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Programmable Logic Controller

Positioning Module

XGT Series

User's Manual

APM module
XPM module
Network type XPM 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

※ 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

Congratulations on purchasing PLC of LS Industrial System 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://eng.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)	XGI-CPUU/CPUH/CPUS 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

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 XG5000are possible to connect at the same time witout 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

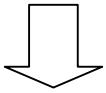
XG-PM provides various forms of operation monitoring function. User can check the information about servo easily with system view function and analyze the operating state of module in another way with two-dimensional trend and trace function.

1.2 Construction of Manual

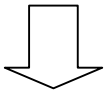
This manual consists of 11 chapters and appendix.

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

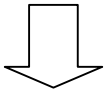
Sequence1 – Install and wire positioning control system.	Reference
Install and wire PLC, servo amp, motor, external equipment and PLC such as XGT CPU, XPM module (XGF-PO1H, XGF-PO2H, XGF-PO3H, XGF-PO4H, XGF-PD1H, XGF-PD2H, XGF-PD3H, XGF-PD4H), APM module (XGF-PO1A, XGF-PO2A, XGF-PD3A, XGF-PD1A, XGF-PD2A,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



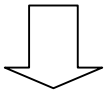
Sequence2 - Learn the function and working of XG-PM	Reference
Check the system can be used with XG-PM	Chapter 2
Check the function can be used with XG-PM	Chapter 3
Install and start XG-PM	Chapter 4
Learn the operating method and the construction of monitor screen	Chapter 5



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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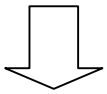
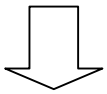
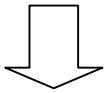


Sequence5 – Set data and write into positioning module	Reference
Set parameter according to positioning control system and control method	Chapter 8
Set servo parameter according to servo drive, motor specification (dedicated for XGF-PN8A)	
Execute the servo-tuning (dedicated for XGF-PN8A)	
Check positioning 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 – 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	

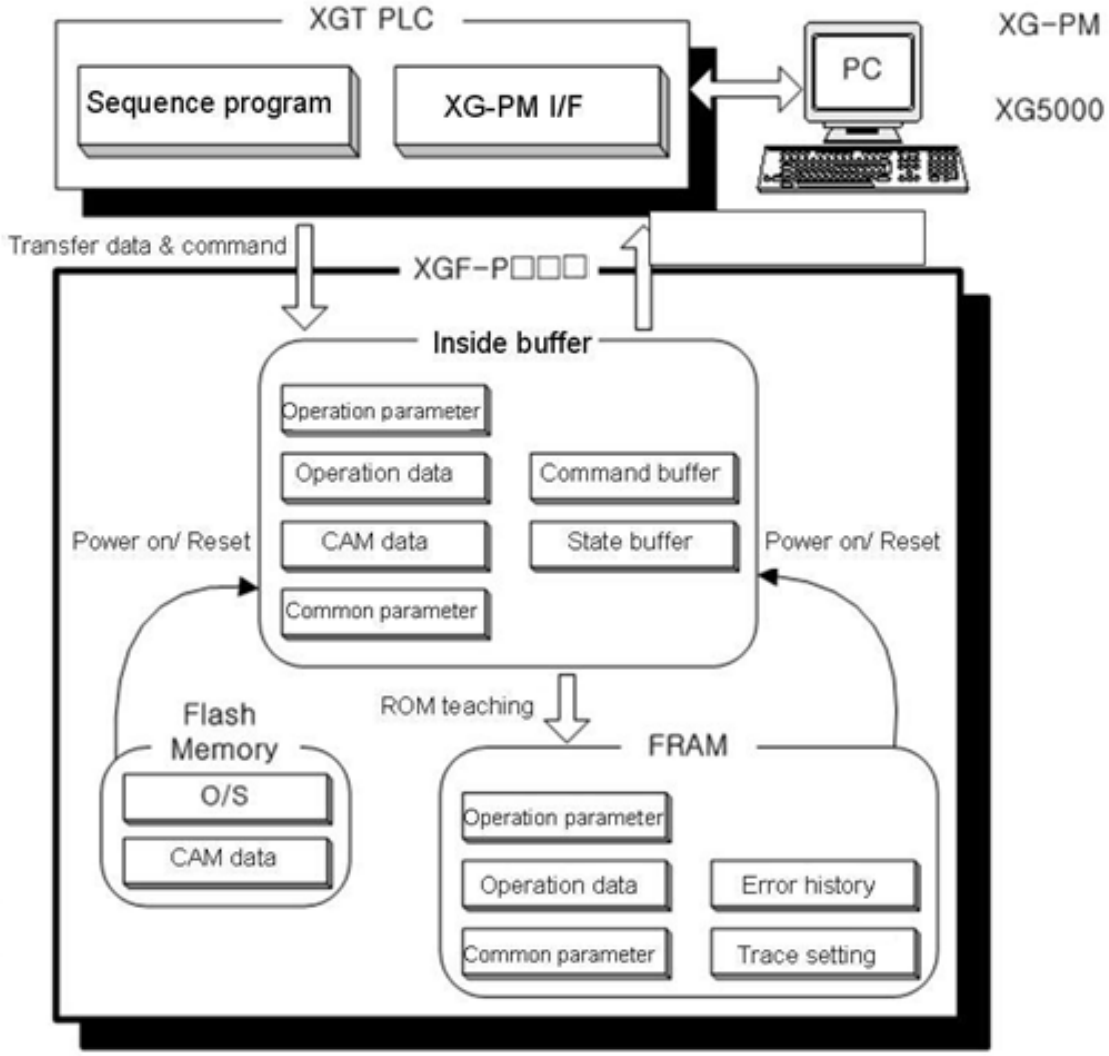


Sequence7 – Operate positioning control system	Reference
Operate positioning control system by PLC CPU program	Refer to user's manual of positioning module pulse ouput type

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



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 60MB empty space
	telecommunications environment	RS-232C or USB
	Display	Resolution of over 1024*768 Over 64MB graphic memory
	Windows environment	Windows 2000/XP/Vista environment
XGT CPU module version	XGK CPU	Over V3.0
	XGI CPU	Over V3.0
	XGR CPU	Over V1.6

Chapter 3 Function Table

3.1 Function Table

Here describes important function of XG-PM.

Function			Content	Support			
				XGF-POxA XGF-PDxA	XGF-POxH XGF-PDxH	XGF-PN8A	XGF-PN8B
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.	○	○	○	○
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.	○	○	○	×

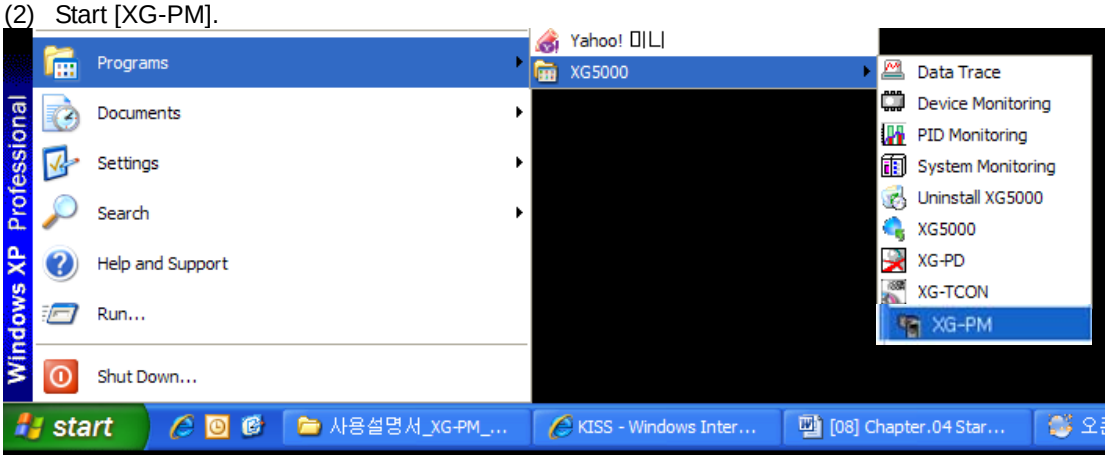
Function		Content	Support			
			XGF-POxA XGF-PDxA	XGF-POxH XGF-PDxH	XGF-PN8A	XGF-PN8B
Check of connection	Confirm connection	Expresses signal from external. Tests initial operation by JOG operation.	○	○	○	○
Trace	Bit/Word Trace	Expresses situation bit information & position speed information in operation. 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.	×	○	○	○
Printin Function	Individual print	Prints each setting display.	○	○	○	○
	Project print	Prints whole project.	○	○	○	○

Chapter 4 Start & End of XG-PM

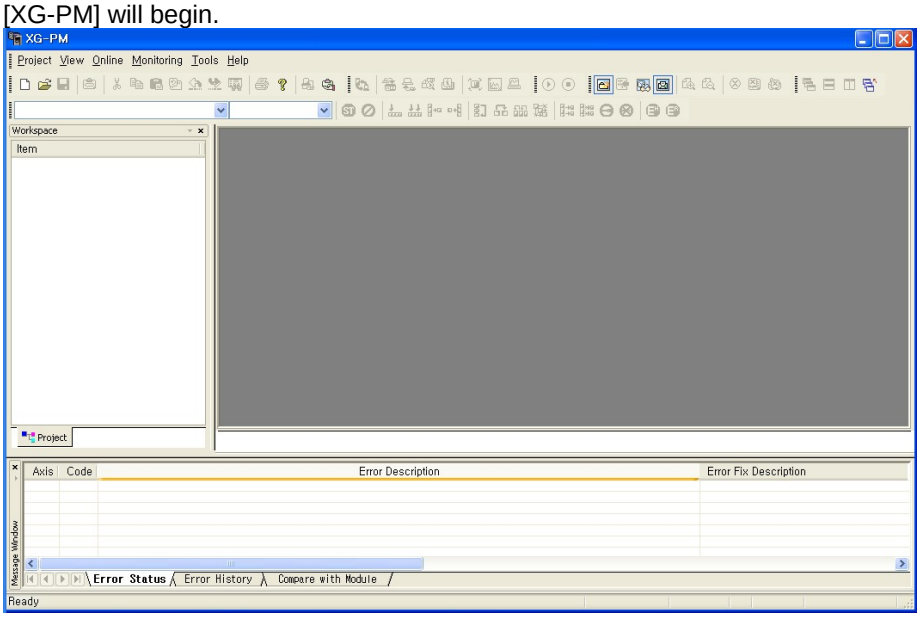
4.1 Start of XG-PM

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.

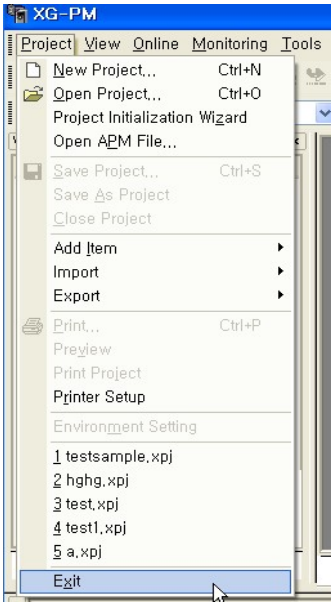


4.2 End of XG-PM

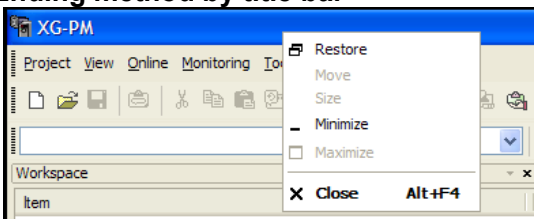
Here describes the way of ending XG-PM.

(1) Ending method by menu

(a) Execute [Project]->[Exit].
(b) XG-PM is ended.

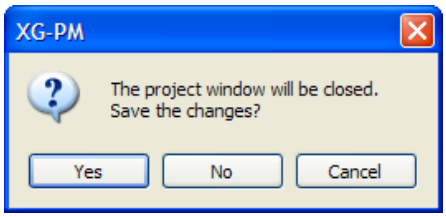


(2) Ending method by title bar



Note

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

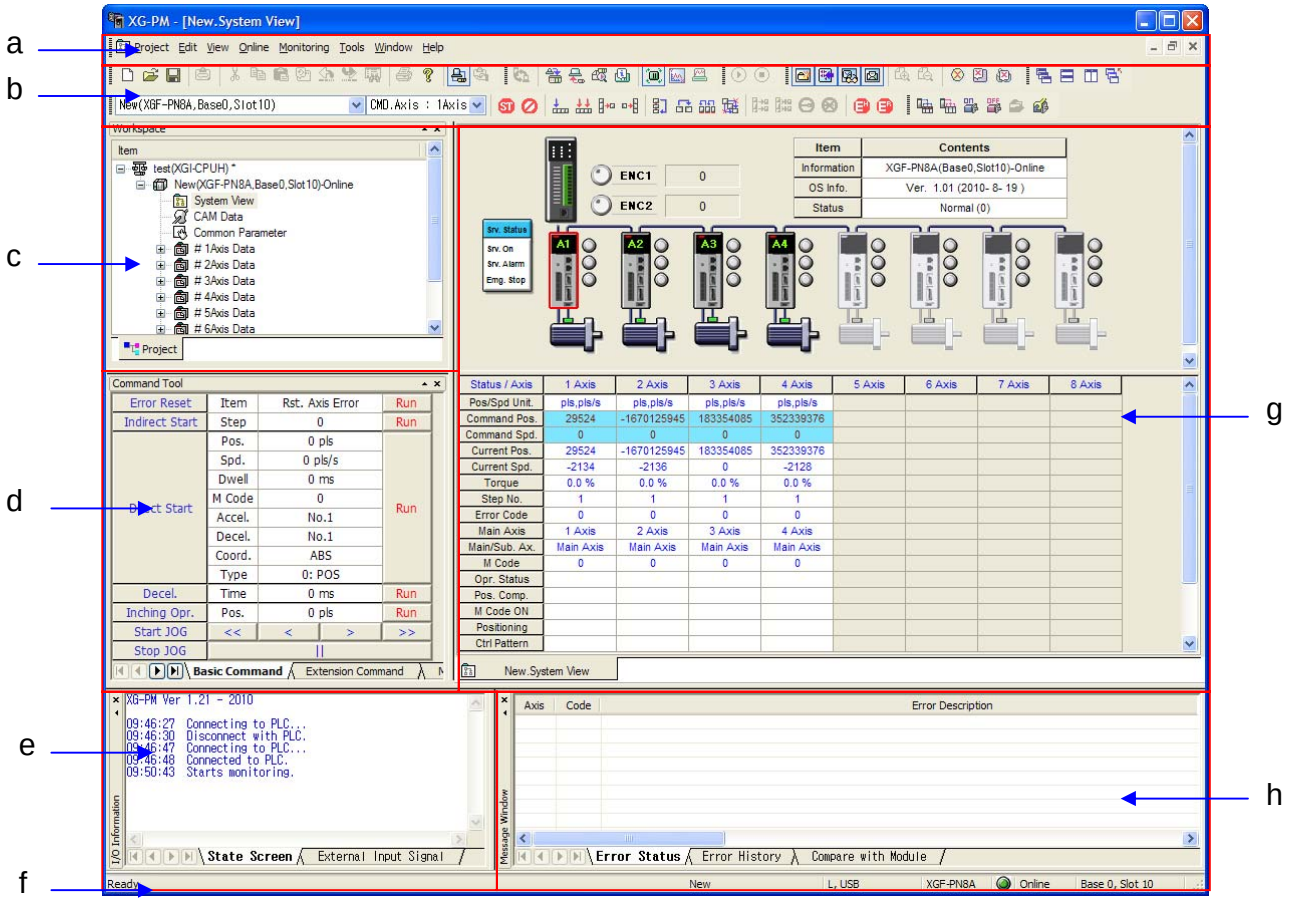


Click <Yes> button, end program with saving project.
Click <No> button, end program without saving project.
Click <Cancel> button, cancel ending program.

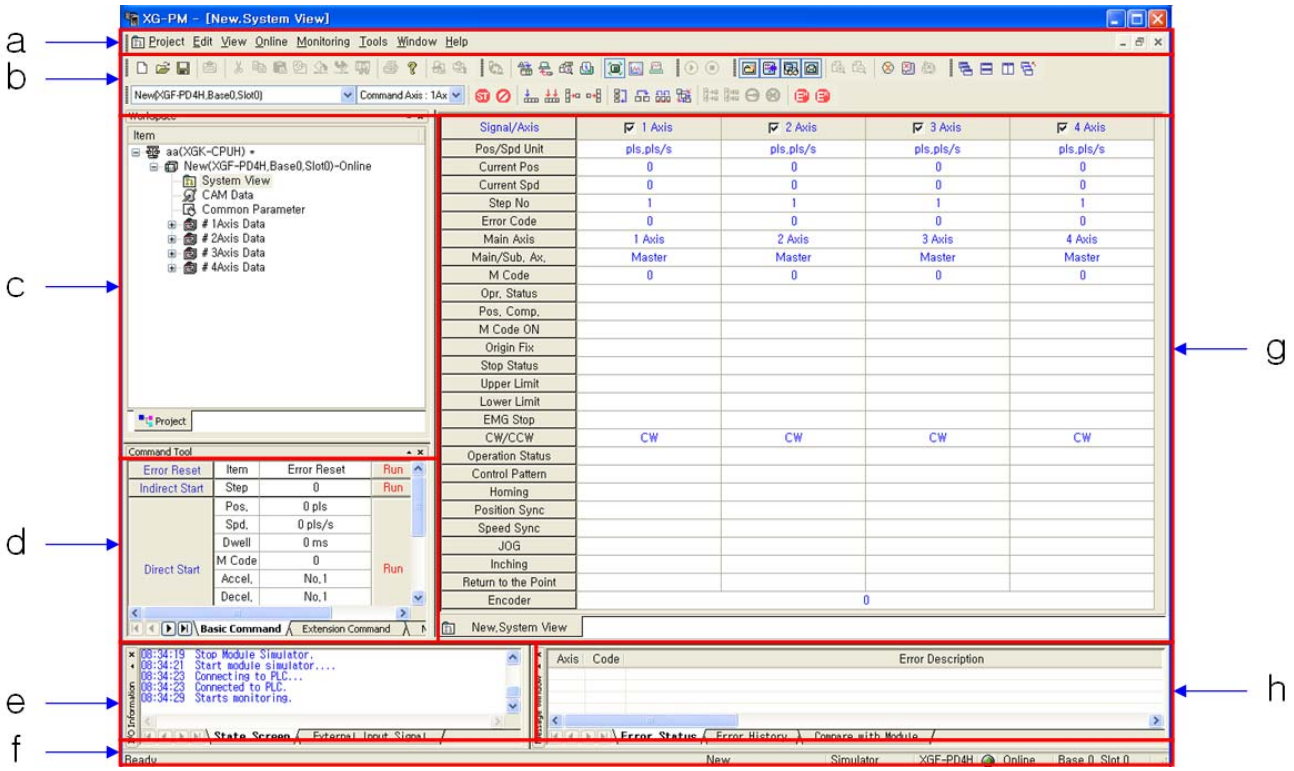
Chapter 5 Composition & the Way of Basic Using of Operation Screen

5.1 Screen Composition

The XG-PM screen composition is as follows;



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



<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 axises, 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.

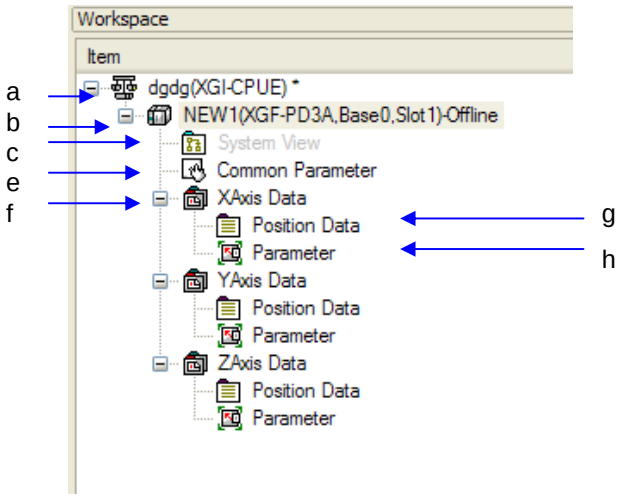
(1) Project

Command		Description
New project		Creat project first time
Open project		Open established project
Project initialization wizard		Open new project. User don't need to write a separate data for operation after performing initialization wizard.
Open APM file		Read '*.apm' file from APM software, convert to XG-PM project file (*.xpj).
Save project		Save project.
Save other name		Save the project as other name.
Close project		Close the project.
Add item	Module	Add new module to project.
Import	Module data	Read module data from file.
	CAM setting data	Read setting data for creating cam profile from file.
	CAM CSV file data	Read CAM profile data of CSV type
	Common parameter	Read common parameter data from file.
	Operation parameter	Read operating parameter data from file.
	Operation data	Read operating data from file.
Export	Configuration file	Save the selected item about setting from project window.
	CSV file	Save file as CSV file form with project window.
Print		Print the activated window.
Preview		It will show you window for printing.
Print project		Print the selected project item.
Printer Setup		Select printer option.
Recents project		Display latest 20 projects.
End		End XG-PM.

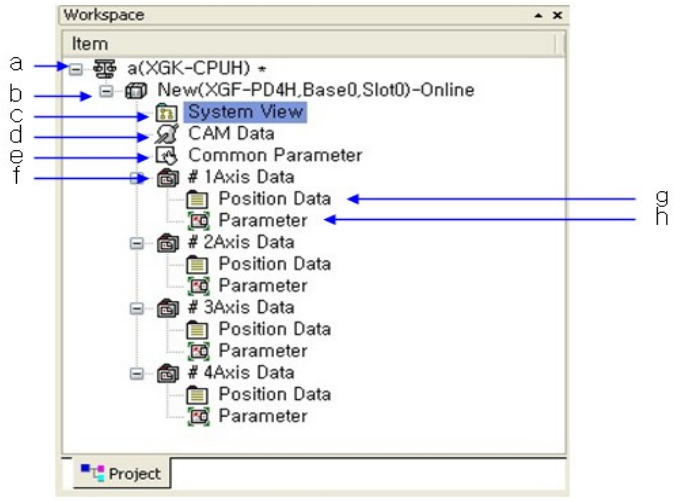
Chapter 6 Drawing Up of Project

6.1 Composition of Project

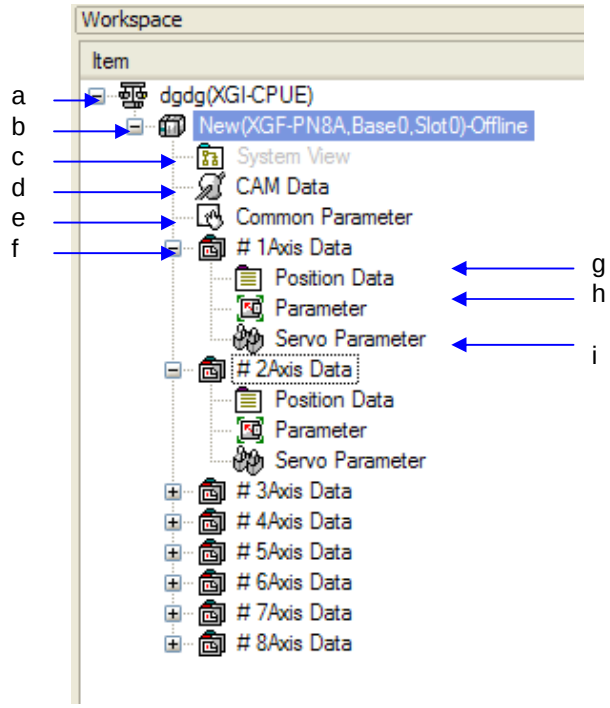
Composition of project is as follows ;



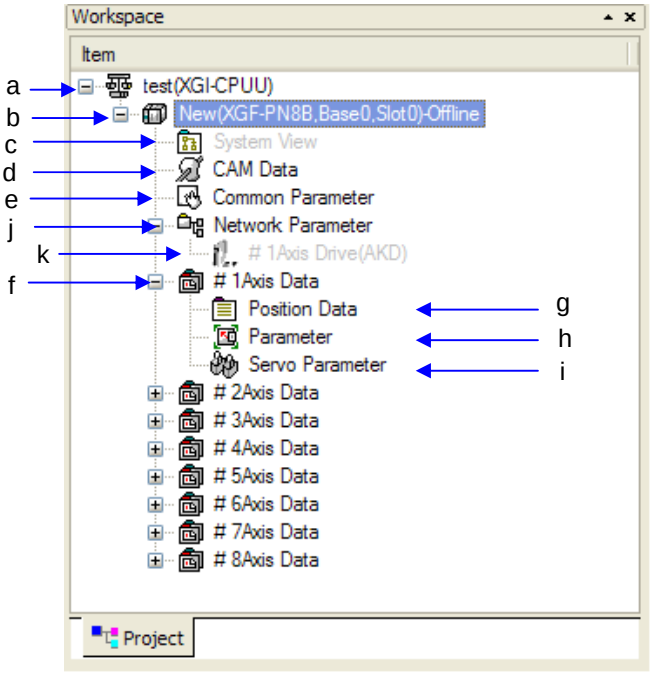
<APM module project configuration>



<XPM module project configuration>



<Network XPM module project configuration>



<Standard Network XPM module project cofifuration>

Chapter 7 System Check

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

7.1 Connect PLC

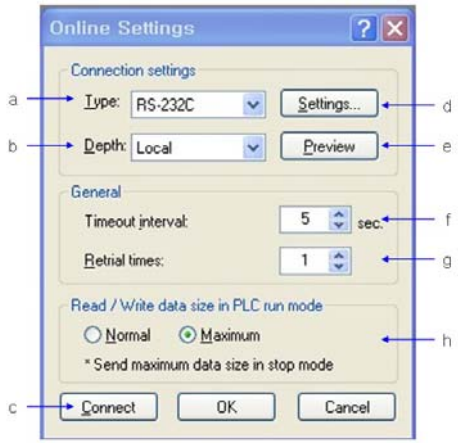
7.1.1 Setting Local Connection

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

[Sequence]

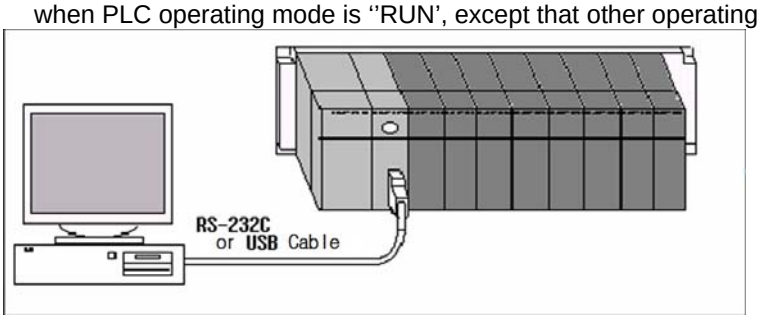
1) Menu [Online]->[Connection setting].

[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.

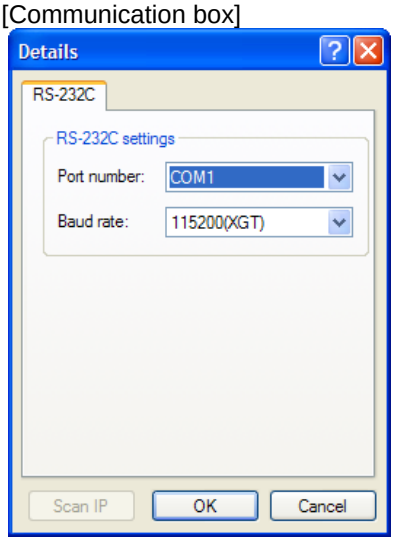


(1) Local RS-232C Connection

[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

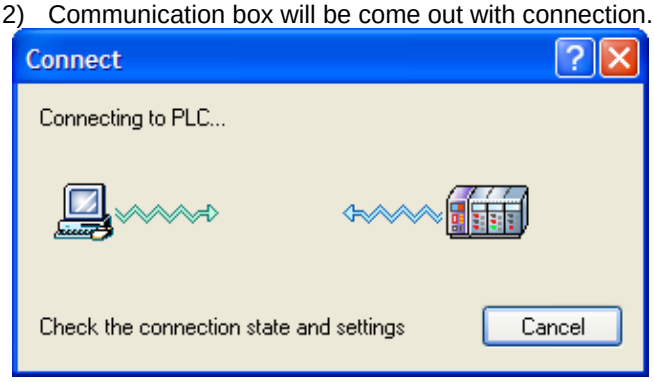
1. If user want to connect with PLC by USB, user need to install USB device driver.
2. When user install XG5000, USB driver will be auto-download and install. If USB driver installation is not normal, please download Driver from home page of LS industrial system.

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.

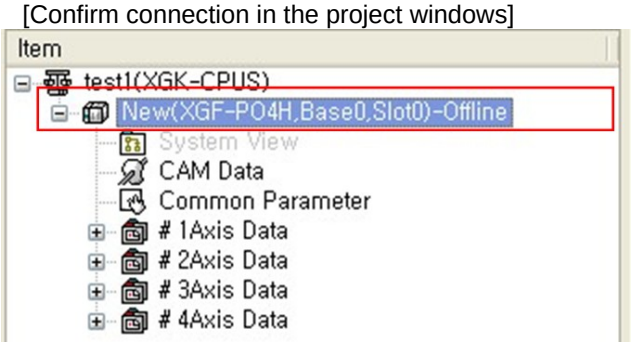


3) Display On-line menu and condition with connecting PLC.

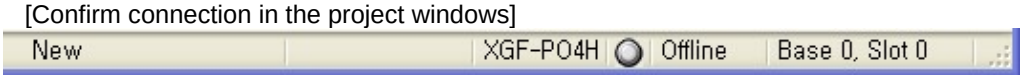
Notes

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]



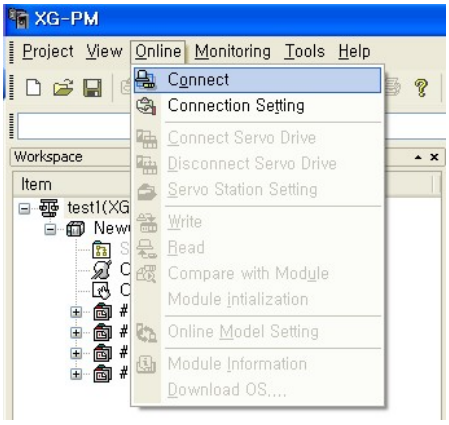
3. After connecting PLC, In case of connecting with other type PLC, connecting PLC automatically be disconnected.
4. Monitoring will be end when it performs disconnection.

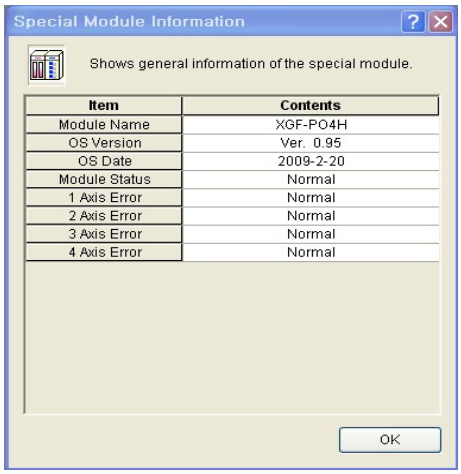
7.2 Confirm Module O/S Information

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.

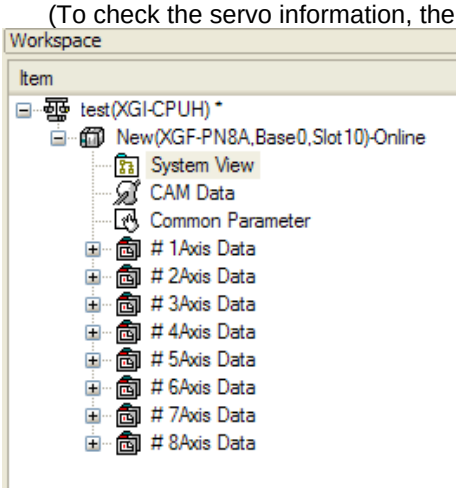
7.3 Check Servo (Supported for Network Type XPM/Standard Network Type XPM)

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

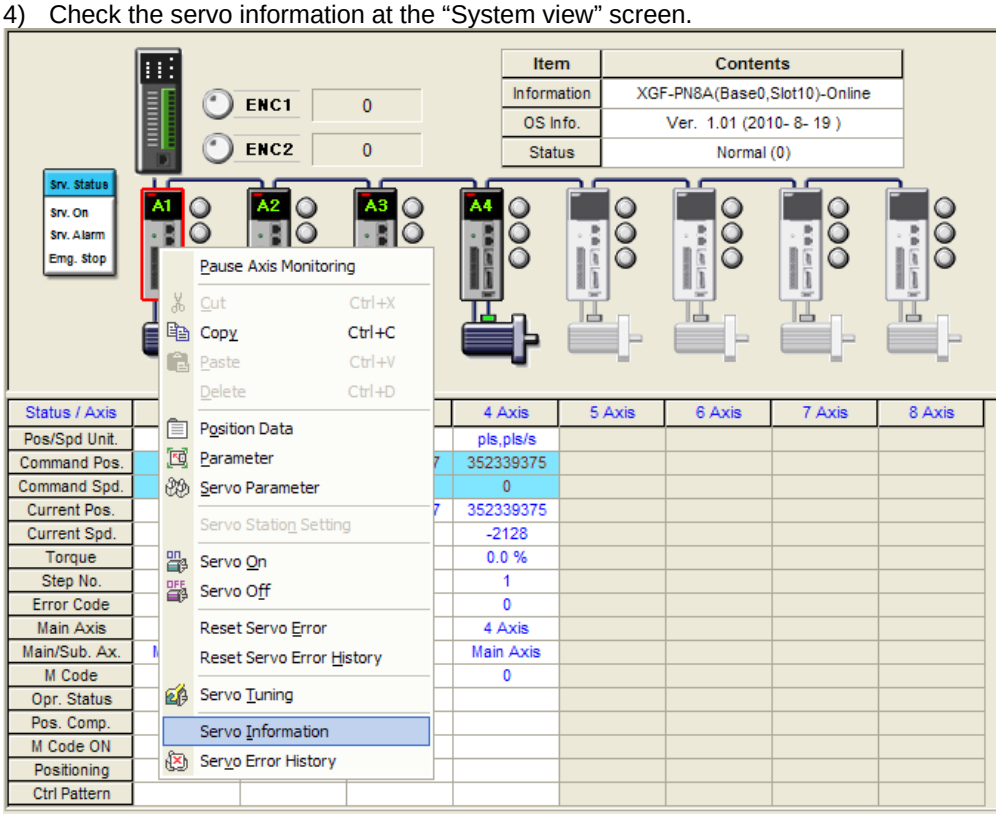
[Sequence]

1) Click menu [Online] → [Connect] and connec to PLC (module)
2) Check the module connection status of the project window

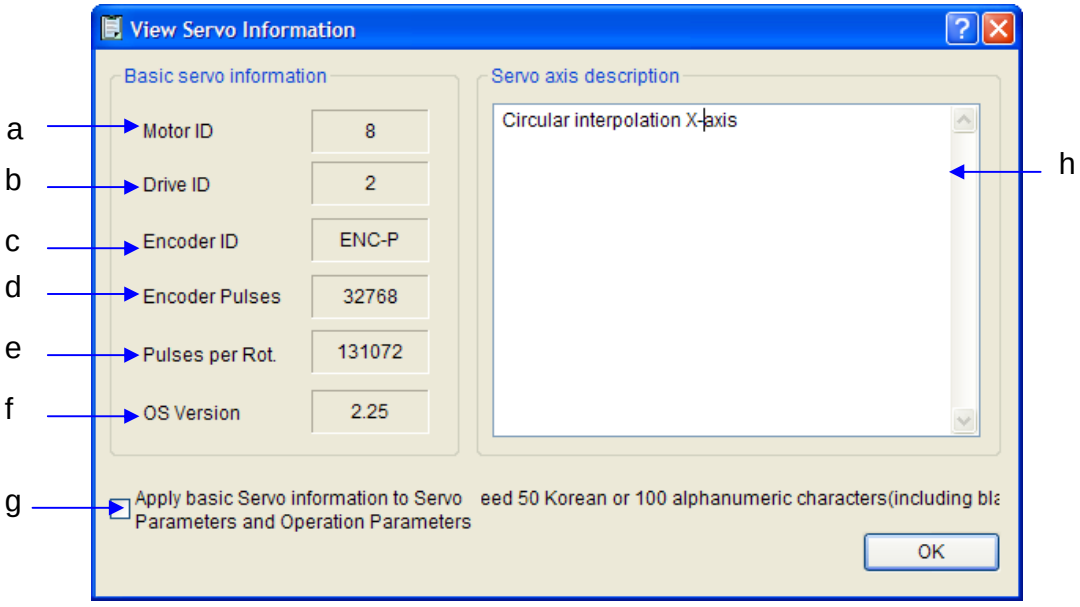
   (To check the servo information, the module should be “online” status.)



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



[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.

Chapter 8 Setting Data

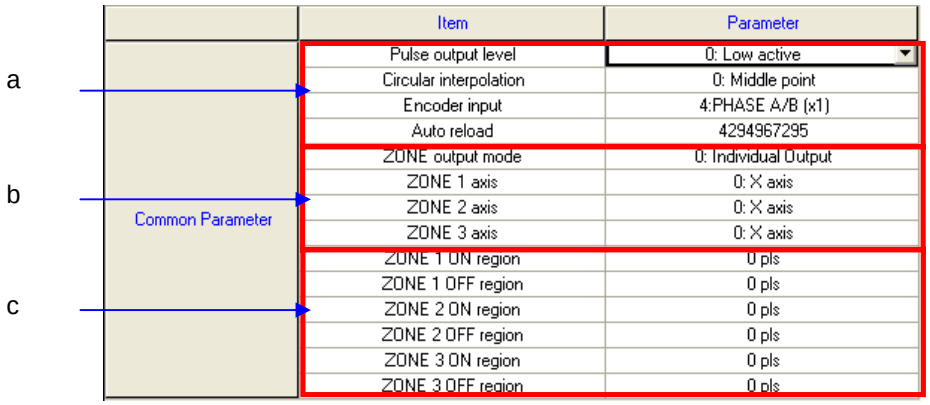
Here describes setting data of positioning module.

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.

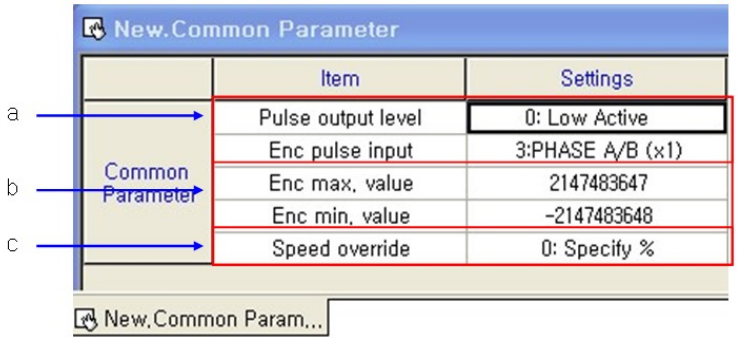
[APM module Setting screen]



[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

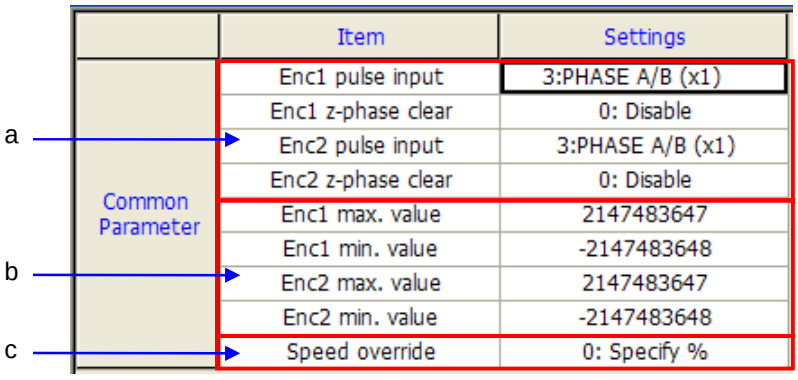
[XPM module Setting screen]



[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.)

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



	Item	Settings
Common Parameter	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
	Enc1 max. value	2147483647
	Enc1 min. value	-2147483648
	Enc2 max. value	2147483647
	Enc2 min. value	-2147483648
	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)

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

[Setting screen]

a →
b →
c →
d →
e →

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

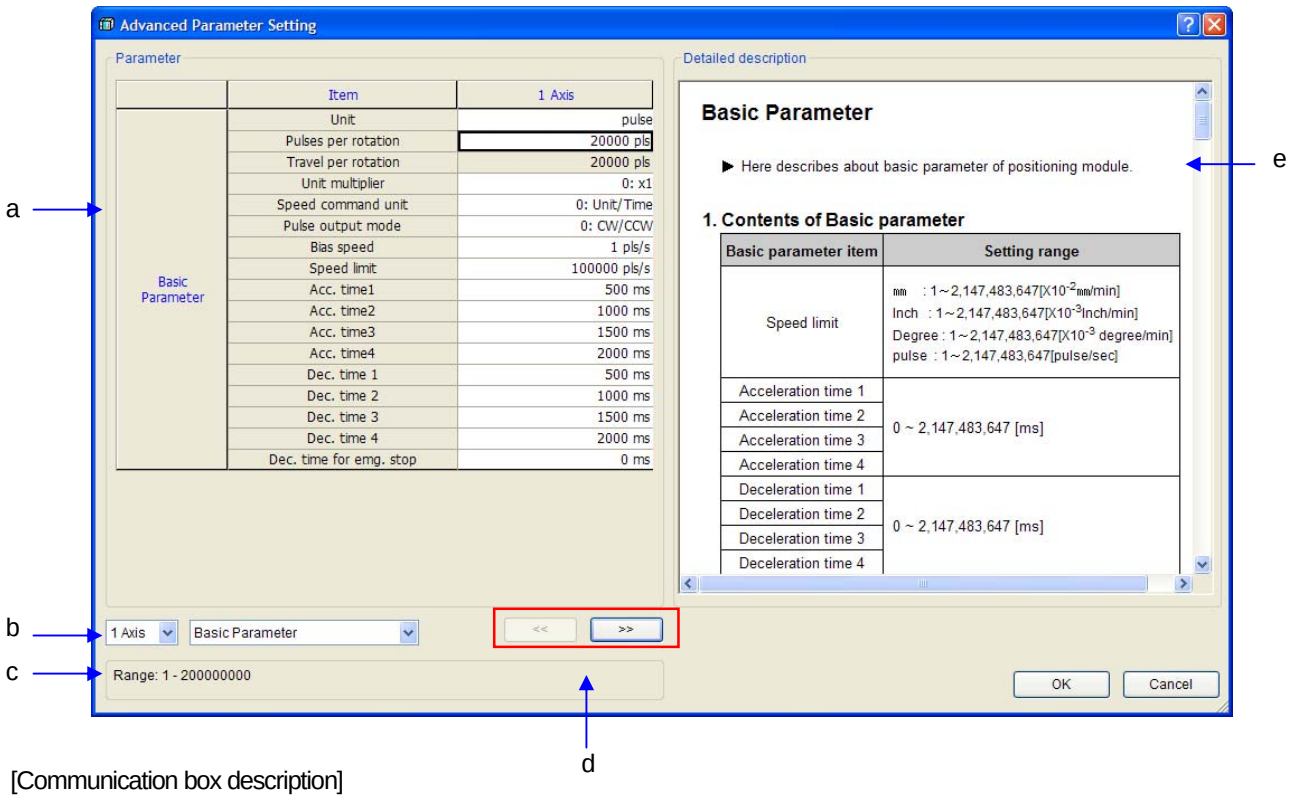
8.2.1 Setting detailed parameter

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)
   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 module)
2) Progress this sequence; Menu [Edit]->[Detail parameter setting].
3) 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	pulse	pulse
		20000 pls	20000 pls
	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
Basic Parameter	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
	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
Extended Parameter	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 :

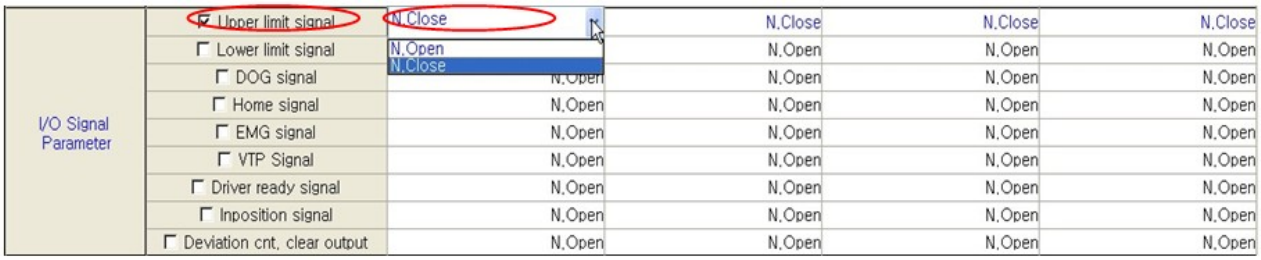
Detail view: Display all parameter on the screen.

Simple view: Display parameter which is necessary parameter for operating.

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

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]



8.3 Setting Servo Parameter

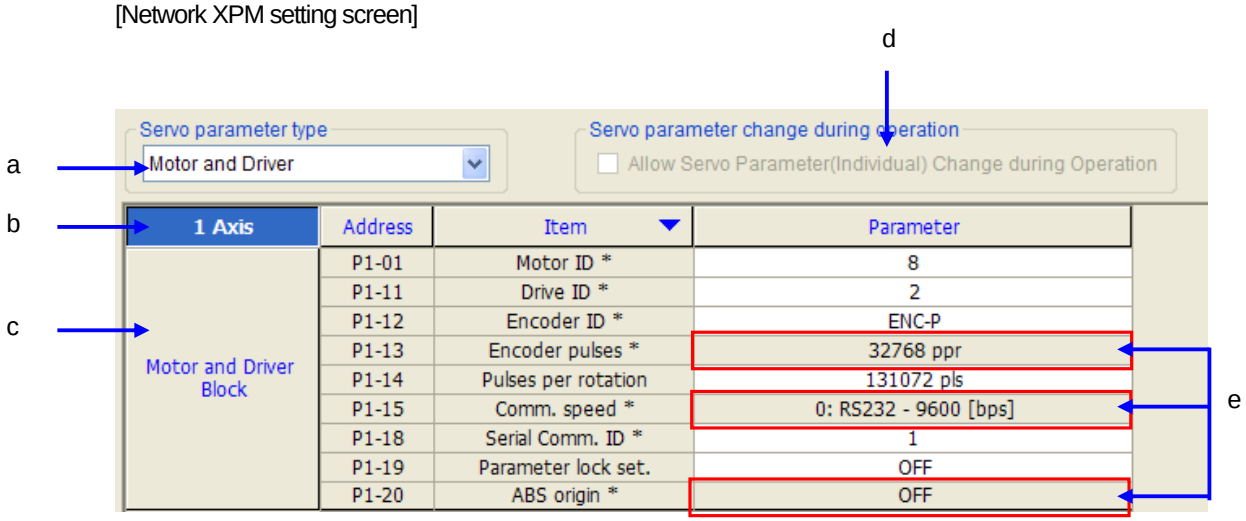
(Only applied to Network Type XPM/Standard network type XPM)

[Sequence]

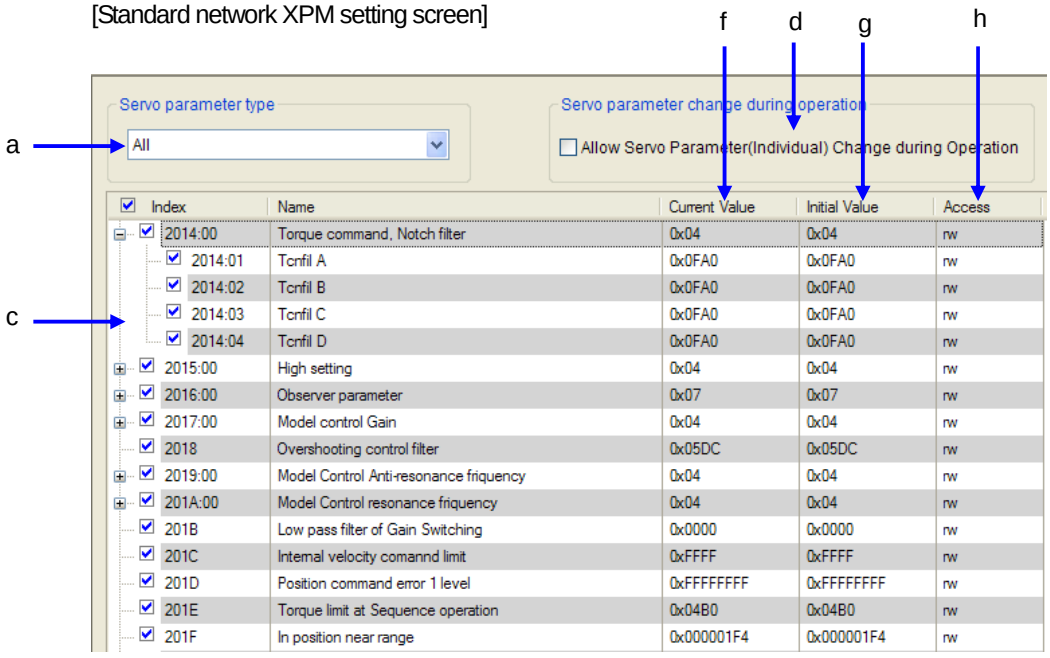
1) Double-click [Axis #1~8 data]→[Servo Parameter] in the project tree.
2) Input data after clicking the shell you want to set up.

[Setting screen]

[Network XPM setting screen]



[Standard network XPM setting screen]



[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.

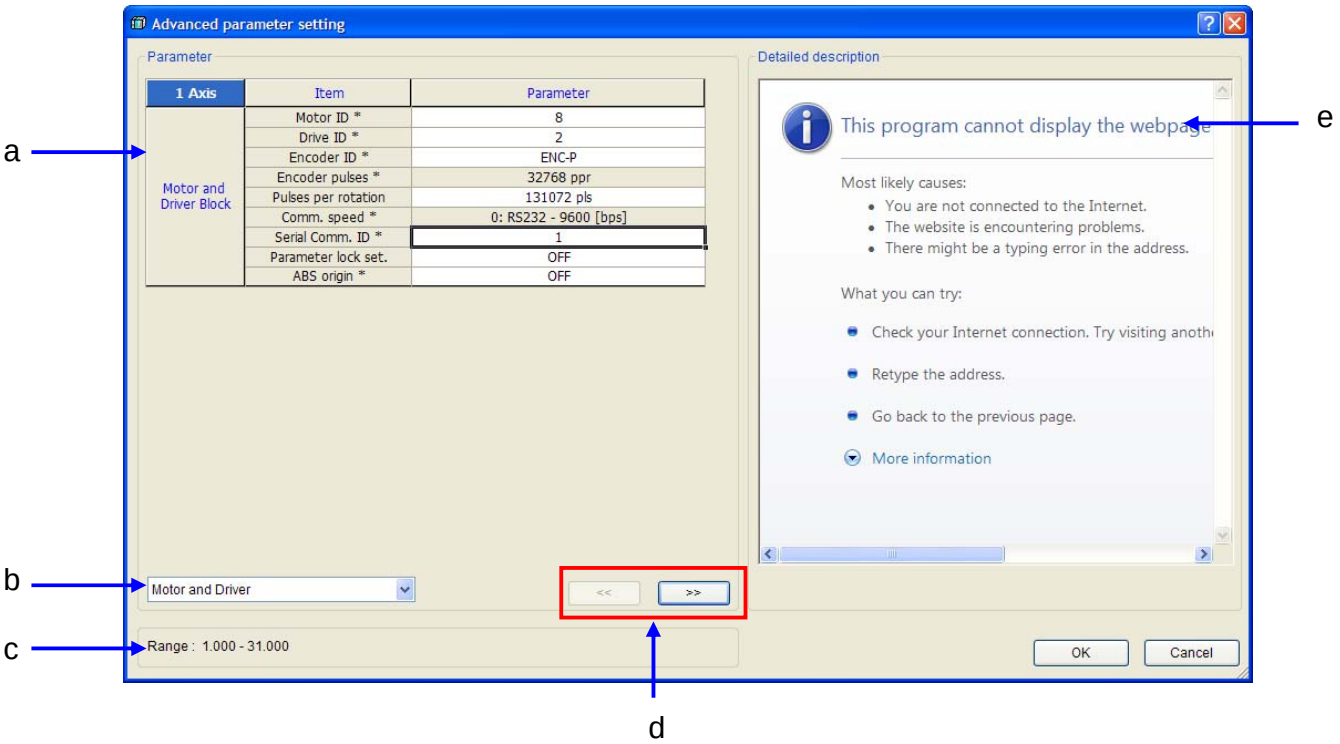
8.3.1 Detailed Parameter Setting

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

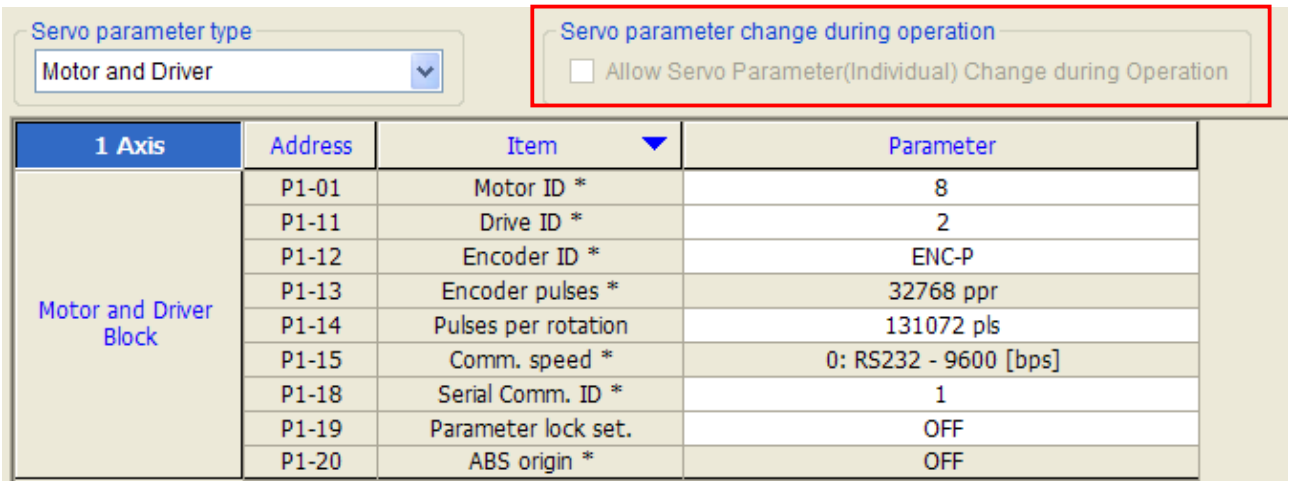
XG-PM software package provides “Individual Writing of the Servo Parameter” function so that you can modify and check the servo parameter individually.

[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.



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

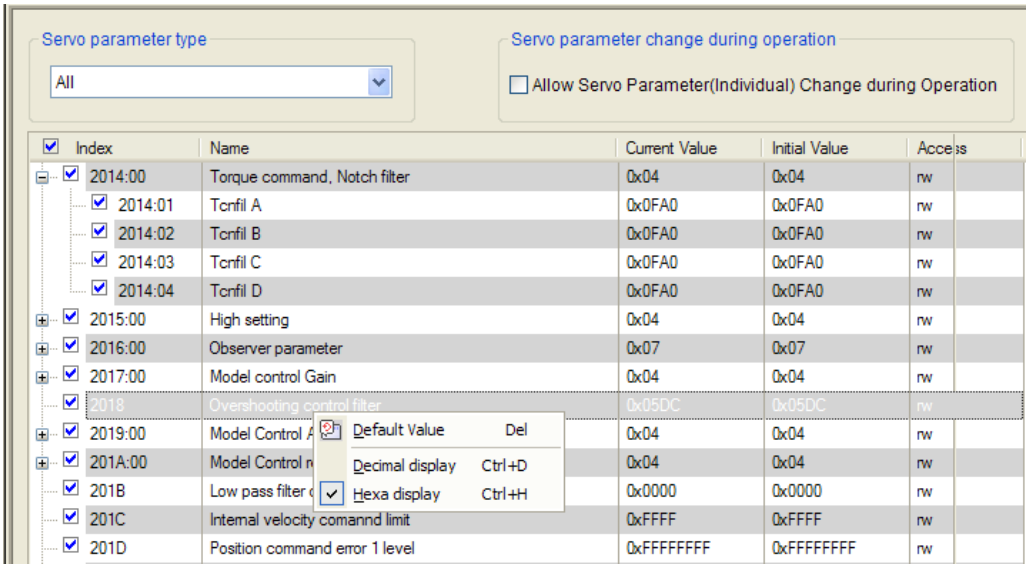
8.3.3 Servo Parameter Display Method (Only applied to standard network type XPM)

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 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]

a
b

Axis	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
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.

8.4.1 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]

b) 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>

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>

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>

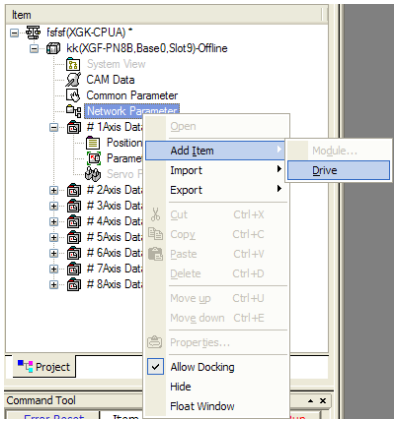
X axis	Coordi.	Control type	Operation pattern	Operation type	Target position [pls]	M code	Acc./Dec. no.	Speed [pls/s]	Dwell time [ms]
1	ABS	POS	END	SNG	0	0	No. 1	0	0

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

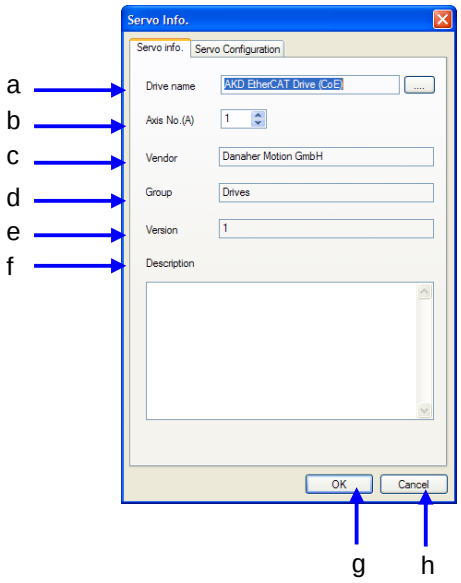
[Sequence]

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]

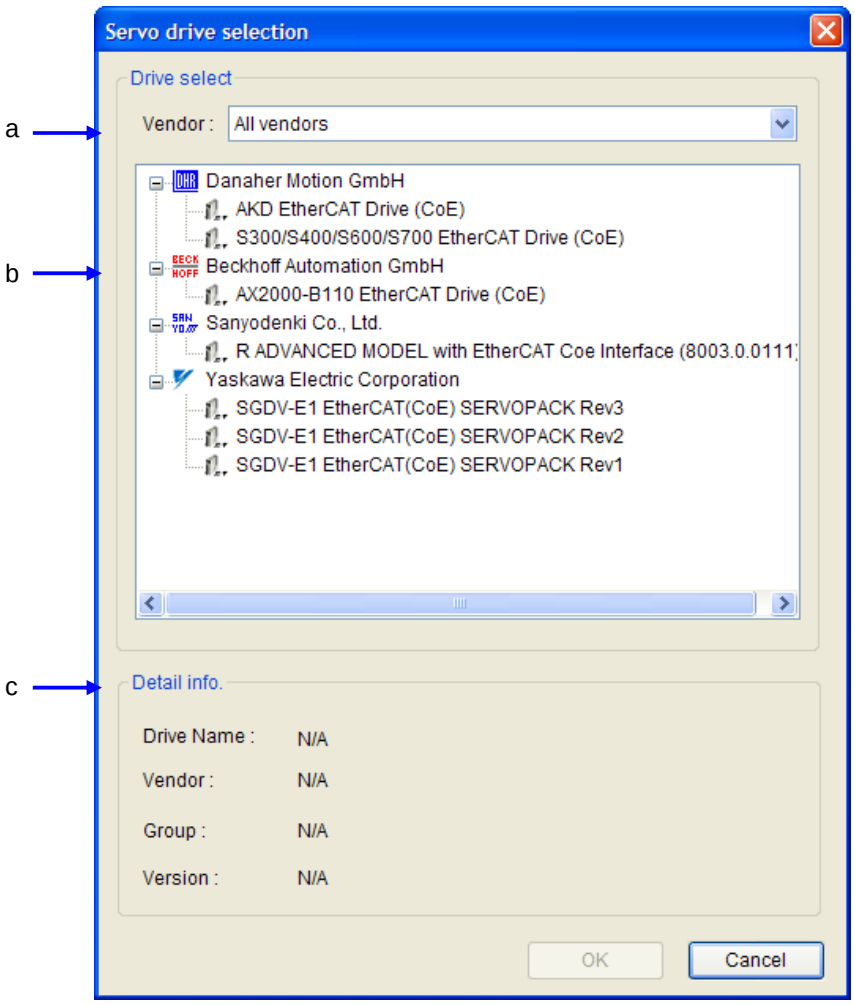
a) Drive name : selects the device and displays device name.
b) Axis No. : inputs axis no. of the selected device.
c) Vendor : shows maker name of the selected device.
d) Group : shows type of the selected device.
e) Version : shows the version of the selected device.
f) Description : inputs servo information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

8.5.1 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.

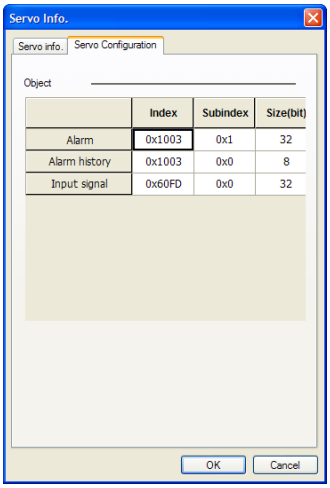
8.5.2 Modifying Servo Setup Information

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.

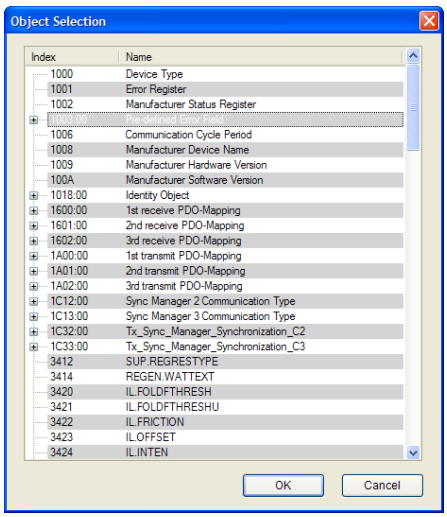
[Servo information dialog box]



[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]

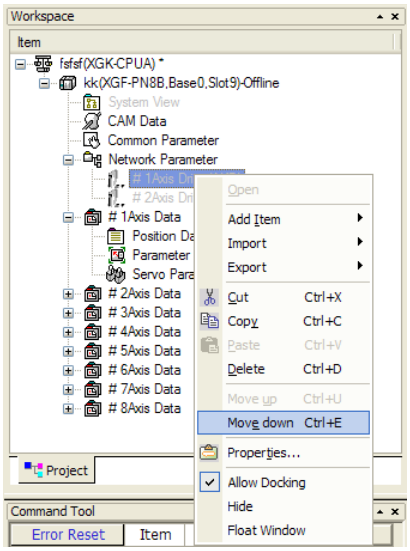


8.5.3 Up/Down Network Parameter

[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.

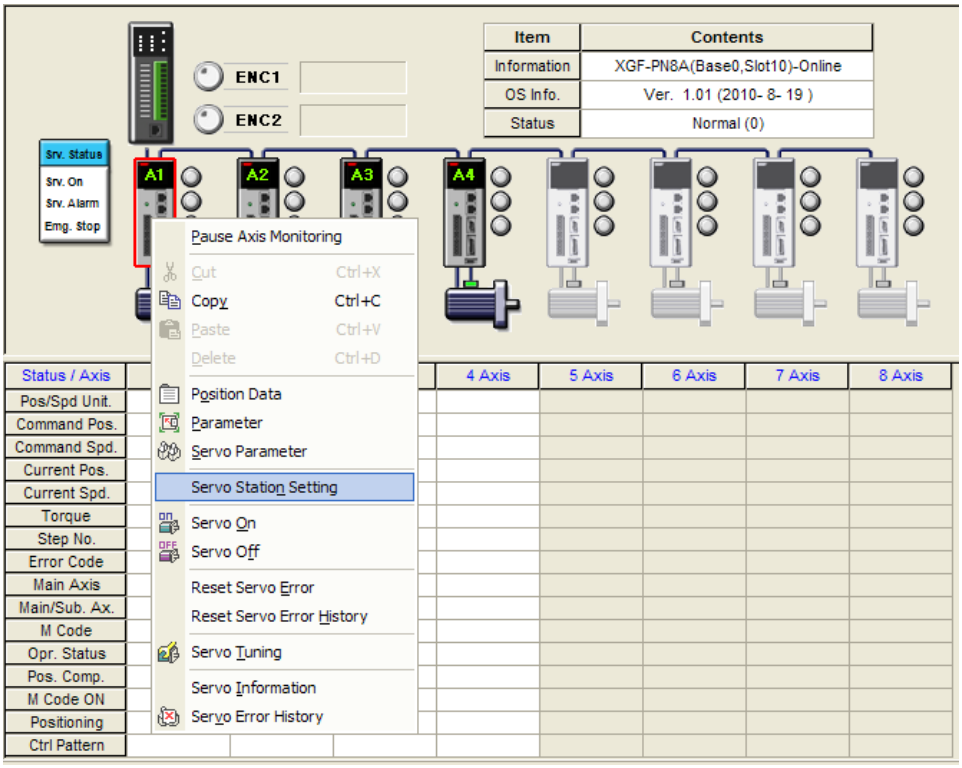
8.6 Servo Station Setting

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

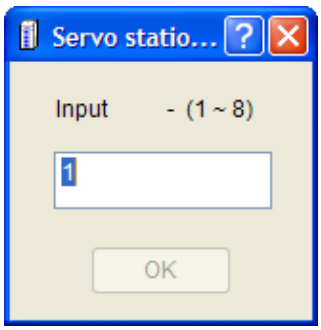
[Sequence]

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]

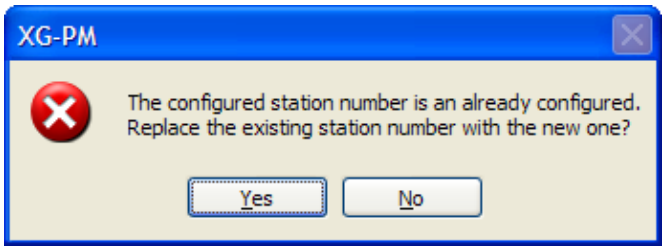


[Servo station setting dialog box]



8.6.1 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.

8.7 Setting Electronic CAM

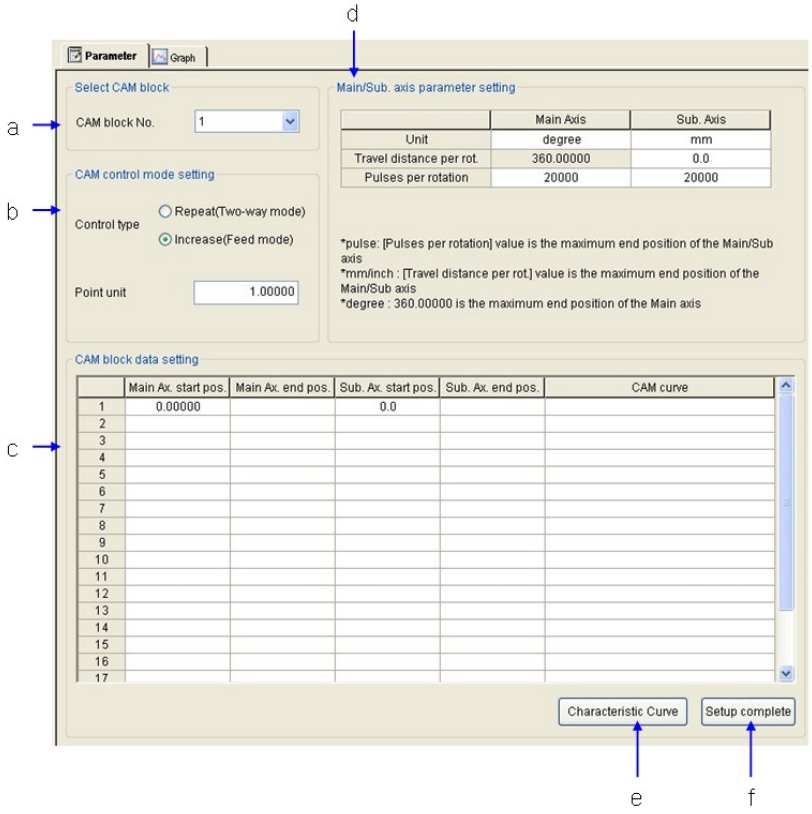
(only applied to XPM, Network type XPM, Standard Network type XPM)

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 principal axis/the sub axis. Set CAM block data depends on this standard.
5) Set CAM block data.

[Setting screen]



[Description of setting screen]

a) Select CAM block : Setting CAM data block what you need to set. CAM data block can be set from no.1 to no.8.

b) Setting CAM control mode : 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) Setting CAM block data : Set CAM block data depends on setting CAM control mode and the principal axis/ the axis of ordinates of parameter.

Start position of the principal 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) Setting the principal axis/the sub axis parameter: 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 principal axis/ the sub axis)

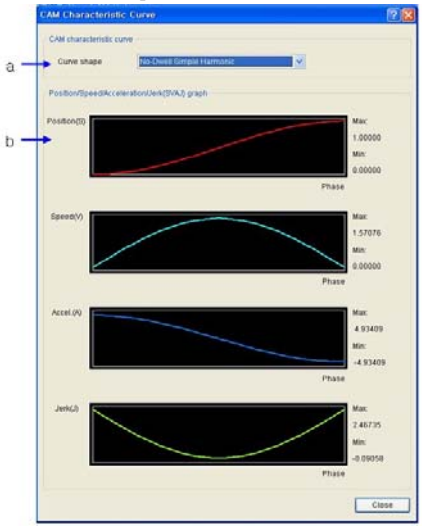
In case that pulse is unit of axis (the principal axis/ the sub axis)**:** [the number of pulses per rotation] The value to be maximum last position of axis (principal axis/the sub axis)
In case that mm/inch is unit of axis (the principal axis/ the sub axis): [travel distance per rotation] The value to be maximum last position of axis (principal axis/the sub axis)
In case that degree is unit of the principal axis: 360.00000 is the maximum last position of the principal axis. (The sub axis has not unit degree)

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

.

8.7.1 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.

8.7.2 Confirm CAM graph

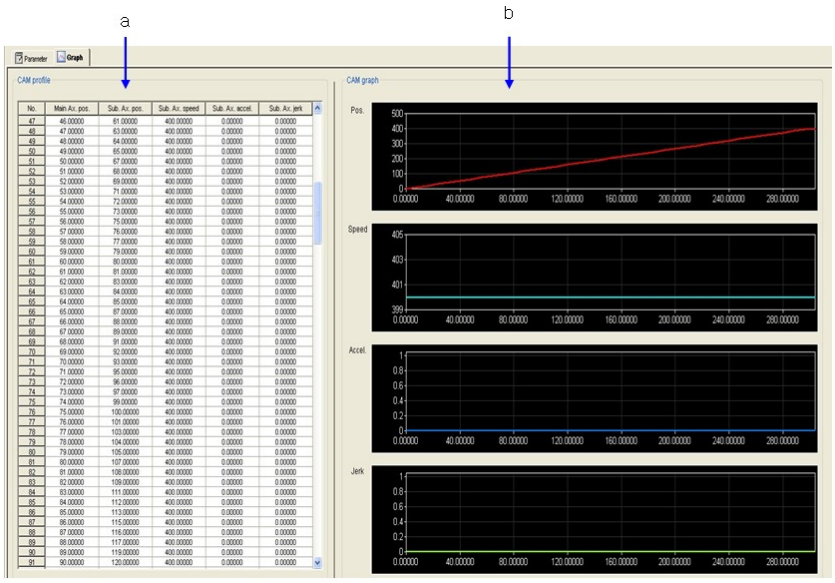
User can confirm CAM profile by CAM parameter which is set by user on the graph screen of CAM data screen
It is possible that user confirm CAM profile which is made by CAM parameter as data value on the graph and each point.

[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.

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

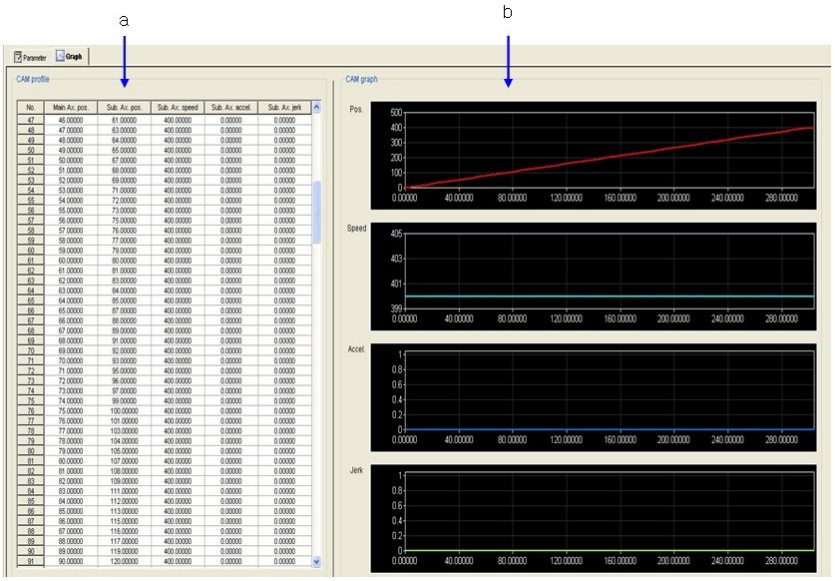
After setting the CAM profile by CAM parameter, you can modify the CAM profile (sub axis position) finely. Namely, you can modify the error that occurred during operation.

[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.

8.8 Simulation

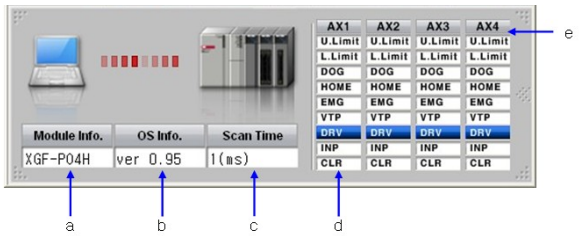
XG-PM provides simulation function that it is confirm performance of positioning module before operation.

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

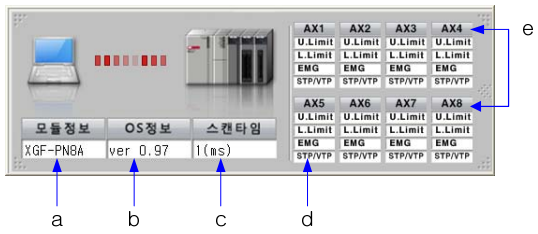
[Sequence]

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]



<XPM module simulator dialog box>



<Network type simulator dialog box>

[Explain communication box]

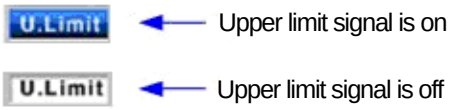
a) Module information: Simulator display module.
b) OS information: Simulator display OS information of simulating module.
c) Scan time: Display cycle of performing command.
d) Setting button of external I/O: Can confirm value of external input/output signal and can set value of external IO.
e) Axis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

8.8.2 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.

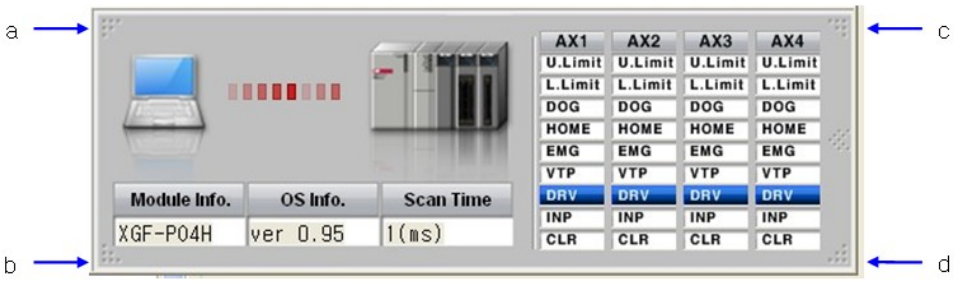
8.8.3 Simulator screen control function (only applied to XPM, network type module)

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]

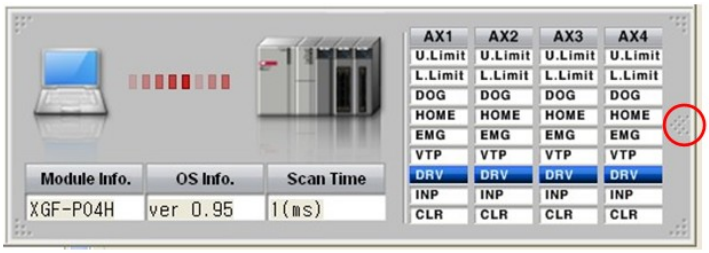


[Explain communication box]

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.

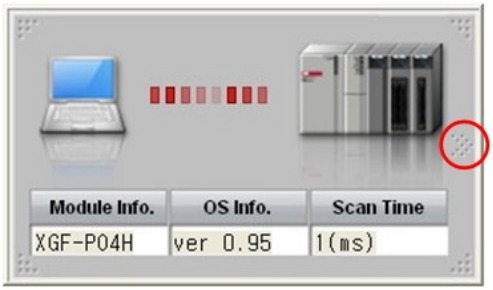
(2) Hiding external I/O setting button

[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.



8.8.4 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

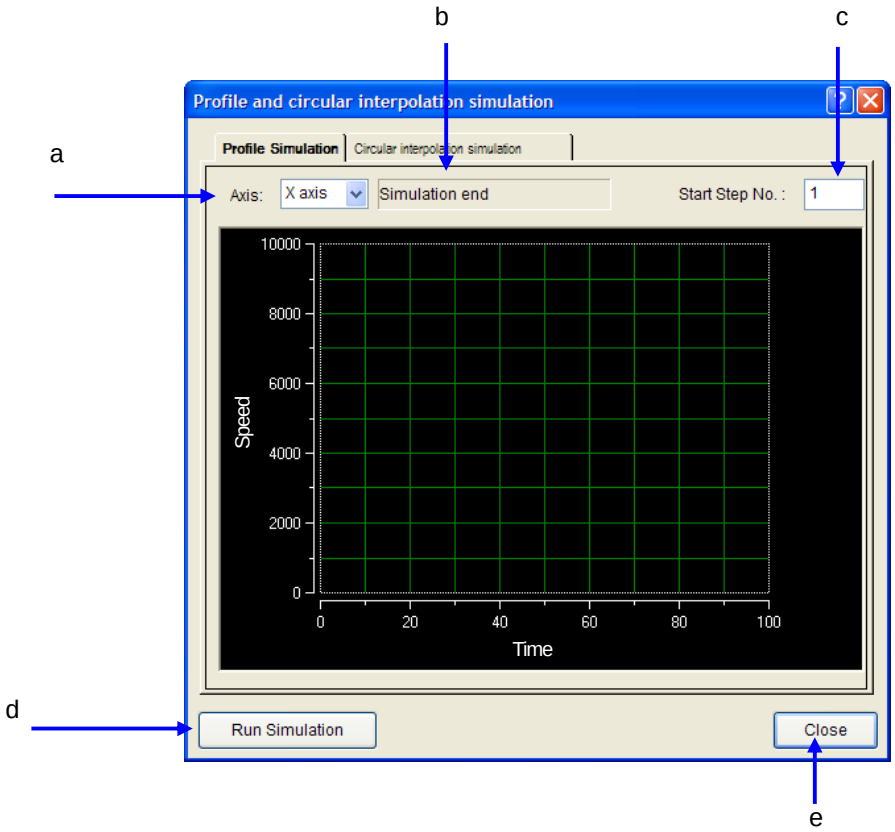
Function	Feasible or not
Multi module online	X

8.8.5 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]



[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

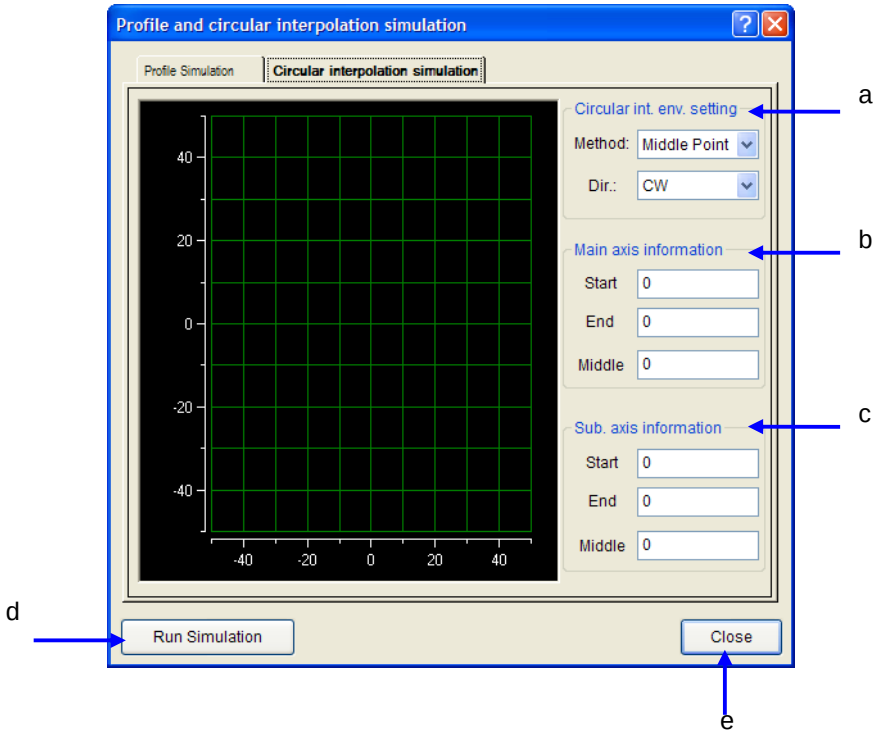
Profile simulation is available for only one axis. Operations using 2 axes such as interpolation operation can not be simulated

8.8.6 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) Sun. 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.

Chapter 9 Write/Read/Comparison data

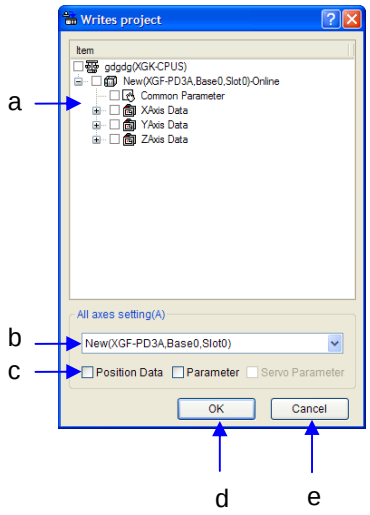
9.1 Write data

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

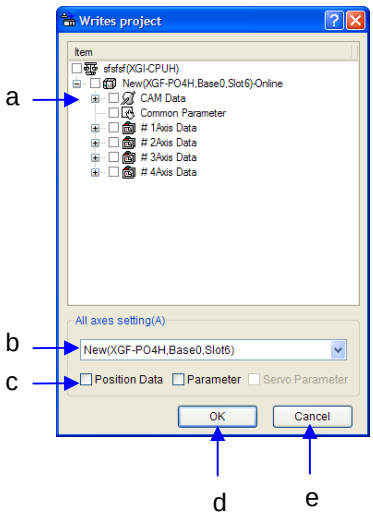
[Sequence]

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

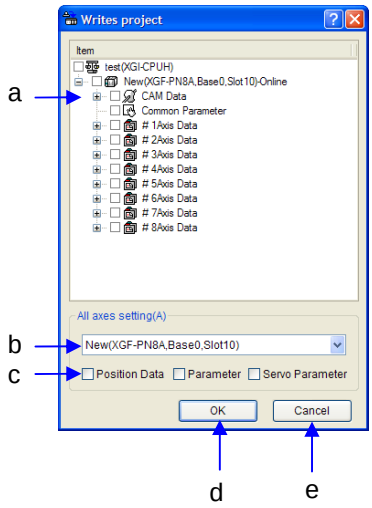
[Communication box]



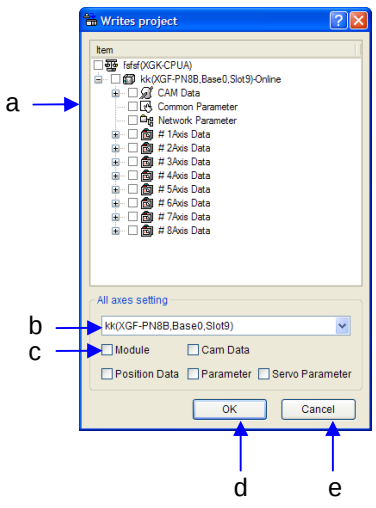
<APM>



<XPM>



<Network type XPM>



<Standard network type XPM>

[Explain communication box]

a) Select tree: Select data for sending to 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) Confirm button: Begin to send data to module with confirm button.
e) Cancel button: Stop 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.

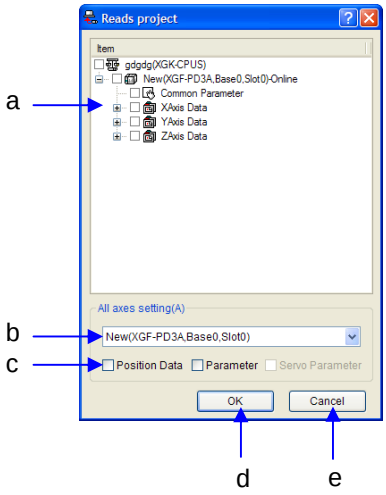
9.2 Read data

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

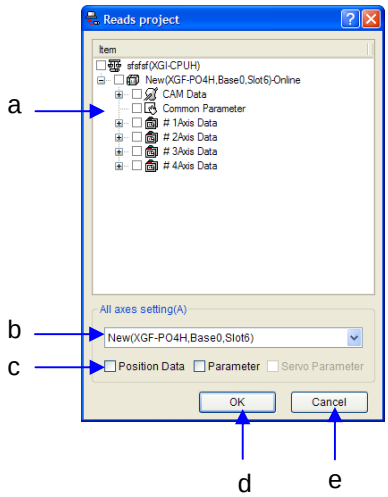
[Sequence]

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.

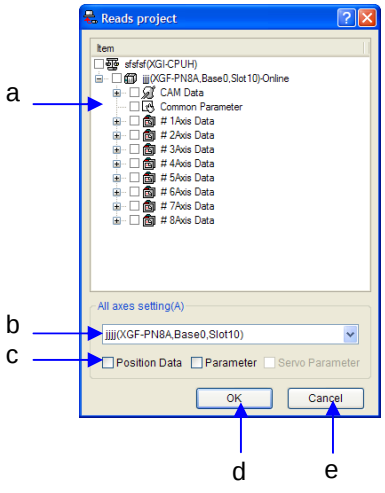
[Communication box]



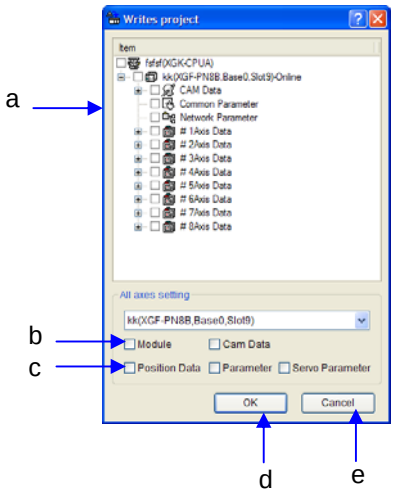
<APM module>



<XPM module>



<Network type XPM>



<Standard network type XPM>

[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

Confirm button: Begin to read data from module with confirm.

d) Cancel button: Stop reading with cancel button.

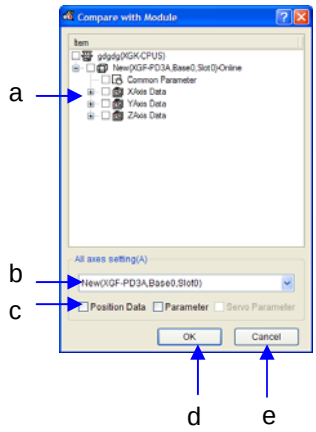
9.3 Comparison Data

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.

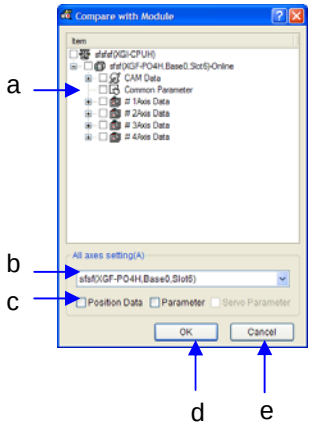
[Sequence]

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.

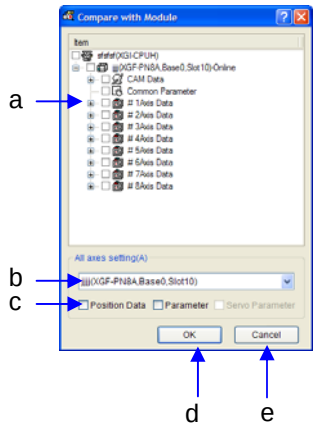
[Communication box]



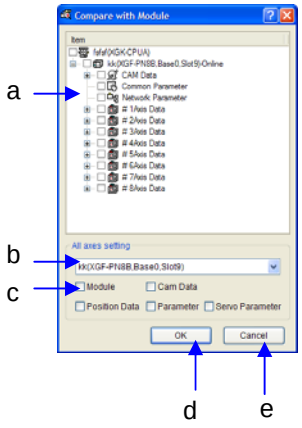
<APM>



<XPM>



<Network type XPM>



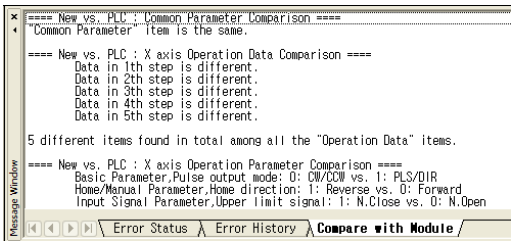
<Standard network type XPM>

[Communication box description]

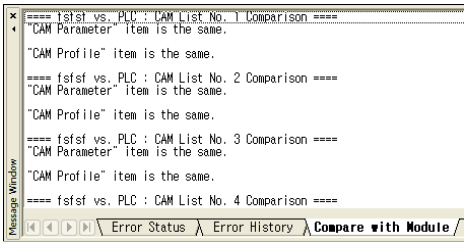
a) Select tree: Select comparison data which data is compare with project data on the module.
b) All axes setting: select the module for all axes setting per each item
c) All axes setting item: select the item for all axis setting. When selecting the item, all items are set for the selected module
d) Confirm 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

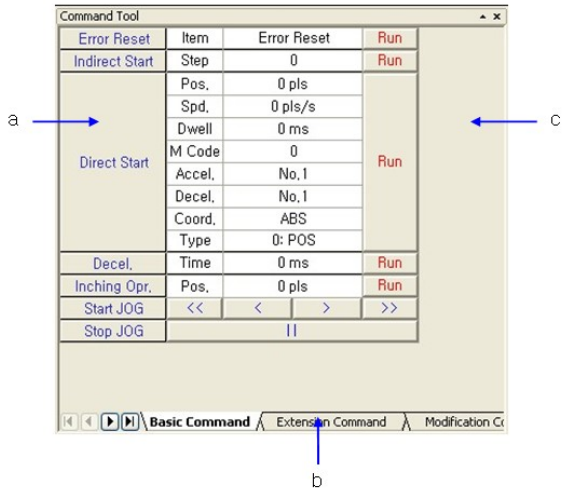
Here descript about test running XG-PM.

10.1 Composition of a Picture of Test Run

10.1.1 Composite command screen

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

[Composition of a picture]



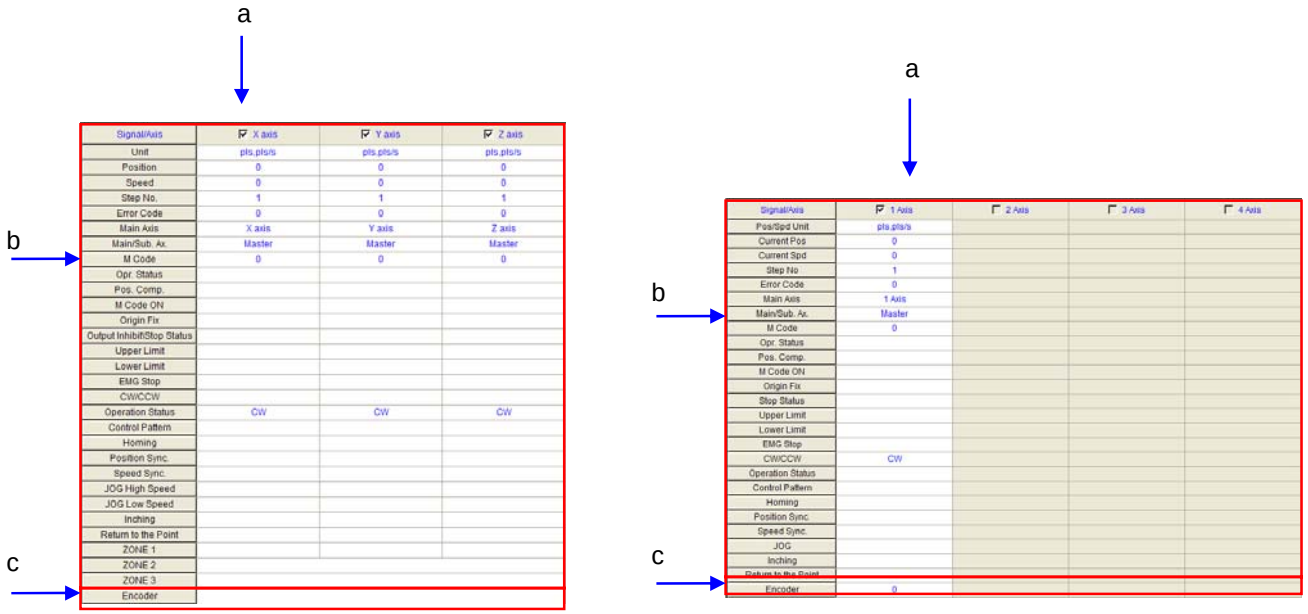
[Screen explanation]

a) Data setting: Set the data which user wants to command.
b) Conversing command tab: User can select what he wants to use within command screen.
c) Action button: Operate with action button.

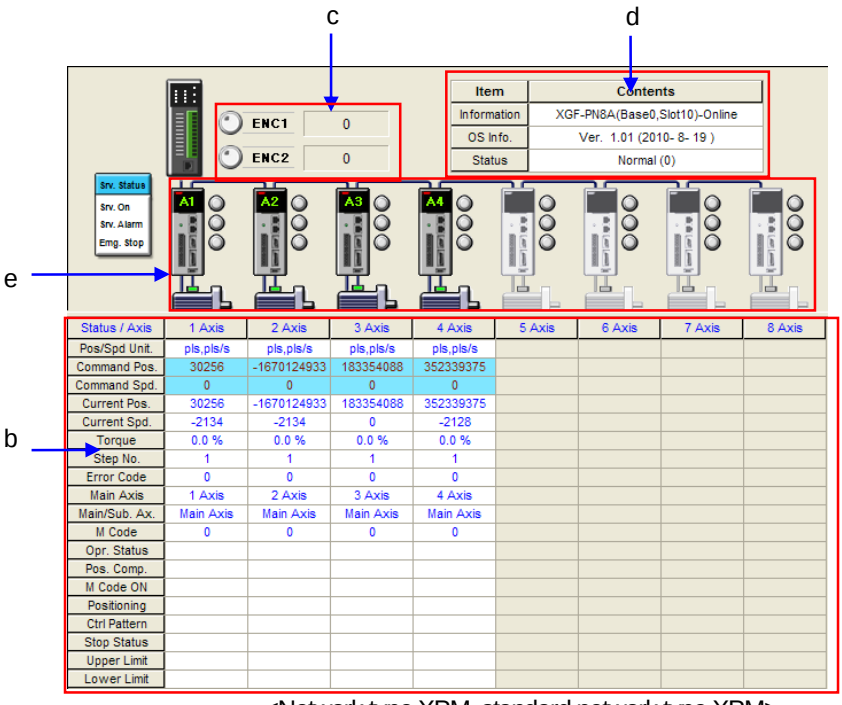
10.1.2 System View

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]



<APM> <XPM>



<Network type XPM, standard network type XPM>

[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

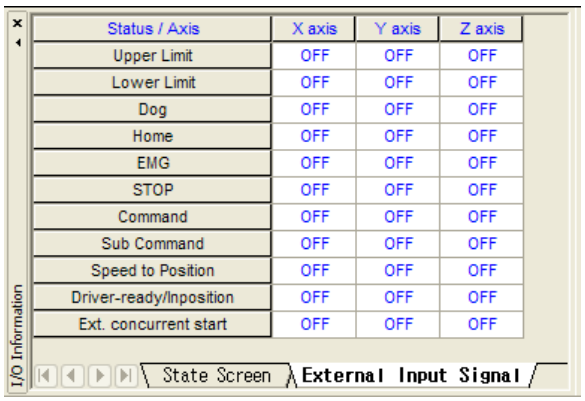
Notes

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

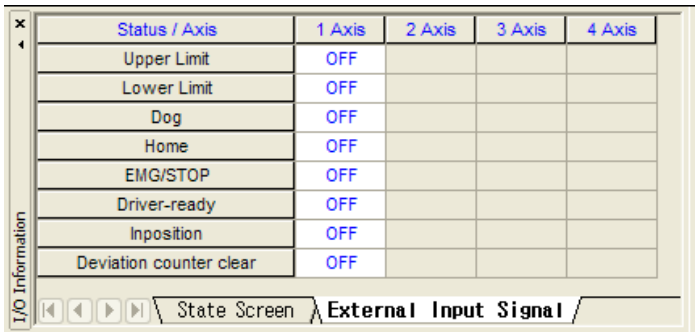
10.1.3 Screen of External Input/Output Signal

External input/output signal screen displays signal status that it is inputted from outside.

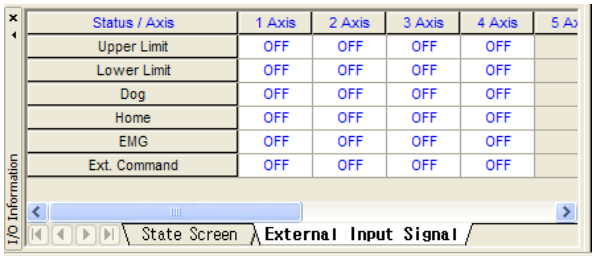
[Composition of a Picture]



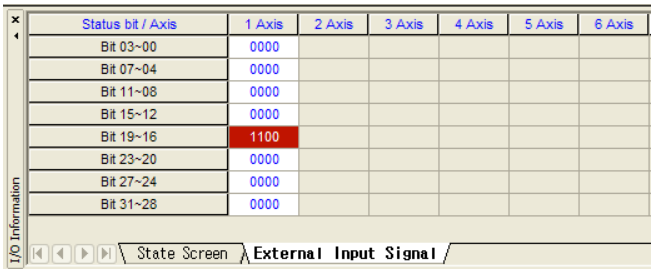
<APM>



<XPM>



<Network type XPM>

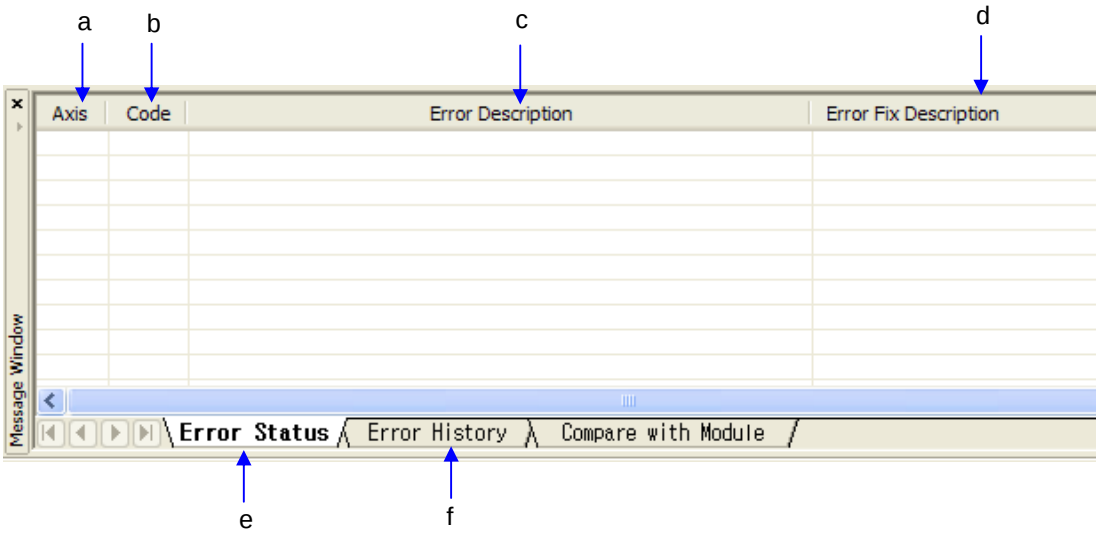


<Standard network type XPM>

10.1.4 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.

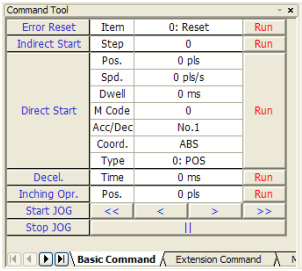
10.2.2 Implementation

Operate command to selected axis at 10.2.1, when command.

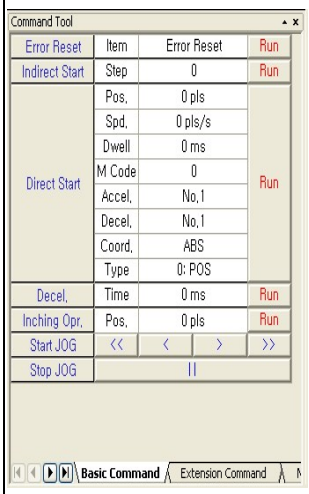
10.2.3 Test Run

(1) Basic command

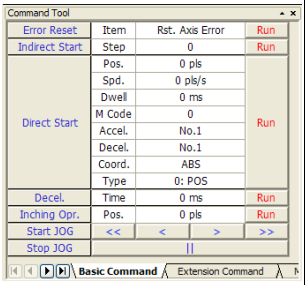
① APM module (XGF-POxA, XGF-PDxA)

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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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 [X10^{-2} mm/min](XGF-PDxA) mm : 0 ~ 2,000,000,000 [X10^{-2} mm/min] (XGF-POxA) inch : 0 ~ 2,000,000,000 [X10^{-3} inch/min](XGF-PDxA) inch : 0 ~ 2,000,000,000 [X10^{-3} inch/min](XGF-POxA) degree : 0 ~ 2,000,000,000 [X10^{-3} degree/min](XGF-PDxA) degree : 0 ~ 2,000,000,000 [X10^{-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 [X10^{-2} mm/min] (XGF-POxA, PDxA) inch : 0 ~ 2,000,000,000 [X10^{-3} inch/min] (XGF-POxA, PDxA) degree : 0 ~ 2,000,000,000 [X10^{-3} degree/min] (XGF-POxA, PDxA)	-

② XPM module (XGF-POxH, XGF-PDxH)

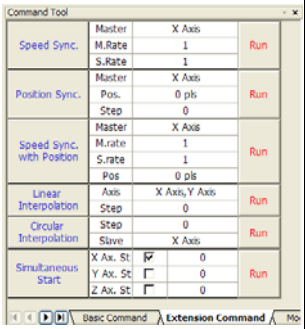
Screen	Command	Setting range	Related Command
	Error Reset	Axis error reset/Common error reset	XCLR
	Indirect Start	Step : 1 ~ 400	XIST
	Direct start	1. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ 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 [$X10^{-2}$ mm/min] (XGF-POxH, XGF-PDxH) inch : 0 ~ 2,000,000,000 [$X10^{-3}$ inch/min] (XGF-POxH, XGF-PDxH) degree : 0 ~ 2,000,000,000 [$X10^{-3}$ 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 [$X10^{-2}$ mm/min] (XGF-POxH, XGF-PDxH) inch : 0 ~ 2,000,000,000 [$X10^{-3}$ inch/min] (XGF-POxH, XGF-PDxH) degree : 0 ~ 2,000,000,000 [$X10^{-3}$ degree/min] (XGF-POxH, XGF-PDxH)	-

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

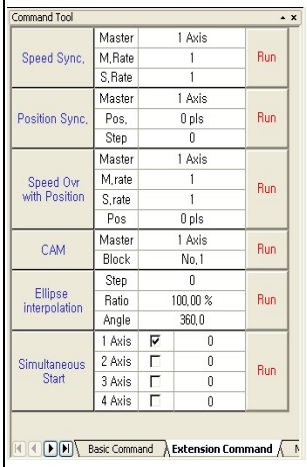
Screen	Command	Setting range	Related Command
	Error Reset	Axis error reset/Common error reset	XCLR
	Indirect Start	Step : 1 ~ 400	XIST
	Direct start	1. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ degree] 2. Speed (each Unit range) pulse : 0 ~ 10,000,000 [pulse/sec] mm : 0 ~ 2,000,000,000 [$X10^{-2}$ mm/min] inch : 0 ~ 2,000,000,000 [$X10^{-3}$ inch/min] degree : 0 ~ 2,000,000,000 [$X10^{-3}$ 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 [$X10^{-2}$ mm/min] inch : 0 ~ 2,000,000,000 [$X10^{-3}$ inch/min] degree : 0 ~ 2,000,000,000 [$X10^{-3}$ degree/min]	-

(2) Extension command

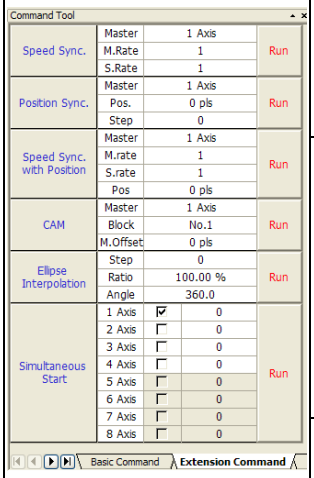
① APM module (XGF-POxA, XGF-PDxA)

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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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

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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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 [X10^{-2} %] 3. Each operation: 0 ~ 65535 [X10^{-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)

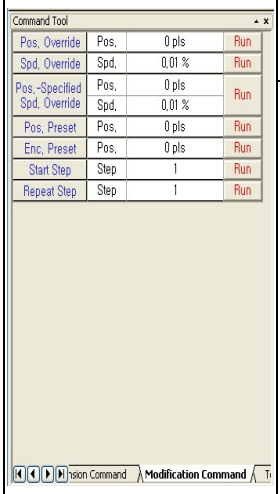
Screen	Command	Setting range	Related command
	Speed sync.	1. Main axis range : Axis 1 ~ Axis 8 and Encoder 2. Main axis rate : 1 ~ 65535 3. Sub axis rate : 1 ~ 65535	XSSS
	Position sync.	1. Step : 1 ~ 400 2. Position (each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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 [X10^{-2} %] 3. Each operation: 0 ~ 65535 [X10^{-1} degree	XELIN
	Synch start	Axis : Select 1 ~ 4 axis, Step No.: 1 ~ 400	XSST

(3) Modification command

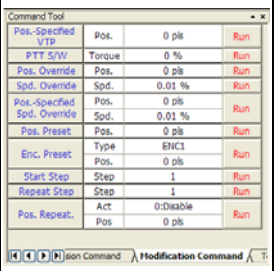
① APM module (XGF-POxA, XGF-PDxA)

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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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 [X10^{-2} mm/min](XGF-POxA, XGF-PDxA) inch : 0 ~ 2,000,000,000 [X10^{-3} inch/min](XGF-POxA, XGF-PDxA) degree : 0 ~ 2,000,000,000 [X10^{-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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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 [X10^{-2} mm/min](XGF-POxA, XGF-PDxA) inch : 0 ~ 2,000,000,000 [X10^{-3} inch/min] (XGF-POxA,XGF-PDxA) degree : 0 ~ 2,000,000,000 [X10^{-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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-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 [X10^{-1} mm] inch : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} inch] degree : -2,147,483,648 ~ 2,147,483,647 [X10^{-5} degree]	RCP

② XPM module (XGF-POxH, XGF-PDxH)

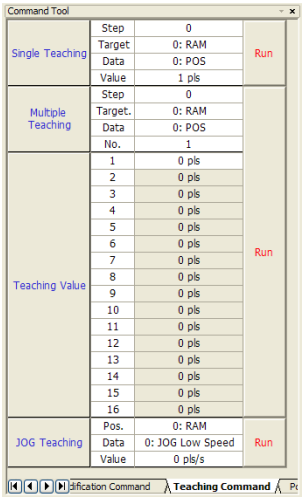
Screen	Command	Setting range	Related command
	Position override	Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ degree]	XPOR
	Speed Override	Speed (In case of designating %) 0 ~ 65535 [$X10^{-2}$ %] 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 [$X10^{-2}$ mm/min](XGF-POxH, XGF-PDxH) inch : 0 ~ 2,000,000,000 [$X10^{-3}$ inch/min](XGF-POxH, XGF-PDxH) degree : 0 ~ 2,000,000,000 [$X10^{-3}$ 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 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ degree] 2. Speed(In case of designating %) 0 ~ 65535 [$X10^{-2}$ %] 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 [$X10^{-2}$ mm/min](XGF-POxH, XGF-PDxH) inch : 0 ~ 2,000,000,000 [$X10^{-3}$ inch/min](XGF-POxH, XGF-PDxH) degree : 0 ~ 2,000,000,000 [$X10^{-3}$ 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 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ 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

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

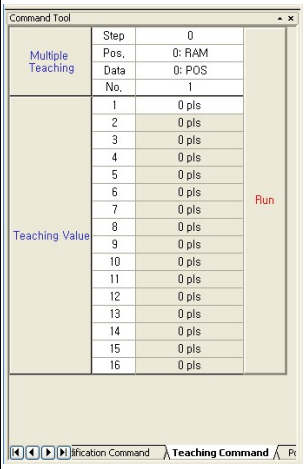
Screen	Command	Setting range	Related command
	Position/ Torque switching	Torque value: -300~300% (Sets the ratio to the rated torque of the servo parameter)	XPTT
	Position override	Position (Each Unit range) pulse : -2,147,483,648 ~ 2,147,483,647 [pulse] mm : -2,147,483,648 ~ 2,147,483,647 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ degree]	XPOR
	Speed Override	Speed (In case of designating %) 0 ~ 65535 [$X10^{-2}$ %] Speed (in case of designating speed, each unit range) pulse : 0 ~ 10,000,000 [pulse/sec] mm : 0 ~ 2,000,000,000 [$X10^{-2}$ mm/min] inch : 0 ~ 2,000,000,000 [$X10^{-3}$ inch/min] degree : 0 ~ 2,000,000,000 [$X10^{-3}$ 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 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ degree] 2. Speed(In case of designating %) 0 ~ 65535 [$X10^{-2}$ %] Speed (In case of designating speed, each unit range) pulse : 0 ~ 10,000,000 [pulse/sec] mm : 0 ~ 2,000,000,000 [$X10^{-2}$ mm/min] inch : 0 ~ 2,000,000,000 [$X10^{-3}$ inch/min] degree : 0 ~ 2,000,000,000 [$X10^{-3}$ 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 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ 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 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ degree]	XRCP

(4) Teaching Command

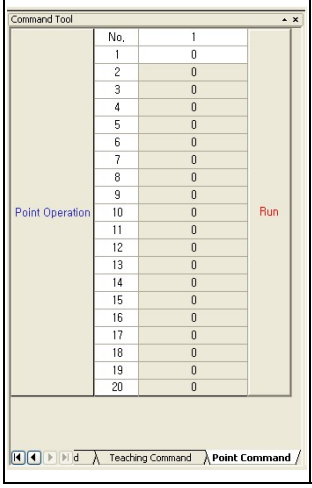
① APM module (XGF-POxA, XGF-PDxA)

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 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ 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 [$X10^{-2}$ mm/min](XGF-POxA, XGF-PDxA) inch : 0 ~ 2,000,000,000 [$X10^{-3}$ inch/min] (XGF-POxA, XGF-PDxA) degree : 0 ~ 2,000,000,000 [$X10^{-3}$ degree/min] (XGF-POxA, XGF-PDxA)	TMP

② XPM module (XGF-POxH, XGF-PDxH, XGF-PNxA), network type XPM (XGF-PN8A), standard network type XPM (XGF-PN8B)

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 [$X10^{-1}$ mm] inch : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ inch] degree : -2,147,483,648 ~ 2,147,483,647 [$X10^{-5}$ 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)

(a) Point operation operate maximum 20 set operation step positioning by once.
(b) When set the step number, have to set highest step No. while operating mode is continue or consecutive.
(c) 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
a →	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
b →	Operation Status	Constant	Constant	
	Control Pattern			
	Homing			
	Position Sync.			
	Speed Sync.			
c →	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	☑ 1 Axis	☑ 2 Axis	☑ 3 Axis	☐ 4 Axis
Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	
a → 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	
b → Operation Status	Constant	Constant		
c → Control Pattern	JOG	JOG		
Homing				
Position Sync.				
Speed Sync.				
JOG	ON	ON		
Inching				
Return to the Point				
Encoder	0			

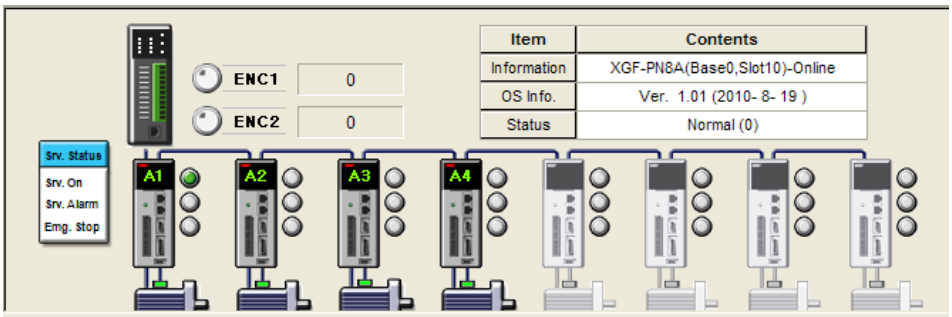
a) Command speed: When proceed jog low(high) speed operation, set value will be displayed by operation parameter.
b) Operation status: Operation status is displayed as “Steady speed” while it is jog operating.
c) Control pattern: Operation status is displayed as “Jog operating” while jog operating.

[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.)



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								

a → Pos/Spd Unit. / Command Pos. / Command Spd. / Current Pos.
b → Opr. Status
c → Ctrl Pattern

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.

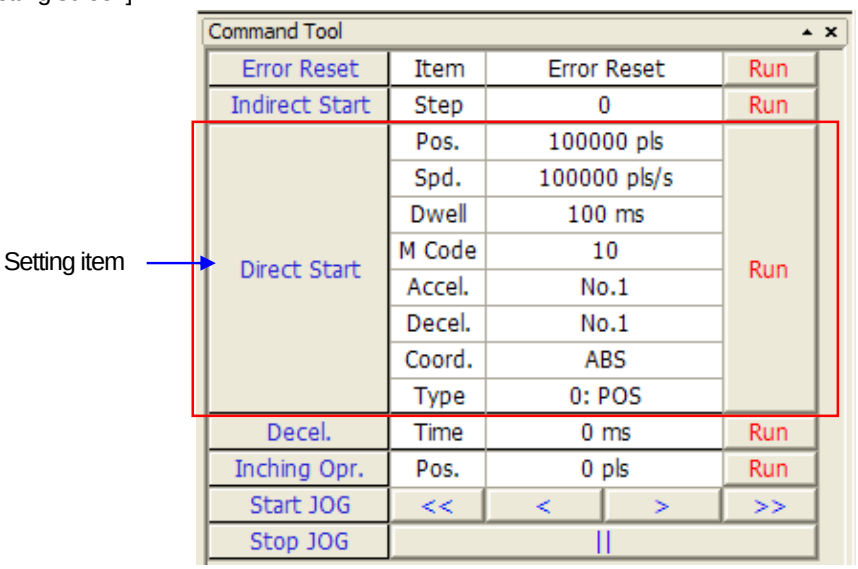
10.4.2 Direct Start (single axis position control)

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. ex1)
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.

ex1) 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.
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.

a

b

c

Signal/Axis	X axis	Y axis	Z axis
Unit	pls,pls/s	pls,pls/s	pls,pls/s
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
M Code	10	0	0
Opr. Status			
Pos. Comp.			
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.

a

b

c

Signal/Axis	1 Axis	2 Axis	3 Axis	4 Axis
Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	
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	
M Code	10	0	0	
Opr. Status				
Pos. Comp.				
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			

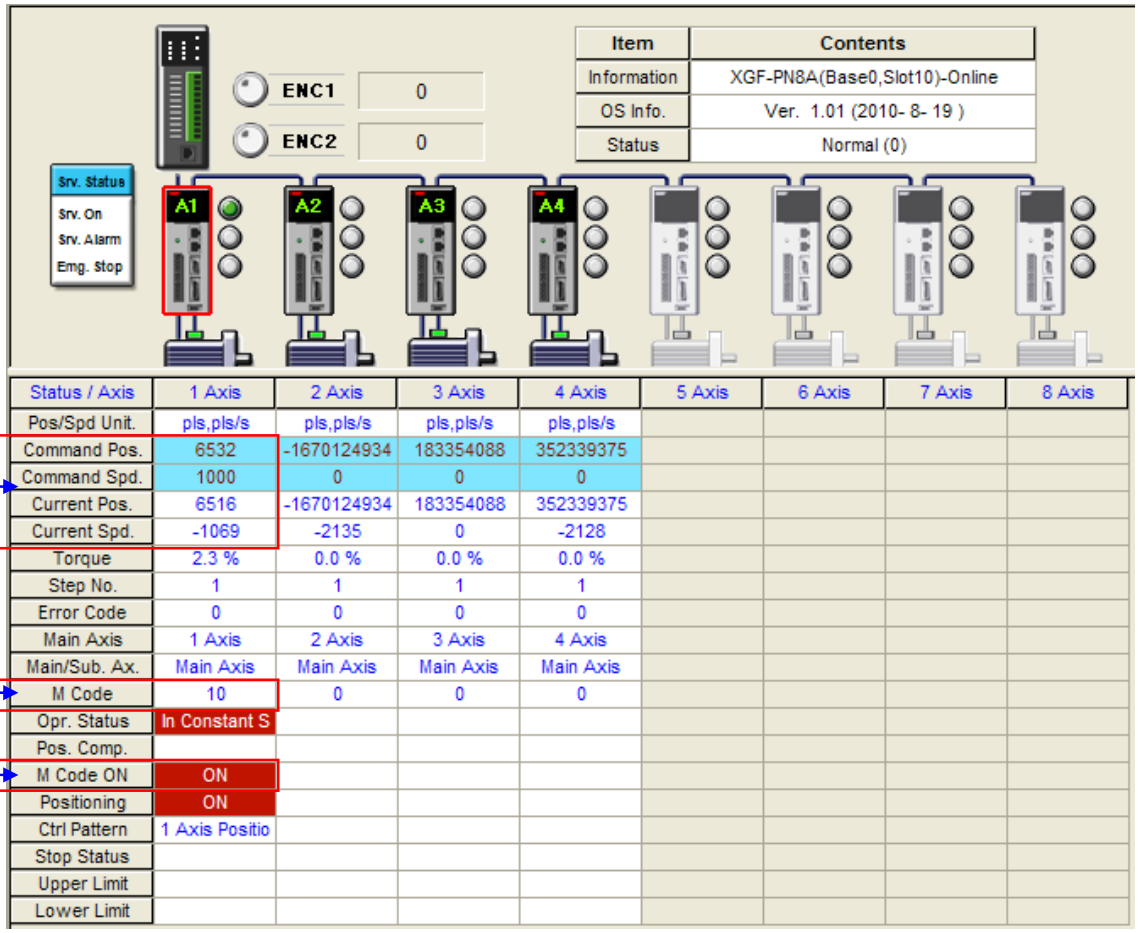
a) Current position: Current position display target position value 100,000.

b) M code No.: Display setting value 10.

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

[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

b

c

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.

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)

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

X 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		||	

[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).

a
b
c
d

Signal/Axis	☑ X axis	☑ Y axis	☑ Z axis
Unit	pls,pls/s	pls,pls/s	pls,pls/s
Position	1000000	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
M Code	10	0	0
Opr. Status			
Pos. Comp.			
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).

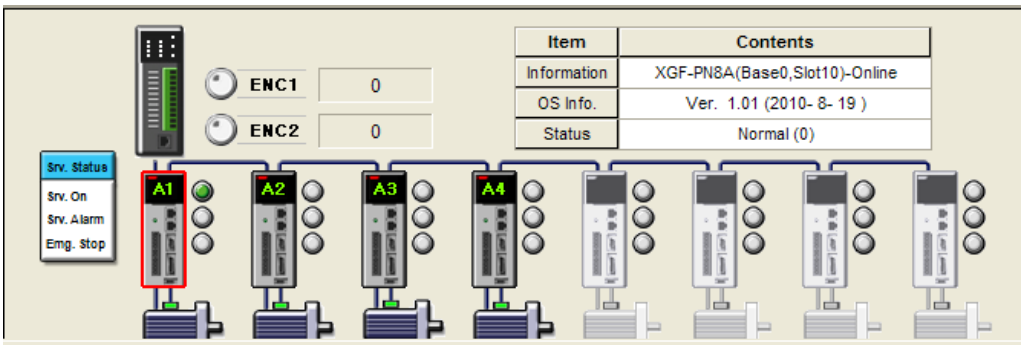
a
b
c
d

Signal/Axis	☑ 1 Axis	☑ 2 Axis	☑ 3 Axis	☐ 4 Axis
Pos/Spd Unit	pls,pls/s	pls,pls/s	pls,pls/s	
Current Pos	1000000	201739	0	
Current Spd	0	0	0	
Step No	2	1	1	
Error Code	0	0	0	
Main Axis	1 Axis	2 Axis	3 Axis	
Main/Sub. Ax.	Master	Master	Master	
M Code	10	0	0	
Opr. Status				
Pos. Comp.				
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			

[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).



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				
a → 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 %				
b → 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				
c → M Code	10	0	0	0				
Opr. Status								
Pos. Comp.								
d → 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 after revitalize)
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

[Setting value]

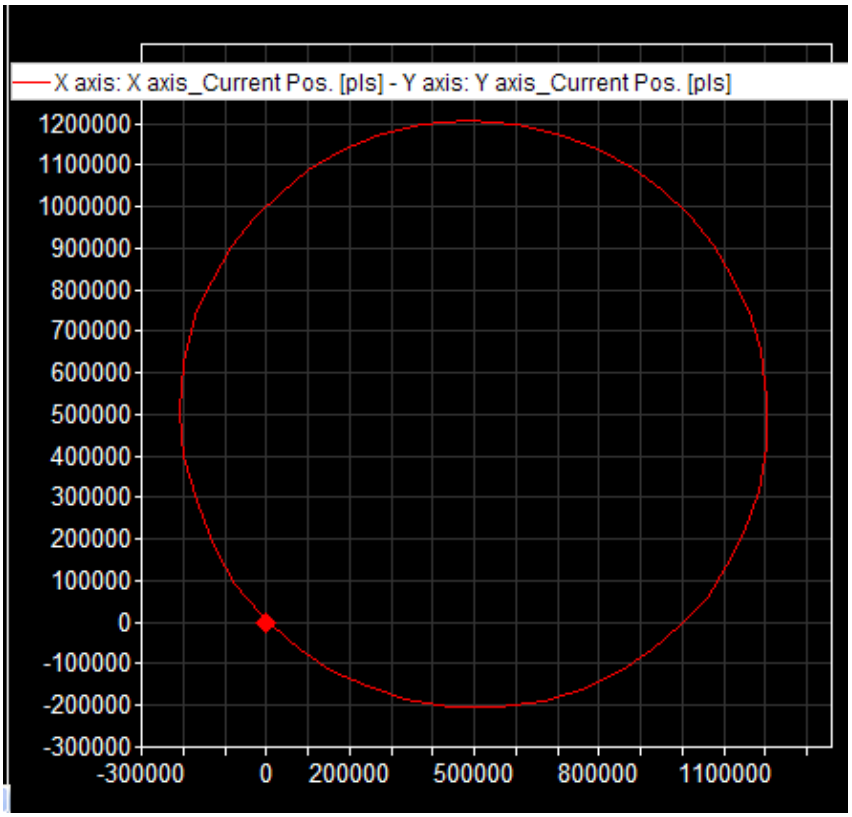
[Axis X data]

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.)

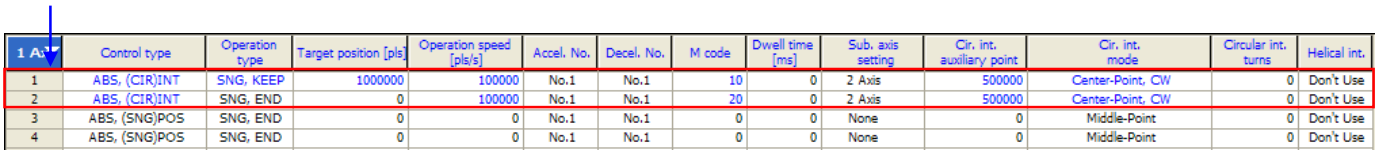


[XPM, network type XPM, standard network type XPM Sequence]

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.)

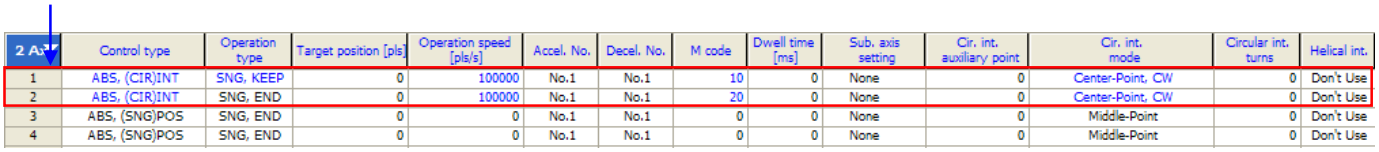
[Setting screen]

Axis 1 data setting



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, (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 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, (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]

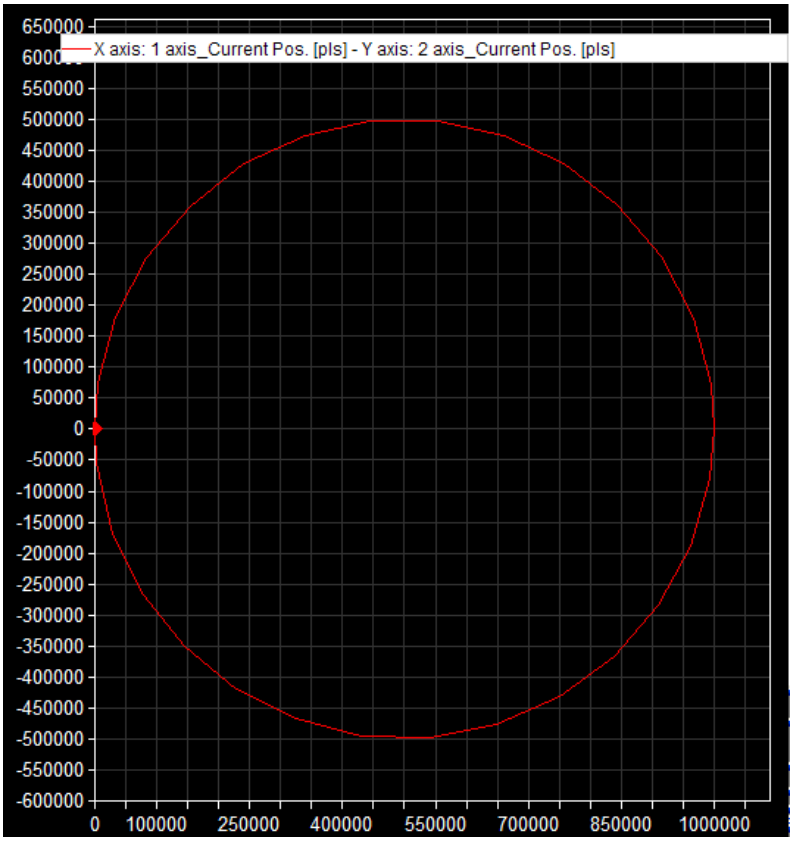
[Axis 1 data]

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.)



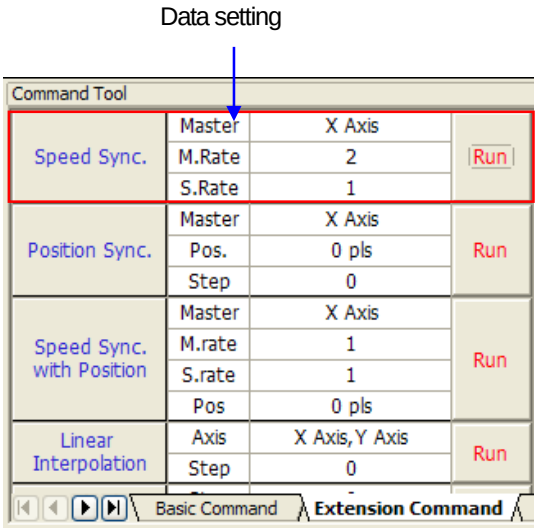
10.4.4 Speed Synch

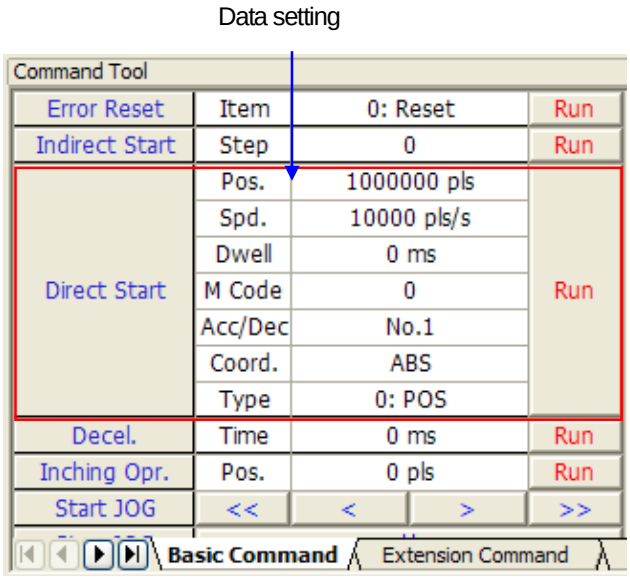
Speed synch means that sub axis operate speed synch as set rate, even if main axis speed is variable by operation speed rate of sub/main axis. Following example shows example of speed synch operation.

[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]





[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.

[Confirm Operation]

[System view]

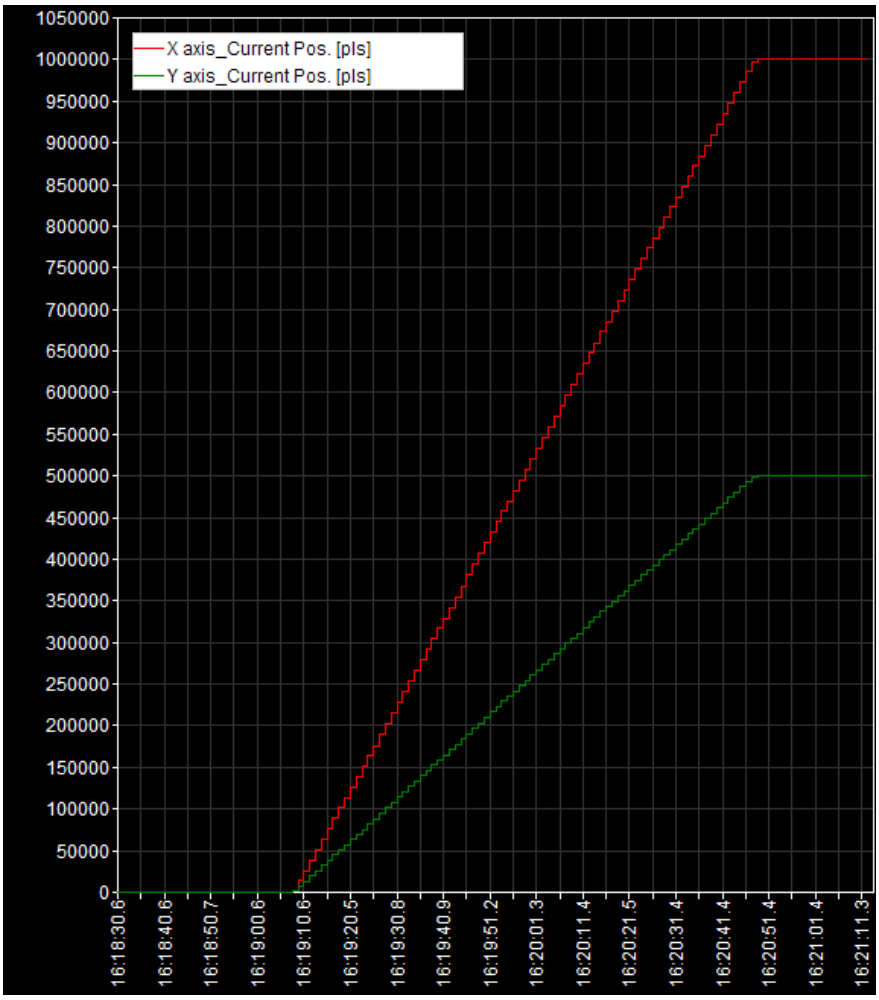
Signal/Axis	☑ X axis	☑ Y axis	☑ Z axis
Unit	pls,pls/s	pls,pls/s	pls,pls/s
a → Position	1000000	500000	0
Speed	0	0	0
Step No.	2	2	1
Error Code	0	0	0
Main Axis	X axis	X axis	Z axis
Main/Sub. Ax.	Master	Slave	Master
M Code	0	0	0
Opr. Status		ON	
Pos. Comp.			
M Code ON			
Origin Fix	ON	ON	
Output Inhibit			
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)

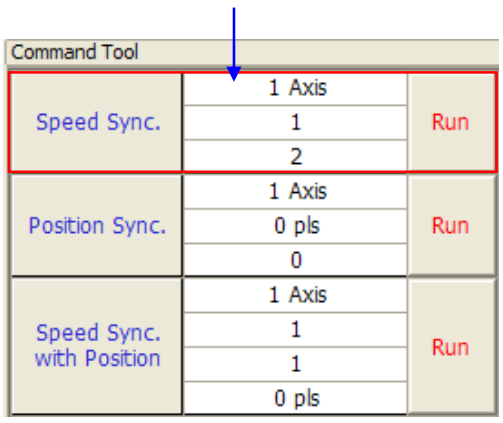


[XPM, network type XPM, standard network type XPM Sequence]

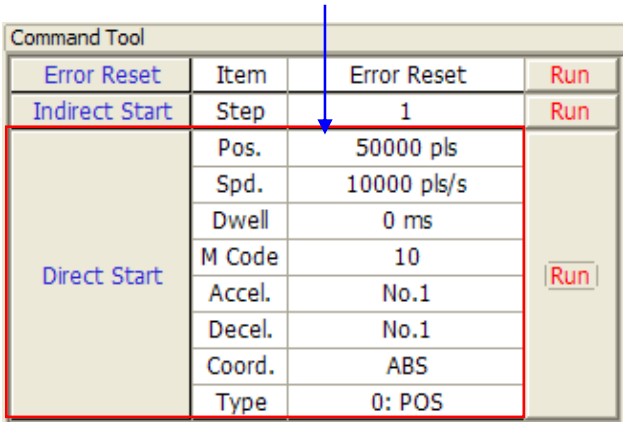
1) Create new project by proceeding [Project]->[New project].
2) Online module by proceeding [Online]->[Connection].
3) Connect the module to the servo drive by proceeding [Online] -> [Connect to all servo] (network type)
4) Make the axis for indirect start "Servo on" status at the servo tool (1 and 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 date 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



Data setting



[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]

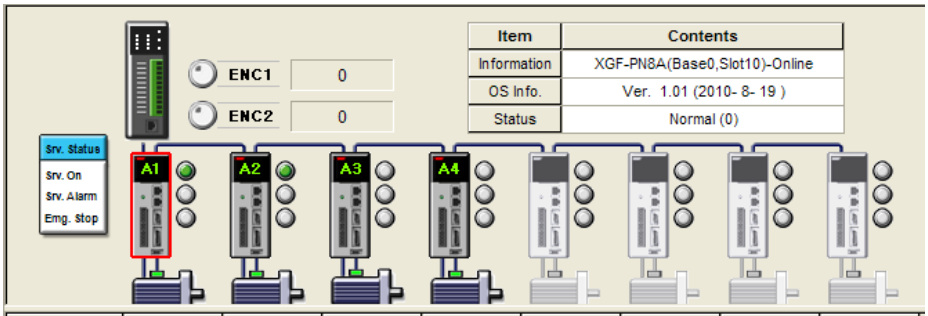
Item	Detail item	Setting value	Content
Direct start	Command axis	1	Set axis 1 as command axis. (refer to this manual 10.2.1)
	Position	50,000 pls	Set starting position.
	Speed	10,000 pls/s	Set starting speed.

[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]



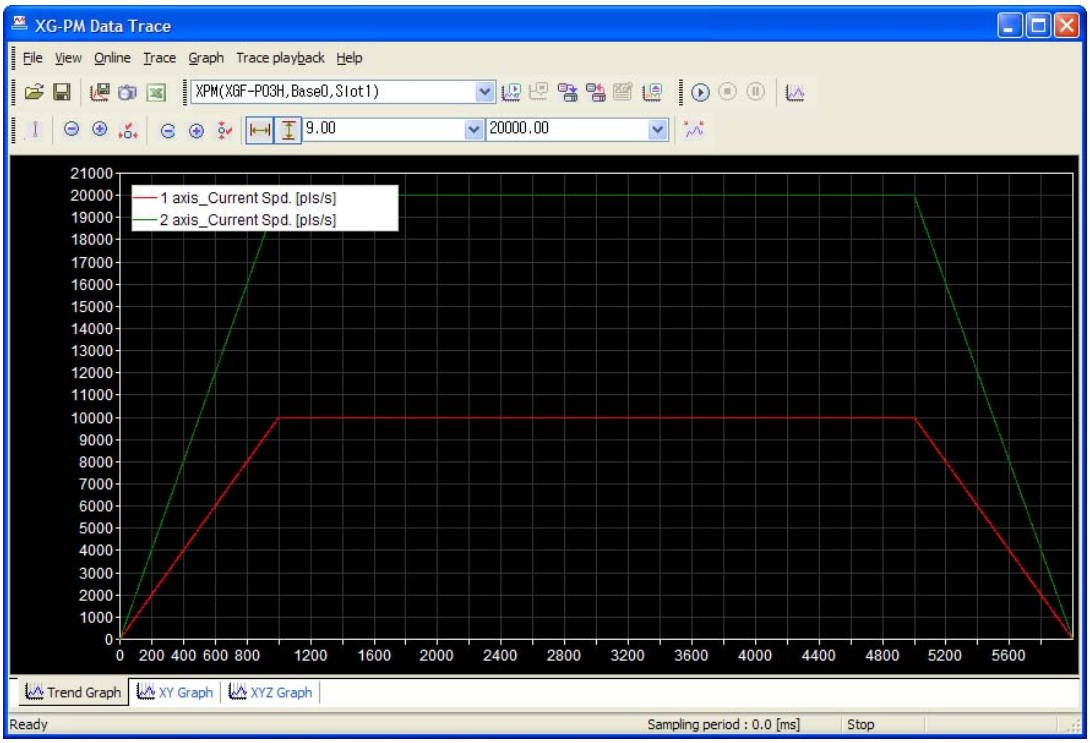
Status / Axis	1 Axis	2 Axis	3 Axis	4 Axis	5 Axis	6 Axis	7 Axis	8 Axis
Pos/Spd Unit.	pls,pls/s	pls,pls/s	pls,pls/s	pls,pls/s				
Command Pos.	1707	9686	183354088	352339375				
a → Command Spd.	10000	20000	0	0				
Current Pos.	1617	9103	183354088	352339375				
Current Spd.	6213	17802	0	-2128				
Torque	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)



Chapter 11 Useful Function of XG-PM

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

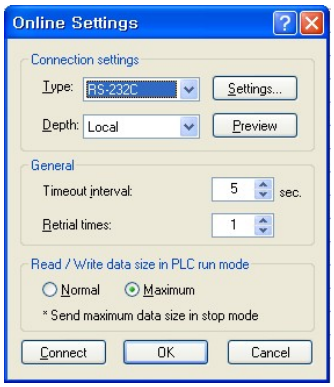
11.1 Project Management Function

11.1.1 Project Initialization Function

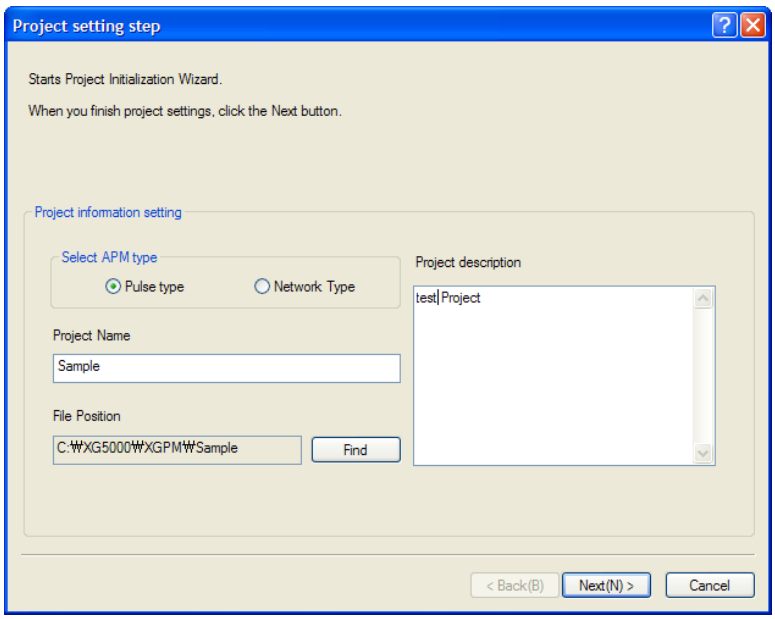
XG-PM provides project initialization function for convenient.

[APM, XPM module Sequence]

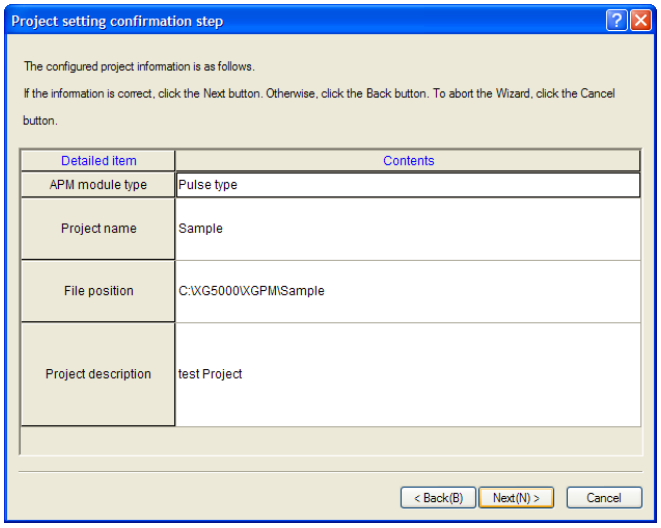
1) Proceed [Project]->[Project Initialization wizard].
2) Project setting communication box is displayed on the screen when click the connection button at connection setting communication box.



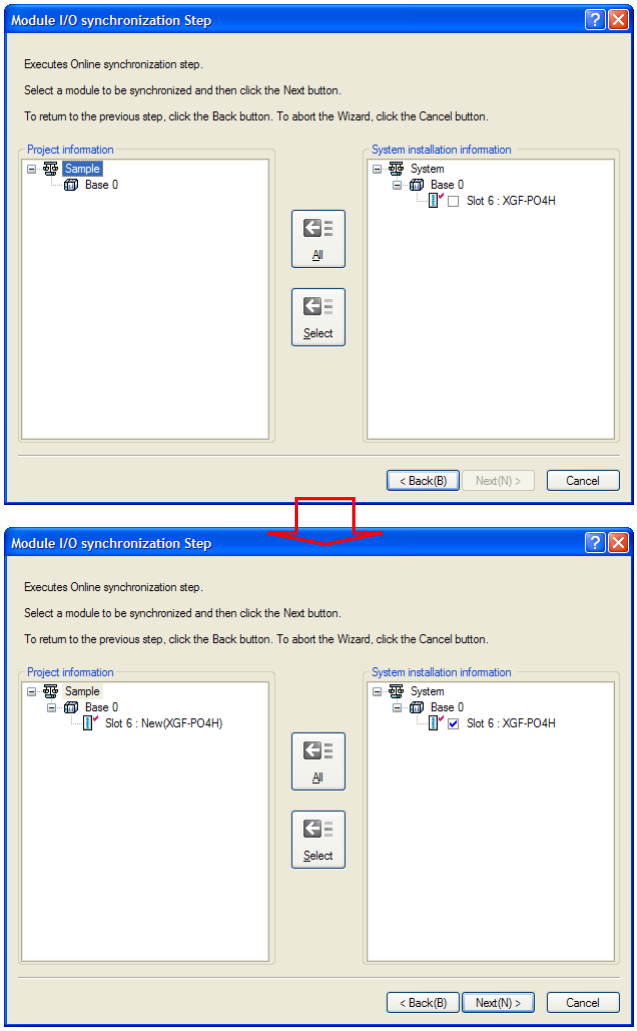
3) Set the project information on the project setting communication box and click the next button. At this time, select “Pulse output type” as the module type.



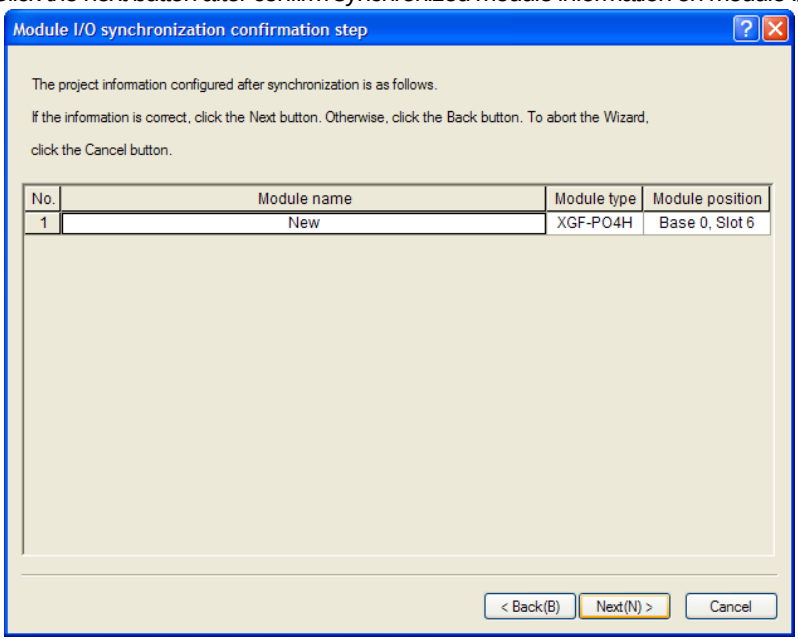
4) Click the next button after confirming set project information at the project setting confirmation step.



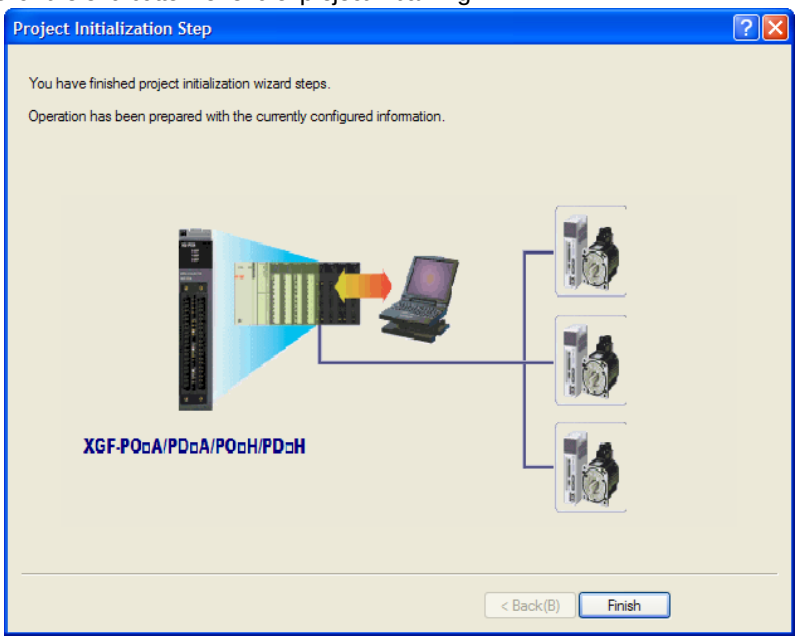
5) Click the select/all button module for synchronization on module I/O synchronization.



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

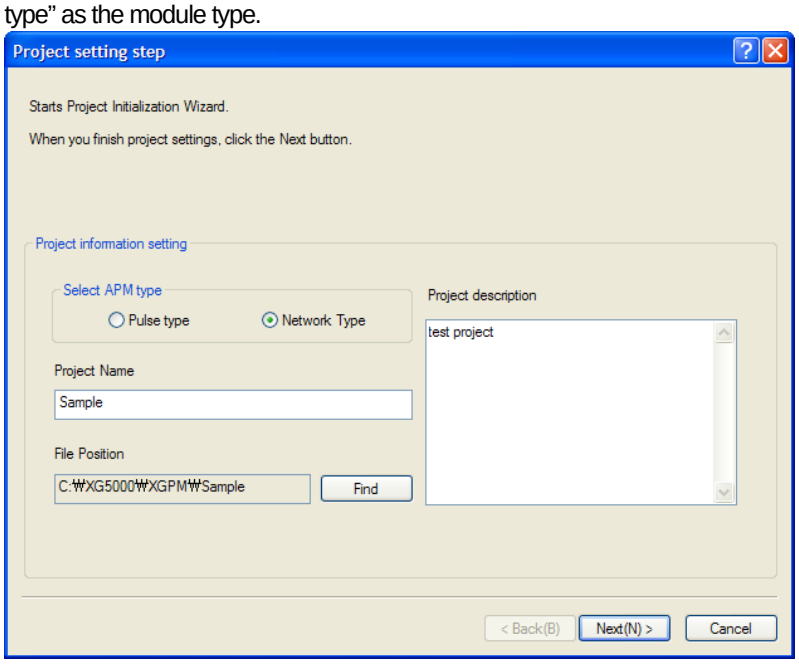


7) Click the end button for end of project initializing.

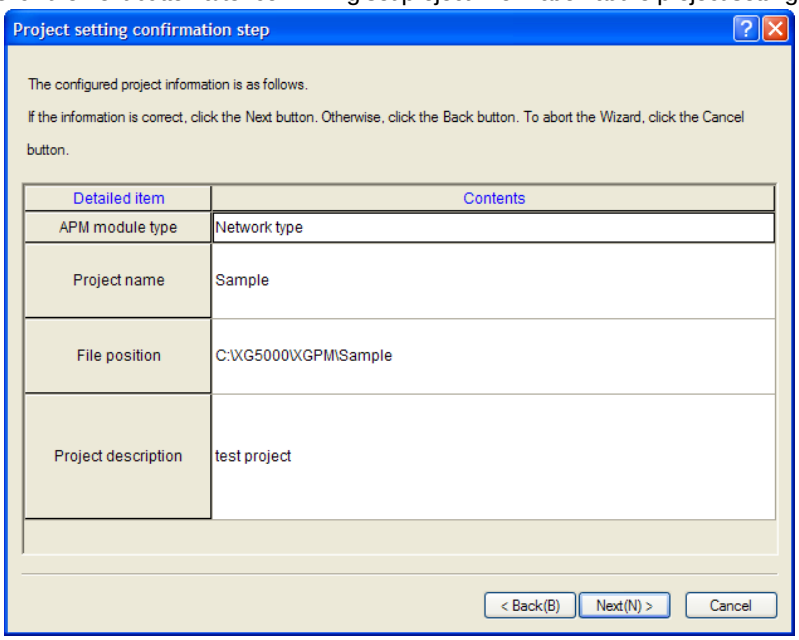


[Network type XPM Sequence]

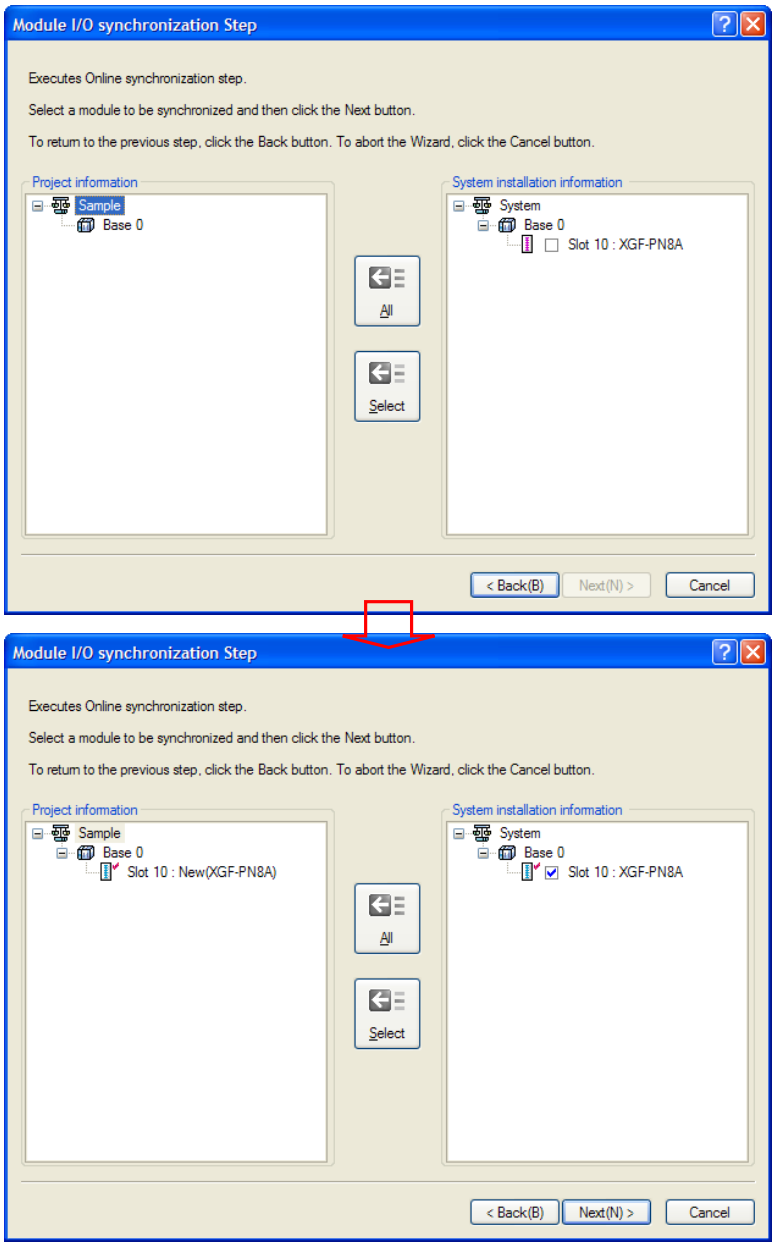
1) Proceed [Project]->[Project Initialization wizard].
2) Project setting communication box is displayed on the screen when you click the connection button at connection setting communication box.
3) Set the project information on the project setting communication box and click the next button. At this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



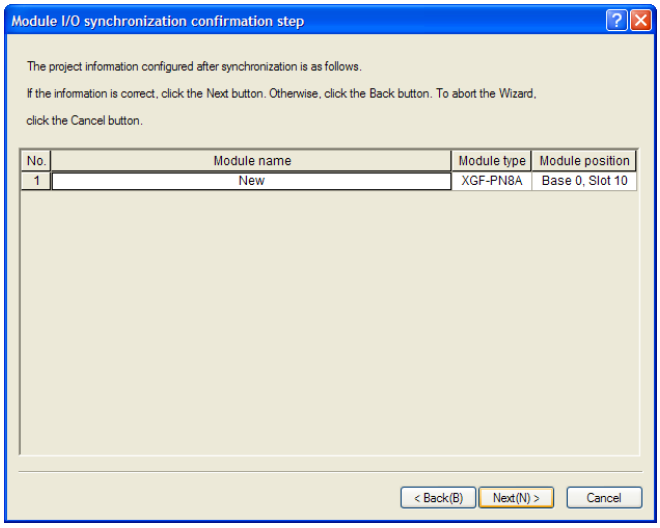
4) Click the next button after confirming set project information at the project setting confirmation step.



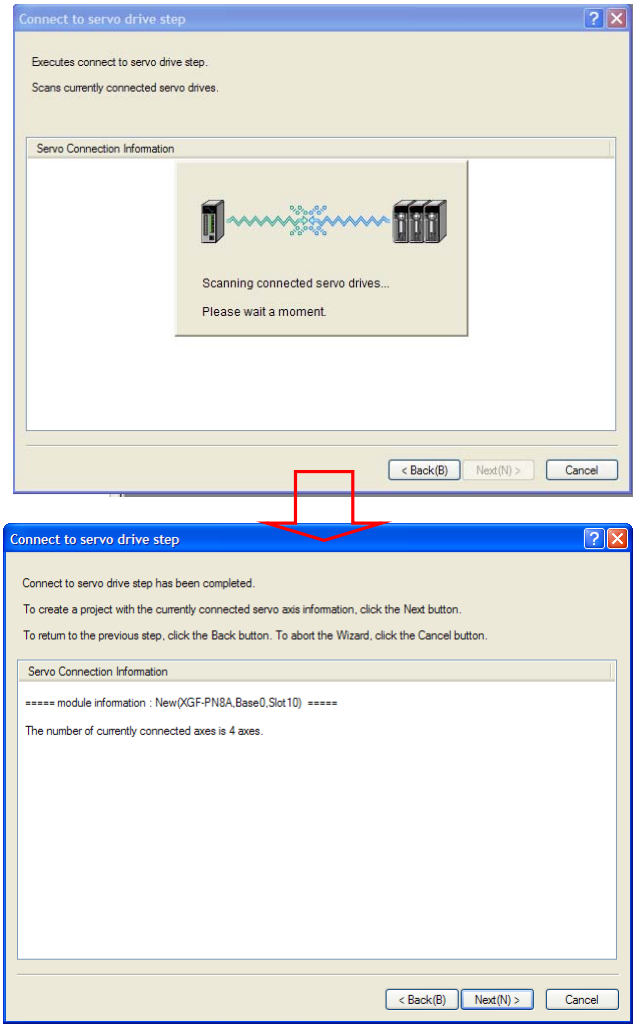
5) Click the select/whole button module for synchronization module I/O synchronization.



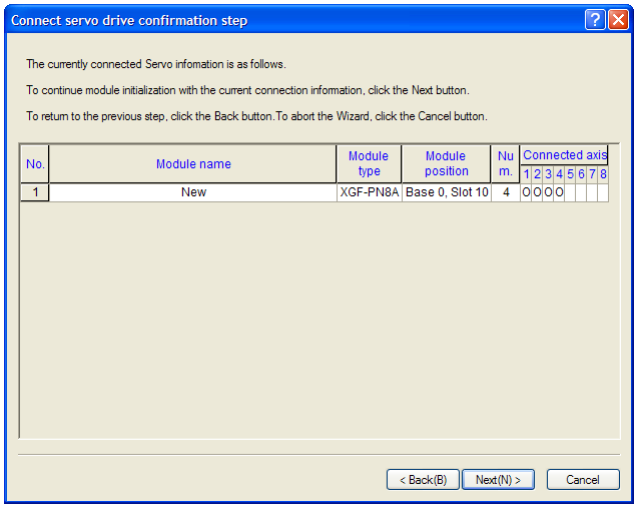
6) Click the next button after confirm synchronized module information on module I/O confirmation step.



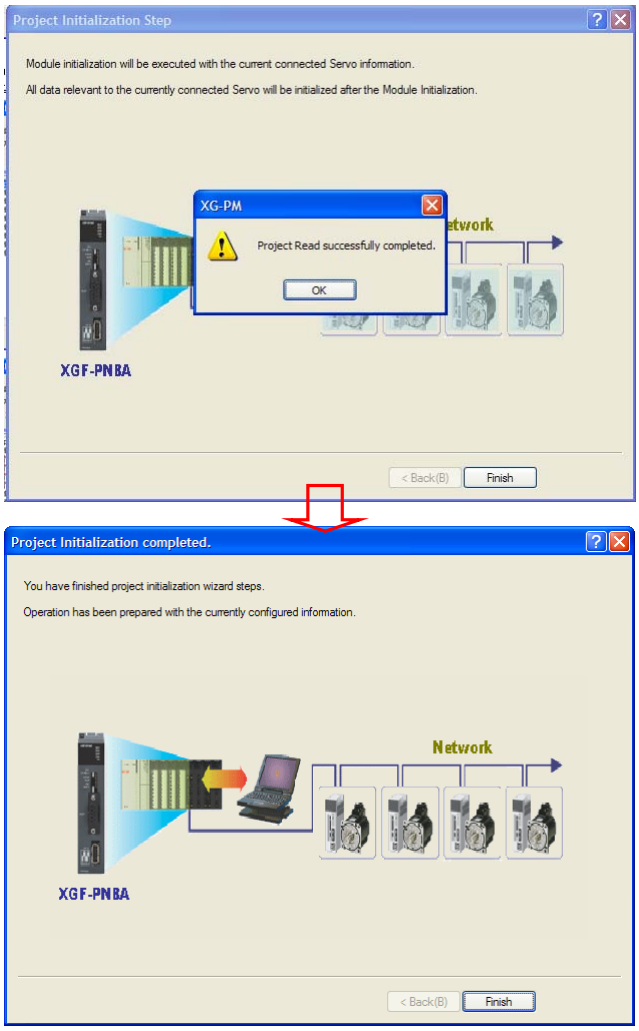
7) Check the servo drive connection status and click “Next” button.



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

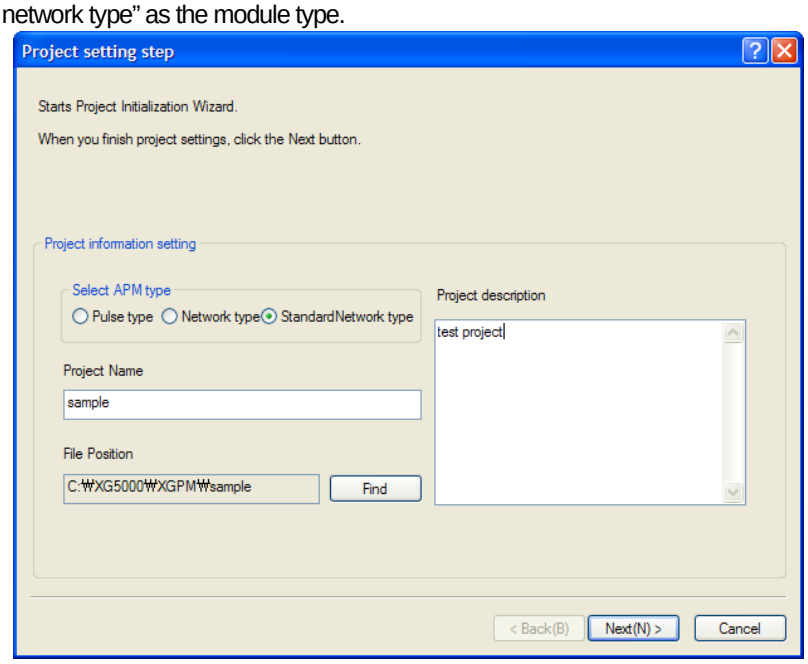


9) Click the end button for end of project initializing.

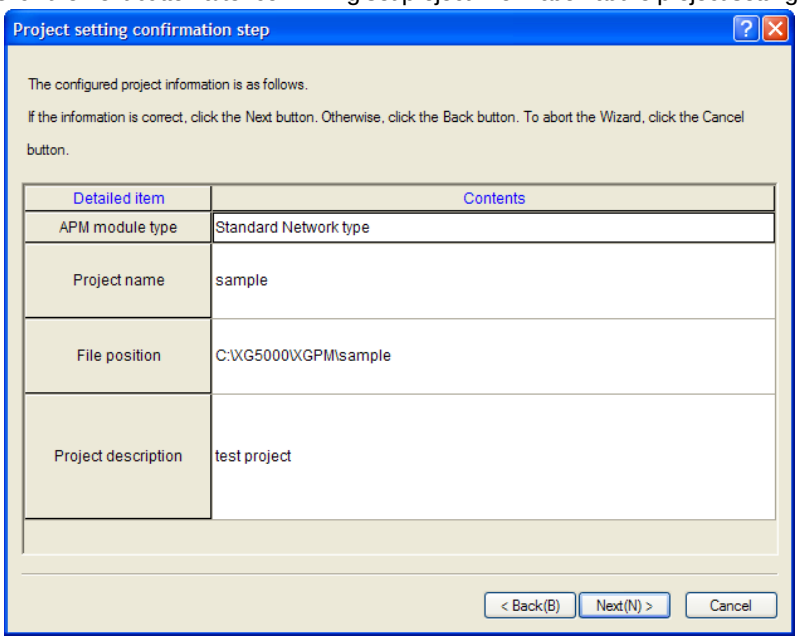


[Standard network type XPM Sequence]

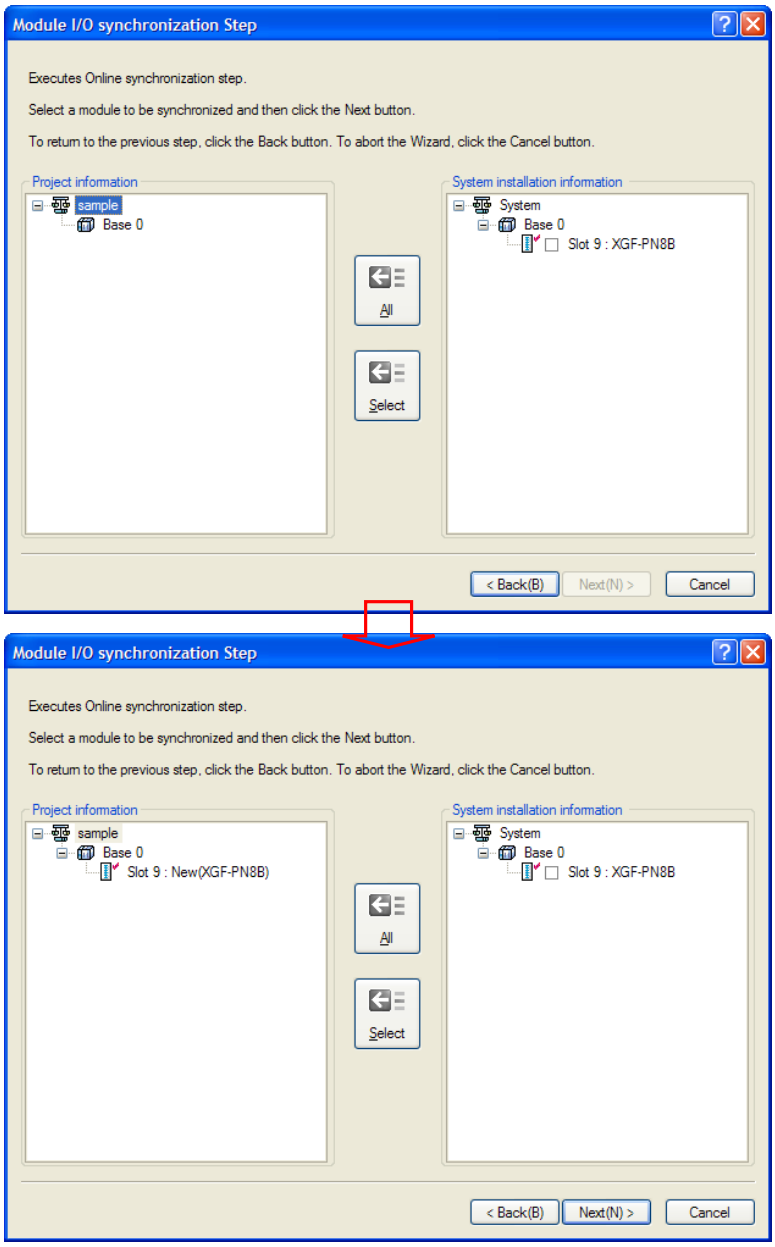
1) Proceed [Project]->[Project Initialization wizard].
2) Project setting communication box is displayed on the screen when you click the connection button at connection setting communication box.
3) Set the project information on the project setting communication box and click the next button. At this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



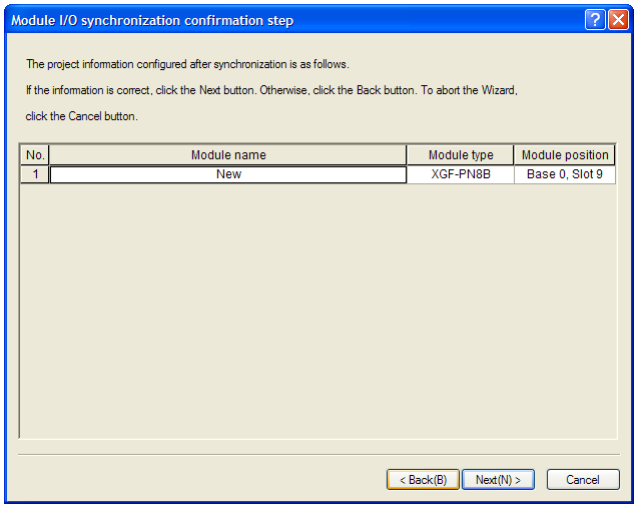
4) Click the next button after confirming set project information at the project setting confirmation step.



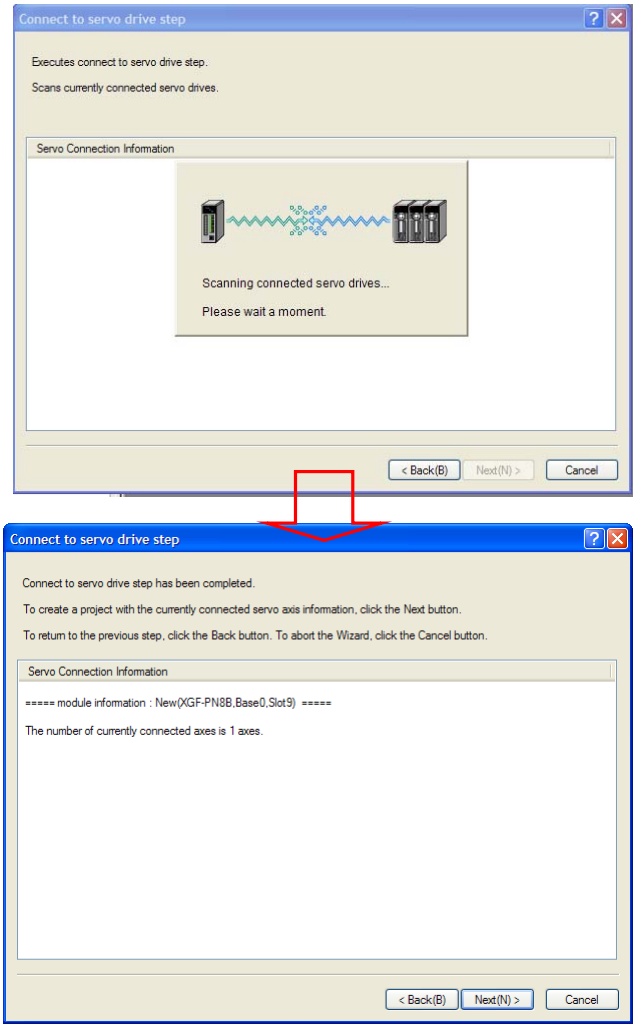
5) Click the Select or All button module for synchronization module I/O synchronization.



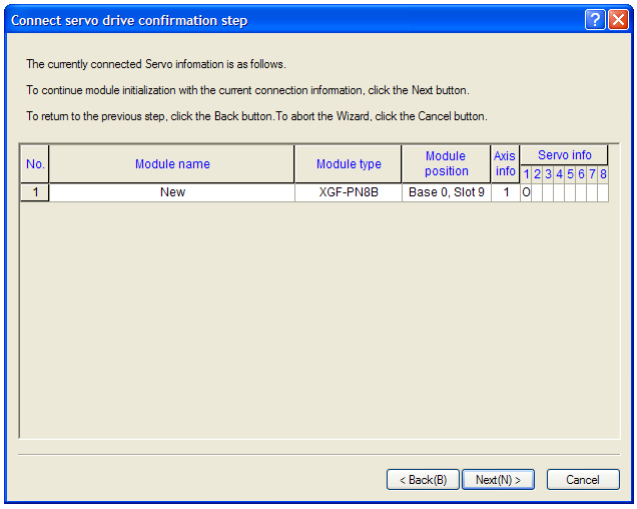
6) Click the next button after confirm synchronized module information on module I/O confirmation step.



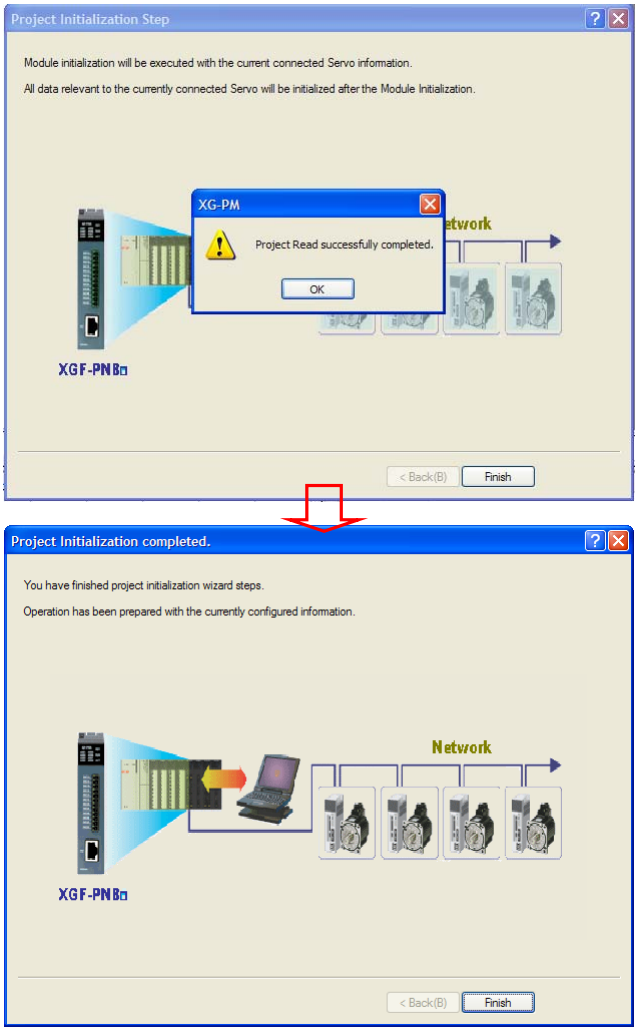
7) Check the servo drive connection status and click “Next” button.



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



11) 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)

11.1.2 Multi-Module Batch Write/Read/Comparison

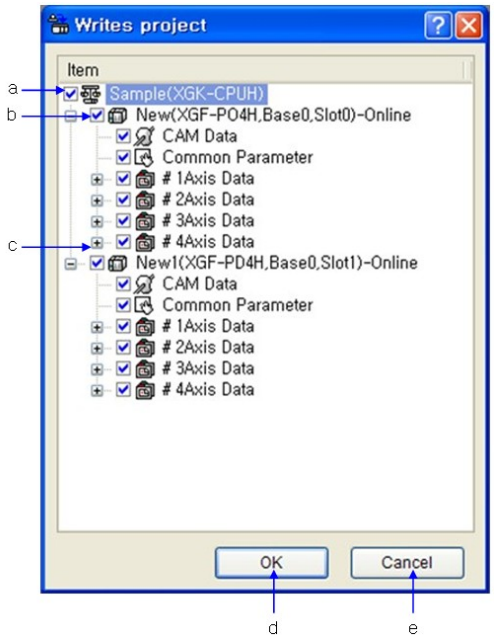
XG-PM provides project management function for multi-module. Basically it provides some functions for write/read/comparison. (Don't need to additional setting, can use menu that are write/read/comparison.)

(1) Write multi-module

[Sequence]

1) Proceed [Online]->[Write].
2) Select item for writing at project write communication box. If the Multi-module is onlined, 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 onlined 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

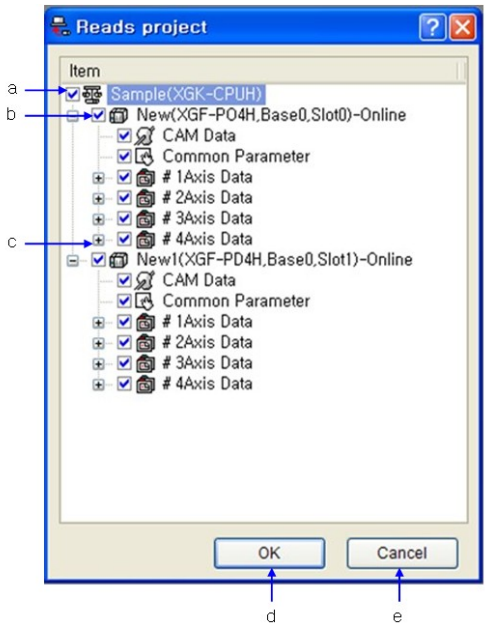
Online modules which were set on the project write/read/comparison communication box of current step are displayed only.

(2) Read multi module

[Sequence]

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

[Communication box]



[Communication box description]

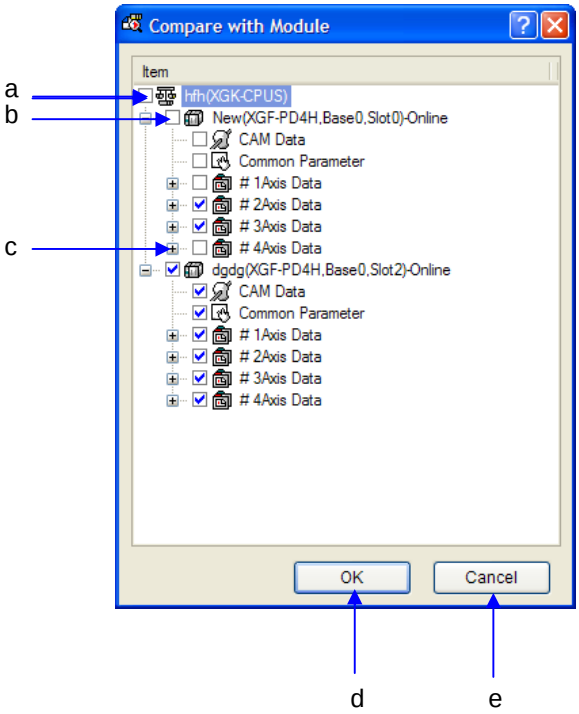
a) Check for each project: Can read all data item of all onlined module for each project by chenking this part.
b) Check for each Module: Read all data item belonged to module.
c) Check for item: Can read data for each item.
d) OK: End the communication box. Begine to read data after ending communication 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. Select item for comparison on the module and data comparison communication box. If the multi-module is onlined, 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 onlined 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.

11.2 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/Operation parameter/operation data, partially can proceed copy/Paste.

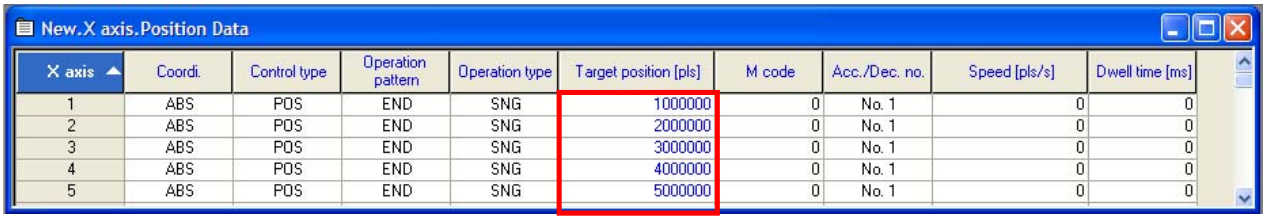
(1) Copy

Copy selected range to clip board.

[Sequence]

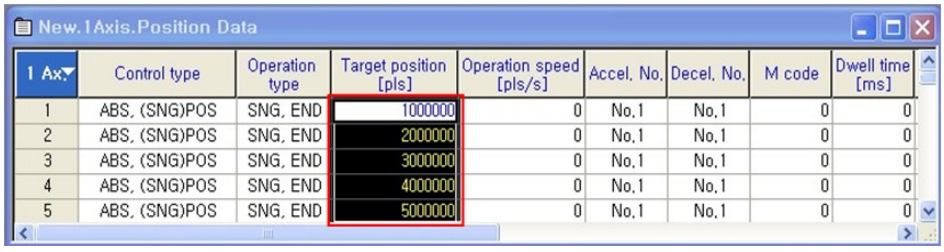
1. Select copy for range.
2. Click [Edit] --> [Copy].

[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]



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	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.

[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 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	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 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	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

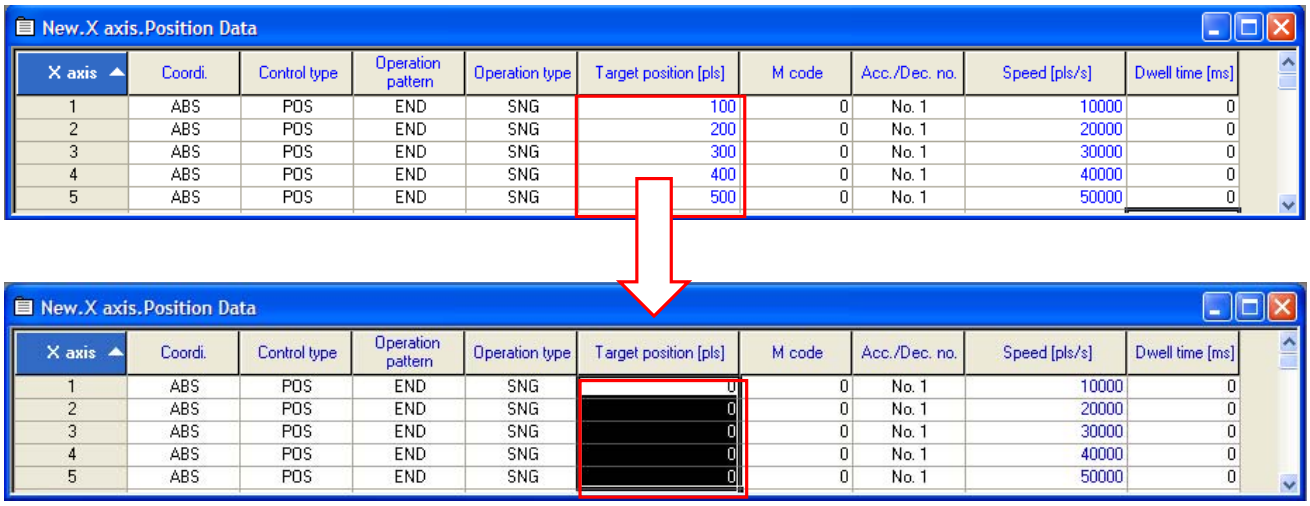
11.2.2 Set Value of Initial Data

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]->[Initial value setting].
3) Selected data is set as initial value.

[Editorial screen]
[APM module]



<XPM, network type XPM, standard type XPM>

Notes

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

11.2.3 Cancel/Restart Edition

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

[Sequence]

1) Edit data.
2) Click [Edit]->[Cancel edit] or [Restart].

Notes

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

11.2.4 Auto fill

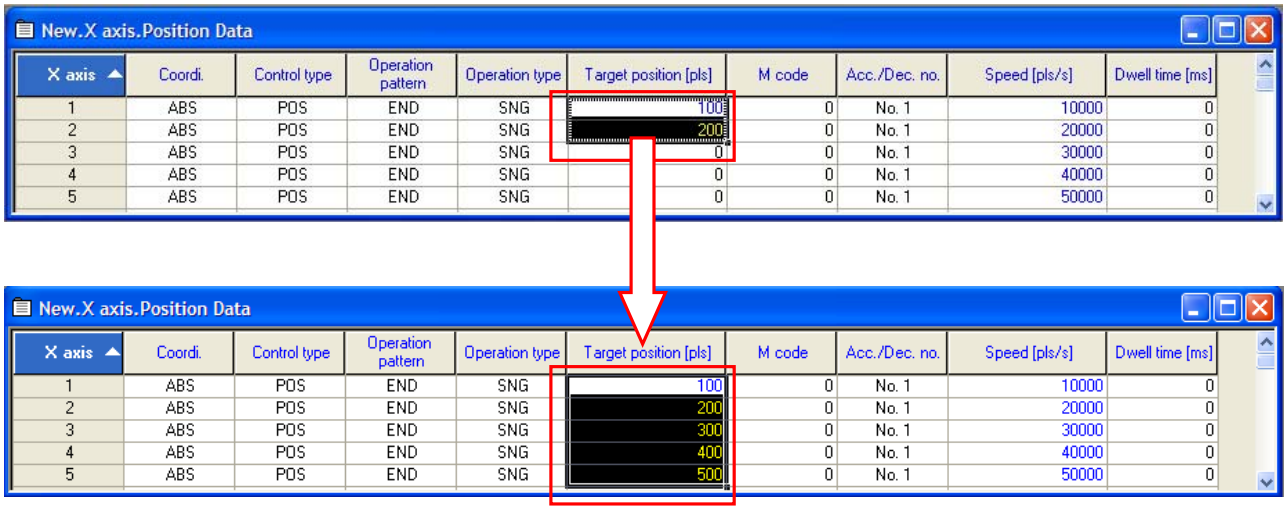
When set operation data, user easily makes progressived data by auto fill function. But, auto fill function only can perform for 1 vertical line.

[SEquence]

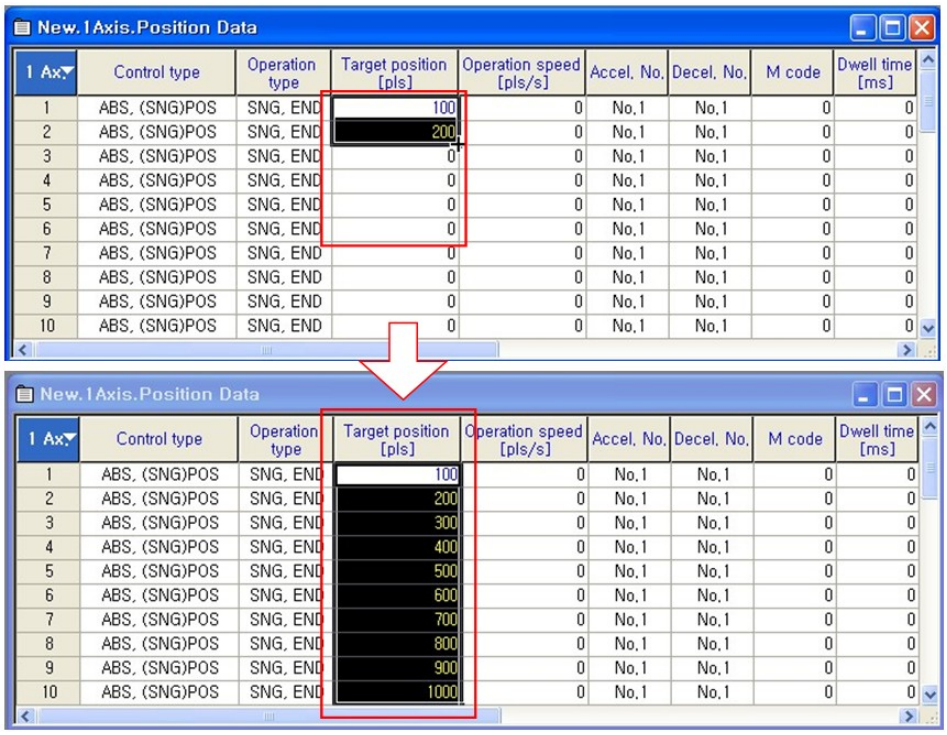
1) Set data on screen of the operation data. (Set data over 2.)
2) Set data and move mouse pointer to right top of the last setting data.
3) When mouse pointer change to"+", then drag mouse.
4) Automatically created data is filled in the selected cell.

[Editorial screen]

[APM module]



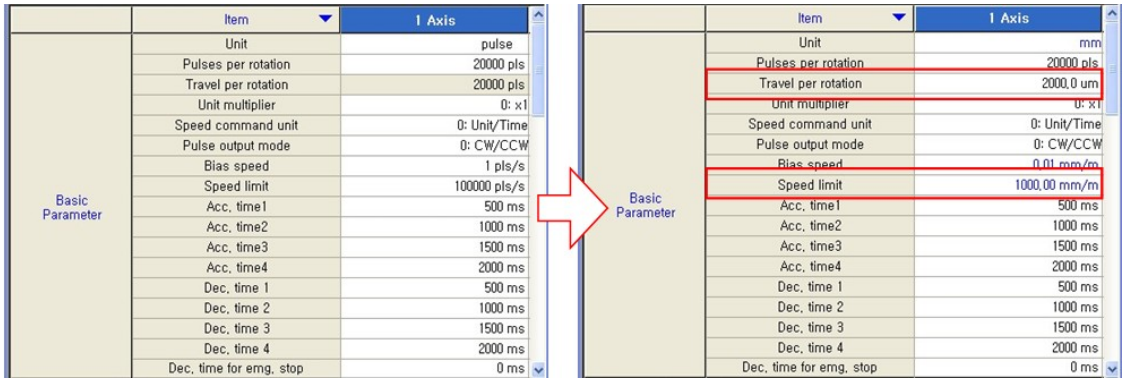
<XPM, network type XPM, standard network type XPM>



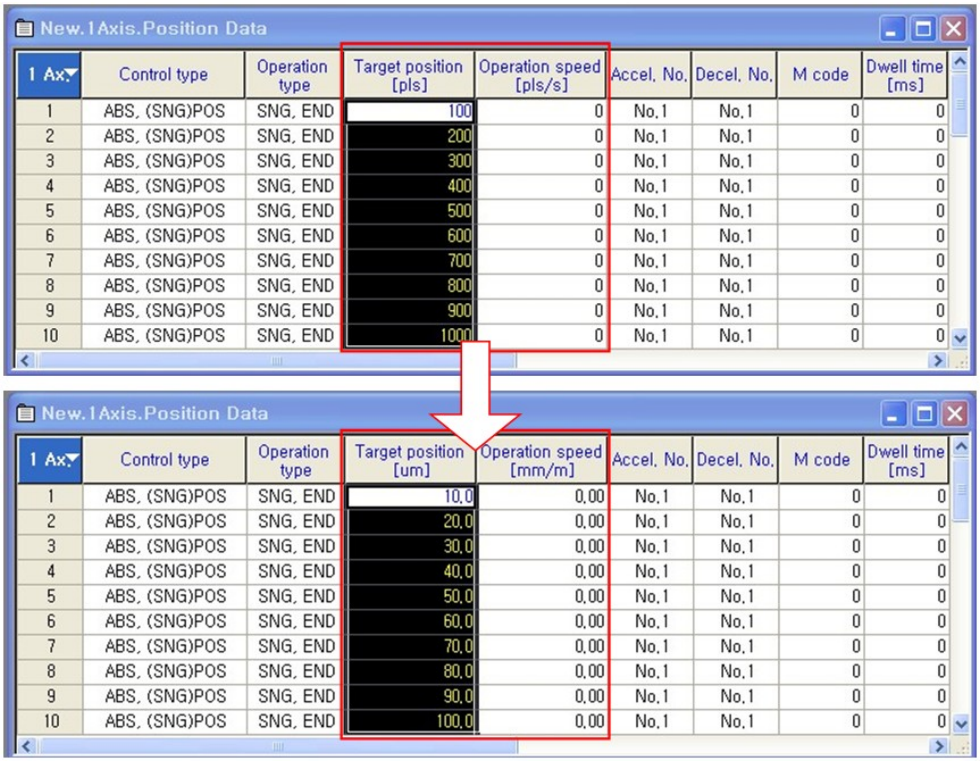
11.2.5 Unit Auto Changing Function

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 operation data of target position/operation speed item are automatically change by changing unit.

[Operation parameter editorial screen]



[Operation data editorial screen]



New.1Axis.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.1Axis.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

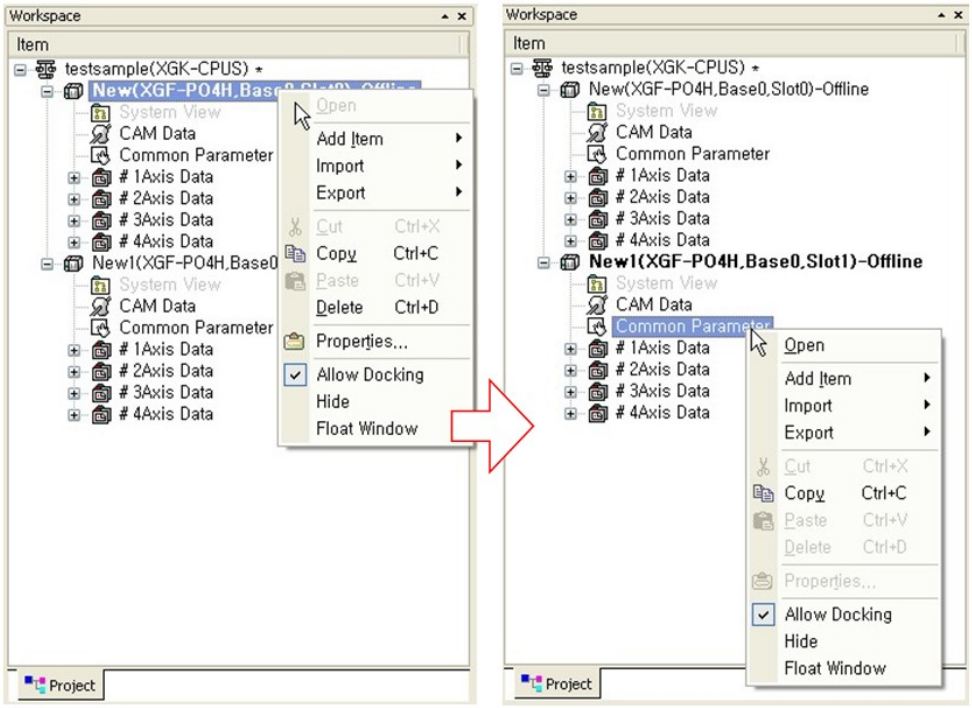
XG-PM provides useful data copy function when edit data item with XG-PM. Also provides not only copying each data item but copying each axis, copying module unit.

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

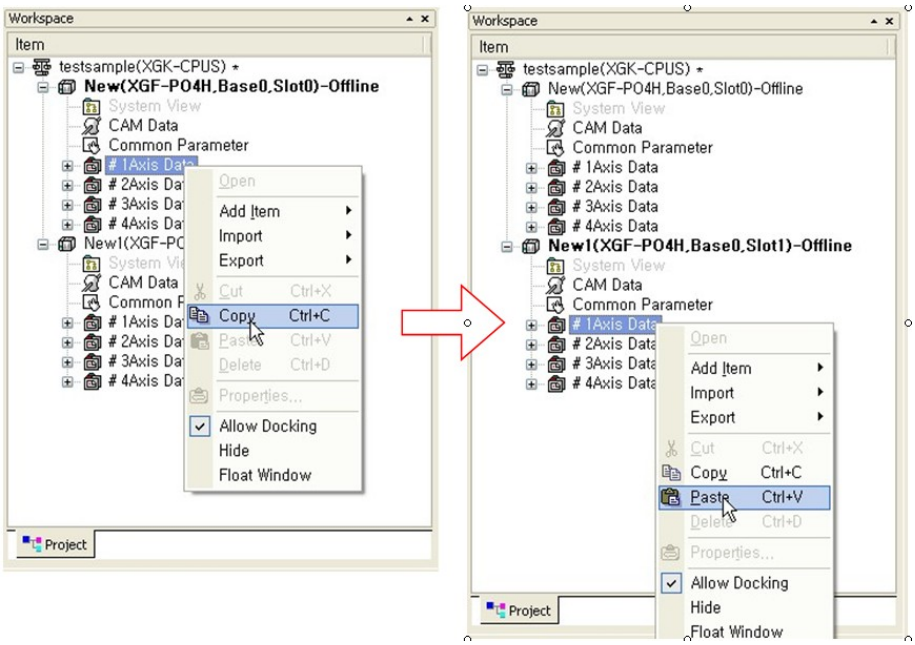
Perform copy for each item to CAM data/Common parameter/Operation data/Operation parameter.

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

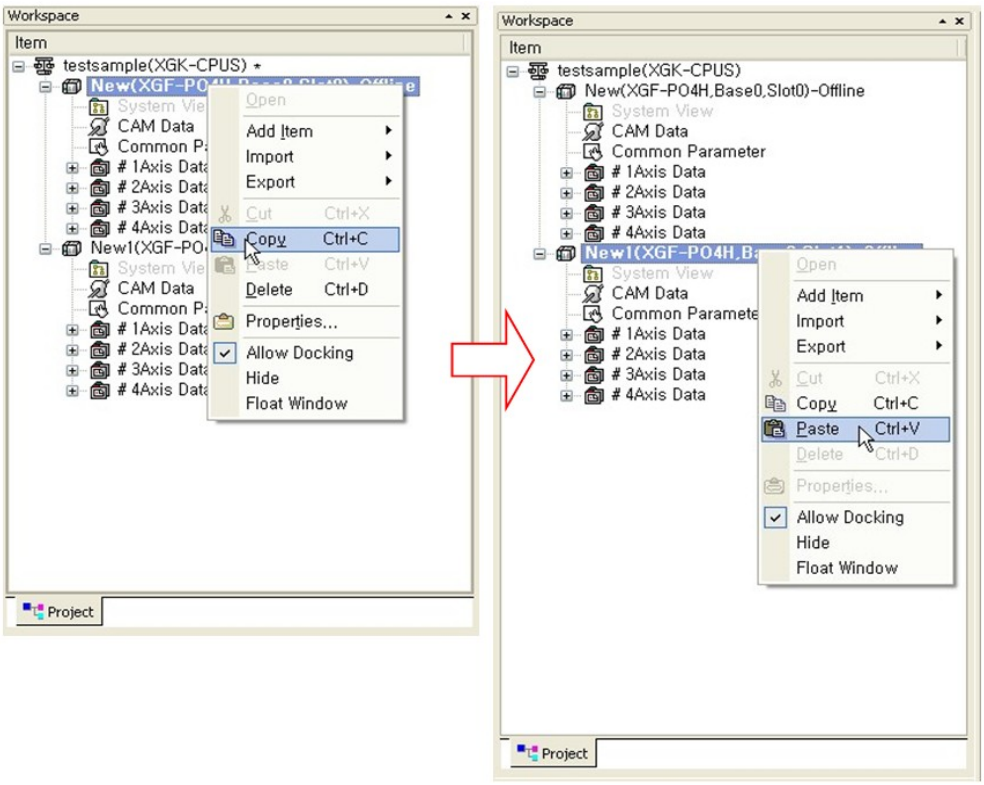
When copy axis unit data, both Operation data/Operation parameter data is copied.

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 operation data from axis 1 to axis 4/Operation parameter item data.

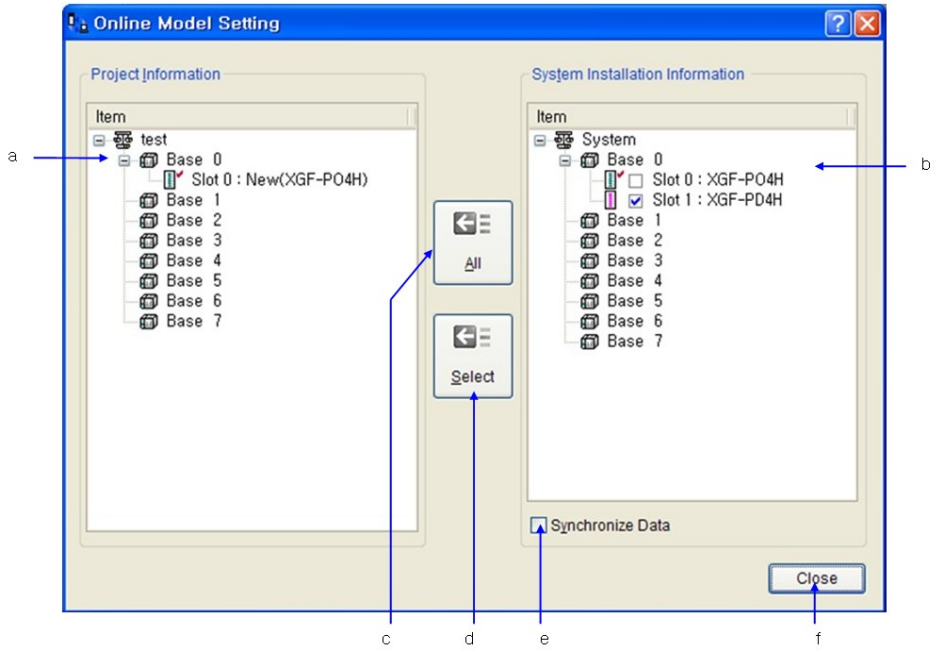
11.4 Online Model Setting

Online model setting function provides solution that it set onlined module on the current project and data which it is onlined 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

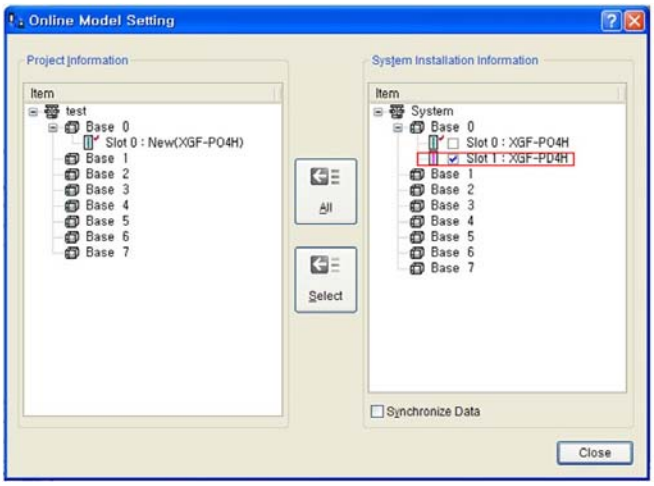
Module synchronize function recognize positioning module which it is exist on the PLC system and set that on the project.

(1) Synch of Select Module

[Sequence]

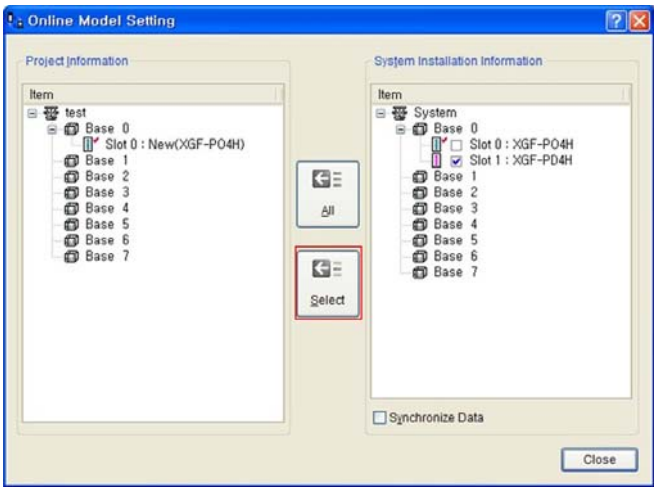
1) Create project.
2) Connect to PLC by [Online]->[Connect].
3) Proceed [Online]->[Online model setting].
4) Select module for synchronizing on online model setting communication box system equipment information window.

[Communication box]



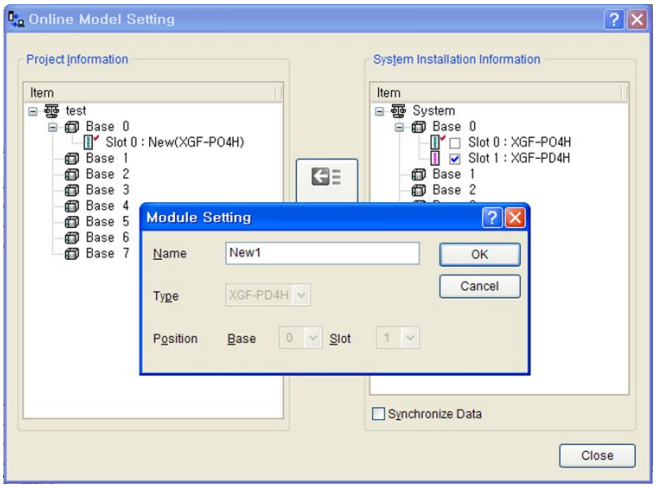
5) Click the select button for module synchronize.

[Communication box]



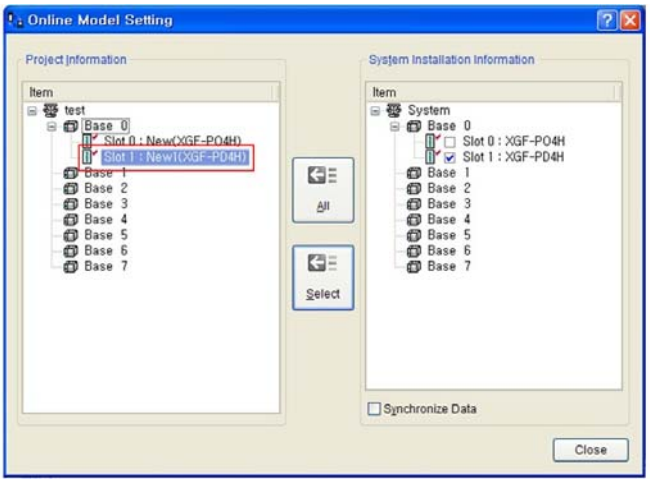
6) Set module name that it is need to synchronize and confirm.

[Communication box]



7) Confirm set module on the project.

[Communication box]



Notes

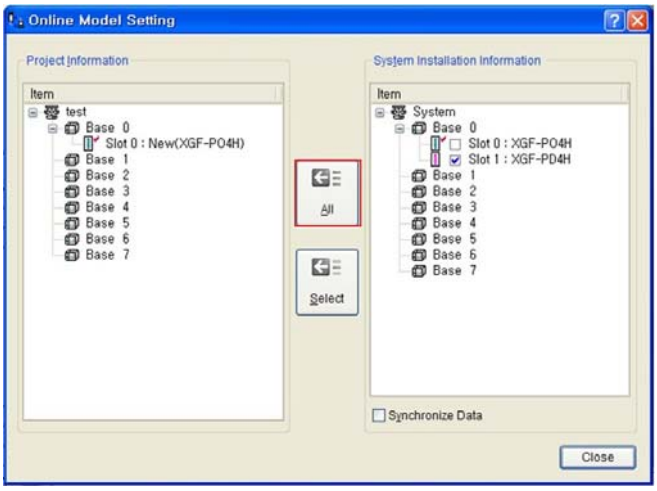
Module is automatically added to project tree when module is set on the project information after module synchronize.

(2) Synchronization of whole module

[Sequence]

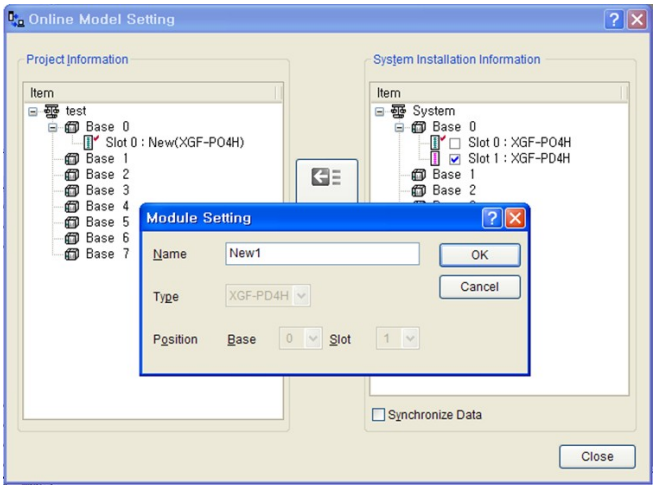
1) Create project.
2) Connect to PlC by proceeding [Online]->[connection].
3) Proceed menu [Online]->[online model setting].
4) Click Entire button for module synchronize.

[Communication box]



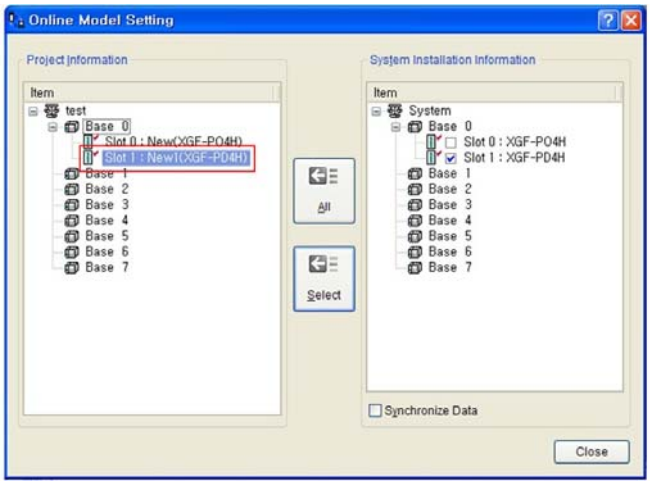
5) Set the module name for synchronize on module setting communication box and click.
(Then module communication box is revitalized as much as the number of module, set the each module name for each module.)

[Communication box]



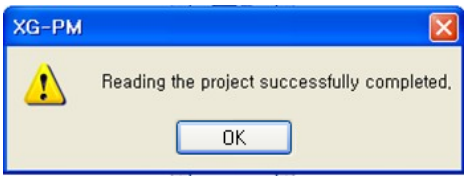
6.Confirm set module on the project.

[Communication box]



Notes

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



11.4.2 Data Synchro Function

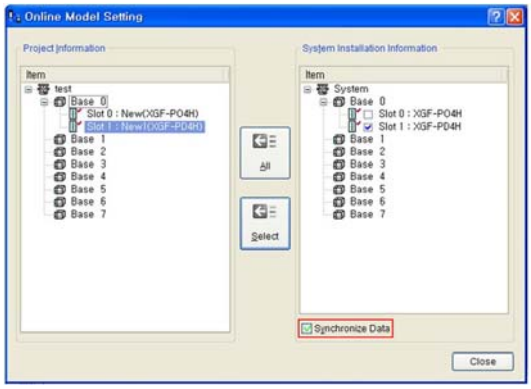
Provide setting function by read module data from PLC system.

(1) Data synch of selecting module

[Sequence]

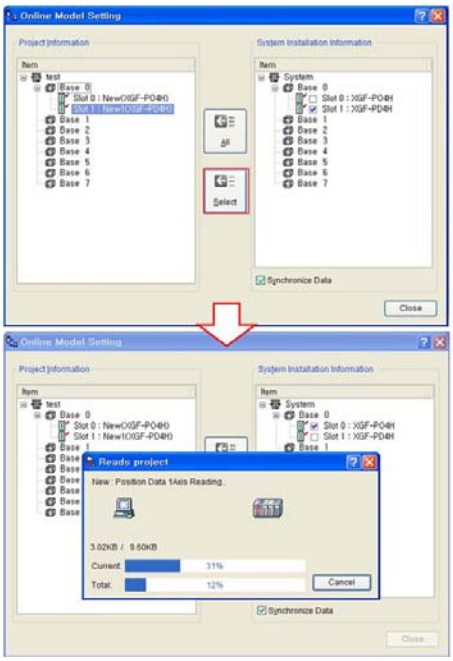
1. Create project.
2. Connect to PLC by menu [Online]->[Connection].
3. Proceed menu [Online]->[Online model setting].
4. Select module for synchronize on the online model setting communication box system equipment information window.
5. Check data synchronize item.

[Communication box]



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

[Communication box]



Notes

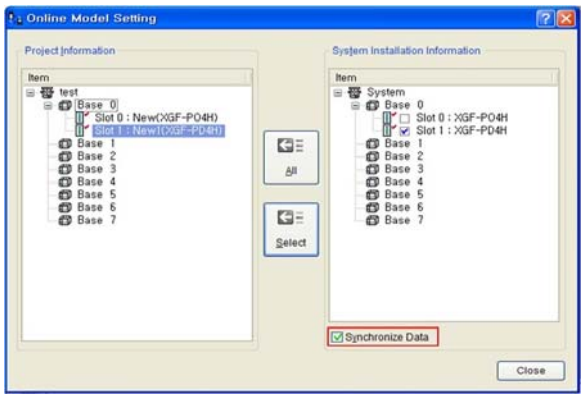
When proceed module synchronize function, if check data synchronize item, then proceed module synchronize and data synchronize at the same time.

(2) Data synch of whole module

[Sequence]

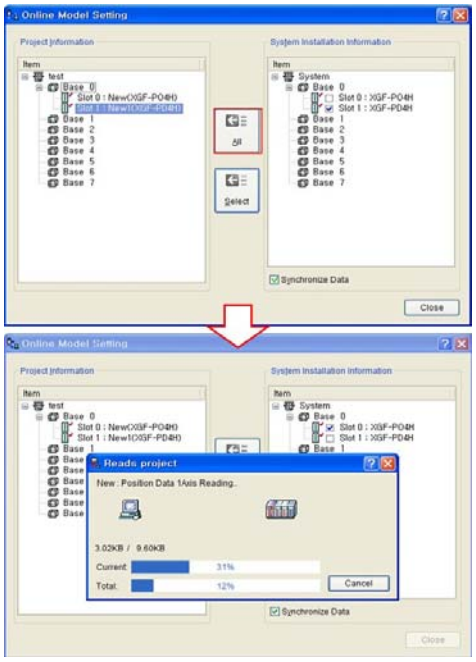
1. Create project.
2. Connect to PLC by proceeding [Online]->[Connection].
3. Proceed [Online]->[Online model setting].
4. Check data synchronize item.

[Communication box]



5. Read data from module by click the selecting button.

[Communication box]



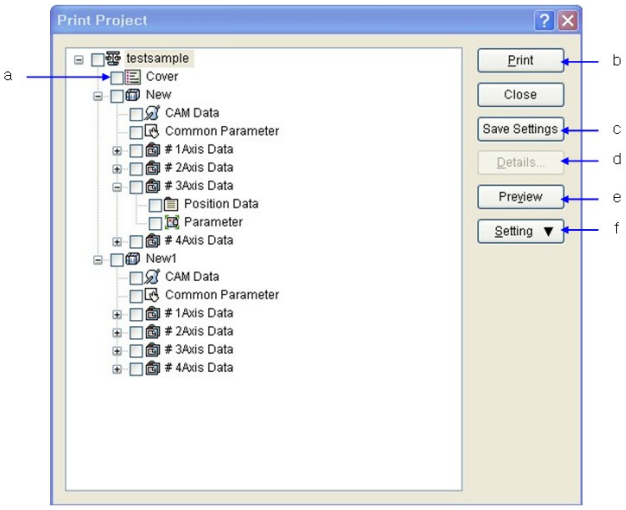
11.5 Project Printing

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]->[Project printing].
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.

[Communicarion box]

[Communication box description]

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

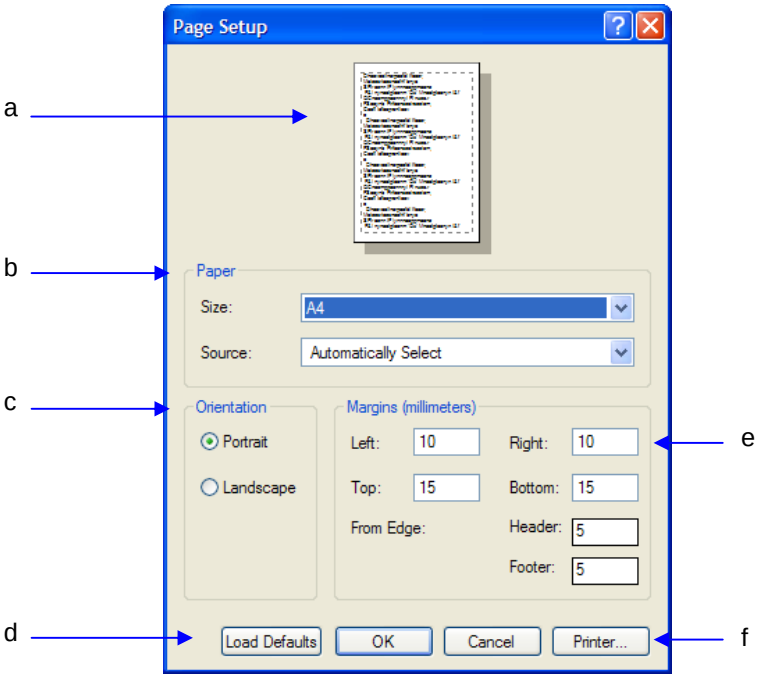
11.5.2 Space Setting

Set space for printing paper.

[Sequence]

1) Execute page setting 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.

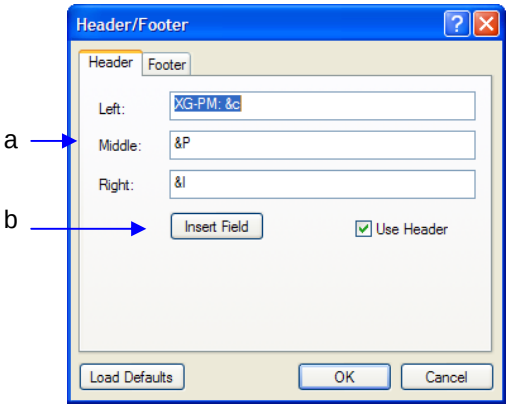
11.5.3 Header/Footer Setting

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.

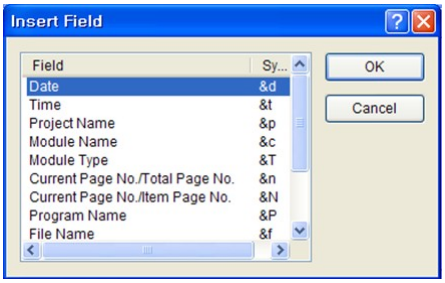
[Communication box]



[Communication box description]

a) Explain content: Input contents on the left/center/light 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: Print as "&d-> yyyy-mm-dd".
   (2) Time: Print as "&t -> 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.

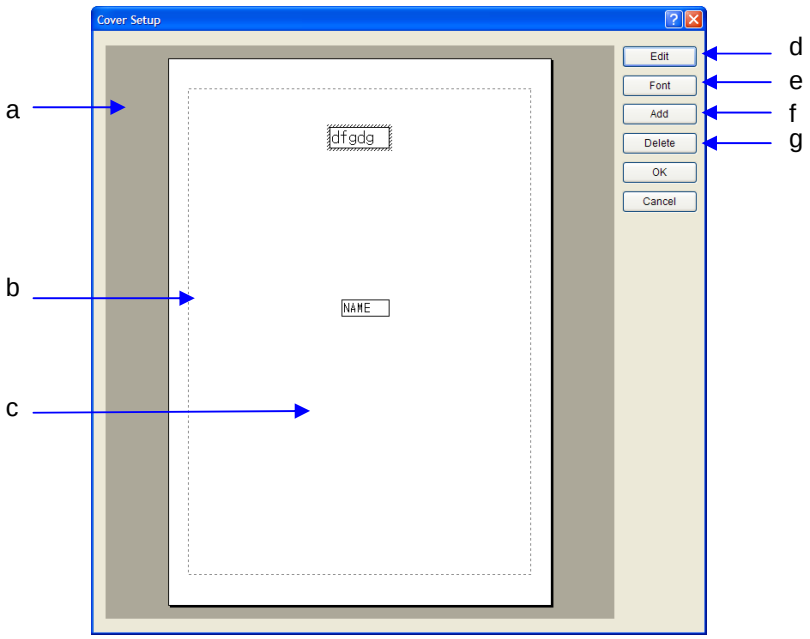
11.5.4 Cover Printing Setting

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]

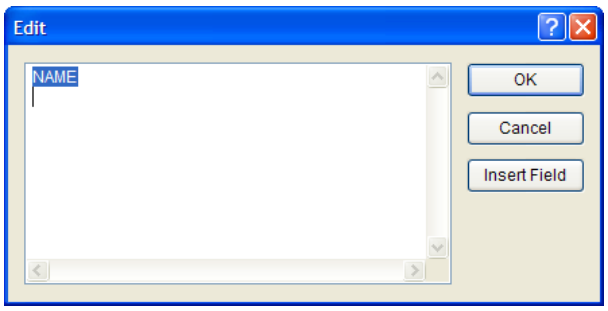


[Communication box description]

1) Cover paper: Basically A4 vertical direction. It depends on paper setting.
2) Margin indication: Set margin is displayed by dotted line.
3) Editorial box: That is preview. Content, Font, Position can be changed.
4) Editorial button: Content of editorial box can be changed.
5) Font button: It is possible that font of selected editorial box change.
6) Addition: Can add new editorial box of cover page.
7) Delete: Can delete selected editorial box.

[Add contents sequence]

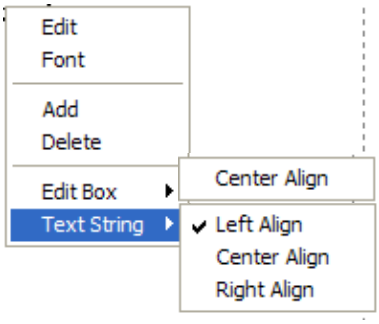
1) Click the [Add] button.
2) Mouse pointer move to paper.
3) Mouse pointer change to next.
4) Click the paper by mouse left button.
5) Editorial communication box is appeared.



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

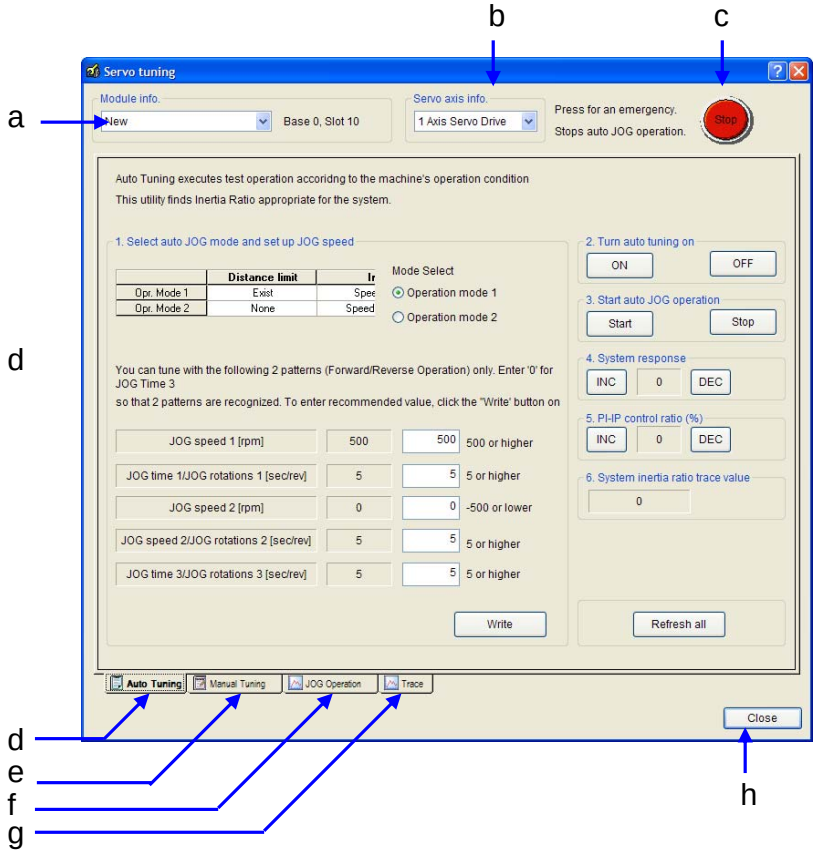
11.6 Servo Tuning (Only Applied to Network Type XPM)

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 : select the module connected to the servo drive.
b) Servo drive information : select 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.

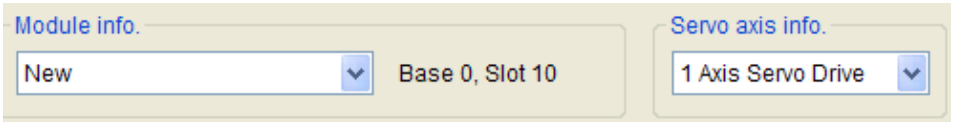
11.6.1 Select Servo Drive for Tuning

Select a servo drive for tuning

[Sequence]

a) Select the module connected to a servo for tuning at the “Module Information” list.
b) Select a servo for tuning at the “Servo Axis Information”

[Dialog box]



Tip

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

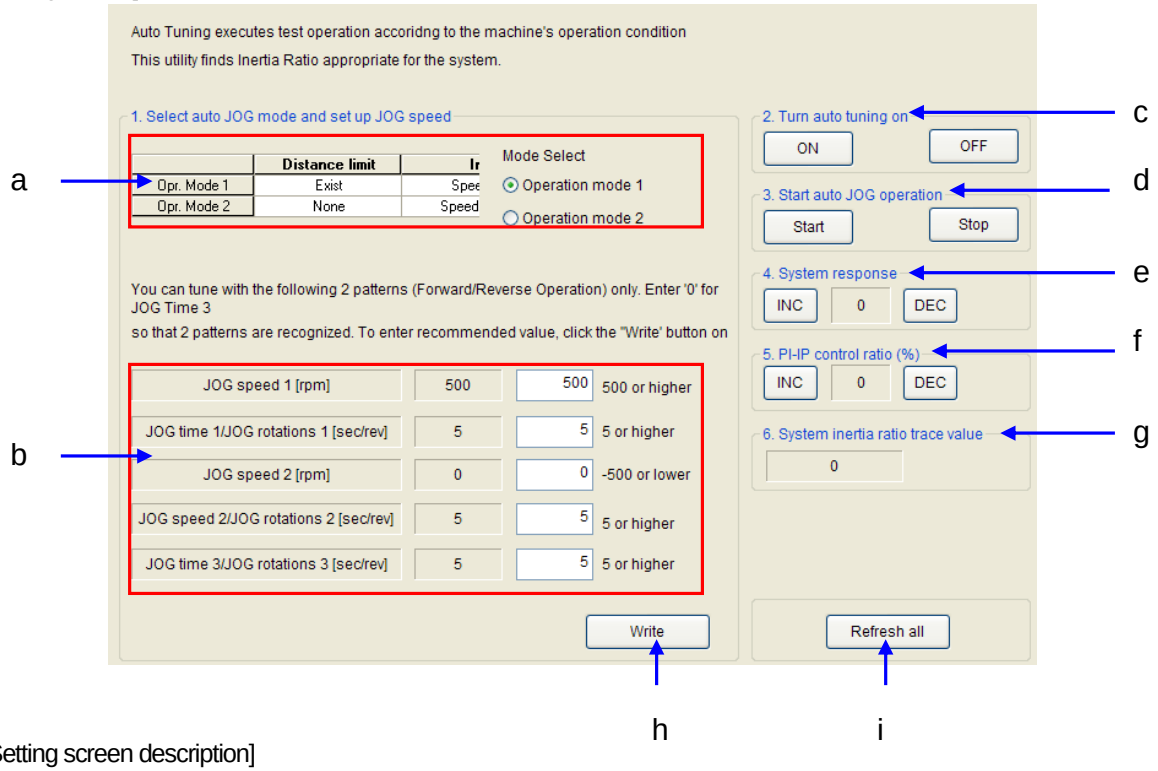
11.6.2 Auto-Tuning

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

[Sequence]

a) Activate the auto-tuning tap

[Setting screen]



[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) Auto tuning ON setting : activates the auto tuning function (ON button) or not (OFF button)
d) Auto JOG operation start : 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".

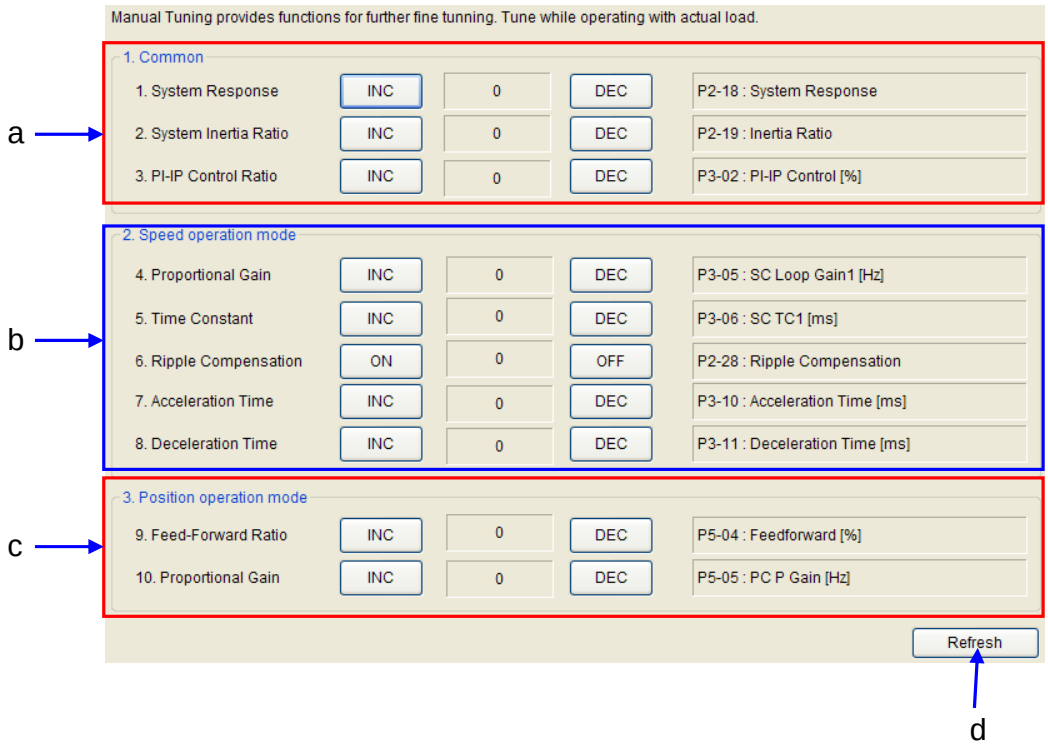
11.6.3 Manual Tuning

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]



[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.

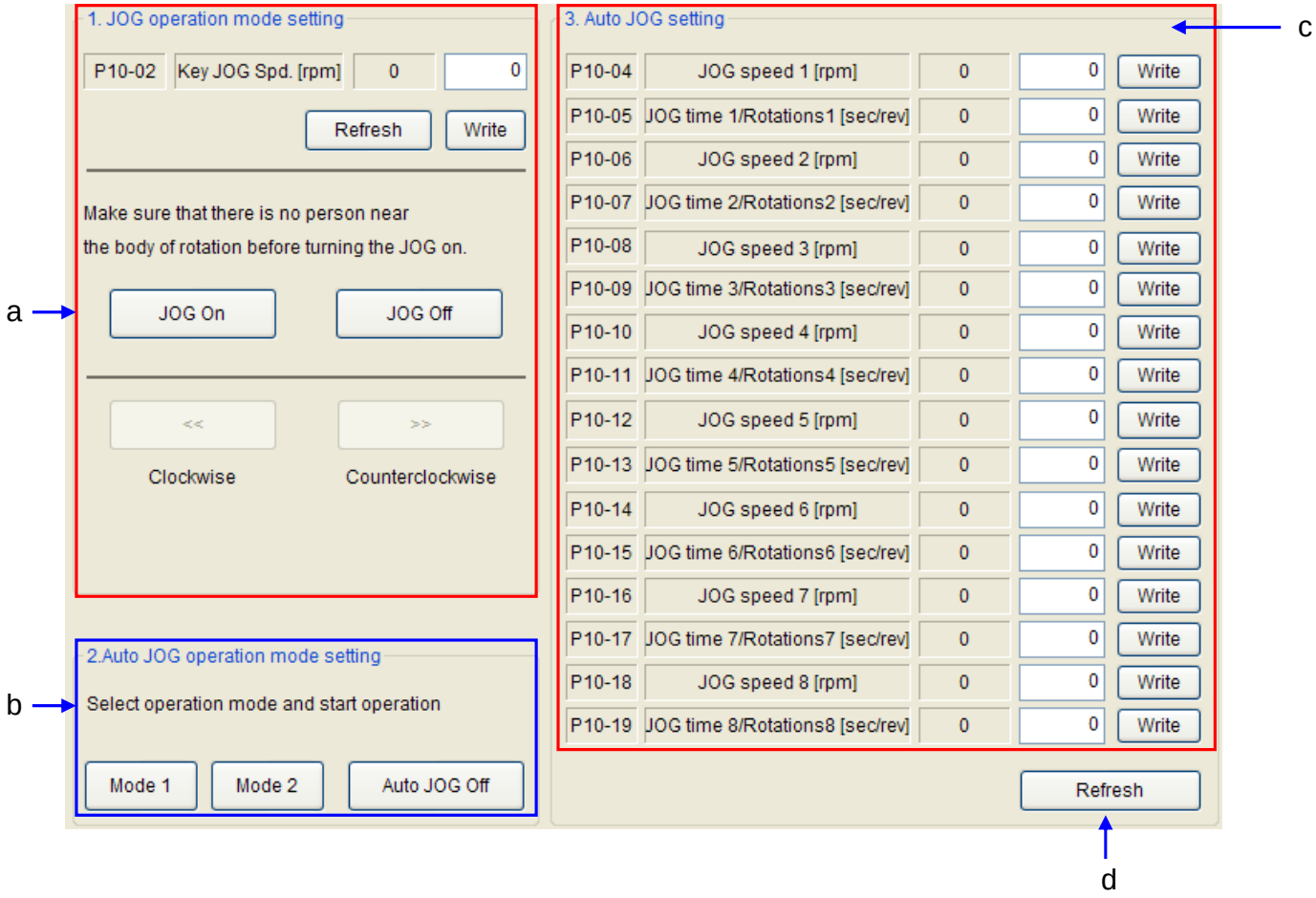
11.6.4 JOG operation

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]



[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

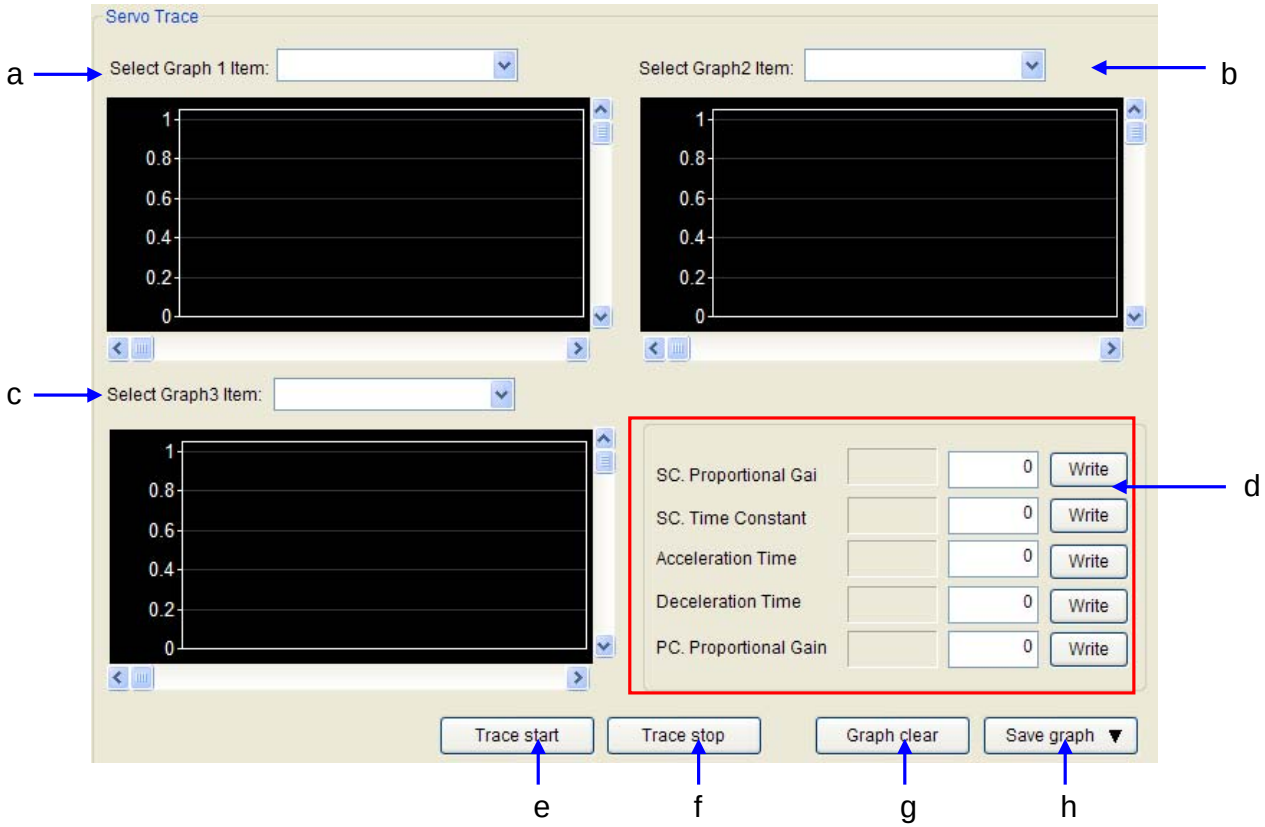
11.6.5 Trace

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 Trend monitor

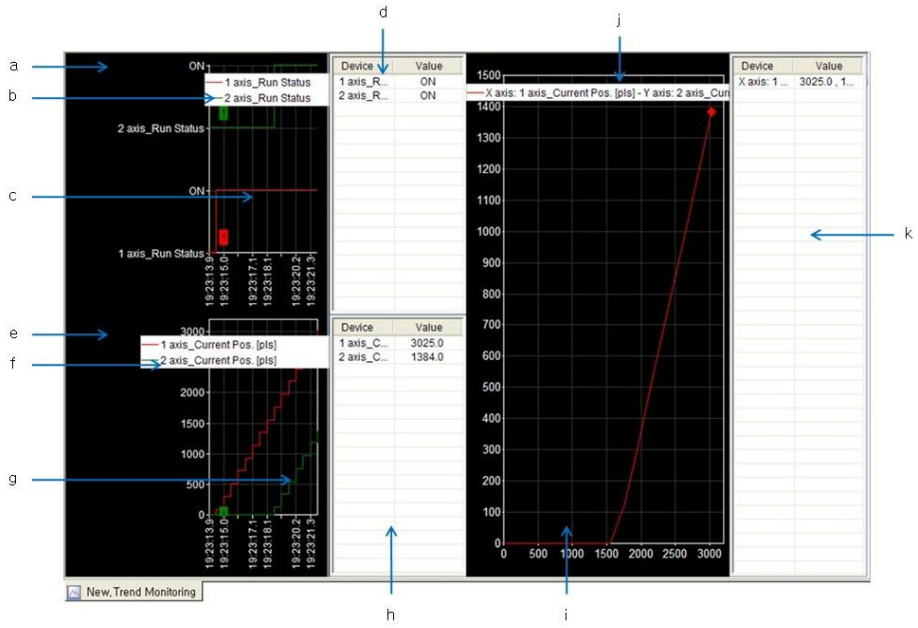
Trend monitor read data from module with online and display graph. Trend monitor window compose by bit graph, trend graph, XY graph.
Bit graph: Display On/Off of bit type device by step graph.
Trend graph: Word type device value change to selected device type and display changing. Trend graph display changing value by device value change to changed data type.

11.7.1 Begin to Trend Monitor

[Sequence]

1) Online module.
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

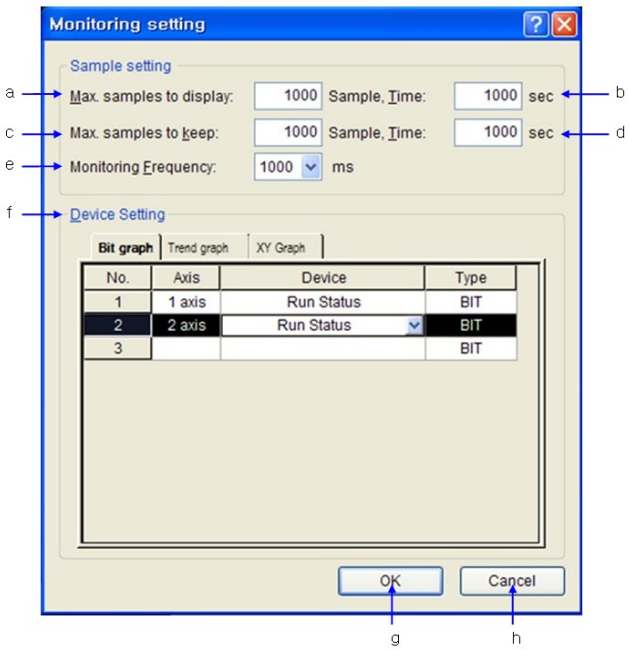
The data which is displayed on the trend monitor can be different with real data. If you want to monitor correct timing, then use data trace function.
Refer to this manual 11.8 for data trace function.

11.7.2 Trend Monitor Setting

[Sequence]

1) Proceed menu [Graph]-[Trend device setting].

[Communication box]

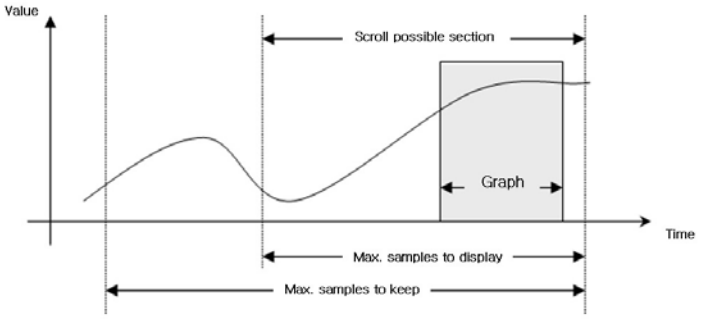


[Communication box description]

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.

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) 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

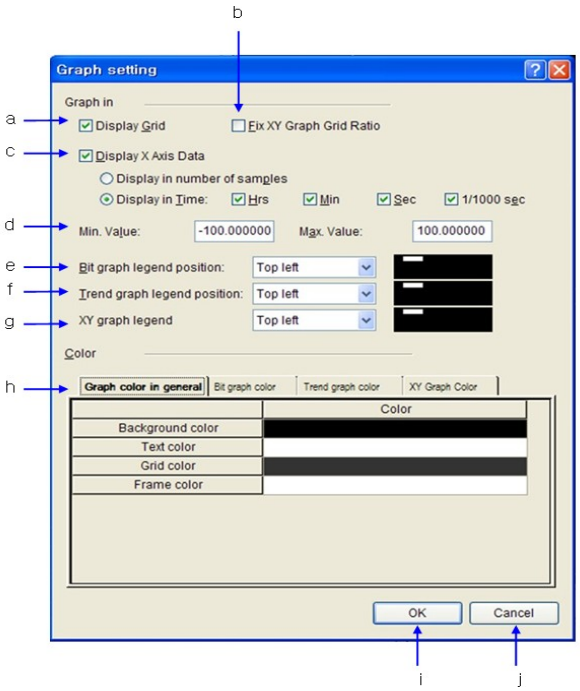
1. Need to device setting for registration of axis X device and axis Y device on the XY graph.
2. Axis X/Y device can select only one device which is set on the trend graph tab.

11.7.3 Graph Setting

[Sequence]

1) Proceed menu [Graph]-[Graph setting].

[Communication box]

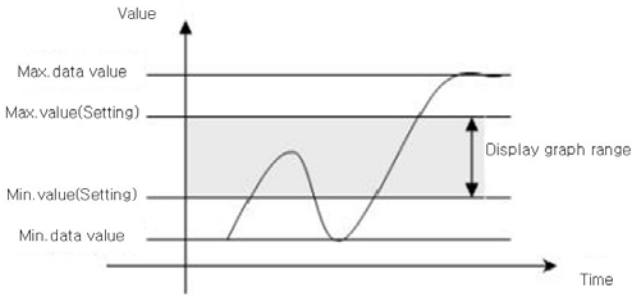


[Communication box description]

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.

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.

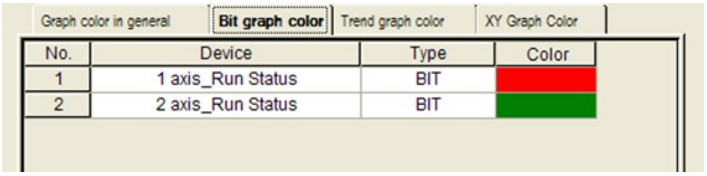


e) Bit graph legend position: Set index position of bit graph.
f) Trend graph legend position: Set trend graph index position.
g) XY graph legend: Set position of XY setting graph.
h) Color setting: Set device color of each graph.
i) OK: Close communication box after applying changing.
j) Cancel: Close communication box.

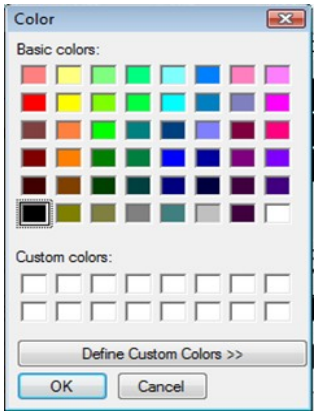
(1) Graph Color Setting Method

[Sequence]

1) Select device for changing color.



2) Click color line. Communicator be display with clicking color line. Confirm after select color.



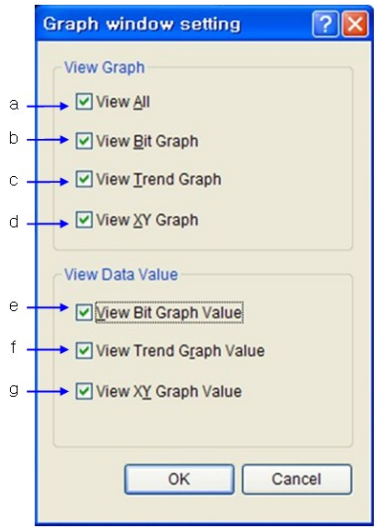
11.7.4 Setting Graph Window

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.

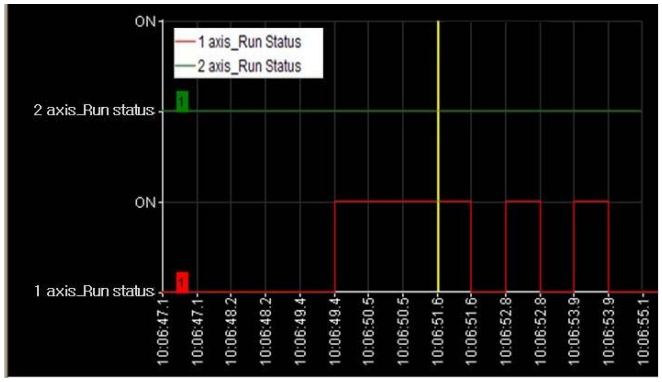
11.7.5 Graph Function

(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

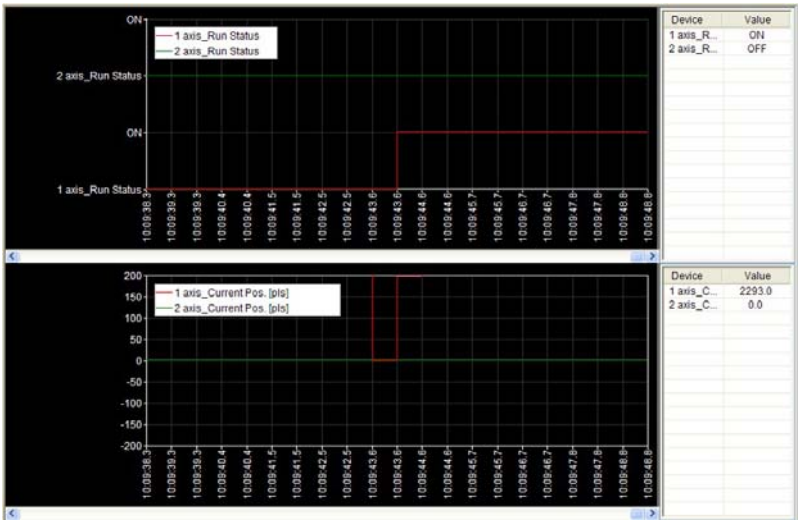
Show cursor function revitalize only when monitor/trend monitor is ended.

(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.

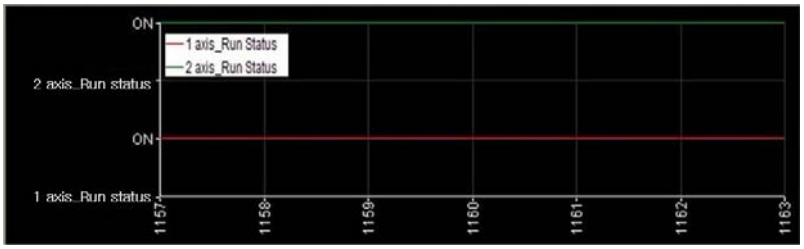


(3) Magnification control of axis X

Control magnification of axis X.

[Sequence]

1) Proceed menu [Graph]->[Expansion of axis X], [reduction of axis X], [as original axis X]. Time interval of axis X is expansed or reducted by selected item.

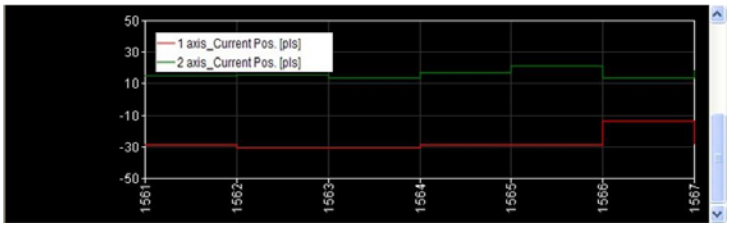


(4) Magnification control of axis Y

Control magnification axis Y.

[Sequence]

1) Proceed menu [Graph]->[Expansion of axis Y], [reduction of axis Y], [as original axis Y]. Time interval of axis Y is expansed or reducted by selected item.

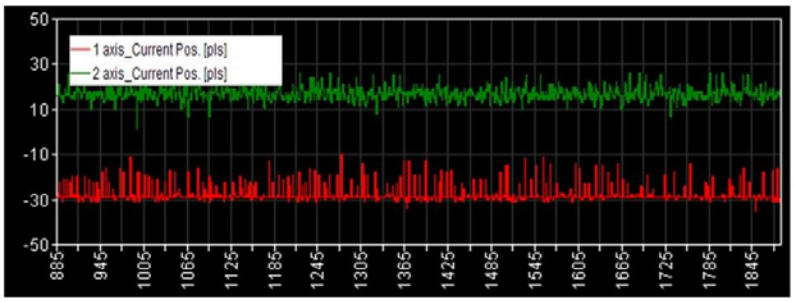


(5) Auto align of axis X

Set auto align of axis X or not. Horizontal scroll bar is disappeard after auto aligns and whole data can show at once.

[Sequence]

1) Proceed menu [Graph]->[Auto align axis X].



(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 align of Axis Y].

Notes

Trend graph is displayed by min/max value which is set unless auto align of axis Y.

(7) Save bitmap

Save graph on the current screen as bitmap file.

[Sequence]

1) Proceed menu [Graph]->[Save bitmap].
2) Confirm button after saving file.

(8) Save text

Save graph data as text file. Samples are saved as the number of set maximum sustained samples.

[Sequence]

1) Proceed menu [Graph]->[Save 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 clipboard].

11.8 Data Trace

(only applied to XPM, network type XPM, standard network type XPM)

Set device for trace and trace codition 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 11.7), 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 11.7.2 for detail.
Write setting on the module	Record to module about trace setting item. Refer to 1) Write to trace setting of this manual 11.7.8 for detail.
Start to trace	Start to trace. Start automatically by set trigger condition or select manual trace. Refer to 11.7.2 for trace setting, refer to 11.7.8 for manual trace.
Read data	Read trace data from module. Refer to 11.7.8 for 3) Read trace.
Operating graph (Data analysis)	Refer to 11.7.9 for detail.

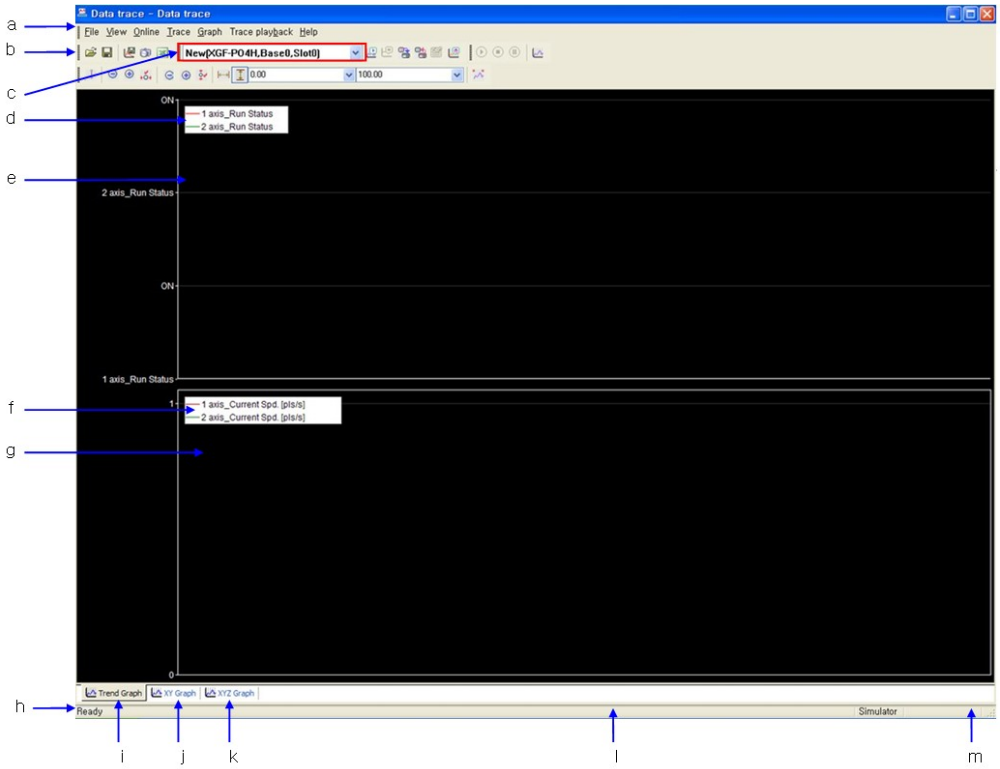
[Sequence]

1) Proceed menu [Monitoring]->[Data trace].

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.

[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.

11.8.1 Connection

[Sequence]

1) Proceed menu [Online]->[Connect].

Notes

When proceed XG-PM [Monitoring]->[Data trace], automatically proceed [Online]->[Connect].

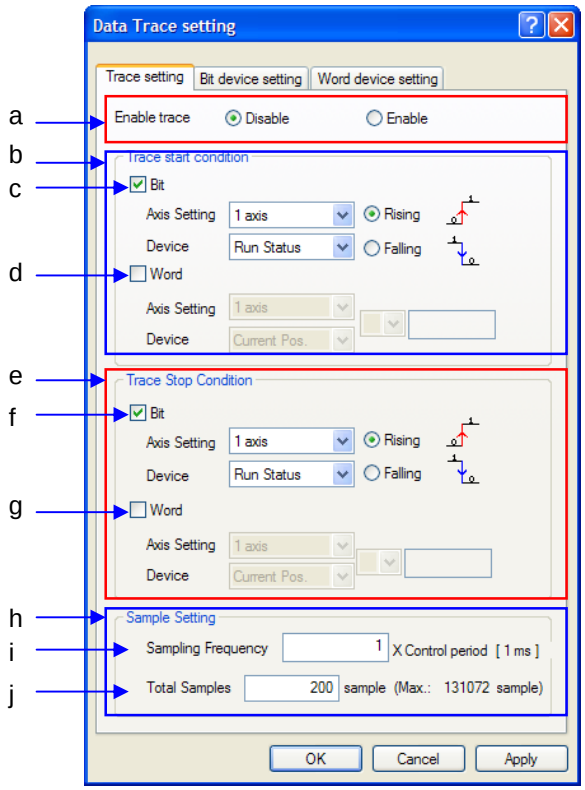
11.8.2 Trace setting

Set trace condition and trace device.

[Sequence]

1) Data trace menu [Trace]->[Trace setting].

[Communication box]



[Communication box description]

a) Permit 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 onlined, 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) Set trigger condition. Can select rise or fall as trigger condition. (Rise: device value change to 1 from 0, Fall: 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 constant that it is compared with word device.
4) Select condition that it is compared with inputted constant.
   Available select function is as follows:.
   <(Small), <= (Small or equal), ==(equal), >=(Big or equal), >(Big)

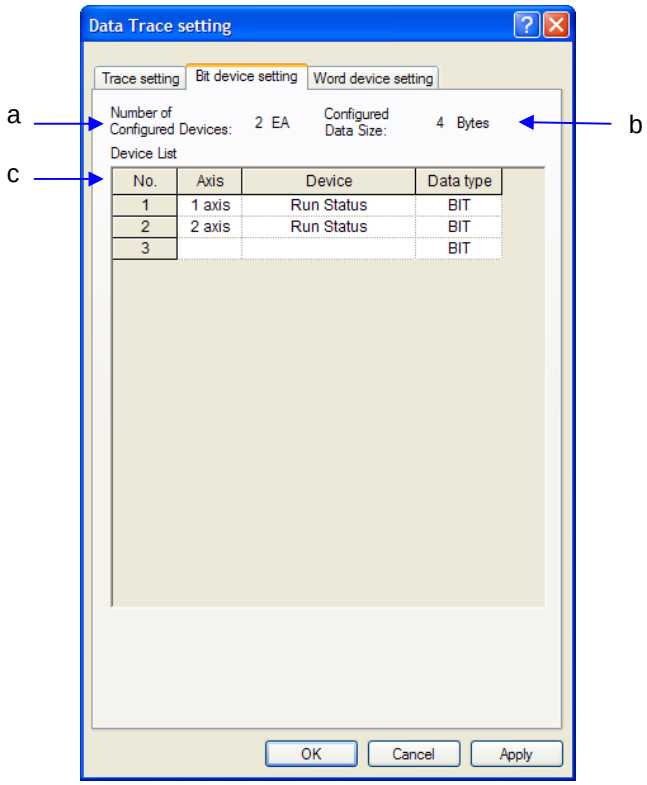
(3) Bit device setting

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]



[Communication box description]

a) The number of setting devices: Display the number of set devices.
b) Setting data size: Display setting data size. If need to set devices more than one, it is displayed by 2 byte.
c) Device catalogue: Display set device catalogue.

Notes

Device can be set max 8 with word device and bit type device.

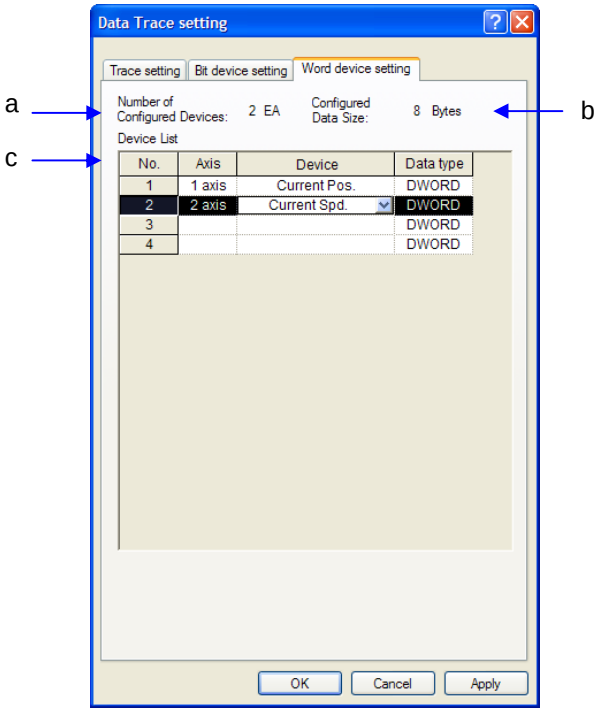
(4) Word device setting

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]



[Communication box description]

a) The number of setting devices: Display the number of set word devices.
b) Setting data size: Display setting data size. Size is decides by set data type.
c) Device catalogue: Display set word device catalogue.

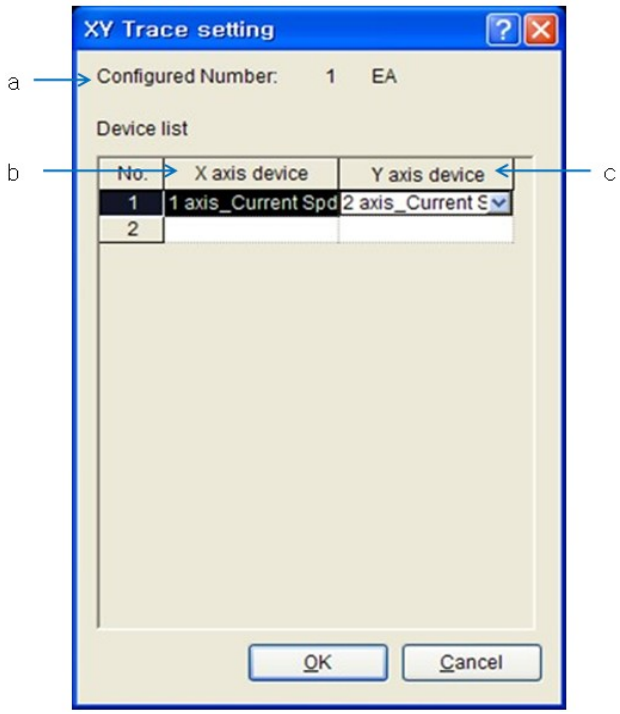
11.8.3 XY Trace Setting

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.

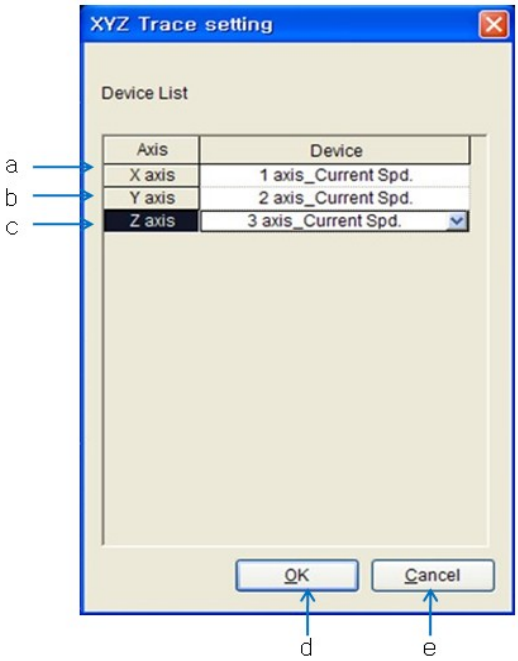
11.8.4 XYZ Trace Setting

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.

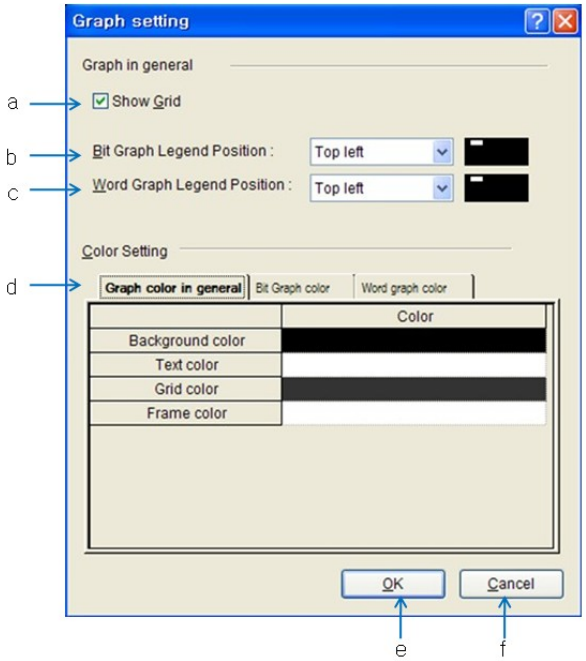
11.8.5 Graph Setting

Set graph of trend graph tab.

[Sequence]

1) Revitalize trend graph tab.
2) Proceed menu [Graph]->[Graph setting].

[Communication box]



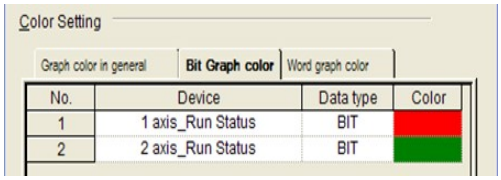
[Communication box description]

a) Show grid: Decides whether setting display grid on the screen or not.
b) Bit graph legend position: Set position of bit graph index.
c) Word graph legend position: Set position of trend graph index.
d) Color setting: Set general color and device color of graph background.
e) OK: Apply change and close communication box.
f) Cancel: Close communication box.

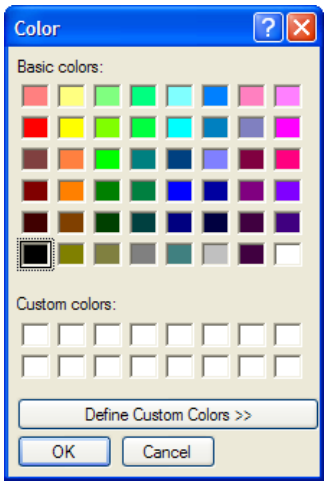
(1) Graph color setting method

[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.



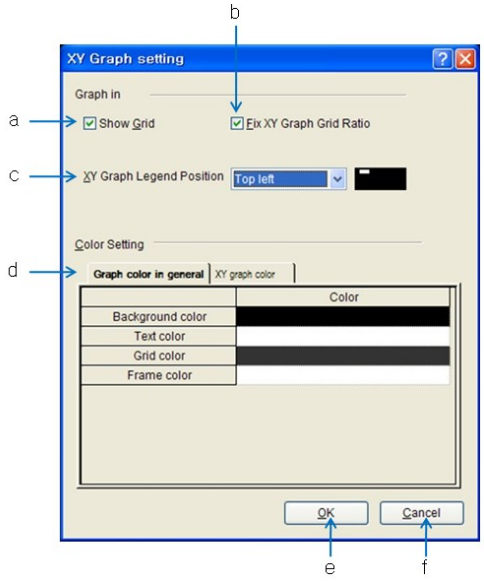
11.8.6 XY Graph Setting

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 backround.
e) OK: Close communication box after setting.
f) Cancel: Close communication box.

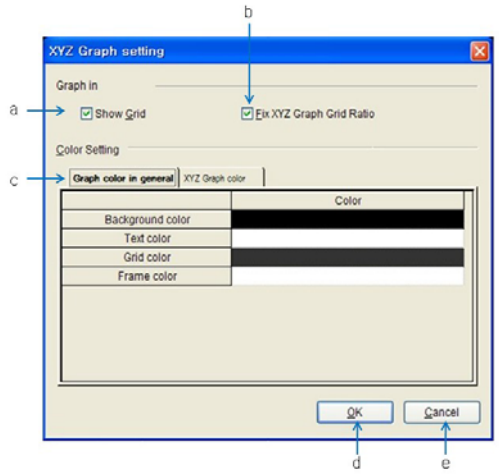
11.8.7 XYZ Graph Setting

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.

11.8.8 Trace

Read traced data from module or read setting.

(1) Write trace setting

Apply trace setting to module.

[Sequence]

1) Proceed menu [trace]->[Writing trace setting].

(2) Read trace setting

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) Reading Trace

Read data of trace result from module.

[Sequence]

1) Proceed menu [Trace]->[Reading trace].

(4) Starting manual trace

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) Stopping manual trace

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.

11.8.9 Playing Trace

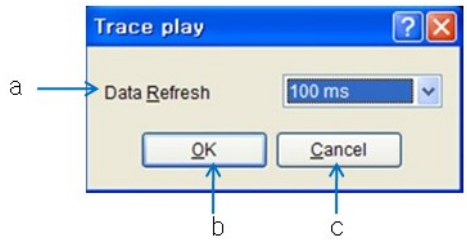
It is displayed by trace data that it read from module with time.

(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].

11.8.10 Graph Function

Refer to graph function (11.7.4) of this manual 11.7 trend monitor.

11.8.11 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) Saving

[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) Save bitmap

Save present graph as bitmap file.

[Sequence]

1) Proceed menu [file]->[out] ->[Save bitmap].
2) Input file name what you need to save and confirm.

(5) Save 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]->[Out] ->[Save text].
2) Input file name what you need to save and confirm.

(6) Copy clipboard

Graph on the present screen, Copy to window clipboard.

[Sequence]

1) Proceed menu [File]->[Out] ->[Copy clipboard].

11.8.12 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/recycle tool.

(2) View status bar

[Sequence]

1) Select/Cancellation menu [View]->[Status bar].

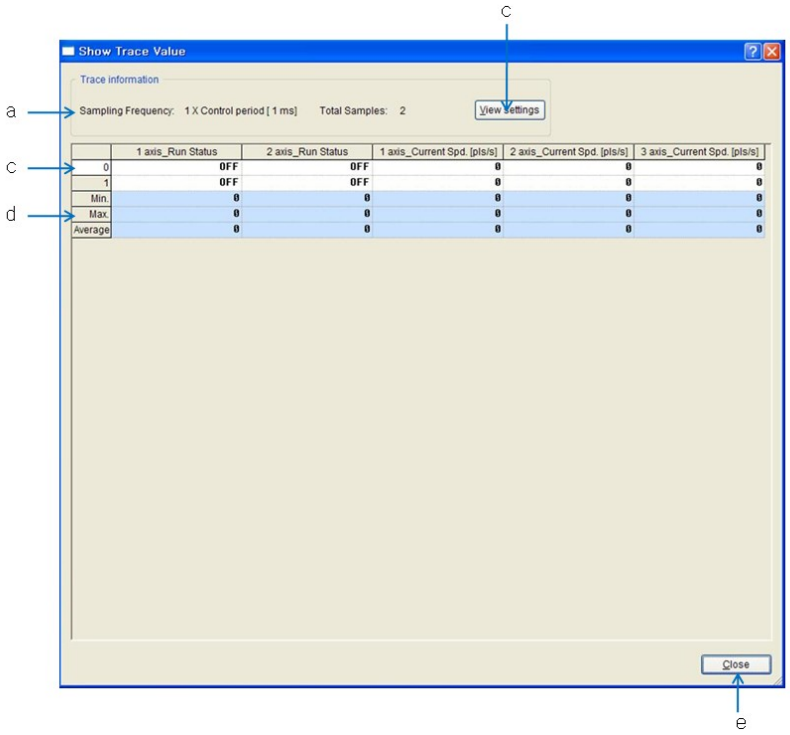
(3) View data

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.
The number of total samples: Display the number of collected total samples.
b) View settings: Display trace setting communication box.
c) 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.
d) Min/Max data, average value.
e) Close: Close communication box.

11.9 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
Select CAM block	Select one of 8 CAM block for setting.
Setting CAM control mode	Set CAM control mode. When make increasing profile to one direction or repeat one section, set repeat mode.
Setting Main axis/Sub axis parameter	Set main/sub parameter. Refer to 8.4 electronic CAM setting for details.
Setting CAM block data (Considering characteristic curve)	Set CAM data of selected block. Refer to 8.4 electronic CAM setting for details.
Creating profile	Create CAM profile by set blockdata.
Confirm graph and data	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.
Download CAM block data	Download profile to module.
Operating CAM by command	Operate CAM profile that it is saved on module by command.

11.9.1 Creating electronic CAM profile

Refer to 8.4 electronic CAM setting for CAM data setting and CAM profile creation proceeding.

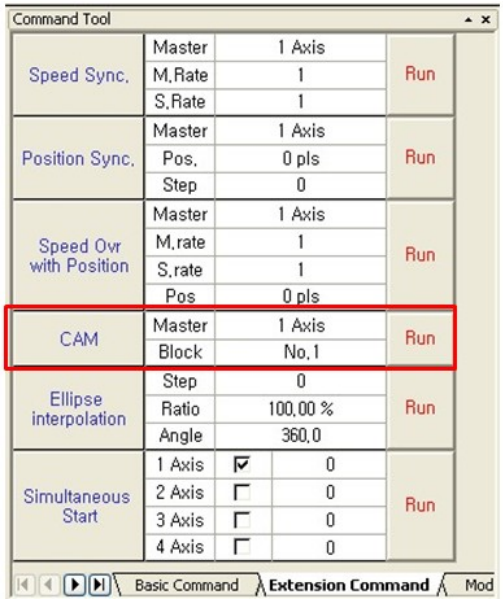
11.9.2 Proceeding electronic CAM

Operate electric CAM of XG-PM after downloading CAM profile to module XG-PM.

[Sequence]

1) Select axis command. (Select from command tool)
2) Set main axis from item of expansion command window CAM operation.
3) Select CAM block.
4) Click confirm button.

[Setting screen]



11.10 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 Servo 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	APD-L7E
	APD-VE
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 8.5 network parameter setting.

Appendix 1 What is the difference between APM software package and XG-PM.

Appendix1.1 Difference

PADT / Item	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)
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.

Appendix1.2 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

(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 >> Registeration 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	-

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	Initilizes data of the selected shell area and copy data to clipboard	Common
	Copy	Copies data to clipboard	Common
	Paste	Copies data from cllipboard to the selected shell area	Common
	Initial value setup	Initilizes 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

3. 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
	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

4. 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
	Trend monitor	Executes trend monitoring	Common
	Data trace	Specifies the device and monitors the data change of that device	XPM, Network type XPM

5. Trend toolbar

Command icon	Command	Description	Remark
	Start trend monitoring	Starts (restarts) trend monitoring	Common
	Stop Trend monitoring	Stops (pauses) trend monitoring	Common

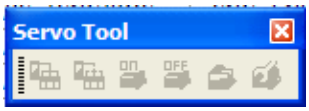
6. View toolbar

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
	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

7. 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

8. Servo toolbar



Command icon	Command	Description	Remark
	Connect to all servo	Connects all servo drives connected to the module	Network type XPM
	Disconnect to all servo	Disconnects all servo drives connected to the module	Network type XPM
	Servo on	Turn on the selected axis servo	Network type XPM
	Servo off	Turn off the selected axis servo	Network type XPM
	All servo station setting	Sets up station number of all servo	Network type XPM
	Servo tuning	Tunes servo drive	Network type XPM

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

LSIS considers the environmental preservation as the preferential management subject and every staff of LS Industrial Systems use the reasonable endeavors for the pleasurably environmental preservation of the earth.

About Disposal

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.

http://eng.lsis.biz

LS IS

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※ LSIS constantly endeavors to improve its product so that information in this manual is subject to change without notice.

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