

Motion Controller

GM1 Controller EtherCAT
User's Manual

Setup Edition

(MEMO)

Introduction

Thank you for purchasing a Panasonic product. Before you use the product, please carefully read through the installation instructions and the manuals, and understand them in detail to use the product properly.

Types of Manual

- There are different types of manuals for the GM1 series, as listed below. Refer to the appropriate manual according to your need.

These manuals can be downloaded from our website: <https://industrial.panasonic.com/ac/e/motor/motion-controller/mc/gm1/index.jsp>

Manuals for GM1 series

Manual name	Manual code	Description
GM1 Controller EtherCAT User's Manual (Setup Edition)	WUME-GM1ETCSU	Explains wiring between the GM1 and its peripheral devices, installation method, and operation check method.
GM1 Controller EtherCAT User's Manual (Operation Edition)	WUME-GM1ETCOP	Explains how to use GM Programmer and PANATERM Lite for GM, set up each function, create projects, and perform other operations.
GM1 Series Reference Manual (Hardware Edition)	WUME-GM1H	Explains the functions and performance of each GM1 unit.
GM1 Series Reference Manual (Instruction Edition)	WUME-GM1PGR	Explains the specifications of each instruction that can be used with the GM1 Series.
GM1 Series Reference Manual (Analog I/O Unit)	WUME-GM1AIO	Explains the functions and performance of each GM1 Analog Expansion Unit.
GM1 Series Reference Manual (Pulse Output Unit)	WUME-GM1PG	Explains the functions and performance of each GM1 Pulse Output unit.

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1 Before Using This Product



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1.1 Safety Precautions





1.1 Safety Precautions










This section explains important rules that must be observed to prevent personal injury and property damage.

- Injuries and damages that may occur as a result of incorrect use are classified into the following levels and safety precautions are explained according to the level.

 WARNING	Indicates that there is a risk of death or serious injury
 CAUTION	Indicates that there is a risk of minor injury or property damage






	Indicates an action that is prohibited
	Indicates an action that must be taken

 WARNING	
	<ul style="list-style-type: none"> • Take safety measures outside this product to ensure the safety of the entire system even if this product fails or an error occurs due to external factors.
	<ul style="list-style-type: none"> • Do not use this product in atmospheres that contain flammable gases. Doing so may result in explosion.
	<ul style="list-style-type: none"> • Do not throw this product into the fire. Doing so may cause the batteries or other electronic parts to explode.

 CAUTION	
	<ul style="list-style-type: none"> • To prevent abnormal heat generation or smoke generation, use this product with some leeway from the guaranteed characteristics and performance values of the product.
	<ul style="list-style-type: none"> • Do not disassemble or modify this product. Doing so may result in abnormal heat generation or smoke generation.
	<ul style="list-style-type: none"> • Do not touch any terminals while the power is on. Doing so may result in electrical shock.
	<ul style="list-style-type: none"> • Configure emergency stop and interlock circuits outside this product.
	<ul style="list-style-type: none"> • Connect wires and connectors properly. Failure to do so may result in abnormal heat generation or smoke generation.
	<ul style="list-style-type: none"> • Do not perform work (such as connection or removal) with the power turned on. Doing so may result in electrical shock.
	<ul style="list-style-type: none"> • If this product is used in any way that is not specified by Panasonic, its protection function may be impaired.
	<ul style="list-style-type: none"> • This product has been developed and manufactured for industrial use only.

1.2 Description of Icons Used in this Document

- In this manual, the following symbols are used to indicate safety information that must be observed.

	Indicates an action that is prohibited or a matter that requires caution.
	Indicates an action that must be taken.
	Indicates supplemental information.
	Indicates details about the subject in question or information useful to remember.
	Indicates operation procedures.

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1.3 Software License Agreement

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2 Basic System Configuration

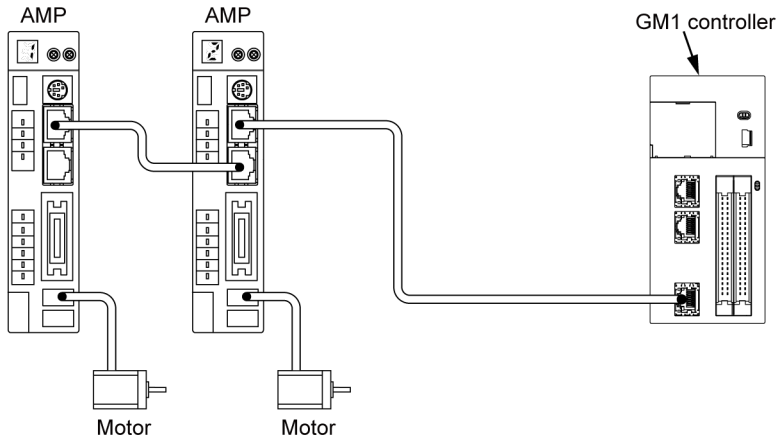
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2.1 Outline of the GM1 System

2.1 Outline of the GM1 System

■ Network control

A MINAS series servomotor network system can be easily configured by adopting EtherCAT communication.



■ System configuration including virtual axes

A motion system that combines real and virtual axes can be configured.

■ Two LAN ports

There are two Ethernet connection ports.

Each port can have a unique IP address. They can be used for different purposes, such as for an in-device network or for a host system network.

■ Equipped with the high-speed counter input and PWM output

The GM1 Controller is equipped with a 2-ch high-speed counter input for 16 MHz (multiplied by 4) and a 4-ch PWM output that can output a maximum of 100 kHz. These functions can be used without adding expansion units.

2.2 Unit Types

■ Controller

Type	Function	Product number
GM1 EtherCAT compatible controller (sink type)	EtherCAT 16-axis motion controller Transistor NPN type	AGM1CSEC16T
GM1 EtherCAT compatible controller (source type)	EtherCAT 16-axis motion controller Transistor PNP type	AGM1CSEC16P

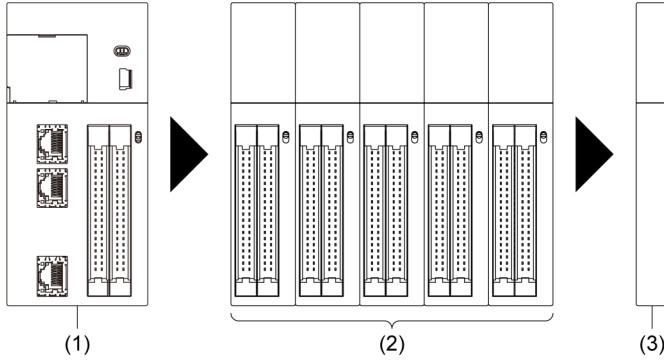
■ Expansion unit

Type	Function	Product number
64 digital input points	24 V DC, 64 input points	AGM1X64D2
64 digital output points (sink type)	64 output points Transistor NPN type	AGM1Y64T
64 digital output points (source type)	64 output points Transistor PNP type	AGM1Y64P
64 digital I/O points (sink type)	24 V DC, 32 input points 32 output points Transistor NPN type	AGM1XY64D2T
64 digital I/O points (source type)	24 V DC, 32 input points 32 output points Transistor PNP type	AGM1XY64D2P
8 analog input points	8 input points	AGM1AD8
4 analog output points	4 output points	AGM1DA4
Pulse output (transistor output type)	4 axes, pulse train, 500 kpps Open collector output	AGM1PG04T
Pulse output (line driver output type)	4 axes, pulse train, 4 Mpps Line driver output	AGM1PG04L

2.3 Restrictions on the Number of Expansion Units

2.3 Restrictions on the Number of Expansion Units

Up to 15 expansion units can be mounted on the right side of the GM1 Controller.



(1)	Controller	(2)	Expansion unit	(3)	End unit
-----	------------	-----	----------------	-----	----------



- Be sure to connect an end unit to the end of the system.

3 Restrictions on the GM1 Controller and Servo Amplifiers

3.1 Restrictions on the Combination of the GM1 Controller and Servo Amplifiers	3-2
3.2 Restrictions on Servo Amplifier Parameters	3-3

3.1 Restrictions on the Combination of the GM1 Controller and Servo Amplifiers

3.1 Restrictions on the Combination of the GM1 Controller and Servo Amplifiers

As for the combination of the GM1 Controller and each MINAS series, confirm the following restrictions.

Combination of the GM1 Controller and servo amplifiers

Connectable servo amplifier		Description
A5B	A6B	
•	•	A5B and A6B can be connected to the same network.

Note

- When using servo amplifiers in combination with the GM1 Controller, use the ones with the latest software version.

■ Setting ranges of movement amount and speed

The input range of the movement amount or speed specified in the GM1 Controller may differ from the upper and lower setting limits of the servo amplifier.

Info.

- The respective control cycles supported by the GM1 Controller and servo amplifiers A5B and A6B are shown below.
 - GM1 Controller: 500 μ s to 4 ms (control cycle)
 - Servo amplifier A5B: 500 μ s to 4 ms (control cycle)
 - Servo amplifier A6B: 500 μ s to 4 ms (control cycle)

3.2 Restrictions on Servo Amplifier Parameters

Some parameters of servo amplifiers affect the operation of the GM1 Controller. Use the following parameter.

No.	Name	Settings	Factory default setting
Pr5.04	Over-travel inhibit input setup	Use set value 1. (Recommended)	1 ^(Note 1)

(Note 1) We recommend that the set value not be changed due to the characteristics of the GM1 and MINAS.

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4 Basic Operations of the GM1 Controller

4.1 Power ON	4-2
4.2 Operation Mode Switching.....	4-3

4.1 Power ON

4.1 Power ON

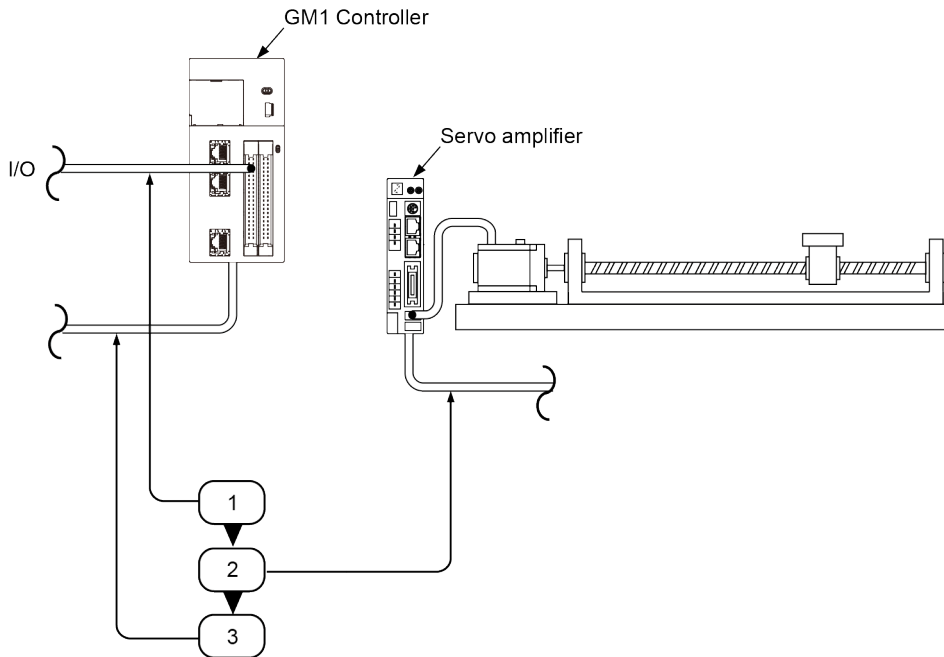
When turning ON the power to the system incorporating the GM1 Controller, follow the power ON sequence described in the procedure below.



- Consider the performance and statuses of any external devices connected to the system, and take sufficient care so that turning ON the power will not initiate unexpected movements.

1 2 Procedure

1. Turn ON the power to the I/O devices connected to the GM1 Controller.
2. Turn ON the power to the servo amplifier.
3. Turn ON the power to the GM1 Controller.



4.2 Operation Mode Switching

■ Switching to the RUN mode

There are the following two methods.

- Press the operation button (▶) on the GM Programmer while the STOP LED is lit.
- Set the RUN/STOP switch on the GM1 Controller to RUN.

Info.

- The switch cannot be set to the RUN mode if an error that does not allow to continue operation has occurred or if an exceptional situation has occurred.

■ Switching to the STOP mode

There are the following two methods.

- Press the stop button (■) on the GM Programmer while the RUN LED is lit.
- Set the RUN/STOP switch on the GM1 Controller to STOP.

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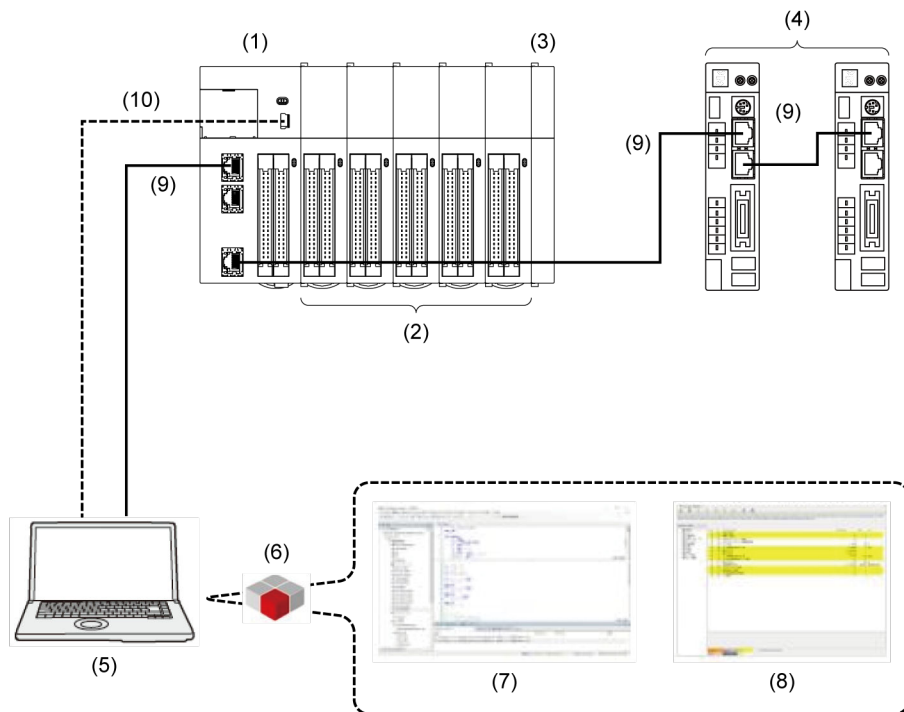
5 Installation and System Setup

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5.1 System Configuration Diagram

5.1 System Configuration Diagram

The figure below shows the configuration of the GM1 series motion controller (controller and expansion units), servo amplifiers, and PC. GM Programmer and PANATERM Lite for GM communicate with the GM1 Controller via Gateway.



No.	Name
(1)	GM1 Controller
(2)	Expansion unit
(3)	End unit
(4)	Servo amplifier
(5)	PC (on which GM Programmer and PANATERM Lite for GM are installed)
(6)	Gateway, CodeMeter
(7)	GM Programmer
(8)	PANATERM Lite for GM
(9)	Ethernet cable ^(Note 1)
(10)	USB cable ^(Note 1)

(Note 1) Use either Ethernet cables or USB cables.

i Info.

- To operate the system, you must install GM Programmer and PANATERM Lite for GM on the PC.
- When GM Programmer is installed, MINAS setup support software "PANATERM Lite for GM", Gateway (the application that connects GM Programmer and the GM1 Controller), and CodeMeter are installed at the same time.

5.2 Work Flowchart

5.2 Work Flowchart

The following table explains the workflow from installation of the GM1 Controller through to its operation.

Step	Description	Reference	
1	Install GM Programmer and PANATERM Lite for GM.	"P.6-3"	
2	Make preparations for the servo amplifiers.	"P.8-1"	
	2-1	Connect the servo amplifiers and the PC.	"P.8-2"
	2-2	Install the USB driver on the PC.	"P.8-2"
	2-3	Configure initial settings for the servo amplifiers.	"P.8-2"
	2-4	Disconnect the servo amplifiers from the PC.	"P.8-4"
3	Connect the GM1 Controller and each servo amplifier with cables.	"P.9-1"	
4	Connect the GM1 Controller and GM Programmer.	"P.10-1"	
	4-1	Connect the GM1 Controller and the PC with a cable.	"P.10-2"
	4-2	Create a new project.	"P.10-3"
	4-3	Configure communication settings.	"P.10-6"
	4-4	Add and set up device objects for servo amplifiers.	"P.10-10"
	4-5	Configure basic settings for EtherCAT axes.	"P.10-15"
	4-6	Connect the GM1 Controller to the PC and each servo amplifier and perform an operation check.	"P.10-22"
	4-7	Log in to the GM1 Controller.	"P.10-25"
	4-8	Log out from the GM1 Controller.	"P.10-26"
5	Connect the GM1 Controller and PANATERM Lite for GM.	"P.11-1"	
	5-1	Set up the servo amplifier connected to the GM1 Controller.	"P.11-2"
	5-2	Write parameters to the servo amplifier.	"P.11-8"
	5-3	Write objects to the servo amplifier.	"P.11-9"
6	Prepare for operation.	"P.12-1"	
	6-1	Check if a safety circuit is designed properly.	"P.12-3"
	6-2	Check wiring for each device.	"P.12-2"
	6-3	Perform an operation check.	"P.12-7"
7	Using GM Programmer, configure settings for GM1 parameters, motion control, unit control, and communication function.	GM1 Controller EtherCAT User's Manual (Operation Edition)	
	7-1		Configure settings for the GM1 Controller.
	7-2		Configure settings for motion control.
	7-3		Configure settings for unit control.
	7-4		Configure settings for the communication function.
8	Create programs with GM Programmer.		
	8-1		Create objects (POU objects) for a program.
	8-2		Select a programming language (LD, ST, SFC, FBD, IL, or CFC) and enter a program.

Step	Description	Reference
	8-3 Set variables.	
9	Set up the GM1 Controller in GM Programmer.	
	9-1 Configure time settings.	
	9-2 Log in to the GM1 Controller.	
	9-3 Log out from the GM1 Controller.	
	9-4 Upload the source.	
10	Configure security settings with GM Programmer.	
	10-1 Configure user management settings.	
	10-2 Configure encryption and signature settings.	
	10-3 Configure write-protection settings.	

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6 Overview of the GM Programmer

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6.1 System Requirements

6.1 System Requirements

6.1.1 Operating Environment of GM Programmer

Programming software

Product name	Version	Applicable language
GM Programmer	Ver.1.1	Japanese / English / Chinese

(Note 1) When GM Programmer is installed, MINAS setup support software "PANATERM Lite for GM" is installed at the same time.

Software operating environment

Item	Description
OS	Microsoft(R) Windows(R) 10: 32bit / 64bit
PC	PC with the following software installed: <ul style="list-style-type: none">● Microsoft.NET Framework 4.6.1 or later● Microsoft Visual C++ 2010 SP1 Redistributable Package (x86)● Microsoft Visual C++ 2010 SP1 Redistributable Package (x64)● Microsoft Visual C++ 2013 Redistributable Package (x86)● Microsoft Visual C++ 2013 Redistributable Package (x64)● Microsoft Visual C++ 2015 Update 3 Redistributable Package (x86)● Microsoft Visual C++ 2015 Update 3 Redistributable Package (x64)
HDD	At least 4 GB of free space
Memory	At least 8 GB
Communication port	LAN port (for Ethernet connection) USB 2.0 port (for USB connection)

6.2 Installation and Uninstallation

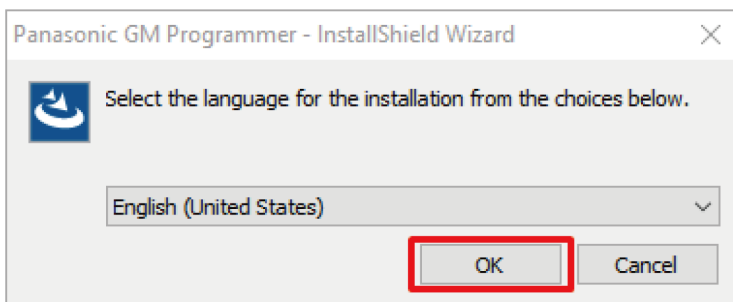
6.2.1 Installing GM Programmer

Before installing the GM Programmer on a PC, log on to the PC as an account with Administrator privileges.

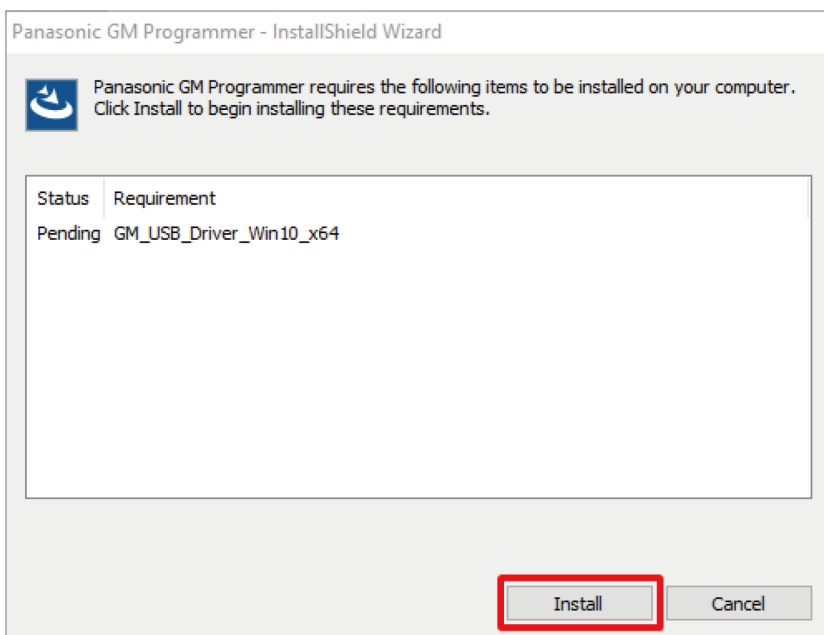
If other applications are running, be sure to close all the applications before installing GM Programmer.

1 2 Procedure

1. Double-click "setup.exe".
The following window will be displayed. Click [OK].

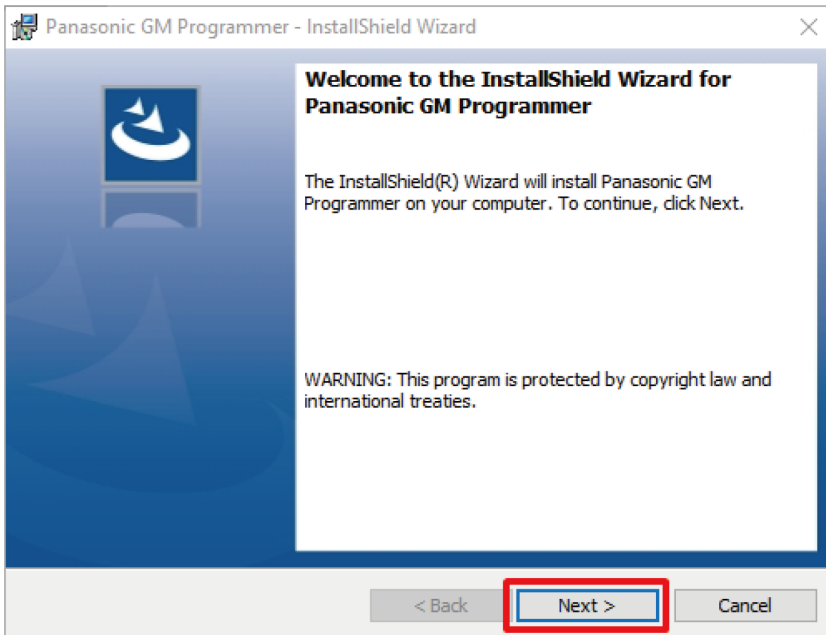


2. The following window will be displayed. Click [Install].
The display content differs according to the PC environment that you use. (This window may not be displayed at all, depending on the situation.)

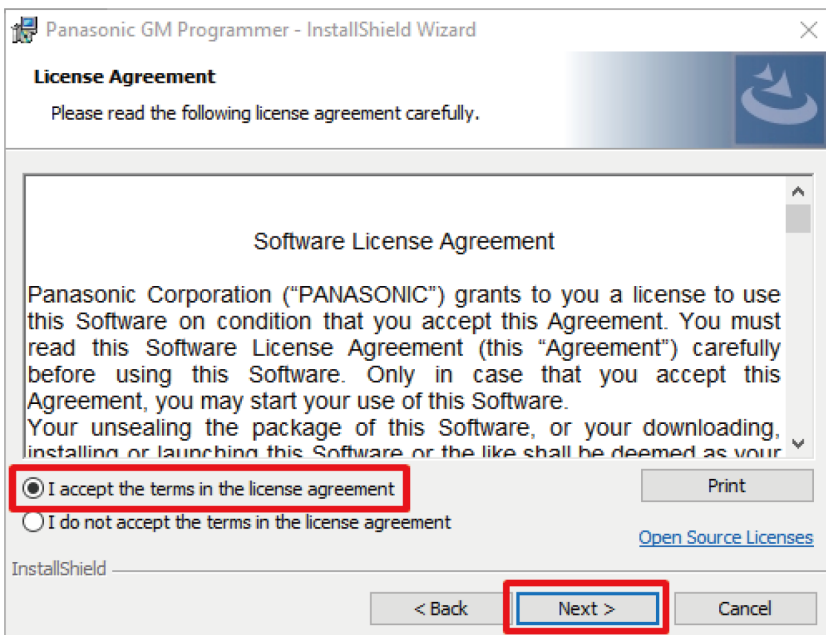


6.2 Installation and Uninstallation

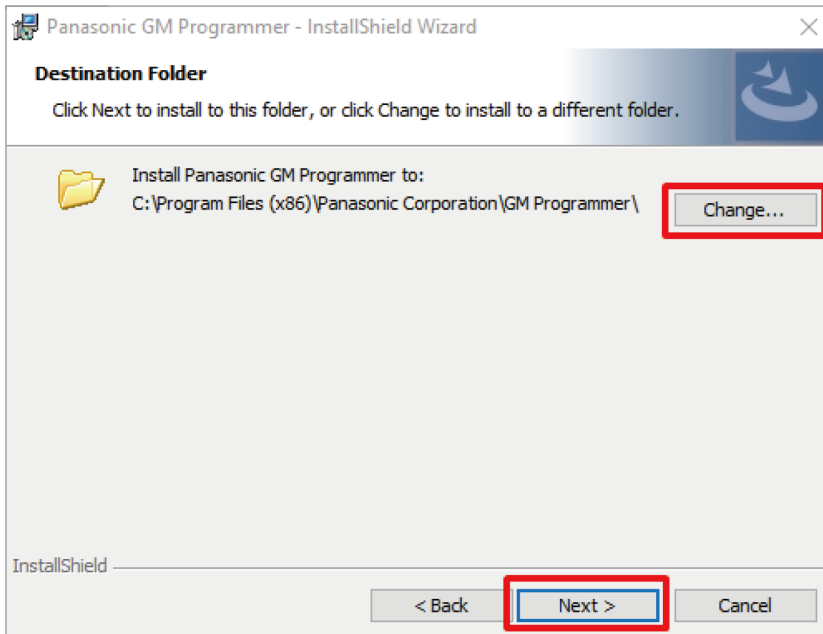
3. The following window will be displayed. Click [Next].



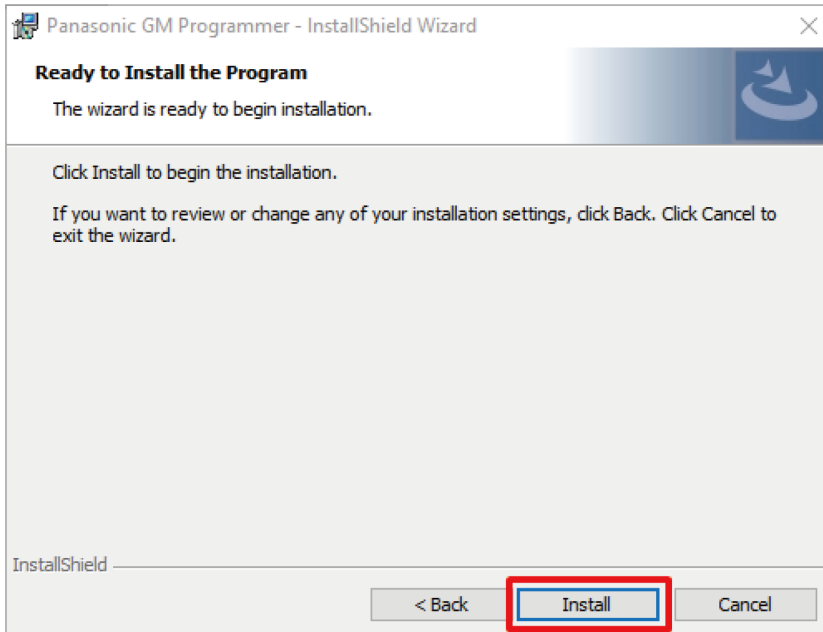
4. The following window will be displayed. Select [I accept the terms in the license agreement] and click [Next].



5. The following window will be displayed. If you change the installation destination folder, click [Change] and specify a desired installation destination. If you do not change the installation destination folder, click [Next].

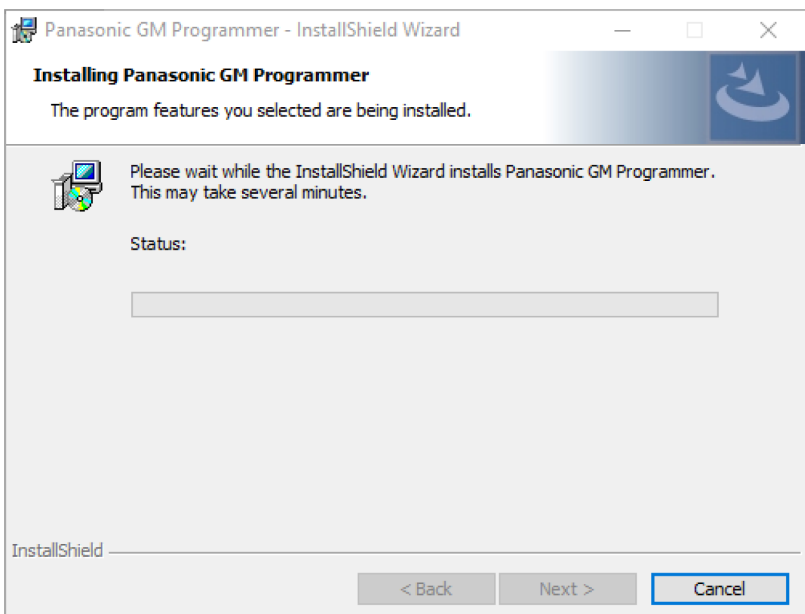


6. The window below will be displayed. Click [Install] to start the installation.



7. The following window will be displayed while the installation is in progress.

6.2 Installation and Uninstallation

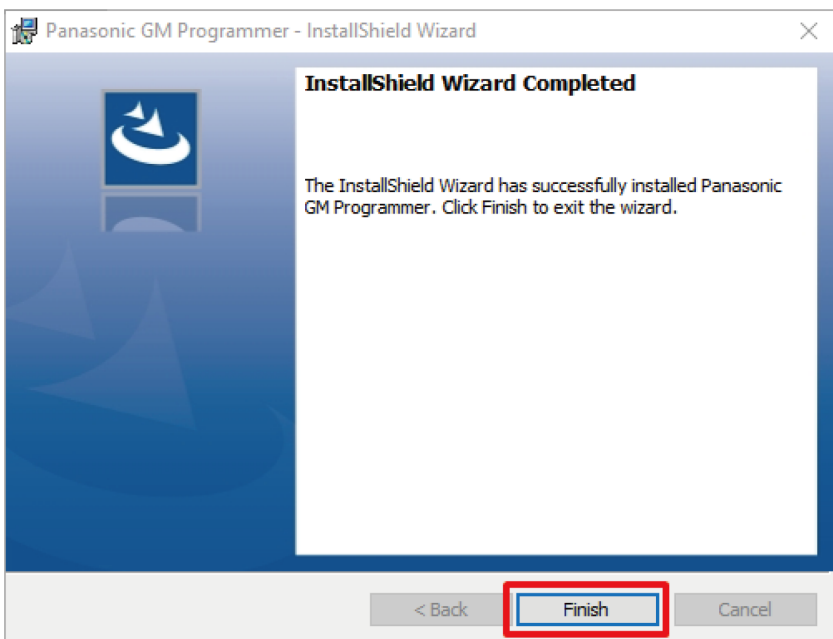


Following this installation, the three packages below will be installed. (The segments indicated by * differ according to the version of the software.)

- CODESYS SoftMotion*.*.*.*_P
- GMPLibrary (*.*.*.*)
- PANATERM-Lite for GM V*.*

These packages take a long time to install. Take care not to click [Cancel] while the installation is in progress.

8. When the installation of all the packages is completed, the following window will be displayed. Click [Finish].



This completes the installation procedure.

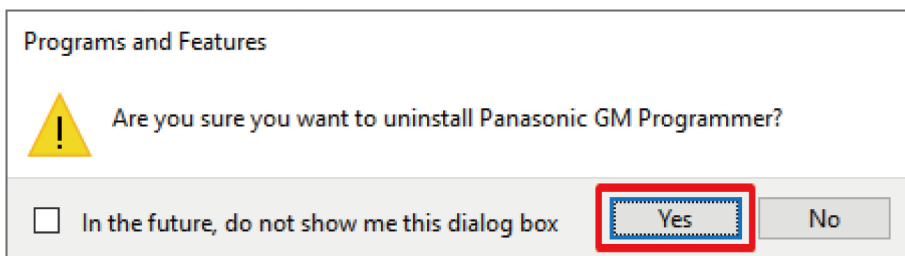
Info.

- When the GM Programmer is installed, PANATERM Lite for GM, Gateway (CODESYS Gateway), and CodeMeter applications are installed at the same time.

6.2.2 Uninstalling GM Programmer

1 2 Procedure

1. From the Start menu, select **Windows System>Control Panel**, and then click "Uninstall a program".
A list of installed programs will be displayed.
2. Double-click "Panasonic GM Programmer".
The following window will be displayed. [Yes]



3. Click the [Yes] button.
The GM Programmer will be uninstalled.

Info.

- When the GM Programmer is uninstalled, PANATERM Lite for GM and Gateway are also uninstalled at the same time.
- CodeMeter will not be uninstalled at this time. Uninstall it separately.

6.3 Basic Operations

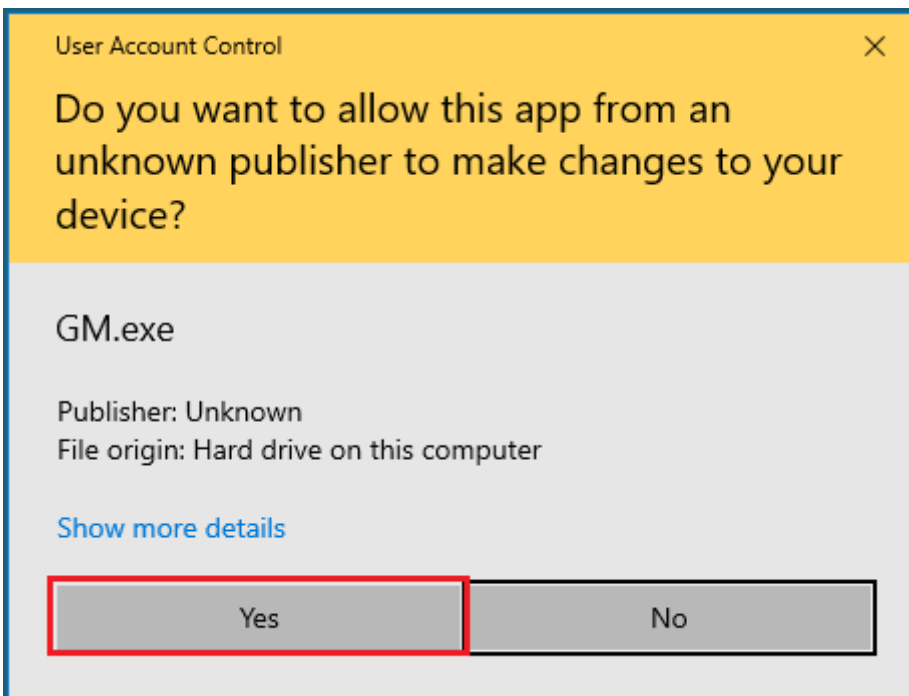
6.3 Basic Operations

This section explains how to start and quit GM Programmer.

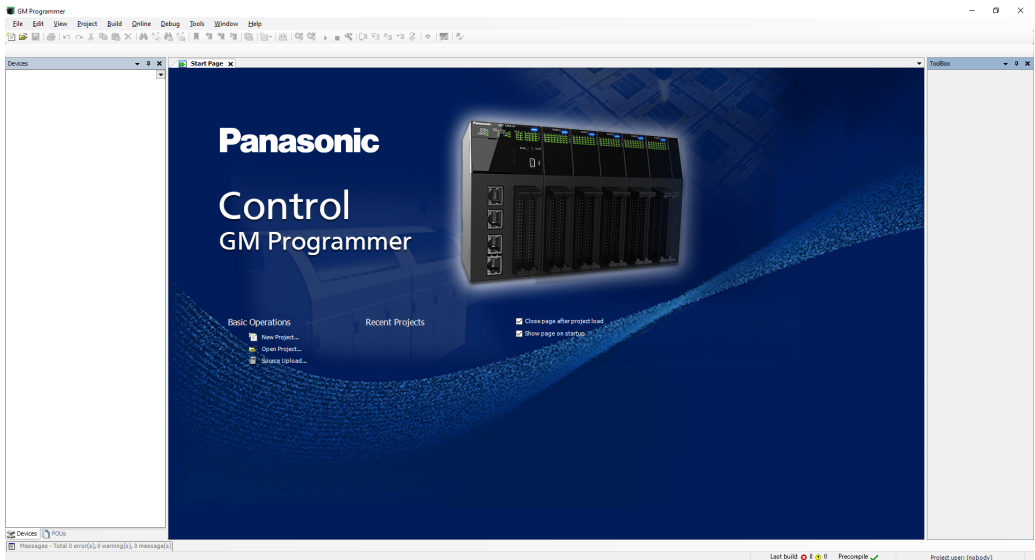
6.3.1 How to start

1 2 Procedure

1. Click the [Start] button and select **Panasonic Corporation>GM Programmer**. The "User Account Control" dialog box will be displayed. Click [Yes].



GM Programmer will be started.



6.3.2 How to quit

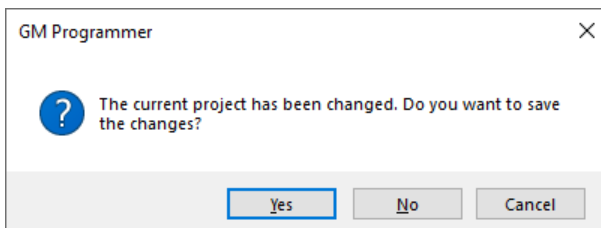


- Before closing GM Programmer, be sure to save any project files that you are editing and must save.

1 2

Procedure

1. From the menu bar, select **File>Exit**.
If changes have not been saved, the following window will be displayed.
If exiting without saving, select [No].
If changes need to be saved, select [Yes] to perform the save process.



2. Click the [Yes] button.
GM Programmer will be closed.

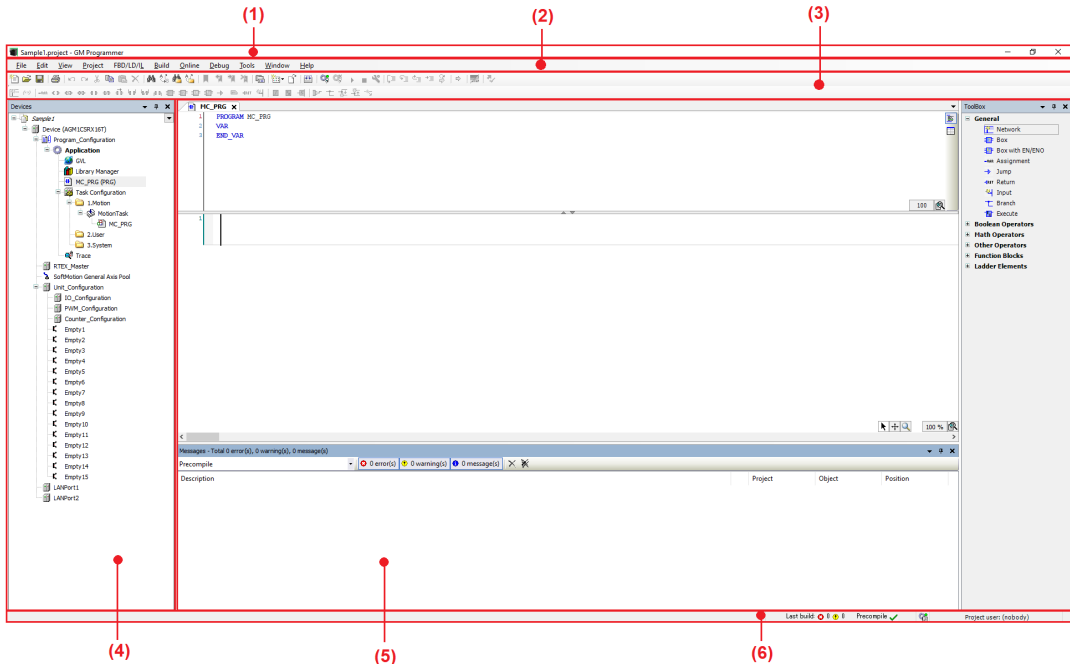
Info.

- You can also close GM Programmer by clicking the [x] button on the title bar.

6.4 Component Names

6.4 Component Names

This section presents the name and display content of each component of GM Programmer.



No.	Name	Description
(1)	Title bar	The title bar displays the project file name, [minimize] button, [maximize] button, and [close] button.
(2)	Menu bar	The menu bar displays the menu commands for each purpose in list format.
(3)	Toolbar	The toolbar displays each command as an icon.
(4)	Navigator pane	The navigator pane displays the objects (such as devices, applications, and programs) added to the project in a tree structure.
(5)	Main pane	The main pane displays a program, function settings, messages, and other data. The window can be switched by selecting a desired tab.
(6)	Status field	The status bar displays the build status, logged-in users, and other information.

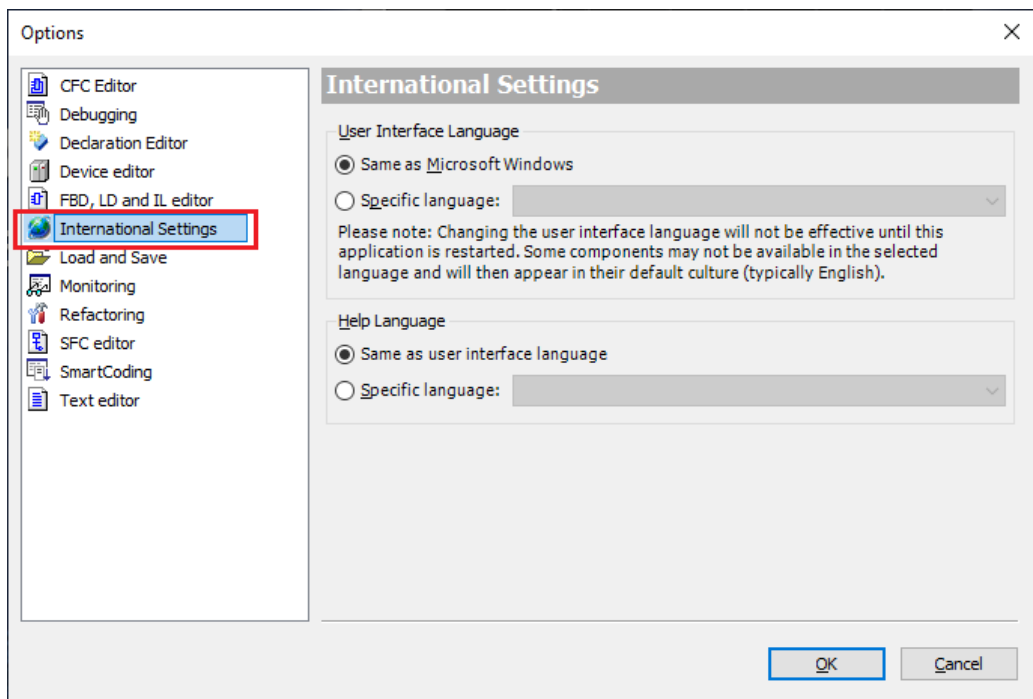
6.5 Other Functions

6.5.1 Display Language Setting Function

This function allows the user to change the display language setting for GM Programmer. The default setting is the same language as the one used in the operating system. If you want to use a different language from the one used in the operating system, change the display language setting. After you change the language setting, you must restart GM Programmer.

1 2 Procedure

1. From the menu bar, select **Tools>Options**.
The "Options" dialog box will be displayed.
2. Select "International Settings" from the Categories pane.
The "International Settings" pane will be displayed.



3. Select **User Interface Language>Specific language** option and specify a desired language in the field.
4. Click [OK].
The "Options" dialog box will be closed.
At this stage, the language has not been changed yet.
5. Close GM Programmer and then start GM Programmer again.
After GM Programmer is started, the selected language takes effect.

6.5 Other Functions

i Info.

- The display language setting of GM Programmer is linked with that of PANATERM Lite for GM. Therefore, if the display language setting of PANATERM Lite for GM is changed, the display language setting of GM Programmer will also be changed automatically.

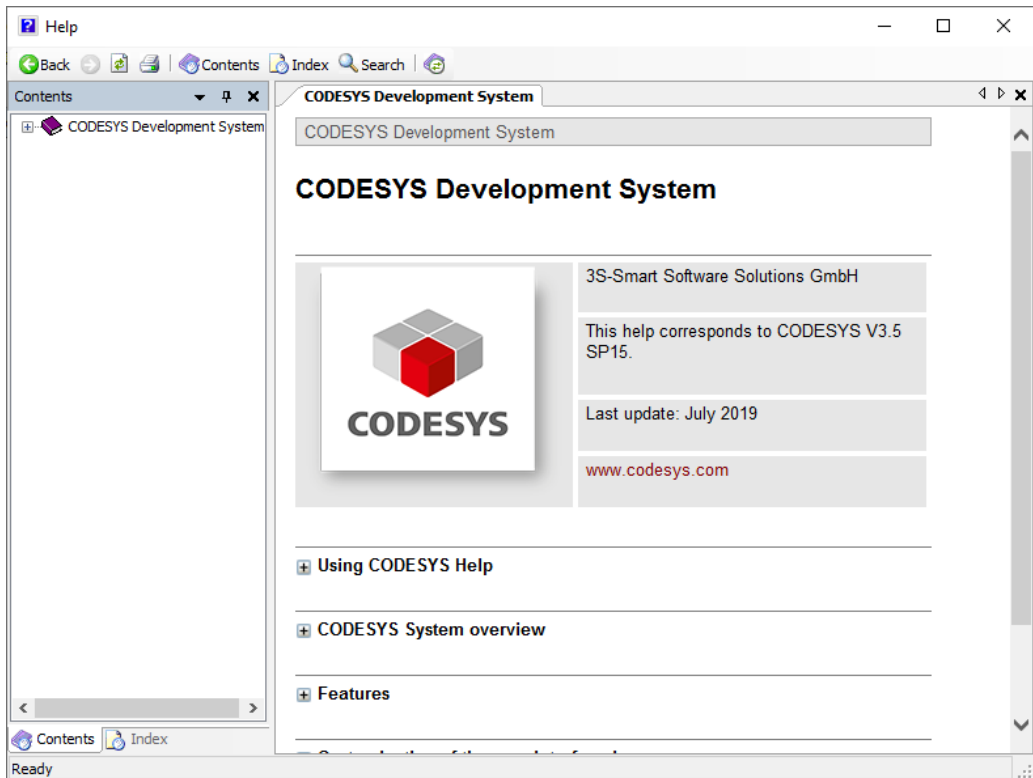
6.5.2 Online Help Function

This function allows the user to open the manual and check information such as operating methods.

1 2 Procedure

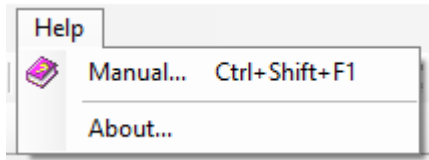
1. Press the [F1] key.

Online help will be started and the page corresponding to the displayed window will be displayed.



i Info.

- You can also start online help by selecting **Help>Manual** from the menu bar.



6.5.3 Version Display Function

This function allows the user to check the version, license, and other information for GM Programmer.

1 2 Procedure

- From the menu bar, select **Help>About**.

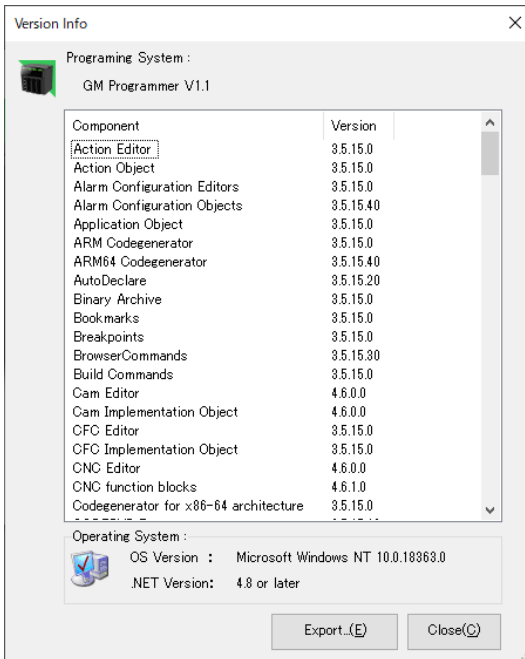


- Click a desired button at the bottom of the window.

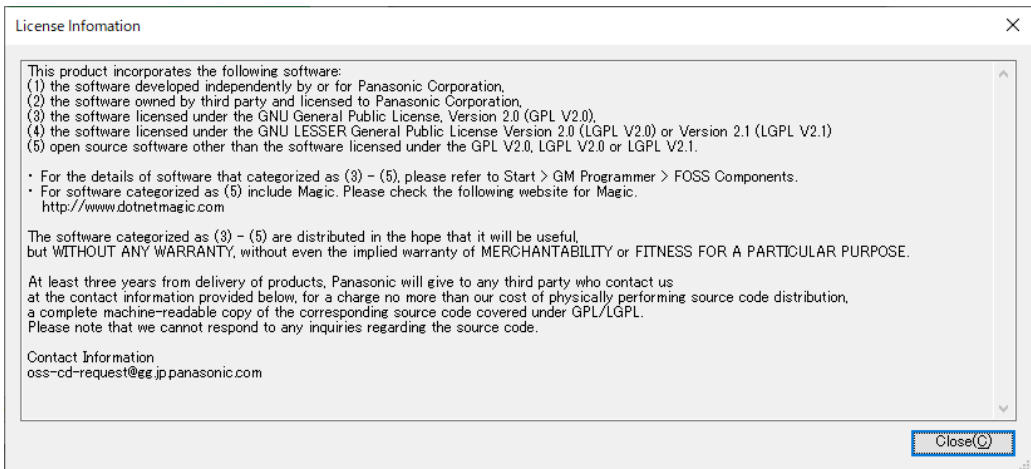
Button	Description
Version Info	Displays information about the plug-ins that have been applied and the operating system of the PC that is used.
License Info	Displays license information for the software used by GM Programmer.

Clicking the [Version Info] button displays the "Version Info" dialog box.

6.5 Other Functions



Clicking the [License Info] button displays the "License Information" dialog box.



7 Overview of PANATERM Lite for GM

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7.1 System Requirements

7.1 System Requirements

7.1.1 Operating Environment of PANATERM Lite for GM

Programming software

Product name	Version	Applicable language
PANATERM Lite for GM	Ver.1.1	Japanese / English / Chinese

(Note 1) When GM Programmer is installed, MINAS setup support software "PANATERM Lite for GM" is installed at the same time.

Software operating environment

Item	Description
OS	Microsoft(R) Windows(R) 10: 32bit / 64bit
PC	PC with the following software installed: <ul style="list-style-type: none">● Microsoft.NET Framework 4.6.1 or later● Microsoft Visual C++ 2010 SP1 Redistributable Package (x86)● Microsoft Visual C++ 2010 SP1 Redistributable Package (x64)● Microsoft Visual C++ 2013 Redistributable Package (x86)● Microsoft Visual C++ 2013 Redistributable Package (x64)● Microsoft Visual C++ 2015 Update 3 Redistributable Package (x86)● Microsoft Visual C++ 2015 Update 3 Redistributable Package (x64)
HDD	At least 4 GB of free space
Memory	At least 8 GB
Communication port	LAN port (for Ethernet connection) USB 2.0 port (for USB connection)

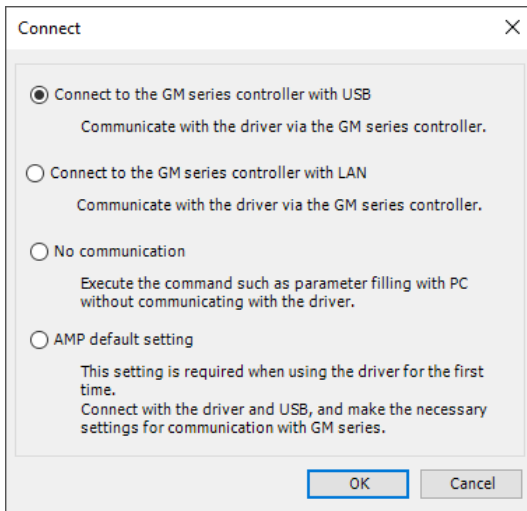
7.2 Basic Operations

This section explains how to start and exit PANATERM Lite for GM.

7.2.1 How to Start

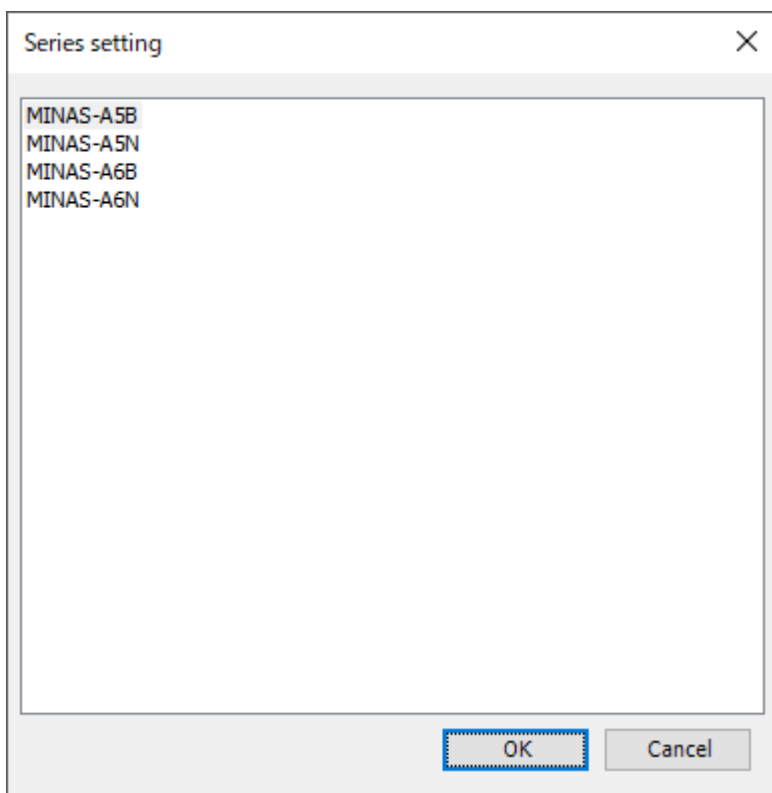
1 2 Procedure

1. Click the [Start] button in the Windows task bar and select **Panasonic Corporation>PANATERM Lite for GM**.
2. The "Connect" dialog box will be displayed.
Select a communication setting option and click [OK].



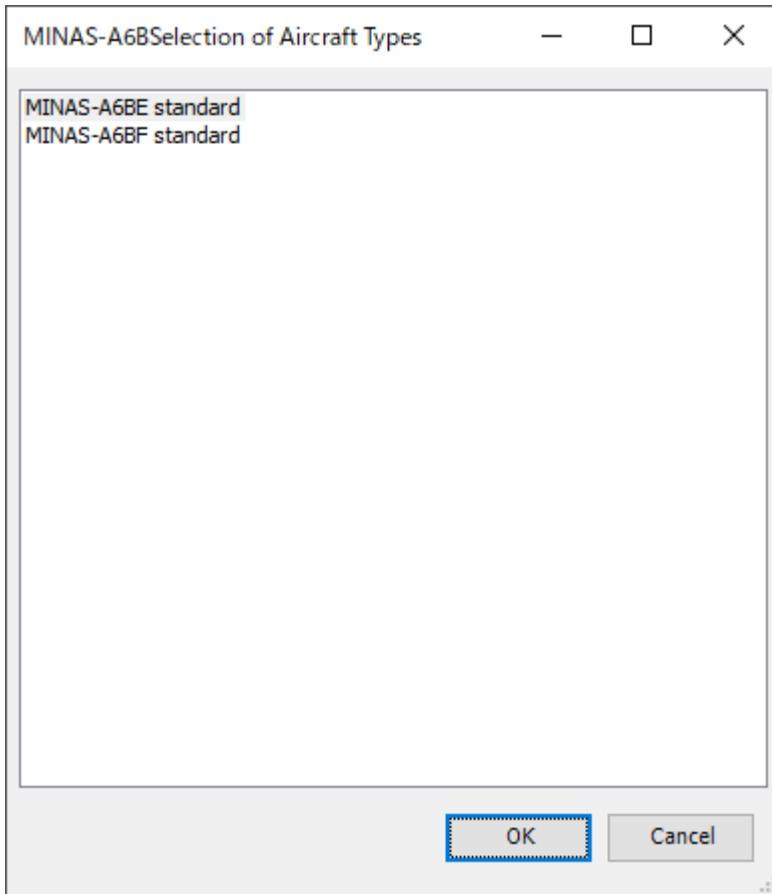
3. The "Series Setting" dialog box will be displayed.

7.2 Basic Operations



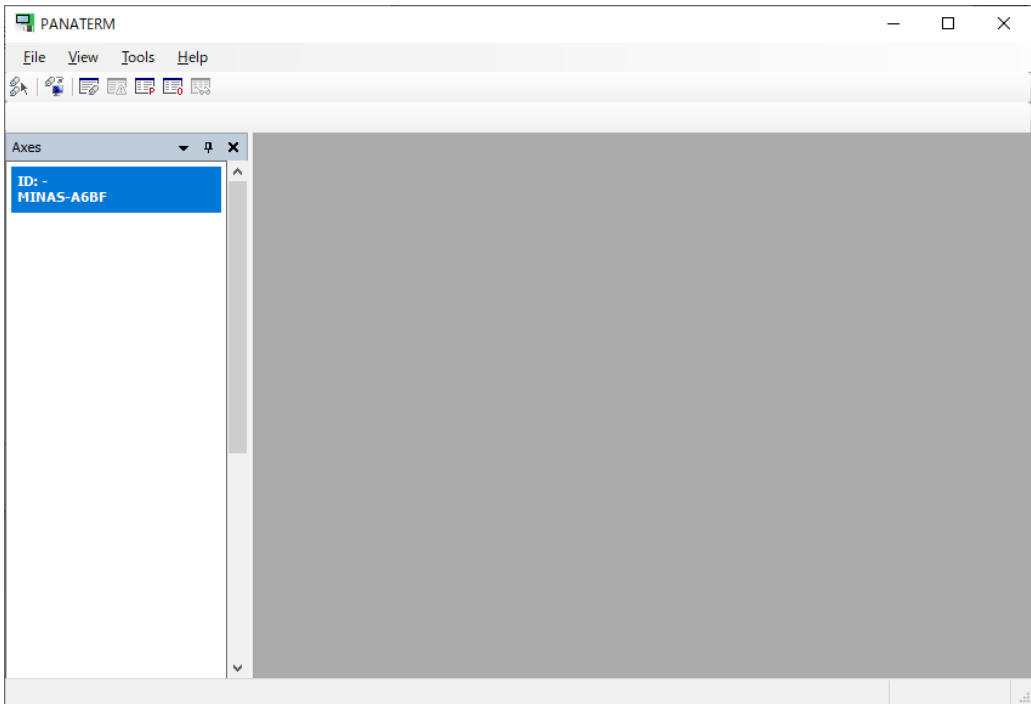
Note

When the "Selection of Aircraft Types" dialog box is displayed, select a model and click the "OK" button.



4. PANATERM Lite for GM will be started.

7.2 Basic Operations



7.2.2 How to Exit



- Note that all information will be lost if you close the program without saving settings, collected data, or other information.

1 2

Procedure

1. From the menu bar, select **File>Exit**.
PANATERM Lite for GM will be closed.

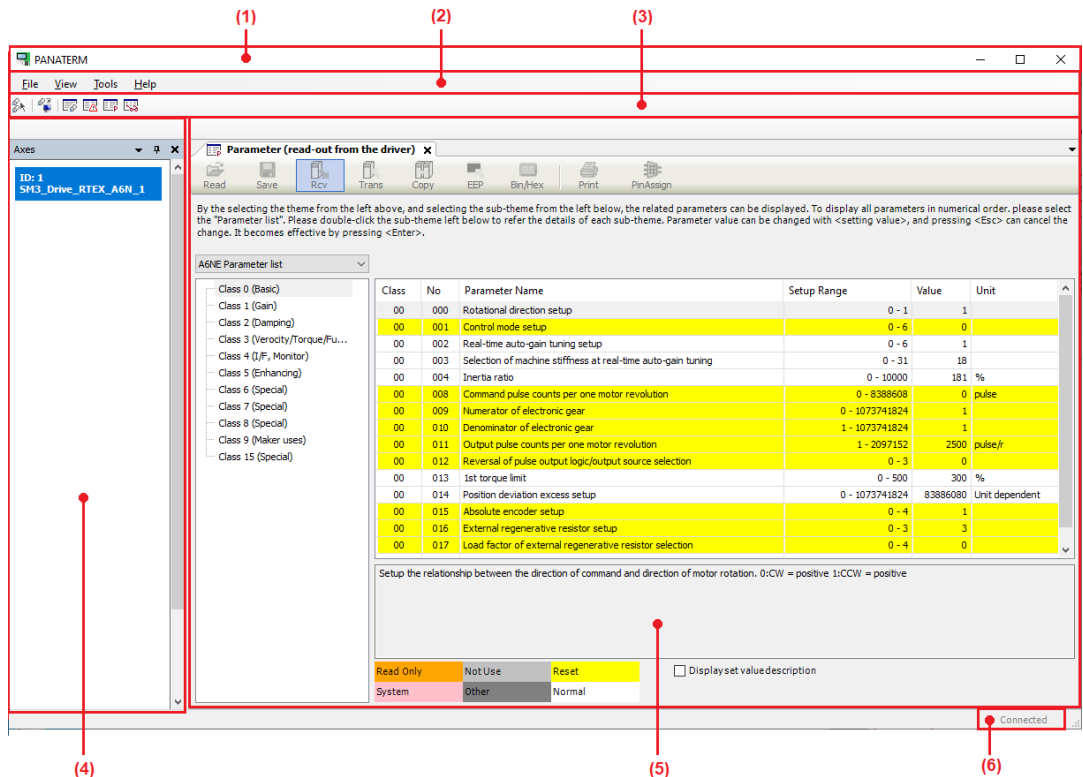


Info.

- You can also close PANATERM Lite for GM by clicking the [x] button on the title bar.

7.3 Component Names

This section explains the components and displays of PANATERM Lite for GM.



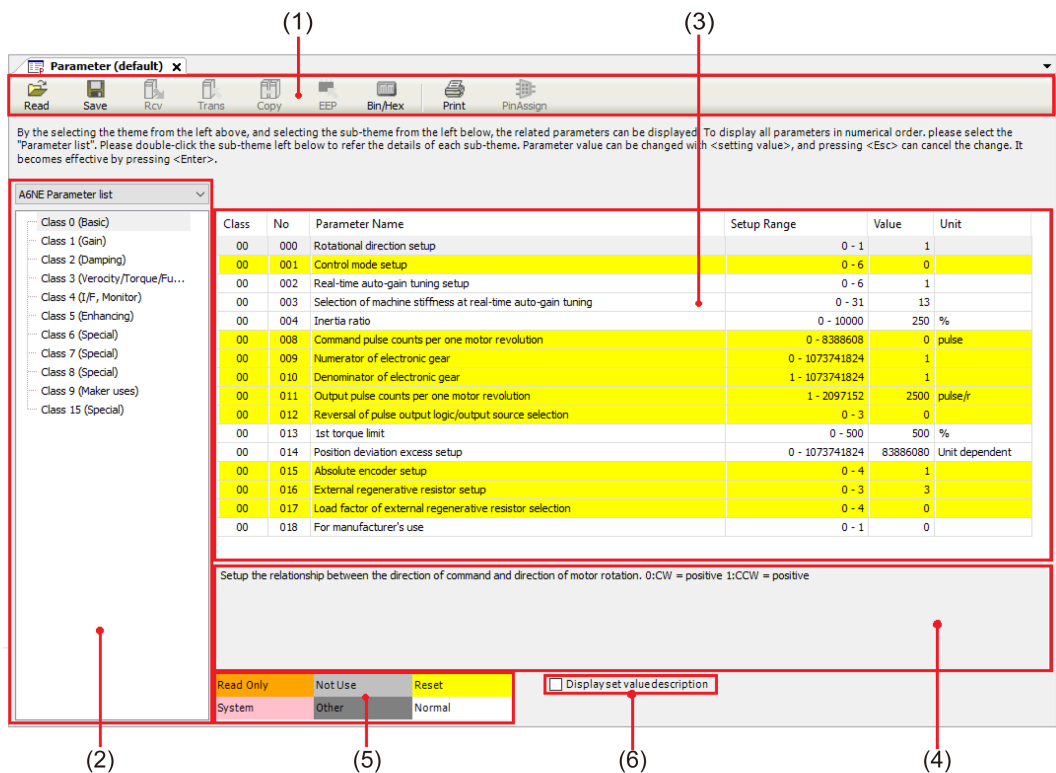
No.	Name	Description
(1)	Title bar	The title bar displays the project file name, [minimize] button, [maximize] button, and [close] button.
(2)	Menu bar	The menu bar displays the menu commands for each purpose in list format.
(3)	Toolbar	The toolbar displays each command as an icon.
(4)	Navigator pane	This pane displays a list of axes.
(5)	Main pane	This pane displays the Parameter window, Monitor window, Alarm window, and other windows. The window can be switched by selecting a desired tab.
(6)	Status field	This field displays the status of connection to the GM1 controller.

7.4 Parameter Window







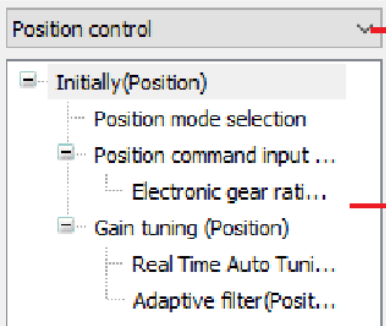
7.4 Parameter Window

The Parameter window allows the user to check and rewrite the values of servo amplifier parameters, save them to parameter files, and perform other parameter-related operations.

7.4.1 Configuration of Parameters Window



No.	Name	Function												
(1)	Toolbar	The toolbar consists of basic operation commands related to parameters, such as save and read.												
		<table border="1"> <thead> <tr> <th>Icon</th> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td></td> <td>Read</td> <td>Reads parameters from file ".prm5". When this button is enabled, you can specify a parameter file also by drag-and-drop operation.</td> </tr> <tr> <td></td> <td>Save</td> <td>Writes parameters to file ".prm5".</td> </tr> <tr> <td></td> <td>Rcv</td> <td>Receives parameters from the servo amplifier.</td> </tr> </tbody> </table>	Icon	Name	Function		Read	Reads parameters from file ".prm5". When this button is enabled, you can specify a parameter file also by drag-and-drop operation.		Save	Writes parameters to file ".prm5".		Rcv	Receives parameters from the servo amplifier.
		Icon	Name	Function										
	Read	Reads parameters from file ".prm5". When this button is enabled, you can specify a parameter file also by drag-and-drop operation.												
	Save	Writes parameters to file ".prm5".												
	Rcv	Receives parameters from the servo amplifier.												

No.	Name	Function														
		Icon	Name	Function												
			Trans	Transmits parameters to the servo amplifier.												
			Copy	Copies the parameters of a servo amplifier to servo amplifiers for other axes.												
			EEP	Writes parameters to EEPROM of the servo amplifier.												
			Bin / Hex	Inputs the selected settings in binary or hexadecimal format.												
			Print	Prints parameters.												
			Pin assignment setting	Sets I/O pin assignment.												
(2)	Theme selection pane	<p>After a theme is selected, if a parameter category is selected from a sub-theme, related parameters will be displayed in the parameter setting area.</p>  <p style="text-align: right;">Theme</p> <p style="text-align: right;">Sub-theme</p>														
(3)	Parameter setting area	<p>Allows the user to set or edit parameters.</p> <table border="1"> <thead> <tr> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Class</td> <td>Displays parameter categories</td> </tr> <tr> <td>No.</td> <td>Displays parameter numbers</td> </tr> <tr> <td>Parameter Name</td> <td>Displays parameter names</td> </tr> <tr> <td>Setup Range</td> <td>Displays the maximum and minimum allowable values of parameter settings</td> </tr> <tr> <td>Value</td> <td>Displays parameter values. Values can be changed. For parameters provided with a ▼ button beside the set value, a desired value can be selected from the combo box. After selecting a value from the combo box, press the <Enter> key. For parameters without a ▼ button beside the set value, either directly enter a value using <numerical> keys or click "▲""▼" to edit the value by increasing or decreasing it. To set a</td> </tr> </tbody> </table>			Name	Function	Class	Displays parameter categories	No.	Displays parameter numbers	Parameter Name	Displays parameter names	Setup Range	Displays the maximum and minimum allowable values of parameter settings	Value	Displays parameter values. Values can be changed. For parameters provided with a ▼ button beside the set value, a desired value can be selected from the combo box. After selecting a value from the combo box, press the <Enter> key. For parameters without a ▼ button beside the set value, either directly enter a value using <numerical> keys or click "▲""▼" to edit the value by increasing or decreasing it. To set a
Name	Function															
Class	Displays parameter categories															
No.	Displays parameter numbers															
Parameter Name	Displays parameter names															
Setup Range	Displays the maximum and minimum allowable values of parameter settings															
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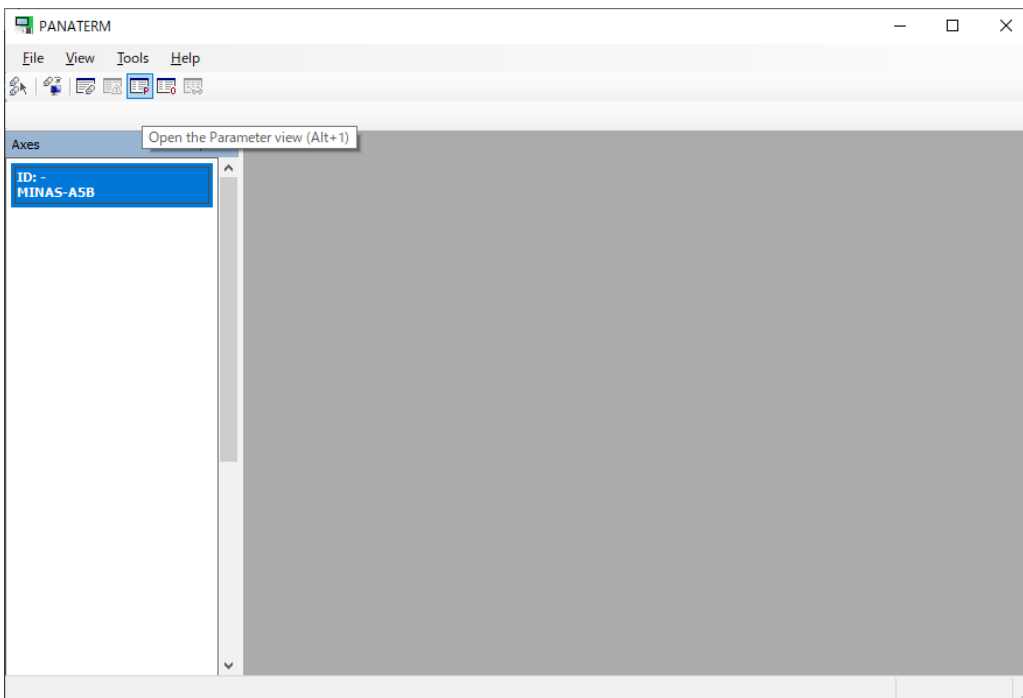
7.4 Parameter Window

No.	Name	Function	
		Name	Function
			value, press the <Enter> key. To return a value to its original value, press the <Esc> key.
		Unit	Displays the unit of parameter settings.
(4)	Text display area	Displays a description related to the selected parameter.	
(5)	Parameter attribute description area	Displays a description of parameter attributes. The background color of each parameter in the parameter setting area represents an attribute.	
(6)	"Display-set value description" check box	Selecting the check box displays combo boxes and decimal points in the "Value" column of the parameter setting area. To display parameter set values in an easy-to-understand manner, select the check box.	

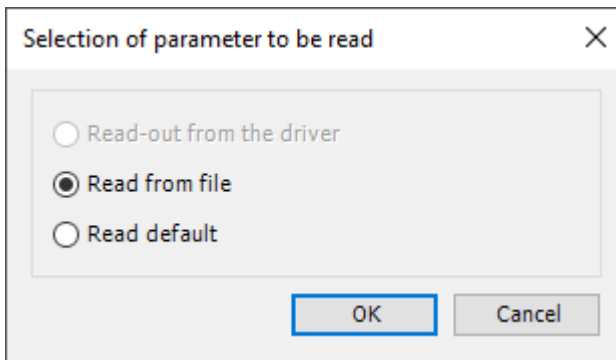
7.4.2 Setting Parameters

1 2 Procedure

1. From the menu bar on the main pane, select **View>Parameter**. Alternatively, on the toolbar, click the "Open the Parameter view" icon.



The "Selection of parameter to be read" dialog box will be displayed.



Read-out from the driver

Communicates with the connected servo amplifier and reads the parameter settings from the servo amplifier. If this mode is selected, parameter values will be reflected in the servo amplifier as soon as they are changed.

Read from file

Reads the parameter file (".prm5") that was edited previously. If communication is performed with the servo amplifier, parameter values will be reflected in the servo amplifier as soon as they are changed.

Read default

Reads the factory default settings of the servo amplifier that were saved during installation. If communication is performed with the servo amplifier, parameter values will be reflected in the servo amplifier as soon as they are changed.

2. Select one of the three options above and click the [OK] button.
The Parameter window will be displayed.

By the selecting the theme from the left above, and selecting the sub-theme from the left below, the related parameters can be displayed. To display all parameters in numerical order, please select the "Parameter list". Please double-click the sub-theme left below to refer the details of each sub-theme. Parameter value can be changed with <setting value>, and pressing <Esc> can cancel the change. It becomes effective by pressing <Enter>.

Class	No	Parameter Name	Setup Range	Value	Unit
00	000	For manufacturer's use	0 - 1	1	
00	001	Control mode setup	0 - 6	0	
00	002	Real-time auto tuning setup	0 - 6	1	
00	003	Machine stiffness at real-time auto tuning	0 - 31	13	
00	004	Inertia ratio	0 - 10000	250	%
00	008	For manufacturer's use	0 - 1048576	0	
00	009	For manufacturer's use	0 - 1073741824	1	
00	010	For manufacturer's use	1 - 1073741824	1	
00	011	Number of output pulses per motor revolution(Not supported)	1 - 262144	2500	pulse/r
00	012	Reversal of pulse output logic(Not supported)	0 - 3	0	
00	013	1st torque limit	0 - 500	500	%
00	014	Position deviation excess setup	0 - 134217728	100000	pulse
00	015	Absolute encoder setup	0 - 3	1	

1 Please fix.

Display set value description

Read Only Not Use Reset Display set value description
 System Other Normal

7.4 Parameter Window

3. After changing the parameter settings, click the [EEP] button to write the parameter settings to the EEPROM of the servo amplifier.
4. Click the [x] button on the Parameter window to close the Parameter window.

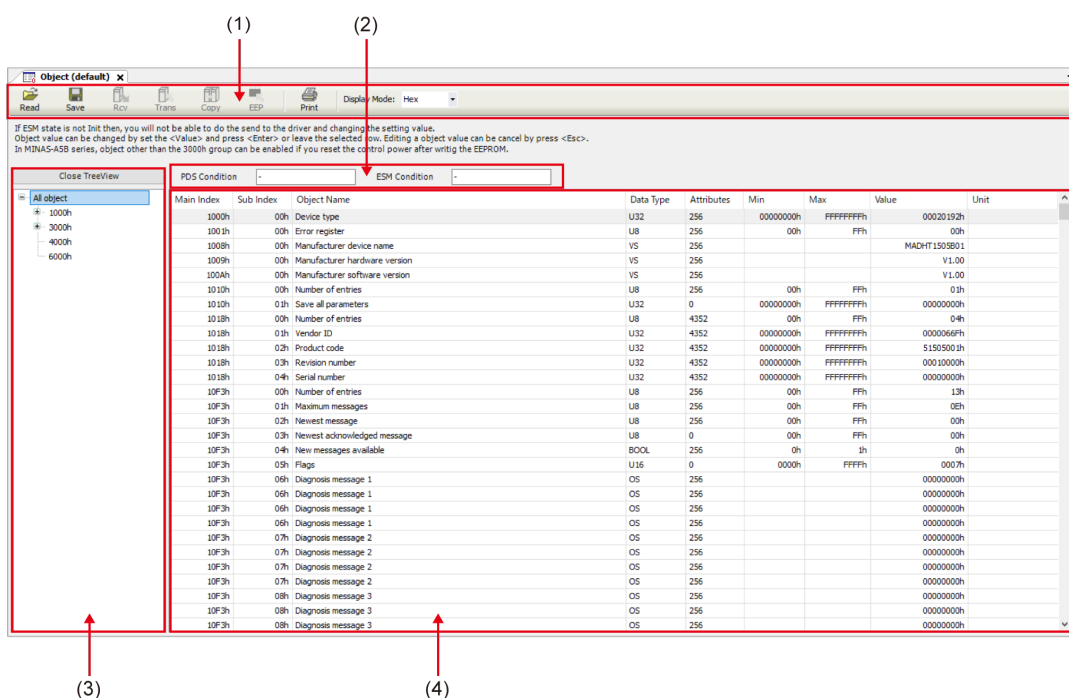
7.5 Object Window

Troubleshooting can be performed more easily by displaying and editing the list of objects on the amplifier side without using a host device.

Info.


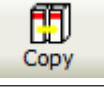

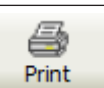

- Some objects affect the behaviors of servo amplifiers or motors. Therefore, before changing the objects, carefully read the instruction manual and other technical references for the servo amplifier and pay careful attention when changing them.

7.5.1 Configuration of Object Window



No.	Name	Function												
(1)	Toolbar	The toolbar consists of basic operation commands related to objects, such as save and read.												
		<table border="1"> <thead> <tr> <th>Icon</th> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td></td> <td>Read</td> <td>Reads objects from the file (.obj5). When this button is enabled, you can specify a file by drag-and-drop operation.</td> </tr> <tr> <td></td> <td>Save</td> <td>Writes objects to the file (.obj5).</td> </tr> <tr> <td></td> <td>Rcv</td> <td>Receives objects from the servo amplifier.</td> </tr> </tbody> </table>	Icon	Name	Function		Read	Reads objects from the file (.obj5). When this button is enabled, you can specify a file by drag-and-drop operation.		Save	Writes objects to the file (.obj5).		Rcv	Receives objects from the servo amplifier.
		Icon	Name	Function										
			Read	Reads objects from the file (.obj5). When this button is enabled, you can specify a file by drag-and-drop operation.										
	Save	Writes objects to the file (.obj5).												
	Rcv	Receives objects from the servo amplifier.												

7.5 Object Window

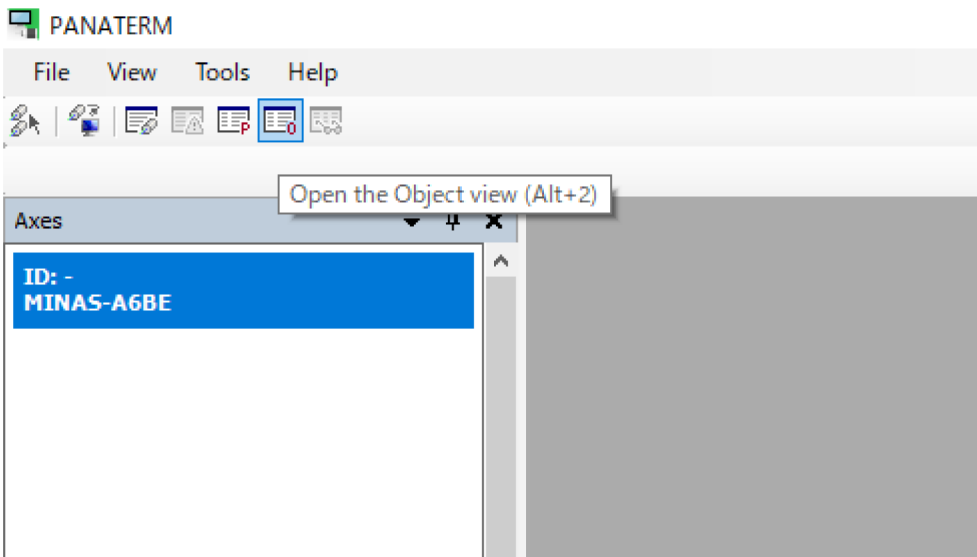
No.	Name	Function	
			<p>Trans</p> <p>Transmits objects to the servo amplifier. If you turn OFF the power supply to the servo amplifier without writing to EEPROM, the object will be reverted back to the value before the change was made.</p>
			<p>Copy</p> <p>Copies the objects of a servo amplifier to servo amplifiers for other axes.</p>
			<p>EEP</p> <p>Writes objects to EEPROM of the servo amplifier. Do not turn OFF the power supply to the servo amplifier and the PC while data is being written to EEPROM. If the power supply is cut off while data is being written, the data content is not warranted.</p>
			<p>Print</p> <p>Prints objects.</p>
			<p>Display mode</p> <p>Changes the numerical display of the object being displayed. Hex: Displayed in hexadecimal number and "h" is placed at the end of the number. Dec: Displayed in decimal number and a sign is set. Bin: Displayed in binary number and "b" is placed at the end of the number. The values in the Min-Max column are displayed in hexadecimal number.</p>
(2)	Condition monitor	<p>PDS Condition Displays the PDS condition on the servo amplifier side. It varies depending on the object value of 6041h-00h.</p>	
		<p>ESM Condition Displays the condition that indicates whether the object can be rewritten on the servo amplifier side. Rewriting is possible when "Operational" is displayed.</p>	Full display
(3)	Object tree	<p>When a node is selected from the object tree, related objects are displayed in the object setting field. Operate Close TreeView or Open TreeView to hide or display the object tree. Select "All object" to display all objects. When a parent node is selected, all child node objects under the selected node are displayed. When a child node is selected, objects of the selected node are displayed. For details of each object, refer to the instruction manual and other technical references for the servo amplifier.</p>	

No.	Name	Function																				
(4)	Object setting field	Allows the user to edit and set an object.																				
		<table border="1"> <thead> <tr> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>"Main Index"</td> <td>Displays the Main Index of an object.</td> </tr> <tr> <td>Sub Index</td> <td>Displays the Sub Index of an object.</td> </tr> <tr> <td>Object Name</td> <td>Displays the name of an object.</td> </tr> <tr> <td>Data Type</td> <td>Displays the data type of an object. I8: Integer 8 type I16: Integer 16 type I32: Integer 32 type U8: Unsigned 8 type U16: Unsigned 16 type U32: Unsigned 32 type Bool: Boolean type OS: Octet String type VS: Visible String type</td> </tr> <tr> <td>Attributes</td> <td>Displays the attributes of an object. RO: Read-only attribute, exclusively for reading. RW: Read/write attribute, possible to read or write.</td> </tr> <tr> <td>Min</td> <td>Displays the setting range of an object.</td> </tr> <tr> <td>Max</td> <td>The setting range is not displayed for an object whose Data Type is "OS" or "VS".</td> </tr> <tr> <td>Value</td> <td>Displays the value of an object. The value can be changed if the object attribute is "RW" and the set value is a numerical value. Note that there are input restrictions for each Display mode setting. The following values can be input. Hex: 0 to 9, A to F (After editing, ""h"" is automatically placed at the end of the number.) Dec: 0 to 9 and minus sign "-" Bin: 0 and 1 ("b" is automatically placed at the end of the number.) After changing the value, press the <ENTER> key or click the [Trans] button. To return a value to its original value press the <ESC> key.</td> </tr> <tr> <td>Unit</td> <td>Displays the unit of an object set value.</td> </tr> </tbody> </table>	Name	Function	"Main Index"	Displays the Main Index of an object.	Sub Index	Displays the Sub Index of an object.	Object Name	Displays the name of an object.	Data Type	Displays the data type of an object. I8: Integer 8 type I16: Integer 16 type I32: Integer 32 type U8: Unsigned 8 type U16: Unsigned 16 type U32: Unsigned 32 type Bool: Boolean type OS: Octet String type VS: Visible String type	Attributes	Displays the attributes of an object. RO: Read-only attribute, exclusively for reading. RW: Read/write attribute, possible to read or write.	Min	Displays the setting range of an object.	Max	The setting range is not displayed for an object whose Data Type is "OS" or "VS".	Value	Displays the value of an object. The value can be changed if the object attribute is "RW" and the set value is a numerical value. Note that there are input restrictions for each Display mode setting. The following values can be input. Hex: 0 to 9, A to F (After editing, ""h"" is automatically placed at the end of the number.) Dec: 0 to 9 and minus sign "-" Bin: 0 and 1 ("b" is automatically placed at the end of the number.) After changing the value, press the <ENTER> key or click the [Trans] button. To return a value to its original value press the <ESC> key.	Unit	Displays the unit of an object set value.
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Unit	Displays the unit of an object set value.																					

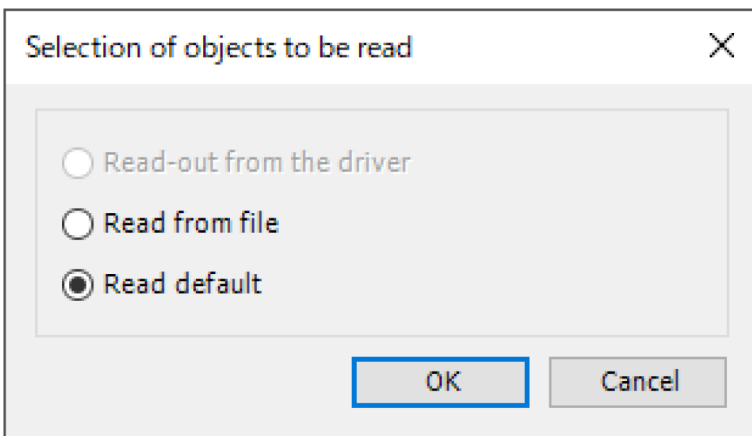
7.5.2 Setting Objects

1.2 Procedure

1. From the menu bar on the main pane, select **View>Object**. Alternatively, on the toolbar, click the "Open the Object view" icon.



The "Selection of objects to be read" dialog box will be displayed.



Read-out from the amplifier.

Communicates with the connected servo amplifier and reads objects set in the servo amplifier.

If this mode is selected, object values will be reflected in the servo amplifier as soon as they are changed.

Read from file

Reads the parameter file ("obj5") that was edited previously. If communication is performed with the servo amplifier, object values will be reflected in the servo amplifier as soon as they are changed.

Read default

Reads the standard default settings of the servo amplifier that were saved during installation.

If communication is performed with the servo amplifier, object values will be reflected in the servo amplifier as soon as they are changed.

2. Select one of the three options above for reading the object settings and click the [OK] button.

The Object window will be displayed.

Main Index	Sub Index	Object Name	Data Type	Attributes	Min	Max	Value	Unit
1000h	00h	Device type	U32	256	00000000h	FFFFFFFFh	00020192h	
1001h	00h	Error register	U8	256	00h	FFh	00h	
1008h	00h	Manufacturer device name	VS	256			MADHT1503801	
1009h	00h	Manufacturer hardware version	VS	256			V1.00	
100Ah	00h	Manufacturer software version	VS	256			V1.00	
1010h	00h	Number of entries	U8	256		00h	FFh	
1010h	01h	Save all parameters	U32	0	00000000h	FFFFFFFFh	00000000h	
1018h	00h	Number of entries	U8	4352		00h	FFh	04h
1018h	01h	Vendor ID	U32	4352	00000000h	FFFFFFFFh	0000666Fh	
1018h	02h	Product code	U32	4352	00000000h	FFFFFFFFh	51505001h	
1018h	03h	Revision number	U32	4352	00000000h	FFFFFFFFh	00010000h	
1018h	04h	Serial number	U32	4352	00000000h	FFFFFFFFh	00000000h	
10F3h	00h	Number of entries	U8	256		00h	FFh	13h
10F3h	01h	Maximum messages	U8	256		00h	FFh	08h
10F3h	02h	Newest message	U8	256		00h	FFh	00h
10F3h	03h	Newest acknowledged message	U8	0		00h	FFh	00h
10F3h	04h	New messages available	BOOL	256		0h	1h	00h
10F3h	05h	Flags	U16	0	0000h	FFFFh	0007h	
10F3h	06h	Diagnosis message 1	OS	256			00000000h	
10F3h	06h	Diagnosis message 1	OS	256			00000000h	
10F3h	06h	Diagnosis message 1	OS	256			00000000h	
10F3h	07h	Diagnosis message 2	OS	256			00000000h	
10F3h	07h	Diagnosis message 2	OS	256			00000000h	
10F3h	07h	Diagnosis message 2	OS	256			00000000h	
10F3h	07h	Diagnosis message 2	OS	256			00000000h	
10F3h	08h	Diagnosis message 3	OS	256			00000000h	
10F3h	08h	Diagnosis message 3	OS	256			00000000h	
10F3h	08h	Diagnosis message 3	OS	256			00000000h	

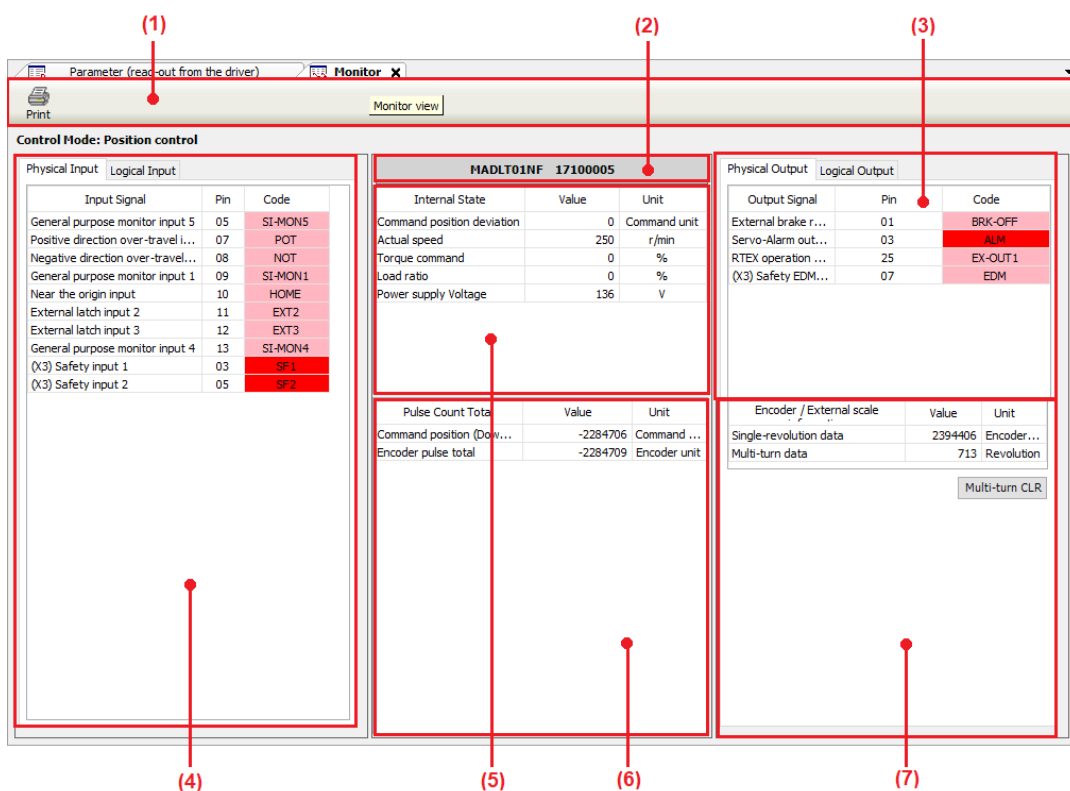
3. After changing the object settings, click the [EEP] button to write the object settings to the EEPROM of the servo amplifier.
4. Click the [x] button on the Object window to close the Object window.

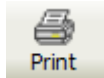
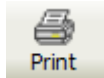
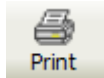
7.6 Monitor Window

7.6 Monitor Window

The Monitor window displays the operating states of servo amplifiers and motors, I/O signals, internal statuses, and other information and also allows the user to check them.

7.6.1 Configuration of Monitor Window



NO.	Name	Description				
(1)	Toolbar	The toolbar consists of basic operation commands related to parameters.				
		<table border="1"> <thead> <tr> <th>Icon</th> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td></td> <td>Print</td> <td>Prints the contents of the Monitor window.</td> </tr> </tbody> </table>	Icon	Name	Function	
Icon	Name	Function				
	Print	Prints the contents of the Monitor window.				
(2)	Amplifier model name and serial number	Displays the model name and serial number of the servo amplifier.				
(3)	Output signal status monitor	<p>Displays the status of each output signal. The tab can be switched between "Physical Output" and "Logical Output".</p> <p>Physical Output – Displays the status of output signals from the servo amplifier.</p> <p>Red: Indicates that output transistor is ON</p> <p>Pink: Indicates that output transistor is OFF</p>				

NO.	Name	Description												
		Logical Output – Displays the status of signals within the servo amplifier. Red: Indicates that signal status is active Pink: Indicates that signal status is inactive												
(4)	Input signal status monitor	Displays the status of input signals. The tab can be switched between "Physical Input" and "Logical Input". Physical Input – Displays the status of input signals to the servo amplifier. Red: Indicates that COM- is connected Pink: Indicates that signal status is open Logical Input – Displays the status of signals within the servo amplifier. Red: Indicates that signal status is active Pink: Indicates that signal status is inactive												
(5)	Internal status monitor	Displays the internal status of the servo amplifier. <table border="1" data-bbox="528 681 1249 996"> <thead> <tr> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td>Commanded position deviation</td> <td>Displays the position deviation of a command unit.</td> </tr> <tr> <td>Actual speed</td> <td>Displays the monitor speed</td> </tr> <tr> <td>Torque command</td> <td>Displays the torque command.</td> </tr> <tr> <td>Load factor</td> <td>Displays the ratio relative to the rated load. Adjust the operation pattern so that 100% is not exceeded.</td> </tr> <tr> <td>Power supply voltage value</td> <td>Displays the voltage (voltage between the P and N terminals) of power supply to the servo amplifier.</td> </tr> </tbody> </table>	Name	Function	Commanded position deviation	Displays the position deviation of a command unit.	Actual speed	Displays the monitor speed	Torque command	Displays the torque command.	Load factor	Displays the ratio relative to the rated load. Adjust the operation pattern so that 100% is not exceeded.	Power supply voltage value	Displays the voltage (voltage between the P and N terminals) of power supply to the servo amplifier.
Name	Function													
Commanded position deviation	Displays the position deviation of a command unit.													
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Torque command	Displays the torque command.													
Load factor	Displays the ratio relative to the rated load. Adjust the operation pattern so that 100% is not exceeded.													
Power supply voltage value	Displays the voltage (voltage between the P and N terminals) of power supply to the servo amplifier.													
(6)	Pulse sum monitor	Displays the sum of command and encoder pulses received by the servo amplifier.												
(7)	Encoder information monitor	Displays encoder information. <table border="1" data-bbox="528 1114 1249 1242"> <tbody> <tr> <td>Single-turn data</td> <td>Displays an absolute position when the motor makes no more than a single turn.</td> </tr> <tr> <td>Multi-turn data</td> <td>Displays how many turns the motor made after "Clear" operation.</td> </tr> </tbody> </table> <p>Clicking "Clear Multi-turn" resets the multi-turn data stored in the encoder to "0" and clears all encoder errors.</p> <p>Note 1: Before using "Clear Multi-turn", check the precautions on use. To clear encoder errors, you may need to restart the servo amplifier.</p> <p>Note 2: If the connected device is A5B, single-turn data and multi-turn data will be displayed as "-".</p>	Single-turn data	Displays an absolute position when the motor makes no more than a single turn.	Multi-turn data	Displays how many turns the motor made after "Clear" operation.								
Single-turn data	Displays an absolute position when the motor makes no more than a single turn.													
Multi-turn data	Displays how many turns the motor made after "Clear" operation.													

(Note 1) Because Ethernet communication is used to transfer data between the servo amplifier and PC, there is a difference or delay between the value displayed on the screen and the actual value of the servo amplifier.

(Note 2) When the polarity is "+", symbol "+" is not displayed.

(Note 3) The monitor function is not a measuring instrument. Use the values displayed in the Monitor window as a guide.

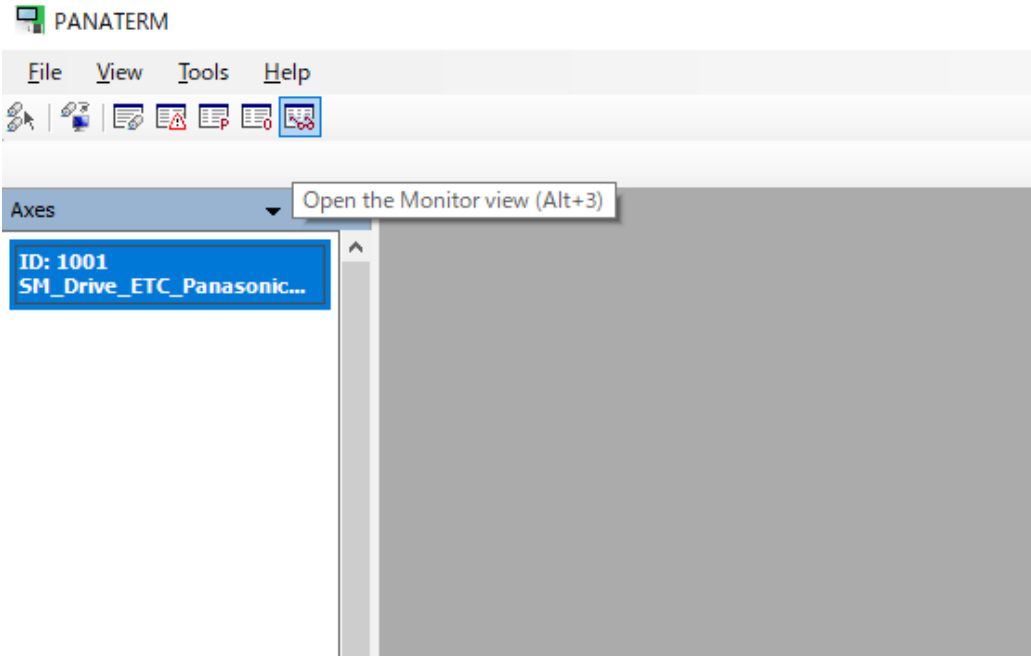
(Note 4) If the servo amplifier outputs "Error 40.0 Error protection from absolute system failure" or "Error 42.0 Error protection from absolute overspeed", execute "Clear Multi-turn". Unless the absolute encoder is reset, the alarm cannot be cleared.

7.6 Monitor Window

7.6.2 Checking the Monitor Window

1.2 Procedure

1. From the menu bar on the main pane, select **View>Monitor**. Alternatively, on the toolbar, click the "Open the Monitor view" icon.



The Monitor window will be displayed.

Parameter (read-out from the driver) Monitor X

Print Monitor view

Control Mode: Position control

Physical Input		
Input Signal	Pin	Code
General purpose monitor input 5	05	SI-MON5
Positive direction over-travel...	07	POT
Negative direction over-travel...	08	NOT
General purpose monitor input 1	09	SI-MON1
Near the origin input	10	HOME
External latch input 2	11	EXT2
External latch input 3	12	EXT3
General purpose monitor input 4	13	SI-MON4
(X3) Safety input 1	03	SF1
(X3) Safety input 2	05	SF2

MADLT01NF 17100005		
Internal State	Value	Unit
Command position deviation	0	Command unit
Actual speed	0	r/min
Torque command	0	%
Load ratio	0	%
Power supply Voltage	137	V

Physical Output		
Output Signal	Pin	Code
External brake r...	01	BRK-OFF
Servo-Alarm out...	03	ALM
RTEX operation ...	25	EX-OUT1
(X3) Safety EDM...	07	EDM

Encoder / External scale		
Value	Unit	
Single-revolution data	2394434	Encoder...
Multi-turn data	713	Revolution

Multi-turn CLR

2. Check each item.
Check the input signal state, output signal state, and the internal status of the servo amplifier.
3. Click the [×] button on the Monitor window.
The Monitor window will be closed.

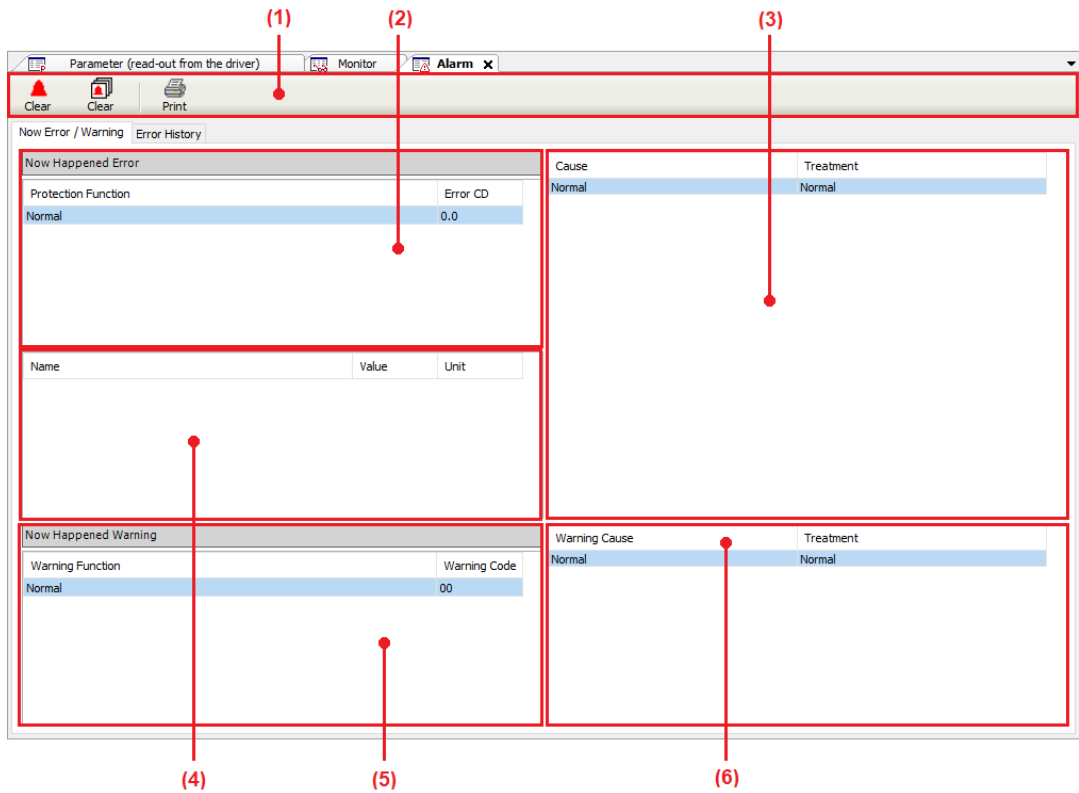
7.7 Alarm Window

7.7 Alarm Window

The Alarm window allows the user to check error status when the front panel of the servo amplifier is blinking due to motor operation failure or for some other reason.

7.7.1 Configuration of Alarm Window

Display of the current errors and warnings (only during communication with servo amplifier)



Display of error histories

The screenshot shows the Alarm window interface. At the top, there are buttons for 'Clear', 'Clear', and 'Print'. Below these, there are tabs for 'Now Error / Warning' and 'Error History'. The main area is divided into three sections:

- Error History Table:** A table with columns 'Hist', 'Protection Function', and 'Error CD'. It lists 14 error events, including 'Command error protection' and 'RTEX communication timeout error protection'.
- Parameters Table:** A table with columns 'Name', 'Value', and 'Unit'. It lists various system parameters such as 'Control mode', 'Motor speed', 'Position control speed', etc.
- Cause and Treatment:** A text area providing details for the selected error. The cause is 'Position command variation (value after electronic gear) exceeds the specified value.' The treatment includes instructions to check the position command, electronic gear ratio, and parameter settings.

Red callouts are used to highlight specific features: (7) points to the 'Error CD' column in the error history table; (8) points to the 'Cause' and 'Treatment' text area; and (9) points to the 'Parameters' table.

No.	Name	Description												
(1)	Toolbar	<table border="1"> <thead> <tr> <th>Icon</th> <th>Name</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td></td> <td>Clear</td> <td>Allows the user to clear the current alarm history. If you click this button after eliminating the cause of the alarm, the current alarm will be cleared and normal operation will be performed. However, you cannot clear any alarms that cannot be cleared by alarm clear input signals of servo amplifiers. In such a case, turn off the servo amplifier, eliminate the cause of the alarm, and then turn the power on again.</td> </tr> <tr> <td></td> <td>Clear</td> <td>Allows the user to clear error histories.</td> </tr> <tr> <td></td> <td>Print</td> <td>Prints error-related information.</td> </tr> </tbody> </table>	Icon	Name	Function		Clear	Allows the user to clear the current alarm history. If you click this button after eliminating the cause of the alarm, the current alarm will be cleared and normal operation will be performed. However, you cannot clear any alarms that cannot be cleared by alarm clear input signals of servo amplifiers. In such a case, turn off the servo amplifier, eliminate the cause of the alarm, and then turn the power on again.		Clear	Allows the user to clear error histories.		Print	Prints error-related information.
		Icon	Name	Function										
			Clear	Allows the user to clear the current alarm history. If you click this button after eliminating the cause of the alarm, the current alarm will be cleared and normal operation will be performed. However, you cannot clear any alarms that cannot be cleared by alarm clear input signals of servo amplifiers. In such a case, turn off the servo amplifier, eliminate the cause of the alarm, and then turn the power on again.										
	Clear	Allows the user to clear error histories.												
	Print	Prints error-related information.												
(2)	Current error display area	Displays the alarm numbers and names of all errors that are currently occurring.												

7.7 Alarm Window

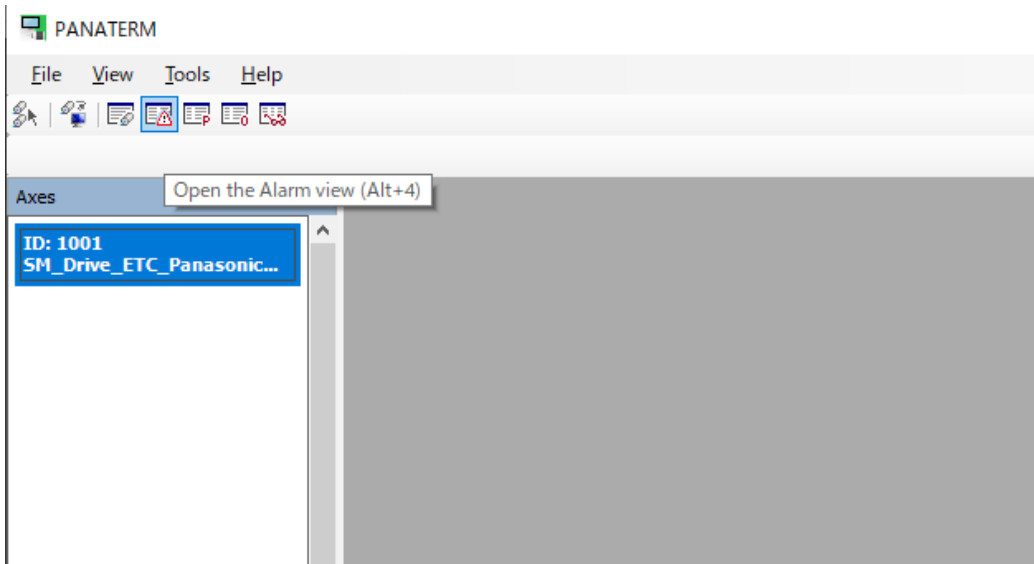
No.	Name	Description
		The alarm displayed on the top of the list is the alarm displayed on the front panel of the servo amplifier.
(3)	Error cause / treatment display area	Displays the cause and treatment of the selected error.
(4)	Motor internal status display area	Displays the motor internal status in the event of an alarm.
(5)	Current warning display area	Displays the warning numbers and names of all warnings that are currently occurring.
(6)	Warning cause / treatment display area	Displays the cause and treatment of the selected warning.
(7)	Error history display area	Displays the order of error histories, alarm numbers, and error names.
(8)	Error cause / treatment display area	Displays the cause and treatment of the selected error.
(9)	Motor internal status display area	Displays the motor internal status in the event of an alarm.

- (Note 1) Some alarms cause tripping as errors but are not recorded in error histories. For alarms that are not recorded in error histories, refer to the instruction manual of the servo amplifier.
- (Note 2) Up to 14 error histories are stored. When more than 14 errors occur, error histories are erased in chronological order (the oldest error history is erased first).
- (Note 3) Up to three histories of motor internal status in the event of an alarm are stored. If an alarm occurs immediately after the power is turned on, motor internal status may not be captured normally.

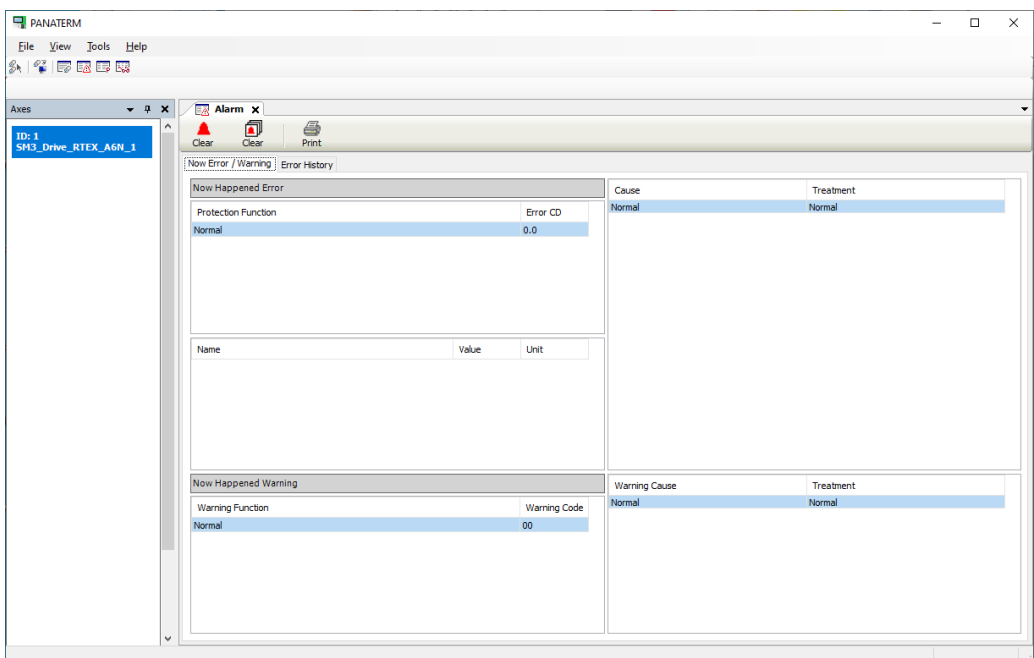
7.7.2 Checking Alarms

1 2 Procedure

1. From the menu bar on the main pane, select **View>Alarm**. Alternatively, on the toolbar, click the "Open the Alarm view" icon.



The Alarm window will be displayed.



2. Check for any errors that are currently occurring.
Click the "Now Error / Warning" tab and check for any errors that are currently occurring.
3. Check for any errors that occurred in the past.
Click the "Error History" tab and check for any errors that occurred in the past.
4. Click the [×] button on the Alarm window.
The Alarm window will be closed.

7.8 Other Functions

7.8 Other Functions

7.8.1 Language Setting Function

This function allows the user to set the display language of PANATERM Lite for GM. The default setting is the same language as the one set in GM Programmer.

1 2 Procedure

1. Select a language from the menu bar tool.
The language set in PANATERM Lite for GM will be switched.

i Info.

- The display language setting of PANATERM Lite for GM is linked with that of the GM Programmer.

7.8.2 Help Function

While performing operation in PANATERM Lite for GM, you can start the Help function to check information such as operating methods.

1 2 Procedure

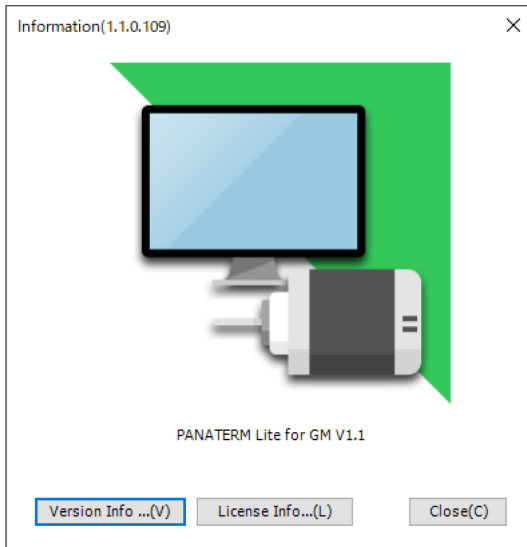
1. From the menu bar, select **Help>PANATERM Lite for GM Help**.
"PANATERM Lite for GM Operation Guide" will be started.

7.8.3 Version Display Function

This function allows the user to check the version, license, and other information for PANATERM Lite for GM.

1 2 Procedure

1. From the menu bar, select **Help>About**.



2. Click a desired button at the bottom of the window.

Button	Description
Version Info	Displays information about the plug-ins that have been applied and the operating system of the PC that is used.
License Info	Displays license information for the software used by PANATERM Lite for GM.

(MEMO)

8 Preparing for Servo Amplifiers

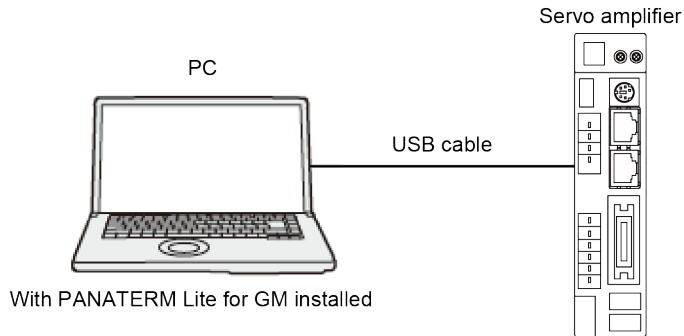
8.1 Initial Setup for Servo Amplifiers.....	8-2
8.1.1 Connecting the Servo Amplifier and PC	8-2
8.1.2 Installing the USB Driver	8-2
8.1.3 Initial Setup for Servo Amplifiers	8-2
8.1.4 Disconnecting the Servo Amplifier from the PC.....	8-4

8.1 Initial Setup for Servo Amplifiers

8.1 Initial Setup for Servo Amplifiers

8.1.1 Connecting the Servo Amplifier and PC

Use a USB cable to connect the servo amplifier and a PC on which PANTERM Lite for GM has been installed.



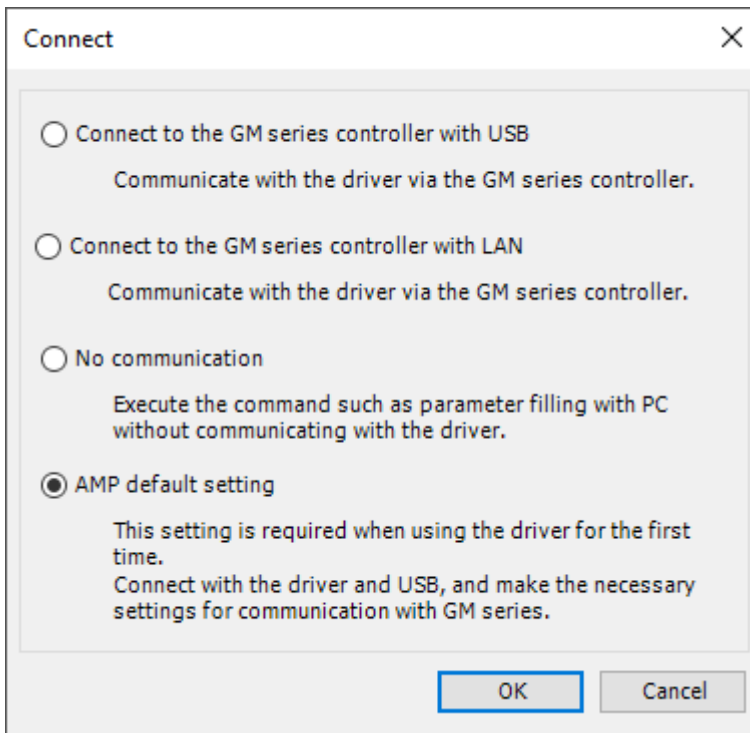
8.1.2 Installing the USB Driver

When the GM Programmer is installed, the USB driver is also installed at the same time.

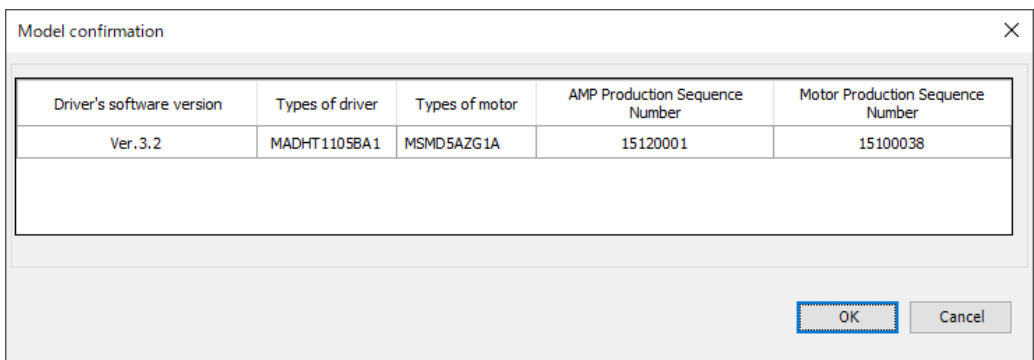
8.1.3 Initial Setup for Servo Amplifiers

12 Procedure

1. Start PANATERM Lite for GM.
The "Connect" dialog box will be displayed.

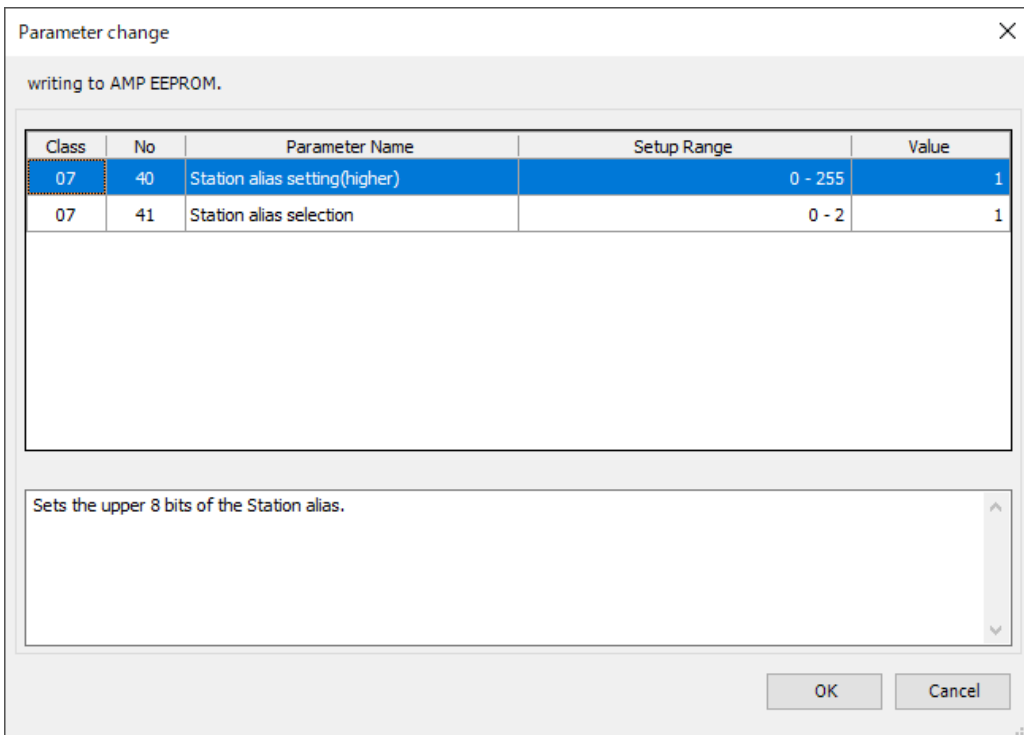


2. Select "AMP default setting" and click [OK].
The "Model confirmation" dialog box will be displayed.



3. Check the software version of the servo amplifier for which settings are to be changed and then click [OK].
The "Parameter change" dialog box will be displayed.

8.1 Initial Setup for Servo Amplifiers



If Pr7.41 is set to 0, the setting of the rotary switch on the front panel of the servo amplifier and the setting of Pr7.40 will be set as Station alias.

Station alias	
High-order 8 bits	Low-order 8 bits
3740H setting	Rotary switch setting

If Pr7.41 is set to 1, the value of the SII area (0004h) will be set as Station alias.

The value of the SII area (0004h) can be set using the EtherCAT slave device object of GM Programmer.

4. Click the [OK] button.
The "Setting Complete" dialog box will be displayed.
5. Click the [OK] button.
The main pane will be displayed. Start the servo amplifier.

8.1.4 Disconnecting the Servo Amplifier from the PC

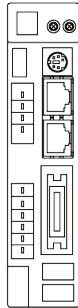
Disconnect the USB cable connecting the PC and the servo amplifier.

8.1 Initial Setup for Servo Amplifiers

PC



Servo amplifier



(MEMO)

9 Connecting the GM1 Controller and Servo Amplifiers

9.1 Setting an Address for Each Servo Amplifier.....	9-2
9.1.1 Reading the Value of Rotary Switch.....	9-2
9.1.2 Reading the Value of SII Area.....	9-2
9.2 Connecting the GM1 Controller and Each Servo Amplifier with Cables.....	9-3

9.1 Setting an Address for Each Servo Amplifier

9.1 Setting an Address for Each Servo Amplifier

The following are the address setting methods prescribed by EtherCAT.

- Reading the Value of Rotary Switch
- Reading the Value of SII Area

9.1.1 Reading the Value of Rotary Switch

Addresses are set using the value of the rotary switch on each servo amplifier.

This setting method is explained using MINAS-A5B as an example.

By setting the Pr7.41 parameter to 0, the value of the rotary switch on the front panel can be used as an address.

In this case, the value of the rotary switch and the value of Pr7.40 are combined and used as an address.

Station alias	
High-order 8 bits	Low-order 8 bits
3740H setting	Rotary switch setting

9.1.2 Reading the Value of SII Area

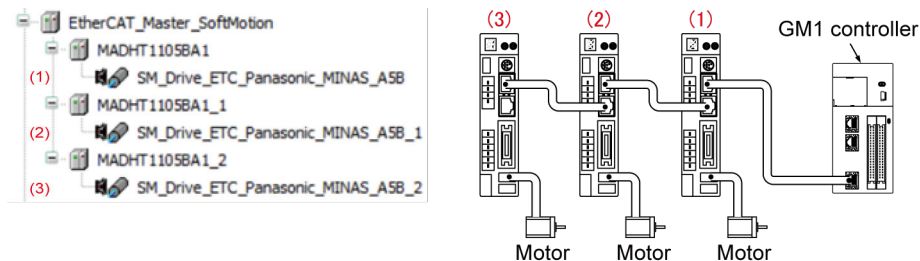
Addresses are set using the value of the SII area (0004h) in each servo amplifier.

This setting method is explained using MINAS-A5B as an example.

By setting the Pr7.41 parameter to 1, the value of the SII area (0004h) can be used as an address.

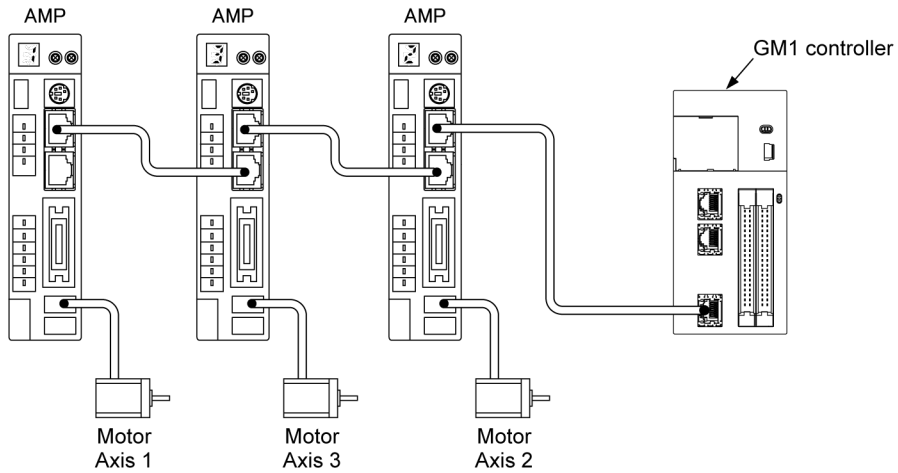
The value of the SII area (0004h) can be set using the EtherCAT slave device object of GM Programmer.

The following figure illustrates the correlation between the settings in GM Programmer and the wiring of each servo amplifier when addresses are set using the value of the SII area.



9.2 Connecting the GM1 Controller and Each Servo Amplifier with Cables

Connect the EtherCAT port on the GM1 Controller and each servo amplifier with cables.



(MEMO)

10 Connecting the GM1 Controller and the GM Programmer

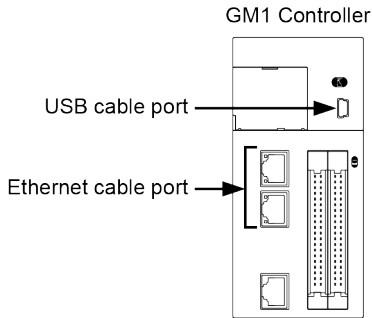
10.1	Connecting the GM1 Controller and PC	10-2
10.1.1	Selecting a Connection Port for GM Programmer	10-2
10.1.2	Connecting the GM1 Controller and PC with a Cable.....	10-2
10.2	Creating a New Project.....	10-3
10.3	Communication Setting.....	10-6
10.3.1	Setting the LAN Port	10-6
10.3.2	Adding USB Ports	10-6
10.4	Basic Setting for GM1 Controller	10-9
10.5	Adding and Setting up Servo Amplifiers	10-10
10.6	Basic Settings for EtherCAT Axes	10-15
10.6.1	General Settings	10-15
10.6.2	Scaling / Mapping Settings	10-17
10.7	Connecting to the GM1 Controller	10-20
10.8	Commissioning	10-22
10.8.1	Online Config Mode	10-22
10.8.2	Conducting Commissioning for Servo Amplifiers.....	10-23
10.9	Login	10-25
10.10	Logout.....	10-26

10.1 Connecting the GM1 Controller and PC

10.1 Connecting the GM1 Controller and PC

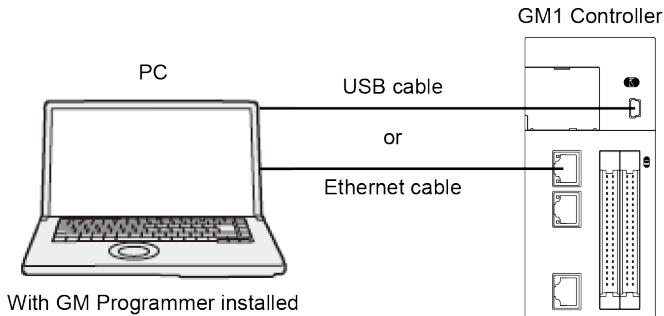
10.1.1 Selecting a Connection Port for GM Programmer

Select either LAN port connection or USB port connection.



10.1.2 Connecting the GM1 Controller and PC with a Cable

Use an Ethernet cable or USB cable to connect the GM1 Controller and a PC on which GM Programmer is installed.



10.2 Creating a New Project

When creating a program using GM Programmer for the first time, create a new project. For the new project, set a device and a programming language to be used.

This section describes how to create a new project.

Given below is an example that explains the procedure to create a project for the GM1 Controller (product number: AGM1CSEC16T/P) in Structured Text (ST) format.

1 2 Procedure

1. Start GM Programmer.

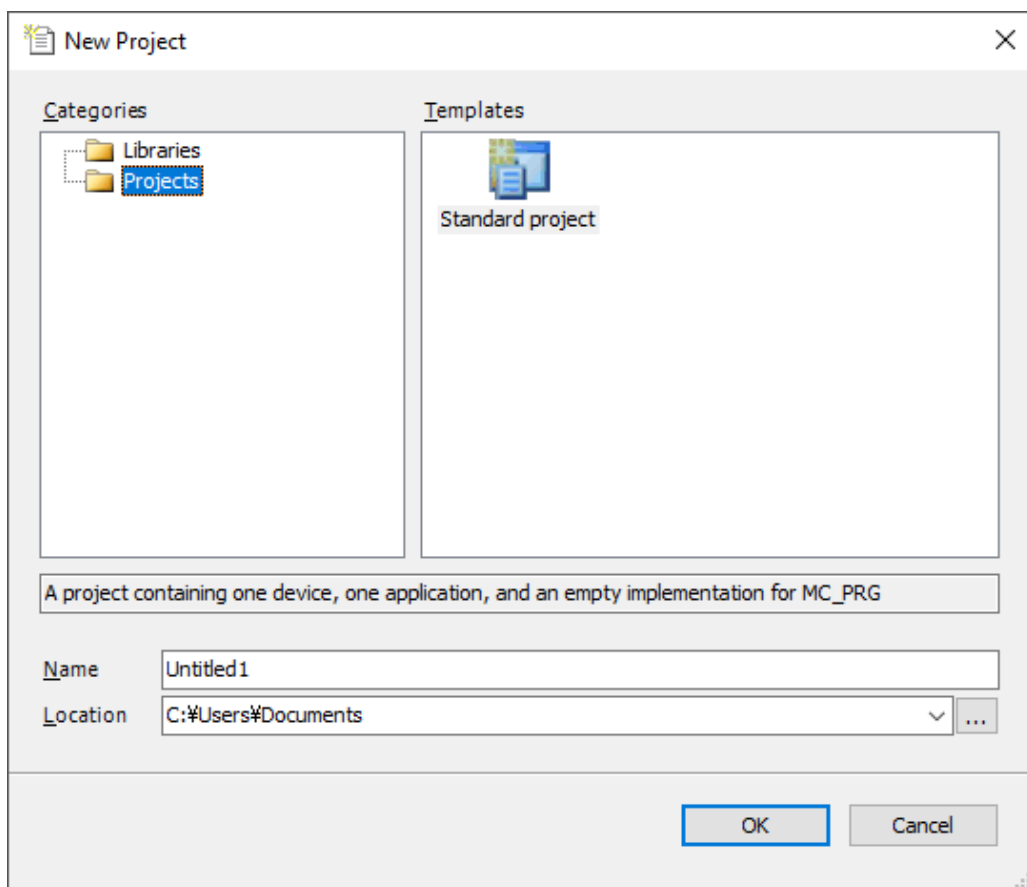
For details on how to start GM Programmer, refer to "6.3.1 How to start".

When GM Programmer is started, the Start Page will be displayed.

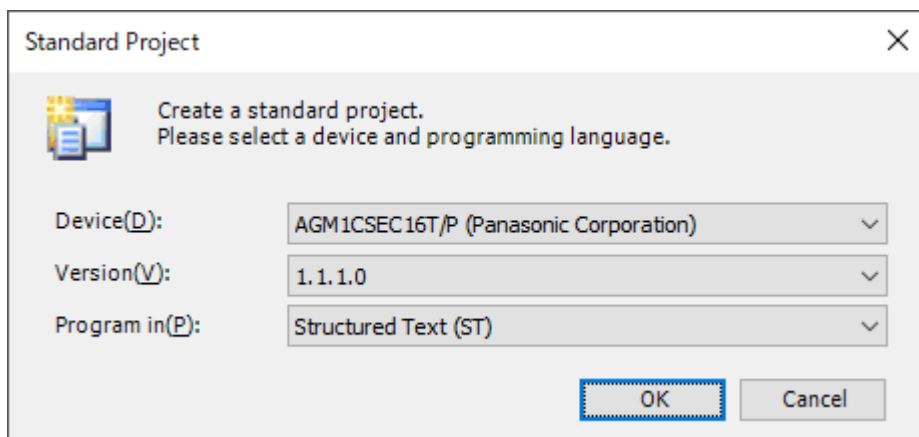


- #### 2. Select "New Project" under "Basic Operations".
- The "New Project" dialog box will be displayed.

10.2 Creating a New Project



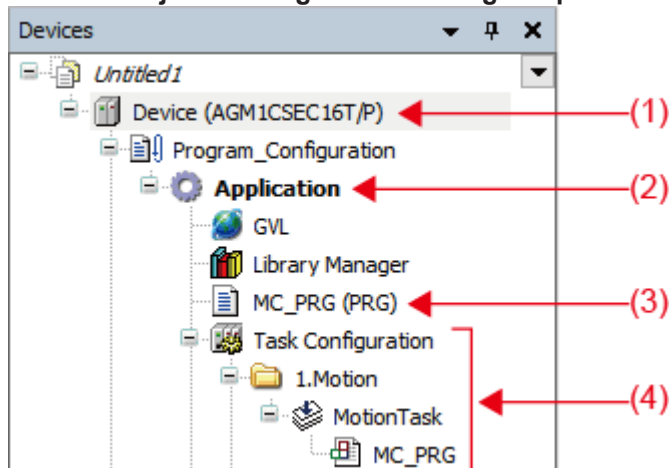
3. Select **Projects>Standard project**, and specify a project file name in the "Name" field and a project storage location in the "Location" field.
4. Click the [OK] button.
The "Standard project" dialog box will be displayed.



5. Select "AGM1CSEC16T/P(Panasonic Corporation)" in the "Device" field and "Structured" in the "Program in" field, and click the [OK] button.

A new project will be created. Device and other objects including objects for ST programs are arranged in the navigator pane.

<Uses of objects arranged in the navigator pane>



No.	Name	Function
(1)	Device object	Sets up device objects.
(2)	Application object	Sets up application objects.
(3)	Program object (POU object)	Sets up program objects (POU objects).
(4)	Task object	Sets up task objects.

i Info.

- A new project can also be created from the menu bar by selecting **File>New Project**.

10.3 Communication Setting

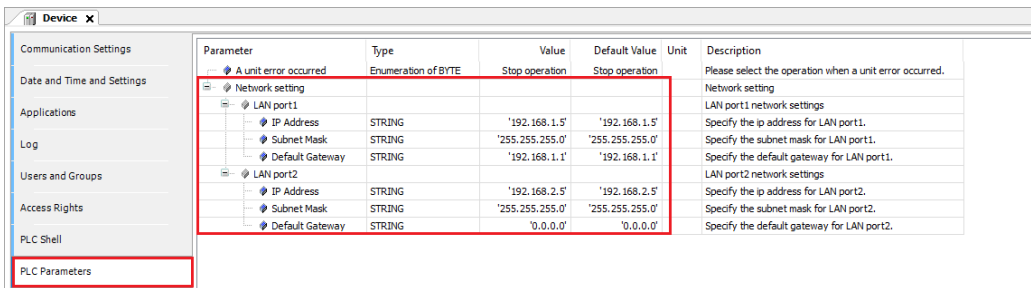
10.3.1 Setting the LAN Port

Configure communication settings for the LAN port using "Network setting" in the "PLC Parameters" tab.

When connecting GM Programmer and the GM1 Controller via the LAN port, match the network settings of the PC with those of the GM1 Controller.

1 2 Procedure

1. Double-click the "Device(AGM1CSEC16T/P)" object in the navigator pane. The device editor will open.
2. Open the "PLC Parameters" tab.



The screenshot shows the 'Device x' editor with the 'PLC Parameters' tab selected. The 'Network setting' section is expanded, showing parameters for LAN port1 and LAN port2. A red box highlights the network settings for both ports.

Parameter	Type	Value	Default Value	Unit	Description
Unit error occurred	Enumeration of BYTE	Stop operation	Stop operation		Please select the operation when a unit error occurred.
Network setting					Network setting
LAN port1					LAN port1 network settings
IP Address	STRING	'192.168.1.5'	'192.168.1.5'		Specify the ip address for LAN port1.
Subnet Mask	STRING	'255.255.255.0'	'255.255.255.0'		Specify the subnet mask for LAN port1.
Default Gateway	STRING	'192.168.1.1'	'192.168.1.1'		Specify the default gateway for LAN port1.
LAN port2					LAN port2 network settings
IP Address	STRING	'192.168.2.5'	'192.168.2.5'		Specify the ip address for LAN port2.
Subnet Mask	STRING	'255.255.255.0'	'255.255.255.0'		Specify the subnet mask for LAN port2.
Default Gateway	STRING	'0.0.0.0'	'0.0.0.0'		Specify the default gateway for LAN port2.

3. Check the network settings of the GM1 Controller and match the network settings of the PC with those of the GM1 Controller.
4. Open the "Communication Settings" tab and click "Network scan".
5. Select a GM1 Controller to which you want to connect and click the [OK] button.



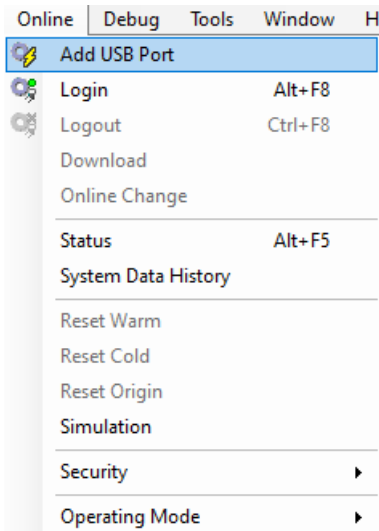
- If the network settings of the GM1 Controller have been changed, the changes will take effect after the project is downloaded.

10.3.2 Adding USB Ports

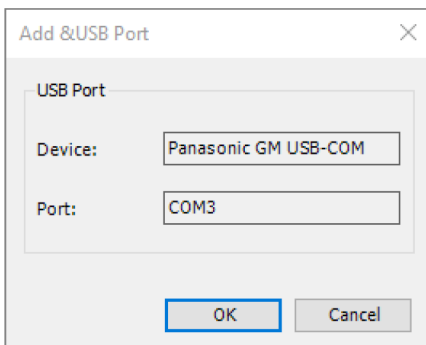
This function allows the user to set a USB port as the communication interface between a tool such as GM Programmer or PANATERM Lite for GM and the GM1 Controller.

1 2 Procedure

1. Connect the GM1 Controller and PC with a USB cable.
2. From the menu bar, select **Online>Add USB Port**.

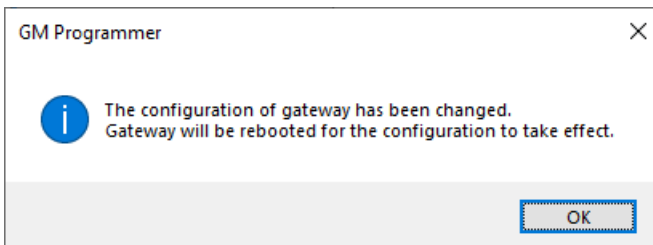


The "Add USB Port" dialog box will be displayed.



3. Click the [OK] button.

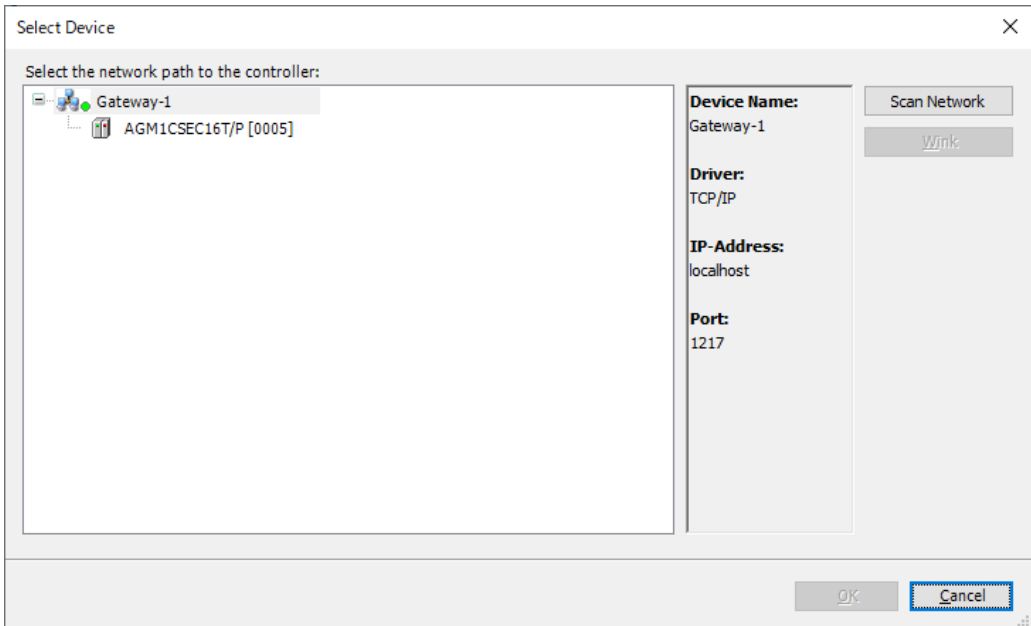
A dialog box to restart the Gateway will be displayed.



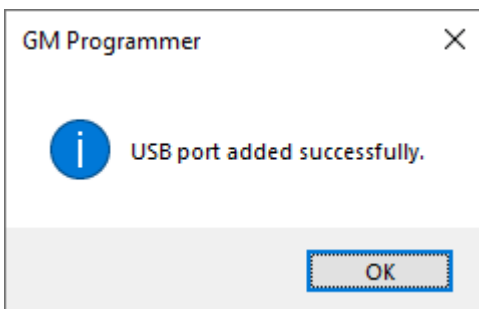
4. Click the [OK] button.

The "Select Device" dialog box will be displayed.

10.3 Communication Setting



5. Select a GM1 Controller to which you want to connect and click the [OK] button. When the connection is completed, a dialog box will be displayed to notify successful connection.



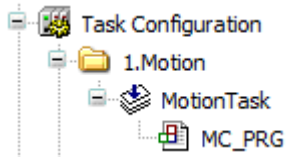
6. Click the [OK] button. A USB port will be added as the communication interface between the PC and GM1 Controller.

10.4 Basic Setting for GM1 Controller

Set a control cycle for the GM1 Controller.

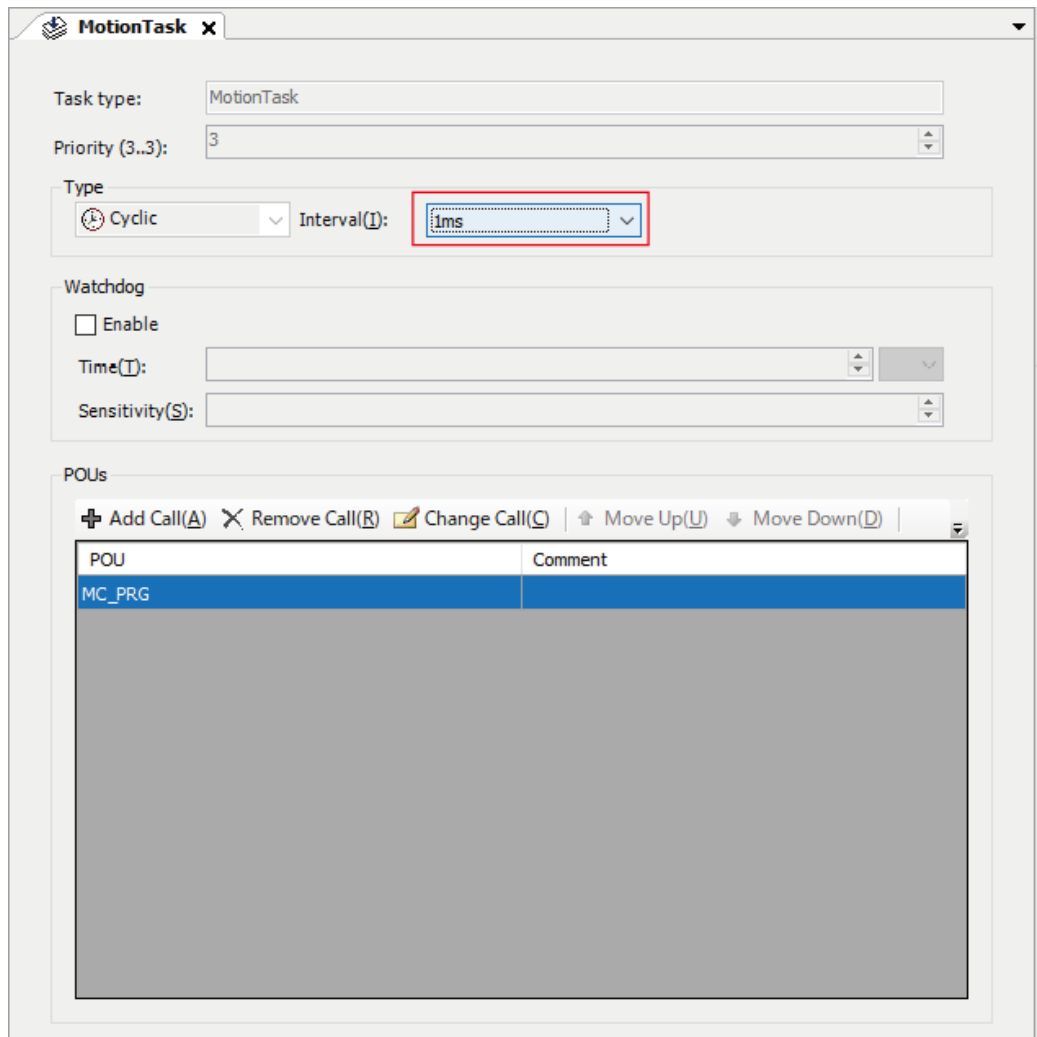
1 2 Procedure

1. Double-click the **MotionTask** object in the navigator pane.



The "MotionTask" editor will open in the main pane.

2. Set a control cycle.



10.5 Adding and Setting up Servo Amplifiers

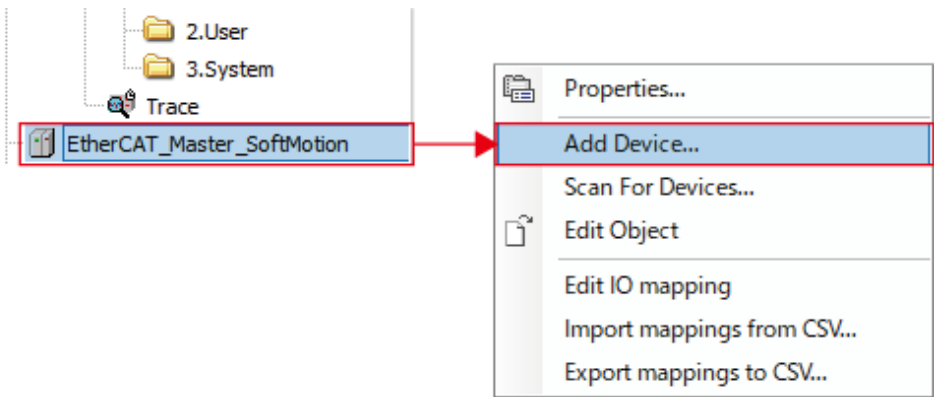
10.5 Adding and Setting up Servo Amplifiers

This section explains how to add device objects for servo amplifiers to a project and set them up.

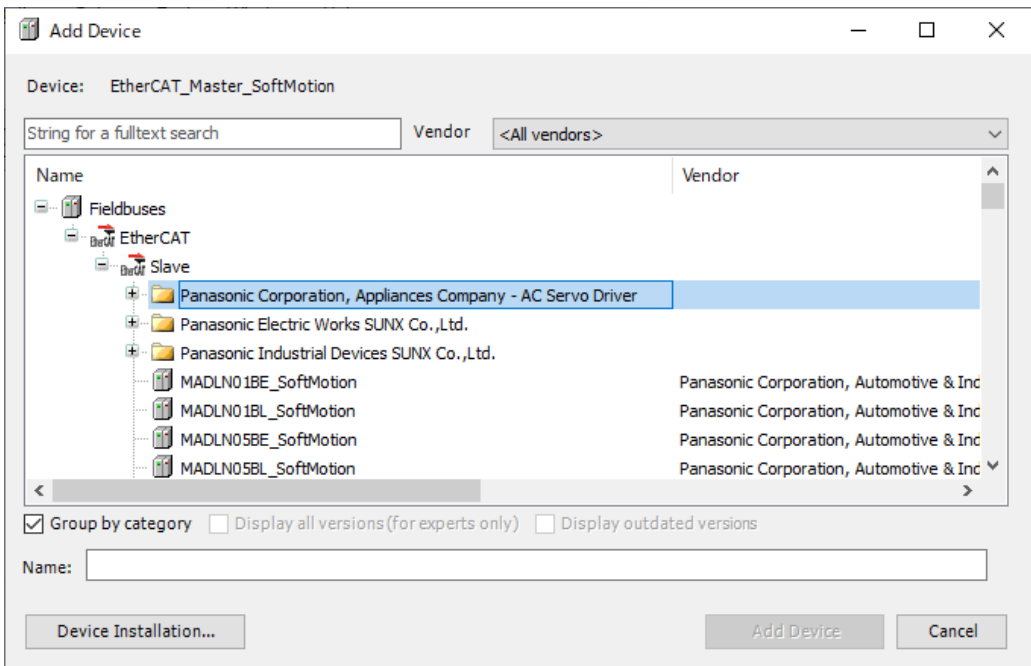
The description below explains how to add device objects for A5B servo amplifiers to a project and how to set them up.

1 2 Procedure

1. Right-click the **EtherCAT_Master_SoftMotion** object in the navigator pane and then select **Add Device** from the context-sensitive menu that is displayed.

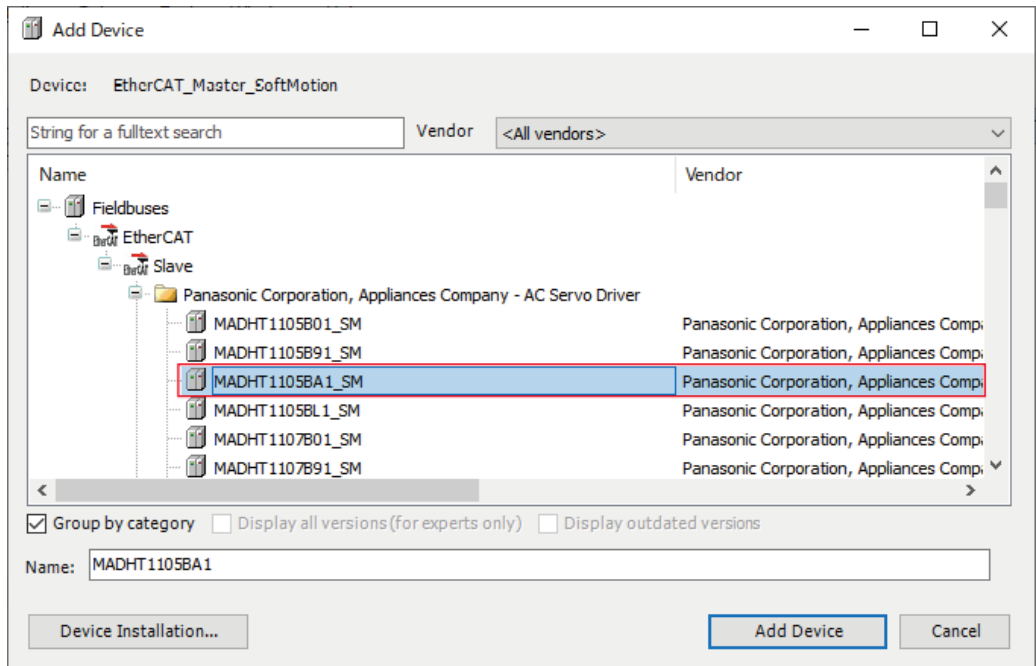


The "Add Device" dialog box will be displayed.



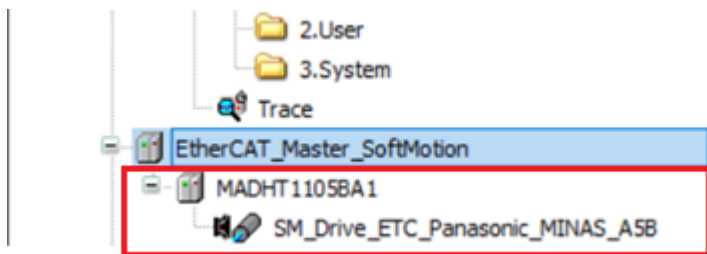
2. Select a device object for the servo amplifier.

The selected device object of the servo amplifier will be added.



3. Click the [Add Device] button.

The selected device object of the servo amplifier will be added to the navigator pane.

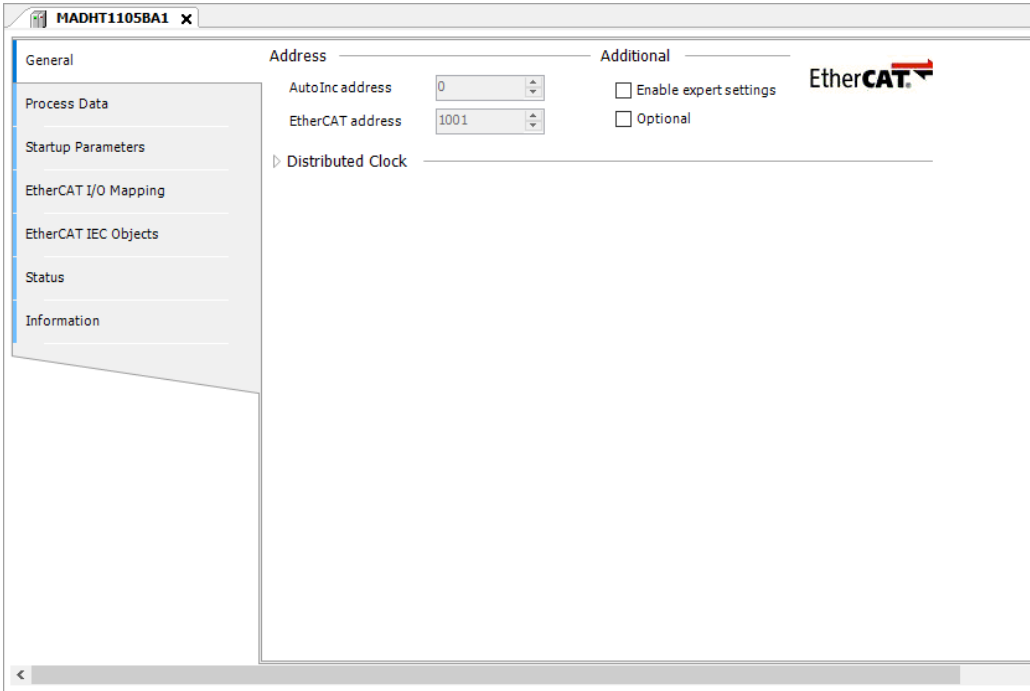


Click the [Cancel] button to close the "Select Device" dialog box.

4. Double-click the added object.

The setting pane will be displayed in the main pane.

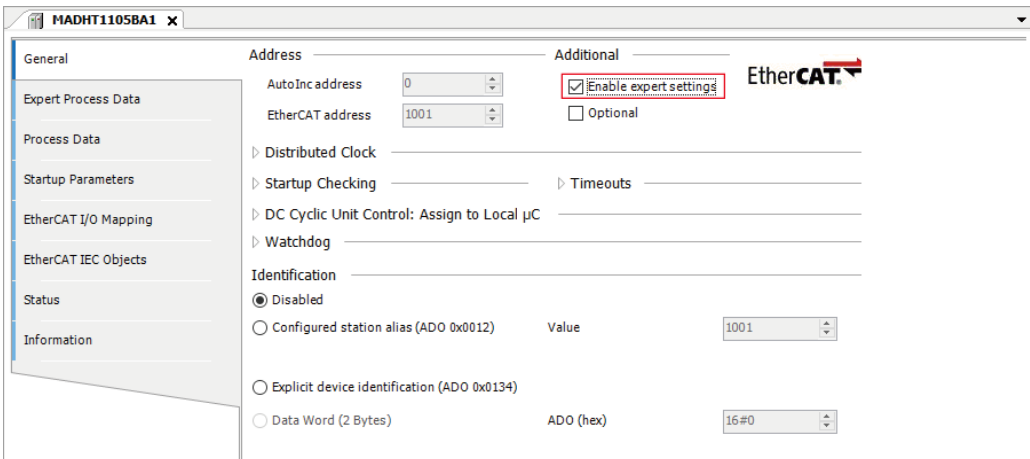
10.5 Adding and Setting up Servo Amplifiers



i Info.

- To remove a device object that has been added, select the device object in the navigator pane and press the <Delete> key.

5. Select the "Enable expert settings" check box.



6. Set a station alias.

How to set a station alias differs according to the setting of Pr7.41 in "8.1.3 Initial Setup for Servo Amplifiers".

- When Pr.7.41 is set to 0

10.5 Adding and Setting up Servo Amplifiers

Select the "Configured station alias" option and enter the setting of the rotary switch on the front panel of the servo amplifier and the setting of Pr7.40 into the input field.

Example: When the value of the rotary switch on the front panel of the servo amplifier is set to 8 and the value of Pr7.40 is set to 1

The high-order 8 bits and low-order 8 bits represent 1 and 8, respectively. Therefore, enter 264 in the input field.

Station alias	
High-order 8 bits	Low-order 8 bits
3740H setting	Rotary switch setting

The screenshot shows the configuration interface for a servo amplifier. The 'Identification' section is expanded, and the 'Configured station alias (ADO 0x0012)' option is selected. The 'Value' field is set to 264. Other options include 'Explicit device identification (ADO 0x0134)' and 'Data Word (2 Bytes)'. The 'EtherCAT address' is set to 1001.

- When Pr.7.41 is set to 1

Select the "Disable" option.

The numerical value displayed in "EtherCAT address" is set as the station alias value.

The screenshot shows the configuration interface for a servo amplifier. The 'Identification' section is expanded, and the 'Disabled' option is selected. The 'EtherCAT address' field is set to 1001. Other options include 'Configured station alias (ADO 0x0012)' and 'Data Word (2 Bytes)'. The 'EtherCAT address' is set to 1001.

10.5 Adding and Setting up Servo Amplifiers

i Info.

- You can also set any desired value after logging in by selecting the configured station alias value.

Enter any desired value in the input field and click the [Write to Eeprom] button.

<input checked="" type="radio"/> Configured station alias (ADO 0x0012)	Value	<input type="text" value="2"/>
<input type="button" value="Write to Eeprom"/>	Actual address	<input type="text"/>

When you log in again after restarting the servo amplifier, the value entered in the input field is set as the station alias value.

If you log in for the first time after selecting the "Configured station alias" option, station alias value inconsistency will occur, causing the device name of the servo amplifier in the navigator pane to be grayed out.



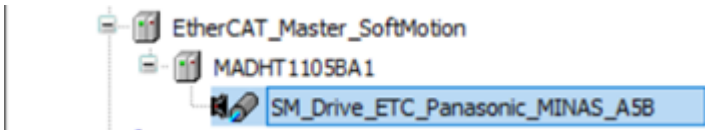
10.6 Basic Settings for EtherCAT Axes



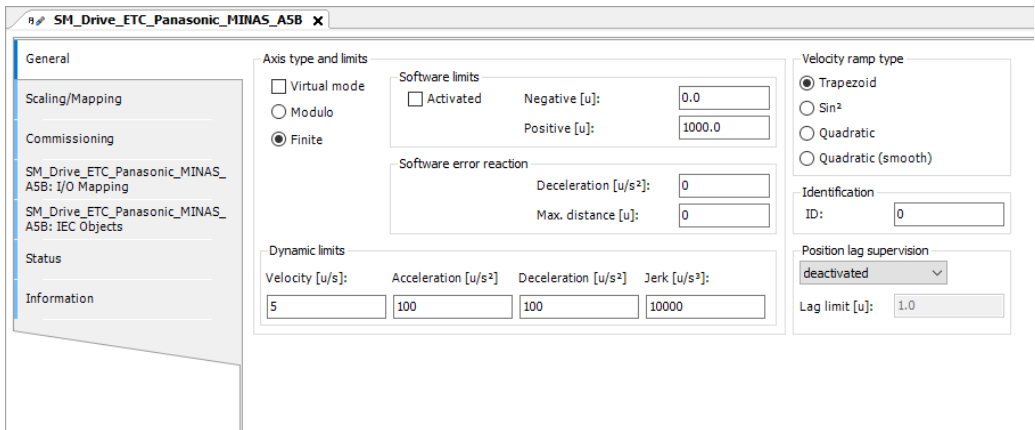
- Be sure to configure settings for EtherCAT axes.

1 2 Procedure

1. Double-click the servo amplifier object in the navigator pane.

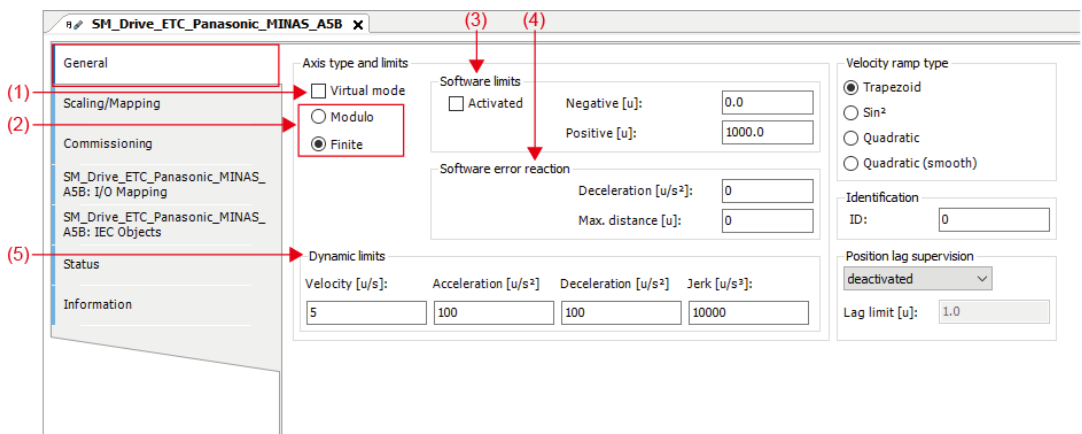


The setting pane will be displayed in the main pane.



10.6.1 General Settings

Select the "General" tab and set the following items.



10.6 Basic Settings for EtherCAT Axes

(1) Virtual mode

You can set real axes or virtual axes.

Use of real axes: Real axes are used to actually control the servo amplifier.

Use of virtual axes: Virtual axes create and execute a virtual servo amplifier within the GM1 Controller.

(2) Modulo / Finite

The axis type can be specified.

- Modulo

Modulo: The motor rotates infinitely (belt drive, etc.) without limiting the travel range.

- The value of the commanded position keeps looping between 0 and modulo value.
- The maximum settable modulo value is "255×units in application" (*1).

*1: For "units in application", specify settings in the "Scaling / Mapping" tab.

- A negative value cannot be set. (A warning is issued. If a download is performed without correcting the value, an error will occur when the GM1 Controller is started.)

The screenshot shows the 'Axis type and limits' configuration window. On the left, under 'Axis type and limits', there are three radio buttons: 'Virtual mode' (unchecked), 'Modulo' (checked), and 'Finite' (unchecked). On the right, under 'Modulo settings', there is a text input field labeled 'Modulo value [u]' with the value '8388608' entered.

- Finite

The set value of the commanded position is a finite value.

Soft limits can be set. Note that an error will occur if a 32-bit real number is exceeded.

The screenshot shows the 'Axis type and limits' configuration window. On the left, under 'Axis type and limits', there are three radio buttons: 'Virtual mode' (unchecked), 'Modulo' (unchecked), and 'Finite' (checked). On the right, under 'Software limits', there is a checkbox labeled 'Activated' which is unchecked. Below it are two text input fields: 'Negative [u]' with the value '0.0' and 'Positive [u]' with the value '8388608'.

(3) Soft limits

If the axis type is set to "Finite", soft limits can be set.

If the commanded position falls outside the soft limit setting range, an error stop will occur, causing the operation to stop.

If the operation is stopped because the soft limit setting range is exceeded, the value specified in "Deceleration" or "Max. distance" in "Soft error reaction" or the value specified in "Deceleration" in "Dynamic limits" will be applied, whichever is the shortest time from when deceleration starts until a stoppage occurs.

This screenshot is identical to the one above, showing the 'Axis type and limits' configuration window for Finite mode. The 'Activated' checkbox under 'Software limits' is unchecked, and the 'Negative [u]' and 'Positive [u]' fields contain '0.0' and '8388608' respectively.

(4) Software error reaction

Settings can be configured to stop operation when an error occurs.

Software error reaction	
Deceleration [μ/s^2]:	8388608
Max. distance [μ]:	0

i Info.

- If the mode is switched from run to stop during operation, an emergency stop will be executed, regardless of the settings in "Software error reaction".
- For stop operation that takes place when an error stop occurs or when the soft limit range is exceeded, one of the values specified in the following items is applied, whichever is the shortest time from when deceleration starts until a stoppage occurs.
 - "Deceleration" in "Software error reaction"
 - "Max. distance" in "Software error reaction"
 - "Deceleration" in "Dynamic limits"
- If "Deceleration" and "Max. distance" in "Software error reaction" are set to 0, these settings will be disabled. In this case, operation is stopped according to the value specified in "Deceleration" in "Dynamic limits".

(5) Dynamic limits

"Velocity", "Acceleration", and "Deceleration" cannot be set to 0. If they are set to 0, a warning will be issued.

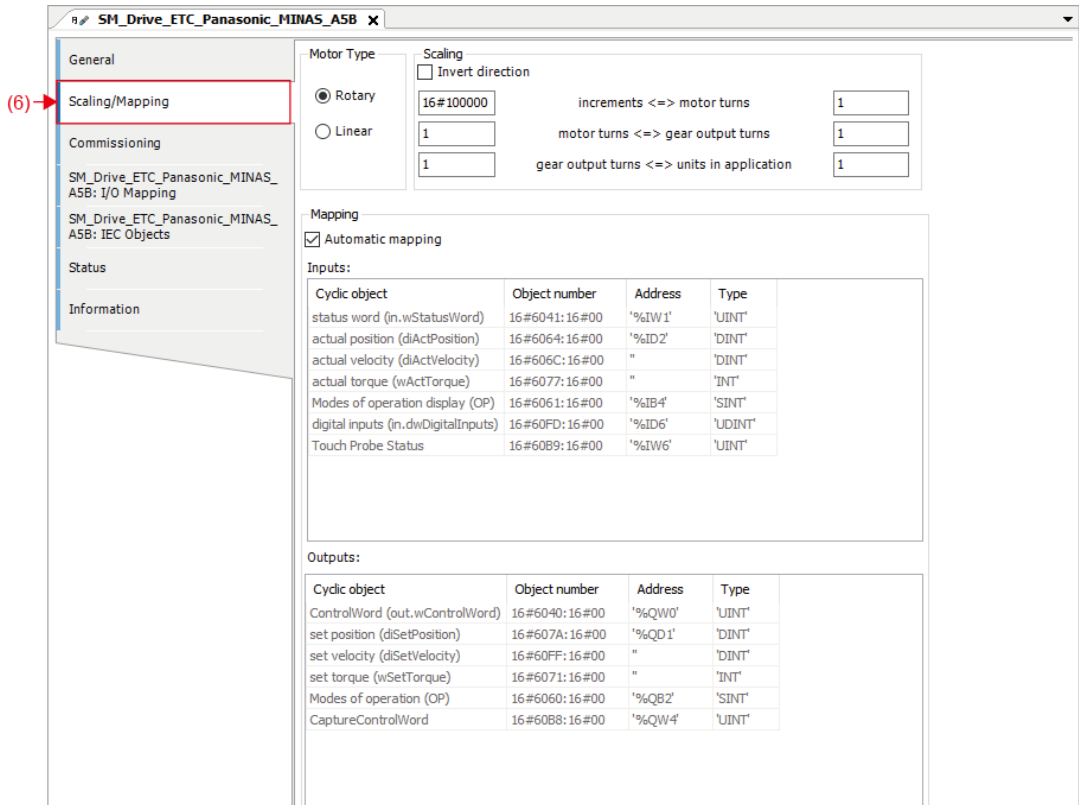
Dynamic limits			
Velocity [μ/s]:	Acceleration [μ/s^2]	Deceleration [μ/s^2]	Jerk [μ/s^3]:
10	100	8388608	10000

The "SMC_CheckLimits" function block can be used to check whether the values set in "Dynamic limits" were exceeded during axis operations. Note that the "SMC_CheckLimits" function block cannot detect whether the value set in "Jerk" was exceeded. Therefore, do not use the "Jerk" field.

10.6.2 Scaling / Mapping Settings

Select the "Scaling / Mapping" tab and set the following items.

10.6 Basic Settings for EtherCAT Axes



(6) Scaling / Mapping

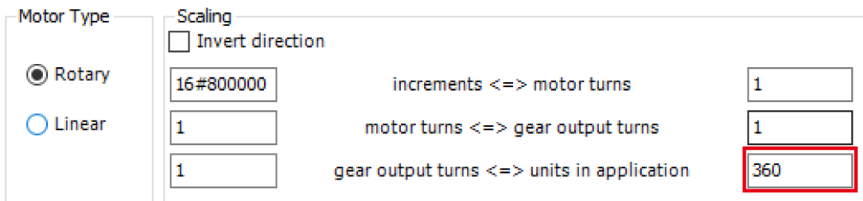
- Rotary type

When the axis type is set to "Modulo", the ratio in conversion from drive increments to the application unit is set.

The unit on the servo amplifier and the unit on the application (POU) are converted.

Example:

One revolution of the MINAS A6B MADHT1105BA1 is 0x800000. To treat one revolution as 360 in the application, set this ratio to 360.



Invert direction: The direction is reversed.

- Linear type

When the axis type is set to "Finite", the ratio in conversion from drive increments to the application unit is set.

Motor Type	Scaling
<input type="radio"/> Rotary	<input type="checkbox"/> Invert direction
<input checked="" type="radio"/> Linear	<input type="text" value="16#800000"/> increments <=> units in application <input type="text" value="360"/>

Invert direction: The direction is reversed.

10.7 Connecting to the GM1 Controller

10.7 Connecting to the GM1 Controller

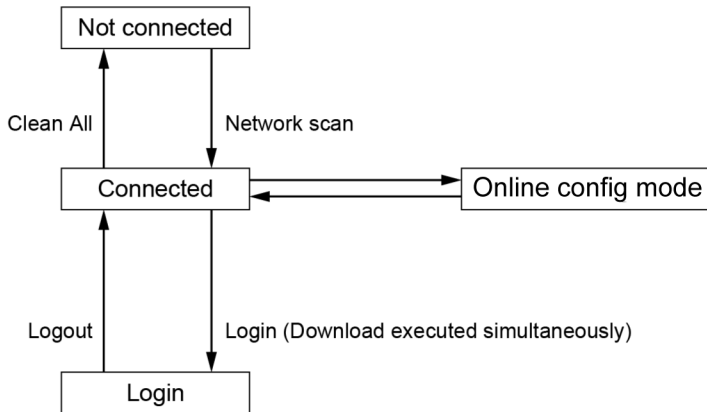
Connect the PC where the GM Programmer is installed to the GM1 Controller.

The connection status of the PC includes "Connected", "Connection as a device user", "Login", and "Online config mode".

Depending on the connection status, operations that can be executed are different.

If the Controller is provided with a device user registration, connection must be made as the device user.

■ Without device user registration



List of available GM1 Controller operations

Function	Not connected	Connected	Login	Online config mode
Setting / acquiring Controller information	x	o	o (Note 1)	x
Application management	x	x (Note 2)	o	x
Reset	x	x (Note 3)	o	x (Note 4)
Security	x	x	o	o
Debug	x	x	o	x
Commissioning	x	x	x	o

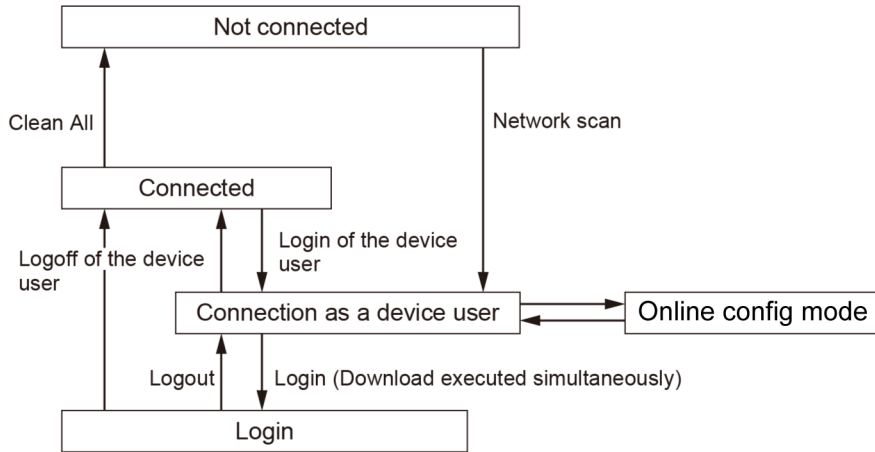
(Note 1) Not possible to operate the PLC Shell.

(Note 2) Possible to upload the source.

(Note 3) Possible to reset the device (PLC initialization) or to delete device application from the device.

(Note 4) Possible to reset the device (PLC initialization).

■ With device user registration



List of available GM1 Controller operations

Function	Not connected	Connected	as a device user	Login	Online config mode
Setting / acquiring Controller information	x	x	o	o (Note 1)	x
Application management	x	x	x (Note 2)	o	x
Reset	x	x	x (Note 3)	o	x (Note 4)
Security	x	x	o (Note 5)	o	o
Debug	x	x	x	o	x
Commissioning	x	x	x	x	o

(Note 1) Not possible to operate the PLC Shell.

(Note 2) Possible to upload the source.

(Note 3) Possible to reset the device (PLC initialization) or to delete device application from the device.

(Note 4) Possible to reset the device (PLC initialization).

(Note 5) Addition of the device user, changing the password for the device user, or deletion of the device user cannot be made if the user of the Device Editor is not synchronized with "Synchronization" of the group tab.

10.8 Commissioning

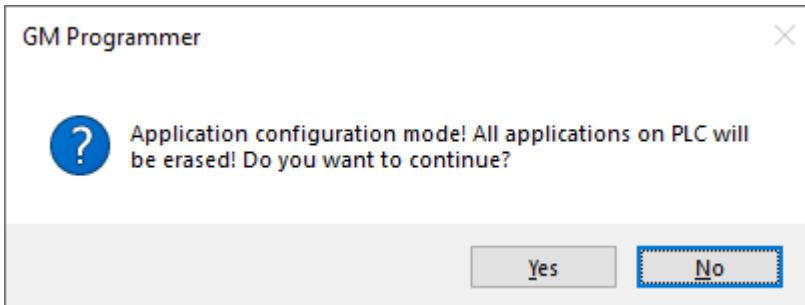
10.8.1 Online Config Mode

When the online config mode is selected, the servo amplifiers are set to be connected to the GM1 Controller.

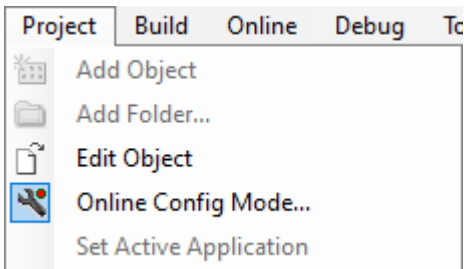
When using the online config mode, perform the setting as described in "10.3 Communication Setting" in advance.

1 2 Procedure

1. From the menu bar, select **Project>Online Config Mode**.
A confirmation message will be displayed, asking whether to remove all applications.



2. Click [Yes].
All applications will be removed from the GM1 controller, and the GM1 controller and servo amplifiers will be connected in online config mode.
While online config mode is in progress, "Online Config Mode" in the menu bar remains selected.



i Info.

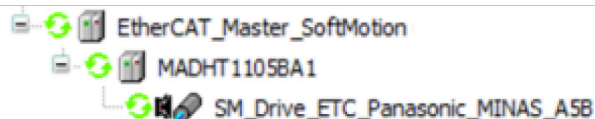
- To cancel the online config mode, select **Project>Online Config Mode** from the menu bar again.

10.8.2 Conducting Commissioning for Servo Amplifiers

While in online config mode, you can conduct commissioning for servo amplifiers. There is no need to create a program for commissioning. The following is an example of commissioning using the A5B-series servo amplifiers.

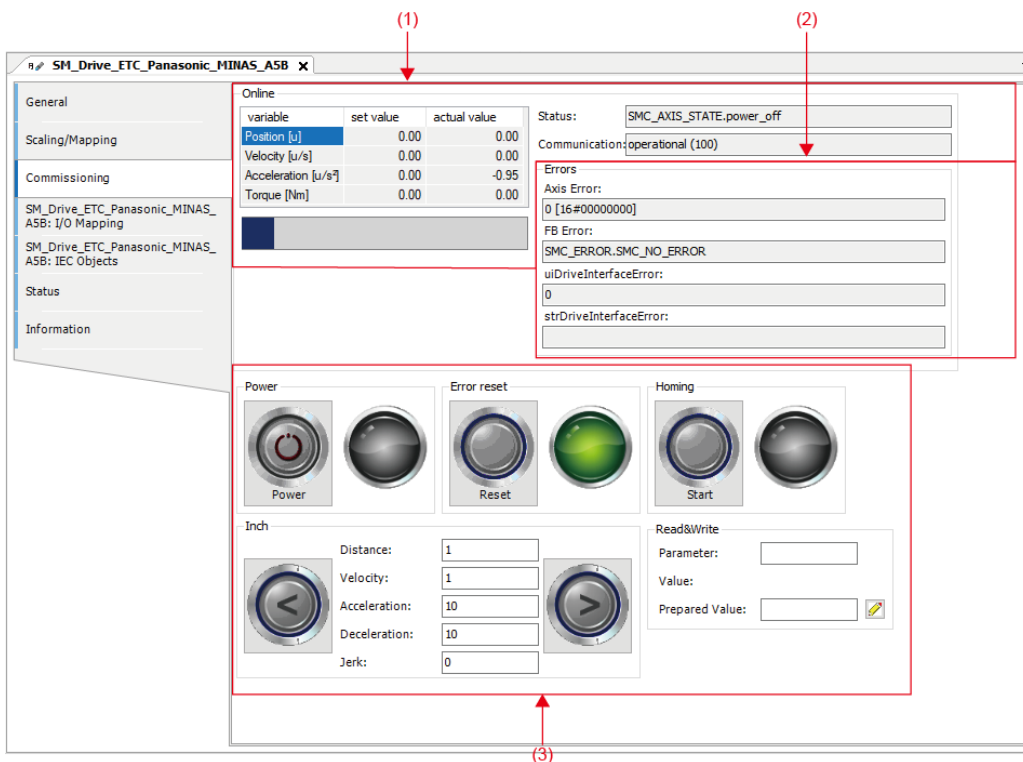
1 2 Procedure

1. Double-click the servo amplifier object in the navigator pane.



The "EtherCAT Axis Setting" dialog box will be displayed.

2. Click the "Commissioning" tab. The Commissioning pane will be displayed.

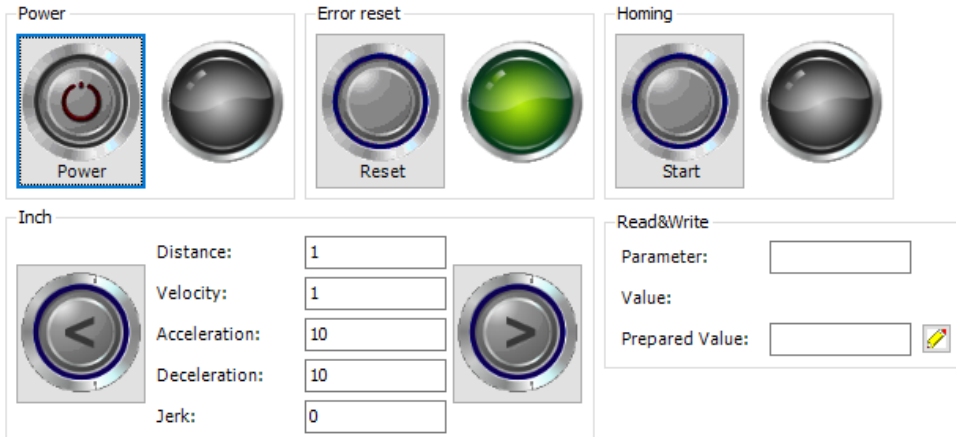


No.	Group	Description
(1)	Status	Displays the running status of the servo amplifiers during commissioning.
(2)	Error	Displays errors that occurred during commissioning. Allows the user to clear errors.

10.8 Commissioning

No.	Group	Description
(3)	Operation	Allows the user to set commissioning parameters. Allows the user to execute commissioning.

- Click an appropriate button in the Operation group to start commissioning.
Clicking an icon starts the corresponding commissioning.
To change home return parameters, use the "Program" tab.



- For the servo amplifier status during commissioning, check the "Status" and "Error" groups.
 - To clear errors that are displayed, click the [Reset] button in the "Operation" group.
Clicking the [Reset] button clears all errors.
- From the menu bar, select **Project>Online Config Mode**.
Online config mode will be canceled and commissioning will be terminated.

This completes commissioning for servo amplifiers.

i Info.

- Even if communication with the servo amplifier is disrupted during "Inching" or "Home Return" operation, the servo amplifier will continue commissioning operation.
- If online config mode is canceled, commissioning will be terminated. To cancel the online config mode, select **Project>Online Config Mode** from the menu bar again.

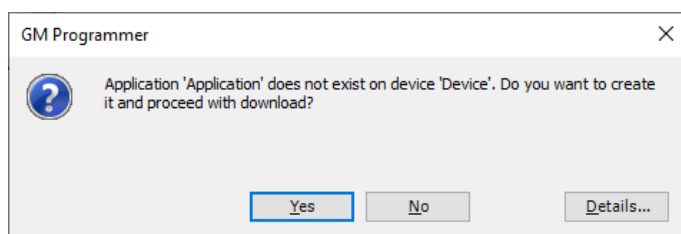
10.9 Login

GM Programmer allows the user to log in to the GM1 Controller. When "Login" is executed, applications are downloaded to the GM1 Controller.

1 2 Procedure

1. From the menu bar, select **Online>Login**, or press the <Alt> key and the <F8> key simultaneously.

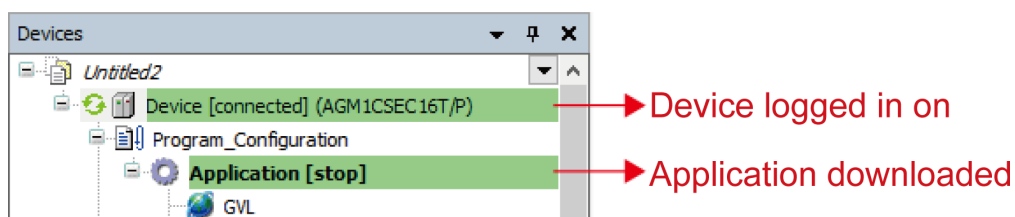
A confirmation message will be displayed, asking whether to download the applications to the GM1 controller (device).




2. Click [Yes].

The applications will be downloaded to the GM1 Controller at the same time as you log in to the GM1 Controller (device).

"connected" will be displayed at the [Device] object in the navigator pane and the status of the downloaded applications will be displayed.



i Info.

- You can also log in by clicking  on the toolbar.
- If you log in again after the applications have been downloaded, the confirmation message will not be displayed.


10.10 Logout

This function allows the user to log out from the device to which the user logged in.

1 2 Procedure

1. From the menu bar, select **Online>Logout**, or press the <Ctrl > + <F8> key simultaneously. You will be logged out.

i Info.

- You can also log out by clicking  on the toolbar.

11 Setting up the Servo Amplifier Connected to the GM1 Controller

11.1	Setting up the Servo Amplifier Connected to the GM1 Controller.....	11-2
11.1.1	If Connected with Ethernet Cables.....	11-2
11.1.2	If Connected with USB Cables.....	11-4
11.2	Writing Parameters to Servo Amplifier	11-8
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11.1 Setting up the Servo Amplifier Connected to the GM1 Controller

11.1 Setting up the Servo Amplifier Connected to the GM1 Controller

This section explains how to set up MINAS series servo amplifiers connected to the GM1 Controller.

For other devices, refer to their instruction manuals when setting up them.

The PC communicates with the servo amplifier connected to the GM1 Controller.

Connect the PC and GM1 Controller with an Ethernet cable or USB cable. With the GM1 Controller and servo amplifier connected with a Cat5e shielded cable, set up the servo amplifier.



- Perform this setup work only after the connection between the GM1 Controller and the servo amplifier has been established.

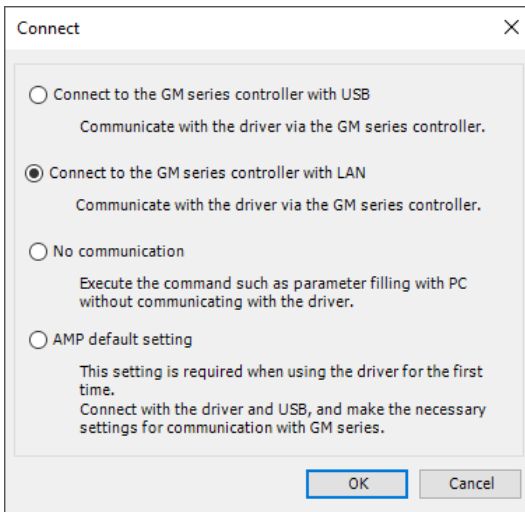
11.1.1 If Connected with Ethernet Cables

If connected with Ethernet cables, use the following procedure.

1 2 Procedure

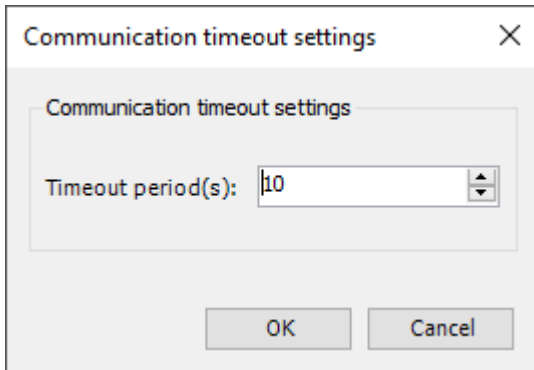
1. Start PANATERM Lite for GM.

The "Connect" dialog box will be displayed.

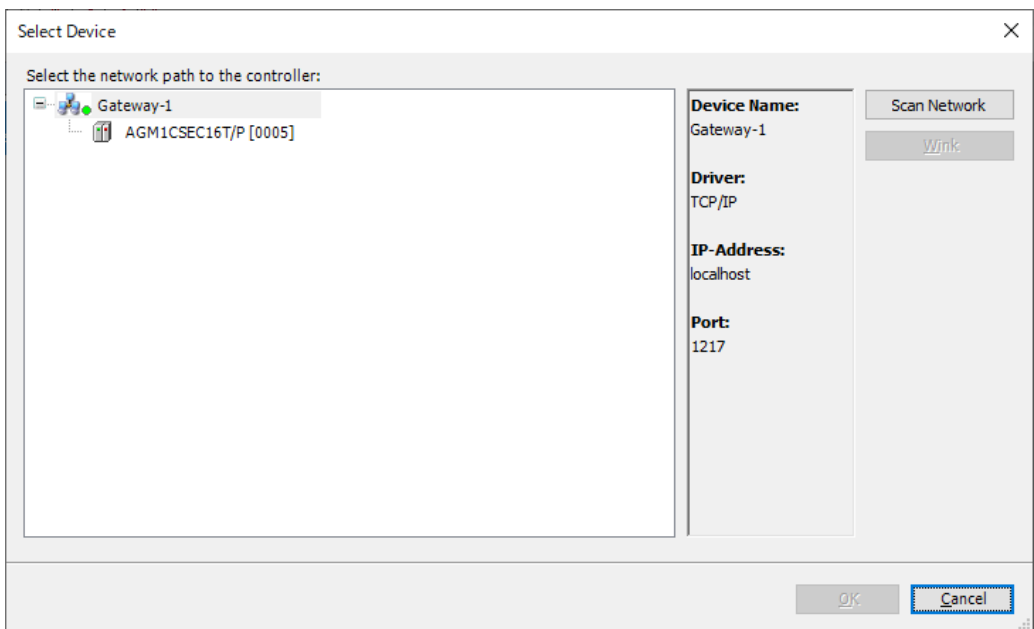


2. Select "Connect to the GM series controller with LAN" and click the [OK] button. The "Communication timeout settings" dialog box will be displayed.

11.1 Setting up the Servo Amplifier Connected to the GM1 Controller

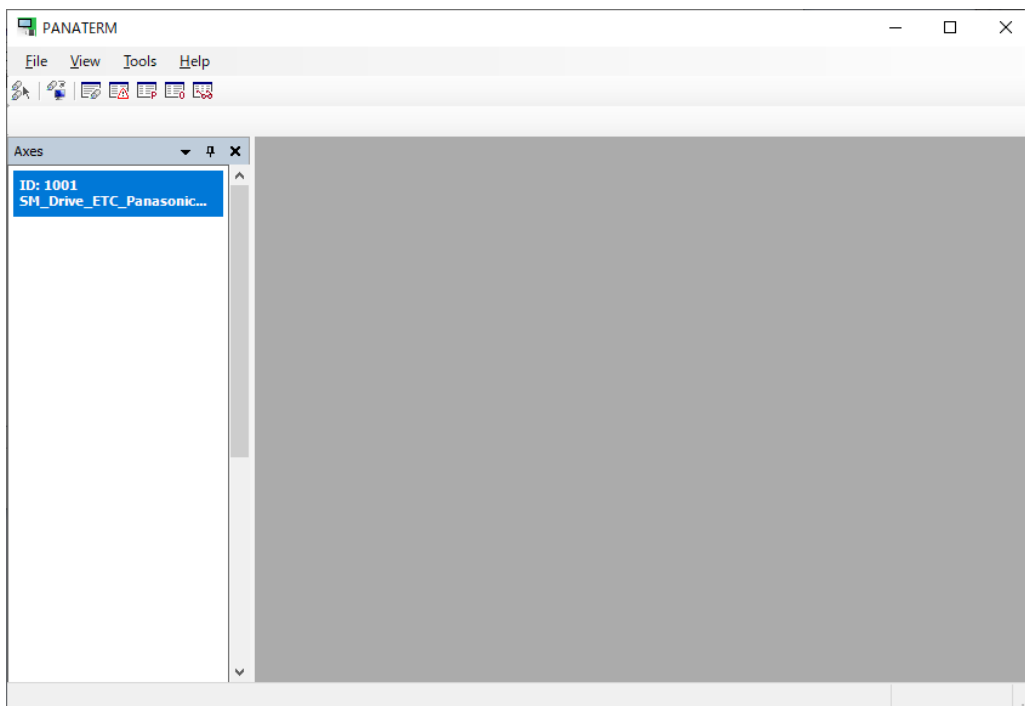


3. Change the timeout period and click the [OK] button. The "Select Device" dialog box will be displayed.



4. Click the [Search Network] button, select the GM1 Controller, and click the [OK] button. The main pane will be displayed.

11.1 Setting up the Servo Amplifier Connected to the GM1 Controller



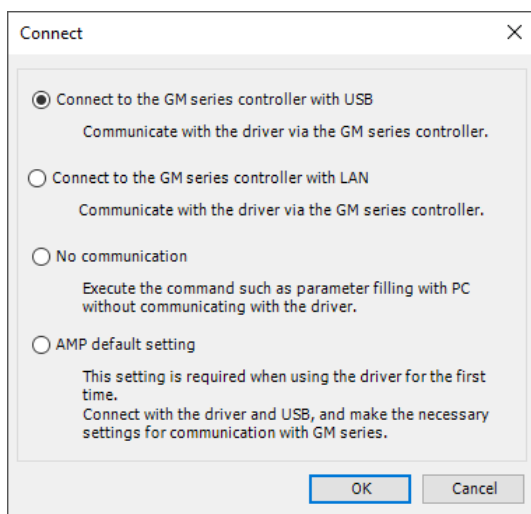
11.1.2 If Connected with USB Cables

If connected with USB cables, use the following procedure.

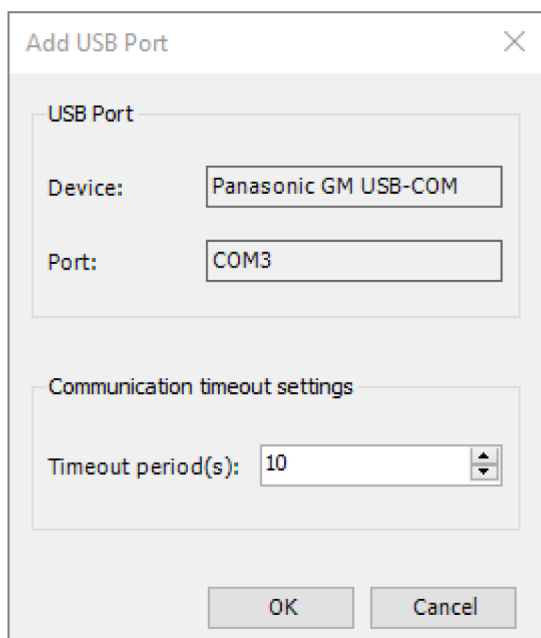
1 2 Procedure

1. Start PANATERM Lite for GM.
The "Connect" dialog box will be displayed.

11.1 Setting up the Servo Amplifier Connected to the GM1 Controller

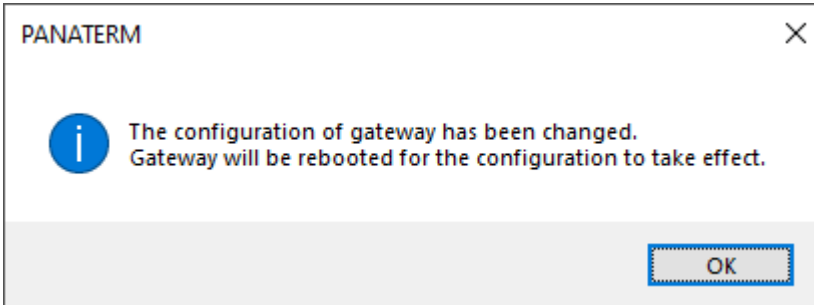


2. Select "Connect to the GM series controller with USB" and click the [OK] button. The "Add USB Port" dialog box will be displayed.

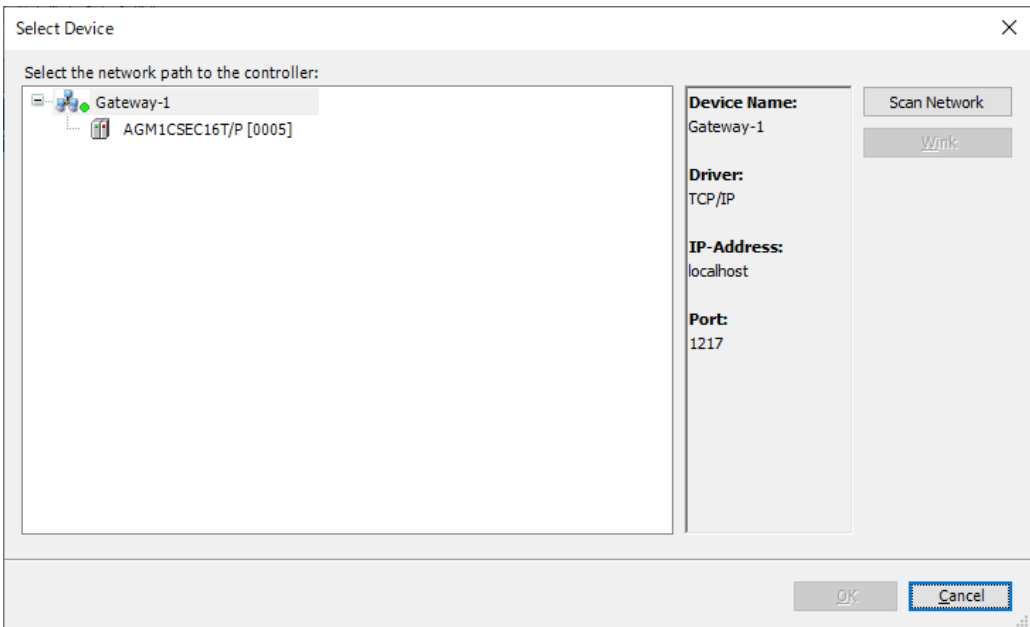


3. Change the timeout period and click the [OK] button. A message window will be displayed, asking whether to add a USB port and restart the Gateway.

11.1 Setting up the Servo Amplifier Connected to the GM1 Controller

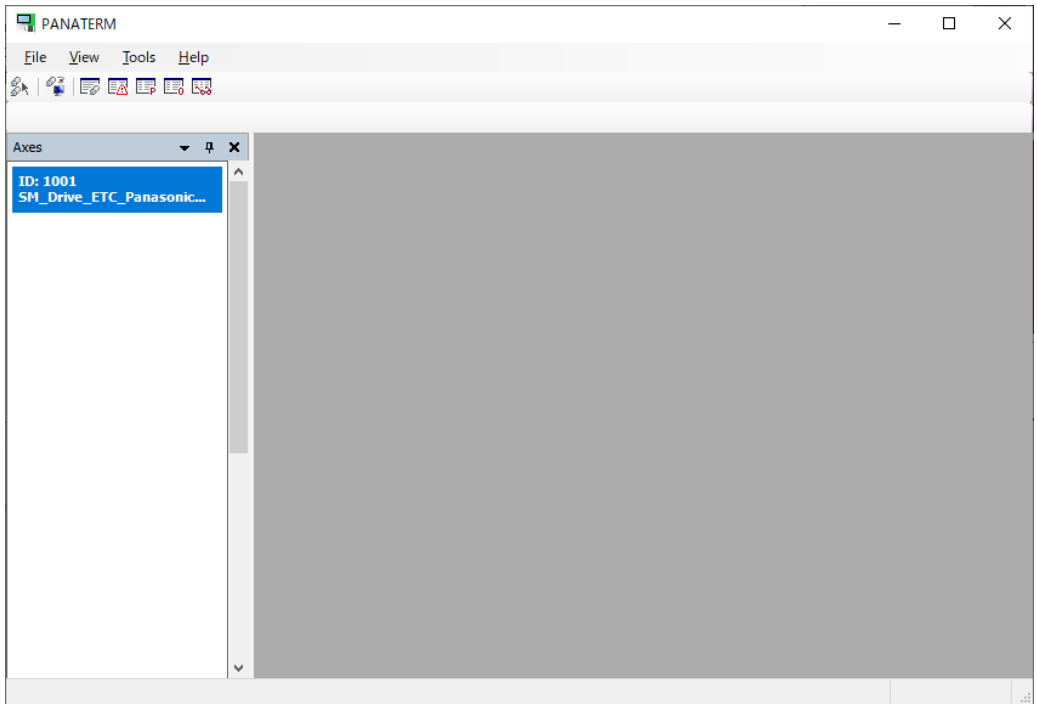


4. Click the [OK] button.
The "Select Device" dialog box will be displayed.



5. Click the [Search Network] button, select the GM1 Controller, and click the [OK] button.
The main pane will be displayed.

11.1 Setting up the Servo Amplifier Connected to the GM1 Controller



11.2 Writing Parameters to Servo Amplifier

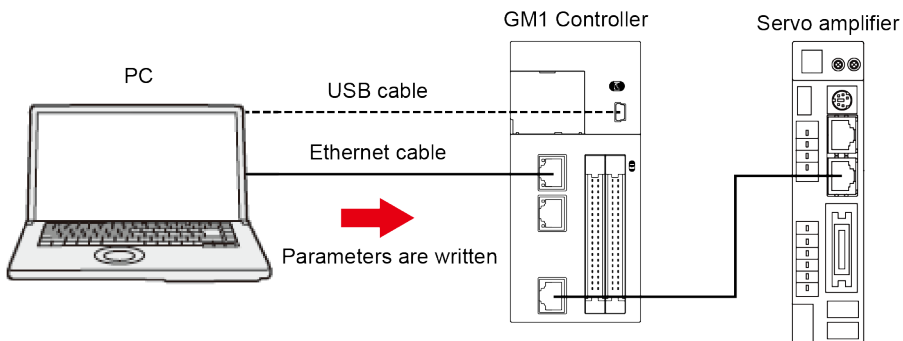
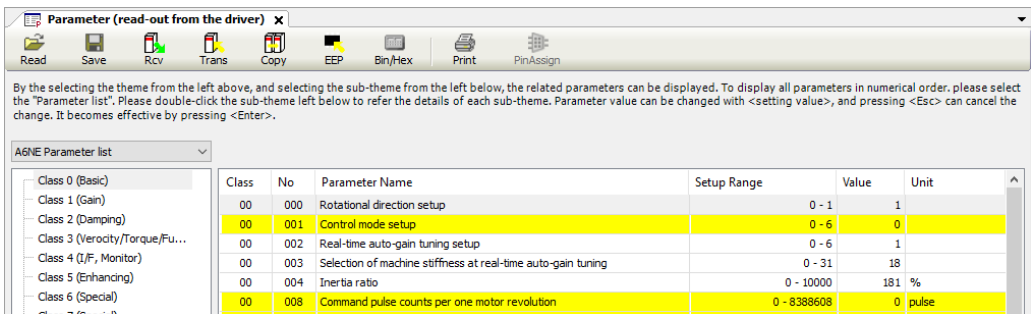
11.2 Writing Parameters to Servo Amplifier

By connecting the PC and a servo amplifier, the parameters set with PANATERM Lite for GM can be written directly to the servo amplifier.

1 2 Procedure

1. Start PANATERM Lite for GM.
2. Click "Trans" on the toolbar.

The parameters will be sent from PANATERM Lite for GM to the servo amplifier.



i Info.

- If you have changed parameters on a yellow background, click "EEP" on the toolbar to restart the servo amplifier.

11.3 Writing Objects to Servo Amplifier

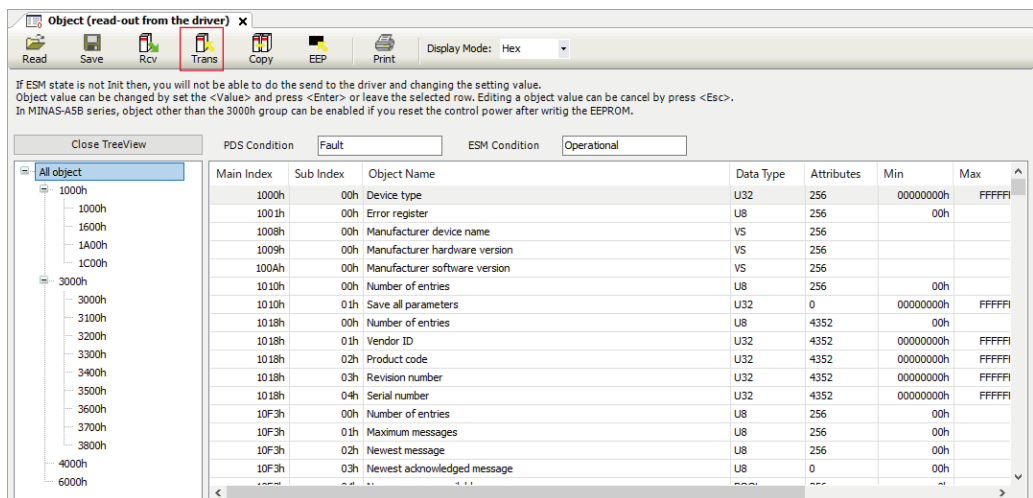
By connecting the PC and a servo amplifier, the objects set with PANATERM Lite for GM can be written directly to the servo amplifier.

1 2 Procedure

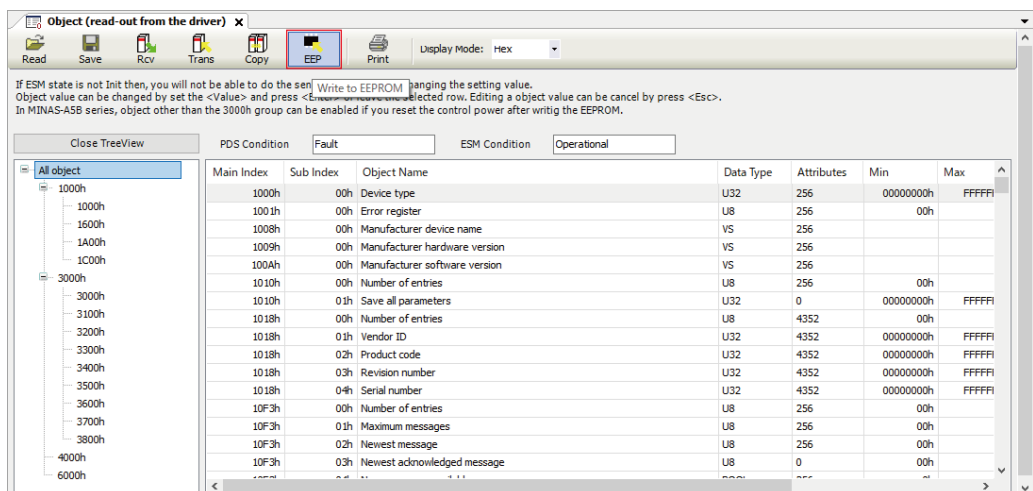
1. Start PANATERM Lite for GM.

2. Click [Trans] on the toolbar.

The objects will be sent from PANATERM Lite for GM to the servo amplifier.



3. Click the [EEP] button to write the objects to the EEPROM of the servo amplifier.



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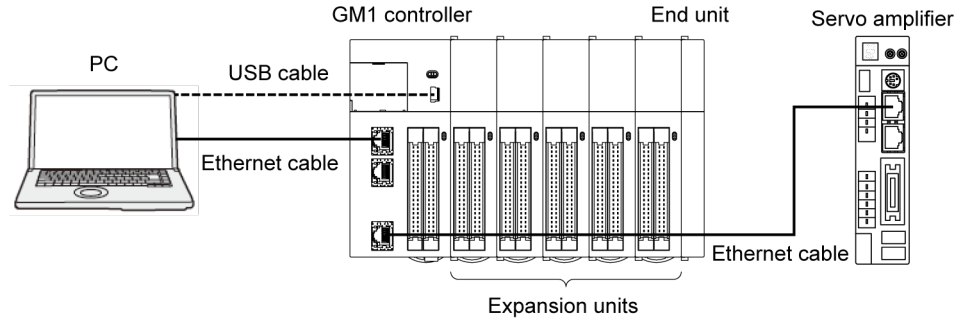
12 Preparation for Operation

12.1	Checking Wiring	12-2
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12.2.1	Safety Circuit Design	12-3
12.2.2	Items to Check during Wiring	12-4
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12.1 Checking Wiring

12.1 Checking Wiring

Firstly, check whether the GM1 Controller, expansion units, servo amplifier, and PC are connected correctly.



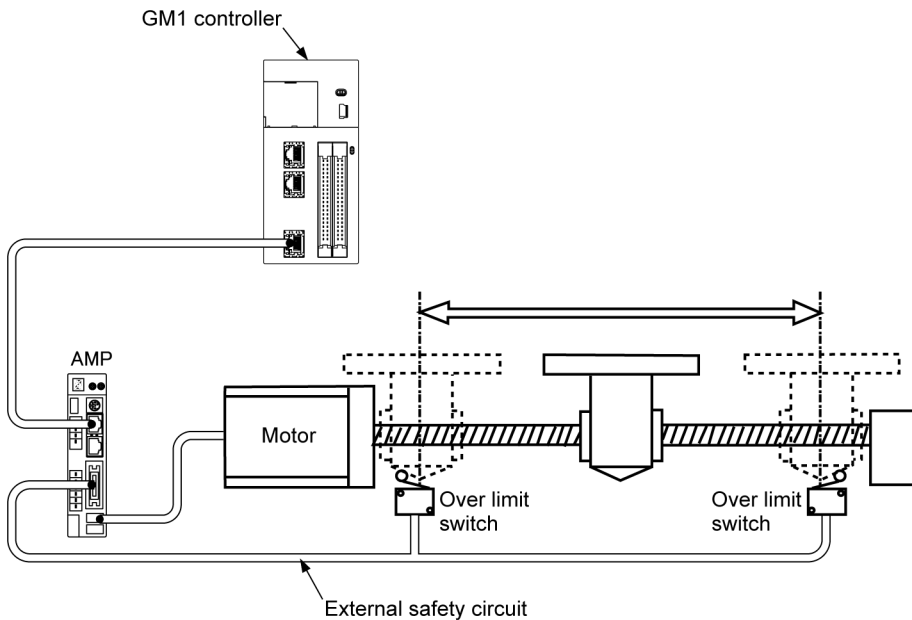
12.2 Checking Safety Circuit Design

12.2.1 Safety Circuit Design

■ Example of a safety circuit

Be sure to create a safety circuit when using this product.

Installation of over limit switches



- Install over limit switches as shown above.
- Connect them to the CW and CCW over-travel inhibit inputs of the parallel I/O connector of the servo amplifier. The GM1 Controller receives these inputs as limit (+) and limit (-) inputs through the network.

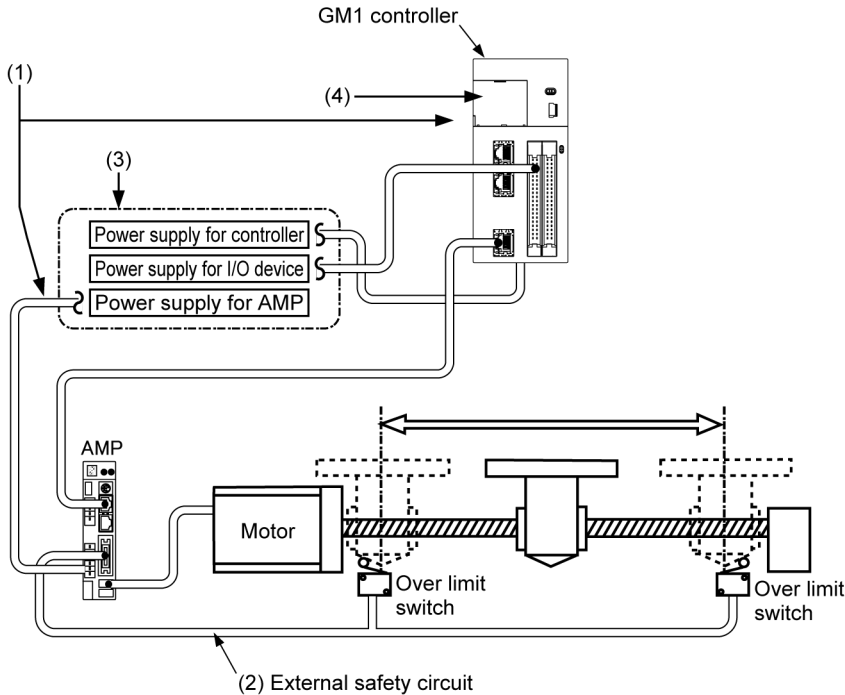


- Install the safety circuit recommended by the manufacturer of the motor being used.

12.2 Checking Safety Circuit Design

12.2.2 Items to Check during Wiring

■ System configuration example



(1) Checking connections of each device

Check whether each device has been connected as indicated by the design.

(2) Checking the installation of an external safety circuit

Check that the safety circuit is installed as an external circuit by installing and wiring over limit switches properly.

(3) Checking the settings for power ON sequence

Check whether settings have been configured so that the power is turned on in sequence.

(4) Checking the GM1 Controller mode selector switch

Set the GM1 Controller to STOP mode. Setting to RUN mode can cause unexpected operation.

12.2.3 Power ON Operation

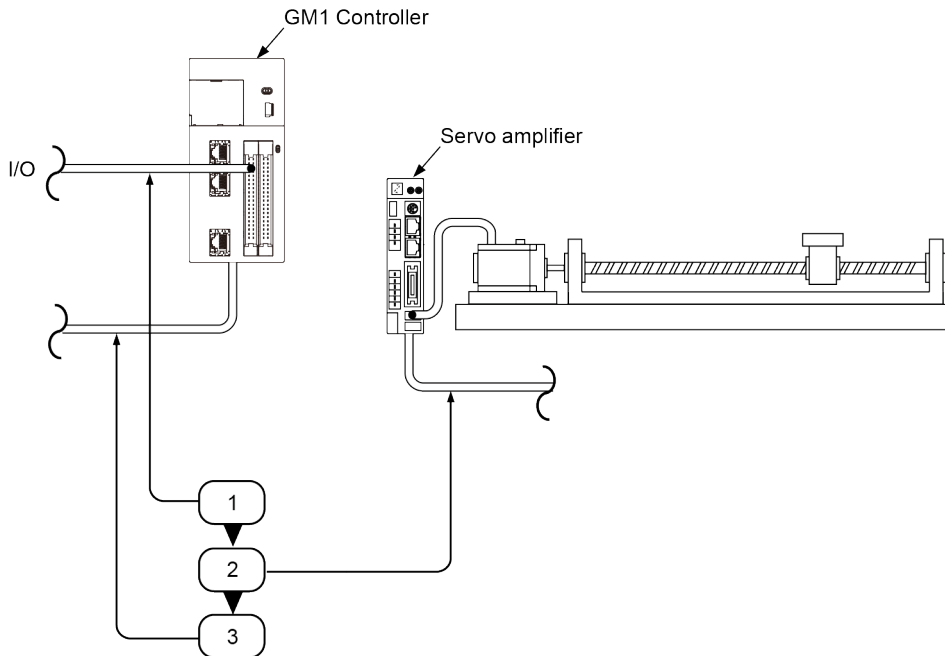
When turning ON the power to the system incorporating the GM1 Controller, follow the power ON sequence described in the procedure below.



- Consider the performance and statuses of any external devices connected to the system, and take sufficient care so that turning ON the power will not initiate unexpected movements.

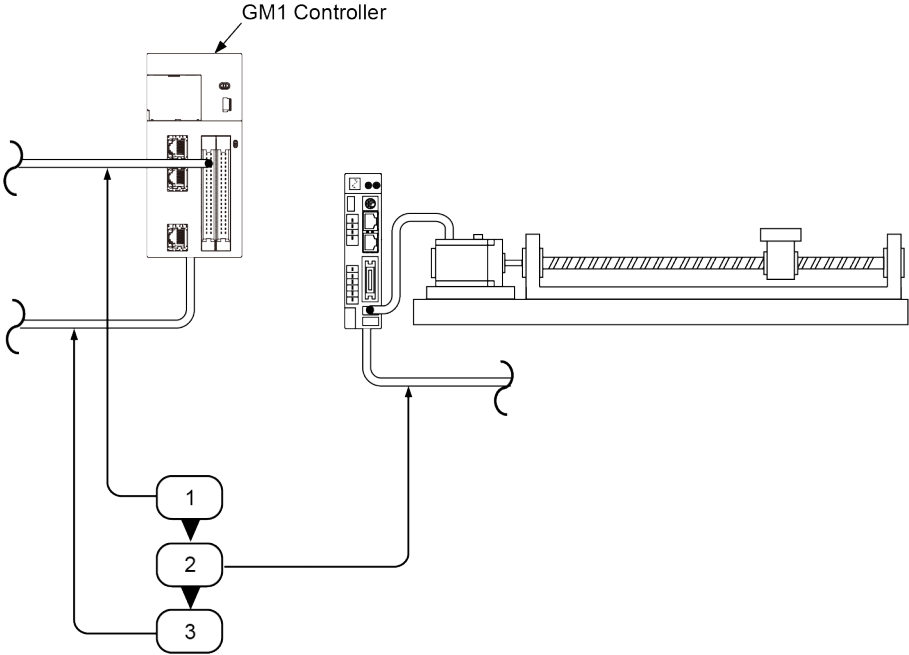
1 2 Procedure

1. Turn ON the power to the I/O devices connected to the GM1 Controller.
2. Turn ON the power to the servo amplifier.
3. Turn ON the power to the GM1 Controller.

**12.2.4 Power OFF Operation****1 2 Procedure**

1. Check that the rotation of the motor has stopped and then turn OFF the power to the GM1 Controller.
2. Turn OFF the power to the servo amplifier.
3. Turn OFF the power to the I/O devices connected to the GM1 Controller.

12.2 Checking Safety Circuit Design



12.3 Operation Check

12.3.1 Checking the Network

After turning ON the power supplies, check if the operation monitor LEDs of the GM1 Controller are in the following states.

- STATUS: Lit
- LINK: Lit

i Info.

- If the "STATUS" LED is flashing, the network is not established.
- If the "LINK" LED is not lit, the "RX" (reception side) of the GM1 Controller and "TX" (transmission side) of the servo amplifier are not electrically connected normally.

12.3.2 Checking Input Signals

Check the inputs of the over limit switches for the safety circuit that are connected to the servo amplifier and the input of the near home (DOG) switch.

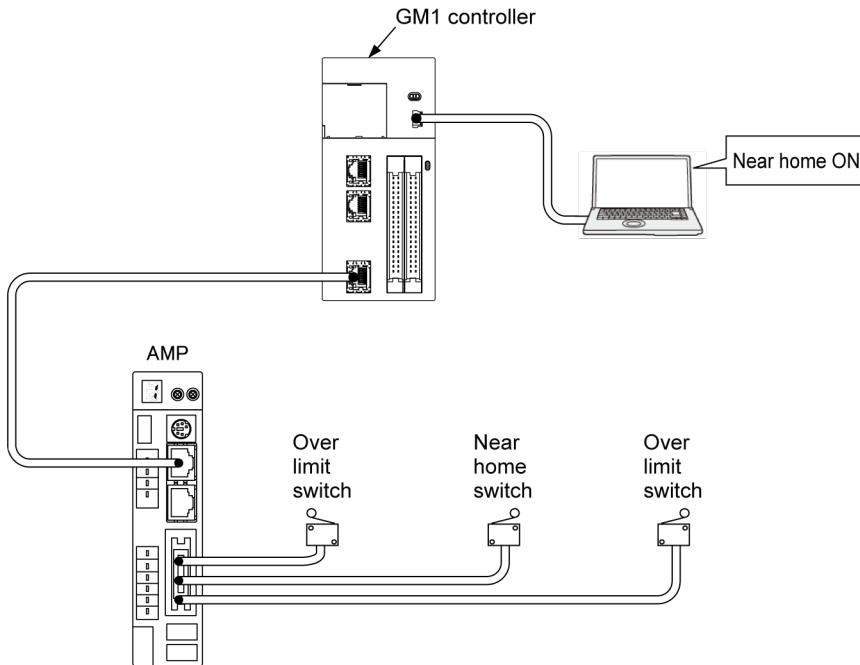
By operating each switch forcibly, check whether signals are normally input into the GM1 Controller.

The input state of each switch can be checked on the monitor screen of the MINAS setup support software "PANATERM Lite for GM".

i Info.

- After the over limit switches are installed, if the moving direction of the motor is reverse to the limit (+) and limit (-) positions, review the physical connections of each limit switch.

12.3 Operation Check



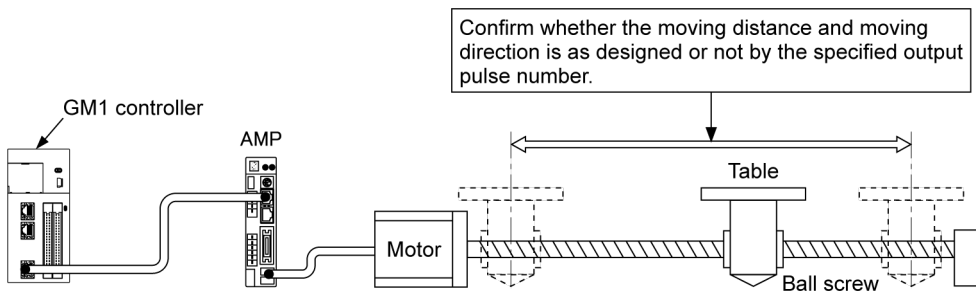
12.3.3 Checking the Rotation and Movement Directions and Movement Distance

Check whether the rotation and movement directions of the motor and the movement distance are correct. Movements can be easily checked using the commissioning function of GM Programmer without having to create a user program.

■ Using the commissioning function

In GM Programmer, select **Project>Online Config Mode**.

Opening the commissioning window for each axis allows you to use the commissioning function.



■ Checking the rotation direction

Set the rotation direction on the servo amplifier.

Check the rotation direction by executing inching operation in the commissioning window.

■ Checking the movement distance

Set the movement distance on the servo amplifier.

Then, set the scale in the "Scaling / Mapping" window for each axis in GM Programmer.

Check the movement distance by executing inching operation in the commissioning window.

Info.

For details on inching operation in the commissioning window, refer to "[10.8.2 Conducting Commissioning for Servo Amplifiers](#)".

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Appendix Warranty / Cautions for Proper Use

Warranty	App-2
Warranty Period	App-2
Warranty Scope	App-2
Cautions for Proper Use	App-3

Warranty

Warranty Period

Warranty period shall be 12 months from the ex-factory date or 18 months from the date of manufacturing.

This Warranty shall be exempted in the following cases,

1. Defects resulting from misuse and/or repair or modification by the customer.
2. Defects resulting from drop of the Product or damage during transportation.
3. Defects resulting from improper usage of the Product beyond the Specifications.
4. Defects resulting from fire, earthquake, lightening, flood, damage from salt, abnormal voltage or other Act of God, or other disaster.
5. Defects resulting from the intrusion of foreign material to the Product, such as water, oil or metallic particles.

Parts exceeding their standard lifetime specified in this document are excluded.

Warranty Scope

Panasonic warrants the replacement of the defected parts of the Product or repair of them when the defects of the Product occur during the Warranty Period, and when the defects are under Panasonic responsibility. This Warranty only covers the Product itself and does not cover any damage incurred by such defects.

Panasonic in accordance with 'Warranty Period' records, in any case, the machine state is poor, and cause damage to your company and the third party, all liability, Panasonic is not responsible.

1. The machines are not assembled in accordance with the instructions or precautions noted in this specification.
2. When the machine does not match the product assembled in the machine.
3. This specification does not depend on your company.
4. When the machine condition is not caused by Panasonic reasons.

Cautions for Proper Use

- Practical considerations for exporting the product or assembly containing the product
When the end user of the product or end use of the product is associated with military affair or weapon, its export may be controlled by the Foreign Exchange and Foreign Trade Control Law. Complete review of the product to be exported and export formalities should be practiced.
- This product is intended to be used with a general industrial product, but not designed or manufactured to be used in a machine or system that may cause personal death when it is failed.
- Installation, wiring, operation, maintenance, etc., of the equipment should be done by qualified and experienced personnel.
- Install a safety equipments or apparatus in your application, when a serious accident or loss of property is expected due to the failure of this product.
- This product is designed for general industrial equipments. Don't use this product under special conditions such as nuclear energy control, aerospace equipments, transportation, medical equipment, various safety equipments or special equipments.
- The wiring condition(earth wire method and cables length and shield cable condition of signal lines) may affect the noise resistance, please confirm the noise resistance of the machine.
- Failure of this product depending on its content, may generate smoke of about one cigarette. Take this into consideration when the application of the machine is clean room related.
- Product overload can cause the goods to fall, please follow the marking.
- Do not use benzine, thinner, alcohol, acidic cleaner and alkaline cleaner because they can discolor or damage the exterior case.
- This product shall be treated as industrial waste when you dispose.
- This product related standards, laws and the user is responsible for matching between machine and components in terms of configuration, dimensions, life expectancy, characteristics, when installing the machine or changing specification of the machine. The user is also responsible for complying with applicable laws and regulations.
- The product will not be guaranteed when it is used outside its specification limits.
- Parts are subject to minor change to improve performance.

(MEMO)

Revision History

The manual code is shown at the bottom of the cover page.

Date of issue	Manual code	Revision details
August 2021	WUME-GM1ETCSU-01	First edition
March 2022	WUME-GM1ETCSU-02	2nd edition <ul style="list-style-type: none"><li data-bbox="783 365 1023 392">• Clerical corrections
April 2022	WUME-GM1ETCSU-03	3rd edition <ul style="list-style-type: none"><li data-bbox="783 448 1140 475">• Changed the Company name

(MEMO)

(MEMO)

Please contact

**Industrial Device Business Division,
Panasonic Industry Co., Ltd.**

7-1-1 Morofuku, Daito City, Osaka, 574-0044, Japan
industrial.panasonic.com/ac/e/

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WUME-GM1ETCSU-03