

## Right choice for ultimate yield

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Programmable Logic Controller

# XG-PM

XGT Series

User's Manual

APM module

XPM module

Network type XPM module

Motion Control module



### Safety Instructions

- Read this manual carefully before installing, wiring, operating, servicing or inspecting this equipment.
- Keep this manual within easy reach for quick reference.

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## Before using the product ...

For your safety and effective operation, please read the safety instructions thoroughly before using the product.

- ▶ Safety Instructions should always be observed in order to prevent accident or risk with the safe and proper use the product.
- ▶ Instructions are divided into “Warning” and “Caution”, and the meaning of the terms is as follows.



### **Warning**

This symbol indicates the possibility of serious injury or death if some applicable instruction is violated



### **Caution**

This symbol indicates the possibility of severe or slight injury, and property damages if some applicable instruction is violated

Moreover, even classified events under its caution category may develop into serious accidents relying on situations. Therefore we strongly advise users to observe all precautions properly just like warnings.

- ▶ The marks displayed on the product and in the user’s manual have the following meanings.



Be careful! Danger may be expected.



Be careful! Electric shock may occur.

- ▶ The user’s manual even after read shall be kept available and accessible to any user of the product.

## Safety Instructions for design process

### Warning

- ▶ **Please install a protection circuit on the exterior of PLC so that the whole system may operate safely regardless of failures from external power or PLC.** Any abnormal output or operation from PLC may cause serious problems to safety in whole system.
  - Install protection units on the exterior of PLC like an interlock circuit that deals with opposite operations such as emergency stop, protection circuit, and forward/reverse rotation or install an interlock circuit that deals with high/low limit under its position controls.
  - If any system error (watch-dog timer error, module installation error, etc.) is detected during CPU operation in PLC, all output signals are designed to be turned off and stopped for safety. However, there are cases when output signals remain active due to device failures in Relay and TR which can't be detected. Thus, you are recommended to install an addition circuit to monitor the output status for those critical outputs which may cause significant problems.
- ▶ **Never overload more than rated current of output module nor allow to have a short circuit.** Over current for a long period time may cause a fire .
- ▶ **Never let the external power of the output circuit to be on earlier than PLC power**, which may cause accidents from abnormal output or operation.
- ▶ **Please install interlock circuits in the sequence program for safe operations in the system when exchange data with PLC or modify operation modes using a computer or other external equipments** Read specific instructions thoroughly when conducting control operations with PLC.

## Safety Instructions for design process

### **Caution**

- ▶ **I/O signal or communication line shall be wired at least 100mm away from a high-voltage cable or power line.** Fail to follow this

## Safety Instructions on installation process

### **Caution**

- ▶ **Use PLC only in the environment specified in PLC manual or general standard of data sheet.** If not, electric shock, fire, abnormal operation of the product may be caused.
- ▶ **Before install or remove the module, be sure PLC power is off.** If not, electric shock or damage on the product may be caused.
- ▶ **Be sure that every module is securely attached after adding a module or an extension connector.** If the product is installed loosely or incorrectly, abnormal operation, error or dropping may be caused. In addition, contact failures under poor cable installation will be causing malfunctions as well.
- ▶ **Be sure that screws get tighten securely under vibrating environments.** Fail to do so will put the product under direct vibrations which will cause electric shock, fire and abnormal operation.
- ▶ **Do not come in contact with conducting parts in each module,** which may cause electric shock, malfunctions or abnormal operation.



## Safety Instructions for wiring process

### Warning

- ▶ **Prior to wiring works, make sure that every power is turned off.** If not, electric shock or damage on the product may be caused.
- ▶ **After wiring process is done, make sure that terminal covers are installed properly before its use.** Fail to install the cover may cause electric shocks.

### Caution

- ▶ **Check rated voltages and terminal arrangements in each product prior to its wiring process.** Applying incorrect voltages other than rated voltages and misarrangement among terminals may cause fire or malfunctions.
- ▶ **Secure terminal screws tightly applying with specified torque.** If the screws get loose, short circuit, fire or abnormal operation may be caused. Securing screws too tightly will cause damages to the module or malfunctions, short circuit, and dropping.
- ▶ **Be sure to earth to the ground using Class 3 wires for FG terminals which is exclusively used for PLC.** If the terminals not grounded correctly, abnormal operation or electric shock may be caused.
- ▶ **Don't let any foreign materials such as wiring waste inside the module while wiring,** which may cause fire, damage on the product or abnormal operation.
- ▶ **Make sure that pressed terminals get tighten following the specified torque. External connector type shall be pressed or soldered using proper equipments.**

## Safety Instructions for test-operation and maintenance

### **Warning**

- ▶ **Don't touch the terminal when powered.** Electric shock or abnormal operation may occur.
- ▶ **Prior to cleaning or tightening the terminal screws, let all the external power off including PLC power.** If not, electric shock or abnormal operation may occur.
- ▶ **Don't let the battery recharged, disassembled, heated, short or soldered.** Heat, explosion or ignition may cause injuries or fire.

### **Caution**

- ▶ **Do not make modifications or disassemble each module.** Fire, electric shock or abnormal operation may occur.
- ▶ **Prior to installing or disassembling the module, let all the external power off including PLC power.** If not, electric shock or abnormal operation may occur.
- ▶ **Keep any wireless equipment such as walkie-talkie or cell phones at least 30cm away from PLC.** If not, abnormal operation may be caused.
- ▶ **When making a modification on programs or using run to modify functions under PLC operations, read and comprehend all contents in the manual fully.** Mismanagement will cause damages to products and accidents.
- ▶ **Avoid any physical impact to the battery and prevent it from dropping as well.** Damages to battery may cause leakage from its fluid. When battery was dropped or exposed under strong impact, never reuse the battery again. Moreover skilled workers are needed when exchanging batteries.

## Safety Instructions for waste disposal



### Caution

- ▶ **Product or battery waste shall be processed as industrial waste.** The waste may discharge toxic materials or explode itself.

# Revision History

Version	Date	Remark	Page
V 1.0	'09. 8	First Edition	-
V 1.1	'10. 4	APM module added	CH5, CH8, CH9, Ch10, CH11
V 1.2	'11.5	XGF-PN8A module added	CH1, CH3, CH5, CH6, CH7, CH8, CH9, CH10, CH11
V 1.3	'11.8	XGF-PN8B module added	CH1, CH3~CH11
V 2.0	'13.8	XGF-M32E module added	CH1~CH3, CH5~CH17
		L7N series Servo Drive tuning tool added	CH11

※ The number of User’s manual is indicated right part of the back cover.

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**Warranty and Environmental Policy**

About User's Manual

Thank you for purchasing PLC of LSIS Co.,Ltd.

Before use, make sure to carefully read and understand the User's Manual about the functions, performances, installation and programming of the product you purchased in order for correct use and importantly, let the end user and maintenance administrator to be provided with the User's Manual.

The User's Manual describes the product. If necessary, you may refer to the following description and order accordingly.

In addition, you may connect our website(<http://www.lsis.biz/>) and download the information as a PDF file.

Relevant User's Manuals

Title	Description
XG5000 User's Manual (for XGK, XGB)	XG5000 software user manual describing online function such as programming, print, monitoring, debugging by using XGK, XGB CPU
XG5000 User's Manual (for XGI, XGR)	XG5000 software user manual describing online function such as programming, print, monitoring, debugging by using XGI, XGR CPU
XGK/XGB Instructions & Programming User's Manual	User's manual for programming to explain how to use instructions that are used PLC system with XGK, XGB CPU.
XGI/XGR/XEC Instructions & Programming User's Manual	User's manual for programming to explain how to use instructions that are used PLC system with XGI, XGR,XEC CPU.
XGK CPU User's Manual (XGK-CPUA/CPUE/CPUH/CPUS/CPUU)	XGK-CPUA/CPUE/CPUH/CPUS/CPUU user manual describing about XGK CPU module, power module, base, IO module, specification of extension cable and system configuration, EMC standard
XGI CPU User's Manual (XGI-CPUU/CPUH/CPUS/CPUE/CPUU/D)	XGI-CPUU/CPUH/CPUS/CPUE/CPUU/D user manual describing about XGI CPU module, power module, base, IO module, specification of extension cable and system configuration, EMC standard
XGR redundant series User's Manual	XGR- CPUH/F, CPUH/T user manual describing about XGR CPU module, power module, extension drive, base, IO module, specification of extension cable and system configuration, EMC standard



# Chapter 1 Overview

This manual describes the function and operation method of XG-PM.  
XG-PM is the software that controls positioning modules corresponding to CPU of XGT PLC series and carries out the functions below.

- Setting Parameter, Data of Positioning Module
- Simulating by Positioning Data
- Reading/Writing data on Positioning Module and comparing data with module
- Monitoring in Positioning Control status
- Test operating of Positioning Control

These are the positioning module that XG-PM can be applied to

Positioning module types		Models
Open Collector Ouput	APM positioning module	XGF-PO1A, XGF-PO2A, XGF-PO3A
	XPM positioning module	XGF-PO1H, XGF-PO2H, XGF-PO3H, XGF-PO4H
Line Drive Output	APM positioning module	XGF-PD1A, XGF-PD2A, XGF-PD3A
	XPM positoning module	XGF-PD1H, XGF-PD2H, XGF-PD3H, XGF-PD4H
Network type	EtherCAT positioning module	XGF-PN8A
	Standard type EtherCAT positioning module	XGF-PN8B
	Motion Cotrol module	XGF-M32E

### 1.1 Characteristics

#### 1. Application of intuitive icon design

Intuitive icon design is applied for user to operate more easily.

#### 2. Three-dimensional Structure to check data Easily and Quickly.

Users can check external I/O signal and error history easily and quickly even while data monitoring. Especially, users can check error information and solutions on monitoring screen and can be given much help from it. In addition, the state of external I/O signal is displayed in various colors for user to check conveniently.

#### 3. Multi-Communication

XG-PM and XG5000 are possible to connect at the same time without extra work for connection.

#### 4. Editing and Monitoring Data of Several modules at a time

XG-PM can edit data of several positioning module connected to XGT PLC and monitor several modules at a time. When users install several modules, the modules will be installed easily and quickly.

#### 5. Simulator Function

XG-PM has simulator for positioning module so simulation is possible to execute before real operating. User can check the movement of positioning module through the simulator and prevent some unexpected errors.

#### 6. Compatible with Former APM Software Package

XG-PM can read files written in former APM software package and convert it into the project file for XG-PM.

#### 7. Servo-Tuning Function

You can connect to the servo and execute the servo-tuning function without other softwares.

(There is a limit to the servo tuning function, according to the servo)

#### 8. Various Monitor Function

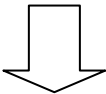
XG-PM provides various forms of operation monitoring function. User can check the information about servo easily with system view function and analyze the operating state of module in another way with two-dimensional trend and trace function.

1.2 Construction of Manual

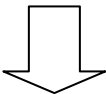
This manual consists of 17 chapters and appendix.

This manual hypothesize that users execute from confirmation of positioning control system to operation in the order below.

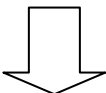
Sequence1 – Install and wire positioning control system.	Reference
Install and wire PLC, servo amp, motor, external equipment and PLC such as XGT CPU, XPM module (XGF-PO1H, XGF-PO2H, XGF-PO3H, XGF-PO4H, XGF-PD1H, XGF-PD2H, XGF-PD3H, XGF-PD4H), APM module (XGF-PO1A, XGF-PO2A, XGF-PD3A, XGF-PD1A, XGF-PD2A, XGF-PD3A), network type XPM module(XGF-PN8A, XGF-PN8B), Motion Control module(XGF-M32E), I/O module, Specialfunction module etc	Refer to user’s manual of positioning module pulse ouput type



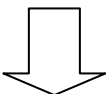
Sequence2 - Learn the function and working of XG-PM	Reference
Check the system can be used with XG-PM	Chapter 2
Check the function can be used with XG-PM	Chapter 3
Install and start XG-PM	Chapter 4
Learn the operating method and the construction of monitor screen	Chapter 5



Sequence3 – Execute function of XG-PM	Reference
Write a project with XG-PM	Chapter 6



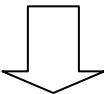
Sequence4 – Check the connection state of positioning module with system and the initial state.	Reference
Select a port to connect to positioning module and etc	Chapter 7
Check the positioning module type and module information	
Check the state of positioning module(Warning/Error)	
Check the state of servo connected to positioning module	
Check the operation of servo motor by JOG operation	



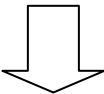
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# Chapter 1 Overview

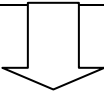
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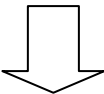
Sequence5 – Set data and write into positioning module	Reference
Set parameter according to positioning control system and control method	Chapter 8
Set servo parameter according to servo drive, motor specification (dedicated for XGF-PN8A, XGF-PN8B, XGF-M32E)	
Execute the servo-tuning (dedicated for XGF-PN8A, XGF-PN8B, XGF-M32E)	
Check positioning data through the simulation	
Check the state of positioning data by automatic error check function for setting data	
Write/Read/Compare the data set on project	Chapter 9



Sequence6 – Writing the motion control program (for Motion Control Module only)	Reference
Set variables used for the motion control program.	Chapter 12
Write the motion control program with LD, ST.	Chapter 13, Chapter 14
Check errors of the written program.	Chapter 15
Write/Read/Compare the written program.	Chapter 9



Sequence7 – Execute test operating and check/modify the setting	Reference
Connect to module and have module ready to execute test operating	Chapter 10
Check the operating state set on module through JOG operation, Direct, Indirect start and Speed synch. operation	
Check the state of positioning control by monitor	
Operate the program written in a module through mode conversion (for Motion Control Module only).	

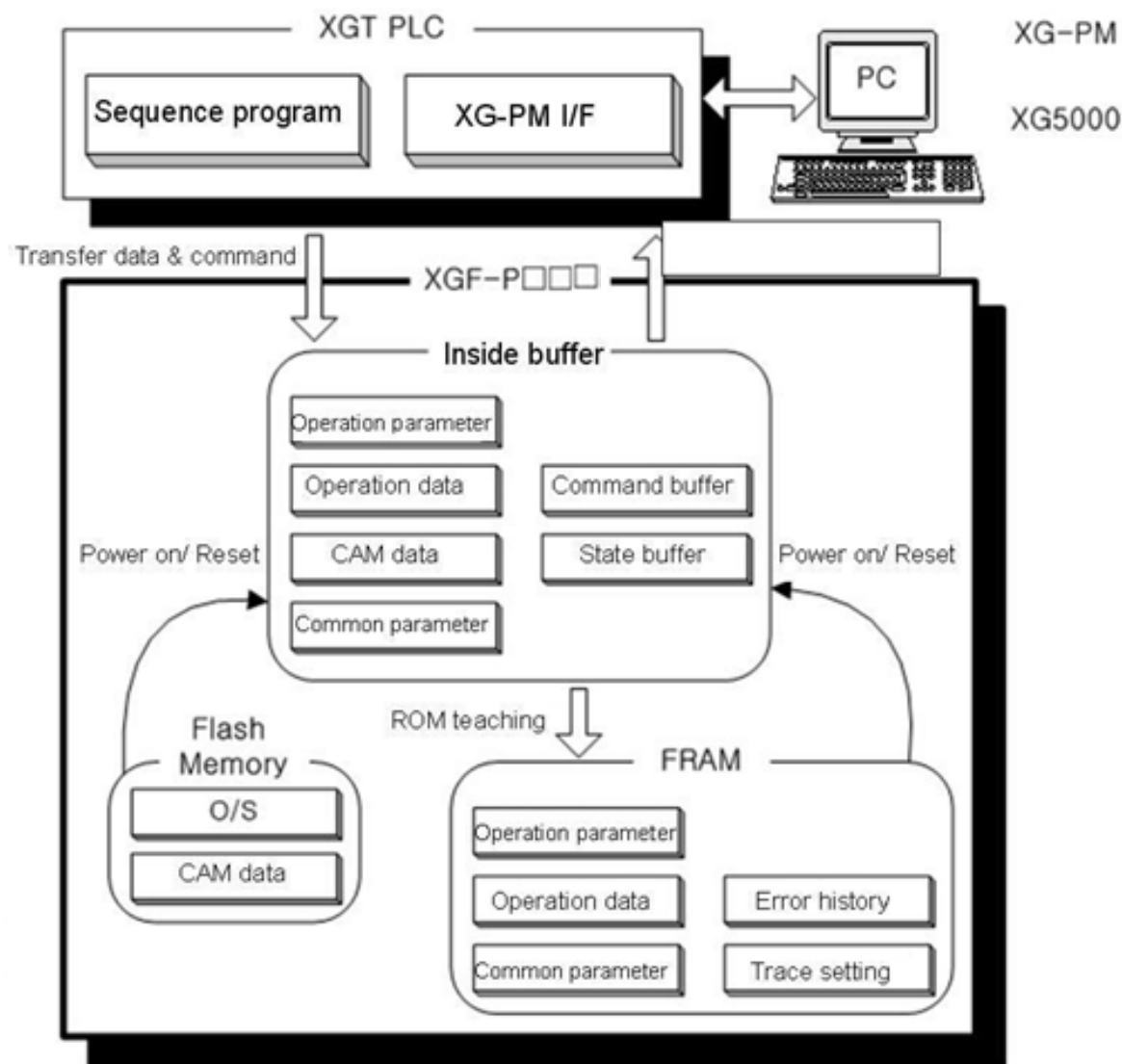


Sequence8 – Operate positioning control system	Reference
Operate positioning control system by PLC CPU program	Refer to user's manual of positioning module pulse output type, network type.

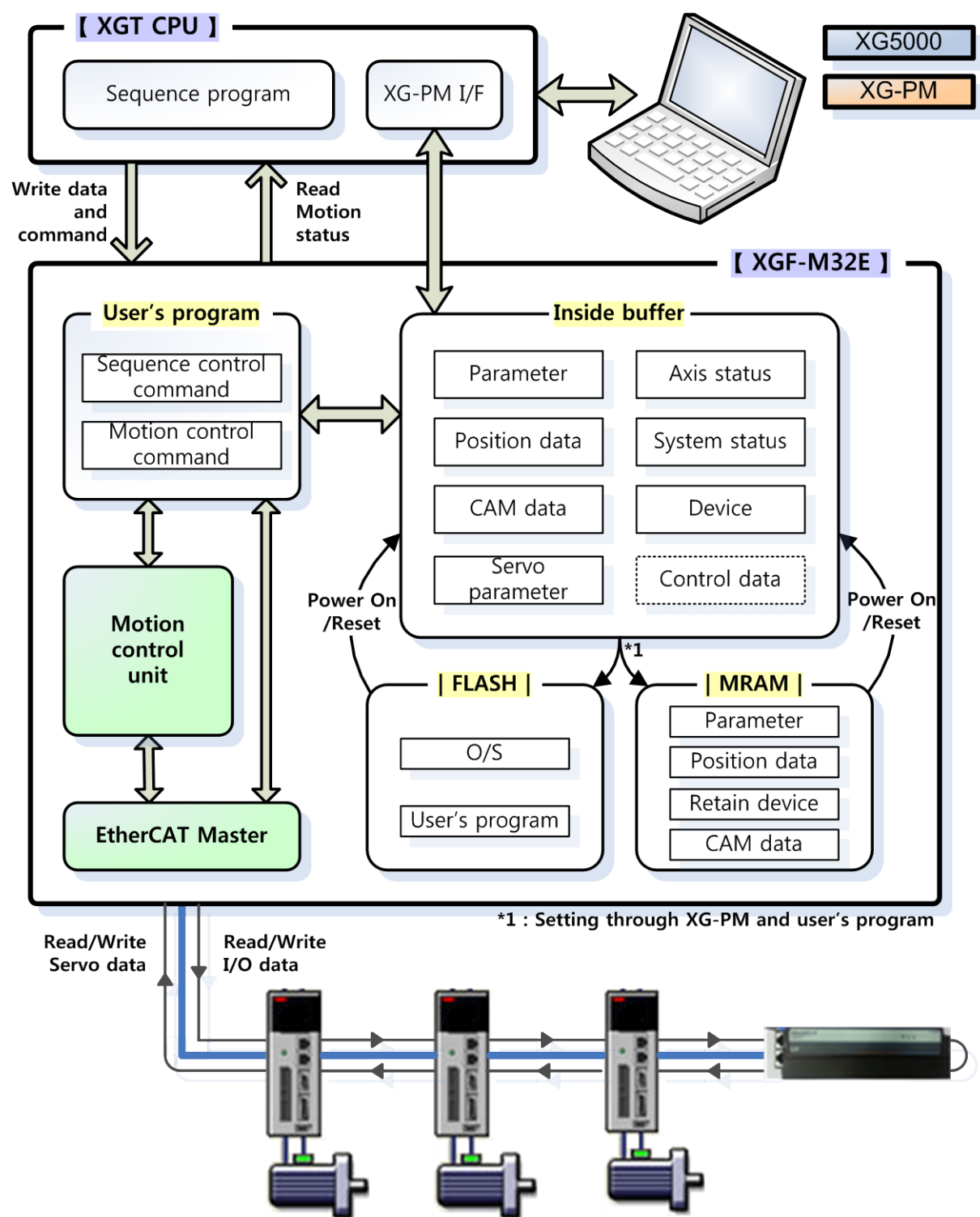
## Chapter 2 System Composition

### 2.1 System Composition

This drawing describes flow of data when setting data and checking the operation status by XG-PM.



<The data flow diagram of the Network type XPM module>



<The data flow diagram of the Motion control module>

2.2 Motion Environment

XG-PM motion environment is as follows;

Item		Content
Peripherals	PC	Using Windows PC
	CPU module	CPU module corresponding to XGT CPU series
Standard of motion PC	CPU	Over Pentium processor
	Memory	Over 512MB
	HDD disk	the least over 200MB empty space
	Telecommunications environment	RS-232C or USB
	Display	Resolution of over 1024*768 Over 64MB graphic memory
	Windows environment	Windows 2000/XP/Vista/Window7 environment
XGT CPU module version	XGK CPU	Over V3.0
	XGI CPU	Over V3.0
	XGR CPU	Over V1.6
Etc.	MSXML version	Over 3.0 SP5
	Adobe Reader	Over 6.0

Chapter 3 Function Table

3.1 Function Table

Here describes important function of XG-PM.

Function		Content	Support				
			A P M	X P M	P N 8 A	P N 8 B	M 3 2 E
Editing	Setting Parameter	Sets common, basic, expansion, manual operation, homing and external signal parameter.	○	○	○	○	○
	Setting Operation Data	Sets control method, operation method, accerelation/deceleration time, M code and circular interpolation data per axis unit.	○	○	○	○	○
	Setting Servo Parameter	Sets motor and actuator part, general control part, speed control part, didital speed and torque, position control part, torque control part, input point function, output point function and analog monitor parameter	✕	✕	○	○	○
	Setting Network Parameter	Sets driver name, axis number, alarm information, alarm history information and input signal information of network servo drive	✕	✕	✕	○	○
Monitor	Monitor Position Data	Monitors positioning data in operation	○	○	○	○	○
	Monitor Operating Motion - Monitor Error Records - Monitor External Signal - Monitor Motion - Monitor Servo	Monitors position, speed value, situation, etc of all axes.	○	○	○	○	○
		Monitors recorded error, warning, etc of all axes.	○	○	○	○	○
		Monitors external signal of all axes.	○	○	○	○	○
		Monitors motion situation of all axes.	○	○	○	○	○
		Monitors servo drive and motor status.	✕	✕	○	○	○
	Trand monitor	Expresses positioning data in operation by graph.	○	○	○	○	○
Program	Variable monitor	Monitors variables and flags of module.	✕	✕	✕	✕	○
	LD program	Writes and edits the program with LD.	✕	✕	✕	✕	○
	ST program	Writes and edits the program with ST.	✕	✕	✕	✕	○
	Program Check	Checks the written program and detects errors.	✕	✕	✕	✕	○
	Online Editing	Edits the task program during RUN mode.	✕	✕	✕	✕	○



## Chapter 4 Positioning Parameter & Operation Data

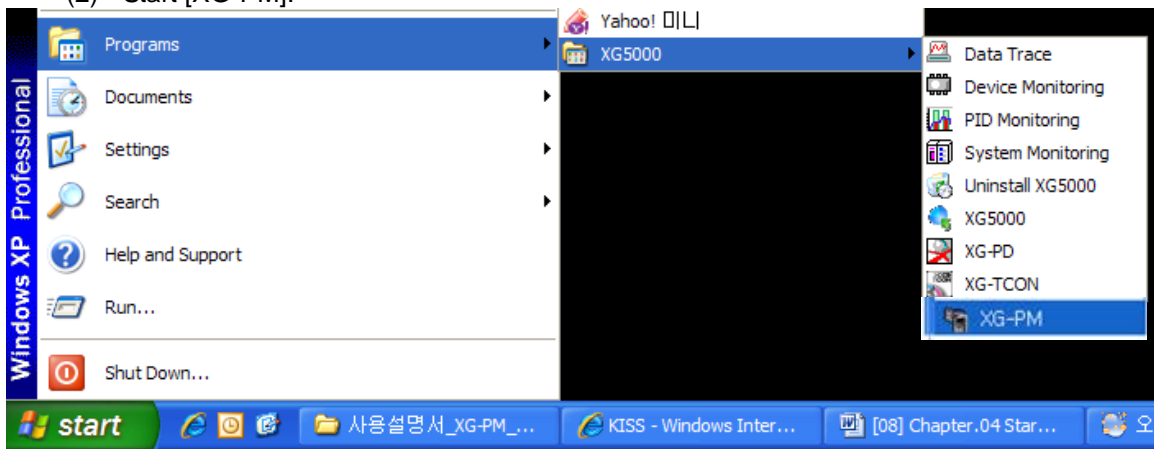
Function			Content	Support				
				A P M	X P M	P N 8 A	P N 8 B	M 3 2 E
Test	Editing positioning data		Write setting parameter, operation data to module in operation and monitoring	○	○	○	○	○
	Motion Test	Indirecting start	Assign positioning data, step number and execute test.	○	○	○	○	×
		Directing start	Directly sets position, speed, dwell time, M code, acceleration&deceleration time and tests positioning operation.	○	○	○	○	○
		Position change	Tests target position change in positioning operation.	○	○	○	○	×
		Speed change	Tests speed change to axis of positioning.	○	○	○	○	×
		interpolation	Edits data of linear interpolation, circular interpolation, elliptic interpolation, helical interpolation and tests.	○	○	○	○	×
		Cam operation	Tests cam operation from created profile by setting cam parameter.	×	○	○	○	×
		Step change	Tests by Positioning operation after changing starting step of positioning operation.	○	○	○	○	×
		Teaching operation	Tests operation of single teaching, plural teaching.	○	○	○	○	×
		Inching operation	Tests operating designated distance per each operation.	○	○	○	○	×
		MPG operation	Tests operation by manual pulse generator (MPG).	○	○	○	○	×
	Simulation		Simulates motion of positioning module.	○	○	○	×	×
Check of connection	Confirm connection		Expresses signal from external. Tests initial operation by JOG operation.	○	○	○	○	○
Trace	Bit/Word Trace		Expresses situation bit information & position speed information in operation. Can express Maximum 8 items.	×	○	○	○	○
	XY Trace		Expresses position/speed information using by 2 dimensions in operation. Can express Maximum 4 items.	×	○	○	○	○
	XYZ Trace		Expresses position/speed information using by 3 dimensions in operation.	×	○	○	○	○
Extended Function	Cam operation		Tests cam operation by created profile for operating cam.	×	○	○	○	○
Printing Function	Individual print		Prints each setting display.	○	○	○	○	○
	Project print		Prints whole project.	○	○	○	○	○

## Chapter 4 Start & End of XG-PM

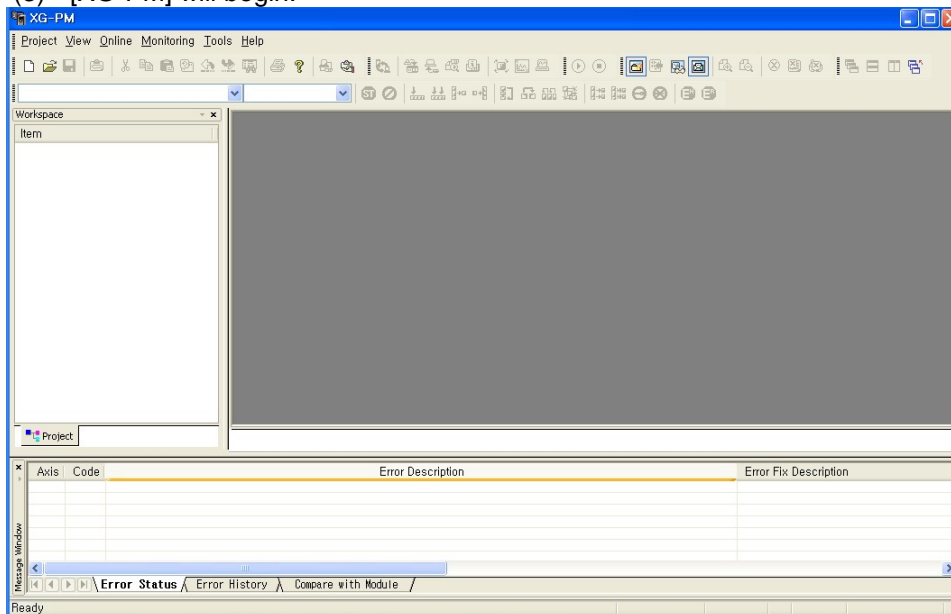
### 4.1 Start of XG-PM

Here describes the way of using XG-PM by windows.

- (1) Move cursor as follows: [Start] → [Programs] → [XG5000] → [XG-PM].
- (2) Start [XG-PM].



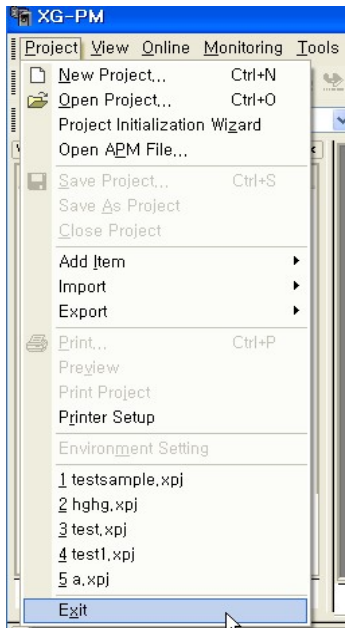
- (3) [XG-PM] will begin.



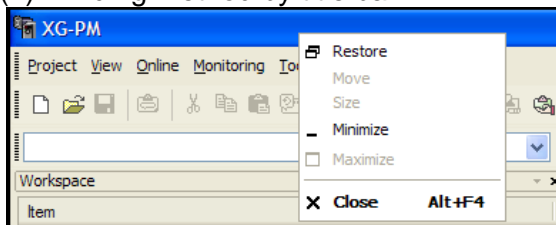
### 4.2 End of XG-PM

Here describes the way of ending XG-PM.

- (1) Ending method by menu
  - (a) Execute [Project] → [Exit].
  - (b) XG-PM is ended.

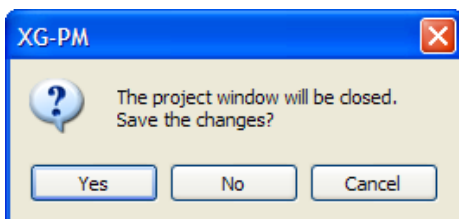


- (2) Ending method by title bar



#### Note

If it is ended without saving change after changing project data, project saving window is displayed for asking save of project.

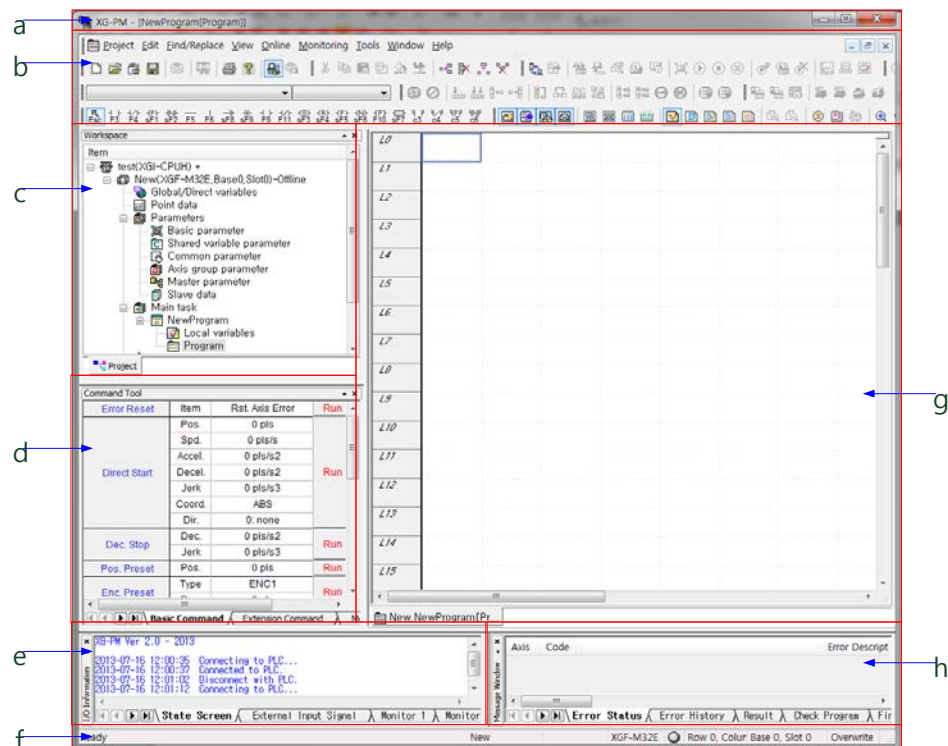


Click <Yes> button, end program with saving project.  
Click <No> button, end program without saving project.  
Click <Cancel> button, cancel ending program.

## Chapter 5 Composition & the Way of Basic Using of Operation Screen

### 5.1 Screen Composition

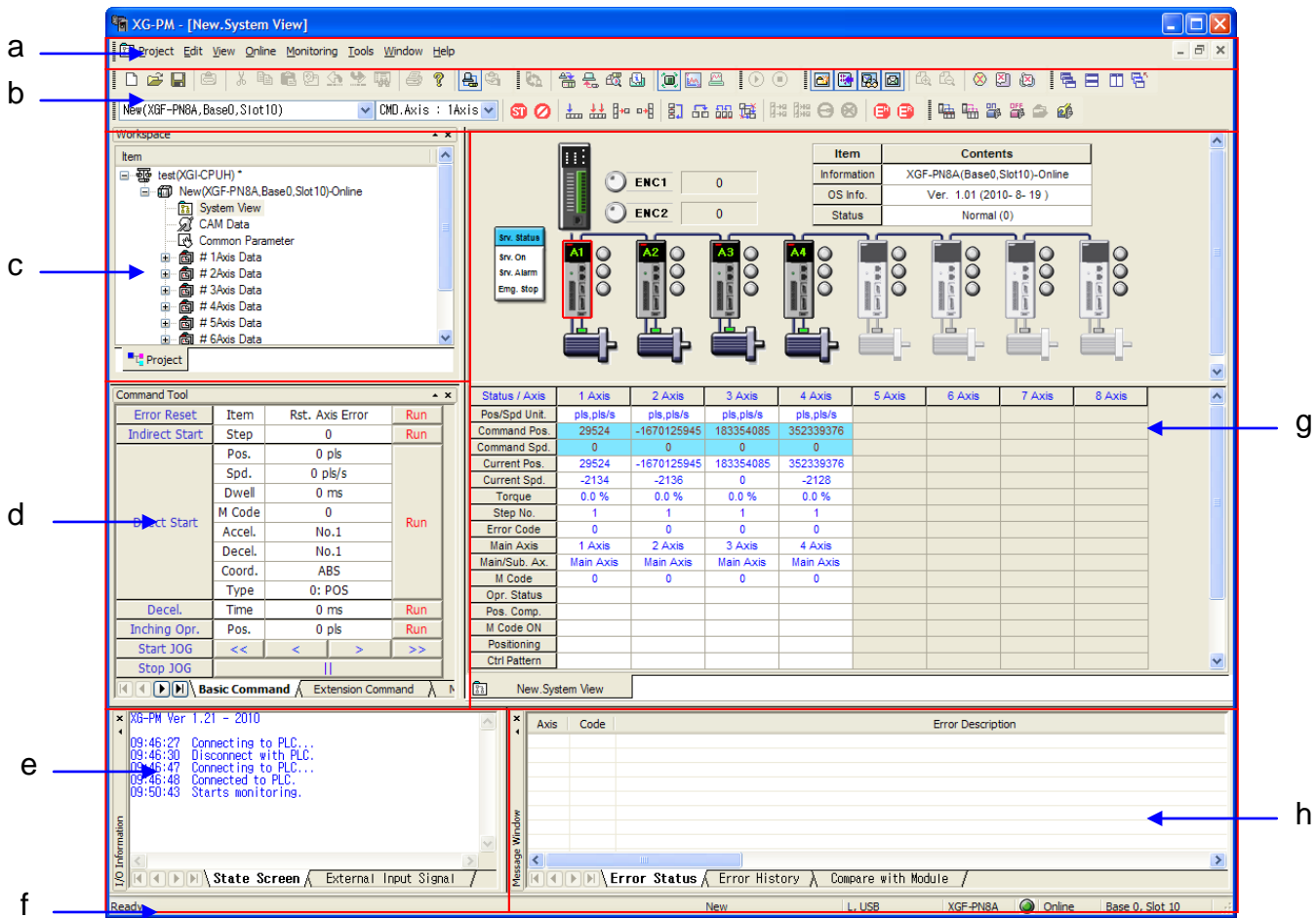
The XG-PM screen composition is as follows;



<Motion Control module screen configuration>

No.	Item	Description
a	Menu	This is basic menu for each operation
b	Tool bar	For convenience, it displays Shotcuts
c	Project window	Provides some function (searching between module, add module, data copy between axes, etc), Can setting expository writing and password of project.
d	Command window	It is easy of performance because It gathered commands for module test.
e	Input/output window	Monitors input signal from external device, global/local variable, flag.
f	Situation Bar	Displays connecting situation and position of positioning module.
g	Editor window	Modifies program/ variable/parameter, etc.
h	Message window	Displays error and error status with various messages occurred during use of XG-PM.

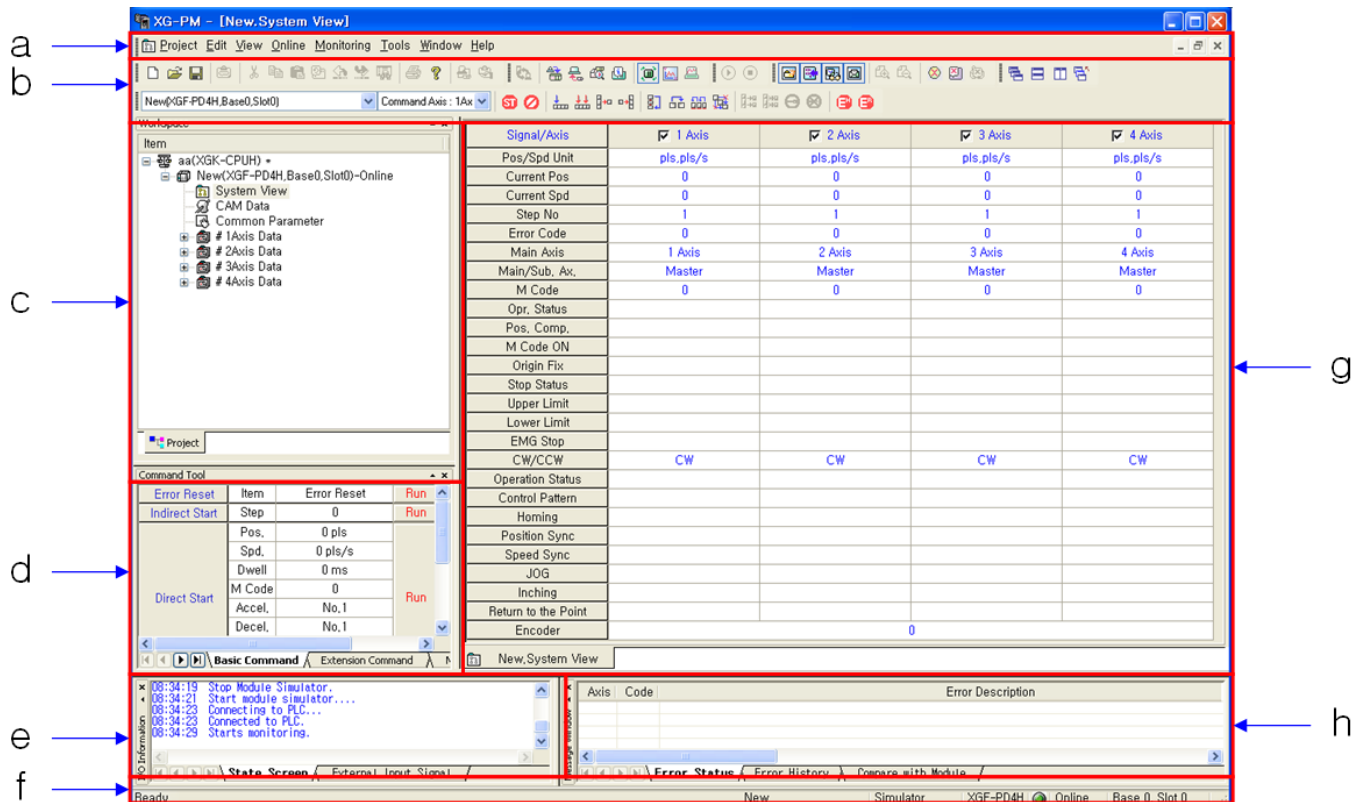
Chapter 5 Composition and the Way of Basic Using of Operation Screen



<Network type XPM, standard network type XPM screen configuration>

No.	Item	Description
a	Menu	This is basic menu for each operation
b	Tool bar	For convenience, it displays Shotcuts
c	Project window	Provides some function (searching between module, add module, data copy between axes, etc), Can setting expository writing and password of project.
d	Command window	It is easy of performance because It gathered commands for module test.
e	Input/output window	Monitors input signal from external device, global/local variable, flag.
f	Situation Bar	Displays connecting situation and position of positioning module.
g	Editor window	Modifies program/ variable/parameter, etc.
h	Message window	Displays error and error status with various messages occurred during use of XG-PM.

## Chapter 5 Composition & the Way of Basic Using of Operation Screen



<APM, XPM screen configuration>

No.	Item	Description
a	Menu	This is basic menu for each operation
b	Tool bar	For convenience, it displays Shotcuts
c	Project window	Provides some function (searching between module, add module, data copy between axes, etc), Can setting expository writing and password of project.
d	Command window	It is easy of performance because It gathered commands for module test.
e	Input/output window	Monitors input signal from external device.
f	Situation Bar	Displays connecting situation and position of positioning module.
g	System view (operating information)	Displays operating information of selected module. In case of network type module, you can check the status of the servo drive and motor connected to the module
h	Message window	Displays each axis error & error history of selected module. And when module compared with data, the result data was displayed to screen.

5.2 The Way of Basic Using

Here describes the way of basic using of XG-PM

5.2.1 Menu composition

When you select menu, commands will be displayed. Select the command with mouse or key to execute commands. If the menu has shortcut key, you can directly execute by shortcut key.

1. Project

Command		Description
New project		Creates project first time
Open project		Opens established project
Open from PLC		Reads the module information from the PLC and creates the project automatically.
Project initialization wizard		Opens new project. User don't need to write a separate data for operation after performing initialization wizard.
Open APM file		Reads '*.apm' file from APM software, convert to XG-PM project file (*.xpi).
File save for simulator		Saves the data to simulate the positioning module in XG5000.
Save project		Saves project.
Save other name		Saves the project as other name.
Close project		Closes the project.
Add item	Module	Adds new module to project.
	Slave	Adds a slave.
	Axis group	Adds the axis group.
	Program	Adds a program.
	Cam profile	Adds the cam profile.
	Data type	Adds the user data type.
Import	Module data	Reads module data from a file.
	CAM setting data	Reads setting data for creating cam profile from a file.
	CAM CSV file data	Reads CAM profile data of CSV type
	Common parameter	Reads common parameter data from a file.
	Operation parameter	Reads operating parameter data from a file.
	Servo parameter	Reads servo parameter data from a file.
	Operation data	Reads operating data from file.
	Global/Direct variable	Reads the global/direct variable from a file.
	Program	Reads the program from a file.
	Basic parameter	Reads the basic parameter from a file.
	Position data	Reads the position data from a file.
	Master parameter	Reads themaster parameter from a file.
	Axis group parameter	Reads the axis group parameter from a file.
	SDO parameter	Reads the user SDO parameter from a file.
	Cam profile	Reads the user cam profile from a file.
	User data type	Reads the user data type from a file.
Export	Configuration file	Saves the selected item about setting from project window.
	CSV file	Saves file as CSV file form with project window.
Print		Prints the activated window.
Preview		It will show you window for printing.
Print project		Prints the selected project item.
Printer Setup		Selects printer option.
Recents project		Displays latest 20 projects.
End		Ends XG-PM.

### 2. Edit

Command		Description
Default Parameter Setting		Initializes selected data of cell territory.
Undo		Cancels edition with selected window and back to former times.
Redo		Restores canceled editing performance.
Detail Parameter Setting		Opens detailed parameter window from operating parameter.
Cut		Initializes data which is selected in cell territory, and copy to clipboard.
Copy		Copies to clipboard data which is selected in cell territory.
Paste		Copies data to selected cell territory from clipboard.
Delete		Deletes data which is selected.
Move Up		Moves up the drive data selected from the network parameter.
Move Down		Moves down the drive data selected from the network parameter.
Select All		Selects all data of the window in variables or program.
Insert mode/Overwrite mode		Sets the Insert mode/Overwrite mode when inputting a program.
Insert line		Inserts a line in variables or program.
Delete line		Deletes a line in variables or program.
Insert Cell		Inserts a cell.
Delete Cell		Deletes a cell.
Insert Comment/Label		Inputs the comment/label.
Set Block Mask		Sets the selected program as non-execute statement.
Remove Block Mask		Removes the settings of the selected non-execute statement.
Bookmark	Set/Remove	Sets or remove the bookmark.
	Remove All	Removes all settings of bookmarks.
	Previous Bookmark	Moves to the previous bookmark.
	Next Bookmark	Moves to the next bookmark.
Tools		Includes editing tools used for the LD program.

### 3. Find/Replace(for Motion Control Module only)

Command		Description
Find Device		Finds the device by type.
Find Text		Finds the targeted string.
Replace Device		Finds the targeted device and change it into new one.
Replace Text		Finds the targeted string and change it into new one.
Find again		Repeats the existing Find or Change.
Go To	Step/Line	Moves a cursor to the desired step/line position.
	Rung Comment	Moves a cursor to the desired rung comment position.
	Label	Moves a cursor to the label position.
	END Command	Moves a cursor to the END command position.
Previous Message		Moves to the area indicated by the previous message in a message window.
New Message		Moves to the area indicated by the next message in a message window.

### 4. View

Command	Description
Project window	Shows or hides project window.
Command window	Shows or hides command window.
Input/output window	Shows or hides Input/output window.
Message window	Shows or hides message window.
View Network	Monitors the connection type of network and individual slave.
Cross reference	Shows memory use information at the memory reference tab of a message window.



## Chapter 5 Composition and the Way of Basic Using of Operation Screen

Command	Description
Used device	Shows the information on the used device at the used device tab of a message window.
Check Program	Checks the program and shows the results at the check tab of a message window.
Variables	Shows the variables in the program.
Devices	Shows the devices in the program.
Devices/Variables	Shows the devices and variables in the program.
Devices/Comments	Shows the devices and comments in the program.
Variables/Comments	Shows the variables and comments in the program.
Zoom In	Displays the expanded screen.
Zoom Out	Displays the reduced screen.
Full Screen	Displays a full screen.
Basic tool	Shows or hide basic tool.
Online tool	Shows or hide online tool.
Trand tool	Shows or hide trand tool.
View tool	Shows or hide view tool.
Command Tager Tool	Shows or hide command target tool.
Command Tool	Shows or hide command tool.
Servo Tool	Shows or hide servo tool.
Simulation Tool	Shows or hide simulation tool.
Error Status	Activates error status tab in message window.
Error History	Activates error history tab in message window.
Slave Error History	Activates servo error history window.
View value of the bit	Will be displayed only when trand monitor window is revitalized. Revital viewing window of present value on the graph.
View value of trand	Displayed only when trand monitor window is revitalized. Revital viewing window of present value on the trand graph.
View value of XY graph	Will be displayed only when XY graph monitor window is revitalized. Revital viewing window of present value on the XY graph.
Properties	Revital information dialog box which is selected by project window. Ex) Project & Module information
LD Properties	Sets the attribute of LD view.
Change Columns	Changes the number of contacts in the LD view.
Open Local Variables	Converts the program screen into the local variable screen.
/Open Program	/Converts the local variable screen into the program screen.

### 5. Graph (Menu is displayed only when trand monitor window is Revitalized)

Command	Description
Show cursor	Displays or hides cursor for displaying data.
Scroll synchro	Synchro bit graph and width scroll of trand graph. At the same time, can be compared bit graph with data of trand graph
Zoom-In X Axis	Extends screen X axis.
Zoom-Out X Axis	Contracts screen X axis.
Restore X Axis	Shows you screen axis X as origin rate.
Zoom-In Y Axis	Shows screen of Y axis.
Zoom-Out Y Axis	Contract screen Y axis.
Restore Y Axis	Shows screen of axis Y as origin rate.
Auto Fit X Axis	Auto-adjust screen for displaying axis X data at a screen.
Auto Fit Y Axis	Auto-adjust screen for displaying axis Y data at a screen.
Export as Bitmap	Saves present screen as bitmap file.
Expotr as Text	Saves present screen as Text file (.csv).

## Chapter 5 Composition & the Way of Basic Using of Operation Screen

Command	Description
Copy to clipboard	Copies present screen to clipboard.
Graph Setting	Sets screen color, line color, index color of present screen.
Trend Device Setting	Registers or deletes device what you want monitoring.
Screen Setting	Setting graph type which you want displaying. And setting whether you see the data value of graph or not.

### 6. Online

Command	Description
Connect/Disconnect	Connects with PLC or cancel.
Connection Setting	Setting the way of connection.
Change Mode	Changes the mode.
Connect all servo	Connects all servo
Disconnect all servo	Disconnects all servo
All servo station setting	Sets up all servo station
Network Slave Autoconnect	Connects to the network servo automatically without setup.
Get Slave Serial Numbers	Gets the serial numbers of the slave.
Save slave parameter to EEPROM	Saves the servo parameters to EEPROM.
Servo On	Gives the Servo On command.
Servo Off	Gives the Servo Off command.
Write	Writes data in the module.
Read	Reads the data from module.
Compare with Module	Compares Module with setted data of project, Display result on "the compare with module" tab of the message window.
Module initialization	Initializes operating parameter of module and cam setting data.
Online Model Setting	Checks the module with online, and add to project module. And can read data of module when it selected.
Force I/O	Shows the window for the forced I/O setup.
Module History	Shows the history of a module.
Module information	Displays present module information with online on the screen.
OS download	Updates OS of present module with online.
Start Online Editing	Starts online editing.
Write Modified Program	Writes the program and information modified during RUN to the PLC.
End Online Editing	Terminates online editing.

### 7. Monitor

Command	Description
Start/End Monitoring	Start/End monitor.
Trend Monitoring	Operates trend monitor.
Data traces	Assigns device and Monitoring data changing.
Device Monitoring	Operates Device Monitor.

### 8. Tool

Command	Description
Servo-tuning	Starts servo-tuning.
Starting Simulator	Starts simulator.
LIVE-I.C.E	Integrated configuring environment tool for L7S, L7N servo drive
Simulation Tool	Starts profile/circular interpolation simulator(for APM module only)
Customize	Makes definition of tool, word of command by user.
Shortcut Setting	Sets shortcut key by user.
Option	Setting items (basic folder/ the number of back up file/ the number of latest project/ former project opening option) when create new project.

9. Window

Command	Description
Cascade	Arranges windows like tiers in XG-PM
Tile Horizontally	Horizontally arranges windows in XG-PM.
Tile Vertically	Perpendicularly arranges windows in XG-PM.
Close All	Closes all of the windows in XG-PM.
Arrange Icon	Orders windows(minimum size as Icon condition) standing in line in XG-PM.

10. Help

Command	Description
XG-PM help	Opens help XG-PM.
Homepage of LSIS	Links to homepage of LSIS
XG-PM information	Displays XG-PM information.

Notes

Menus not supported in APM module are as follows.

Menu	Command
Import	Common parameter
View	Servo tool, Servo error history
Online	Module initialization, OS download, Connect all servo, Disconnect all servo, All servo station setting
Monitor	Data Trace
Tools	Starts/Ends simulator, Servo-tuning
Edit	Selects All, Insert mode/Overwrite mode, Insert line, Delete line, Insert Cell, Deletes Cell, Set Block Mask, Remove Block Mask, Bookmark, Tools
Find/Replace	All command
View	View Network, Cross reference, Used device, Check Program, Variables, Devices, Devices/Variables, Devices/Comments, Variables/Comments, Zoom In, Zoom Out, LD Properties, Change Columns, Open Local Variables/Open Program
Online	Change Mode, Connect all servo, Disconnect all servo, All servo station setting, Network Slave Autoconnect, Get Slave Serial Numbers, Save slave parameter to EEPROM, Servo On, Servo Off, Force I/O, OS download, Start Online Editing, Write Modified Program, End Online Editing, Device Monitor

Menus not supported in XPM module are as follows.

Menu	Command
View	Servo tool, Servo error history
Online	Connects all servo, Disconnect all servo, All servo station setting
Tools	Simulation Tool(Start profile/circular interpolation simulator), Servo-tuning
Edit	Selects All, Insert mode/Overwrite mode, Insert line, Delete line, Insert Cell, Deletes Cell, Set Block Mask, Remove Block Mask, Bookmark, Tools
Find/Replace	All command
View	View Network, Cross reference, Used device, Check Program, Variables, Devices, Devices/Variables, Devices/Comments, Variables/Comments, Zoom In, Zoom Out, LD Properties, Change Columns, Open Local Variables/Open Program
Online	Change Mode, Connect all servo, Disconnect all servo, All servo station setting, Network Slave Autoconnect, Get Slave Serial Numbers, Save slave parameter to EEPROM, Servo On, Servo Off, Force I/O, OS download, Start Online Editing, Write Modified Program, End Online Editing, Device Monitor

Menus not supported in the network type XPM module are as follows.

Menu	Command
Tools	Simulation Tool(Start profile/circular interpolation simulator)
Edit	Select All, Insert mode/Overwrite mode, Insert line, Delete line, Insert Cell, Delete Cell, Set Block Mask, Remove Block Mask, Bookmark, Tools
Find/Replace	All command
View	View Network, Cross reference, Used device, Check Program, Variables, Devices, Devices/Variables, Devices/Comments, Variables/Comments, Zoom In, Zoom Out, LD Properties, Change Columns, Open Local Variables/Open Program
Online	Change Mode, Force I/O, Start Online Editing, Write Modified Program, End Online Editing, Device Monitor

Menus not supported in the Motion Control module are as follows.

Menu	Command
Tools	Simulation Tool(Start profile/circular interpolation simulator)

### 5.2.2 Collecting Tool

We provide shortcut for useful menu with XG-PM. It will begin to operate with click on the tool icon.



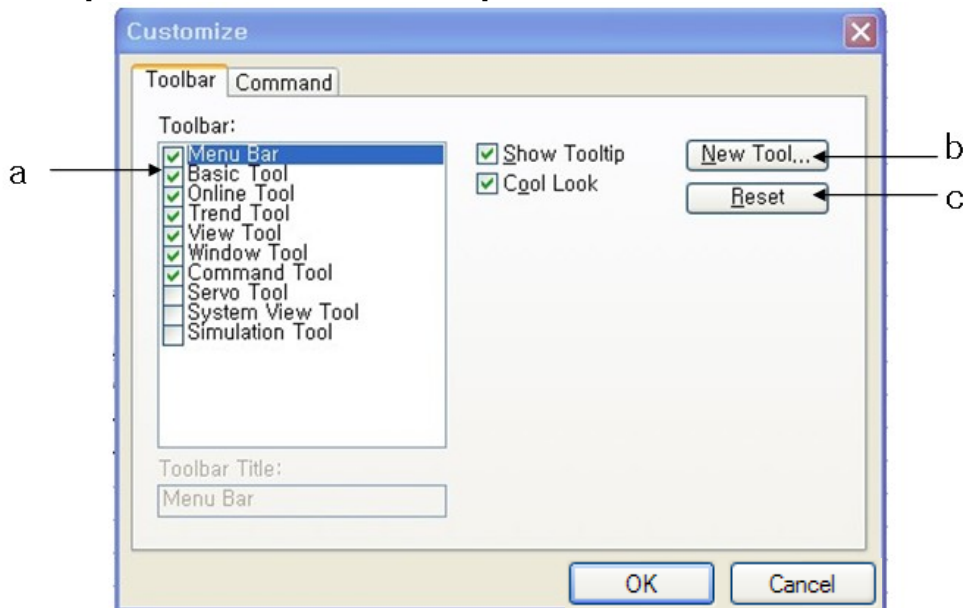
#### 1. Make a new collection of tool

You can make a new Collecting tool.

[Sequence]

- (1) Select like this : Menu [Tool]->[Customize]
- (2) Click on the new tool button.
- (3) Input the name at the new collection of tool communication box.
- (4) Click on the confirm button. Then, will be create new empty tool box.

[User-defined communication box]



[Communication box description]

- (a) Tool collection: Check the checkboxes which were placed in front of the each tool name.
- (b) New tool: Make the new tool collection.
- (c) Reset: Initialize tool collection.

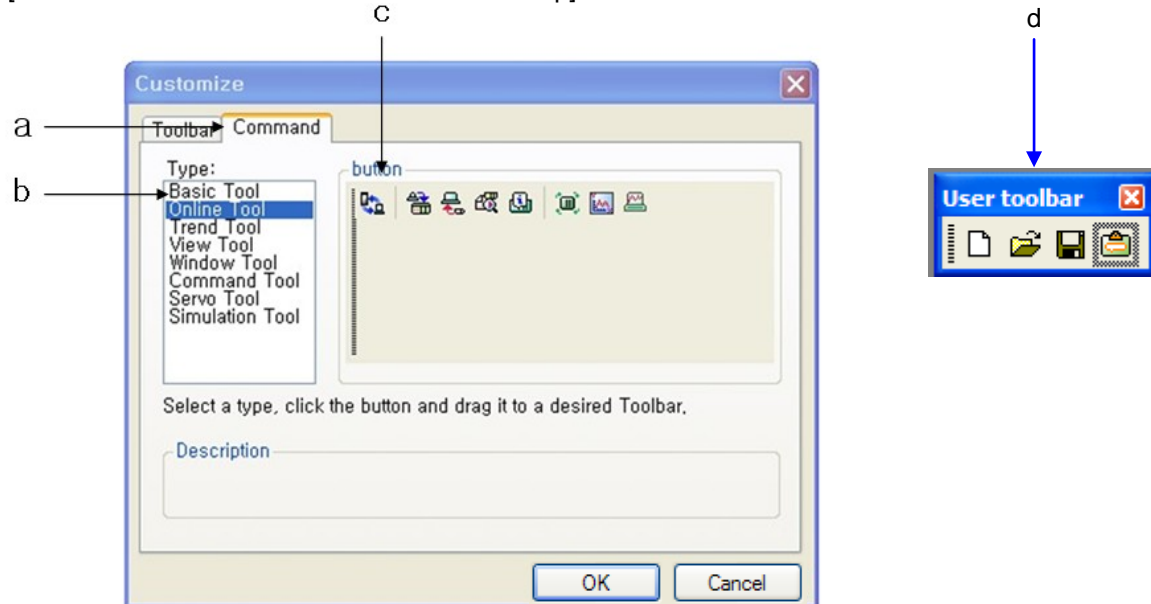
### 2. Fill the tool collection

Fill the tool in the new tool collection.

[Sequence]

- (1) Select the command tab in the user-defined communication box.
- (2) Fill the commands which were needed to use in the new created tool collection.

[Customize communication box – command tap]



[Communication box description]

- (a) Command : This is the command tab of user communication box.
- (b) Type : Select the existing tool collection.
- (c) Button : select tool that you need.
- (d) User toolbar: drag tool you want into user tool box to add tool.

5.2.3 Status Bar

User can confirm editing condition, online location or condition of selected module, etc by status bar.



[Explaining picture]

- (a) Explaining command / Indicating data range : It means selected menu & command, explain of tool collection. When it is editing data, data range will be displayed on the screen.
- (b) Module name: Display selected module.
- (c) Model name of module: Display model name of selected module.
- (d) Displaying connection by picture: Display On-line/Off-line of selected module using by picture.
- (e) Displaying connection: Display On-line/Off-line of selected module.
- (f) Displaying connected location: Display location where selected module is installed.

5.2.4 Conversion of Viewing Window

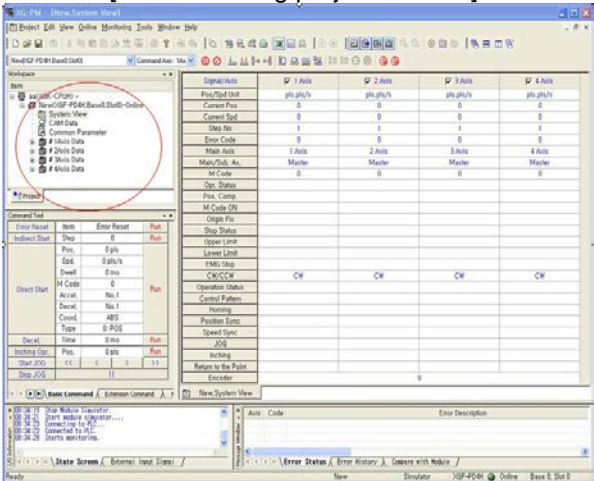
All of the windows which are saw in the viewing menu (project window, input/output information window, message window, etc) has docking function. Using mouse can change the window size. And can hide window.

1. Moving location

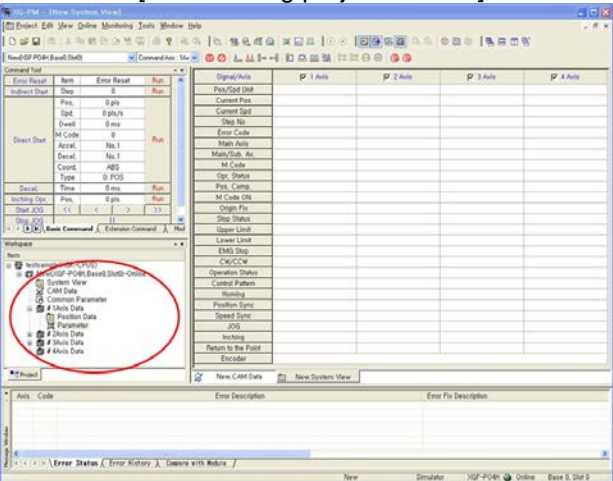
Use for left button of mouse drag to place where you need.

As shown below, before- and after-pictures of project windows moved downward

[Before moving project window]

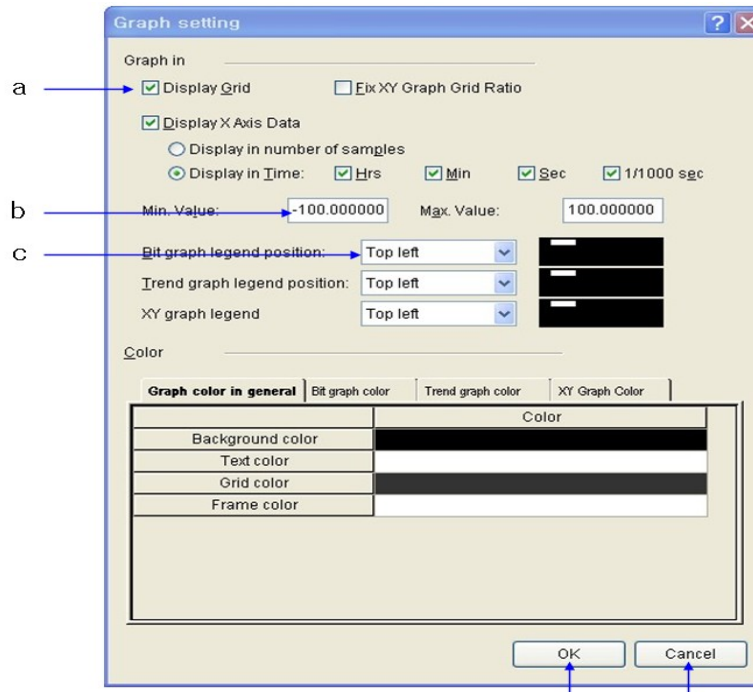


[After moving project window]



### 5.2.5 How to Use Communication Box

There are blank for input, confirm, selecting option, index, etc. User can setting figure what they want.



[Communication box description]

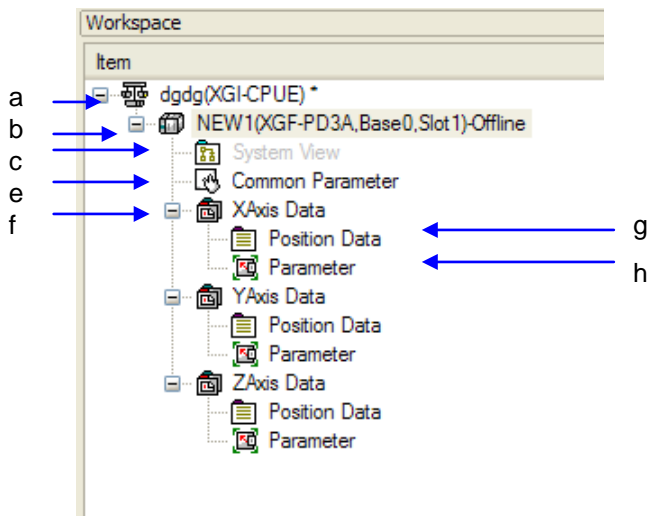
- (a) Option: You can use this when you check function check box.  
(check box: can check more than 2 / radio box : check just one function.)
- (b) Input: Using the key can input word or figure.what you need.
- (c) Index: Select one from among them. Put the arrow key of index, can find and click what you want.
- (d) OK: Setting value will be apply with end of communication box.
- (e) Cancel: Cancel present setted value without changing.



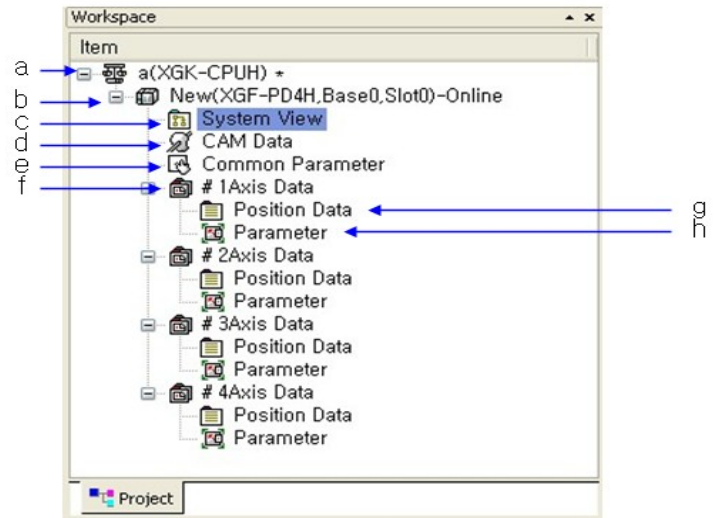
## Chapter 6 Drawing Up of Project

### 6.1 Composition of Project

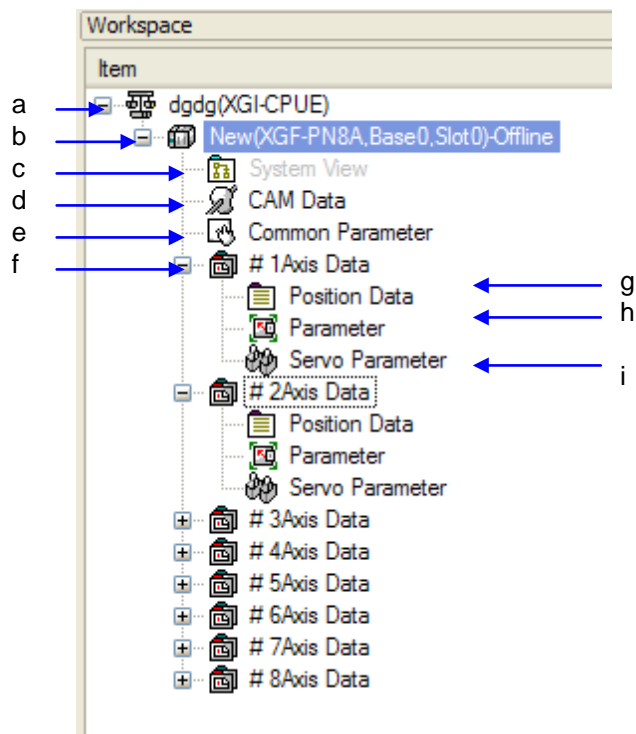
Composition of project is as follows ;



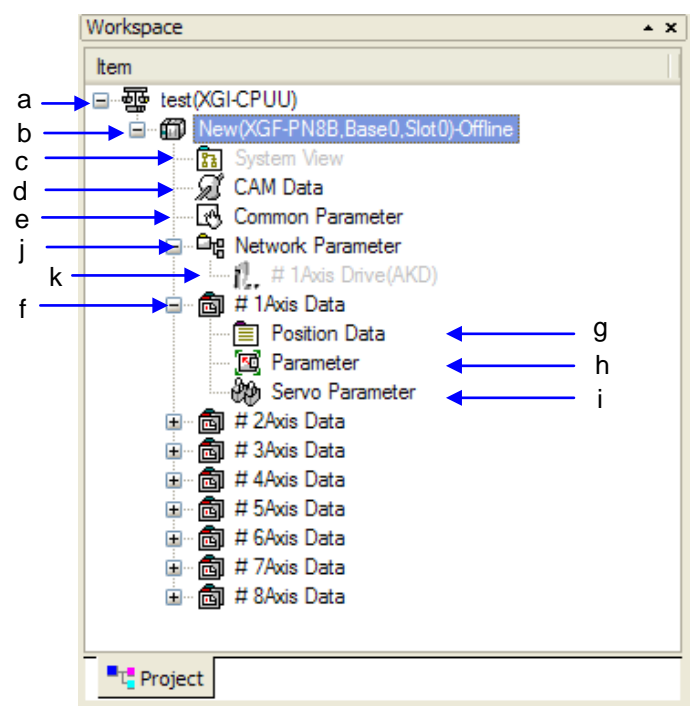
<APM module project configuration>



<XPM module project configuration>



<Network XPM module project configuration>



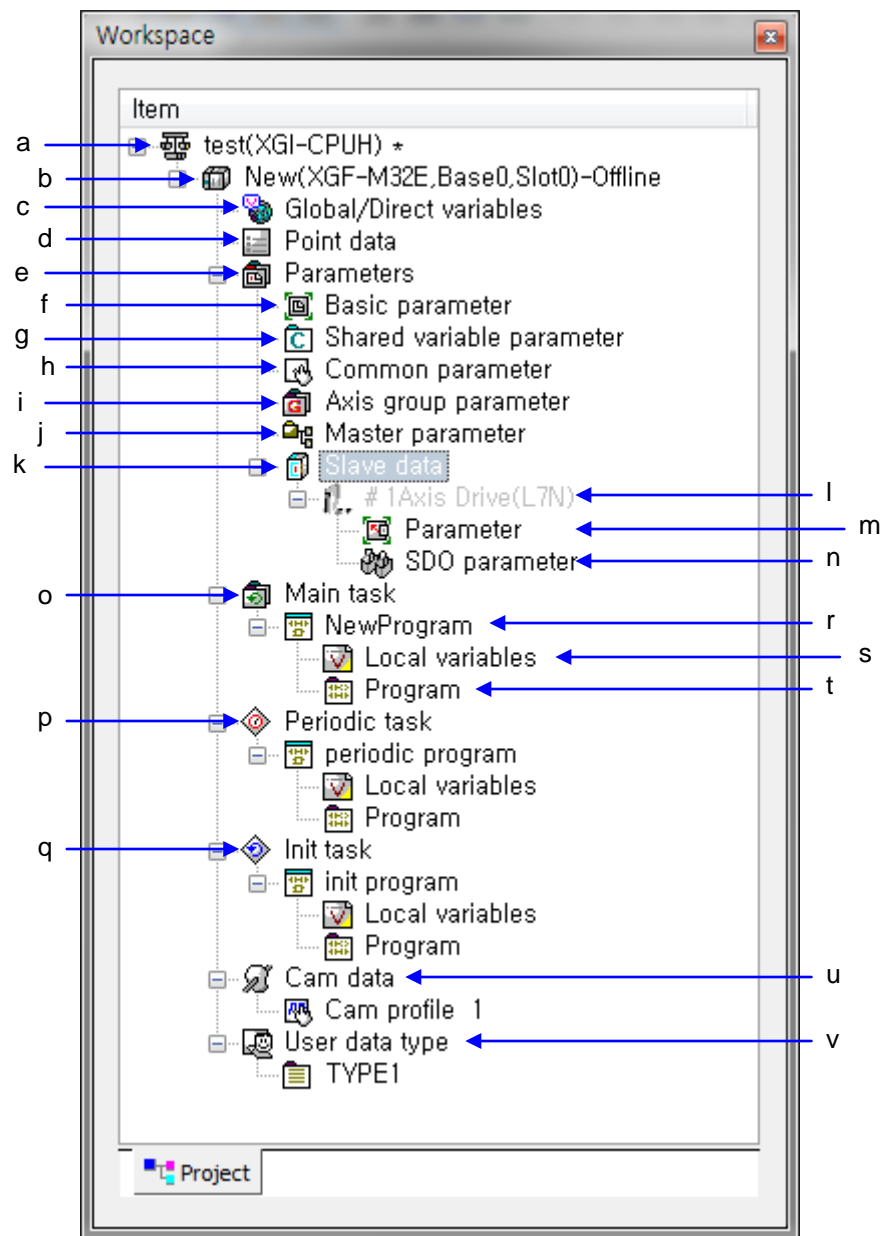
<Standard Network XPM module project configuration>

## Chapter 6 Drawing up of project

No.	Item	Description
a	Project	It means whole system. That can include many positioning module of project.
b	Positioning module	It means the system which is one of the positioning module.
c	System view	Displays windows which can display system condition of selected module.
d	CAM data	Defines the setting cam data for creating cam profile that is using for cam operating.
e	Common parameter	It is common parameter which is applied to selected whole module.
f	Axis X-Z data Axis 1-4 data Axis 1-8 data	Each axis data define to sub-item in axis X-Z. (APM module) Each axis data define to sub-item in axis 1-4. (XPM module) Each axis data define to sub-item in axis 1-8. (Network type XPM module/Standard network type XPM module)
g	Operating data	Defines about operating data profile for positioning operation.
h	Operating parameter	Defines setting parameter value for positioning operation.
i	Servo parameter	Defines servo parameter for servo motor (Network type module/Standara network type XPM module)
j	Network parameter	Defines network setting information of each axis under child item (Standard network type XPM module)
k	Servo information	Defines driver setting information for network connection (Standard network type XPM module)

### Notes

Can include several modules to one project. In case of using several modules with a project, management is easy. And it can connect with several modules for monitoring after operating just one XG-PM.



<Motion control module project configuration>

No.	Item	Description
a	Project	Defines the whole system. One project can include several positioning muddles.
b	Motion Control module	Shows the system for one motion control module.
c	Global/Direct variable	Edits and shows the global variable declaration and direct variable's description remark.
d	Point data	Defines the profile of the positioning data.
e	Parameter	Defines the operation and composition of the module system.
f	Basic parameter	Defines the basic operations.
g	Shared variable parameter	Checks the settings of the shared variable between the PLC's CPU and a module.
h	Common parameter	Defines common parameters applied to the whole selected modules.

## Chapter 6 Drawing up of project

No.	Item	Description
i	Axis group parameter	Defines the axis group information in subcategories.
j	Master parameter	Defines the network setting information of each axis in subcategories.
k	Slave data	Defines the slave setting information in subcategories.
l	Slave information	Defines the network setting information of a slave.
m	Operation parameter	Saves the parameters to operate a slave
n	SDO parameter	Sets the slave parameters.
o	Main task	Defines the frequently executed programs in the subcategories.
p	Cyclical task	Defines the programs executed in a fixed cycle in the subcategories.
q	Initialization task	Defines the programs executed for initializing modules in the subcategories.
r	Program information	Saves the program information and defines programs local variables in the subcategories.
s	Local variable	Defines the local variable used in a program.
t	Program	Writes a program.
u	Cam data	Makes the cam profile to operate cam in the subcategories.
v	User data type	Makes the user data type in the subcategories.

## 6.2 Managing Project File

User using through various managing project function can composite and manage project more easy.

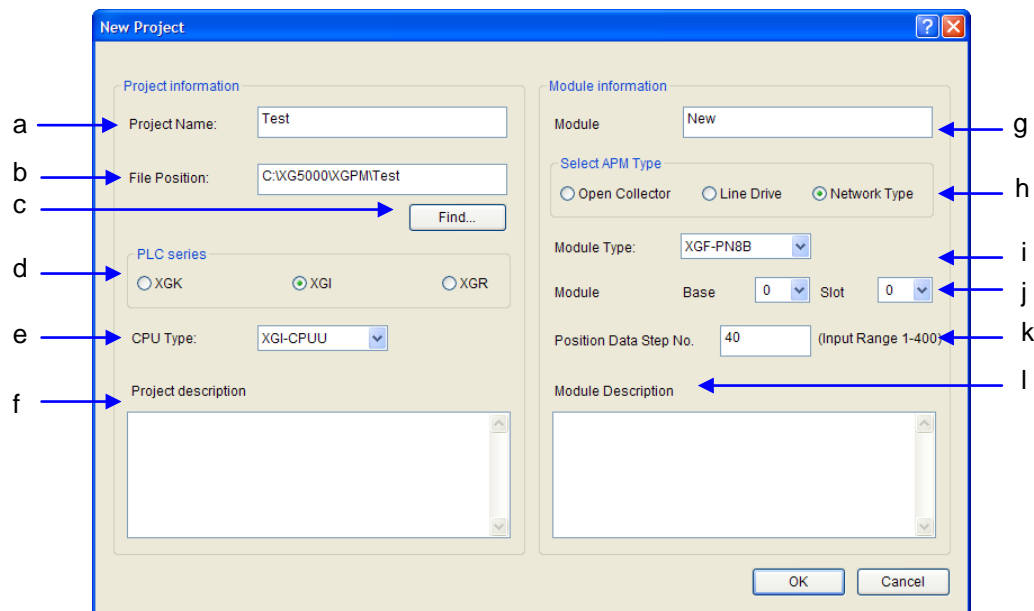
### 6.2.1 Make a New Project

When you make a project, new folder (The name of same with project file.) will be created. And also project file will be created in the sub-folder.

[Sequence]

- (1) Proceed this sequence; like this ; Menu [project]->[New project]
- (2) Input the project name.
- (3) Input the file position for saving project.
- (4) Select the PLC series.
- (5) Select the CPU type.
- (6) Input the project caption.
- (7) Input the module name.
- (8) Select the module type.
- (9) Select the module class.
- (10) Select location of module.
- (11) Input the number of operation data steps.
- (12) Input the module caption.
- (13) Click the confirm button.

[Communication box]



[Description of communication box]

- (a) Project name: Input the project name which user want. Inputted name will be project name. And file "Project name.xpj" will be created after creating project.
- (b) File position: Folder name will be made by inputted name by user. Then, project file will be created there.
- (c) Find: Specify folder to crease project file.

## Chapter 6 Drawing up of project

- (d) PLC series: Setting PLC series.
- (e) CPU type: Setting CPU type of PLC.
- (f) Project description: Inputs project description.
- (g) Module information: Inputs the module name.
- (h) Select APM type: Setting positioning module type.
- (i) Module type: Sets positioning module kind.
- (j) Module: Sets position of positioning module.
- (k) Position data step No.: Sets the number of operation data steps.
- (l) Module description: Inputs module caption.

### Notes

When you make a project, new folder (The name of same with project file.) will be created. And also project file will be created in the sub-folder. XG-PM project file extension is "xpj", and It will proceed auto naming when makes project.

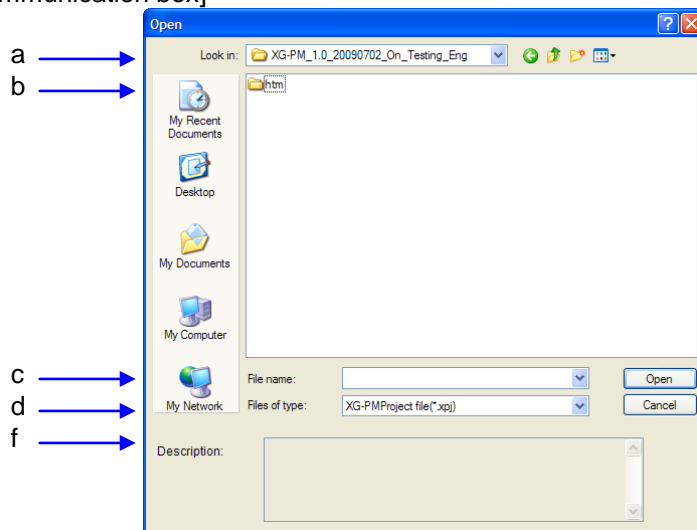
### 6.2.2 Open Project

Open existing project file.

[Sequence]

- (1) Proceed this sequence; Menu [Project] → [Open project].
- (2) Adjust position which you want to find and select the project positioned folder.
- (3) Select and open the file that extension is "xpj".

[Communication box]



[Description of communication box]

- (a) Position for finding: Search folder that project was saved by user.
- (b) Displaying windows for project file: Display the file that extension is "xpj".
- (c) File name: Display project file name that is selected by user. And user can change file name what you want.
- (d) File type: Select the type of project file.
- (e) Caption: Display project caption that is saved in project file which is selected by user.

### Notes

Can see description that was wrote by user when select project file. And this description will help what user select project.

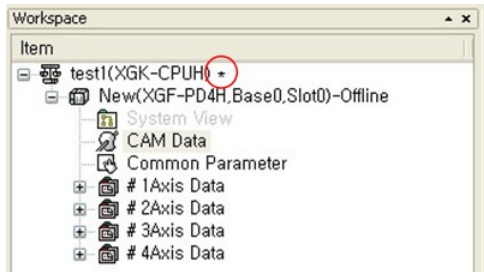
### 6.2.3 Saving Project

Save project file that is changed by user editing.

[Sequence]

- (1) Proceed this sequence; Menu [Project]->[Save project...].

#### Notes



In case that project need saving because project was edited. There are "\*" next to name of project windows.

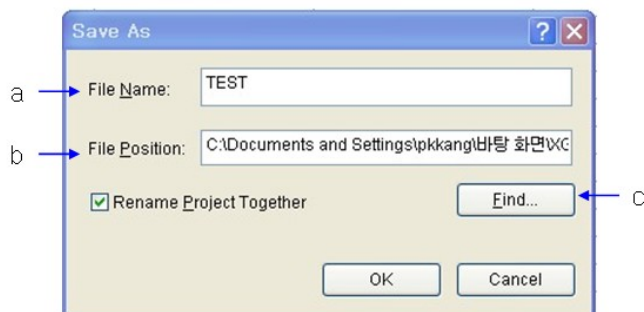
### 6.2.4 Saving as Other Name

Save the project as other file.

[Sequence]

- (1) Proceed this sequence ; Menu [Project]->[Save as...]
- (2) Click OK button.

[Communication box]



[Describe communication box]

- (a) File name : Input name that user want as project name.
- (b) File position : The project file will be created in the folder which is the name of same with project .
- (c) Find : Set position of project file. Then existing folder is a standard position.

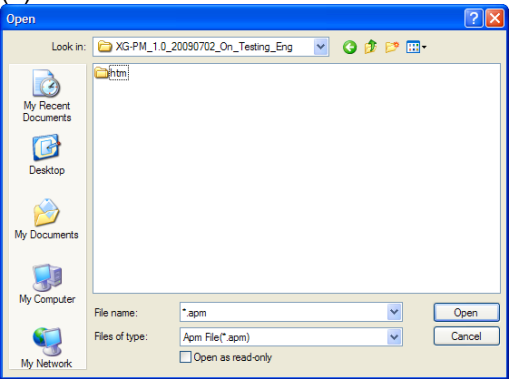
6.3 Open APM File

Read data file (\*.apm) for APM software packaging and change to project file(\*.xproj) in the menu of opening APM file . These are data index that are can call from APM file.

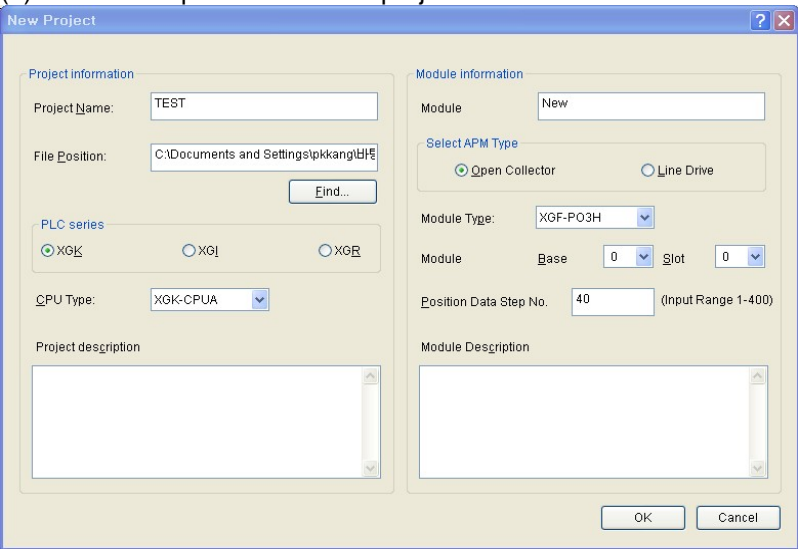
- 1. Common parameter
- 2. Operating parameter
- 3. Operating data

[Sequence]

- (1) Menu [Project]->[Open APM file]
- (2) Move to folder where APM file is located and select the file, when come out opening windows.



- (3) Click the open button. New project communication window come out.



- (4) Input the Project name, PLC type, module type and click the confirm button. Then APM file will change to XG-PM project, and create project.

Notes

Not only read “\*.apm” file and create project of module but also appointing new module type can help creating project. But if there is no data in APM file, it will be initialized.  
Ex) XGF-PO3A -> XGF-PO4H



### 6.4 Project Item

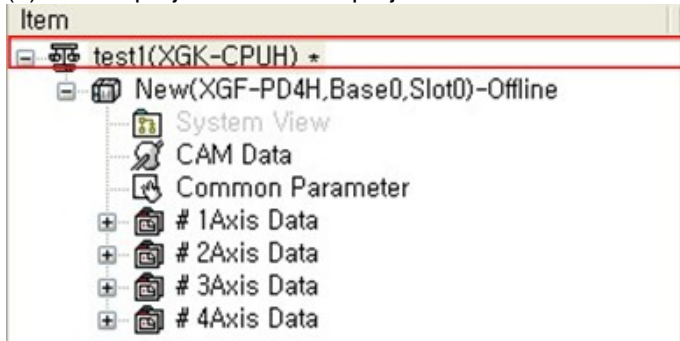
Here describes how to add or delete project file, how to confirm information of each item.

#### 6.4.1 Add Item

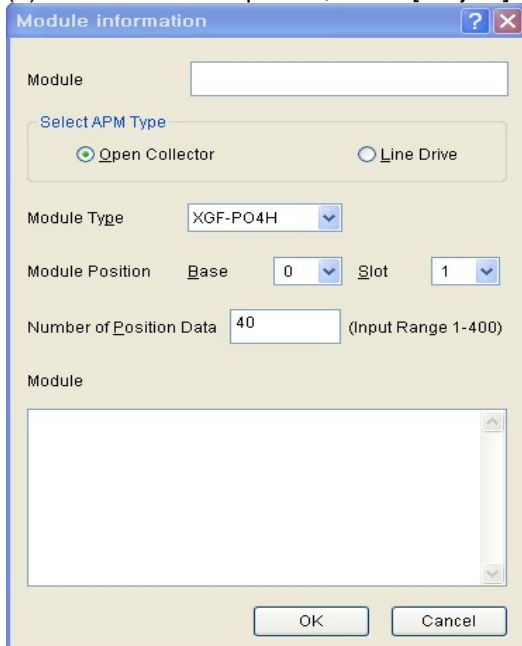
Add module to project.

[Sequence]

- (1) Select project item in the project windows with offline.

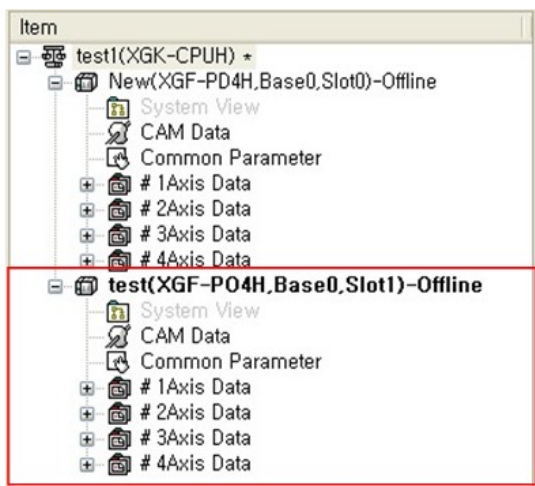


- (2) Proceed this sequence; Menu [Project]->[Add item]->[Module]



## Chapter 6 Drawing up of project

- (3) Click the confirm button after input module name, module type, which kind of module, module position, the number of operating data steps, module caption. Will be add new module in the project.



### Notes

The maximum number of modules that can be added is 32 EA.  
However, in the case of XGR system, the setting for XGF-M32E (Motion Control Module) is limited to 2 modules due to system constraint.

### 6.4.2 Read Item From File

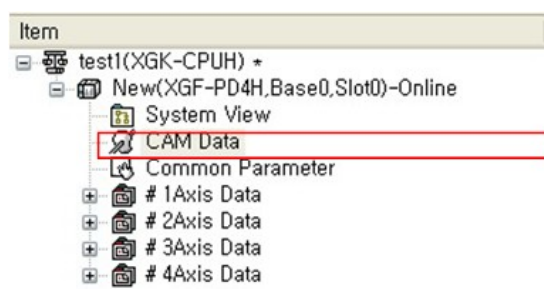
These items can be read as other files.

Item	File extension	Description
CAM setting data	*.caf	Reads setted data from that file for creating CAM profile.
CAM CSV file data	*.csv	Reads CAM profile needed for operation from that file
Common parameter	*.cp	Reads data of common parameter from that file.
Operating data	*.rpd	Reads profile data from that file.
Operating parameter	*.bp	Reads operating parameter from that file.
Servo parameter	*.sp	Reads servo parameter need for servo motor form that file
Module data	*.pm	Reads module data from that file.
Global/Direct variable	*.gda	Reads the description remark data of Global/Direct variables from the relevant file.
Program	*.prm	Reads the program data from the relevant file.
Basic parameter	*.mbp	Reads the basic parameter from the relevant file.
Position data	*.pos	Reads the position data from the relevant file.
Master parameter	*.msp	Reads the master parameter from the relevant file.
Axis group parameter	*.agd	Reads the axis group parameter from the relevant file.
Cam profile	*.uca	Reads the cam profile data from the relevant file.
User data type	*.udd	Reads the user data type data from the relevant file.

### 1. Cam Setting Data (Supported for XPM, network type module)

[Sequence]

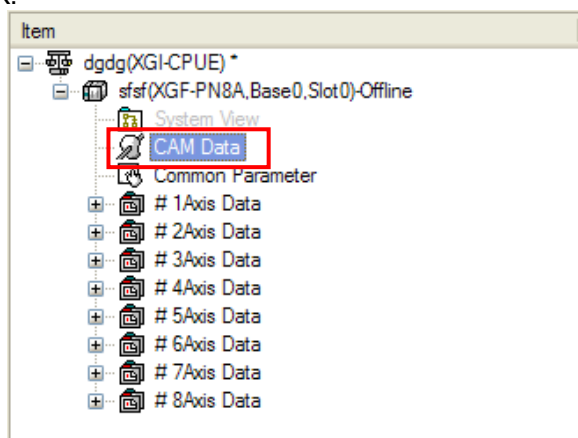
- (1) Select cam data item from project windows.
- (2) Proceed this sequence; Menu [Project]->[Import]->[Cam setting data]
- (3) Click the button after select file.



### 2. CAM CSV file data (Supported for XPM, network type module)

[Sequence]

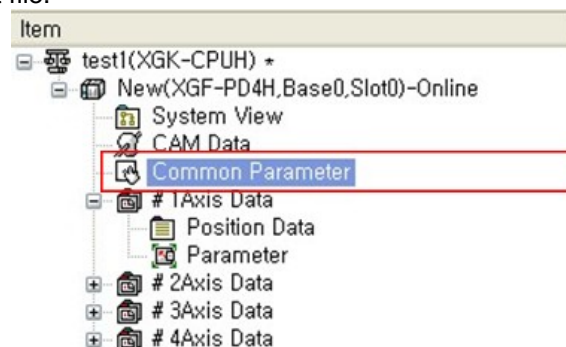
- (1) Select CAM data item at the project window
- (2) Select [Project] → [Import] → [CAM CSV file data].
- (3) Select the file and press OK.



### 3. Common Parameter

[Sequence]

- (1) Select common parameter from project windows.
- (2) Proceed this sequence ; Menu[Project]->[Import]->[Common parameter..]
- (3) Click the button after select file.

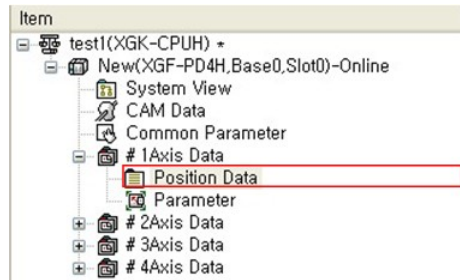


## Chapter 6 Drawing up of project

### 4. Operation Data

[Sequence]

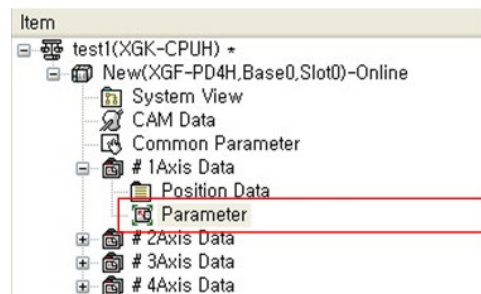
- (1) Select common parameter from project windows.
- (2) Proceed this sequence ; Menu [Project]->[Import]->[Position data]
- (3) Click the button after select file.



### 5. Operation Parameter

[Sequence]

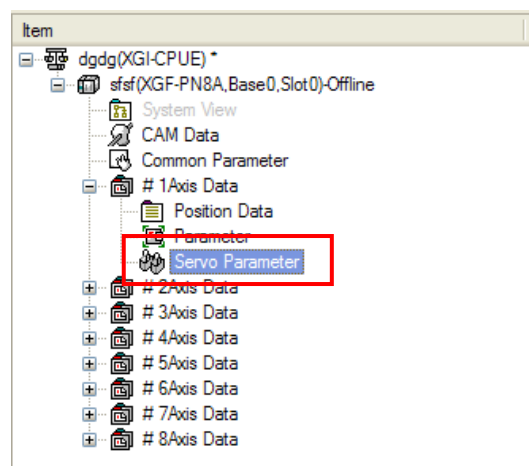
- (1) Select common parameter from project windows.
- (2) Proceed this sequence ; Menu[Project]->[ Import ]->[Parameter]
- (3) Click the button after select file.



### 6. Servo Parameter (supported for network type module)

[Sequence]

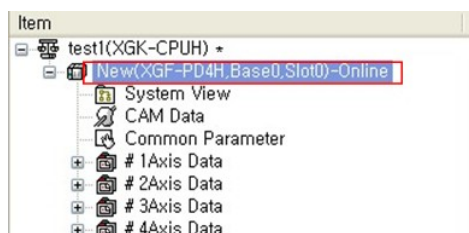
- (1) Select Servo Parameter item at the project window
- (2) Select [Project] → [Import] → [Servo parameter].
- (3) Select the file and press OK.



### 7. Module Data

[Sequence]

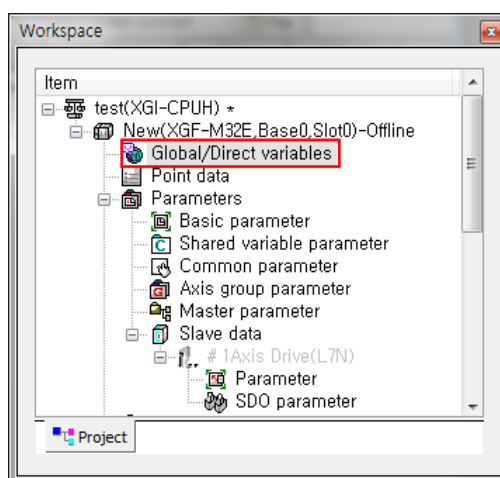
- (1) Select module from project windows.
- (2) Proceed this sequence ; Menu[Project]->[Import]->[Module data]
- (3) Click the button after select file.



### 8. Global/Direct variable(For the Motion Control Module only)

[Sequence]

- (1) Select the Global/Direct variable in a project window.
- (2) Select [Project]->[Import]->[Variable/Comment].
- (3) After selecting the file, press OK button.

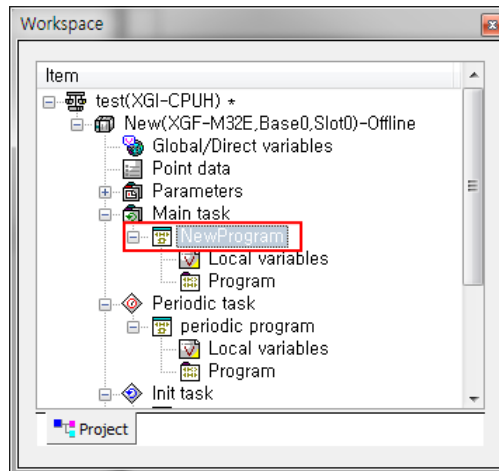


## Chapter 6 Drawing up of project

### 9. Program(For the Motion Control Module only)

[Sequence]

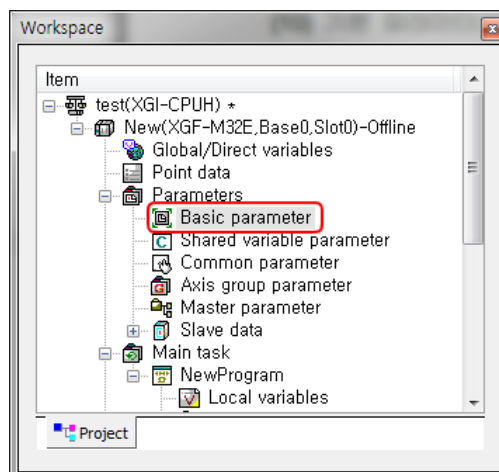
- (1) Select the program information in a project window.
- (2) Select [Project]->[ Import]->[program].
- (3) After selecting the file, press OK button.



### 10. Basic parameter(For the Motion Control Module only)

[Sequence]

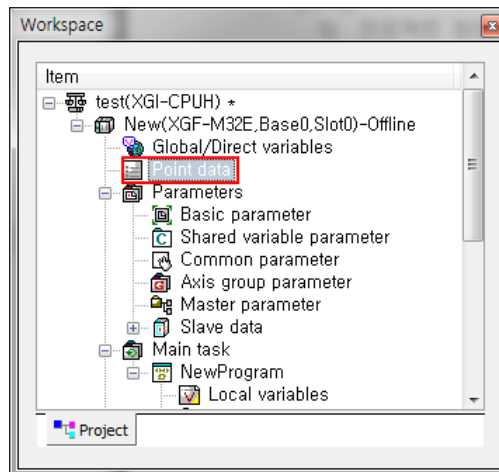
- (1) Select the basic parameter in a project window.
- (2) Select [project]->[ Import]->[Basic parameter].
- (3) After selecting the file, press OK button.



### 11. Point data(For the Motion Control Module only)

[Sequence]

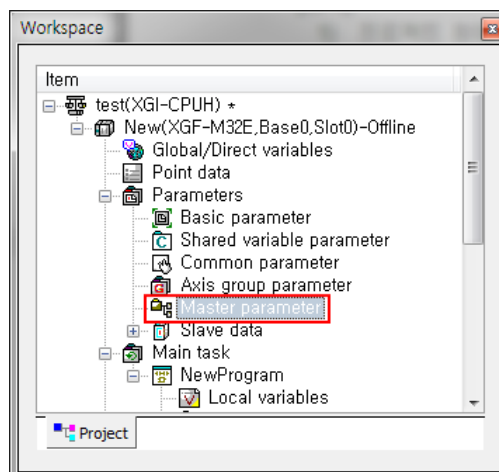
- (1) Select the position data in a project window.
- (2) Select [Project]->[ Import]->[Point data].
- (3) After selecting the file, press OK button.



### 12. Master parameter(For the Motion Control Module only)

[Sequence]

- (1) Select the master parameter in a project window.
- (2) Select [Project]->[ Import]->[Master parameter].
- (3) After selecting the file, press OK button.

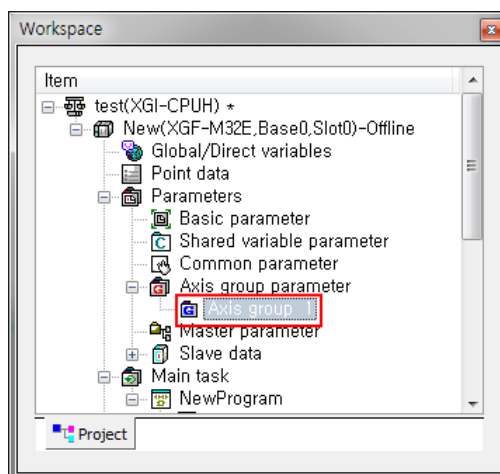


## Chapter 6 Drawing up of project

### 13. Axis group parameter(For the Motion Control Module only)

[Sequence]

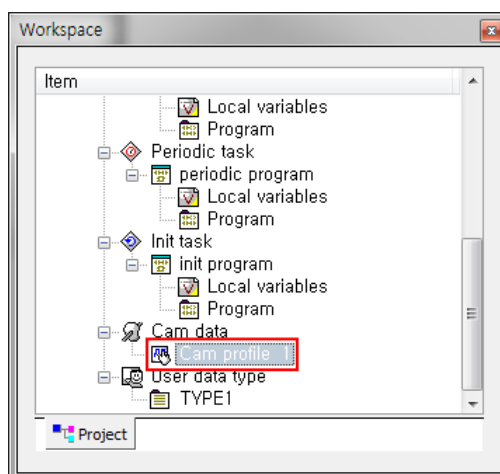
- (1) Select the axis group in a project window.
- (2) Select [Project]->[ Import]->[Axis group parameter].
- (3) After selecting the file, press OK button.



### 14. Cam profile(For the Motion Control Module only)

[Sequence]

- (1) Select the cam profile in a project window.
- (2) Select [Project]->[Import]->[User Cam profile].
- (3) After selecting the file, press OK button.

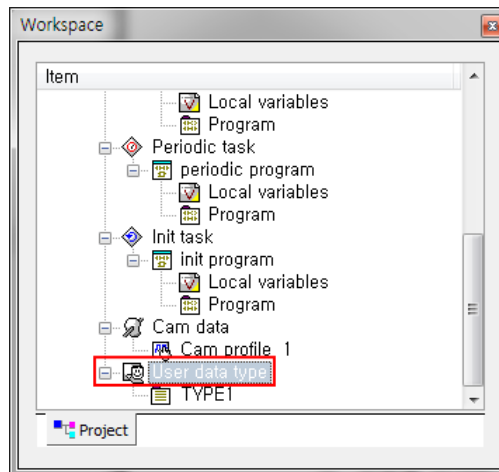




### 15. User data type(For the Motion Control Module only)

[Sequence]

- (1) Select the user data type in a project window.
- (2) Select [Project]->[Import]->[Data type].
- (3) After selecting the file, press OK button.



## Chapter 6 Drawing up of project

### 6.4.3 Saving Item as File

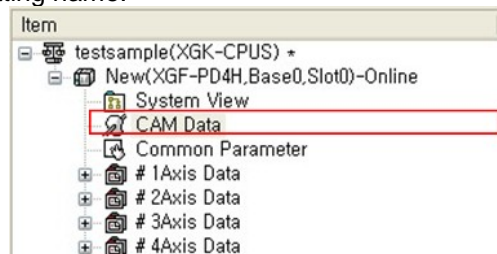
These items can be saved as other files.

Item	File extension	설명
Cam setting data	*.caf	Saves the setted data for creating cam profile.
Cam profile data	*.csv	Saves cam profile created data as "csv" file type.
Common parameter	*.cp	Saves common parameter.
Operation data	*.rpd	Saves profile data for operating.
Operation parameter	*.bp	Saves operation paramete that need to operate.
Module data	*.pm	Saves module data as file.
Global/Direct variable	*.gda	Saves the description remark data of Global/Direct variables.
Program	*.prm	Saves the program data.
Basic parameter	*.mbp	Saves the basic parameter.
Position data	*.pos	Saves the position data.
Master parameter	*.msp	Saves the master parameter.
Axis group parameter	*.agd	Saves axis group parameter.
Cam profile	*.uca	Saves the cam profile data.
User data type	*.udd	Saves User data type data.

#### 1. Cam Setting Data (Supported for XPM, network type module)

[Sequence]

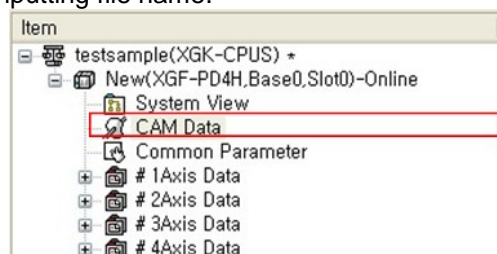
- (1) Select cam data item in the project windows.
- (2) Proceed this sequence; Menu [Project]→[Export]→[setted files].
- (3) Click confirm button after inputting name.



#### 2. Cam Profile Data (Supported for XPM, network type module)

[Sequence]

- (1) Select cam data item in the project windows.
- (2) Proceed this sequence; Menu [Project] → [Export] → [CSV file].
- (3) Click the confirm button after inputting file name.



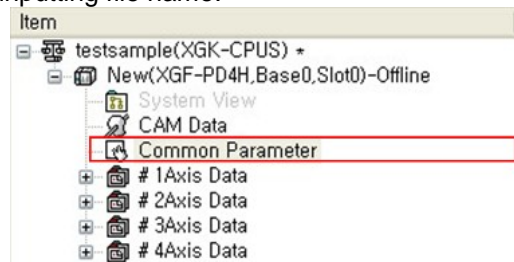
#### Notes

Cam profile data only after setting cam setting data in the cam data item and creating profile can save as item.  
(Please refer to 8.6. setting electric cam on this manual.)

### 3. Common Parameter

[Sequence]

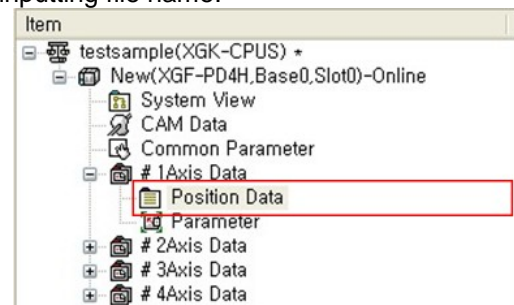
- (1) Select common parameter from project windows.
- (2) Proceed this sequence; Menu [Project] → [Export] → [Setting file].
- (3) Click the confirm button after inputting file name.



### 4. Operation Data

[Sequence]

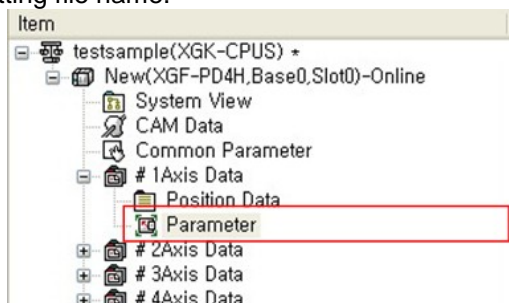
- (1) Select operation data from project windows.
- (2) Proceed this sequence ; Menu[Project] → [Export] → [Setting file].
- (3) Click the confirm button after inputting file name.



### 5. Operating Parameter

[Sequence]

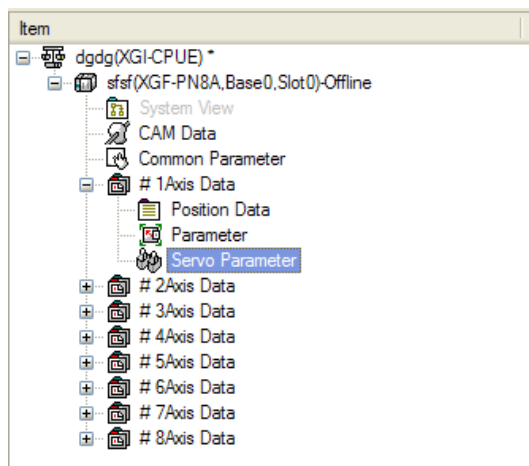
- (1) Select operation parameter in the project windows.
- (2) Proceed this sequence; Menu [Project] → [Export] → [setting file].
- (3) Click confirm button after inputting file name.



### 6. Servo Parameter

[Sequence]

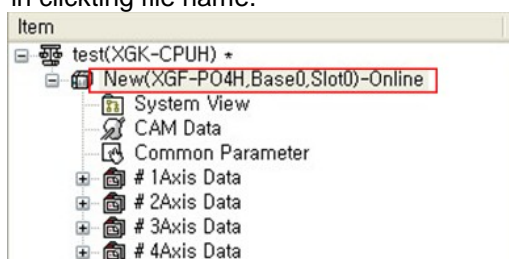
- (1) Select Servo Parameter item at the project window
- (2) Select [Project] → [Export] → [Configuration file].
- (3) Select the file and press OK.



### 7. Module Data

[Sequence]

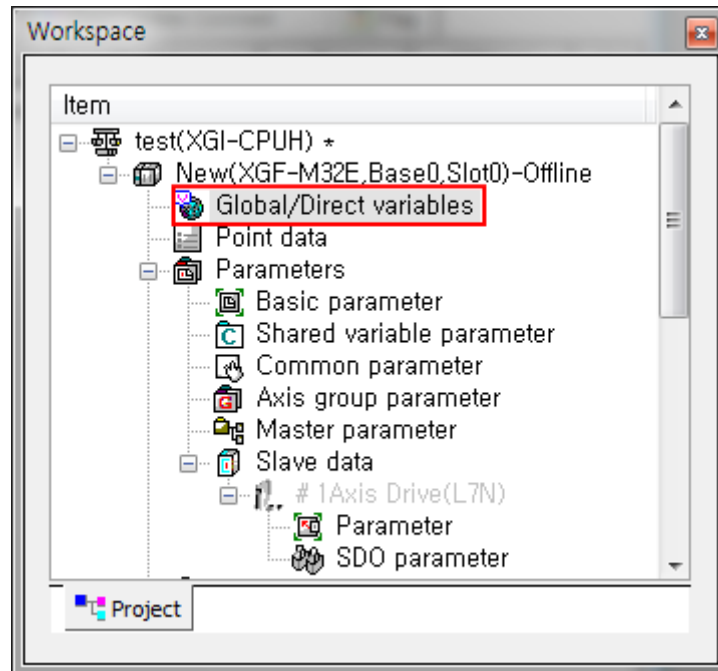
- (1) Select module in project windows.
- (2) Proceed this sequence ; Menu [Project] → [Export] → [Module data]
- (3) Click the icconfirm button after in clicking file name.



### 8. Global/Direct variable(For the Motion Control Module only)

[Sequence]

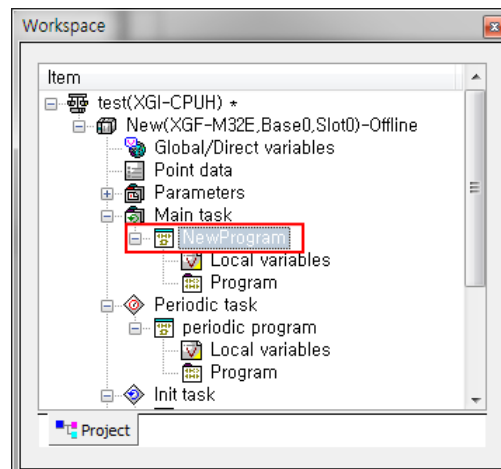
- (1) Select the Global/Direct variable in a project window.
- (2) Select [Project] → [ Export] → [Configuration file].
- (3) After selecting the file, press OK button.



### 9. Program(For the Motion Control Module only)

[Sequence]

- (1) Select the program information in a project window.
- (2) Select [Project] → [ Export] → [ Configuration file].
- (3) After selecting the file, press OK button.

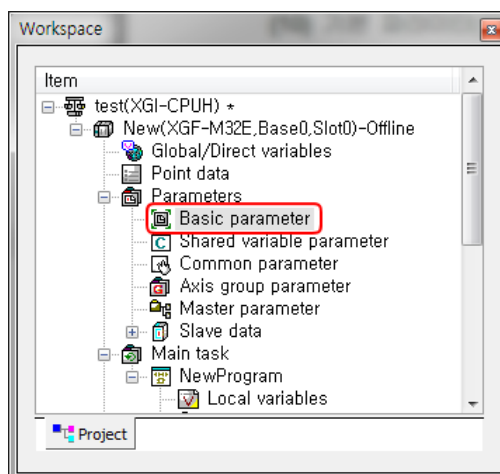


## Chapter 6 Drawing up of project

### 10. Basic parameter(For the Motion Control Module only)

[Sequence]

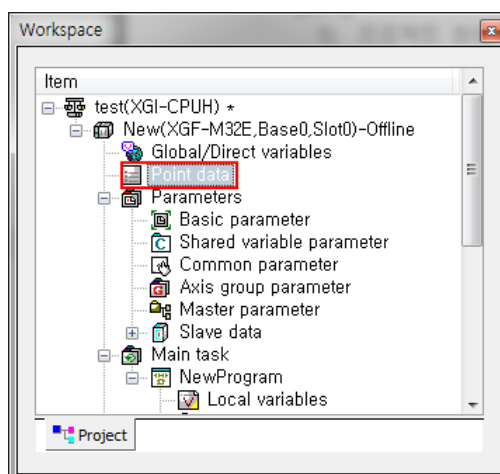
- (1) Select the basic parameter in a project window.
- (2) Select [project] → [ Export] → [ Configuration file].
- (3) After selecting the file, press OK button.



### 11. Point data(For the Motion Control Module only)

[Sequence]

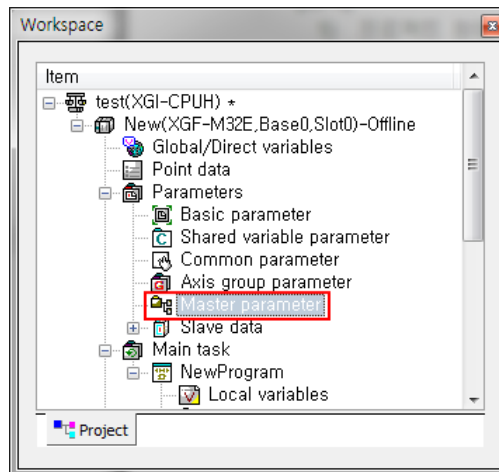
- (1) Select the position data in a project window.
- (2) Select [Project] → [ Export] → [ Configuration file].
- (3) After selecting the file, press OK button.



### 12. Master parameter(For the Motion Control Module only)

[Sequence]

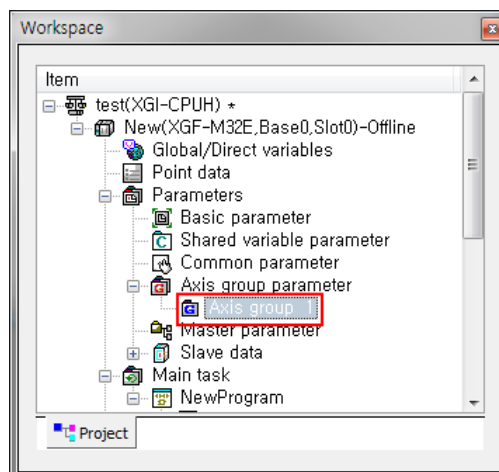
- (1) Select the master parameter in a project window.
- (2) Select [Project] → [ Export] → [Configuration file].
- (3) After selecting the file, press OK button.



### 13. Axis group parameter(For the Motion Control Module only)

[Sequence]

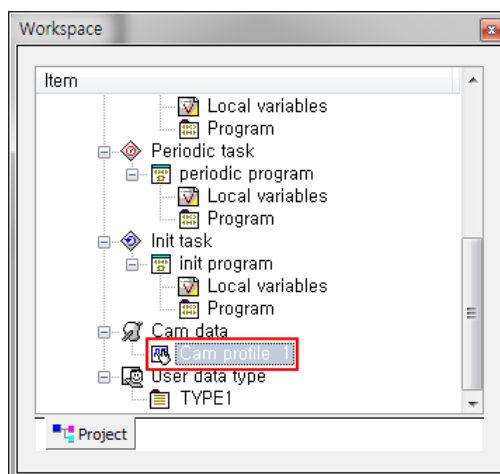
- (1) Select the axis group in a project window.
- (2) Select [Project] → [ Export] → [Configuration file].
- (3) After selecting the file, press OK button.



### 14. Cam profile(For the Motion Control Module only)

[Sequence]

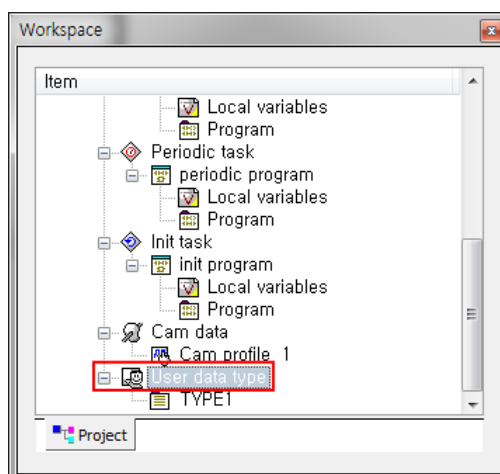
- (1) Select the cam profile in a project window.
- (2) Select [Project] → [Export] → [Configuration file].
- (3) After selecting the file, press OK button.



### 15. User data type(For the Motion Control Module only)

[Sequence]

- (1) Select the user data type in a project window.
- (2) Select [Project] → [Export] → [Configuration file].
- (3) After selecting the file, press OK button.





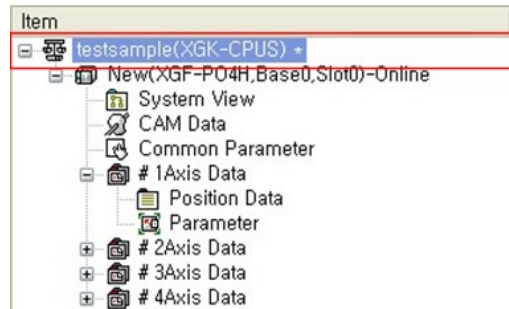
### 6.4.4 Item Registration Information

Can confirm and change registration information of each items.

#### 1. Project Registration Information

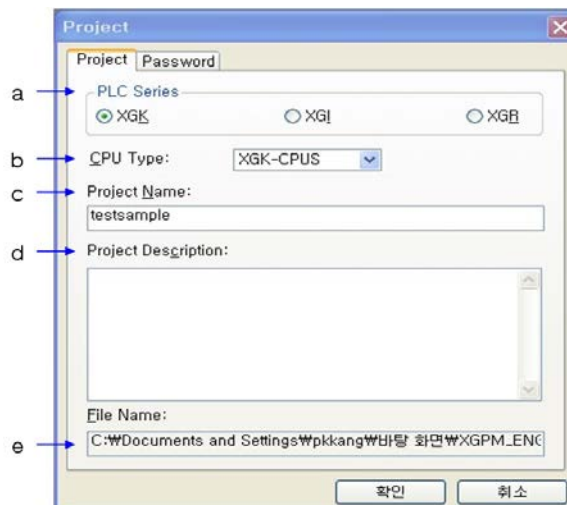
[Sequence]

- (1) Select the project in the project windows.



- (2) Proceed this sequence ; Menu [view] → [Properties...].
- (3) Click the confirm button after fixing.

[Communication box]



[Describing communication box]

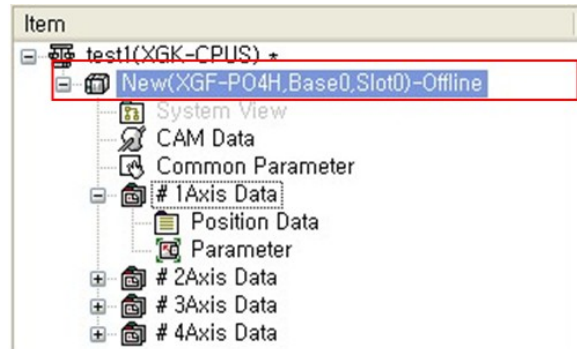
- (a) PLC series: Display PLC series. Can do editing.
- (b) CPU type: Display CPU type. Can do editing.
- (c) Project name: Display project name. Can do editing.
- (d) Project description: Display project caption. Can do editing.
- (e) File name: It will show you file route which is saved and file name. But, File name can not edit, And should use this menu ([project] → [Save as..]) for saving as other file name.

## Chapter 6 Drawing up of project

### 2. Module Registration Information

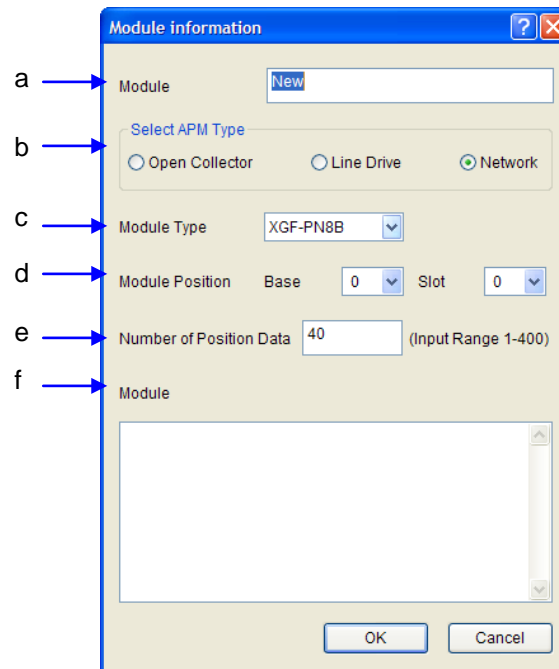
[Sequence]

- (1) Select module in the project windows.



- (2) Proceed this sequence ; menu[view] → [Properties...].
- (3) Click the OK button after modification.

[Communication box]



[Description about Communication box]

- (1) Module name: Display module name. Can do editing.
- (2) Select APM type: Select positioning type and can do editing.
- (3) A kind of Module: Display a kind of module which is selected. Can do editing.
- (4) Module position: Display module position which is selected. Can do editing.
- (5) Number of position data: Display selected the number of operation data steps that can be edited. Can do editing.
- (6) Module : Display module caption of selected module. Can do editing.

#### Notes

Each item and registration information of module can not edit when it is on-line.

### 6.5 Project Password

It is possible that it set password with project file for safety. And this password has no relationship with PLC password.

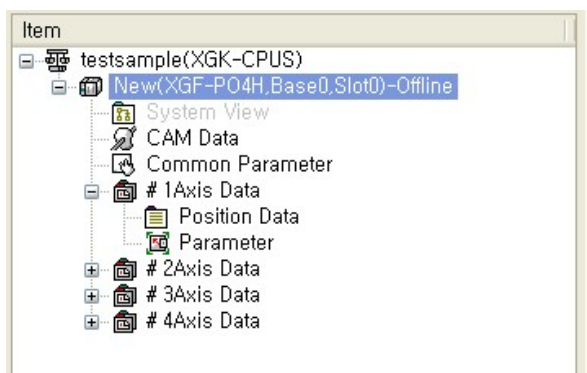
#### Notes

1. Keyboard key can not understanding difference of Korean/English key and just can understand difference of big letters and small letters for password. It has 8 maximum key spaces for inputting password.
2. Please be careful, If you forget the password, can not open the project file.

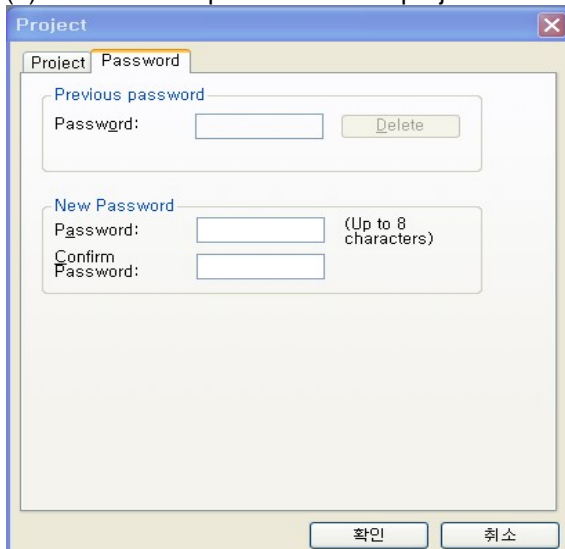
#### 6.5.1 Setting Password

[Sequence]

- (1) Select the project in the project windows.



- (2) Proceed this sequence ; Menu [View]->[Registration information].
- (3) Select tab of password in the project communication box.

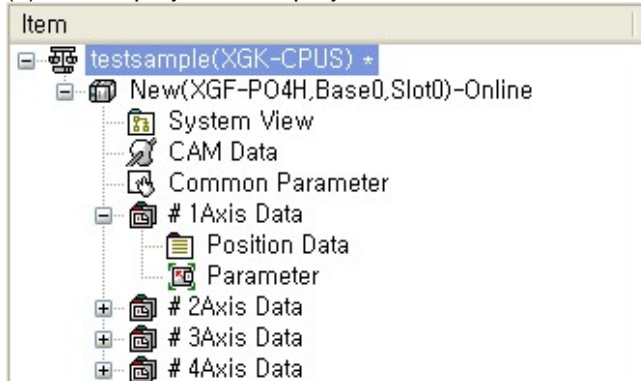


- (4) Input the password to blank of new password.
- (5) Retry to input same password to blank of confirm password.  
(Then, Password should same with 4) )
- (6) Click the confirm button.

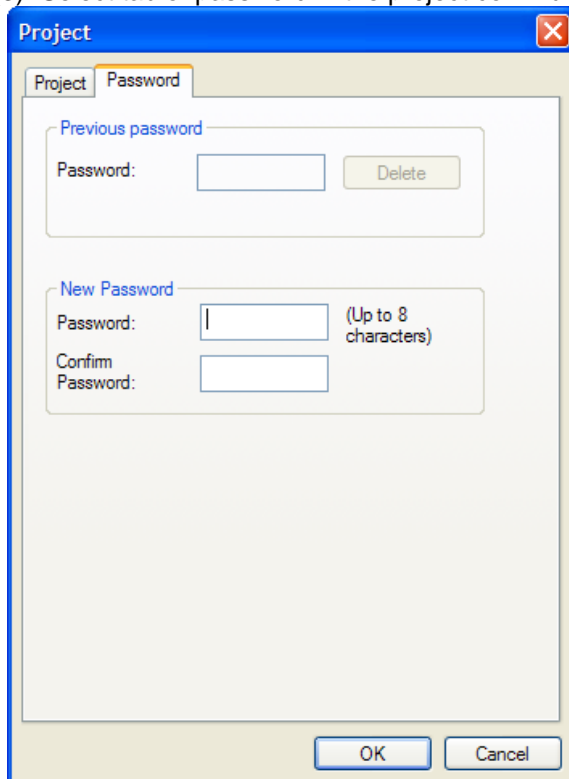
### 6.5.2 Password Modification

[Sequence]

- (1) Select project in the project windows.



- (2) Proceed this sequence; Menu [View] → [Properties...].
- (3) Select tab of password in the project communication box.

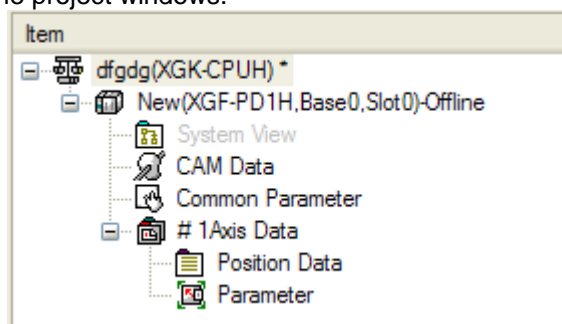


- (4) Input the old password in the blank of before password.
- (5) Input new password in the blank of new password.
- (6) Retry to input same password to blank of confirm password.  
(Then, Password should same with 5)
- (7) Click the confirm button.

### 6.5.3 Delete password

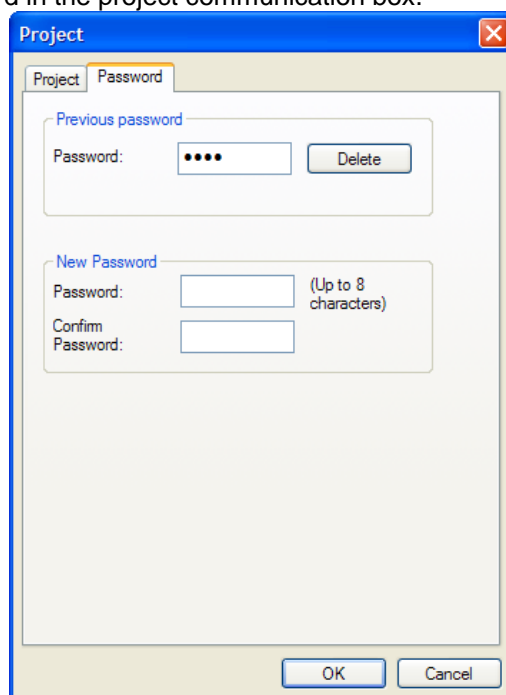
[Sequence]

- (1) Select the project in the project windows.



<XPM module example>

- (2) Proceed this sequence; Menu [View] → [Properties...].
- (3) Select the tab of password in the project communication box.



- (4) Input the old password in the blank of before password.
- (5) Click the 'Delete' button.

## Chapter 7 System Check

Assign the module to connect. And check the connection with the external device (servo motor and drive) and initial operation.

### 7.1 Connect PLC

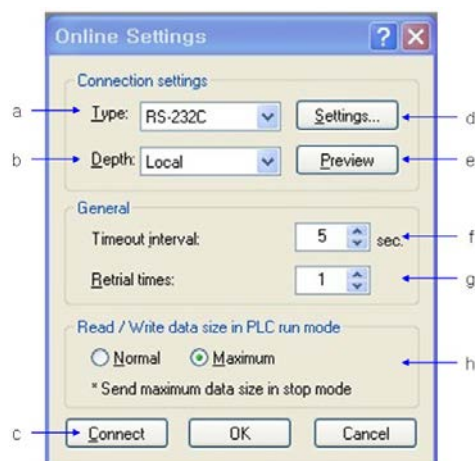
#### 7.1.1 Setting Local Connection

Setting local connection can connect with RS-232C or USB.

[Sequence]

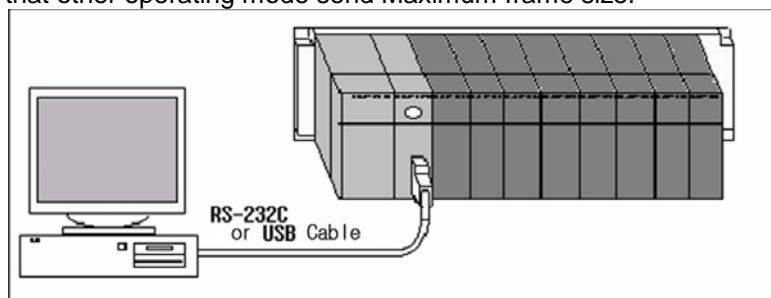
(1) Menu [Online] → [Connection setting].

[Communication box]



[Descript communication box]

- (a) Type : This is setting communication media when it connect with PLC. Can set by RS-232C, USB, Ethernet, Model.
- (b) Depth : Set connection structure with PLC. Can set Local, remote level 1, remote level 2.
- (c) Connect : Try to connect with PLC by setted connection option.
- (d) Settings : Can set by the way of connection which is selected a.
- (e) Preview : Can confirm at a glance. About whole connection option.
- (f) Timeout interval : In case that can not connect with PLC within the setted time, can retry to connect by time-out.
- (g) Retrial times : In case that failed connection with PLC, decide how many times to retry connection.
- (h) Read/Write data size in PLC run mode  
: Set size of data transmission frame. This option only is applied when PLC operating mode is "RUN", except that other operating mode send Maximum frame size.

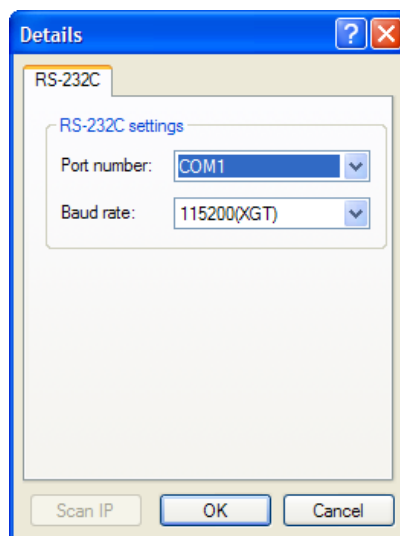


### 1. Local RS-232C Connection

[Sequence]

- (1) Select RS-232C in the way of connection.
- (2) Put the 'Settings' button and set communication speed, communication COM port.
- (3) Put the confirm button and save communication option.

[Communication box]



#### Notes

1. Basic setting is setted by RS-232C, COM1 and communication speed is 115200 bps.
2. Transmission speed suppoer 38400 bps and 115200 bps.
3. Transmission speed of XGK series is 115200 bps. In case of connecting remote (using by Rnet), transmission speed is 38400 bps.
4. Transmission port can set from COM1 to COM8.
5. When user use 'USB to Serial' device, should use virtual COM port as communication port. If you need confirm setted port No.,please confirm device manager.
6. XG-PM, XG-PD, Device monitor, system monitor can connect with just one PLC at the same time in XG5000. But, connection option have to consensus with others.

### 2. Local Connecting USB

[Sequence]

- (1) Select 'USB' for communication method.
- (2) USB has no detail setting option. Therefore, setting button will be deactivated.
- (3) Put the confirm button and save connection option.

#### Notes

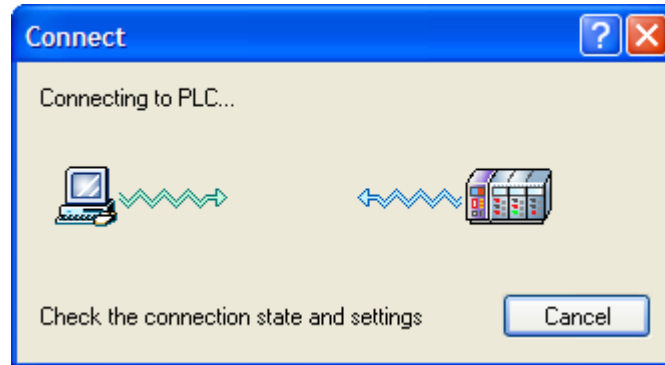
1. If user want to connect with PLC by USB, user need to install USB device driver.
2. When user install XG5000, USB driver will be auto-download and install. If USB driver installation is not normal, please download Driver from home page of LS industrial system.

### 7.1.2 Module Connection & Confirm connection

Try to connect with PLC by setted option.

[Sequence]

- (1) Select Menu [Online]->[Connect].
- (2) Communication box will be come out with connection.

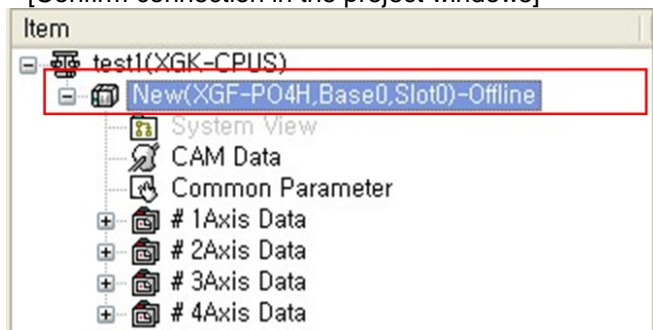


- (3) Display On-line menu and condition with connecting PLC.

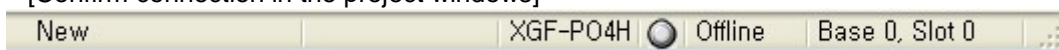
#### Notes

1. Communication box rapidly will be come out and gone, when it success connecting with PLC.
2. Module connection condition will be display by the side of project name and status bar after connecting with PLC.

[Confirm connection in the project windows]



[Confirm connection in the project windows]



3. After connecting PLC, In case of connecting with other type PLC, connecting PLC automatically be disconnected.
4. Monitoring will be end when it performs disconnection.

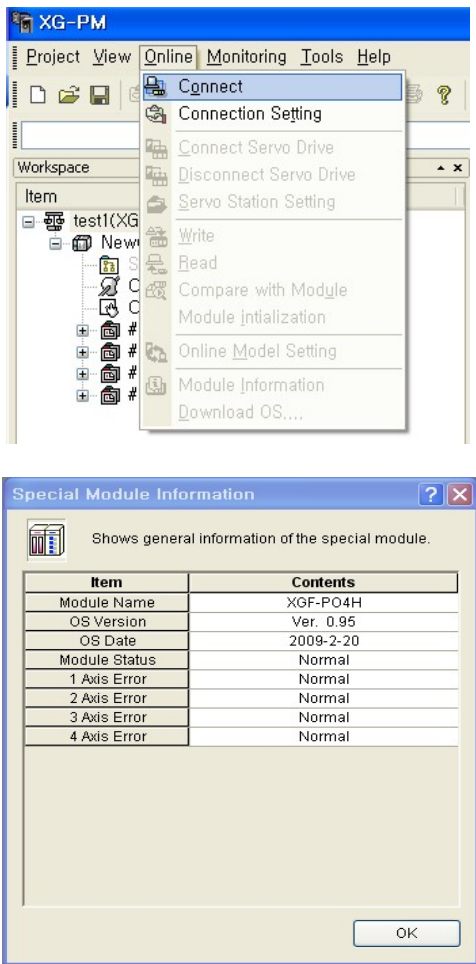


7.2 Confirm Module O/S Information

You can confirm module O/S information at the system view.  
Display version information with product of the day.

[Sequence]

- (1) Select this sequence; Menu [Online] → [Connect] ; Connecting PLC (Module).
- (2) Select this sequence; Menu [Online] → [Module information].
- (3) Confirm O/S information in the module information windows.



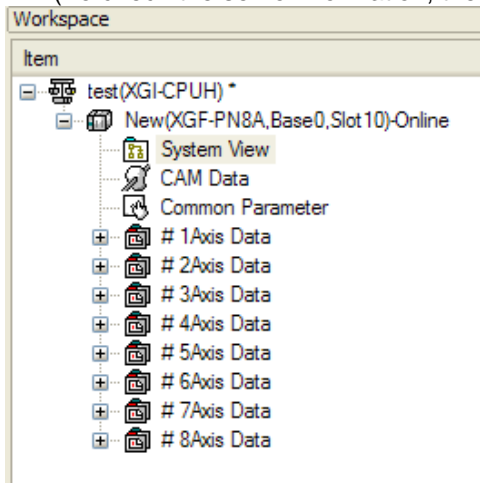
Notes

Display O/S version information only when module installed in that position.

7.3 Check Servo Information (For Network Type XPM/Standard Network Type XPM only)

You can check the servo through the “System view” screen.

- [Sequence]
- (1) Click menu [Online] → [Connect] and connec to PLC (module)
  - (2) Check the module connection status of the project window
- (To check the servo information, the module should be “online” status.)



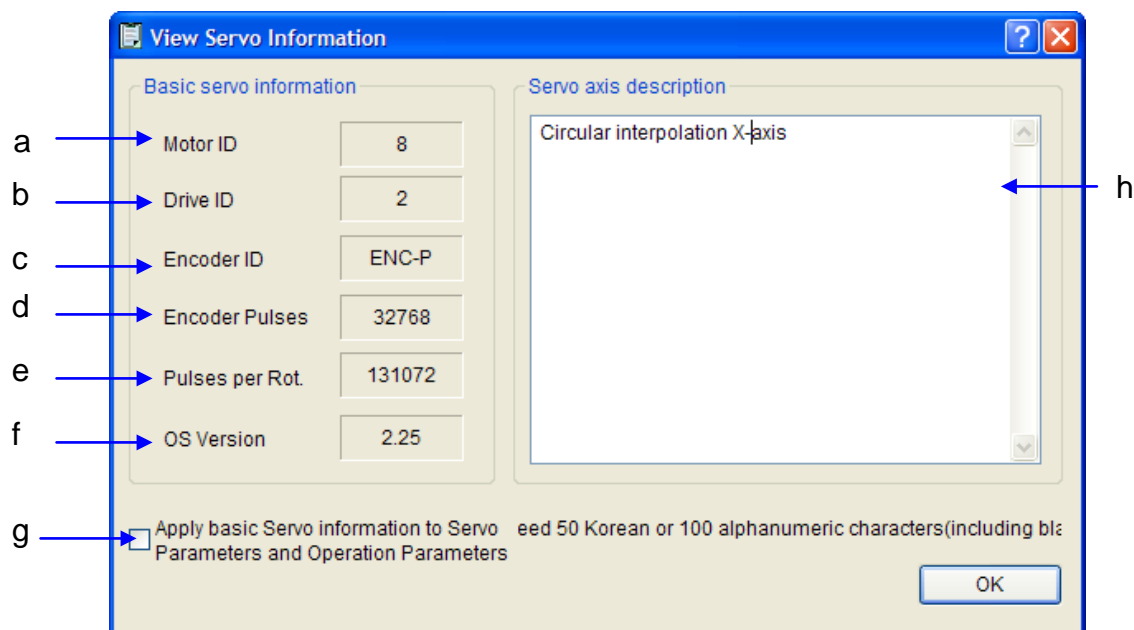
- (3) Click menu [Online] → [Connect to all servos] and connec to the servo drive.
- (4) Check the servo information at the “System view” screen.

Item	Contents
Information	XGF-PN8A(Base0,Slot10)-Online
OS Info.	Ver. 1.01 (2010- 8- 19 )
Status	Normal (0)

Status / Axis	4 Axis	5 Axis	6 Axis	7 Axis	8 Axis
Pos/Spd Unit.	pls,pls/s				
Command Pos.	352339375				
Command Spd.	0				
Current Pos.	352339375				
Current Spd.	-2128				
Torque	0.0 %				
Step No.	1				
Error Code	0				
Main Axis	4 Axis				
Main/Sub. Ax.	Main Axis				
M Code	0				
Opr. Status					
Pos. Comp.					
M Code ON					
Positioning					
Ctrl Pattern					

[Dialog box]



[Dialog box description]

- (a) Motor ID : Shows the motor ID of the currently selected axis.
- (b) Driver ID : Shows the servo drive ID of the currently selected axis.
- (c) Encoder ID : Shows the encoder ID of the currently selected axis.
- (d) Encoder pulse count : Shows the encoder pulse count for the currently selected axis.
- (e) Pulse count per rotation : Shows the pulse count per rotation for the currently selected axis.
- (f) OS Version: Shows OS version of a servo.
- (g) Apply parameter : Decides whether to apply the data from the current axis to basic parameter and servo parameter.
- (h) Servo axis description  
: Shows servo axis description and you edit servo axis description.(But, servo axis description is not saved at the module or servo, that is saved at the only project file.)

### Note

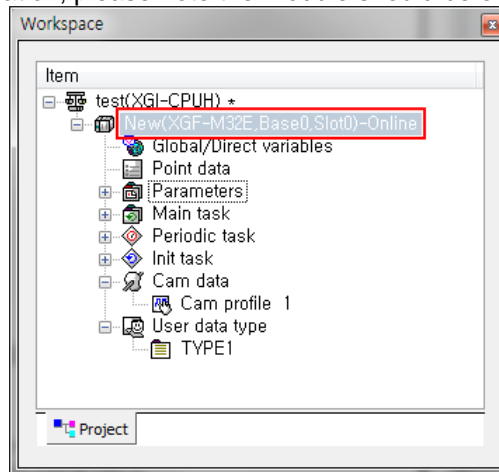
You can check the servo information on the only one axis specified by the user.

## 7.4 Check Slave Information (For Motion Control Module only)

You can check the information of the currently connected slave through a network view screen.

[Sequence]

- (1) Press [Online] → [Access] and access to the PLC (module).
- (2) Check the module access status of a project window.  
(To check the servo information, please note the module should be online.)



- (3) Press [Online] → [Access] → [Auto connection of Servo slave to connect the Servo drive.
- (4) Press [View] → [Network view] for network view.
- (5) Check the Properties in a network view screen.

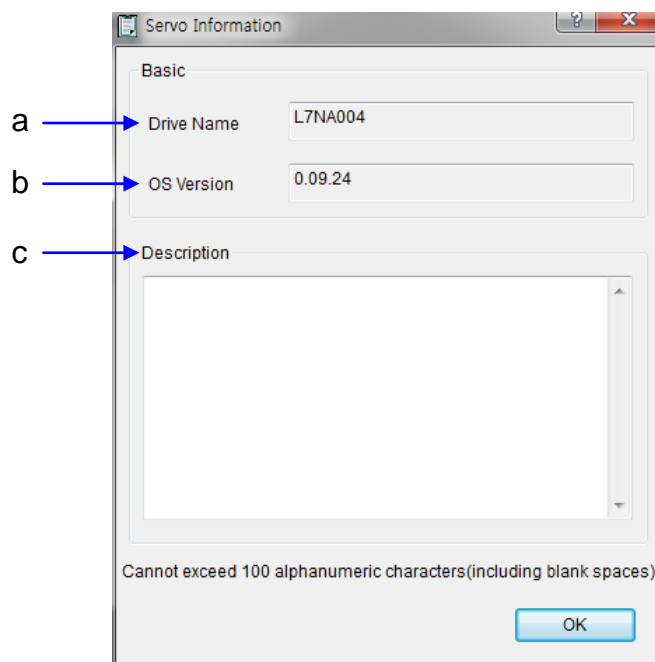
The screenshot displays the 'Network view' screen. On the left, a network topology shows a central bus connected to five slave drives, numbered 1 to 5. Each drive is labeled 'EtherCAT' and 'Drive'. A red box highlights the first drive. A context menu is open over the first drive, showing options like 'Add slave', 'Cut', 'Copy', 'Paste', 'Delete', 'Zoom In', 'Zoom Out', 'View In Detail', 'View Briefly', 'View As List', 'View As Table', 'Network Slave Autoconnect', 'Get Slave Serial Numbers', 'Properties...', and 'Slave error history'.

On the right, a table displays detailed information for a specified operation slave. The table has two columns: 'Status / Axis' and 'State'.

Status / Axis	State
Ch. Sel	# 1
Servo ready	ON
Servo on	ON
Pos/Spd Unit	pls,pls/s
Command Pos.	-138
Command Spd.	0
Command Torq.	-0.3
Current Pos.	-138
Current Spd.	1000
Current Torq.	-0.3
Error Code	0x0
Main Axis	1 Axis
Main/Sub. Ax.	Main Axis
Opr. Status	
Pos. Comp.	
Origin Fix	
Ctrl Pattern	
Stop Status	
Upper Limit	
Lower Limit	
Ext. Input (Bit 15~Bit 0)	0000 0000 0000 0000
Ext. Input (Bit 31~Bit 16)	0000 0000 0000 0000

## Chapter 7 System Check

[Dialog box]



[Dialog box description]

- (a) Drive Name : Displays the drive name of the currently selected axis.
- (b) OS Version : Displays the OS version of the currently selected axis.
- (c) Description : Displays or edits description remark of the currently selected Servo axis.  
(In this case, the description remark on servo axis is not saved to the module or servo but is saved to the project file only.)

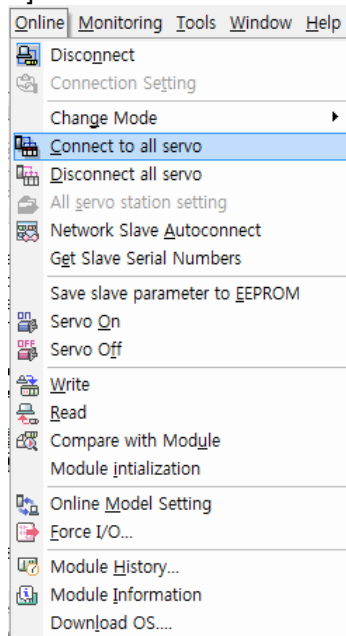
## 7.5 Connect/Disconnect all servo (For Network typed XPM/ standard network typed XPM/ Motion Control Module only)

### 7.5.1 Connect all servo

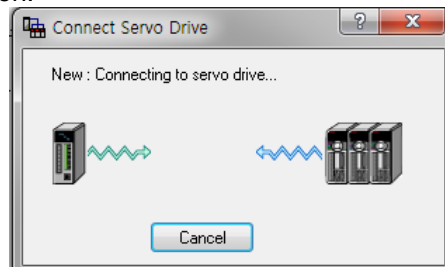
It connects all servo drives linked to the module.

[Sequence]

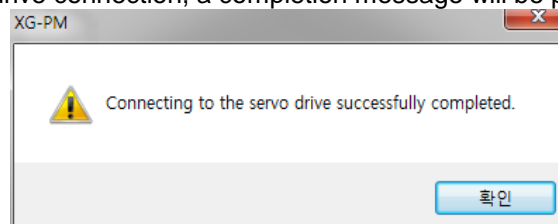
- (1) Press [Online] → [Connect] and access to the PLC (module).
- (2) Press [Online] → [Connect all servo] to connect servo drive.



- (3) Execute servo drive connection.



- (4) After completing servo drive connection, a completion message will be printed out.



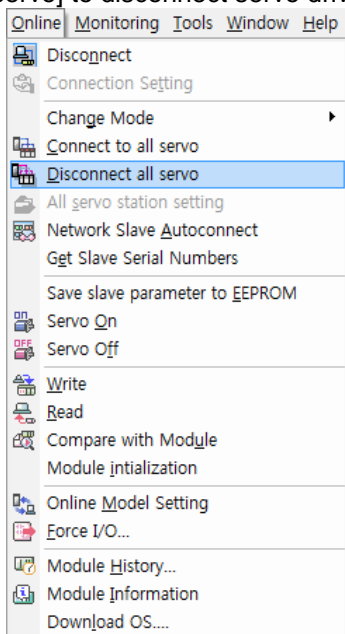
## Chapter 7 System Check

### 7.5.2 Disconnect all servo

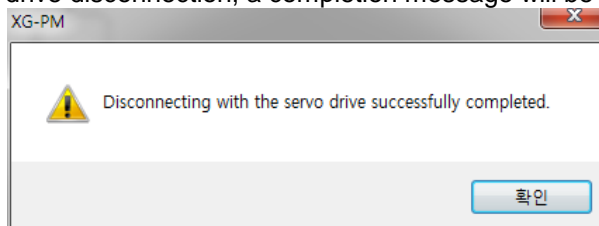
It disconnects the whole Servo drives linked to the module.

[Sequence]

- (1) Press [Online] → [Connect] and access to the PLC (module).
- (2) Press [Online] → [Disconnect all servo] to disconnect servo drive.



- (3) Execute servo drive disconnection.
- (4) After completing servo drive disconnection, a completion message will be printed out.



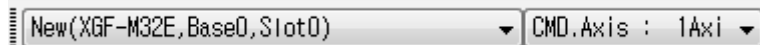
## 7.6 Servo-On/Off (For Network typed XPM/standard Network typed XPM / Motion Control Module only)

### 7.6.1 Servo On

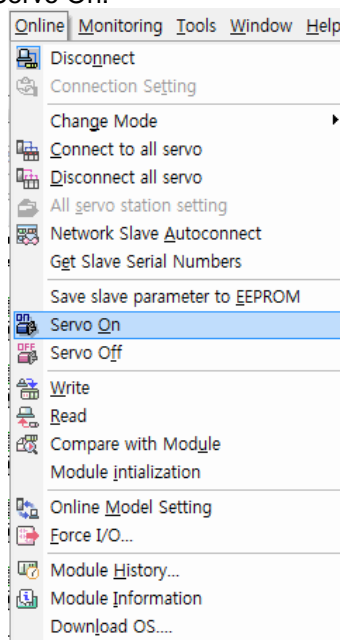
Among servo drives connected to the module, it converts the selected servo drive into Servo-On status. To execute operation command, the servo drive should be converted into Servo-on status. Under Servo-On status, some commands such as Save Slave parameter to EEPROM related parameter save can not be executed.

[Sequence]

- (1) Set the network parameter (standard Network typed XPM)  
Set the slave parameter. (Motion Control Module)
- (2) Press [Online] → [Connect] to access to the PLC(module).
- (3) Press [Online] → [Connect all servo] to connect the servo drive.
- (4) Select the command axis to execute Servo On in the command object tools.



- (5) Press [Online]-[Servo On] to execute Servo On.



### 7.6.2 Servo Off

Among servo drives connected to the module, it converts the selected servo drive into Servo-Off status. Under Servo-Off status, the servo drive can not execute position control and operation commands transmitted from a module are not available.

[Sequence]

- (1) Select the command axis to execute Servo On in the command object tools.
- (2) Press [Online]-[Servo Off] to execute Servo Off.



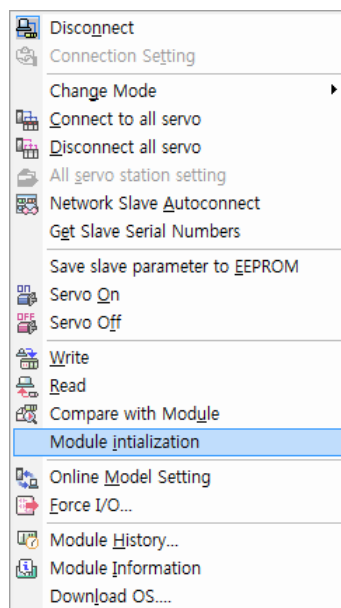
### 7.7 Module initialization

#### 7.7.1 Module initialization

XG-PM provides the module initialization function that can initialize all settings and data of a module. Users can initialize the module status from wrong settings through this function.

[Sequence]

- (1) Press [Online]->[Connect] and access to the PLC (module).
- (2) Press [Online]->[Module initialization] to execute the module initialization.



## 7.8 Module history (For the Motion Control Module only)

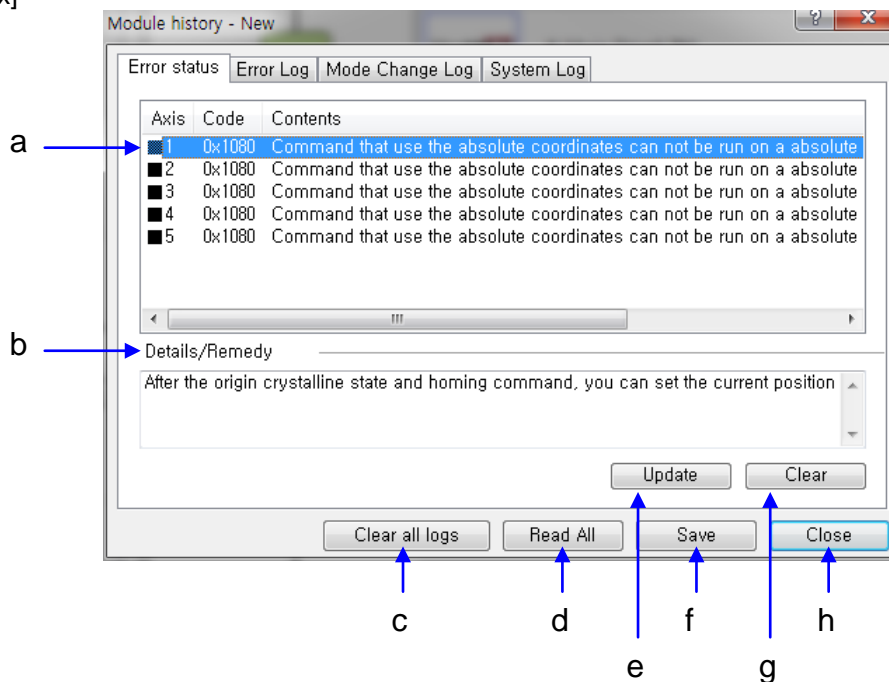
XG-PM displays the error status/error history/mode conversion history/system history of a Motion Control Module.

### 7.8.1 Error status

[Sequence]

- (1) Press [Online]->[Connect] and access to the PLC (module).
- (2) Select [Online]->[module history].
- (3) Select the error history tab in a module history dialog box.

[Dialog box]



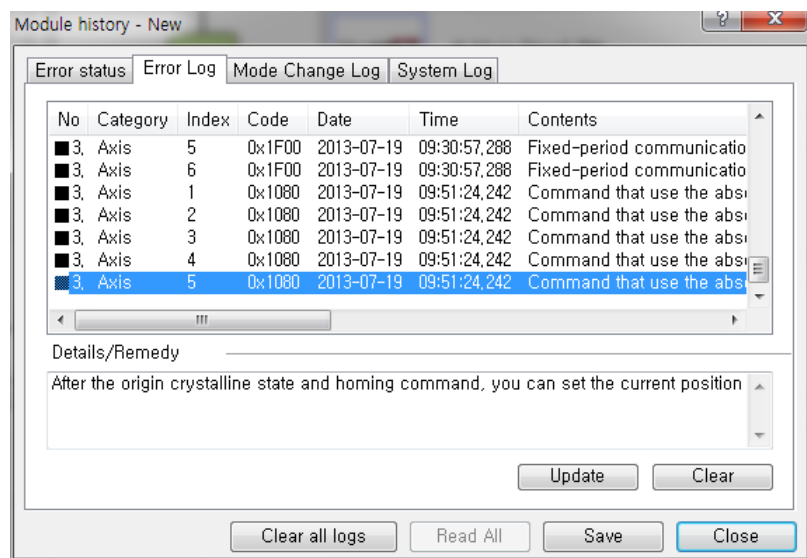
[Dialog box description]

- (a) List: Displays the error status.
- (b) Details/Remedy: Displays the details on the error selected from a list with related remedy.
- (c) Clear all logs: Deletes all history.
- (d) Read all: Reads and displays all history of a module.
- (e) Update: Updates the module history.
- (f) Save: Saves the module history to a file.
- (g) Clear: Clears the module history.
- (h) Close: Closes a dialog box.

7.8.2 Error Log

It shows the error log of a module.

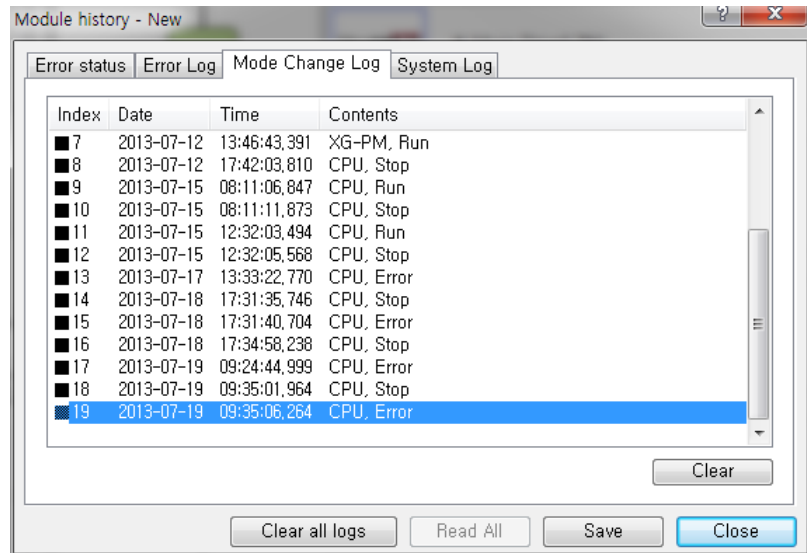
[Dialog box]



7.8.3 Mode Change Log

It shows the operation mode change log of a module.

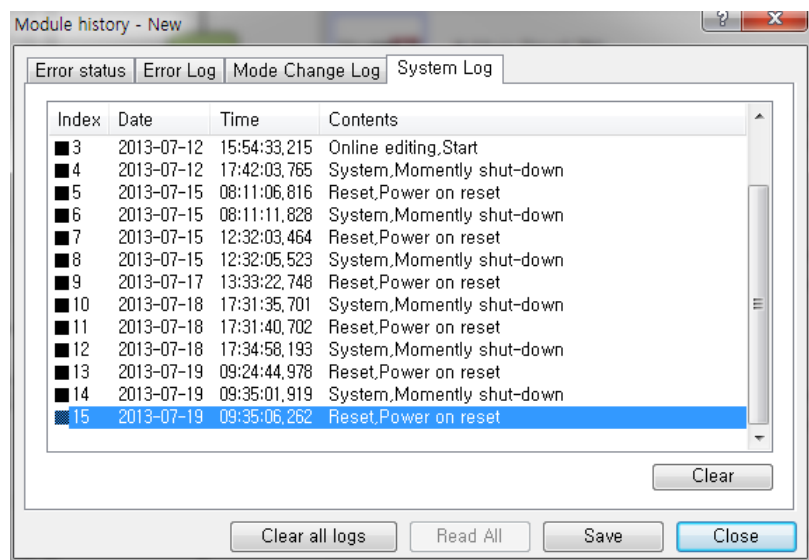
[Dialog box]



7.8.4 System Log

It shows the log executed by XG-PM among module operations.

[Dialog box]



Note

- Each log is aligned in order of time.
- Each log is saved as "CSV" file. This file can be opened in Excel and other text editing application programs.
- Double-click the first row of a list to change alignment method.
- Every time a dialog box is displayed, 100EA history can be read. To read the log of more modules, press the 'Read All' button.
- After pressing the 'Read All' button or in case each history of the module is less than 100EA, the 'Read All' button will not be activated.

# Chapter 8 Setting Data

Here describes setting data of positioning module.

## 8.1 Setting Common Parameter

[Sequence]

- (1) Double-click [Common parameter] in the project tree.
- (2) Click the cell which you want to set and input data.

[APM module Setting screen]

	Item	Parameter
a	Pulse output level	0: Low active
	Circular interpolation	0: Middle point
	Encoder input	4:PHASE A/B (x1)
	Auto reload	4294967295
b	ZONE output mode	0: Individual Output
	ZONE 1 axis	0: X axis
	ZONE 2 axis	0: X axis
	ZONE 3 axis	0: X axis
c	ZONE 1 ON region	0 pls
	ZONE 1 OFF region	0 pls
	ZONE 2 ON region	0 pls
	ZONE 2 OFF region	0 pls
	ZONE 3 ON region	0 pls
	ZONE 3 OFF region	0 pls

[Setting screen description]

- (a) Setting pulse output level, Circular interpolation, encoder input and Auto Reload
- (b) Setting ZONE output module and ZONE axis
- (c) Setting ZONE ON and OFF region

[XPM module Setting screen]

New.Common Parameter		
	Item	Settings
a	Pulse output level	0: Low Active
	Enc pulse input	3:PHASE A/B (x1)
b	Enc max. value	2147483647
	Enc min. value	-2147483648
c	Speed override	0: Specify %

[Setting screen description]

- (a) Encoder input mode and setting pulse output level.
- (b) Setting encoder input range.
- (c) Setting speed override unit. (Designate % or Can designate speed input value.)

## Chapter 8 Setting Data

[Network type XPM module, standard network type XPM module setting screen]

	Item	Settings
a	Enc1 pulse input	3:PHASE A/B (x1)
	Enc1 z-phase clear	0: Disable
	Enc2 pulse input	3:PHASE A/B (x1)
	Enc2 z-phase clear	0: Disable
b	Enc1 max. value	2147483647
	Enc1 min. value	-2147483648
	Enc2 max. value	2147483647
	Enc2 min. value	-2147483648
c	Speed override	0: Specify %

[Setting screen description]

- (a) Encoder 1,2 input mode and setting whether to use “z-phase clear”
- (b) Encoder 1,2 input range setting
- (c) Speed override unit setting (% or speed)

[Motion Control module setting screen]

	Item	Settings
a	Encoder1 Unit	0: pulse
	Encoder1 Pulses per rotation	8192 pls
	Encoder1 Travel per rotation	10 pls
	Encoder1 Pulse input	3:PHASE A/B (x1)
	Encoder2 Unit	0: pulse
	Encoder2 Pulses per rotation	8192 pls
b	Encoder2 Travel per rotation	10 pls
	Encoder2 Pulse input	3:PHASE A/B (x1)
	Encoder1 Max. value	2147483647 pls
	Encoder1 Min. value	-2147483648 pls
c	Encoder2 Max. value	2147483647 pls
	Encoder2 Min. value	-2147483648 pls
	Override	0: Specified by ratio

[Setting screen description]

- (a) Encoder 1,2 input mode
- (b) Encoder 1,2 input range setting
- (c) Speed override unit setting (% or speed)

## 8.2 Setting Operation parameter

[Sequence]

- (1) Double-click [Axis #X~Z data] → [Parameter] in the project tree. (APM module)  
 Double-click [Axis #1~4 data] → [Parameter] in the project tree. (XPM module)  
 Double-click [Axis #1~8 data] → [Parameter] in the project tree.  
 (Network type XPM module, standard network type XPM module)  
 Double-click [Parameter] → [Slave data] → [#1~32 Axis Drive] → [operating parameter] in the project tree.

- (2) Click cell which you want to set and input data.

[Setting screen]

	Item ▼	1 Axis	2 Axis	3 Axis	4 Axis
a	Basic Parameter	Unit	pulse	pulse	pulse
		Pulses per rotation	20000 pls	20000 pls	20000 pls
		Travel per rotation	20000 pls	20000 pls	20000 pls
		Unit multiplier	0: x1	0: x1	0: x1
		Speed command unit	0: Unit/Time	0: Unit/Time	0: Unit/Time
		Pulse output mode	0: CW/CCW	0: CW/CCW	0: CW/CCW
		Base speed	1 pls/s	1 pls/s	1 pls/s
		Speed limit	100000 pls/s	100000 pls/s	100000 pls/s
		~acc. time1	500 ms	500 ms	500 ms
		~acc. time2	1000 ms	1000 ms	1000 ms
		~acc. time3	1500 ms	1500 ms	1500 ms
		~acc. time4	2000 ms	2000 ms	2000 ms
		Dec. time 1	500 ms	500 ms	500 ms
		Dec. time 2	1000 ms	1000 ms	1000 ms
		Dec. time 3	1500 ms	1500 ms	1500 ms
		Dec. time 4	2000 ms	2000 ms	2000 ms
		Dec. time for emergency stop	0 ms	0 ms	0 ms
b	Extended Parameter	S/W upper limit	2147483647 pls	2147483647 pls	2147483647 pls
		S/W lower limit	-2147483648 pls	-2147483648 pls	-2147483648 pls
		Backlash compensation	0 pls	0 pls	0 pls
		Position completion time	1000 ms	1000 ms	1000 ms
		S-Curve ratio	50 %	50 %	50 %
		~acc./Dec. pattern	0: Trapezoid	0: Trapezoid	0: Trapezoid
		UI code mode	0: None	0: None	0: None
		Software limit detect	0: Don't detect	0: Don't detect	0: Don't detect
		External /TP	0: Disable	0: Disable	0: Disable
		External stop selection	0: ENG stop	0: ENG stop	0: ENG stop
		Position complete condition	0: Dwell	0: Dwell	0: Dwell
		Int. continuous opr. type	0: Pass target pos.	0: Pass target pos.	0: Pass target pos.
c	Manual Operation Parameter	~Arc insertion position	0 pls	0 pls	0 pls
		~Arc insertion	0: Don't insert	0: Don't insert	0: Don't insert
		Spd. override with pos. coordi.	0: -BS	0: -BS	0: -BS
		JOG high speed	5000 pls/s	5000 pls/s	5000 pls/s
		JOG low speed	1000 pls/s	1000 pls/s	1000 pls/s
		JOG acceleration time	1000 ms	1000 ms	1000 ms
d	Homing Parameter	JOG deceleration time	1000 ms	1000 ms	1000 ms
		Inching speed	100 pls/s	100 pls/s	100 pls/s
		Home position	0 pls	0 pls	0 pls
		Home high speed	5000 pls/s	5000 pls/s	5000 pls/s
		Home low speed	500 pls/s	500 pls/s	500 pls/s
		Home acc. time	1000 ms	1000 ms	1000 ms
		Home dec. time	1000 ms	1000 ms	1000 ms
		Home dwell time	0 ms	0 ms	0 ms
e	I/O Signal Parameter	Home compensation	0 pls	0 pls	0 pls
		Home restart time	0 ms	0 ms	0 ms
		Home method	0: DOG/Home(OFF)	0: DOG/Home(OFF)	0: DOG/Home(OFF)
		Home direction	1: CCW	1: CCW	1: CCW
		<input type="checkbox"/> Upper limit signal	II: Open	II: Open	II: Open
		<input type="checkbox"/> Lower limit signal	II: Open	II: Open	II: Open
		<input type="checkbox"/> DOG signal	II: Open	II: Open	II: Open
		<input type="checkbox"/> Home signal	II: Open	II: Open	II: Open
		<input type="checkbox"/> ENG signal	II: Open	II: Open	II: Open
		<input type="checkbox"/> /TP signal	II: Open	II: Open	II: Open
		<input type="checkbox"/> Driver ready signal	II: Open	II: Open	II: Open
		<input type="checkbox"/> Inposition signal	II: Open	II: Open	II: Open
		<input type="checkbox"/> Deviation cnt. clear output	II: Open	II: Open	II: Open

[Setting screen description]

- (a) Basic parameter : Set basic parameter for operating.
- (b) Extended parameter : Set expansion parameter.
- (c) Manual operation parameter: Set parameter for manual operation.

## Chapter 8 Setting Data

- (d) Homing parameter: Set parameter when it is homing.
- (e) I/O signal parameter: Set contact type of external signal (contact A or contact B).

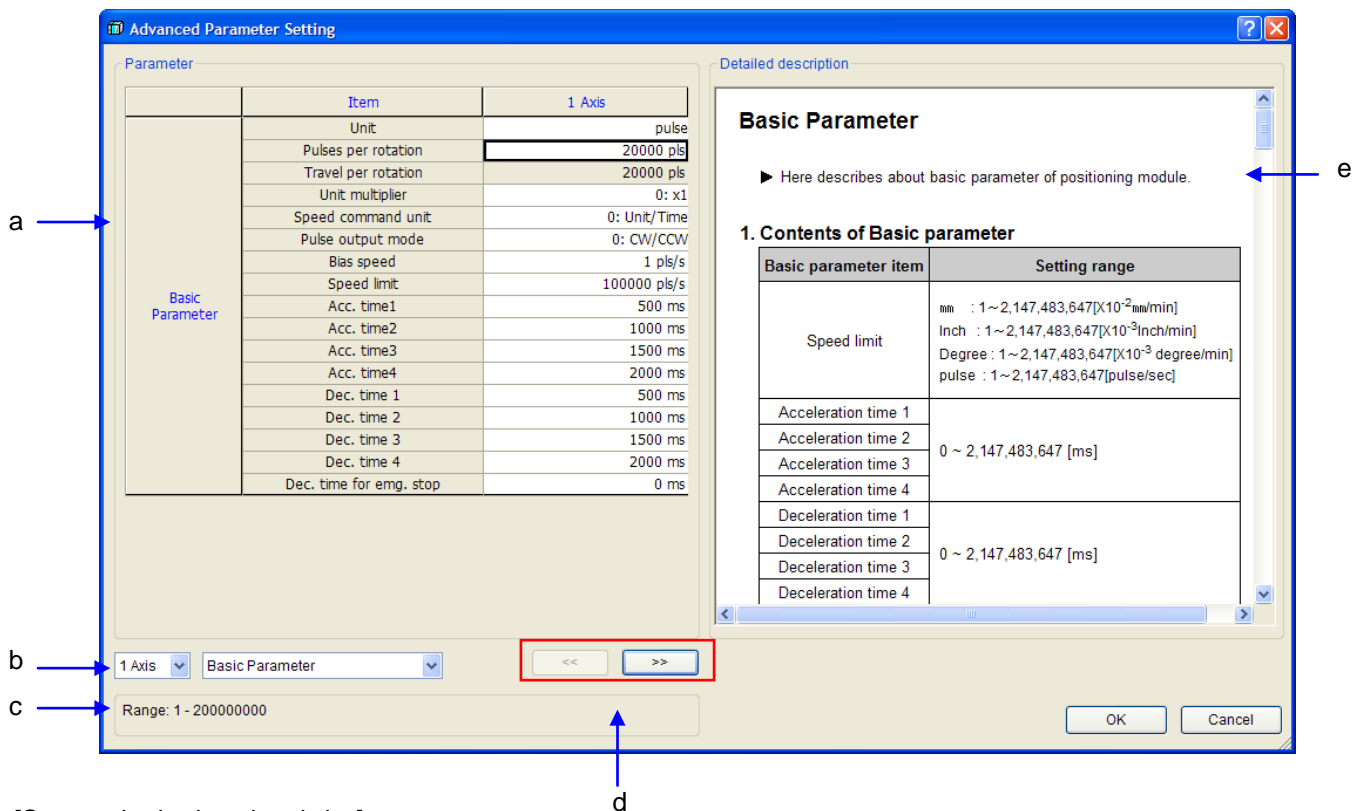
### 8.2.1 Setting detailed parameter

XG-PM provides setting parameter function for convenient setting operation parameter. User can set operation parameter by help of each parameter.

[Sequence]

- (1) Double-click [Axis #X~Z data]→[Parameter] in the project tree. (APM module)
- (2) Double-click [Axis #1~4 data]→[Parameter] in the project tree. (XPM module)
- (3) Double-click [Axis #1~8 data]→[Parameter] in the project tree. (Network type module)
- (4) Progress this sequence; Menu [Edit]->[Detail parameter setting ].
- (5) Set parameter in the communication box of setting detail parameter.

[Communication box]



[Communication box description]

- (a) Parameter : Display parameter Display parameter according to each group. Select each cell and set parameter.
- (b) Axis & Parameter move to between groups : Provide item list for convenient moving between groups. Then, detailed screen also will be new according to moving between groups.
- (c) Display data range : Set range of selected parameter data.
- (d) Moving group button: Set that was displayed moving between groups of parameter screen. Then, detailed screen also will be new according to moving between groups.
- (e) Detail description : Provides help about each item of set parameter.

#### Notes

Application of editing data : Set detail parameter data, only put the [Confirm] button of communication box, can apply editing data. Put the [cancel] button, will not be applied set data.



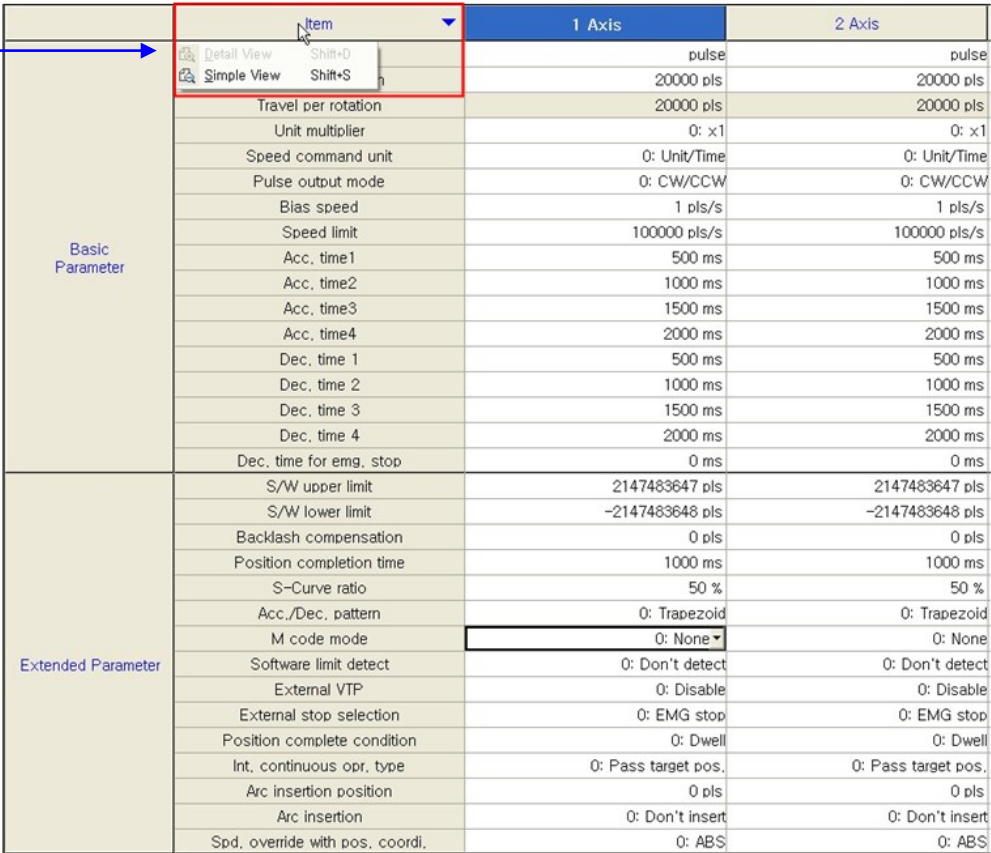
8.2.2 Detail View/Simple View

Use menu (positioned on the top of the operation parameter screen) and provides function (detail view /simple view).  
If user want more detail, Select [detail view] and set parameter.

[Sequence]

- (1) Revitalize operation parameter screen.
- (2) Click [Item] on the upper end.
- (3) When user clicks [item], dropdown menu will be come out. And User can select detail view /simple view.
- (4) Select menu (detail view /simple view) and perform.

[Setting screen]

a		Item ▼		1 Axis	2 Axis
		Detail View Shift+D	Simple View Shift+S		
Basic Parameter	Travel per rotation	20000 pls	20000 pls		
	Unit multiplier	0: x1	0: x1		
	Speed command unit	0: Unit/Time	0: Unit/Time		
	Pulse output mode	0: CW/CCW	0: CW/CCW		
	Bias speed	1 pls/s	1 pls/s		
	Speed limit	100000 pls/s	100000 pls/s		
	Acc. time1	500 ms	500 ms		
	Acc. time2	1000 ms	1000 ms		
	Acc. time3	1500 ms	1500 ms		
	Acc. time4	2000 ms	2000 ms		
	Dec. time 1	500 ms	500 ms		
	Dec. time 2	1000 ms	1000 ms		
	Dec. time 3	1500 ms	1500 ms		
	Dec. time 4	2000 ms	2000 ms		
	Dec. time for emg. stop	0 ms	0 ms		
Extended Parameter	S/W upper limit	2147483647 pls	2147483647 pls		
	S/W lower limit	-2147483648 pls	-2147483648 pls		
	Backlash compensation	0 pls	0 pls		
	Position completion time	1000 ms	1000 ms		
	S-Curve ratio	50 %	50 %		
	Acc./Dec. pattern	0: Trapezoid	0: Trapezoid		
	M code mode	0: None ▼	0: None		
	Software limit detect	0: Don't detect	0: Don't detect		
	External VTP	0: Disable	0: Disable		
	External stop selection	0: EMG stop	0: EMG stop		
	Position complete condition	0: Dwell	0: Dwell		
	Int. continuous opr. type	0: Pass target pos.	0: Pass target pos.		
	Arc insertion position	0 pls	0 pls		
	Arc insertion	0: Don't insert	0: Don't insert		
	Spd. override with pos. coordi.	0: ABS	0: ABS		

[Setting screen description]

- a) Detail view /Simple view :
  - Detail view: Display all parameter on the screen.
  - Simple view: Display parameter which is necessary parameter for operating.

8.2.3    Setting Input/Output signal parameter (For XPM, APM module only)

Provides function (Setting input/output signal parameter at a time.) for convenient (setting easily parameter of input/output signal).  
In case that check input/output signal parameter,  
When user checks input/output signal parameter, it can be set parameter several of axis at a time. If user didn't check the check box, it can be set only one.

[Setting screen]

I/O Signal Parameter	<input checked="" type="checkbox"/> Upper limit signal	N.Close	N.	N.Close	N.Close	N.Close
	<input type="checkbox"/> Lower limit signal	N.Open		N.Open	N.Open	N.Open
	<input type="checkbox"/> DOG signal	N.Close		N.Open	N.Open	N.Open
	<input type="checkbox"/> Home signal		N.Open	N.Open	N.Open	N.Open
	<input type="checkbox"/> EMG signal		N.Open	N.Open	N.Open	N.Open
	<input type="checkbox"/> VTP Signal		N.Open	N.Open	N.Open	N.Open
	<input type="checkbox"/> Driver ready signal		N.Open	N.Open	N.Open	N.Open
	<input type="checkbox"/> Inposition signal		N.Open	N.Open	N.Open	N.Open
	<input type="checkbox"/> Deviation cnt, clear output		N.Open	N.Open	N.Open	N.Open

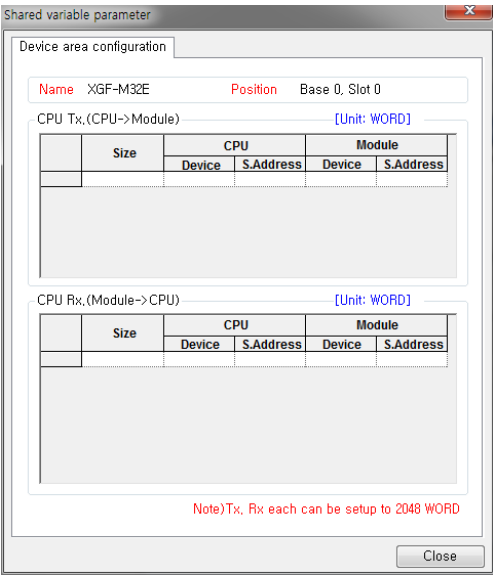
8.2.4    Shared variable parameter view (For Motion Control Module only)

The Motion Control Module can set the shared variable area to share the data between CPU module and Motion Control Module. You can set shared variable parameters in XG5000 and XG-PM provides the function to check the shared variable parameters.

[Sequence]

- (1) Double-click the [shared variable parameter] in a project tree.

[Setting screen]



[Setting screen description]

- (a) Module information : Displays the infomration of the currently selected moudle.
- (b) CPU transmission : Sets the shared variabes transmitted to the module from CPU.
- (c) CPU reception : Sets the shared variabes transmitted to the CPU from module.

8.3 Setting Servo Parameter

(For Network Type XPM/Standard network type XPM only)

[Sequence]

- (1) Double-click [Axis #1~8 data]→[Servo Parameter] in the project tree.
- (2) Input data after clicking the shell you want to set up.

[Setting screen]

[Network XPM setting screen]

Servo parameter type: Motor and Driver

Servo parameter change during operation: ☐ Allow Servo Parameter(Individual) Change during Operation

1 Axis	Address	Item	Parameter
Motor and Driver Block	P1-01	Motor ID *	8
	P1-11	Drive ID *	2
	P1-12	Encoder ID *	ENC-P
	P1-13	Encoder pulses *	32768 ppr
	P1-14	Pulses per rotation	131072 pls
	P1-15	Comm. speed *	0: RS232 - 9600 [bps]
	P1-18	Serial Comm. ID *	1
	P1-19	Parameter lock set.	OFF
	P1-20	ABS origin *	OFF

[Standard network XPM setting screen]

Servo parameter type: All

Servo parameter change during operation: ☐ Allow Servo Parameter(Individual) Change during Operation

Index	Name	Current Value	Initial Value	Access
2014:00	Torque command, Notch filter	0x04	0x04	rw
2014:01	Tcnfil A	0x0FA0	0x0FA0	rw
2014:02	Tcnfil B	0x0FA0	0x0FA0	rw
2014:03	Tcnfil C	0x0FA0	0x0FA0	rw
2014:04	Tcnfil D	0x0FA0	0x0FA0	rw
2015:00	High setting	0x04	0x04	rw
2016:00	Observer parameter	0x07	0x07	rw
2017:00	Model control Gain	0x04	0x04	rw
2018	Overshooting control filter	0x05DC	0x05DC	rw
2019:00	Model Control Anti-resonance frequency	0x04	0x04	rw
201A:00	Model Control resonance frequency	0x04	0x04	rw
201B	Low pass filter of Gain Switching	0x0000	0x0000	rw
201C	Internal velocity comand limit	0xFFFF	0xFFFF	rw
201D	Position command error 1 level	0xFFFFFFFF	0xFFFFFFFF	rw
201E	Torque limit at Sequence operation	0x04B0	0x04B0	rw
201F	In position near range	0x000001F4	0x000001F4	rw

## Chapter 8 Setting Data

[Setting screen description]

- (a) Servo parameter type : Shows specific parameter group
- (b) Axis display : Shows the axis under edition
- (c) Data setting screen : Sets up the data
- (d) Servo parameter change during operation: Sets up whether to apply the servo parameter change during operation.  
If checked, the currently set data will be written to the module
- (e) Read only parameter : The data that should be not edited by the user is displayed with gray background
- (f) Current value : Shows current value of the servo parameter.
- (g) Initial value : Shows initial value of the servo parameter.
- (h) Access : Shows 'Read/Write' property of the servo parameter.

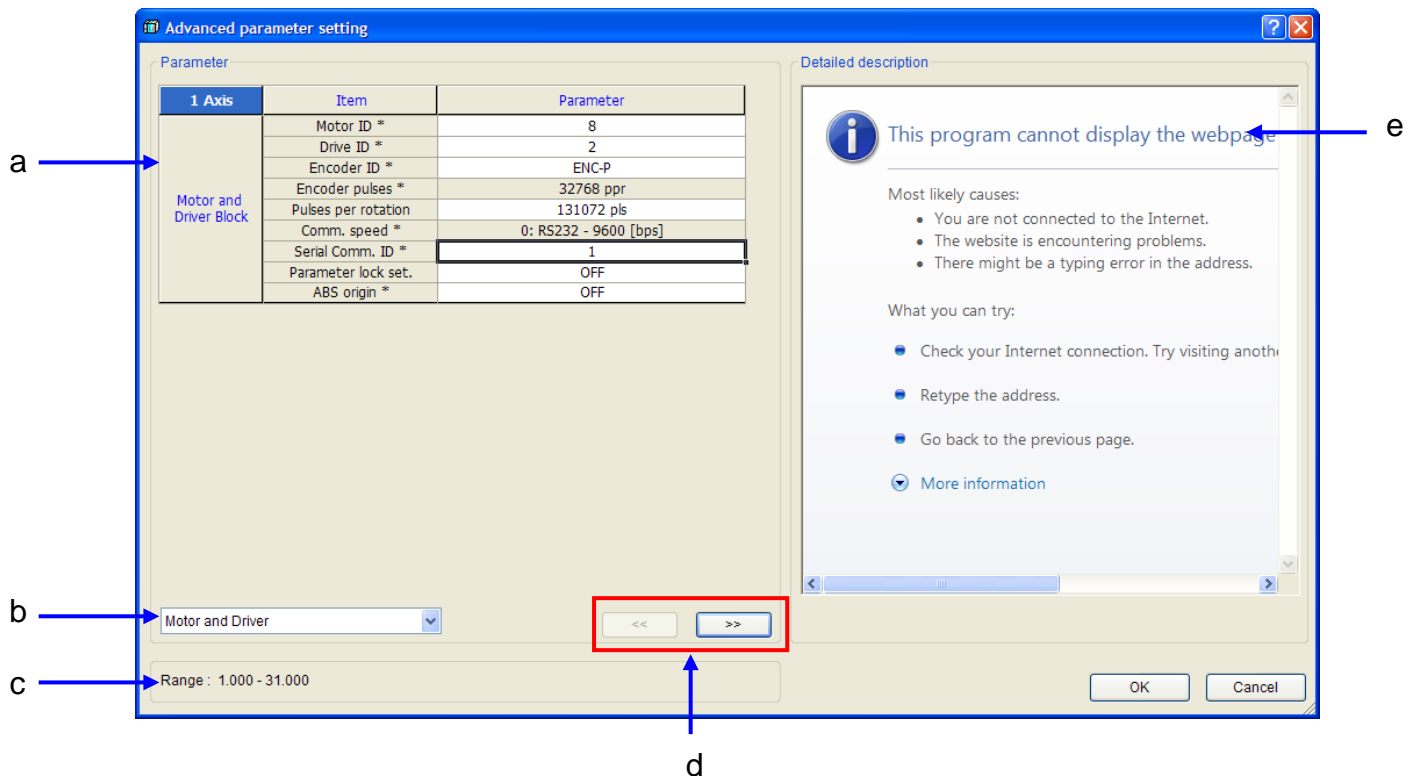
### 8.3.1 Detailed Parameter Setting

XG-PM software provides “detail parameter setting” function so that the user can set up the operating parameter easily. You can set up the servo parameter easily referring to the detailed description of each parameter item.

[Sequence]

- (1) Double-click [Axis #1~8 data]→[Servo Parameter] in the project tree.
- (2) Click menu [edit]→ [Detail parameter setting]
- (3) Set up the parameter at the [parameter detailed setting dialog box]

[Setting screen]



[Setting screen description]

- (a) Parameter : shows parameter group. Select the each shell and set up the parameter
- (b) Axis and parameter group shift  
: Provides item list so that you can easily move between groups and axes of the parameter. At this time, detailed description screen refreshes automatically.
- (c) Data range : Shows the data range of the currently selected parameter item.

- (d) Group shift button : Moves between parameter groups. At this time, detailed description screen refreshes automatically.
- (e) Detailed description : Provides detailed description on each parameter item.

8.3.2 Individual Writing of the Servo Parameter

XG-PM software package provides “Individual Writing of the Servo Parameter” function so that you can modify and check the servo parameter individually.

[Sequence]

- (1) Double-click [Axis #1~8 data]→[Servo Parameter] in the project tree.
- (2) Check “Allow Servo Parameter (Individual) Change during Operation” at “Servo parameter change during operation”
- (3) After modifying the shell, press “Enter” key or cancel the cursor from the current shell

Tip

Condition for “Servo parameter change during operation”  
- The module should be “Online” status, and servo axis should be connected to the module. If not, “Servo parameter change during operation” is not activated.

Servo parameter type

Motor and Driver

Servo parameter change during operation

☐ Allow Servo Parameter(Individual) Change during Operation

1 Axis	Address	Item	Parameter
Motor and Driver Block	P1-01	Motor ID *	8
	P1-11	Drive ID *	2
	P1-12	Encoder ID *	ENC-P
	P1-13	Encoder pulses *	32768 ppr
	P1-14	Pulses per rotation	131072 pls
	P1-15	Comm. speed *	0: RS232 - 9600 [bps]
	P1-18	Serial Comm. ID *	1
	P1-19	Parameter lock set.	OFF
	P1-20	ABS origin *	OFF

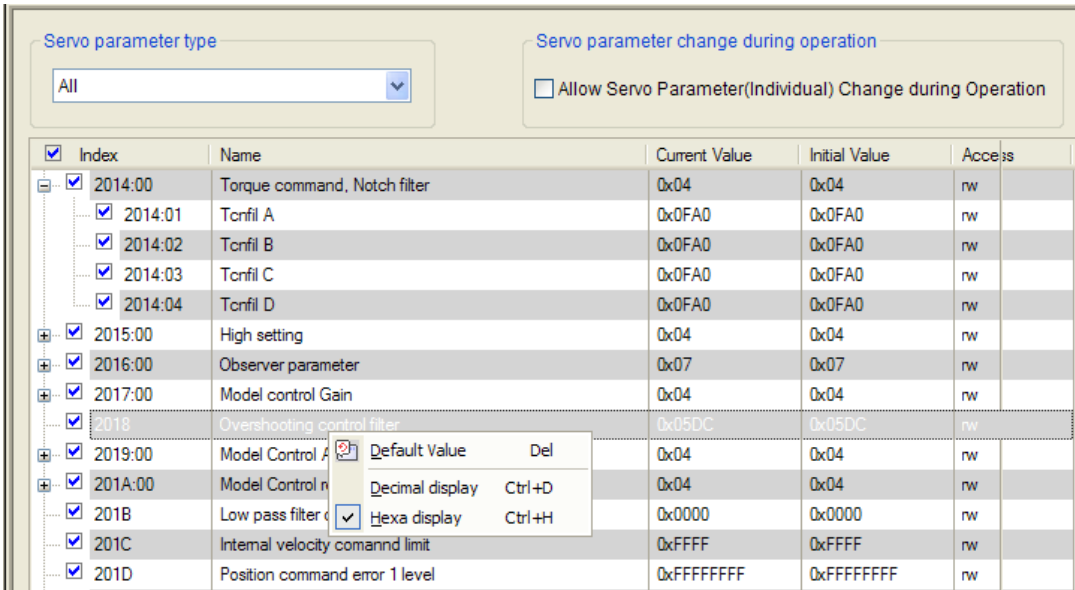
8.3.3 Servo Parameter Display Method (Only applied to standard network type XPM)

XG-PM software provides two ways of decimal and hexadecimal display to express the number for user convenient.

[Sequence]

- (1) In project tree, double-click [#1~8 Axis data] → [Servo Parameter].
- (2) In data setting screen, after clicking the right mouse button, click [Decimal Display] or [Hexa Display] menu.

[Setting screen]



[Setting screen description]

- (a) [Decimal display] / [Hexa display]  
: [Decimal display] displays all current value and initial value of the servo parameter as decimal number and [Hex display] displays all current value and initial value of the servo parameter as hexadecimal.

8.3.4 Saving Servo Parameter at EEPROM (Only applied to XPM type)

XG-PM software package provides a function to save the servo parameter at EEPROM

[Sequence]

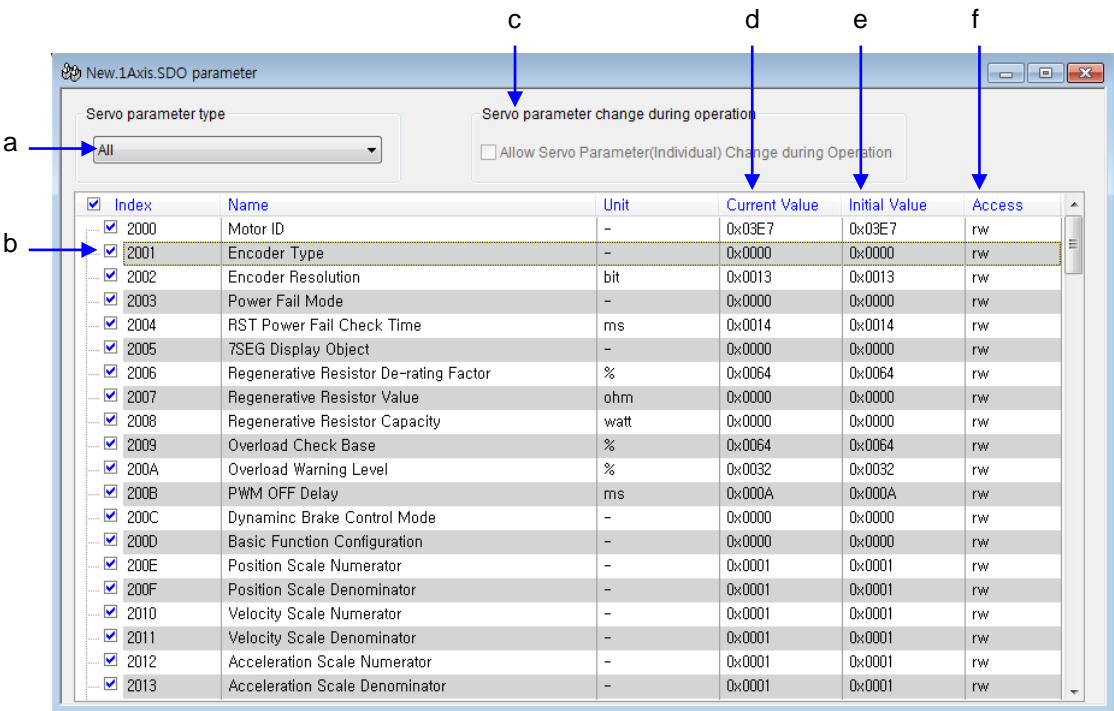
- (1) Set the servo parameter
- (2) Press [Online] → [Save Servo Parameter to EEPROM]

8.4 Setting SDO Parameter(For Motion Control Module only)

[Sequence]

- (1) Double-click [Slave data]->[#1~32 Axis Drive]->[SDO parameter] in a project tree.
- (2) Click the targeted cell and input data.

[Setting screen]



[Setting screen description]

- (a) Servo parameter type : Shows the relevant group in the data setting screen
- (b) Data setting screen: Sets the data.
- (c) Servo parameter change during operation: Sets whether servo parameter during operation is applied or not. If you check the checkbox, the currently setting data will be written in a module.
- (d) Current Value: Displays the current value of servo parameters.
- (e) Initial Value: Displays the initial value of servo parameters.
- (f) Access: Displays the Read/Write attributes of servo parameters.  
(ro: Read-only parameter, rw: Read/Write-enable parameter)

### 8.4.1 Servo Parameter change during operation

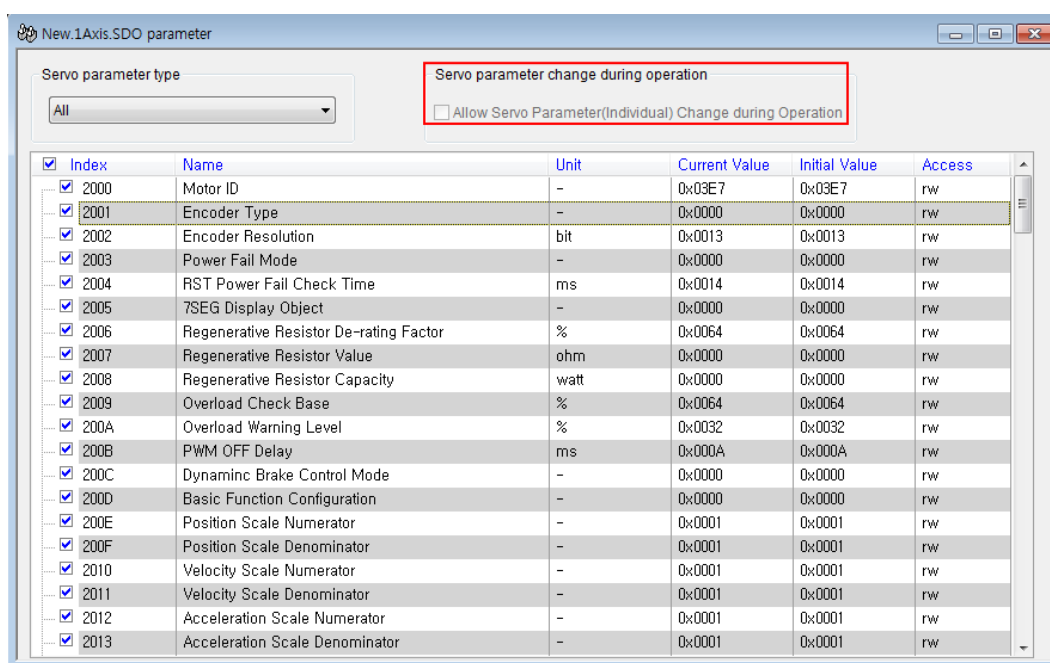
The XG-PM software package makes users change and check the SDO parameters individually and provides the modification function during SDO parameter operation for a test run.

- (1) Double-click [Slave parameter]->[#1~32 axis drive]->[SDO parameter] in a project tree.
- (2) In the items of Modification during Servo parameter operation, check the related checkbox.
- (3) After changing the targeted cell, press Enter or move the mouse cursor from the current cell.

#### Notes

Conditions to modify parameters during SDO parameter operation

- In this case, the module should be online and should be connected to the relevant slave and module. Otherwise, the servo parameter change during operation will not be activated in a SDO parameter screen.





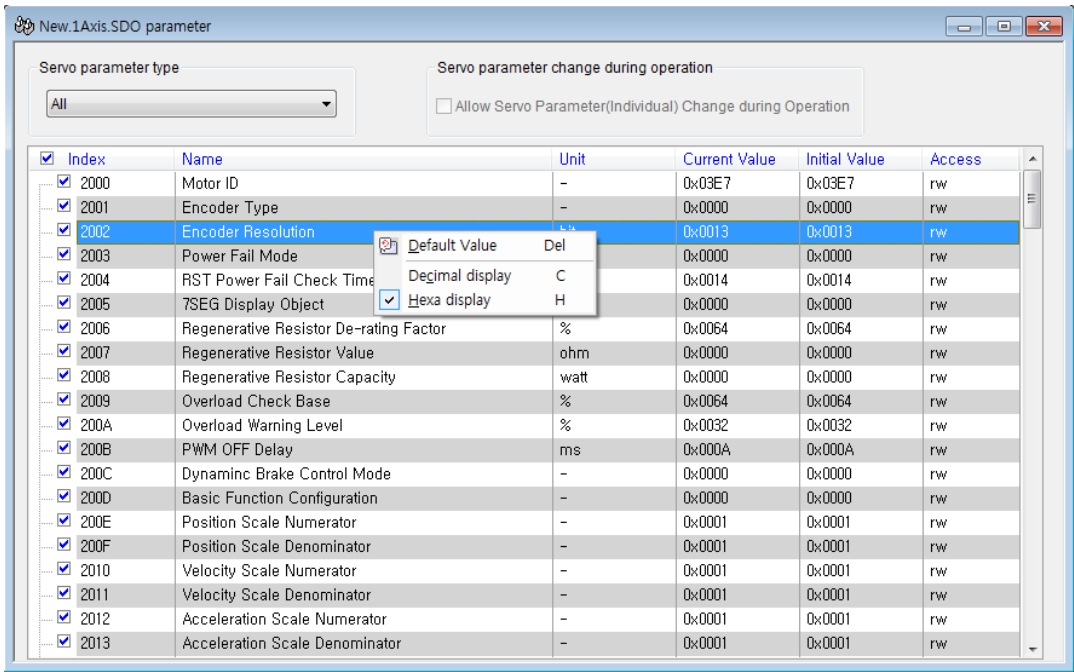
8.4.2 Changing the display method of SDO parameter

For convenience of setting and checking SDO parameters, the XG-PM software package provides two methods; hexadecimal number, decimal number.

[Sequence]

- (1) Double-click [Slave parameter]->[#1~32axis drive]->[SDO parameter] in a project tree.
- (2) After clicking the right mouse in a data setting screen, click [Decimal display] or [Hexa display].

[Setting screen]



[Setting screen description]

- (a) Decimal display: Display all current values and initial values of Servo parameters as a decimal number.
- (b) Hexa display: Display all current values and initial values of Servo parameters as a hexadecimal number.

8.4.3 Save Slave parameter to EEPROM

XG-PM software package provides 'Save Slave parameter to EEPROM' function that saves the slave parameter set by a user to EEPROM.

[Sequence]

- (1) Set the Servo parameters.
- (2) Press [Online]->[Save Slave parameter to EEPROM].

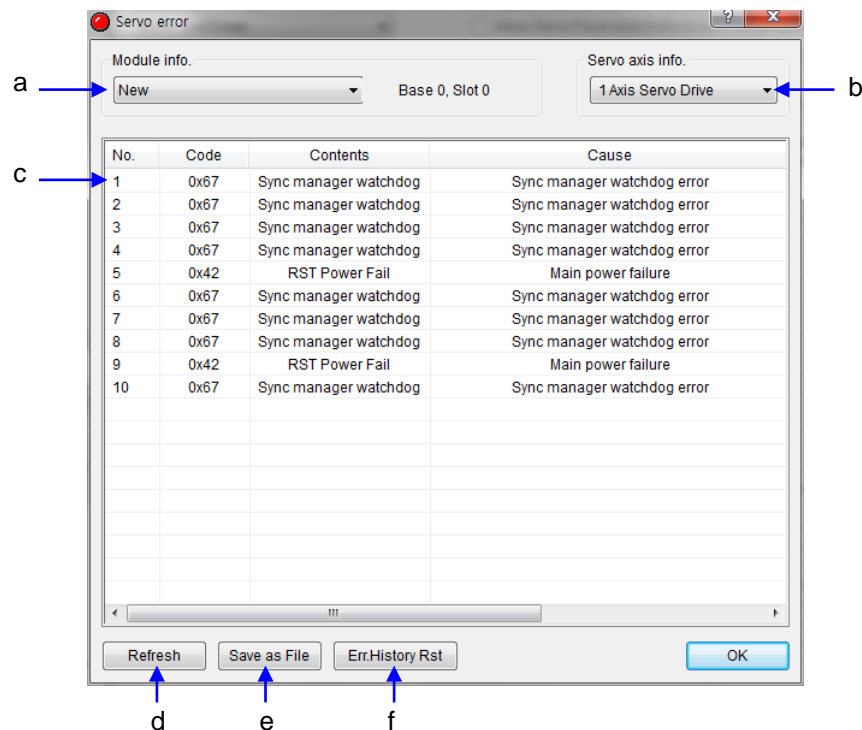
### 8.4.4 Slave error history view

XG-PM software package provides the function of Servo error history view through which a user can check the error of the inside of a Servo drive.

[Sequence]

- (1) Select [Slave parameter]->[#1~32 axis drive] in a project tree.
- (2) Press [View]->[Slave error history] .

[Setting screen]



[Setting screen description]

- (a) Module info.: Selects the module to read Servo error history
- (b) Servo axis Info.: Selects the axis to read error history.
- (c) Error history: Displays the Servo error history on a screen sequentially.
- (d) Refresh: Reads Servo error history newly.
- (e) Save as File: Saves Servo error history as a file.
- (f) Err. History Rst: Deletes all Servo error history.

### 8.4.5 Save Servo error history as file

XG-PM software package provides the function of 'Save Servo error history as file' set by a user.

[Sequence]

- (1) Press the [Save as file] button in a Servo error history screen.
- (2) In the dialog box for 'Save As', input the file name to be saved and press Save button.

## 8.5 Setting Position Data

[Sequence]

- (1) Double-click [Axis #X~Z data]→[Position data] in the project tree. (APM module)  
 Double-click [Axis #1~4 data]→[Position data] in the project tree. (XPM module)  
 Double-click [Axis #1~8 data]→[Position data] in the project tree. (Network type XPM, standard network type XPM)
- (2) Input data after selecting cell which you want to set.

[Setting screen]

	1 Ax	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]	Sub. axis setting	Cir. int. auxiliary point	Cir. int. mode	Circular int. turns	Helical int.
a	1	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
b	2	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	3	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	4	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	5	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	6	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	7	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	8	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	9	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	10	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	11	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	12	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	13	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	14	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	15	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	16	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	17	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	18	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	19	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	20	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	21	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	22	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	23	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	24	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	25	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	26	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	27	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	28	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	29	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	30	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	31	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	32	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	33	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	34	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	35	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	36	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	37	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	38	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	39	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
	40	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use

[Setting screen description]

- (a) Display axis : Show you axis that it is setting.
- (b) Display step : Display the number of operation steps.

### 8.5.1 View in detail/simple

It provides function (detail view/simple view) by menu where it is positioned at the top of operation screen. If user set only elementary factor of operation data by function (detail view/ simple view), user can select simple view for setting operation data. If user wants for more detail setting, user can select detail view for setting operation data.

[Sequence]

- (1) Revitalize operation data screen.
- (2) Click [#X~axisY] of the top of screen. (APM module)  
Click [#1~axis4] of the top of screen. (XPM module)  
Click [#1~axis8] of the top of screen. (Network type XPM, standard network type XPM)  
When click [#1~axis4], drop down menu will be appeared and can see menu (detail view/simply view).
- (3) Select detail view or simply view and execute.

[Setting screen]

a →

1 Ax▼	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.
Detail View	Shift+D	NG, END	0	0	No. 1	No. 1
Simple View	Shift+S	NG, END	0	0	No. 1	No. 1
3	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1
4	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1
5	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1
6	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1
7	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1
8	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1
9	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1
10	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1

[Description of setting screen]

(a) Detail view/Simple view

: Detail view display editing item of whole operation data. Simple view display elementary item of the operation data.

#### Notes

This is the displayed item of operation data at the screen when select detail view menu.

<XPM module, Network type XPM, standard network type XPM >

1 Ax▼	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]	Sub. axis setting	Cir. int. auxiliary point	Cir. int. mode	Circular int. turns	Helical int.
1	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1	0	0	None	0	Middle-Point	0	Don't Use

<APM module>

X axis ▼	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	Cir. int. auxiliary point [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]	Circular int. dir.
1	ABS	POS	END	SNG	0	0	0	No. 1	0	0	CW

This is the displayed item of operation data at the screen when select simply view menu.

<XPM module, Network type XPM, standard network type XPM >

1 Ax▼	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	0	0	No. 1	No. 1	0	0

<APM module>

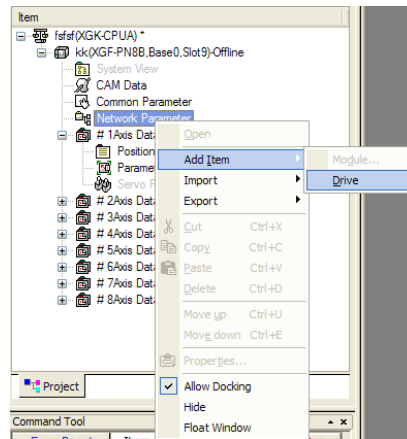
X axis ▲	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	ABS	POS	END	SNG	0	0	No. 1	0	0

## 8.6 Network Parameter Setting (Only applied to standard network type XPM)

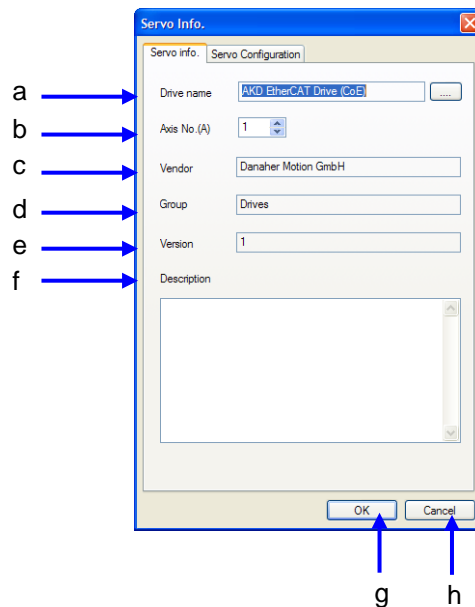
[Sequence]

- (1) In project tree, after clicking [Network Parameter], click right mouse button and click [Add Item] → [Drive].
- (2) In servo information dialog box, set up driver name and axis number and click OK

[Setting screen]



[Servo Information dialog box]



[Dialog description]

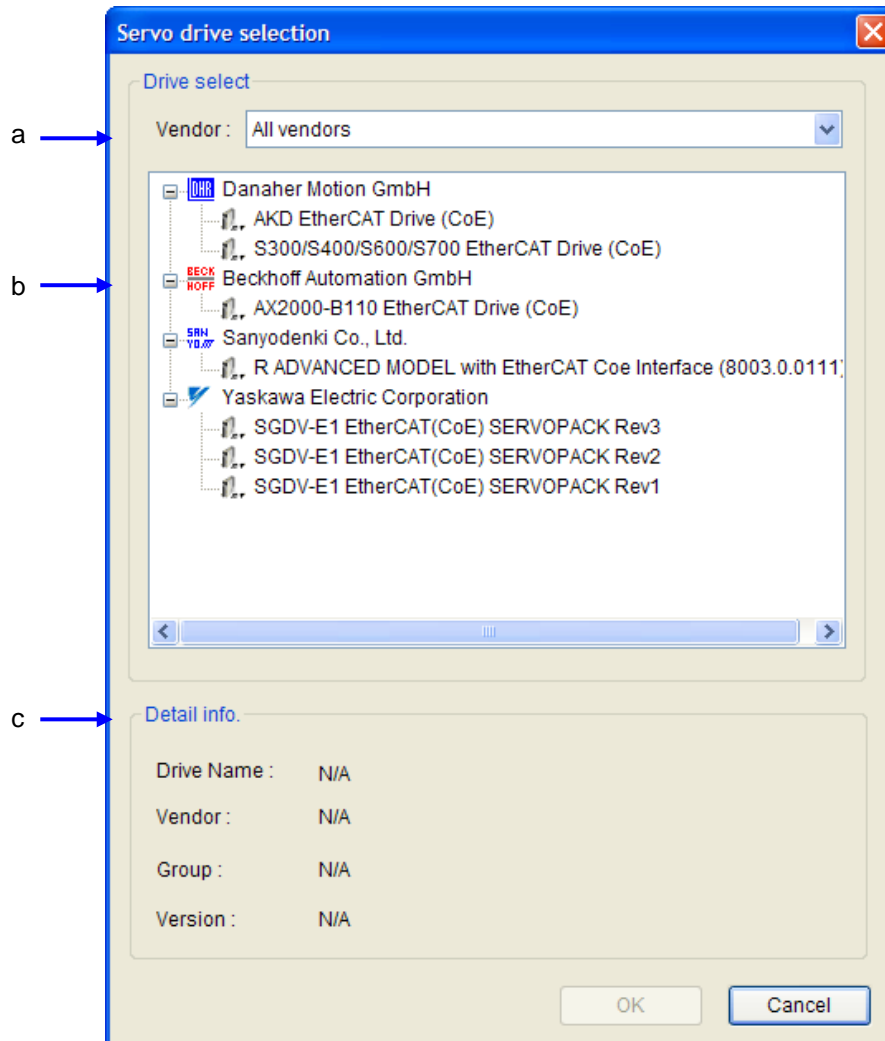
- (a) Drive name : Selects the device and displays device name.
- (b) Axis No. : Inputs axis no. of the selected device.
- (c) Vendor : Shows maker name of the selected device.
- (d) Group : Shows type of the selected device.
- (e) Version : Shows the version of the selected device.
- (f) Description : Inputs servo information description.
- (g) OK : Ends the dialog box. After ending the dialog box, servo information is saved.
- (h) Cancel : Ends the dialog box.

### 8.6.1 Servo drive Selection

[Sequence]

- (1) Click '...' on the servo information dialog box.
- (2) Select the device in the servo drive selection dialog box and click OK.

[Servo Information Dialog Box]



[Dialog description]

- (a) Classification: by using this item list, you can see the applicable group at the driver selection screen.
- (b) Drive selection: selects the drive.
- (c) Detail info.: shows detailed information of the selected device.

#### Note

Device information shown at the servo drive selection dialog box is in "Drive Info" folder of the XG-PM installation path. When adding new device, save xml file provided from the maker in Drive Info folder and restart XG-PM.

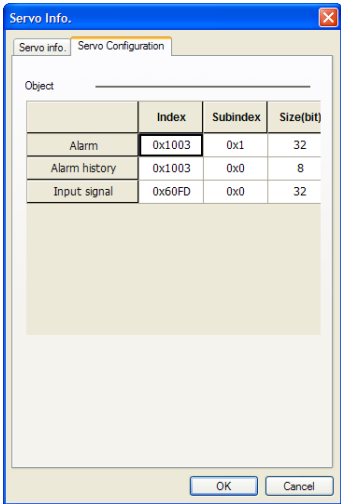
8.6.2 Modifying Servo Setup Information

Servo setup information has object information on alarm information/ alarm history information/ input signal information. That information is not defined by xml file of the device maker and set up automatically when adding the servo drive. If servo setup information doesn't coincide with actual device, there may be limits on using the device. So you have to modify the servo setup information.

[Sequence]

- (1) Select the servo configuration tap in the Servo Info. dialog box.
- (2) In the servo configuration tap, select item you want to modify and double-click it.
- (3) In the object selection dialog box, select object you want to modify and click OK.

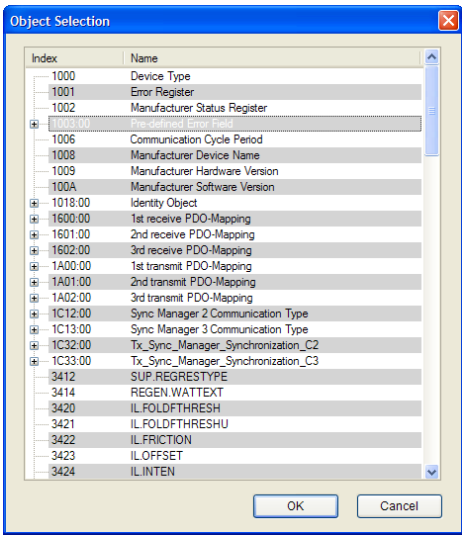
[Servo information dialog box]



[Dialog box description]

- (a) Alarm: Shows object on alarm information.
- (b) Alarm history information: Shows object on alarm history information.
- (c) Input signal: Shows object on input signal information.
- (d) Use: Selects whether to use applicable servo information.

[Servo information dialog box]



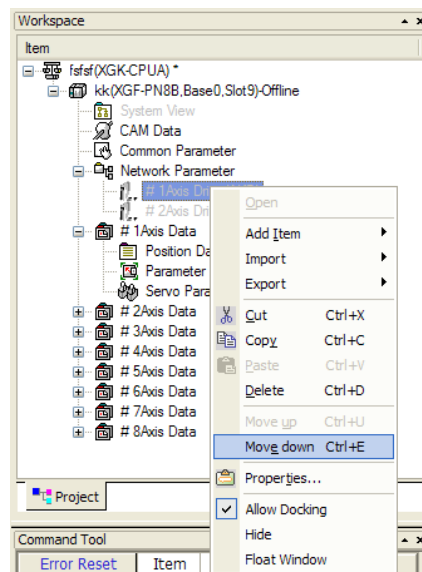
## Chapter 8 Setting Data

### 8.6.3 Up/Down Network Parameter

[Sequence]

- (1) After clicking [Network Parameter] in the project tree, select the drive you want to move
- (2) After click right mouse button, click [Move down] or [Move up] menu.

[Setting screen]



#### Note

Sequence of network parameter should coincide with physical connection sequence of the network drive.

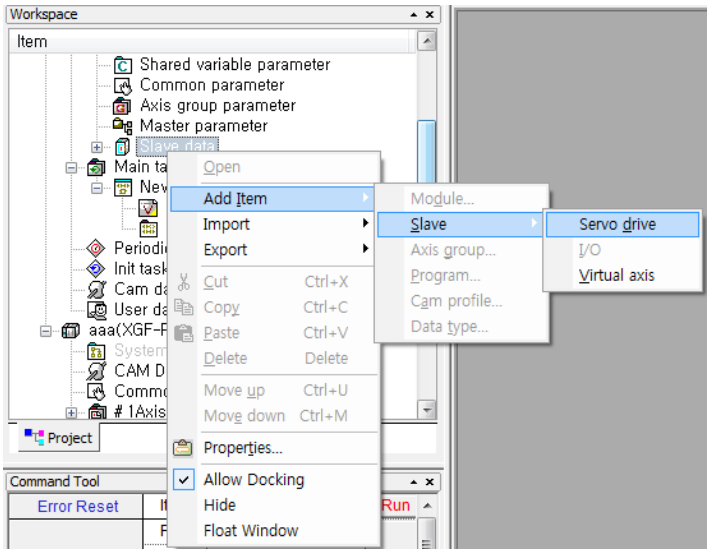


8.7 Slave Parameter Setting (For Motion Control Module only)

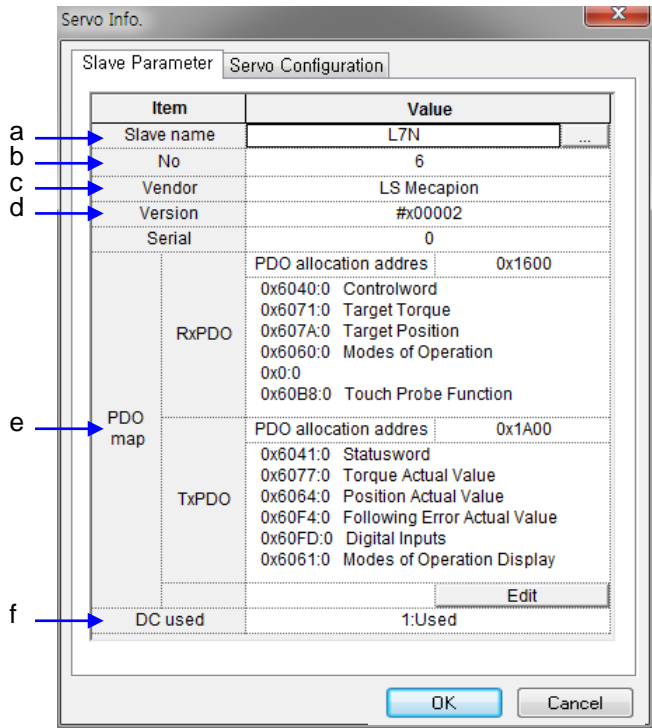
[Sequence]

- (1) After selecting [Slave data] in a project tree and clicking the right mouse, click [Add Item] → [Slave].
- (2) Select the slave type to be added.(Choose one among Servo drive, I/O, Virtual axis)
- (3) In the slave information dialog box, set the Servo information including slave name, station No, PDO map, etc. and press the OK button.

[Setting screen]



[Slave information dialog box]




## Chapter 8 Setting Data

[Dialog description]

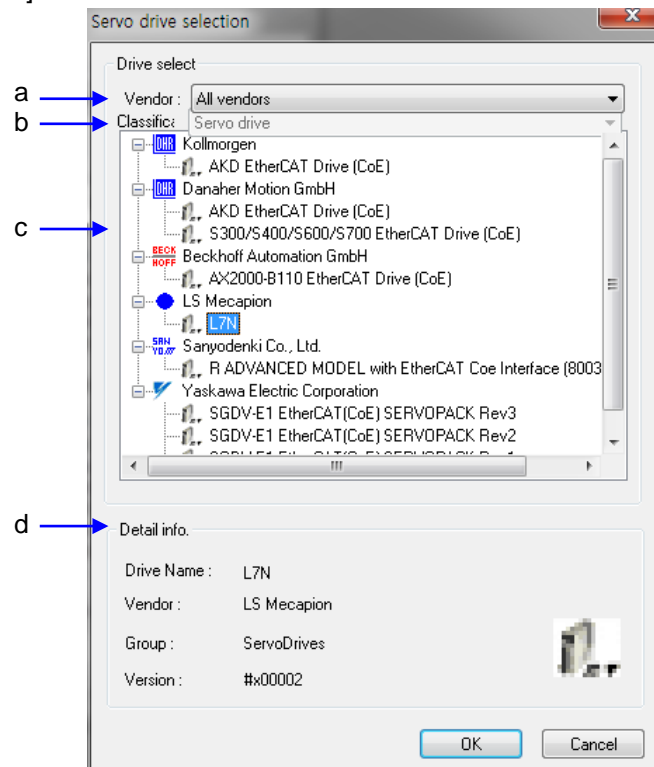
- (a) Slave name: Selects the device and displays the selected device's name.
  - (b) No. : Inputs the station no. to which the selected device will be applied.
  - (c) Vendor: Displays the vendor name of the selected device.
  - (d) Version: Displays the version of the selected device.
  - (e) PDO Map: Displays the slave's PDO mapping information.
  - (f) Whether using DC or not: Determines whether using DC(Distributed Clock) or not.
- (For more details, refer to Chap.5.6 of XDL-N series manual.)

### 8.7.1 Slave Selection

[Sequence]

- (1) In a slave information dialog box, click the  button.
- (2) Select the device in a slave information dialog box and press the OK button.

[Servo information dialog box]



[Dialog box description]

- (a) Vendor: Selects the slave's manufacturer; all manufacturers or classification by manufacturers
- (b) Classification: Shows the relevant group of the drive on a screen.
- (c) Select drive: selects the drive.
- (d) Detailed info.: Displays the detailed information on the selected device.

#### Note

For the slave information displayed in a slave information dialog box, Servo drive information is saved to the DriveInfo folder and I/O information is saved to the IOInfo folder respectively. To add new slaves, you need to save the xml file provided by the manufacture to the relevant folder and restart XG-PM.

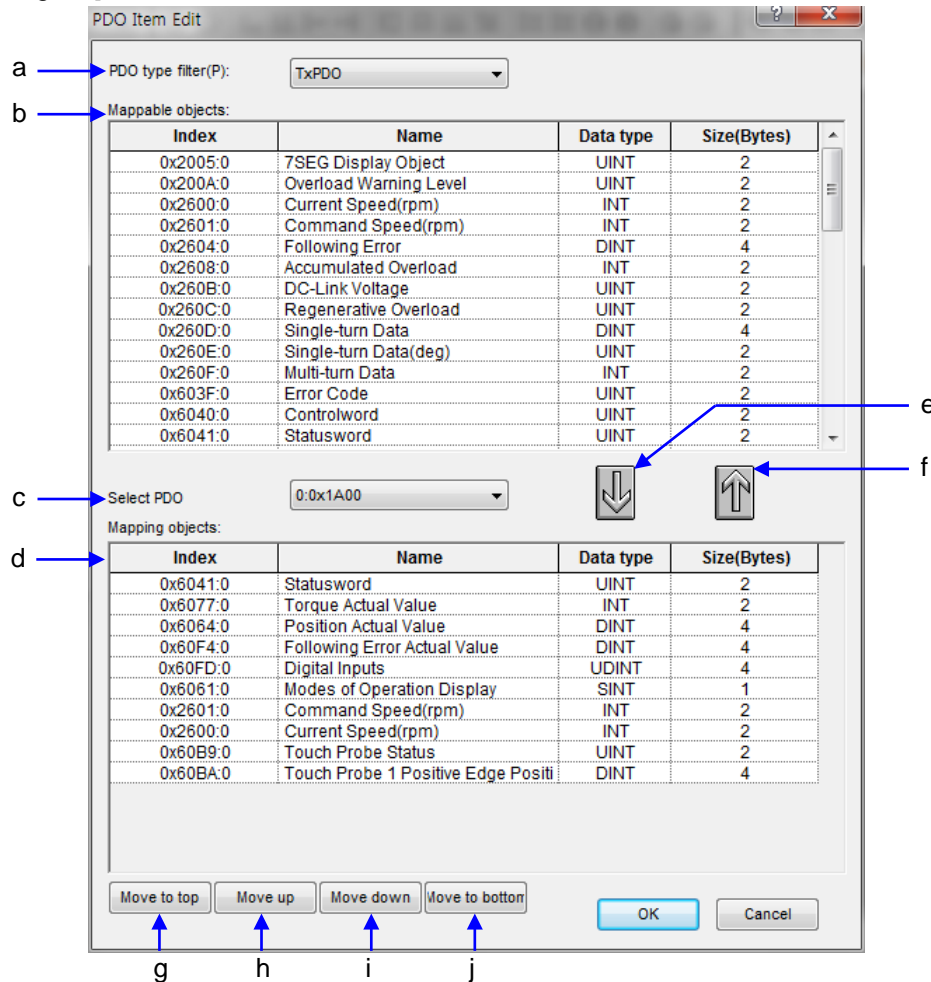
### 8.7.2 PDO Item Edit

XG-PM provides the function of editing PDO items that can modify the PDO settings of a slave. You can modify PDO assignment information or mapping information through the PDO items editing function. PDO items can be edited only if the PDO settings of the device information provided by the slave manufacturer can be modified.

[Sequence]

- (1) Click the editing  button in a slave information dialog box.
- (2) Set the PDO in the dialog box for editing PDO items and click the OK button.

[Servo information dialog box]



[Dialog box description]

- (a) PDO type filter: Select the PDO type to be modified.(Choose one among TxPDO, RxPDO)
- (b) Mappable objects: Display the mappable objects in the PDO.
- (c) Select PDO: Select the PDO whose item should be modified.
- (d) Mapping objects: Display the mapping objects in the selected PDO.
- (e) Add object: Add the selected object from mappable objects to the PDO.
- (f) Remove object: Remove the selected object from mapping objects.
- (g) Move to top: Position the selected object on the top of mapping objects.
- (h) Move up: Step up the selected object a notch.
- (i) Move down: Step down the selected object a notch.
- (j) To the bottom: Position the selected object on the bottom of mapping objects.

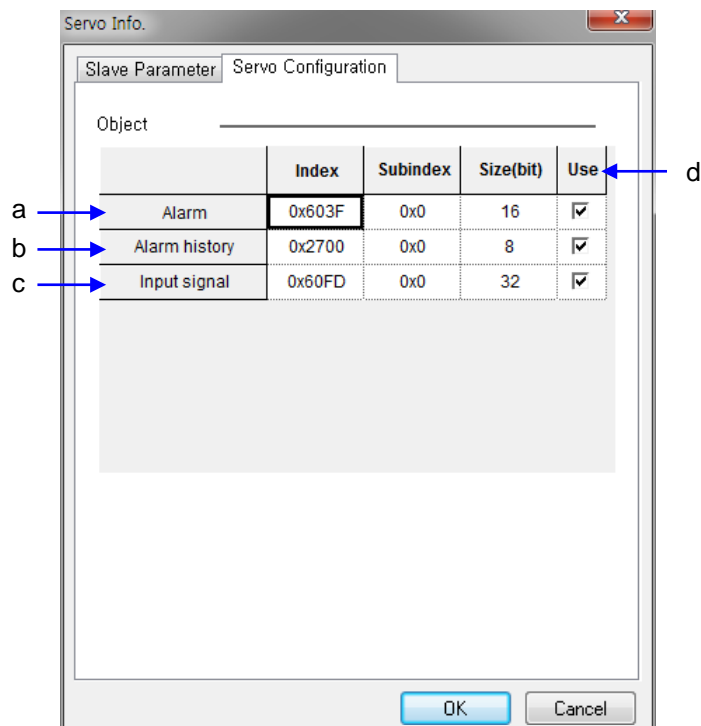
### 8.7.3 Slave Configuration

Slave configuration has the object information including alarm information/alarm history information/Input signal information. When the device maker adds the Servo drive with the contents that are not defined in the xml file, the relevant information will be automatically set. In case the Servo configuration does not match with the actual device, it may cause limits and restrictions on using the device so users should modify the Servo configuration personally.

[Sequence]

- (1) Select the Servo configuration tab in a slave information dialog box.
- (2) Select and double-click the settings to be modified in a Servo configuration tab.
- (3) Select the object to be changed in the object selection dialog box and click the OK button.

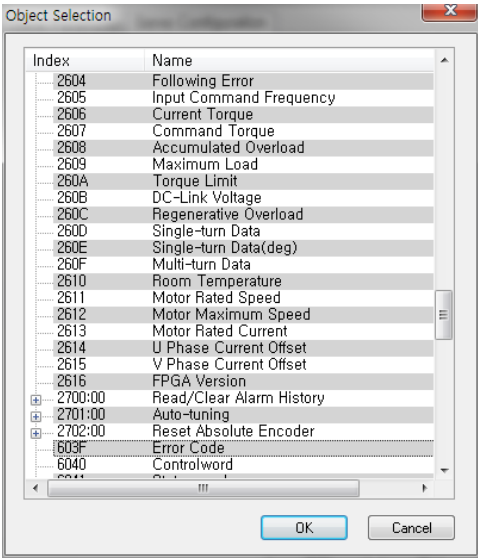
[Servo information dialog box]



[Dialog box description]

- (a) Alarm: Displays the object information where the alarm information is located.
- (b) Alarm history: Displays the object information where the alarm history is located.
- (c) Input signal: Displays the object information where the input signal information is located.
- (d) Use: Determines whether the relevant Servo information is used or not.

[Object Selection dialog box]

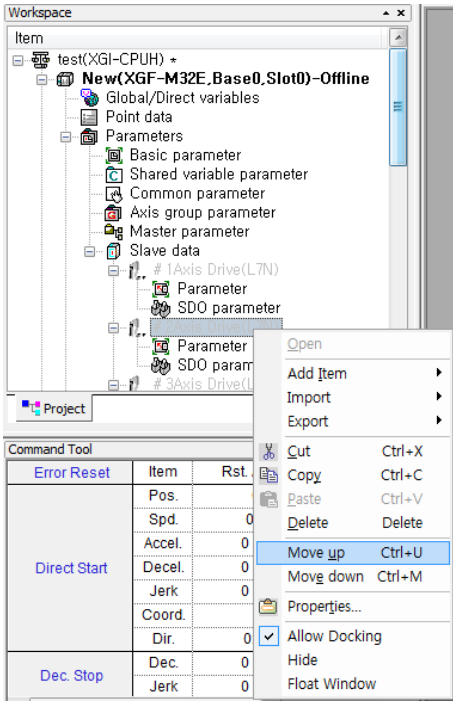


8.7.4    Move up/down slave parameter

[Sequence]

- (1) After clicking the [Slave data] in a project tree, select the drive to be moved.
- (2) After clicking the right mouse, clock [Move Up] or [Move Down] .

[Servo information dialog box]



**Note**

The procedures to add slave parameters should be set in the same way of the procedure to connect slaves physically.

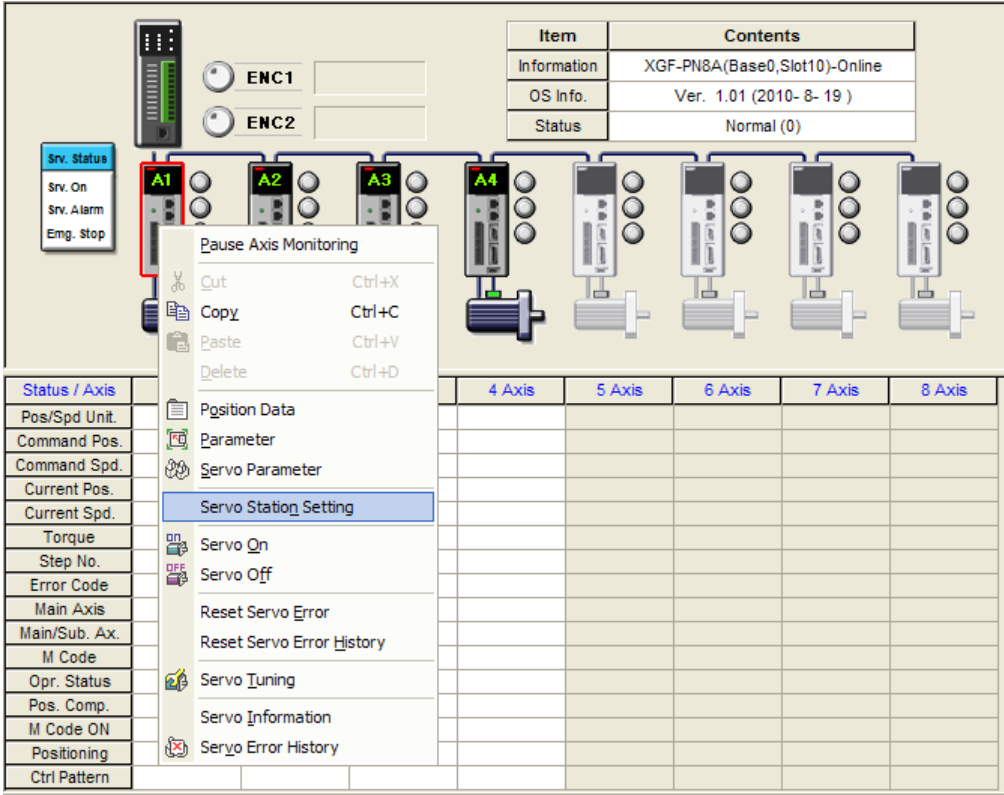
8.8 Servo Station Setting

(Only applied to Network Type XPM, Standard network type XPM)

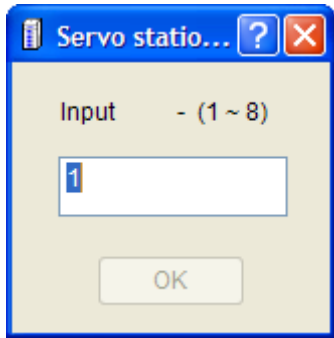
[Sequence]

- (1) Activate the “System view” screen
- (2) Locate the mouse cursor on the servo drive you want to set up the station and click the right mouse button. And click “Servo station setting” menu.
- (3) Set up the servo station at the servo station setting dialog box and press OK button

[Setting screen]

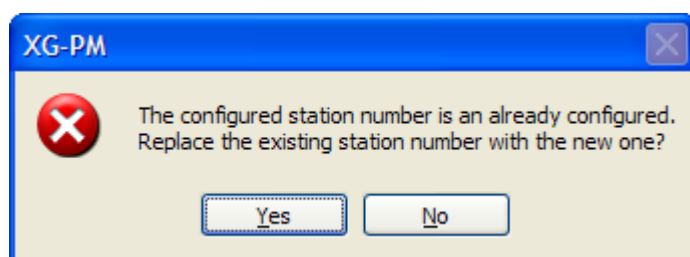


[Servo station setting dialog box]



### 8.8.1 Auto Detection of Duplicated Servo Station

Servo station can be set by software setting in the XG-PM software package. When setting the servo station, since there is “Auto Detection of Duplicated Servo Station” function, you can prevent duplicated servo station setting. If there is duplicated servo station, the following warning message shows.



If you press “Yes”, the existing station changes in to current station. If not, it keeps current station.

### 8.9 Setting Electronic CAM

(only applied to XPM, Network type XPM, Standard Network type XPM)

XG-PM provides function of creating profile for operating electronic CAM.

[Sequence]

- (1) Double click [CAM data] on the project tree.
- (2) Setting CAM block number what you want.
- (3) Setting CAM control mode. Then setting unit of point.
- (4) Set the main axis/the sub axis. Set CAM block data depends on this standard.
- (5) Set CAM block data.

[Setting screen]

The screenshot shows the 'Parameter' tab of the CAM setting interface. It is divided into three main sections: 'Select CAM block', 'CAM control mode setting', and 'CAM block data setting'.

- a** points to the 'CAM block No.' dropdown menu, which is currently set to '1'.
- b** points to the 'Control type' section, which includes two radio buttons: 'Repeat(Two-way mode)' and 'Increase(Feed mode)'. The 'Increase(Feed mode)' option is selected. Below this is a 'Point unit' input field set to '1.00000'.
- c** points to the 'CAM block data setting' table, which has columns for 'Main Ax. start pos.', 'Main Ax. end pos.', 'Sub. Ax. start pos.', 'Sub. Ax. end pos.', and 'CAM curve'. The first row shows '0.00000' for the main axis start position and '0.0' for the sub-axis start position.
- d** points to the 'Main/Sub. axis parameter setting' table, which defines the units and limits for the axes.
- e** points to the 'Characteristic Curve' button at the bottom right.
- f** points to the 'Setup complete' button at the bottom right.

	Main Axis	Sub. Axis
Unit	degree	mm
Travel distance per rot.	360.00000	0.0
Pulses per rotation	20000	20000

	Main Ax. start pos.	Main Ax. end pos.	Sub. Ax. start pos.	Sub. Ax. end pos.	CAM curve
1	0.00000		0.0		
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

[Description of setting screen]

- (a) Select CAM block No. : Setting CAM data block what you need to set. CAM data block can be set from no.1 to no.8.
- (b) CAM control mode setting: Set control method & point unit of CAM data. Select repeat mode of control method when creating profile. (But, not increase direction and when create repeated profile).  
Select increasing mode when creating CAM profile which is increased to one-way.
- (c) CAM block data setting: Set CAM block data depends on setting CAM control mode and the main axis/ the axis of ordinates of parameter.

#### Start position of the main axis

: Set the position which main axis is began on the current step. When set main ax. end position, next main ax. start position also to be set automatically.



But, if the last position of main axis is set, start position of main axis not to be set automatically.

**Last position of main axis**

: Set the last position for movement of main axis. Set to maximum last position of main axis.

**Start position of sub axis**

: Set the position which the sub axis is begun on the current step. When set sub ax. end position, next sub ax. start position also to be set. But, if the last position of the sub axis is set to maximum position, start position of the sub axis not to be set automatically.

**Last position of the sub axis**

: Set the last position for movement of the sub axis. Set the last position for movement of the sub axis on the current step. Can set it to the last position of the sub axis.

**CAM curve**

: Set the type of CAM curve for application on the current step. XG-PM support total 22 type of CAM curve.

- (d) Main/Sub. axis parameter setting: Set the data for positioning several \*axis with CAM operation. Then, the data which is meaning last position of the \*axis is as follow. And the axis position is depends on setting unit of \*axis. (\*axis: the main axis/ the sub axis)

**In case that pulse is unit of axis (the main axis/ the sub axis)**

: [the number of pulses per rotation] The value to be maximum last position of axis (the main axis/the sub axis)

**In case that mm/inch is unit of axis (the main axis/ the sub axis)**

: [travel distance per rotation] The value to be maximum last position of axis (main axis/the sub axis)

**In case that degree is unit of the main axis**

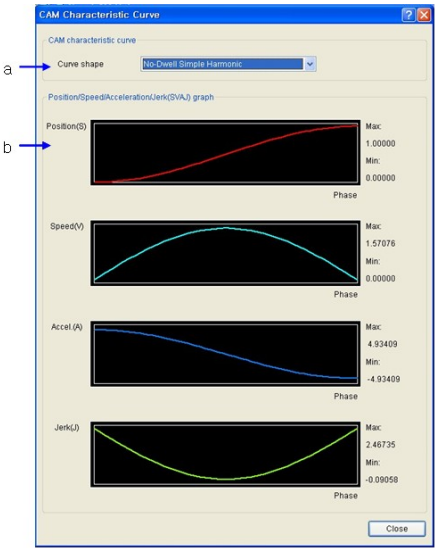
: 360.00000 is the maximum last position of the main axis. (The sub axis has not unit degree)

- (e) Characteristic Curve: Special character curve communication box to be revitalization when put this button.  
(f) Setup complete: Create profile as set CAM block data up to now.

8.9.1 Confirm of CAM special character curve

Can set XG-PM after confirm CAM special character curve before set electronic CAM operation.

[Communication box]



[Communication box description]

- (a) CAM characteristic curve: Select type of CAM curve what you need to confirm. Support total 22 type of curve.  
(b) Position/Speed/Acceleration/Jerk (SVAJ) graph: Display characteristic curve of position/Speed/Acceleration/Jerk of selected CAM curve by each graph. And then in case of setting maximum value as "1", can confirm value of maximum/minimum.

### 8.9.2 Confirm CAM graph

User can confirm CAM profile by CAM parameter which is set by user on the graph screen of CAM data screen  
It is possible that user confirm CAM profile which is made by CAM parameter as data value on the graph and each point.

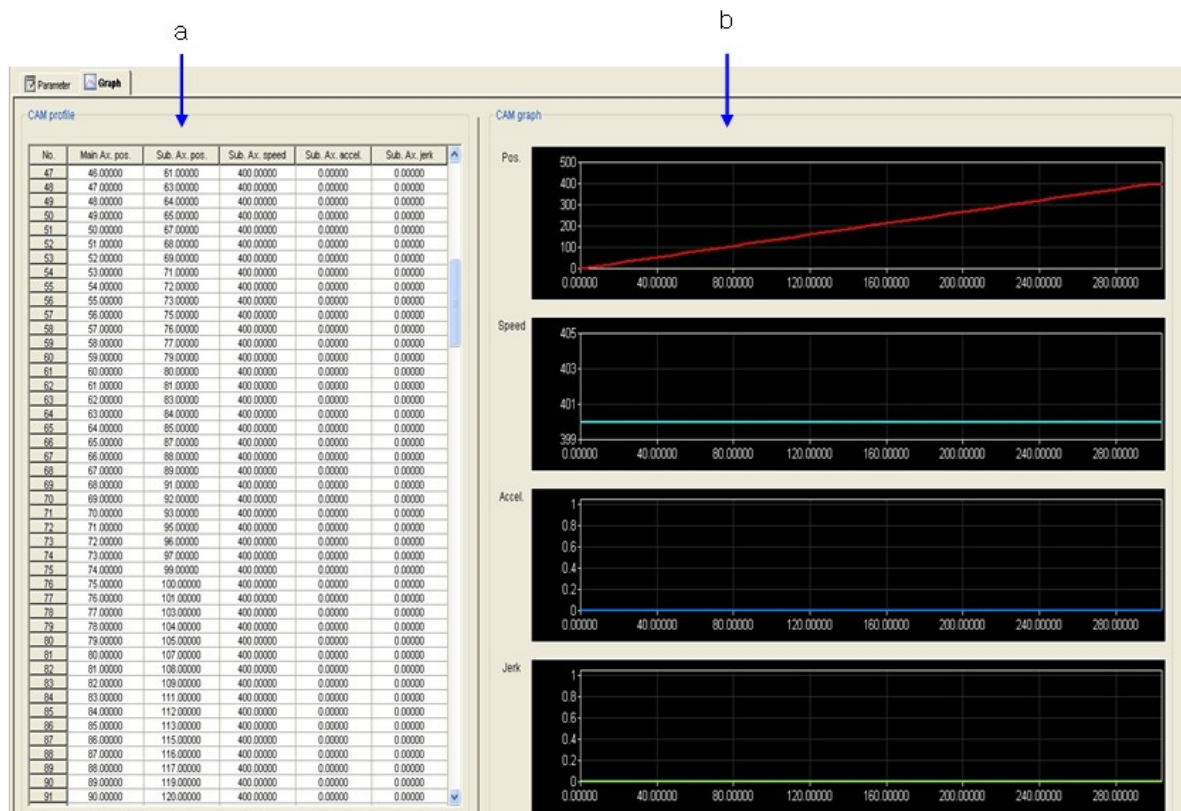
[Sequence]

- (1) Revitalize CAM data screen.
- (2) Set CAM data on the parameter screen. (refer to this manual 8.6)
- (3) Put the setting complete button.
- (4) Put setting complete button, automatically change to graph screen with this picture.  
(But, this picture will be disappeared automatically).



- (5) Confirm Cam profile which is set by user of CAM block.

[Graph tab screen]



[Graph tab screen description]

- (a) CAM profile: Display created result data after setting CAM profile. Display position of main axis/position of the sub axis/speed of the sub axis/acceleration of the sub axis/Jerk of the sub axis.
- (b) CAM graph: Position of sub axis is displayed by axis X. The values of sub axis Position/Speed/Acceleration/Jerk are displayed by axis Y.

8.9.3 Edit CAM profile (Supported at V1.1 or above)

After setting the CAM profile by CAM parameter, you can modify the CAM profile (sub axis position) finely. Namely, you can modify the error that occurred during operation.

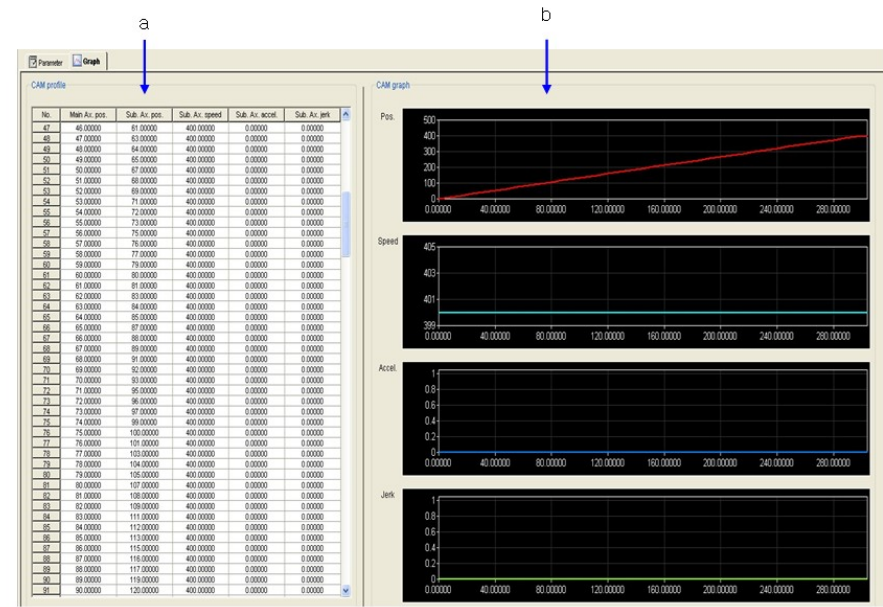
[Sequence]

- (1) Revitalize CAM data screen.
- (2) Set CAM data on the parameter screen.
- (3) Put the setting complete button.
- (4) Put setting complete button, automatically change to graph screen with this picture.  
(But, this picture will be disappeared automatically).



- (5) Confirm Cam profile which is set by user of CAM block.
- (6) Edit the sub axis position
- (7) After download, check the profile through trial-run or cam profile graph
- (8) Repeat step (6)~(7) and create the CAM profile you want

[Graph tab screen]



[Graph tab screen description]

- (a) CAM profile: Display created result data after setting CAM profile. Display position of main axis/position of the sub axis/speed of the sub axis/acceleration of the sub axis/Jerk of the sub axis.
- (b) CAM graph: Position of sub axis is displayed by axis X. The values of sub axis Position/Speed/Acceleration/Jerk are displayed by axis Y.

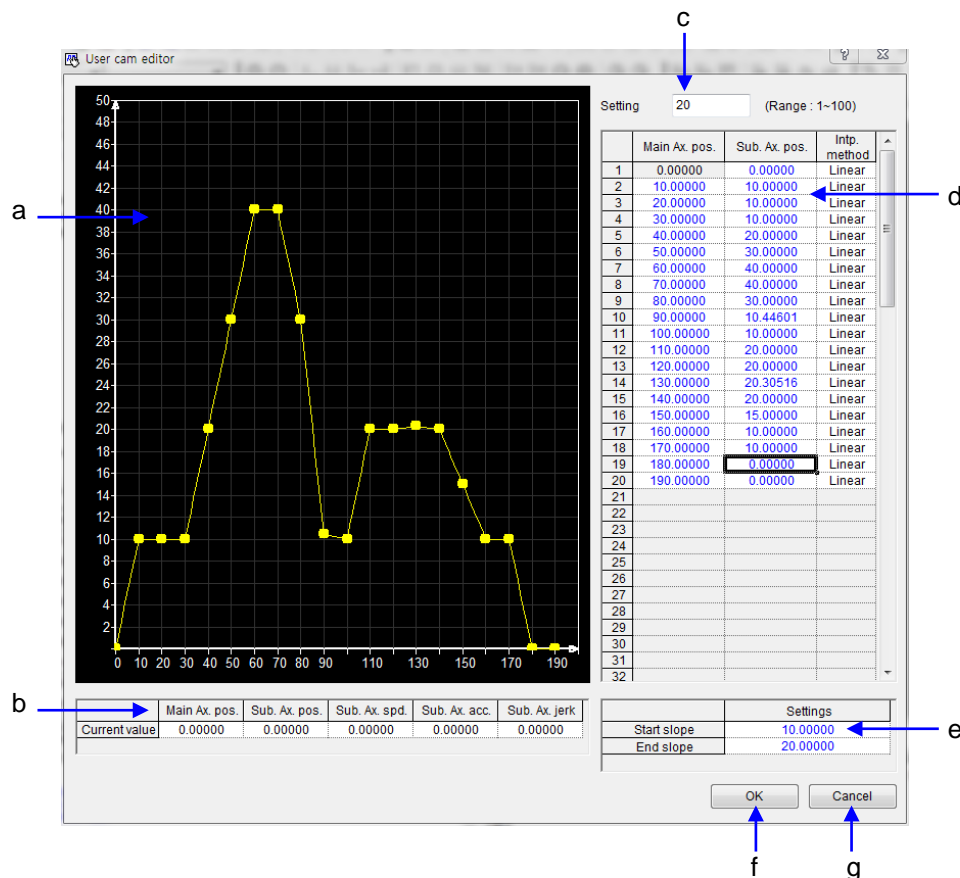
### 8.10 User Cam Editor (For Motion Control Module only)

XG-PM provides the function to create the Cam profile for user Cam operation.

[Sequence]

- (1) Select the [Cam data] in a project tree.
- (2) Select Pop-up menu [Add items] → [Cam profile] in the Cam data items to add the Cam profile.
- (3) Double-click the added Cam profile.
- (4) Input the number of Cam settings in the dialog box for User Cam Editor.
- (5) Sets the Cam data.

[Setting screen]



[Setting screen description]

- (a) Cam graph: Display the shape of the selected Cam profile on a graph and users can modify the data directly on the graph.
- (b) Current value: Display the current value of the data that is in the process of modification in the Cam graph.
- (c) Setting: Set the number of Cam data.
- (d) Setting Cam data: Set the Cam data.
  - Main Ax. pos.: Set the Main axis position at the current step.
  - Sub. Ax. pos.: Set the sub. axis position at the current step.
  - Intp. method: Set the interpolation method at the current step; Linear/Cubic.
- (e) Slope: Set the start and end slope of the Cam data.
- (f) OK: Save the Cam block data that has been set up to now.
- (g) Cancel: Close the Cam Editor screen without saving settings.

8.11 Simulation

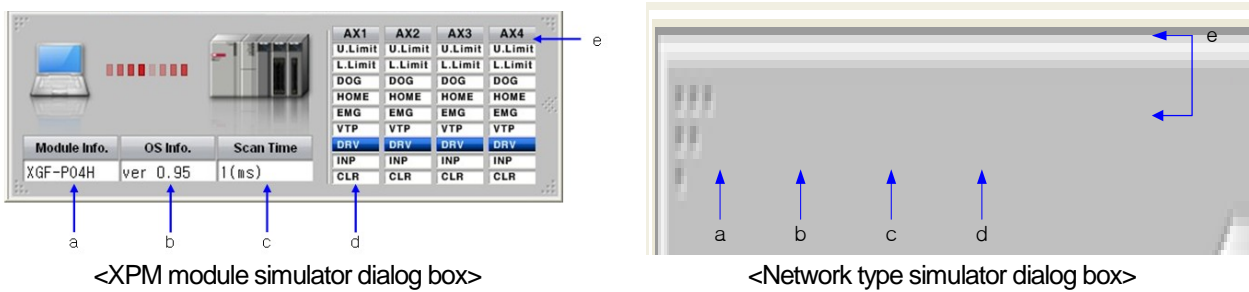
XG-PM provides simulation function that it is confirm performance of positioning module before operation.

8.11.1 Execution of Simulator (only applied to XPM, network type module)

[Sequence]

- (1) Execute Menu[Project]->[New project], create project or execute Menu[Project]->[Open project], open project for simulation.
- (2) Menu [Instrument]-> [Starting simulator].
- (3) Confirm Module information of simulator, OS information, Scan time.
- (4) Confirm performance of positioning module.
- (5) End simulation by following proceed : Menu [Instrument]->[Simulator End]

[Communication box]



[Explain communication box]

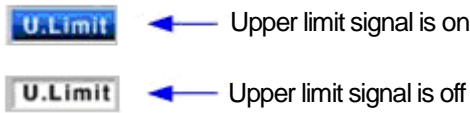
- (a) Module information: Simulator display module.
- (b) OS information: Simulator display OS information of simulating module.
- (c) Scan time: Display cycle of performing command.
- (d) Setting button of external I/O: Can confirm value of external input/output signal and can set value of external IO.
- (e) Axis information of external I/O: Display axis information of external I/O.

**Note**

Simulator can simulate for only a module. Simulator cannot perform with over 2 project module.  
Connecting option of situation bar is displayed as “Simulator” while simulator is operating.

8.11.2 External I/O setting of Simulator (only applied to XPM, network type module)

External I/O setting screen of simulator only display ON/OFF of external input/output signal regardless of I/O signal HIGH/LOW. External I/O can be set by click the I/O button of pertinent axis.



[External I/O description]

- U.Limit : Upper limit signal
- L.Limit : Low limit signal
- DOG : Approximate origin signal
- HOME :Origin signal
- EMG : Emergency stop signal
- VTP : Speed/Position control conversion signal
- DRV : Drive ready signal
- INP : In position signal
- CLR : Clear signal

**Note**  
Drive ready signal is set as “ON” for convenient. All of the initial status of signal is “OFF” except for drive ready signal.

8.11.3 Simulator screen control function (only applied to XPM, network type module)

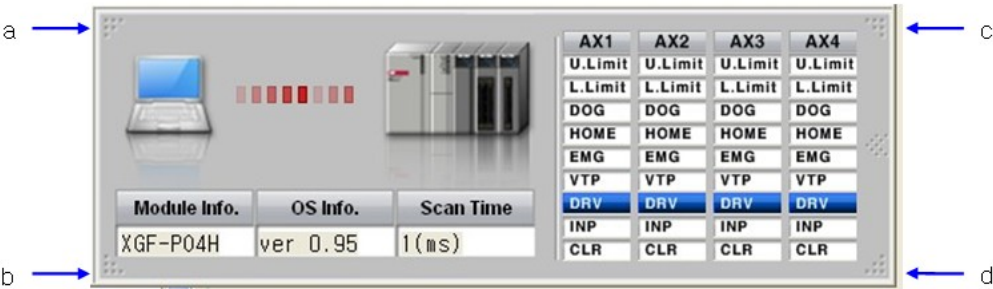
Simulator provides screen position movement and hides function of external I/O setting button for convenient.

1. Screen position movement

[Sequence]

Click screen movement mark at the corner of simulator screen.

[Communication box]

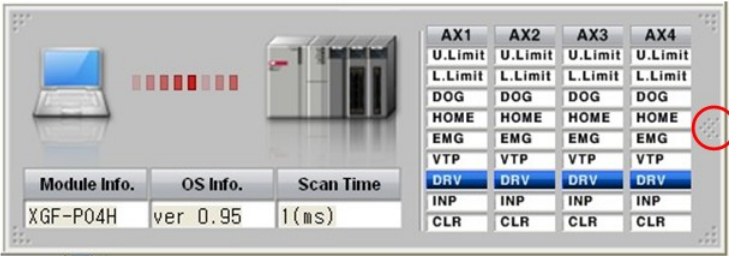


[Explain communication box]

- (a) Left top corner movement: Simulator move to left top corner movement of XG-PM.
- (b) Right top corner movement: Simulator move to right top corner movement of XG-PM.
- (c) Left bottom corner movement: Simulator move to left bottom corner movement of XG-PM.
- (d) Right bottom corner movement: Simulator move to right bottom corner movement of XG-PM.

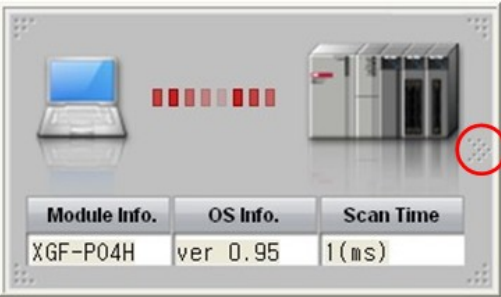
2.    Hiding external I/O setting button

[Sequence]  
Click hiding mark of external I/O setting button on the simulator screen.



3.    Displaying external I/O setting button

When external I/O setting button was hided, click showing mark for external I/O setting of simulator screen.



8.11.4 Sight of simulator support function (only applied to XPM, network type module)

Simulator can simulate only one module. The function is as following:

1.    Project management function

Function	Feasible or not
New project	O
Open project	O
Project initialization wizard	X
Open APM file	X
Save project	O
Save as	O
Close project	O
Add item	X
Import	O
Export	O
Print	O
Preview	O
Printing project	O
Setting project	O
The latest project	O
Exit	O



### 2. Online & Connecting module function

Function	Feasible or not
Connect/ Disconnect	X
Connection setting	X
Write	O
Read	O
Compare with module	O
Module initialization	O
Online model setting	X
Module information	O
Download O/S	X
Operation command	O
Pause axis monitor	O

### 3. Command function

Function	Detail command	Feasible or not
Basic Command	Error reset	O
	Indirect starting	O
	Direct starting	O
	Deceleration stop	O
	Inching operation	O
	Jog operation	O
	Jog stop	O
Expansion command	Speed synch	O
	Position synch	O
	Positioning speed synch	O
	CAM operation	O
	Ellipse interpolation	O
	Start at the same time	O
Changing command	Position override	O
	Speed override	O
	Positioning speed override	O
	Current position preset	O
	Encoder preset	O
	Starting step	O
	Repeating step	O
Teaching command	Plural teaching / Teaching value	O
Point command	Point operation	O
Tool bar command	Function command	O



4. Monitoring function

Function	Feasible or not
Start monitoring	O
Axis monitor pause	O
System view monitoring	O
Trend monitoring	O
Data Trace	O
External I/O Monitoring	O

5. Other function

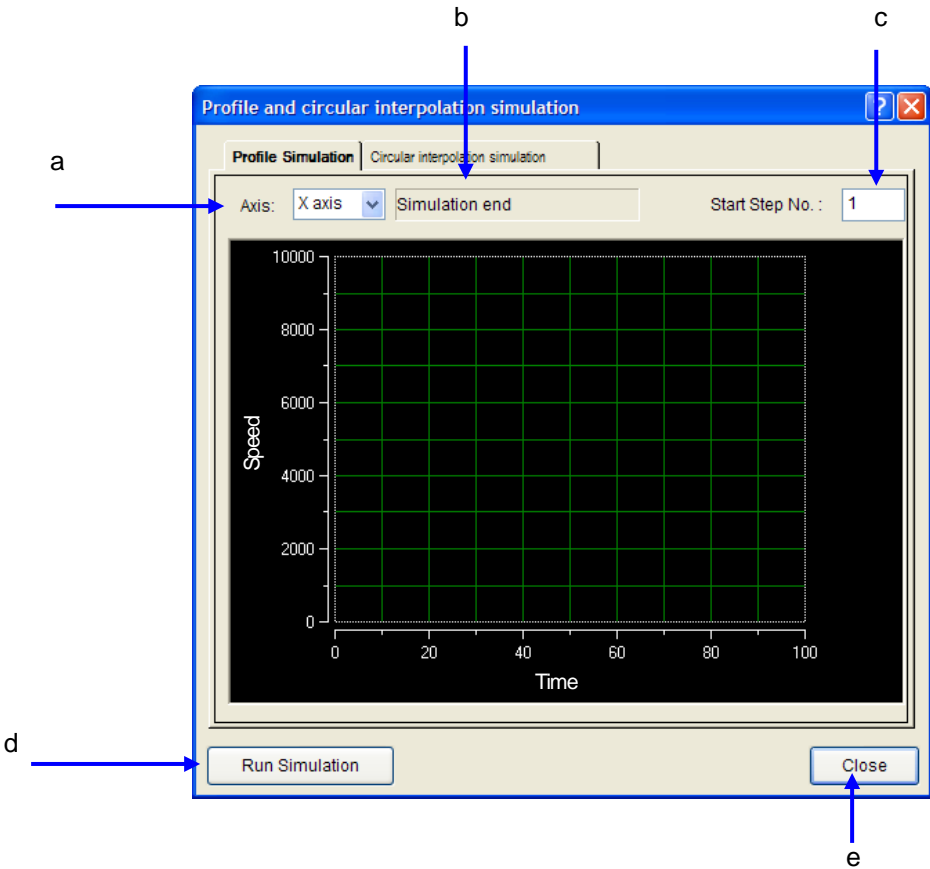
Function	Feasible or not
Multi module online	X

8.11.5 Profile simulation (only applied to APM module)

[Sequence]

- (1) Input data to the operation data item of axis to simulate.
- (2) Execute [Tools] → [Profile/Circular interpolation simulation]
- (3) Select [Profile Simulation] tap in the communication box.
- (4) After setting simulation axis and step number in the simulation communication box, press the [Run Simulation] button.

[Communication Box]



## Chapter 8 Setting Data

[Explain communication box]

- (a) Axis : Sets target axis for profile simulation.
- (b) Simulation state : Displays current simulation state
- (c) Start step number : Sets step number of axis for profile simulation
- (d) Run simulation : Runs profile simulation
- (e) Close : Closes profile and circular interpolation simulation communication box.

### Note

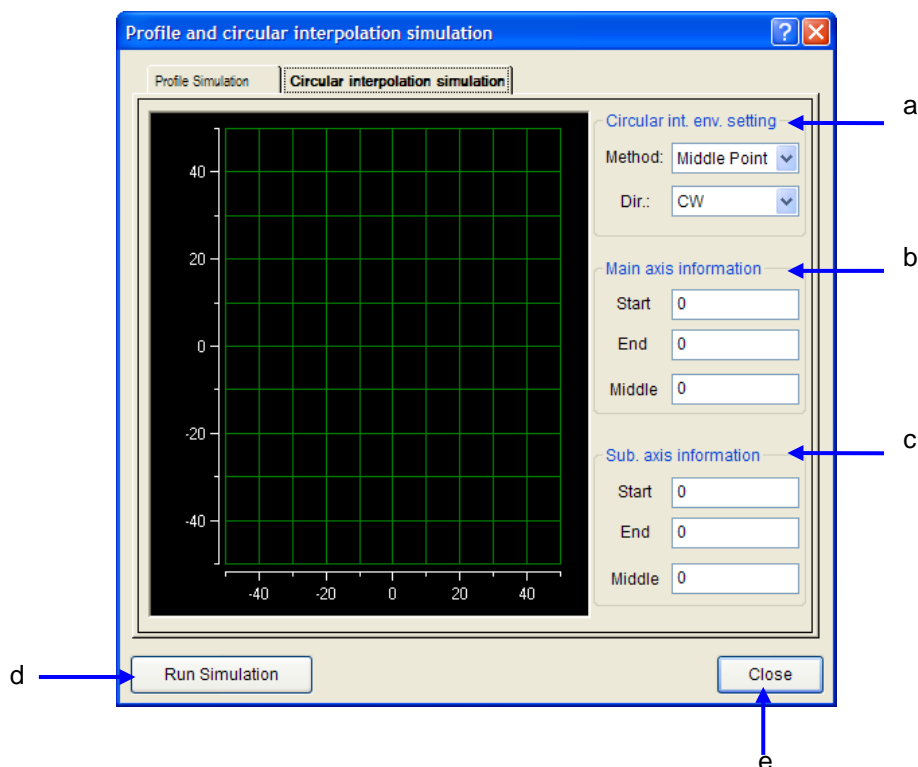
Profile simulation is available for only one axis. Operations using 2 axes such as interpolation operation can not be simulated

### 8.11.6 Circular interpolation simulation (only applied to APM module)

[Sequence]

- (1) Input data to the operation data item of axis to simulate.
- (2) Execute [Tools] → [Profile/interpolation simulation]
- (3) Select [circular interpolation] tap in the communication box.
- (4) After setting axis and step number in the simulation communication box, press “Run Simulation” button.

[Communication box]



[Explain communication box]

- (a) Circular interpolation environment setting : sets method and direction of circular interpolation
- (b) Main axis information : sets main axis of circular interpolation (horizontal axis information)
- (c) Sub. axis information : sets sub axis of circular interpolation (vertical axis information)
- (d) Run Simulation : runs circular interpolation simulation
- (e) Close : closes profile and circular interpolation simulation communication box.

## 8.12 Basic Parameter Setup (For Motion Control Module only)

Set the basic parameters related to module operations.

### Note

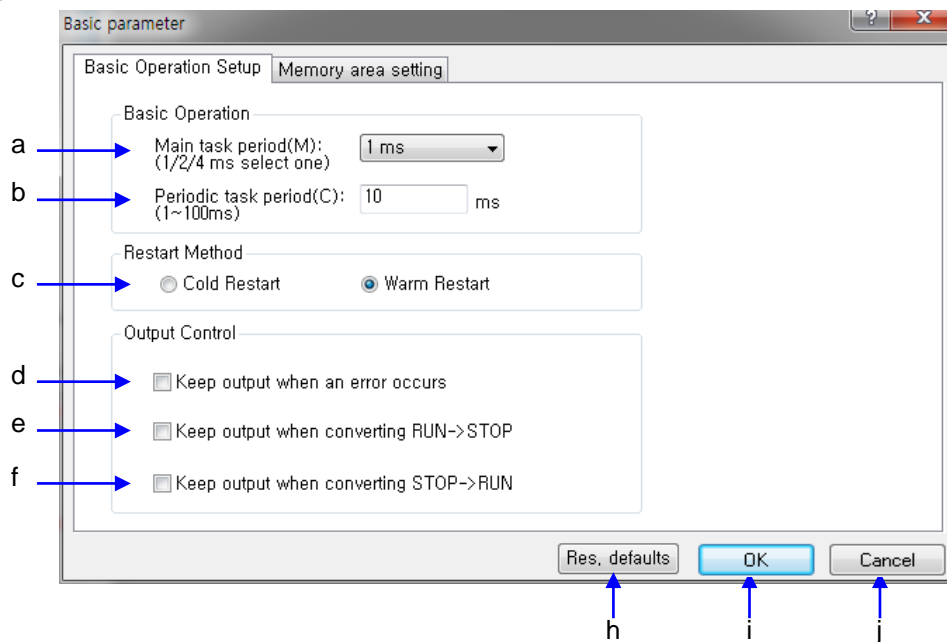
For more details on the basic parameters, refer to the module manual.

### 8.12.1 Basic Operation Setup

[Sequence]

- (1) Double-click [Parameters]->[Basic parameter] in a project tree.
- (2) Select [Basic Operation Setup] tab in dialog box.

[Setting screen]



[Setting screen description]

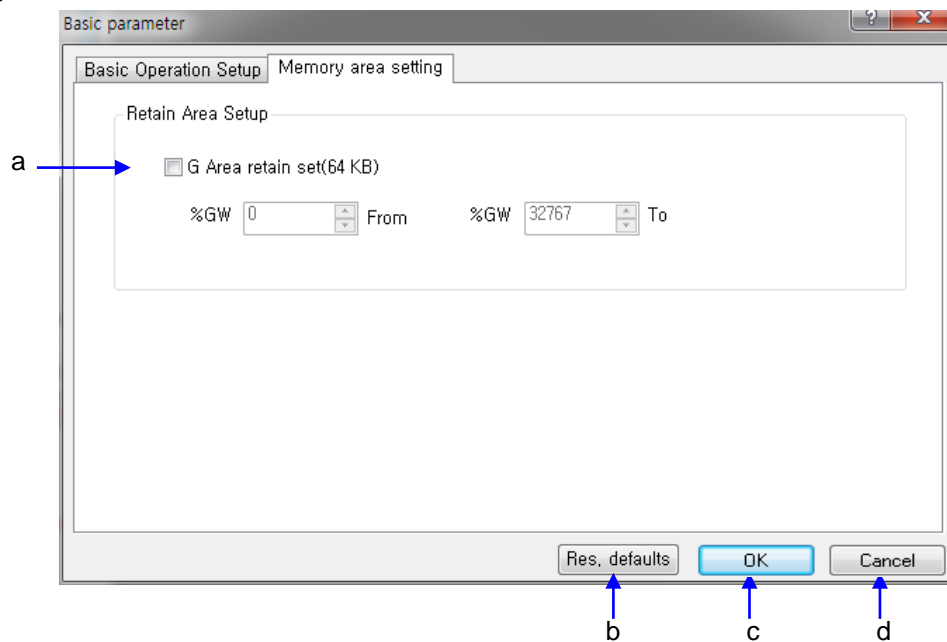
- (a) Main task period: Set the operating period of main task.
- (b) Periodic task period: Set the operating period of periodic task.
- (c) Restart Method: Set the restart method.
  - Cold Restart : Execute data initialization when restarting it.
  - Warm Restart : Do not execute data initialization when restarting it.
- (d) Keep output when an error occurs: Determine whether outputting the data normally in case of error or the particular input.
- (e) Keep output when converting RUN→STOP: Determines whether outputting the data normally when converting the operation mode from RUN into STOP.
- (f) Keep output when converting STOP→RUN: Determines whether outputting the data normally when converting the operation mode from STOP into RUN.
- (g) Res. defaults: Restores the settings of basic parameters to default value.
- (h) OK: Saves the settings of basic parameters and closes a dialog box.
- (i) Cancel: Closes the dialog box without saving the setting of basic parameters.

### 8.12.2 Memory area setting

[Sequence]

- (1) Double-click [Parameters] → [Basic parameter] in a project tree.
- (2) In a dialog box, select the [Memory area setting] tab.

[Setting screen]



[Setting screen description]

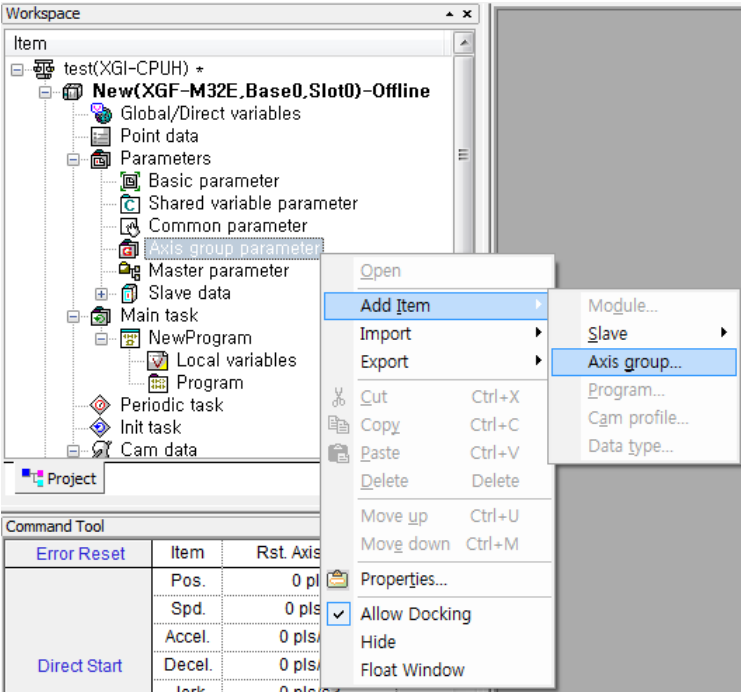
- (a) Retain Area Setup: Executes the retain setting of G area.
- (b) Res. defaults: Restores the settings of basic parameters to default value.
- (c) OK: Saves the settings of basic parameters and closes a dialog box.
- (d) Cancel: Closes the dialog box without saving the setting of basic parameters.

8.13 Axis Group Parameter Setting (For Motion Control Module only)

8.13.1 Adding Axis Group

[Sequence]

- (1) Select the [Axis group parameter] in a project tree.
- (2) In the axis group parameter items, select the Pop-up menu [Add Item] → [Axis group].



8.13.2 Setting Axis Group Parameter

[Sequence]

- (1) Double-click. [Axis group parameter]->[Axis group1~16] in a project tree.

[Setting screen]

	Item	Axis group 1	Axis group 2
a	Axis1	None	
	Axis2	None	
	Axis3	None	
	Axis4	None	
b	Intp. speed Max	20000000 u/s	

[Setting screen description]

- (a) Setting axis: Sets the axis included to the axis group.(up to 4 axes)
- (b) Intp. speed Max: Sets the max interpolation speed for interpolation operation of the axis group.

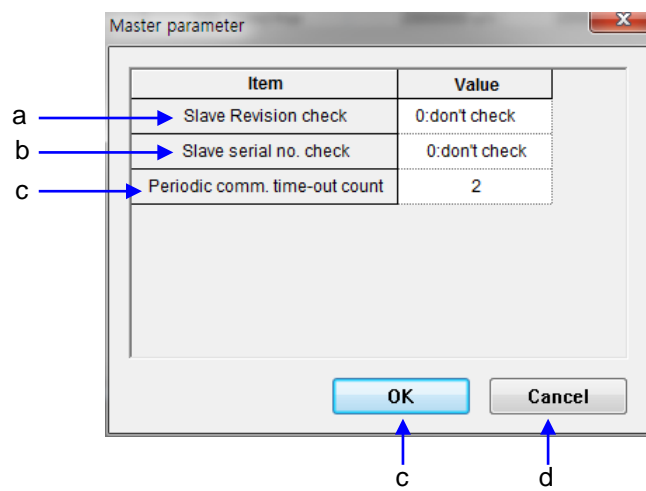
### 8.14 Master Parameter Setting (For Motion Control Module only)

#### 8.14.1 Master Parameter Setting

[Sequence]

- (1) Double-click the [Master parameter] in a project tree.

[Setting screen]



[Setting screen description]

- Slave Revision check: Determines whether applying the slave revision check in case of slave access.
- Slave Serial No. check: Determines whether applying the slave Serial No. check in case of slave access.
- Periodic comm. time-out count: Sets the number of periodic communication timeout in case of slave access.

8.15 Point data Setting (For Motion Control Module only)

8.15.1 Point data Setting

[Sequence]

- (1) Double-click the [Position data] in a project tree.

[Setting screen]

	a	n	c	d
	Address	Value	Type	Comment
1	%PL0	0	LREAL	Position data 1
2	%PL1	0	LREAL	Position data 2
3	%PL2	0	LREAL	Position data 3
4	%PL3	0	LREAL	Position data 4
5	%PL4	0	LREAL	Position data 5
6	%PL5	0	LREAL	Position data 6
7	%PL6	0	LREAL	Position data 7
8	%PL7	0	LREAL	Position data 8
9	%PL8	0	LREAL	Position data 9
10	%PL9	0	LREAL	Position data 10
11	%PL10	0	LREAL	Position data 11
12	%PL11	0	LREAL	Position data 12

[Setting screen description]

- (a) Address: Displays the device where the point data is assigned.
- (b) Value: Sets the point data.
- (c) Type: Displays the point data type.
- (d) Comment: Displays the comment of the device.

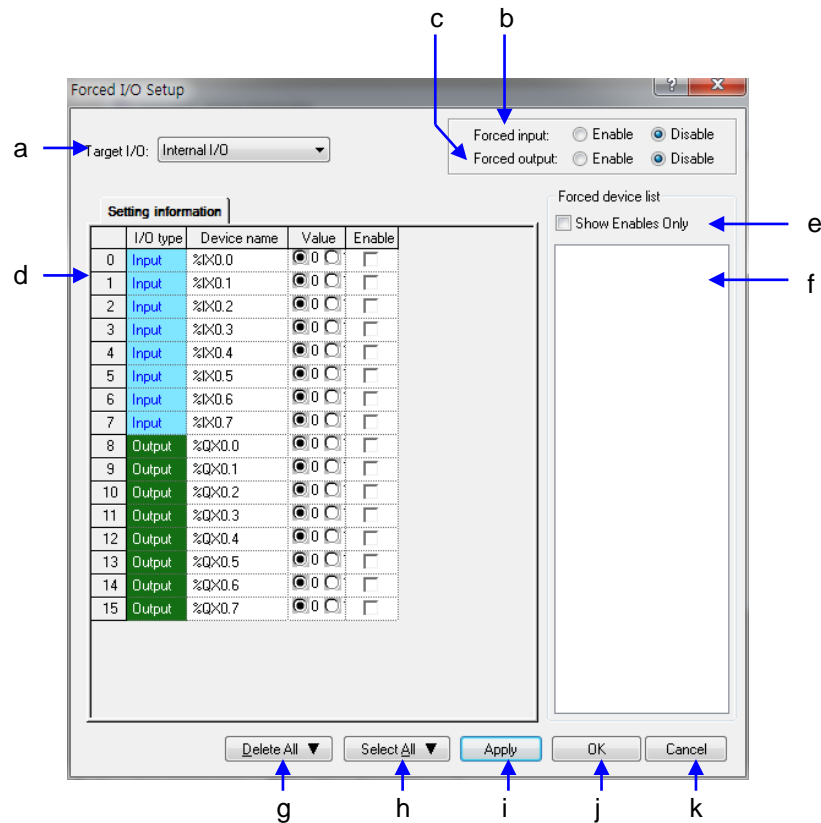
8.16 Forced I/O Setting (For Motion Control Module only)

It set the forced Input / Output of the I/O refresh area on the menu.

[Sequence]

- (1) Select the [Online] → [Forced I/O].

[Setting screen]



[Setting screen description]

- (a) Target I/O: Select the target I/O.
- (b) Forced input: Select whether allowing forced input or not.  
Forced input value can be applied by bit only if forced input is enable status.
- (c) Forced output: Select whether allowing forced output or not.  
Forced output value can be applied by bit only if forced output is enable status.
- (d) Setting information: Set the enable flag and value by bit

Note

- 'Enable flag' indicates whether I/O is used by bit. If it is selected, the force value is enable status, otherwise, disable status.
- 'Value' displays forced value. If '1' is selected, the forced value will be 1, otherwise, 0. It is available only if the 'Enable flag' is selected.

Enable flag	Value	Forced Value
0(Nothing Selected)	0(Nothing Selected)	X
0(Nothing Selected)	1(Selected)	X
1(Selected)	0(Nothing Selected)	0
1(Selected)	1(Selected)	1

- (e) Show enables only: Displays the enable items only in the set device.
- (f) Set device: Displays the flag where the forced I/O is enable or device whose data is set.



- (g) Delete All: Cancels the enable flag and data for all area
- (h) Select All: Sets the enable flag and data for all area.
- (i) Apply: Applies the setting data.
- (j) OK: Applies the changed details and close the dialog box.
- (k) Cancel: Close the dialog box.

8.16.1 Forced I/O Setting

[Sequence] (Ex.: Forced output 1 of embedded I/O's bit 8)

- (1) Select the [Online] → [Forced I/O].
- (2) Select the internal I/O.

Target I/O: Internal I/O

- (3) Select the enable flag and set value of bit 8. %QX0.0 will be registered in the set device.

Setting information				
	I/O type	Device name	Value	Enable
0	Input	%IX0.0	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
1	Input	%IX0.1	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
2	Input	%IX0.2	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
3	Input	%IX0.3	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
4	Input	%IX0.4	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
5	Input	%IX0.5	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
6	Input	%IX0.6	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
7	Input	%IX0.7	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
8	Output	%QX0.0	<input type="radio"/> 0 <input checked="" type="radio"/> 1	<input checked="" type="checkbox"/>
9	Output	%QX0.1	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
10	Output	%QX0.2	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
11	Output	%QX0.3	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
12	Output	%QX0.4	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
13	Output	%QX0.5	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
14	Output	%QX0.6	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
15	Output	%QX0.7	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>

Forced device list  
☐ Show Enables Only  
%QX0.0

- (4) Select the flag allowing forced output and press the OK button to apply the forced value.

Forced input: ☐ Enable ☒ Disable  
Forced output: ☒ Enable ☐ Disable

8.16.2 Clear Forced I/O

[Sequence] (Ex.: Deselect I the forced value of internal I/O's bit 8)

- (1) Select the [Online] → [Forced I/O].
- (2) Select the Internal I/O.

Target I/O: Internal I/O

- (3) Deselect the Enable flag of bit 8.

Setting information				
	I/O type	Device name	Value	Enable
0	Input	%IX0.0	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
1	Input	%IX0.1	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
2	Input	%IX0.2	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
3	Input	%IX0.3	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
4	Input	%IX0.4	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
5	Input	%IX0.5	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
6	Input	%IX0.6	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
7	Input	%IX0.7	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
8	Output	%QX0.0	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
9	Output	%QX0.1	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
10	Output	%QX0.2	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
11	Output	%QX0.3	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
12	Output	%QX0.4	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
13	Output	%QX0.5	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
14	Output	%QX0.6	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>
15	Output	%QX0.7	<input type="radio"/> 0 <input type="radio"/> 1	<input type="checkbox"/>

Forced device list  
☐ Show Enables Only  
%QX0.0


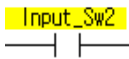
- (4) Press the Apply button.

8.16.3    Monitoring forced I/O in the program

You can monitor the forced I/O status and set value in the program. For monitoring in the program, you need to set “Monitoring forced I/O status” in the [Tool]-[Option]. It will be displayed as below depending on the program and set value.


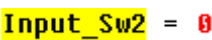
1.    LD Language

The color of a device part indicates whether allowing forced I/O and the color of LD symbol indicates the set values.

Indicated symbol	Remarks
	The contact(Input_Sw1) indicates forced I/O is enable status and the set value is 1.
	The contact(Input_Sw2) indicates forced I/O is enable status and the set value is 0.

2.    ST Language

The background color of a device part indicates whether enable forced I/O and the background color of the part displaying the monitor value indicates the set value.

Indicated symbol	Remarks
	The contact(Input_Sw1) indicates forced I/O is enable status and the set value is 1.
	The contact(Input_Sw2) indicates forced I/O is enable status and the set value is 0.

Chapter 9 Write/Read/Comparison data

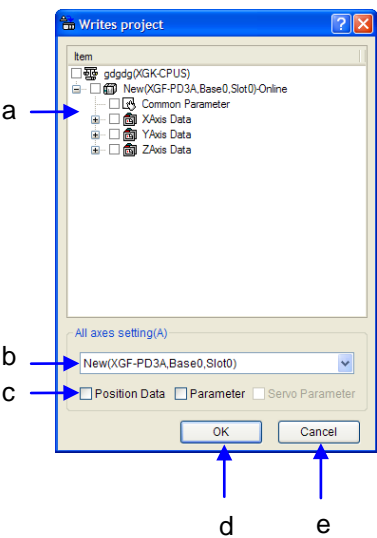
9.1 Write data

Send Cam setting data/operation parameter/operation data to module.

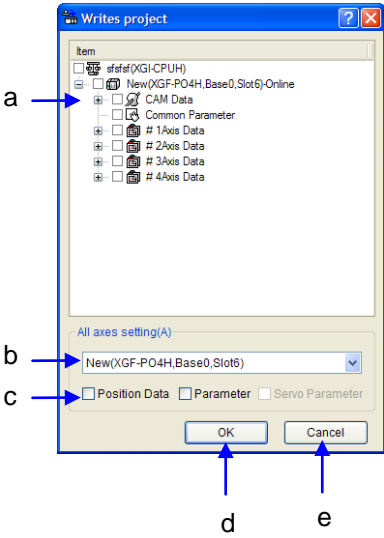
[Sequence]

- (1) Select "Menu [Online]->[Connect]" connect with module and online.
- (2) Select "Menu [Online]->[Write]"
- (3) Select data and confirm for sending to module.

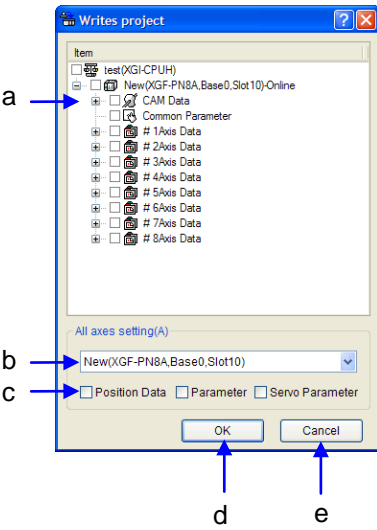
[Communication box]



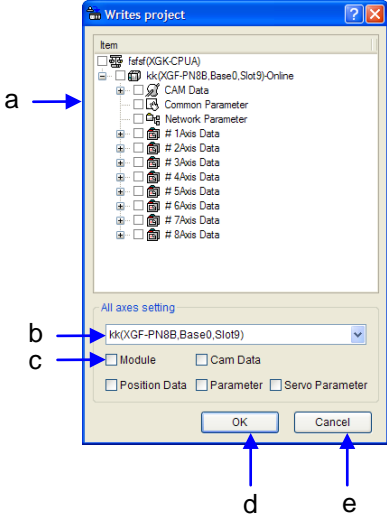
<APM>



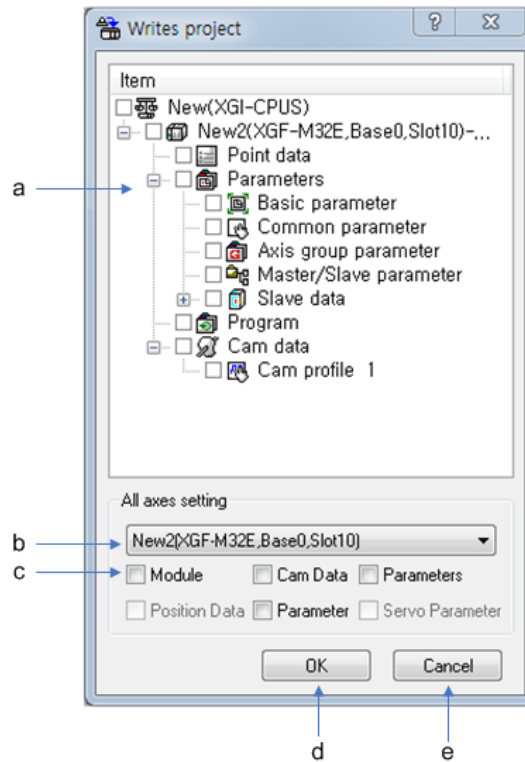
<XPM>



<Network type XPM>



<Standard network type XPM>



<Motion Control Module>

[Explain communication box]

- (a) Select tree: Selects data for sending to module.
- (b) All axes setting: Selects the module for all axes setting per each item
- (c) All axes setting item: Selects the item for all axis setting. When selecting the item, all items are set for the selected module.
- (d) OK button: Begins to send data to module with confirm button.
- (e) Cancel button: Stops writing with cancel button.

### Note

1. Cannot use corresponding data while it is operating.(Operation data/Operation parameter)
2. Common parameter and CAM data (only applied to XPM module) can be written while it is operating.
3. All axes setting function is supported at XG-PM V1.2 or above.
4. In case the power of PLC is off or is disconnected during Write Project, make sure to re-execute Write Data.

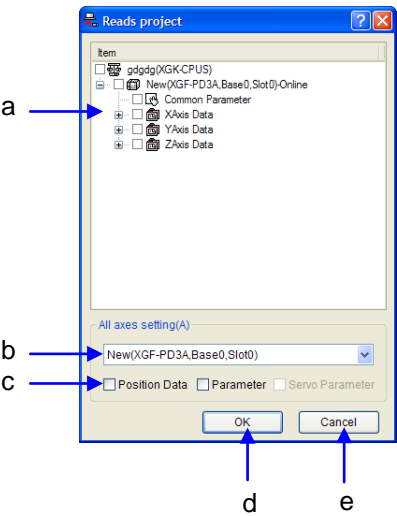
9.2 Read data

Read CAM setting data/operation parameter/operation data from selected online module by user.

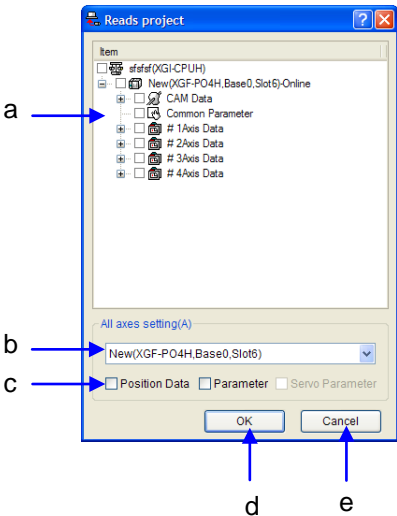
[Sequence]

- (1) Select “Menu [Online]->[Connect]” connect with module and online.
- (2) Select “Menu [Online]->[Read]”.
- (3) Select data and confirm for reading data from module.

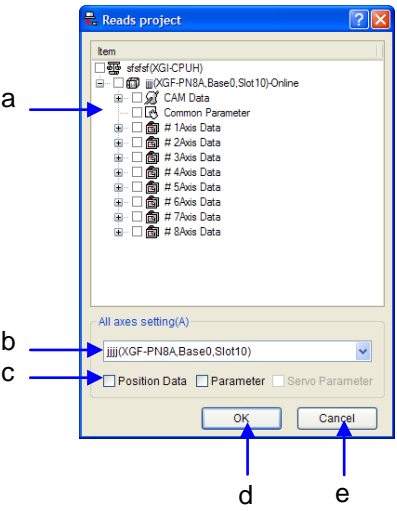
[Communication box]



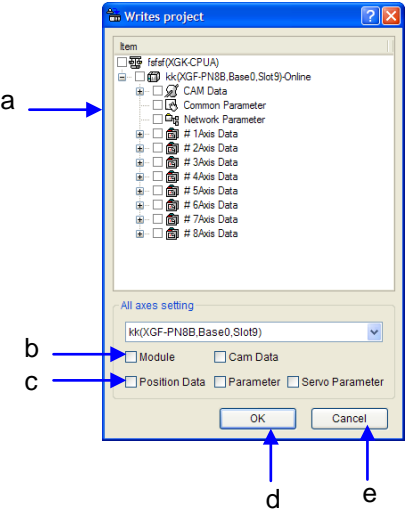
<APM module>



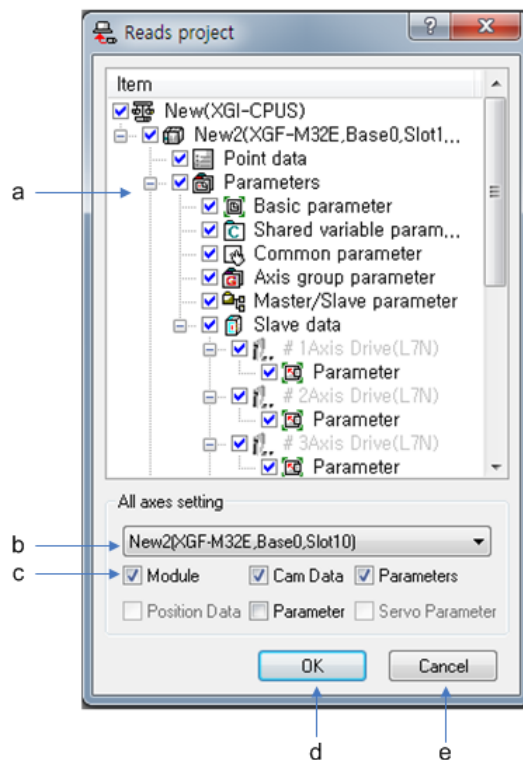
<XPM module>



<Network type XPM>



<Standard network type XPM>



<Motion Control Module>

[Explain communication box]

- (a) Select tree: Select data which it is red from module.
- (b) All axes setting: select the module for all axes setting per each item
- (c) All axes setting item: select the item for all axis setting. When selecting the item, all items are set for the selected module
- (d) OK button: Begin to read data from module with confirm.
- (e) Cancel button: Stop reading with cancel button.

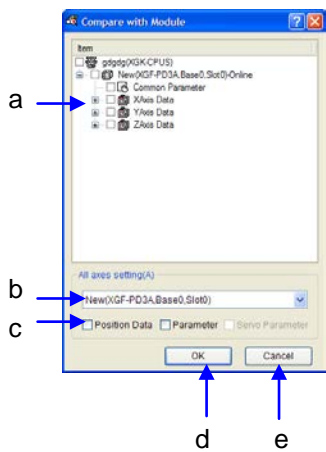
### 9.3 Comparison Data

Read CAM setting data/ operation parameter/ operation data from selected online module by user, compare with project data and display the result on the screen.

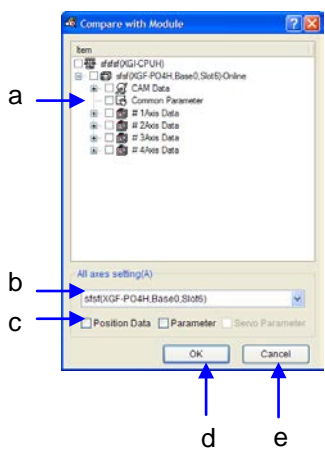
[Sequence]

- (1) Select "Menu [Online]->[Connect]" connect with module by online.
- (2) Select "Menu [Online]->[Compare with module]"
- (3) To compare the module and data, select the target data and press OK. Then it reads the selected data from the module and shows comparison result at [Compare with Module] window.

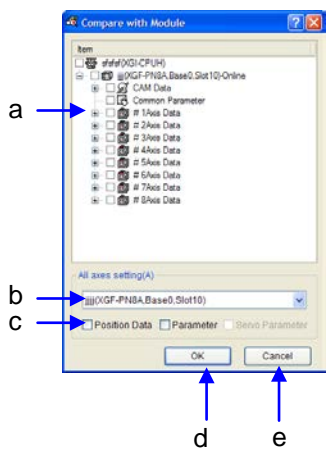
[Communication box]



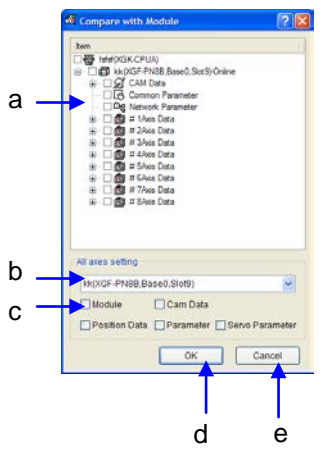
<APM>



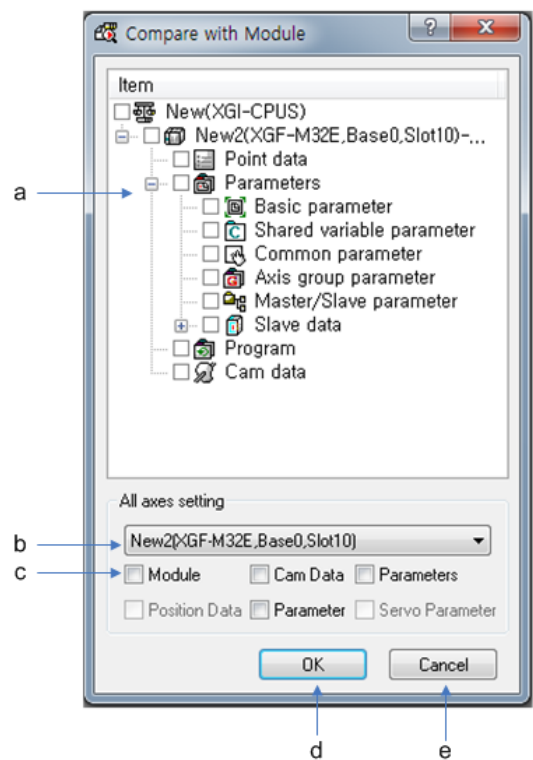
<XPM>



<Network type XPM>



<Standard network type XPM>



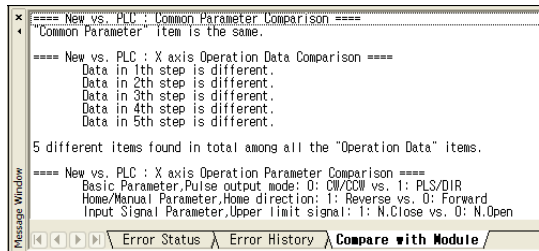
<Motion Control Module>

[Communication box description]

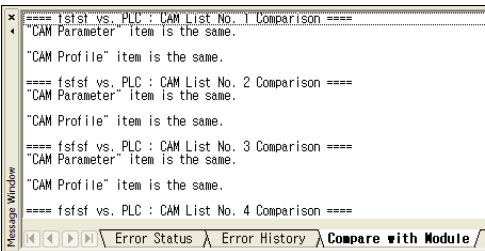
- (a) Select tree: Select comparison data which data is compare with project data on the module.
- (b) All axes setting: select the module for all axes setting per each item
- (c) All axes setting item: select the item for all axis setting. When selecting the item, all items are set for the selected module
- (d) OK button: Begin to read data with confirm.
- (e) Cancel button: Stop to read with cancel button.

Note

The data comparison result is displayed on the [Compare with module] of message window.



<APM>



<XPM, Network type module>



# Chapter 10 Test Run by XG-PM

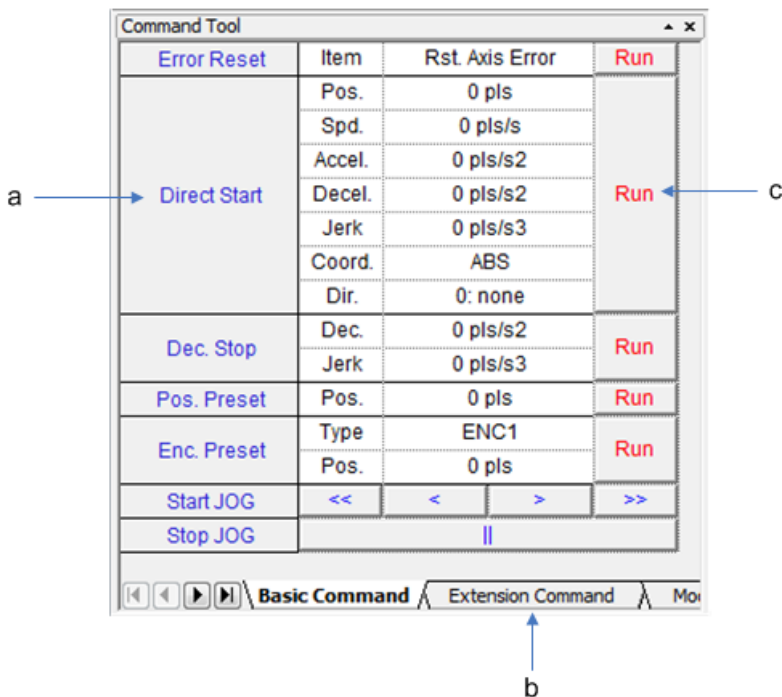
Here descript about test running XG-PM.

## 10.1 Composition of a Picture of Test Run

### 10.1.1 Composite command screen

Command screen is composite by 5 tab (Basic command/ Extension command/ Modification command/ Teaching command/ Point command). Basic composition of command screen is as following:

[Composition of a picture]



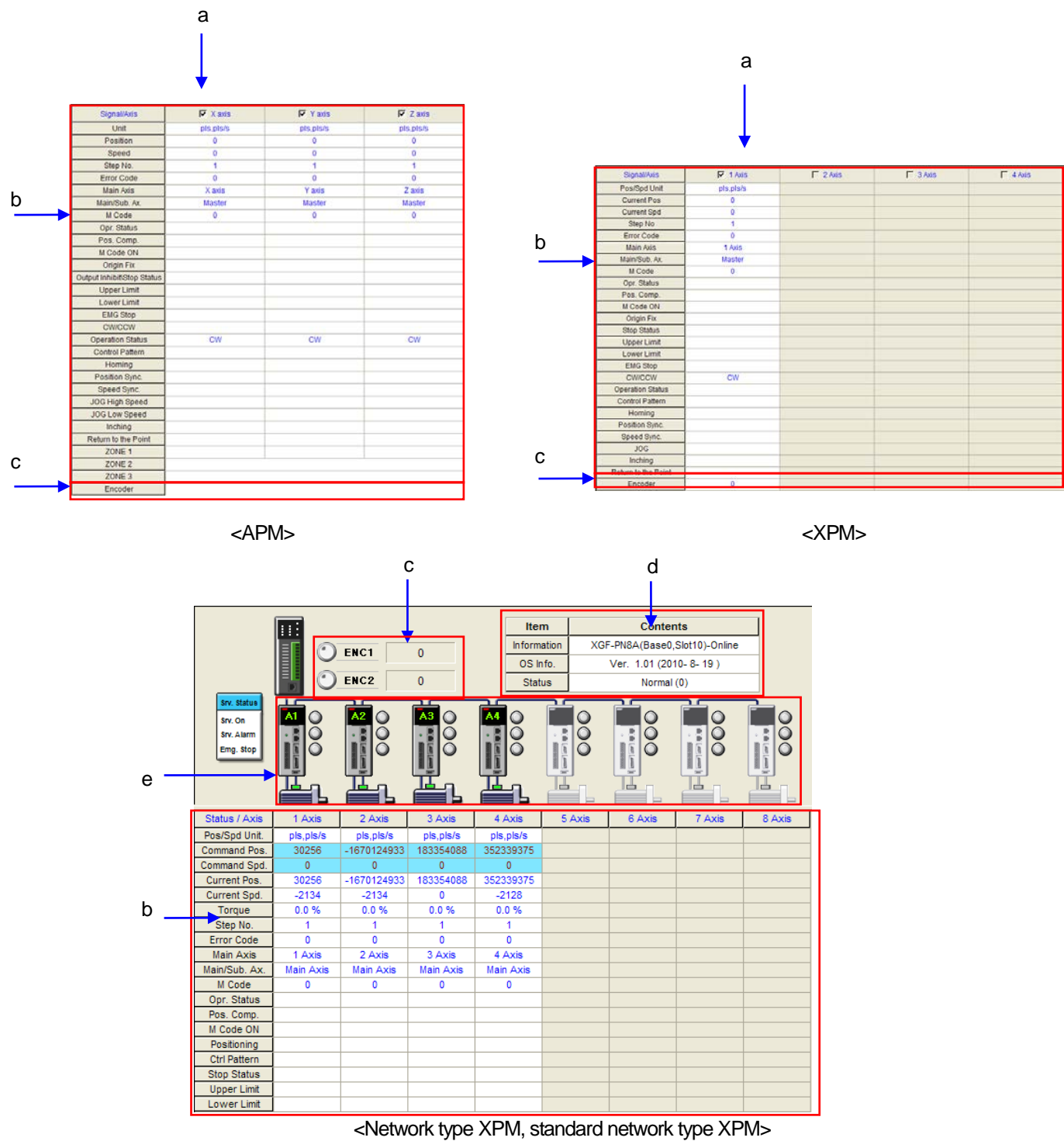
[Screen explanation]

- (a) Data setting: Sets the data which user wants to command.
- (b) Conversing command tab: User can select what he wants to use within command screen.
- (c) Run: Operates command.

10.1.2 System View

XG-PM provides module and servo status with one screen of system view. User can easily confirm operation status of each axis, encoder value, servo address (network type XPM, standard network type XPM) and system information (network type XPM, standard network type XPM) by system view screen.

[Composition of a Picture]



[Screen description]

- (a) Monitoring revitalization check box: Revitalize (check)/not Revitalize (uncheck) function of operation status confirm.
- (b) Display operation status of each axis: Display operation status of each axis.
- (c) Display encoder value: Display current encoder value on the screen.
- (d) Display servo status: Display the operation status of the connected servo
- (e) Display system information: Display information of the connected module. Module position, module information, module O/S version and module error status

Notes

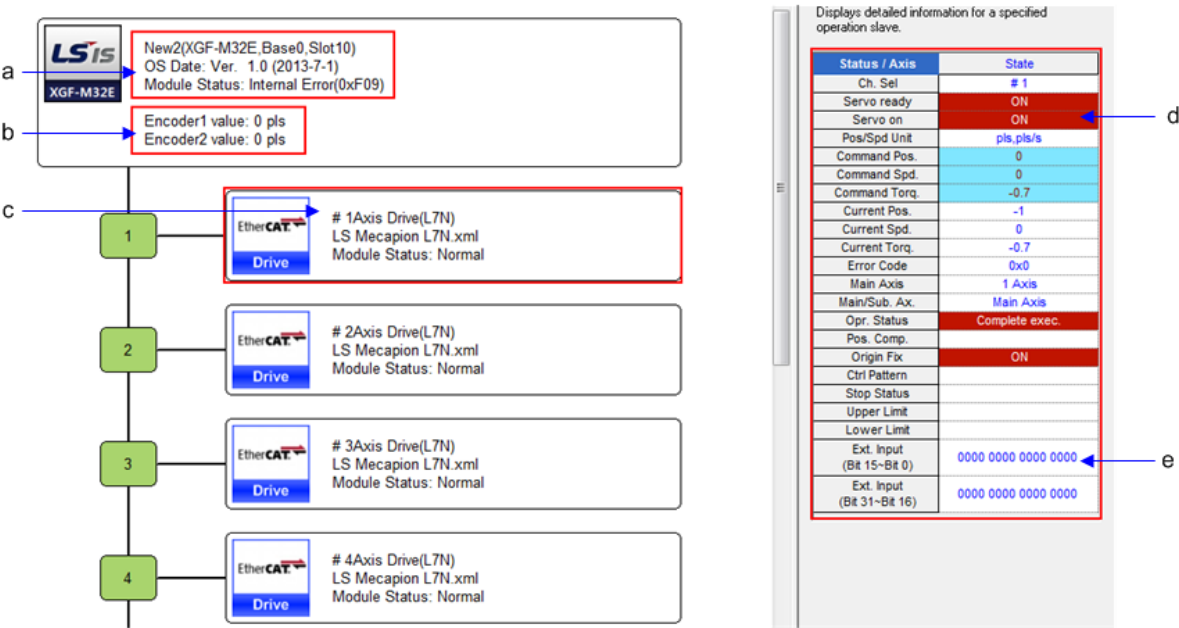
If cancel monitoring revitalizing check box, XG-PM load can be decrease.

10.1.3 Network View (Motion Control Module)

A network view screen displays the status of the current Motion Control Module(operation status of each axis and encoder values, system information).

[Sequence]

- (1) Select the [view]->[view network].



<Network View Screen>

[Screen explanation]

- (a) Display system information: Displays the information of the currently connected module; module position, module information, module O/S version and module error status.
- (b) Display encoder value : Displays the current encoder value on a screen.
- (c) Display slave information: Displays the information of the currently connected slave; slave information, operation status.
- (d) Display detailed operation information of slave : Displays the detailed operation information of the selected slave
- (e) External input signal screen: Displays the external input signal of the selected slave.

10.1.4 Screen of External Input/Output Signal

External input/output signal screen displays signal status that it is inputted from outside. (Please refer to this manual 10.1.3 Network View.)

[Composition of a Picture]

Status / Axis	X axis	Y axis	Z axis
Upper Limit	OFF	OFF	OFF
Lower Limit	OFF	OFF	OFF
Dog	OFF	OFF	OFF
Home	OFF	OFF	OFF
EMG	OFF	OFF	OFF
STOP	OFF	OFF	OFF
Command	OFF	OFF	OFF
Sub Command	OFF	OFF	OFF
Speed to Position	OFF	OFF	OFF
Driver-ready/Inposition	OFF	OFF	OFF
Ext. concurrent start	OFF	OFF	OFF

<APM>

Status / Axis	1 Axis	2 Axis	3 Axis	4 Axis
Upper Limit	OFF			
Lower Limit	OFF			
Dog	OFF			
Home	OFF			
EMG/STOP	OFF			
Driver-ready	OFF			
Inposition	OFF			
Deviation counter clear	OFF			

<XPM>

Status / Axis	1 Axis	2 Axis	3 Axis	4 Axis	5 Axis
Upper Limit	OFF	OFF	OFF	OFF	
Lower Limit	OFF	OFF	OFF	OFF	
Dog	OFF	OFF	OFF	OFF	
Home	OFF	OFF	OFF	OFF	
EMG	OFF	OFF	OFF	OFF	
Ext. Command	OFF	OFF	OFF	OFF	

<Network type XPM>

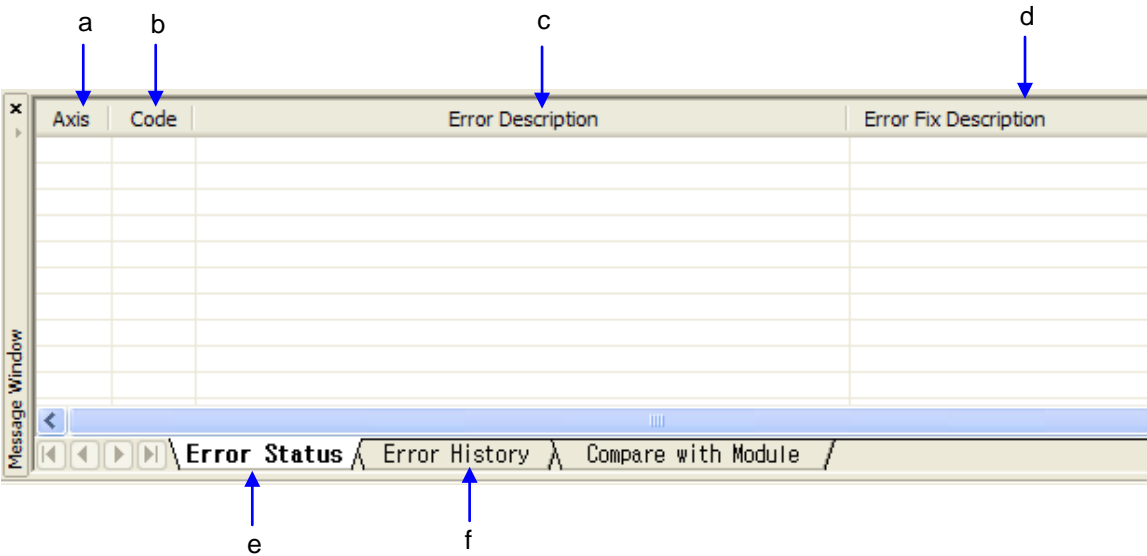
Status bit / Axis	1 Axis	2 Axis	3 Axis	4 Axis	5 Axis	6 Axis
Bit 03~00	0000					
Bit 07~04	0000					
Bit 11~08	0000					
Bit 15~12	0000					
Bit 19~16	1100					
Bit 23~20	0000					
Bit 27~24	0000					
Bit 31~28	0000					

<Standard network type XPM>

10.1.5 Error Message Screen

Display error status and error record of each operating axes.

[Composition of a picture]



[Composition of a Picture]

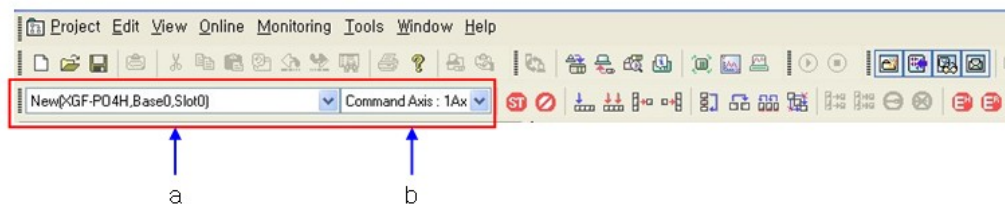
- a) Axis: Display erroneous axis.
- b) Code: Display error code.
- c) Error explanation: Display detailed explanation of error.
- d) Error Fix Description: Display error fix description for cancel error.
- e) Error status: Display the latest error. (Display standing in line from axis 1 to axis 4.)
- f) Error record: Display error record of each axes. (Can display max 10 for each axes, display standing in line from axis 1 to axis 8(X~Z aixs).)

### 10.2 Test Run Mode

Here describes test run of positioning module by XG-PM.

#### 10.2.1 Select Operation Command Axis

[Composition of a picture]



[Explanation of screen]

- (a) Select command module: Select module for command.
- (b) Select command axis: Select axis for command.


#### 10.2.2 Implementation

Operate command to selected axis at 10.2.1, when command.

## 10.2.3 Test Run

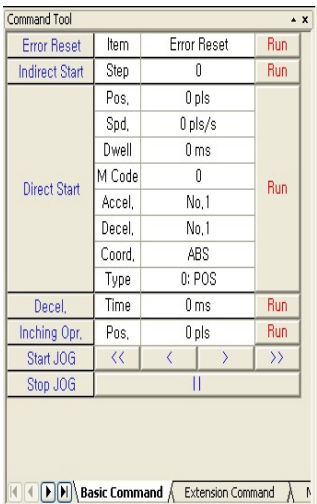
## 1. Basic command

## (1) APM module (XGF-POxA, XGF-PDxA)

Screen	Command	Setting range	Related Command
	Error Reset	Axis error reset, Axis error reset/Enable output	CLR
	Indirect Start	Step : 1 ~ 400	IST
	Direct start	1. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree] 2. Speed (each Unit range) pulse : 0 ~ 1,000,000 [pulse/sec](XGF-PDxA) pulse : 0 ~ 200,000 [pulse/sec](XGF-POxA) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min](XGF-PDxA) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min] (XGF-POxA) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min](XGF-PDxA) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min](XGF-POxA) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min](XGF-PDxA) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min](XGF-POxA) 3. Dwell : 0 ~ 50,000 ms 4. M code : 0 ~ 65,535	DST
	Deceleration stop	Stop time : 0 ~ 65,535 ms	STP
	Inching operation	Amount of Inching : -2,147,483,648 ~ 2,147,483,647 pls	INCH
	Jog Operation /Stop	Speed (each Unit range) pulse : 0 ~ 1,000,000 [pulse/sec](XGF-PDxA) pulse : 0 ~ 200,000 [pulse/sec](XGF-POxA) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min] (XGF-POxA, PDxA) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min] (XGF-POxA, PDxA) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (XGF-POxA, PDxA)	-

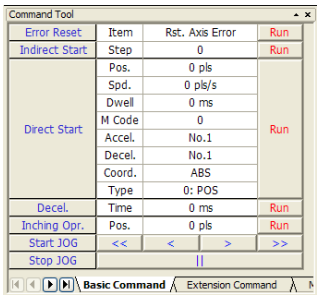
## Chapter 10 Test run by XG-PM

### (2) XPM module (XGF-POxH, XGF-PDxH)

Screen	Command	Setting range	Related Command
	Error Reset	Axis error reset/Common error reset	XCLR
	Indirect Start	Step : 1 ~ 400	XIST
	Direct start	1. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree] 2. Speed (each Unit range) pulse : 0 ~ 4,000,000 [pulse/sec](XGF-PDxH) pulse : 0 ~ 500,000 [pulse/sec](XGF-POxH) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min] (XGF-POxH, XGF-PDxH) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min] (XGF-POxH, XGF-PDxH) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (XGF-POxH, XGF-PDxH) 3. Dwell : 0 ~ 65,535 ms 4. M code : 0 ~ 65,535	XDST
	Deceleration stop	Stop time : 0 ~ 2,147,483,647 ms	XSTP
	Inching operation	Amount of Inching : -2,147,483,648 ~ 2,147,483,647 pls	XINCH
	Jog Operation /Stop	Speed (each Unit range) pulse : 0 ~ 4,000,000 [pulse/sec](XGF-PDxH) pulse : 0 ~ 500,000 [pulse/sec](XGF-POxH) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min] (XGF-POxH, XGF-PDxH) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min] (XGF-POxH, XGF-PDxH) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (XGF-POxH, XGF-PDxH)	-

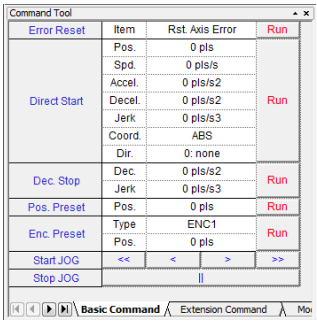


## (3) Network type XPM (XGF-PN8A), standard network type XPM (XGF-PN8B)

Screen	Command	Setting range	Related Command
	Error Reset	Axis error reset/Common error reset	XCLR
	Indirect Start	Step : 1 ~ 400	XIST
	Direct start	1. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree] 2. Speed (each Unit range) pulse : 0 ~ 10,000,000 [pulse/sec] mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min] inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min] degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] 3. Dwell : 0 ~ 65,535 ms 4. M code : 0 ~ 65,535	XDST
	Deceleration stop	Stop time : 0 ~ 2,147,483,647 ms	XSTP
	Inching operation	Amount of Inching : -2,147,483,648 ~ 2,147,483,647 pls	XINCH
	Jog Operation /Stop	Speed (each Unit range) pulse : 0 ~ 10,000,000 [pulse/sec] mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min] inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min] degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min]	-

## Chapter 10 Test run by XG-PM

### (4) Motion Control Module

Screen	Command	Setting range	Related Command
	Error Reset	Axis error reset/Common error reset	XTRUN
	Direct start	1. Position : $-1.7976931348623158 \times 10^{308} \sim 1.7976931348623158 \times 10^{308}$ [pulse] 2. Speed : $2.2250738585072014 \times 10^{-308} \sim 1.7976931348623158 \times 10^{308}$ [pulse/초] 3. Acceleration : $2.2250738585072014 \times 10^{-308} \sim 1.7976931348623158 \times 10^{308}$ [pls/s <sup>2</sup> ] 4. Deceleration : $2.2250738585072014 \times 10^{-308} \sim 1.7976931348623158 \times 10^{308}$ [pls/s <sup>2</sup> ] 5. Jerk : $2.2250738585072014 \times 10^{-308} \sim 1.7976931348623158 \times 10^{308}$ [pls/s <sup>3</sup> ] 6. Coordinate : Absolue/Relative 7. Direction : None/CW/Shortest distance/CCW/Current Direction	XTRUN
	Deceleration stop	Deceleration : $2.2250738585072014 \times 10^{-308} \sim 1.7976931348623158 \times 10^{308}$ pls/s2 Jerk : $2.2250738585072014 \times 10^{-308} \sim 1.7976931348623158 \times 10^{308}$ pls/s3	XTRUN
	Encoder Preset	Type : 엔코더1/엔코더2 Position : $-1.7976931348623158 \times 10^{308} \sim 1.7976931348623158 \times 10^{308}$ [pulse]	-
	Jog Operation /Stop	Speed (each Unit range) pulse : 0 ~ 10,000,000 [pulse/sec]	-

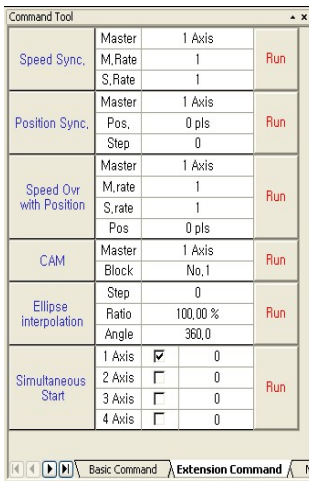
## 2. Extension command

## (1) APM module (XGF-POxA, XGF-PDxA)

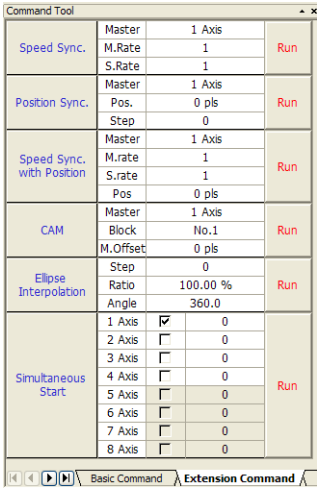
Screen	Command	Setting range	Related command
	Speed sync.	1. Main axis range : Axis X~ Axis Z and Encoder 2. Main axis rate : 1 ~ 65535 3. Sub axis rate : 1 ~ 65535	SSS
	Position sync.	1. Step : 1 ~ 400 2. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree] 3. Main axis range : Axis X~ Axis Z and Encoder	SSP
	Speed sync. with position	1. Main axis range : Axis X~ Axis Z and Encoder 2. Main axis rate : 1 ~ 65535 3. Sub axis rate : 1 ~ 65535 4. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	SSSP
	Linear interpolation	1. Axis: Axis X, Axis Y/Axis X, Axis Z/ Axis X, Axis Y, Axis Z 2. Step : 1~400	LIN
	Circular interpolation	1. Step : 1~400 2. Sub axis: Axis X ~ Axis Z	CIN
	Synch start	Axis : Select X ~ Z axis, Step No.: 1 ~ 400	SST

## Chapter 10 Test run by XG-PM

### (2) XPM module (XGF-P0xH, XGF-PDxH)

Screen	Command	Setting range	Related command
	Speed sync.	1. Main axis range : Axis 1 ~ Axis 4 and Encoder 2. Main axis rate : 1 ~ 65535 3. Sub axis rate : 1 ~ 65535	XSSS
	Position sync.	1. Step : 1 ~ 400 2. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree] 3. Main axis range : Axis 1 ~ Axis 4 and Encoder	XSSP
	Speed sync. with position	1. Main axis range : Axis 1 ~ Axis 4 and Encoder 2. Main axis rate : 1 ~ 65535 3. Sub axis rate : 1 ~ 65535 4. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	
	CAM operation	1. Main axis range : Axis 1 ~ Axis 4 2. CAM block : No.1 ~ No.8	XCAM
	Ellipse interpolation	1. Step: 1 ~ 400 2. Range: 0 ~ 65535 [ $\times 10^{-2}$ %] 3. Each operation: 0 ~ 65535 [ $\times 10^{-1}$ degree]	XELIN
	Synch start	Axis : Select 1 ~ 4 axis, Step No.: 1 ~ 400	XSST


## (3) Network type XPM (XGF-PN8A), standard network type XPM (XGF-PN8B)

Screen	Command	Setting range	Related command
	Speed sync.	1. Main axis range : Axis 1 ~ Axis 8 and Encoder 2. Main axis rate : 1 ~ 65535 3. Sub axis rate : 1 ~ 65535	XSSS
	Position sync.	1. Step : 1 ~ 400 2. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree] 3. Main axis range : Axis 1 ~ Axis 8 and Encoder	XSSP
	Speed sync. with position	1. Main axis range : Axis 1 ~ Axis 8 and Encoder 2. Main axis rate : 1 ~ 65535 3. Sub axis rate : 1 ~ 65535 4. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	
	CAM operation	1. Main axis range : Axis 1 ~ Axis 8 2. CAM block : No.1 ~ No.8	XCAM
	Ellipse interpolation	1. Step: 1 ~ 400 2. Range: 0 ~ 65535 [ $\times 10^{-2}$ %] 3. Each operation: 0 ~ 65535 [ $\times 10^{-1}$ degree]	XELIN
	Synch start	Axis : Select 1 ~ 4 axis, Step No.: 1 ~ 400	XSST

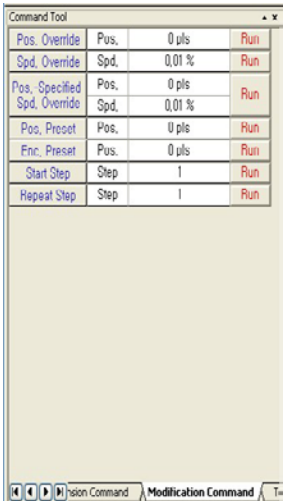
## Chapter 10 Test run by XG-PM

### 3. Modification command

(1) APM module (XGF-POxA, XGF-PDxA)

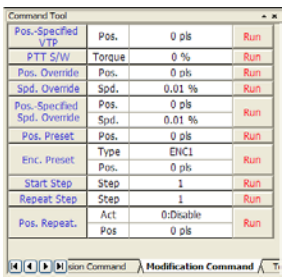
Screen	Command	Setting range	Related command
	Position override	Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	POR
	Speed Override	Speed (Each Unit range) pulse : 0 ~ 1,000,000 [pulse/sec](XGF-PDxA) pulse : 0 ~ 200,000 [pulse/sec](XGF-POxA) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min](XGF-POxA, XGF-PDxA) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min](XGF-POxA, XGF-PDxA) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (XGF-POxA, XGF-PDxA)	SOR
	Pos.-specified Speed Override	1. Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree] 2. Speed (Each unit range) pulse : 0 ~ 1,000,000 [pulse/sec](XGF-PDxA) pulse : 0 ~ 200,000 [pulse/sec](XGF-POxA) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min](XGF-POxA, XGF-PDxA) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min] (XGF-POxA,XGF-PDxA) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (XGF-POxA, XGF-PDxA)	PSO
	Current position preset	1. Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	PRS
	Encoder Preset	Position : 0 ~ 4,294,967,295 [pulse]	EPRS
	Start step	Step : 1 ~ 400	SNS
	Repeat step	Step : 1 ~ 400	SRS
	Pos. Repeat.	Position (Each unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	RCP

## (2) XPM module (XGF-POxH, XGF-PDxH)

Screen	Command	Setting range	Related command
	Position override	Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	XPOR
	Speed Override	Speed (In case of designating %) 0 ~ 65535 [ $\times 10^{-2}$ %] Speed (in case of designating speed, each unit range) pulse : 0 ~ 4,000,000 [pulse/sec](XGF-PDxH) pulse : 0 ~ 500,000 [pulse/sec](XGF-POxH) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min](XGF-POxH, XGF-PDxH) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min](XGF-POxH, XGF-PDxH) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (XGF-POxH, XGF-PDxH) (Decided designating % or designating speed at [Speed Override] parameter setting of common parameter.)	XSOR
	Pos-specified Speed Override	1. Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree] 2. Speed(In case of designating %) 0 ~ 65535 [ $\times 10^{-2}$ %] Speed (In case of designating speed, each unit range) pulse : 0 ~ 4,000,000 [pulse/sec](XGF-PDxH) pulse : 0 ~ 500,000 [pulse/sec](XGF-POxH) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min](XGF-POxH, XGF-PDxH) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min](XGF-POxH, XGF-PDxH) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (XGF-POxH, XGF-PDxH) (Decided designating % or designating speed at [Speed Override] parameter setting of common parameter.)	XPSO
	Current position preset	1. Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	XPRS
	Encoder Preset	1. Position : -2,147,483,648 ~ 2,147,483,647 [pulse]	XEPRS
	Start step	Step : 1 ~ 400	XSNS
	Repeat step	Step : 1 ~ 400	XSRS

## Chapter 10 Test run by XG-PM

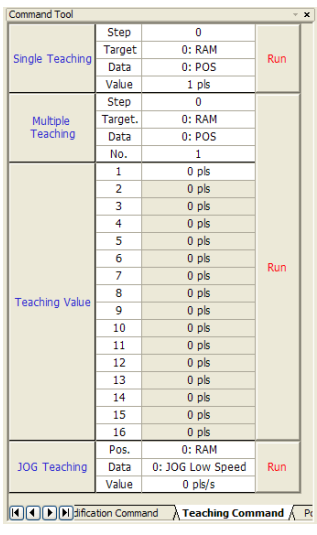
(3) Network type XPM (XGF-PN8A), standard network type XPM (XGF-PN8B)

Screen	Command	Setting range	Related command
	Position/ Torque switching	Torque value: -300~300% (Sets the ratio to the rated torque of the servo parameter)	XPTT
	Position override	Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	XPOR
	Speed Override	Speed (In case of designating %) 0 ~ 65535 [ $\times 10^{-2}$ %] Speed (in case of designating speed, each unit range) pulse : 0 ~ 10,000,000 [pulse/sec] mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min] inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min] degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (Decided designating % or designating speed at [Speed Override] parameter setting of common parameter.)	XSOR
	Pos- specified Speed Override	1. Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree] 2. Speed(In case of designating %) 0 ~ 65535 [ $\times 10^{-2}$ %] Speed (In case of designating speed, each unit range) pulse : 0 ~ 10,000,000 [pulse/sec] mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min] inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min] degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (Decided designating % or designating speed at [Speed Override] parameter setting of common parameter.)	XPSO
	Current position preset	1. Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	XPRS
	Encoder Preset	1. Position : -2,147,483,648 ~ 2,147,483,647 [pulse]	XEPRS
	Start step	Step : 1 ~ 400	XSNS
	Repeat step	Step : 1 ~ 400	XSRS
	Current position section repeat	Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	XRCP

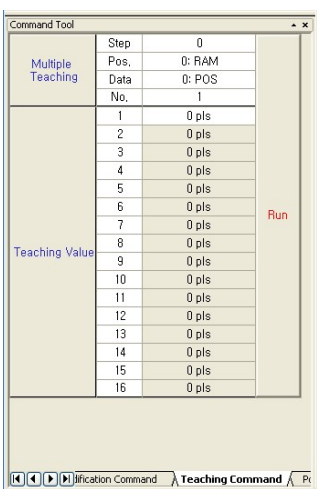


#### 4. Teaching Command

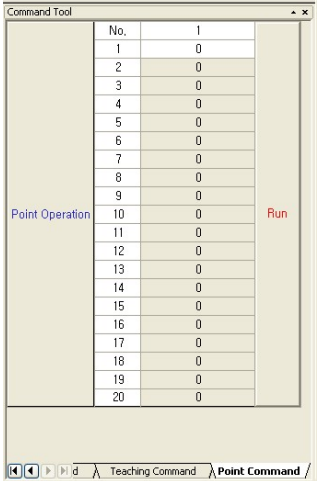
(1) APM module (XGF-POxA, XGF-PDxA)

Screen	Command	Setting range	Related command
	Single teaching	1. Step : 1 ~ 400 2. System : 0 (RAM teaching), 1 (ROM teaching) 3. Method : 0 (Position teaching), 1 (Speed teaching) 4. The number : 1 ~ 16	TEA
	Multiple teaching	1. Step : 1 ~ 400 2. System : 0 (RAM teaching), 1 (ROM teaching) 3. Method : 0 (Position teaching), 1 (Speed teaching) 4. The number : 1 ~ 16	TEAA
	Teaching value	Position pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	
	JOG teaching	1. Method : 0 (RAM teaching), 1 (ROM teaching) 2. Data : 0 (JOG high speed), 1 (JOG low speed) 3. Speed : pulse : 0 ~ 1,000,000 [pulse/sec](XGF-PDxA) pulse : 0 ~ 200,000 [pulse/sec](XGF-POxA) mm : 0 ~ 2,000,000,000 [ $\times 10^{-2}$ mm/min](XGF-POxA, XGF-PDxA) inch : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ inch/min] (XGF-POxA, XGF-PDxA) degree : 0 ~ 2,000,000,000 [ $\times 10^{-3}$ degree/min] (XGF-POxA, XGF-PDxA)	TMP

(2) XPM module (XGF-POxH, XGF-PDxH, XGF-PNxH), network type XPM (XGF-PN8A), standard network type XPM (XGF-PN8B), Motion Control Module

Screen	Command	Setting range	Related command
	Multiple teaching	1. Step : 1 ~ 400 2. System : 0 (RAM teaching), 1 (ROM teaching) 3. Method : 0 (Position teaching), 1 (Speed teaching) 4. The number : 1 ~ 16	XTEAA
	Teaching value	Position pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [ $\times 10^{-5}$ degree]	





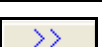
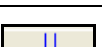
### 5. Point operation (APM, XPM, network type XPM, standard network type XPM common)

Screen	Command	Setting range	Related command
	POINT Operation	1. The number : 1 ~ 20 2. Point setting (0 ~ 19) : 1 ~ 400 => Operation step setting	PST(APM) XPST(XPM)

- (1) Point operation operate maximum 20 set operation step positioning by once.
- (2) When set the step number, have to set highest step No. while operating mode is continue or consecutive.
- (3) When operate point operation, if set the number of point, below item(0~19) is revitalized as the set number.

## 10.2.4 Jog Operation

Operate to Jog command by clicking Jog operation icon.

Screen	Icon	Command	Related command
		Reverse high speed jog operation.	-
		Reverse low speed jog operation.	
		Forward low speed jog operation	
		Forward high speed jog operation	
		Jog operation stop	

















10.3 Command Icon

Can easily process command, executed solely without command condition, through icon

[Composition of a picture]



[Screen description]

Command Icon	Command contents	Operation description	Note
	Axis stop	Designated axis deceleration command	Common
	Emergency stop	Internal emergency stop command during operation.	Common
	Homing	Homing command.	Common
	Immoveable origin setting	Origin setting command by software.	Common
	Speed/Position Conversion	This command for converse to positioning control during speed control operation.	Common
	Position/Speed Conversion	This command for converse to speed control during speed control operation.	Common
	Skip operation	Stop current operating step and operate next step.	Common
	Consecutive operation	Operation pattern of current operation step change to consecutive operation, operate to next step without stop section.	Common
	Manual operation before homing	Operate manual operation (jog operation, inching operation) after complete positioning operation, then in case of positioning spot is changed, it is moved to positioning completion spot before manual operation.	Common
	Cancel M Code	This command cancels M code.	Common
	Enable ZONE Output	Enable ZONE output.	Only APM
	Disable ZONE Output	Disable ZONE output	Only APM
	Enable MPG	Enable MPG	Only APM
	Disable MPG	Disable MPG	Only APM
	Error history reset	Clear current error history during operation.	Only APM
	Error reset	Clear current error during operation.	Common

### 10.4 Example of Test Run

Here describes example of test run when test run needed.

#### 10.4.1 Jog Operation

Following example describes jog operation for testing initialize operation after connect with motor.

[APM module Sequence]

- (1) Make a new project by proceeding [Project]->[New project].
- (2) Proceed [Online]->[connect] , online with module.
- (3) Revitalize operation parameter screen of axis for performance.
- (4) Set jog parameter of manual operation parameter on the operation parameter.  
(Set Jog high speed/Jog low speed/Jog acceleration time/Jog deceleration time)
- (5) Proceed [Online]->[Write] , write the set jog parameter to module.  
(Please refer to this manual 9.1 writing data for method of writing.)
- (6) Select axis for performing jog operation at the command tool.  
(Please refer to 10.2.1. select of command axis.)
- (7) Proceed jog operation with basic command tab of command tool window.
- (8) Confirm jog operation by system view screen.

[Confirm performance]

Following example is system view screen after performing jog operation on the axis X, axis Y.  
(Perform automatically monitoring function when perform jog operation.)

Signal/Axis	✓ X axis	✓ Y axis	✓ Z axis
Unit	pls,pls/s	pls,pls/s	pls,pls/s
Position	0	0	0
Speed	1000	5000	0
Step No.	1	1	1
Error Code	0	0	0
Main Axis	X axis	Y axis	Z axis
Main/Sub. Ax.	Master	Master	Master
M Code	0	0	0
Opr. Status	ON	ON	
Pos. Comp.			
M Code ON			
Origin Fix			
Output Inhibit			
Stop Status			
Upper Limit			
Lower Limit			
EMG Stop			
CW/CCW	CW	CW	CW
Operation Status	Constant	Constant	
Control Pattern			
Homing			
Position Sync.			
Speed Sync.			
JOG High Speed		ON	
JOG Low Speed	ON		
Inching			
Return to the Point			
ZONE 1			
ZONE 2			
ZONE 3			
Encoder		0	

- (a) Command speed: When proceed jog low(high) speed operation, set value will be displayed by operation parameter.
- (b) Operation status: Operation status is displayed as “Steady speed” while it is jog operating.
- (c) Control pattern: Operation status is displayed as “Jog operating” while jog operating.

## [XPM module Sequence]

- (1) Make a new project by proceeding [Project]->[New project].
- (2) Proceed [Online] → [connect] , online with module.
- (3) Revitalize operation parameter screen of axis for performance.
- (4) Set jog parameter of manual operation parameter on the operation parameter.  
(Set Jog high speed/Jog low speed/Jog acceleration time/Jog deceleration time)
- (5) Proceed [Online] → [Write] , write the set jog parameter to module.  
(Please refer to this manual 9.1 writing data for method of writing.)
- (6) Select axis for performing jog operation at the command tool.  
(Please refer to 10.2.1. select of command axis.)
- (7) Proceed jog operation with basic command tab of command tool window.
- (8) Confirm jog operation by system view screen.

## [Confirm performance]

Following example is system view screen after performing jog operation on the axis 1, axis 2.

(Perform automatically monitoring function when perform jog operation.)

Signal/Axis	<input checked="" type="checkbox"/> 1 Axis	<input checked="" type="checkbox"/> 2 Axis	<input checked="" type="checkbox"/> 3 Axis	<input type="checkbox"/> 4 Axis
Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	
Current Pos	18360	4115	0	
Current Spd	1000	1000	0	
Step No	1	1	1	
Error Code	0	0	0	
Main Axis	1 Axis	2 Axis	3 Axis	
Main/Sub. Ax.	Master	Master	Master	
M Code	0	0	0	
Opr. Status	ON	ON		
Pos. Comp.				
M Code ON				
Origin Fix				
Stop Status				
Upper Limit				
Lower Limit				
EMG Stop				
CW/CCW	CW	CW	CW	
Operation Status	Constant	Constant		
Control Pattern	JOG	JOG		
Homing				
Position Sync.				
Speed Sync.				
JOG	ON	ON		
Inching				
Return to the Point				
Encoder		0		

(a) Command speed: When proceed jog low(high) speed operation, set value will be displayed by operation parameter.

(b) Operation status: Operation status is displayed as “Steady speed” while it is jog operating.

(c) Control pattern: Operation status is displayed as “Jog operating” while jog operating.

## Chapter 10 Test run by XG-PM

[Network type XPM, standard network type XPM Sequence]

- (1) Make a new project by proceeding [Project]->[New project].
- (2) Proceed [Online]->[connect] , online with module.
- (3) Proceed [Online]->[Connect to all servo] to connect the module to servo.
- (4) Make the axis for JOG operation “Servo on” status
- (5) Revitalize operation parameter screen of axis for performance.
- (6) Set jog parameter of manual operation parameter on the operation parameter.  
(Set Jog high speed/Jog low speed/Jog acceleration time/Jog deceleration time)
- (7) Proceed [Online]->[Write] , write the set jog parameter to module.  
(Please refer to this manual 9.1 writing data for method of writing.)
- (8) Select axis for performing jog operation at the command tool.  
(Please refer to 10.2.1. select of command axis.)
- (9) Proceed jog operation with basic command tab of command tool window.
- (10) Confirm jog operation by system view screen.

[Confirm performance]

Following example is system view screen after performing jog operation on the axis 1, axis 2.  
(Perform automatically monitoring function when perform jog operation.)

The screenshot displays the XG-PM system view interface. At the top, there are indicators for ENC1 and ENC2, both set to 0. Below these are status indicators for A1, A2, A3, and A4. To the right, a table shows system information:

Item	Contents
Information	XGF-PN8A(Base0,Slot10)-Online
OS Info.	Ver. 1.01 (2010- 8- 19 )
Status	Normal (0)

Below the status indicators is a large table with 8 columns representing different axes (1 Axis to 8 Axis) and multiple rows for various parameters. The table is divided into three sections marked with letters a, b, and c:

Status / Axis	1 Axis	2 Axis	3 Axis	4 Axis	5 Axis	6 Axis	7 Axis	8 Axis
Pos/Spd Unit.	pls,pls/s	pls,pls/s	pls,pls/s	pls,pls/s				
Command Pos.	35100	-1670124933	183354088	352339375				
Command Spd.	1000	0	0	0				
Current Pos.	35090	-1670124933	183354088	352339375				
Current Spd.	-1382	-2135	0	-2128				
Torque	2.4 %	0.0 %	0.0 %	0.0 %				
Step No.	1	1	1	1				
Error Code	413	0	0	0				
Main Axis	1 Axis	2 Axis	3 Axis	4 Axis				
Main/Sub. Ax.	Main Axis	Main Axis	Main Axis	Main Axis				
M Code	0	0	0	0				
Opr. Status	In Constant S							
Pos. Comp.								
M Code ON								
Positioning								
Ctrl Pattern	JOG Operatio							
Stop Status								
Upper Limit								
Lower Limit								

Section a points to the Command Spd. row. Section b points to the Opr. Status row. Section c points to the Ctrl Pattern row.

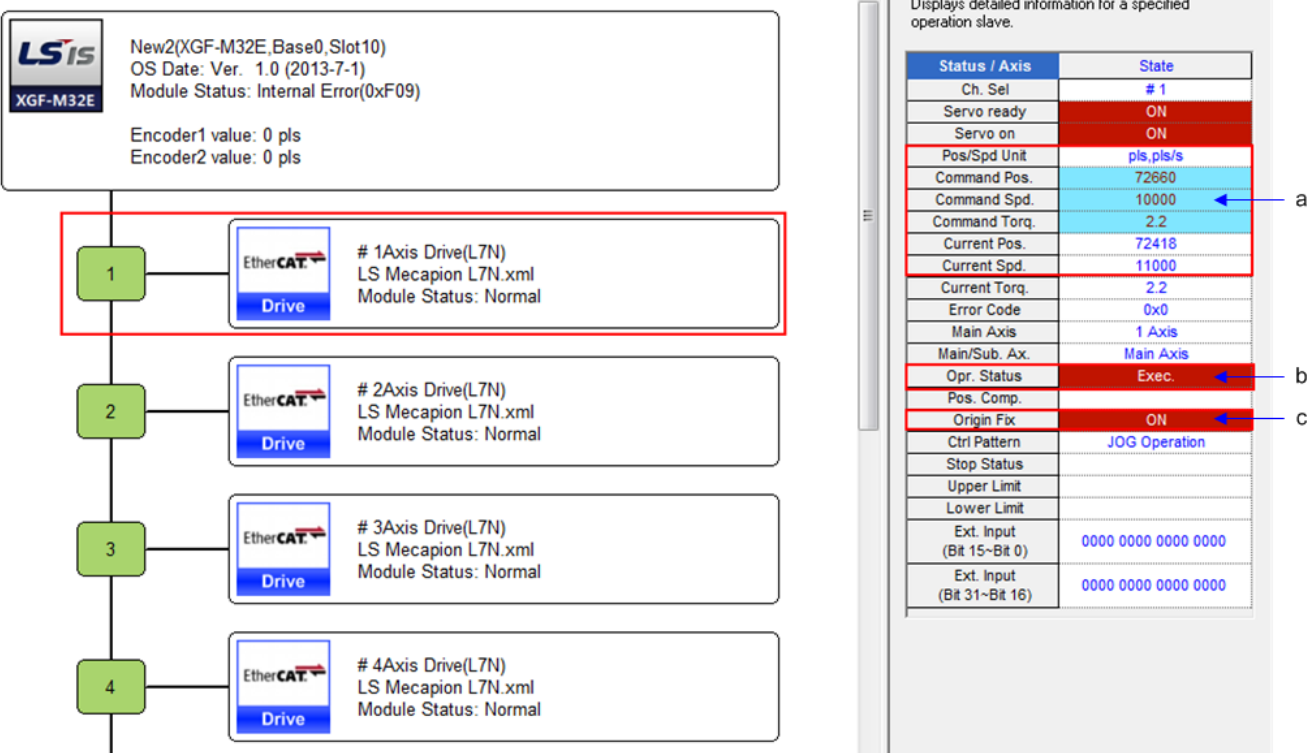
- (a) Command speed: When proceed jog low/high speed operation, set value will be displayed by operation parameter.
- (b) Operation status: Operation status is displayed as “Steady speed” while it is jog operating.
- (c) Control pattern: Operation status is displayed as “Jog operating” while jog operating.

[Motion Control Module Sequence]

- (1) Execute [project] → [New project] to create a new project.
- (2) Execute [Online] → [Connect] menu to make the module online.
- (3) Execute [Online] → [Connect to all Servo] to connect the module to the Servo drive.
- (4) In the Servo Tool, Execute Servo-On for the axis that needs JOG operation
- (5) Activate the operation parameter screen of the axis that needs JOG.
- (6) Set the parameters related JOG in the manual operation parameter.  
(JOG high speed /JOG low speed/JOG Acceleration time/JOG deceleration time)
- (7) Execute [Online]->[Write] to write the set JOG parameters in the relevant module.  
(For more details on how to execute Write, refer to 9.1 Write Data of the Manual)
- (8) In the Command Tool, select the axis that needs JOG operation(Refer to 10.2.1 Select command axis)
- (9) Execute the JOG operation in the basic command tab of a Command Tool window.
- (10) Check the JOG operation through a network view screen.

[Confirm performance]

The below example shows the network view screen executing JOG operation for 1 axis after the Servo drive is connected.




- (a) Command speed : Displays the JOG low speed(high speed) set value set by the operation parameters when executing JOG low speed(high speed)operation.
- (b) Command operation status : Displays the command operation status as 'Execution' during JOG operation.
- (c) Operation control type : Displays the operation control status as 'JOG operation' during JOG operation.

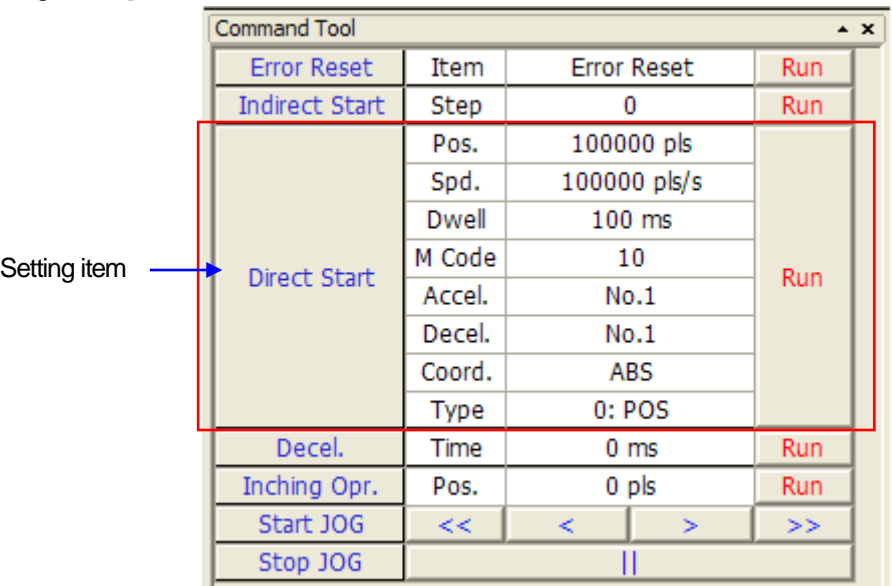
10.4.2 Direct Start (single axis position control)

Here describes Shortcut position control by direct start.

[Sequence]

- (1) Create new project by proceeding [Project]->[New project].
- (2) Online module by proceeding [Online]->[Connect].
- (3) Execute stability origin setting command for directing start operation.(shortcut icon ).
- (4) Revitalize basic command tab of command tool window.
- (5) Execute direct start by operation condition.

[Setting screen]



[Setting value]

Setting item	Setting value	Content
Position	100,000 pls	Operate motor to 100,000 pls.
Speed	10,000 pls/s	Operate motor as 10,000 pls/s.
Dwell	100 ms	Dwell time is 100ms after operating.
M code	10	M code is 10 while it is operating. <sup>ex1)</sup>
Acceleration	No.1	Operate No.1 during accelerating.
Deceleration	No.1	Operate No.1 during accelerating.
Coordinate	Absolute	Operate absolute position coordinate.
Method	Position control	Operation method operates by position control method.

**Note 1)** M code mode(Operation parameter→Expansion parameter) should be set as 1 : With(Display M code during operating) or 2 : After(Display M code after operating) for displaying M code on screen.  
In this case, confirm M code after operation complete by set 2.



[APM module operation]

This is a screen of system view after operation complete when it is operating by data setting.

Signal/Axis	<input checked="" type="checkbox"/> X axis	<input checked="" type="checkbox"/> Y axis	<input checked="" type="checkbox"/> Z axis
Unit	pls,pls/s	pls,pls/s	pls,pls/s
a → Position	100000	0	0
Speed	0	0	0
Step No.	1	1	1
Error Code	0	0	0
Main Axis	X axis	Y axis	Z axis
Main/Sub. Ax.	Master	Master	Master
b → M Code	10	0	0
Opr. Status			
Pos. Comp.			
c → M Code ON	ON		
Origin Fix	ON		
Output Inhibit			
Stop Status			
Upper Limit			
Lower Limit			
EMG Stop			
CW/CCW	CW	CW	CW
Operation Status			
Control Pattern	1 Axis Position		
Homing			
Position Sync.			
Speed Sync.			
JOG High Speed			
JOG Low Speed			
Inching			
Return to the Point			
ZONE 1			
ZONE 2			
ZONE 3			
Encoder		0	

[XPM operation]

This is a screen of system view after operation complete when it is operating by data setting.

Signal/Axis	<input checked="" type="checkbox"/> 1 Axis	<input checked="" type="checkbox"/> 2 Axis	<input checked="" type="checkbox"/> 3 Axis	<input type="checkbox"/> 4 Axis
Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	
a → Current Pos	100000	201739	0	
Current Spd	0	0	0	
Step No	1	1	1	
Error Code	322	322	0	
Main Axis	1 Axis	2 Axis	3 Axis	
Main/Sub. Ax.	Master	Master	Master	
b → M Code	10	0	0	
Opr. Status				
Pos. Comp.				
c → M Code ON	ON			
Origin Fix	ON			
Stop Status				
Upper Limit				
Lower Limit				
EMG Stop				
CW/CCW	CW	CW	CW	
Operation Status				
Control Pattern				
Homing				
Position Sync.				
Speed Sync.				
JOG				
Inching				
Return to the Point				
Encoder		0		

- (a) Current position: Current position display target position value 100,000.
- (b) M code No.: Display setting value 10.
- (c) M code On : Current M code display 10, display M code on the screen.

## Chapter 10 Test run by XG-PM

[Network type XPM, standard network type XPM operation]

This is a screen of system view after operation complete when it is operating by data setting.

Status / Axis	1 Axis	2 Axis	3 Axis	4 Axis	5 Axis	6 Axis	7 Axis	8 Axis
Pos/Spd Unit.	pls,pls/s	pls,pls/s	pls,pls/s	pls,pls/s				
Command Pos.	6532	-1670124934	183354088	352339375				
Command Spd.	1000	0	0	0				
Current Pos.	6516	-1670124934	183354088	352339375				
Current Spd.	-1069	-2135	0	-2128				
Torque	2.3 %	0.0 %	0.0 %	0.0 %				
Step No.	1	1	1	1				
Error Code	0	0	0	0				
Main Axis	1 Axis	2 Axis	3 Axis	4 Axis				
Main/Sub. Ax.	Main Axis	Main Axis	Main Axis	Main Axis				
M Code	10	0	0	0				
Opr. Status	In Constant S							
Pos. Comp.								
M Code ON	ON							
Positioning	ON							
Ctrl Pattern	1 Axis Positio							
Stop Status								
Upper Limit								
Lower Limit								


(a) Current position: Current position display target position value 100,000.

(b) M code : Display setting value 10.

(c) M code ON : Current M code display 10, display M code on the screen.

### Notes

Cancel M code On: In case of displaying M code, Have to cancel M code for operating other command when it is restart after operation complete.

M code can be cancelled by [Cancel M code] on the command tool bar. (shortcut Icon )

[Motion Control Module Sequence]

- (1) Execute [project]->[New project] to create a new project.
- (2) Execute [Online]->[Connect] menu to make the module online.
- (3) Set the current position as 0 by executing 'Preset the current position'.
- (4) Activate the basic command tab in command tools window.
- (5) Execute the direct operation with the below conditions.

[Motion Control Module Setting screen]

Command Tool				
Error Reset	Item	Rst. Axis Error	Run	
Direct Start	Pos.	100000 pls	Run	
	Spd.	10000 pls/s		
	Accel.	10000 pls/s <sup>2</sup>		
	Decel.	10000 pls/s <sup>2</sup>		
	Jerk	0 pls/s <sup>3</sup>		
	Coord.	ABS		
	Dir.	0: none		
Dec. Stop	Dec.	0 pls/s <sup>2</sup>	Run	
	Jerk	0 pls/s <sup>3</sup>		
Pos. Preset	Pos.	0 pls	Run	
Enc. Preset	Type	ENC1	Run	
	Pos.	0 pls		
Start JOG	<<	<	>	>>

Basic Command   Extension Command

[Motion Control Module Setting Value]

Setting item	Set value	Description
Position	100,000 pls	Operates a motor up to the position of 100,000 pls.
Speed	10,000 pls/s	Operates a motor at a speed of 10,000 pls/s.
Acceleration	10,000 pls/s <sup>2</sup>	Operates a motor at the acceleration speed of 10,000 pls/s <sup>2</sup> .
Deceleration	10,000 pls/s <sup>2</sup>	Operates a motor at the deceleration speed of 10,000 pls/s <sup>2</sup> .
Jerk	0 pls/s <sup>3</sup>	Operates a motor at the jerk of 0 pls/s <sup>3</sup> .
Coordinate	Absolute coordinate	Adopts the absolute coordinate.
Direction	Undesignated	Adopts a position control mode for the operation mode.

## Chapter 10 Test run by XG-PM

[Motion Control Module operation]

When the above data setting are applied, this is the network view screen after completing operation.

**Top Drive Details:**  
 New2(XGF-M32E,Base0,Slot10)  
 OS Date: Ver. 1.0 (2013-7-1)  
 Module Status: Internal Error(0xF09)  
 Encoder1 value: 0 pls  
 Encoder2 value: 0 pls

**Drive 1 Details:**  
 # 1Axis Drive(L7N)  
 LS Mecapion L7N.xml  
 Module Status: Normal

**Drive 2 Details:**  
 # 2Axis Drive(L7N)  
 LS Mecapion L7N.xml  
 Module Status: Normal

**Drive 3 Details:**  
 # 3Axis Drive(L7N)  
 LS Mecapion L7N.xml  
 Module Status: Normal

**Drive 4 Details:**  
 # 4Axis Drive(L7N)  
 LS Mecapion L7N.xml  
 Module Status: Normal

Displays detailed information for a specified operation slave.

Status / Axis	State
Ch. Sel	# 1
Servo ready	ON
Servo on	ON
Pos/Spd Unit	pls,pls/s
Command Pos.	100000
Command Spd.	0
Command Torq.	1.2
Current Pos.	100001
Current Spd.	1000
Current Torq.	1.2
Error Code	0x0
Main Axis	1 Axis
Main/Sub. Ax.	Main Axis
Opr. Status	Complete exec.
Pos. Comp.	ON
Origin Fix	ON
Ctrl Pattern	
Stop Status	
Upper Limit	
Lower Limit	
Ext. Input (Bit 15~Bit 0)	0000 0000 0000 0000
Ext. Input (Bit 31~Bit 16)	0000 0000 0000 0000

(a) Current position: The current position indicates the targeted position value, 100, 000.


(b) Operation status: It indicates that command operation status is completely executed.

10.4.3 Indirect Start (single axis position control and circular interpolation)

Following example describes about operation method by indirect start (operation data).

1. Single-axis position control

[Sequence]

- (1) Create new project by proceeding [Project]->[New project].
- (2) Online module by proceeding [Online]->[Connection].
- (3) Connect the module to the servo drive by proceeding [Online] -> [Connect to all servo] (network type)
- (4) Make the axis “Servo on” status at the servo tool (network type)
- (5) Operate stability origin setting command on the axis for direct start. (Shortcut Icon ).
- (6) Set data after revitalize operation data screen of axis for start. (Proceed simply view after revitalize)
- (7) Write operation data to module by proceeding [Online]->[Write].  
(Refer to this manual 9.1 writing data for execution method)
- (8) Revitalize basic command tab of command tool window.
- (9) Set step No. of indirection start item and click the start button.

[APM module Setting screen]

Setting item →

× axis ▲	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	END	SNG	1000000	10	No. 1	100000	0
2	END	SNG	0	0	No. 1	0	0
3	END	SNG	0	0	No. 1	0	0
4	END	SNG	0	0	No. 1	0	0

Setting item →

Command Tool

Error Reset	Item	Error Reset	Run	
Indirect Start	Step	1	Run	
Direct Start	Pos.	100000 pls	Run	
	Spd.	100000 pls/s		
	Dwell	100 ms		
	M Code	10		
	Accel.	No.1		
	Decel.	No.1		
	Coord.	ABS		
	Type	0: POS		
Decel.	Time	0 ms	Run	
Inching Opr.	Pos.	0 pls	Run	
Start JOG	<<	<	>	>>
Stop JOG				

## Chapter 10 Test run by XG-PM

[XPM, network type XPM, standard network type XPM Setting screen]

Setting item	1 Ax	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
	1	ABS, (SNG)POS	SNG, END	1000000	100000	No.1	No.1	10	0
	2	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
	3	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
	4	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0

Setting item →

Command Tool				
Error Reset	Item	Error Reset	Run	
Indirect Start	Step	1	Run	
Direct Start	Pos.	100000 pls	Run	
	Spd.	100000 pls/s		
	Dwell	100 ms		
	M Code	10		
	Accel.	No.1		
	Decel.	No.1		
	Coord.	ABS		
	Type	0: POS		
Decel.	Time	0 ms	Run	
Inching Opr.	Pos.	0 pls	Run	
Start JOG	<<	<	>	>>
Stop JOG				

[Setting value]

Setting item	Setting value	Contents
Control method	Absolute, Single-axis position control	Execute position control operation by absolute coordinate.
Operation method	Single, End	Execute single stop operation of current step.
Target position	1,000,000 pls	Operate motor to 1,000,000 pls.
Operation speed	100,000 pls/s	Operate motor as 100,000 pls/s.
Acceleration No.	No.1	Set acceleration speed as No.1.
Deceleration No.	No.1	Set deceleration speed as No.1.
M code	10	M code is 10, when it is operating.
Dwell time	0 ms	Dwell time is 0ms after operation.

[APM operation]

This picture is the system view screen of operation complete by data setting.  
(It is same with result of 10.4.2 direct start (single axis position control)).

Signal/Axis	<input checked="" type="checkbox"/> X axis	<input checked="" type="checkbox"/> Y axis	<input checked="" type="checkbox"/> Z axis
Unit	pls,pls/s	pls,pls/s	pls,pls/s
a → Position	1000000	0	0
b → Speed	0	0	0
Step No.	1	1	1
Error Code	0	0	0
Main Axis	X axis	Y axis	Z axis
Main/Sub. Ax.	Master	Master	Master
c → M Code	10	0	0
Opr. Status			
Pos. Comp.			
d → M Code ON	ON		
Origin Fix	ON		
Output Inhibit			
Stop Status			
Upper Limit			
Lower Limit			
EMG Stop			
CW/CCW	CW	CW	CW
Operation Status			
Control Pattern	1 Axis Position		
Homing			
Position Sync.			
Speed Sync.			
JOG High Speed			
JOG Low Speed			
Inching			
Return to the Point			
ZONE 1			
ZONE 2			
ZONE 3			
Encoder		0	

[XPM operation]

This picture is the system view screen of operation complete by data setting.  
(It is same with result of 10.4.2 direct start (single axis position control).

Signal/Axis	<input checked="" type="checkbox"/> 1 Axis	<input checked="" type="checkbox"/> 2 Axis	<input checked="" type="checkbox"/> 3 Axis	<input type="checkbox"/> 4 Axis
Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	
a → Current Pos	1000000	201739	0	
Current Spd	0	0	0	
b → Step No	2	1	1	
Error Code	0	0	0	
Main Axis	1 Axis	2 Axis	3 Axis	
Main/Sub. Ax.	Master	Master	Master	
c → M Code	10	0	0	
Opr. Status				
Pos. Comp.				
d → M Code ON	ON			
Origin Fix	ON			
Stop Status				
Upper Limit				
Lower Limit				
EMG Stop				
CW/CCW	CW	CW	CW	
Operation Status				
Control Pattern				
Homing				
Position Sync.				
Speed Sync.				
JOG				
Inching				
Return to the Point				
Encoder		0		

## Chapter 10 Test run by XG-PM

[Network type XPM, standard network type XPM operation]

This picture is the system view screen of operation complete by data setting.

(It is same with result of 10.4.2 direct start (single axis position control)).

The screenshot displays the XG-PM system view. At the top, there are indicators for ENC1 and ENC2, both set to 0. Below these are four axis units labeled A1, A2, A3, and A4. A1 is highlighted with a red box. To the right of the axis units is a table with two columns: 'Item' and 'Contents'.

Item	Contents
Information	XGF-PN8A(Base0,Slot10)-Online
OS Info.	Ver. 1.01 (2010- 8- 19 )
Status	Normal (0)

Below the axis units is a large table with 9 columns: 'Status / Axis' and '1 Axis' through '8 Axis'. The table contains various status parameters for each axis. Red boxes and arrows highlight specific data points:

- a** points to the 'Current Pos.' row for 1 Axis, which displays '100000'.
- b** points to the 'Step No.' row for 1 Axis, which displays '2'.
- c** points to the 'Main/Sub. Ax.' row for 1 Axis, which displays 'Main Axis'.
- d** points to the 'M Code ON' row for 1 Axis, which displays 'ON'.

Status / Axis	1 Axis	2 Axis	3 Axis	4 Axis	5 Axis	6 Axis	7 Axis	8 Axis
Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	pls,pls/s				
Command Pos.	1000000	21	183354088	352339375				
Command Spd.	0	0	0	0				
Current Pos.	1000006	21	183354088	352339375				
Current Spd.	2183	-2094	0	-2128				
Torque	0.0 %	0.0 %	0.0 %	0.0 %				
Step No.	2	1	1	1				
Error Code	0	0	0	0				
Main Axis	1 Axis	2 Axis	3 Axis	4 Axis				
Main/Sub. Ax.	Main Axis	Main Axis	Main Axis	Main Axis				
M Code	10	0	0	0				
Opr. Status								
Pos. Comp.								
M Code ON	ON							
Positioning	ON	ON						
Ctrl Pattern								
Stop Status								
Upper Limit								
Lower Limit								

(a) Current position: Current position display target value 100,000.

(b) Step No.: Display 2 as next step of indirect step.

(c) M code No.: Display setting value 10.

(d) M code ON: Display current M code 10 and Display M code on current screen.


### Notes

Can change operation data displaying item for convenient by menu on display part of each axes, when set operation data.  
(View detail / Simply detail function, refer to manual 8.3.1)



## 2. Circular Interpolation

[APM module Sequence]

- (1) Create new project by proceeding [Project]->[New project].
- (2) Online module by proceeding [Online]->[Connect].
- (3) Execute stability origin setting command on the axes (axis X, axis Y) for circular interpolation.(Shortcut Icon .
- (4) Revitalize operation data screen of axis which need to start and set data. (Execute detailed view afteritalize)
- (5) Write operation data to module by proceeding [Online]->[Write].  
(Refer to this manual 9.1 writing data for execution)
- (6) Revitalize basic command tab of command tool window.
- (7) Revitalize XY graph after proceeding [Monitoring]->[Trend Monitoring] .
- (8) Set current position (axis X: axis X current position, axis Y: axis Y current position) after proceeding [Graph]->[Trend device setting].  
(Refer to this manual 11.6 data trend for setting.)
- (9) Click start button after setting step number as 1 and slave as Axis Y in the circular interpolation item of command tool.  
(Then command axis should be set axis X. Axis X is main executing axis on the below example.)

[Setting screen]

Center point setting

	Item	Parameter
Common Parameter	Pulse output level	0: Low active
	Circular interpolation	1: Center point
	Encoder input	4:PHASE A/B (x1)
	Auto reload	4294967295
	ZONE output mode	0: Individual Output
	ZONE 1 axis	0: X axis
	ZONE 2 axis	0: X axis
	ZONE 3 axis	0: X axis
	ZONE 1 ON region	0 pls
	ZONE 1 OFF region	0 pls
	ZONE 2 ON region	0 pls
	ZONE 2 OFF region	0 pls
	ZONE 3 ON region	0 pls
	ZONE 3 OFF region	0 pls

Axis X data setting

X axis	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	Cir. int. auxiliary point [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]	Circular int. dir.
1	ABS	POS	END	SNG	0	500000	10	No. 1	100000	0	CW
2	ABS	POS	END	SNG	0	0	0	No. 1	0	0	CW
3	ABS	POS	END	SNG	0	0	0	No. 1	0	0	CW

Axis Y data setting

Y axis	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	Cir. int. auxiliary point [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]	Circular int. dir.
1	ABS	POS	END	SNG	0	500000	10	No. 1	100000	0	CW
2	ABS	POS	END	SNG	0	0	0	No. 1	0	0	CW
3	ABS	POS	END	SNG	0	0	0	No. 1	0	0	CW

## Chapter 10 Test run by XG-PM

[Setting value]

[Axis X data]

Setting item	Setting value	Content
	Step 1	
Coordinate	Absolute	Execute operation by absolute coordinate.
Control type	Position	Execute operation by position control
Operation pattern	End	Set operation pattern as END
Operation type	Single	Set operation type as single
Target position[pls]	0 pls	Both start and end point is 0 pls.
Circular interpolation auxiliary point	500,000	Set circular interpolation auxiliary point (Center point ) as 500,000
M code	10	Display M code 10 while operating.
ACC/DEC No.	No.1	Set ACC/DEC number as No.1.
Speed	100,000	Operate motor with 100000 pls/s speed
Dwell time[ms]	0 ms	Dwell time is 0ms after operating.
Circular interpolation direction	CW	Set circular interpolation as CW (Clockwise)

[Axis Y data]

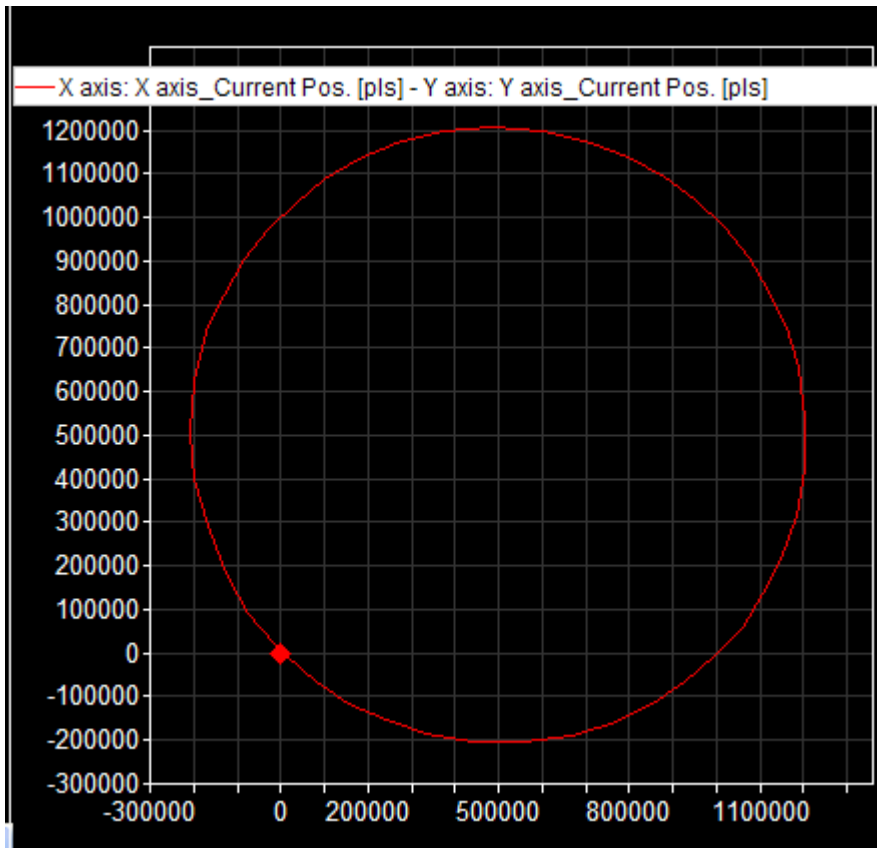
Setting item	Setting value	Content
	Step 1	
Coordinate	Absolute	Execute operation by absolute coordinate.
Control type	Position	Execute operation by position control
Operation pattern	End	Set operation pattern as END
Operation type	Single	Set operation type as single
Target position[pls]	0 pls	Both start and end point is 0 pls.
Circular interpolation auxiliary point	500,000	Set circular interpolation auxiliary point (Center point ) as 500,000
M code	10	Display M code 10 while operating.
ACC/DEC No.	No.1	Set ACC/DEC number as No.1.
Speed	100,000	Operate motor with 100000 pls/s speed
Dwell time[ms]	0 ms	Dwell time is 0ms after operating.
Circular interpolation direction	CW	Set circular interpolation as CW (Clockwise)

## [Confirm operation]


This is XY graph on the trend screen after operation complete by data setting.

This is an example for drawing circle that center point is (500000, 500000).

(Axis X is current position of axis X, axis Y is current position of axis Y.)



## [XPM, network type XPM, standard network type XPM Sequence]

- (1) Create new project by proceeding [Project]->[New project].
- (2) Online module by proceeding [Online]->[Connect].
- (3) Connect the module to the servo drive by proceeding [Online] -> [Connect to all servo] (network type)
- (4) Make the axis for indirect start "Servo on" status at the servo tool (1 and 2 axis servo on, network type)
- (5) Execute stability origin setting command on the axes(axis1, axis2) for circular interpolation.(Shortcut Icon .
- (6) Revitalize operation data screen of axis which need to start and set data. (Execute detailed view after revitalize)
- (7) Write operation data to module by proceeding [Online]->[Write].  
(Refer to this manual 9.1 writing data for execution)
- (8) Revitalize basic command tab of command tool window.
- (9) Revitalize XY graph after proceeding [Monitoring]->[Trend Monitoring] .
- (10) Set current position (axis X: 1, axis Y: 2) after proceeding [Graph]->[Trend device setting].  
(Refer to this manual 11.6 data trend for setting.)
- (11) Click start button after setting step No. of indirect start item as 1.  
(Then command axis should be set axis1. Axis1 is main executing axis on the below example.)

## Chapter 10 Test run by XG-PM

[Setting screen]

Axis 1 data setting

1 A	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]	Sub. axis setting	Cir. int. auxiliary point	Cir. int. mode	Circular int. turns	Helical int.
1	ABS, (CIR)INT	SNG, KEEP	1000000	100000	No.1	No.1	10	0	2 Axis	500000	Center-Point, CW	0	Don't Use
2	ABS, (CIR)INT	SNG, END	0	100000	No.1	No.1	20	0	2 Axis	500000	Center-Point, CW	0	Don't Use
3	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
4	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use

Axis 2 data setting

2 A	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]	Sub. axis setting	Cir. int. auxiliary point	Cir. int. mode	Circular int. turns	Helical int.
1	ABS, (CIR)INT	SNG, KEEP	0	100000	No.1	No.1	10	0	None	0	Center-Point, CW	0	Don't Use
2	ABS, (CIR)INT	SNG, END	0	100000	No.1	No.1	20	0	None	0	Center-Point, CW	0	Don't Use
3	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use
4	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0	None	0	Middle-Point	0	Don't Use

[Setting value]

[Axis 1 data]

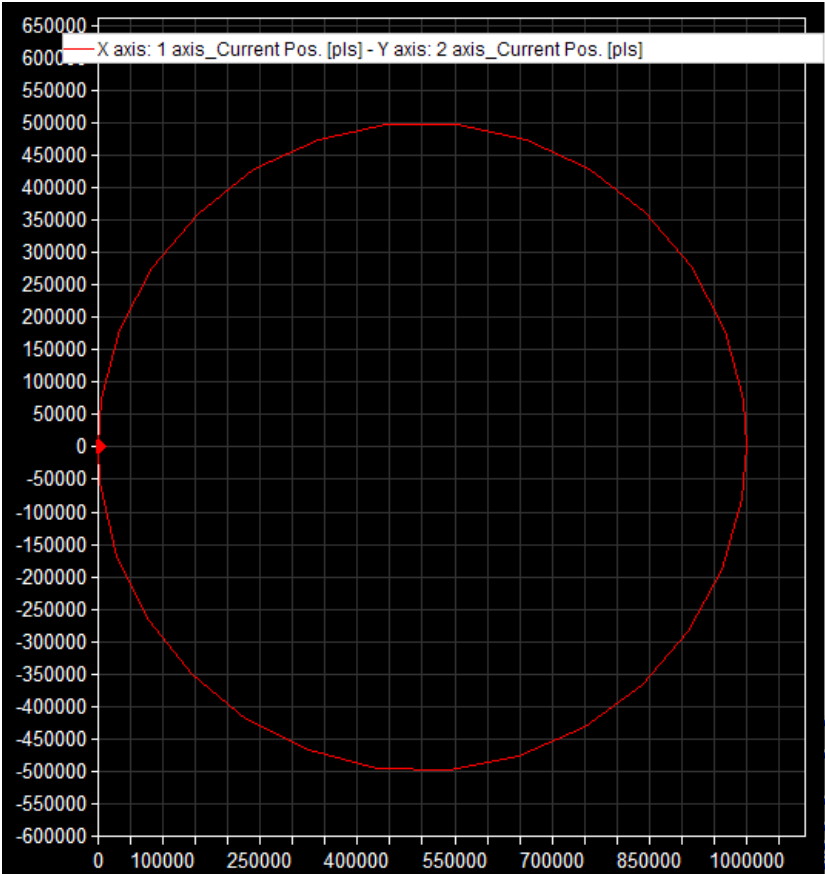
Setting item	Setting value		Content
	Step 1	Step 2	
Control type	Absolute, circular interpolation	Absolute, circular interpolation	Execute circular interpolation operation by absolute coordinate.
Operation type	Single, keep	Single, End	Execute 2 step to succeed 1 step.
Target position[pls]	1,000,000 pls	0 pls	Operate motor to 1,000,000 -> 0 pls
Operation speed[pls/s]	100,000 pls/s	100,000 pls/s	Operate motor as 100,000 pls/s.
Accel No.	No.1	No.1	Set acceleration speed as No.1.
Decel No.	No.1	No.1	Set deceleration speed as No.1.
M code	10	20	Display M code as 10, 20 while operating.
Dwell time[ms]	0 ms	0 ms	Dwell time is 0ms after operating.
Sub axis setting	Axis 2	Axis 2	Sub axis is axis1, sub axis is axis2, when it is setting.
Cir. int. auxiliary point	500,000	500,000	Auxiliary point(center point) is (500,000, 0).
Cir. int. mode	Center point, CW	Center point, CW	Operate to CW by center point method.

[Axis 2 data]

Setting item	Setting value		Content
	Step 1	Step 2	
Control type	Absolute, Circular interpolation	Absolute, Circular interpolation	Execute circular interpolation operation as absolute coordinate.
Operation type	Single, Kee[	Single, End	Execute 2 step to succeed 1 step.
Target position[pls]	0 pls	0 pls	Starting point and end point are both 0 pls.
Operation	100,000 pls/s	100,000 pls/s	Operate motor as 100,000 pls/s.
Accel No.	No.1	No.1	Set acceleration speed as No.1.
Decel No.	No.1	No.1	Set deceleration speed as No.1.
M code	10	20	Display M code as 10, 20 while operating.
Dwell time[ms]	0 ms	0 ms	Dwell time is 0ms after operating.
Sub axis setting	Axis unset	Axis unset	Main axis is axis1, sub axis is axis2, when it is setting.
Cir. int. auxiliary point	0	0	Auxiliary point(center point) is (500,000, 0).
Cir. int. mode	Center point, CW	Center point, CW	Operate to CW by center point method.

[Confirm operation]


This is XY graph on the trend screen after operation complete by data setting.  
This is an example for drawing circle that center point is (500000, 0), Radius is 1000000.  
(Axis X is current position of axis1, axis Y is current position of axis2.)



### 10.4.4 Speed Synch


Speed synch means that sub axis operate speed synch as set rate, even if main axis speed is variable by operation speed rate of sub/main axis. Following example shows example of speed synch operation.

[APM module Sequence]

- (1) Create new project by proceeding [Project]->[New project].
- (2) Online module by proceeding [Online]->[Connection].
- (3) Execute stability origin setting command on the axis for speed synch operation(axis X and axis Y).(Shortcut Icon ).
- (4) Write operation parameter to module by proceeding [Online]->[Write].  
(Refer to 9.1. writing data for writing execution method.)
- (5) Click the speed synch execution button after setting speed synch item on the expansion command tab of command tool window. (Refer to setting data.)
- (6) Set the direct start item on the basic command tab of command tool window. (refer to setting data)
- (7) Revitalize trend graph tab after operating data trace program by proceeding [Monitor]->[Trend Monitor].
- (8) After executing [Trend device setting], set axis X current position and axis Y current position as device at the Trend graph tap.
- (9) Set command axis as axis1 and execute direct start.
- (10) Confirm operating by system view and data trace.

[Setting screen]

Data setting

Command Tool			
Speed Sync.	Master	X Axis	
	M.Rate	2	
	S.Rate	1	
Position Sync.	Master	X Axis	Run
	Pos.	0 pls	
	Step	0	
Speed Sync. with Position	Master	X Axis	Run
	M.rate	1	
	S.rate	1	
	Pos	0 pls	
Linear Interpolation	Axis	X Axis, Y Axis	Run
	Step	0	

Data setting

Command Tool

Error Reset	Item	0: Reset	Run	
Indirect Start	Step	0	Run	
Direct Start	Pos.	1000000 pls	Run	
	Spd.	10000 pls/s		
	Dwell	0 ms		
	M Code	0		
	Acc/Dec	No.1		
	Coord.	ABS		
	Type	0: POS		
Decel.	Time	0 ms	Run	
Inching Opr.	Pos.	0 pls	Run	
Start JOG	<<	<	>	>>

Basic Command

Extension Command

[Setting value]

[Operation parameter setting]

Setting item	Setting value		Content
	Axis X	Axis Y	
ACC/DEC time1	500 ms	500 ms	Axis X, Y ACC/DEC time setting (Each axis operation parameter => Set on the basic parameter)

[Speed synch item setting]

Setting item	Detail item	Setting value	Content
Speed synch	Main axis	X	Set axis X as main axis.
	Main axis rate	2	Set 2 as main axis speed rate.
	Sub axis rate	1	Sub axis speed rate set 1/2 to main axis.

[Speed synch item setting]

Item	Detail item	Setting value	Content
Direct start	Command axis	X	Set axis X as command axis. (refer to this manual 10.2.1)
	Position	1,000,000 pls	Set target position.
	Speed	10,000 pls/s	Set starting speed.

## Chapter 10 Test run by XG-PM

[Confirm Operation]

[System view]

Signal/Axis	<input checked="" type="checkbox"/> X axis	<input checked="" type="checkbox"/> Y axis	<input checked="" type="checkbox"/> Z axis
Unit	pls,pls/s	pls,pls/s	pls,pls/s
a → Position	1000000	500000	0
Speed	0	0	0
Step No.	2	2	1
Error Code	0	0	0
Main Axis	X axis	X axis	Z axis
Main/Sub. Ax.	Master	Slave	Master
M Code	0	0	0
Opr. Status		ON	
Pos. Comp.			
M Code ON			
Origin Fix	ON	ON	
Output Inhibit			
Stop Status			
Upper Limit			
Lower Limit			
EMG Stop			
CW/CCW	CW	CW	CW
Operation Status			
Control Pattern			
Homing			
Position Sync.			
b → Speed Sync.		ON	
JOG High Speed			
JOG Low Speed			
Inching			
Return to the Point			
ZONE 1			
ZONE 2			
ZONE 3			
Encoder		0	

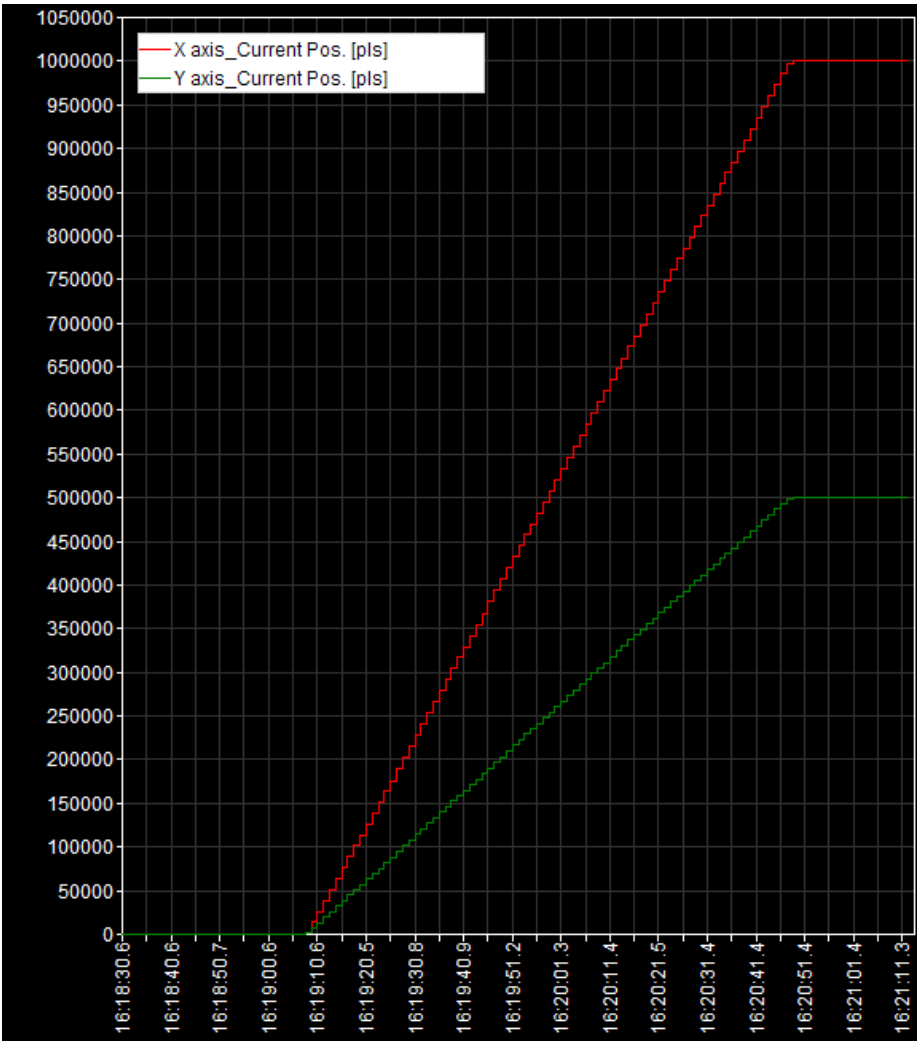
(a) Position: Speed of Axis X is twice that of axis Y. So position of axis X is twice that of axis Y.

(b) Axis Y is under speed synch. operation.




[Trend monitor]

This is a trend graph after operating by upper data setting.  
(Speed synch main axis: Sub axis speed = 2 : 1)



## Chapter 10 Test run by XG-PM

[XPM, network type XPM, standard network type XPM Sequence]

- (1) Create new project by proceeding [Project]->[New project].
- (2) Online module by proceeding [Online]->[Connect].
- (3) Connect the module to the servo drive by proceeding [Online] -> [Connect to all servo] (network type)
- (4) Make the axis for indirect start "Servo on" status at the servo tool (1 and 2 axis servo on, network type)
- (5) Execute stability origin setting command on the axis for speed synch operation(axis1 and axis2).(Shortcut Icon .
- (6) Write operation parameter to module by proceeding [Online]->[Write].  
(Refer to 9.1. writing data for writing execution method.)
- (7) Click the speed synch execution button after setting speed synch item on the expansion command tab of command tool window. (Refer to setting data.)
- (8) Set the indirect start item on the basic command tab of command tool window. (refer to setting data)
- (9) Revitalize trend graph tab after operating data trace program by proceeding [Monitor]->[Data trace].  
Set axis 1 command speed, axis 2 command speed on the word device setting tab after proceeding [Trace]->[Trace setting] of data trace program. (Refer to this manual 11.7 data trace for setting.)
- (10) Set command axis as axis1 and execute direct start.
- (11) Confirm operating by system view and data trace.

[Setting screen]

Data setting

Command Tool		
Speed Sync.	1 Axis	Run
	1	
	2	
Position Sync.	1 Axis	Run
	0 pls	
	0	
Speed Sync. with Position	1 Axis	Run
	1	
	1	
	0 pls	

Data setting

Command Tool			
Error Reset	Item	Error Reset	Run
Indirect Start	Step	1	Run
Direct Start	Pos.	50000 pls	Run
	Spd.	10000 pls/s	
	Dwell	0 ms	
	M Code	10	
	Accel.	No.1	
	Decel.	No.1	
	Coord.	ABS	
	Type	0: POS	

[Setting value]

[Operation parameter setting]

Setting item	Setting value		Content
	Axis 1	Axis 2	
Acceleration time 1	10000 ms	10000 ms	Axis1,2 deceleration time setting (Each axis operation parameter => Set on the basic parameter)
Deceleration time 1	10000 ms	10000 ms	Axis1,2 deceleration time setting (Each axis operation parameter => Set on the basic parameter)

[Speed synch item setting]

Setting item	Detail item	Setting value	Content
Speed synch	Main axis	1	Set axis1 as main axis.
	Main axis rate	1	Set 1 as main axis speed rate.
	Sub axis rate	2	Sub axis speed rate set a multiple to main axis.

[Speed synch item setting]

Item	Detail item	Setting value	Content
Direct start	Command axis	1	Set axis 1 as command axis. (refer to this manual 10.2.1)
	Position	50,000 pls	Set starting position.
	Speed	10,000 pls/s	Set starting speed.

## Chapter 10 Test run by XG-PM

[Confirm Operation]

[XPM System view]

Signal/Axis	✓ 1 Axis	✓ 2 Axis	✓ 3 Axis	□ 4 Axis
Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	
Current Pos	15500	36501	0	
a → Current Spd	10000	20000	0	
Step No	1	1	1	
Error Code	0	0	0	
Main Axis	1 Axis	1 Axis	3 Axis	
Main/Sub. Ax.	Master	Slave	Master	
M Code	10	0	0	
Opr. Status	ON	ON		
Pos. Comp.				
M Code ON	ON			
Origin Fix	ON	ON		
Stop Status				
Upper Limit				
Lower Limit				
EMG Stop				
CW/CCW	CW	CW	CW	
b → Operation Status	Constant			
Control Pattern	1 Axis Position	Speed Sync		
Homing				
Position Sync.				
Speed Sync.		ON		
JOG				
Inching				
Return to the Point				
Encoder		0		

[Network type XPM, standard network type XPM System view]

Item		Contents	
Information		XGF-PN8A(Base0,Slot10)-Online	
OS Info.		Ver. 1.01 (2010- 8- 19 )	
Status		Normal (0)	

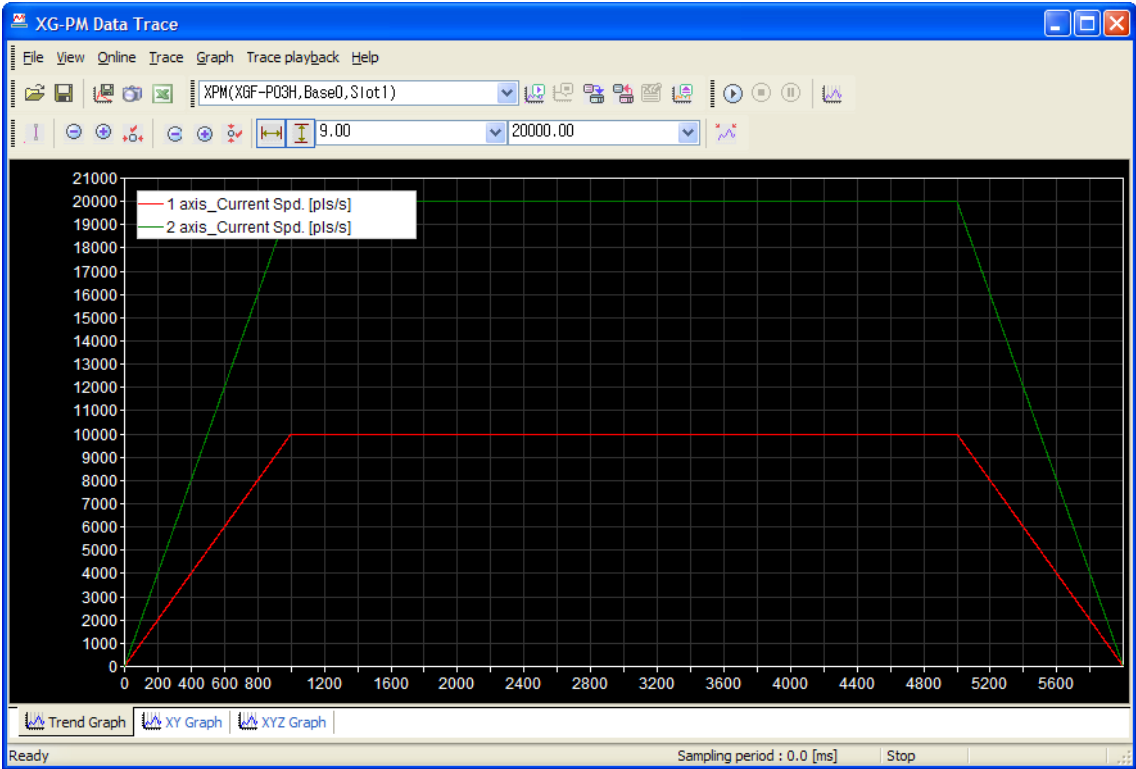
Status / Axis	1 Axis	2 Axis	3 Axis	4 Axis	5 Axis	6 Axis	7 Axis	8 Axis
Pos/Spd Unit.	pls,pls/s	pls,pls/s	pls,pls/s	pls,pls/s				
Command Pos.	1707	9686	183354088	352339375				
a → Command Spd.	10000	20000	0	0				
Current Pos.	1617	9103	183354088	352339375				
Current Spd.	6213	17802	0	-2128				
Torque	5.9 %	4.3 %	0.0 %	0.0 %				
Step No.	1	1	1	1				
Error Code	0	0	0	0				
Main Axis	1 Axis	1 Axis	3 Axis	4 Axis				
Main/Sub. Ax.	Main Axis	Sub. Axis	Main Axis	Main Axis				
M Code	0	0	0	0				
b → Opr. Status	In Constant S	In Operation						
Pos. Comp.								
M Code ON								
Positioning	ON	ON						
Ctrl Pattern	1 Axis Positio	Synchronous						
Stop Status								
Upper Limit								
Lower Limit								

(a) Command speed: Axis 2 speeds increase to 2 times of axis 1 speed with operating.

(b) Control pattern: In case of axis1, display as axis1 position control operation, axis2 operation control is displayed as speed synch.

[Data trace]

This is a trend graph after operating by upper data setting.  
Can confirm that the steady speed section speed of axis1 is 10,000 pls/s, the steady speed section speed of axis2 is 20,000 pls/s. (Speed synch main axis: Sub axis speed = 1 : 2)



### 10.5 Change Mode (Motion Control Module only)

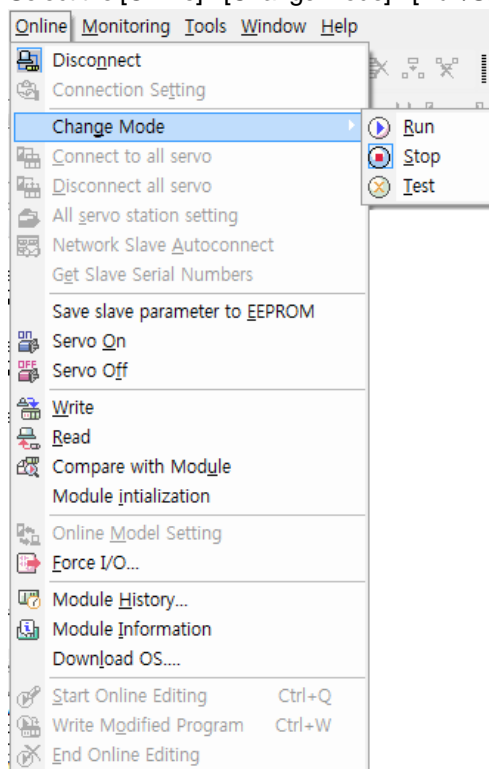
Motion Control Module supports 3 modes; Run, Stop, Test.

- Run mode : Runs the program made by users.
- Stop mode : Stops the program and Servo connection/Servo tuning is available.
- Test mode : Executes test run.

XG-PM provides the change mode function that converts the module's operation mode and tests the module's program and settings.

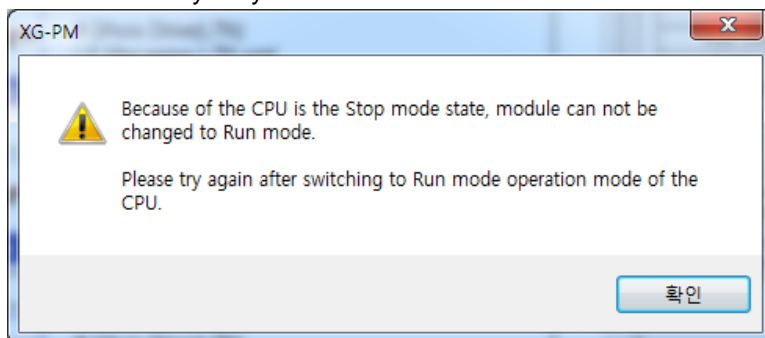
[Sequence]

- (1) Press [Online]->[Connect] to access to the PLC (module).
- (2) Select the [Online]->[Change Mode]->[Run/Stop].



#### Notes

- In case that the CPU module's operation mode is not RUN mode, you cannot convert the operation status of the module into RUN mode. If you try to convert the Motion Control Module into RUN mode, the below message will be brought up.



- If the CPU module's operation mode is converted, the module's operation status will be converted at the same time.

# Chapter11 Useful Function of XG-PM

XG-PM provides many useful functions for making project, editing project. XG-PM providing functions are as follows: Multi-module batch write/read/comparison for each project, copy data for each unit, synchronize I/O, data trend, data trace and electronic CAM operation.

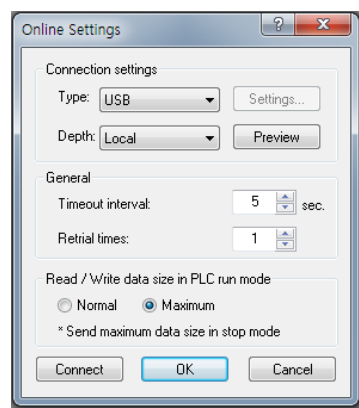
## 11.1 Project Management Function

### 11.1.1 Project Initialization Function

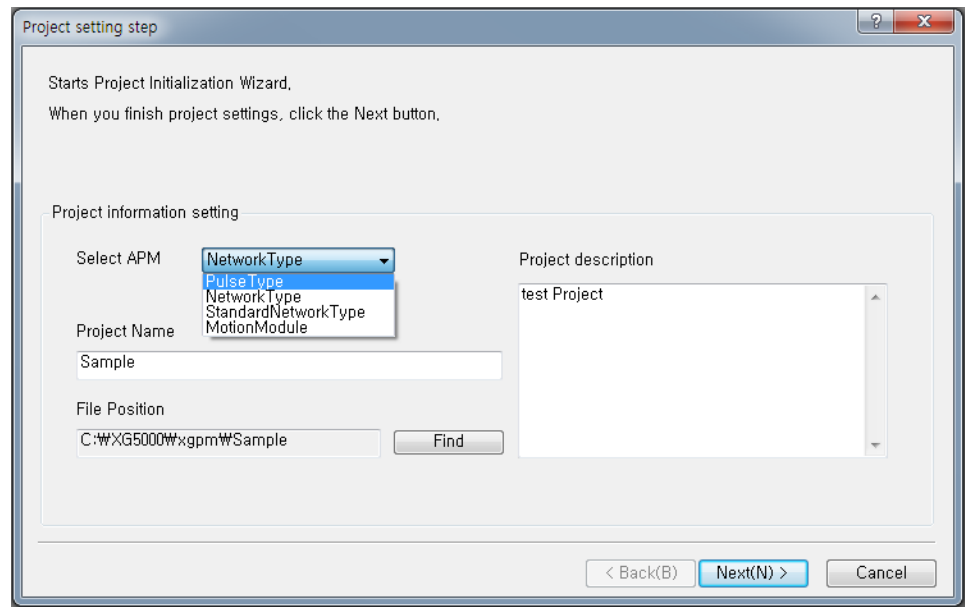
XG-PM provides project initialization function for convenient.

[APM, XPM module Sequence]

- (1) Proceed [Project]→[Project Initialization wizard].
- (2) Project setting communication box is displayed on the screen when click the connection button at connection setting communication box.

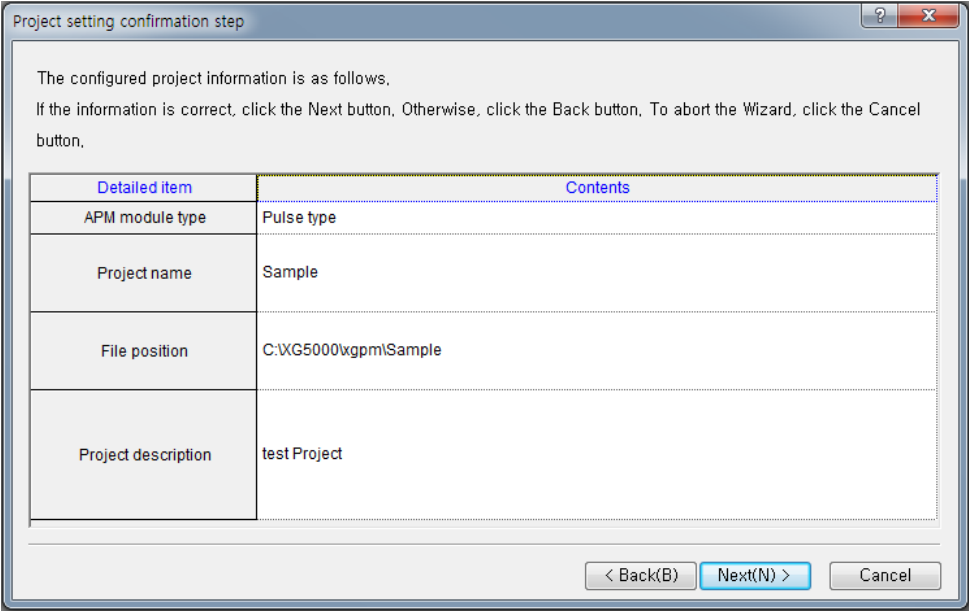


- (3) Set the project information on the project setting communication box and click the next button. At this time, select “Pulse type” as the module type.

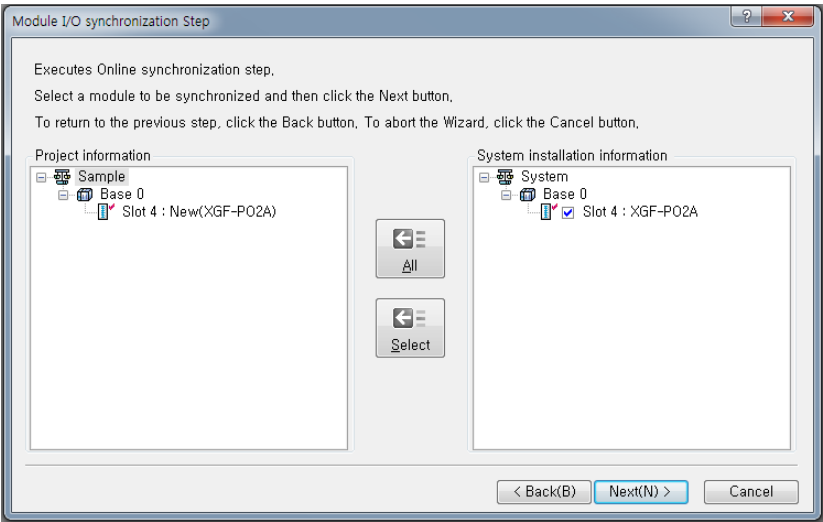
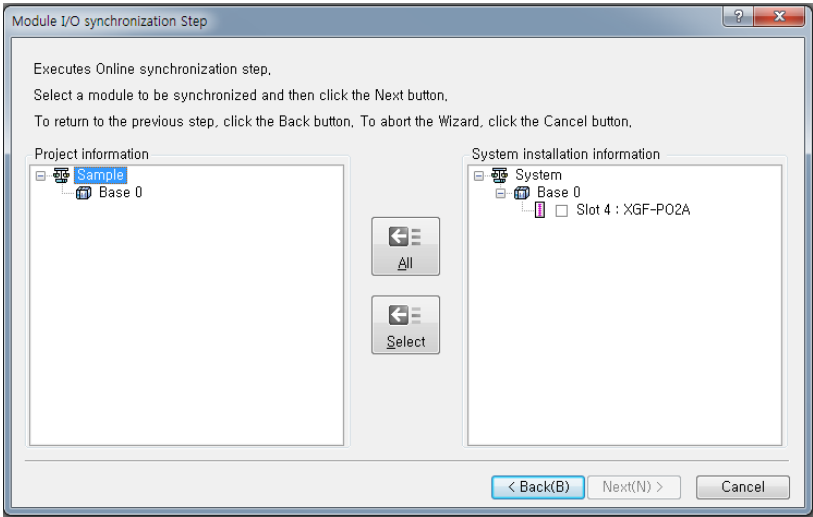


# Chapter 11 Useful Function of XG-PM

(4) Click the next button after confirming set project information at the project setting confirmation step.

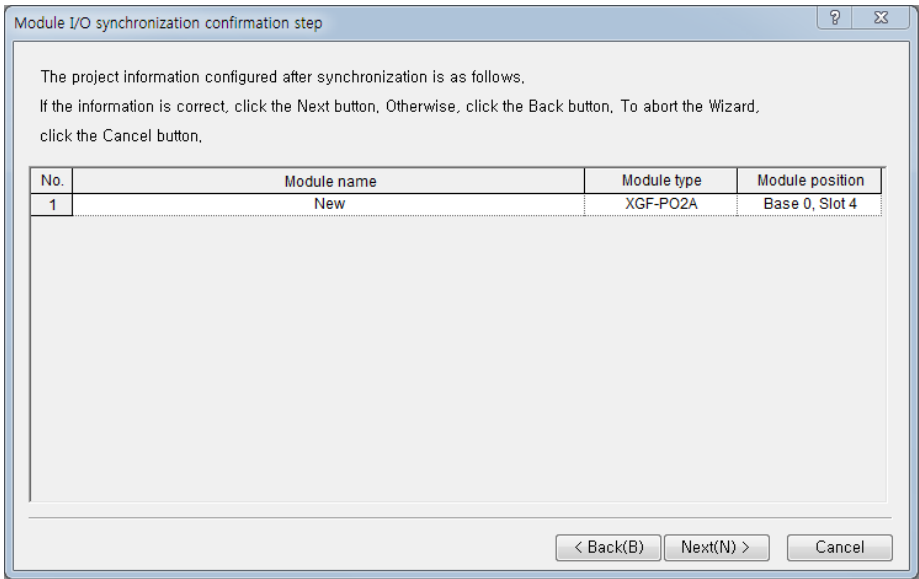


(5) Click the select/all button module for synchronization on module I/O synchronization.

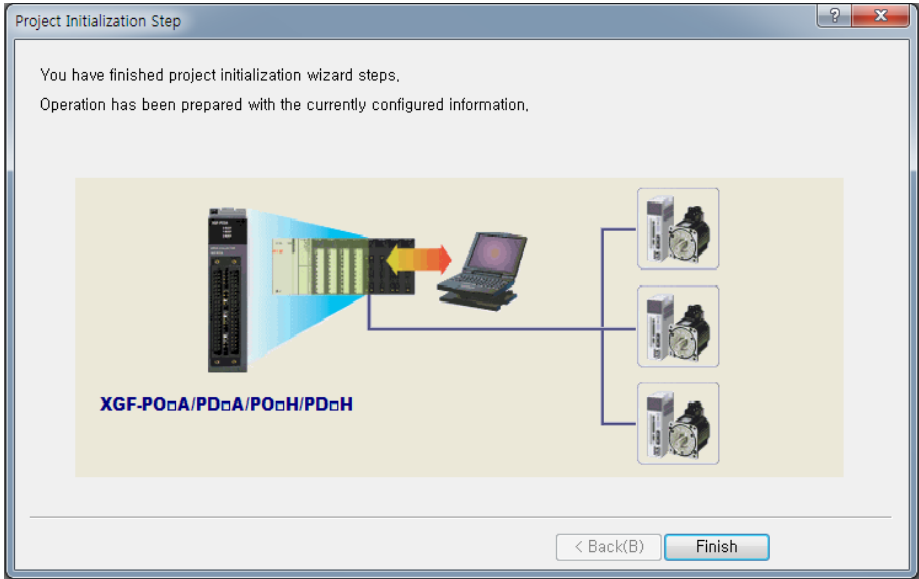




(6) Click the next button after confirm synchronized module information on module I/O confirmation step.



(7) Click the end button for end of project initializing.



# Chapter 11 Useful Function of XG-PM

[Network type XPM Sequence]

- (1) Proceed [Project]→[Project Initialization wizard].
- (2) Project setting communication box is displayed on the screen when you click the connection button at connection setting communication box.
- (3) Set the project information on the project setting communication box and click the next button. At this time, select “network type” as the module type.

Project setting step

Starts Project Initialization Wizard,  
When you finish project settings, click the Next button.

Project information setting

Select APM: **NetworkType**  
PulseType  
NetworkType  
StandardNetworkType  
MotionModule

Project Name: Sample

File Position: C:\XG5000\Xgpm\Sample

Project description: test Project

< Back(B)   Next(N) >   Cancel

- (4) Click the next button after confirming set project information at the project setting confirmation step.

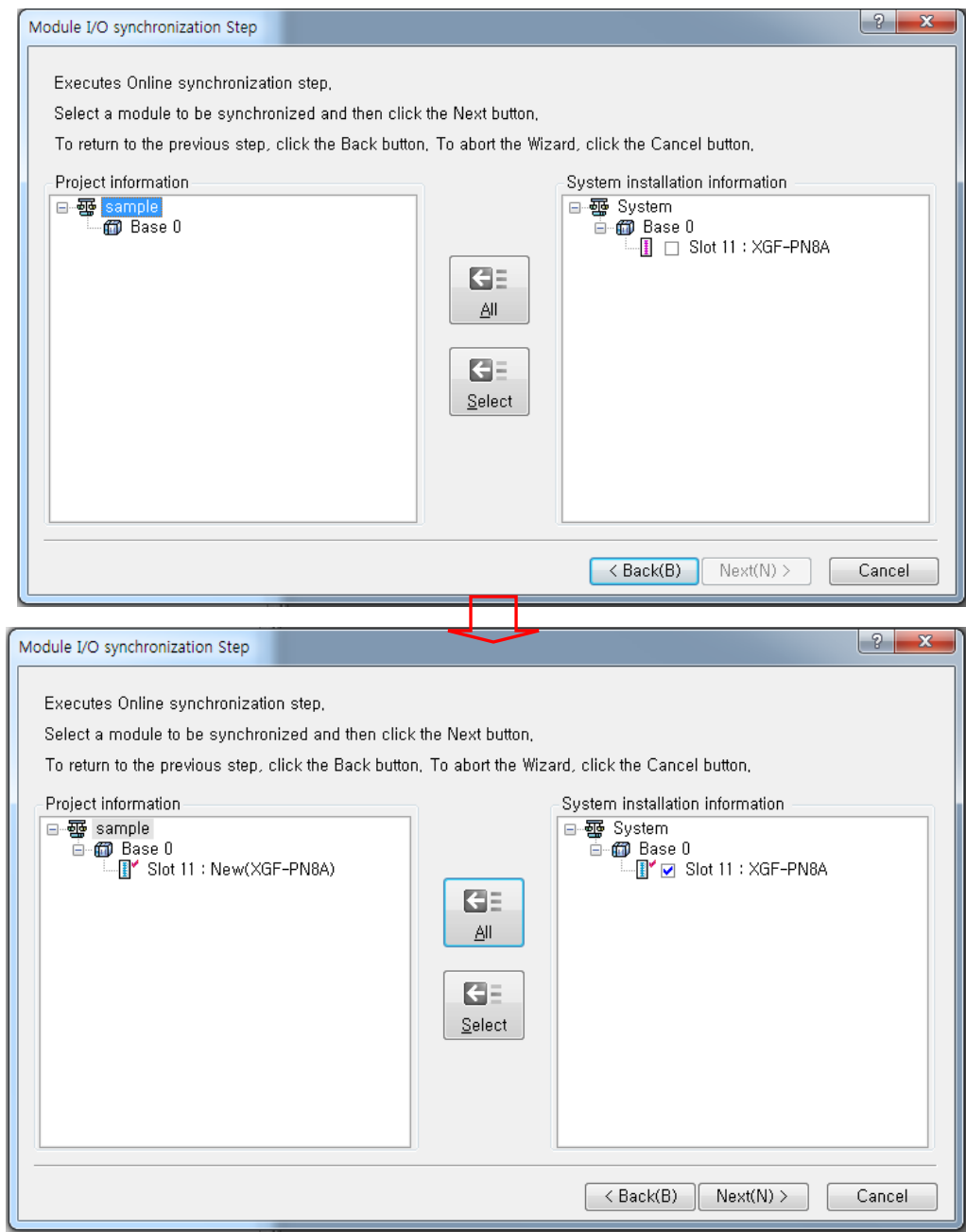
Project setting confirmation step

The configured project information is as follows.  
If the information is correct, click the Next button. Otherwise, click the Back button. To abort the Wizard, click the Cancel button.

Detailed item	Contents
APM module type	Network type
Project name	Sample
File position	C:\XG5000\Xgpm\Sample
Project description	test Project

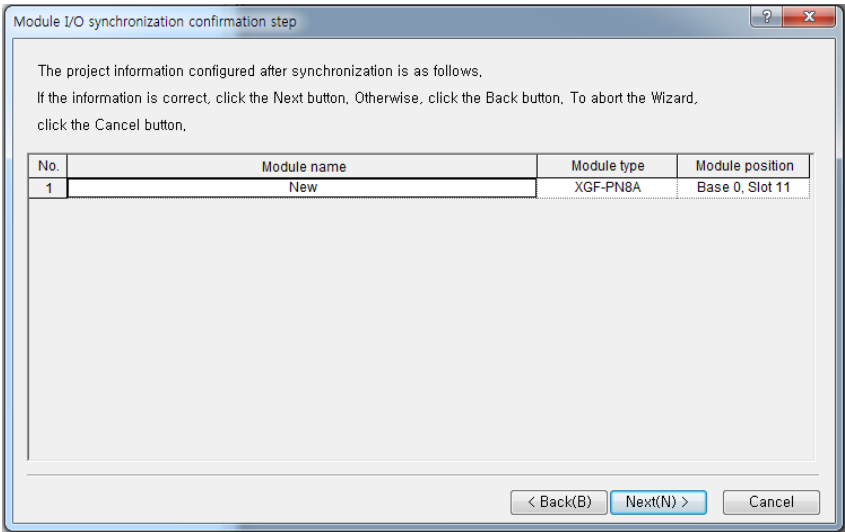
< Back(B)   Next(N) >   Cancel

(5) Click the select/whole button module for synchronization module I/O synchronization.

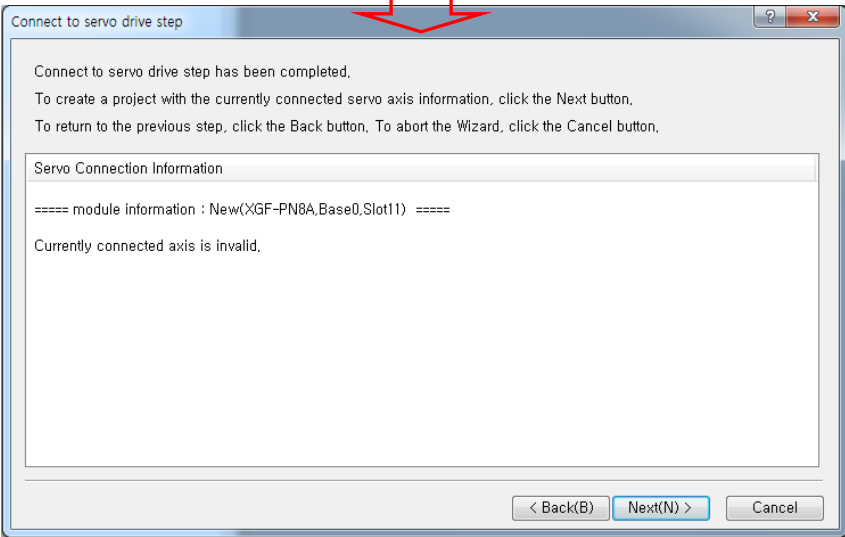
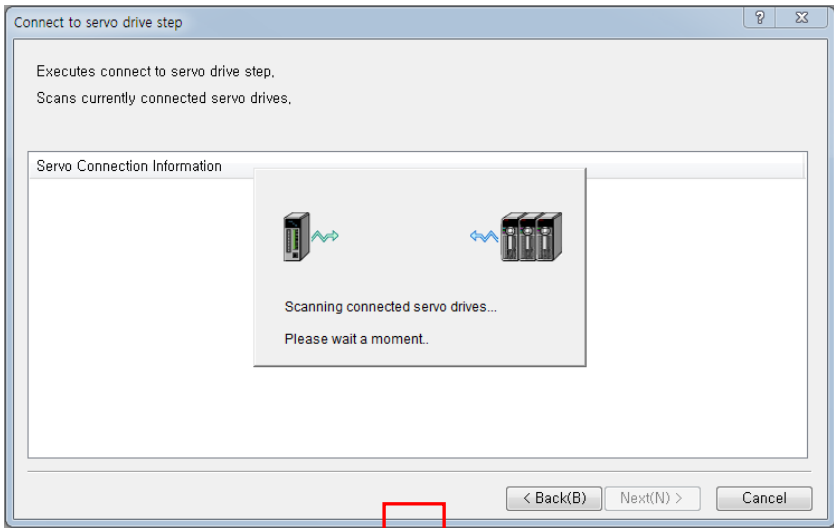


## Chapter 11 Useful Function of XG-PM

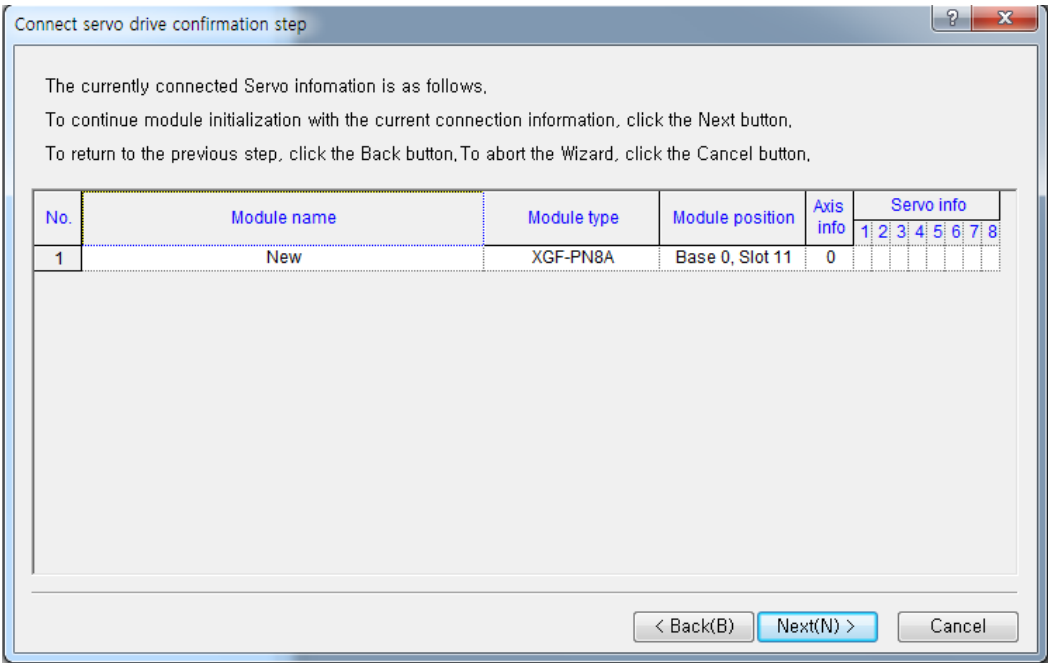
(6) Click the next button after confirm synchronized module information on module I/O confirmation step.



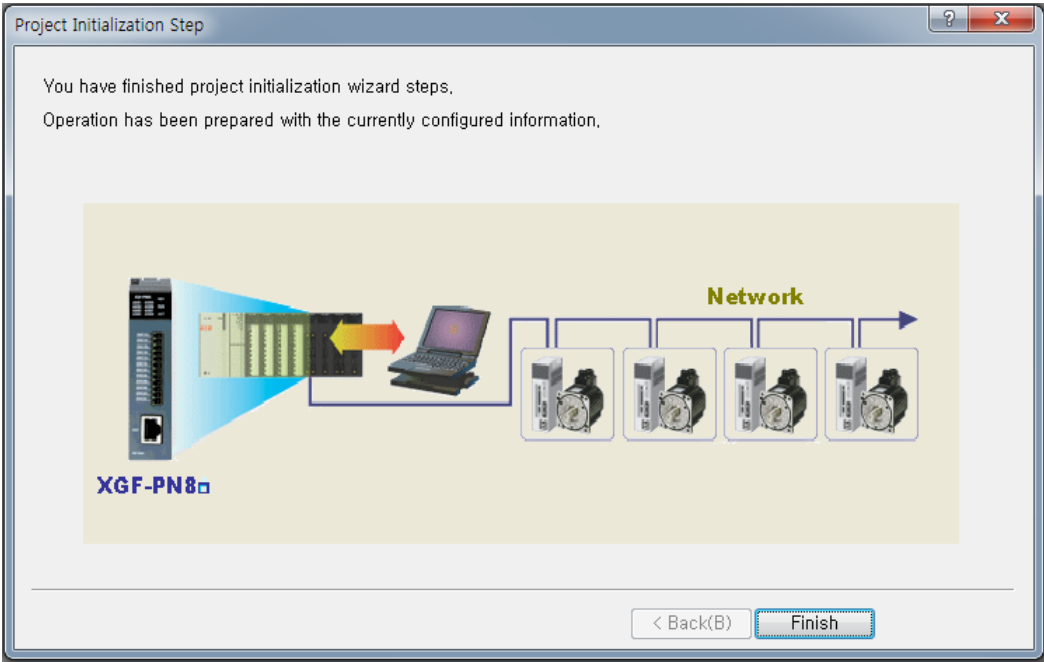
(7) Check the servo drive connection status and click "Next" button.



- (8) Check the number of the axis and the axis information and press “Next” button.



- (9) Click the end button for end of project initializing.



## Chapter 11 Useful Function of XG-PM

[Standard network type XPM Sequence]

- (1) Proceed [Project]->[Project Initialization wizard].
- (2) Project setting communication box is displayed on the screen when you click the connection button at connection setting communication box.
- (3) Set the project information on the project setting communication box and click the next button. At this time, select "Standard network type" as the module type.

Project setting step

Starts Project Initialization Wizard.  
When you finish project settings, click the Next button.

Project information setting

Select APM: StandardNetworkType  
PulseType  
NetworkType  
StandardNetworkType  
MotionModule

Project Name: sample

File Position: C:\XG5000\Xgpm\sample Find

Project description: test Project

< Back(B) Next(N) > Cancel

- (4) Click the next button after confirming set project information at the project setting confirmation step.

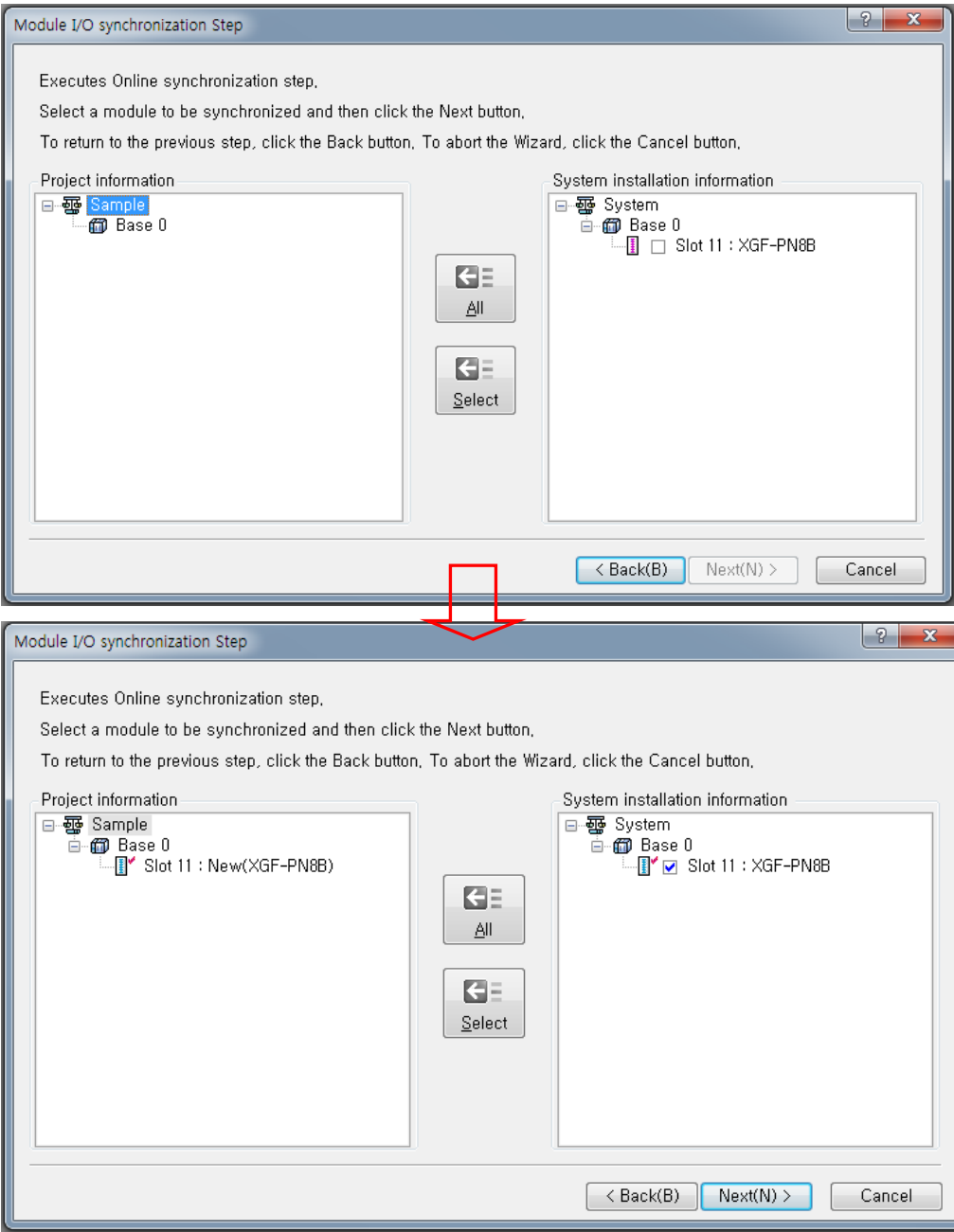
Project setting confirmation step

The configured project information is as follows.  
If the information is correct, click the Next button. Otherwise, click the Back button. To abort the Wizard, click the Cancel button.

Detailed item	Contents
APM module type	Network type
Project name	Sample
File position	C:\XG5000\Xgpm\Sample
Project description	test Project

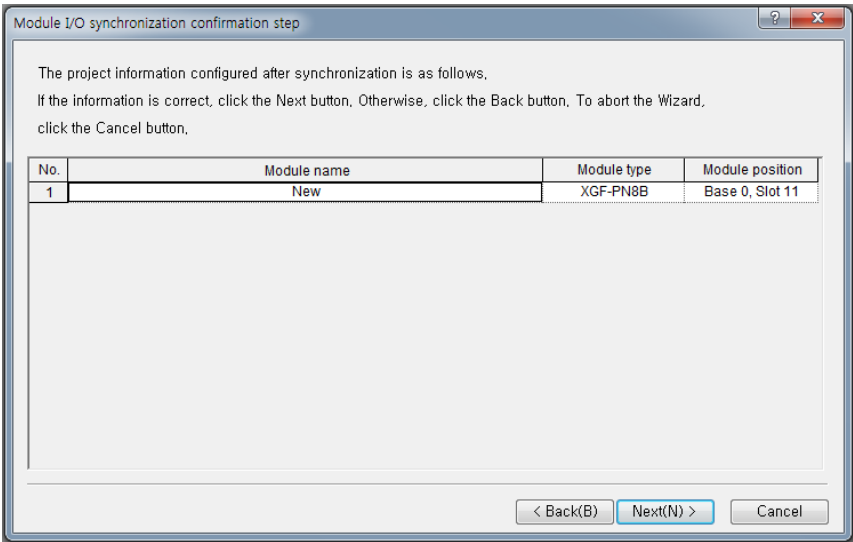
< Back(B) Next(N) > Cancel

- (5) Click the Select or All button module for synchronization module I/O synchronization.

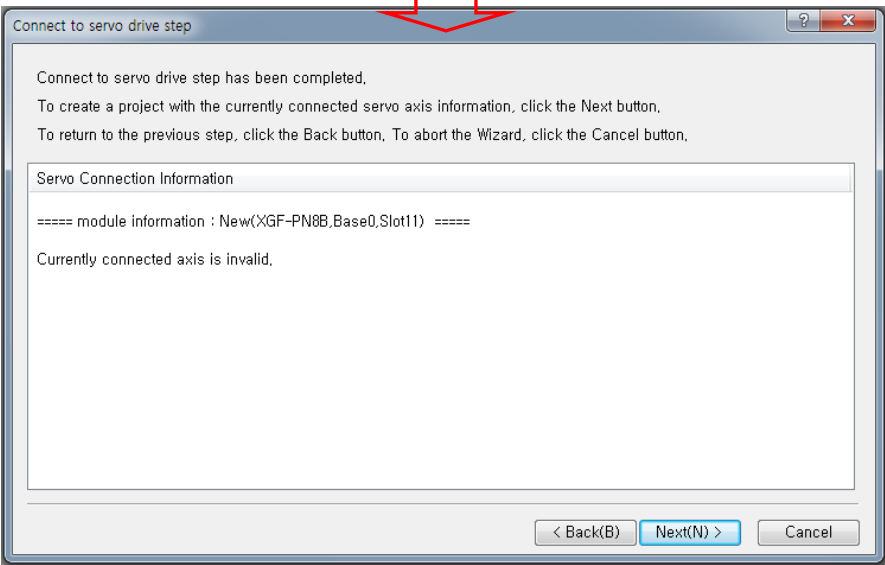
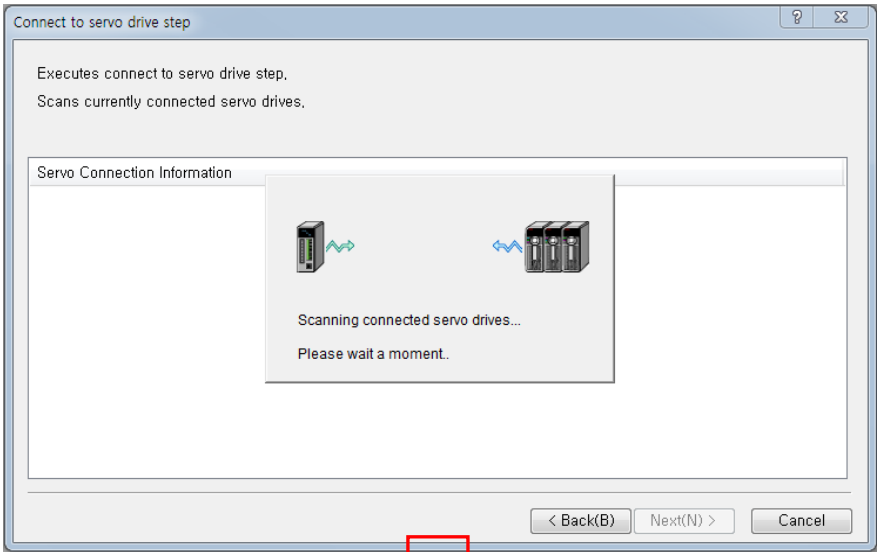


# Chapter 11 Useful Function of XG-PM

- (6) Click the next button after confirm synchronized module information on module I/O confirmation step.

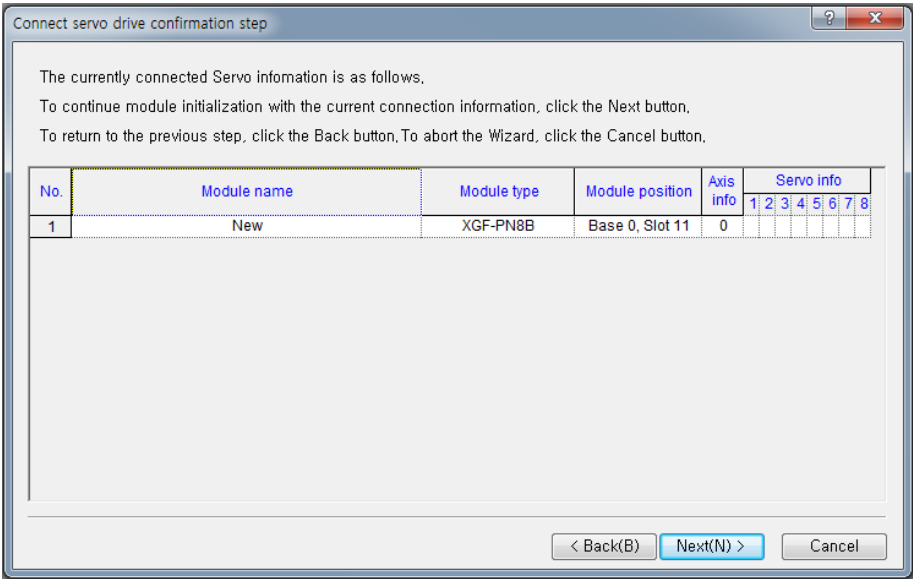


- (7) Check the servo drive connection status and click "Next" button.

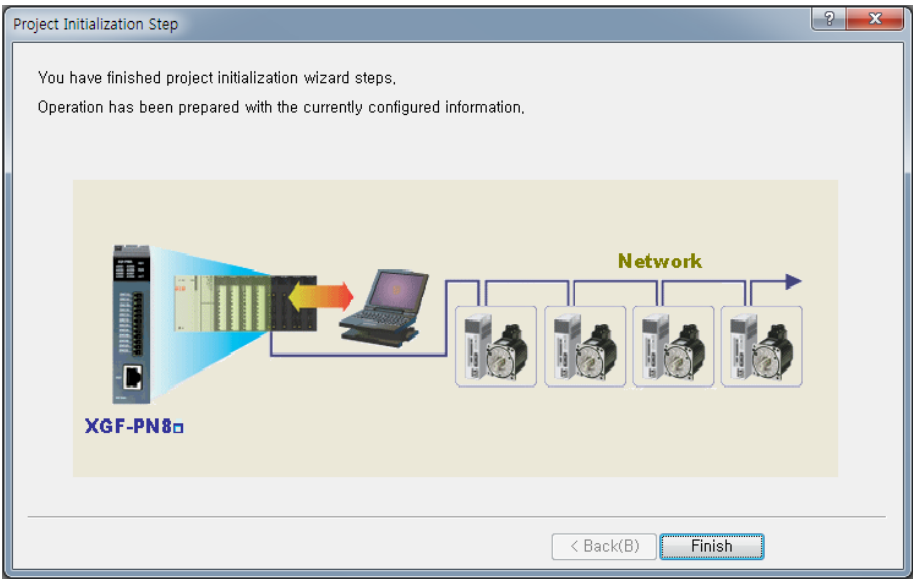




(8) Check the number of the axis and the axis information and press “Next” button.



(9) Click the end button for end of project initializing.



**Tip**

After “Project initialization wizard”, new project is created.  
The function of Project initialization wizard is same as the result that you execute the following functions among XG-PM software package.

1. Create new project
2. Connect to all servo (Network type module)
3. Read servo parameter (Network type module)
4. Apply the “pulse count per one rotation – basic parameter” among operating parameter to servo parameter (network type module)

## Chapter 11 Useful Function of XG-PM

### [Motion Control Module Procedures]

- (1) Proceed [Project]→[Project initialization wizard].
- (2) Project setting communication box is displayed on the screen when click the connection button at connection setting communication box.
- (3) Set the project information on the project setting communication box and click the next button. At this time, select “Motion Module” as the module type.

Project setting step

Starts Project Initialization Wizard.  
When you finish project settings, click the Next button.

Project information setting

Select APM: NetworkType

Project Name: Sample

File Position: C:\XG5000\Xgpm\Sample Find

Project description: test project

< Back(B) Next(N) > Cancel

- (4) Click the next button after confirming set project information at the project setting confirmation step.

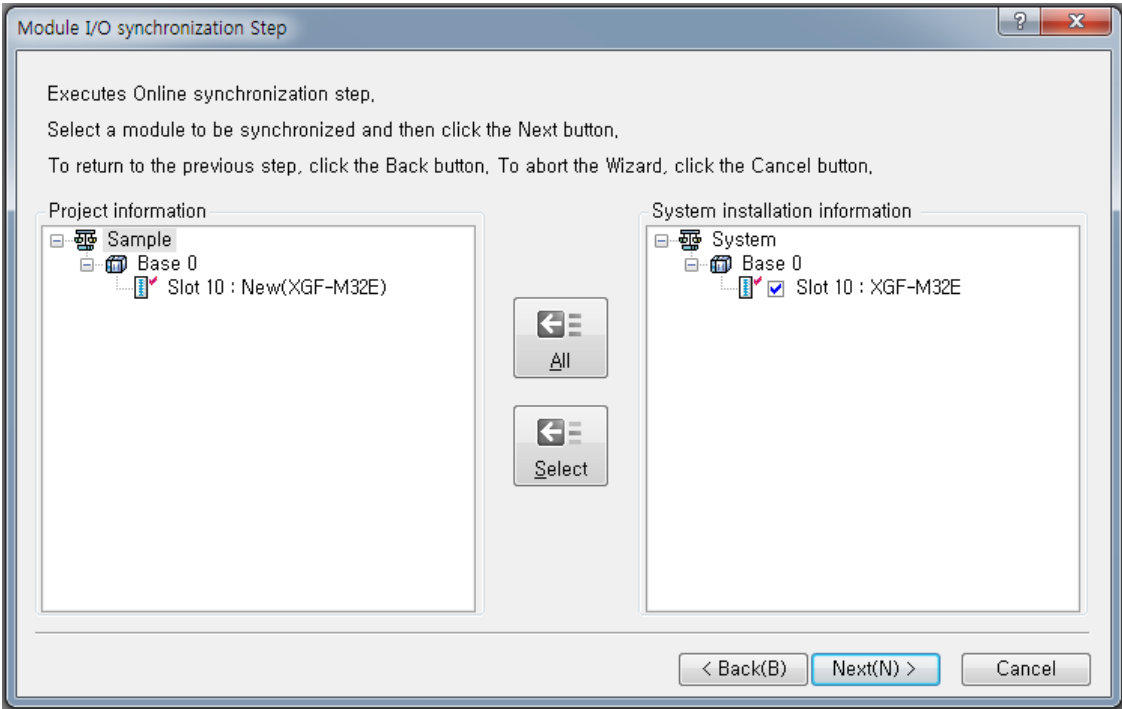
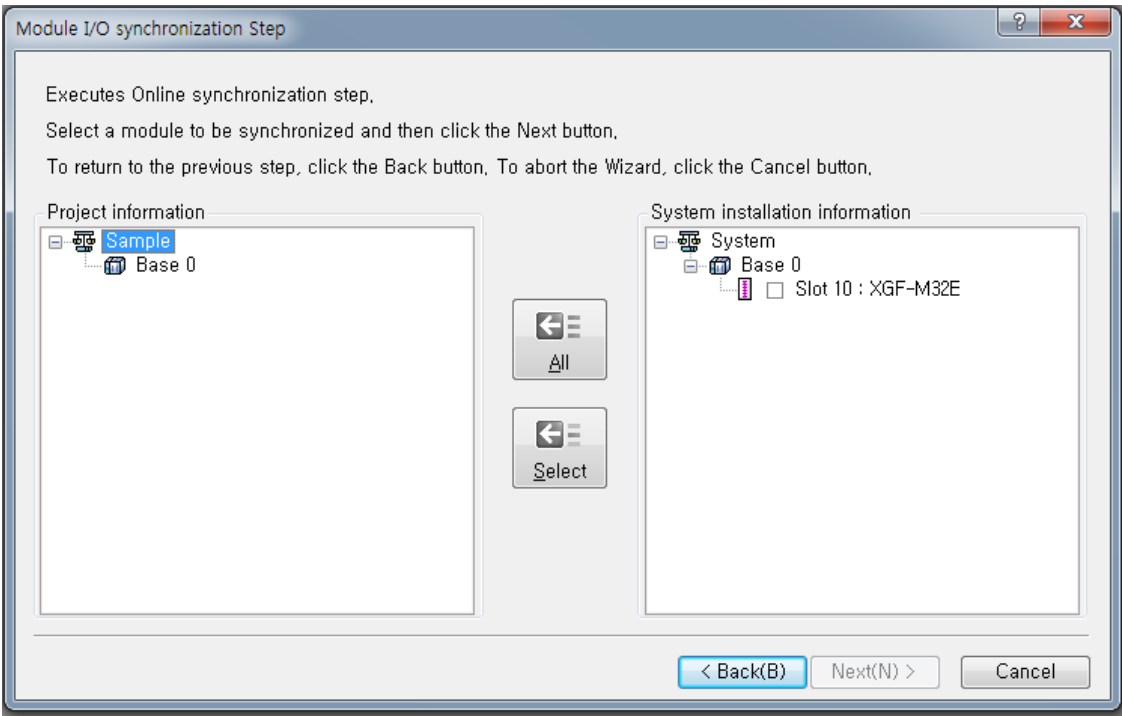
Project setting confirmation step

The configured project information is as follows.  
If the information is correct, click the Next button. Otherwise, click the Back button. To abort the Wizard, click the Cancel button.

Detailed item	Contents
APM module type	MotionModule
Project name	Sample
File position	C:\XG5000\Xgpm\Sample
Project description	test project

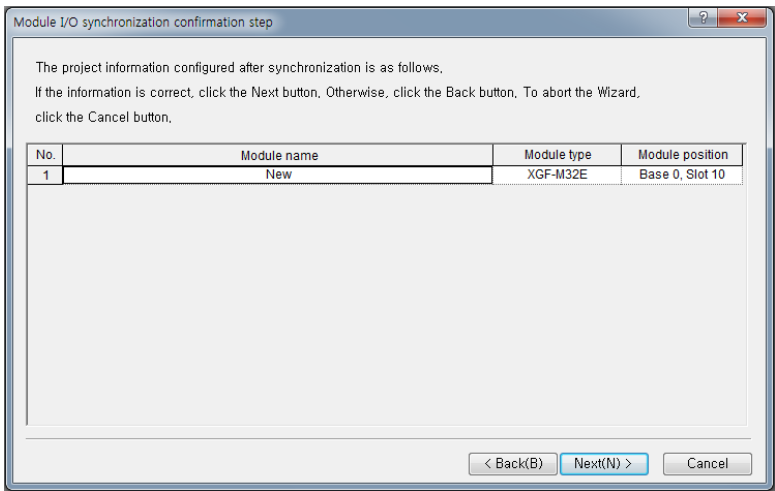
< Back(B) Next(N) > Cancel

(5) Click the select/all button module for synchronization on module I/O synchronization.

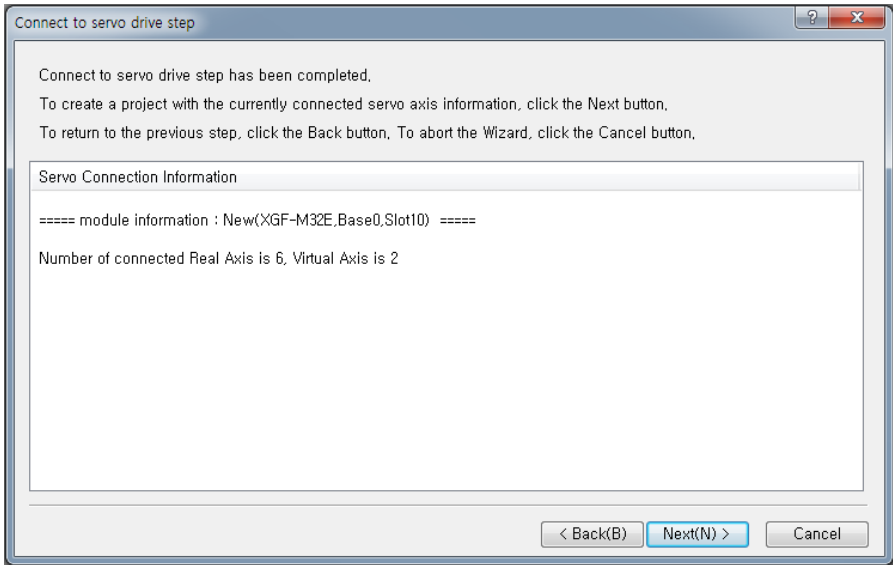
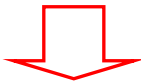
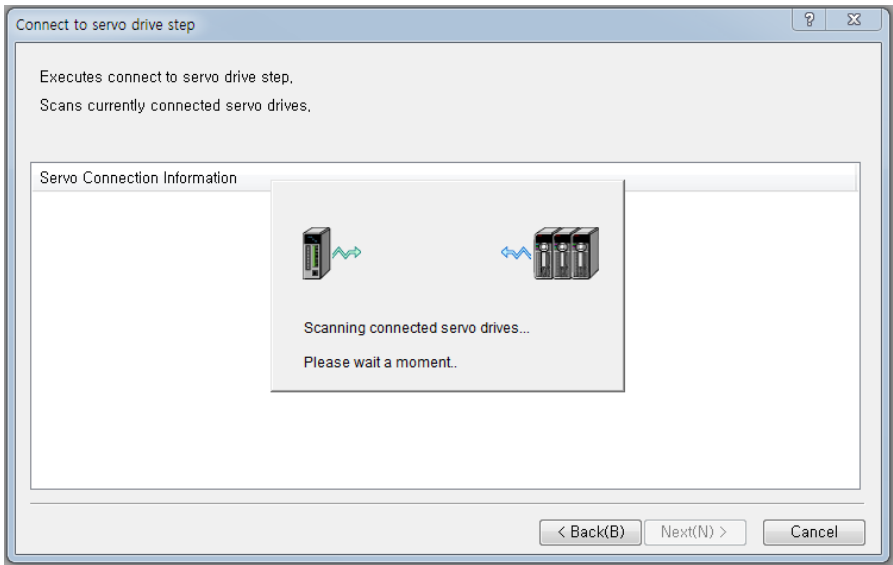


# Chapter 11 Useful Function of XG-PM

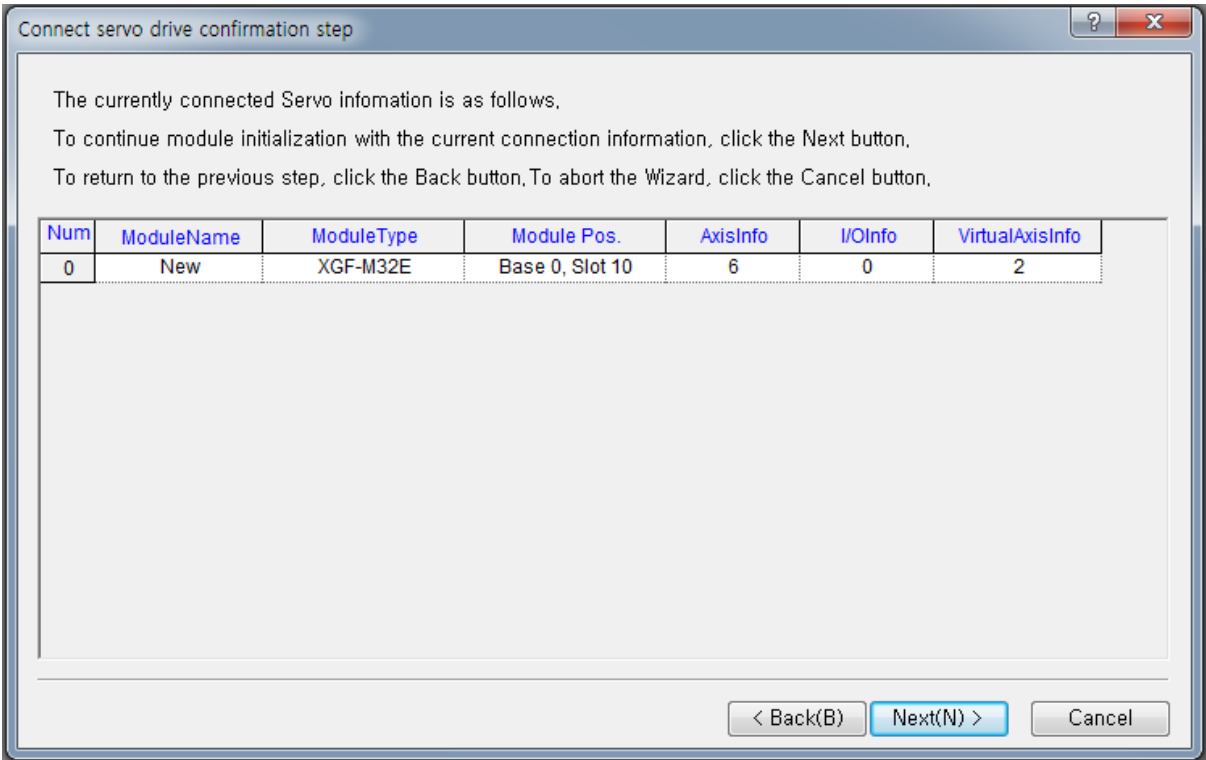
(6) Click the next button after confirm synchronized module information on module I/O confirmation step.



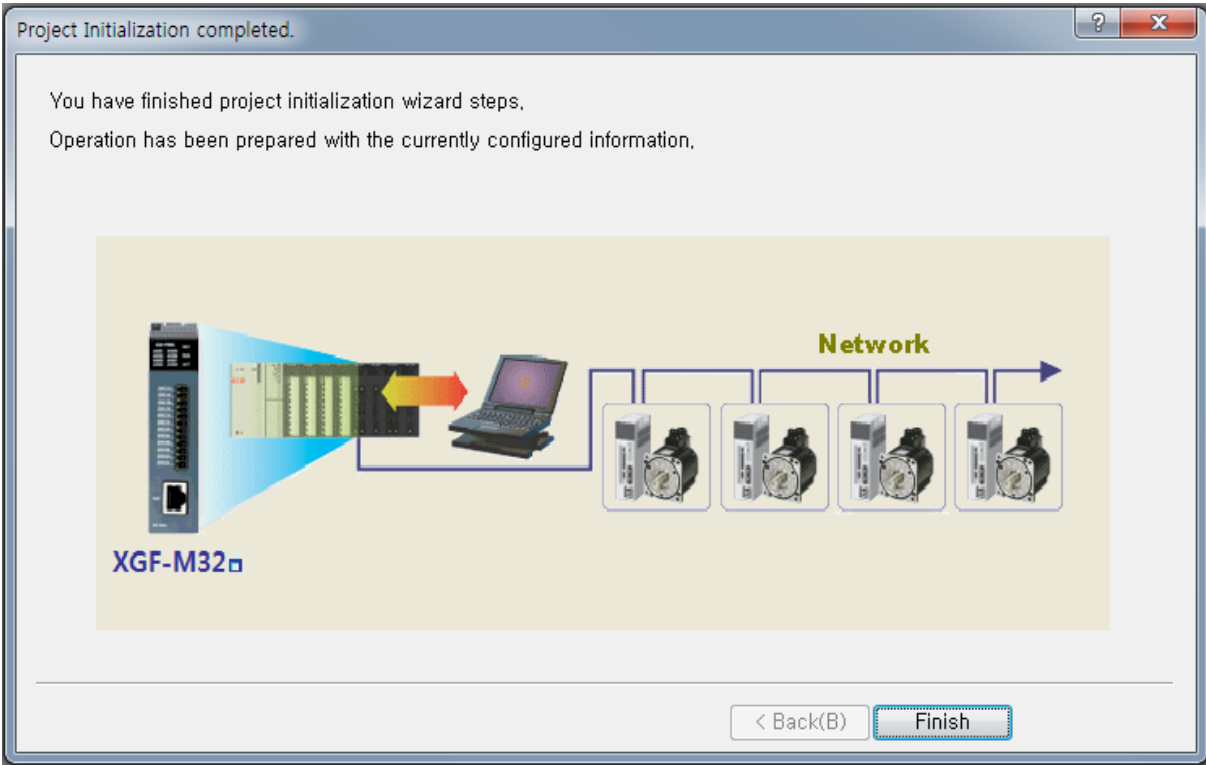
(7) Check the servo drive connection status and click "Next" button.



(8) Check the number of the axis and the axis information and press “Next” button.



(9) Click the end button for end of project initializing.

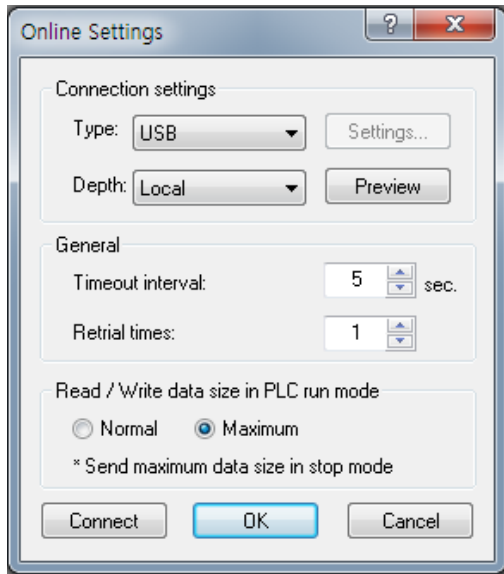


### 11.1.2 Open From PLC

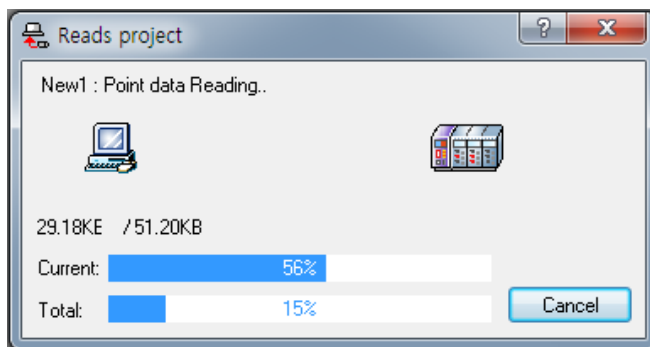
It provides the solutions for users to create a new project easily and quickly by making the module that exists online in a project and synchronizing data.

[Sequence]

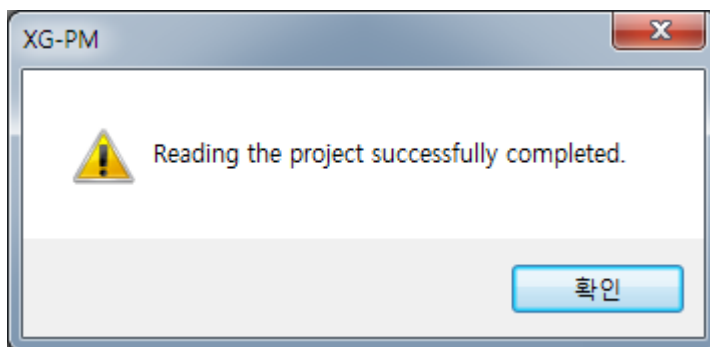
- (1) Proceed [Project]->[Open From PLC].
- (2) If you press the Access button in the dialog box to set access, the dialog box to read a project will be displayed on a screen.



- (3) Read the data from the module.



- (4) If the process of Read Project is normally completed, press the OK button to close OPEN FROM PLC.



### 11.1.3 Multi-Module Batch Write/Read/Comparison

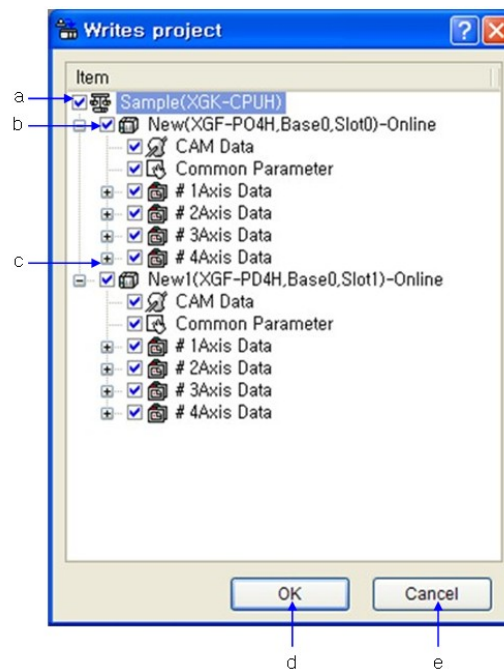
XG-PM provides project management function for multi-module. Basically it provides some functions for write/read/comparison. (Can use menu that are write/read/comparison.)

#### 1. Write multi-module

[Sequence]

- (1) Proceed [Online]->[Write].
- (2) Select item for writing at project write communication box. If the Multi-module is online, can writing data to selected module.
- (3) Click the confirm button after select item.

[Communication box]



[Communication box content]

- (a) Check for each project: Can write all data of all online module for each project by checking.
- (b) Check for each module: Can write all data item belonged to module.
- (c) Check for each item: Can write data for each item.
- (d) Confirm: End communication box. Begin to writing data after end of communication box.
- (e) Cancel: End communication box.

#### Notes

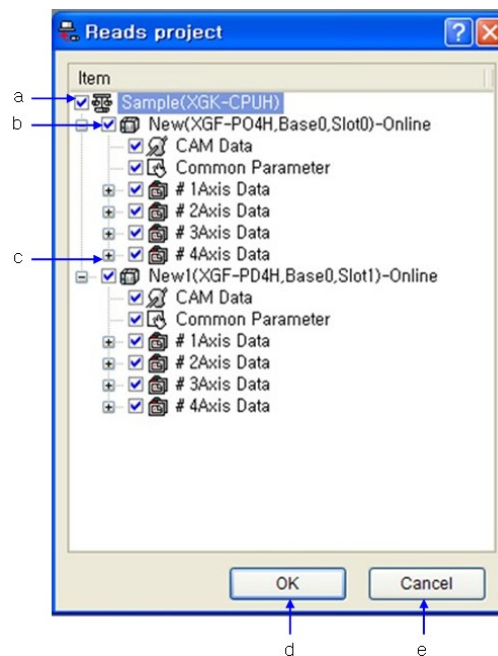
Online modules which were set on the project write/read/comparison communication box of current step are displayed only.

### 2. Read multi-module

[Sequence]

- (1) Proceed [Online]→[Read].
- (2) Select item for reading on the project reading communication box. If multi-module was online, user can read data to selected module.
- (3) Select item and confirm.

[Communication box]



[Communication box description]

- (a) Check for each project: Can read all data item of all online module for each project by chinking this part.
- (b) Check for each Module: Read all data item belonged to module.
- (c) Check for item: Can read data for each item.
- (d) OK: End the communication box. Begin to read data after ending communication box.
- (e) Cancel: End communication box.

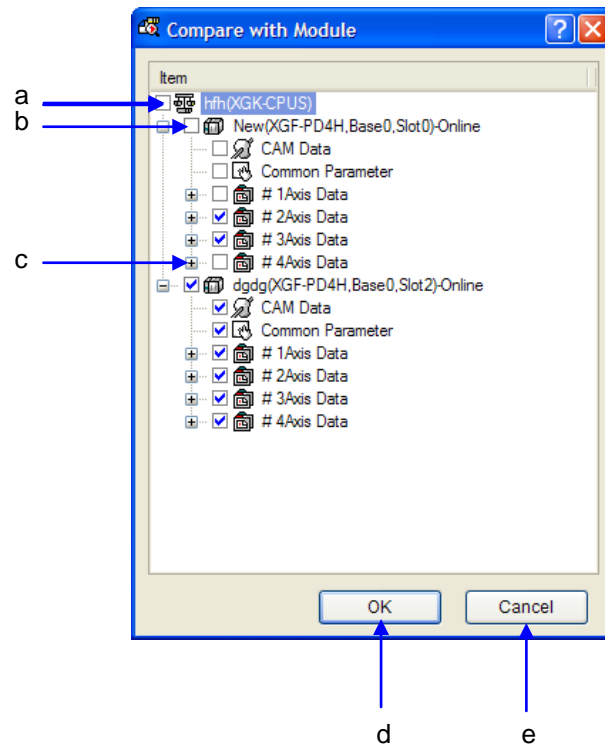
### 3. Multi-module comparison

[Sequence]

- (1) Proceed [Online]->[compare with module].
- (2) Select item for on the module and data comparison communication box. If the multi-module is online, can compare data with selected module by user.



[Communication box]



[Communication box description]

- (a) Check for each project: If check this item, can compare all data item of all online module for each project.
- (b) Check for each module: Can compare all data item which is belonged to module.
- (c) Check for each item: Can compare data for each item.
- (d) OK: End communication box. Begin to read data after end of communication box.
- (e) Cancel: End communication box.

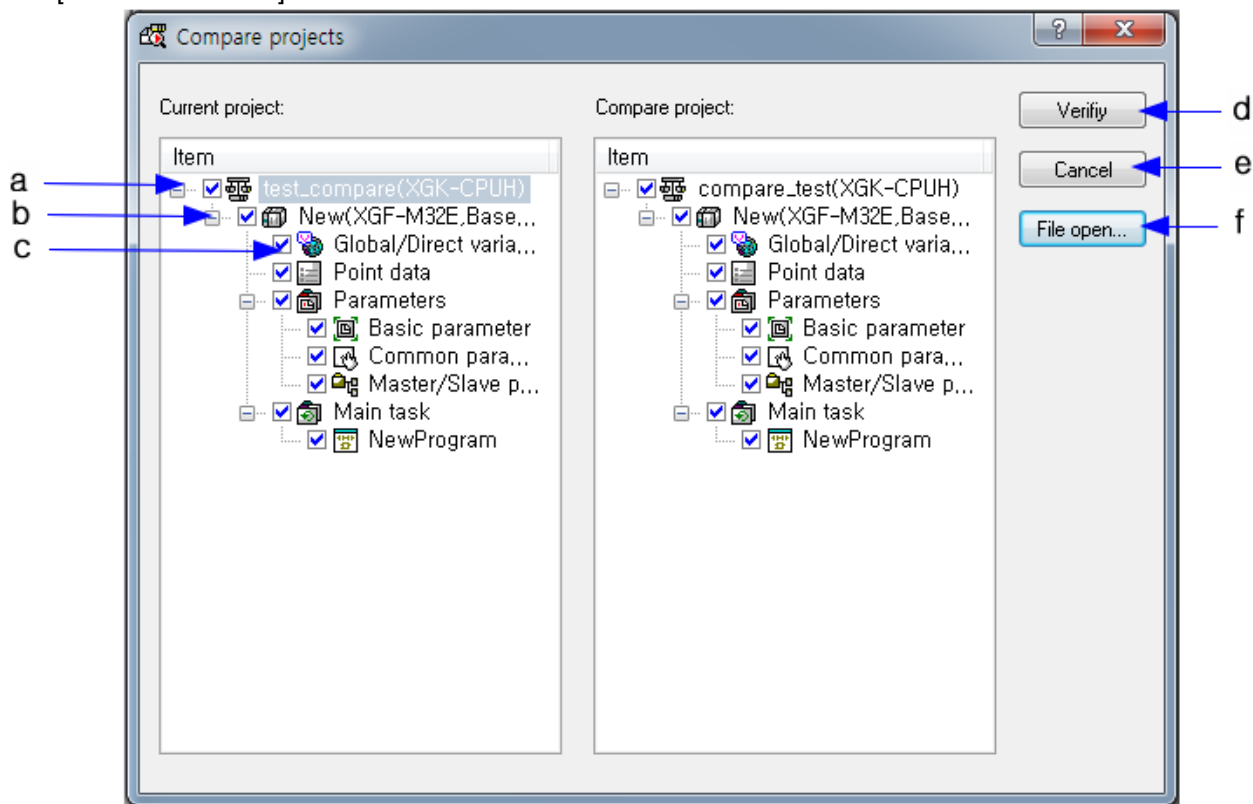
### 11.1.4 Compare projects Function

XG-PM provides the function comparing projects for users to compare the data of between the current project and the existing saved project.

[Sequence]

- (1) Select the [Project]->[Compare projects].
- (2) Select the project to be compared by pressing the 'File open' button in the dialog box for comparing projects.
- (3) If the targeted project is normally selected, select the items to be compared.
- (4) Press the comparison button.

[Communication box]



- (a) Project unit check: If it is checked, all data of all modules can be compared with the whole projects as a unit
- (b) Module unit check : Compares all data belonging to the modules.
- (c) Item unit check : Compares data with each item as a unit.
- (d) Verify: Closes the dialog box. Right after the dialog box is closed, Read data will start immediately.
- (e) Cancel : Closes the dialog box.
- (f) File open : Select the project to be compared.

11.2 Editing Data Function

XG-PM provides useful function for editing each data contents.  
It provides basic editing function which are data Copy/Paste, even if provides initializing function for each item. And it provides editing data function that the function proceeds without other calculating by auto-fill function and auto-unit changes function.

11.2.1 Copy/Paste

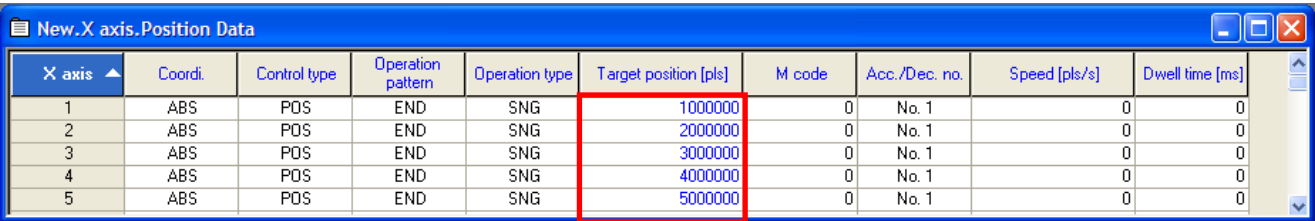
When user edit Common parameter/Position parameter/Position data, partially can proceed Copy/Paste.

1. Copy

Copy selected range to clip board.

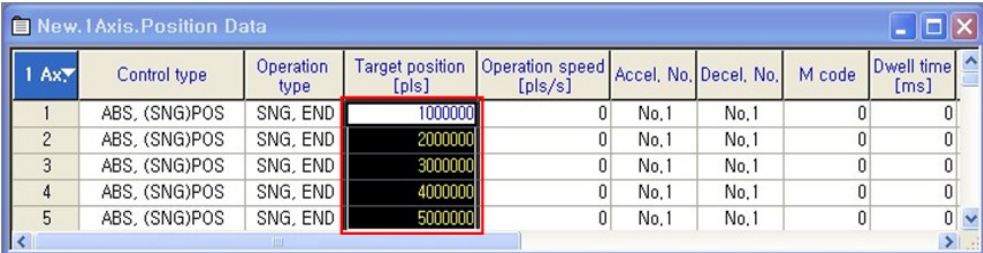
- [Sequence]
- (1) Select copy for range.
  - (2) Click [Edit] --> [Copy].

[Editorial screen]  
[APM]



X axis ▲	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	ABS	POS	END	SNG	1000000	0	No. 1	0	0
2	ABS	POS	END	SNG	2000000	0	No. 1	0	0
3	ABS	POS	END	SNG	3000000	0	No. 1	0	0
4	ABS	POS	END	SNG	4000000	0	No. 1	0	0
5	ABS	POS	END	SNG	5000000	0	No. 1	0	0

[XPM, network type module]



I Ax▼	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	1000000	0	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	2000000	0	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	3000000	0	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	4000000	0	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	5000000	0	No.1	No.1	0	0

2. Paste

Paste copied content to selected range.

- [Sequence]
- (1) Select range for Pasting copied range.
  - (2) Click [Edit]->[Paste].
  - (3) Data is displayed on the selected range.

# Chapter 11 Useful Function of XG-PM

[Editorial screen]  
[APM module]

New.X axis.Position Data

X axis ▲	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	ABS	POS	END	SNG	0	0	No. 1	10000	0
2	ABS	POS	END	SNG	0	0	No. 1	20000	0
3	ABS	POS	END	SNG	0	0	No. 1	30000	0
4	ABS	POS	END	SNG	0	0	No. 1	40000	0
5	ABS	POS	END	SNG	0	0	No. 1	50000	0

New.X axis.Position Data

X axis ▲	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	ABS	POS	END	SNG	1000000	0	No. 1	10000	0
2	ABS	POS	END	SNG	2000000	0	No. 1	20000	0
3	ABS	POS	END	SNG	3000000	0	No. 1	30000	0
4	ABS	POS	END	SNG	4000000	0	No. 1	40000	0
5	ABS	POS	END	SNG	5000000	0	No. 1	50000	0

[XPM, network type XPM, standard type XPM]

New.2Axis.Position Data

2 Axis▼	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	0	10000	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	0	20000	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	0	30000	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	0	40000	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	0	50000	No.1	No.1	0	0

New.2Axis.Position Data

2 Axis▼	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	10000	0	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	20000	0	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	30000	0	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	40000	0	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	50000	0	No.1	No.1	0	0

11.2.2 Set Value of Initial Data

When user edit Common parameter/Operation parameter/operation data, partially can set initial value.

[Sequence]

- (1) Select range for setting initial value.
- (2) Click [Edit]→[Default parameter setting].
- (3) Selected data is set as initial value.

[Editorial screen]

[APM module]

X axis	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	ABS	POS	END	SNG	100	0	No. 1	10000	0
2	ABS	POS	END	SNG	200	0	No. 1	20000	0
3	ABS	POS	END	SNG	300	0	No. 1	30000	0
4	ABS	POS	END	SNG	400	0	No. 1	40000	0
5	ABS	POS	END	SNG	500	0	No. 1	50000	0

X axis	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	ABS	POS	END	SNG	0	0	No. 1	10000	0
2	ABS	POS	END	SNG	0	0	No. 1	20000	0
3	ABS	POS	END	SNG	0	0	No. 1	30000	0
4	ABS	POS	END	SNG	0	0	No. 1	40000	0
5	ABS	POS	END	SNG	0	0	No. 1	50000	0

<XPM, network type XPM, standard type XPM>

1 Ax▼	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	100	0	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	200	0	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	300	0	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	400	0	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	500	0	No.1	No.1	0	0
6	ABS, (SNG)POS	SNG, END	600	0	No.1	No.1	0	0
7	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0

1 Ax▼	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
6	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0
7	ABS, (SNG)POS	SNG, END	0	0	No.1	No.1	0	0

Notes

Initial data value is displayed as black color, not initial data value is displayed as blue color.

## 11.2.3 Undo/Redo

When user edits common parameter/operation parameter/operation data, it provides return/restore function.

[Sequence]

- (1) Edit data.
- (2) Click [Edit]->[Undo] or [Redo].

### Notes

When Set CAM data, do not provides return/restore function.

## 11.2.4 Auto fill

When set position data, user easily makes progressived data by auto fill function. But, auto fill function only can perform for 1 vertical line.

[Sequence]

- (1) Set data on screen of the operation data. (Set data over 2.)
- (2) Set data and move mouse pointer to right top of the last setting data.
- (3) When mouse pointer change to "+", then drag mouse.
- (4) Automatically created data is filled in the selected cell.

[Editorial screen]

[APM module]

X axis ▲	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	ABS	POS	END	SNG	100	0	No. 1	10000	0
2	ABS	POS	END	SNG	200	0	No. 1	20000	0
3	ABS	POS	END	SNG	0	0	No. 1	30000	0
4	ABS	POS	END	SNG	0	0	No. 1	40000	0
5	ABS	POS	END	SNG	0	0	No. 1	50000	0

X axis ▲	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	ABS	POS	END	SNG	100	0	No. 1	10000	0
2	ABS	POS	END	SNG	200	0	No. 1	20000	0
3	ABS	POS	END	SNG	300	0	No. 1	30000	0
4	ABS	POS	END	SNG	400	0	No. 1	40000	0
5	ABS	POS	END	SNG	500	0	No. 1	50000	0

<XPM, network type XPM, standard network type XPM>

1 Ax	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS. (SNG)POS	SNG. END	100	0	No.1	No.1	0	0
2	ABS. (SNG)POS	SNG. END	200	0	No.1	No.1	0	0
3	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0
4	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0
5	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0
6	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0
7	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0
8	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0
9	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0
10	ABS. (SNG)POS	SNG. END	0	0	No.1	No.1	0	0

1 Ax	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS. (SNG)POS	SNG. END	100	0	No.1	No.1	0	0
2	ABS. (SNG)POS	SNG. END	200	0	No.1	No.1	0	0
3	ABS. (SNG)POS	SNG. END	300	0	No.1	No.1	0	0
4	ABS. (SNG)POS	SNG. END	400	0	No.1	No.1	0	0
5	ABS. (SNG)POS	SNG. END	500	0	No.1	No.1	0	0
6	ABS. (SNG)POS	SNG. END	600	0	No.1	No.1	0	0
7	ABS. (SNG)POS	SNG. END	700	0	No.1	No.1	0	0
8	ABS. (SNG)POS	SNG. END	800	0	No.1	No.1	0	0
9	ABS. (SNG)POS	SNG. END	900	0	No.1	No.1	0	0
10	ABS. (SNG)POS	SNG. END	1000	0	No.1	No.1	0	0

11.2.5 Unit Auto Changing Function

When edit operation parameter, if change each axis unit, unit and range of item about speed and position are automatically change. Following the example describes editorial screen, when unit of axis1 is change to [pulse]->[mm]. And user can edit data without additional operation because position data of target position/operation speed item are automatically change by changing unit.

[Operation parameter editorial screen]

Item	1 Axis
Unit	pulse
Pulses per rotation	20000 pls
Travel per rotation	20000 pls
Unit multiplier	0: x1
Speed command unit	0: Unit/Time
Pulse output mode	0: CW/CCW
Bias speed	1 pls/s
Speed limit	100000 pls/s
Acc. time1	500 ms
Acc. time2	1000 ms
Acc. time3	1500 ms
Acc. time4	2000 ms
Dec. time 1	500 ms
Dec. time 2	1000 ms
Dec. time 3	1500 ms
Dec. time 4	2000 ms
Dec. time for emg. stop	0 ms

Item	1 Axis
Unit	mm
Pulses per rotation	20000 pls
Travel per rotation	2000.0 um
Unit multiplier	0: x1
Speed command unit	0: Unit/Time
Pulse output mode	0: CW/CCW
Bias speed	0.01 mm/m
Speed limit	1000.00 mm/m
Acc. time1	500 ms
Acc. time2	1000 ms
Acc. time3	1500 ms
Acc. time4	2000 ms
Dec. time 1	500 ms
Dec. time 2	1000 ms
Dec. time 3	1500 ms
Dec. time 4	2000 ms
Dec. time for emg. stop	0 ms



## Chapter 11 Useful Function of XG-PM

[Position data editorial screen]



New, I Axis, Position Data

1 Ax▼	Control type	Operation type	Target position [pls]	Operation speed [pls/s]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	100	0	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	200	0	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	300	0	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	400	0	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	500	0	No.1	No.1	0	0
6	ABS, (SNG)POS	SNG, END	600	0	No.1	No.1	0	0
7	ABS, (SNG)POS	SNG, END	700	0	No.1	No.1	0	0
8	ABS, (SNG)POS	SNG, END	800	0	No.1	No.1	0	0
9	ABS, (SNG)POS	SNG, END	900	0	No.1	No.1	0	0
10	ABS, (SNG)POS	SNG, END	1000	0	No.1	No.1	0	0

New, I Axis, Position Data

1 Ax▼	Control type	Operation type	Target position [um]	Operation speed [mm/m]	Accel. No.	Decel. No.	M code	Dwell time [ms]
1	ABS, (SNG)POS	SNG, END	10.0	0.00	No.1	No.1	0	0
2	ABS, (SNG)POS	SNG, END	20.0	0.00	No.1	No.1	0	0
3	ABS, (SNG)POS	SNG, END	30.0	0.00	No.1	No.1	0	0
4	ABS, (SNG)POS	SNG, END	40.0	0.00	No.1	No.1	0	0
5	ABS, (SNG)POS	SNG, END	50.0	0.00	No.1	No.1	0	0
6	ABS, (SNG)POS	SNG, END	60.0	0.00	No.1	No.1	0	0
7	ABS, (SNG)POS	SNG, END	70.0	0.00	No.1	No.1	0	0
8	ABS, (SNG)POS	SNG, END	80.0	0.00	No.1	No.1	0	0
9	ABS, (SNG)POS	SNG, END	90.0	0.00	No.1	No.1	0	0
10	ABS, (SNG)POS	SNG, END	100.0	0.00	No.1	No.1	0	0



## 11.3 Copy Data

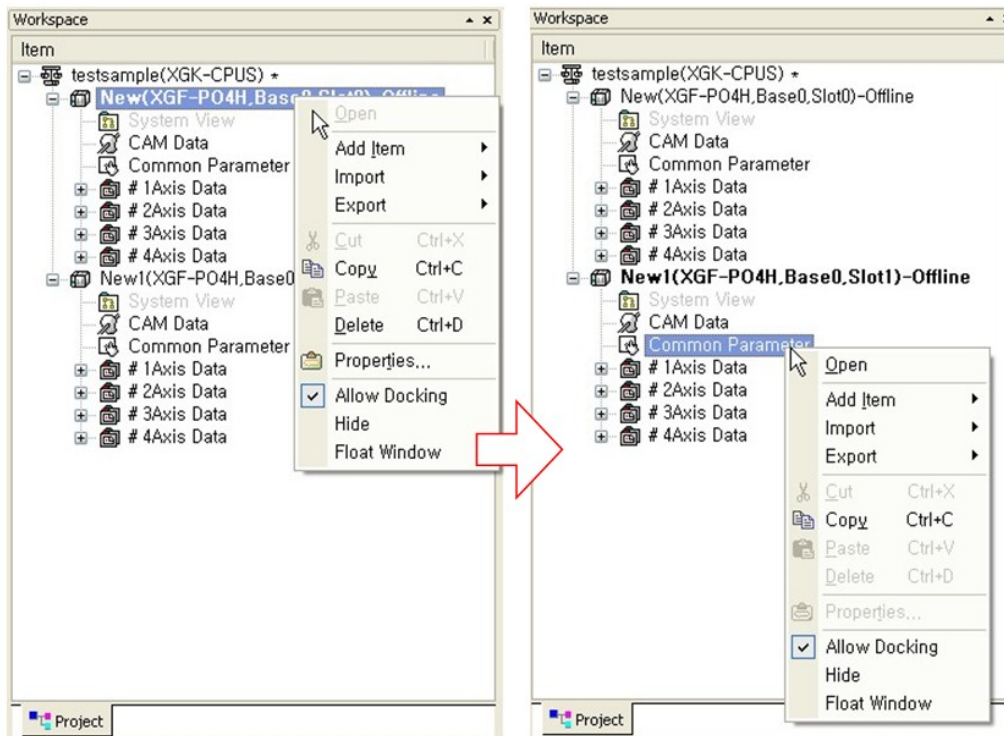
XG-PM provides useful data copy function when edit data item with XG-PM. Also provides not only copying each data item but copying each axis, copying module unit.

### 11.3.1 Copy for Each Data Item

[Sequence]

- (1) Select item for copying data on the project tree.
- (2) Proceed [Edit]->[Copy] after click mouse right button.
- (3) Select item for pasting data on the project tree.
- (4) Proceed [Edit]->[Paste] after click mouse right button.

[Copy common parameter]



#### Notes

Perform copy for each item to CAM data/Common parameter/Operation data/Operation parameter.

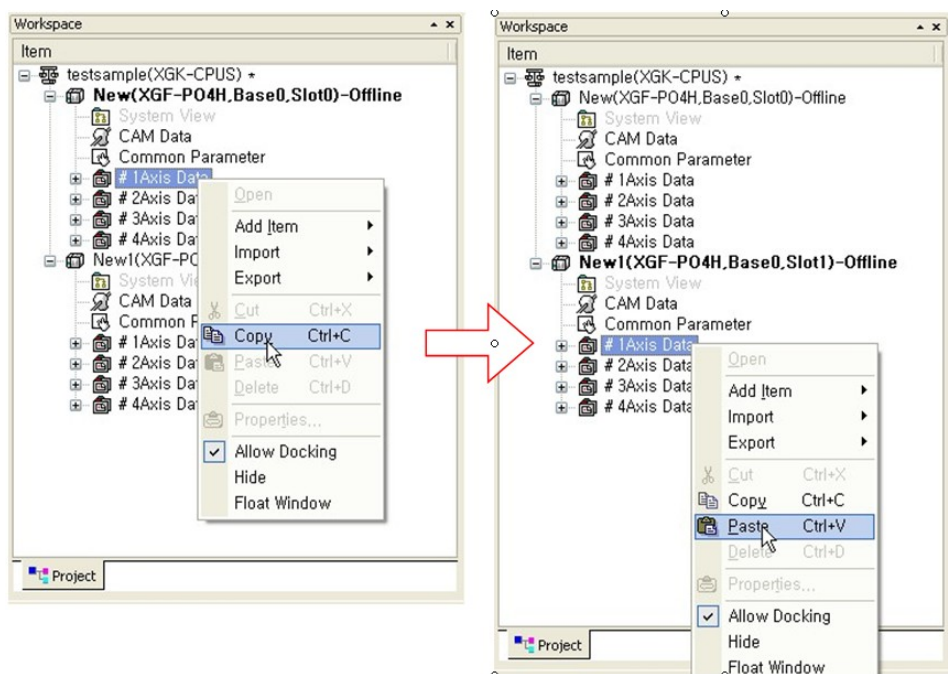
## Chapter 11 Useful Function of XG-PM

### 11.3.2 Copy for Each Axis Data

[Sequence]

- (1) Select item on the project tree.
- (2) Proceed [Edit]->[Copy] after click mouse right button.
- (3) Select item on the project tree for Pasteing.
- (4) Proceed [Edit]->[Paste] after click mouse right button.

[Copy axis data]



#### Notes

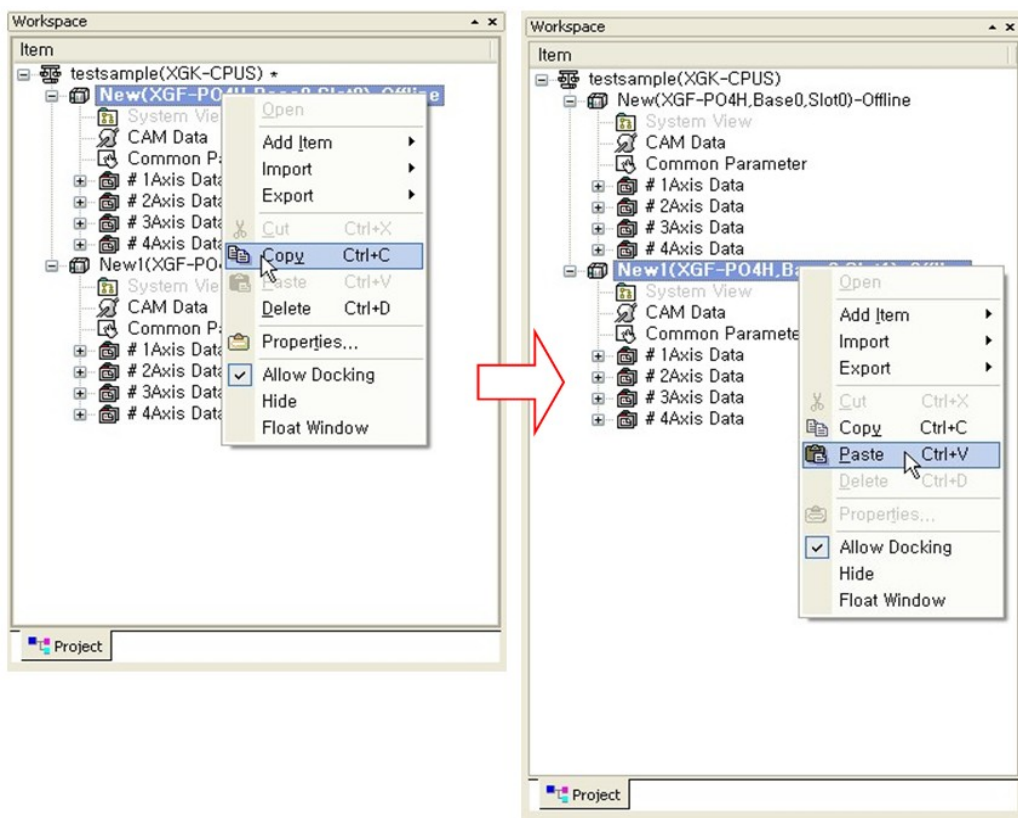
When copy axis unit data, both Operation data/Operation parameter data is copied.

### 11.3.3 Copy Data for Each Module

[Sequence]

- (1) Select module item on the project tree.
- (2) Proceed [Edit]->[Copy] after click mouse right button.
- (3) Select module item from project tree for Paste.
- (4) Proceed [Edit]->[Paste] after click mouse right button.

[Copy module unit]



#### Notes

When copy module unit data, copy all CAM data/Common parameter and position data/operation parameter from each axis.

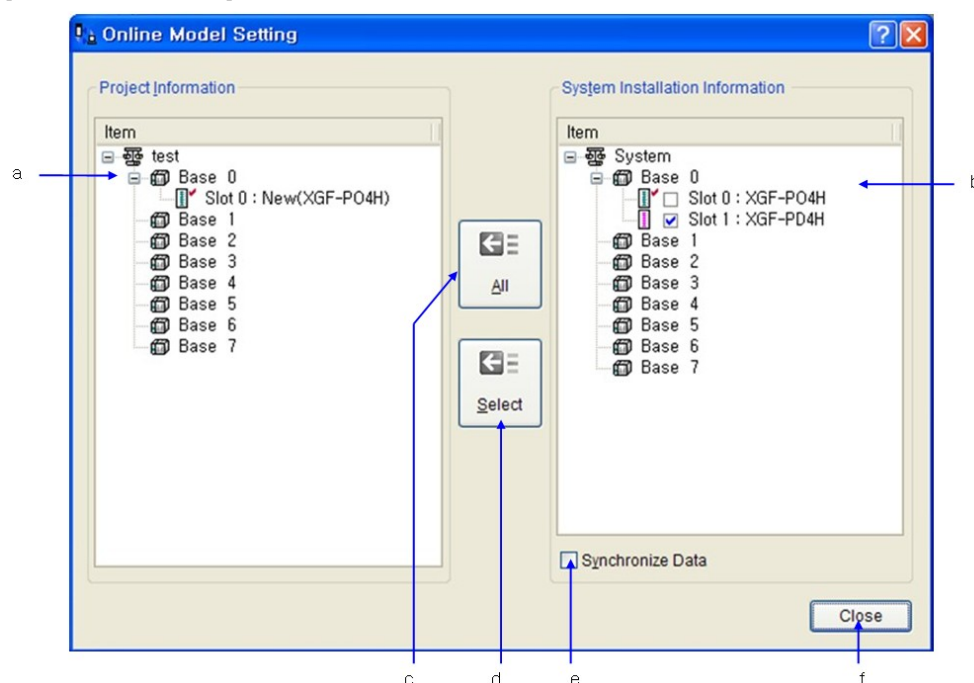
### 11.4 Online Model Setting

Online model setting function provides solution that it set online module on the current project and data which it is online on the module is made synchronize for fast and convenient method.

[Sequence]

- (1) Create project.
- (2) Connect with PLC by [Online]->[Connect].
- (3) Proceed [Online]->[Online model setting].

[Communication box]



[Communication box description]

- (a) Project information: Display set module information on the current.
- (b) System installation information: Display equipped positioning module information.
- (c) All: Perform equipped entire positioning module for setting.
- (d) Select: Selected positioning module make perform for setting on the project module.
- (e) Synchronize data: Renew data by read data from equipped positioning module data.
- (f) Close: End communication box.

### 11.4.1 Module Synch Function

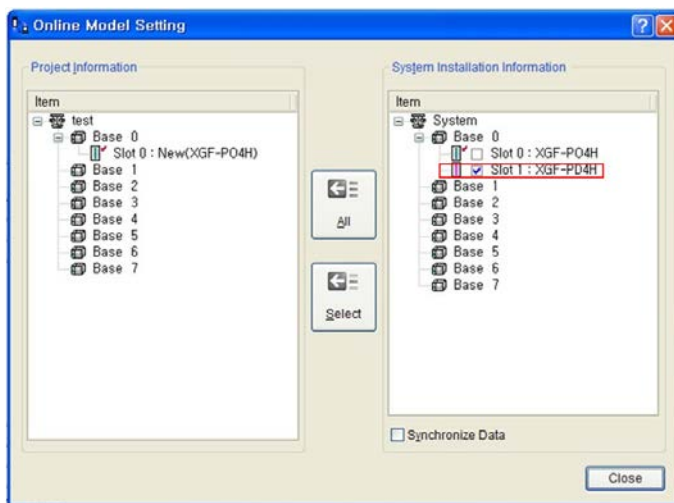
Module synchronize function recognize positioning module which it is exist on the PLC system and set that on the project.

#### 1. Synch of Select Module

[Sequence]

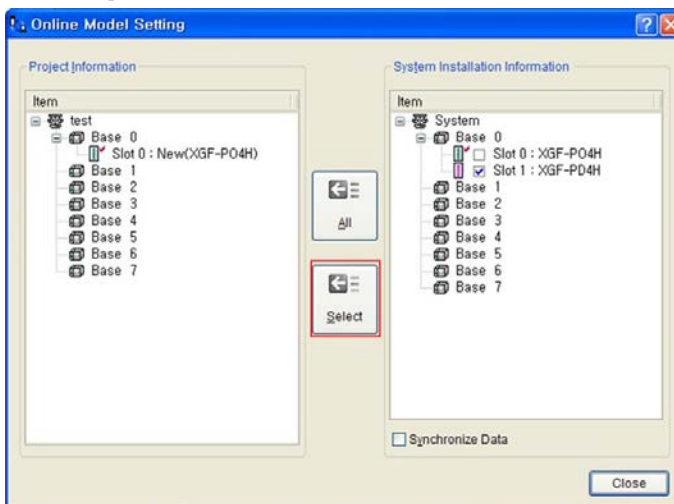
- (1) Create project.
- (2) Connect to PLC by [Online]->[Connect].
- (3) Proceed [Online]->[Online model setting].
- (4) Select module for synchronizing on online model setting communication box system equipment information window.

[Communication box]



- (5) Click the select button for module synchronize.

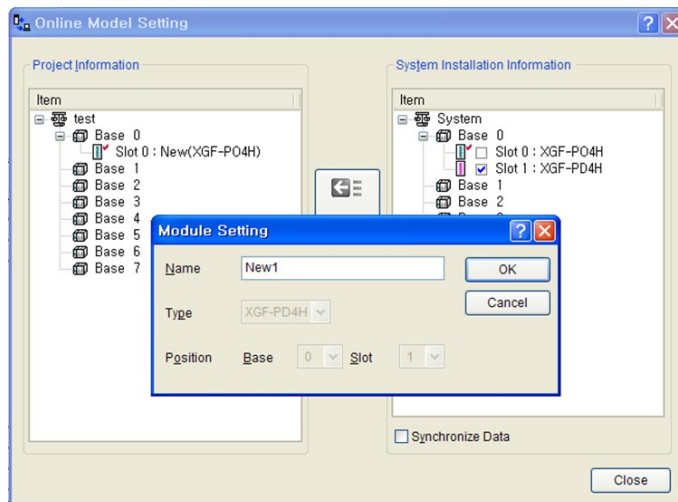
[Communication box]



## Chapter 11 Useful Function of XG-PM

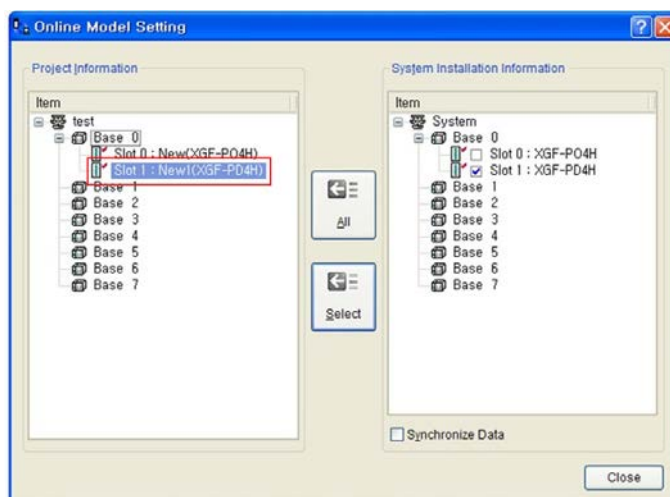
(6) Set module name that it is need to synchronize and confirm.

[Communication box]



(7) Confirm set module on the project.

[Communication box]



### Notes

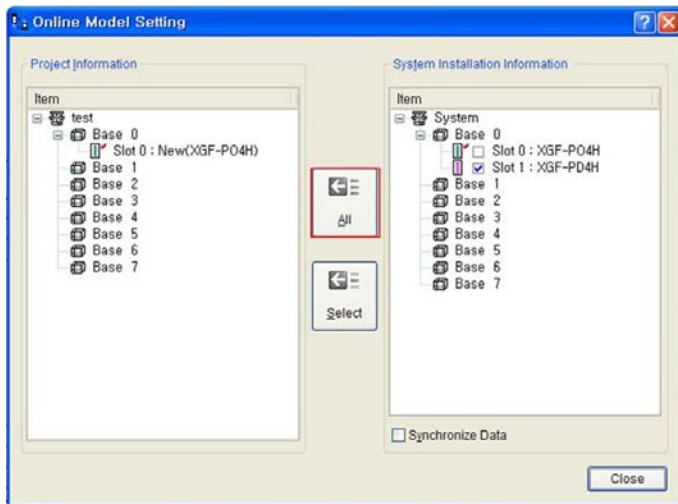
Module is automatically added to project tree when module is set on the project information after module synchronize.

## 2. Synchronization of whole module

[Sequence]

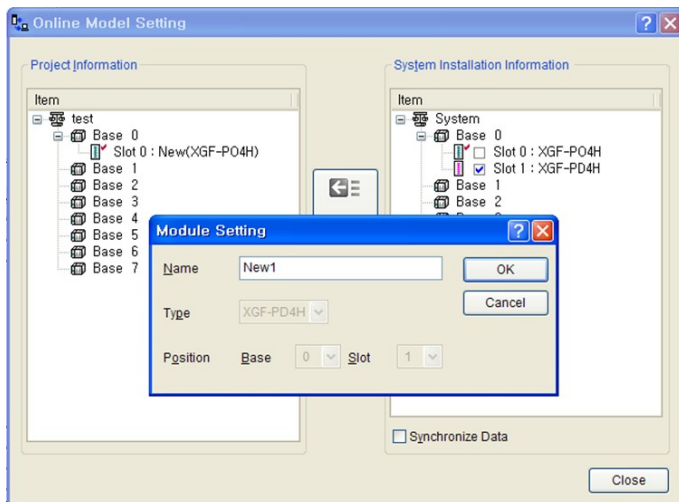
- (1) Create project.
- (2) Connect to PLC by proceeding [Online]→[connect].
- (3) Proceed menu [Online]→[Online Model Setting].
- (4) Click Entire button for module synchronize.

[Communication box]



- (5) Set the module name for synchronize on module setting communication box and click.  
(Then module communication box is revitalized as much as the number of module, set the each module name for each module.)

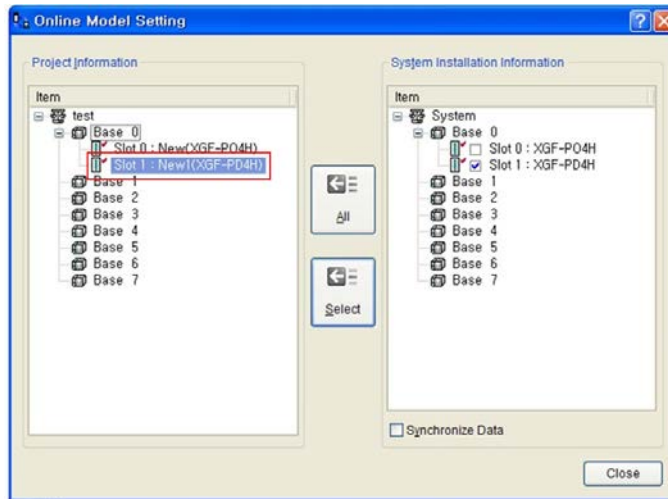
[Communication box]



## Chapter 11 Useful Function of XG-PM

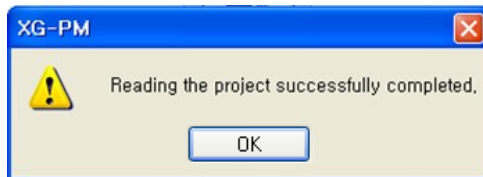
(6) Confirm set module on the project.

[Communication box]



### Notes

This message will be displayed when click the “All” or “Select” button after synchronizing entire module.





### 11.4.2 Data Synch Function

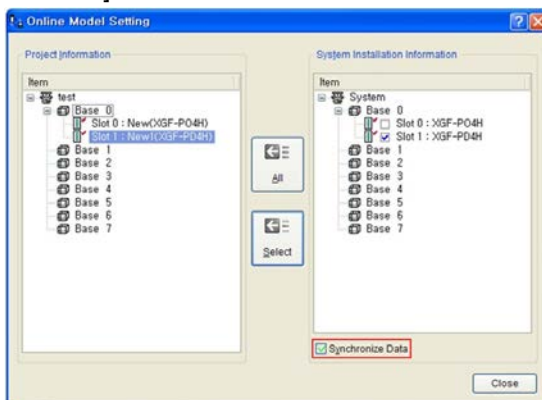
Provide setting function by read module data from PLC system.

#### 1. Data synch of selecting module

[Sequence]

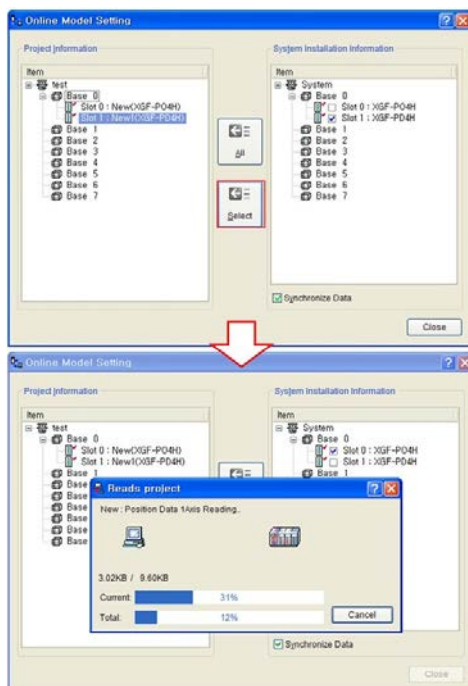
- (1) Create project.
- (2) Connect to PLC by menu [Online]→[Connect].
- (3) Proceed menu [Online]→[Online Model Setting].
- (4) Select module for synchronize on the online model setting communication box system equipment information window.
- (5) Check Synchronize Data item.

[Communication box]



- (6) Begin to read data from module when click the select button.

[Communication box]



#### Notes

When proceed module synchronize function, if check data synchronize item, then proceed module synchronize and data synchronize at the same time.

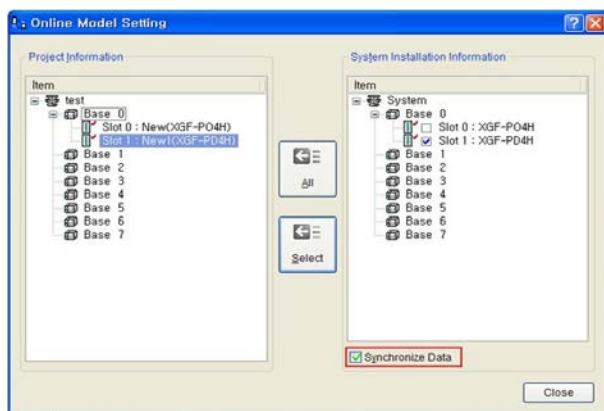
## Chapter 11 Useful Function of XG-PM

### 2. Data synch of whole module

[Sequence]

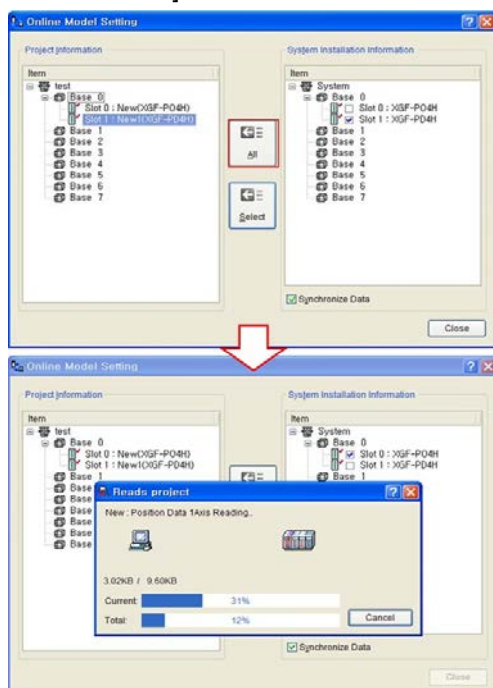
- (1) Create project.
- (2) Connect to PLC by proceeding [Online]→[Connect].
- (3) Proceed [Online]→[Online Model Setting].
- (4) Check Synchronize Data item.

[Communication box]



- (5) Read data from module by click the selecting button.

[Communication box]



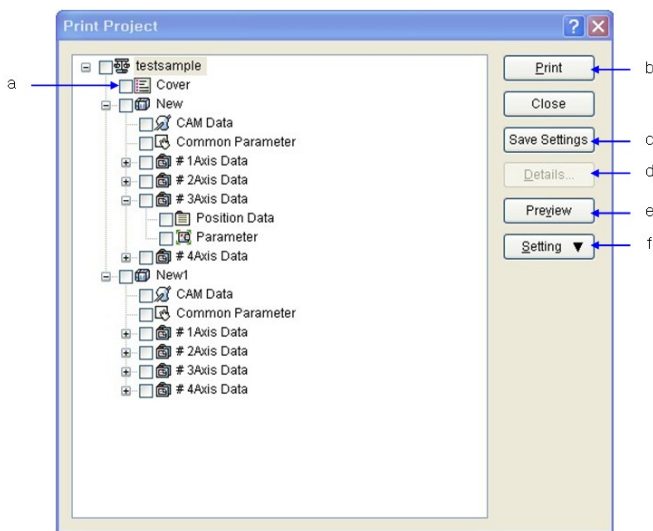
11.5 Project Printing

XG-PM provides project printing function for printing entire data which user set at once. These functions progressively print all contents of project. It performs setting item when it is selecting/printing, preview function, printing function.

[Sequence]

- (1) Proceed menu [Project]→[Print Project].
- (2) Project printing communication box is appeared.
- (3) Set item what user need to print.

[Communication box]



[Communication box description]

- (a) Project tree: Express tree structure which it can print on the project.
- (b) Print button: Print checked item on the project tree.
- (c) Save settings: Can save selected item at the project tree.
- (d) Details: Set details selected item on the project tree.
- (e) Preview: Provides preview function what it was checked on the project tree.
- (f) Setting: Set entire printing. For example, set process printer setting, printing page setting, space setting, etc.

Notes

Detail button is revitalized only, when selected current item is [Cover].

### 11.5.1 Printing setting

Set paper and print.

[Sequence]

- (1) Click setting button on the project printing communication box or click mouse right button on the project tree.

[Communication box]



[Communication box description]

- (a) Details: To be revitalized when select cover setting item, detail setting is possible to [Cover].
- (b) Page Setup: Can set paper setting for printing.
- (c) Header/Footer: Can input header and footer.

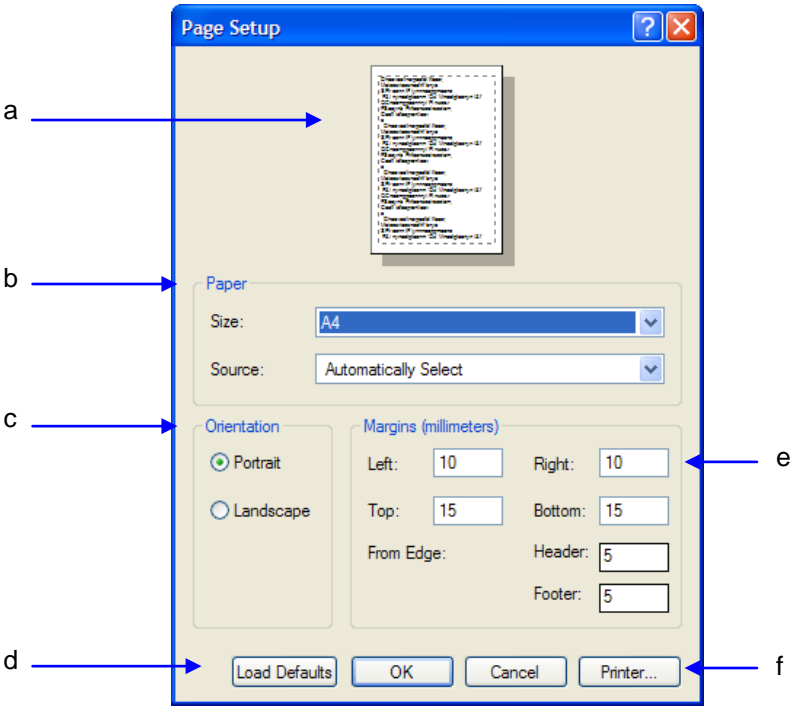
11.5.2 Space Setting

Set space for printing paper.

[Sequence]

- (1) Execute page setup menu after click the setting button on the project printing communication box or click mouse right button on the project tree.

[Communication box]



[Communication box description]

- (a) Preview: Can preview layout of selected paper space.
- (b) Paper: Select printing paper.
- (c) Direction: Select printing direction of paper.
- (d) Load Defaults: Change contents of space, header, footer as default when it is installed.
- (e) Margin setting: Set space of printing paper.
- (f) Printer: Can change printer setting.

Notes

- 1. When print contents should be careful that it is overlap with header/footer.
- 2. Can not be printed without setting header/footer contents.

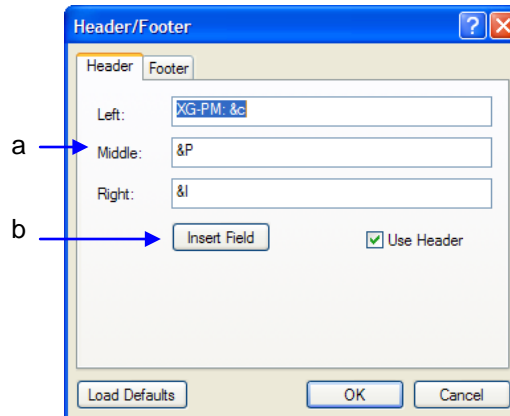
### 11.5.3 Header/Footer Setting

Set contents of header/footer.

[Sequence]

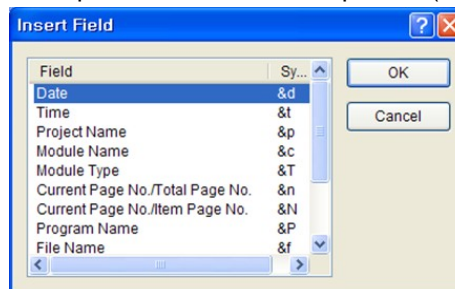
- (1) Set header/footer with setting button on the project printing communication box or header/footer setting menu on the project tree.

[Communication box]



[Communication box description]

- (a) Explain content: Input contents on the left/center/right of header/footer.
- (b) Field interpolation button: Field is interpolated to current cursor position (editing box; left, center, right).



#### Notes

1. It is possible that it set header/footer by input of user and field.  
Ex) Input header/footer as "Today is the &d."  
It will be printed as "Today is june 1, 2007."
2. Field contents
  - (1) Date: &d → Print as "yyyy-mm-dd".
  - (2) Time: &t → Print as "hh:mm:ss".
  - (3) Project name: &p
  - (4) Module name: &c
  - (5) Module type: &T
  - (6) Current page No./the number of entire page: &n → Current No./The number of entire page of selected item.
  - (7) File name: &f → Current project file name.
  - (8) File name that it is included route: &F → It is displayed as directory route name that file name is included.
  - (9) Project description: &C → Print project description.

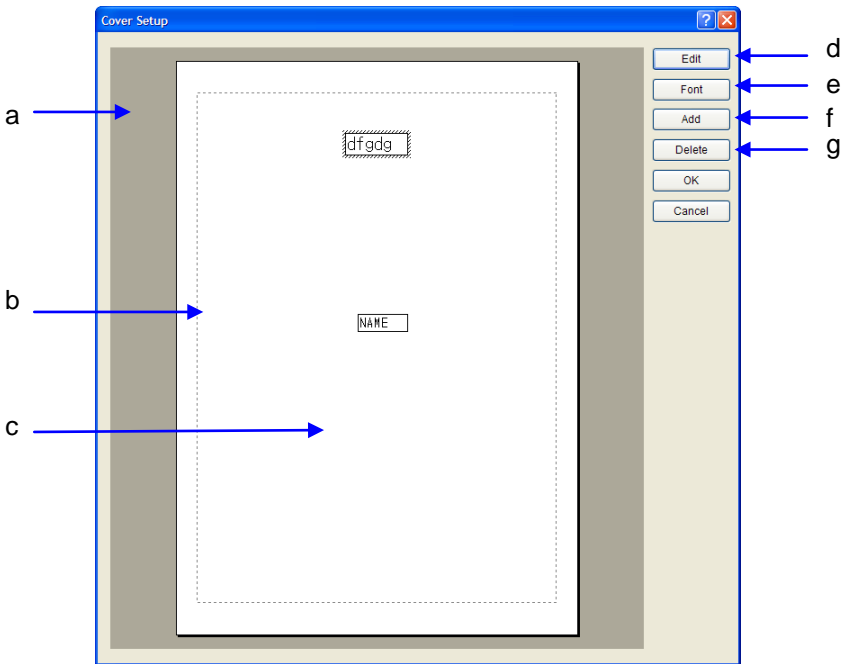
11.5.4 Cover Printing Setting

It is possible that it set printing cover.

[Sequence]

- (1) Select cover on the project tree of printing communication box.
- (2) Click the detail button or click enter key while select cover.

[Communication box]



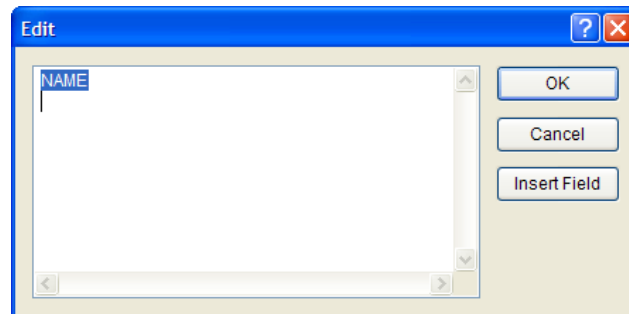
[Communication box description]

- (a) Cover paper: Basically A4 vertical direction. It depends on paper setting.
- (b) Margin indication: Set margin is displayed by dotted line.
- (c) Edit box: That is preview. Content, Font, Position can be changed.
- (d) Edit: Content of editorial box can be changed.
- (e) Font: It is possible that font of selected editorial box change.
- (f) Add: Can add new editorial box of cover page.
- (g) Delete: Can delete selected editorial box.

## Chapter 11 Useful Function of XG-PM

[Add contents sequence]

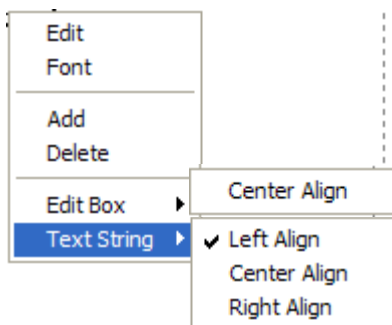
- (1) Click the [Add] button.
- (2) Mouse pointer move to paper.
- (3) Mouse pointer change to next.
- (4) Click the paper by mouse left button.
- (5) Editorial communication box is appeared.



- (6) In case of ending after edition, mouse cursor change to arrow.

### Notes

1. Can line up editorial box in the paper and editorial box.
  - By mouse right button with menu.



- (1) [Edit box]-[Center Align]: Center selected edit box.
- (2) [Text String]-[Left Align]: Contents is arranged to left side on the edit box.
- (3) No print frame of edit box during printing.
- (4) It is possible that move edit box by arrow key.
- (5) No provides Undo and Redo.
- (6) Display real contents of field with preview, if the sentence includes field. When editing, display field.



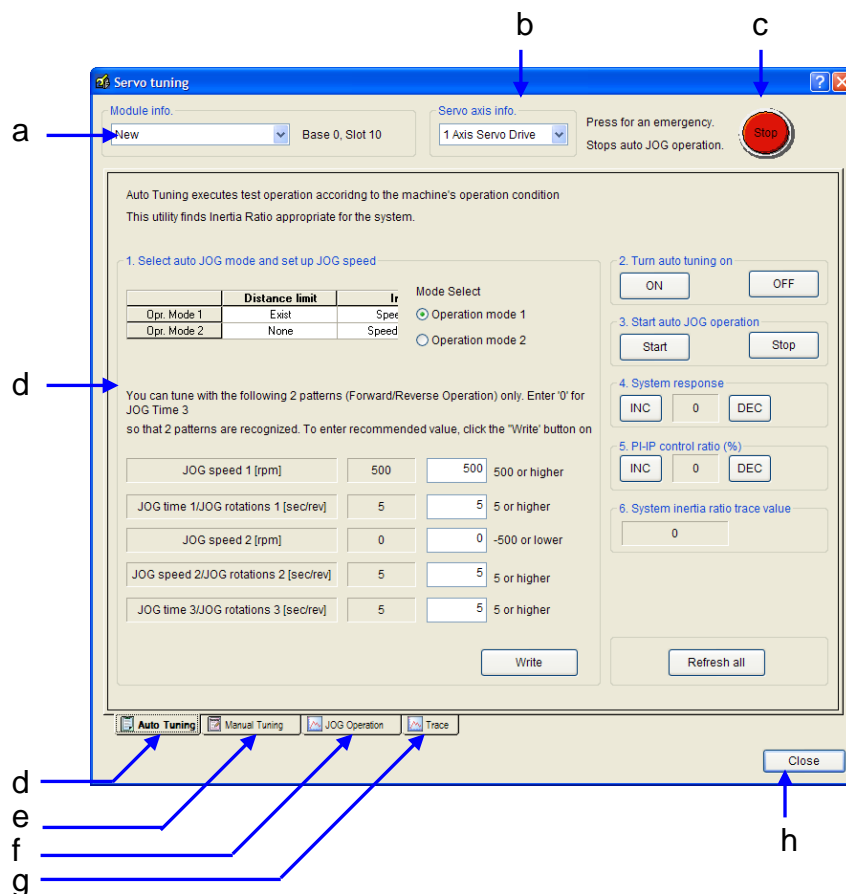
## 11.6 Servo Tuning (Only Applied to Network Type XPM)

You can connect to XGT servo series and check the connection status and alarm and execute the auto-JOG, auto-tuning easily through the XG-PM software package without the other software.

[Sequence]

- (1) Create a project
- (2) Connect to PLC through menu [Online] -> [Connect]
- (3) Connect to the servo drive connected to the module through menu [Online] -> [Connect to all servo]
- (4) Select menu [Tool] -> [Servo Tuning]

[Dialog box]



[Dialog box description]

- (a) Module information : Selects the module connected to the servo drive.
- (b) Servo axis information : Selects a servo drive to execute servo-tuning among currently connected servo drives.
- (c) EMG stop button : You can stop auto-Jog operation by this button when servo drive is under emergency status or malfunction during auto-Jog operation.
- (d) Auto-tuning tap : Screen providing auto-tuning function
- (e) Manual-tuning tap : Screen providing manual-tuning function
- (f) JOG operation tap : Screen providing JOG operation function
- (g) Trace tap : Screen monitoring data during operation. You can modify the parameter during operation and check the effect of the modified parameter with graph easily.
- (h) Close : Closes the dialog box.

### 11.6.1 Select Servo Drive for Tuning

Select a servo drive for tuning

[Sequence]

- (1) Select the module connected to a servo for tuning at the “Module Information” list.
- (2) Select a servo for tuning at the “Servo Axis Information”

[Dialog box]

Module info. New Base 0, Slot 10

Servo axis info. 1 Axis Servo Drive

#### Tip

If you select the module information, servo drives connected to that module will refresh at the servo axis information list.

11.6.2 Auto-Tuning

Auto-tuning is function that finds the inertia of system, by operating the control target system in accordance with specific pattern.

[Sequence]

- (1) Activate the auto-tuning tap

[Setting screen]

Auto Tuning executes test operation according to the machine's operation condition  
This utility finds Inertia Ratio appropriate for the system.

1. Select auto JOG mode and set up JOG speed

	Distance limit	Ir
Opr. Mode 1	Exist	Spee
Opr. Mode 2	None	Speed

Mode Select  
☒ Operation mode 1  
☐ Operation mode 2

You can tune with the following 2 patterns (Forward/Reverse Operation) only. Enter '0' for JOG Time 3 so that 2 patterns are recognized. To enter recommended value, click the "Write" button on

JOG speed 1 [rpm]	500	500	500 or higher
JOG time 1/JOG rotations 1 [sec/rev]	5	5	5 or higher
JOG speed 2 [rpm]	0	0	-500 or lower
JOG speed 2/JOG rotations 2 [sec/rev]	5	5	5 or higher
JOG time 3/JOG rotations 3 [sec/rev]	5	5	5 or higher

2. Turn auto tuning on  
ON OFF

3. Start auto JOG operation  
Start Stop

4. System response  
INC 0 DEC

5. PI-IP control ratio (%)  
INC 0 DEC

6. System inertia ratio trace value  
0

Write Refresh all

a b c d e f g h i

[Setting screen description]

- (a) Operating mode selection : checks data according to operating mode and selects operating mode
- (b) JOG speed setting: inputs JOG speed. Sets the auto JOG operation speed to find the inertia ratio of a servo.
- (c) Turn auto tuning ON: activates the auto tuning function (ON button) or not (OFF button)
- (d) Start auto JOG operation : starts auto tuning operation (Start button) or stops (Stop button)
- (e) System response: increases or decreases system response by step
- (f) PI-IP control ratio(%): increases or decreases PI-PH control ratio to find the PI-IP control ratio proper to the servo.
- (g) System inertia ratio trace value: shows system inertia found by auto tuning
- (h) Write: writes auto-tuning JOG operating mode and JOG speed data to the servo drive
- (i) Refresh all: reads JOG speed, system response, PI-IP control ratio and system inertia ratio trace value from the servo drive

Tip

In case of an emergency, press "EMG stop" button on the top of dialog box. Then it executes "Auto JOG operation stop".

### 11.6.3 Manual Tuning

This function is used to tune more accurately with real load operation. Modify the value by pressing “INC” or “DEC” button.

[Sequence]

- (1) Activate the manual tuning tap

[Setting screen]

Manual Tuning provides functions for further fine tuning. Tune while operating with actual load.

1. Common				
1. System Response	INC	0	DEC	P2-18 : System Response
2. System Inertia Ratio	INC	0	DEC	P2-19 : Inertia Ratio
3. PI-IP Control Ratio	INC	0	DEC	P3-02 : PI-IP Control [%]

2. Speed operation mode				
4. Proportional Gain	INC	0	DEC	P3-05 : SC Loop Gain1 [Hz]
5. Time Constant	INC	0	DEC	P3-06 : SC TC1 [ms]
6. Ripple Compensation	ON	0	OFF	P2-28 : Ripple Compensation
7. Acceleration Time	INC	0	DEC	P3-10 : Acceleration Time [ms]
8. Deceleration Time	INC	0	DEC	P3-11 : Deceleration Time [ms]

3. Position operation mode				
9. Feed-Forward Ratio	INC	0	DEC	P5-04 : Feedforward [%]
10. Proportional Gain	INC	0	DEC	P5-05 : PC P Gain [Hz]

Refresh

[Setting screen description]

- (a) Common : Increases or decrease system response/inertia ratio/PI-IP control ratio
- (b) Speed operation mode : Increases or decreases proportional gain, time constant, ripple compensation, acceleration time and deceleration time used for speed operation mode.
- (c) Position operation mode: Increases or decreases feed-forward ratio, proportional gain used for position operation mode.
- (d) Refresh: Reads all values on the screen from the servo drive.

### 11.6.4 JOG operation

You can check basic operation of the servo drive through JOG operation mode and check the JOG operation of 8 patterns through auto JOG operation.

[Sequence]

- (1) Activate JOG operation tap.

[Setting screen]

**1. JOG operation mode setting**

P10-02 Key JOG Spd. [rpm] 0 0

Refresh Write

Make sure that there is no person near the body of rotation before turning the JOG on.

JOG On JOG Off

<< >>

Clockwise Counterclockwise

**2. Auto JOG operation mode setting**

Select operation mode and start operation

Mode 1 Mode 2 Auto JOG Off

**3. Auto JOG setting**

P10-04	JOG speed 1 [rpm]	0	0	Write
P10-05	JOG time 1/Rotations1 [sec/rev]	0	0	Write
P10-06	JOG speed 2 [rpm]	0	0	Write
P10-07	JOG time 2/Rotations2 [sec/rev]	0	0	Write
P10-08	JOG speed 3 [rpm]	0	0	Write
P10-09	JOG time 3/Rotations3 [sec/rev]	0	0	Write
P10-10	JOG speed 4 [rpm]	0	0	Write
P10-11	JOG time 4/Rotations4 [sec/rev]	0	0	Write
P10-12	JOG speed 5 [rpm]	0	0	Write
P10-13	JOG time 5/Rotations5 [sec/rev]	0	0	Write
P10-14	JOG speed 6 [rpm]	0	0	Write
P10-15	JOG time 6/Rotations6 [sec/rev]	0	0	Write
P10-16	JOG speed 7 [rpm]	0	0	Write
P10-17	JOG time 7/Rotations7 [sec/rev]	0	0	Write
P10-18	JOG speed 8 [rpm]	0	0	Write
P10-19	JOG time 8/Rotations8 [sec/rev]	0	0	Write

Refresh

[Setting screen]

- (a) JOG operation mode setting : sets the speed for JOG operation  
JOG On/JOG Off : turns on/off JOG operation  
<< button, >> button: If you press direction button after JOG On, the motor moves clockwise or counterclockwise with JOG speed
- (b) Auto JOG operation mode setting: selects auto JOG operation mode  
Auto JOG Off: stops auto JOG operation
- (c) Auto JOG setting: sets speed and time of 8 patterns used for auto JOG operation
- (d) Refresh: reads all values on the screen from the servo drive

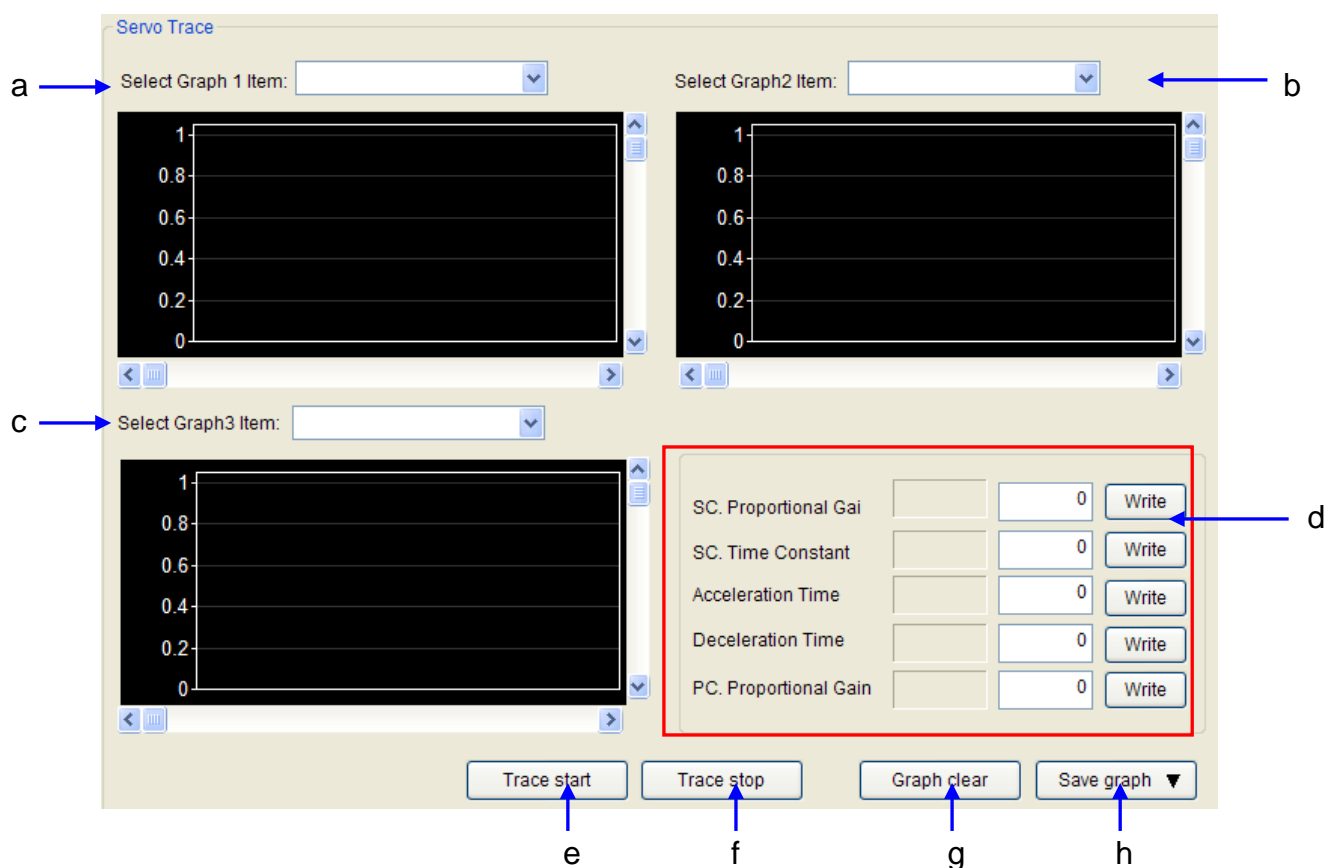
### 11.6.5 Trace

You can check command speed, current speed of a servo and load ratio with the graph

[Sequence]

- (1) Activate trace tap

[Setting screen]



[Setting screen]

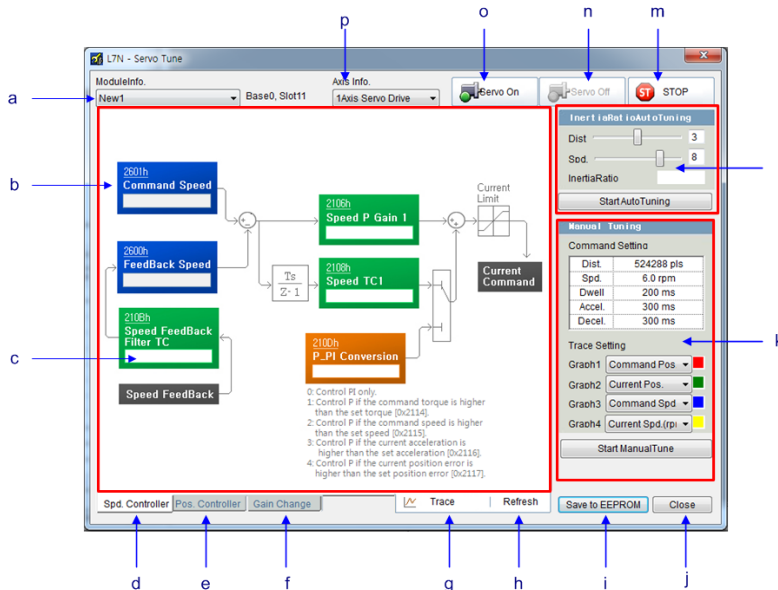
- (a) Select Graph 1 Item : Selects the item for trace at graph 1. selects one among 15 items.
- (b) Select Graph 2 Item : Selects the item for trace at graph 2. selects one among 15 items.
- (c) Select Graph 3 Item : Selects the item for trace at graph 3. selects one among 15 items.
- (d) Change item during tracing : You can trace while changing servo tuning parameter during tracing. You can check the position/speed of the servo changed by parameter change in real time through the graph.
- (e) Trace start: Starts trace
- (f) Trace stop: Stops trace
- (g) Graph clear: Clears all data on the graph
- (h) Save graph: Saves each graph as bit map type

## 11.7 Servo tuning(Only standard Network type XPM, Motion Control Module)

When using XG-PM software package with L7N series Servo Drive, you can set the Servo Drive's parameters easily through Auto tuning, Manual tuning and do not need to install the other software.

[Sequence]

- (1) Create project.
- (2) Connect to the PLC through the menu [Online]→[Connect].
- (3) Select the [Online] → [ Servo Auto Connection to Network] and connect it to the Servo Drive linked to a module.
- (4) Select the [Tool] → [Servo tuning].



[Communication box]

- (a) Module information : Selects the module connected to the Servo Drive.
- (b) Controller screen : Displays the controller's structure with settable parameters.
- (c) Set current value : Shows the current values of parameters. If it is not Read-only parameter, it can be set by a user.
- (d) Speed controller tab : Sets the Servo drive's speed controller.
- (e) Position controller tab : Sets the Servo drive's position controller.
- (f) Gain change tab : Sets the Servo drive's gain switching.
- (g) Trace : Displays the trace graph on manual tuning on a controller screen.
- (h) Refresh : Read all parameters again from a Servo Drive.
- (i) Save to EEPROM : Saves the set Servo parameters to a Servo Drive's EEPROM,
- (j) Close : Closes the dialog box.
- (k) Manual tuning : Sets and executes the manual tuning.
- (l) Auto-tuning : Sets and executes the Auto-tuning.
- (m) Emergency Stop : In case a Servo Drive is under mis-operation or emergency state, you can stop the Servo Drive by pressing the Emergency Stop button.
- (n) Servo-Off : Makes a Servo Drive come to Servo-Off status. You need to execute Servo-Off to use the Auto-tuning function.
- (o) Servo-On : Makes a Servo Drive come to Servo-On status. You need to execute Servo-On to use the manual tuning function.
- (p) Axis information : Among Servo Drives connected the module currently, select the Servo Drive for tuning.

### 11.7.1 Selecting the object of Servo tuning

It selects the Servo drive object for tuning.

[Sequence]

- (1) Among the module information list, select the module to which the Servo for tuning is connected.
- (2) Select the Servo for tuning in the Servo Drive axis information.

[Communication Box]

ModuleInfo.	Axis Info.
New1	Base0, Slot11
	1Axis Servo Drive

#### Notes

If you select the module information, among the Servo Drives connected to the relevant module, the Servo Drive information that can fulfill servo tuning(L7Nseries) only will be updated on the Servo Drive axis's information list.

### 11.7.2 Auto-tuning

Auto-tuning is the function that finds the inertia ratio of the system by operating the system to be controlled in accordance with the set patterns.

[Sequence]

- (1) Execute Servo-Off by pressing the Servo-Off button.
- (2) Sets the Auto tuning distance.
- (3) Sets the Auto tuning speed.
- (4) Press the Start button for Auto tuning.

[Setting Screen]

[Description on a setting screen]

- (a) Auto tuning distance: Controls the distance operating a Servo motor to execute Auto-tuning.
- (b) Auto tuning speed: Controls the speed operating a Servo motor to execute Auto-tuning.
- (c) Inertia ratio: Indicates the inertia ratio that is the result of Auto-tuning. You can set it directly.
- (d) Start Auto Tuning Button: Starts Auto-tuning.

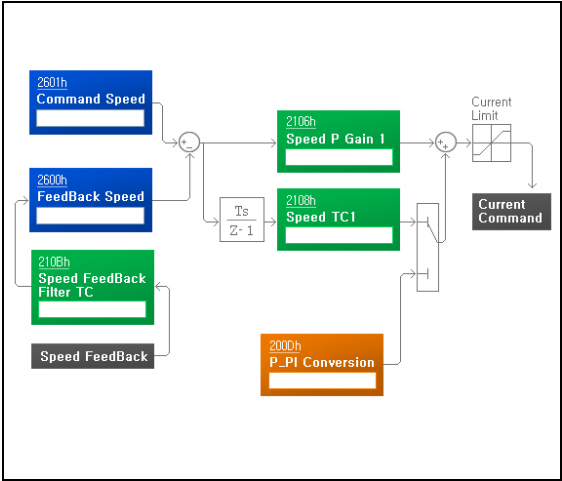
#### Notes

When Auto-tuning is executed, the controller's parameters will be automatically changed into standard values corresponding to the inertia ratio.

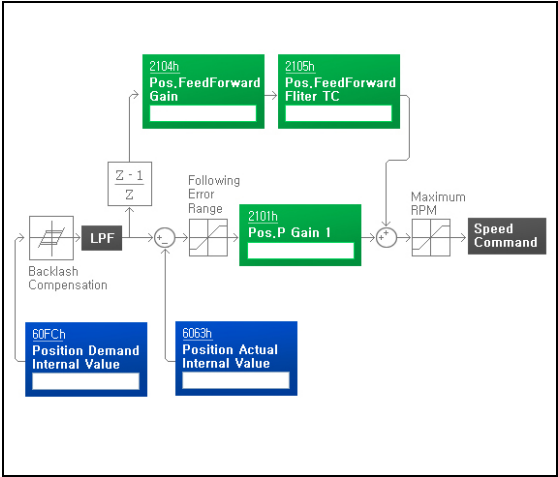


11.7.3 Manual tuning

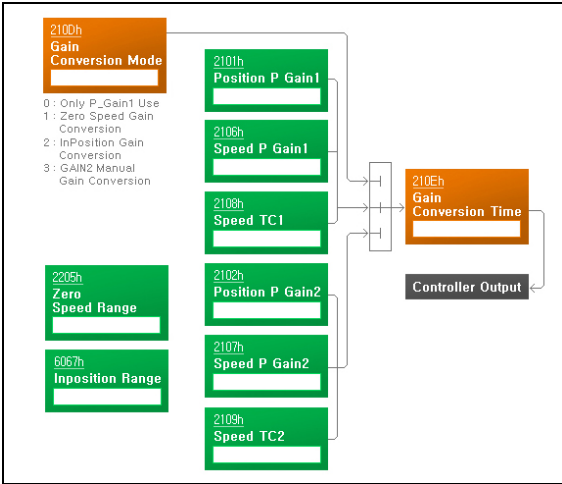
Manual tuning is used for more precise tuning under the actual load operation(speed controller/position controller/gain change). If you select a tab, the relevant controller screen shows the structure of each controller and you can set the controller's parameters on the related screen.



<Speed Controller>



<Position Controller>



<Gain Change>

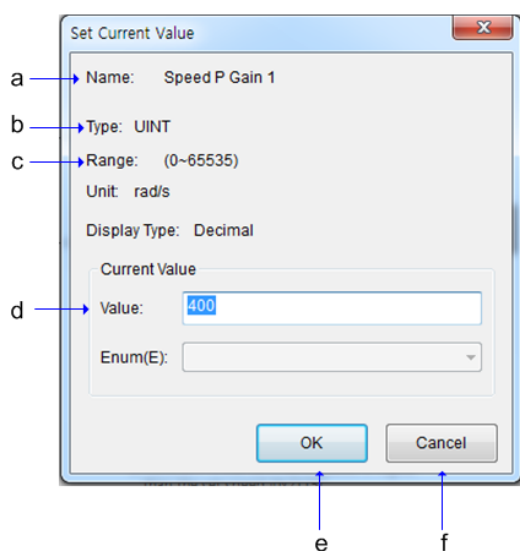
## Chapter 11 Useful Function of XG-PM

### 1. Setting controller parameter

[Sequence]

- (1) Select the controller tab (speed controller/position controller/gain change) to be set.
- (2) Click the parameter value of a controller.

[Setting Screen]



- (a) Name : Indicates the parameter's name.
- (b) Type : Indicates the parameter's data type.
- (c) Range : Indicates the settable maximum/minimum values of parameters
- (d) Value : Indicates and sets the current values of parameters.
- (e) OK : Executes 'Write parameter'
- (f) Cancel : Cancels the 'Write parameter'.

### 2. Executing manual tuning

- (1) Execute Servo-On by pressing the Servo-On button.
- (2) Set the trace items.
- (3) Set the operation mode.(distance/speed/dwell/acceleration/deceleration)
- (4) Press the Start button for manual tuning.

[Setting Screen]

The screenshot shows a 'Manual Tuning' window with two main sections: 'Command Setting' and 'Trace Setting'. The 'Command Setting' section contains a table with five rows. The 'Trace Setting' section contains four rows, each with a graph name, a dropdown menu, and a color selection box. At the bottom is a 'Start ManualTune' button. Labels a through h point to specific elements: a points to 'Dist.', b to 'Spd.', c to 'Dwell', d to 'Accel.', e to 'Decel.', f to the 'Command Pos.' dropdown, g to the red color box for Graph1, and h to the 'Start ManualTune' button.

Manual Tuning		
Command Setting		
a → Dist.		524288 pls
b → Spd.		6.0 rpm
c → Dwell		200 ms
d → Accel.		300 ms
e → Decel.		300 ms

Trace Setting		
Graph1	f → Command Pos	g → [Red]
Graph2	Current Pos.	[Green]
Graph3	Command Spd	[Blue]
Graph4	Current Spd.(rpm)	[Yellow]

h → Start ManualTune

- (a) Operation distance: Sets the operating distance in case of manual tuning
- (b) Operation speed: Sets the operating speed in case of manual tuning
- (c) Dwell time: Sets the dwell time in case of manual tuning
- (d) Acceleration time: Sets the acceleration time in case of manual tuning.
- (e) Deceleration time: Sets the deceleration time in case of manual tuning.
- (f) Trace items: Selects the data to be traced in case of manual tuning.
- (g) Trace color: Selects the color of a trace graph.
- (h) Start Manual Tune: Executes the manual tuning.

## Chapter 11 Useful Function of XG-PM

### 11.7.4 Trace

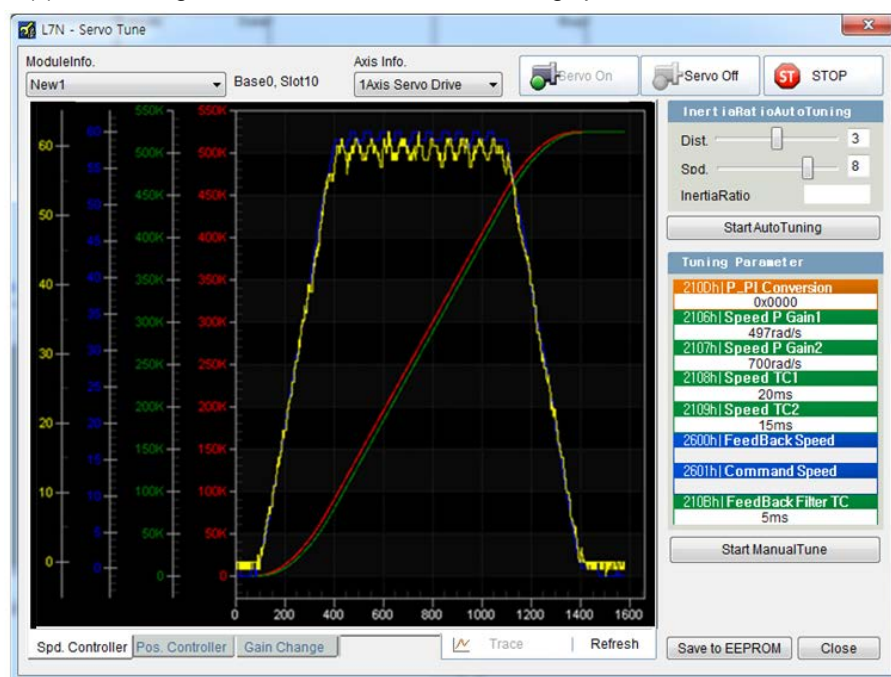
If the manual tuning is executed, the effects of set parameters can be displayed with a trace graph. XG-PM provides the following functions for easy and simple analysis of a trace graph.

#### 1. Multiple axis view

It separates the Y-axis of a trace graph and displays it.

[Sequence]

(1) Click the right mouse on a trace screen to bring up the shortcut menu and select the [Multiple Axis].



#### 2. Show Cursor

It displays the data value of the mouse position on a trace graph.

[Sequence]

(1) Click the right mouse on a trace screen to bring up the shortcut menu and select the [Show Cursor].



### 3. Measurement

It compares and displays the two position values on a trace graph.

#### [Sequence]

- (1) Click the right mouse on a trace screen to bring up the shortcut menu and select [Measure 1].
- (2) Click and select the position to be measured.
- (2) Click the right mouse on a trace screen to bring up the shortcut menu and select the [Measure 2].
- (3) Click and select the position to be measured.

#### Notes

The parameters of the controller that is currently setting are displayed on the right of a trace screen. You can check and revise the current values of parameters.

### 11.8 Trend monitor

Trend monitor read data from module with online and display graph. Trend monitor window compose by bit graph, trend graph, XY graph.

Bit graph: Display On/Off of bit type device by step graph.

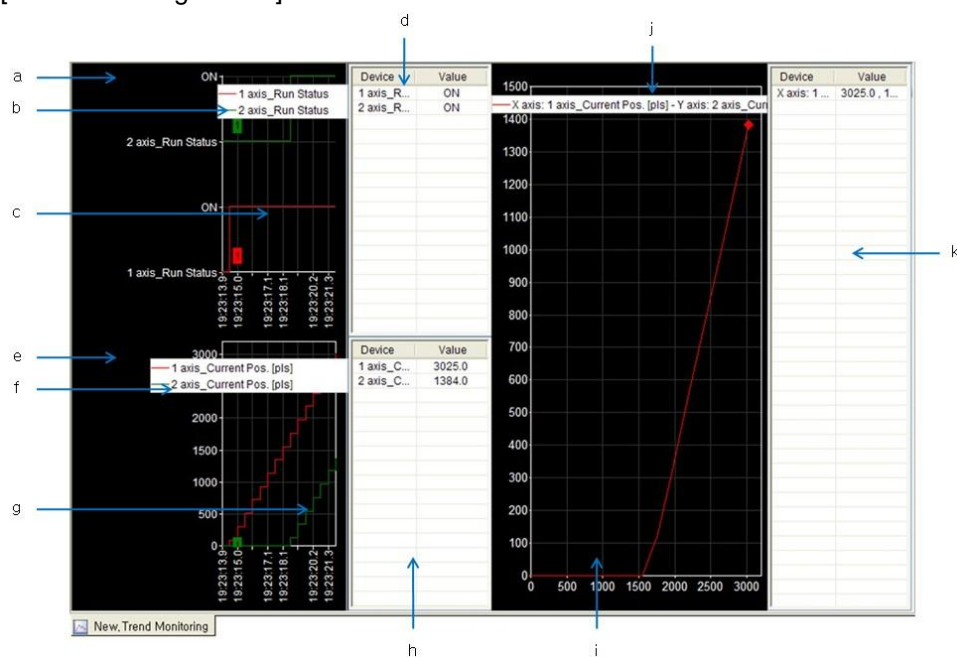
Trend graph: Word type device value change to selected device type and display changing. Trend graph display changing value by device value change to changed data type.

#### 11.8.1 Begin to Trend Monitor

[Sequence]

- (1) Proceed [Online]->[Connect].
- (2) Proceed menu [Monitoring]->[Trend monitoring].

[Trend monitoring window]



[Trend monitor window description]

- (a) Bit graph: Display bit device data.
- (b) Bit graph index: Display bit device name and graph color.
- (c) Display bit graph current step: Display step No. while it is operating axis of included set device.
- (d) Bit graph current value: Display current value of bit device.
- (e) Trend graph: Display data of word device.
- (f) Trend graph index: Display trend graph name and graph color.
- (g) Display trend graph current step: Display step No. while it is operating axis of included set device.
- (h) Current value of trend graph: Display current value of trend device.
- (i) XY graph: Display word device data by two-dimension graph.
- (j) XY graph index: Display XY device name and graph color.
- (k) XY graph current value: Current value of XY device display by two-dimension.

Notes

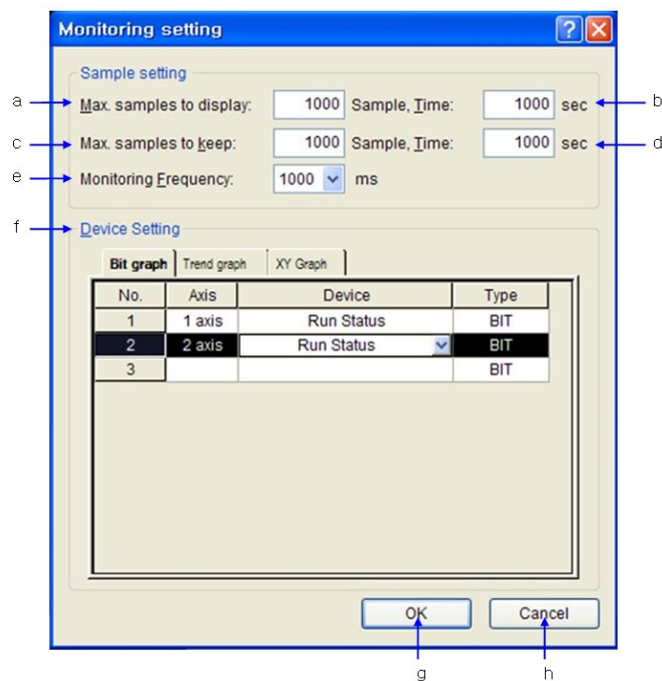
The data which is displayed on the trend monitor can be different with real data. If you want to monitor correct timing, then use data trace function.  
Refer to this manual 11.9 for data trace function.

11.8.2 Trend Monitor Setting

[Sequence]

- (1) Proceed menu [Graph]-[Trend device setting].

[Communication box]



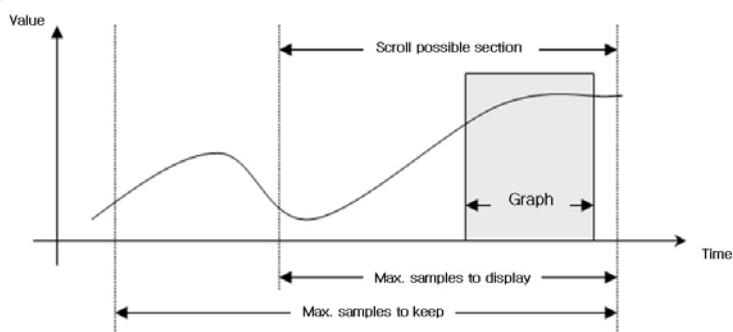
[Communication box description]

- (a) Max. samples to display: Display the number of scrollable maximum sample on the graph.
- (b) Sample. time: Display maximum display sample for each monitoring cycle.
- (c) Max. samples to keep: Display the number of maximum sample which it can save as file.
- (d) Sample. time: Display maximum samples to keep for each monitoring cycle.
- (e) Monitoring Frequency: Set cycle which it read data from module. If the cycle is more short, the data more correct, can give effect to efficiency of PLC scan and PC.
- (f) Device setting: Set device for monitoring.
- (g) OK: Apply changes and close the communication box.
- (h) Cancel: Close the communication box.

## Chapter 11 Useful Function of XG-PM

### Notes

1. Maximum display sample can't bigger than maximum sustain sample.
2. Maximum display time can't bigger than maximum sustain time.
3. "Graph" is graph range which is displayed on the current screen, can horizontally scroll as much as the number of maximum display sample.
4. Maximum sustain sample is the number of maximum sample which it can be saved. Refer to this manual 6.4.3 file for saving item as file.



### 1. Bit graph setting

Input bit device for monitoring.

[Sequence]

- (1) Select bit graph tab on the trend device setting communication box.
- (2) Input device of bit type.

### 2. Trend graph setting

Input trend device for monitoring.

[Sequence]

- (1) Select trend graph tab on the trend device setting communication box.
- (2) Input device of word type.

### Notes

1. Can registrate total 8 devices with bit device and trend device.
2. The setting of data type depends on device, set to BIT, WORD, DWORD type.
3. In the Motion Control Module, you can input the data type directly. The following data types are available.

Type	Size	Type	Size
BIT	1 Bit	REAL	4 Byte
NIBBLE	4 Bit	LREAL	8 Byte
BYTE	1 Byte	INT	2 Byte
WORD	2 Byte	DINT	4 Byte
DWORD	4 Byte	LINT	8 Byte
LWORD	8 Byte	-	-



3. XY graph setting

Input XY device for monitoring.

[Sequence]

- (1) Select XY graph tab on the trend device setting communication box.
- (2) Input axis X device and axis Y device.

Notes

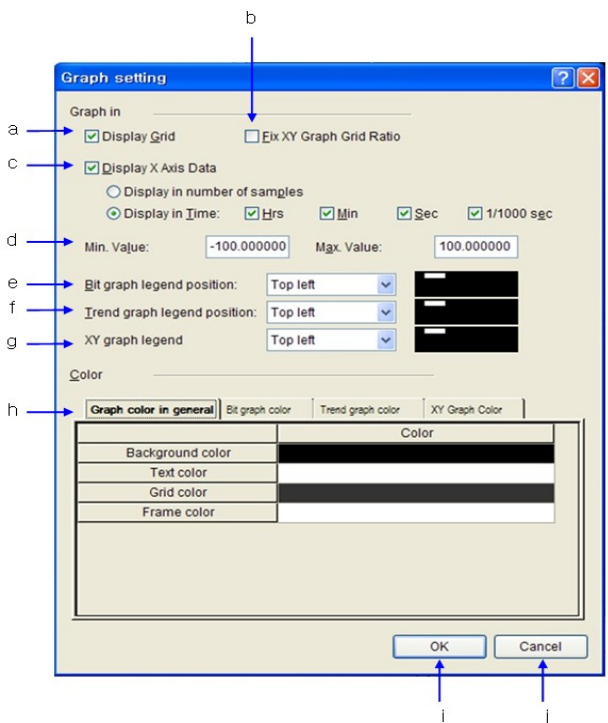
- 1. Need to device setting for registration of axis X device and axis Y device on the XY graph.
- 2. Axis X/Y device can select only one device which is set on the trend graph tab.

11.8.3 Graph Setting

[Sequence]

- (1) Proceed menu [Graph]-[Graph setting].

[Communication box]



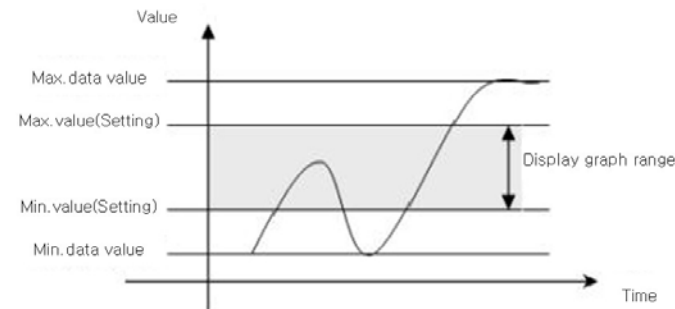
[Communication box description]

- (a) Display Grid: Set displaying XY grid on the screen.
- (b) Fix XY graph grid ratio: Set grid option of XY graph. (When check, horizontal/vertical grid rate should be same.)
- (c) Display X Axis data: Set available display data and display method
- (d) Min/Max value: Set min/max range of graph.
- (e) Bit graph legend position: Set index position of bit graph.
- (f) Trend graph legend position: Set trend graph index position.
- (g) XY graph legend: Set position of XY setting graph.
- (h) Color setting: Set device color of each graph.
- (i) OK: Close communication box after applying changing.
- (j) Cancel: Close communication box.

# Chapter 11 Useful Function of XG-PM

## Notes

- 1. Max/Min values only apply to axis Y of trend graph. But if current axis Y view is auto alignment, then can not be applied.
- 2. Inputted minimum value is smaller than maximum value.
- 3. Display min/max value range of real data and min/max value range of set graph is as following : The range of grey color is displayed by graph only.



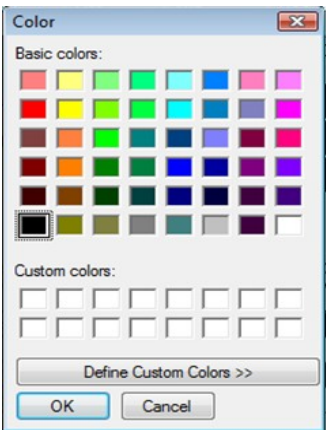
## 1. Graph Color Setting Method

[Sequence]

- (1) Select device for changing color.

Graph color in general			
Bit graph color			
Trend graph color			
XY Graph Color			
No.	Device	Type	Color
1	1 axis_Run Status	BIT	Red
2	2 axis_Run Status	BIT	Green

- (2) Click color line. Communicator be display with clicking color line. Confirm after select color.



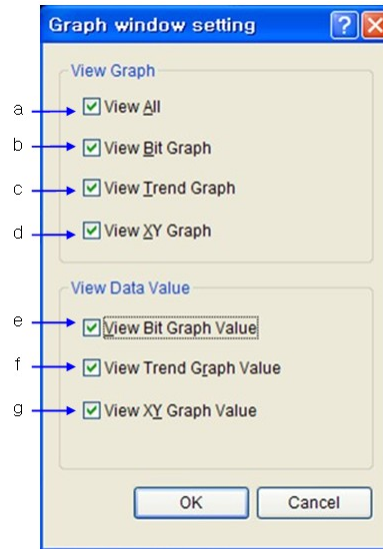
### 11.8.4 Setting Graph Window

Setting display graph view changing option and data value or not.

[Sequence]

- (1) Select menu [Graph]→[Screen setting].

[Communication box]



[Communication box description]

- (a) View all: Display Bit, Trend, XY graph.
- (b) View bit graph: Display bit graph.
- (c) View trend graph: Display trend graph only.
- (d) View XY graph: Display XY graph.
- (e) View bit graph value: Display bit graph value.
- (f) View trend graph value: Display trend graph value.
- (g) View XY graph value: Display XY graph.

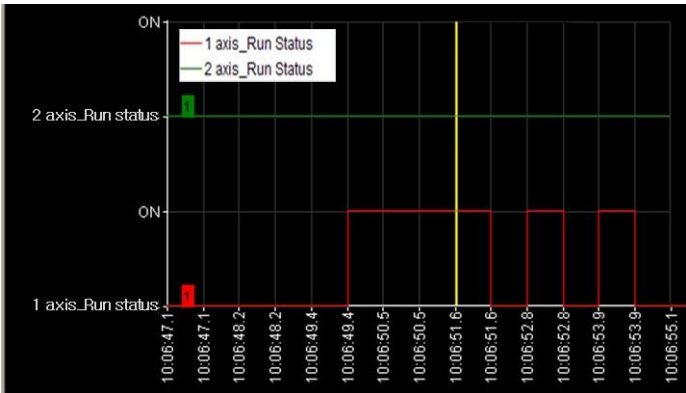
11.8.5 Graph Function

1. Show Cursor

Display data value of mouse position on the graph.

[Sequence]

- (1) Proceed menu [Graph] → [Show cursor].
- (2) Select graph with mouse left button. According to mouse pointer, data is displayed.



Notes

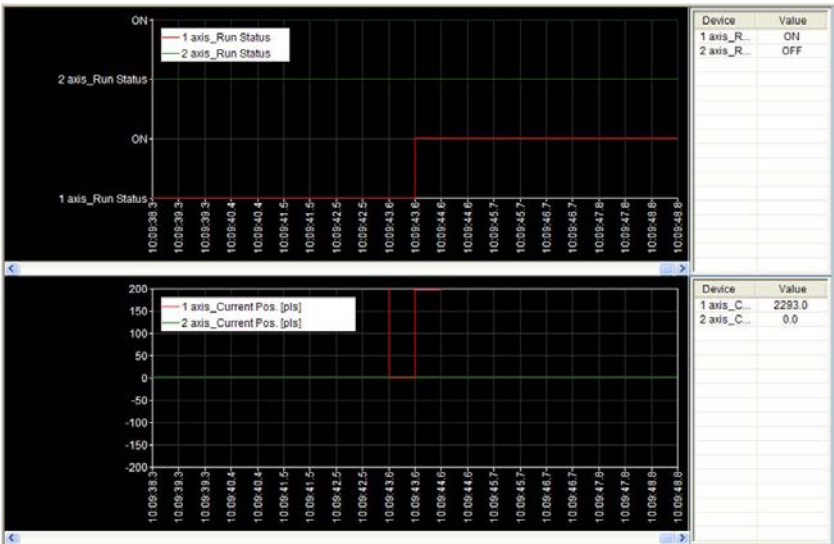
Show cursor function revitalize only when monitor/trend monitor is ended.

2. Scroll synch

Set that synchronize time axis of bit graph and trend graph or not. This is useful for monitoring bit graph data and trend graph at the same time.

[Sequence]

- (1) Proceed menu [Graph] → [Scroll synch].
- (2) Move horizontal bar. Bit graph and trend graph are scrolled by setting scroll synch or not.

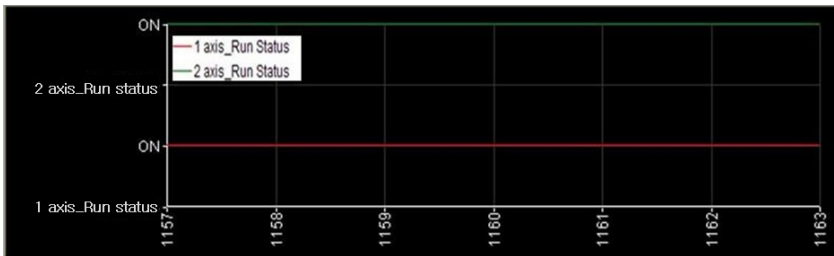


3. Magnification control of axis X

Control magnification of axis X.

[Sequence]

- (1) Proceed menu [Graph] → [Zoom-in X axis], [Zoom-out X axis], [Restore X axis]. Time interval of axis X is expanded or reduced by selected item.

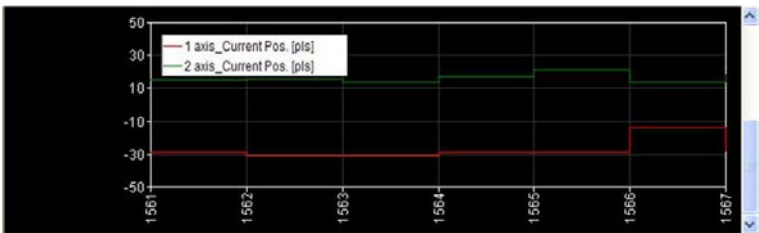


4. Magnification control of axis Y

Control magnification axis Y.

[Sequence]

- (1) Proceed menu [Graph] → [Zoom-in Y axis], [Zoom-out Y axis], [Restore Y axis]. Time interval of axis Y is expanded or reduced by selected item.

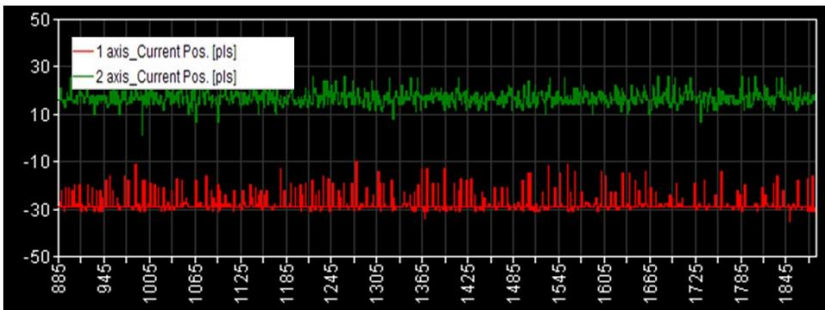


5. Auto align of axis X

Set auto align of axis X or not. Horizontal scroll bar is disappeared after auto aligns and whole data can show at once.

[Sequence]

- (1) Proceed menu [Graph] → [Auto fit X axis].



### 6. Auto align axis Y

Set auto align of axis Y or not. Axis Y auto align only apply to trend graph.

[Sequence]

- (1) Proceed [Graph] → [Auto fit Y axis].

#### Notes

Trend graph is displayed by min/max value which is set unless auto align of axis Y.

### 7. Export as Bitmap

Save graph on the current screen as bitmap file.

[Sequence]

- (1) Proceed menu [Graph] → [Export as Bitmap].
- (2) Confirm button after saving file.

### 8. Export as Text

Save graph data as text file. Samples are saved as the number of set maximum sustained samples.

[Sequence]

- (1) Proceed menu [Graph] → [Export as Text].
- (2) Confirm button after inputting save file name.

#### Notes

Use .CSV format of excel for saving text file.

### 9. Copy Clipboard

Copy present graph to window clip board.

[Sequence]

- (1) Proceed menu [Graph] → [Copy to clipboard].

11.9 Data Trace

(only applied to XPM, network type XPM, standard network type XPM)

Set device for trace and trace condition on module. When it satisfies condition, collect data from module. Display data that it is read from module by graph on XG-PM. This function is similar with trend monitor (This manual 11.8), can collect accurate data, because can collect interval of max module scan.

This is sequence for data trace.

Sequence	Contents
Ready	Connect with module.
Setting trace	Set whether to allow trace and set trigger, sample attribute, trace device. Refer to this manual 11.9.2 for detail.
Write setting on the module	Record to module about trace setting item. Refer to 1) Write to trace setting of this manual 11.9.8 for detail.
Start to trace	Start to trace. Start automatically by set trigger condition or select manual trace. Refer to 11.9.2 for trace setting, refer to 11.9.8 for manual trace.
Read data	Read trace data from module. Refer to 11.9.8 for 3) Read trace.
Operating graph (Data analysis)	Refer to 11.9.9 for detail.

[Sequence]

(1) Proceed menu [Monitoring] → [Data trace].

## Chapter 11 Useful Function of XG-PM

[Data trace screen]



[Data trace setting screen]

- (a) Menu: Display data trace menu.
- (b) Instrument collection: View bit graph : Display bit graph.
- (c) Select trace setting module: Select trace setting data module.
- (d) Bit graph index: Display bit device and graph color.
- (e) Bit graph: Display bit device and data.
- (f) Word graph index: Display word device and graph color.
- (g) Word graph: Display word device data.
- (h) State bar: Display state of data trace.
- (i) Trend graph tab: Display bit device and word device trace data on a screen.
- (j) XY graph tab: Axis X and Y set device and display circle data by 3D data.
- (k) XYZ graph tab: Axis X,Y,Z set device and display circle data by 3D data.
- (l) Progress bar: Display progress state, if read data from module.
- (m) Trace state: Display trace state of module.

### Tip

Trace result data saved at the module is removed when module power is off. (not saved at the module)  
So, when turning on the module, can't read that result data.



### 11.9.1 Connection

[Sequence]

- (1) Proceed menu [Online] → [Connect].

#### Notes

When proceed XG-PM [Monitoring] → [Data traces], automatically proceed [Online]->[Connect].

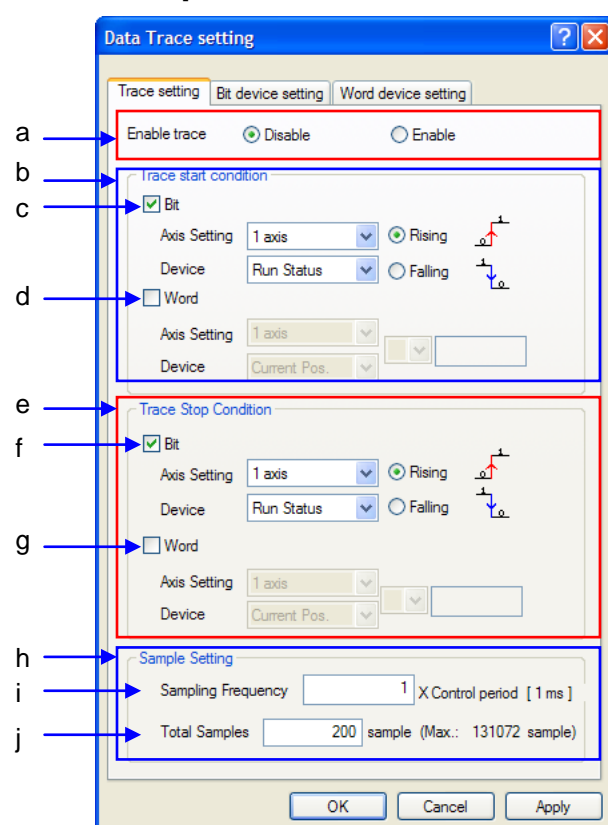
### 11.9.2 Trace setting

Set trace condition and trace device.

[Sequence]

- (1) Data trace menu [Trace] → [Trace setting].

[Communication box]



[Communication box description]

- (a) Enable trace: Set trace permission or not.
- (b) Trace start condition: Set trace starting condition. Can select bit condition and word condition.
- (c) Trace start condition (bit): Decides whether setting bit trigger condition or not and set device for watching bit trigger condition.
- (d) Trace start condition (word): Decides whether setting word trigger condition or not and set device for watching word trigger condition.
- (e) Trace stop condition: Set trace stop condition. Can select bit condition or word condition.

- (f) Trace stop condition (bit): Decides whether bit trigger condition or not, set device for watching bit trigger condition.
- (g) Trace stop condition (word): Decides whether setting word trigger condition or not and set device for watching word trigger condition.
- (h) Sample setting: The number of data trace samples and set sampling periods.
- (i) Sampling Frequency : Set data collection cycle. Can set maximum 131072 by multiple of scan periods.
- (j) Total samples: Set the number of samples for collection. The number of total samples is decided by sample device.
- (k) OK : Save changed item and close the communication box. If the module is online, current setting data automatically write to module.
- (l) Cancel: Close communication.

### 1. Bit trigger setting (Trace starting condition and stop condition common)

Use changing device value as trigger condition.

[Sequence]

- (1) Select bit condition check box.
- (2) Select device for bit condition. (Axis setting and device setting)
- (3) Input device for bit condition in the format of bit device. (Motion Control Module)
- (4) Set trigger condition. Can select Rising or Falling as trigger condition. (Rising: device value change to 1 from 0, Falling: Device value change to 0 from 1)

### 2. Word trigger setting (Trace starting condition and stop condition common)

Use changing word device value as trigger condition.

[Sequence]

- (1) Select word condition check box.
- (2) Select device for word condition. (Axis setting and device setting)
- (3) Input device for word condition in the format of word device. (Motion Control Module)
- (4) Input constant that it is compared with word device.
- (5) Select condition that it is compared with inputted constant.  
Available select function is as follows: <(Small), <=(Small or equal), ==(equal), >=(Big or equal), >(Big)

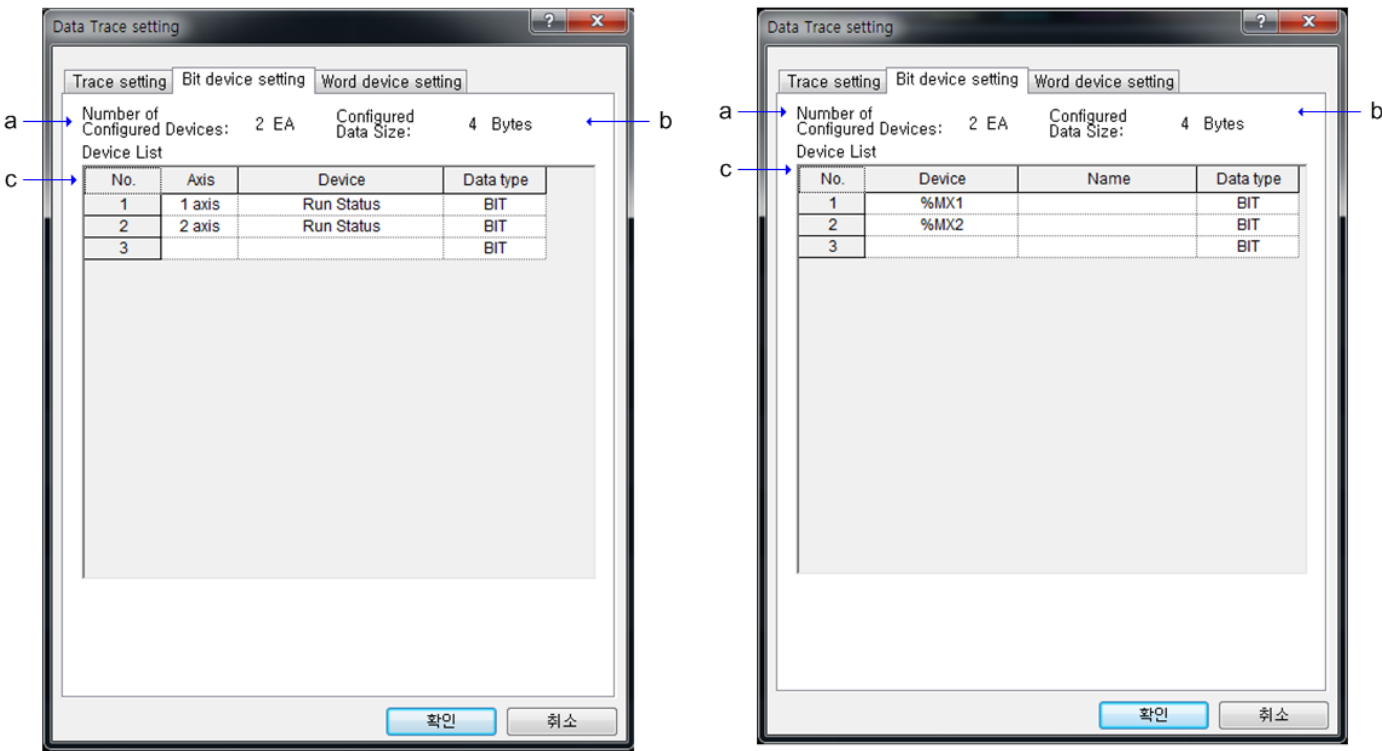
3. Bit device setting

Select bit device for collecting data. Bit device display selected device.

[Sequence]

- (1) Select bit device setting tab on the data trace setting communication box.
- (2) Select bit type device. If need to add line or delete line, select menu by right mouse button.

[Communication box]



<XPM, Network Type XPM, Standard Network Type XPM>

<Motion Control Module>

[Communication box description]

- (a) The number of Configured devices: Display the number of set devices.
- (b) Configured Data Size: Display setting data size. If need to set devices more than one, it is displayed by 2 byte.
- (c) Device List: Display set device catalogue.

Notes

For XPM, Network typed XPM, standard Network typed XPM, you can set the device up to 8EA including bit type device and word type device.  
For the motion module, you can set the device up to 32EA including bit type device and word type device.  
In case the sum of bit type device and word type device exceeds 15, a bit graph will be displayed in one Y-axis and some functions including Multi-axis view will not be available.

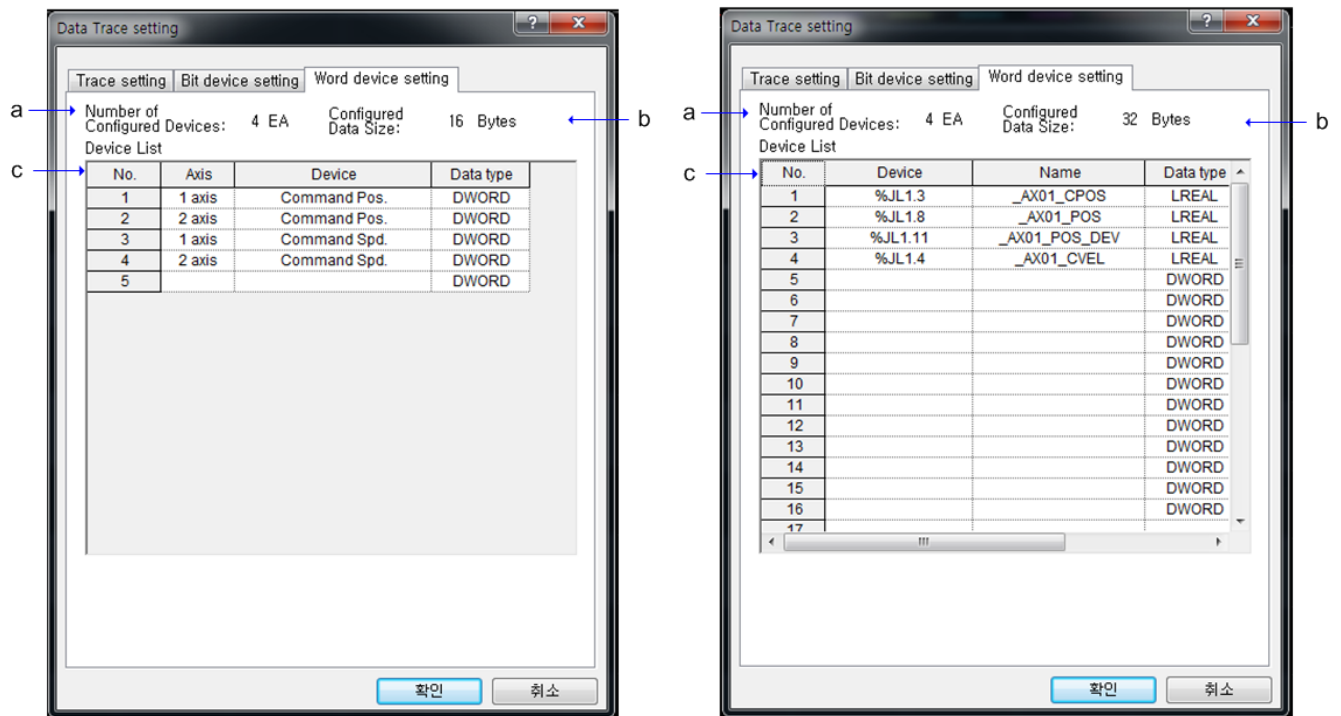
### 4. Word device setting

Select word device for collecting data. Word graph display selected device.

[Sequence]

- (1) Select word device setting tab on the data trace setting communication box.
- (2) Select word type device. Select menu by mouse right button, when need to add or delete line.

[Communication box]



<XPM, Network Type XPM, Standard Network Type XPM>

<Motion Control Module>

[Communication box description]

- (a) The number of Configured devices: Display the number of set word devices.
- (b) Configured Data Size: Display setting data size. Size is decides by set data type.
- (c) Device List: Display set word device catalogue.

#### Notes

1. The data type is automatically set as BOOL, WORD, DWORD, LWORD depending on the device type.
2. In the Motion Control Module, you can input the data type directly. The following data types are available.

Type	Size	Type	Size
BIT	1 Bit	REAL	4 Byte
BYTE	1 Byte	LREAL	8 Byte
WORD	2 Byte	INT	2 Byte
DWORD	4 Byte	DINT	4 Byte
LWORD	8 Byte	LINT	8 Byte

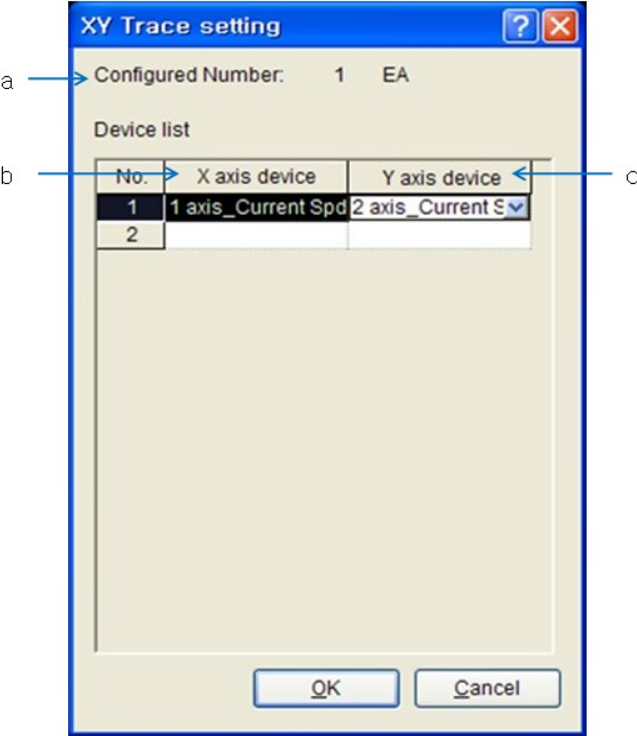
11.9.3 XY Trace Setting

XY trace setting after proceed data trace that it display 2D data on the XY coordinate by recorded word device, set X device, Y device.

[Sequence]

- (1) Revitalize XY graph tab.
- (2) Revitalize menu by click right button, select [XY trace setting] menu.

[Communication box]



[Communication box description]

- (a) Configured Number: Display the number of XY devices. Have to set axis X device and axis Y device for increasing a device.
- (b) X axis device: Set device for recording on the axis X.
- (c) Y axis device: Set device for recording on the axis Y.
- (d) OK: Saves XY trace settings and closes a dialog box.
- (e) Cancellation: Closes the dialog box.

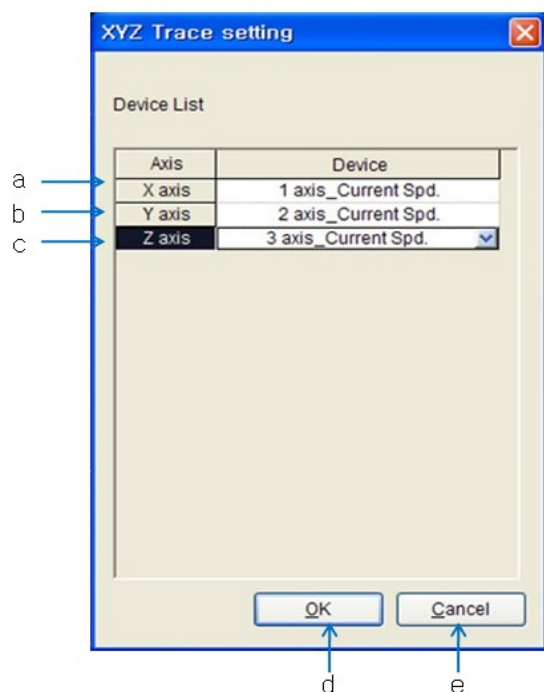
### 11.9.4 XYZ Trace Setting

Set axis X,Y,Z devices to display 3D data on the XYZ coordinates by recorded word device.

[Sequence]

- (1) Revitalize XYZ graph tab.
- (2) Click right button to revitalize menu, select [XYZ trace setting] menu.

[Communication box]



[Communication box description]

- (a) Axis X device: Set device to record on the axis X.
- (b) Axis Y device: Set device to record on the axis Y.
- (c) Axis Z device: Set device to record on the axis Z.
- (d) OK: Save XY trace setting and end communicator.
- (e) Cancel: End communication box.

#### Notes

XY trace setting and XYZ trace setting not save to module.

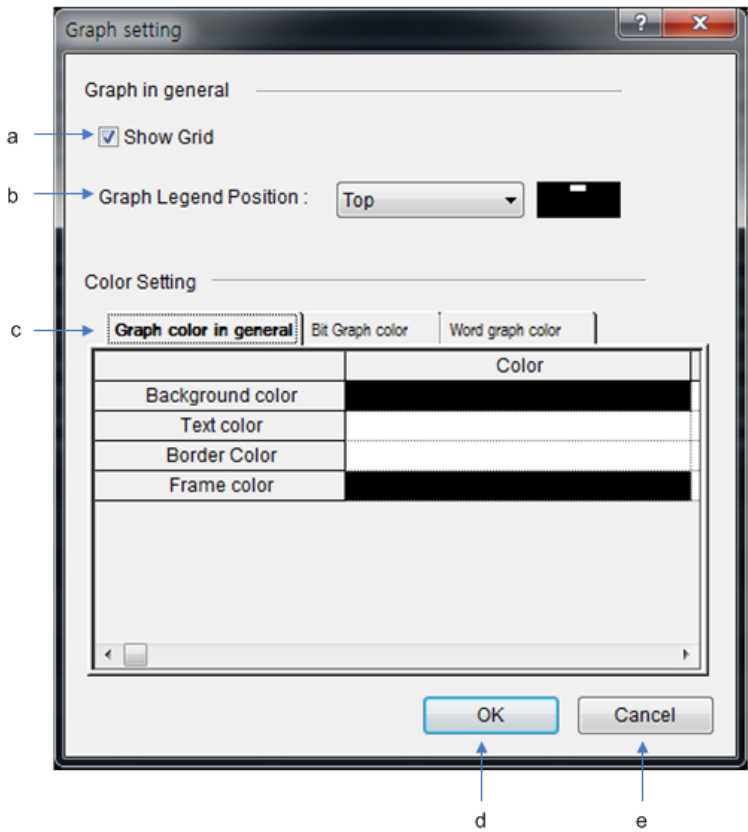
11.9.5 Graph Setting

Set graph of trend graph tab.

[Sequence]

- (1) Revitalize trend graph tab.
- (2) Proceed menu [Graph]->[Graph setting].

[Communication box]



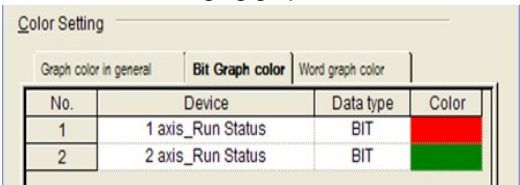
[Communication box description]

- (a) Show grid: Decides whether setting display grid on the screen or not.
- (b) Graph Legend position: Set position of graph index.
- (c) Color setting: Set general color and device color of graph background.
- (d) OK: Apply change and close communication box.
- (e) Cancel: Close communication box.

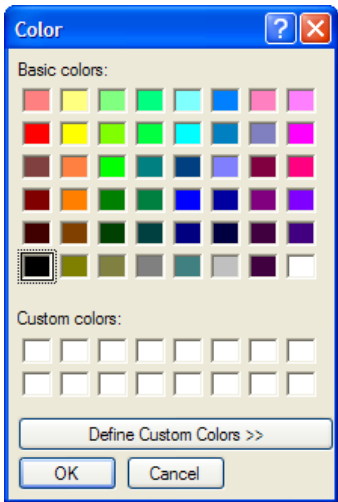
1. Graph color setting method

[Sequence]

- (1) Select line for changing graph color.



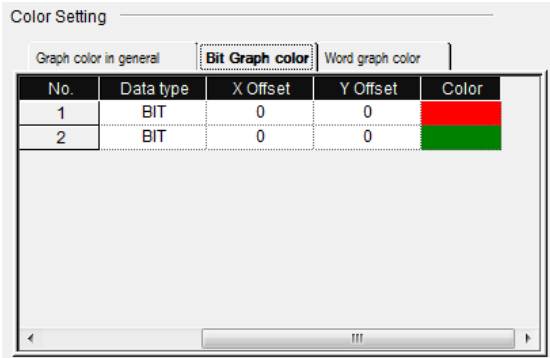
- (2) Click color line. Communication box to be displayed, if click the color line. Select communication box and confirm.



### 2. Setting Graph offset

It moves the graph in accordance with the X-AXIS offset, Y-AXIS offset values without revising the data of a graph.  
[Sequence]

- (1) Selects the object whose graph offset should be revised.

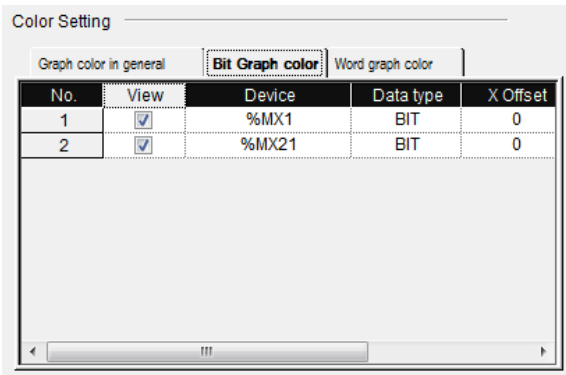


- (2) Input X-axis offset/Y-axis offset values and click the OK button.

### 3. Setting graph view

It displays or hides a graph individually.

- (1) Select the object whose graph view settings should be revised.



- (2) Set the checkbox of a view and click the OK button.



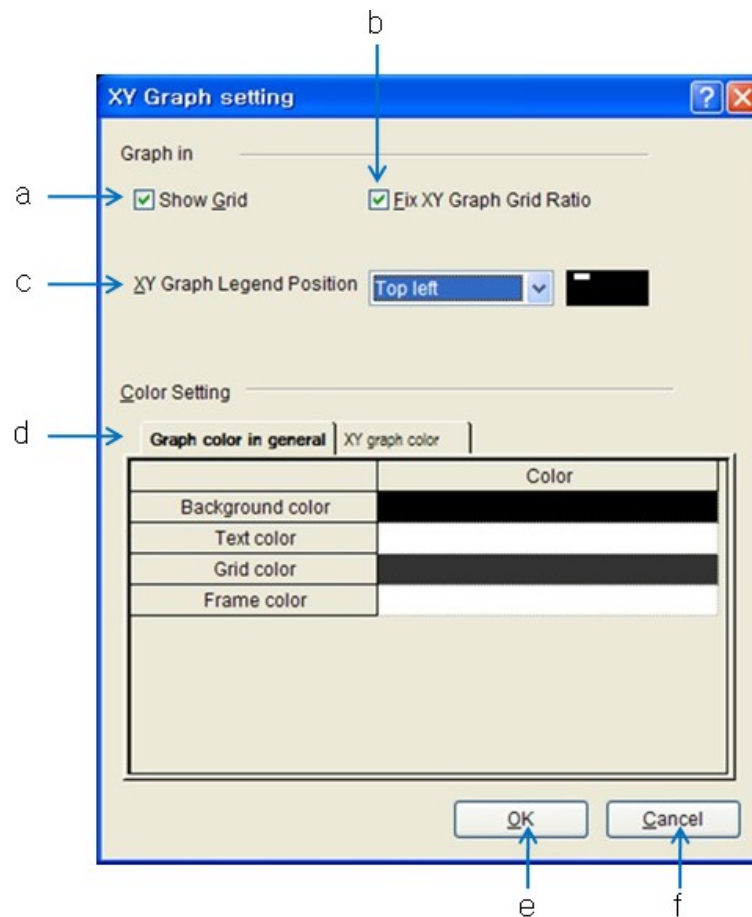
### 11.9.6 XY Graph Setting

Set graph of XY graph tab.

[Sequence]

- (1) Revitalize XY graph tab.
- (2) Proceed menu [Graph]->[Graph setting].

[Communication box]



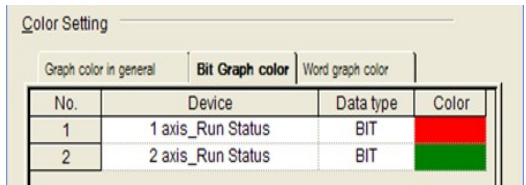
[Communication box description]

- (a) Show Grid: Decides whether setting display XY grid.
- (b) Fix XY graph grid ratio: Set grid rate of XY graph. When it check, grid vertical and horizontal rates are same. When it uncheck, display rate with screen rate.
- (c) XY graph legend position: Set position of X graph index.
- (d) Color setting: Set device color and general color of graph background.
- (e) OK: Close communication box after setting.
- (f) Cancel: Close communication box.

(1) Graph color setting method

[Sequence]

- (1) Select line for changing graph color.



- (2) Click color line. Communication box to be displayed, if click the color line. Select communication box and confirm.

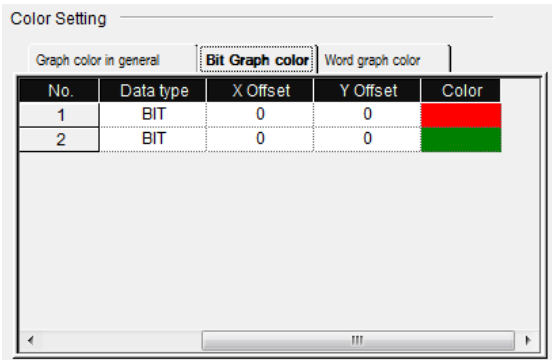


2. Setting Graph offset

It moves the graph in accordance with the X-AXIS offset, Y-AXIS offset values without revising the data of a graph.

[Sequence]

- (1) Selects the object whose graph offset should be revised.

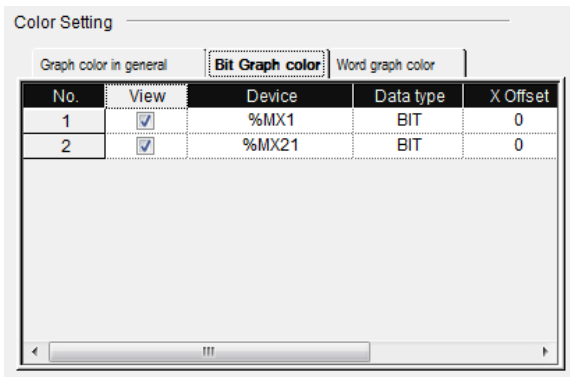


- (2) Input X-axis offset/Y-axis offset values and click the OK button.

3. Setting graph view

It displays or hides a graph individually.

- (1) Select the object whose graph view settings should be revised.



- (2) Set the checkbox of a view and click the OK button.

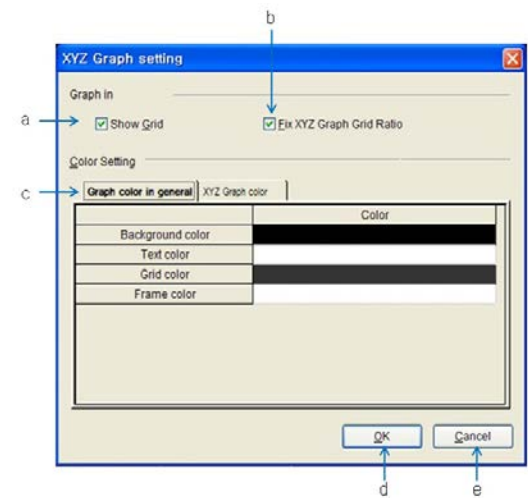
11.9.7 XYZ Graph Setting

Set XYZ graph tab.

[Sequence]

- (1) Revitalize XYZ graph tab.  
(2) Proceed menu [graph] → [graph setting].

[Communication box]



[Communication box description]

- (a) Show grid: Decides whether setting XYZ grid or not.  
(b) Fix XYZ graph grid ratio: Set grid rate on the XYZ graph. When it check, grid vertical and horizontal rates are same.  
When it uncheck, display rate with screen rate.  
(c) Color setting: Set device color and general color of graph background.  
(d) OK: Close communication box after changing.  
(e) Cancel: Close communication box.

### 11.9.8 Trace

Read traced data from module or read setting.

#### (1) Trace Setting Write

Apply trace setting to module.

[Sequence]

(1) Proceed menu [trace] → [Writing trace setting].

#### (2) Trace Setting Read

Read trace setting from module.

[Sequence]

(1) Proceed menu [Trace] → [Read trace setting].

#### Notes

When proceed data trace with XG-PM, first trace setting read is automatically start one time.

#### (3) Trace Read

Read data of trace result from module.

[Sequence]

(1) Proceed menu [Trace] → [Reading trace].

#### (4) Manual Trace Start

Begin to data trace by current set trace condition.

[Sequence]

(1) Proceed menu [Trace] → [Starting manual trace]. If it is tracing now, menu to be inactivated.

#### (5) Manual Trace Stopping

Manual trace stop make stop trace and read data to present.

[Sequence]

(1) Proceed menu [Trace] → [Stopping manual trace]. It is revitalized only operate previous trace menu.

### 11.9.9 Playing Trace

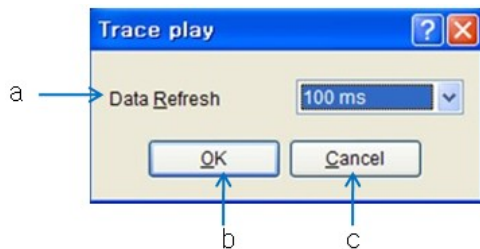
It is displayed by trace data that it read from module with time.

#### 1. Play setting

[Sequence]

(1) Proceed menu [Playing trace] → [Play setting].

[Communication box]



[Communication box description]

- (a) Data Refresh: Set renew period of data sample.
- (b) OK: Close communication box with applying change.
- (c) Cancel: Close communication box.

#### 2. Start

Begin to play trace. Playing trace is revitalized only, when there are trace data.

[Sequence]

(1) Proceed menu [trace playing] → [Play setting].

#### 3. Pause

Pause trace.

[Sequence]

(1) Proceed menu [Playing trace] → [Playing pause/continue].

#### 4. Continue

Continue paused trace.

[Sequence]

(1) Proceed menu [Playing trace] → [Playing pause/continue].

5. Stop

End playing trace.

[Sequence]

- (1) Proceed menu [Renew playing trace]->[Stop playing].

11.9.10 Graph Function

Refer to graph function (11.8.5) of this manual 11.8 trend monitor.

1. Multi-axis view

It shows the Y-axis of a trend graph separately.

- (1) Select [Graph]->[MultipleAxis].



2. Measurement

It compares and shows the two position values on a graph.

[Sequence]

- (1) Select [graph]->[Measure 1].
- (2) Click and select the position to be measured.
- (3) Select [graph]->[Measure 2].
- (4) Click and selected the position to be measured.

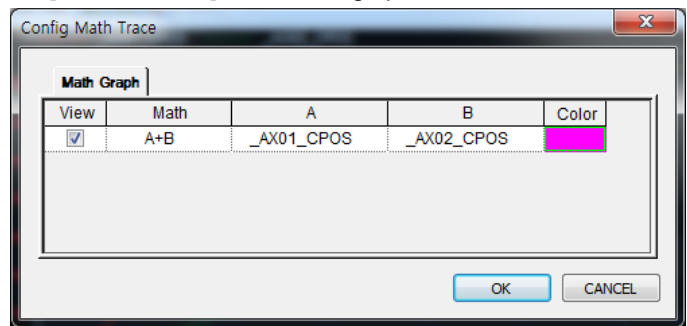


3. Math trace

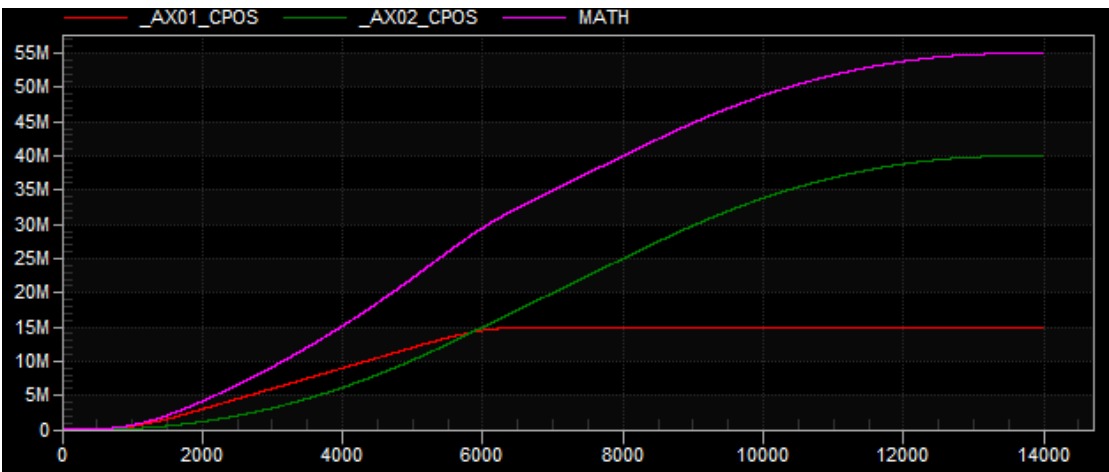
It adds the graph to which a formula is applied to a word graph.

[Sequence]

- (1) Select the Pop-up menu [Formula trace] in a trend graph.



- (2) Input the formula calculation and A, B to the dialog box to set the formula graph.
- (3) Check the color and view of a formula graph in the dialog box to set the formula graph.
- (4) Click the OK button to complete the formula graph setting.



### 11.9.11 File Function

Save trace setting, read setting from file.

#### 1. Open

[Sequence]

- (1) Proceed menu [File] → [Open].
- (2) Confirm after selecting the file on file communication box.

#### 2. Save

[Sequence]

- (1) Select menu [File] → [Save].
- (2) Input file name that it need to save on the file saving communication box and confirm.

#### 3. Save as ...

[Sequence]

- (1) Proceed menu [File] → [Save as ...].
- (2) Input file name that it need to save as other name and confirm.

#### 4. Export as bitmap

Save present graph as bitmap file.

[Sequence]

- (1) Proceed menu [file] → [Export] → [Export as bitmap].
- (2) Input file name what you need to save and confirm.

#### 5. Export as text

Save graph data as text file. To be saved data as the number of datas on the current screen.

[Sequence]

- (1) Proceed menu [File] → [Export] → [Export as text].
- (2) Input file name what you need to save and confirm.

#### 6. Copy to clipboard

Graph on the present screen, Copy to window clipboard.

[Sequence]

- (1) Proceed menu [File] → [Export] → [Export as clipboard].



11.9.12 View Function

Display or hide tool bar and status bar.

1. View tool bar

[Sequence]

- (1) Select/Cancellation menu [View] → ["Tool name"].

Notes

"Tool name" include file tool/trace tool/graph tool/play tool.

2. View status bar

[Sequence]

- (1) Select/Cancellation menu [View] → [Status bar].

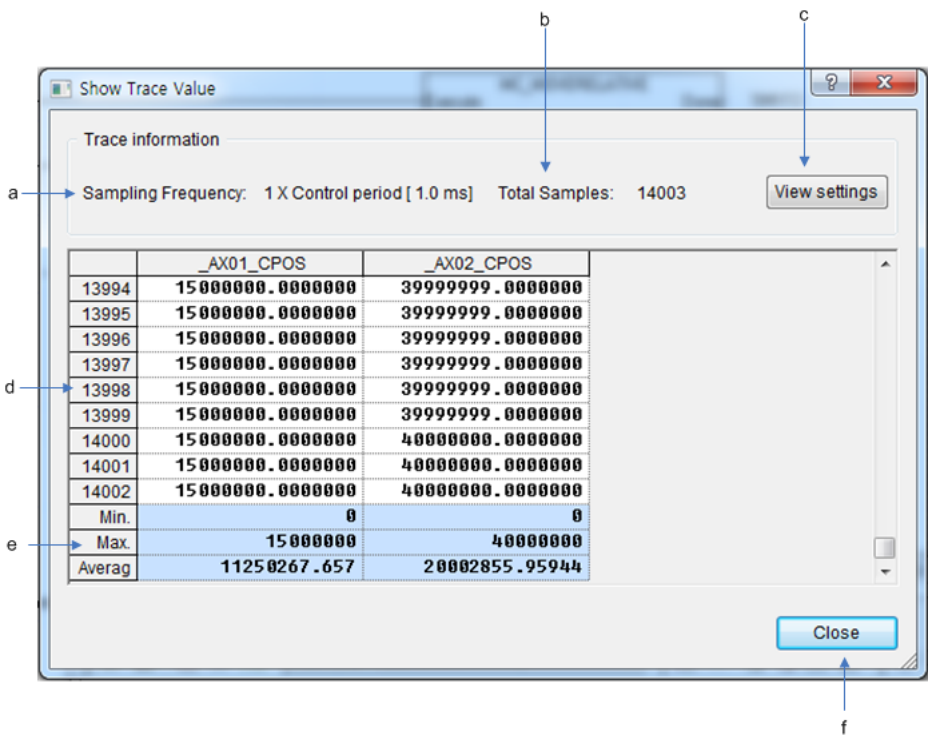
3. View data

Display Trace data by value. View data item is revitalized with trace data only.

[Sequence]

- (1) Proceed menu [view] → [View data].

[Communication box]



[Communication box description]

- (a) Sampling Frequency: Display scan period by trace setting.
- (b) The number of total samples: Display the number of collected total samples.
- (c) View settings: Display trace setting communication box.
- (d) Data: Display data trace result value in order of sample. Sample data display the number of collected samples on the basis of a trace time-point.
- (e) Min/Max data, average value.
- (f) Close: Close communication box.

11.10 Electronic CAM  
(only applied to XPM, network type XPM, standard network type XPM)

XG-PM provides function that it creates electronic CAM profile and operate electronic CAM. User proceed “editing cam data and confirm → Download to module → Cam operation command” for CAM operation.

This is a sequence of operating electronic CAM.

Sequence	Contents
<div>Select CAM block</div>	Select one of 8 CAM block for setting.
<div>Setting CAM control mode</div>	Set CAM control mode. When make increasing profile to one direction or repeat one section, set repeat mode.
<div>Setting Main axis/Sub axis parameter</div>	Set main/sub parameter. Refer to 8.4 electronic CAM setting for details.
<div>Setting CAM block data (Considering characteristic curve)</div>	Set CAM data of selected block. Refer to 8.4 electronic CAM setting for details.
<div>Creating profile</div>	Create CAM profile by set blockdata.
<div>Confirm graph and data</div>	Confirm created profile by graph and data. If user wants to modify profile, reset CAM block data. Fine modification of CAM profile is available through editing the sub axis position.
<div>Download CAM block data</div>	Download profile to module.
<div>Operating CAM by command</div>	Operate CAM profile that it is saved on module by command.



11.11 Network Servo Auto Connect (only applied to standard network type XPM)

XG-PM provides 'Network Servo Auto Connect' function for you to connect the servo drive easily. This function is to connect the servo drive automatically using the driver information saved at the module while online status, not setting network parameter. You can connect the servo drive easily without network parameter setup by using 'Network Servo Auto Connect' function.

[Sequence]

- (1) Select menu [Online] → [Network Slave Auto Connect]
- (2) Servo drive is connected, setting up network parameter automatically.

Note

Since this function uses the driver information saved at the module to set up network parameter, auto-connection function is not available for all servo drives. Servo drives supporting auto-connection are as follows.

Maker	Driver name
LS Mecapion	L7N
Sanyodenki Co.Ltd.	R ADVANCED MODEL with EtherCAT Coe Interface
Beckhoff Automation GmbH	AX2000-B110 EtherCAT Drive (CoE)
Danaher Motion GmbH	AKD EtherCAT Drive (CoE)
	S300/S400/S600/S700 EtherCAT Drive (CoE)
Yaskawa Electric Corporation	SGDV-E1 EtherCAT(CoE) SERVOPACK REV3
	SGDV-E1 EtherCAT(CoE) SERVOPACK REV2
	SGDV-E1 EtherCAT(CoE) SERVOPACK REV1
	SGDV-E5 EtherCAT(CoE) SERVOPACK REV3
	SGDV-E5 EtherCAT(CoE) SERVOPACK REV2
	SGDV-E5 EtherCAT(CoE) SERVOPACK REV1
Schneider Electric Motion	ICLA ILA2 PLCOpen
	ICLA ILA2 DS402
	ICLA ILS2 PLCOpen
	ICLA ILS2 DS402
	ICLA ILE2 PLCOpen
	ICLA ILE2 DS402

When connecting servo drive which doesn't support 'Network Servo Auto Connect', you have to set up network parameter by yourself. For how to set up, refer to chapter 8.6 network parameter setting.

11.12 Common functions of a monitor

Among the monitor functions of XG-PM, it describes the common functions (Start Monitoring/Stop Monitoring).

11.12.1 Start/Stop Monitor

1. Start monitoring

[Sequence]

- (1) Select the [Online]-[Connection] and connect it to a module in online state.
- (2) Select the [Monitoring]-[Start/Stop monitoring ] to start monitoring.

Notes

In case the module's program is not matched with the XG-PM's program in the Motion Control Module, it may cause incorrect monitor.

2. Stop monitoring

[Sequence]

- (1) Select the [Monitoring]-[Start/Stop monitoring ] to stop monitor.

Notes

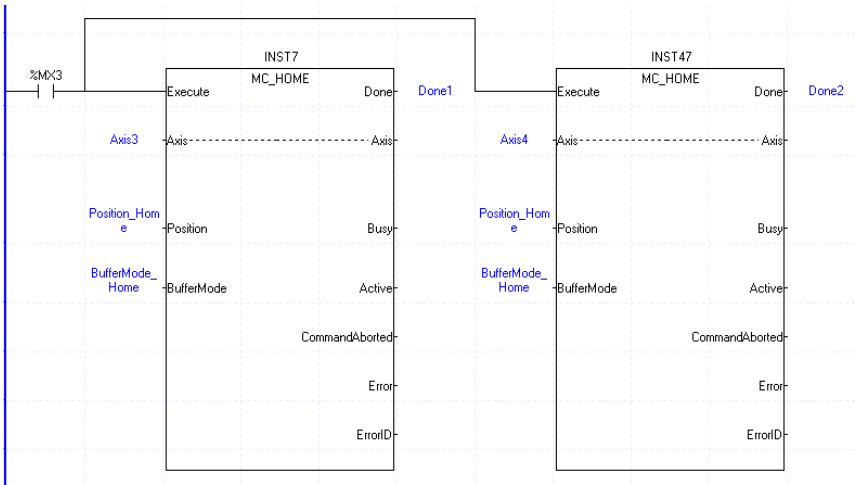
If Start monitoring has been executed so far, Stop monitoring will be executed. If the monitor has not been executed yet, Start monitor will be executed.

11.12.2 Program monitor (Motion Control Module only)

XG-PM monitors the contact written in the LD program and coil, Function/Function block's current values.

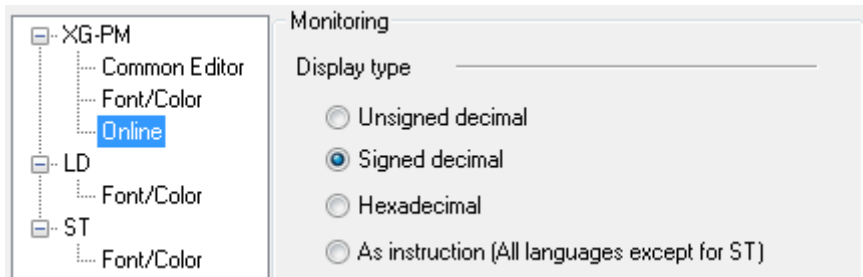
[Sequence]

- (1) Select [monitor]-[Start/Close monitor] to start monitoring.
- (2) LD program will be changed into the monitor mode.



Notes

You can select monitor displaying type in the [Tools]-[Options].



11.12.3 ST program monitor (Motion Control Module only)

XG-PM monitors the current value of the variable used for the ST program.

[Sequence]

- 1) Select the [Monitor]-[Start/Close monitor] to start monitoring.
- 2) ST program will be changed into the monitor mode.

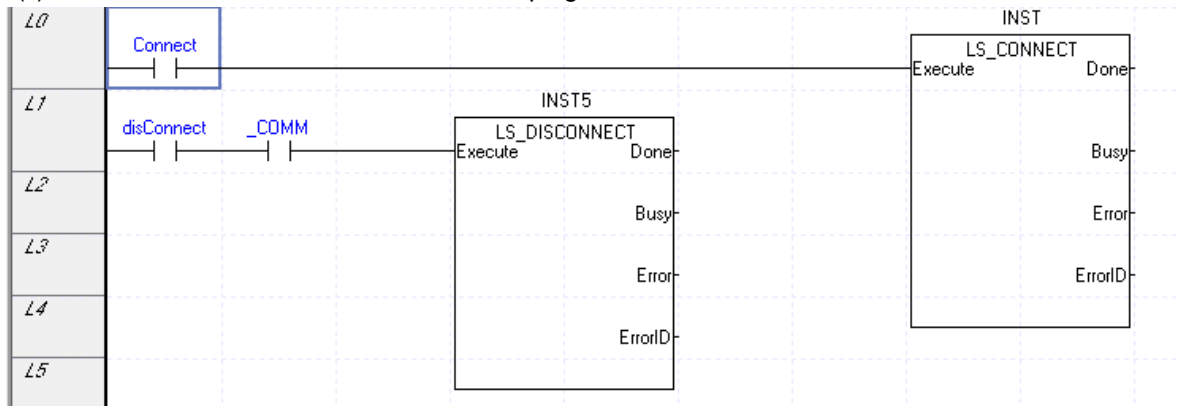
<pre>1//Initialize 2IF _RUN = 1 AND InitFlag = 0 THEN 3input := 0; 4InitFlag := 1; 5count1 :=0; 6count2 :=0; 7END_IF; 8 9//Counter Use ADD Function 10IF (_T1S = 1) THEN 11  IF bEdgeCount1 = 0 THEN 12    count1 := ADD(IN1:=count1, IN2:= 13  END_IF; 14  bEdgeCount1 := 1; 15ELSE 16  bEdgeCount1 := 0; 17END_IF;</pre>	<pre>1 2RUN = 1; InitFlag = 0 3input = 0 4InitFlag = 0 5count1 = 0 6count2 = 0 7 8 9 10T1S = 1 11bEdgeCount1 = 0 12count1 = 0 13 14bEdgeCount1 = 0 15 16bEdgeCount1 = 0 17</pre>
--	--

11.12.4 Changing the current value (Motion Control Module only)

It can change the settings of the current value or forced I/O for variables or devices.

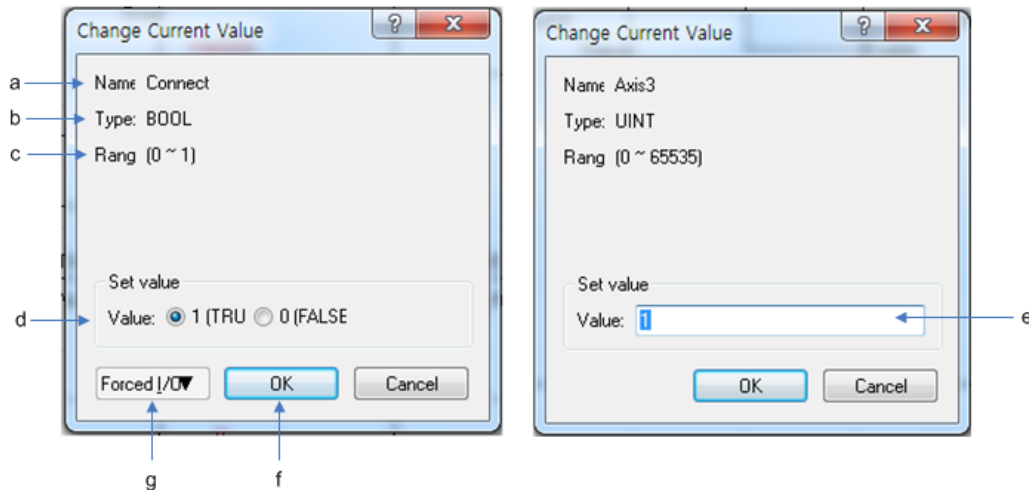
[Sequence]

- (1) Select the [Online]-[Connect] to connect to a module in online state.
- (2) Select the [Monitoring]-[Start/Stop monitoring] to start a monitor.
- (3) Double-click the device or variable in the program or variable window.



(4) If you input the current value in a dialog box and click the OK button, the current value will be changed.

[Communication Box]



- (a) Device : It is the name of the device whose current value should be changed.
- (b) Type : It is the type of the device whose current value should be changed.
- (c) Range : Indicates the allowable range of the input current value by types.
- (d) On/Off: In case BOOL type is applied, set the device's On/Off.
- (e) Value : In case BOOL type is not applied, input the set value of the device.
- (f) OK : Transmits the set value to the module.
- (g) Forced I/O : Sets the forced I/O data values.

### Notes

1. The initial value of the box for inputting the current value is indicated depending on displaying type. Namely, if the value is indicated as the hexadecimal number during monitoring, changing the current value will be displayed as the hexadecimal number.
2. You do not need to input the value in accordance with the monitoring type. Namely, when the value is indicated as the hexadecimal number, the decimal number without a sign can be input.
3. When pressing the OK button, an error message may occur through checking the effectiveness and range of the input value.
4. Inputting the hexadecimal number starts with "16#" such as "16#1234".

11.13 Variable Monitor (For the Motion Control Module only)

It can register and monitor a certain variable or device.

[Variable monitor window]

	a	b	c	d	e	f	g
	Module	Program	Variable/Device	Value	Type	Device/Variable	Comment
1	New1	<GLOBAL>	%JL1.3	1.5000000000000000e+007	LREAL	_AX01_CPOS	Axis 01 command position of current scan
2	New1	<GLOBAL>	%JL2.3	4.0000000000000000e+007	LREAL	_AX02_CPOS	Axis 02 command position of current scan
3	New1	DiscreteMotion	Deceleration_Halt	5.0000000000000000e+007	LREAL		
4	New1	DiscreteMotion	Jerk_Halt	0.0000000000000000e+000	LREAL		
5	New1	<GLOBAL>			BOOL		
6							

I/O Information

State Screen

External Input Signal

Monitor 1

Monitor 2

[Variable monitor window description]

- (a) Module: Displays the registrable module's position.
- (b) Program: Displays the registrable program's name.
- (c) Variable/device: Inputs the name of the variable/device to be monitored.
- (d) Value: Displays the relevant device's value during monitoring. You can change the value by revising the current value.
- (e) Type: Displays the data type.
- (f) Device/variable: If you input the device name to the variable/device, the variable name will be displayed. If there is no variable name, the device will be displayed.
- (g) Comment: Displays the device's description remark.
- (h) Display error: In case there are some errors in input, they will be marked in red.



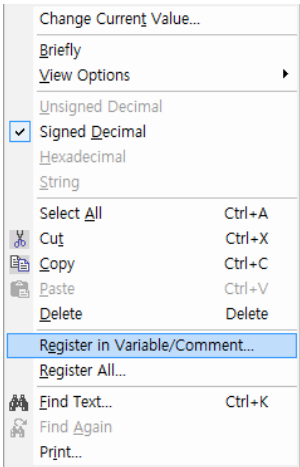
11.13.1 Registering monitor

1. Registration in variable selection

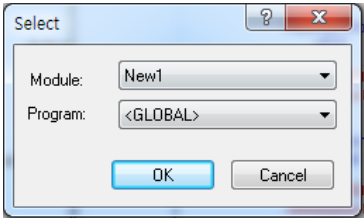
You can register the variable monitor item in the Communication box for variable selection.

[Sequence]

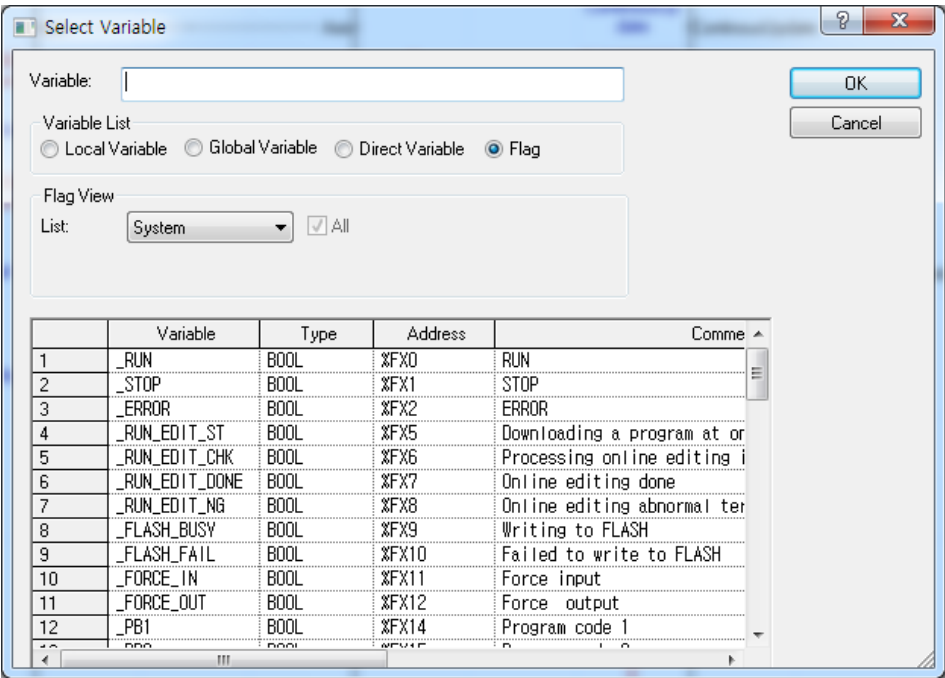
- (1) Click the right mouse in the variable monitor window and select the [Register in variable/Comment].



- (2) Select the module and program where the variable to be monitored is located.



- (3) If the dialog box for [Variable selection] is brought up, select the variable and register the variable in the monitor window.



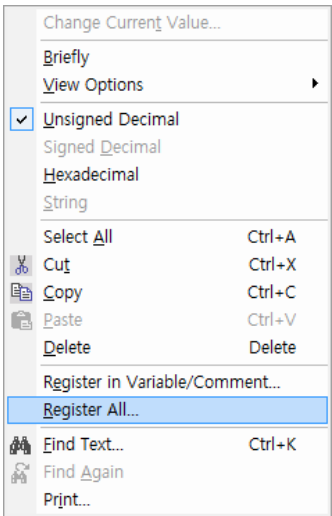
	Variable	Type	Address	Comme
1	_RUN	BOOL	%FX0	RUN
2	_STOP	BOOL	%FX1	STOP
3	_ERROR	BOOL	%FX2	ERROR
4	_RUN_EDIT_ST	BOOL	%FX5	Downloading a program at or
5	_RUN_EDIT_CHK	BOOL	%FX6	Processing online editing i
6	_RUN_EDIT_DONE	BOOL	%FX7	Online editing done
7	_RUN_EDIT_NG	BOOL	%FX8	Online editing abnormal ter
8	_FLASH_BUSY	BOOL	%FX9	Writing to FLASH
9	_FLASH_FAIL	BOOL	%FX10	Failed to write to FLASH
10	_FORCE_IN	BOOL	%FX11	Force input
11	_FORCE_OUT	BOOL	%FX12	Force output
12	_PB1	BOOL	%FX14	Program code 1

# Chapter 11 Useful Function of XG-PM

## 2. Register all

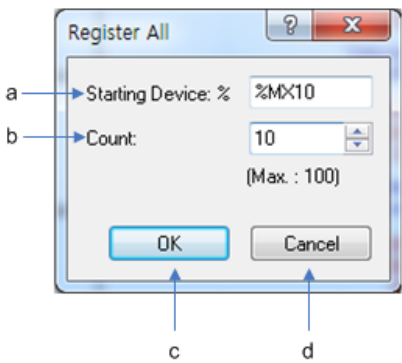
You can register the multiple devices of the same variable type (BOOL, WORD...) at the same time.

(1) Click the right mouse in the variable monitor window and select the [Batch registration].



(2) Then, the Communication box for [Register all] will be brought up.

[Communication Box]



[Communication box content]

- (a) Starting device: Inputs the initial address of the device to be registered. (Ex: %MX10, %CL1.4, %PW20)
- (b) Count: Inputs the number of registered devices from the starting device.
- (c) OK: Executes the batch registration.
- (d) Cancellation: Closes the dialog box without executing the batch registration.

	Module	Program	Variable/Device	Value	Type	Device/Variable	Comment
8	New1	<GLOBAL>	%MX12	10	OFF BOOL		
9	New1	<GLOBAL>	%MX13	10	OFF BOOL		
10	New1	<GLOBAL>	%MX14	10	OFF BOOL		
11	New1	<GLOBAL>	%MX15	10	OFF BOOL		
12	New1	<GLOBAL>	%MX16	10	OFF BOOL		
13	New1	<GLOBAL>	%MX17	10	OFF BOOL		
14	New1	<GLOBAL>	%MX18	10	OFF BOOL		
15	New1	<GLOBAL>	%MX19	10	OFF BOOL		

### Notes

- 1. The number of batch registration is up to 100EA at a time.
- 2. The item to be registered is added from the last line of the variable monitor window.
- 3. Even the same item as the existing one is also registered.

3. Registration by user editing

A user can directly input and register the variable in the variable window.  
The areas that can be edited by a user are module, program, variable/device, type row.

Notes

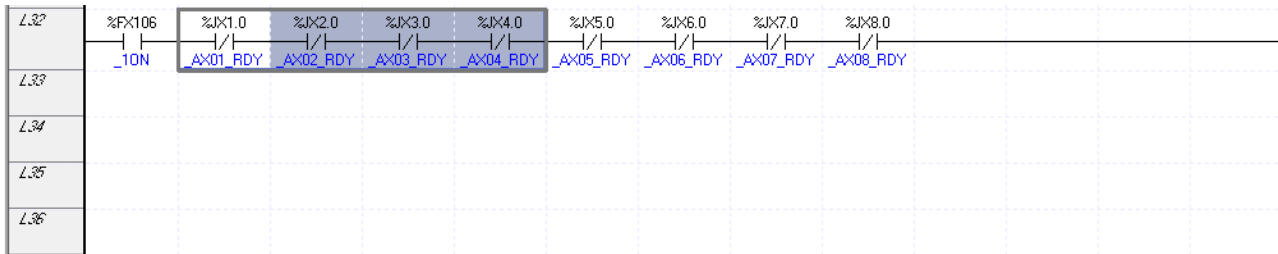
- 1. The functions of Copy, Paste, Delete are available.
- 2. Copy: It is copied in the format of text on the variable monitor window. It can be pasted through Excel and other text editors.
- 3. Paste: After being copied from Excel or other text editors, it can be pasted to the variable monitor.
- 4. Delete: The selected row is deleted instead of the selected cell.
- 5. You can select and delete several rows.
- 6. The functions of undo and redo are not available.

4. Registration by drag & drop in other windows

After selecting the contact, coil, variable, etc. in other windows (LD, variable/Description), if you drag and drop them to the variable monitor window, they will be registered.

[Sequence]

- (1) Select (drag) the area that will be registered in the variable monitor from other windows.  
(LD, variable/Description)



- (2) Move the selected area to the variable window, pressing the left mouse.

	Module	Program	Variable/Device	Value	Type	Device/Variable	Comment
8	New1	<GLOBAL>	%MX12	10	BOOL		
9	New1	<GLOBAL>	%MX13	10	BOOL		
10	New1	<GLOBAL>	%MX14	10	BOOL		
11	New1	<GLOBAL>	%MX15	10	BOOL		
12	New1	<GLOBAL>	%MX16	10	BOOL		
13	New1	<GLOBAL>	%MX17	10	BOOL		
14	New1	<GLOBAL>	%MX18	10	BOOL		
15	New1	<GLOBAL>	%MX19	10	BOOL		

- (3) Drop the left mouse on the row to be inserted to the variable monitor window.
- (4) Then, the selected items will be registered in the variable monitor window.

	Module	Program	Variable/Device	Value	Type	Device/Variable	Comment
8	New1	DiscreteMotion	%JX1.0	#10	BOOL	_AX01_RDY	Axis 01 ready
9	New1	DiscreteMotion	%JX2.0	#10	BOOL	_AX02_RDY	Axis 02 ready
10	New1	DiscreteMotion	%JX3.0	#10	BOOL	_AX03_RDY	Axis 03 ready
11	New1	DiscreteMotion	%JX4.0	#10	BOOL	_AX04_RDY	Axis 04 ready
12	New1	<GLOBAL>	%MX12	10	BOOL		
13	New1	<GLOBAL>	%MX13	10	BOOL		
14	New1	<GLOBAL>	%MX14	10	BOOL		
15	New1	<GLOBAL>	%MX15	10	BOOL		

### Notes

1. In case the registered variables are large in number, it may cause longer registering time.
2. There is no limitation on the number of registrations.
3. In case you insert the data to the middle row, it will be registered between inserted rows.
4. If you move the mouse on the variable monitor number tab (monitor 1, monitor 2) with pressing the left mouse, the data can be registered in the variable monitor tab.

### 11.13.2 View function

#### 1. Detail view/Simple view

When you try to view as many variables as possible in the variable monitor window, this is useful function.

[Sequence]

- (1) Click the right mouse in the variable monitor window and select the [Briefly].

	Variable/Device	Value	Variable/Device	Value
1	%JL1.3		%JL2.3	
2	Deceleration_Halt		Jerk_Halt	
3	%MX11		%JX1.0	
4	%JX2.0		%JX3.0	
5	%JX4.0		%MX12	

- (2) If you select the [Detailed], it will be displayed with various rows as follows.

	Module	Program	Variable/Device	Value	Type	Device/Variable	Comment
1	New1	<GLOBAL>	%JL1.3	0.0000000000000000e+000	LREAL	_AX01_CPOS	Axis 01 command position of current scan
2	New1	<GLOBAL>	%JL2.3	0.0000000000000000e+000	LREAL	_AX02_CPOS	Axis 02 command position of current scan
3	New1	DiscreteMotion	Deceleration_Halt	0.0000000000000000e+000	LREAL		
4	New1	DiscreteMotion	Jerk_Halt	0.0000000000000000e+000	LREAL		
5	New1	<GLOBAL>	%MX11	0.0000000000000000e+000	BOOL		

### Notes

1. In the Simple view, the module, program, type, variable, device/variable, comment column are hidden.
2. The hidden columns can be shown through the View function even in Simple view.
3. The number of rows is determined depending on the size of a variable monitor window.
4. When the size of a variable monitor window is changed in the simple view mode, the number of rows will be changed.
5. All editing functions such as registration, deletion, editing are available even in the simple view mode. (However, undo, redo functions are not available.)
6. In the Simple view mode, the mouse tool tip is available.

	Variable/Device	Value	Variable/Device	Value
1	%JL1.3	0.0000000000000000e+000	%JL2.3	0.0000000000000000e+000
2	Deceleration_Halt	5.0000000000000000e+007	Jerk_Halt	0.0000000000000000e+000
3	%MX11		%JX1.0	
4	%JX2.0		%JX3.0	
5	%JX4.0		%MX12	

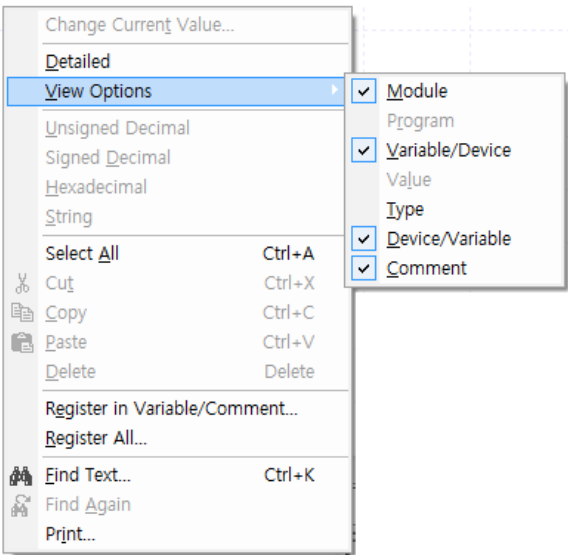
7. The mouse tool tip displays the module, type, device only. However, if the variable is declared, the variable will be displayed.

2. Display function

A user can select the row that you wants to see according to your preference.

[Sequence]

- (1) Click the right mouse in a variable monitor window and select the [View options]-[Row name(module, program, variable/ device, device/variable, Comment)].



- (2) Hide the selected row.
- (3) If you select the same menu again, the selected row will be shown.

Notes

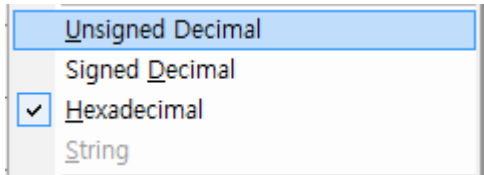
- 1. The initial state is Display All.
- 2. This function is available even in the Detail view mode.
- 3. The value row does not support the hiding function.
- 4. When it is converted into the Detail view or Simple view mode, it will come to the initial state that shows even the hidden rows.
- 5. When copying the hidden row, text copy is not available. Accordingly, when pasting it with other text editors, the test of the hidden row will not be pasted.

3. Display

You can change the displaying method of the device registered in a variable monitor.

[Sequence]

- (1) In a variable monitor window, click the right mouse and select the displaying methods; unsigned decimal number, signed decimal number, hexadecimal number.



- (2) Then, the device displaying method of the selected row will be changed.

Notes

- 1. When viewing the BOOL type as unsigned decimal number, it will be displayed as “On/Off”.
- 2. In the displaying method adopting the hexadecimal number, ‘16#’ indicates the hexadecimal number such as “16#10AC”.
- 3. It can be applied regardless of setting the monitor displaying method in the [Tool]-[Option].
- 4. The displaying menus are activated /deactivated depending on the available displaying type.

11.13.3 Search

1. Search

For string, the searching function is available depending on classifying capital and small letter, partial matching, direction.

Notes

- 1. The variable monitor does not support the function of Search All.
- 2. The variable monitor does not support the function of Change.
- 3. For searching in a value row, the value is regarded as string not number.

2. Re-search

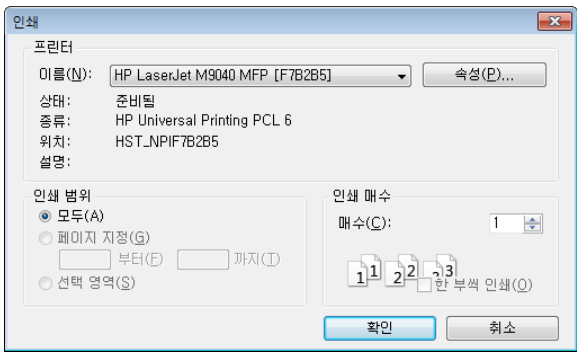
It re-searches the previously searched string. Even if re-searching is done in the variable monitor after searching in the Variable/Description , searching will be executed.

11.13.4 Print

It prints the currently activated variable monitor tab.

[Sequence]

- (1) In a variable monitor window, click the right mouse and select the ‘Print’ from a menu.
- (2) Set Printer/Printing range/Number of printed pages and click the OK button.



Notes

- 1. Non-activated variable monitor tab is not printed.
- 2. The value that is in progress of monitoring is also printed.
- 3. The way that is displayed on a screen is printed. Namely, hidden line is not printed
- 4. The Printing preview function is not available.

11.13.5 Shortcut key

The functions can be operated with a shortcut key in a variable monitor.

Shortcut key	Description
Home/End	When selecting a cell in a variable monitor window, in the editing available row, a cursor will put in the cell for the editing mode.
Ctrl+Home/End	Moves to the first cell or the last cell.
Ctrl+arrow	Moves to the first cell or the lest cell of the left, right, upward, downward direction from the currently selected cell
Tab	Moves the current cell from left to right.
Shift+Tab	Moves the current cell from right to left.
Enter	Moves the current cell from top to bottom. If the current cell is the value row, changing the current value will also be done. If the current cell is the variable row, registering variable/description will be done.
Shift+Enter	Moves the current cell from bottom to top.

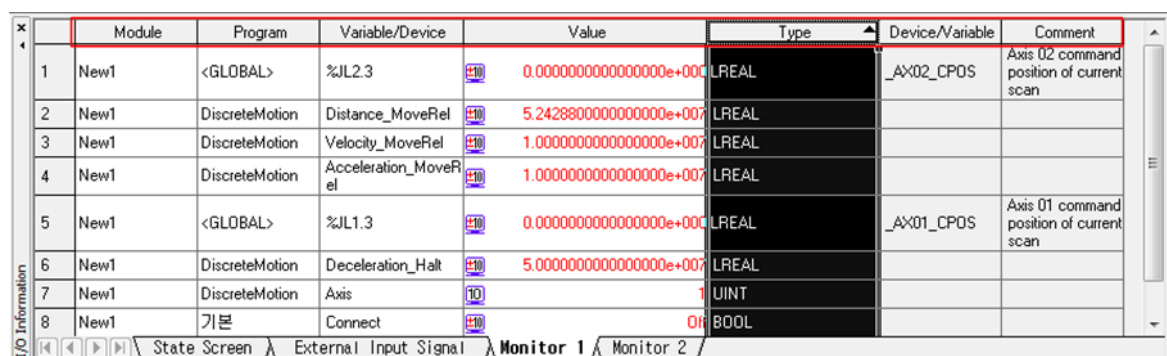
## Chapter 11 Useful Function of XG-PM

### 11.13.6 Sort

You can change the sort ordering into ascending or descending.

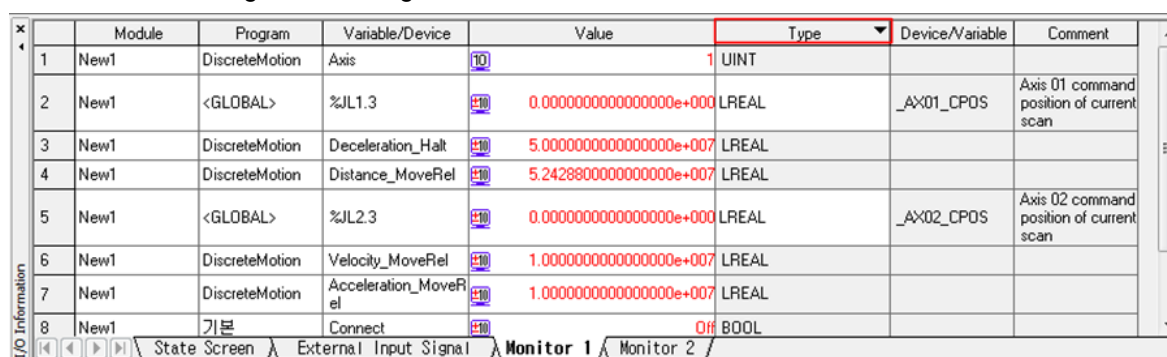
[Sequence]

- (1) Double-click the header of a row to be sorted.



	Module	Program	Variable/Device	Value	Type	Device/Variable	Comment
1	New1	<GLOBAL>	%JL2.3	0.000000000000000e+000	LREAL	_AX02_CPOS	Axis 02 command position of current scan
2	New1	DiscreteMotion	Distance_MoveRel	5.242880000000000e+007	LREAL		
3	New1	DiscreteMotion	Velocity_MoveRel	1.000000000000000e+007	LREAL		
4	New1	DiscreteMotion	Acceleration_MoveRel	1.000000000000000e+007	LREAL		
5	New1	<GLOBAL>	%JL1.3	0.000000000000000e+000	LREAL	_AX01_CPOS	Axis 01 command position of current scan
6	New1	DiscreteMotion	Deceleration_Halt	5.000000000000000e+007	LREAL		
7	New1	DiscreteMotion	Axis	1	UINT		
8	New1	기본	Connect	Off	BOOL		

- (2) Select the descending or ascending sort.



	Module	Program	Variable/Device	Value	Type	Device/Variable	Comment
1	New1	DiscreteMotion	Axis	1	UINT		
2	New1	<GLOBAL>	%JL1.3	0.000000000000000e+000	LREAL	_AX01_CPOS	Axis 01 command position of current scan
3	New1	DiscreteMotion	Deceleration_Halt	5.000000000000000e+007	LREAL		
4	New1	DiscreteMotion	Distance_MoveRel	5.242880000000000e+007	LREAL		
5	New1	<GLOBAL>	%JL2.3	0.000000000000000e+000	LREAL	_AX02_CPOS	Axis 02 command position of current scan
6	New1	DiscreteMotion	Velocity_MoveRel	1.000000000000000e+007	LREAL		
7	New1	DiscreteMotion	Acceleration_MoveRel	1.000000000000000e+007	LREAL		
8	New1	기본	Connect	Off	BOOL		

- (3) After sorting, the arrow will be drawn depending on descending or ascending ordering.

#### Notes

1. The descending sort makes a drop down arrow and ascending arrow makes an up arrow.
2. When opening a project, sort is not applied.
3. When sorting again in the descending sort, ascending sort will be applied.
4. The row unit sort function is not available.



11.14 Device monitor (For the Motion Control Module only)

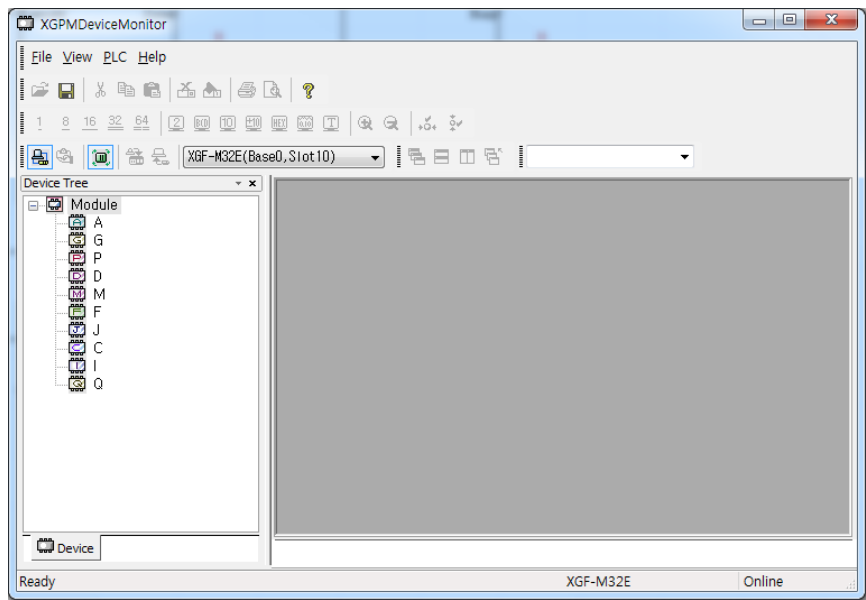
It can monitor the data of all device areas of the module.

You can write or read the data value in a certain device of the module. In addition, you can display the data value on a screen in various ways depending on bit type and displaying method.

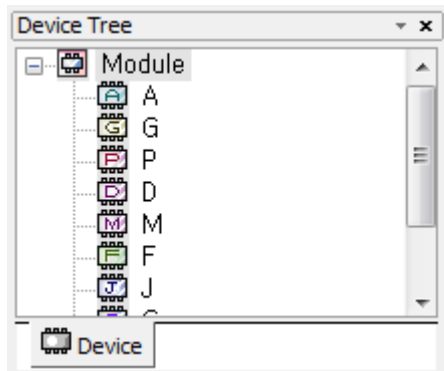
11.14.1 Basic Instructions

[Sequence]

(1) Select the [Monitor]-[Device monitor] in the XG-PM menu.



The device information window displays all device area of the module.



You can open the device with the following mehtods; Double-click the device icons (Ex: A, G, ...) or select the [Open device] in the mouse's right button menu.

Notes

- 1. In case a device monitor is executed in the XG-PM menu, it will be under an access, monitor mode.
- 2. If it is not under a monitor mode, opening a device will display the data value.
- 3. Basically, the data value is initialized to 0.

## 11.14.2 Close device monitor

It closes the device monitor program.

[Sequence]

- (1) Select the [File]-[Exit] in a device monitor menu.

## 11.14.3 Device areas

Various type of data is required for efficient and precision control. The module proves various device areas of data to control such data effectively. A user should classify the data areas so that the program can refer to these areas.

For each data area, refer to 5.1.2 Device of the Motion Control Module Manual.

## 11.14.4 Data type and displayed items

There are two major methods for displaying data on a screen.

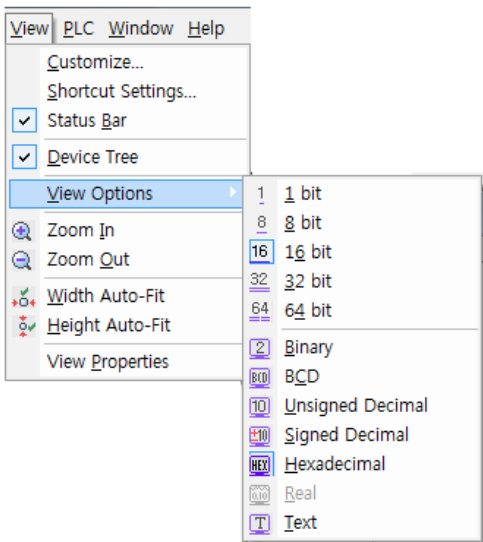
Display	Description
Data size	1bit, 8bit, 16bit, 32bit, 64bit
Display format	Binary, BCD, unsigned decimal, signed decimal, hexadecimal, real

### 1. Changing data size

It changes the unit monitoring the device's data.

[Sequence]

- (1) Select the [View]—[View options]-[1bit, 8bit, 16bit, 32bit, 64bit].



### 2. Changing display method

It changes the unit monitoring the device's data.

[Sequence]

- (1) Select the [View]—[View options]-[Binary, BCD, unsigned decimal, signed decimal, hexadecimal, real, text].

### 11.14.5 Editing data

You need to set the data value to write the device's data or the only selected area to a module.

#### 1. Editing cell

It edits the data in a cell data.

[Sequence]

- (1) Select a cell randomly with a mouse or keyboard.
- (2) Input the data to the selected cell.

#### 2. Cut

It deletes the data of the selected area and saves it to a clipboard.

[Sequence]

- (1) Select the area to be cutted.
- (2) Select the [Edit]-[Cut].

#### 3. Copy

It saves the data of the selected data to a clipboard.

[Sequence]

- (1) Selects the area to be copied.
- (2) Select [Edit]-[Copy].

#### 4. Delete

It deletes the data of the selected area.

[Sequence]

- (1) Select the area to be deleted.
- (2) Select [Edit]-[Delete].

#### 5. Paste

It pastes the data saved to a clipboard to the targeted position.

[Sequence]

- (1) Select the area to be pasted.
- (2) Select [Edit]-[Paste].

#### 6. Auto filling

It applies Auto filling to the selected data.

[Sequence]

- (1) Select the cell area for auto filling with a mouse.
- (2) If you put a mouse at the end of the cell, a mouse cursor will be changed into +.
- (3) Move it Up/Down, pressing the left mouse.
- (4) Take your hand off the left mouse.

## Chapter 11 Useful Function of XG-PM

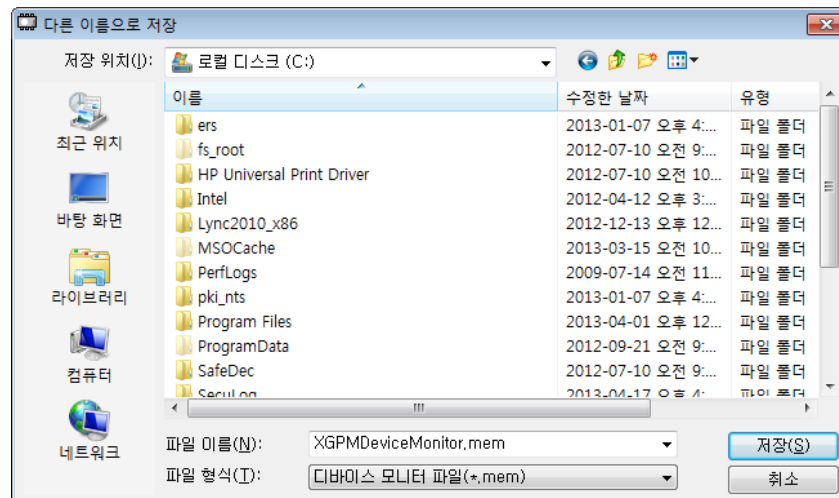
### 11.14.6 Save device

There are 3 methods to save the device.

#### 1. Saving the whole device areas

[Sequence]

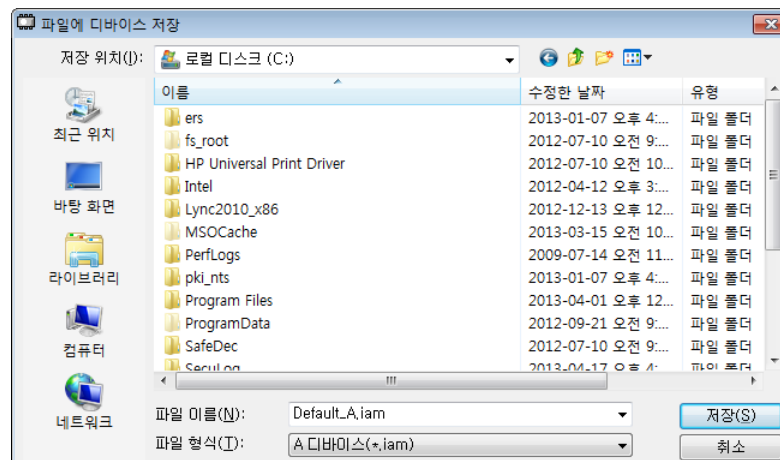
- (1) Select the [File]-[Save].
- (2) You can save it as a different name by selecting the [File]-[Save as].



#### 2. Saving individual device area only

[Sequence]

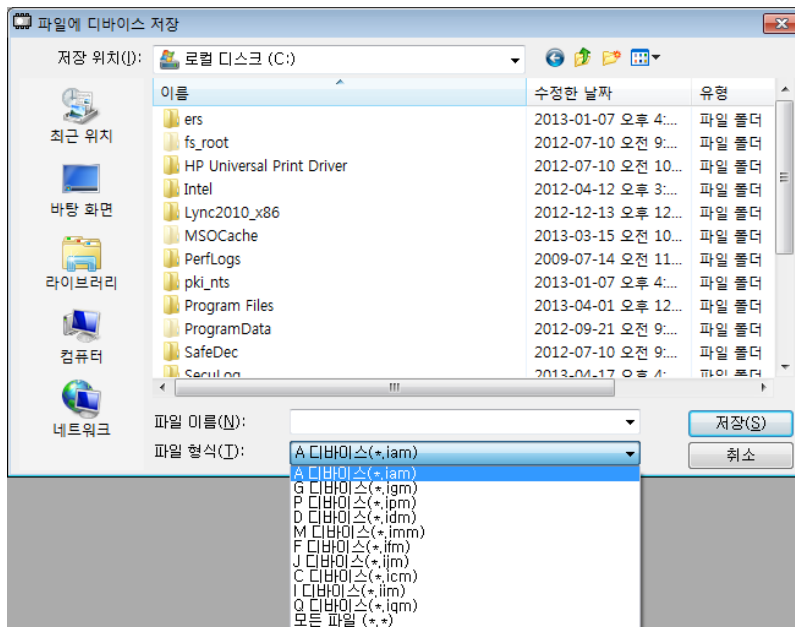
- (1) Select the [File]-[Saves the device in file].  
(The file extension is set as (idevice+m). (Ex, iAm,iGm,iPm,...))



### 3. Saving each device area only when all windows are close

[Sequence]

- (1) Select the [File]-[Save the device in file].
- (2) Select the file format of the device to be saved.



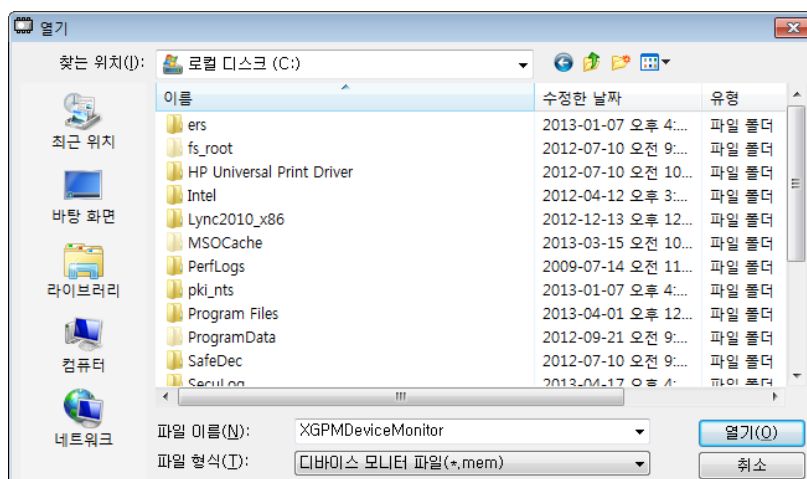
#### 11.14.7 Open device

There are 3 methods to open the device.

##### 1. Open the whole device areas

[Sequence]

- (1) Select the [File]-[Open].

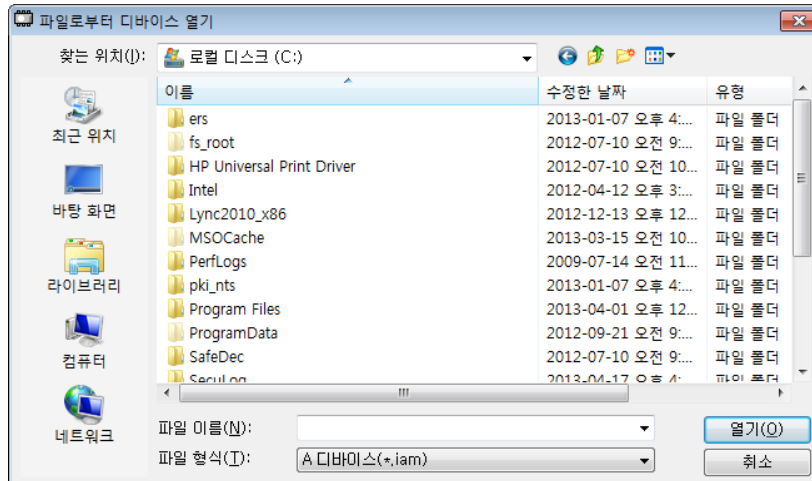


## Chapter 11 Useful Function of XG-PM

### 2. Open individual device area only

[Sequence]

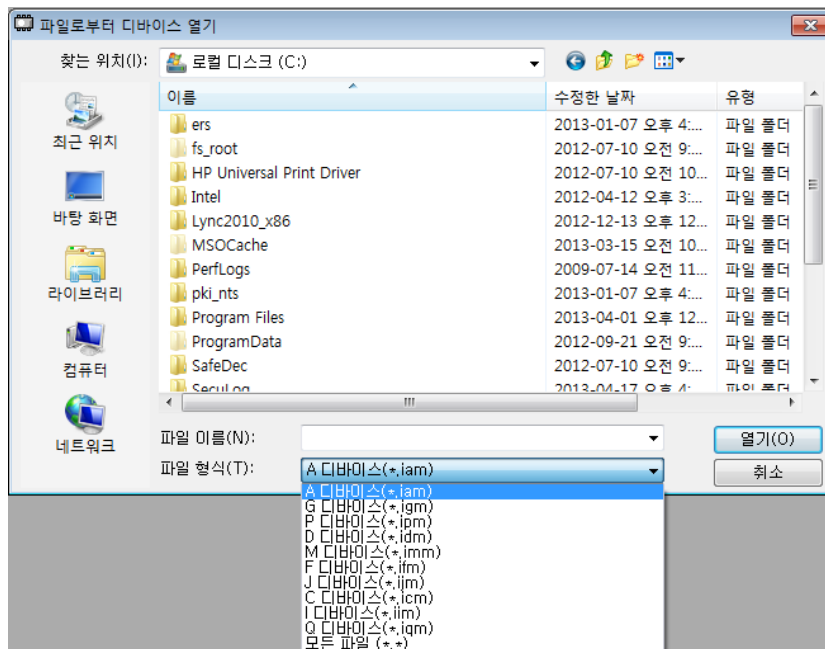
- (1) Select the [File]-[Opens Device from the File].



### 3. Open individual device only when all windows are closed

[Sequence]

- (1) Select the [File]-[Opens Device from the File].
- (2) Select the file format of the device to be opened.



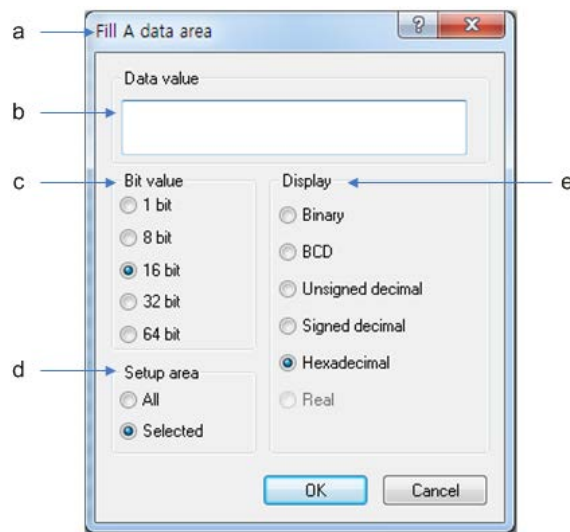
### 11.14.8 Setting data values

It sets the data value of a device depending on display methods and bit number. In addition, you can select the setting area of a data value.

[Sequence]

- (1) It should be connected to the PLC and should not be under a monitor mode.
- (2) Select the cell whose data value should be set.
- (3) Select the [Edit]-[Fill data area]

[Communication box]



[Communication box description]

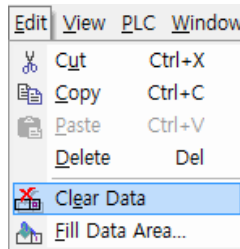
- (a) Title bar: Indicates the device whose data value should be set.
- (b) Data value : Inputs and displays the data in accordance with bit number and display method.
- (c) Bit value : Determines the data size.
- (d) Setup area : Determines the range that the data value is applied.
- (e) Display : Determines the data input type and in case there is a data value, the data value type will change depending on the display method.

### 11.14.9 Data initialization

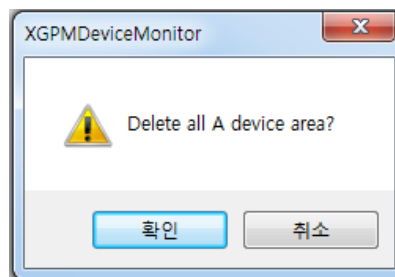
It deletes all data values of a device.

[Sequence]

- (1) It should be connected to the PLC and should not be under a monitor mode.
- (2) Select [Edit]-[Clear Data].



- (3) Call the message that asks whether deleting the whole areas of a device or not.



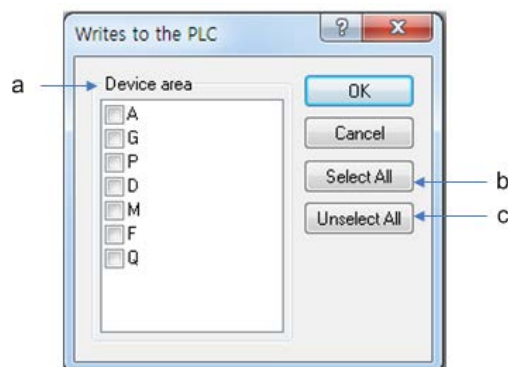
### 11.14.10 Write to PLC

It transmits the device data of a computer to the PLC in online state.

[Sequence]

- (1) It should be connected to the PLC and should not be under a monitor mode.
- (2) Select the [PLC]-[Write to PLC].
- (3) In the communication box for Write to PLC, select the device that should be written to the PLC
- (4) If you press the OK button, the selected device will be written to the PLC.

[Communication box]



[Communication box description]

- (a) Device area: Displays the device list to be written to the PLC.
- (b) Select All : Selects all devices to be written to the PLC.
- (c) Unselect All : Deselects all devices to be written to the PLC.



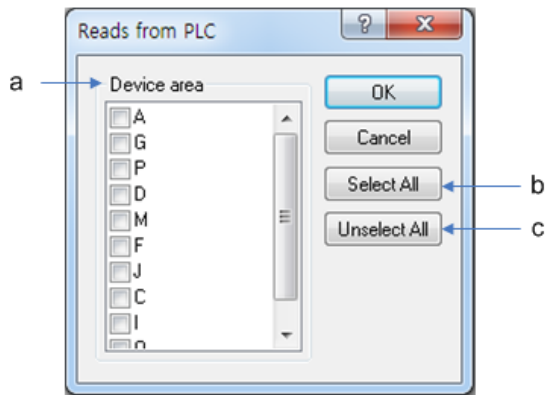
### 11.14.11 Read from PLC

It reads the device data of the PLC to a computer in online state.

[Sequence]

- (1) It should be connected to the PLC and should not be under a monitor mode.
- (2) Select the [PLC]-[Read from PLC].
- (3) In the dialog box for Read from PLC, select the device that should be read from the PLC
- (4) If you press the OK button, the selected device will be read from the PLC.

[Communication box]



[Communication box description]

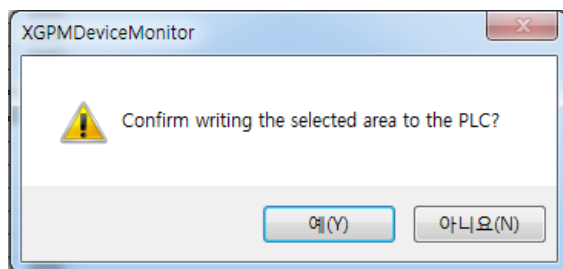
- (a) Device area: Displays the device list to be read from the PLC.
- (b) Select All : Selects all devices to be read from the PLC.
- (c) Unselect All : Unselects all devices to be read from the PLC.

### 11.14.12 Write the selected area to PLC

It writes the device data value of the selected area in online state.

[Sequence]

- (1) Select the area to be written to the PLC.
- (2) Select the [PLC]-[Write selected area to PLC].
- (3) Call the Communication box that asks whether writing the selected area to the PLC.



- (4) Write the selected area to the PLC.

### 11.14.13 Connect/Disconnect

It connects or disconnect to the PLC

#### 1. Connect

It connects to the PLC.

[Sequence]

- (1) Select the [PLC]-[Connection].

#### 2. Disconnection

It disconnects to the accessed PLC.

[Sequence]

- (1) Select the [PLC]-[Disconnection].

### 11.14.14 Start/Close Monitoring

It reads the device data of the PCL in online state and displays it in a screen or doest not read data.

#### 1. Start monitor

It reads the device data value of the PLC in online state and displays it on a screen.

[Sequence]

- (1) Check whether it is connected to the module.
- (2) Select the [PLC]-[Start monitoring].

#### 2. Close monitor

It finished to read the data value of the PLC in online state.

[Sequence]

- (1) Check whether it is connected to the module.
- (2) Select the [PLC]-[Close monitoring].

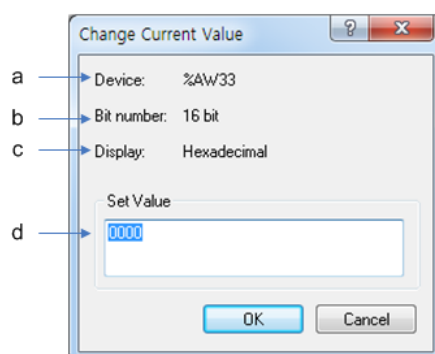
### 11.14.15 Changing the current value

It changes the data value of a cell in a monitor mode.

[Sequence]

- (1) Check whether it is connected to the PLC under a monitor mode.
- (2) Select the [PLC]-[Change current value].
- (3) Call the dialog box to change the current value.

[Communication box]



- (a) Device: Indicates the device that will revise the current value.
- (b) Bit number : Indicates the number of bits of the device that will revise the current value.
- (c) Display : Indicates the displaying method of the device the will revise current value.
- (d) Set value : Indicates the data value that will revise current value.

### 11.14.16 Zoom in/Zoom out

It expands or reduces the size displayed on a screen.

#### 1. Zoom in

It expands the screen.

[Sequence]

- (1) Select the [View]-[Zoom in].

#### 2. Zoom out

It reduces the screen.

[Sequence]

- (1) Select the [View]-[Zoom out].

### 11.14.17 Auto-fit in width/height

In case the data value is not displayed on a screen, the function is used to display the data value on a screen.

#### 1. Auto-fit in width

It adjusts the size depending on a cell's text length.

[Sequence]

- (1) Select the [View]-[Width Auto-Fit].

#### 2. Auto-fit in height

It adjusts the height of a line depending on a cell's text height.

[Sequence]

- (1) Select the [View]-[height Auto-Flt].

### 11.14.18 Customize

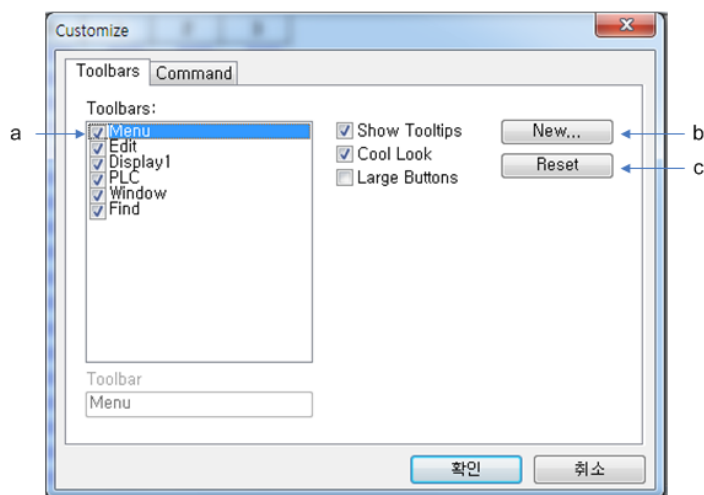
It shows or hides the tool tip of a device monitor individually. In addition, you can make a new tool tip or add the command to the existing tool tip or remove the command from the existing tool tip.

#### 1. Adding new tool

[Sequence]

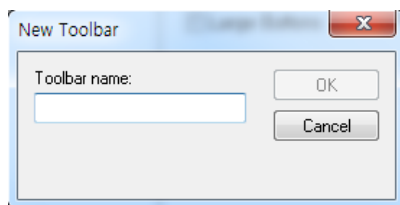
- (1) Select [view]-[Customize].

[Communication Box]

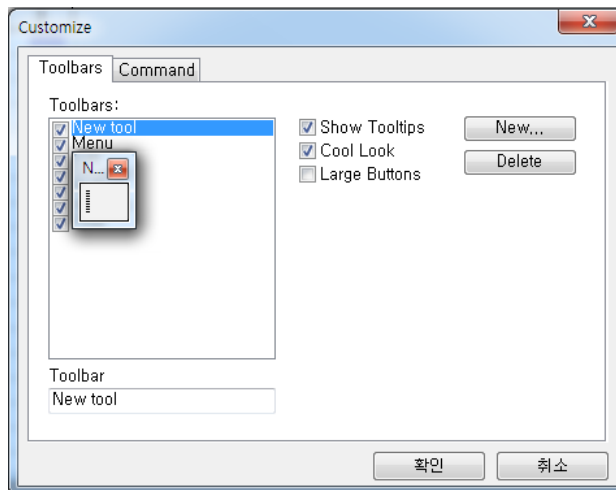


[Communication box description]

- (a) Tool group : Sets/cancels a checkbox, displaying or hiding a tool group individually.
  - (b) New : Adds a new tool.
  - (c) Reset : Initializes the settings of a tool group.
- (2) Execute 'Add new tool' by selecting the 'New' button.
  - (3) Input the tool name and click the OK button.



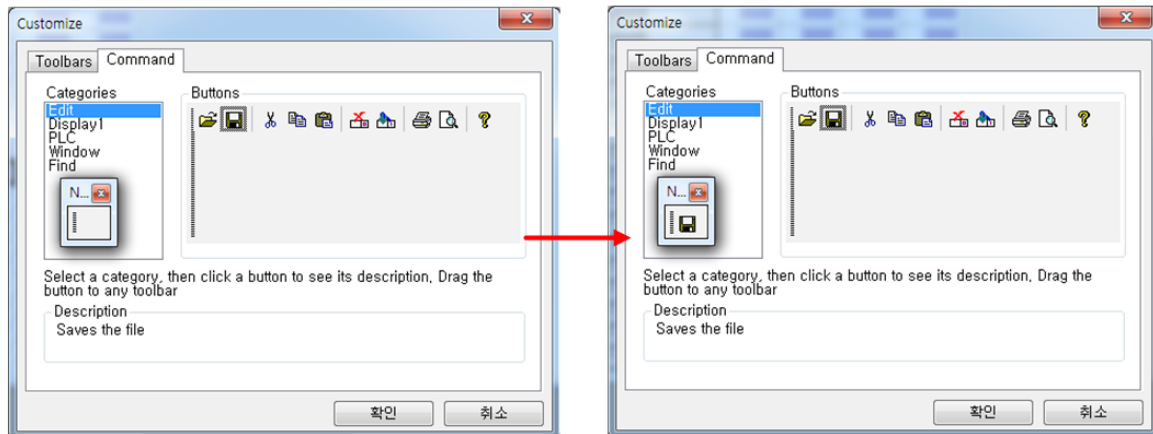
- (4) If you press the OK button, the tool group will be added with set values.



### 2. Adding command

[Sequence]

- (1) Select [View]-[Customize].
- (2) Select a command tab in a Customize Communication box.
- (3) Select the command type to be added.
- (4) Click the button and drag it to the targeted toolbar to add command.



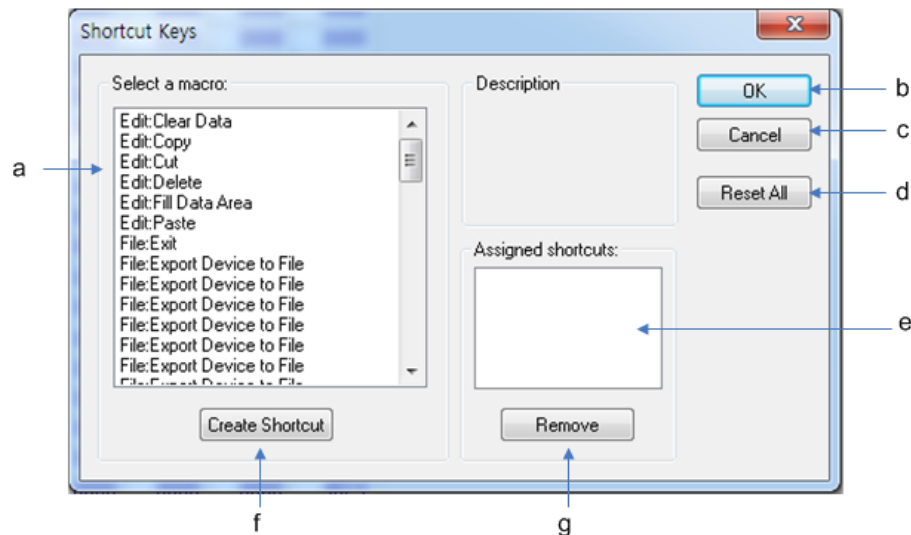
### 11.14.19 Setting shortcut key

A user can set and cancel the shortcut key directly.

[Sequence]

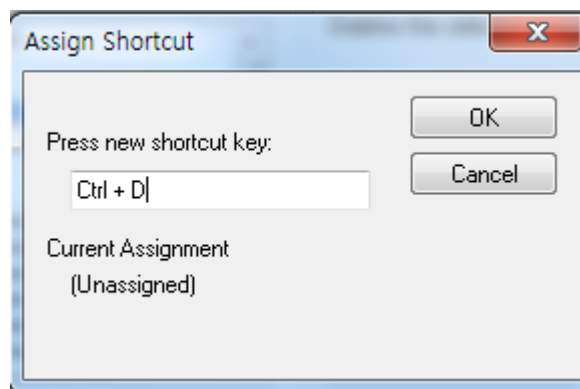
- (1) Select the [view]-[shortcut Setting].

[Communication box]



[Communication box description]

- (a) Select a macro : Selects the menu to set the shortcut key
  - (b) OK: Adds a new tool.
  - (c) Cancel : Initialize the settings of a tool group.
  - (d) Reset All : Initialize the whole set shortcut keys to initial values.
  - (e) Assigned Shortcuts : Displays the set shortcut key of the currently selected menu.
  - (f) Create Shortcut : Makes the shortcut key in the selected menu.
  - (g) Remove : Removes the shortcut key of the selected menu.
- (2) Select the menu in which the shortcut key should be set.
  - (3) Select the 'Create shortcut' button.
  - (4) Execute shortcut key setting process by pressing the shortcut key to be set and press the OK button.
  - (5) If you check the set shortcut key and press the OK button, the set shortcut key will be applied.

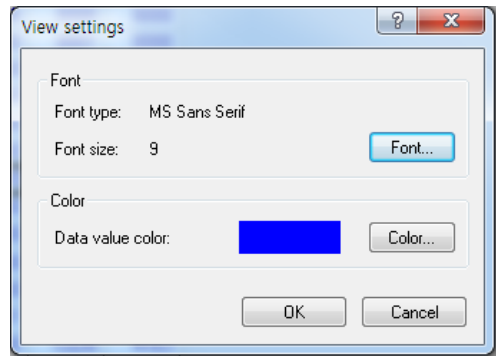


11.14.20 View Setting

It changes the font name and font size of a data value displayed on the screen.  
In addition, you can change the color of a data value under a monitor mode.

[Sequence]

- (1) Select the [View]-[View properties].



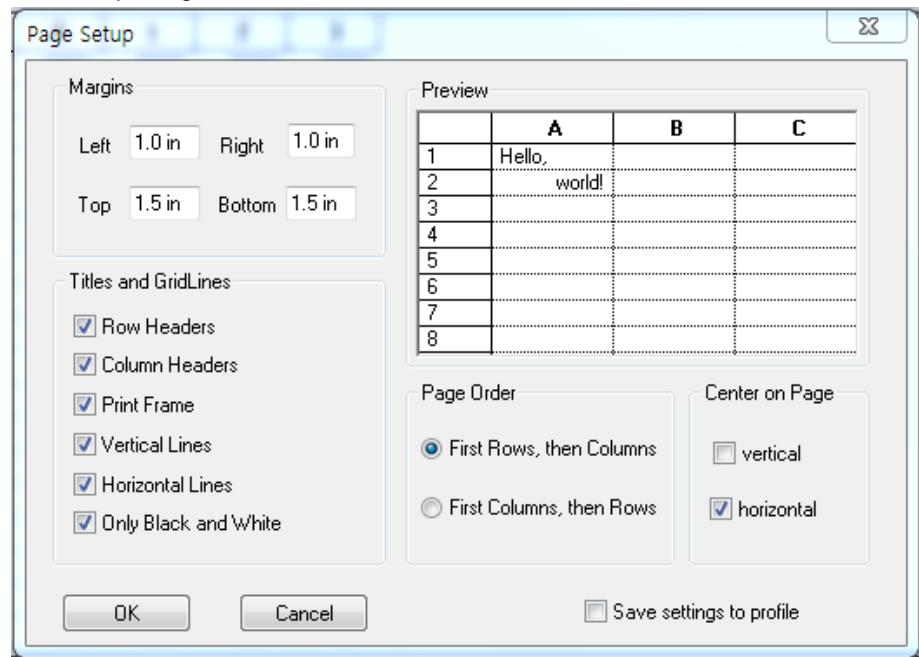
- (2) Select the [font(F)...] to change font.
- (3) Select the [Color(C)...] to change color.
- (4) If you press the OK button, the set value will be applied.

11.14.21 Page setting

It sets the printed page of a device. You can display or hide a title and grid line with setting margins of a page. In addition, you can set the page ordering; row-major ordering or column-major ordering.

[Sequence]

- (1) Select the [File]-[Page setting].
- (2) You can set margins.
- (3) You can display or hide a title and grid line.
- (4) You can set the page ordering; row-major ordering or column-major ordering.
- (5) You can set the center printing; Vertical or horizontal



## Chapter 11 Useful Function of XG-PM

### 11.14.22 Print

It prints the currently selected device.

[Sequence]

- (1) In a variable monitor window, click the right mouse and select the displaying method; unsigned decimal, signed decimal, hexadecimal.
- (2) Set Printer/printing range/Number of printed pages and click the OK button..



#### Notes

1. Non-activated variable monitor tab is not printed.
2. The value that is in progress of monitoring is also printed.
3. The way that is displayed on a screen is printed, namely, hidden line is not printed.
4. The Printing preview function is not available.

### 11.14.23 Setting a printer

It executes printing settings such as printer/paper/printing direction, etc.

[Sequence]

- (1) Select the [File]-[Setting printer] for setting a printer.
- (2) Execute the printing settings such as printer/paper/printing direction, etc and click the OK button.



# Chapter 12 Variable(Motion Control Module Only)

This chapter describes the Motion Control Module’s variables.

## 12.1 Global/Direct Variable

Global/Direct variable consist of global variable, direct variable comments and flags.  
Global variable declares the variable to be used for a program or displays a list of the declared variables, based on the variables. Direct variable comment declares the direct variable comment available in a program or displays the comment. Flag displays a list of flags provided by the declaration. Flag types are divided into system flag, Motion flag, I/O flag.

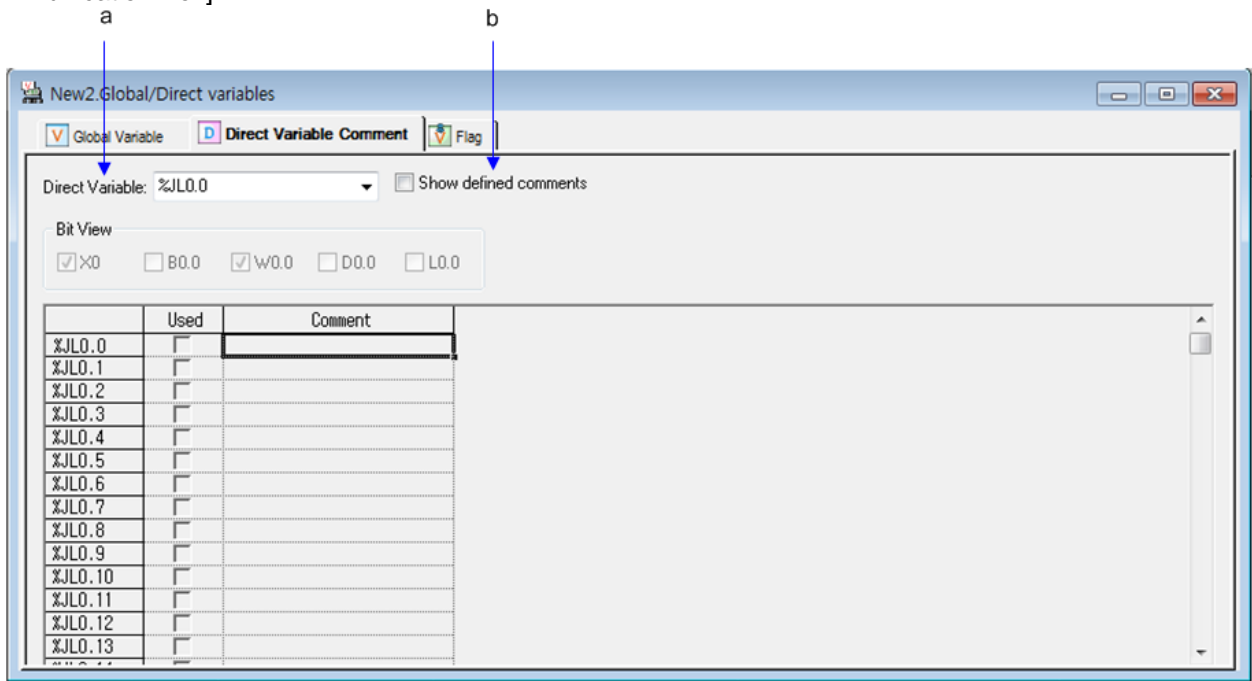
### 12.1.1 Global Variable

It declares variables and displays a list of the declared global variables.

### 12.1.2 Direct Variable Comment

It displays the comment of direct variable entered or declared from the variables.

[Communication Box]



[Description of Communication Box]

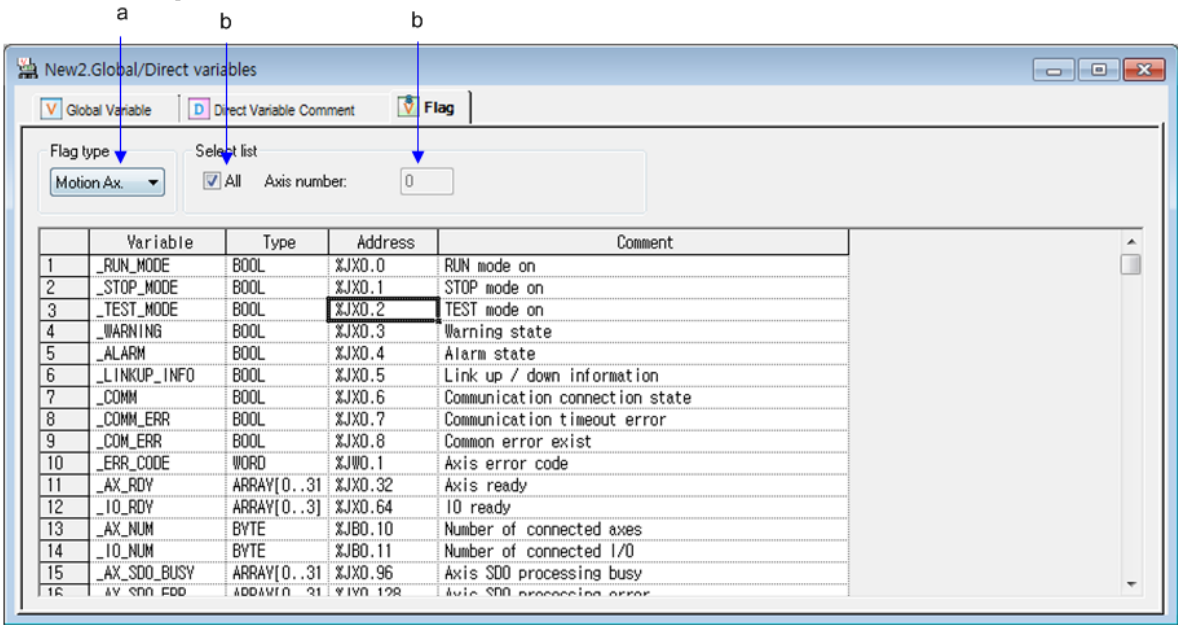
- (a) Direct variable: If entering a variable, it displays the data of the direct variable comment.
- (b) Show defined comments: Displays list of defined comment.

#### Notes

- Bit View is activated when ‘Show defined comments’ is checked.
- At Bit View, more than one button should be checked.

12.1.3 Flag

[Communication Box]



[Description of Communication Box]

- (a) Flag kind: used to select kind of flag among System, Motion axis, Motion axis group and I/O.
- (b) All: used to display the whole list of the flags selected from [Flag type]. In case of the system flag, all the details only will be displayed on the screen. If [All] is not checked, only the flag applicable to [Axis number] will be displayed.
- (c) Parameter number: Only the flag item of the input parameter number will be displayed.  
(Example, If Parameter Number 1 is inputted, it will be as shown below.)

Notes

Flag can not declare a flag exclusively for Read.

12.2 Global/Direct Variable Edit

On the list of the presently declared global/direct variables, variable kind, variable name, memory address, initial value, retain, use or not and comment items can be edited. In addition, a new global variable can be added to the list of the global/direct variables.

12.2.1 Global/Direct Variable Registration

This is used to register global/direct variables to use in the program. In order to register on the list of global/direct variables, go through Global Variable.

1. Register in Global Variable

A variable can be added to the list of global variables, modified or deleted from it.

[Communication Box]

	Variable Kind	Variable	Type	Address	Initial Value	Retain	Used	Comment
1	VAR_GLOBAL	Axis1	UINT	\$MW1	1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
2	VAR_GLOBAL	Axis2	UINT	\$MW2	2	<input type="checkbox"/>	<input type="checkbox"/>	
3	VAR_GLOBAL	Done_1	BOOL	\$MX2		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4	VAR_GLOBAL	OUT_A	BOOL	\$MX3		<input type="checkbox"/>	<input type="checkbox"/>	
5	VAR_GLOBAL	Position21	LREAL	\$MR21	100000	<input type="checkbox"/>	<input type="checkbox"/>	
6	VAR_GLOBAL	Velocity21	LREAL		100000	<input type="checkbox"/>	<input type="checkbox"/>	
7						<input type="checkbox"/>	<input type="checkbox"/>	

[Description of Communication Box]

- (a) Variable kind: VAR\_GLOBAL and VAR\_GLOBAL\_CONSTANT are available.
- (b) Variable name: The declared variable can not be duplicated with the identical name.
  - A figure is unavailable for the first character.
  - A special character is unavailable. (However, '\_' is available.)
  - Space is not available as a character.
  - A same name with a direct variable is unavailable (i.e. MX0, WB0,...)
  - If a line is empty, BOOL is displayed as the default type when entering a variable.
- (c) Type: 22 types are available; 19 basic types and 3 induced types.
  - Basic type (19)
    - : BOOL, BYTE, WORD, DWORD, LWORD, SINT, INT, DINT, LINT, USINT, UINT, UDINT, ULINT, REAL, LREAL, TIME, DATE, TIME\_OF\_DAY, DATE\_AND\_TIME
  - Induced type (3)
    - : ARRAY(i.e. ARRAY[0..6,0..2,0..4] OF BOOL) => factor limit (up to 3rd),
    - STRUCT(i.e. STRUCT name display) => STRUCT type is not available in STRUCT,
    - FB\_INST (i.e. FB name display)
- (d) Memory address: enters it by using direct variable (G,D,M).
- (e) Initial value: default value can be set.
- (f) Retain: if memory address is set, retain column is inactive.
- (g) R, W: always retain area.
- (h) M: check it by obtaining basic parameter information.
- (i) I, Q: always not retain area.
- (j) Used: display whether to use a declared variable.
- (k) Comment: every character is available.
- (l) Line validity: To register on global variable window, it needs variable type, variable and type.
  - If not registered on global variable, it is displayed in pink.

### Notes

1. If any error occurs when editing a cell, it is displayed in pink.
2. Press ESC key to recover the previous value during the cell edit.

### 12.2.2 Copy, Cut, Delete and Paste

Copy, cut, delete or paste can be executed to edit the list of global/direct variables used in the program.

#### 1. Copy

[Sequence]

- (1) Select the area to copy.
- (2) Select [Edit] - [Copy] on the menu.

#### 2. Delete

[Sequence]

- (1) Select the area to delete.
- (2) Select [Edit] - [Delete] on the menu

### 3. Cut

[Sequence]

- (1) Select the area to cut.
- (2) Select [Edit]-[Cut] on the menu.

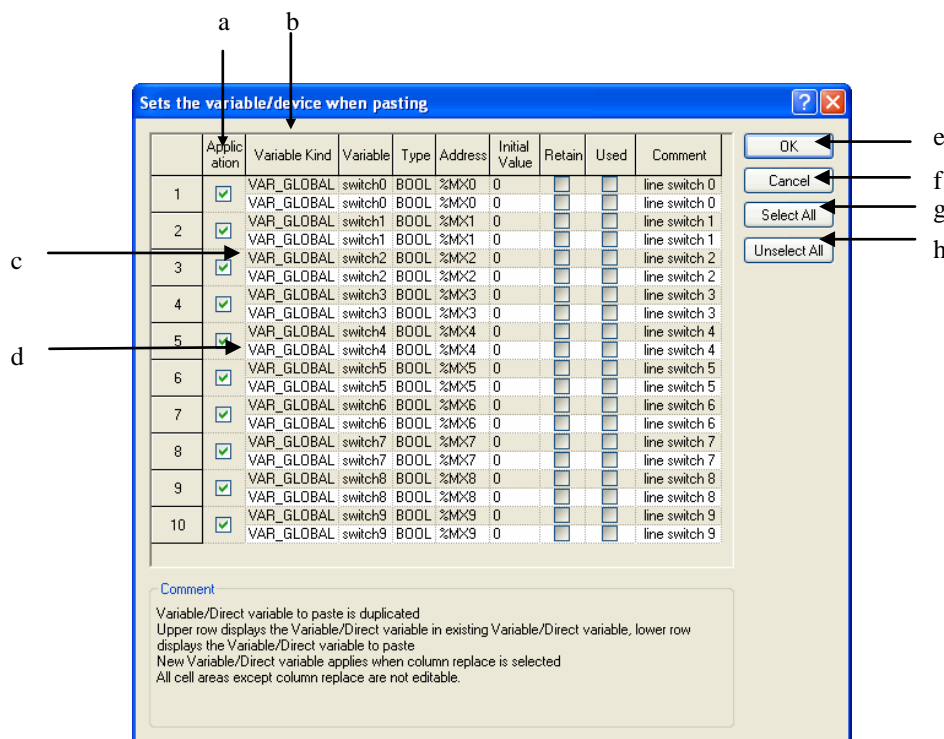
### 4. Paste

If the data saved in the clipboard is a part of columns,

[Sequence]

- (1) Select the position to paste on.
- (2) Select [Edit]-[Paste] on the menu.
- (3) If the variable and direct variable are identical on the list of variables/comments, the dialog box will be called.

[Communication Box]



[Description of Communication Box]

- (a) Application: Used to apply Paste.
- (b) Variable Kind: Used to display a kind of virables.
- (c) Gray Line: Used to display the existing list of variables/comments, which will not be edited.
- (d) White Line: Used to display the list of variables/comments obtained from the clipboard, which will not be edited.
- (e) OK: Applies the lines of the selected check box. The existing list of variables/comments will be deleted to add a new list of variables/comments.
- (f) Cancel: The existing list of variables/comments will not be deleted, and a new the list of variables/comments will not be applied accordingly.
- (g) Select All: Used to check all the check boxes in the [Replace] column.
- (h) Unselect All: Used to cancel all the selected check boxes in the [Replace] column.

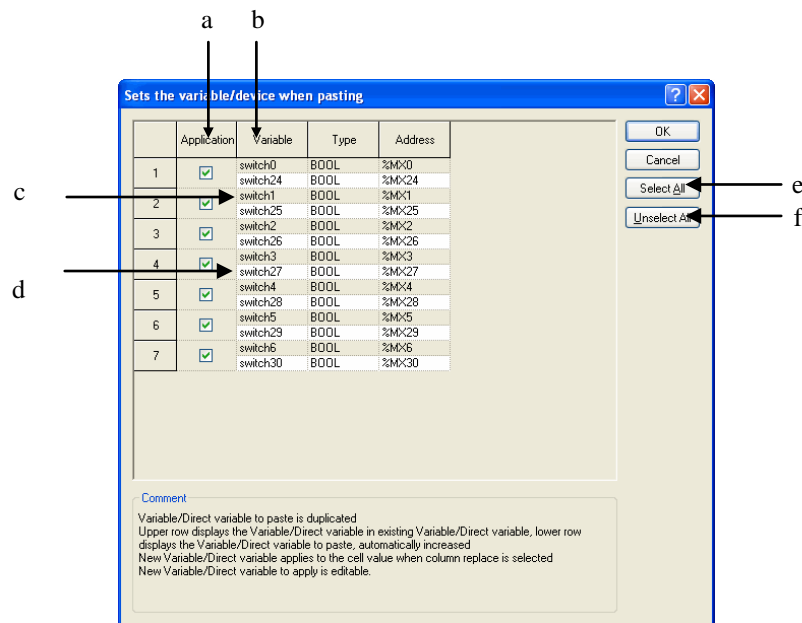
## Chapter 12 Variable

\* If the data saved in the clipboard is of the partial column,

[Sequence]

- (1) Select the position to paste on.
- (2) Select [Edit] – [Paste] on the menu.
- (3) If the variable and direct variable are identical on the list of variables/comments, the dialog box will be called.

[Communication Box]



[Comment of Dialog Box]

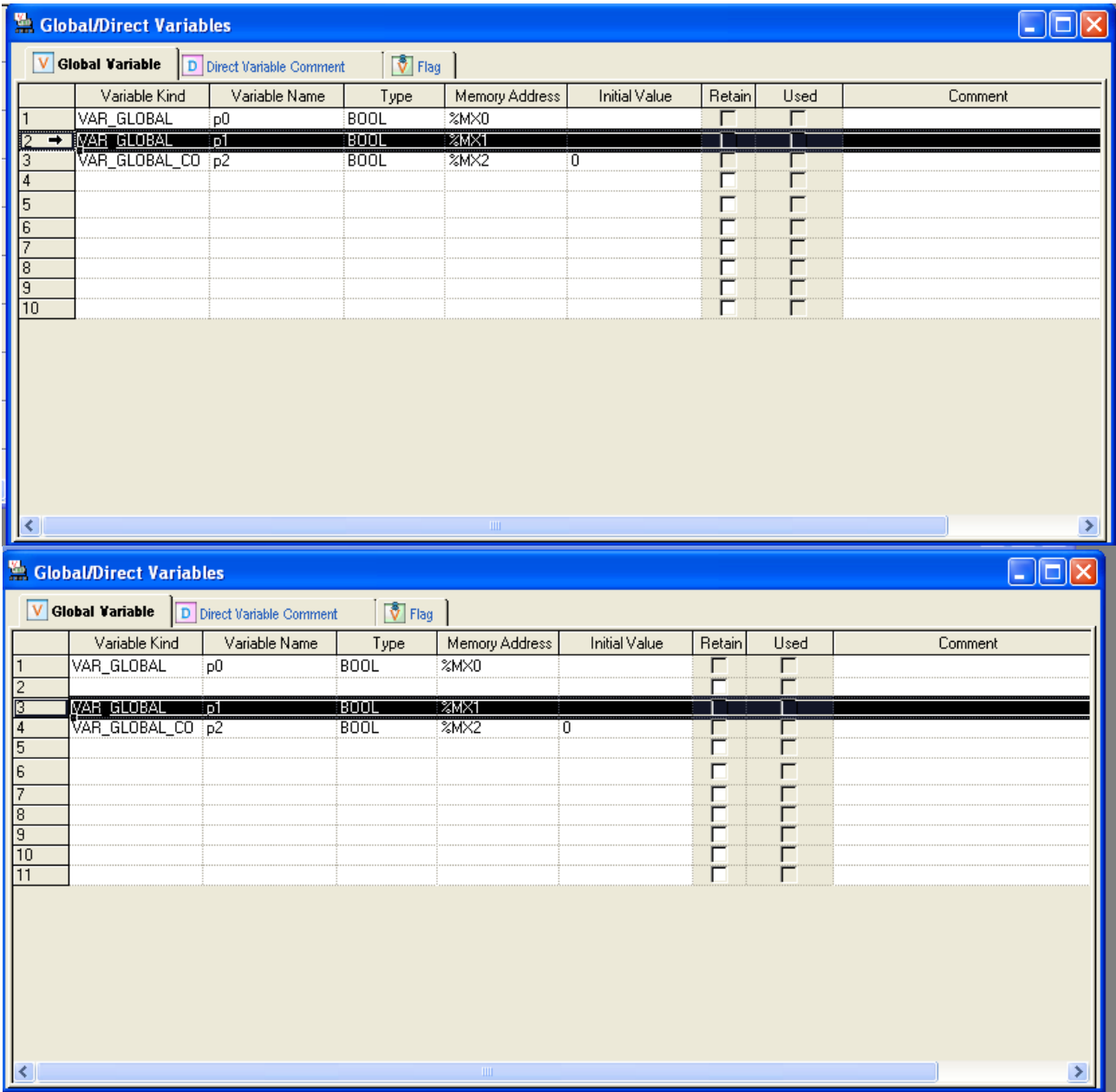
- (a) Application: Used to apply Paste.
- (b) Variable: Used to display the name of variable.
- (c) Gray Line: Used to display the data in the existing cell, which will not be edited.
- (d) White Line: If the variable or device of the data to paste is duplicated, it will be automatically increased and then displayed on the screen. In addition, the cell can be edited.
- (e) Select All: Used to check all the check boxes in the [Replace] column.
- (f) Unselect All: Used to cancel all the selected check boxes in the [Replace] column.

12.2.3 Insert line

It is used to insert new lines as many as the lines of the selected area, which will make the existing lines move downward.

[Sequence]

- (1) Select the area to insert the lines into.
- (2) Select [Edit] - [Insert Line] on the menu.

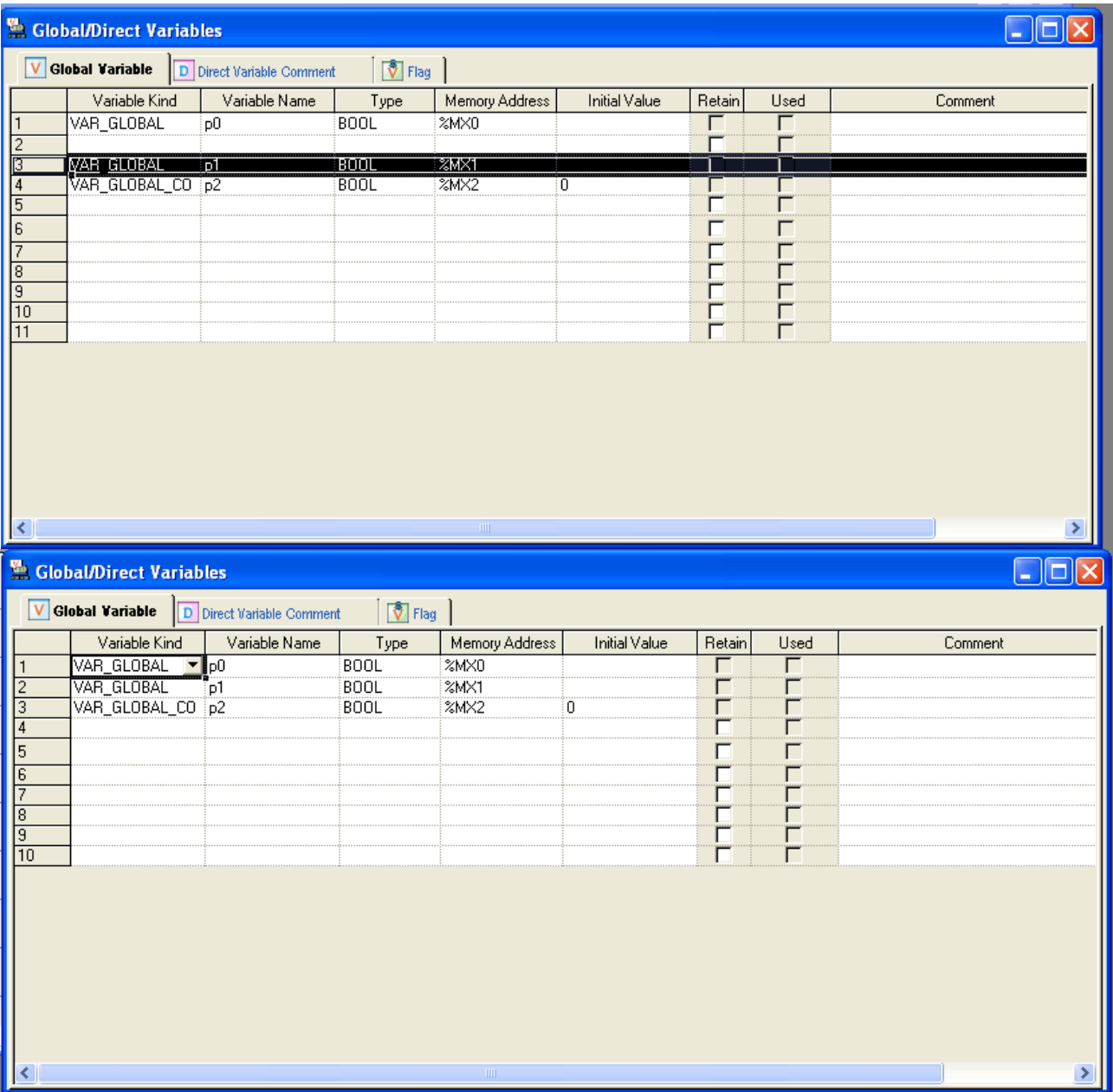


12.2.4 Delete line

It is used to delete the lines as many as the lines of the selected area.

[Sequence]

- (1) Select the area to delete the lines from.
- (2) Select [Edit] - [Delete Line] on the menu.



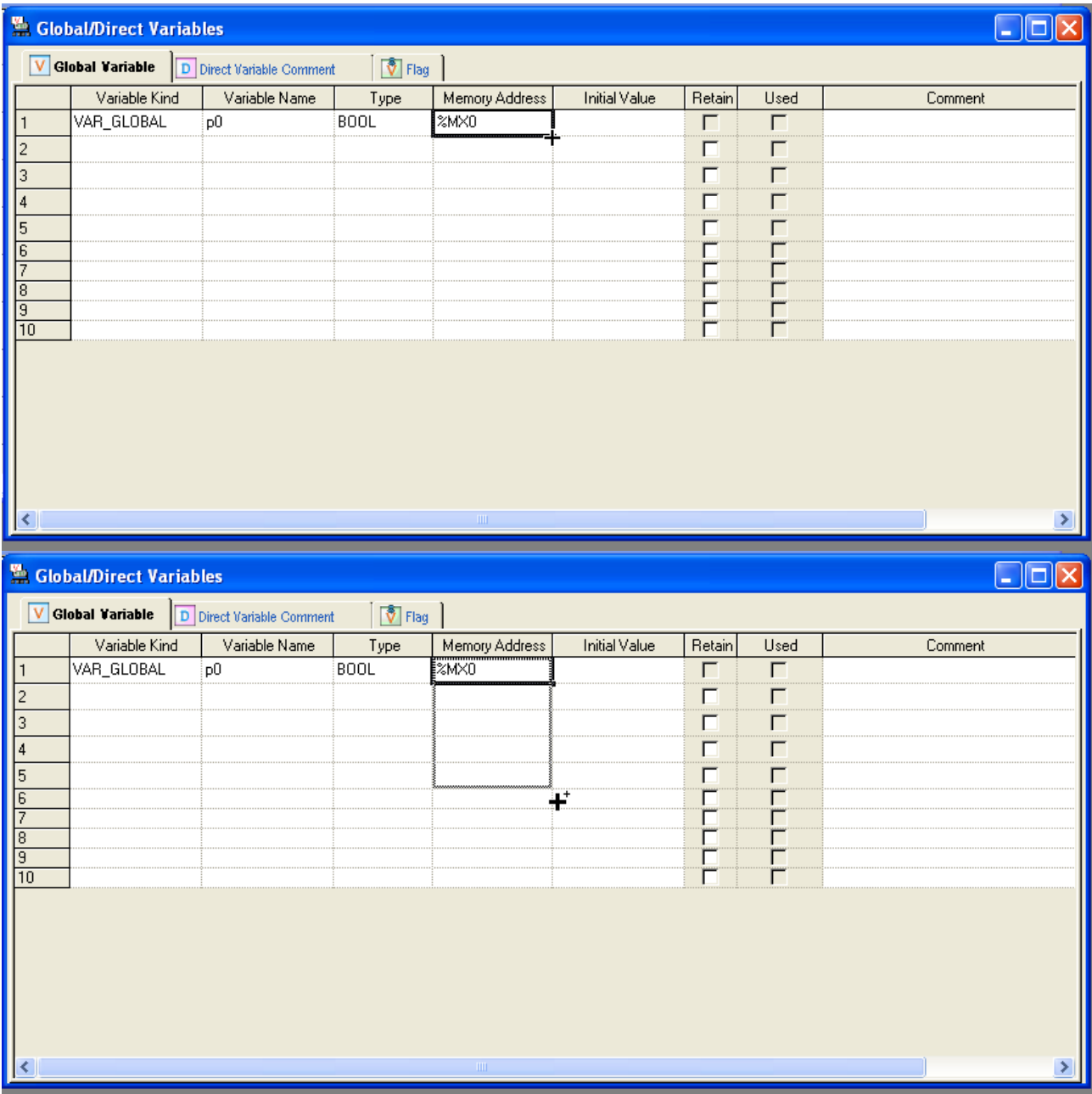


12.2.5 Automatic fill

It is used to increase or decrease variables and direct variables to add on the list of variables/comments.

[Sequence]

- (1) Move the mouse to the end of the cell and the mouse cursor will change to + shape.
- (2) Move the mouse upward and downward with its left button being pressed.



## Chapter 12 Variable

	a	b	c	d	e	f	g	h
	Global/Direct Variables							
	Global Variable Direct Variable Comment Flag							
	Variable Kind	Variable Name	Type	Memory Address	Initial Value	Retain	Used	Comment
1	VAR_GLOBAL	p0	BOOL	%Mx0		<input type="checkbox"/>	<input type="checkbox"/>	
2				%Mx1		<input type="checkbox"/>	<input type="checkbox"/>	
3				%Mx2		<input type="checkbox"/>	<input type="checkbox"/>	
4				%Mx3		<input type="checkbox"/>	<input type="checkbox"/>	
5				%Mx4		<input type="checkbox"/>	<input type="checkbox"/>	
6						<input type="checkbox"/>	<input type="checkbox"/>	
7						<input type="checkbox"/>	<input type="checkbox"/>	
8						<input type="checkbox"/>	<input type="checkbox"/>	
9						<input type="checkbox"/>	<input type="checkbox"/>	
10						<input type="checkbox"/>	<input type="checkbox"/>	

### [Details]

- (a) Variable kind: The value is filled in a cell as copied.
- (b) Variable Name: It always executes Automatic Fill because a variable can not be declared in duplicate. If it contains a number, it automatically increases. If not, it adds a number at the end and counts it automatically.
- (c) Type: It is filled in a cell as copied.
- (d) Memory address: It always executes Automatic Fill because memory allocation can not be declared in duplicate. If it contains a number, it searches for the part and increases it automatically.
- (e) Initial value: It is filled in a cell as copied.
- (f) Retain: It is checked as copied.
- (g) Used: It can not be modified because of Read Only.
- (h) Comment: If Automatic Fill is executed with Ctrl key being pressed, the figures area will automatically increase, and if with Ctrl key not pressed, it will be copied.

### Notes

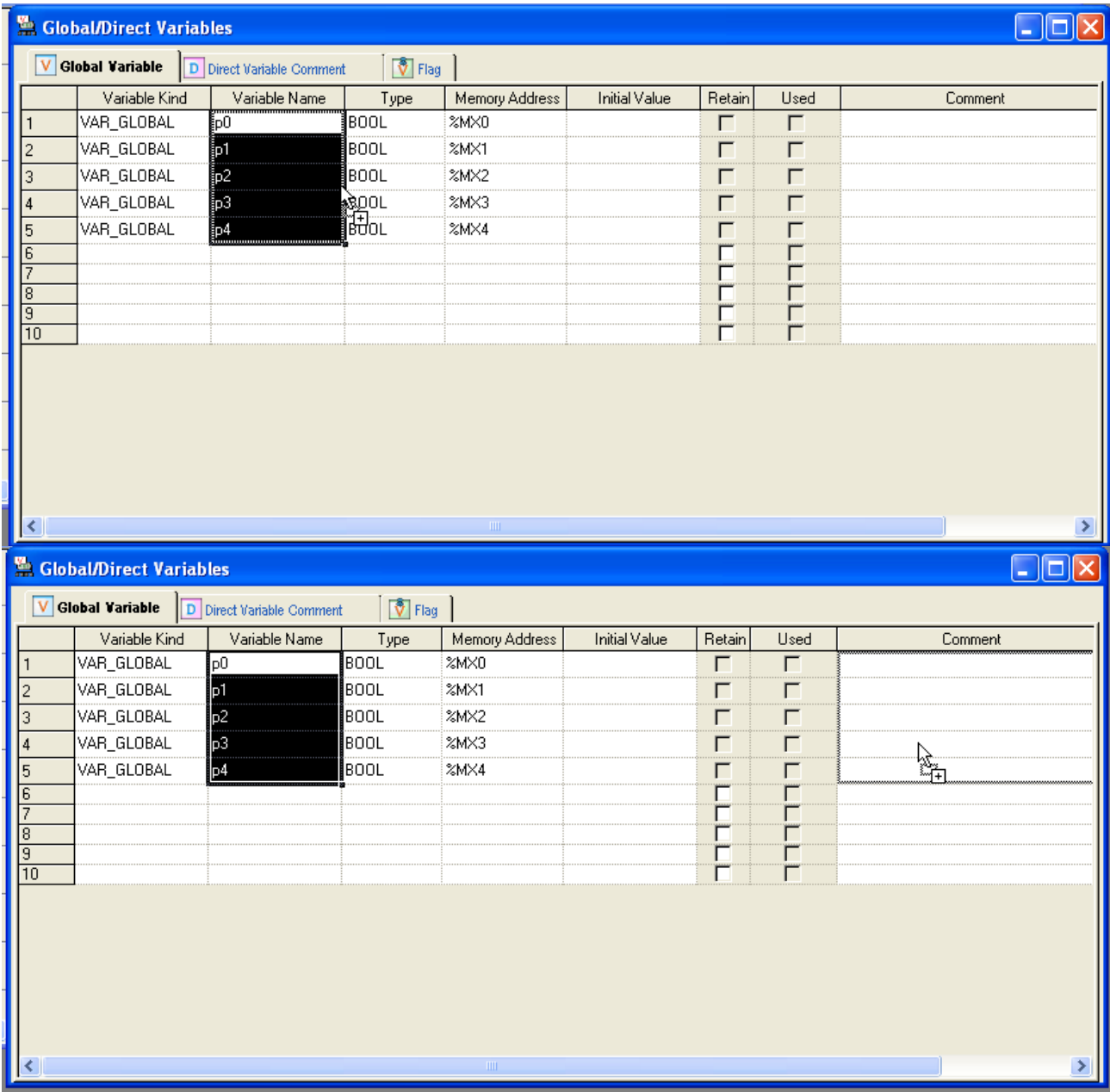
1. If Automatic Fill is executed with an empty cell, it will be deleted
2. Automatic Fill is available for many cells
3. It is available only in global variable and direct variable comments.

12.2.6 Drag & Drop

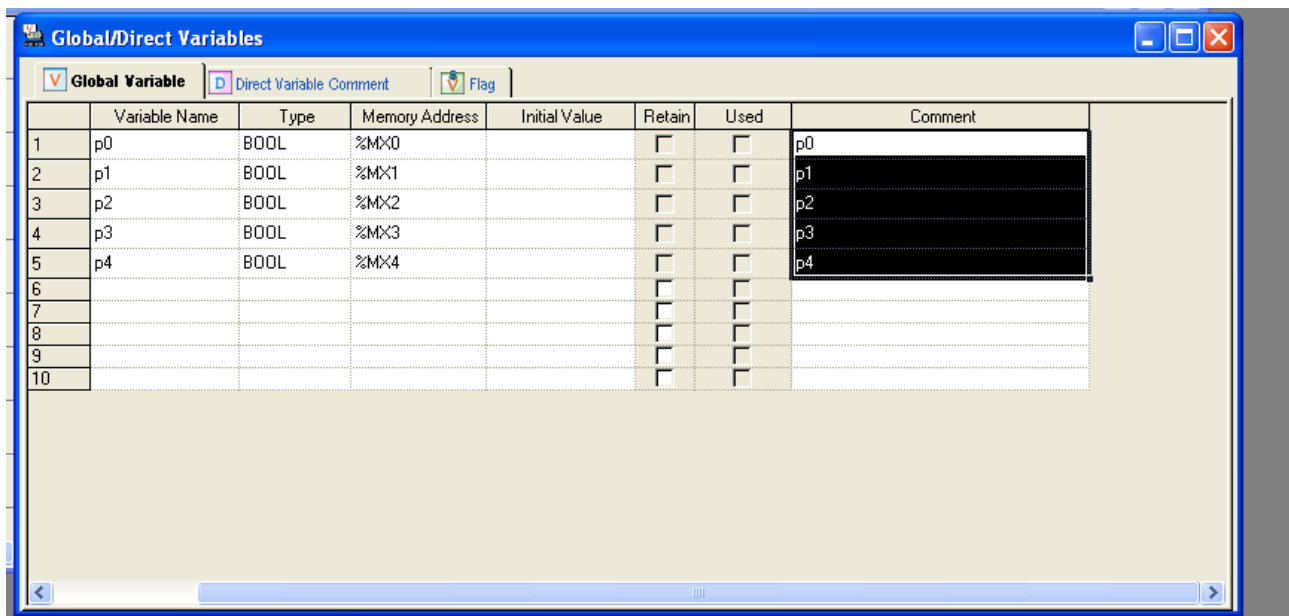
It is used to copy the selected items to paste on different positions.

[Sequence]

- (1) Select the area to drag and drop.
- (2) The mouse cursor will change to the state available for drag and drop.
- (3) With the left mouse button being pressed, drag and drop the selected items onto a position to paste on



## Chapter 12 Variable



[Details]

- (a) Drag and drop is available onto Variable Monitoring Window.
- (b) Drag and drop is available onto LD Window.
- (c) Copy is available when drag and drop is executed onto Excel program.
- (d) Drag and drop is available onto Data Traces window.
- (e) Drag and drop is available onto Global Variable of other XG5000 programs.
- (f) Drag and drop is available onto Direct Variable Comment of other XG5000 programs.

### 12.2.7 Undo/Redo

Undo is used to cancel the edited detail in order to return to its previous state. Redo cancels again the operation of Edit Cancel.

[Details]

- (a) Undo/Redo is available for Cell Edit.
- (b) Undo/Redo is available for Change.
- (c) Undo/Redo is available for All Change.
- (d) Undo/Redo is available for Delete.
- (e) Undo/Redo is available for Cut.
- (f) Undo/Redo is available for Paste.
- (g) Undo/Redo is available for Automatic Fill.
- (h) Undo/Redo is available for Insert Line. (Only in Global Variable)
- (i) Undo/Redo is available for Delete Line. (Only in Global Variable)
- (j) Undo/Redo is available for drag and drop.
- (k) Undo/Redo is available for Align. (Only in Global Variable)

#### Notes

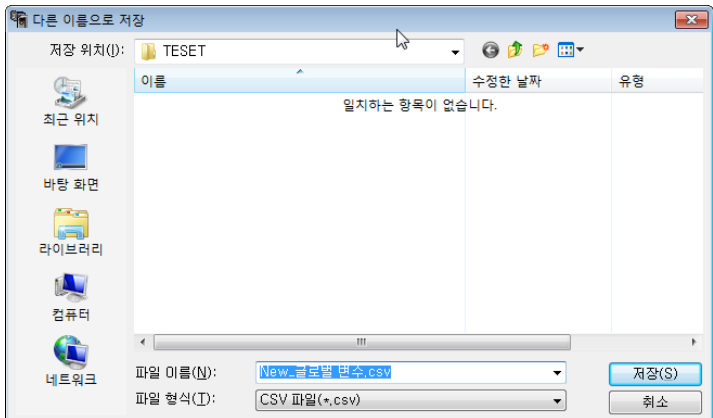
1. In Global Variable, if the data is moved to other windows or a variable is added in LD and IL, all the information for Undo/Redo will disappear.
2. In Direct Variable Comment, if the direct variable item changes, all the information for Undo/Redo will disappear.
3. It is not used in Flag.

12.2.8 Export into text file

It is used to save the previously declared list of global variables on the file and to open and read in the external programs.

[Sequence]

- (1) Click the right mouse in a global window and select [Export into text file] from a shortcut menu.
- (2) If you press 'Save', file is saved as inputted file name at selected folder location.
- (3) If you press 'Cancel', file is not created and dialog box is closed
- (4) File is classified by tap.



Notes

- 1. In case there is a comma(,) in a type or description remark column, double quotation marks("") will be added at the front and the rear of a string.
- 2. In case there are letters such as \r, \n, \t in a description remark, they will be changed into "\\r", "\\n", "\\t".
- 3. In case that there are double quotation marks("") in a description remark, it will be changed into two double quotation marks("").

## Chapter 12 Variable

### 12.2.9 Preview

This function is used to previously show the screen which will be printed.

[Sequence]

- (1) The window to previously show shall be displayed on the screen.
- (2) Select [Project]-[Preview] on the menu.

**XG5000 - [Global/Direct Variables]**

Print... Next Page Prev Page Two Page Zoom In Zoom Out Close

🔍

	VariableKind	Variable	Type	Address	Initial Value	Retain	Used	Comment
1	VAR_GLOBAL	switch0	BOOL	%MX0	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 0
2	VAR_GLOBAL	switch1	BOOL	%MX1	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 1
3	VAR_GLOBAL	switch10	BOOL	%MX10	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 10
4	VAR_GLOBAL	switch11	BOOL	%MX11	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 11
5	VAR_GLOBAL	switch12	BOOL	%MX12	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 12
6	VAR_GLOBAL	switch13	BOOL	%MX13	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 13
7	VAR_GLOBAL	switch14	BOOL	%MX14	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 14
8	VAR_GLOBAL	switch15	BOOL	%MX15	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 15
9	VAR_GLOBAL	switch16	BOOL	%MX16	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 16
10	VAR_GLOBAL	switch17	BOOL	%MX17	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 17
11	VAR_GLOBAL	switch18	BOOL	%MX18	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 18
12	VAR_GLOBAL	switch19	BOOL	%MX19	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 19
13	VAR_GLOBAL	switch2	BOOL	%MX2	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 2
14	VAR_GLOBAL	switch20	BOOL	%MX20	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 20
15	VAR_GLOBAL	switch21	BOOL	%MX21	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 21
16	VAR_GLOBAL	switch22	BOOL	%MX22	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 22
17	VAR_GLOBAL	switch23	BOOL	%MX23	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 23
18	VAR_GLOBAL	switch3	BOOL	%MX3	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 3
19	VAR_GLOBAL	switch4	BOOL	%MX4	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 4
20	VAR_GLOBAL	switch5	BOOL	%MX5	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 5
21	VAR_GLOBAL	switch6	BOOL	%MX6	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 6
22	VAR_GLOBAL	switch7	BOOL	%MX7	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 7
23	VAR_GLOBAL	switch8	BOOL	%MX8	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 8
24	VAR_GLOBAL	switch9	BOOL	%MX9	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	line switch 9
25						<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Page 1      NewPLC      Offline      Overwrite

## Notes

1. By changing the size of the column, the window previously displayed on the screen can be adjusted
2. In View Device, all the areas of the specified type will be displayed on the Direct Variable Comment.
3. In Global Variable, incomplete variables displayed on the present screen will be also displayed on the Preview screen

12.2.10 Print

It is used to print the window displayed on the screen in Global Variable, Direct Variable Comment and Flag.

- [Sequence]
- (1) The window to print shall be displayed on the screen.
  - (2) Select [Project]-[Print] on the menu.

Notes

- 1. By changing the size of the column, the details to be printed on paper can be adjusted.
- 2. In Direct Variable Comment, all the areas of the specified type will be printed.
- 3. In Global Variable, incomplete variables displayed on the present screen will be also printed.

12.2.11 Convenient Functions

1. **Align**
- (1) Double-click the column header to align in the descending sequence and in the ascending sequence.
  - (2) Presently aligned positions are displayed with the arrow direction.

Notes

- 1. It is available only in Global Variable and Flag.
- 2. If the Flag mode changes to Global Variable, variables will be aligned to display.

2. **View**
- 1. Screen Zoom-In: shows the screen magnified.
  - 2. Select [View]-[Zoom-In] on the menu.
  - 3. Screen Zoom-Out: shows the screen reduced.
  - 4. Select [View]-[Zoom-Out] on the menu.

3. **Shortcut Keys**

Shortcut Keys	Comment
Home	Used to move to the first in the cell.
End	Used to move to the end in the cell.
Ctrl + Home	Used to move to the first cell position.
Ctrl + End	Used to move to the last cell position.
Shift + Ctrl + Home	From the present to the highest cells selected.
Shift + Ctrl + End	From the present to the lowest cells selected.
Shift + Page Up	From the cell to the page up position selected.
Shift + Page Down	From the cell to the page down position selected.
Shift + Tab, Shift + Enter	Used to move to the next cell (right->left, bottom->top), and to move to the last cell in the first cell.
Tab, Enter	Used to move to the next cell (left->right, top->bottom). A new line will be created in the last call.
Ctrl + Enter	Multi-line will be input in the comment column.

12.2.12 Registering induced variables

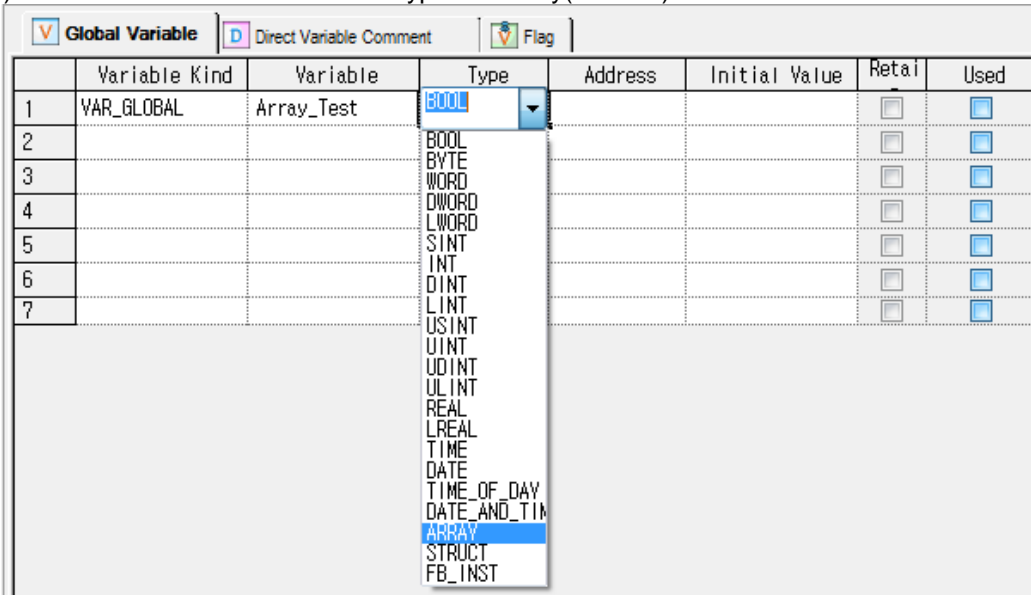
It adds the derived variables (structure, array, structure array).

1. Registering array type

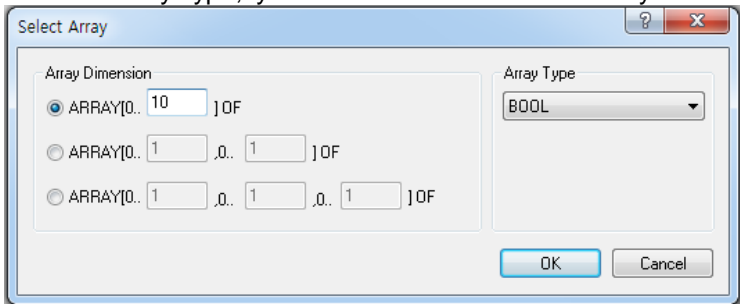
It registers the variables of array type.

[Sequence]

- (1) Select the Global/Direct variable in project items.
- (2) Set the variable and set the type as array (ARRAY).



- (3) Set the array dimension and array type in the dialog box for array selection. If you select STRUCT f or the array type, you can use the structure array.



- (4) Then, the variable of array type is registered as below.

	Variable Kind	Variable	Type	Address	Initial Value
1	VAR_GLOBAL	Array_Test	ARRAY[0..10]		
2					

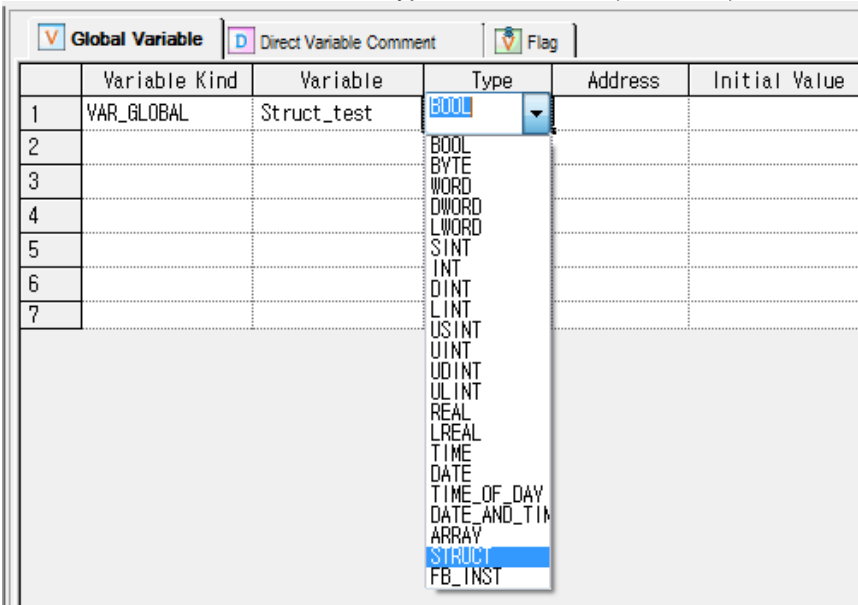


2. Registering structure type

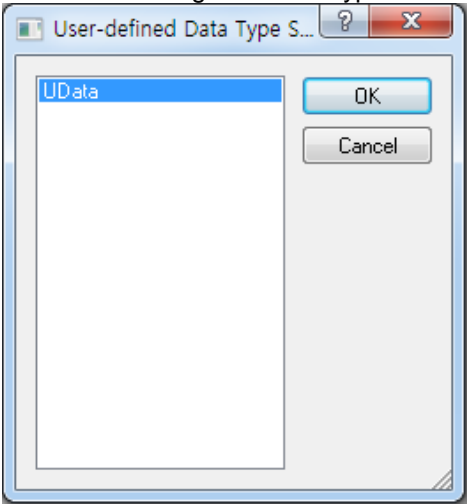
It registers the variable of structure (STRUCT) type. To register the variable of structure type, you need to add the data type to be added to a user data type. For more details on adding a user data type, refer to 12.5.1.

[Sequence]

- (1) Select the 'Global/Direct variable' in project items.
- (2) Set the variable and set the type as structure (STRUCT).



- (3) Select the targeted data type in the dialog box for selecting user data type.



- (4) Then, the variable of structure type will be registered as below.

	Variable Kind	Variable	Type	Address	Initial Value
1	VAR_GLOBAL	Struct_test	UData		
2					
3					

12.2.13 Memory assignment for the derived variable

It sets the memory assignment, retain, initial value, description remark for the derived variables (structure, array, structure array).

[Sequence]

- (1) Select the Global/Direct variable in the project items.
- (2) After setting the variable, set the type as the derived one(STRUCT, ARRAY).
- (3) Double-click the variable's memory assignment or the initial value's column.

	Variable Kind	Variable	Type	Address	Initial Value
1	VAR_GLOBAL	TTE	ARRAY[0..5]		
2					
3					
4					
5					
6					
7					

- (4) Input the memory assignment/initial value/retain setting/description remark in the dialog box to set array items. The cell where the data can be input is displayed as white and the cell where the data can not be input is displayed as gray.

Array Set Item

The sub-item of the variable "TTE", the type "ARRAY[0..5] OF UData" is set.

OK

Cancel

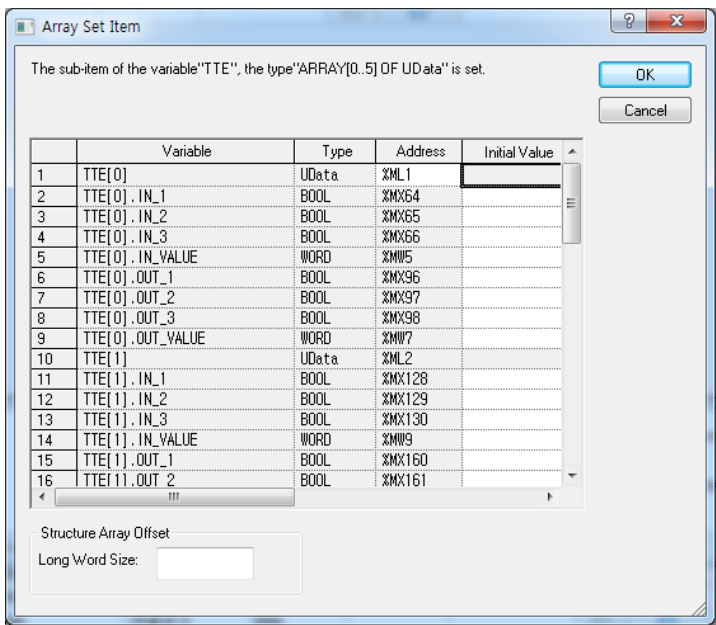
	Variable	Type	Address	Initial Value
1	TTE[0]	UData		
2	TTE[0].IN_1	BOOL		
3	TTE[0].IN_2	BOOL		
4	TTE[0].IN_3	BOOL		
5	TTE[0].IN_VALUE	WORD		
6	TTE[0].OUT_1	BOOL		
7	TTE[0].OUT_2	BOOL		
8	TTE[0].OUT_3	BOOL		
9	TTE[0].OUT_VALUE	WORD		
10	TTE[1]	UData		
11	TTE[1].IN_1	BOOL		
12	TTE[1].IN_2	BOOL		
13	TTE[1].IN_3	BOOL		
14	TTE[1].IN_VALUE	WORD		
15	TTE[1].OUT_1	BOOL		
16	TTE[1].OUT_2	BOOL		

Structure Array Offset

Long Word Size:

- (5) The memory assignment can be input to the first member variable only.
  - (6) The structure array offset is activated when the memory assignment is set.
- If the structure array offset is input, the initial address of array will be allocated to the relevant offset.

Ex.) If you input 10, the initial address will be allocated in the format of TTE[0] => %ML0, TTE[1] => %ML10.



Notes

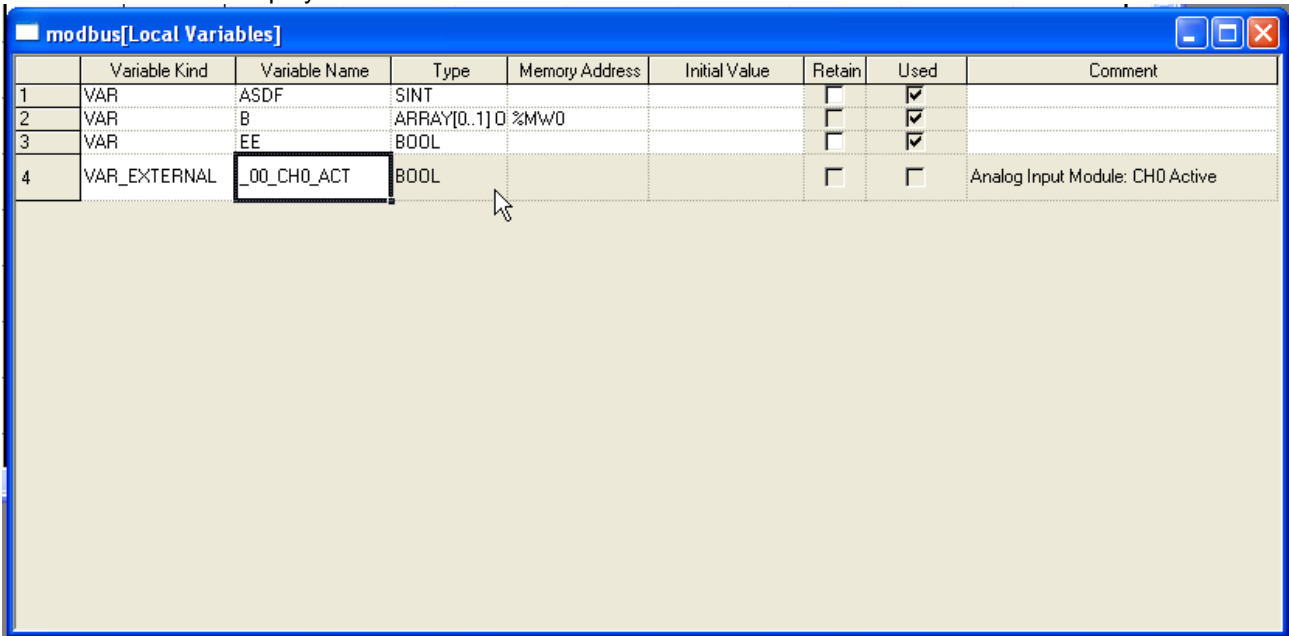
- 1. In case the memory assignment, initial value, etc. is set for the derived member variables, <Set-up> will be displayed on a screen.
- 2. If the Flag mode changes to Global Variable, variables will be aligned to display

12.3 Local Variable

Local Variable declares the variables used in the program or displays the list of declared variables, based on variables.

12.3.1 Local Variable

It declares variables and displays the list of declared local variables.



12.4 Local Variable Edit

12.4.1 Local Variable Registration

Register local variable to use in the program.

1. Register in Local Variable

A variable can be added, modified or deleted to/from the list of local variables.

[Communication Box]

	Variable Kind	Variable Name	Type	Memory Address	Initial Value	Retain	Used	Comment
1	VAR	ASDF	SINT			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
2	VAR	B	ARRAY[0..1] D %MW0			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3	VAR	EE	BOOL			<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4	VAR_EXTERNAL	_00_CH0_ACT	BOOL			<input type="checkbox"/>	<input type="checkbox"/>	Analog Input Module: CH0 Active

[Description of Communication Box]

- (a) Variable kind: VAR, VAR\_CONSTANT and VAR\_EXTERNAL, VAR\_EXTERNAL\_CONSTANT are available.
  - If variable type is CONSTANT, it sets the initial value as the default.
  - If the variable type is VAR\_EXTERNAL or VAR\_EXTERNAL\_CONSTANT, the columns of the initial value and retain value are displayed as the defaults.
- (b) Variable name: The declared variable can not be duplicated with the identical name.
  - A figure is unavailable for the first character.
  - A special character is unavailable. (However, '\_' is available.)
  - Space is not available as a character.
  - A name same with direct variable can not be used as a name(i.e. MB4, W4, RW9...)
  - If a line is empty, BOOL is displayed as the default type when entering a variable.
- (c) Type: 22 types are available; 19 basic types and 3 induced types.
  - Basic types(19): BOOL, BYTE, WORD, DWORD, LWORD, SINT, INT, DINT, LINT, USINT, UINT, UDINT, ULINT, REAL, LREAL, TIME, DATE, TIME\_OF\_DAY, DATE\_AND\_TIME
  - Induced types(3): ARRAY(i.e. ARRAY[0..6,0..2,0..4] OF BOOL) => factor limit (up to 3rd), STRUCT(i.e. STRUCT name display) => STRUCT type is no available in STRCT, FB\_INST(i.e., FB name display)
- (d) Memory address: enter it by using direct variable(G,M,D).
- (e) Initial value: default value can be set.
- (f) Retain: if memory allocation is set, retain column is inactive.
- (g) Used: display whether to use a declared variable.
- (h) Comment: every character is available.

- (i) Multi line entry is available by using Ctrl + Enter key.
- (j) Line validity: To register on global variable window, it needs variable type, variable and type.
- (k) If not registered on global variable, it displays in pink.

**Notes**

1. If any error occurs when editing a cell, it is displayed in pink.
2. Press ESC key to recover the previous value during the cell edit.

### 12.4.2 Copy, Cut, Delete and Paste

Copy, cut, delete or paste can be executed to edit the list of local variables used in the program

#### 1. Copy

[Sequence]

- (1) Select the area to copy.
- (2) Select [Edit] - [Copy] on the menu.

#### 2. Delete

[Sequence]

- (1) Select the area to delete.
- (2) Select [Edit] - [Delete] on the menu.

#### 3. Cut

[Sequence]

- (1) Select the area to cut.
- (2) Select [Edit]-[Cut] on the menu.

# Chapter 12 Variable

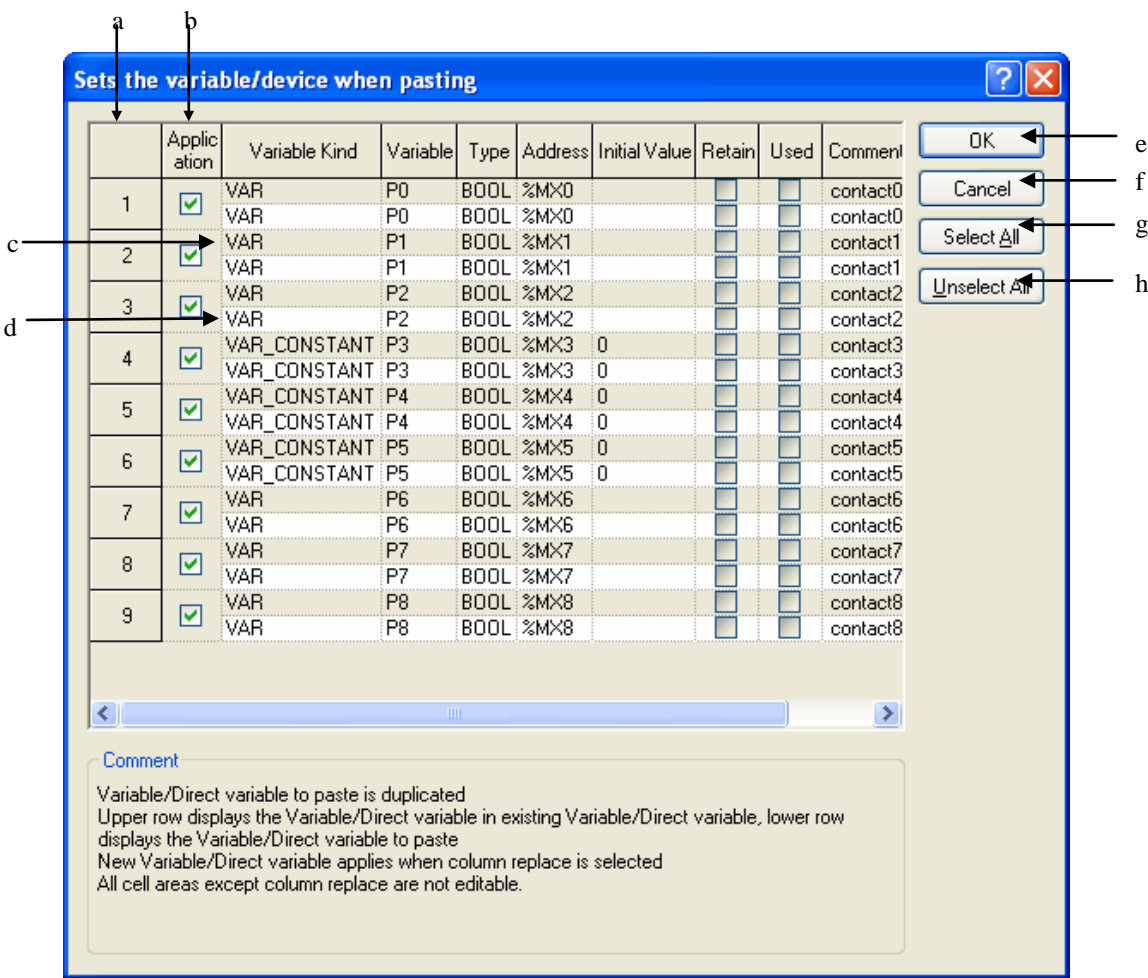
## 4. Paste

\* If the data saved in the clipboard is a part of columns,

[Sequence]

- (1) Select the position to paste on.
- (2) Select [Edit]-[Paste] on the menu.
- (3) If the variable and direct variable are identical on the list of variables/comments, the dialog box will be called.

[Communication Box]

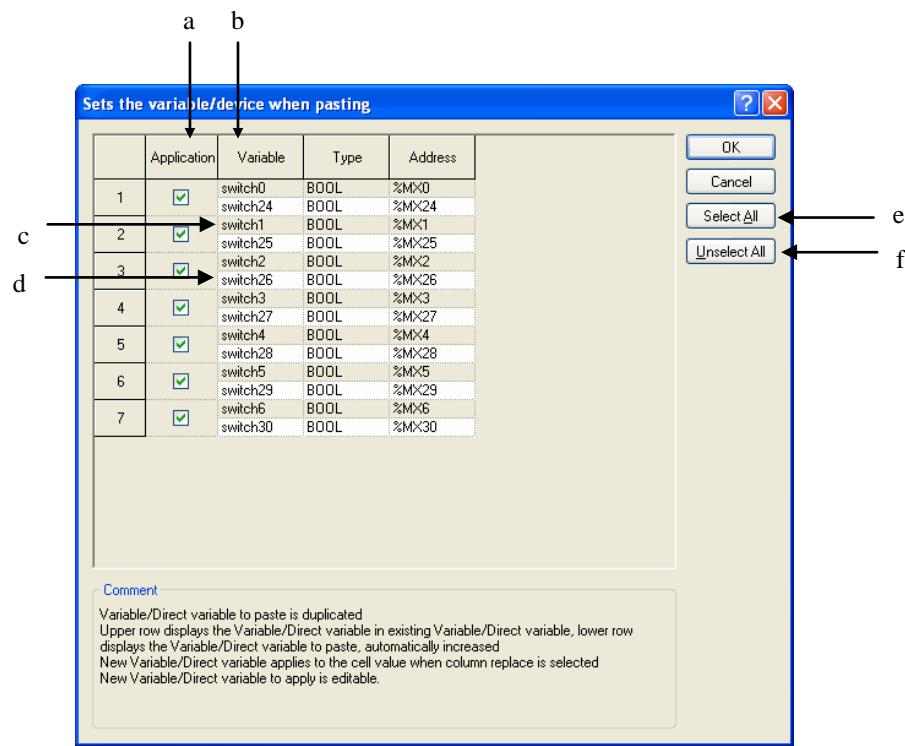


[Comment of Communication Box]

- (a) Number: Used to display the duplicated number of the variables and direct variables to paste
- (b) Application: Used to apply Paste.
- (c) Gray Line: Used to display the existing list of variables/comments, which will not be edited.
- (d) White Line: Used to display the list of variables/comments obtained from the clipboard, which will not be edited.
- (e) OK: Applies the lines of the selected check box. The existing list of variables/comments will be deleted to add a new list of variables/comments.
- (f) Cancel: The existing list of variables/comments will not be deleted, and a new the list of variables/comments will not be applied accordingly.
- (g) Select All: used to check all the check boxes in the [Replace] column.
- (h) Unselect All: used to cancel all the selected check boxes in the [Replace] column.

- \* If the data saved in the clipboard is of the partial column,  
[Sequence]
- (1) Select the position to paste on.
  - (2) Select [Edit] – [Paste] on the menu.
  - (3) If the variable and direct variable are identical on the list of variables/comments, the dialog box will be called.

[Communication Box]



[Description of Communication Box]

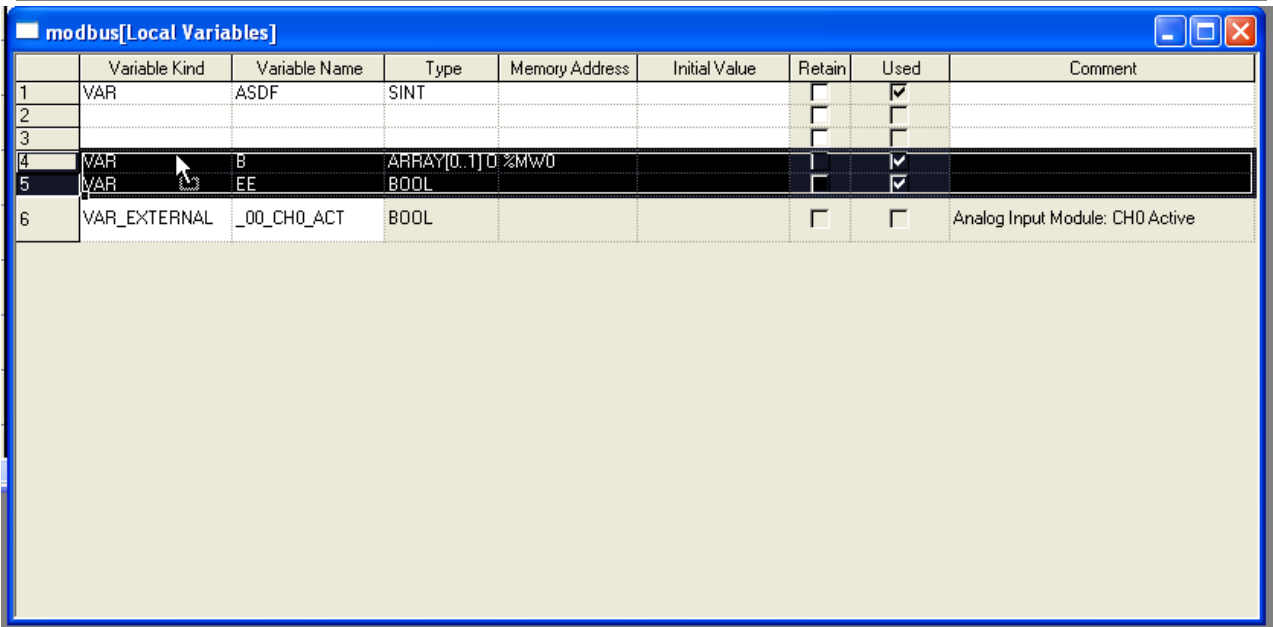
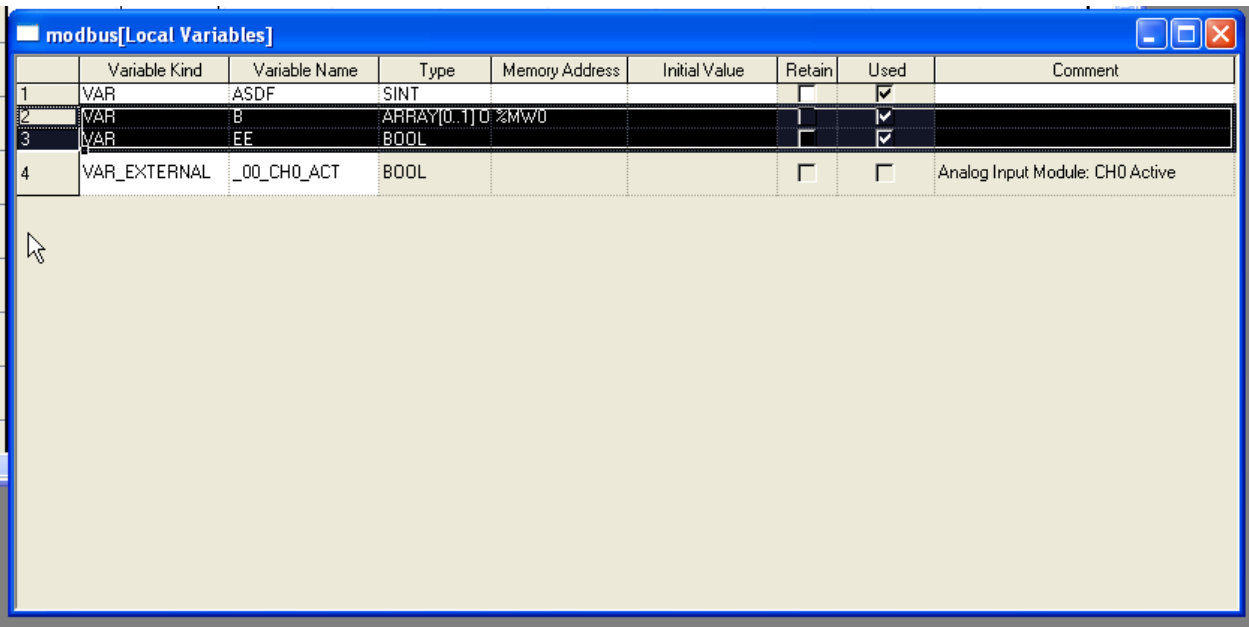
- (a) Number: used to display the duplicated number of the variables and direct variables to paste.
- (b) Application: used to apply Paste.
- (c) Gray Line: used to display the data in the existing cell, which will not be edited.
- (d) White Line: If the variable or device of the data to paste is duplicated, it will be automatically increased and then displayed on the screen. In addition, the cell can be edited.
- (e) Select All: used to check all the check boxes in the [Replace] column.
- (f) Unselect All: used to cancel all the selected check boxes in the [Replace] column.

12.4.3 Insert line

It is used to insert new lines as many as the lines of the selected area, which will make the existing lines move downward.

[Sequence]

- (1) Select the area to insert the lines into.
- (2) Select [Edit] - [Insert Line] on the menu.



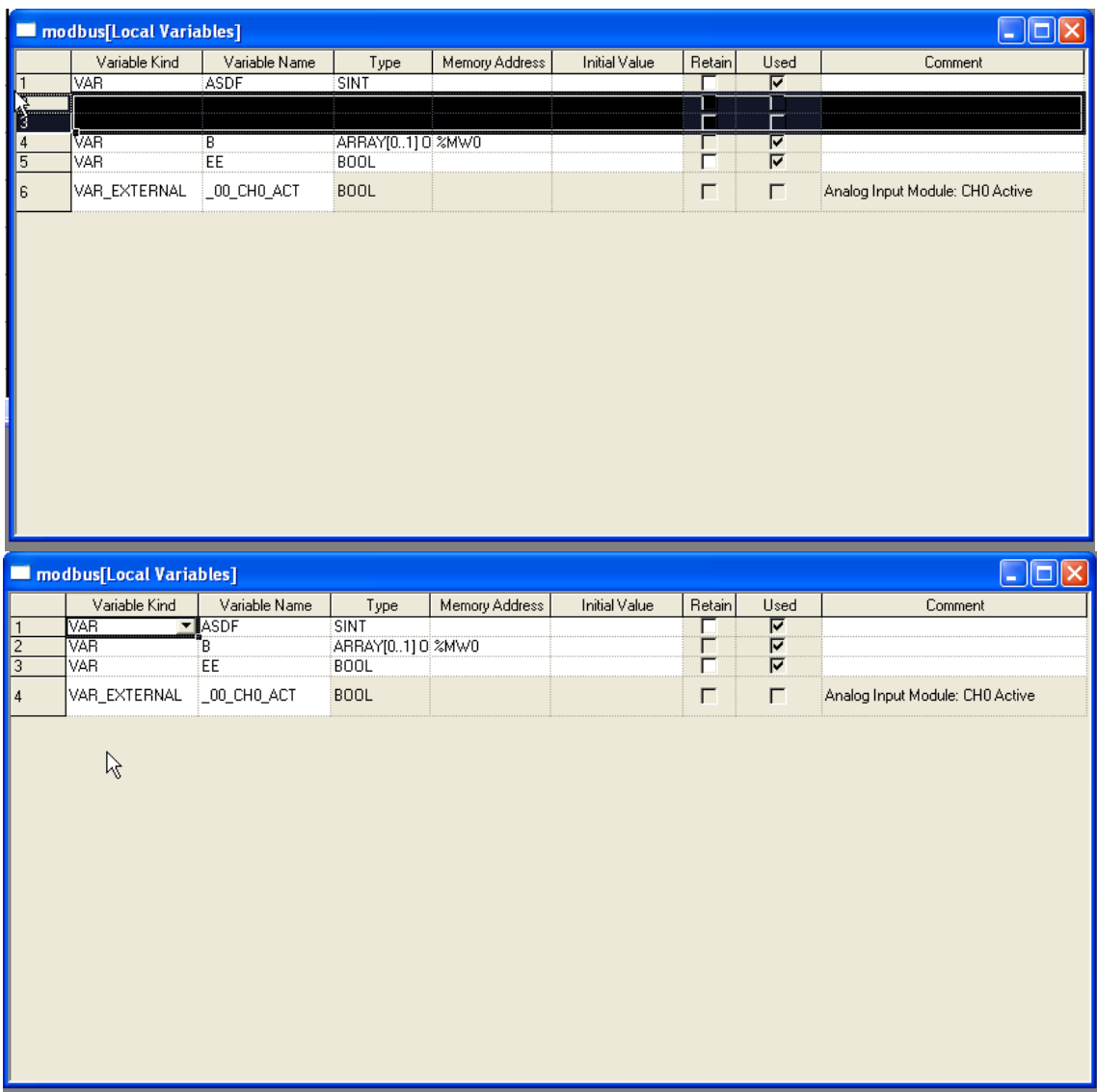


12.4.4 Delete line

It is used to delete the lines as many as the lines of the selected area.

[Sequence]

- (1) Select the area to delete the lines from.
- (2) Select [Edit] - [Delete Line] on the menu.

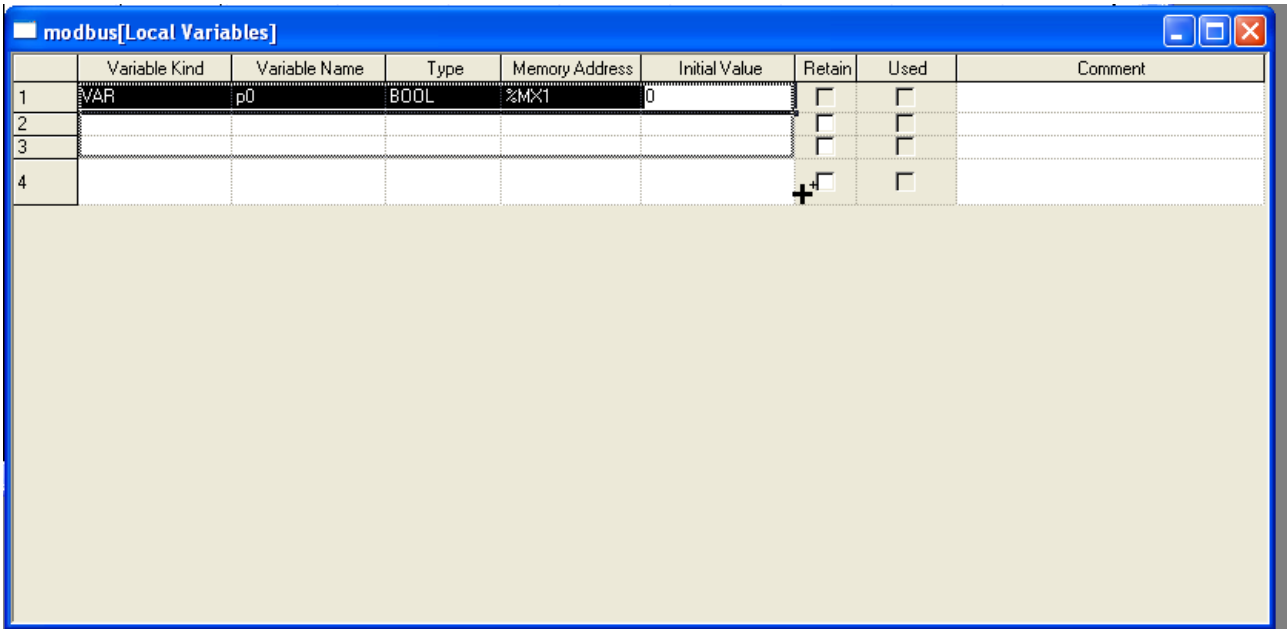
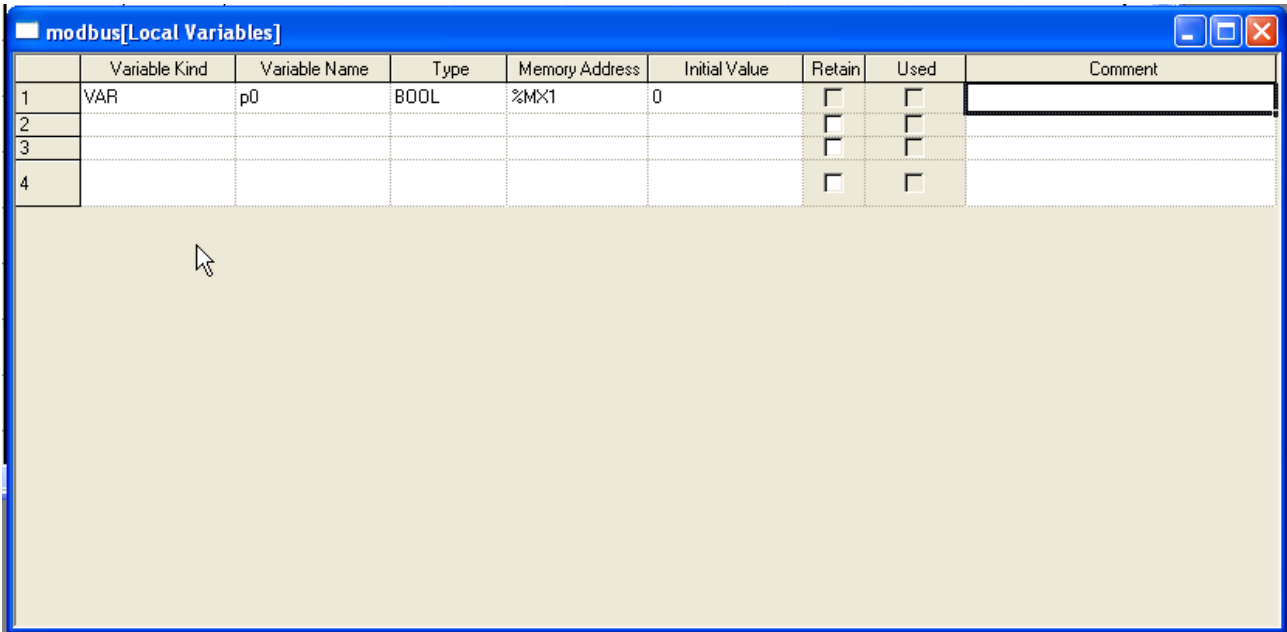


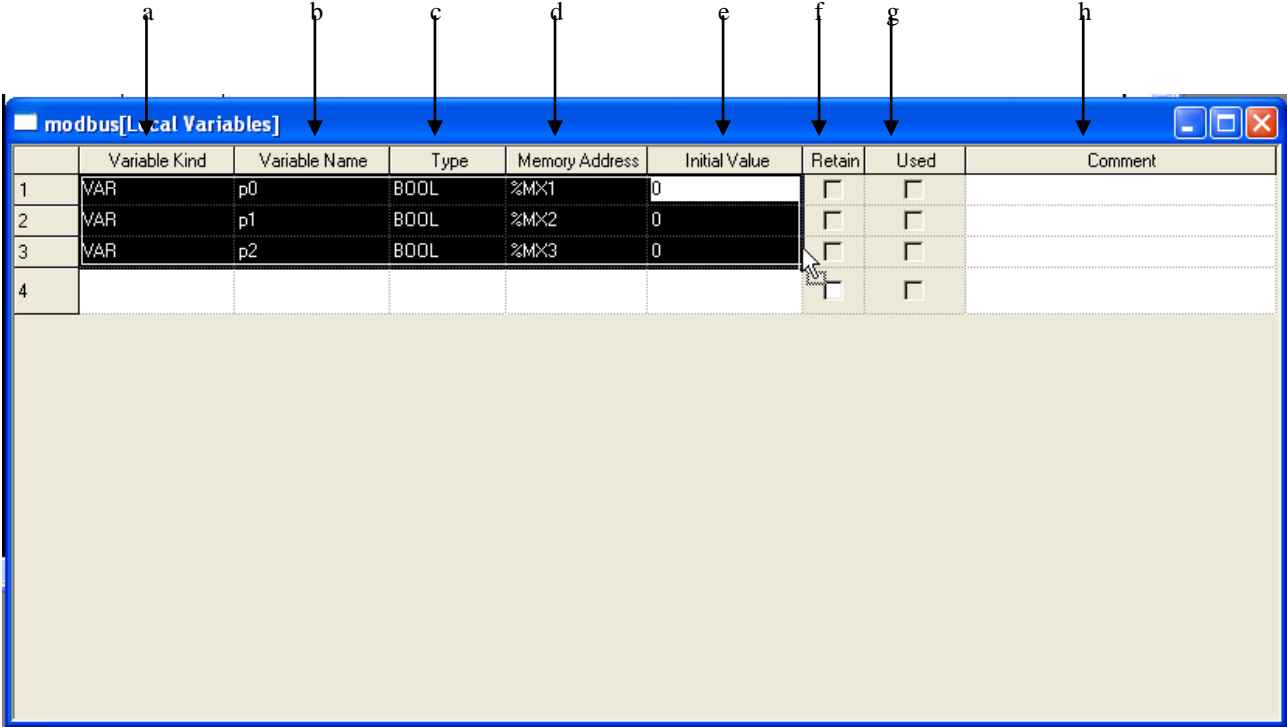
12.4.5 Automatic fill

It is used to increase or decrease variables and direct variables to add on the list of variables/comments.

[Sequence]

- (1) Move the mouse to the end of the cell and the mouse cursor will change to + shape.
- (2) Move the mouse upward and downward with its left button being pressed.





[Description of dialog box]

- (a) Variable kind: the value is filled in a cell as copied.
- (b) Variable name: it always executes Automatic Fill because a variable can not be declared in duplicate. If it contains a number, it automatically increases. If not, it adds a number at the end and counts it automatically.
- (c) Type: it is filled in a cell as copied.
- (d) Memory address: it always executes Automatic Fill because memory allocation can not be declared in duplicate. If it contains a number, it searches for the part and increases it automatically.
- (e) Initial value: it is filled in a cell as copied.
- (f) Retain: it is checked as copied.
- (g) Used: it can not be modified because of Read Only.
- (h) Comment: If Automatic Fill is executed with Ctrl key being pressed, the figures area will automatically increase, and if with Ctrl key not pressed, it will be copied.

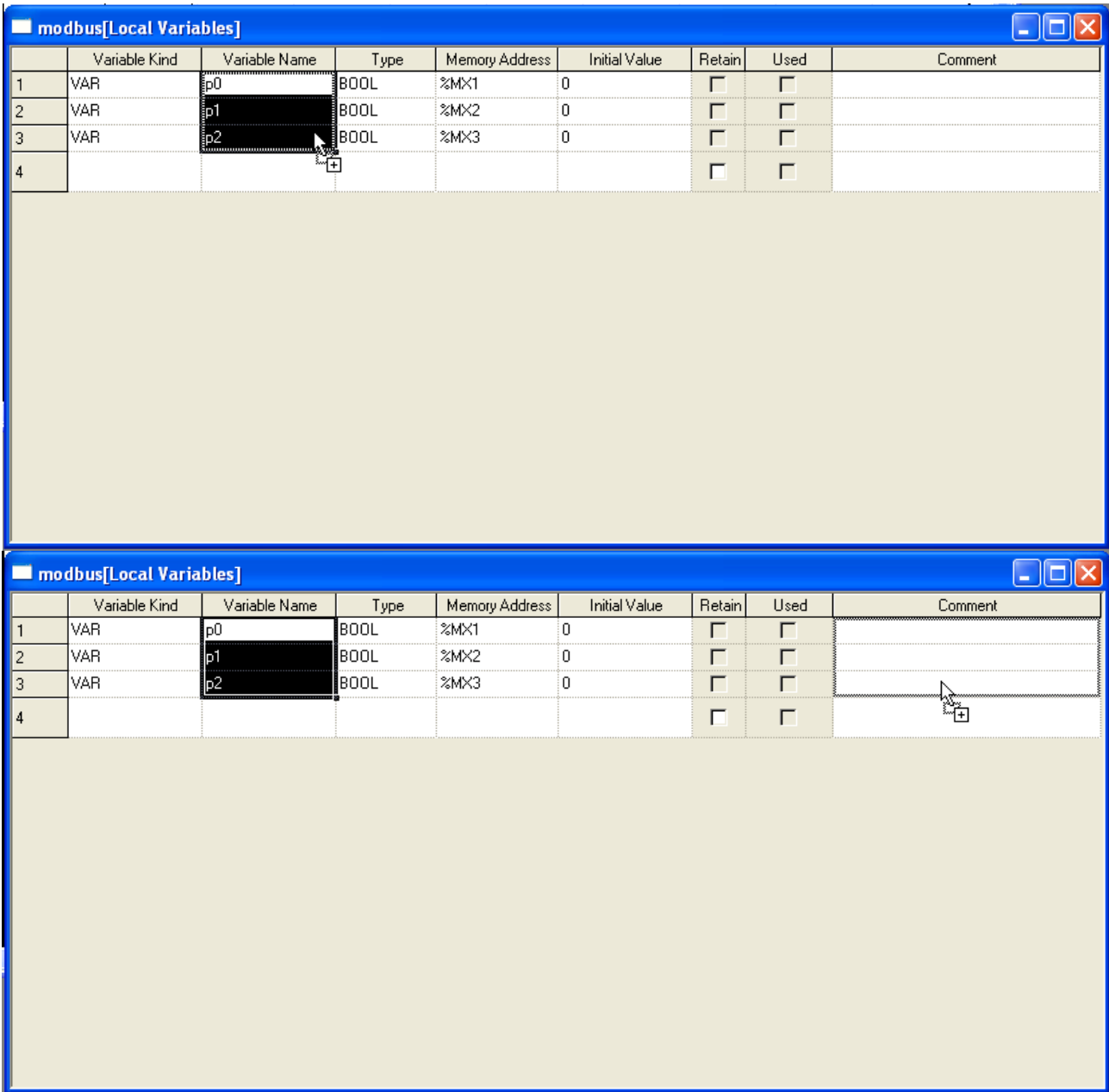
Notes	
1.	If Automatic Fill is executed with an empty cell, it will be deleted.
2.	Automatic Fill is available for many cells.
- It is applied to the global variable/ direct variable/position data only.	

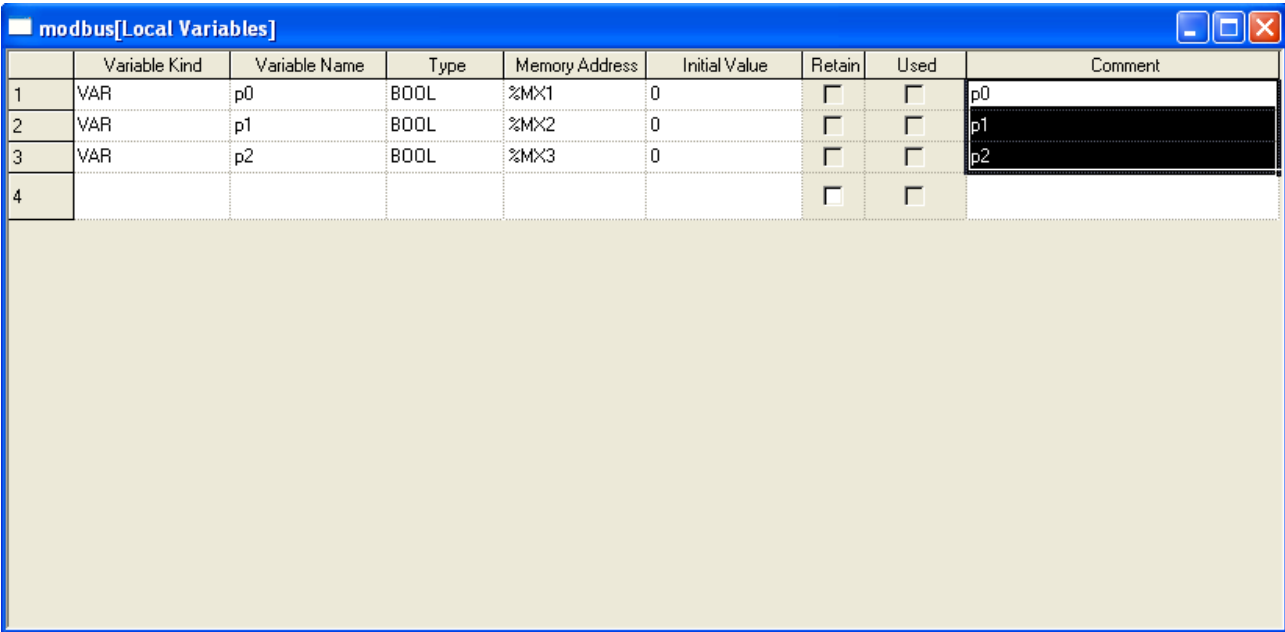
12.4.6 Drag & Drop

It is used to copy the selected items to paste on different positions.

[Sequence]

- (1) Select the area to drag and drop.
- (2) The mouse cursor will change to the state available for drag and drop.
- (3) With the left mouse button being pressed, drag and drop the selected items onto a position to paste on.





	Variable Kind	Variable Name	Type	Memory Address	Initial Value	Retain	Used	Comment
1	VAR	p0	BOOL	%M×1	0	<input type="checkbox"/>	<input type="checkbox"/>	p0
2	VAR	p1	BOOL	%M×2	0	<input type="checkbox"/>	<input type="checkbox"/>	p1
3	VAR	p2	BOOL	%M×3	0	<input type="checkbox"/>	<input type="checkbox"/>	p2
4						<input type="checkbox"/>	<input type="checkbox"/>	

[Details]

- (a) Drag and drop is available onto Variable Monitoring Window.
- (b) Drag and drop is available onto LD Window.
- (c) Copy is available when drag and drop is executed onto Excel program.
- (d) Drag and drop is available onto Data Traces window.
- (e) Drag and drop is available onto Global Variable of other XG5000 programs.
- (f) Data is not moved but just copied always when dragged and dropped.

12.4.7 Undo/Redo

Undo is used to cancel the edited detail in order to return to its previous state. Redo cancels again the operation of Edit Cancel.

[Details]

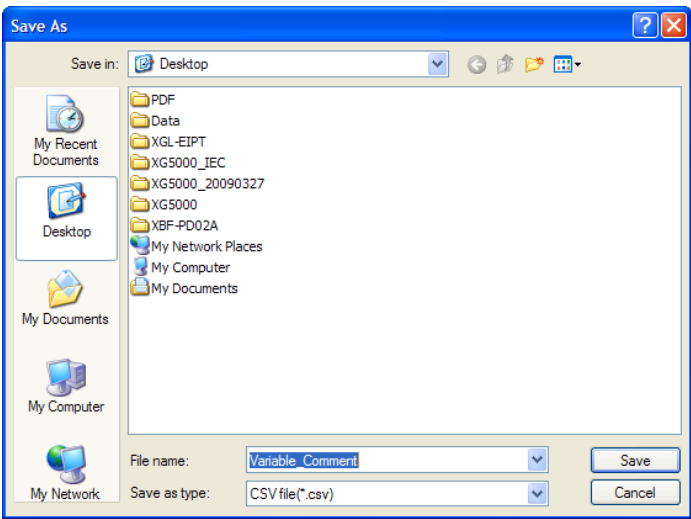
- (1) Undo/Redo is available for Cell Edit.
- (2) Undo/Redo is available for Change.
- (3) Undo/Redo is available for All Change.
- (4) Undo/Redo is available for Delete.
- (5) Undo/Redo is available for Cut.
- (6) Undo/Redo is available for Paste.
- (7) Undo/Redo is available for Automatic Fill.
- (8) Undo/Redo is available for Insert Line. (Only in Global Variable)
- (9) Undo/Redo is available for Delete Line. (Only in Global Variable)
- (10) Undo/Redo is available for drag and drop.
- (11) Undo/Redo is available for Align. (Only in Global Variable)
- (12) If EXTERNAL variable is added, it executes Undo/Redo.

12.4.8 Export into text file

It is used to save the previously declared list of global variables on the file and to open and read in the external programs.

[Sequence]

- (1) Select [Edit] - [Export to File] on the menu.
- (2) If you press 'Save', file is saved as inputted file name at selected folder location.
- (3) If you press 'Cancel', file is not created and dialog box is closed.
- (4) File is classified by tap.



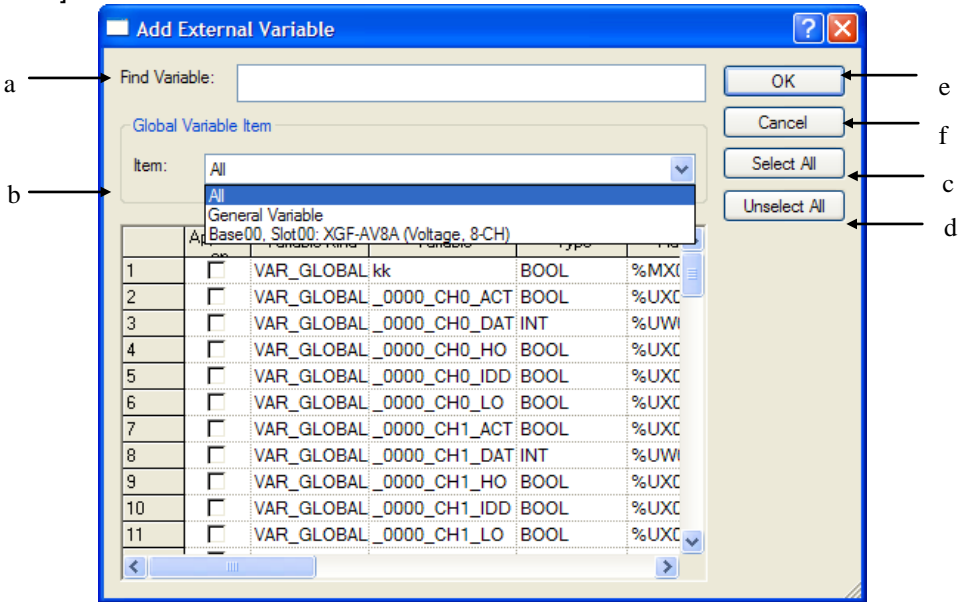
12.4.9 Add EXTERNAL Variable

The list created by Global Variable can be loaded by Add External Variable.

[Sequence]

- (1) Select [Edit]-[Add EXTERNAL Variable] on the menu.
- (2) Global Variable Selection Dialog Box will be called.

[Communication box]



[Description of Communication box]

- (a) Find Variable: Finds variable meeting the condition at information of Global Variable Item.
- (b) Global Variable item: At declared global variable item, displays items according to item types. All, general variable, special module - related variable
- (c) Select All: Selects all application column at global variable item.
- (d) Unselect All: Unselects all application columns at global variable item.
- (e) OK: Closes dialog box and registers global variable as External variable.
- (f) Cancel: Closes dialog box and doesn't register the selected variable as External variable.

## 12.5 User data type

XG-PM provides the function that can register the data type to be used for the program and edit the variable, type, description remark, etc., other than the basic data type.

### 12.5.1 Registering user data type

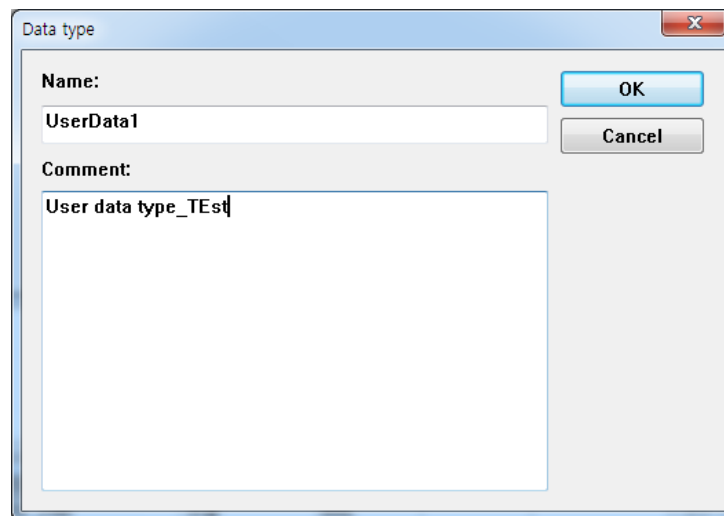
It registers the data type to be used for the program. Registering the data type in a list can be done in the data type.

#### 1. Adding user data type

It adds the user data type.

[Sequence]

- (1) Select the [User data type] in a project tree.
- (2) Select the [Project]-[Add items]-[User data type].
- (3) Input the name of data type and description remark in a dialog box and click the OK button.



2. Adding variable in a user data type

[Communication box]

	Variable	Type	Address	Initial Value	Retain	Comment
1	IN_1	BOOL	0.0		<input type="checkbox"/>	
2	IN_2	BOOL	0.1		<input type="checkbox"/>	
3	IN_3	BOOL	0.2		<input type="checkbox"/>	
4	IN_VALUE	WORD	2.0		<input type="checkbox"/>	
5	OUT_1	BOOL	4.0		<input type="checkbox"/>	
6	OUT_2	BOOL	4.1		<input type="checkbox"/>	
7	OUT_3	BOOL	4.2		<input type="checkbox"/>	
8	OUT_VALUE	WORD	6.0		<input type="checkbox"/>	
9					<input type="checkbox"/>	
10					<input type="checkbox"/>	
11					<input type="checkbox"/>	

[Description of Communication box]

- (a) Variable name: The declared variable can not be duplicated with the identical name.
  - A figure is unavailable for the first character.
  - A special character is unavailable. (However, ‘\_’ is available.)
  - Space is not available as a character.
  - A same name with a direct variable is unavailable (i.e. MX0, WB0,...)
  - If a line is empty, BOOL is displayed as the default type when entering a variable.
- (b) Type: 22 types are available; 19 basic types and 3 induced types.
  - Basic type (19): BOOL, BYTE, WORD, DWORD, LWORD, SINT, INT, DINT, LINT, USINT, UINT, UDINT, ULINT, REAL, LREAL, TIME, DATE, TIME\_OF\_DAY, DATE\_AND\_TIME
  - Induced type (1): ARRAY(i.e. ARRAY[0..6,0..2,0..4] OF BOOL) => factor limit (up to 3rd),
- (c) Memory address: enters it by using direct variable (G,D,M).
- (d) Initial value: default value can be set.
- (e) Retain: if memory address is set, retain column is inactive.
- (f) Comment: every character is available.

Notes

- 1. If any error occurs when editing a cell, it is displayed in pink.
- 2. Press ESC key to recover the previous value during the cell edit
- 3. The memory assignment information is indicated in the format of “BYTE.BIT”.



### 12.5.2 Copy, Cut, Delete and Paste

Copy, cut, delete or paste can be executed to edit the list of local variables used in the program.

#### 1. Copy

[Sequence]

- (1) Select the area to copy.
- (2) Select [Edit] - [Copy] on the menu.

#### 2. Delete

[Sequence]

- (1) Select the area to delete.
- (2) Select [Edit] - [Delete] on the menu.

#### 3. Cut

[Sequence]

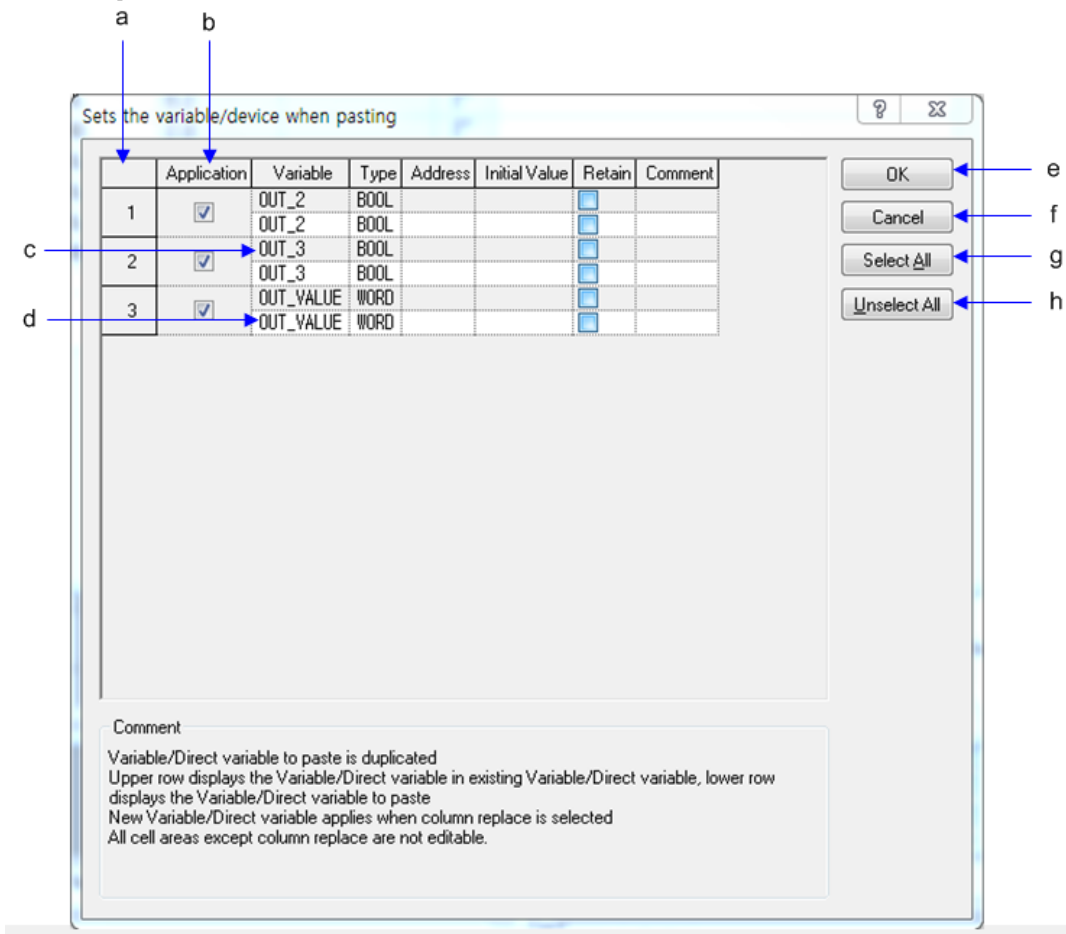
- (1) Select the area to cut.
- (2) Select [Edit]-[Cut] on the menu.

4. Paste

\* If the data saved in the clipboard is a part of columns,  
[Sequence]

- (1) Select the position to paste on.
- (2) Select [Edit]-[Paste] on the menu.
- (3) If the variable and direct variable are identical on the list of variables/comments, the dialog box will be called.

[Communication Box]



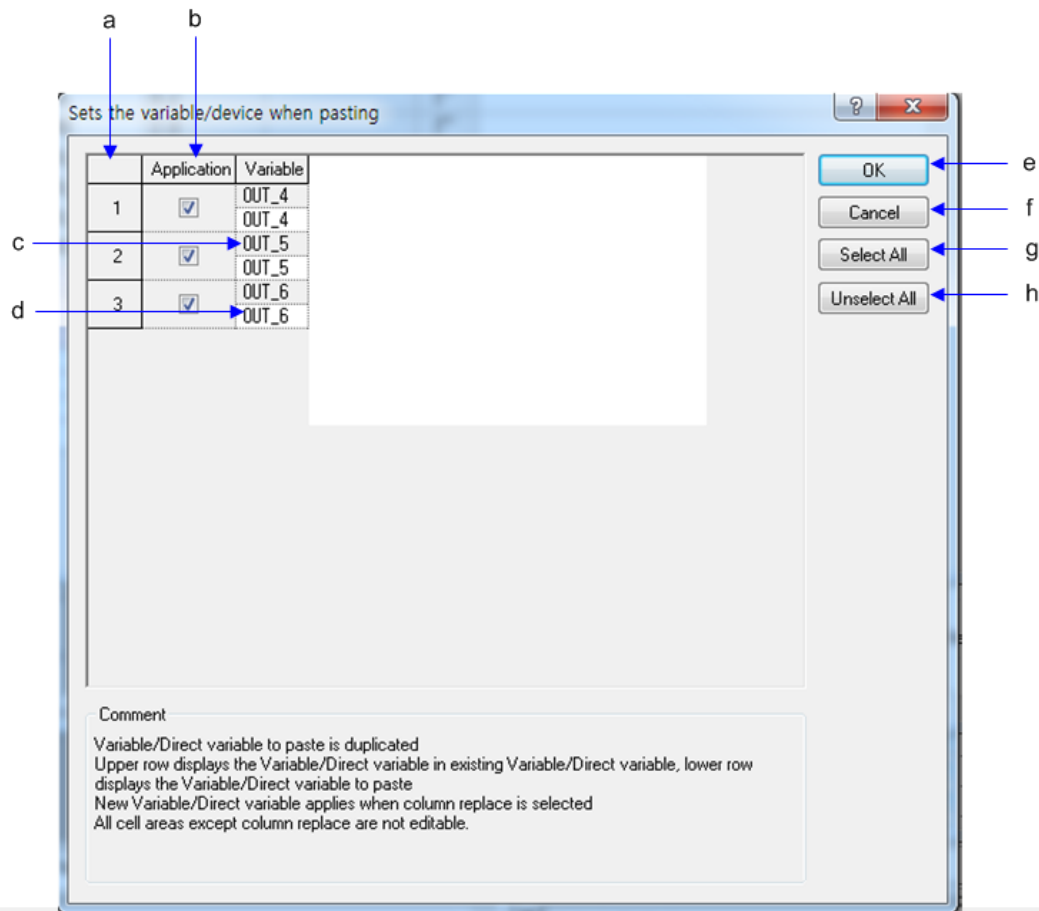
[Comment of Dialog Box]

- (a) Number: Used to display the duplicated number of the variables and direct variables to paste
- (b) Application: Used to apply Paste.
- (c) Gray Line: Used to display the existing list of variables/comments, which will not be edited.
- (d) White Line: Used to display the list of variables/comments obtained from the clipboard, which will not be edited.
- (e) OK: Applies the lines of the selected check box. The existing list of variables/comments will be deleted to add a new list of variables/comments.
- (f) Cancel: The existing list of variables/comments will not be deleted, and a new the list of variables/ comments will not be applied accordingly.
- (g) Select All: Used to check all the check boxes in the [Replace] column.
- (h) Unselect All: Used to cancel all the selected check boxes in the [Replace] column.

\* If the data saved in the clipboard is of the partial column,  
[Sequence]

- (1) Select the position to paste on.
- (2) Select [Edit] – [Paste] on the menu.
- (3) If the variable and direct variable are identical on the list of variables/comments, the dialog box will be called.

[Communication Box]



[Comment of Dialog Box]

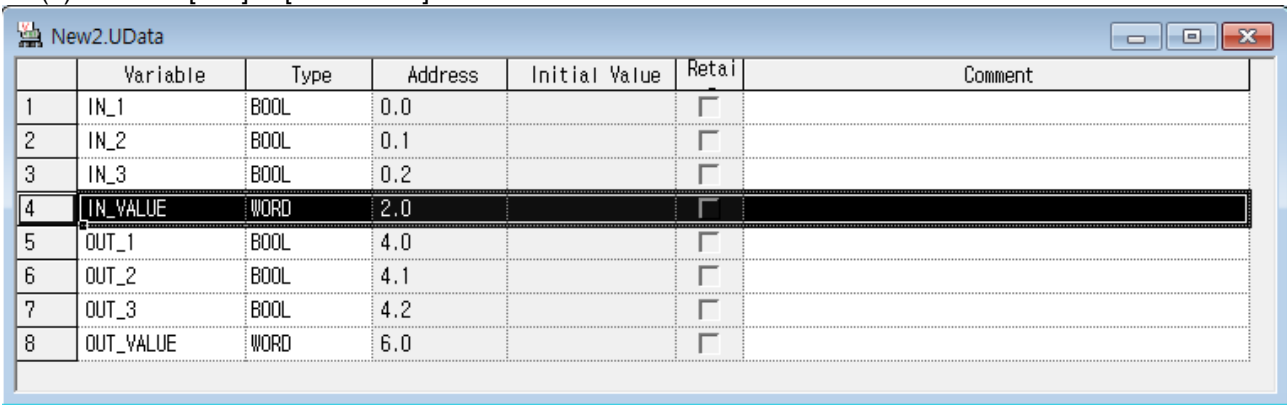
- (a) Number: used to display the duplicated number of the variables and direct variables to paste.
- (b) Application: used to apply Paste.
- (c) Gray Line: used to display the data in the existing cell, which will not be edited.
- (d) White Line: If the variable or device of the data to paste is duplicated, it will be automatically increased and then displayed on the screen. In addition, the cell can be edited.
- (e) Select All: used to check all the check boxes in the [Replace] column.
- (f) Unselect All: used to cancel all the selected check boxes in the [Replace] column.

12.5.3 Insert line

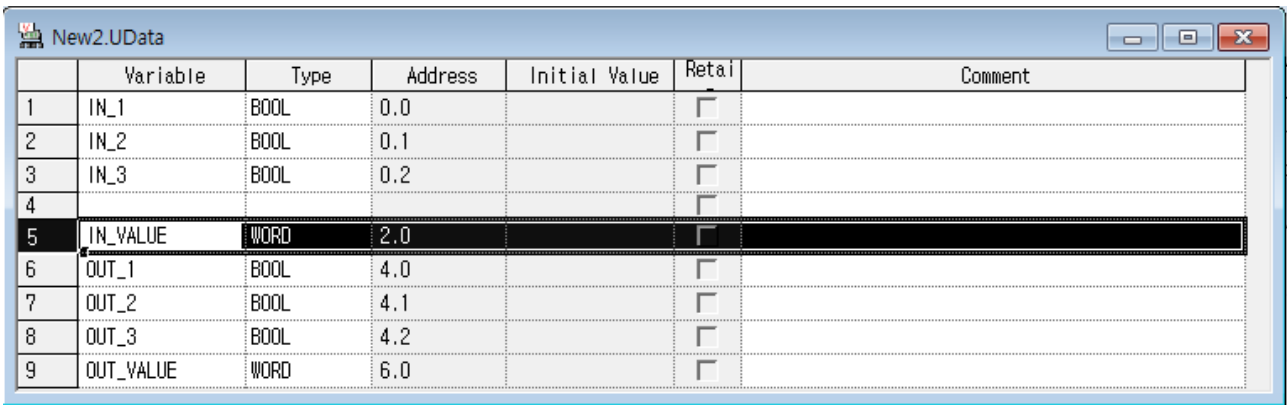
It is used to insert new lines as many as the lines of the selected area, which will make the existing lines move downward.

[Sequence]

- (1) Select the area to insert the lines into.
- (2) Select [Edit] - [Insert Line] on the menu.



	Variable	Type	Address	Initial Value	Retai	Comment
1	IN_1	BOOL	0.0		<input type="checkbox"/>	
2	IN_2	BOOL	0.1		<input type="checkbox"/>	
3	IN_3	BOOL	0.2		<input type="checkbox"/>	
4	IN_VALUE	WORD	2.0		<input type="checkbox"/>	
5	OUT_1	BOOL	4.0		<input type="checkbox"/>	
6	OUT_2	BOOL	4.1		<input type="checkbox"/>	
7	OUT_3	BOOL	4.2		<input type="checkbox"/>	
8	OUT_VALUE	WORD	6.0		<input type="checkbox"/>	



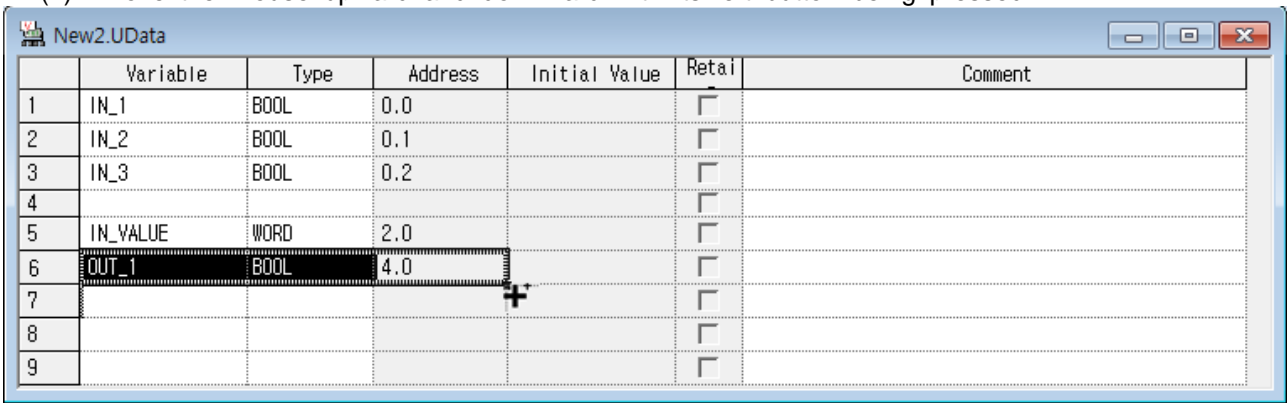
	Variable	Type	Address	Initial Value	Retai	Comment
1	IN_1	BOOL	0.0		<input type="checkbox"/>	
2	IN_2	BOOL	0.1		<input type="checkbox"/>	
3	IN_3	BOOL	0.2		<input type="checkbox"/>	
4					<input type="checkbox"/>	
5	IN_VALUE	WORD	2.0		<input type="checkbox"/>	
6	OUT_1	BOOL	4.0		<input type="checkbox"/>	
7	OUT_2	BOOL	4.1		<input type="checkbox"/>	
8	OUT_3	BOOL	4.2		<input type="checkbox"/>	
9	OUT_VALUE	WORD	6.0		<input type="checkbox"/>	

12.5.4 Automatic fill

It is used to increase or decrease variables and direct variables to add on the list of variables/comments.

[Sequence]

- (1) Move the mouse to the end of the cell and the mouse cursor will change to + shape
- (2) Move the mouse upward and downward with its left button being pressed.



	Variable	Type	Address	Initial Value	Retai	Comment
1	IN_1	BOOL	0.0		<input type="checkbox"/>	
2	IN_2	BOOL	0.1		<input type="checkbox"/>	
3	IN_3	BOOL	0.2		<input type="checkbox"/>	
4					<input type="checkbox"/>	
5	IN_VALUE	WORD	2.0		<input type="checkbox"/>	
6	OUT_1	BOOL	4.0		<input type="checkbox"/>	
7					<input type="checkbox"/>	
8					<input type="checkbox"/>	
9					<input type="checkbox"/>	

New2.UData

	Variable	Type	Address	Initial Value	Retain	Comment
1	IN_1	BOOL	0.0		<input type="checkbox"/>	
2	IN_2	BOOL	0.1		<input type="checkbox"/>	
3	IN_3	BOOL	0.2		<input type="checkbox"/>	
4					<input type="checkbox"/>	
5	IN_VALUE	WORD	2.0		<input type="checkbox"/>	
6	OUT_1	BOOL	4.0		<input type="checkbox"/>	
7					<input type="checkbox"/>	
8					<input type="checkbox"/>	
9					<input type="checkbox"/>	

New2.UData

	Variable	Type	Address	Initial Value	Retain	Comment
1	IN_1	BOOL	0.0		<input type="checkbox"/>	
2	IN_2	BOOL	0.1		<input type="checkbox"/>	
3	IN_3	BOOL	0.2		<input type="checkbox"/>	
4					<input type="checkbox"/>	
5	IN_VALUE	WORD	2.0		<input type="checkbox"/>	
6	OUT_1	BOOL	4.0		<input type="checkbox"/>	
7	OUT_2	BOOL	4.1		<input type="checkbox"/>	
8	OUT_3	BOOL	4.2		<input type="checkbox"/>	
9					<input type="checkbox"/>	

[Details]

- (a) Variable Kind: the value is filled in a cell as copied.
- (b) Variable Name: it always executes Automatic Fill because a variable can not be declared in duplicate. If it contains a number, it automatically increases. If not, it adds a number at the end and counts it automatically.
- (c) Type: it is filled in a cell as copied.
- (d) Memory address: it can not be declared as Read Only.
- (e) Initial value: it is filled in a cell as copied.
- (f) Retain: it can not be declared as Read Only.
- (g) Used: it can not be declared as Read Only.
- (h) Comment: a number is automatically increased if automatic fill is executed with Ctrl pressed; if not, it is copied.

Notes

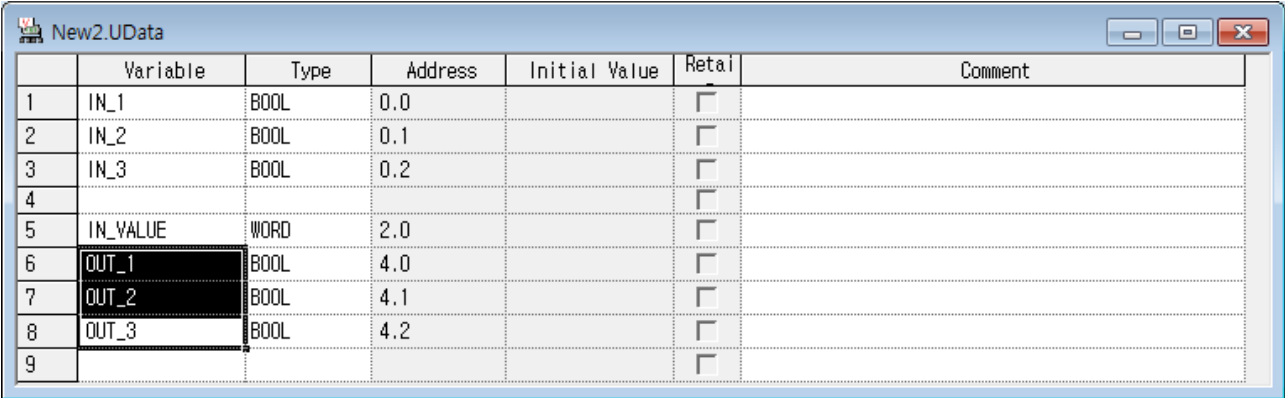
- 1. If any error occurs when editing a cell, it is displayed in pink.
- 2. Press ESC key to recover the previous value during the cell edit.
- 3. It is applied to the global variable/ direct variable/position data only.

12.5.5 Drag & Drop

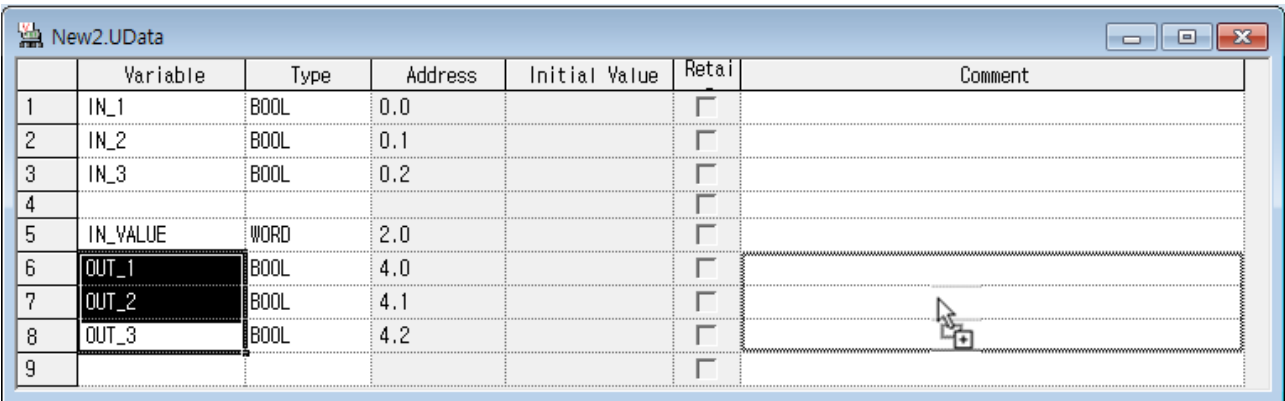
It is used to copy the selected items to paste on different positions.

[Sequence]

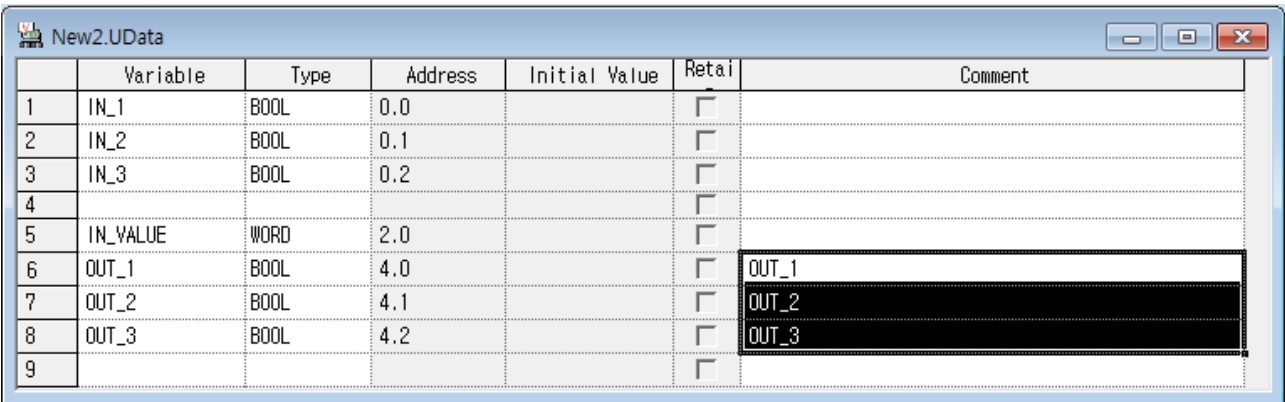
- (1) Select the area to drag and drop.
- (2) The mouse cursor will change to the state available for drag and drop.
- (3) With the left mouse button being pressed, drag and drop the selected items onto a position to paste on.



	Variable	Type	Address	Initial Value	Retai	Comment
1	IN_1	BOOL	0.0		<input type="checkbox"/>	
2	IN_2	BOOL	0.1		<input type="checkbox"/>	
3	IN_3	BOOL	0.2		<input type="checkbox"/>	
4					<input type="checkbox"/>	
5	IN_VALUE	WORD	2.0		<input type="checkbox"/>	
6	OUT_1	BOOL	4.0		<input type="checkbox"/>	
7	OUT_2	BOOL	4.1		<input type="checkbox"/>	
8	OUT_3	BOOL	4.2		<input type="checkbox"/>	
9					<input type="checkbox"/>	



	Variable	Type	Address	Initial Value	Retai	Comment
1	IN_1	BOOL	0.0		<input type="checkbox"/>	
2	IN_2	BOOL	0.1		<input type="checkbox"/>	
3	IN_3	BOOL	0.2		<input type="checkbox"/>	
4					<input type="checkbox"/>	
5	IN_VALUE	WORD	2.0		<input type="checkbox"/>	
6	OUT_1	BOOL	4.0		<input type="checkbox"/>	
7	OUT_2	BOOL	4.1		<input type="checkbox"/>	
8	OUT_3	BOOL	4.2		<input type="checkbox"/>	
9					<input type="checkbox"/>	



	Variable	Type	Address	Initial Value	Retai	Comment
1	IN_1	BOOL	0.0		<input type="checkbox"/>	
2	IN_2	BOOL	0.1		<input type="checkbox"/>	
3	IN_3	BOOL	0.2		<input type="checkbox"/>	
4					<input type="checkbox"/>	
5	IN_VALUE	WORD	2.0		<input type="checkbox"/>	
6	OUT_1	BOOL	4.0		<input type="checkbox"/>	OUT_1
7	OUT_2	BOOL	4.1		<input type="checkbox"/>	OUT_2
8	OUT_3	BOOL	4.2		<input type="checkbox"/>	OUT_3
9					<input type="checkbox"/>	

[Details]

- (a) Copy is available when drag and drop is executed onto Excel program.
- (b) Drag and drop is available onto local variable of other XG-PM programs.
- (c) Data is not moved but just copied always when dragged and dropped.

### 12.5.6 Undo/Redo

Undo is used to cancel the edited detail in order to return to its previous state. Redo cancels again the operation of Edit Cancel.

[Details]

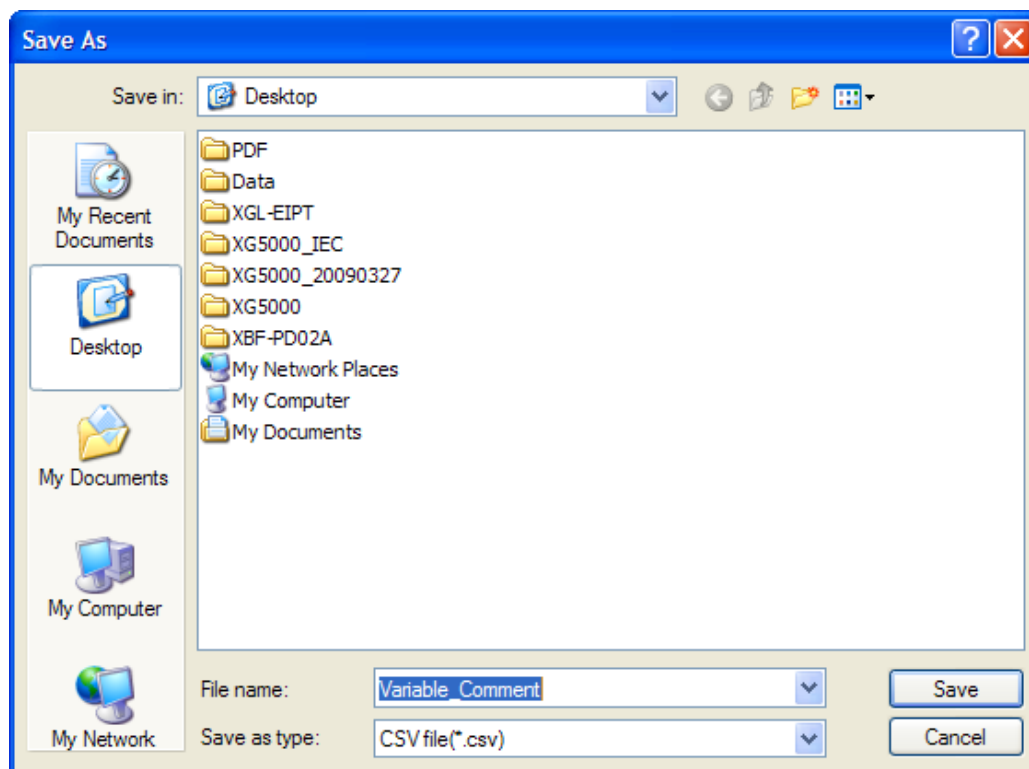
- (1) Undo/Redo is available for Cell Edit.
- (2) Undo/Redo is available for Change.
- (3) Undo/Redo is available for All Change.
- (4) Undo/Redo is available for Delete.
- (5) Undo/Redo is available for Cut.
- (6) Undo/Redo is available for Paste.
- (7) Undo/Redo is available for Automatic Fill.
- (8) Undo/Redo is available for Insert Line. (Only in Global Variable)
- (9) Undo/Redo is available for Delete Line. (Only in Global Variable)
- (10) Undo/Redo is available for drag and drop.
- (11) Undo/Redo is available for Align. (Only in Global Variable).

### 12.5.7 Export into text file

It is used to save the previously declared list of global variables on the file and to open and read in the external programs.

[Sequence]

- (1) Select [Edit] - [Export into text File] on the menu



- (2) If you press 'Save', file is saved as inputted file name at selected folder location.
- (3) If you press 'Cancel', file is not created and dialog box is closed.
- (4) File is classified by tap.





Chapter 13 LD Edit (Motion Control Module Only)

LD program displays the PLC program through graphic signals of coils or contact points used in the relay logic diagram.

13.1 Limit

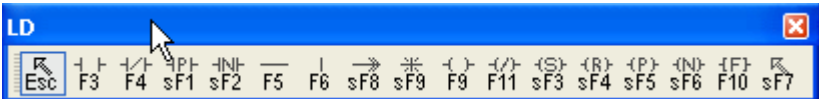
There are functional limits in LD Program Edit as described below.

Item	Description	Limit
Maximum contact points	Maximum contact points available to input in a line	Up to 31
Maximum lines	Maximum lines available to edit	Up to 65535
Maximum Copy lines	Maximum Copy lines available to copy at a time	Up to 300
Maximum Paste lines	Maximum Paste lines to paste at a time	Up to 300

13.2 Program Edit

13.2.1 Edit Tools

The input of LD Edit items shall be started after the input symbols are selected from the LD tool box and the mouse clicked on the specified position or with applicable Shortcut Key pressed.



Symbol	Shortcut key	Description
	Esc	Changes to selection mode
	F3	Normally open contact point
	F4	Normally closed contact point
	Shift + F1	Positive-conversion detection contact point
	Shift + F2	Negative-conversion detection contact point
	F5	Horizontal line
	F6	Vertical line
	Shift + F8	Connection line
	Shift + F9	Reverse input
	F9	Coil

Symbol	Shortcut key	Description
	F11	Reverse coil
	Shift + F3	Set(latch) coil
	Shift + F4	Reset(unlatch) coil
	Shift + F5	Positive-conversion detection coil
	Shift + F6	Negative-conversion detection coil
	F10	Function/Function block
	Shift + F7	Extended function
	Ctrl+3	Normally Open OR Contact
	Ctrl+4	Normally Closed OR Contact
	Ctrl+5	Positive Transition-sensing OR Contact
	Ctrl+6	Negative Transition-sensing OR Contact

### Notes

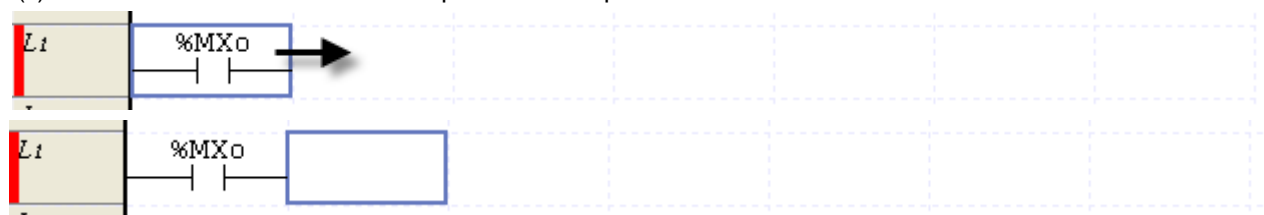
- Among Shortcut Keys in Edit Toolbox, 's' stands for Shift key, 'c' for Ctrl key.  
Ex.) Positive-conversion detection contact point: Shift + F1 → s + F1 → sF1

### 13.2.2 Input Contact point

This is used to input the contact points (normally open contact, normally closed contact, positive-conversion detection contact and negative-conversion detection contact).

[Sequence]

- (1) Move the cursor to the location to input the contact point on.



- (2) After the device name is input on the Variable Input Dialog Box, click [OK]. Refer to 13.2.4 Variable/Device Input for details on the Variable Input Dialog Box.

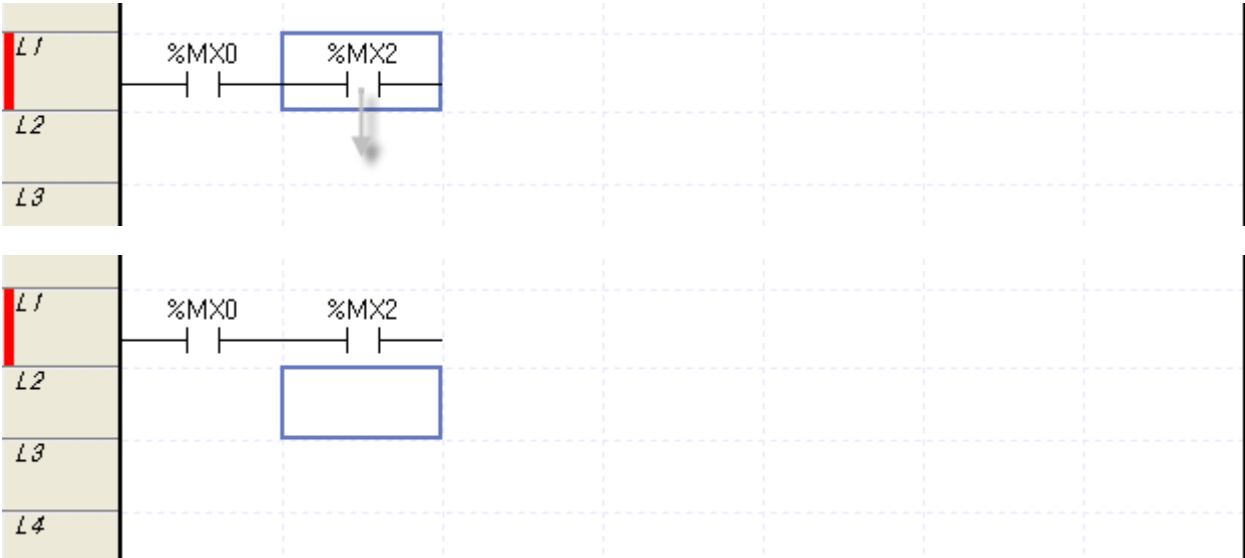


13.2.3 Input OR contact point

Inputs OR contact point (Normally opened OR contact point, Normally closed OR contact point, Positive-conversion detection OR contact point, Negative-conversion detection OR contact point)

[Sequence]

(1) Move the cursor where you want connect OR



- (2) Select contact point kind at Toolbar and click editing area. Or press shortcut key corresponding to OR contact point
- (3) Input device name at dialog box for variable input. For detail on dialog box for variable input, refer to 13.2.4



Note

- 1. In duplicated mode, in case contact point is in cursor, OR connection does not operate

### 13.2.4 Input Variable/Device

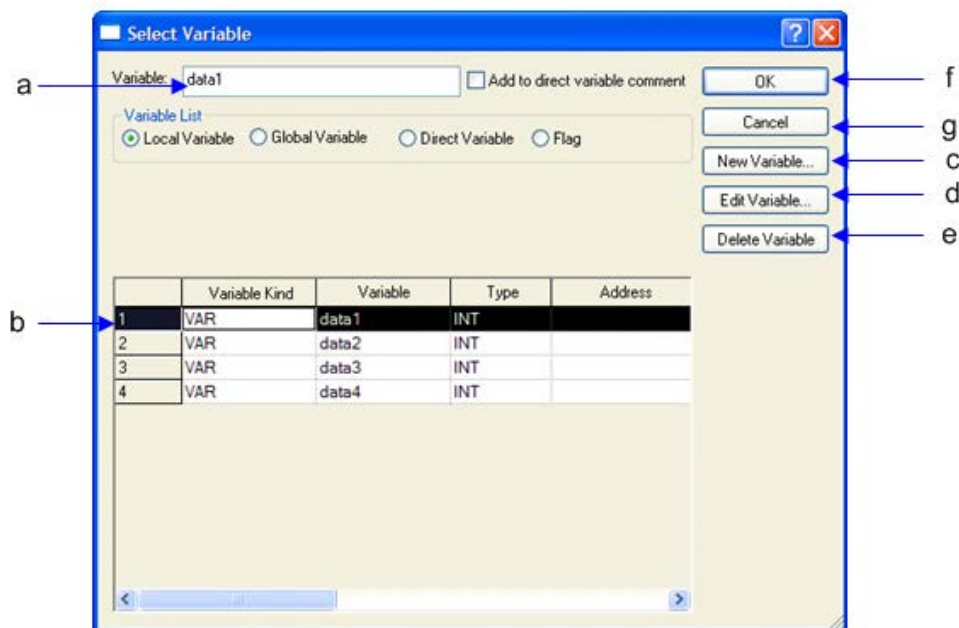
#### 1. Input Local variable

It is used to input the Device or Variable/Comment.

[Sequence]

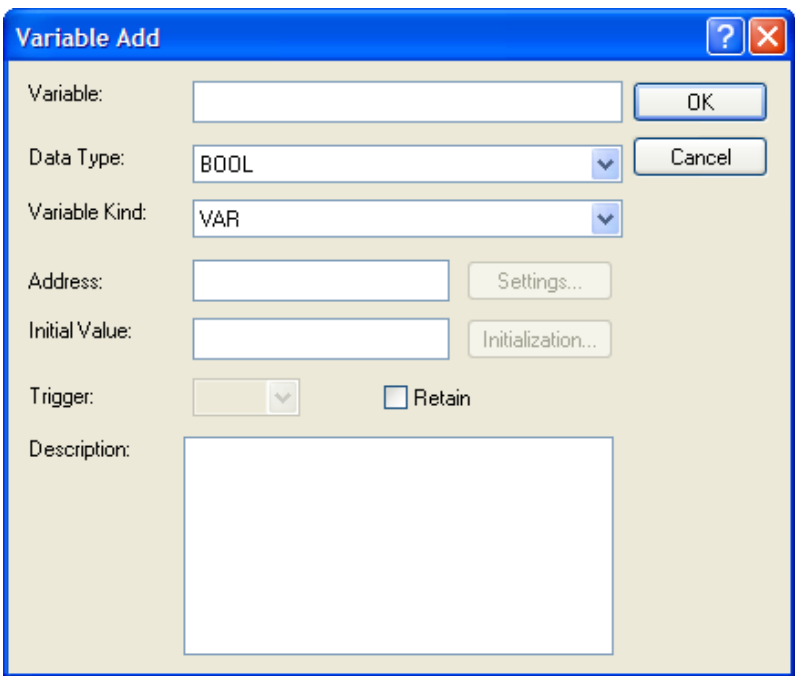
- (1) Move a cursor to the position where the variable should be input and double-click.
- (2) Select the local variable in a variable type (default).

[Communication Box]



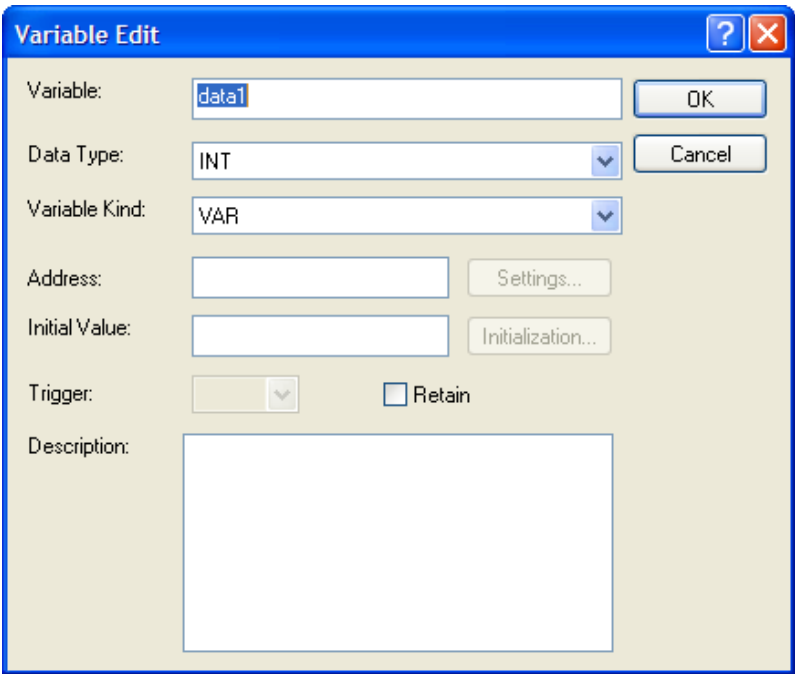
[Description of Dialog Box]

- (a) Variable: used to input a variable or declared variable name. If the input String is of variable format and the applicable String is not registered as a variable in the Variable/Comment, the Variable/Comment Add Dialog Box will be displayed.
- (b) Local variable: displays the list of declared local variable
- (c) New Variable: recalls dialog box to add variable into local variable list



The 'Variable Add' dialog box is a standard Windows-style window with a blue title bar containing a question mark and a close button. The main area has a light beige background. It contains several input fields and buttons: 'Variable:' with an empty text box; 'Data Type:' with a dropdown menu showing 'BOOL'; 'Variable Kind:' with a dropdown menu showing 'VAR'; 'Address:' with an empty text box and a 'Settings...' button; 'Initial Value:' with an empty text box and an 'Initialization...' button; 'Trigger:' with a dropdown menu and a 'Retain' checkbox; and a large 'Description:' text area at the bottom. 'OK' and 'Cancel' buttons are located in the top right corner.

(d) Edit Variable: recalls dialog box to edit the selected variable



The 'Variable Edit' dialog box is similar to the 'Variable Add' dialog box but with some pre-filled data. The 'Variable:' text box contains 'data1'. The 'Data Type:' dropdown shows 'INT'. The 'Variable Kind:' dropdown shows 'VAR'. The 'Address:', 'Initial Value:', and 'Trigger:' fields are empty. The 'Retain' checkbox is unchecked. The 'Description:' text area is empty. The 'OK' and 'Cancel' buttons are in the top right corner.

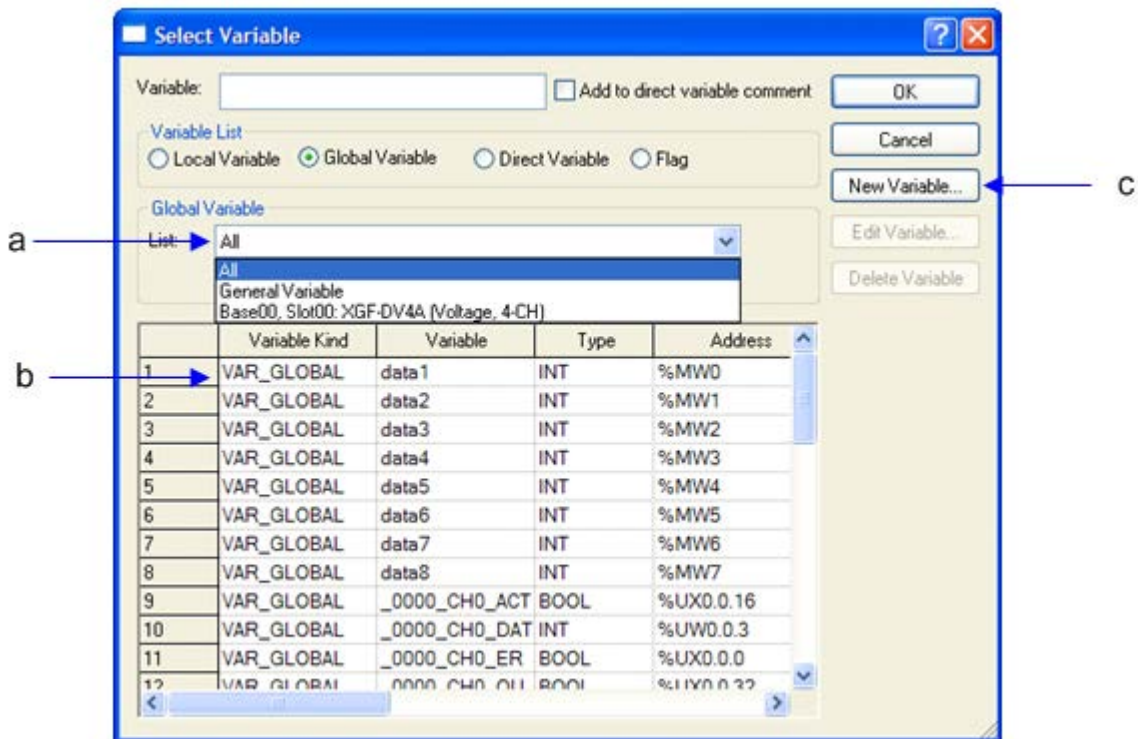
- (e) Delete Variable: deletes the selected variable from local variable list
- (f) OK: applies the inputted or selected items and closes the dialog box
- (g) Cancel: closes dialog box

2. Input Global variable

[Sequence]

- (1) Move a cursor to the position where the variable should be input and double-click.
- (2) Select the Global variable in a variable type

[Dialog box]



[Description of dialog box]

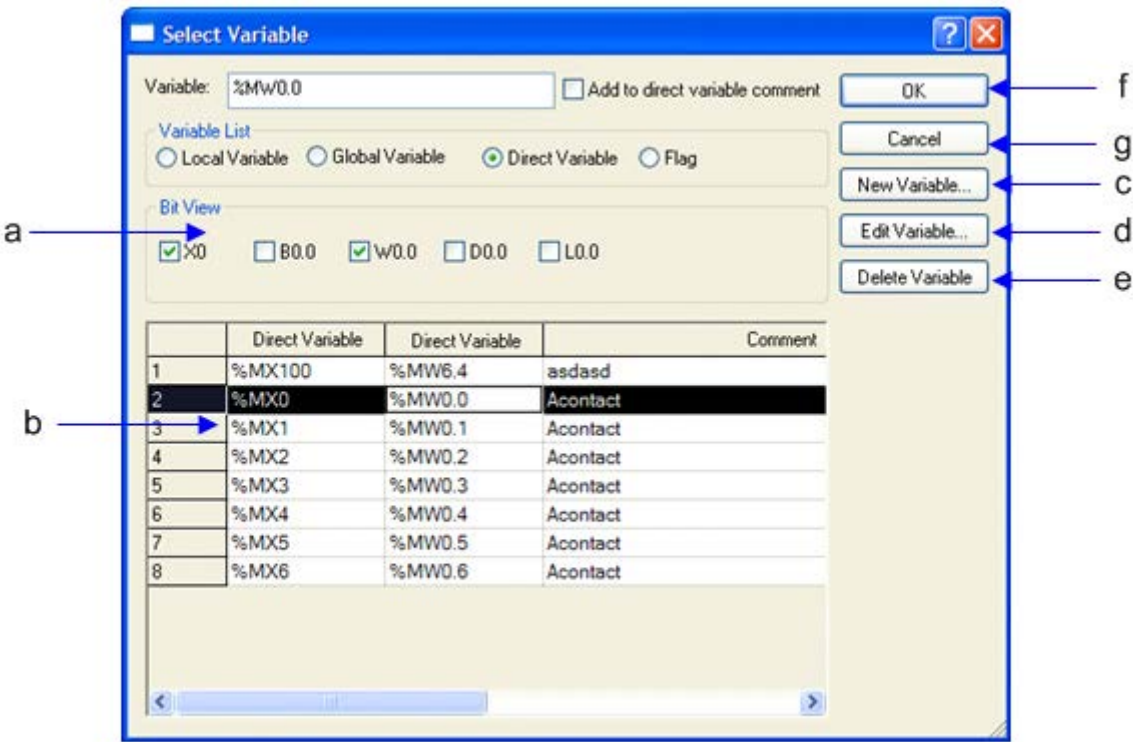
- (a) Global variable: displays the declared global variable list. Can be registered as EXTERNAL variable
- (b) Global variable list: classify the entire list into all, general variable, special module related variable
- (c) New Variable: recalls the dialog box to add variable into global variable list

3. Input Direct Variable

[Sequence]

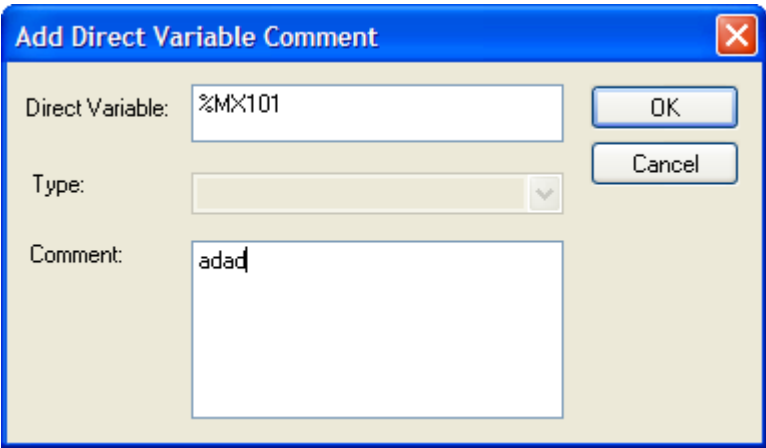
- (1) Move a cursor to the position where the variable should be input and double-click.
- (2) Select the Direct variable in a variable type.

[Dialog box]

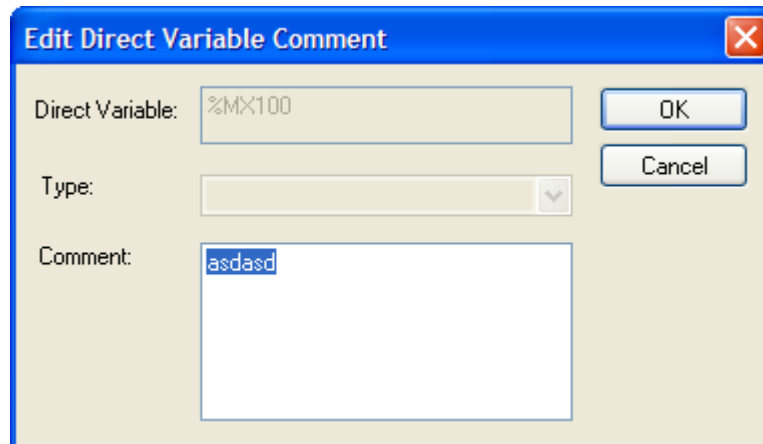


[Description of dialog box]

- (a) Bit View: For bit type direct variable, displays direct variable in diverse type. Displayed in Bit (X0), byte (B0.0), word (W0.0), double word (D0.0), long word (L0.0).
- (b) Direct variable: Displays direct variable list.
- (c) New Variable: Recalls dialog box to add comment of variable at direct variable list



- (d) Edit variable: recalls the dialog box to edit the direct variable comment



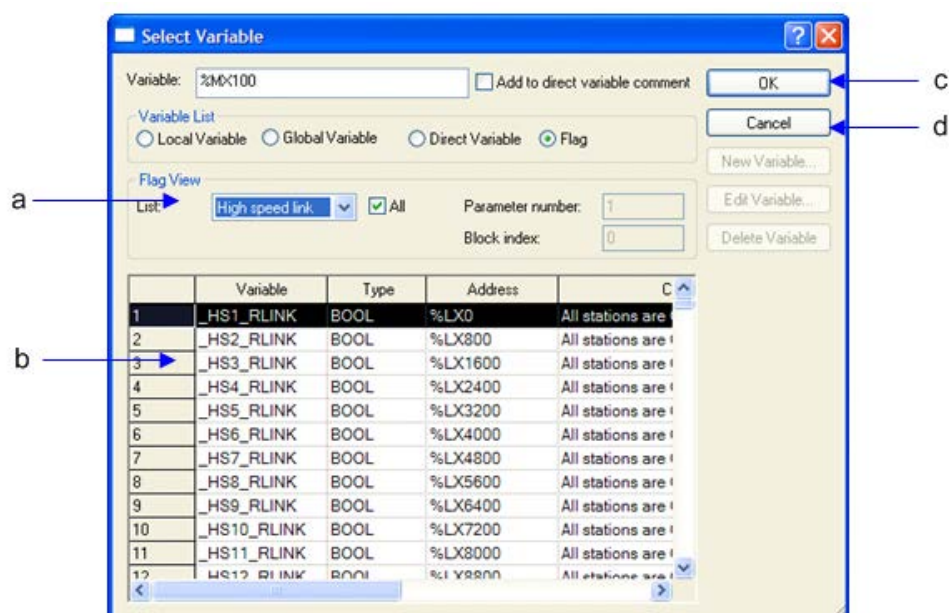
- (e) Delete Variable: deletes the selected direct variable from direct variable list  
 (f) OK: applies the inputted or selected item and closes the dialog box  
 (g) Cancel: closes the dialog box

### 4. Input Flag

[Sequence]

- (1) Move a cursor to the position where the variable should be input and double-click.
- (2) Select the Direct variable in a variable type.

[Dialog box]





[Description of dialog box]

- (a) List: as selection box displaying flag type, you can select System/Motion/IO flag.
- (b) Flag: displays flag at list. You can select detail type at flag view item.
- (c) OK: applies the inputted or selected items and closes the dialog box.
- (d) Cancel: closes the dialog box.

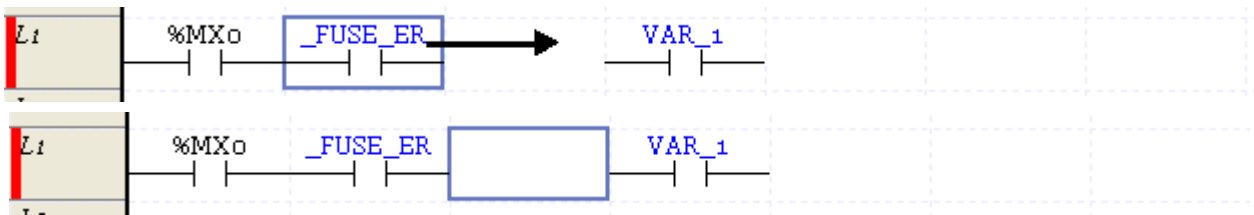
13.2.5 Input Line

The horizontal line shall be inputted for horizontal connection between LD Edit factors, and the vertical line shall be for vertical connection.

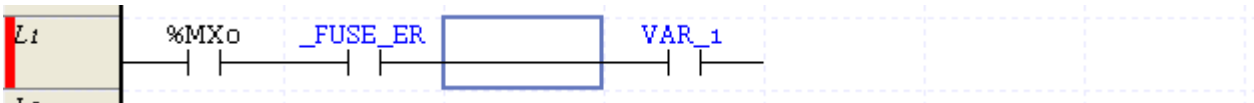
1. Horizontal Line Input

[Sequence]

- (1) Move the cursor onto the location to connect to.



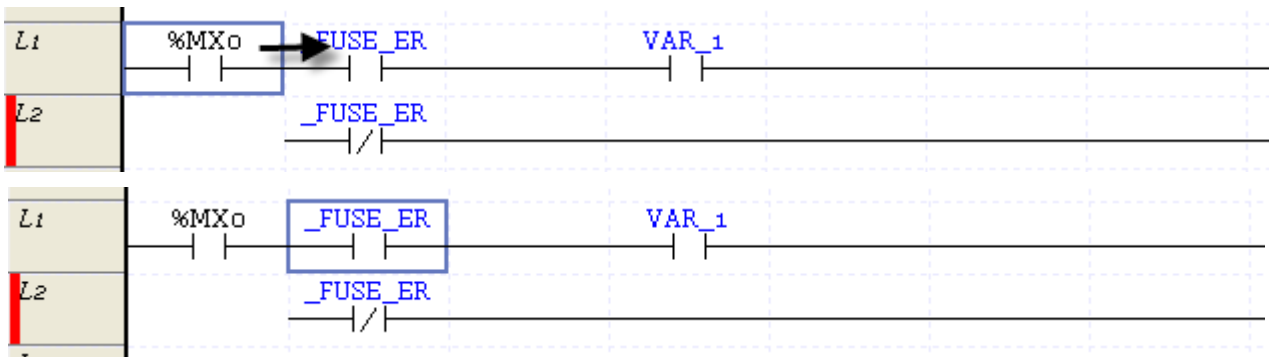
- (2) Select the Shortcut Key of Horizontal Line Input. Or select Horizontal Line on the tool box and select the Edit area to input the Horizontal Line in.



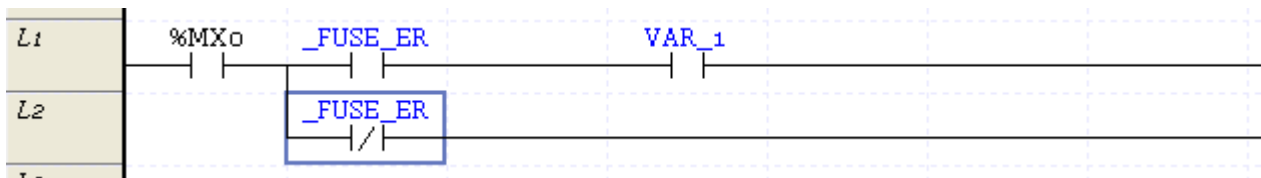
2. Vertical Line Input

[Sequence]

- (1) Move the cursor onto the location to connect to.



- (2) Select the Shortcut Key of Vertical Line Input. Or select Vertical Line on the tool box and select the Edit area to input the Vertical Line in.

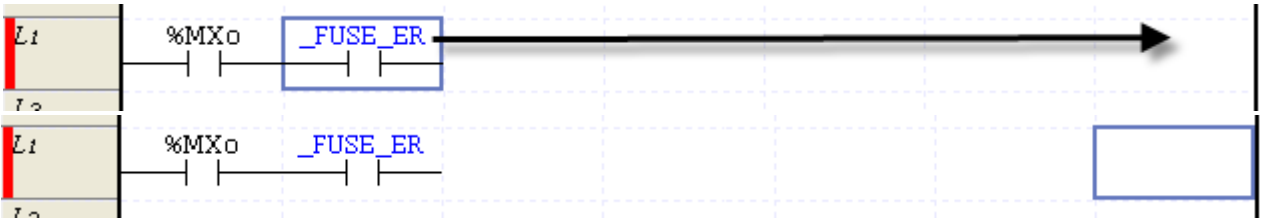


### 13.2.6 Input Coil

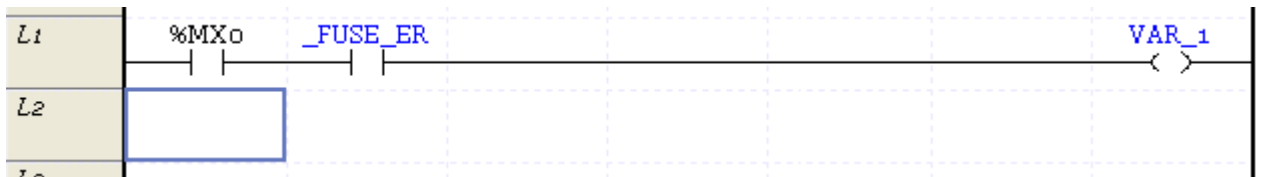
It is used to input the coils (coil, reverse coil, positive-conversion detection coil and negative-conversion detection coil).

[Sequence]

- (1) Move the cursor to the location to input the coil on.



- (2) On the tool box, select the type of the coil to input and then click the edit area. Or click the Shortcut Key applicable to the coil to input.
- (3) After a variable name is input on the Variable Selection Dialog Box, click [OK].



#### Notes

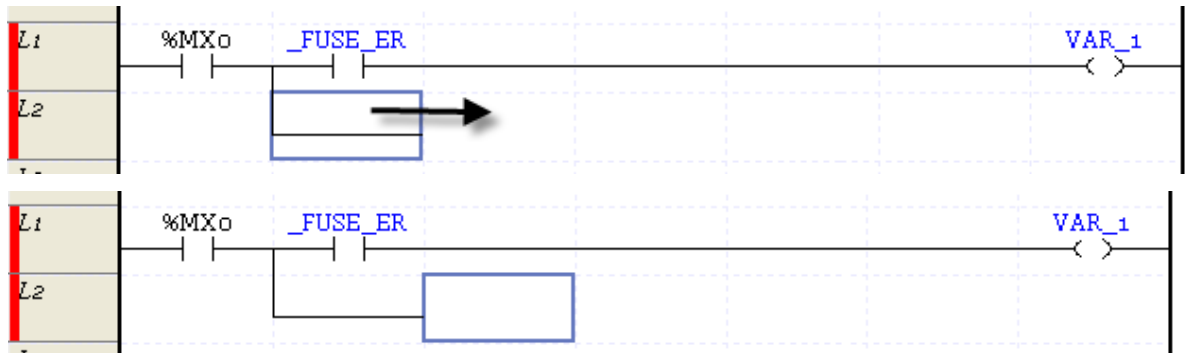
1. If a coil and output related application instruction is inputted, a horizontal line will be automatically inputted to connect with the left factor.
2. When there is duplicate coil, outputs to output module according to last coil status.

13.2.7 Input Function (block)

Input a function(block) for operation.

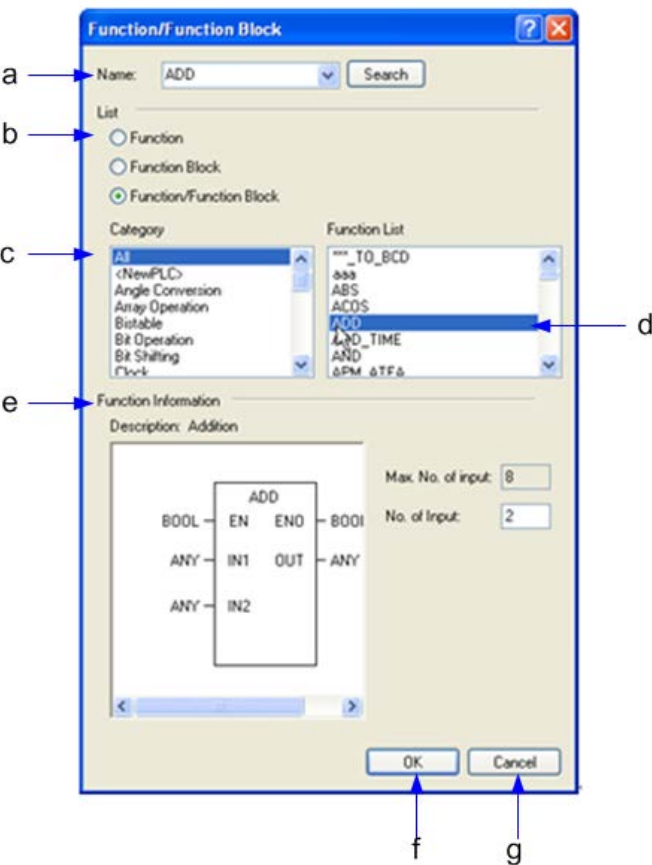
[Sequence]

- (1) Move the cursor to the location to input the function(block).



- (2) On the tool box, select the function(block) to input and then click the edit area. Or click the Shortcut Key applicable to the function(block) input

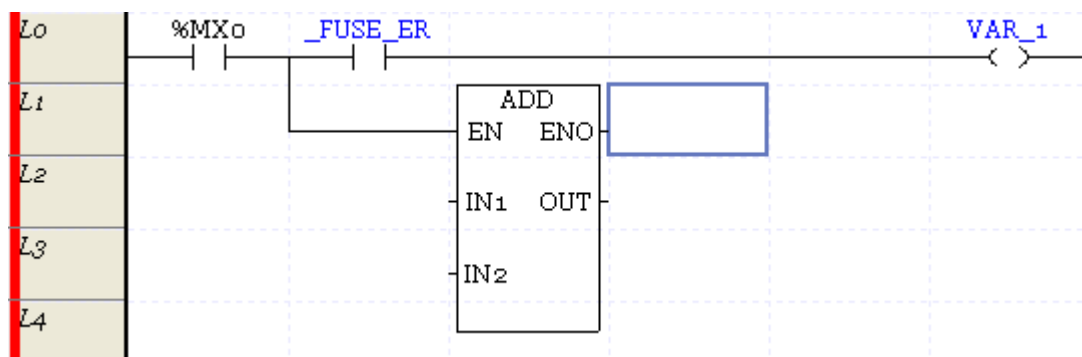
[Dialog Box]



### [Description of Dialog Box]

- Name: Input a name of function(block) to use.
- List: Select whether to display a function, function block or both on the dialog box.
- Category: Displays the categories of function(block).
- Function list: Displays the list of function(block) of a selected category
- Function information: Displays the information and properties of a function. In case of function, a user can set the properties of an input parameter; in case of function block, a user can select the name and class of an instance.
- OK: Applies the input details and closes the Dialog Box.
- Cancel: Closes the Dialog Box.

### 3. On the Function(block) Input Dialog Box, input the function(block), and then click [OK].



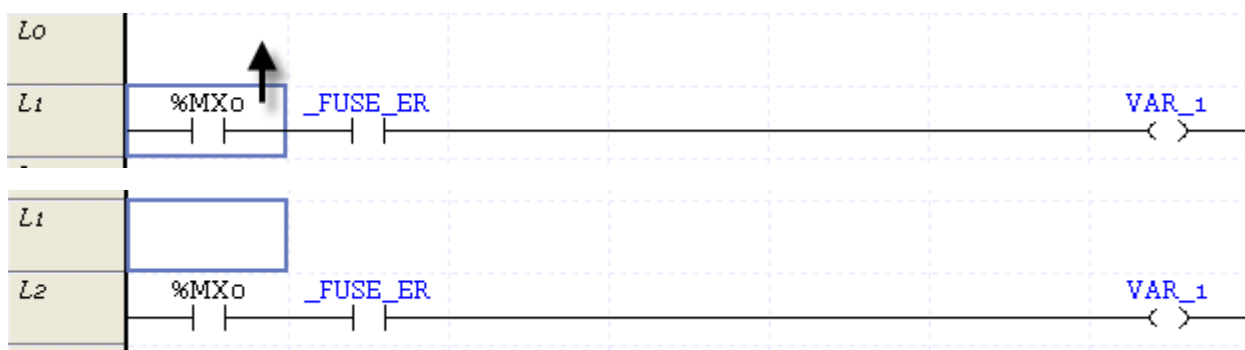
## 13.2.8 Input Comment

It is used to input the Rung and Output Comment. The comment displayed on the start position of Rung is called [Rung Comment], and the comment for the output factor is called [Output Comment].

### 1. Rung Comment

#### [Sequence]

- Move the cursor to the location to input the rung comment on.



- (2) Select [Edit]-[Comment/Label Input].
- (3) After selecting the Comment, click the 'OK'.

## Chapter 13 LD Edit

[Dialog Box]

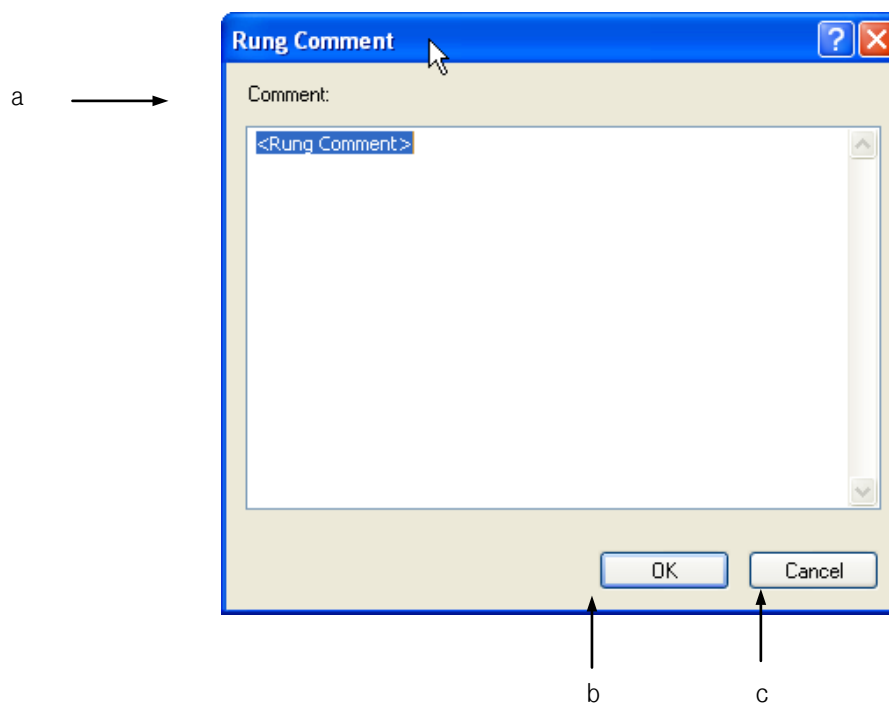


[Description of Dialog Box]

- (a) Comment: used to select the Rung Comment to input.
- (b) Label: used to select the Label to input.
- (c) OK: applies the selected details and closes the Dialog Box.
- (d) Cancel: closes the Dialog Box.

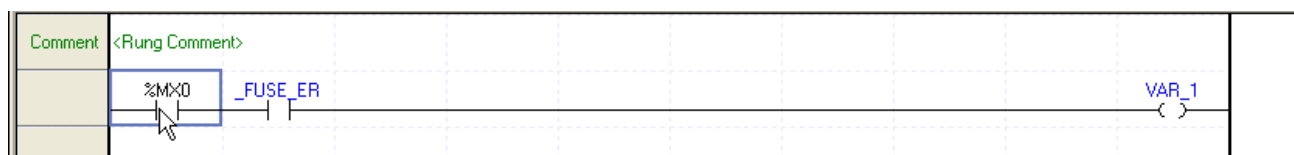
(4) If the Rung Comment Dialog Box is displayed, input the comment and click [OK].

[Dialog Box]



[Description of Dialog Box]

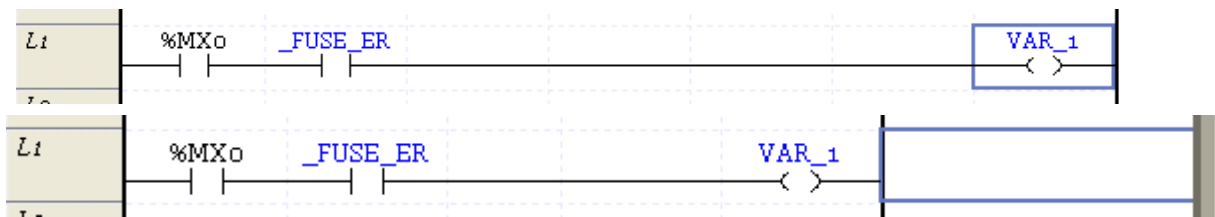
- (a) Comment: used to input the details of the rung comment or the output comment.
- (b) OK: applies the input details and closes the Dialog Box.
- (c) Cancel: closes the Dialog Box.



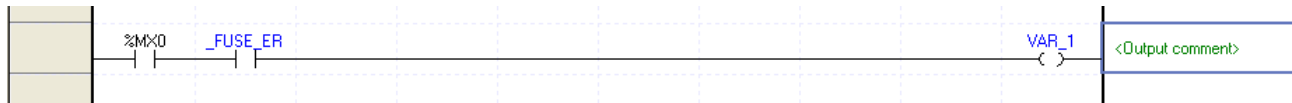
2. Output Comment

[Sequence]

(1) Move the cursor to the location to input the output comment on.



- (2) Double-click the left mouse button or press Enter key.
- (3) Input the output comment on the Output Comment Dialog Box and then click [OK].



Notes

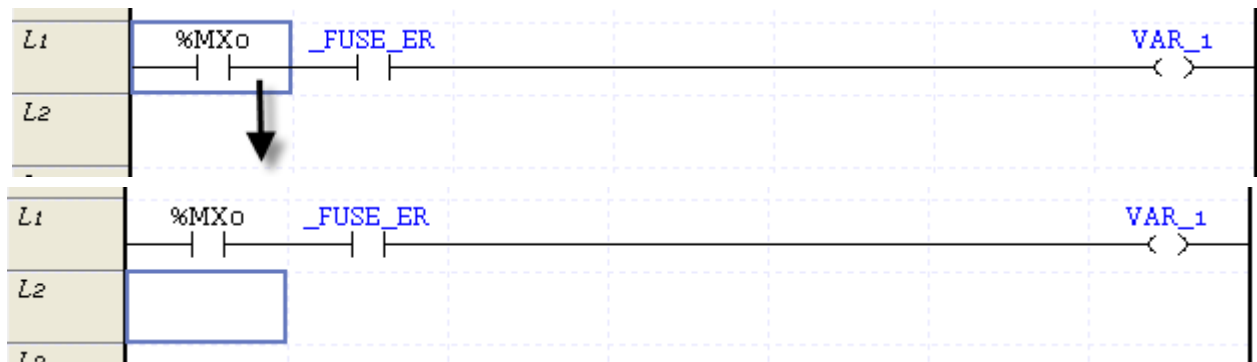
- 1. The output comment will be available to input only when the output factor exists.

13.2.9 Input Label

This is used to input the label to refer to from the extended function of JMP.

[Sequence]

(1) Move the cursor to the location to input the label on.



## Chapter 13 LD Edit

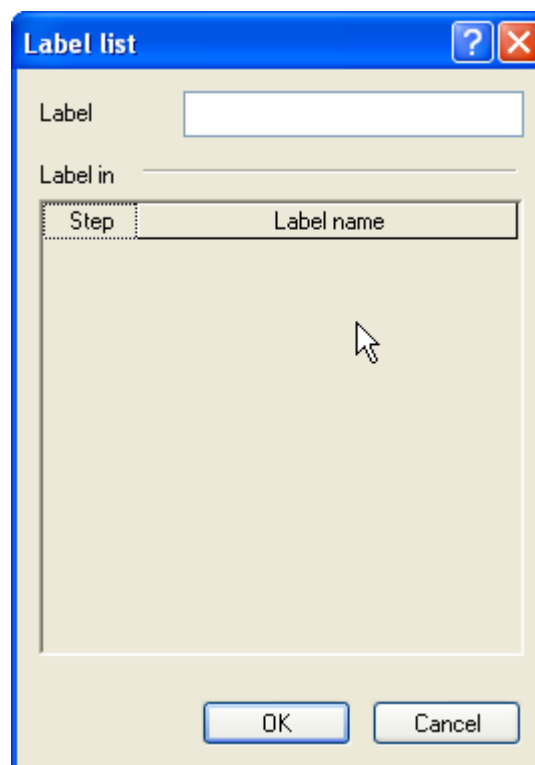
- (2) Select [Edit] – [Comment/Label Input].
- (3) On the Dialog Box, select Label and then press Enter or click [OK].



- (4) On the Label Dialog Box, input the label to add, and then click [OK].

[Dialog Box]

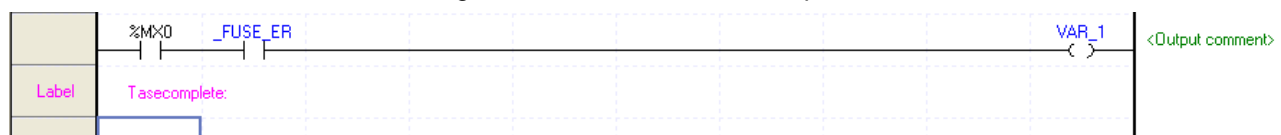
a →  
b →



[Description of Dialog Box]

- (a) Label: used to input the label to use.
- (b) Label being used: used to display the label presently used in the same scan program. If selecting an item on the

label being used, the selected item is input.



Notes



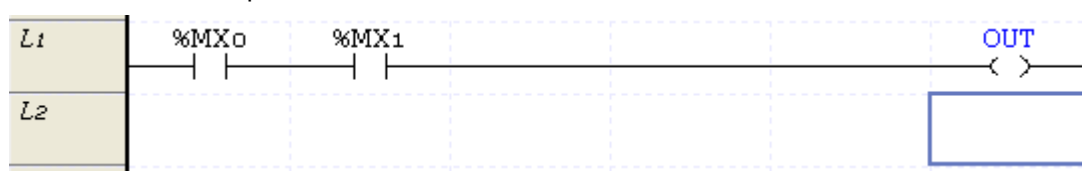
1. Up to 16 characters in English(8 in Korean) is available for the label.
2. Capital/Small letters are sorted out for the label. The first letter of the label can not be a figure or a special character.
3. Label Input rules shall conform to the Variable/Comment Input rules. Refer to 4.2.1 in Chapter 4 Variable/ Comment for details on the Variable/Comment Input rules.

### 13.2.10 Insert Extended Function

It is used to insert the extended function such as insert/call subroutine and program end.

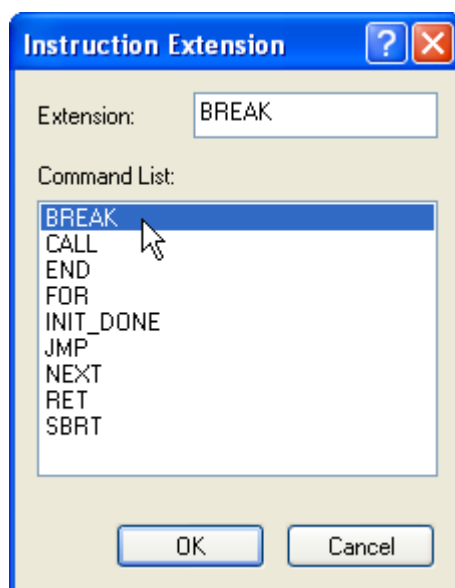
[Sequence]

- (1) Move the cursor to the position to insert an extended function.



- (2) Select [Edit]-[Tools]-[Extended Function] on the menu.
- (3) Select an extended function to insert and click OK.

[Dialog Box]



[Comment of Dialog Box]

- (a) Extended Command: Inputs an extended function or displays the input extended function.
- (b) Command List: Displays the available extended function.
- (c) OK: Applies a selected item and closes the Dialog Box.
- (d) Cancel: Closes the Dialog Box.

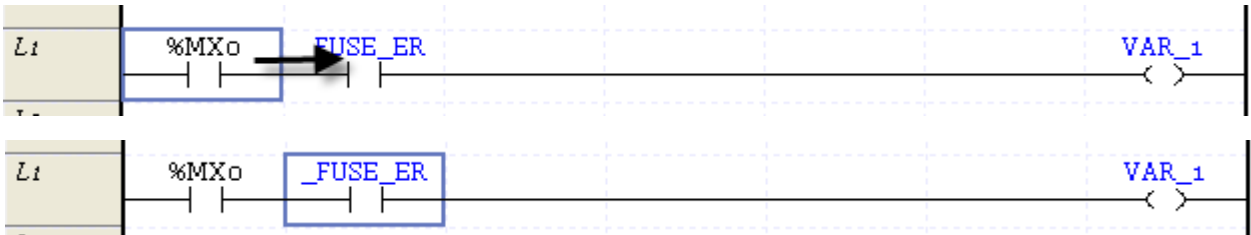


13.2.11 Insert Cell

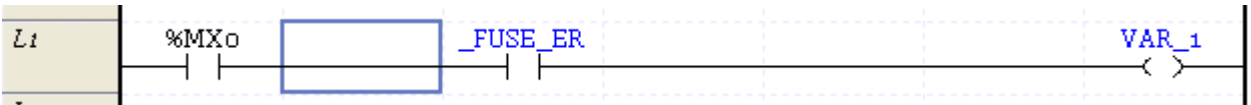
It is used to insert a new cell in the present cursor position.

[Sequence]

- (1) Move the cursor to the location to insert the cell in.

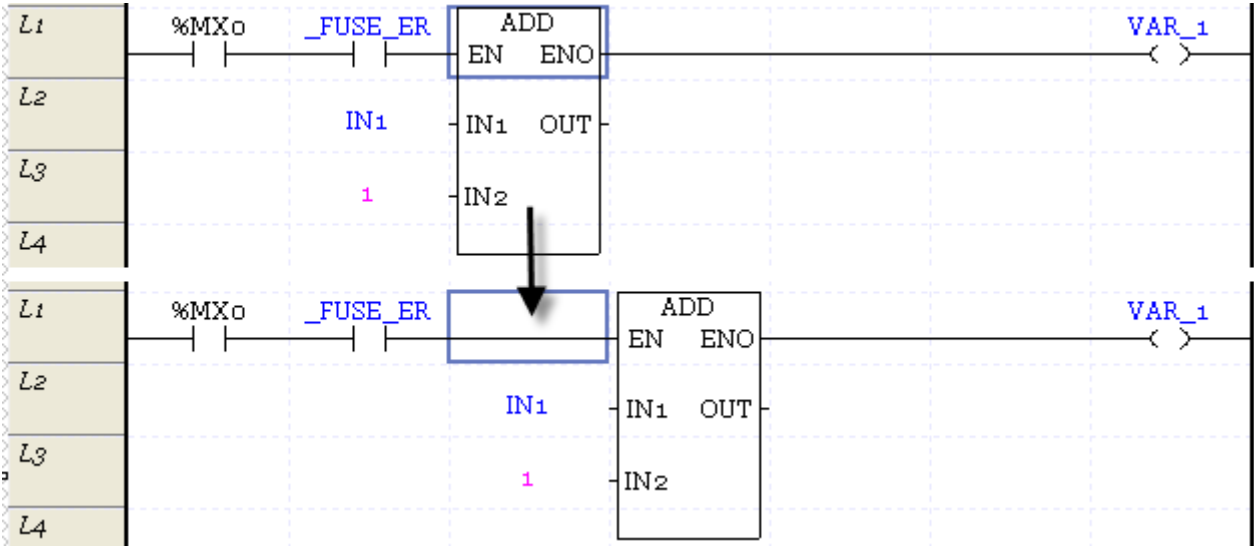


- (2) Select [Edit] - [Cell Insert].



Notes

- 1. If inserting a cell in Function(Block), a variable is also moved together.

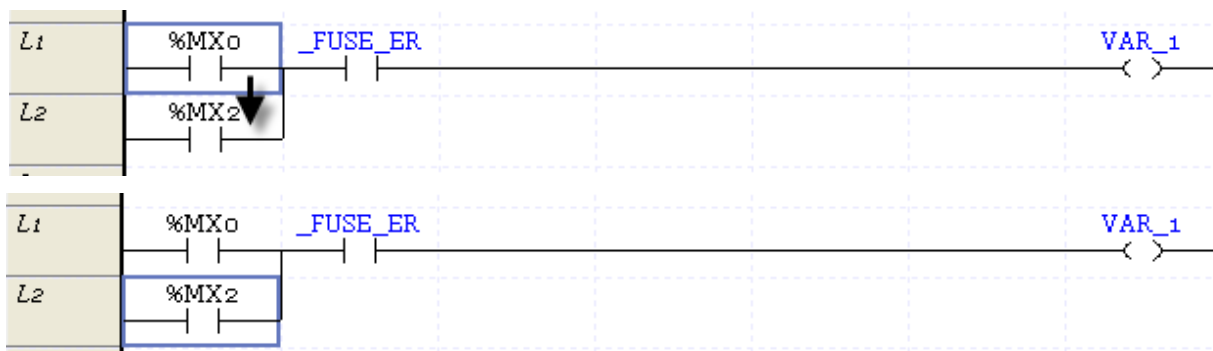


### 13.2.12 Insert Line

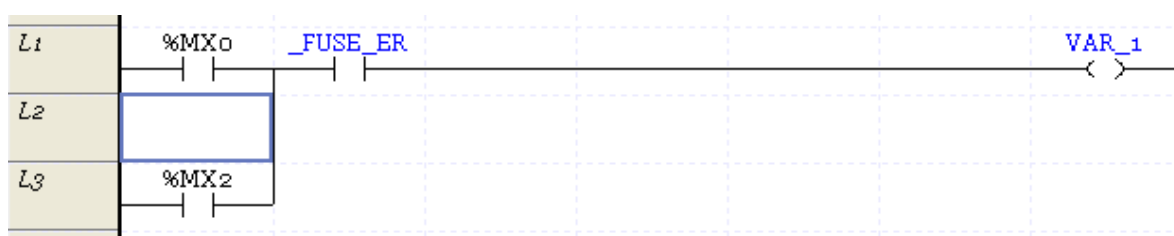
It is used to insert a new line in the present cursor position.

[Sequence]

- (1) Move the cursor to the location to insert the line in.



- (2) Select [Edit] - [Line Insert].



#### Notes

1. If Line Insert is executed, a new line will be inserted in the present cursor position.
2. If an area is selected for Line Insert, new lines as many as the lines in the selected area will be inserted.
3. If function (block) is contained, line can not be inserted.

### 13.2.13 Delete Factor

It is used to delete the input contact point, coil, function (block), line, rung/output comment and label.

[Sequence]

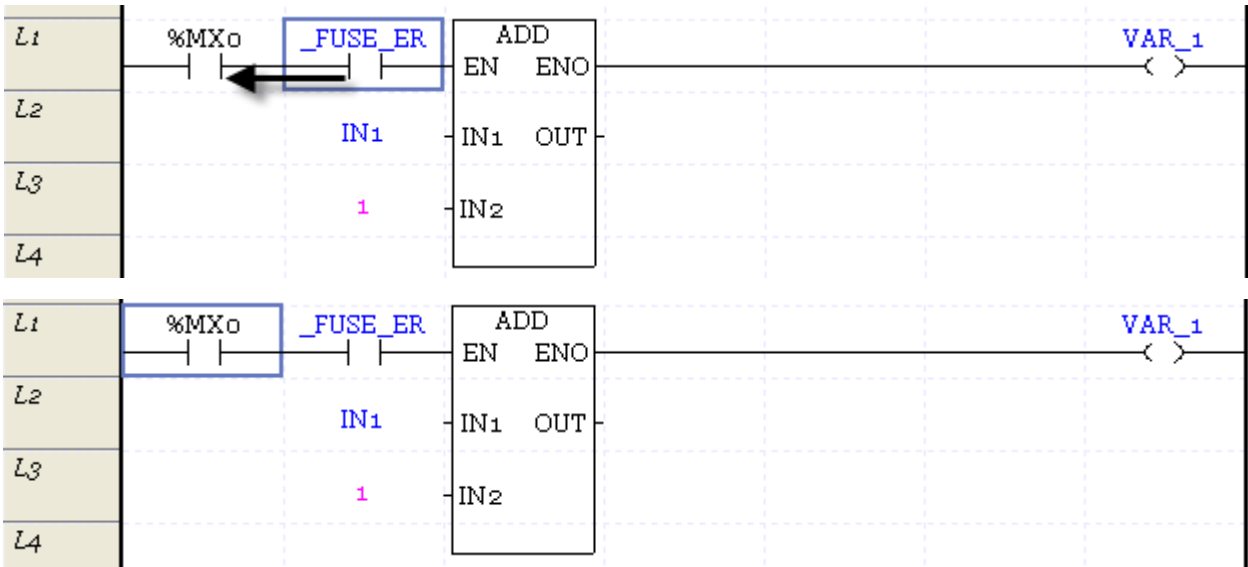
- (1) Move the cursor to the location to delete the factor from.
- (2) Select [Edit] - [Delete].

13.2.14 Delete Cell

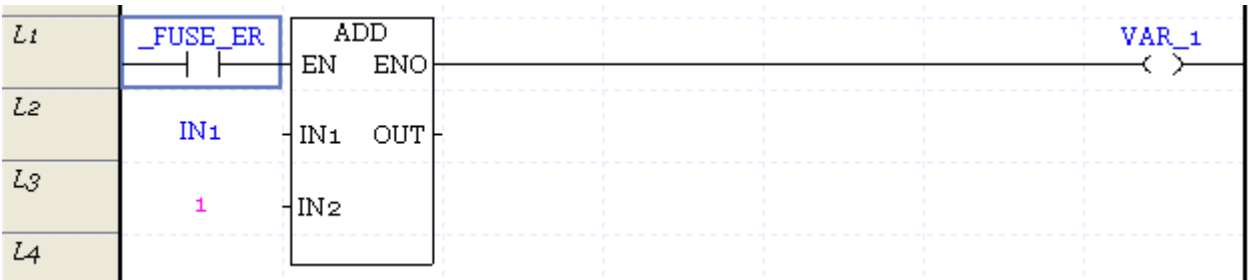
It is used to delete the factors such as the input contact point and horizontal line to draw in the next cell.

[Sequence]

(1) Move the cursor to the location to delete the cell from.



(2) Select [Edit] – [Delete Cell].



Notes

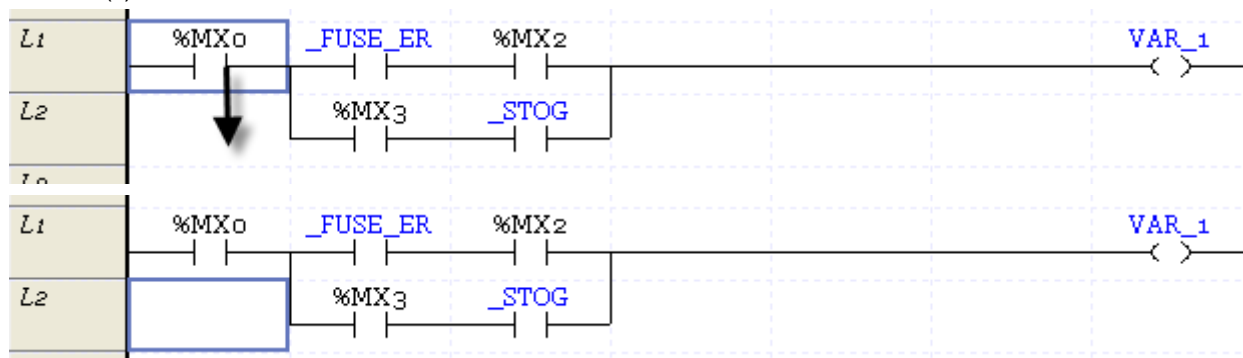
1. If there is no data where the cursor is positioned, Delete Cell is operated by pressing Delete. Therefore, if there is data, Delete Cell operates after deletion if pressing Delete twice.

### 13.2.15 Delete Line

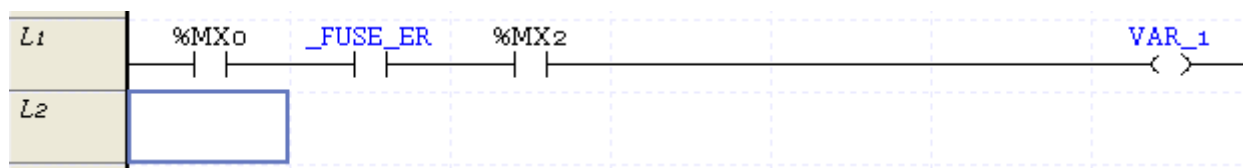
It is used to delete all the lines in the selected area.

[Sequence]

- (1) Move the cursor onto the line to delete.



- (2) Select [Edit] - [Delete Line].



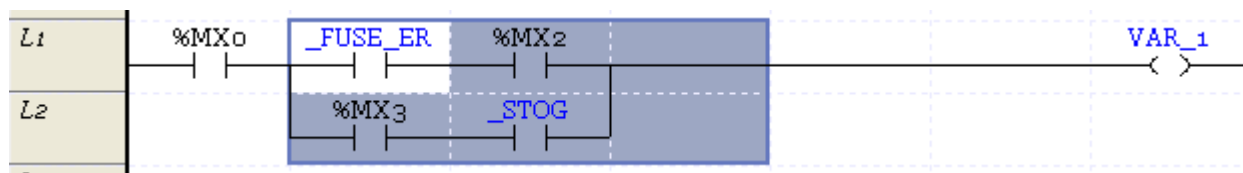
### 13.2.16 Copy/Cut/Paste

It is used to copy the data in the selected area, or cut the data to copy on the specified position. Differently from [Copy], [Cut] is used to delete the data in the presently selected area.

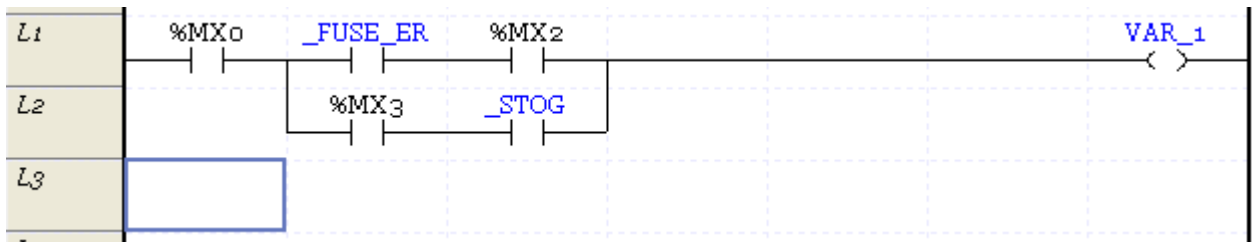
1. Copy

[Sequence]

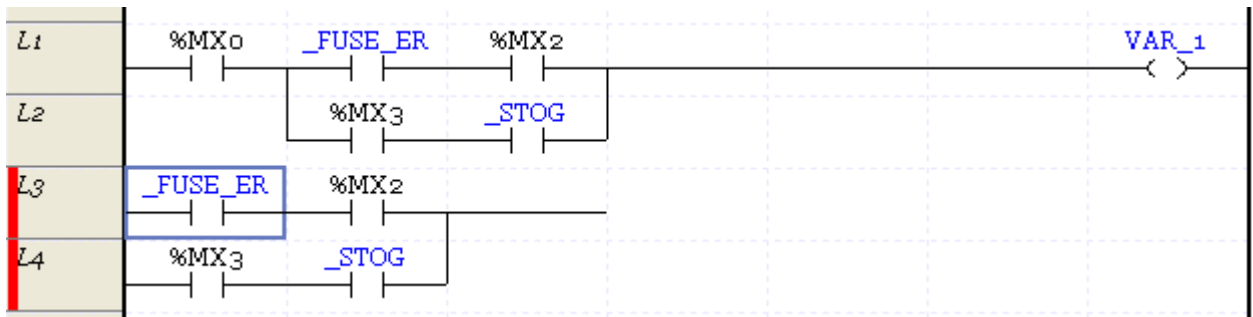
- (1) Select the area to copy.



- (2) Select [Edit] - [Copy] on the menu.
- (3) Move the cursor to the area to paste on.



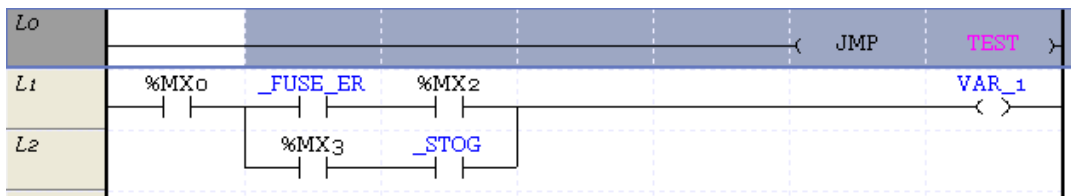
- (4) Select [Edit] - [Paste] on the menu.



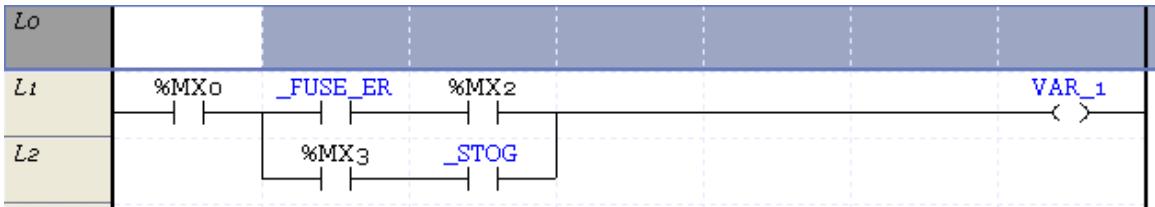
2. Cut

[Sequence]

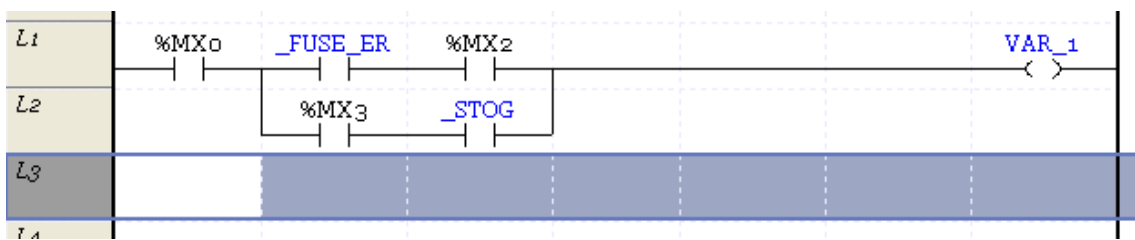
- (1) Select the area to cut.



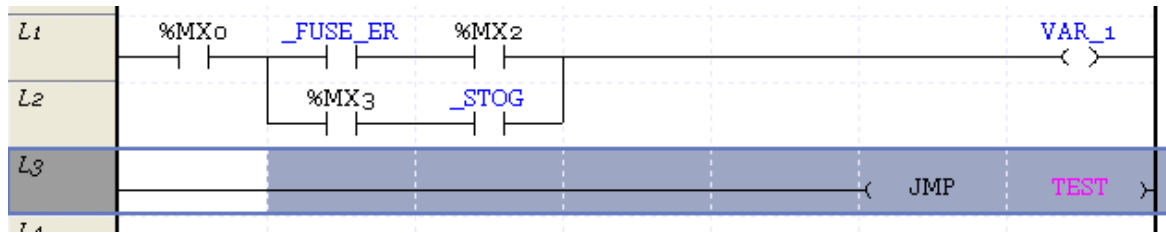
- (2) Select [Edit] - [Cut] on the menu.



- (3) Move the cursor to the area to paste on.



- (4) Select [Edit]-[Paste] on the menu.



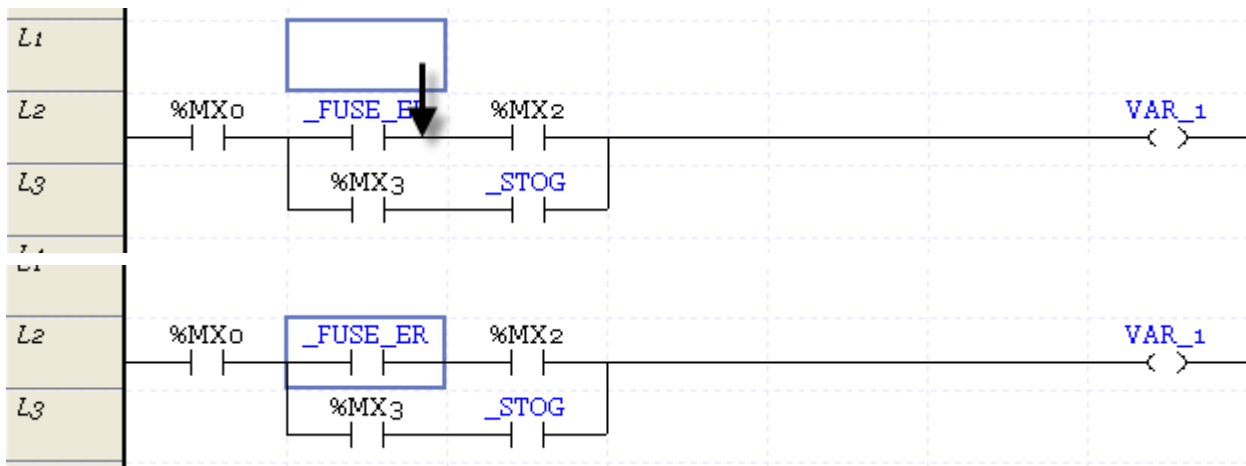
### 13.2.17 Undo and Redo

It is used to Undo the details edited by Program Edit back to its previous state, or execute again the details cancelled.

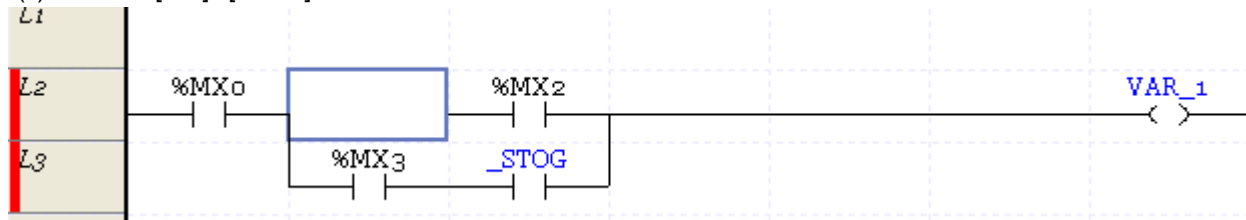
1. Undo (example of Delete)

[Sequence]

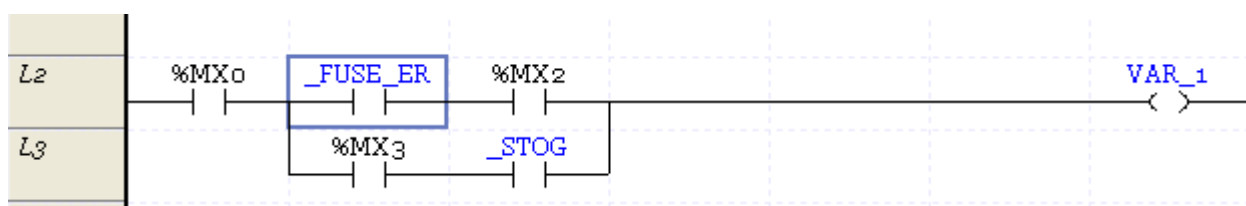
- (1) Move the cursor onto the position to delete.



- (2) Select [Edit] - [Delete] on the menu.



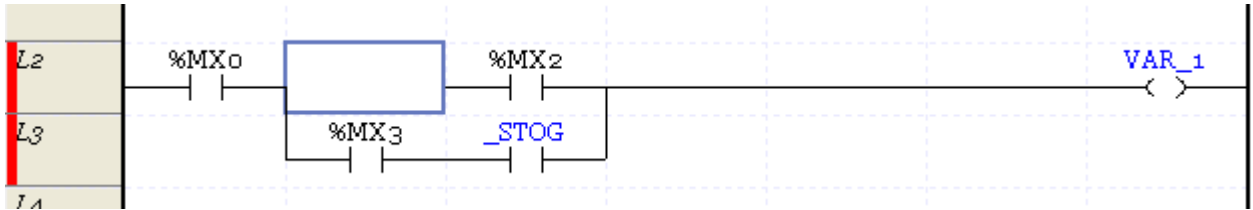
- (3) Select [Edit] - [Undo] on the menu.





2. Redo (example of Delete)

(1) Select [Edit] - [Redo].



13.3 View Program

It is used to specify the Program View options.

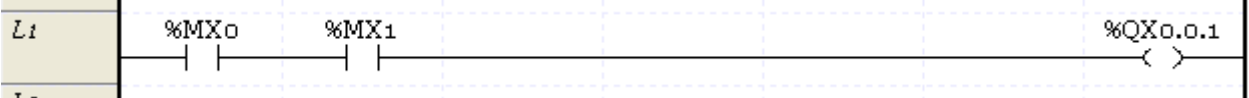
13.3.1 View Device

It is used to display only the name of the device for the variable or device used as the contact point, coil and function(block). If there is no device, it displays a name of variable.

[Sequence]

(1) Select [View]-[Devices].

	Variable Kind	Variable Name	Type	Memory Address	Initial Value	Retain	Used	Comment
1	VAR	C_ON	BOOL	%QX0.0.1		<input type="checkbox"/>	<input type="checkbox"/>	
2	VAR	INB_1	BOOL	%MX0		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3	VAR	INB_2	BOOL	%MX1		<input type="checkbox"/>	<input checked="" type="checkbox"/>	
4						<input type="checkbox"/>	<input type="checkbox"/>	

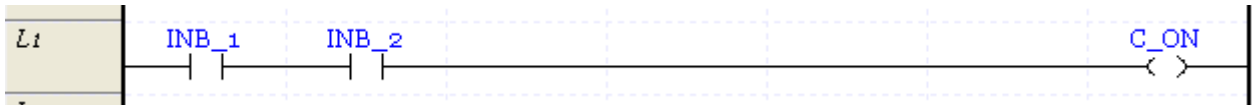
  


13.3.2 View Variable

It is used to display the name of the variable for the variable or device used as the contact point, coil and function(block). If no variable is declared for the device, it will be displayed as the device name.

[Sequence]

(1) Select [View]-[Variable].



13.3.3 View Device/Variable

It is used to display the name of the device/variable for the variable or device used in the contact point, coil and function(block). If there is no device in the variable, the variable name only will be displayed.

[Sequence]

(1) Select [View]-[Devices/Variables] Item.

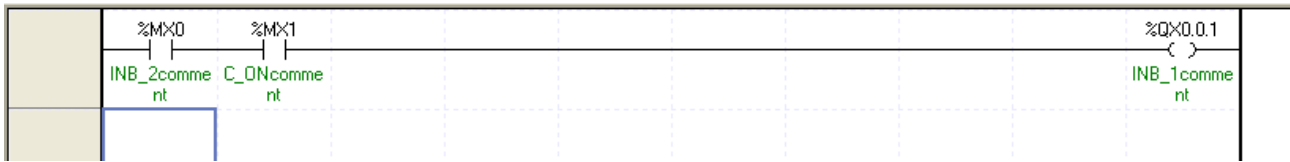


13.3.4 View Device/Comment

It is used to display the device/comment for the variable or device used in the contact point, coil and function(block).  
If there is no device in the variable, the variable name only will be displayed.

[Sequence]

- (1) Select [View]-[Devices/Comments] Item.

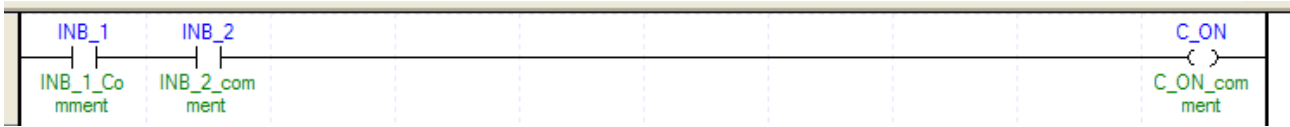


13.3.5 View Variable/Comment

It is used to display the variable/comment for the device used as the contact point, coil and Function (Block).  
If there is no variable in the device, the device name only will be displayed.

[Sequence]

- (1) Select [View]-[Variable/Comment]



Notes

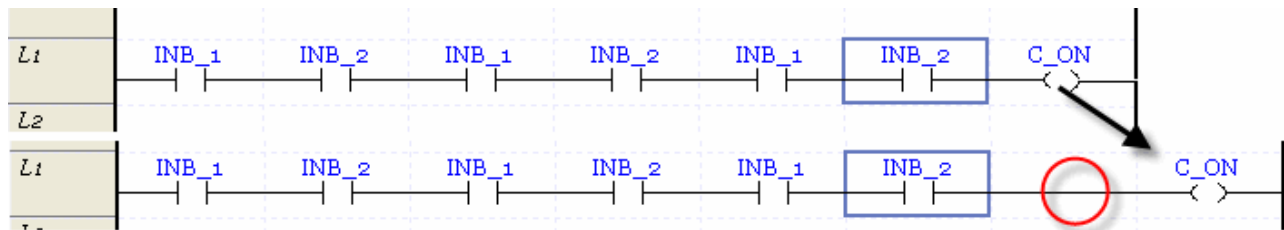
- 2. If View Options are changed, it may take some time according to the edited program amount.

### 13.3.6 Adjust No. of Contact Point

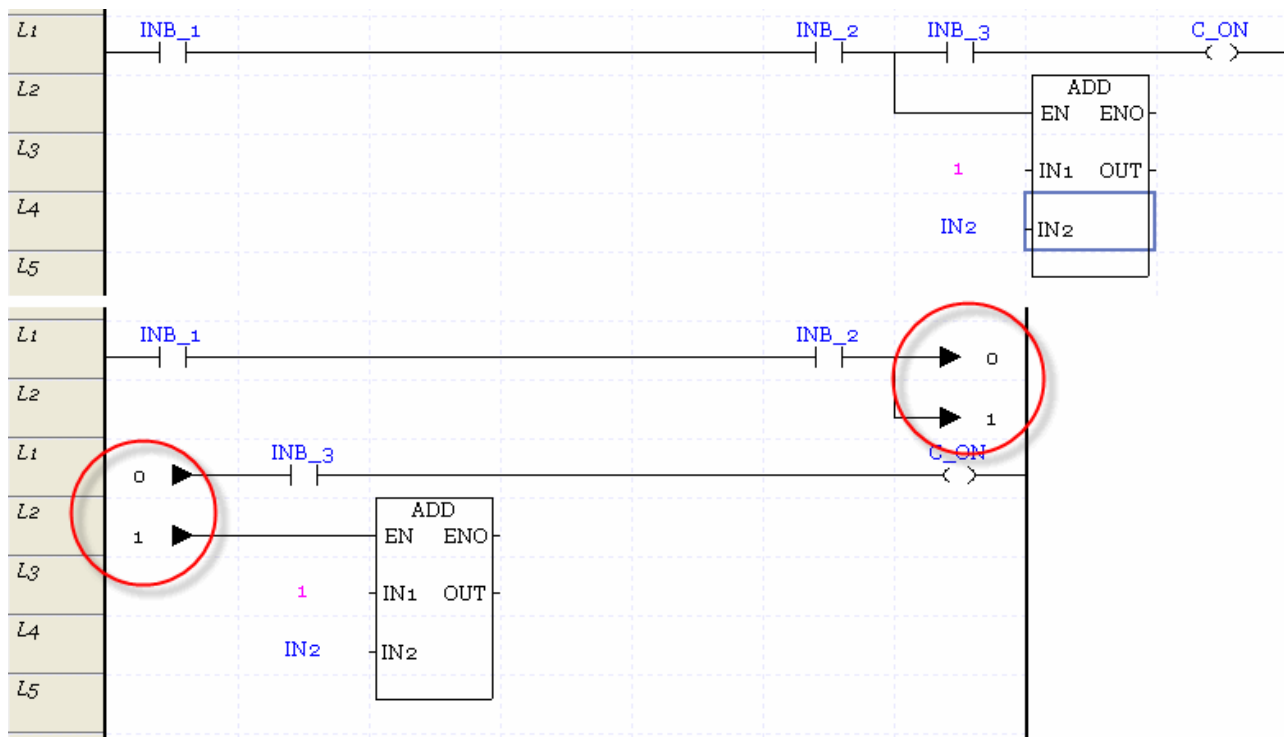
It is used to adjust the number of contact points displayed in the screen. Here, the number of contact points is total number (horizontal cell - 1), excluding the output position.

[Sequence]

(1) Select [View]-[Change Columns]-[Increase Columns] on the menu.



If the data in the very right of the present screen is larger than the number of contact points to display, it may be displayed by rung including arrow.



#### Notes

1. It may increase or decrease one by one in [View]-[Toolbox].
2. The number of contact to set is 10 ~ 32.

13.3.7 Program Magnification Change

This is used to change the magnification of the LD program displayed on the screen.

1. Zoom-In

[Sequence]

- (1) Select [View]-[Zoom-In] on the menu.

2. Zoom-Out

[Sequence]

- (1) Select [View]-[Zoom-Out] on the menu.

Notes
1. Ctrl + Upward Wheel if available perform Zoom-Out step by step.
2. Ctrl + Downward Wheel if available perform Zoom-In step by step.

13.3.8 LD Screen Properties

It is used to designate the properties of View LD Screen. In the screen properties, the options of device, variable and comment view can be set while magnification and the number of contact points can be set simultaneously. In addition, the same properties for the entire LD screen can be also set.

[Sequence]

- (1) Select [View]-[LD Properties] on the menu.
- (2) Change the LD screen properties and click OK.

## Chapter 13 LD Edit

[Dialog Box]



[Comment of Dialog Box]

- (a) View Options: designates the view options for variable and device.
- (b) Magnification: designates the magnification displayed in the screen. It is allowed from 40 to 200%.
- (c) No. of contacts: designates the number of contact points displayed in the screen.
- (d) OK: applies the settings and closes the dialog box.
- (e) Cancel: closes the dialog box.
- (f) Apply applies the settings to the present LD window.
- (g) Default: sets the present settings as the defaults of LD window. If creating a new LD program, it is displayed in the presently set view mode.
- (h) Reset: restores the present settings to the default.
- (i) All Windows: applies the present settings to every screen.

13.4 Edit Function Additional

Additional functions will be described below for convenient edit.

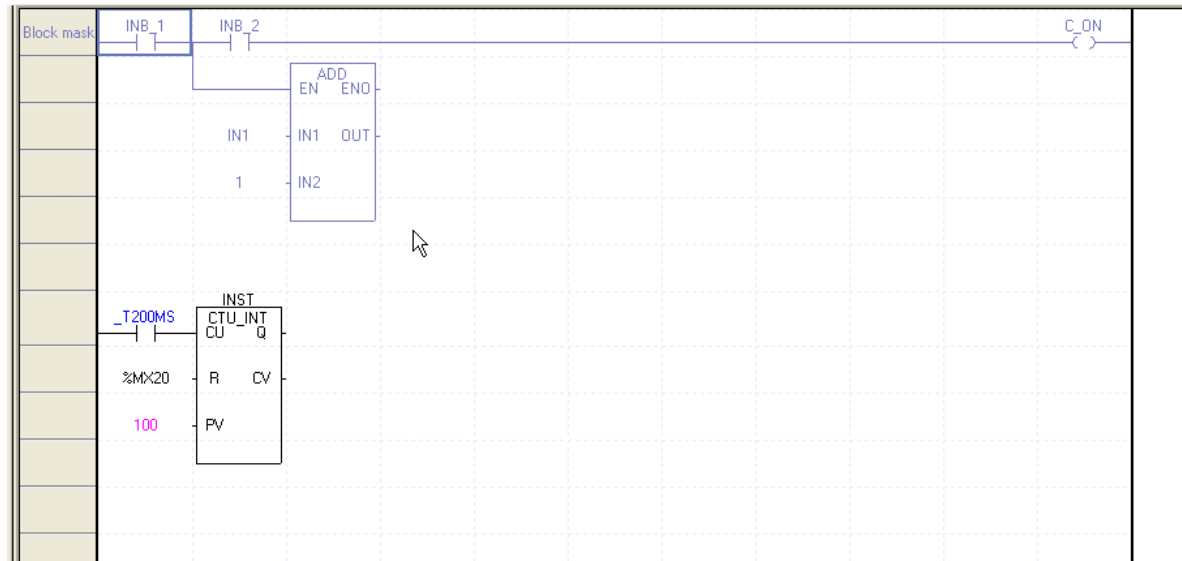
13.4.1 Block Mask Instruction

This is used to specify or cancel the area Block Mask in PLC among the LD programs.

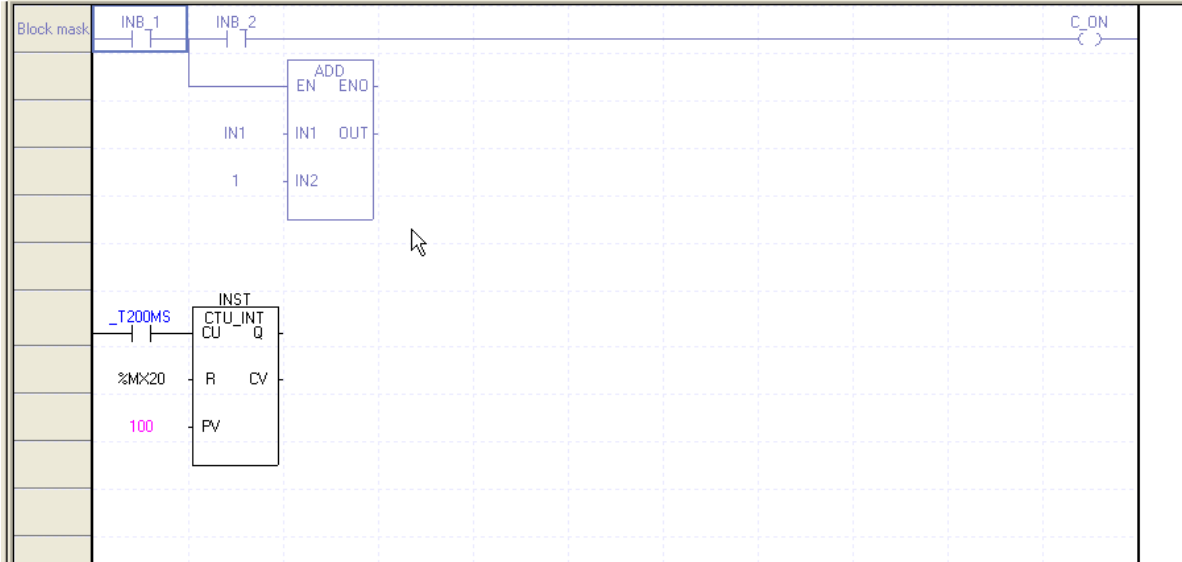
1. Block Mask Instruction Setting

[Sequence]

- (1) Move the cursor to the rung to specify the Block Mask.



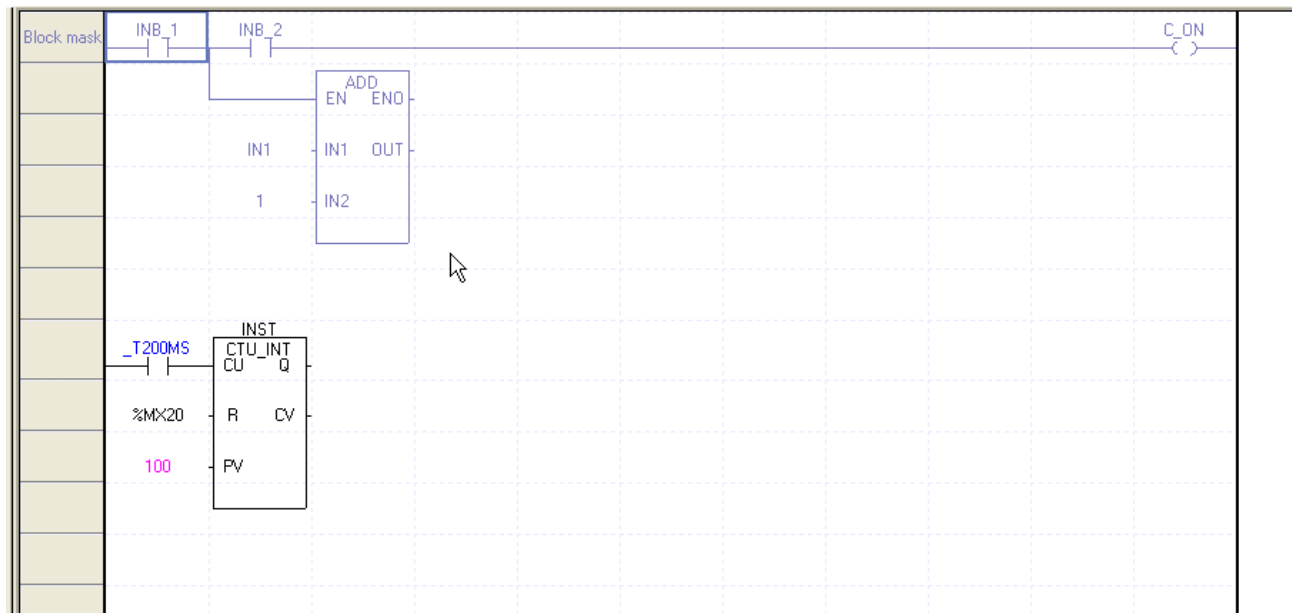
- (2) Select [Edit] - [Set Block Mask].



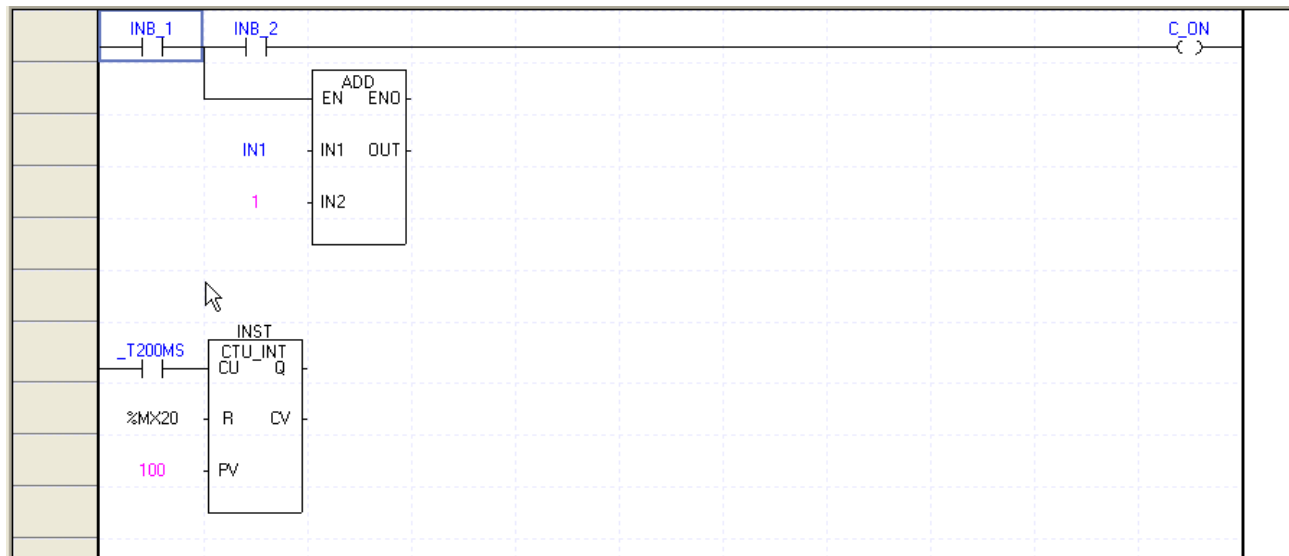
2. Block Mask Instruction Cancel

[Sequence]

- (1) Move the cursor to the rung to cancel the Block Mask instruction.



- (2) Select [Edit] - [Remove Block Mask] on the menu.





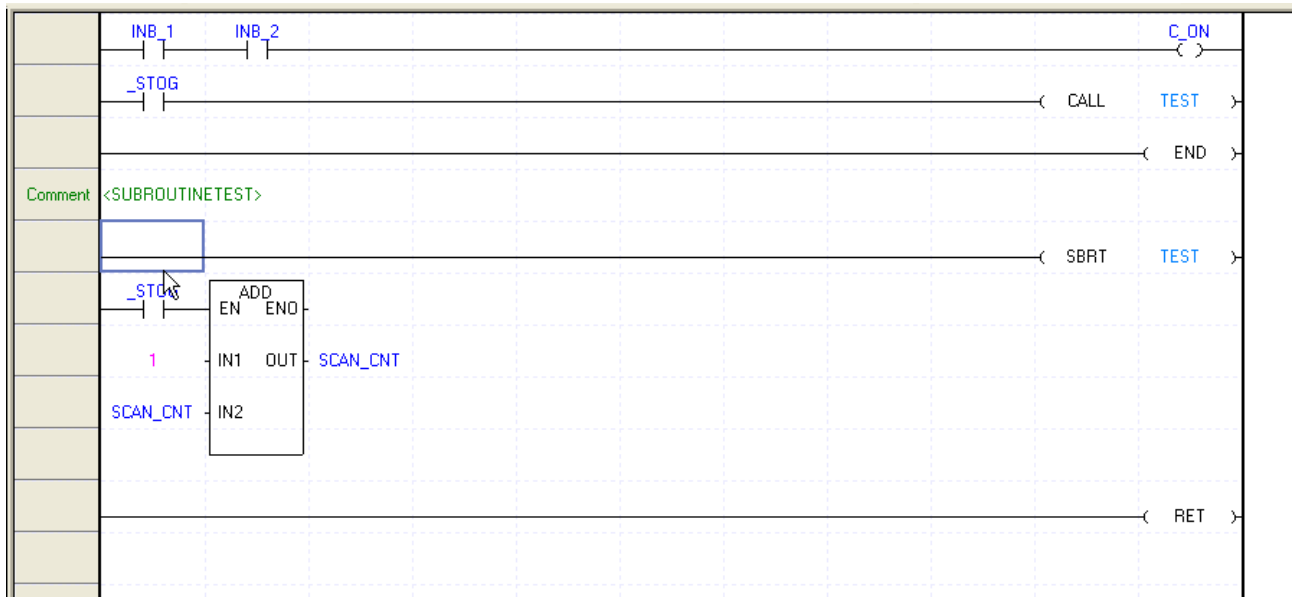
13.4.2 Bookmark

It allows the user easily to move to an interesting area with the bookmark specified on the line.

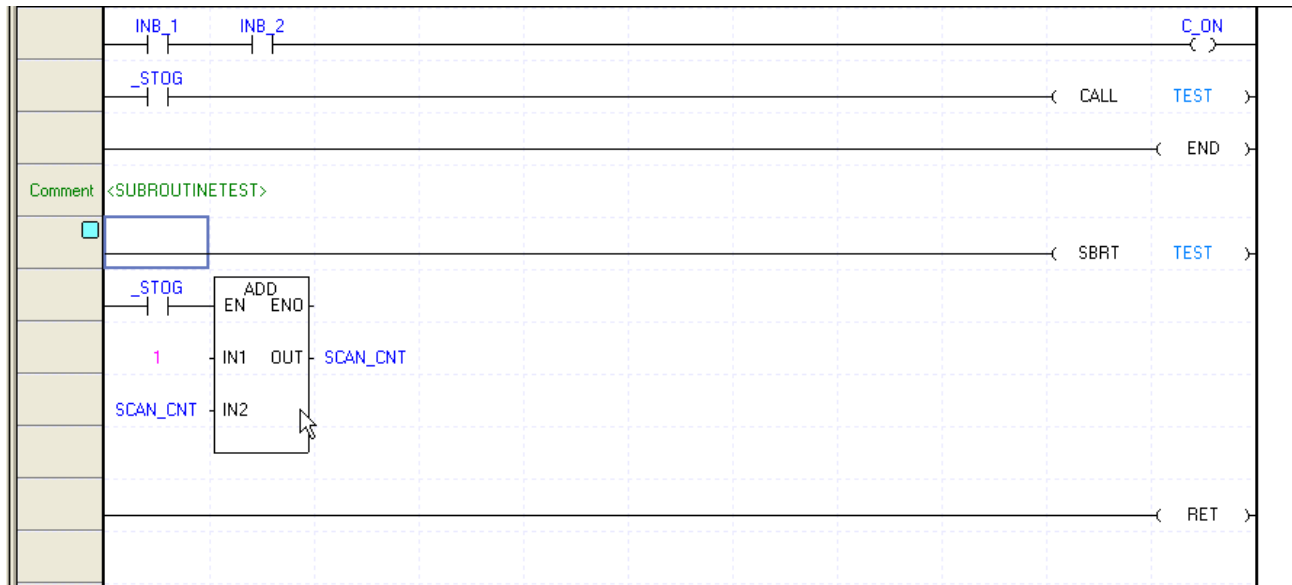
1. Set Bookmark

[Sequence]

- (1) Move the cursor to the line to specify the bookmark on.



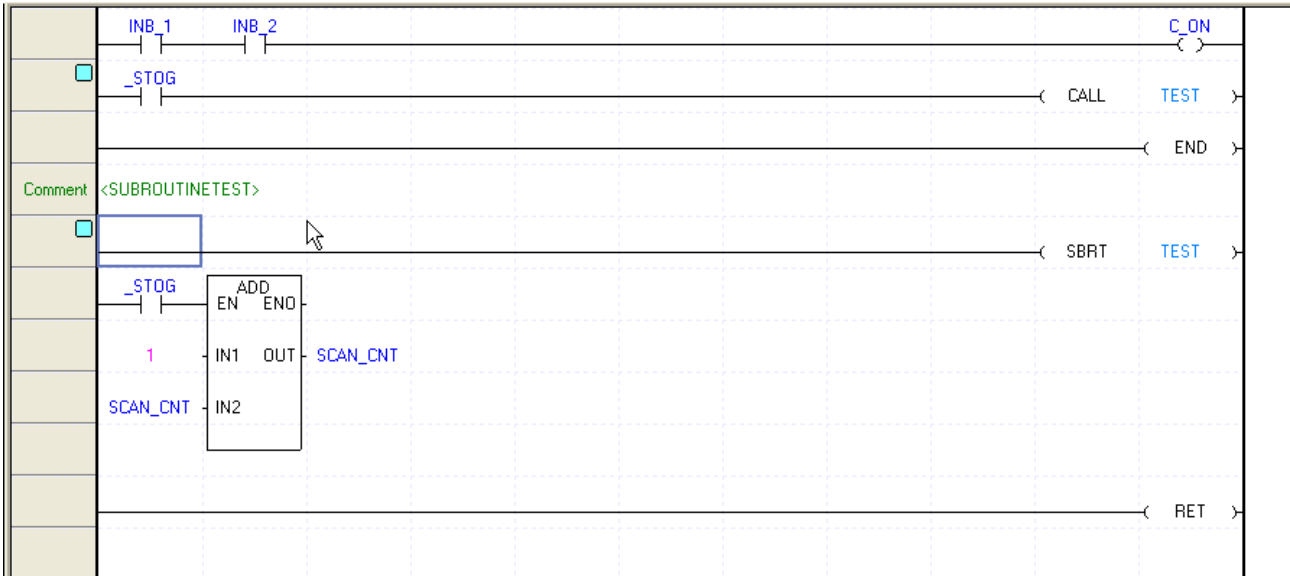
- (2) Select [Edit] - [Bookmark] - [Set/Remove] on the menu.



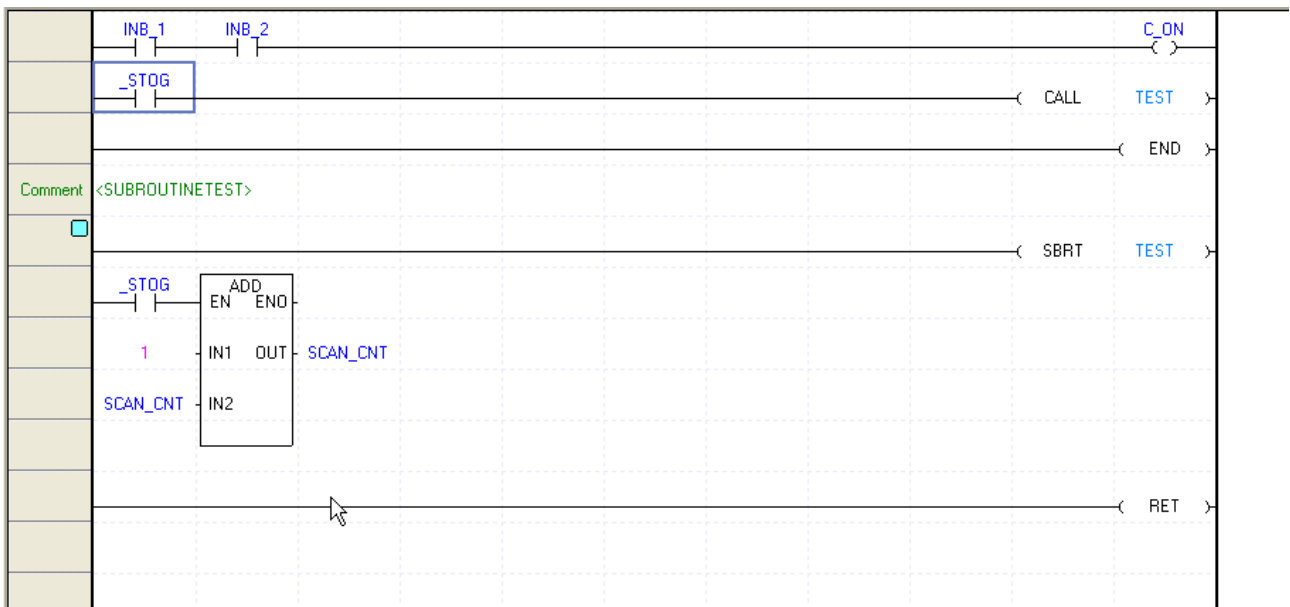
2. Bookmark Reset

[Sequence]

(1) Move the cursor to the line to cancel the bookmark from.



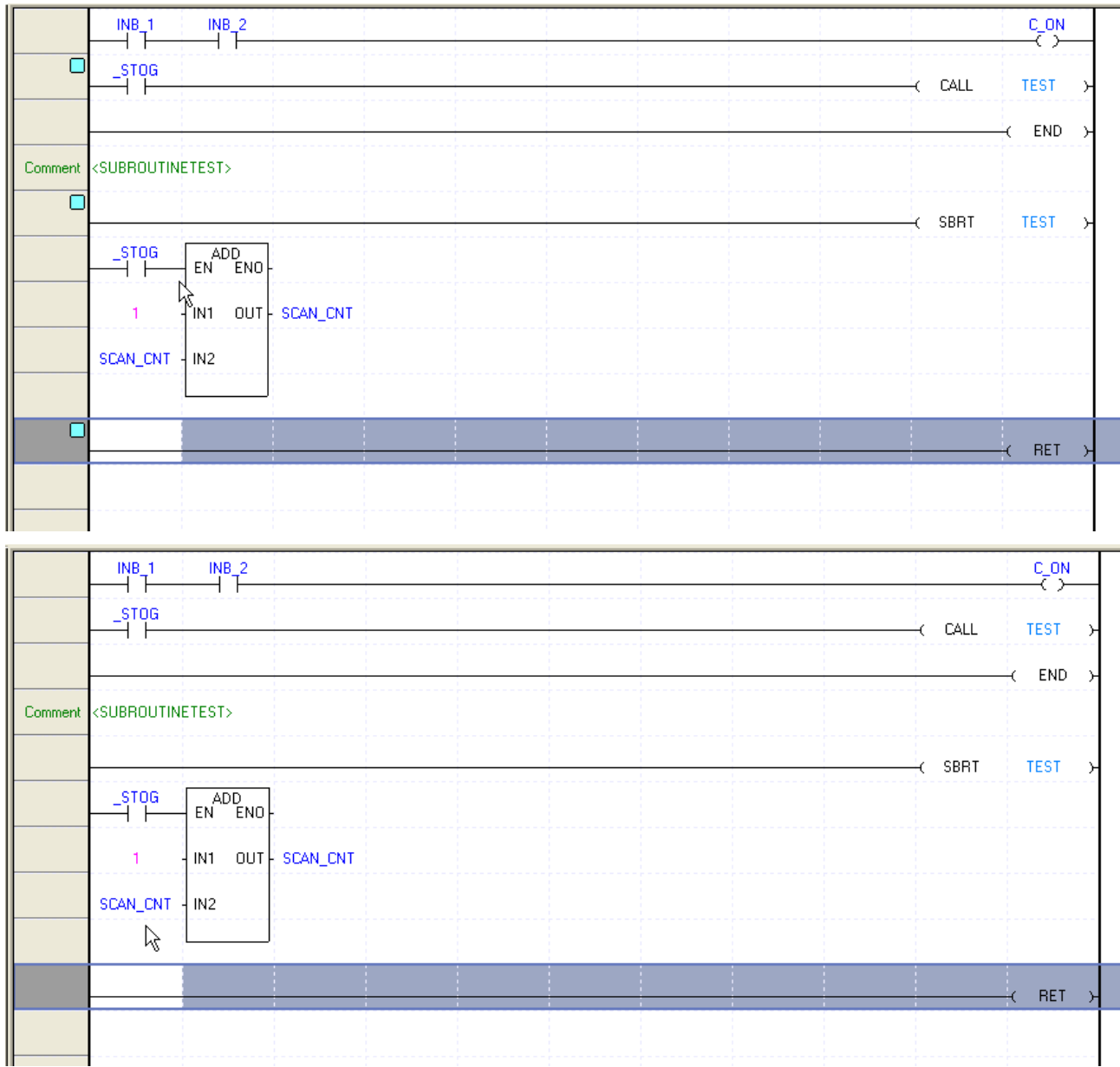
(2) Select [Edit] - [Bookmark] - [Set/Reset] on the menu.



3. Reset All Bookmark

[Sequence]

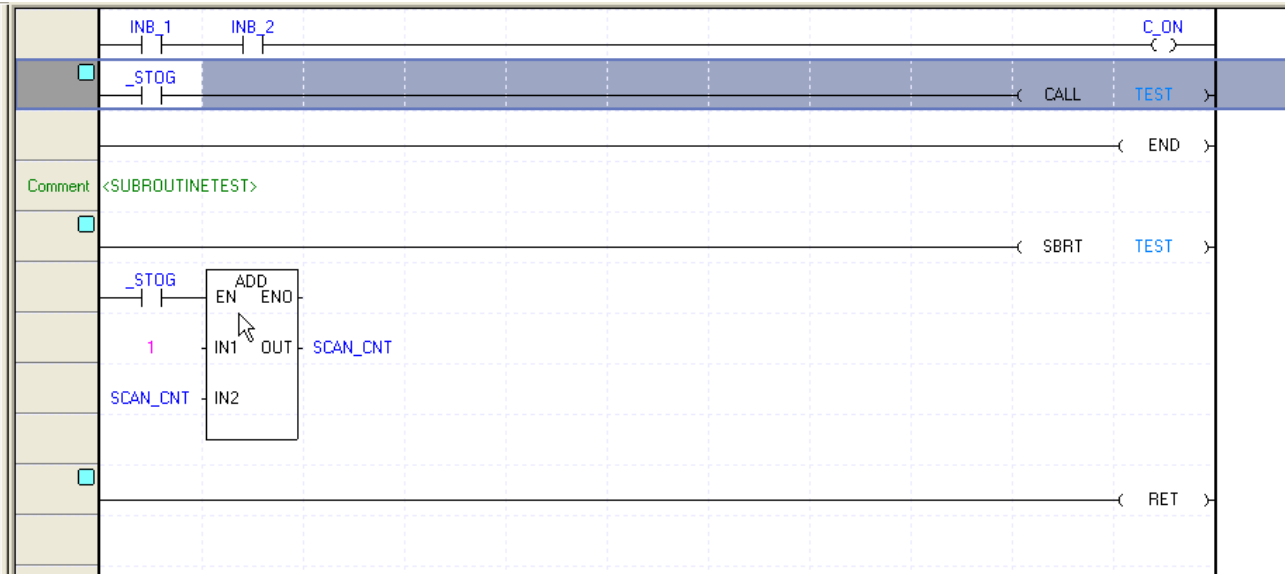
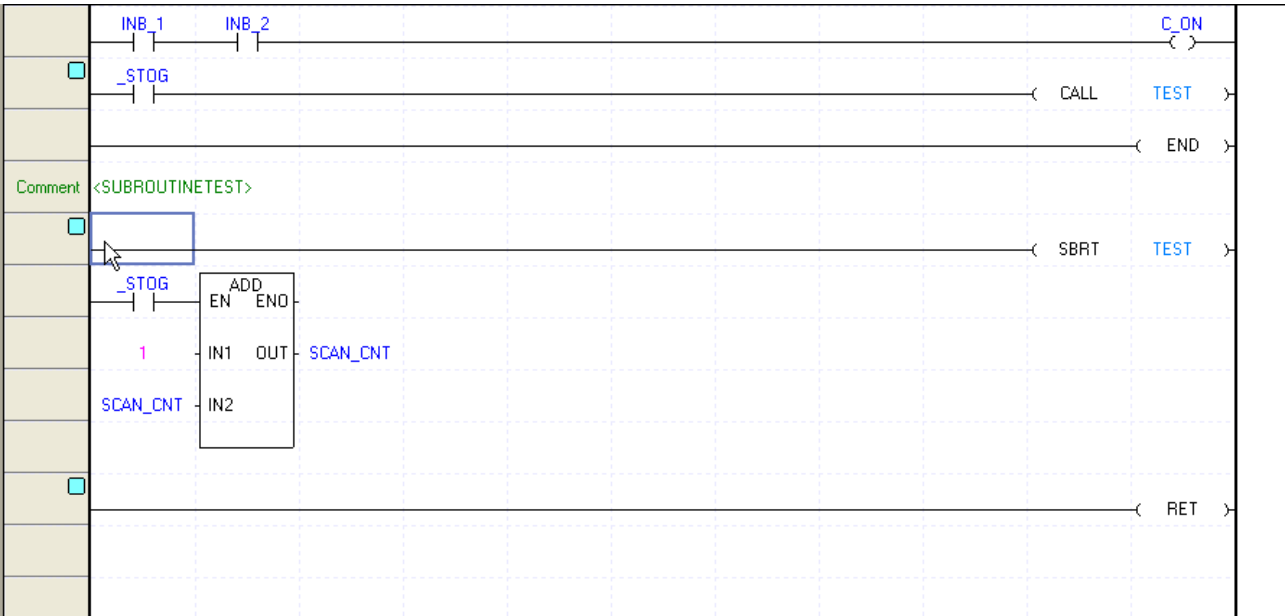
- (1) Select [Edit] - [Bookmark] - [Remove All] on the menu.



4. Previous Bookmark

[Sequence]

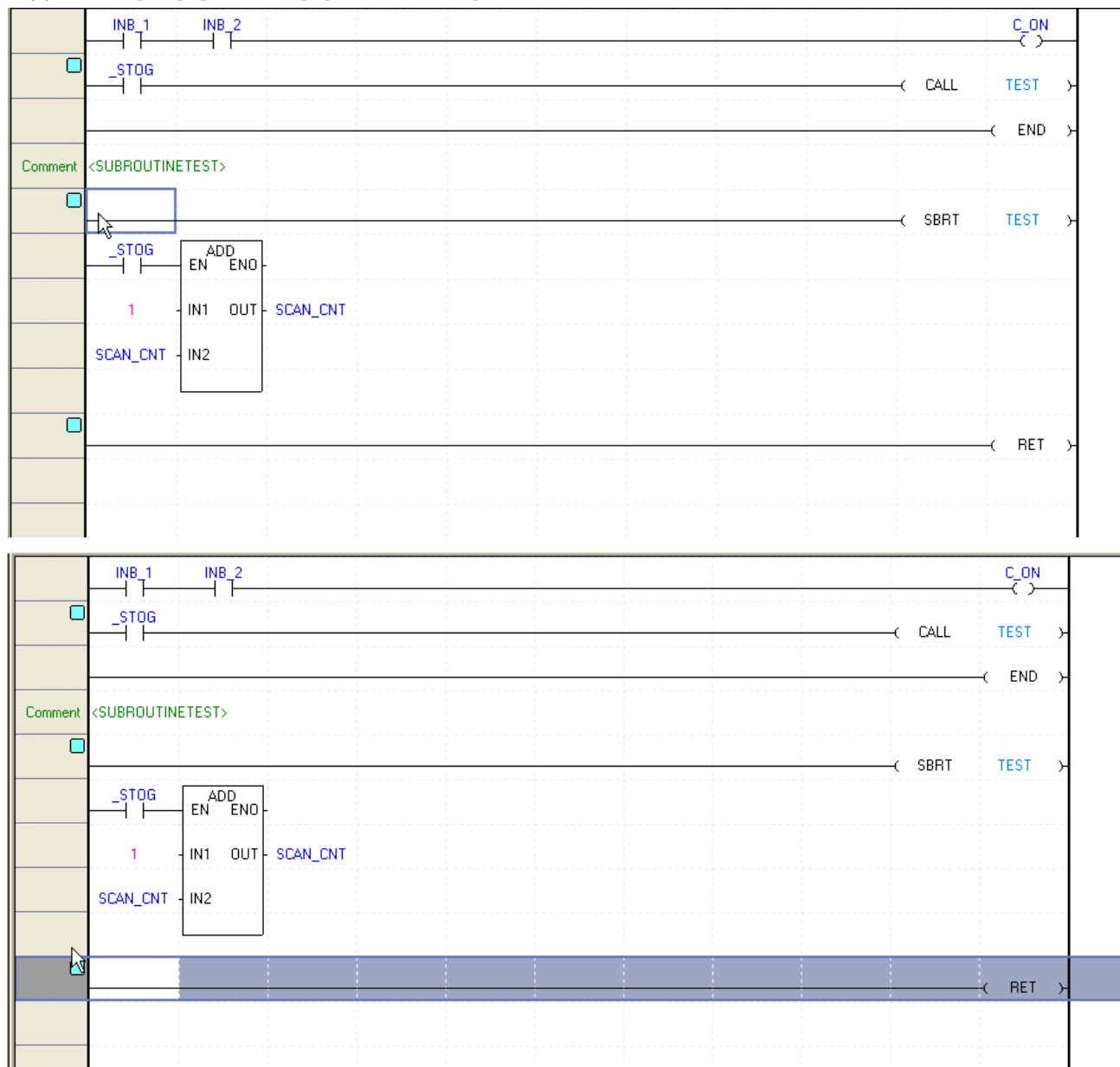
(1) Select [Edit] - [Bookmark] - [Previous Bookmark] on the menu.



5. Next Bookmark

[Sequence]

(1) Select [Edit] - [Bookmark] - [Next Bookmark] on the menu.



Notes

1. Bookmark will be specified in line unit.
2. Bookmark is not an item to edit, thus the Set/Reset options will not be included in Undo and Redo.

### 13.4.3 Go To

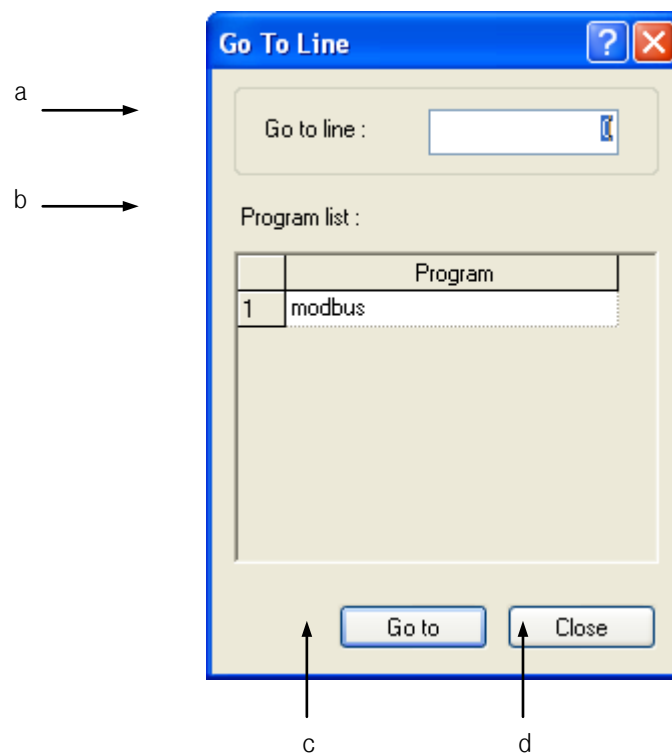
It is used to move to the specified line position, or go to the position of the edited label and rung comment.

#### 1. Go to Line

[Sequence]

- (1) Select [Find/Replace]-[Go To]-[Step] on the menu.

[Dialog Box]



[Description of Dialog Box]

- (a) Go to what: used to input the line to go to
- (b) Program list: used to display the list of the present PLC programs
- (c) Go to: closes the Dialog Box to go to the selected program's step to find
- (d) Cancel: closes the Dialog Box.

- (2) Input the step to move to on the Dialog Box.

#### Notes

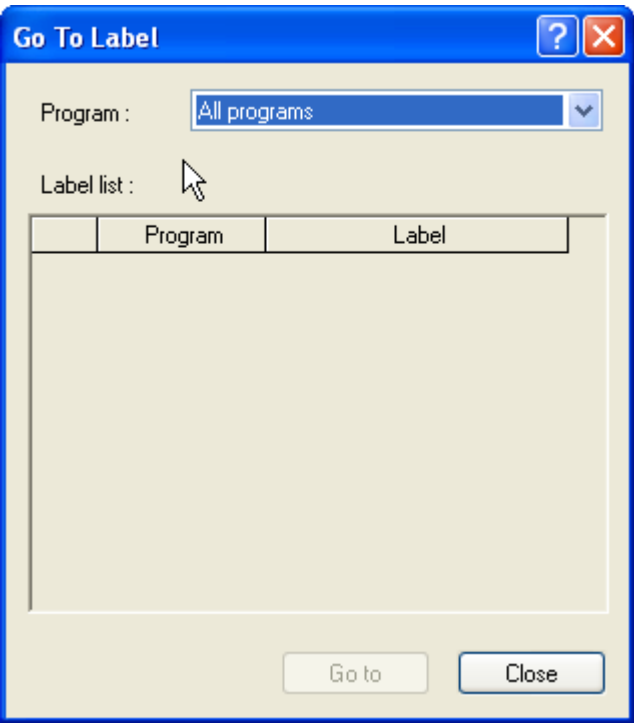
- It is available only in the LD program going to line.

2. Go To Label

[Sequence]

- (1) Select [Find/Replace]-[Go To]-[Label].

[Dialog Box]



[Description of Dialog Box]

- (a) Program: Used to display the list of the present PLC programs. If 'All Programs' is selected, the list of all the labels will be displayed.
  - (b) Labels list inside the program: used to display the list of the labels used in the selected program.
  - (c) Go To: Closes the Dialog Box to go to the selected label.
  - (d) Cancel: Closes the Dialog Box.
- (2) Select the label to go to on the Dialog Box.

Notes

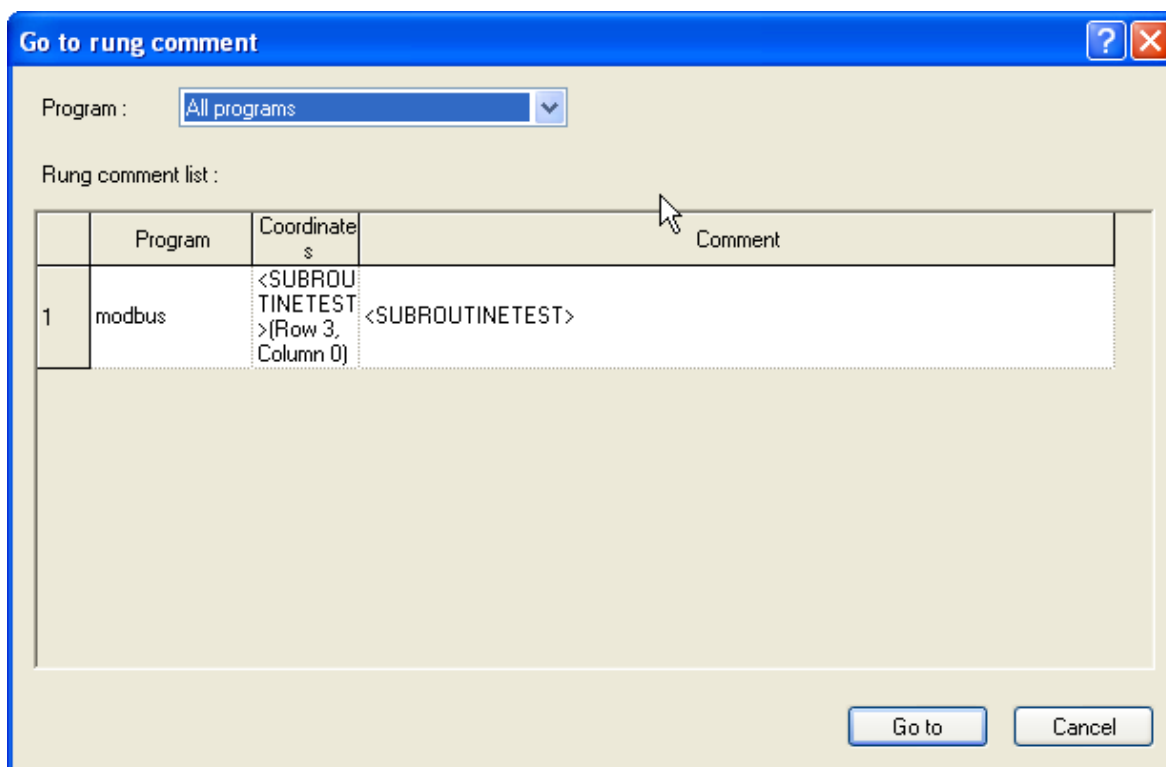
- Go To Label is available only in the LD Program.

### 3. Go To Rung Comment

[Sequence]

- (1) Select [Find/Replace]-[Go To]-[Rung Comment].

[Dialog Box]



[Description of Dialog Box]

- (a) Program: Used to display the list of the present PLC programs. If 'All Programs' is selected, the list of all the rung comments will be displayed.
- (b) Rung comment list: Used to display the list of the rung comments used in the selected program.
- (c) Go to: Closes the Dialog Box to go to the selected rung comment.
- (d) Cancel: Closes the Dialog Box.

- (2) Select the rung comment to go to on the Dialog Box.

#### Notes

- Go To Rung Comment is available only in the LD Program.

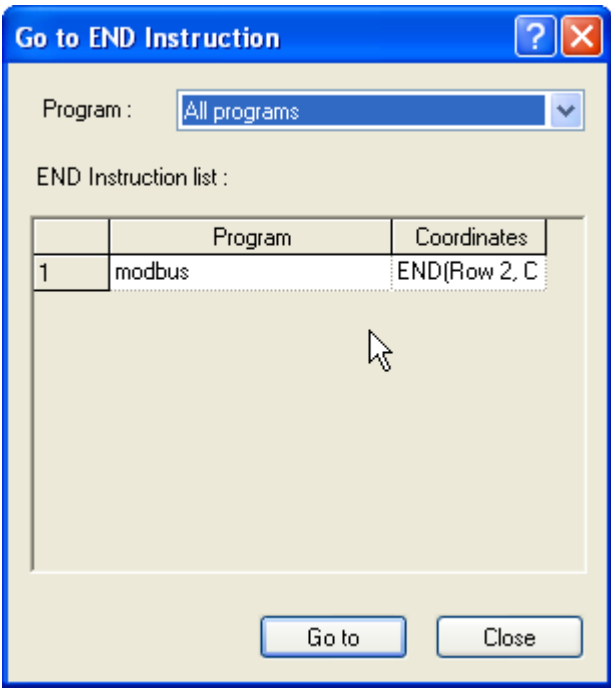


4. Go To END Instruction

[Sequence]

- (1) Select [Find/Replace]-[Go To]-[END Instruction] on the menu.

[Dialog Box]



[Description of Dialog Box]

- (a) Program: Used to display the list of the present PLC programs. If 'All Programs' is selected, the list of all the END instructions will be displayed.
  - (b) END instruction list: used to display the list of the END instructions used in the selected program.
  - (c) Go to: Closes the Dialog Box to go to the selected END instruction.
  - (d) Cancel: Closes the Dialog Box.
- (2) Select the END instruction to go to on the Dialog Box.

Notes

- Go To END Instruction is available only in the LD Program

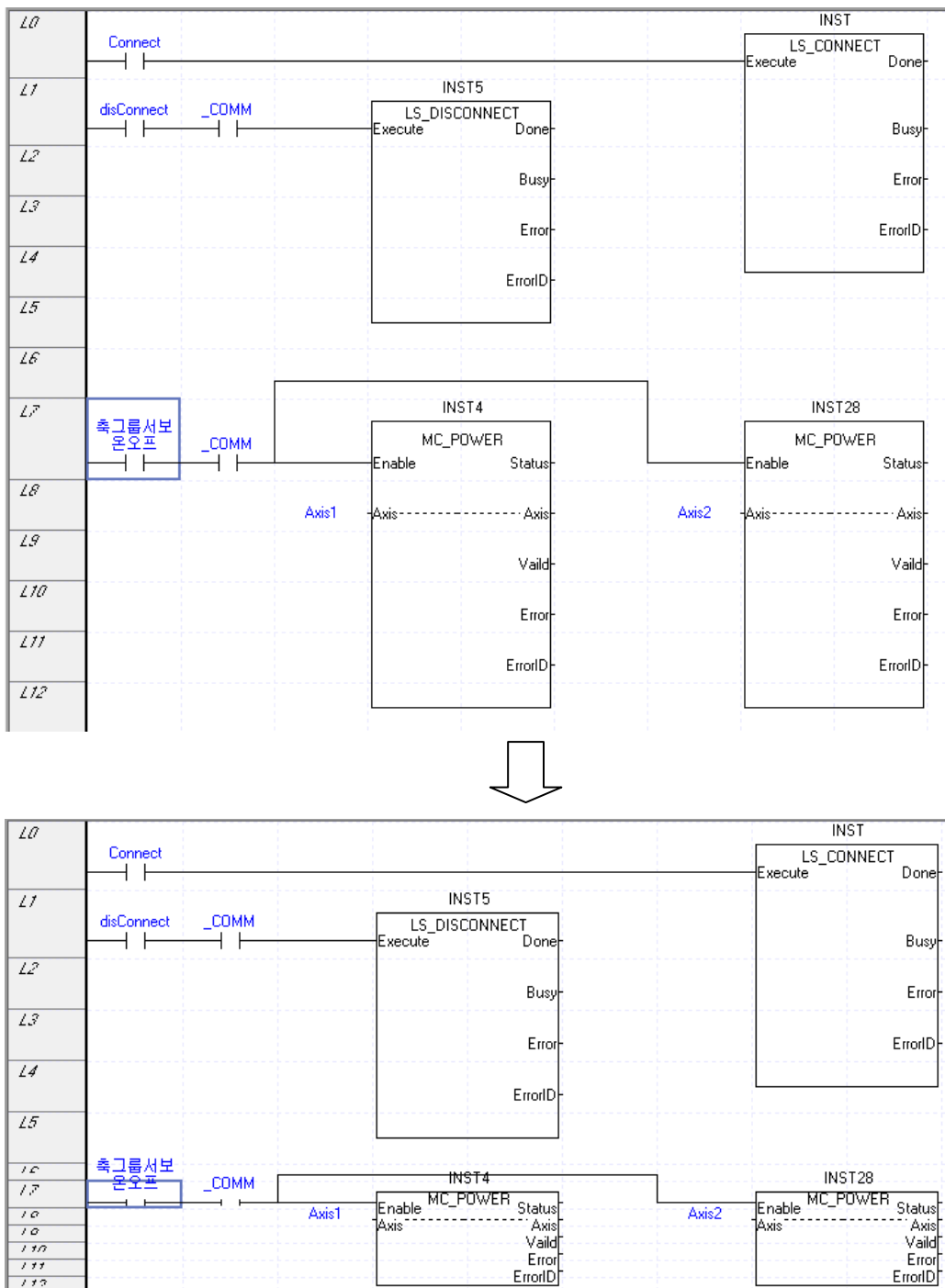
### 13.4.4 Set Simplified View

It provides the Simple View function reducing the selected area in the LD program.

#### 1. Setting Simple View

[Sequence]

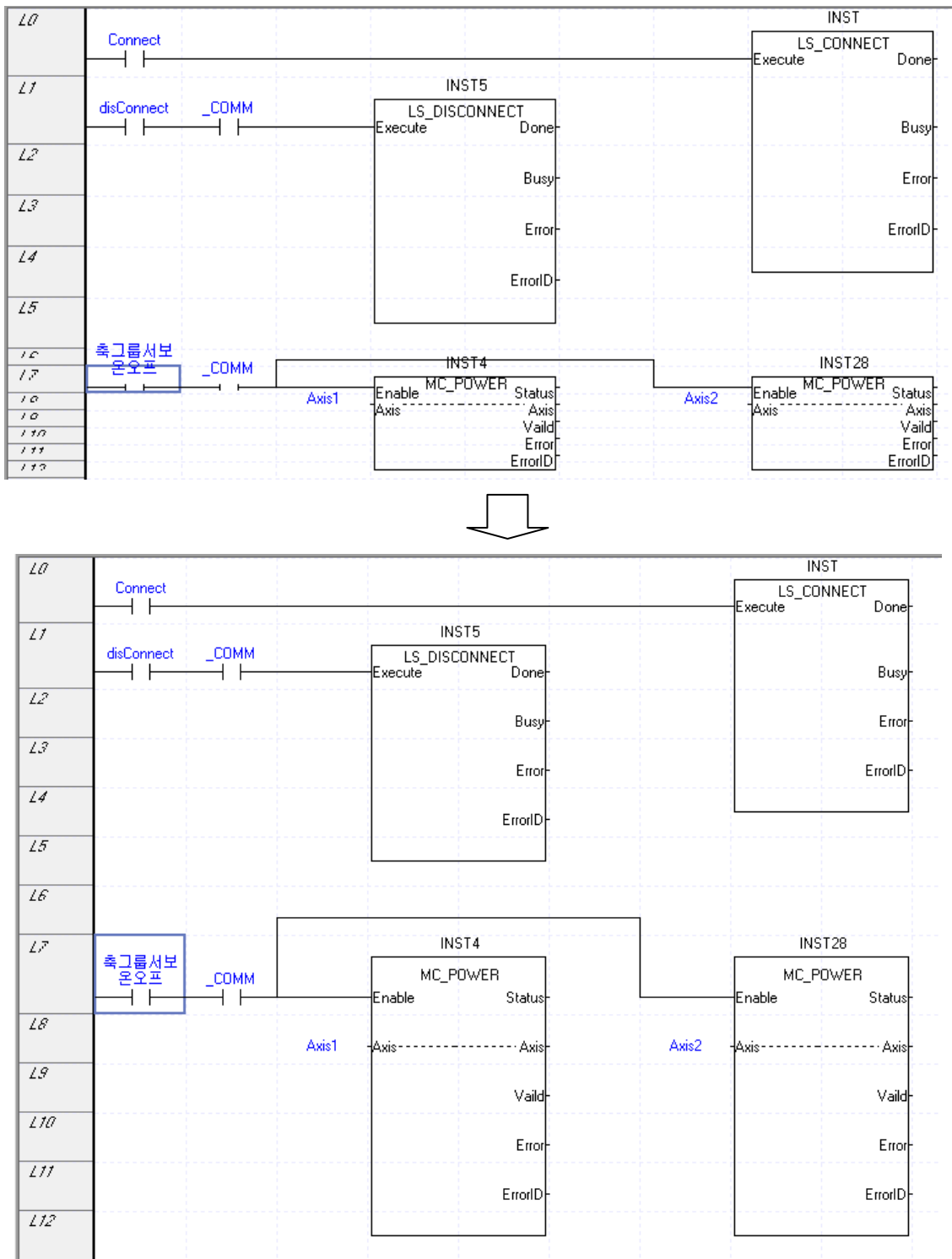
- (1) Select the area for Simple View in the LD program window.
- (2) After clicking the right mouse in the LD program window, click the [Simple View Setting].



2. Cancelling Simple View

[Sequence]

- (1) Select the area where Simple View should be cancelled in the LD program window.
- (2) After clicking the right mouse in the LD program window, click the [Cancel Simple View].



# Chapter 14 ST Edition

ST based on character is program language and conforms to IEC 61131-3.

## 14.1 Limit

When editing the ST program, please note that there are the following limitations on functions.

Item	Content	Limit
Max. no. of character in one line	Max. no. of character in one line is 2,048 for English and 1,024 for Korean.	2,048

Note

1.

Only one language is available for one scan program.

2.

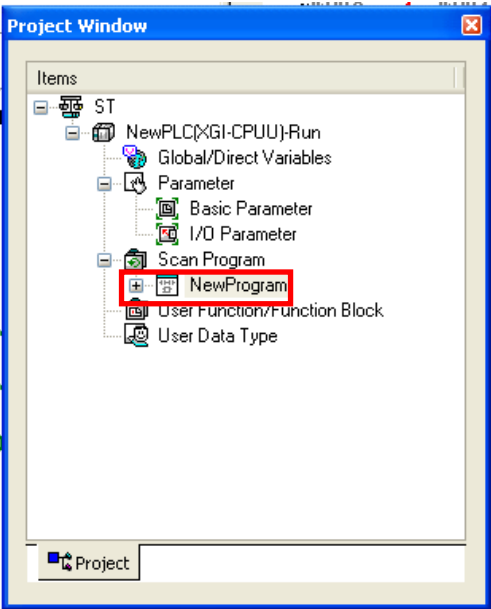
A certain language applied to the program can't be converted into other language.

## 14.2 Writing ST program

### 14.2.1 Adding Scan Program

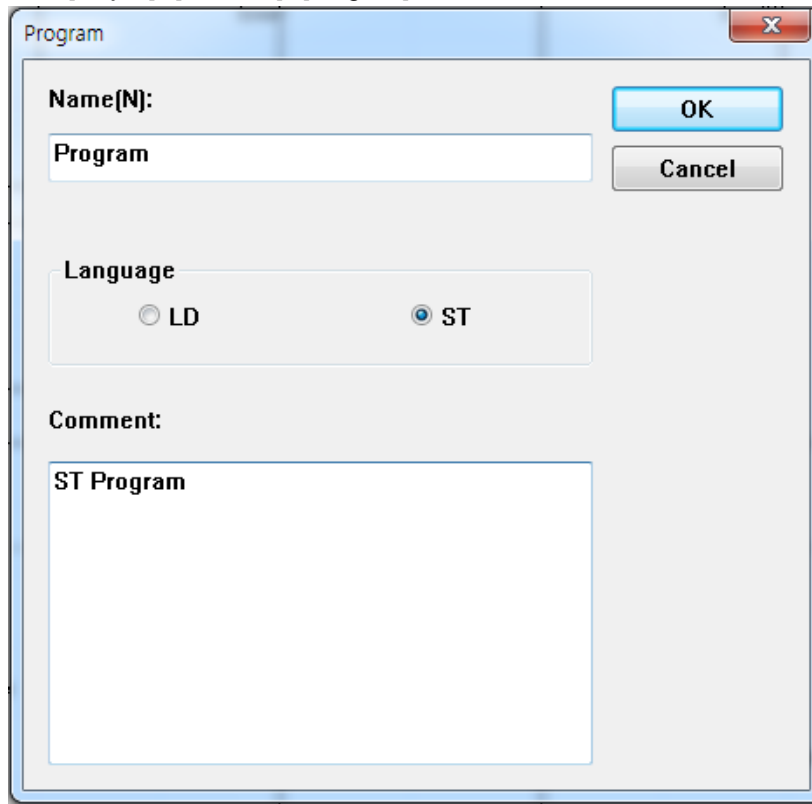
[Sequence]

1.
- Select Scan Program in the project window.



## Chapter 14 ST Edit

2. Select [Project] - [Add item] - [Program].



The image shows a 'Program' dialog box with a title bar containing a close button (X). The dialog contains three main sections: 'Name(N):' with a text input field containing 'Program' and 'OK'/'Cancel' buttons; 'Language' with radio buttons for 'LD' and 'ST' (selected); and 'Comment:' with a text area containing 'ST Program'.

**Program**

**Name(N):**

Program

**Language**

☐ LD ☒ ST

**Comment:**

ST Program

14.3 Editing Program

14.3.1 Shortcut key

The followings are shortcut key.

The user can change shortcut key in [Tools] - [Shortcut key Settings].

Action	Shortcut key	Description
Copy	Ctrl + C	Copies selected character string.
Paste	Ctrl + V	Pastes copied character string.
Delete	Del	Deletes selected character string.
Cut	Ctrl + X	Copies selected character string and deletes it.
Undo	Ctrl + Z	Cancels edition.
Redo	Ctrl + Y	Cancels Redo action.
Select All	Ctrl + A	Selects all character strings.

The followings are shortcut key about movement. The user can't change the following shortcut keys.

Shortcut key	Description
Home	Goes to start of line.
Ctrl + Home	Goes to start of program.
→	Moves cursor to right one space.
←	Moves cursor to left one space.
↑	Moves cursor to upper line.
↓	Moves cursor to lower line.
End	Goes to end of line.
Page up	Goes to upper one page.
Page down	Goes to lower one page.
Ctrl + End	Goes to end of edited line.
Ctrl + →	Goes to start of next word.
Ctrl + ←	Goes to start of previous word.
Ctrl + Del	Deletes by start of next word.
Ctrl + BS	Deletes by start of current word.
Shift + Move	Selects from current cursor location to location to move.

### Note

1. The described shortcut key is based on default of XG5000
2. For user defined- shortcut key, refer to chapter 2.4

### 14.3.2 Copy/Paste

Copies selected character string into clipboard and pastes it.

[Sequence]

1. Select the character string to copy.

```
22 // SETTING ERROR FLAG!
23 IF LWORD_TMP <> LINT_VAL THEN ERROR := TRUE;
24 ELSE ERROR := FALSE;
25 END_IF;
26
27 DWORD_LOWER := LWORD_TO_DWORD(LWORD_TMP AND 16#00000000FFFFFFFF);
28 DWORD_HIGHER := LWORD_TO_DWORD(SHR(LWORD_TMP AND 16#FFFFFFFF00000000, 32));
29
```

2. Select [Edit] - [Copy].
3. Move to location to paste.

```
22 // SETTING ERROR FLAG!
23 IF LWORD_TMP <> LINT_VAL THEN ERROR := TRUE;
24 ELSE ERROR := FALSE;
25 END_IF;
26
27 DWORD_LOWER := LWORD_TO_DWORD(LWORD_TMP AND 16#00000000FFFFFFFF);
28 DWORD_HIGHER := LWORD_TO_DWORD(SHR(LWORD_TMP AND 16#FFFFFFFF00000000, 32));
29 |
30 END_IF;
```

4. Select [Edit] – [Paste].

```
22 // SETTING ERROR FLAG!
23 IF LWORD_TMP <> LINT_VAL THEN ERROR := TRUE;
24 ELSE ERROR := FALSE;
25 END_IF;
26
27 DWORD_LOWER := LWORD_TO_DWORD(LWORD_TMP AND 16#00000000FFFFFFFF);
28 DWORD_HIGHER := LWORD_TO_DWORD(SHR(LWORD_TMP AND 16#FFFFFFFF00000000, 32));
29 LWORD_TO_DWORD
30 END_IF;
```

### Note

1. Clipboard: memory area of PC to save temporary information.
2. When parting, if the user selects the area, the character string is overwritten and if the user doesn't select the area, it is inserted.
3. Only text is pasted.
4. When copying/pasting a function block, you will get the same instance name so you need to register a new instance name by inserting a function block.

### 14.3.3 Undo/Redo

Undo cancels edition and Redo cancels Undo action.

[Sequence]

1. After executing Paste, selects [Edit] – [Undo].  
=> Pasted contents are deleted.

```

22 // SETTING ERROR FLAG!
23 IF LWORD_TMP <> LINT_VAL THEN ERROR := TRUE;
24 ELSE ERROR := FALSE;
25 END_IF;
26
27 DWORD_LOWER := LWORD_TO_DWORD(LWORD_TMP AND 16#00000000FFFFFFFF);
28 DWORD_HIGHER := LWORD_TO_DWORD(SHR(LWORD_TMP AND 16#FFFFFFFF00000000, 32));
29 |
30 END_IF;

```

2. Select [Edit] – [Redo].  
=> Paste action is executed again.

```

22 // SETTING ERROR FLAG!
23 IF LWORD_TMP <> LINT_VAL THEN ERROR := TRUE;
24 ELSE ERROR := FALSE;
25 END_IF;
26
27 DWORD_LOWER := LWORD_TO_DWORD(LWORD_TMP AND 16#00000000FFFFFFFF);
28 DWORD_HIGHER := LWORD_TO_DWORD(SHR(LWORD_TMP AND 16#FFFFFFFF00000000, 32));
29 LWORD_TO_DWORD
30 END_IF;

```

### 14.3.4 Adding/Selecting variable

Inputs variable at the selected location.

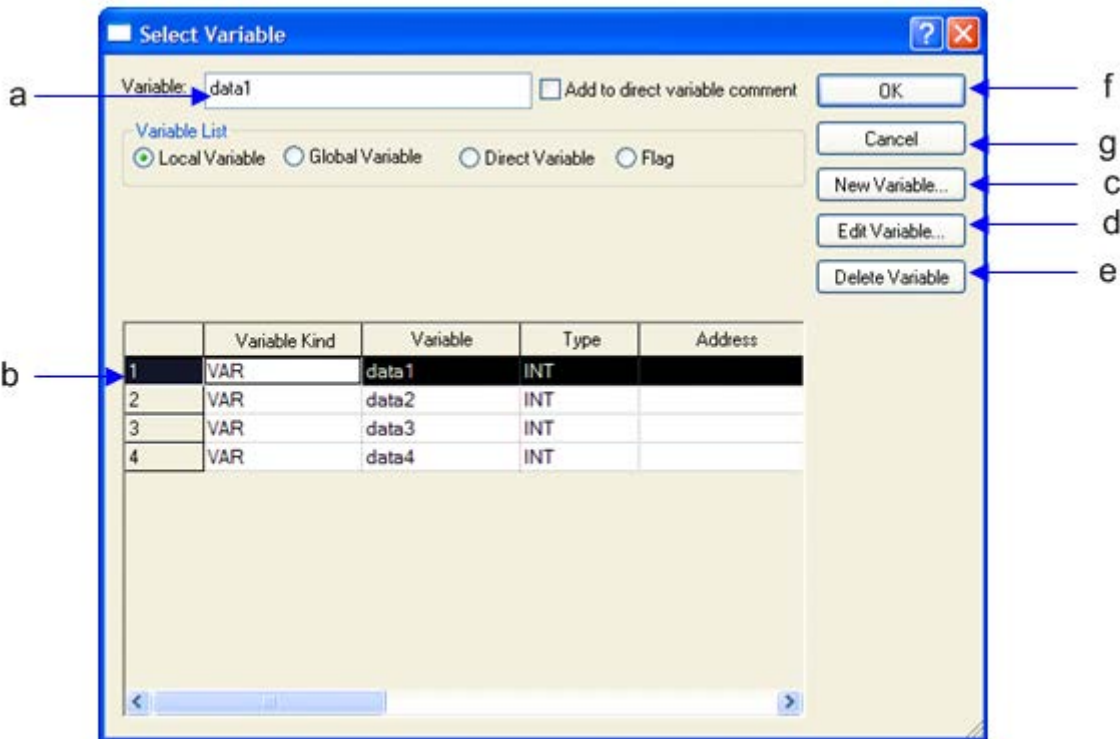
- 1) Input Local Variable

[Sequence]

1. Move a cursor to the position where the variable should be input and double-click.
2. Select the local variable in a variable type (default).

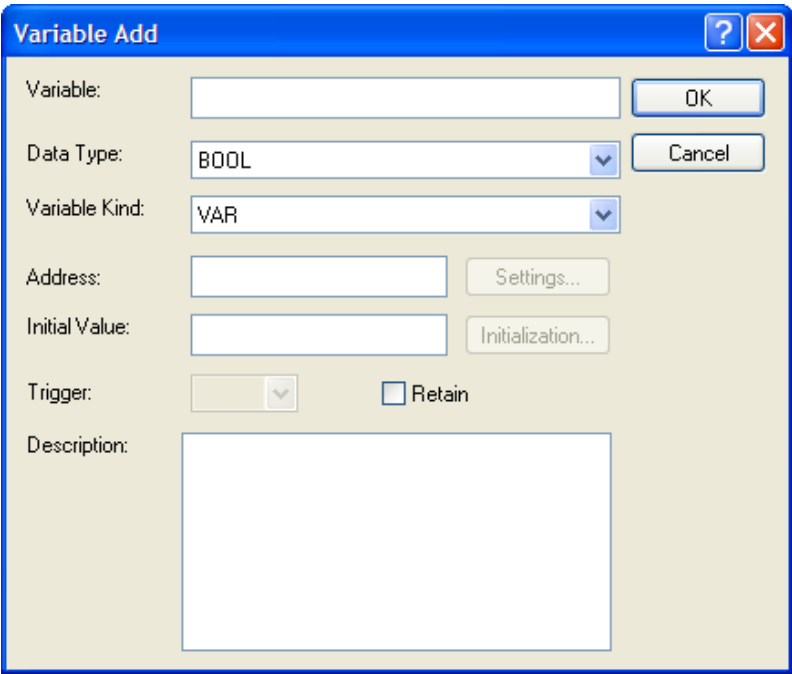
[Communication Box]



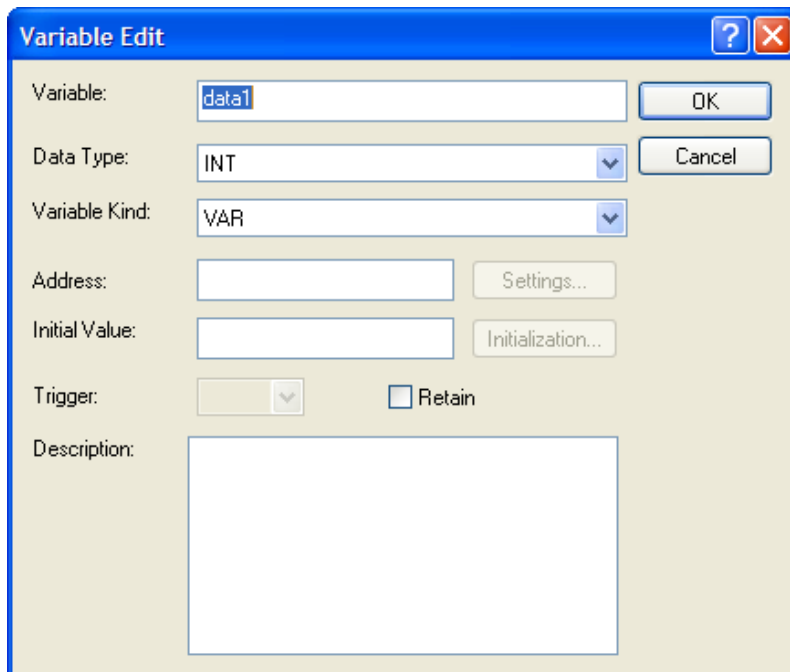


[Description of Communication Box]

- a. Variable: used to input a variable or declared variable name. If the input String is of variable format and the applicable String is not registered as a variable in the Variable/Comment, the Variable/Comment Add Communication Box will be displayed.
- b. Local variable: displays the list of declared local variable
- c. New Variable: recalls Communication box to add variable into local variable list



d. Edit Variable: recalls Communication box to edit the selected variable



The Variable Edit dialog box is shown with the following fields and controls:

- Variable:** A text box containing "data1".
- Data Type:** A dropdown menu showing "INT".
- Variable Kind:** A dropdown menu showing "VAR".
- Address:** A text box with a "Settings..." button next to it.
- Initial Value:** A text box with an "Initialization..." button next to it.
- Trigger:** A dropdown menu with a "Retain" checkbox.
- Description:** A large text area.
- Buttons:** "OK" and "Cancel" buttons are located at the top right.

e. Delete Variable: deletes the selected variable from local variable list

f. OK: applies the inputted or selected items and closes the Communication box

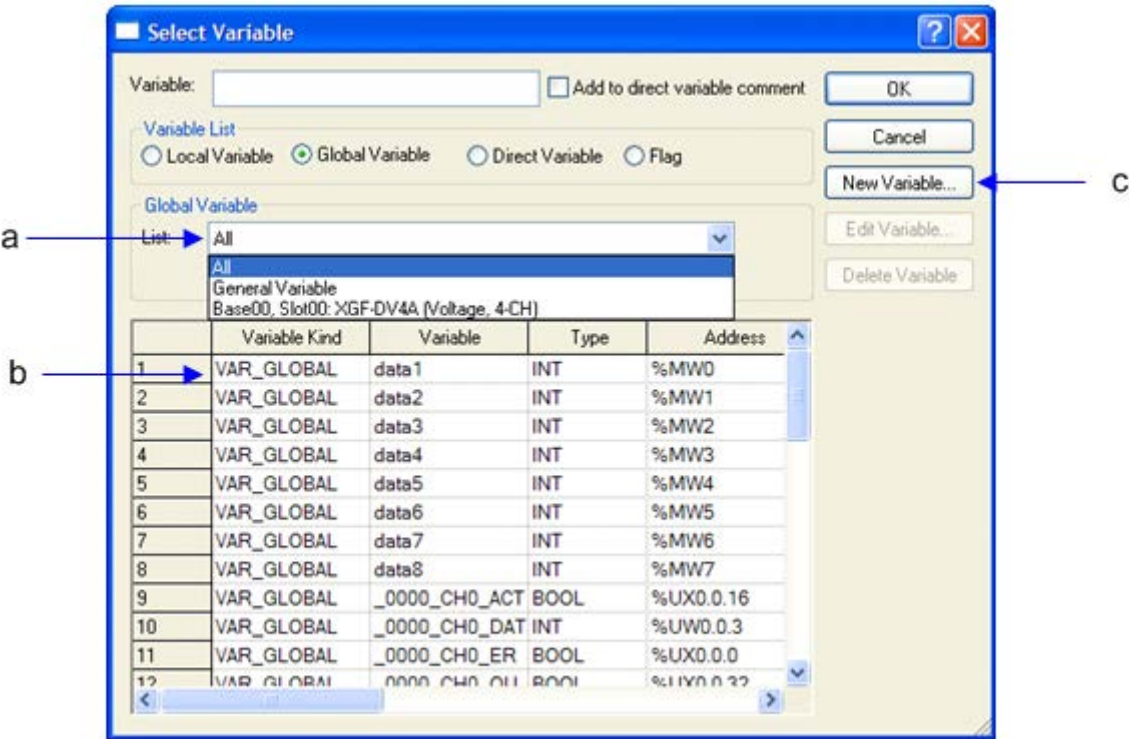
g. Cancel: closes Communication box

2) Input Global variable

[Sequence]

- 1. Move a cursor to the position where the variable should be input and double-click.
- 2. Select the Global variable in a variable type

[Communication box]



[Description of Communication box]

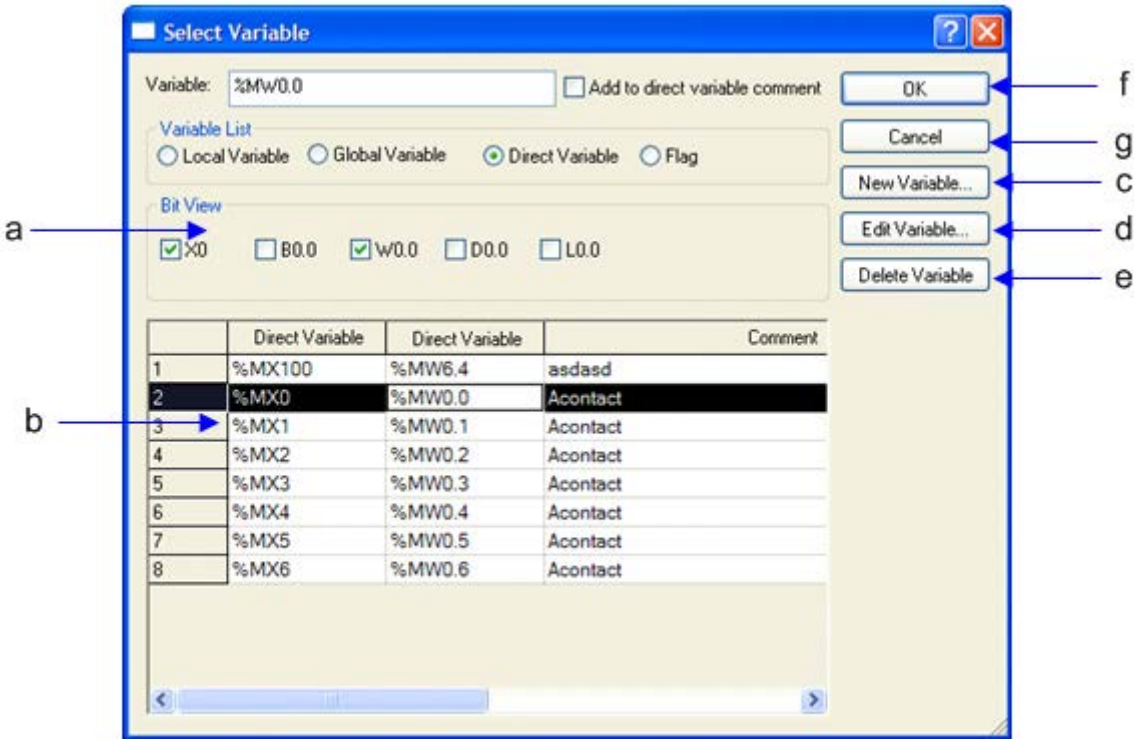
- a. Global variable: displays the declared global variable list. Can be registered as EXTERNAL variable
- b. Global variable list: classify the entire list into all, general variable, special module related variable
- c. New Variable: recalls the Communication box to add variable into global variable list

3) Input Direct Variable

[Sequence]

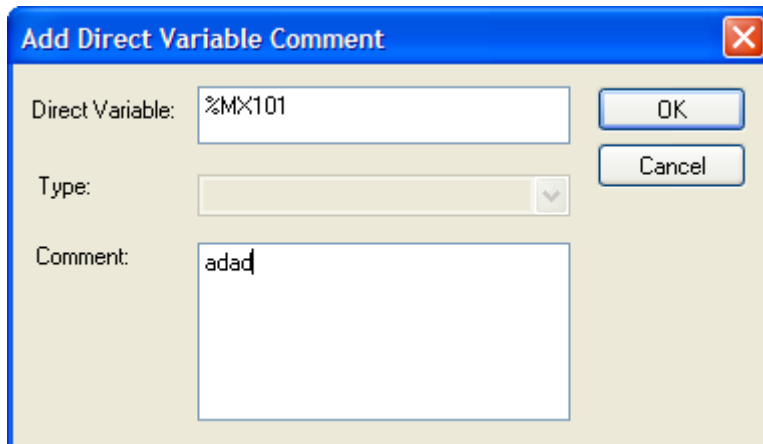
- 1. Move a cursor to the position where the variable should be input and double-click.
- 2. Select the Direct variable in a variable type.

[Communication box]



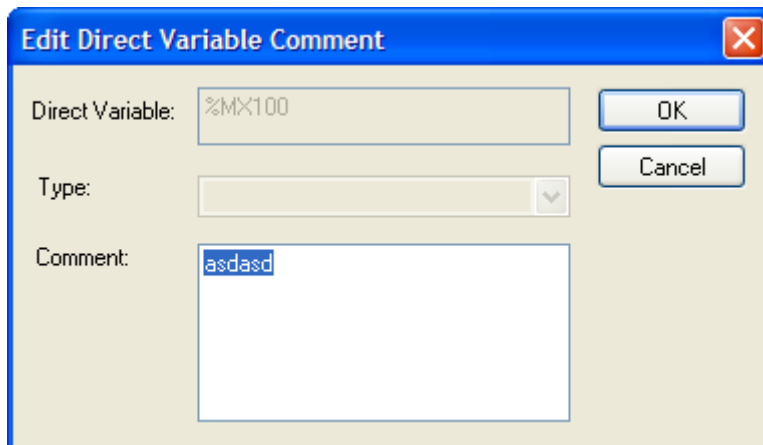
### [Description of Communication box]

- a. Bit View: for bit type direct variable, displays direct variable in diverse type. Displayed in Bit (X0), byte (B0.0), word (W0.0), double word (D0.0), long word (L0.0).
- b. Direct variable: displays direct variable list.
- c. New Variable: recalls Communication box to add comment of variable at direct variable list



The 'Add Direct Variable Comment' dialog box has a blue title bar with a close button. It contains three input fields: 'Direct Variable' with the text '%MX101', 'Type' with a dropdown arrow, and 'Comment' with the text 'adad'. To the right of these fields are 'OK' and 'Cancel' buttons.

- d. Edit variable: recalls the Communication box to edit the direct variable comment



The 'Edit Direct Variable Comment' dialog box has a blue title bar with a close button. It contains three input fields: 'Direct Variable' with the text '%MX100', 'Type' with a dropdown arrow, and 'Comment' with the text 'asdasd'. To the right of these fields are 'OK' and 'Cancel' buttons.

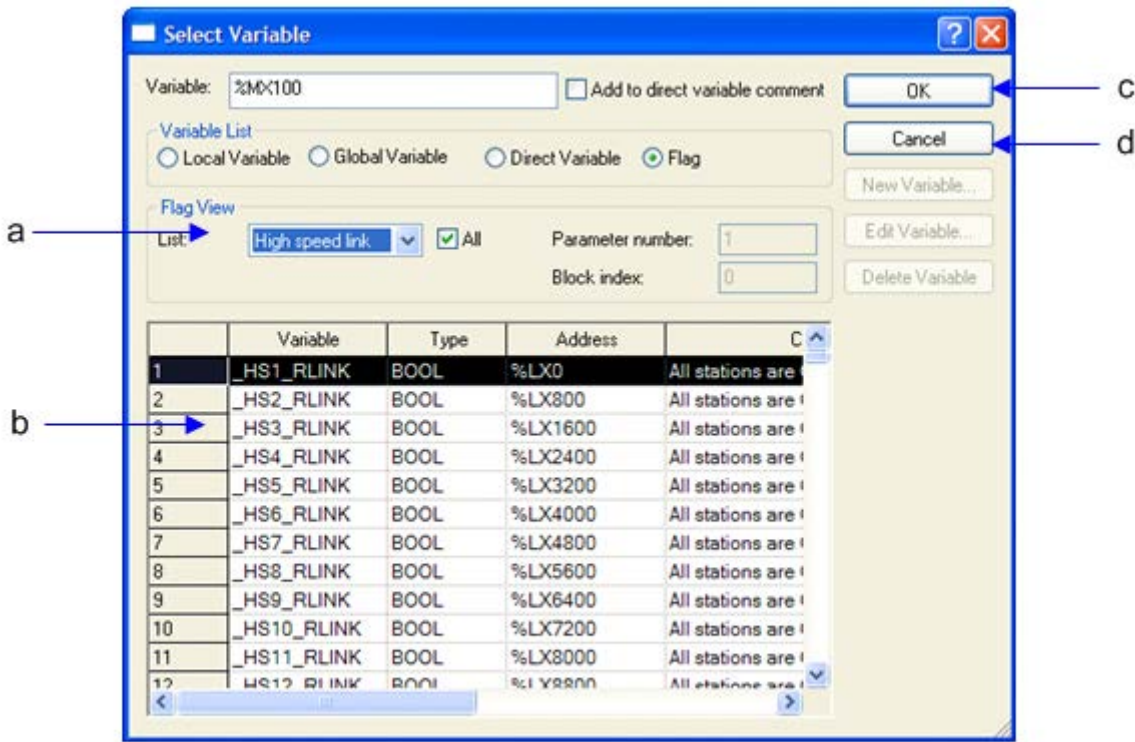
- e. Delete Variable: deletes the selected direct variable from direct variable list
- f. OK: applies the inputted or selected item and closes the Communication box
- g. Cancel: closes the Communication box

4) Input Flag

[Sequence]

- 1. Move a cursor to the position where the variable should be input and double-click.
- 2. Select the Direct variable in a variable type.

[Communication box]



[Description of Communication box]

- a. List: as selection box displaying flag type, you can select System/Motion/IO flag.
- b. Flag: displays flag at list. You can select detail type at flag view item
- c. OK: applies the inputted or selected items and closes the Communication box
- d. Cancel: closes the Communication box

### 14.3.5 Inserting Function/Function Block

Inserts Function/Function Block at the cursor location.

[Sequence]

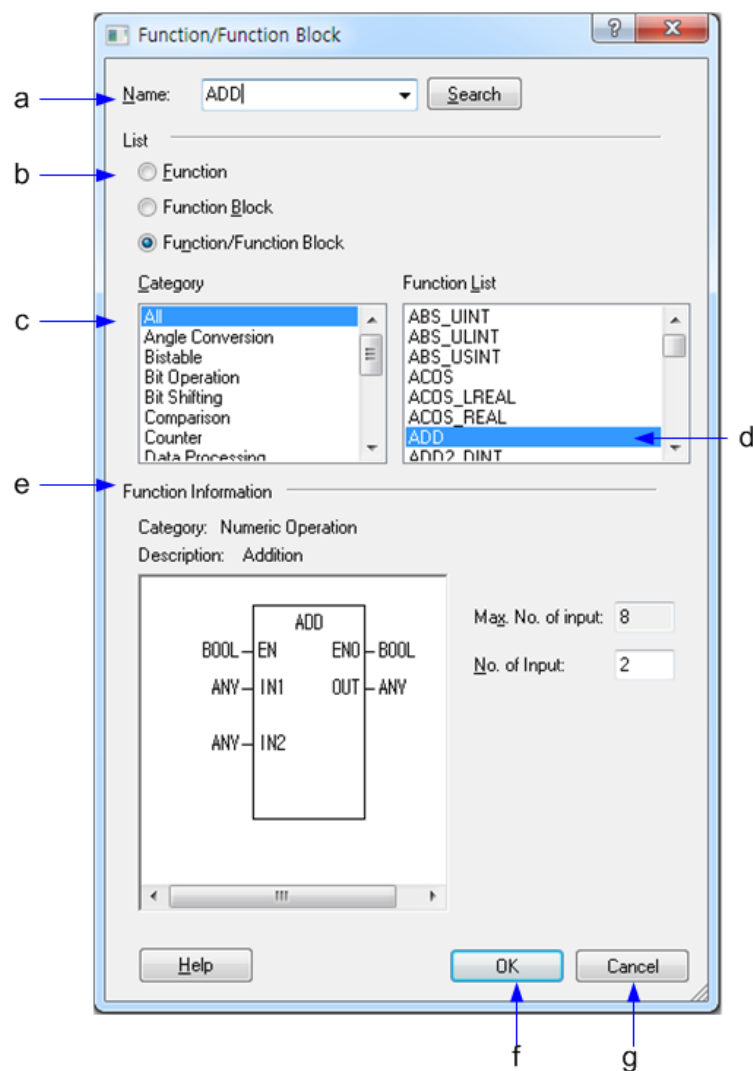
1. Move the cursor to insert.

```

22 // SETTING ERROR FLAG!
23 IF LWORD_TMP <> LINT_VAL THEN ERROR := TRUE;
24 ELSE ERROR := FALSE;
25 END_IF;
26
27 DWORD_LOWER := LWORD_TO_DWORD(LWORD_TMP AND 16#00000000FFFFFFFF);
28 DWORD_HIGHER := LWORD_TO_DWORD(SHR(LWORD_TMP AND 16#FFFFFFFF00000000, 32));
29 |
30 END_IF;
    
```

2. Select [Edit] – [Function/Function Block].

[Communication box]



## [Description of Communication box]

- a. Name: inputs name of Function (Block) to use.
- b. List: it is used to sort Function, Function Block .
- c. Category: indicates category of Function (Block).
- d. Function List: displays list of Function (Block) in the selected category.
- e. Function Information: displays information of Function (Block). In case of Function, it is available to set properties about input parameter. In case of Function Block, it is available to set instance name and instance class.
- f. OK: applies them and closes window.
- g. Cancel: closes window without application.

## 3. Function/Function Block is inserted.

```

22  // SETTING ERROR FLAG!
23  IF LWORD_TMP <> LINT_VAL THEN ERROR := TRUE;
24  ELSE ERROR := FALSE;
25  END_IF;
26
27  DWORD_LOWER := LWORD_TO_DWORD(LWORD_TMP AND 16#00000000FFFFFFFF);
28  DWORD_HIGHER := LWORD_TO_DWORD(SHR(LWORD_TMP AND 16#FFFFFFFF00000000, 32));
29  ADD( ANY_IN1, ANY_IN2, ANY_IN3, ANY_IN4, ANY_IN5, ANY_IN6, ANY_IN7, ANY_IN8 )
30 END_IF;

```

## Note

- I/O parameters of function/function block are not inserted automatically. The user should edit them additionally.
- When copying/pasting a function block, you will get the same instance name so you need to register a new instance name by inserting a function block.



### 14.4 Viewing Program

Describes about display properties in the ST program.

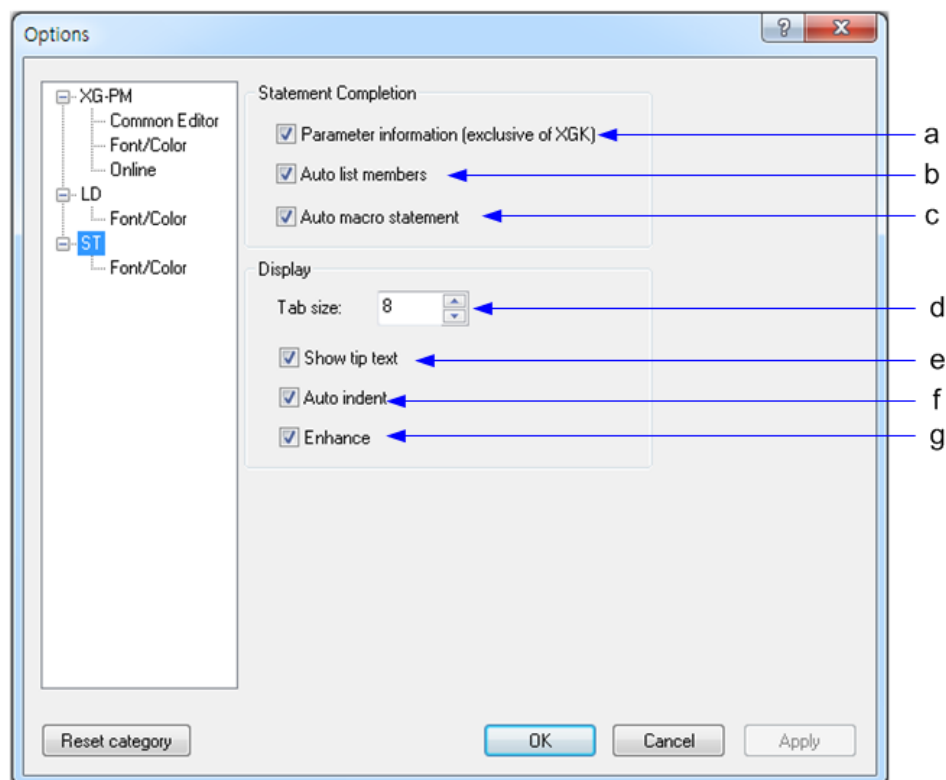
#### 14.4.1 ST option

Description about Communication box of option in the ST program.

[Sequence]

1. Select [Tools]-[Options].
2. Select ST.

[Communication box]



[Description of Communication box]

- a. Parameter information: when inserting Function//FB, example text of IO parameter is added.
- b. Auto list members: when inserting character string by keyboard, variable or Function/FB starting with same character are displayed.
- c. Auto macro statement: when inserting the control text of ST (IF, WHILE, SWITCH), control text is completed according to ST grammar
- d. Tap size: inputs tap size.
- e. Show tip text: when cursor is on the character string in ST program, description of character string is displayed.
- f. Auto indent: when changing line with ENTER, indent is applied automatically with same tap size of previous line
- g. Enhance: character string used in ST program is displayed with various colors according to variable, comment, Function (Block)

14.4.2 Font/Color

Available to designate font or color in the ST program.

1) Font

[Sequence]

- 1. Select [Tools]-[Options].
- 2. Select ST Font/Color.
- 3. Change Font.

Note

1. The user can't change the character size  
2. Default font is "Fixedsys".

2) Color

[Sequence]

- 1. Select [Tools] - [Options].
- 2. Select ST font/color.
- 3. Change color.

14.4.3 Tap size

When using Tap, Tap size is designated.

[Sequence]

- 1. Select [Tools] – [Options].
- 2. Select ST.
- 3. Change Tap size.

```
1
2CLOCK_SOURCE := _T1S;
3
4// LEFT rotate, FIND transition
5IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6//IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7    LINT_VAL := LINT_VAL + 1;
8    %ML0 := %ML0 + 1;
9
10    FOR IDX := 0 TO MAX_VALUE - 1 DO
11        mask := SHL(LWORD#1, IDX);
12        LONG_ARRAY[IDX, IDX] := mask = (LINT_VAL AND mask);
13    END_FOR;
14
```

[Tap size 4 screen]

## Chapter 14 ST Edit

```
1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10    FOR IDX := 0 TO MAX_VALUE - 1 DO
11        mask := SHL(LWORD#1, IDX);
12        LONG_ARRAY[IDX, IDX] := mask = (LINT_VAL AND mask);
13    END_FOR;
```

[Tap size 8 screen]

### Note

1. Default tap size is 4.
2. Range of tap size is 1~100.

### 14.4.4 Showing line numbers

Shows/hides line numbers in the ST program

[Sequence]

1. Select [Tools] – [Options].
2. Select XG5000 Common Editor.
3. Check 'Show line numbers'.

### Note

1. XGI/XGR is displayed all the time.

## 14.5 Additional Edition Function

Describes additional edition function for convenient.

### 14.5.1 Book mark

The user can set bookmark and go there easily.

#### 1) Setting book mark

[Sequence]

1. Move the cursor to set bookmark.

```

1
2CLOCK_SOURCE := _T1S;
3
4// LEFT rotate, FIND transition
5IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6//IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7    LINT_VAL := LINT_VAL + 1;
8    %ML0 := %ML0 + 1;
9
10    FOR IDX := 0 TO MAX_VALUE - 1 DO
11        mask := SHL(1, IDX);
12        LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13    END_FOR;
14

```

2. Select [Edit] – [Bookmark] – [Set/Remove].

```

1
2CLOCK_SOURCE := _T1S;
3
4// LEFT rotate, FIND transition
5IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6//IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7    LINT_VAL := LINT_VAL + 1;
8    %ML0 := %ML0 + 1;
9
10    FOR IDX := 0 TO MAX_VALUE - 1 DO
11        mask := SHL(1, IDX);
12        LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13    END_FOR;
14

```

## Chapter 14 ST Edit

### 2) Removing bookmark

[Sequence]

1. Move the cursor to remove bookmark.

```
1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10  FOR IDX := 0 TO MAX_VALUE - 1 DO
11      mask := SHL(1, IDX);
12      LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13  END_FOR;
14
```

2. Select [Edit] – [Bookmark] – [Set/Remove]

```
1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10  FOR IDX := 0 TO MAX_VALUE - 1 DO
11      mask := SHL(1, IDX);
12      LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13  END_FOR;
14
```

### 3) Removing all bookmark

[Sequence]

1. Select [Edit] – [Bookmark] – [Remove All].

```
1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10  FOR IDX := 0 TO MAX_VALUE - 1 DO
11      mask := SHL(1, IDX);
12      LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13  END_FOR;
14
15  LWORD_TMP := 0;
16  FOR IDX := 0 TO MAX_VALUE - 1 DO
17      //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18      mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19      LWORD_TMP := mask OR LWORD_TMP;
20  END_FOR;
```

## 4) Going to previous bookmark

[Sequence]

1. Select [Edit] – [Bookmark] – [Previous Bookmark].

## 5) Going to next bookmark

[Sequence]

1. Select [Edit] – [Bookmark] – [Next Bookmark].

**Note**

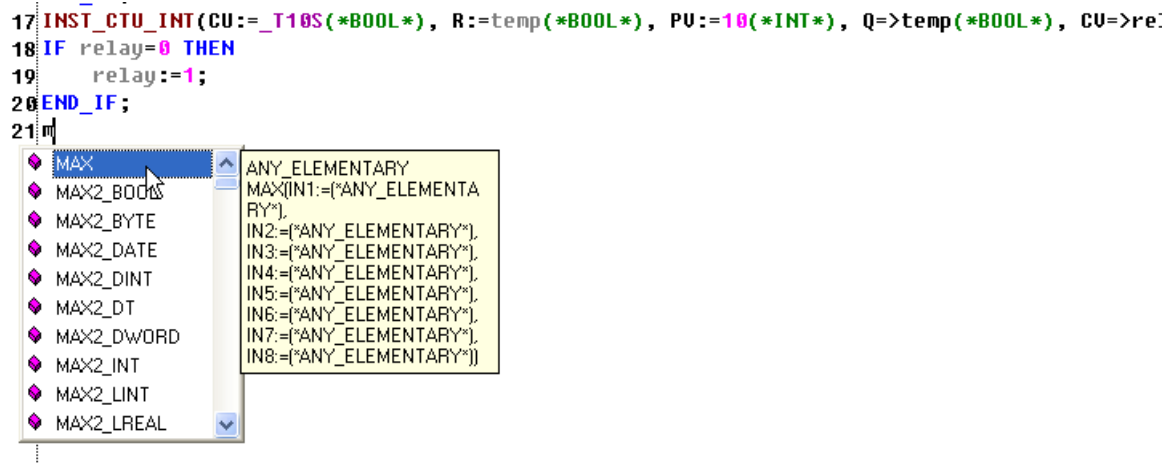
1. Bookmark is set by line unit
2. Undo/Redo can't cancel action about bookmark.

**14.5.2 Selection from character string list**

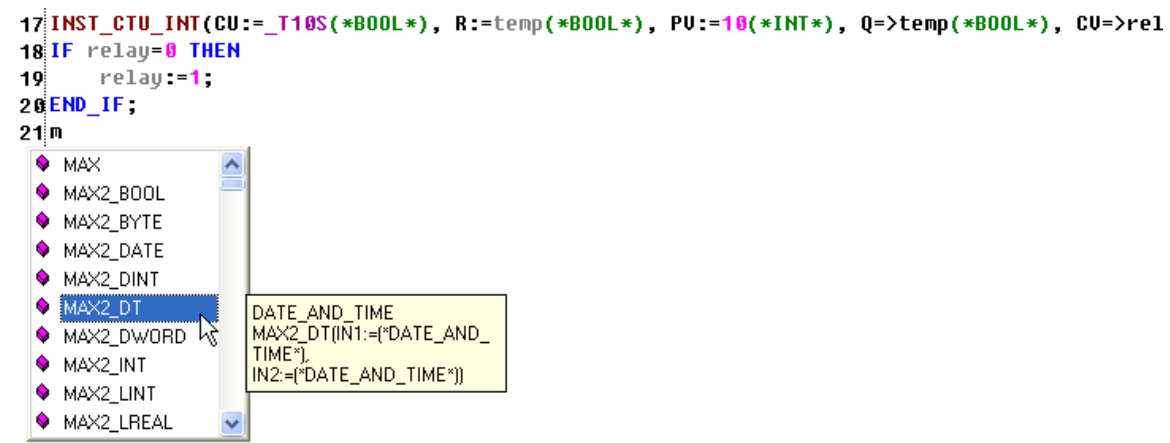
When inputting character string, character string starting with same character string is displayed and the user selects it conveniently.

[Sequence]

1. Input character string by keyboard.



2. Select character string from list.



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3. Press 'Enter' or double-click.

```
17 INST_CTU_INT(CU:=_T10S(*BOOL*), R:=temp(*BOOL*), PU:=10(*INT*), Q=>temp(*BOOL*), CU=>relay(
18 IF relay=0 THEN
19     relay:=1;
20 END_IF;
21 MAX2_DT
```

### Note

Description of character string list bit map

1. 📌: ST language key word (IF, CASE WHILE etc.)
2. 📌: Variable name
3. 📌: Flag variable name
4. 📌: Function name
5. 📌: Function block instance name

### 14.5.3 Selecting member variable from character string list

It is used to select member variable from character string list by name of FB or user data type instance.

1. Input '.' after name of FB or user data type instance.

Ex.) In case that instance name of TON is TON\_Inst

```
5 TON_Inst(IN:=%MX34(*BOOL*), PT:=T#5S(*TIME*), Q=>%MX7(*BOOL*), ET=>%MD124(*TIME*));
6 TON_Inst.
7 IF %MX
8     %M
9 ELSE
10    %M
11 END_IF,
12
13 IF _T1S =1 THEN
14    (*ARRAY[0..-1]_OF_ANY_ELEMENTARY*)%QW0.1.0:=MOVE(IN:=WORD#16#FFFF(*ARRAY[0..-1]
```

2. Select member variable to input.

```
5 TON_Inst(IN:=%MX34(*BOOL*), PT:=T#5S(*TIME*), Q=>%MX7(*BOOL*), ET=>%MD124(*TIME*);
6 TON_Inst.
7 IF %MX
8     %M
9 ELSE
10    %M
11 END_IF,
12
13 IF _T1S =1 THEN
14    (*ARRAY[0..-1]_OF_ANY_ELEMENTARY*)%QW0.1.0:=MOVE(IN:=WORD#16#FFFF(*ARRAY[0..-1]
```

3. Press 'Enter' or double-click.

```

5 TON_Inst(IN:=%MX34(*BOOL*), PT:=T#5S(*TIME*), Q=>%MX7(*BOOL*), ET=>%MD124(*TIME*)
6 TON_Inst.PT|
7 IF %MX0=1 THEN
8     %MX8:=0;
9 ELSE
10    %MX8:=1;
11 END_IF;
12
13 IF _T1S =1 THEN

```

#### 14.5.4 Setting/Removing Block Mask

Sets or removes the Block Mask area. The Block Mask area is not executed.

Block Mask area is indicated by symbol “(\*)” and “(\*)”.

##### 1) Setting Block Mask

1. Select area to set Block Mask.

```

1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10    FOR IDX := 0 TO MAX_VALUE - 1 DO
11        mask := SHL(1, IDX);
12        LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13    END_FOR;
14
15    LWORD_TMP := 0;
16    FOR IDX := 0 TO MAX_VALUE - 1 DO
17        //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18        mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19        LWORD_TMP := mask OR LWORD_TMP;
20    END_FOR;

```



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### 2. Select [Edit] – [Set/Remove Block Mask].

```
1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10 (* FOR IDX := 0 TO MAX_VALUE - 1 DO
11     mask := SHL(1, IDX);
12     LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13 END_FOR;
14 *)
15 LWORD_TMP := 0;
16 FOR IDX := 0 TO MAX_VALUE - 1 DO
17     //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18     mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19     LWORD_TMP := mask OR LWORD_TMP;
20 END_FOR;
```

### 2) Removing Block Mask

#### 1. Select area in which Block Mask is already set.

```
1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10 (* FOR IDX := 0 TO MAX_VALUE - 1 DO
11     mask := SHL(1, IDX);
12     LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13 END_FOR;
14 *)
15 LWORD_TMP := 0;
16 FOR IDX := 0 TO MAX_VALUE - 1 DO
17     //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18     mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19     LWORD_TMP := mask OR LWORD_TMP;
20 END_FOR;
```

2. Select [Edit] – [Set/Remove Block Mask].

```

1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10 (* FOR IDX := 0 TO MAX_VALUE - 1 DO
11     mask := SHL(1, IDX);
12     LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13 END_FOR;
14 *)
15 LWORD_TMP := 0;
16 FOR IDX := 0 TO MAX_VALUE - 1 DO
17     //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18     mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19     LWORD_TMP := mask OR LWORD_TMP;
20 END_FOR;

```

### 14.5.5 Setting/Removing Line Block Mask

Selected line is not executed.

Symbol“//” Is used to set Line Block Mask.

1) Setting line block mask

1. Select area to set line block mask.

```

1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (* _T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (* _T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10 FOR IDX := 0 TO MAX_VALUE - 1 DO
11     mask := SHL(1, IDX);
12     LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13 END_FOR;
14
15 LWORD_TMP := 0;
16 FOR IDX := 0 TO MAX_VALUE - 1 DO
17     //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18     mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19     LWORD_TMP := mask OR LWORD_TMP;
20 END_FOR;

```

2. Select [Edit] – [Set/Remove Line Block Mask].

```
1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (*_T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (*_T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10 // FOR IDX := 0 TO MAX_VALUE - 1 DO
11 //     mask := SHL(1, IDX);
12 //     LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13 // END_FOR;
14
15 LWORD_TMP := 0;
16 FOR IDX := 0 TO MAX_VALUE - 1 DO
17     //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18     mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19     LWORD_TMP := mask OR LWORD_TMP;
20 END_FOR;
```

- 2) Removing line block mask

1. Select area to remove line block mask.

```
1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (*_T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (*_T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10 // FOR IDX := 0 TO MAX_VALUE - 1 DO
11 //     mask := SHL(1, IDX);
12 //     LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13 // END_FOR;
14
15 LWORD_TMP := 0;
16 FOR IDX := 0 TO MAX_VALUE - 1 DO
17     //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18     mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19     LWORD_TMP := mask OR LWORD_TMP;
20 END_FOR;
```

2. Select [Edit] – [Set/Remove Line Block Mask].

```

1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (*_T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (*_T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10 FOR IDX := 0 TO MAX_VALUE - 1 DO
11     mask := SHL(1, IDX);
12 //     LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13 // END_FOR;
14
15 LWORD_TMP := 0;
16 FOR IDX := 0 TO MAX_VALUE - 1 DO
17     //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18     mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19     LWORD_TMP := mask OR LWORD_TMP;
20 END_FOR;

```

### 14.5.6 Indent/Outdent

Makes indent/outdent at the selected area.

1) Indent

1. Select area to make indent.

```

1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (*_T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (*_T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10 FOR IDX := 0 TO MAX_VALUE - 1 DO
11     mask := SHL(1, IDX);
12     LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13 END_FOR;
14
15 LWORD_TMP := 0;
16 FOR IDX := 0 TO MAX_VALUE - 1 DO
17     //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18     mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19     LWORD_TMP := mask OR LWORD_TMP;
20 END_FOR;

```

### 2. Press TAB.

```

1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (*_T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (*_T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10    FOR IDX := 0 TO MAX_VALUE - 1 DO
11        mask := SHL(1, IDX);
12        LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13    END_FOR;
14
15    LWORD_TMP := 0;
16    FOR IDX := 0 TO MAX_VALUE - 1 DO
17        //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18        mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19        LWORD_TMP := mask OR LWORD_TMP;
20    END_FOR;

```

### 2) Outdent

#### 1. Select area to make outdent.

```

1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (*_T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (*_T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10    FOR IDX := 0 TO MAX_VALUE - 1 DO
11        mask := SHL(1, IDX);
12        LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13    END_FOR;
14
15    LWORD_TMP := 0;
16    FOR IDX := 0 TO MAX_VALUE - 1 DO
17        //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18        mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19        LWORD_TMP := mask OR LWORD_TMP;
20    END_FOR;

```

2. Press Shift + TAB.

```

1
2 CLOCK_SOURCE := _T1S;
3
4 // LEFT rotate, FIND transition
5 IF (*_T1S XOR *) 0 = PREV_STATUS THEN
6 //IF (*_T1S XOR *) 0 = PREV_STATUS AND (PREV_STATUS XOR CLOCK_SOURCE) THEN
7     LINT_VAL := LINT_VAL + 1;
8     %ML0 := %ML0 + 1;
9
10    FOR IDX := 0 TO MAX_VALUE - 1 DO
11        mask := SHL(1, IDX);
12        LONG_ARRAY[IDX] := mask = (LINT_VAL AND mask);
13    END_FOR;
14
15    LWORD_TMP := 0;
16    FOR IDX := 0 TO MAX_VALUE - 1 DO
17        //MASK := MASK OR SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
18        mask := SHL(BOOL_TO_LWORD(LONG_ARRAY[IDX]), IDX);
19        LWORD_TMP := mask OR LWORD_TMP;
20    END_FOR;

```

# Chapter 15 Programming Convenience

## 15.1 Cross Reference

It is used to display the application details of all the devices and variables used in the program. It includes contact points (normally open contact point, normally closed contact point, positive-conversion detection contact point and negative-conversion detection contact point), coils (coil, reverse coil, positive-conversion detection coil and negative-conversion detection coil), I/O parameter of function(block) and all the devices and variables used as the operand of extended function.

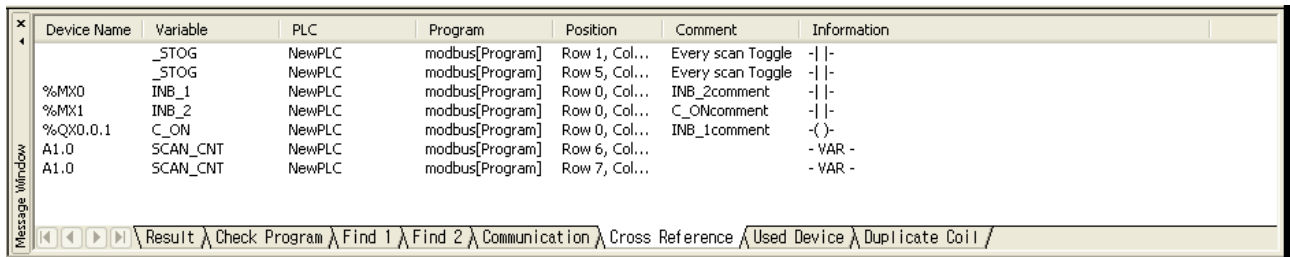
### 15.1.1 View All Device

It is used to display all the devices used in the present PLC.

[Sequence]

- (1) Select [View] - [Cross Reference] on the menu.

[Cross Reference Window]



[Description of Cross Reference Window]

Column	Details
Device Name	Displays the names of all the devices used in the present PLC
Variable	Displays the names of all variables used in the present PLC.
PLC	Displays names of PLC belonging to the present program
Program	Displays name of the program using the applicable device.
Position	Displays the coordinates inside the program.
Comment	Displays the comment of device and variable.
Information	The following signs are displayed for the type of instructions; -( ):- Coil -(/):- Reverse coil -(S):- Set coil -(R):- Reset coil -(P):- Positive-conversion detection coil -(N):- Negative-conversion detection coil -   :- Normally open contact point - /:- Normally closed contact point -P :- Positive-conversion detection contact point

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Column	Details
	-[N]-: Negative-conversion detection contact point -[F]-: Extended function parameter -VAR-: Function(block) I/O parameter

### 1. Data Alignment

Click the column header to align the applicable column. Whenever the column is clicked, it will be aligned in the ascending and then descending sequence repeatedly. A triangle will be displayed on the basic column of the present alignment. The normal triangle means that the alignment is in the ascending sequence, and the reverse triangle means that the alignment is in the descending sequence.

*Example.1)* Alignment in the ascending sequence based on the device names

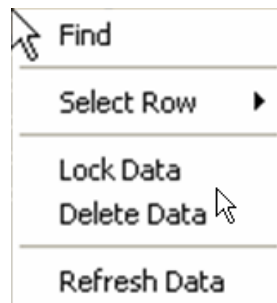
▲ Device ...	Variable	PLC	Program	Position	Comment	Information
--------------	----------	-----	---------	----------	---------	-------------

*Example.2)* Alignment in the descending sequence based on the device names

▼ Device ...	Variable	PLC	Program	Position	Comment	Information
--------------	----------	-----	---------	----------	---------	-------------

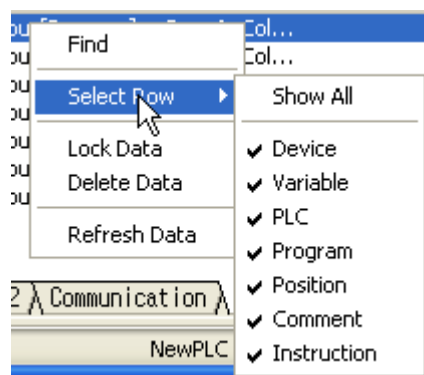
### 2. Go To

It is used to go to the position of the program using the selected device. Double-click the applicable line, or click the right mouse button to select [Go To] on the menu.



### 3. Select Row

It is used to display the desired data only on the screen. Click the right mouse button to select each item on the menu [Select Row].





#### 4. Lock Data

Details of the Cross Reference Window are updated when the cursor moves in the program. If you don't want to update them, specify the Fix function. Click the right mouse button to select [Lock Data].

## 5. Delete Data

It deletes all the details of the Cross Reference Window.

## Notes

- It may take some time accordingly based on the number of devices used for aligning the data.

## 15.2 Used Device

It shows all the devices and the number used in the program (LD, SFC). The devices used in each device area according to the designated types will be displayed as classified into input and output.

[Description of Window]

[illegible]

- (a) Device Display: Displays each device used in the program.
- (b) Word Column: Used to display the number of the applicable device types used in the program. The column displays the number in accordance with the device type designated when executing the device used.
- (c) Bit Column: Used to display the number of the applicable bit devices used in the program. The devices of S area, T area and C area are displayed. The column displays the devices of the types smaller than these designated when executing the used device in bit type. Therefore, if designating word type, it displays the bit only. If the column designates 16 data types, 8 columns are created.
- (d) I/O classification: Used to display the number of the applicable bit devices as classified into input(I) and output(O).
- (e) It displays there is 1 device using the 5th bit of %MW1 as the output.
- (f) It displays there is 1 device using %MW2 as the input.

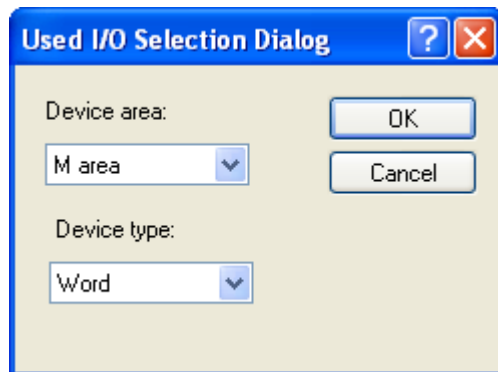
### 15.2.1 Execute Used Device

[Sequence]

- (1) Select [View]-[Used Device] on the menu.
- (2) Select a desirable device on the Used Device selection Communication box.

## Chapter 14 Programming Convenience

[Communication Box]



[Description of Communication Box]

- (a) Device Are: Selects a device area. The available areas are All, I area, Q area, M area, R area and W area.
- (b) Device Type: Selects a device type. Bit, Byte, Word, Double word and Long word can be selected.

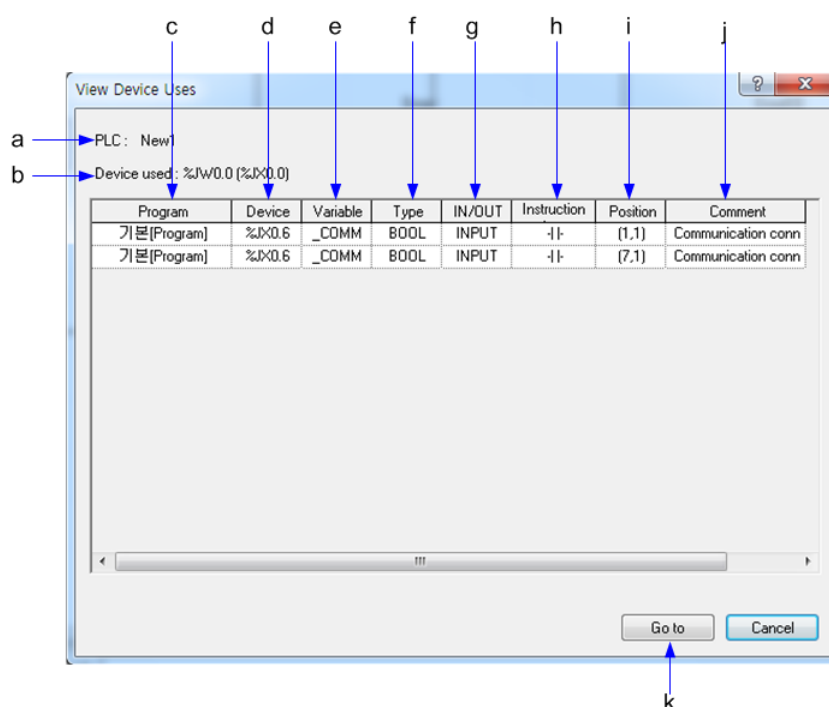
### Notes

1. Select [Update Used Device] on the context menu to display the used devices
2. After Used Device is executed, if you edit the program, the content of the Used Device is not updated automatically. If you want to see the Used Device of edited program, select [Update Used Device] again.

## 15.2.2 View Device Uses

Double-click the mouse on the cell where the used I/O figures are displayed, or click 'View Device Uses' on the context menu.

[Communication Box]



[Description of Communication Box]

- (a) PLC: used to display the PLC name with the applicable device used.
- (b) Device: It is the device that the Device Uses View Communication box shows.
- (c) Program: displays the program name with the applicable device used
- (d) Device: displays the name of a device used in the program.
- (e) Variable: displays the variable used in the program.
- (f) Type: displays the device type used in the program.
- (g) IN/OUT: displays whether the device is used as Input or Output.
- (h) Instruction Type: shows for which instruction type of operand the applicable device is used. (displayed as identical as the instruction tool bar of LD editor).
- (i) Position: displays the position in the program.
- (j) Comment: displays the comment of a selected device.
- (k) Go To: the function going to the program using the device of a selected line.

### 15.3 Check Program

This function is used to check the prepared LD program for errors. Inspection items are as follows;

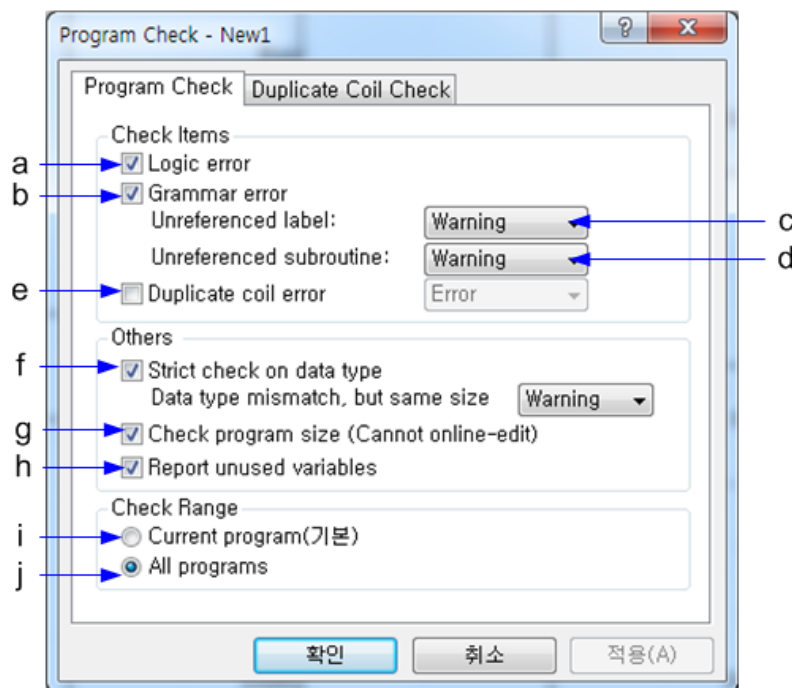
- Logic Error: checks for LD connection errors.
- Grammar Error: checks for errors related with grammar used in SBRT/CALL, FOR/NEXT, etc.
- Duplicated Coil Error: checks for errors if output factors are used as duplicated.

#### 15.3.1 Check Program Setting

[Sequence]

- (1) Select [View]-[Check Program] on the menu.

[Communication Box]



[Description of Communication Box]

- Logic Error: used to check for program's logic errors such as LD connection errors and short circuit.
- Grammar Error: used to check for errors in application instructions such as CALL/SBRT, MCS/MCSCLR, etc.
- Unreferenced label: used to specify the processing range of the declared label which was not used. [Ignore], [Warning] or [Error] can be selected.

#### Notes

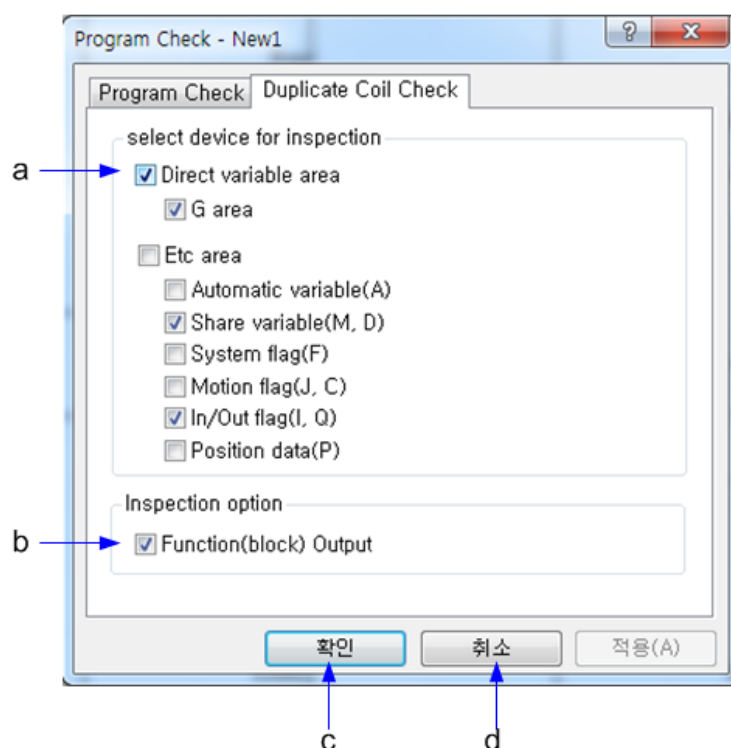
1. Ignore: used not to check for any error.
2. Warning: If any error occurs, [Warning] will be displayed on the Result Window and writing a program on PLC is available.
3. Error: If any error occurs, [Error] will be displayed on the Result Window and writing a program on PLC is unavailable.

- (d) Unreferenced subroutine: used to specify the processing range of the declared subroutine which was not used. [Ignore], [Warning] or [Error] can be selected.
- (e) Duplicated coil error: used to check for the Duplicated Coil error, used to select [Error] or [Warning] for the Duplicated Coil.
- (f) Strict check on data type: If it is not checked, it checks only the size of input/output parameter of function (function block).
- (g) Check program size: displays program capacity information when checking.
- (h) Report unused variables: displays unused variables in program.
- (i) Current program (modbus): used to inspect the present program only.
- (j) All programs: used to inspect all the programs listed on the present PLC item.

### Notes

1. Refer to 15.3.3 and 15.3.4 for details on Logic Error and Grammar Error.
2. If the present program only is selected while one or more programs are listed on the present PLC item, inspection of CALL/SBRT will not be executed.
3. When writing a program on PLC, all the items except the Duplicated Coil will be always inspected if specified or not by the user.

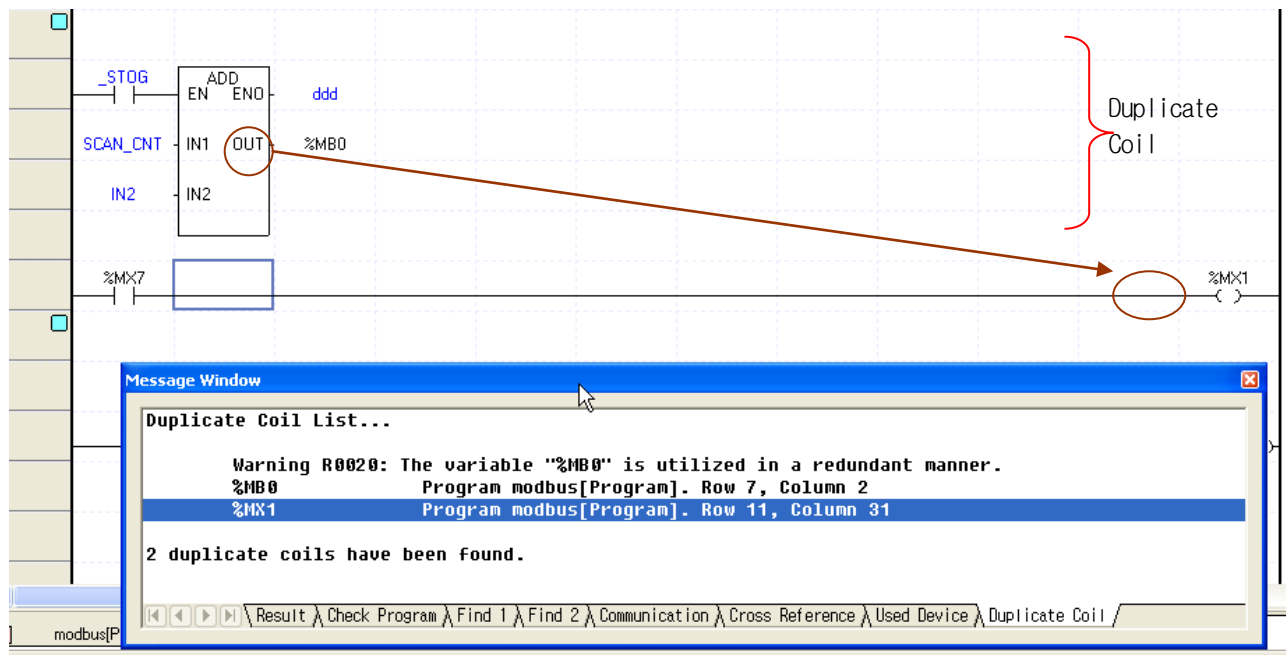
[Communication Box]



[Description of Communication Box]

- (a) Checking Device Specification: sets the device and variable area to check.
- (b) Checking Option: designates whether to check duplicated coil for a function(block) output.
- (c) OK: applies the setting and closes the Communication box.
- (d) Cancel: closes the Communication box.

## Chapter 14 Programming Convenience

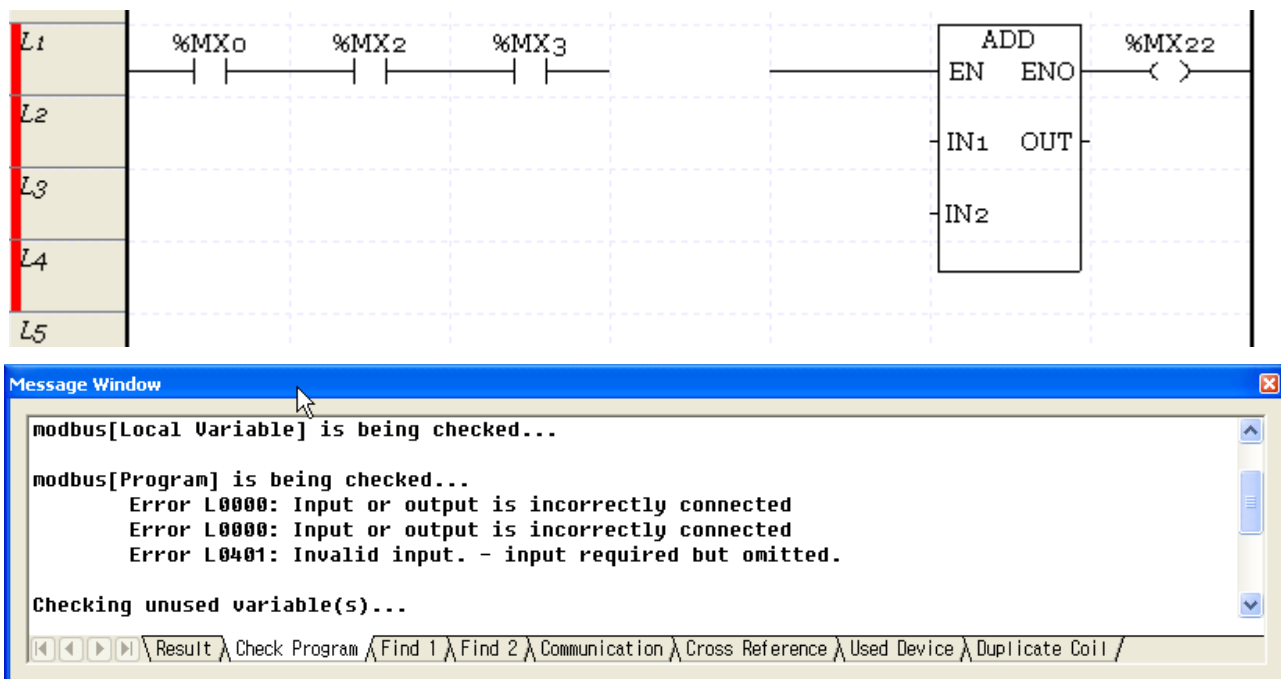


### Notes

1. Set coil -(S)- and Reset coil -(R)- are not the object to check for the Duplicated Coil.
2. In the Function(block) output check, the range is determined by the parameter type.

### 15.3.2 Check Result Trace

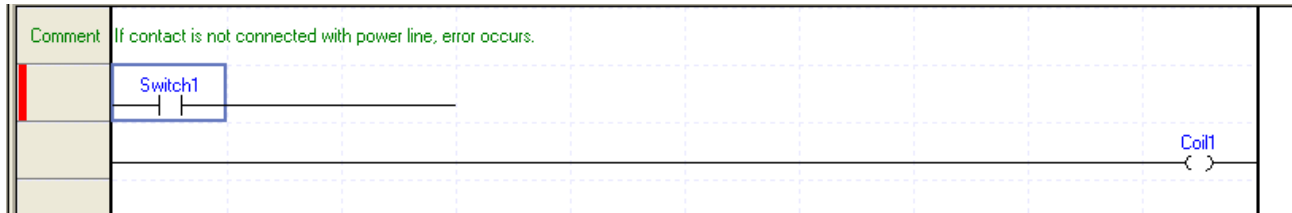
If any error occurs on the program, its details will be displayed on the Program Inspect tap of the message window. Double-click the error details to move to the location where the error occurs.



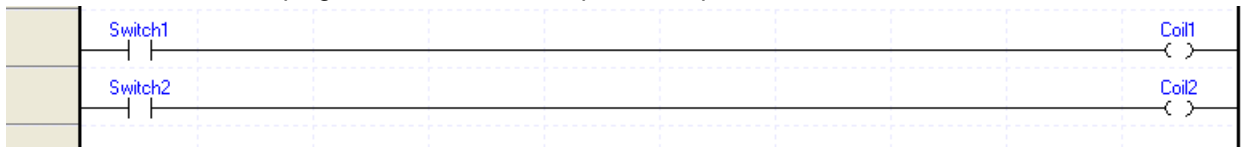
15.3.3 Logic Error

It is used to check for any logic error, and display its details and location if any occurs.

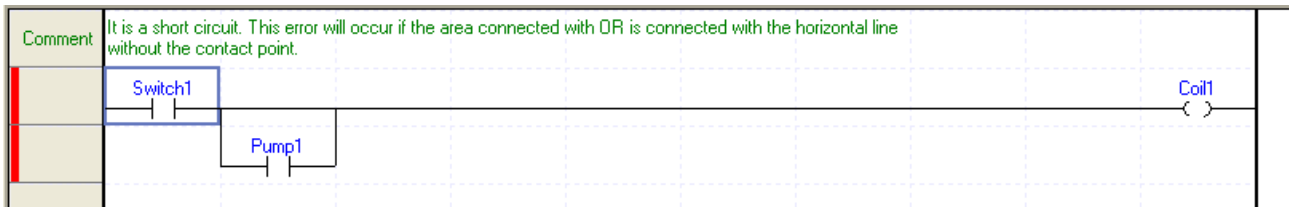
- (1) L0000: Input or output is not connected. This error will occur if the contact point is not connected with the power line.



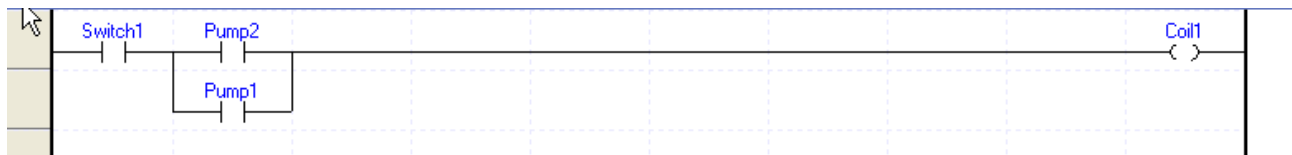
Action: Correct the LD program in order not to let input and output disconnect.



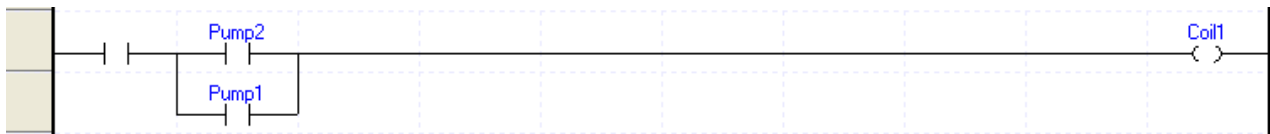
- (2) L0100: It is a short circuit. This error will occur if the area connected with OR is connected with the horizontal line without the contact point.



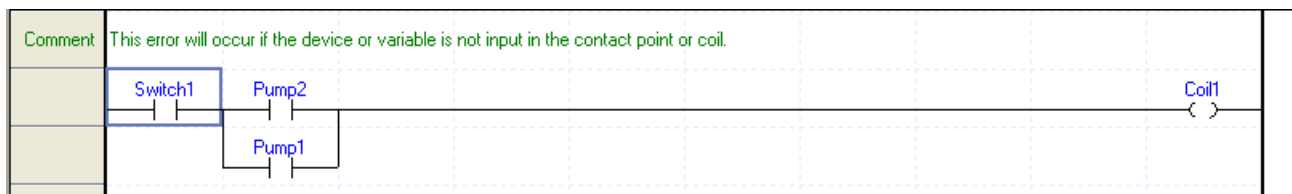
Action: Delete OR if the OR connection is not necessary any more, or input the contact point in the applicable location.



- (3) L0200: Device or variable is not input. This error will occur if the device or variable is not input in the contact point or coil.

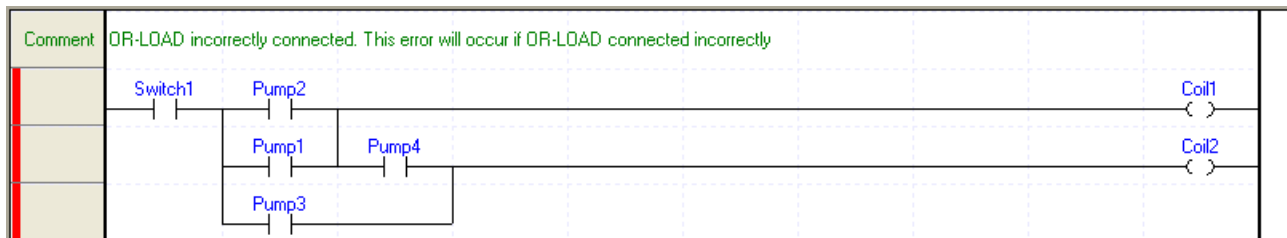


Action: Input a proper device in the contact point or coil where the error occurs.

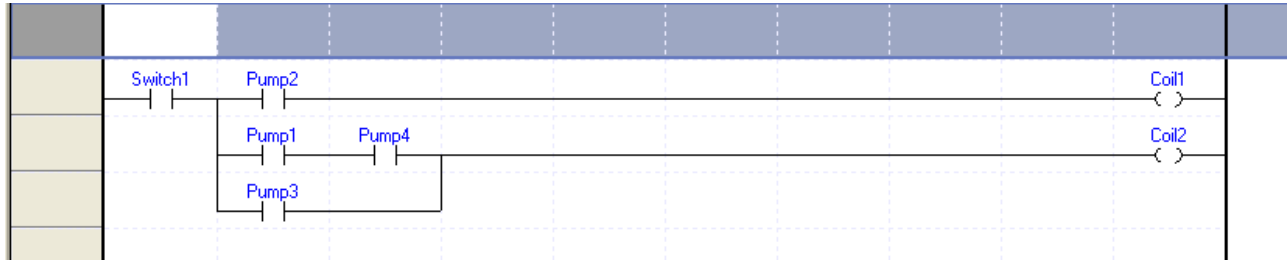


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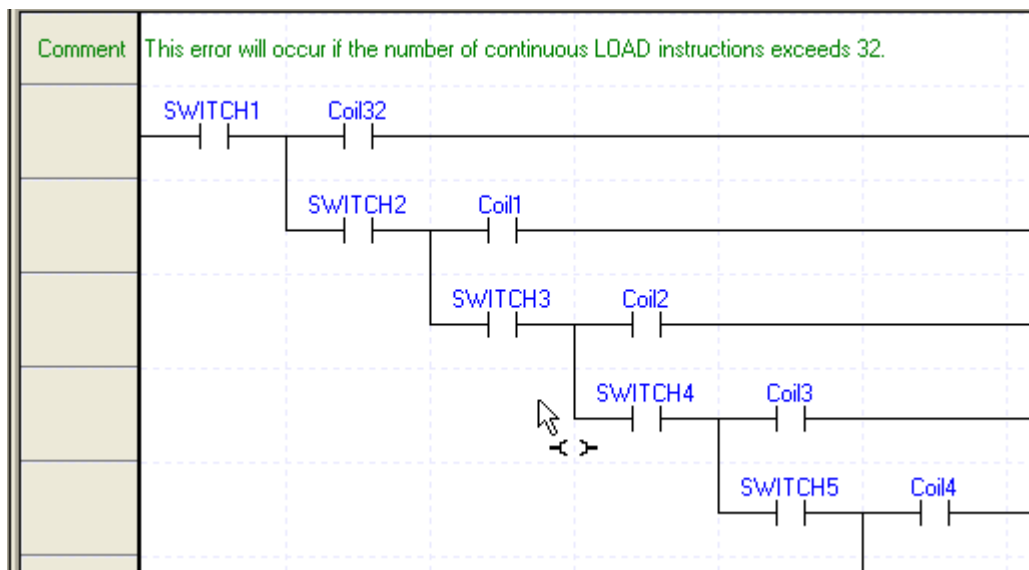
(4) L0300: OR-LOAD incorrectly connected. This error will occur if OR-LOAD connected incorrectly.



Action: Search for OR-LOAD incorrectly connected and then correct the LD program.

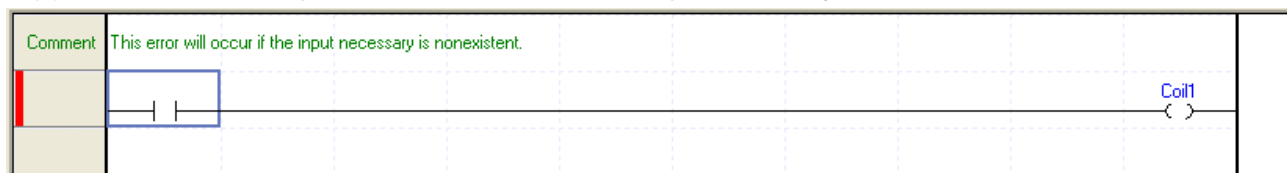


(5) L0400: Specified number of contact points is exceeded. This error will occur if the number of continuous LOAD instructions exceeds 32.

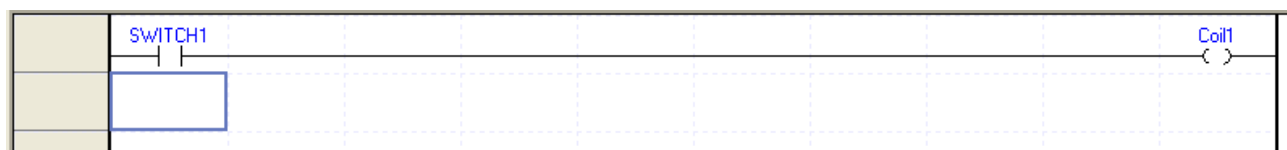


Action: Correct the LD program in order not to let the LOAD instructions exceed 32.

(6) L0401: Incorrect input. This error will occur if the input necessary is nonexistent.

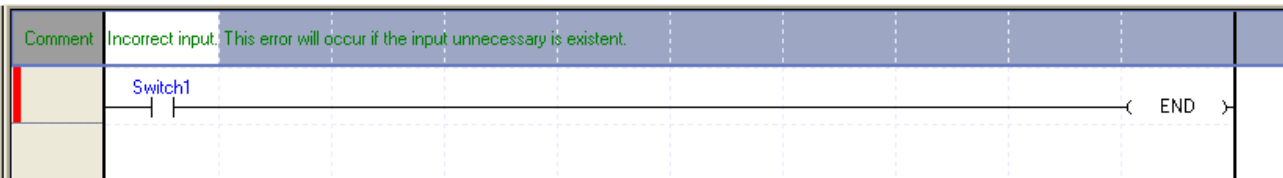


Action: Add the necessary input to the input terminal.

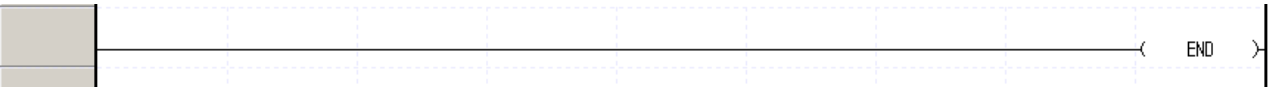




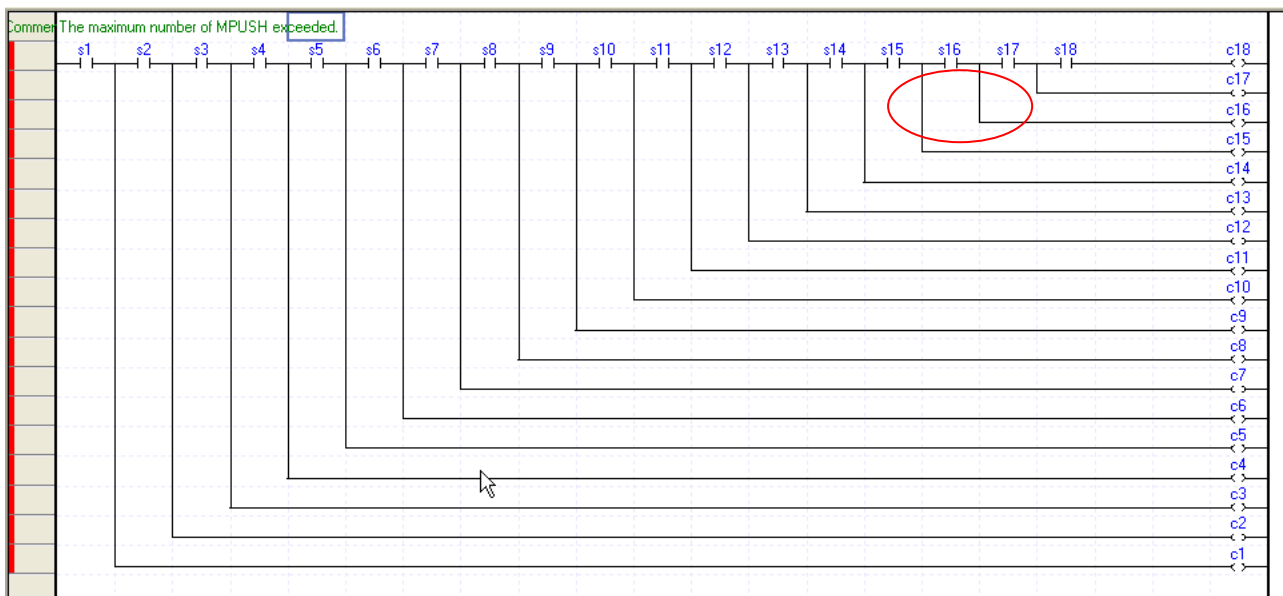
(7) L0402: Incorrect input. This error will occur if the input unnecessary is existent.



Action: Delete the input unnecessary from the input terminal.



(8) L0404: The maximum number of MPUSH exceeded. This error will occur if the number of continuous MPUSH/MPOP exceeds 16.

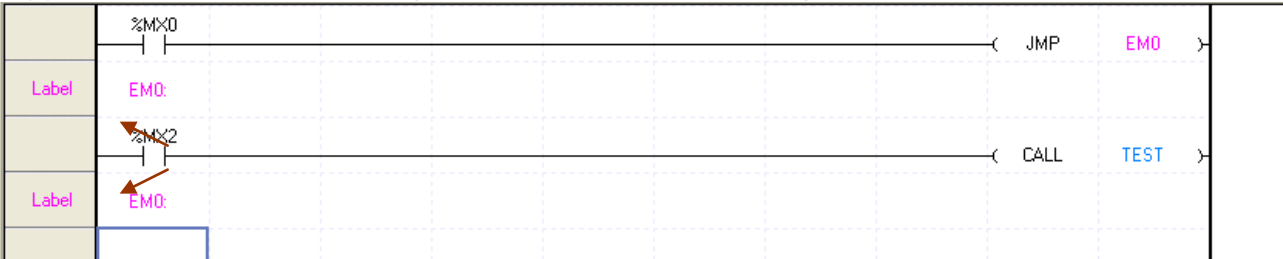


Action: Correct the LD program in order not to let the continuous MPUSH/MPOP exceed 16.

15.3.4 Grammar Error

This function is used to check for grammar-related errors generated when a application instruction is used.

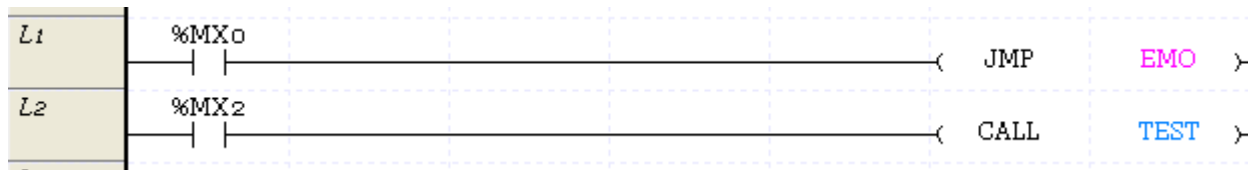
(1) E1001: Label declared as duplicated. This error will occur if duplicated LABEL used.



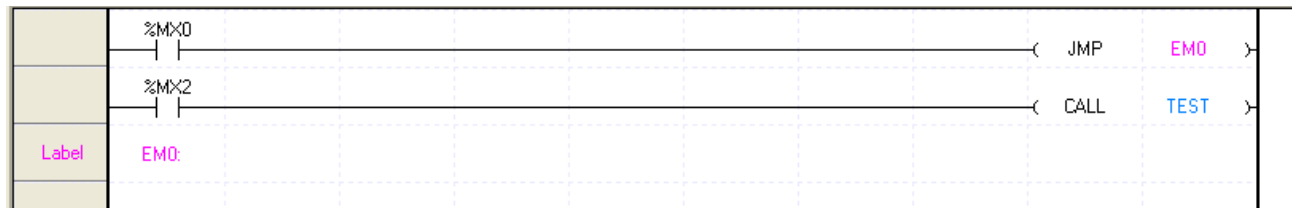
Action: Delete the duplicated label, or change the name of the label.

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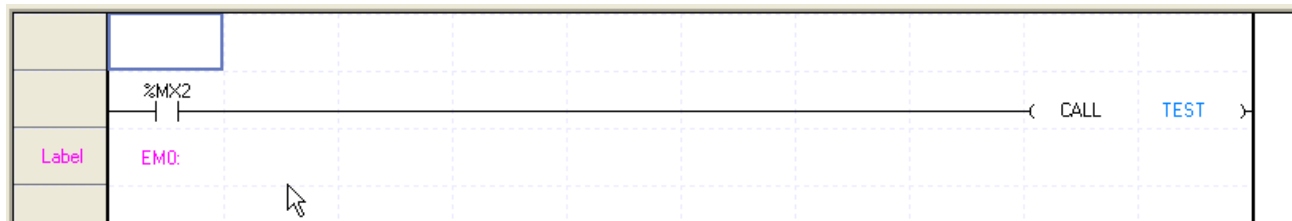
(2) E1002: Label '*Label Name*' nonexistent. This error will occur if JMP is used to refer to the nonexistent label.



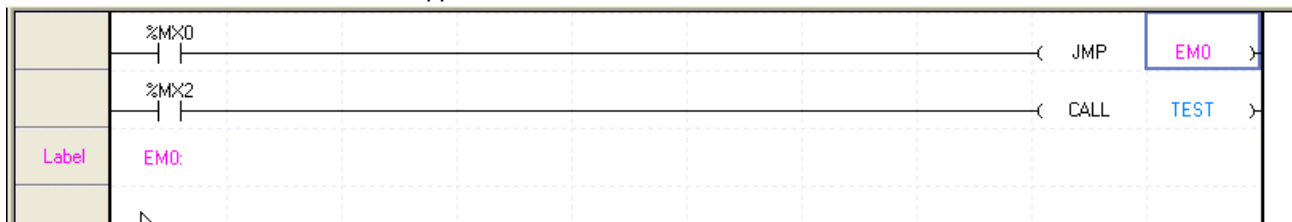
Action: Add the label where the error occurs, or correct the JMP instruction which uses the label.



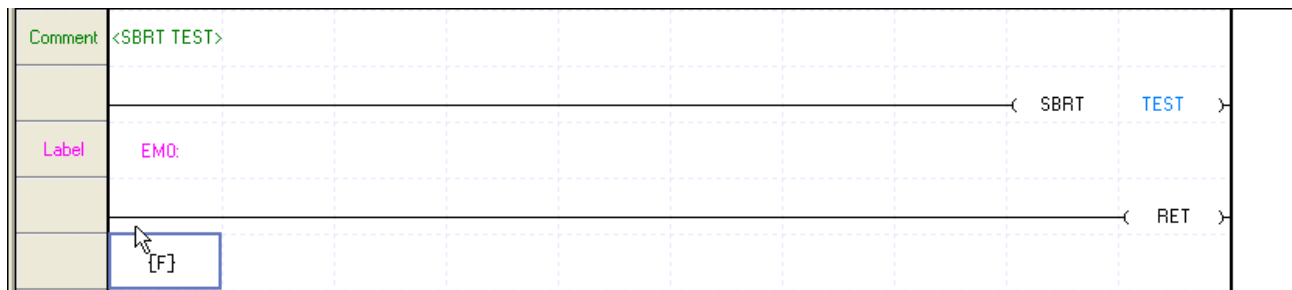
(3) E1003: Label '*Label Name*' not used. This error will occur if the JMP instruction is nonexistent to use the label existent.



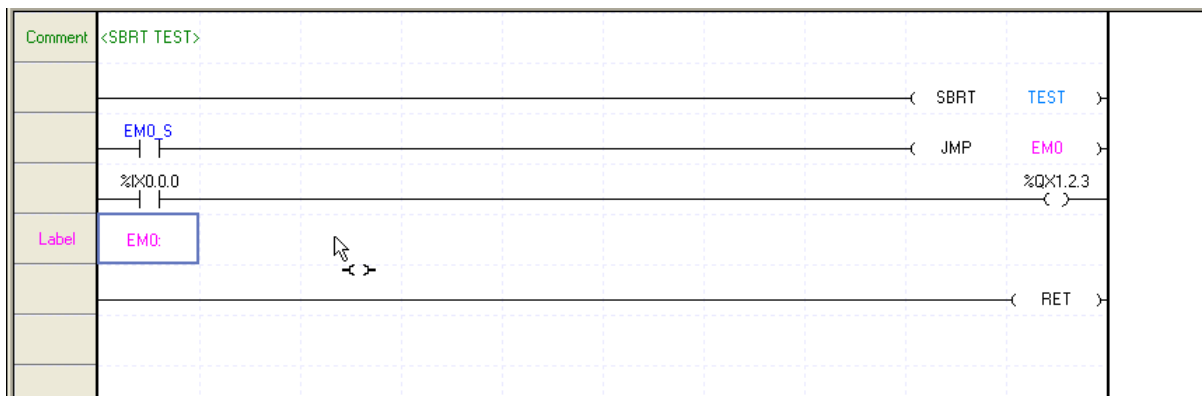
Action: Delete the label, or add the application JMP instruction.



(4) E1004: Label '*Label Name*' not used in the subroutine. This error will occur if the JMP instruction is nonexistent to use the label existent in the subroutine.



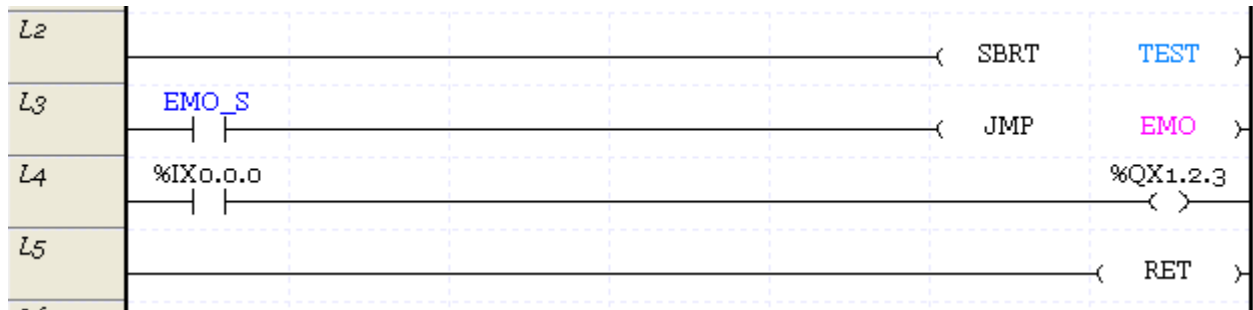
Action: Delete the label in the subroutine, or add the application JMP instruction.



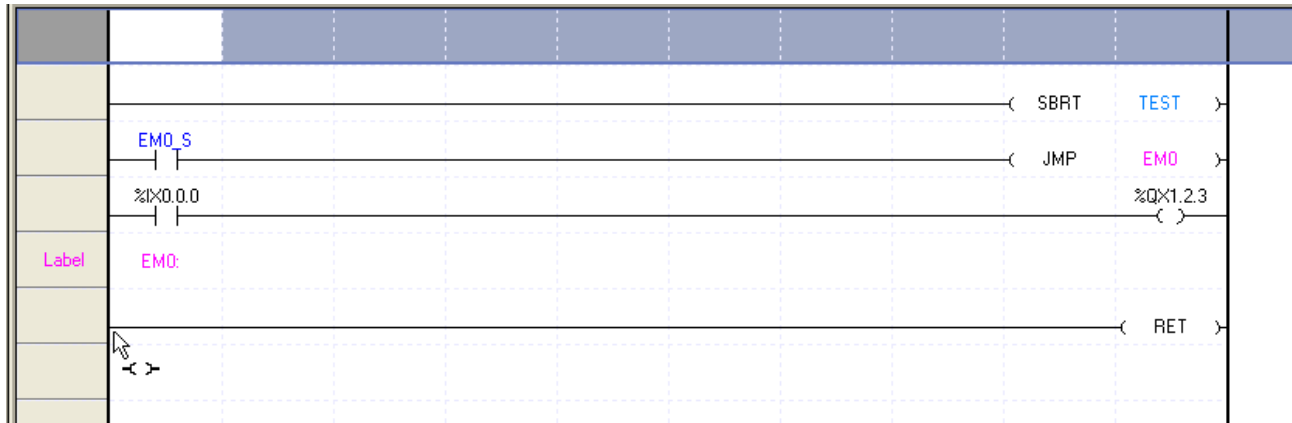
Notes

1. The error number E1003/E1004 will occur only when [Warning] or [Error] is selected for the label not referred to in the Grammar Error Inspect item. Refer to 15.3.1 Program Inspect Setting for details..

(5) E1005: Label 'Label Name' nonexistent in the subroutine. This error will occur if the JMP instruction uses the label nonexistent in the subroutine.



Action: Add the label in the subroutine, or correct the JMP instruction.

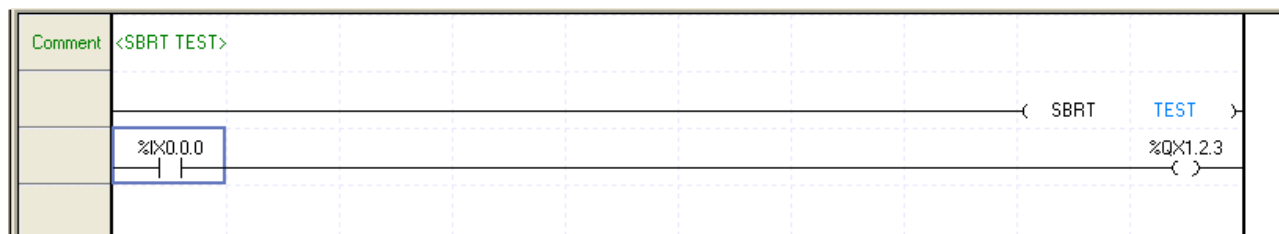


Notes

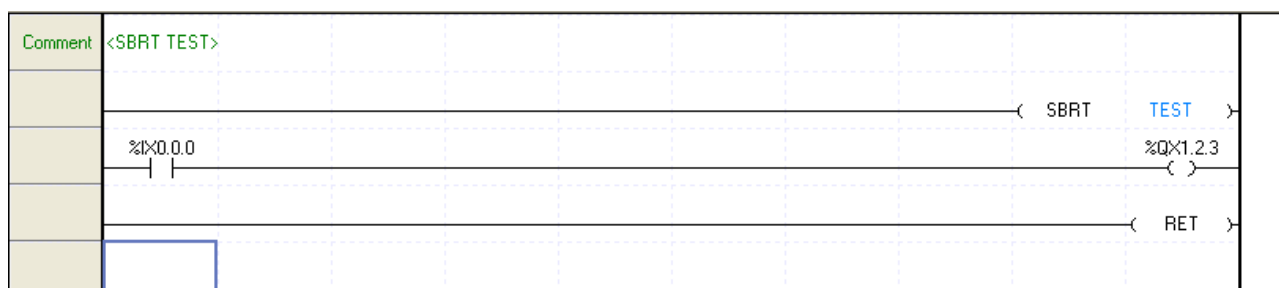
1. The error number E1005 will occur only when [Warning] or [Error] is selected for the label not referred to in the Grammar Error Inspect item. Refer to 15.3.1 Program Inspect Setting for details.

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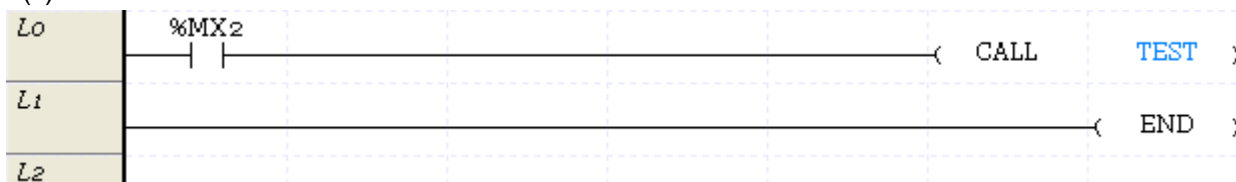
- (6) E2001: Return instruction nonexistent in the subroutine 'Subroutine Name'. The subroutine shall be finished with the RET instruction.



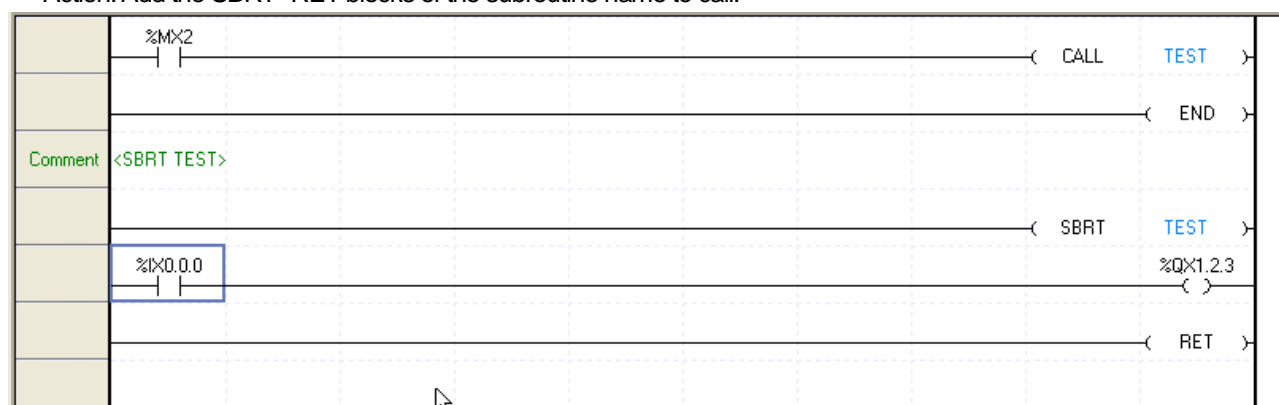
Action: Add the RET instruction in the subroutine block.



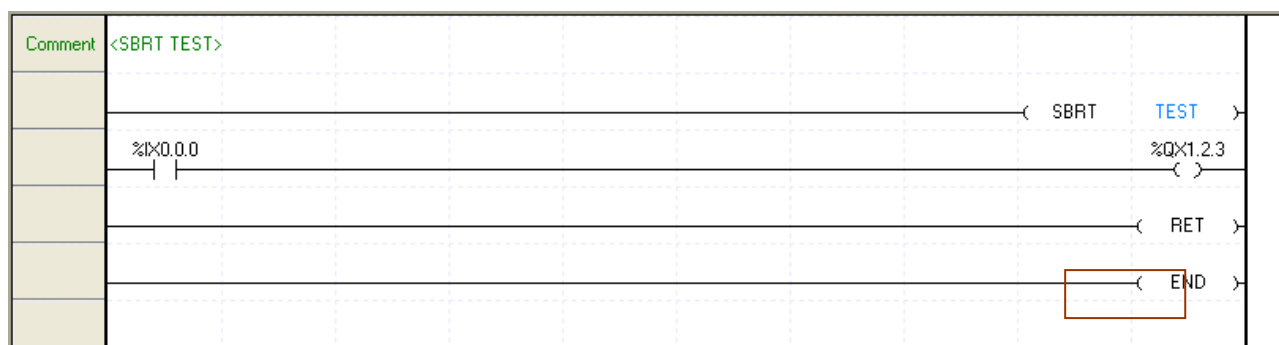
- (7) E2010: Subroutine call nonexistent. The call of nonexistent SBRT causes an error.



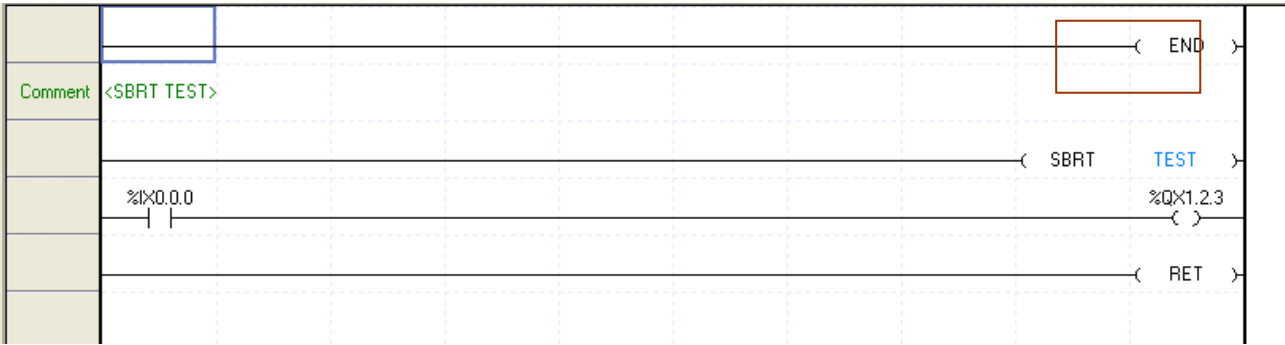
Action: Add the SBRT~RET blocks of the subroutine name to call.



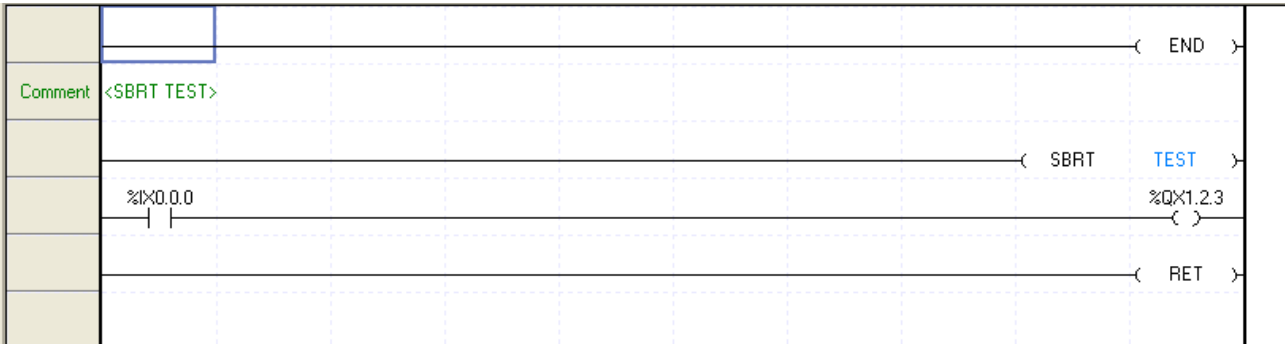
- (8) E2003: Subroutine 'Subroutine Name' is positioned prior to END instruction. SBRT and RET positioned prior to END instruction cause an error.



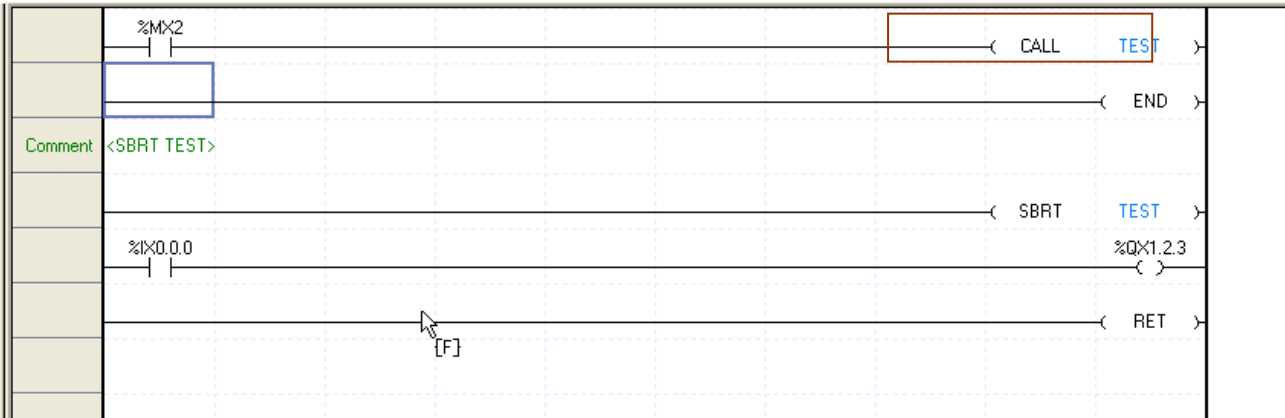
Action: Move the application instructions SBRT and RET to the position after the End instruction.



(9) E2011: Subroutine not used. Although SBRT~RET blocks exist, no CALL instruction is available to use the applicable subroutine.



Action: Delete the subroutine not to be used, or add the CALL instruction.

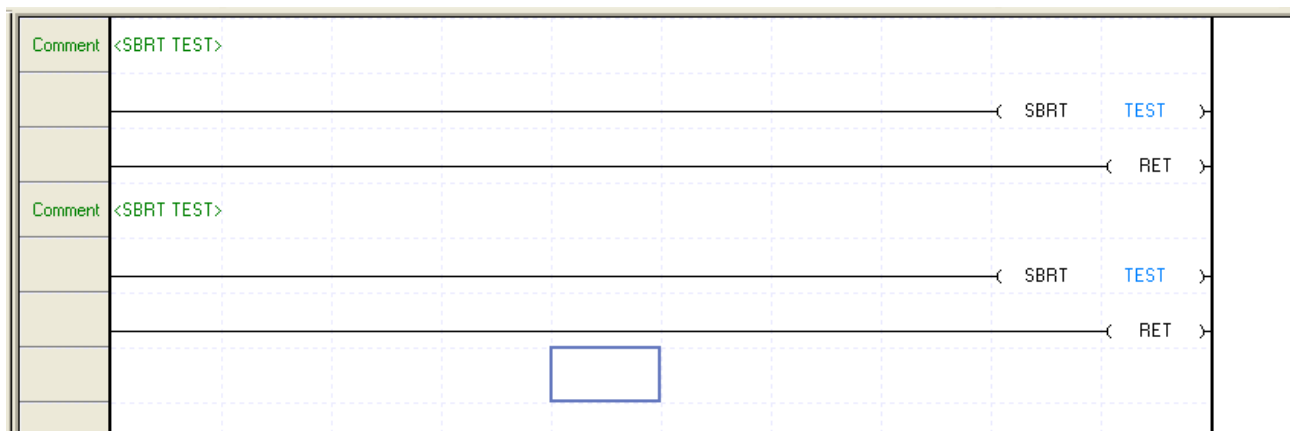


Notes

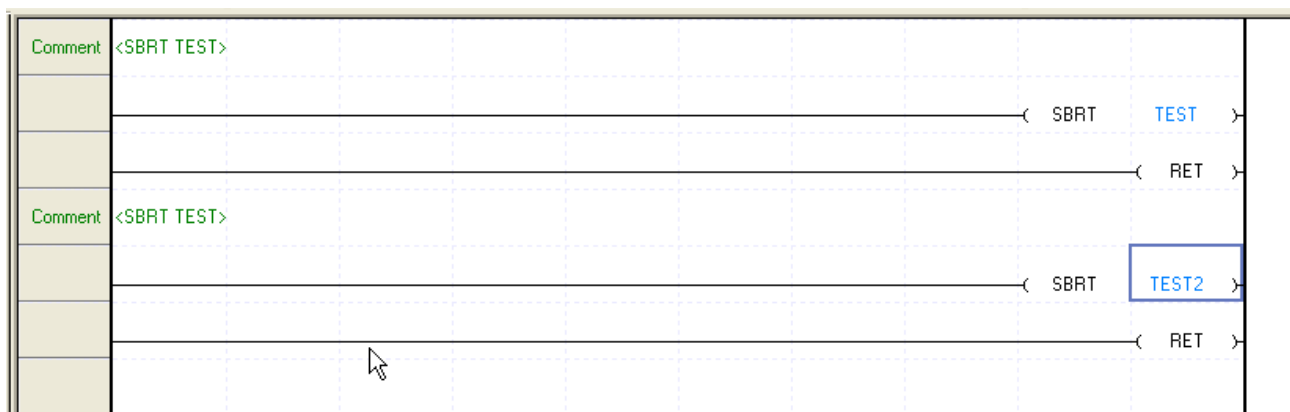
1. The error number E2011 will occur only when [Warning] or [Error] is selected for the subroutine not referred to in the Grammar Error Inspect item. Refer to 15.3.1 Program Inspect Setting for details.

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- (10) E2012: Subroutine declared as duplicated. '*Subroutine Name*'- An identical name of the subroutine can not be used.



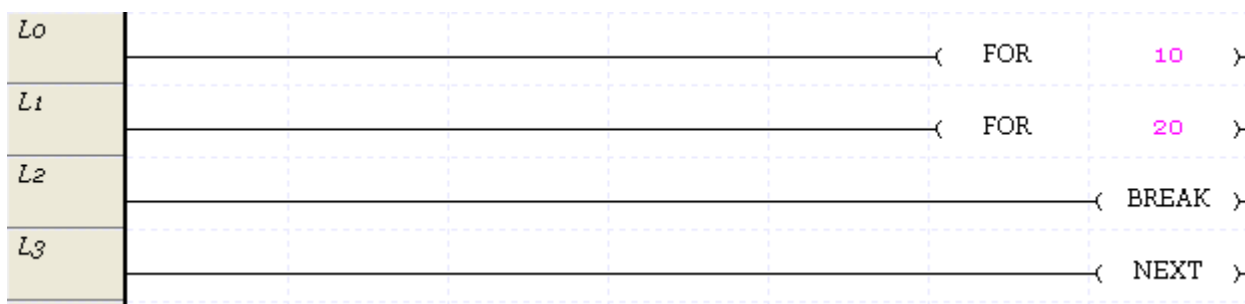
Action: Change the duplicated name of the subroutine.



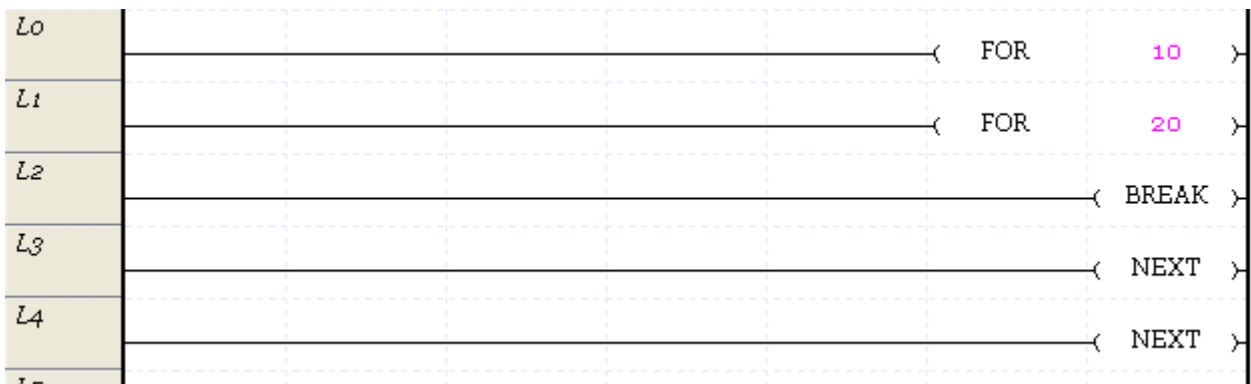
- (11) E2014: The maximum number of subroutines exceeded. Based on the PLC type, the maximum number of subroutines is exceeded.

Action: Check the number of the subroutines used.

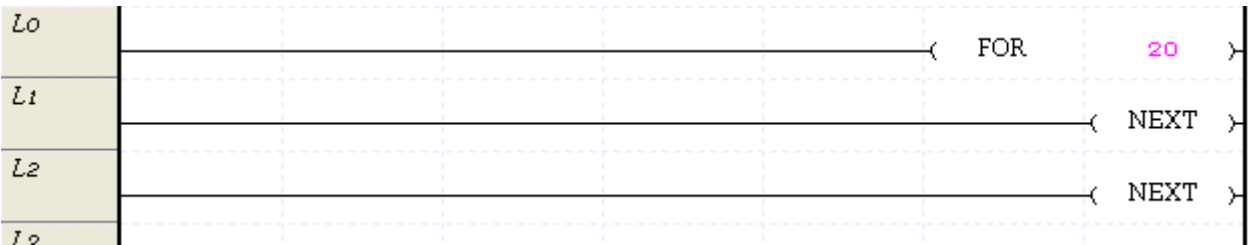
- (12) E3001: Identical NEXT unavailable. If the application times of FOR/NEXT instructions are not identical, it will cause an error.



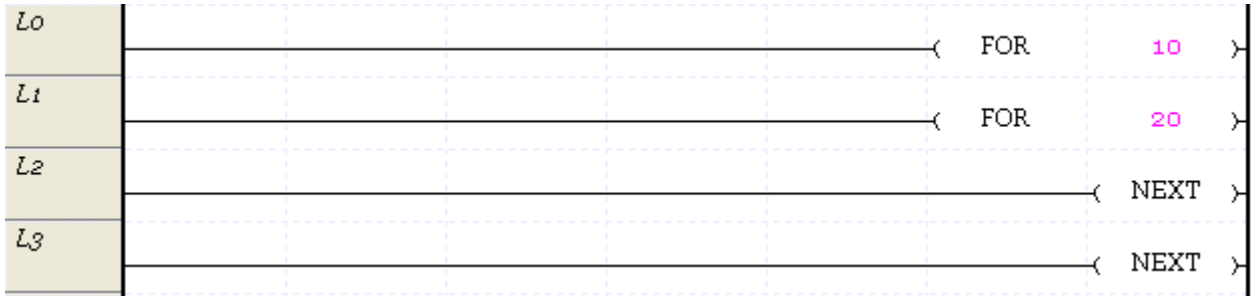
Action: Let the number of FOR instructions and NEXT instructions identical.



(13) E3002: Identical FOR unavailable. If the application times of FOR/NEXT instructions are not identical, it will cause an error.



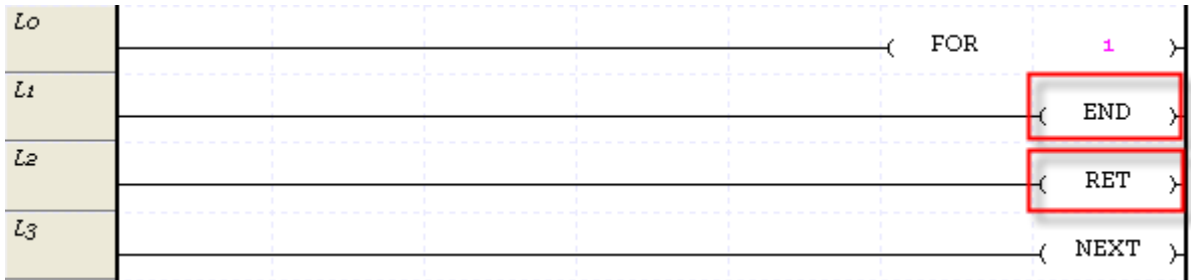
Action: Let the number of FOR instructions and NEXT instructions identical.



(14) E3003: FOR-NEXT can not be duplicated more than 16 times. FOR/NEXT can be duplicated up to 16 blocks. If the number of the duplicated FOR/NEXT blocks exceeds 16, it will cause an error.

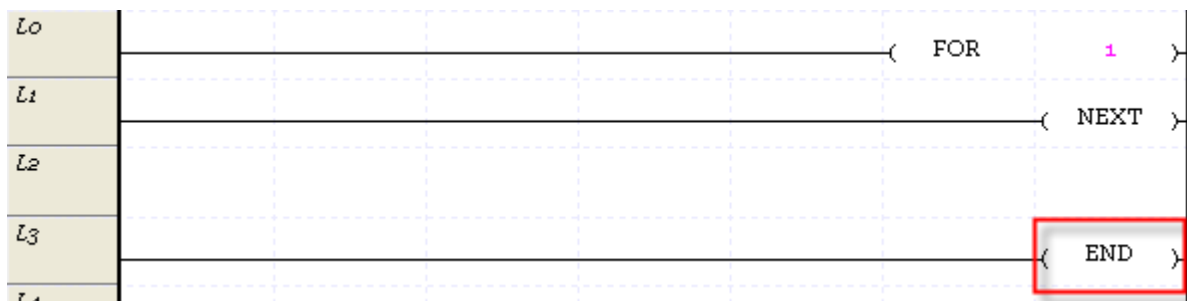
Action: Correct the number of the FOR / NEXT blocks not to exceed 16.

(15) E3004: Between FOR-NEXT, RET or END is not available. If RET or END is included between FOR and NEXT, it will cause an error.

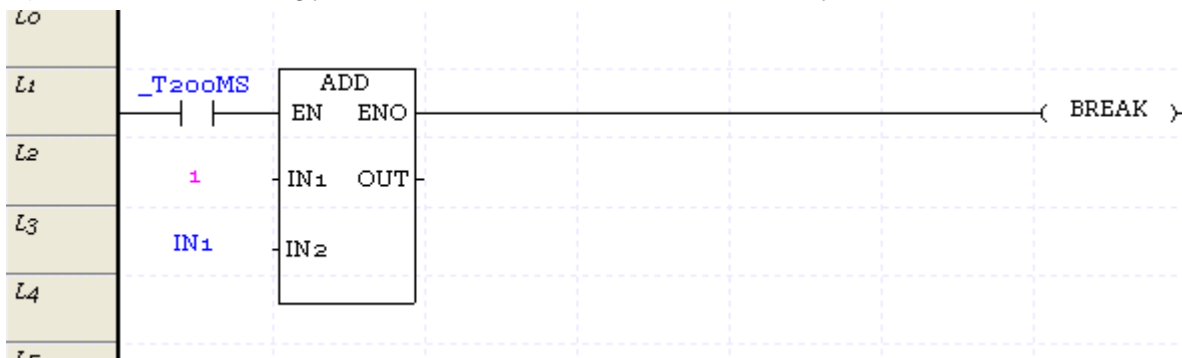


Action: Change the location of END and RET instruction positioned between FOR/NEXT blocks.

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- (16) E3005: BREAK singly used. BREAK instruction can be used only between FOR/NEXT blocks.



Action: Change the location of BREAK instruction.

- (17) 00002: needs one and more scan program. – There is no scan program in the present PLC item, which will cause an error.

Action: add an applicable program item to the Project[Scan Program].

- (18) 00003: There is no program to check – There is no program in the present PLC item.

Action: add a scan program and try again.

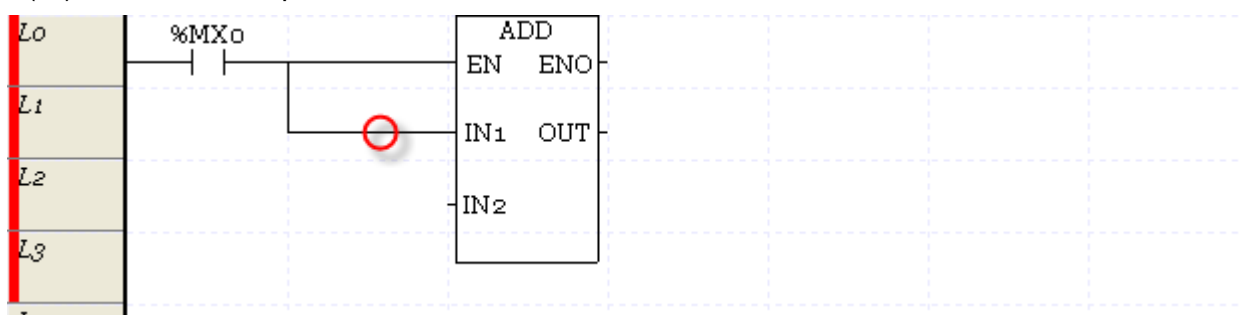
- (19) L0700: Undeclared variable

Action: the variable used as the IO parameter of contact point, coil and function(Block) is not declared. Check whether the variable is declared in the local variable.

- (20) L0701: Input unsuitable data type.

Action: the type of used device or variable is not suitable. Check the type of used device or variable.

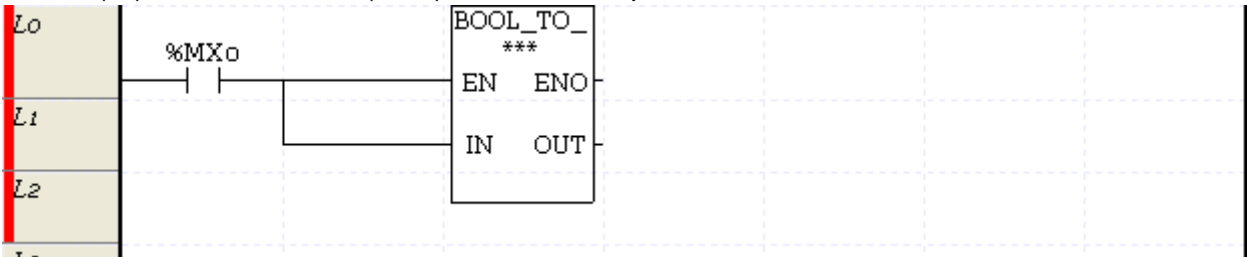
- (21) L0702: Invalid input connection





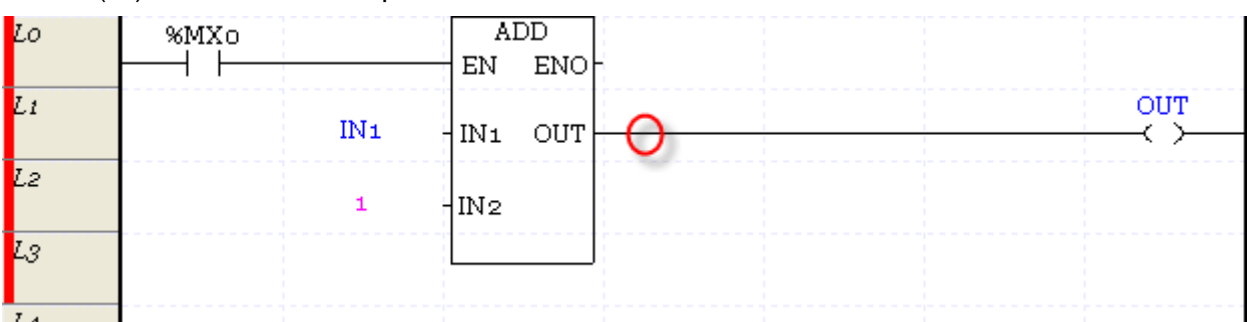
Action: the line connection of function (block) is only available for BOOL type. Since line can not be connected to other type but BOOL, check the line input.

(22) L0703: Function(block) can not have input line more than 1.



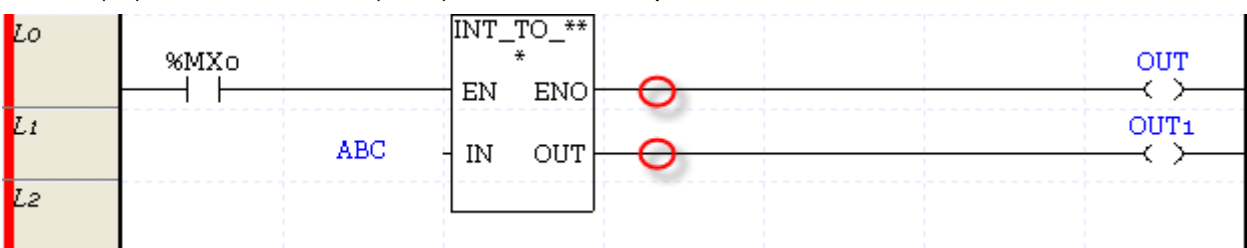
Action: Function(block) can not have input line more than 1. Check the line connection.

(23) L0704: Invalid output connection



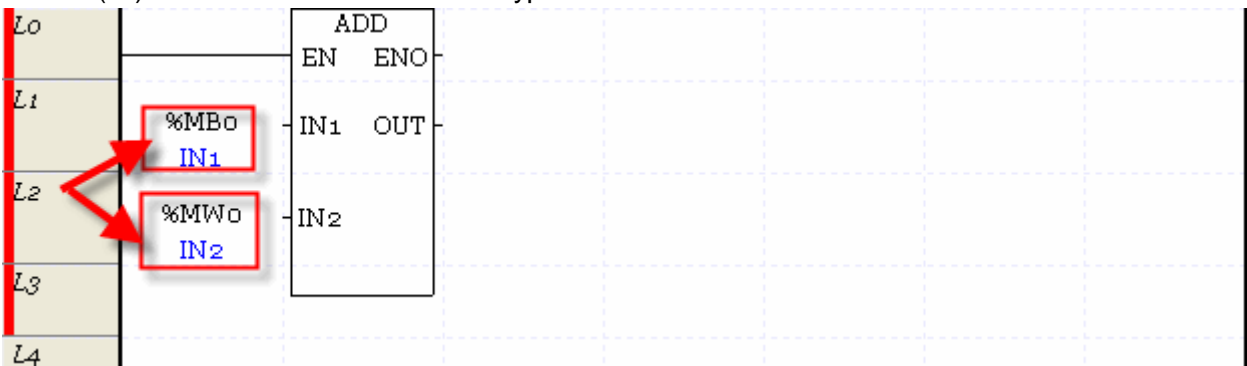
Action: the line connection of function(block) is only available for BOOL type. Since line can not be connected to other type but BOOL, check the line output.

(24) L0705: Function (block) can not have output line more than 1.



Action: Function (block) can not have output line more than 1. Check the line connection.

(25) L0706: Incorrect function IO type



Action: in case of the function (block) having ANY type as the IO parameter, the data type of IO parameter indicated as ANY type should coincide. Check the data type of the input IO parameter.

## Chapter 14 Programming Convenience

### Notes

1. If the strict data type check is not set in the program check options, it checks the only IO parameter size of function(block).

(26) L0707: The size of array does not coincide.

Action: the size of array used in MOVE function as the IO parameter should coincide.

(27) L0708: Unknown function.

Action: unavailable function. Check whether the function is user-defined function.

(28) L0709: Instance name is omitted.

Action: the instance name is omitted in the function block. Check the input items.

(29) L0710: Instance type does not coincide.

Action: the instance type of function block is not identical with the function block. Check the input items.

(30) L0711: Undeclared instance

Action: the function block instance is not declared in the local variable. Declare the function block instance in the local variable before use.

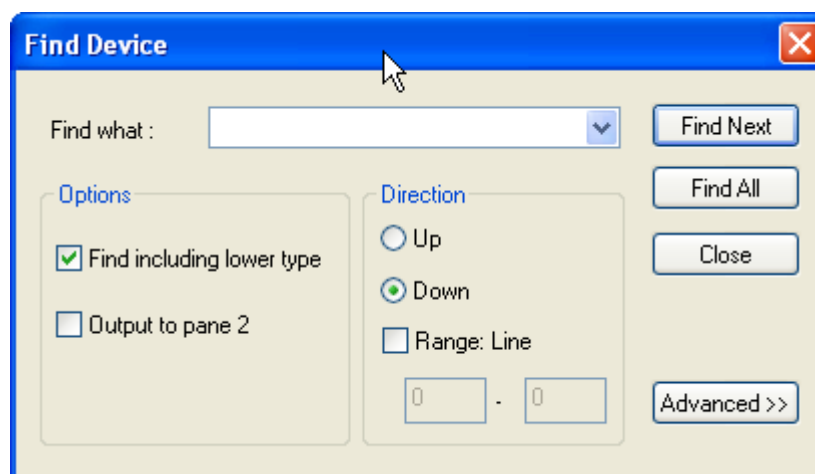
## Chapter 16 Find/Replace

This is used to find or change the device and the String in LD, Variable/Comment of XG5000

### 16.1 Find Device

This function is used to find the device previously made in LD Editor, Variable/Comment Editor

[Communication Box]



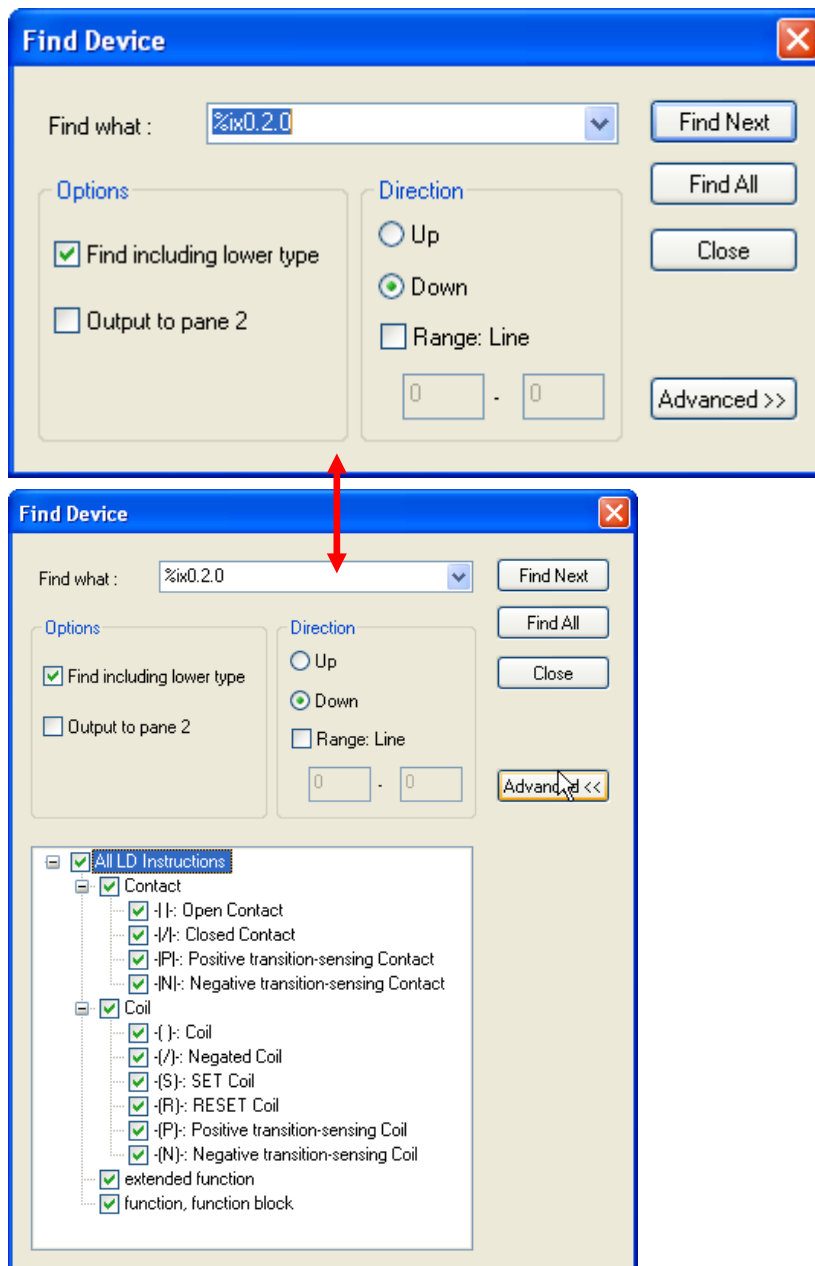
[Description of Communication Box]

- (a) Find what: used to specify the device to find.
- (b) Find including lower type: used to select the device type containing the device to find. Then, if checking the checkbox, it finds %IB0.1.0, %IW0.1.0, %IL0.1.0 and others containing %IX0.1.1.
- (c) Output to pane 2: XG5000 has two Find result windows. Basically the result is yielded to Find 1 result window, but if this check box is selected, the result will be yielded to Find 2 result windows.
- (d) Direction: used to specify the location to find upward or downward from the line presently selected in the respective editor.
- (e) Range: selects it to find by designating a specific line after designating the direction. If Range is selected, the start and end lines should be also entered.
- (f) Find Next: finds the detail specified above right in the next to the line (position) presently selected. If the applicable device is found, the position the applicable device is located will be selected.
- (g) Find All: finds all the details specified above to display the result on the find result window.
- (h) Advanced >>: It is only used in LD editor. 'Advanced>>' and 'Advanced<<' is changed by click. It is used to find specific contact point, specific coil and extended function and function/function block used in LD editor

## Chapter 16 Find/Replace

### Notes

1. The result will be displayed on the find window only with Find All executed.
2. Since Find All finds all details in the applicable documents, it is insignificant to select the direction.
3. Advanced>> is displayed only in Ladder editor.
4. Advanced>> (extension) and Advanced<< (shrink) is as shown below.

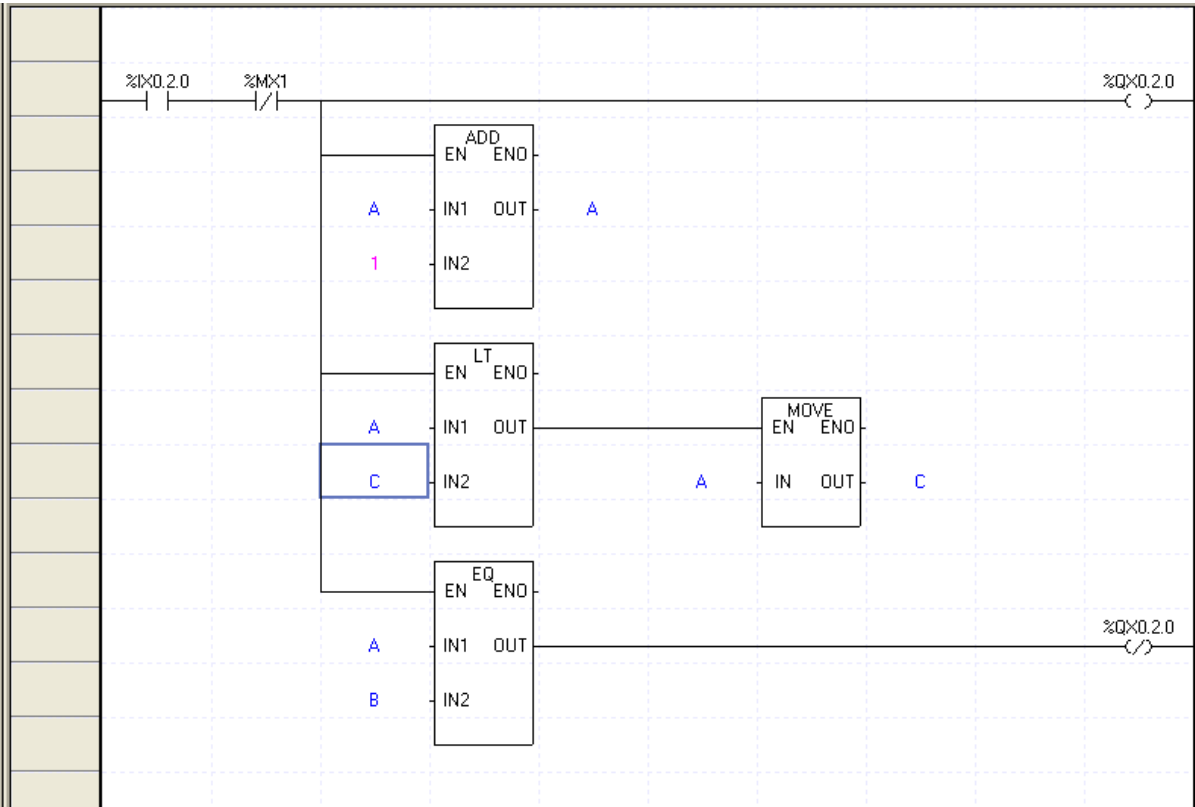


16.1.1 Find Next Device

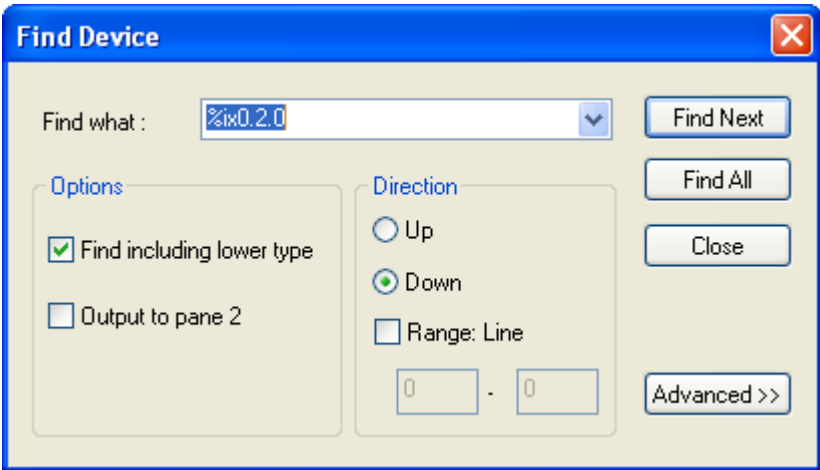
It is used for LD, IL, Global/Direct Variable, Variable and Local Variable in common.  
Details of this function will be described below based on LD.

[Sequence]

- (1) Select the basic cell of the direction.

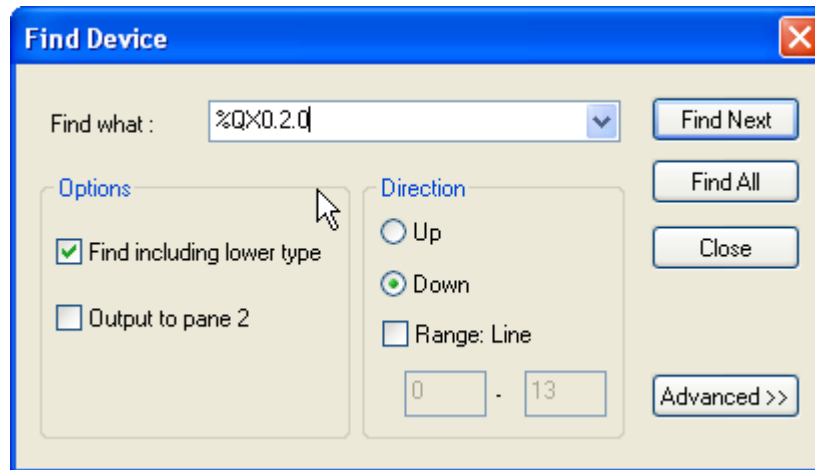


- (2) Select [Find/Replace]-[Find Device] on the menu.

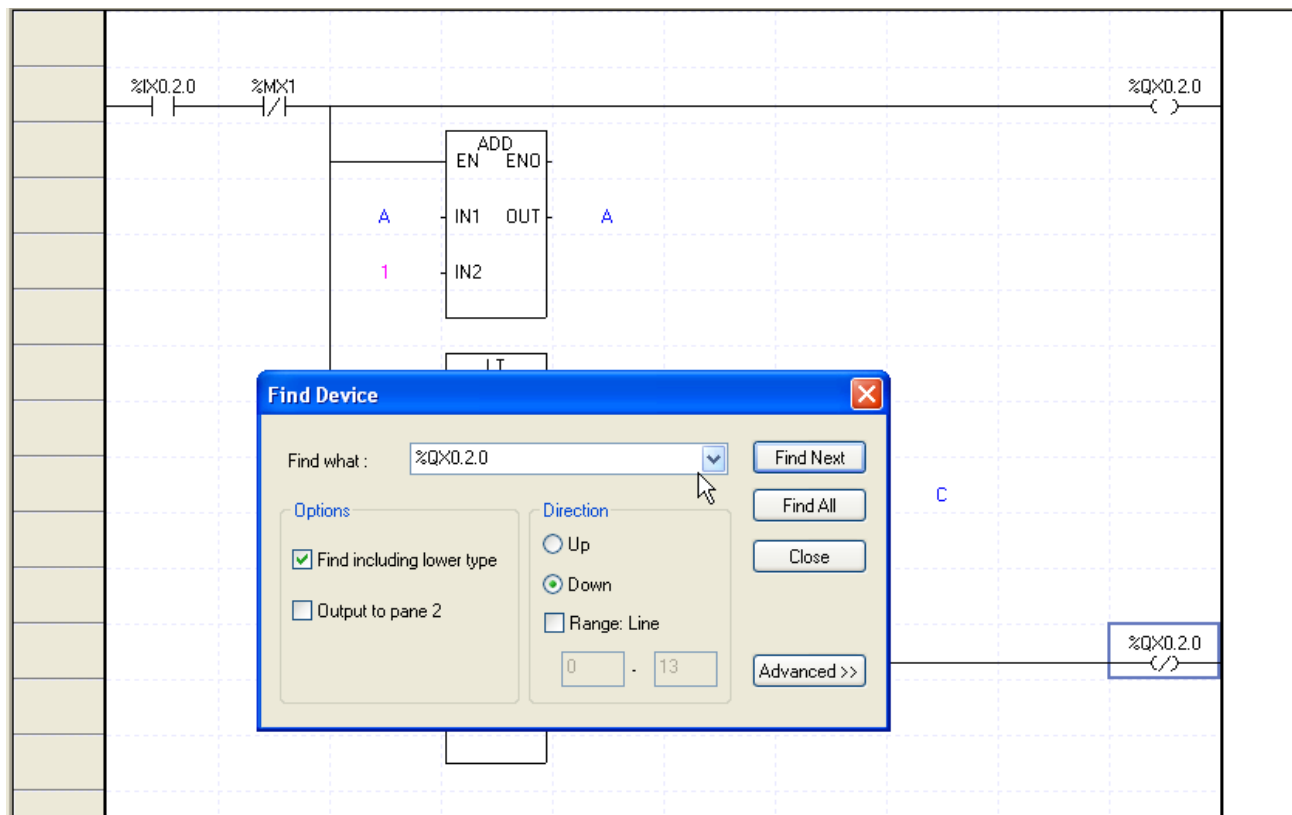


## Chapter 16 Find/Replace

- (3) Specify the device to find, the direction and the options.

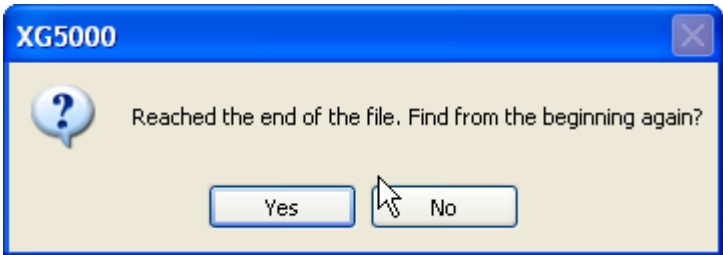


- (4) Click [Find Next]. If on the Communication Box any device is found identical to the detail as specified, move to the device whose cell is identical.



Notes

- 1. If on the Communication box no device is found identical to the detail as specified, the following message will appear.



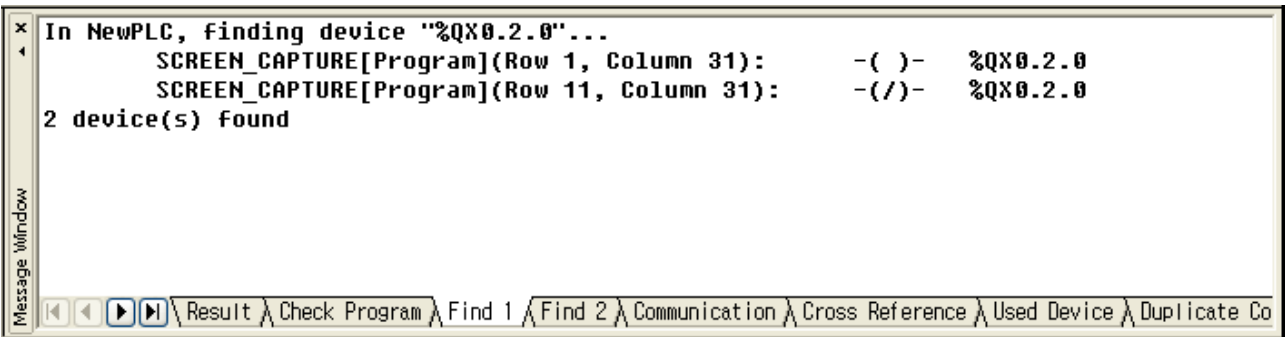
- 2. [Find Next] will find all the present programs based on the selected cell when the device find Communication box is displayed. Namely, if the direction is set Downward, it will start to find the device identical right from the next cell of the selected cell to the last of the programs, and then the device identical again from the first of the programs to the basic cell.

16.1.2 Find All Device

It is used for LD, IL, Global/Direct Variable and Local Variable in common.  
Details of this function will be described below based on LD.

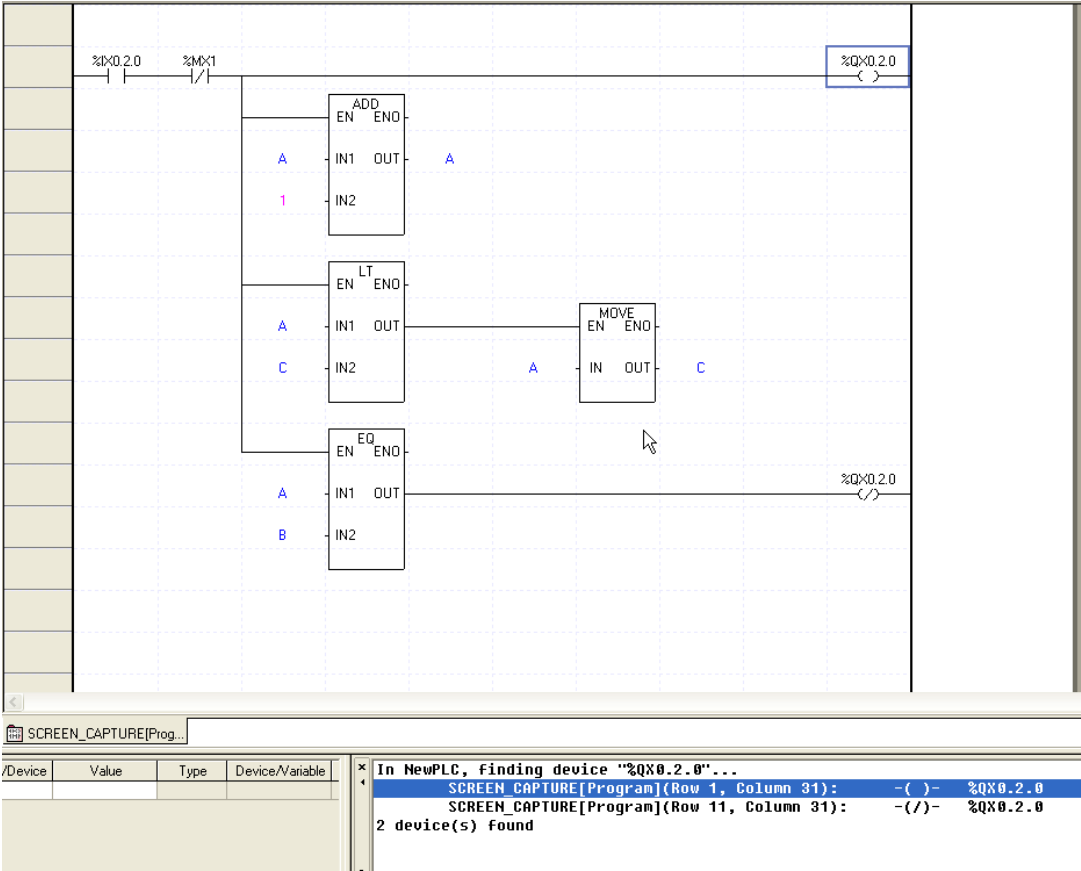
[Sequence]

- (1) Select [Find/Replace]-[Find Device] on the menu.
- (2) Specify the device to find, the direction and the options.
- (3) Click [Find All]. Find All will yield its result on the find message window as below.



Chapter 16 Find/Replace

(4) On the find window, select the line to find and then click [Enter] to move the cell to the line of the applicable LD program.



Notes

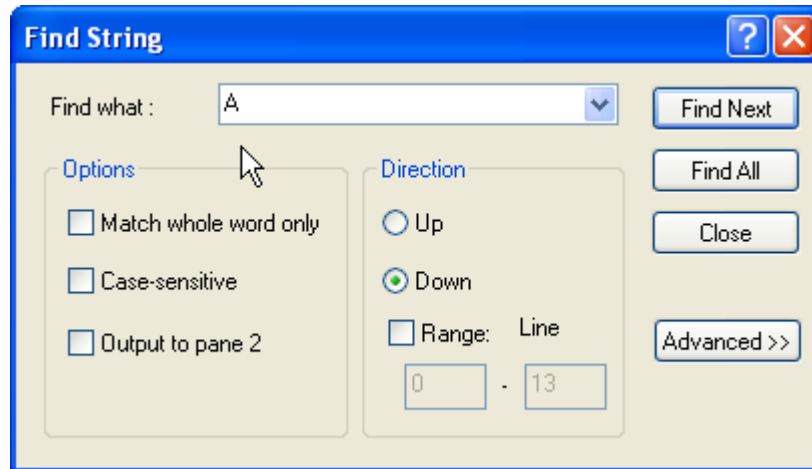
- Find All finds the device in all the programs included in the present PLC.



## 16.2 Find Text

This function is used to find the String of Rung Comment, Variable, Variable Comment, Application Instruction and Label except the device.

[Communication Box]



[Description of Communication Box]

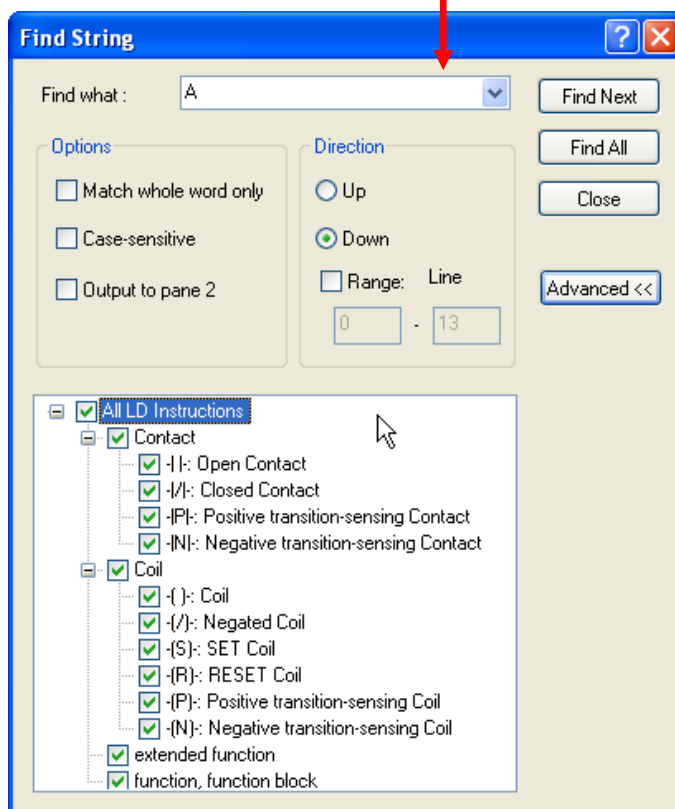
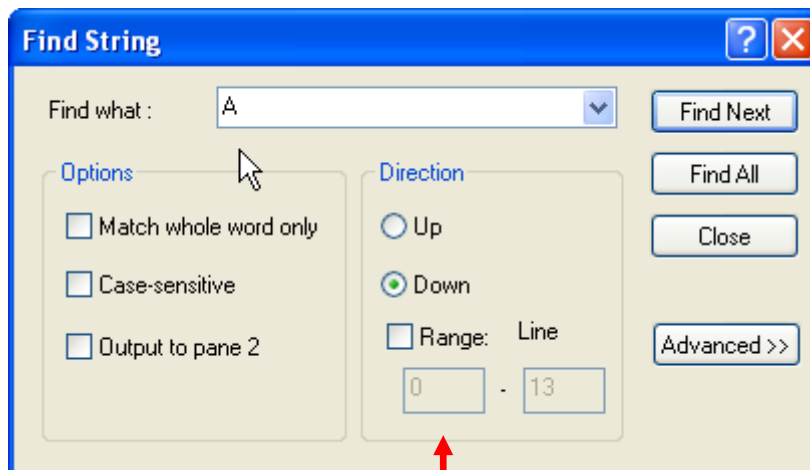
- (a) Find what: used to specify the String to find.
- (b) Match whole word only: If All Identical checked, it will find the string only exactly identical to the string specified in the detail to find. If not checked, it will find also the string where the detail to find is included.
- (c) Case-sensitive: If this checked, it will find the string only exactly identical to the string with Case-sensitive characters sorted out. If not checked, it will find the string in characters not sorted out.
- (d) Output to pane 2: XG5000 has two Find result windows. Basically the result is yielded to Find 1 result window, but if this check box is selected, the result will be yielded to Find 2 result windows.
- (e) Direction: Used to specify the location to find upward or downward from the line presently selected in the respective editor.
- (f) Find Next: Finds the detail specified above right in the next to the line (position) presently selected. If the applicable String is found, the position the applicable String is located will be selected.
- (g) Find All: Finds all the details specified above to display the result on the Find result window.
- (h) Range: If Range is selected, Find Sting is executed in a specific Sequence. If Range is selected, the start and last Sequence should be also entered.
- (i) Advanced >>: It is only used in LD editor. 'Advanced>>' and 'Advanced<<' is changed by click. It is used to find specific contact point, specific coil and application instruction used in LD editor.

## Chapter 16 Find/Replace

### Notes

- The result will be displayed on the Find windows 1 and 2 only with Find All executed.
- Since Find All finds all details in the applicable documents, the direction is not significant to select.
- Advanced>> is displayed only in LD editor.

Advanced>> (extension) and Advanced<< (shrink) is as shown below.

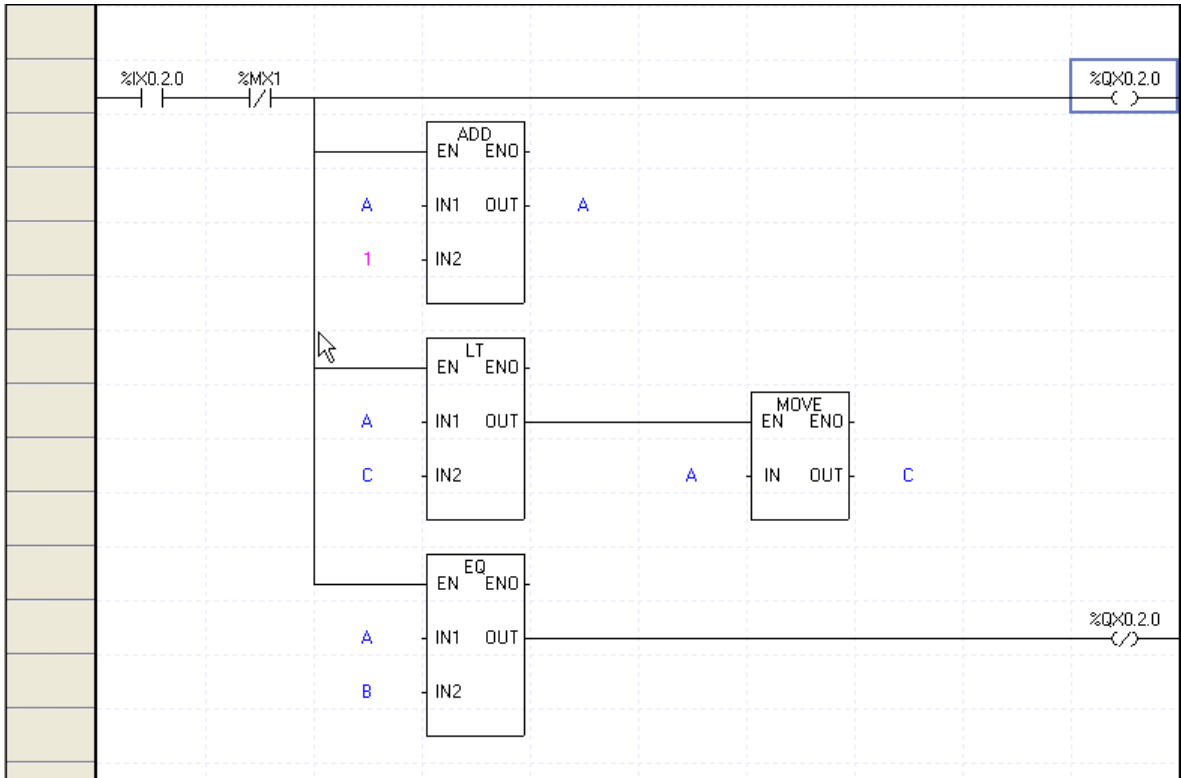


16.2.1 Find Text

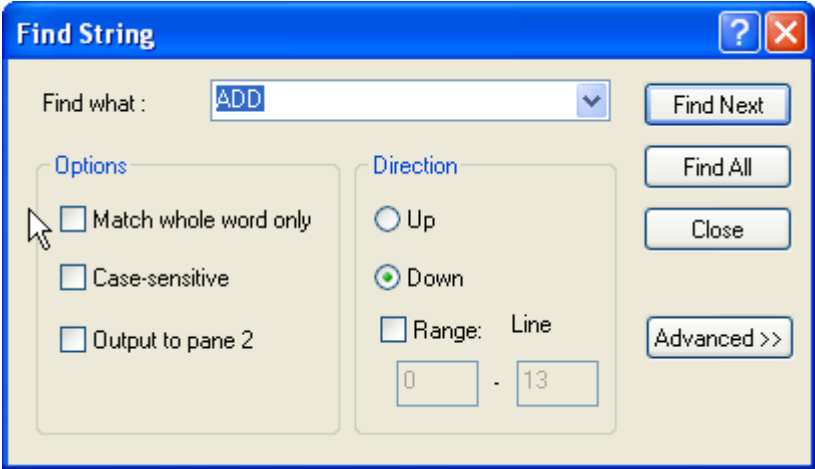
It is used for LD, IL, Global/Direct Variable, Variable and Local Variable in common.  
Details of this function will be described below based on LD.

[Sequence]

(1) Select the basic cell of the direction.

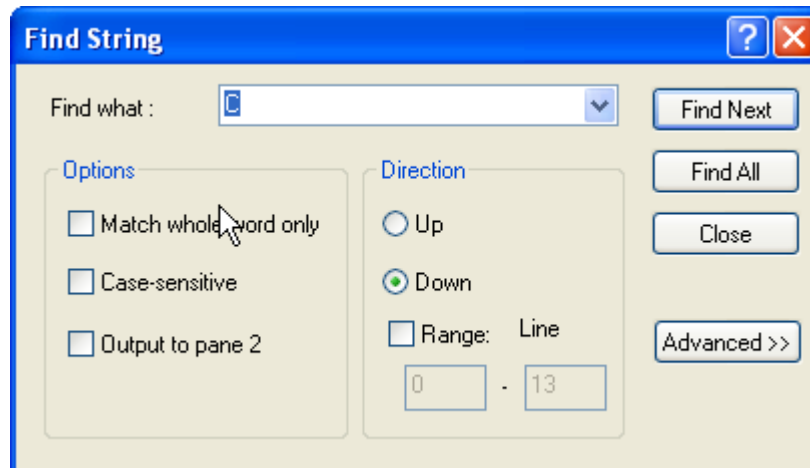


(2) Select [Find/Replace]-[Find Text] on the menu.

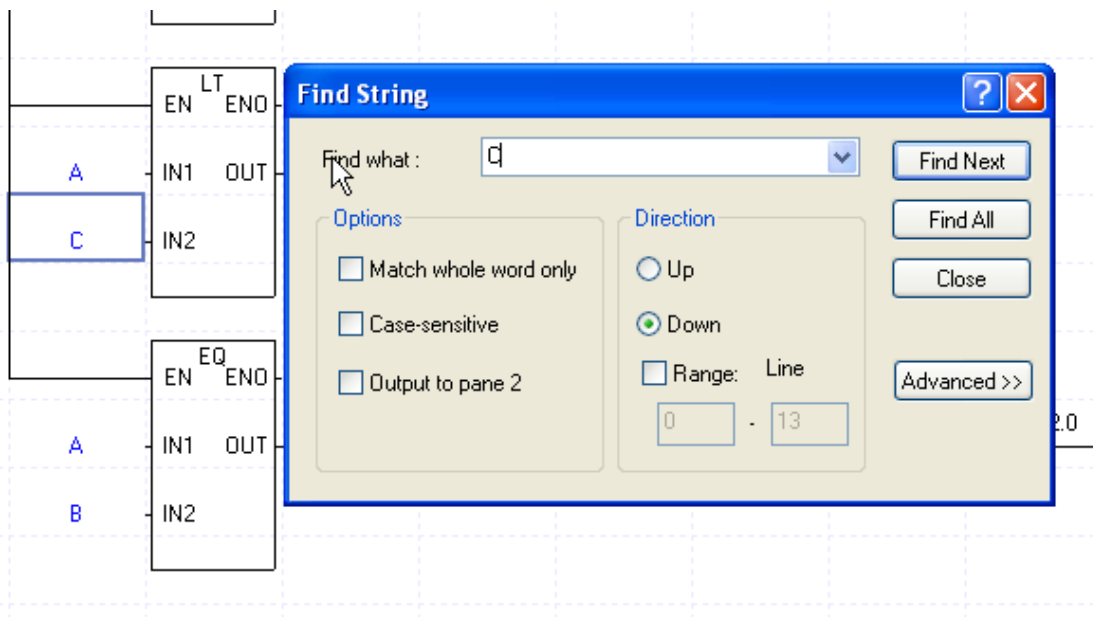


## Chapter 16 Find/Replace

(3) Specify the String to find, the selection options and the direction.

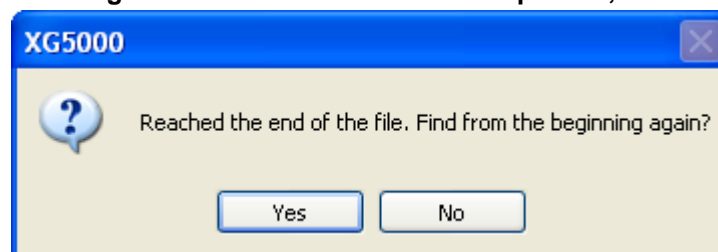


(4) Click [Find Next]. If on the Communication box any string is found identical to the detail as specified, it moves to the string whose cell is identical.



### Notes

– If on the Communication box no String is found identical to the detail as specified, the following message will appear.



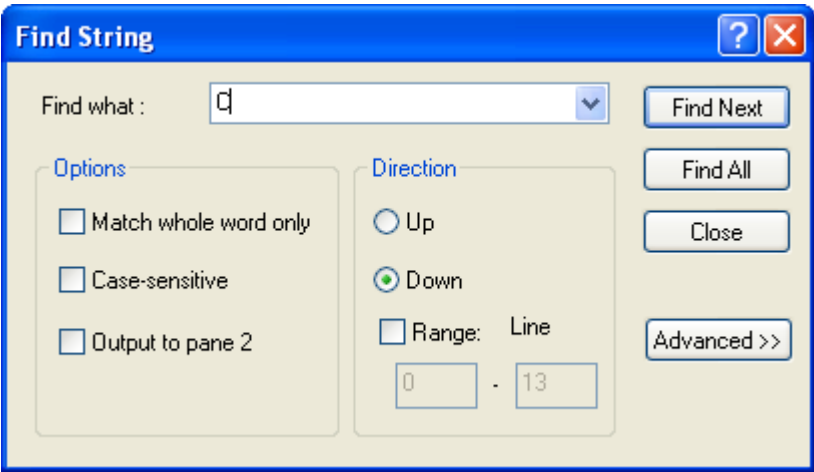
– [Find Next] will find all the present programs based on the selected cell when the String Find Communication Box is displayed. Namely, if the direction is set Downward, it will start to find the String identical right from the next cell of the selected cell to the last of the programs, and then the String identical again from the first of the programs to the basic cell.

16.2.2 Find All String

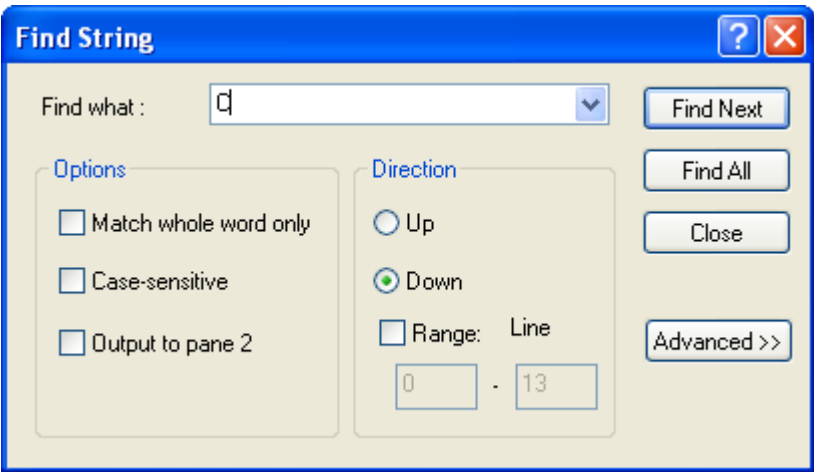
It is used for LD, IL, Global/Direct Variable and Local Variable in common.  
Details of this function will be described below based on LD.

[Sequence]

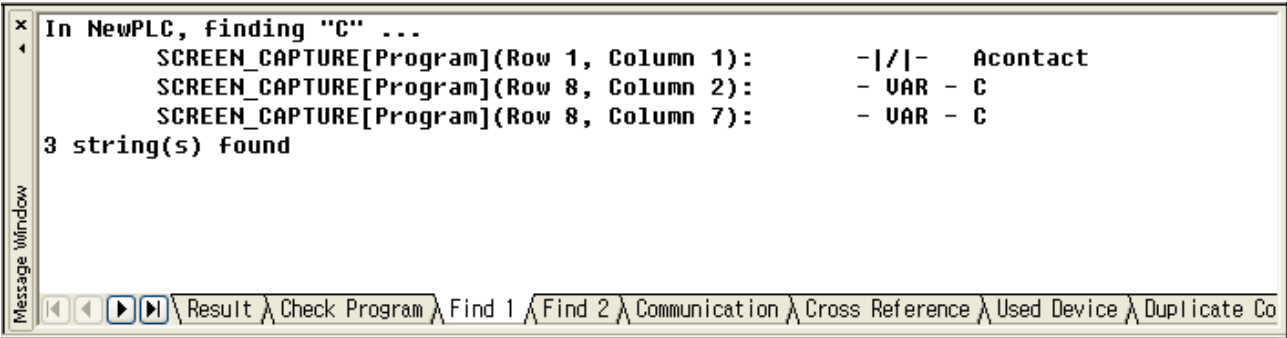
- (1) Select [Find/Replace]-[Find String] on the menu.



- (2) Specify the string to find, the selection options and the direction.



- (3) Click [Find All]. Find All will yield its result on the find message window as below.



## Chapter 16 Find/Replace

(4) On the find window, select the line to find and then click [Enter] to move the cell to the line of the applicable LD program.

The screenshot displays a ladder logic program with three rungs. The first rung contains a normally open contact labeled '1' in pink, connected to a coil labeled 'A' in blue. The second rung contains two normally open contacts, 'A' and 'C', both in blue, connected to a coil labeled 'C' in blue. The third rung contains two normally open contacts, 'A' and 'B', both in blue, connected to a coil labeled '%QX0.2.0' with a reset symbol. Below the ladder logic, a search window titled 'In NewPLC, Finding "C" ...' is open. It shows the following results:

Type	Device/Variable
SCREEN_CAPTURE[Program](Row 1, Column 1):	- / - Acontact
SCREEN_CAPTURE[Program](Row 8, Column 2):	- VAR - C
SCREEN_CAPTURE[Program](Row 8, Column 7):	- VAR - C

Below the results, it states '3 string(s) found'. At the bottom of the search window, there are navigation buttons: 'Result', 'Check Program', 'Find 1', 'Find 2', 'Communication', 'Cross Reference', 'Used Device', and 'Dup'.

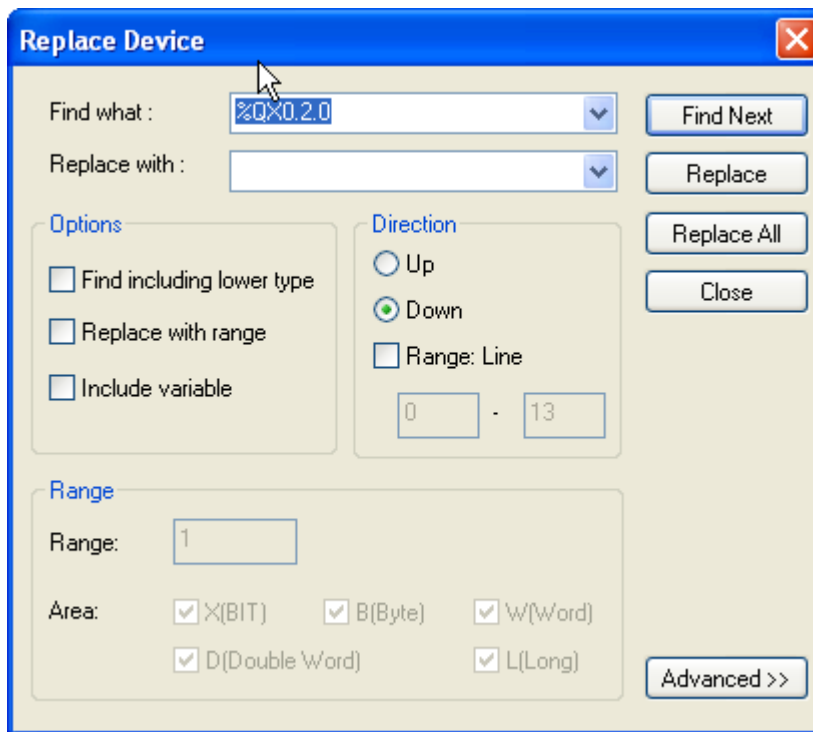
### Notes

- Find All finds the String in all the programs included in the present PLC.

## 16.3 Replace Device

This function is used to change the device previously made in LD Editor, IL Editor, or Variable/Comment Editor.

[Communication Box]



[Description of Communication Box]

- (a) Find what: Used to specify the device to find.
- (b) Replace with: Used to specify the device to replace.
- (c) Find including lower type: If selecting the checkbox when finding the device containing the device input in Find With, it finds %IB0.1.0, %ID0.1.0, %IL0.1.0 and others including %IX0.1.1.
- (d) Replace with range: If checking Mass Change, the number of device and the coverage to match change so that the devices can be mass changed.
- (e) Include Variable: Selects whether to replace the variable/comment of the input device with the variable/comment of the device to replace. That is, select whether to replace with the variable/comment of the device.
- (f) Range - Range: Designates the number of device for mass change. It is activated only when the Mass Change checkbox is checked.
- (g) Range - Area: Selects whether to contain by device types. If mass changing %IL0.0.1, for instance, they can be mass changed by selecting bit, byte, word and double word less than L area respectively.
- (h) Direction: Used to specify the location to find upward or downward from the line presently selected in the respective editor.
- (i) Direction - Range: If selecting Range, Device Change can be executed within a specific line. If selecting Range, the start and last lines should be also entered.
- (j) Find Next: Finds the detail specified above right in the next to the line (position) presently selected. If the applicable device is found, the position the applicable device is located will be selected.

## Chapter 16 Find/Replace

- (k) Replace: Replaces the device as specified above based on the presently selected position (line).
- (l) Replace All: Replaces all the details specified above after found.
- (m) Advanced>>: It is only used in Ladder editor. 'Advanced>>' and 'Advanced<<' is changed by click. It is used to find specific contact point, specific coil and extended function/function block used in Ladder editor.

### Notes

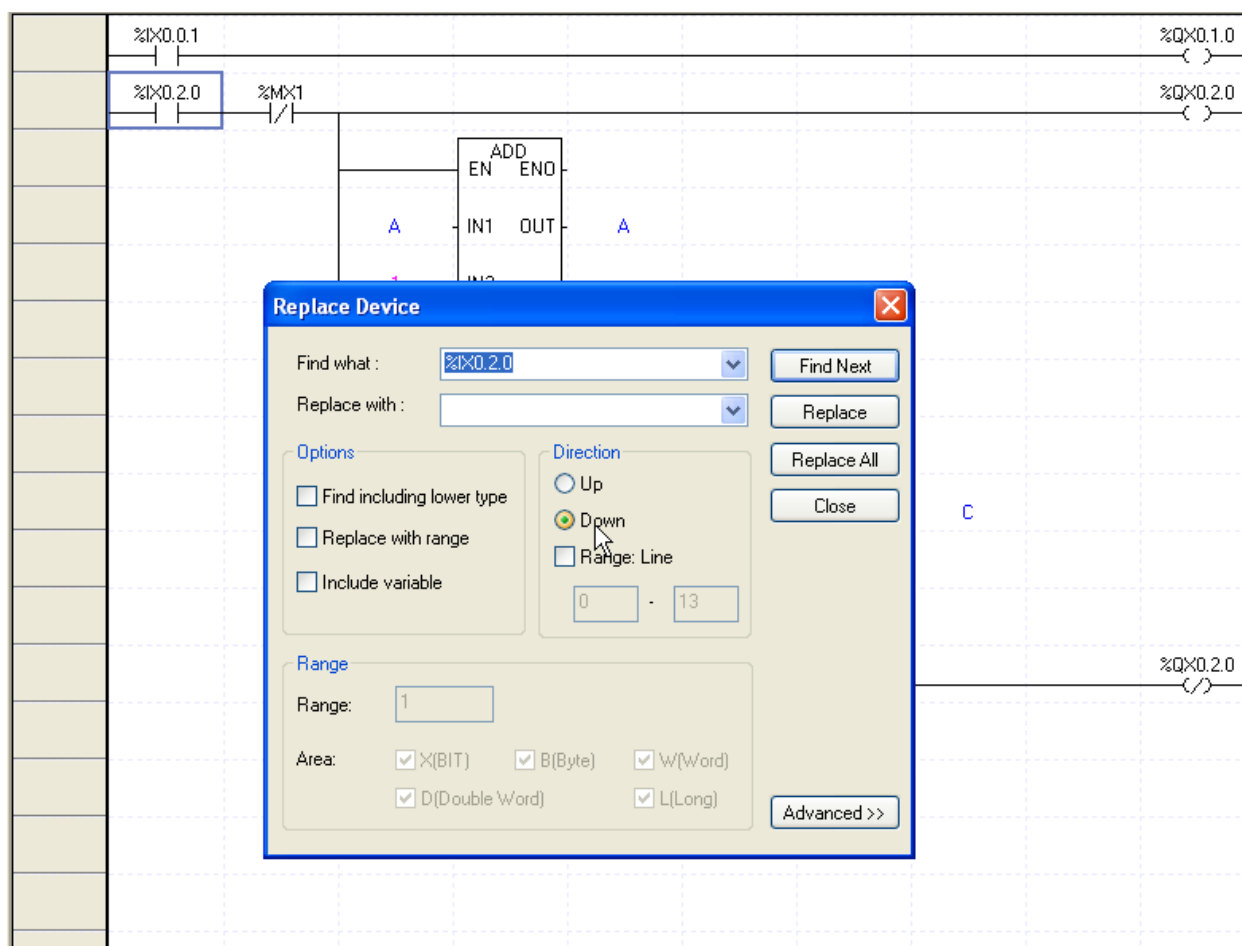
- It is insignificant to select the direction in the case of Replace All.
- If 'Replace with range' is checked, Replace All only will be available.
- Advanced>> is displayed only in LD editor
- Message box is same as chapter 8.1 Find Device when 'Advanced' button is used.

### 16.3.1 Replace Device

It is used for LD editor and Variable/Comment in common. This is the function to fine the previously created device. Details of this function will be described below based on LD.

[Sequence]

- (1) Select the basic cell of the direction.
- (2) Select [Find/Replace]-[Replace Device] on the menu.





(3) Specify the details to find and replace the type and the direction.

Replace Device

Find what :  
Replace with :

%IX0.2.0

%MX1.0

Find Next

Replace

Replace All

Close

Options

☐ Find including lower type

☐ Replace with range

☐ Include variable

Direction

☐ Up

☒ Down

☐ Range: Line

0

-

13

Range

Range:

1

Area:

☒ X(BIT)

☒ B(Byte)

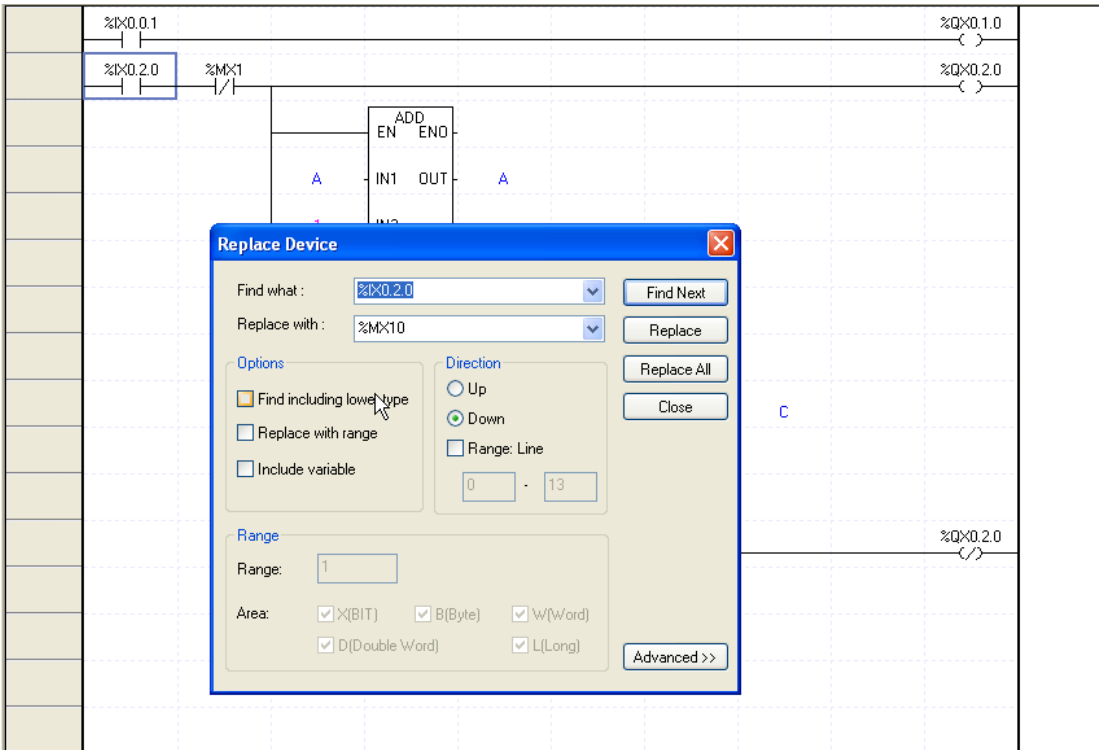
☒ W(Word)

☒ D(Double Word)

☒ L(Long)

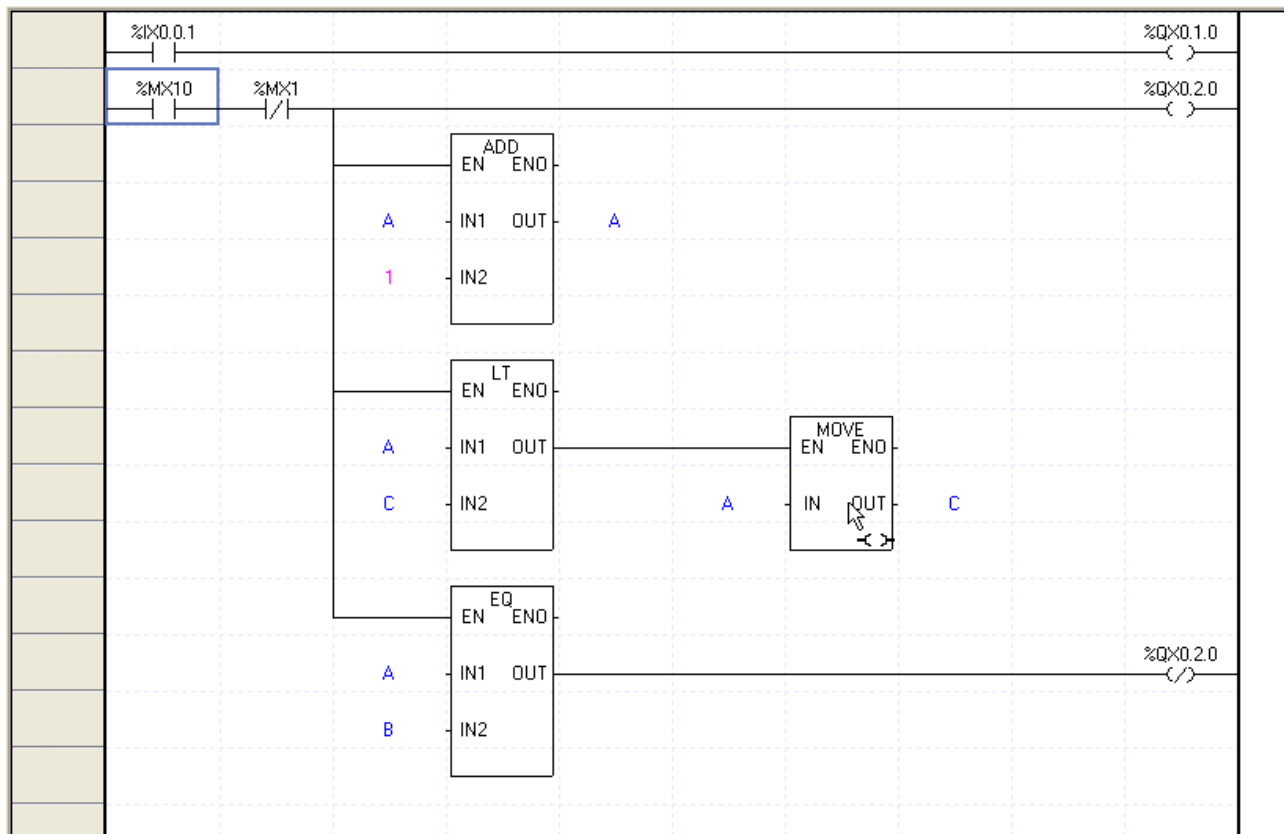
Advanced >>

(4) Click [Replace]. If the device of the cell presently selected is identical to the detail to find, replace the present cell to the detail as specified on the Communication box to move to the next cell identical to the detail to find.



## Chapter 16 Find/Replace

(5) Below screen is the previously executed [Replace].



### Notes

- [Replace] will be available only when the device and the type of the cell presently selected are identical to the detail to find and to the type as specified on the Communication box.
- Click [Replace] to move to the next cell identical to the detail to find as specified on the Communication box regardless of the execution of [Replace].
- [Replace] will find all the present programs based on the selected cell when the device Replace Communication box is displayed. Namely, if the direction is set downward, it will start to find the device identical from the cell selected to the last of the programs, and then the device identical again from the first of the programs to the basic cell.

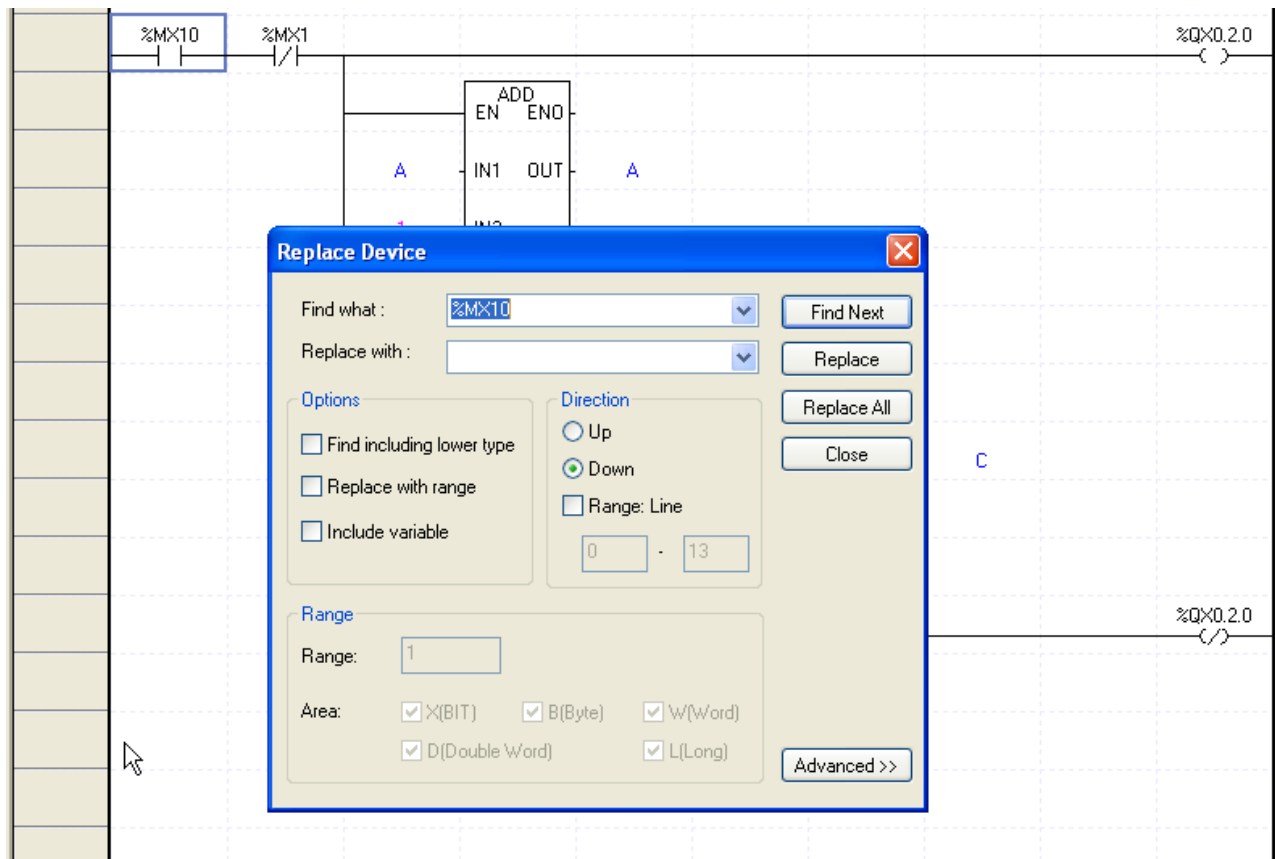
16.3.2 Replace All Device

It is used for LD editor and Variable/Comment editor in common. This is used to find the previously created device. Details of this function will be described below based on LD.

1. All Change

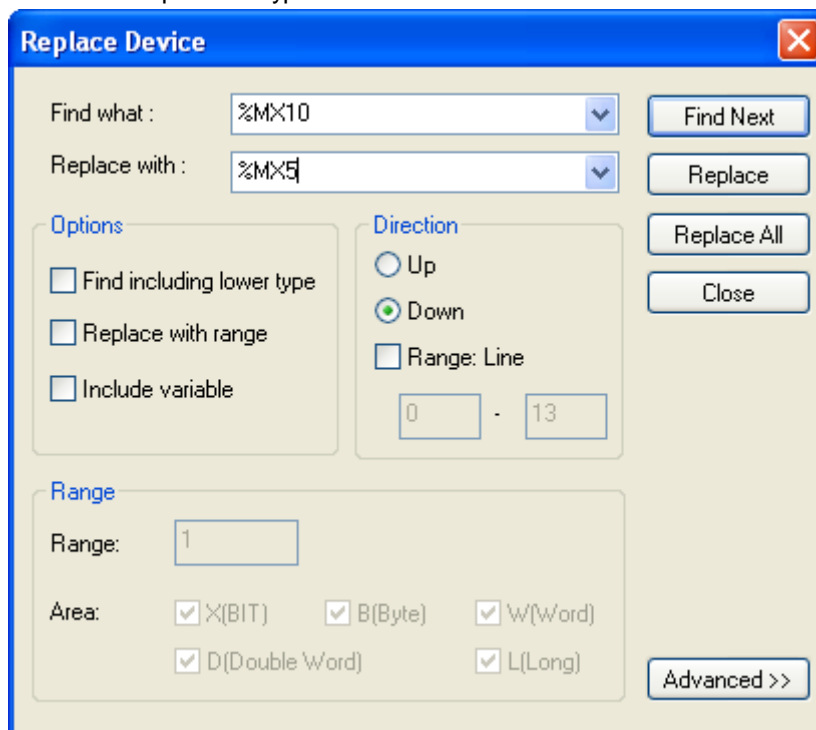
[Sequence]

(1) Select [Find/Replace] - [Replace All Device] on the menu.



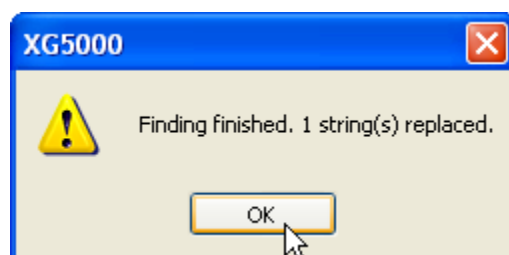
## Chapter 16 Find/Replace

(2) Specify the details to find and Replace the type and the direction.



(3) Click [Replace All].

(4) If [Replace All] is complete in the present program, the following message box will appear.



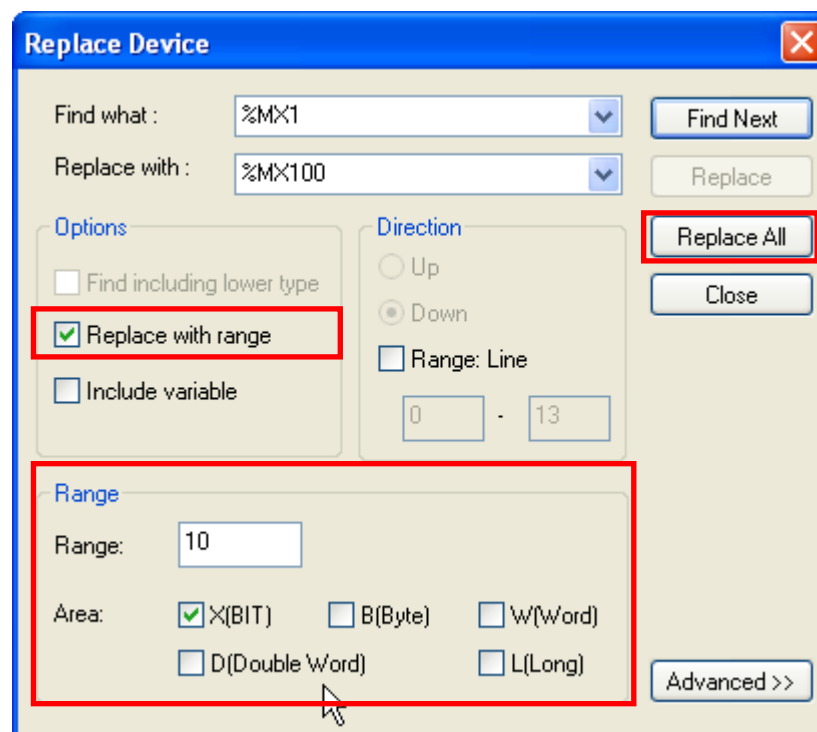
### 2. Replace with range

It is used to change the consecutive devices in bulk. For example, the devices of %MX1 ~ %MX10 can be changed to %MX100 ~ %MX109.

ex) If the detail to find is %MX1, the detail to change is %MX100 and the number of device is 10,

[Sequence]

- (1) Select [Find/Replace]-[Replace Device] on the menu.
- (2) Specify the details to Find and Replace the type and the direction, check the Range Replace box and then input the number of devices to Replace with range.



(3) Click [Replace All].

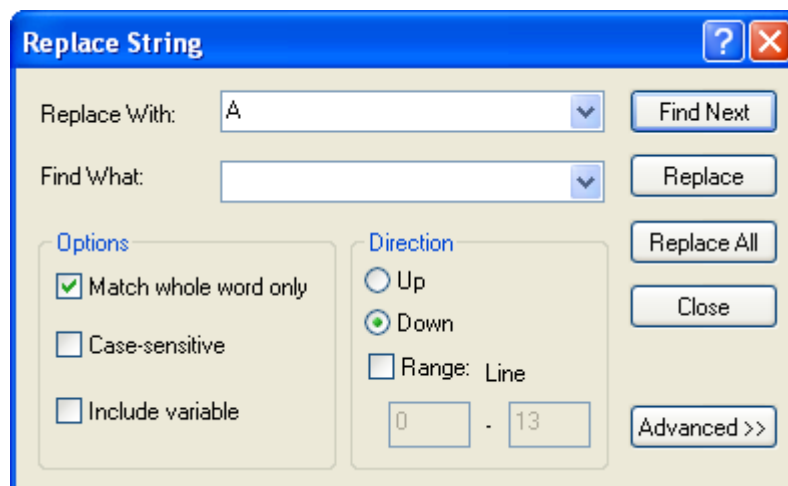
#### Notes

1. 'Replace with range' is available only for the devices, not for the constants.

### 16.4 Replace String

This function is used to find the String of Comment, Variable, etc. except the device.

[Communication Box]



[Description of Communication Box]

- (a) Replace With: used to specify the string to find.
- (b) Find What: used to specify the string to replace.
- (c) Match whole word only: If All Identical checked, it will find the string only exactly identical to the string specified in the detail to find. If not checked, it will find also the string where the detail to find is included.
- (d) Case-sensitive: If this checked, it will find the string only exactly identical to the string with Case-sensitive characters sorted out. If not checked, it will find the string in characters not sorted out.
- (e) Include variable: If this checked, the variable will be also replaced as applicable when the string is replaced. If this is not checked, the variable will not be included in the replace when the string is replaced.
- (f) Direction: used to specify the location to find upward or downward from the line presently selected in the respective editor...
- (g) Range: if selecting a range, Replace String can be executed within a specific line. If Range is selected, the first and last Sequence should be entered.
- (h) Find Next: finds the detail specified above right in the next to the line (position) presently selected. If the applicable string is found, the cell will move to the position the applicable string is located.
- (i) Replace: replaces the detail specified above after found.
- (j) Replace All: replaces all the details specified above after found.
- (k) Advanced>>: It is only used in Ladder editor. 'Advanced>>' and 'Advanced<<' is changed by click. It is used to find specific contact point, specific coil, extended function, function/function block used in Ladder editor.

#### Notes

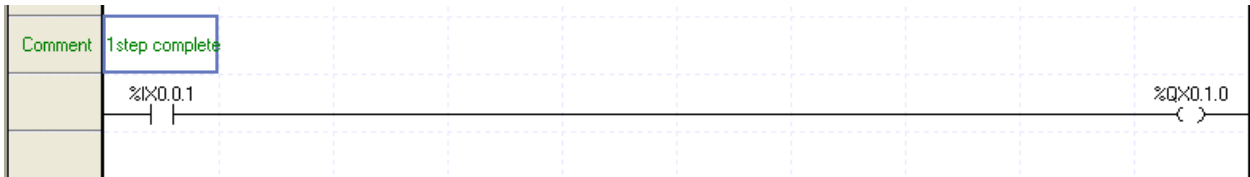
- **Advanced>> is displayed only in Ladder editor**  
**Message box is same as chapter 8.2 Find Device when 'Advanced' button is used.**

16.4.1 Replace String

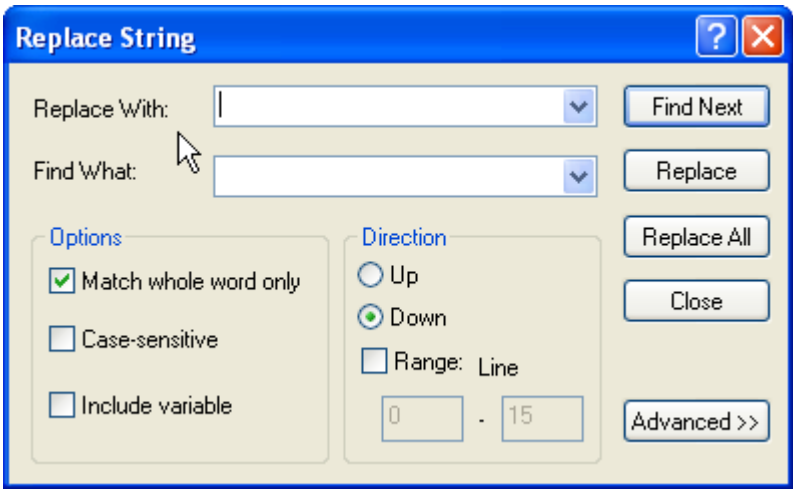
It is used for LD editor and Variable/Comment editor in common. It is used to find the previously created device. Details of this function will be described below based on LD.

[Sequence]

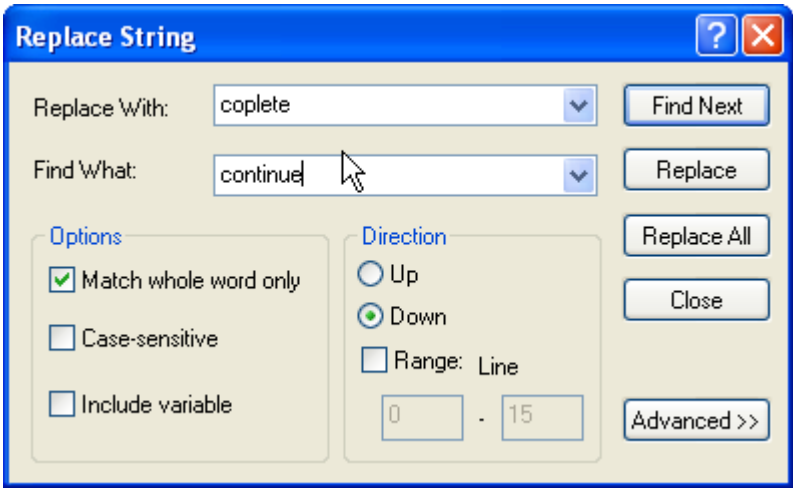
(1) Select the basic cell of the direction.



(2) Select [Find/Replace]-[Replace String] on the menu.

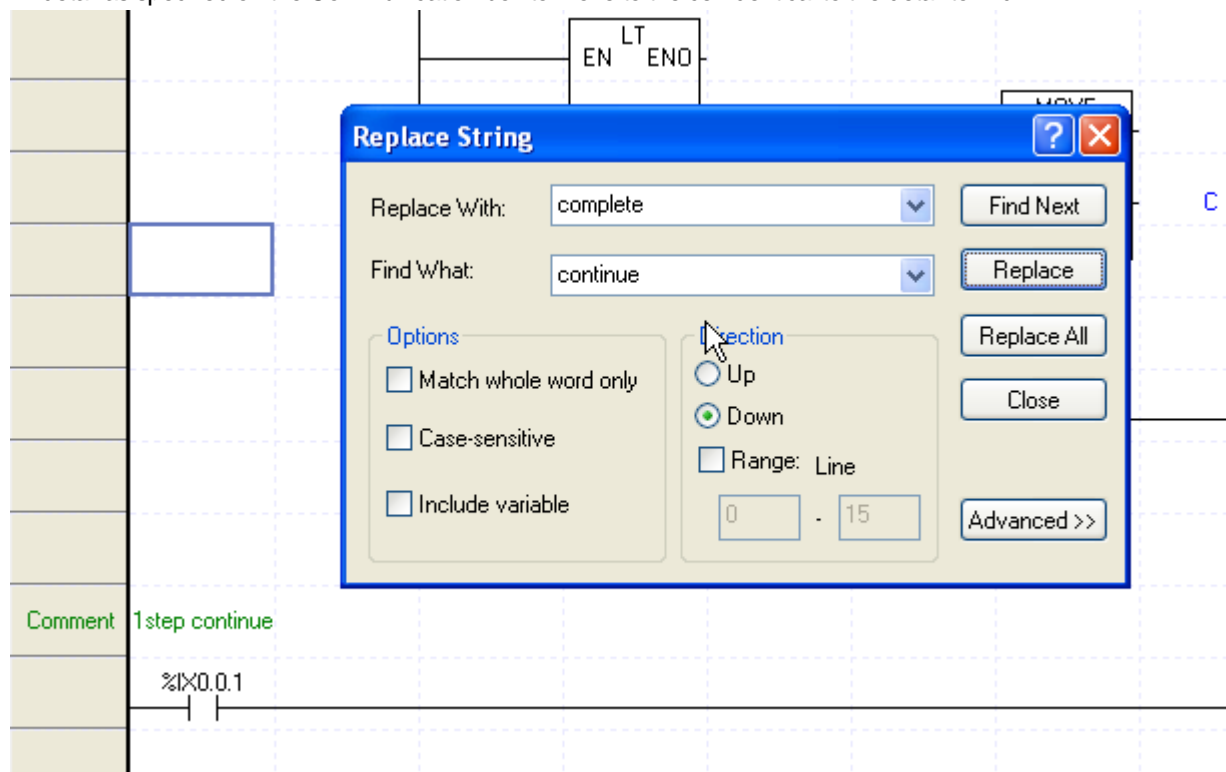


(3) Specify the String to find and replace the selection options and the direction.



## Chapter 16 Find/Replace

- (4) Click [Replace]. If the string of the cell presently selected is identical to the detail to find, replace the present cell to the detail as specified on the Communication box to move to the cell identical to the detail to find.



### Notes

- [Replace] will be available only when the string of the cell presently selected is identical to the detail to find as specified on the Communication box.
- Click [Replace] to move to the next cell identical to the detail to find as specified on the Communication box regardless of the execution of [Replace].
- [Replace] will find all the present programs based on the selected cell when the device Replace Communication box is displayed.

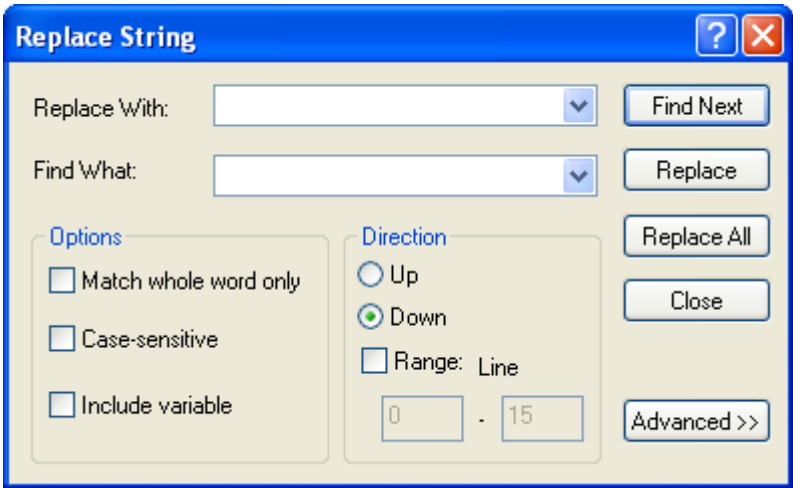


16.4.2 Replace All String

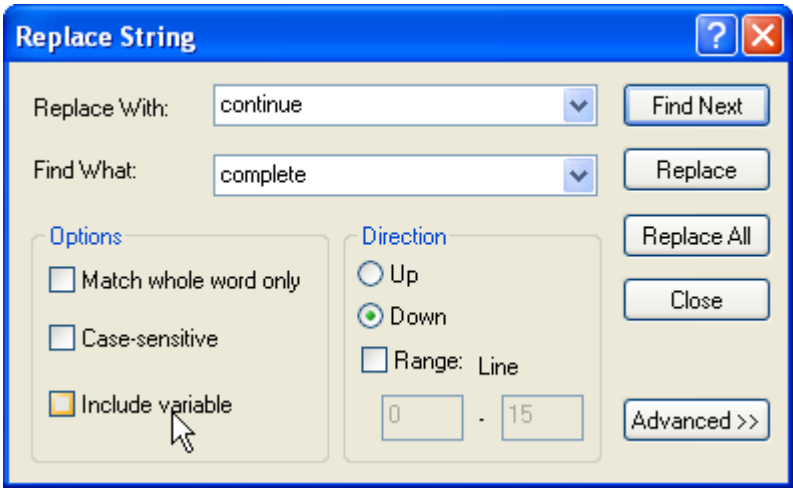
It is used for LD editor and Variable/Comment editor in common. It is used to find the previously created device. Details of this function will be described below based on LD

[Sequence]

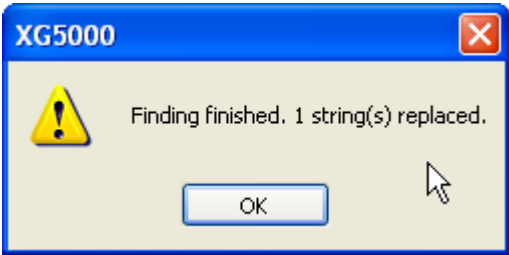
- (1) Select [Find/Replace]-[Replace String] on the menu.



- (2) Specify the details to Find and Replace the selection options and the direction.



- (3) Click [Replace All].
- (4) If [Replace All] is complete in the present program, the following message box will appear for you to decide to Replace in the other program or not.



### 16.5 Find Again

[Find Again] is used to find the details of [Find Device] or [Find String] again if once executed previously. If [Find] was not executed previously, it will be inactive.

[Sequence]

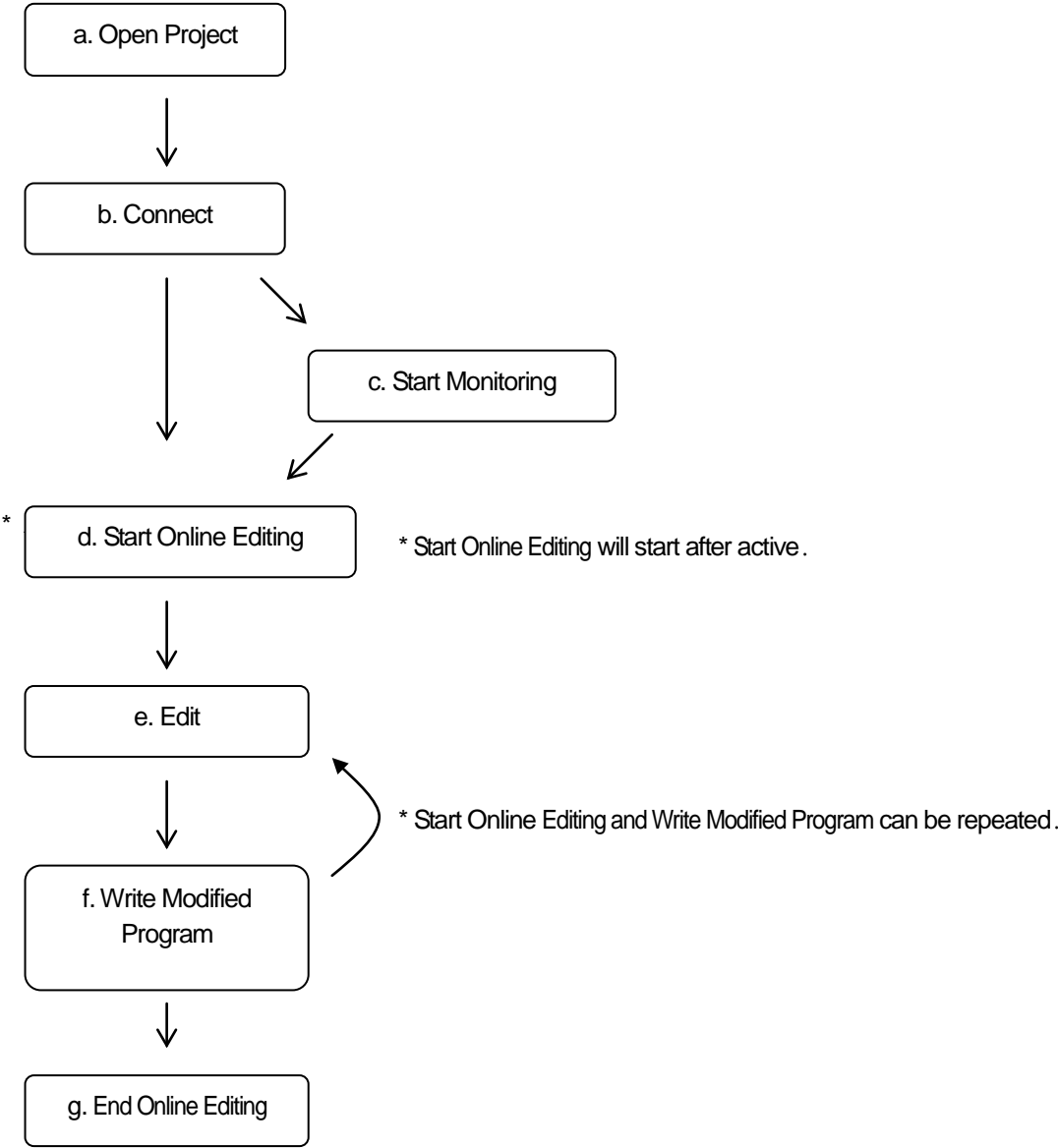
- (1) Select [Find/Replace]-[Find Again] on the menu.

# Chapter 17 Online Editing

This function is used to edit the PLC program with PLC operation status in Run mode.

## 17.1 Sequence of Online Editing

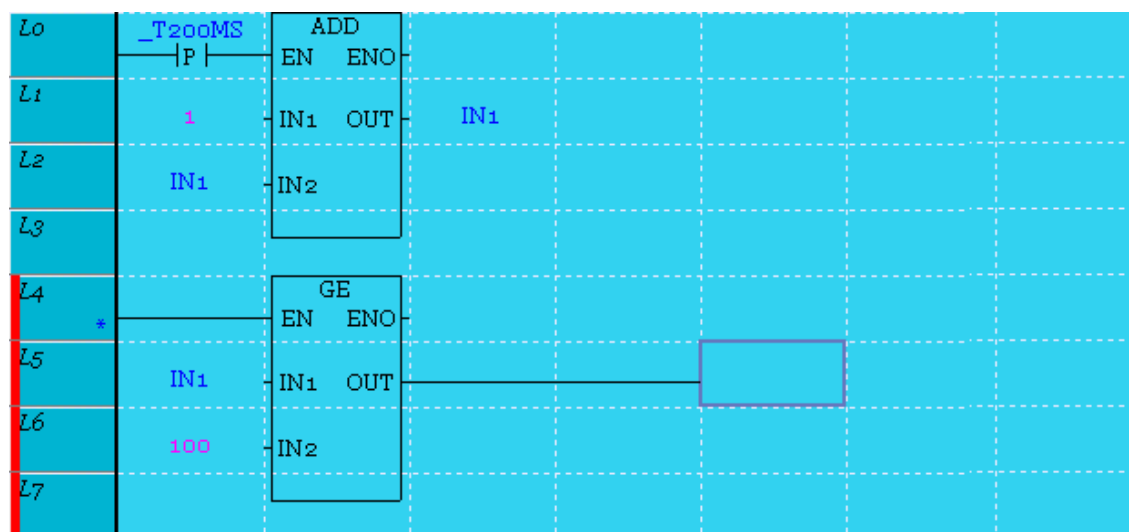
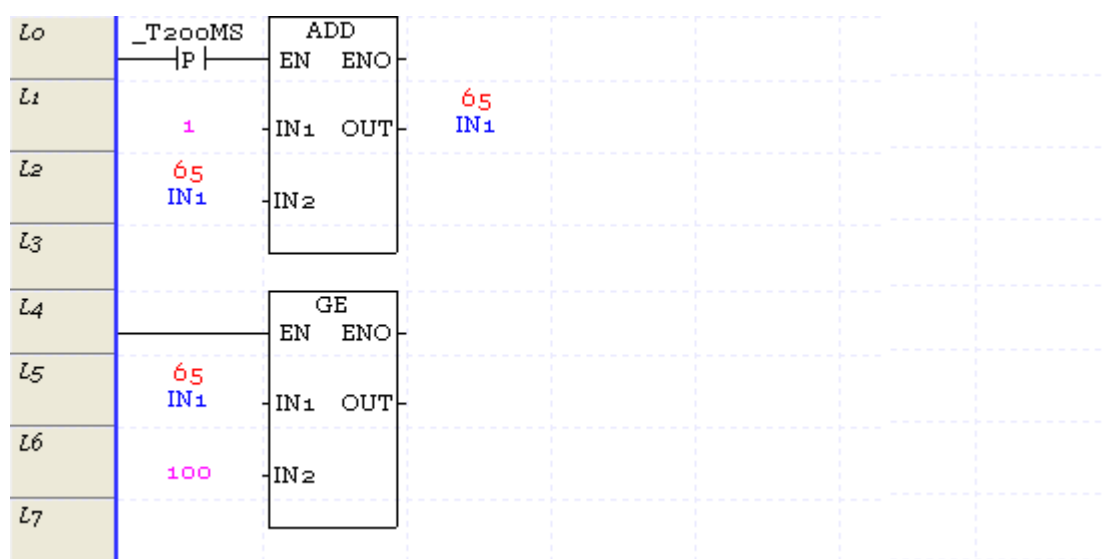
### 17.1.1 Sequence of Online Editing



## Chapter 17 Online Editing

[Description of Sequence]

- (a) Open Project
  - Select [Project]-[Open Project] on the menu. Open the project identical to the PLC project to perform Online Editing.
  - Select [Project]-[Open from PLC] on the menu.
- (b) Connect
  - Select [Online]-[Connect] on the menu to connect with PLC.
- (c) Start Monitoring
  - Select [Monitor]-[Start Monitoring] on the menu.
  - Online Editing is available while monitoring.
  - Start/Stop Monitoring is available during Online Editing.
- (d) Start Online Editing
  - Select [Online]-[Start Online Editing] on the menu.
  - Online Editing will be available after its program window is active and the program is selected.
  - After Program or Variable is edited during Run, the program window will be changed to edit mode during Run



- If Online Editing starts, the background color of the program can be changed through its applicable option.

- (e) Edit
  - Edit Online Editing is the same as specified in the off-line Edit.
  - In case of the LD, the edited rung is indicated with ("\*").
- (f) Write Modified Program
  - Select [Online]-[Write Modified Program] on the menu.
  - The applicable program only will be transferred to PLC.
  - In case of the LD, the edited rung is indicated with ("\*").
- (g) End Online Editing
  - Select [Online]-[End Online Editing] on the menu.

Notes

- Project can not be closed during Run Modify
- One or more programs can be modified during Run.
- While editing during Run, the monitoring value is not correct. The correct value can be monitored as long as modifying during Run.
- For the items to edit during Run, refer to the followings  
(Edit Item means that add, delete and change are available)

Item	Description	Edit	Item	Description	Edit
Project properties	Add	X	User-defined type	Add	○
	Delete	X		Delete	X
	Change	X		Change	X
Program	Add	X	LD	Edit	○
	Delete	X	ST	Edit	○
	Change	○	Local Variable Retain Set	Edit	○
Global variable	Add	○	Global Variable Retain Set	Edit	X
	Delete	X			
	Change	X			
Local variable	Add	○			
	Delete	○			
	Change	○			

## Appendix 1 What is the difference between APM software package and XG-PM.

### Appendix1.1 Difference

Item \ PADT	APM Software package	XG-PM
Supported module	1) XGF-PO1A/PO2A/PO3A (3 types) 2) XGF-PD1A/PD2A/PD3A (3 types)	1) XGF-PO1A/PO2A/PO3A (3 types) 2) XGF-PD1A/PD2A/PD3A (3 types) 3) XGF-PO1H/PO2H/PO3H/ PO4H (4 types) 4) XGF-PD1H/PD2H/PD3H/PD4H (4 types) 5) XGF-PN8A (1 type)/XGF-PN8B(2 types) 6) XGF-M32E(1 type)
Programming structure	1) Single module programming method 2) Cannot comparison operation data/parameter screen at once. 3) No support copy/attach parameter/operation data on the project tree.	1) Multi module programming method 2) Support comparing Operation data/Parameter screen at once 3) Function of copying/attaching parameter/profile data.
Editorial function	No support data copy. attach without same item. No support /Undo/Redo.	Support function for data copy/ attach/ Undo/ Redo with difference item.
Parameter detail setting	No support	Provide parameter detailed setting function with help (Description + Graphic)
Online module setting	One module online function	1) Online synch function (It is possible that it synchronize module information on system and project structure on the program.) 2) Multi module online function
Read data/ Write/ Comparison with module	No support	Support comparison function of read/write/module project. (Multi module)
Communication sharing	It is impossible that it share communication port with other software.	It is possible that it share communication port with XG5000 software.
Module O/S download	No support	Support download function of multi module O/S.
File Import/Export	No support	Can save and load as operation data/operation parameter file.
Monitoring	Not provides graphic monitor function.	Graphic monitoring (System monitor, Display module OS information.)
Trace	Provides data Tracking function.	Data trace, X/Y trace, XYZ trace function.
Simulation	Profile/ Circular interpolation simulation	Operation simulation
Print	Provide a module printing function.	Provide project printing function. (Print multi module)
Servo tuning	No support	Support (network type XPM)
CAM setting function	No support	CAM profile setting (22 types), Data analysis/ Display editorial CAM graph.
Help	Descript basic operation.	Menu tool tip each function and promote help.

## Appendix1 What is the difference between APM software package and XG-PM

### Appendix1.2 Menu List

#### 1.2.1. Menu list

##### 1. File

APM software package	XG-PM	Remark
New File	Project >> New Project	Available to change File -> Project
Open	Project >> Open Project	Available to change File -> Project
Save	Project >> Save Project	Available to change File -> Project
Save as	Project >> Save as Project	Available to change File -> Project
Print	Project >> Print	Supports Project Print
Print Setup	Print Setup	-
Recent File	Recent File	-
Environement Setting	Environment Setting	"Change step number" is available by "Change Module Registration Information"
Exit	Exit	-

##### 2. Edit

APM software package	XG-PM	Remark
Copy	Copy	Same as XG5000
Paste	Paste	Same as XG5000
Undo	Undo	Same as XG5000
Redo	Redo	Same as XG5000
Initial value seutup	Initial value setup	-

##### 3. Data

APM software package	XG-PM	Remark
Operation parameter	-	Unnecessary part is removed
X-axis operation data	-	Unnecessary part is removed
Y-axis operation data	-	Unnecessary part is removed
Z-axis operation data	-	Unnecessary part is removed

Appendix1 What is the difference between APM software package and XG-PM

4. Communication

APM software package	XG-PM	Remark
Comm. Enviroment setting	Online >> Connection Setting	Same as XG5000
Connect	Online >> Connect	Same as XG5000
Disconnect	Online >> Disconnect	Same as XG5000
Read/Write Data	Online >> Write Online >> Read	Same as XG5000

5. Tool

APM software package	XG-PM	Remark
Online model setup	Online >> Online model setup	Multiple module setup is available
Offline model setup	View >> Registration information	Module information setup is available
Operation status monitoring	Monitoring>> Start/End monitoring	Same as XG5000
Profile Tracking	Monitoring >> Trend monitoring	Same as XG5000
Profile Simulation	Tool >> Profile/Circular interpolation simulation	-
Circular Interpolation simulation	Tool >> Profile/Circular interpolation simulation	-

6. View

APM software package	XG-PM	Remark
Main tool	Basic tool	-
Command tool	Command tool	-
Tracking tool	Trend tool	Same as XG5000
Simulation tool	Simulation tool	-
Status bar	-	Same as XG5000
Worke space	Project window	Same as XG5000
External I/O signal and status screen	I/O window	Simplify terminology
Error History information	Error Status / Error History	Separate item

7. Help

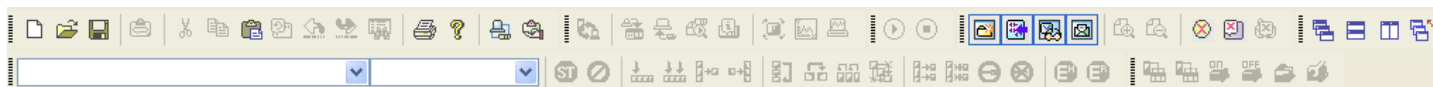
APM software package	XG-PM	Remark
APM software package information	About XG-PM	-
About Help	XG-PM Help	-



## Appendix1 What is the difference between APM software package and XG-PM
















### 1.2.2. Toolbar list

#### 1. Entire toolbar













#### 2. Basic toolbar



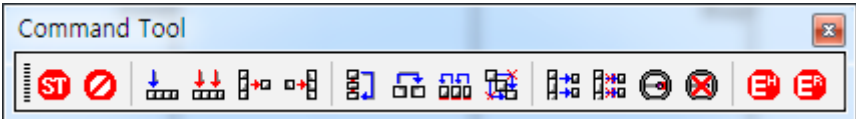
Command icon	Commend	Description	Remark
	New Project	Creates new project	Common
	Open Project	Opens previous project	Common
	Save Project	Saves project	Common
	Properties	Activates detailed information dialog box on the selected item at the project window (Ex) Project and module information	Common
	Cut	Initializes data of the selected shell area and copy data to clipboard	Common
	Copy	Copies data to clipboard	Common
	Paste	Copies data from clipboard to the selected shell area	Common
	Initial value setup	Initializes data of the selected shell area	Common
	Undo	Cancels the editing at the selected item window and return to the previous status	Common
	Redo	Restores the canceled operation	Common
	Detailed parameter setup	Shows detailed paramter window at the operation paramter	Common
	Print	Prints contents of the activated window	Common
	XG-PM Information	Shows XG-PM's information	Common
	Connect/Disconnect	Connect to/disconnect from PLC	Common
	Connection setting	Sets up connection method	Common









Appendix1 What is the difference between APM software package and XG-PM

3. Edit toolbar









Command icon	Commend	Description	Remark
	Cut	Initializes data of the selected shell area and copy data to clipboard	Common
	Copy	Copies data to clipboard	Common
	Paste	Copies data from clipboard to the selected shell area	Common
	Initial value setup	Initializes data of the selected shell area	Common
	Undo	Cancels the editing at the selected item window and return to the previous status	Common
	Redo	Restores the canceled operation	Common
	Insert line	Inserts a line to the selected position.	Montion Control Module
	Delete line	Deletes the selected line.	Motion Control Module
	Insert cell	Inserts the selected position cell.	Motion Control Module
	Delete cell	Deletes the selected cell.	Motion Control Module

4. Command toolbar

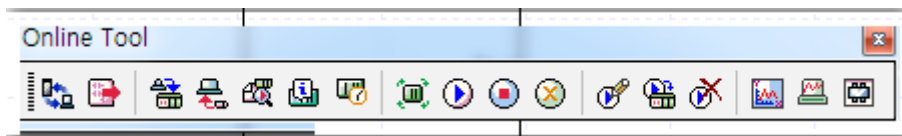












Command icon	Commend	Description	Remark
	Axis stop	Selected axis dec. stop command	Common
	EMG stop	Internal EMG stop command during operation	Common
	Home return	Home return command according to Home return method	Common
	Floating origin setting	Software origin setting command	Common
	Speed/Position switching	Switches speed control to position control during operation	Common
	Position/speed switching	Switches position control to speed control during operation	Common
	Skip operation	Stops current step and run next step	Common
	Continuous operation	Changes operation pattern of the current step to continuous operation and runs next step without stop	Common

## Appendix1 What is the difference between APM software package and XG-PM




Command icon	Command	Description	Remark
	Return to position before manual operation	When positioning complete position is changed by manual operation such as JOG operation and Inching operation after positioning complete, moves to the position before manual operation	Common
	Cancel M code	Cancels M code when M code arise	Common
	Enable ZONE output	Enables ZONE output	APM
	Disable ZONE output	Disables ZONE output	APM
	Enable MPG	Enables MPG function	APM
	Disable MPG	Disables MPG function	APM
	Error history reset	Clears entire error history	Common
	Error reset	Clears current error	Common

### 5. Online toolbar

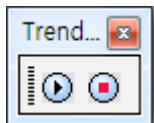




Command icon	Command	Description	Remark
	Online model setup	Checks the module under online status and add to the project. When selecting the module, it reads data from that module	Common
	Write	Writes the data to module	Common
	Read	Reads the data from module	Common
	Compare with module	Compares the data in the module and in the project and shows the result at "Compare with module" tap	Common
	Module information	Shows the module information under online status at the screen	Common
	Start/End monitoring	Starts/Ends monitoring	Common
	RUN	Converts the module into the RUN mode.	Motion Control Module
	Stop	Converts the module into the Stop mode.	Motion Control Module
	Test	Shows the test mode state of the module.	Motion Control Module
	Start online editing	Starts modification during RUN.	Motion Control Module

Appendix1 What is the difference between APM software package and XG-PM

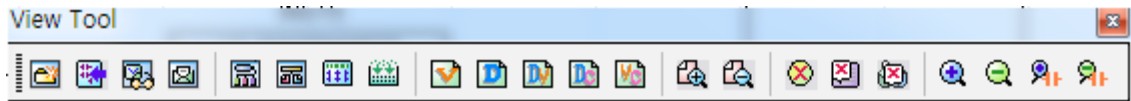
Command icon	Command	Description	Remark
	Trend monitor	Executes trend monitoring	Common
	Data trace	Specifies the device and monitors the data change of that device	XPM, Network type XPM
	Device monitor	Monitors and saves the current device of a module.	Motion Control Module











6. Trend toolbar














Command icon	Command	Description	Remark
	Start trend monitoring	Starts (restarts) trend monitoring	Common
	Stop Trend monitoring	Stops (pauses) trend monitoring	Common

7. View toolbar







Command icon	Command	Description	Remark
	Project window	Shows or hides project window	Common
	Command window	Shows or hides command window	Common
	I/O window	Shows or hides I/O window	Common
	Message window	Shows or hides message window	Common
	View Network	Executes network window view.	Motion Control Module
	Cross Reference	Shows all positions where the device is used for a program.	Motion Control Module
	Used device	Shows the devices used for a program.	Motion Control Module
	Check Program	Checks the program's errors.	Motion Control Module
	Variables	Indicates the variable name.	Motion Control Module
	Devices	Indicates the device name.	Motion Control Module

Appendix1 What is the difference between APM software package and XG-PM

Command icon	Command	Description	Remark
	View Device/variable	Indicates the device and comment.	Motion Control Module
	View Device/Comment	Indicates the device and comment.	Motion Control Module
	View Variable/Comment	Indicates the variable and comment.	Motion Control Module
	Detail view	Executes paramter detail view	Common
	Simple view	Executes paramter simple view	Common
	Error status	Activates error status tap at the message window	Common
	Error history	Activates error history tap at the message window	Common
	Zoom In	Zoom in screen.	Motion Control Module
	Zoom Out	Zoom out screen.	Motion Control Module
	Increase columns	Increases the number of contacts that can be connected horizontally in the ladder editor.	Motion Control Module
	Decreases columns	Decreases the number of contacts that can be connected horizontally in the ladder editor.	Motion Control Module

8. Window toolbar



Command icon	Command	Description	Remark
	Cascade	Arrays windows in XG-PM in cascade	Common
	Tile	Arrays windows in XG-PM horizontally	Common
	Tile	Arrays windows in XG-PM vertically	Common
	Close all	Close all windows in XG-PM	Common

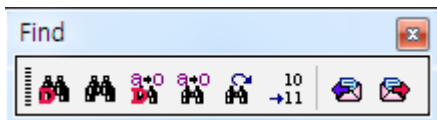
Appendix1 What is the difference between APM software package and XG-PM

9. Servo toolbar



Command icon	Command	Description	Remark
	Connect to all servo	Connects all servo drives connected to the module	Network type XPM Motion Control Module
	Disconnect to all servo	Disconnects all servo drives connected to the module	Network type XPM Motion Control Module
	Servo on	Turn on the selected axis servo	Network type XPM Motion Control Module
	Servo off	Turn off the selected axis servo	Network type XPM Motion Control Module
	All servo station setting	Sets up station number of all servo	Network type XPM Motion Control Module
	Servo tuning	Tunes servo drive	Network type XPM Motion Control Module

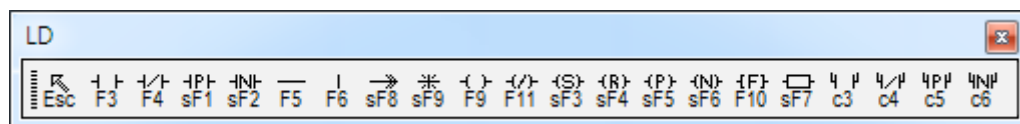
10. Find toolbar























Command icon	Command	Description	Remark
	Find device	Finds the device by types.	Motion Control Module
	Find text	Finds the targeted text.	Motion Control Module
	Replace device	Finds the targeted device and replaces it into new one.	Motion Control Module
	Replace text	Find the targeted text and replaces it into new one.	Motion Control Module
	Find again	Repeat the previously executed Find or Replace.	Motion Control Module
	Find Step/Line	Moves the cursor the targeted step position.	Motion Control Module
	Previous message	Moves to the previous message in a message window.	Motion Control Module
	Next message	Moves to the next message in a message window.	Motion Control Module


## Appendix1 What is the difference between APM software package and XG-PM

### 11. LD toolbar



Command icon	Command	Description	Remark
	Arrow mode	Changes into the arrow mode.	Motion Control Module
	Normally open contact	Inserts the normally opened contact( -  - ) to the cursor position.	Motion Control Module
	Normally closed contact	Inserts the normally closed contact( - /- ) to the cursor position.	Motion Control Module
	Positive transition-sensing contact	Inserts the positive transition-sensing contact( - P - ) to the cursor position.	Motion Control Module
	Negative transition-sensing contact	Inserts the negative transition-sensing contact ( - N - ) to the cursor position.	Motion Control Module
	Horizontal line	Inserts a horizontal line( ---- ) to the cursor position.	Motion Control Module
	Vertical line	Inserts a vertical line (   ) to the cursor position.	Motion Control Module
	Fill Horizontal line	Fills a horizontal line ( -->> ) in the direction of right end from the cursor position.	Motion Control Module
	NOT Instruction Contact	Inserts the reversed contact ( -* - ) to the cursor position.	Motion Control Module
	Coil	Inserts the coil( - ( ) - ) to the cursor position.	Motion Control Module
	Negative coil	Inserts the reverse coil( -( / ) - ) to the cursor position.	Motion Control Module
	SET coil	Inserts the SET(latch)coil( -(S)- ) to the cursor position.	Motion Control Module
	RESET coil	Inserts RESET(latch)coil( -(R)- ) to the cursor position.	Motion Control Module
	Positive transition-sensing coil	Inserts the positive transition-sensing coil ( -(P)- )to the cursor position.	Motion Control Module
	Negative transition-sensing coil	Inserts the negative transition-sensing coil( -(N)- ) to the cursor position.	Motion Control Module
	Function/Function block	Inserts the Function/Function block( -[F]- )to the cursor position.	Motion Control Module
	Extension Function	Insert he expanded function to the cursor position.	Motion Control Module
	Normally open OR contact	Inserts the normally opened contact( -    - ) with OR connection.	Motion Control Module
	Normally closed OR contact	Inserts the normally closed contact( -  /   - ) with OR connection.	Motion Control Module
	Positive transition-sensing OR contact	Inserts the positive transition-sensing contact( - P  - ) with OR connection.	Motion Control Module

Appendix1 What is the difference between APM software package and XG-PM

Command icon	Command	Description	Remark
	Negative transition-sensing OR contact	Inserts the negative transition-sensing contact( - N - ) with OR connection.	Motion Control Module



Warranty

1. Warranty Period
- The product you purchased will be guaranteed for 18 months from the date of manufacturing.
2. Scope of Warranty
- Any trouble or defect occurring for the above-mentioned period will be partially replaced or repaired. However, please note the following cases will be excluded from the scope of warranty.
- (1) Any trouble attributable to unreasonable condition, environment or handling otherwise specified in the manual,

(2) Any trouble attributable to others' products,

(3) If the product is modified or repaired in any other place not designated by the company,

(4) Due to unintended purposes

(5) Owing to the reasons unexpected at the level of the contemporary science and technology when delivered.

(6) Not attributable to the company; for instance, natural disasters or fire
3. Since the above warranty is limited to PLC unit only, make sure to use the product considering the safety for system configuration or applications.

Environmental Policy

LSIS Co., Ltd supports and observes the environmental policy as below.

Environmental Management	About Disposal
LSIS considers the environmental preservation as the preferential management subject and every staff of LSIS use the reasonable endeavors for the pleasurable environmental preservation of the earth.	LSIS PLC unit is designed to protect the environment. For the disposal, separate aluminum, iron and synthetic resin (cover) from the product as they are reusable.



**LSIS values every single customers.**

**Quality and service come first at LSIS.**

**Always at your service, standing for our customers.**

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