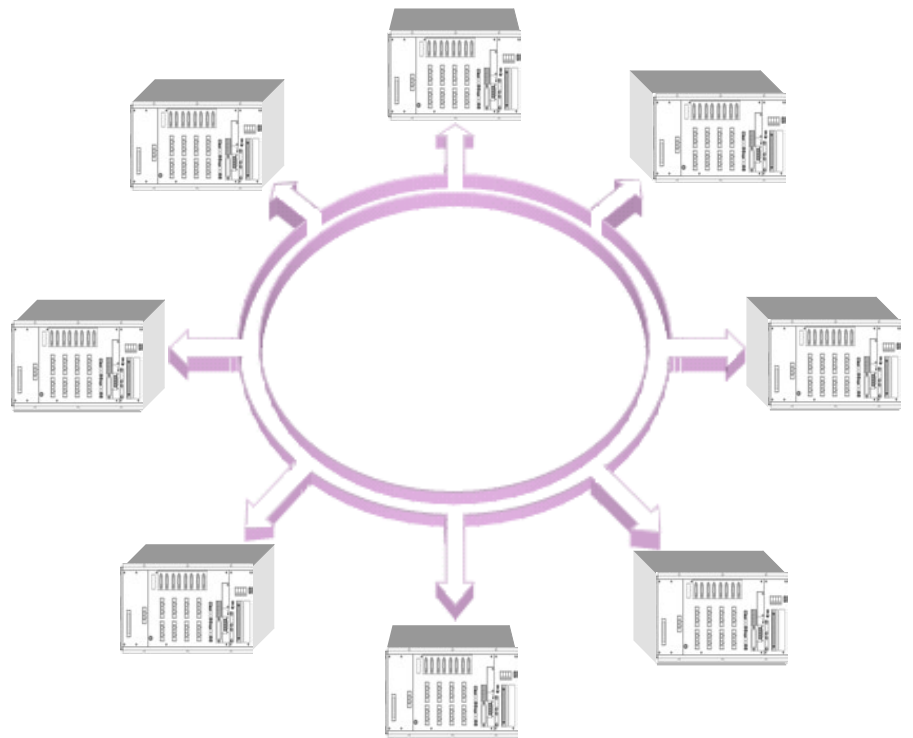


# **IA Net Instruction Manual**

**Second Edition**  
**XSEL-R/S/RX/SX/RXD/SXD**



***IAI America, Inc.***



## Please Read Before Use

Thank you for purchasing our product.

This Instruction Manual describes all necessary information to operate this product safely such as the operation procedure, structure and maintenance procedure.

Before operation, read this manual carefully and fully understand it to operate this product safely. The CD/DVD that comes with the product contains instruction manuals for IAI products. For a use of the products, print out or display on your personal computer the necessary pages of the applicable Instruction Manuals.

After reading the Instruction Manuals, be sure to keep them in a convenient place easily accessible to the personnel using this product.

### [Important]

- This Instruction Manual is original.
- This product is not to be used for any other purpose from what is noted in this Instruction Manual. IAI shall not be liable whatsoever for any loss or damage arising from the result of using the product for any other purpose from what is noted in the manual.
- The information contained in this Instruction Manual is subject to change without notice for the purpose of production improvement.
- If you have any question or finding regarding the information contained in this Instruction Manual, contact our customer center or our sales office near you.
- Using or copying all or a part of this Instruction Manual without permission is prohibited.
- The company names, names of products, and trademarks of each company referenced in this document are registered trademarks.

IA Net \_\_\_\_\_ XSEL-R/S

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IA Net \_\_\_\_\_ XSEL-R/S

## 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 Description | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Model Selection       | <ul style="list-style-type: none"> <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. Accordingly, do not use it in any of the following applications.               <ol style="list-style-type: none"> <li>Medical equipment used to maintain, control or otherwise affect human life or physical health.</li> <li>Mechanisms and machinery designed for the purpose of moving or transporting people (For vehicle, railway facility or air navigation facility)</li> <li>Important safety parts of machinery (Safety device, etc.)</li> </ol> </li> <li>Do not use the product outside the specifications. Failure to do so may considerably shorten the life of the product.</li> <li>Do not use it in any of the following environments.               <ol style="list-style-type: none"> <li>Location where there is any inflammable gas, inflammable object or explosive</li> <li>Place with potential exposure to radiation</li> <li>Location with the ambient temperature or relative humidity exceeding the specification range</li> <li>Location where radiant heat is added from direct sunlight or other large heat source</li> <li>Location where condensation occurs due to abrupt temperature changes</li> <li>Location where there is any corrosive gas (sulfuric acid or hydrochloric acid)</li> <li>Location exposed to significant amount of dust, salt or iron powder</li> <li>Location subject to direct vibration or impact</li> </ol> </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 Description    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2   | Transportation           | <ul style="list-style-type: none"> <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.<br/>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 leave a load hung up with a crane.</li> <li>• Do not stand under the load that is hung up with a crane.</li> </ul> |
| 3   | Storage and Preservation | <ul style="list-style-type: none"> <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 Start   | <p>(1) Installation of Robot Main Body and Controller, etc.</p> <ul style="list-style-type: none"> <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.<br/>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.             <ol style="list-style-type: none"> <li>1) Location where electric noise is generated</li> <li>2) Location where high electrical or magnetic field is present</li> <li>3) Location with the mains or power lines passing nearby</li> <li>4) Location where the product may come in contact with water, oil or chemical droplets</li> </ol> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

| No. | Operation Description  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4   | Installation and Start | <p>(2) Cable Wiring</p> <ul style="list-style-type: none"> <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> <p>(3) Grounding</p> <ul style="list-style-type: none"> <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 on the AC power cable of the controller and the grounding plate in the control panel, make sure to use a twisted pair cable with wire thickness <math>0.5\text{mm}^2</math> (AWG20 or equivalent) or more 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 technical standards).</li> <li>• Perform Class D Grounding (former Class 3 Grounding with ground resistance <math>100\Omega</math> or below).</li> </ul> |

| No. | Operation Description  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4   | Installation and Start | <p>(4) Safety Measures</p> <ul style="list-style-type: none"> <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 style="list-style-type: none"> <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> </ul> <p>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| No. | Operation Description | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6   | Trial Operation       | <ul style="list-style-type: none"> <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 Operation   | <ul style="list-style-type: none"> <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 Description      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8   | Maintenance and Inspection | <ul style="list-style-type: none"> <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 damaged due to an unnecessary operation.</li> <li>• Pay attention not to lose the cover or untightened screws, and make sure to put the product back to the original condition after maintenance and inspection works.</li> </ul> <p>Use in incomplete condition may cause damage to the product or an injury.</p> <p>* Safety protection Fence : In the case that there is no safety protection fence, the movable range should be indicated.</p> |
| 9   | Modification and Dismantle | <ul style="list-style-type: none"> <li>• Do not modify, disassemble, assemble or use of maintenance parts not specified based at your own discretion.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 10  | Disposal                   | <ul style="list-style-type: none"> <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.</li> </ul> <p>The product may burst or generate toxic gases.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 11  | Other                      | <ul style="list-style-type: none"> <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.        |  Danger  |
| Warning | This indicates a potentially hazardous situation which, if the product is not handled correctly, could result in death or serious injury.       |  Warning |
| Caution | This indicates a potentially hazardous situation which, if the product is not handled correctly, may result in minor injury or property damage. |  Caution |
| Notice  | This indicates lower possibility for the injury, but should be kept to use this product properly.                                               |  Notice  |

## Caution in Handling

---

1. Ensure use of the product in the specified conditions, environments and ranges.

Not doing so may cause a drop in performance or malfunction of the product.

2. Use an appropriate teaching tool.

Make sure to use the PC software or teaching pendant that is applicable for this system.

[Refer to 1.1.2 Teaching Tool.]

3. Turn OFF the power before performing wiring maintenance.



**Warning**

Turn OFF the power before performing wiring maintenance on the system, or plugging in or disconnecting teach pendants or communication cables. Performing maintenance while the power is kept ON may cause an electric shock, short-circuit or ground fault, which may result in an accident such as equipment damage, or burn-down of components, or a burn on your body.

4. Employ noise abatement precautions.

To avoid an operation error due to noise, take precautions to reduce the effect of noise, especially among devices sharing the same power supply, or installed as components of the same control system.

5. Simultaneous power application to XSEL controllers connected to the IA Net is recommended.

When booting an IA Net connected XSEL controller, the system waits for the link (connection) of all the stations set in I/O Parameters No.605 and 606. In case the link of all the stations is not confirmed, "211/552: IA Net Link Error" will be issued. To avoid the link error at the startup, it is suggested to set IA Net Error Monitor to 0 (Invalid) temporarily, or reboot the power to all the connected stations at the same time. Thus, it is necessary to boot the power to all the connected stations (controllers) at the same time.

In such cases as commissioning, or for tuning which requires the power to be supplied individually, the link error can be avoided by setting IA Net Error Monitor in Parameter No. 607 to 0 (Not to Monitor). It is recommended to enable IA Net error monitoring (1: Monitor) after the work is completed.

## What's IA Net

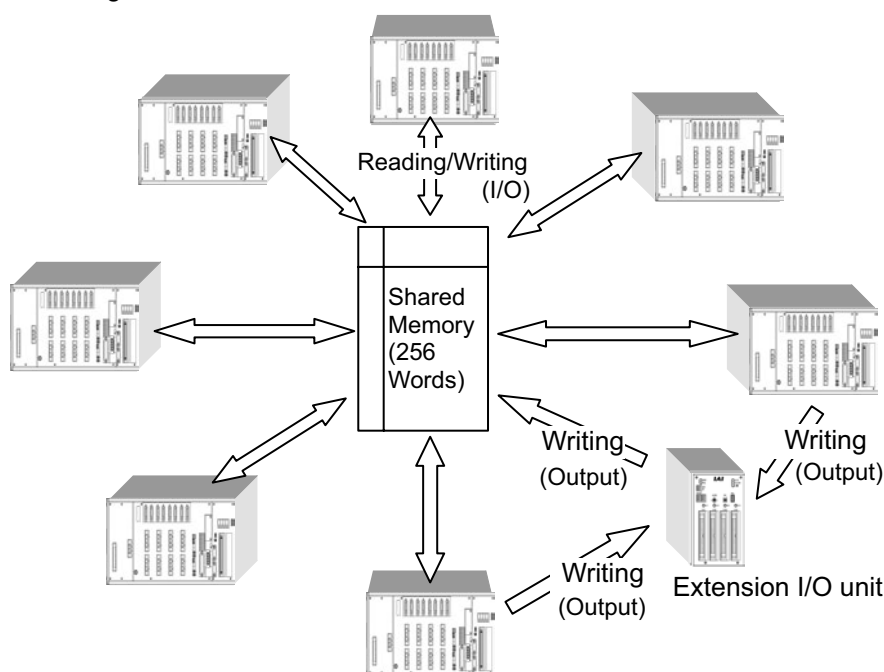
IA Net is a function that enables the connection of multiple units (64 units max.) of XSEL-R/S related controllers <sup>\*1</sup> and operate them while monitoring the conditions of each controller via the shared memory.

Remote I/O is accomplished through the use of extension I/O units. The input and output of an extension I/O unit can be referenced by all the XSEL controllers.

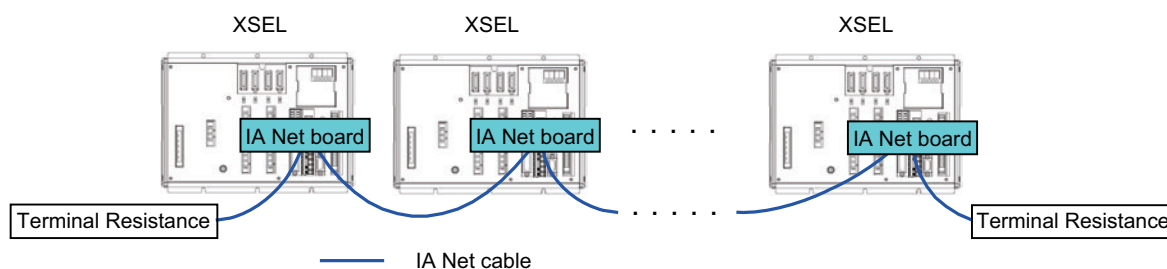
Also, IA Net allows for a single point of connection for the XSEL software, allowing access to all connected controller via a single network connection.

<sup>\*1</sup> XSEL-R/S related controllers = XSEL-R/S/RX/SX/RXD/SXD

### • Network Image



### • Image of Connection



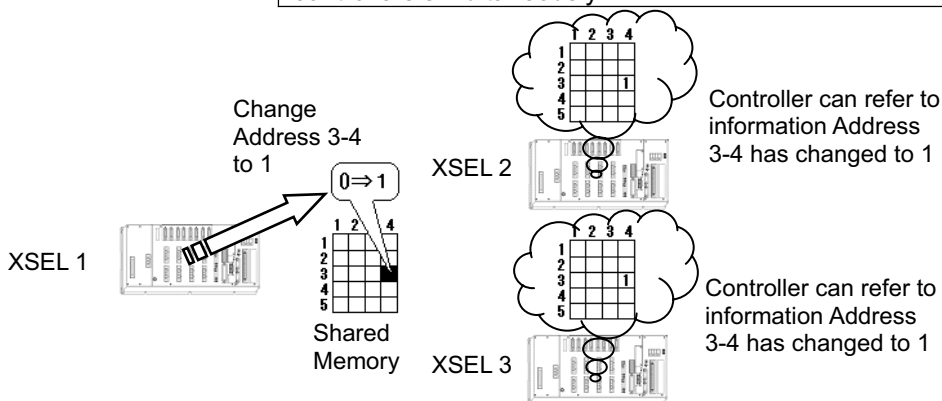
- IA Net is available for connection of 64 stations <sup>\*1</sup> at the maximum
- One unit of XSEL occupies four stations at the maximum (including number of stations on extension I/O unit)
- An extension I/O unit occupies four, and may contain up to four slots of I/O.
- Each of the four output slots of an extension I/O unit may be assigned to different XSEL controllers. Only one XSEL controller may control the output of any one given slot at a time.
- The input and output of an extension I/O unit can be referenced by all the XSEL controllers

<sup>\*1</sup> : Station: indicates a four word memory allocation of shared memory area.

## Main Functions

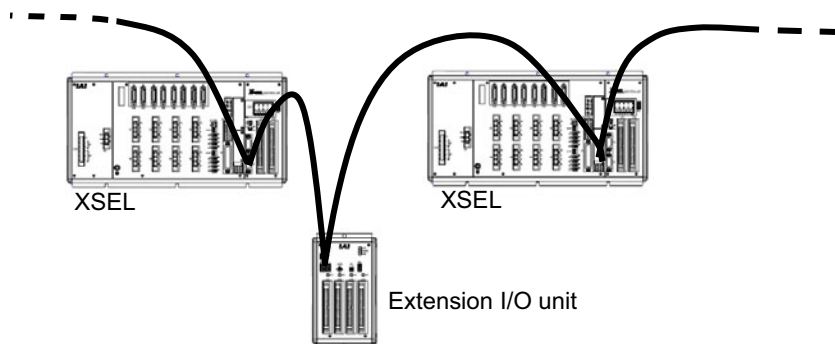
### 1) I/O Communication among Controllers

In IA Net, I/O communication among the connected controllers is available. All the controllers can refer to the data written in the shared memory area. The output of one controller can be monitored by multiple controllers simultaneously.



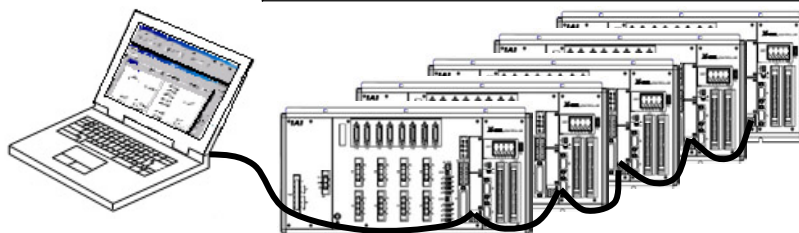
### 2) Connection of extension I/O units

By using an extension I/O unit, the control of an I/O device installed far from the controller can be performed via IA Net. I/O can be monitored by multiple controllers at the same time. The output slots of the extension I/O unit may be assigned to and controlled by different XSEL controllers. Only one XSEL controller can control the output of a specific extension I/O slot.



### 3) Connection of XSEL PC Software via IA Net (This is not applicable for teaching pendants.)

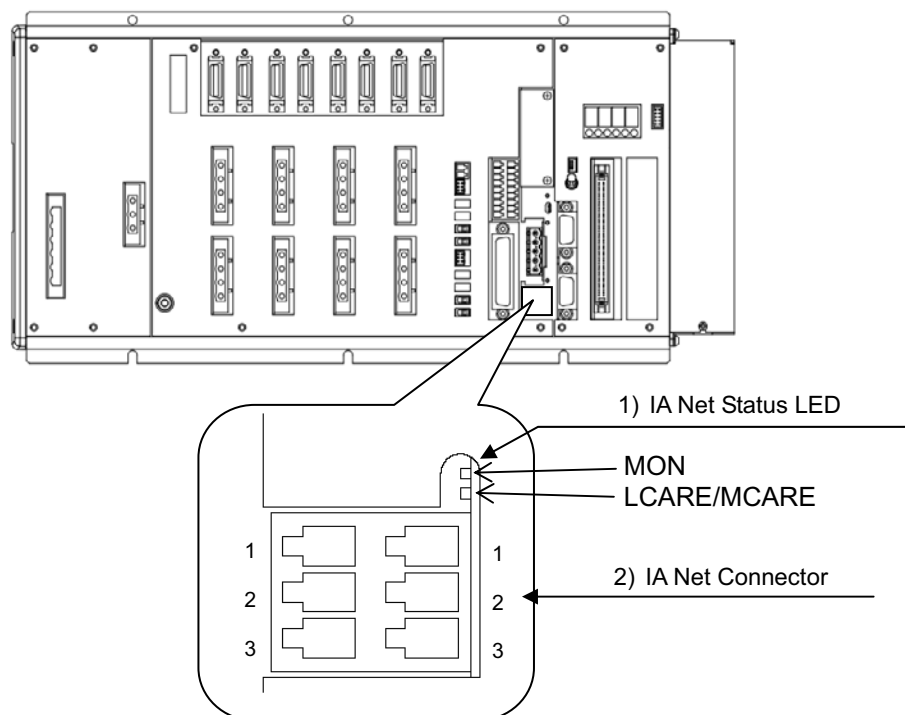
The PC software for XSEL connected to one unit of controller can be connected with other controllers by remote connection. Note It is not able to edit the position data in and refer to RC Gateway function.



## Name and Function of each Part related to IA Net

Described below are the explanations of the parts related to IA Net. For others, refer to XSEL-R/S Instruction Manual.

### (1) XSEL Controller (XSEL-R/S/RX/SX/RXD/SXD)



#### 1) IA Net Status LED

IA Net condition (status) is displayed with the Illuminating patterns.

○ Illuminating, × OFF, ☆ Flashing

| Name  | Color  | Lamp condition | Explanation                                                                                 |
|-------|--------|----------------|---------------------------------------------------------------------------------------------|
| MON   | Green  | ○              | Normal communication (in communication with other stations or units) <sup>(Note 1)</sup>    |
|       |        | ×              | Link (connection) not established with other stations or units                              |
| LCARE | Orange | ☆              | The number of connected stations has reduced, or transient communication error has occurred |
| MCARE | Orange | ☆              |                                                                                             |

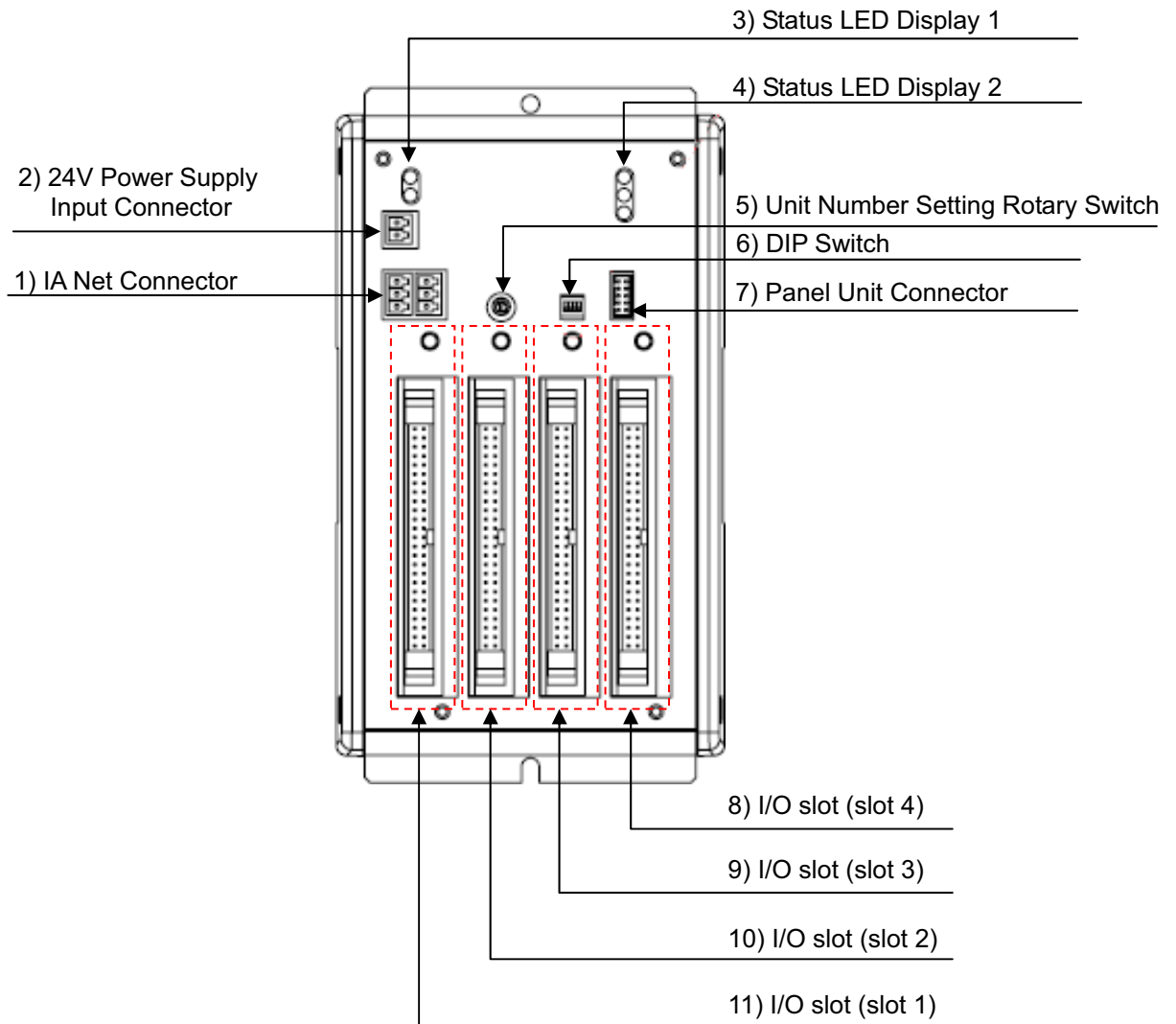
Note 1 MON flashes when a communication connection is established between any two or more controllers, and/or an extension I/O unit. It does not necessarily mean that communication to all configured controllers or I/O units has been attained, and therefore, that the entire communication network is established.

#### 2) IA Net Connector [Refer to Chapter 2 Wiring]

Provides connection for either dedicated IA Net communications cables, or a dedicated termination resistor unit. Use only genuine IAI cables and components.

| Pin No. | Signal Name              | Signal Abbreviation |
|---------|--------------------------|---------------------|
| 1       | Sent and received data A | SA                  |
| 2       | Sent and received data B | SB                  |
| 3       | Shield                   | SLD                 |

(2) Extension I/O unit



1) IA Net Connector [Refer to Chapter 2 Wiring]

2) 24V Power Supply Input Connector

## 3) Status LED Display 1

This shows the current condition of the power. ○ : Illuminating, × : OFF, ☆ : Flashing



## 4) Status LED Display 2

This shows the current condition of the power.



| Name                    | Lamp condition | Color  | Description                                                                                                               |
|-------------------------|----------------|--------|---------------------------------------------------------------------------------------------------------------------------|
| PWR                     | ○              | Green  | Power ON                                                                                                                  |
|                         | ×              | -      | Power OFF                                                                                                                 |
| PSE                     | ○              | Orange | Internal power supply error                                                                                               |
|                         | ×              | -      | Internal power in normal condition                                                                                        |
| ALM <sup>(Note 1)</sup> | ○              | Orange | <ul style="list-style-type: none"> <li>• Error in mounted extension I/O board</li> <li>• System abnormality</li> </ul>    |
|                         | ×              | -      | System Normal                                                                                                             |
| C-ERR                   | ☆              | Orange | <ul style="list-style-type: none"> <li>• Reduction in number of stations</li> <li>• IA Net communication error</li> </ul> |
|                         | ×              | -      | IA Net communication in normal condition                                                                                  |
| LINK                    | ○              | Green  | IA Net communication in normal condition with connected controllers                                                       |
|                         | ×              | -      | Communication not established with connected controllers                                                                  |

Note 1 : To cancel the alarm, it is necessary to reboot the extension I/O unit.

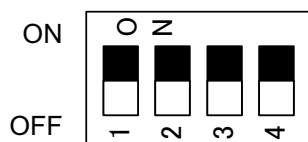
However, alarm will be generated again unless the cause of it is removed.

## 5) Unit Number Setting Rotary Switch

Set the occupied station for the extension I/O unit.

## 6) DIP Switch

Put all the switches 1 to 4 OFF when using.



7) Panel Unit Connector

This is a connector to plug in the optional panel unit.

8) to 11) Expanded I/O board (slot 1 to 4)

One I/O board can be inserted to each slot.

| No. of Input points | No. of Output points | Type | Model         |
|---------------------|----------------------|------|---------------|
| 32                  | 16                   | NPN  | IA-103-X-32   |
|                     |                      | PNP  | IA-103-X-32-P |
| 16                  | 32                   | NPN  | IA-103-X-16   |
|                     |                      | PNP  | IA-103-X-16-P |
| 48                  | 48                   | NPN  | IA-10-3204-NP |
|                     |                      | PNP  | IA-10-3204-PN |

There is a status LED above each slot, and it is used to monitor the condition of each I/O board.

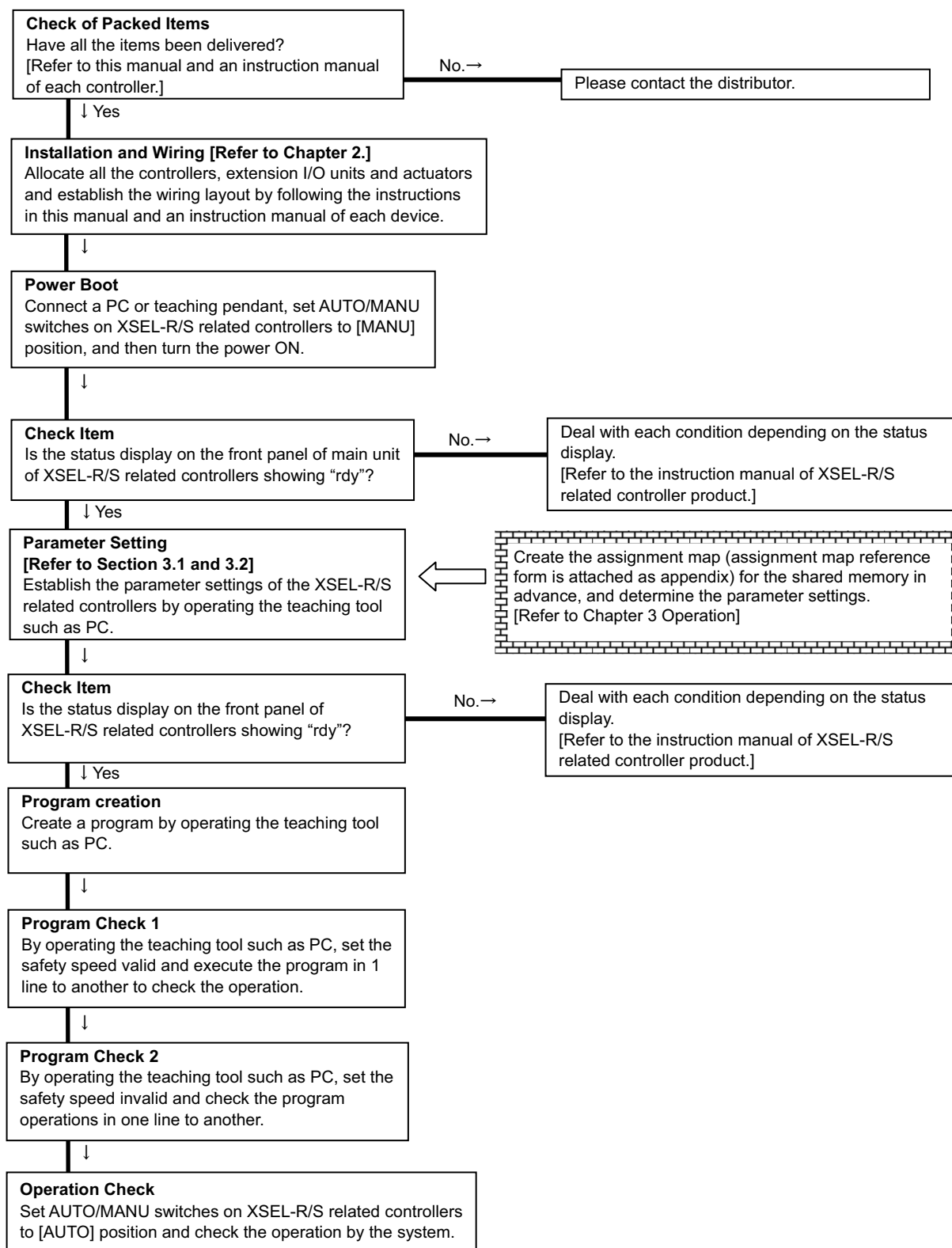
○ : Illuminating, × : OFF

| Name                          | Lamp condition | Color | Description                                                                                                           |
|-------------------------------|----------------|-------|-----------------------------------------------------------------------------------------------------------------------|
| I/O * RDY <sup>(Note 1)</sup> | ○              | Green | In the normal operation                                                                                               |
|                               | ×              | -     | <ul style="list-style-type: none"> <li>• I/O Not to use</li> <li>• Error</li> <li>• I/O board not Equipped</li> </ul> |

Note 1 : Slot number comes to \*

## Starting Procedures

When using this product for the first time, make sure to avoid omission and incorrect wiring by referring to the procedure below. "PC" stated in this section means "PC software".



IA Net ===== XSEL-R/S

## Chapter 1 Specifications Check

### 1.1 Product Check

#### 1.1.1 Parts

To use this function, it is necessary to prepare the following parts. Use the following list to determine if all of the necessary components are available, and if there is anything missing, contact your local IAI distributor.

| No. | Part Name                          | Model                                                                                                            | Quantity                         | Remarks                                                                                                           |
|-----|------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 1   | XSEL Controller (XSEL-R/S related) | Refer to "How to read the model plate", "How to read the model No." (Extension network board should be inserted) | For number of constructing units | For the accessories enclosed to each controller, refer to the instruction manuals of XSEL-R/S related controllers |
| 2   | IA Net Dedicated cable             | CB-RS-IAN * * *                                                                                                  | Number of necessary IA Net       | * * * : Cable Length<br>Standard : 2m<br>Max : 10m (1m Unit)                                                      |
| 3   | Terminal Resistance Unit           | (Necessary to purchase additions)                                                                                | 2 units / set                    | 100Ω 1/2W                                                                                                         |
| 4   | First Step Guide                   |                                                                                                                  | 1 part / set                     |                                                                                                                   |
| 5   | Instruction Manual (DVD)           |                                                                                                                  | 1 piece / set                    |                                                                                                                   |
| 6   | Safety Guide                       |                                                                                                                  | 1 part / set                     |                                                                                                                   |

#### 1.1.2 Teaching Tool

A teaching tool such as PC software is necessary to perform commissioning of this product. Any of the following teaching tools may be used.

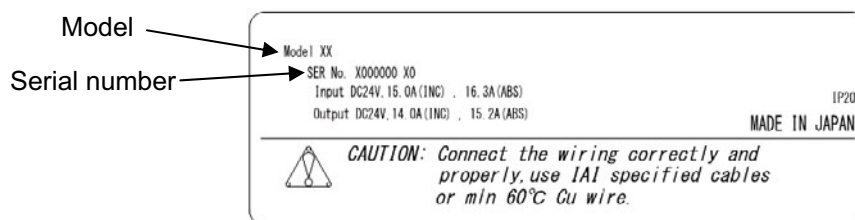
| No. | Part Name                                                                  | Model          |
|-----|----------------------------------------------------------------------------|----------------|
| 1   | PC software (with RS232C Cable + Emergency Stop Box)                       | IA-101-X-MW    |
| 2   | PC software (with USB conversion adaptor + USB Cable + Emergency Stop Box) | IA-101-X-USBMW |
| 3   | PC software (with Safety Category 4 Compliance Type + Emergency Stop Box)  | IA-101-XA-MW   |
| 4   | Teaching pendant                                                           | SEL-T          |
| 5   | Teaching pendant (with deadman switch)                                     | SEL-TD         |
| 6   | Teaching pendant (with deadman switch + TP adapter (RCB-LB-TG))            | SEL-TG         |

# IA Net XSEL-R/S

## 1.1.3 Instruction Manuals related to this product, which are provided on the DVD.

| No. | Name                                                          | Manual No. |
|-----|---------------------------------------------------------------|------------|
| 1   | IA Net Instruction Manual                                     | ME0307     |
| 2   | XSEL-R/S/RX/SX/RXD/SXD Controller Instruction Manual          | ME0313     |
| 3   | PC Software<br>IA-101-X-MW/ IA-101-X-USBMW Instruction Manual | ME0154     |
| 4   | Teaching Pendant SEL-T/TD/TG Instruction Manual               | ME0183     |

## 1.1.4 How to read the model plate



# IA Net XSEL-R/S

## 1.1.5 How to read the model No.

(1) Single Axis and Orthogonal Type XSEL-R Type/S Type

**XSEL - R - 8 - 400A-200AB-200ABL-200A-100I-100IB-30IB-30I - EPDVIA - N1N3 - 2 - 3**  
 1) 2) 3) 4) 5)6)7) 8) 9) 10)

Model table

| 1)<br>Series<br>Name | 2)<br>Control-<br>ler Type                           | 3)<br>Number<br>of Axes | 4)<br>Details of axis 1 to axis 8 |                             |                                    |                                    |                                          |                                               | 5)6)7)<br>Network Dedicated Slot |                       |                                  | 8)<br>I/O Order                                                   |                                                                   | 9)<br>Cable<br>Length | 10)<br>Power-supply<br>Voltage |
|----------------------|------------------------------------------------------|-------------------------|-----------------------------------|-----------------------------|------------------------------------|------------------------------------|------------------------------------------|-----------------------------------------------|----------------------------------|-----------------------|----------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|-----------------------|--------------------------------|
|                      |                                                      |                         | Motor<br>Wattage                  | Encoder<br>Type             | Brake                              | Creep                              | Home<br>Sensor<br>(LS)                   | Synchroniza-<br>tion<br>Designation           | I/O1 Slot                        | I/O2 Slot             | I/O3 Slot                        | I/O1 Slot                                                         | I/O2 Slot                                                         |                       |                                |
| XSEL                 | R<br>(Standard<br>Type)<br><br>S<br>(Global<br>Type) |                         | 12<br>(12W)                       |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |
|                      |                                                      |                         | 20<br>(20W)                       |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |
|                      |                                                      |                         | 30D<br>(30W for DS)               |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |
|                      |                                                      |                         | 30R<br>(30W for RS)               |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |
|                      |                                                      | 1<br>(1-axis)           | 60<br>(60W)                       |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |
|                      |                                                      | 2<br>(2-axis)           | 100<br>(100W)                     |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |
|                      |                                                      | 3<br>(3-axis)           | 100S<br>(100W for Linear)         | I<br>(For<br>Incremental)   | Not<br>Specified<br>(w/o<br>brake) | Not<br>Specified<br>(w/o<br>creep) | Not<br>Specified<br>(w/o home<br>sensor) | Not Specified<br>(No<br>synchroniza-<br>tion) | E<br>(w/o<br>network)            | E<br>(w/o<br>network) | Not<br>Specified<br>(w/o IA Net) |                                                                   |                                                                   |                       |                                |
|                      |                                                      | 4<br>(4-axis)           | 150<br>(150W)                     | A<br>(Absolute)             | B<br>(w/ brake)                    | C<br>(w/ creep)                    | L<br>(w/ home<br>sensor)                 | M<br>(Master-axis<br>designation)             | EP<br>(EtherNet<br>IP)           | DV<br>(DeviceNet)     | CC<br>(CC-Link)                  | P1<br>(32IN /16OUT NPN type)                                      | P2<br>(32IN /16OUT PNP type)                                      |                       |                                |
|                      |                                                      | 5<br>(5-axis)           | 200<br>(200W)                     | G<br>(Spurious<br>absolute) |                                    |                                    |                                          | S<br>(Slave-axis<br>designation)              | EC<br>(EtherCAT)                 | CC<br>(CC-Link)       | IA<br>(Interface for<br>IA Net)  | P3<br>(48IN /48OUT PNP type)                                      | P3<br>(48IN /48OUT PNP type)                                      |                       |                                |
|                      |                                                      | 6<br>(6-axis)           | 200S<br>(200W for Linear)         |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  | MC<br>(Electronic Cam<br>pulse I/O board)                         | MC<br>(Electronic Cam<br>pulse I/O board)                         |                       |                                |
|                      |                                                      | 7<br>(7-axis)           | 300<br>(300W)                     |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  | DG<br>(Only for I/O1 Slot<br>(Devicenet Gateway<br>Master Board)) | DG<br>(Only for I/O1 Slot<br>(Devicenet Gateway<br>Master Board)) |                       |                                |
|                      |                                                      | 8<br>(8-axis)           | 400<br>(400W)                     |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |
|                      |                                                      |                         | 600<br>(600W)                     |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |
|                      |                                                      |                         | 750<br>(750W)                     |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |
|                      |                                                      |                         |                                   |                             |                                    |                                    |                                          |                                               |                                  |                       |                                  |                                                                   |                                                                   |                       |                                |

# IA Net XSEL-R/S

(2) SCARA/Single Axis and Orthogonal Type XSEL-RX Type/SX Type

**XSEL - RX8 - NNN5020H-100I-100IB-30IB-30I - EPDVIA - N1N3 - 2 - 3**

1) 2) 3) 4) 5)6)7) 8) 9) 10)

Model table

| 1)<br>Series Name | 2)<br>Controller Type                 | 3)<br>SCARA Robot Main Machine Type                                                                                                                                                                                                                                                                                                                                       | 4)<br>Details of axis 1 to axis 8 |                                                                               |                              |                              |                                    |                                       | 5)6)7)<br>Network Dedicated Slot |                    |                               | 8)<br>I/O Order                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              | 9)<br>Cable Length | 10)<br>Power-supply Voltage                                                                                                                              |
|-------------------|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------|------------------------------|------------------------------|------------------------------------|---------------------------------------|----------------------------------|--------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |                                       |                                                                                                                                                                                                                                                                                                                                                                           | Motor Wattage                     | Encoder Type                                                                  | Brake                        | Creep                        | Home Sensor (LS)                   | Synchronization Designation           | I/O1 Slot                        | I/O2 Slot          | I/O3 Slot                     | I/O1 Slot                                                                                                                                                                                                                                                                                                    | I/O2 Slot                                                                                                                                                                                                                                                                                                    |                    |                                                                                                                                                          |
| XSEL              | RX4<br>(1 unit of SCARA)              | NNN1205 to 8040H<br>(Standard Type)<br><br>NSN5016H to 6016H<br>(High-Speed Type)<br><br>NNC1205 to 8040H<br>(Clean Type)<br><br>NNW2515H to 8040H<br>(Splash-Proof Type)<br><br>TNN3015H to 3515H<br>(Wall-mount Type)<br><br>UNN3015H to 3515H<br>(Wall-mount Inverse Type)<br><br>HNN5020H to 8040H<br>(Ceiling-mount Type)<br><br>INN5020H to 8040H<br>(Inverse Type) | 12<br>(12W)                       | I<br>(For Incremental)<br><br>A<br>(Absolute)<br><br>G<br>(Spurious absolute) | Not Specified<br>(w/o brake) | Not Specified<br>(w/o creep) | Not Specified<br>(w/o home sensor) | Not Specified<br>(No synchronization) | E<br>(w/o network)               | E<br>(w/o network) | Not Specified<br>(w/o IA Net) | E<br>(w/o PIO)<br><br>N1<br>(32IN /16OUT NPN type)<br><br>N2<br>(16IN /32OUT NPN type)<br><br>N3<br>(48IN /48OUT NPN type)<br><br>P1<br>(32IN /16OUT PNP type)<br><br>P2<br>(16IN /32OUT PNP type)<br><br>P3<br>(48IN /48OUT PNP type)<br><br>DG<br>(Only for I/O1 Slot)<br>(DeviceNet Gateway Master Board) | E<br>(w/o PIO)<br><br>N1<br>(32IN /16OUT NPN type)<br><br>N2<br>(16IN /32OUT NPN type)<br><br>N3<br>(48IN /48OUT NPN type)<br><br>P1<br>(32IN /16OUT PNP type)<br><br>P2<br>(16IN /32OUT PNP type)<br><br>P3<br>(48IN /48OUT PNP type)<br><br>DG<br>(Only for I/O1 Slot)<br>(DeviceNet Gateway Master Board) | 2:2m<br>(Standard) | 3<br>(3-phase 200V)<br><br>3L<br>(3-phase 200V for Linear Actuator)<br><br>2<br>(Single-phase 200V)<br><br>2L<br>(Single-phase 200V for Linear Actuator) |
|                   | RX5<br>(SCARA+1-Axis)                 |                                                                                                                                                                                                                                                                                                                                                                           | 20<br>(20W)                       |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   | RX6<br>(SCARA+2-Axes)                 |                                                                                                                                                                                                                                                                                                                                                                           | 30D<br>(30W for DS)               |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   | RX7<br>(SCARA+3-Axes)                 |                                                                                                                                                                                                                                                                                                                                                                           | 30R<br>(30W for RS)               |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   | RX8<br>(SCARA+4-Axes)                 |                                                                                                                                                                                                                                                                                                                                                                           | 60<br>(60W)                       |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   | SX4<br>(1 unit of SCARA, Global Type) |                                                                                                                                                                                                                                                                                                                                                                           | 100<br>(100W)                     |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   | SX5<br>(SCARA+1-Axis, Global Type)    |                                                                                                                                                                                                                                                                                                                                                                           | 100S<br>(100W for Linear)         |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   | SX6<br>(SCARA+2-Axes, Global Type)    |                                                                                                                                                                                                                                                                                                                                                                           | 150<br>(150W)                     |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   | SX7<br>(SCARA+3-Axes, Global Type)    |                                                                                                                                                                                                                                                                                                                                                                           | 200<br>(200W)                     |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   | SX8<br>(SCARA+4-Axes, Global Type)    |                                                                                                                                                                                                                                                                                                                                                                           | 200S<br>(200W for Linear)         |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   |                                       |                                                                                                                                                                                                                                                                                                                                                                           | 300<br>(300W)                     |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   |                                       |                                                                                                                                                                                                                                                                                                                                                                           | 400<br>(400W)                     |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   |                                       |                                                                                                                                                                                                                                                                                                                                                                           | 600<br>(600W)                     |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |
|                   |                                       |                                                                                                                                                                                                                                                                                                                                                                           | 750<br>(750W)                     |                                                                               |                              |                              |                                    |                                       |                                  |                    |                               |                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                              |                    |                                                                                                                                                          |

(3) 2 units of SCARA Type XSEL-RXD8 Type/SXD8 Type

**XSEL - RXD8 – NNN5020H-NNN1205 – EPDVIA - N1N3 - 2 - 3**  
 1) 2) 3) 4) 5)6)7) 8) 9) 10)

Model table

| 1)<br>Series Name | 2)<br>Controller Type                 | 3)<br>SCARA Robot Main Machine Type            | 5)6)7)<br>Network Dedicated Slot |                      |                               | 8<br>I/O Order                                           |           | 9)<br>Cable Length | 10)<br>Power-supply Voltage                   |
|-------------------|---------------------------------------|------------------------------------------------|----------------------------------|----------------------|-------------------------------|----------------------------------------------------------|-----------|--------------------|-----------------------------------------------|
|                   |                                       |                                                | I/O1 Slot                        | I/O2 Slot            | I/O3 Slot                     | I/O1 Slot                                                | I/O2 Slot |                    |                                               |
| XSEL              | RX4<br>(1 unit of SCARA)              |                                                |                                  |                      |                               |                                                          |           |                    |                                               |
|                   | RX5<br>(SCARA+1-Axis)                 |                                                |                                  |                      |                               |                                                          |           |                    |                                               |
|                   | RX6<br>(SCARA+2-Axes)                 | NNN1205 to 8040H<br>(Standard Type)            |                                  |                      |                               | E<br>(w/o PIO)                                           |           |                    | 3<br>(3-phase 200V)                           |
|                   | RX7<br>(SCARA+3-Axes)                 | NSN5016H to 6016H<br>(High-Speed Type)         |                                  |                      |                               | N1<br>(32IN /16OUT NPN type)                             |           |                    |                                               |
|                   | RX8<br>(SCARA+4-Axes)                 | NNC1205 to 8040H<br>(Clean Type)               |                                  |                      |                               | N2<br>(16IN /32OUT NPN type)                             |           |                    | 3L<br>(3-phase 200V for Linear Actuator)      |
|                   | SX4<br>(1 unit of SCARA, Global Type) | NNW2515H to 8040H<br>(Splash-Proof Type)       | E<br>(w/o network)               | E<br>(w/o network)   | Not Specified<br>(w/o IA Net) | N3<br>(48IN /48OUT NPN type)                             |           | 2:2m<br>(Standard) |                                               |
|                   | SX5<br>(SCARA+1-Axis, Global Type)    | TNN3015H to 3515H<br>(Wall-mount Type)         | EP<br>(EtherNet IP)              | DV<br>(DeviceNet)    | IA<br>(Interface for IA Net)  | P1<br>(32IN /16OUT PNP type)                             |           | 3 : 3m             | 2<br>(Single-phase 200V)                      |
|                   | SX6<br>(SCARA+2-Axes, Global Type)    | UNN3015H to 3515H<br>(Wall-mount Inverse Type) | EC<br>(EtherCAT)                 | CC<br>(CC-Link)      |                               | P2<br>(16IN /32OUT PNP type)                             |           | 5 : 5m             |                                               |
|                   | SX7<br>(SCARA+3-Axes, Global Type)    | HNN5020H to 8040H<br>(Ceiling-mount Type)      |                                  | PR<br>(PROFIBUS -DP) |                               | P3<br>(48IN /48OUT PNP type)                             |           | 0:None             | 2L<br>(Single-phase 200V for Linear Actuator) |
|                   | SX8<br>(SCARA+4-Axes, Global Type)    | INN5020H to 8040H<br>(Inverse Type)            |                                  |                      |                               | (Only for I/O1 Slot)<br>(Devicenet Gateway Master Board) |           |                    |                                               |

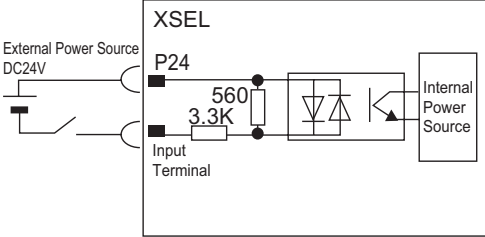
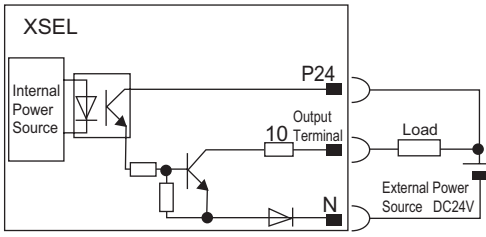
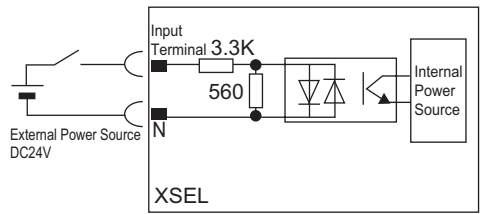
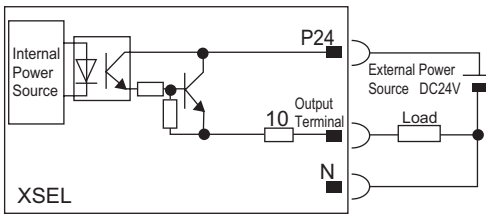
## 1.2 Basic Specifications List

| Item                           |            | Description                                                                        | Remarks                                                                                                                              |
|--------------------------------|------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Communication System           |            | Half-duplex multi-drop                                                             | Insulation with pulse transformers                                                                                                   |
| Baud Rate                      |            | 12Mbps                                                                             | —                                                                                                                                    |
| Number of Connectable Units    |            | 64 units at maximum                                                                | There are restrictions in the number of units depending on the system construction of the network.<br>[Refer to Chapter 3 Operation] |
| Occupied Memory Units          |            | 1 to 4 stations                                                                    | XSEL : 1 to 4 stations to be occupied<br>Expansion I/O Unit : 4 stations to be occupied                                              |
| Shared Memory Capacity         |            | 256 words                                                                          | 1 station (4 words) × 64 areas                                                                                                       |
| Cycle Time <sup>(Note 1)</sup> |            | 0.102msec<br>(when 2 units connected) to<br>2.365msec<br>(when 64 units connected) | Refer to 3.1.3 Regarding Communication Cycle Time                                                                                    |
| Cable                          |            | Dedicated Cable<br>(CB-RS-IAN * * *)                                               | Shielded two-cored twisted pair cable                                                                                                |
| Total Cable Length             |            | 100m                                                                               | —                                                                                                                                    |
| Terminal Resistance            |            | External mount                                                                     | 100Ω (1/2W) necessary on both terminals                                                                                              |
| Connector                      | XSEL Side  | MCDN1.5/3-G1-3.5P26THR                                                             | Manufactured by PHOENIX CONTACT                                                                                                      |
|                                | Cable Side | FMC1.5/3-ST-3.5                                                                    | Manufactured by PHOENIX CONTACT                                                                                                      |

Note1 The calculation for IA Net communication cycle time is based on the last station number.

- When 2 units connected (= final station No.1)  
 $\{(1+152) \times (1 + 3) \times 2\} / 12000 = 0.102\text{ms}$
- When 64 units connected (= final station No.63)  
 $\{(63 + 152) \times (63 + 3) \times 2\} / 12000 = 2.365\text{ms}$

## 1.3 Extension I/O Unit PIO Input and Output Interface

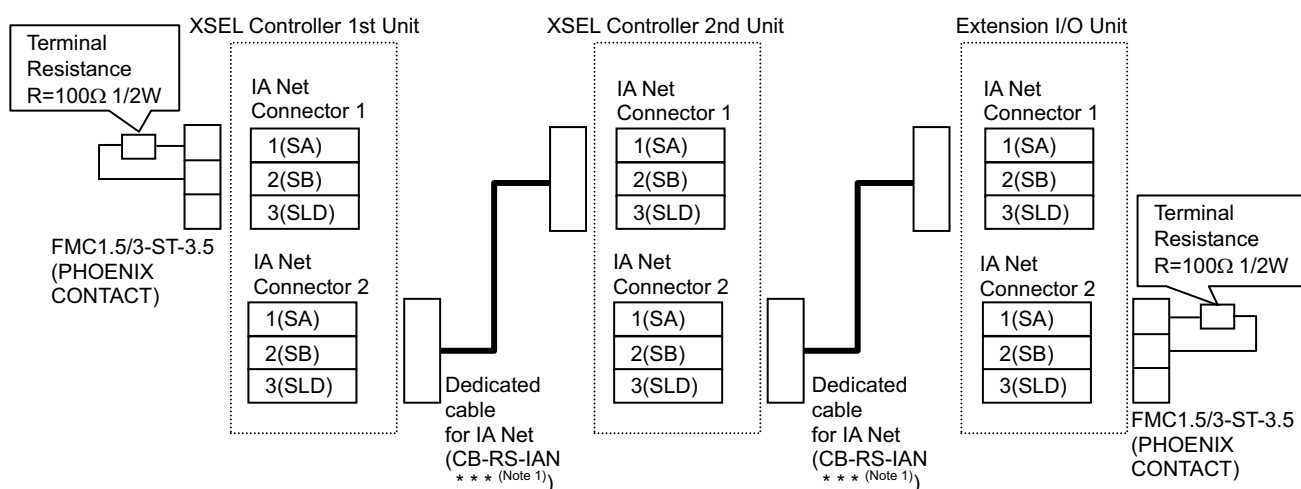
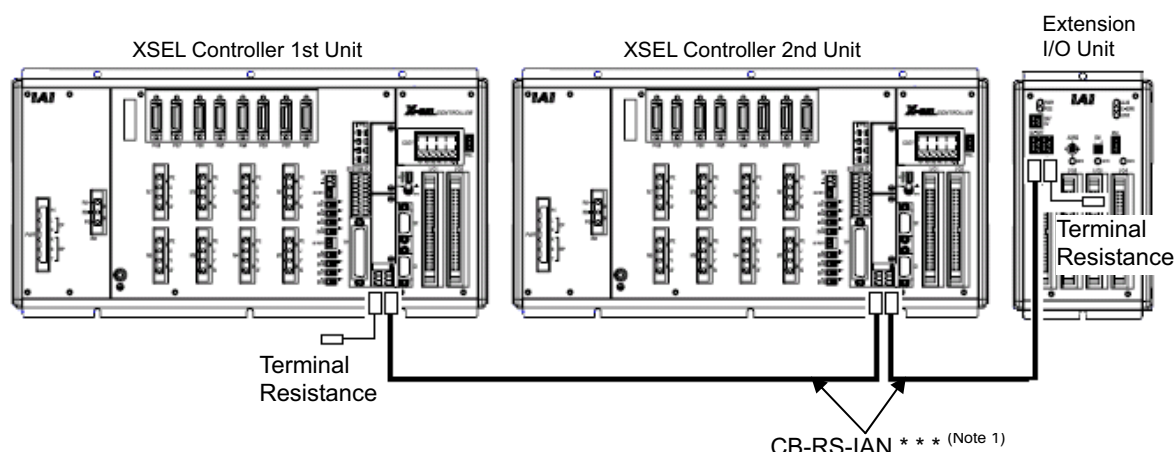
|          | Input section                                                                       |                                                | Output section                                                                       |                                                 |
|----------|-------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------|
| NPN Type | Input voltage                                                                       | 24V DC $\pm$ 10%                               | Load voltage                                                                         | 24V DC                                          |
|          | Input current                                                                       | 7mA per input                                  | Peak load electric current                                                           | 100mA per output<br>Total of 8 outputs of 400mA |
|          | ON/OFF Voltage                                                                      | ON Voltage MIN 16V DC<br>OFF Voltage MAX 5V DC | Leakage current                                                                      | MAX 0.1mA/1 point                               |
|          |    |                                                |    |                                                 |
| PNP Type | Input voltage                                                                       | 24V DC $\pm$ 10%                               | Load voltage                                                                         | 24V DC                                          |
|          | Input current                                                                       | 7mA per input                                  | Peak load electric current                                                           | 100mA per output<br>Total of 8 outputs of 400mA |
|          | ON/OFF Voltage                                                                      | ON Voltage MIN 8V DC<br>OFF Voltage MAX 19V DC | Leakage current                                                                      | MAX 0.1mA/1 point                               |
|          |  |                                                |  |                                                 |

Each terminal of input and output are isolated from internal circuit with opto-isolators.



## Chapter 2 Wiring

The wiring between each of XSEL controllers and extension I/O units should be accomplished exclusively with dedicated IAI original equipment cables.  
 Connect terminal resistors on both ends of the network.  
 The maximum number of connectable units (total of XSEL controllers and extension I/O units) differs depending on the construction. Establish the network construction in advance and check the number of connectable units. Refer to Section 3. Operation for details.



Note 1 \*\*\* : Cable length



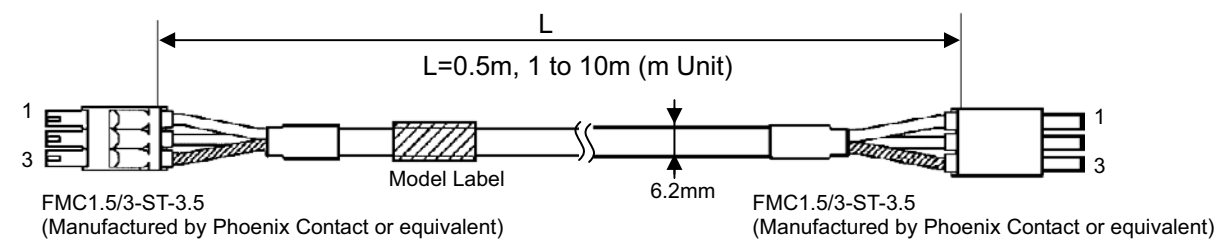
### Caution

Simultaneous power application to XSEL controllers connected to the IA Net is recommended. When booting an IA Net connected XSEL controller, the system waits for the link of all the stations set in I/O Parameters No.605 and 606. In case the link of all the stations is not confirmed, "211/552: IA Net Link Error" will be issued.

Link Establish Waiting Time can be adjusted in Bit 24 to 31: IA Net Initializing Link Waiting Timeout (sec) in I/O Parameter No. 608 "IA Net Attribute 1" (Initial setting = 15sec). Adjust the time if necessary.

# IA Net XSEL-R/S

- Dedicated cable (Model : CB-RS-IAN \*\*\* )  
\*\*\* indicates the cable length. (Example) 020 = 2m



| Wiring | Color | Signal Name         | No. | No. | Signal Name         | Color | Wiring |
|--------|-------|---------------------|-----|-----|---------------------|-------|--------|
| AWG 22 | Blue  | SA                  | 1   | 1   | SA                  | Blue  | AWG 22 |
|        | White | SB                  | 2   | 2   | SB                  | White |        |
|        | -     | SLD (Drainage wire) | 3   | 3   | SLD (Drainage wire) | -     |        |

## Chapter 3    Operation (Construction for Network)

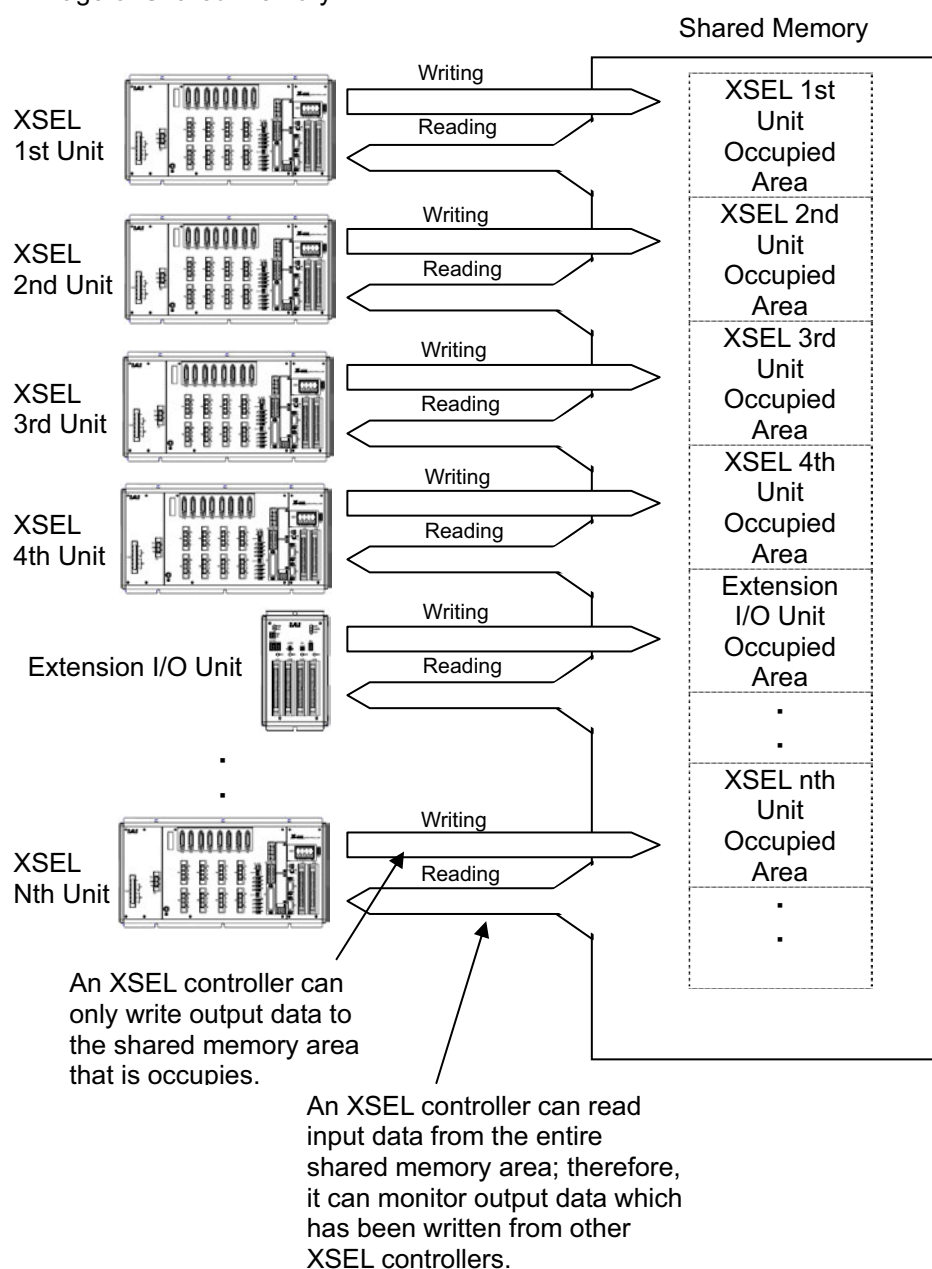
### 3.1    Before Initial Setting

#### 3.1.1    Writing to and Reading from Shared Memory

IA Net possesses a shared memory with 256 words that all the connected XSEL controllers can write data to and read data from.

XSEL controllers and extension I/O units have the occupied domains in the shared memory. They write (output) their own information (ON/OFF information in binary unit) to this shared memory area, and thereby make the information available to other networked XSEL controllers. Since all the XSEL controllers can read (input) the contents in the shared memory, operations can be performed while exchanging information.

- Image of Shared Memory



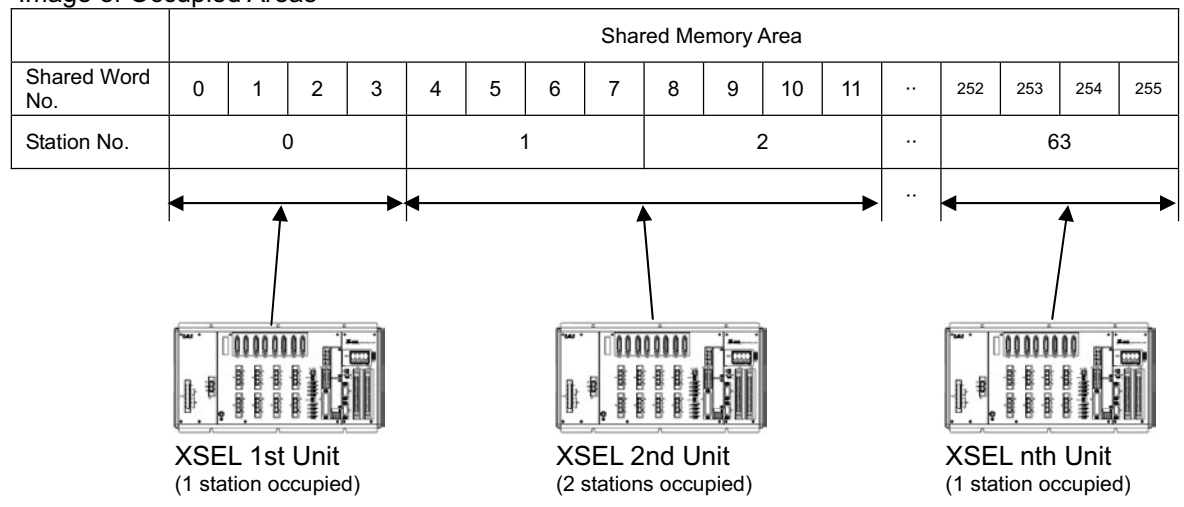
## 3.1.2 Occupied Area in Shared Memory

In the shared memory, there is a area equivalent to 256 words in total. The shared word numbers from No. 0 to 255 are given to every word (16 bits) unit. Also every four words denotes one station and each station unit is identified with the station numbers from No. 0 to 63. The construction of the network has to have 64 (Station No. 0 to 63) total stations, or less. Each XSEL controller occupies from one up to four station(s) and an extension I/O unit occupies four stations.

Therefore, 64 units can be connected if IA Net network is constructed with only XSEL controllers and all of them occupying one station each. If connecting an extension I/O unit or a unit of XSEL controller that occupies two or more stations, the number of connectable units will reduce according to the number of stations.

The number of the stations to be occupied by XSEL is to be set in the parameter. [Refer to 3.2 Shared Memory Assignments]

Image of Occupied Areas



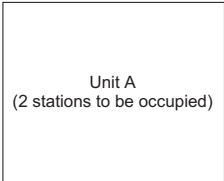
**! Caution** Duplicate station number settings are not permitted. If duplication is made, "Error No. 211/552 IA Net Link Error" will occur and communication becomes unavailable. Be careful not to duplicate station number assignments. When an XSEL controller or an extension I/O unit is configured to occupy more than one station, be sure that other XSEL controllers are not also configured to occupy the same stations (overlapping stations).

Station No.0

Station No.1

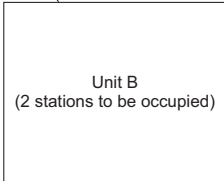
Station No.2

Station No.0



Unit A  
(2 stations to be occupied)

Station No.1



Unit B  
(2 stations to be occupied)

**Example:** There is duplication between Unit A and Unit B in Station No. 1. Because Unit A occupies two stations, the station number for Unit B should be 2. If Station 2 was accidentally assigned station number 1, both Unit A and unit B (as shown) would both be attempting to occupy station 1. Unit A is configured for two stations, therefore, it occupies stations 0 and 1. Unit B is also configured for two stations, and it occupies stations 2 and 3.

## (1) Station Numbers and Shared Words

The table below shows the relationship between the XSEL or extension I/O unit station number assignment and the word numbers of the shared memory area.

The station number assigned to any XSEL unit depends upon which words of the shared memory area the XSEL will occupy. The station number is assigned to an XSEL unit through a parameter setting.

| Station No. | Shared Word No. | Station No. | Shared Word No. | Station No. | Shared Word No. | Station No. | Shared Word No. |
|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 0           | 0 to 3          | 16          | 64 to 67        | 32          | 128 to 131      | 48          | 192 to 195      |
| 1           | 4 to 7          | 17          | 68 to 71        | 33          | 132 to 135      | 49          | 196 to 199      |
| 2           | 8 to 11         | 18          | 72 to 75        | 34          | 136 to 139      | 50          | 200 to 203      |
| 3           | 12 to 15        | 19          | 76 to 79        | 35          | 140 to 143      | 51          | 204 to 207      |
| 4           | 16 to 19        | 20          | 80 to 83        | 36          | 144 to 147      | 52          | 208 to 211      |
| 5           | 20 to 23        | 21          | 84 to 87        | 37          | 148 to 151      | 53          | 212 to 215      |
| 6           | 24 to 27        | 22          | 88 to 91        | 38          | 152 to 155      | 54          | 216 to 219      |
| 7           | 28 to 31        | 23          | 92 to 95        | 39          | 156 to 159      | 55          | 220 to 223      |
| 8           | 32 to 35        | 24          | 96 to 99        | 40          | 160 to 163      | 56          | 224 to 227      |
| 9           | 36 to 39        | 25          | 100 to 103      | 41          | 164 to 167      | 57          | 228 to 231      |
| 10          | 40 to 43        | 26          | 104 to 107      | 42          | 168 to 171      | 58          | 232 to 235      |
| 11          | 44 to 47        | 27          | 108 to 111      | 43          | 172 to 175      | 59          | 236 to 239      |
| 12          | 48 to 51        | 28          | 112 to 115      | 44          | 176 to 179      | 60          | 240 to 243      |
| 13          | 52 to 55        | 29          | 116 to 119      | 45          | 180 to 183      | 61          | 244 to 247      |
| 14          | 56 to 59        | 30          | 120 to 123      | 46          | 184 to 187      | 62          | 248 to 251      |
| 15          | 60 to 63        | 31          | 124 to 127      | 47          | 187 to 191      | 63          | 252 to 255      |

## (2) Station No. of Extension I/O Unit

Extension I/O units occupy four stations for each unit, and the station number is to be set on the rotary switches on the front panel.

The relation of the rotary switches and the station numbers is as shown in the table below. This relation also cannot be changed. The relation of the station numbers and the shared word numbers is as shown in the table above.

| Rotary Switch | Station No. | Shared Word No. |
|---------------|-------------|-----------------|
| 0             | 0 to 3      | 0 to 15         |
| 1             | 4 to 7      | 16 to 31        |
| 2             | 8 to 11     | 32 to 47        |
| 3             | 12 to 15    | 48 to 63        |
| 4             | 16 to 19    | 64 to 79        |
| 5             | 20 to 23    | 80 to 95        |
| 6             | 24 to 27    | 96 to 111       |
| 7             | 28 to 31    | 112 to 127      |
| 8             | 32 to 35    | 128 to 143      |
| 9             | 36 to 39    | 144 to 159      |
| A             | 40 to 43    | 160 to 175      |
| B             | 44 to 47    | 176 to 191      |
| C             | 48 to 51    | 192 to 207      |
| D             | 52 to 55    | 208 to 223      |
| E             | 56 to 59    | 224 to 239      |
| F             | 60 to 63    | 240 to 255      |

(3) Input and Output Port on XSEL Controller for IA Net

Extended Input Ports No. : Select 256 points in a row from 1000 to 3999

Extended Output Ports No. : Select 256 points in a row from 4000 to 6999

These are the input and output port numbers used for the communication among the extension units and XSEL controllers.

IA Net exchanges data between controllers in units of words (16 bits).

The station numbers one to four that XSEL controllers can occupy include the number of the stations occupied by extension I/O units.

The output of PIO boards on an extension I/O unit is treated as an extension output port on the occupying XSEL controller, thus the number of the stations XSEL controller occupies is up to four stations including any extension I/O unit output assignments.

The number of stations an XSEL controller will occupy when used with an extension I/O module varies depending upon how many slots of the extension I/O module are occupied by the XSEL controller. The XSEL occupies from 1 to 4 stations; 1 station for each slot of occupied extension I/O module.

It is possible for more than one XSEL controller to occupy an extension I/O module. One XSEL can occupy some extension I/O slots, while another XSEL can occupy other slots.

The input and output signals of an extension I/O unit can be read as input data from all the XSEL controllers in the IA Net network.

On an extension I/O unit, four PIO boards can be mounted (4 slots), and there are three types of input and output as shown below. Therefore, there are a maximum of 192 input points, and a maximum of 192 output points (48 inputs x 4 slots, 48 outputs x 4 slots).

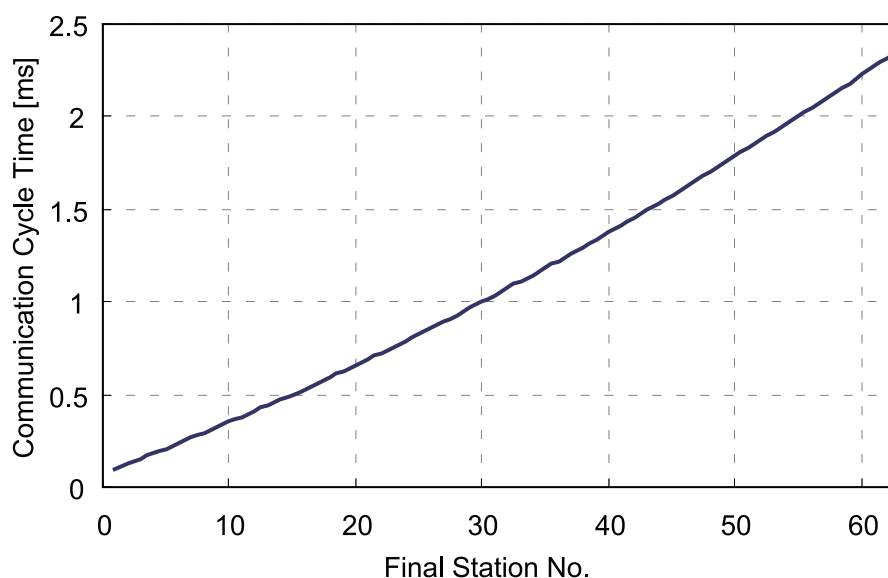
- 1) Input 32 Points/Output 16 Points
- 2) Input 16 Points/Output 32 Points
- 3) Input 48 Points/Output 48 Points

## 3.1.3 Regarding Communication Cycle Time

The communication cycle time is determined by the final station number of the connected units. The communication cycle time (TS) can be expressed with the formula below.

$$TS [ms] = [(Final\ station\ number + 152) \times (Final\ station\ number + 3) \times 2] / 12000$$

TS indicates only the IA Net communication time, and does not show the total performance including the execution time for SEL program and so on.



The communication cycle time for IA Net is shortened as the final station number is smaller. The communication cycle time will get longer if the setting is established with some station numbers skipped on the way or there is an unoccupied station number.

In IA Net, "resizing" is the method to change the final station number. Revise the network construction and resize the final station number to minimize the number of the stations.



### CAUTION

It is recommended to leave some number of stations unoccupied to ease future network configuration changes. (Example: if an XSEL is planned to occupy only two stations, beginning at station 0, leave at least one adjacent station, station 3, unoccupied). If no "spare," unoccupied station(s) are left between stations in the initial network configuration, and it becomes necessary to expand a controller's shared memory occupation (add a station), then the station addressing of all controllers following that controller in the network configuration will have to be shifted. Of course the port addresses of input and output also shift, therefore the programming also needs to be revised.

## 3.1.4 Functions of IA Net

IA Net possesses three communication functions.

- (1) I/O communication among XSEL controllers
- (2) I/O communication of extension I/O unit
- (3) Connection of PC software with XSEL controllers

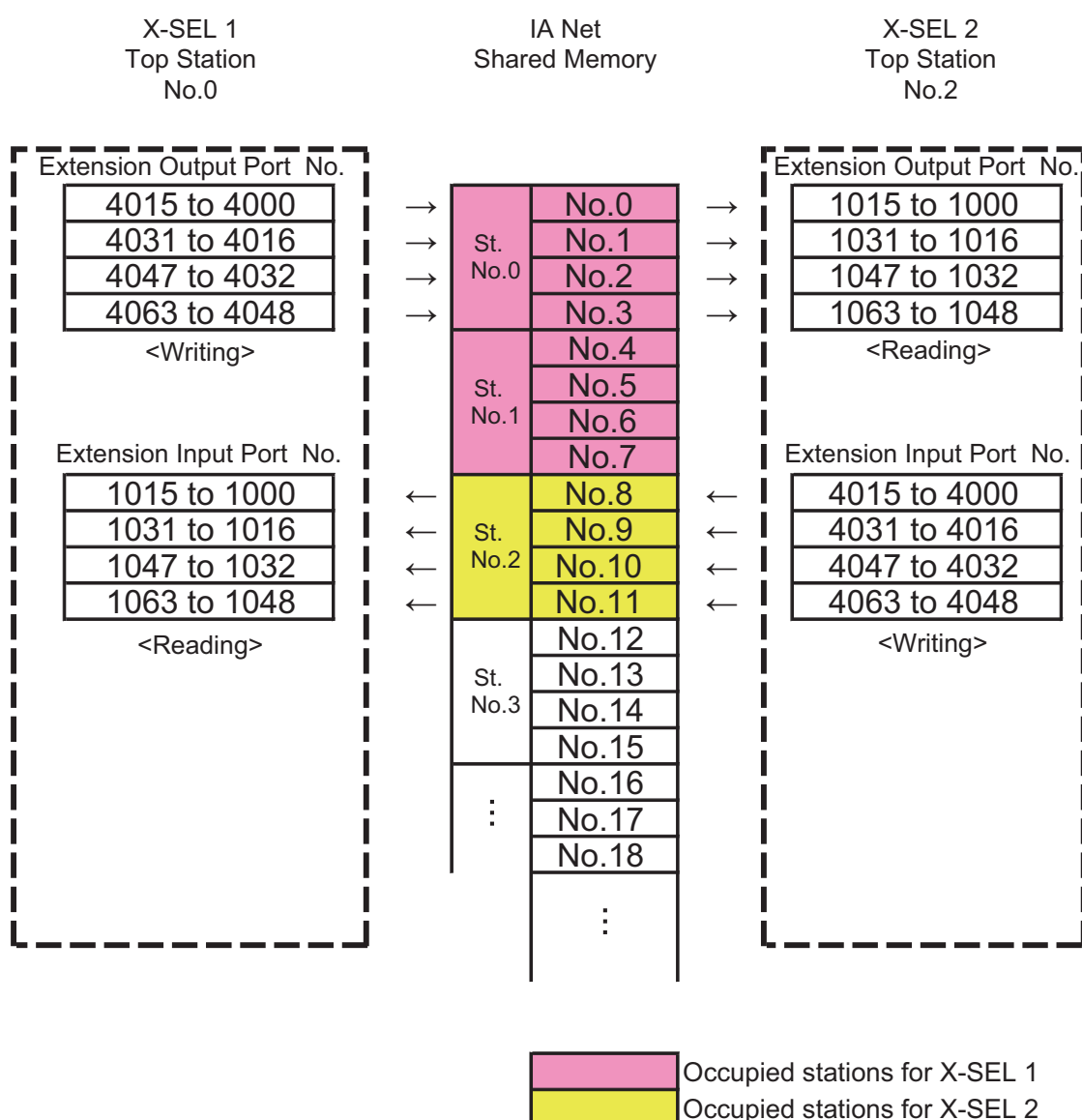
### [1] Guideline of I/O Communication among XSEL Controllers

The diagram below shows the flow of PIO signals between two units of XSEL

The condition of the extension output port that is turned ON/OFF on X-SEL1 can be written from the extension input port on X-SEL2 via the shared memory. At the same time, the condition of the extension output port that is turned on/off on X-SEL2 can be written from the extension input port on X-SEL1.

X-SEL can turn ON/OFF from the extension output port only on the stations that it occupies.

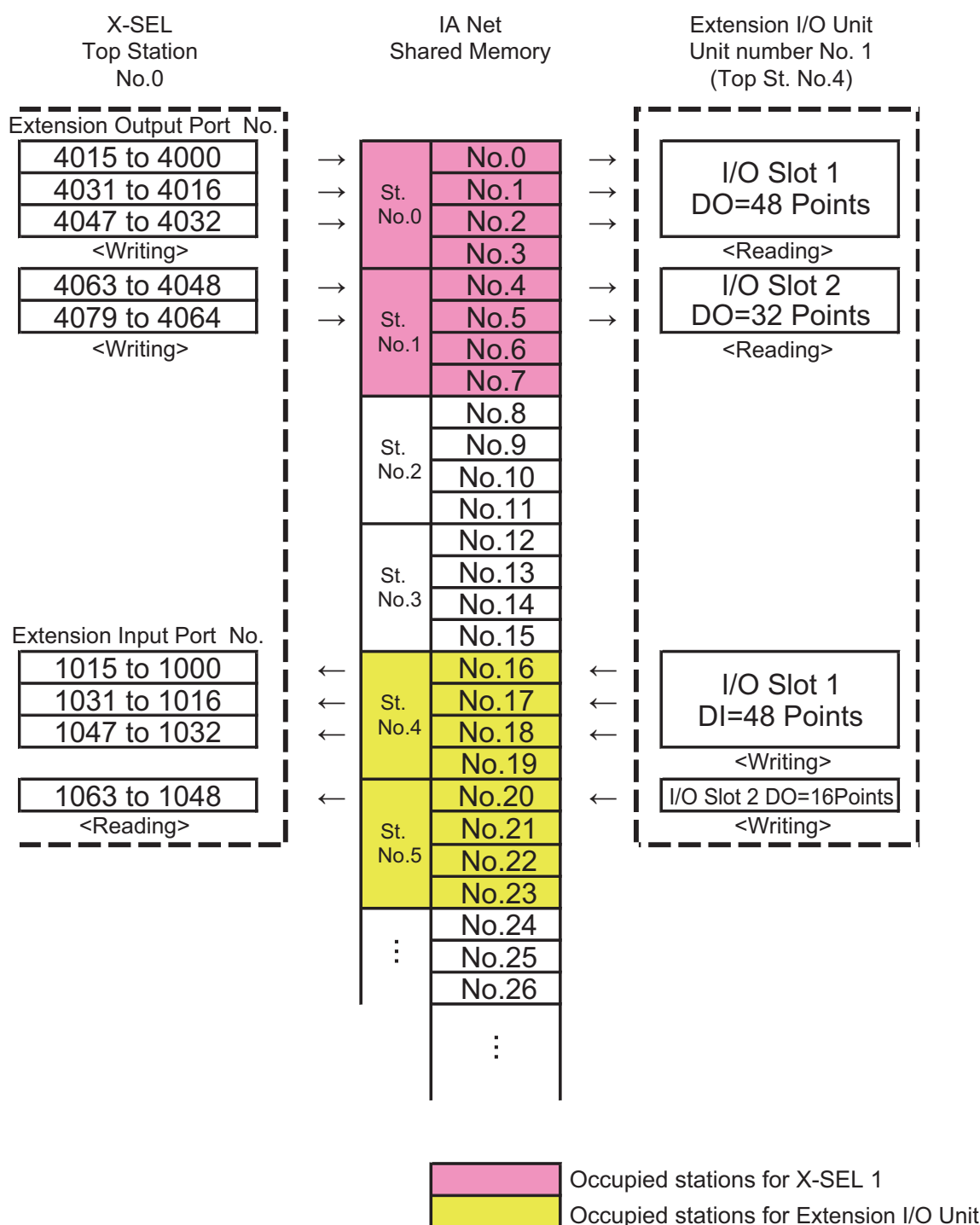
The stations other than what are occupied cannot be turned ON/OFF. The condition of ON/OFF can be referred (read) from all the XSEL controllers connected to the IA Net network.



## [2] Guideline of I/O Communication Extension I/O Unit

The diagram below shows the flow of PIO signals between one unit of XSEL and one unit of the extension I/O unit.

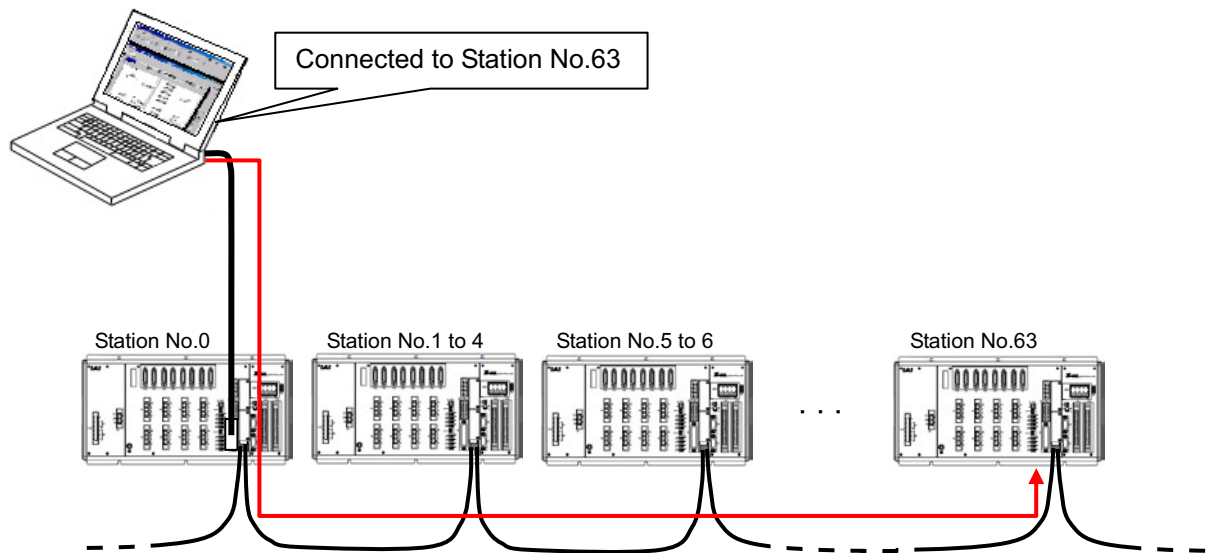
With IA Net, it is possible for multiple XSEL controllers to turn ON/OFF PIO boards mounted in the slots of an extension I/O unit. Each slot of an extension I/O unit is an IA Net station. One XSEL controller can occupy some, or all, of the extension I/O unit stations (slots). Another XSEL controller can also occupy some extension I/O unit stations. Any given XSEL can only turn ON/OFF the outputs of an extension I/O unit PIO board for the extension unit I/O stations that it occupies. The outputs of slots other than what is occupied cannot be turned ON/OFF. Also the condition of ON/OFF of the input and output on an extension unit can be referenced (read) by all the XSEL controllers connected to the IA Net network.



## [3] Each XSEL Controller and PC Soft Connection

By connecting the PC software to one of the XSEL controllers, communication can be held also with other XSEL controllers in the IA Net network. However, communication at the same time with multiple XSEL controllers cannot be conducted.

(Note) This function is not applicable for teaching pendants.



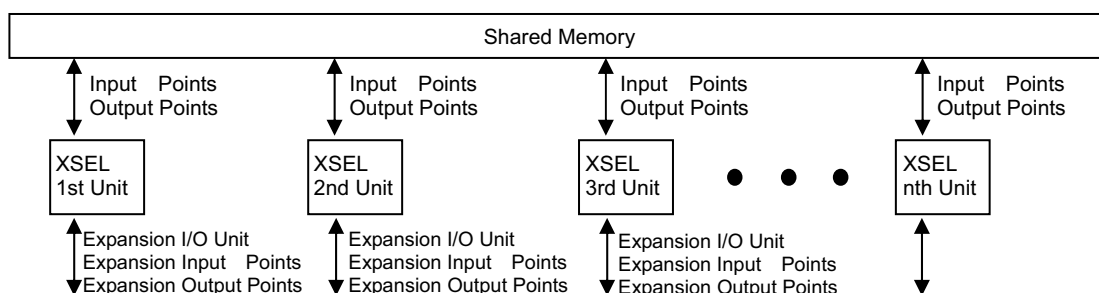
## 3.2 Construction for Network

To construct the network, the parameter setting is to be performed on XSEL PC Software <sup>(Note)</sup>. Initial setting is to be conducted to all the XSEL controllers connected to IA Net.

(Note) See the instruction manuals of the XSEL PC software for the applicable version.

### [1] Setting Procedure

(Preparation) Draw a construction map of the system and make the shared memory allocations according to the requirements of the system being designed. Draw the construction map showing the number of units that are connected to IA Net and the shared memory utilization.



- (1) Determine <sup>(Note1)</sup> the number of input and output signals to have communication among XSEL.

Write down the numbers of points (16 points per unit) of the input and output signals in the figure drawn in (Preparation). For the number of input points, write down the numbers considering the numbers of the input points from XSEL to be referred to and the number of input points for the extension I/O unit to be referred to.

- (2) Determine <sup>(Note1)</sup> the number of points for the output signals of the extension I/O unit that each XSEL requires.

At the bottom of each XSEL drawn in the diagram in (Preparation), put the number of output (16 points) used for the extension I/O unit.

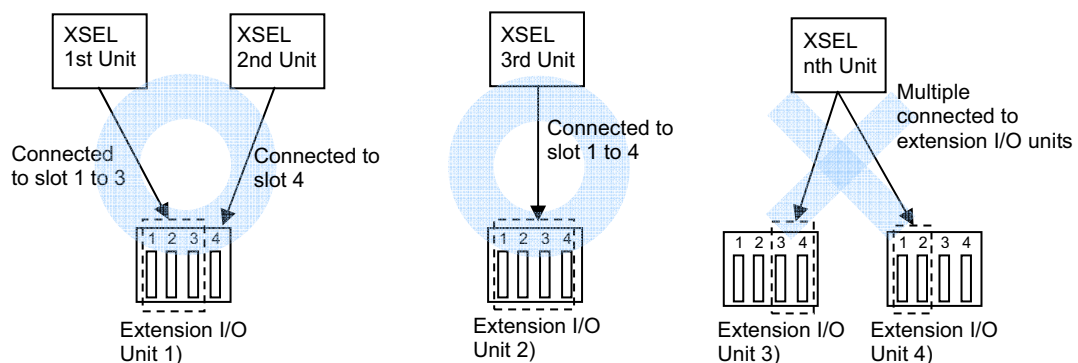
The maximum number of the output points should be the total number of output ports on the I/O boards (four at max.) mounted on the extension I/O unit.

I/O Boards Available to Mount on Extension I/O Unit

| No. of Output point | No. of Input point | Type | I/O board model |
|---------------------|--------------------|------|-----------------|
| 16                  | 32                 | NPN  | IA-103-X-32     |
|                     |                    | PNP  | IA-103-X-32-P   |
| 32                  | 16                 | NPN  | IA-103-X-16     |
|                     |                    | PNP  | IA-103-X-16-P   |
| 48                  | 48                 | NPN  | IA-IO-3204-NP   |
|                     |                    | PNP  | IA-IO-3204-PN   |

Note 1 Make the total of the number of the output points for (1) and (2) 256 or less.

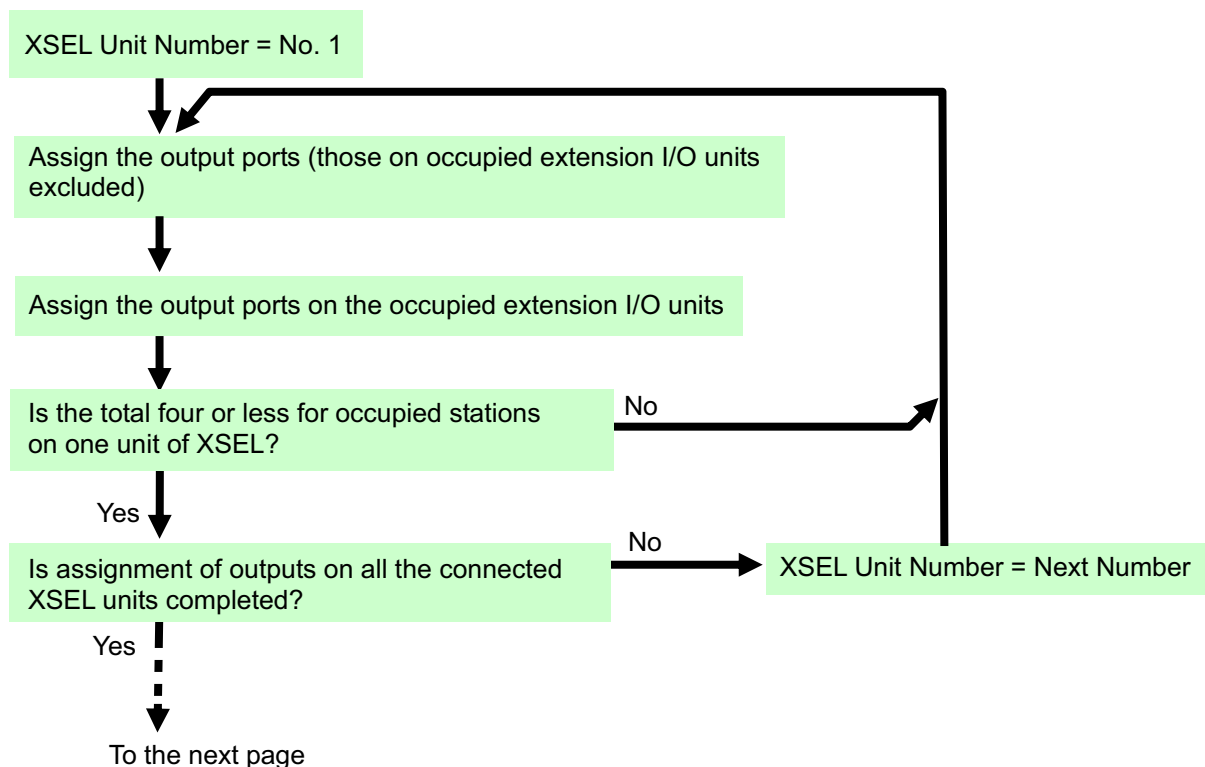
- (3) Only one unit of the extension I/O unit can be connected to one unit of XSEL.  
 Make the extension I/O unit related to each XSEL with care to satisfy the required number of output points defined in (2) and not to assign to the I/O board mounted in multiple I/O units. Write the total number of input on the I/O board mounted in the related slot to the number of input points on the extension I/O.  
 Draw extension I/O units below each XSEL in the diagram drawn in (Preparation) and also draw arrows to show the relations.  
 Note One piece of I/O board (output port) cannot be controlled by multiple XSEL.  
 (Even if there is an excess output port, another XSEL cannot be assigned.)



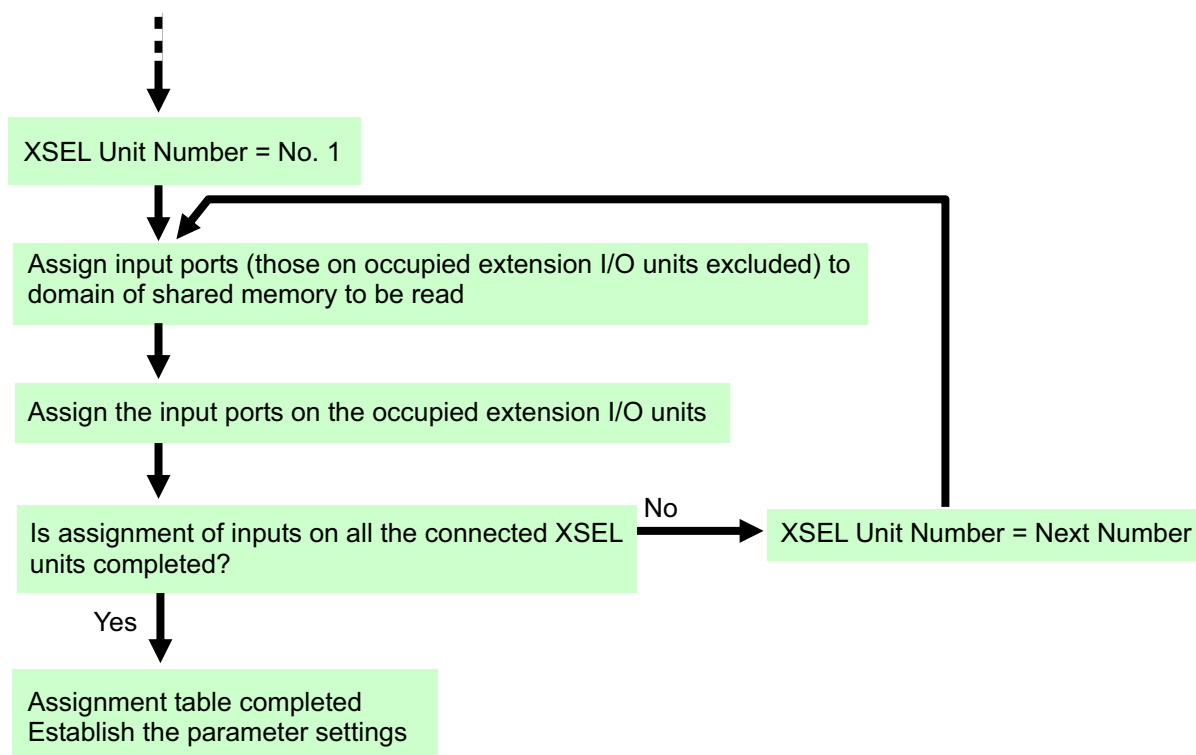
Have the assignments based on the system construction map created by now. Print out the shared memory assignment table and parameter setting table in the appendix in the end of this manual, and write them down.

[Refer to [2] Examples for Parameter Setting and Shared Memory Assignment in the next page and sections 3.2.1 to 3.2.4]

- Basic Flow to Create Assignment Table



Continued from previous page



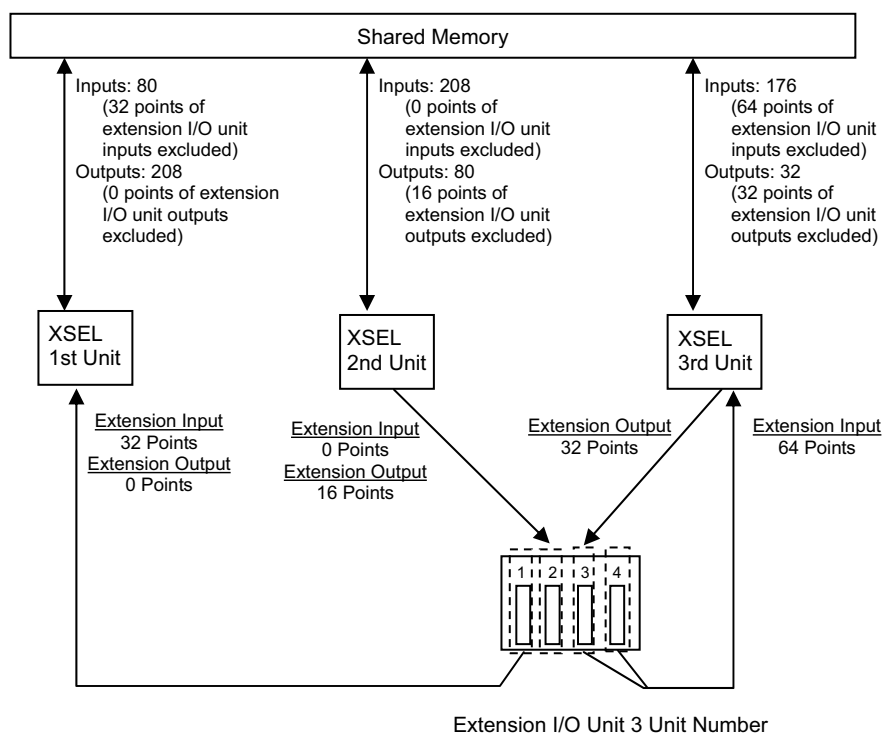
The following steps explain the basic flow to create the assignment table.

- (4) Assign <sup>(Note 2) (Note 4)</sup> the number of output points (256 points at max.) except for those on extension I/O units in 1<sup>st</sup> unit of XSEL to the shared memory (output side). Assign the numbers in a row from the top shared word number of each station.
- (5) Assign <sup>(Note 2) (Note 4)</sup> the number of output points on extension I/O units occupied by one unit of XSEL to the shared memory (output side). Even if there is a shared word domain that is not assigned at that time, do not assign to a station that is already assigned in (4) and assign to the next station. Also, when occupying multiple slots, assign to slots one by one.
- (6) Make the total of the number of the stations assigned in (4) and (5) four or less <sup>(Note 3)</sup>.
- (7) Conduct steps (4) to (6) also to the rest of the XSEL units. Have the settings done from the station number after those used for the XSEL unit set one before.
- (8) Reserve four stations in a row that are occupied by extension I/O unit with a consideration that the top station number is a multiple of 4 (4n).  
In case several extension I/O units are to be connected, reserve four stations in the same way for each unit. The reserved four stations apply for Input port of each slot on each extension I/O unit. [Refer to the table below.]

| Station No.         | Slot Number of Extension I/O Unit Slot |
|---------------------|----------------------------------------|
| 4n (Multiples of 4) | 1                                      |
| 4n+1                | 2                                      |
| 4n+2                | 3                                      |
| 4n+3                | 4                                      |

- (9) Set the number n, a multiple of 4, set in (8) to the unit number rotary switch on an extension I/O unit.  
 Example) If the top station number = 12, n = 3, therefore this extension I/O unit is No. 3.  
 Set the rotary switch to 3.
- (10) Assign <sup>(Note 5)</sup> the output ports of other XSEL units that the first XSEL unit refers (inputs) to the shared memory (input side) in the order from the smaller.
- (11) Conduct (10) also to other XSEL units.
- (12) When occupying the slots on an extension I/O unit and using input ports on the occupied slots, check the number of used input ports on (2) in the table, and reserve the shared memory (input side) required for each slot. Do not have it assigned <sup>(Note 6)</sup> yet.
- (13) Have (12) conducted for all the XSEL units that the slots for extension I/O units are occupied.
- (14) When referring (inputting) the input ports of the slots that another XSEL unit occupies, assign <sup>(Note 5)</sup> the shared memory of the referred XSEL from (10).
- (15) Have (14) conducted also on all the XSEL units.
- (16) Finally, assign <sup>(Note 6)</sup> the shared memory reserved in (12).
- Note 2 Be careful not to exceed the number of extension output ports on an XSEL controller. (Extended Output Ports : Port No. 4000 to 6999)。
- Note 3 The number of stations that one unit of XSEL can occupy in the shared memory on the output side is four.
- Note 4 One station consists of four shared word domain with 16 bits, and there are domains of 64 bits.
- Note 5 There is no limit in number of occupied stations in the shared memory on the input side. Make sure not to exceed the number of extension input ports on an XSEL controller.(Extended Input Ports : Port No.1000 to 3999)
- Note 6 The assignment of the input ports on an extension I/O unit to be conducted at the last after assignment of all other referred ports is completed.

## [2] Example for Parameter Setting and Shared Memory Assignment



The following tables show the parameter settings for the three networked XSEL controllers, when connected and configured as shown in the completed construction map above.

Noto Add color code for Shared Memory Map here: see next markup page.

## • Example for Shared Memory Assignment

| Station No.                |        |    | Shared word No. | Occupations of Shared Memory    | XSEL 1st Unit   |                                                   | XSEL 2nd Unit + Extension                         |                      | XSEL 3rd Unit + Extension I/O |                  |                              |                    |                  |                              |
|----------------------------|--------|----|-----------------|---------------------------------|-----------------|---------------------------------------------------|---------------------------------------------------|----------------------|-------------------------------|------------------|------------------------------|--------------------|------------------|------------------------------|
|                            |        |    |                 |                                 | Input           | Output                                            | Input                                             | Output               | Input                         | Output           |                              |                    |                  |                              |
| 1st Unit                   | 0      | 1  | 0               | Output Occupations (208 points) |                 | 4015 to 4000                                      | →                                                 | 1015 to 1000         | →                             | 1015 to 1000     | Procedure (10)(11)           |                    |                  |                              |
|                            |        |    | 1               |                                 |                 | 4031 to 4016                                      | →                                                 | 1031 to 1016         | →                             | 1031 to 1016     |                              |                    |                  |                              |
|                            |        |    | 2               |                                 |                 | 4047 to 4032                                      | →                                                 | 1047 to 1032         |                               |                  |                              |                    |                  |                              |
|                            |        |    | 3               |                                 |                 | 4063 to 4048                                      | →                                                 | 1063 to 1048         |                               |                  |                              |                    |                  |                              |
|                            |        |    | 4               |                                 |                 | 4079 to 4064                                      | →                                                 | 1079 to 1064         | Procedure (10)(11)            |                  |                              |                    |                  |                              |
|                            |        |    | 5               |                                 |                 | 4095 to 4080                                      | →                                                 | 1095 to 1080         |                               |                  |                              |                    |                  |                              |
|                            |        |    | 6               |                                 | Procedure (4)   | 4111 to 4096                                      | →                                                 | 1111 to 1096         |                               |                  |                              |                    |                  |                              |
|                            |        |    | 7               |                                 |                 | 4127 to 4112                                      | →                                                 | 1127 to 1112         |                               |                  |                              |                    |                  |                              |
|                            |        |    | 8               |                                 |                 | 4143 to 4128                                      | →                                                 | 1143 to 1128         |                               |                  |                              |                    |                  |                              |
|                            |        |    | 9               |                                 |                 | 4159 to 4144                                      |                                                   |                      | →                             | 1047 to 1032     |                              |                    |                  |                              |
|                            |        |    | 2               |                                 |                 | 10                                                | 4175 to 4160                                      |                      |                               | →                | 1063 to 1048                 | Procedure (10)(11) |                  |                              |
|                            |        |    |                 |                                 |                 | 11                                                | 4191 to 4176                                      |                      |                               | →                | 1079 to 1064                 |                    |                  |                              |
|                            |        |    |                 |                                 |                 | 12                                                | 4207 to 4192                                      |                      |                               | →                | 1095 to 1080                 |                    |                  |                              |
|                            |        |    | 3               |                                 |                 | 13                                                |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    |                 |                                 |                 | 14                                                |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 15                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 2nd Unit                   | 4      | 5  | 16              | Output Occupations (80 points)  | 1015 to 1000    | Procedure (10)                                    | ←                                                 |                      | 4015 to 4000                  | →                | 1111 to 1096                 | Procedure (10)(11) |                  |                              |
|                            |        |    | 17              |                                 | 1031 to 1016    |                                                   | ←                                                 |                      | 4031 to 4016                  |                  |                              |                    |                  |                              |
|                            |        |    | 18              |                                 | 1047 to 1032    |                                                   | ←                                                 | Procedure (4)(7)     | 4047 to 4032                  |                  |                              |                    |                  |                              |
|                            |        |    | 19              |                                 | Reference Ports |                                                   |                                                   | 4063 to 4048         | →                             | 1127 to 1112     | Procedure (10)(11)           |                    |                  |                              |
|                            |        |    | 20              |                                 |                 |                                                   |                                                   | 4079 to 4064         | →                             | 1143 to 1128     |                              |                    |                  |                              |
|                            |        |    | 21              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 22              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 23              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 6               |                                 |                 | 24                                                | Extension I/O unit Output Occupations (16 points) | 1063 to 1048         | ← Procedure (10)              | ←                | Procedure (5)(7)             | 4095 to 4080       |                  |                              |
|                            |        |    |                 |                                 |                 | 25                                                |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 26                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 3rd Unit                   | 7      | 8  | 27              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 28              |                                 |                 |                                                   | 1159 to 1144                                      | ← Procedure (10)(11) | ←                             | Procedure (4)(7) | 4015 to 4000<br>4031 to 4016 |                    |                  |                              |
|                            |        |    | 29              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 30              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 31              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 32              |                                 | 32              | Extension I/O unit Output Occupations (32 points) |                                                   |                      |                               | 1175 to 1160     | Procedure (10)(11)           | ←                  | Procedure (5)(7) | 4047 to 4032<br>4063 to 4048 |
|                            |        |    |                 |                                 | 33              |                                                   |                                                   |                      | 1191 to 1176                  | ←                |                              |                    |                  |                              |
|                            |        |    |                 |                                 | 34              |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    |                 |                                 | 35              |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | Empty           | 9                               | 10              | 36                                                | Empty (for station number adjustment)             |                      |                               |                  |                              |                    |                  |                              |
| 37                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 38                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 39                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 40                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 41                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 42                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 43                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 44                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| 45                         |        |    |                 |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| Procedure (8)              | 11     |    | 46              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 47              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 48              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 49              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 50              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 51              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 52              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 53              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 54              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 55              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
| Extension I/O unit (INPUT) | Slot 1 | 12 | 56              | Slot 1 Input (32 points)        | 1095 to 1080    | Procedure (12)(16)                                | →                                                 | 1207 to 1192         | ← Procedure (14)(15)          | →                | 1159 to 1144                 | Procedure (14)(15) |                  |                              |
|                            |        |    | 49              |                                 | 1111 to 1096    |                                                   | →                                                 |                      | →                             | 1175 to 1160     |                              |                    |                  |                              |
|                            |        |    | 50              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 51              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            | Slot 2 | 13 | 52              | Slot 2 Input (None)             |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 53              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 54              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 55              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            | Slot 3 | 14 | 56              | Slot 3 Input (16 points)        | 1079 to 1064    | Procedure (14)                                    | ←                                                 |                      |                               | ←                | 1191 to 1176                 |                    |                  |                              |
|                            |        |    | 57              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 58              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 59              |                                 |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            | Slot 4 | 15 | 60              | Slot 4 Input (48 points)        |                 |                                                   |                                                   |                      |                               |                  |                              |                    |                  |                              |
|                            |        |    | 61              |                                 |                 |                                                   |                                                   |                      |                               | 1207 to 1192     | Procedure (12)(13)(16)       |                    |                  |                              |
|                            |        |    | 62              |                                 |                 |                                                   |                                                   |                      | 1223 to 1208                  |                  |                              |                    |                  |                              |
|                            |        |    | 63              |                                 |                 |                                                   |                                                   |                      | 1239 to 1224                  |                  |                              |                    |                  |                              |

| XSEL First Units          |                                                                       |           |
|---------------------------|-----------------------------------------------------------------------|-----------|
| IA Net Related Parameters |                                                                       | Set Value |
| 1                         | I/O Port Allocation Type                                              | 0         |
| 602                       | Top Occupied Station Number                                           | 0         |
| 603                       | Resizing executed station number                                      | 0         |
| 604                       | Final station number                                                  | 15        |
| 605                       | All Connected Station Patterns (31-00)                                | F1FF      |
| 606                       | All Connected Station Patterns (63-32)                                | 0         |
| 691                       | Input Port Start No. in Network I/F                                   | 1000      |
| 692                       | Output Port Start No. in Network I/F                                  | 4000      |
| 693                       | Shared memory reference word pattern (31-00) <sup>(Note 1)</sup>      | 01070000  |
| 694                       | Shared memory reference word pattern (63-32) <sup>(Note 1)</sup>      | 1000000   |
| 695 to 700                | Extension I/O unit input ports connected directly excluded            |           |
|                           | Shared memory reference word pattern (255-64) <sup>(Note 1)</sup>     | 0         |
| 701                       | Output Ports <sup>(Note 2)</sup>                                      | 208       |
| 705                       | Extension I/O Unit Use Select                                         | 2         |
| 706                       | Unit Number of Extension I/O Unit                                     | 3         |
| 707                       | Start number of extension input ports at fixed assignment for Slot 1  | 1080      |
| 708                       | Start number of extension output ports at fixed assignment for Slot 1 | -1        |
| 709                       | Start number of extension input ports at fixed assignment for Slot 2  | -1        |
| 710                       | Start number of extension output ports at fixed assignment for Slot 2 | -1        |
| 711                       | Start number of extension input ports at fixed assignment for Slot 3  | -1        |
| 712                       | Start number of extension output ports at fixed assignment for Slot 3 | -1        |
| 713                       | Start number of extension input ports at fixed assignment for Slot 4  | -1        |
| 714                       | Start number of extension output ports at fixed assignment for Slot 4 | -1        |

| XSEL Third Units          |                                                                       |           |
|---------------------------|-----------------------------------------------------------------------|-----------|
| IA Net Related Parameters |                                                                       | Set Value |
| 1                         | I/O Port Allocation Type                                              | 0         |
| 602                       | Top Occupied Station Number                                           | 7         |
| 603                       | Resizing executed station number                                      | 0         |
| 604                       | Final station number                                                  | 15        |
| 605                       | All Connected Station Patterns (31-00)                                | F1FF      |
| 606                       | All Connected Station Patterns (63-32)                                | 0         |
| 691                       | Input Port Start No. in Network I/F                                   | 1000      |
| 692                       | Output Port Start No. in Network I/F                                  | 4000      |
| 693                       | Shared memory reference word pattern (31-00) <sup>(Note 1)</sup>      | 00191E03  |
| 694                       | Shared memory reference word pattern (63-32) <sup>(Note 1)</sup>      | 30000     |
| 695 to 700                | Extension I/O unit input ports connected directly excluded            |           |
|                           | Shared memory reference word pattern (255-64) <sup>(Note 1)</sup>     | 0         |
| 701                       | Output Ports <sup>(Note 2)</sup>                                      | 32        |
| 705                       | Extension I/O Unit Use Select                                         | 2300      |
| 706                       | Unit Number of Extension I/O Unit                                     | 3         |
| 707                       | Start number of extension input ports at fixed assignment for Slot 1  | -1        |
| 708                       | Start number of extension output ports at fixed assignment for Slot 1 | -1        |
| 709                       | Start number of extension input ports at fixed assignment for Slot 2  | -1        |
| 710                       | Start number of extension output ports at fixed assignment for Slot 2 | -1        |
| 711                       | Start number of extension input ports at fixed assignment for Slot 3  | 1176      |
| 712                       | Start number of extension output ports at fixed assignment for Slot 3 | 4032      |
| 713                       | Start number of extension input ports at fixed assignment for Slot 4  | 1192      |
| 714                       | Start number of extension output ports at fixed assignment for Slot 4 | -1        |

- Note 1 Establish the settings with a care not to include the input ports of an extension I/O unit that XSEL controller directly controls (which is set in Parameter No. 705) in the word pattern.
- Note 2 Establish the settings with a care not to include the output ports of an extension I/O unit that XSEL controller directly controls (which is set in Parameter No. 705) in the number of used output ports.

| XSEL Second Units         |                                                                       |           |
|---------------------------|-----------------------------------------------------------------------|-----------|
| IA Net Related Parameters |                                                                       | Set Value |
| 1                         | I/O Port Allocation Type                                              | 0         |
| 602                       | Top Occupied Station Number                                           | 4         |
| 603                       | Resizing executed station number                                      | 0         |
| 604                       | Final station number                                                  | 15        |
| 605                       | All Connected Station Patterns (31-00)                                | F1FF      |
| 606                       | All Connected Station Patterns (63-32)                                | 0         |
| 691                       | Input Port Start No. in Network I/F                                   | 1000      |
| 692                       | Output Port Start No. in Network I/F                                  | 4000      |
| 693                       | Shared memory reference word pattern (31-00) <sup>(Note 1)</sup>      | 100001FF  |
| 694                       | Shared memory reference word pattern (63-32) <sup>(Note 1)</sup>      | 10003     |
| 695 to 700                | Shared memory reference word pattern (255-64) <sup>(Note 1)</sup>     |           |
|                           |                                                                       | 0         |
| 701                       | Output Ports <sup>(Note 2)</sup>                                      | 80        |
| 705                       | Extension I/O Unit Use Select                                         | 10        |
| 706                       | Unit Number of Extension I/O Unit                                     | 3         |
| 707                       | Start number of extension input ports at fixed assignment for Slot 1  | -1        |
| 708                       | Start number of extension output ports at fixed assignment for Slot 1 | -1        |
| 709                       | Start number of extension input ports at fixed assignment for Slot 2  | -1        |
| 710                       | Start number of extension output ports at fixed assignment for Slot 2 | 4080      |
| 711                       | Start number of extension input ports at fixed assignment for Slot 3  | -1        |
| 712                       | Start number of extension output ports at fixed assignment for Slot 3 | -1        |
| 713                       | Start number of extension input ports at fixed assignment for Slot 4  | -1        |
| 714                       | Start number of extension output ports at fixed assignment for Slot 4 | -1        |

| Expansion I/O units             | Rotary Switch (unit number setting) | 3 |
|---------------------------------|-------------------------------------|---|
| Number of I/O points for Slot 1 | I/O=32/16                           |   |
| Number of I/O points for Slot 2 | I/O=32/16                           |   |
| Number of I/O points for Slot 3 | I/O=16/32                           |   |
| Number of I/O points for Slot 4 | I/O=48/48                           |   |

| Slot No.          | XSEL1            |        | XSEL2 |                  | XSEL3            |                  |
|-------------------|------------------|--------|-------|------------------|------------------|------------------|
|                   | Input            | Output | Input | Output           | Input            | Output           |
| 1                 | ○<br>(32 points) |        |       |                  |                  |                  |
| 2                 |                  |        |       | ○<br>(16 points) |                  |                  |
| 3                 |                  |        |       |                  | ○<br>(16 points) | ○<br>(32 points) |
| 4                 |                  |        |       |                  | ○<br>(48 points) |                  |
| Parameters No.705 | 2                |        | 10    |                  | 2300             |                  |

Station Numbers and Shared Word Numbers on Extension I/O Unit

| Rotary Switch (unit number setting) | Station No. | Shared Word No. |
|-------------------------------------|-------------|-----------------|
| 0                                   | 0 to 3      | 0 to 15         |
| 1                                   | 4 to 7      | 16 to 31        |
| 2                                   | 8 to 11     | 32 to 47        |
| 3                                   | 12 to 15    | 48 to 63        |
| 4                                   | 16 to 19    | 64 to 79        |
| 5                                   | 20 to 23    | 80 to 95        |
| 6                                   | 24 to 27    | 96 to 111       |
| 7                                   | 28 to 31    | 112 to 127      |
| 8                                   | 32 to 35    | 128 to 143      |
| 9                                   | 36 to 39    | 144 to 159      |
| A                                   | 40 to 43    | 160 to 175      |
| B                                   | 44 to 47    | 176 to 191      |
| C                                   | 48 to 51    | 192 to 207      |
| D                                   | 52 to 55    | 208 to 223      |
| E                                   | 56 to 59    | 224 to 239      |
| F                                   | 60 to 63    | 240 to 255      |

## 3.2.1 Setting of Parameter in Common

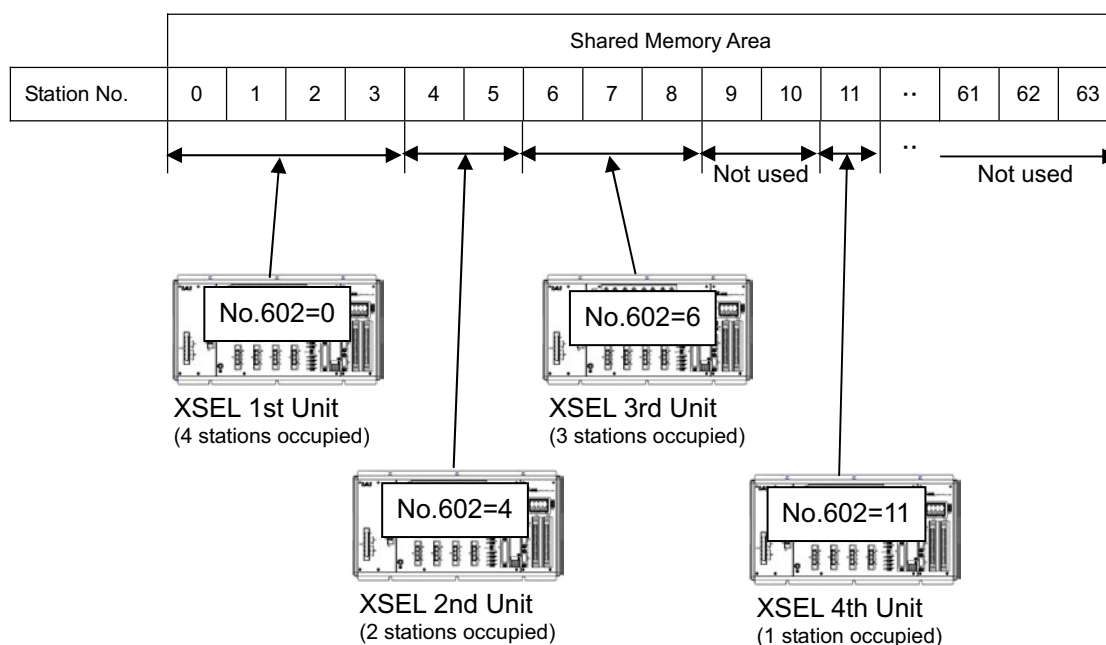
The following settings must be established whenever IA Net is used.

[Setting 1: Setting of Top Occupied Station Number]

| I/O                |                |           |
|--------------------|----------------|-----------|
| Common to All Axes |                |           |
| No                 | Parameter Name | Set Value |
| 602                | TopNoStIANT    | 0         |

In I/O Parameter No.602, set the lowest occupied station number (settable range from 0 to 63) that the controller occupies.

Shown below is an example for setting (when connecting four units of XSEL).



[Caution in Setting]

- 1 When setting the top occupied station number, do not attempt to duplicate the number with another device. In IA Net, the specific XSEL controller units having duplicate station numbers can not be detected. In case there is a duplication, an error "211/552: IA Net Link Error" be issued.
- 2 Configuring spare station numbers into the network topology is advisable. When it is required, set in I/O Parameter No.605 and 606 as the station not to be used in "IA Net All Connected Station Patterns (31-00) / (63-32)".
- 3 An extension I/O unit occupies four stations with multiples of 4 as the top station number. The unit numbers are determined by the shared station numbers. Set them on the rotary switches. Pay attention not to duplicate the station number when assigning in the shared memory.

**Note** Establishing the resizing station number and final station number parameters will speed up networked communication, as unused stations are skipped in the communications polling.

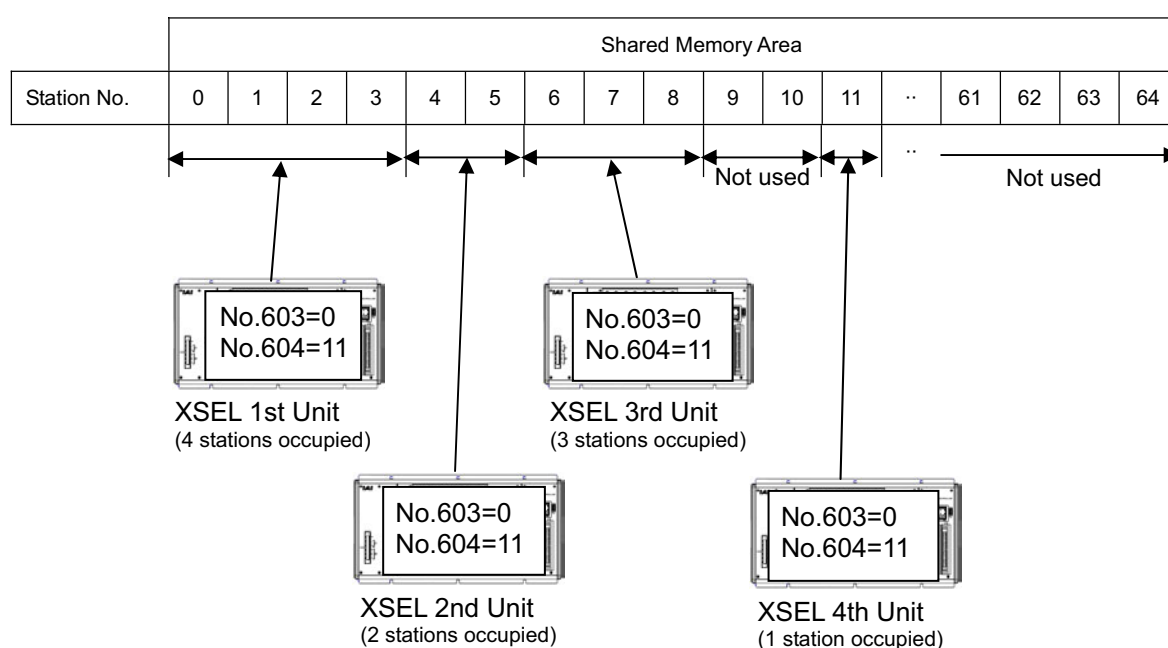
**[Setting 2: Setting of Resizing Station Number and Final Station Number]**

| I/O |                |           | Common to All Axes | Specific Axis | Driver | Encoder | I/O device | Other |
|-----|----------------|-----------|--------------------|---------------|--------|---------|------------|-------|
| No  | Parameter Name | Set Value |                    |               |        |         |            |       |
| 603 | NoRszExeStIANT | 0         |                    |               |        |         |            |       |
| 604 | LstNoStIANT    | 63        |                    |               |        |         |            |       |

Set the resizing station number (settable range from 0 to 63) to I/O Parameter No.603.  
(Set the top station number of the first XSEL controller unit.)

Set the final station number (settable range from 1 to 63) to I/O Parameter No. 604.  
(Set the top station number of the last networked device.)

Shown below is an example for setting (when connecting four units of XSEL).



**[Caution in Setting]**

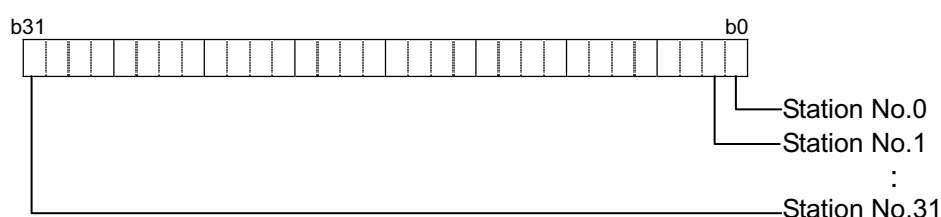
- For I/O Parameters No.603 and 604, set the same values in common for all the XSEL controllers. If not the same value, "548: IA Net Resizing Overlapping Error" will be generated.
- When a change is made to a value in I/O Parameters No. 603 or 604, it is necessary to either cold reboot (power cycle) all networked IA Net devices (all networked controllers) or perform a simultaneous software reset on all controllers.

## [Setting 3: Setting of All Connected Station Patterns]

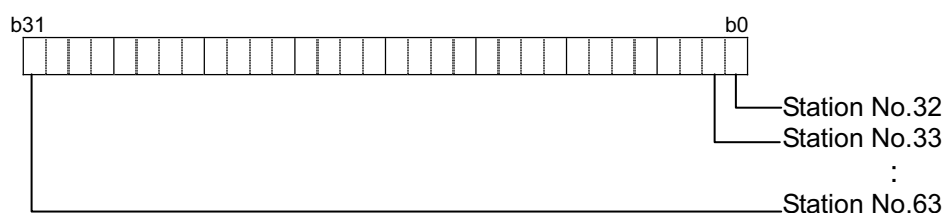
| I/O | Common to All Axes | Specific Axis | Driver | Encoder | I/O device | Other |
|-----|--------------------|---------------|--------|---------|------------|-------|
| No  | Parameter Name     | Set Value     |        |         |            |       |
| 605 | PtnStCnc (31-00)   | FFh           |        |         |            |       |
| 606 | PtnStCnc (63-32)   | 0h            |        |         |            |       |

To I/O Parameters No.605 and 606, set whether to connect all the stations (Station No.0 to 63) in the IA Net network by inputting 0: Not to Use (Not Connected) or 1: Connected. The setting value is calculated in the hexadecimal system with the bit patterns of 0 and 1 described above. The relation between each bit and station number is as explained below:

- I/O Parameter No.605 "IA Net All Connected Station Patterns (31-00)"



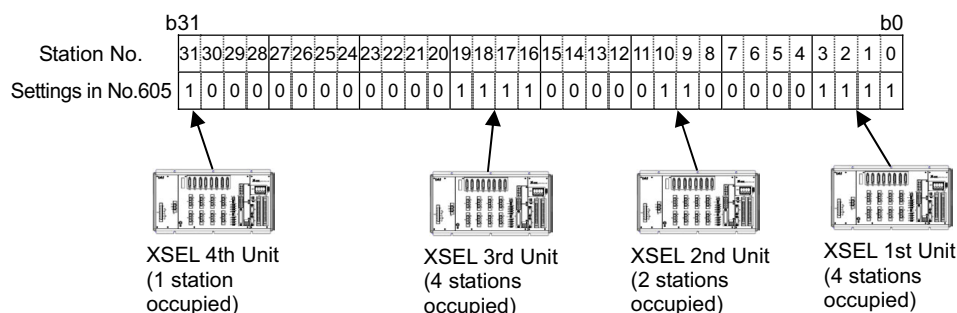
- I/O Parameter No.606 "IA Net All Connected Station Patterns (63-32)"

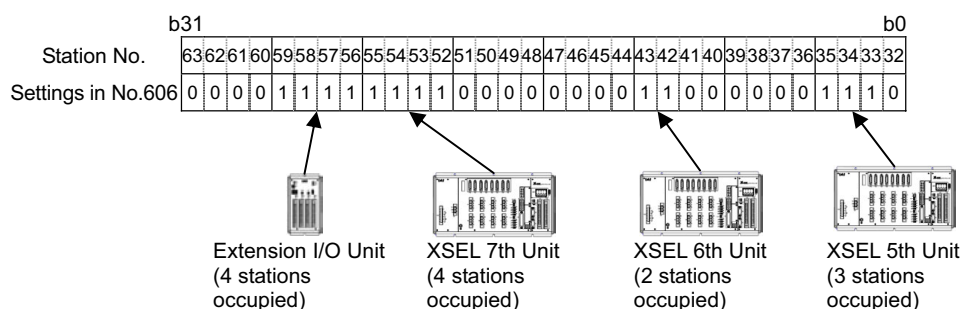


- Caution**

  - 1) With the settings of these parameters, a judgment is made to see a link error. In case these parameters are not set properly, the judgment of a link error cannot be executed correctly.
  - 2) An extension I/O unit occupies four stations with multiples of 4 as the top station number. Pay attention not to duplicate the station number when assigning in the shared memory.

**Example** Shown below is an example for setting for the network construction as shown below:





Convert the bit data set in No.605 into the hexadecimal numbers.

|                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Settings in No.605                | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| ↓                                 | ↓ |   |   |   |   |   |   |   |   |   | ↓ |   |   |   | ↓ |   |   |   |   | ↓ |   |   |   |   | ↓ |   |   |   |   |   |   |   | ↓ |   |   |
| (Covert into hexadecimal numbers) | 8 |   |   |   |   |   |   |   |   |   | 0 |   |   |   | F |   |   |   |   | 0 |   |   |   |   | 6 |   |   |   |   |   |   |   | F |   |   |

The value to set in No.605 is 800F060F<sub>H</sub>.

Convert the bit data set in No.606 into the hexadecimal numbers.

|                                   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Settings in No.606                | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 |
| (Covert into hexadecimal numbers) | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ |
|                                   | 0 | 0 | 0 | 0 | F | F | F | F | F | F | F | 0 | 0 | 0 | 0 | 0 | 0 | 0 | C | C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | E |

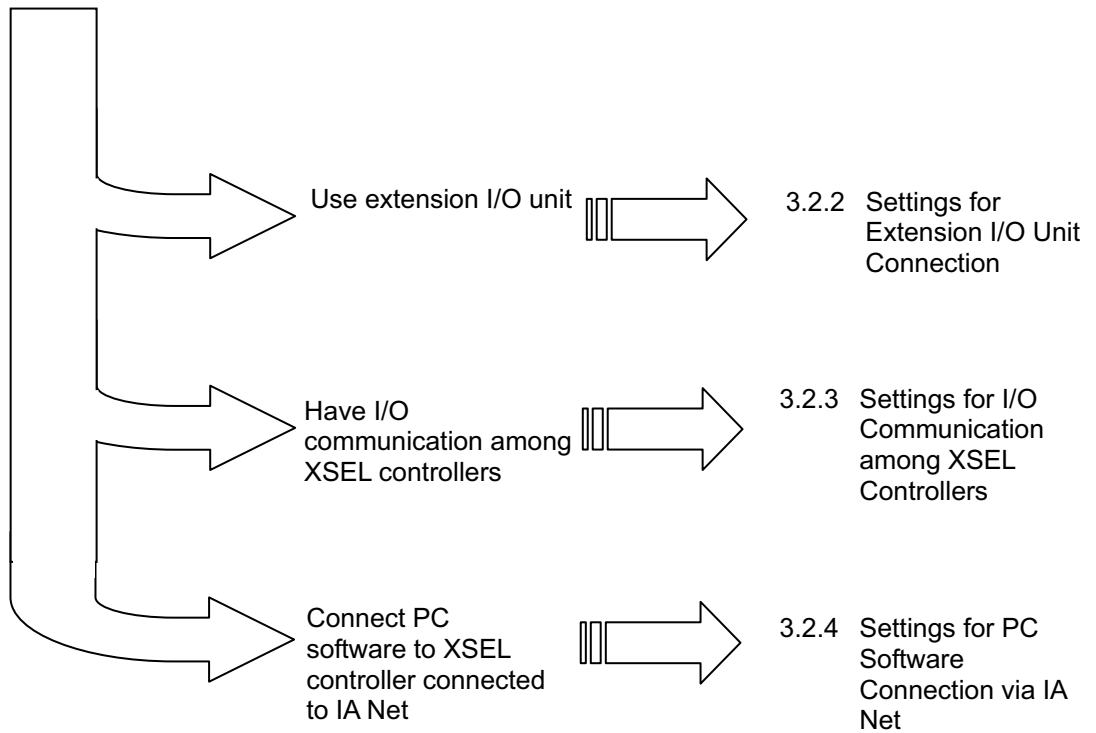
The value to set in No.606 is 0FF00C0E<sub>H</sub>.

Reference Matching Table for Bit Data (Binary Numbers) and Hexadecimal Numbers

| Bit Data<br>(Binary Numbers) | Hexadecimal<br>Numbers |
|------------------------------|------------------------|
| 0000                         | 0                      |
| 0001                         | 1                      |
| 0010                         | 2                      |
| 0011                         | 3                      |
| 0100                         | 4                      |
| 0101                         | 5                      |
| 0110                         | 6                      |
| 0111                         | 7                      |
| 1000                         | 8                      |
| 1001                         | 9                      |
| 1010                         | A                      |
| 1011                         | B                      |
| 1100                         | C                      |
| 1101                         | D                      |
| 1110                         | E                      |
| 1111                         | F                      |

After the preceding settings, which are common to all networked IA Net controllers have been established, Go forward to the page for the setting of the function to be used.

Setting in common for  
all functions complete



## 3.2.2 Settings for Extension I/O Unit Connection

To an extension I/O unit, four I/O boards at the maximum can be mounted.  
 There are three types of I/O boards available with different number of input and output points.  
 [Refer to the instruction manual of XSEL-R/S for the details.]  
 Set the following parameters demonstrated in steps 1 through 3.

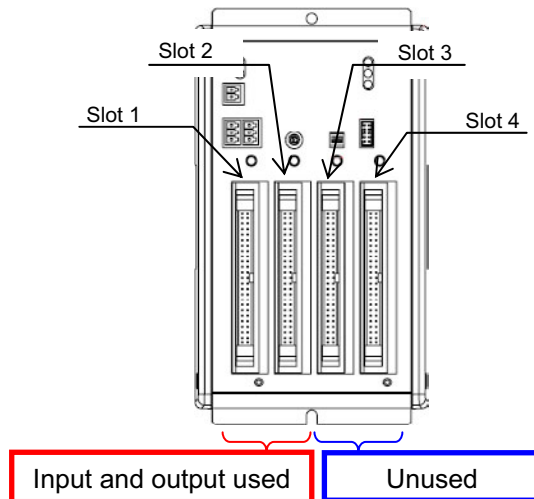
### [Setting 1: Selection of Slot to Use]

| No. | Parameter name<br>(I/O parameters) | Initial Value<br>(Reference) | Input Range                  | Remarks                                                                                                                                                                                                                                                                         |
|-----|------------------------------------|------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 705 | Extension I/O Unit Use Select      | 0 <sub>H</sub>               | 0 to<br>FFFFFFF <sub>H</sub> | Bits 0 to 3 : Select Slot 1 Usage<br>Bits 4 to 7 : Select Slot 2 Usage<br>Bits 8 to 11 : Select Slot 3 Usage<br>Bits 12 to 15 : Select Slot 4 Usage<br>Set Value: (0 : Unused,<br>1 : Only output to be used,<br>2 : Only input to be used,<br>3 : Input and output to be used) |

In I/O Parameter No.705 “Extension I/O Unit Use Select”, set whether to use or not to use each slot.

(Example) Case that the input and output in Slot 1 and Slot 2 are used, but Slot 3 and Slot 4 are not used

□ Set I/O Parameter No.705 = 0033<sub>H</sub>



Note 1 A PIO board mounted in an Extension Unit I/O slot occupies 1 station. Output boards can not be shared among multiple XSEL controllers.

Note 2 Input boards can be shared among multiple XSEL controllers.

Note 3 The total number of I/O points on an extension I/O unit is determined by the type and number of mounted PIO boards.

## [Setting 2: Selection of Unit Number of Extension I/O Unit]

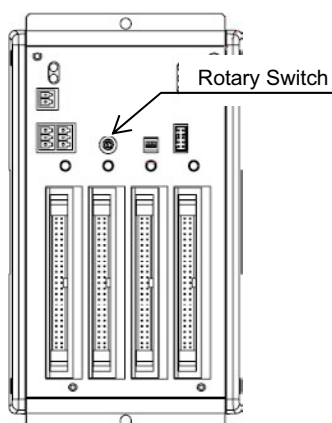
| No. | Parameter Name<br>(I/O parameters) | Initial Value<br>(Reference) | Input Range         | Remarks                                                        |
|-----|------------------------------------|------------------------------|---------------------|----------------------------------------------------------------|
| 706 | Extension I/O Unit Number          | 0 <sub>H</sub>               | 0 to F <sub>H</sub> | Set the unit number of the extension I/O unit to be connected. |

Set the unit number (0 to F) on the rotary switch in the extension I/O unit.

Set the same value as set on the rotary switch in Extension I/O Unit Parameter No.706

“Extension I/O Unit No.” in a hexadecimal number.

An extension I/O unit occupies four stations with multiples of 4 as the top station number. Pay attention not to duplicate the station number when assigning in the shared memory.



| Setting Value for<br>Unit Number | Occupied Station of<br>Extension I/O Unit |
|----------------------------------|-------------------------------------------|
| 0                                | 0 to 3                                    |
| 1                                | 4 to 7                                    |
| 2                                | 8 to 11                                   |
| 3                                | 12 to 15                                  |
| 4                                | 16 to 19                                  |
| 5                                | 20 to 23                                  |
| 6                                | 24 to 27                                  |
| 7                                | 28 to 31                                  |
| 8                                | 32 to 35                                  |
| 9                                | 36 to 39                                  |
| A                                | 40 to 43                                  |
| B                                | 44 to 47                                  |
| C                                | 48 to 51                                  |
| D                                | 52 to 55                                  |
| E                                | 56 to 59                                  |
| F                                | 60 to 63                                  |

[Setting 3: Input and Output Ports Assignment for Extension I/O Unit]

| No. | Parameter Name<br>(I/O parameters)                                               | Initial Value<br>(Reference) | Input Range | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|----------------------------------------------------------------------------------|------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | I/O Port Allocation Type                                                         | 1                            | 0 to 1      | 0 : Fixed Allocation (recommended)<br>1 : Automatic Allocation<br><br>The priority in order for extension input and output ports assignment at automatic assignment is as shown below:<br>(1) Network I/F Module 2<br>(2) Extension I/O Unit<br>(3) IA Net (for communication among controllers)<br><br>Assignment is applied to extension input and output ports.<br>Input Port No.1000 to 3999<br>Output Port No.4000 to 6999 |
| ⋮   | ⋮                                                                                | ⋮                            | ⋮           | ⋮                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 707 | Extension Input Port Start Number at Extension I/O Unit Slot 1 Fixed Assignment  | -1                           | -1 to 3999  | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                     |
| 708 | Extension Output Port Start Number at Extension I/O Unit Slot 1 Fixed Assignment | -1                           | -1 to 6999  | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                     |
| 709 | Extension Input Port Start Number at Extension I/O Unit Slot 2 Fixed Assignment  | -1                           | -1 to 3999  | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                     |
| 710 | Extension Output Port Start Number at Extension I/O Unit Slot 2 Fixed Assignment | -1                           | -1 to 6999  | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                     |
| 711 | Extension Input Port Start Number at Extension I/O Unit Slot 3 Fixed Assignment  | -1                           | -1 to 3999  | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                     |
| 712 | Extension Output Port Start Number at Extension I/O Unit Slot 3 Fixed Assignment | -1                           | -1 to 6999  | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                     |
| 713 | Extension Input Port Start Number at Extension I/O Unit Slot 4 Fixed Assignment  | -1                           | -1 to 3999  | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                     |
| 714 | Extension Output Port Start Number at Extension I/O Unit Slot 4 Fixed Assignment | -1                           | -1 to 6999  | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                     |
| 715 | Extension I/O Unit Error Monitoring                                              | 0                            | 1           | 0 : No Monitoring<br>1 : Monitoring                                                                                                                                                                                                                                                                                                                                                                                             |

When 1 (Automatic Assignment) is set in I/O Parameter No.1, the extension input and output ports are assigned from the smaller number in the order described below:

- 1) Number of used ports in Network I/F Module 2 (CC-Link, DeviceNet, etc.)
- 2) Number of used ports in the Extension I/O Unit
- 3) Number of used ports in IA Net (for I/O communication among controllers)

When 0 (fixed assignment) is set in I/O Parameter No.1, set the assignment start port number for each of input and output to I/O Parameters No.707 to 714 in every slot of each extension I/O unit to be used. Set to -1 (invalid) to the slots not to be used.

**Note** It is recommended to set to 0 (Fixed Assignment) in I/O Parameter No. 1.

 **Caution**

- 1) A PIO board mounted in an Extension Unit I/O slot occupies 1 station.
- 2) When using only the input ports, it is necessary to occupy one station no matter of the number of slots.
- 3) The number of stations that can be occupied by one unit of XSEL controller on the IA Net network is four at the maximum. When using together with communication among controllers, be careful not to exceed four stations.  
(Number of stations used for I/O communication among controllers + Number of stations used for extension I/O units ≤ 4)

## 3.2.3 Settings for I/O Communication among XSEL Controllers

Set the following parameters demonstrated in steps 1 and 2.

### [Setting 1 : Input Port Settings]

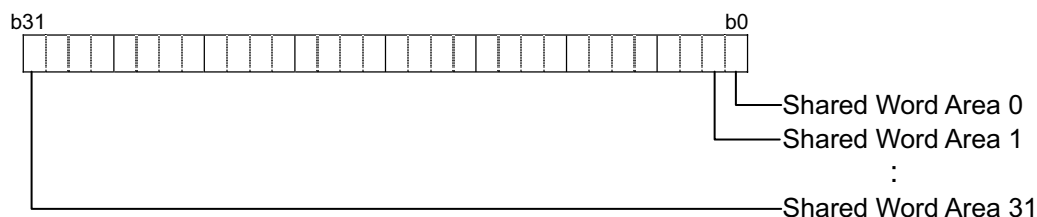
| No. | Parameter Name<br>(I/O parameters)                                | Initial Value<br>(Reference) | Input Range                   | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----|-------------------------------------------------------------------|------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 693 | IA Net Common Input Acquisition<br>Shared Word Patterns (31-00)   | 0                            | 0 to<br>FFFFFFFF <sub>H</sub> | <p>0<sub>b</sub> : Condition of this shared word area not to be acquired<br/>1<sub>b</sub> : Make condition of this shared word area able to be acquired</p> <p>Note 1 If this parameter is set to 1, the condition of 16-bit in the indicated area can be acquired.</p> <p>Note 2 In this parameter, selection of to acquire / not to acquire the condition of each bit can be made with binary numbers, and is converted into the hexadecimal system for setting.</p> |
| 694 | IA Net Common Input Acquisition<br>Shared Word Patterns (63-32)   | 0                            | 0 to<br>FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 695 | IA Net Common Input Acquisition<br>Shared Word Patterns (95-64)   | 0                            | 0 to<br>FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 696 | IA Net Common Input Acquisition<br>Shared Word Patterns (127-96)  | 0                            | 0 to<br>FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 697 | IA Net Common Input Acquisition<br>Shared Word Patterns (159-128) | 0                            | 0 to<br>FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 698 | IA Net Common Input Acquisition<br>Shared Word Patterns (191-160) | 0                            | 0 to<br>FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 699 | IA Net Common Input Acquisition<br>Shared Word Patterns (223-192) | 0                            | 0 to<br>FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 700 | IA Net Common Input Acquisition<br>Shared Word Patterns (255-224) | 0                            | 0 to<br>FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

Set whether the condition of the specific shared word area <sup>(Note)</sup> in the shared memory to be acquired or not to be acquired with 0: Not to Acquire and 1: To Acquire in I/O Parameters No.693 to 700. The setting value is calculated in the hexadecimal system with the bit patterns of 0 and 1 described above.

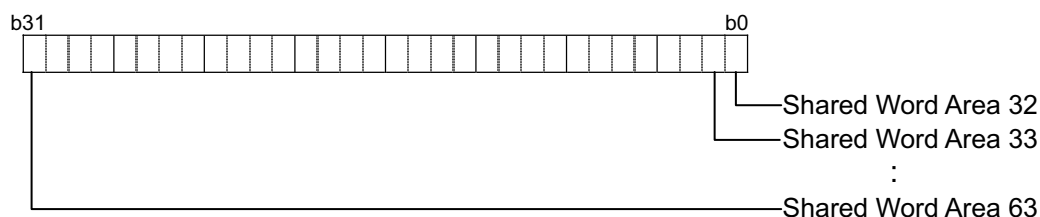
**Caution** Even when using only the input ports, an occupation of one station is required no matter of the number of slots.

The relation between each bit and shared word area is as explained below:

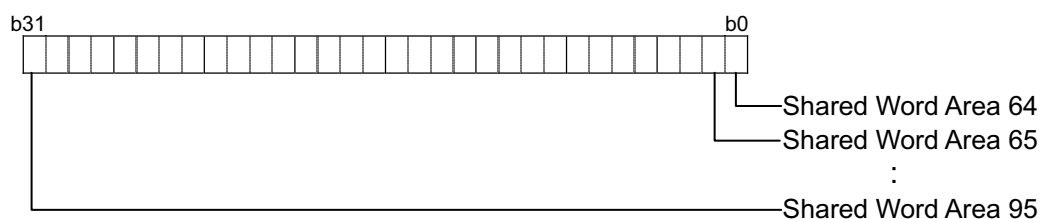
- I/O Parameter No.693 “IA Net Common Input Acquisition Shared Word Patterns (31-00)”



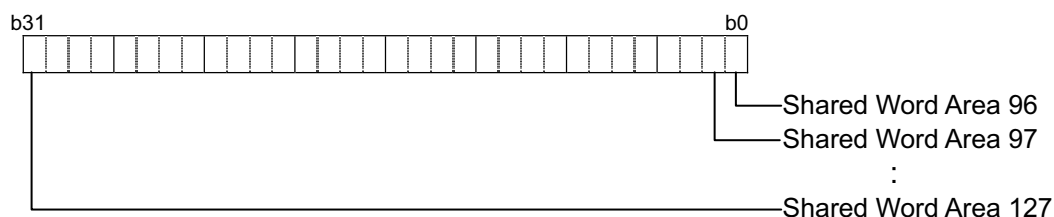
- I/O Parameter No.694 “IA Net Common Input Acquisition Shared Word Patterns (63-32)”



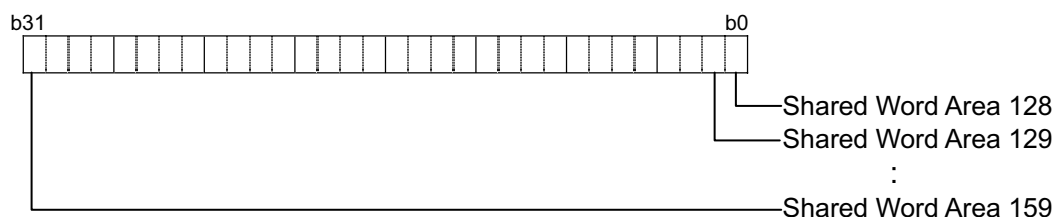
- I/O Parameter No.695 “IA Net Common Input Acquisition Shared Word Patterns (95-64)”



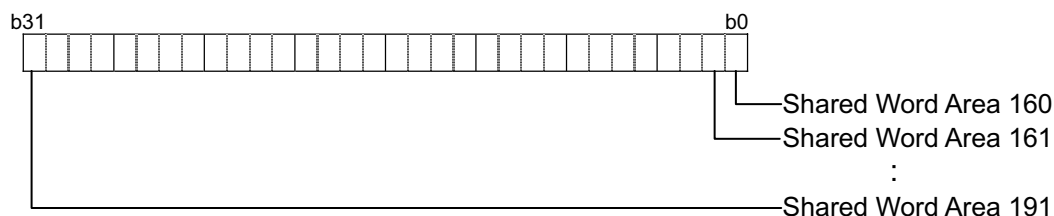
- I/O Parameter No.696 “IA Net Common Input Acquisition Shared Word Patterns (127-96)”



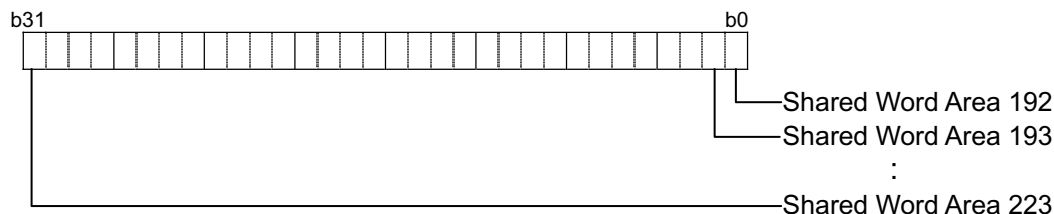
- I/O Parameter No.697 “IA Net Common Input Acquisition Shared Word Patterns (159-128)”



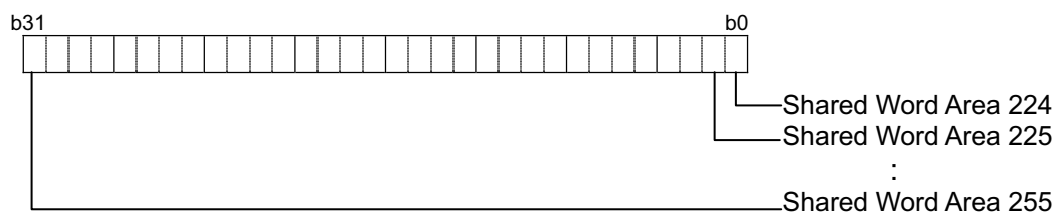
- I/O Parameter No.698 “IA Net Common Input Acquisition Shared Word Patterns (191-160)”



- I/O Parameter No.699 “IA Net Common Input Acquisition Shared Word Patterns (223-192)”

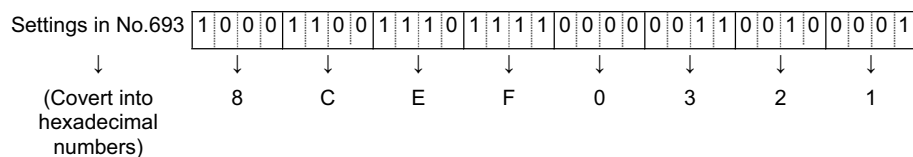


- I/O Parameter No.693 “IA Net Common Input Acquisition Shared Word Patterns (255-224)”



The bit data of the values set in No.693 to 700 are converted into the hexadecimal numbers for settings.

Shown below is an example for No.693.



The value to set in No.693 is 8CEF0321<sub>H</sub>.

Reference Matching Table for Bit Data (Binary Numbers) and Hexadecimal Numbers

| Bit Data<br>(Binary Numbers) | Hexadecimal<br>Numbers |
|------------------------------|------------------------|
| 0000                         | 0                      |
| 0001                         | 1                      |
| 0010                         | 2                      |
| 0011                         | 3                      |
| 0100                         | 4                      |
| 0101                         | 5                      |
| 0110                         | 6                      |
| 0111                         | 7                      |
| 1000                         | 8                      |
| 1001                         | 9                      |
| 1010                         | A                      |
| 1011                         | B                      |
| 1100                         | C                      |
| 1101                         | D                      |
| 1110                         | E                      |
| 1111                         | F                      |

## [Setting 2 : Output Port Settings]

### 1) Number of Used Ports Setting

| No. | Parameter Name<br>(I/O parameters) | Initial Value<br>(Reference) | Input Range | Remarks                                                           |
|-----|------------------------------------|------------------------------|-------------|-------------------------------------------------------------------|
| 701 | IA Net Shared Number of Output Use | 0                            | 0 to 256    | Multiples of 16<br>* One station is occupied for every 64 points. |

Set the number of the ports used for the output in IA Net in I/O Parameter No.701.

**Note 1** The number of occupied stations is determined by the number of used output ports.

| Number of Points used for Output | Number of Occupied Stations |
|----------------------------------|-----------------------------|
| 0                                | 0                           |
| 16 to 64                         | 1                           |
| 80 to 128                        | 2                           |
| 144 to 192                       | 3                           |
| 208 to 256                       | 4                           |

## 2) Port Assignment Settings

| No. | Parameter Name<br>(I/O parameters)                            | Initial Value<br>(Reference) | Input Range | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----|---------------------------------------------------------------|------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | I/O Port Allocation Type                                      | 1                            | 0 to 1      | 0 : Fixed Allocation (recommended)<br>1 : Automatic Allocation<br><br>The priority in order for extension input and output ports assignment at automatic assignment is as shown below:<br>1) Network I/F Module 2<br>2) Extension I/O Unit<br>3) IA Net (for communication among controllers)<br><br>Assignment is applied to extension input and output ports.<br>Input Ports No.1000 to 3999<br>Output Port No.4000 to 6999 |
| 691 | Extension Input Port Start Number at IA Net Fixed Assignment  | -1                           | -1 to 3999  | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                   |
| 692 | Extension Output Port Start Number at IA Net Fixed Assignment | -1                           | -1 to 6999  | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                   |

When 1 (Automatic Assignment) is set in I/O Parameter No.1, the extension input and output ports are assigned from the smaller number in the order described below:

- 4) Number of used ports in Network I/F Module 2 (CC-Link, DeviceNet, etc.)
- 5) Number of used ports in the Extension I/O Unit
- 6) Number of used ports in IA Net (for I/O communication among controllers)

When 0 (fixed assignment) is set in I/O Parameter No.1, set the assignment start port number for each of input and output to I/O Parameters No.691 and 692. Set to -1 (invalid) to the slots not to be used.

**Note** It is recommended to set to 0 (Fixed Assignment) in I/O Parameter No. 1.

 **Caution**

- 1) For output ports, every 64 points require to occupy one station each.
- 2) When using only the input ports, it is necessary to occupy one station no matter of the number of slots.
- 3) The number of stations that can be occupied by one unit of XSEL controller on the IA Net network is four at the maximum. When using together with communication among controllers, be careful not to exceed four stations.  
(Number of stations used for I/O communication among controllers + Number of stations used for extension I/O units ≤ 4)  
 If the number of used stations exceeds four, "560: Number of IA Net Occupied Station Exceeded Error" will be generated.

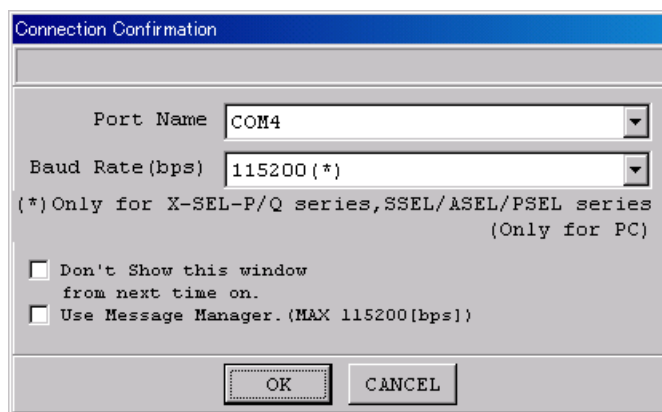
## 3.2.4 Settings for PC Software Connection via IA Net

To connect the XSEL PC software through IA Net, indicate the station number \* of the controller to be connected to on the screen of the XSEL PC software. Select the top station number when the controller to be connected to occupies several stations.

\* I/O Parameter No.602 "IA Net Occupied Station Top No." of connected controller

### [1) Connection Check]

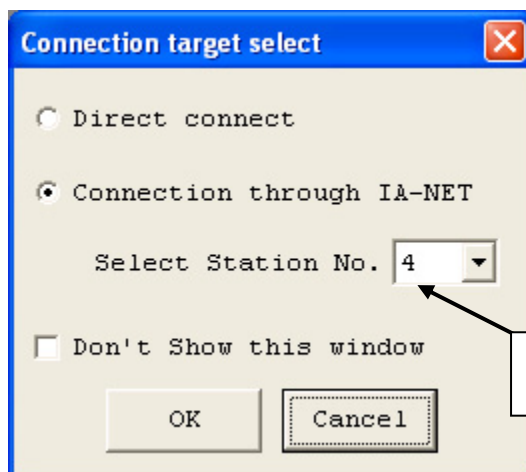
Start up the XSEL PC software, set the communication port and baud rate in the connection check window and click on the OK button.



### [2) Connected Controller Setting]

If IA Net is used, the connected controller setting window appears.

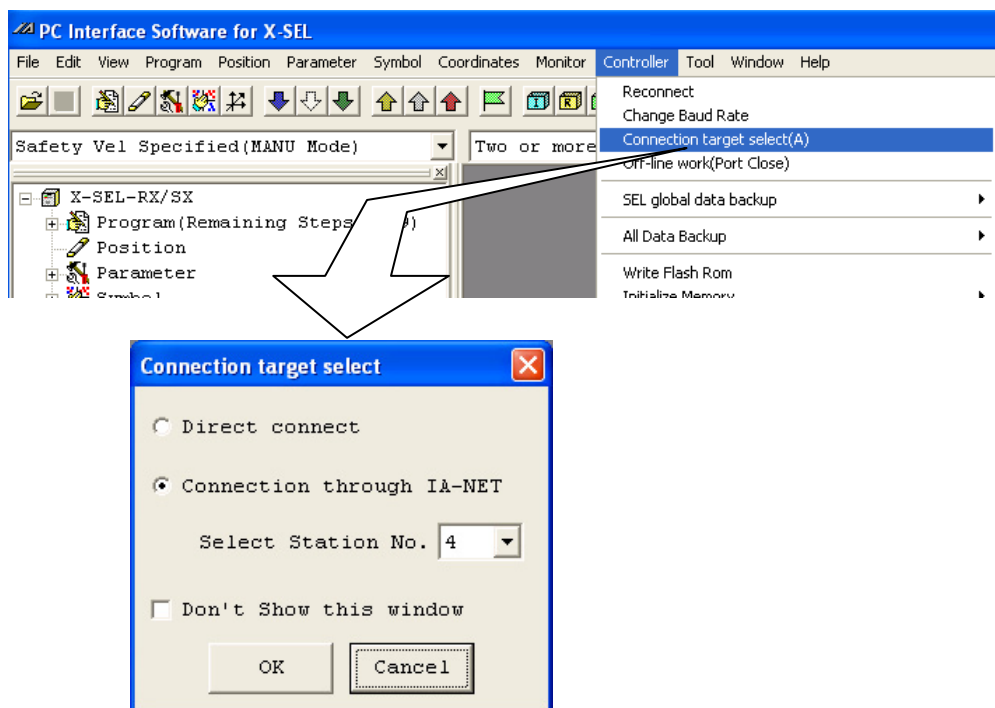
Select "Connect to controller via IA Net", determine the connected station number and click on the OK button.



Select the top station number of the controller to be connected to.

## [3] Connected Controller Change]

Changing the controller to connect to is able to perform in the XSEL PC software from the menu "Controller (C)" → "IA Net Connection Change (U)". The connection setting window appears. Change the controller to connect to in the same way as conducted when selected the controller to connect to. [Refer to 2) Connected Controller Setting]



- Note 1** If the connection of the PC software is established through IA Net, it requires more time to complete the operation compared to the case of being connected directly to TP Port. Connect the PC software directly to TP port on the XSEL controller to be edited if necessary.
- Note 2** It is recommended to have the baud rate setting at 115200bps when connecting to the PC software through IA Net.
- Note 3** The number of XSEL controller that the XSEL PC software can be connected is only one. It cannot be connected to multiple units at the same time.
- Note 4** When connecting the PC software, set the mode to MANU Mode on the XSEL controller to be referred to through the IA Net network (that is connected to TP port) and on the controller that the data edit is to be conducted. The PC software cannot be connected in AUTO Mode.
- Note 5** When a command of TP Port connection and another of connection via IA Net are executed on one XSEL controller at the same time, the priority is put on the connection from TP Port. (The connection via IA Net will be disconnected.)
- Note 6** In the case IA Net is in the link error condition, the connection via IA Net cannot be established. It is recommended to set I/O Parameter No.607 "IA Net Error Monitor" to 1 (Monitor) when having a connection via IA Net.
- Note 7** With the connection via IA Net, it is possible to check the operation of XSEL controller in a distanced place. However, considering a case the operation became unstable due to such reasons as a communication error, it is recommended that an emergency stop switch for the connected controllers is prepared within the reach so the axes can be immediately stopped in emergency.

## 3.3 Operation

**Caution**

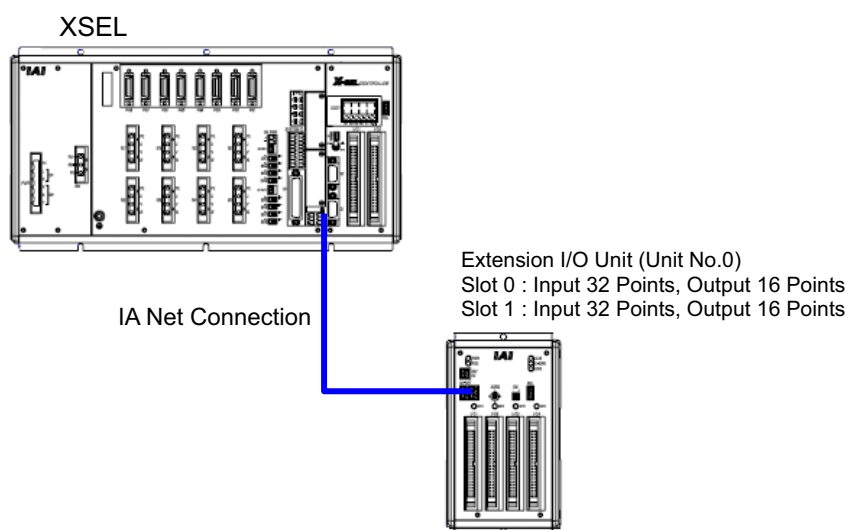
- 1) XSEL controllers check the links of all the stations set in I/O Parameters No.605 and 606 at the startup, and will generate "211/552: IA Net Link Error" in case any of the stations was not confirmed. Therefore, it is recommended to have the power supplied to all the units connected to IA Net is turned ON at the same time.
  - \* The time to wait for the link establishment can be changed in Bits 24 to 34: Timeout duration (sec) for link waiting at IA Net initializing in I/O Parameter No.608 "IA Net Attribute 1". (Initial setting = 15sec)
- 2) If the software reset is conducted or the power is turned OFF on a station in the link with I/O Parameter No.607 "IA Net Error Monitor" set to 1 (Valid), controllers on other stations will issue "211/552: IA Net Link Error". To avoid the link error at the startup, it is suggested to set IA Net Error Monitor to 0 (Invalid) temporarily, or reboot the power to all the connected stations at the same time.
- 3) The shared data of a station with an error in IA Net network is unreliable.

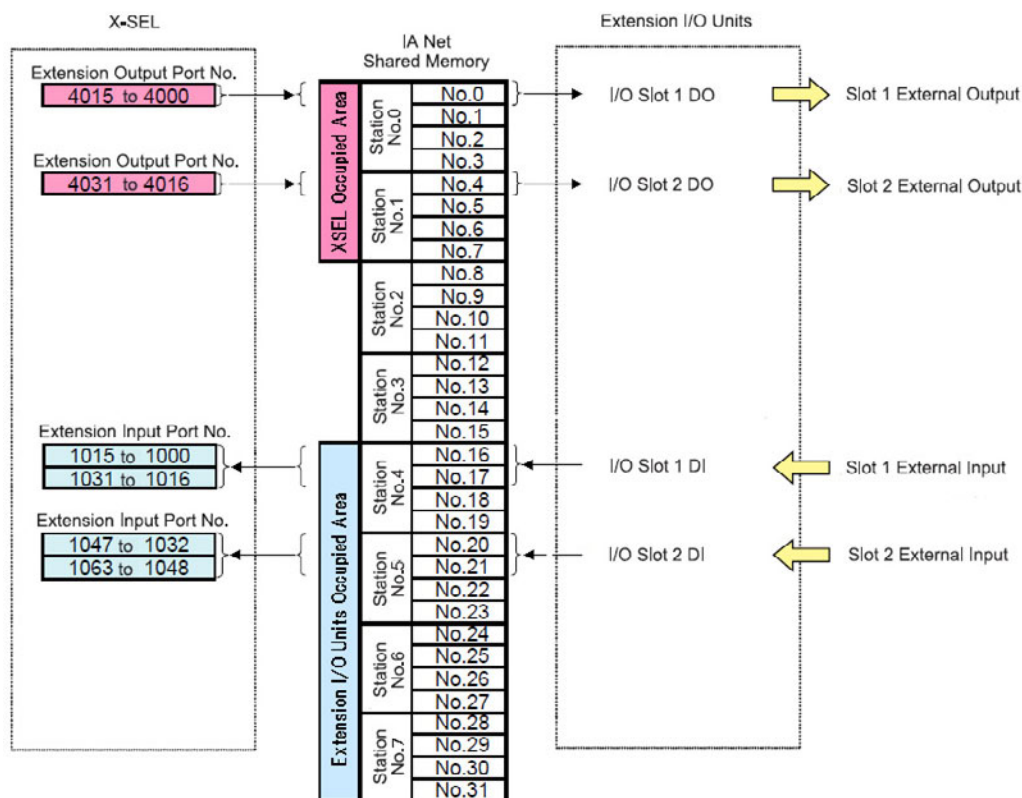
### 3.3.1 Example for Extension I/O Unit Connection

Connect an extension I/O unit to an XSEL controller through IA Net.  
 Shown below is an example for parameter settings assuming an I/O port with 32 points of output and 64 point of input (occupies two slots) is used.  
 Listed below is the usage condition.

• Usage Condition

| Item                                 | XSEL | Extension I/O Units | Remarks                                                             |
|--------------------------------------|------|---------------------|---------------------------------------------------------------------|
| Top Station No.                      | 0    | 4                   | XSEL occupies 2 stations,<br>Extension I/O unit occupies 4 stations |
| Extension I/O Unit No.               |      | 1                   |                                                                     |
| Number of Output Points              | 0    | 32                  | Assign to the I/O boards in Slot 0 and 1                            |
| Number of Input Points               | 0    | 64                  |                                                                     |
| Used Extension Input Port Start No.  | 1000 |                     | Use in fixed assignment                                             |
| Used Extension Output Port Start No. | 4000 |                     | Use in fixed assignment                                             |





## • Example for I/O Parameter Settings

| No. | Parameter Name                                | Example for Setting | Input Range                | Remarks                                                                                                                                                                                                                                                                 |
|-----|-----------------------------------------------|---------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | I/O Port Allocation Type                      | 0                   | 0 to 1                     | 0 : Fixed Allocation<br>1 : Automatic Allocation                                                                                                                                                                                                                        |
| 602 | IA Net Occupied Station Top No.               | 0                   | 0 to 63                    |                                                                                                                                                                                                                                                                         |
| 603 | IA Net Resizing Executed Station No.          | 0                   | 0 to 63                    | Station number to optimize the communication cycle time at the IA Net startup                                                                                                                                                                                           |
| 604 | IA Net Final Station No.                      | 7                   | 1 to 63                    | In this example, the extension I/O unit uses only two slots, 1 and 2, but station assignment requires four stations. (Stations No. 4 to 7)                                                                                                                              |
| 605 | IA Net All Connected Station Patterns (31-00) | 0 <sub>H</sub>      | 0 to FFFFFFFF <sub>H</sub> | As described in this example, optimized setting can be automatically established if writing with setting 0 when connecting only an XSEL controller and an extension I/O unit.                                                                                           |
| 606 | IA Net All Connected Station Patterns (63-32) | 0 <sub>H</sub>      | 0 to FFFFFFFF <sub>H</sub> | With 0: Disconnected and 1: Connected, make the connection conditions of Stations No.63 to No.32 in bit patterns and convert them into the hexadecimal numbers to input.                                                                                                |
| 705 | Extension I/O Unit Use Select                 | 33 <sub>H</sub>     | 0 to FFFFFFFF <sub>H</sub> | Bits 0 to 3 : Slot 1 Use Select<br>Bits 4 to 7 : Slot 2 Use Select<br>Bits 8 to 11 : Slot 3 Use Select<br>Bits 12 to 15 : Slot 4 Use Select<br>Set Value: (0 : Unused,<br>1 : Only output to be used,<br>2 : Only input to be used,<br>3 : Input and output to be used) |
| 706 | Extension I/O Unit No.                        | 1 <sub>H</sub>      | 0 to F <sub>H</sub>        | Set the unit number of the extension I/O unit to be connected.                                                                                                                                                                                                          |

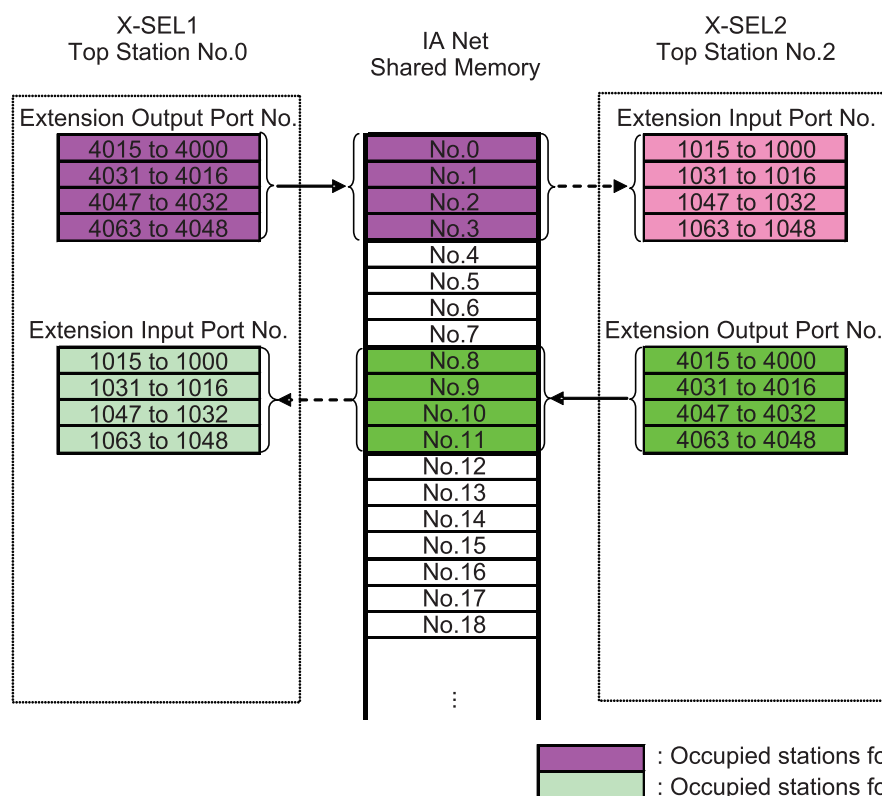
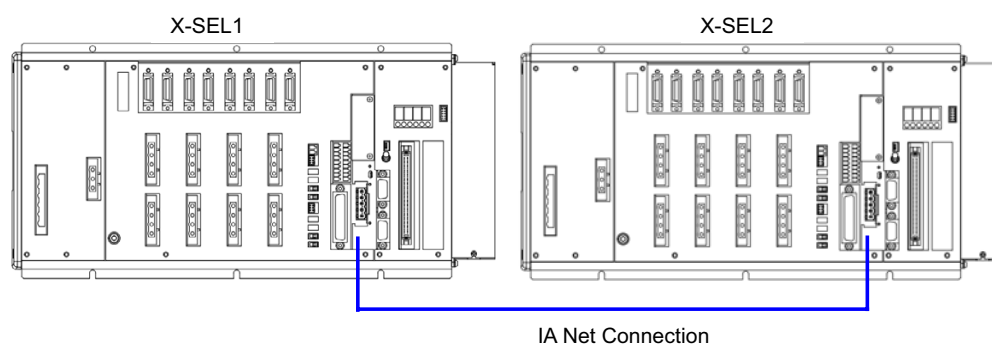
| No. | Parameter Name                                                                   | Example for Setting | Input Range | Remarks                                                     |
|-----|----------------------------------------------------------------------------------|---------------------|-------------|-------------------------------------------------------------|
| 707 | Extension Input Port Start Number at Extension I/O Unit Slot 1 Fixed Assignment  | 1000                | -1 to 3999  | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1) |
| 708 | Extension Output Port Start Number at Extension I/O Unit Slot 1 Fixed Assignment | 4000                | -1 to 6999  | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1) |
| 709 | Extension Input Port Start Number at Extension I/O Unit Slot 2 Fixed Assignment  | 1032                | -1 to 3999  | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1) |
| 710 | Extension Output Port Start Number at Extension I/O Unit Slot 2 Fixed Assignment | 4016                | -1 to 6999  | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1) |
| 711 | Extension Input Port Start Number at Extension I/O Unit Slot 3 Fixed Assignment  | -1                  | -1 to 3999  | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1) |
| 712 | Extension Output Port Start Number at Extension I/O Unit Slot 3 Fixed Assignment | -1                  | -1 to 6999  | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1) |
| 713 | Extension Input Port Start Number at Extension I/O Unit Slot 4 Fixed Assignment  | -1                  | -1 to 3999  | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1) |
| 714 | Extension Output Port Start Number at Extension I/O Unit Slot 4 Fixed Assignment | -1                  | -1 to 6999  | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1) |
| 715 | Extension I/O Unit Error Monitoring                                              | 0                   | 1           | Set this to 1                                               |

## 3.3.2 Example for I/O Communication among XSEL Controllers

Shown below is an example for the parameters when connecting two units of XSEL controllers to IA Net and have I/O communication with 64 points of output and 64 points of input. Listed below is the usage condition.

### • Usage Condition

| Item                                 | XSEL1 | XSEL2 | Remarks                           |
|--------------------------------------|-------|-------|-----------------------------------|
| Top Station No.                      | 0     | 2     |                                   |
| No. of Output Points                 | 64    | 64    | 1 station occupied when 64 points |
| No. of Input Points                  | 64    | 64    |                                   |
| Used Extension Input Port Start No.  | 1000  | 1000  | Use in fixed assignment           |
| Used Extension Output Port Start No. | 4000  | 4000  | Use in fixed assignment           |



• Example for I/O Parameter Settings

| No. | Parameter Name                                                 | Example for Setting |                | Input Range                | Remarks                                                                                                                                                                  |
|-----|----------------------------------------------------------------|---------------------|----------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                | XSEL1               | XSEL2          |                            |                                                                                                                                                                          |
| 1   | I/O Port Allocation Type                                       | 0                   | 0              | 0 to 1                     | 0 : Fixed Allocation<br>1 : Automatic Allocation                                                                                                                         |
| 602 | IA Net Occupied Station Top No.                                | 0                   | 2              | 0 to 63                    |                                                                                                                                                                          |
| 603 | IA Net Resizing Executed Station No.                           | 0                   | 0              | 0 to 63                    | Station number to optimize the communication cycle time at the IA Net startup                                                                                            |
| 604 | IA Net Final Station No.                                       | 63                  | 63             | 1 to 63                    | Final station number in the same network<br>Note Have the same value set in common for all the controllers in the same network.                                          |
| 605 | IA Net All Connected Station Patterns (31-00)                  | 5 <sub>H</sub>      | 5 <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> | With 0: Disconnected and 1: Connected, make the connection conditions of Stations No.31 to No.0 in bit patterns and convert them into the hexadecimal numbers to input.  |
| 606 | IA Net All Connected Station Patterns (63-32)                  | 0 <sub>H</sub>      | 0 <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> | With 0: Disconnected and 1: Connected, make the connection conditions of Stations No.63 to No.32 in bit patterns and convert them into the hexadecimal numbers to input. |
| 691 | Extension Input Port Start Number at IA Net Fixed Assignment   | 1000                | 1000           | -1 to 3999                 | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                              |
| 692 | Extension Output Port Start Number at IA Net Fixed Assignment  | 4000                | 4000           | -1 to 6999                 | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                              |
| 693 | IA Net Common Input Acquisition Shared Word Patterns (31-00)   | F00 <sub>H</sub>    | F <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> | 0 <sub>b</sub> : Not to Acquire<br>1 <sub>b</sub> : To Acquire<br>Note 16 points can be acquired from one word                                                           |
| 694 | IA Net Common Input Acquisition Shared Word Patterns (63-32)   | 0 <sub>H</sub>      | 0 <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                          |
| 695 | IA Net Common Input Acquisition Shared Word Patterns (95-64)   | 0 <sub>H</sub>      | 0 <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                          |
| 696 | IA Net Common Input Acquisition Shared Word Patterns (127-96)  | 0 <sub>H</sub>      | 0 <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                          |
| 697 | IA Net Common Input Acquisition Shared Word Patterns (159-128) | 0 <sub>H</sub>      | 0 <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                          |
| 698 | IA Net Common Input Acquisition Shared Word Patterns (191-160) | 0 <sub>H</sub>      | 0 <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                          |
| 699 | IA Net Common Input Acquisition Shared Word Patterns (223-192) | 0 <sub>H</sub>      | 0 <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                          |
| 700 | IA Net Common Input Acquisition Shared Word Patterns (255-224) | 0 <sub>H</sub>      | 0 <sub>H</sub> | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                          |
| 701 | IA Net Shared Number of Outputs Use                            | 64                  | 64             | 0 to 256                   | Multiples of 16<br>Note One station is occupied for every 64 points.                                                                                                     |

## Chapter 4 Appendix

### 4.1 IA Net Related Parameters

Parameter data should be set appropriately according to the application requirements.  
In IA Net, settings are conducted with using the XSEL PC software and a teaching pendant.  
[Refer to the instruction manual of the used teaching tool for the details.]



**Warning :** Establishment of parameter settings has a great influence on operation. Wrongly established setting could cause not only an operation error or malfunction, but also it is very dangerous.  
The parameter settings established upon product delivery allow for standard operation. When it is necessary to manipulate settings to suit the application requirements, please take care to understand thoroughly the effects that changes will evoke. Please contact IAI Technical Support with any questions.  
Do not turn OFF the power to the controller during the parameter writing.

Listed below are the parameters related to IA Net. Refer to XSEL-R/S Instruction Manual for the parameters of the XSEL controller main unit.

• I/O parameters

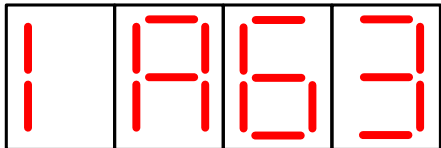
| No. | Parameter Name                                | Initial Value (Reference) | Input Range                | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----|-----------------------------------------------|---------------------------|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | I/O Port Allocation Type                      | 1                         | 0 to 1                     | 0 : Fixed Allocation (Recommended when IA Net is used)<br>1 : Automatic Allocation<br><br>(Note) Priority of I/O Port Assignment when automatically assigned<br>Input Port No.0 to 299<br>Output Port No.300 to 599<br>1) Network I/F Module 1<br>2) I/O Slots 1 (I/O 1) Mounting Board<br>(Note) I/O Slots 1 (I/O 1) Assigned for the continuously mounted range from mounting board = for safety<br>(Note) Priority of extension I/O ports at automatic assignment<br>Input Port No.1000 to 3999<br>Output Port No.4000 to 6999<br>1) Network I/F Module 2<br>2) Extension I/O Unit<br>3) IA Net |
| 20  | Input Filtering Cycle                         | 2                         | 1 to 9                     | Input signal is identified after the condition is retained for a period with two times or more of the value set in this parameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 602 | IA Net Top Occupied Station No.               | 0                         | 0 to 63                    | Set the smallest number in the station numbers (settable range from 0 to 63) that the controller occupies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 603 | IA Net Resizing Station No.                   | 0                         | 0 to 63                    | Station number to optimize the communication cycle time at the IA Net startup<br>(Note) Have the same value set in common for all the controllers in the same network.<br>(Recommendation: Set the smallest value available to assign in all the station numbers available for assignment in the shared memory.)                                                                                                                                                                                                                                                                                   |
| 604 | IA Net Final Station No.                      | 63                        | 1 to 63                    | Final station number in the same network<br>(Note) Have the same value set in common for all the controllers in the same network.<br>(Recommendation: Set the biggest value available to assign in all the station numbers available for assignment in the shared memory.)                                                                                                                                                                                                                                                                                                                         |
| 605 | IA Net All Connected Station Patterns (31-00) | 0 <sub>H</sub>            | 0 to FFFFFFFF <sub>H</sub> | With 0: Disconnected and 1: Connected, make the connection conditions of Stations No.31 to No.0 in bit patterns and convert them into the hexadecimal numbers to input.                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 606 | IA Net All Connected Station Patterns (63-32) | 0 <sub>H</sub>            | 0 to FFFFFFFF <sub>H</sub> | With 0: Disconnected and 1: Connected, make the connection conditions of Stations No.63 to No.32 in bit patterns and convert them into the hexadecimal numbers to input.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 607 | IA Net Error Monitor                          | 1                         | 0 to 5                     | 0 : No Monitoring<br>1 : Monitoring<br>2 : Monitoring (Monitoring only on the errors related to link error)<br>(Note 1) There are some exceptions<br>(Note 2) IA Net Link Error occurs when the duration of the condition being in the network link error exceeds the value set in IA Net Network Link Error Confirmation Timer. (Refer to I/O parameter No.608)                                                                                                                                                                                                                                   |

| No.        | Parameter Name                                                 | Initial Value (Reference) | Input Range                | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------|----------------------------------------------------------------|---------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 608        | IA Net Attribute 1                                             | F000000 <sub>H</sub>      | 0 to FFFFFFFF <sub>H</sub> | Bits 0 to 7 : Network Link Error Confirmation Timer Value (in 10ms unit)<br>(Note) Valid when I/O Parameter No.607 = 1 or 2<br>Bits 8 to 19 : System Reservation<br>Bits 20 to 23: Select the IA Net link error level<br>(0 : Cold-start level alarms<br>1 : Message Level)<br>Bits 24 to 31: Timeout duration (sec) for link waiting at IA Net initializing                                                                                                                                                                                                       |
| 609        | IA Net Attribute 2                                             | F05 <sub>H</sub>          | 0 to FFFFFFFF <sub>H</sub> | Bits 0 to 7 : IAI Protocol B / SIO, IAI Protocol B / TCP non-communication confirmation timer value (sec)<br>(Time to become receivable condition via IAI Protocol B / IA Net and other controllers)<br>Bits 8 to 15 : IAI Protocol B / IA Net non-communication confirmation timer value (sec)<br>(Time to become receivable condition for command via other controllers after command received via IAI Protocol B / IA Net and other controllers)<br>Bits 16 to 23: Value (sec) with "PC/TP Reconnection Delay Time at Software Reset" added when IA Net is used |
| 610        | IA Net Attribute 3                                             | 0 <sub>H</sub>            | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 611        | (For extension)                                                | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 612        | (For extension)                                                | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 613 to 678 | System Reservation                                             | :                         | :                          | :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 679 to 690 | (For extension)                                                | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 691        | Extension Input Port Start Number at IA Net Fixed Assignment   | -1                        | -1 to 3999                 | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 692        | Extension Output Port Start Number at IA Net Fixed Assignment  | -1                        | -1 to 6999                 | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 693        | IA Net Common Input Acquisition Shared Word Patterns (31-00)   | 0                         | 0 to FFFFFFFF <sub>H</sub> | 0 <sub>b</sub> : Condition of this shared word area not to be acquired<br>1 <sub>b</sub> : Make condition of this shared word area able to be acquired<br><br>Note 1 If this parameter is set to 1, the condition of 16-bit in the indicated area can be acquired.<br><br>Note 2 In this parameter, selection of to acquire / not to acquire the condition of each bit can be made with binary numbers, and is converted into the hexadecimal system for setting.                                                                                                  |
| 694        | IA Net Common Input Acquisition Shared Word Patterns (63-32)   | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 695        | IA Net Common Input Acquisition Shared Word Patterns (95-64)   | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 696        | IA Net Common Input Acquisition Shared Word Patterns (127-96)  | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 697        | IA Net Common Input Acquisition Shared Word Patterns (159-128) | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 698        | IA Net Common Input Acquisition Shared Word Patterns (191-160) | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 699        | IA Net Common Input Acquisition Shared Word Patterns (223-192) | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 700        | IA Net Common Input Acquisition Shared Word Patterns (255-224) | 0                         | 0 to FFFFFFFF <sub>H</sub> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| No. | Parameter Name                                                                   | Initial Value (Reference) | Input Range                | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----|----------------------------------------------------------------------------------|---------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 701 | IA Net Shared Number of Outputs Use                                              | 0                         | 0 to 256                   | Multiples of 16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 702 | (For extension)                                                                  |                           |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 703 | (For extension)                                                                  |                           |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 704 | (For extension)                                                                  |                           |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 705 | Extension I/O Unit Use Select                                                    | 0 <sub>H</sub>            | 0 to FFFFFFFF <sub>H</sub> | Bits 0 to 3 : Slot 1 Use Select<br>Bits 4 to 7 : Slot 2 Use Select<br>Bits 8 to 11 : Slot 3 Use Select<br>Bits 12 to 15 : Slot 4 Use Select<br>(0:Unused<br>1:Only output to be used<br>2:Only input to be used<br>3:Both output and input to be used)                                                                                                                                                                                                                                                                                                                              |
| 706 | Extension I/O Unit No.                                                           | 0 <sub>H</sub>            | 0 to F <sub>H</sub>        | Set the unit number of the used extension I/O unit.<br>(Note) Extension I/O unit is that;<br>• Top station number = unit number × 4<br>• Number of occupied stations = 4 in IA Net network.                                                                                                                                                                                                                                                                                                                                                                                         |
| 707 | Extension Input Port Start Number at Extension I/O Unit Slot 1 Fixed Assignment  | -1                        | -1 to 3999                 | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 708 | Extension Output Port Start Number at Extension I/O Unit Slot 1 Fixed Assignment | -1                        | -1 to 6999                 | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 709 | Extension Input Port Start Number at Extension I/O Unit Slot 2 Fixed Assignment  | -1                        | -1 to 3999                 | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 710 | Extension Output Port Start Number at Extension I/O Unit Slot 2 Fixed Assignment | -1                        | -1 to 6999                 | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 711 | Extension Input Port Start Number at Extension I/O Unit Slot 3 Fixed Assignment  | -1                        | -1 to 3999                 | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 712 | Extension Output Port Start Number at Extension I/O Unit Slot 3 Fixed Assignment | -1                        | -1 to 6999                 | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 713 | Extension Input Port Start Number at Extension I/O Unit Slot 4 Fixed Assignment  | -1                        | -1 to 3999                 | 1000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 714 | Extension Output Port Start Number at Extension I/O Unit Slot 4 Fixed Assignment | -1                        | -1 to 6999                 | 4000+(Multiples of 16)<br>(Setting is invalid if set to -1)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 715 | Extension I/O Unit Error Monitor                                                 | 0                         | 0 to 5                     | 0 : No Monitoring<br>1 : Monitoring<br>2 : Monitoring<br>(Not to monitor 24V I/O power related error)<br>3 : Monitoring<br>(To monitor only 24V I/O power related error)<br>4 : Monitoring (makes 24V I/O Power Supply Related Error message level)<br>(Note) There are some exceptions<br>(Note) When it is set to 0 (= Not monitored) or 2 (=24V I/O Power Supply Related Error not monitored), a system error would not be generated even in an error related to 24V I/O power supply, but the actual output would not be executed for the protection of the extension I/O unit. |

| No. | Parameter Name                                                                                                                         | Initial Value<br>(Reference) | Input Range                   | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 716 | Extension I/O Unit<br>Multi-Channel DIO External<br>Terminal Block Overcurrent /<br>Power Supply Failure<br>Detection Input Indication | 0 <sub>H</sub>               | 0 to<br>FFFFFFFF <sub>H</sub> | Bits 0 to 3 : Extension I/O unit slot 1 input<br>indication<br>Bits 4 to 7 : Extension I/O unit slot 2 input<br>indication<br>Bits 8 to 11 : Extension I/O unit slot 3 input<br>indication<br>Bits 12 to 15 : Extension I/O unit slot 4 input<br>indication<br>(0: Error detection not to be input<br>1: Error detection input = use IN023 in card<br>2: Error detection input = use IN047 in card<br>3: Error detection input = use IN023/47 in card)<br>(Note) See the specification of the connected<br>terminal unit for the multi-channel DIO for<br>setting.<br>(Note) The input port used as the error detection<br>input cannot be used as a<br>general-purposed input port. |

• Other Parameters

| No. | Parameter Name                                    | Initial Value<br>(Reference) | Input Range | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----|---------------------------------------------------|------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 49  | Classification of Panel<br>7-Segment Display Data | 0                            | 0 to 9      | <p>0: Controller Status Display</p> <p>1: Motor Current Indicator Display<br/>The current pattern of each axis is displayed instead of "Ready Status Display" and "Program Executing Number Display".<br/>"Indicator Display Axis No. MIN" (on the right end column) is to be indicated in "Other Parameters No.50".</p> <p>2: User Information Number Display (U001 to U999)<br/>User information number is displayed instead of "Ready Status Display" and "Program Executing Number Display" when the user information number is other than 0.<br/>"User Information Number Indication Global Integral Variable Number" is to be indicated in "Other Parameters No.50".</p> <p>3: IA Net Station Number Display (IA00 to IA63)<br/>IA Net Occupied Station Top Number is displayed instead of "Ready Status Display" only when IA Net is used.<br/>[Example] for IA Net Station No.63, the display is as shown below.</p> <div style="text-align: center;">  </div> <p>Last 2 digits show the station number.</p> |

## 4.2 Error Codes Related to IA Net

### 4.2.1 Action to Be Taken upon Occurrence of Problem

When a problem occurs, take an appropriate action, as described in the steps below, to remedy the situation and prevent further occurrence.

- 1) Check the illuminating condition of the IA Net status LEDs above the IA Net connection plug [Refer to Name and Function of Each Part]
- 2) Check if there is an alarm issued on the host controller (PLC, etc.)
- 3) Check the voltage of the main power source (200V AC) for the XSEL controllers
- 4) Check the voltage of the field network power source
- 5) If an actuator equipped with a brake is connected, check the voltage (24V DC) of the brake power source
- 6) Alarm check  
For the alarm codes, check on a teaching tool such as the PC software.
- 7) Disconnection or incomplete connection of connector related components
- 8) Check on the connection, wire breakage and pinch of cables  
When checking the electrical conductivity, cut off the main power of the devices mounted to this controller (to prevent electric shock) and remove the cables on the measured part (to avoid conductivity due to sneak circuit) prior to the check.
- 9) Check the I/O signals.  
Check with using a teaching tool such as the host controller (PLC, etc.) or PC software that there is no inconsistency in the conditions of the input and output signals.
- 10) Check on noise preventing actions (connection of ground line, connection of surge absorber, etc.)
- 11) Background of trouble occurrence and check on operational condition at the time
- 12) Cause analysis
- 13) Treatment

### 4.2.2 Typical Errors and Counteractions

| Error Code | Error Name                             | Check Items                                                                                                                                             | Check/Treatment                                                                                                                             |
|------------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 212        | IA Net Break Station Detection Error   | Check if you are trying to get the IA Net station after the final station number of the communication cycle currently running connected to the network. | Check if there is any controller or unit with a station number greater than what is set in I/O Parameter No.604 "IA Net Final Station No.". |
| 492        | IA Net IAI Protocol Mail Sending Error | Check if there is "Link Error" occurred on a controller that you may want to connect XSEL PC software through IA Net.                                   | Check on the 7-segment LEDs and error issuances on the controller to be connected to via IA Net.                                            |
|            |                                        | Check if you are trying to indicate a station that is not connected to the XSEL PC software through IA Net.                                             | Indicate the station number that is connected                                                                                               |
|            |                                        | Check if the top station of the controller to connect to is indicated for the connection to the XSEL PC software through IA Net.                        | Indicate the top station number of the controller connected via IA Net.                                                                     |
| 552<br>211 | IA Net Link Error                      | Is the station to execute resizing connected?                                                                                                           | Check that the station same as what is set in I/O Parameter No.603 "IA Net Resizing Executed Station No." is connected.                     |
|            |                                        | Is there any duplication in the station numbers?                                                                                                        | Check I/O Parameter No.601 "IA Net Occupied Station No." and I/O Parameter No.602 "IA Net Occupied Station Top No.".                        |
|            |                                        | Check on the IA Net communication connectors if they are disconnected.                                                                                  | Check the IA Net communication connectors.                                                                                                  |
|            |                                        | Are there terminal resistors connected on the controllers on the ends.                                                                                  | Check whether the terminal resistors are connected.                                                                                         |
|            |                                        | Check there is no cable breakage on IA Net cables.                                                                                                      | Check the condition of the cables by visual.                                                                                                |

| Error Code | Error Name                                             | Check Items                                                                                                                                                                                                        | Check/Treatment                                                                                                                                                                                          |
|------------|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 548        | IA Net Resizing Overlapping Error                      | Aren't there several stations to execute resizing?                                                                                                                                                                 | Check that the value set in I/O Parameter No.603 "IA Net Resizing Executed Station No." matches to the controller in the same network.                                                                   |
| 54C        | IA Net Communication Parameter Error                   | Check if the station number is exceeding 63.                                                                                                                                                                       | Check the values in I/O Parameters No.601 "IA Net Occupied Station No.", No.602 "IA Net Top Occupied Station Number" and No.604 "IA Net Final Station Number".                                           |
|            |                                                        | Check if the station number of the controller itself is exceeding the final station number.                                                                                                                        | Confirm that the value set in I/O Parameter No.602 "IA Net Occupied Station Top No." is smaller than what is set in I/O Parameter No.604 "IA Net Final Station No."                                      |
|            |                                                        | Isn't the resizing executed station number exceeding the final station number?                                                                                                                                     | Confirm that the value set in I/O Parameter No.603 "IA Net Resizing Executed Station No." is smaller than what is set in I/O Parameter No.604 "IA Net Final Station No."                                 |
|            |                                                        | Check if the controller itself is being subject to the resizing executed station.                                                                                                                                  | Confirm that the value set in I/O Parameter No.603 "IA Net Resizing Executed Station No." is the same as what is set in No.602 "IA Net Occupied Station Top No."                                         |
|            |                                                        | Is the controller itself involved in the all connected stations pattern parameter?                                                                                                                                 | Check if all the stations in the controller are set in I/O Parameters No.605 and 606 "IA Net All Connected Station Patterns (31-00)/(63-32)".                                                            |
|            |                                                        | Isn't the all connected stations parameter including a station number later than the final station number?                                                                                                         | Check if no station number later than what is set in I/O Parameter No.604 "IA Net Final Station Number" is set in I/O Parameters No.605 and 606 "IA Net All Connected Station Patterns (31-00)/(63-32)". |
| 560        | IA Net Number of Occupied Stations Overflow Error      | Check if the total of the occupied number determined by the number of the I/O communication use Output points and occupied number determined by the number of the extension I/O unit DO use exceeds four stations. | Confirm the number of occupied stations from I/O Parameter No.701 "IA Net Shared Number of Outputs Use" and No.705 "Extension I/O Unit Use Select".                                                      |
| 561        | IA Net I/O Assignment Number Overflow Error            | Isn't the number of the shared word to acquire from exceeding 16?                                                                                                                                                  | Make sure that the total number of ON bits in I/O Parameters No.693 to 700 "IA Net Common Input Acquisition Shared Word Patterns" is not exceeding 16 bits.                                              |
| 562        | Extension I/O Unit Parameter Error                     | Check if the station numbers for X-SEL and the extension I/O unit are duplicated.                                                                                                                                  | Check the values in I/O Parameters No.602 "IA Net Occupied Station Top No." and No.706 "Extension I/O Unit No."                                                                                          |
|            |                                                        | Check if trying to use an extension I/O unit with a greater station number than what it is for I/O Parameter No.604 "IA Net Final Station Number".                                                                 | Check the values in I/O Parameters No.604 "IA Net Final Station No." and No.706 "Extension I/O Unit No."                                                                                                 |
|            |                                                        | Isn't an extension I/O unit being subject to resizing executed station?                                                                                                                                            | Check the values in I/O Parameters No.603 "IA Net Resizing Executed Station No." and No.706 "Extension I/O Unit No."                                                                                     |
| 563        | Extension I/O Unit DO Duplication Error                | Aren't another X-SEL controller and an extension I/O unit used DO competing with each other?                                                                                                                       | DO cannot be used for multiple XSEL at the same time. Revise the setting in I/O Parameter No.705 "Extension I/O Unit Use Select".                                                                        |
| 564        | Extension I/O Unit Initial Communication Timeout Error | Check the extension I/O unit is connected to IA Net.                                                                                                                                                               | Check the conditions of 24V power supply for extension I/O units, IA Net cables and the mount of the terminal resistors.                                                                                 |
|            |                                                        | Is the extension I/O unit set in the parameter matching with the station number actually connected?                                                                                                                | Make sure the number set in I/O Parameter No.706 "Extension I/O Unit No." is matching with the condition of the unit number setting switch on the extension I/O unit.                                    |
| 565        | Extension I/O Unit Board Undetected Error              | Is the I/O slot that you are trying to use equipped with DIO boards?                                                                                                                                               | Confirm that an I/O slot with no DIO board mounted on is not set to be used in the setting of I/O Parameter No.705 "Extension I/O Unit Use Select".                                                      |
| 567        | IA Net Communication Cycle Time Error                  | Check that the same final station number as the resizing executed station is set to the final station number.                                                                                                      | Confirm that the setting in I/O Parameter No.604 "IA Net Final Station No." is the same in all the controllers.                                                                                          |

## 4.2.3 Error Codes Related to IA Net

- Message Level Error

| No. | Error Name                                                  | Contents / Counteractions                                                                                                                                                                                                                                 |
|-----|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 211 | IA Net Link Error                                           | IA Net Link Error was detected. Check if the stations indicated in I/O Parameters No.605 and 606 are connected to IA Net properly, or if the station numbers are duplicated in the IA Net network.                                                        |
| 212 | IA Net Break Station Detection Error                        | A station that cannot be joined in the IA Net communication cycle was detected. Check if there is a controller or unit with the station number greater than what is set in I/O Parameter No.604 "IA Net Final Station No.".                               |
| 213 | IA Net Mail Undefined Error Code Receive Error              | Undefined IA Net mail error code was received. There is a concern that there is a function that is available in other controllers and units in the IA Net network, but is not available on this controller. Update the application in the main CPU board. |
| 214 | IA Net Stop Detection Error                                 | Communication stop of IA Net was detected. Check if there is an IA Net related error being occurred.                                                                                                                                                      |
| 215 | External Terminal Block Overcurrent or Power Supply Failure | Overcurrent on external terminal block or an error in the power supply to external terminal block.                                                                                                                                                        |
| 216 | DO Output Current Error                                     | There is a failure in DO output current.                                                                                                                                                                                                                  |
| 217 | 24V I/O Power Supply Failure                                | There is a failure in 24V I/O power supply.                                                                                                                                                                                                               |

- Operation Cancel Level Errors

| No. | Error Name                                           | Contents / Counteractions                                                                                                                                                     |
|-----|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 491 | IA Net Stop Detection Error at IAI Protocol Transfer | IA Net is not working properly during the IAI protocol transfer in IA Net. Confirm that the IA Net board is mounted in the appropriate way or the IA Net is working properly. |
| 492 | IA Net IAI Protocol Mail Sending Error               | IAI protocol communication failed in IA Net.<br>Check the condition of IA Net connection, communication station number, I/O Parameters No.602 to 605, etc.                    |

• Cold Start Level

| No. | Error Name                                                         | Contents / Counteractions                                                                                                                                                                                                                                                                                                                                                                                       |
|-----|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 548 | IA Net Resizing Overlapping Error                                  | Several stations executed the resizing. There is a concern multiple stations are subject to resizing execution. Check the conformity of I/O Parameter No.603 with the controller on the same network.                                                                                                                                                                                                           |
| 54C | IA Net Communication Parameter Error                               | There is a failure in the communication parameters of IA Net. Check in I/O Parameters No.601 to 606 and other considerable numbers.                                                                                                                                                                                                                                                                             |
| 552 | IA Net Link Error                                                  | IA Net Link Error was detected. Confirm that all the controllers occupying the stations indicated in I/O Parameters No.603 and 604 are connected properly to IA Net.<br>This error also occurs when the occupied stations indicated in I/O Parameters No.601 and 602 are duplicating with other controllers connected to IA Net.                                                                                |
| 553 | IA Net Message Command Sending Busy Error                          | Message command could not be sent due to the busy condition at the process of IA Net message command sending.                                                                                                                                                                                                                                                                                                   |
| 554 | IA Net Message Command Sending Timeout Error                       | IA Net message command could not be completed to be sent in the specified time. There is a concern of message commands not being able to be sent properly.                                                                                                                                                                                                                                                      |
| 556 | IA Net Message Command Area Access Right Acquirement Timeout Error | Access right to IA Net message command area could not be gained in the specified time.                                                                                                                                                                                                                                                                                                                          |
| 560 | Number of IA Net Occupied Station Exceeded Error                   | The number of IA Net occupied stations has exceeded the number allowed in the system.                                                                                                                                                                                                                                                                                                                           |
| 561 | IA Net I/O Assignment Number Overflow Error                        | The number of IA Net I/O assignments has exceeded the specified range.                                                                                                                                                                                                                                                                                                                                          |
| 562 | Extension I/O Unit Parameter Error                                 | There is a failure in the extension I/O unit parameters.<br>It could be considered that;<br>1) The station numbers for a controller and an extension I/O unit are duplicated,<br>2) An extension I/O unit with a station number greater than the value set in I/O Parameter No.604 "IA Net Final Station No." is attempted to be used, or<br>3) Extension I/O unit is subject to the resizing executed station. |
| 563 | Extension I/O Unit DO Duplication Error                            | Multiple controllers attempted to use DO in one I/O board on the extension I/O unit.                                                                                                                                                                                                                                                                                                                            |
| 564 | Extension I/O Unit Initial Communication Timeout Error             | Initial communication with the extension remote I/O unit was not established correctly.<br>It could be considered that;<br>1) Extension remote I/O unit is not connected,<br>2) Power is not supplied to extension remote I/O unit, or<br>3) Wrong unit number is set in I/O parameters.                                                                                                                        |
| 565 | Extension I/O Unit Board Undetected Error                          | I/O board in an extension I/O unit was not detected.                                                                                                                                                                                                                                                                                                                                                            |
| 566 | Extension I/O Unit Undefined Error Code Detection                  | Undefined extension I/O unit error code was detected.<br>This error occurs when the main CPU board software is not applicable for the error code of the extension I/O unit. Updating is required on the application in the main CPU board.                                                                                                                                                                      |
| 567 | IA Net Communication Cycle Time Error                              | There is an error in the communication cycle time of IA Net.                                                                                                                                                                                                                                                                                                                                                    |
| 568 | Extension I/O Unit Self Checking Error                             | There is a failure in the CPU program of extension I/O unit.                                                                                                                                                                                                                                                                                                                                                    |
| 569 | Extension I/O Unit Initial Communication Parameter Failure         | There is a failure in the parameter acquired in the initial communication with a controller.                                                                                                                                                                                                                                                                                                                    |
| 678 | Extension I/O Port Assignment Parameter Error                      | There is an error in a parameter related to the extension I/O port assignment.                                                                                                                                                                                                                                                                                                                                  |
| 679 | Extension I/O Port Assignment Number Overflow Error                | The number of extension I/O port assignment exceeded the specification range.                                                                                                                                                                                                                                                                                                                                   |
| 67A | Extension I/O Port Duplicated Assignment Error                     | Extension I/O port assignment has duplicated.<br>For the set values in Parameter No. 701, make sure not to include the number of output ports on an extension I/O unit.                                                                                                                                                                                                                                         |
| D69 | External Terminal Block Overcurrent or Power Supply Failure        | Overcurrent on external terminal block or an error in the power supply to external terminal block.                                                                                                                                                                                                                                                                                                              |
| E69 | 24V I/O Power Supply Failure                                       | There is a failure in 24V I/O power supply.                                                                                                                                                                                                                                                                                                                                                                     |
| E6C | DO Output Current Error                                            | There is a failure in DO output current.                                                                                                                                                                                                                                                                                                                                                                        |

- Table for Shared Memory Assignment • Print out this page and use. [Refer to Section 3.2]

| Station No |  |    | Shared Word No. | Occupations of Shared Memory |       |        |        |       |        |        |       |        |  |
|------------|--|----|-----------------|------------------------------|-------|--------|--------|-------|--------|--------|-------|--------|--|
|            |  |    |                 |                              | Input | Output | ←<br>→ | Input | Output | ←<br>→ | Input | Output |  |
|            |  | 0  | 0               |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 1               |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 2               |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 3               |                              |       |        |        |       |        |        |       |        |  |
|            |  | 1  | 4               |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 5               |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 6               |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 7               |                              |       |        |        |       |        |        |       |        |  |
|            |  | 2  | 8               |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 9               |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 10              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 11              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 3  | 12              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 13              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 14              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 15              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 4  | 16              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 17              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 18              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 19              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 5  | 20              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 21              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 22              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 23              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 6  | 24              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 25              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 26              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 27              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 7  | 28              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 29              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 30              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 31              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 8  | 32              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 33              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 34              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 35              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 9  | 36              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 37              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 38              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 39              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 10 | 40              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 41              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 42              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 43              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 11 | 44              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 45              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 46              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 47              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 12 | 48              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 49              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 50              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 51              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 13 | 52              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 53              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 54              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 55              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 14 | 56              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 57              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 58              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 59              |                              |       |        |        |       |        |        |       |        |  |
|            |  | 15 | 60              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 61              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 62              |                              |       |        |        |       |        |        |       |        |  |
|            |  |    | 63              |                              |       |        |        |       |        |        |       |        |  |

| Station No |  | Shared Word No. | Occupations of Shared Memory | Input | Output | ←<br>→ | Input | Output | ←<br>→ | Input | Output |
|------------|--|-----------------|------------------------------|-------|--------|--------|-------|--------|--------|-------|--------|
|            |  | 64              |                              |       |        |        |       |        |        |       |        |
|            |  | 65              |                              |       |        |        |       |        |        |       |        |
|            |  | 66              |                              |       |        |        |       |        |        |       |        |
|            |  | 67              |                              |       |        |        |       |        |        |       |        |
|            |  | 68              |                              |       |        |        |       |        |        |       |        |
|            |  | 69              |                              |       |        |        |       |        |        |       |        |
|            |  | 70              |                              |       |        |        |       |        |        |       |        |
|            |  | 71              |                              |       |        |        |       |        |        |       |        |
|            |  | 72              |                              |       |        |        |       |        |        |       |        |
|            |  | 73              |                              |       |        |        |       |        |        |       |        |
|            |  | 74              |                              |       |        |        |       |        |        |       |        |
|            |  | 75              |                              |       |        |        |       |        |        |       |        |
|            |  | 76              |                              |       |        |        |       |        |        |       |        |
|            |  | 77              |                              |       |        |        |       |        |        |       |        |
|            |  | 78              |                              |       |        |        |       |        |        |       |        |
|            |  | 79              |                              |       |        |        |       |        |        |       |        |
|            |  | 80              |                              |       |        |        |       |        |        |       |        |
|            |  | 81              |                              |       |        |        |       |        |        |       |        |
|            |  | 82              |                              |       |        |        |       |        |        |       |        |
|            |  | 83              |                              |       |        |        |       |        |        |       |        |
|            |  | 84              |                              |       |        |        |       |        |        |       |        |
|            |  | 85              |                              |       |        |        |       |        |        |       |        |
|            |  | 86              |                              |       |        |        |       |        |        |       |        |
|            |  | 87              |                              |       |        |        |       |        |        |       |        |
|            |  | 88              |                              |       |        |        |       |        |        |       |        |
|            |  | 89              |                              |       |        |        |       |        |        |       |        |
|            |  | 90              |                              |       |        |        |       |        |        |       |        |
|            |  | 91              |                              |       |        |        |       |        |        |       |        |
|            |  | 92              |                              |       |        |        |       |        |        |       |        |
|            |  | 93              |                              |       |        |        |       |        |        |       |        |
|            |  | 94              |                              |       |        |        |       |        |        |       |        |
|            |  | 95              |                              |       |        |        |       |        |        |       |        |
|            |  | 96              |                              |       |        |        |       |        |        |       |        |
|            |  | 97              |                              |       |        |        |       |        |        |       |        |
|            |  | 98              |                              |       |        |        |       |        |        |       |        |
|            |  | 99              |                              |       |        |        |       |        |        |       |        |
|            |  | 100             |                              |       |        |        |       |        |        |       |        |
|            |  | 101             |                              |       |        |        |       |        |        |       |        |
|            |  | 102             |                              |       |        |        |       |        |        |       |        |
|            |  | 103             |                              |       |        |        |       |        |        |       |        |
|            |  | 104             |                              |       |        |        |       |        |        |       |        |
|            |  | 105             |                              |       |        |        |       |        |        |       |        |
|            |  | 106             |                              |       |        |        |       |        |        |       |        |
|            |  | 107             |                              |       |        |        |       |        |        |       |        |
|            |  | 108             |                              |       |        |        |       |        |        |       |        |
|            |  | 109             |                              |       |        |        |       |        |        |       |        |
|            |  | 110             |                              |       |        |        |       |        |        |       |        |
|            |  | 111             |                              |       |        |        |       |        |        |       |        |
|            |  | 112             |                              |       |        |        |       |        |        |       |        |
|            |  | 113             |                              |       |        |        |       |        |        |       |        |
|            |  | 114             |                              |       |        |        |       |        |        |       |        |
|            |  | 115             |                              |       |        |        |       |        |        |       |        |
|            |  | 116             |                              |       |        |        |       |        |        |       |        |
|            |  | 117             |                              |       |        |        |       |        |        |       |        |
|            |  | 118             |                              |       |        |        |       |        |        |       |        |
|            |  | 119             |                              |       |        |        |       |        |        |       |        |
|            |  | 120             |                              |       |        |        |       |        |        |       |        |
|            |  | 121             |                              |       |        |        |       |        |        |       |        |
|            |  | 122             |                              |       |        |        |       |        |        |       |        |
|            |  | 123             |                              |       |        |        |       |        |        |       |        |
|            |  | 124             |                              |       |        |        |       |        |        |       |        |
|            |  | 125             |                              |       |        |        |       |        |        |       |        |
|            |  | 126             |                              |       |        |        |       |        |        |       |        |

Note the station numbers and shared word numbers on this sheet in case of exceeding 31 stations.

[illegible]

• Table for Parameter Setting

| XSEL ■ Units              |                                                                       |           |
|---------------------------|-----------------------------------------------------------------------|-----------|
| IA Net Related Parameters |                                                                       | Set Value |
| 1                         | I/O Port Allocation Type                                              | 0         |
| 602                       | Top Occupied Station Number                                           |           |
| 603                       | Resizing executed station number                                      |           |
| 604                       | Final station number                                                  |           |
| 605                       | All Connected Station Patterns (31-00)                                |           |
| 606                       | All Connected Station Patterns (63-32)                                |           |
| 691                       | Input Port Start No. in Network I/F                                   |           |
| 692                       | Output Port Start No. in Network I/F                                  |           |
| 693                       | Shared memory reference word pattern (31-00) <sup>(Note 1)</sup>      |           |
| 694                       | Shared memory reference word pattern (63-32) <sup>(Note 1)</sup>      |           |
| 695                       | Shared memory reference word pattern (64-95) <sup>(Note 1)</sup>      |           |
| 696                       | Shared memory reference word pattern (96-127) <sup>(Note 1)</sup>     |           |
| 697                       | Shared memory reference word pattern (128-159) <sup>(Note 1)</sup>    |           |
| 698                       | Shared memory reference word pattern (160-191) <sup>(Note 1)</sup>    |           |
| 699                       | Shared memory reference word pattern (192-223) <sup>(Note 1)</sup>    |           |
| 700                       | Shared memory reference word pattern (224-255) <sup>(Note 1)</sup>    |           |
| 701                       | Output Ports <sup>(Note 2)</sup>                                      |           |
| 705                       | Extension I/O Unit Use Select                                         |           |
| 706                       | Unit Number of Extension I/O Unit                                     |           |
| 707                       | Start number of extension input ports at fixed assignment for Slot 1  |           |
| 708                       | Start number of extension output ports at fixed assignment for Slot 1 |           |
| 709                       | Start number of extension input ports at fixed assignment for Slot 2  |           |
| 710                       | Start number of extension output ports at fixed assignment for Slot 2 |           |
| 711                       | Start number of extension input ports at fixed assignment for Slot 3  |           |
| 712                       | Start number of extension output ports at fixed assignment for Slot 3 |           |
| 713                       | Start number of extension input ports at fixed assignment for Slot 4  |           |
| 714                       | Start number of extension output ports at fixed assignment for Slot 4 |           |

| XSEL ■ Units              |                                                                       |           |
|---------------------------|-----------------------------------------------------------------------|-----------|
| IA Net Related Parameters |                                                                       | Set Value |
| 1                         | I/O Port Allocation Type                                              | 0         |
| 602                       | Top Occupied Station Number                                           |           |
| 603                       | Resizing executed station number                                      |           |
| 604                       | Final station number                                                  |           |
| 605                       | All Connected Station Patterns (31-00)                                |           |
| 606                       | All Connected Station Patterns (63-32)                                |           |
| 691                       | Input Port Start No. in Network I/F                                   |           |
| 692                       | Output Port Start No. in Network I/F                                  |           |
| 693                       | Shared memory reference word pattern (31-00) <sup>(Note 1)</sup>      |           |
| 694                       | Shared memory reference word pattern (63-32) <sup>(Note 1)</sup>      |           |
| 695                       | Shared memory reference word pattern (64-95) <sup>(Note 1)</sup>      |           |
| 696                       | Shared memory reference word pattern (96-127) <sup>(Note 1)</sup>     |           |
| 697                       | Shared memory reference word pattern (128-159) <sup>(Note 1)</sup>    |           |
| 698                       | Shared memory reference word pattern (160-191) <sup>(Note 1)</sup>    |           |
| 699                       | Shared memory reference word pattern (192-223) <sup>(Note 1)</sup>    |           |
| 700                       | Shared memory reference word pattern (224-255) <sup>(Note 1)</sup>    |           |
| 701                       | Output Ports <sup>(Note 2)</sup>                                      |           |
| 705                       | Extension I/O Unit Use Select                                         |           |
| 706                       | Unit Number of Extension I/O Unit                                     |           |
| 707                       | Start number of extension input ports at fixed assignment for Slot 1  |           |
| 708                       | Start number of extension output ports at fixed assignment for Slot 1 |           |
| 709                       | Start number of extension input ports at fixed assignment for Slot 2  |           |
| 710                       | Start number of extension output ports at fixed assignment for Slot 2 |           |
| 711                       | Start number of extension input ports at fixed assignment for Slot 3  |           |
| 712                       | Start number of extension output ports at fixed assignment for Slot 3 |           |
| 713                       | Start number of extension input ports at fixed assignment for Slot 4  |           |
| 714                       | Start number of extension output ports at fixed assignment for Slot 4 |           |

| XSEL ■ Units              |                                                                       |           |
|---------------------------|-----------------------------------------------------------------------|-----------|
| IA Net Related Parameters |                                                                       | Set Value |
| 1                         | I/O Port Allocation Type                                              | 0         |
| 602                       | Top Occupied Station Number                                           |           |
| 603                       | Resizing executed station number                                      |           |
| 604                       | Final station number                                                  |           |
| 605                       | All Connected Station Patterns (31-00)                                |           |
| 606                       | All Connected Station Patterns (63-32)                                |           |
| 691                       | Input Port Start No. in Network I/F                                   |           |
| 692                       | Output Port Start No. in Network I/F                                  |           |
| 693                       | Shared memory reference word pattern (31-00) <sup>(Note 1)</sup>      |           |
| 694                       | Shared memory reference word pattern (63-32) <sup>(Note 1)</sup>      |           |
| 695                       | Shared memory reference word pattern (64-95) <sup>(Note 1)</sup>      |           |
| 696                       | Shared memory reference word pattern (96-127) <sup>(Note 1)</sup>     |           |
| 697                       | Shared memory reference word pattern (128-159) <sup>(Note 1)</sup>    |           |
| 698                       | Shared memory reference word pattern (160-191) <sup>(Note 1)</sup>    |           |
| 699                       | Shared memory reference word pattern (192-223) <sup>(Note 1)</sup>    |           |
| 700                       | Shared memory reference word pattern (224-255) <sup>(Note 1)</sup>    |           |
| 701                       | Output Ports <sup>(Note 2)</sup>                                      |           |
| 705                       | Extension I/O Unit Use Select                                         |           |
| 706                       | Unit Number of Extension I/O Unit                                     |           |
| 707                       | Start number of extension input ports at fixed assignment for Slot 1  |           |
| 708                       | Start number of extension output ports at fixed assignment for Slot 1 |           |
| 709                       | Start number of extension input ports at fixed assignment for Slot 2  |           |
| 710                       | Start number of extension output ports at fixed assignment for Slot 2 |           |
| 711                       | Start number of extension input ports at fixed assignment for Slot 3  |           |
| 712                       | Start number of extension output ports at fixed assignment for Slot 3 |           |
| 713                       | Start number of extension input ports at fixed assignment for Slot 4  |           |
| 714                       | Start number of extension output ports at fixed assignment for Slot 4 |           |

| Extension I/O Units             |  | Rotary Switch (unit number setting) |        |
|---------------------------------|--|-------------------------------------|--------|
| Number of I/O points for Slot 1 |  | Input                               | Output |
| Number of I/O points for Slot 2 |  | Input                               | Output |
| Number of I/O points for Slot 3 |  | Input                               | Output |
| Number of I/O points for Slot 4 |  | Input                               | Output |

| Slot No.          | XSEL number |        | XSEL number |        | XSEL number |        |
|-------------------|-------------|--------|-------------|--------|-------------|--------|
|                   | Input       | Output | Input       | Output | Input       | Output |
| 1                 |             |        |             |        |             |        |
| 2                 |             |        |             |        |             |        |
| 3                 |             |        |             |        |             |        |
| 4                 |             |        |             |        |             |        |
| Parameters No.705 |             |        |             |        |             |        |

Note 1 Establish the settings with a care not to include the input ports of an extension I/O unit that XSEL controller directly controls (which is set in Parameter No. 705) in the word pattern.

Note 2 Establish the settings with a care not to include the output ports of an extension I/O unit that XSEL controller directly controls (which is set in Parameter No. 705) in the number of used output ports.



Change History

| Revision Date | Description of Revision                                                               |
|---------------|---------------------------------------------------------------------------------------|
| 2012.09       | First edition                                                                         |
| 2013.03       | Second edition<br>Setting process of network construction and examples revised in 3.2 |





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