with each other to ensure the safety of the workers.</li> <li>Perform the work out of the safety protection fence, if possible. In the case that the operation is to be performed unavoidably inside the safety protection fence, prepare the "Stipulations for the Operation" and make sure that all the workers acknowledge and understand them well.</li> <li>When the work is to be performed inside the safety protection fence, basically turn OFF the power switch.</li> <li>When the operation is to be performed inside the safety protection fence, the worker should have an emergency stop switch at hand with him so that the unit can be stopped any time in an emergency.</li> <li>When the operation is to be performed inside the safety protection fence, in addition to the workers, arrange a watchman so that the machine can be stopped any time in an emergency. Also, keep watch on the operation so that any third person can not operate the switches carelessly.</li> <li>Place a sign "Under Operation" at the position easy to see.</li> <li>For the grease for the guide or ball screw, use appropriate grease according to the instruction manual for each model.</li> <li>Do not perform the dielectric strength test. Failure to do so may result in a damage to the product.</li> <li>When releasing the brake on a vertically oriented actuator, exercise precaution not to pinch your hand or damage the work parts with the actuator dropped by gravity.</li> <li>The slider or rod may get misaligned OFF the stop position if the servo is turned OFF. Be careful not to get injured or damage to the and unnecessary operation.</li> <li>Pay attention not to lose the removed cover or screws, and make sure to put the product back to the original condition after maintenance and inspection works.</li> <li>Use in incomplete condition may cause damage to the product or an injury.</li> </ul> |
| 9   | Modification<br>and Dismantle | <ul> <li>Do not modify, disassemble, assemble or use of maintenance parts not<br/>specified based at your own discretion.</li> </ul>   |
| 10  | Disposal                      | <ul> <li>When the product becomes no longer usable or necessary, dispose of it properly as an industrial waste.</li> <li>When removing the actuator for disposal, pay attention to drop of components when detaching screws.</li> <li>Do not put the product in a fire when disposing of it. The product may burst or generate toxic gases.</li> </ul>   |
| 11  | Other                         | <ul> <li>Do not come close to the product or the harnesses if you are a person who requires a support of medical devices such as a pacemaker. Doing so may affect the performance of your medical device.</li> <li>See Overseas Specifications Compliance Manual to check whether complies if necessary.</li> <li>For the handling of actuators and controllers, follow the dedicated instruction manual of each unit to ensure the safety.</li> </ul>   |

## **Alert Indication**

The safety precautions are divided into "Danger", "Warning", "Caution" and "Notice" according to the warning level, as follows, and described in the instruction manual for each model.

| Level   | Degree of Danger and Damage   | Symbol      |         |
|---------|---|-------------|---------|
| Danger  | This indicates an imminently hazardous situation which, if the product is not handled correctly, will result in death or serious injury.              | $\triangle$ | Danger  |
| Warning | This indicates a potentially hazardous situation which, if the product is not handled correctly, could result in death or serious injury.             | Â           | Warning |
| Caution | This indicates a potentially hazardous situation which, if the product<br>is not handled correctly, may result in minor injury or property<br>damage. |             | Caution |
| Notice  | This indicates lower possibility for the injury, but should be kept to use this product properly.   | !           | Notice  |

## **Support Models**

| Model<br>Name | Various data file extensions |                    |                            |                     |           |        |            |                | Support        |                    |
|---------------|------------------------------|--------------------|----------------------------|---------------------|-----------|--------|------------|----------------|----------------|--------------------|
|               | Program<br>(Individually)    | Program<br>(Batch) | Position<br>(Individually) | Position<br>(Batch) | Parameter | Symbol | Coordinate | Global<br>data | Backup<br>Data | Started<br>Version |
| XSEL2-T       | .x7pg                        | .x7pa              | .x7pt                      | .x7pta              | .x7pm     | .x7sm  | -          | .x7gd          | .x7bk          | V15.00.00.00       |
| XSEL2-TX      | .s7pg                        | .s7pa              | .s7pt                      | .s7pta              | .s7pm     | .s7sm  | .s7cd      | .s7gd          | .s7bk          | V15.00.00.00       |

\* XSEL2-T/TX is capable to divide the construction axes into two groups at the maximum. Positions can be edited in unit of axes groups.

The positions of individual axes groups should be stored with an extension .x7pt,.s7pt.

The positions of all axes groups consolidated position should be stored with an extension .x7pta,.s7pta.

## **Software License Agreement**

Before opening the software package, please read this Software License Agreement (hereinafter referred to as "Agreement").

This Agreement is applied to the PC interface software for this product (hereinafter referred to as "this Software", and also includes updated versions.).

Regardless of the reason, opening the this Software package will be regarded as your acknowledgement of consenting to this Agreement. You may not use this software if you do not agree to the terms of this Agreement.

IAI Corporation (hereinafter referred to as "IAI") shall grant to the user (hereinafter referred to as "the User"), and the User shall accept, a non-transferable, non-exclusive right to use the Licensed Software supplied with this Agreement, based on the following terms and conditions.

#### Witnesseth

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This Agreement shall take effect the moment the User opens the Licensed Software and remain effective until the User submits a termination request to IAI in writing or the Agreement is otherwise terminated pursuant to the provision of Section 3.

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If the User owns an electronic medium, such as DVD-R, which is sold by IAI and which this Software is recorded to, or if user registration has been held to this Software, it should be allowed that the User uses this Software on multiple computers.

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#### 3. Termination of the Agreement

In the event of breach by the User of any of the terms and conditions hereunder, or upon discovery of a material cause that makes continuation of this Agreement impossible, IAI may immediately terminate this Agreement without serving any prior notice to the User.

In this case, the User should delete or dispose everything of this Software (including software copies) and dedicated connection cables within ten days after the day when the Agreement is terminated.

#### 4. Range of Guarantee

IAI does not guarantee that this Software works in normal condition in every operational environment.

IAI may change all the specifications related to this Software without serving any prior notice. Also, IAI should not take any responsibility to any loss or damage caused as a result of use of this Software.

The User or a third party agrees not to claim compensation for damage from IAI for any loss suffered by the User or a third party as a result of installing and using the Licensed Software.

Based on this Agreement, the upper limit of the responsibility that IAI may take should be the amount of money that the User has actually paid to purchase this Software.

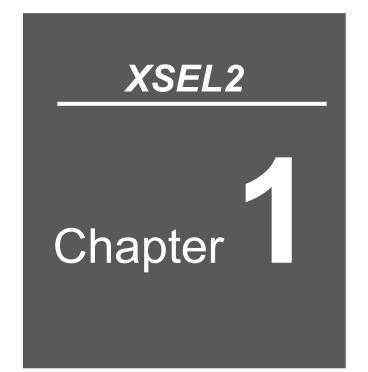
## **Caution in Handling**

- (1) This software is copyrighted by IAI Corporation (IAI).
- (2) The software and the manual can only be used under the terms and conditions of the license agreement.
- (3) IAI cannot assume responsibility for any damage or loss resulting from the use of this software or the manual.
- (4) Please note that the version or edition number printed on the face of this manual does not correspond to the software version number.
- (5) The content of this manual is subject to change without notice.
- (6) The software runs with the Windows operation systems listed in the table below. Accordingly, it is a prerequisite to have a basic Windows operating environment to use this software. (Note, however, that Windows is not included with the software.)

| Port used | Туре                         | Operable Windows       |
|-----------|------------------------------|------------------------|
| RS-232C   | IA-101-X-MW-JS               | Windows 10, Windows 11 |
| USB       | IA-101-N <sup>(Note 1)</sup> | Windows 10, Windows 11 |

Note 1 There is no cable enclosed. Please prepare yourself an USB cable to connect to the USB connector on XSEL2-T/TX Controllers.

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# **Before You Begin**

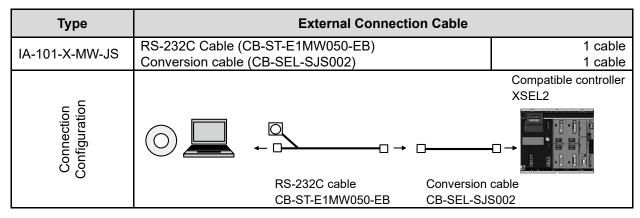
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## 1.1 Components

Please check to make sure that the following items are included in your software package.

| (1) Instruction manual                                   | One          |
|--|--------------|
| (2) DVD-ROM containing the software                      | One          |
| (3) Permission of use contract (manual) for the software | One          |
| (4) Connection cables                                    | One set      |
|  | <i>c</i> , , |

Enclosed connection cables vary depending on the PC interface software type. The types and connection cables are shown in the table below.



| Туре                        | External Connection Cable  |  |  |
|-----------------------------|--|--|--|
| IA-101-N                    | No USB cable enclosed (Note 1)   |  |  |
| Connection<br>Configuration | O Dummy plug<br>DP-4S<br>(Enclosed in XSEL2)<br>USB cable (Note 2)<br>(To be prepared by user) |  |  |

Note 1 There is no USB cable enclosed. Please prepare yourself a general-purposed USB cable.

Note 2 A general-purposed UBS cable (the connector on the controller side should be mini-B) can be used. A recommended USB cable is U2C-MF50BK (manufactured by ELECOM).

## 1.2 System Requirements

The following operating environment is required to run this software.

|  | Туре  | Operable OS  |  |  |
|--|---|--|--|--|
| Supported OS                               | IA-101-X-MW-JS<br>IA-101-N <sup>(Note 1)</sup>  | Windows 10, or Windows 11                          |  |  |
| Computer                                   | PC compatible with supported OS (Windows)   |  |  |  |
| Keyboard                                   | Keyboard compatible   | e with a PC compatible with supported OS (Windows) |  |  |
| Memory                                     | Capacity of memory necessary to run a supported OS (Windows)  |  |  |  |
| Display                                    | XGA and above   |  |  |  |
| Pointing device                            | Mouse or a compatible driver  |  |  |  |
| Storage medium<br>drive                    | DVD-ROM drive   |  |  |  |
| Hard disk                                  | Hard disk with at least 200 MB of available space<br>(The software is installed on the hard disk.)    |  |  |  |
| Serial port RS-232C<br>(EIA-S74 compliant) | Required for PC software of the following model number:<br>Model number: IA-101-X-MW-JS               |  |  |  |
| USB port                                   | Required for PC software of the following model number:<br>Model number: IA-101-N <sup>(Note 1)</sup> |  |  |  |
| Other                                      | It is necessary to install the following.<br>.NET Framework 4.8.1 or later                            |  |  |  |

Note 1 There is no cable enclosed. Please prepare yourself an USB cable to connect to the USB connector on XSEL2-T/TX Controllers.

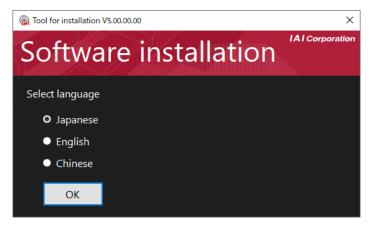
## 1.3 Installing the Software

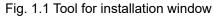
This software is run from the hard disk. This section explains how to install the software.

#### 1.3.1 How to Install the PC Software

[1] Launching the tool for installation

- 1) Insert the software DVD-ROM into the computer's optical drive.
- 2) The tool for installation window (Fig. 1.1) will be displayed.





(The window displayed may vary depending on the version, DVD data, etc.)

\* What to do if the tool for installation window (Fig. 1.1) is not displayed

If the data installation selection window (Fig. 1.1) is not displayed even when the DVD-ROM is inserted, display the window according to the process below.

a. Using Explorer, etc., display a list of the folders in the DVD-ROM. Figure 1.2 is displayed.



Fig. 1.2 List of Folders, etc., in the DVD-ROM

b. Double-click to mathematical display the tool for installation window (Fig. 1.1).

- [2] Installation of the PC software for XSEL.
  - 1) Select "English" on the tool for installation window (Fig. 1.3) and click OK.



Fig. 1.3 Tool for installation Window

 When the tool for installation window (Fig. 1.4) is displayed, select "PC Interface software for XSEL."



Fig. 1.4 Installation Window

3) Click Installarion.

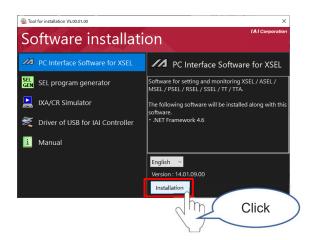


Fig.1.5 Installation Window

4) The standby window (Fig. 1.6) is displayed. Wait for the installation to launch.



Fig.1.6 Standby Window

5) Installation preparation (Fig. 1.7) begins.

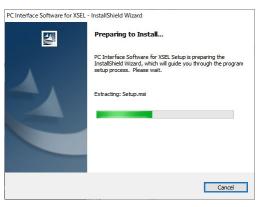
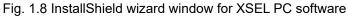


Fig. 1.7 Preparing to Install

6) InstallShield wizard window for XSEL PC software (Fig. 1.8) will be displayed. Click Next.





7) The user information registration window (Fig. 1.9) will be displayed. Enter user information and click Next.

| PC Interface Software for XSEL - InstallShield Wizard | ×      |
|---|--------|
| Customer Information                                  |        |
| Please enter your information.                        |        |
| User Name:  |        |
| USER  |        |
| Organization:   |        |
|   |        |
|   |        |
|   |        |
|   |        |
|   |        |
|   |        |
|   |        |
|   |        |
| stallShield   | _      |
| < <u>B</u> ack <u>Next</u> >                          | Cancel |
|   | n      |
| \'  |        |
|   |        |

Fig. 1.9 User Information Registration Window

8) Designate the destination for installation of the XSEL PC software (Fig. 1.10). Normally, the window as displayed is fine.

After designation, click Next.

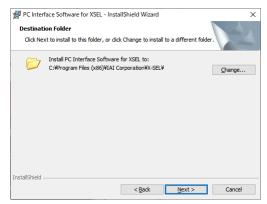


Fig. 1.10 Installation Destination Folder Designation Window

9) Click Anyone who uses this computer (all users)

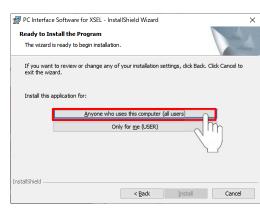


Fig. 1.11 Ready to Install Program Window

Installation begins. During installation, the window in Fig. 1.12 will be displayed.

| 🔀 PC Interf     | ace Software for XSEL - InstallShield Wizard — 🗌 🗙   |
|-----------------|--|
| Installing      | PC Interface Software for XSEL   |
| The prog        | ram features you selected are being installed.   |
| 12              | Please wait while the InstallShield Wizard installs PC Interface Software for XSEL. This may take several minutes. |
|                 | Status:  |
|                 | Updating component registration  |
|                 |  |
|                 |  |
|                 |  |
|                 |  |
|                 |  |
|                 |  |
| InstallShield - | Canada Navita Canada   |
|                 | < <u>B</u> ack <u>N</u> ext > Cancel   |

Fig. 1.12 Installing Program Window

10) When installation is complete, the window in Fig. 1.13 will be displayed. Uncheck "Launch the program" and click Finish.

| nterface |
|----------|
| nterface |
|          |
|          |
|          |
| ncel     |
|          |

Fig. 1.13 Installation Complete

- When program installation is complete, the start menu program (P) → IAI →XSEL PC software item will be displayed. Select this item to launch the software.
- 12) Eject the DVD-ROM.
- 13) After launching the program, click Help in the menu to check whether the version is the same as the DVD-ROM version.

If the version has not been updated, uninstall the program and install from the DVD-ROM again.

#### **1.3.2** How to Install Driver Software for USB Connection of XSEL2-T/TX

It is necessary to install the driver software when using USB by connecting to USB connector. <u>Make sure to prepare the stop switch in your reach when having an actuator operated by USB connection so that you can stop the actuator in an emergency case.</u>

- 1) Connect the PC to the controller using the USB cable. After connection being established, turn on the power to the controller if it is not on.
- 2) Installation process of the driver software automatically starts.

#### [Remarks]

Once the installation of the USB driver is complete, COM port gets automatically added. The way to change the COM port, refer to [1.3.3 How to change the USB COM port] (The name of the COM port is differ from the one on USB converter adapter)

| 🗂 Device Manager                                       | _       |          | ×   |
|--|---------|----------|-----|
| File Action View Help                                  |         |          |     |
| ⇐ ➡   🖬   📓   🖬   🛶   🖳   💺 🗙 🕒                        |         |          |     |
| ✓ Ⅰ<br>>   Batteries                                   |         |          |     |
| > 🛄 Computer   |         |          |     |
| > 👝 Disk drives  |         |          |     |
| > 🏣 Display adapters                                   |         |          |     |
| > PVD/CD-ROM drives                                    |         |          |     |
| > 🛺 Human Interface Devices                            |         |          |     |
| > 📷 IDE ATA/ATAPI controllers                          |         |          |     |
| > 🔤 Keyboards  |         |          |     |
| > III Mice and other pointing devices                  |         |          |     |
| > 🛄 Monitors   |         |          |     |
| V 📮 Ports (COM & LPT)                                  |         |          |     |
| USB Serial Device (COM5)  The names of COM port is "US | B Seria | al Devic | e". |
| > 🚍 Print queues                                       |         |          |     |
| > Processors   |         |          |     |
| > Software devices                                     |         |          |     |
| > 🍇 Storage controllers                                |         |          |     |
| > 🏣 System devices                                     |         |          |     |
| > 🏺 Universal Serial Bus controllers                   |         |          |     |
|  |         |          |     |

Fig. 1.14 Device Manager Window

#### 1.3.3 How to change the USB COM port

The COM port set in the installation of USB conversion adapter driver software can be changed by the following procedures.

- Click Windows Start, Setting, and Control Panel to open the Control Panel window. Double click System to open the Property window. Click and open Hardware above the System icon. Click and open Device Manager inside the Hardware folder. Double click and extend Port (COM and LPT) inside the Device Manager folder.
- Double click <u>IAI USB to UART Bridge Controller (COM?)</u>.
   (Note) COM? is the COM port number before the port is changed.

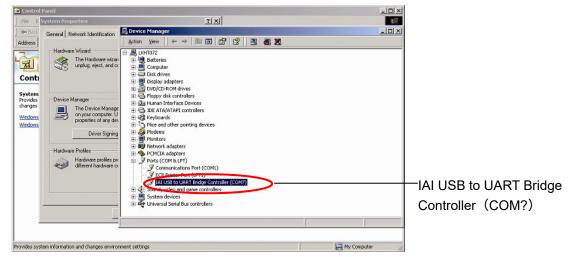


Fig. 1.15 Device Manager Window

 Property window of "IAI USB to UART Bridge Controller (COM?)" will be displayed. Click Advanced on the Property window.

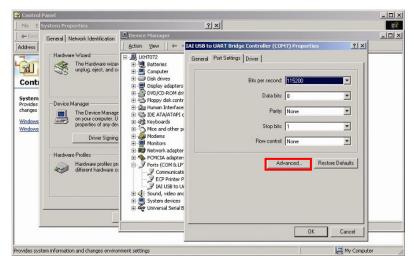


Fig. 1.16 Property Window

4) "COM? Port Option window" will be displayed.

Change the COM port number in the "COM Port Number" box to the number to be set. Click OK.

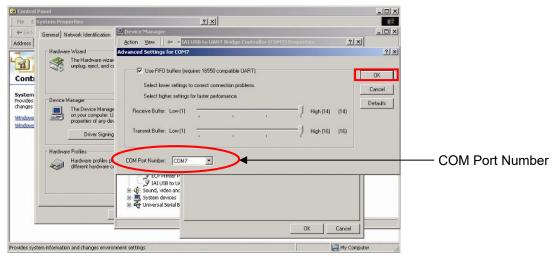
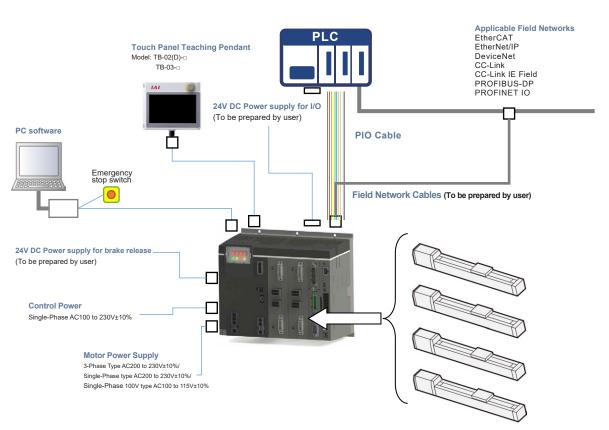


Fig. 1.17 COM? Port Option Window

- 5) "COM? Port Option window" will be disappeared.COM port number will be changed by clicking OK on the "Property window" (Fig. 1.16)
- 6) To confirm that the COM port number is changed, close the "Device Manager window" and display it again.

After confirming the change, close all windows including the "Device Manager window".

## **1.4 Connection to Controller**





### **1.5 Starting the Software (Online Connection)**

- 1) Turn off the power to the controller and PC, and connect the controller to the PC using the standard RS-232C cable or USB cable that comes with the software. Set the mode switch on the controller to the MANU side.
  - When this software is started, the "safety velocity mode is enabled (enable the safety velocity limit)".
     In this mode, the maximum velocity is limited to 250mm/sec or below in programs started from the PC software. To operate programs according to their programmed velocity commands, the "safety velocity mode must be disabled (disable the safety velocity limit)".
     Refer to [3.3 Explanation of the Toolbar] for how to enable/disable the safety velocity mode.
- 2) Turn on the power to the controller and PC, and start Windows.
- Once you start up "XSEL PC Software" from the start menu of Windows, the controller select window (figure shown below) will show up.
   Select a controller that you would like to connect to the PC or to edit data, a window conform to the selected controller should come up.

If you put a check mark on "Don't show this window again.", you will have an automatic connection to the controller with the communication setting you had last time (COM port number, baud rate, etc.) when you start it up next time.

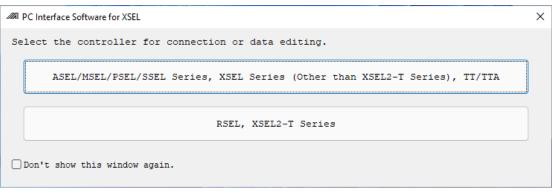


Fig. 1.19 Controller Select Window

If it is required to show this window again, remove the check mark on "When the PC Interface Software for XSEL is started up, the controller selection windows is skipped, and the controller is automatically connected with the current communication settings." in Environment Setup window for the XSEL PC software. Click OK.

\* This environmental setting is equipped for both RSEL, XSEL2-T/TX and other than RSEL, XSEL2-T/TX.

| 2021 Environment Setup  | _  |     | ×   |
|---|----|-----|-----|
| Setting Timer   |    |     |     |
| File save format selection  |    |     |     |
| (Only available in supported Controller)  |    |     |     |
| Select the format saved in the file. $\vee$   |    |     |     |
| Maximum row number of error and warning<br>before data transfer (Position Edit Window)  |    |     |     |
| Show Symbols in a Variable window, I/O window,<br>Flag window and Position editor   |    |     |     |
| Check Symbol when checking program.(When Off-line Mode  | )  |     |     |
| Allow Editing in NonMANU Mode.  |    |     |     |
| $\square$ The connection to the CTL by Ethernet is supported.   |    |     |     |
| Permit cut/copy/paste in each cell.   |    |     |     |
| Overwrite to the cursor position when you paste<br>the SEL step data.   |    |     |     |
| Search for the communication port which can be used.<br>(COM1 - COM256)   |    |     |     |
| Display the SEL command explanation window at<br>'Cmnd' column doubleclick in program edit window.  |    |     |     |
| In Connect, Check Setting of Two or more programs star<br>(Only available in supported this function)   | t. |     |     |
| Do not move the cursor to the next position<br>when the axis completes the movement at the position<br>by having pushed the MV button   |    |     |     |
| 🗹 In connect, confirm safety circuit.   |    |     |     |
| When the PC Interface Software for XSEL is started up,<br>the controller selection windows is skipped,<br>and the controller is automatically connected<br>with the current communication settings. |    |     |     |
| Prohibiting home return for axes<br>that have completed home return.  |    |     |     |
|   | OK | Can | cel |

Fig. 1.20 Environment setup Window

4) The Connection Confirmation window (Fig. 1.21) will open.

In the list boxes of "Port Name" and "Baud Rate (bps)", select the communication port (\*1) to which the XSEL2-T/TX controller is connected and an applicable baud rate (\*2), and then click OK.

| Connection Confirmation |  |            |
|-------------------------|--|------------|
| Port Name               | COM4   | ~          |
|                         |  |            |
| Baud Rate(bps)          |  | ~          |
|                         | (*)Only for XSEI   | .2 series  |
|                         | to the controller via USB,<br>constant regardless of the sett: | ing value. |
| Don't show this windo   | w again.   |            |
|                         |  |            |
|                         | OK CANCEL  |            |

- \*1 Only the communication ports that are available when the application is started can be selected.
- \*2 230,400bps Max.

Fig. 1.21 Connection Confirmation Window

 After connection gets established, multiple program simultaneous startup permission/prohibition setting window (Fig. 1.22) opens. Set whether you prohibit or permit the simultaneous starting of multiple programs during the manual mode, and click OK.

[Two or more programs start prohibition (MANU)]

It prohibits the simultaneous starting of multiple programs during the manual mode.

[Two or more programs start permission (MANU)]

It permits the simultaneous starting of multiple programs during the manual mode.

| Setting of Two or more programs start        |         |
|--|---------|
| Two or more programs start(MANU)             |         |
| Two or more programs start permission ()     | MANU) 💌 |
| Don't Show this window<br>from next time on. |         |
| OK CANCEL                                    |         |

Fig. 1.22 Multiple Program Simultaneous Startup Permission/Prohibition Setting Window

If "Don't Show this window from next time on" is checked, connection will be established with the settings at the last connection time without displaying the window in Fig. 1.22. To remove this check, select the checkbox "In Connect, Check Setting of Two or more programs start" on the Environment Setup (Online) window (Fig. 13.2) or Environment Setup (Offline) window (Fig. 13.1). The window in Fig. 1.22 will be displayed at the next startup time to remove the check.

For the Environment Setup (Online) window and Environment Setup (Offline) window, refer to [13. Tool].

If you set "Two or more programs start prohibition (MANU)" when multiple programs have already started, the warning message will be displayed. To prohibit the simultaneous starting of multiple programs, click Yes to stop all the programs.

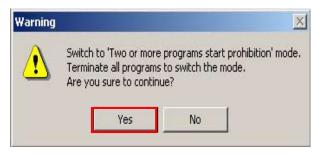


Fig. 1.23 Warning Message

- A confirmation window for the safety circuit will be displayed. Refer to [1.6 Operation System Command Restriction].
- 7) Once the controller connection is confirmed, the application will start in the online mode. If the controller cannot be recognized or <u>CANCEL</u> is clicked in this window, the application will start in the offline mode. (Even after the application has started in the offline mode, you can use the "Reconnect" function explained later to switch the application to the online mode.)

If "Don't Show this window from next time on" is selected, the software will automatically select the communication port and baud rate that were in use the last time the application was closed and check the controller connection based on these settings.

## $\triangle$

## Caution

• The open status of the TP port (teaching connector) should be as shown below depending on whether or not the servo is in use.

### <MANU mode/Servo not in use>

|                    | Before the OPEN command      | After the OPEN command                       |
|--------------------|------------------------------|--|
| TP port connection | Connected to the PC software | Forcibly switched to SEL program connection. |

Error code 414 "SIO unopened error" will occur following the OPEN command.

## <MANU mode/Servo in use>

|                    | Before the OPEN command      | After the OPEN command                            |
|--------------------|------------------------------|---|
| TP port connection | Connected to the PC software | Connection to the PC software<br>The program end. |

Error code 414 "SIO unopened error" will occur following the OPEN command. The channel number of the TP port is 0 ch'OPEN 0'

The "Caution" information provided in the above box applies to a condition where the controller is in the MANU mode and I/O parameter No. 90 is not set to "2" (IAI protocol).

#### **Operation System Command Restriction** 1.6

When connected with a controller, confirm the user if there is a stop switch to stop the actuator immediately at hand, and if there is no stop switch, the actuator operation gets controlled from the XSEL PC software. (V13.00.00.00 or later)

After display of multiple program simultaneous startup permission and prohibition setting windows, the safety circuit confirmation window will be displayed.

| Confirmation Safety Circuit   |
|---|
| You can operate the actuator by this software.<br>Do you have a safety circuit at hand<br>to stop the actuator immediately? |
| *Operation of actuator or SEL program by this software is possible only if there is a safety circuit at hand.               |
| Don't show this window from next time on.   |
| <u>Y</u> es <u>No</u>   |

Fig. 1.24 Safety circuit confirmation window

Select if there is a stop switch to stop the actuator immediately at hand prepared. Only when Yes is selected in the safety circuit confirmation window (there is a stop switch), such operations as actuator operation by the XSEL PC software and SEL program execution (operational system commands) become available.

When No is selected in the safety circuit confirmation window (there is no stop switch), such operations as actuator operation by the XSEL PC software and SEL program execution (operational system commands) become unavailable.

(Note) When the operation system commands are to be executed, 31A "Execution Condition Unsuccessful Error" or 32F "No Safety Circuit Execution Prohibited Error" is displayed.

The selected content will be shown in the main window.

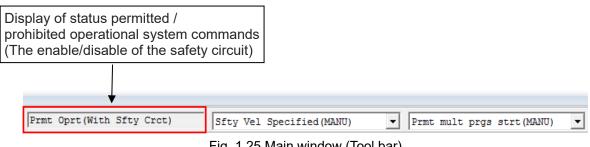


Fig. 1.25 Main window (Tool bar)

\* Put a check mark on "Don't show this window from next time on." in the safety circuit confirmation window and the safety circuit confirmation window will not show up again when the controller is connected. (Operation will be made with the setting of the previous connection) If it is required to show the safety circuit confirmation window again, put a check mark on "In connect, confirm safety circuit." in Environment Setup window.

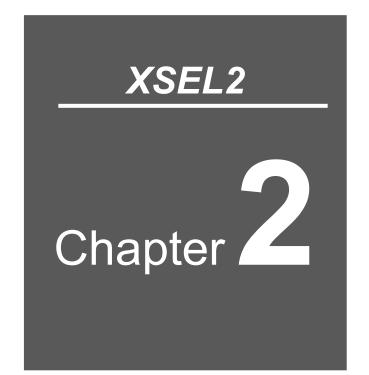
| 201 Environment Setup  | _    |     | ×    |
|--|------|-----|------|
| Setting Timer  |      |     |      |
| File save format selection<br>(Only available in supported Controller)   |      |     |      |
| Select the format saved in the file. $\vee$  |      |     |      |
| Maximum row number of error and warning<br>before data transfer (Position Edit Window)   |      |     |      |
| Show Symbols in a Variable window, I/O window,<br>Flag window and Position editor  |      |     |      |
| Check Symbol when checking program.(When Off-line Mod  | le)  |     |      |
| Allow Editing in NonMANU Mode.   |      |     |      |
| $\hfill\square$ The connection to the CTL by Ethernet is supported.  |      |     |      |
| Permit cut/copy/paste in each cell.  |      |     |      |
| Overwrite to the cursor position when you paste<br>the SEL step data.  |      |     |      |
| Search for the communication port which can be used.<br>(COM1 - COM256)  |      |     |      |
| Display the SEL command explanation window at<br>'Cmnd' column doubleclick in program edit window.   |      |     |      |
| ✓ In Connect, Check Setting of Two or more programs sta<br>(Only available in supported this function)   | art. |     |      |
| Do not move the cursor to the next position<br>when the axis completes the movement at the position<br>by having pushed the MV button  |      |     |      |
| ✓ In connect, confirm safety circuit.  |      |     |      |
| When the PC Interface Software for XSEL is started up<br>the controller selection windows is skipped,<br>and the controller is automatically connected<br>with the current communication settings. | ),   |     |      |
| Prohibiting home return for axes<br>that have completed home return.   |      |     |      |
|  | OK   | Car | ncel |

Fig. 1.26 Environment setup Window

\* When Yes was selected in the previous safety circuit confirmation window and a check mark was put on "Don't show this window from next time on.", a warning message shown in the figure below will be displayed when a controller is connected.

| ſ | Warning   |   |
|---|---|---|
|   | Operation of actuator or SEL program by this software is permitted no   | ът.   |
|   | *If you don't have a safety circuit at hand to stop the actuator imm-<br>for prevention of danger, check the "In connect, confirm safety cir<br>in the "Environment Setup" window, reconnect with the controller<br>and select "No" in the "Confirmation Safety Circuit". | Click this button and<br>Environment Setup window |
|   | Environment Setup 0   | opens.  |
|   |   |   |

Fig. 1.27 Warning Message (When Operational System Commands Permitted)



# How to Save Data

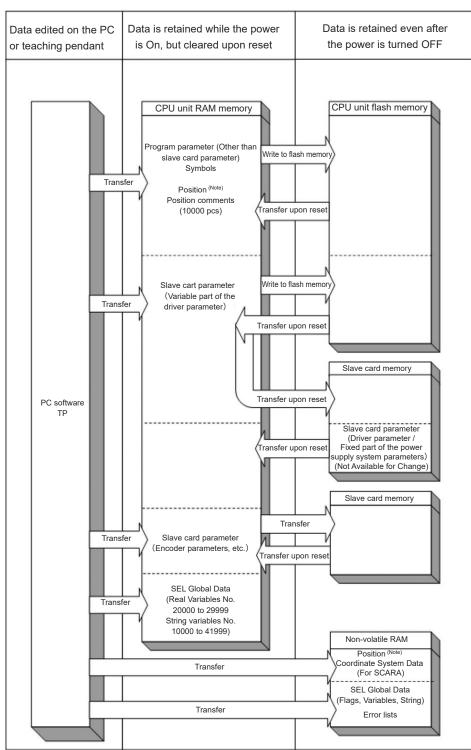
| 2.1 | XSEL2     |   |
|-----|-----------|---|
| 2.2 | Notes 2-3 | 3 |

## 2.1 XSEL2

In the controller, there are storage domains in the non-volatile RAM (FRAM) and storage domains in the flash memory depending on the type of data to be stored.

Also note that transferring data from the PC software or teaching pendant to the controller will only write the data in the controller's memory, as illustrated below, and the data will be cleared once the controller power is turned off or the controller is reset.

To save important data, always write it in the flash memory.



Since programs, parameters and symbols are loaded from the flash memory upon restart, these data in the temporary memories will return to the conditions before editing unless written to the flash memory.

The controller always operates according to the data in main CPU memory (excluding parameters).

(Note) The position data from No. 1 to 5000 should be stored in the non-volatile RAM and the remaining should be stored in the flash memory.
 When there are two axis groups, No. 1 to 2500 should be stored in the non-volatile RAM and the remaining should be stored in the flash memory.

2. How to Save Data

## 2.2 Notes

Note on transferring data and writing it to the flash memory:

Never turn off the main power while data is still being transferred or written to the flash memory.

The data may be lost and the controller operation may be disabled.

Note on saving position data:

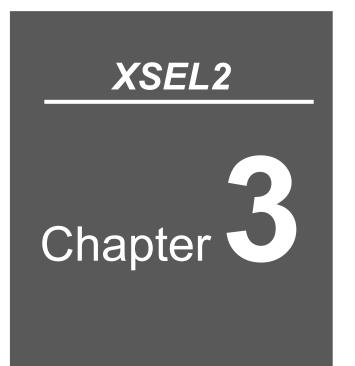
The domains to save the position data are the non-volatile RAM for the position data No.1 to 5000 and the flash memory for the remaining.

The position data comments are to be saved in the flash memory.

Therefore, if the power is turned OFF or the software is reset without writing into the flash ROM, the data and the position data comments saved in the flash memory should be

erased and the data written to the flash ROM previously should get read in.

Write it to the flash ROM if you wish to retain the data.



# Menu Window

| 3.1 | Explanation of the Menu ······3-1     |
|-----|---------------------------------------|
|     | 3.1.1 Online Window                   |
| 3.2 | Explanation of the Commands ······3-2 |
| 3.3 | Explanation of the Toolbar            |
| 3.4 | Tree View                             |
| 3.5 | Controller Monitor                    |

## 3.1 Explanation of the Menu

## 3.1.1 Online Window

#### [1] XSEL2-T/TX controller

When this software has been started, the main window in Fig. 3.1 will open showing the menu items with icons on the tool bar in the case of the XSEL2-T/TX controller.

The tree view appearing on the left side of the window can be displayed by clicking "View (V)" from the menu bar and then selecting "Tree View (T)". (Initial window: Main menu)

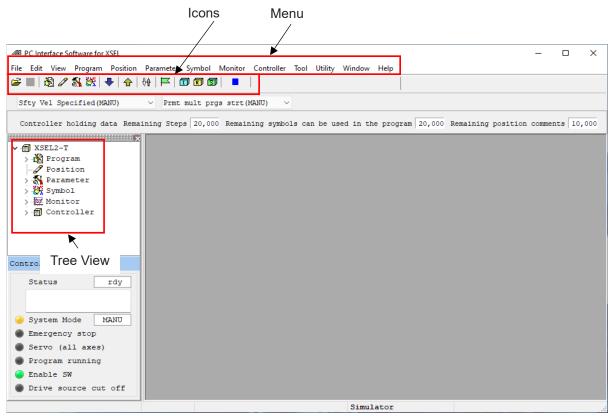


Fig. 3.1 Online Window (XSEL2-T/TX Controller)

## 3.2 Explanation of the Commands

## [1] File (F)

- (1) New (N) Create new SEL data.
  - Program (S) Open the edit window for creating a new program.
  - Position (O) Open the edit window for creating new position data.
  - Symbol (Y) Open the edit window for creating new symbol data.
  - Coordinate System (D) Open the edit window for the new coordinate system definition data.

| Target selection | ×            |
|------------------|--------------|
| Controller Type  | XSEL2-T V    |
| Number of Axes   | 8 ~          |
| 🗌 For 6-axis car | tesian robot |
| OK               | Cancel       |

Fig. 3.2 Target Select Window

The Target Select Window (Figure 3.2) should open. Select controller type and axis quantity (necessary to select when creating position data only).

- \* The created data should be stored in the file format (Refer to List of Supported Models in the front page) in accordance with the target selected here.
- (2) Open (O)
- (3) Close (C) Close the
- (4) Close All (L)
- (5) Save (S)
- (6) Save as (A)

- Load data currently saved in a file.
- Close the currently active window.
- Close all the windows.
- Save the data in the active edit window by overwriting the corresponding file.
- Save the data in the active edit window to a different file under a desired name.

#### (7) Print Setup (P) S

Set the print font and printer.

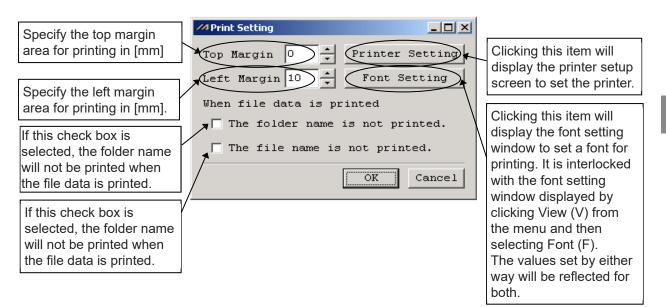


Fig. 3.3 Print Setting Window

- (Note) If you restart the controller, settings will return to the default values shown below.
  - Upper margin: 0mm
  - Left margin: 10mm
  - Font: Font in PC Software Itself (\*)
  - Style: Standard
  - Size: Font size in PC Software Itself
  - \* The font and font size in the PC software can be set in "Display"  $\rightarrow$  "Font" in the menu.
- (8) Recent Files (D)

Display a list of files most recently loaded to the software, where you can select and load desired files.

(9) Exit (X) Close the application.

## [2] Edit (E)

This menu lets you perform auxiliary operations used in editing data.

(1) Undo (U) Up to the most recent 10 operations can be canceled. However, they cannot be canceled when you perform any of the following

operations:

- Transfer of data on the editing window such as the program edit window to the controller
- Saving of data on the editing window such as the program edit window in a file
- Closing of the editing window such as the program edit window

The following are the operations for which this function is enabled:

|                                       | Input | Line insertion | Line<br>Deletion | Cut | Paste |
|---------------------------------------|-------|----------------|------------------|-----|-------|
| Program Edit Window                   | 0     | 0              | 0                | 0   | 0     |
| Position Edit Window                  | 0     | -              | -                | 0   | 0     |
| Symbol Edit Window                    | 0     | -              | -                | 0   | 0     |
| Parameter Edit Window                 | 0     | -              | -                | -   | -     |
| Coordinate System Data Edit<br>Window | 0     | -              | -                | -   | -     |

When this operation is performed, and the warning window below will be displayed. Clicking Yes will cancel the operation executed immediately before.

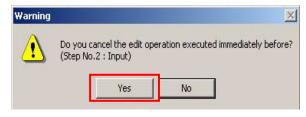


Fig. 3.4 Warning

- (2) Cut (T) Cut the data at the cursor line in the edit window.
- (3) Copy (C) Copies the data at the cursor line in the edit window.
- (4) Paste (P) Paste the copied or cut data to the cursor line in the edit window.
- (5) Find (F) Find a specified character string.
- (6) Find Next Match (S) Find the character string specified in (5) again, starting from the cursor line position.

## [3] View (V)

This menu lets you set options relating to window views. (Refer to [3.4 Tree View]).

- (1) Tree view (T) Show/hide the tree view that appears on the left side of the main window.
- (2) Font (F) Set the font of text shown in the windows.

[4] Program (S)

This menu lets you perform operations relating to programs. (Available only in the online mode.) (Refer to [4. Program Edit Window]).

| (1) Edit (E)               | Load a selected program from the controller for editing.           |  |  |
|----------------------------|--|--|--|
|                            | Cycle time can be measured.  |  |  |
|                            | Refer to [4.5 Cycle Time Measurement]                              |  |  |
| (2) Copy/Move (C)          | Copy/move (cut & paste) a program                                  |  |  |
| (3) Clear (L)              | Clear a program.   |  |  |
| (4) Save File AS (S)       | Save a selected program or all programs to a file under a desired  |  |  |
|                            | name.  |  |  |
| (5) Stop All Operations (T | ) End all programs and operations that are currently running/being |  |  |
|                            | performed.   |  |  |
| (6) SEL Program Assista    | nt (A) Start up SEL Programming Support Tool.                      |  |  |
|                            |  |  |  |

[5] Position (O)

This menu lets you operate position data. (Available only in the online mode.) (Refer to [6. Position Data Edit Window]).

(1) Edit (E)

Load position data from the controller for editing.

(2) Copy/Move (C)

Copy/move (cut & paste) position data.

(3) Clear (L)

Clear position data.

\* It is not available to select clear items when XSEL2-T/TX connected.

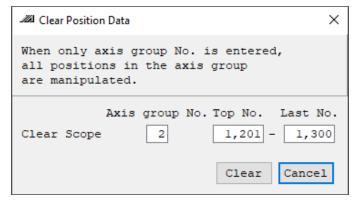


Fig. 3.5 Clear Position Data Window

(4) Save File AS (S)

Save position data.

## [6] Parameter (P)

This menu lets you operate parameters. (Available only in the online mode.) (Refer to [8. Parameter Edit Window]).

(1) Edit (E) Load position parameters from the controller for editing.

(2) Easy Parameter Setup (S) Parameter edit is to be conducted in the setting window of each feature for those features listed below.

- RS-232C
- IAI Protocol Multiple Channels
- Fieldbus (CC-Link, DeviceNet, PROFIBUS-DP, EtherCAT, PROFINET IO, CC-Link IE Field)
- Ethernet
- Vision System

(3) I/O Output Setting (I)

The I/O output setting is a feature to perform this monitor setting easily. Also, it is available to establish the settings for the input feature select and the output feature select.

[7] Symbol (Y)

This menu lets you operate symbol data. (Available only in the online mode.) (Refer to [9. Symbol Edit Window]).

- (1) Edit (E) Load symbol data from the controller for editing.
- (2) Clear All (C) Clear all symbol data.

#### [8] Coordinate System (D)

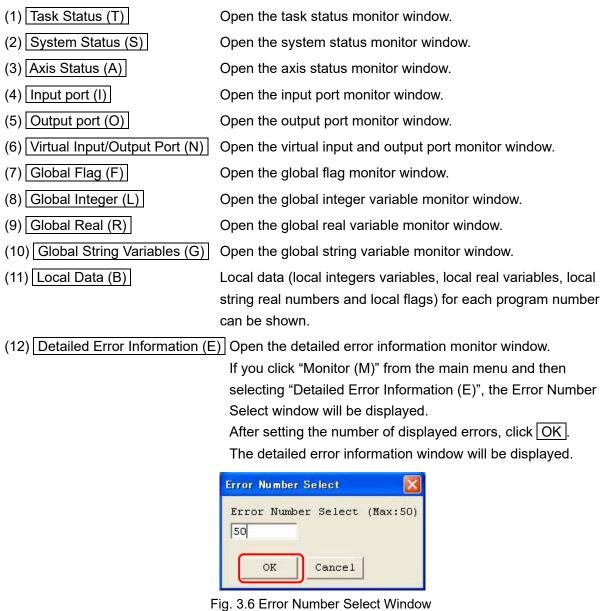
It should be displayed when XSEL2-TX is connected..

Edit the coordinate system definition data. (Available only in the online mode.) (Refer to [10. Coordinate System Definition Data edit Window]).

- (1) Edit (E) Load the coordinate system definition data from the controller and edit the data.
- (2) Clear (L) Clear the coordinate system definition data.

[9] Monitor (M)

This menu lets you monitor various statuses, global variables, port statuses, and so on. (Available only in the online mode.) (Refer to [11. Monitor]).

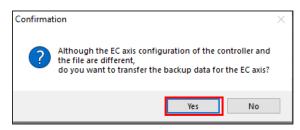


- (13) Maintenance Information (X) Open the maintenance information monitoring window.
- (14) Servo Addition Datamonitor (V) The data of the monitoring type that the controller supports should be displayed at once for each axis group.
- (15) Monitoring Data (M) Open the monitoring data window.

[10] Controller (C)

#### This menu lets you perform operations relating to the controller, such as executing a software reset or resetting controller errors. (1) Reconnect (C) Reestablish communication with the controller. If the software is currently in the offline mode but is able to establish communication with the controller, selecting this menu item will switch the software to the online mode. (2) Change Baud Rate (B) Change the baud rate used for communication between the controller and PC. (3) Off-line work (Port Close) (O) (4) Axes Setting (G) The construction of the driver unit that is connected should be displayed. Assignment of axes can be changed individually. (5) SEL global data backup (G) Save to File (S) Can save global flags, global integer variables, global real variables, and global strings. Transfer to Controller (L) Can transfer global flags, global integer variables, global real variables, and global strings to the controller. (6) All Data Backup (X) • Save to File (S) Save all program, position, symbol, parameter, coordinate system definition data (only if available to edit) and global data in the controller.

The following confirmation window will be displayed if an ELECYLINDER axis is still connected after saving backup files. Select Yes to save all ELECYLINDER axes in a file named "Backup File Name + \_Axis + Axis number."



#### Fig. 3.7 Message to confirm saving all ELECYLINDER axes

The following window will be displayed next. Select Yes to save the error list to a separate file.

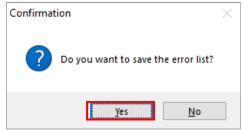


Fig. 3.8 Error List Save Confirmation Message

## [10] Controller (C) (6) All Data Backup (X) (continued)

- Open File (O)
  - In the Transfer / Select Divided Data window, data transfer to a controller, file division for all data and referring to data can be conducted.

| Backup.rsbk  | ×  |
|--|----|
| Select Data Information                                      |    |
| File comment RSEL Backup File                                |    |
| Please Select Transfer or Split Data                         |    |
| Program Transfer to Controller                               |    |
| Position Split File  |    |
| Parameter  |    |
| Symbol   |    |
| Coordinates  |    |
| 🗹 Global data  |    |
|  |    |
| Backup.rsbk  | ×  |
| Select Data Information                                      |    |
| File save date 2020/01/29 16:05:30                           |    |
| Controller main application version V1.00 2020/01/27 12:00:0 | .0 |
| Controller serial number A08178050                           |    |
| Tool version 14.00.00.00 2020/01/27                          |    |
|  |    |
|  |    |
|  |    |
|  |    |
|  |    |
|  |    |

Fig. 3.9 Backup Window

## [10] Controller (C) (6) All Data Backup (X) • Open File (O) (continued)

Click on the Transfer to Controller, and the selected data should be transferred to the controller. Click on the Divide File, and the selected data should be individually saved in files. Drag & drop All Data Backup File to the window for the XSEL PC software and the backup

window should open.

#### [Caution]

Data transfer to controller is not available in the following cases.

#### Table: Condition Backup Data Transfer Unavailable (XSEL2-T/TX)

| Data type | Transfer unavailable conditions  |
|-----------|--|
| Parameter | <ul> <li>The axes setting does not match between the file data and the controller.<br/>(Activated axes pattern and Number of activated axes groups)</li> </ul>   |
| Position  | <ul> <li>The axes setting does not match between the file data and the controller.<br/>(Number of activated axes groups)<br/>The position cannot be transferred also when the maximum valid axis number on<br/>the controller is larger than the maximum valid axis number in the file data.</li> <li>* When the data is transferred with parameters at the same time, transfer to the<br/>controller is available even with the condition above.</li> </ul> |
| EC        | <ul> <li>There is no EC backup file ("Backup file name + _Axis + Axis number") available for transfer.</li> <li>MANU Mode and EC I/O command permitted at the same time</li> <li>ROBO Pump in operation</li> </ul>   |

The following section explains about "Transfer to Controller" and "Divide File." and "View/Edit".

Transfer to Controller
 On the Data Transfer/Division Selection Window, click

 Transfer to Controller
 On the Data Transfer/Division Selection Window, click

 Transfer to Controller
 The File Setup Window will appear.
 Select Backup All Saved Data (all data including programs, positions, etc.) and transfer to the controller. (If you are not selecting, click □ to select the data to be transferred. The selected data will be marked with ✓.)
 (Note) When transferring parameters, they should not be transferred if the parameters written in the controller and the axis patterns do not match with each other.
 Divide Files
 The backup data (all data including program and position) can be divided into program, position, parameter, symbol, coordinate system and global data.

Click Divide Files on the Transfer/Divide data selection window. The program, position, parameter, symbol and global data are displayed in order on the File Save Window. Save them with a file name.

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## [10] Controller (C) (6) All Data Backup (X) (continued)

- Browse/Edit The Edit window for the selected data should be displayed.
  - \* Each data can be saved individually to a file in the displayed Edit window. However, it is not available to overwrite a backup file.
  - \* The global data is for viewing only.
  - \* The backup data for the EC axis should not be displayed.

## [10] Controller (C) (continued)

(7) Write Flash ROM (W)

Clear the data areas in the flash ROM and then write the data saved in the controller's RAM to the flash ROM.

\* There is a limit in the number of writing to the flash ROM (write limit: about 100,000 times).
 If you do not want to write all the data, select "Select the data range" and write to the flash ROM.

| PC Interface Software for XSEL | Х |
|--------------------------------|---|
| Write Flash ROM?               |   |
| 🗹 Program                      |   |
| Symbol                         |   |
| Position                       |   |
| Parameter                      |   |
| Position" always selected.     |   |
| <u>Y</u> es <u>N</u> o         |   |

Fig. 3.10 Confirmation

(8) Initialize Memory (I)

Position (O)

Clear all position data.

- (Note) If 60A "Position Data Error" occurs, use this command to initialize the position data.
- (Note) 20B "Position Data Error" will occur if the software is reset or power is turned OFF after this operation without writing the position data to the flash ROM first when connection is established.
- Coordinate System Definition Data (C)

Clear all coordinate system definition data.

It should be displayed when XSEL2-TX is connected.

Clear all global variables and flags to zero.

- (Note) If 623 "Coordinate System Error" occurs, use this command to initialize the coordinate system definition data.
- Global Val./Flag (V)

Parameter of Shipping (S)

Memory for PLC (L)

will become available by inputting a password. Refer to [8.5 How to Initialize Parameter (at the time of shipment)].

Can return parameters to the ones at the time of shipment. This item is not displayed normally. It is a function which

The PLC data (user data, program, etc.) should be initialized.

| [10] Controller (C) (continued)                  |  |  |  |  |
|--|--|--|--|--|
| (9) Abs. Encoder Reset (A) Reset the a           | bsolute data. It should be displayed when XSEL2-TX   |  |  |  |
| is connecte                                      | d.   |  |  |  |
| (10) Abs. Encoder Reset(Scara)(&Q) (Q)           | The absolute data of a SCARA axis should be          |  |  |  |
|  | reset. It should be displayed when XSEL2-TX is       |  |  |  |
|  | connected.   |  |  |  |
| (11) Abs. Encoder Reset(Line)(&A) (A)            | The absolute data of an Orthogonal axis should be    |  |  |  |
|  | reset. It should be displayed when XSEL2-TX is       |  |  |  |
|  | connected.   |  |  |  |
| (12) Software Reset (R) Execute softw            | are reset of the controller.                         |  |  |  |
| (13) Reset Error (E) Reset errors p              | present in the controller.                           |  |  |  |
| (14) Request Drive Power Recovery (P)            | Issue a request drive power recovery to the          |  |  |  |
|  | controller.  |  |  |  |
| (15) Request Release Pause (L)                   | Issue request release pause to the controller.       |  |  |  |
| (16) Collision Detection Function Setting (D     | ) Enable / disable of SCARA Robot Collision          |  |  |  |
|  | Detection Feature should be set up. It should be     |  |  |  |
|  | displayed when XSEL2-TX is connected.                |  |  |  |
|  |  |  |  |  |
| Collision Detection Function Setting             | ×  |  |  |  |
| Click the axis button to switch the enable /     | disable setting of the collision detection function. |  |  |  |
| Status<br>Jl Axis (1st Arm) Switch Non-effective |  |  |  |  |
| J2 Axis (2nd Arm) Switch Non-effective           |  |  |  |  |

| CIICK the axis button to switch the enable / | disable secting | g of the collision | detection function. |
|--|-----------------|--------------------|---------------------|
| Status                                       |                 |                    |                     |
| Jl Axis (1st Arm) Switch Non-effective       |                 |                    |                     |
| J2 Axis (2nd Arm) Switch Non-effective       |                 |                    |                     |
| Vert.Axis Switch Non-effective               |                 |                    |                     |
| Rot.Axis Switch Non-effective                |                 |                    |                     |
| Enable All Axes Disable All Axes             |                 |                    |                     |
|  |                 |                    |                     |

Fig. 3.11 Setup Collision Detection Feature

(17) Compliance Mode Release (M)

(18) Brake Operation (B)

Compliance Mode (compliance control) of SCARA Robot should be released.

Compulsory release / lock of a brake should be conducted.

| 🔳 Brake o | peration   |           |            | ×   |
|-----------|------------|-----------|------------|---|
| Be care   | ful not to | pinch you | ur hand or | ally oriented actuator,<br>ot dropped by gravity. |
|           | Brake Op   | eration   | Status     |   |
| Axisl     | Release    | Lock      | Lock       |   |
| Axis2     | Release    | Lock      | Lock       |   |
| Axis3     | Release    | Lock      | Lock       |   |
| Axis4     | Release    | Lock      | Lock       |   |
|           |            |           |            |   |

Fig. 3.12 Brake Operation

#### [10] Controller (C) (18) Brake Operation (B) (continued)

- \* The moving part being dropped may cause injury or damage on the actuator main body, workpiece or equipment. Pay special attention on it.
- \* Make sure to lock the brake without failure after a work is finished.
- \* When the Release Brake window is closed, or the servo is on, the brake compulsory release should automatically get disabled.
- (19) Time Setting Set the time.

## (20) Version Information (V) Show the various version information regarding the controller.

Select "Controller (C)"  $\rightarrow$  "About Version (V)" in the menu. Version information is displayed for the controller, driver, encoder, EC axis, and I/O slot.

| Version Information             |           |              |                     |   |
|---------------------------------|-----------|--------------|---------------------|---|
| Main Driver Enc                 | oder EC J | xis   I/O SI | lot                 |   |
| Type                            | Version   | Unit Code    | Date                |   |
| Main_A                          | V1.01     | 74           | 2024/08/08 00:00:00 |   |
| Board ID                        | 0000h     |              |                     |   |
| FAN_SVP                         | V1.00     | 00           | 00/00/00 00:00:00   |   |
| Power supply unit               | V0.16     | 00           | 00/00/00 00:00:00   |   |
| Version V1.01<br>Date 2024/08/0 | 8 00:00:0 | Unit Cod     |                     |   |
|                                 |           |              | 0                   | ĸ |

#### Fig.3.13 Controller-related version information

| Version Information            |              |              |                   |
|--------------------------------|--------------|--------------|-------------------|
| Main Driver                    | Encoder   EC | Axis   I/O S | lot               |
| Axis No.                       |              | Unit Code    | Date              |
| Unit1Drv1[Axis                 | 1] VO.00     | 00           | 00/00/00 00:00:00 |
| Unit1Drv2[Axis                 | 2] V0.00     | 00           | 00/00/00 00:00:00 |
| Unit2Drv1[Axis                 | 3] V0.00     | 00           | 00/00/00 00:00:00 |
| Unit2Drv2[Axis                 | 4] V0.00     | 00           | 00/00/00 00:00:00 |
| Version   V0.00<br>Date   00/0 | 0/00 00:00:  |              | ode 00            |
|                                |              |              |                   |

Fig. 3.14 Driver-related version information

## [10] Controller (C) (20) Version Information (V) (continued)

| Axis No.                                    | Version   | Unit Code | Date                      | Serial code | Function Ver   | Axis type | User memo |
|---|-----------|-----------|---------------------------|-------------|----------------|-----------|-----------|
| nitlDrvl[Axisl]                             |           |           | 00/00/00 00:00:00         |             | ,,             |           |           |
| nit1Drv2[Axis2]                             | 0000h     | 00        | 00/00/00 00:00:00         |             |                |           |           |
| nit2Drv1[Axis3]                             | 0000h     | 00        | 00/00/00 00:00:00         |             |                |           |           |
| nit2Drv2[Axis4]                             | 0000h     | 00        | 00/00/00 00:00:00         |             |                |           |           |
| Axis No. Uni<br>Version 00000<br>erial code | tlDrvl[Ax | - T       | Unit Code 00<br>ction Ver | Date 00/0   | 00/00 00:00:00 |           |           |
| Version 0000                                | _         | - T       |                           | Date 00/0   | 00/00 00:00:00 |           |           |
| Version 00000                               | _         | - T       |                           | Date 00/0   | 00/00 00:00:00 | í<br>     |           |



| Version Info  | rmation    |          |           |            |             |           |            |             |             | × |
|---|------------|----------|-----------|------------|-------------|-----------|------------|-------------|-------------|---|
| Main Dr   | iver   End | coder EC | Axis I/O  | Slot       |             |           |            |             |             |   |
| Slot No.  | Drv No.    | EC No.   | Version   | Core part  | Serial code | PCB type  | Mfg. info. | ABS version | I/F Version |   |
| 1   | 0          | 1        | ECO1000Eh | EC080001h  | B10237815   | 28018361h | 30463031h  | 00000023h   | 00000004h   |   |
| 1 1 2 EC01000Bh EC080001h B10426575 28018361h 30463036h 00000023h 00000006h |            |          |           |            |             |           |            |             |             |   |
|   |            |          |           |            |             |           |            |             |             |   |
|   |            |          |           |            |             |           |            |             |             |   |
| Slot N  | No. 1      | Drv No.  | 0         | EC No. 1   | Ī           |           |            |             |             |   |
| Versi   | ion EC01   | OOOEh    | Co        | re part EC | 080001h     |           |            |             |             |   |
| Serial co   | de B10     | 237815   |           |            |             |           |            |             |             |   |
| PCB ty  | /pe 28018  | 8361h    | Mfg       | . info. 30 | 463031h     |           |            |             |             |   |
| ABS versi   | on 0000    | 0023h    | I/F       | Version 00 | 000004h     |           |            |             |             |   |
|   | ,          |          |           | ,          |             |           |            |             |             |   |
|   |            |          |           |            |             |           |            |             |             |   |
|   |            |          |           |            |             |           |            |             |             |   |
|   |            |          |           |            | OK          |           |            |             |             |   |
|   |            |          |           |            |             |           |            |             |             |   |



| Version Information                  |
|--------------------------------------|
| Main Driver Encoder EC Axis I/O Slot |
| Slot Version                         |
| I/O Slot 1 V00.00.00                 |
| I/O \$1ot 2 V00.00.00                |
|                                      |
|                                      |
| Slot I/O Slot 1                      |
| Version 000.00.00                    |
|                                      |
|                                      |
|                                      |
|                                      |
|                                      |
|                                      |
|                                      |
| OK                                   |
|                                      |

Fig. 3.17 I/O Slot-related version information

When the actuators support the actuator identification feature, it is available to edit the user memo.

(Rewrite the user memo by pressing Update .)

## [11] Tool (T)

This menu lets you specify settings relating to this application.

(1) Environment Setup (S) Set items that define how the application is run.

## [12] Utilities (U)

(1) SEL Program Assistant (A) Start up SEL Programming Support Tool.

## [13] EC(E)

(1) Teaching Tool (T)

Start up the EC teaching tool.

## [14] Window (W)

This menu lets you change how the windows are displayed.

(1) Cascade (C)

Cascade all open windows diagonally from top to bottom. Arrange all open windows vertically without overlapping.

- (2) Tile Vertically (V)
- (3) Tile Horizontally (H)
- (4) Minimize All (M)
- (5) Make to Window (N)
- (6) Arrange Icons (A)

Arrange all open windows horizontally without overlapping.

Minimize all open windows (reduce them to icons).

Make all minimized windows (window icons) to windows.

Arrange minimized windows (window icons).

## [15] Help (H)

- (1) Tool Version Information (A) Show the version information of this software.
- (2) Search for Error Countermeasures (T) Shows the error countermeasure search window. Select "Help (H)"  $\rightarrow$  "Search for Error Countermeasures (T)" in the menu. Following Search for Error Countermeasures window is displayed.

| © 551 bookdwards ×<br>© trigitish ~<br>Troubleshooter   | Select XSEL2 in <u>Combo Box</u> in the left of the window.<br>Input an error code in three digits of hexadecimal numbers to <u>Text Box</u> located in the right center of the window.               |
|---|---|
| Error Code Search<br>XSEL2 Ceres: 61A Composition.<br>Copyright (c) 7022 IAI Composation.<br>Version 2.0.0.0  | Click () on the right side of Text Box and the error countermeasure window for the input error code should be displayed.  |
| XOLIFCOMMANY     Err Info     Check model num. Contact Support     Err Accurate The Cold start     Name Overload error     Descr. Actuator's operating condition exceeded the rating, or the     external force applied to the actuator's slider part made the     overload of the motor. | Click Troubleshoot and the error<br>countermeasure window should be displayed.<br>Follow the instruction in the window to remove the<br>cause of the error. (Refer to [16. Error<br>Countermeasures]) |
| Troubleshoot  | Click 🟠 and the screen goes back to the error countermeasure search window.   |

Fig. 3.18 Search for Error Countermeasures

## 3.3 Explanation of the Toolbar

This section explains the toolbar (Fig.3.19) shown at the top of the main window (below the menu bar).

|   | <u> </u> | । 🗞 🖉 🖏 👯   🗣   🏠   🙌                     | I I 🗊 🕅 🕅        | 0   💻   🌆  |
|---|----------|---|------------------|--|
|   |          | Fig. 3.19 Tool                            | bar              | Sfty Vel Specified(MANU) 🗸                                   |
|   |          |   |                  | Prmt mult prgs strt(MANU) $\qquad \lor$                      |
|   |          |   |                  | EC I/O Command Prohibited $\qquad \lor$                      |
| ſ | Z        | Open File                                 | Same as File (F) | $\rightarrow$ Open (O)                                       |
| 1 |          | Save                                      | Same as File (F) | $\rightarrow$ Save (S)                                       |
| 1 | <b>B</b> | Edit Program                              | Same as Program  | $n(S) \rightarrow Edit(E)$                                   |
|   | Ĵ        | Edit Position                             | Same as Position | $(O) \rightarrow Edit(E)$                                    |
|   | 1        | Edit Parameter                            | Same as Parame   | ter (P) $\rightarrow$ Edit (E)                               |
| į | Ø£       | Edit Symbol                               | Same as Symbol   | $(Y) \rightarrow \boxed{\text{Edit (E)}}$                    |
| - | 抖        | Edit Coordinate System Definition<br>Data |                  | ate System (D) → Edit (E)<br>yed when XSEL2-TX is connected. |
| • | ₽        | Monitor Input Port                        | Same as Monitor  | $(M) ] \rightarrow [Input Port (I)]$                         |
|   | ি        | Monitor Output Port                       | Same as Monitor  | (M) $\rightarrow$ Output Port (O)                            |
|   | ₿\$      | Monitor Virtual Input/Output Port         | Same as Monitor  | (M) $\rightarrow$ Virtual Input/Output Port (N)              |
| ł |          | Monitor Global Flag                       | Same as Monitor  | (M) $\rightarrow$ Global Flag (F)                            |
| 1 | ī        | Monitor Global Integer Variable           | Same as Monitor  | (M) $\rightarrow$ Global Integer (L)                         |
| ſ | R        | Monitor Global Real Variable              | Same as Monitor  | (M) $\rightarrow$ Global Real (R)                            |
| ſ | S        | Monitor Global String Variable            | Same as Monitor  | (M) $\rightarrow$ Global String Variables (G)                |
|   |          | End All Operations                        | Same as Program  | $n(S) \rightarrow Stop All Operations (T)$                   |

| Sfty Vel Specified(MANU) $\vee$ | <ul> <li>Enable/disable the safety velocity limit when in the MANU (manual) mode.</li> <li>[Safety Vel Specified (MANU)] Enable the safety velocity limit (the maximum speed will be limited to 250 mm/s or below regardless of program or parameter settings).</li> <li>[Safety Vel Not Specified (MANU)] Disable the safety velocity limit.</li> </ul>  |
|---------------------------------|---|
| Prmt mult prgs strt(MANU) V     | <ul> <li>Permit/prohibit the simultaneous starting of multiple programs in the MANU (manual) mode.</li> <li>[Prhbt mult prgs strt (MANU)] <ul> <li>Prohibit the simultaneous starting of multiple programs in the MANU mode.</li> </ul> </li> <li>[Prmt mult prgs strt (MANU)] <ul> <li>Permit the simultaneous starting of multiple programs in the MANU mode.</li> </ul> </li> </ul>  |
| EC I/O Command Prohibited       | <ul> <li>Permit/prohibit sending I/O commands to ELECYLINDER axes.</li> <li>[EC I/O Command Prohibited(MANU)] <ul> <li>Prohibit sending I/O commands to ELECYLINDER axes.</li> <li>Select this when performing tasks such as using the EC teaching tool to perform teaching.</li> </ul> </li> <li>[EC I/O Command Permission (MANU)] <ul> <li>Permit sending I/O commands to ELECYLINDER axes.</li> <li>Select this when controlling ELECYLINDER axes from the I/O port.</li> </ul> </li> </ul> |

## 3.4 Tree View

You can display easily various data edit windows in the online mode by double-clicking the corresponding items displayed in the tree view (Fig. 3.12) that appears on the left side of the main window.

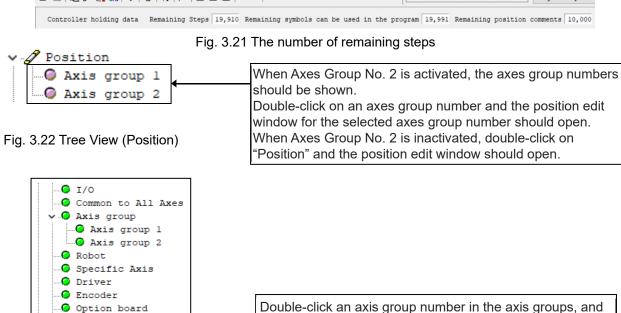
You can show or hide the tree view by clicking "View (V)" from the menu bar and then selecting "Tree View (T)".

| ✓ 1 Program<br>□ 1 (3) [PRG 01] | Unregistered programs  |
|---------------------------------|--|
| [] 2 (0) [PRG_02]               | Currently registered programs  |
| 3 (1) [PRG_03]                  | Number of registered steps in()<br>Program name in[] (if a symbol is registered) |
|                                 |  |

Fig. 3.20 Tree View (Controller model, Program)

In XSEL2-T/TX, the number of remaining steps should not be displayed in the tree view. (It should be displayed in the main window.)

| Eile | Edit | View | Program | Position     | Parameter | Symbol | Monitor | Controller | Tool | Window | Help |                            |                |
|------|------|------|---------|--------------|-----------|--------|---------|------------|------|--------|------|----------------------------|----------------|
| 2    |      | 1    | SV 104  | <b>₽</b>   ♠ | ₩   🖛   🕯 | 7 🗊 🕤  | 0 -     | 1          |      |        |      | Prmt Oprt (With Sfty Crct) | Sfty Vel Speci |



Edit Parameter for the axis group number that was double-

clicked and the parameter type should be displayed.

Fig. 3.23 Tree View (Parameter)

O PLC

🙆 Other

(System Reserved)

(System Reserved)

3. Menu Window

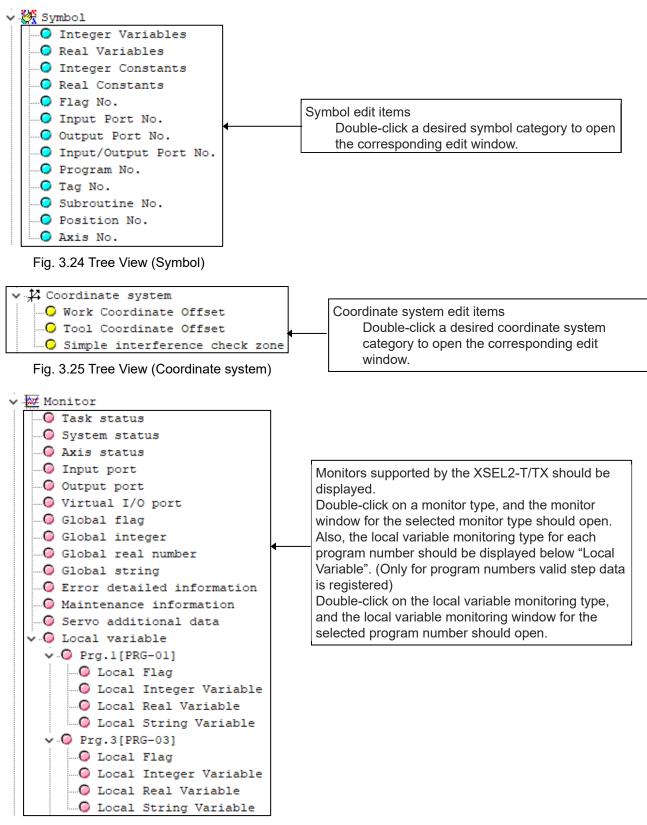


Fig. 3.26 Tree View (Monitor)

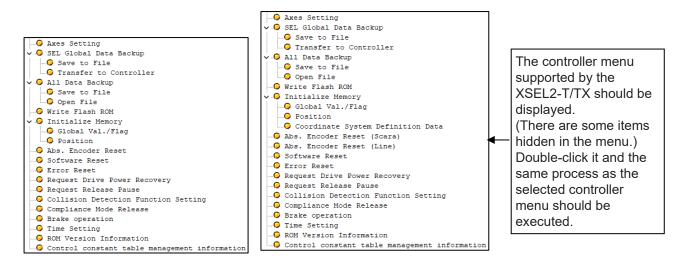


Fig. 3.27 Tree View (Controller)

#### Other Operations

Drag an item other than the controller to the main window and drop it, and the window for the selected item should be displayed in the main menu. (The same process as when an item is double-clicked)

#### **Controller Monitor** 3.5

Together with display of the tree view, the controller monitoring window should be displayed and the condition of a controller should be shown.

| Controller monitor     | Controller monitor   |  |  |
|------------------------|--|--|--|
| Status ErG             | Status E600  |  |  |
|                        | Encoder error  |  |  |
| System Mode            | System Mode MANU   |  |  |
| 🥌 Emergency stop       | Emergency stop   |  |  |
| Servo (all axes)       | Servo (all axes)   |  |  |
| Program running        | Program running  |  |  |
| 🥚 Enable SW            | 🥚 Enable SW  |  |  |
| 🥚 Drive source cut off | Drive source cut off   |  |  |
|                        | <ul> <li>System Mode AUTO</li> <li>Emergency stop</li> <li>Servo (all axes)</li> <li>Program running</li> <li>Enable SW</li> </ul> |  |  |

MANU Mode + All Axes Servo-On AUTO Mode + Emergency Stop Fig. 3.28 Controller Monitor

MANU Mode + Error Occurred

| Status:               | The controller status state is displayed.                               |
|-----------------------|---|
|                       | Refer to [Table on next page] for contents of display.                  |
| System Mode:          | The current operation mode is displayed.                                |
|                       | Yellow lamp should turn on in MANU Mode while green in AUTO Mode.       |
| Emergency stop:       | Status of Emergency stop is displayed.                                  |
|                       | Red lamp should turn on in emergency stop.                              |
| Servo (all axes):     | Green lamp should turn on when the servo in all the axes connected to a |
|                       | controller is on.   |
|                       | Note: EC axes should not be included to servo-on status.                |
| Program running:      | Status of program execution is displayed.                               |
|                       | Green lamp should turn on while a program is being executed.            |
| Enable SW:            | Status of Enable SW is displayed.                                       |
|                       | Green lamp should turn on when the enable switch is on.                 |
| Drive source cut off: | Status of Drive source cut off is displayed.                            |
|                       | Red lamp should turn on during the drive cutoff.                        |

Gray lamp should turn on and all letters turn into gray when offline.

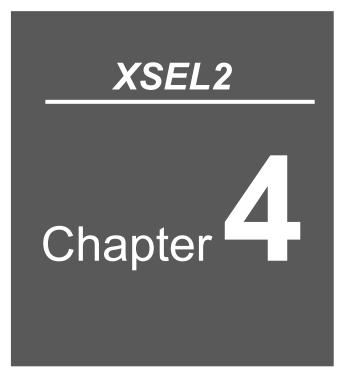
| Table: | 3.5 | Status | display | v list |
|--------|-----|--------|---------|--------|
| Tubio. | 0.0 | olalao | alopia. | y 110t |

| Display | Priority <sup>*</sup> | Detail  |  |  |  |
|---------|-----------------------|---|--|--|--|
| Prd     | 2                     | In Data Flush ROM Write   |  |  |  |
|         |                       |   |  |  |  |
| ErG     | 3                     | In Emergency Stop (Update Mode excluded)  |  |  |  |
| enb     | 4                     | When Enable Switch is off (Deadman Switch, Safety Gate)<br>(Update Mode excluded) |  |  |  |
| EE**    | 5                     |   |  |  |  |
| Ed**    | 5                     | Cold Start Level Error  |  |  |  |
| E6**    | 5                     |   |  |  |  |
| E5**    | 5                     |   |  |  |  |
| EC**    | 5                     |   |  |  |  |
| Eb**    | 5                     | Operation Cancelation Level Error   |  |  |  |
| E4**    | 5                     |   |  |  |  |
|         |                       |   |  |  |  |
| -rS     | 6                     | Operation Paused (standby for resuming) (Update Mode excluded)                    |  |  |  |
| -ILC    | 7                     | Servo All Axes Interlock (Update Mode excluded)                                   |  |  |  |
| EA**    | 8                     |   |  |  |  |
| E9**    | 8                     | Message Level Error   |  |  |  |
| E2**    | 8                     |   |  |  |  |
| Ardy    | 9                     | Ready Status (AUTO mode)  |  |  |  |
| rdy     | 9                     | Ready Status (MANU mode)  |  |  |  |

\* Smaller number has higher priority

In simultaneous occurrence, one in high priority should be displayed.

When the status display is Priority 2 to 8, the content of error should be shown in the text box at the bottom of the status.



# Program Edit Window

| 4.1 | Explanation of the Items Displayed in the Program Edit Window······4-1 |
|-----|--|
| 4.2 | Saving a Program, Transferring and<br>Closing the Edit Window ······   |
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## 4.1 Explanation of the Items Displayed in the Program Edit Window

- [1] Select "Program (S)"  $\rightarrow$  "Edit (E)" from the menu.
- [2] When the program number selection window opens, select the program you want to edit, and then click Read.

Program name assigned in the symbol edit window

|                      |      | froman No. Select |         |      |  |  |  |  |
|----------------------|------|-------------------|---------|------|--|--|--|--|
|                      | Na.  | rt Program        | a Salad | leas |  |  |  |  |
|                      | Nane | Frogram           | Steps   | No   |  |  |  |  |
| 2                    |      | test1             | 131     | 1    |  |  |  |  |
|                      |      | test2             | 11      | 2    |  |  |  |  |
|                      |      | test3             | 5       | 3    |  |  |  |  |
| Remaining Steps 5556 |      |                   | 22      | 4    |  |  |  |  |
|                      |      |                   | 3       | 5    |  |  |  |  |
|                      |      |                   | 15      | e    |  |  |  |  |
|                      |      |                   | 11      | 7    |  |  |  |  |
| Pead                 |      |                   | 17      | 8    |  |  |  |  |
|                      |      |                   | Э       | 9    |  |  |  |  |
| Cancel               |      |                   | 12      | 10   |  |  |  |  |

Fig. 4.1 Program Number Selection

\* When Axes Group No. 2 is valid, "Axis Group Number Initial Value" should be displayed. Axis Group Number Initial Values: Axis group number applicable for control at program start

| gram | No. Select |               |                |                   |   |                                    |
|------|------------|---------------|----------------|-------------------|---|------------------------------------|
| Leas | e Select   | t Program No. |                |                   |   |                                    |
| No   | Steps      | Program Name  | AxisGrpInitVal |                   | ^ |                                    |
| 1    | 26         |               | 2              | Init. Val. Change |   |                                    |
| 2    | 0          |               | 1              | Init. Val. Change |   |                                    |
| 3    | 26         |               | 1              | Init. Val. Change |   |                                    |
| 4    | 26         |               | 1              | Init. Val. Change |   | Remaining Steps 19,                |
| 5    | 0          |               | 1              | Init. Val. Change |   | Remaining symbols can be used 19,9 |
| 6    | 0          |               | 1              | Init. Val. Change |   | in the program [137.               |
| 7    | 0          |               | 1              | Init. Val. Change |   |                                    |
| 8    | 4          |               | 1              | Init. Val. Change |   |                                    |
| 9    | 4          |               | 1              | Init. Val. Change |   |                                    |
| 10   | 0          |               | 1              | Init. Val. Change |   | Read                               |
| 11   | 0          |               | 1              | Init. Val. Change |   | Cancel                             |

Fig. 4.2 Program Number Select Window

The axis group number initial value should be changed in the following process.

- (1) Select "Program (S)"  $\rightarrow$  "Edit (E)" in the menu. (Window shown above should appear)
- (2) Click Init. Val. Change on the program number you would like to make a change to the axis group number initial value, and the window shown in the figure below should open.

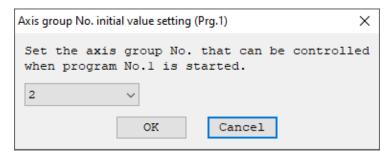


Fig. 4.3 Axis Group Initial Value Setting

- (3) Select an axes group number initial value and click OK.
- (4) Confirmation for flash ROM writing should be displayed. Select "Program" and click Yes.

| PC Interface Software for XSEL | Х |
|--------------------------------|---|
| Write Flash ROM?               |   |
| 🗹 Program                      |   |
| Symbol                         |   |
| Position                       |   |
| Parameter                      |   |
| Position" always selected.     |   |
| <u>Y</u> es <u>N</u> o         |   |

Fig. 4.4 Confirmation for Flash ROM Writing

(Note) Without writing the program to the flash ROM, the axes group number initial value should go back to that before change after the power gets OFF or controller gets reset.

[3] The program edit window will open. This window has the following controls and fields.

| No.         | Step number.  |
|-------------|---|
| В           | Use this field to set a breakpoint. (Supported only in the online edit mode.)<br>Click the "B" field in the line you want to set a breakpoint for. Once a<br>breakpoint is set, "B" will be shown in the field.<br>A breakpoint will be cancelled by executing software reset.              |
| Т           | Indicate the start point and end point for cycle time measurement.  |
| E           | Enter a desired extended condition.   |
| Ν           | Specify reversing "N" of the input condition.   |
| Cnd *       | Enter a desired input condition.  |
| Cmnd SEL    | Enter a desired SEL command.<br>Double-clicking this field or pressing the F1 key will open the SEL Command<br>Explanation window (Fig. 4.9).<br>This window provides an explanation of each SEL command. You can select<br>a desired command in this window and input it to the step data. |
| Operand 1 * | Enter desired operand 1.  |
| Operand 2 * | Enter desired operand 2.  |
| Pst *       | Enter a desired output (operand 3).   |
| Comment     | Enter a comment, if necessary (32 half-width characters and 16 full-width characters max.).<br>You can also double-click this field to modify a part of the comment currently entered.<br>* Press F11 to find a specific symbol in the input condition/operand fields.                      |

\* Column T should be shown. Indicate the start point and end point for cycle time measurement. Refer to [4.5 Cycle Time Measurement]

|     | <b>√</b> | <b>s</b> | • |     | =   P | i 🗊 🗊 🖾   |           | 43C:Progr | am # err Detailed information |  |
|-----|----------|----------|---|-----|-------|-----------|-----------|-----------|-------------------------------|--|
| No. | в т      | E        | N | Cnd | Cmnd  | Operand 1 | Operand 2 | Pst       | Comment                       |  |
| 1   |          |          |   |     | LET   | 整数変数1     | &H0       |           |                               |  |
| 2   |          |          |   |     | EXPG  | *整数変数1    |           |           |                               |  |
| 3   |          |          |   |     | EXIT  |           |           |           |                               |  |
| 4   |          |          |   |     |       |           |           |           |                               |  |
| 5   |          | 1        |   |     |       |           |           |           |                               |  |



\*1 It is available to set in Operand 1 and Operand 2 with binary and hexadecimal systems.

| /// Prg. | 1 |   |   |     |      |           |           |     |             | × |
|----------|---|---|---|-----|------|-----------|-----------|-----|-------------|---|
| 82       | V | 1 | 3 |     |      |           | 30        |     |             |   |
| No.      | в | Е | N | Cnd | Cmnd | Operand 1 | Operand 2 | Pst | Comment     |   |
| 1        |   |   |   |     | LET  | 1         | &HABCD    |     |             |   |
| 2        |   |   |   |     | LET  | &B11      | 10000     |     |             |   |
| 3        |   |   |   |     | EXIT |           |           |     |             |   |
| 4        |   |   |   |     |      |           |           |     |             |   |
| 5        |   |   |   |     |      |           |           |     |             | - |
|          |   |   |   |     |      |           |           |     | - · · · · · |   |

Fig.4.6 Setting with Binary and Hexadecimal Systems

#### [How to set up]

When using the binary numbers, apply "&B" at the top of the value.

When using the hexadecimal numbers, apply "&H" at the top of the value.

Eight digits can be input at maximum for binary and hexadecimal numbers.

- \* In the operand to input the axis pattern (the operand input values in binary system), do not apply "&B" at the top to input with the binary numbers.
- \* Binary numbers are treated as an unsigned integer.
- (e.g. &B11111111 = 255)\* Hexadecimal numbers treated as a signed integer.
  - (e.g. &HFFFFFFFF = -1)

[Restrictions]

- Binary and hexadecimal systems cannot be used for the operand indirect indication in the program.
- There will be no change to the input range of each operant even if binary or hexadecimal system is used.
- \*2 Press Enter key in the condition that the cursor is placed on the comment in the final line, and 100 lines of blank step data will be added.

If even one line is changed, all step numbers will be displayed in red. Right-clicking a desired input item in each line will display a pop-up menu (Fig. 4.7). The items in the pop-up menu are explained below.

| Cut (T)                 | Same as clicking "Edit (E)" $\rightarrow$ "Cut (T)" from the menu.  |
|-------------------------|---|
| Copy (C)                | Same as clicking "Edit (E)" $\rightarrow$ "Copy (C)" from the menu.   |
| Paste (P)               | Copy the entire cursor line.<br>Same as clicking "Edit (E)" $\rightarrow$ "Paste (P)" from the menu.<br>The step data copied or cut should be inserted to the line where the cursor<br>is placed.   |
| Insert Line (I)         | Insert line at the cursor line. You can also insert multiple lines.   |
| Delete Selected Lines ( | D) Delete the lines in the selected range.  |
| Set Comment (S)         | Set the entire cursor line as a comment (invalid step). If a valid step has<br>been set as a comment by mistake, you can select Release Comment<br>explained below to return the line to a valid step.<br>Executing Release Comment on a line containing character strings will<br>clear all character strings in the line. |
| Release Comment (R)     | Return the selected comment line to a step.   |

| 🖫 🗸   | 3     |      | 🔳   F | = 🖬 🖻 🗊   |                |        | Detailed information |
|-------|-------|------|-------|-----------|----------------|--------|----------------------|
| Io. B | TEN   | Cnd  | Cmnd  | Operand 1 | Operand 2      | Pst    | Comment              |
| 1     |       |      | LET   | 1         | 1              |        |                      |
| 2     | *Comn | nent |       | <u> </u>  |                | C1 1 Y |                      |
| 3     |       |      |       | Cut       |                | Ctrl+X |                      |
| 4     |       |      |       | Сору      |                | Ctrl+C |                      |
| 5     |       |      |       | Paste     |                | Ctrl+V |                      |
| 6     |       |      |       | Insert L  | ine            |        |                      |
| 7     |       |      |       | Delete    | Selected Lines |        |                      |
| 8     |       |      |       |           |                |        |                      |
| 9     |       |      |       | Set Con   | nment          |        |                      |
| 10    |       |      |       | Release   | Comment        |        |                      |

Fig. 4.7 Pop-up Menu

In the program edit window, selecting "Edit (E)" from the menu and then "Undo (U)" can cancel up to the most recent 10 operations.

Alternatively, pressing the Ctrl + Z key simultaneously can cancel the operations.

However, the cancel function will become disabled when any of the following operations is performed:

- Transfer of data on the edit window to the controller
- Saving data on the edit window to a file
- Closing of the edit window

When this operation is performed, the warning window in Fig. 4.8 will be displayed. Clicking Yes will cancel the operation executed immediately before.

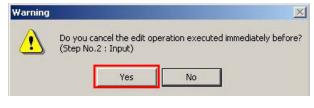


Fig. 4.8 Warning

Double-clicking the Cmnd field or pressing the F1 key will open the SEL Command Explanation window. Use this window as a reference when editing data.

|       |            | Saf                          | ety Vel Specified( | MANU Mode)        |          |   |
|-------|------------|------------------------------|--------------------|-------------------|----------|---|
|       |            |                              |                    |                   |          |   |
|       |            |                              |                    |                   |          | SEL Programing Manual ca  |
|       |            |                              |                    |                   |          | be displayed from the SEL   |
|       |            |                              |                    | <b>-</b>          |          |   |
| . BEN |            | perand 1 Operand 2 Pst       | Comment            |                   |          | Command Explanations  |
| 1     | VELS       | SEL Command Explanation      |                    |                   |          | •   |
| 2     | ACCS       | Category                     | Cmnd Input Cond.   | Operand 1         | <u>^</u> | window  |
| 3     | DCLS       | Actuator Control Designation | HOLD Optional      | Input Port/Flag   | U or 1   | miliaen   |
| 4     |            | Structured IF                | IFEQ Optional      | Variable No.      | Data     |   |
| 5     | PTPR       | Structured IF                | IFGE Optional      | Variable No.      | Data     |   |
|       | gram start | Structured IF                | IFGT Optional      | Variable No.      | Data     | INTELLIGENT ACTIVATOR   |
| 7     | HOVP       | Structured IF                | IFLE Optional      | Variable No.      | Data     | BASE (Specify axis base)  |
| 8     | ACHZ       | Structured IF                | IFLT Optional      | Variable No.      | Data     | Extension Insul condition Command, declaration Output   |
| 9     | TAG        | Structured IF                | IFNE Optional      | Variable No.      | Data     | (D, A, O, AR, OB) (FO, Reg) (Communit, Operand 1 Operand 2 (Origin, Reg)<br>E N, Ond Canada Operand 1 Operand 2 Pat   |
| 10    | GTTR       | Input/Output/Flag Operation  | IN Optional        | Input/Output/Flag | Input/6  | Optional Optional RASE Participated CP  |
| 11    | ATRG       | Input/Output/Flag Operation  | IND Optional       | Input/Output/Flag | # of BC  | Applicable models   |
| 12    | ARCH       | Communication                | IPCN Optional      | Channel No.       | Integer  | XSEL_X0XX +<br>Other then XSEL_XXXX O   |
|       |            | Structured IF                | ISEQ Optional      | Column No.        | Charact  | Function Count the axes sequentially based on the axis number specified in operand 1  |
|       |            | Structured IF                | ISNE Optional      | Column No.        | Charact  | Basic the first exist.<br>BASE Commend is evolution in PRED, PRDQ, AXST, exclusion control commends,<br>ARCH, PRCH, PRVP, PMVL, zone commands, actuator control declaration |
|       |            | Structured DO                | ITER Optional      |                   |          | Commands OLTL, SLWK, WGHT, WGTZ, PTPR, PTPL, PTPD, RIGH,<br>LEFT and the system information acquirement command GARM. Note that each  |
|       |            | Structured DO                | LEAV Optional      |                   |          | 70mm range is assigned to the actuatic via perameter<br>Rote 11 For XSELBX/SX/R/I/SBD_XSELBX/SAX/RAXD/SAXD Commands are   |
|       |            | Actuator Control Designation | LEFT Optional      |                   |          | available in the actuator control declaration commands SLTL, SLWK, WGHT,<br>WGLZ, FLTPK, FTLPS, FTLP, FTLPS, MSLM, LTPT, and the avalant information                        |
|       |            | Assignment                   | LET Optional       | Variable No.      | Data     | interprisement commercial CARM. Refue to [Per source of the Commercial<br>[Example 1] BASE 5 Axis 5 is considered the first axis.   |
|       |            | Calculation                  | MOD Optional       | Variable No.      | Data     | pcamper to text 5 Axis 5 in Considered the rest also.<br>HOME 1 Axis 5 returns to the forms.<br>HOME 50 Axis 6 returns to the forms.  |
|       |            | Actuator Control Commands    | HOVL Optional      | Position No.      |          | [Example 2] LET 1 5 Addight 5 to variable 1.<br>BASE *1 The content of variable 1 (unix 5) will be considered   |
|       |            | Actuator Control Commands    | NOVP Optional      | Position No.      |          | as the first axis.  |
|       |            | Calculation                  | HULT Optional      | Variable No.      | Data 😴   | Thereafter, axes 5 and 5 move according to the specifications for axes 1 and 2.   |

Fig. 4.9 SEL Command Explanation

Pressing the F2 key can change data in the cell partially. (Example: "MOVP"  $\rightarrow$  "MOVL")

Right-clicking on the SEL Command Explanation window will open a pop-up menu containing the following items.

| Input | Input the command in the cursor line to the step data (into the cursor line in the |
|-------|--|
|       | program edit window).  |
|       | It should made the same behavior when double-click on the selected line in the SEL |
|       | Command Explanation window.  |
| Font  | Font settings for SEL Command Explanation  |

- Font settings for SEL Command Explanation
  - Alphabetical order
    - Display should be shown in the command type order.
- Help

Sort

The SEL programing manual of the selected command should show up. Pressing the F1 key in the selected line in the SEL Command Explanation window should behave in the same way.

| Category                     | Cmnd | Input Cond. | Operand 1                | Operand 2           | Operand 3        |           |
|------------------------------|------|-------------|--------------------------|---------------------|------------------|-----------|
| Assignment                   | LET  | Optional    | Input                    | Data                | ZERO             | Assignmer |
| Logic                        | LSFT | Optional    | mput                     | Data                | ZERO             | Bitwise I |
| Calculation                  | MOD  | Optional    | Font                     | Data                | ZERO             | Module    |
| Actuator Control Commands    | MOVD | Optional    | Sort >                   | Axis Pattern        | Position End     | Direct Mo |
| Actuator Control Commands    | MOVL | Optional    |                          |                     | Position End     | Interpola |
| Actuator Control Commands    | MOVP | Optional    | Help                     |                     | Position End     | Position  |
| Calculation                  | MULT | Optional    | Variable No.             | Data                | ZERO             | Multiply  |
| Actuator Control Commands    | MVDI | Optional    | Data                     | Axis Pattern        | Position End     | Increment |
| Actuator Control Commands    | MVLI | Optional    | Position No.             |                     | Position End     | Increment |
| Actuator Control Commands    | MVPI | Optional    | Position No.             |                     | Position End     | Increment |
| Logic                        | NOT  | Optional    | Variable No.             | Data                | ZERO             | Bitwise N |
| Actuator Control Designation | NTCH | Optional    | Axis Pattern             | Data                | Command Complete | Vibration |
| Palettize                    | OFAZ | Optional    | Data                     |                     | Command Pass     | Arch moti |
| Palettize                    | OFPZ | Optional    | Data                     |                     | Command Pass     | Pallet Z  |
| Actuator Control Designation | OFST | Optional    | Axis Pattern             | Data                | Command Pass     | Disignate |
| Communication                | OPEN | Optional    | Channel No.              | 0 or 1              | Command Complete | Open Char |
| Logic                        | OR   | Optional    | Variable No.             | Data                | ZERO             | Bitwise C |
| Branch                       | OTHE | Prohibited  |                          |                     | Command Pass     | When Cond |
| Input/Output/Flag Operation  | OUT  | Optional    | Output/Flag              | Output/Flag         | Command Complete | Binary Ou |
| Input/Output/Flag Operation  | OUTB | Optional    | Output/Flag              | # of BCD Characters | Command Complete | BCD Outpu |
| Imitation Ladder Task        | OUTR | Optional    | Output/Flag              |                     | Command Pass     | Ladder's  |
| ctuator Control Designation  | OVRD | Optional    | Override Ratio           | 0 or 1              | Command Pass     | Velocity  |
| Position Data Operation      | PACC | Optional    | Acceleration(Can 0 input | ) Position No.      | Command Pass     | Assign A  |
| Palettize                    | PACH | Optional    | Pallet No.               | Position No.        | Position End     | Pallet po |
| Palettize                    | PAPG | Optional    | Pallet No.               | Position No.        | Command Pass     | Get Palle |

Fig. 4.10 Pop-up Menu

#### [4] This window has the various buttons shown below.

| (a) (b)        | ) ( | c)  | (d) | ) ( | e) (f) (g) | (h)   | (i) (j) (k) (l)  | )         |           |           | (m)                  |   |
|----------------|-----|-----|-----|-----|------------|-------|--|-----------|-----------|-----------|----------------------|---|
| $ \perp \perp$ |     |     | 1   |     |            |       | I $I$ $I$ $I$  |           |           |           |                      |   |
| JEI Prg.       | 1   | , , | ļ   | Ţ   |            |       | $\downarrow \downarrow \downarrow \downarrow \downarrow$ |           |           |           |                      |   |
| Ó 🗄            | ¥   | €   | 3   | Þ   |            | •   F | × 📅 🗑 🗑  |           | 43C:Progr | ram # err | Detailed information |   |
| No.            | в   | т   | Е   | N   | Cnd        | Cmnd  | Operand 1  | Operand 2 | Pst       |           | Comment              | ^ |
| 1              |     |     |     |     |            | LET   | 整数変数1  | &H0       |           |           |                      |   |
| 2              |     |     |     |     |            | EXPG  | *整数変数1   |           |           |           |                      |   |
| 3              |     |     |     |     |            | EXIT  |  |           |           |           |                      |   |
| 4              |     |     |     |     |            |       |  |           |           |           |                      |   |
| 5              |     |     |     |     |            |       |  |           |           |           |                      | ~ |
|                |     |     |     |     |            |       |  |           |           |           |                      |   |

#### Fig. 4.11 Buttons

(a) Save to File

Click this button to save the program in a file with a name.

#### ∧ Caution

- In "Program File Format 1" of the X-SEL-P/Q, PX/QX (with gateway function), controllers that are compatible with increased memory, steps No. 6001 and thereafter and programs No. 65 and thereafter cannot be saved. SSEL In a controller, Step No. 2001 and later and Program No. 65 and later cannot be stored to "Program File Format 1" in the normal format. Store them to "Program File Format 2" in the extension format.
- (b) <u>Transfer to Controller</u> Clicking this button will prompt the software to check the program data for syntax errors and transfer the program data to the controller if no errors have been found.
- (c) Check Program

Clicking this button will display information regarding syntax errors found in the program you have created, as well as operands used in the program.

(d) Print

Clicking this button will print the program.

(e) <u>Run</u>

Clicking this button will run the program. If the program has not yet been saved after editing, you must <u>transfer the program</u> to the controller beforehand.

#### Caution

- Since the controller's processing speed is faster than the PC's communication speed, the cursor position in the program edit window may not always correspond to the actual movement of the actuator.
- (f) <u>Run 1 Step</u> The program will run one step every time this button is clicked.

- (g) <u>Pause</u> Clicking this button will pause the program currently running.
- (h) <u>End</u>

Clicking this button will end the program currently running.

- (i) <u>Show Local Flag</u> Clicking this button will show the local flag window for the program currently running.
- (j) <u>Show Local Integer Variable</u> Clicking this button will show the local integer variable window for the program currently running.
- (k) <u>Show Local Real Variable</u> Clicking this button will show the local real variable window for the program currently running.
- <u>Show Local String Variable</u>
   Clicking this button will show the local string variable window for the program currently running.
- (m) <u>Program Error Information</u> It shows program errors. Click on the Detail Information button and the details of the program errors should be displayed.

| Program # error    |                     |
|--------------------|---------------------|
| Err                | 430                 |
| Date               | 2020/01/15 10:12:52 |
| Prg. no            | 1                   |
| Step no            | 2                   |
| AxesGrp. no        | 0                   |
| Axis no(Axes Grp.) | 0                   |
| Unit no            | 0                   |
| Drv no             | 0                   |
| Pos. no            | 0                   |
| Dtl. code          | C2C                 |
| Info. 1            | 0h                  |
| Info. 2            | 0h                  |
| Info. 3            | 0h                  |
| Info. 4            | 0h                  |

Fig. 4.12 Program Error Detail Information

#### [5] Checking the program

The software will check the program you have created, for SEL syntax errors.

- (1) Click Check Program button in the program edit window.
- (2) If any error is found, the error list will be displayed.

Check Program button Cmnd Operand 1 Operand 2 No. B E N Cnd Comment Pst VELS 100 ACCS 0 DCLS 0 PTPR \*program start 1000000 MOVP ACHZ TAG 1 GTTM 200 10 11 ATRG 82 84 12 ARCH 85 83 Step No. Column Message Operand 1 Out of scope 7 Operand 1 Out of scope Variable No. Input/Output/Flag No. Program No. Tag No. Subroutine No. Position No. Axis No. Err

Fig. 4.13 Error List

The error list has the Step No., Operand and Message fields. Double-clicking an error line will move the cursor to the location of the corresponding error.

(3) Information regarding the operands (Cnd, Operand 1, Operand 2 and Pst) in the program you are editing is displayed.

|    |                     | Comment                | Pst        | Operand 2    | Operand 1  | Cmnd   | N Cnd   | EI  |  |
|----|---------------------|------------------------|------------|--------------|--|--|---|-----|--|
|    |                     |                        |            | operand a    | 100  | VELS   |   |     | Jo. E  |
|    |                     |                        |            |              | 205  | ACCS   |   |     | 2  |
|    |                     |                        |            |              |  | DCLS   |   |     | 3  |
|    |                     |                        |            |              |  | 2.0210   | -   |     | 4  |
|    |                     |                        |            |              |  | PTPR   |   |     | 5  |
|    |                     |                        |            |              |  | t  | ogram star  | *pr | 6  |
|    |                     |                        |            |              | 1000000  | MOVP   | -   |     | 7  |
|    |                     |                        |            |              | 3  | ACHZ   |   |     | 8  |
| -  |                     |                        |            |              | 1  | TAG  |   |     | 9  |
| 22 | op-up menu          | P                      |            |              | 200  | GTTM   |   |     | 10   |
|    |                     |                        |            | 84           | 82   | ATRG   |   |     | 11   |
|    |                     |                        |            | 83           | 85   | ARCH   |   |     | 12   |
|    |                     | /                      |            | 1            |  |  |   | 1 1 |  |
|    |                     |                        |            |              | And Address of the Ad | PROVIDENT DATA DATA DATA DATA DATA DATA DATA DA  | and the second se |     | interesting to the local division of the loc |
|    |                     |                        |            |              | and the second se  | and the state of t | the second s  |     |  |
|    |                     | Line b                 |            |              |  |  |   |     |  |
|    |                     | Hide                   |            |              | or scope   | Out c  | Operand 1   |     | 1  |
|    |                     |                        |            |              |  |  |   |     |  |
|    | ne No. Position No. | No. Subroutin          | em No Ter  | ag No Progr  | ut/Output/F1   | . Tnni   | ariable No  | 37  | Err  |
|    |                     | Hide<br>No. Subrout in | am No. Tag | ag No. Progr | of scope<br>of scope<br>of scope   | Out o  | Column<br>Operand 1<br>Operand 1<br>Operand 1   |     |  |

Fig. 4.14 Operand Information

- [a] Syntax Error"Message" (Error content)
- [b] Variable No. Use Condition
  - "Variable No."
    - "Category" (Integer/real number determination)
    - "Scope" (Global/local determination)
    - \* If the applicable variable number is specified indirectly, the Category and Scope fields will show "(Unknown)".
- [c] Input/Output/Flag No. Use Condition

"Port/Flag No."

- "Category" (Input Port No./ Output Port No./ Flag No. determination)
- "Scope" (Global/local determination)
- \* If the applicable port/flag number is specified indirectly, the Category and Scope fields will show "(Unknown)".
- [d] Program No. Use Condition "Program No."
- [e] Tag No. Use Condition"Tag No." (Tag number in use)"Declaration/Jump"
- [f] Subroutine No. Use Condition"Subroutine No.""Declaration/Call"
- [g] Position No. Use Condition "Position No."
- [h] Axis No. Use Condition "Axis No."
  - \* If a symbol is used in any of the numbers in [b] through [h], the corresponding definition value will be displayed in the margin.

The above information is displayed in an itemized list at the bottom of the program edit window. You can double-click a desired item to move the cursor to the corresponding program. You can also right-click the list to display a pop-up menu and hide the list or sort the records.

## 4.2 Saving a Program, Transferring and Closing the Edit Window

### 4.2.1 Saving a Program Online, Transferring and Closing the Edit Window

[1] Saving to a file the program data you are editing

Click Save AS in the program edit window.

This is the same as clicking "File (F)"  $\rightarrow$  "Save As (A)".

A window to input a file comment should appear at file saving. Input a file comment and click OK.

If you click Cancel, the file can be saved but the file comment will not be saved.

| Save file comment                           | × |
|---|---|
| Save file comment File property             | _ |
| Please enter a comment to save in the file. |   |
| RSEL Program                                |   |
|   |   |
|   |   |
| OK Cancel                                   |   |

Fig. 4.15 File Comment Save Window

- \* The file comment you had can be confirmed by clicking the file property button (1) in each edit window.
- [2] Transferring to the controller the program data you are editing.

You can save the program data you are editing to the controller's memory.

Click Transfer to Controller in the program edit window.

This button is selectable only in the online edit mode.



## Caution

• If the program contains any error, the error will be displayed and the program will not be transferred to the controller.

#### [3] Writing to the flash ROM

Once the program has been transferred to the controller, the following confirmation dialog box with the message, "Write Flash ROM?" will be displayed.

| PC Interface Software for XSEL | × |  |  |  |  |  |  |  |  |
|--------------------------------|---|--|--|--|--|--|--|--|--|
| Write Flash ROM?               |   |  |  |  |  |  |  |  |  |
| 🗹 Program                      |   |  |  |  |  |  |  |  |  |
| Symbol                         |   |  |  |  |  |  |  |  |  |
| Position                       |   |  |  |  |  |  |  |  |  |
| Parameter                      |   |  |  |  |  |  |  |  |  |
| Position" always selected.     |   |  |  |  |  |  |  |  |  |
| <u>Y</u> es <u>N</u> o         |   |  |  |  |  |  |  |  |  |

Fig. 4.16 Confirmation

Click and select a desired item (Program, etc.) to write to the flash ROM.

Click Yes  $\rightarrow$  The memory data will be written to the flash ROM.

- Click No → The memory data will not be written to the flash ROM. If No (N) is selected, the controller will clear all data in its memory after a reset (i.e., after the controller power is reconnected or a software reset is executed), and then load the data from the flash ROM. (The controller will operate in accordance with the transferred data until a reset is executed.)
- \* The number of writing to the flash ROM is limited. (can write approx. 100,000 times) If you don't want to write all the data to the flash ROM, select "Write selected data region".

#### [4] Closing the program edit window

Attempting to close the program edit window will display the following confirmation dialog box with the message, "Data will be transmitted to the controller, Are you sure to continue?"



Fig. 4.17 Confirmation

| Yes    | The edited data will be transferred to the controller $ ightarrow$ [3] Writing to the flash ROM |
|--------|---|
| No     | The software will close the program edit window without saving the edited data.                 |
| Cancel | The software will cancel the operation and return to the program edit window.                   |

## 4.2.2 Transferring a Program Created Offline

A program created offline can be transferred to a controller by following the steps below.

- (1) Select "File"  $\rightarrow$  "Open" from the menu.
  - In the window of "Open File", select a program created offline and open it.
- (2) If a controller is connected, Controller Transfer button 😫 gets activated once the program is opened.

Press Controller Transfer button 🔛 , the program gets transferred to the controller.

| <i>M</i> 2 File E | dit Viev | w Progra | im F | osition Param | eter Symbol | Monitor Cont | roller Tool Window H   | elp _ & × |
|-------------------|----------|----------|------|---------------|-------------|--------------|------------------------|-----------|
| 🛩 🖬 🤞             | 1/1      | 🐹 🐥      | ₽    | <u>∲</u> ∲ ⊨  |             |              |                        |           |
|                   |          |          |      |               |             |              | nt mult prgs strt(MANU | 0 -       |
| ( ) ·             | <b>a</b> |          |      |               |             |              |                        |           |
|                   | N (      | Cnd C    | mnd  | Operand 1     | Operand 2   | Pst          | Comment                | <u> </u>  |
| 1                 |          | v        | /EL  | 200           |             |              |                        |           |
| 2                 |          | A        | ACC  | 0.3           |             |              |                        |           |
| 3                 |          | D        | CL   | 0.3           |             |              |                        |           |
| 4                 |          | Т        | AG   | 1             |             |              |                        |           |
| 5                 |          | M        | IOVP | 1             |             |              |                        |           |
| 6                 |          | M        | IOVP | 2             |             |              |                        |           |
| 7                 |          | G        | ото  | 1             |             |              |                        |           |
| 8                 |          | E        | TIX  |               |             |              |                        |           |
| 9                 |          |          |      |               |             |              |                        |           |
| 10                |          |          |      |               |             |              |                        |           |
| 11                |          |          |      |               |             |              |                        |           |
| 12                |          |          |      |               |             |              |                        |           |
| 13                |          |          |      |               |             |              |                        |           |
| 14                |          |          |      |               |             |              |                        | -         |
|                   |          |          |      |               |             |              |                        |           |

Fig. 4.18 Program Edit Window

(3) A confirmation window asking if it is okay to transfer the data to the controller will appear. Press Yes.

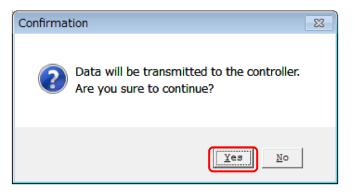


Fig. 4.19 Confirmation Window

(4) Next, a window to select the program number for transfer destination will be shown. Click on a program number line for transfer destination to select a transfer destination. Press Write.

| Program | n No. Selec | t              |                |   | ×                                    |
|---------|-------------|----------------|----------------|---|--------------------------------------|
| Plea    | se Seleo    | ct Program No. |                |   |                                      |
| No      | Steps       | Program Name   | AxisGrpInitVal | ^ |                                      |
| 1       | 1           |                | 1              |   |                                      |
| 2       | 0           |                | 1              |   |                                      |
| 3       | 26          |                | 1              |   |                                      |
| 4       | 26          |                | 1              |   | Remaining Steps 19,908               |
| 5       | 0           |                | 1              |   | Remaining symbols can be used 19,991 |
| 6       | 0           |                | 1              |   | in the program 15,551                |
| 7       | 26          |                | 2              |   |                                      |
| 8       | 4           |                | 1              |   |                                      |
| 9       | 4           |                | 1              |   |                                      |
| 10      | 0           |                | 1              |   | Write                                |
| 11      | 0           |                | 1              | ¥ | Cancel                               |

Fig. 4.20 Program No. Select

(5) A confirmation window stating "Write Flash ROM" will appear. Press Yes.

| PC Interface Software for XSEL   |
|----------------------------------|
| Write Flash ROM?                 |
| O Write all data areas.          |
| • Write the selection data area. |
| 🔽 Program                        |
| 🗖 Symbol                         |
| Position                         |
| Parameter                        |
| User data-hold memory            |
| Position" always selected.       |
| <u>Y</u> es <u>N</u> o           |

Fig. 4.21 Confirmation Window

(6) The program will be transferred to the controller.

Also, flash ROM writing will be conducted, and the display below flashes during writing. The display will disappear once writing is complete.

| PC Interface Software f |
|-------------------------|
| Writing Flash ROM       |

Fig. 4.22 Writing Flash ROM Window

# 4.3 Saving All Programs to a File

#### [1] Saving all programs

You can save programs from No. 1 to 512 in the controller as a single file.

- (1) Click "Program"  $\rightarrow$  "Save to File" from the menu.
- (2) In the program number selection window, click Save All. Then specify a desired file name and folder.

| ogran | n No. Select |               |                |                                    |
|-------|--------------|---------------|----------------|------------------------------------|
| lea   | se Select    | t Program No. |                |                                    |
| No    | Steps        | Program Name  | AxisGrpInitVal | ^                                  |
| 1     | 1            |               | 1              |                                    |
| 2     | 0            |               | 1              |                                    |
| 3     | 26           |               | 1              |                                    |
| 4     | 26           |               | 1              | Remaining Steps 19,9               |
| 5     | 0            |               | 1              | Remaining symbols can be used 19,9 |
| 6     | 0            |               | 1              | in the program 19,9                |
| 7     | 26           |               | 2              |                                    |
| 8     | 4            |               | 1              | Save                               |
| 9     | 4            |               | 1              |                                    |
| 10    | 0            |               | 1              | Save All                           |
| 11    | 0            |               | 1              | Cancel                             |

Fig. 4.23 Program Save

#### [2] Opening the all programs file

- (1) Click "File"  $\rightarrow$  "Open" from the menu.
- (2) In the file open window, select the file you want to open and then click Open.
- (3) The program No. selection window will be displayed. Select a desired program No. to read and click Read.

If you want to transfer all programs to the controller, select Load All Program. If you want to select programs in the all programs file and transfer them individually, select desired program numbers and then click Load a Program to transfer the corresponding programs to the controller.

| _  |       | : Program No. |                |                      |
|----|-------|---------------|----------------|----------------------|
| No | Steps | Program Name  | AxisGrpInitVal | ^                    |
| 1  | 1     |               | 1              |                      |
| 2  | 0     |               | 0              |                      |
| 3  | 26    |               | 1              |                      |
| 4  | 26    |               | 1              | Remaining Steps 19,9 |
| 5  | 0     |               | 0              | Teed 311 Duemon      |
| 6  | 0     |               | 0              | Load All Program     |
| 7  | 26    |               | 2              | Load a Program       |
| 8  | 4     |               | 1              | Read                 |
| 9  | 4     |               | 1              |                      |
| 10 | 0     |               | 0              | Print All            |
| 11 | 0     |               | 0              | Print                |
| 12 | 4     |               | 1              | Cancel               |

Fig. 4.24 Program Transfer (Online)

Print All : Print all programs (excluding the program with "0" steps).

Print : Print only the program selected from the list at the left of the button.

#### [3] Important note on transferring an all programs file to the controller

- (1) Transferring all program files to a controller at once will clear all existing programs No. 1 to 512.
  - If necessary, back up all current programs before the transfer.
- (2) If the all programs file includes any program that contains symbols and the symbols are not defined in the controller's memory, an error will occur when the applicable program is transferred to the controller. If an error occurs, none of the programs will be transferred to the controller. Therefore, if the applicable symbol data is saved to a file, transfer the symbol definition file first. If there is no symbol definition file, define the applicable symbols in the symbol edit window and then transfer the definitions to the controller, before transferring the all programs file again.
- (3) If the all programs file contains any error, the error window will be displayed and none of the programs will be transferred to the controller. In this case, double-click the error shown in the error window to open the program file that contains the applicable error. Correct the error, and then save the file by overwriting. If multiple errors exist, correct all errors. When all errors have been corrected, transfer the programs to the controller again. The procedure in (3) provides an important recovery method for program files containing errors.
- [4] Saving the all programs file
  - (1) If the program files read from the all programs file are saved as the all programs file, click Save.
  - (2) If the program files are saved individually, click Save as.

#### 4.4 **Running the Program**

You can run the program in the program edit window. To run the program you are editing, transfer it to the controller first.



### Caution

• Once transferred to the controller, the program can be run without being written to the flash ROM first. If the program is not written to the flash ROM, however, it will be lost once the controller power is reconnected or a software reset is executed.

| [e] Run:      | Clicking this button will run the program.    |
|---------------|---|
| If Dun 1 Sten | The pregram will run and step every time this |

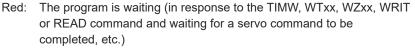
- The program will run one step every time this button is clicked. [f] Run 1 Step:
- [g] Pause: Clicking this button will pause the program currently running.
- Clicking Run or Run 1 Step will resume the program.
- [h] End: Clicking this button will end the program currently running.
- You can pause the program in a desired step. "B" will appear/disappear every time Breakpoint: the field is clicked.
  - (Note) A breakpoint will be cleared once the controller power is reconnected or a software reset is executed.

| 🗟 🖌 🎒   🕨   | 🕨   📩   🖮   🇮 ( | I 🛛 🖉 🗌 🗌  |         |     | Detailed information |  |
|-------------|-----------------|------------|---------|-----|----------------------|--|
| No. B T E N | Cnd Cmnd Op     | erand 1 Op | erand 2 | Pst | Comment              |  |
| 1           | VEL             | 100        |         |     |                      |  |
| 2           | ACC             | 0.35       |         |     |                      |  |
| 3           | DCL             | 0.35       |         |     |                      |  |
| 4           |                 |            |         |     |                      |  |
| 5 B         | WTON            | 600        |         |     |                      |  |
| 6 **Progr   | am start        | · · · · ·  |         |     |                      |  |
| 7           | MOVP            | 81         |         |     |                      |  |
| 8           | ACHZ            | 3          |         |     |                      |  |
| 9           | TAG             | 1          |         |     |                      |  |
| 10          | GTTM            | 200        |         |     |                      |  |
| 11          | ATRG            | 82         | 84      |     |                      |  |
| 12          | ARCH            | 85         | 83      |     |                      |  |





Green: The program is paused (by step operation, by a breakpoint, by the pause button, by the SSPG command, etc.)



Blue: Any condition other than those represented by a green or red cursor.

Background colors

Gray: The program is running.

White: The program is not

running.

# 4.5 Cycle Time Measurement

By setting up the measurement start point and end point in the program, the cycle time during program operation can be measured.

### 4.5.1 How to Measure Cycle Time

Select "Program (S)"  $\rightarrow$  "Edit (E)" and Program Number Select window appears. Select a program to operate and click Read.

Program Edit window appears.

Column T (marked in red box), which is for the setup of measurement start point and end point for cycle time measurement, should be shown in Program Edit window.

|    |        |   |   | [ | C | olumn T |      |           |           |     |         |          |  |
|----|--------|---|---|---|---|---------|------|-----------|-----------|-----|---------|----------|--|
| 11 | 🕅 Prg. | 1 |   | / | / |         |      |           |           |     |         | • 🗙      |  |
| E  |        |   |   |   |   |         |      |           |           |     |         |          |  |
|    | No.    | E | Т | Е | N | Cnd     | Cmnd | Operand 1 | Operand 2 | Pst | Comment | <u> </u> |  |
| L  | 1      |   |   |   |   |         | VEL  | 100       |           |     |         |          |  |
|    | 2      |   |   |   |   |         | ACC  | 0.3       |           |     |         |          |  |
|    | 3      |   |   |   |   |         | DCL  | 0.3       |           |     |         |          |  |
|    | 4      |   |   |   |   |         |      |           |           |     |         |          |  |
| L  | 5      |   |   |   |   |         | TAG  | 1         |           |     |         |          |  |
| L  | 6      |   |   |   |   |         | MOVP | 1         |           |     |         |          |  |
| L  | 7      |   |   |   |   |         | MOVL | 2         |           |     |         |          |  |
|    | 8      |   |   |   |   |         | MVPI | 3         |           |     |         |          |  |
|    | 9      |   |   |   |   |         | MVLI | 4         |           |     |         |          |  |
|    | 10     |   |   |   |   |         | MOVP | 5         |           |     |         |          |  |
|    | 11     |   |   |   |   |         | MOVL | 6         |           |     |         |          |  |
|    | 12     |   |   |   |   |         | GOTO | 1         |           |     |         |          |  |
|    | 13     |   |   |   |   |         |      |           |           |     |         | <u> </u> |  |
|    |        |   |   |   |   |         |      |           |           |     |         |          |  |

Fig. 4.26 Program Edit window

There are three types of setting in the setup in Column T.

- S: Cycle Time Measurement Start Point
- E: Cycle Time Measurement End Point
- SE: Measurement Point for Cycle Time Measurement for One Step Only

- [1] Setting of Cycle Time Measurement Area Section
  - (Note) The section of area to be set up should be just one section. Two or more sections cannot be established.
  - (Note) When establishing the input / extension status setting, set "S" and "E" in the command (Cmnd column) description step.

If the setting is established in the steps of only input / extension stays, it will not be subject to measurement.

- (1) Measurement Start Point and End Point Setup
  - 1) Right-click on Column T (blank cell) of the start step of the area section that you would like to measure.

|     |   | 1 | 6 |   |     |      |           |           |     |         |
|-----|---|---|---|---|-----|------|-----------|-----------|-----|---------|
| io. | в | Т | Ε | N | Cnd | Cmnd | Operand 1 | Operand 2 | Pst | Comment |
| 1   |   |   |   |   |     | VEL  | 100       |           |     |         |
| 2   |   |   |   |   |     | ACC  | 0.3       |           |     |         |
| 3   |   |   |   |   |     | DCL  | 0.3       |           |     |         |
| 4   |   |   |   |   |     |      |           |           |     |         |
| 5   |   |   |   |   |     | TAG  | 1         |           |     |         |
| 6   |   | S |   |   |     | MOVP | 1         |           |     |         |
| 7   |   |   |   |   |     | MOVL | 2         |           |     |         |
| 8   |   |   |   |   |     | MVPI | 3         |           |     |         |
| 9   |   |   |   |   |     | MVLI | 4         |           |     |         |
| 10  |   |   |   |   |     | MOVP | 5         |           |     |         |
| 11  |   |   |   |   |     | MOVL | 6         |           |     |         |
| 12  |   |   |   |   |     | GOTO | 1         |           |     |         |
| 13  |   |   |   |   |     |      |           |           |     |         |

S: Measurement start point will be displayed.

Fig. 4.27 Measurement start point Setup

- 2) Secondly, right-click on Column T (blank cell) of the end step of the area section that you would like to measure.
  - E: Measurement end point will be displayed.

| ) <b>ដ</b> |   |   | 5 |   |     |      |           |           |     |         |  |
|------------|---|---|---|---|-----|------|-----------|-----------|-----|---------|--|
| lo.        | в | Т | Ε | N | Cnd | Cmnd | Operand 1 | Operand 2 | Pst | Comment |  |
| 1          |   |   |   |   |     | VEL  | 100       |           |     |         |  |
| 2          |   |   |   |   |     | ACC  | 0.3       |           |     |         |  |
| 3          |   |   |   |   |     | DCL  | 0.3       |           |     |         |  |
| 4          |   |   |   |   |     |      |           |           |     |         |  |
| 5          |   |   |   |   |     | TAG  | 1         |           |     |         |  |
| 6          |   | E |   |   |     | MOVP | 1         |           |     |         |  |
| 7          |   |   |   |   |     | MOVL | 2         |           |     |         |  |
| 8          |   |   |   |   |     | MVPI | 3         |           |     |         |  |
| 9          |   |   |   |   |     | MVLI | 4         |           |     |         |  |
| 10         |   |   |   |   |     | MOVP | 5         |           |     |         |  |
| 11         |   |   |   |   |     | MOVL | 6         |           |     |         |  |
| 12         |   |   |   |   |     | GOTO | 1         |           |     |         |  |

Fig. 4.28 Measurement end point Setup

#### (2) Measurement One Step Setup

- 1) Right-click on Column T (blank cell) of the step that you would like to measure.
  - S: Measurement start point will be displayed.

|       | </th <th>9</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> | 9 |   |     |      |           |           |     |         |  |
|-------|---|---|---|-----|------|-----------|-----------|-----|---------|--|
| Io. E | Т   | E | N | Cnd | Cmnd | Operand 1 | Operand 2 | Pst | Comment |  |
| 1     |   |   |   |     | VEL  | 100       |           |     |         |  |
| 2     |   |   |   |     | ACC  | 0.3       |           |     |         |  |
| 3     |   |   |   |     | DCL  | 0.3       |           |     |         |  |
| 4     |   |   |   |     |      |           |           |     |         |  |
| 5     |   |   |   |     | TAG  | 1         |           |     |         |  |
| 6     | s   |   |   |     | MOVP | 1         |           |     |         |  |
| 7     |   |   |   |     | MOVL | 2         |           |     |         |  |
| 8     |   |   |   |     | MVPI | 3         |           |     |         |  |
| 9     |   |   |   |     | MVLI | 4         |           |     |         |  |
| 10    |   |   |   |     | MOVP | 5         |           |     |         |  |
| 11    |   |   |   |     | MOVL | 6         |           |     |         |  |
| 12    |   | 1 |   |     | GOTO | 1         |           |     |         |  |

Fig. 4.29 Measurement start point Setup

2) Secondly, right-click on the point that "S" is being displayed.

SE: The measurement point will be displayed.

|       | ✓  | 5 |      |        |             |           |     |         |  |
|-------|----|---|------|--------|-------------|-----------|-----|---------|--|
| No. E | T  | E | N Ci | nd Cmn | d Operand 1 | Operand 2 | Pst | Comment |  |
| 1     |    |   |      | VEL    | 100         |           |     |         |  |
| 2     |    |   |      | ACC    | 0.3         |           |     |         |  |
| 3     |    |   |      | DCL    | 0.3         |           |     |         |  |
| 4     |    |   |      |        |             |           |     |         |  |
| 5     |    |   |      | TAG    | 1           |           |     |         |  |
| 6     | SE |   |      | MOV    | P 1         |           |     |         |  |
| 7     |    |   |      | MOV    | L 2         |           |     |         |  |
| 8     |    |   |      | MVP    | I 3         |           |     |         |  |
| 9     |    |   |      | MVL    | I 4         |           |     |         |  |
| 10    |    |   |      | MOV    | P 5         |           |     |         |  |
| 11    |    |   |      | MOV    | L 6         |           |     |         |  |
| 12    |    |   |      | GOT    | 0 1         |           |     |         |  |

Fig. 4.30 The measurement point Setup

Follow the steps below when it is required to set up again or cancel the items that you have already set up.

- When "S" and "E" are displayed right-click on the cell of "S", and "S" will be erased.
   If "E" is displayed, it means that the measurement area section setting is not activated.
   Right-click on a blank cell, and "S" will be shown and the measurement area section setting gets activated.
- Right-click on the cell of "E", and "E" will be erased.
   If "S" is displayed, it means that the measurement area section setting is not activated.
   Right-click on a blank cell, and "E" will be shown and the measurement area section setting gets activated.
- Right-click on the cell of "SE", and "E" will be erased. Click it again, and "E" will be erased.

#### [2] Displaying Cycle Time Measurement Result

Once a program gets operated, cycle time will be measured and the result will be displayed at the position marked in red.

Once the program starts executed and the step with "S" being shown gets executed,

measurement will start and display shows -----s.

Once the step with "E" being shown is completed, the measurement will finish and the cycle time measurement result will be displayed.

The time to be shown should be from 0.000sec to 86399.999sec (one day).

Once the first measurement is completed and the step with "S" being shown has been executed, measurement will start again and -----s will be displayed.

If a change is made to the cycle time measurement area section after measurement is finished, the display will turn to blank.

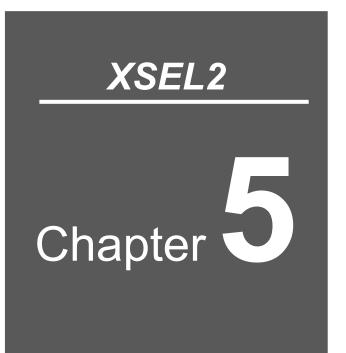
|            |    |    |       |      |           | Measur    | ement Res | sult Display Area |     |
|------------|----|----|-------|------|-----------|-----------|-----------|-------------------|-----|
|            |    |    |       |      |           |           |           |                   |     |
| //// Prg.1 | L  |    |       |      |           |           | •         |                   | • • |
| 8          | ✓  | 9  |       |      |           |           |           |                   |     |
| No. I      | ΒТ | Εl | N Cnd | Cmnd | Operand 1 | Operand 2 | Pst       | Comment           | -   |
| 1          |    |    |       | VEL  | 100       |           |           |                   | -   |
| 2          |    |    |       | ACC  | 0.3       |           |           |                   |     |
| 3          |    |    |       | DCL  | 0.3       |           |           |                   |     |
| 4          |    |    |       |      |           |           |           |                   |     |
| 5          |    |    |       | TAG  | 1         |           |           |                   |     |
| 6          |    |    |       | MOVP | 1         |           |           |                   |     |
| 7          |    |    |       | MOVL | 2         |           |           |                   |     |
| 8          |    |    |       | MVPI | 3         |           |           |                   |     |
| 9          |    |    |       | MVLI | 4         |           |           |                   |     |
| 10         |    |    |       | MOVP | 5         |           |           |                   |     |
| 11         |    |    |       | MOVL | 6         |           |           |                   |     |
| 12         |    |    |       | GOTO | 1         |           |           |                   |     |
| 13         |    |    |       |      |           |           |           |                   |     |

Fig. 4.31 Measurement Result Display

- Blank Displayed: Status of Cycle Time Measurement Not Executed
- ----- Displayed: Status of Cycle Time Measurement Under Execution
- Time Displayed: Status of Cycle Time Measurement Completed

[Note]

- Measurement keeps executed unless the execution of the step with "E" displayed in Column T is completed.
- In case setting is established in an area section that is looped in short period of time, it could seem as if -----s is kept displayed because measurement will start straight after the previous measurement is finished.
- In case of a program being stopped by breakpoint / pause, the stop duration should be included to the cycle time.
- In case the steps with "S" and "E" displayed are set to the input / extension condition, cycle time will be measured when input / extension condition has been succeeded.
- In case the step with "S" displayed is set to the breakpoint, measurement will start once the program is executed.
- The maximum time to be display should be 86399.999sec (one day). Also, when the cycle time exceeds 4294967.295sec, the cycle time measurement result will not be displayed correctly.



# Copying/Moving/ Clearing a Program

| 5.1 | Program Copy/Move Window |
|-----|--------------------------|
| 5.2 | Program Clear Window 5-3 |

## 5.1 Program Copy/Move Window

The steps to copy or move a program to other program number are explained below.

(1) Select "Program (S)"  $\rightarrow$  "Copy/Move (C)" from the menu.

(2) The "program Copy/Move" window will be displayed.

|       |          |               |                  |          | Program number to copy/move from |
|-------|----------|---------------|------------------|----------|----------------------------------|
| Pleas | se Selec | t Program No. |                  |          |                                  |
| No    | Steps    | Program Name  | AxisGrpInitVal ^ |          |                                  |
| 1     | 1        |               | 1                | From (Db | l Click) 1                       |
| 2     | 0        |               | 1                | To (Cl   | ick) 2                           |
| 3     | 26       |               | 1                |          |                                  |
| 4     | 26       |               | 1                |          |                                  |
| 5     | 0        |               | 1                | Remainin | Program number to copy/move to   |
| 6     | 0        |               | 1                |          | in the program (                 |
| 7     | 26       |               | 2                | Move     |                                  |
| 8     | 4        |               | 1                | Сору     |                                  |
| 9     | 4        |               | 1                |          |                                  |
| 10    | 0        |               | 1                |          |                                  |
| 11    | 0        |               | 1 🗸              | Cancel   |                                  |

Fig. 5.1 Program Copy/Move

Double-click the source program you want to copy or move.

Click the destination program you want to copy or move the source program to.

To copy the program, click Copy. To move the program, click Move.

Both operations are done in the memory.

Clicking Cancel will cancel the selected operation.

\* It is available to copy, move and delete the local symbols in the applicable programs when conducting copy, move or delete of programs.

The following message should be displayed when conducting copy, move or delete of programs. Click Yes and copy, move or delete of the local symbols in the applicable programs should be executed.

| Confirmation   | Confirmation ×  |
|--|---|
| Do you also copy the symbol of program No. of<br>copy source?<br>[Caution]<br>All symbols of copy destination program No. will be cleared. | <ul> <li>Do you also move the symbol of program No. of move source?</li> <li>[Caution]</li> <li>All symbols of move destination program No. will be cleared.</li> </ul> |
| <u>Y</u> es <u>N</u> o   | <u>Y</u> es <u>N</u> o  |
| Fig. 5.2 Confirmation Message (copy)   | Fig. 5.2 Confirmation Message (move)  |
| Confirmation $	imes$   |   |
| <b>?</b> Do you also clear the symbol definition of cleared program No.?   | (Note) When copy or move of the local<br>symbols are conducted, all the local<br>symbols saved in the program number<br>of destination should all be cleared.           |
| <u>Y</u> es <u>N</u> o   |   |

Fig. 5.2 Confirmation Message (clear)

#### (3) Writing to the flash ROM

When the copy or move is completed, the following confirmation dialog box with the message, "Write Flash ROM?" will be displayed.

| PC Interface Software for XSEL                                  |
|---|
| Write Flash ROM?  |
| C Write all data areas.   |
| $\widehat{oldsymbol{arepsilon}}$ Write the selection data area. |
| 🔽 Program   |
| 🗖 Symbol  |
| Position  |
| Parameter   |
| 🗌 User data-hold memory   |
| "Position" always selected.                                     |
| <u>Y</u> es <u>N</u> o  |

Fig. 5.3 Confirmation

Click and select a desired item (Program, etc.) to write to the flash ROM.

- Click Yes  $\rightarrow$  The memory data will be written to the flash ROM.
- Click No → The memory data will not be written to the flash ROM.
   Once the controller is reset (the controller power is reconnected or a software reset is executed), the original program arrangement before the copy or move will be restored.
- \* The number of writing to the flash ROM is limited (approx. 100,000 times). If you do not want to write all the data to the flash ROM, select "Write the selection data area."

# 5.2 Program Clear Window

The steps to clear a program are explained below.

- (1) Select "Program (S)"  $\rightarrow$  "Clear (L)" from the menu.
- (2) The program clear window will be displayed.

|     | se Select Program |              |                |                                     |
|-----|-------------------|--------------|----------------|-------------------------------------|
| No. | Steps             | Program Name | AxisGrpInitVal | ^                                   |
| 1   | 1                 |              | 1              |                                     |
| 2   | 0                 |              | 1              |                                     |
| 3   | 26                |              | 1              |                                     |
| 4   | 26                |              | 1              | Remaining Steps 19,90               |
| 5   | 0                 |              | 1              | Remaining symbols can be used 19,99 |
| 6   | 0                 |              | 1              | in the program (1977)               |
| 7   | 26                |              | 2              |                                     |
| 8   | 4                 |              | 1              | Clear                               |
| 9   | 4                 |              | 1              |                                     |
| 10  | 0                 |              | 1              | All Clear                           |
| 11  | 0                 |              | 1 .            | Cancel                              |

Fig. 5.4 Program Clear

Click the program you want to clear.

You can select multiple programs by dragging the mouse or pressing the  $Ctrl + \uparrow \downarrow$  key

simultaneously.

Next, click Clear .

(This operation is done in the memory.)

Clicking Cancel will cancel the operation.

When clearing all programs in the controller, click All Clear.

#### (3) Writing to the flash ROM

When the clear is completed, the following confirmation dialog box with the message, "Write Flash ROM?" will be displayed.

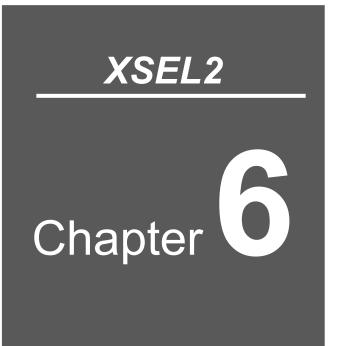
| PC Interface Software for XSEL                   |
|--|
| Write Flash ROM?                                 |
| C Write all data areas.                          |
| $\widehat{ullet}$ Write the selection data area. |
| 🔽 Program  |
| 🗌 Symbol   |
| Position   |
| Parameter  |
| 🗌 User data-hold memory                          |
| "Position" always selected.                      |
| Yes No   |

Fig. 5.5 Confirmation

Click and select a desired item (Program, etc.) to write to the flash ROM.

- Click Yes  $\rightarrow$  The memory data will be written to the flash ROM.
- Click  $No \rightarrow$  The memory data will not be written to the flash ROM.

Once the controller is reset (the controller power is reconnected or a software reset is executed), the cleared program will be restored.



# Position Data Edit Window

| 6.1 | Explanation of the Items Displayed in the Position Data Edit Window6-1   |
|-----|--|
| 6.2 | Saving Position Data, Transferring and<br>Closing the Edit Window ······ |
|     | 6.2.1 Saving a Position Online, Transferring and                         |
|     | Closing the Edit Window6-15  |
|     | 6.2.2 Transferring a Position Created Offline ······6-21                 |

# 6.1 Explanation of the Items Displayed in the Position Data Edit Window

- (1) Select "Position (O)"  $\rightarrow$  "Edit (E)" from the menu.
- (2) The position data edit window will be displayed. This window has the following controls and fields.

The Position edit range window should appear.

Set the number of the position data to be displayed in the position edit window in the section of 2. The section of 1 should be displayed when the axes group numbers are divided into two groups. The position data is to be edited in the unit of axes group.

Select Axes Group No. 1 and No. 2 targeted for edit. (Multiple select available) Click Edit .

| Position edit range selection   |                                | ×                               | ]            |   |
|---|--------------------------------|---------------------------------|--------------|---|
| 1.Please select the target at<br>Axis group No. Maximu<br>1<br>2<br>Batch selecti | n axis No. Maximum p<br>6<br>2 | osition No.<br>18,000<br>18,000 | <pre>}</pre> | Displayed only when<br>Axes Group No. 2 activated |
| 2.Please select the target po<br>1 - 18,000<br>3.Please select an operation       | osition number.                |                                 | J            |   |

Fig. 6.1 Position edit range selection

1) Position data 2) Common buttons 3) Axis-specific buttons 4) Setting functions

| 🕅 Edit Position Data  |       |       |           |              |             |            |         |         |        |            |        |          |          |         | - • × |
|---|-------|-------|-----------|--------------|-------------|------------|---------|---------|--------|------------|--------|----------|----------|---------|-------|
| a 🖹 🥖 🎒   | 🗱   💽 | <> DB | ) 🖉   Po  | sition movem | ent type CP | ∨ 🗹 View B | utton o | of Each | Axis a | and Jog Se | tting  |          |          |         |       |
| When Mov/Cont.Mov operate, the output operation function is disabled. |       |       |           |              |             |            |         |         |        |            |        |          |          |         |       |
|   |       |       |           |              |             |            |         |         |        |            |        |          |          |         |       |
| 0.000   |       | 0.000 | 0.000     |              | 0.000       | 0.000      |         | 0       | .000   | Acc 0.     | 30     |          |          |         |       |
| ◆ (-) ◆ (+)   |       | ♦ (+) | (-) 🔷 (+) | - (-)        | ► (+) 📥     | -) 🔶 (+)   | -) 🕈    | ) 🔶     | (+)    | Dcl 0.     | 30     |          |          |         |       |
| TP  | tr TP | - E   | TP        | TP           | - W         | rp         | TI 🔤    | ?       |        | Inc 0.0    | 00     |          |          |         |       |
|   |       |       |           |              |             |            |         |         |        |            | _      |          |          |         |       |
| No.(Name)   | Axisl | Axis2 | Axis3     | Axis4        | Axis5       | Axis6      | Vel     | Acc     | Dcl    | OutFn      | OutNo. | OutParal | OutPara2 | Comment |       |
| 1()   |       |       |           |              |             |            |         |         |        |            |        |          |          |         |       |
| 2()   |       |       |           |              |             |            |         |         |        |            |        |          |          |         |       |
| - , ,   |       |       |           |              |             |            |         |         |        |            |        |          |          |         |       |
| 3()   |       |       |           |              |             |            |         |         |        |            |        |          |          |         |       |
|   |       |       |           |              |             |            |         |         |        |            |        |          |          |         |       |
| 3()   |       |       |           |              |             |            |         |         |        |            |        |          |          |         |       |

Fig.6.2 Position Data Edit (XSEL2-T)

(Note) Position of synchronized slave axis is not available for edit.

## 1) Position data

| [ | No. | Ax                     | is1 | Axi   | s2      | Axi                               | s3   | Axis     | :4 | I       |
|---|-----|------------------------|-----|-------|---------|-----------------------------------|------|----------|----|---------|
| I | Ax  | Axis5 Axis6 Axis7 Axis |     | is8   | 7       | 7) Position Output Operation Data |      |          |    |         |
| I | Vel | Acc                    | Del | OutFn | Out No. | OutP                              | aral | OutPara2 | 2  | Comment |

Fig. 6.3 Position Data (XSEL2-T)

- 1) Position data 2) Common buttons 3) Axis-specific buttons 4) Setting functions 5) Move Setting
- 6) Switching over Axis Identification Button / Setup Feature / Select Movement Displays

| ZZI Edit Position Data  |   |  |  |  |  |  |  |  |  |
|---|---|--|--|--|--|--|--|--|--|
| 🖬 🖹 🗲 🎒 🛛 🗮 < 🍽 🖪 🔗 🛛 Position movement type  | PTP 🗸 🗹 View Button of Each Axis and Jog Setting  |  |  |  |  |  |  |  |  |
| Aris1-0 Aris1-4 Aris5-0   |   |  |  |  |  |  |  |  |  |
| Mov/Cont.Mov operate with the selected work coordinate system.<br>When Mov/Cont.Mov operate, the output operation function is disabled.   |   |  |  |  |  |  |  |  |  |
| 1 SV HV 2 SV HV 3 SV HV 4 SV HV<br>W 0.000 W 450.000 W 0.000 W 0.000<br>★ (-) ★ (+) ★ (-) ★ (+) ★ (-) ★ (+)<br>Jog/Inc: Vel 30 Acc 0.10 Del 0.10 Inc 0.00<br>Vel 2 Acc 20 Del 20 Inc(deg) 0.00<br>Howe: Vel 30 Acc 0.10 Del 0.10<br>Vel 2 Acc 20 Del 20<br>Axtel-4 batch selection Axtel-4 batch release<br>5 SV HH HV 6 SV HH HV 7 SV HH HV 9 S<br>0.000 0.000 0.000 0.000 | Current arm system Right Change<br>Jog movement XY(work)<br>coordinate sys.<br>Scara-Work coord sys slct No.<br>(0=base coord sys slct No.<br>(0=no tool offset)<br>asymptotic coord sys slct No.<br>(0=no tool offset)<br>asymptotic coord system of the system of |  |  |  |  |  |  |  |  |
| Jog/Inc/Hove: Vel 30 Acc 0.30 Dcl 0.30 Inc 0.000  |   |  |  |  |  |  |  |  |  |
| No.(Name) Axisl Axis2 Axis3 Axis4 Axis5 A   | xisé Axis7 Axis8 Arm Vel Acc Dcl OutFn OutNo. OutParal O  |  |  |  |  |  |  |  |  |
| 1()   |   |  |  |  |  |  |  |  |  |
| 3()   |   |  |  |  |  |  |  |  |  |
| 4()   |   |  |  |  |  |  |  |  |  |
| 5()   |   |  |  |  |  |  |  |  |  |
|   |   |  |  |  |  |  |  |  |  |
| Input Range: -99,999.999 to 99,999.999 Position No. for holding data  | when controller power is off: 1 to 5,000  |  |  |  |  |  |  |  |  |

Fig. 6.4 Position Data Edit (XSEL2-TX)

## 1) Position data

∽ 7) Position Output Operation Data

Fig. 6.5 Position data (XSEL2-TX)

#### No. (Name)

The position number and corresponding symbol are displayed.

You can press the [F11] key to open the symbol edit window where you can edit the symbol assigned to the applicable position number. Pressing the [F11] key on the symbol edit window will return the input focus to the applicable position data in the edit window.

- \* You can press the F11 key to return the input focus from the symbol edit window to the position data edit window only when the position data edit window is currently open.
- \* To show or hide symbols, do so in the Environment Setup window accessible from Tool. (For the switching method, refer to [13. Tool])

#### Axis1 to 8

Specify each desired position for Axis 1 to Axis 8.

For XSEL2-TX, Axis1 to Axis4 should be indication of a SCARA axis position. Those after Axis5 should be indication of an added axis position.

Arm (It should be displayed for XSEL2-TX)

The target arm system of a SCARA axis should be indicated in Left or Right.

- (Note) The target arm system indication set in this item should be effective in the following operations.
  - Move with "Move" button ( ) or "Continuous Move" button ( ) in the Edit Position window (When there is no target arm system set in the position data, operation should be made as "Current Arm System (permit move of opposite arm system when not available)".)
  - Servo Operation SEL Command Using Position Data

(Note) When edit, indication is available by inputting the top letter of the indication format. [Example] •Enter "L"  $\rightarrow$  Left

•Enter "R"  $\rightarrow$  Right

## Vel

Specify a desired speed.

Available range is from 1 to 9999.

However, for XSEL2-T, All Axes Common Parameter No. 21 "Operation Velocity Max. for Input Check" should be the maximum value in the set value when All Axes Common Parameter No. 20 "Max. Operation Velocity Check Timing" is set to "0".

#### <u>Acc</u>

Specify a desired acceleration.

Available range is from 0.01 to 9.99.

However, for XSEL2-T, All Axes Common Parameter No. 22 "Acceleration Max." should be the maximum value in the set value when All Axes Common Parameter No. 18 "Max. Operation Acceleration/Deceleration Check Timing" is set to "0".

## Dcl

Specify a desired deceleration.

Available range is from 0.01 to 9.99.

However, for XSEL2-T, All Axes Common Parameter No. 23 "Deceleration Max." should be the maximum value in the set value when All Axes Common Parameter No. 18 "Max. Operation Acceleration/Deceleration Check Timing" is set to "0".

## <u>Comment</u>

Enter comment, if necessary (using up to 32 single-byte characters/16 double-byte characters).

In the position edit window, clicking "Edit (E)"  $\rightarrow$  "Undo (U)" from the menu can cancel the most recent 10 operations.

Alternatively, pressing Ctrl + Z key simultaneously can cancel the operations.

However, the cancel function will become disabled when any of the following operations is performed:

- Transfer of data on the edit window to the controller
- Saving data on the edit window to a file
- Closing of the edit window

When this operation is performed, the warning window in Fig. 6.6 will be displayed. Clicking Yes will cancel the operation executed immediately before.



Fig. 6.6 Warning

| 2) Con | nmon buttons   |  |  |  |  |  |  |
|--------|--|--|--|--|--|--|--|
| R 🖬 🗲  | 😂 🛛 🔣 🔛 🕑 🖉 Position movement type 🛛 PTP 🗸 🖉 View Button of Each Axis and Jog Setting      |  |  |  |  |  |  |
|        | Fig. 6.7 Common Buttons  |  |  |  |  |  |  |
|        | Save to File   |  |  |  |  |  |  |
|        | Clicking this button will open a dialog box where you can save the position data to a file |  |  |  |  |  |  |
|        | under a desired name.  |  |  |  |  |  |  |
|        | Transfer to Controller   |  |  |  |  |  |  |
|        | Clicking this button will transfer the position data to the controller.                    |  |  |  |  |  |  |
| 1      | Refresh Position Data  |  |  |  |  |  |  |
| >      | After a program that rewrites position data has been run, click this button to refresh the |  |  |  |  |  |  |
| _      | position data display.   |  |  |  |  |  |  |
| 8      | Print  |  |  |  |  |  |  |
| -      | Clicking this button will print the position data.   |  |  |  |  |  |  |
|        | Capture Current Position   |  |  |  |  |  |  |
|        | Clicking this button will capture the current position into the position number            |  |  |  |  |  |  |
|        | corresponding to the cursor 🔽 position for all axes indicated by. (The captured position   |  |  |  |  |  |  |
|        | is not yet transferred to the controller.)   |  |  |  |  |  |  |
|        | For XSEL2-TX, the window in Figure 6.8 should be displayed. Select an axis and arm         |  |  |  |  |  |  |
|        | system to read in the current position and current arm system, and click OK.               |  |  |  |  |  |  |

| Current position teach setting | ×                               |
|--------------------------------|---------------------------------|
| Axis pattern                   |                                 |
| 🗹 Axisl 🔽 Teach the            | e current arm system of Axisl-4 |
| 🗸 Axis2                        |                                 |
| 🗸 Axis3                        |                                 |
| 🗹 Axis4                        |                                 |
| 🗹 Axis5                        |                                 |
| 🗸 Axis6                        |                                 |
| 🗹 Axis7                        |                                 |
| 🗸 Axis8                        |                                 |
| Batch sele                     | ection Batch release            |
|                                | OK Cancel                       |

Fig. 6.8 Current Position Load Setting Window

# 🗲 <u>Jog –</u>

The axes specified as the ones to be operated by the common buttons and whose servo is ON will jog backward while this button is pressed. However, indication of a SCARA axis and orthogonal axis at the same time cannot be performed.

## Jog +

The axes specified as the ones to be operated by the common buttons and whose servo is ON will jog forward while this button is pressed. However, indication of a SCARA axis and orthogonal axis at the same time cannot be performed.

## Move

Clicking this button will move all axes indicated by 💽 to the position of the position number corresponding to the cursor position.

\* If there is changed position data, transfer the data to the controller first.

## Move Continuously

Clicking this button will move all axes indicated by  $\checkmark$  to the position of the position corresponding to the cursor position. Thereafter, each axis will continue to move to the position set by the data in next position number.

\* If there is changed position data, transfer the data to the controller first.

## Stop All Axes

Clicking this button will stop all axes currently moving.

## Position Move Type

A move type (PTP move or CP move) can be selected for when a position move is executed. (Display in V15.00.00.00 and later)

#### ☑ View Button of Each Axis and Jog Setting

If a checkmark is placed in the checkbox of this button, the axisspecific button/setting window (Fig. 6.2) will be displayed. If the checkmark is not placed, the position data will only be displayed.

| 🗟 🗲 🖨     | 羅  🧧  |       | 🖉 🛛 Po | sition moveme | nt type | e CP | ~ C | )View Butt | con of Ea | ach Axis and | d Jog Settin | ıa      |
|-----------|-------|-------|--------|---------------|---------|------|-----|------------|-----------|--------------|--------------|---------|
| No.(Name) | Axisl | Axis2 | Axis3  | Axis4         | Vel     | Acc  | Dcl | OutFn      | OutNo.    | OutParal     | OutPara2     | Comment |
| 1()       |       |       |        |               |         |      |     |            |           |              |              |         |
| 2()       |       |       |        |               |         |      |     |            |           |              |              |         |
| 3()       |       |       |        |               |         |      |     |            |           |              |              |         |
| 4()       |       |       |        |               |         |      |     |            |           |              |              |         |
| 5()       |       |       |        |               |         |      |     |            |           |              |              |         |
| 6( )      |       |       |        |               |         |      |     |            |           |              |              |         |
| 7()       |       |       |        |               |         |      |     |            |           |              |              |         |
| 8()       |       |       |        |               |         |      |     |            |           |              |              |         |
| 9()       |       |       |        |               |         |      |     |            |           |              |              |         |
| 10()      |       |       |        |               |         |      |     |            |           |              |              |         |

Fig. 6.9 Window of Position Data Only

(3) Axis-specific buttons (Orthogonal axis)

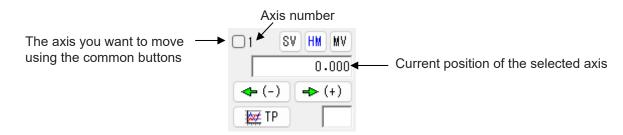


Fig. 6.10 Axis-specific Button (XSEL2-T)

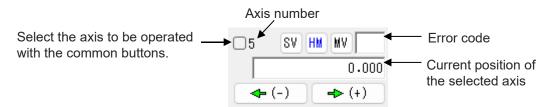


Fig. 6.11 Axis-specific Button (XSEL2-TX)

- Clicking this button will turn the servo of the selected axis OFF if it is currently ON, or turn the axis servo ON if it is currently OFF. (The button is text shown in light blue when the servo is ON.)
   Clicking this button will perform homing if the servo of the selected axis is ON.
  - Clicking this button will perform homing if the servo of the selected axis is ON. (The button is text shown in blue after home return.) (Note) Axes from Axis 1 to Axis 4 of the XSEL2-TX should not be displayed.
  - Clicking this button will move the selected axis to the position specified by the data in the position number corresponding to the cursor position, if the axis servo is ON. (The button text remains yellow while the axis is moving.)



The selected axis will jog forward while this button is clicked, if the axis servo is ON.

If a value (0.001 to 1) is entered in the Inc. field in the setting function group, the axis will perform inching. In this case, one click will move the axis by one inching distance.



The selected axis will jog backward while this button is clicked, if the axis servo is ON. If a value (0.001 to 1) is entered in the Inc. field in the setting function group, the axis will perform inching. In this case, one click will move the axis by one inching distance.



Clicking this button will capture the current position of the selected axis into the position number corresponding to the cursor position. (It is not transferred to the controller.)

(Note) In the case of the XSEL2-TX, there is no "TP" button.

To load the current position, click the current position load button ( 🔛 ) among the common buttons in (2) and (3).

(3) Axis-specific buttons (SCARA axis)

| □1 S  | VMV  |   |
|-------|------|---|
| W     | 0.00 | 0 |
| 🗲 (-) | (+)  |   |

fig. 6.12 Axis-specific Button (SCARA axis)



- Clicking a button of any SCARA axis can turn the servo on/off for all the SCARA axes. (The letters on the buttons should turn into light blue when the servo gets turned on.)
- Caution C

Click this button, and the servo on all the SCARA axes should turn on when the servo on the axes are off, and the servo on all the SCARA axes should turn off when the servo is on.

MV

Clicking this button will move the selected axis to the position specified by the data in the position number corresponding to the cursor position, if the axis servo is ON. (The button text remains yellow while the axis is moving.)



The selected axis will jog forward while this button is clicked, if the axis servo is ON. If a value (0.001 to 1) is entered in the Inc. field in the setting function group, the axis will perform inching. In this case, one click will move the axis by one inching distance.

� (-)

The selected axis will jog backward while this button is clicked, if the axis servo is ON. If a value (0.001 to 1) is entered in the Inc. field in the setting function group, the axis will perform inching. In this case, one click will move the axis by one inching distance.

(4) Setting functions (Orthogonal axis)

| Vel[mm/sec] | 30    |
|-------------|-------|
| Acc[G]      | 0.30  |
| Dcl[G]      | 0.30  |
| Inc[mm]     | 0.000 |

Set the velocity (Vel), acceleration (Acc), deceleration (Dcl) and inching distance (Inc.) to be used when the actuator is operated using the various buttons. If a value is entered in any of the Vel, Acc and Dcl fields in the position data area, the value in the applicable position data field will be given priority for movement to the corresponding position number.

Fig. 6.13 Settings of Velocity, Acceleration, Deceleration and Inching Distance (XSEL2-T)

The maximum settings for Vel (Velocity), Acc (Acceleration) and Dcl (Deceleration) are as stated below:

- Velocity: 250mm/sec
- Acceleration: All Axes Common Parameter No.22
- Deceleration: All Axes Common Parameter No.23

Jog/Inc/Move: Vel[mm/sec] 30 Acc[G] 0.30 Dcl[G] 0.30 Inc[mm] 0.00

Fig. 6.14 Setting functions (Axis 5 to Axis 8 of the XSEL2-TX)



Fig. 6.15 Jog Buttons

These jog buttons can also be used to jog those axes that have not yet completed homing. However, coordinate values have no meaning for these axes, so pay due attention to avoid contact with the stroke end. If a value (0.001 to 1) is entered in the Inc. field in the setting function group, the jog buttons will function as inching buttons.

Continue to click an inching button will change the operation to jogging. Specifically, the axis will start jogging approx. 1.6 second after the inching button is clicked. If the button is held continuously, the jogging velocity will change approx. every second thereafter in the order of  $1 \rightarrow 10 \rightarrow 30 \rightarrow 50 \rightarrow 100$  [mm/s].



## Caution

• Operating any selectable jog button for an operating axis will jog the axis, and the axis will stop once the button is released. (If the next operation command is input, the axis will perform the specified operation.)

## (4) Setting functions (SCARA axis)

| Jog/Inc | :Vel[mm/sec] | 30 | Acc[G] | 0.10 | Dcl[G] | 0.10 | Inc[mm]  | 0.00 |
|---------|--------------|----|--------|------|--------|------|----------|------|
|         | Vel[%]       | 2  | Acc[%] | 20   | Dcl[%] | 20   | Inc[deg] | 0.00 |
| Move:   | Vel[mm/sec]  | 30 | Acc[G] | 0.10 | Dcl[G] | 0.10 |          |      |
|         | Vel[%]       | 2  | Acc[%] | 20   | Dcl[%] | 20   |          |      |

Fig. 6.16 Settings of Velocity, Acceleration, Deceleration and Inching Distance (XSEL2-TX)

Set the velocity (Vel), acceleration (Acc), deceleration (Dcl) and inching distance (Inc.) to be used when the actuator is operated using the various buttons. Set it up for both the jog/inching (Jog/Inc) and the position indication move (Move).

There are two types of set units for Vel, Acc, Dcl and Inc.

## For Jog/Inching (Jog/Inc)

Vel [mm/sec] , Acc [G], Dcl [G], Inc [mm]

It should be enabled when the jog move coordinate system is set to the XY (workpiece) coordinate system or XY (tool) coordinate system.

Vel [%], Acc [%], Dcl [%], Inc [deg]

It should be enabled when the jog move coordinate system is set to each axis system.

For Position indication move (Move)

Vel [mm/sec], Acc [G], Dcl [G] It should be enabled when the position move type is set to CP. Vel [%], Acc [%], Dcl [%] It should be enabled when the position move type is set to PTP.

The maximum set value of Vel [mm/sec], Acc [G] and Dcl [G] should be as follows. (In common for jog/inching and position indication move)

- Velocity: 250mm/sec
- Acceleration: Robot Parameter No.22
- Deceleration: Robot Parameter No.23

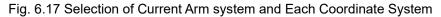
The maximum set value of Vel [%], Acc [%] and Dcl [%] should be as follows. (In common for jog/inching and position indication move)

- Velocity: Robot parameter No.35
- Acceleration:100%
- Deceleration:100%

#### (5) Movement Selection

Establish the setting for [Current Arm System], [Jog Movement Coordinate System], [SCARA Work Coordinate System Select No.] and [SCARA Tool Coordinate System Select No.] in each button.

| Current arm system                                  | Right  | Change |
|---|--------|--------|
| Jog movement<br>coordinate sys.                     | XY (wo | rk) ~  |
| Scara-Work coord sys slct No.<br>(0=base coord sys) | 0      | hange  |
| Scara-Tool coord sys slct No.<br>(0=no tool offset) | 0      | hange  |



#### Current arm system

Arm system can be changed by clicking Change

| Current arm system Ri | ght Change |
|-----------------------|------------|
|-----------------------|------------|

Fig. 6.18 Current Arm system



## Caution

• When a change of the arm system is made to an axis in stop, the arm may operate.

Jog movement coordinate sys.

The coordinate system can be changed by clicking

XY (work) coordinate system (Can be offset using Work Coordinate System Selection No.)

XY (tool) coordinate system

Each axis coordinate system

| Jog movement    | XY(work) v |
|-----------------|------------|
| coordinate sys. |            |

Fig. 6.19 Jog movement coordinate sys.

SCARA-Work coord sys slct No.

A desired work coordinate system No. can be selected by clicking Change.

| Scara-Work  | coord  | sys | slct | No. |   |        |
|-------------|--------|-----|------|-----|---|--------|
| (0=base coo | rd sys | 3)  |      |     | 0 | Change |

Fig. 6.20 SCARA Work coord sys slct No.

SCARA-Tool coord sys slct No.

A desired tool coordinate system No. can be selected by clicking Change.

Scara-Tool coord sys slct No. 0 Change

Fig. 6.21 SCARA Tool coord sys slct No.

(6) Axis-specific button/setting function/movement selection display axis switching

Axis1-8 Axis1-4 Axis5-8

Fig. 6.22 Axis-specific Button/Setting Function/Movement Selection Display Axis Switching

Switch the axes displayed in the axis-specific button, setting function and movement selection areas.

- Axis1-8: Display the axis-specific buttons, setting functions and movement selections of all effective axes.
- Axis1-4: It should display the axis-specific buttons, setting functions and movement selections only for the SCARA axis (Axis 1 to 4).

(This item is displayed only when the SCARA axis (Axis 1 to 4) is an activated axis.)

Axis5-8: It should display the axis-specific buttons, setting functions and movement selections only for the Orthogonal axis (Axis 5 to 8).

(This item is displayed only when Axis 5 or later is an activated axis in the XSEL2-TX.)

## (7) Position output operation data

| No.(Name) | Axis1   | Axis2   | Axis3 | Axis4 | Vel | Acc  | Del  | OutFn | Out No. | OutPara1 | Out Para2 |
|-----------|---------|---------|-------|-------|-----|------|------|-------|---------|----------|-----------|
| 10( )     | 100.000 |         |       |       | 100 | 0.30 | 0.30 | ON    | 316     | 0.000    | 0.000     |
| 11( )     |         | 150.000 |       |       | 100 | 0.30 | 0.30 |       |         |          |           |
| 12( )     | 150.000 |         |       |       | 100 | 0.30 | 0.30 |       |         |          |           |
| 13( )     |         | 100.000 |       |       | 100 | 0.30 | 0.30 | OFF   | 316     | 0.000    | 0.000     |

Fig. 6.23 Position Output Operation Data

## <u>OutFn</u>

Set the output function code.

There are two ways to establish setting. Without setting, the output operation will be invalid.

- 1) Bring the cursor to the setting position and click to show the output function code list. Select in the list from ON, OFF, etc.
- 2) Input a number from 1 to 6 that is applicable as an output function from the table below. As shown below, the display will be ON if "1" is selected for example.

| Output Function Code                      | Numerical Setting | Display |
|---|-------------------|---------|
| Turns ON after movement                   | 1                 | ON      |
| Turns OFF after movement                  | 2                 | OFF     |
| Turns ON after passed specified distance  | 3                 | OND     |
| Turns OFF after passed specified distance | 4                 | OFFD    |
| Turns ON after passed specified ratio     | 5                 | ONR     |
| Turns OFF after passed specified ratio    | 6                 | OFFR    |

## [Output Function Code]

• Turns ON/OFF after movement:

It turns ON/OFF the specified output ports and flags after moved to the applicable position.

• Turns ON/OFF after passed specified distance:

It turns ON/OFF the output ports and flags at the position where proceeded from the movement start position for the distance specified in Function Parameter 1 during movement to the applicable position.

• Turns ON/OFF after passed specified ratio:

It turns ON/OFF the output ports and flags at the position where proceeded from the movement start position for the ratio specified in Function Parameter 1 to the whole movement mount during movement to the applicable position.

## <u>OutNo.</u>

Set the output ports and flags applicable for operation.

## OutPara1

Set the parameters defined for each output function.

#### OutPara2

One-shot pulse will be output if output pulse timer time is set.

| Output Function Code<br>Name              | Function Parameter 1                | Function Parameter 2      |  |
|---|-------------------------------------|---------------------------|--|
| Turns ON after movement                   | Output Delay Timer Time             | Output Pulse Timer Time   |  |
| Turns OFF after movement                  | (0.000 to 999.999 second)           | (0.000 to 999.999 second) |  |
| Turns ON after passed specified distance  | Output Operation Specified Distance | Output Pulse Timer Time   |  |
| Turns OFF after passed specified distance | (0.000 to 9999.999mm)               | (0.000 to 999.999 second) |  |
| Turns ON after passed<br>specified ratio  | Output Operation Specified Ratio    | Output Pulse Timer Time   |  |
| Turns OFF after passed specified ratio    | (0.000 to 100.000%)                 | (0.000 to 999.999 second) |  |

#### Settings for Each Output Function

## ⊙ Display of Output Port

Output port can be displayed on position edit window.

To show the display, it is necessary to establish the following parameter settings.

| I/O Parameter | Name  | Setting Details   |
|---------------|---|---|
| No.74         | Number of Use of PC/TP<br>User Output Ports (such as<br>hand) | Set the number of output ports to be displayed on the position edit window.   |
| No.75         | PC/TP User Output Port Start<br>Number (such as hand)         | Set the output port start number.<br>With this number as the start number, ports are<br>displayed in a row for the number set in No. 74.<br>(Note) The display will not be shown if a number<br>out of the output ports is set. An error will<br>also not be shown. |

(Note) Virtual output port number can be set in No. 75 to show on the display.

| 2021 Edit Position Data   |  |  |  |  |  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|--|--|--|--|
| ▋≌≶≦  ፼ ◀▶ ₽₿ ⊘   |  |  |  |  |  |  |  |  |  |  |  |  |
| Position movement type CP 🗸 🖉 View Button of Each Axis and Jog Setting User specified output port position — Top 🗸  |  |  |  |  |  |  |  |  |  |  |  |  |
| When Mov/Cont.Mov operate, the output operation function is disabled.   |  |  |  |  |  |  |  |  |  |  |  |  |
| 1         SV         HM         KV         3         SV         HM         KV         4         SV         HM         KV         6         SV         HM         KV         Ve1         30           0.000  |  |  |  |  |  |  |  |  |  |  |  |  |
| $\begin{array}{c} \bullet (-) \bullet (+) \\ \hline \blacksquare \ IP \\ \blacksquare \ IP \\ \hline \blacksquare \ IP \\ \hline \blacksquare \ IP \\ \blacksquare \ IP \\ \blacksquare \ IP \\ \hline \blacksquare \ IP \\ IP \\ \blacksquare \ IP \\ IP$ | Dc1 0.30<br>Inc 0.000                    |  |  |  |  |  |  |  |  |  |  |  |
|   |  |  |  |  |  |  |  |  |  |  |  |  |
| User specified output port  | 12_404 )                                 |  |  |  |  |  |  |  |  |  |  |  |
| @ 405(Out_405) @ 406(Out_406) @ 407(Out_407) @ 408(Out_407)   | at_408 )                                 |  |  |  |  |  |  |  |  |  |  |  |
| No.(Name) Axis1 Axis2 Axis3 Axis4 Axi 5 Axis6 Vel Acc Dol   | 1 OutFn OutNo. OutParal OutPara2 Comment |  |  |  |  |  |  |  |  |  |  |  |
|   | I  |  |  |  |  |  |  |  |  |  |  |  |
| 2()<br>3() () () () () () () () () () () () () (  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1) User specified output port display   |  |  |  |  |  |  |  |  |  |  |  |  |
| 5()   |  |  |  |  |  |  |  |  |  |  |  |  |
| Input Range: -99,999.999 to 99,999.999 Position No. for holding data when controller power is off: 1  | to 5,000                                 |  |  |  |  |  |  |  |  |  |  |  |

2) User specified output port position

Fig. 6.24 User Specified Output Port Display

1) User Indicated Output Port Display

It shows the user indicated output port. It displays on the position edit window the same condition as 1 (ON) and 0 (OFF) displayed on the monitor output port window.

It is on when the light is ON, and OFF when the light is off.

When a check mark is put to the following in the configuration of the tool, not only the output ports such as 300, but also the symbols defined in the symbol edit window will be displayed.

• Display symbol names to variable monitor, I/O port monitor, flag monitor and position edit window.

Refer to [9. Symbol Edit and 13. Tools].

2) User Specified Output Port Position

You can choose where around the position data you would like to display the user indicated output port.

Selection can be made from "Top", "Bottom", "Left" and "Right".

Also, by selecting "None", display can be disappeared.

# 6.2 Saving Position Data, Transferring and Closing the Edit Window

## 6.2.1 Saving a Position Online, Transferring and Closing the Edit Window

[1] Saving to a file the position data you are editing

Click Save to File in the position edit window.

This is the same as clicking "File (S)"  $\rightarrow$  " Save As (A)"

After clicking Save to File, File Save Select window will be displayed.

When Axes Group No. 2 is activated, the position data in Axes Group No. 1 and 2 can be saved in one file.

When Axes Group No. 2 is activated, select "Position (O)"  $\rightarrow$  "Save to File (S)" in the menu and the window shown below should appear.

| P | ositi | on data s | ave    |        |                         |        |      |         |       |     |      | × |
|---|-------|-----------|--------|--------|-------------------------|--------|------|---------|-------|-----|------|---|
|   | 1.    | Please    | select | ; a po | sition sav              | ing ra | nge. |         |       |     |      |   |
|   |       | Axis      | group  | No.    | Maximum                 | axis   | No.  | Maximum | posit | ion | No.  |   |
|   |       |           |        | 1      |                         |        | 6    |         |       | 18, | ,000 |   |
|   |       |           |        | 2      |                         |        | 2    |         |       | 18, | ,000 |   |
|   |       |           | S      |        | position<br>osition dat |        |      |         | -     |     |      |   |

Fig. 6.25 Position data save

"Save position data of all axis groups"

The position data in Axes Group No. 1 and 2 should be saved in one file at once.

"Save position data of specified axis group"

An individual position data file of the axes group number selected in 1. should be saved.

If you open the consolidated saved file, the window shown below should come out.

| C:\P | C\PntAll.rspta                                      |                |             |                 | ×             |
|------|---|----------------|-------------|-----------------|---------------|
| 1    | Please select the                                   | target axis gr | oup No.     |                 | File property |
|      | Axis group No.                                      | . Maximum axi  | s No. Maxim | um position No. | Tite property |
|      | 1   | L              | 8           | 36,000          |               |
|      | 2   | 2              | 8           | 36,000          |               |
|      | Bato  |                |             |                 |               |
|      | Please select the<br>Valid only when 'Tr<br>1 - 100 |                |             |                 |               |
| 3    | Please select an o                                  | operation.     |             |                 |               |
|      | Transfer to Cont:                                   | roller         | Read        | Print           |               |

Fig. 6.26 Batch selection

## Transfer to Controller

The position data of the axes group number selected in 1. should be transferred to the controller. The transfer position range is to be set in Window 1..

## Read

The axes group number selected in 1. can be read in and the position edit window (offline edit) can be displayed.

## Print

The axes group number selected in 1. can be printed out.

\* Multiple axes group numbers can be selected.

Click Select All and all the axes groups displayed in the window can be selected.

Click Release All and the select of all the axes groups displayed in the window can be released.

Click Transfer to Controller in the position edit window (offline edit), and the window shown below should come up.

| 1.Please | select the | target axi                | s group No |                    |          |      |
|----------|------------|---------------------------|------------|--------------------|----------|------|
| Axis     | group No.  | Maximum                   | axis No.   | Maximum            | position | No.  |
|          | 1          |                           | (          | 5                  | 18       | ,000 |
|          | 2          |                           | 2          | 2                  | 18       | ,000 |
| 2.Please | select the | h selection<br>target pos |            | atch releas<br>er. | 30       |      |
| 1        | - 18,000   | peration.                 |            |                    |          |      |

Fig. 6.27 Position data transfer

Set the axes group number to transfer the data to in 1. and set the position number range to transfer in 2., and click Transfer to Controller.

[2] Transferring to the controller the position data you are editing

Click Transfer to Controller in the position edit window.

The position data you are editing will be saved to the controller's memory.

This button is selectable only in the online edit mode.

 $\odot\,\mbox{Error/warning}$  display before data transfer

When transferring position data to the controller, the position data to be transferred is checked for problems and if any of the data cannot be transferred (due to excessive speed, acceleration, deceleration, etc.), applicable errors/warnings are displayed in a list.

| -20 C:\Do | ocuments and S | ettings\User\te | est.x4pt     |              |        |        |       |                                   |                      |          |
|-----------|----------------|-----------------|--------------|--------------|--------|--------|-------|-----------------------------------|----------------------|----------|
|           | 6              |                 |              |              |        |        |       |                                   |                      |          |
| No.       | Axis1          | Axis2           | Axis3        | Axis4        | Ve1    | Acc    | Dcl   | Comment                           |                      | ^        |
| 1         | 100.000        | 100.000         |              |              | 600    |        |       | Posl                              |                      |          |
| 2         | 200.000        | 200.000         |              |              | 1200   |        |       |                                   |                      |          |
| 3         |                |                 | 100.000      | 100.000      |        | 0.60   | 1.20  |                                   |                      |          |
| 4         |                |                 | 200.000      | 200.000      |        | 1.20   | 0.60  |                                   |                      |          |
|           | Select the     | e "Displa       | y only th    | e error"     |        |        |       |                                   | -                    |          |
|           |                | •               |              |              | -      |        |       |                                   |                      |          |
|           | check b        | ox to sho       | ow only e    | errors.      |        |        |       | Click Hide in the                 | e pop-up menu        |          |
| 9         |                |                 |              |              |        |        |       | to hide the error I               | ist.                 |          |
| 10        |                |                 |              |              |        |        |       |                                   |                      | ~        |
| Before    | e transfer     |                 |              |              |        |        |       |                                   |                      |          |
| □ Di:     | splay only t   | he error        | Error to     | tal:3 1      | Jarnin | g tota | 1:1   |                                   |                      |          |
| Posit     | ion No. Cat    | egory           |              |              |        |        |       | Message                           |                      |          |
|           | 1 War          | ning The co     | omment data  | cannot be tr | ansfe  | rred.  | OBeca | use controllrer is not support fo | r position comment f | unction. |
|           | 2 Er           | ror The ve      | elocity exce | eds the maxi | imum v | alue ( | 1000[ | mm/sec]).                         |                      |          |
|           | 3 Er           | ror The de      | eceleration  | exceeds the  | maxim  | um val | ue (1 | .00[G]).                          |                      |          |
|           | 4 Er           | ror The ad      | celeration   | exceeds the  | maxim  | um val | ue (1 | .00[G]).                          | Hide                 |          |
| Tunut     | Denge . 0000   | 0 000 to 00     | 000 000      |              |        |        |       |                                   |                      |          |

Fig. 6.28 Position Data Error List

If an error is found in the position data to be transferred, the position data will not be transferred. If the position data to be transferred only generates a warning, the warning window appears.



Fig. 6.29 Warning Window

Click Yes to transfer the position data.

Click No to cancel the transfer of position data.

(Note) The maximum number of errors/warnings displayed in the position data error list is set on the Environment Setup window. Refer to [13. Tool Environment Setup Window].

## [3] Writing to the flash ROM

Once the position has been transferred to the controller, the following confirmation dialog box with the message, "Write Flash ROM?" will be displayed.

| PC Interface Software for XSEL | Х |
|--------------------------------|---|
| Write Flash ROM?               |   |
| Program                        |   |
| 🗹 Symbol                       |   |
| Position                       |   |
| Parameter                      |   |
| Position" always selected.     |   |
| <u>Y</u> es <u>N</u> o         |   |

Fig. 6.30 Confirmation

Click and select a desired item (Position, etc.) to write to the flash ROM.

Click  $\underline{Yes} \rightarrow$  The memory data will be written to the flash ROM.

Click  $\boxed{\text{No}} \rightarrow \text{The memory data will not be written to the flash ROM}$ .

Comment data for Position No. 10001 and later also can be transferred.

However, the number of the position comments available to save is 10000 for the total of all the axes groups.

The number of position comments available to transfer can be confirmed in the main window.

| M PC Interface Software for XSEL  |   |                                |                                |                 |
|-----------------------------------|---|--------------------------------|--------------------------------|-----------------|
| <u>File Edit View Program Pos</u> | ition <u>P</u> arameter S <u>y</u> mbol <u>M</u> onitor <u>C</u> ontroller <u>T</u> o | ol <u>W</u> indow <u>H</u> elp |                                |                 |
| 🚔 🔳   🖓 🖉 🖏 👯   🖊                 | <u>↑</u>   🙀   🛏   🗊 🗊 🗊   🔳  |                                | Prmt Oprt(With Sfty Crct)      | Sfty Vel Specif |
| Controller holding data           | Remaining Steps 19,910 Remaining symbols  | s can be used in the prog      | gram 19,991 Remaining position | comments 10,000 |

Fig. 6.31 Display for Number of Remaining Position Comments

## [4] Closing the position data edit window

Attempting to close the program edit window will display the following confirmation dialog box with the message, "Data will be transmitted to the controller, Are you sure to continue?"



Fig. 6.32 Confirmation



The edited data will be transferred to the controller  $\rightarrow$  (3) Writing to the flash ROM.

The software will close the point edit window without saving the edited data.

The software will cancel the operation and return to the position edit window.

## 6.2.2 Transferring a Position Created Offline

A position created offline can be transferred to a controller by following the steps below.

- (1) Select "File (F)"→ "Open (O)" from the menu.
   In the window of "Open File", select a position created offline and open it.
  - (2) If a controller is connected, Controller Transfer button 😭 gets activated once the position is opened.

Press Controller Transfer button 🔛 , the position gets transferred to the controller.

|    | i 🕖     |         |     |     |     |       |        |          |          |         |  |
|----|---------|---------|-----|-----|-----|-------|--------|----------|----------|---------|--|
|    | Axisl   | Axis2   | Vel | Acc | Dcl | OutFn | OutNo. | OutParal | OutPara2 | Comment |  |
| 1  | 10.000  | 50.000  |     |     |     |       |        |          |          |         |  |
| 2  | 100.000 | 150.000 |     |     |     |       |        |          |          |         |  |
| з  |         |         |     |     |     |       |        |          |          |         |  |
| 4  |         |         |     |     |     |       |        |          |          |         |  |
| 5  |         |         |     |     |     |       |        |          |          |         |  |
| 6  |         |         |     |     |     |       |        |          |          |         |  |
| 7  |         |         |     |     |     |       |        |          |          |         |  |
| 8  |         |         |     |     |     |       |        |          |          |         |  |
| 9  |         |         |     |     |     |       |        |          |          |         |  |
| 10 |         |         |     |     |     |       |        |          |          |         |  |

Fig. 6.33 Position Edit Window

(3) A confirmation window asking if it is okay to transfer the data to the controller will appear. Press Yes.

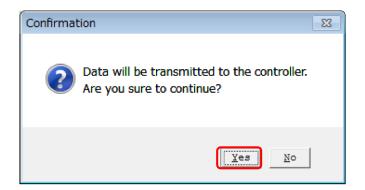


Fig. 6.34 Confirmation Window

(4) Next, a window to select the position number for destination will be shown. Select the axes group number and also numbers to indicate transfer from what number to what number of the positions to be performed. Press OK.

| l.Plea | se | select | the | target a <b>x</b> i | s grou | p No. |             |          |      |
|--------|----|--------|-----|---------------------|--------|-------|-------------|----------|------|
| Axi    | s  | group  | No. | Maximum             | axis   | No.   | Maximum     | position | No.  |
|        |    |        | 1   |                     |        | 6     |             | 18,      | ,000 |
|        |    |        | 2   |                     |        | 2     |             | 18       | ,000 |
|        |    |        |     | h selection         |        |       | atch releas | 3e       |      |
| 2.Plea |    | select |     | target pos          | ition  | numbe | er.         |          |      |
|        |    | aplast |     | peration.           |        |       |             |          |      |

Fig. 6.35 Position No. Select

(5) A confirmation window stating "Write Flash ROM?" will appear. Press Yes.

| PC Interface Software for XSEL   |
|----------------------------------|
| Write Flash ROM?                 |
| C Write all data areas.          |
| • Write the selection data area. |
| Program                          |
| 🗌 Symbol                         |
| V Position                       |
| Farameter                        |
| 🗌 User data-hold memory          |
| "Position" always selected.      |
| Yes No                           |

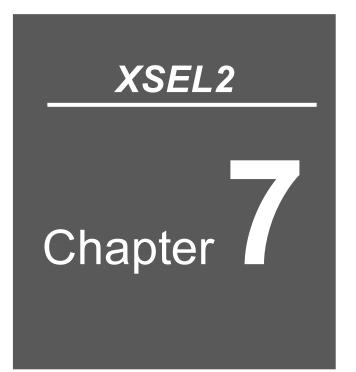
Fig. 6.36 Confirmation Window

(6) The position will be transferred to the controller.
 Also, flash ROM writing will be conducted, and the display below flashes during writing.
 The display will disappear once writing is complete.

| PC Interfac | e Softwa | are f |
|-------------|----------|-------|
| Writing     | Flash    | ROM   |

Fig. 6.37 Writing Flash ROM Window

6. Position Data Edit Window



# Copying/Moving/Clearing Position Data

| 7.1 | Copying/Moving Position Data Window ······7-1 |
|-----|---|
| 7.2 | Clearing Position Data 7-2                    |

# 7.1 Copying/Moving Position Data Window

- (1) Select "Position (O)"  $\rightarrow$  "Copy/Move (C)" from the menu.
- (2) The position data copy/move window will be displayed.

Specify the Top No. and the last No. of the Copy/Move source, and specify the Top No. of the Copy/Move destination.

Copying position data: Click Copy

The positions specified in Source to Copy/Move will be copied to the positions specified in Destination to Copy/Move.

Moving position data: Click Move

The positions specified in Source to Copy/Move will move to the positions specified in Destination to Copy/Move.

| 20 Copy/Move Position Data   | ×                          |
|--|----------------------------|
| When only axis group No. is a<br>all positions in the axis gro<br>are manipulated. |                            |
| Axis   | group No. Top No. Last No. |
| Source to Copy/Move  | 1 1,001 - 1,100            |
| Destination to Copy/Move   | 2 1,501 - 1,600            |
|  | Copy Move Cancel           |

Fig. 7.1 Position Data Copy/Move

\* Clicking Cancel will cancel the selected operation.

## (3) Writing to the flash ROM

When the copy or move is completed, the following confirmation dialog box with the message, "Write Flash ROM?" will be displayed.

| PC Interface Software for XSEL | $\times$ |
|--------------------------------|----------|
| Write Flash ROM?               |          |
| Program                        |          |
| Symbol                         |          |
| Position                       |          |
| Parameter                      |          |
| "Position" always selected     |          |
| <u>Y</u> es <u>N</u> o         |          |

Fig. 7.2 Confirmation

Click and select a desired item (Position, etc.) to write to the flash ROM.

Click Yes  $\rightarrow$  The memory data will be written to the flash ROM.

Click  $No \rightarrow$  The memory data will not be written to the flash ROM.

# 7.2 Clearing Position Data

- (1) Select "Position (O)"  $\rightarrow$  "Clear (L)" from the menu.
- (2) The position data clear window will be displayed.

| 2021 Clear Position Data  | ×      |
|---|--------|
| When only axis group No. is entered,<br>all positions in the axis group<br>are manipulated. |        |
| Axis group No. Top No. L<br>Clear Scope 2 1,201 -   |        |
| Clear   | Cancel |

Fig. 7.3 Clear Position Data

Input the first number and the last number of the position data to be deleted.

Then, click Clear. Clicking Cancel will cancel the operation.

(3) Writing to the flash ROM

When the clear is completed, the following confirmation dialog box with the message, "Write Flash ROM?" will be displayed.

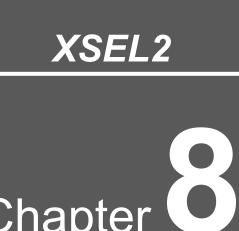
| PC Interface Software for XSEL | $\times$ |
|--------------------------------|----------|
| Write Flash ROM?               |          |
| Program                        |          |
| Symbol                         |          |
| Position                       |          |
| Parameter                      |          |
| "Position" always selected     |          |
| <u>Y</u> es <u>N</u> o         |          |

Fig. 7.4 Confirmation

Click and select a desired item (Position, etc.) to write to the flash ROM.

Click Yes  $\rightarrow$  The memory data will be written to the flash ROM.

Click  $No \rightarrow$  The memory data will not be written to the flash ROM.



Chapter

# **Parameter Edit** Window

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## 8.1 Explanation of the Parameter Edit Window

- (1) Select "Parameter (P)"  $\rightarrow$  "Edit (E)" from the menu.
- (2) The parameter edit window will be displayed.

You can select a desired parameter and change the value.

Values that are grayed out are read-only and cannot be changed.

## Save to File

Clicking this button will open a dialog box where you can save the parameter data to a file under a desired name.

Transfer to Controller

Clicking this button will transfer the parameter data to the controller.

## Print

Clicking this button will print the parameter data.

```
Easy Parameter Setup
```

Clicking this button and you can conduct Easy Parameter Setup.

| 9 ' | 🖀 🚔 🛛 Easy Parameter Setup I/O Output Setting Data Compare                |           |       |  |
|-----|---|-----------|-------|--|
| I/  | O Common to All Axes Axis group Robot Specific Axis Driver Encoder Option | board PLC | Other |  |
| 0   | Parameter Name  | Set Value |       |  |
| L   | I/O type  | 1         |       |  |
| 2   | (Sys Rsv) Oh  |           |       |  |
| 3   | (Sys Rsv)   | Oh        |       |  |
| 1   | (Sys Rsv)   | Oh        |       |  |
| 5   | (Sys Rsv)   | Oh        |       |  |
| 6   | (Sys Rsv)   | Oh        |       |  |
| 7   | (Sys Rsv)   | Oh        |       |  |
| 3   | (Sys Rsv)   | Oh        |       |  |

## Fig. 8.1 Parameter Edit

\* The above window shows axis group parameters. You can display other parameters by clicking each items.

In the parameter edit window, clicking "Edit (E)"  $\rightarrow$  "Undo (U)" from the menu can cancel up to the most recent 10 input operations.

Alternatively, pressing Ctrl + Z key simultaneously can cancel the operations.

However, the cancel function will become disabled when any of the following operations is performed:

- Transfer of data on the edit window to the controller
- Saving data on the edit window to a file
- Closing of the edit window

When this operation is performed, the warning window in Fig. 8.2 will be displayed. Clicking Yes will cancel the operation executed immediately before.



Fig. 8.2 Warning

# 8.2 Saving Parameter Data and Closing the Edit Window

- Saving to a file the parameter data you are editing Click Save As in the parameter edit window.
   This is the same as "Clicking File (F)" → "Save As (A)".
- (2) Transferring to the controller the parameter data you are editing You can save the parameter data you are editing to the controller's memory. Click Transfer to Controller in the parameter edit window.
- (3) Writing to the flash ROM

Once the parameter has been transferred to the controller, the following confirmation dialog box with the message, "Write Flash ROM?" will be displayed.

| PC Interface Software for XSEL | × |  |  |  |  |
|--------------------------------|---|--|--|--|--|
| Write Flash ROM?               |   |  |  |  |  |
| Program                        |   |  |  |  |  |
| Symbol                         |   |  |  |  |  |
| Position                       |   |  |  |  |  |
| Parameter                      |   |  |  |  |  |
| Position" always selected.     |   |  |  |  |  |
| <u>Y</u> es <u>N</u> o         |   |  |  |  |  |

Fig. 8.3 Confirmation

Click and select a desired item (Parameter, etc.) to write to the flash ROM.

- Click Yes  $\rightarrow$  The memory data will be written to the flash ROM.
- Click No → The memory data will not be written to the flash ROM. If No is selected, the controller will clear all data in its memory after a reset (i.e., after the controller power is reconnected or a software reset is executed), and then load the data from the flash ROM.

(4) Restarting the controller (software reset)

After the data has been written to the flash ROM, the following confirmation dialog box with the message, "Restart the controller?" will be displayed.

| Yes |  |  |
|-----|--|--|
| No  |  |  |

The new parameters will become effective.

The new parameters will not become effective.

The parameters will become effective after the controller is restarted (software reset) or the controller power is reconnected.

| Confirmation | ×                  |
|--------------|--------------------|
| Restart      | rt the controller? |
| Yes          | No                 |

Fig. 8.4 Confirmation

(5) Closing the parameter edit window

Attempting to close the parameter edit window will display the following confirmation dialog box with the message, "Save edited data in the Controller?"

| Confirmation |                   | X              |
|--------------|-------------------|----------------|
| Save         | edited data in ti | he Controller? |
| Yes          | No                | Cancel         |

Fig. 8.5 Confirmation



The edited data will be transferred to the controller → (3) Writing to the flash ROM.
The software will close the parameter edit window without saving the edited data.
The software will not close and go back to the parameter edit window.

- The user of the PC software is recommended to back up the parameters when the controller is delivered and also when the system into which the controller has been assembled is started.
- \* There are many customizable parameters. It is recommended that you back up the parameters frequently just like you do the programs.

# 8.3 Transferring a Parameter File

Pay attention to parameter categories when transferring parameter data files to the controller. The controller is shipped with its axis-related parameters set, for each axis number, to values appropriate for the type of the robot connected.

The axis-specific related parameters are Each axis / Driver / Encoder.

Exercise caution when using an existing file containing customized parameters.

# Caution

• If parameter data is lost during parameter writing to the flash ROM due to main power OFF or any other factor, all parameters will be rewritten to initial values.

## 8.3.1 Selecting Categories of Parameters to Be Transferred

- (1) Select "File" → "Open" from the menu or click Open File and select the parameter file you want to transfer to the controller. Load the file into the PC software and open the parameter edit window.
- (2) Click Transfer to Controller in the parameter edit window.
- (3) The Select Parameter Category window (Fig. 8.6) will be displayed.

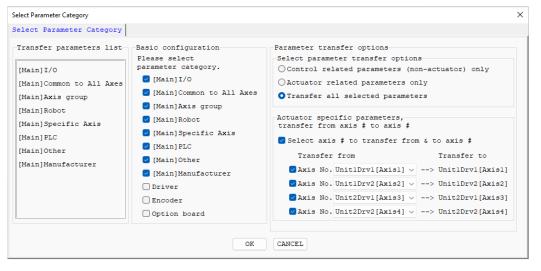


Fig. 8.6 Select Parameter Category window (XSEL2-T)

| Parameter Category         Transfer parameters list         [Main]I/0         [Main]Common to All Axes         [Main]Bobot         [Main]Specific Axis         [Main]Dther         [Main]Manufacturer         [Main]Manufacturer         * When the valid axis pattern on the controller side is on the controller side and the execute again.         * When the valid axis pattern on the controller side and the execute again.         * When the valid axis pattern on the controller side and the execute again.         * When the valid axis pattern on the controller side and file side is different,.         Parameter related to a anis   | elect Parameter Category   |  |   |  |
|--|--|--|---|--|
| [Main] I/O       [Main] I/O         [Main] I/O       [Main] Rometer Category.         [Main] Kaing group       [Main] Robot         [Main] Specific Axis       [Main] Robot         [Main] PLC       [Main] Specific Axis         [Main] Manufacturer       [Main] Maingerup         [Main] Manufacturer       [Main] Maingerup         [Main] Manufacturer       [Main] Specific Axis         [Main] Manufacturer       [Main] Manufacturer         [Main] Conter       [Main] Manufacturer         [Main] Manufacturer       [Main] No. Unit3Drv2[Axis5]      > Unit3Drv2[Axis5] <td>elect Parameter Category</td> <td></td> <td></td> <td></td> | elect Parameter Category   |  |   |  |
| Please restart and then execute again.<br>When the number of scalar axes on the controller side<br>and file sid sifterent,   | [Main]10<br>[Main]Axis group<br>[Main]Axis group<br>[Main]Robot<br>[Main]Specific Axis<br>[Main]FLC<br>[Main]Other<br>[Main]Manufacturer<br>When the valid axis patt<br>Parameters related to ea<br>cannot be transferred. | <pre>Please select<br/>parameter category.<br/>@ [Main] I/O<br/>@ [Main] Axis group<br/>@ [Main] Axis group<br/>@ [Main] Axis group<br/>@ [Main] Bectific Axis<br/>@ [Main] PLC<br/>@ [Main] PLC<br/>@ [Main] Diver<br/>@ Driver<br/>@ Encoder<br/>@ Option board<br/>ern on the controller side is 0,<br/>ch robot axis</pre> | Select parameter transfer options<br>Ocontrol related parameters (non-actuator) only<br>Okctuator related parameters only<br>Transfer all selected parameters<br>Actuator specific parameters,<br>transfer from axis \$ to axis \$<br>Select axis \$ to transfer from \$ to axis \$<br>Transfer from \$<br>axis \$ to Unit3Drv1[Axis]-Unit2Drv2[Axis\$] \$<br>axis \$ No. Unit3Drv2[Axis\$] \$<br>Axis \$ No. Unit4Drv1[Axis7] \$<br>Axis \$<br>Axis \$ No. Unit4Drv1[Axis7] \$<br>Axis \$<br>Ax | Transfer to<br>> UnitlDrvl[Axis1]-Unit2Drv2[Axis4]<br>> Unit3Drv1[Axis5]<br>> Unit3Drv2[Axis6]<br>> Unit4Drv1[Axis7] |
| cannot be transferred to the scalar axis.<br>Transfer robot parameters first.  | When the number of scala<br>and file side is different<br>Parameters related to eau<br>cannot be transferred to  | r axes on the controller side<br>nt,<br>ch robot axis<br>the scalar axis.  |   |  |

Fig. 8.7 Select Parameter Category window (XSEL2-TX)

## 1) Transferred Parameter List

By selecting (2) to (4) below, the parameters to be transferred to a controller should be displayed.

Make sure that you confirm the parameter type to be transferred before pressing OK.

## 2) Basic configration

Click the checkbox corresponding to each category of parameters you want to transfer (the clicked checkbox will be selected).

Only the parameters of the selected category or categories will be transferred to the controller.

3) Parameter transfer options - Selecting parameter transfer options

Selection whether to transfer parameters related to each axis of a robot only, or to transfer parameters other than those related to each axis of a robot only, to transfer all the selected parameters in the parameters selected in Basic configration should be made.

Parameters would not be transferred in the following cases, and a warning message stating "Parameters cannot be transferred." should be shown.

• When "Actuator related parameters only" is selected in

Parameter transfer options - Selecting parameter transfer options is selected while nothing is selected in the parameters related to each axis of robot (axis type, driver, encoder) in Basic configration.

 When "Control related parameters (non-actuator) only" is selected in Parameter transfer options - Selecting parameter transfer options is selected while nothing is selected in the parameters not related to each axis of robot in Basic Setup.

## 4) Detail Setup - Actuator specific parameter, transfer from axis # to axis #

Parameters related to each axis for a file at the origin of transfer can be indicated and transferred individually for each axis number to the destination controller.

Put a checkmark in [ Indicate Origin / Destination of Transfer].

Put a checkmark in the checkbox at the destination axis number to indicate the destination axis number.

It should be in order of the driver slots on the controller side from the top. A checkmark should not be put to a checkbox of an axis number of the controller that should not receive transfer. Indicate the axis number at the origin of transfer for the parameter related to each axis of the file to the box for the axis number at origin of transfer.

Shown in the figure below is an example of indication to transfer;

Axis2 data in file to Axis1 in controller,

Axis1 data in file to Axis2 in controller, and

Axis3 data in file to Axis4 in controller

cause a failure or error.

(Not to be transferred to Axis3 in controller)

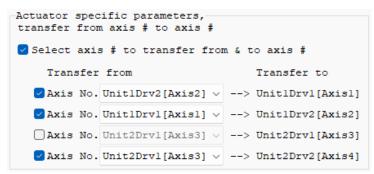


Fig. 8.8 Actuator specific parameter, transfer from axis # to axis #

- (Note) Do not put a checkmark to "□ Indicate Origin / Destination of Transfer" when transferring parameters related to each axis for all the axes without making any change to the axis number (All axes as are) or when parameters related to each axis are not to be transferred. A checkmark should not be put in usual case. Also, the electric circuit in a controller should differ depending on the connected robots for each axis. Making a change to configuration of axes only with parameter changes could
- (Note) For the XSEL2-TX controller, axes from Axis1 to Axis4 (or Axis3) applicable for SCARA should be indicated simultaneously. They cannot be indicated individually. Also, an axis number cannot be selected.

For the origin of transfer for the axes from Axis5 to Axis8 applicable for the cartesian axes in XSEL2-TX, from Axis5 to Axis8 should be available for selection.

- (Note) If the number of axes on the controller side and the file side differ to each other when IXA SCARA Robot (3-axis specification or 4-axis specification) is used, parameters related to each axis should not be able to be transferred.
- (4) Write the parameters to the controller according to steps 8.2 3) to 5).

# 8.4 Easy Parameter Setup

(1) Click Easy Parameter Setup in Edit Parameter window.

Or, select "Parameter"  $\rightarrow$  "Easy Parameter Setup" from the menu.

|                | 🖀 🎒 🛛 Easy Parameter Setup 🛛 I/O Output Setting 🗋 Data Compare            |           |       |  |
|----------------|---|-----------|-------|--|
| I/             | O Common to All Axes Axis group Robot Specific Axis Driver Encoder Option | board PLC | Other |  |
| Io             | Parameter Name  | Set Value |       |  |
| 1              | I/O type  | 1         |       |  |
| 2 (Sys Rsv) Oh |   |           |       |  |
| 3 (Sys Rsv) 0h |   |           |       |  |
| 4              | (Sys Rsv)   | Oh        |       |  |
| 5              | (Sys Rsv)   | Oh        |       |  |
| 6              | (Sys Rsv)   | Oh        |       |  |
| 7              | (Sys Rsv)   | Oh        |       |  |
| 8              | (Sys Rsv)   | Oh        |       |  |

Fig. 8.9 Edit Parameter Window

| AN PC Interface Software for XSEL |                              |
|-----------------------------------|------------------------------|
| File Edit View Program Position   | Parameter Symbol Monitor Con |
| 🖻 🔳 🖓 🖉 🖏 👯 🖊 🟠                   | Edit                         |
|                                   | Easy Parameter Setup         |
| Prmt Oprt (With Sfty Crct)        | I/O Output Setting           |
|                                   |                              |

Fig. 8.10 Menu Command

(2) The top menu of Easy Parameter Setup appears.Click on a button for a function of which you would like to set up or change the parameter.

| 🐔 Easy Parar | meter Setup |          | <b>x</b>         |
|--------------|-------------|----------|------------------|
| RS-232C      | Fieldbus    | Ethernet | Vision<br>System |

Fig. 8.11 Easy Parameter Setup Top Menu

(Note) Fieldbus may be replaced with a network name that is equipped to a controller.

(3) For example, if you click RS-232C, the setup window for RS-232C will appear. Set up or change the parameters.

| ſ                      | 🖄 RS-232C Setting               |            |
|------------------------|---------------------------------|------------|
|                        | CH1 CH2                         |            |
|                        | Use Selection Use               |            |
|                        | Bit Rate (bit/sec)              |            |
|                        | Data Length 8                   |            |
|                        | Stop Bit Length                 |            |
|                        | Parity Type None 🔻              |            |
|                        | 1) Set up or change             | parameters |
| 2) Click Transmit to C | Advanced(A) Standard Setting(S) |            |
|                        | Transmit to Controller Cancel   |            |

Fig. 8.12 Example for Setup Window (RS-232C)

- (4) After setting up or changing the parameters, click Transmit to Controller and the setup change data gets transmitted to the controller and the setup window closes. Once the setup window is finished, close the top menu of Easy Parameter Setup window, and the confirmation for flash ROM writing of parameters will be displayed. Once the flash ROM writing is complete, the controller will get rebooted.
  - (Note) Transmit to Controller is displayed when Easy Parameter Setup is clicked during online edit (controller edit) of parameters, or "Parameter" → "Easy Parameter Setting" is selected in the menu.
  - (Note) If editing the parameters saved in the PC offline and clicking Easy Parameter Setup, Transmit to Controller in the setup window changes to

Reflect to Edit Parameter Window .

Click Reflect to Edit Parameter Window, and the settings and changes conducted in Easy Parameter Setup will be reflected (changed) to the setting values in the Edit Parameter window. (But, controller transmission will not be executed.)

As parameters will not be transmitted to the controller, close the top menu of Easy Parameter Setup window, go to Edit Parameter window to save the parameter file and transmit the data to the controller.

(Note) If there is data in edit (data in red writing) in Edit Parameter window during online edit (controller data edit) of parameters, Easy Parameter Setup function cannot be used. If you click Easy Parameter Setup, a message will appear saying "There is data not written to the controller. Write to the controller first, or close the edit window".

## 8.4.1 Explanation of Easy Parameter Setup

Parameter edit is to be conducted in the setting screen of each function for those functions listed below.

The settings in each window should differ depending on the controller type and hardware construction.

Place the mouse cursor on the settings in each window, and the help for each item should be displayed.

• RS-232C

Setup for communication with external devices using RS-232C communication can be conducted. Select the communication settings for use / not to use of communication functions,

communication speed and so on.

Click <u>Standard Setting(S)</u>, and the settings in each item should be changed to the standard ones.

| RS-232C Setting<br>CH1 |             |          |            |
|------------------------|-------------|----------|------------|
|                        |             |          |            |
| Use Se                 | lection Us  | se       | ~          |
| Bit Rate (I            | bit/sec) 38 | 3400     | ~          |
| Data                   | Length 8    |          | ~          |
| Stop Bit               | Length 1    |          | ~          |
| Pari                   | ty Type No  | one      | ~          |
| Advan                  | nced(A)     | Standard | Setting(S) |
| Advan                  | nced(A)     | Standard | Setting(S) |

Fig. 8.13 RS-232C Setting

Set up the how to use COM Port (CH1) in the Communication Mode Setting (CH1) tab. Click Standard Setting(S), and the settings in each item should be changed to the standard ones.

| 督 RS-232C Sett            | ing  |  | × |
|---------------------------|--|--|---|
| COM port (CH1)            | Communication                                | mode (CH1)   |   |
| Minimum<br>IAI Protocol R | CH1 Usage<br>Delay Time of<br>esponse (msec) | IAI protocol<br>0 (0 - 999)<br>Standard Setting(S) |   |
| Transmit to               | Controller                                   | Cancel   |   |

Fig. 8.14 Communication Mode Setting

IAI Protocol Multiple Channels

IAI Protocol Multiple Channel Function should be set up.

Click Standard Setting(S), and the settings in each item should be changed to the standard ones.

| IAI Protocol Multiple Channel Setting                               | ×                            |
|---|------------------------------|
| IAI Protocol Multiple Channel<br>Communication Permission Selection | Permit ~                     |
| IAI Protocol Execution Command<br>Acceptance Channel (In AUTO Mode) | TP port (CH0) $\sim$         |
|   | Standard Setting( <u>S</u> ) |
| Transmit to Controller Ca   | ancel                        |
|   |                              |

Fig. 8.15 IAI Protocol Multiple Channel setting

 Fieldbus (CC-Link, DeviceNet, PROFIBUS-DP, EtherCAT, PROFINET IO, CC-Link IE Field) Setup of Fieldbus communication and I/O assignment can be conducted. Basic settings for communication should be established in Communication Tab. Settings should differ depending on the fieldbus type.

Click Standard Setting(S), and the settings in each item should be changed to the standard ones.

| 💀 Fieldbus Setting   | × |
|--|---|
| Communication Setting I/O Assignment Setting (SEL controller) I/O Assignment Information (device which connects to SEL controller) |   |
| Communication Setting (Slot 1)   |   |
| Network Type CC-Link   |   |
| Network Error Monitoring V   |   |
| Station Number 1 (1 - 64)  |   |
| Communication Speed 156kbps V  |   |
| Data Retention Setting (Communication error) Input Port Data Clear V   |   |
|  |   |
| Advanced(A) Standard Setting(S)  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
|  |   |
| Apply Cancel   |   |

Fig. 8.16 Communication Setting

Click Advanced Setting, and the detailed setting window for such as the timeout duration should open.

(There should be no need of setting change in normal use.)

| Advanced Setting  | ×                            |
|---|------------------------------|
| Setting of below items are normally not required to change. |                              |
| Network Link Error Confirmation Timer Link(CC-Link) (sec)   | 0.00 (0.00 - 2.55)           |
| Fieldbus Initialization Link Timeout Value (sec)            | 20.0 (0.0 - 409.5)           |
|   | Standard Setting( <u>S</u> ) |
| Apply Cancel  |                              |

Fig. 8.17 Advanced Setting

Set I/O start port number and the number of ports to be used in SEL Controller in I/O Assignment Setting (SEL Controller) Tab.

Click Standard Setting(S), and the settings in each item should be changed to the standard ones.

\* There is a setting for the number of remote register words only in CC-Link IE Field setting.

| mmunication Setting                      | I/O Assignr      | ment Setting (SEL controller)  | I/O Assignment Information | on (device w     | hich connects to SEL controlle                  | er)                          |  |
|--|------------------|--|----------------------------|------------------|---|------------------------------|--|
| initial load of Footang                  |                  |  | o roughner mennad          |                  |   |                              |  |
| I/O Port No. Assign                      | Type Fixe        | ed Assignment $\sim$   | *In case of automatic      | assignment,      | only the number of used netw                    | ork I/O port is settable.    |  |
| I/O Assignment Se                        | tting (SEL co    | ntroller)  |                            |                  |   |                              |  |
|  |                  | Input Port Setting   |                            |                  | Output Port Setting                             | ,                            |  |
| I/O Type                                 | Use<br>Selection | Start Port Number<br>(0,1000 + Multiple of 8)  | Number of<br>used port (*) | Use<br>Selection | Start Port Number<br>(300,4000 + Multiple of 8) | Number of<br>used port (*)   |  |
| CC-Link                                  | 🗹 Use            | 0 (0 - 296,<br>1000 - 3992)  | 64 🖨 (0 - 256)             | Use Use          | 300 (300 - 596,<br>4000 - 6992)                 | 64 🔹 (0 - 256)               |  |
| I/0 1                                    | Use Use          | 64 🜩 (0 - 296)   |                            | Use Use          | 364 🔹 (300 - 596)                               |                              |  |
| 1/0 2                                    | 🗹 Use            | 96 🗘 (0 - 296)   |                            | 🗹 Use            | 396 🜩 (300 - 596)                               |                              |  |
| For using other the<br>*In CC-Link, when | the number of    | nultiple number of 16.<br>please set multiple number of 8<br>of output ports and the number<br>n not be displayed. |                            |                  |   |                              |  |
|  |                  |  |                            |                  |   | Standard Setting( <u>S</u> ) |  |
|  |                  |  |                            |                  |   |                              |  |
|  |                  |  |                            |                  |   |                              |  |

Fig. 8.18 I/O Assignment Setting (SEL controller)

Display the I/O assignment information for the device SEL Controller is connected to (such as PLC) and SEL Controller in I/O Assignment Setting (SEL controller connected device) Tab.

Input the I/O assignment top address of PLC to "Top Address", and such information as the range of the fieldbus I/O assigned to the device SEL Controller is connected to (such as PLC) can be confirmed.

| VO Assignment Information (device which conne<br>Network Type [CC-Link<br>- Setting of PLC Side<br>Station Type [Ver1 compatible remote device<br>Top Address Remote Input (RX)<br>Remote Register (Rw) | Station Number 1 station Expanded Cyclic single Nu 0 Remote Output (RY) | mber of Remote Device 1<br>0 Radix HEX   |                                |
|---|---|--|--------------------------------|
| Station Type Ver1 compatible remote device<br>Top Address Remote Input (RX)   | station Expanded Cyclic single Nu                                       |  |                                |
| Station Type Ver1 compatible remote device<br>Top Address Remote Input (RX)   | 0 Remote Output (RY)  |  |                                |
| Top Address Remote Input (RX)   | 0 Remote Output (RY)  |  |                                |
|   |   | 0 Radix HEX                              |                                |
| Permete Persister (Pur)   |   |  |                                |
| (Temote Register (TWI)  | 0 Remote Register (Rww)   | 100 Radix DEC ~                          |                                |
| Connected Device<br>Input Assignment SEL Output   | Assignment Connected Device<br>Output Assignment                        | SEL Input Assignment                     |                                |
| RX(Start No.) 0 Out 300   | RY(Start No.)   | In 0                                     |                                |
| RX(End No.) 1F Out 331  | RY(End No.) 1F  | In 79                                    |                                |
| RWr(Start No.) 0 Out 332  | - 347 RWw(Start No.) 100  | In 32 - 47                               |                                |
| RWr(End No.) 1 Out 348  | - 363 RWw(End No.) 101  | In 48 - 63                               |                                |
|   |   | 1071                                     |                                |
| "I/O Assignment Information" displays the I/O at  | ssignment range of the connected device an                              | d SEL controller. It does not affect the | controller parameter settings. |
|   |   |  |                                |
|   |   |  |                                |
|   |   |  |                                |
|   |   |  |                                |



| 🏪 Fieldbus Setting                                      |  |                                       |                                       |                                  | × |
|---|--|---------------------------------------|---------------------------------------|----------------------------------|---|
| Communication Setting I/O Assignment                    | ment Setting (SEL controller)  | Assignment Information (device        | which connects to SEL controller)     | ]                                |   |
| I/O Assignment Information (dev                         | ice which connects to SEL contro   | ler)                                  |                                       |                                  |   |
| Network Type DeviceNet                                  | Node Ad  | ldress 0                              |                                       |                                  |   |
| Setting of PLC Side                                     |  |                                       |                                       |                                  |   |
| I/O Size Setting In<br>Top Address In<br>(Word Unit) In | 12         byte         Out         12         by           0         Out         0 <td< td=""><td>Radix DEC ~</td><td></td><td></td><td></td></td<> | Radix DEC ~                           |                                       |                                  |   |
| Connected Device<br>Input Assignment                    | SEL Output Assignment  | Connected Device<br>Output Assignment | SEL Input Assignment                  |                                  |   |
| Start Input<br>Word Address 0                           | Out 300 - 315  | Start Output<br>Word Address 0        | In 0 - 15                             |                                  |   |
| End Input<br>Word Address 5                             | Out 380 - 395  | End Output<br>Word Address 5          | In 80 - 95                            |                                  |   |
| **1/O Assignment Information* di                        | splays the I/O assignment range  | of the connected device and S         | EL controller, It does not affect the | e controller parameter settings. |   |
|   |  | Apply                                 | Cancel                                |                                  |   |

Fig. 8.20 I/O Assignment Information (For DeviceNet and Others)

| Fieldbus Setting                               |                                    |                                       |                                      | ×                               |
|--|------------------------------------|---------------------------------------|--------------------------------------|---------------------------------|
| mmunication Setting I/O Assig                  | nment Setting (SEL controller)     | Assignment Information (device        | which connects to SEL controller)    |                                 |
|  | evice which connects to SEL contro | ,                                     |                                      |                                 |
| Network Type CC-Link IE<br>Setting of PLC Side | Station Num                        | ber 1 Netw                            | ork No. 1                            |                                 |
| Station Type Intelligent de                    | evice station                      |                                       |                                      |                                 |
|  | emote Input (RX) 128 bit           |                                       | 28 bit                               |                                 |
|  |                                    |                                       | word                                 |                                 |
|  | emote Input (RX) 0                 | Remote Output (RY)                    | 0 Radix HEX                          |                                 |
| Remot  | e Register (Rwr) 0 F               | emote Register (Rww)                  | 100 Radix DEC V                      |                                 |
| Connected Device<br>Input Assignment           | SEL Output Assignment              | Connected Device<br>Output Assignment | SEL Input Assignment                 |                                 |
| RX(Start No.) 0                                | Out 300                            | RY(Start No.) 0                       | In 0                                 |                                 |
| RX(End No.) 7F                                 | Out 427                            | RY(End No.) 7F                        | In 127                               |                                 |
| RWr(Start No.) 0                               | Out 428 - 443                      | RWw(Start No.) 100                    | In 128 - 143                         |                                 |
| RWr(End No.) 7                                 | Out 540 - 555                      | RWw(End No.) 107                      | In 240 - 255                         |                                 |
| *100 A   | displays the I/O assignment range  | - (                                   | 51                                   |                                 |
| VO Assignment Information                      | usprays the volassignment range    | or the connected device and S         | EL CONTOIRER, IL DOES NOT Affect the | s controller parameter setungs. |
|  |                                    |                                       |                                      |                                 |
|  |                                    |                                       |                                      |                                 |
|  |                                    | Apply                                 | Cancel                               |                                 |

Fig. 8.21 I/O Assignment Information (For CC-Link IE Filed)

#### • Ethernet

Setup of I/O communication, IAI protocol B/TCP communication and program message communication by Ethernet can be conducted.

| mmon I/O IAI Protocol B/   | TCP SEL Program Message Comr                            | munication   |   |  |
|--|---|--|---|--|
| I/O Communication Address<br>IP Address (SEL controller)<br>Subnet Mask<br>Default Gateway |   | Message Communication Addre<br>IP Address (SEL controller)<br>Subnet Mask<br>Default Gateway | 192     .     168     .     0     .     1       255     .     255     .     0     .     0       0     .     0     .     0     .     0 |  |
|  | hegotiation (Recommended)<br>'anced(Δ) Standard Setting | ×<br>(5)   |   |  |
|  |   |  |   |  |

Fig. 8.22 Ethernet Setting (Common)

Setting of IP address on SEL Controller side and communication speed should be established in Common Tab.

In XSEL2-T/TX, it is necessary to set the IP addresses individually for I/O communication and for message communication.

(Setting of address only for message communication is available when there is no EtherNet/IP module connected.)

Click Standard Setting(S), and the settings in each item should be changed to the standard ones.

Click Advanced Setting, and the detailed setting window for such as the timeout duration should open.

(There should be no need of setting change in normal use.)

| ិត្តិ៍ Advanced Setting (Common)  | × |  |  |  |  |
|---|---|--|--|--|--|
| Setting of below items are normally not required to change.             |   |  |  |  |  |
| Network Link Error Confirmation Timer Value (sec)(*) 0.00 (0.00 - 2.55) | ) |  |  |  |  |
| *Valid only when Ethernet is used as I/O                                |   |  |  |  |  |
| Standard Setting( <u>S</u> )  |   |  |  |  |  |
| Apply Cancel  |   |  |  |  |  |

Fig. 8.23 Advanced Setting (Common)

|         | 1100     | 1                     |  |                 |  |
|---------|----------|-----------------------|--|-----------------|--|
| ommon   | 1/0      | IAI Protocol B/TCP    | SEL Program Message Communication          |                 |  |
| For I/O | commu    | ication with Ethernet | please configure setting for fieldbus comr | nunication here |  |
|         | Continua |                       | prodoc configure county for norable confi  |                 |  |
|         |          |                       | Fieldbus Communication Setting(F)          |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
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|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       |  |                 |  |
|         |          |                       | Apply                                      | Cancel          |  |
|         |          |                       | нриу                                       | Cancer          |  |

Fig. 8.24 Ethernet Setting (I/O)

When it is required to establish settings for I/O communication for EtherNet/IP, click Fieldbus Communication Setting in I/O Setting Tab, and the fieldbus communication setting window can be displayed in a separate window.

| Common I/O       | IAI Protocol B/TCP   | SEL Program Message Comm    | nunication  |  |
|------------------|--|-----------------------------|---|--|
| - For Controller | MANU Mode  |                             |   |  |
|                  |  |                             | Set same as "For Controller AUTO Mode"(U)         |  |
|                  |  |                             |   |  |
|                  |  | Use Selection               | Use (Controller : Client) ~                       |  |
| IP Add           | dress (device which c  | onnects to SEL controller)  | 192 . 168 . 0 . 100                               |  |
| Port Number      | er (device which conn  | ects to SEL controller) (*) | 64611 (0, 1025 - 65535)                           |  |
|                  | Pe   | ort Number (SEL controller) | 64511 (1025 - 65535)                              |  |
|                  | S  | electing Keep Alive Funtion | Do not use V                                      |  |
|                  |  | Use Selection               | Use (Controller : Client)                         |  |
|                  |  | Use Selection               | Use (Controller : Client) ~                       |  |
| IP Add           | dress (device which c  | onnects to SEL controller)  |   |  |
| Port Number      | er (device which conn  | ects to SEL controller) (*) | 64611 (0, 1025 - 65535)                           |  |
|                  | Pe   | ort Number (SEL controller) | 64511 (1025 - 65535)                              |  |
|                  | S  | electing Keep Alive Funtion | Do not use 🗸                                      |  |
| (For 0 setting   | er is the server, 0 car<br>g, the port number of o<br>es with the controller i | device which                | Advanced( <u>A</u> ) Standard Setting( <u>S</u> ) |  |
|                  |  |                             |   |  |

Fig. 8.25 Ethernet Setting (IAI Protocol B/TCP)

Setup for having the message communication with IAI protocol B/TCP can be done in "IAI Protocol B/TCP" Tab.

Click Set Same as AUTO Mode, and the setting in MANU Mode can be set to the same as those in AUTO Mode.

Click Set Same as MANU Mode, and the setting in AUTO Mode can be set to the same as those in MANU Mode.

Click Standard Setting(S), and the settings in each item should be changed to the standard ones.

Click Advanced(A), and the detailed setting window for such as the retry pitch should open. (There should be no need of setting change in normal use.)

| 🖀 Advanced Setting (IAI Protocol B/TCP)  | × |  |  |  |  |  |  |
|--|---|--|--|--|--|--|--|
| Setting of below items are normally not required to change.  |   |  |  |  |  |  |  |
| In case the SEL controller is the server,<br>allow the unquestion setting for IP address of the device<br>which the SEL controller communicates with (not reco<br>"If you want the unquestion setting for IP address<br>of the communicating device,<br>please set the IP address as "0. 0. 0. 0." |   |  |  |  |  |  |  |
| Standard Setting(S)  |   |  |  |  |  |  |  |
| Apply Cancel   |   |  |  |  |  |  |  |

Fig. 8.26 Advanced Setting (IAI Protocol B/TCP)

| Ethernet Setti  | -                    |                                   |              |                              |                         |        |
|-----------------|----------------------|-----------------------------------|--------------|------------------------------|-------------------------|--------|
| ommon I/O       | IAI Protocol B/TC    | P SEL Program Message Comm        | nunication   |                              |                         |        |
| *IP address and | port number of the   | e device which the controller cor | mmunicates v | vith                         |                         |        |
|                 | ,<br>SEL program (IF |                                   |              |                              |                         |        |
| -Ch31 (open cha | annel for user)      |                                   | Ch           | 33 (open channel for user) — |                         |        |
|                 | Use Selection        | Use (Ch31 : Client)               | ~            | Use Selection                | Use (Ch33 : Client)     | $\sim$ |
| Port Number (   | SEL controller)      | 64512 (1025 - 65535)              | Po           | rt Number (SEL controller)   | 64514 (1025 - 65535)    |        |
| Selecting Keep  | p Alive Funtion      | Do not use                        | √ Se         | lecting Keep Alive Funtion   | Do not use              | $\sim$ |
| Ch32 (open cha  | annel for user)      |                                   | -Ch          | 34 (open channel for user)   |                         |        |
|                 | Use selection        | Use (Ch32 : Server)               | ~            | Use Selection                | Use (Ch34 : Server)     | $\sim$ |
| Port Number (   | SEL controller)      | 64513 (1025 - 65535)              | Po           | rt Number (SEL controller)   |                         |        |
|                 | p Alive Funtion      |                                   | _            | lecting Keep Alive Funtion   |                         |        |
| Selecting Keep  | p Alive Funtion      | Do not use                        | ∽ Se         | lecting Keep Alive Funtion   | Do not use              | $\sim$ |
|                 |                      |                                   |              | Adva                         | nced(A) Standard Settir | a(S)   |
|                 |                      |                                   |              | Auva                         | Standard Settin         | 9(2)   |
|                 |                      |                                   |              |                              |                         |        |
|                 |                      |                                   |              |                              |                         |        |
|                 |                      |                                   |              |                              |                         |        |
|                 |                      |                                   |              |                              |                         |        |
|                 |                      |                                   |              |                              |                         |        |
|                 |                      |                                   |              |                              |                         |        |
|                 |                      |                                   |              |                              |                         |        |
|                 |                      |                                   |              |                              |                         |        |

Fig. 8.27 Ethernet Setting (SEL Program Message Communication)

Setup for having the message communication in SEL program can be done in "SEL Program Message Communication" Tab.

Click Standard Setting(S), and the settings in each item should be changed to the standard ones.

Click Advanced(A), and the detailed setting window for such as the timeout duration should open.

(There should be no need of setting change in normal use.)

| TAdvanced Setting (Message Communication)   |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|
| Setting of below items are normally not required to change.   |  |  |  |  |  |  |  |
| <ul> <li>In case the SEL controller is the server,<br/>allow the unquestion setting for IP address of the device<br/>which the SEL controller communicates with (not recommended).</li> <li>*If you want the unquestion setting for IP address<br/>of the communicating device,<br/>please set the IP address as "0. 0. 0. 0."</li> </ul> |  |  |  |  |  |  |  |
| Standard Setting( <u>S</u> )  |  |  |  |  |  |  |  |
| Apply Cancel  |  |  |  |  |  |  |  |

Fig. 8.28 Advanced Setting (SEL Program Message Communication)

#### Vision System

Setup of Vision System I/F function can be conducted.

| Basic Setting  |  | Vision System Setting   |                                      |
|--|--|---|--------------------------------------|
| Use Selection  | Use $\checkmark$                           | Image-Capture Command Physical Output Port Number   | 300 (300 - 599)                      |
| Vision System Maker Selection  | Keyence $\checkmark$                       | Initializing Complete Status Physical Input Port Number   | 0 (0 - 299)                          |
| Communication Setting  |  | Axis number of robot to relate to X-axis on vision system   | 1 ~                                  |
| Communication Device Selection   | Ch31 (open channel for user) $\qquad \lor$ | Axis number of robot to relate to Y-axis on vision system   | 2 ~                                  |
| Ethernet   | Message Communication Setting(E)           | Axis number of robot to relate to Z-axis on vision system   | 3 ~                                  |
| IP Address (vision system)   | 192 168 0 102                              | Axis number of robot to relate to R-axis on vision system   | 4 ~                                  |
| Port Number (vision system)  | 64613 (1 - 65535)                          | R-Axis Correction Direction Reverse Setting   | No signal reverse                    |
|  |  | Advance   | ed(A) Standard Setting(              |
|  |  |   |                                      |
|  |  |   |                                      |
|  | Apply                                      | Cancel  |                                      |
|  | Арріу                                      | Cancel  |                                      |
|  | Apply                                      | Cancel  |                                      |
| Vision System Setting  | Apply                                      | Cancel  |                                      |
| Vision System Setting<br>Basic Setting   | Apply                                      |   |                                      |
| , ,  | Apply<br>Use V                             | Vision System Setting   | 300 (300 - 599)                      |
| Basic Setting<br>Use Selection   |  | Vision System Setting<br>Image-Capture Command Physical Output Port Number  | 300 (300 - 599)<br>0 (0 - 299)       |
| Basic Setting<br>Use Selection<br>Vision System Maker Selection  | Use  | Vision System Setting<br>Image-Capture Command Physical Output Port Number<br>Initializing Complete Status Physical Input Port Number   | 0 (0 - 299)                          |
| Basic Setting<br>Use Selection<br>Vision System Maker Selection<br>Communication Setting                                   | Use V<br>Keyence V                         | Vision System Setting<br>Image-Capture Command Physical Output Port Number<br>Initializing Complete Status Physical Input Port Number<br>Axis number of robot to relate to X-axis on vision system  | 0 (0 - 299)                          |
| Basic Setting<br>Use Selection<br>Vision System Maker Selection<br>Communication Setting<br>Communication Device Selection | Use  V Keyence  Standard SIO Ch1  V        | Vision System Setting<br>Image-Capture Command Physical Output Port Number<br>Initializing Complete Status Physical Input Port Number<br>Axis number of robot to relate to X-axis on vision system<br>Axis number of robot to relate to Y-axis on vision system   | 0 (0 - 299)<br>1 2                   |
| Basic Setting<br>Use Selection<br>Vision System Maker Selection<br>Communication Setting<br>Communication Device Selection | Use V<br>Keyence V                         | Vision System Setting<br>Image-Capture Command Physical Output Port Number<br>Initializing Complete Status Physical Input Port Number<br>Axis number of robot to relate to X-axis on vision system<br>Axis number of robot to relate to Y-axis on vision system<br>Axis number of robot to relate to Z-axis on vision system  | 0 (0 - 299)<br>1<br>2<br>3           |
| Basic Setting<br>Use Selection<br>Vision System Maker Selection<br>Communication Setting<br>Communication Device Selection | Use  V Keyence  Standard SIO Ch1  V        | Vision System Setting<br>Image-Capture Command Physical Output Port Number<br>Initializing Complete Status Physical Input Port Number<br>Axis number of robot to relate to X-axis on vision system<br>Axis number of robot to relate to Y-axis on vision system<br>Axis number of robot to relate to Z-axis on vision system<br>Axis number of robot to relate to R-axis on vision system | 0 (0 - 299)<br>1<br>2<br>3<br>4<br>4 |
| Basic Setting<br>Use Selection<br>Vision System Maker Selection<br>Communication Setting<br>Communication Device Selection | Use  V Keyence  Standard SIO Ch1  V        | Vision System Setting<br>Image-Capture Command Physical Output Port Number<br>Initializing Complete Status Physical Input Port Number<br>Axis number of robot to relate to X-axis on vision system<br>Axis number of robot to relate to Y-axis on vision system<br>Axis number of robot to relate to Z-axis on vision system  | 0 (0 - 299)<br>1<br>2<br>3           |

Fig. 8.29 Vision System Setting

Setup for selection of Vision System I/F functions and selection of vision system manufacturer can be done in "Basic Setting".

Setup for communication setting for the controller and vision system can be done in "Communication Setting".

Select either to use RS-232C or Ethernet in "Select Communication Device".

(Select communication channel here)

Click Ethernet Message Communication Setting and the Ethernet communication setting window can be displayed in a separate window.

Click RS-232C Communication Setting and the RS-232C setting window can be displayed in a separate window.

Setup for capturing command physical output port and vision system coordinate axis number can be done in "Vision System Setting".

\* For XSEL2-T/TX, indicate an axis number in Axes Group No. 1. An axis in Axes Group No. 2 cannot be set as the vision system coordinate axis.

Click Standard Setting(S), and the settings in each item should be changed to the standard ones.

Click Advanced(A), and the detailed setting window for such as the timeout duration should open.

(There should be no need of setting change in normal use.)

| etting of below items are normally not required to change.                       |       |                      |
|--|-------|----------------------|
| Vision System I/F Setting  |       |                      |
| Response Timeout Value (sec)   | 5     | (0 - 15)             |
| Image-Capture Command OFF Extension Timer Value (msec)                           | 5     | (0 - 255)            |
| Image-Capture Delay Estimation Timer Value (msec)                                | 1     | (0 - 15)             |
| Number of Image-Capture Command Re-try   | 3     | (0 - 255)            |
| GTVD Command Acquisition Data Setting  |       |                      |
| X-Axis Correction Offset Value (mm)  | 0.000 | (-99.999 - 99.999)   |
| Y-Axis Correction Offset Value (mm)  | 0.000 | (-99.999 - 99.999)   |
| R-Axis Correction Offset Value (deg)   | 0.000 | (-360.000 - 360.000) |
| Setting for vision installation on robot   |       |                      |
| Z-Axis Direction Position Criteria Distance (mm)<br>(Invalid in the case of 0.0) | 0.0   | (0.0 - 25.5)         |
|  |       | Standard Setting(S)  |
|  |       |                      |

Fig. 8.30 Advanced Setting

## 8.5 How to Initialize Parameter (at the time of shipment)

(1) Right-click a blank space in the tool bar (refer to [Fig. 8.31]) while pressing Ctrl key. The Input Password will be displayed as shown in the Fig. 8.32.

| ≠ PC Interface Software for X-SEL  |                                       |
|--|---------------------------------------|
| <u>Eile E</u> dit <u>V</u> iew Program P <u>o</u> sition <u>P</u> arameter Symbol <u>M</u> onitor <u>C</u> ontroller <u>T</u> ool <u>W</u> indow | v <u>H</u> elp                        |
| ☞ ■ 월 2 \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$  |                                       |
| Safety Vel Specified(MANU Mode)  | ct permission (MANU)                  |
| Fig. 8.31 Men  | u Bar                                 |
| Input Password   | Right-click a blank space in the tool |
| Input Password   | bar while pressing Ctrl.              |
|  |                                       |
| OK CANCEL  |                                       |

Fig. 8.32 Input Password Window

- (2) Enter a password (5119) in the displayed Input Password screen. The "Parameter of Shipping" menu will be displayed in the Initialize Memory menu (Fig. 8.33).
  - \* The password will be valid until the end of application once it has been entered.

| 🚧 PC Interface Software for X-SEL                               |   |                              |
|---|---|------------------------------|
| <u>File Edit View Program Position Parameter Symbol Monitor</u> | Controller Tool Window Help   |                              |
| ≤ ■ \$2/\$ <u>\$</u> \$4000 =                                   | Re <u>c</u> onnect<br>Change <u>B</u> aud Rate                              |                              |
| Safety Vel Specified(MANU Mode) 🛛 🗾 Two or                      | SEL global data backup  | > <u>-</u>                   |
|   | All <u>D</u> ata Backup   | •                            |
| 日   | Write Flash Rom   |                              |
| 2 Position  | Initialize Memory   | Global Val /Elas             |
| 🖅 🚮 Parameter   | Abs. Encoder Reset  | Parameter of Shipping        |
| + 👯 Symbol  | Software <u>R</u> eset<br><u>E</u> rror Reset                               |                              |
|   | Request Drive <u>P</u> ower Recovery<br>Request Re <u>l</u> ease Pause      |                              |
|   | ROM version information<br>Control constant table management information(2) |                              |
|   |   |                              |
|   |   | in the shirt of a state of a |

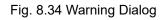
Fig. 8.33 Menu Bar (Parameter of Shipping [Shipment Values])

(3) Selecting the displayed menu "Parameter of Shipping" displayed in (2) will display a dialog in Fig. 8.34.

 Warning
 Warning

 Parameter will be recovered to shipping record.<br/>Parameter of the controller data shall be lost.<br/>Are you sure to continue?
 Encoder parameter will be not transferred.<br/>If different actuator at shipping is connected, there will be unexpected error.<br/>Are you sure to continue?

 Yes
 Yes



(4) After completion of rewriting, write the parameters to the flash ROM.



# Caution

If you have no problem, click Yes.

• Encoder parameters are not initialized. Because of this an unexpected error may be detected when the actuator different from the one at the time of shipment is connected.

# 8.6 Parameter Comparison

Comparison of the parameter files below can be performed.

- Saved parameter files
- Parameters in the controller and saved parameters

[Comparable Parameter Files]

Parameters in the same controller (same extension) and also a file in the same effective axis pattern and hardware configuration

#### 8.6.1 How to Compare Parameters

Choose either to open parameter files by selecting "File (F)"  $\rightarrow$  "Open (O)" or to select "Parameter (P)"  $\rightarrow$  "Edit (E)" to open the parameter edit window.

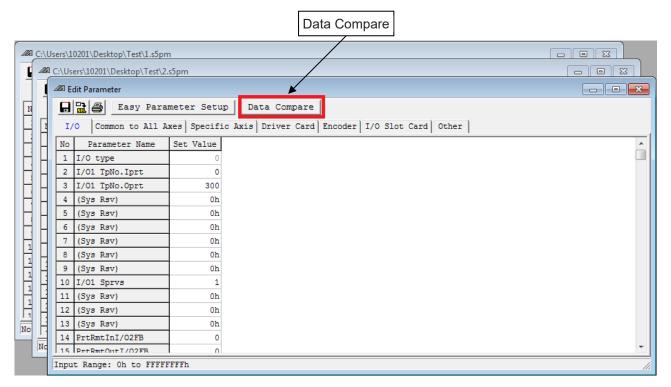


Fig. 8.35 Edit Parameter Window

Click Data Compare .

Parameter files which are open should be subject to comparison.

A dialog will open if there are data exist available for parameter comparison.

| C:\Users\10201\Desktop\Test\2.s5pm |                                    |  |  |  |  |  |  |  |
|------------------------------------|------------------------------------|--|--|--|--|--|--|--|
|                                    | C:\Users\10201\Desktop\Test\2.s5pm |  |  |  |  |  |  |  |
|                                    | C:\Users\10201\Desktop\Test\1.s5pm |  |  |  |  |  |  |  |
|                                    |                                    |  |  |  |  |  |  |  |

Fig. 8.36 Select Dialog Window

When there is no data available for parameter comparison existed, the message in Fig 8.37 should appear.

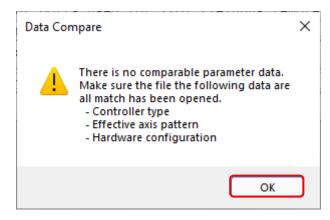


Fig. 8.37 Message

Select parameter data to be compared in the select dialog and click OK. Parameter comparison will start. After the parameter comparison is finished, the form gets changed and numbers in difference are displayed and parameters in difference turns to yellow.

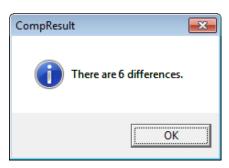


Fig. 8.38 CompResult

|  |  |  |                  | / /                 | 1          | 1        |      |
|--|--|--|------------------|---------------------|------------|----------|------|
| 🔊 Edit I   | Parameter  |  |                  |                     |            |          |      |
|  | Easy Pare  | meter Setup  | Data Compare     | SyncScroll:Effec    | t PrevDiff | NextDiff |      |
| I/0  | Common to All A  | Axes   Specific )  | Axis Driver Card | Encoder I/O Slot Ca | rd Other   |          |      |
| No   | Parameter Name   | Set Value  |                  |                     |            |          |      |
| 1 I/   | 0 type   | 0  |                  |                     |            |          |      |
| 2 I/   | 01 TpNo.Iprt   | 0  |                  |                     |            |          |      |
|  | 01 TpNo.Oprt   | 300  |                  |                     |            |          |      |
| 4 (5   | Sys Rav)   | Oh   |                  |                     |            |          |      |
| 5 (9   | Sys Rav)   | Oh   |                  |                     |            |          |      |
| 6 (S   | Sys Rav)   | Oh   |                  |                     |            |          |      |
| 7 (5   | Sys Rav)   | Oh   |                  |                     |            |          |      |
|  |  |  |                  |                     |            |          |      |
| 8 (5   | Sys Rav)   | Oh   |                  |                     |            |          |      |
|  | Sys Rav)   | 0h<br>0h   |                  |                     |            |          | -    |
| 0 19   |  | -  |                  |                     |            |          | -    |
| Not Cha  | Ztra Datri   | 01   |                  |                     |            |          |      |
| Not Cha  | angeable   | est\1.s5pm   | Data Compare     | SyncScroll:Effec    | t PrevDiff | NextDiff | <br> |
| Not Cha  | Isers\10201\Desktop\Te   | nh<br>est\1.s5pm<br>ameter Setup   |                  | SyncScroll:Effec    |            | NextDiff |      |
| iot Cha  | Isers\10201\Desktop\Te   | nh<br>est\1.s5pm<br>ameter Setup   |                  |                     |            | NextDiff |      |
| A /S   | angeable<br>sers\10201\Desktop\Te<br>Easy Pare<br>Common to All J  | nh<br>est\1.s5pm<br>umeter Setup   |                  |                     |            | NextDiff |      |
| a /s<br>Not Cha<br>221 C:\U<br>1/0<br>No<br>1 I/   | Arra Davil<br>angeable<br>Isers/10201/Desktop/To<br>Easy Parc<br>Common to All J<br>Parameter Name   | nh<br>est\1.s5pm<br>umeter Setup   |                  |                     |            | NextDiff |      |
| a /s<br>Not Cha<br>22 C:\U<br>1/0<br>No<br>1 I/<br>2 I/  | Arra Darri<br>angeable<br>Isers/10201/Desktop/Tr<br>Easy Parc<br>Common to All J<br>Parameter Name<br>(O type  | oh<br>est\1.s5pm<br>wmeter Setup<br>kxes Specific i<br>Set Value<br>0  |                  |                     |            | NextDiff |      |
| a /s<br>Not Cha<br>I/O<br>No<br>1 I/<br>2 I/<br>3 I/   | Arra Davit<br>angeable<br>sersil0201\Desktop\Tr<br>Easy Parce<br>Common to All J<br>Parameter Name<br>/01 TpNo.Iprt  | on<br>est\1.55pm<br>wweter Setup<br>Axes Specific ;<br>Set Value<br>0<br>0   |                  |                     |            | NextDiff |      |
| a /s<br>Not Cha<br>22 C:\U<br>1/0<br>No<br>1 I/<br>2 I/<br>3 I/<br>4 (S  | Aris Davit<br>angeable<br>Sers/10201/Desktop/T<br>Common to All J<br>Parameter Name<br>Vo type<br>Vol TpNo.Iprt<br>Vol TpNo.Oprt                           | ok<br>est/1.s5pm<br>ameter Setup<br>kxes Specific ;<br>Set Value<br>0<br>0<br>300  |                  |                     |            | NextDiff |      |
| a /s<br>Not Cha<br>22 C:\U<br>1/0<br>No<br>1 I/<br>2 I/<br>3 I/<br>4 (S<br>5 (S  | Arra Davit<br>angeable<br>Isers10201\Desktop\To<br>Easy Para<br>Common to All J<br>Parameter Name<br>'0 type<br>'01 TpNo.Iprt<br>'01 TpNo.Oprt<br>Sys Rav) | nk<br>est/1.55pm<br>wmeter Setup<br>kxes Specific i<br>Set Value<br>0<br>300<br>0h   |                  |                     |            | NextDiff |      |
| a /c<br>Not Cha<br>ARI C:\U<br>I/O<br>No<br>1 I//<br>3 I//<br>4 (S<br>5 (S<br>6 (S   | Arrs David<br>angeable<br>isers10201/Desktop/Te<br>Common to All J<br>Parameter Name<br>/O type<br>/O type<br>/O TyNo.Iprt<br>/O TyNo.Oprt<br>Sys Rav)     | nk<br>estl.s5pm<br>weeter Setup<br>ixes Specific J<br>Set Value<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0<br>0 |                  |                     |            | NextDiff |      |
| a         //e           Not Cha           I/O           No           1           2           1/2           1/2           1/4           (S)           6           7           (S) | Arrs David<br>angeable<br>isers10201\Desktop\Te<br>Common to All J<br>Parameter Name<br>/O type<br>/O1 TpNo.Iprt<br>/O1 TpNo.Oprt<br>Sys Rav)<br>Sys Rav)  | nk<br>est(1.55pm<br>uneter Setup<br>Set Value<br>0<br>0<br>300<br>0h<br>1h<br>0h   |                  |                     |            | NextDiff |      |

Fig. 8.39 Edit Window after Comparison Result

1) SyncScroll: Effect: When it is displayed in blue, the scroll of the grid gets synchronized to the move.

The form that the button is not pressed also moves. Tab movement also synchronizes.

SyncScroll: Invalid : When it is displayed in black, each form scrolls and tab moves individually.

- 2) <u>PrevDiff</u>: Moves to the nearest previous difference from the cell position of which PrevDiff button was pressed.
- 3) NextDiff: Moves to the nearest previous difference from the cell position of which NextDiff button was pressed.

# 8.7 I/O Output Setting

There is a function to output various monitor data such as the current position to the output port domains in XSEL2-T/TX.

The I/O output setting is a function to perform this monitor setting easily.

Also, it is available to establish the settings for the input function select and the output function select. There are two ways to start up the I/O output setting function.

(1) Click I/O Output Setting in the parameter edit window to start up the I/O output setting function.

| Z Edit Parameter     |                    |              |  |
|----------------------|--------------------|--------------|--|
| Easy Parameter Setup | I/O Output Setting | Data Compare |  |

Fig. 8.40 I/O Output Setting

(2) Select "Parameter (P)" → "I/O Output Setting (I)" in the menu to start up the I/O output setting function.

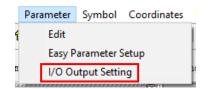


Fig. 8.41 I/O Output Setting

<Explanation of I/O Output Setting Function>

The I/O output setting function shows the following window based on the parameter values in the parameter edit window.

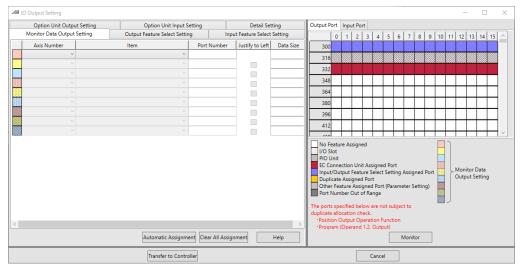


Fig. 8.42 I/O Output Setting (Monitor Data Output Setting)

In the left window, shows the menu for each setting. The monitor data output setting window should be displayed after startup.

In the right window, shows the status of port assignments. The output port assignment status should be displayed after startup.

8. Parameter Edit Window

## 8.7.1 Monitor Data Output Setting

After starting up the I/O output setting function, the monitor data output setting window should be displayed in the left window.

In the monitor data output setting window, operations stated below should be available.

| Operation  | Things Available to Do   |
|--|--|
| Select "Output Function Select Setting" tab in the left window.          | The left window can be switched to the output function select setting window.                      |
| Select "Input Function Select Setting" tab in the left window.           | The left window can be switched to the input function select setting window.                       |
| Select "Axis Number" combo box in the list in the left window.           | A list of axes available in the monitor data output setting can be displayed. Refer to [8.7.1 [1]] |
| Select "Item" combo box in the list in the left window.                  | A list of items in the monitor data output setting can be displayed. Refer to [8.7.1 [1]]          |
| Select "Top Output Port Number" text box in the list in the left window. | A port number can be input. Refer to [8.7.1 [1]]   |
| Select "Allocate" check box in the list in the left window.              | Allocate function for output port assignment can be turned ON/OFF.                                 |
| Select "Input Port" tab in the right window.                             | The right window can be switched to the input port assignment status window.                       |
| Select "Automatic Assignment" button in the left window.                 | Automatic assignment of the monitor data output setting can be performed. Refer to [8.7.1 [3]]     |
| Select "Clear All Assignment" button in the left window.                 | The monitor data output setting can be all cleared.  |
| Select "Help" button in the left window.                                 | Helps for operation in the monitor data output setting can be displayed.                           |
| Select "Monitor" button in the right window.                             | The monitor window should be displayed.<br>Refer to [8.7.5]  |
| Select "Transfer to Controller" button on the bottom of the window.      | The setting data can be transferred to the controller. Refer to [8.7.4]                            |
| Select "Cancel" button on the bottom of the window.                      | I/O output setting function window closes.   |

[1] How to Establish Monitor Data Output Setting

Established the settings in "Axis Number", "Item" and "Top Output Port Number" to conduct the monitor data output setting.

"Axis Number" setting is to be done in a combo box.

In the combo box list, axis numbers (axes group numbers) available for setting should be displayed.

Select an axis for monitoring from the list.

| Item to be Displayed               | Explanation of Item  |
|------------------------------------|--|
|                                    | When axes from Axis No. 1 to Axis No. 4 are available in Axes<br>Group 1, the combo box list should show as it is shown below. |
| Axis Number (Axes Group<br>Number) | 1 (Axes Group No. 1)<br>2 (Axes Group No. 1)<br>3 (Axes Group No. 1)<br>4 (Axes Group No. 1)                                   |
|                                    | When Axes Group No. 2 and later are invalid, there should be no display of the axis group number.                              |

"Item" setting is to be done in a combo box.

A list of the items for the monitor data output setting should be displayed in the combo box list. Select an item for monitoring from the list.

| Item to be Displayed          | Explanation of Item  |
|-------------------------------|--|
| Current Position [mm] (2W)    | The current position should be displayed in the monitor in<br>unit of [mm].<br>The current position in the range of -2,147,483,648 to<br>2,147,483,647mm (for two words) should be displayed in the<br>monitor.    |
| Current Position 0.01mm (2W)  | The current position should be displayed in the monitor in<br>unit of 0.01mm.<br>The current position in the range of -21,474,836.48 to<br>21,474,836.47mm (for two words) should be displayed in the<br>monitor.  |
| Current Position 0.001mm (2W) | The current position should be displayed in the monitor in<br>unit of 0.001mm.<br>The current position in the range of -2,147,483.648 to<br>2,147,483.647mm (for two words) should be displayed in the<br>monitor. |
| Current Position [mm] (1W)    | The current position should be displayed in the monitor in<br>unit of [mm].<br>The current position in the range of -32,768 to 32,767mm (for<br>one word) should be displayed in the monitor.                      |
| Current Position 0.01mm (1W)  | The current position should be displayed in the monitor in unit of 0.01mm.<br>The current position in the range of -327.68 to 327.67mm (for one word) should be displayed in the monitor.                          |
| Current Velocity [mm/s] (1W)  | Current velocity should be displayed in the monitor in the unit<br>of [mm/s].<br>The current velocity in the range of 0 to 65,535mm/s (for one<br>word) should be displayed in the monitor.                        |

| Item to be Displayed                            | Explanation of Item  |
|---|--|
| Current Velocity 0.1mm/s (1W)                   | Current velocity should be displayed in the monitor in the unit<br>of 0.1mm/s.<br>The current velocity in the range of 0 to 6,553.5mm/s (for one<br>word) should be displayed in the monitor.  |
| Alarm Code (1W)                                 | The alarm code (from 0000h to FFFFh) should be displayed in the monitor.   |
| Axis Operation Status (1W)                      | Axis Operation Status (from 0000h to FFFFh) should be<br>displayed in the monitor.<br>The configuration for axis operation status is the same as for<br>the ECMD 5 command.<br>Refer to [SEL Language Programming Manual (ME0224)] for<br>details. |
| Motor Command Current Rated Ratio<br>[%] (1W)   | The motor command current should be displayed in the monitor in the unit of rated ratio [%].<br>The motor command current in the range of -3,276.8 to 3,276.7% (for one word) should be displayed in the monitor.                                  |
| Motor Command Current Rated Ratio 0.1% (1W)     | The motor command current should be displayed in the monitor in the unit of rated ratio 0.1%.<br>The motor command current in the range of -3,276.8 to 3,276.7% (for one word) should be displayed in the monitor.                                 |
| Motor Command Current [mA] (2W)                 | The motor command current should be displayed in the monitor in the unit of [mA].<br>The motor command current in the range of -2,147,483.648 to 2,147,483.647mA (for two words) should be displayed in the monitor.                               |
| Motor Command Current [mA] (1W)                 | The motor command current should be displayed in the monitor in the unit of [mA].<br>The motor command current in the range of -32,768 to 32,767mA (for one word) should be displayed in the monitor.  |
| Position Deviation [Pulse] (2W)                 | The position deviation in the range of -2,147,483.648 to 2,147,483.647pulse (for two words) should be displayed in the monitor.  |
| Position Deviation [Pulse] (1W)                 | The position deviation in the range of -32,768 to 32,767 [pulse] (for one word) should be displayed in the monitor.  |
| Overload Level 0.1% (1W)                        | The overload level should be displayed in the monitor in the unit of 0.1%.<br>The overload level in the range of 0 to 6,553.5% (for one word) should be displayed in the monitor.  |
| Motor Feedback Current Rated Ratio<br>[%] (1W)  | The motor feedback current should be displayed in the monitor in the unit of rated ratio [%].<br>The motor feedback current in the range of -32,768 to 32,767% (for one word) should be displayed in the monitor.                                  |
| Motor Feedback Current Rated Ratio<br>0.1% (1W) | The motor feedback current should be displayed in the monitor in the unit of rated ratio 0.1%.<br>The motor feedback current in the range of -3,276.8 to 3,276.7% (for one word) should be displayed in the monitor.                               |
| Motor Feedback Current [mA] (2W)                | The motor feedback current should be displayed in the monitor in the unit of [mA].<br>The motor feedback current in the range of -2,147,483.648 to 2,147,483.647mA (for two words) should be displayed in the monitor.                             |
| Motor Feedback Current [mA] (1W)                | The motor feedback current should be displayed in the<br>monitor in the unit of [mA].<br>The motor feedback current in the range of -32,768 to<br>32,767mA (for one word) should be displayed in the monitor.                                      |

| Item to be Displayed             | Explanation of Item   |
|----------------------------------|---|
| Maintenance Bit (EC Status) (1W) | Display ELECYCLINDER ALML bits in the monitor in axis number order. |

In case of selecting a monitor item for the power supply unit, the axis number setting should become "in common".

- The power supply unit output size will be the number of power supply units connected (Other Parameter No. 61)  $\times$  1W
- The data configuration for each power supply unit is as follows.
  - bit15: Power supply unit connection status (ON once communication is established)
  - bit9: Reduced FAN revolution speed error (ON once revolution speed reduced 30%)
  - bit8: Reduced FAN revolution speed error (ON once revolution speed reduced 50%)

bit0 to 7: Selection data

Input a port number with 3 to 4 digits in "Top Output Port Number" to set it up.

| Content of Input         | Explanation for Value to Input  |
|--------------------------|---|
| Value with 3 to 4 Digits | Input a value with 3 to 4 digits of decimal number.<br>Input a value in the range of either the physical output port (300 to<br>599) or the extension output port (4000 to 6999). |

It is available to set nine at the maximum in the monitor data output setting.

The settings from 1 to 9 should be displayed in the colors shown below in the port assignment status of the output in the window on the right.

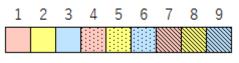


Fig. 8.43 Colors

Set "Axis Number", "Item", "Top Output Port Number", and the monitor data output setting should be displayed in the port assignment status in the window on the right.

# Example: When setting 1 (Axes Group No. 1), Current Position [mm] (2W) and Port No. 300 in the first monitor data output setting.

| itor data Outpu  | function Input f | unction Advance | ed setting |            |    |        |          |           | Outpu   | it port   | Inp   | ut po  | rt  |  |   |                                  |                  |      |    |    |                                  |        |        |          |
|------------------|------------------|-----------------|------------|------------|----|--------|----------|-----------|---|---|---|--|---|--|---|----------------------------------|------------------|------|----|----|----------------------------------|--------|--------|----------|
| Axis No.         |                  | Item            |            |            | Po | rt No. | Allocate | Data size |   | 0   | 1   | 2  | 3   | 4  | 5   | 6                                | 7 8              | 9    | 10 | 11 | 12 1                             | 13   1 | 4   15 | 5        |
| 1(Axis group No. | I) v Current pos | ition(mm)(DWORI | D)         | Ý          |    | 300    |          | DWORD     | 3   | 00  |   |  |   |  |   |                                  |                  |      |    |    |                                  |        |        | 1        |
|                  | ~                |                 |            | ~          |    |        |          |           | 3   | 16  |   |  |   |  |   | +                                |                  |      |    |    |                                  |        | +      | 1        |
|                  | ~                |                 |            | ~          |    |        |          |           |   |   |   |  |   |  |   | •.••                             | 100              | 1000 |    |    |                                  | 10 20  |        |          |
|                  | ~                |                 |            | ~          |    |        |          |           |   | - St  |   | ort N  |   |  | No.1)   |                                  |                  |      |    |    |                                  |        |        | 4        |
|                  | ~                |                 |            | ~          |    |        |          |           |   | - i c   |   |  |   |  | )(DW0   |                                  |                  |      |    |    |                                  |        |        |          |
|                  | ~                |                 |            | ~          |    |        |          |           | 3   | 64  | ::::  |  | ::::  |  |   |                                  |                  |      |    |    |                                  |        |        | ŝ.       |
|                  | ~                |                 |            | ~          |    |        |          |           | 3   | 80  |   |  |   |  |   |                                  |                  |      |    |    |                                  |        |        |          |
|                  | v                |                 |            | ~          |    |        |          |           | 3   | 96  |   |  |   |  |   |                                  |                  |      |    |    |                                  |        |        |          |
|                  | ~                |                 |            | ~          |    |        |          |           | 4   | 12  |   |  |   |  |   |                                  |                  |      |    |    |                                  |        |        |          |
|                  |                  |                 |            |            |    |        |          |           | No<br>Fit<br>Dr<br>Dr<br>Dr<br>Pr<br>duplic<br>-Pr<br>-Pr | on-field<br>eldbus a<br>put/out<br>uplicate<br>ther fun<br>ort No. c<br>orts spe<br>ate allo<br>sition o<br>ogram ( | area<br>put f<br>assi<br>oction<br>out o<br>cotifie<br>ocatio<br>outpu<br>(oper | (no fi<br>functi<br>gnme<br>n assi<br>of ran<br>d bel<br>on ch<br>it ope<br>rand | uncti<br>ion s<br>ent p<br>gnec<br>ge<br>ow a<br>eck.<br>eratic<br>1.2, c | on as<br>elect<br>ort<br>I por<br>re no<br>on fu | ssignn<br>ion as<br>t (para<br>ot subj<br>nction<br>ut part | nent)<br>signr<br>amet<br>ject t | ment p<br>er spe |      |    | 2  | Monit<br>outpu<br>assign<br>port | t      |        | <u>:</u> |
|                  |                  |                 | Au         | ito assign |    | Clear  | all      | Help      | •Sir  | nplified  | l inte  | rfere  | nce o   | :heck  | zone  |                                  | onitor           |      |    |    |                                  |        |        |          |

Fig. 8.44 Monitor Data Output Setting (Example)

**Clue:** Place the mouse cursor on the monitor data output setting in the window on the right, and a help display shows up to display the contents of setting.

#### [2] How to Allocate Output Ports

Check in the Allocate check box, and port numbers in a row after the those for the one step previous in the monitor item can be allocated automatically.

Example: 1 (Axes Group No. 1), Current Position [mm] (2W) and Port No. 300 are set in the first monitor data output setting. When 1 (Axes Group No. 2) and Alarm Code (1W) are set in the second monitor data output setting, and Allocate gets turned on.

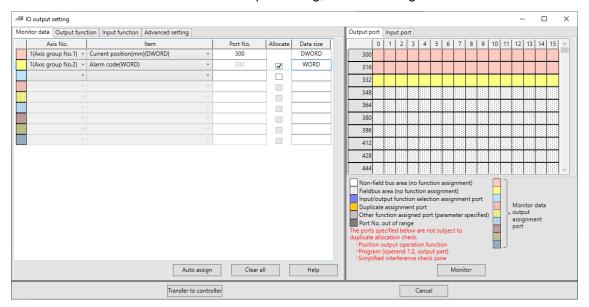


Fig. 8.45 How to Allocate Output Ports

With Allocate ON, output port numbers (332 to 347) which are in row after the port numbers (300 to 331) set to the first setting item can be allocated to the second setting item automatically. When the port numbers are set automatically with Allocate ON, the top output port number turns to grey and gets banned to input.

When you require to turn Allocate OFF, remove the check mark in the check box.

Even if Allocate gets turned OFF, the port numbers should remain without being cleared.

Allocate setting should be kept activated while the check box is ON.

If the port number for the first setting item in the example above is changed from 300 to 4000, the port number for the second setting item should automatically be updated to 4032.

#### [3] How to Automatic Assignment

Select the "Automatic Assignment" button, and the automatic assignment of the monitor data output setting should be conducted.

The setting items for automatic assignment may differ depending on the number of effective axes.

| Monitoring Items for Automatic  | Number of Effective Axes |   |   |   |           |  |  |  |  |  |  |  |
|---------------------------------|--------------------------|---|---|---|-----------|--|--|--|--|--|--|--|
| Assignment                      | 1                        | 2 | 3 | 4 | 5 or more |  |  |  |  |  |  |  |
| Current Position 0.001mm (2W)   | 0                        | 0 | 0 | 0 | 0         |  |  |  |  |  |  |  |
| Current Velocity 0.1mm/s (1W)   | 0                        | 0 | 0 | 0 | х         |  |  |  |  |  |  |  |
| Alarm Code (1W)                 | 0                        | 0 | 0 | × | х         |  |  |  |  |  |  |  |
| Axis Operation Status (1W)      | 0                        | 0 | × | × | ×         |  |  |  |  |  |  |  |
| Motor Command Current [mA] (2W) | 0                        | × | × | × | ×         |  |  |  |  |  |  |  |

Relation between Monitoring Items for Automatic Assignment and Effective Axes

When there is one effective axis, five monitoring items, Current Position 0.001mm (2W), Current Velocity 0.1mm/s (1W), Alarm Code (1W), Axis Operation Status (1W) and Motor Command Current [mA] (2W), should be assigned automatically to the axis.

When there are two effective axes, four monitoring items, Current Position 0.001mm (2W), Current Velocity 0.1mm/s (1W), Alarm Code (1W) and Axis Operation Status (1W), should be assigned automatically to each axis.

When there are three effective axes, three monitoring items, Current Position 0.001mm (2W), Current Velocity 0.1mm/s (1W) and Alarm Code (1W), should be assigned automatically to each axis.

When there are four effective axes, two monitoring items, Current Position 0.001mm (2W) and Current Velocity 0.1mm/s (1W), should be assigned automatically to each axis.

When there are five or more effective axes, the monitoring item of Current Position 0.001mm (2W) should be assigned automatically to each axis.

# 8.7.2 Output Function Select Setting

| onitor data | Output function Input function Advanced setting |      |               |            |   | Output port Input port   |
|-------------|---|------|---------------|------------|---|--|
| No.         | Function selection                              |      | Port No.      | Allocate ^ |   | 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  |
| 300         | General purpose output                          | ~    |               |            |   | 300  |
| 301         | General purpose output                          | ~    |               |            |   | 316  |
| 302         | General purpose output                          | ~    |               |            |   |  |
| 303         | General purpose output                          | *    |               |            |   |  |
| 304         | General purpose output                          | ~    |               |            |   |  |
| 305         | General purpose output                          | ~    |               |            |   | 364  |
| 306         | General purpose output                          | ~    |               |            |   | 380  |
| 307         | General purpose output                          | ~    |               |            |   | 396  |
| 308         | General purpose output                          | ~    |               |            |   | 412  |
| 309         | General purpose output                          | ~    |               |            |   |  |
| 310         | General purpose output                          | ~    |               |            |   |  |
| 311         | General purpose output                          | ~    |               |            | ш | 444  |
| 312         | General purpose output                          | ~    |               |            |   | Non-field bus area (no function assignment)  |
| 313         | General purpose output                          | ~    |               |            |   | Fieldbus area (no function assignment)   |
| 314         | General purpose output                          | ~    |               |            |   | Input/output function selection assignment port Duplicate assignment port Monitor data |
| 315         | General purpose output                          | ~    |               |            |   | Other function assigned port (parameter specified)                                     |
| 300(Area2)  | No function assignment                          | ~    |               |            |   | Port No. out of range<br>The ports specified below are not subject to                  |
| 301(Area2)  | No function assignment                          | ~    |               |            |   | duplicate allocation check.  |
| 302(Area2)  | No function assignment                          | ~    |               |            |   | Position output operation function     Program (operand 1.2, output part)              |
| 303(Area2)  | No function assignment                          | ~    |               | ~ ~        |   | *Simplified interference check zone  |
|             |   | Stan | dard settings | Help       | 1 | Monitor  |

Fig. 8.46 Output Function Select Setting

In the output function select setting window, the following operations can be performed.

| Operation   | Things Available to Do  |
|---|---|
| Select "Monitor data" in left window.                                 | The left window can be switched to the monitoring data output setting window.                           |
| Select "Input function" tab in the left window.                       | The left window can be switched to the input function select setting window.                            |
| Select "Function selection" combo box in the list in the left window. | A list of items available for setting in each output function should be displayed. Refer to [8.7.2 [1]] |
| Select "Port No." text box in the list in the left window.            | A port number can be input. Refer to [8.7.2 [1]]  |
| Select "Allocate" check box in the list in the left window.           | Allocate function for output port assignment can be turned ON/OFF.                                      |
| Select "Input port" tab in the right window.                          | The right window can be switched to the input port assignment status window.                            |
| Select "Standard Settings" button in the left window.                 | The standard setting should be set to the output function select setting. Refer to [8.7.2 [3]]          |
| Select "Help" button in the left window.                              | Helps for operation in the output function select setting can be displayed.                             |
| Select "Monitor" button in the right window.                          | The monitor window should be displayed.<br>Refer to [8.7.5]   |
| Select "Transfer to controller" button on the bottom of the window.   | The setting data can be transferred to the controller. Refer to [8.7.4]                                 |
| Select "Cancel" button on the bottom of the window.                   | I/O output setting function window closes.  |

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#### [1] How to Output Function Select Setting

Establish the settings in "Function Select" and "Output Port Number" to perform the output function select setting.

The setting for "Function Select" is to be conducted in the combo box.

Items for each output function number should be displayed in the list of the combo box. Select an item to set from the list.

| Items in List for Output Function No. 300   | Items in List for Output Function No. 300 (Area 2) |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|--|
| General Output  | No Function Assigned                               |  |  |  |  |  |  |  |
| Error output higher than operation cancellation level (ON)                          |  |  |  |  |  |  |  |  |
| Error output higher than operation cancellation level (OFF)                         |  |  |  |  |  |  |  |  |
| Error output higher than operation cancellation level + emergency stop output (ON)  |  |  |  |  |  |  |  |  |
| Error output higher than operation cancellation level + emergency stop output (OFF) |  |  |  |  |  |  |  |  |
| Error output higher than cold start level (ON)                                      |  |  |  |  |  |  |  |  |
| Error output higher than cold start level (OFF)                                     |  |  |  |  |  |  |  |  |
| Error output in maintenance information alert function related message level (ON)   |  |  |  |  |  |  |  |  |
| Error output in maintenance information alert function                              | tion related message level (OFF)                   |  |  |  |  |  |  |  |

| Items in List for Output Function No. 301  | Items in List for Output Function No. 301 (Area 2) |  |  |  |  |  |
|--|--|--|--|--|--|--|
| General Output   | No Function Assigned                               |  |  |  |  |  |
| READY Output (PIO trigger program available for  | operation)   |  |  |  |  |  |
| READY Output (PIO trigger program available for operation and error higher than operation cancellation level not occurred) |  |  |  |  |  |  |
| READY Output (PIO trigger program available for operation and error higher than cold start level not occurred)             |  |  |  |  |  |  |

| Items in List for Output Function No. 302 | Items in List for Output Function No. 302 (Area 2) |
|---|--|
| General Output                            | No Function Assigned                               |
| Emergency Stop Output (ON)                |  |
| Emergency Stop Output (OFF)               |  |

| Items in List for Output Function No. 303                  | Items in List for Output Function No. 303 (Area 2) |
|--|--|
| General Output   | No Function Assigned                               |
| AUTO Mode Output   |  |
| Output During Automatic Operation (Other Parameter No. 12) |  |

| Items in List for Output Function No. 304                                     | Items in List for Output Function No. 304 (Area 2) |
|---|--|
| General Output  | No Function Assigned                               |
| Output When All Effective Axes at Home Position (= 0)                         |  |
| Output When All Effective Axes Home-Return Complete Status (Coordinates Firm) |  |
| Output When All Effective Axes at Home Position Preset Coordinates            |  |

| Items in List for Output Function No. 305                | Items in List for Output Function No. 305 (Area 2) |
|--|--|
| General Output   | No Function Assigned                               |
| 1st Axis In-Position Output (OFF when pressing missed)   |  |
| 1st Axis Servo-on Output (System Monitoring Task Output) |  |

| Items in List for Output Function No. 306                | Items in List for Output Function No. 306 (Area 2) |
|--|--|
| General Output   | No Function Assigned                               |
| 2nd Axis In-Position Output (OFF when pressing missed)   |  |
| 2nd Axis Servo-on Output (System Monitoring Task Output) |  |

| Items in List for Output Function No. 307                | Items in List for Output Function No. 307 (Area 2) |
|--|--|
| General Output   | No Function Assigned                               |
| 3rd Axis In-Position Output (OFF when pressing missed)   |  |
| 3rd Axis Servo-on Output (System Monitoring Task Output) |  |

| Items in List for Output Function No. 308                | Items in List for Output Function No. 308 (Area 2) |
|--|--|
| General Output   | No Function Assigned                               |
| 4th Axis In-Position Output (OFF when pressing missed)   |  |
| 4th Axis Servo-on Output (System Monitoring Task Output) |  |

| Items in List for Output Function No. 309                | Items in List for Output Function No. 309 (Area 2) |
|--|--|
| General Output   | No Function Assigned                               |
| 5th Axis In-Position Output (OFF when pressing missed)   |  |
| 5th Axis Servo-on Output (System Monitoring Task Output) |  |

| Items in List for Output Function No. 310                | Items in List for Output Function No. 310 (Area 2) |
|--|--|
| General Output   | No Function Assigned                               |
| 6th Axis In-Position Output (OFF when pressing missed)   |  |
| 6th Axis Servo-on Output (System Monitoring Task Output) |  |

| Items in List for Output Function No. 311                | Items in List for Output Function No. 311 (Area 2) |
|--|--|
| General Output   | No Function Assigned                               |
| 7th Axis In-Position Output (OFF when pressing missed)   |  |
| 7th Axis Servo-on Output (System Monitoring Task Output) |  |

| Items in List for Output Function No. 312                | Items in List for Output Function No. 312 (Area 2) |
|--|--|
| General Output   | No Function Assigned                               |
| 8th Axis In-Position Output (OFF when pressing missed)   |  |
| 8th Axis Servo-on Output (System Monitoring Task Output) |  |

| Items in List for Output Function No. 313 | Items in List for Output Function No. 313 (Area 2) |
|---|--|
| General Output                            | No Function Assigned                               |
|   |  |
| Items in List for Output Function No. 314 | Items in List for Output Function No. 314 (Area 2) |
| General Output                            | No Function Assigned                               |
|   |  |
| Items in List for Output Function No. 315 | Items in List for Output Function No. 315 (Area 2) |
| General Output                            | No Function Assigned                               |

Input the port number in 3 to 4 digits in "Output Port Number" for setting.

| Content of Input         | Explanation for Value to Input  |
|--------------------------|---|
| Value with 3 to 4 Digits | Input a value with 3 to 4 digits<br>Input a value in the range of either the physical<br>output port (300 to 599) or the extension output port<br>(4000 to 6999). |

The output function select setting should be shown in the following color.

Establish the settings in "Function Select" and "Output Port Number", and the output function select setting should be displayed in the port assignment status for the output port in the right window.

Example: When Error output higher than operation cancellation level (ON) and Port No. 316 are set in Output Function No. 300.

| ///al IO output se | tting   |                   |            | - 🗆 X  |
|--------------------|---|-------------------|------------|--|
| Monitor data       | Output function Input function Advanced setting           |                   |            | Output port Input port   |
| No.                | Function selection  | Port No.          | Allocate ^ | 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 ^  |
| 300                | Error output higher than operation cancellation level(ON) | × 316             |            | 300  |
| 301                | General purpose output                                    | v                 |            | 316  |
| 302                | General purpose output                                    | ~                 |            |  |
| 303                | General purpose output                                    | v                 |            | Port No.316  |
| 304                | General purpose output                                    | v                 | 1 🖬 📕      | 348 Output function selection300   |
| 305                | General purpose output                                    | ~                 |            | 364 Error output higher than operation cancellation level(ON)                          |
| 306                | General purpose output                                    | ¥                 | 1 🖬 📕      | 380  |
| 307                | General purpose output                                    | ~                 |            | 396  |
| 308                | General purpose output                                    | v                 | 1 🖬 📕      | 412  |
| 309                | General purpose output                                    | ~                 | 1 🖬 📕      |  |
| 310                | General purpose output                                    | v                 | 1 🖬 📕      | 428  |
| 311                | General purpose output                                    | v                 |            | 444  |
| 312                | General purpose output                                    | v                 |            | Non-field bus area (no function assignment)  |
| 313                | General purpose output                                    | v                 |            | Fieldbus area (no function assignment)   |
| 314                | General purpose output                                    | ~                 |            | Input/output function selection assignment port Duplicate assignment port Monitor data |
| 315                | General purpose output                                    | v                 |            | Other function assigned port (parameter specified)                                     |
| 300(Area2)         | No function assignment                                    | ~                 |            | Port No. out of range assignment   |
| 301(Area2)         | No function assignment                                    | v                 |            | The ports specified below are not subject to duplicate allocation check.               |
| 302(Area2)         | No function assignment                                    | v                 |            | Position output operation function   |
| 303(Area2)         | No function assignment                                    | ~                 | × 1        | Program (operand 1.2, output part)<br>Simplified interference check zone               |
|                    |   | Standard settings | Help       | Monitor  |
|                    | Transfer to controlle                                     | r                 |            | Cancel   |

Fig. 8.47 Output function select setting (Example)

[2] How to Allocate to Output Ports

Check in the Allocate check box, and port numbers in a row after the those for the one step previous in the output function select setting item can be allocated automatically.

Example: When Error output higher than operation cancellation level (ON) and Port No. 316 are set in Output Function No. 300.

And READY output (PIO trigger program available for operation) is set to Output Function No. 301 and Allocate is turned ON.

| lonitor data | Output function Input function Advanced setting           |      |                |            | 0   | utput p           | port   | Inp   | ut p  | ort  |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
|--------------|---|------|----------------|------------|-----|-------------------|--------|-------|-------|------|-------|------|--------|-------|-------|-------|--------|----|----|-------|-------------|------|----|---|
| No.          | Function selection  |      | Port No.       | Allocate ^ |     |                   | 0      | 1     | 2     |      | 3     | 4    | 5      | 6     | 7     | 8     | 9      | 10 | 11 | 12    | 13          | 14   | 15 | ^ |
| 300          | Error output higher than operation cancellation level(ON) | ×    | 316            |            | IC  | 300               | )      |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    | 1 |
| 301          | READY output (PIO trigger program operation possible)     | Ŷ    | 317            | ~          |     | 316               | 5      |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    | 1 |
| 302          | Emergency stop output (ON)                                | ~    |                |            | IF. | 332               |        |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 303          | General purpose output                                    | ~    |                |            | ١H  |                   | 1000   |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 304          | General purpose output                                    | ~    |                |            | IH- | 348               |        |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 305          | General purpose output                                    | ×    |                |            |     | 364               |        |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 306          | General purpose output                                    | ~    |                |            |     | 380               | )      |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 307          | General purpose output                                    | ~    |                |            |     | 396               | 5      |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 308          | General purpose output                                    | ~    |                |            | IF. | 412               | ,      |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 309          | General purpose output                                    | ~    |                |            | IH: | 428               |        |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 310          | General purpose output                                    | ×    |                |            | ١H  |                   | 1.11   |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 311          | General purpose output                                    | ~    |                |            |     | 444               |        |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    | ~ |
| 312          | General purpose output                                    | ×    |                |            |     | Non               |        |       |       |      |       |      |        |       |       | ent)  |        |    | ٦  |       |             |      |    |   |
| 313          | General purpose output                                    | ~    |                |            |     | Field             |        |       |       |      |       |      |        |       |       |       |        |    |    |       |             |      |    |   |
| 314          | General purpose output                                    | ~    |                |            |     | Inpu<br>Dup       |        |       |       |      |       |      | on a   | assig | Inmi  | ent p | ort    |    |    |       |             | data |    |   |
| 315          | General purpose output                                    | ×    |                |            |     | Othe              | er fur | nctio | n as  | sigr | ied j |      | (pa    | ram   | eter  | spec  | cified | )  | }  | - out | put<br>ignm |      |    |   |
| 300(Area2)   | No function assignment                                    | ~    |                |            |     | Port<br>ne port   |        |       |       |      |       |      |        |       |       |       |        |    |    | por   |             | ent  |    |   |
| 301(Area2)   | No function assignment                                    | ~    |                |            |     | ne por<br>uplicat |        |       |       |      |       | e no | et sui | bjec  | t to  |       |        |    |    |       |             |      |    |   |
| 302(Area2)   | No function assignment                                    | ~    |                |            | н   | Posit     Prog    |        |       |       |      |       |      |        |       |       |       |        |    | J  |       |             |      |    |   |
| 303(Area2)   | No function assignment                                    | Ŷ    |                | × ×        | н   | Simp              | lified | l int | erfer | enc  | e ch  | eck  | zon    | ie i  |       |       |        |    |    |       |             |      |    |   |
|              |   | Star | ndard settings | Help       |     |                   |        |       |       |      |       |      |        | N     | /loni | itor  |        |    |    |       |             |      |    |   |

Fig. 8.48 How to Allocate to Output Ports

Once Allocate at Output Function No. 301 is turned ON, the port number (317) in a row to the output port number (316) set in Output Function No. 300 should be automatically set.

When the port numbers are set automatically with Allocate ON, the output port numbers turn to grey and get banned to input.

When you require to turn Allocate OFF, remove the check mark in the check box.

Even if Allocate gets turned OFF, the port numbers should remain without being cleared.

Allocate setting should be kept activated while the check box is ON.

If the port number for the setting item in Output Function No. 300 is changed from 316 to 4000, the port number for Output Function No. 301 should automatically be updated to 4001.

### [3] How to Change to Standard Setting

Select "Standard settings" button, and the standard setting should be allocated to the output function select setting.

| Output Function Select Setting   | Items  | Output Port<br>Number |
|----------------------------------|--|-----------------------|
| Output Function No. 300          | Error output higher than operation cancellation level (OFF)  | 300                   |
| Output Function No. 301          | READY Output (PIO trigger program available<br>for operation and error higher than cold start<br>level not occurred) | 301                   |
| Output Function No. 302          | Emergency stop output (OFF)  | 302                   |
| Output Function No. 303          | General Output   | 303                   |
| Output Function No. 304          | General Output   | 304                   |
| Output Function No. 305          | General Output   | 305                   |
| Output Function No. 306          | General Output   | 306                   |
| Output Function No. 307          | General Output   | 307                   |
| Output Function No. 308          | General Output   | 308                   |
| Output Function No. 309          | General Output   | 309                   |
| Output Function No. 310          | General Output   | 310                   |
| Output Function No. 311          | General Output   | 311                   |
| Output Function No. 312          | General Output   | 312                   |
| Output Function No. 313          | General Output   | 313                   |
| Output Function No. 314          | General Output   | 314                   |
| Output Function No. 315          | General Output   | 315                   |
| Output Function No. 300 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 301 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 302 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 303 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 304 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 305 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 306 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 307 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 308 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 309 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 310 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 311 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 312 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 313 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 314 (Area 2) | No Function Assigned   | Not Allocated         |
| Output Function No. 315 (Area 2) | No Function Assigned   | Not Allocated         |

#### Contents of Standard Setting in Output Function Select Setting

# 8.7.3 Input Function Select Setting

| nitor data | Output function Input function Advanced setting |                   |          | Output port Input port   |
|------------|---|-------------------|----------|--|
| No.        | Function selection                              | Port No.          | Allocate | 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  |
| 000        | General purpose input                           | Ý                 |          | 300  |
| 001        | General purpose input                           | ¥                 |          | 316  |
| 002        | General purpose input                           | ¥                 |          | 332  |
| 003        | General purpose input                           | v                 |          |  |
| 004        | General purpose input                           | v                 |          | 348  |
| 005        | General purpose input                           | v                 |          | 364  |
| 006        | General purpose input                           | v                 |          | 380  |
| 007        | General purpose input                           | ¥                 |          | 396  |
| 008        | General purpose input                           | ¥                 |          |  |
| 009        | General purpose input                           | ¥                 |          |  |
| 010        | General purpose input                           | v                 |          | 428  |
| 011        | General purpose input                           | ¥                 |          | 444  |
| 012        | General purpose input                           | ¥                 |          | Non-field bus area (no function assignment)  |
| 013        | General purpose input                           | ¥                 |          | Fieldbus area (no function assignment)   |
| 014        | General purpose input                           | ¥                 |          | Duplicate assignment port Monitor data   |
| 015        | General purpose input                           | ¥                 |          | Other function assigned port (parameter specified)   |
|            |   |                   |          | Port No. out of range<br>The ports specified below are not subject to<br>duplicate allocation check.<br>• Position output operation function<br>• Program (operand 1.2, output part)<br>• Simplified interference check zone |
|            |   | Standard settings | Help     | Monitor  |

Fig. 8.49 Input Function Select Setting

In the input function select setting window, the following operations can be performed.

| Operation   | Things Available to Do  |
|---|---|
| Select "Monitor data" tab in left window.                             | The left window can be switched to the monitoring data output setting window.   |
| Select "Output Function Select Setting" tab in the left window.       | The left window can be switched to the output function select setting window.   |
| Select "Function selection" combo box in the list in the left window. | A list of items available for setting in each input function should be displayed. Refer to [8.7.3 [1]]  |
| Select "Port No." text box in the list in the left window.            | A port number can be input. Refer to [8.7.3 [1]]  |
| Select "Allocate" check box in the list in the left window.           | Allocate function for input port assignment can be turned ON/OFF.   |
| Select "Input port" tab in the right window.                          | In the input function selection setting, the right side of the screen can be switched from the input port display (default) to the output port display. |
| Select "Standard settings" button in the left window.                 | The standard setting should be set to the input function select setting. Refer to [8.7.3 [3]]   |
| Select "Help" button in the left window.                              | Helps for operation in the input function select setting can be displayed.  |
| Select "Monitor" button in the right window.                          | The monitor window should be displayed.<br>Refer to [8.7.5]   |
| Select "Transfer to Controller" button on the bottom of the window.   | The setting data can be transferred to the controller. Refer to [8.7.4]   |
| Select "Cancel" button on the bottom of the window.                   | I/O output setting function window closes.  |

#### [1] How to Input Function Select Setting

Establish the settings in "Function selection" and "Port No." to conduct the function select setting.

The setting for "Function selection" is to be conducted in the combo box.

Items for each input function number should be displayed in the list of the combo box. Select an item to set from the list.

#### List Items of Input Function No. 000

General Input Program Start Signal (ON-edge)

(Indication Program Number for Input Port Numbers from No. 007 to 014BCD)

Program Start Signal (ON-edge)

(Binary Indication Program Number for Input Port Numbers from No. 007 to 014)

Program Start Signal (ON-edge)

(Indication Program Number for Input Port Numbers from No. 008 to 014BCD)

Program Start Signal (ON-edge)

(Binary Indication Program Number for Input Port Numbers from No. 008 to 014)

#### List Items of Input Function No. 001

General Input Soft Reset Signal (ON for 1sec)

#### List Items of Input Function No. 002

General Input Servo-ON

#### List Items of Input Function No. 003

General Input

General Input (Automatic start program startup with power-ON reset / soft reset in AUTO Mode) Automatic Start Program Startup Signal (ON-edge: Start, OFF-edge: All operations and programs stopped (excluding I/O process program at operation and program stop))

#### List Items of Input Function No. 004

General Input

All Servo Axes Soft Interlock (OFF level) (Effective in commands other than Servo-OFF Command) (Operations withheld at interlock during automatic operation, Operations stopped at interlock during non-automatic operation)

#### List Items of Input Function No. 005

General Input Operation Resume Signal (ON-edge)

#### List Items of Input Function No. 006

General Input

Operation Pause Signal (OFF level)

#### List Items of Input Function No. 007

General Input

Program Start Indicating Program Number (Lowest bit)

#### List Items of Input Function Numbers from No. 008 to No. 012

General Input

Program Start Indicating Program Number

#### List Items of Input Function No. 013

General Input Program Start Indicating Program Number Error Reset (ON-edge)

#### List Items of Input Function No. 014

General Input Drive Cutoff Release Input (ON-edge) (Effective after cause removed) Program Start Indicating Program Number

#### List Items of Input Function No. 015

General Input All Activated Axes Home-Return (ON-edge)

All Incremental Activated Axes Home-Return (ON-edge)

Input the port number in 1 to 4 digits in "Port No." for setting.

| Content of Input         | Explanation for Value to Input   |
|--------------------------|--|
| Value with 1 to 4 Digits | Input a value with 1 to 4 digits<br>Input a value in the range of either the physical input port<br>(0 to 299) or the extension input port (1000 to 3999). |

The input function select setting should be shown in the following color.

Set "Function selection" and "Port No.", and the input function select setting should be displayed in the port assignment status in the window on the right.

Example: When Program Start Signal (ON-edge) (Input Port No. 007 to 014 BCD Indication Program Number) and Port No. 16 are set in Input Function No. 000.

| No. | Output function Input function Advanced setting                   |                |          | Output port Input port  |
|-----|---|----------------|----------|---|
|     | Function selection  | Port No.       | Allocate |   |
| 000 | Program start signal (ON edge) (input port No. 007 to 014 BCD s 🗸 | 16             |          |   |
| 001 | General purpose input v   |                |          |   |
| 002 | General purpose input v   |                |          |   |
| 003 | General purpose input v   |                |          | Port No.16  |
| 004 | General purpose input v   |                |          | Input function selection000   |
| 005 | General purpose input v   |                |          | Program start signal (ON edge) (input port No. 007 to 014 BCD specified program N   |
| 006 | General purpose input v   |                |          | 80 80 80 80 80 80 80 80 80 80 80 80 80 8  |
| 007 | General purpose input v   |                |          | 96  |
| 008 | General purpose input v   |                |          |   |
| 009 | General purpose input v   |                |          |   |
| 010 | General purpose input v   |                |          | 128   |
| 011 | General purpose input v   |                |          | 144   |
| 012 | General purpose input v   |                |          | Non-field bus area (no function assignment)   |
| 013 | General purpose input v   |                | 1 8 1    | Fieldbus area (no function assignment)  |
| 014 | General purpose input v   |                |          | Input/output function selection assignment port Duplicate assignment port Monitor data  |
| 015 | General purpose input v   |                |          | Other function assigned port (parameter specified)  |
|     | -   |                |          | Port No. out of range<br>The ports specified below are not subject to<br>duplicate allocation check.<br>-Position output operation function<br>-Program (operand 1.2, output part)<br>-Simplified interference check zone |
|     | Star  | ndard settings | Help     |   |

Fig. 8.50 Input function select setting (Example)

#### [2] How to Allocate Input Port

Check in the Allocate check box, and port numbers in a row after those for the one step previous in the input function select setting can be allocated automatically.

Example: Program Start Signal (ON-edge) (Input Port No. 007 to 014 BCD Indication Program Number) and Port No. 16 are set in Input Function No. 000. And Soft Reset Signal (ON for 1sec) is set to Input Function No. 001 and Allocate gets turned ON.

| onitor data | Output function Input function Advanced setting                   |                |           | Output port Input port   |
|-------------|---|----------------|-----------|--|
| No.         | Function selection  | Port No.       | Allocate  | 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15  |
| 000         | Program start signal (ON edge) (input port No. 007 to 014 BCD s 💉 | 16             | · · · · · |  |
| 001         | Soft reset signal (1 sec ON) v                                    | 17             | 2         | 16   |
| 002         | General purpose input v   |                |           |  |
| 003         | General purpose input v   |                |           |  |
| 004         | General purpose input v   |                | 1 🖬 🗌     | 48   |
| 005         | General purpose input v   |                |           | 64   |
| 006         | General purpose input v   |                |           | 80 80 80 80 80 80 80 80 80 80 80 80 80 8   |
| 007         | General purpose input v   |                |           | 96   |
| 008         | General purpose input v   |                |           |  |
| 009         | General purpose input v   |                |           |  |
| 010         | General purpose input v   |                |           | 128  |
| 011         | General purpose input v   |                |           | 144  |
| 012         | General purpose input v   |                |           | Non-field bus area (no function assignment)  |
| 013         | General purpose input v   |                |           | Fieldbus area (no function assignment)   |
| 014         | General purpose input v   |                |           | Input/output function selection assignment port<br>Duplicate assignment port   |
| 015         | General purpose input v   |                |           | Other function assigned port (parameter specified)   |
|             |   | ndard settings | Help      | Port No. out of range<br>The ports specified below are not subject to<br>duplicate allocation check<br>-Position output operation function<br>-Program (operand 1.2, output part)<br>-Simplified interference check zone |

Fig. 8.51 How to Allocate Input Port

Once Allocate at Input Function No. 001 is turned ON, the consecutive port number (17) in a row to the input port number (16) set in Input Function No. 000 should be automatically set.

When the port numbers are set automatically with Allocate on, the input port numbers turn to grey and get banned to input.

When you require to turn Allocate OFF, remove the check mark in the check box.

Even if Allocate gets turned OFF, the port numbers should remain without being cleared.

Allocate setting should be kept activated while the check box is ON.

If the port number for the setting item in Input Function No. 000 is changed from 16 to 1000, the port number for Input Function No. 001 should automatically be updated to 1001.

## [3] How to Change to Standard Setting

Select "Standard settings" button, and the standard setting should be allocated to the input function select setting.

| Input Function Select Setting | Items  | Input Port<br>Number |
|-------------------------------|--|----------------------|
| Input Function No. 000        | Program Start Signal (ON-edge)<br>(Indication Program Number for Input Port Numbers<br>from No. 007 to 014BCD) | 000                  |
| Input Function No. 001        | General Output   | 001                  |
| Input Function No. 002        | General Output   | 002                  |
| Input Function No. 003        | General Input (Automatic start program startup with power-ON reset / soft reset in AUTO Mode)                  | 003                  |
| Input Function No. 004        | General Output   | 004                  |
| Input Function No. 005        | General Output   | 005                  |
| Input Function No. 006        | General Output   | 006                  |
| Input Function No. 007        | Program Start Indicating Program Number (Lowest bit)   | 007                  |
| Input Function No. 008        | Program Start Indicating Program Number  | 008                  |
| Input Function No. 009        | Program Start Indicating Program Number  | 009                  |
| Input Function No. 010        | Program Start Indicating Program Number  | 010                  |
| Input Function No. 011        | Program Start Indicating Program Number  | 011                  |
| Input Function No. 012        | Program Start Indicating Program Number  | 012                  |
| Input Function No. 013        | Program Start Indicating Program Number  | 013                  |
| Input Function No. 014        | General Output   | 014                  |
| Input Function No. 015        | General Output   | 015                  |

#### Contents of Standard Setting in Input Function Select Setting

## 8.7.4 EC connection input setting / EC connection output setting

In the EC Connection Input Setting window and the EC Connection Output Setting window, display / setting of the domains that the fieldbus domains and PIO unit domains are assigned, and the ports that the EC connection and the input / output function select are assigned can be conducted.

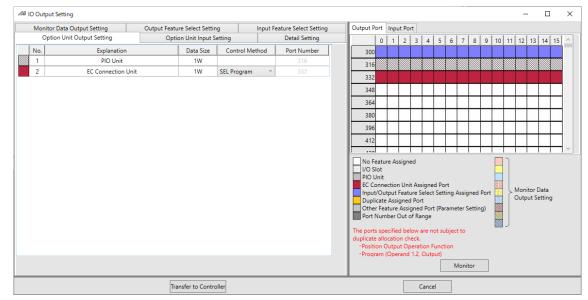


Fig. 8.52 EC connection input setting / EC connection output setting

Input ports and output ports are displayed as follows.

| Display | Description  |
|---------|--|
|         | Unassigned area  |
|         | Domain with fieldbus assigned                                  |
|         | Domain with PIO unit and IA net assigned                       |
|         | Domain with EC connection port assigned                        |
|         | When EC connection port assigned to fieldbus domain            |
|         | When EC connection port assigned to PIO unit and IA net domain |

| Display | Description  |
|---------|--|
|         | Area with an assigned input/output function selection port                         |
|         | When ports for input/output function select assigned to fieldbus domain            |
|         | When ports for input/output function select assigned to PIO unit and IA net domain |
|         | Duplicate assigned port  |
|         | Port with another function already assigned  |

The followings can be selected in "Control System" on the left of the window.

- SEL program: Select this if a SEL program will be used to perform EC axis control and monitor its status.Host device: Select this if a host device will be used to perform EC axis control and monitor its
- Host device: Select this if a host device will be used to perform EC axis control and monitor its status. Assign the leading input port number or leading output port number to an I/O slot or PIO unit area.
- Built-in PLC: It should be selected when performing control of an EC axis from the occupied input and output ports in the software PLC.

## 8.7.5 Software PLC setting

| IO Output Setti               | ng                       |                      |          |                                    |                                      |  |   |  |   |  |  |                      |                  |     |      |       | _                           |        | ;    |
|-------------------------------|--------------------------|----------------------|----------|------------------------------------|--------------------------------------|--|---|--|---|--|--|----------------------|------------------|-----|------|-------|-----------------------------|--------|------|
| Monitor Data<br>EC Connection | Output Setting           | Output Feature Sele  |          | Input Feat<br>Software PLC Setting | ure Select Setting<br>Detail Setting | Outp   | ut Port   |  |   |  | 1  |                      | 1 1              | 1   | 1 1  |       |                             |        | 1    |
|                               |                          |                      | 2        | -                                  |                                      |  |   | 1  | 2   | 3  | 4 5  | 6                    | 7                | 8 9 | 10   | 11 1  | 2 13                        | 14     | 15 / |
| I/O Slot No.                  | PLC Bridge Enabled       | Top Offset (Word)    | Opt.     | Size (PLC Output)                  | Size (PLC Input)                     |  | 300   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
| 1                             | $\checkmark$             | 0                    |          | 64                                 | 64                                   |  | 316   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
| 2                             | $\checkmark$             | 4                    |          | 128                                | 128                                  |  | 332   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
|                               |                          |                      |          |                                    |                                      |  | 348   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
| RUN signal out                | out port No. (disabled a | at 0) 4001 (0,300~59 | 9,4000~6 | i999)                              |                                      |  | 364   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
| ERR signal out                | out port No. (disabled a | at 0) 4002 (0,300~59 | 9.4000~6 | (999)                              |                                      |  | 380   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
|                               |                          |                      |          |                                    |                                      |  | 396   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
|                               |                          |                      |          |                                    |                                      |  | 412   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
|                               |                          |                      |          |                                    |                                      |  | 428   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
|                               |                          |                      |          |                                    |                                      | <u> </u>   | 444   |  |   |  |  |                      |                  |     |      |       |                             |        |      |
|                               |                          |                      |          |                                    |                                      | F P<br>P<br>P<br>Ir<br>C<br>C<br>P<br>The ;<br>dupli | lo Featu<br>ieldbus<br>IO, IA-N<br>C Conn<br>LC Occu<br>Uplicato<br>Other Fe<br>ort Nun<br>ports sp<br>icate all<br>osition f<br>rogram | VET<br>ection<br>upied<br>utput l<br>e Assignature<br>ober (<br>becifier<br>ocation<br>Output<br>(Oper | Area<br>Area<br>Featu<br>gned<br>Assig<br>Dut o<br>d bel<br>on cho<br>it Op<br>rand | gned<br>Port<br>f Ran<br>ow ar<br>eck.<br>eratic<br>1.2, C | lect Se<br>Port (F<br>ge<br>e not<br>m Fun<br>lutput | Parame<br>subjection | eter Se<br>ct to |     | rt . | > Out | nitor E<br>tput Se<br>igned | etting |      |
|                               |                          | <b>D n</b>           |          | rameter Edit                       | Help                                 |  |   |  |   |  |  | ncel                 | _                |     |      |       |                             |        |      |

Fig. 8.53 Software PLC setting

The software PLC should be set up.

Setup of the signal output port numbers and setup / display of assigned ports in the PLC bridge domain should be conducted.

Set up "Enable PLC Bridge" and "Top Offset (Word)" and the port assignment status of the PLC bridge domain should be displayed with in the output port.

#### [Enable PLC Bridge]

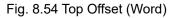
Put a checkmark, and the PLC bridge domain should get enabled.

#### [Top Offset (Word)]

The top address in the bridge domain on the side of PLC should be indicated with offset (in word unit).

(Effective Range: 0 to 63)

| Bridge doma<br>Top Offset (\ |           | Bridge domain<br>Top port No. |
|------------------------------|-----------|-------------------------------|
| 0                            | 16 points | 2952/5952                     |
| 1                            |           | 2968/5968                     |
| 2                            |           | 2984/5984                     |
| 3                            |           | 3000/6000                     |
|                              |           |                               |
| 60                           |           | 3912/6912                     |
| 61                           |           | 3928/6928                     |
| 62                           |           | 3944/6944                     |
| 63                           |           | 3960/6960                     |



[Allocate]

Put a checkmark, and the offset values consecutive to the "Top offset (word)" set in the previous I/O slot number should be set up automatically.

[RUN Signal Output Port No.]

[ERR Signal Output Port No.]

The port numbers to output RUN Signal and ERR Signal in the software PLC should be set up.

A decimal number in 3 to 4 digits should be input directly.

A value in the range of the physical output ports (300 to 599) or extension output ports (4000 to 6999) should be input.

#### 8.7.6 How to Data Transfer

Transfer the setting data to the controller with Transfer to Controller after the monitoring data output setting, output function select setting and input function select setting are conducted. The transfer to the setting data should get cancelled when there is an error in the setting and the content of the error should show up.

Example: When Top Output Port Number is not set in the monitoring data output setting

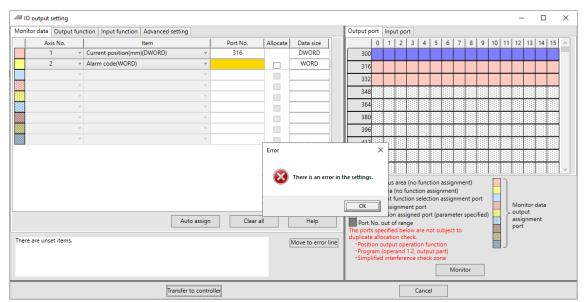


Fig. 8.55 How to Data Transfer

An error dialog should be displayed.

The content of an error occurred should be displayed on the lower left of the window. The port number in the line that the error occurred should be shown in the following color.

Close the error dialog and select "Move to Where Applicable", and the cursor should move to the line that the error has occurred.

Select "Move to Where Applicable" again, and the cursor should move to the line that the next error has occurred.

Once the cursor moves to the line that the error has occurred, correct the setting where there is an error.

| Error  | Correction  |
|--|---|
| There is an item that is not set.  | Establish the setting in the item with no setting done.   |
| There is a port that the assignments are duplicated.                               | Set the port numbers that should not duplicate.   |
| There is a port that the monitoring items are duplicated.                          | Change the duplicated settings or delete them.  |
| There is a port out of the setting range.  | Set the port numbers that are in the effective range.   |
| There is a port used that should not be used.                                      | Set the port numbers that do not duplicate with<br>the ports that have other functions already<br>assigned.                               |
| The monitoring data output is set to a port not for the fieldbus.                  | Set the fieldbus domain to the port number in the monitoring data output setting.   |
| The setting of the program numbers is not in a row.                                | Set the program numbers with care not to have them discontinued in the input function select setting.                                     |
| Indicate (Top port number in port domain + Multiple of 8) for the top port number. | The top port number for the EC output setting /<br>EC input setting in (Top port number in port<br>domain + multiple of 8) should be set. |
| The PLC bridge domain has exceeded the PLC occupied domain.                        | The top offset (word) in the software PLC setting should be set.  |

Once all the errors are corrected, try to transfer the data again to the controller by

Transfer to Controller.

If the setting is correct, the error display should go away and the setting data should be transferred to the controller.

Clue: Even if "There are some ports that the monitoring item is duplicated." error is occurred, the set data can be transferred to a controller. Once you select Transfer to Controller, there should appear a confirmation dialog. Select OK in the confirmation dialog when the setting data is to be transferred.

**Clue:** For "Program Start Indication Program Number" in the input function select setting, do not input any "general input" in between. Also, it is necessary to set values in a row in ascending order for the input port numbers in "Program Start Indication Program Number".

#### Example for Appropriate Setting

| •        |   |   |                        |
|----------|---|---|------------------------|
|          |   | Program Start Indicating Program No. Input Port No. 000 | Input Function No. 007 |
|          |   | Program Start Indicating Program No. Input Port No. 001 | Input Function No. 008 |
|          |   | Program Start Indicating Program No. Input Port No. 002 | Input Function No. 009 |
| In a row |   | Program Start Indicating Program No. Input Port No. 003 | Input Function No. 010 |
|          |   | Program Start Indicating Program No. Input Port No. 004 | Input Function No. 011 |
|          |   | Program Start Indicating Program No. Input Port No. 005 | Input Function No. 012 |
|          | 7 | Program Start Indicating Program No. Input Port No. 006 | Input Function No. 013 |
|          |   |   |                        |
| $\wedge$ |   |   |                        |

| Input Function No. 007 Program Start Indicating Program No. Input Port No. 000 | 11       |
|--|----------|
| Input Function No. 008 Program Start Indicating Program No. Input Port No. 001 |          |
| Input Function No. 009 Program Start Indicating Program No. Input Port No. 002 | In a row |
| Input Function No. 010 Program Start Indicating Program No. Input Port No. 003 |          |
| Input Function No. 011 Program Start Indicating Program No. Input Port No. 004 |          |
| Input Function No. 012 General Input Input Port No. 016                        |          |
| Input Function No. 013 General Input Input Port No. 017                        |          |

| Input Function No. 007 General Input Input Port No. 016                        |              |
|--|--------------|
| Input Function No. 008 General Input Input Port No. 017                        |              |
| Input Function No. 009 Program Start Indicating Program No. Input Port No. 002 |              |
| Input Function No. 010 Program Start Indicating Program No. Input Port No. 003 |              |
| Input Function No. 011 Program Start Indicating Program No. Input Port No. 004 | In a row     |
| Input Function No. 012 Program Start Indicating Program No. Input Port No. 005 |              |
| Input Function No. 013 Program Start Indicating Program No. Input Port No. 006 | $\checkmark$ |

#### Example for Wrong Setting

| Input Function No. 007 Program Start Indicating Program No. Input Port No. |
|--|
| Input Function No. 008 Program Start Indicating Program No. Input Port No. |
| Input Function No. 009 General Input Input Port No. 016                    |
| Input Function No. 010 General Input Input Port No. 017                    |
| Input Function No. 011 General Input Input Port No. 018                    |
| Input Function No. 012 Program Start Indicating Program No. Input Port No. |
| Input Function No. 013 Program Start Indicating Program No. Input Port No. |
|  |
| Input Function No. 007 Program Start Indicating Program No. Input Port No. |

Input Function No. 007 Program Start Indicating Program No. Input Port No. Input Function No. 008 Program Start Indicating Program No. Input Port No. Input Function No. 009 Program Start Indicating Program No. Input Port No. Input Function No. 010 Program Start Indicating Program No. Input Port No. Input Function No. 011 Program Start Indicating Program No. Input Port No. Input Function No. 012 Program Start Indicating Program No. Input Port No. Input Function No. 013 Program Start Indicating Program No. Input Port No.



"General input" settings are involved between "program start indicating program numbers" and "program start indicating program numbers"



Setting of input port numbers is not in a row



Clue: When the I/O output setting function is started up offline, <u>Transfer to Controller</u> should be turned into <u>Reflect to Parameter Edit Window</u>. When also the parameters are to be reflected to the parameter edit window with <u>Reflect to Parameter Edit Window</u>, if there is an error in the setting, the error should be displayed and reflecting of the setting data to the parameter edit window should be cancelled.

**Clue:** The ports that have other functions already assigned are the ports that the parameters below are used. Check separately for the functions and settings for each parameter.

| Parameter Type / Number    | Function Name   |
|----------------------------|---|
| I/O Parameter No.28        | I/O Ready Output Port Number  |
| I/O Parameter No.74        | Number of TP User Output Port Use (hand, etc.)                        |
| I/O Parameter No.75        | TP User Output Port Start Number(hand, etc.)                          |
| I/O Parameter No.76        | AUTO Mode Output Port Number  |
| I/O Parameter No.79        | Remote Mode Control Input Port Number                                 |
| I/O Parameter No.356       | Vision System I/F1 Initial Complete Status Physical Input Port Number |
| I/O Parameter No.357       | Vision System I/F1 Capturing Command Physical Output Port Number      |
| Each Axis Parameter No.88  | Zone 1 Output Number  |
| Each Axis Parameter No.91  | Zone 2 Output Number  |
| Each Axis Parameter No.94  | Zone 3 Output Number  |
| Each Axis Parameter No.97  | Zone 4 Output Number  |
| Each Axis Parameter No.114 | OLWNO Driver Overload Warning Output Number                           |
| Each Axis Parameter No.231 | Output Number with Servo On   |
| Each Axis Parameter No.232 | In-Position Output Number   |

Details of Ports Other Functions Already Assigned

#### 8.7.7 How to Controller Data Monitoring

After transferring the setting data to the controller, select <u>Monitor</u> to open the output port monitoring window.

In the output port monitor window, the values in the output port indicated in the monitoring data output setting can be monitored.

Example: When setting "1" (Axes Group No. 1), Current Position [mm] (2W) and Port No. 316 in the first monitoring data output setting. And setting "1" (Axes Group No. 2), Alarm Code (1W) and Port No. 348 in the second monitor data output setting.

| Display the | symbol                      |                    |           |                       |   |
|-------------|-----------------------------|--------------------|-----------|-----------------------|---|
| First No.   | Monitor item                | Axis No.           | Data size | Select monitor radix  | State                                   |
| 316         | Current position(mm)(DWORD) | 1(Axis group No.1) | DWORD     | 32-bit order(0, 31) v | 0000 0000 0000 0000 0000 0000 0000 0000 |
| 348         | Alarm code(WORD)            | 1(Axis group No.2) | WORD      | 16-bit order(0, 15) v | 0000 0000 0000 0000                     |
|             |                             |                    |           |                       |   |
|             |                             |                    |           |                       |   |
|             |                             |                    |           |                       |   |
|             |                             |                    |           |                       |   |
|             |                             |                    |           |                       |   |

Fig. 8.56 How to Controller Data Monitoring

From Top No. to Size, the contents set in the monitoring data output setting should be displayed. The how to display the output port numbers can be selected in Monitor Radix.

| Monitor Radix                         | Status Display  |
|---------------------------------------|---|
| Bit Order 0 to 31 / Bit Order 0 to 15 | Data is to be shown in binary numbers with the left LSB. (LSB: Lowest bit)  |
| Bit Order 31 to 0 / Bit Order 15 to 0 | Data is to be shown in binary numbers with the left MSB. (MSB: Highest bit) |
| 10 (unsigned)                         | Data is to be shown in unsigned decimal numbers.                            |
| 10 (singed)                           | Data is to be shown in singed decimal numbers.                              |
| 16                                    | Data is to be shown in hexadecimal numbers.                                 |

#### 8.7.8 How to Monitoring Data Swap Setting

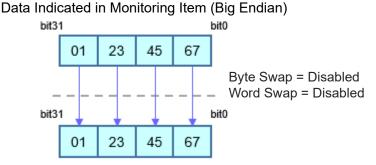
| /// IO output | setting         |                |             |                  |       |  |      |   |  |   |   |  |   |  |   |                        |        |   |    |         | _                              |    | ×    |
|---------------|-----------------|----------------|-------------|------------------|-------|--|------|---|--|---|---|--|---|--|---|------------------------|--------|---|----|---------|--------------------------------|----|------|
| Monitor data  | Output function | Input function | Advanced se | etting           |       |  |      | Outp  | ut port  | t Ir  | nput  | port   | t   |  |   |                        |        |   |    |         |                                |    |      |
| Byte order :  | setting         |                |             |                  |       |  |      |   | 0  |   | 1   3   | 2  | 3   | 4   5  | 5   6   | 7                      | 8      | 9 | 10 | 11   12 | 2   13                         | 14 | 15 ^ |
| byte order .  | Byte swapped    | Disabled       | v 1         |                  |       |  |      |   | 300  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  |      |   | 316  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               | Word swapped    | Disabled       | ~           |                  |       |  |      |   | 332  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  |      |   | 348  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  |      |   | 364  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  |      |   | 12   |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  |      |   | 380  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  |      |   | 396  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  |      |   | 412  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  |      |   | 428  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  |      |   | 444  |   |   |  |   |  |   |                        |        |   |    |         |                                |    |      |
|               |                 |                |             |                  |       |  | łelp | F<br>Ir<br>C<br>C<br>C<br>P<br>The p<br>dupli | on-fie<br>ieldbu:<br>uplica<br>uplica<br>ther fu<br>ort No<br>orts s<br>cate al<br>osition<br>ogran<br>mplifie | s are<br>utpu<br>te a:<br>unct<br>out<br>peci<br>lloca<br>out | ea (no<br>ut fur<br>ssign<br>tion a<br>tof r<br>ified l<br>ation<br>tput o<br>perar | o fui<br>nctic<br>assig<br>rang<br>belo<br>che<br>oper<br>nd 1 | nctio<br>on sel<br>nt po<br>ned j<br>je<br>ow are<br>sck.<br>ratior<br>.2, ou | n assi<br>lectio<br>rt<br>port (<br>e not<br>n func<br>itput | ignmi<br>n assi<br>parar<br>subje<br>:tion<br>part)<br>:one | ent)<br>ignme<br>neter | ent po |   |    | > ou    | onitor<br>tput<br>signme<br>rt |    |      |
|               |                 |                | Tra         | insfer to contro | oller |  |      | -   |  |   | [   |  | Ca  | ncel   |   |                        |        |   | _  |         |                                |    |      |

Fig. 8.57 How to Monitoring Data Swap Setting

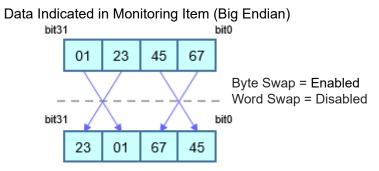
| In the Advanced setting window  | the endian for monitoring data | a read from the controller can be set. |
|---------------------------------|--------------------------------|--|
| In the Advanced setting window, | the chulan for mornioning data | a reau nonn the controller can be set. |

| Setting   | Detail   |
|-----------|--|
| Byte Swap | Select either to enabled or disabled.<br>When selected to enabled, swapping should be conducted in the byte unit.    |
| Word Swap | Select either to enabled or disabled.<br>When selected to enabled, swapping should be conducted in the<br>word unit. |

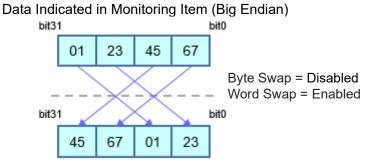
**Clue:** In the swap setting, the data shown in the monitoring window can be set in four ways as shown below.



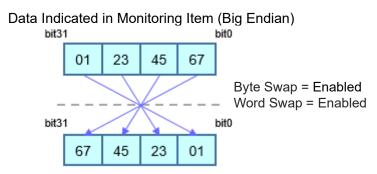
Data Displayed in Monitoring Window (Big Endian)



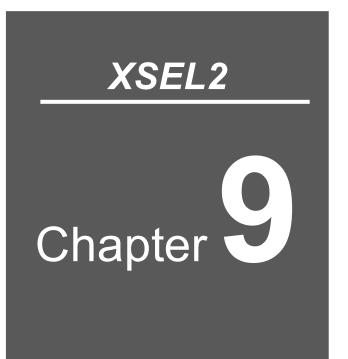




Data Displayed in Monitoring Window







# Symbol Edit Window

| 9.1 | About Symbols9-1                                  |
|-----|---|
| 9.2 | Explanation of the Symbol Edit Window9-2          |
| 9.3 | Saving Symbol Data and Closing the Edit Window9-6 |

## 9.1 About Symbols

Variable numbers, flag numbers and other values can be treated as symbols.

(1) Support range

The range that supports symbolization is as follows.

Variable number, flag number, tag number, subroutine number, program number, position number, input port number, output port number, input/output port number, axis number, constant

- (2) Symbol description rules
  - 1) First character: A single-byte alphabet, single-byte underscore, single-byte character (halfwidth kana) in ASCII Code 0x80 or later or two-byte character (excluding full-width space)
  - 2) Second and subsequent characters: Any single-byte character or two-byte character (excluding full-width space) in ASCII Code 0x21 or later.
  - 3) Maximum number of characters: 40 single-byte characters (20 two-byte characters).
  - Definition of the same symbol for two or more values within a given function is prohibited. (The same symbol can be defined for two or more local values that are each used in a different program.)
  - 5) Definition of the same symbol for two or more flag numbers, input port number, output port number and/or input/output port number is prohibited.
     (The same symbol can be defined for two or more local flags/ports that are each used in a different program.)
  - 6) Definition of the same symbol for two or more integer variable numbers and/or real variable numbers is prohibited.

(The same symbol can be defined for two or more local variables that are each used in a different program.)

- Definition of the same symbol for two or more integer constants and/or real constants is prohibited.
- (3) Number of symbol definitions: Up to 2,000
- (4) Number of symbol uses allowed in commands: Up to 20,000
  - \* Defining the input condition, operands 1 and 2 and output in a step all using symbols is equivalent to four symbol uses in one step.

## 9.2 Explanation of the Symbol Edit Window

- (1) Select "Symbol (Y)"  $\rightarrow$  "Edit (E)" from the menu.
- (2) The symbol edit window will be displayed.

#### B Save to File

Clicking this button where you can save the symbol data to a file under a desired name.



### Caution

• X-SEL-P/Q applicable for increased memory capacity, PX/QX (equipped with the gateway function) and SSEL controllers are not capable of saving the symbols in Program No. 65 and after and Position No. 4001 and after in "Symbol File Format 1" in the normal format.

Save them in "Position File Format 2" in the extension format.

#### Transfer to Controller

Clicking this button will transfer the symbol data to the controller.

#### Print

Clicking this button will print the symbol data.

Select the scope as Global or Local. If Local is selected, specify a desired program number.

| 🖉 Edit Symbo |                 |          |         |           |      |           |      |     |   |
|--------------|-----------------|----------|---------|-----------|------|-----------|------|-----|---|
| 8 2 8        | Global CI       | Local Pr | ogram 1 | +         | Rest | 991       |      |     |   |
| Integer Var  | iables Real Var | riables  | Integer | Constants | Real | Constants | Flag | No. | 1 |
| Variable No  | . Symbol        |          |         |           |      |           |      |     | ^ |
| 200          | CountO          |          |         |           |      |           |      |     |   |
| 201          | Count1          |          |         |           |      |           |      |     |   |
| 202          | Count2          |          |         |           |      |           |      |     |   |
| 203          | Count3          | Cut C    | trl+X   |           |      |           |      |     |   |
| 204          |                 | Copy C   |         |           |      |           |      |     |   |
| 205          |                 | Paste C  |         |           |      |           |      |     |   |
| 206          |                 |          |         |           |      |           |      |     |   |
| 207          |                 |          |         |           |      |           |      |     |   |
| 208          |                 |          |         |           |      |           |      |     |   |
| 209          |                 |          |         |           |      |           |      |     |   |
| 210          |                 |          |         |           |      |           |      |     |   |
| 211          |                 |          |         |           |      |           |      |     |   |
| 212          |                 |          |         |           |      |           |      |     |   |
| 213          |                 |          |         |           |      |           |      |     |   |
| 214          |                 |          |         |           |      |           |      |     |   |
| 215          |                 |          |         |           |      |           |      |     |   |
| 216          |                 |          |         |           |      |           |      |     |   |
| 217          |                 |          |         |           |      |           |      |     |   |
| 218          |                 |          |         |           |      |           |      |     | ~ |
|              |                 |          |         |           |      |           | _    |     | - |

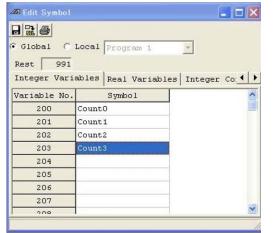
#### Fig. 9.1 Symbol Edit

\* The above symbol edit window is for integer variables. You can display other symbol edit window by clicking each category tab.

- (3) Right-click in the symbol edit window will display the pop-up menu which has the options of "Cut (T)", "Copy (C)" and "Paste (P)". The "Cut (T)" or "Copy (C)" data can be "Paste (P)" only in the symbol edit window. (The data cannot be pasted in the other windows such as the program edit window and position data edit window.)
- (4) A symbol character string can be drag & drop between the symbol edit window and program edit window.

By dragging a symbol character string on the symbol edit window while pressing <u>Ctrl</u> key and then dropping it into any cell of "Cnd", "Operand 1", "Operand 2" and "Pst", the symbol character string can be copied.

The reverse operation (drag & drop operation from the program edit window to the symbol edit window) is also available.



| Fig. 9.2 Symbol Edit Window |
|-----------------------------|
|-----------------------------|

| No. | в | E  | N    | Cnd    | Cmnd | Operand 1 | Operand 2 | Pst | - |
|-----|---|----|------|--------|------|-----------|-----------|-----|---|
| 1   |   |    |      |        | VELS | 100       |           |     | - |
| 2   |   |    |      |        | ACCS | 35        |           |     |   |
| 3   |   |    |      |        | DCLS | 35        |           |     |   |
| 4   |   |    |      |        |      |           |           |     |   |
| 5   |   |    |      |        | PTPR |           |           |     |   |
| 6   |   | *p | rogi | am sta | rt   |           |           |     |   |
| 7   |   |    |      |        | MOVP | 81        |           |     |   |
| 8   |   |    |      |        | ACHZ | 3         |           |     |   |
| 9   |   |    |      |        | TAG  | 1         |           |     |   |
| 10  |   |    |      |        | GTTM | Count3    |           |     |   |
| 11  |   |    |      |        | ATRG | 82        | 84        |     |   |
| 12  |   |    |      |        | ARCH | 85        | 83        |     |   |

Fig. 9.3 Program Edit Window

In the symbol edit window, clicking "Edit (E)"  $\rightarrow$  "Undo (U)" from the menu can cancel up to the most recent 10 input operations.

Alternatively, pressing Ctrl + Z key simultaneously can cancel the operations.

However, the cancel function will become disabled when any of the following operations is performed:

- Transfer of data on the edit window to the controller
- Saving data on the edit window to a file
- Closing of the edit window

When this operation is performed, the warning window in Fig. 9.4 will be displayed. Clicking Yes will cancel the operation executed immediately before.



Fig. 9.4 Warning

\* Setting in binary and hexadecimal numbers is available in the definition value for the integral constants.

| 🖉 Edit | t Symbol           |           |            |          |        |           |        |          |
|--------|--------------------|-----------|------------|----------|--------|-----------|--------|----------|
|        | 🕞 🙆 Global         | C Local   | Program    | 1 💌      | Res    | t 998     |        |          |
| Inte   | ger Variables Real | Variables | Integer Co | onstants | Real C | Constants | Flag 1 | No. 🔸 🕨  |
| No.    | Symbol             | Defined   | i Value    |          |        |           |        | <u>^</u> |
| 1      | Int1               |           | &HFFFFFFF0 |          |        |           |        |          |
| 2      | Int2               |           | &B1000000  |          |        |           |        |          |
| 3      |                    |           |            |          |        |           |        |          |
| 4      |                    |           |            |          |        |           |        |          |
| 5      |                    |           |            |          |        |           |        | -        |
|        |                    |           |            |          |        |           |        |          |

Fig. 9.5 Setting with Binary and Hexadecimal Systems

#### [How to set up]

When using the binary numbers, apply "&B" at the top of the value.

When using the hexadecimal numbers, apply "&H" at the top of the value.

Eight digits can be input at maximum for binary and hexadecimal numbers.

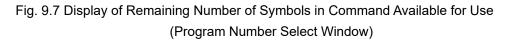
- \* In the operand to input the axis pattern (the operand input values in binary system), do not apply "&B" at the top to input with the binary numbers.
- \* Binary numbers are treated as unsigned integer. (Example: &B1111111 = 255)
- \* Hexadecimal numbers treated as signed integer. (Example: &HFFFFFFF = -1)

(5) The remaining number of symbols in the command available for use can be checked in the main window and program number select window.

| # PC Interface Software for XSEL  |  |  |  |  |  |  |  |
|---|--|--|--|--|--|--|--|
| <u>File Edit View Program Position Parameter Symbol Monitor Controller Tool Window Help</u> |  |  |  |  |  |  |  |
| 😂 🔲 🖓 🛠 👯 🗣 🗛 🙌 🖬 🗊 🗊   | Prmt Oprt(With Sfty Crct) Sfty Vel Specif      |  |  |  |  |  |  |
| Controller holding data Remaining Steps 19,910 Remaining symbols can be used in the pro     | gram 19,991 Remaining position comments 10,000 |  |  |  |  |  |  |

Fig. 9.6 Display of Remaining Number of Symbols in Command Available for Use (Main Window)

| ogran | n No. Select |               |                |                   |   |                                    |
|-------|--------------|---------------|----------------|-------------------|---|------------------------------------|
| lea   | se Selec     | t Program No. |                |                   |   |                                    |
| No    | Steps        | Program Name  | AxisGrpInitVal |                   | ^ |                                    |
| 1     | 26           |               | 2              | Init. Val. Change |   |                                    |
| 2     | 0            |               | 1              | Init. Val. Change |   |                                    |
| 3     | 26           |               | 1              | Init. Val. Change |   |                                    |
| 4     | 26           |               | 1              | Init. Val. Change |   | Remaining Steps 19,9               |
| 5     | 0            |               | 1              | Init. Val. Change |   | Remaining symbols can be used 19,9 |
| 6     | 0            |               | 1              | Init. Val. Change |   | in the program (12)                |
| 7     | 0            |               | 1              | Init. Val. Change |   |                                    |
| 8     | 4            |               | 1              | Init. Val. Change |   |                                    |
| 9     | 4            |               | 1              | Init. Val. Change |   |                                    |
| 10    | 0            |               | 1              | Init. Val. Change |   | Read                               |
| 11    | 0            |               | 1              | Init. Val. Change | ~ | Cancel                             |



## 9.3 Saving Symbol Data and Closing the Edit Window

(1) Saving to a file the symbol data you are editing
 Click Save to File in the symbol edit window.
 This is the same as clicking "File (F)" → "Save As (A)".
 After clicking Save to File, "File save format selection window" will be displayed.

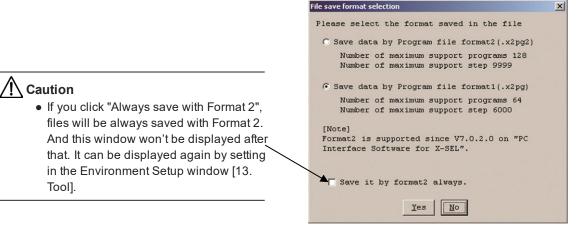


Fig. 9.8 File save format selection window

 (2) Transferring to the controller the symbol data you are editing You can save the symbol data you are editing to the controller's memory. Click Transfer to Controller in the symbol edit window.
 It is available to use only when it is connected to a controller.

#### (3) Writing to the flash ROM

Once the symbol has been transferred to the controller, the following confirmation dialog box with the message, "Write Flash ROM?" will be displayed.

| PC Interface Software for XSEL | < |  |  |  |  |
|--------------------------------|---|--|--|--|--|
| Write Flash ROM?               |   |  |  |  |  |
| Program                        |   |  |  |  |  |
| 🗹 Symbol                       |   |  |  |  |  |
| Position                       |   |  |  |  |  |
| Parameter                      |   |  |  |  |  |
| "Position" always selected.    |   |  |  |  |  |
| <u>Y</u> es <u>N</u> o         |   |  |  |  |  |

Fig. 9.9 Confirmation

Click and select a desired item (Symbols, etc.) to write to the flash ROM.

- Click Yes  $\rightarrow$  The memory data will be written to the flash ROM.
- Click  $No \rightarrow The memory data will not be written to the flash ROM.$ 
  - If No is selected, the controller will clear all data in its memory after a reset (i.e., after the controller power is reconnected or a software reset is executed), and then load the data from the flash ROM. (The controller will operate in accordance with the transferred data until a reset is executed.)
- \* The number of writing to the flash ROM is limited (approx. 100,000 times). If you do not write all the data, select "Write Selected Data Region" and write to the flash ROM.
- (4) Closing the symbol edit window

Attempting to close the symbol edit window will display the following confirmation dialog box with the message, "Save edited data in the Controller?"

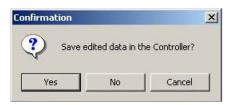


Fig. 9.10 Confirmation

| Yes    |
|--------|
| No     |
| Cancel |

The edited data will be transferred to the controller.

The software will close the symbol edit window without saving the edited data.

The software will cancel the operation and return to the symbol edit window.

(Note) If a symbol in use in SEL program gets deleted or changed, 44C "Symbol Searching Error" could occur when the SEL program is executed.

In such a case, have the SEL program that refers the deleted or changed symbol transferred again to the controller.

\* In case the error would not be cleared, it may be necessary to edit the SEL program again.

- \* Symbol edit is available also in the following windows.
- 1) Conduct the following operations, and the symbol input dialog should appear.

| Window Name   | Editable Symbols      | How to Show  |
|---|-----------------------|--|
| Position Edit Window<br>(Offline Edit)                      | Position Number       | Right-click on the position data while in symbol display $\rightarrow$ select "Symbol Edit (&E)" in the right-click menu |
| Program Number Select<br>Window (Edit, Copy/Move,<br>Clear) | Program Number        | Right-click on the program information $\rightarrow$ select "Symbol Edit (&E)" in the right-click menu                   |
| Tree View   | Program Number        | Right-click on the program number $\rightarrow$ select "Program name Edit (&E)" in the right-click menu                  |
| Input Port Monitor  | Input Port            | Right-click on the monitor while in symbol display $\rightarrow$ select "Symbol Edit (&E)" in the right-click menu       |
| Output Port Monitor   | Output Port           | Right-click on the monitor while in symbol display $\rightarrow$ select "Symbol Edit (&E)" in the right-click menu       |
| Input and Output Port Monitor                               | Input and Output Port | Right-click on the monitor while in symbol display $\rightarrow$ select "Symbol Edit (&E)" in the right-click menu       |
| Integer Variables Monitor                                   | Integer Variables     | Right-click on the monitor $\rightarrow$ select "Symbol Edit (&E)" in the right-click menu                               |
| Real Variables Monitor                                      | Real Variables        | Right-click on the monitor $\rightarrow$ select "Symbol Edit (&E)" in the right-click menu                               |
| Flag Monitor  | Flag                  | Right-click on the monitor while in symbol display $\rightarrow$ select "Symbol Edit (&E)" in the right-click menu       |

#### 2) Input a symbol name and click OK.

The symbol that was input should be transferred to the controller.

| 🛲 Edit symbol                      |           | × |
|------------------------------------|-----------|---|
| Enter symbol.<br>(Input port No.0) |           |   |
| InPort0                            |           |   |
|                                    | OK CANCEL |   |

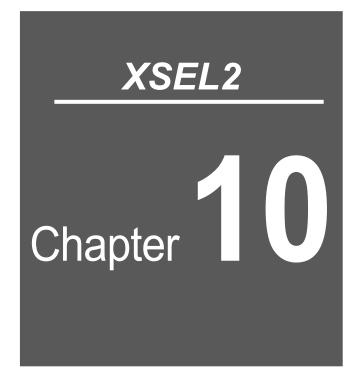
Fig. 9.11 Symbol Name Input

3) Flash ROM writing window opens.Put a check mark at Symbol and click Yes.It should be reflected also to the symbol edit window.

| PC Interface Software for XSEL | Х |
|--------------------------------|---|
| Write Flash ROM?               |   |
| Program                        |   |
| Symbol                         |   |
| Position                       |   |
| Parameter                      |   |
| "Position" always selected.    |   |
| <u>Y</u> es <u>N</u> o         |   |

Fig. 9.12 Flash ROM Writing Window

(Note) If you click No to cancel writing, the symbol setting should get back to that before change after the power is turned off or controller reset is performed.



# Coordinate System Definition Data Edit Window

| 10.1 | Explanation of Coordinate System Definition         |
|------|---|
|      | Data Edit Window 10-1                               |
| 10.2 | Work Coordinate System ······10-2                   |
| 10.3 | Tool Coordinate System 10-3                         |
| 10.4 | Simple Interference Check Zone 10-5                 |
| 10.5 | Coordinate System Definition Data Clear Window 10-8 |
| 10.6 | Printing of Coordinate System Definition Data10-9   |

## 10.1 Explanation of Coordinate System Definition Data Edit Window

Edit of the coordinate system definition data can be performed for the XSEL2-TX.

|     | 2 💋 🚭        |            |                      |               |                            |  |
|-----|--------------|------------|----------------------|---------------|----------------------------|--|
| Wor | k Coordinate | Offset Too | l Coordinate         | e Offset Simp | le interference check zone |  |
| No. | X[0.001mm]   | Y[0.001mm] | 2[0.001mm]           | K[U.TUI eg]   |                            |  |
|     | 250.000      | -250.000   | 173.000              | 0.000         |                            |  |
| T   |              |            | Sector Sector Sector |               |                            |  |
| 2   | 0.000        | 0.000      | 0.000                | 0.000         |                            |  |



(1) Select "Coordinate System (D)"  $\rightarrow$  "Edit (E)" from the menu.

In the coordinate system definition data edit window, clicking "Edit (E)"  $\rightarrow$  "Undo (U)" from the menu can cancel up to the most recent 10 input operations.

Alternatively, pressing the Ctrl + Z key simultaneously can cancel the operations.

However, the cancel function will become disabled when any of the following operations is performed:

- Transfer of data on the edit window to the controller
- Saving data on the edit window to a file
- Closing of the edit window

When this operation is performed, the warning window in Fig. 10.2 will be displayed. Clicking Yes will cancel the operation executed immediately before.

| Warning |  | ×                                     |
|---------|--|---------------------------------------|
| ⚠       | Do you cancel the edit op<br>(Step No.2 : Input) | peration executed immediately before? |
|         | Yes  | No                                    |

Fig. 10.2 Warning

## 10.2 Work Coordinate System

The work coordinate system (X, Y, Z and R) should be defined by the offset against the base coordinate system. If the offset is all "0", it is the same as the base coordinate system.

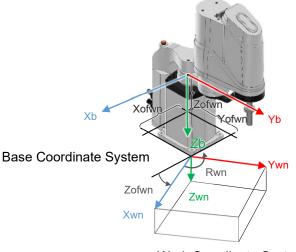
Xofwn: X Work Coordinate System Offset Yofwn: Y Work Coordinate System Offset Zofwn: Z Work Coordinate System Offset Rofwn: R Work Coordinate System Offset

Xwn: Work Coordinate System X-axis

Ywn: Work Coordinate System Y-axis Zwn: Work Coordinate System Z-axis

Rwn: Work Coordinate System R-axis

(n is the work coordinate system No.)



Work Coordinate System

Fig. 10.3 Work Coordinate System

The edit window should be as shown below.

|       | 1 🖉          |               |           |              |        |        |              |             |     |
|-------|--------------|---------------|-----------|--------------|--------|--------|--------------|-------------|-----|
| Scara | a-Work Coord | linate Offset | Scara-Too | l Coordinate | Offset | Simple | interference | Scara-check | zoi |
| No.   | X[mm]        | Y[mm]         | Z [mm]    | R[deg]       |        |        |              |             |     |
| 1     | 0.000        | 0.000         | 0.000     | 0.000        |        |        |              |             |     |
| 2     | 0.000        | 0.000         | 0.000     | 0.000        |        |        |              |             |     |
| з     | 0.000        | 0.000         | 0.000     | 0.000        |        |        |              |             |     |
| 4     | 0.000        | 0.000         | 0.000     | 0.000        |        |        |              |             |     |
| 5     | 0.000        | 0.000         | 0.000     | 0.000        |        |        |              |             |     |

Fig. 10.4 Work Coordinate System Offset Setting Window

The content of each edit item is as stated below.

<SCARA Work Coordinate System Offset>

- No. Work coordinate system number should be shown.
- X [mm] Input the offset value of the X-axis to the base coordinate.
- Y [mm] Input the offset value of the Y-axis to the base coordinate.
- Z [mm] Input the offset value of the Z-axis to the base coordinate.
- R [deg] Input the offset value of the R-axis to the base coordinate.

## 10.3 Tool Coordinate System

It is the 3-dimensional cartesian coordinates + rotary axis coordinates in 128 kinds defined with the dimensions (offset) of a tool (such as hand) attached on the tool attachment surface.

However, Tool Coordinate System No. 0 should be reserved as Offset 0 in the tool coordinate system by the system.

Select a defined tool coordinate system number, and the tool tip, not the center of the tool attachment surface, should be used as the reached point at positioning.

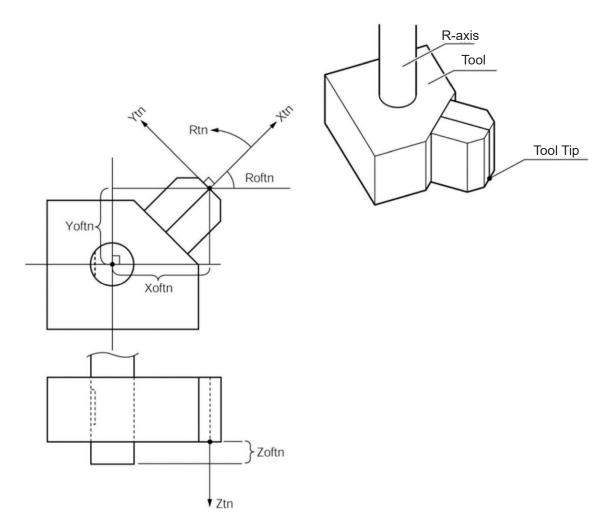
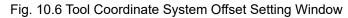


Fig. 10.5 Tool Coordinate System

The edit window should be as shown below.

|       | 1 🖉          |              |            |            |        |        |              |               |
|-------|--------------|--------------|------------|------------|--------|--------|--------------|---------------|
| Scara | a-Work Coord | inate Offset | Scara-Tool | Coordinate | Offset | Simple | interference | Scara-check z |
| No.   | X [mm]       | Y[mm]        | Z [mm]     | R[deg]     |        |        |              |               |
| 1     | 0.000        | 0.000        | 0.000      | 0.000      |        |        |              |               |
| 2     | 0.000        | 0.000        | 0.000      | 0.000      |        |        |              |               |
| з     | 0.000        | 0.000        | 0.000      | 0.000      |        |        |              |               |
| 4     | 0.000        | 0.000        | 0.000      | 0.000      |        |        |              |               |
| 5     | 0.000        | 0.000        | 0.000      | 0.000      |        |        |              |               |



The content of each edit item is as stated below.

<SCARA Tool Coordinate System Offset>

- No. Tool coordinate system number should be shown.
- X [mm] Input the offset value of the X-axis
- Y [mm] Input the offset value of the Y-axis
- Z [mm] Input the offset value of the Z-axis
- R [deg] Input the offset value of the R-axis

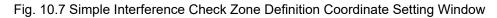
## **10.4 Simple Interference Check Zone**

The simple interference check zone is the area to be set in order to have an interference check between a robot and peripheral devices.

Interference in a simple interference check zone at the center position on the tool attachment surface for Tool Coordinate No. 0 (= tool coordinate system offset 0) and the tip position on a tool for the tool coordinate system No. 1 to 127 (=tool coordinate system offset valid) can be detected. Interference in a simple interference check zone at the center position on the tool attachment surface (when Tool Coordinate No. 0 is selected) and the tip position on a tool (when Tool coordinate system No. 1 to 127 is selected) should be detected. Any interference at an area other than the outer circumference of the R-axis or the tip position of a tool should not be detected.

The edit window should be as shown below.

| 3 🖹 🗲 i  | <b>4</b>             |                              |                              |                              |                              |  |          |           |
|----------|----------------------|------------------------------|------------------------------|------------------------------|------------------------------|--|----------|-----------|
| Scara-Wo | rk Coordi            | inate Offset                 | Scara-Tool                   | L Coordinate                 | Offset Sim                   | ple interference   | Scara-ch | neck zone |
|          | by Scar<br>pe when s | ra-work coor<br>simple inter | rdinate syst<br>rference Sca | em selection<br>ra-check zon | n No.0(= bas<br>ne invades : | e definition coc<br>e coordinate sys<br>on release level | tem)     |           |
| Zone No. |                      | X [mm]                       | Y[mm]                        | Z [mm]                       | R[deg]                       | Phy,Ext.Output/<br>Global Flag                           | FrrType  |           |
| Zone 1   | Crd 1                |                              |                              |                              |                              | 0  | 0        |           |
|          | Crd 2                |                              |                              |                              |                              |  |          |           |
| Zone 2   | Crd 1                |                              |                              |                              |                              | 0  | 0        |           |
|          | Crd 2                |                              |                              |                              |                              |  |          |           |
| Zone 3   | Crd 1                |                              |                              |                              |                              | 0  | 0        |           |
|          | Crd 2                |                              |                              |                              |                              |  |          |           |
| Zone 4   | Crd 1                |                              |                              |                              |                              | 0  | 0        |           |
|          | Crd 2                |                              |                              |                              |                              |  |          |           |
| Zone 5   | Crd 1                |                              |                              |                              |                              | 0  | 0        |           |
|          | Crd 2                |                              |                              |                              |                              |  |          |           |



The content of each edit item is as stated below.

<Simple Interference Check Zone Coordinate Definition>

| Zone No.           | Zone No. should be displayed.   |
|--------------------|---|
| Coordinate No.     | Coordinate No. should be displayed. There are Coordinate 1 and        |
|                    | Coordinate 2.   |
| X [mm]             | Input the interference area data of the X-axis.                       |
| Y [mm]             | Input the interference area data of the Y-axis.                       |
| Z [mm]             | Input the interference area data of the Z-axis.                       |
| R [deg]            | Input the interference area data of the R-axis.                       |
| Physical/Extension | on Output Port Number/Global Flag Number:                             |
|                    | Input the output port / flag number when getting into the check zone. |
| Error Type         | Select the error type.  |
|                    | 0 = Error not to be processed   |
|                    | 1 = Error output in message level                                     |
|                    | 2 = Error output in operation cancel level                            |
|                    |   |

#### • X, Y, Z

Set the values for the space diagonal points on a rectangular parallelepiped on the base coordinates to Coordinate 1 and Coordinate 2.

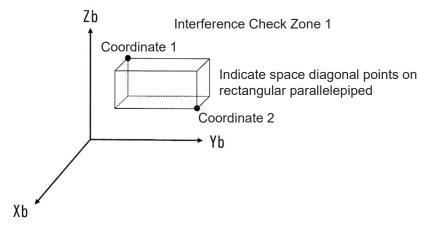


Fig. 10.8 Simple Interference Check Zone Coordinate

- Output Port / Global Flag Numbers
   Set the values for 300 to 500 / 4000 to 6999 / 600 to 899.
   If there are values set, ON while the tool tip is entering the zone.
- Error Type

Establish the setting from:

- 0 = No error process while in the zone
- 1 = Message level error while in the zone
- 2 = Operation cancel level error while in the zone

- Caution
  - If the operation cancel level error while in the zone is selected, the robot will decelerate and stop after the tool tip gets into the simple interference check zone, thus the position where the robot actually stops should be in the zone. It is recommended to have the zone range set relatively large considering the size of the tool and the distance to decelerate and stop.
  - The simple interference check zone gets valid after the absolute coordinates are confirmed. Note that the interference check will not be held when the absolute coordinates are not confirmed.
  - The frequency of invasion monitor is 5ms.

There may be a case that the invasion cannot be detected if the tool tip stays in the zone for 5ms or more.

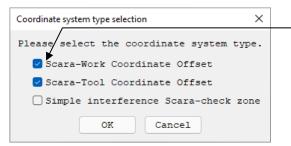
It is recommended to have the zone range set relatively large considering the size of the tool and the duration not detected. There may be a case that it takes 5ms before the change to the simple interference check zone setting gets reflected. It is recommended to have the robot stopped while in the simple interference check zone setting change.

• The tool tip that the invasion monitor is to be conducted should be determined by the tool coordinate system definition data and currently selected tool coordinate system number. It is mandatory to have the tool coordinate system definition data and currently selected tool coordinate system number set properly.

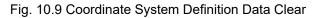
## 10.5 Coordinate System Definition Data Clear Window

The procedure to delete coordinate system definition data is explained below:

- (1) Select "Coordinate System (D)"  $\rightarrow$  "Clear (L)" from the menu.
- (2) The coordinate system definition data clear window will be displayed.



Click in the applicable checkbox to select the type of data you wish to delete.



Select the type of coordinate system data you wish to delete. Next, click OK.

A warning message will be displayed to

confirm if you really want to delete the data. Click OK.

The data will be transferred to the controller. Clicking Cancel will cancel the operation.

| Warning |   | ×   |
|---------|---|-----|
| ⚠       | Selected Coordinate definition data will be cleare<br>Are you sure to continue? | :d. |
|         | OK CANCEL   |     |

Fig. 10.10 Warning

## 10.6 Printing of Coordinate System Definition Data

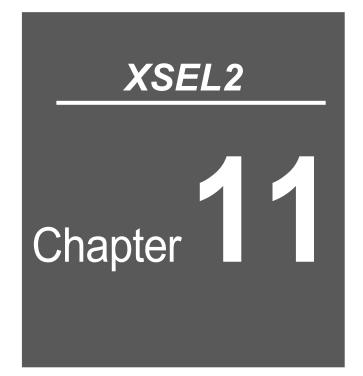
The procedure to print coordinate system definition data is explained below.

- (1) Click 😅 in the menu in the coordinate system data definition edit window.
- (2) Select whether to print all types or the coordinate system data being displayed.

|       |       | Print all types     |        |           |
|-------|-------|---------------------|--------|-----------|
| Scara | a-Wor | Print showing types | I-Tool | Coordinat |
| No.   | X[mm] | Y [mm]              | Z [mm] | R[deg]    |
| 1     | 0.00  | 0.000               | 0.000  | 0.000     |
| 2     | 0.00  | 0.000               | 0.000  | 0.000     |
| 3     | 0.00  | 0.000               | 0.000  | 0.000     |

Fig. 10.11 Print Type Selection

(3) The coordinate system definition data will be printed in accordance with the selected content.



## Monitor

| 11.1 | Various | status | 11- | -1 |
|------|---------|--------|-----|----|
|------|---------|--------|-----|----|

## 11.1 Various status

You can check the current statuses of various items from the "Monitor" menu.

(1) <u>Task status monitor window</u>

This window shows the statuses of running programs.

|    | Task S | Status | Moni | tor  |      |     | • |   | 2 | ٢. |
|----|--------|--------|------|------|------|-----|---|---|---|----|
| No | Prg    | Sts    | Lvl  | Step | AGRP | Stp | W | H | С | ^  |
| 1  | 1      | RDY    | 8    | 1    | 1    | 0   | 0 | 0 | 0 |    |
| 2  | 512    | RDY    | 8    | 1    | 2    | 0   | 0 | 0 | 0 |    |
| 3  |        |        |      |      |      |     |   |   |   |    |
| 4  |        |        |      |      |      |     |   |   |   |    |
| 5  |        |        |      |      |      |     |   |   |   |    |
| 6  |        |        |      |      |      |     |   |   |   |    |
| 7  |        |        |      |      |      |     |   |   |   |    |
| 8  |        |        |      |      |      |     |   |   |   |    |
| 9  |        |        |      |      |      |     |   |   |   |    |
| 10 |        |        |      |      |      |     |   |   |   | ~  |
|    |        |        |      |      |      |     |   |   |   |    |

Fig. 11.1 Task Status

- No.: Task No.
- Prg: Program No.
- Sts: Task status
  - RUN (Run): Being executed
  - RDY (Ready): The task is ready to be performed.
  - WAT (Wait): The task is suspended.
  - WAS (Wait Suspend): Double suspension
  - SUS (Suspend): Compulsory suspension
- Lv1: Task level
- Step: Program executed step number
- AGRP: Axes group number indication current value
- Stp: While in execution stop command (0 or 1)
- W: Waiting (in response to the TIMW, WTxx, WZxx, WRIT or READ command, waiting for a servo command to be completed, etc.) (0 or 1)
- H: HOLD input (0 or 1)
- C: CANC input (0 or 1)

#### (2) System status monitor window

| System Status Monitor              |   | <ul> <li>The current operation mode is displayed.</li> <li>("MANUAL", "AUTO")</li> </ul> |
|------------------------------------|---|--|
| System Mode                        | MANUAL  |  |
|                                    | <u>, , , , , , , , , , , , , , , , , , , </u> | Of the errors currently occurring,<br>the most serious level system error number         |
| Statusl Status2 Status3 Status4    |   | is displayed.  |
| Status Name                        | Status  |  |
| Drive Mode SW Status               | MANUAL  |  |
| TP Deadman SW Status               | ON  | ➤ Of the errors currently occurring,   |
| Safety Gate Status                 | CLOSE   | the latest system error number is displayed  |
| Emergency Stop SW Status           | Non Emergency-Stop                            | the latest system ener hamber is displayed   |
| Power Abnormality Status           | NORMAL  |  |
| Battery Voltage Low Warning Status | Not Lowering                                  | → Various statuses are displayed.  |
| Battery Voltage Abnormality Status | NORMAL  | vanoao statacos are displayed.   |
| (Reserved)                         | OFF   |  |

Fig. 11.2 System Status

(3) Axis status monitor window

This window shows the status of each axis.

| anta anta al anta anana al    |   |                                |                              |
|-------------------------------|---|--------------------------------|------------------------------|
| Axis group 1 Axis group 2     |   |                                |                              |
| Axis1   Axis2   Axis3   Axis4 |   |                                |                              |
| Current Position              | 0.000                                     |                                |                              |
| Axis Error Code               | 000                                       |                                |                              |
| Axis Status                   |   | Axis Sensor Status             | Ecdr Status(when restarting) |
| 🥥 Servo Axis in Use           | Overload Warning                          | Creep Sensor                   | Ø OS                         |
|                               | Operation Mode (ON at AUTO / OFF at MANU) | Ø Overrun Sensor               | Ø FS                         |
| @ Home Return                 | Low Battery Warning                       | @ Home Sensor                  | Ø CE                         |
| Servo ON/OFF                  | (System Reserve)                          | Break of belt detection sensor | O OF                         |
| Motion Completion             | (System Reserve)                          |                                | 🖉 (System Reserve)           |
| 🖉 Push Force Not Encountered  | 🔘 (System Reserve)                        |                                | Ø ME                         |
| 🥥 (System Reserve)            | (System Reserve)                          |                                | Ø BE                         |
| (System Reserve)              | G (System Reserve)                        |                                | G BA                         |

## Fig. 11.3 Axis status (XSEL2-T)

| Axis Status Monitor  |   |                    | - • •                        |
|--|---|--------------------|------------------------------|
| Axis group 1 Axis group 2                                  |   |                    |                              |
| Axisl Axis2 Axis3 Axis4                                    |   |                    |                              |
|  |   |                    |                              |
| Current arm system Rigi                                    | nt  |                    |                              |
| Current Position   | 2,000                                     |                    |                              |
| Current Position   | 5.000                                     |                    |                              |
| Current location type Sel                                  | ected work coordinate system              |                    |                              |
| Scara-Work coordinate sys slct No. 0<br>(0=base crd sys)   |   |                    |                              |
| Scara-Tool coordinate sys slct No. 0<br>(O=no tool offset) |   |                    |                              |
| Compliance Mode  | effective                                 |                    |                              |
| Axis Error Code 000  |   |                    |                              |
| Axis Status  |   | Axis Sensor Status | Ecdr Status(when restarting) |
| Servo Axis in Use  | 🕼 Overload Warning                        | Creep Sensor       | © os                         |
|  | Operation Mode (ON at AUTO / OFF at MANU) | 🕼 Overrun Sensor   | Ø FS                         |
| C Home Return  | Low Battery Warning                       | @ Home Sensor      | CE CE                        |
| Servo ON/OFF   | (System Reserve)                          | (System Reserve)   | OF OF                        |
| Motion Completion  | (System Reserve)                          |                    | 🕼 (System Reserve)           |
| Push Force Not Encountered                                 | (System Reserve)                          |                    | G ME                         |
| Collision Detection Function in Use                        | (System Reserve)                          |                    | G BE                         |
| (System Reserve)   | G (System Reserve)                        |                    | Ø BA                         |

Fig. 11.4 Axis status (XSEL2-TX)

(4) Input port, virtual input port, output port and virtual output port windows

These windows show the ON/OFF status of each input/output. 1: ON, 0: OFF

\* The physical ports and extension ports can be monitored in one window.

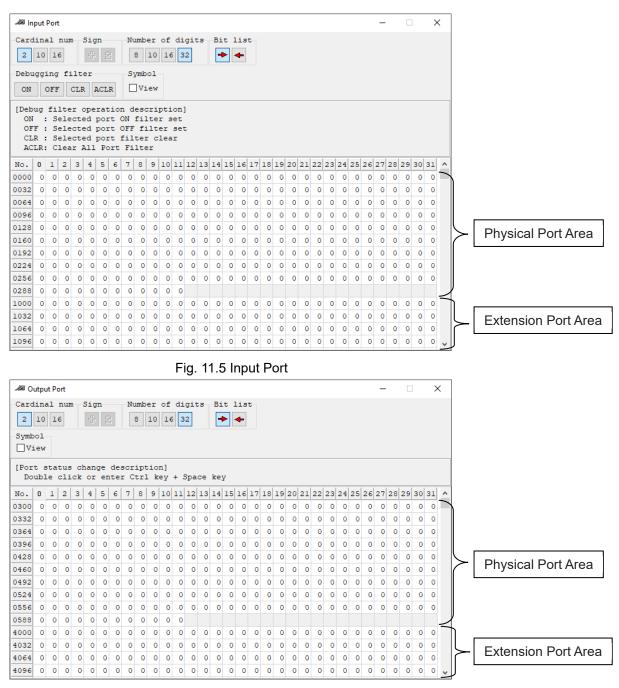


Fig. 11.6 Output port

The 1/0 (ON/OFF) of output ports and virtual output ports can be switched by double-clicking the applicable port or pressing Ctrl + space key simultaneously.

The virtual input/output port No. 7000 to 7599 are shown all together.

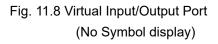
Refer to [SEL Language Programming Manual] for the assignment of the virtual input/output ports.

The display on the left will be shown when a tick mark is put in the "Symbol" box, and the display on the right will be shown when a tick mark is removed.

|             | Input/Output<br>er of dig |        | LIST     |
|-------------|---------------------------|--------|----------|
| 8           | 10 16 32                  |        |          |
| Symbolic V: |                           |        |          |
| No.         | Symbol                    | Status | <b>_</b> |
| 7000        |                           | 0      |          |
| 7001        |                           | 1      |          |
| 7002        |                           | 0      |          |
| 7003        |                           | 0      |          |
| 7004        |                           | 0      |          |
| 7005        |                           | 0      |          |
| 7006        |                           | 0      |          |
| 7007        |                           | 0      |          |
| 7008        |                           | 1      | -        |
|             |                           |        |          |

| AND AIL.   | INDI       | IC/U | ucp | UC P | orc |   |    |     | - |   |   |
|--|------------|------|-----|------|-----|---|----|-----|---|---|---|
| Numb   | er         | of   | di  | igi  | ts  | B | it | lis | t |   |   |
| 8  | 10         | 1    | 6 3 | 32   |     | - | ►  | +   |   |   |   |
| Symbolic Sym | ol-<br>iew |      |     |      |     |   |    |     |   |   |   |
| No.  | 0          | 1    | 2   | 3    | 4   | 5 | 6  | 7   | 8 | 9 |   |
| 7000   | 0          | 1    | 0   | 0    | 0   | 0 | 0  | 0   | 1 | 0 |   |
| 7010   | 1          | 1    | 0   | 0    | 0   | 0 | 0  | 0   | 0 | 0 |   |
| 7020   | 0          | 0    | 0   | 0    | 0   | 0 | 0  | 0   | 0 | 0 |   |
| 7030   | 0          | 0    | 0   | 0    | 0   | 0 | 0  | 0   | 0 | 0 |   |
| 7040   | 0          | 0    | 0   | 0    | 0   | 0 | 0  | 0   | 0 | 0 |   |
| 7050   | 0          | 0    | 0   | 0    | 0   | 0 | 0  | 0   | 0 | 0 |   |
| 7060   | 0          | 0    | 0   | 0    | 0   | 0 | 0  | 0   | 0 | 0 |   |
| 7070   | 0          | 0    | 0   | 0    | 0   | 0 | 0  | 0   | 0 | 0 |   |
| 7080   | 0          | 0    | 0   | 0    | 0   | 0 | 0  | 0   | 0 | 0 | - |
|  |            |      |     |      |     |   |    |     |   |   |   |

Fig. 11.7 Virtual Input/Output Port (with Symbol display)



(Note) 488 "Virtual Input/Output Port Operation Error" will occur if the ON/OFF of the input ports in Virtual Input/Output Port No. 7000 to 7599 are switched over.

In the input port window, you can set an input port debug filter.

"Input port debug filter" is a function that causes the controller to recognize a given physical input port as ON or OFF regardless of the actual input status of the physical input port.

To set a debug filter, use the following four buttons provided on the Debug filter setting panel in the input port window (available in the MANUAL mode).

1) ON

Clicking this button will set an ON filter for the input port corresponding to the cursor position. The controller will always recognize the specified port as ON.

2) OFF

Clicking this button will set an OFF filter for the input port corresponding to the cursor position. The controller will always recognize the specified port as OFF.

## 3) CLR

Clicking this button will clear the debug filter currently set for the input port corresponding to the cursor position.

4) ACLR

Clicking this button will clear the debug filters currently set for all physical input ports.

\* While a debug filter is set, the status of the port ("0" or "1") for which the ON or OFF filter is set will be shown in red (all ports for which a debug filter is not set will be shown in black).

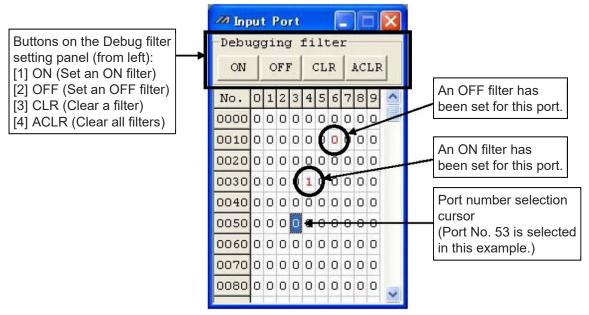


Fig. 11.9 Input Port Window

Clicking CLR or ACLR will display the warning message shown in Fig. 11.10. Select Yes (clear the filter(s)) or No (cancel the clear) after carefully reading the content of the message.

| Warning | ×   |
|---------|---|
|         | It changes to a real input state at the moment of debugging filter release.<br>The processing is performed when there is a function assigned to the real input state.<br>Be fully careful of a start of operation etc.  |
|         | <ul> <li>* The function assigned to input ports, such as program starting,<br/>Homing,etc.</li> <li>* The SEL program which is performing branch by input conditions.</li> <li>* The SEL program which is using the command which supervises the<br/>state of an input port.<br/>(WTON,WTOF,IN,INB,HOLD,CANC,JBWF,JBWN,JFWF,JFWN,etc)</li> <li>* In addition, processing which supervises the state of an input<br/>port and is performed.</li> </ul> |
|         | Are you sure to continue?   |
|         | Yes No  |

Fig. 11.10 Warning Message



## Caution

• The status (ON/OFF) of each input port as recognized by the controller changes the moment the debug filter is cleared or controller operation mode (MANUAL or AUTO) is changed.

### (1) Upon clearing a filter

| Actual input status Filter type | ON         | OFF        |
|---------------------------------|------------|------------|
| ON                              |            | $ON\toOFF$ |
| OFF                             | $OFF\toON$ |            |

(2) Upon switching the controller mode from MANUAL to AUTO

| Actual input status Filter type | ON         | OFF        |
|---------------------------------|------------|------------|
| ON                              |            | $ON\toOFF$ |
| OFF                             | $OFF\toON$ |            |

(3)Upon switching the controller mode from MANUAL to AUTO and then back to MANUAL

| Actual input status Filter type | ON         | OFF        |
|---------------------------------|------------|------------|
| ON                              |            | $OFF\toON$ |
| OFF                             | $ON\toOFF$ |            |

\* <u>Changing the controller mode (MANUAL or AUTO) will not clear debug filters.</u> Accordingly, changing the controller mode back to MANUAL from AUTO will make effective again the debug filters that were set in the previous MANUAL mode.

If any function is assigned to an input port, the applicable process will be executed. Exercise caution against start of the following operations and others.

- Functions assigned to input ports, such as program start and homing of all valid axes
- SEL programs that use branching based on input condition
- SEL programs that include commands for monitoring input port statuses
- (WTON, WTOF, IN, INB, HOLD, CANC, JBWF, JBWN, JFWE, JFWN, etc.) • Other processes executed according to the input port statuses as monitored (recognized) by
- Other processes executed according to the input port statuses as monitored (recognized) by the controller

|       | 303    | ※ 원 수 전 |         |        | Sa:     | fet | y Vel | Spec  | ifi  | ed (1 | IANU | Mo | de) |    | -  | ]  |    |    | _ |       |
|-------|--------|---------|---------|--------|---------|-----|-------|-------|------|-------|------|----|-----|----|----|----|----|----|---|-------|
| Ø G-1 |        |         | /// G-1 |        |         | ×   |       | 221 G |      |       |      |    |     |    |    |    |    |    |   | ×     |
| No.   | Symbol | Status  | No.     | Symbol | Value   | ^   |       |       | 00   | 01    | 02   | 03 | 04  | 05 | 06 | 07 | 08 | 09 |   | ^     |
| 600   |        | 0 =     | 0300    |        | 0.00000 |     |       | 300   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 601   |        | 0       | 0301    |        | 0.00000 |     |       | 310   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 602   |        | 0       | 0302    |        | 0.00000 |     |       | 320   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 0603  |        | 0       | 0303    |        | 0.00000 |     |       | 330   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 0604  | 2      | 0       | 0304    |        | 0.00000 |     |       | 340   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 605   |        | 0       | 0305    |        | 0.00000 |     |       | 350   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 606   |        | 0       | 0306    |        | 0.00000 |     |       | 360   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 607   |        | 0       | 0307    |        | 0.00000 |     |       | 370   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 608   |        | 0       | 0308    |        | 0.00000 |     |       | 380   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 609   |        | 0       | 0309    |        | 0.00000 | ~   |       | 390   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 0610  |        | 0       |         |        |         |     |       | 400   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
|       |        |         |         |        |         |     |       | 410   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| Ø G-1 | Int    |         |         |        |         |     |       | 420   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| Radix | DEC -  |         |         |        |         |     |       | 430   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| No.   | Symbol | Value   | ^       |        |         |     |       | 440   | 00   | 00    | 00   | 00 | 00  | 00 | 00 | 00 | 00 | 00 |   |       |
| 200   |        | 6278154 |         |        |         |     |       | 450   | l nn | nn    | nn   | nn | nn  | nn | nn | nn | nn | nn |   | <br>~ |
| 201   |        | 245     | 5       |        |         |     |       |       |      |       |      |    |     |    |    |    |    |    |   |       |
| 202   |        | 310315  | 5       |        |         |     |       |       |      |       |      |    |     |    |    |    |    |    |   |       |
| 203   |        | 22      |         |        |         |     |       |       |      |       |      |    |     |    |    |    |    |    |   |       |
| 204   |        | 4948245 | 5       |        |         |     |       |       |      |       |      |    |     |    |    |    |    |    |   |       |
| 205   |        | 22      |         |        |         |     |       |       |      |       |      |    |     |    |    |    |    |    |   |       |
| 206   |        | 494826  | 7       |        |         |     |       |       |      |       |      |    |     |    |    |    |    |    |   |       |
| 207   |        | 61      | 5       |        |         |     |       |       |      |       |      |    |     |    |    |    |    |    |   |       |
| 208   | 1      | 620     | 0       |        |         |     |       |       |      |       |      |    |     |    |    |    |    |    |   |       |
| 209   |        | 3548    |         |        |         |     |       |       |      |       |      |    |     |    |    |    |    |    |   |       |

(5) Global flag, global integer variable, global real variable and global string windows

Fig. 11.11 Global

You can change the values in global variables or assign values to global variables. You can also change the characters in global strings or assign characters to global strings. The 1/0 (ON/OFF) of global flags can be switched by double-clicking the applicable global flag or pressing the <u>Ctrl</u> + <u>space</u> key simultaneously.

In the integer variable monitor, select Decimal or Hexadecimal for the data radix. (Select it from the combo box at the top of the window.)

| Radix | DEC -  |         |     |
|-------|--------|---------|-----|
| No.   | Symbol | Value   | ^   |
| 0200  |        | 6278154 | III |
| 0201  |        | 245     |     |
| 0202  |        | 310315  |     |
| 0203  |        | 22      |     |
| 0204  |        | 4948245 |     |
| 0205  |        | 22      |     |
| 0206  |        | 4948267 |     |
| 0207  |        | 66      |     |
| 0208  | 1      | 620     |     |
| 0209  |        | 3548    | ~   |

Fig. 11.12 Decimal Notation

| Radix | HEX -  |            |   |
|-------|--------|------------|---|
| No.   | Symbol | Value      | ^ |
| 0200  |        | 0x005FCCOA |   |
| 0201  |        | 0x000000F5 |   |
| 0202  |        | 0x0004BC2B |   |
| 0203  |        | 0x00000016 |   |
| 0204  |        | 0x004B8115 |   |
| 0205  |        | 0x00000016 |   |
| 0206  |        | 0x004B812B |   |
| 0207  |        | 0x00000042 |   |
| 0208  |        | 0x0000026C |   |
| 0209  |        | 0x00000DDC | ~ |

Fig. 11.13 Hexadecimal Notation

Select "Move to specified variable (flag) No." in the right-click menu in each variable monitoring window or press Ctrl+G keys, and the variable (flag) number shown at the top of the window should change.

| .## G- | Int      | – 🗆 🗙                                 | (  |
|--------|----------|---------------------------------------|----|
| Radix  | DEC V    |                                       |    |
|        |          | nge description]<br>k or enter number |    |
| No.    | Symbol   | Value                                 |    |
| 0200   |          | 200                                   | I. |
| 0201   |          | 201                                   |    |
| 0202   |          | 202                                   |    |
| 0203   |          | 203                                   |    |
| 020    | Move to  | specified variable No. Ctrl+G         | ]  |
| 020(   | Edit Sym | bol                                   |    |
| 0207   |          | 207                                   |    |
| 0208   |          | 208                                   |    |
| 0209   |          | 209                                   |    |

Fig. 11.14 G-Int

The window to input the top variable (flag) number should be displayed. Input the top variable (flag) number and click <u>Move</u>, and cursor should move to the input variable (flag) number.

| Move to specified varia | ble No. 🛛 🗙 |
|-------------------------|-------------|
| Top variable No         | . 2000 ~    |
| Move                    | Cancel      |

Fig. 11.15 Move to specified variable No.

Activate "Displayed only in character strings" in the String Variable window, and the number of characters to be shown in one line should increase to 100 characters, however, the variables in each column number should be hidden.

|  | <i>.11</i> 2 ( | G-Strir      | ng   |      |            |      |      |                |      |      |      | _                |       |      | ×    |      |      |        |        |     |
|--|----------------|--------------|------|------|------------|------|------|----------------|------|------|------|------------------|-------|------|------|------|------|--------|--------|-----|
|  | -              |              | -    |      |            |      |      |                |      |      |      | columr<br>ue dis |       |      | ]    |      |      |        |        |     |
|  | -              | scri<br>oubl | -    |      |            |      |      |                |      |      |      | in sti           | ing   | uni  | ts)] | 1    |      |        |        |     |
|  |                | ispl         | .aye | d or | nly        | in ( | char | act            | er s | stri | ngs  | 1                |       |      |      |      |      |        |        |     |
|  |                | 00           | 01   | 02   | 03         | 04   | 05   | 06             | 07   | 08   | 09   |                  |       |      |      |      |      |        |        |     |
|  | 300            | 31           | 32   | 33   | 34         | 35   | 36   | 37             | 38   | 39   | ЗA   | 12345            | 6789  | :    |      |      |      |        |        |     |
|  | 310            | 3B           | 3C   | ЗD   | 3E         | ЗF   | 40   | 41             | 42   | 43   | 44   | ;<=>?            | (ABCI | D    |      |      |      |        |        |     |
|  | 320            | 45           | 46   | 47   | 48         | 49   | 4A   | 4B             | 4C   | 4D   | 4E   | EFGHI            | JKLM  | N    |      |      |      |        |        |     |
|  | 330            | 4F           | 50   | 51   | 52         | 53   | 54   | 55             | 56   | 57   | 58   | OPQRS            | TUVW  | х    |      |      |      |        |        |     |
|  | 340            | 59           | 5A   | 5B   | 5C         | 5D   | 5E   | 5F             | 60   | 61   | 62   | YZ [\]           | ^_`al | b    |      |      |      |        |        |     |
|  | 350            | 63           | 64   | 65   | 66         | 67   | 68   | 69             | 6A   | 6B   | 6C   | cdefg            | hijk  | 1    |      |      |      |        |        |     |
|  | 360            | 6D           | 6E   | 6F   | 70         | 71   | 72   | 73             | 74   | 75   | 76   | mnopq            | rstu  | v    |      |      |      |        |        |     |
|  | 370            | 77           | 78   | 79   | 7 <b>A</b> | 7B   | 7C   | 7D             | 7E   | 31   | 32   | wxyz{            | }~13  | 2    |      |      |      |        |        |     |
|  | 380            | 33           | 34   | 35   | 36         | 37   | 38   | 39             | ЗA   | 3B   | 3C   | 34567            | 89:;  | <    |      |      |      |        |        |     |
| J G-String                                       |                |              |      |      |            |      |      | $\overline{\}$ | 7    |      |      |                  |       |      |      |      |      | _      |        | ×   |
| [Description of changi                           | .ng a v        | varia        | able | (co  | lumr       | ı un | its) | 1              |      |      |      |                  |       |      |      |      |      |        |        | ~   |
| Numeric value input                              | on va          | riab.        | le v | alue | dis        | spla | У    |                |      |      |      |                  |       |      |      |      |      |        |        |     |
| [Description of changi<br>Double click on the    | -              |              |      |      | sti        | ing  | uni  | ts)]           |      |      |      |                  |       |      |      |      |      |        |        |     |
| Displayed only in ch                             | aract          | er s         | trin | gs   |            |      |      |                |      |      |      |                  |       |      |      |      |      |        |        |     |
| 1  | 1              |              | 1    |      |            | 1    |      |                | I.   |      | 1    |                  | 1     |      |      | 1    |      | 1      |        | 1   |
| 300 123456789:;<=>?@AE                           |                |              |      |      |            |      |      | _              |      |      |      |                  |       |      |      |      |      |        |        |     |
| 400 GHIJKLMNOPQRSTUVWX                           |                | -            |      | -    | -          | -    | -    |                | -    |      |      |                  |       |      |      |      |      |        |        | -   |
| 500 ]^_`abcdefghijklmr<br>600 stuvwxyz{ }~123456 |                |              | -    |      |            |      |      |                |      |      |      |                  |       |      |      | _    |      |        |        | -   |
| 700 ;<=>?@ABCDEFGHIJKI                           |                |              |      |      |            |      |      |                |      |      | -    |                  |       |      |      |      |      |        |        |     |
| 800 QRSTUVWXYZ[\]^_`ak                           |                |              |      |      | -          |      |      |                |      |      |      |                  |       |      |      |      |      |        |        |     |
| 900 ghijklmnopqrstuvwx                           | yz{ }          | ~123         | 4567 | 89:; | <=>?       | @AB  | CDEF | GHIC           | KLM  | NOPQ | RSTU | VWXYZ            | [\]^_ | `abo | def  | ghij | klmn | opqrst | uvwxyz | 2 { |
|  |                |              |      |      |            |      |      |                |      |      |      |                  |       |      |      |      |      |        |        |     |
|  |                |              |      |      |            |      |      |                |      |      |      |                  |       |      |      |      |      |        |        |     |

Fig. 11.16 String Variable Window

### (6) Local Data

Select "Monitor (M)"  $\rightarrow$  "Local Data (B)" in the main menu and the Show Local Data window opens.

The Program No. selected in the Show Local Data window and the local data in the Category of Local Data are displayed.

| 40 Show Local Data  |                                    |                              |              |
|---|------------------------------------|------------------------------|--------------|
| The load to the pers<br>screen increases. The<br>generated in display<br>difference of the pe | here is a possi<br>7 and display : | bility that<br>screen handli | the delay is |
| Program No.<br>Selectable Program   | NO.                                | Selected Pro                 | ogram No.    |
| Prg.1<br>Prg.3<br>Prg.4<br>Prg.6<br>Prg.7<br>Prg.8<br>Prg.9                                   |                                    | Prg.2<br>Prg.5<br>Prg.1      |              |
| Prg.9<br>Prg.10<br>Prg.13<br>Prg.14<br>Prg.15<br>Prg.15<br>Prg.16<br>Prg.17<br>Prg.18         | <<br><<                            |                              |              |
| Category of Local 1   | Data                               | ,                            |              |
| ✓ Local Integer Ve<br>Local Real Varie  |                                    |                              |              |
| V Local String Va   |                                    |                              |              |
| 🗖 Local Flag  |                                    |                              |              |
| Batch selection   | Batch relea                        | Be                           |              |
|   | Show                               | Hide                         | Cancel       |

Fig. 11.17 Show Local Data Window

Select the Program No. to the local data and the Category of Local Data by following the steps below to show the local data.

1) Selection of Program No.

Select a Program No. from the Selectable Program No. and click on it. The background color of the Selectable Program No. turns into blue. Click >. The data will be displayed in the Selectable Program No..

2) Selection of Category of Local Data

Click in the box  $\Box$  for the item to be displayed from the Category of Local Data. A tick mark  $\checkmark$  will be shown in the selected box.

(Click again to remove the tick mark  $\checkmark$  and cancel the selection.)

Click Batch selection to select all the selectable items at once.

(Click Batch release to make all the selected ones cancelled.)

3) Click Show and the local data display window will be shown.

(Click Hide and the display window will be hidden.)

All are shown at once at the first time one on top of another.

| PC Interface Software for X-SEL                                    | <br>                                     |          |         |                  |   |                            |
|--|--|----------|---------|------------------|---|----------------------------|
| a Edit View Program Position Parameter Symbol Monitor Controller T |  | Safety V | el Spec | ified(MANU Mode) | <ul> <li>Two or more program</li> </ul> | ns start permission (HANU) |
|  |  | 1        |         |                  |   |                            |
|  |  |          |         |                  |   |                            |
|  |  |          |         |                  |   |                            |
|  | 44 L-String[11]                          |          |         |                  |   |                            |
|  | 00 01 02 03 04                           | 05 06 07 | 7 08 09 |                  |   |                            |
|  | 000 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 010 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 020 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 040 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 050 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 060 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 070 00 00 00 00 00                       | 00 00 00 | 00 00   |                  |   |                            |
|  | 080 00 00 00 00 00                       | 00 00 00 | 00 00   |                  |   |                            |
|  | 090 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 100 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 110 00 00 00 00 00<br>120 00 00 00 00 00 |          |         |                  |   |                            |
|  | 130 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 140 00 00 00 00 00 00                    |          |         |                  |   |                            |
|  | 150 00 00 00 00 00                       | 00 00 00 | 0 00 00 |                  |   |                            |
|  | 160 00 00 00 00 00                       | 00 00 00 | 00 00   |                  |   |                            |
|  | 170 00 00 00 00 00                       | 00 00 00 | 00 00   |                  |   |                            |
|  | 180 00 00 00 00 00                       |          |         |                  |   |                            |
|  | 190 00 00 00 00 00                       | 00 00 00 | 0 00 00 |                  |   |                            |
|  |  |          |         |                  |   |                            |
|  |  |          |         |                  |   |                            |
|  |  |          |         |                  |   |                            |
|  |  |          |         |                  |   |                            |
|  |  |          |         |                  |   |                            |
|  |  |          |         |                  |   |                            |
|  |  |          |         |                  | Port : COM1                             | Baud Rate : 115200[bps]    |

Fig. 11.18 Local Data Display Window (display at first time)

| 10           | l 🙆    | ∥‱∭ ♣∿♣           | <u>+++</u>  |   |           |            |        | Safety | v Vel S | ecified(NA | NU Mode) | *       | Two     | or more | e progr    | ams sta | art p | ermission | (MANU) |   |
|--|--------|-------------------|-------------|---|-----------|------------|--------|--------|---------|------------|----------|---------|---------|---------|------------|---------|-------|-----------|--------|---|
| Radix         D2C         Image: mark         D2C         D2C         D2C  |        | /// L-Int[2]      |             |   |           | <i>a</i> . | nt[5]  |        |         |            |          |         |         | 201     | 111        |         |       |           |        |   |
| No.         Symbol         Value         No.         Symbol  |        |                   |             |   |           |            | _      | -      |         |            |          |         |         | Redix   |            |         |       |           |        |   |
|  |        |                   | Value 🔼     |   |           |            | _      |        | 11-1    |            |          |         |         |         | Grande a 1 | 1 1/2   | 1110  |           |        |   |
| 0002         0         0002         0         0002         0         0         0002         0         0         0002         0         0         0002         0         0         0002         0         0         0002         0         0         0002         0         0         0002         0         0         0002         0         0         0002         0         0         0002         0         0         0002         0         0         0002         0<  |        |                   |             |   |           |            | 5 ymbo |        | varue   | - Î        |          |         |         | _       | o ynao o r |         | arue  | 1         |        |   |
| 0000         0000 <th< td=""><td></td><td>0002</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>0</td><td></td><td></td></th<> |        | 0002              | 0           |   |           |            |        |        |         | 0          |          |         |         |         |            |         |       | 0         |        |   |
| 0005         0         0004         0         0         0005         0         0         0005         0         0         0005         0         0         0005         0         0         0005         0         0         0005         0         0         0005         0         0         0005         0         0         0005         0         0         0         0005         0  |        |                   | 0           |   |           | 0003       |        |        |         | 0          |          |         |         | 0003    |            |         |       | 0         |        |   |
| 0000         0003         0003         0003         0003         0003         0003         0003         0003         0003         0003         0003         0003         0003         0003         0003         0003         0003  |        |                   | -           |   |           | 0004       |        |        |         | 0          |          |         |         | 0004    |            |         |       | 0         |        |   |
| Internet         Interne         Internet         Internet   |        |                   |             |   |           | 0005       |        |        |         | 0          |          |         |         | _       |            |         |       | 0         |        |   |
| Construint         Original  |        |                   |             |   |           |            |        |        |         |            |          |         |         | _       |            | _       |       | -         |        |   |
| Correction         Original  |        |                   |             |   |           |            |        |        |         |            |          |         |         |         |            | -       |       |           |        |   |
| OD10         OD10 <th< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>-</td><td></td><td>-</td><td></td><td></td></th<>     |        |                   |             |   |           |            |        | _      |         |            |          |         |         |         |            | -       |       | -         |        |   |
| Lstring(2)         I   |        |                   |             |   |           |            |        |        |         |            |          |         |         | _       |            | -       |       |           |        |   |
| 00         01         02         03         04         05         04         05         04         05         04         05<   |        |                   |             |   |           | 0010       |        |        |         | 0          |          |         |         | 0010    | _          | _       | _     | •         |        |   |
| 00         01         02         03         04         05         06         07         06         01         02         04         05         06         07         06<   | L-Stri | ing[2]            |             |   | ML-String |            |        |        |         | _          |          | ZZ L-SI | ring[11 |         |            |         |       |           |        |   |
| 12         02         00<   | 00     | 0 01 02 03 04 05  | 06 07 08 09 | ^ | 00 0      | 01 02 0    | 3 04 1 | 05 06  | 07 08   | 09         | <u>^</u> |         | 00 01   | 02 03   | 04 05      | 06 07   | 08    |           |        | ^ |
| 0          | 00 00  | 00 00 00 00 00    | 00 00 00 00 |   | 000 00 0  | 10 00 C    | 0 00 0 | 00 00  | 00 00   | 00         |          | 000     | 00 00   | 00 00   | 00 00      | 00 00   | 00    | 00        | 6      | 8 |
| 3         0  | _      |                   |             | _ | 010 00 0  | 00 00 0    | 00 00  | 00 00  | 00 00   | 00         |          | 010     | 00 00   | 00 00   | 00 00      | 00 00   | 00 0  | 00        |        |   |
| 10         00<   | _      |                   |             |   |           | 00 00 0    | 00 00  | 00 00  | 00 00   | 00         |          | 020     | 00 00   | 00 00   | 00 00      | 00 00   | 00    | 00        |        |   |
| S0         00<   | _      |                   |             |   |           |            |        |        |         |            | _ 1      |         |         |         |            |         |       |           |        |   |
| 0         00 </td <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>  | _      |                   |             |   |           |            |        |        |         |            | _        |         |         |         |            |         |       |           |        |   |
| 10         00<   | _      |                   |             |   |           |            |        |        |         |            | _        |         |         |         |            |         |       |           |        |   |
| a0       00 <td< td=""><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>  | _      |                   |             |   |           |            |        |        |         |            | _        |         |         |         |            |         |       |           |        |   |
| a0       00 <td< td=""><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>  | _      |                   |             |   |           |            |        |        |         |            | _        |         |         |         |            |         |       |           |        |   |
| 30       00 <td< td=""><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>  | -      |                   |             |   |           |            |        |        |         |            |          |         | _       |         |            |         |       |           |        |   |
| 10       00 <td< td=""><td>00 00</td><td>00 00 00 00 00</td><td>00 00 00 00</td><td></td><td></td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>   | 00 00  | 00 00 00 00 00    | 00 00 00 00 |   |           |            | _      |        |         |            |          |         |         |         |            |         |       |           |        |   |
| 20 00 00 00 00 00 00 00 00 00 00 00 00 0   | 10 00  | 00 00 00 00 00    | 00 00 00 00 |   |           |            |        |        |         |            |          |         |         |         |            |         |       |           |        |   |
|  | 20 00  | 00 00 00 00 00    | 00 00 00 00 |   |           |            |        |        |         |            |          |         |         |         |            |         |       |           |        |   |
| 30 00 00 00 00 00 00 00 00 00 00 00 00 0   | 30 00  | 00 00 00 00 00 00 | 00 00 00 00 |   | 130 00 0  | 00 00 0    | 0 00 0 | 00 00  | 00 00   | 00         |          |         |         |         |            |         |       |           |        |   |

Drag one by one from the top to bottom and show all in the window.

Fig. 11.19 Local Data Display Window

11. Monitor

Numbers in the brackets [] show the program numbers.

## (7) Detailed error information

Select "Monitor (M)"  $\rightarrow$  "Detailed Error Information (E)" in the main menu and the Error Number Select window opens.

Clicking OK after setting the Error Number Select will display the Detailed Error Information window.

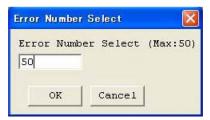


Fig. 11.20 Error Number Select Window

| 1     | 💋 🌌         |                     |           |            |          |          |          |          |           |         |         |         |         |
|-------|-------------|---------------------|-----------|------------|----------|----------|----------|----------|-----------|---------|---------|---------|---------|
| yster | Error Error | per Axis Program er | ror Drive | r Alarm Li | st Error | List     |          |          |           |         |         |         |         |
| Er    | r Message   | Date                | Prg. No.  | Step No.   | Axis No. | Unit No. | Drv. No. | Pos. No. | Dtl. code | Info. 1 | Info. 2 | Info. 3 | Info. 4 |
| 1 64  | 2 Option un | 2021/04/08 08:41:20 | 0         | 0          | 0        | 0        |          | 0        | 5CCh      | 0h      | 2h      | Oh      |         |
| 2 10  | l Controlle | 2021/04/08 08:41:19 | 0         | 0          | 0        | 0        | 0        | 0        | 824h      | DCh     | 0h      | 0h      | 0       |
| 3 10  | 2 Controlle | 2021/04/06 18:39:10 | 0         | 0          | 0        | 0        | 0        | 0        | 825h      | DCh     | Oh      | Oh      | 0       |
| 4 10  | 2 Controlle | 2021/04/06 18:33:15 | 0         | 0          | 0        | 0        | 0        | 0        | 825h      | DCh     | 0h      | 0h      | (       |
| 5 10  | 2 Controlle | 2021/04/06 18:31:35 | 0         | 0          | 0        | 0        | 0        | 0        | 825h      | DCh     | 0h      | 0h      | (       |
| 6 10  | 2 Controlle | 2021/04/06 18:17:14 | 0         | 0          | 0        | 0        | 0        | 0        | 825h      | DCh     | 0h      | 0h      | (       |
| 7 10  | l Controlle | 2021/04/06 18:09:12 | 0         | 0          | 0        | 0        | 0        | 0        | 824h      | DCh     | 0h      | 0h      | (       |
| 8 10  | 2 Controlle | 2021/04/06 18:06:50 | 0         | 0          | 0        | 0        | 0        | 0        | 825h      | DCh     | 0h      | 0h      | (       |
| 9 10  | 2 Controlle | 2021/04/06 18:01:40 | 0         | 0          | 0        | 0        | 0        | 0        | 825h      | DCh     | 0h      | 0h      | (       |
| 10 64 | 2 Option un | 2021/04/06 18:00:15 | 0         | 0          | 0        | 0        | 0        | 0        | 5CCh      | 0h      | 8h      | 2h      | (       |

| Fig. 11.21 Detailed Error Information | Fig. | 11.21 | Detailed | Error | Information |
|---------------------------------------|------|-------|----------|-------|-------------|
|---------------------------------------|------|-------|----------|-------|-------------|

(Note) If date & time data is lost, the following error occurs. In this case, the date & time data becomes 2000/01/01 00:00:00.

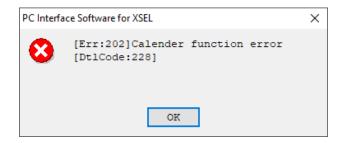


Fig. 11.22 Error Display

- (Note) Refer to [12.6 Setting Time] for how to set the internal clock of the controller.
- (Note) When bits 0 to 3 of Other parameter No. 47, "Other setting bit pattern 2" are set to 2
  (Do not use the calendar function (use the elapsed time after the reset)), the error occurrence time display becomes "After Reset (elapsed time after the reset)".
  (The factory default for bits 0 to 3 of Other parameter No. 47, "Other setting bit pattern 2" is 1 (Use the calendar function).)
- \* When trouble occurs, you may be requested to send the error list saved in a file to resolve the problem at an early stage. The error list file cannot be opened by this PC software.

#### (8) Maintenance information screen

The total movement count of actuator, and total mileage, are displayed. Also, the pairing I.D. of the battery-less absolute encoder can be cleared in this window. Refer to [How to Clear Paring ID] in this section.

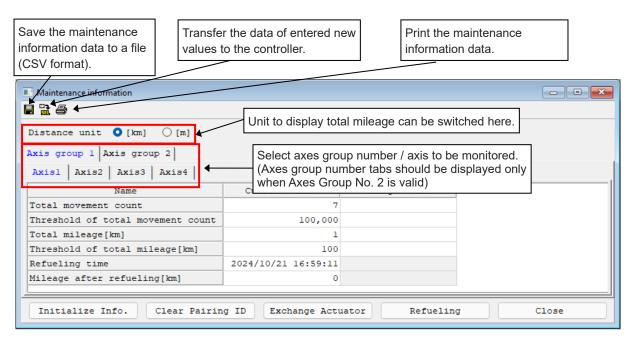


Fig. 11.23 Maintenance Information

There is no change to the tool button specifications.

[Monitored Items when XSEL2-T/TX Connected]

| Total movement count:              | It shows the sum of the number of actuator movement     |
|------------------------------------|---|
|                                    | count.  |
| Threshold of total movement count: | It shows the setting value of the total movement count. |
| Total mileage:                     | It shows the sum of the actuator mileage.               |
| Threshold of total mileage:        | It shows the setting value of the threshold of total    |
|                                    | mileage.  |
| Refueling time:                    | In this, displays the date and time when grease was     |
|                                    | supplied.   |
| Mileage after refueling:           | The sum-up of the mileage of an actuator after grease   |
|                                    | was supplied should be displayed.                       |

"Refueling time" and "Mileage after refueling" should be displayed only when an actuator supports the actuator identifying function.

[Caution in Distance unit]

When the distance unit is in [km], the display of the total mileage should be rounded down.

(Example: When the actual total mileage is 3,600m, The display in the widow should show 3km) Also, when the distance unit is in [km], the threshold of total mileage in the maintenance information window should be in km unit.)

(Example: When the threshold of total mileage before change is 3,500m, and if the threshold of total mileage in the maintenance information window (distance unit: [km]) is set to 3km, the threshold of total mileage after change should become 3,000m)

[Functions of Buttons Displayed when XSEL2-T/TX Connected]

| Information Initialization: | The maintenance information data should be initialized.<br>(Displayed only when there is an error in maintenance information<br>data)   |
|-----------------------------|---|
| Pairing ID Clear:           | The pairing ID to the battery-less absolute encoder should be cleared.<br>(Valid only when password 5119 is valid and battery-less absolute<br>encoder is mounted)            |
| Actuator Replacement:       | The Total movement count and total mileage should be reset.<br>(Valid only when password 5119 is valid)   |
| Refueling:                  | The mileage after refueling should be reset and the refueling time<br>should be updated.<br>(Valid only when "Mileage after refueling" and "Refueling time" are<br>displayed) |

By setting the values for the total movement count and Tatal mileage, you can notify an external device, by means of a message level error or output signal that each setting value has been exceeded. (Alert function)

[How to establish setting values in alert function]

Method 1: Change Each Axis Parameter No. 221 "Threshold of total movement count", Each Axis Parameter No.222 "Threshold of total mileage" in the parameter edit window.

- Method 2: Perform one of the following operations in the desired "New value" cell and enter a new setting value:
  - Double-click the cell.
  - Press the Ctrl + Space keys.
  - Press a number key.

When the new setting value has been entered, click **to** transfer the new setting value to the controller.

When the transfer to the controller is complete, the confirmation message, "Write Flash ROM?" appears.

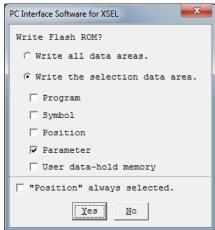


Fig. 11.24 Confirmation

Click to select the items (parameters, etc.) you want to write to the flash ROM.

Yes Write the memory data to the flash ROM.

No Do not write the memory data to the flash ROM.

When a reset is performed (by turning off the power and then turning it back on, or resetting the software), the memory data will be destroyed and data will be loaded from the flash ROM. (The controller will use the transferred memory data until the reset takes effect.)

- (Note) If a reset is performed (by turning off the power and then turning it back on, or resetting the software) without writing the parameters to the flash ROM first, the threshold under the alert function will not be changed and the value set before the change will be restored.
- (Note) The number of writing to the flash ROM is limited. (can write approx. 100,000 times) If you don't want to write all the data to the flash ROM, select "Write selected data region".

When the flash ROM has been written, the confirmation message, "Restart the controller?" appears.



Fig. 11.25 Confirmation



Restart the controller (reset the software).

Do not restart the controller (reset the software).

[How to Clear Pairing ID]

1) Right-click a blank space in the tool bar while pressing <u>Ctrl</u>. The Input Password will be displayed.

| 🖉 PC Interface Software for X-SEL   |  |
|---|--|
| <u>File E</u> dit <u>V</u> iew Program P <u>o</u> sition <u>P</u> arameter Symbol <u>M</u> onitor | <u>C</u> ontroller <u>T</u> ool <u>W</u> indow <u>H</u> elp                              |
|   | $\langle - \rangle$  |
| Safety Vel Specified(MANU Mode) 🗾 Two or 1  | more programs start permission (MANU)  |
| Input Password  | Fig. 11.26 Menu Bar<br>Right-click a blank space in the<br>tool bar while pressing Ctrl. |

Fig. 11.27 Input Password Window

(2) Enter a password (5119) in the displayed Input Password screen. "Clear Pairing ID" will show up in the bottom of Maintenance Information screen.

Click Clear Pairing ID, and the pairing ID for the battery-less absolute encoder will be cleared.

| Maintenance information   |                     |              |  |  |  |  |  |  |  |  |
|---|---------------------|--------------|--|--|--|--|--|--|--|--|
|   |                     |              |  |  |  |  |  |  |  |  |
| Distance unit 🔮 [km] 🔿 [m]  |                     |              |  |  |  |  |  |  |  |  |
| Axis group 1 Axis group 2   |                     |              |  |  |  |  |  |  |  |  |
| Axisl Axis2 Axis3 Axis4   |                     |              |  |  |  |  |  |  |  |  |
| Name  | Current Value       | Change Value |  |  |  |  |  |  |  |  |
| Total movement count  | 7                   |              |  |  |  |  |  |  |  |  |
| Threshold of total movement count                                   | 100,000             |              |  |  |  |  |  |  |  |  |
| Total mileage[km]   | 1                   |              |  |  |  |  |  |  |  |  |
| Threshold of total mileage[km]                                      | 100                 |              |  |  |  |  |  |  |  |  |
| Refueling time  | 2024/10/21 16:59:11 |              |  |  |  |  |  |  |  |  |
| Mileage after refueling[km]   | 0                   |              |  |  |  |  |  |  |  |  |
|   |                     |              |  |  |  |  |  |  |  |  |
| Initialize Info. Clear Pairing ID Exchange Actuator Refueling Close |                     |              |  |  |  |  |  |  |  |  |

Fig. 11.28 Maintenance Information

Or, "Clear Pairing ID" will show up to the menu in "Controller" in Menu.

Select "Pairing ID Clear" and the pairing ID clear window for the battery-less absolute encoder should appear.

#### (9) Monitoring data

The servo monitoring window in XSEL2-T/TX applies the system to indicate the monitoring target axes and data types in the channel (CH).

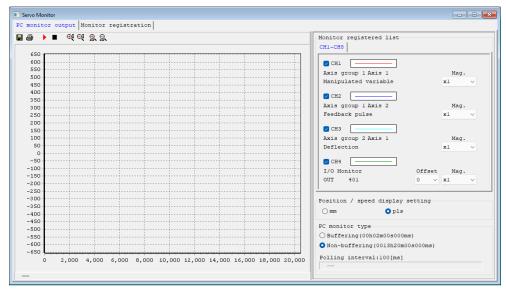


Fig. 11.29 Servo Monitoring Window (when XSEL2-T/TX connected)

<Procedure for Monitoring>

- 1) Select "Monitor Registration" tab in the servo monitoring window.
- 2) Set the monitoring items for each channel.

Select [CH1-CH16] tab when establishing setting for CH1 to CH16. Select [CH17-CH32] tab when establishing setting for CH17 to CH32.

| C moni  | tor output Monit  | or registration    |           |        |                         |      |             |           |              |      |
|---------|-------------------|--------------------|-----------|--------|-------------------------|------|-------------|-----------|--------------|------|
| Buffe   | ring monitor Samp | ling cycle setting | l ms (Ing | ut rai | nge: 1 to 10) Continuou | IS I | monitorable | e time 00 | h00m00s000ms |      |
| CH1-CH1 | L6 CH17-CH32      |                    |           |        |                         |      |             |           |              |      |
| Enb     | Monitor type      | Axis group No.     | Taro      | et ax: | ls Data type            |      | I/O type    | Top No.   | No. of ports | Sign |
|         | Axis monitor ~    | Axis group 1       |           | isl v  | Manipulated variable    | ~    | IN V        | 0         | 1 ~          |      |
| CH2     | Axis monitor v    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN ~        | 0         | 1 ~          |      |
|         | Axis monitor v    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN ~        | 0         | 1 ~          |      |
| CH4     | Axis monitor ~    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN V        | 0         | 1 ~          |      |
| CH5     | Axis monitor V    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    |      | IN V        | 0         | 1 ~          |      |
| СН6     | Axis monitor ~    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN V        | 0         | 1 ~          |      |
| CH7     | Axis monitor ~    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN ~        | 0         | 1 ~          |      |
| СН8 🗌   | Axis monitor ~    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN ~        | 0         | 1 ~          |      |
| сн9 🗌   | Axis monitor ~    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN ~        | 0         | 1 ~          |      |
| СН10 🗌  | Axis monitor ~    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN ~        | 0         | 1 ~          |      |
| СН11 🗌  | Axis monitor v    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN ~        | 0         | 1 ~          |      |
| CH12    | Axis monitor v    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN ~        | 0         | 1 ~          |      |
| CH13 🗌  | Axis monitor v    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN $\sim$   | 0         | 1 ~          |      |
| CH14 🗌  | Axis monitor v    | Axis group 1       | ~ Ax      | isl ~  | Manipulated variable    | ~    | IN $\sim$   | 0         | 1 ~          |      |
| CH15 🗌  | Axis monitor v    | Axis group 1       | ~ Ax      | isl v  | Manipulated variable    | ~    | IN ~        | 0         | 1 ~          |      |
| CH16    | Axis monitor ~    | Axis group 1       | × Ax      | isl v  | Manipulated variable    | ~    | IN V        | 0         | 1 ~          |      |

Fig. 11.30 Monitor Registration Window

[Validity]

Put a check mark on the channels to monitor.

[Monitoring Type]

Select "Axis Monitor" when the axis data is to be monitored. Select "I/O Monitor" when the I/O data is to be monitored. Select "Power Monitor" when the power supply data is to be monitored. (Only when XSEL2-T/TX Connected)

[Axis Group Number]

Select axis group numbers of axes to monitor.

- \* Valid only when "Axis Monitor" selected in "Monitoring Type"
- \* Not displayed when Axis Group No. 2 is invalid

[Target Axis]

Select an axis number of an axis to be monitored.

\* Valid only when "Axis Monitor" selected in "Monitoring Type"

[Data Type]

Select axis data to be monitored.

\* Valid only when "Axis Monitor" and "Power supply monitor" selected in "Monitoring Type"

In XSEL2-T/TX, the following axis data can be monitored when "Axis Monitor" is selected in "Monitoring Type".

| Data Type            | Data Contents  | Servo Monitoring Window<br>Output Unit<br>(When Output Magnification × 1) |  |  |  |  |
|----------------------|--|---|--|--|--|--|
| Manipulated Variable | Original command pulse count or<br>original command distance per<br>sampling time  | PLS/ST or mm/ST   |  |  |  |  |
| Feedback Pulse       | Feedback pulse count per sampling time   | PLS/ST or mm/ST   |  |  |  |  |
| Position Deviation   | Position Deviation   | PLS or mm   |  |  |  |  |
| Current Command      | Motor current command value  | Rated ratio (100% = 4,096) <sup>(*)</sup>                                 |  |  |  |  |
| Feedback Current     | Motor feedback current<br>[Note]<br>Monitoring is not available on an axis<br>connected to the driver unit RCON-<br>PC/PCF. (Monitoring value should<br>always be 0) | Rated ratio (100% = 4,096) <sup>(*)</sup>                                 |  |  |  |  |
| Current Position     | Current position for each axis   | PLS or mm   |  |  |  |  |
| Command Position     | Command position for each axis   | PLS or mm   |  |  |  |  |

## Table: List of Axis Monitoring Data Type

\* Displayed with rated ratio 100% = 4,096 as standard.

Rated Ratio [%] = Displayed Value /  $4,096 \times 100$ 

The following data can be monitored when "Power Supply Monitor" is selected in "Monitoring Type".

(Only when XSEL2-T/TX Connected)

## Table: List of Power supply Monitoring Data Type

| Data Type                                       | Data Contents                                   | Servo Monitoring Window<br>Output Unit<br>(When Output Magnification × 1) |  |  |  |  |
|---|---|---|--|--|--|--|
| DC Bus Voltage                                  | DC Bus Voltage in Power Supply<br>Board         | V   |  |  |  |  |
| Regenerative Resistor<br>Peripheral Temperature | Regenerative Resistor Peripheral<br>Temperature | C   |  |  |  |  |
| Regenerative Resistor<br>Power                  | Load Ratio of Regenerative<br>Resistor          | %   |  |  |  |  |

## [I/O Type]

Select the I/O data type to be monitored.

IN: Input Port

OUT: Output Port

IN/OUT: Virtual Input and Output Port

FLG: Global Flag (Local flag not available to monitor)

\* Valid only when "I/O Monitor" selected in "Monitoring Type"

[Top No.]

Enter the leading number of the port/flag for the I/O data to monitor.

\* Valid only when "I/O Monitor" selected in "Monitoring Type"

[No. of I/O points]

Select the number of I/O points to monitor at the same time (1, 8, 16, or 32). The selected number of points will be monitored as a single unit of data (the leading number will be the lowest bit).

\* Valid only when "I/O Monitor" selected in "Monitoring Type"

[Sign]

Select this to handle monitored data as signed.

- \* Valid only when "I/O Monitor" selected in "Monitoring Type" and a value other than "1" selected in "No. of I/O points"
- 3) Establish the setting for the sampling period (1 to 10ms) when it is required to have the buffering monitor.

Buffering monitor Sampling cycle setting 1 ms (Input range: 1 to 10) Continuous monitorable time 00h01m36s000ms

The continuous monitoring time may vary depending on the setting for the sampling period and number of channels to be monitored at the same time. (More the number of simultaneously monitored channels are, the shorter the monitoring time gets.)

- 4) Select "PC Monitoring Type" in the servo monitoring window.
- 5) The channels registered in 2) should be displayed in "Monitor registered list". Establish the setting for the graph output here.

\* Eight channels should be shown in "Monitor registered list". Select a channel to be set in "CH1-CH8", "CH9-CH16", "CH17-CH24" or "CH25-CH32" tab.

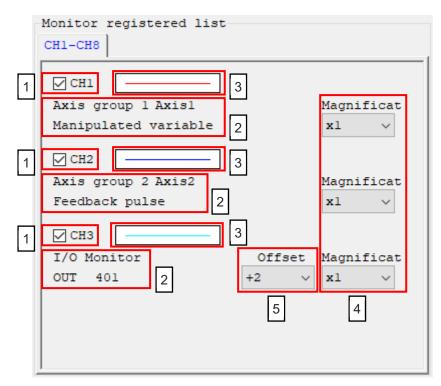


Fig. 11.31 Monitor registered list

1 is provided to put a check mark on the channels to be plotted in the graph.

2 displays the monitoring types and axis numbers registered in "Monitor Registration".

3 shows a type of line plotted in the graph.

4 is provided to set up the output magnification when the graph is plotted.

5 is to be set the offset when the I/O data is displayed.

6) **b** is to be clicked to start monitoring.

<Other Operations>

[Tool Buttons]

🖩 🚑 🕨 🔳 - 핵 핵 🔍 🔍

The function of each button is the same as those for the servo monitor in the XSEL PC software.

[Position / speed display setting]

| Position / | speed | display | setting |  |
|------------|-------|---------|---------|--|
| ⊖ mm       |       | • pls   |         |  |

Select the unit for display of position / speed data (mm system or PLS system).

#### [PC Monitoring Setting]



Buffering:Using data that buffers on the controller side, a graph should be shown.Non-buffering:Reading out the Data at each point of every interval set in "Polling<br/>Interval", a graph should be shown.

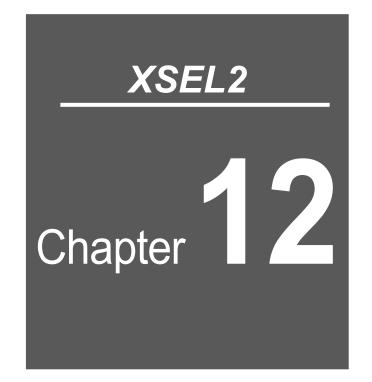
 \* There is no "Synthesis Rate" or "Movement Average Period" setting in the servo monitoring window for XSEL2-T/TX

#### (10) Servo Added Data Monitor

All the servo added data that the controller supports can be monitored in one window at once.

| - Zervo addition Datamonitor          |       |       |       |       |       |       |
|---------------------------------------|-------|-------|-------|-------|-------|-------|
| Axis group 1 Axis group 2             |       |       |       |       |       |       |
| Monitor Type                          | Axisl | Axis2 | Axis3 | Axis4 | Axis5 | Axis6 |
| Overload level[%]                     | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Motor command current[%(Rated ratio)] | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| Motor command current[*(kated fatio)] | 0.01  | 0.01  | 0.01  | 0.01  | 0.01  | 0.0   |

Fig. 11.32 Servo addition Data monitor



# Supplemental on Operation Menu

| 12.1 | Software Reset ······12-1   |                                 |       |  |  |  |  |
|------|---|---------------------------------|-------|--|--|--|--|
| 12.2 | Reset Error ·····   |                                 |       |  |  |  |  |
| 12.3 | Axis Setting  |                                 |       |  |  |  |  |
| 12.4 | SEL P   | rogramming Support Tool······   | 12-9  |  |  |  |  |
| 12.5 | Request Drive Power Recovery and<br>Request Release Pause ······12-10 |                                 |       |  |  |  |  |
| 12.6 | Setting   | g Time ······                   | 12-11 |  |  |  |  |
| 12.7 | SEL G   | lobal Data Backup······         | 12-12 |  |  |  |  |
| 12.8 | Excel File Save and Readout ······ 12-14                              |                                 |       |  |  |  |  |
|      | 12.8.1  | Excel File Save                 | 12-14 |  |  |  |  |
|      | 12.8.2  | Excel File Readout ·····        | 12-16 |  |  |  |  |
|      | 12.8.3  | Excel File Create and Edit····· | 12-17 |  |  |  |  |
|      | 12.8.4  | Caution ·····                   | 12-18 |  |  |  |  |

# 12.1 Software Reset

Selecting this menu item will restart the controller.

Caution is required because data that is not yet written to the flash ROM will be lost after this operation.

Click "Controller (C)"  $\rightarrow$  "Software Reset (R)" from the menu.

# 12.2 Reset Error

Selecting this menu item will reset message level errors and operation-cancellation level errors. Even after selecting Reset Error, those errors whose cause has not been removed will occur again. Click "Controller (C)"  $\rightarrow$  "Reset Error (E)" from the menu.

# 12.3 Axis Setting

Select "Controller (C)"  $\rightarrow$  "Axis Setting (G)" from the menu.

[1] Simple Setting

The logical axes should be assigned in the order of the actually mounted physical axes in the driver unit.

If there is no need of change, press Yes.

If it is required to assign the logical axes individually, press No.

| XSEL2 Axes Setting                          |                                 |   |                              |                             |                             |                                   | - 🗆             |
|---|---------------------------------|---|------------------------------|-----------------------------|-----------------------------|-----------------------------------|-----------------|
|   |                                 | Unit1 Dro<br>No Traag<br>Unknown<br>Unit1 Dro<br>No Traag | e No Ingac<br>Unknown        | je <b>Z</b> R(Z)-1          | No Traa<br>Unknow           | n<br>Drv2<br>ge                   |                 |
| The axis ass                                | gnment has not                  |   | . If you are satis           |                             |                             |                                   | • "Yes" button. |
|   | gnment has not                  |   | . If you are satis           |                             |                             |                                   | Yes" button.    |
| The axis assi<br>Axis Setting Sta<br>Axis 1 | gnment has not                  |   | . If you are satis<br>Axis 4 |                             |                             | status, click the                 |                 |
| xis Setting Sta                             | gnment has not                  | been completed  |                              | fied with the cur           | rent axis setting           | status, click the                 | Yes             |
| Axis Setting Sta<br>Axis 1                  | gnment has not<br>lus<br>Axis 2 | been completed  | Axis 4                       | fied with the cur<br>Axis 5 | rent axis setting<br>Axis 6 | status, click the<br>No<br>Axis 7 | Yes             |

Fig. 12.1 Startup Window

## When "Yes" Pressed The following message should appear. Press Yes if okay.

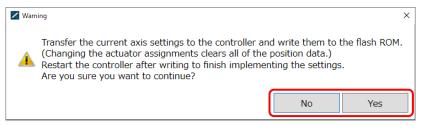


Fig. 12.2 Confirmation Window for Writing to Controller



## Caution

• When the writing to the flash ROM is conducted, initialization of the position data should be conducted at the same time.

When "No" Pressed

The screen switches to the window shown in Fig. 12.3.

Drag the actuator figure (hereinafter described as axis figure) located in the physical axis area on the top of the window, drop it in the logical axis area, and the assignment of the axes can be performed.

In order to cancel the axis figure assigned in the logical axis area;

- Drag the axis figure and drop it in the physical axis area
- Select the axis figure and right-click  $\rightarrow$  "Clear selected changes" or press Delete key

In case of cancel all at once;

- In the logical axis area, right-click → "Clear all changes"
- In the logical axis are, press Ctrl + A to select all and then press Delete key to canceled.

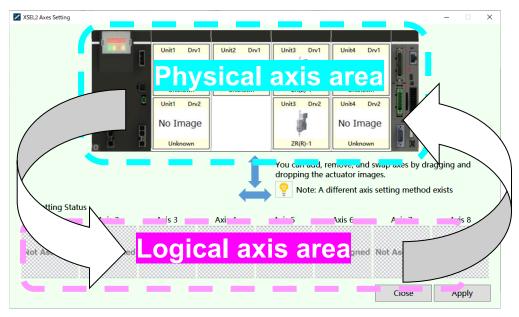


Fig. 12.3 Axis Setting Rearrangement Window

Once the assignment is finished, press Confirm and the window shown in Fig. 12.2 should show up.

Press Close and the setting should be finished.

## [2] Explanation of Areas

## O Physical Axis Area

In the physical area, there should be already installed axis figures displayed.

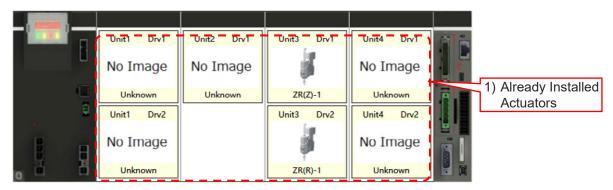


Fig. 12.4 Physical Area Image

1) Already Installed Axis Figures

In the Axis figure of the already installed, there should be following information displayed.

| A | Unit1 Drv1    | В |
|---|---------------|---|
| С |               | E |
|   | RCS4-SA7C-200 |   |

Fig. 12.5 Already Installed Axis Figures

| А | Driver Unit Number (Unit 1 to Unit 4)  |
|---|--|
| В | Physical Axis Number in Driver Unit (Drv 1 to Drv 2)   |
| С | Actuator Figure<br>(A picture showing "No Image" should be shown when<br>there is no figure)   |
| D | Actuator Name<br>(Unknown should be shown when no name acquired)   |
| E | Axis Number Assigned to Axis Setting Status (Axis 1 to<br>Axis 8)<br>(It should be displayed with translucent letter only when<br>assignment is allocated) |

## Logical Axis Area

In the logical axis area, the axis figures that was assigned should be displayed.

There should always be eight axis slots (Axis 1 to Axis 8), and in the slot with no axis assigned should show "Not Assigned".

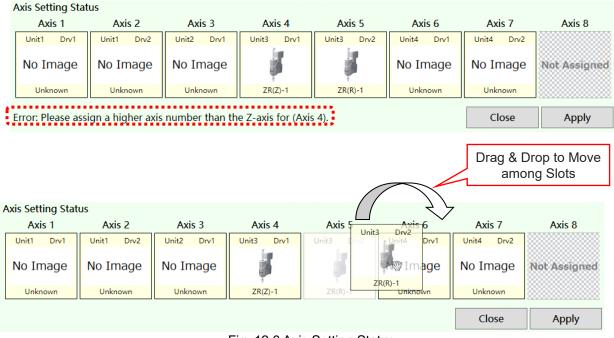


Fig. 12.6 Axis Setting Status

In the logical axis area, it is available to move the axis figures.

However, because there is a limit in the order of logical axes for the special functional axes, there may be a limit in the move of the axes. Pay special attention.

## (Example)

The message shown in the frame with red dotted lines in Fig. 12.6 is an error message when it happened to assign the axis figure of Axis 5 to Axis 3.

## • Special Mechanism Axes

The special mechanism axis is a general term of axes that special mechanism are allocated as the function of the actuator.

There are three types as shown below for the special mechanism axes.

## 1) SCARA Robot



Fig. 12.7 SCARA Robot

In case of connecting the SCARA robot, there should be some limitations as shown below:

- The logical axis numbers should be fixed
- It is not available to assign axes and cancel the axes assignment (move between physical axis area and logical axis area).
- The actuator names should be J1, J2, Z and R.
  - For the 3-axis SCARA, the actuator name for the 4th axis should be "---".
- The actuator figure should be the figure of the SCARA robot.

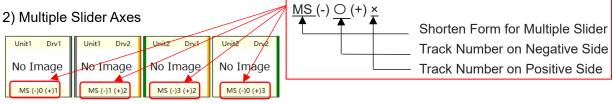


Fig. 12.8 Multiple Slider Axes

For the multiple slider axes, the setting can be established over axis groups like normal axes.

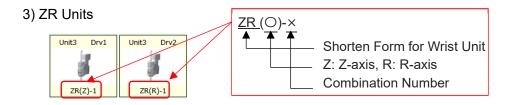


Fig. 12.9 ZR Units

Regarding the ZR units, drag & drop in physical axis area  $\Leftrightarrow$  logical axis area of an axis, and the paired axis should also come together. Also, in the logical axis area, it is necessary to have the Z-axis assigned to a logical axis number lower than that for the R-axis.

## • Axes Group Setting

| XSEL2 Axes Setting |            |  |            |  |  |                 | >                  | XSEL2 Axes Setting  |            |              |  |  |             |                            | - 🗆 X        |
|--------------------|------------|--|------------|--|--|-----------------|--------------------|---------------------|------------|--------------|--|--|-------------|----------------------------|--------------|
|                    | - <b></b>  | Unit Dv1<br>No Frage<br>Unit Dv2<br>No Frage<br>Unitsown | No Traage  | ZR(Z)-1<br>Unit3 D<br>ZR(R)-1<br>You can add | Voltenow<br>V2<br>Units D<br>No Final<br>Units D<br>Units D<br>Units D | pe              | ind dropping the   |                     |            |              | Unit1 Drv1<br>No Image<br>Unit1 Drv2<br>No Image<br>Unit2000 | Uniz Drv1<br>No Image<br>Uniz Drv2<br>No Image<br>Unixnown<br>You can add, I | remove, and | I swap axes by dra         | igging and   |
|                    |            |  |            | actuator ima<br>Changing the<br>data.        |  | inment clears a | II of the position |                     |            |              | - <u>+</u>   | Note: A  |             | ages.<br>is setting method | exists       |
| Axis Setting Stat  |            |  |            |  |  |                 |                    | Axis Setting Status |            |              |  |  |             |                            |              |
| Axis 1             | Axis 2     | Axis 3   | Axis 4     | Axis 5                                       | Axis 6   | Axis 7          | Axis 8             | Axis 1              | Axis 2     | Axis 3       | Axis 4   | Axis 5   | Axis 6      | Axis 7                     | Axis 8       |
| Unit1 Drv1         | Unit1 Drv2 | Unit2 Drv1   | Unit3 Drv1 | Unit3 Drv2                                   | Unit4 Drv1   | Unit4 Drv2      |                    |                     |            |              |  |  |             |                            |              |
| No Image           | No Image   | No Image   | 1          | <b>#</b>                                     | No Image   | No Image        | Not Assigned       | Not Assigned Ni     | t Assigned | Not Assigned | Not Assigned N   | ot Assigned No   | ot Assigned | Not Assigned               | Not Assigned |
| Unknown            | Unknown    | Unknown  | ZR(Z)-1    | ZR(R)-1                                      | Unknown  | Unknown         |                    |                     |            |              |  |  |             |                            |              |
|                    |            |  |            | A  | is group setting   | Close           | Apply              |                     |            |              |  |  |             | Close                      | Apply        |

Fig. 12.10 Axes Group Setting

In the axes group setting, multiple axes should be managed in the unit of "Axes Group", and individual position data can be allocated to each group. With this feature, it is available to move the axes with the same position data when there are two axes with the same structure. Also, the position data for combination axes and added axes can be held separately, thus it gets easier to manage them. If there are two groups with a combination of three axes, it used to input using Axis 1 to Axis 6 for the position data. Grouping enables to have two position data for three axes. In the SEL program, declare the group to be used and indicate the position data to be used. Click <u>Axis group setting</u> in Fig. 12.10 above and two groups should appear in the logical axis area as shown in Fig. 12.11, and it becomes available to assign the axis figure to each.

\* The same axes group show the same background color in the axis figure in the physical axis area.

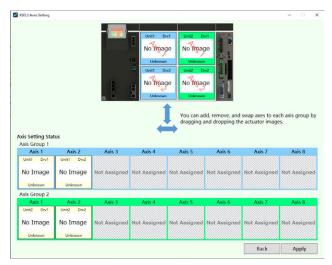


Fig. 12.11 Condition of 3 Axes Assigned in Axes Group 1 and 2

# 12.4 SEL Programming Support Tool

The SEL program support tool is a teaching application for the program controller.

The SEL program support tool is available for the following operations.

- 1. Jog / Inching Operation
- 2. To Create / Edit Position Data and Coordinate System Definition Data
- 3. To Create / Trial Run Programs in Flow Chart Format
- 4. To read in DXF Data and Convert into Position Data / Program

Refer to [SEL Programming Support Tool Instruction Manual (ME0396)] provided separately for detail.

## 12.5 Request Drive Power Recovery and Request Release Pause

- (1) Request Drive Power Recovery
  - 1) Case where a request drive power recovery
    - A request drive power recovery is required only in the following case:
    - When you set I/O parameter No.44 to "1", device-source cut-off occurs. → Recovery after the main cause of cut-off is solved.
  - 2) How to issue a request drive power recovery
    - A request drive power recovery can be issued using one of the following methods:
    - Set I/O parameter No.44 to "1" (input selection function 014 = Drive-source cut-off reset input), and then input the ON edge on input port No. 14
    - From the software menu, execute "Controller (C)"  $\rightarrow$  "Request Drive Power Recovery (P)".
- (2) Request Release Pause
  - 1) Case where a request release pause is required

A request release pause is required in any of the following cases:

- When you set other parameter No.10 to "2", (emergency stop recovery according to type = continuous operation recovery (during automatic operation only)), emergency stop during automatic operation → recovery after emergency stop release (operation pause release).
- When you set other parameter No.11 to "2", (recovery type when safety gate OPEN = continuous operation recovery (during automatic operation only)), safety gate OPEN during automatic operation → recovery after safety gate CLOSE (operation pause release).
- When you set I/O parameter No.36 to "1", (input selection function 006 = pausing operation signal), OFF level input on input port No.6 at automatic operation (pausing operation) → recovery after ON level input on input port No.6 (operation pause release).
- 2) How to issue a request release pause
  - A request release pause can be issued using one of the following methods:
  - Set I/O parameter No.35 to "1" (input selection function 005 = operation-pause reset signal), and then input the ON edge on input port No.5.
  - From the PC software menu, execute "Controller (C)"  $\rightarrow$  "Operation Pause Reset Request (L)".



## Caution

• If the case in (1) of 1) and any of the cases in (2) of 2) are present at the same time, a request drive power recovery must be issued first, followed by a request release pause.

## 12.6 Setting Time

Select "Controller (C)"  $\rightarrow$  "Time Setting (T)" from the PC Software Menu to display the Set Time window.



Fig. 12.12 Time Setting Window

Manual entry:Directly enter the time (date & time) you want to set to the controller.Show PC time:The time (date & time) set in the PC you are currently using is shown.Show controller time:The time (date & time) currently set in the controller is shown."Setting" button:Set the time (date & time) shown on the screen to the controller.

# 12.7 SEL Global Data Backup

#### [1] Saving to a file

Global flags, global integer variables, global real variables and global strings can be saved. Click "Controller (C)  $\rightarrow$  "SEL global data backup (G)"  $\rightarrow$  "Save File AS (S)" from the menu. The SEL global data backup window (Save File AS) will be displayed.

Clicking 🖬 will save the global data.

| Ø SEL  | global data ba | skup 🔲 🗖 🔀      |
|--------|----------------|-----------------|
|        | 🥖 DE           |                 |
| G-Inte | eger G-Real    | G-String G-Flag |
| No.    | Value          | <u>^</u>        |
| 200    | 6278154        |                 |
| 201    | 245            |                 |
| 202    | 310315         |                 |
| 203    | 22             |                 |
| 204    | 4948245        |                 |
| 205    | 22             |                 |
| 206    | 4948267        |                 |
| 207    | 66             | ~               |
|        |                |                 |

Fig. 12.13 SEL Global Data Backup Window (Save File AS)

#### [2] Transmitting to the controller

Global flags, global integer variables, global real variables and global strings can be transmitted to the controller.

Click "Controller (C)  $\rightarrow$  "SEL global data backup (G)"  $\rightarrow$  "Transmit to Controller (L)" from the menu.

The SEL global data backup screen (Transmit to Controller) will be displayed.

If an error occurs, focus will move to the "Detailed Error Information" tag to display the error description.

| 🕫 C:¥Program Files¥IAI Corporation¥X-SEL¥0 🗐 🗖 🔀 |         |                                       |  |  |  |  |  |
|--|---------|---------------------------------------|--|--|--|--|--|
| G-Inte   |         | C 💌<br>  G-String   G-Flag   ErrInfo. |  |  |  |  |  |
| No.  | Value   | <u>^</u>                              |  |  |  |  |  |
| 200  | 6278154 |                                       |  |  |  |  |  |
| 201  | 245     |                                       |  |  |  |  |  |
| 202  | 310315  |                                       |  |  |  |  |  |
| 203  | 22      |                                       |  |  |  |  |  |
| 204  | 4948245 |                                       |  |  |  |  |  |
| 205  | 22      |                                       |  |  |  |  |  |
| 206  | 4948267 |                                       |  |  |  |  |  |
| 207  | 66      | ×                                     |  |  |  |  |  |
|  |         |                                       |  |  |  |  |  |

Fig. 12.14 SEL Global Data Backup Window (Transmit to Controller)

Clicking 🔚 will display the SEL global transfer data type select screen.

Select a desired transfer data type and click OK. The data will be transmitted to the controller.

| 🖉 PC Interface | : So 🗖 🗖 🔀    |
|----------------|---------------|
| Please seled   | ct data type. |
| □ G-Integ      | jer           |
| 🖵 G-Real       |               |
| 🖵 G-Strin      | Jà            |
| 🖵 G-Flag       |               |
| ОК             | CANCEL        |
|                |               |

Fig. 12.15 SEL Global Transfer Data Type Select Window

## 12.8 Excel File Save and Readout

The position data can be saved and read out in the Excel file formats. However, it can only be available on a PC that Microsoft Office Excel has already been installed.

### 12.8.1 Excel File Save

Click Save to File in the position edit window.

This is the same as clicking "File (F)"  $\rightarrow$  "Save to File (A)".

Next, the file save dialog will show up.

Select "Excel 97-2003 Workbook (\*.xls)", put a file name and conduct saving. Excel will open and the file will be saved to the sheet on the leftmost.

| 🖳 Computer            | III                                       |             | 4      |
|-----------------------|---|-------------|--------|
| File <u>n</u> ame:    |   |             | •      |
| Save as <u>t</u> ype: | Position Data for XSEL-RAXD/SAXD(*.s6dpt) |             | •      |
|                       | Position Data for XSEL-RAXD/SAXD(*.s6dpt) |             |        |
| Hide Folders          | Excel97-2003 workbook(*.xls)              | <u>_ave</u> | Cancer |

Fig. 12.16 File Save Dialog

#### [File Format]

The file format available to save file is only "Excel 97-2003 Workbook (\*.xls)".

(Note) Files cannot be saved or read out in other formats such as "Excel Workbook (.xlsx)".

#### [Position Data Format]

The format should be as shown in the table below when the position data is saved in the Excel format.

|                |                               |               |          |              |              | •                    | *                         | 1                       |                         | *2               |
|----------------|-------------------------------|---------------|----------|--------------|--------------|----------------------|---------------------------|-------------------------|-------------------------|------------------|
| No.            | Axis<br>(1-8)                 | Arm           | Vel      | Acc          | Dcl          | (OutFn)              | (OutNo.)                  | (OutPara1)              | (OutPara2)              | (Comment)        |
| Position<br>No | Each axis<br>position<br>data | Arm<br>system | Velocity | Acceleration | Deceleration | Output function code | Output ports<br>and flags | Function<br>Parameter 1 | Function<br>Parameter 2 | Position comment |

#### Table Position Data Title Line (Excel Format)

\*1 These should be displayed when the output operation function is valid

\*2 It should be displayed only on the models with the position comment function valid.

- © Explanation of Each Column Data
  - No. Column ....Position No.. Data with only integer digits.
  - Axis Column ....Position data. Data with down to three decimal digits.
  - Arm Column ...Arm system data. Data of "Right" or "Left".
  - Vel Column ....Velocity data. Data with only integer digits.
  - Acc Column ... Acceleration data. Data with down to two decimal digits.
  - Dcl Column ... Deceleration data. Data with down to two decimal digits.
  - OutFn Column ...Output Function code. Data of any from "ON", "OFF", "OND", "OFFD", "ONR" or "OFFR".
  - OutNo. Column ...Output ports and flags. Data with only integer digits.
  - Outpara1 Column ... Function Parameter 1. Data with down to three decimal digits.
  - Outpara2 Column ... Function Parameter 2. Data with down to three decimal digits.

Comment Column ... Position comment data.

## 12.8.2 Excel File Readout

Click Open File in the toolbar.

This is the same as clicking "File (F)"  $\rightarrow$  "Open (O)".

Open File dialog will appear.

Select either "Excel 97-2003 Workbook (\*.xls)" or "All Files (\*.\*)" and all the ".xls" files should appear.

| All Files for XSEL-RAXD/SAXD (*.s6dpg;*.<br>Program for XSEL-RAXD/SAXD(*.s6dpg;*<br>Position Data for XSEL-RAXD/SAXD(*.s6<br>Batch Program for XSEL-RAXD/SAXD(*.s6<br>Batch Program for XSEL-RAXD/SAXD(*.s6<br>Symbol File for XSEL-RAXD/SAXD(*.s6<br>Coordinate sys data for XSEL-RAXD/SAXD<br>Servo Monitor Data for XSEL-RAXD/SAXD<br>Position data file for RC axis(*.rpt)<br>Setting Data(Ex Motion Control)(*.pbst)<br>Position data edit(Ex Motion Control)(*.pbst)<br>Position data edit(Ex Motion Control)(*.pbst)<br>Position 3 workbook(*.xls)<br>All Files (*.*) | lpt;*.\$s6dpt)<br>5dpa;*.\$s6dpa)<br>n;*.\$s6dsm)<br>dpm;*.\$s6dpm)<br>D(*.s6dcd;*.\$s6dcd)<br>)(*.csv) |
|--|---|
| All Files (*,*)  Open Cancel   |   |

Fig. 12.17 Open File Dialog

The controller selection window will show up once a "Excel 97-2003 Workbook (.xls)" file with the correct position data file format is selected. Select a controller to be used, press OK, and Microsoft Office Excel opens and the file will start to be read out. File error will be displayed if the file format is incorrect.

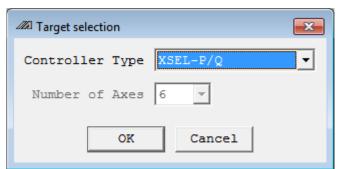


Fig. 12.18 Target Selection

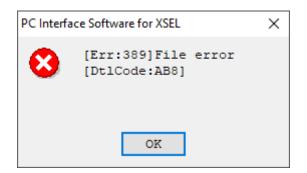


Fig. 12.19 File Error

## 12.8.3 Excel File Create and Edit

When creating and editing the position data in Microsoft Office Excel and reading out in the XSEL PC software, input the title line in the first line of the first Excel sheet, and input the position data from the second line.

Or, by creating a new file and save it with a name in the XSEL PC software, an Excel file with title line and number column are already input can be generated. With using this file, create and edit the position data on the Excel sheet.

Refer to [12.8.1 Position Data Format] for the title line.

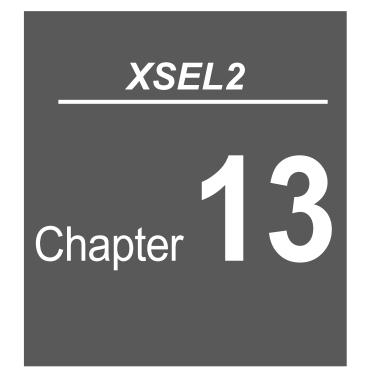
## 12.8.4 Caution

- (1) Do not attempt to input any information except for those described in the position data format to the title line and position number column. Doing so will disturbs reading the data correctly. In the area hatched in the figure below can be used for free input.
  - (Note) Once the file gets overwritten in the XSEL PC software, the data input in the hatched area will all be deleted.

| 4   | A  | B     | C       | D       | E       | F       | G     | Н       | 1     | J       | K      | L   | M     | . N | 4      | 0     | Р      | Q        | R        | S       | T | U | V | W |
|-----|----|-------|---------|---------|---------|---------|-------|---------|-------|---------|--------|-----|-------|-----|--------|-------|--------|----------|----------|---------|---|---|---|---|
| 1 N | ю. | Axis1 | Axis2   | Aasc3   | Axis4   | Axis5   | Axis6 | Axis7   | Axis8 | Arm1-4  | Arm5-8 | Vel | Acc   | Dol | (      | OutFn | OutNo. | OutParal | OutPara2 | Comment |   |   |   |   |
| 2   |    | 1 1.0 | 2.00    | 1 3.001 | 1 4.001 | 5.001   | 6.001 | 7.001   | 8.00  |         | Right  | 1   | 1 1.0 |     | 2.01 0 | DN    | 300    | 3.001    | 4,001    |         |   |   |   |   |
| 3   |    | 2 1.0 | 2.00    | 2 3.000 | 2 4.000 | 2 5.000 | 6.000 | 2 7.002 | 8.00  | 2 Right | Left   | 4   | 2 1.0 | 2   | 2.02 0 | OFF   | 300    | 3.002    | 4.002    | Pos2    |   |   |   |   |
| 4   | 1  | 3 1.0 | 2.00    | 3 3.000 | 3 4.000 | 5.000   | 6.000 | 7.003   | 8.00  | 3 Left  |        | :   | 3 1.0 | 3   | 2.03 ( | DND   | 300    | 3.003    | 4.003    | Pos3    |   |   |   |   |
| 5   |    | 4 1.0 | 2.00    | 4 3.004 | 4 4.004 | 5.004   | 6.004 | 7.004   | 8.00  | 4       | Right  |     | 4 1.0 | )4  | 2.04 0 | OFFD  | 300    | 3.004    | 4.004    | Pos4    |   |   |   |   |
| 6   |    | 5 1.0 | 2.00    | 5 3.005 | 5 4.005 | 5.008   | 6.008 | 5 7.005 | 8.00  | 5 Right | Left   |     | 5 1.0 | 5   | 2.05 0 | DNR   | 300    | 3.005    | 4.005    | Pos5    |   |   |   |   |
| 7   |    | 6 1.0 | 2.00    | 6 3.000 | 6 4.000 | 5.006   | 6.006 | 5 7.006 | 8.00  | 6 Left  |        | (   | 6 1.0 | 6   | 2.06 0 | DFFR  | 300    | 3.006    |          | Pos6    |   |   |   |   |
| 8   |    | 7 1.0 | 07 2.00 | 7 3.001 | 7 4.001 | 5.001   | 6.007 | 7.007   | 8.00  | 7       | Right  |     | 7 1.0 | 07  | 2.07   |       |        |          |          | Pos7    | - |   | - |   |
| 9   | 1  | 8 1.0 | 2.00    | 8 3.008 | B 4.008 | 5.008   | 6.008 | 3 7.008 | 8.00  | 8 Right | Left   | 1   | B 1.0 | 8   | 2.08 0 | DN    | 300    |          | 4.008    | Pos8    |   |   |   |   |
| 10  |    | 9 1.0 | 2.00    | 9 3.009 | 9 4.006 | 5.009   | 6.005 | 7.009   | 8.00  | 9 Left  |        | (   | 9 1.0 | 0   | 2.09 ( | OFF   | 300    | 3.009    | 4.009    | Pos9    | - |   |   |   |
| 11  | 1  | 0 1.  | 01 2.0  | 1 3.01  | 4.01    | 5.01    | 6.01  | 7.01    | 8.0   | 1       | Right  | 10  | 0 1   | .1  | 2.1.0  | DND   | 300    |          | 4.01     | Post 0  |   |   |   |   |
| 12  |    | -     |         |         |         | -       | -     |         | -     | -       |        |     | -     |     |        | -     |        | -        | -        |         |   |   |   |   |
| 13  |    | -     |         |         |         |         |       |         | -     |         |        |     |       |     | _      |       |        |          |          |         |   |   |   |   |
| 14  |    | -     |         |         | -       | -       | -     | -       | -     | -       | -      | -   | -     | -   | -      | /     | -      | -        | -        | -       | - |   | - |   |
| 15  |    | _     |         |         |         |         |       | -       | -     |         |        |     |       |     |        | -     |        |          |          |         |   |   |   |   |
| 16  |    | -     |         | -       |         |         |       |         | -     |         |        |     | -     |     |        | -     | -      | -        |          | -       | - | - |   |   |
| 17  |    |       |         |         |         |         |       |         |       |         |        |     |       |     | -      |       |        |          |          |         |   |   |   |   |
| 18  |    | -     |         |         |         | -       | -     | -       | -     | -       |        | -   | -     | -   |        | -     | 1      | -        | -        | -       |   |   | - |   |

Fig. 12.20 Position Data Input Area

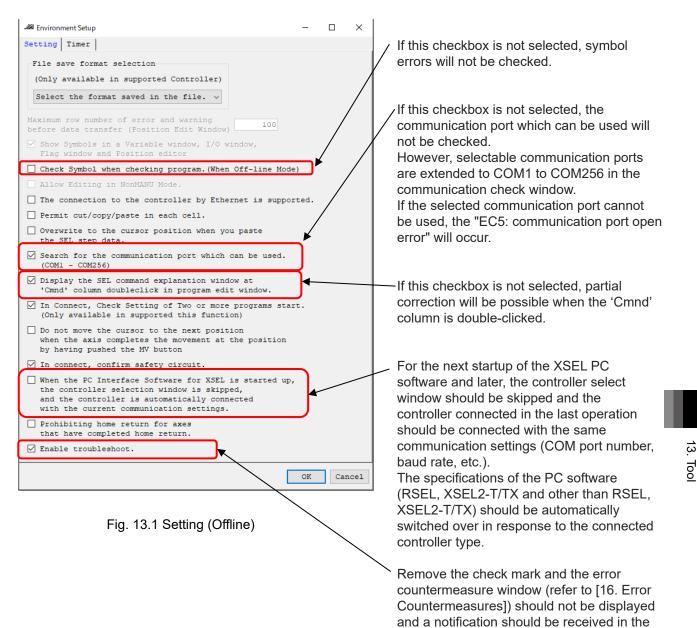
- (2) If there is a restriction on the edit or readout of the Excel file, it will cause a file readout error.
- (3) If you work on Microsoft Office Excel while the file is being saved or read out, file save or readout could fail.



# Tool

# 13.1 Setting

Specify whether or not to check symbols during the program error check.



ਰੂ

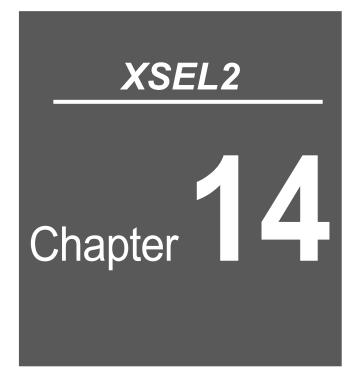
error dialog (Figure 13.3) showing an error

has occurred.

| 2012 Environment Setup - 🗆 🗙   | <  |
|--|--|
| Setting Timer  |  |
| File save format selection   | If this checkbox is selected, symbols will   |
| (Only available in supported Controller)   | be shown in the variable window, I/O   |
| Select the format saved in the file. $\vee$  | window, flag monitor window and position data edit window.   |
| Maximum row number of error and warning  |  |
| Show Symbols in a Variable window, I/O window,<br>Flag window and Position editor  |  |
| Check Symbol when checking program.(When Off-line Mode)  |  |
| Allow Editing in NonMANU Mode.   | , For the next startup of the XSEL PC  |
| ☐ The connection to the controller by Ethernet is supported.   | / software and later, the controller select  |
| Permit cut/copy/paste in each cell.  | / window should be skipped and the   |
| Overwrite to the cursor position when you paste<br>the SEL step data.  | controller connected in the last operation should be connected with the same   |
| Search for the communication port which can be used.<br>(COM1 - COM256)  | communication settings (COM port   |
| Display the SEL command explanation window at<br>'Cmnd' column doubleclick in program edit window.   | <pre>/ number, baud rate, etc.). / The specifications of the PC software</pre>   |
| In Connect, Check Setting of Two or more programs start.<br>(Only available in supported this function)  | (RSEL, XSEL2-T/TX and other than   |
| Do not move the cursor to the next position<br>when the axis completes the movement at the position<br>by having pushed the MV button                  | RSEL, XSEL2-T/TX) should be automatically switched over in response  |
| ☑ In connect, confirm safety circuit.  | to the connected controller type.  |
| When the PC Interface Software for XSEL is started up,<br>the controller selection window is skipped,<br>and the controller is automatically connected |  |
| with the current communication settings.   | Put a check mark, and the home-return  |
| Prohibiting home return for axes<br>that have completed home return.   | operation of the axis with the home-return   |
| Enable troubleshoot.   | operation completed becomes unable in the position edit window.  |
| OK Cancel  |  |
| Fig. 13.2 Setting (Online)   | Remove the check mark and the error<br>countermeasure window (refer to [16.<br>Error Countermeasures]) should not be<br>displayed and a notification should be<br>received in the error dialog (Figure 13.3)<br>showing an error has occurred. |

| PC Interfa | ce Software for XSEL                           |           |        |       |     | × |
|------------|--|-----------|--------|-------|-----|---|
| ⊗          | [Err:315]Motion c<br>[Axis:2]<br>[DtlCode:988] | command ( | during | servo | OFF |   |
|            |  | OK        |        |       |     |   |

Fig. 13.3 Error dialog



# IXA (SCARA Robot) Simulator

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# 14.1 Overview

IXA Simulator is a function that enables operation of a IXA SCARA Robot simulated in PC. SEL programs and position data can be created in the XSEL PC software, and by executing a program in the Edit Program window, operation can be checked in PC.



# Caution

- Even though operation can be performed in simulation, there may be a case that the overload error can occur and not able to operate in the actual robot operation.
- If there is an input signal awaiting in a program, it will not go on to the next step until this program gets executed. If there is an input signal awaiting, use the debug filtering function in the input port monitor window.

# 14.2 Preparation

Here, explains preparation to use IXA Simulator.

## 14.2.1 System Requirements

Required System / Recommended System Requirements

| ltem            | Specifications   |
|-----------------|--|
| OS              | Windows 10/11  |
| CPU             | Intel Core i Series or Intel Core 2 Quad or higher   |
| Memory          | 2G byte or more  |
| Hard Disk Space | Space of 1G byte or more required<br>(This software is to be installed to the hard disk drive to use)                    |
| Graphic         | 1280 × 1024 dots or more<br>Operating environment of DirectX 9.0c is required<br>Graphic memory of 64MB or more required |
| Others          | .Net Framework 4.8.1 or more required  |



## **Caution**

• The software cannot be installed to a PC with Virfit provided by Computer Engineering & Consulting Ltd. already installed.

## 14.2.2 How to Install

It is mandatory that X-SEL PC Software V15.00.00.00 or later is installed in order to operate the IXA simulator.

- 1) Insert the DVD-ROM containing this software into your DVD-ROM drive.
- 2) The installed data selection screen will be displayed.
  - Select English and click OK.

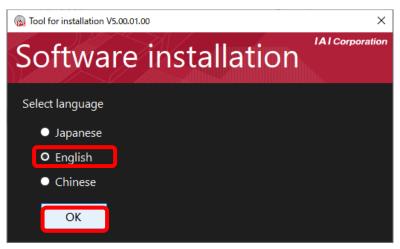


Fig. 14.1 Select language Window

3) Select IXA/CR Simulator and click Installation.

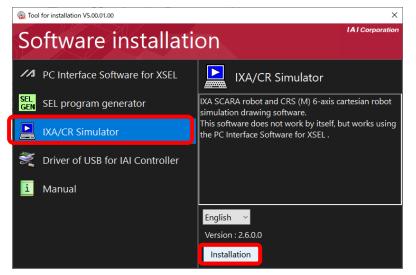


Fig. 14.2 Software installation Window

4) The screen will change to the installation window.

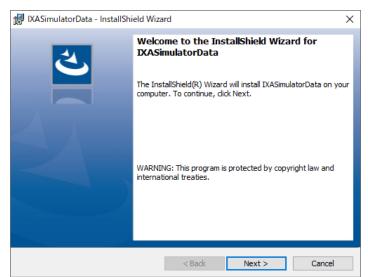


Fig. 14.3 Installation Window

5) Click Next >. The data necessary for simulation gets installed.Following window appears when the installation of simulation data is complete.

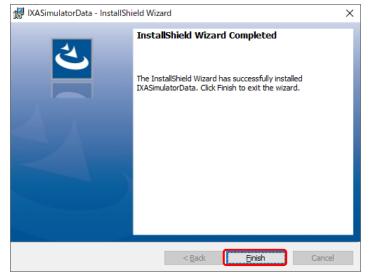


Fig. 14.4 Installation Window

6) Click Finish.

7) Installation of 3D Drawing Software (Virfit) starts.



## Caution

• If this software is installed to a PC with Virfit provided by Computer Engineering & Consulting Ltd. already installed, it will be overwritten by the one dedicated for IXA simulation. Cancel the process and install the software to another PC.

| 1. | Select English as the language to be<br>displayed in Virfit.<br>Click OK.   | Select Setup Language Select the language to use during the installation: English  |
|----|---|--|
| *  | It is the display only in recovery installation.  | OK Cancel  |
| 2. | The setup start window for installation appears.<br>Click Next >.   | Setup - Virfit  Welcome to the Virfit Setup Wizard  Nis will install Virfit 0.11.2.5026 on your computer.  It is recommended that you close all other applications before continuing.  Click Next to continue, or Cancel to exit Setup.  Mext > Cancel   |
| 3. | A window to indicate the destination<br>location to install the software shows<br>up.<br>Click Next > with the default setting<br>unless necessary to change. | Setup - Virfit  Select Destination Location Where should Virfit be installed?  Setup will install Virfit into the following folder.  To continue, click Next. If you would like to select a different folder, click Browse.  (NVrfit) Browse  At least 151.5 MB of free disk space is required.  (Back Next > Cance) |

| 4. Ready to Install window comes up.   | ja Setup - Virfit  |
|--|--|
|  | Ready to Install Setup is now ready to begin installing Virfit on your computer.         |
|  | Click Install to continue with the installation, or click Back if you want to review or  |
| Confirm there is no problem in the display and click Install.                        | change any settings. Destination location:   |
|  | C: \Virfit   |
|  |  |
|  |  |
|  | *  |
|  | < Back Instal Cancel   |
| 5. Install Visual C++ 2005 Redistributable   |  |
| Package.   | Setup  |
|  | Install Microsoft Visual C+ + 2005 redistributable package.                              |
| Click OK.  |  |
|  | ОК   |
| * It may take time to start the installation.  |  |
| 6. A message appears when the  | Setup  |
| installation of Visual C++ 2005<br>Redistributable Package is complete.              | Microsoft Visual C++ 2005 redistributable package installed                              |
| Redistributable i dokage is complete.  | successfully.  |
|  | ОК   |
| Click OK.  |  |
| 7. Install Visual C++ 2008 Redistributable   | Setup  |
| Package.   | Install Microsoft Visual C++ 2008 redistributable package.                               |
|  |  |
| Click OK.  | ОК   |
|  |  |
| <ol> <li>A setup window for Visual C++ 2008<br/>Redistributable shows up.</li> </ol> | Microsoft Visual C++ 2008 Redistributable Setup     Welcome to Microsoft Visual C++ 2008 |
| Redistributable snows up.  | Redistributable Setup  |
|  | This wizard will guide you through the installation process.                             |
| Click Next >.  |  |
| Move on to Step 9.   |  |
|  |  |
|  |  |
|  |  |
|  | Next > Cancel  |

| 8-1. For a PC with Visual C++ 2008       | 썘 Microsoft Visual C++ 2008 Redistributable Setup  |
|--|--|
| Redistributable Package already          | Maintenance mode   |
|  |  |
| installed, a window shown on the         |  |
| right appears.                           | Select one of the options below:   |
|  |  |
|  | © Repair   |
| Click Cancel.                            | Repair Microsoft Visual C++ 2008 Redistributable to its original state.  |
|  |  |
|  | © <u>U</u> ninstall  |
|  | Uninstall Microsoft Visual C++ 2008 Redistributable from this computer.  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  | Next > Cancel  |
|  |  |
| 8-2. Setup should be cancelled and a     | ∰ Microsoft Visual C++ 2008 Redistributable Setup  |
| window shown on the right appears.       | Setup Canceled   |
| 0 11                                     |  |
| Click Finish                             |  |
| Click Finish.                            | You have chosen to cancel setup.   |
| Move on to Step 11.                      |  |
|  |  |
|  |  |
|  |  |
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|  |  |
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|  |  |
|  |  |
|  |  |
|  |  |
|  | Einish   |
|  |  |
| 9. License Terms for Visual C++ 2008     | 🖟 Microsoft Visual C++ 2008 Redistributable Setup  |
| Redistributable software gets displayed. | License Terms  |
| Redistributable software gets displayed. |  |
|  |  |
|  | Be sure to carefully read and understand all the rights and restrictions described in the<br>license terms. You must accept the license terms before you can install the software. |
| Check to the acceptance and click        | MICROSOFT SOFTWARE LICENSE TERMS   |
| Install.                                 | MICROSOFT VISUAL C++ 2008 RUNTIME LIBRARIES (X86, IA64 AND X64), SERVICE<br>PACK 1   |
| motan.                                   | These license terms are an agreement between Microsoft Corporation (or based on<br>where you live, one of its affiliates) and you. Please read them. They apply to the             |
|  | software named above, which includes the media on which you received it, if any. The<br>terms also apply to any Microsoft  |
|  | • updates,   |
|  | Print  |
|  | Press the Page Down key to see more text.  |
|  |  |
|  |  |
|  | I have read and <u>a</u> ccept the license terms.  |
|  |  |
|  | < Back Install > Cance   |

| 10. A setup complete window for Visual   | Microsoft Visual C++ 2008 Redistributable Setup   |
|--|---|
| C++ 2008 Redistributable appears.  | Setup Complete  |
|  |   |
| Click Finish.  | Microsoft Visual C++ 2008 Redistributable has been successfully installed.  |
|  | It is highly recommended that you download and install the latest service packs and<br>security updates for this product. |
|  | For more information, visit the following Web site:   |
|  | Product Support Center  |
|  |   |
|  |   |
|  |   |
|  |   |
|  | Enish   |
| 11. A message appears when the   |   |
| installation of Visual C++ 2008  | Setup 📃   |
| Redistributable Package is complete.   | Microsoft Visual C++ 2008 redistributable package installed   |
|  | successfully.   |
| Click OK.  | ОК  |
|  |   |
| 12. Install Visual C++ 2010 Redistributable                                    |   |
| Package.   | Setup   |
|  |   |
| Click OK.  | Install Microsoft Visual C++ 2010 redistributable package.  |
| * For a PC with Visual C++ 2010  |   |
| Redistributable Package already  | ОК  |
| installed, this window will not appear<br>and the process moves on to Step 16. |   |
| 13. License Terms for Visual C++ 2010  | S Microsoft Visual C++ 2010 x86 Redistributable Setup   |
| Redistributable software gets displayed.                                       | Welcome to Microsoft Visual C++ 2010 x86 Redistributable Setup  |
|  | Please, accept the license terms to continue.   |
|  | MICROSOFT SOFTWARE LICENSE TERMS  |
| Check to the acceptance and click  | MICROSOFT VISUAL C++ 2010 RUNTIME LIBRARIES   |
| Install.   | I have read and accept the license terms.   |
| * It may not be displayed in some  |   |
| environments of use.   |   |
|  |   |
|  | Yes, send information about my setup experiences to Microsoft Corporation.  |
|  | For more information, read the <u>Data Collection Policy</u> .  |
|  |   |
|  | Instal Cancel   |

| 14. A setup complete window for Visual<br>C++ 2010 Redistributable appears.<br>Click <u>Finish</u> .   | Microsoft Visual C++ 2010 x86 Redistributable Setup  |
|--|--|
|  | Enish  |
| 15. A message appears when the<br>installation of Visual C++ 2010<br>Redistributable Package is complete.  | Setup  Microsoft Visual C++ 2010 redistributable package installed successfully.   |
| Click OK.  | ОК   |
| <ul> <li>16. Install DirectX Runtime.</li> <li>Click OK.</li> <li>* For a PC with DirectX already installed, this window will not appear and the process moves on to Step 22.</li> </ul> | Setup 💽 Install DirectX Redist June 2010.  |
| 17. The software license agreement shows<br>up.<br>Click Yes.  | DirectX June 2010 SDK         Please read the following license agreement. Press the PAGE DOWN key to see the rest of the agreement.         MICROSOFT SOFTWARE LICENSE TERMS         MICROSOFT DIRECTX SOFTWARE DEVELOPMENT KIT (SDK)         These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. Please read them. They apply to the software named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft         •       updates,         •       support services         for this software, unless other terms accompany those items. If so, those terms apply.         BY USING THE SOFTWARE, YOU ACCEPT THESE TERMS. IF         Do you accept all of the terms of the preceding License Agreement? If you choose No, Install will close. To install you must accept this agreement. |

| 18. A setup window for DirectX shows up.          | Installing Microsoft(R) DirectX(R)  |  |  |  |
|---|---|--|--|--|
| Check on "accept the agreement" and click Next >. | Microsoft*<br>DirectX*<br>Welcome to setup for DirectX<br>The DirectX setup wizard guides you through installation of<br>DirectX Nutrime Components. Please read the following<br>locanse agreement. Press the PAGE DOWN key to see the rest<br>of the agreement. You must accept the agreement to continue<br>the setup.<br>MICROSOFT SOFTWARE LICENSE TERMS<br>MICROSOFT DIRECTX END USER RUNTIME<br>These locanse terms are an agreement between Microsoft<br>Corporation (or based on where you live, one of its<br>affiliates) and you. Please read then. They apply to the<br>software named above, which includes the media on<br>which you received it, if any. The terms also apply to any<br>"updates." |  |  |  |
|   | < Back Next > Cancel  |  |  |  |
| 19. A installation confirmation window            | Installing Microsoft(R) DirectX(R)  |  |  |  |
| comes up.   | DirectX Setup<br>Install DirectX runtime components   |  |  |  |
| Click Next >.                                     | DirectX Runtime Install:<br>This install package will search for updated DirectX Runtime Components<br>and update as necessary. It may take a few minutes.<br>To start installation, please click Next.   |  |  |  |
|   | < Back Cancel   |  |  |  |
| 20. A DirectX installation complete window        | Installing Microsoft(R) DirectX(R)  |  |  |  |
| appears.  | Installation Complete   |  |  |  |
| appears.  |   |  |  |  |
|   | DirectX*  |  |  |  |
| Click Finish.                                     | The components installed are now ready for use.   |  |  |  |
|   | < <u>Back</u> Cancel  |  |  |  |
| 21.A message appears when the                     | Setup 💌   |  |  |  |
| installation of DirectX Runtime is complete.      | DirectX DirectX Redist June 2010 installed successfully.  |  |  |  |
| Click OK.   | ОК  |  |  |  |

| Setup  |
|--|
| Install HASP HL Device driver.   |
| Sentinel Runtime Setup   |
| Welcome to the Sentinel Runtime<br>Installation Wizard   |
| Click Cancel to quit the setup program, then close any programs<br>you have running. Click Next to continue the installation.<br>WARNING: This program is protected by copyright law and<br>international treaties.<br>Unauthorized reproduction or distribution of this program, or any   |
| Charles of option of the servere civil and criminal penalities, and will be prosecuted to the maximum extent possible under law.           CHARLES   |
| 💀 Sentinel Runtime Setup — 🗆 🗙   |
| License Agreement You must agree with the license agreement below to proceed.  |
| SENTINEL LDK PRODUCT END USER LICENSE AGREEMENT  |
| IMPORTANT INFORMATION - PLEASE READ THIS AGREEMENT CAREFULLY<br>BEFORE USING THE CONTENTS OF THE PACKAGE AND/OR BEFORE<br>DOWNLOADING OR INSTALLING THE SOFTWARE PRODUCT. ALL ORDERS<br>FOR AND USE OF THE SENTINEL® LDK PRODUCTS (including without<br>limitation, the Developer's Kit, libraries, utilities, diskettes, CD_ROM,<br>DVD, Sentinel keys, the software component of Sentinel LDK, and the<br>Sentinel LDK Software Protection and Licensing Guide) (hereinafter<br>"Product") SUPPLIED BY THALES DIS CPL USA, Inc., or one of its affiliates,<br>I accept the license agreement<br>I do not accept the license agreement<br>Reset < Back Next> Cancel |
|  |

| 25. Ready to Install window comes up.        | Sentinel Runtime Setup – – ×   |
|--|--|
| , , , , , , , , , , , , , , , , , , ,        | Ready to Install the Application<br>Click Next to begin installation.  |
|  |  |
| Click Next > .                               | Click the Back button to reenter the installation information or click. Cancel to exit<br>the wizard.  |
|  |  |
|  |  |
|  |  |
|  |  |
|  | < Back Next > Cancel   |
| 26. A Sentinel Runtime installation complete |  |
| window appears.                              | Sentinel Runtime has been successfully installed.  |
| Click Finish.                                | The Sentinel HASP Run-time Environment uses port 1947<br>to communicate with local and remote components. If you<br>use a firewall, ensure that it does not block this port. |
|  | Click the Finish button to exit this installation.   |
|  | < Back Finish Cancel   |
| 27. A message appears when the               | Setup  |
| installation of HASP HL Device Driver is     |  |
| complete.                                    | HASP HL Device driver installed successfully.  |
| Click OK.                                    | ОК   |
|  |  |
| 28. The NET Framework 4.8.1.                 | Setup X  |
| installation message appears.                |  |
| Click OK.                                    | install .NET Framework 4.8.1.  |
|  |  |
|  | ОК   |
| 29. A NET Framework 4.8.1. installation      |  |
| complete window appears.                     | Setup ×  |
| Click OK.                                    | .NET Framework 4.8.1 installed successfully.   |
|  | ОК   |
|  |  |

| 30. Installation of Virfit starts.         | Image: Setup - Virfit     Image: Setup relation of the setup installs Virfit on your computer.  |
|--|---|
| Wait for a while.                          | Extracting files<br>C: \Virfit\bin\xerces-c_2_8.dll   |
| 31. A setup complete window for Virfit     | 15 Setup - Virfit   |
| appears.                                   | Completing the Virfit Setup<br>Wizard<br>Setup has finished installing Virfit on your computer. The<br>application may be launched by selecting the installed icons.<br>Click Finish to exit Setup. |
| Click Finish to complete the installation. | application may be launched by selecting the installed icons.<br>Click Finish to exit Setup.  |
|  | Einish  |

# 14.3 How to Start up

### 14.3.1 Startup

Once you start up "XSEL PC Software" from the start menu of Windows, the controller select window (figure below) will show up. Click RSEL,XSEL2-T series.

| 202 PC Interface Software for XSEL  | × |
|---|---|
| Select the controller for connection or data editing.                       |   |
| ASEL/MSEL/PSEL/SSEL Series, XSEL Series (Other than XSEL2-T Series), TT/TTA |   |
| RSEL, XSEL2-T Series  | ] |
| Don't show this window again.   |   |

Fig. 14.4 Controller Select Window

Select "Simulator (IXA)" (\*1) from the list in "Port Name" and click OK.

\* 1 PC software can be launched in several windows on one PC, however it should be only one window on one PC that can be connected to the simulator.

| Connection Confirmation |   |
|-------------------------|---|
| Port Name               | Simulator (IXA) $\lor$  |
| Baud Rate(bps)          | 115,200 ~   |
|                         | (*)Only for XSEL2 series  |
|                         | to the controller via USB,<br>constant regardless of the setting value.<br>w again. |
|                         | OK CANCEL   |

Fig. 14.5 Connection Confirmation Window

After clicking OK, a robot select window comes up.

Select a robot that you would like to simulate from the list of "Type" and "Model Code", and click OK.

| Robot Sel                | ect                           |                  | - |      | × |
|--------------------------|-------------------------------|------------------|---|------|---|
| Robot1                   |                               |                  |   |      |   |
| Type:                    | High-speed                    |                  |   | ~    |   |
| Model:                   | IXA-4NSN4518                  | 1                |   | ~    |   |
| Cycle time<br>PC perform | measurement<br>nance adjuster | fast 0<br>Cancel |   | slow |   |

Fig. 14.6 Robot Select Window

The parameters should be initialized when a robot model different from the one selected previously is selected.

Refer to [14.5.1 Flash ROM Writing Operation]

In case requires to change the robot model, end the simulation once and reboot.

## 14.3.2 Cycle Time Measurement PC Performance Adjustment

Cycle time measurement is measurement available also when connected to the simulator, but the measurement results will vary due to the performance and load on the PC to be used, and will not perfectly match with the time measured on the actual controller. Utilize this as a reference for cycle time consideration. If the difference between the actual controller and the simulator is expectable in advance, the result on the PC (simulator) can be adjusted slower or faster on the slider bar. (10% of increase/decrease by one gradation)

Refer to [4.5 Cycle Time Measurement]

#### [1] Conditions at Cycle Time Measurement

Note that there are some limitations as follows in the cycle time measurement in the simulator.



## Caution

- Do not attempt to use a program with conditional change of input signals.
   A program that waits for a signal from outside should be commented out at that part or extract only the part to be measured to conduct the cycle time measurement. In case of considering the cycle time of such a program, add the waiting time into the consideration on top of the measurement result.
- Do not attempt to use a program that runs in an infinity loop.
   In case of a program in loop and the time between the end and start in the range of measurement is short, the measurement result display time gets short and always displays under measurement.

- [2] Cause of Cycle Time Measurement Variance in Simulator
  - (1) Variance due to CPU Process Speed and Memory Access Difference There is a tendency in general that a PC has a CPU with better performance and the process is faster (cycle time measurement result shorter) except for the robot operation system commands (arithmetic operation, brunch instruction, etc.). Also in commands to operate the global data, the way of memory access is different from the controller making the cycle time measurement result shorter in a PC (simulator).
  - (2) Using Commands Dependent to Condition of Robot Main Unit In the cycle time measurement in a simulator, there is no connection to a robot unit or external device. This makes the simulator unable to measure the cycle time properly in such commands as those to monitor external force against the robot or those to communicate with external devises.

| No. | Feature           | Command                      | Explanation  |
|-----|-------------------|------------------------------|--|
| 1   | Pressing          | PUSH                         | As there is nothing to push against, always finishes with miss-pressing.   |
| 2   | Communication     | OPEN/CLOS/READ/<br>WRIT/TMRW | Moves on to the next step without conducting<br>communication process.<br>It makes the cycle time shorter than the actual<br>controller.         |
| 3   | Vision System I/F | SLVS/GTVD                    | Go to the next step without having the vision<br>system I/F process conducted.<br>It makes the cycle time shorter than the actual<br>controller. |

Described below are the applicable commands.

## 14.3.3 Warning at First Startup

There may be a case that a warning window as shown below appears at the first startup of the simulator. When this window appears, confirm that there is a check mark in a check box corresponding to your environment of use and click Allow access. It is necessary in order to operate of 3D view.

| iii Windows Security Alert   |                |                                   |  |  |  |
|--|----------------|-----------------------------------|--|--|--|
| Windows Defender Firewall has blocked some features of this app  |                |                                   |  |  |  |
| Windows Defender Firewall has blocked some features of brigid on all public and private<br>networks.   |                |                                   |  |  |  |
| L.   | Name:          | brigid                            |  |  |  |
|  | Publisher:     | Computer Engineering & Consulting |  |  |  |
|  | Pat <u>h</u> : | C:\virfit\bin\brigid.exe          |  |  |  |
| Allow brigid to communicate on these networks:   |                |                                   |  |  |  |
| <ul> <li>Public networks, such as my home or work network</li> <li>Public networks, such as those in airports and coffee shops (not recommended because these networks often have little or no security)</li> <li>What are the risks of allowing an app through a firewall?</li> </ul> |                |                                   |  |  |  |
|  |                | Allow access Cancel               |  |  |  |

Fig. 14.7 Example of Warning Window at First Startup of Simulator

## 14.3.4 Start of Simulation

Either read out a SEL program or position data to be simulated from a file (File - Open in the menu bar) or create a new (File - Create New in the menu bar) and transfer to the simulator. Refer to [3.2 Explanation of the Commands (1)], [4. Program Edit Window] and [6. Position Data Edit Window] for detail of how to edit and transfer a SEL program or position data.

After data transfer, refer to [4.4 Running the Program] in order to execute a program.



## Caution

• As it will be launched with "Safety VEL Specified" at the PC software startup, switch it to "Safety VEL Not Specified" if necessary. Refer to [3.3 Explanation of the Toolbar]

## 14.3.5 Stop of Simulation

Refer to [4.4 Running the Program] in order to stop the program.

## 14.3.6 Termination of Simulation

Either finish the PC software or execute Off-line work (Exit Simulator) in the controller menu. If it is required to perform simulation again from offline condition, reconnect and execute it in the process of startup in [14.3.1] (Reconnection menu gets active offline.)

| Controller          | Tool                          | Utility  | Window | Help |
|---------------------|-------------------------------|----------|--------|------|
| Reconnect           |                               |          |        |      |
| Off-lir             | Off-line work(Exit Simulator) |          |        |      |
| Axes S              | Axes Setting                  |          |        |      |
| SEL gl              | SEL global data backup        |          |        | >    |
| All Da              | All Data Backup               |          |        | >    |
| Write               | Write Flash ROM               |          |        |      |
| Initiali            | Initialize Memory             |          |        | >    |
| Abs. E              | Abs. Encoder Reset            |          |        |      |
| Softwa              | Software Reset                |          |        |      |
| Error F             | Reset                         |          |        |      |
| Reque               | Request Drive Power Recovery  |          |        |      |
| Reque               | st Rele                       | ase Paus | e      |      |
| Time S              | Setting                       |          |        |      |
| Version Information |                               |          |        |      |

Fig. 14.8 Controller Menu

# 14.4 Basic operation in 3D View Window

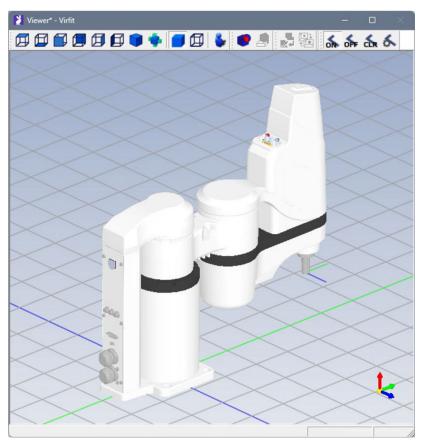


Fig. 14.9 3D View Window

## 14.4.1 View Operation (Normal Mode)

| [1] | View Operation | Using a | Wheel Mouse | (3-button | Mouse)  |
|-----|----------------|---------|-------------|-----------|---------|
| 1.1 | view operation | oonig u |             | (O Dutton | 100000) |

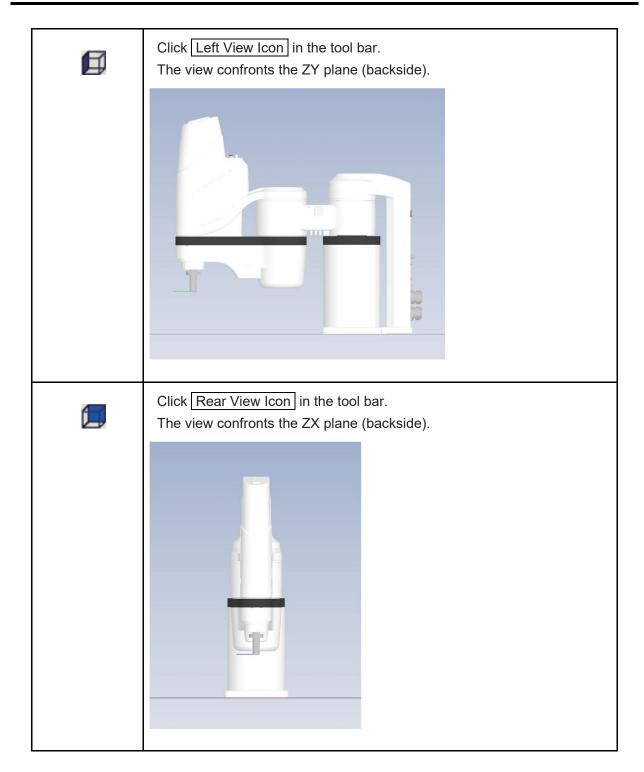
| Action                   | How to Operate  |
|--------------------------|---|
| Rotation                 | Press and hold the wheel button (middle button) and press the left button to drag.  |
| Panning                  | Press and hold the wheel button (middle button) and drag it.  |
| Zooming                  | When using a wheel mouse, turn the wheel to zoom in and out.<br>When using a 3-button mouse, press and hold the middle button, click<br>the left button once and then drag. |
| Changing Rotation Center | Click the wheel button (middle button) at a point to make the center.   |

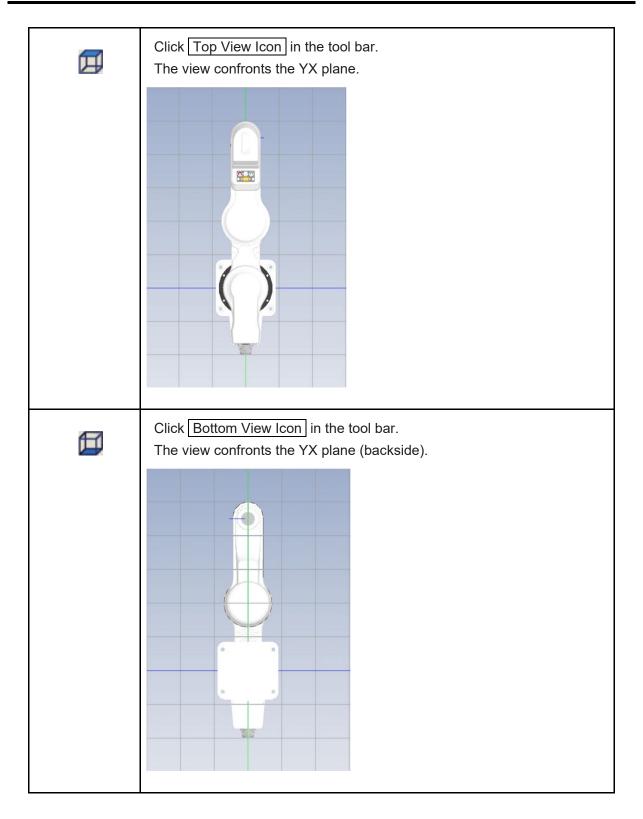
#### [2] View Operation Using Keys and Mouse

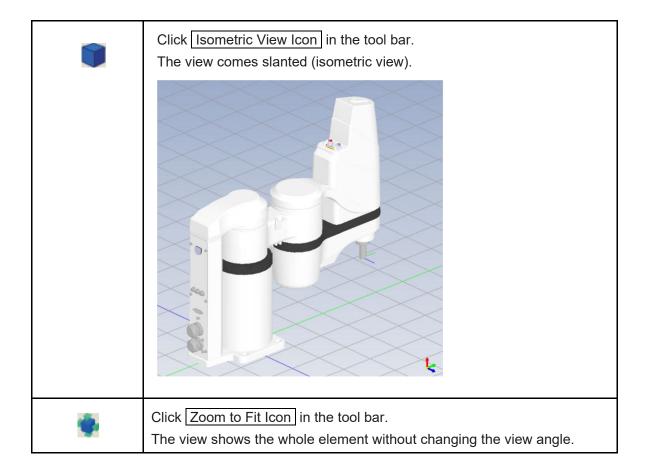
| Action                   | How to Operate   |
|--------------------------|--|
| Rotation                 | Press and hold Alt Key and press the left button and drag.         |
| Panning                  | Press and hold Ctrl Key and press the left button and drag.        |
| Zooming                  | Press and hold Ctrl + Alt Keys and press the left button and drag. |
| Changing Rotation Center | Press and hold Ctrl + Alt Keys and click the left button.          |

[3] Normal Camera Work from Tool Bar

|   | Click Front View Icon in the tool bar.<br>The view confronts the ZX plane. |
|---|--|
|   |  |
| Ū | Click Right View Icon in the tool bar.<br>The view confronts the ZY plane. |
|   |  |







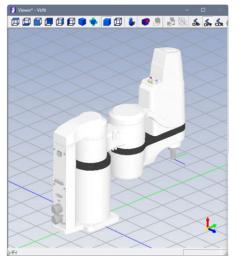
# 14.4.2 View Operation (Walkthrough Mode)

[1] Switching to Walkthrough Mode

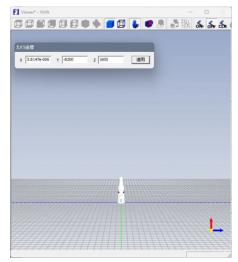
Click "Walkthrough Icon"

During Walkthrough Mode, the icon is kept pressed.

Click on the icon while it is pressed, it gets back to the normal mode.



Normal Mode



Walkthrough Mode

[2] View Operation Using a Wheel Mouse (3-button Mouse)

| Action   | How to Operate  |  |  |
|--|---|--|--|
| Panning (XY plane)   | Press the left button and drag it.<br>For a wheel mouse, turn the wheel to move back and forth. |  |  |
| Vertical Move (Z direction) Press and hold the wheel button (middle button) and dr |   |  |  |
| Camera Rotation  | Press the right button and drag it.   |  |  |

[3] View Operation in Camera Coordinate Window

Input numbers in camera coordinate window and click Apply.

| x -50 | Y -800 | Z 200 | Apply |
|-------|--------|-------|-------|

Fig. 14.10 Camera Coordinate Window

The view moves to the point of coordinates that was input.



# Caution

• Moving the mouse pointer in the view area during number input should cancel the input.

## 14.4.3 Locus drawing

The locus of the vertical axis tip can be displayed. If the SCARA tool coordinate system offset in the coordinate system definition data is set up, the amount of offset is considered in the display.

[1] Turning on Locus drawing

Click Locus Display Activated Icon .

The locus of the tip of the vertical axis gets plotted in response to the robot animation. The locus display shows a certain amount of movement and disappears from the older.

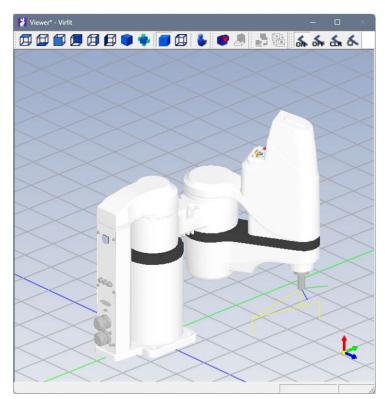


Fig. 14.11 During Locus drawing

# $\triangle$

# Caution

- The pitch of robot locus plotting may get longer in such conditions as described below:
  - Robot movement speed high
  - View changed
  - PC performance is low
  - Another application in operation

etc.

Click Locus Display Inactivated Icon 😽

Locus drawing stops.

Click Locus Display Clear Icon 🔬 .

The displayed locus are cleared up.

Click Locus Display Setup Icon 💰

Color and line width of locus and show/hide of robot is to be set up.

| Robot Numbe | er Display | Color    |       |           |  |
|-------------|------------|----------|-------|-----------|--|
|             | Display    | Settings | Line  | Settings  |  |
|             | Robot      | Locus    | Color | Width(pt) |  |
| Robot 1     | <b>~</b>   | <b>I</b> |       | 1.000     |  |

Fig 14.12 Locus Display Settings

\* Robot Number Display Color: Color of "Robot 1" displayed on the 3D view robot in the locus display setup window

To change color, click on the colored portion and a color setting window pops up. Select a desired color and click OK.

| Color                   |
|-------------------------|
| Basic colors:           |
|                         |
|                         |
|                         |
|                         |
|                         |
|                         |
| <u>C</u> ustom colors:  |
|                         |
|                         |
| Define Custom Colors >> |
| OK Cancel               |

Fig. 14.13 Color

Line width can be changed in the range from 0.1 to 10.0.

# 14.4.4 Other Displays

[1] Lettering Mode

Display format of an object can be changed.

- ♦ Solid
  - Click Solid Display Icon

During the solid display, the icon is kept pressed.

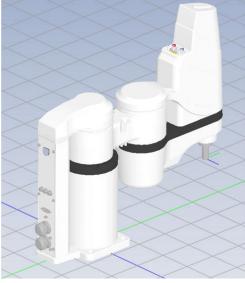


Fig. 14.14 Solid Display

♦ Wireframe

Click Wireframe Display Icon 🕅 .

During the wireframe display, the icon is kept pressed.

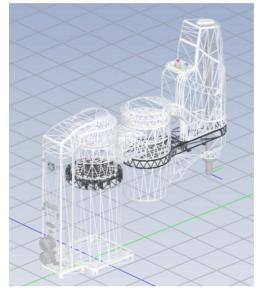


Fig. 14.15 Wireframe Display

# 14.5 Operation on PC Software

The functions described in Chapters from 4 to 13 are available to use while the simulator is connected. However, in Chapter 12, [12.3 Axis Setting], [12.5 Request Drive Power Recovery] and [12.6 Setting Time] cannot be used.

# 14.5.1 Flash ROM Writing Operation

Conducting flash ROM writing operation in the PC software should make each type of data (program data, position data, symbols, coordinate system definition data and parameters) recorded in the hard disk in the PC. The recorded data is available for simulation in the next startup. However, when the robot model is changed in the robot select window at the startup, each type of data (program data, position data, symbols, coordinate system definition data and parameters) will get initialized.

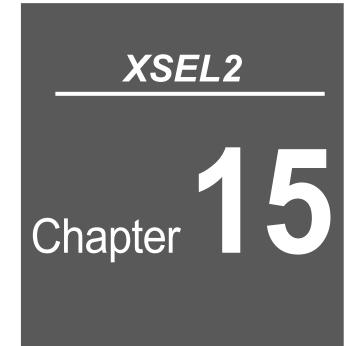
# 14.5.2 Operation of Software Reset

Conducting an operation of software reset in the PC software should bring the robot current position data back to the initial position.

# 14.6 SEL Commands not Applicable for Simulation

Shown below are those with different behaviors between controller and simulator in SEL Commands.

| No. | Feature                  | Command                      | Explanation   |
|-----|--------------------------|------------------------------|---|
| 1   | Pressing                 | PUSH                         | As there is nothing to push against, always finishes with miss-pressing.  |
| 2   | Communication            | OPEN/CLOS/READ/<br>WRIT/TMRW | Moves on to the next step without conducting<br>communication process.<br>The output part should be set, but return codes or<br>received messages should not be set.<br>In case of debugging READ Command, set the<br>received message in advance to executing READ<br>Command. |
| 3   | Expansion<br>Command     | ECMD 1/ECMD 10               | The value read out always comes "0".  |
| 4   | 4 Task Level Change CHPR |                              | This software runs on Windows and strict level change operation cannot be performed.  |
| 5   | Vision System I/F        | SLVS/GTVD                    | Go to the next step without having the vision<br>system I/F process conducted.<br>Even though the output part should get set, other<br>data should not be set.  |



# EC teaching tool

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|------|----------|---|--|--|--|--|
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|------|---------|---------------------------------------|----------|
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# 15.1 Overview

The EC teaching tool is used to perform teaching for an ELECYLINDER axis connected to an XSEL2-T/TX.

# 15.2 How to Startup

Select "EC (E)"  $\rightarrow$  "Teaching tool (T)" from the main menu of the XSEL PC software. The following connected axis check window is displayed during startup. "Connected" will be displayed for any axes confirmed to be connected, while others will be blank. (Only axes recognized by the XSEL2-T/TX will be checked.)

| Check for connected axes |           |  |  |
|--------------------------|-----------|--|--|
| Axis No. Status          |           |  |  |
| 3                        | Connected |  |  |
| 4 (Checking)             |           |  |  |

Fig. 15.1 Check for connected axes

Once the connected axes have been confirmed, the main window will be displayed.

|   |          | Main menu    |                                      |   |    |
|---|----------|--------------|--------------------------------------|---|----|
| C PC Interface Software for XSEL(EC Teaching Tool)  | <u> </u> |              |                                      |   | ×  |
| File Position Parameter Monitor Setting Window  |          |              |                                      |   |    |
|   |          | Safety speed | effective(I/O directive prohibition) | ⊡ |    |
| <pre>XSEL2-T Axis No.1 <ec-s3m-200> [EC] Axis No.1 <ec-s3m-200> [EC] Axis monitor CTL alarm list Velocity/Current Axis No.2[EC-T] Tree view CTL alarm list Velocity/Current Maintenance Information Maintenance Information</ec-s3m-200></ec-s3m-200></pre> | 1<br>C   | Tool buttons |                                      |   |    |
|   |          |              |                                      |   | 11 |

☑ 15.2 Main window of PC software for XSEL

# 15.3 Main menu

# 15.3.1 Operation using the main menu

#### (1) File

- "Open" Reads position data or parameters from a file.
- 2) "Close" Closes the file.
- 3) "Load to CTL" → "Position" Writes position data from the file to the controller.
- 4) "Load to CTL" → "Parameter"
   Writes parameters from the file to the controller.
- "Backup" → "Save all data"
   Saves all position data and parameters from the controller to a file.
- 6) "Backup" → "Load all data"
   Transfers all position data and parameters from a file to the controller.
- "Backup" → "Print Backup Data"
   Prints backup data.
- 8) "Backup" → "Edit parameter"
   Allows parameters from a backup file to be edited on the parameter editing window.
- 9) "Backup" → "Edit position data" Allows position data from a backup file to be edited on the position editing window.
- 10) "Backup"  $\rightarrow$  "Back up multi axes" Saves position data and parameters for axes select

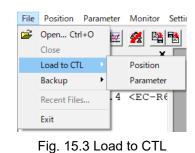
Saves position data and parameters for axes selected from multiple connected axes to individual backup files.

- 11) "Backup" → "Restore multi axes"
   Transfers position data and parameters from a file to the selected folder.
- 12)"Recent Files"

Displays a list of recently loaded files. A file can be selected and read from this list.

13)"Exit"

Exits the application.



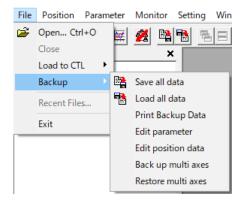


Fig. 15.4 Backup

#### (2) Position

1) "Edit/Teaching"

Reads position data from the controller in order to edit data or perform teaching.

- 2) "Load to CTL"Transfers (writes) edited position data to the controller.
- 3) "Print"

Prints position data being edited.

#### (3) Parameter

1) "Edit"

Reads parameters from the controller for editing.

- 2) "Load to CTL" Transfers (writes) edited parameters to the controller.
- 3) "Print"

Prints parameters being edited.

#### (4) Monitor

1) "Status"

Allows the status of each axis (axis status, internal flags, input/output ports) to be viewed.

Refer to [Status monitor window].

- "CTL alarm list"
   Displays the controller alarm list window.
   Refer to [Controller alarm list window].
- "Velocity/Current"
   Displays the velocity/current monitor window.
   Refer to [Velocity/current monitor window].
- 4) "Maintenance info"Displays the maintenance information window.Refer to [Maintenance information window].

| Posi | tion          | Parameter |  |
|------|---------------|-----------|--|
| ð    | Ædit/Teaching |           |  |
|      | Load to CTL   |           |  |
|      | Print         |           |  |

Fig. 15.5 Position tab



#### Fig. 15.6 Parameter tab

| atus               |              |  |  |
|--------------------|--------------|--|--|
|                    |              |  |  |
| CTL alarm list     |              |  |  |
| 😾 Velocity/Current |              |  |  |
| aintenance         | info         |  |  |
|                    | locity/Curre |  |  |

Fig. 15.7 Monitor tab

- (5) Setting
  - 1) "Application"

Allows application settings to be configured. Refer to [Application setting window].

2) "Controller"  $\rightarrow$  "Disconnect" Disconnects connected axes and closes the

application.

"Controller"  $\rightarrow$  "Software reset"

Resets (restarts) the software.

"Controller"  $\rightarrow$  "Actuator replacement"

e reset" software.

Resets maintenance information total moving count, total moving distance to "0".

"Controller"  $\rightarrow$  "Clear Pairing ID"

Clears the pairing ID of a controller compatible with a battery-less absolute controller.

Enter 5119 as the password and then click OK.

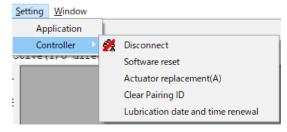
(Note) If an actuator motor is replaced, be sure to perform home return without clearing the pairing ID.

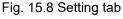
The home position will not be set if home return is not performed.

"Controller"  $\rightarrow$  "Lubrication date and time renewal"

Sets the current time as the "lubrication time" displayed on the maintenance information window, and resets the total moving distance after lubrication to "0".

(Note) This is available only if the actuator recognition function is supported.





#### (6) Window

- "Cascade" Displays windows cascaded.
- "Horizontal" Displays windows arranged horizontally.
- "Vertical"
   Displays windows arranged vertically.
- 4) "Arrange icons" Arranges windows displayed as icons (minimized).
- "Minimizing" Switches all windows to icons (minimized).
- "Normalizing" Reverts all windows switched to icons (minimized) as windows.
- Close all" Closes all open windows.
- "Font size" → "Largest"/"Larger"/"Medium"/"Smaller"/"Smallest" Allows the font size on each window to be changed.
- "Tree View" Shows/hides the tree view.

| <u>W</u> in    | dow           |     |           |
|----------------|---------------|-----|-----------|
|                | Cascade       | 1   |           |
| $\blacksquare$ | Horizontal    |     |           |
|                | Vertical      | hil | oition) 🔻 |
|                | Arrange icons |     |           |
|                | Minimizing    |     |           |
|                | Normalizing   |     |           |
|                | Close all     |     |           |
|                | Font size     |     | Largest   |
| $\checkmark$   | Tree View     | ~   | Larger    |
| _              |               |     | Medium    |
|                |               |     | Smaller   |
|                |               | _   | Smallest  |

#### Fig. 15.9 Window tab

# 15.3.2 Operation using the tool buttons

| 1)       2)       3)       4)       5)       6)       7)       8)       9)       10)       11)       12)       13)  |
|---|
| Image: Safety speed effective (I/O directive prohibition)   |
| 1) Open file<br>This is the same as selecting "File" $\rightarrow$ "Open".  |
| <ol> <li>Edit/teach position data</li> <li>This is the same as selecting "Position" → "Edit/Teaching".</li> </ol>   |
| 3) Edit parameters<br>This is the same as selecting "Parameter" $\rightarrow$ "Edit".   |
| 4) Status monitor This is the same as selecting "Monitor" $\rightarrow$ "Status".   |
| 5) Controller alarm list This is the same as selecting "Monitor" $\rightarrow$ "CTL alarm list".  |
| 6) Speed/current<br>This is the same as selecting "Monitor" $\rightarrow$ "Speed/Current".  |
| 7) Disconnect<br>This is the same as selecting "Setting" $\rightarrow$ "Controller" $\rightarrow$ "Disconnect".   |
| 8) Save all data This is the same as selecting "File" $\rightarrow$ "Backup" $\rightarrow$ "Save all data".   |
| 9) Transfer all data This is the same as selecting "File" $\rightarrow$ "Backup" $\rightarrow$ "Load all data".   |
| * Items that are dimmed cannot be selected.   |
| 10)Display windows cascaded This is the same as selecting "Window" $\rightarrow$ "Cascade".   |
| 11)Display windows arranged vertically This is the same as selecting "Window" $\rightarrow$ "Vertical".   |
| 12)Display windows arranged horizontally This is the same as selecting "Window" $\rightarrow$ "Horizontal".   |
| <ul> <li>13)Enables or disables the safety speed.</li> <li>* This is enabled when the controller switch is set to manual (MANU).</li> <li>* This selection will be enabled if "EC I/O directive prohibition" is specified in the XSEL PC software.</li> </ul>     |
| <ul> <li>Safety speed effective (I/O directive prohibition)         The maximum speed will be the speed set in the parameters, regardless of the position data speed specification.     </li> <li>Safety speed ineffective (I/O directive prohibition)</li> </ul> |
|   |

#### 15.3.3 Tree view

Select "Window"  $\rightarrow$  "Tree View" from the main menu.

```
XSEL2-T

Axis No.1 <EC-S3M-200> [EC]

Position data

Parameter

Status monitor

CTL alarm list

Velocity/Current

Maintenance Information

Fig. 15.10 Tree view
```

Axis No.1 <EC-S3M-200>

The axis numbers and axis names are displayed.

A light blue icon will be displayed if the connection is normal, while a red icon will be displayed if there is an error.

\* Items displayed on the application setting window can be modified.

```
2) 🖉 Position data
```

Double-click this to open the simple data setting window.

(Note) The simple data setting window and parameter editing window cannot be opened at the same time.

3) 📲 Parameter

Double-click this to open the parameter editing window.

4) 🖳 Status monitor

Double-click this to open the status monitor window.

5) 🛅 CTL alarm list

Double-click this to open the controller alarm list window.

Welocity/Current

Double-click this to open the velocity/current monitor window.

7) Maintenance Information

Double-click this to open the maintenance information window.

## 15.3.4 Axis selection

To perform an operation such as position editing, select the corresponding axis number on the select axis window.

Axis numbers that can be selected are displayed in the "Connected axes" box.

Move the cursor and click > to select a viable axis, and then click  $\overline{OK}$ . To select all axes, click >> and then click  $\overline{OK}$ .

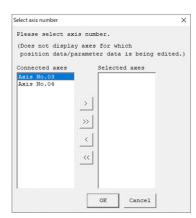


Fig. 15.11 Axis selection



# Caution

• Numbers for axes that are already open on the "Parameter editing window" or "Simple data setting window" will not be displayed. To select such an axis, first close the applicable window.

# 15.4 Simple data setting window

Either select "Position"  $\rightarrow$  "Edit/Teaching" from the main menu, or double-click Position data in the tree view to display the simple data setting window.

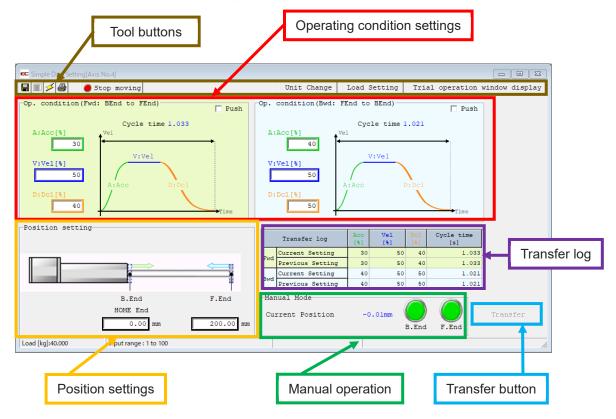


Fig. 15.12 Simple data setting window

# Caution

• If the simple data setting window is open for an axis, the parameter editing window for the same axis cannot be opened.

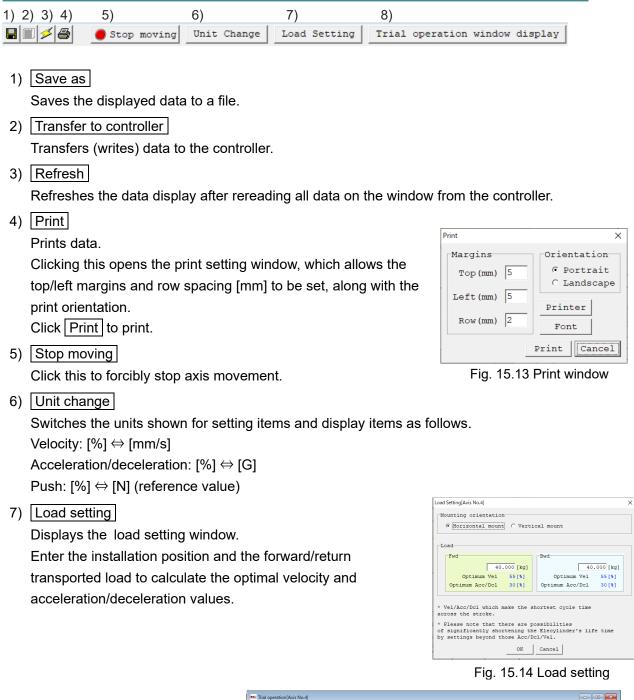
The simple data setting window is used to configure operating conditions (velocity, acceleration, deceleration, push force) and position settings (forward end, backward end, pushing start point) display the current position, cycle time, settings log and perform manual operation.

Operating condition data and position setting data configured here will be valid after being transferred to the controller.

- This can be transferred using either of the following operations.
- Click Transfer on the bottom right corner of the window.
- Click the 🔟 icon (transfer to controller button) in the tool buttons area.

Manual operation will be performed after transferring data to the controller.

# 15.4.1 Tool buttons



 Trial operation window display
 Displays the trial operation window.

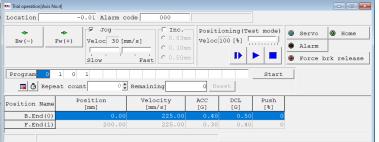
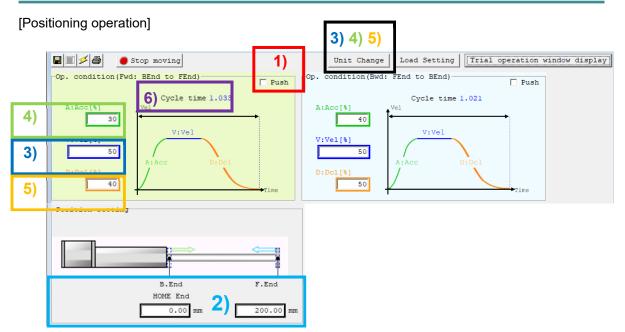


Fig. 15.15 Trial operation window



# 15.4.2 Operating condition settings, position settings

Fig. 15.16 Positioning operation

| <ol> <li>Push checkbox:</li> </ol> | If the push checkbox is not selected ( $\Box$ ), a positioning operation will be |
|------------------------------------|--|
|                                    | performed.   |
| 2) Position setting [mm]:          | Enter the backward end and forward end values.                                   |
|                                    | Enter the position from home as a positioning coordinate value.                  |
|                                    | The unit used is [mm], and the value can be entered up to two positions          |
|                                    | after the decimal point.   |
|                                    | The unit used for EC rotary type actuators [degrees/s], and the value can        |
|                                    | be entered up to two positions after the decimal point.                          |
| 3) Velocity [%] or [mm/s]:         | Set the positioning operation velocity.  |
|                                    | This can be set as a number from 1% to 100%.                                     |
|                                    | The unit can be switched to [mm/s] by pressing Unit Change.                      |
|                                    | When set to [mm/s], the value can be entered up to two positions after the       |
|                                    | decimal point.   |
|                                    | The unit used for EC rotary type actuators [degrees/s], and the value can        |
|                                    | be entered up to two positions after the decimal point.                          |
|                                    | (Note) Use the following equation to calculate the minimum velocity.             |
|                                    | Minimum velocity [mm/s] = Lead length [mm] ÷ 800 ÷ 0.001 [s]                     |
| 4) Acceleration [%] or [G]         | : Set the acceleration when movement starts.                                     |
|                                    | This can be set as a number from 1% to 100%.                                     |
|                                    | The unit can be switched to [G] by pressing the Unit Change.                     |
|                                    | When set to [G], the value can be entered up to two positions after the          |
|                                    | decimal point.   |
|                                    |  |

| 5) Deceleration [%] or | [G]: Set the deceleration when movement stops.                              |
|------------------------|---|
|                        | This can be set as a number from 1% to 100%.                                |
|                        | The unit can be switched to [G] by pressing the Unit Change.                |
|                        | When set to [G], the value can be entered up to two positions after the     |
|                        | decimal point.  |
| 6) Cycle time [s]:     | The displayed cycle time is calculated from the set velocity, acceleration, |
|                        | and deceleration.   |

#### [Push operation]

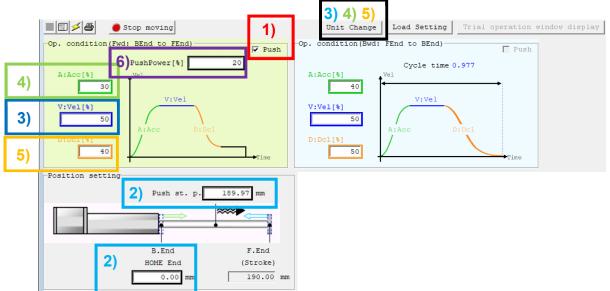


Fig. 15.17 Push operation

| <ol> <li>Push checkbox:</li> <li>Position setting [mm]:</li> </ol> | If the push checkbox is selected ( $\square$ ), a push operation will be performed.<br>Set the movement start position (forward end or backward end) and<br>pushing start position.   |
|--|---|
|  | Enter the position from home as a positioning coordinate value.<br>The unit used is [mm], and the value can be entered up to two positions<br>after the decimal point.<br>The unit used for EC rotary type actuators [degrees/s], and the value can |
|  | be entered up to two positions after the decimal point.   |
| 3) Velocity [%] or [mm/s]:   | Set the velocity up to the movement start position (forward end or backward end) and pushing start position.  |
|  | This can be set as a number from 1% to 100%.  |
|  | The unit can be switched to [mm/s] by pressing the Unit Change.   |
|  | When set to [mm/s], the value can be entered up to two positions after  |
|  | the decimal point.  |
|  | The unit used for EC rotary type actuators [degrees/s], and the value can   |
|  | be entered up to two positions after the decimal point.   |
|  | (Note) Use the following equation to calculate the minimum velocity.  |
|  | Minimum velocity [mm/s] = Lead length [mm] ÷ 800 ÷ 0.001 [s]  |
| 4) Acceleration [%] or [G]   | : Set the acceleration when movement starts.  |
|  | This can be set as a number from 1% to 100%.  |
|  | The unit can be switched to [G] by pressing the Unit Change.  |
|  | When set to [G], the value can be entered up to two positions after the   |
|  | decimal point.  |

| 5) | Deceleration [%] or [G]: | Set the deceleration up to the pushing start position.                     |
|----|--------------------------|--|
|    |                          | This can be set as a number from 1% to 100%.                               |
|    |                          | The unit can be switched to [G] by pressing the Unit Change.               |
|    |                          | When set to [G], the value can be entered up to two positions after the    |
|    |                          | decimal point.   |
| 6) | Push [%] or [N]:         | Set the push torque (current limit value) as a [%] or [N] value.           |
|    |                          | The push velocity will be 20 mm/s.   |
|    |                          | This will be 20 degrees/s for EC rotary type actuators.                    |
|    |                          | If the set velocity is 20 mm/s or less (20 degrees/s or less for EC rotary |
|    |                          | type actuators), pushing will be performed at the set velocity.            |
|    |                          | The unit can be switched to [N] (reference value) by pressing the          |
|    |                          | Unit Change .  |

# 15.4.3 Manual operation

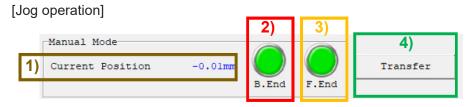


Fig. 15.18 Manual operation (Jog operation)

- 1) Current Position [mm]: Displays the current position.
- B.End: Moves toward the backward end as long as the button is pressed. Movement stops when the button is released or the backward end LS signal switches ON.
- F.End: Moves toward the forward end as long as the button is pressed.
   Movement stops when the button is released or the forward end LS signal switches ON.
  - (Note) Backward end and Forward end can only be used when they are green. If they are not green, it means that the setting values have not yet been transferred. They will need to be transferred to the controller first.
- 4) Transfer: Transfers data that has been set changed to the controller.
   \* This will be dimmed when a jog operation can be performed.

# 15.4.4 Transfer log

|     | Transfer log     | Acc<br>[%] | Vel<br>[%] | Del<br>[%] | Cycle time<br>[s] |
|-----|------------------|------------|------------|------------|-------------------|
| -   | Current Setting  | 30         | 50         | 40         | 1.033             |
| Fwd | Previous Setting | 30         | 50         | 40         | 1.033             |
|     | Current Setting  | 40         | 50         | 50         | 1.021             |
| Bwd | Previous Setting | 40         | 50         | 50         | 1.021             |

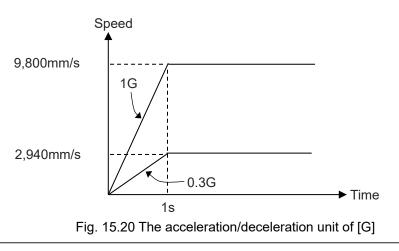
Fig. 15.19 Transfer log

When data is transferred to a controller and the forward movement or backward movement operating conditions (velocity, acceleration/deceleration, push) have been set changed, the previous setting values are displayed in the Previous Setting area, while the new setting values are shown in the Current Setting area. The cycle time calculated from these setting values is also displayed.

If a push operation was selected as an operating condition, the previous setting values and current setting values will not be displayed.

# Reference

- The acceleration/deceleration unit of [G] is described below.
  - 1G = 9,800 mm/s<sup>2</sup>: Acceleration possible up to 9,800 mm/s per second.
  - For 0.3G, the acceleration per second is 9,800 mm/s<sup>2</sup> x 0.3 = 2,940 mm/s<sup>2</sup>.



# Caution

 Reduce acceleration/deceleration if any shock or vibration is generated in the actuator or workpiece.

Continuing use in such a situation could drastically reduce operation life.

# 15.4.5 Automatic Servo OFF Function

#### [1] Overview

Automatic Servo OFF Function of ELECYLINDER can be set up.

With automatic servo OFF function, the servo turns OFF automatically after a certain period of time once (delay time) positioning is completed.

Conduct the next movement command input and the servo should turn on automatically and the positioning operation should be executed.

Since holding current does not flow during the stop, power consumption can be reduced.

#### [Push operation]

When it is necessary to have the push operation performed, do not set up Automatic Servo OFF Function.

Once ST Signal turns off after the pressing completed, Automatic Servo OFF Function should be activated and the servo gets turned off.

EC auto servo OFF supported version: V14.02.03.00 or later

[2] Setting

Below explains how to set it up.

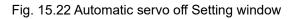
- **1.** Click Automatic servo off Setting on the simple data setting window.
  - The simple data setting window should be displayed.

| Single Data Setting(Asis Na 3) | Automatic servo | off Setting Unit Change  | Load Lettin   | I Trial             | operation a                    | andow display |
|--------------------------------|-----------------|--|---|---------------------|--------------------------------|---------------|
| Op. condition(Ded) MEnd to     | 0               | Push Cp. condition (Bud  |   |                     | [ Fush                         |               |
| Cyc<br>A(Aor(9) Tel            | tie time 1. Q   | AsAou(b)   | Cycle tis   | ne 1.018#           |                                |               |
|                                | VeVe)           |  | Vitel   | ~                   | -                              |               |
| VIVe1(8)                       |                 | ViVe1[8]   |   | 1                   |                                |               |
| DiDel(6) AtAcc                 | B(De)           | D:Dd1(4)   | ASROC   | DiDel               |                                |               |
|                                |                 |  |   |                     |                                |               |
|                                |                 | 14   | <u>/</u>  | 1                   | These                          |               |
| Fosition setting               |                 | 100  | ¥   |                     | - tra                          |               |
|                                |                 | Transfer log   |   |                     | Cycle sime                     |               |
|                                |                 | Transfer log   | 100 (60)  | 10 4                | 1.010                          |               |
|                                |                 | Transfer log<br>Fed Derrest Settin<br>Fersions Settin                                      | 1 4<br>1 4<br>12 4  | 1 4                 | 1x3<br>1.010<br>9.521          |               |
|                                |                 | Transfer log Transfer log Transfer log Transfer log Correct Setting Concern Setting        | 1 (4)<br>1 4<br>12 4<br>13 4<br>14  | 10 4<br>1 4<br>17 4 | 143<br>1.818<br>9.521<br>1.919 |               |
|                                |                 | Transfer log<br>Fed Derrest Settin<br>Fersions Settin                                      | 1 (4)<br>1 4<br>12 4<br>13 4<br>14  | 1 4                 | 1x3<br>1.010<br>9.521          |               |
|                                | B.Bed F.E       | Transfer log<br>Transfer log<br>Tod Orrean Sension<br>Previous Sension<br>Previous Sension | 1 (4)<br>1 4<br>12 4<br>13 4<br>14  | 1 4                 | 143<br>1.818<br>9.521<br>1.919 |               |
| Fosition setting               | D. End P. E     | Transfer log<br>Transfer log<br>Tod Orrean Sension<br>Previous Sension<br>Previous Sension | 1 (4)<br>1 4<br>12 4<br>12 4<br>12 4<br>12 4<br>13 4<br>14 1<br>14 14 1<br>14 1 | 1 4                 | 143<br>1.818<br>9.521<br>1.919 |               |



2. Set the duration from the time after positioning complete until Automatic servo OFF, the Automatic servo off setting window.

| Automatic servo off Setting[Axis No.5]               |          |           | >              |
|--|----------|-----------|----------------|
| Set the data related to the Automat                  | ic servo | off func  | tion.          |
| Name   | Fwd      | Bwd       |                |
| Automatic servo off delay time [s]                   | 0.0      | 0.0       |                |
| * The function is disabled when "Au<br>set to "0.0s" | atomatic | servo off | delay time" is |
|  |          |           | OK             |
| Input range : 0.0 to 9999.9                          |          |           |                |

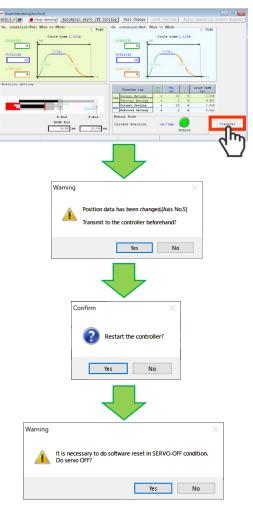


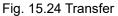
- Input for both the way forth (forward) and the way back (backward).
- The Automatic servo off delay time can be set in unit of 0.1 second.
- **3.** Input the Automatic servo off delay time, and click OK.
  - Set it to "0.0" and this function will inactivated. (The servo will not turn off.)

| Set the data related to the Automa                  | tic servo off function.       |
|---|-------------------------------|
| Name  | Fwd Bwd                       |
| Automatic servo off delay time [s]                  | 1.5 3.0                       |
| * The function is disabled when "A<br>set to "0.0s" | utomatic servo off delay time |
| Input range : 0.0 to 9999.9                         |                               |

Fig. 15.23 Input the Automatic servo off delay time

**4.** After returning to the Easy Data Setup window, click <u>Transfer</u> and proceed with the settings according to each dialog box.







# Caution

- Changing parameters only should not enable the changes made.
- Conduct reboot of the power or software reset after a change is made. After ELECYLINDER is started up, the parameter changes should become enable.
- Do not attempt to turn the power off during the setting transfer. Doing so may damage the controller.
- Do not use Automatic servo OFF function with push operation. When the push operation is conducted, it should be effective only when the pressing is missed.
   (Operation complete without touching subject = same condition as completion when positioning)
- There is no holding torque during Automatic servo off. The actuator will move if external force is applied. Please be careful about interference and safety when setting up.
- Automatic servo off functions only when the controller is in AUTO mode.

# 15.5 Parameter editing window

This window is used to edit parameter data read from a controller or file.

\* Displayed content will vary depending on the model.

| No<br>1 | Name<br>Operation Range Adjustment   | Value<br>200.00 |      |
|---------|--|-----------------|------|
|         | AutSwitch"LS" Signl Detctn Rng Adjst   |                 |      |
| 3       | HOME Direction Change  | 1:Default       |      |
| 4       | HOME Position Adjustment   | 2.00            |      |
| 5       | Smooth accel/decel Setting   | 0:Disable       |      |
| 6       | Current control setting while stop   | 0:Disable       | 2    |
| 7       | (For future expansion)   | 0               | 2    |
| 8       | (For future expansion)   | 0               |      |
| <br>(i) | Actuator operation range (stroke) ad<br>Please do not input the value longer<br>It may cause damage to the unit. |                 | oke. |

Fig. 15.25 Parameter editing window



# Caution

• If the parameter editing window is open for an axis, the simple data setting window for the same axis cannot be opened.

#### 1) Tool buttons

H Save as

Saves parameter data to a file.

#### Transfer to controller

Transfers parameter data to the controller. Once parameters have been transferred, a window confirming whether to restart the controller (software reset) will be displayed.

#### 4 Print

Prints parameter data.

#### 2) Editing area

Used to edit parameters.

For items that allow a value to be selected, clicking to the right of the item will display a list of options in a pull-down menu. Click the option you wish to set.

After editing, closing without transferring data to the controller will cause any changes to be reverted.

#### 3) Explanation area

An explanation of the selected item is displayed here.

# **15.6 Monitor Window**

These windows are used to monitor various statuses, the controller error list, and velocity/current waveforms.

## **15.6.1 Status monitor window**

Either select "Monitor"  $\rightarrow$  "Status" from the main menu, or double-click <u>Status monitor</u> in the tree view to display the status window.

|    | Status monitor[Axis No.3    | <b>3)</b><br>No ripple co | · · · · · · · · · · · · · · · · · · · | t      |                               |
|----|-----------------------------|---------------------------|---------------------------------------|--------|-------------------------------|
|    | Axis status<br>Location[mm] | 0.00                      | Internal flags                        | Servo  | Current<br>Cur. cmnd (mA) 751 |
| 1) | Speed[mm/s]                 |                           | Home Cmplt 2)                         | RUN    | Cur. ratio(%) 62.6<br>3)      |
|    | Cycle time[s]               | 0.000                     |                                       |        |                               |
|    | Input                       |                           | Output                                |        |                               |
|    | No. Name St                 | tatus                     | No. Name                              | Status |                               |
| 4) | 00 Backward                 | OFF                       | 00 Bwd. End[LS0]                      | OFF5)  |                               |
| 11 | 01 Forward                  | OFF                       | 01 Fwd. End[LS1]                      | OFF    |                               |
|    | 02 Alarm reset              | OFF                       | 02 Alarm[norm clos]                   | ON     |                               |

Fig. 15.26 Status monitor window

#### 1) Axis status

Displays the Location [mm], Speed (while moving) [mm/s], Alarm code, Cycle time [s], and Overload level [%].

2) Internal flags

| Power:      | ON/OFF status of controller main power supply |
|-------------|---|
| Servo:      | Servo command status                          |
| Home cmplt: | Home return complete flag (ON/OFF)            |
| RUN:        | Actual servo status                           |

3) Current

Displays the current command value [mA] and rated current ratio [%].

| Ripple compensation ( $\Box$ ):       | Displays the command value of the motor ripple compensation   |
|---------------------------------------|---|
|                                       | amount.   |
|                                       | This may be a larger value than the execution current in some |
|                                       | models.   |
| No ripple compensation ( $\square$ ): | Displays the command value with the motor ripple compensation |
|                                       | amount subtracted.  |
|                                       | The value will be close to the motor execution current.       |

- 4) Displays the ON/OFF status of the input data PIO input ports.
- Output data Displays the ON/OFF status of the PIO output ports.
- 6) I/O Test

Click <u>I/O Test</u> to display the Do output window. Click the port to output. Selecting the checkbox (☑) will force the signal ON.

| I/O Test[Axis No | .3]                   |      |            |
|------------------|-----------------------|------|------------|
|                  | forcibly<br>window is | -    | displayed. |
|                  | □ OUT 0 :             | LS0  |            |
|                  | □ OUT 1 :             | LS1  |            |
|                  | □ OUT 2 :             | *ALM |            |
|                  |                       |      |            |

Fig. 15.27 I/O Test

#### 15.6.2 Controller alarm list

Either select "Monitor"  $\rightarrow$  "CTL alarm list" from the main menu, or double-click CTL alarm list in the tree view to display the controller alarm list.

| 1)       | CTL alarm list[Axi | s No.4] |                |      |   |      | (    | - 0 -   |
|----------|--------------------|---------|----------------|------|---|------|------|---------|
|          | Data offic         | oroup   | oroab name     | 0000 | - 110 B B B B B B B B B B B B B B B B B B   | NALV |      | 1.2000  |
|          | detected last      | Other   | -              | FFF  | PowerUP No Error                            |      |      | ::      |
|          | History 1          | Other   | Inquiry        | 0A2  | Position data error when executing          | 1010 | 0001 | 0:23:33 |
|          | History 2          | Other   | Inquiry        | 0A2  | Position data error when executing          | 1010 | 0001 | 0:16:52 |
|          | History 3          | Other   | -              | FFF  | PowerUP No Error                            |      |      | ::      |
|          | History 4          | Other   | Inquiry        | 080  | Motion command while in SERVO-OFF condition |      |      | 0:06:06 |
|          | History 5          | Other   | Inquiry        | 080  | Motion command while in SERVO-OFF condition |      |      | 0:05:43 |
| <b>)</b> | History 6          | A       | Overload alarm | 0C1  | Servo error                                 |      |      | 0:02:48 |
| 2)       | History 7          | Α       | Overload alarm | 0C1  | Servo error                                 |      |      | 0:01:54 |
| 1        | History 8          | Other   | -              | FFF  | PowerUP No Error                            |      |      | ::      |
|          | History 9          | A       | Overload alarm | 0C1  | Servo error                                 |      |      | 0:02:06 |
|          | History 10         | A       | Overload alarm | 0C1  | Servo error                                 |      |      | 0:01:25 |
|          | History 11         | Other   | -              | FFF  | PowerUP No Error                            |      |      | ::      |
|          | History 12         | Other   | Inquiry        | 0A2  | Position data error when executing          | 1010 | 0001 | 0:34:24 |
|          | History 13         | Other   | Inquiry        | 0A2  | Position data error when executing          | 1010 | 0001 | 0:31:02 |
|          | History 14         | Other   | -              | FFF  | PowerUP No Error                            |      |      |         |

Fig. 15.28 Controller alarm list

#### 1) Tool bar

#### Save as

Saves the alarm list as a file (CSV format).

\* Files saved in this manner cannot be read by this application.

🞒 Print

Prints the alarm list.

#### 🗲 Refresh

Reacquires the alarm list from the controller and refreshes the display.

| 1 | Clear alarm list |  |
|---|------------------|--|

The alarm list is not cleared even if the power is turned OFF. The clear alarm list button can be used to clear the alarm list. Click Clear alarm list. A warning is displayed.

Click Yes to clear the alarm list.

#### 2) Alarm list display

Displays the most recently detected warning code, the last 31 alarm codes and addresses with execution data errors (for manufacturer use), detail codes, and occurrence times.

(Note) The power ON log (no error) indicates that the controller power was turned ON. It is not an error.

The occurrence time is indicated as the amount of time since the power ON log (no error) was generated.

#### 15.6.3 Velocity/current monitor window

Either select "Monitor"  $\rightarrow$  "Velocity/Current" from the main menu, or double-click Velocity/Current in the tree view to display the velocity/current monitor window.

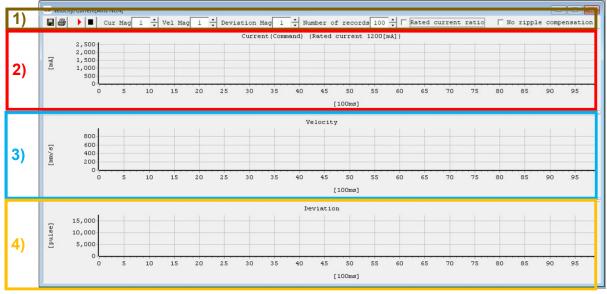


Fig. 15.29 Velocity/current monitor window

1) Tool

Save as

Saves the displayed current, velocity, and deviation data as a file (CSV format).

- \* Only the data displayed in the data display area will be saved.
- \* Files saved in this manner cannot be read by this application.

#### 🗃 Print

Prints the displayed current, velocity, and deviation data.

- Start monitoring Starts monitoring.
- Stop monitoring Stops monitoring.

"Cur Mag, Vel Mag, Deviation Mag" changed.

Changes the vertical axis magnification in the current, velocity, and deviation data display areas.



Number of records

Changes the number of horizontal axis records in the current, velocity, and deviation data display areas.

Rated current ratio checkbox

Changes the type of data displayed in the current data display area.

Unselected (
): Current value (command value) [mA]

Selected (☑): Rated current ratio displayed [%]

No ripple compensation checkbox

If the current data display graph is set to display the current value (command value), this will switch to displaying the current.

| Unselected (□): | Displayed with ripple compensation                            |
|-----------------|---|
|                 | Displays the command value of the motor ripple compensation   |
|                 | amount.   |
|                 | This may be a larger value than the execution current in some |
|                 | models.   |
| Selected (☑):   | Displayed without ripple compensation                         |
|                 | Displays the command value with the motor ripple compensation |
|                 | amount subtracted.  |
|                 | The value will be close to the motor execution current.       |

\* Default values can be set on the application setting window.

- 2) Current data display area
  - Current value (command value) displayed (rated current ratio checkbox unselected (□)) The current value (command value) [mA] is shown on the vertical axis, and the time since monitoring began 100ms is shown on the horizontal axis.
  - Rated current ratio displayed (rated current ratio checkbox selected (☑))
     The rated current ratio [%] is shown on the vertical axis, and the time since monitoring began 100ms is shown on the horizontal axis.

#### 3) Velocity data display area

The velocity [mm/s] is shown on the vertical axis, and the time since monitoring began 100ms is shown on the horizontal axis.

4) Deviation data display area

Deviation is the difference between the actual command pulse and the feedback pulse (actual position).

The deviation [pulse] is shown on the vertical axis, and the time since monitoring began 100ms is shown on the horizontal axis.

\* Current data and velocity data are obtained from the controller on an approximately 100ms cycle.

(The cycle at which data is obtained will vary depending on the number of connected axes.) Any fluctuations in current and velocity that occur during this cycle cannot be monitored accurately.

\* Monitoring will automatically stop if the horizontal axis reaches 65535.

#### **15.6.4 Maintenance information window**

Either select "Monitor"  $\rightarrow$  "Maintenance info" from the main menu, or double-click Maintenance Information in the tree view to display the maintenance information window.

| C Maintenance Information[Axis No.4]                              |                                     | <b>×</b>                    |  |
|---|-------------------------------------|-----------------------------|--|
| Operating noise   | e adjustment -Units of tota<br>[km] | al moving distance<br>C [m] | Switch between<br>displaying [km] or [m] |
| Current state   |                                     |                             |  |
| Total moving count  | 573 < < -                           | Send                        |  |
| Total moving distance[km]   | 0 < < ·                             | Send                        |  |
| Signal output timing setting                                      |                                     |                             | Maintenance information                  |
| Total moving count threshold                                      | 0 < < ·                             | Send                        | update data                              |
| Total moving distance threshold[km]<br>(Measure of grease supply) | 0 < < ·                             | Send                        |  |
| Overload warning level  | 100 < <                             | Send                        |  |
|   |                                     |                             |  |

Fig. 15.30 Maintenance information window

#### (1) Current state

Displays the total moving count and total moving distance of the actuator.

- Total moving count: Displays the total moving count of the actuator.
- Total moving distance: Displays the total moving distance of the actuator.

The unit displayed for total moving distance can be switched between [km] and [m].

\* This will be the back and forth count (back and forth operation between 0 degrees and 180 degrees) for EC rotary actuators

[Changing the total moving count and total moving distance]

The total moving count and total moving distance can be changed by entering a value for the maintenance information update data to the right and clicking <u>Send</u>. (You will need to enter the password.)

#### (2) Signal output timing setting

Displays the thresholds (target values) for total moving count and total moving distance. If the total moving count or total moving distance is set to a value other than "0", a message level alarm (maintenance warning 1, maintenance warning 2) will be displayed when that value is exceeded. [Changing the total moving count threshold and total moving distance threshold]

The total moving count threshold and total moving distance threshold can be changed by entering a value for the maintenance information update data to the right and clicking Send.

Overload warning level

When the motor estimated rise temperature at which an overload alarm occurs is 100% and the ratio set on this window exceeds the motor temperature, the green LED blinks to indicate an overload warning and the maintenance warning 3 window is displayed.

[Changing the overload warning level]

The overload warning level can be changed by entering a value for the maintenance information update data to the right and clicking <u>Send</u>.

No judgment will be made if this set to "100."

#### (3) Operating noise adjustment

Click Operating noise adjustment to display the operating noise adjustment window. The operating noise adjustment window allows the level to be set from 0 to 14 (1 to 9 for Ultra Mini ELECYLINDER).

If an abnormal sound is generated especially if a high tone abnormal sound is generated when stopped or operating at low velocity (50mm/s or less), increase the level and click Setting.

Doing so may prevent the abnormal sound from occurring.

However, setting the level too high could cause vibration.

(This should be adjusted by changing it one level at a time.)

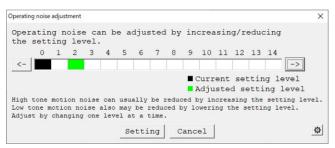
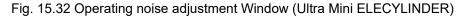


Fig. 15.31 Operating noise adjustment Window (Excluding Ultra Mini ELECYLINDER)

| Operating        |       | -    |      |      | n h | e 20  | 4411 | stor | 4     |        |     |      |      |     |     |       |      | ×   |
|------------------|-------|------|------|------|-----|-------|------|------|-------|--------|-----|------|------|-----|-----|-------|------|-----|
| by in            |       |      |      |      |     |       |      |      |       | pat    | te  | ern  |      |     |     |       |      |     |
|                  | 1     | 2    | 3    | 4    | 5   | 6     | 7    | 8    | 9     |        |     |      |      |     |     |       |      |     |
| <-               |       |      |      |      |     |       |      |      |       | _>     | •   |      |      |     |     |       |      |     |
|                  |       |      | •    | Cur  | ren | t se  | ett: | ing  | pat   | tern   | L   |      |      |     |     |       |      |     |
|                  |       |      |      | Adj  | ust | ed :  | set  | ting | g pa  | tter   | n   |      |      |     |     |       |      |     |
| Changi           | ing t | he o | pera | ting | spe | ed ma | ay r | educ | e the | e ope: | rat | ing  | noi  | se. |     |       |      |     |
| If thi<br>please |       |      |      | -    |     |       |      |      | ng me | ethod  | be  | efor | e us | ing | thi | s fun | ctio | on. |
|                  |       |      |      |      |     | Set   | tin  | ıg   | Ca    | ncel   |     |      |      |     |     |       |      |     |



### 15.7 Setting of application window

Select "Setting"  $\rightarrow$  "Application" from the main menu.

| tting of application         |                 | <u> </u>             |
|------------------------------|-----------------|----------------------|
| Start position of program    |                 | Top of the program 💌 |
| Input warning outside the re | commended range | Warn 💌               |
| Ripple compensation (current | monitor)        | Enable 🔻             |
| Axis name display setting    |                 | Setting              |
|                              | Change Password | ✓ OK X Cancel        |

Fig. 15.33 Setting of application window

#### (1) Start position of program

Click **\_** to select whether to start the simple program from the cursor position or from the top of the program.

(2) Input warning outside the recommended range

Click switch between showing and hiding the warning output when the input value being outside the recommended range could cause abnormal noise or vibration, when entering parameters or position data.

(3) Ripple compensation (current monitor)

This allows the default ripple compensation status to be set for the status window and velocity/current monitor.

| Setting  | Default ripple compensatio<br>velocity/current |                |
|----------|--|----------------|
| Enabled  | Ripple compensation                            | Unselected (□) |
| Disabled | No ripple compensation                         | Selected (☑)   |

(4) OK and cancel buttons

If any of the settings from (1) to (3) were changed, clicking  $\checkmark$  OK will save the changes as the default values for these items when the system is next started. To cancel making changes, click X Cancel.

#### (5) Axis name display setting

Click Setting to display the axis display window.

The names of axes displayed in the tree view, etc. can be set here.

| xis name display setting     | ×   |
|------------------------------|---|
| ee View with axis numbers    |   |
| Axis No.                     |   |
| Axis name                    |   |
| Axis No. + Axis name         |   |
| Tree View with model names   |   |
| Tree View with elapsed time  |   |
| ow Screen title axis         |   |
| Axis No.                     |   |
| Axis name                    |   |
| Axis No. + Axis name         |   |
| we file name initial display | $\sim$  |
| Axis No.                     |   |
| Axis name                    |   |
| Axis No. + Axis name         |   |
| OK Cancel                    |   |
|                              | ee View with axis numbers<br>Axis No.<br>Axis name<br>Axis no. + Axis name<br>Tree View with model names<br>Tree View with elapsed time<br>ow Screen title axis<br>Axis No.<br>Axis no.<br>Axis no.<br>Axis name<br>Axis No. + Axis name<br>ve file name initial display<br>Axis No.<br>Axis name |

Fig. 15.34 Axis display window

- 1) Tree View with axis numbers: Select how each axis on the tree view in the main menu is displayed. Select from axis number, axis name, or axis number with axis name.
- 2) Tree view with model names: Select whether to show or hide the controller name.
- 3) Tree view with elapsed time: Select whether to show or hide the elapsed time from when the controller started.
- 4) Show Screen title axis: Select what to display in addition to the screen title when screens such as the parameter editing screen and simple data setting screen are displayed. Select from axis number, axis name, or axis number with axis name.
- 5) Save file name initial display: Select the file name that is displayed initially when saving parameters or position data as a file. Select from axis number, axis name, or axis number with axis name.

#### [Setting/editing axis names]

To set or edit an axis name, right-click the applicable axis name in the tree view on the main screen to display a pop-up menu, and then open the axis name setting screen from the menu.

| 🖻 🖸 Axis No                | 3 KEC-S1       |   |
|----------------------------|----------------|---|
| 🖉 Posit                    | Edit axis name |   |
| Paramet                    | ter            |   |
| Axis name setting [Axis No | p.3]           | × |
|                            |                |   |
| EC-S3M-200                 | Setting        |   |

Fig. 15.35 Axis name setting window

An axis name may consist of up to 12 half-width characters (6 full-width characters).

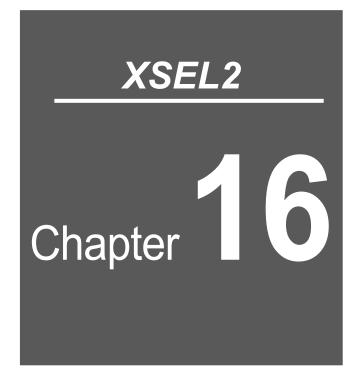
#### (6) Change password

A password can be set for opening the parameter editing screen and simple data setting screen. Follow the instructions below to change the password.

- 1) Click Change Password to open the Select Password screen.
- 2) To set a password for the parameter editing screen, select System Password.To set a password for the simple data setting screen, select Position edit Password.
- The password editing screen will be displayed. Enter the current password ("0000" by default) and new password, and then click OK.

| Select Passwo<br>© System Pass |          |       |
|--------------------------------|----------|-------|
| C Position ed                  | lit Pass | sword |
| OK                             | Car      | ncel  |
|                                |          |       |
| Current passw                  | ord      |       |
| New password                   |          |       |
| New password                   |          |       |
| (for confirma                  | tion)    |       |

Fig. 15.36 Change password



# Error Countermeasures

16.1 Display when Error Occurred ......16-1

## 16.1 Display when Error Occurred

When an error has occurred, an error countermeasure window should open in the default setting.

\* If it is required not to display an error countermeasure when an error has occurred, this feature can be deactivated in the menu "Tool" → "Environment Setting".

Click <u>Troubleshoot</u> in the error countermeasure window, and the error countermeasure window should be displayed. Follow the instruction in the window to remove the cause of the error.

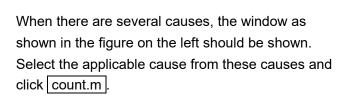
Click Troubleshoot .

| Err                   | Info Check mo       | del num. Contact Su | upport  |
|-----------------------|---------------------|---------------------|---|
|                       |                     |                     |   |
| Err descript          |                     |                     |   |
|                       |                     |                     |   |
| Err No. 6             | 51A                 | Err level           | Cold start  |
| Name Overlo           | ad error            |                     |   |
| outorn                | al force annlie     | d to the actuate    | led the rating, or the<br>or's slider part made the |
| overlo                | ad of the motor     |                     |   |
| Program No.: 3        | ad of the motor     | Position No.: 12345 | er verdestaar teelur •st stren useboleden Houze     |
| overlo Program No.: 3 | ad of the motor     | Position No.: 12345 | er verdensen verd i en seren sesetend have          |
| overlo Program No.: 3 | 123 Step No.: 12345 | Position No.: 12345 | Ax.No.: 1 Ax. group No.: 1<br>12345678h 1234567     |

Fig. 16. 1 Error countermeasure window



Fig. 16. 2 Err Info (Cause Classification)



\* This window should not appear when there is no several causes.

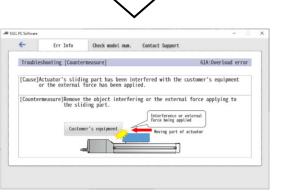
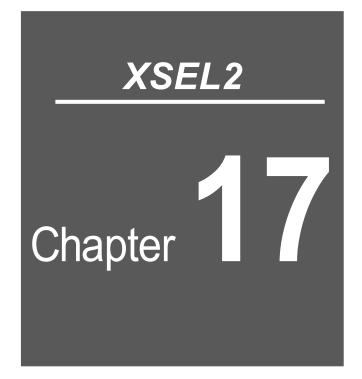


Fig. 16. 3 Err Info (Countermeasure)

As a countermeasure should be shown, follow the instruction in the window to remove the cause of the error.



# Appendix

| 17.1 | Error Level Control               |
|------|-----------------------------------|
| 17.2 | X-SEL PC Software Error Table17-2 |
| 17.3 | EC teaching tool error table      |

## 17.1 Error Level Control

The PC alarm levels are as shown below depending on the content of the error.

- Message Level: Error code No. 300 to 3FF
- Cold Start Level: Error code No. 700 to 7FF

## 17.2 X-SEL PC Software Error Table

(Errors specific to the PC Software are listed below. See the [XSEL2-TS/TL Controller Operation Manual] for controller errors.)

| Error<br>code | Error name                                   | Special note  |  |
|---------------|--|---|--|
| 304           | Undefined symbol usage for operand error     | An undefined symbol is used in Operand 1, 2 and output part (Operand 3) in a SEL command.   |  |
| 306           | Running program editing error                | An edit operation such as write, copy, move or clear<br>was conducted to a program in process. Finish the<br>process of the program applicable for edit and try<br>again.   |  |
| 307           | Symbol error                                 | <ol> <li>A character not permitted is used at the top of a symbol.</li> <li>An inappropriate character is included in a character string for a symbol.</li> <li>The same symbol is defined duplicated.</li> <li>The input exceeds the available number for symbol definition. Delete other symbols in advance to secure open area and try again.</li> <li>Edit of a symbol in a data number that a controller does not support or transferring to a controller is not available.</li> </ol> |  |
| 308           | Input condition undefined symbol usage error | An undefined symbol is used in the input condition of a SEL command.  |  |
| 30D           | Data edit error during non-manual mode       | Data edit operation (write, copy, move, clear, etc.) was attempted in a non-manual mode.  |  |
| 30E           | Input data error                             | There is an error in the input data. Check the input data.  |  |
| 30F           | Input value too small                        | A value that is below the range available for input was input.  |  |
| 310           | Input value too large                        | A value that is above the range available for input was input.  |  |
| 311           | Protected data error                         | <ol> <li>An operation should not be attempted to read out,<br/>copy or move to data prohibited to read out.</li> <li>An operation should not be attempted to write in,<br/>copy, move or clear to data prohibited to write in.</li> <li>An inappropriate value is set in a protection setting<br/>parameter (Other Parameter No. 55, 56 or Axes<br/>Group Parameters from No. 11 to 15).</li> </ol>   |  |
| 313           | Password error                               | There is an error in the input password. Input the correct password.  |  |
| 314           | Homing incomplete error (TP/PC)              | <ol> <li>Movement or continuous movement operation was<br/>attempted to an axis with the home-return operation<br/>incomplete. Finish the home-return operation in<br/>advance.</li> <li>Teaching (reading in current position) operation was<br/>attempted to an axis with the home-return operation<br/>incomplete. Finish the home-return operation in<br/>advance.</li> </ol>   |  |

| Error<br>code | Error name  | Special note  |
|---------------|---|---|
| 315           | Motion command during servo OFF                           | A movement command was executed to an axis with the servo off. Have the servo turned on in advance.   |
| 31A           | Absolute Reset execution condition unsatisfied error      | The conditions to execute an Absolute Reset is not yet<br>established.<br>(When prompt to execute AUTO Mode, etc.)  |
| 31B           | # of break point setting excess error                     | The number of breakpoint setting has exceeded the available number for setting. Cancel other breakpoints in advance and try again.  |
| 326           | Unsupported function error                                | It is an unsupported function.  |
| 329           | Insufficient blank steps error                            | There is no enough number of open steps in a controller.  |
| 32E           | Servo-on Encoder Error Reset<br>Prohibited Error          | The encoder reset should be conducted while the servo is off.   |
| 32F           | Execution Prohibited with No Safety<br>Circuit Error      | The condition to execute the function is not satisfied.<br>(When prompt to execute actuator operation or SEL<br>program with operation system command prohibited,<br>etc.)  |
| 380           | Can not change data being edited on-line                  | Data change operation was conducted while the online edit window is open. Close the edit window in advance.   |
| 381           | Can not initialize memory being edited on-line            | Memory initialization was conducted while the online<br>edit windows for the program, symbol and position data<br>are open. Close the online edit windows in advance.   |
| 382           | Acceleration/deceleration specification error             | A number indicated in the acceleration or deceleration<br>for jog, movement or continuous movement is out of<br>the range, or an inappropriate value is input. Check the<br>values indicated in the acceleration and deceleration.  |
| 383           | The number of file read/write data<br>over                | <ol> <li>The number of data saved in a file (number of steps,<br/>number of positions, etc.) exceeds the allowable.</li> <li>The number of data to be written in a file (number of<br/>steps, number of positions, etc.) exceeds the<br/>allowable.</li> </ol>  |
| 384           | Invalid baud rate specified                               | An inappropriate baud rate was indicated.<br>(At connection check, baud rate change, etc.)  |
| 385           | Can not transmit the data file while sending data         | It is not available to transfer data read in from a file to a controller during the sending and receiving (read-out and write-in) of the data.  |
| 386           | Invalid Ethernet port number                              | There is an error in the Ethernet port number indication.   |
| 388           | Decimal point/digit separator string<br>error (PC)        | The character string of the decimal point is set to something other than [ . ] or the character string to divide numbers is set to something other than [ , ].  |
| 389           | File error  | <ol> <li>The format of a file could differ or abnormal data<br/>could be included.</li> <li>The file cannot be open. Check if the file is used in<br/>another application.</li> <li>The indicted file cannot be found. Check the file<br/>name.</li> </ol>  |
| 38A           | Data editing prohibition error<br>(manual operation type) | Data edit operation, memory initializing operation, flash<br>ROM writing operation or error list clear operation was<br>conducted during an operation mode. Check the<br>manual operation type (in Other Parameter No. 21 and<br>manual operation type in PC software that is currently<br>selected). |

| Error<br>code | Error name                                       | Special note  |
|---------------|--|---|
| 38B           | Can not write data while Flash ROM being written | Data writing operation was conducted during the flash<br>ROM writing process. It is not available to have a data<br>edit operation during the flash ROM writing.  |
| 38C           | Speed specification error                        | A number indicated in the velocity for jog, movement or<br>continuous movement exceeds the range, or an<br>inappropriate value is indicated. Check the values<br>indicated in the velocity.   |
| 38D           | Can not transmit data when not connected         | Data cannot be sent or received as the communication<br>to a controller is cut off. Start up the application in the<br>online mode and try again.   |
| 390           | File type error                                  | There is an error in the file type.<br>Check the file type (extension).   |
| 391           | No data inputted                                 | There is no data input in items with data input mandatory.<br>Input data.   |
| 392           | The input date or time is invalided              | There is an inappropriate data input in the date and time.  |
| 393           | Too long distance for Inching                    | The inching distance indication exceeds the range.<br>Check the inching distance indication.  |
| 394           | Can not close a window while sending data        | It is not available to close the edit window during<br>sending or receiving data. Finish the data transfer<br>before closing the window.  |
| 700           | Communication error                              | <ol> <li>There is an error in the received message. In case<br/>that the error is not solved even after connecting<br/>again, contact a manufacturer.</li> <li>It is a communication error. Check on the cable<br/>connection, short-circuit, noise and so on.</li> <li>There is a concern that the communication is not<br/>completed to establish. Check the physical<br/>connection to a controller and try to "reconnect".</li> <li>A controller not supported is connected.</li> </ol> |
| 780           | Com port open error                              | The communication port cannot be open.<br>Check that the communication port is ready to be used.  |
| 781           | Sum check error (PC)                             | It is a communication error. Check on the cable connection, short-circuit, noise and so on.   |
| 782           | Communication error (PC) (OS)                    | A communication error has occurred.<br>Try to "reconnect".  |
| 783           | Ethernet (receive) time out error<br>(PC)        |   |
| 784           | Connection disconnection error (PC)              |   |
| 785           | Socket error (PC)                                |   |
| 786           | Service port number in use (PC)                  |   |
| 787           | Mismatch I/F register address                    | There is an error in the received message. In case that<br>the error is not solved even after connecting again,<br>contact a manufacturer.  |

# 17.3 EC teaching tool error table

| Error<br>code | Error name  | Content   |
|---------------|---|---|
| 103           | File writing error                                      | Indicates that a data file (position data file, parameter file, complete data backup file, etc.) could not be written.  |
| 104           | Input value too small error                             | The value that was entered is below the setting range.<br>Refer to the actuator specifications and parameter list, and<br>enter an appropriate value.   |
| 105           | Input value too large error                             | The value that was entered is above the setting range.<br>Refer to the actuator specifications and parameter list, and<br>enter an appropriate value.   |
| 10B           | File opening error<br>(reading)                         | <ul> <li>Indicates that the specified file could not be opened. This could be caused by the following.</li> <li>The specified file does not exist.</li> <li>The file has been opened and is being used by another application.</li> </ul>   |
| 10C           | File opening error<br>(writing)                         | <ul><li>Indicates that an attempt was made to save to a file, but that the file could not be opened.</li><li>This could be caused by the following.</li><li>The file has been opened and is being used by another application.</li></ul>  |
| 10D           | File reading error                                      | <ul><li>Indicates that a file could not be read. This could be caused by the following.</li><li>Unable to reserve memory required to read the file.</li></ul>   |
| 10E           | File format error                                       | Indicates that an attempt was made to transfer a parameter<br>file or complete data backup file to a model different from<br>the file source.   |
| 111           | File data error   | <ul><li>Indicates that a file could not be read. This could be caused by the following.</li><li>The specified file contains invalid data.</li></ul>   |
| 122           | Input data error  | <ul><li>Indicates that inappropriate data was entered.</li><li>This could be caused by the following.</li><li>A value exceeding the operation range adjustment value was set.</li></ul>   |
| 123           | Data version<br>mismatch error                          | Indicates that an attempt was made to transfer saved data<br>using an incompatible version of controller.<br>Check the versions of the source and destination<br>controllers.   |
| 124           | I/O directive permission,<br>data editing prohibition   | <ul> <li>Indicates that a position data or parameter write operation was performed to the controller when in "AUTO" mode or in the "EC I/O directive permission" state.</li> <li>This could be caused by the following.</li> <li>The mode switch on the controller is set to "AUTO."</li> <li>The XSEL PC software is set to "EC I/O directive permission".</li> </ul>                      |
| 125           | I/O directive permission,<br>axis operation prohibition | <ul> <li>Indicates that an axis operation (jog, axis operation, home return, continuous movement, etc.) was performed in</li> <li>"AUTO" mode or in the "EC I/O directive permission" state.</li> <li>This could be caused by the following.</li> <li>The mode switch on the controller is set to "AUTO."</li> <li>The XSEL PC software is set to "EC I/O directive permission".</li> </ul> |

| Error<br>code | Error name                          | Content  |
|---------------|-------------------------------------|--|
| 300           | Communication port<br>opening error | <ul> <li>Indicates that the communication port could not be opened.</li> <li>This could be caused by the following.</li> <li>Unable to communicate with the EC axis recognized when<br/>the XSEL PC software was started.</li> </ul> |
| 301           | Reception timeout error             | Indicates that a reception timeout occurred during communication between this application and the connected controller. (*)  |
| 302           | Reception buffer<br>overflow        | Indicates that a reception buffer overflow occurred when receiving a response statement from the controller. (*)   |
| 305           | Communication error                 | Indicates that some other type of communication error occurred when receiving a response statement from the controller. (*)  |
| 306           | Checksum error                      | Indicates that a checksum error occurred when receiving a response statement from the controller. $\sp(*)$   |
| 307           | CRC error                           | Indicates that a CRC error occurred when receiving a response statement from the controller. (*)   |
| 308           | Response statement error            | Indicates that error data is included in the response statement from the controller. (*)   |
| 310           | Unsupported model connection error  | Indicates that a connection with an unsupported model was detected.<br>Check the version of this application and its supported models.   |

\* The cause of this error and possible solutions are listed below.

Contact IAI if you are unable to resolve an error.

| Cause  | Possible solution  |
|--|--|
| Communication error due to a connection defect between the PC and controller | Confirm that the connectors on the cable connecting the PC and controller are firmly inserted. |
| Communication error due to noise (corrupt data, etc.)                        | Review wiring and device placement to ensure that noise has no effect.                         |
| Controller power cutoff  | Confirm that the controller power is ON.   |

## **Revision History**

| 2024.09 First Edition | Revision date | Revised content |
|-----------------------|---------------|-----------------|
|                       | 2024.09       | First Edition   |
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