Servo System Controller

Motion Control Software SWM-G Basics

This course is intended for those who use Motion Control Software SWM-G for the first time. This course describes the installation of SWM-G, basic procedure and settings before operation, and basic programming using a sample project while constructing a motion control system. C++ is used as the programming language.

Click the Forward button at the upper right of the screen to proceed to the next page.

L(NA)00275ENG

Introduction Purpose of the Course

This basic course is intended for those who use Motion Control Software SWM-G for the first time.

This course requires the basic knowledge of Motion Control Software SWM-G.

For beginners, we recommend the following course.

- "Motion Control Software SWM-G for Beginners" course

Introduction Course Structure

The contents of this course are as follows.
We recommend that you start from Chapter 1.

Chapter 1 Installation of Motion Control Software SWM-G

This chapter describes the required procedure and settings for installing Motion Control Software SWM-G.

Chapter 2 Basic Operation of the Engineering Tool (SWMOS)

This chapter describes the basic settings of the engineering tool (SWMOS) included in Motion Control Software SWM-G.

Chapter 3 Operation Check Using a Sample Project

This chapter describes the programming procedures and basic programs using sample projects.

Final Test

5 sections in total (9 questions) Passing grade: 60% or higher

Introduction How to Use This e-Learning Tool

Go to the next page	>	Go to the next page.
Back to the previous page	<	Back to the previous page.
Move to the desired page	TOC	"Table of Contents" will be displayed, enabling you to navigate to the desired page.
Exit the learning	X	Exit the learning. Window such as "Contents" screen and the learning will be closed.

Introduction Cautions for Use

■Safety precautions

When you learn based on using actual products, please carefully read the safety precautions in the corresponding manuals and handle the product properly while taking all precautions for safety.

■Precautions in this course

The screen images shown in the course may differ from the actual screens depending on your software version.
This course is for the following software versions.
For the latest version of each software, check the MITSUBISHI ELECTRIC FA Global Website.

Motion Control Software SWM-G	Ver. 1.006G
MELSOFT MR Configurator2	Ver. 1.145B

 indicates the reference manual.

Chapter 1 Installation of Motion Control Software SWM-G

This chapter describes the procedure and settings required for installing Motion Control Software SWM-G to a personal computer.

1.1 Installation Procedure and Point
1.2 Preparation for Installation
1.3 Installation
1.4 Summary of This Chapter

■ Reference manual

For how to install Motion Control Software SWM-G, refer to the following manual.

Motion Control Software SWM-G User's Manual (Installation)

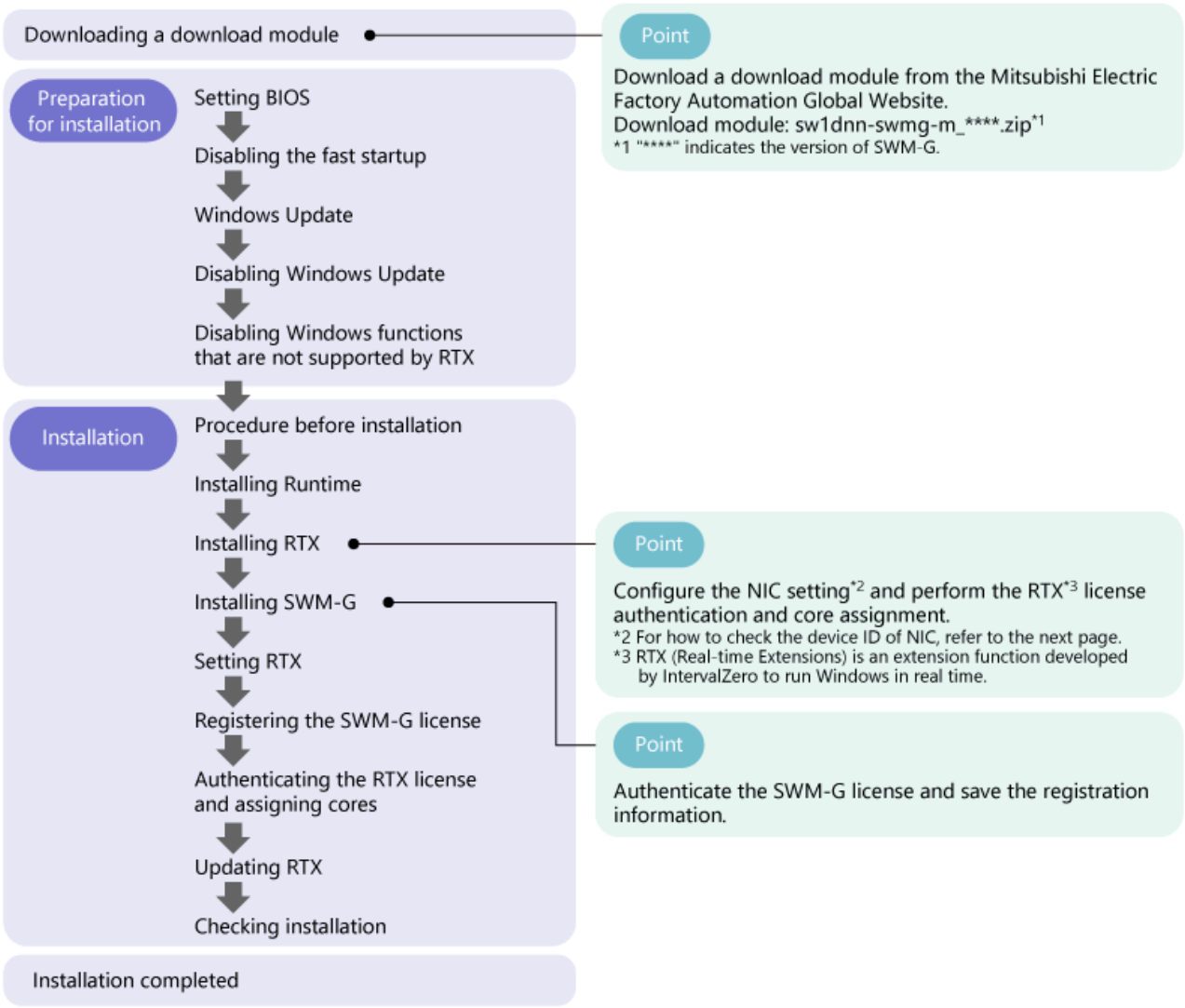
■ Supplementary document

For the arranged items required for taking this course, IPC and components (CPU, NIC) compatible with SWM-G, and motion control performance (number of control axes), refer to the separate PDF.
It can be downloaded from the following link.

Required items and compatible equipment

1.1 Installation Procedure and Point

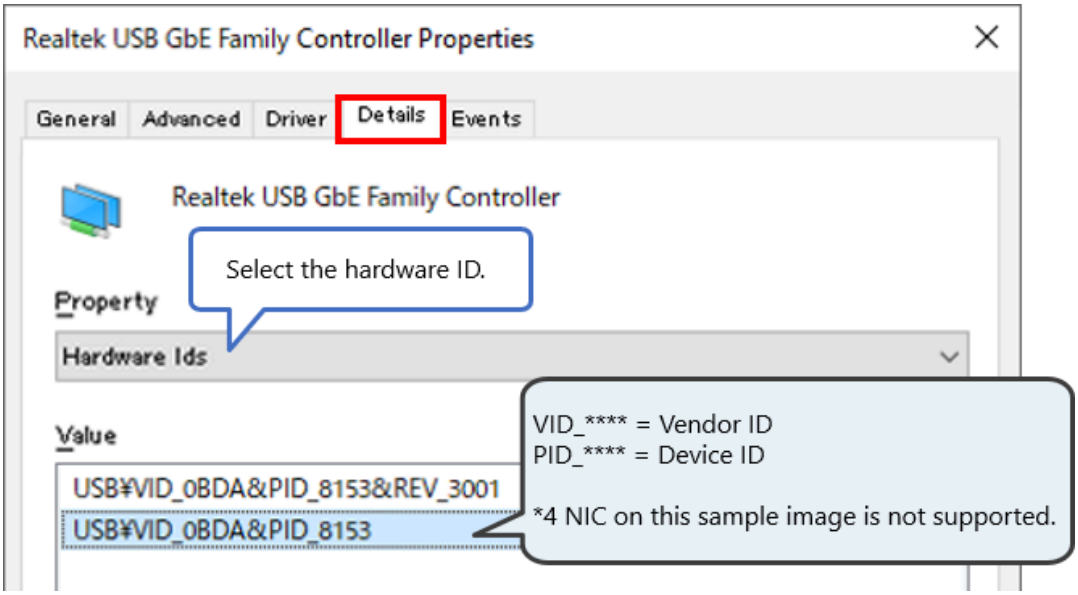
Install Motion Control Software SWM-G by the following procedure.
Download the download module at Mitsubishi Electric Factory Automation Global Website in advance.
Preparation for Installation and "Installation" are described in the following sections.



• How to check the device ID of NIC

Whether NIC of the personal computer to be used is supported or not can be checked by the following procedure.

1. Right-click the Windows logo (start menu) in the task bar, and select [Device Manager] from the displayed menu.
2. Right-click the device in question under [Network adapter], and select [Properties] from the context menu.
3. In the property window for the device, select "Hardware Ids" from the property pull-down menu in the "Details" tab and check the ID.


Realtek USB GbE Family Controller Properties
General
Advanced
Driver
Details
Events
Realtek USB GbE Family Controller
Select the hardware ID.
Property
Hardware Ids
Value
USB¥VID_0BDA&PID_8153&REV_3001
USB¥VID_0BDA&PID_8153
VID_**** = Vendor ID
PID_**** = Device ID
*4 NIC on this sample image is not supported.

1.2 Preparation for Installation

This chapter describes the preparation for installing Motion Control Software SWM-G.
Configure the following settings according to the operating environment of the personal computer used. The details are described in the following sections.

- BIOS setting
- Disabling the fast startup
- Windows Update(Windows 10)
- Disabling Windows Update
- Disabling Windows functions that are not supported by RTX

1.2.1 BIOS setting

If the BIOS in the personal computer to be used supports the following settings, disable these functions.
In the BIOS setting, the setting items differ depending on the personal computer to be used.
For details, refer to the operating manual of the personal computer.

• Disable the following functions before installing SWM-G.

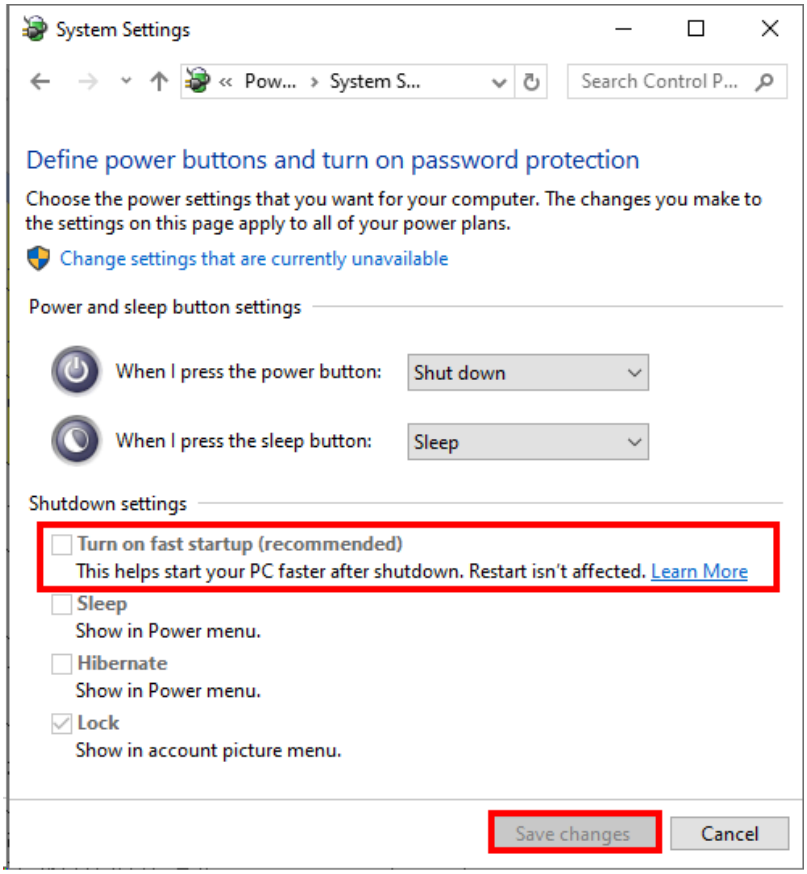
Function name
Hyper-Threading
Intel Virtualization
x2APIC

1.2.2 Disabling the fast startup

Disable the fast startup by following the procedure below.

■ Disabling C++ and fast startup

1. Log on to the personal computer as the administrative account.
2. Select [Windows System] → [Control Panel] from the Windows start menu.
   •The [Control Panel] window appears.
3. Click [System and Security].
   •The [System and Security] window appears.
4. Click [Change what the power buttons do] in [Power Options].
   •The [System Settings] window appears.
5. Remove the check from "Turn on fast startup" in [Shutdown settings] and click [Save changes].
6. Restart the personal computer.



[System Settings] window

1.2.3 Windows Update (Windows 10)

Apply Windows 10 update program that supports RTX to the personal computer to be used.
Windows 10 update program that supports RTX can be checked at the IntervalZero website below.

[IntervalZero website]
www.intervalzero.com/windows-10-updates-support/

[Point]

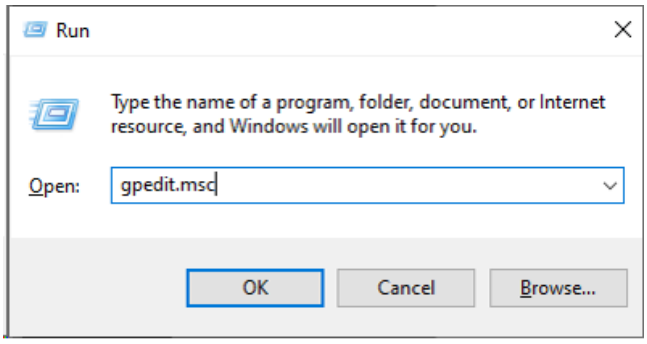
- Do not apply Windows 10 update program that does not support RTX.
- If an error occurs in RTX after updating Windows 10, uninstall RTX and then reinstall it.

1.2.4 Disabling Windows Update

Applying the Windows 10 update program that does not support RTX can cause a malfunction of RTX.
Therefore, it is recommended that the automatic update of Windows Update is disabled and Windows Update is set to update manually.
In addition to setting Windows Update to update manually, you can also prevent Windows Update from being performed by not connecting to the network.
This section describes the procedure for setting Windows Update to update manually.

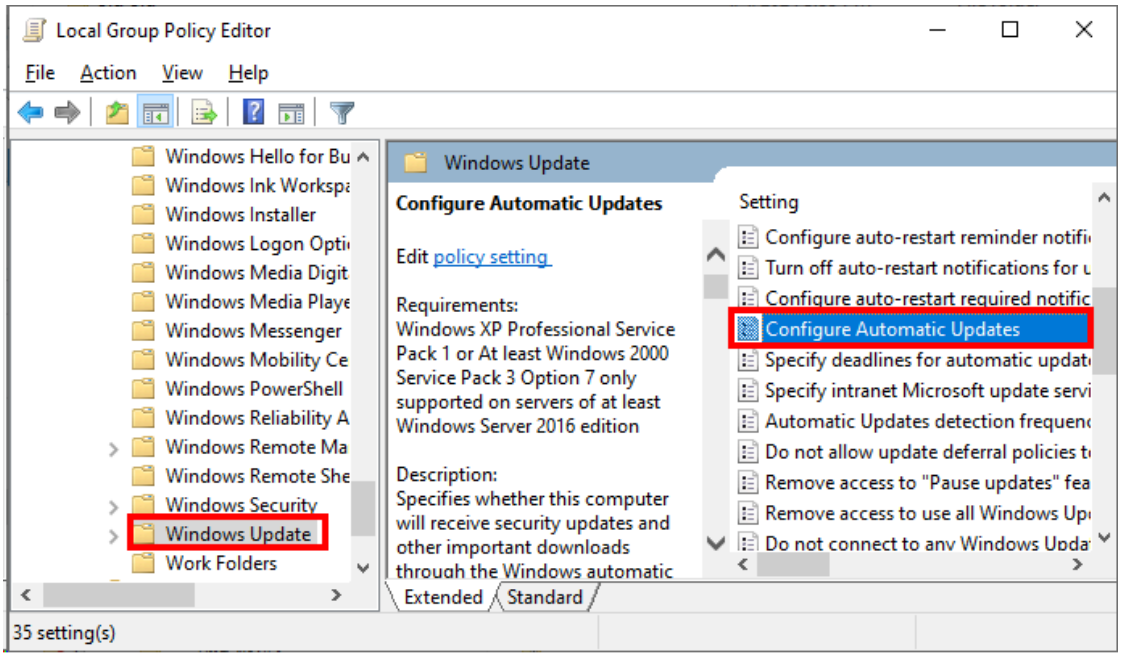
■ Set Windows Update to update manually.

1. Log on to the personal computer as the administrative account.
2. Right-click the Windows logo (start menu) in the task bar and click "Run".
   • The [Run] window appears.
3. Enter "gpedit.msc" and click the [OK] button.
   • Local Group Policy Editor starts.



[Run] window

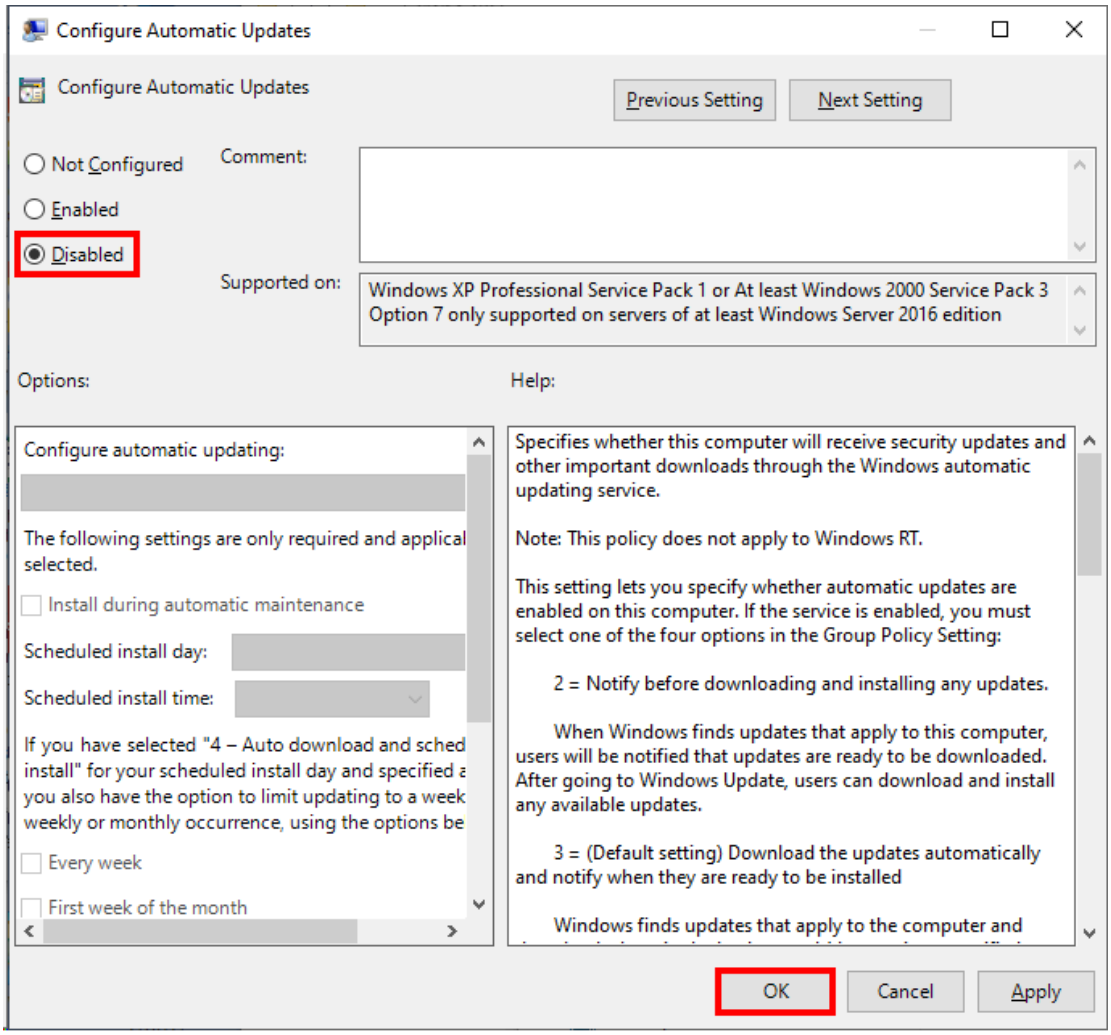
4. Select [Computer Configuration] → [Administrative Templates] → [Windows Components] → [Windows Update], and then open "Configure Automatic Updates".
   • The [Configure Automatic Updates] window appears.



[Local Group Policy Editor] window

5. Select "Disabled" and click the [OK] button.

6. Restart the personal computer.



[Configure Automatic Updates] window

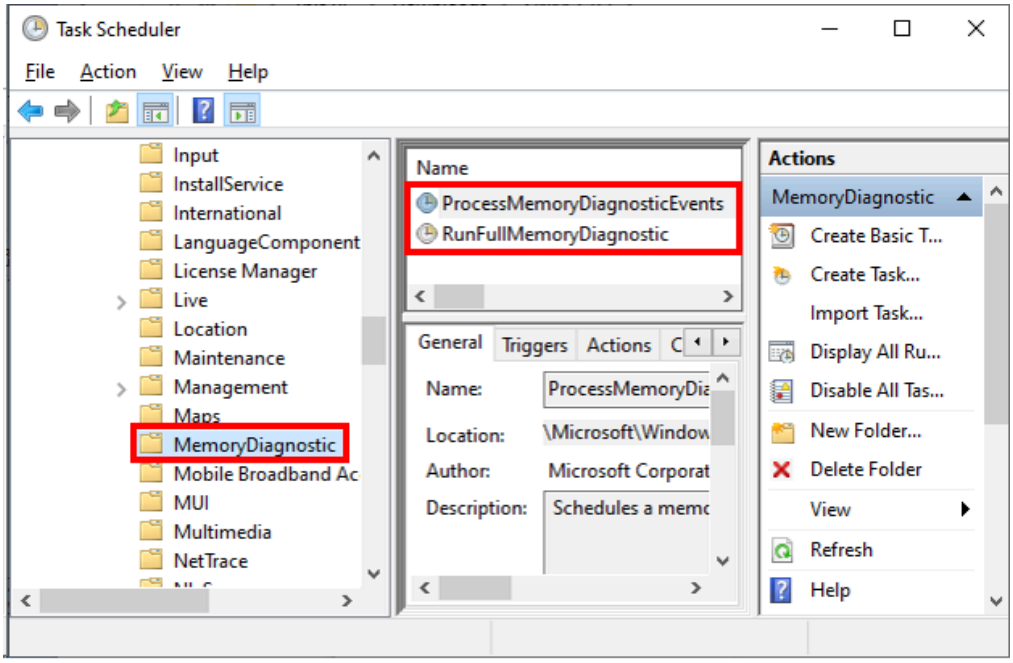
1.2.5 Windows functions that are not supported by RTX

The following two Windows functions are not supported by RTX.
When these functions are enabled, a blue screen error may occur and the personal computer may restart.
Therefore, disable these functions by following the steps a and b below.

Function name	Phenomenon (When the function is enabled)
Windows memory diagnosis	Long-term operation of RTX generates a blue screen error due to memory access violation.
Hyper-V	Starting RTX generates a blue screen error.

a. Disable the Windows memory diagnosis.

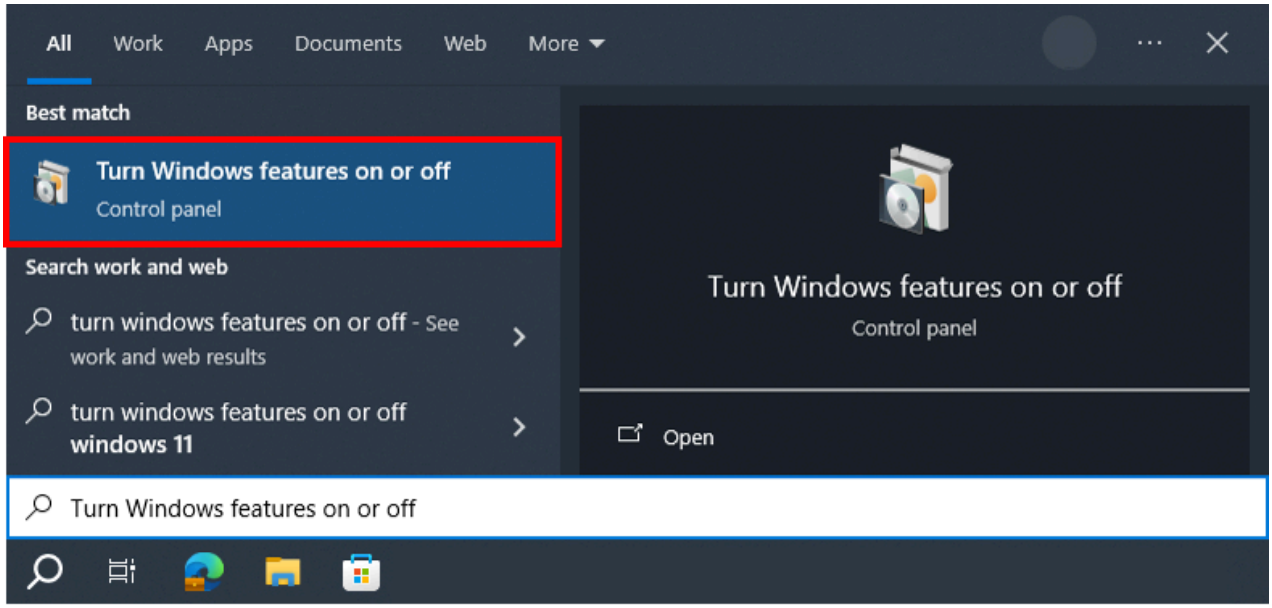
1. Log on to the personal computer as the administrative account.
2. Type "Task Scheduler" in the search box on the task bar and execute the application.
   • Task Scheduler starts.
3. In the left frame, select [Task Scheduler Library] → [Microsoft] → [Windows] → [MemoryDiagnostic].
4. In the center frame, right-click [RunFullMemoryDiagnostic] and select "Disabled".
5. In the same way, right-click [ProcessMemoryDiagnosticEvents] and select "Disabled".
6. Restart the personal computer.



[Task Scheduler] window

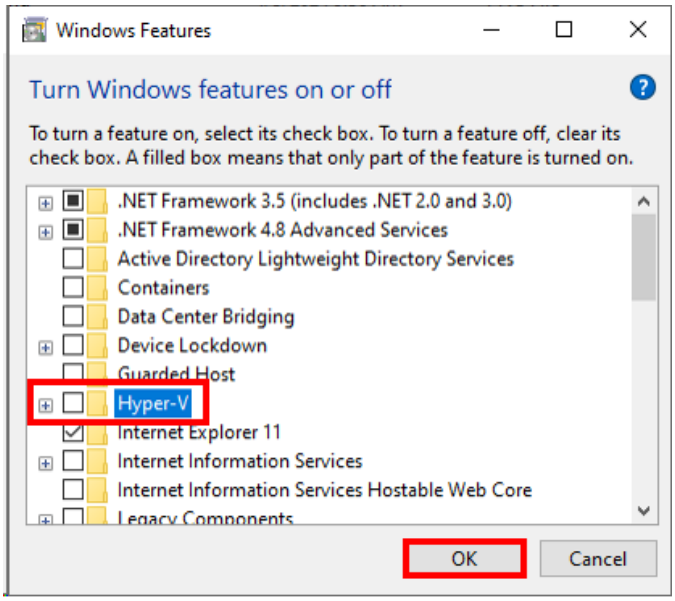
b. Disable Hyper-V.

1. Log on to the personal computer as the administrative account.
2. Type "Turn Windows features on or off" in the search box on the task bar and select it.
   • The [Windows features] window appears.



Search box

3. Remove the check from "Hyper-V" and click the [OK] button.
4. Restart the personal computer.



[Windows Features] window

1.3 Installation

This section describes the installation of Motion Control Software SWM-G.
The details are described in the following sections.

- Procedure before installation
- Installing Runtime
- Installing RTX
- Installing SWM-G
- Setting RTX
- Registering the SWM-G license
- Authenticating the RTX license and assigning cores
- Updating RTX
- Checking installation

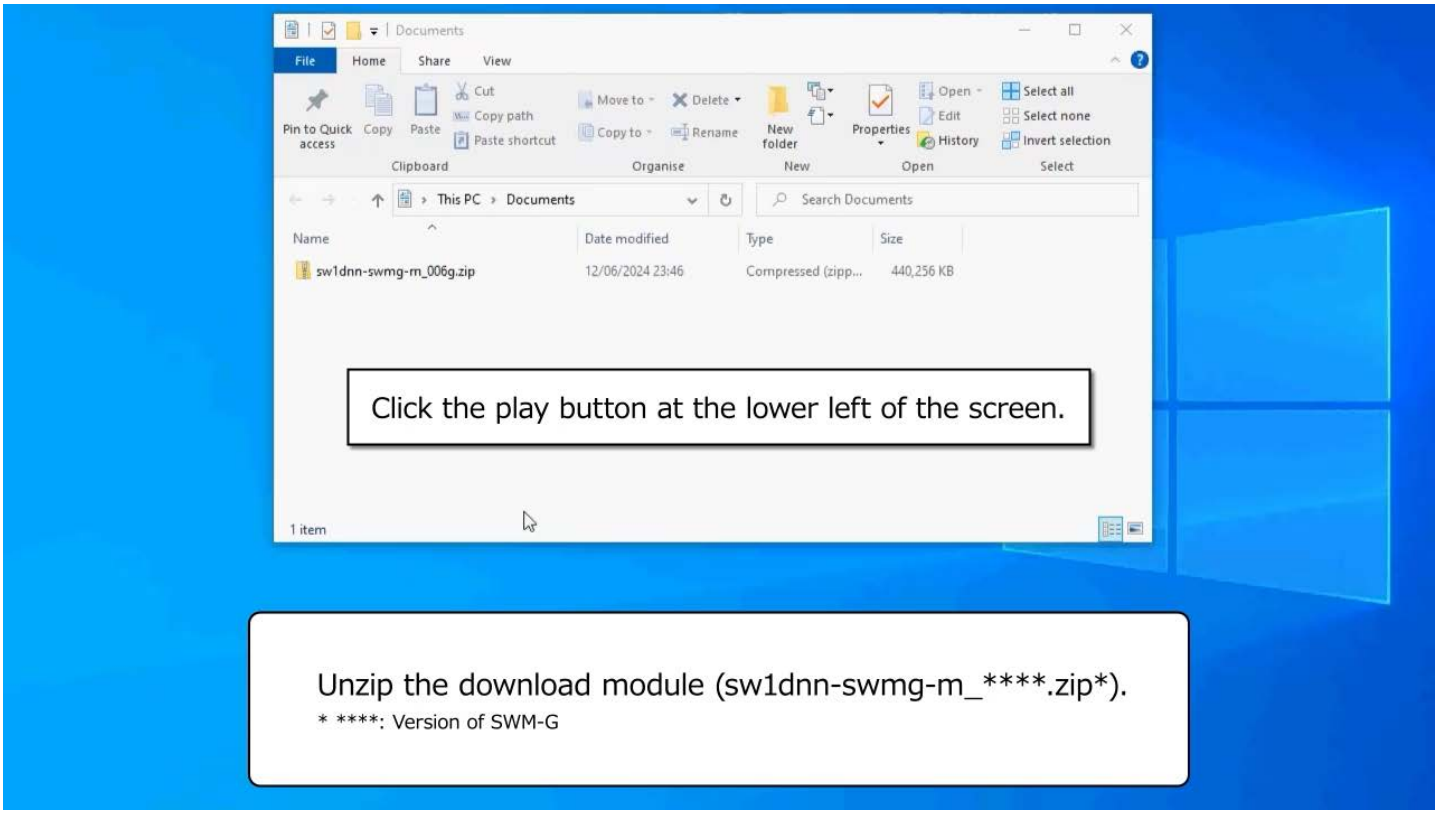
1.3.1 Procedure before installation

Log on to the personal computer as the administrative account.
Close all the applications before installing Motion Control Software SWM-G.

- If Motion Control Software SWM-G is installed while any other applications are running, the product may not operate properly.

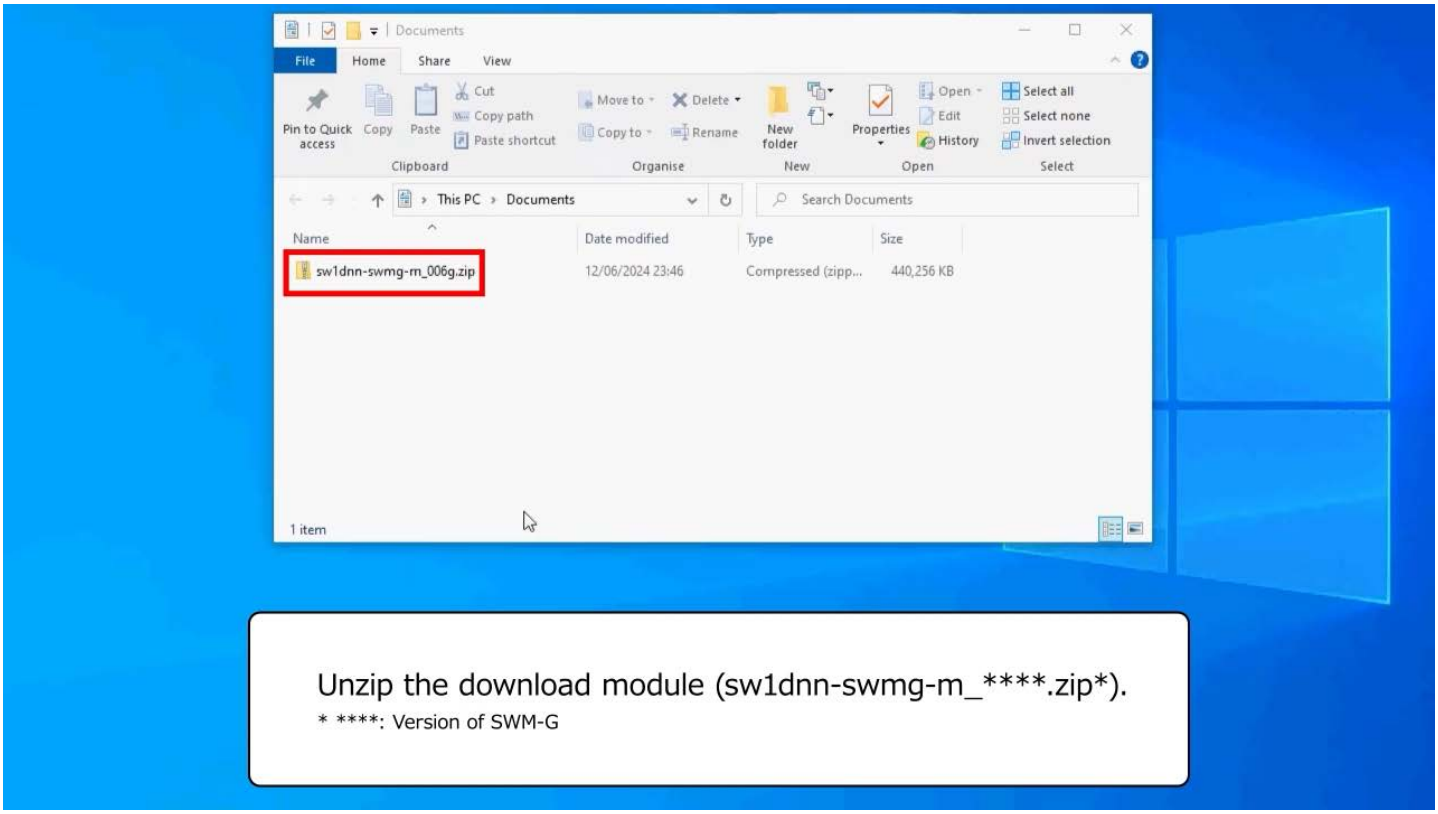
1.3.2 Installing Runtime

Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.



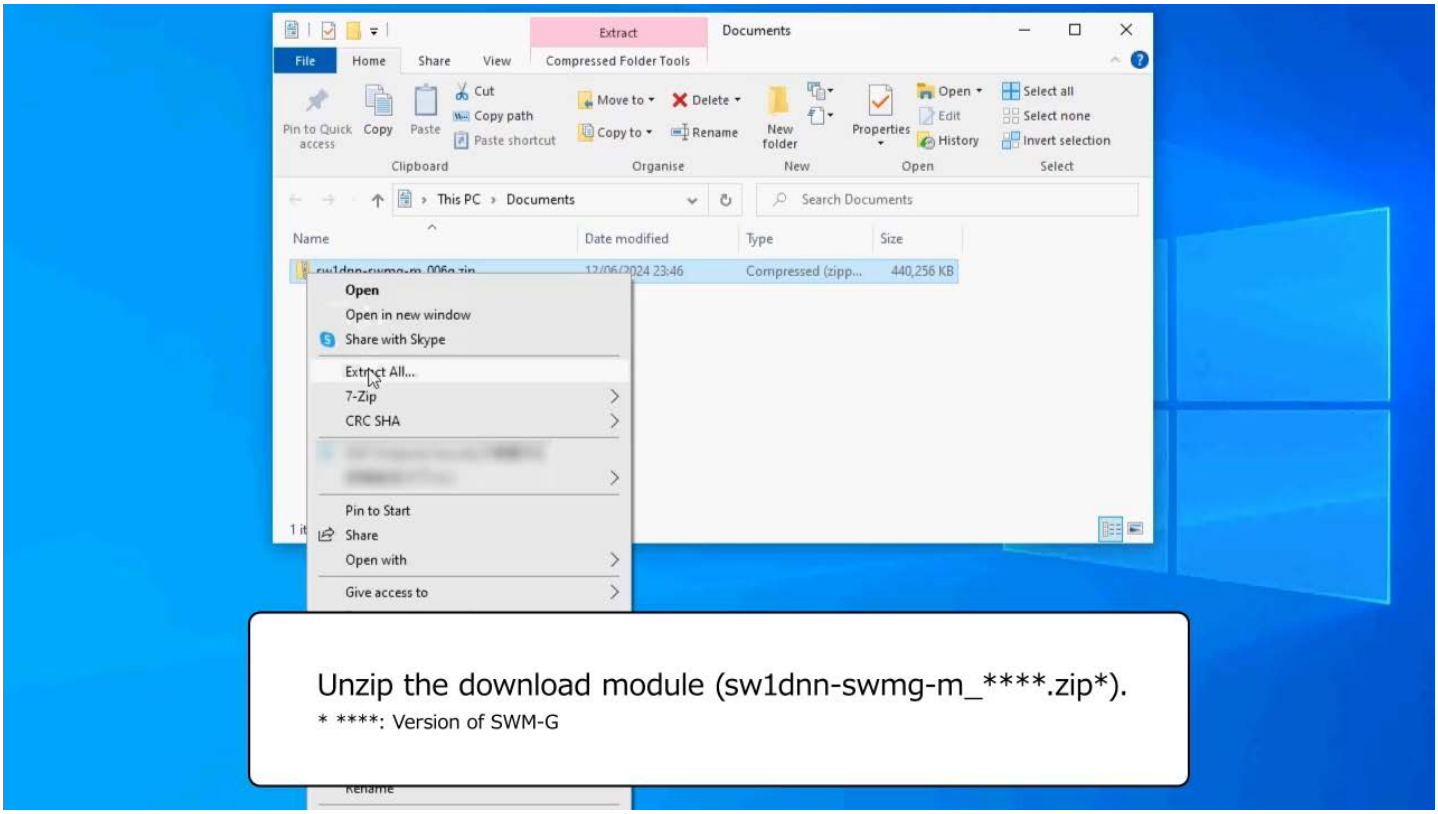
1.3.2 Installing Runtime

Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.



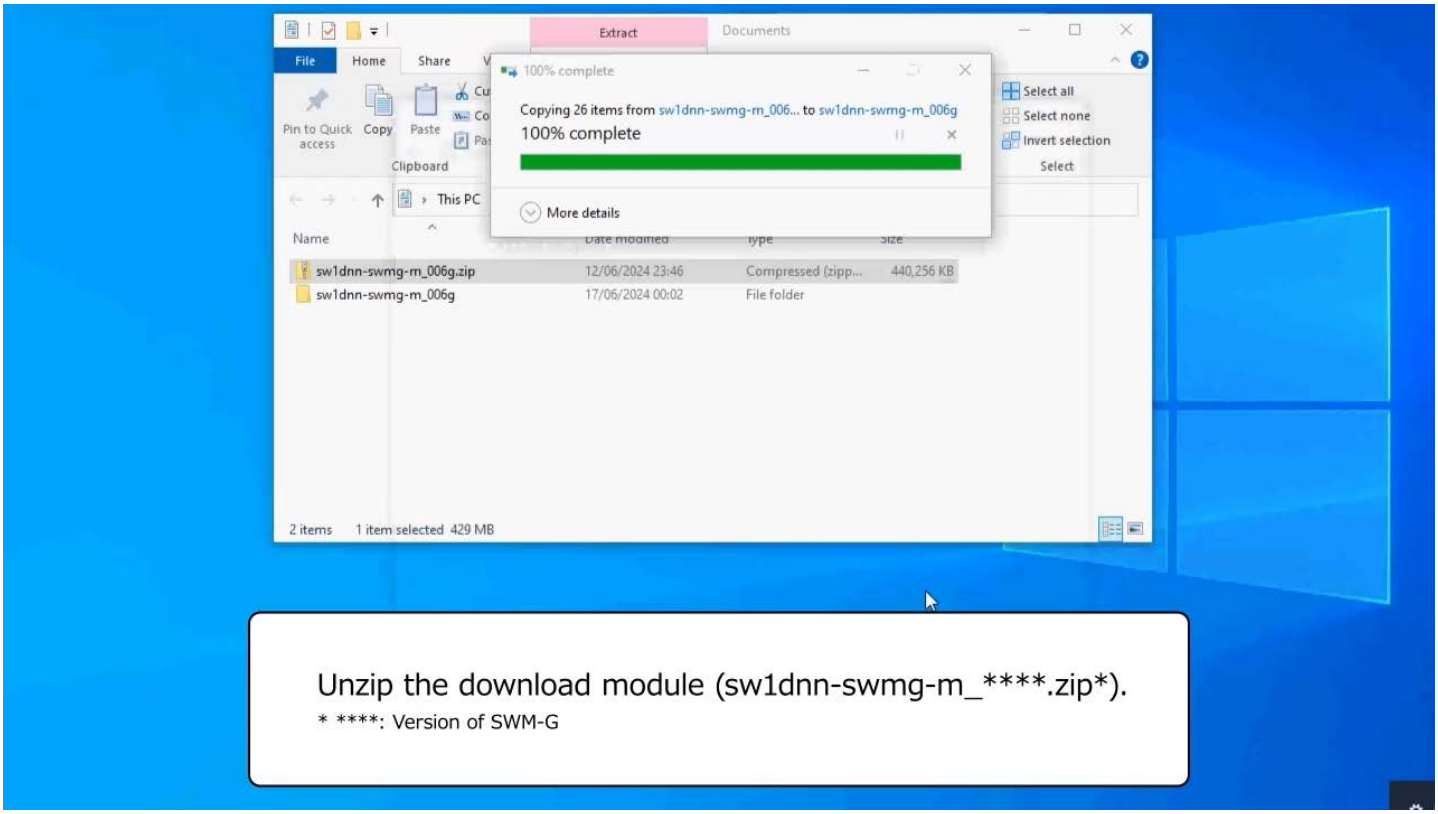
1.3.2 Installing Runtime

Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.



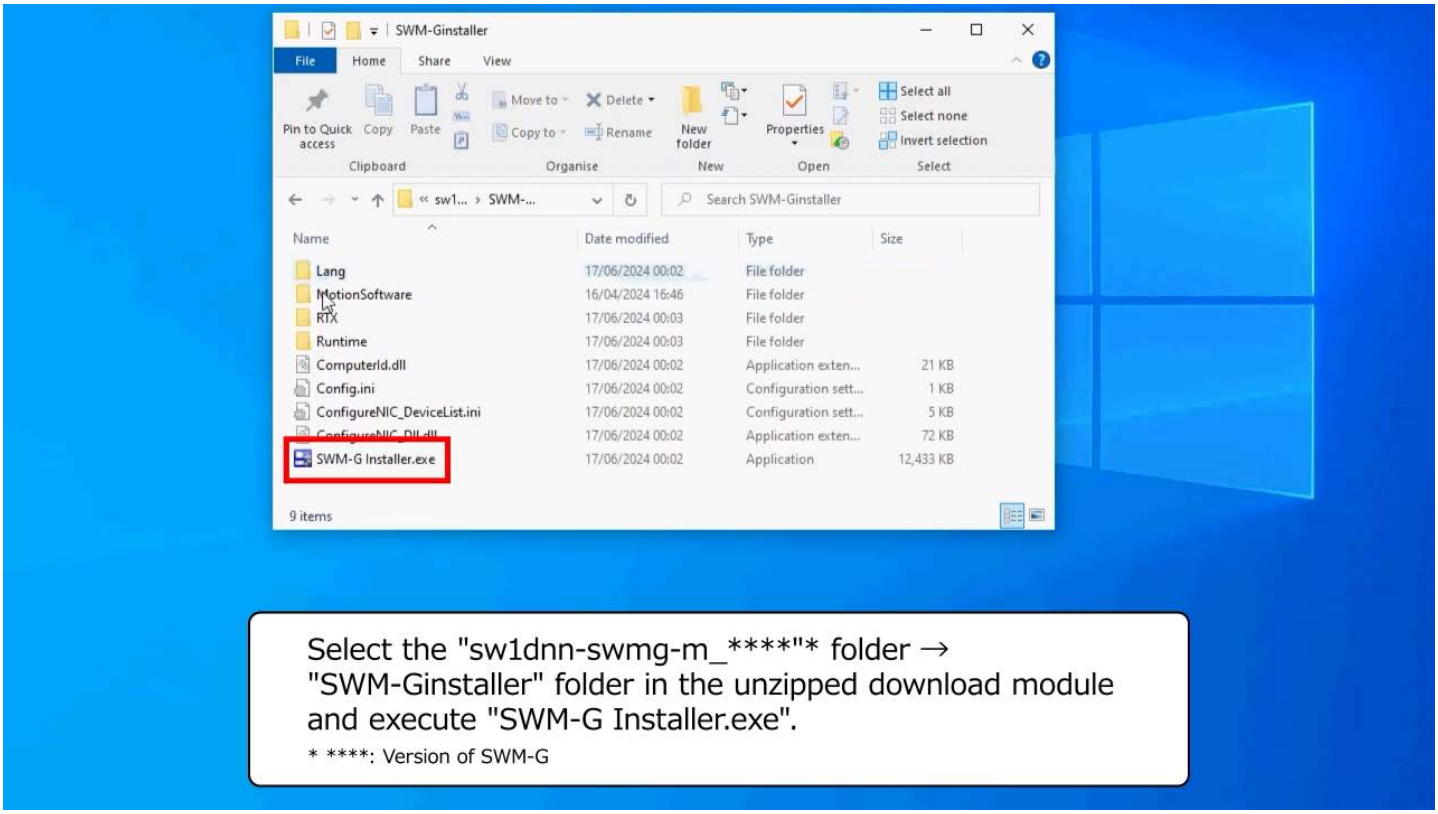
1.3.2 Installing Runtime

Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.



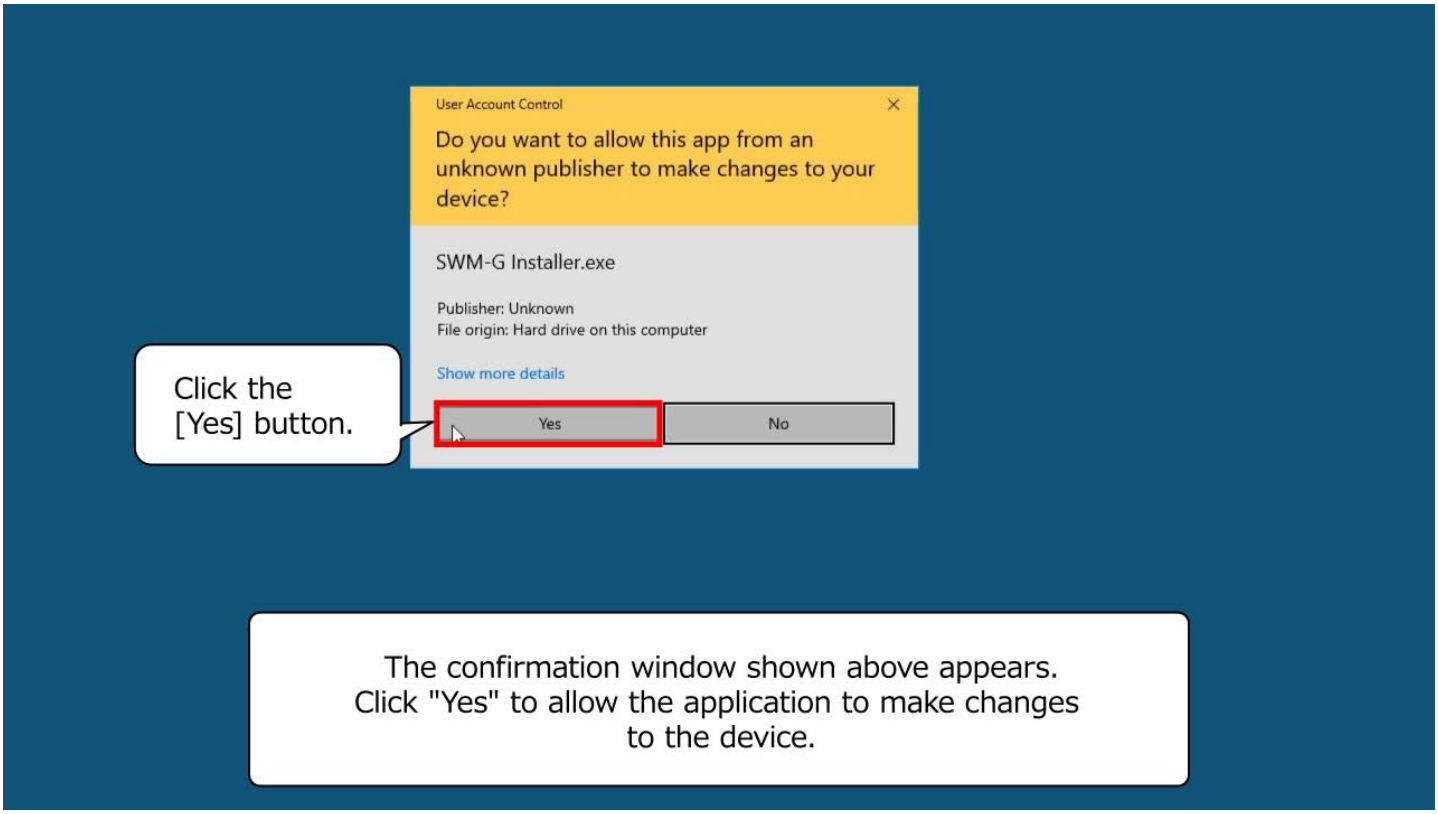
1.3.2 Installing Runtime

Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.



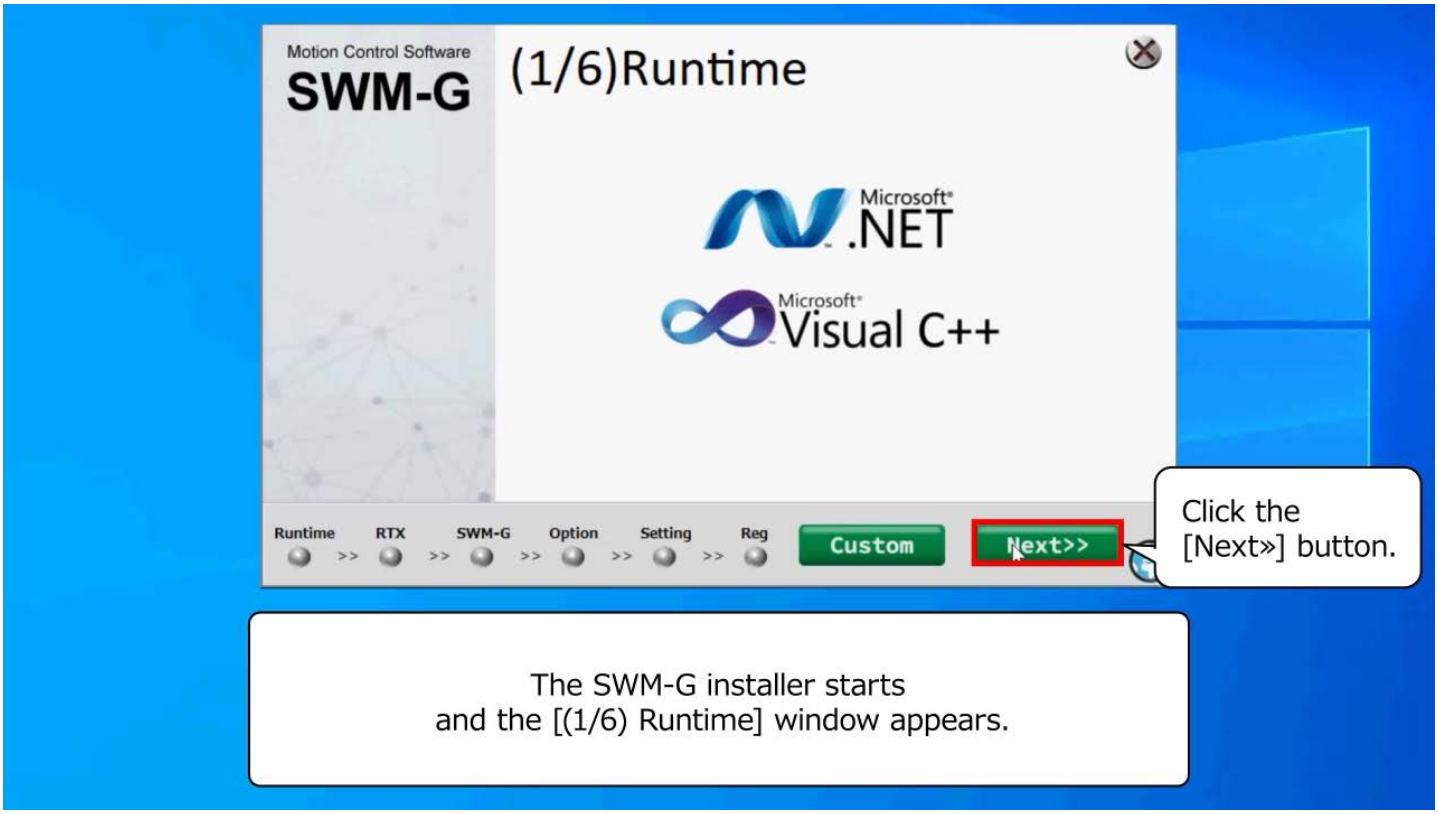
1.3.2 Installing Runtime

Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.



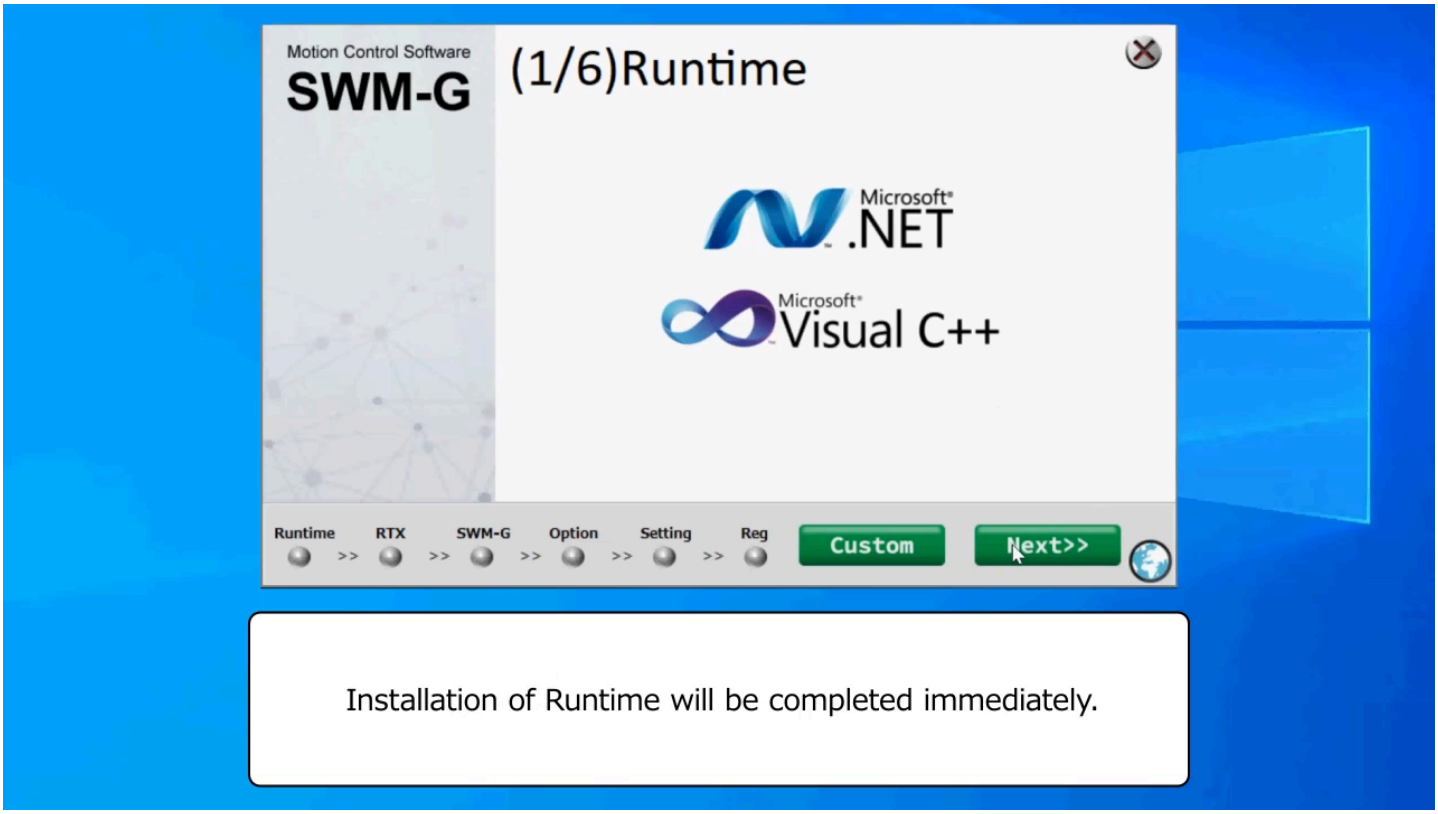
1.3.2 Installing Runtime

Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.



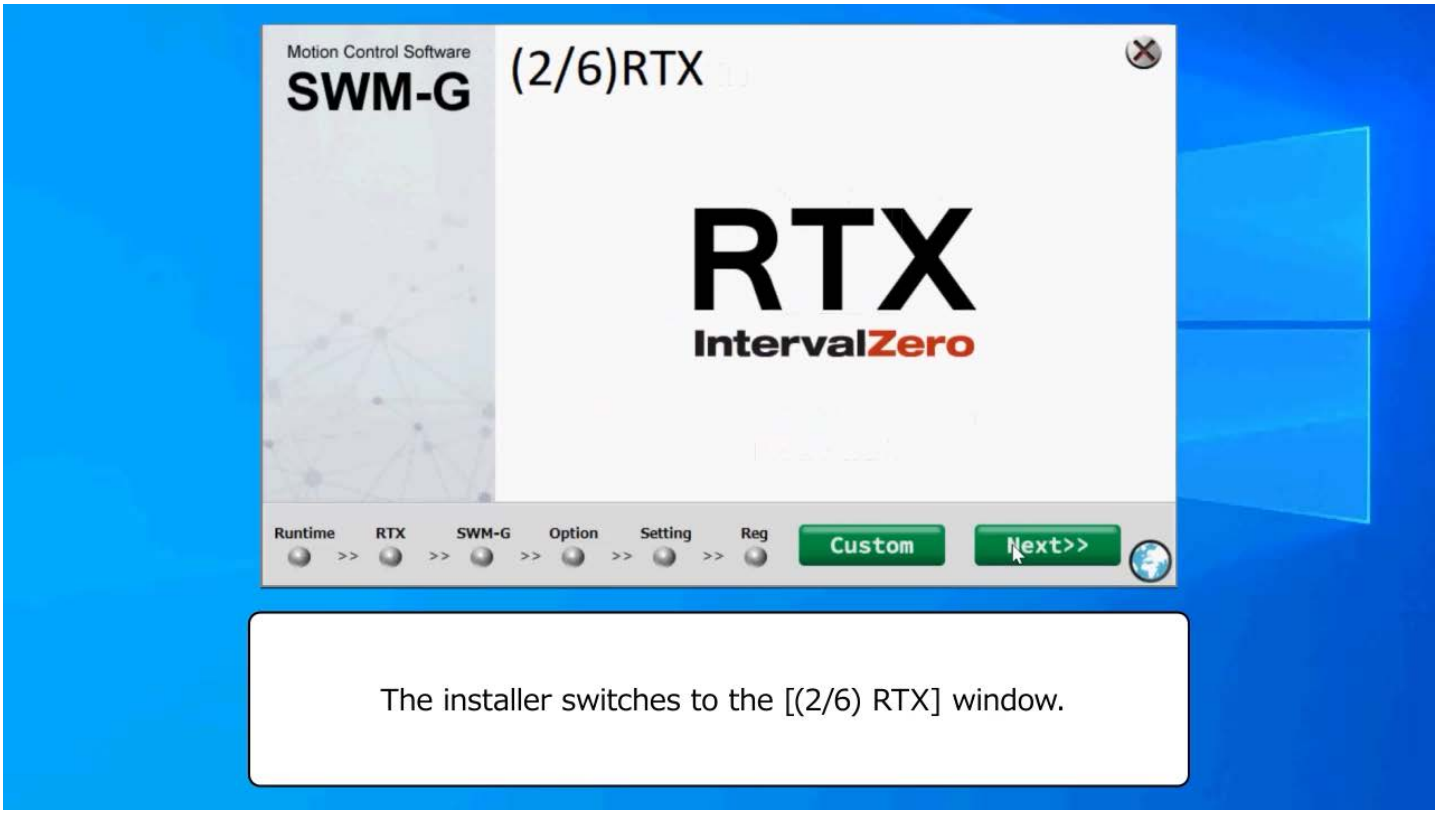
1.3.2 Installing Runtime

Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.



1.3.2 Installing Runtime

Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.



1.3.2 Installing Runtime

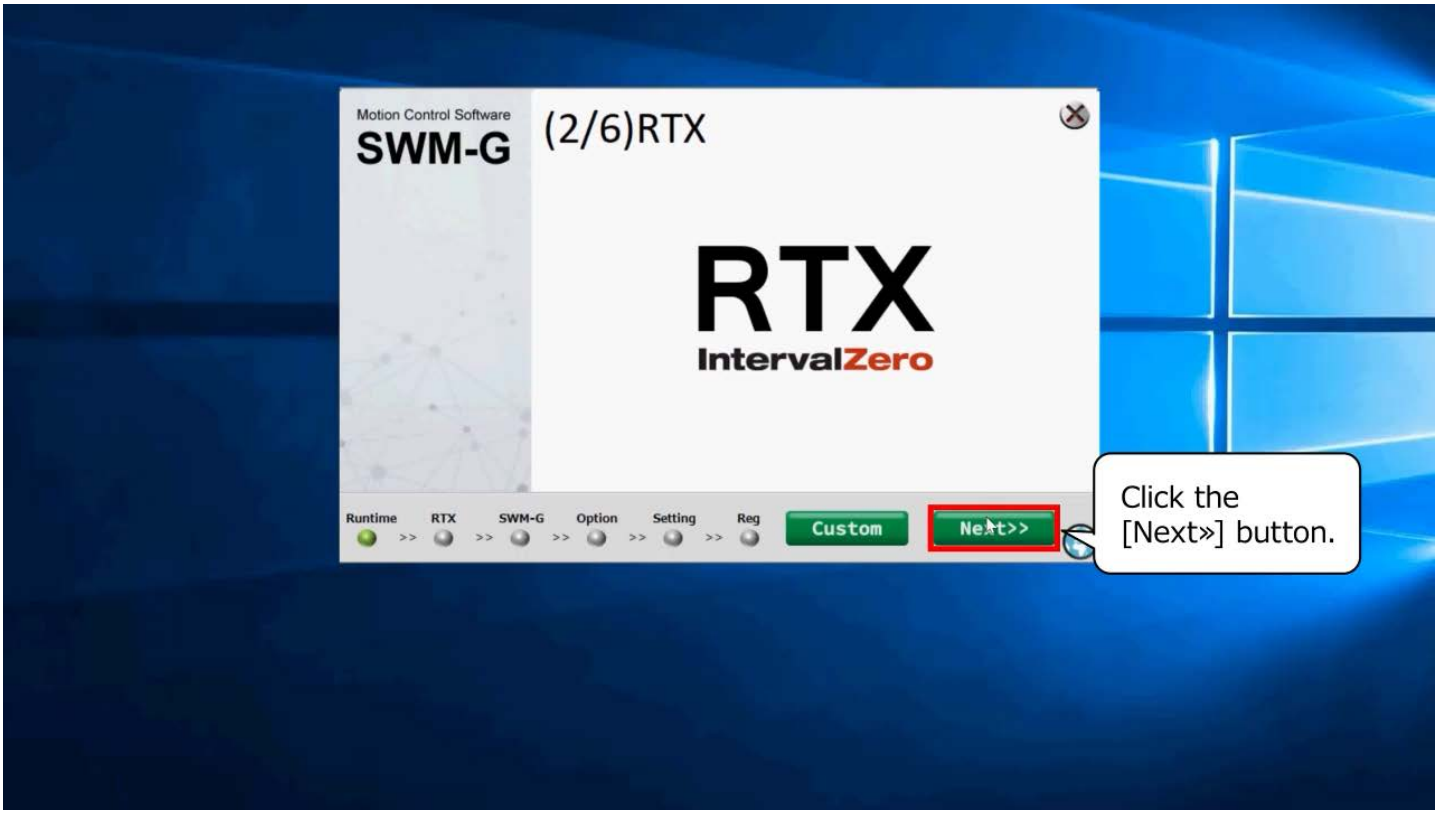
Unzip the download module.
Next, execute SWM-G Installer.exe and install a Runtime. For the procedure, see the video below.

1.3.3 Installing RTX

Next, install RTX.
Check that the [(2/6)RTX] window is displayed. For the procedure, see the video below.

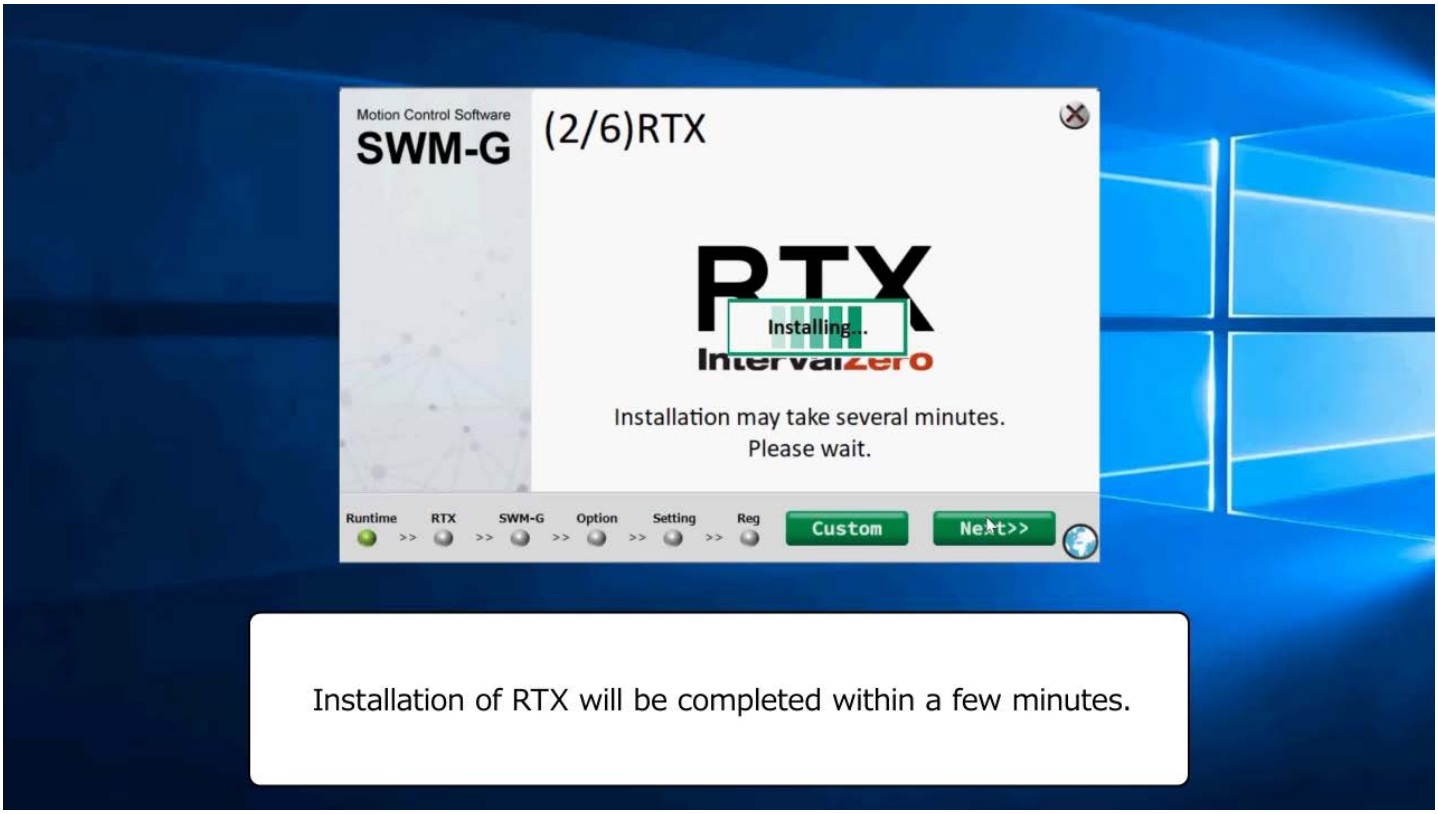
1.3.3 Installing RTX

Next, install RTX.
Check that the [(2/6)RTX] window is displayed. For the procedure, see the video below.



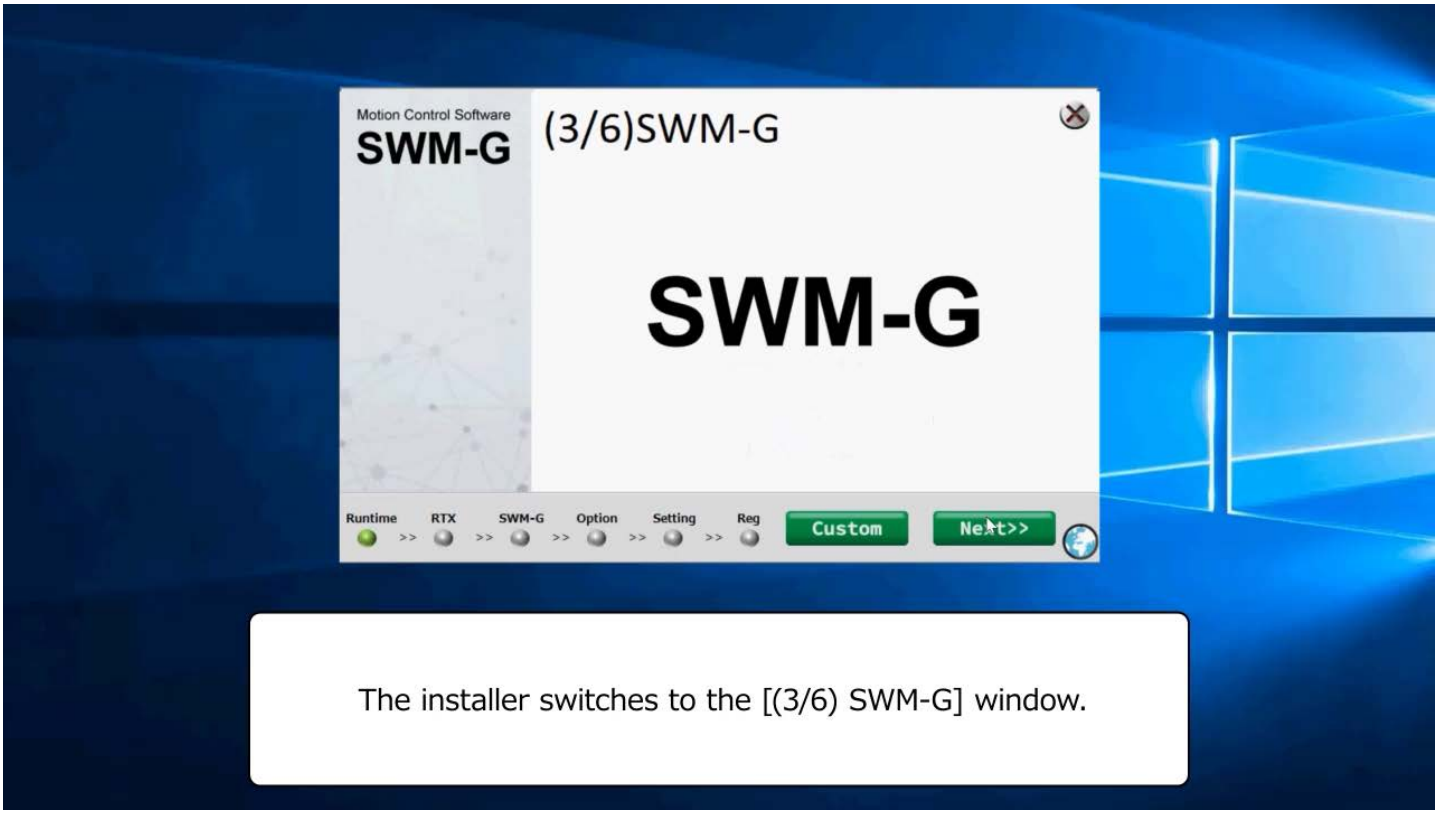
1.3.3 Installing RTX

Next, install RTX.
Check that the [(2/6)RTX] window is displayed. For the procedure, see the video below.



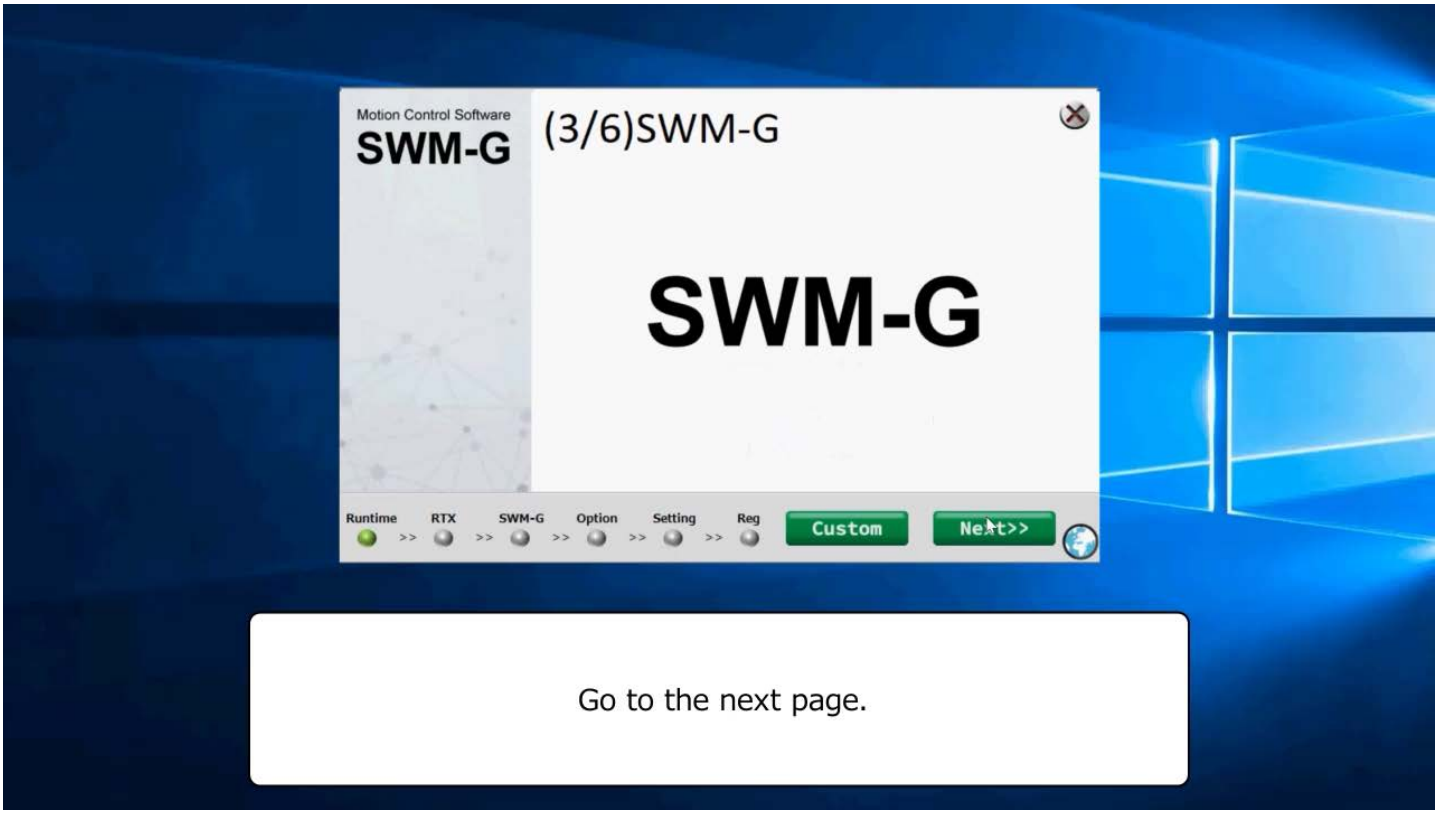
1.3.3 Installing RTX

Next, install RTX.
Check that the [(2/6)RTX] window is displayed. For the procedure, see the video below.



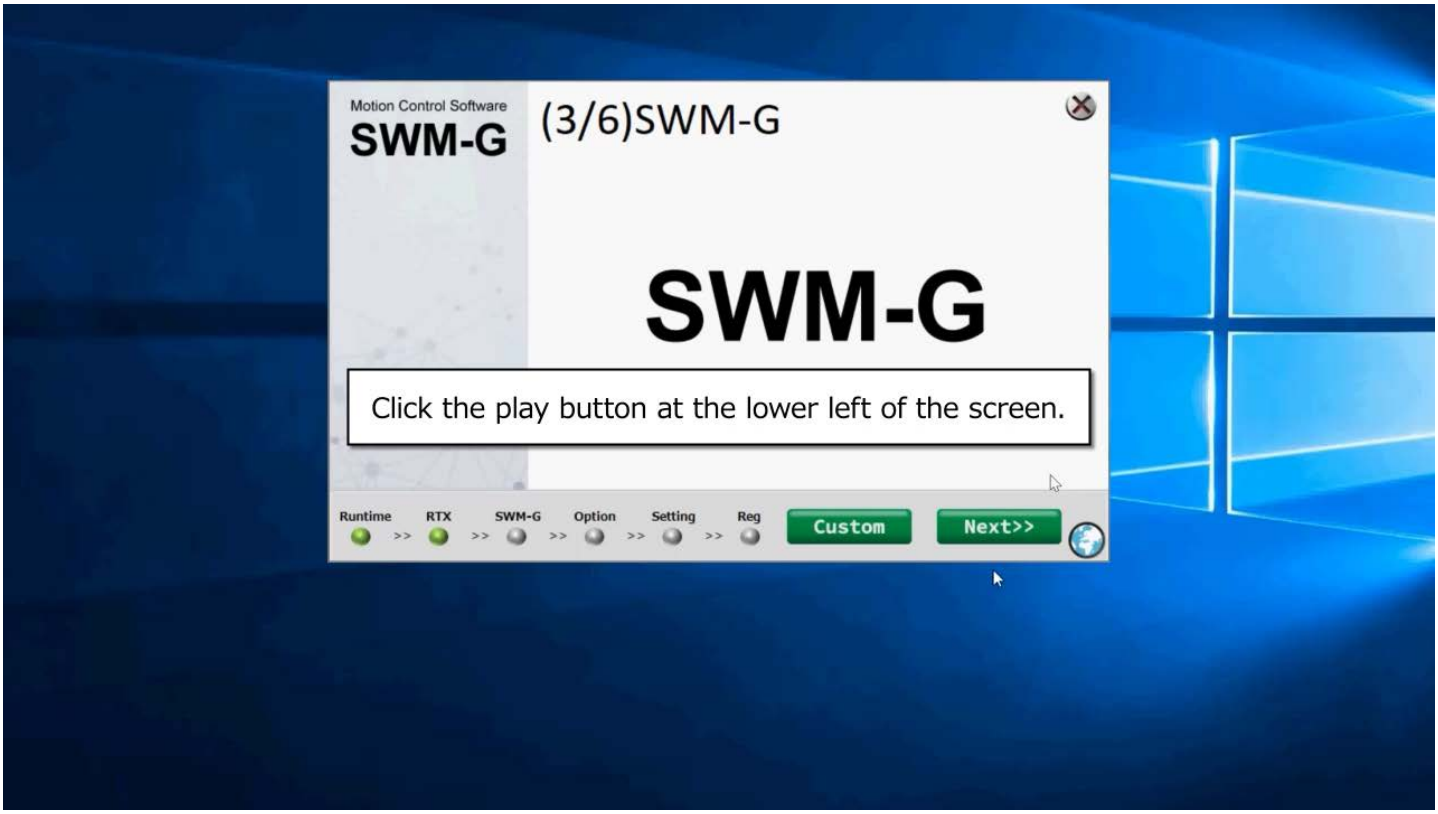
1.3.3 Installing RTX

Next, install RTX.
Check that the [(2/6)RTX] window is displayed. For the procedure, see the video below.



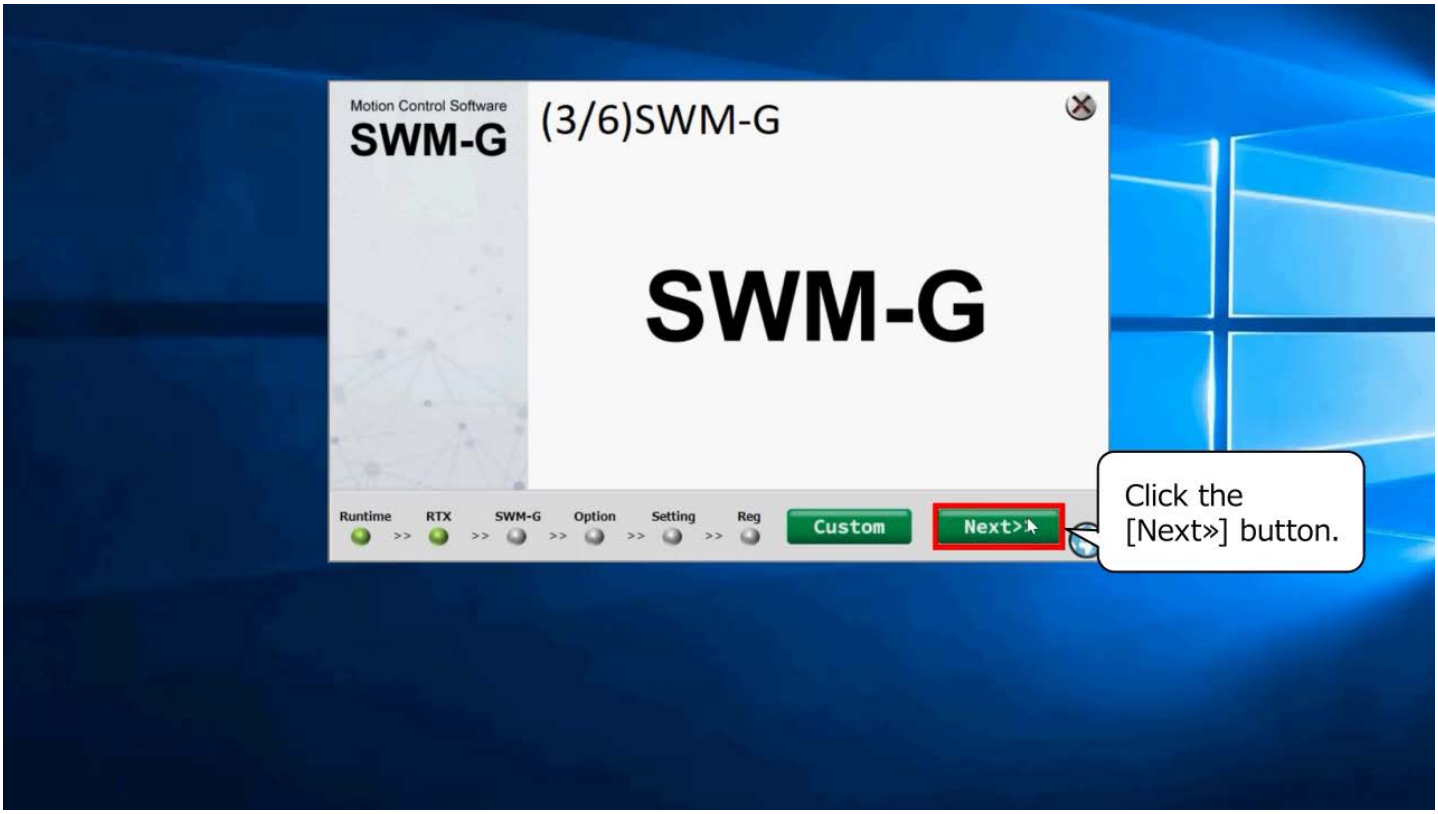
1.3.4 Installing SWM-G

Next, install SWM-G.
Check that the [(3/6)SWM-G] window is displayed. For the procedure, see the video below.



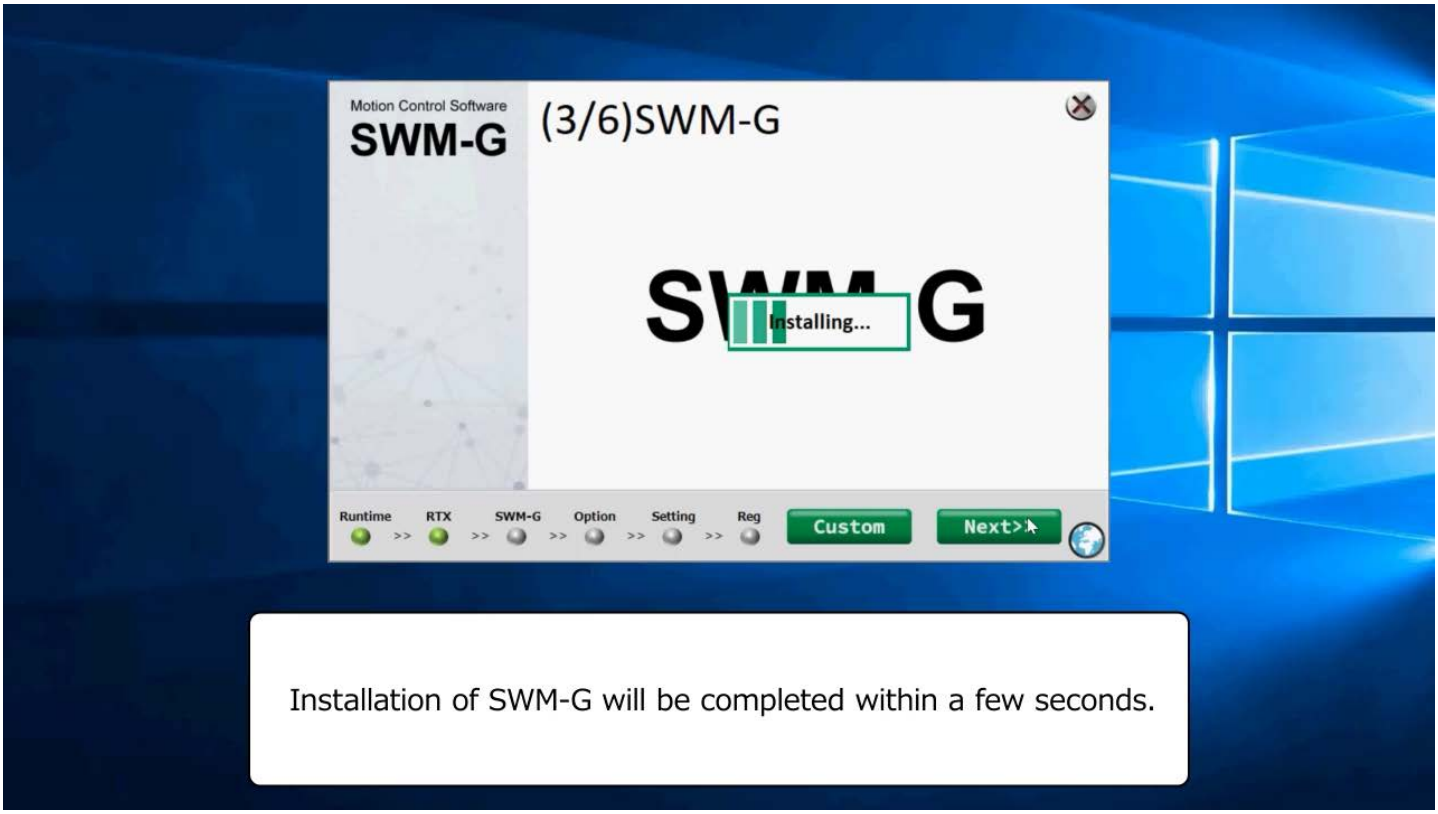
1.3.4 Installing SWM-G

Next, install SWM-G.
Check that the [(3/6)SWM-G] window is displayed. For the procedure, see the video below.



1.3.4 Installing SWM-G

Next, install SWM-G.
Check that the [(3/6)SWM-G] window is displayed. For the procedure, see the video below.



1.3.4 Installing SWM-G

Next, install SWM-G.
Check that the [(3/6)SWM-G] window is displayed. For the procedure, see the video below.

1.3.4 Installing SWM-G

Next, install SWM-G.
Check that the [(3/6)SWM-G] window is displayed. For the procedure, see the video below.

1.3.5 Setting RTX

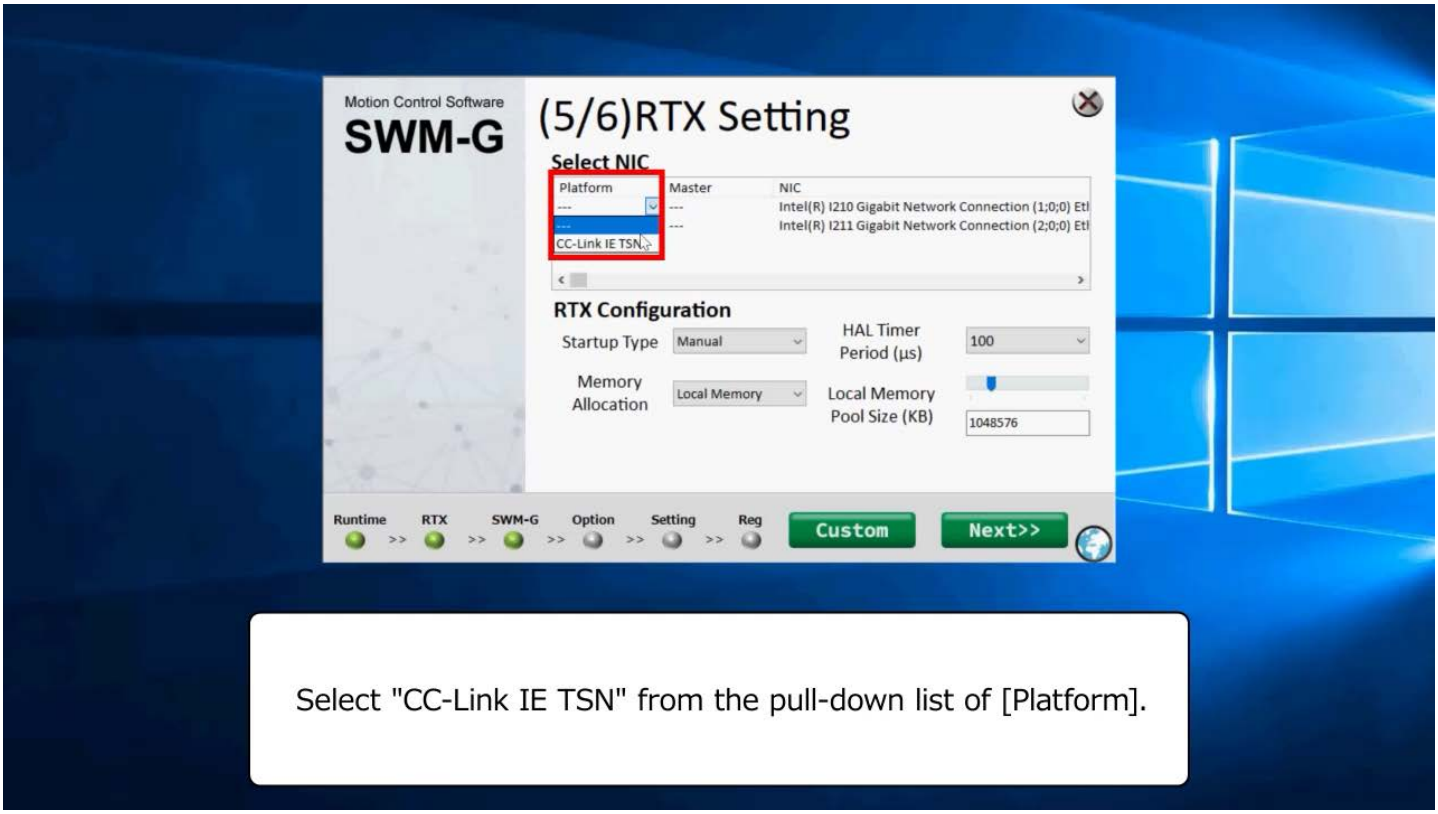
The software has been installed with the steps in the previous section. Next, configure the settings on RTX.
Check that the [(5/6)RTX Setting] window is displayed. For the procedure, see the video below.

1.3.5 Setting RTX

The software has been installed with the steps in the previous section. Next, configure the settings on RTX.
Check that the [(5/6)RTX Setting] window is displayed. For the procedure, see the video below.

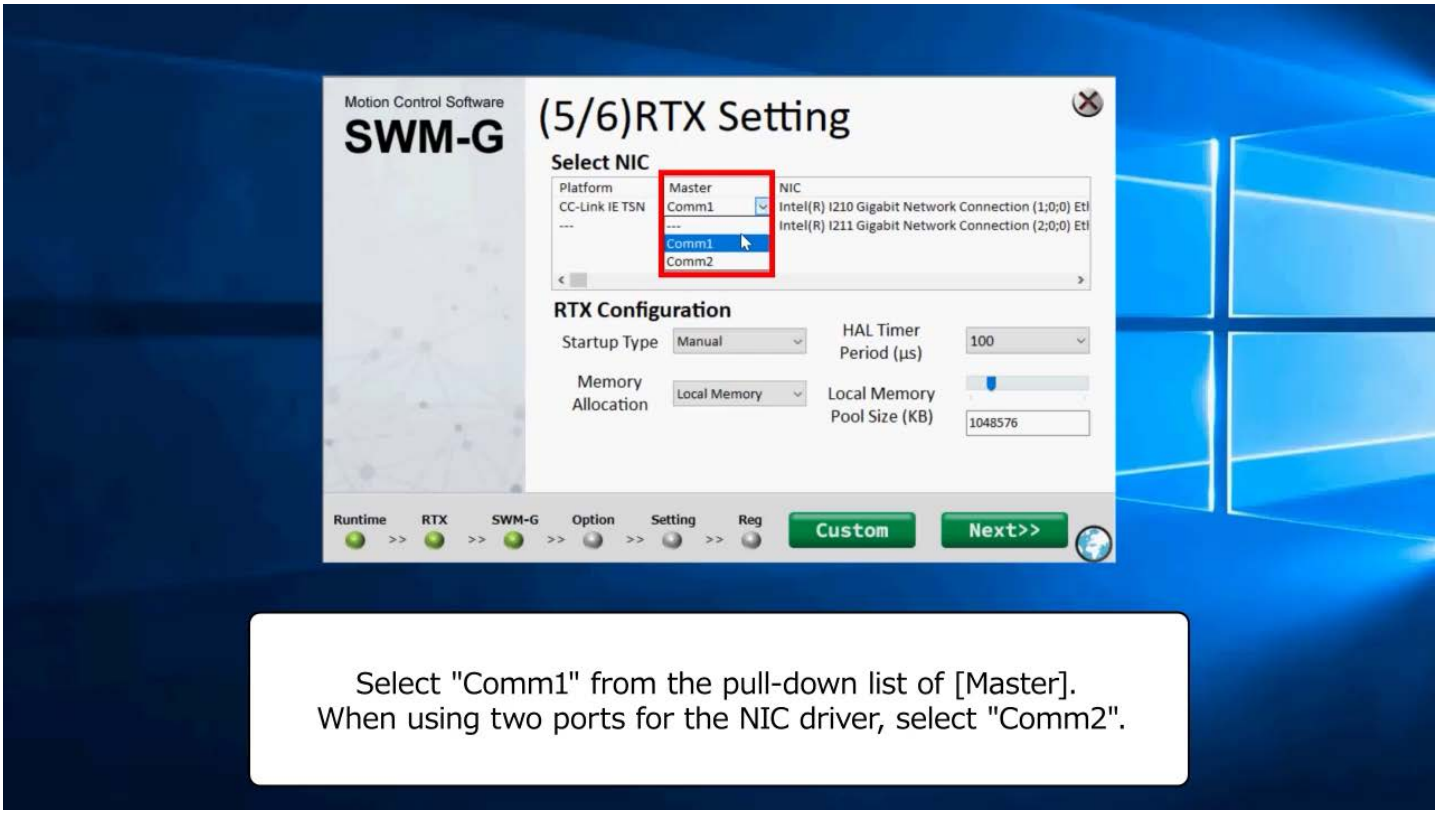
1.3.5 Setting RTX

The software has been installed with the steps in the previous section. Next, configure the settings on RTX.
Check that the [(5/6)RTX Setting] window is displayed. For the procedure, see the video below.



1.3.5 Setting RTX

The software has been installed with the steps in the previous section. Next, configure the settings on RTX.
Check that the [(5/6)RTX Setting] window is displayed. For the procedure, see the video below.



1.3.5 Setting RTX

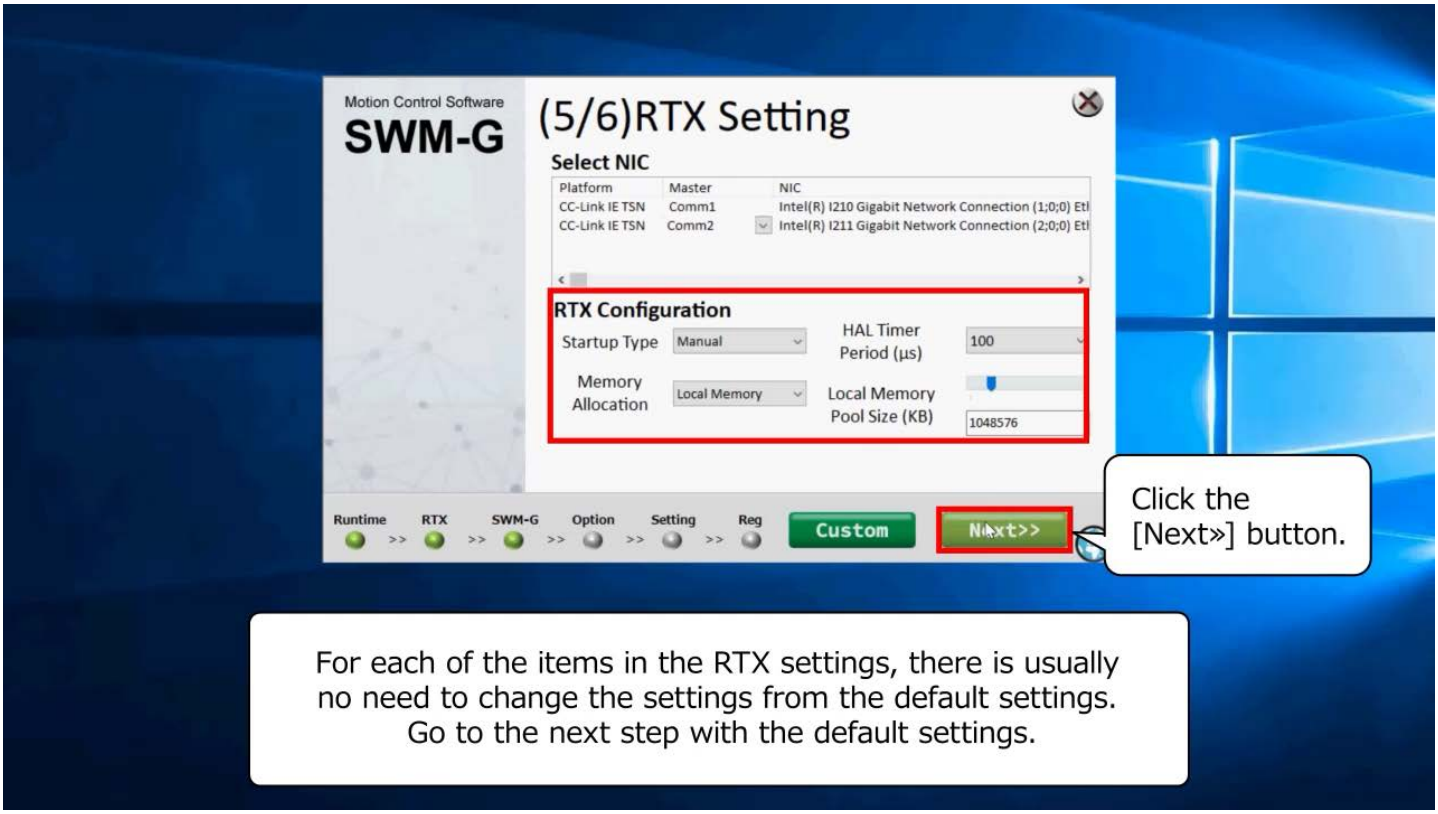
The software has been installed with the steps in the previous section. Next, configure the settings on RTX.
Check that the [(5/6)RTX Setting] window is displayed. For the procedure, see the video below.

1.3.5 Setting RTX

The software has been installed with the steps in the previous section. Next, configure the settings on RTX.
Check that the [(5/6)RTX Setting] window is displayed. For the procedure, see the video below.

1.3.5 Setting RTX

The software has been installed with the steps in the previous section. Next, configure the settings on RTX.
Check that the [(5/6)RTX Setting] window is displayed. For the procedure, see the video below.



1.3.5 Setting RTX

The software has been installed with the steps in the previous section. Next, configure the settings on RTX.
Check that the [(5/6)RTX Setting] window is displayed. For the procedure, see the video below.

1.3.5 Setting RTX

The software has been installed with the steps in the previous section. Next, configure the settings on RTX.
Check that the [(5/6)RTX Setting] window is displayed. For the procedure, see the video below.

1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

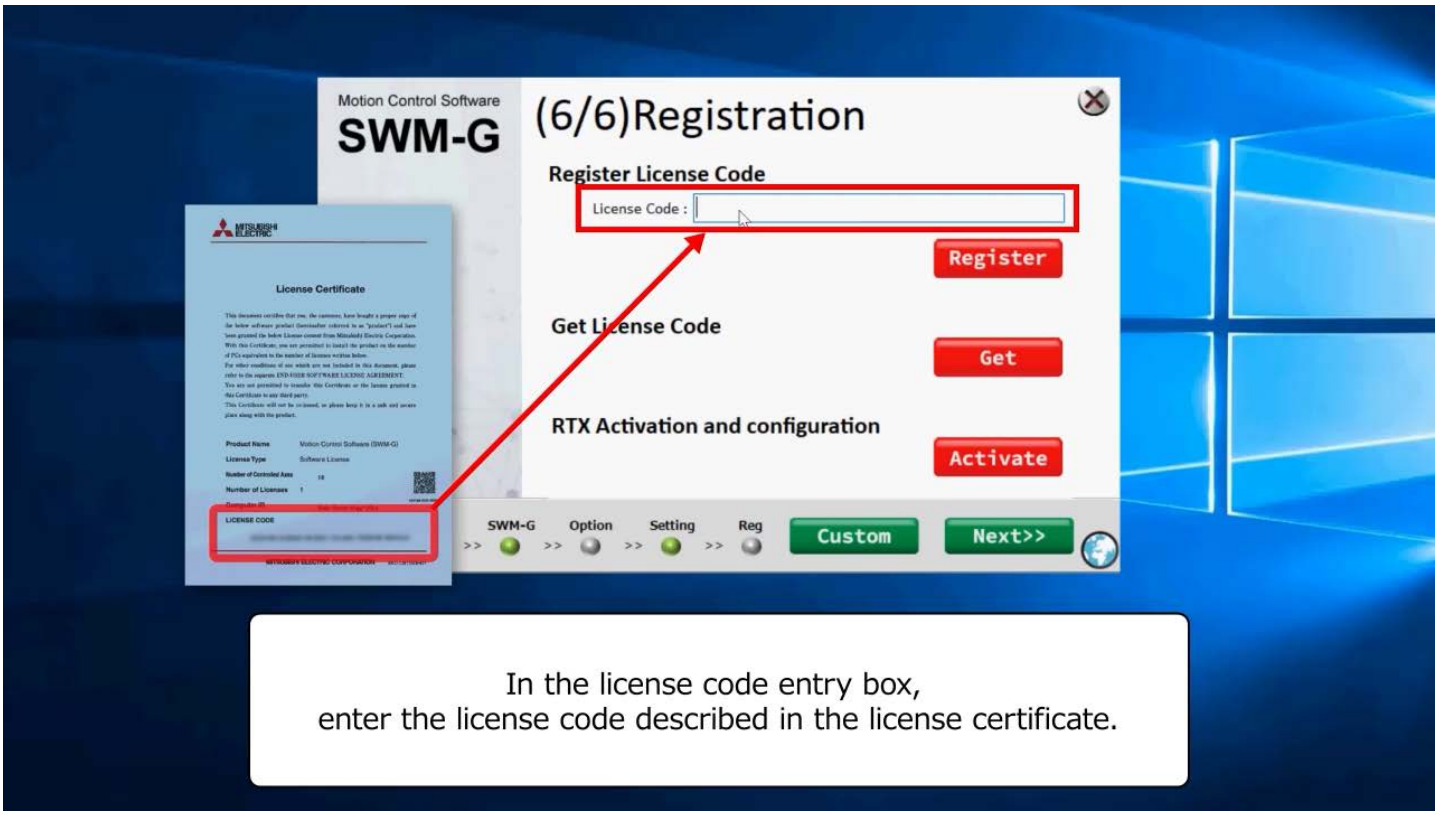
Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.

1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.



1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.

1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

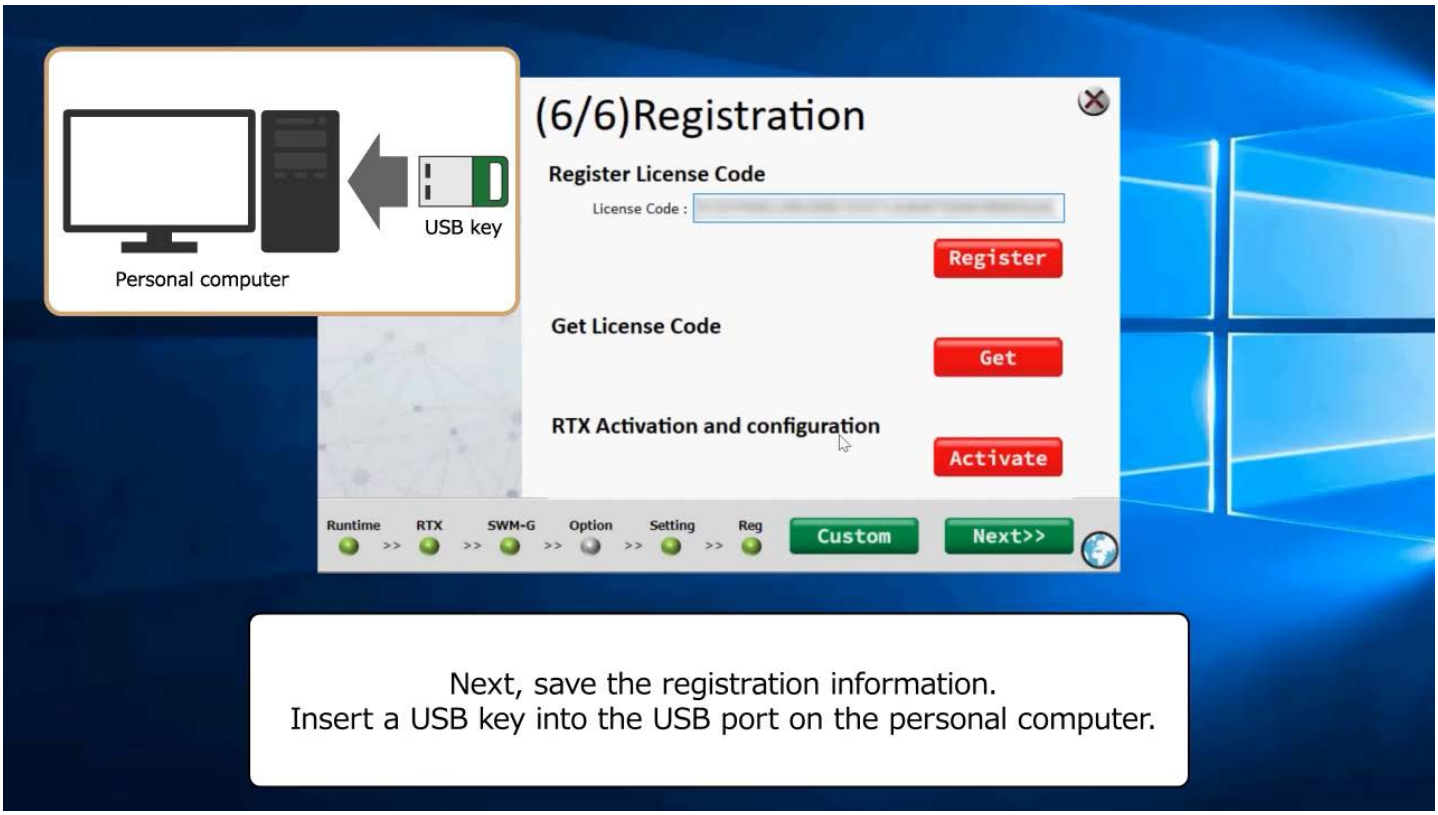
Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.

1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.



1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

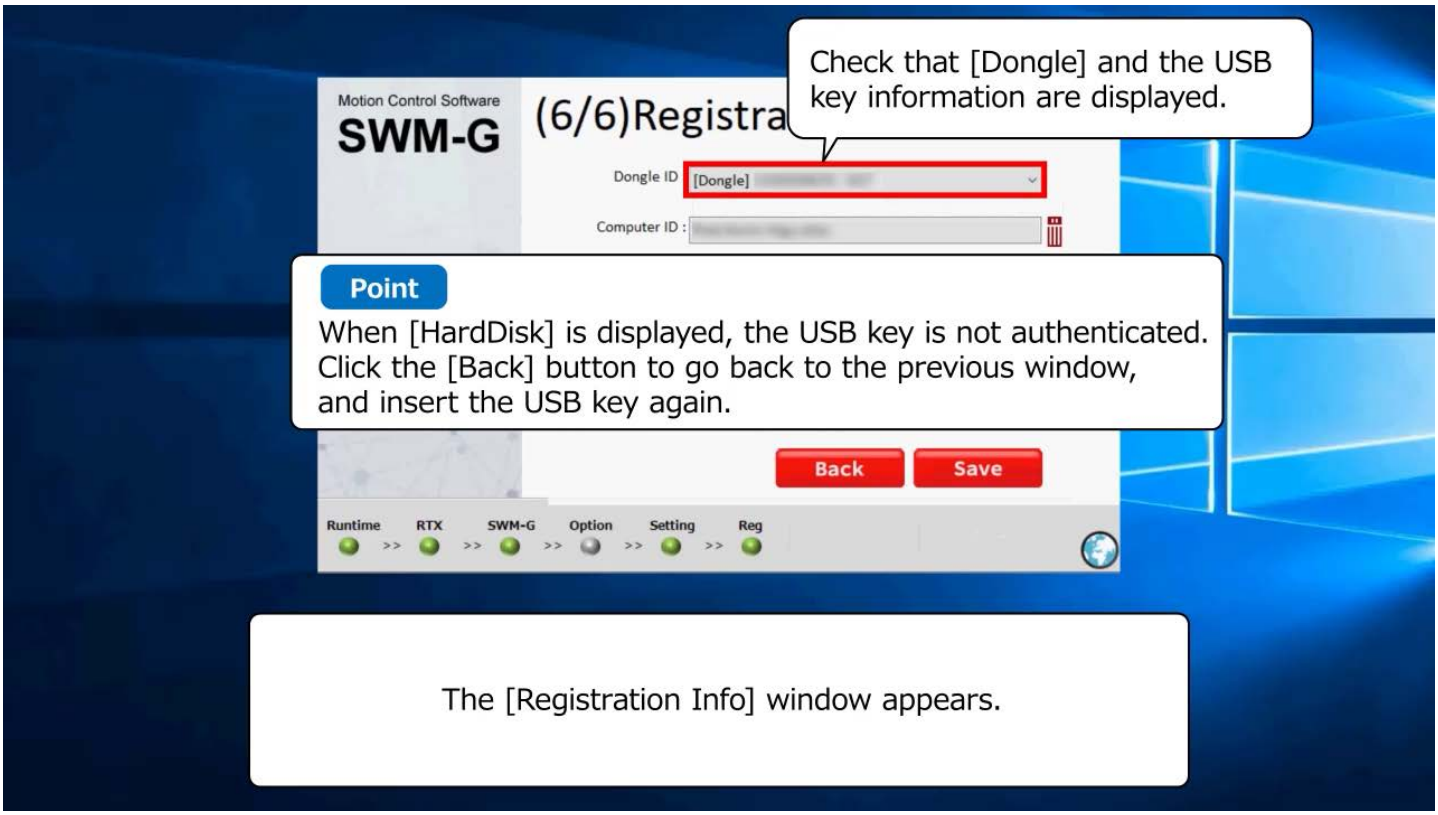
Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.

1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.

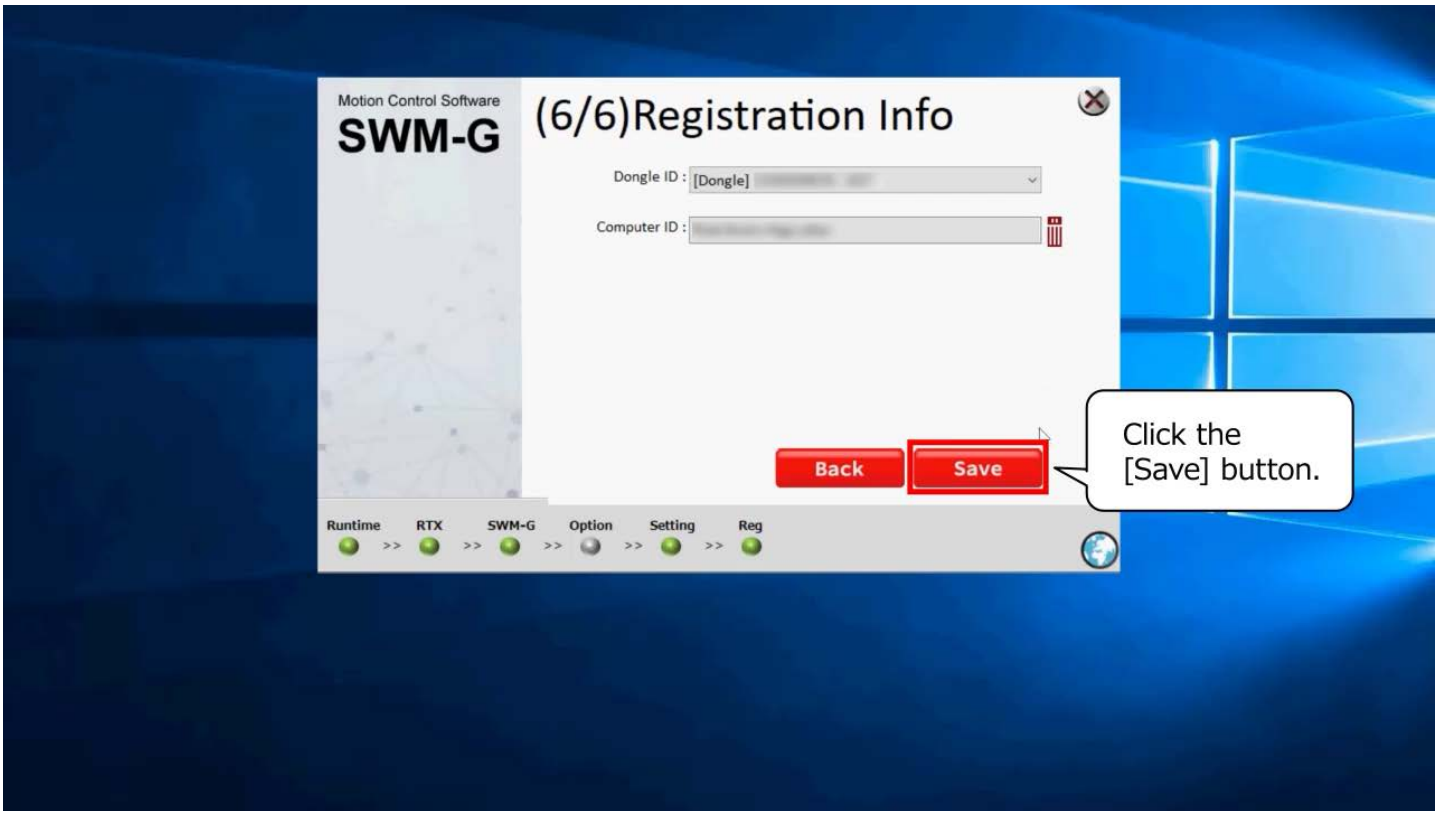


1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.

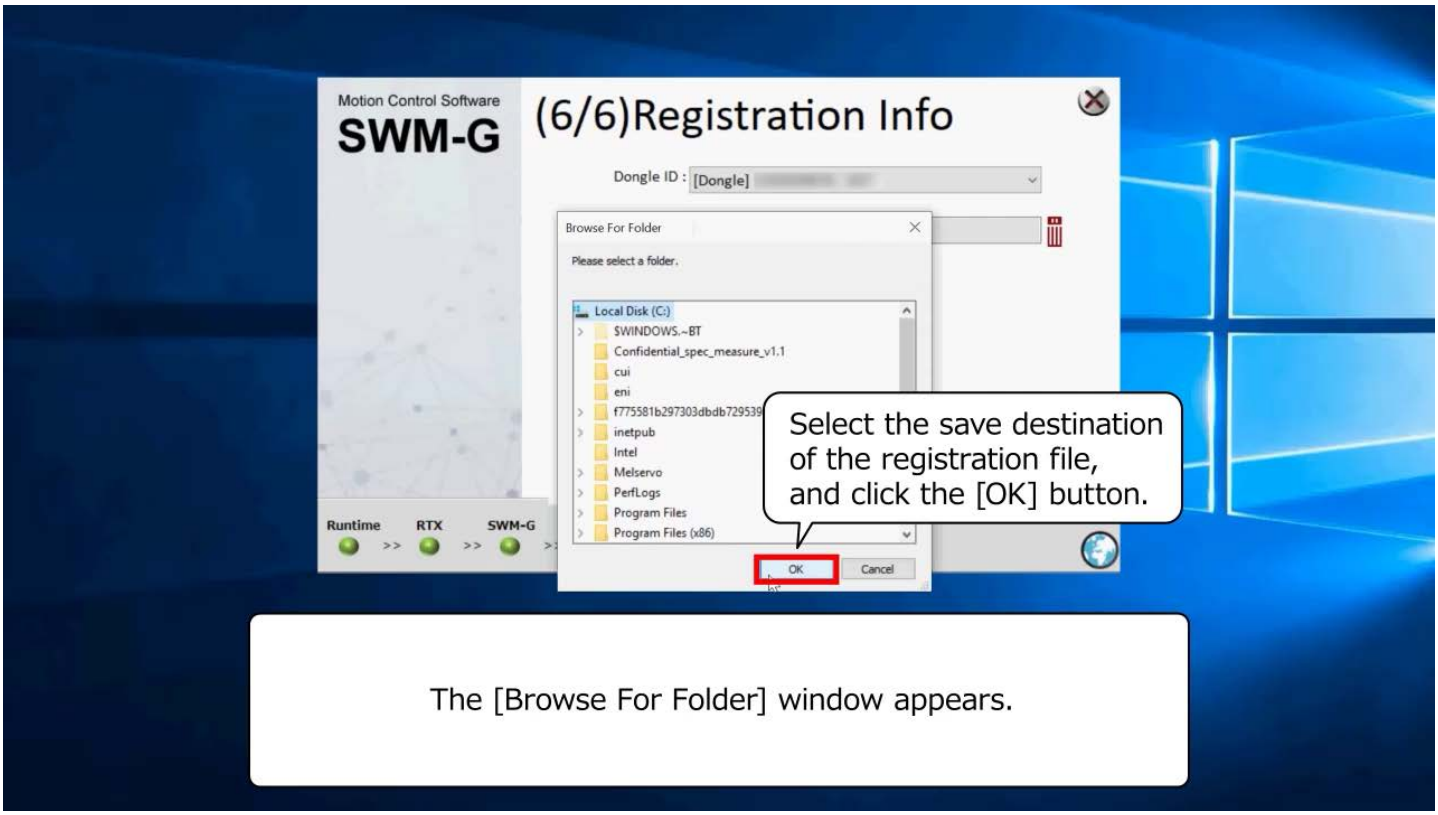


1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.

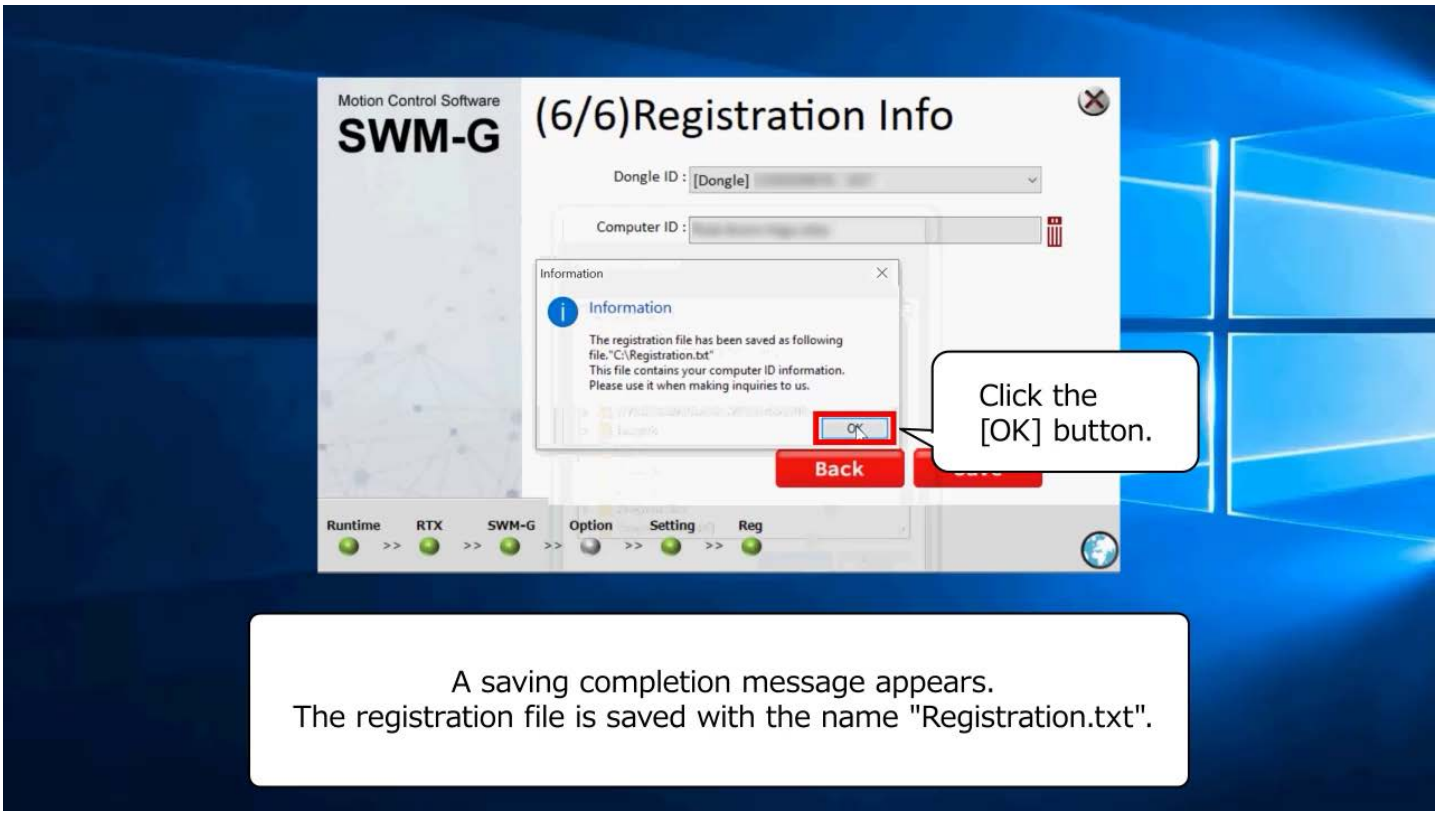


1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.

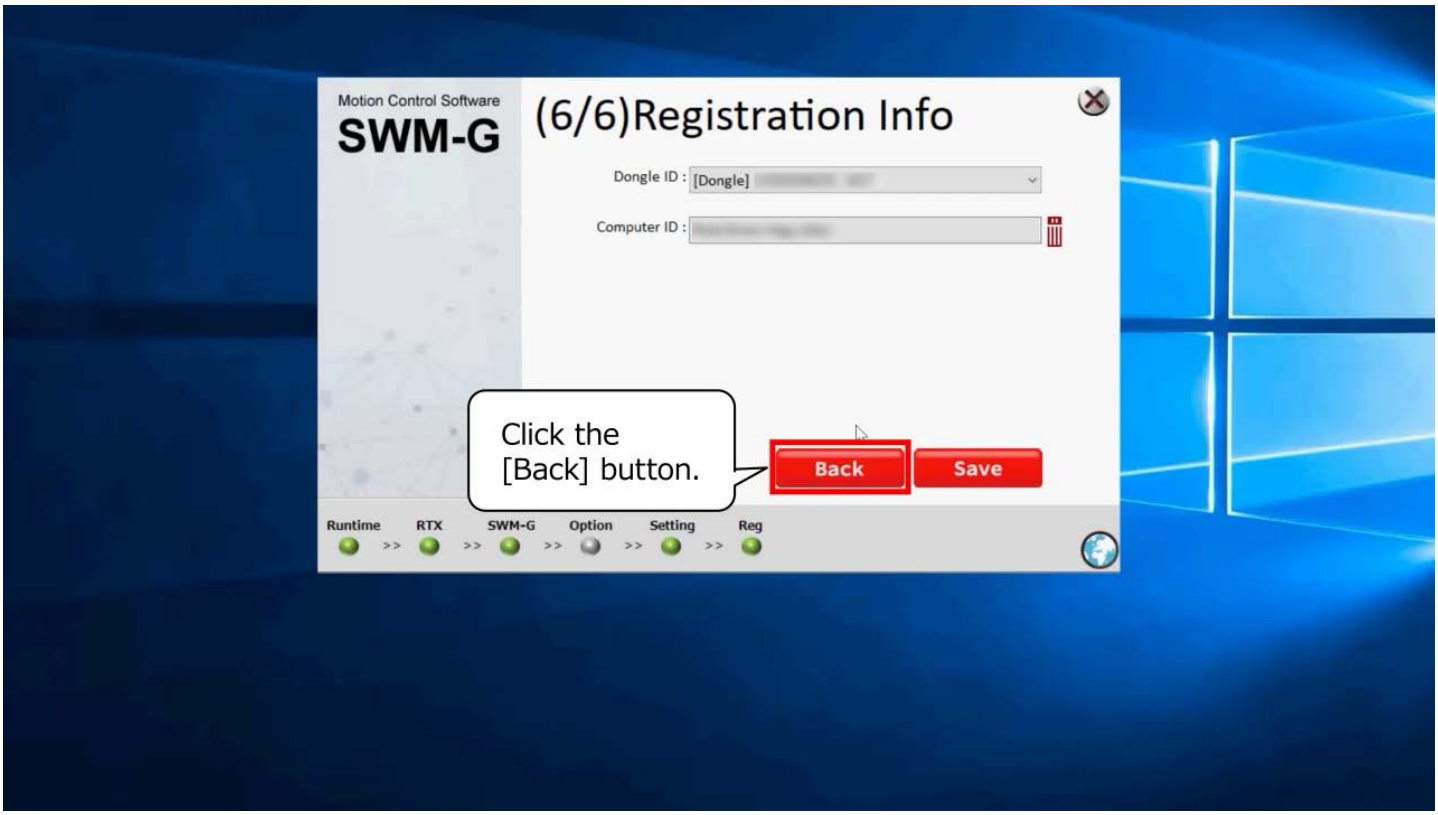


1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.



1.3.6 Registering the SWM-G license

Next, register the license and save the registration file.

1. Enter the license code written on the license certificate to authenticate the SWM-G license.
2. Save the registration file (Registration.txt) where the information required for support is written to the personal computer.
   * If the USB key is broken, the serial number saved in the registration file (Registration.txt) is required.

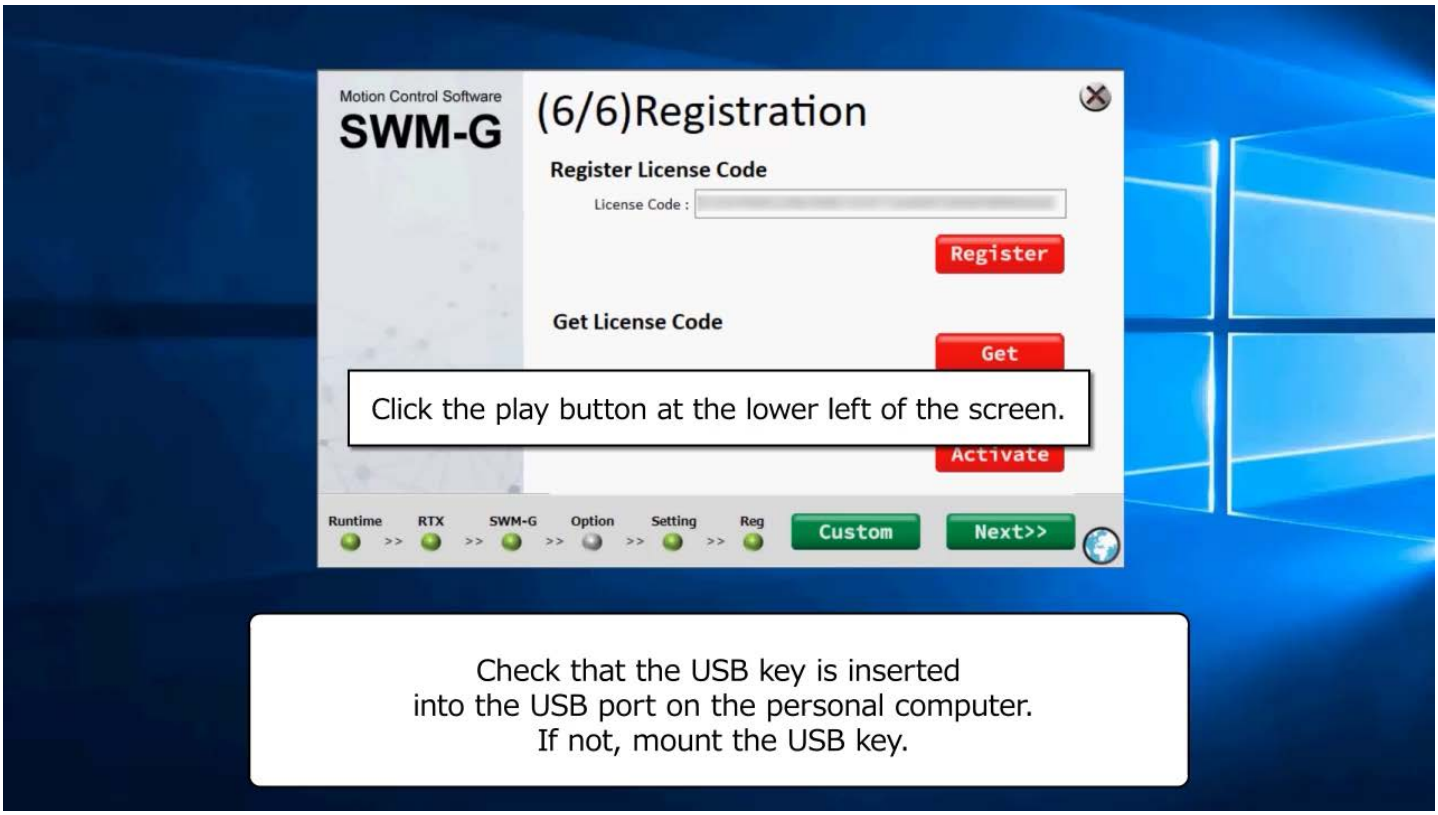
Have the license certificate and USB key ready at hand.
Check that the [(6/6)Registration] window is displayed. For the procedure, see the video below.

1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

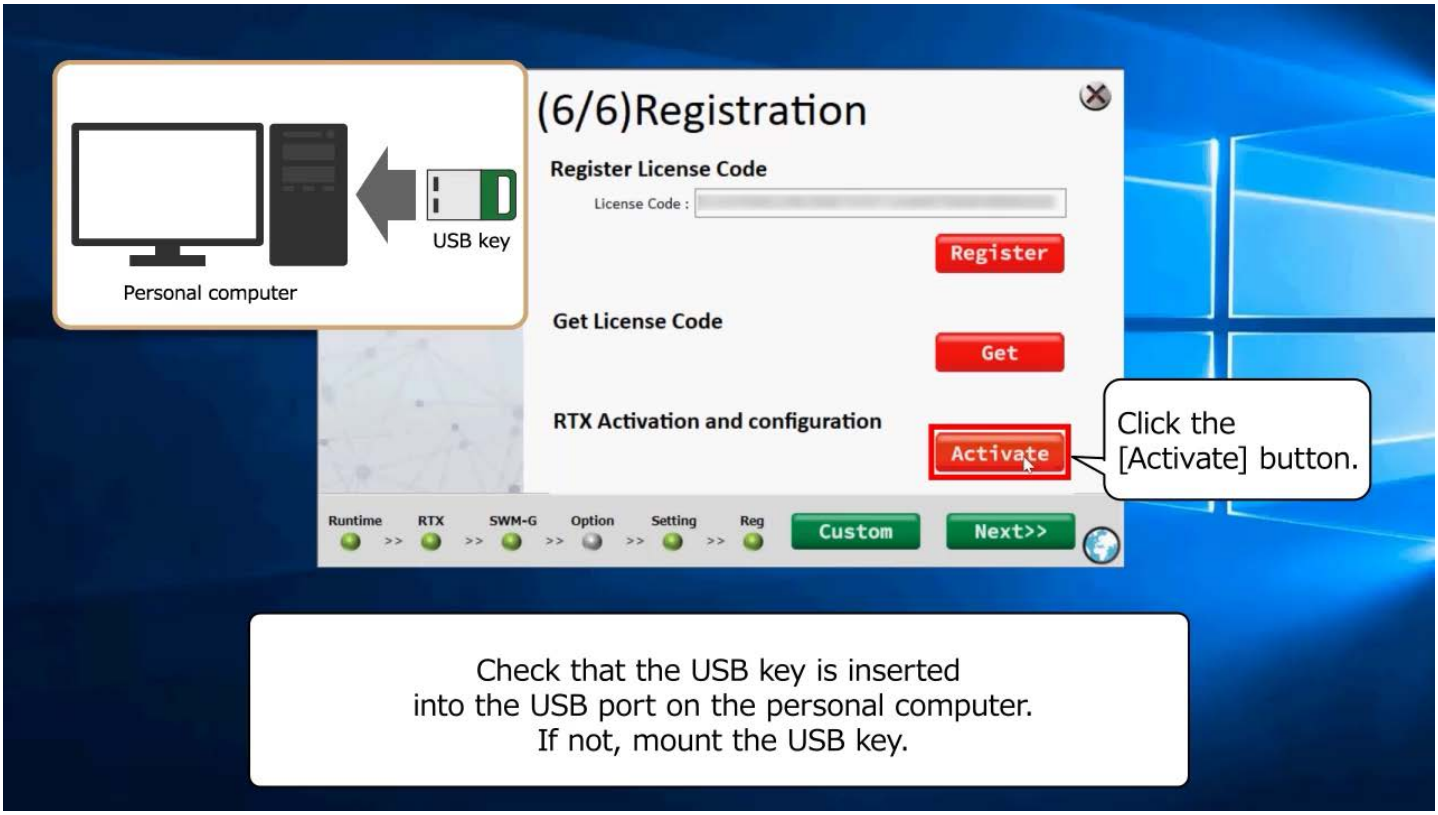


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

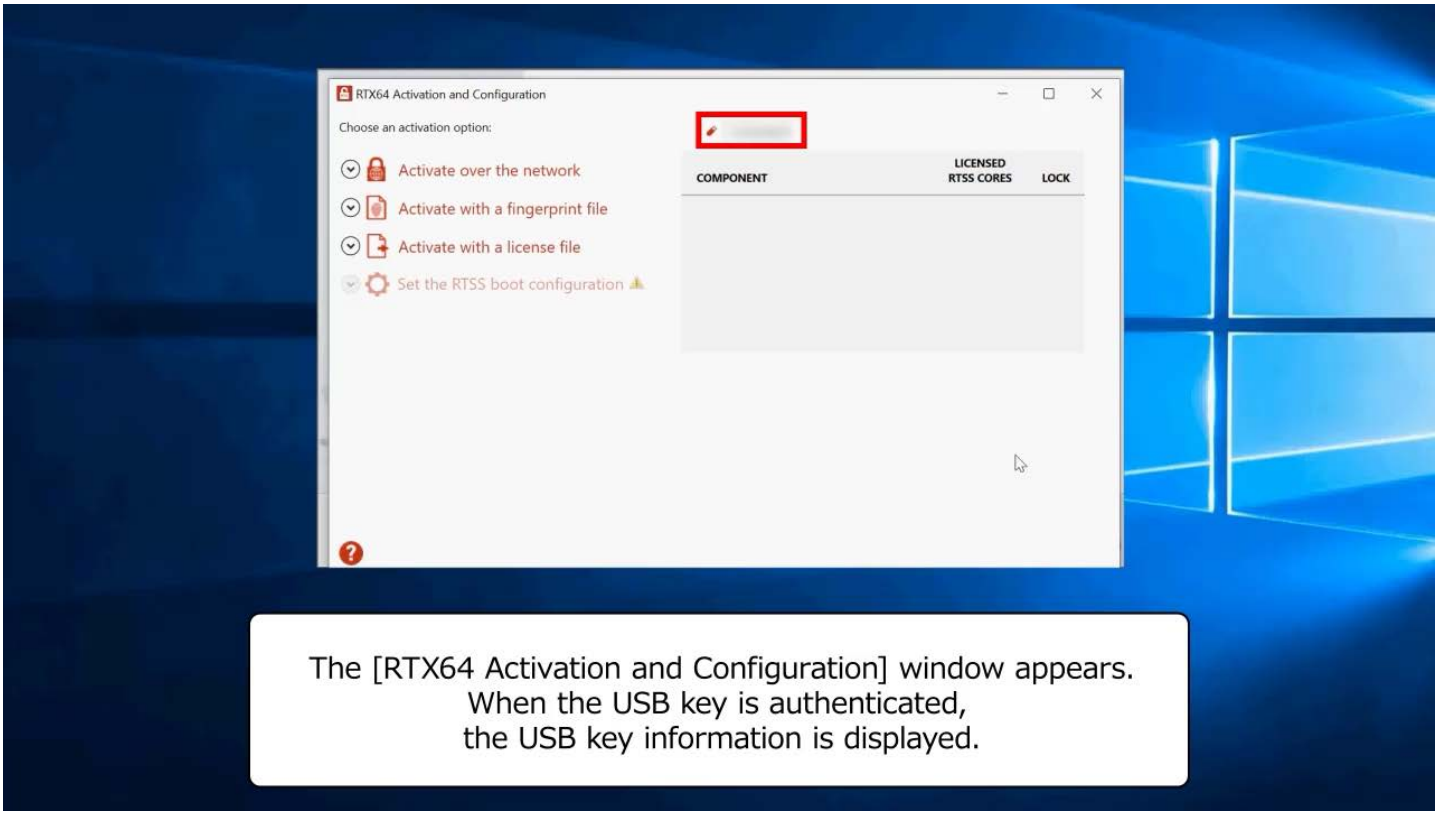


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

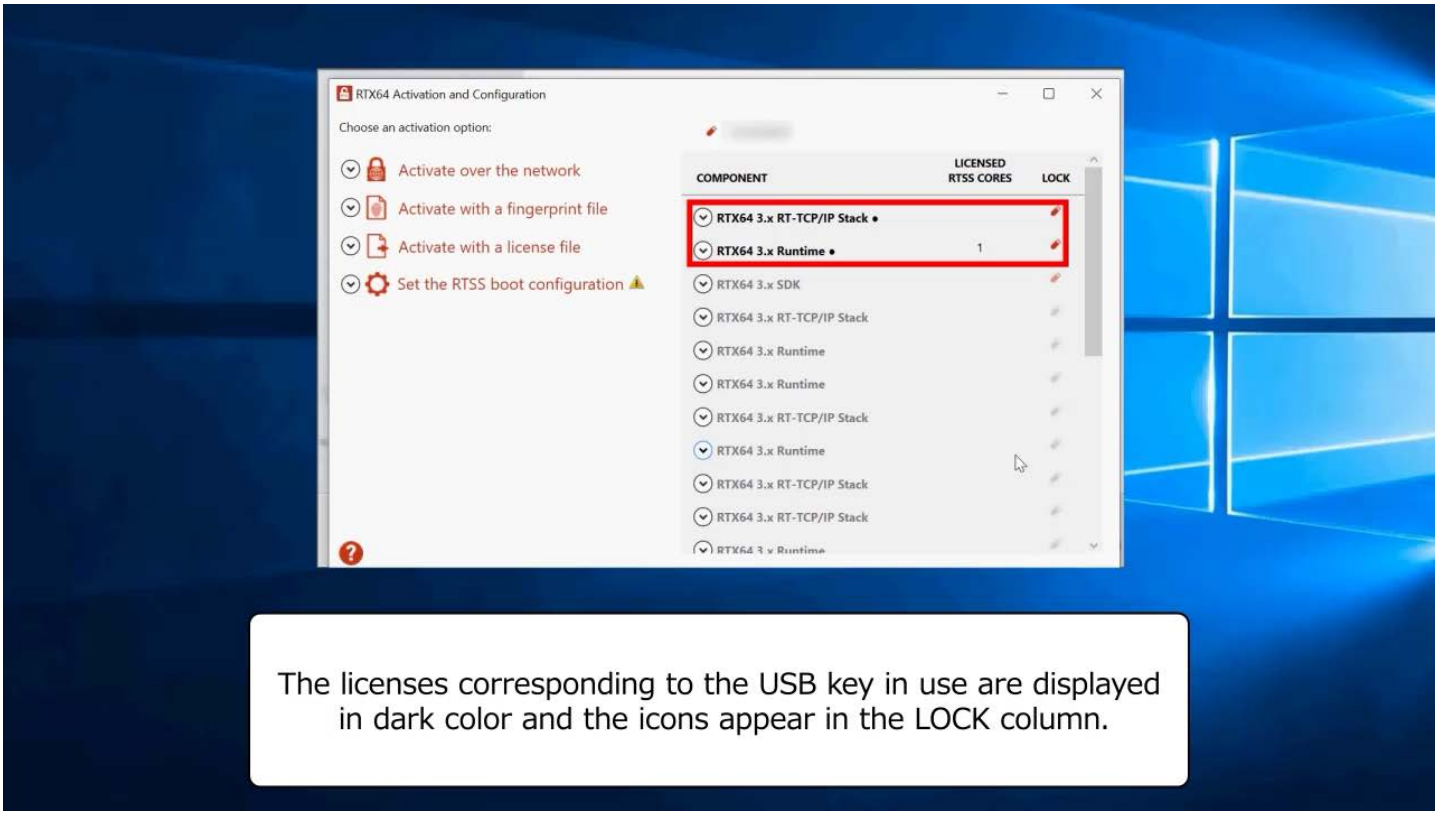


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

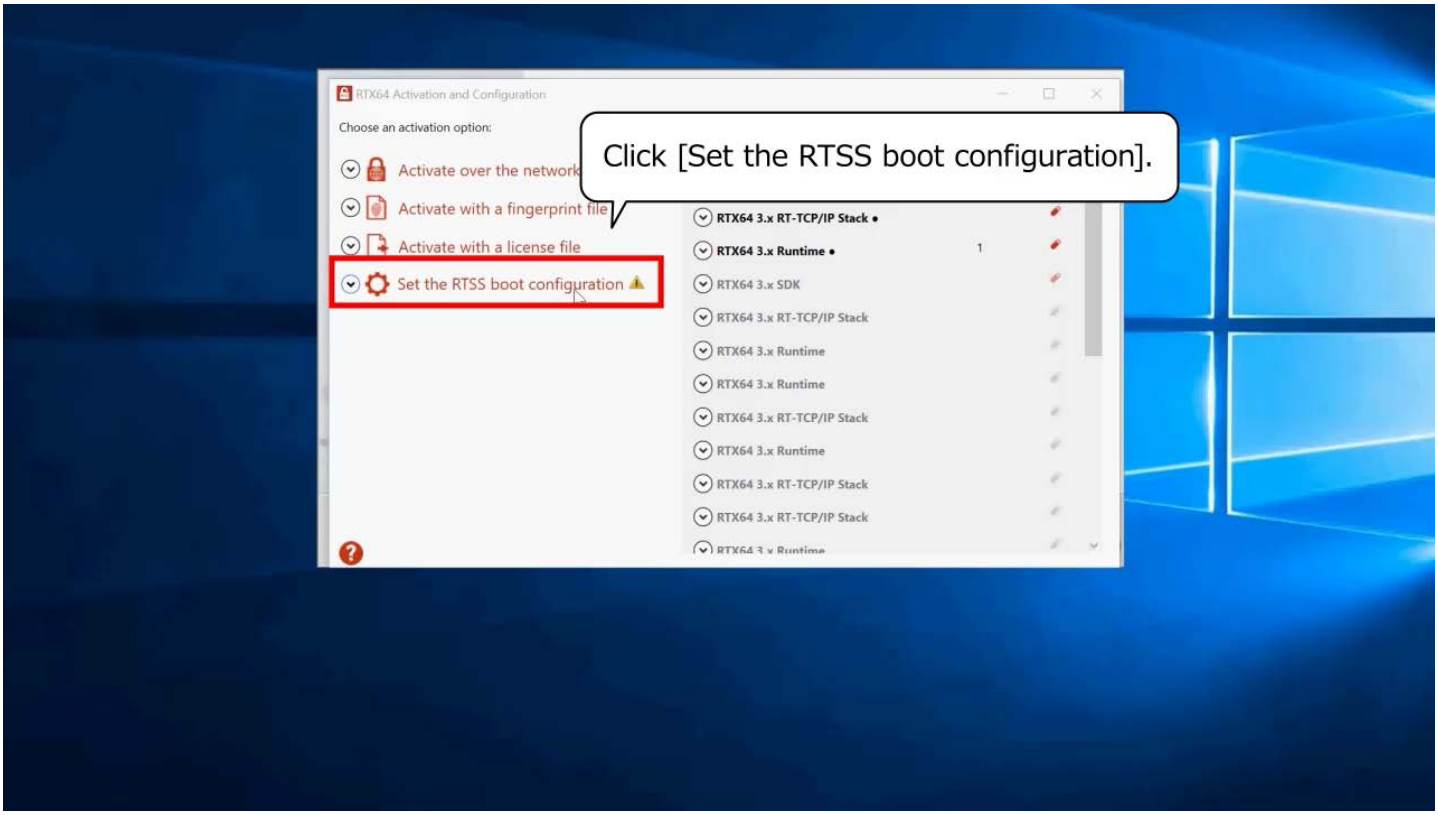


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

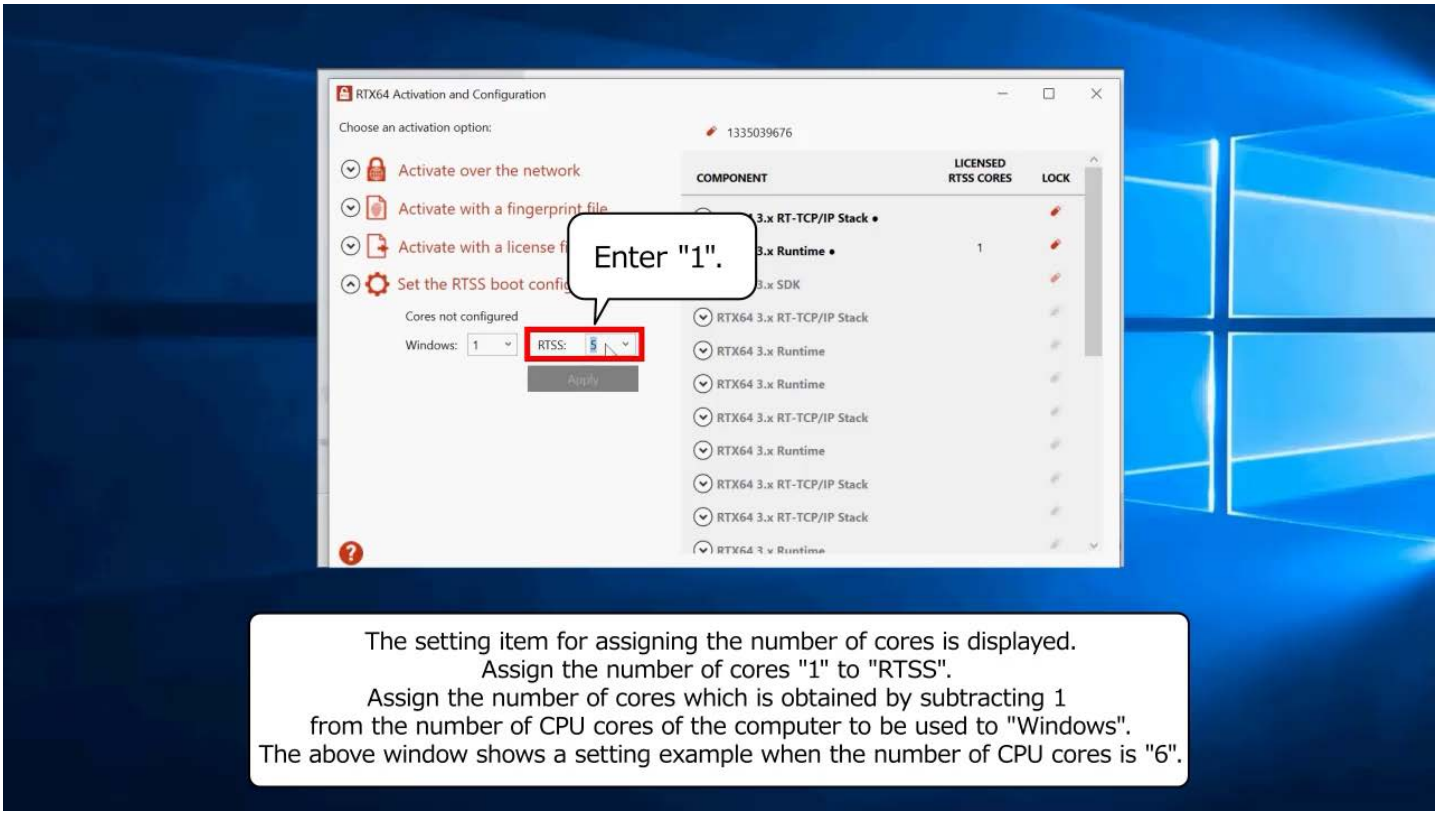


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

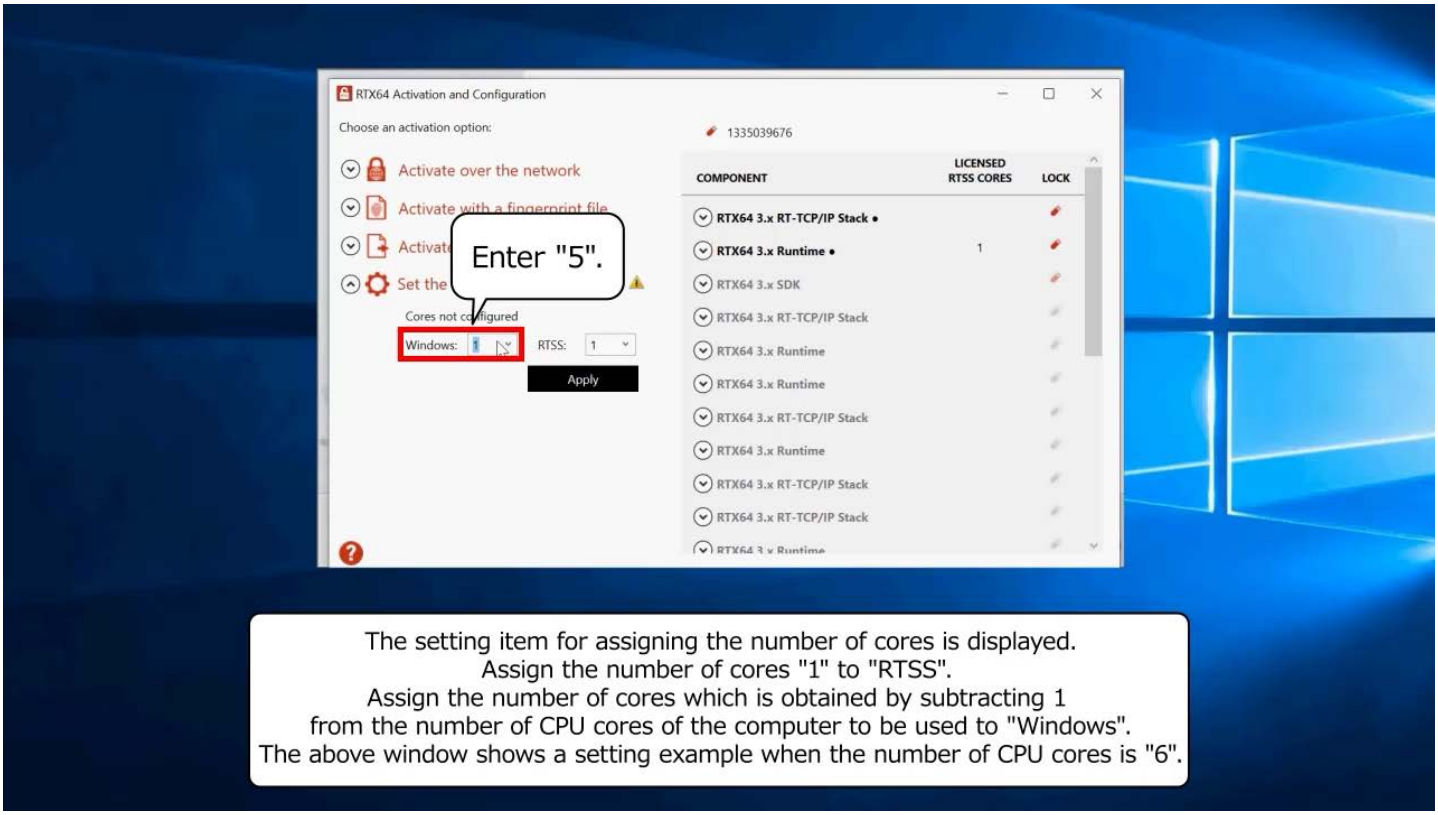


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

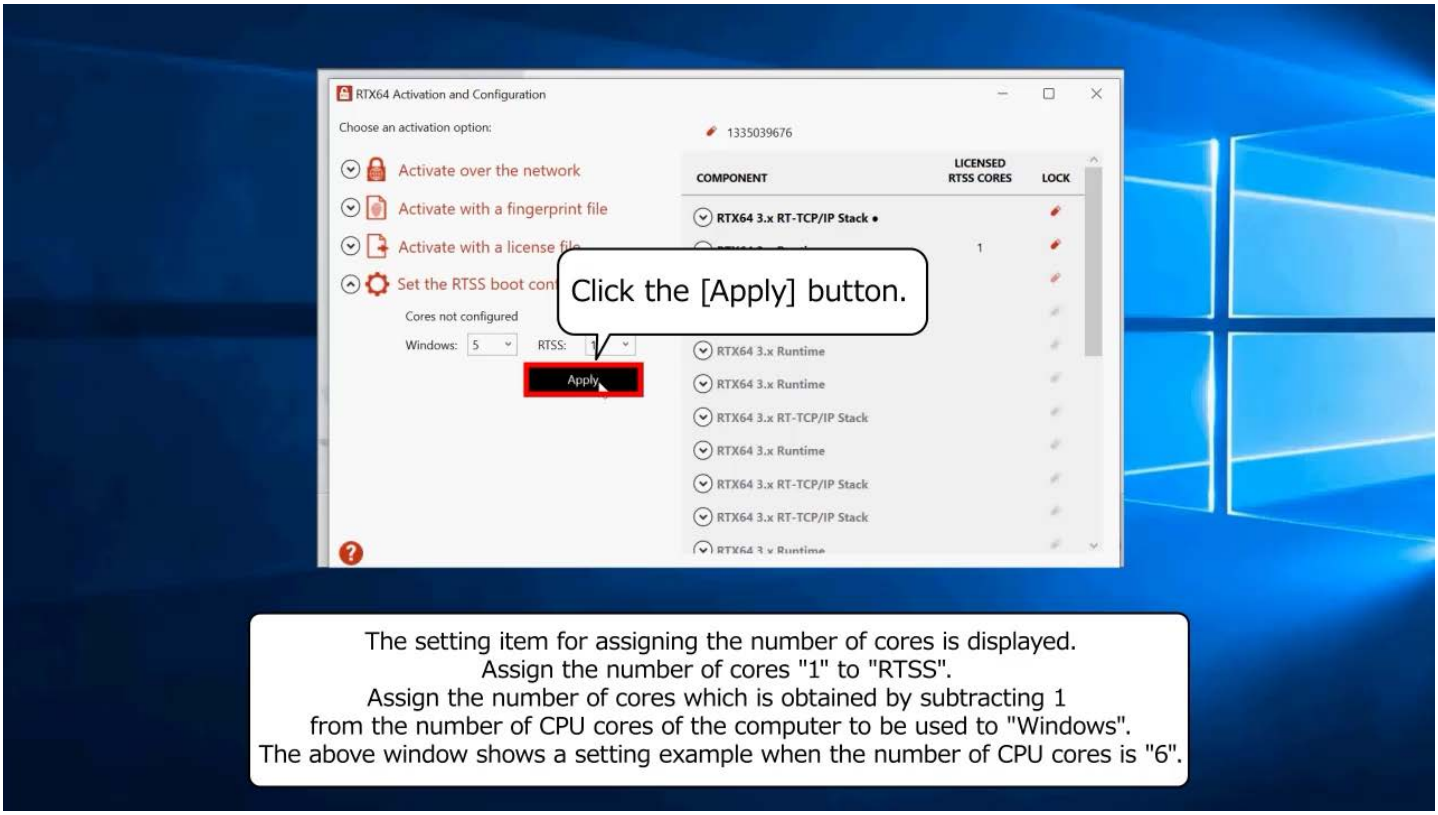


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

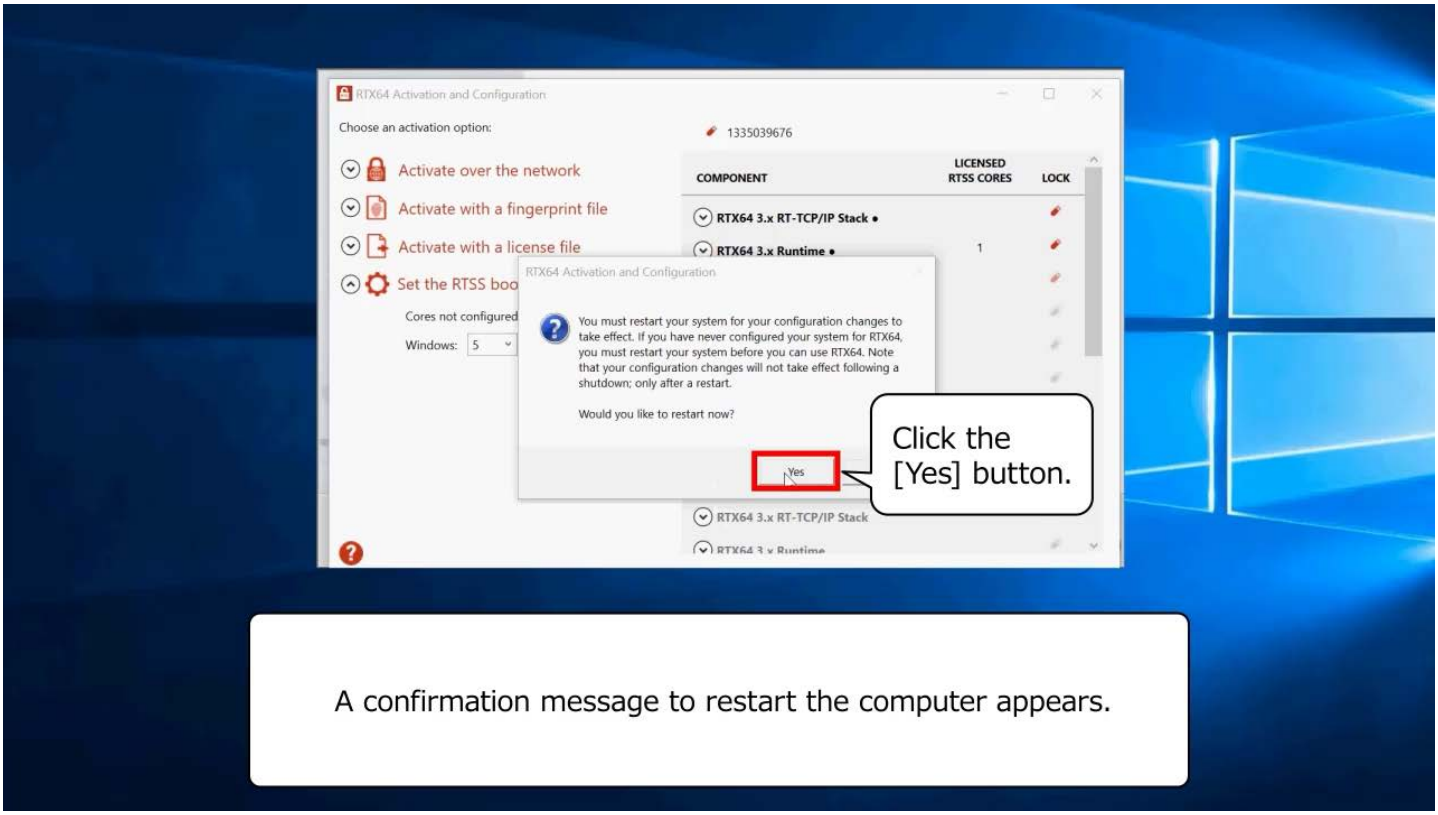


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

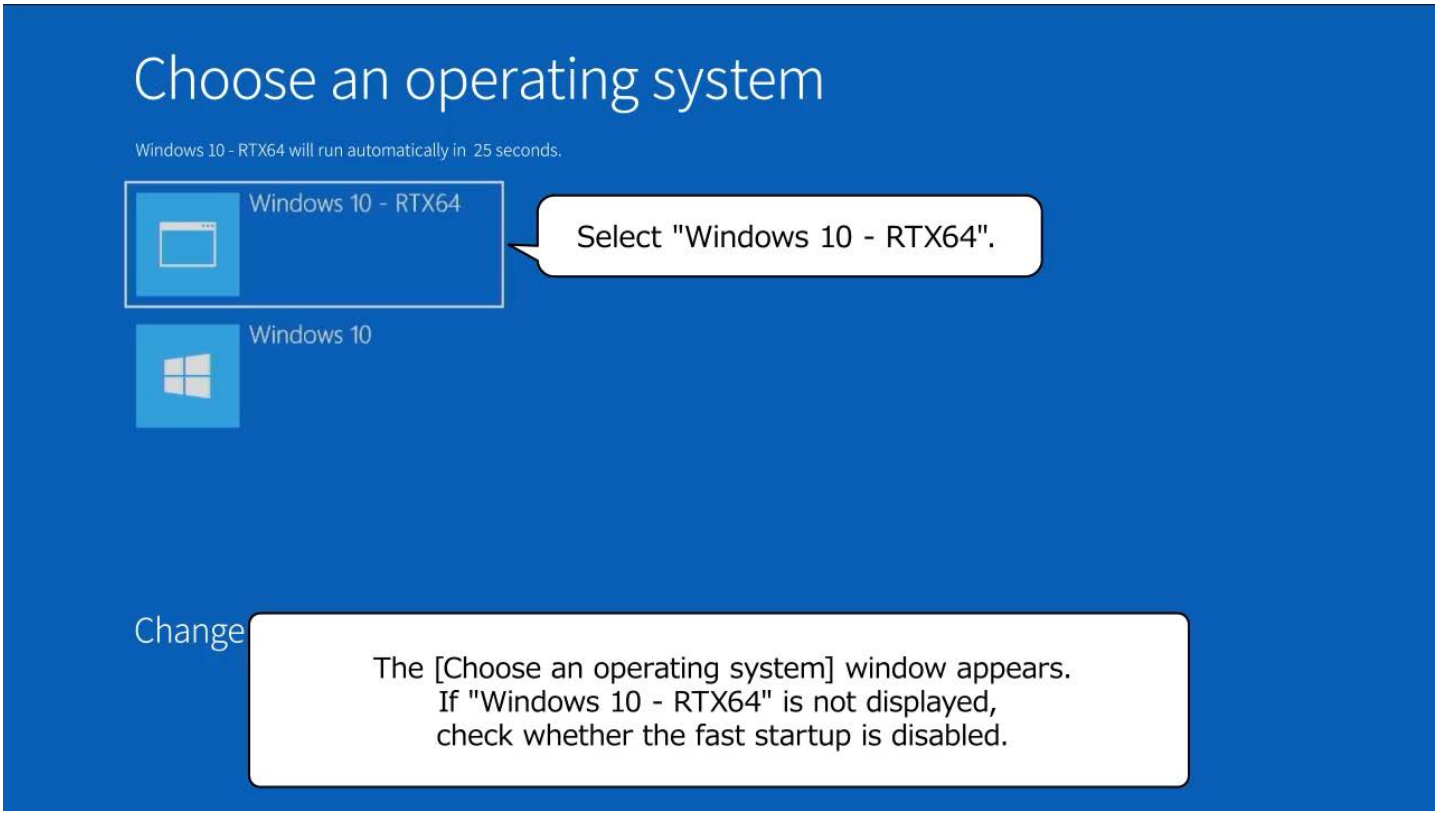


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

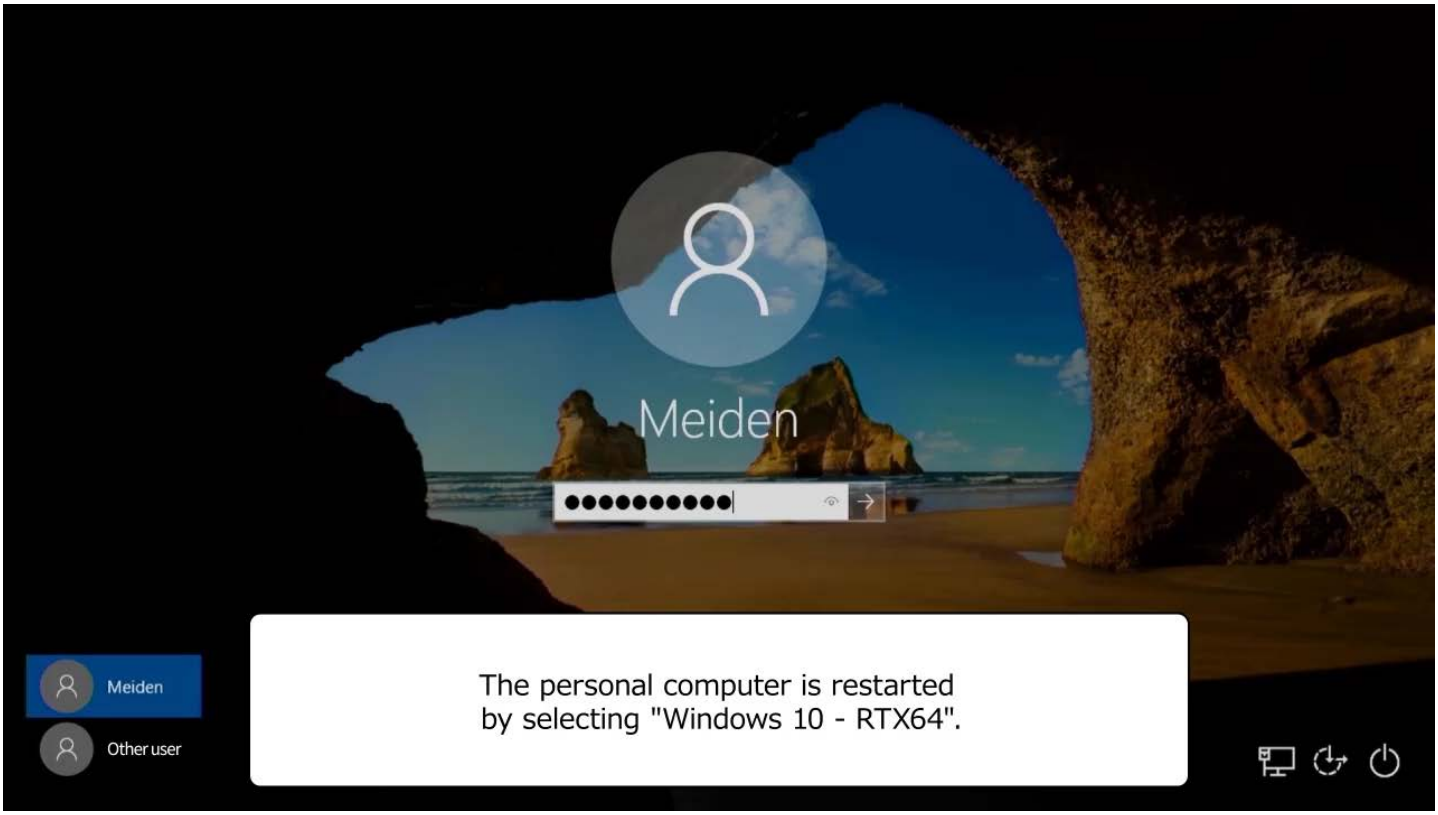


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.

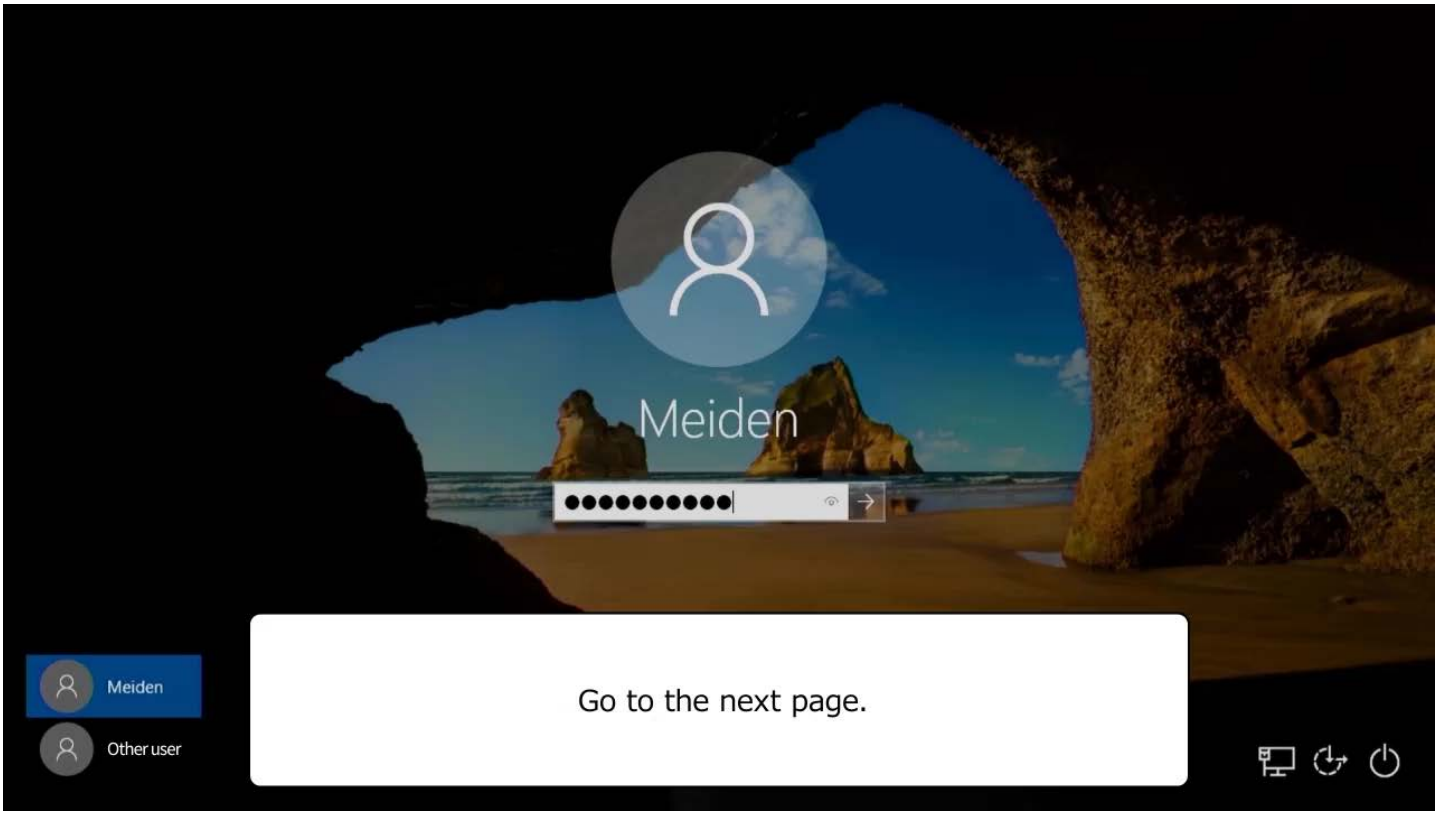


1.3.7 Authenticating the RTX license and assigning cores

Next, authenticate the RTX license and assign cores. In this procedure, the USB key is required. Before the operation, check the following.

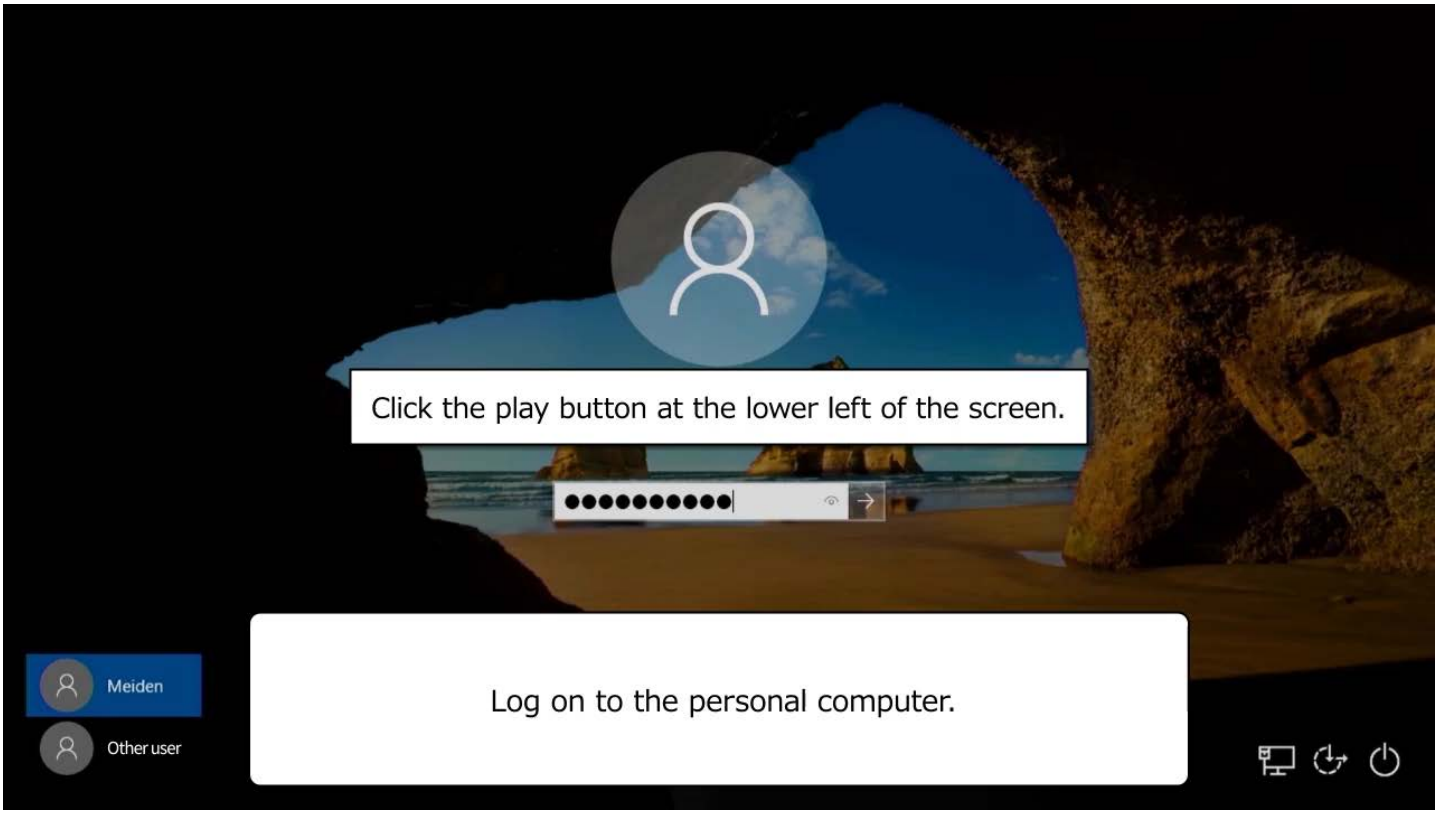
- Number of CPU cores of the personal computer to be used
- The [(6/6)Registration] window is displayed.

For the procedure, see the video below.



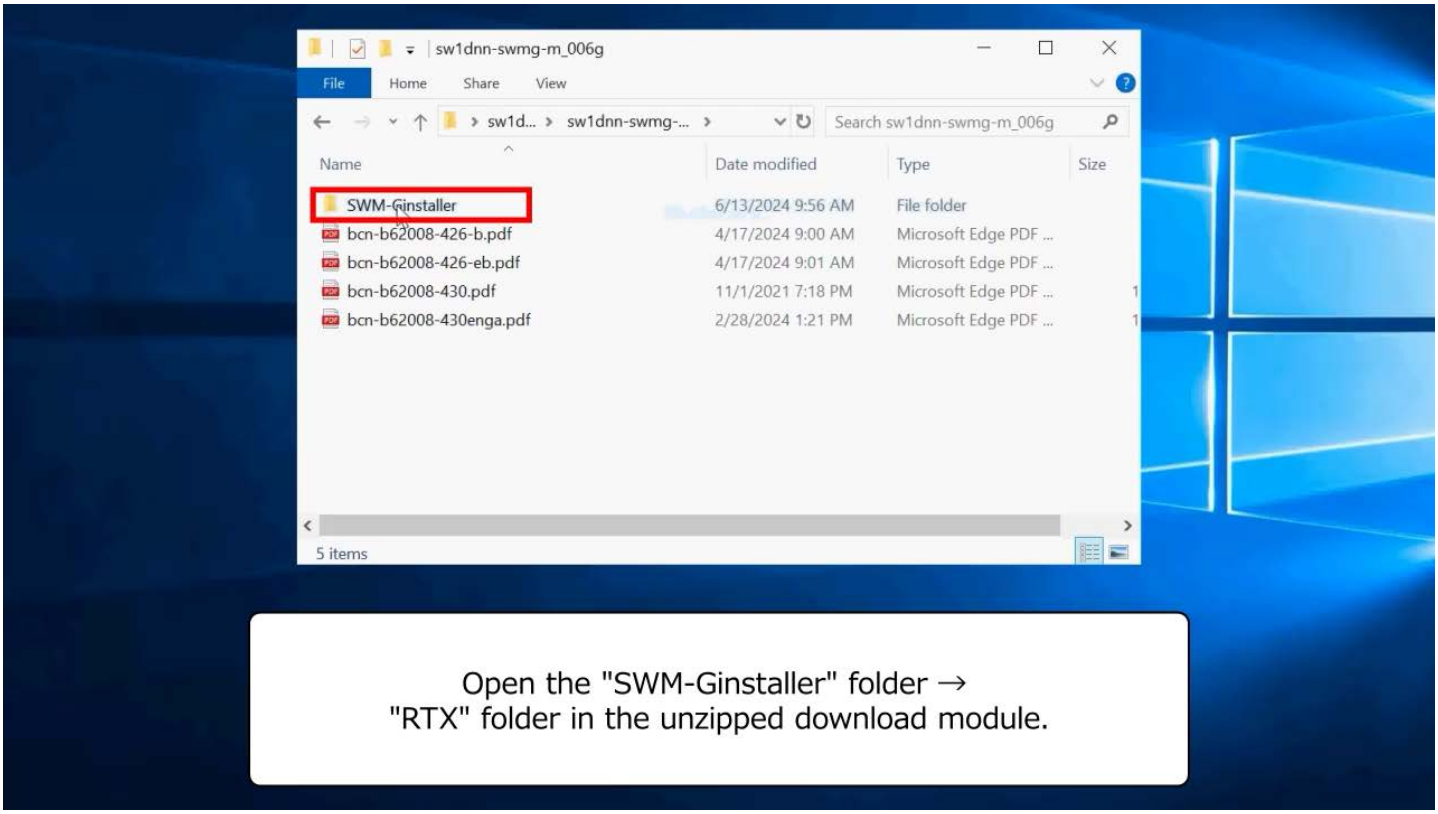
1.3.8 Updating RTX

After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



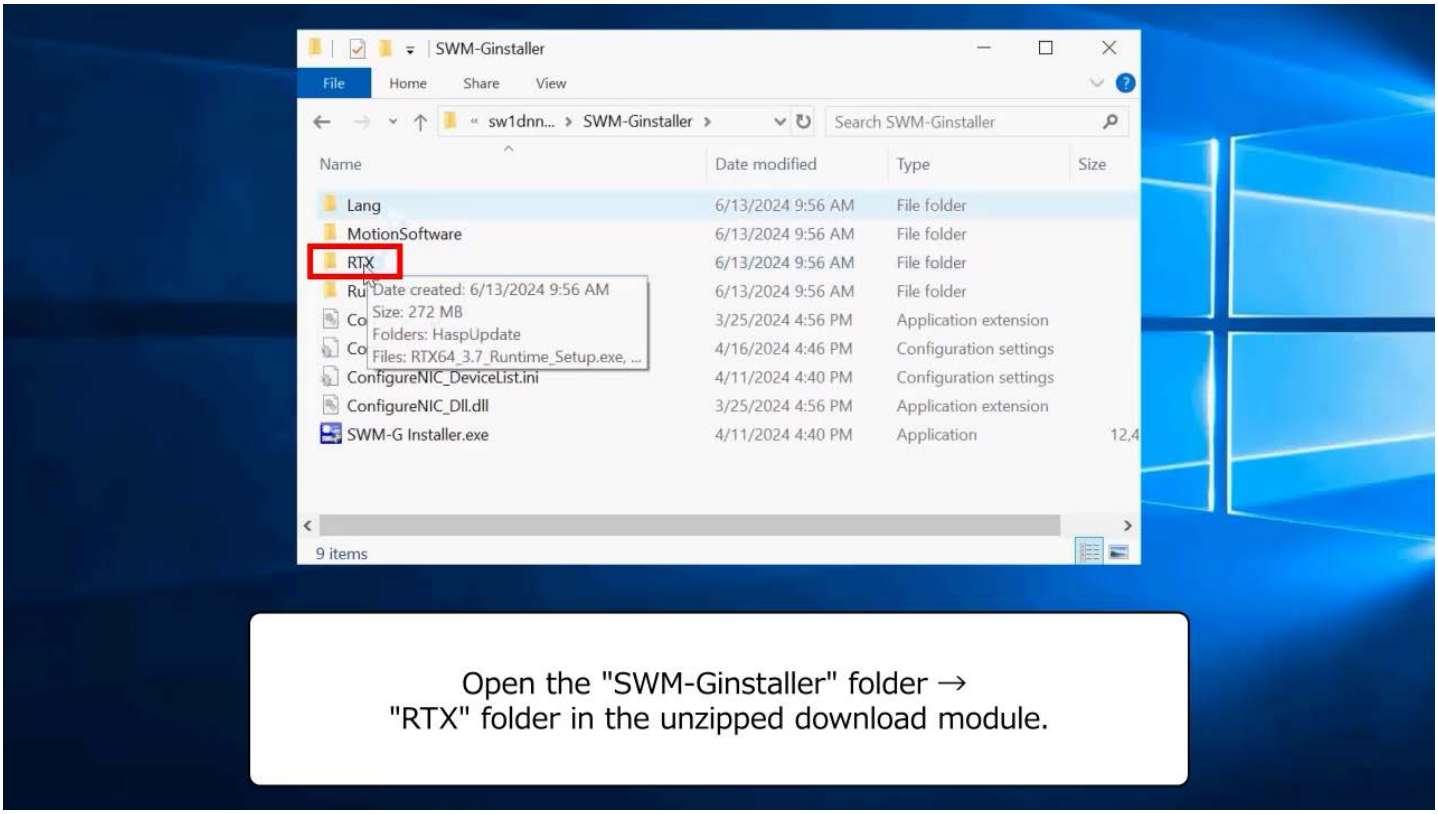
1.3.8 Updating RTX

After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



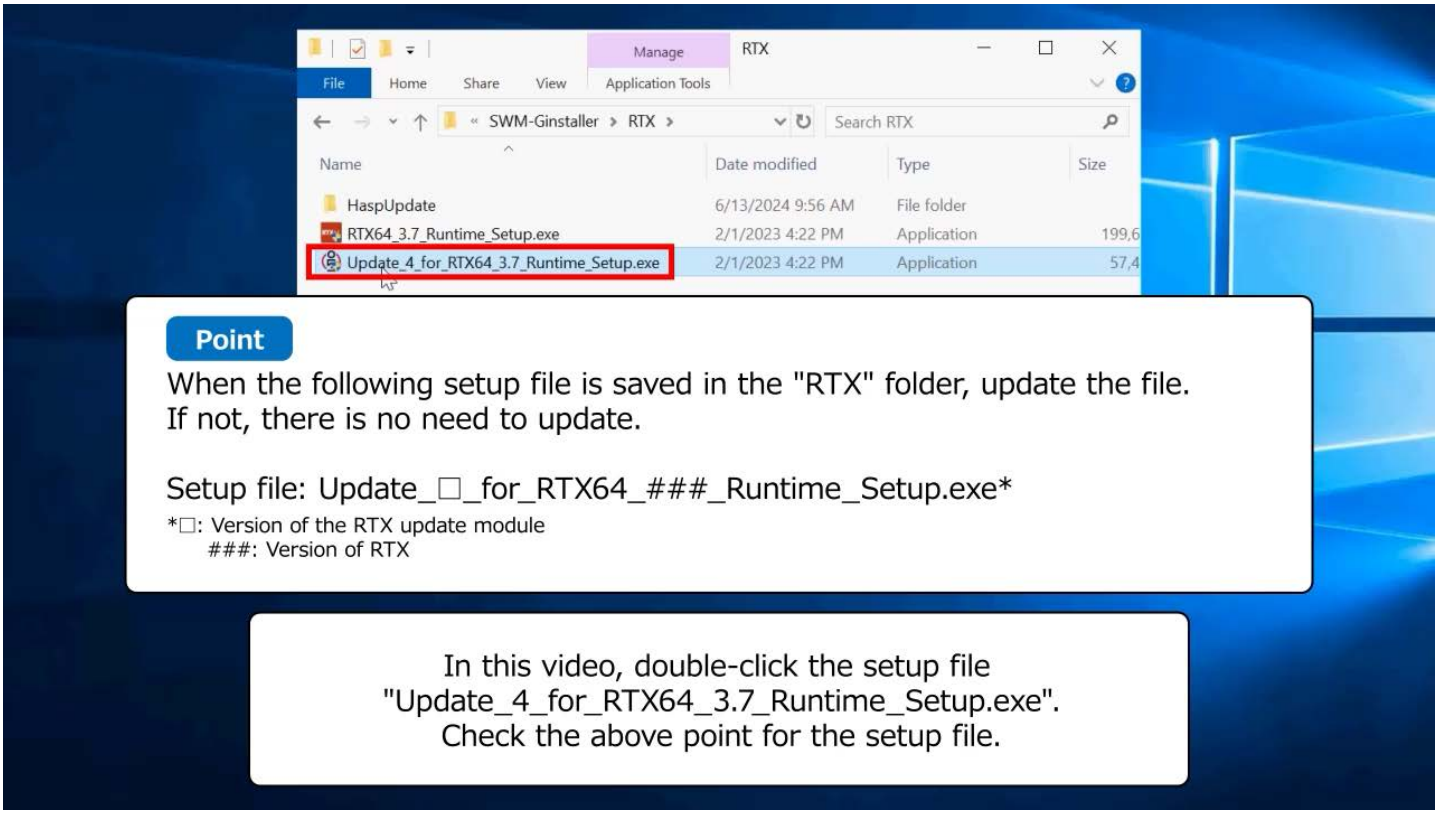
1.3.8 Updating RTX

After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



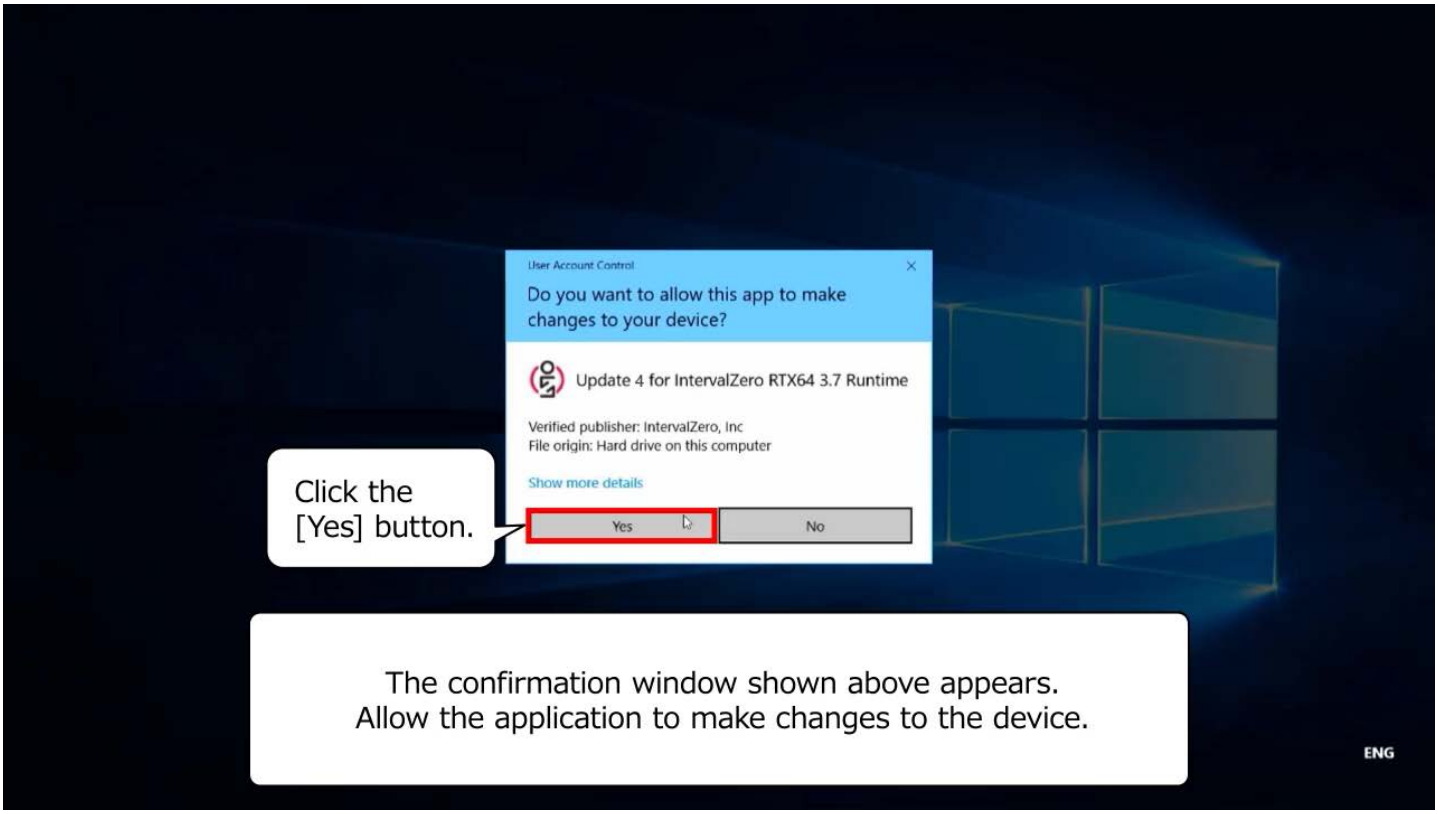
1.3.8 Updating RTX

After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



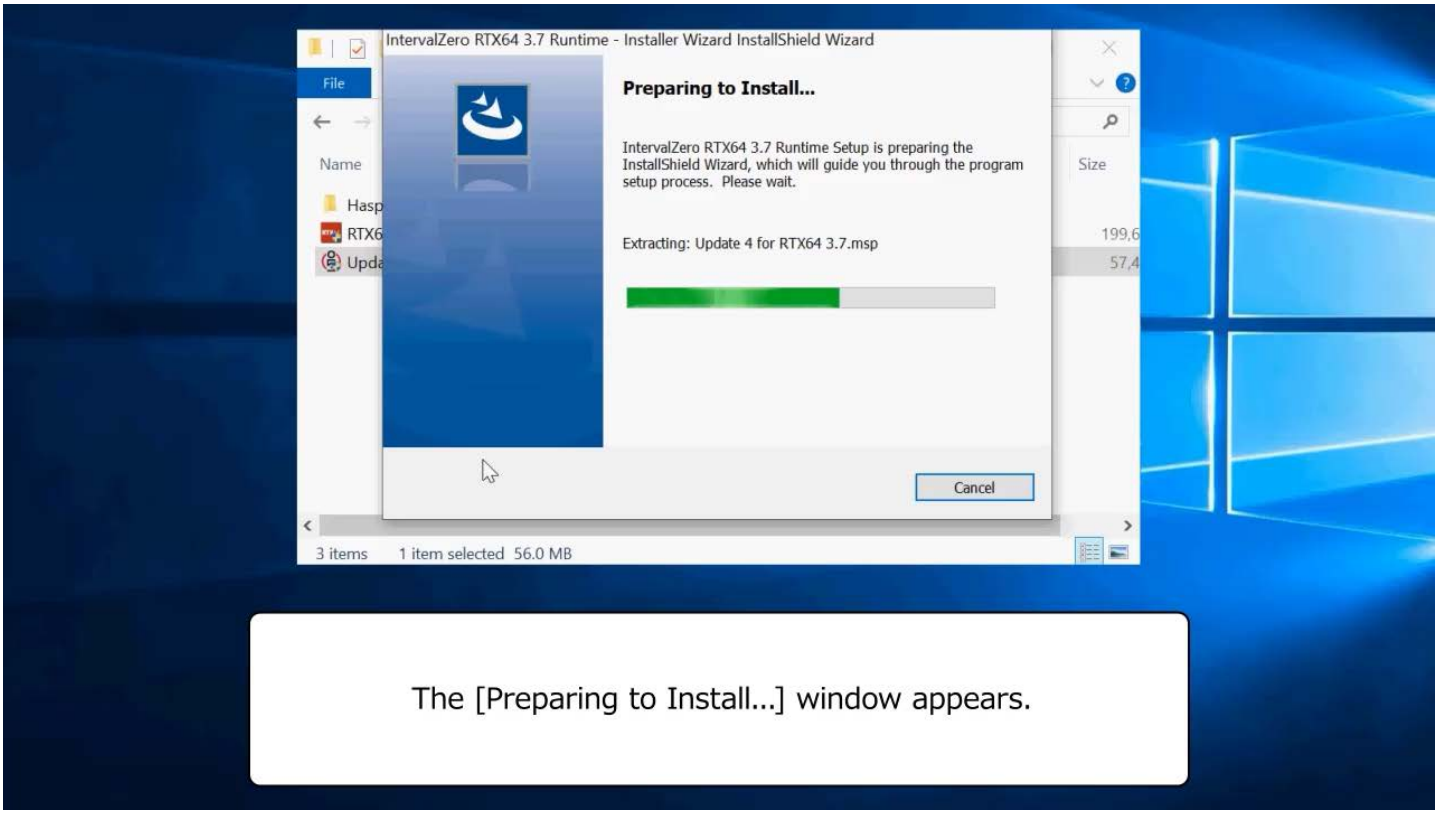
1.3.8 Updating RTX

After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



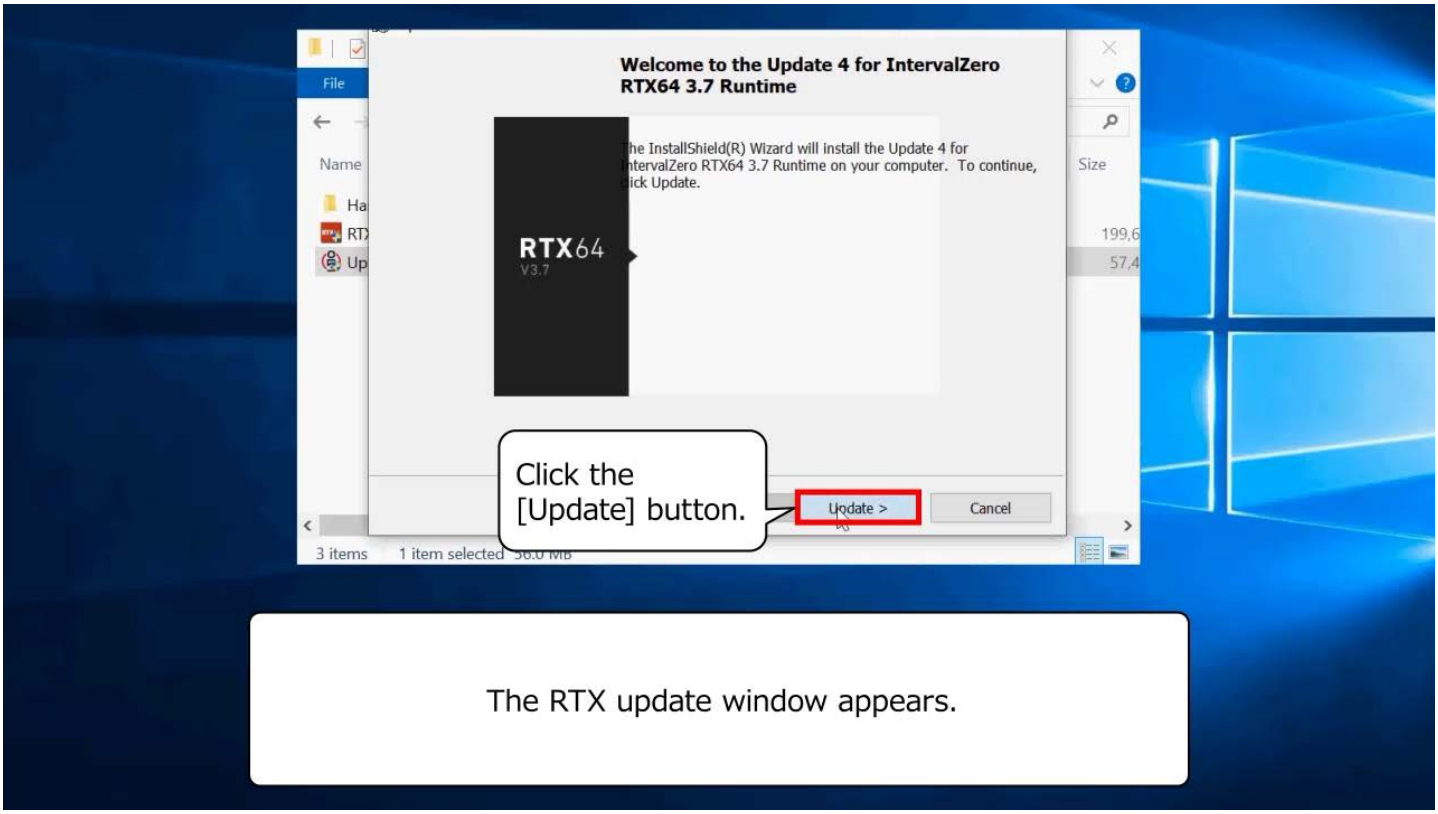
1.3.8 Updating RTX

After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



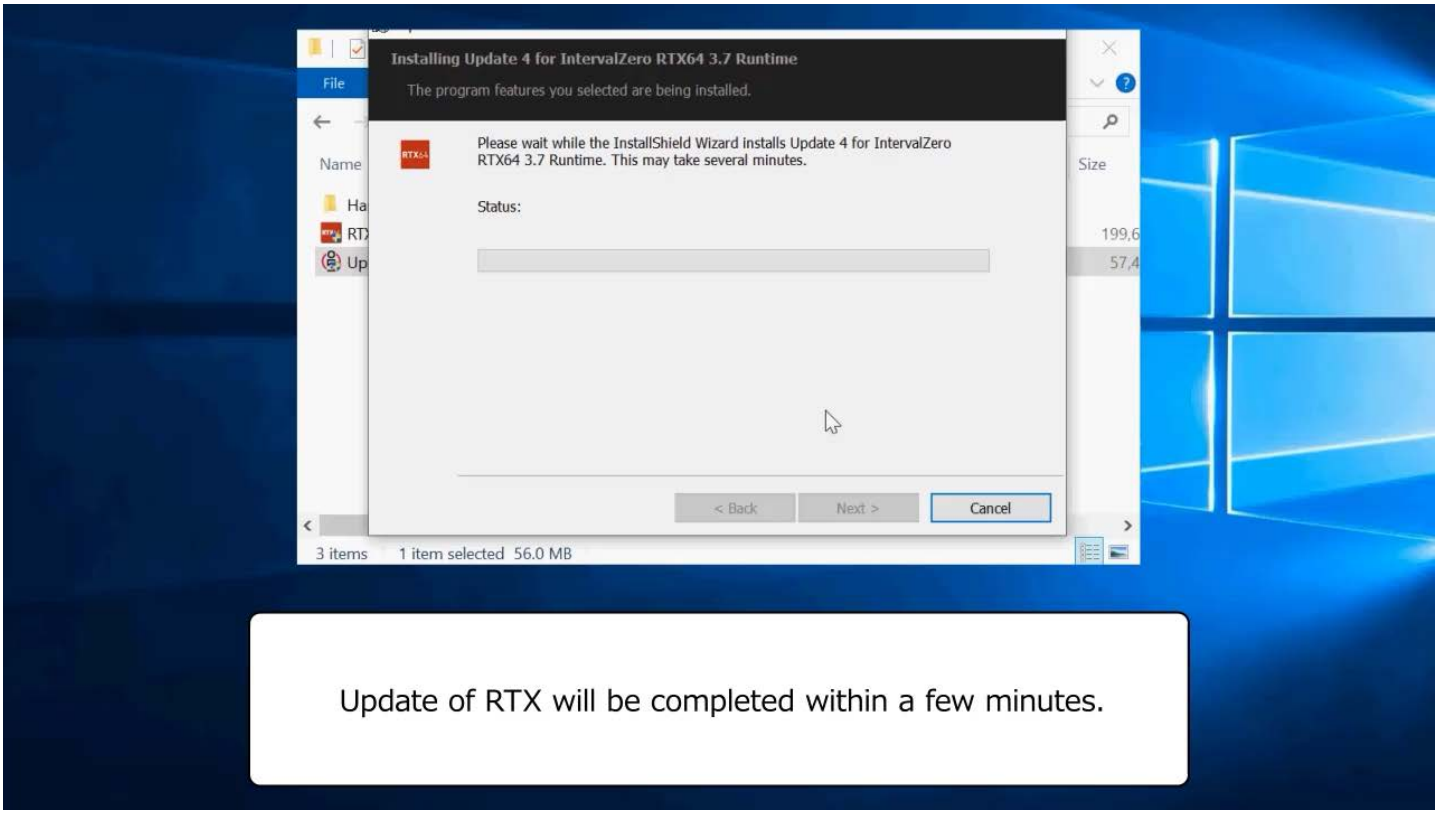
1.3.8 Updating RTX

After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



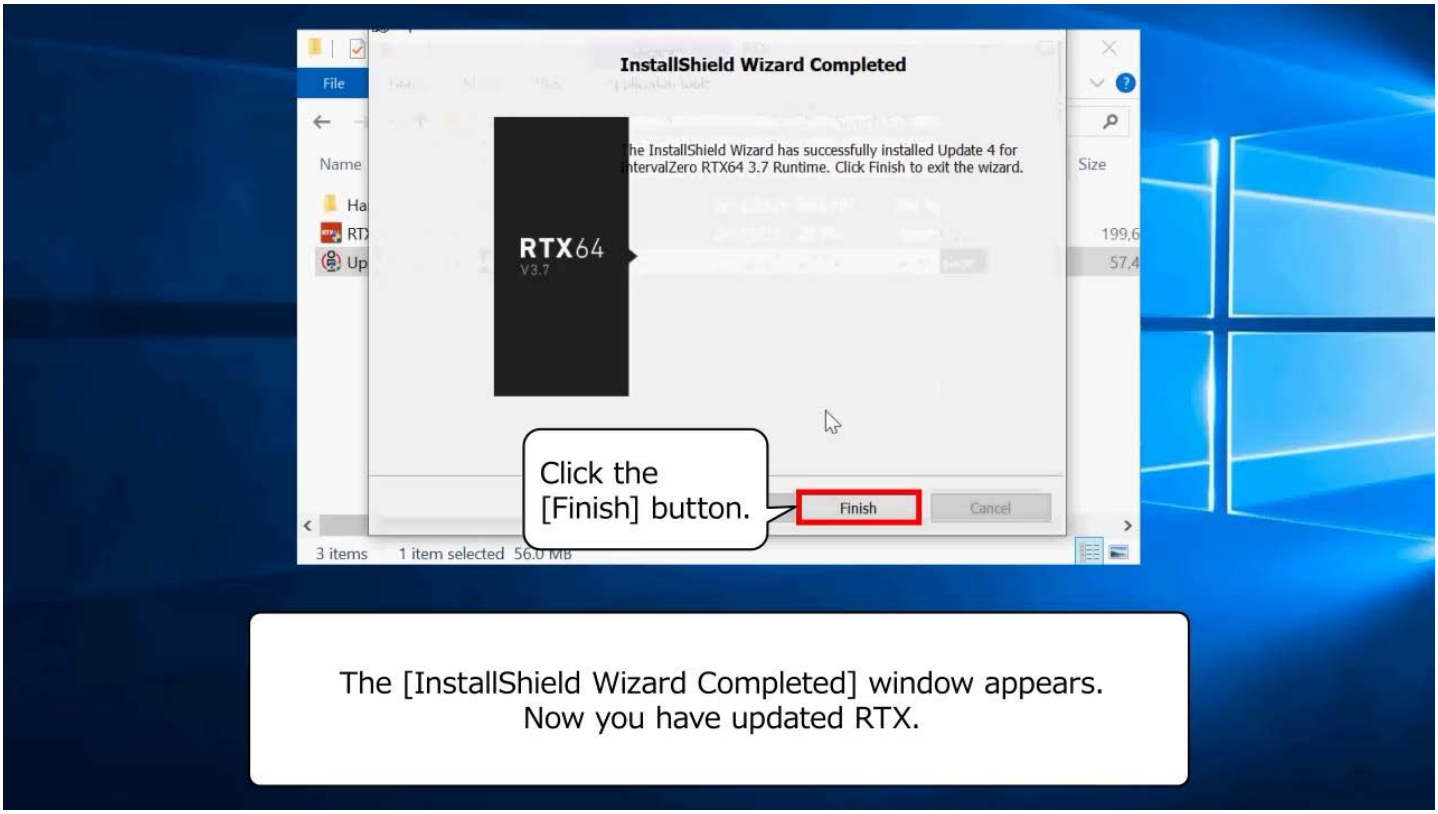
1.3.8 Updating RTX

After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



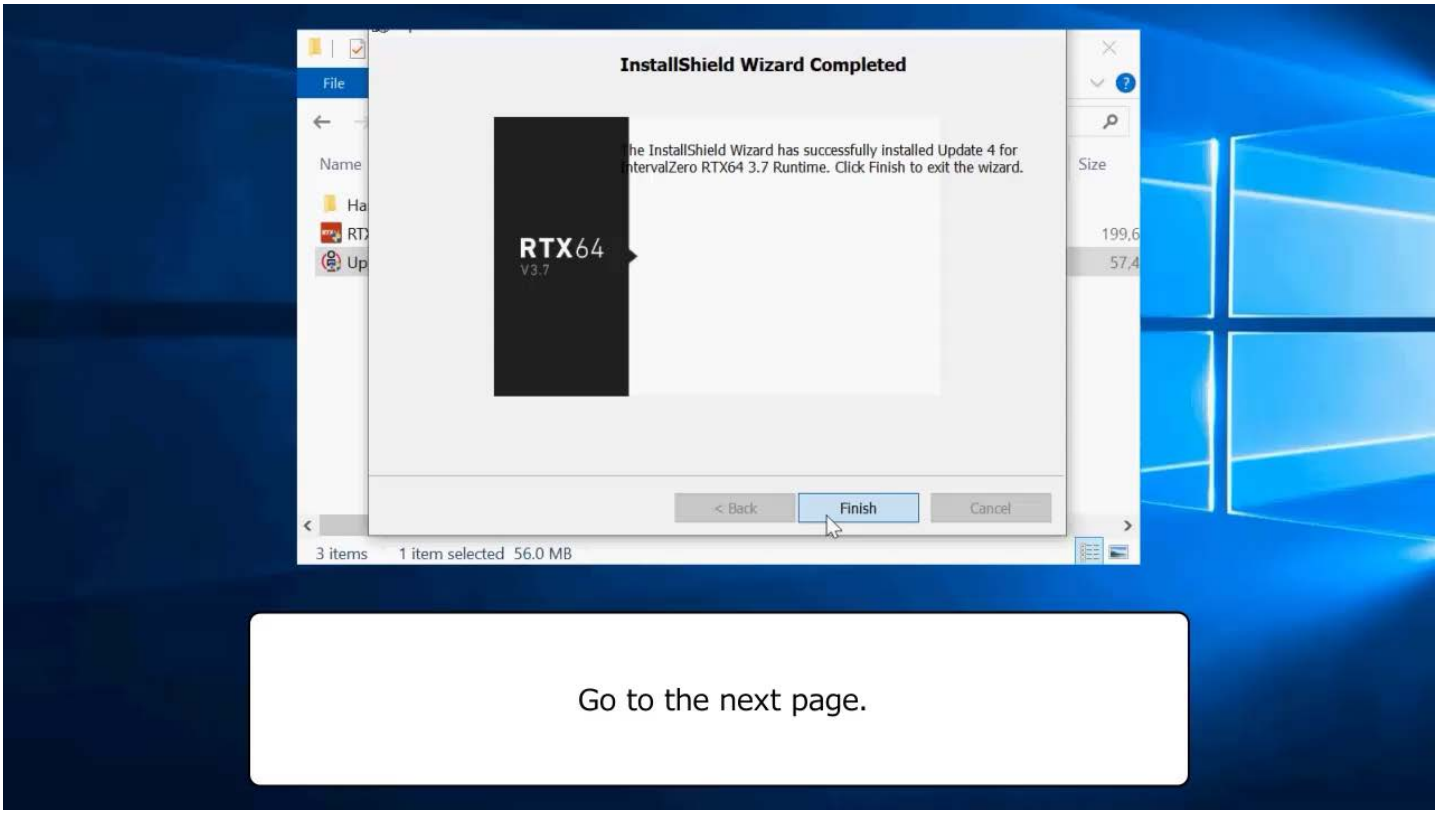
1.3.8 Updating RTX

After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



1.3.8 Updating RTX

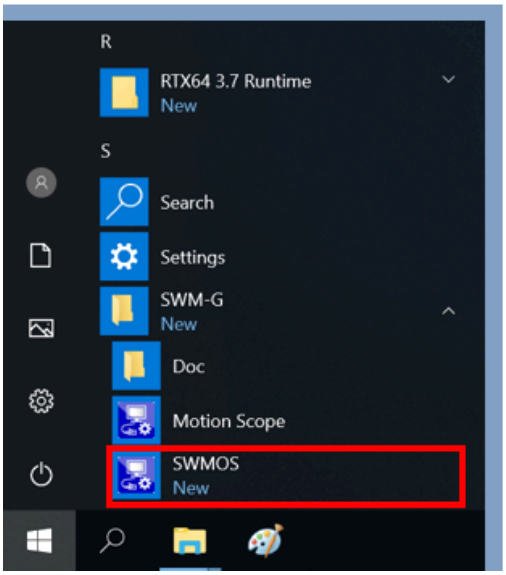
After the restart, log on to the personal computer and update RTX. In this procedure, use the unzipped download module. For the procedure, see the video below.



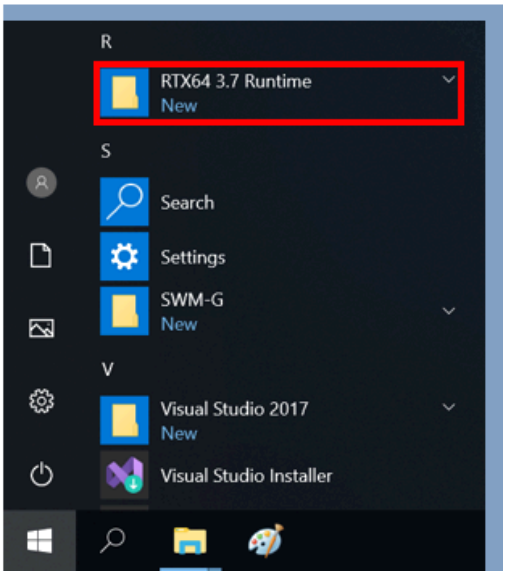
1.3.9 Checking installation

Finally, check that "SWM-G" and "RTX64 ### Runtime"* have been registered in the Windows start menu.
If they are registered, the installation now has been completed.
*###: Version of RTX

[SWM-G]



[RTX64 ### Runtime]*

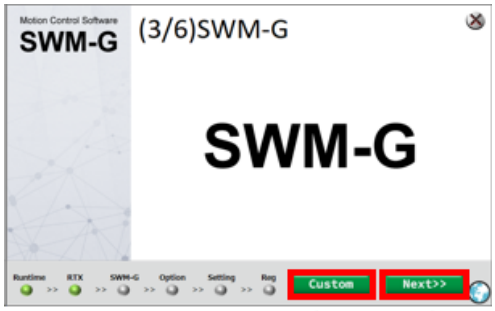


1.3.10 Point at installation

■ When SWM-G related software has already been installed

When the installer is started, a step window for uninstalled software appears. Follow the installation procedure according to cases a and b below.

- The window on the right indicates that only Runtime and RTX have been installed.
- When all the processes up to the RTX setting have been completed, the installation item selection window appears at the startup of the installer.

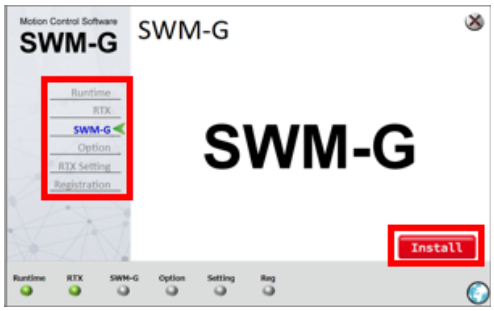


a. Start installation from the displayed step window.

1. Click the [Next»] button.
   - Installation starts.

b. Select the item to be installed.

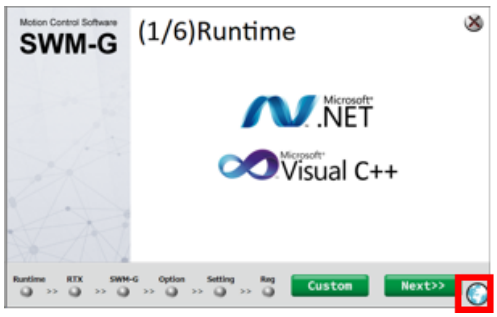
1. Click the [Custom] button.
   - The installation item selection window appears.
2. Select the software to be installed from the menu on the left and click the [Install] button.
   - Installation starts.



■ Switching the display language

The display language of the installer can be switched by the following procedure.

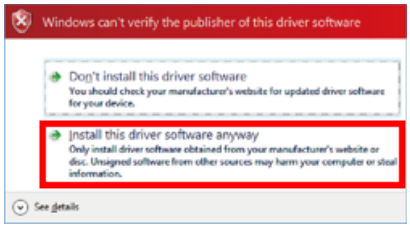
1. Click (1) at the lower right of the window.
   - The [Language] window appears.



2. Select the language to be used and click the [OK] button.
   - The display language is switched.

■ When "Driver Signature Enforcement" is enabled in Windows

At the setting of RTX, when "Driver Signature Enforcement" is enabled in Windows, the warning message shown on the right may be displayed.
At this time, click "Install this driver software anyway".



For the procedure for disabling the driver signature enforcement, refer to the following manual.

Motion Control Software SWM-G User's Manual (Installation)

1.3.11 Troubleshooting

This section describes the errors that may occur during installation, their causes, and corrective actions.

Description	Cause	Corrective action
Installation fails.	The free space on the hard disk is insufficient.	Increase the free space on the hard disk and then perform installation again.
The installer stops during installation. Or, the installer suddenly exits during installation.		
Authentication of the USB key fails.	License authentication of Windows has not been completed.	Authenticate the USB key again after the license authentication of Windows.
	No USB key is inserted into the personal computer.	Check that a USB key is inserted into the personal computer. If a USB key has already been inserted, remove the USB key from the personal computer and insert it again.
The license authentication of SWM-G fails.	The license code is incorrect.	Check the license certificate and enter the license code again.

1.4 Summary of This Chapter

In this chapter, you have learned:

- Installation Procedure and Point
- Preparation for Installation
- Installation

Point

Installation Procedure and Point	To install SWM-G, perform the following three steps: downloading the download module, preparation for installation, and installation.
Preparation for Installation	Before installing SWM-G, perform the following: BIOS setting, disabling the fast startup, performing Windows Update, disabling Windows Update, and disabling Windows functions that are not supported by RTX.
Installation	To install SWM-G, perform the following five steps: installing each software (Runtime, RTX, and SWM-G), setting RTX, registering the SWM-G license, authenticating the RTX license and assigning cores, and updating RTX.

Chapter 2 Basic Operation of the Engineering Tool (SWMOS)

This chapter describes the basic settings of the engineering tool (SWMOS*) included in Motion Control Software SWM-G.
*SWMOS: SWM-G Operating Station

2.1 System Configuration
2.2 Platform Selection
2.3 Master Setting
2.4 Remote Station Setting
2.5 Parameter Setting
2.6 Single-Axis Control
2.7 Multi-Axis Control
2.8 Summary of This Chapter

2.1 System Configuration

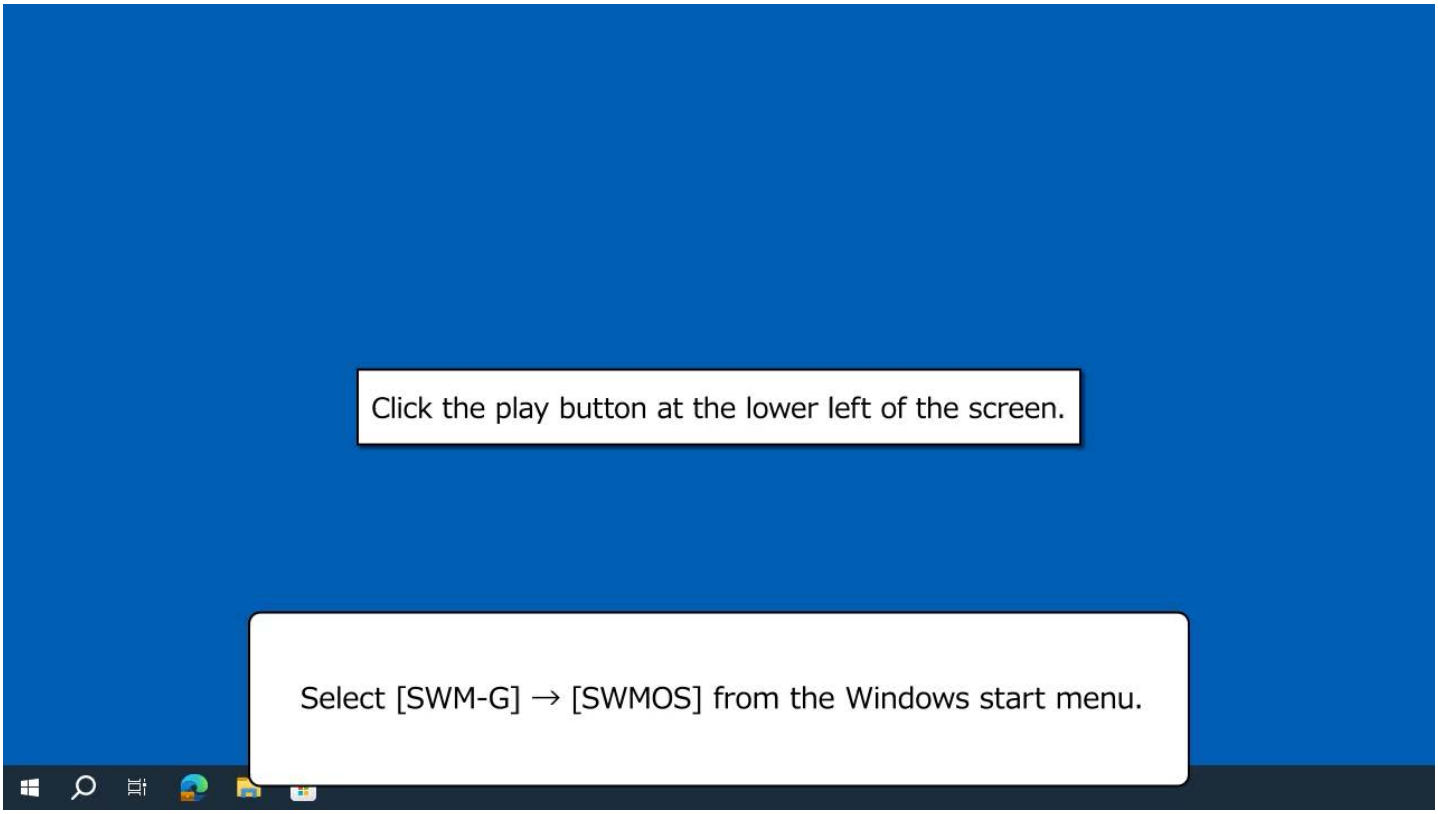
In this chapter, the configuration of the target system is as follows.
As this chapter focuses on the basic settings of SWMOS, the wiring and connection of the components and the rotary switch settings of the servo amplifier are explained in the following chapters.
The IP address of each device is set to the initial value.

Target device	IP address
Personal computer (Master)	192.168.3.253
MR-J5-G	192.168.3.1
MR-J5W3-G	192.168.3.2

[Point]
When using a multi-axis servo amplifier, the setting for disabling the axis cannot be used.

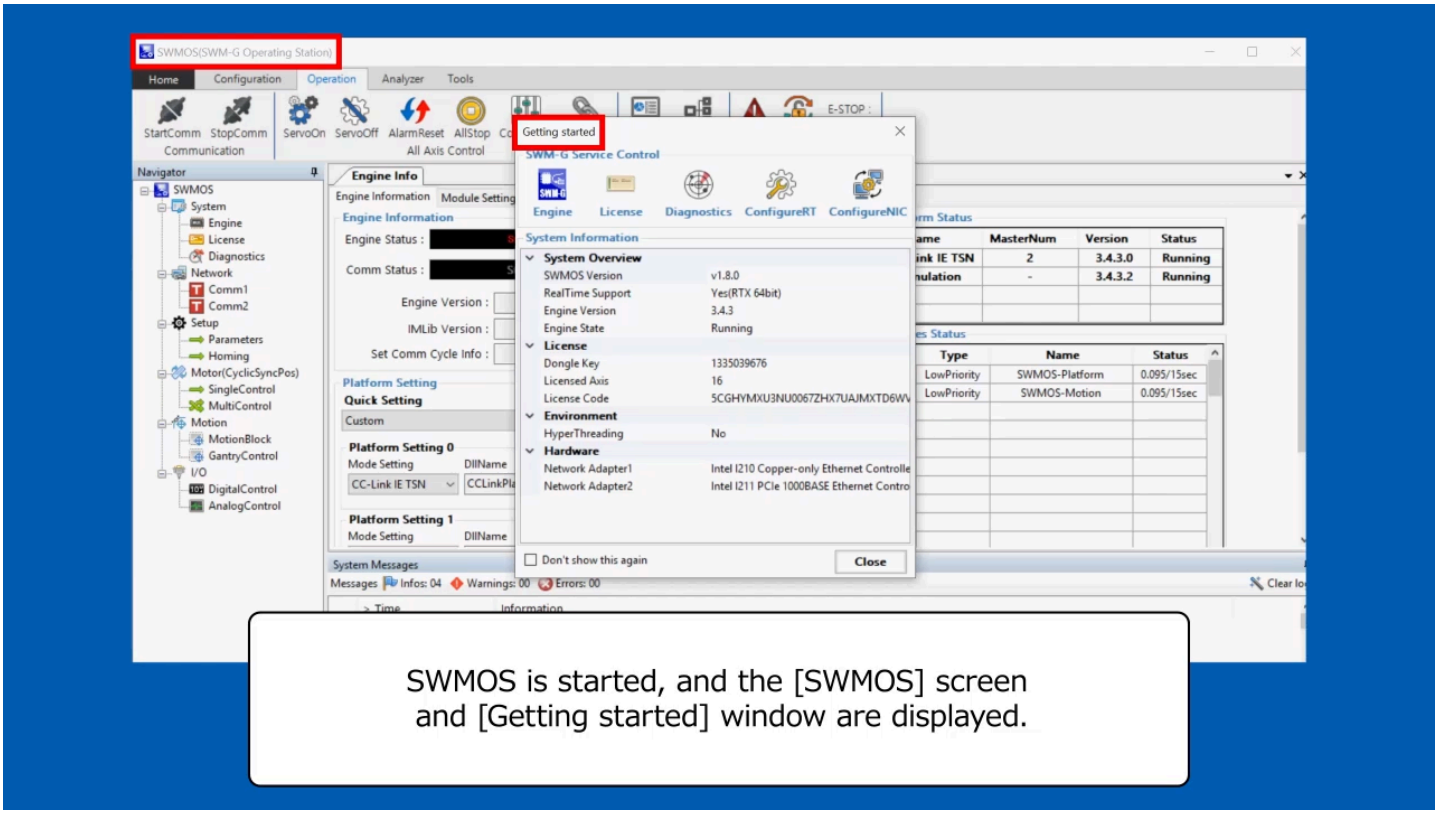
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



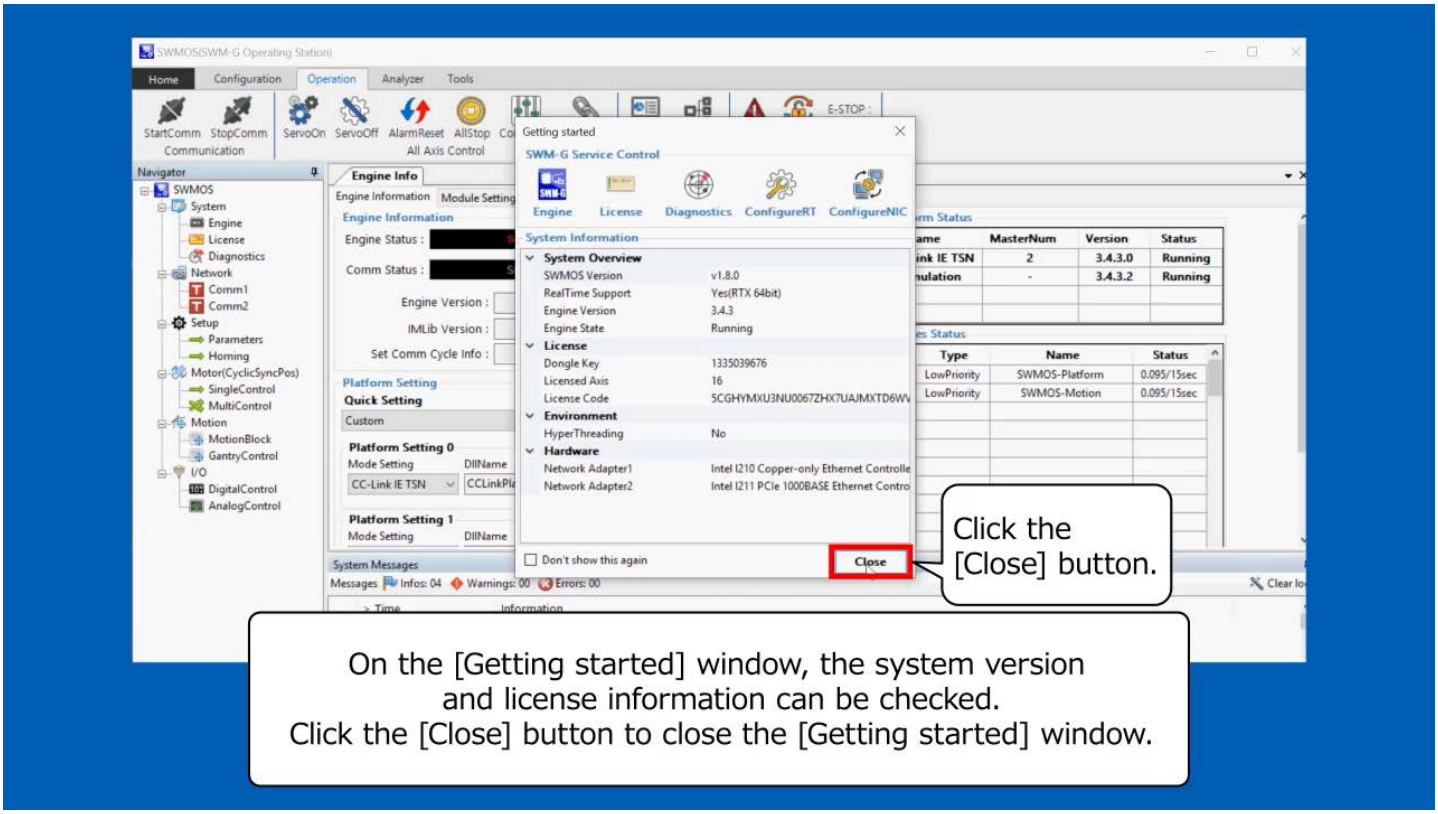
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



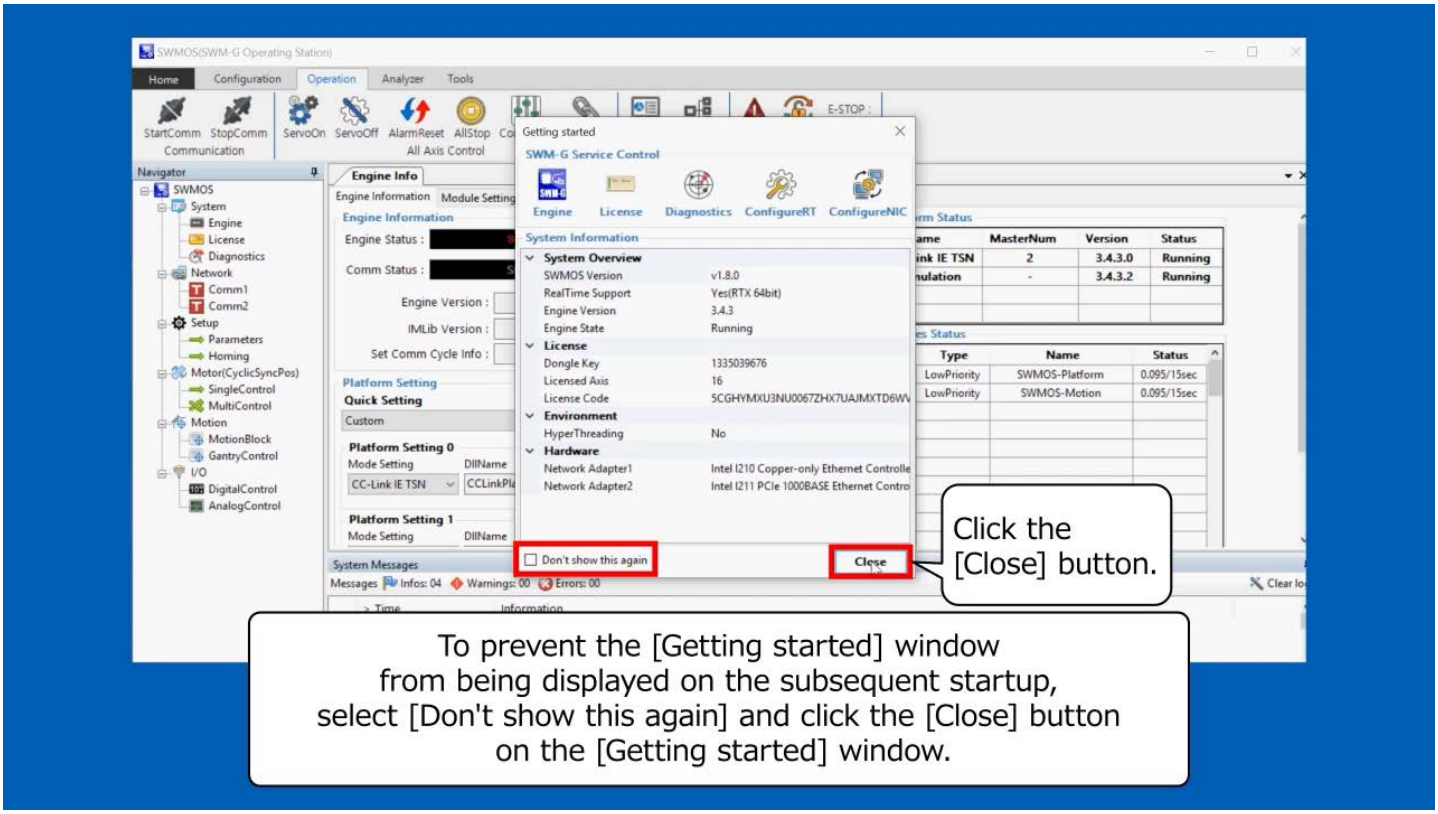
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



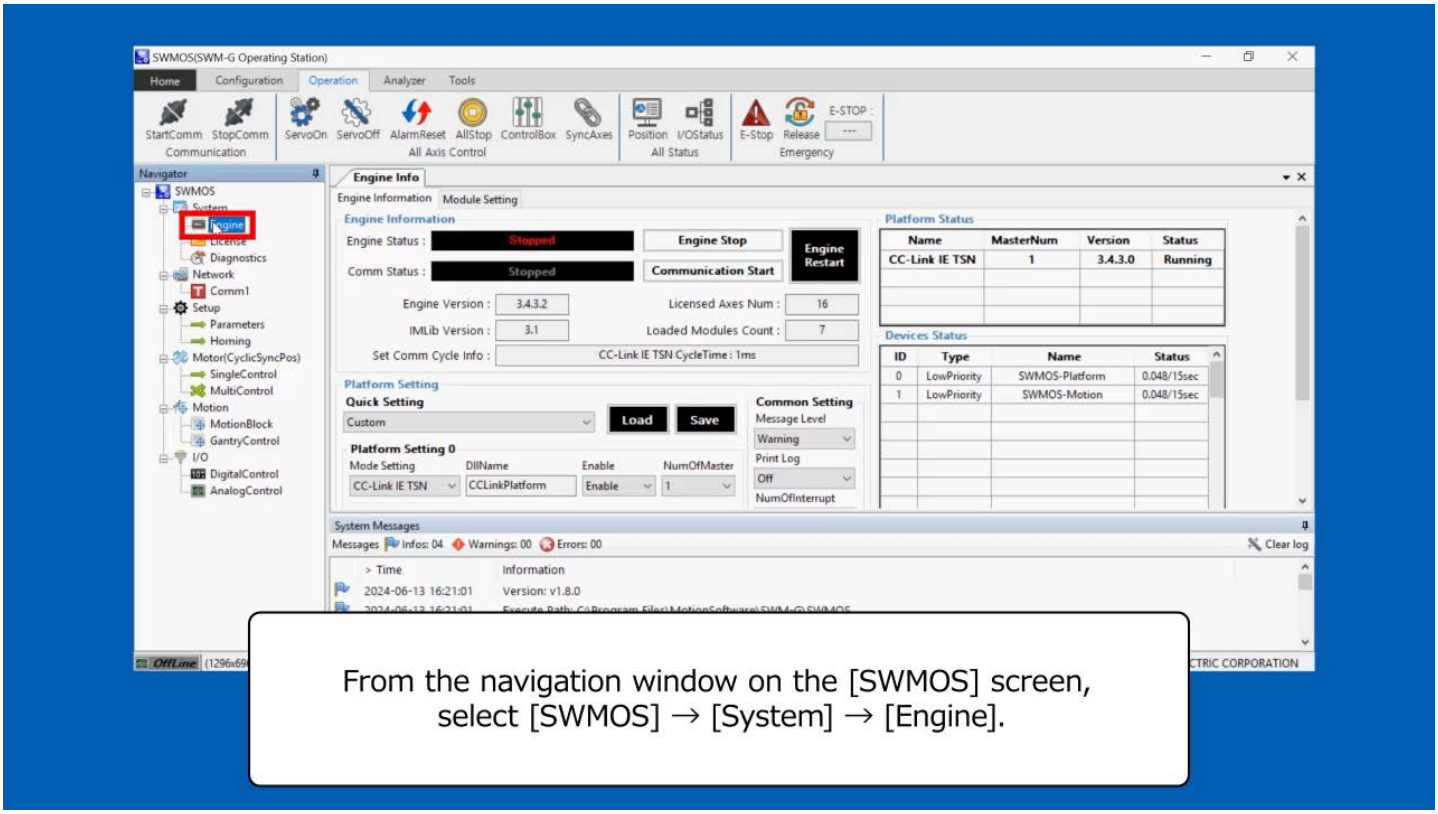
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



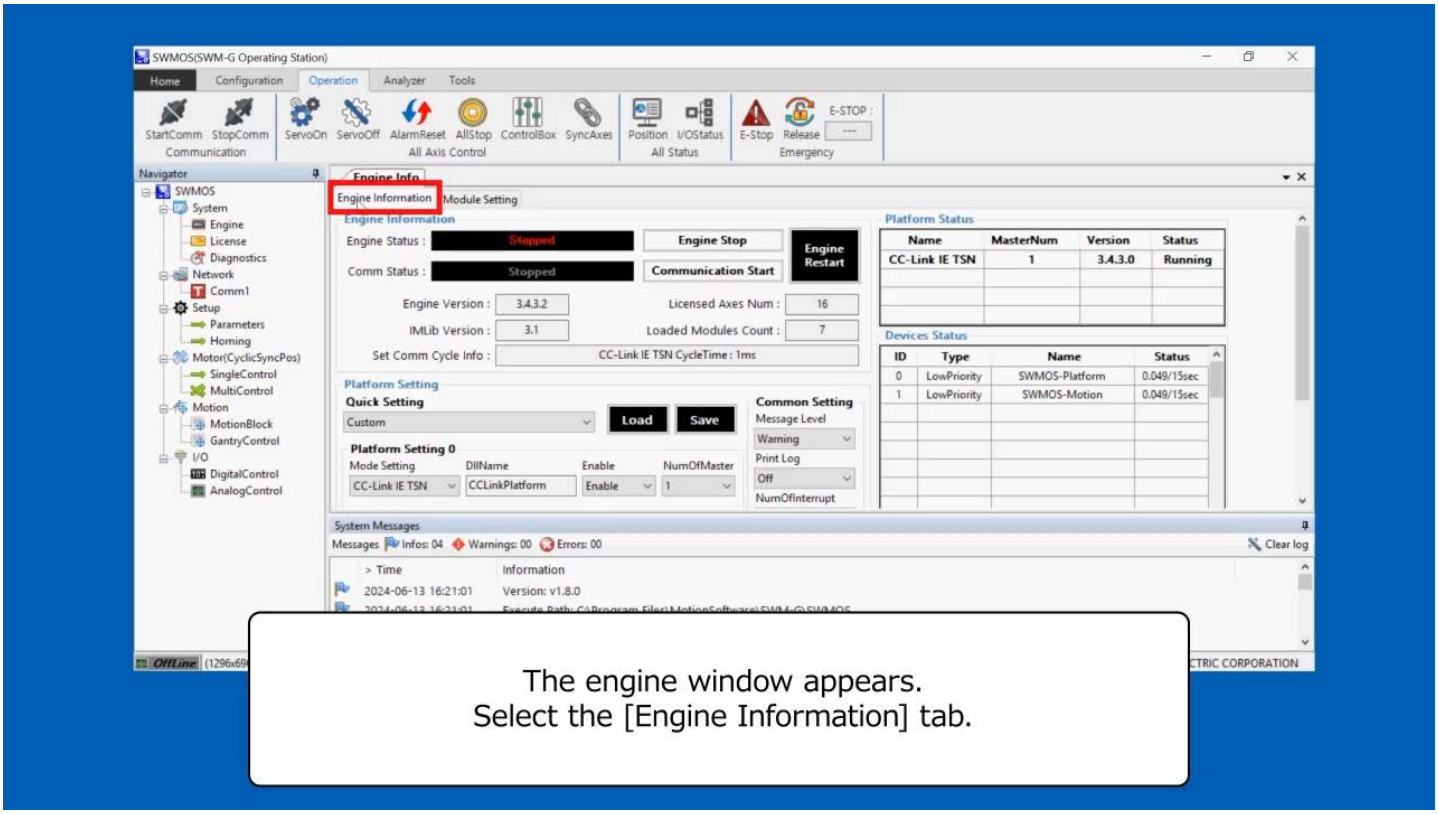
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



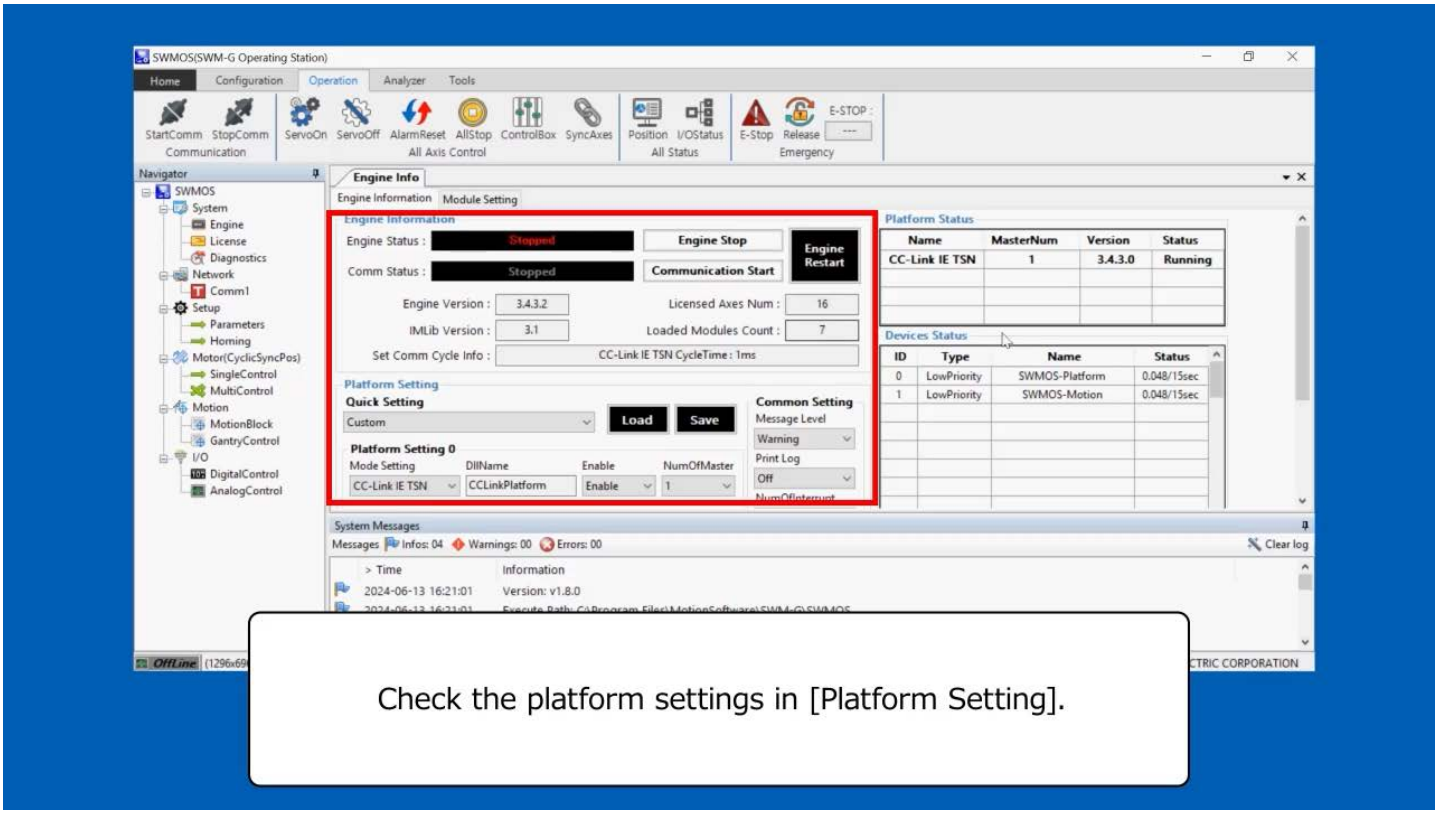
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



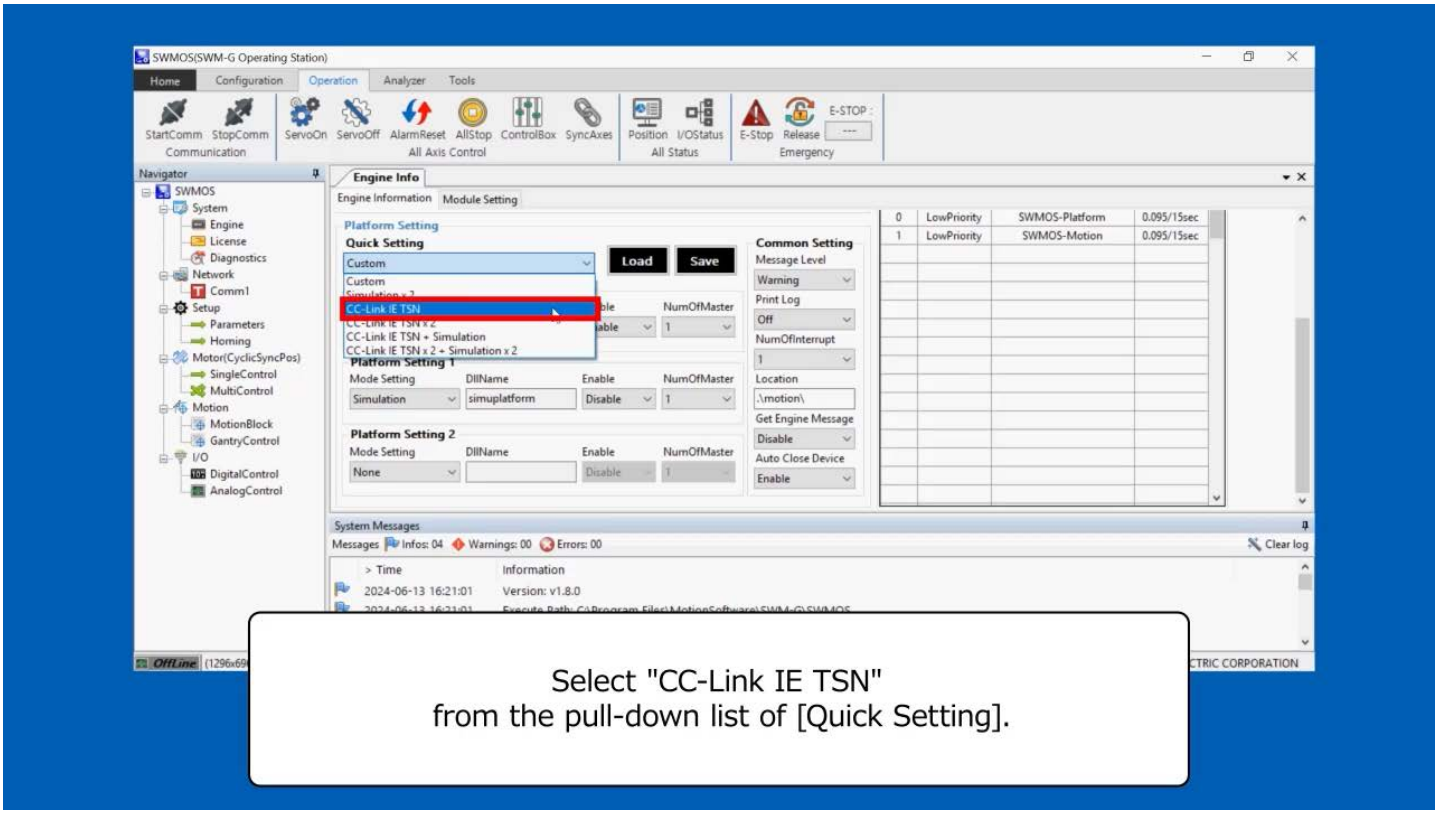
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



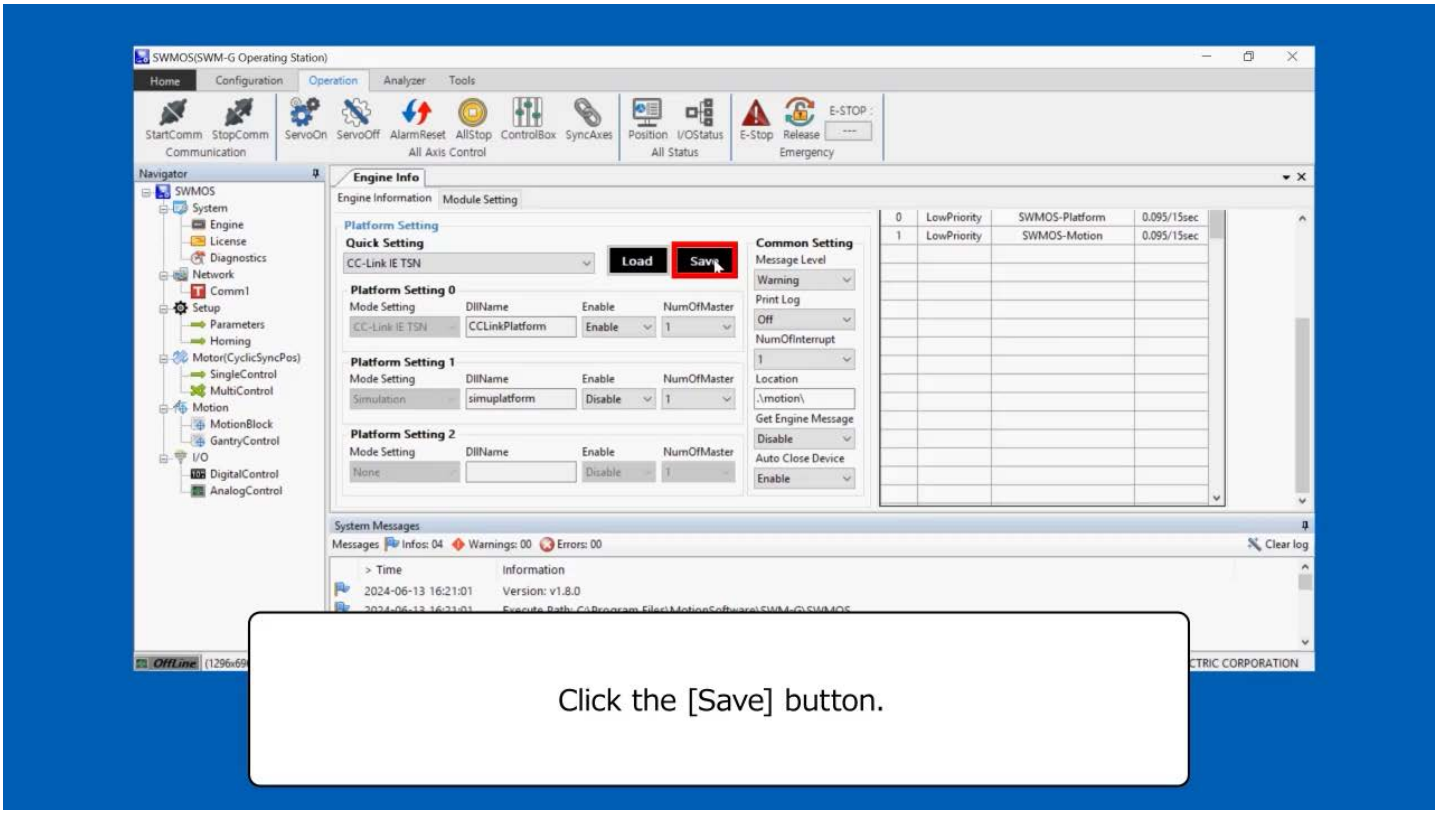
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



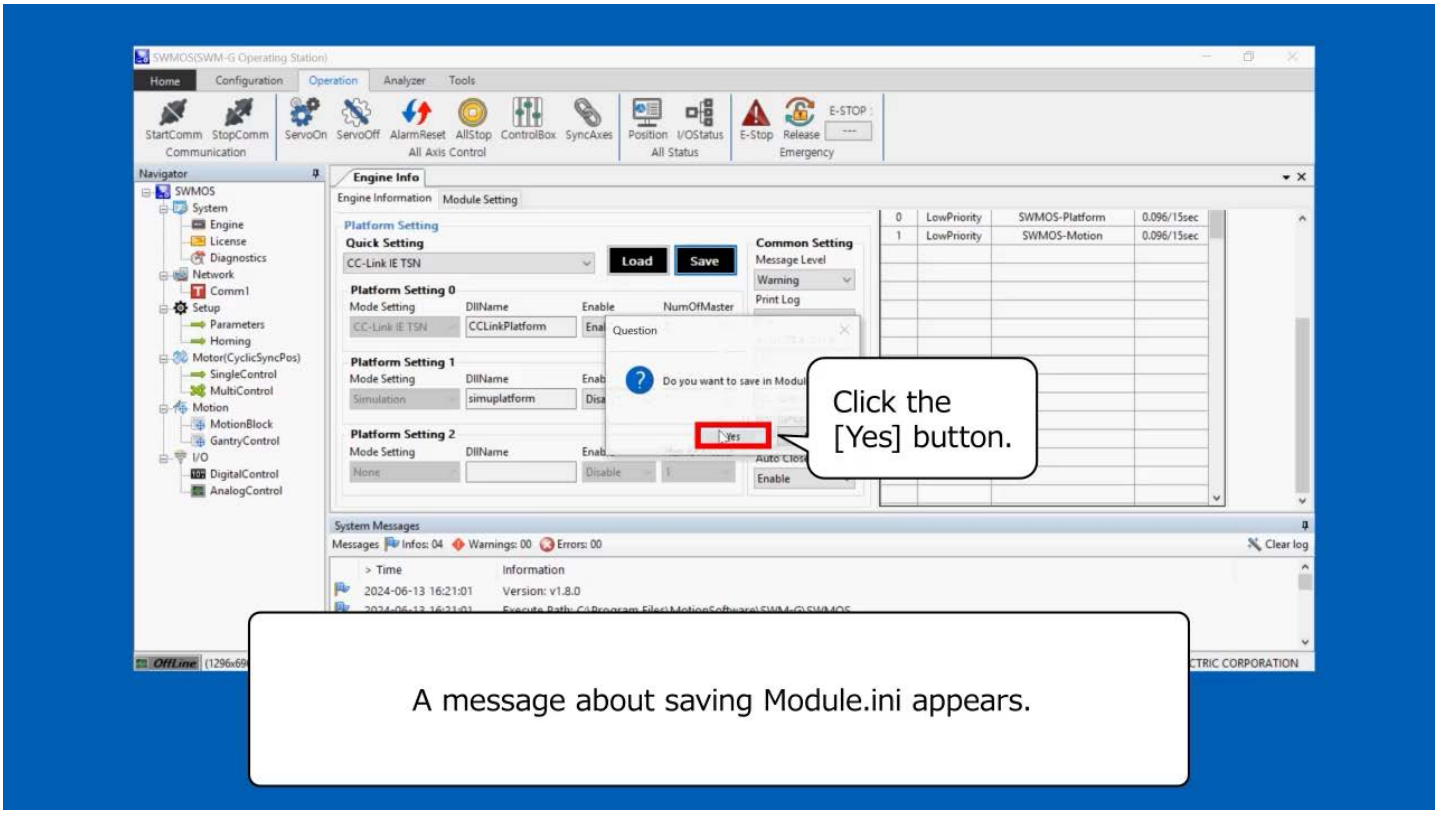
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



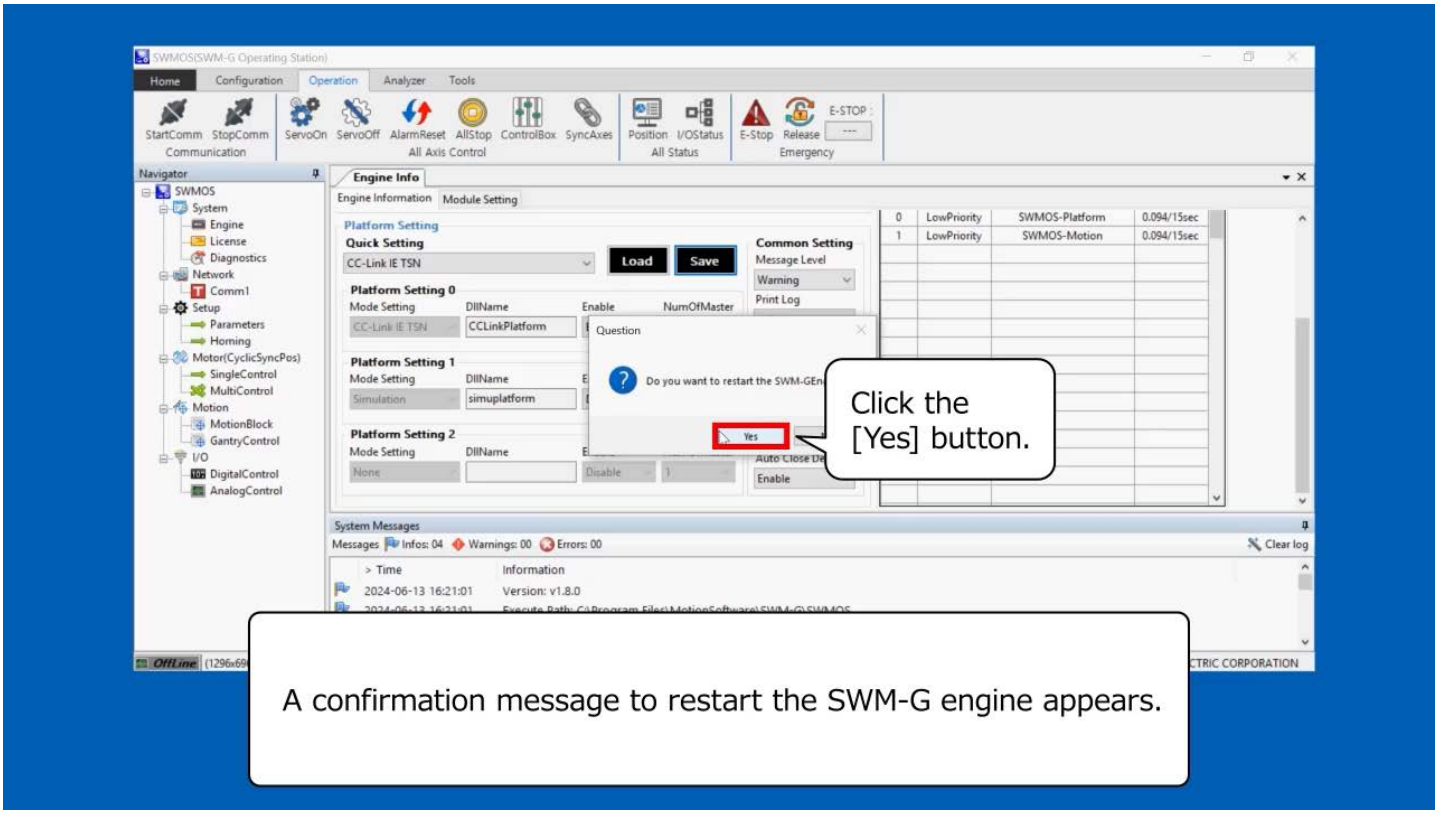
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



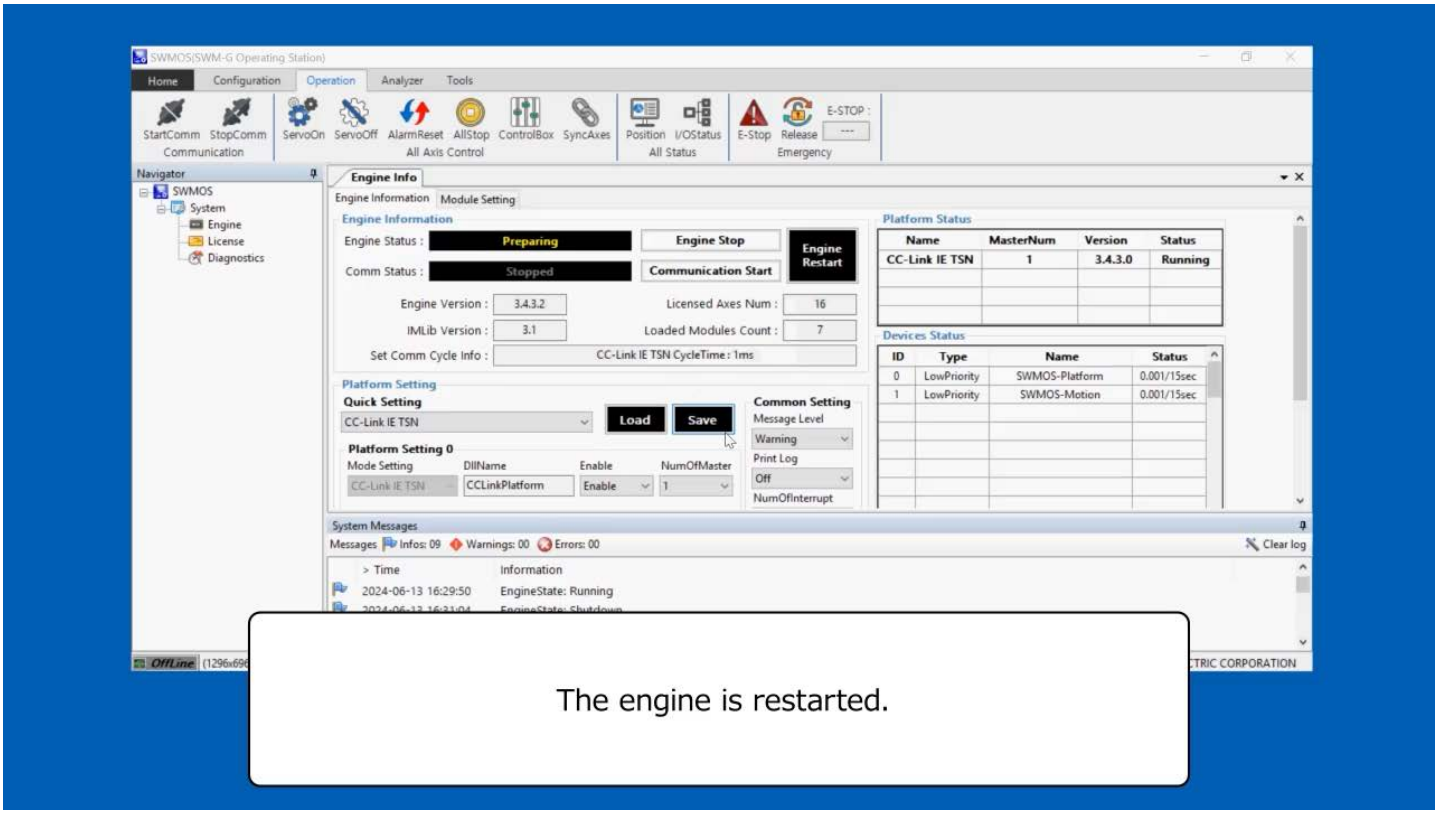
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



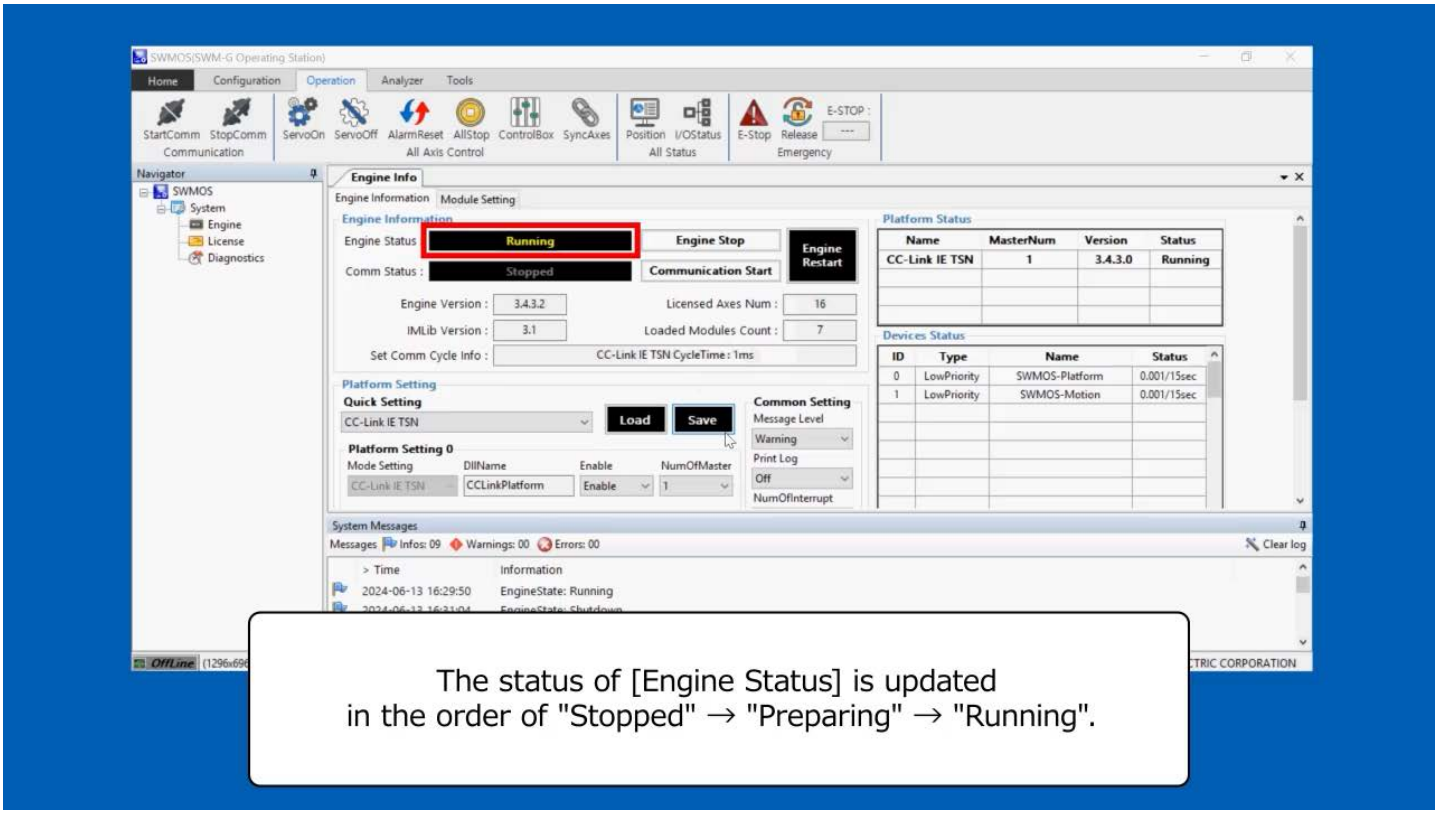
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



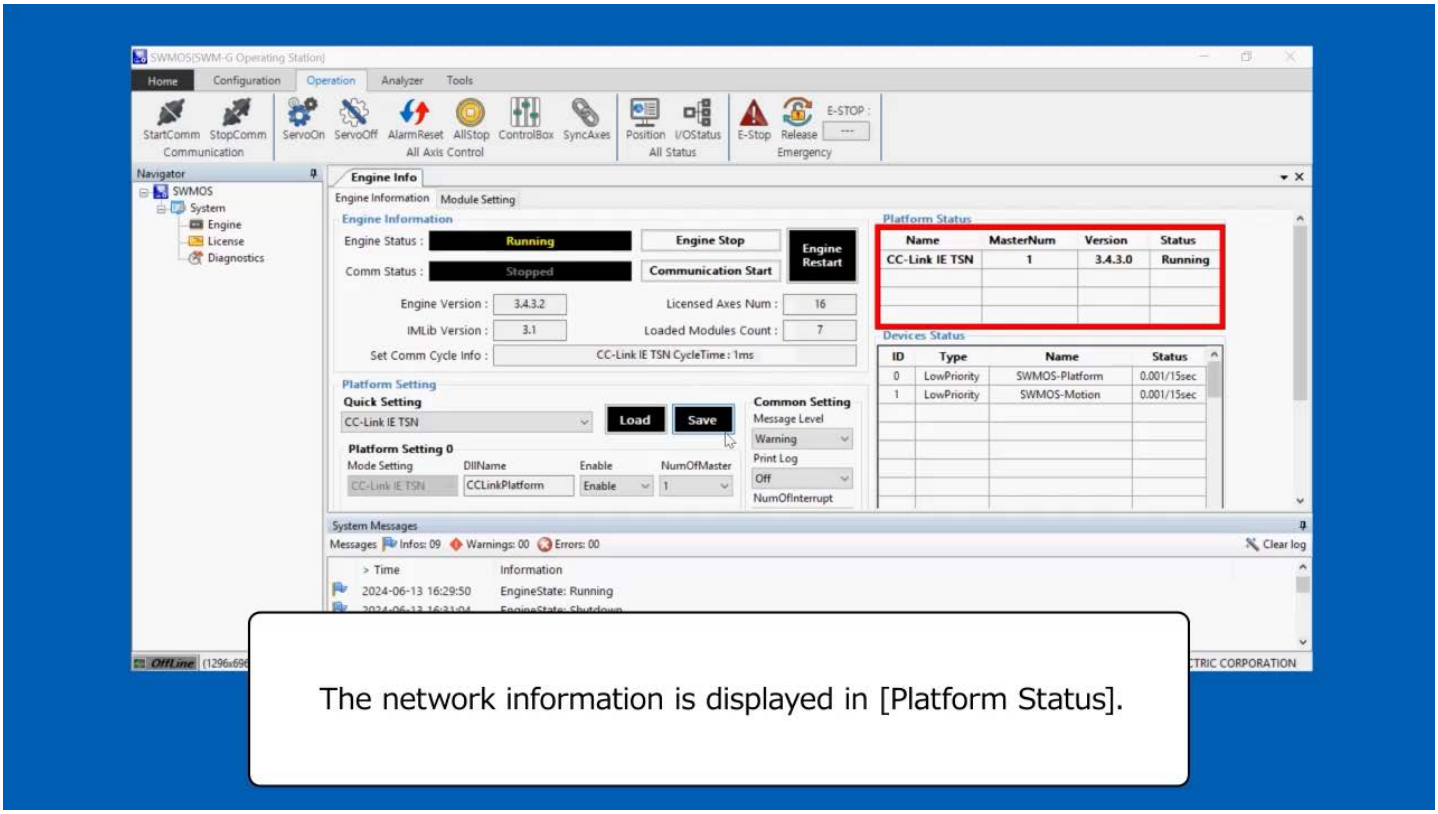
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



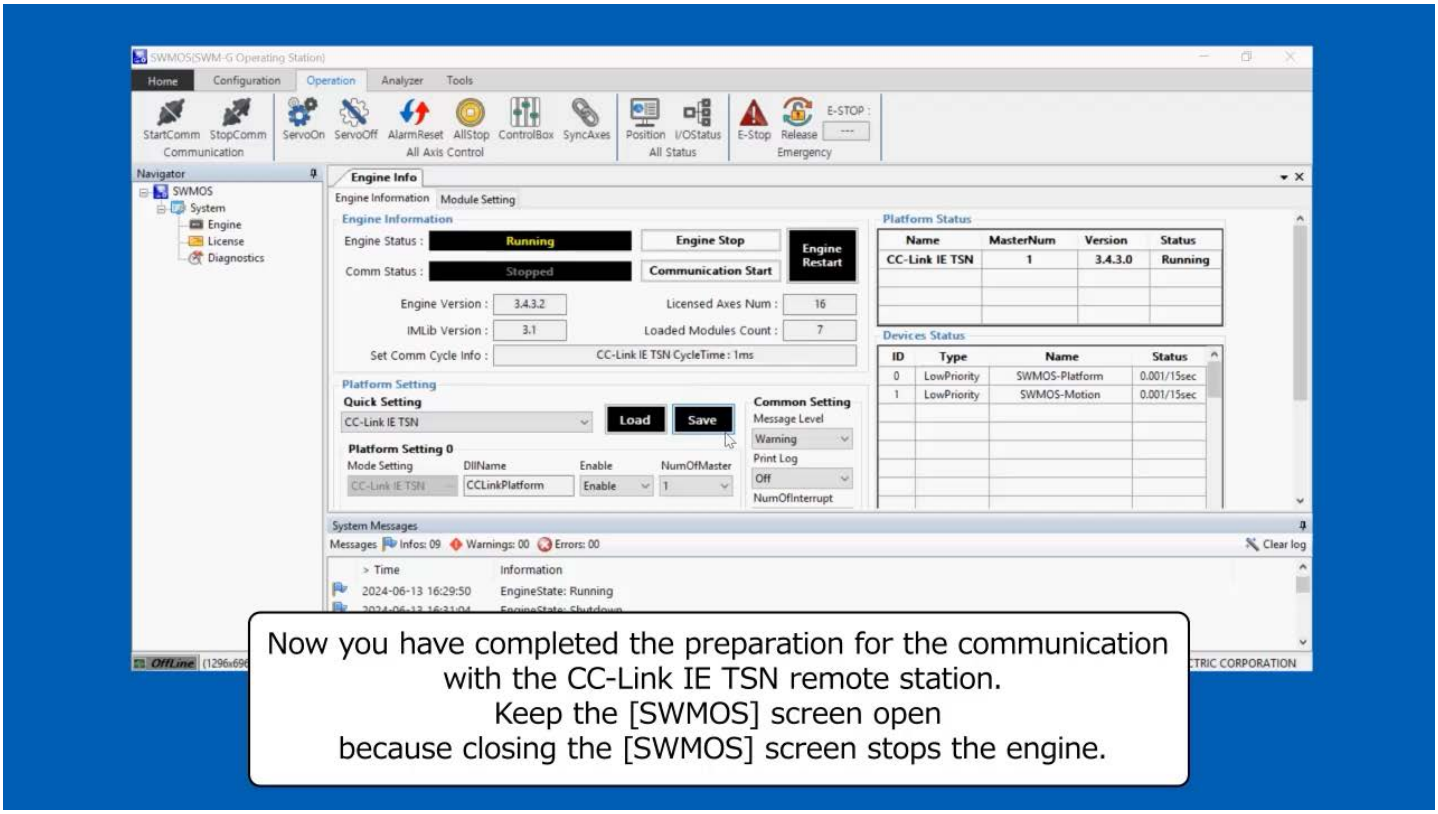
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



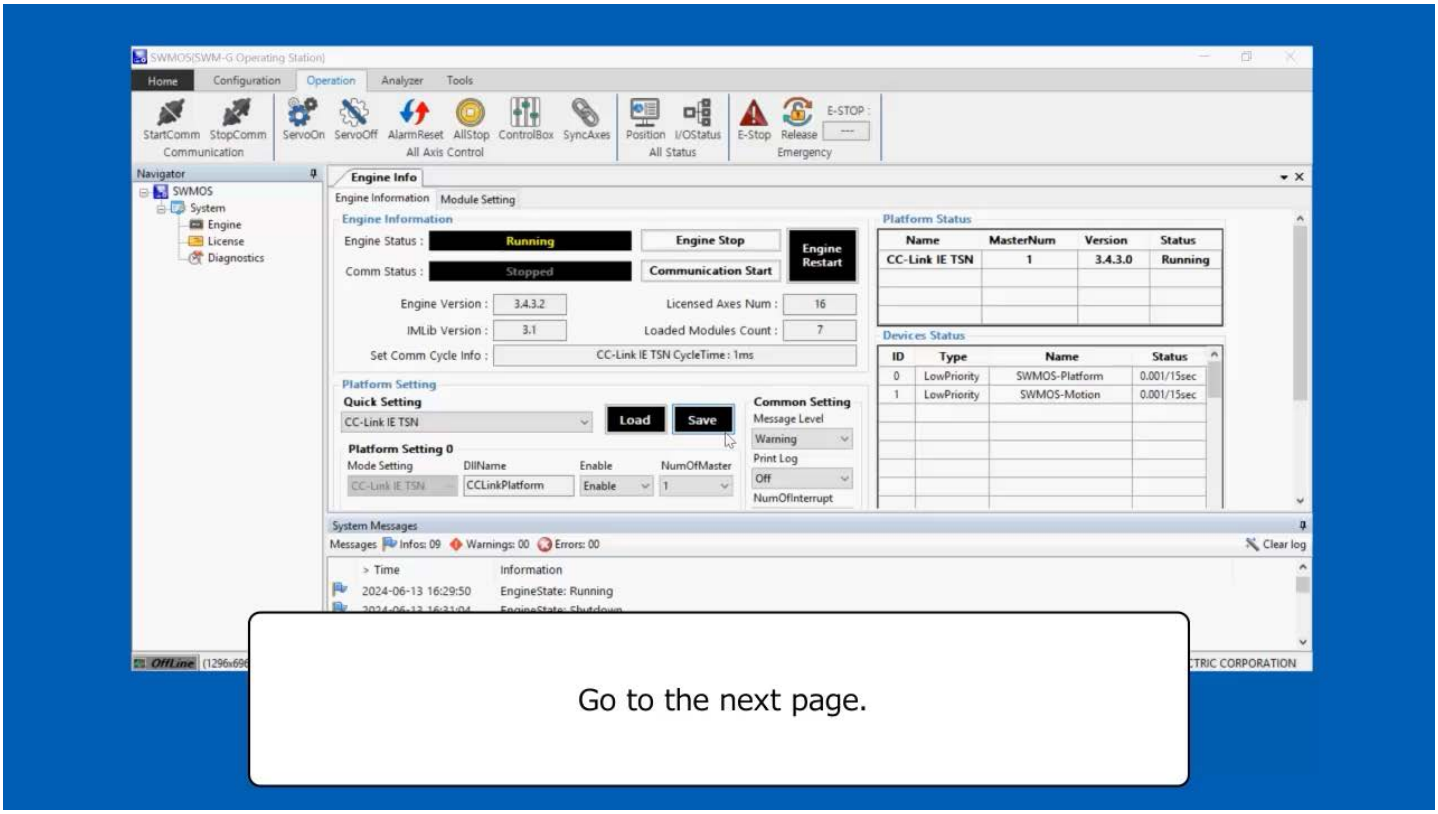
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



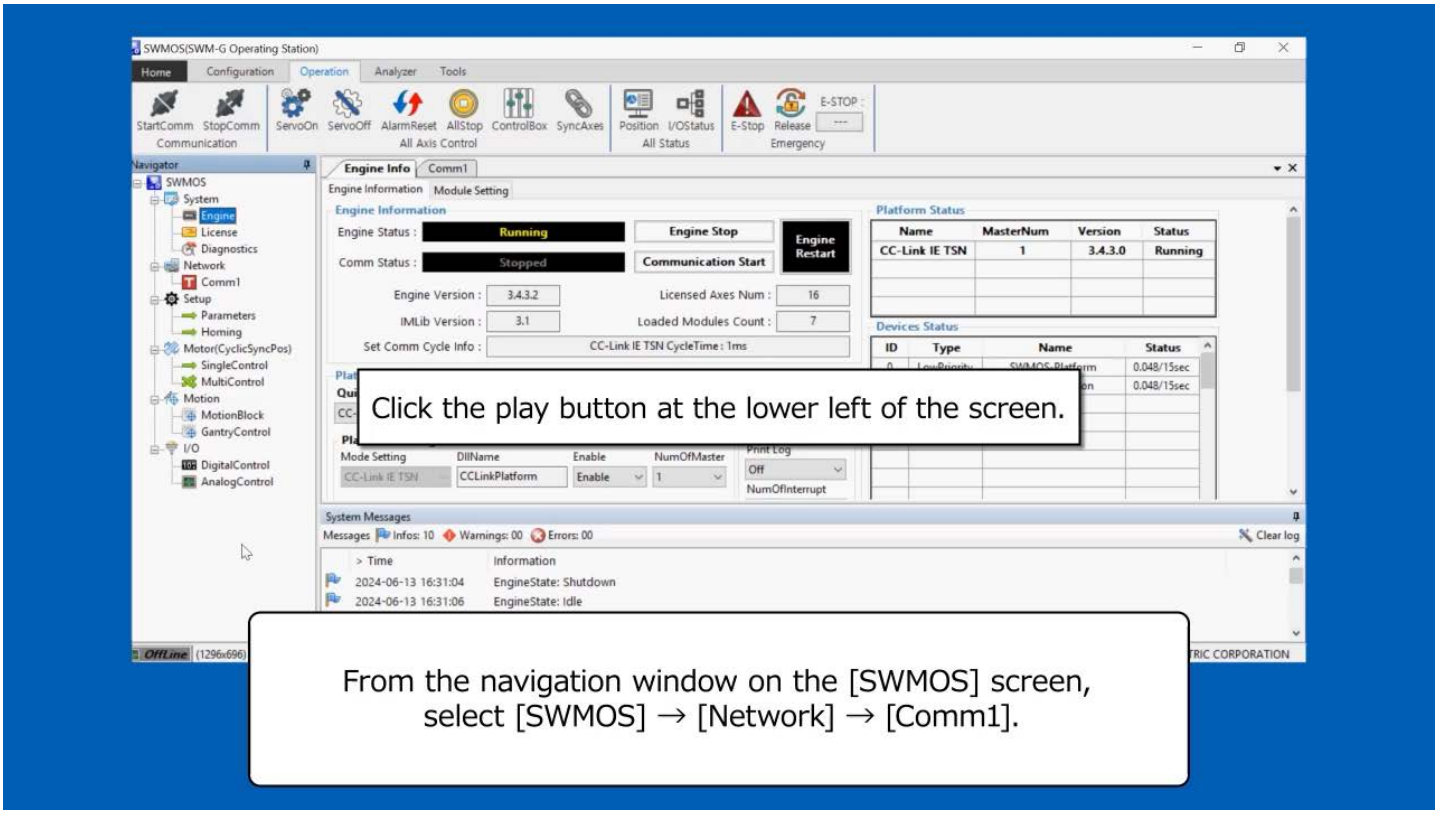
2.2 Platform Selection

Start SWMOS and set the CC-Link IE TSN platform.
This setting enables the communication with the CC-Link IE TSN remote station. For the procedure, see the video below.



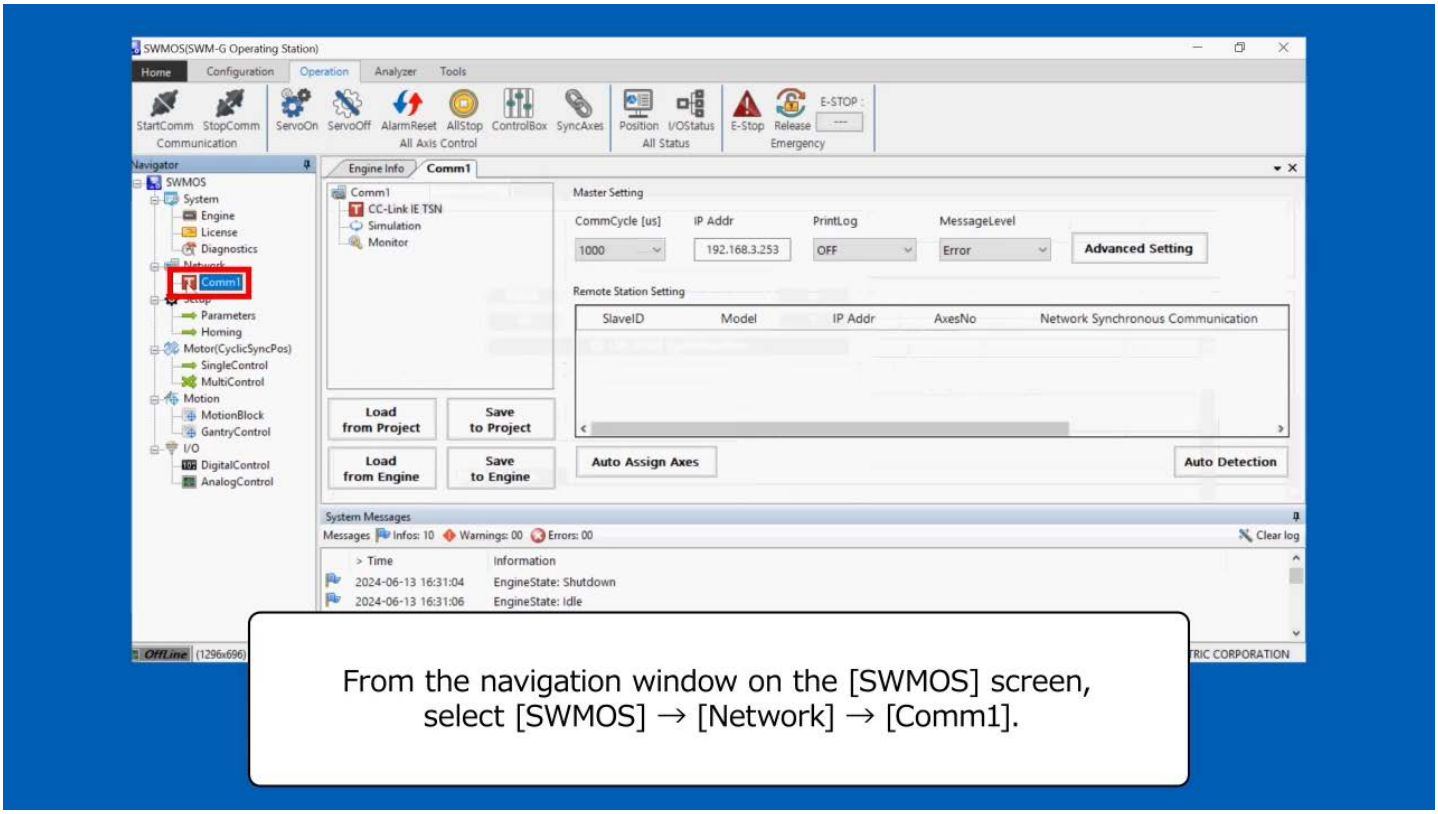
2.3 Master Setting

Then, configure the master setting. For the procedure, see the video below.



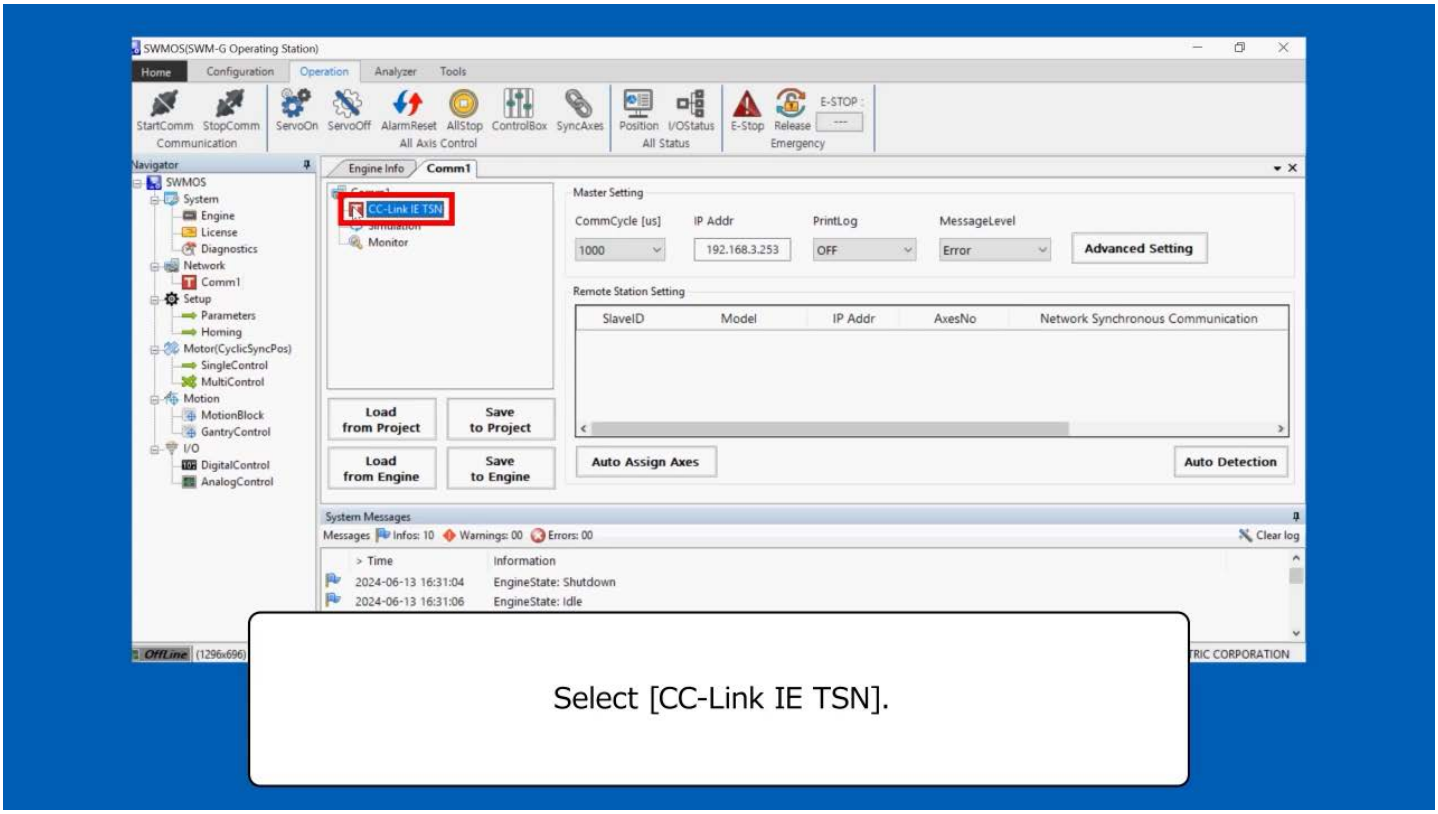
2.3 Master Setting

Then, configure the master setting. For the procedure, see the video below.



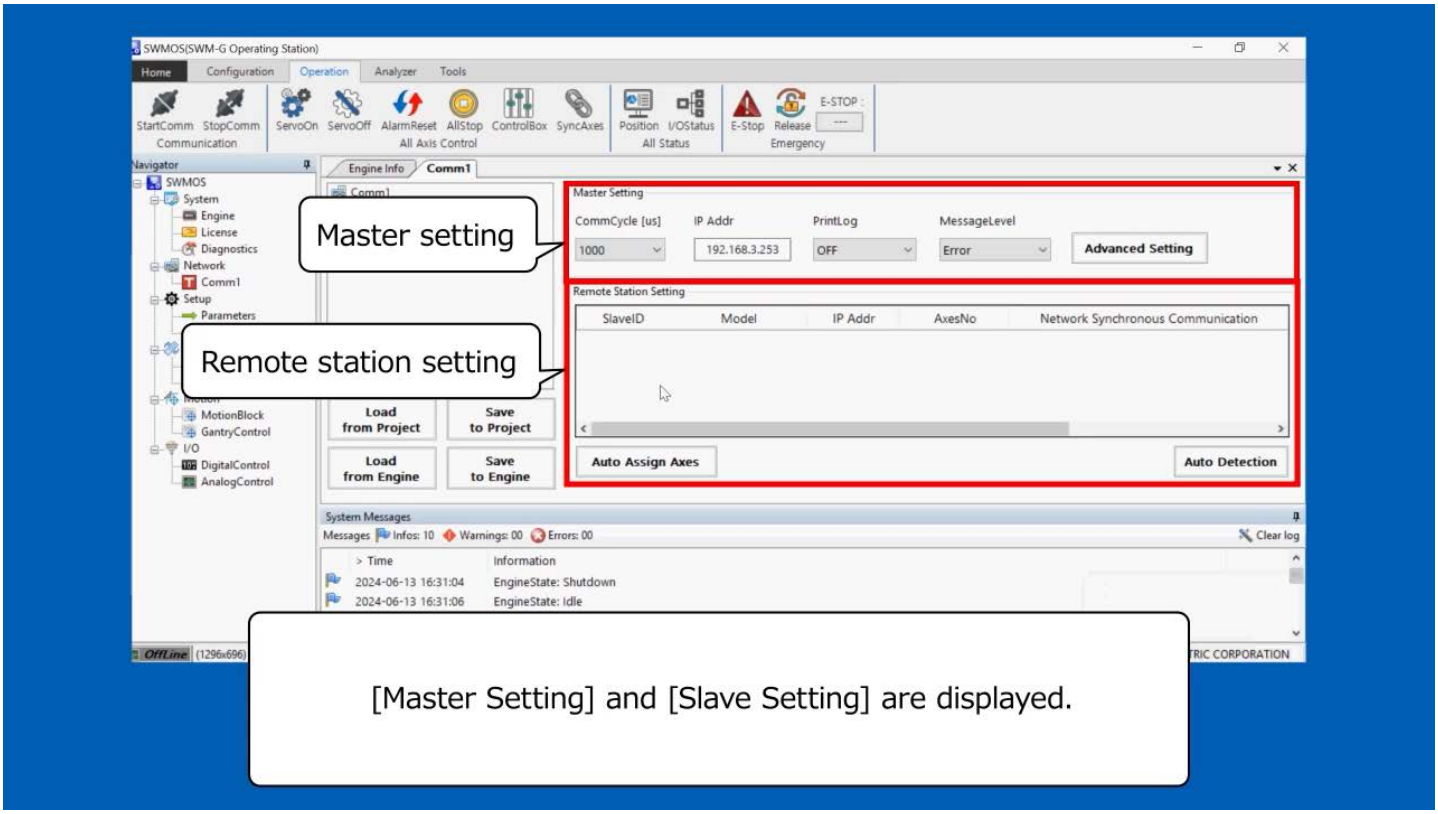
2.3 Master Setting

Then, configure the master setting. For the procedure, see the video below.



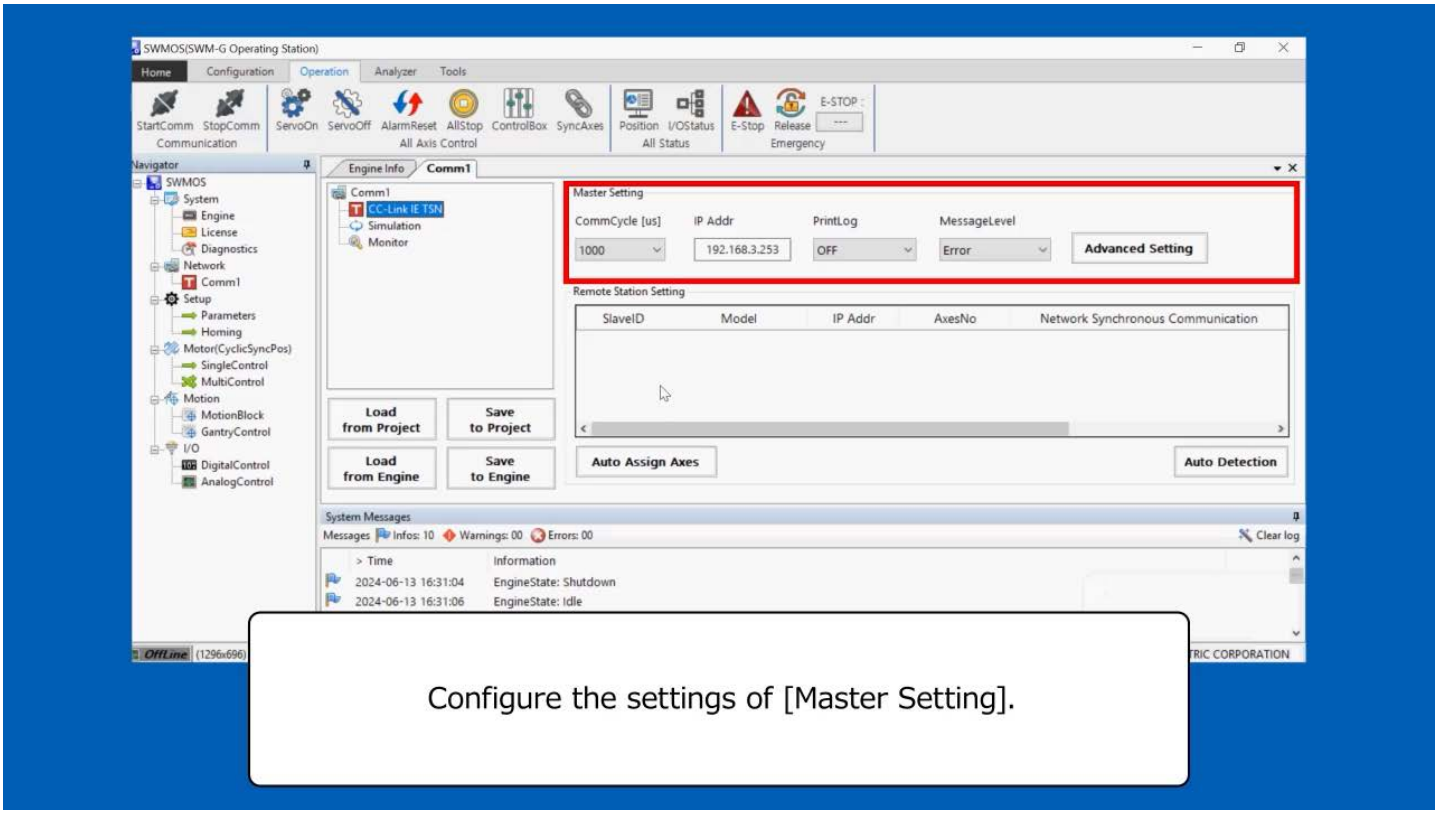
2.3 Master Setting

Then, configure the master setting. For the procedure, see the video below.



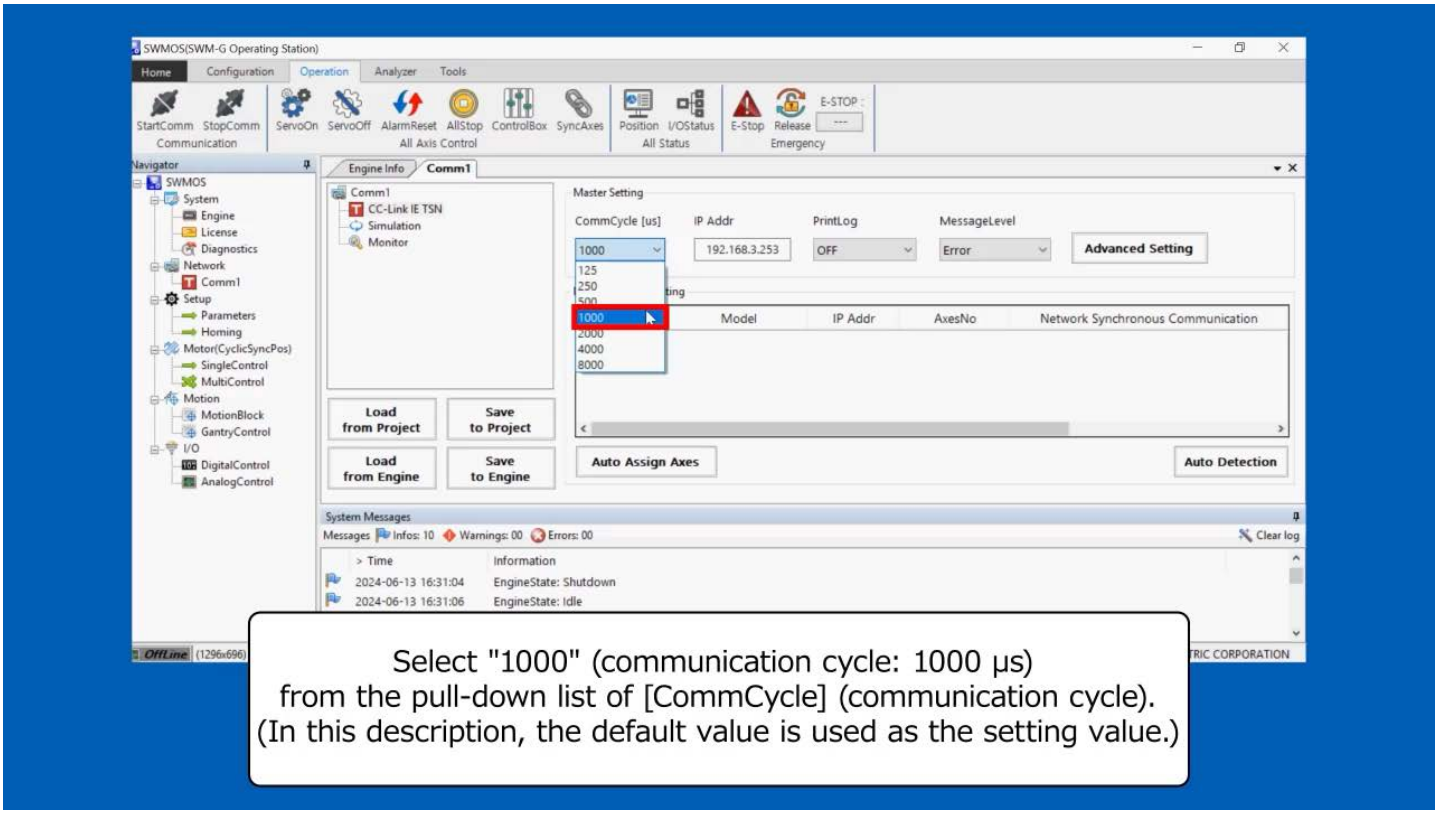
2.3 Master Setting

Then, configure the master setting. For the procedure, see the video below.



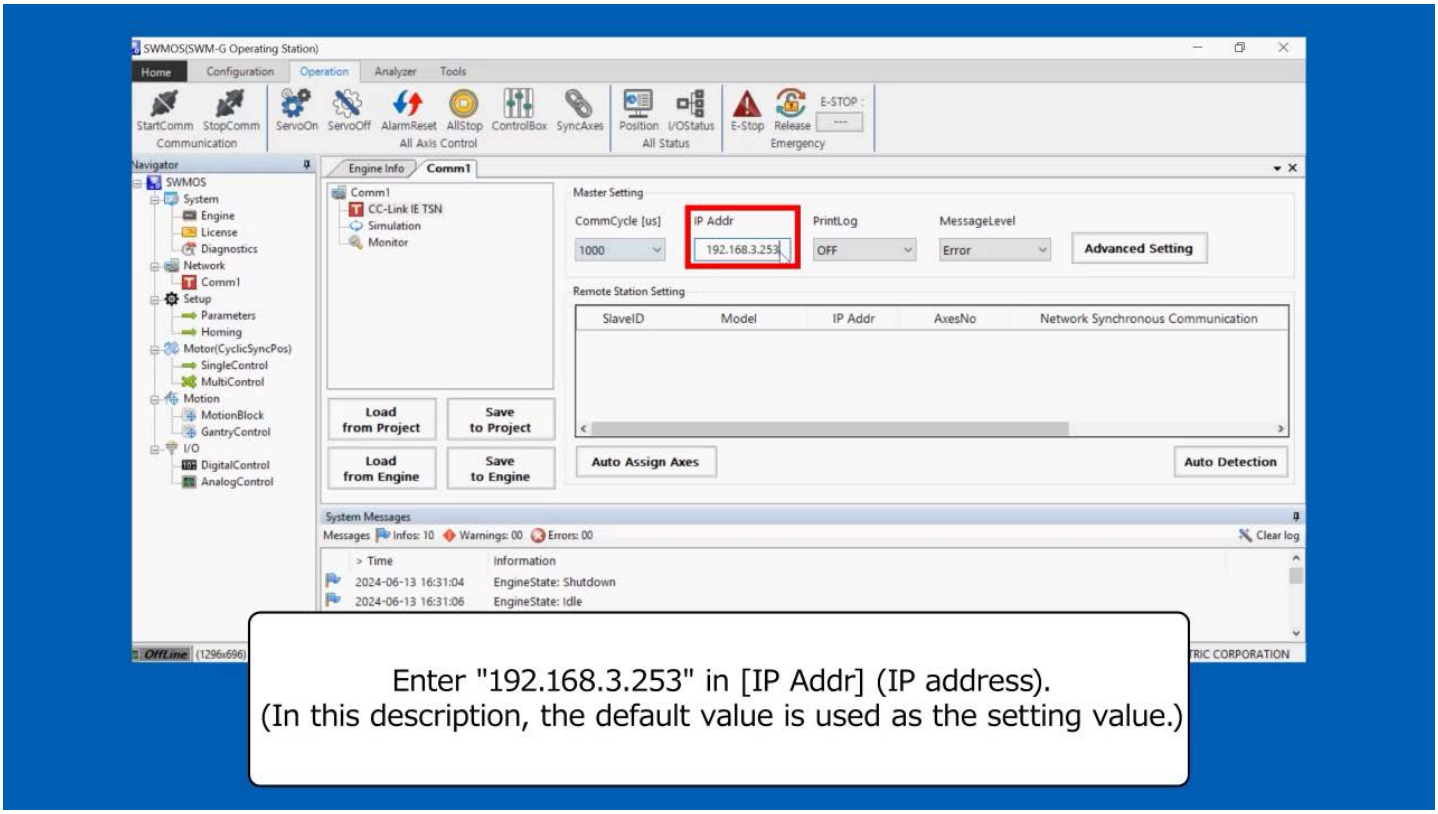
2.3 Master Setting

Then, configure the master setting. For the procedure, see the video below.



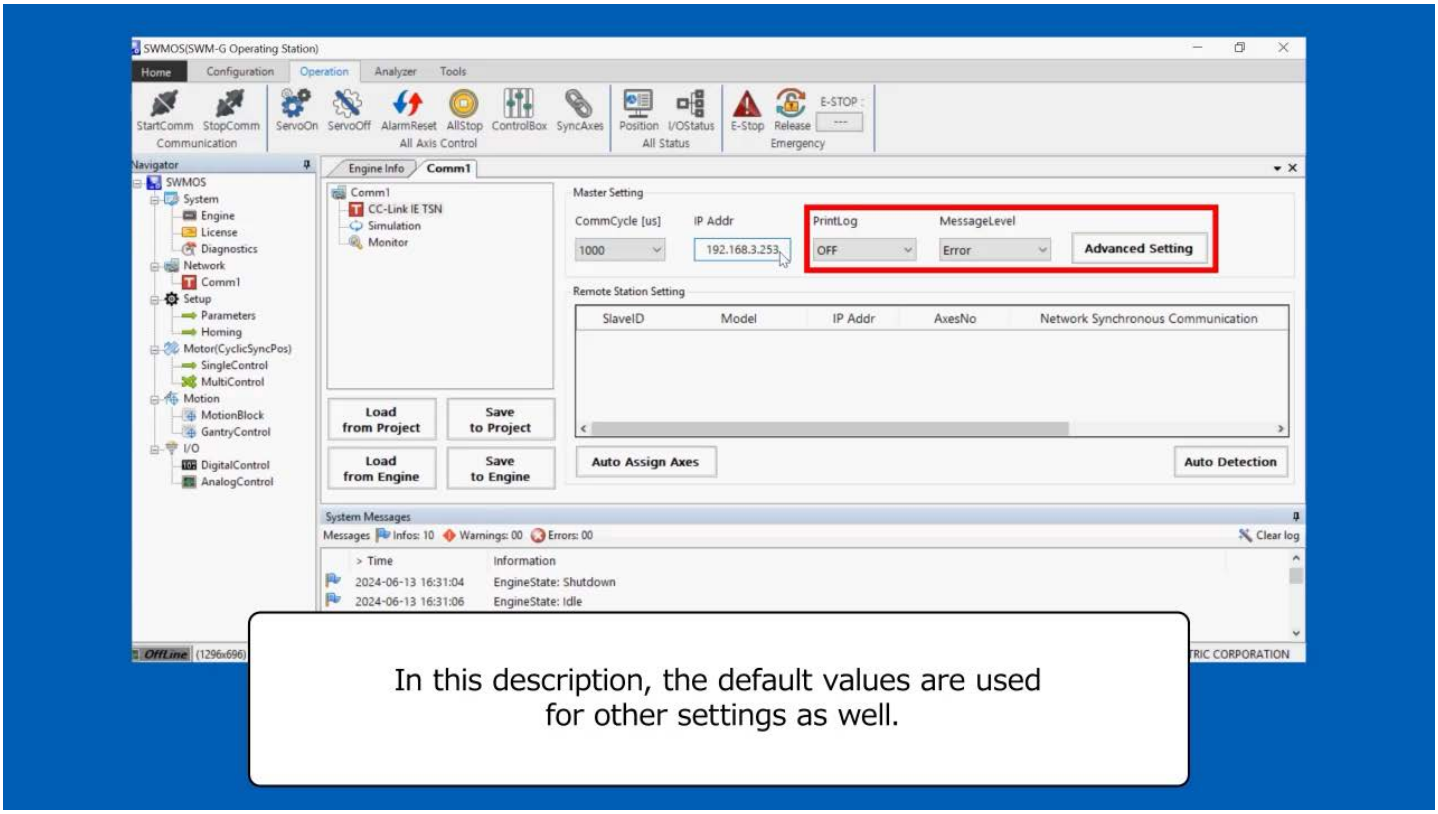
2.3 Master Setting

Then, configure the master setting. For the procedure, see the video below.



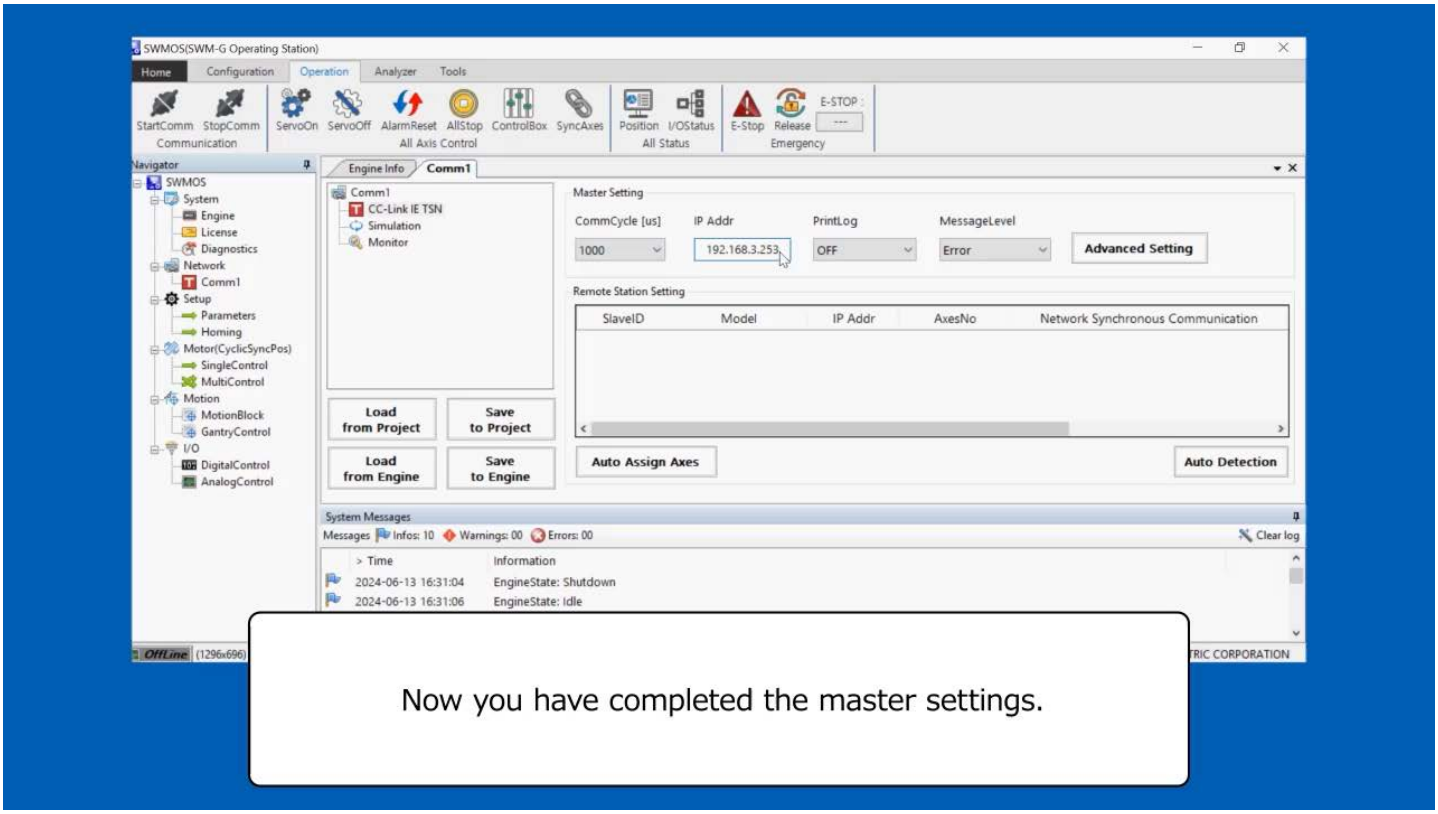
2.3 Master Setting

Then, configure the master setting. For the procedure, see the video below.



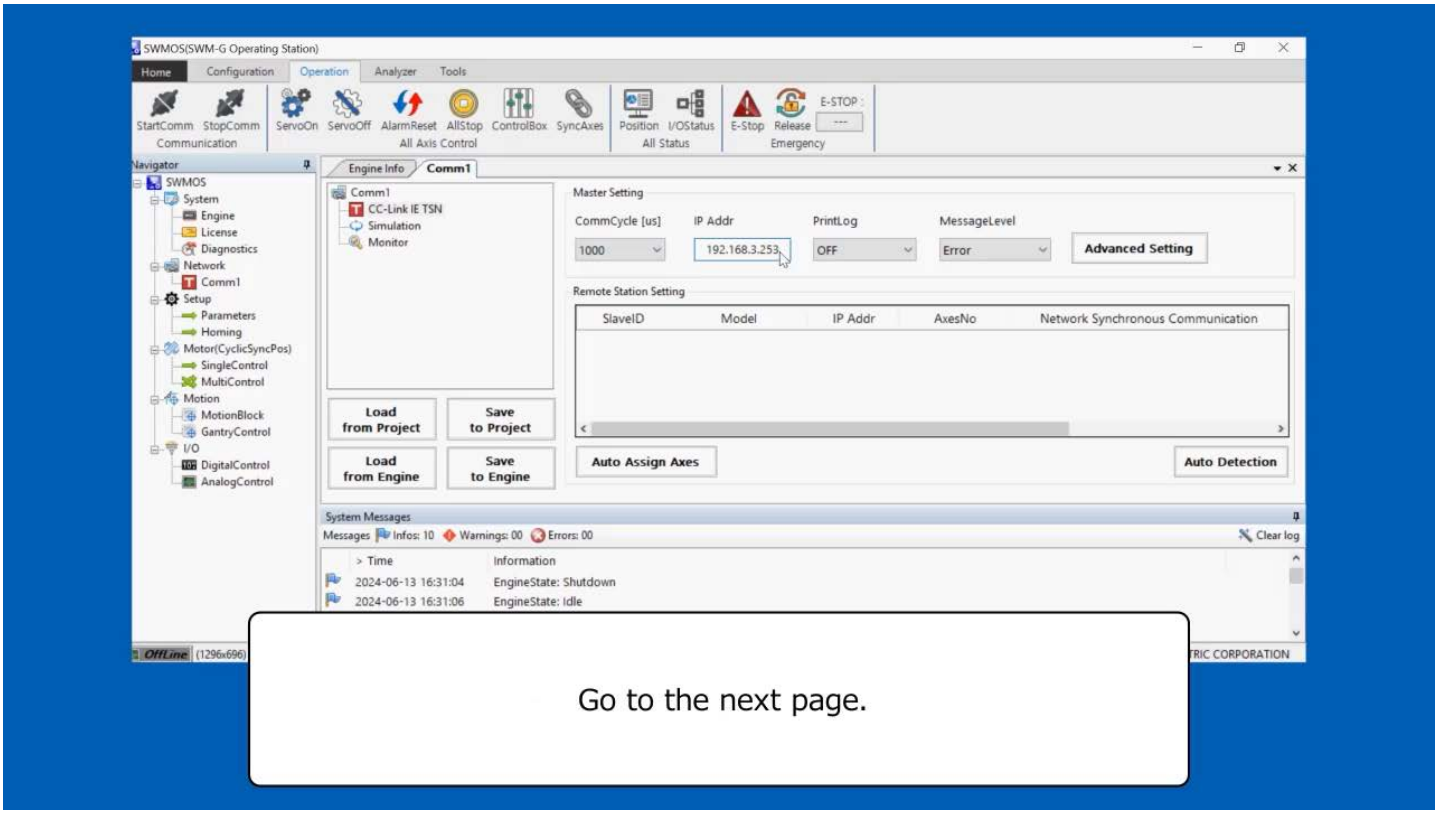
2.3 Master Setting

Then, configure the master setting. For the procedure, see the video below.



2.3 Master Setting

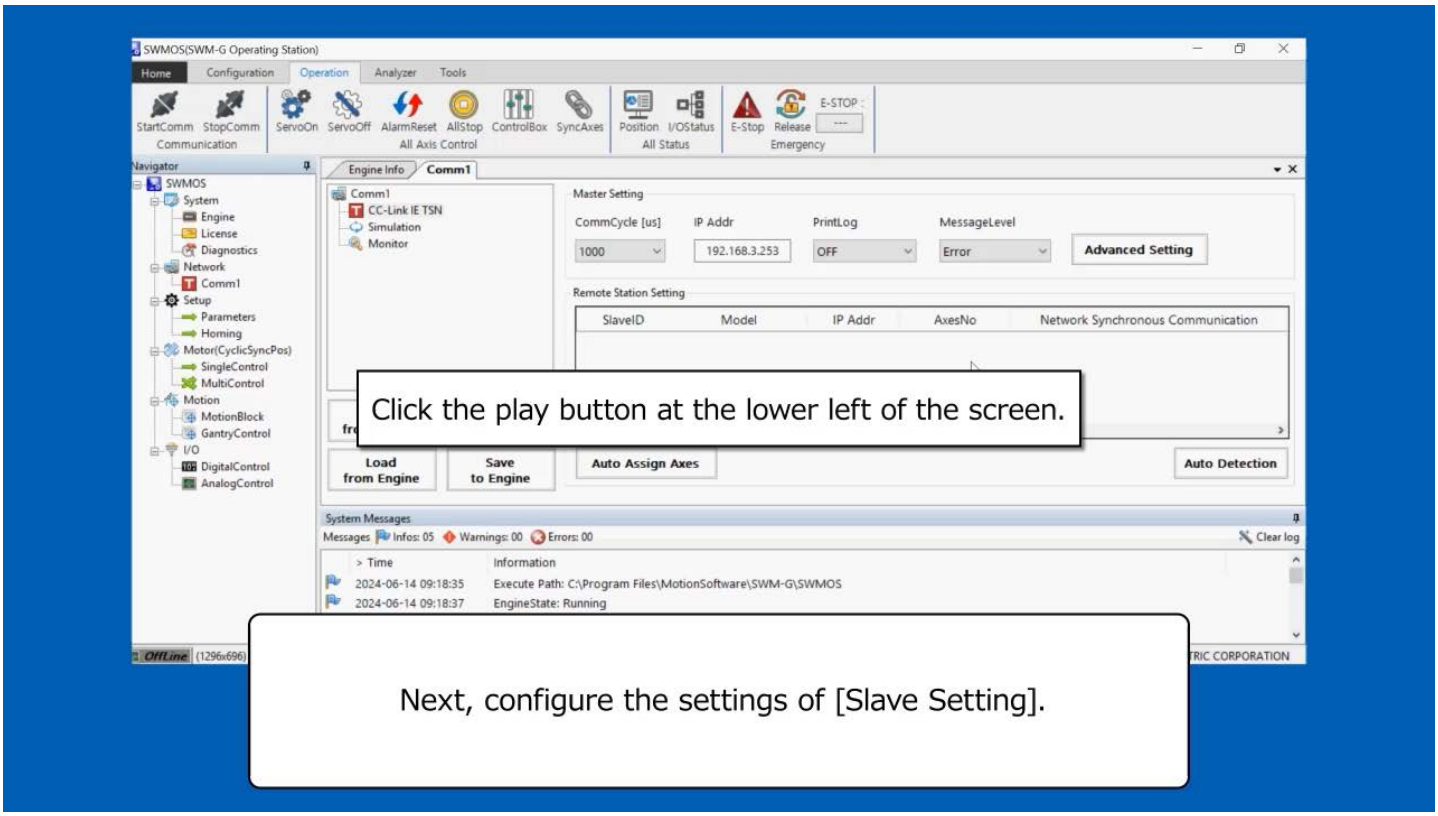
Then, configure the master setting. For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

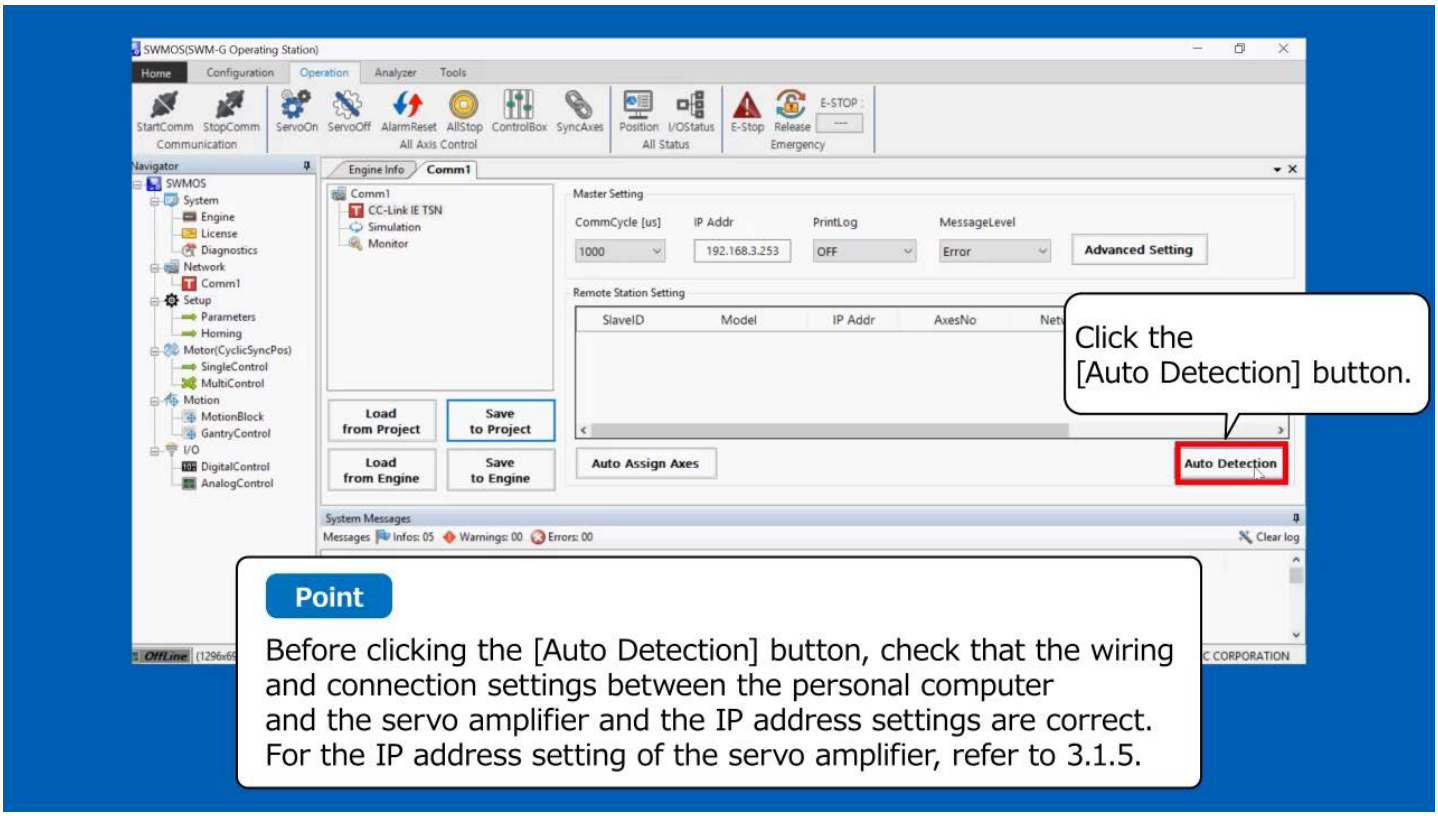
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

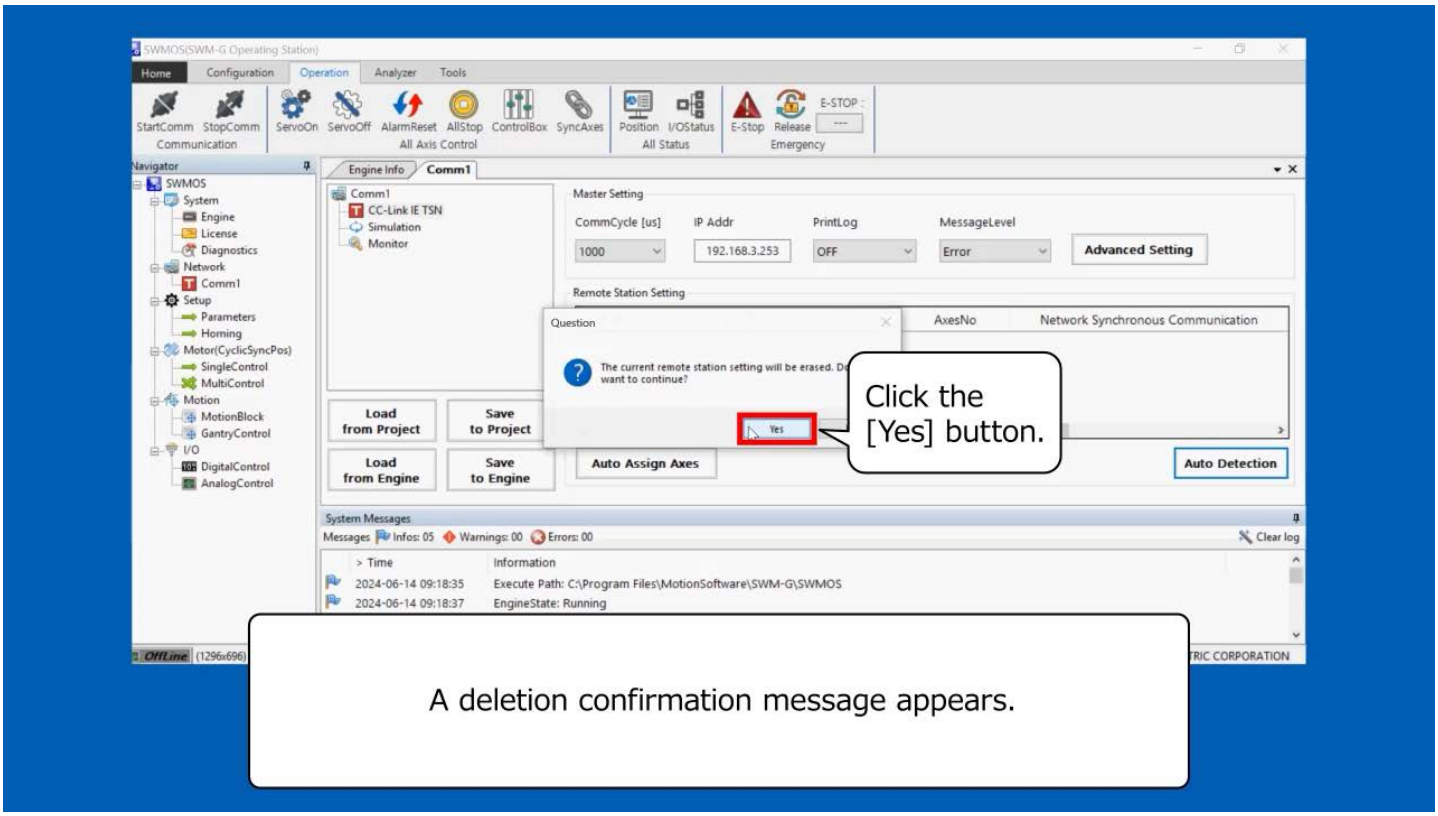
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

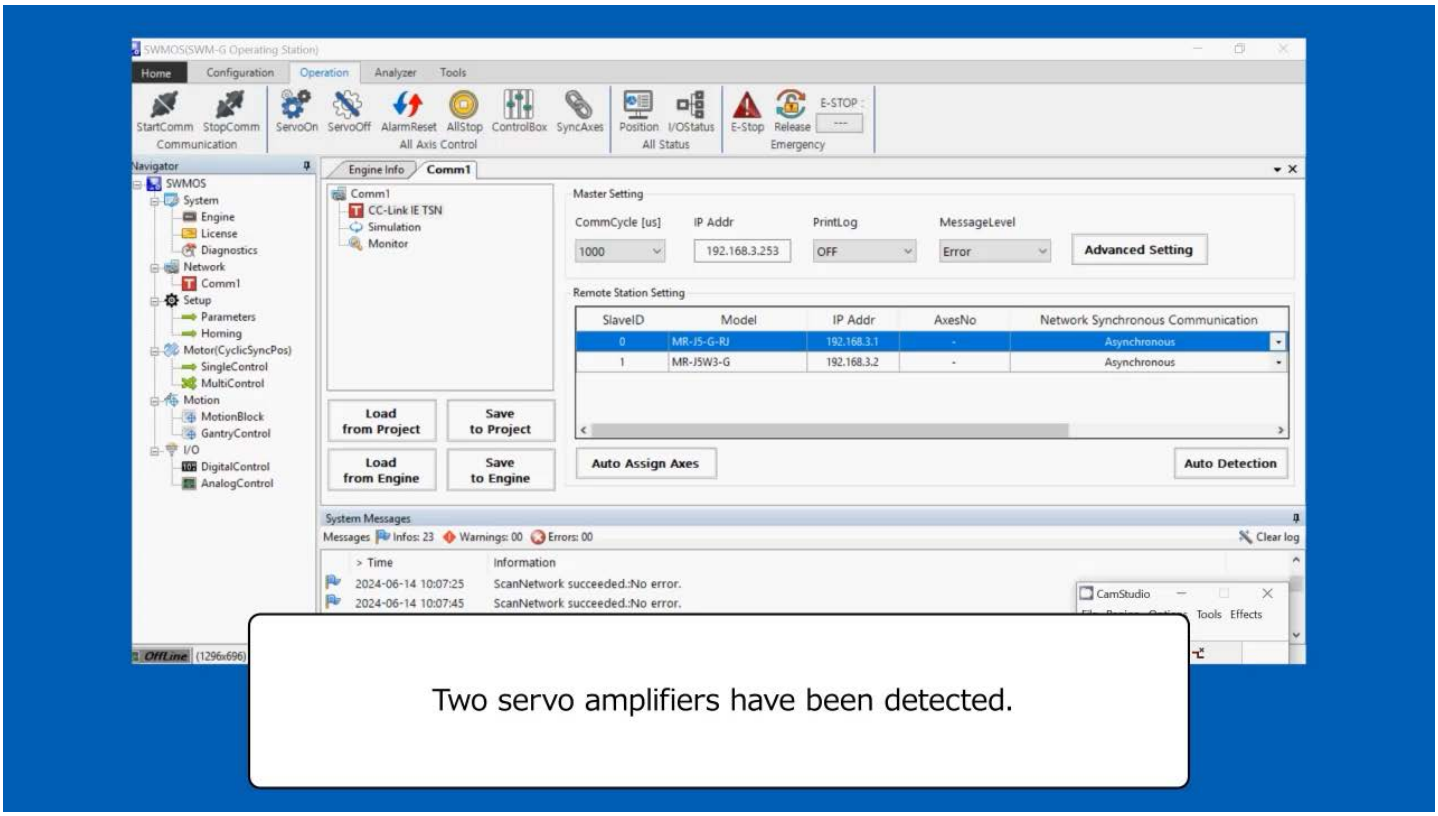
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

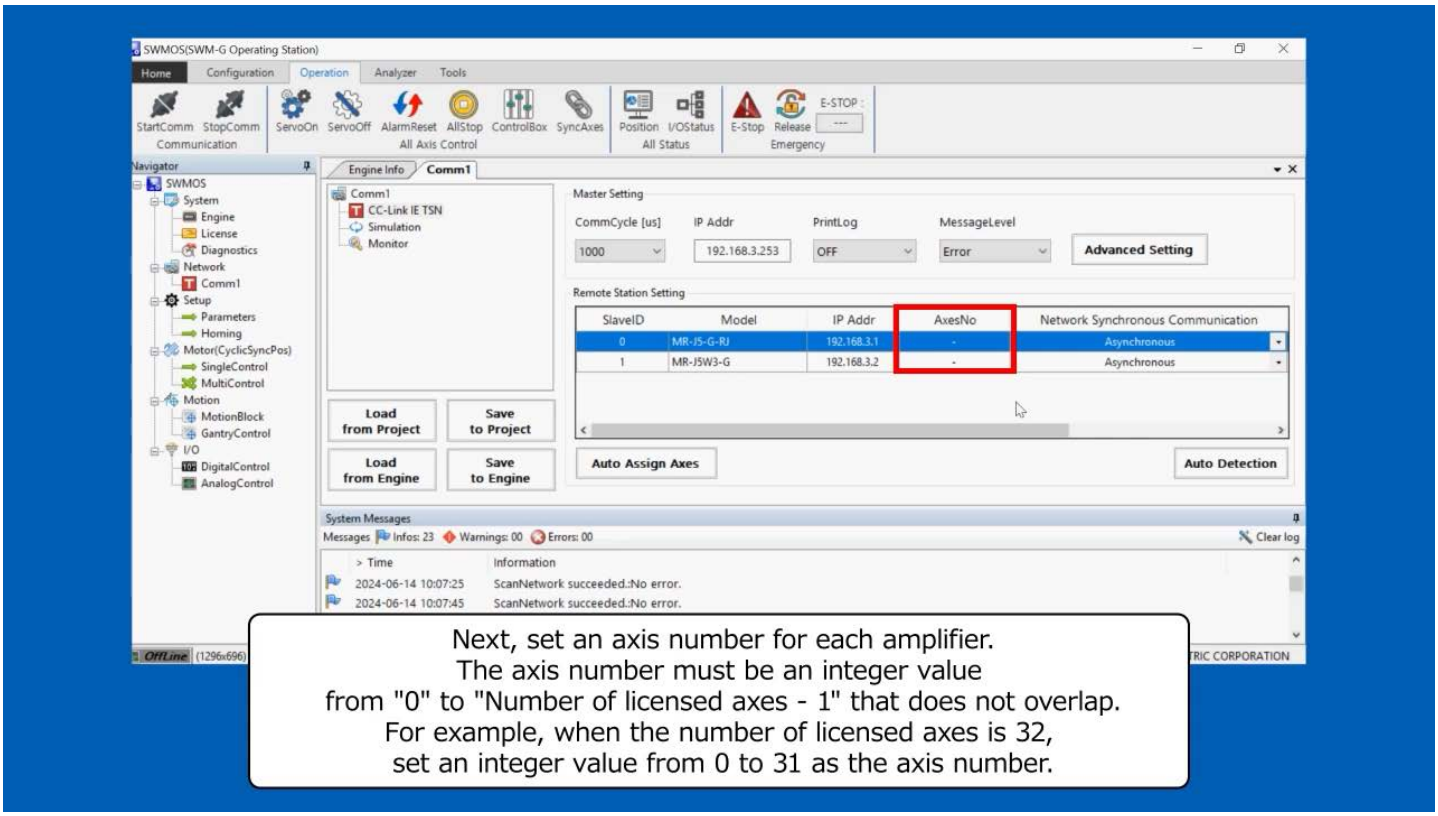
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

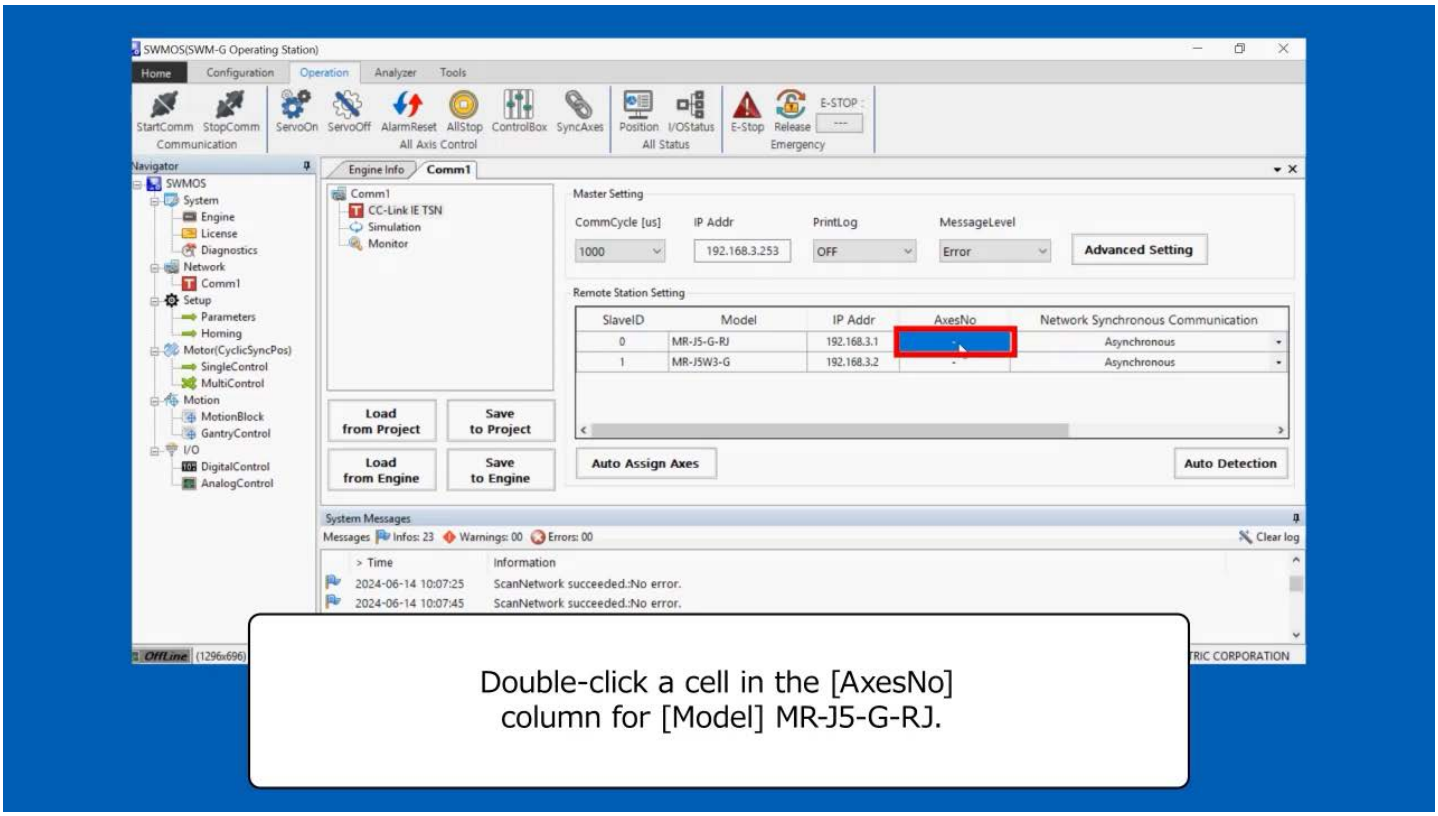
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

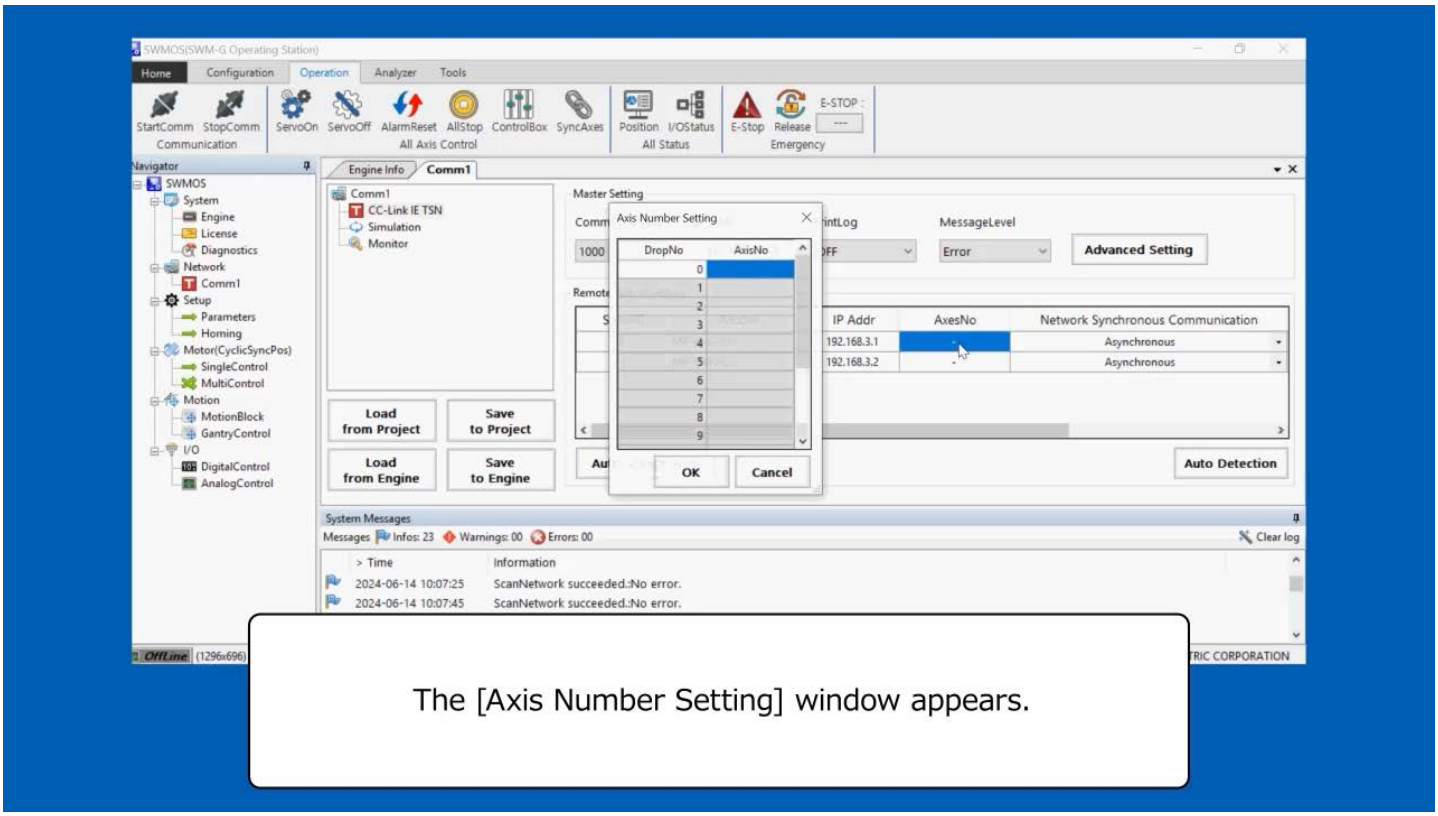
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

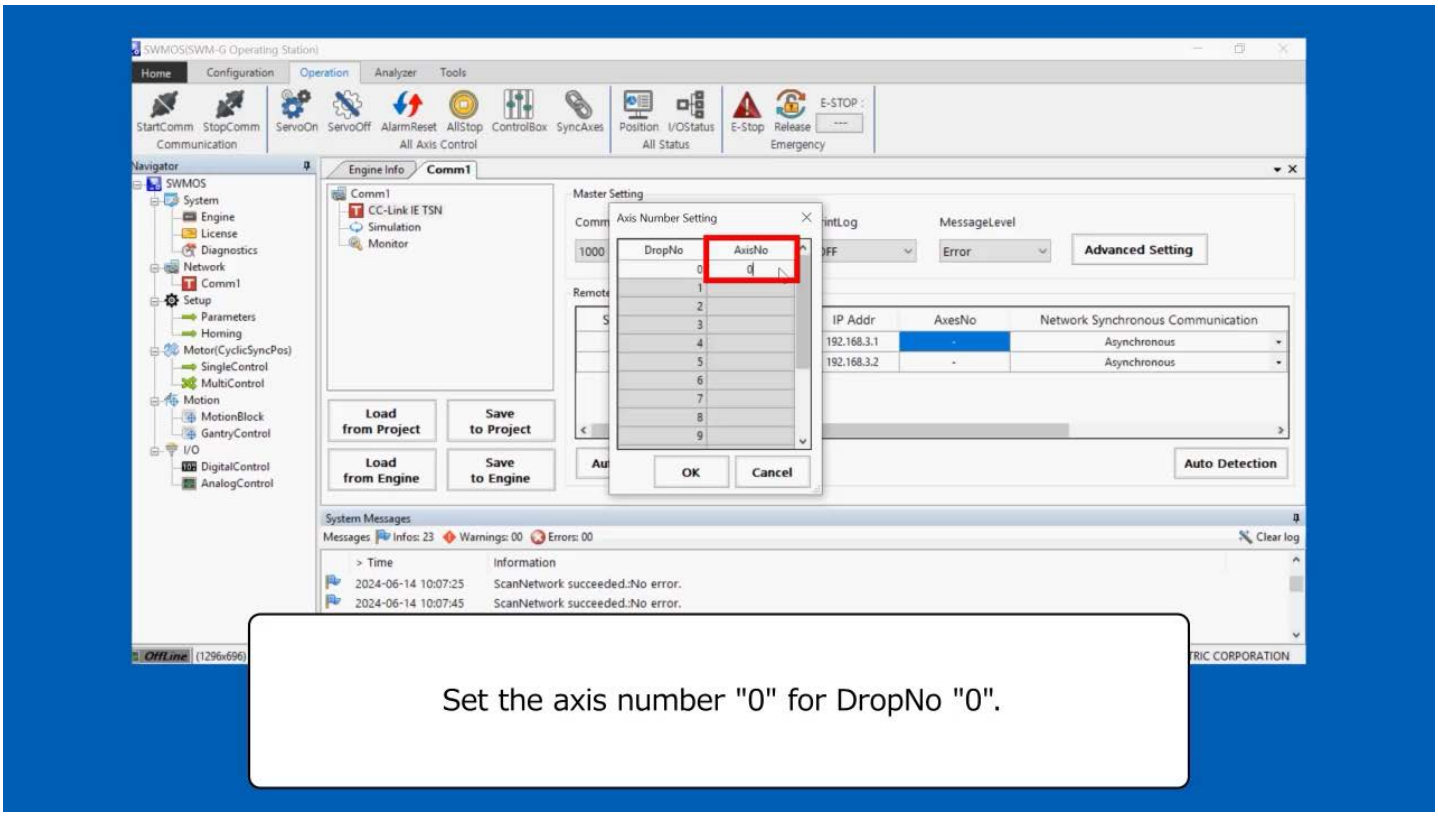
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

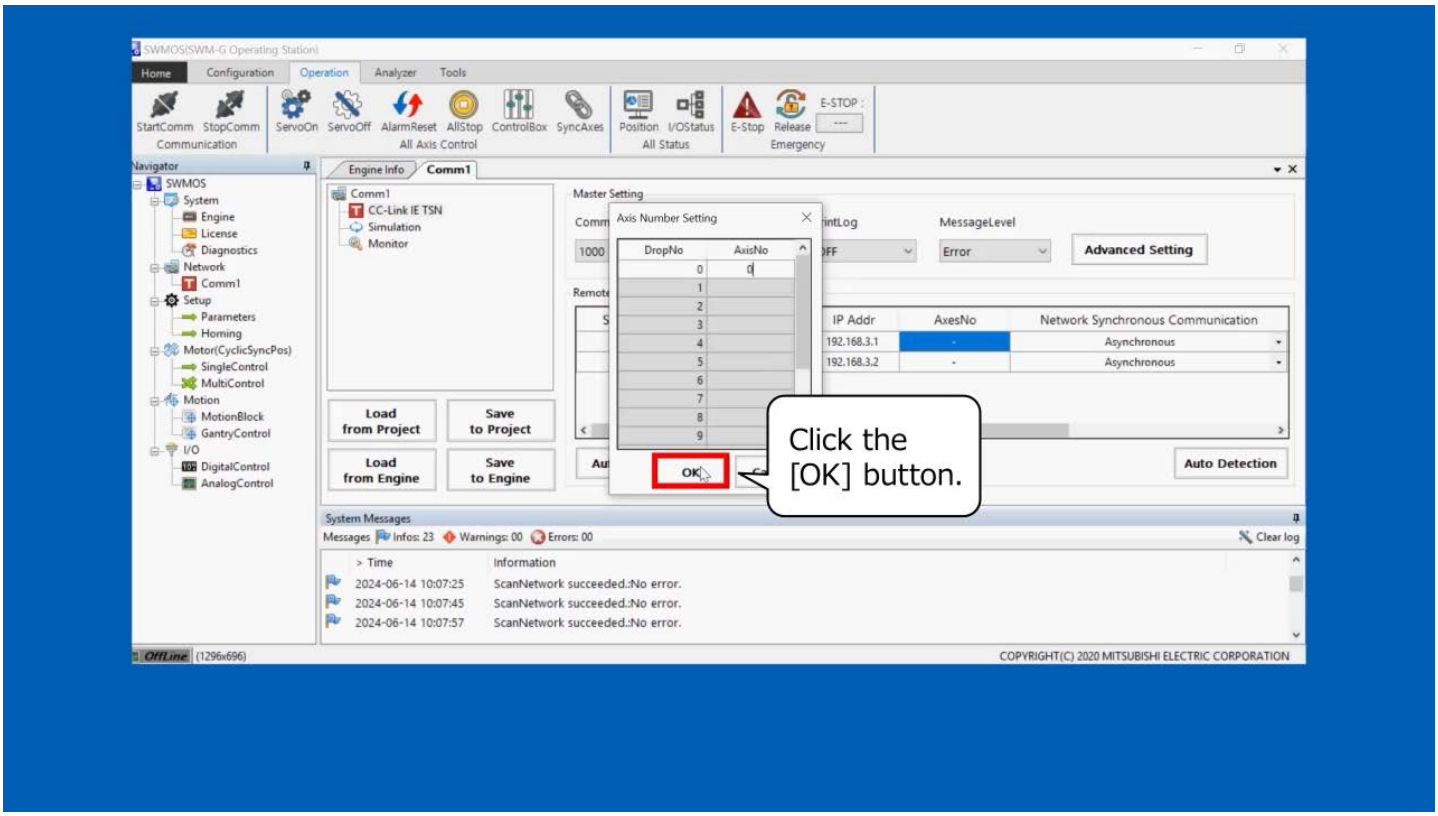
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

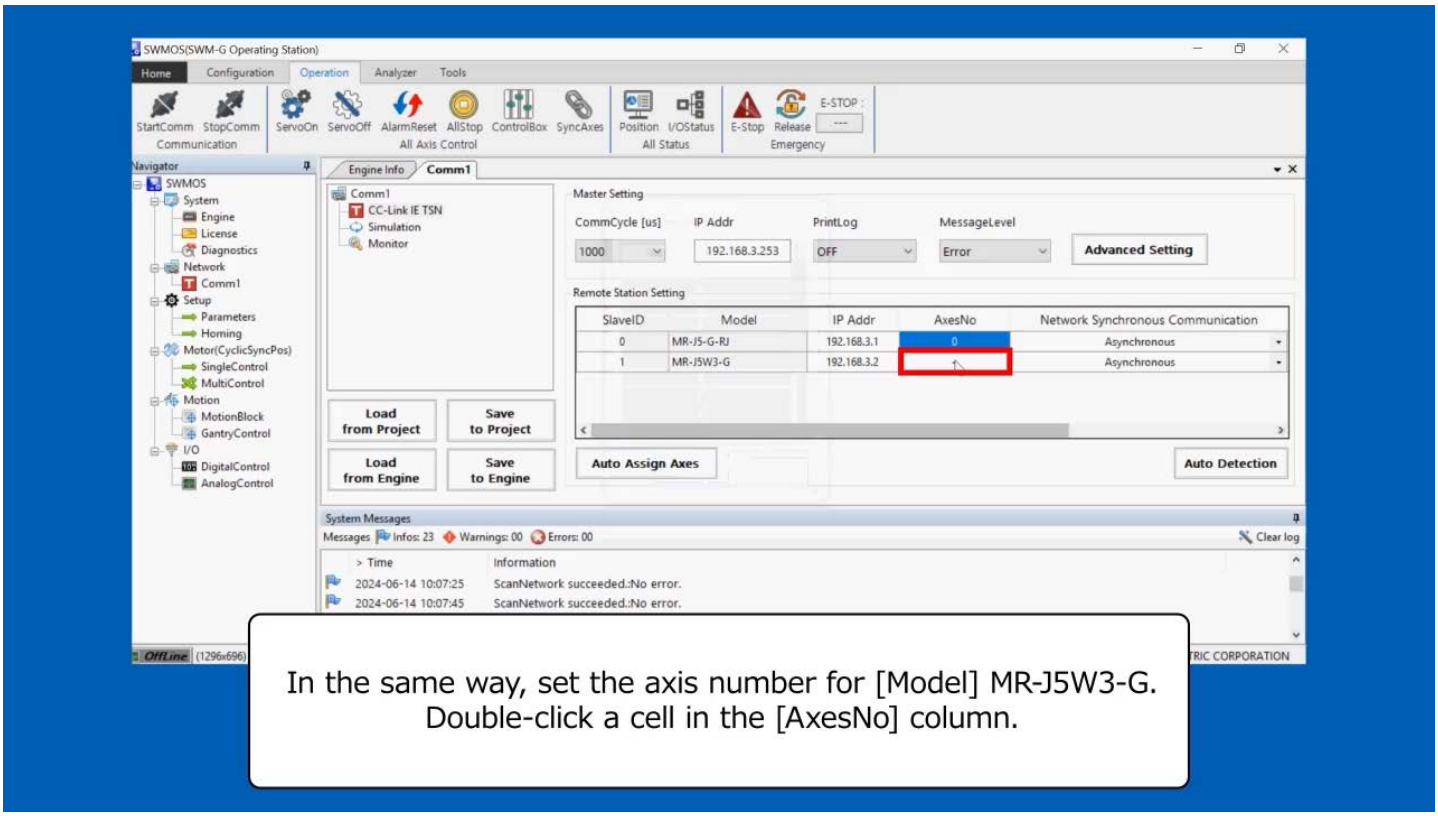
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

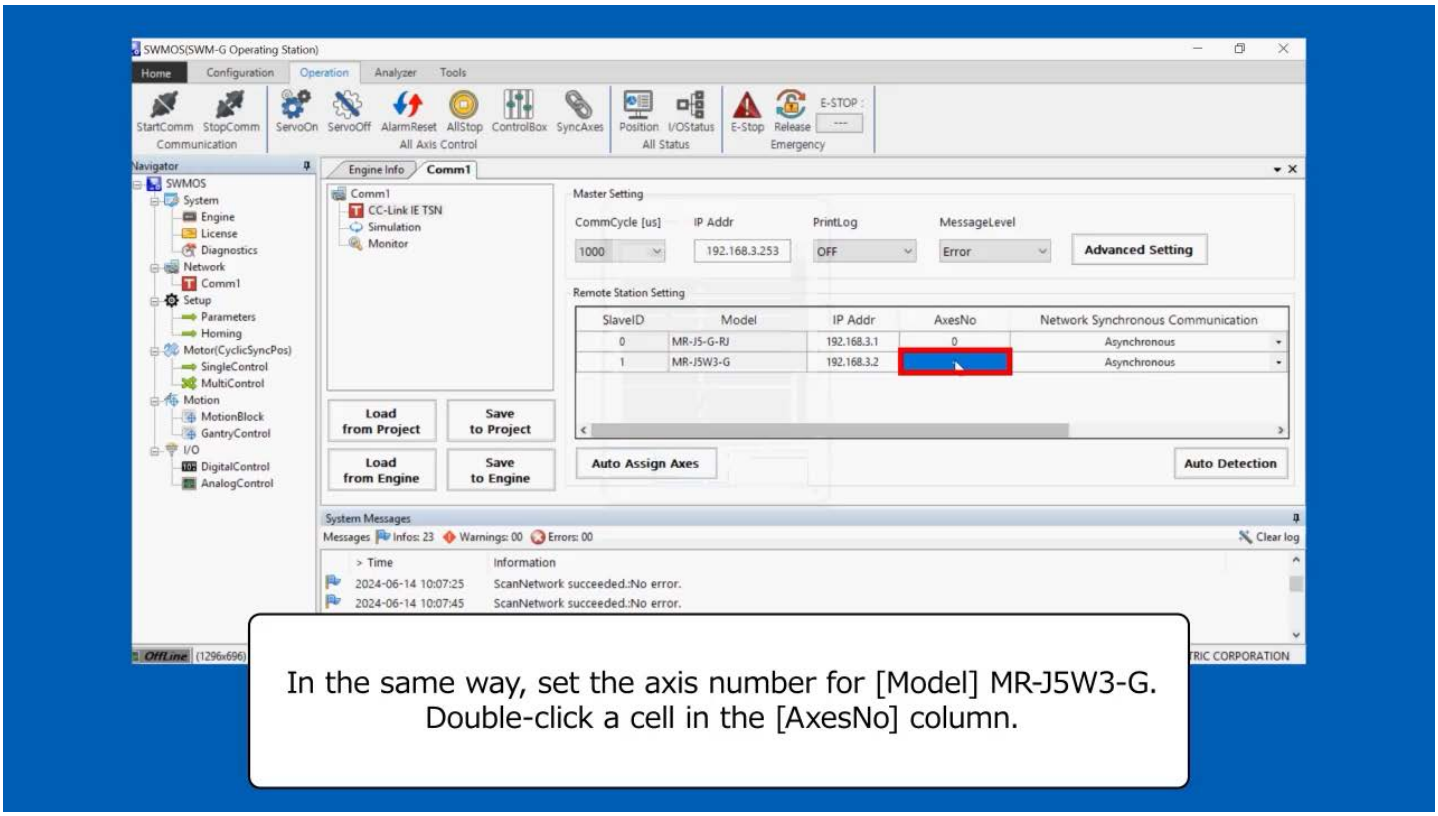
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

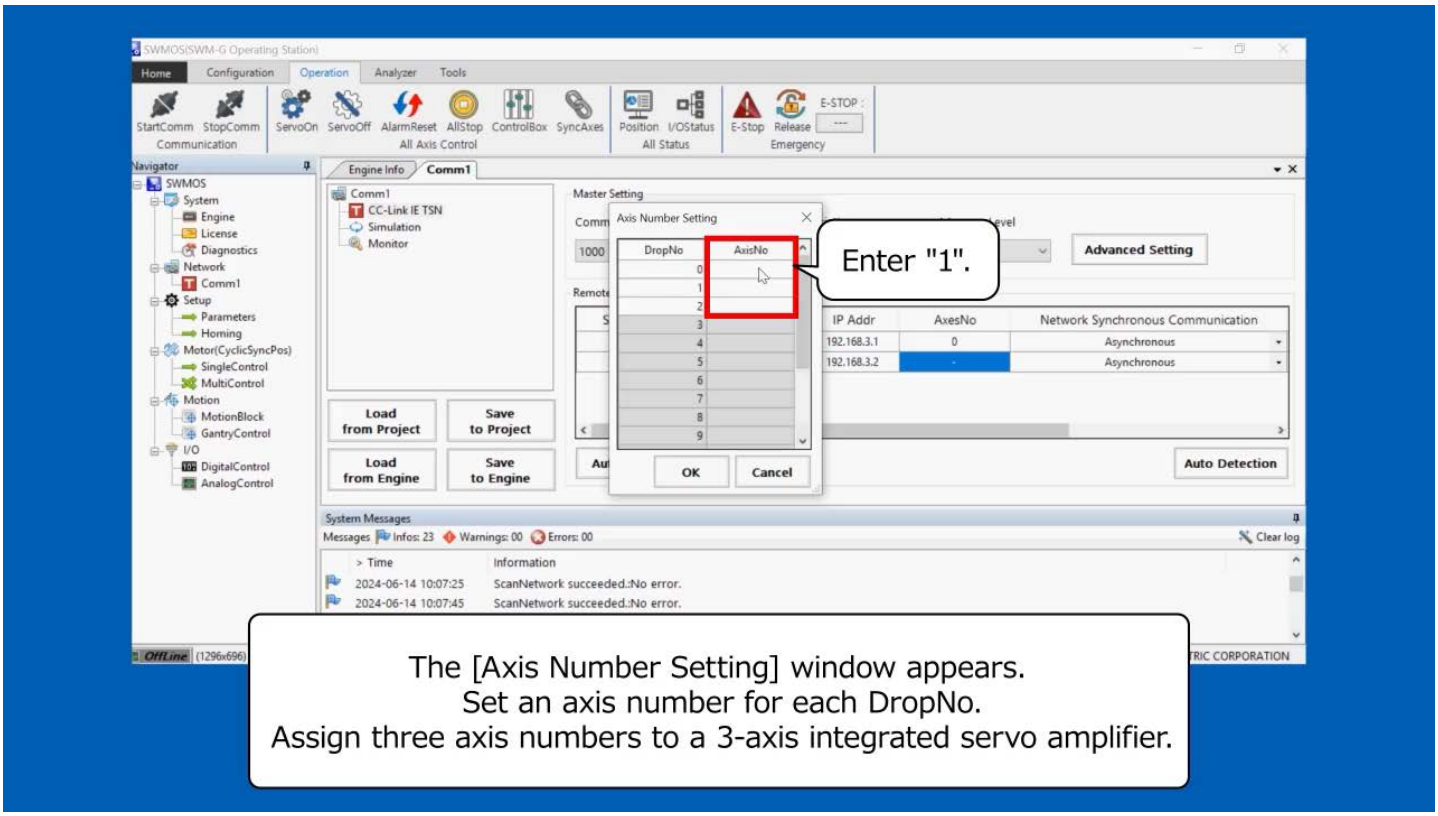
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

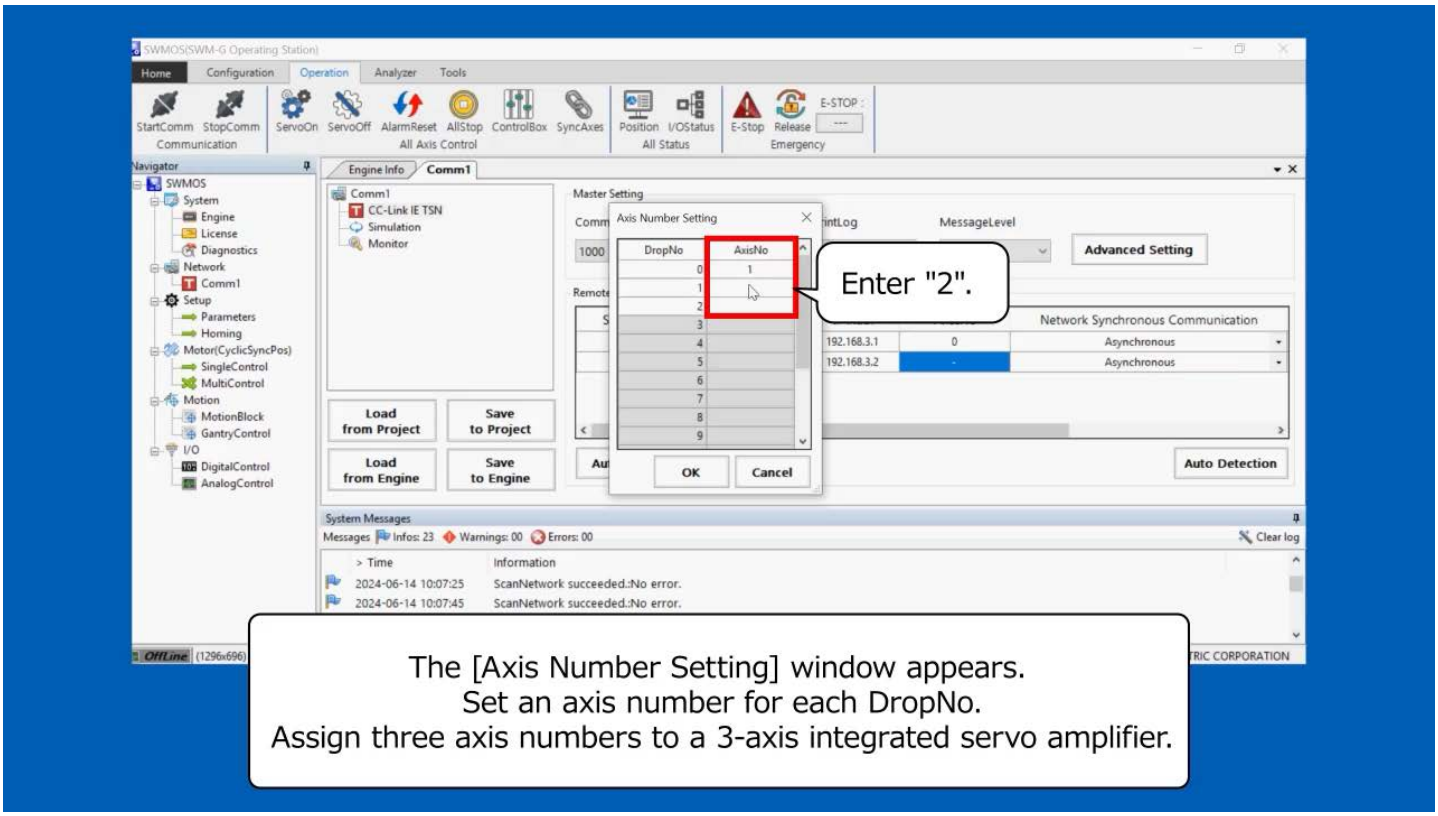
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

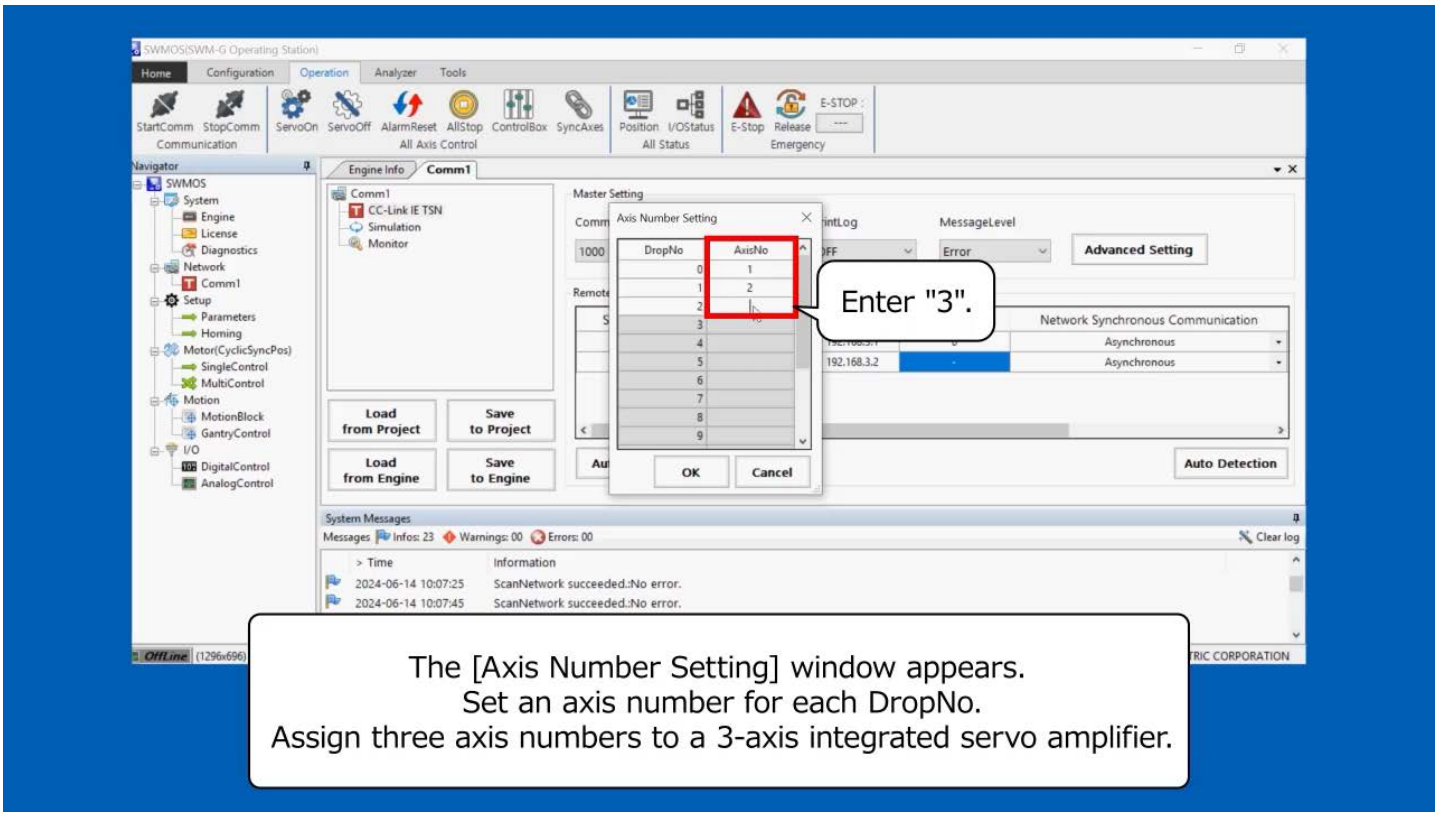
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

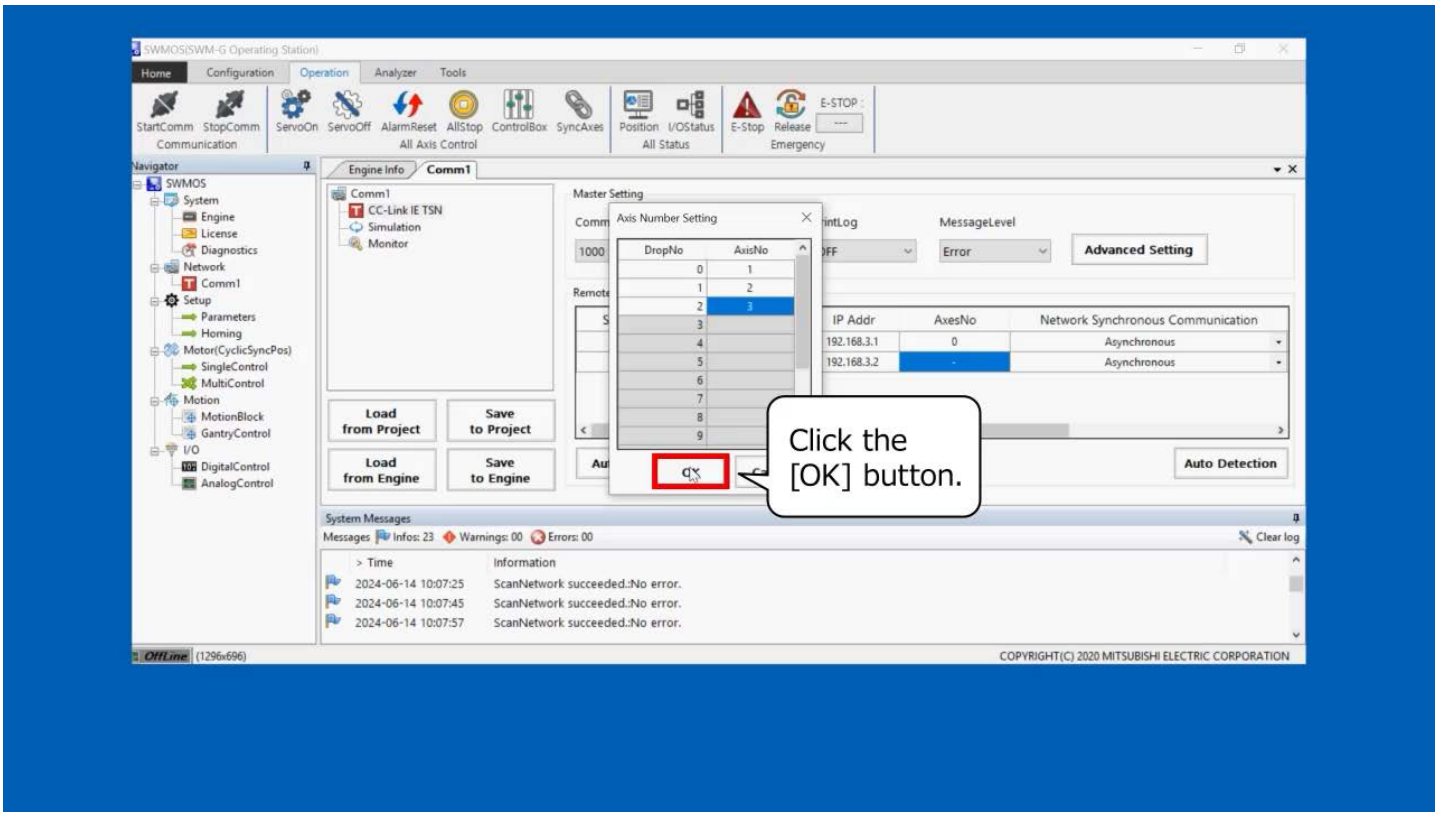
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

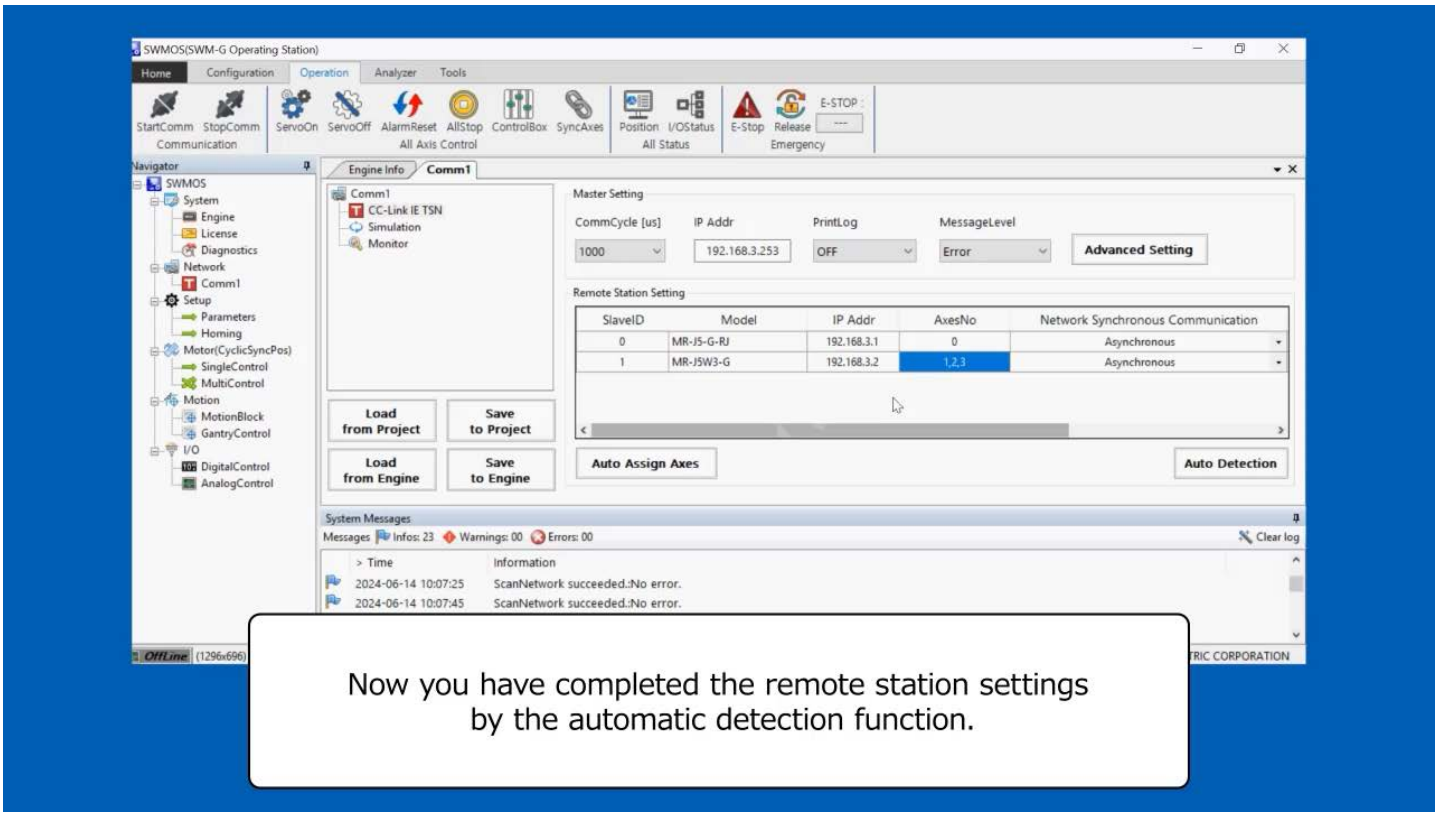
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

2.4.1 Remote station setting by automatic detection function

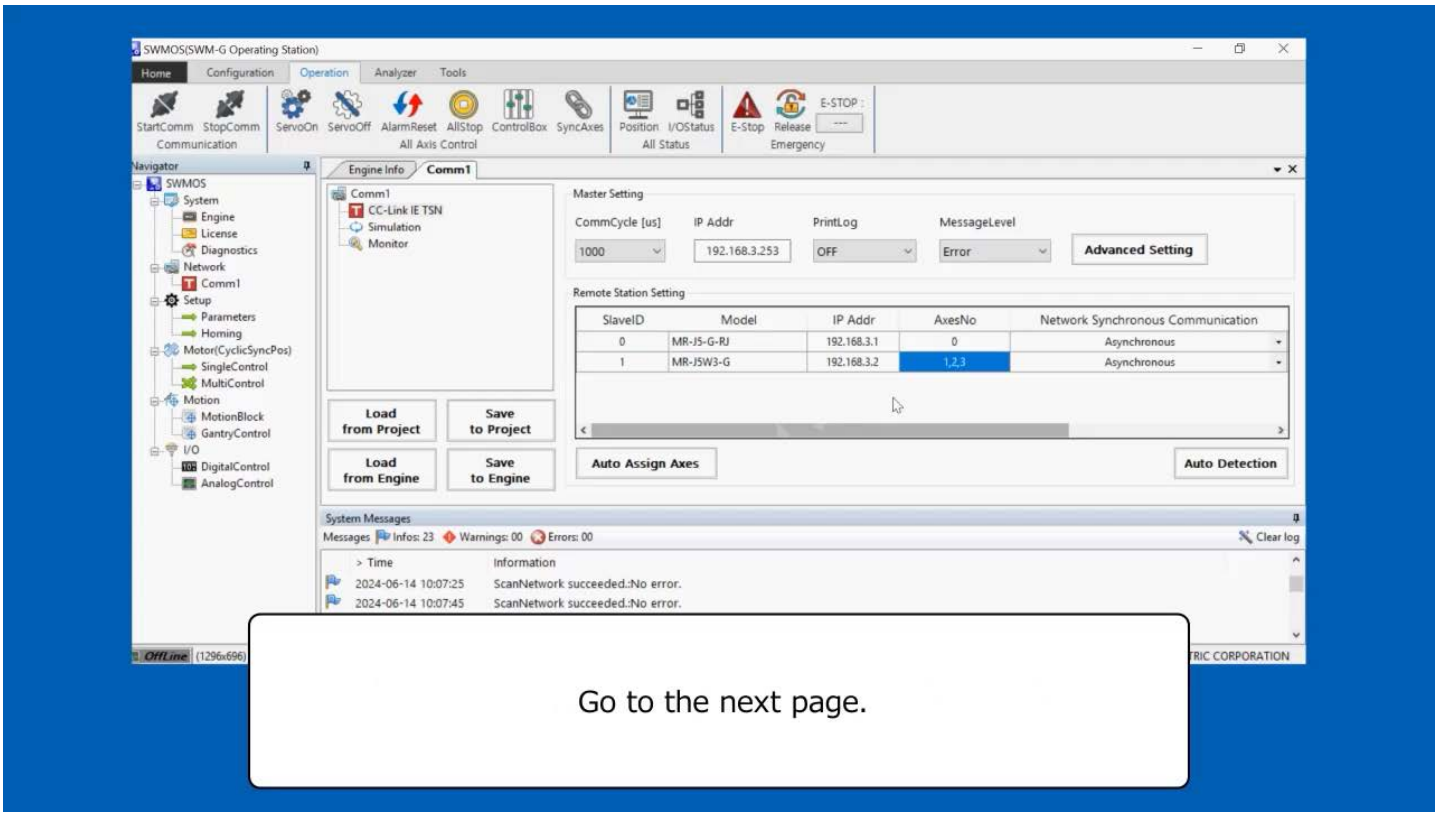
Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



2.4 Remote Station Setting

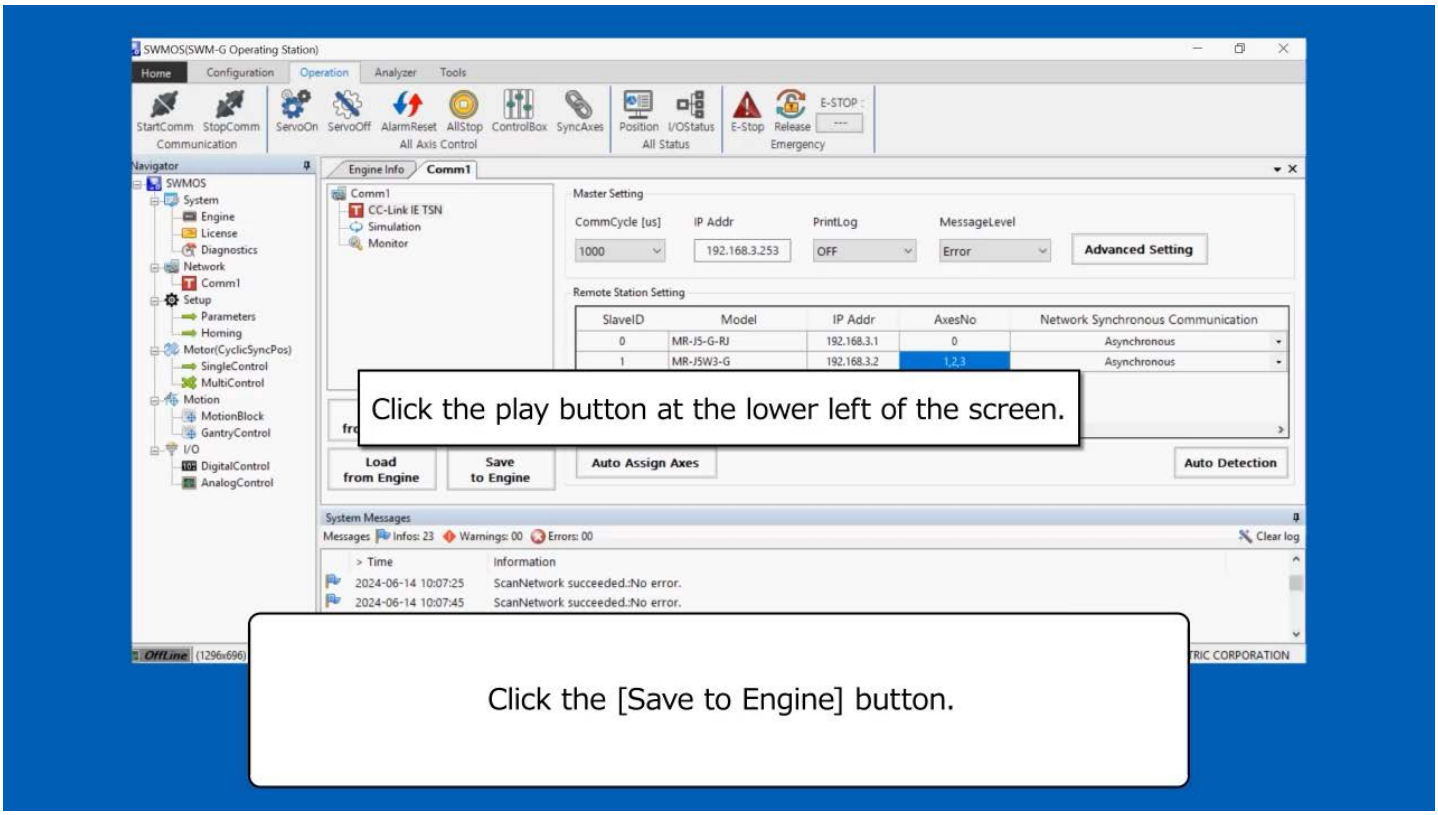
2.4.1 Remote station setting by automatic detection function

Next, this section describes the remote station setting by the automatic detection function.
For the procedure, see the video below.



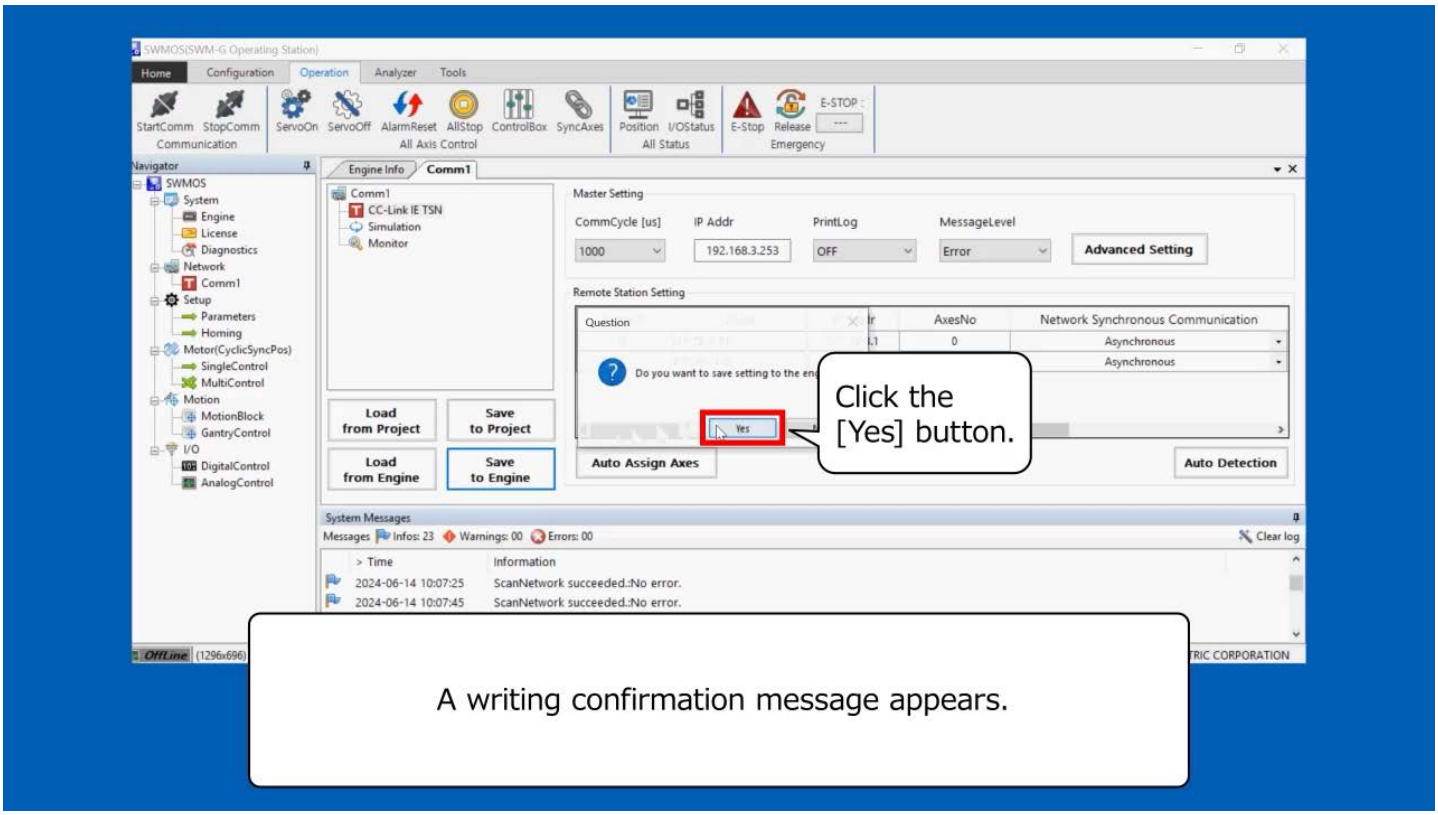
2.4.2 Writing to SWM-G engine

Next, this section describes the procedure for writing the master and remote station settings set in Section 2.3 and 2.4.1 to the engine.
For the procedure, see the video below.



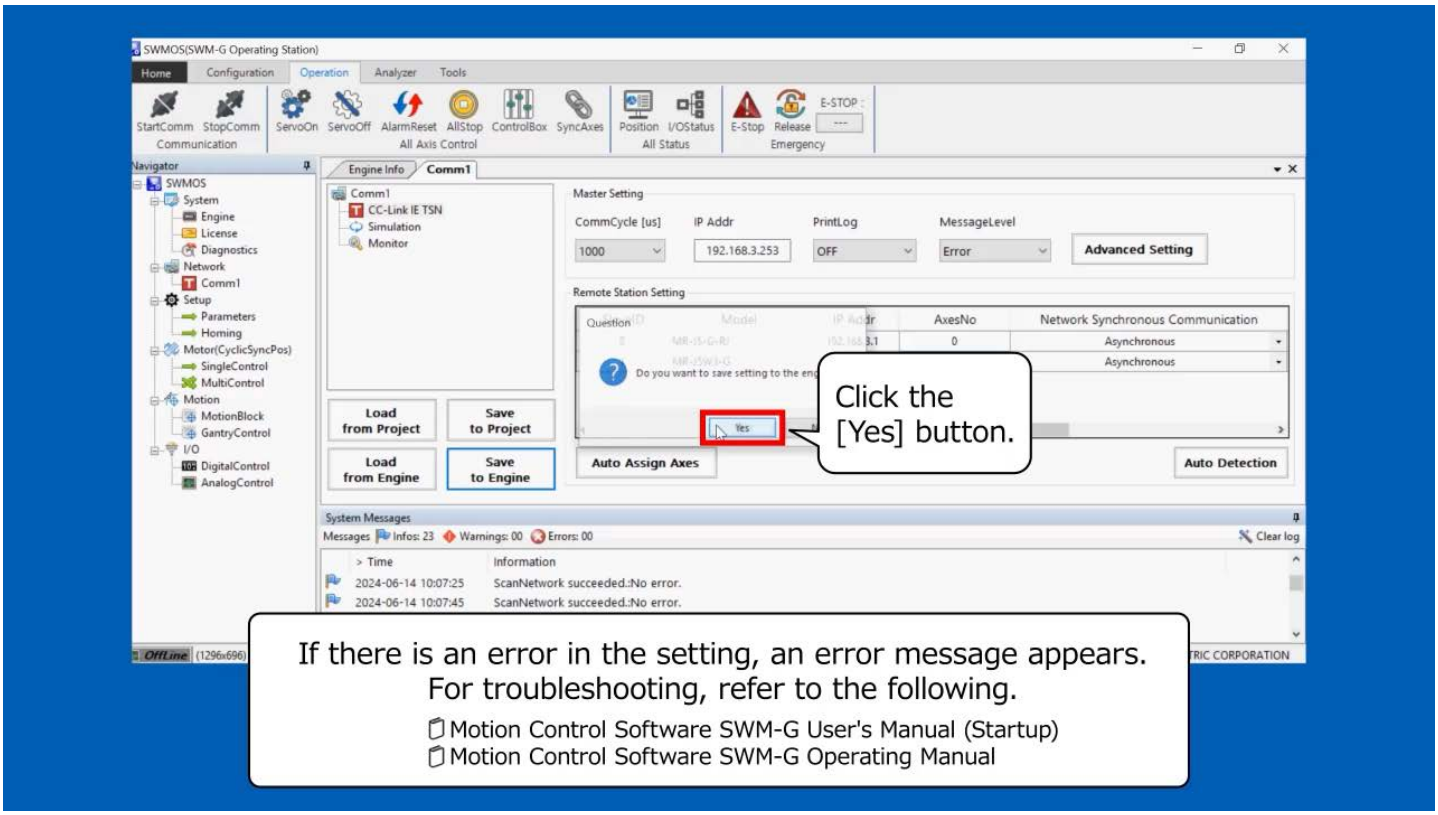
2.4.2 Writing to SWM-G engine

Next, this section describes the procedure for writing the master and remote station settings set in Section 2.3 and 2.4.1 to the engine.
For the procedure, see the video below.



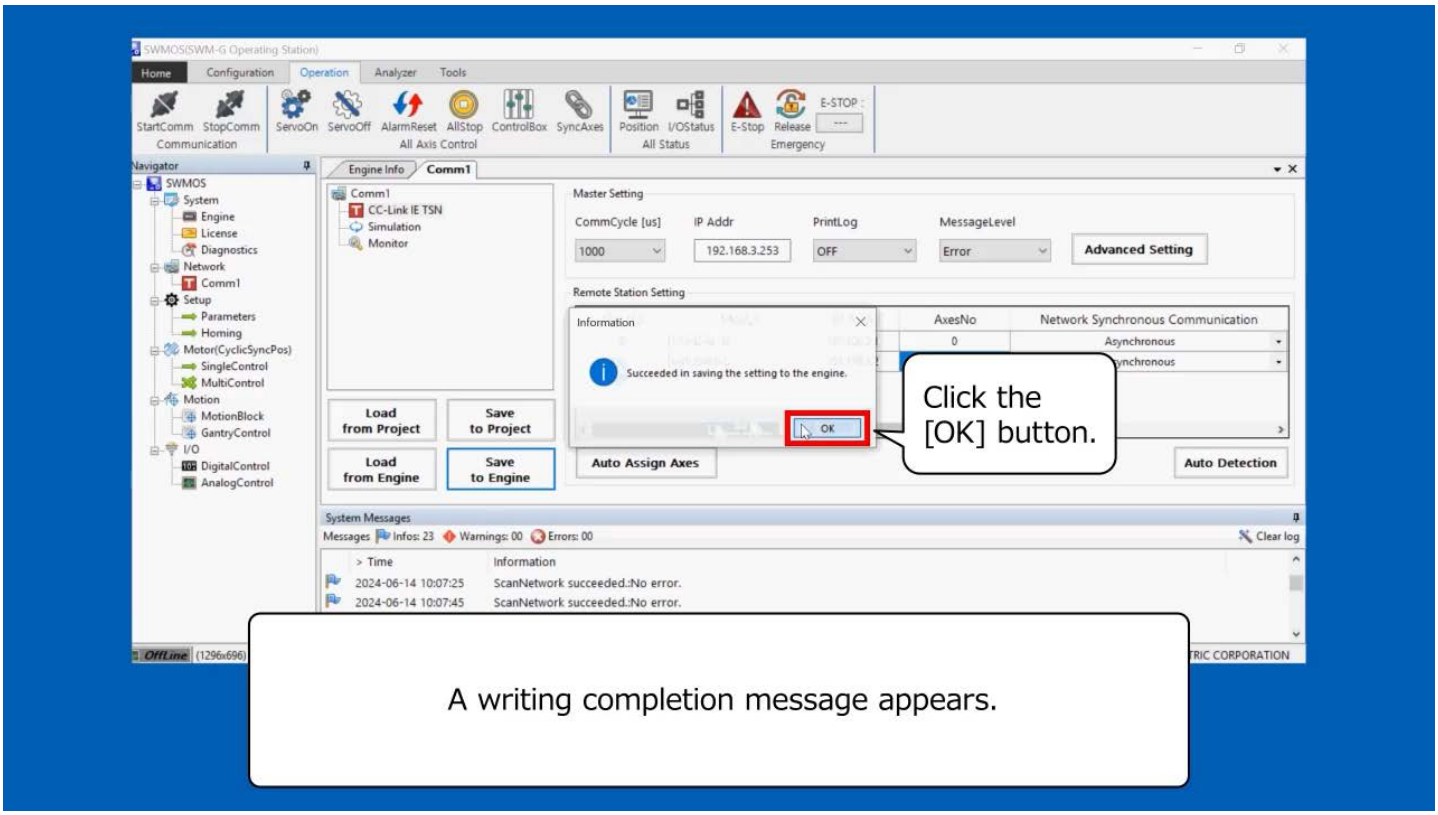
2.4.2 Writing to SWM-G engine

Next, this section describes the procedure for writing the master and remote station settings set in Section 2.3 and 2.4.1 to the engine.
For the procedure, see the video below.



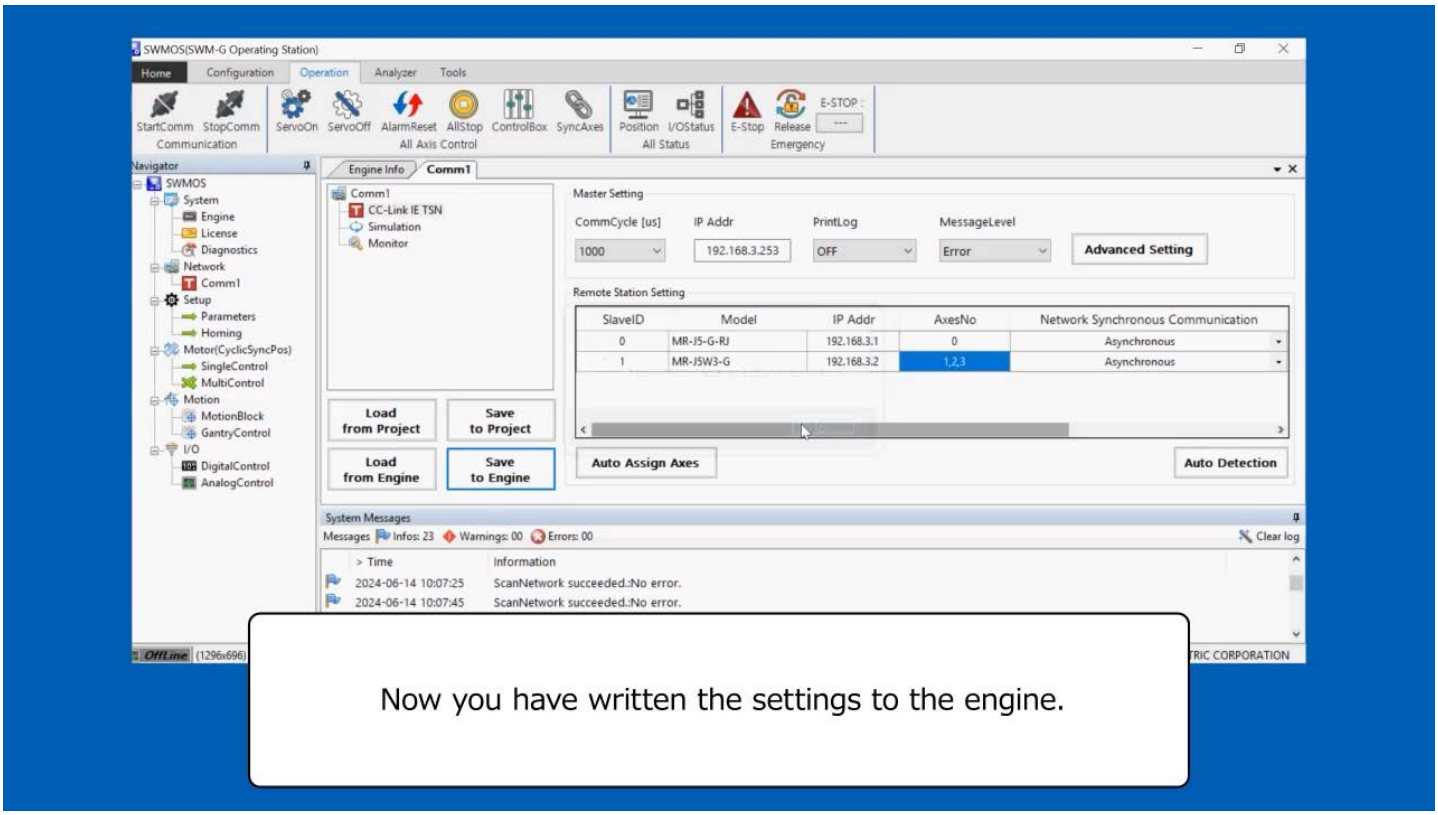
2.4.2 Writing to SWM-G engine

Next, this section describes the procedure for writing the master and remote station settings set in Section 2.3 and 2.4.1 to the engine.
For the procedure, see the video below.



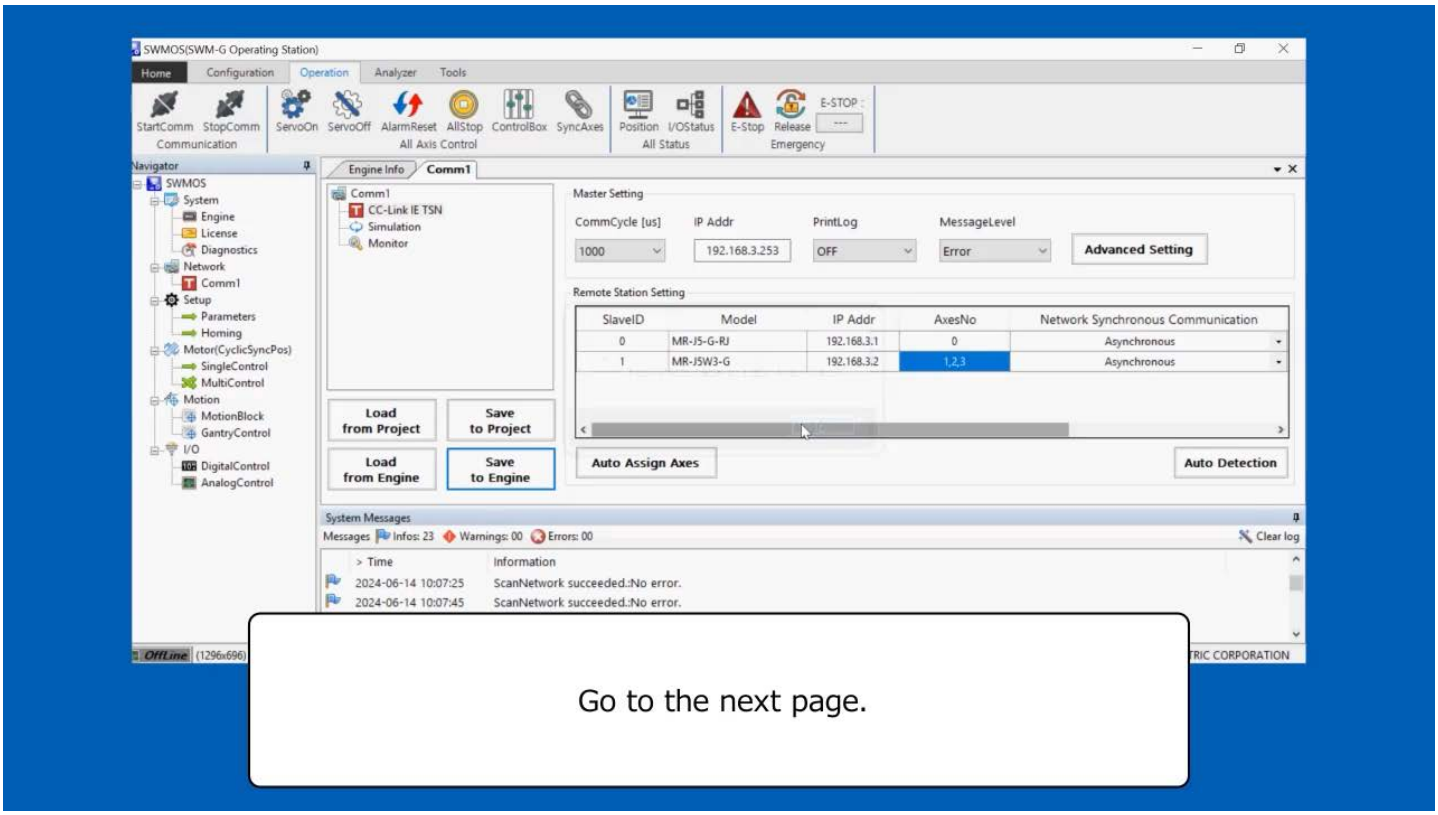
2.4.2 Writing to SWM-G engine

Next, this section describes the procedure for writing the master and remote station settings set in Section 2.3 and 2.4.1 to the engine.
For the procedure, see the video below.



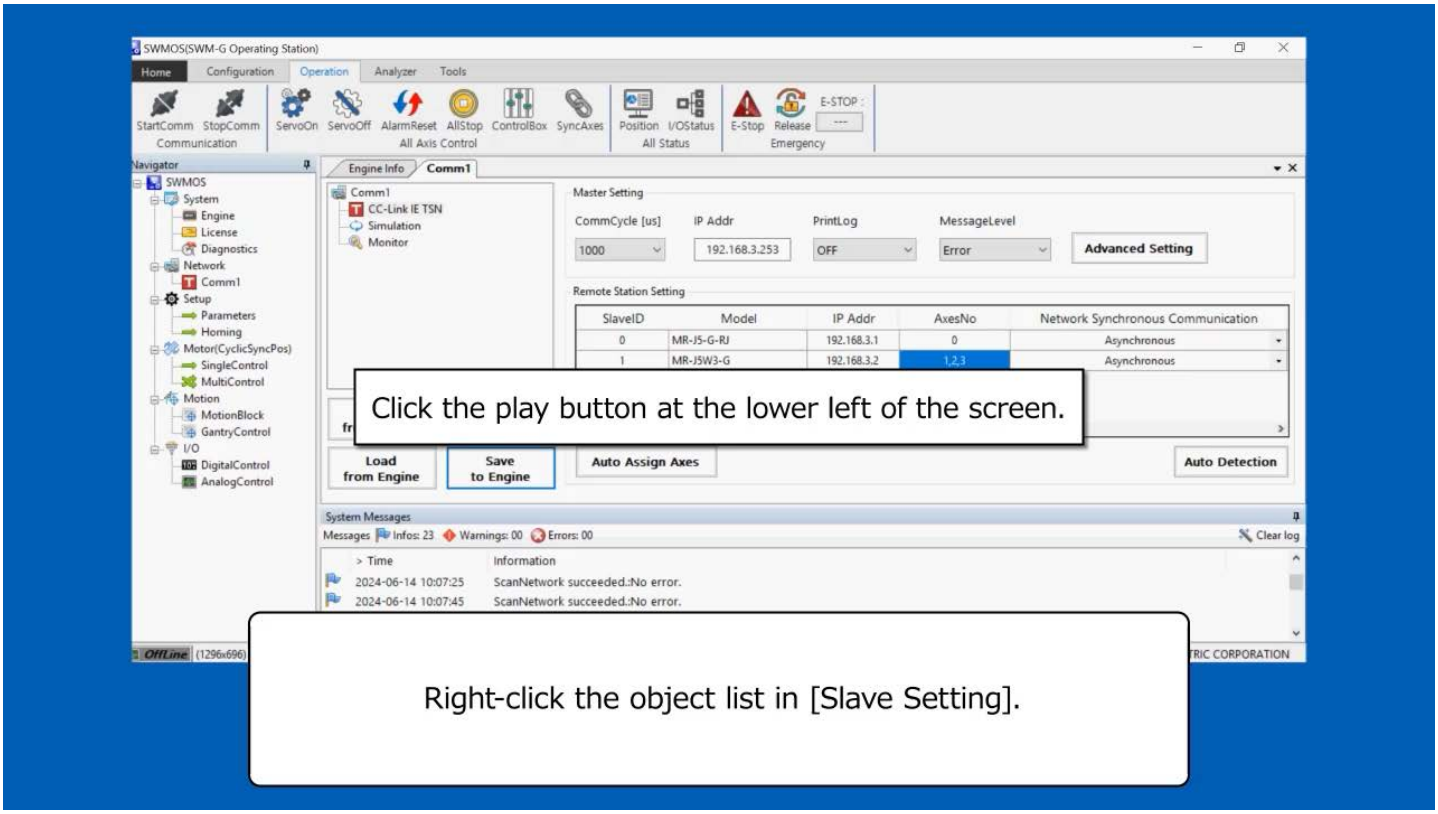
2.4.2 Writing to SWM-G engine

Next, this section describes the procedure for writing the master and remote station settings set in Section 2.3 and 2.4.1 to the engine.
For the procedure, see the video below.



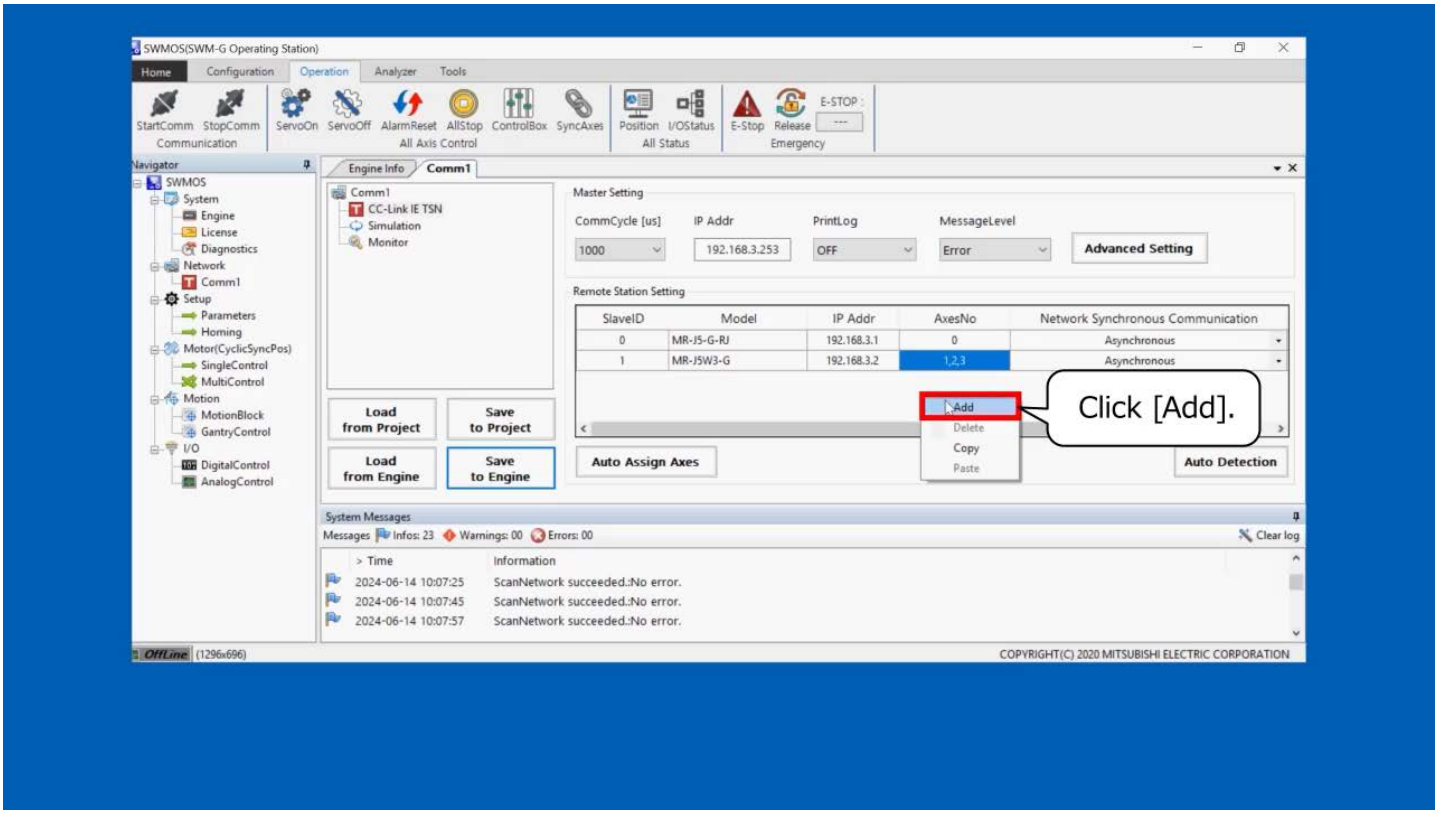
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



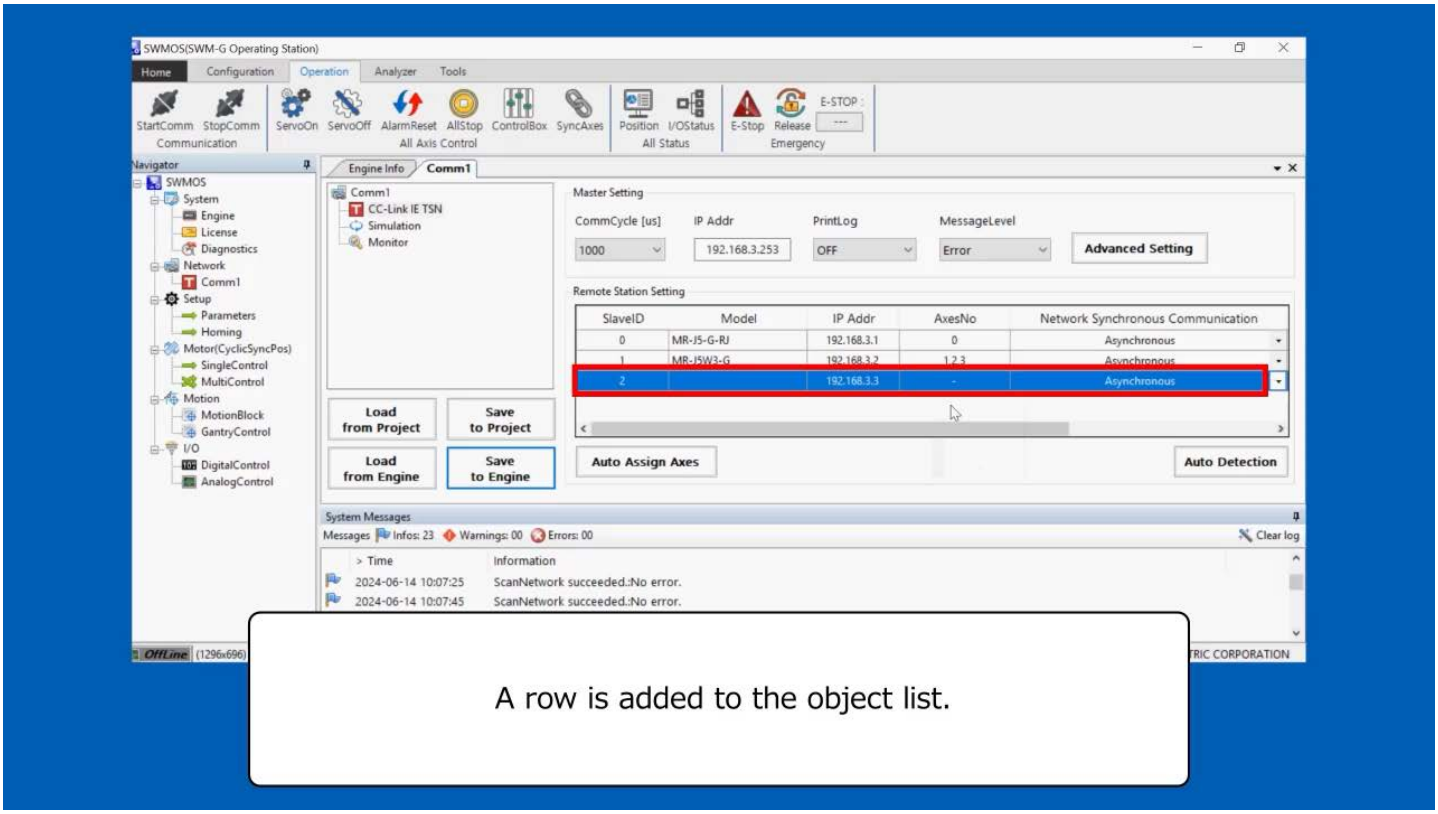
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



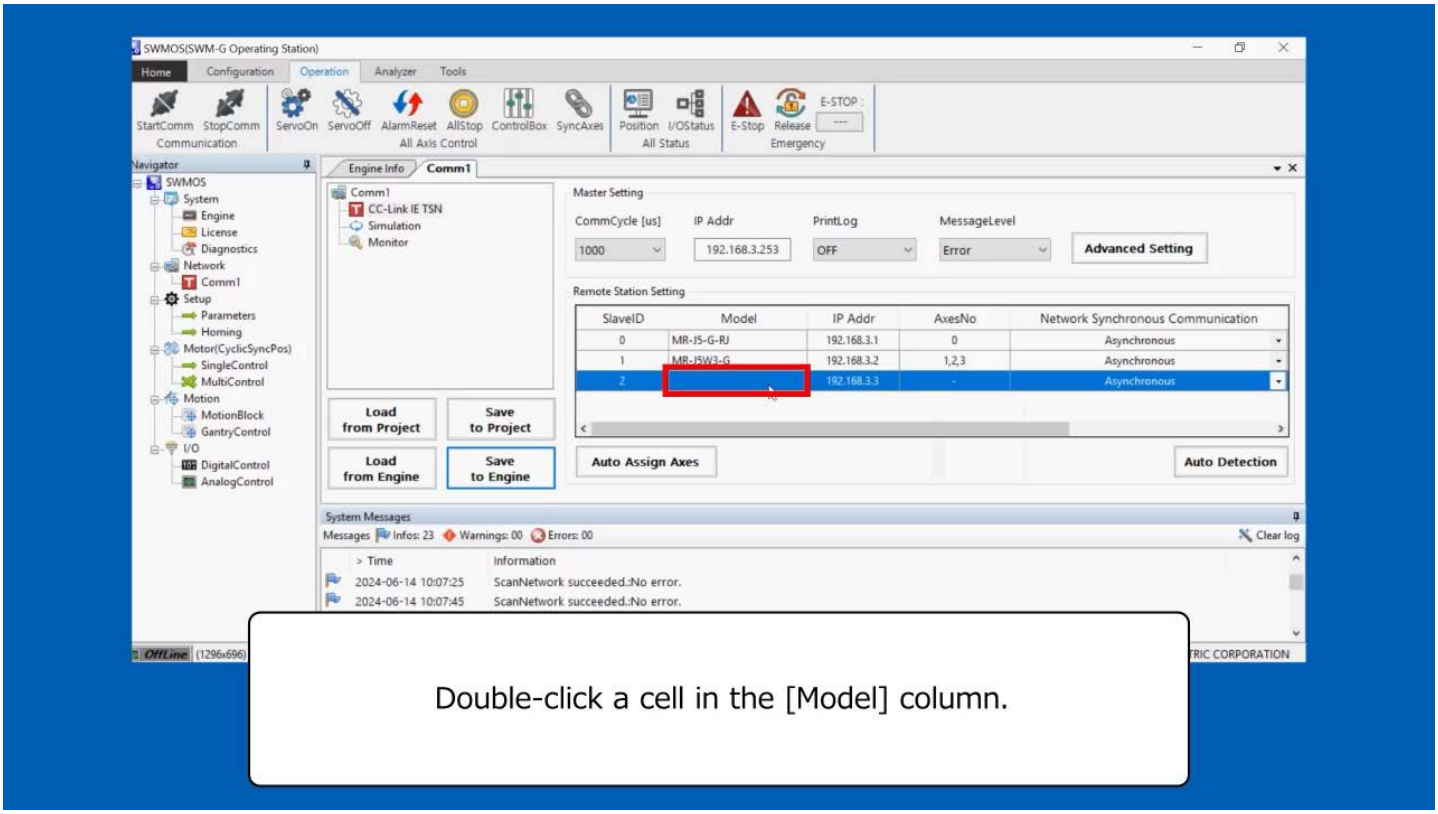
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



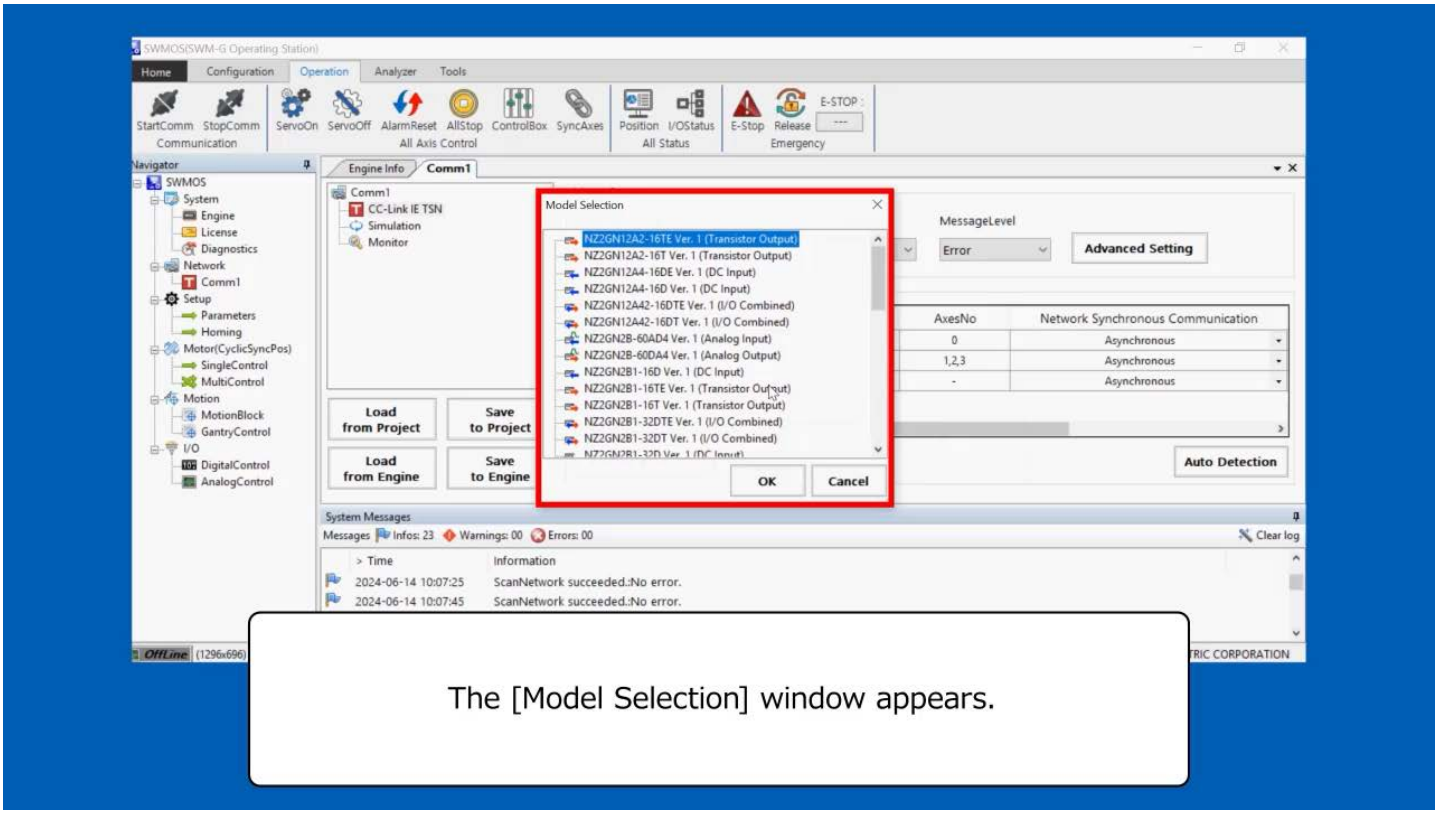
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



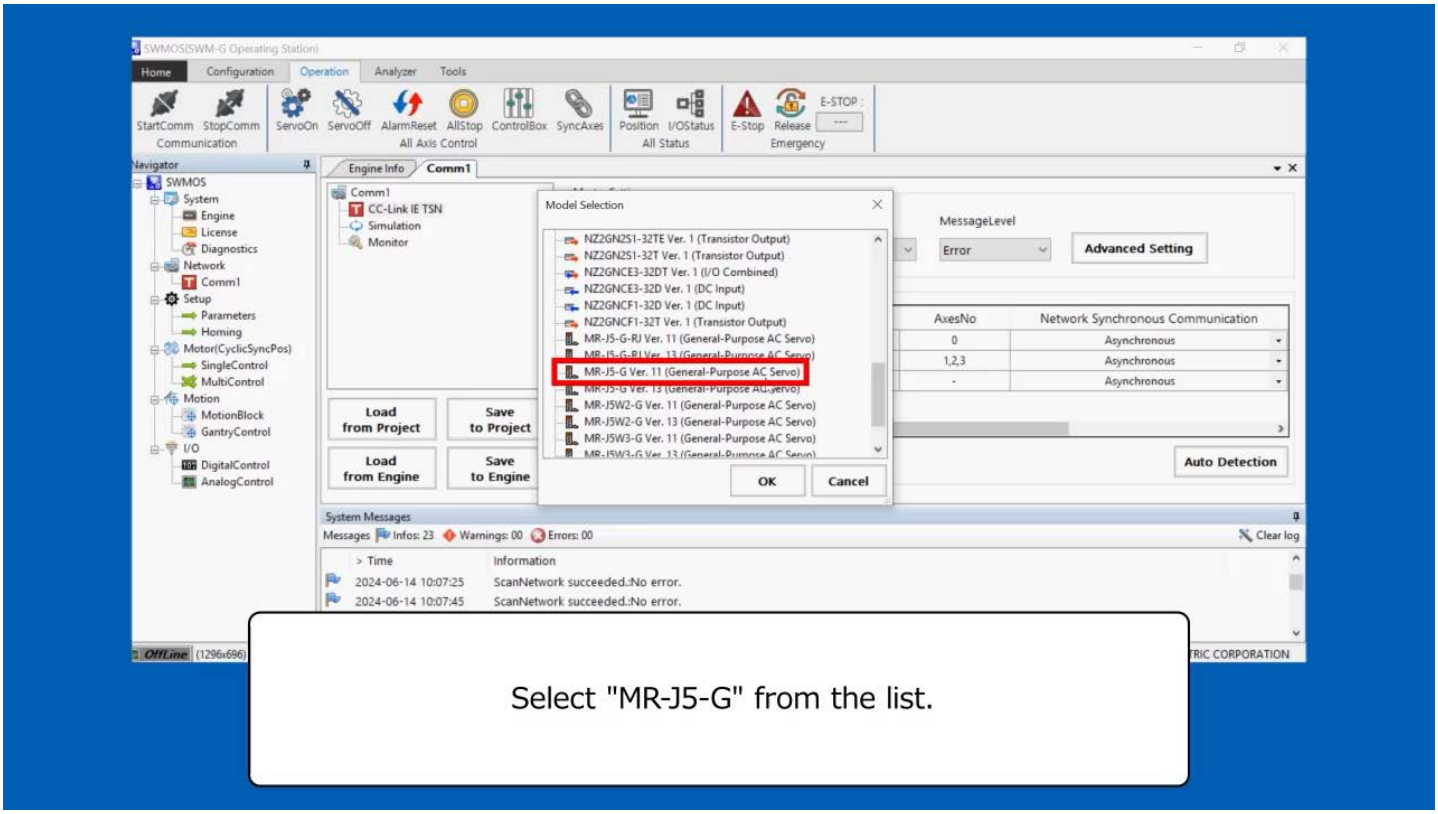
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



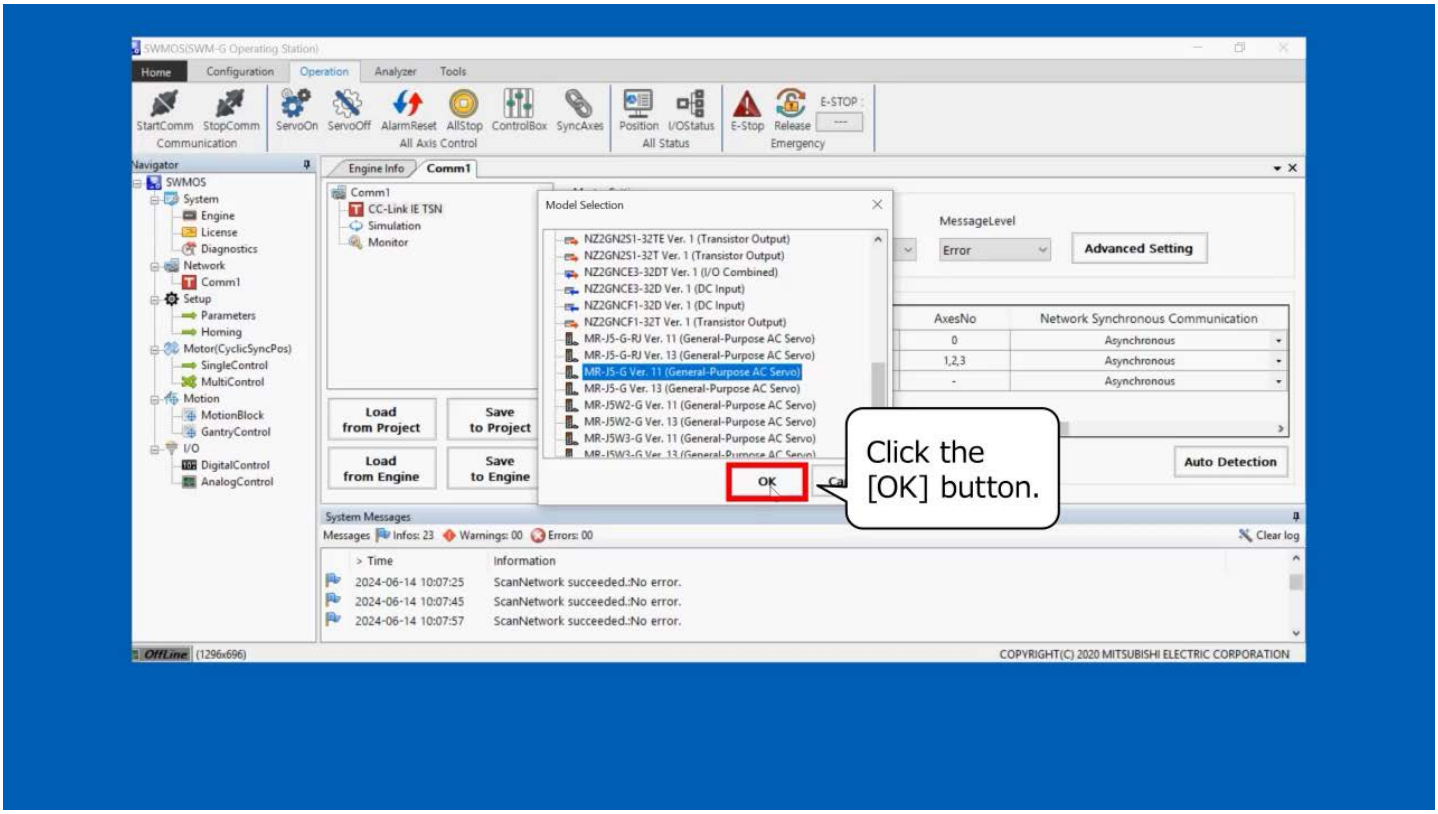
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



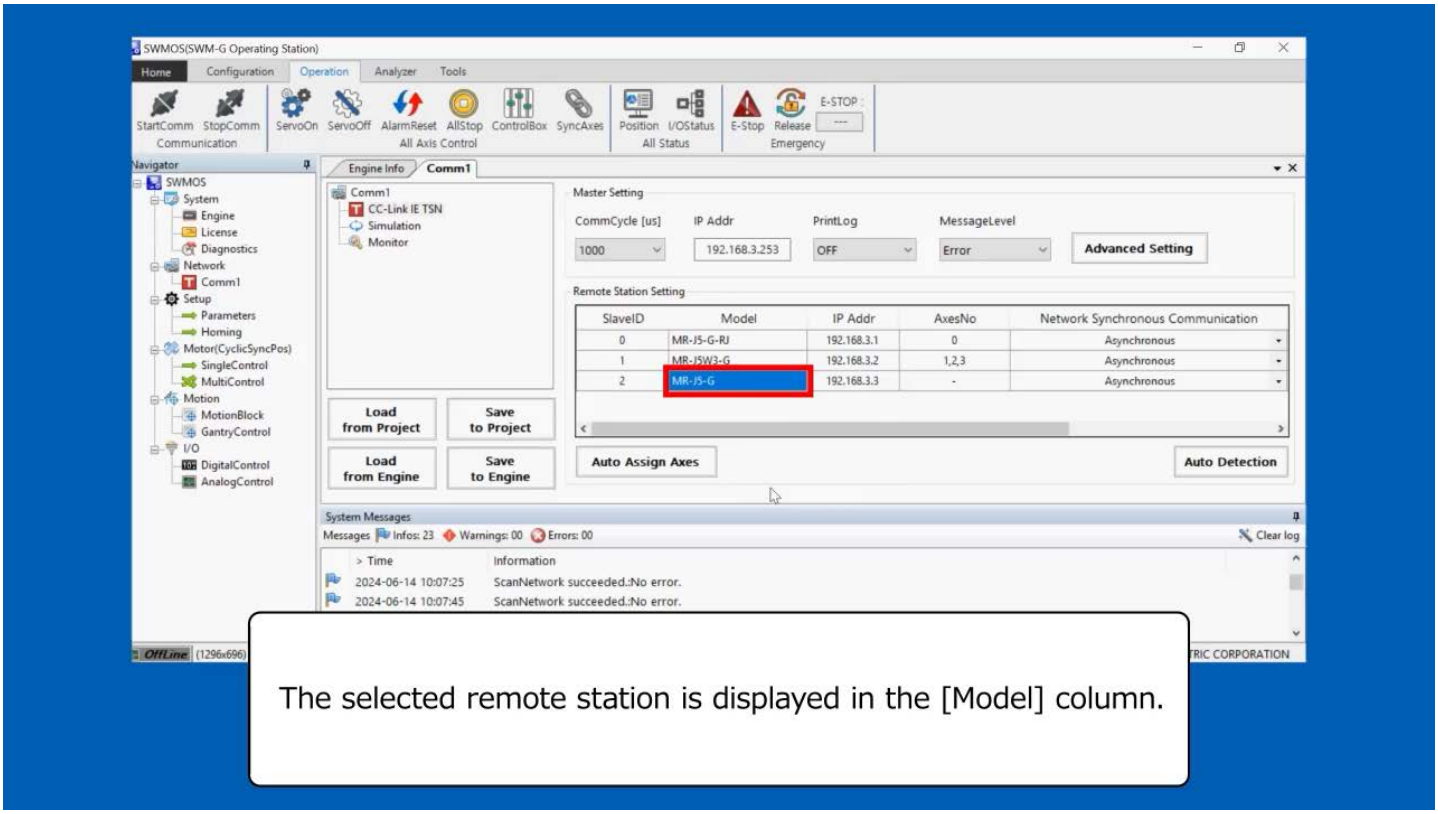
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



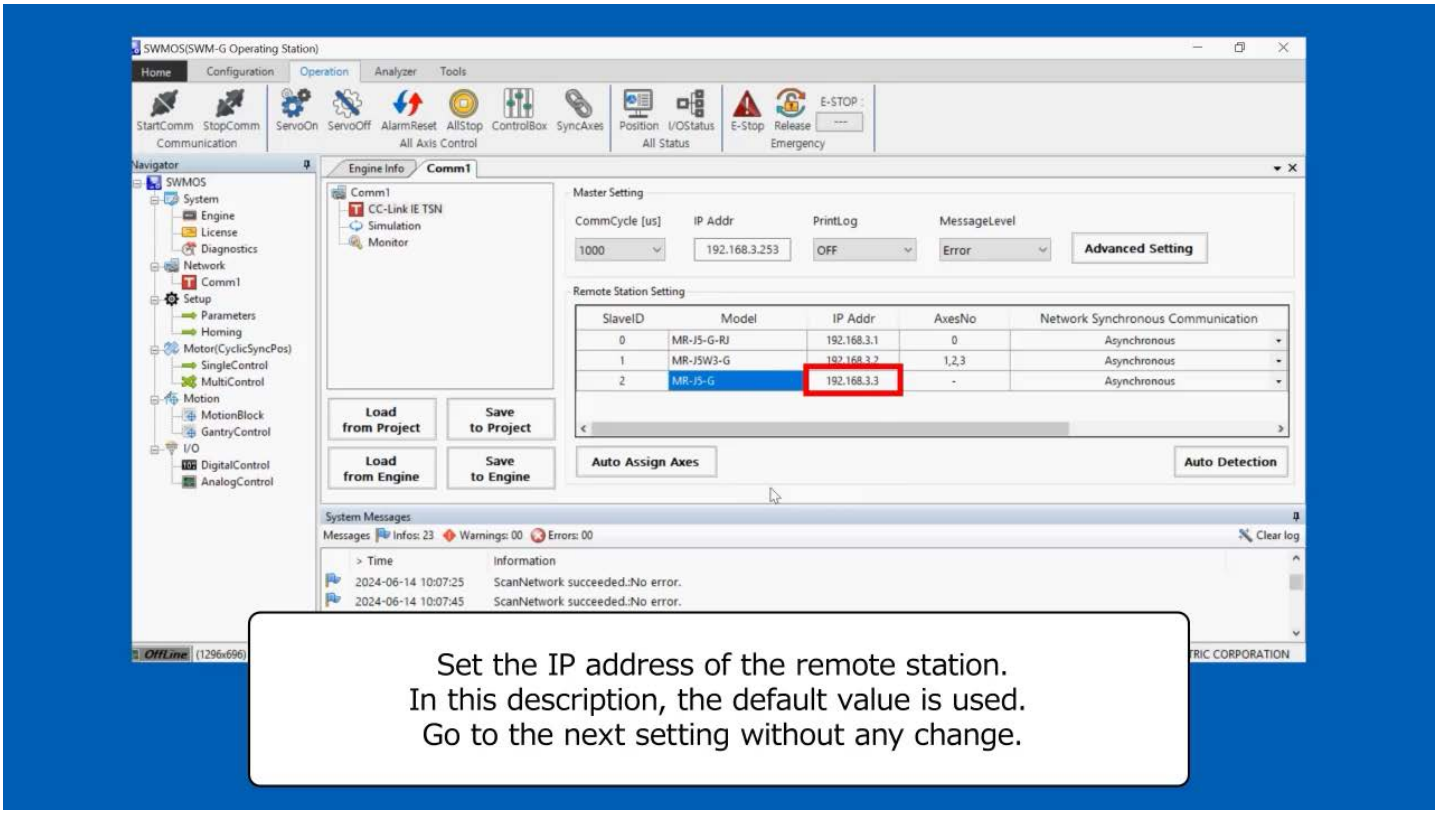
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



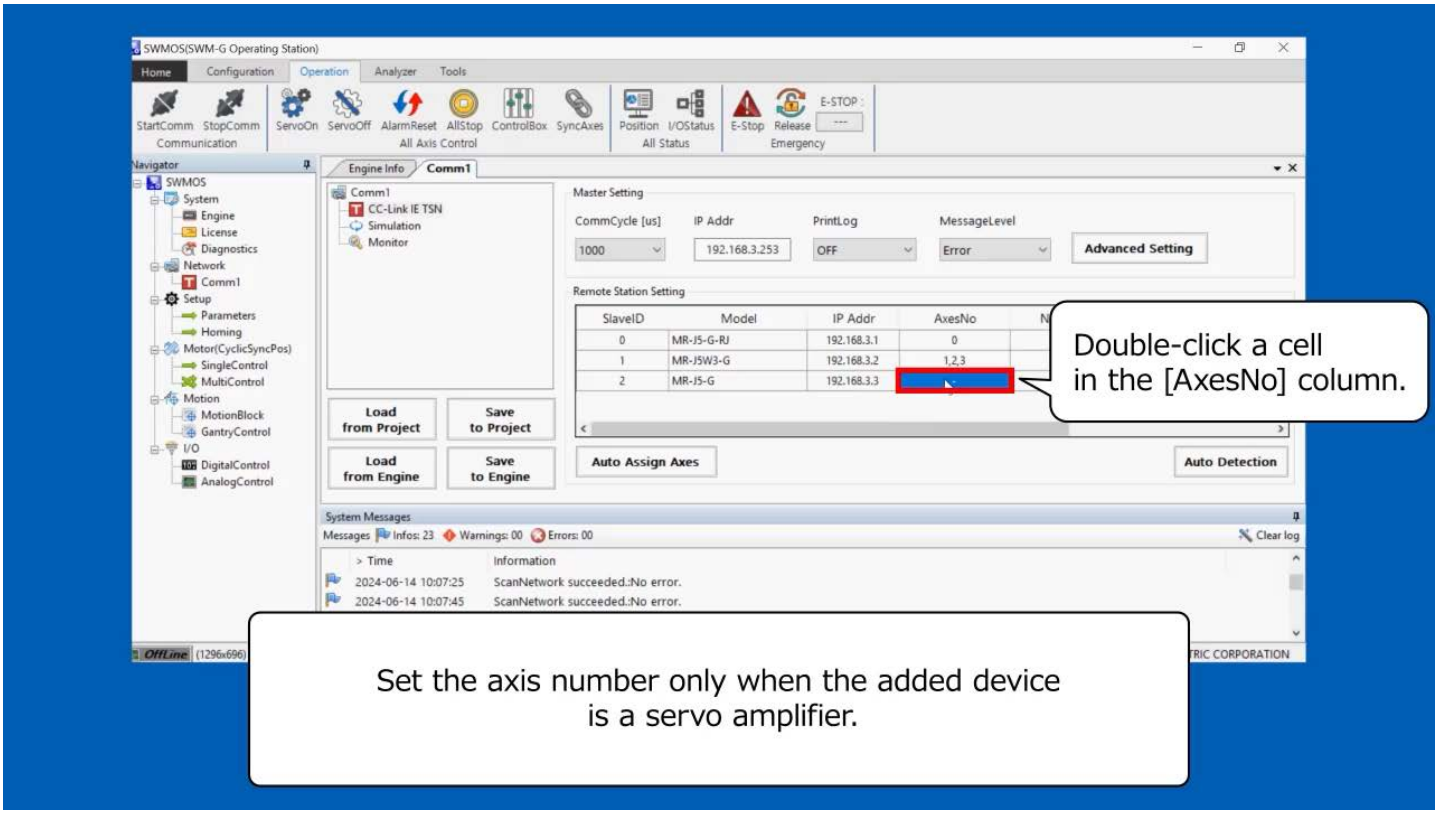
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



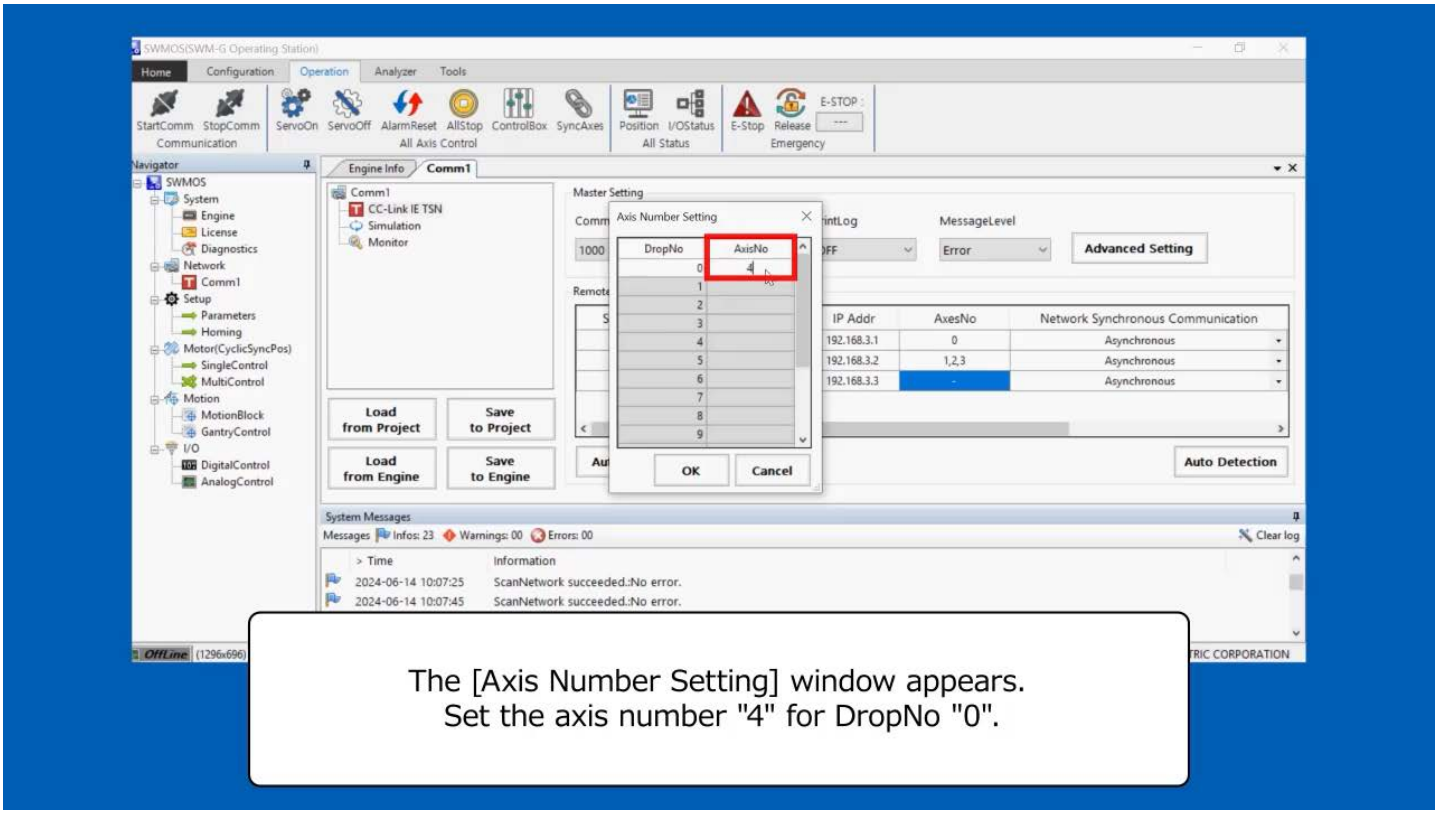
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



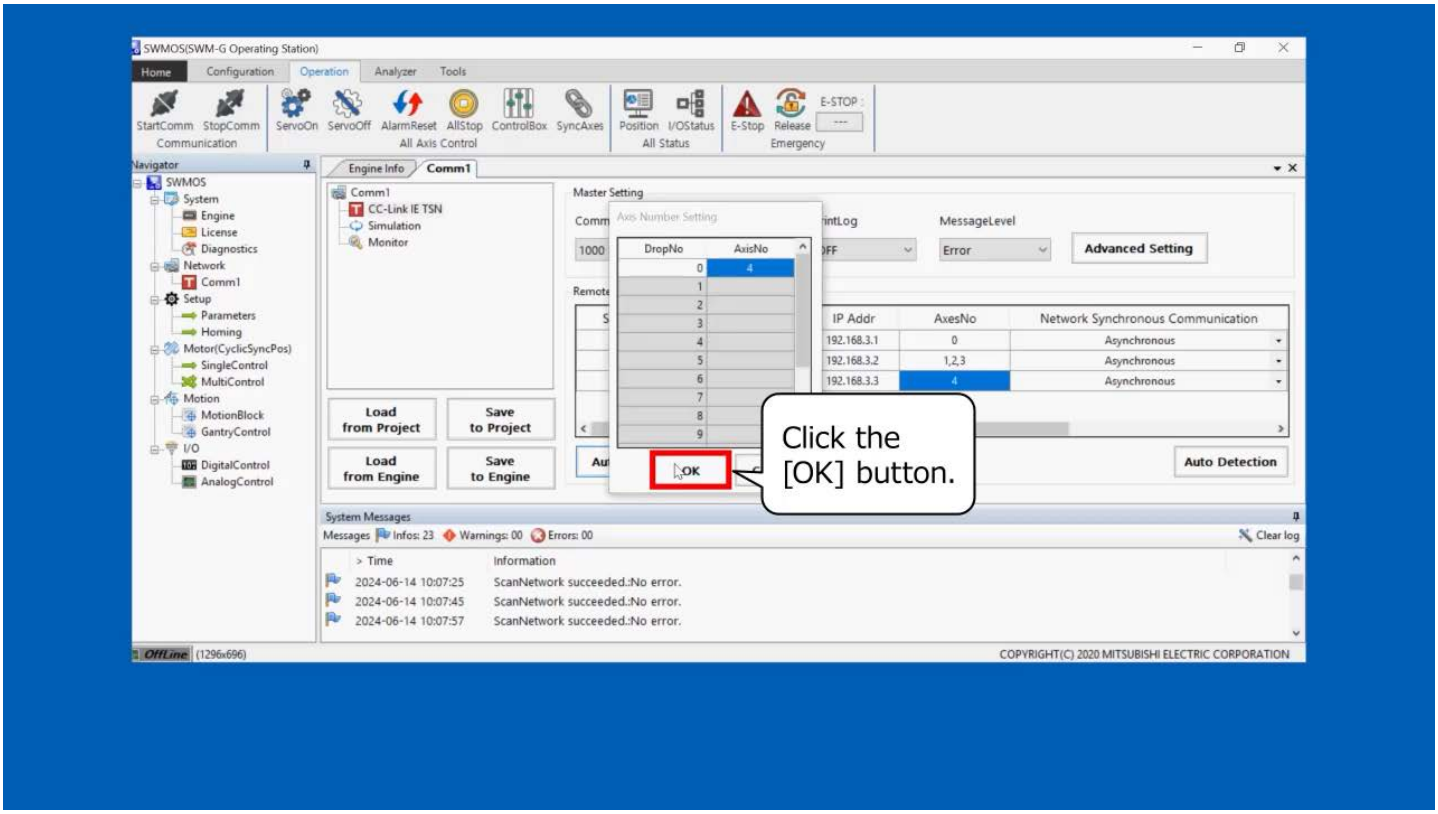
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



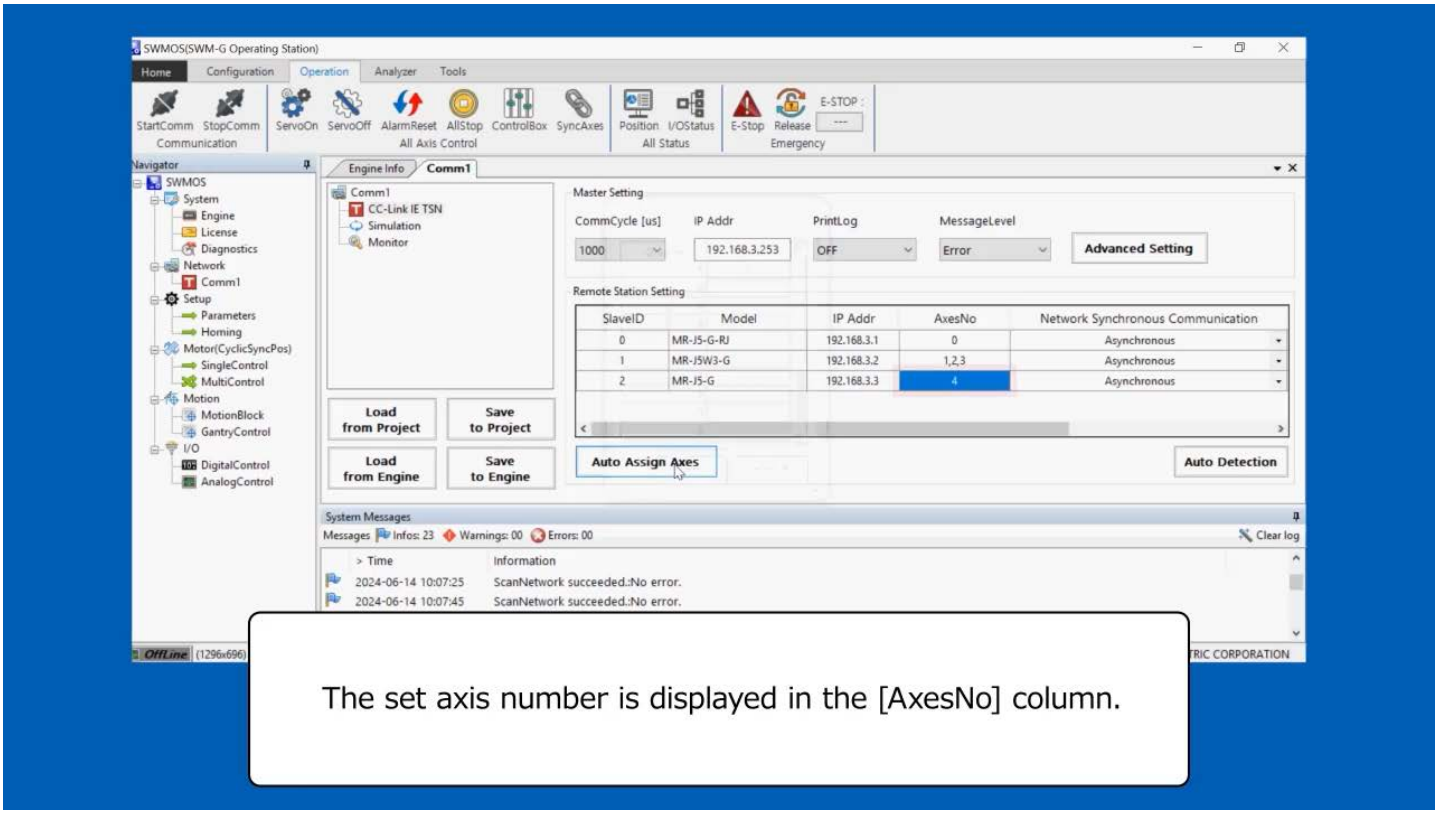
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



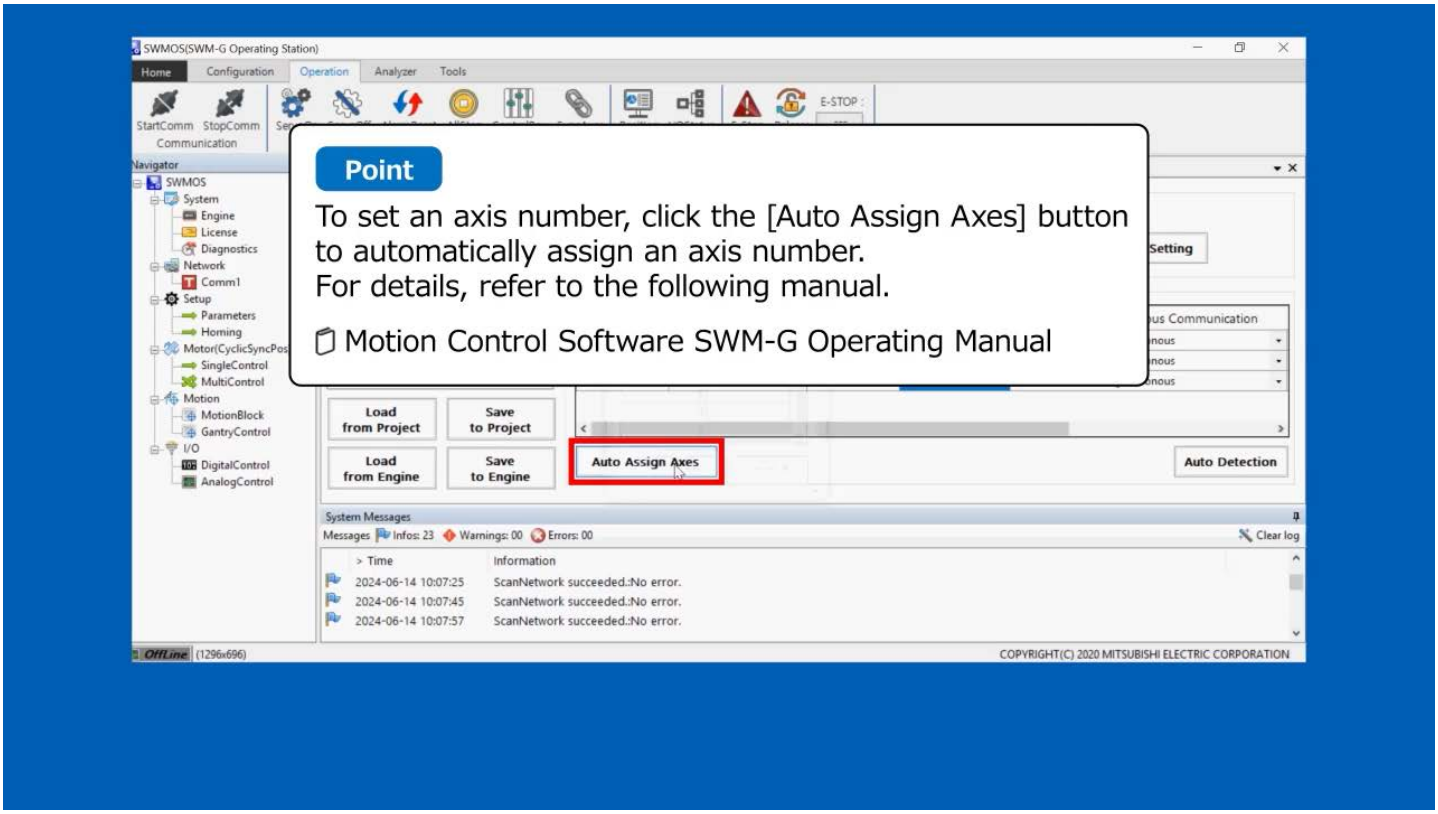
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



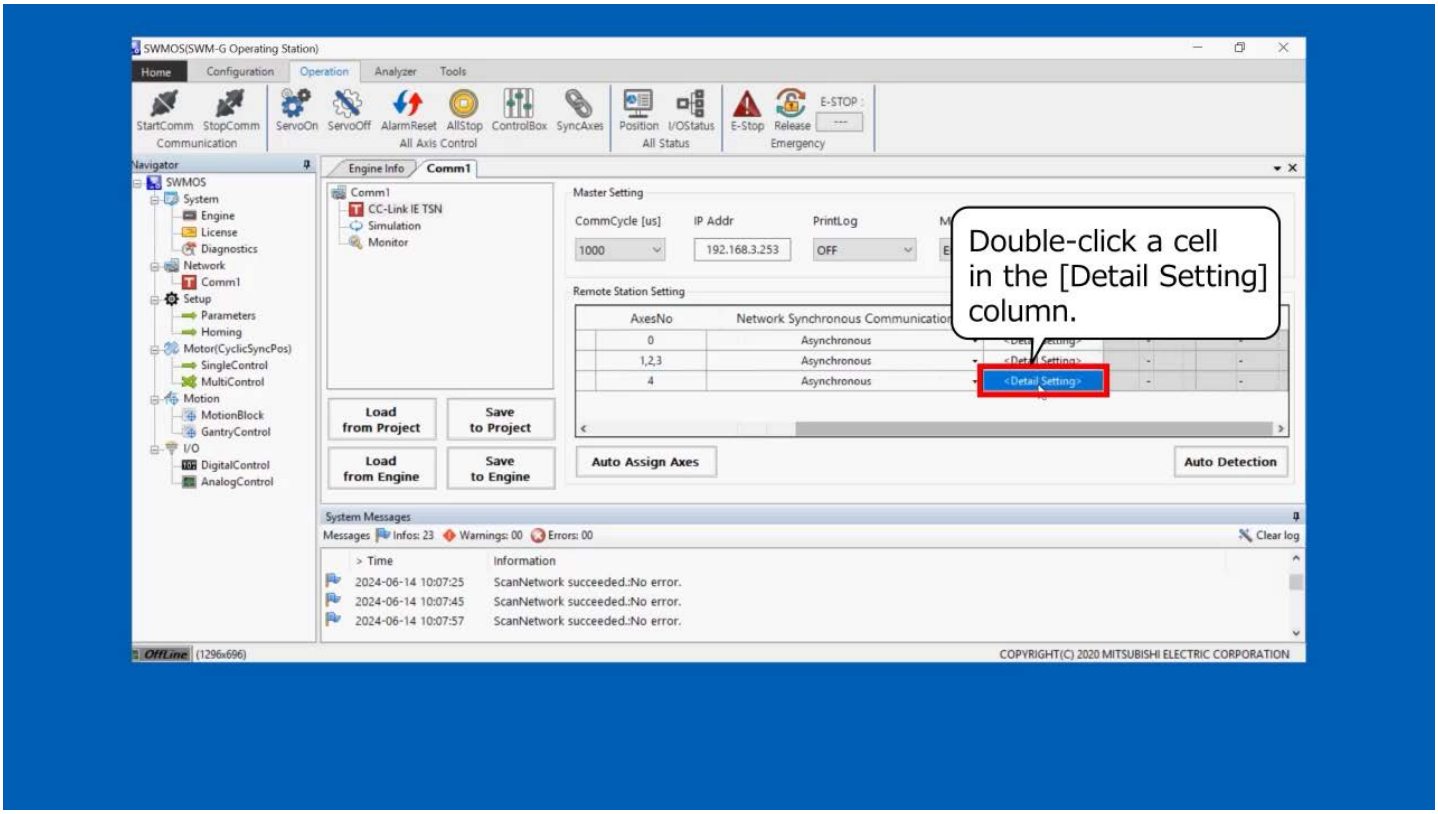
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



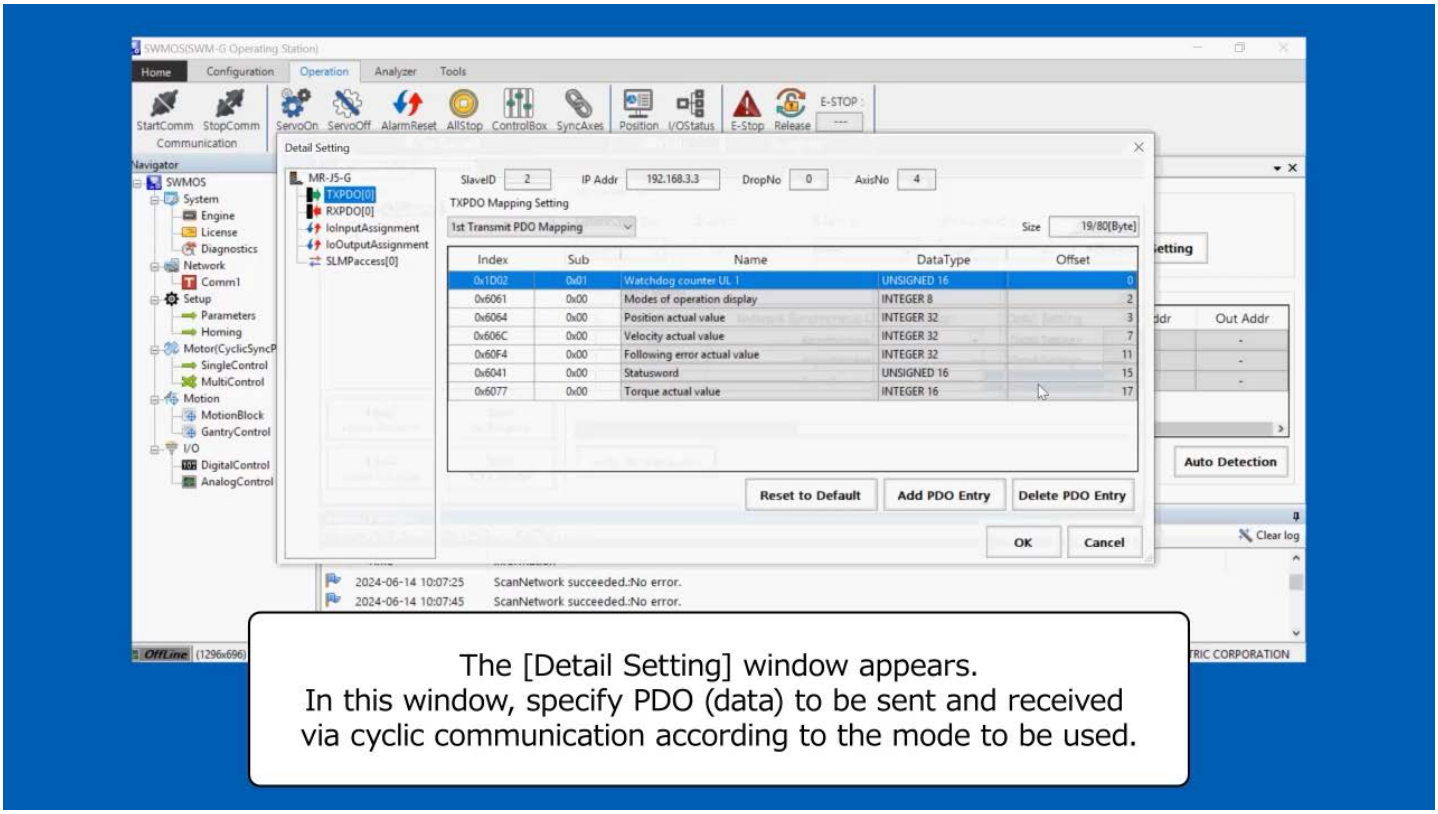
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



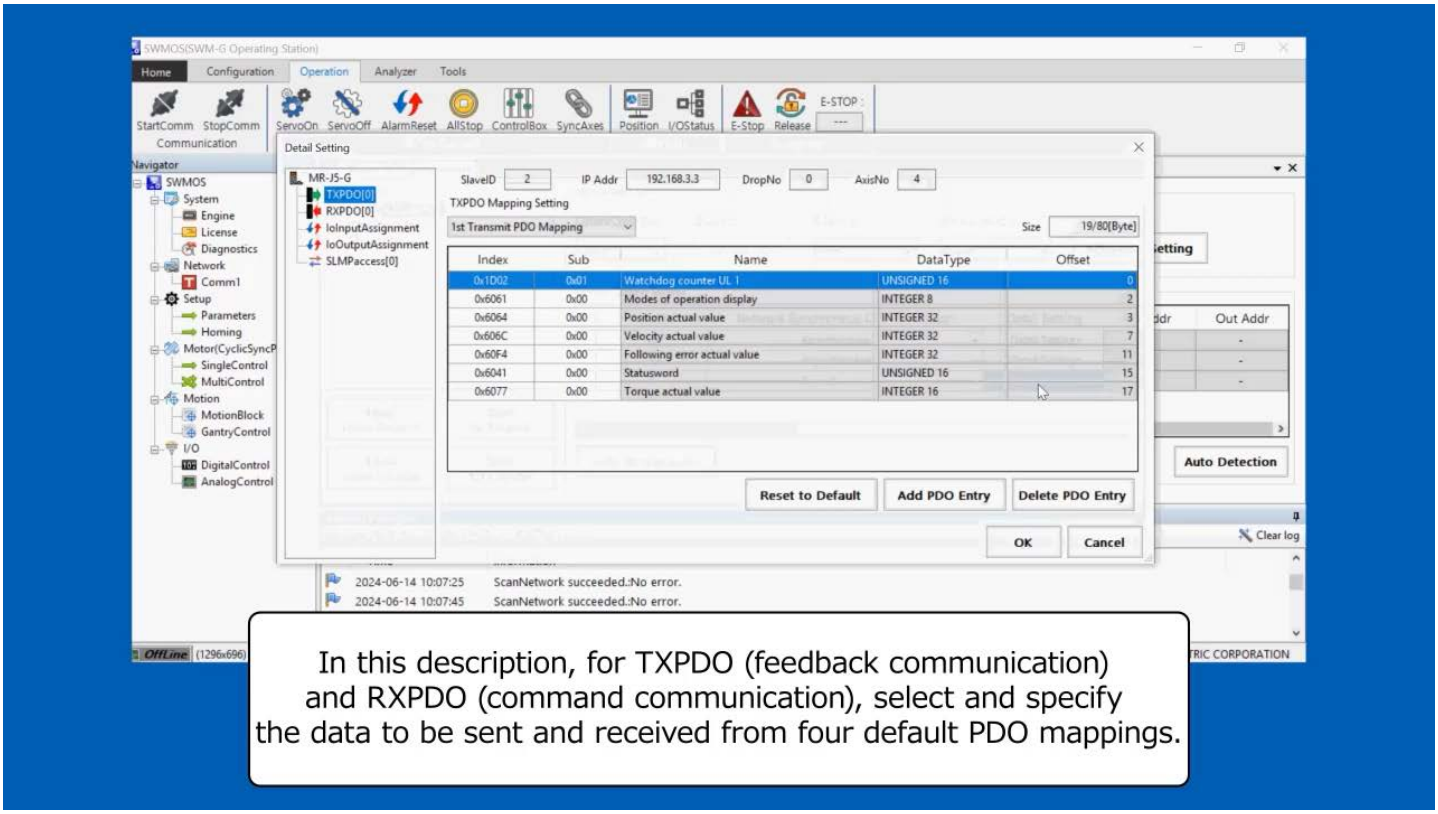
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



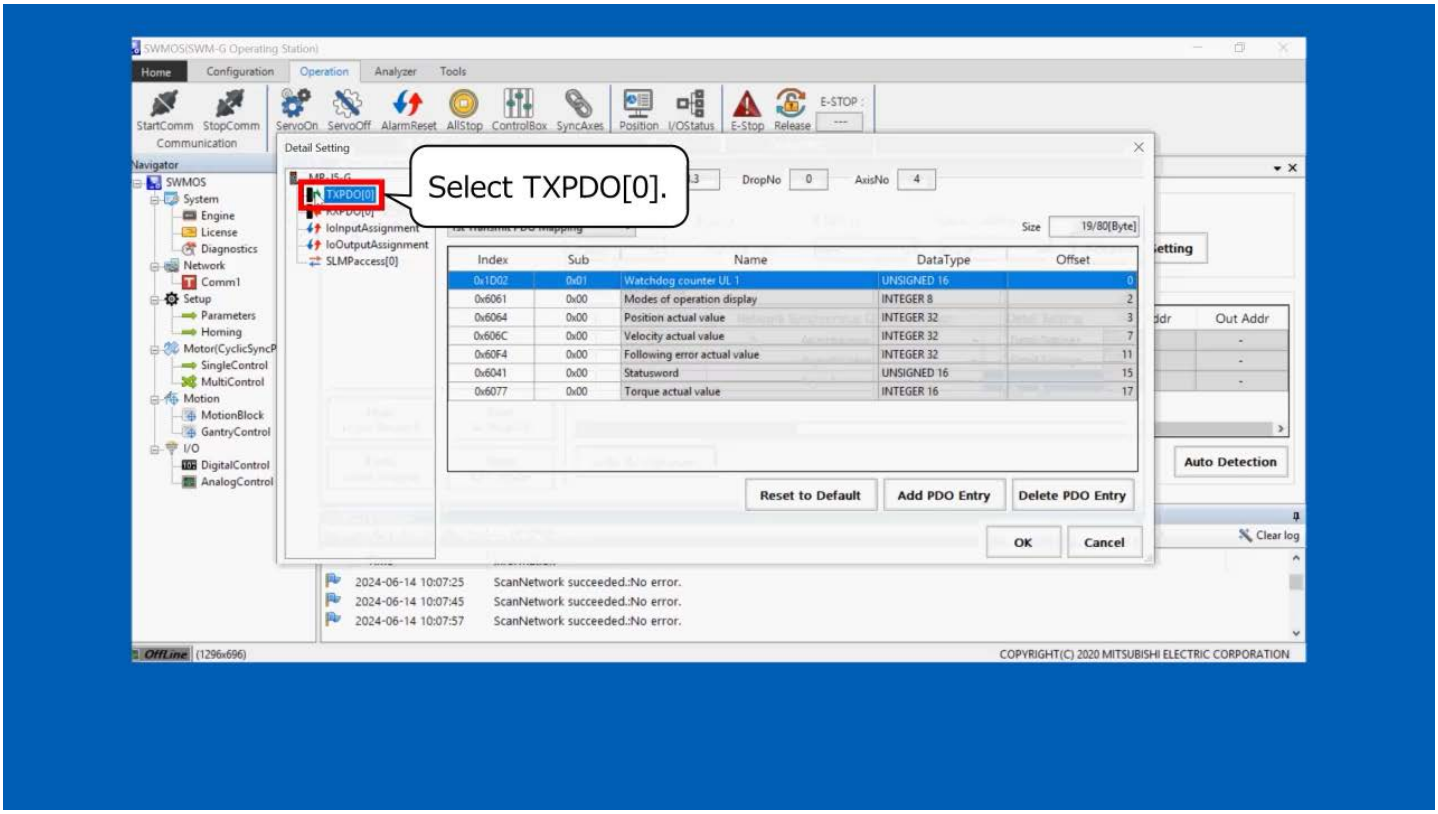
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



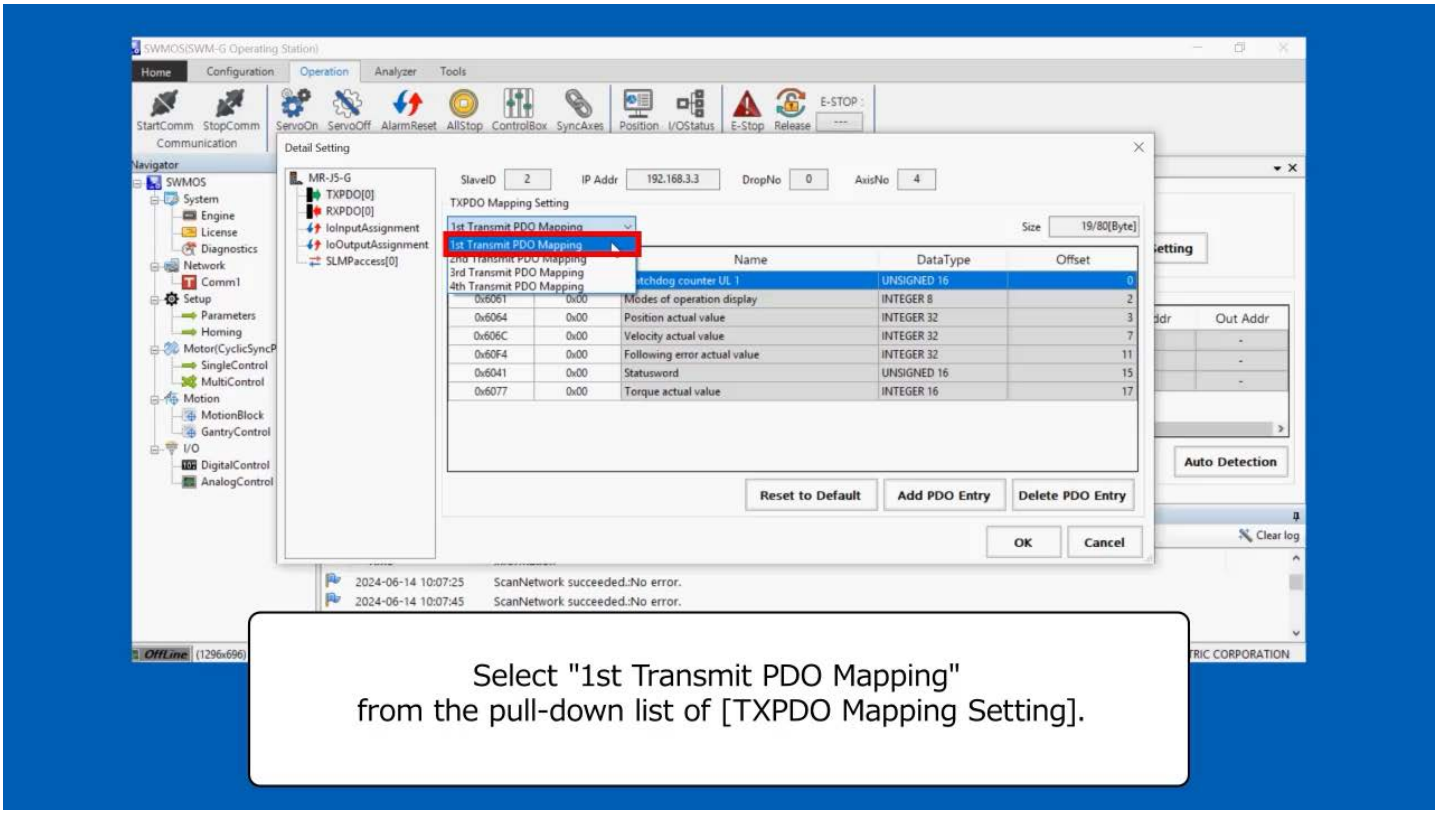
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



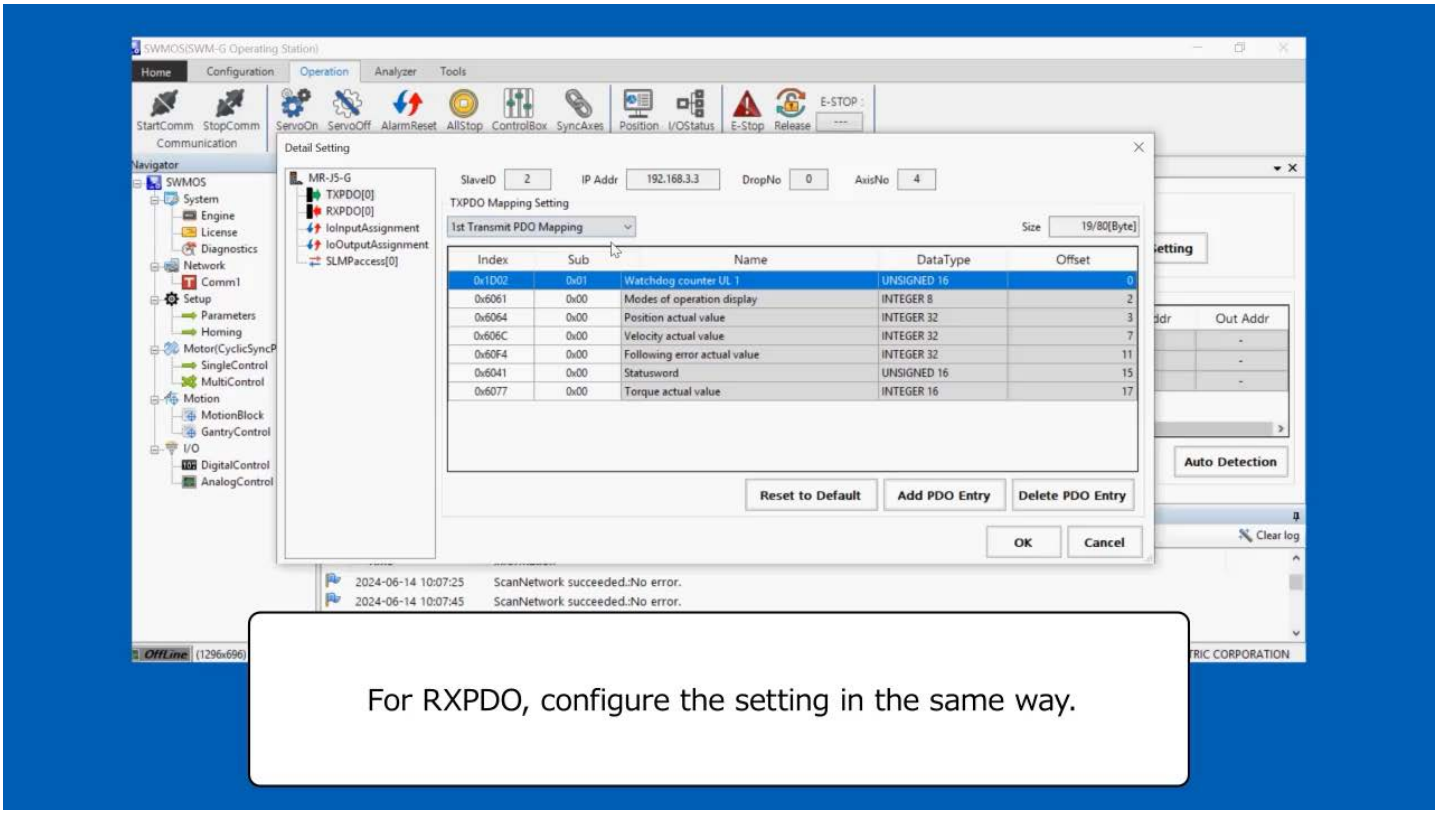
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



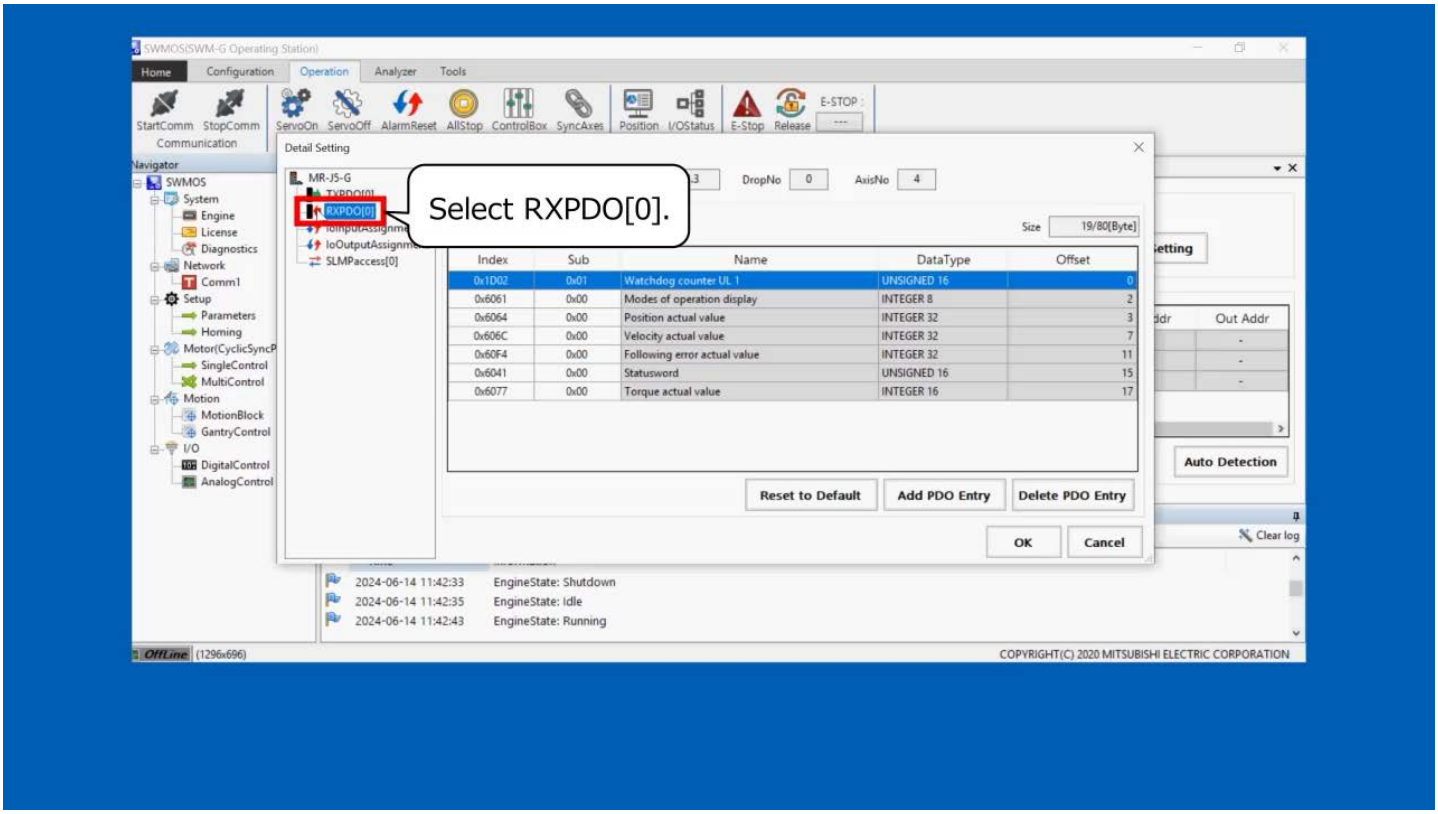
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



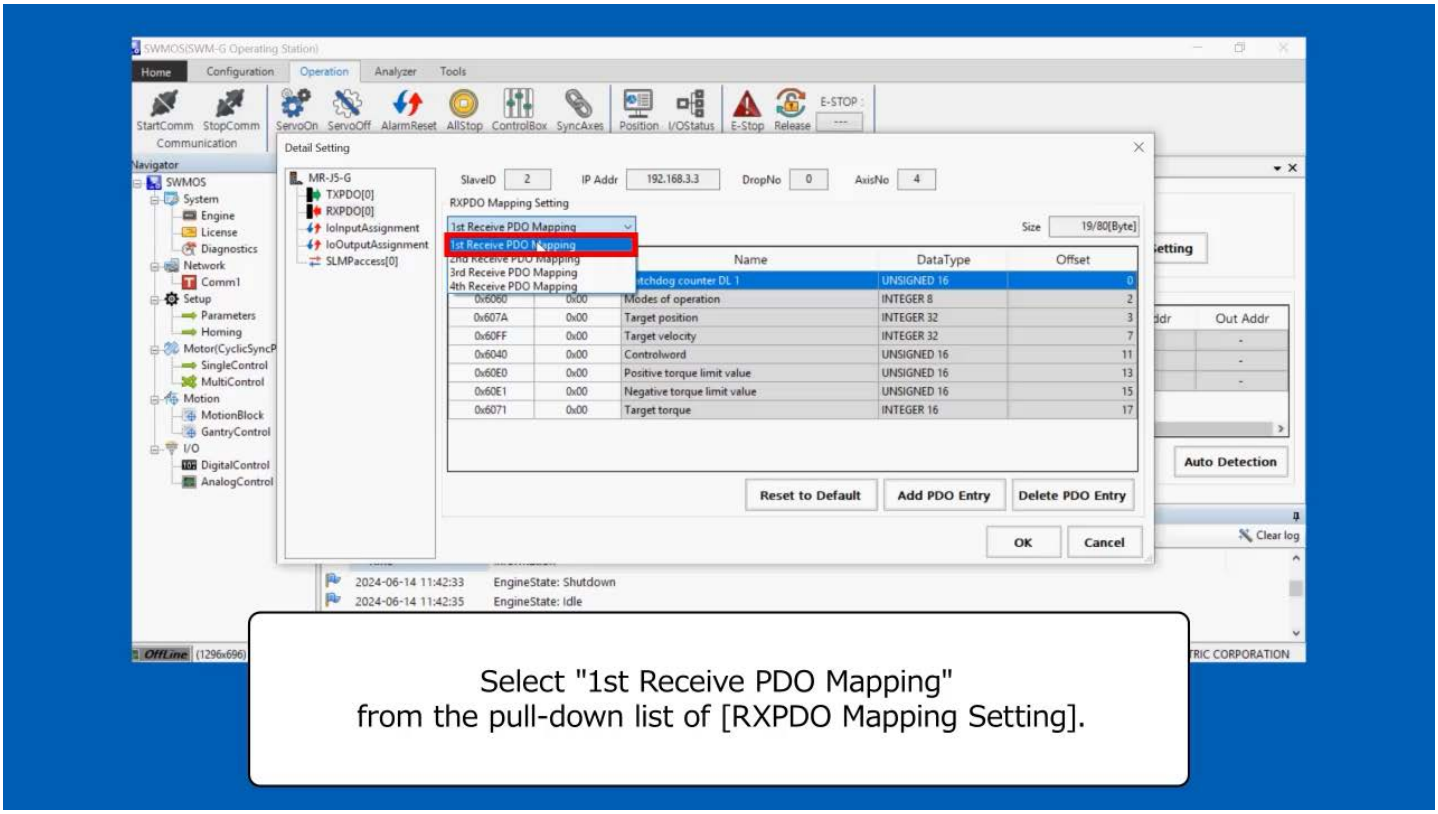
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



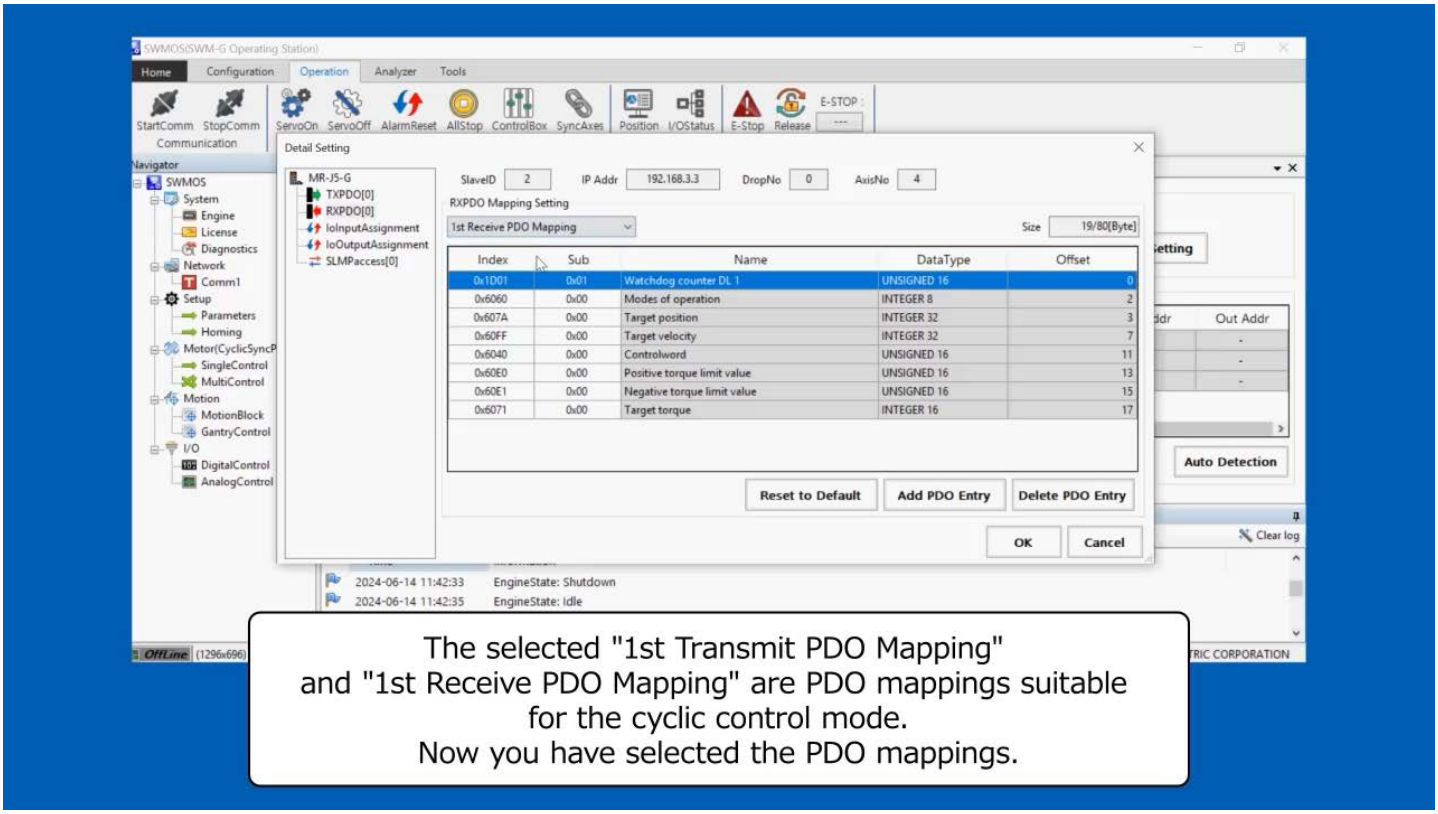
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



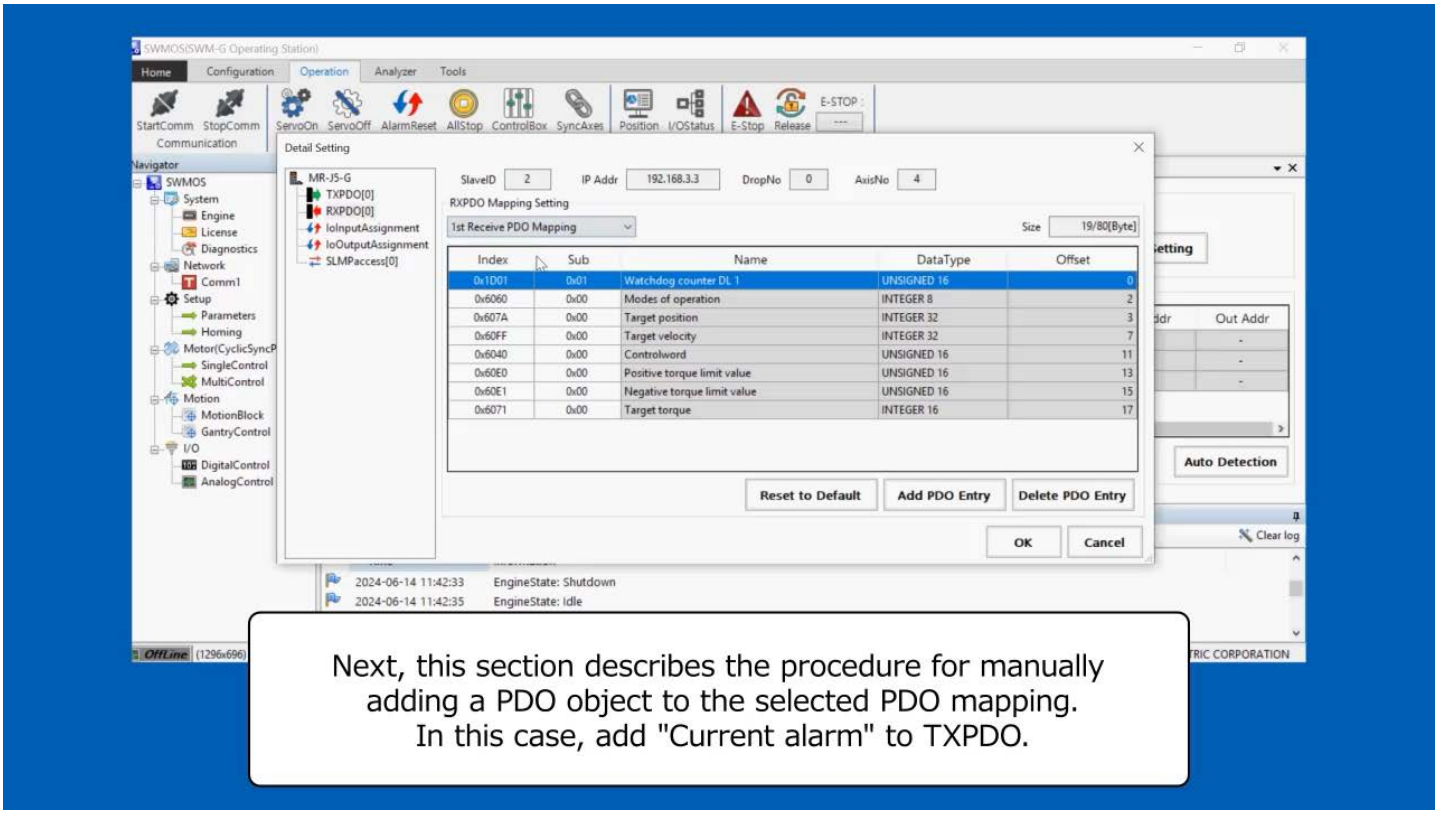
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



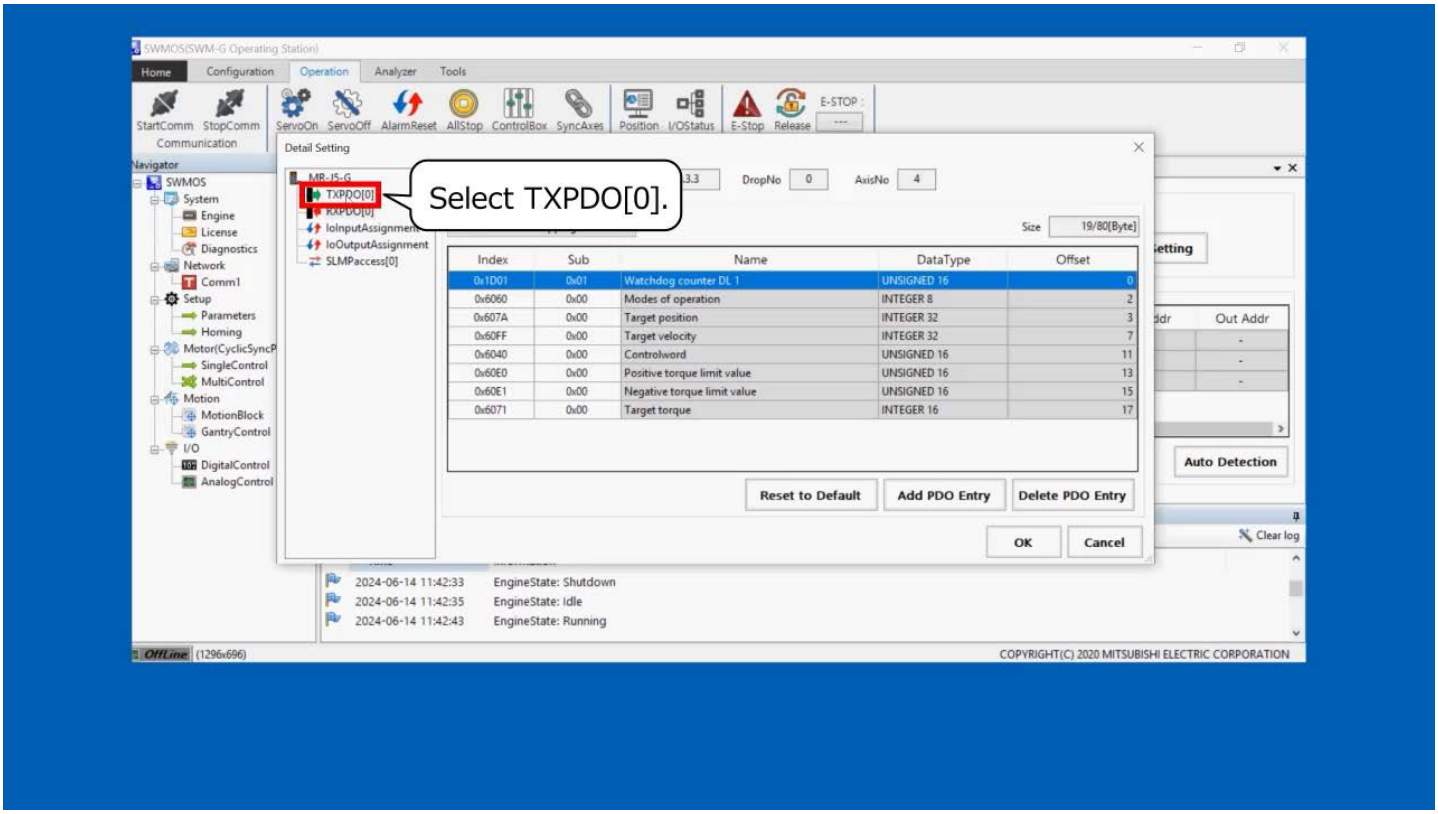
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



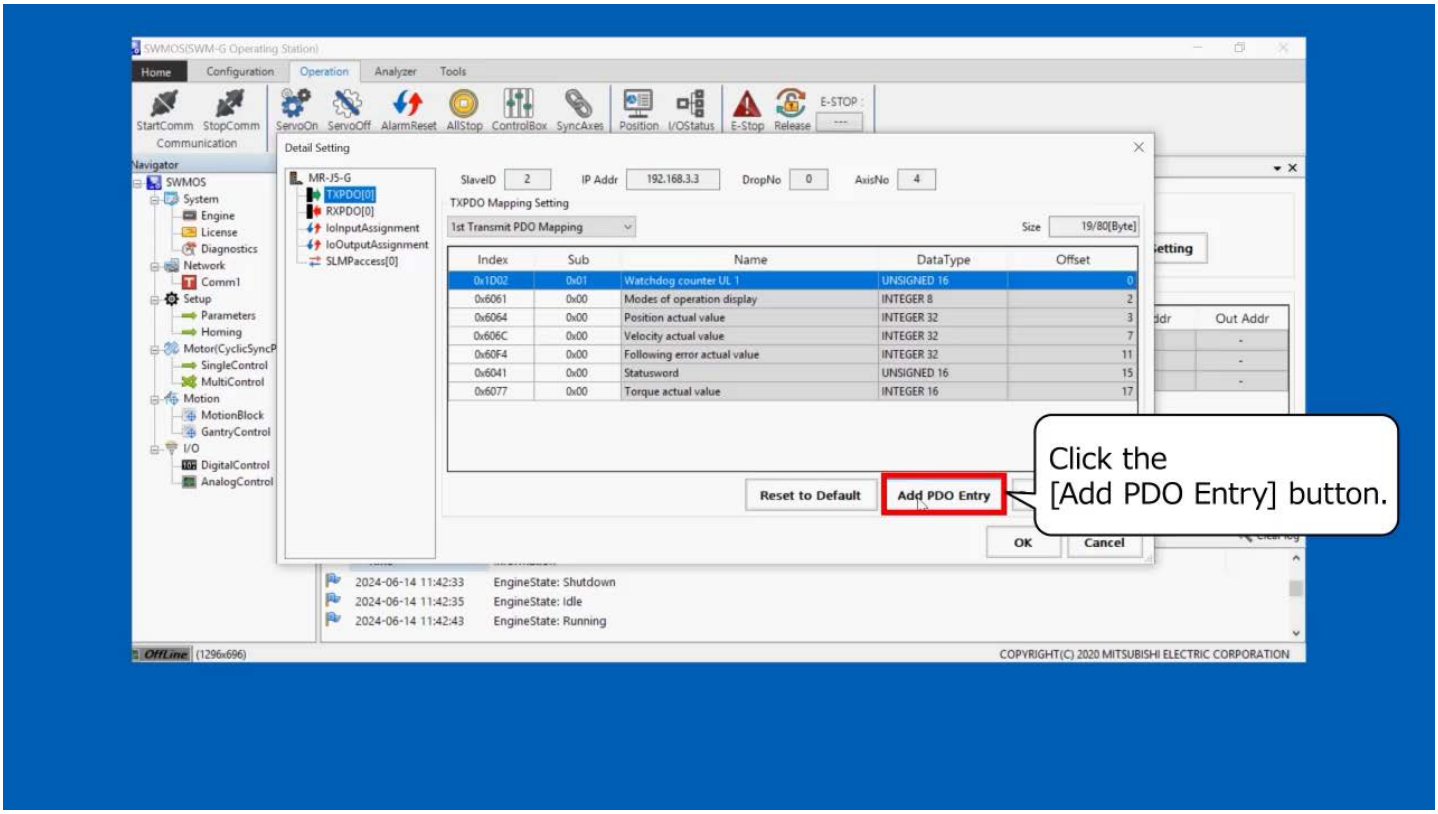
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



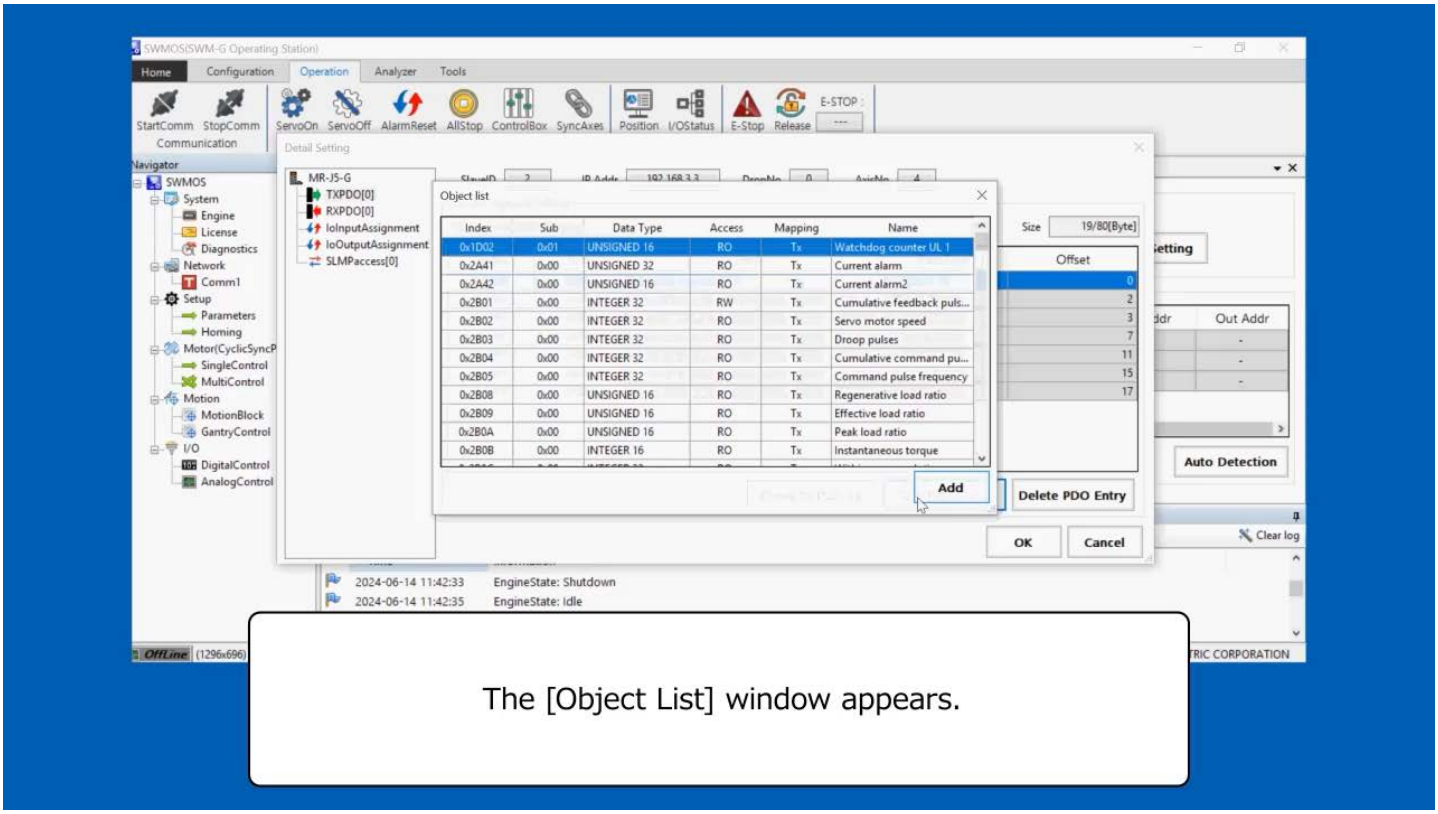
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



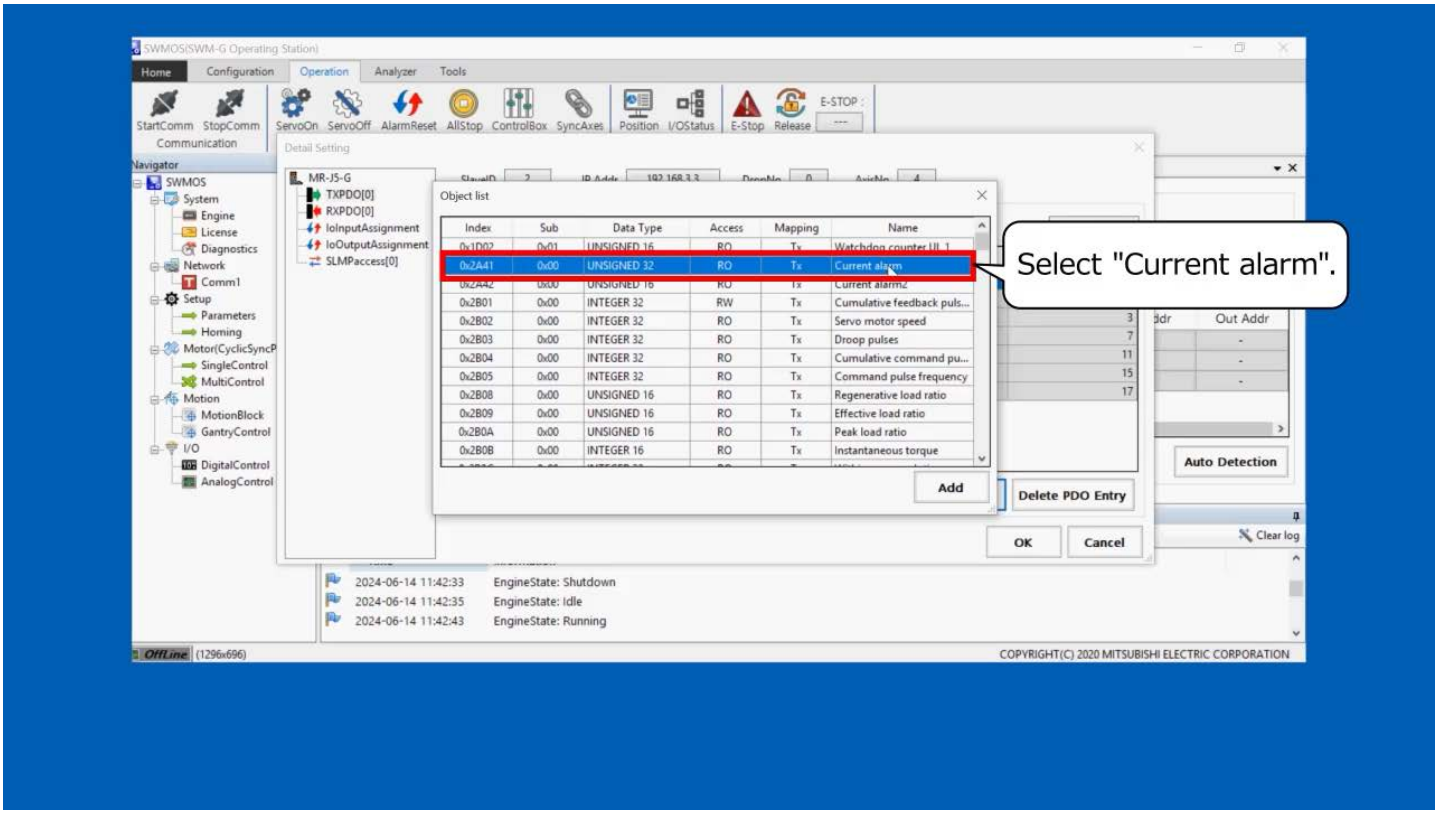
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



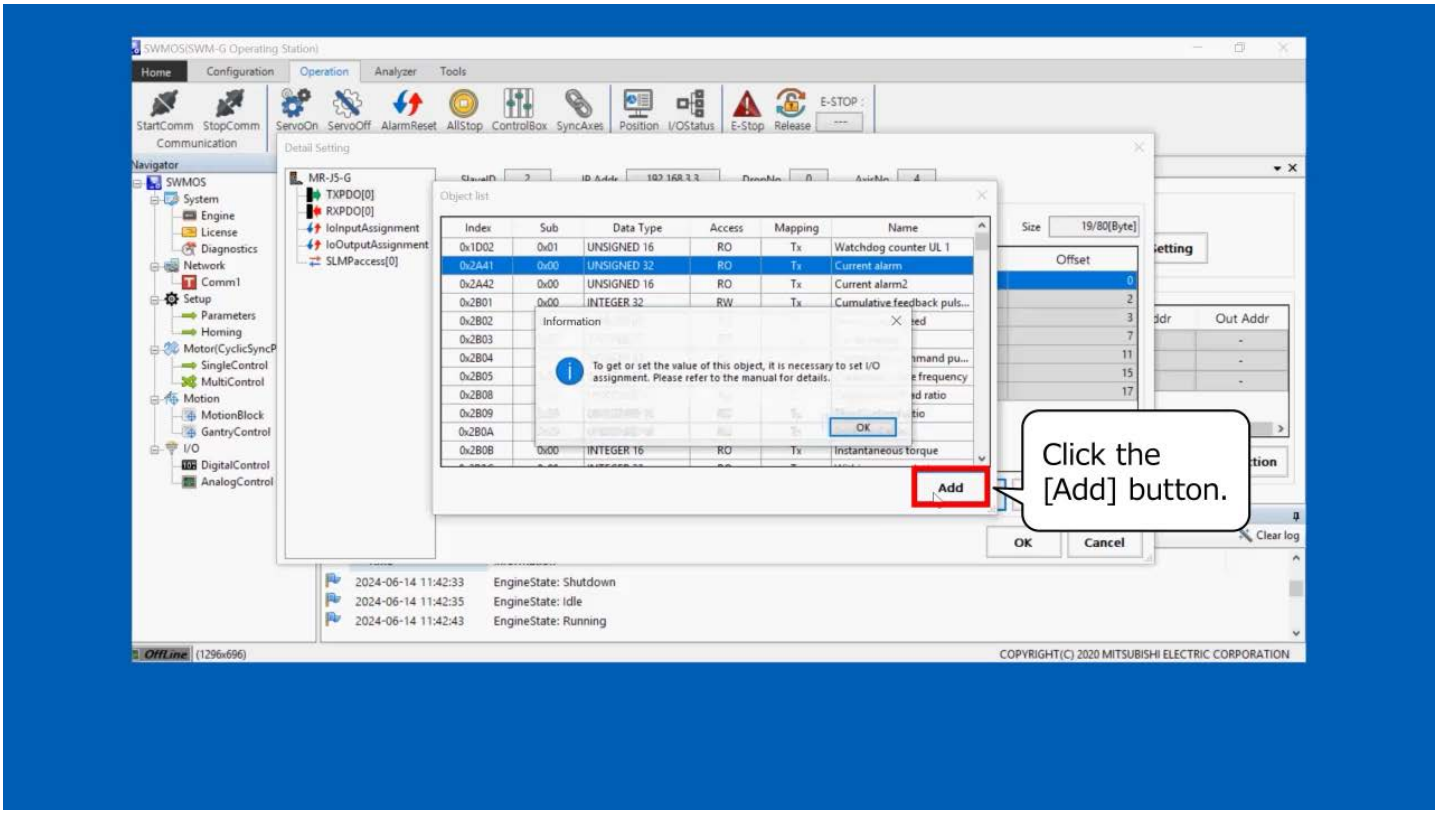
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



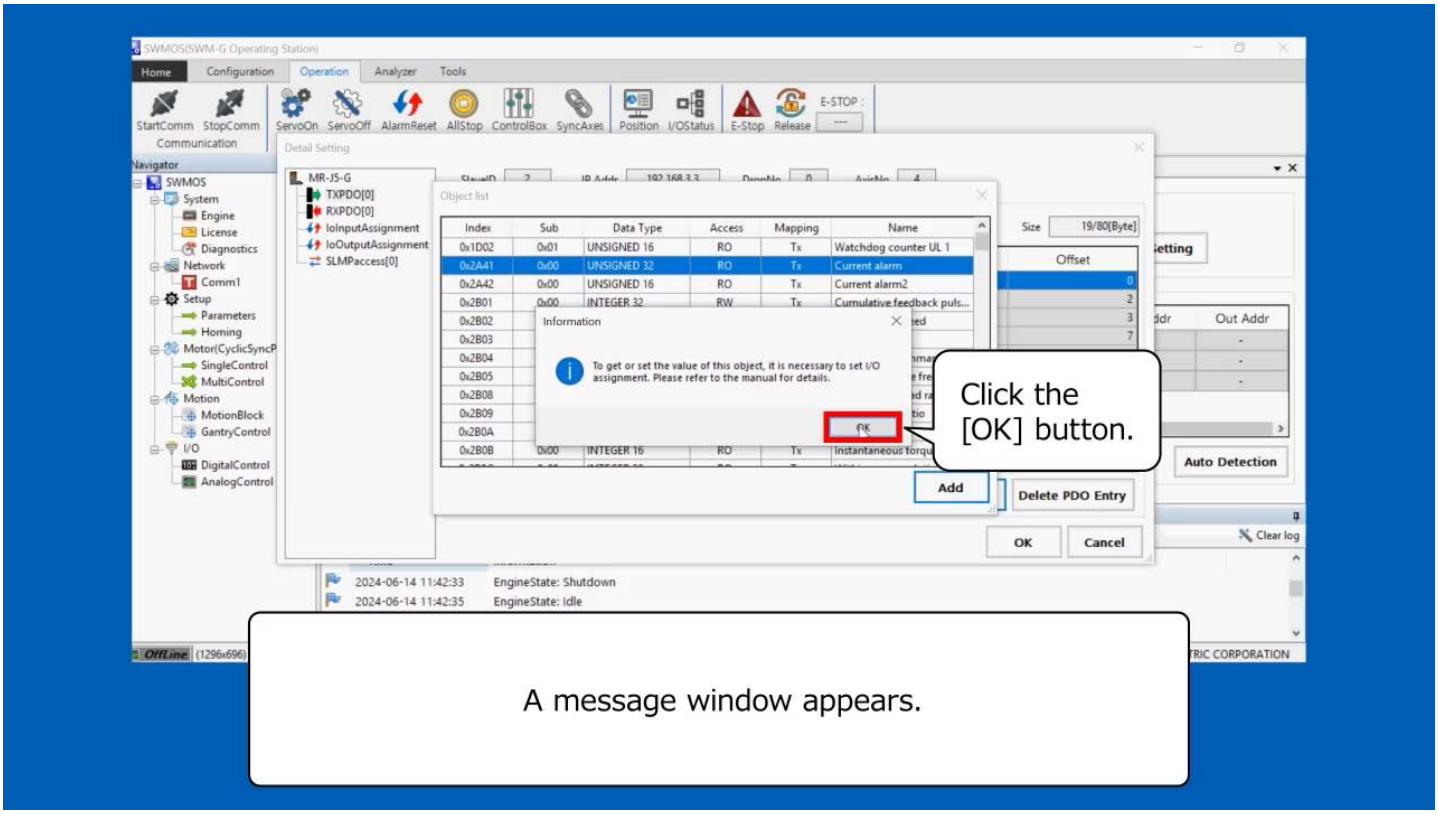
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



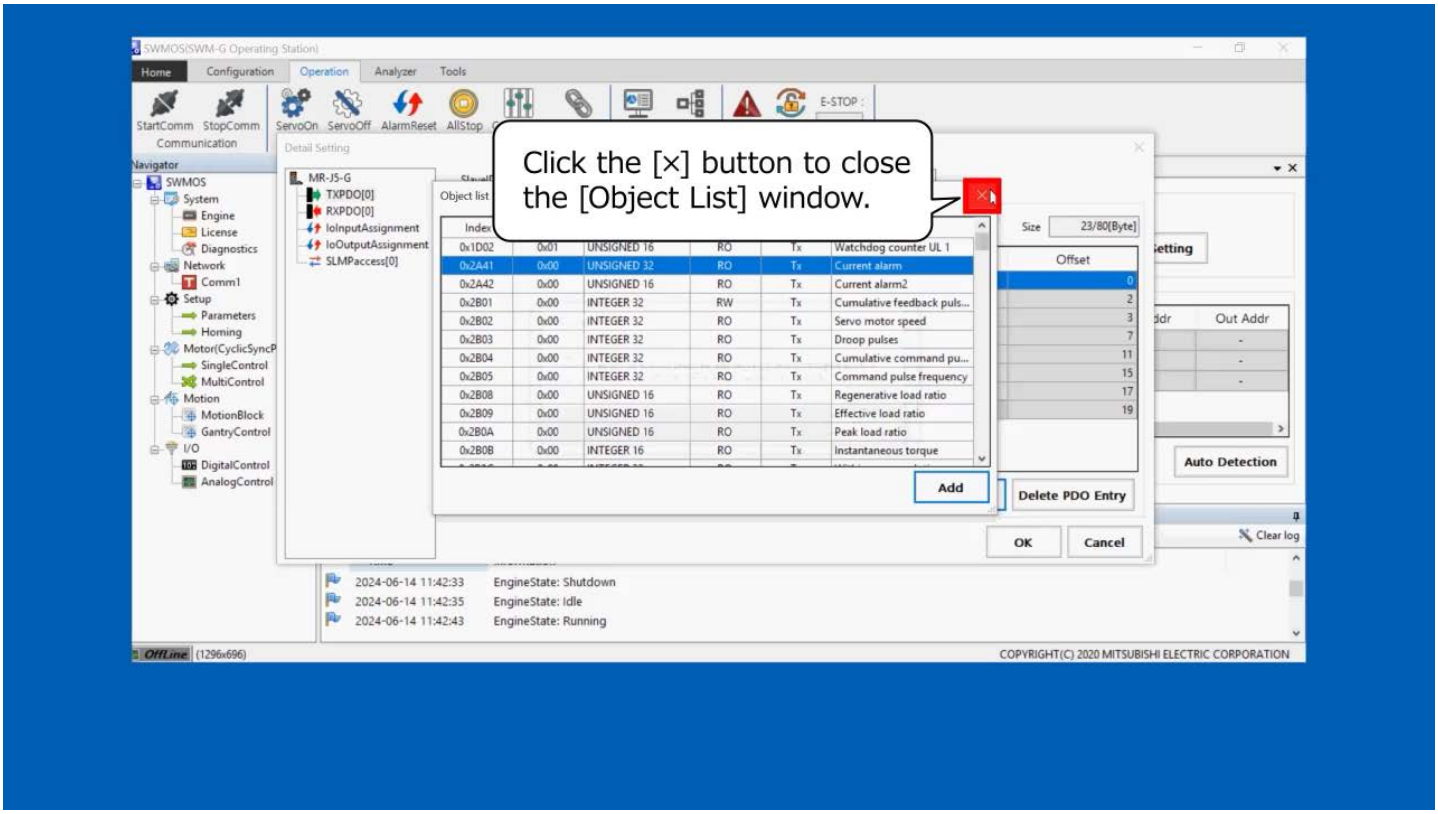
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



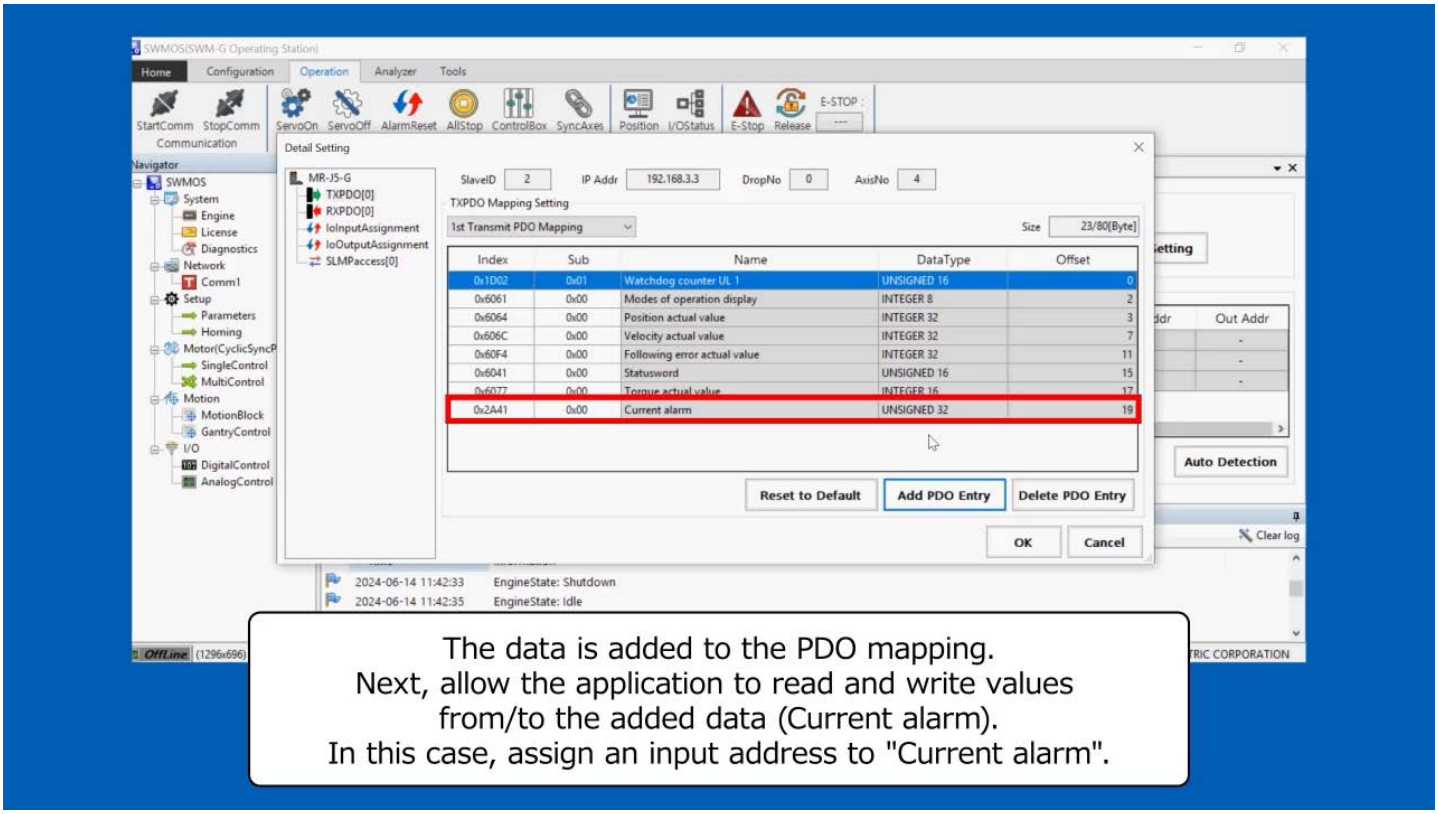
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



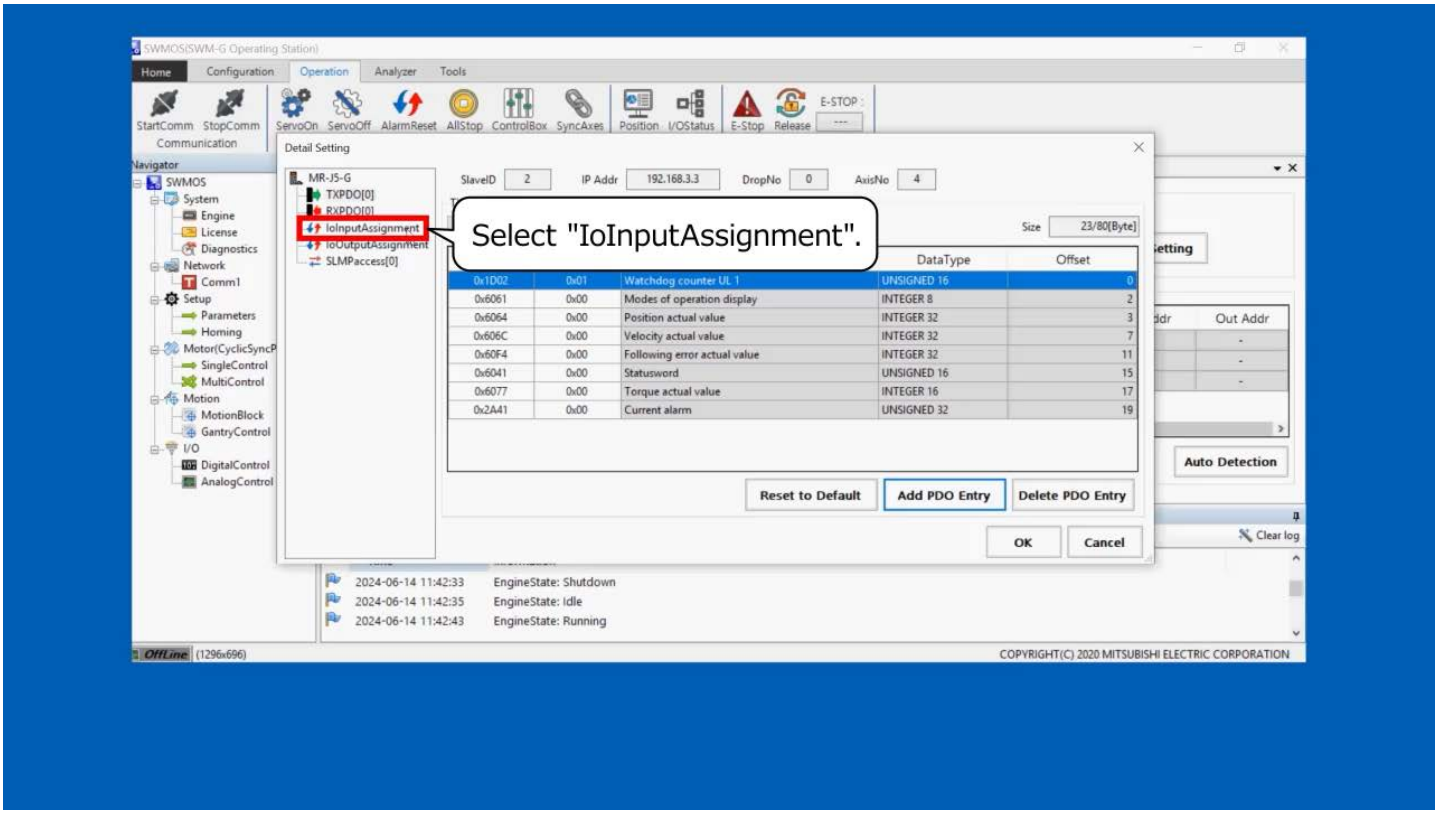
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



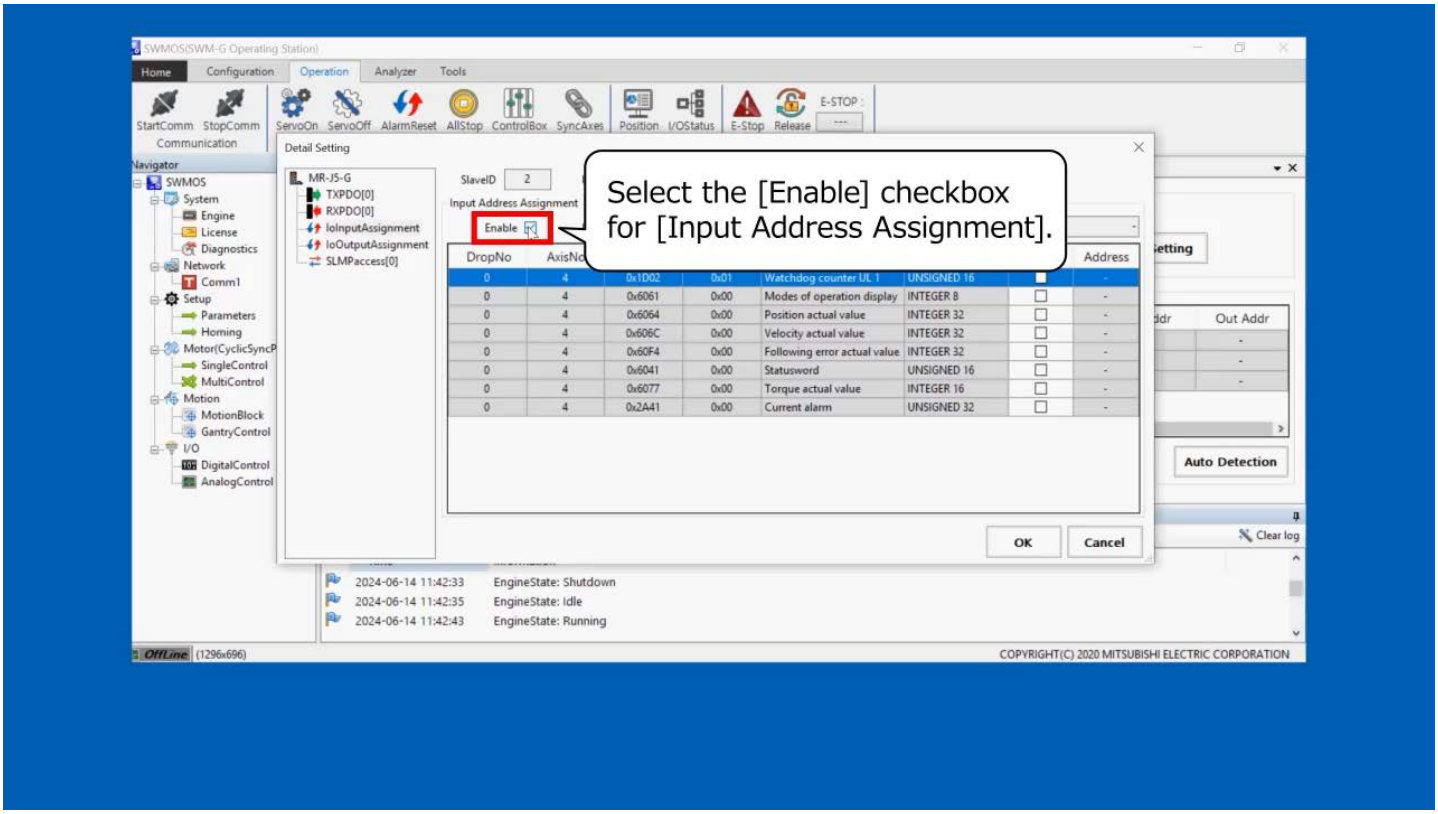
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



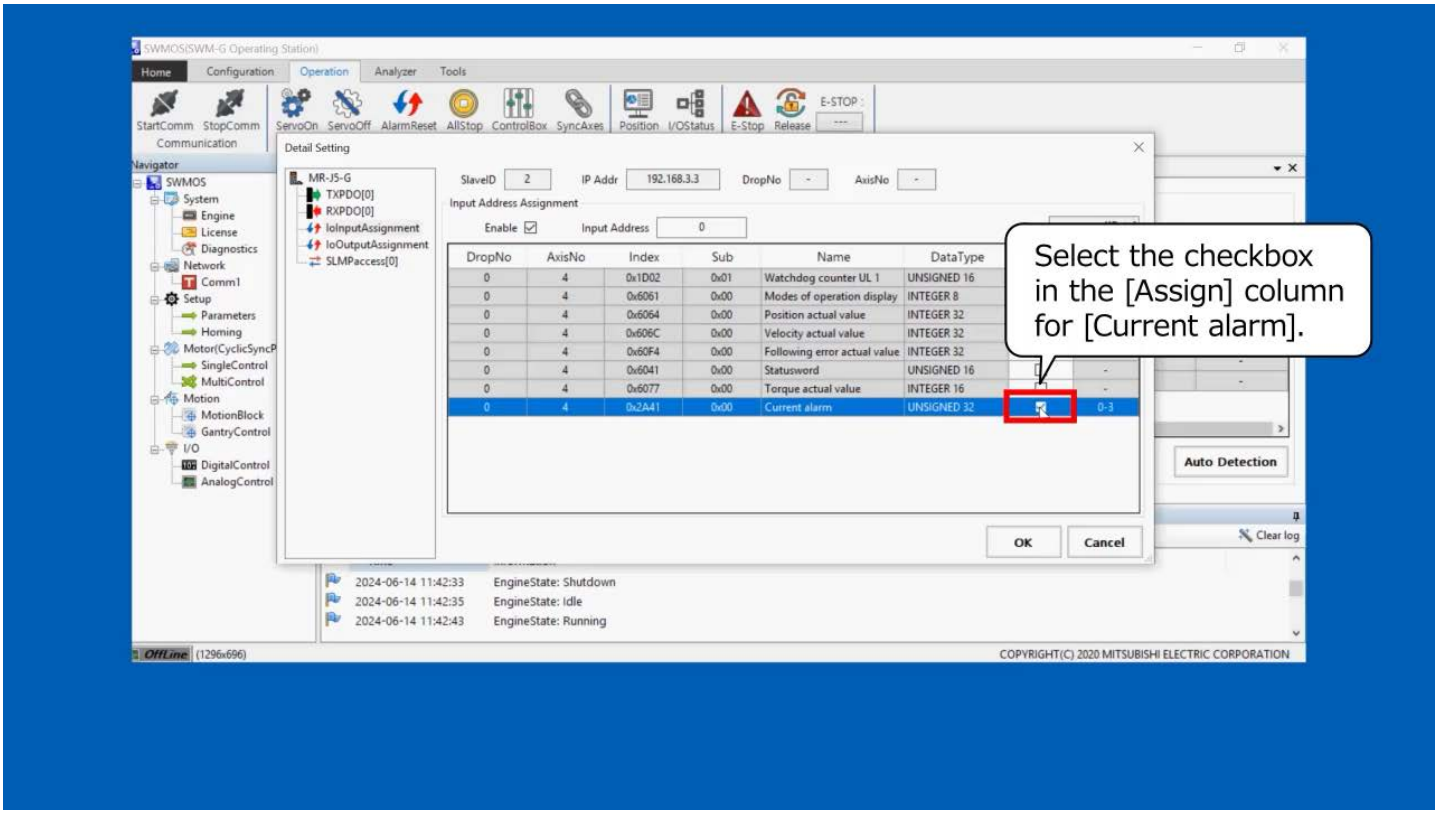
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



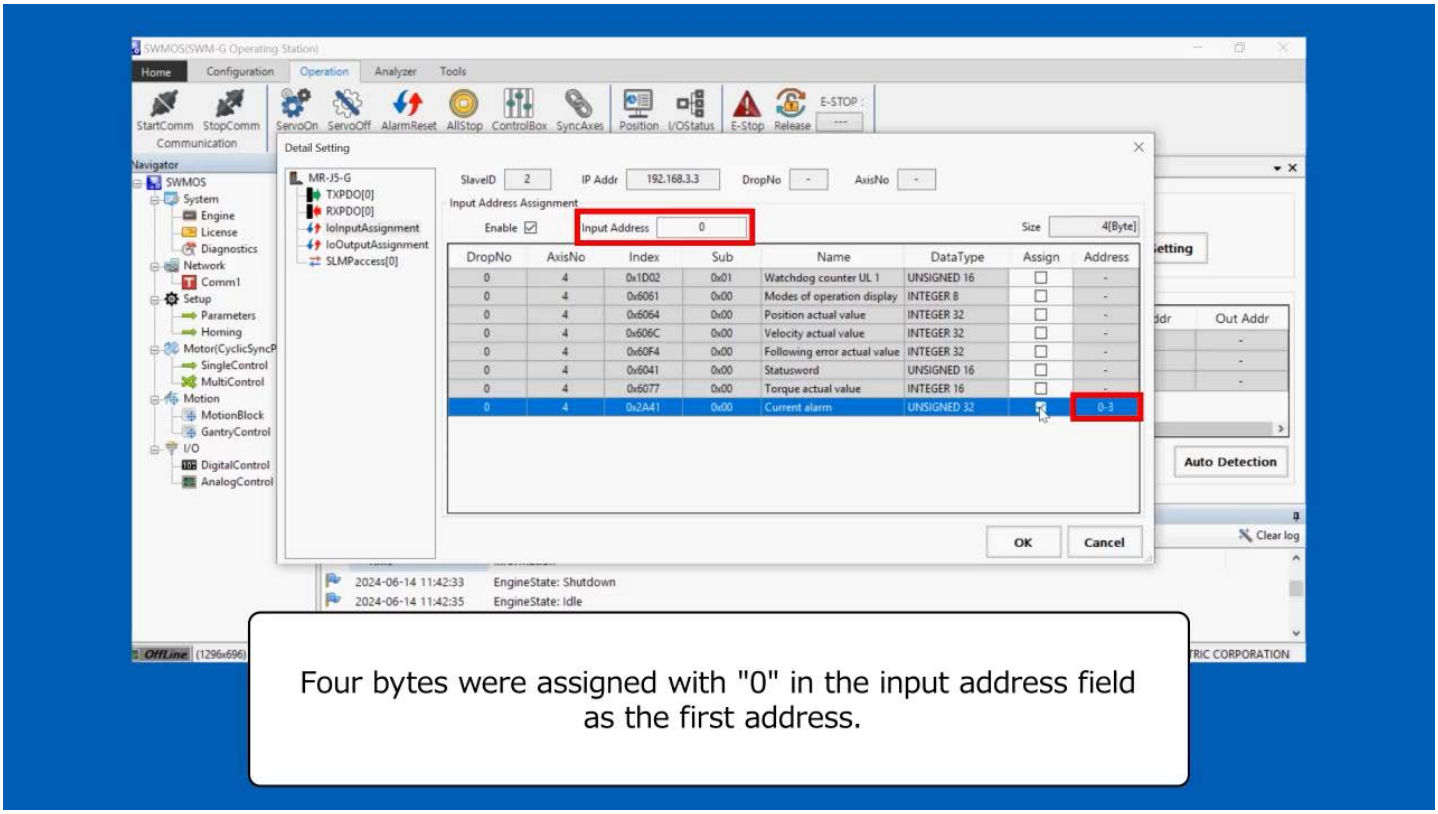
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



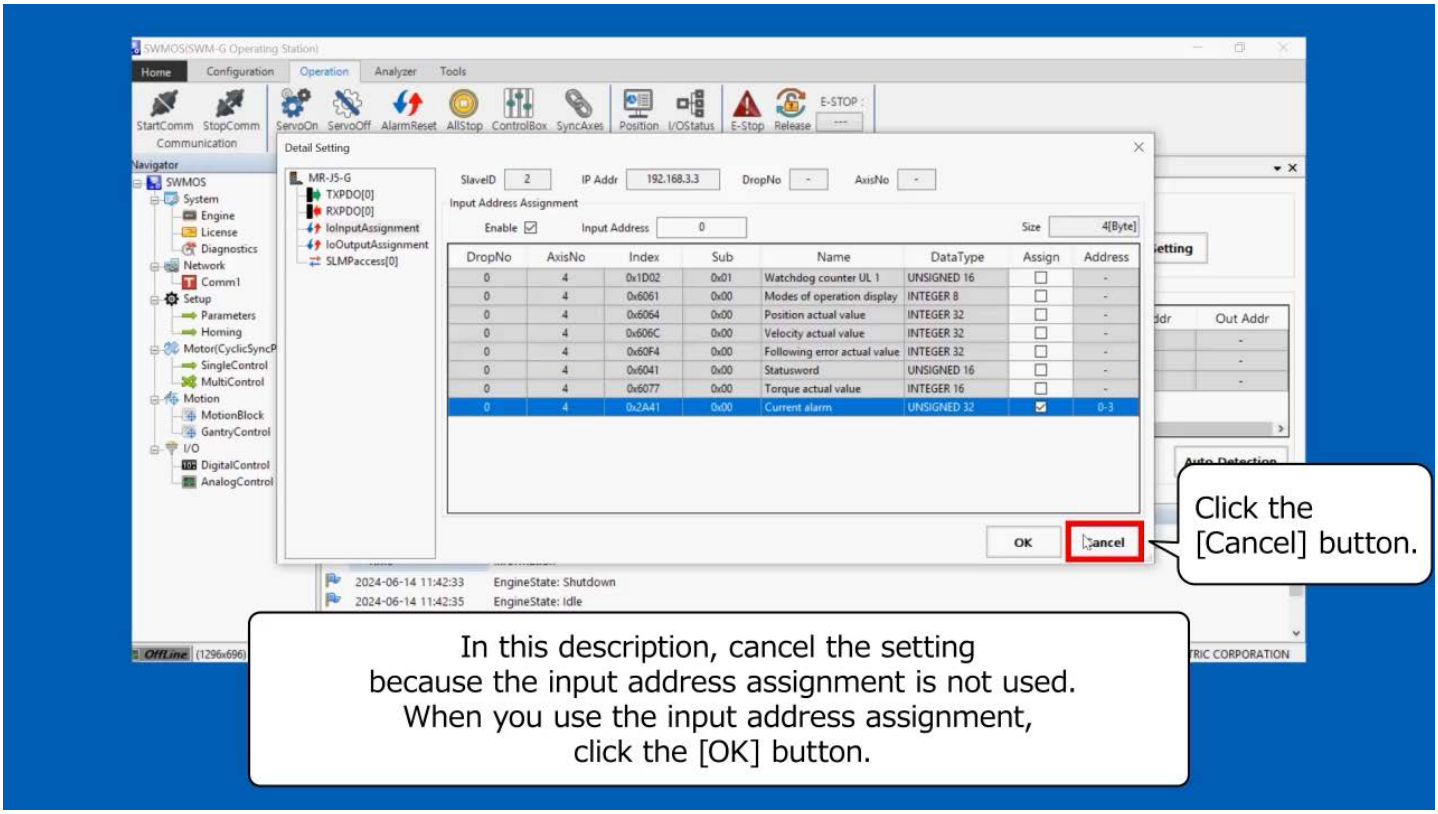
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



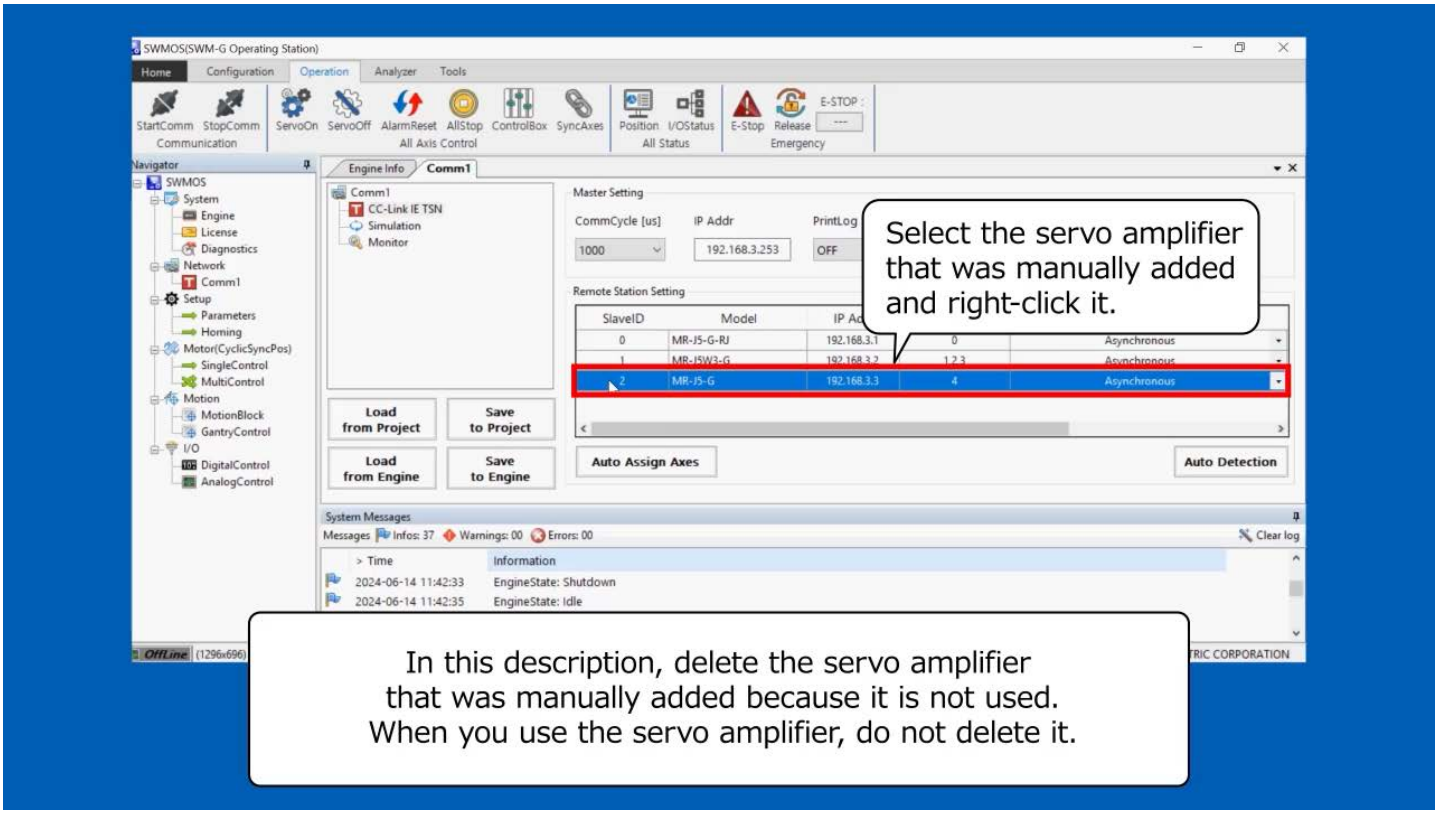
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



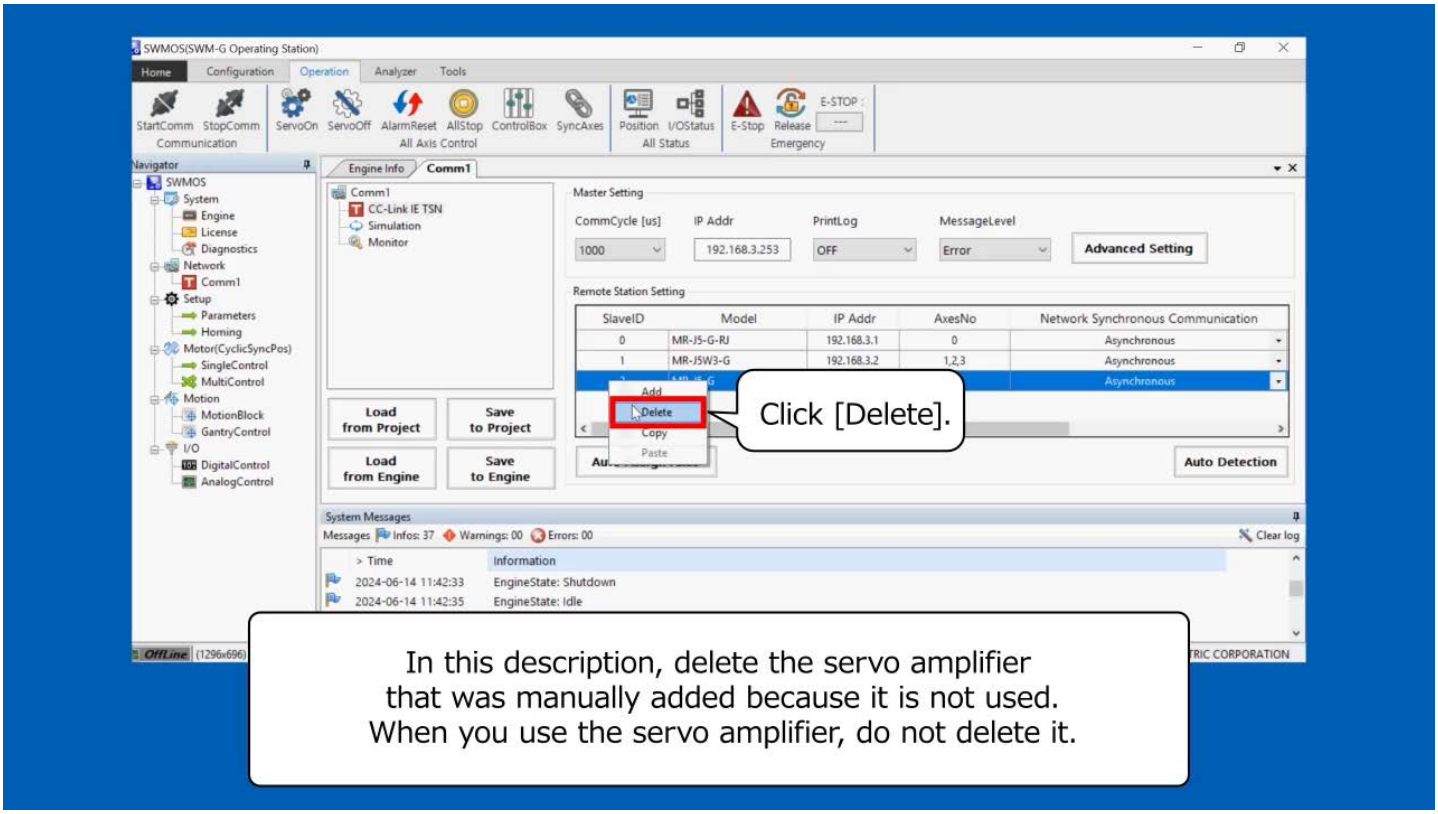
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



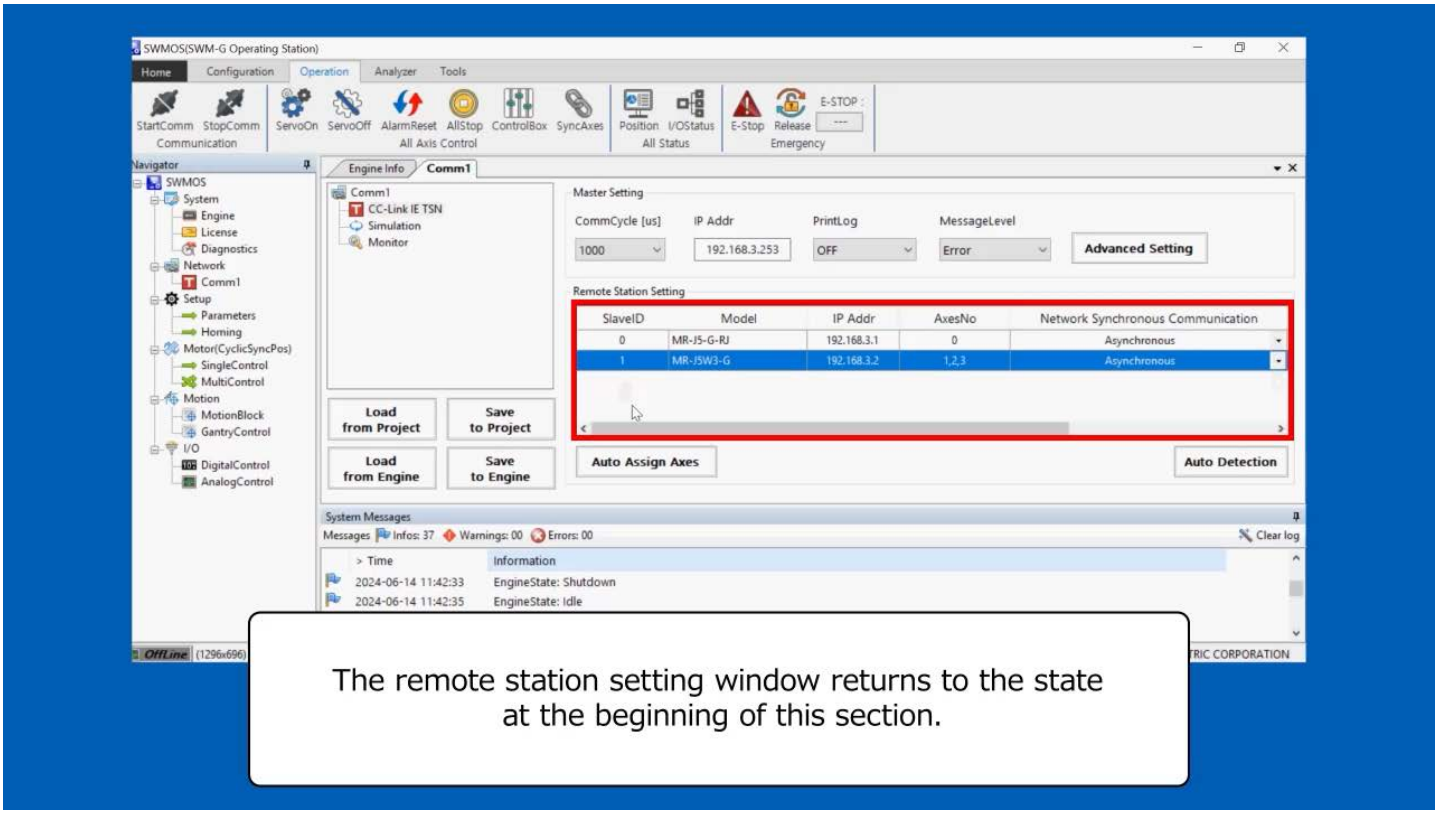
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



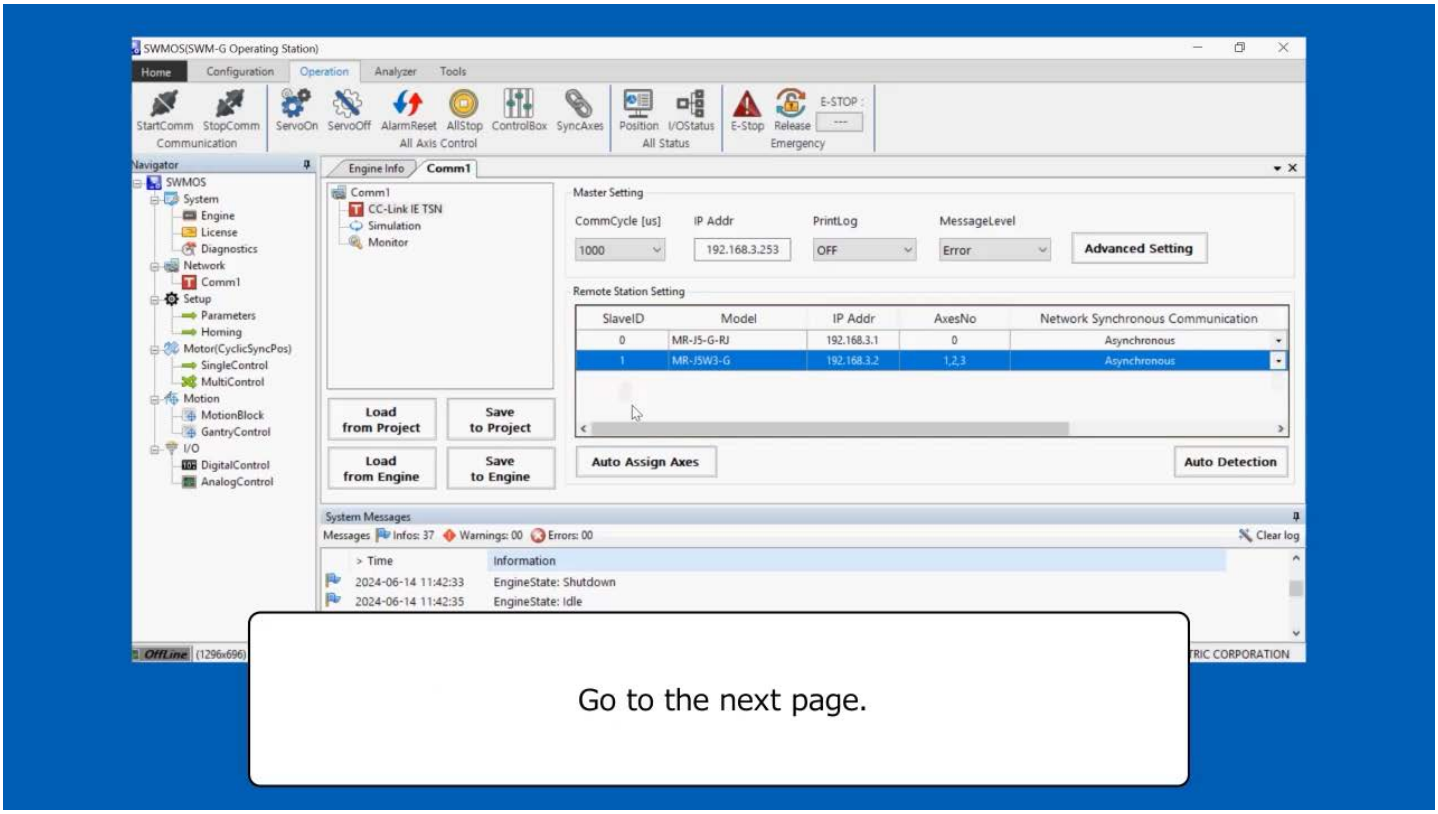
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



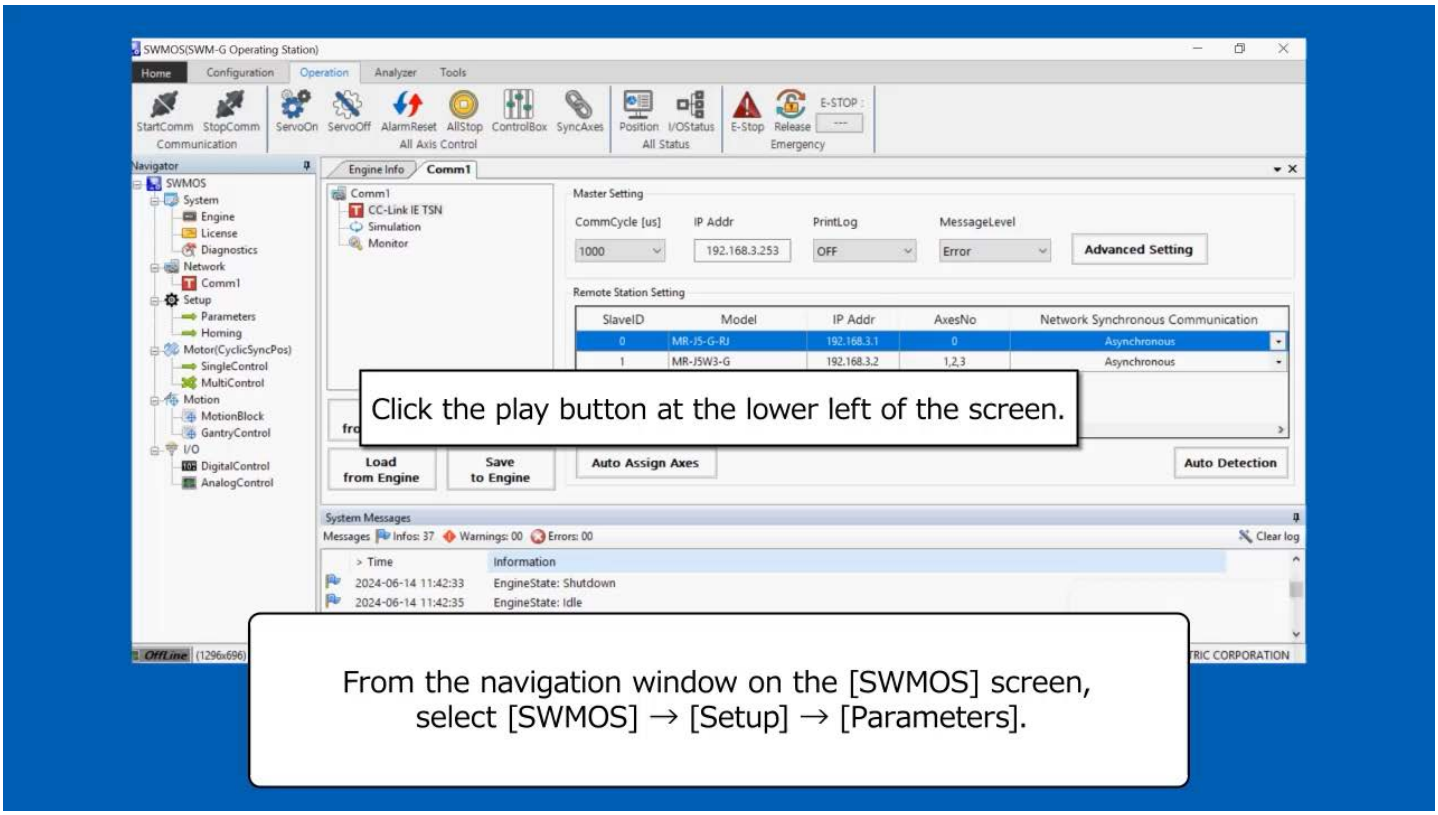
2.4.3 Remote station setting by add function

This section describes the remote station setting by the add function. For the procedure, see the video below.



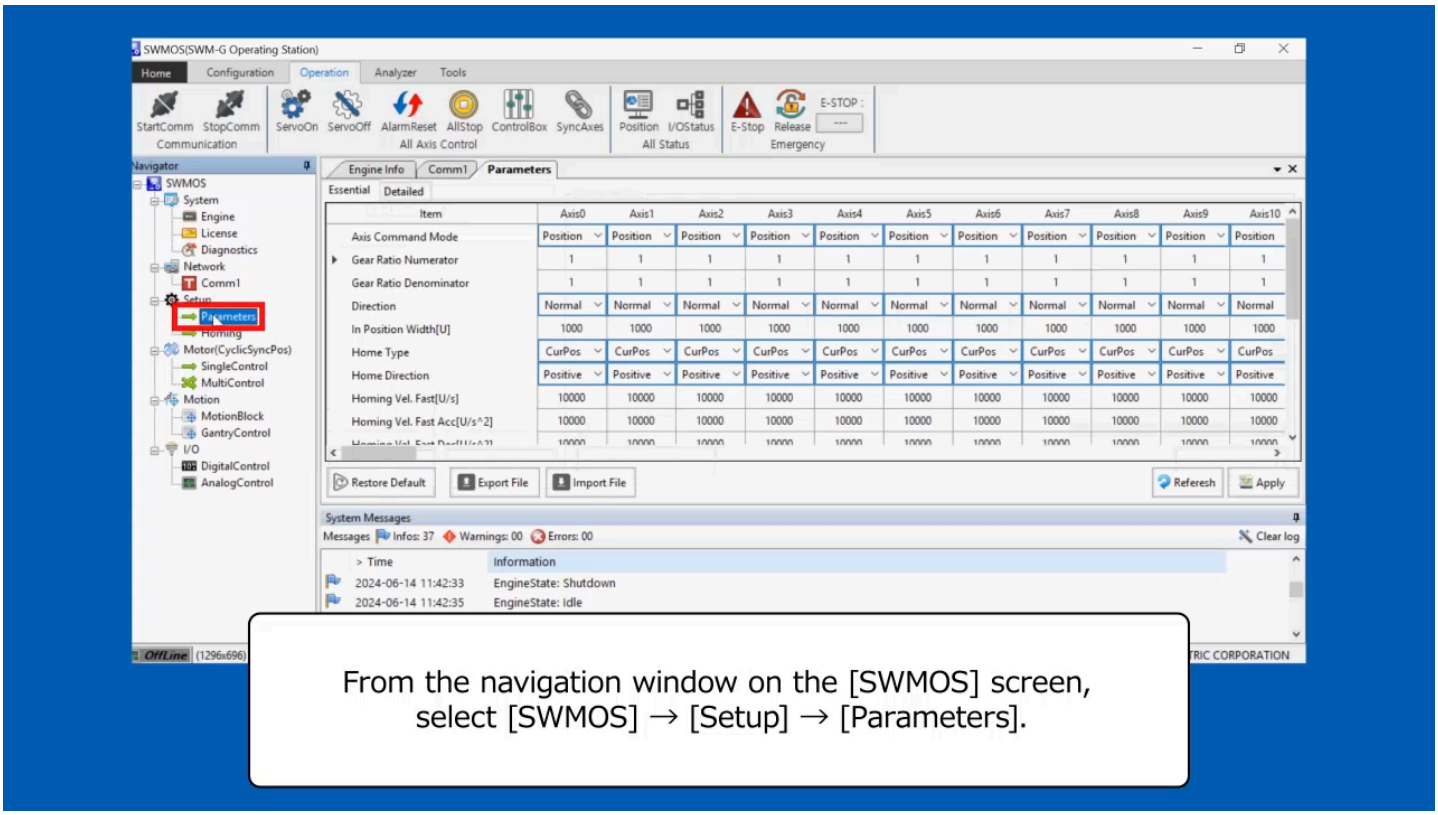
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



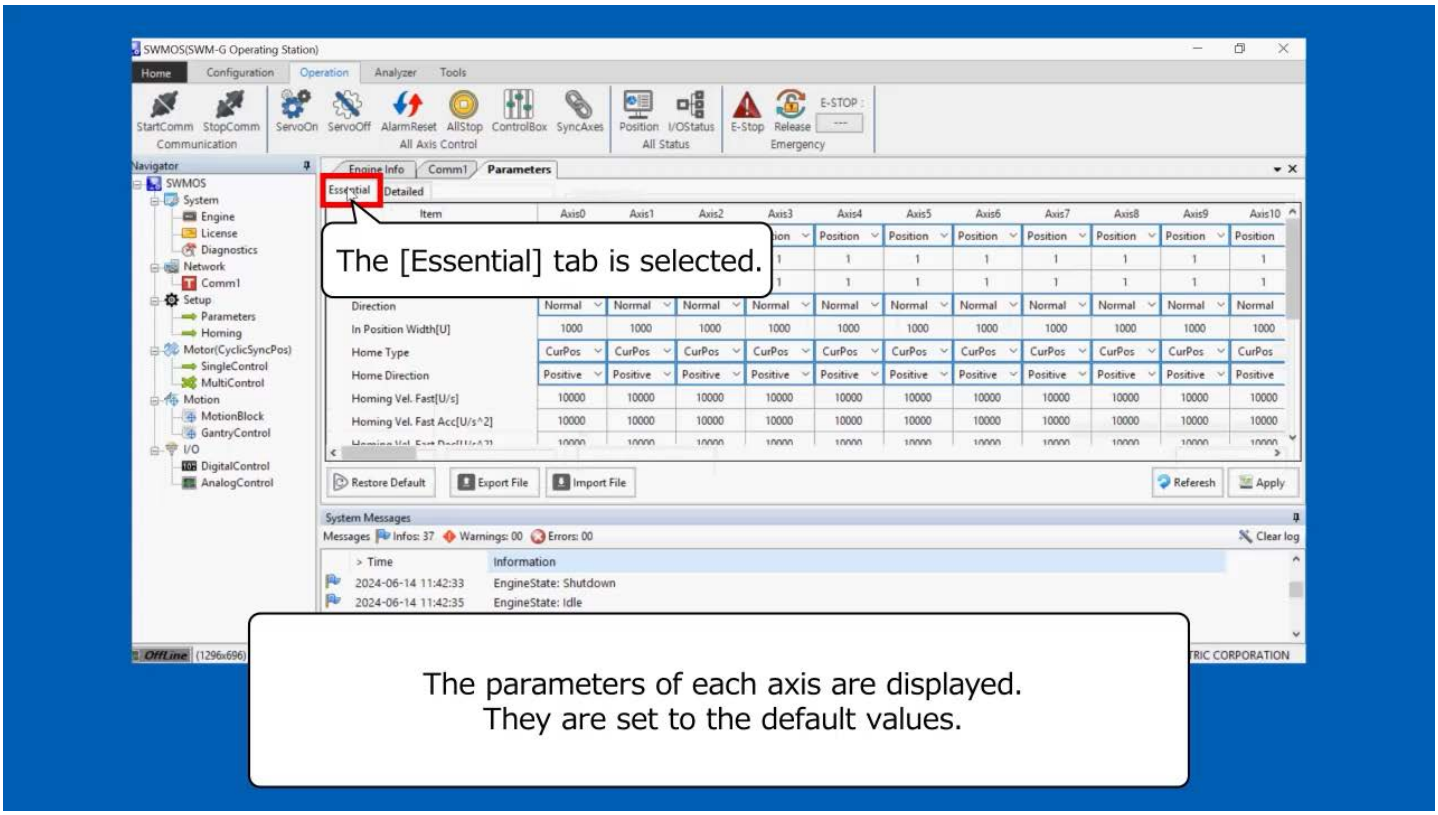
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



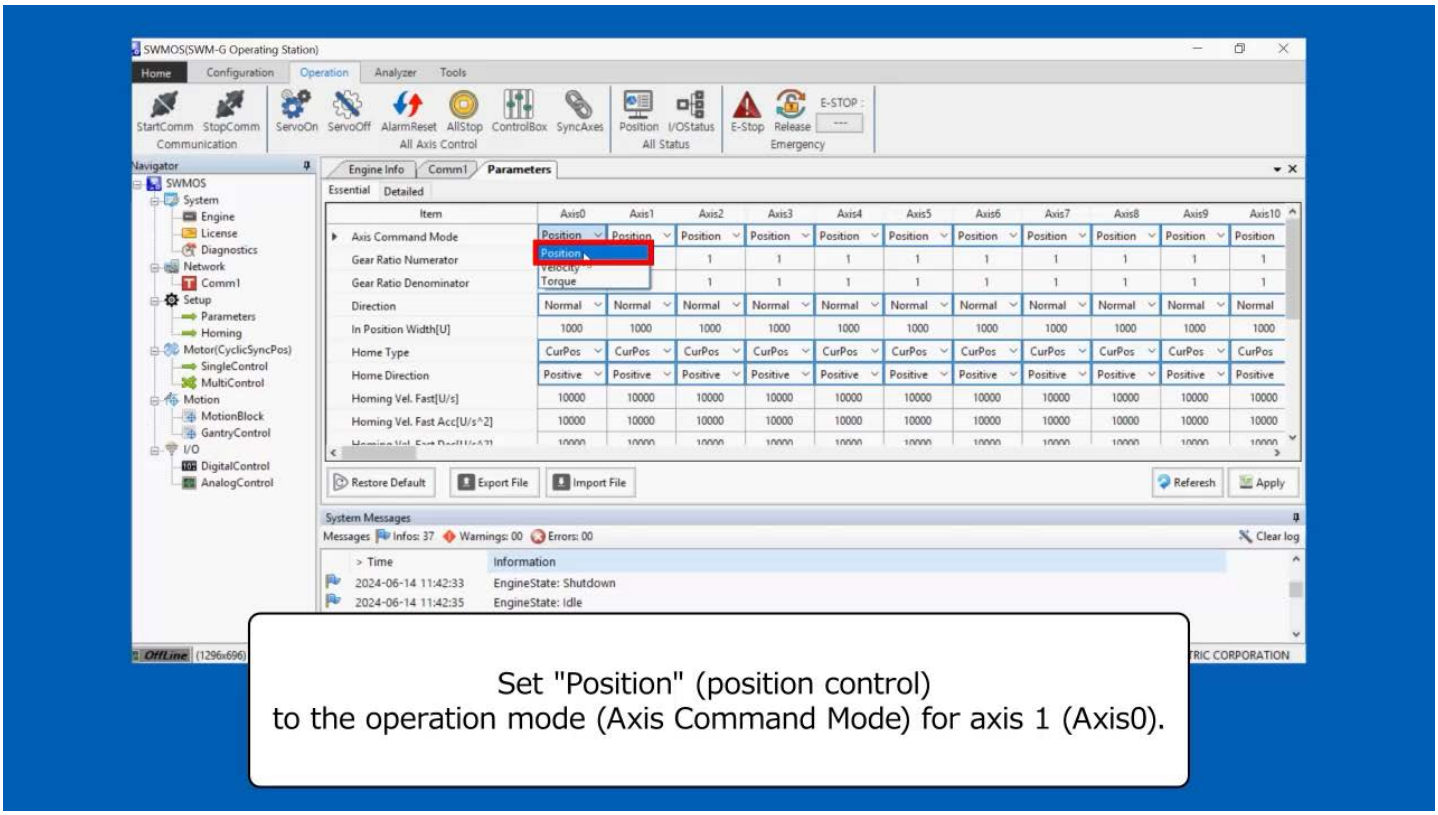
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



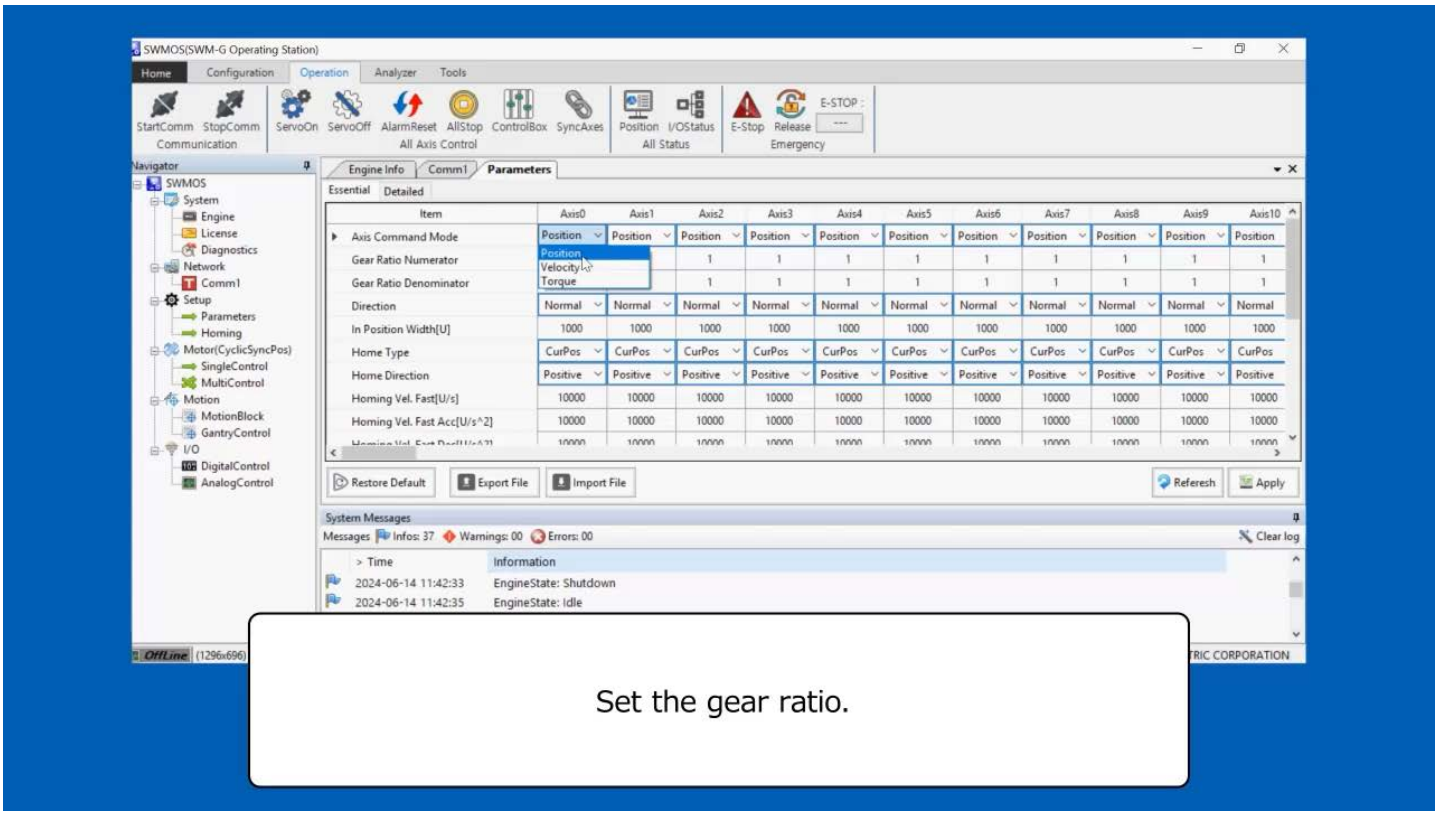
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



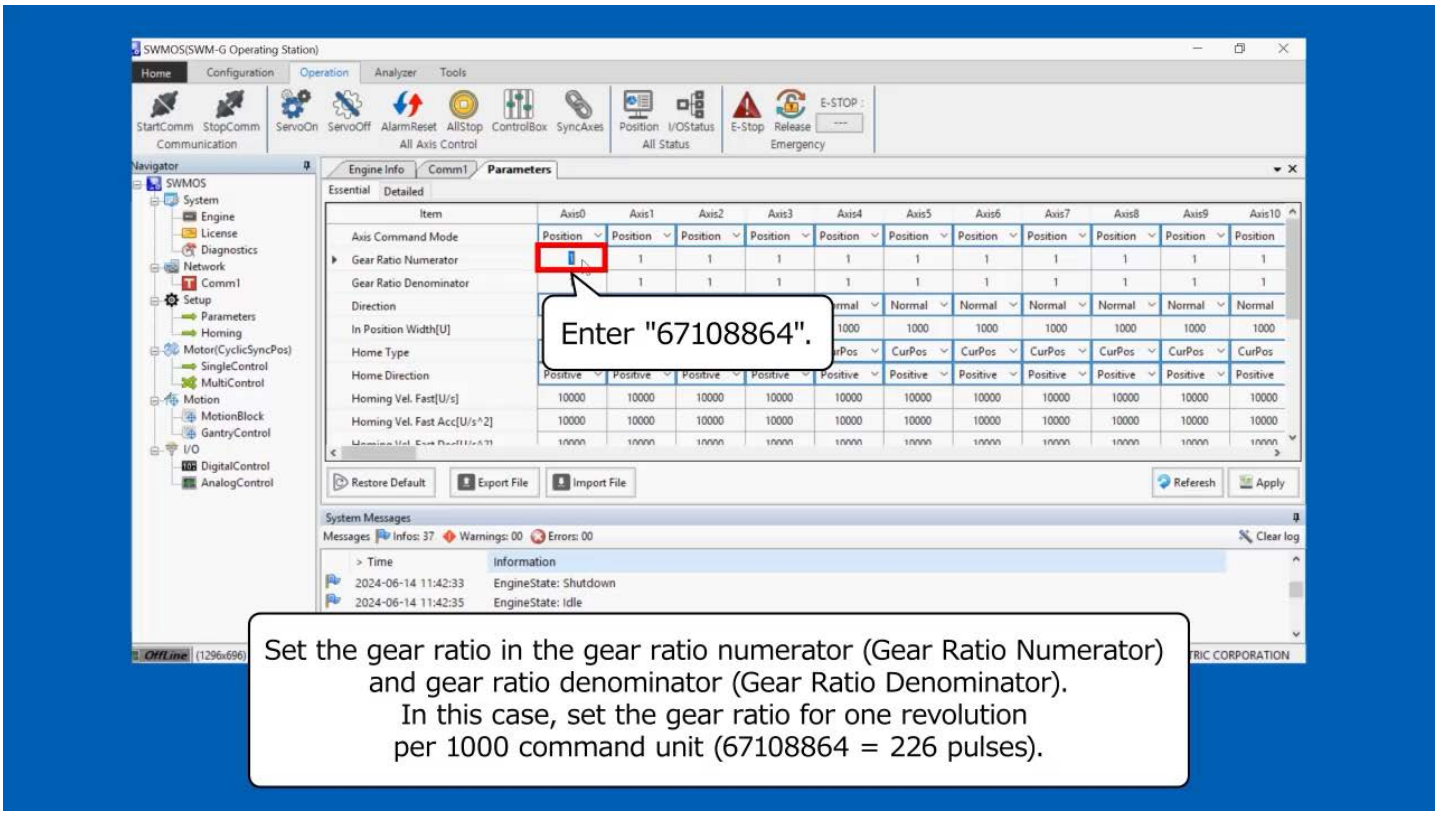
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



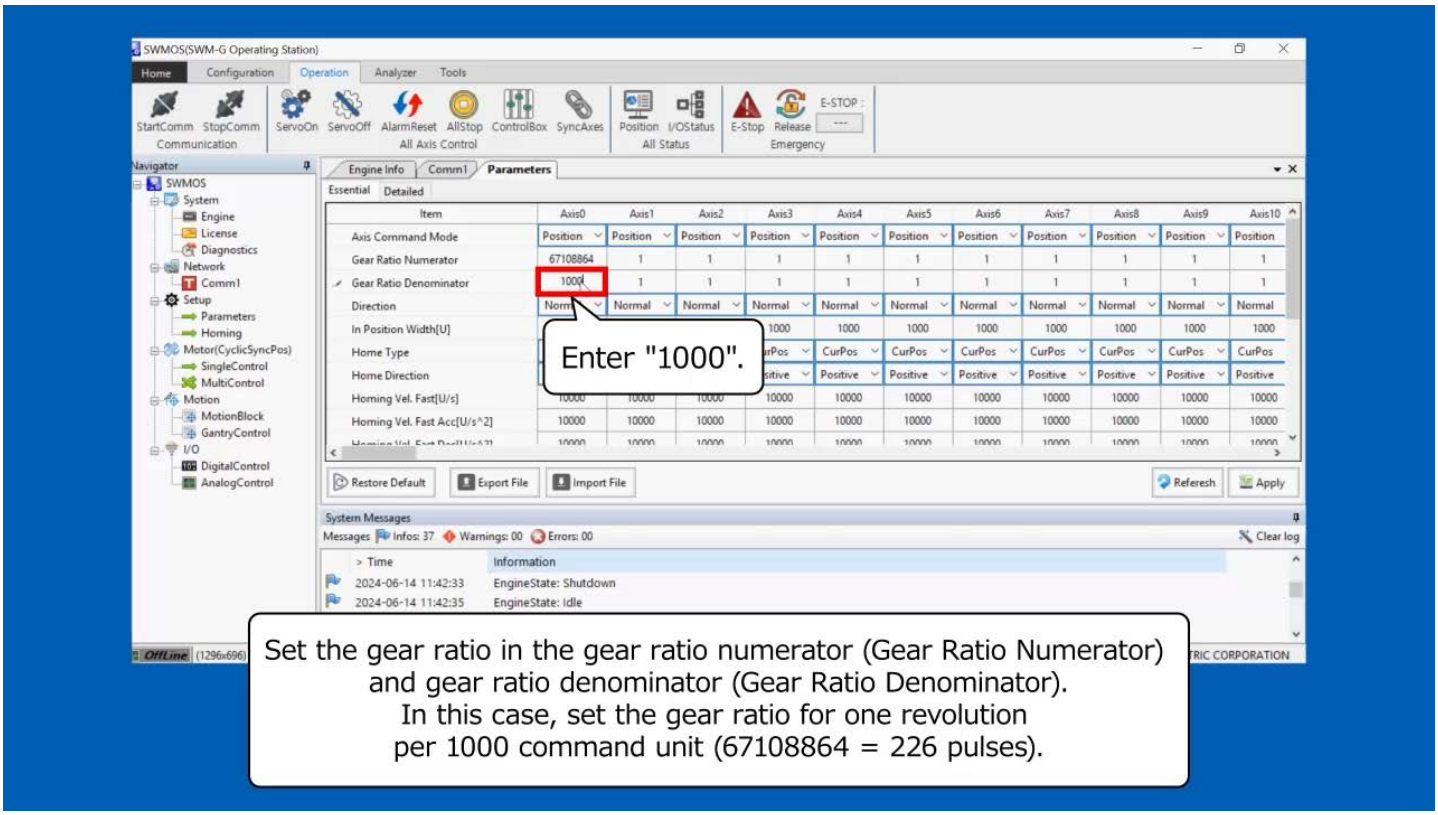
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



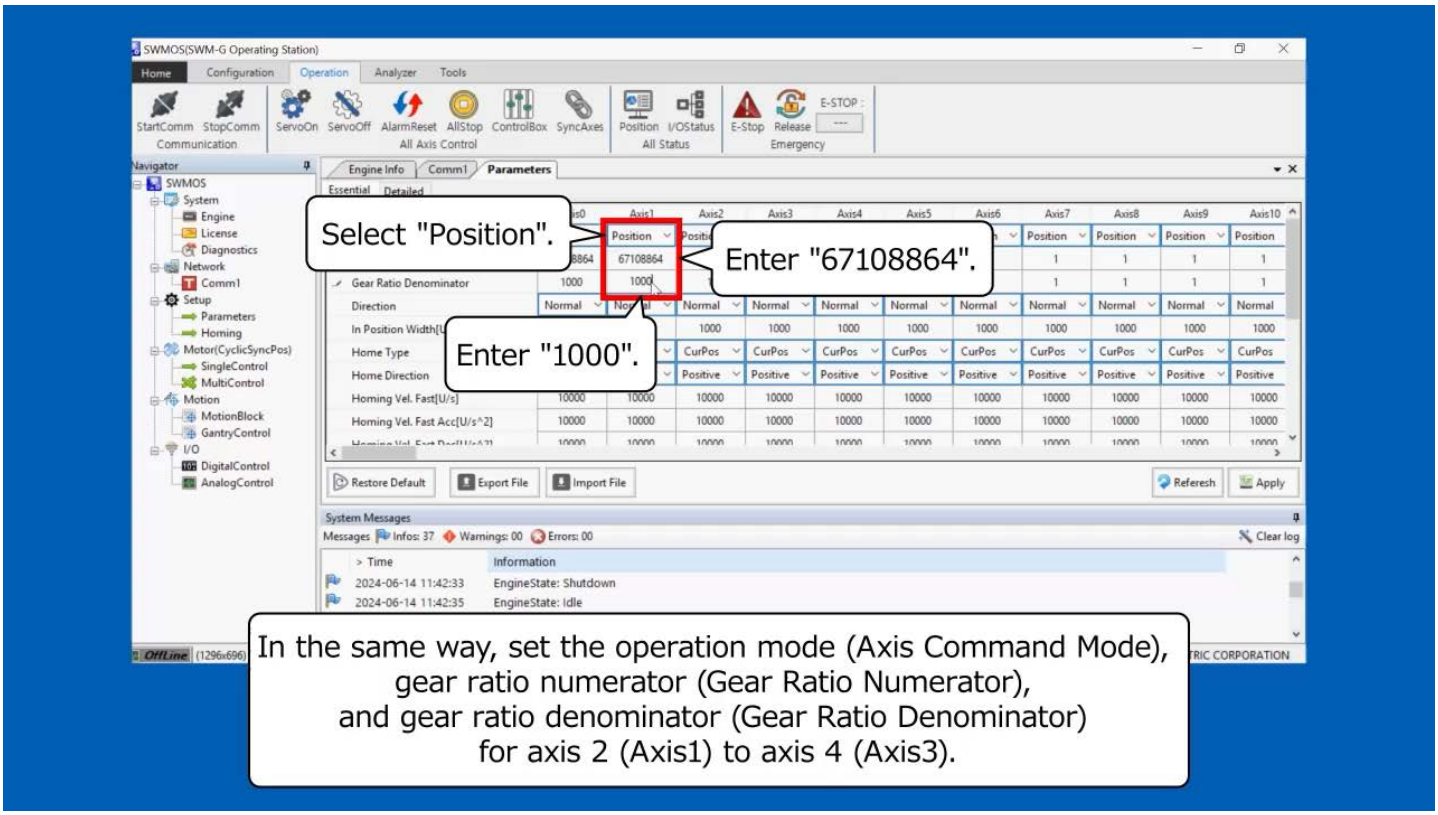
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



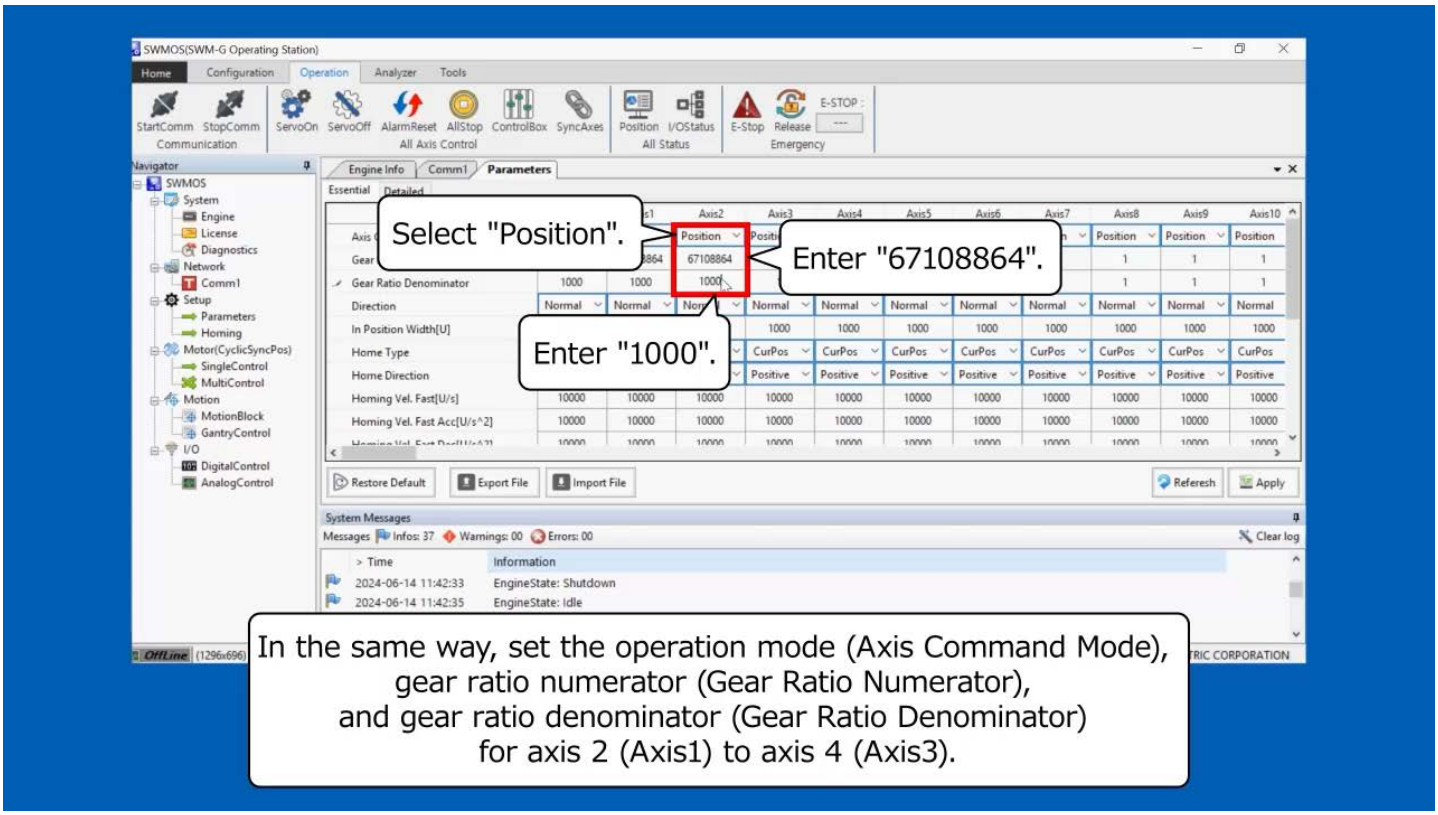
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



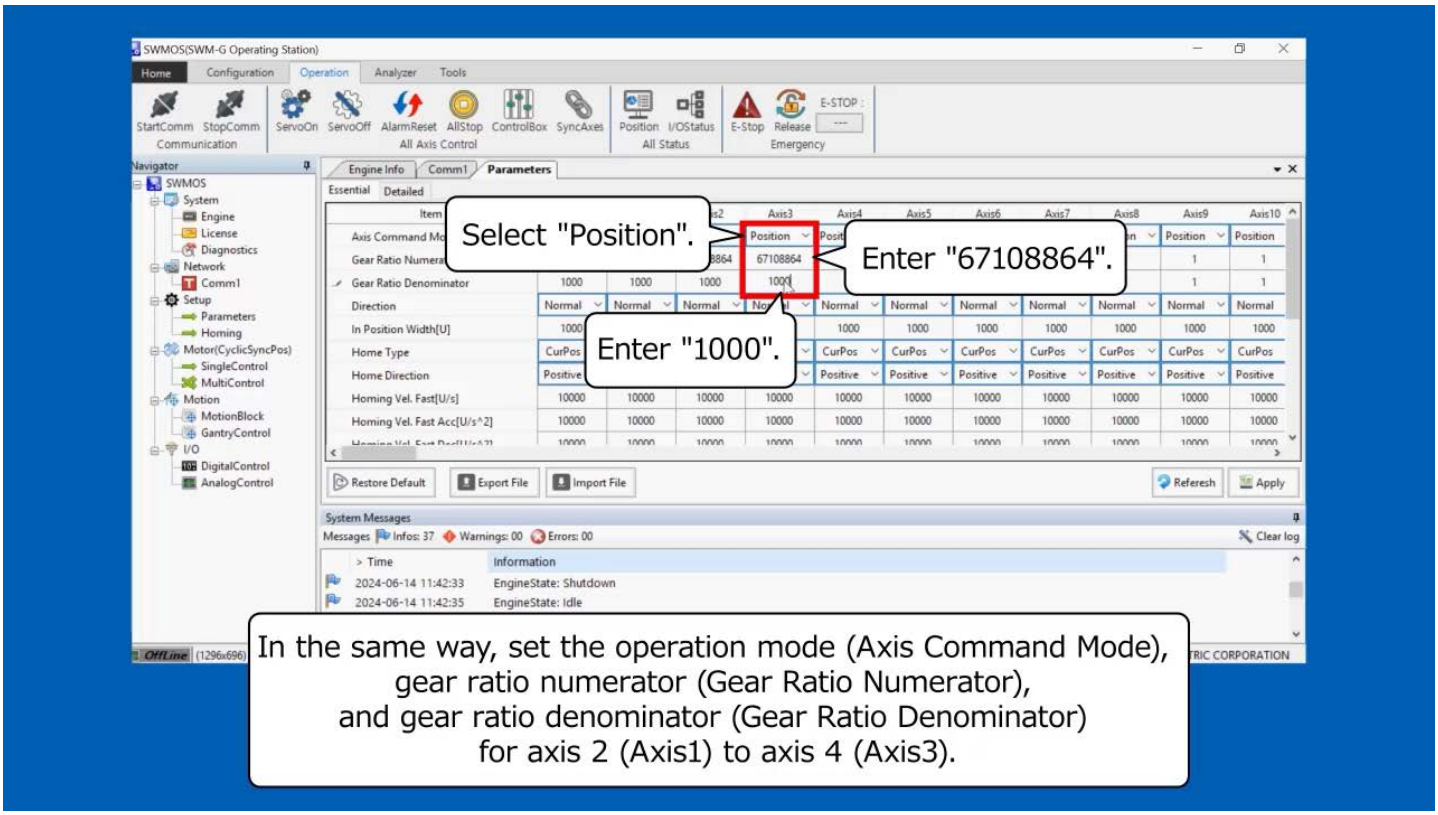
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



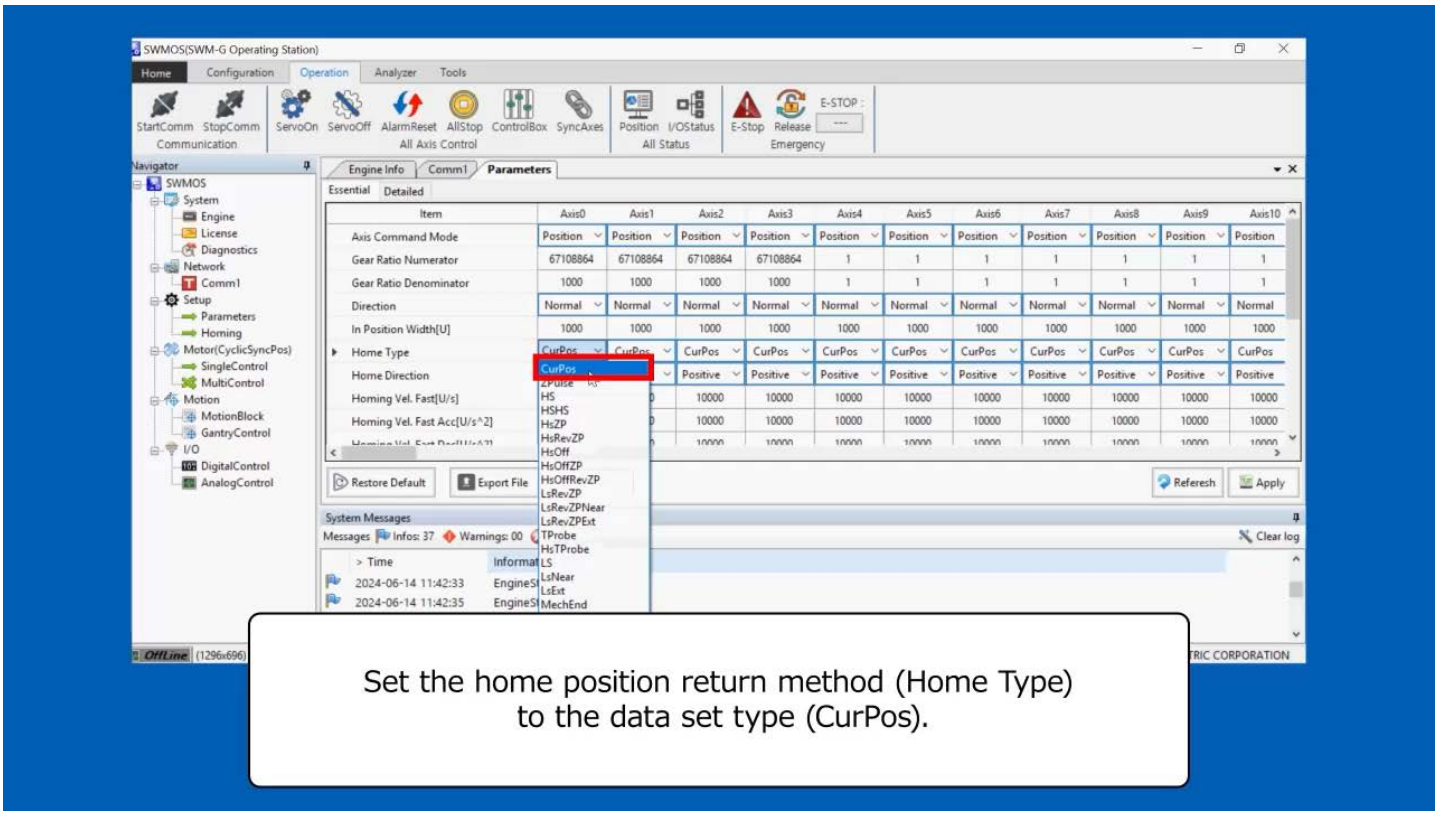
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



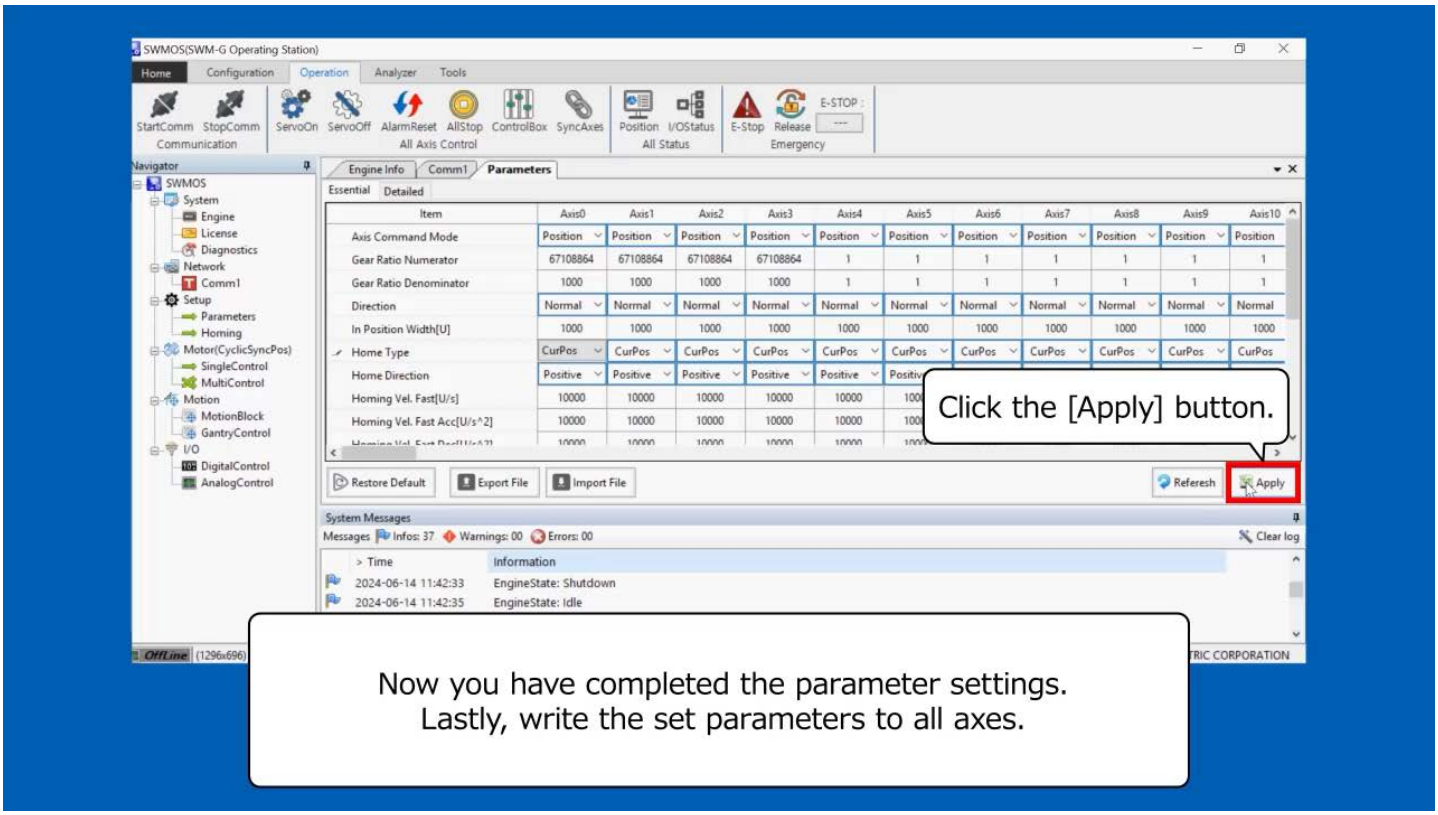
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



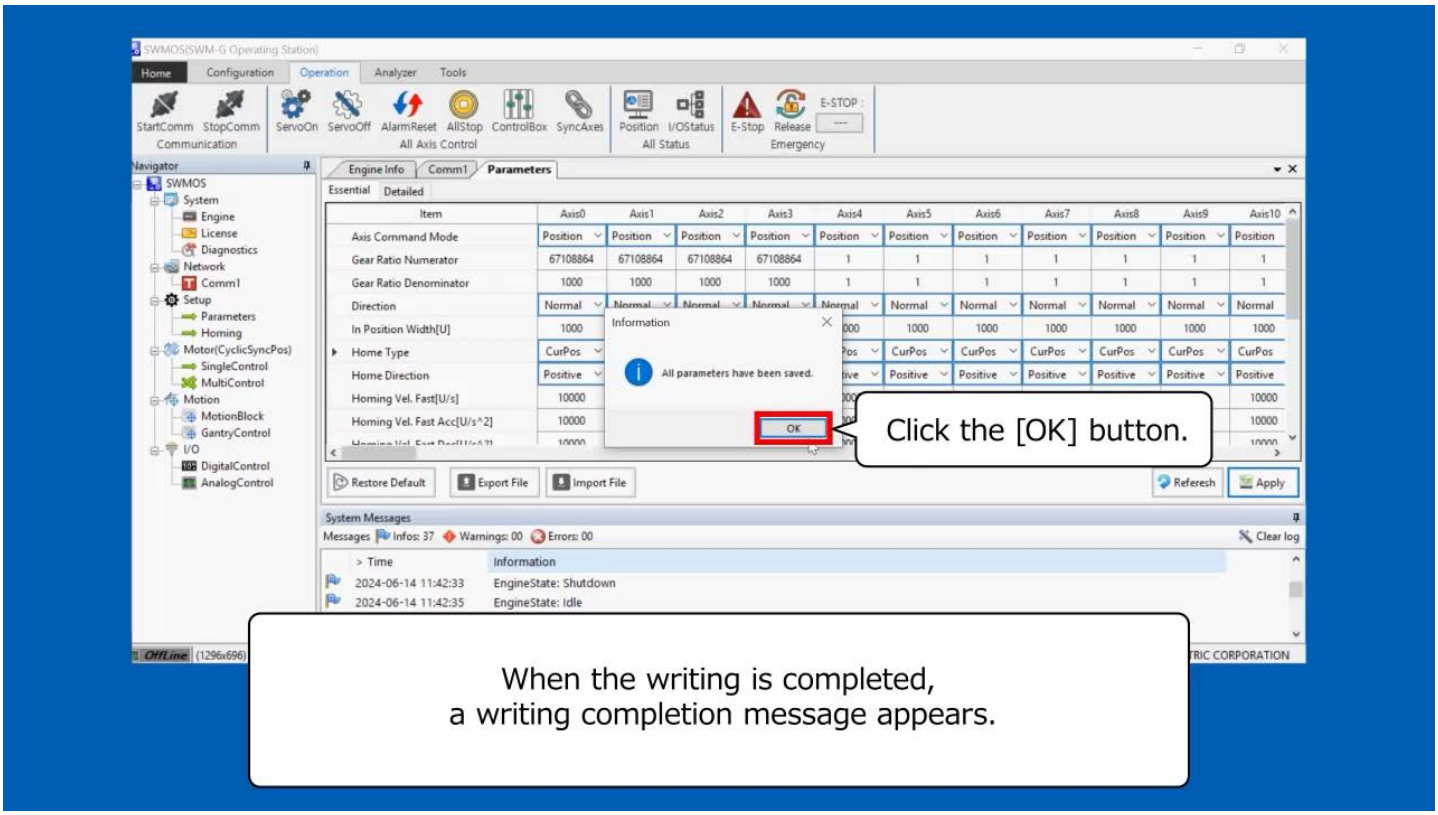
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



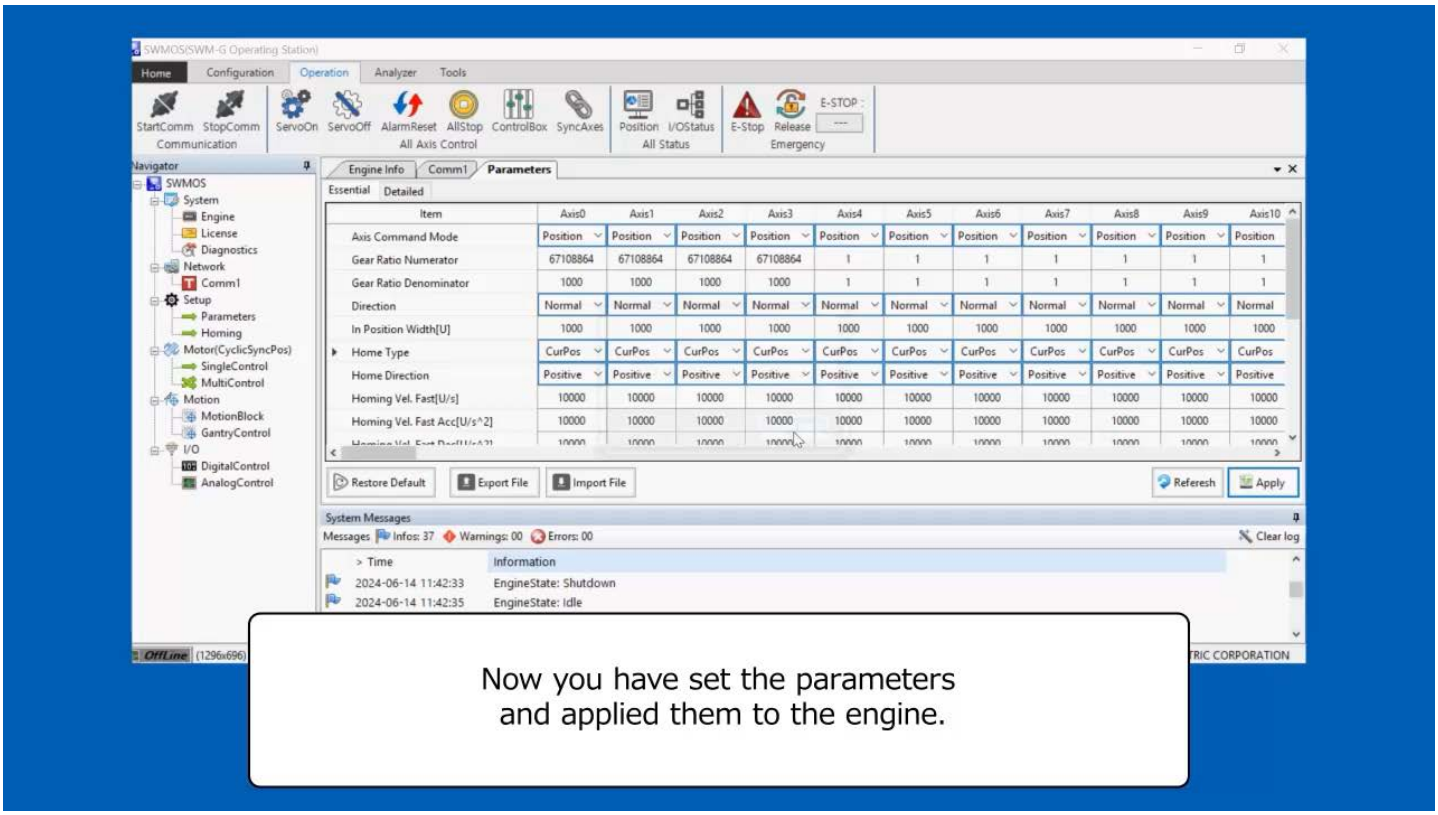
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



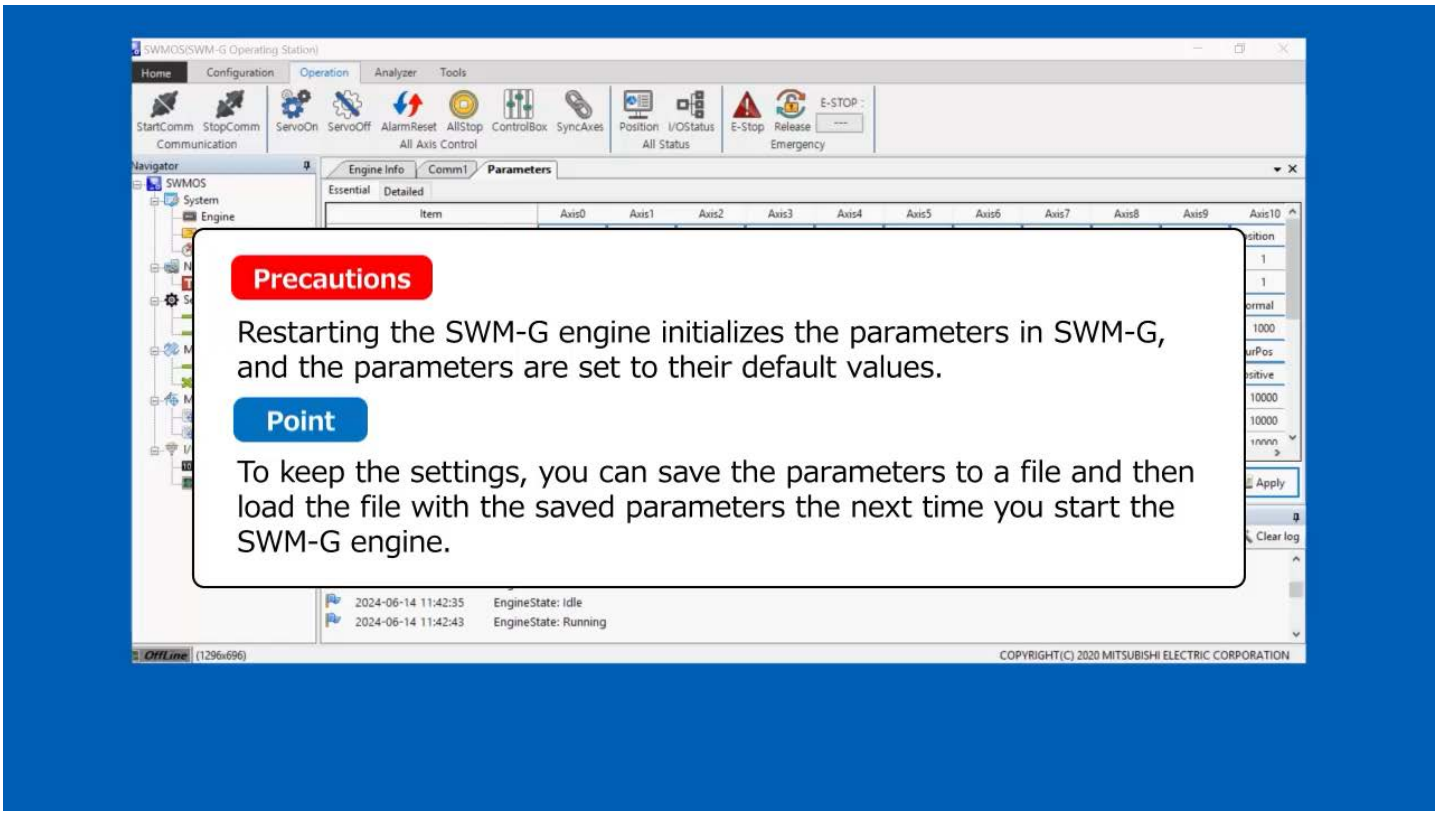
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



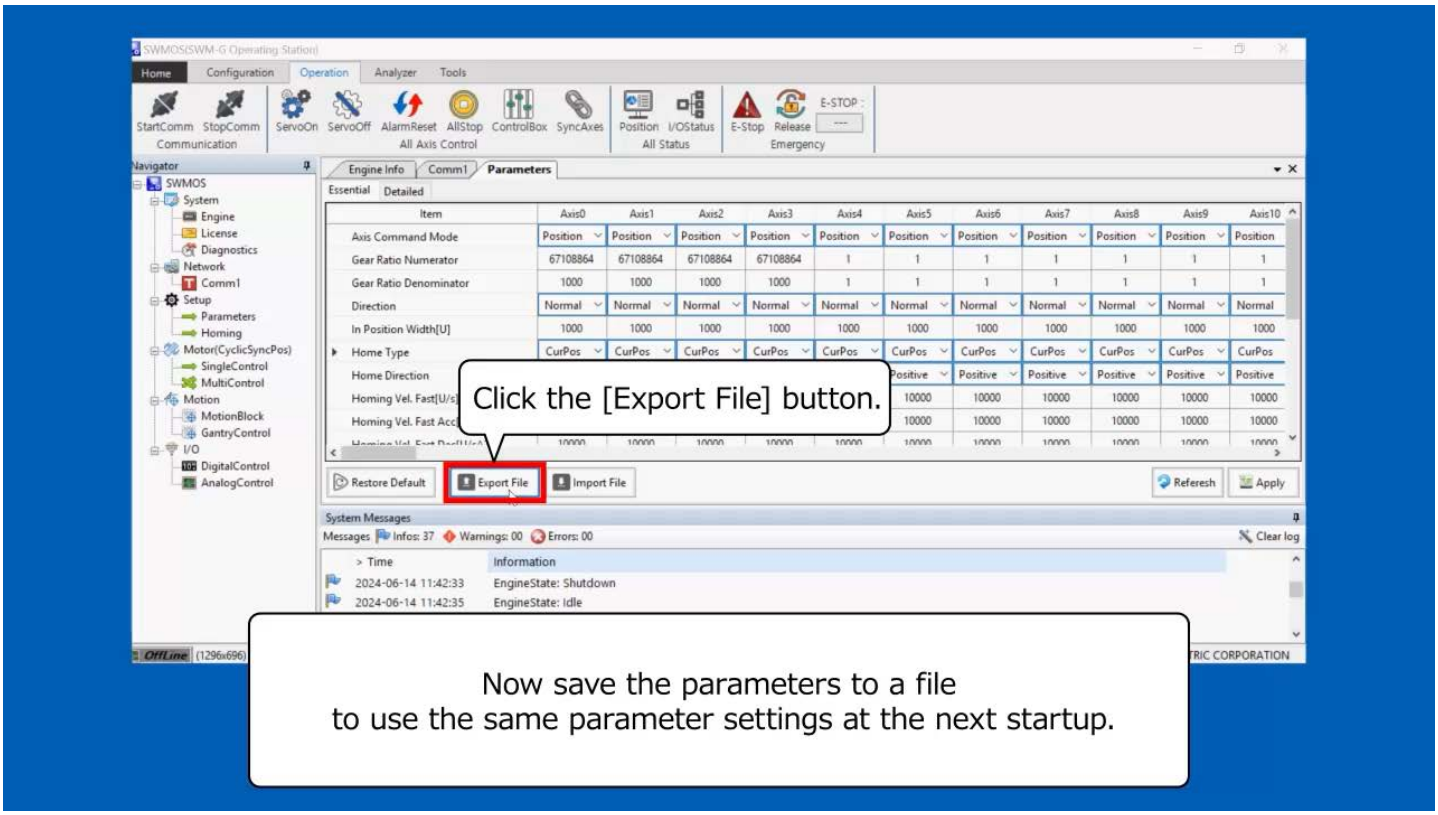
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



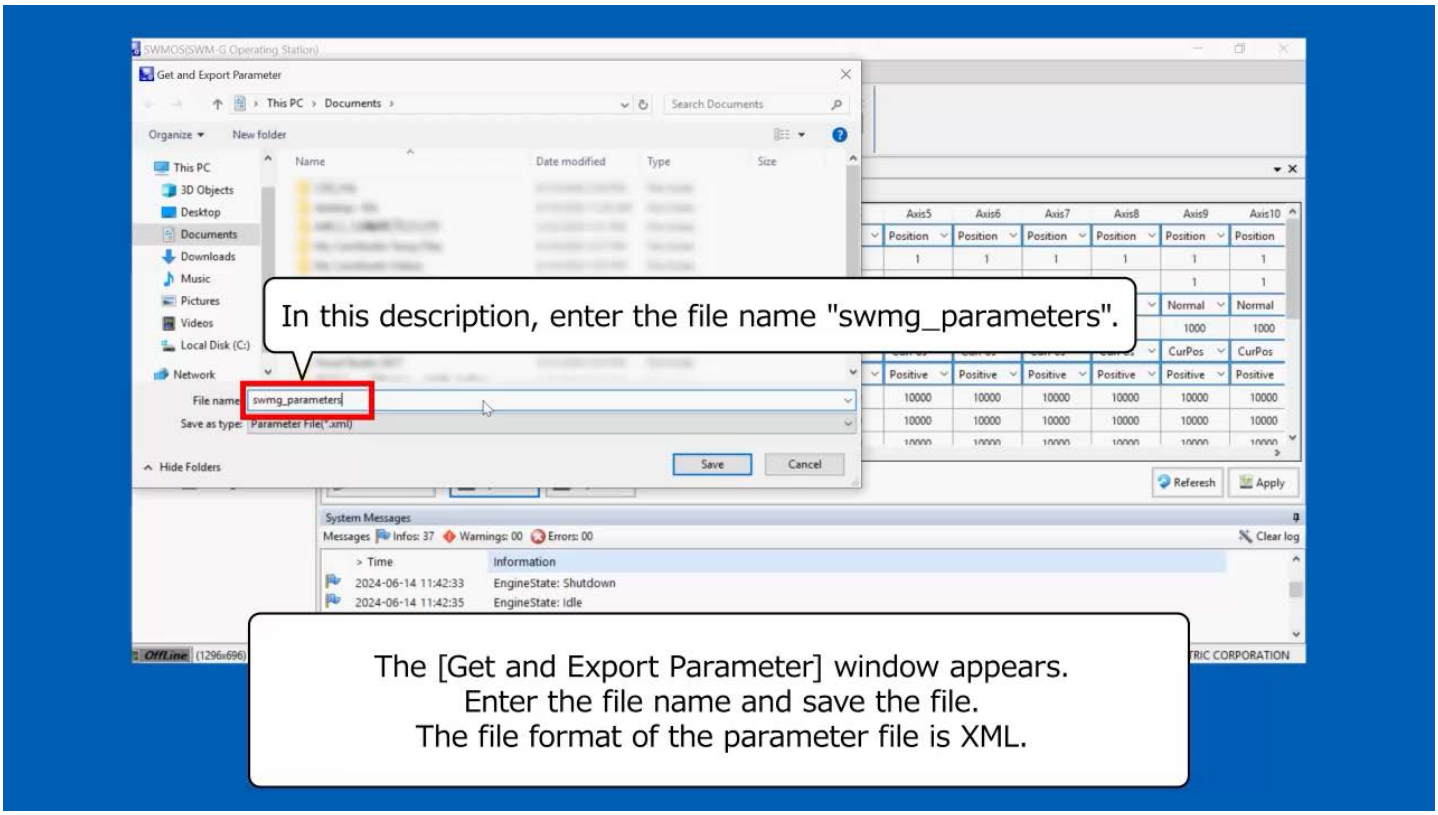
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



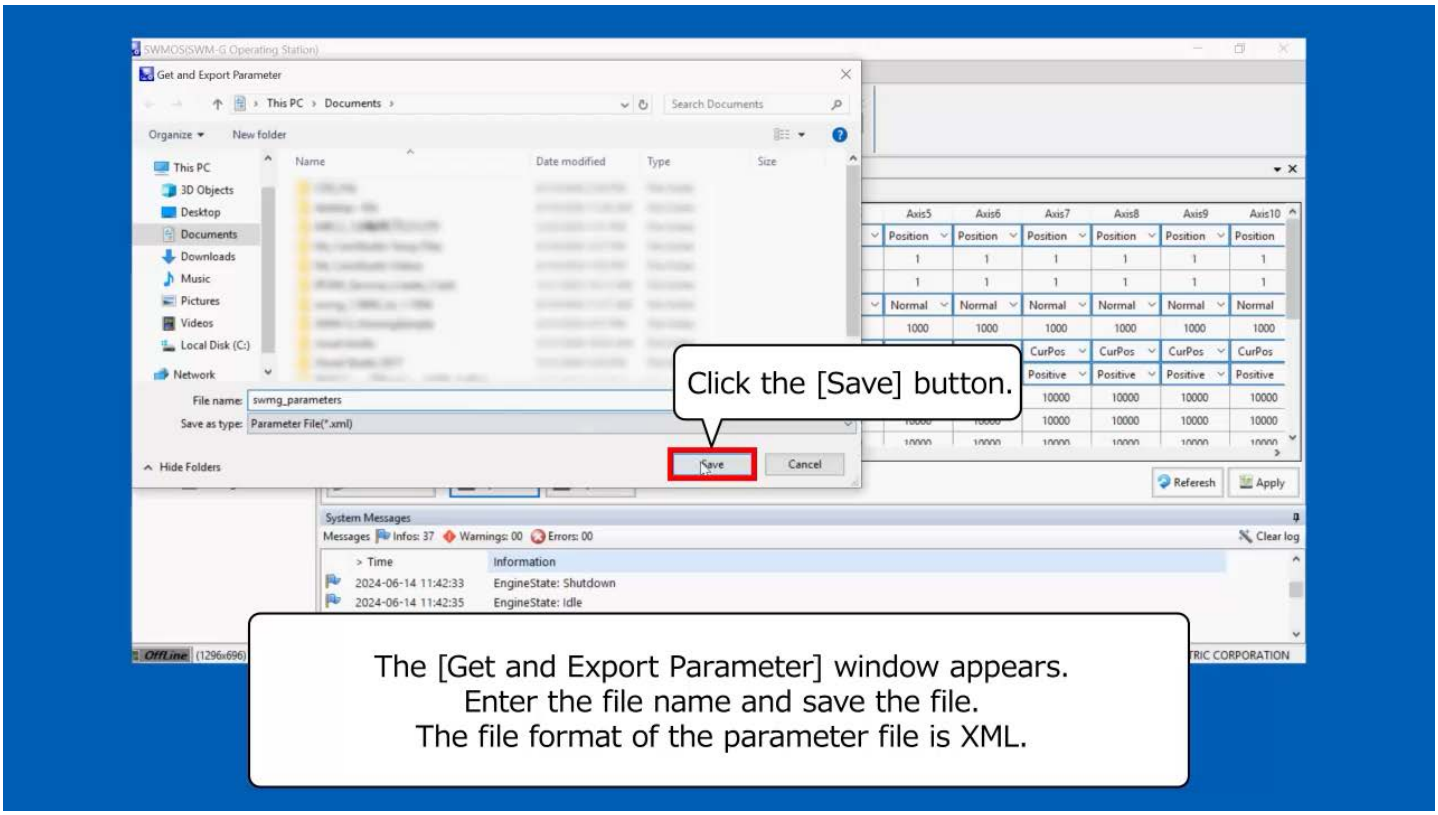
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



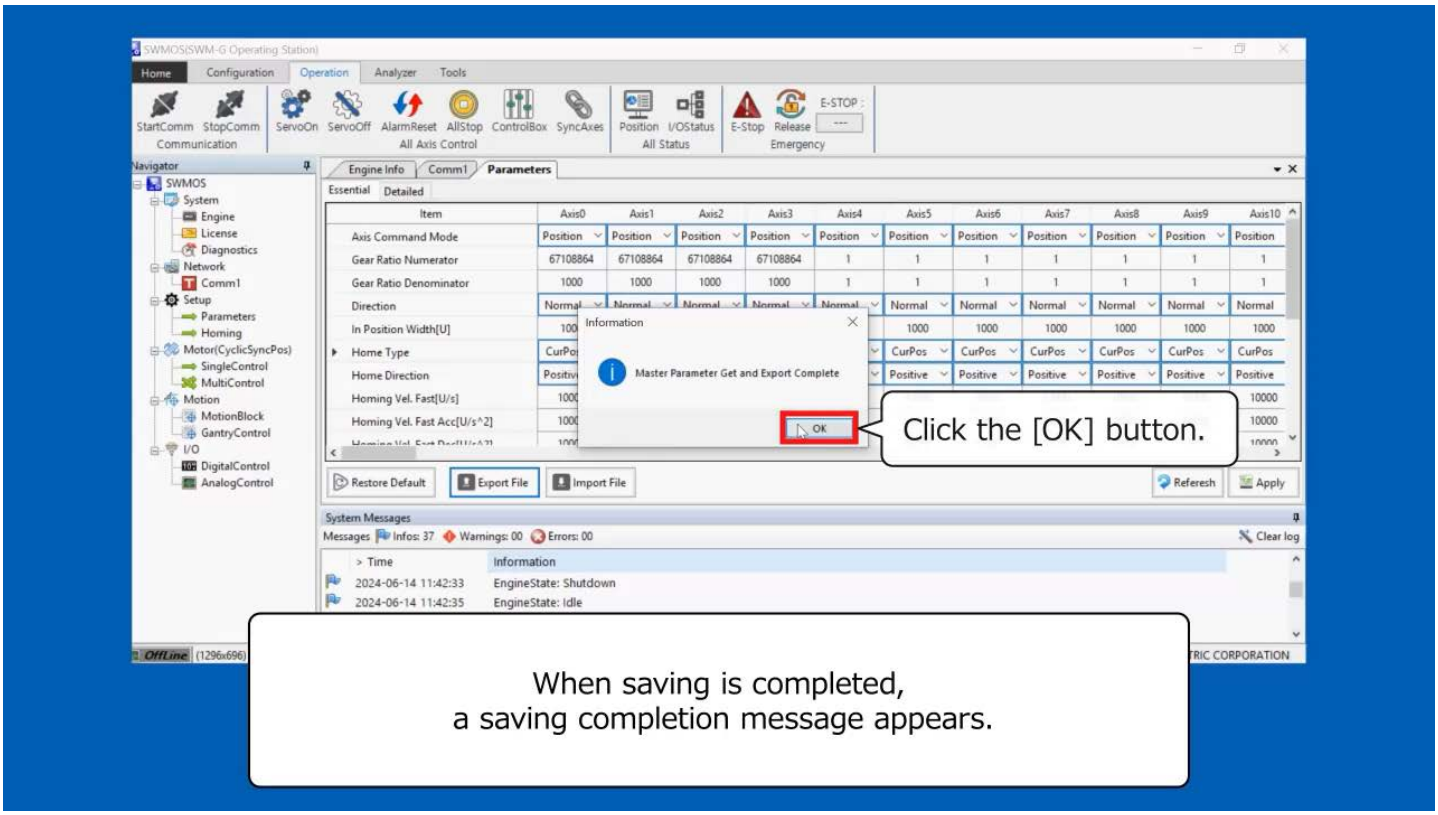
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



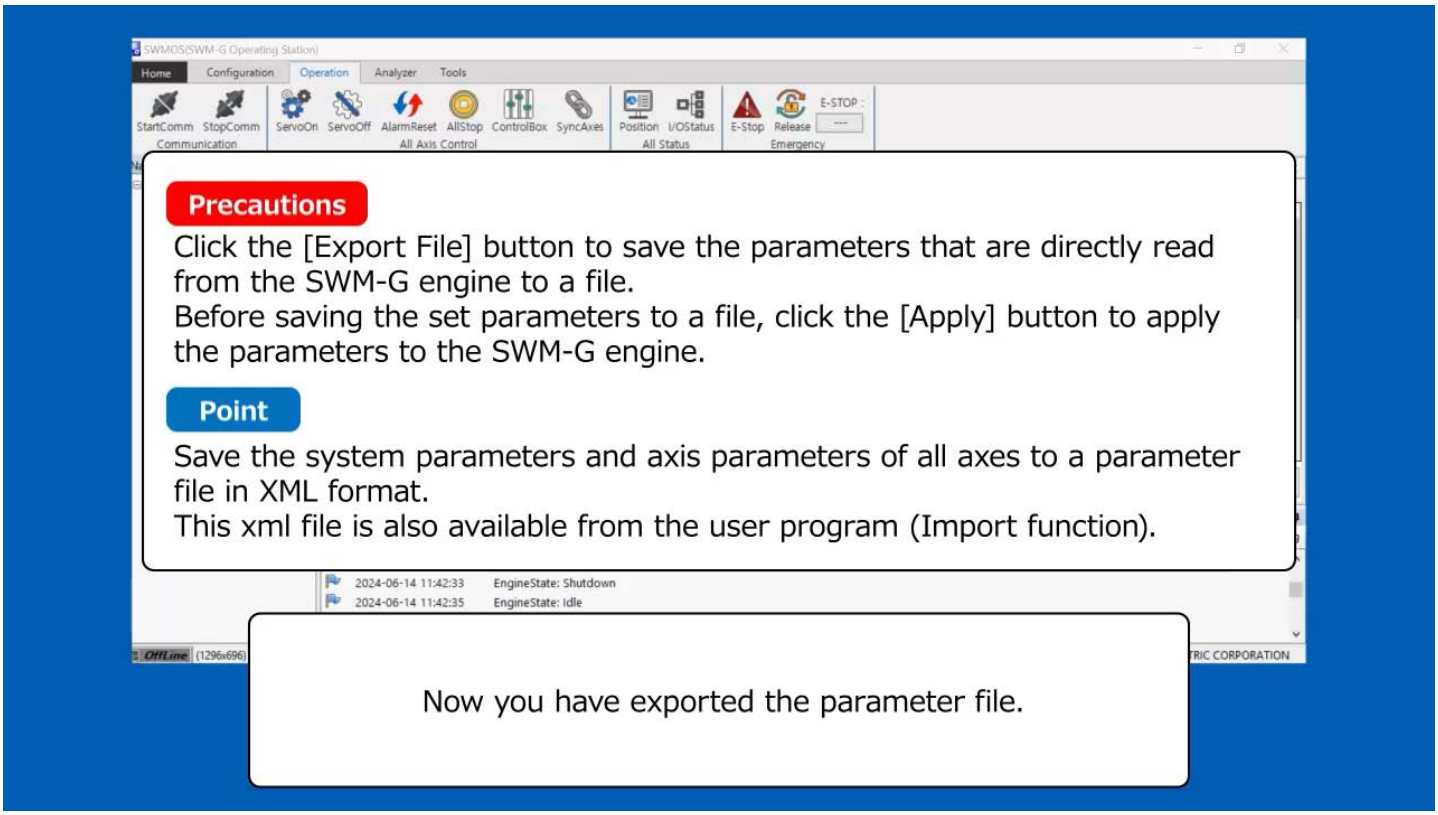
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



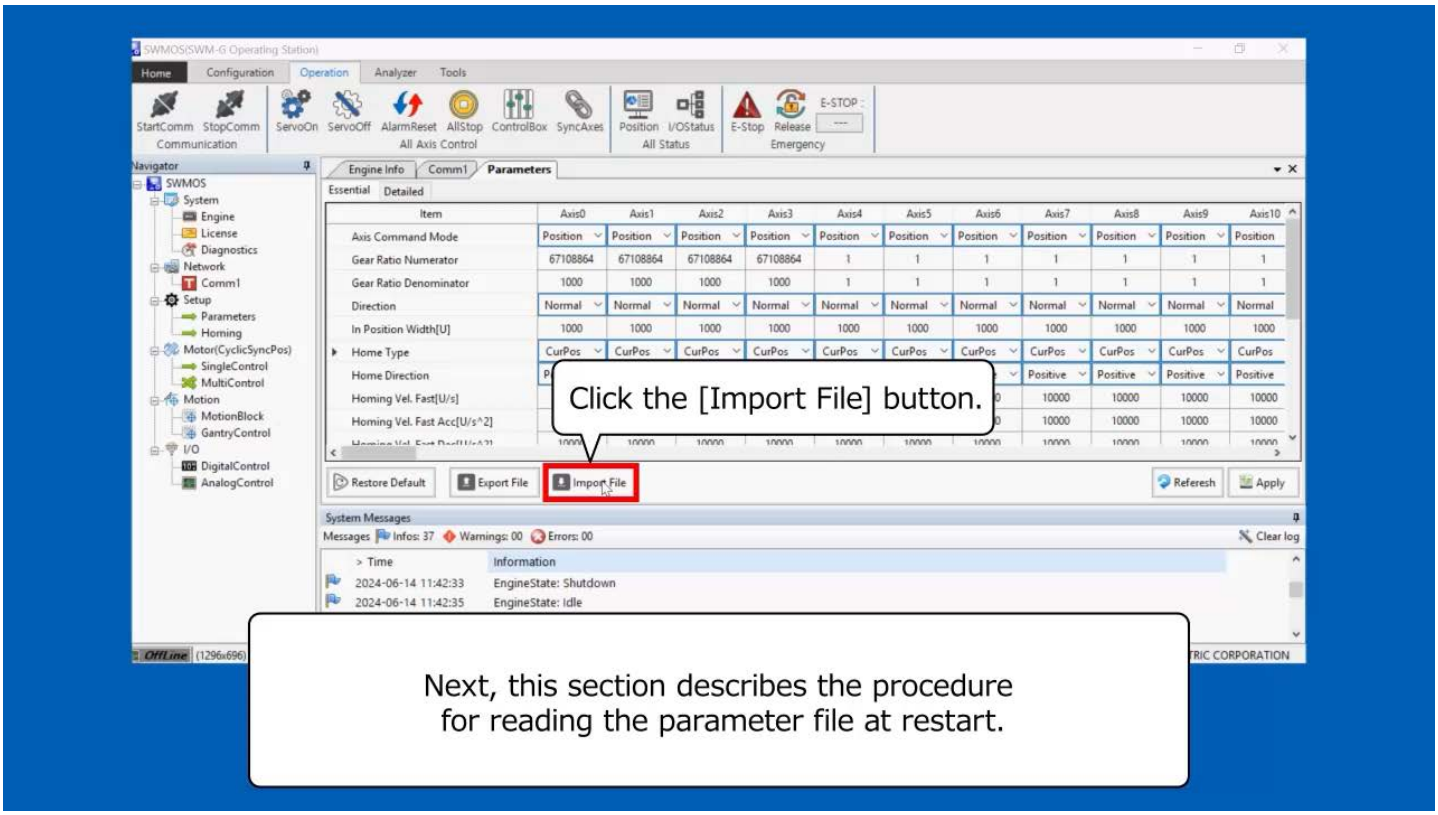
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



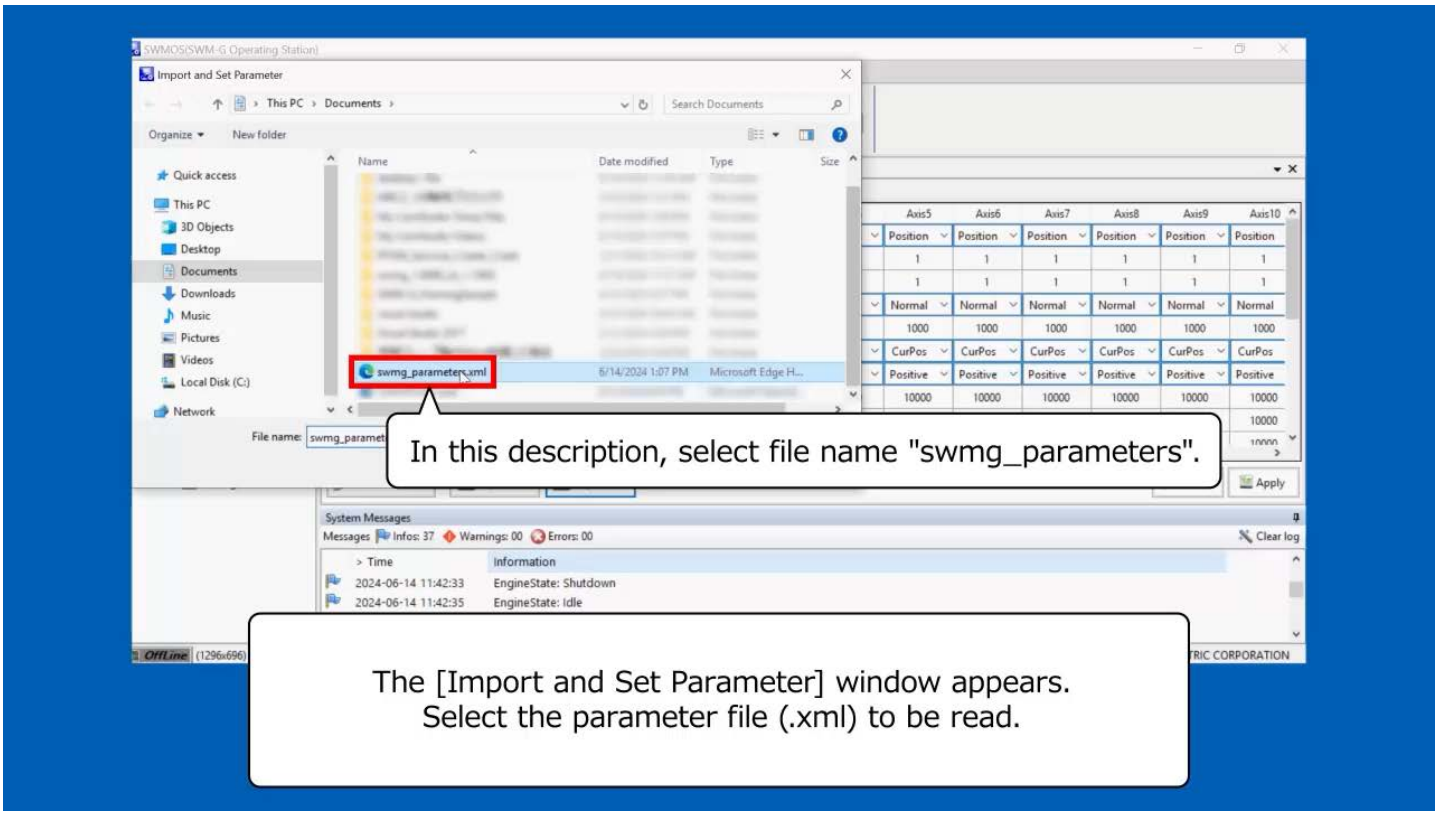
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



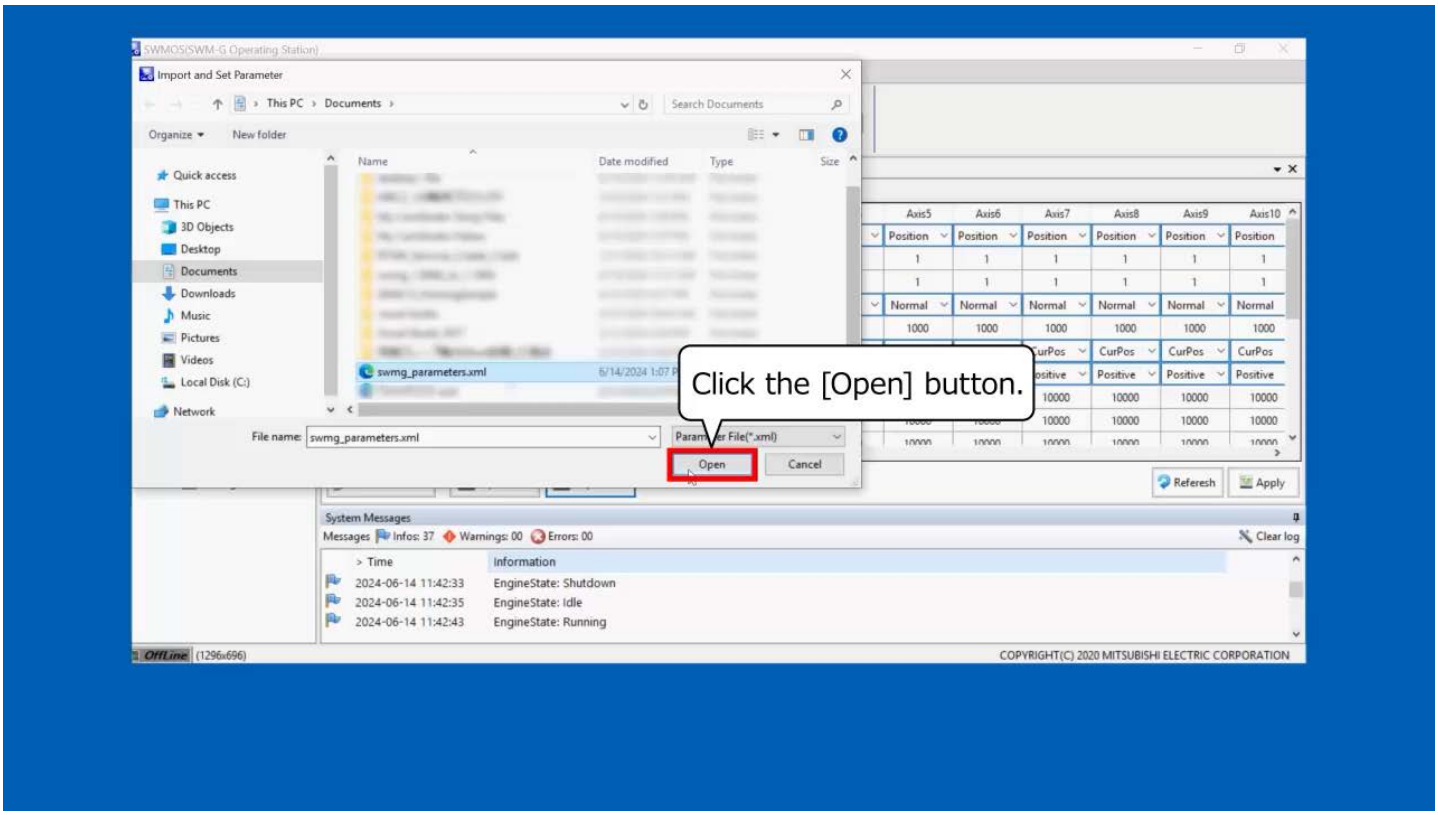
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



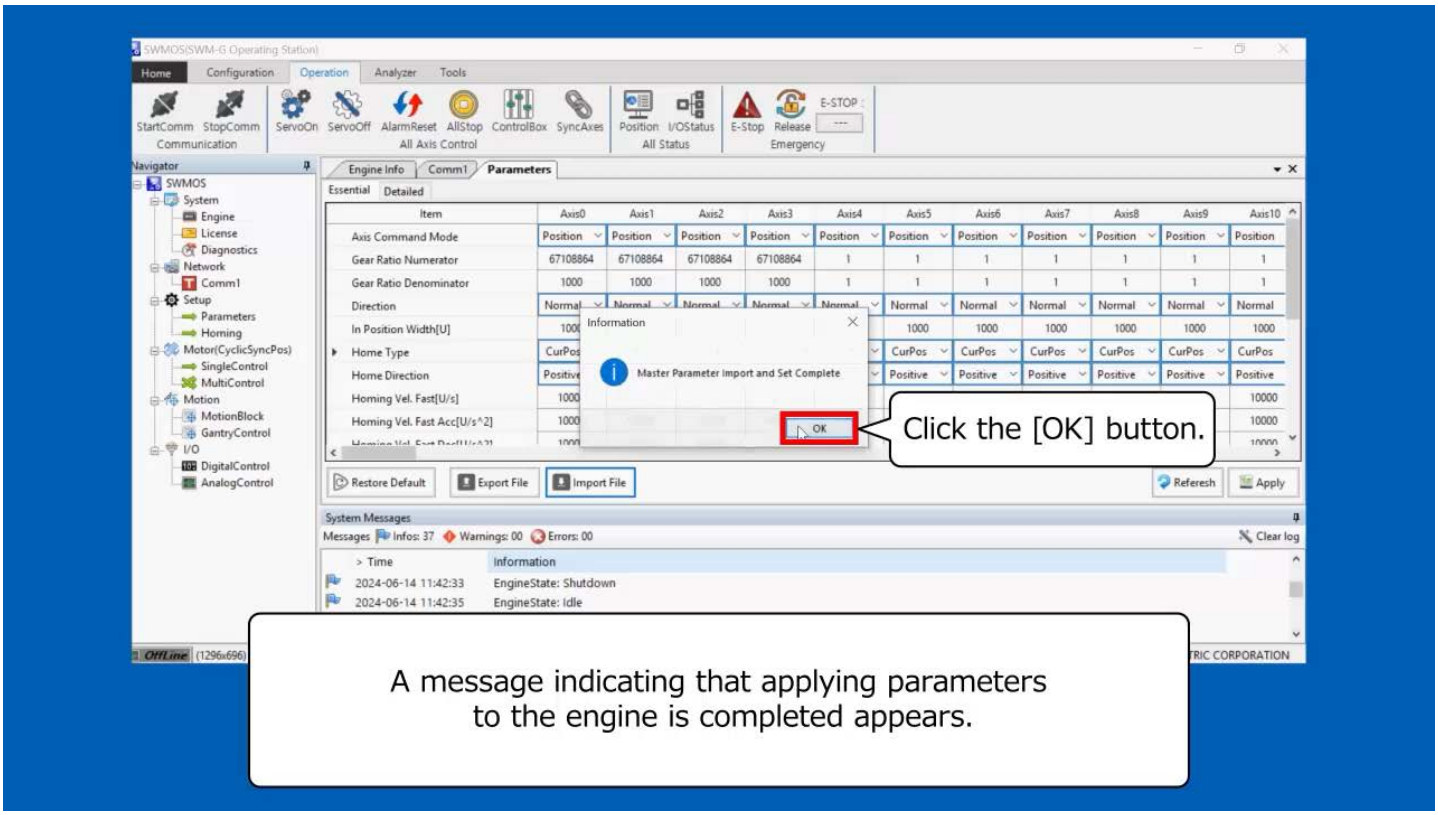
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



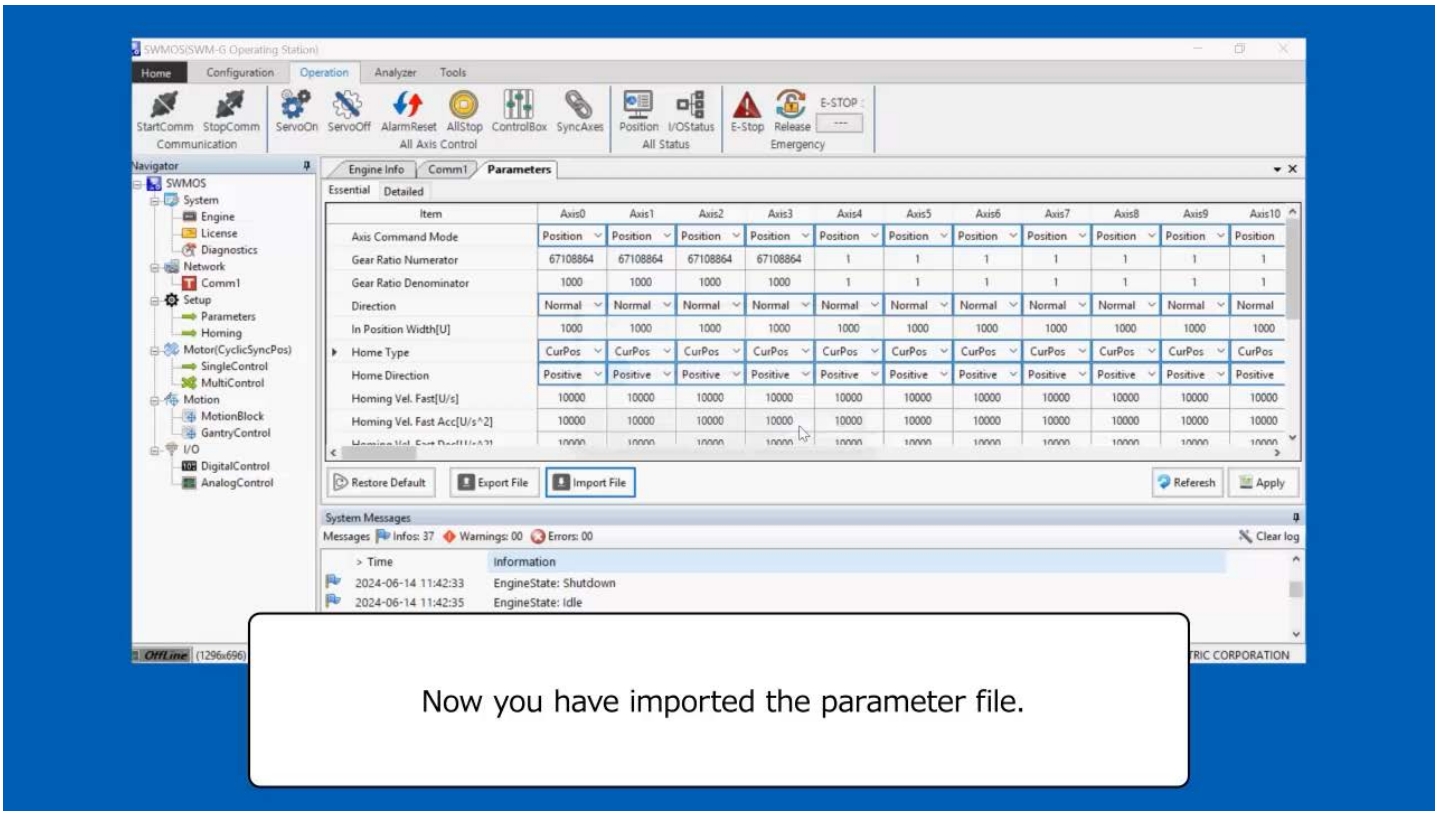
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



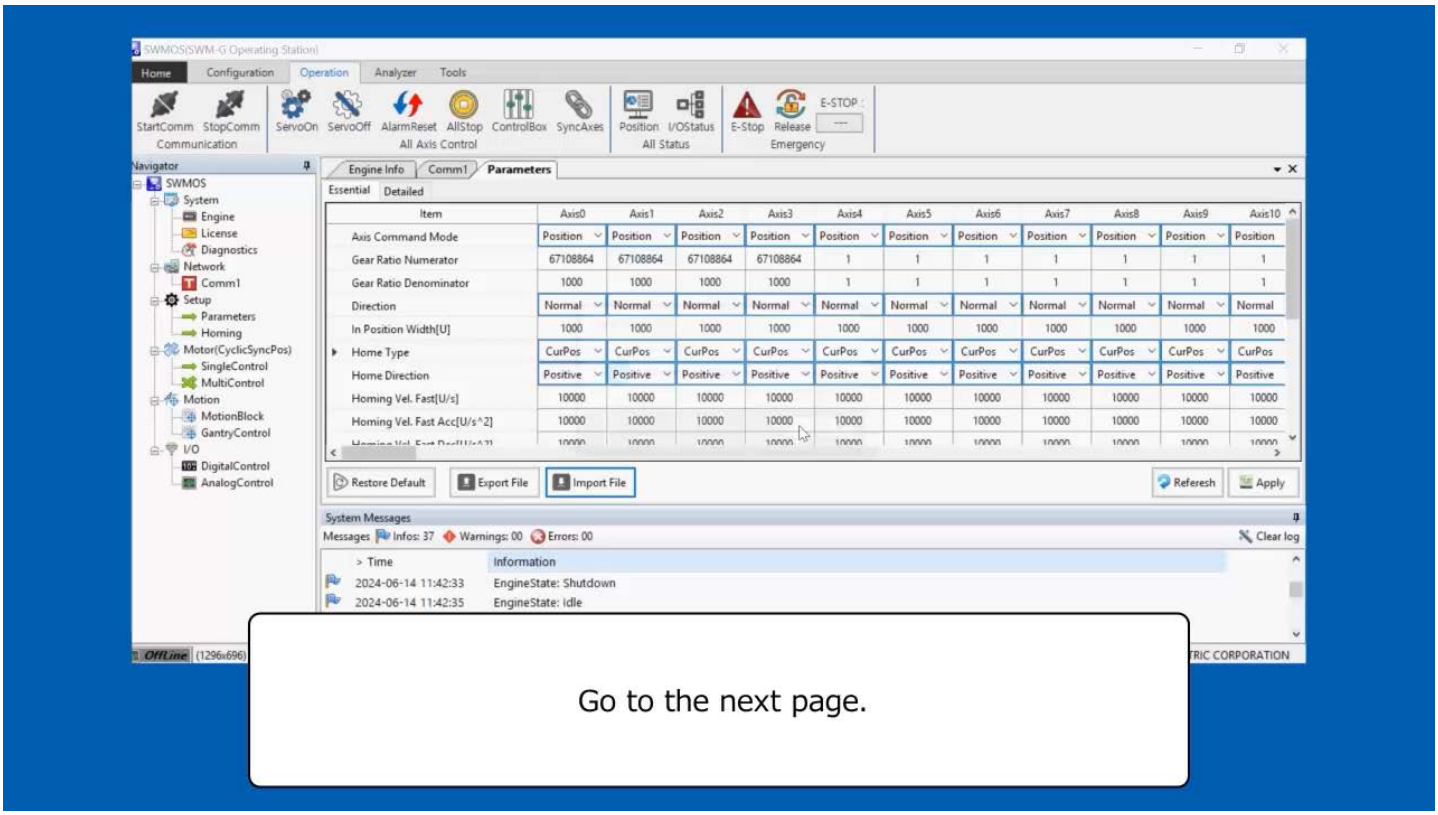
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



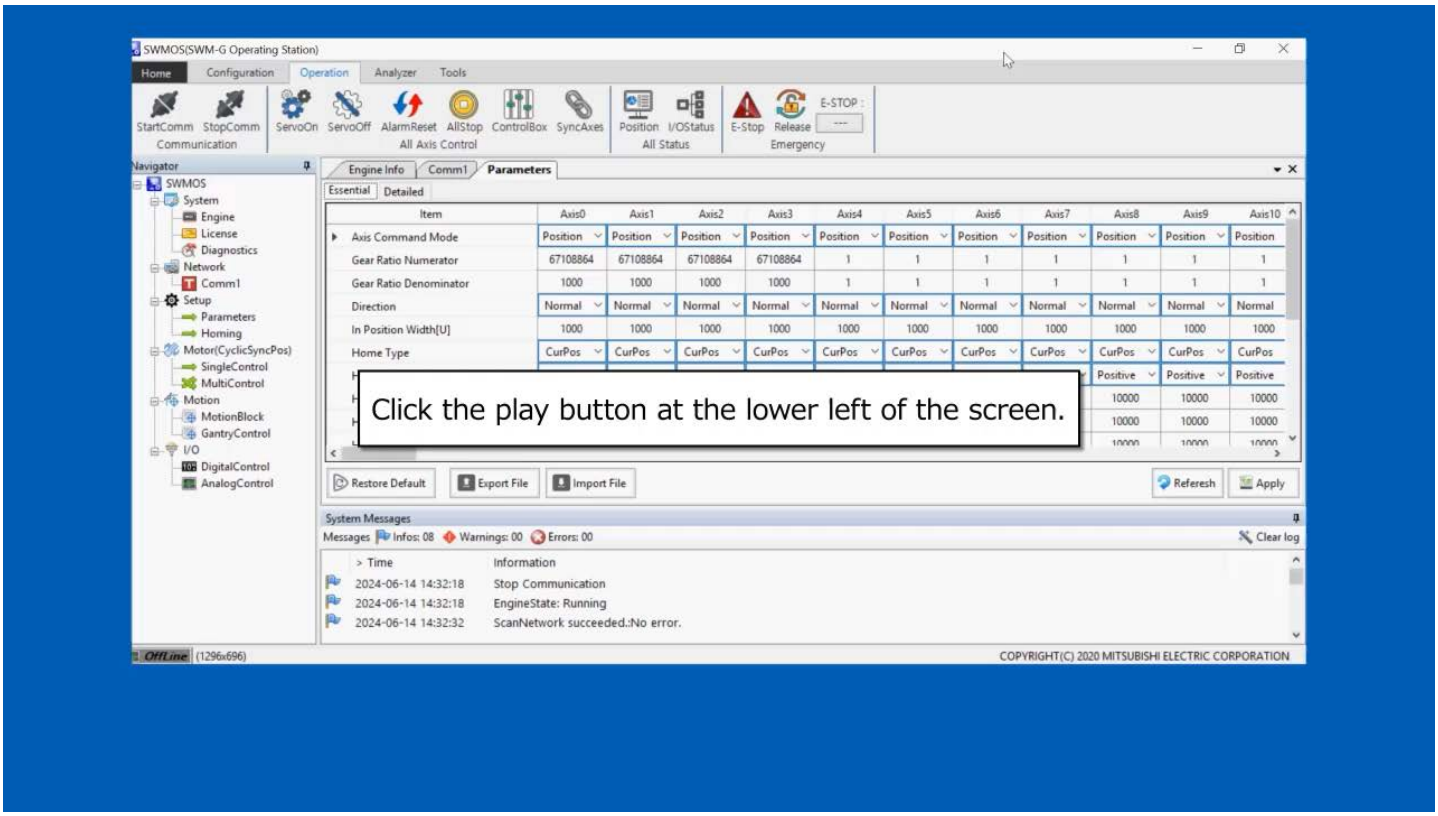
2.5 Parameter Setting

This chapter describes the parameter settings.
Check that the steps up to Section 2.4.2 "Writing to SWM-G engine" have been completed in the SWMOS screen.
For the parameter setting procedure, see the video below.



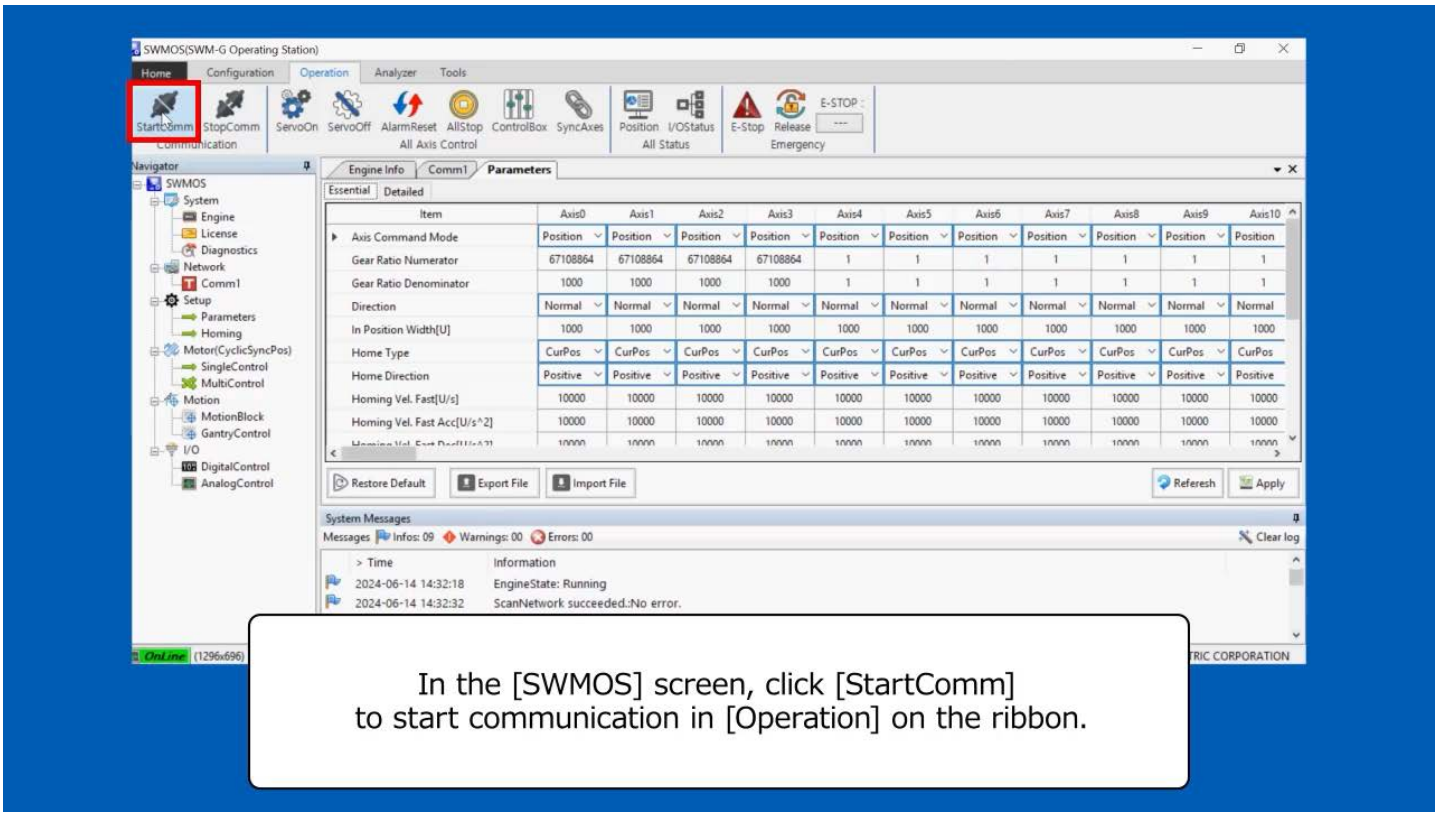
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



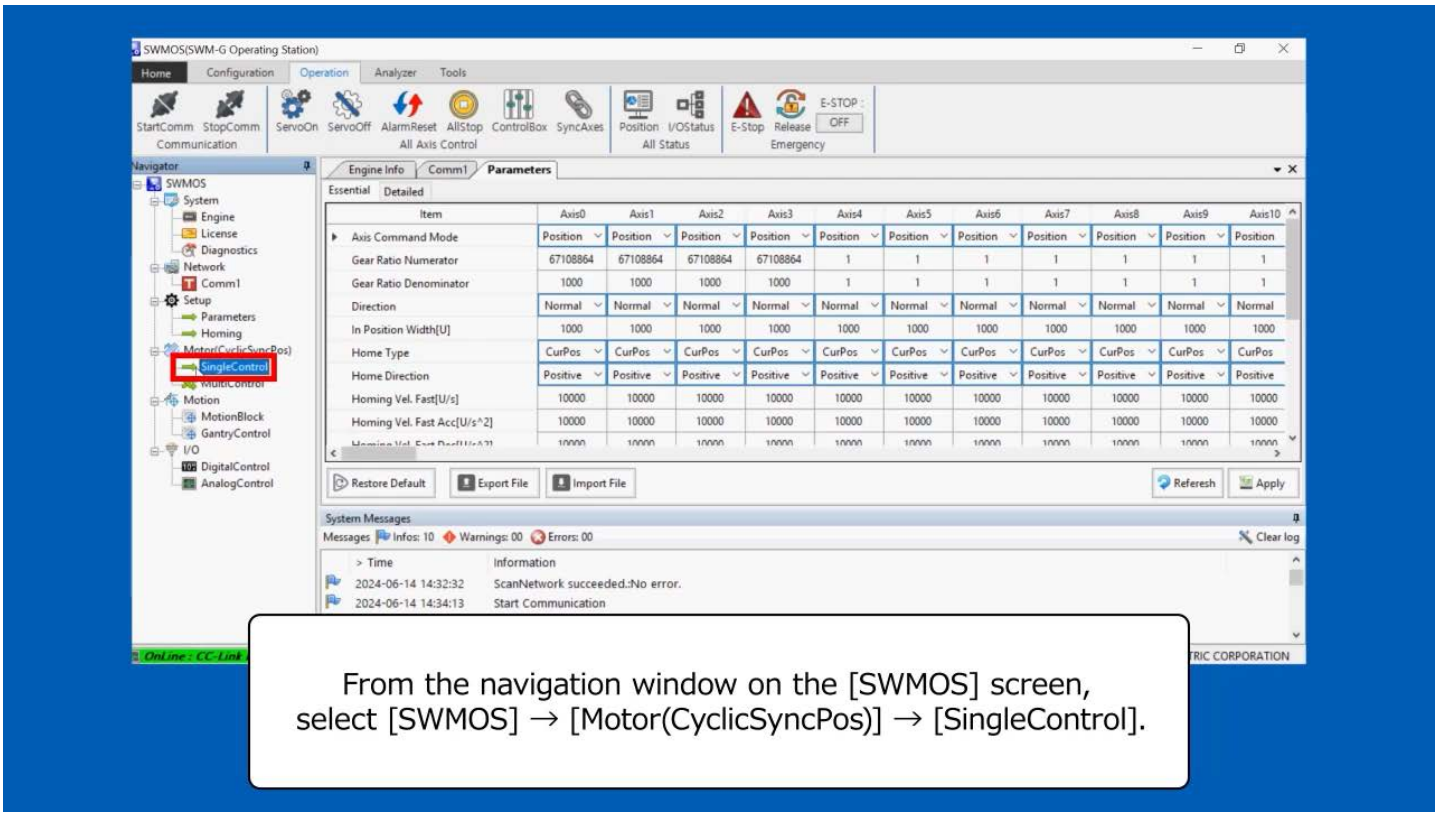
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



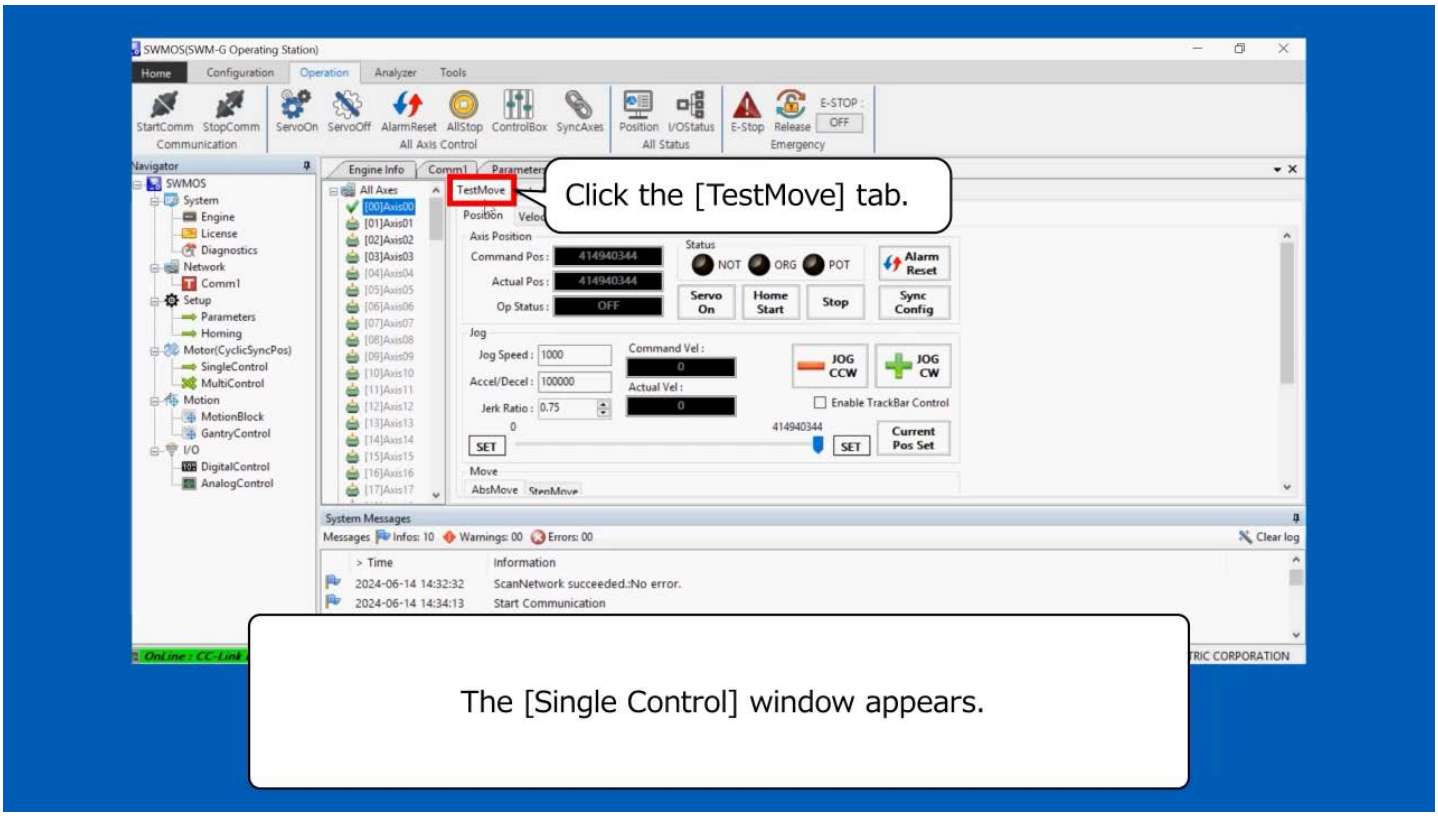
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



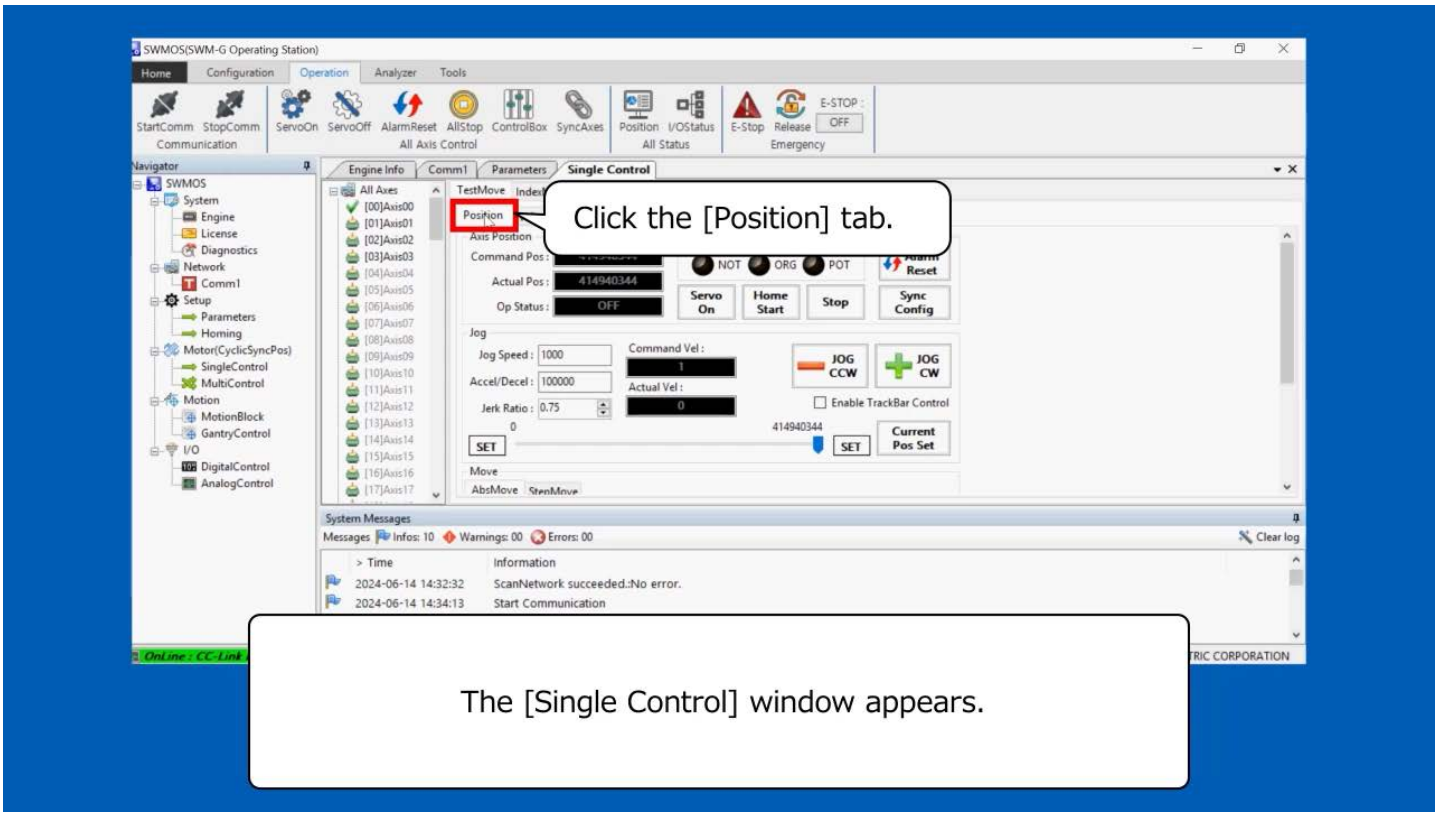
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



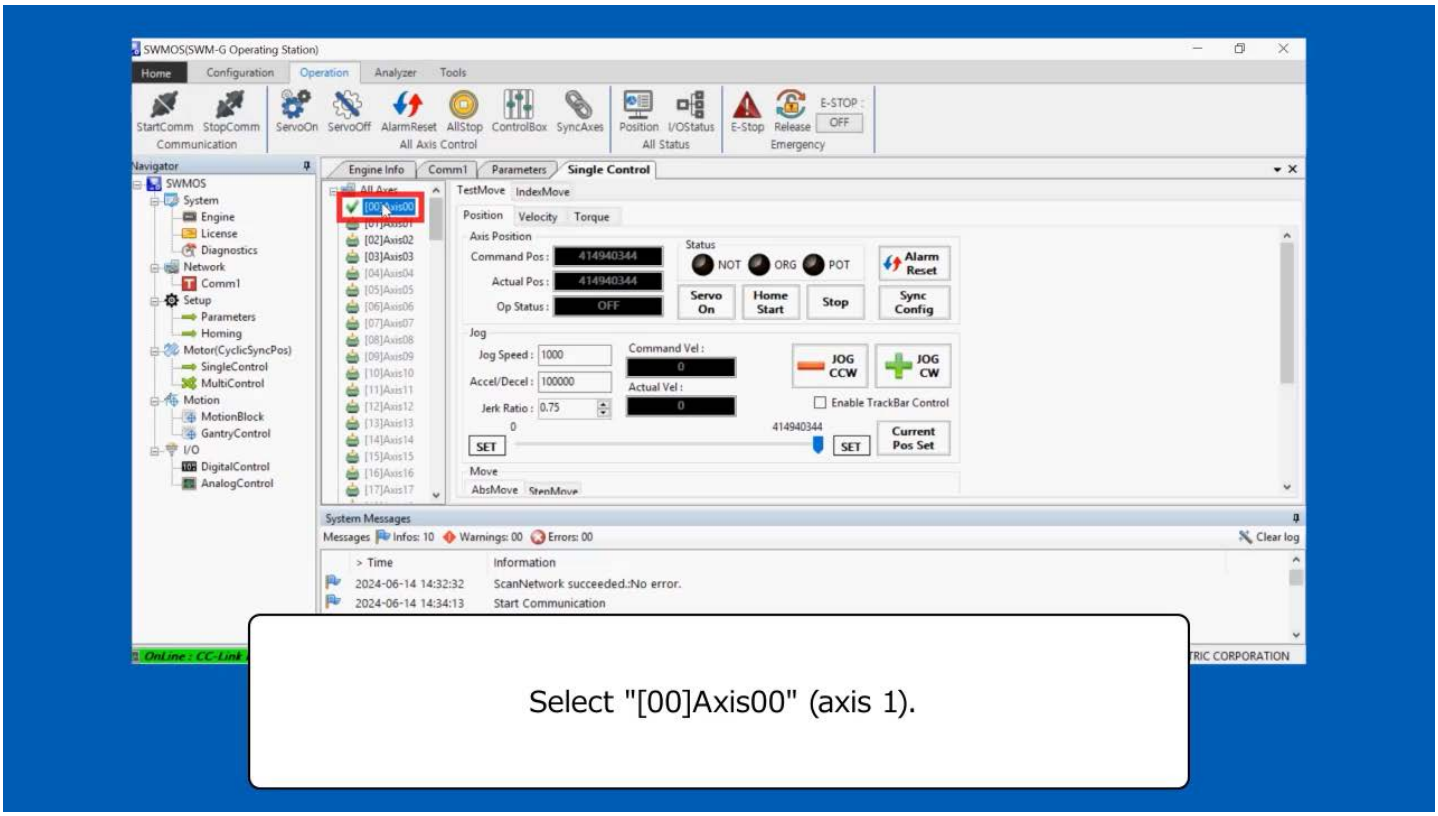
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



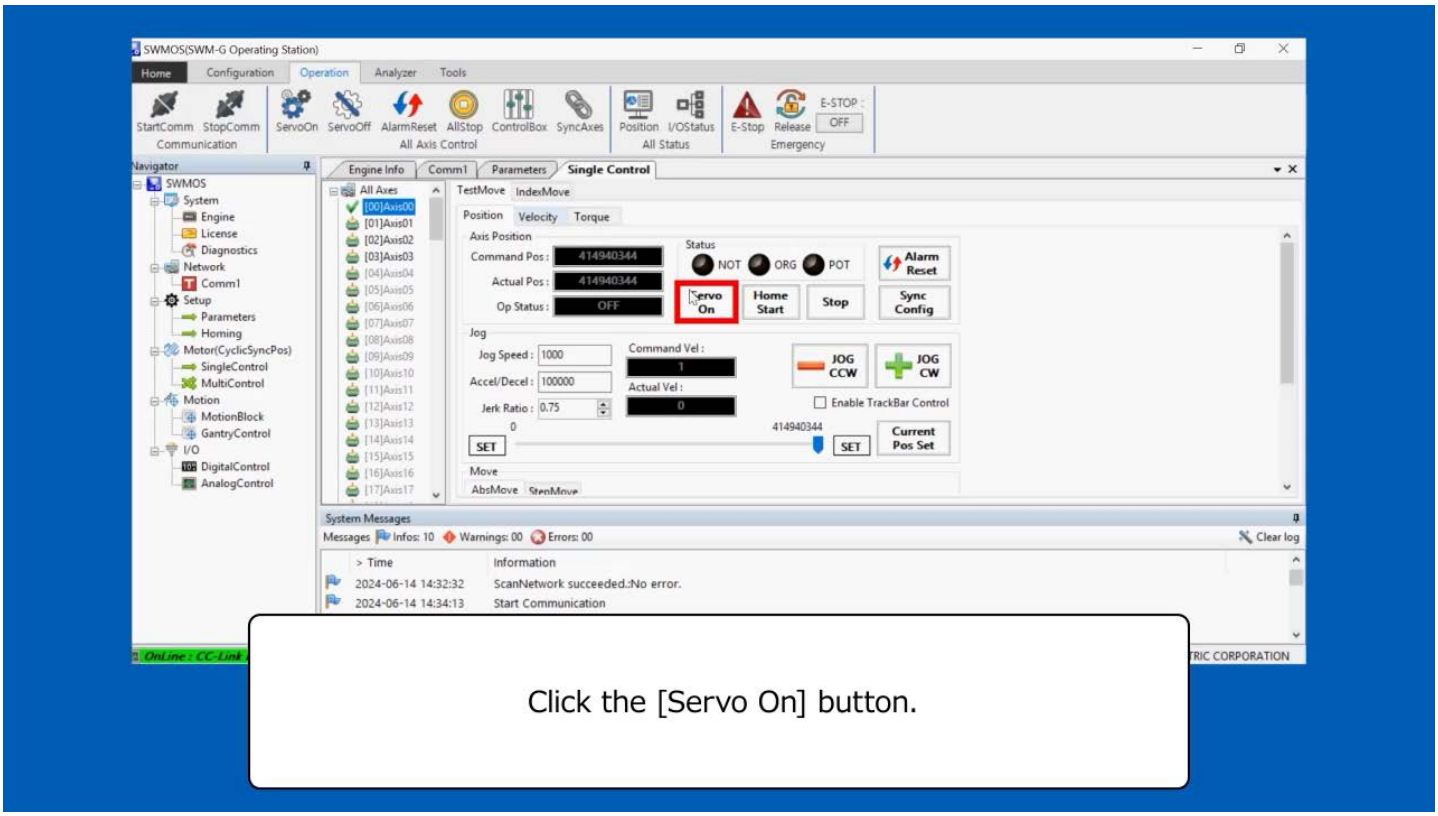
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



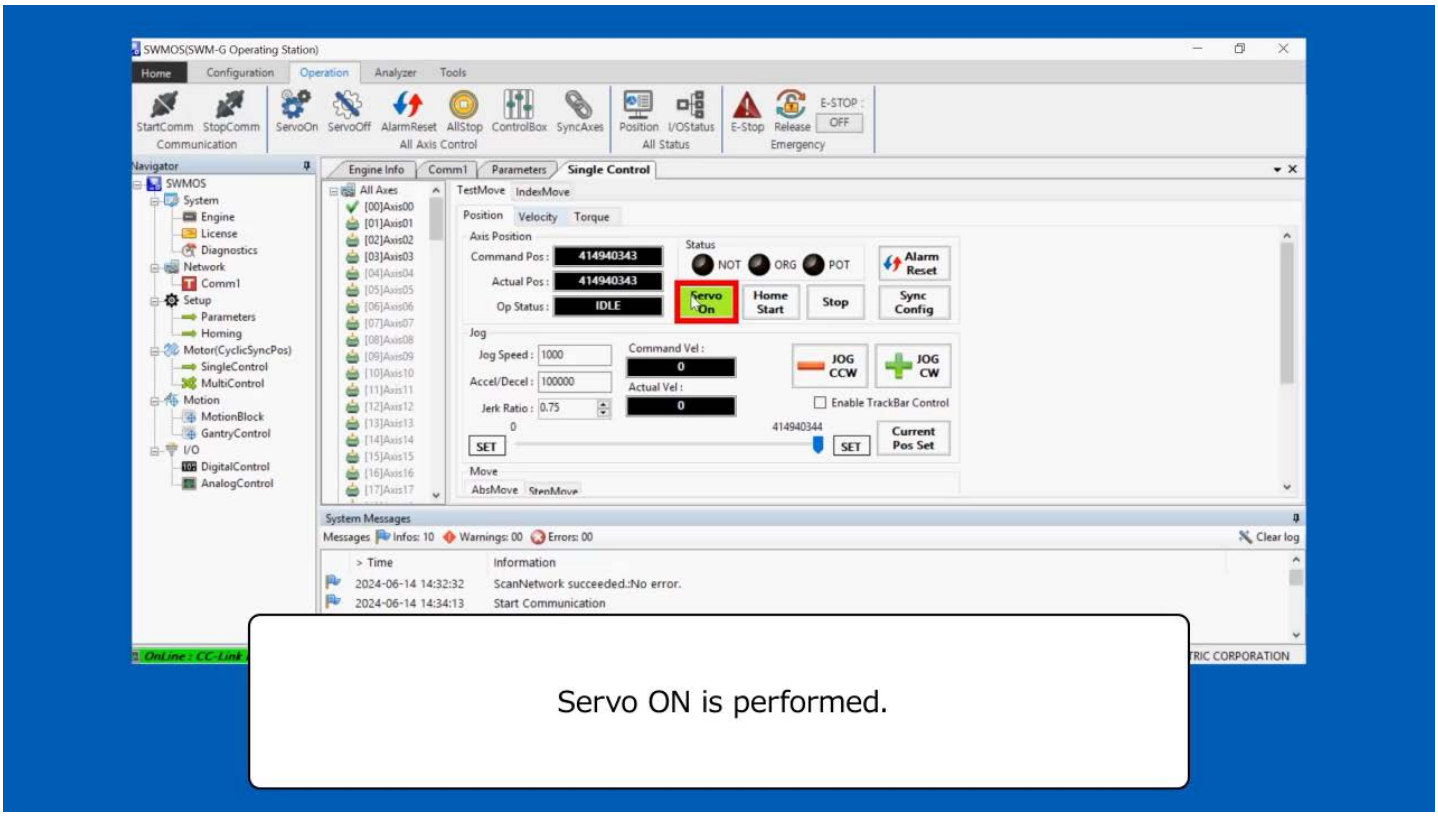
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



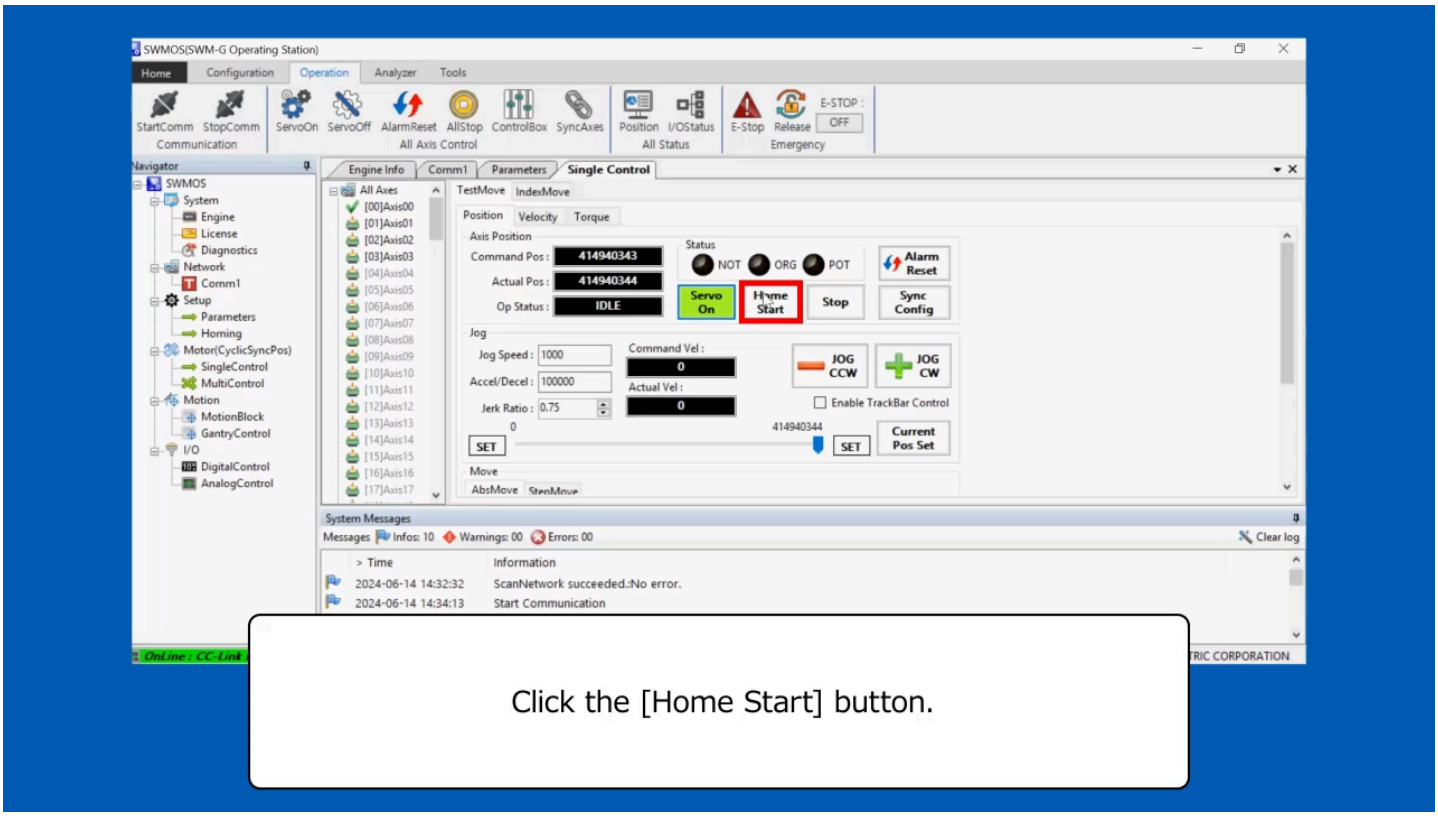
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



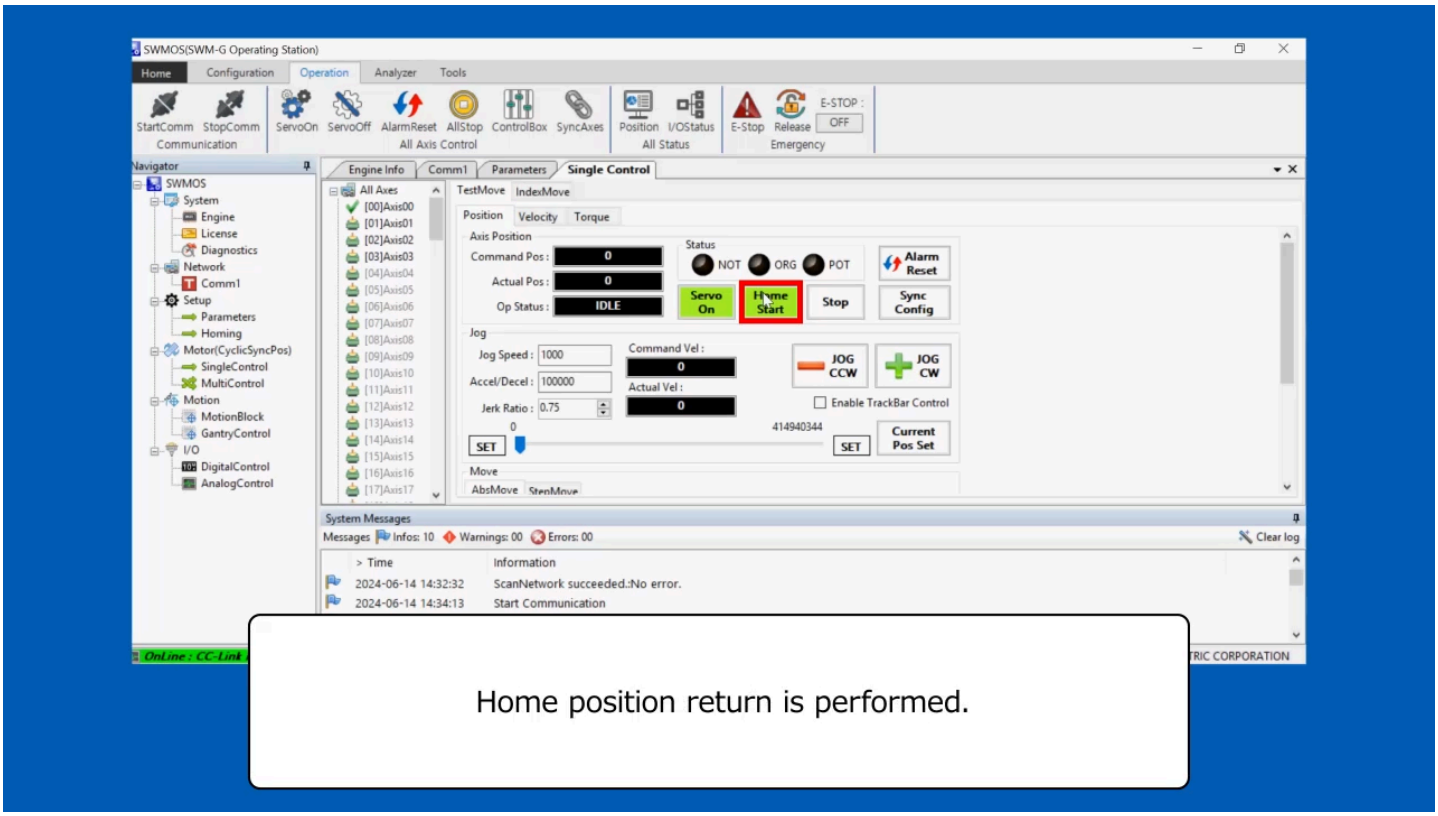
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



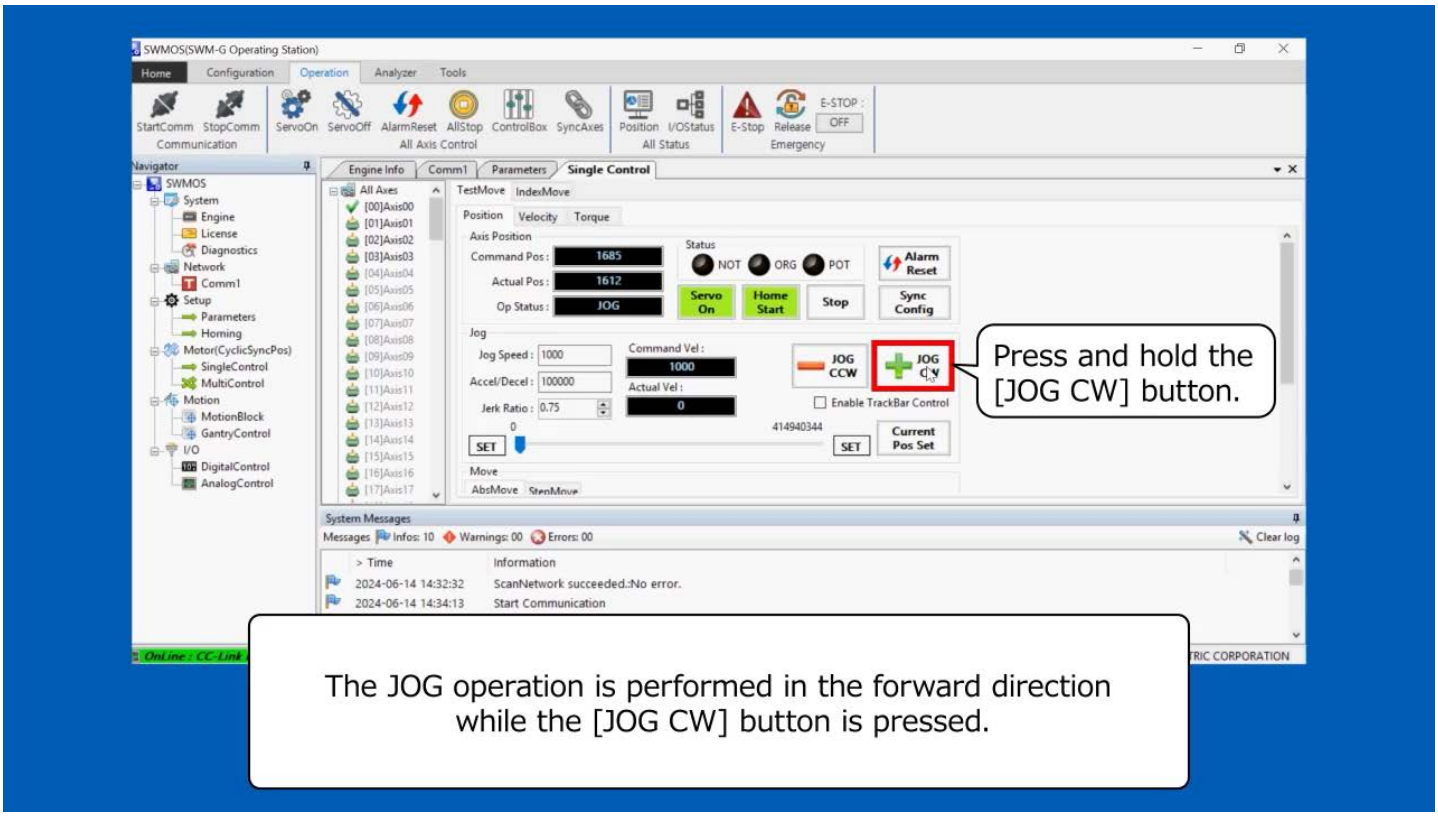
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



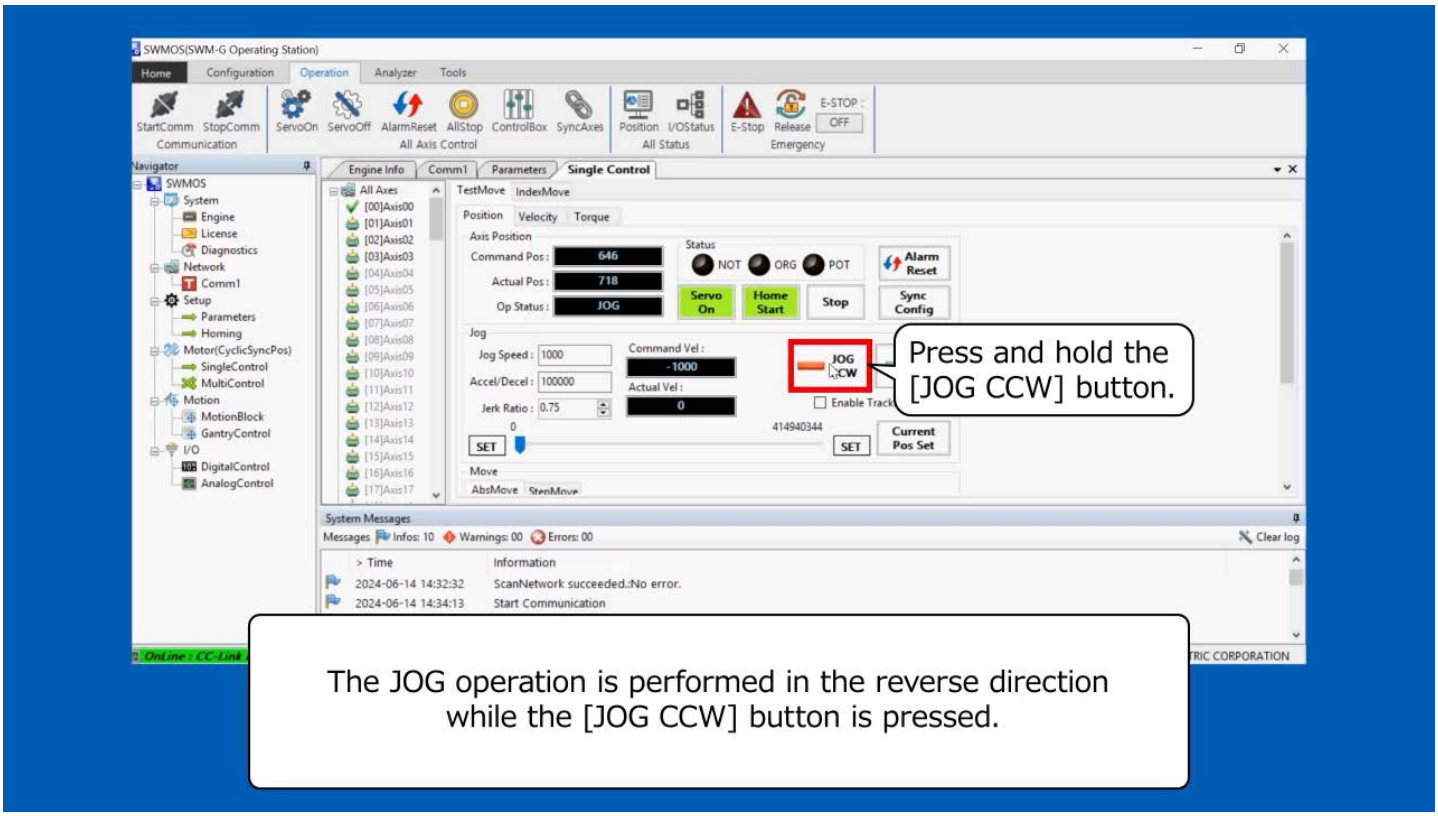
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



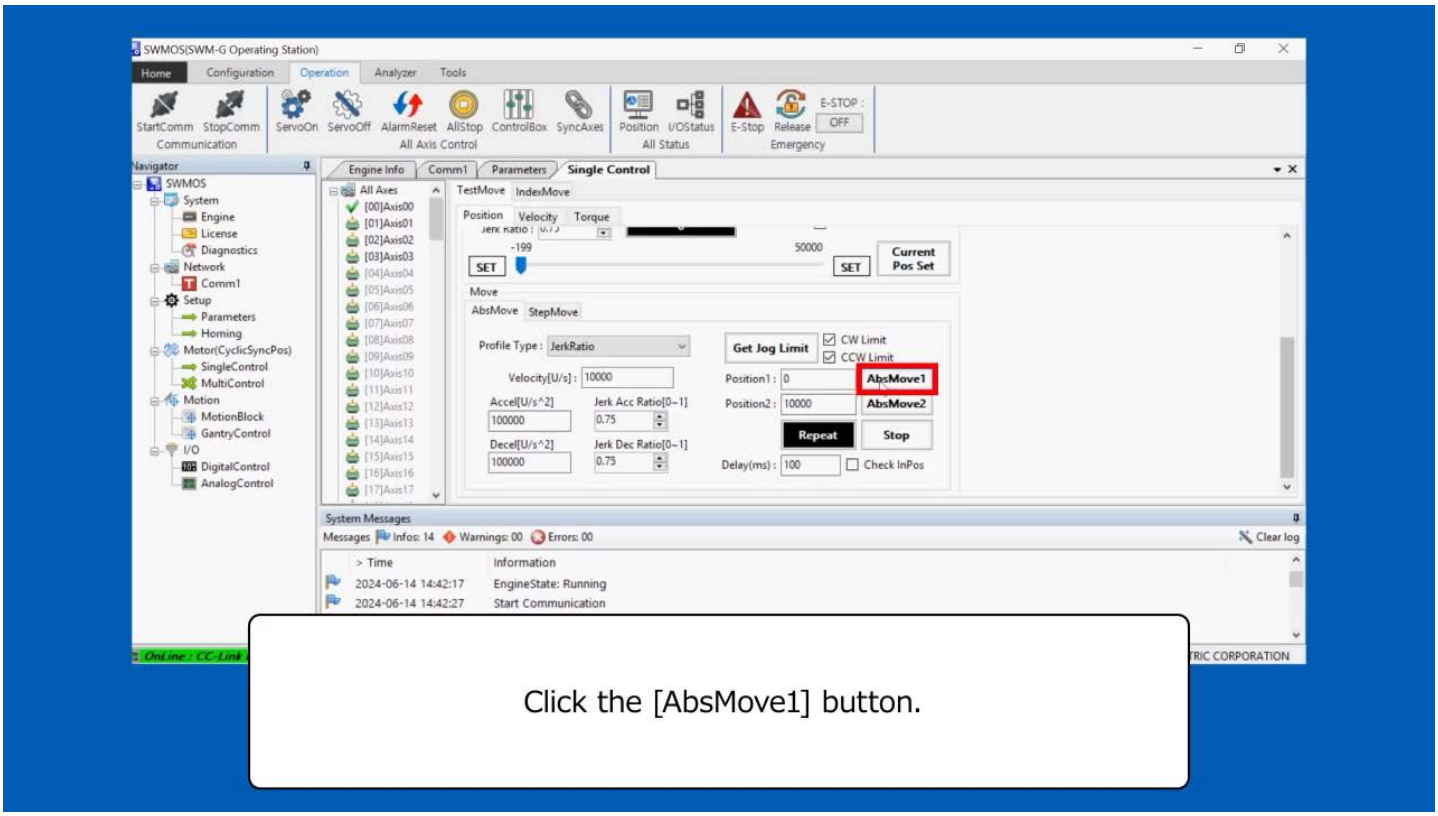
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



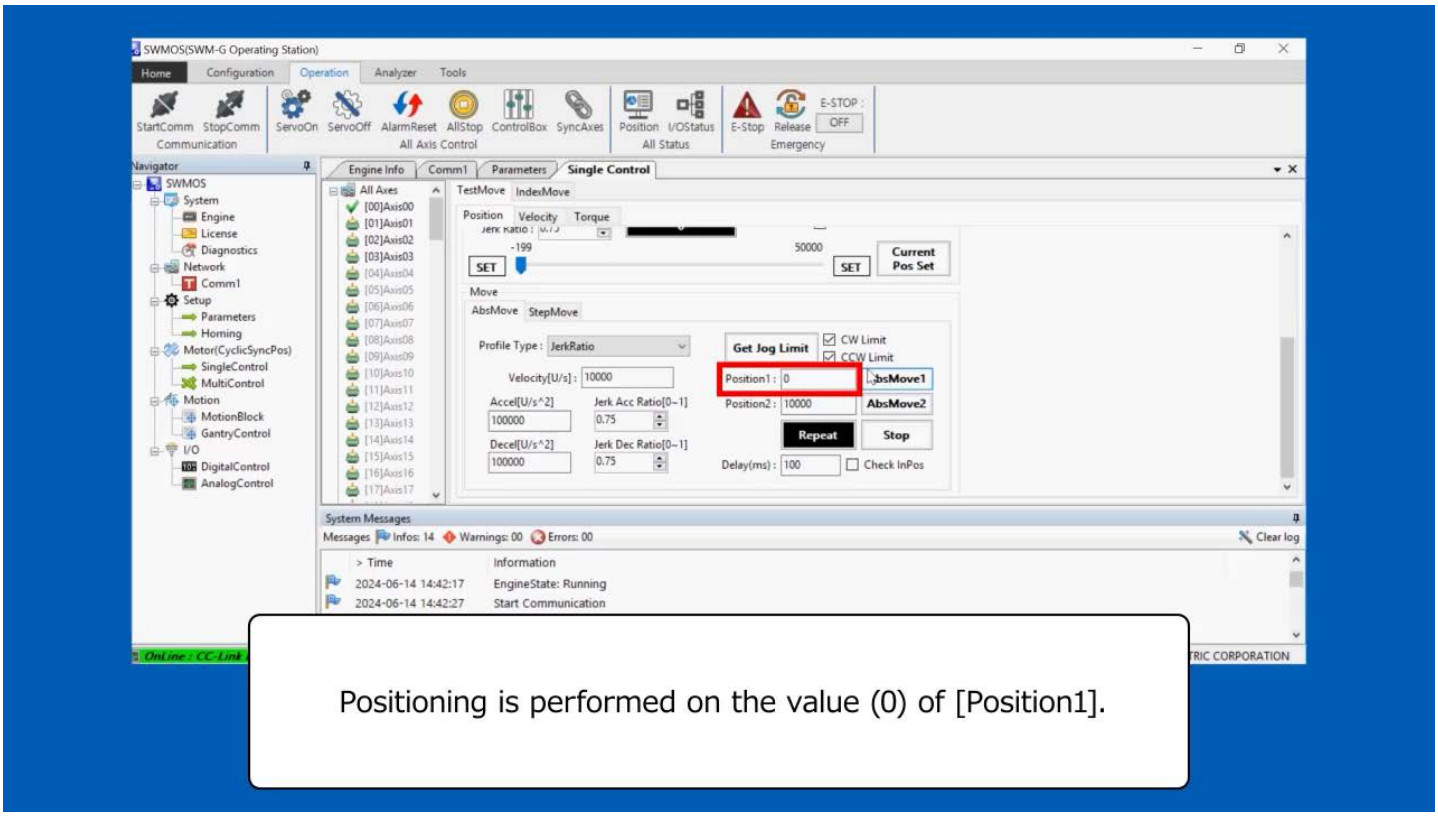
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



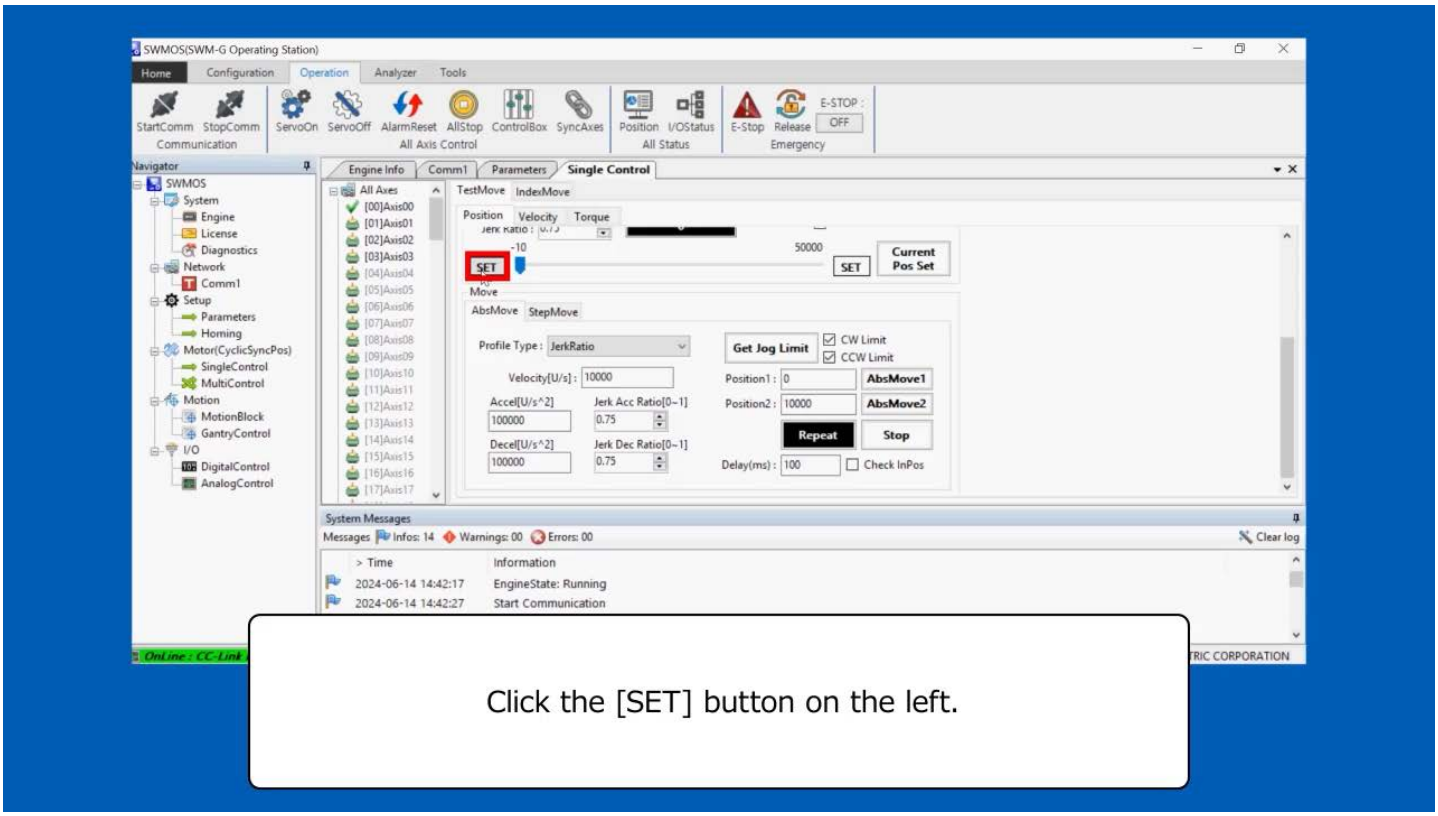
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



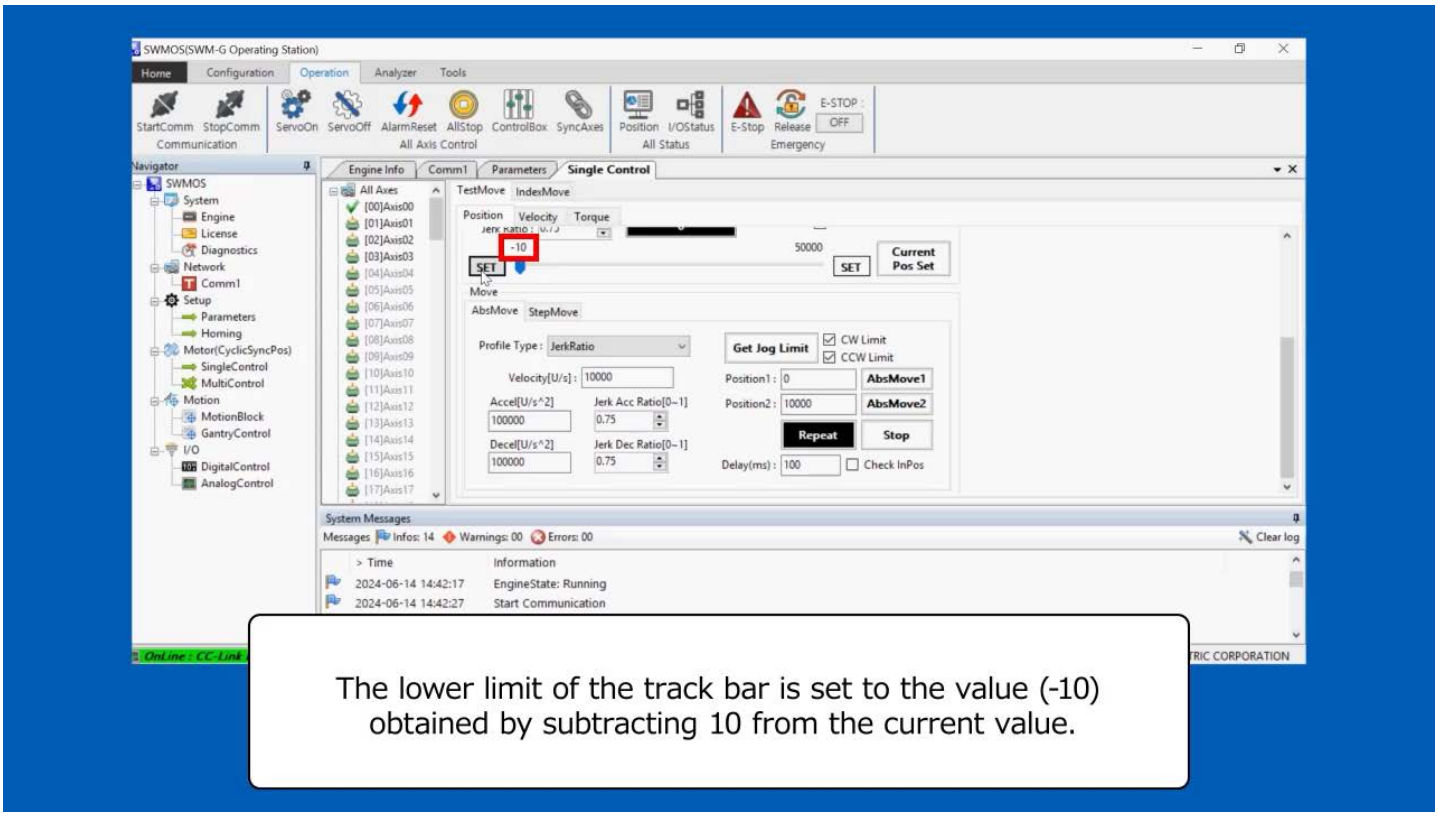
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



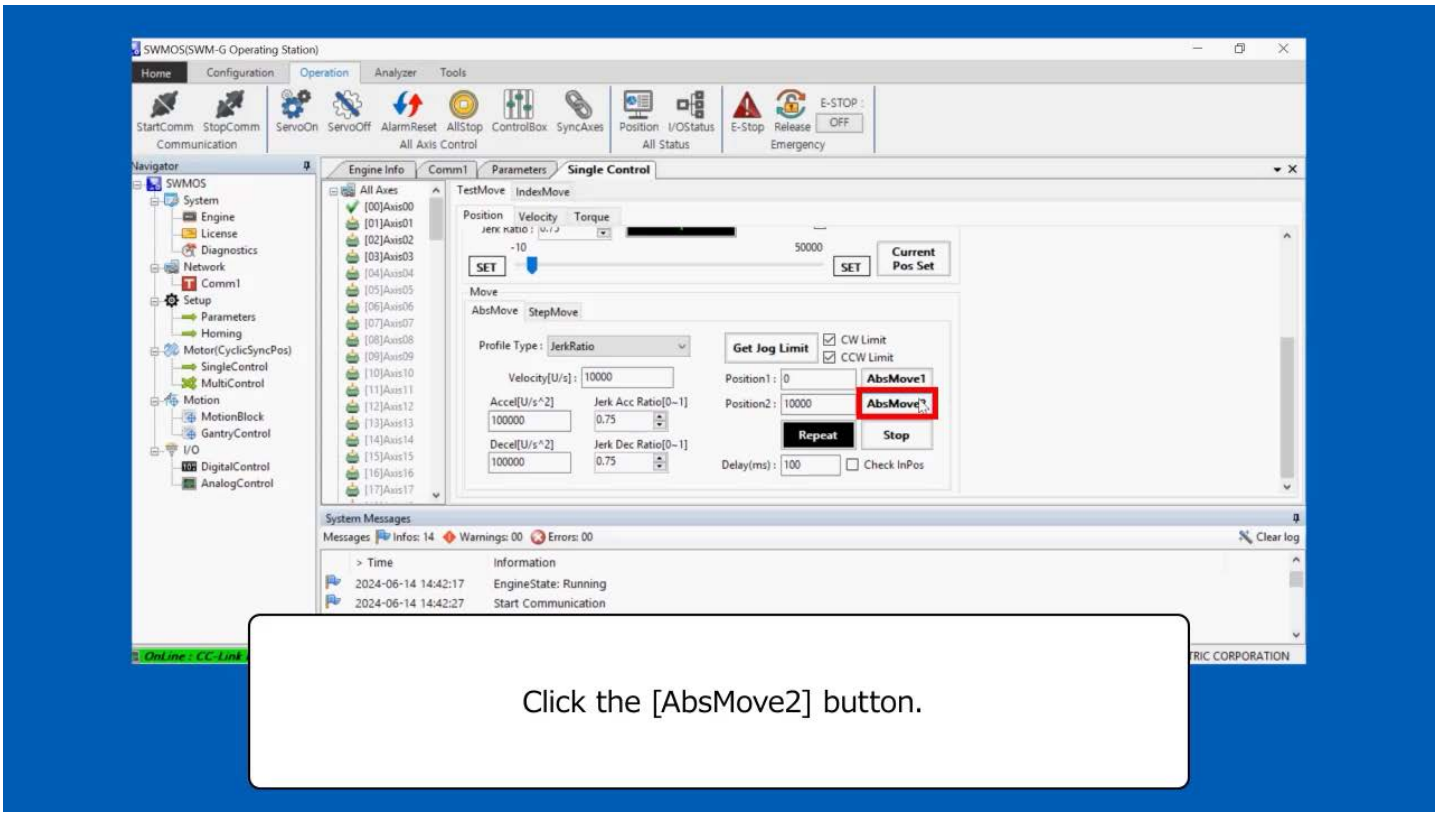
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



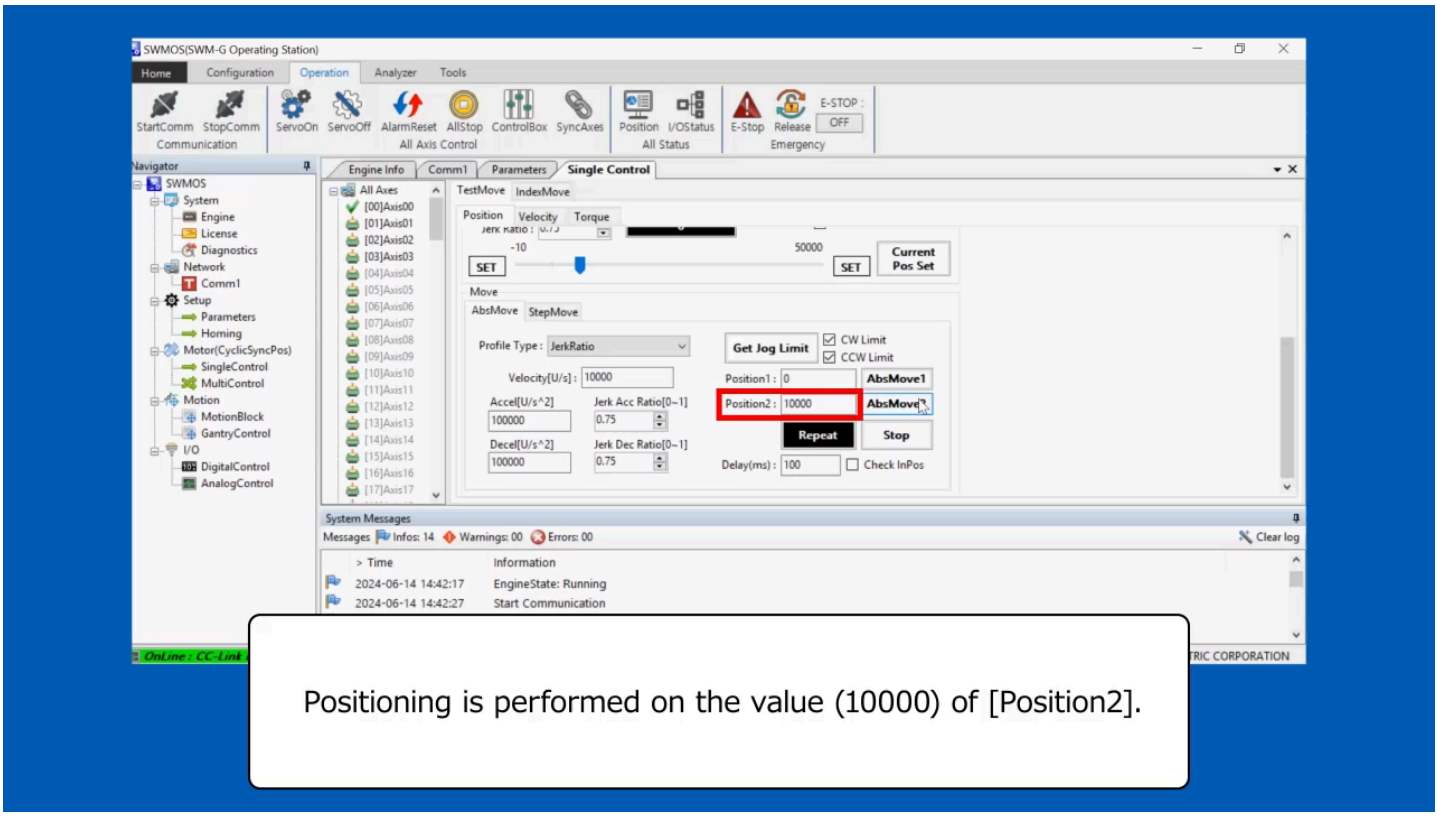
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



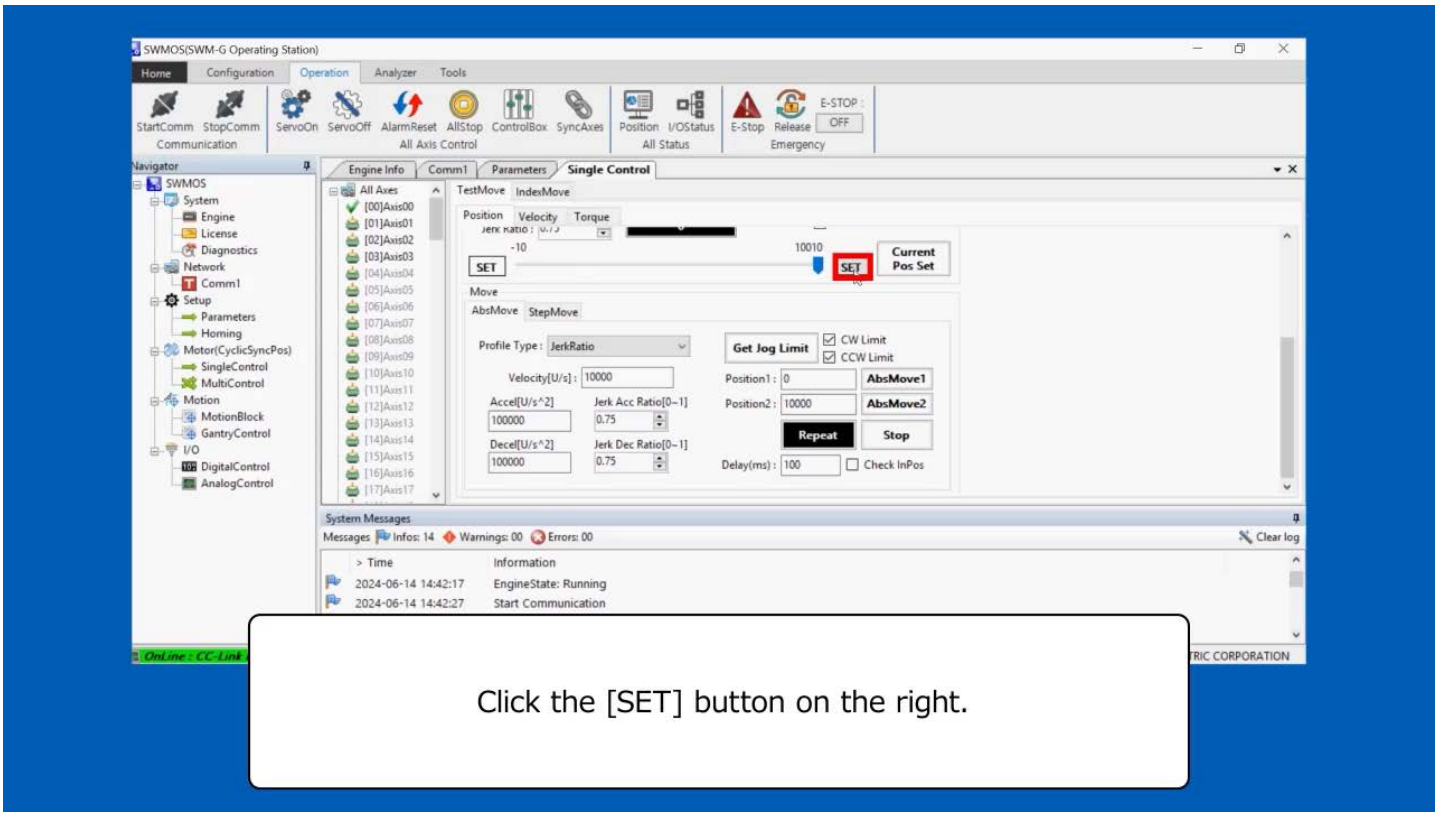
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



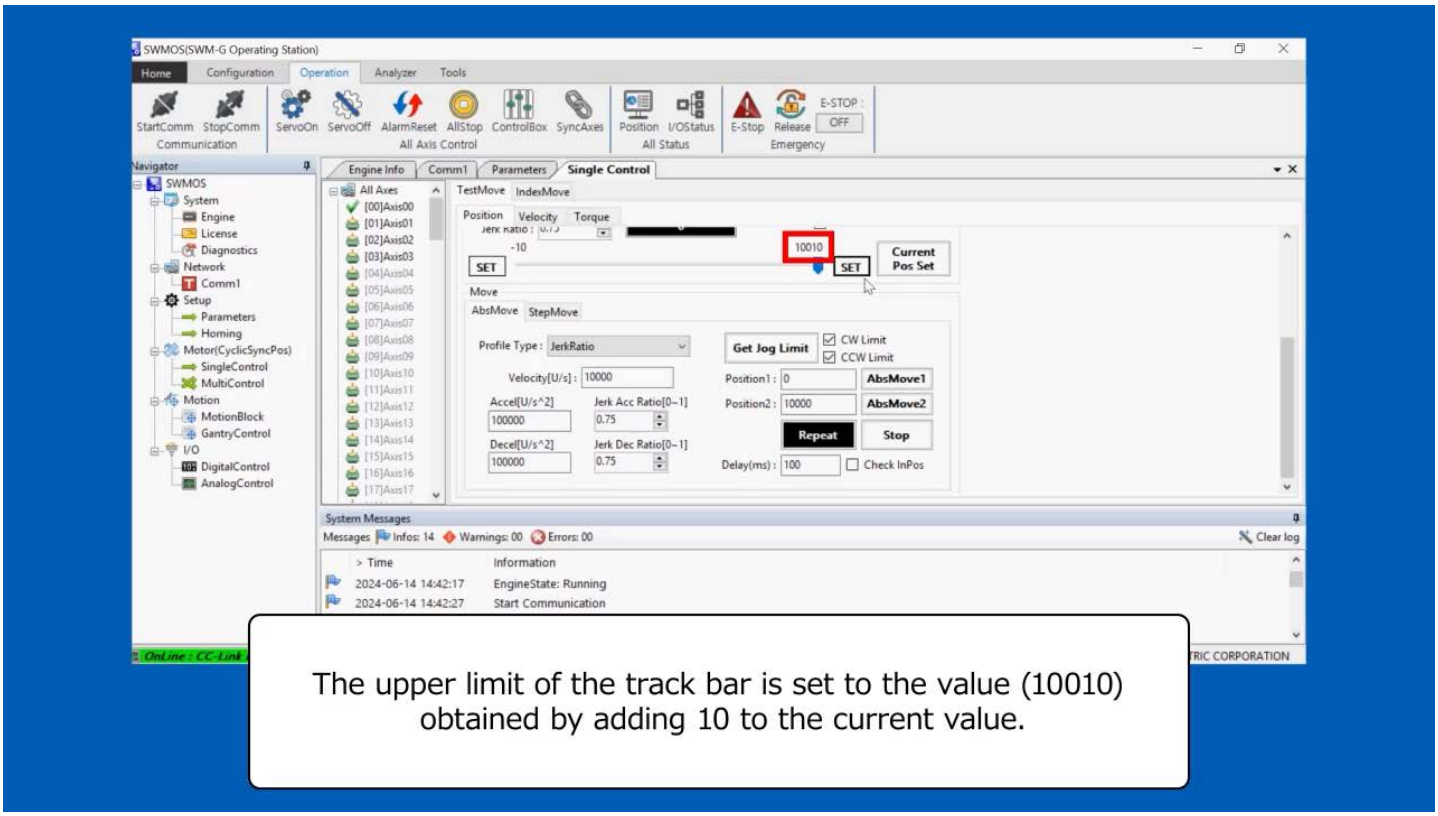
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



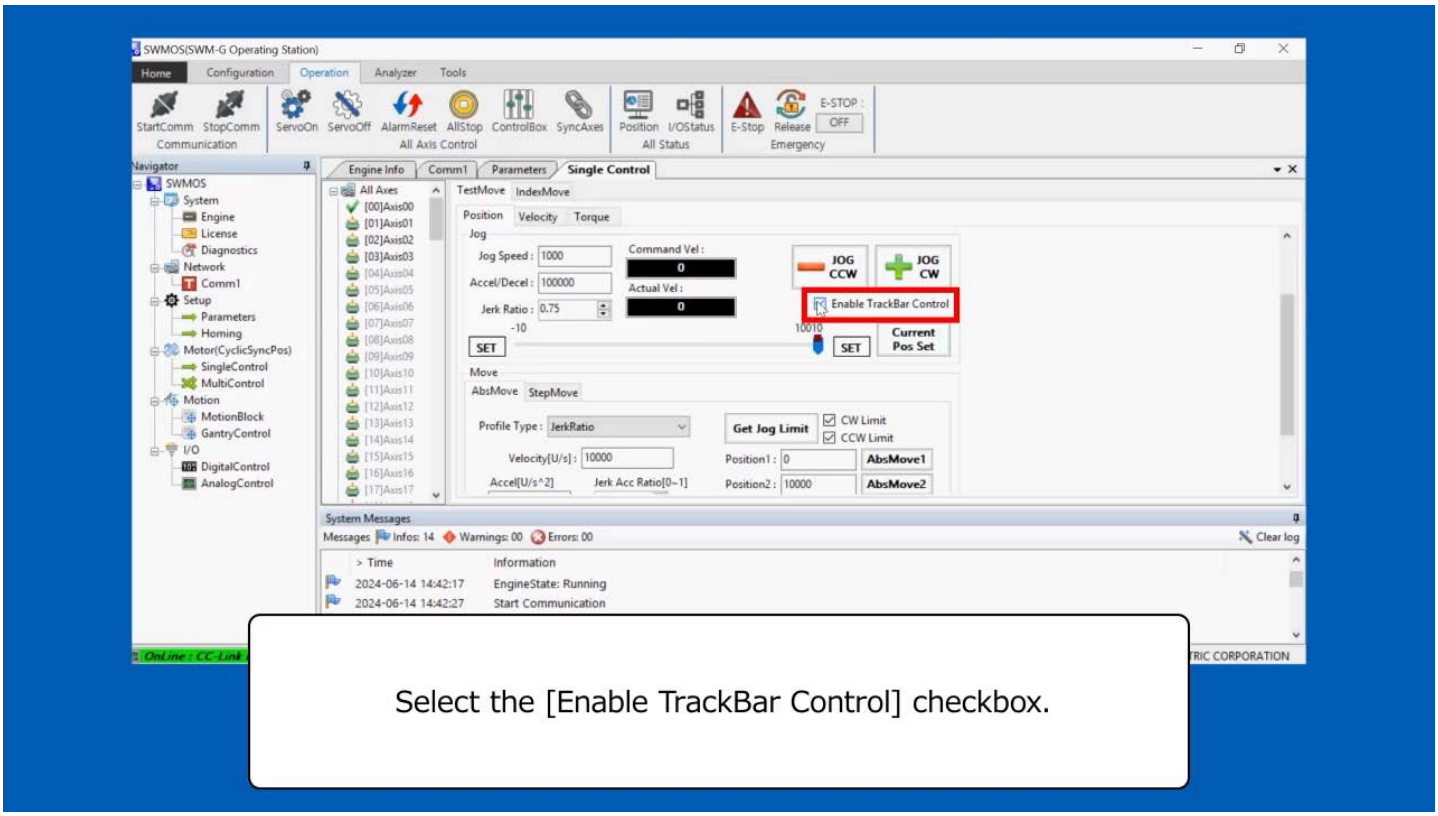
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



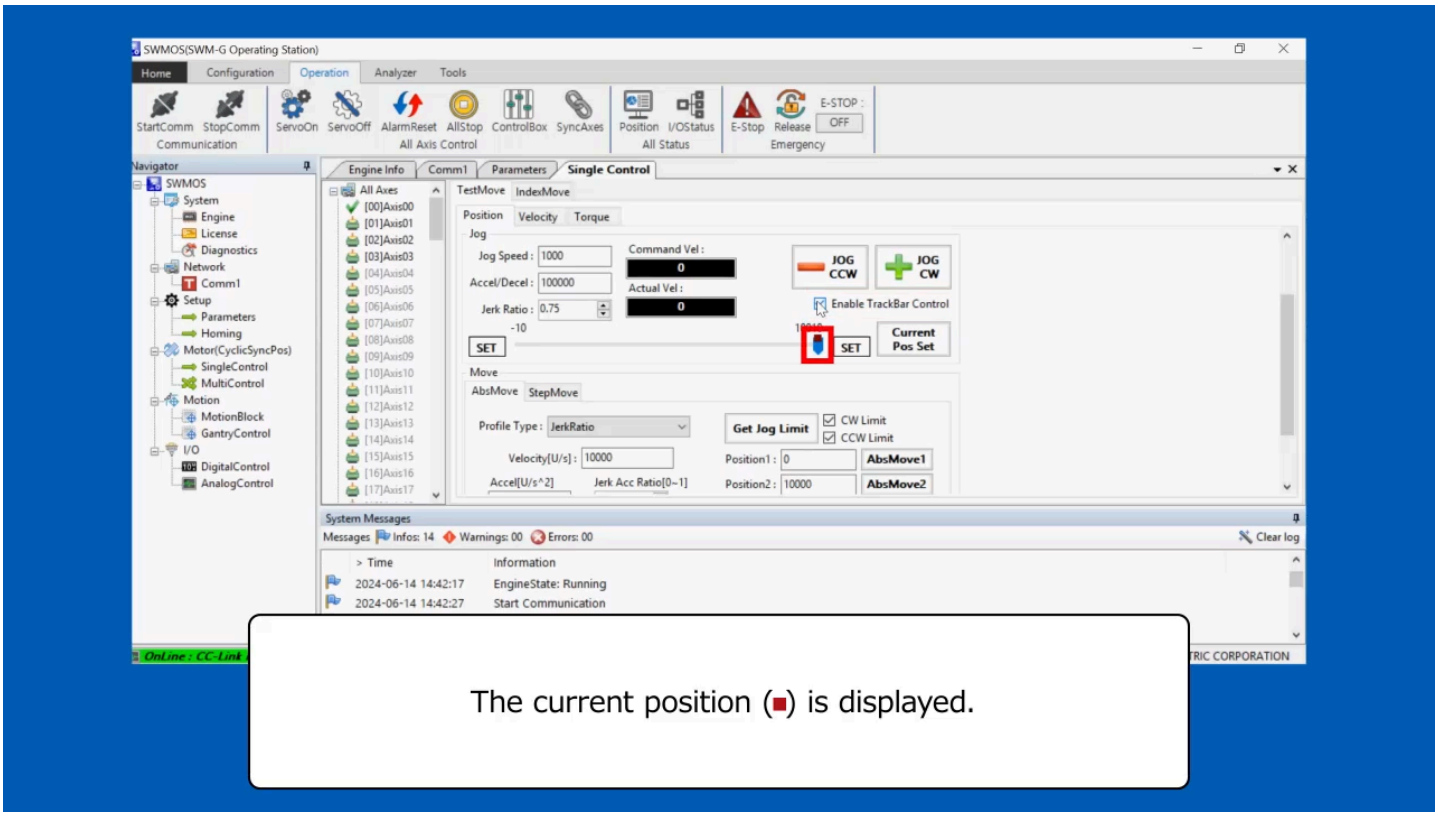
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



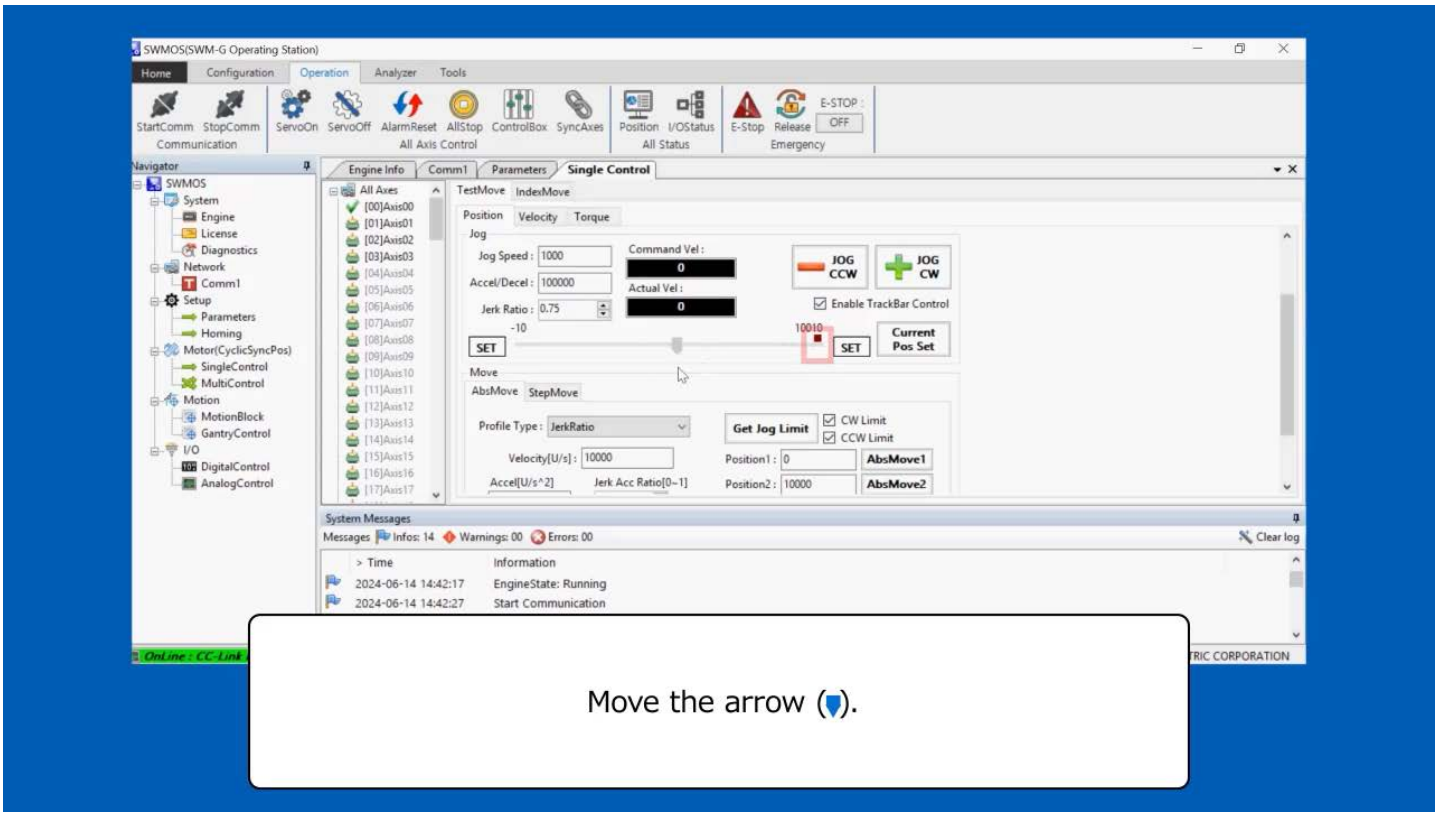
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



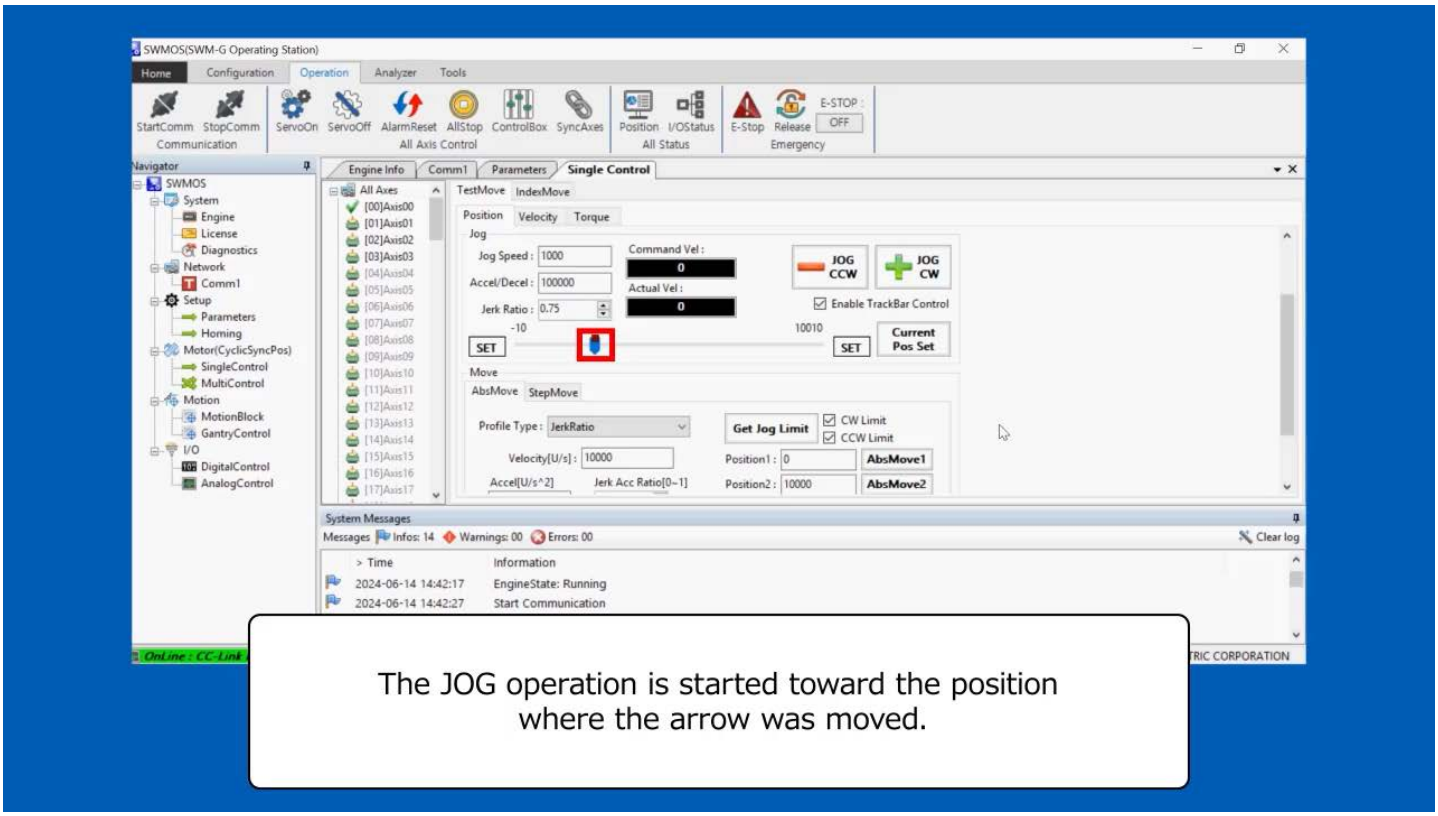
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



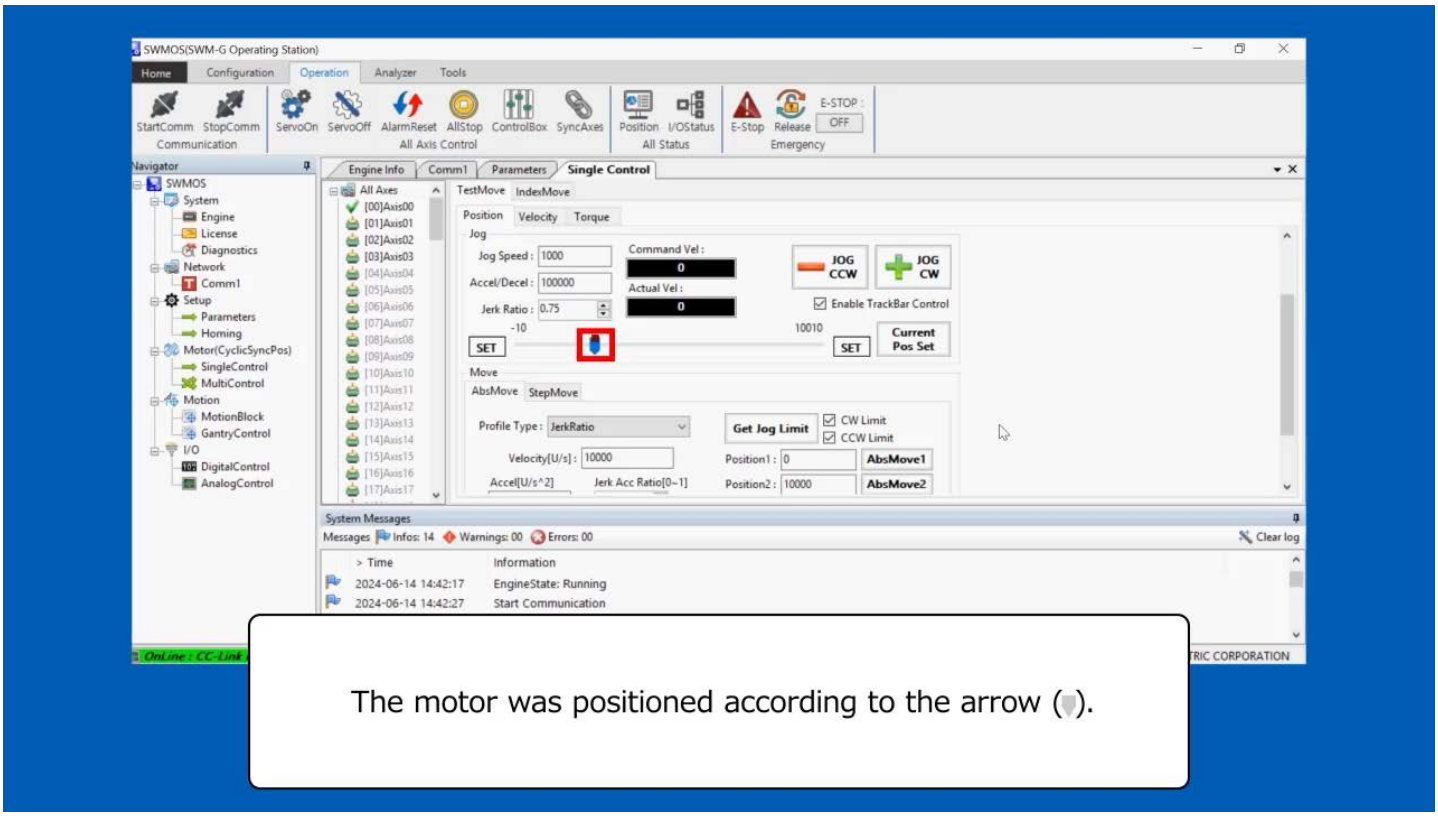
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



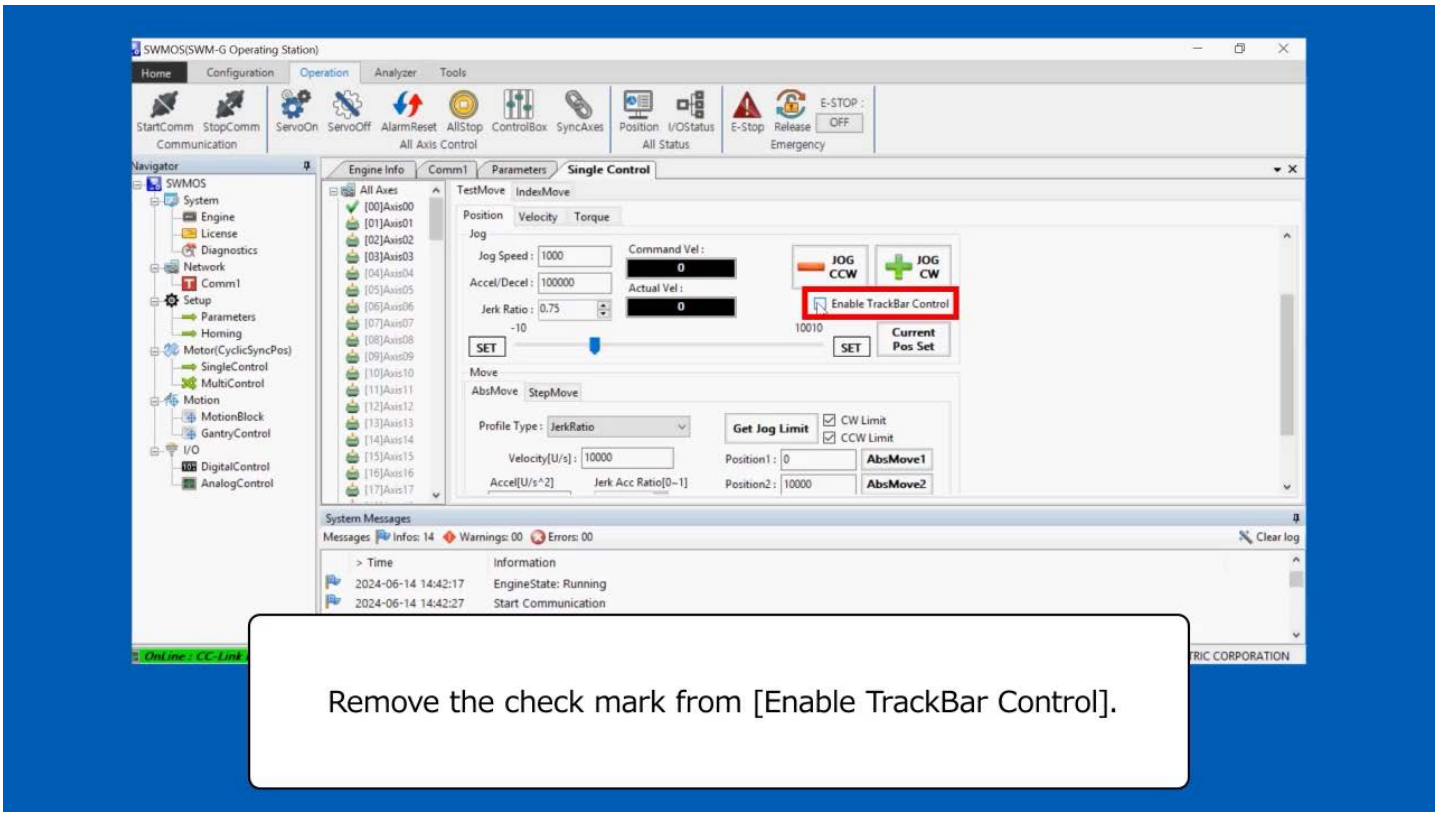
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



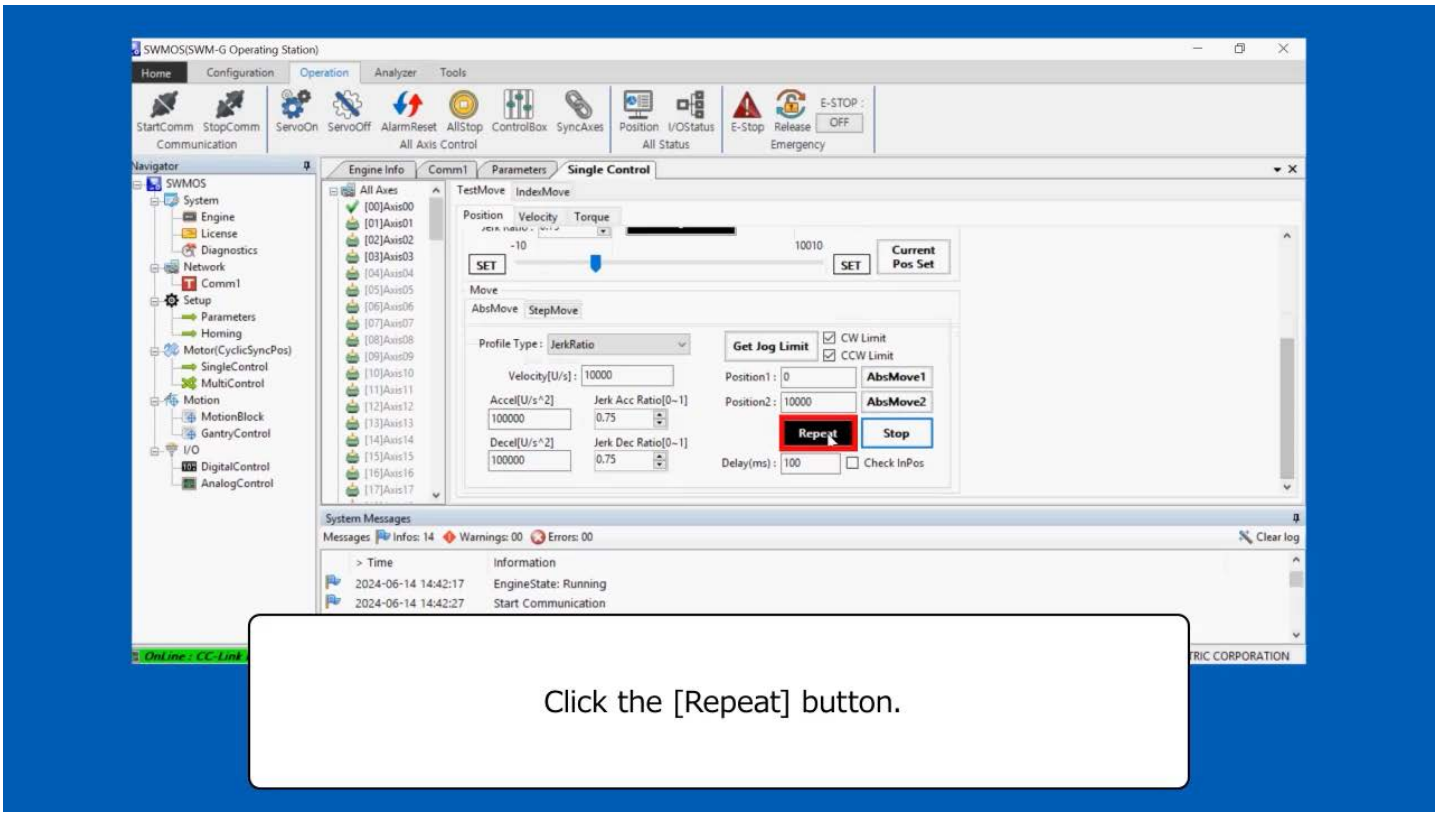
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



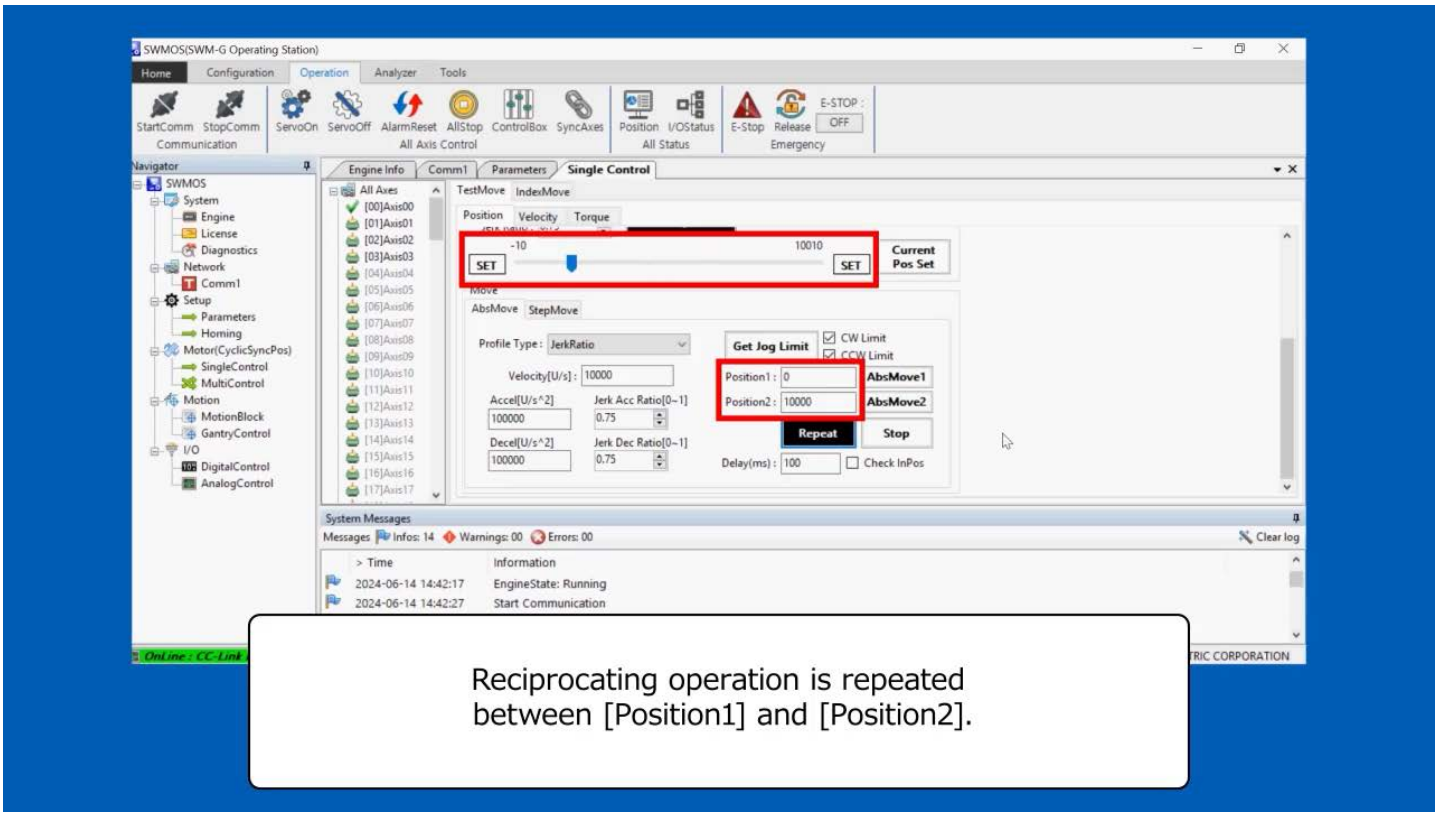
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



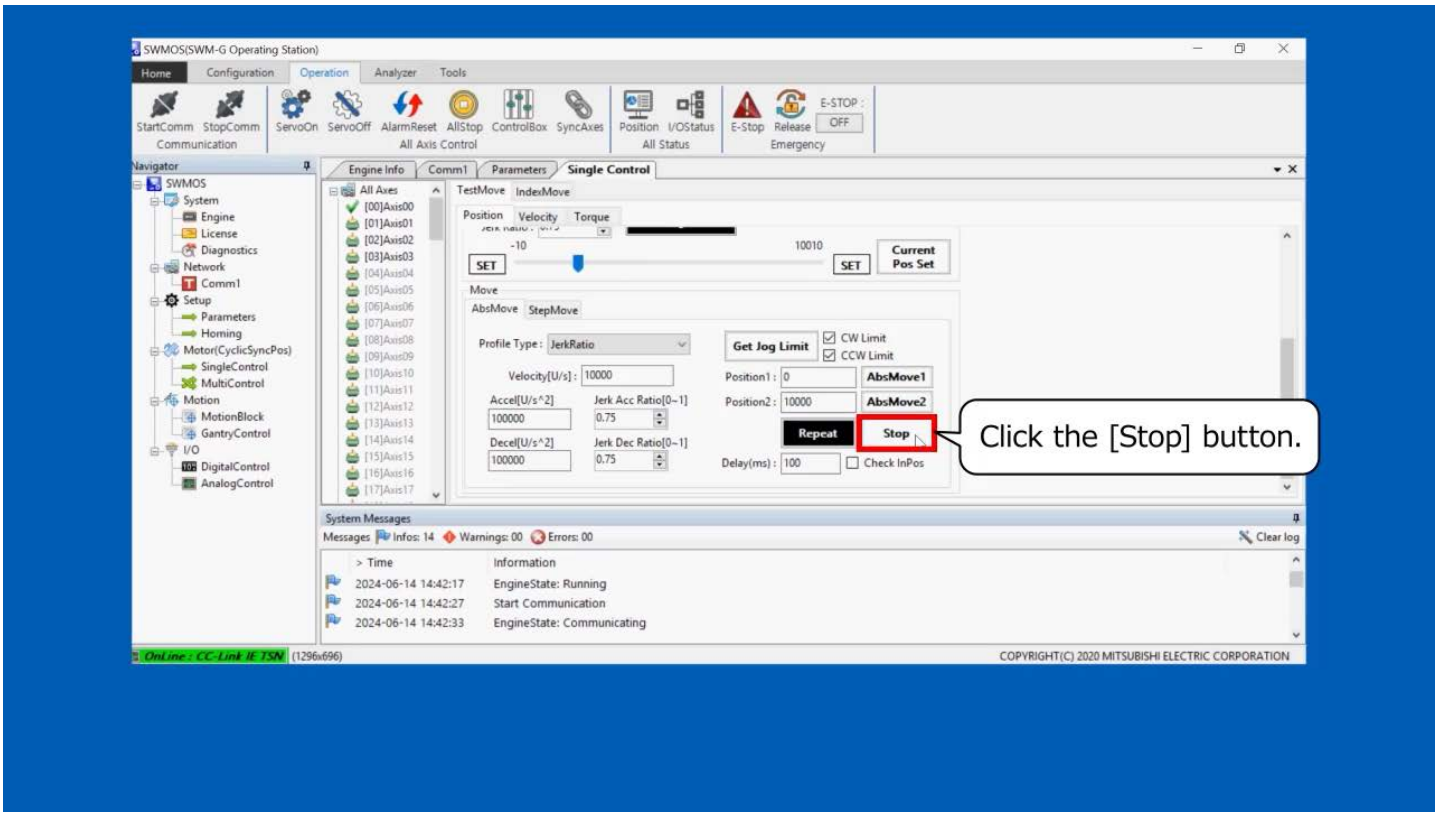
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



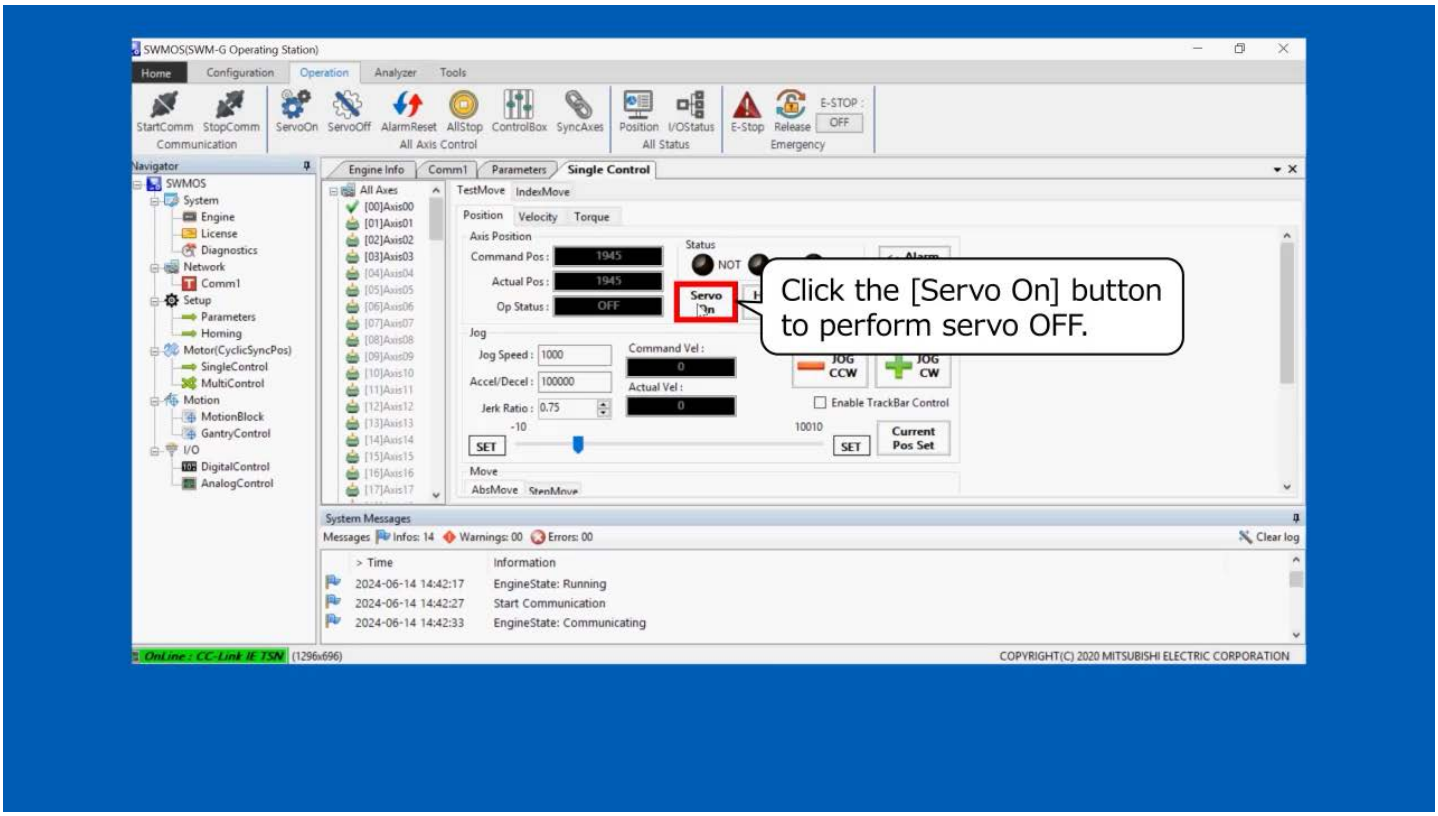
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



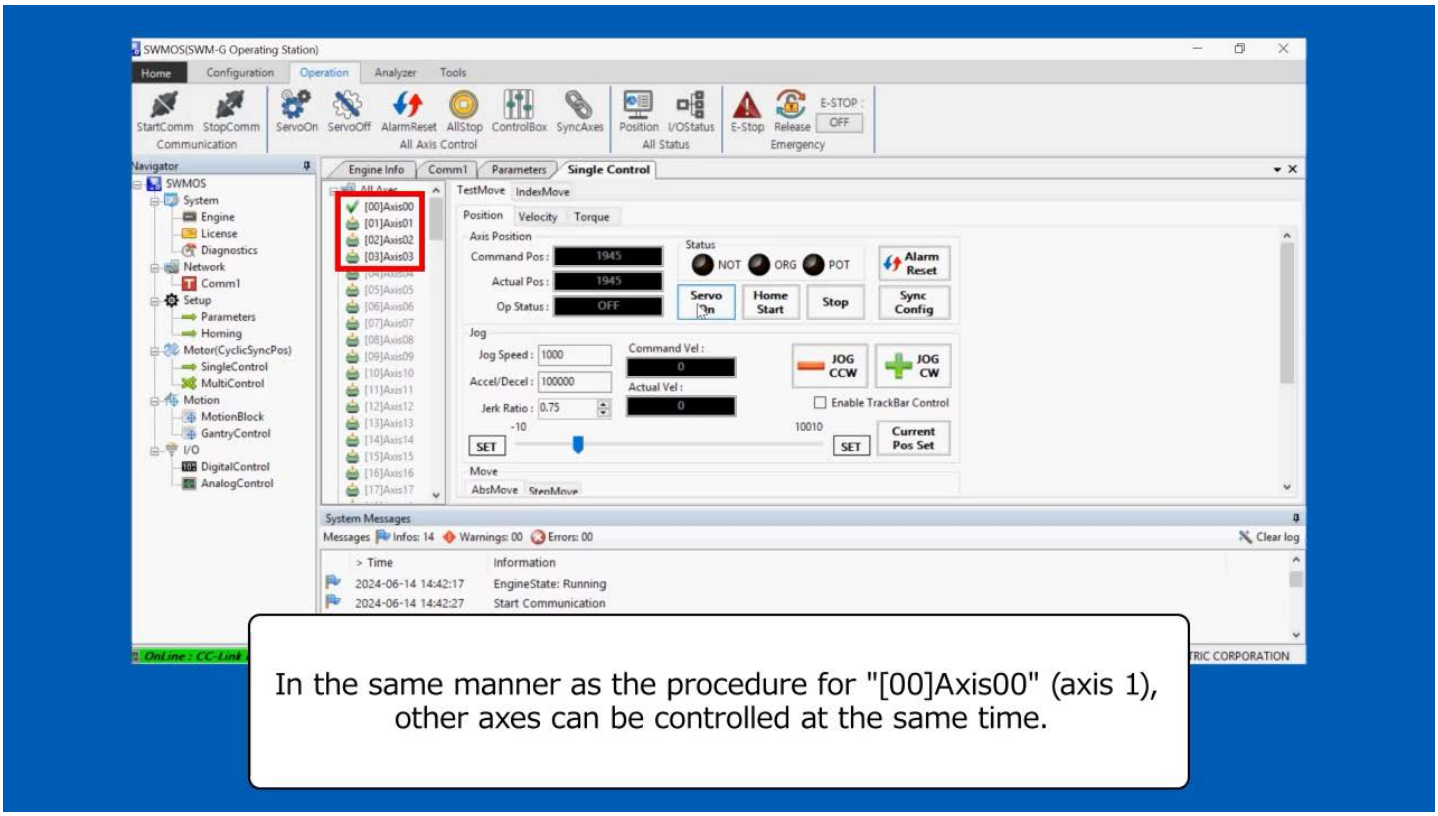
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



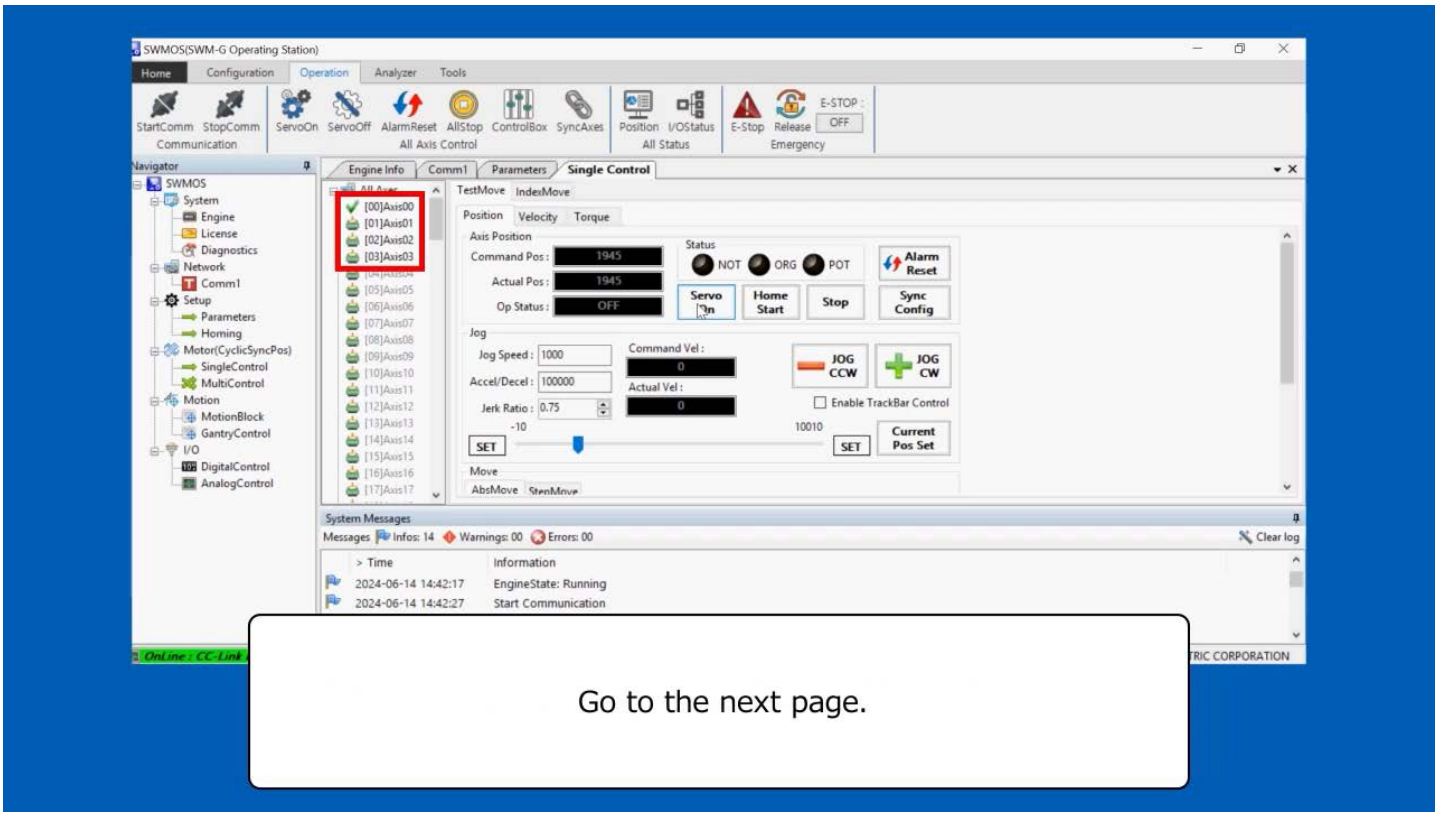
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



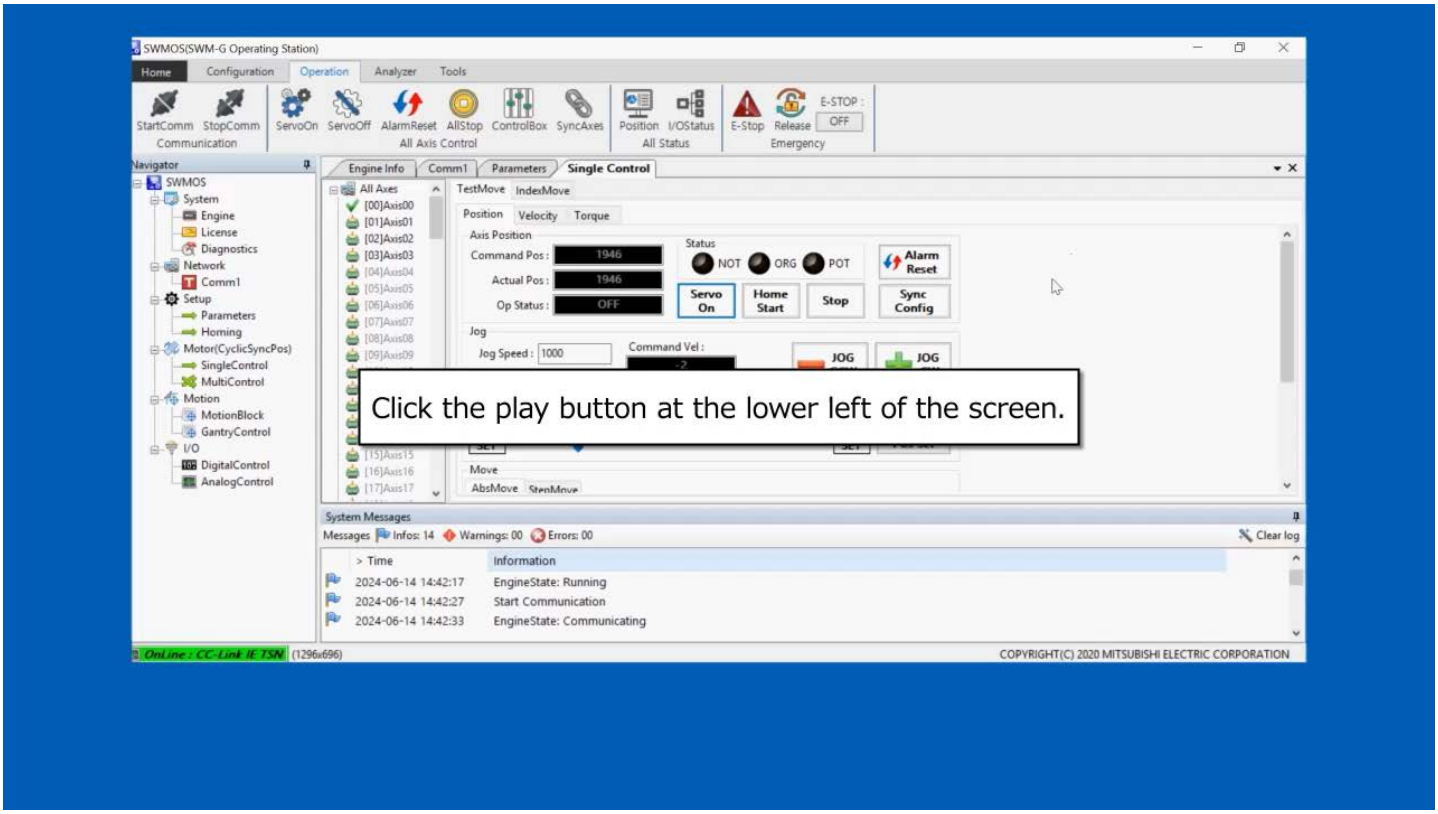
2.6 Single-Axis Control

In the single-axis control, the test operation of position control, speed control, and torque control can be performed. This chapter describes the position control.
Check that the steps in the previous sections have been completed in the SWMOS screen.
For the single-axis control procedure, see the video below.



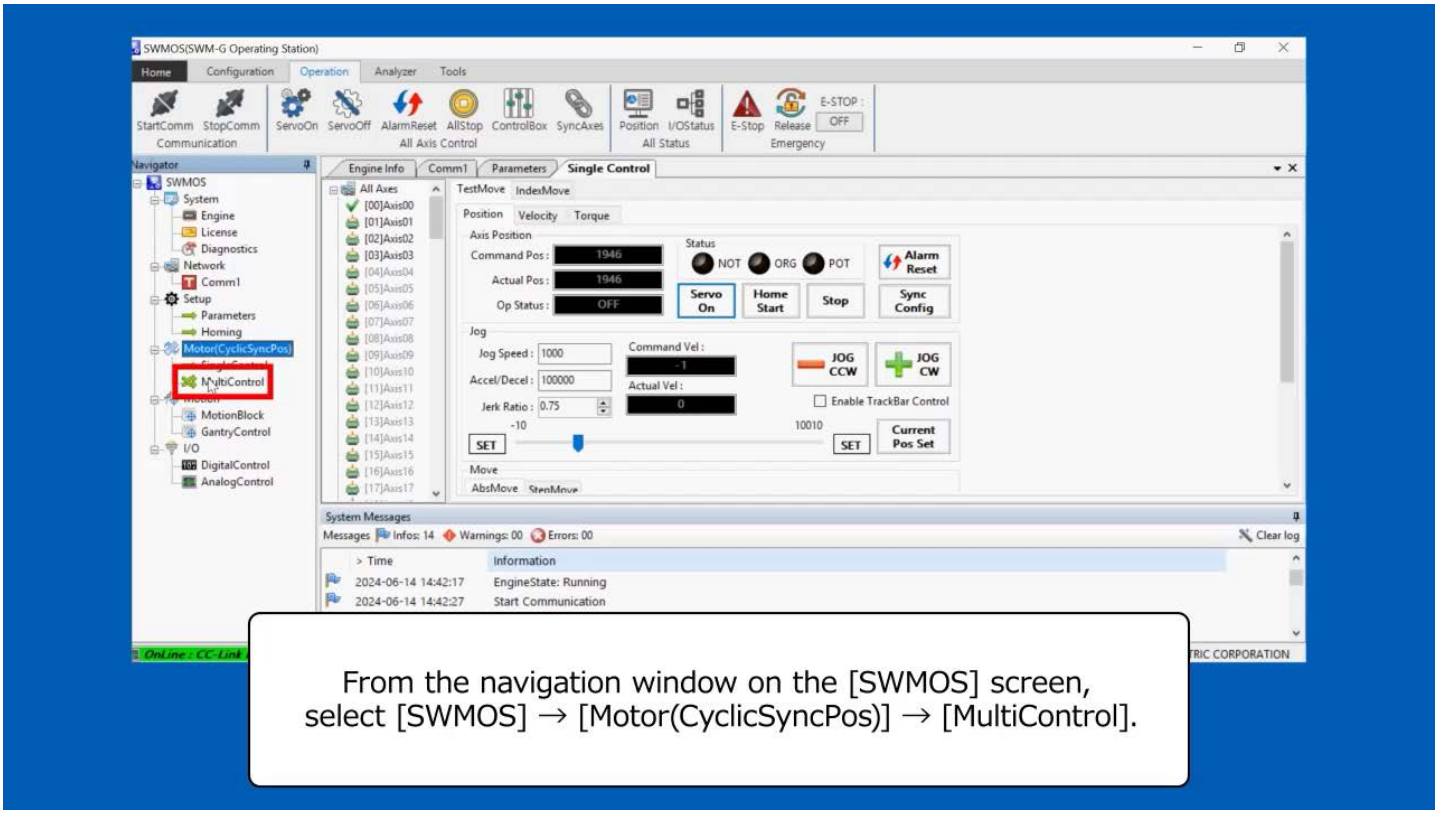
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



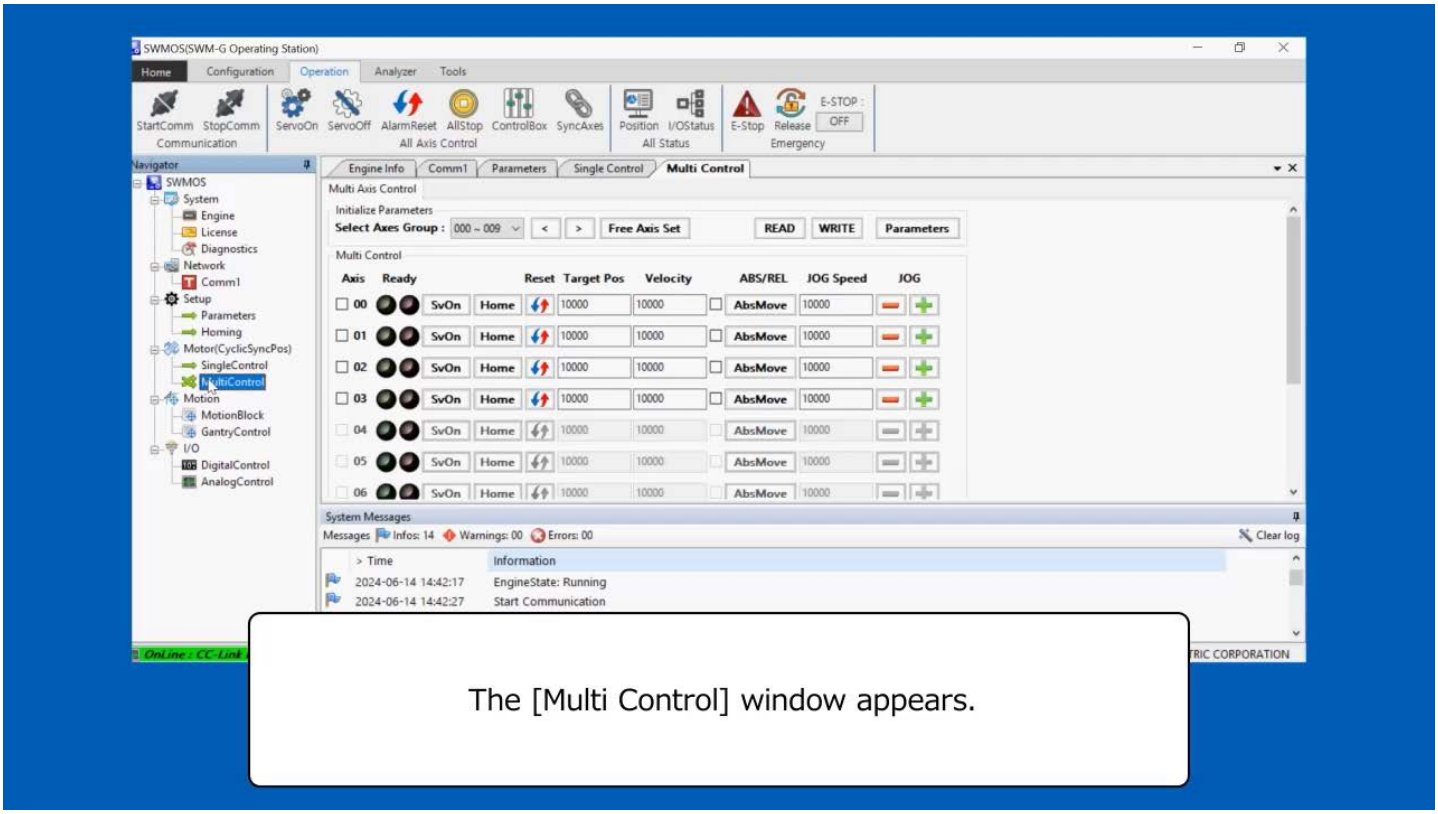
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



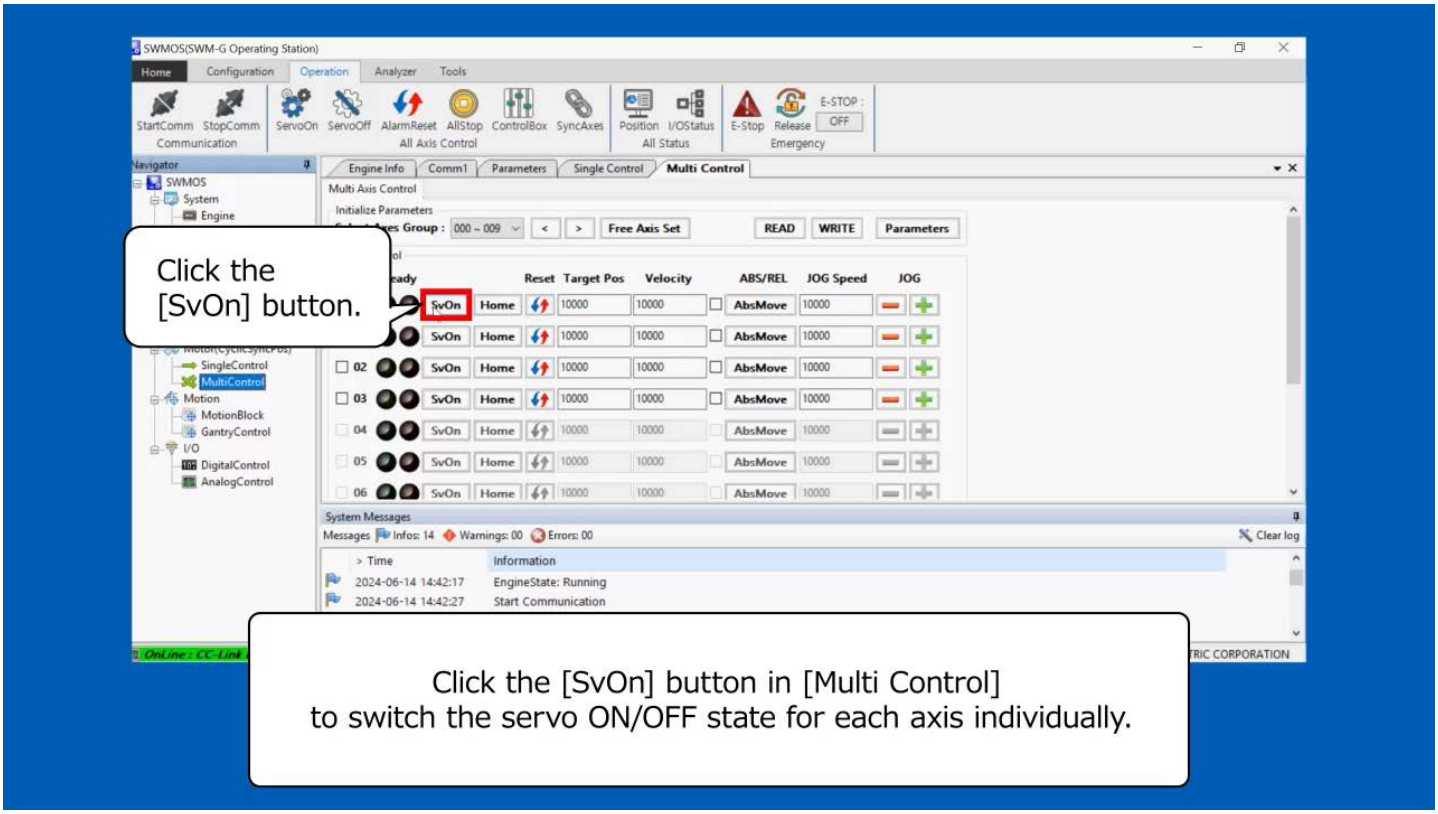
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



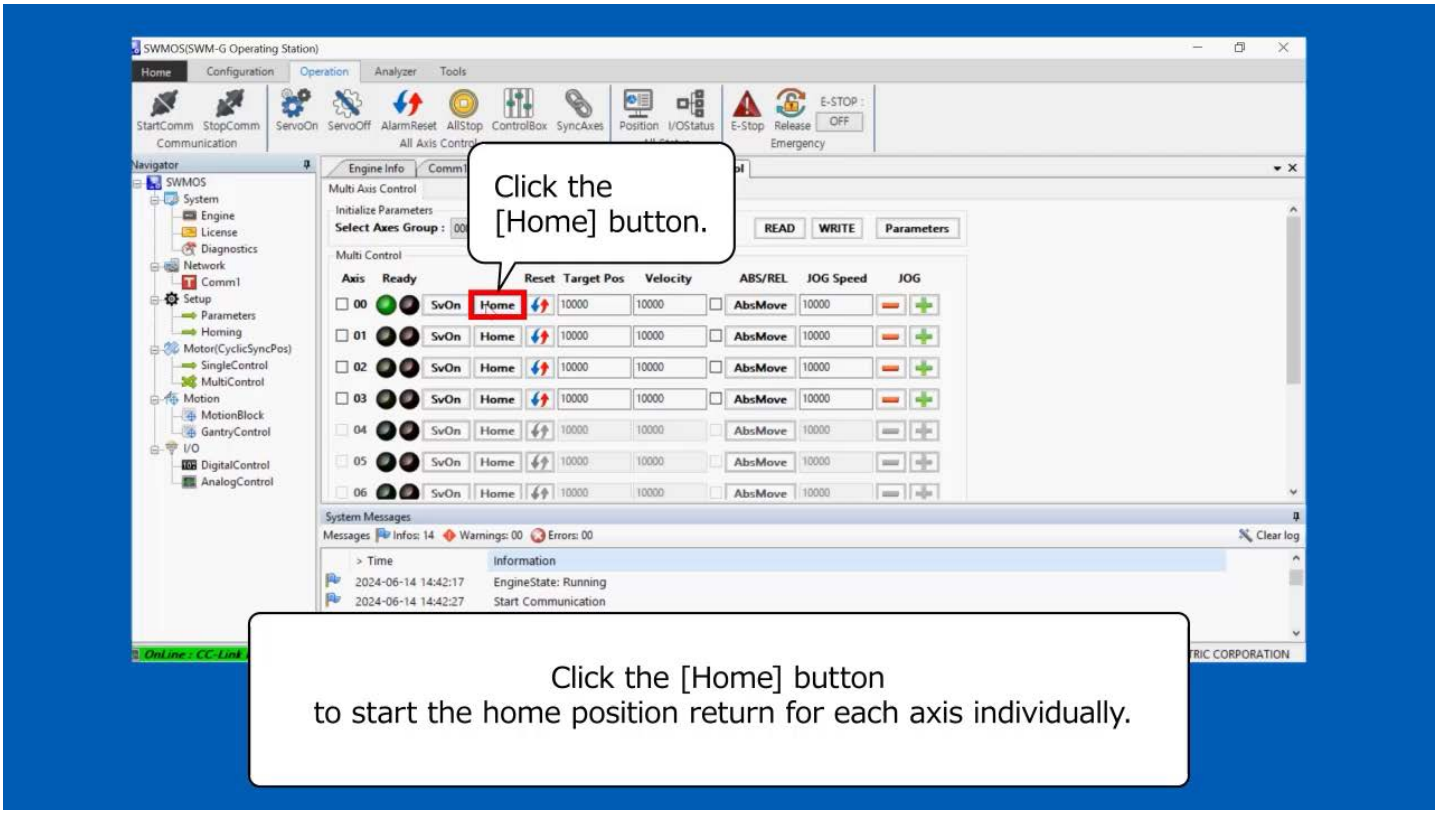
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



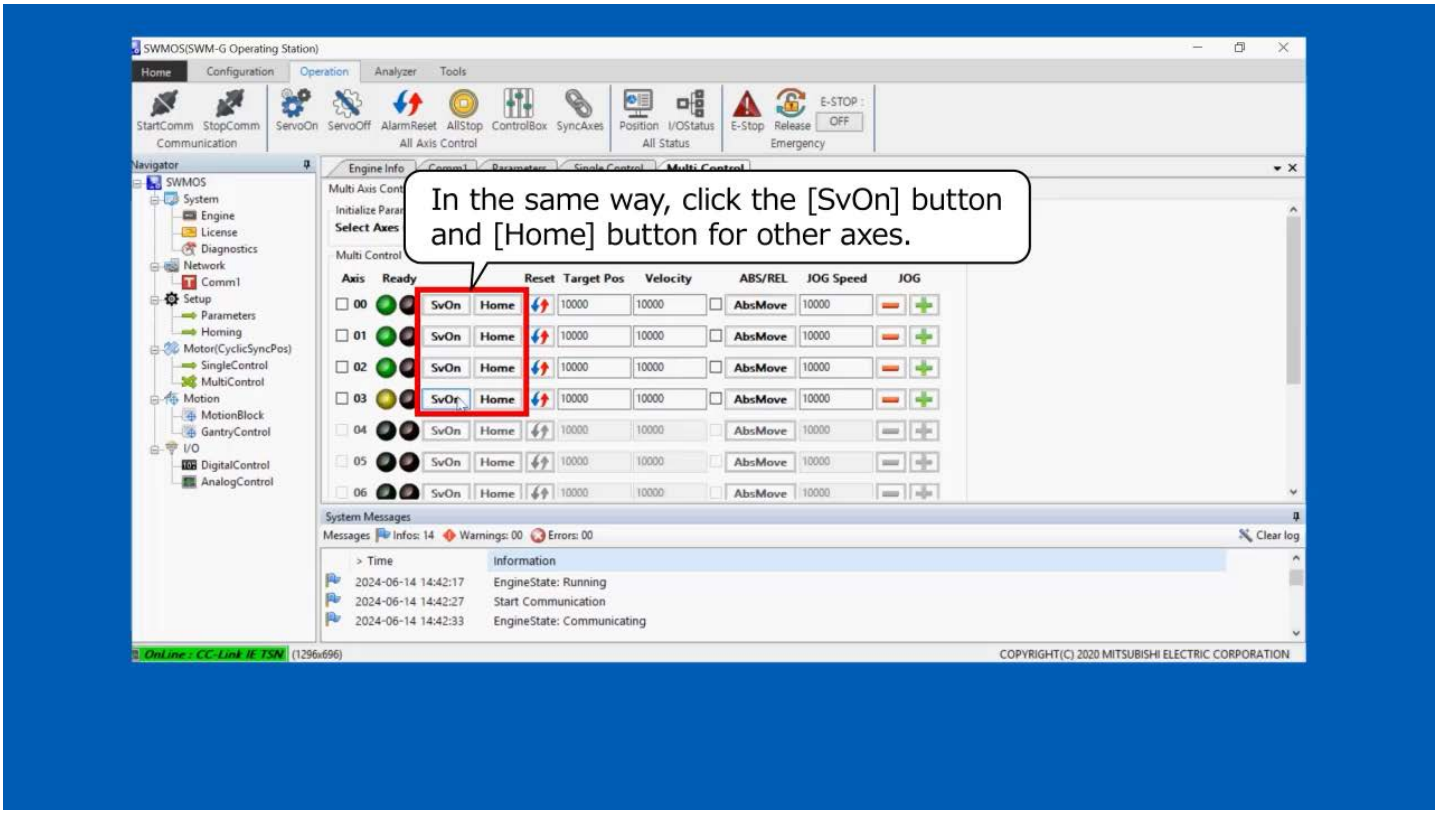
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



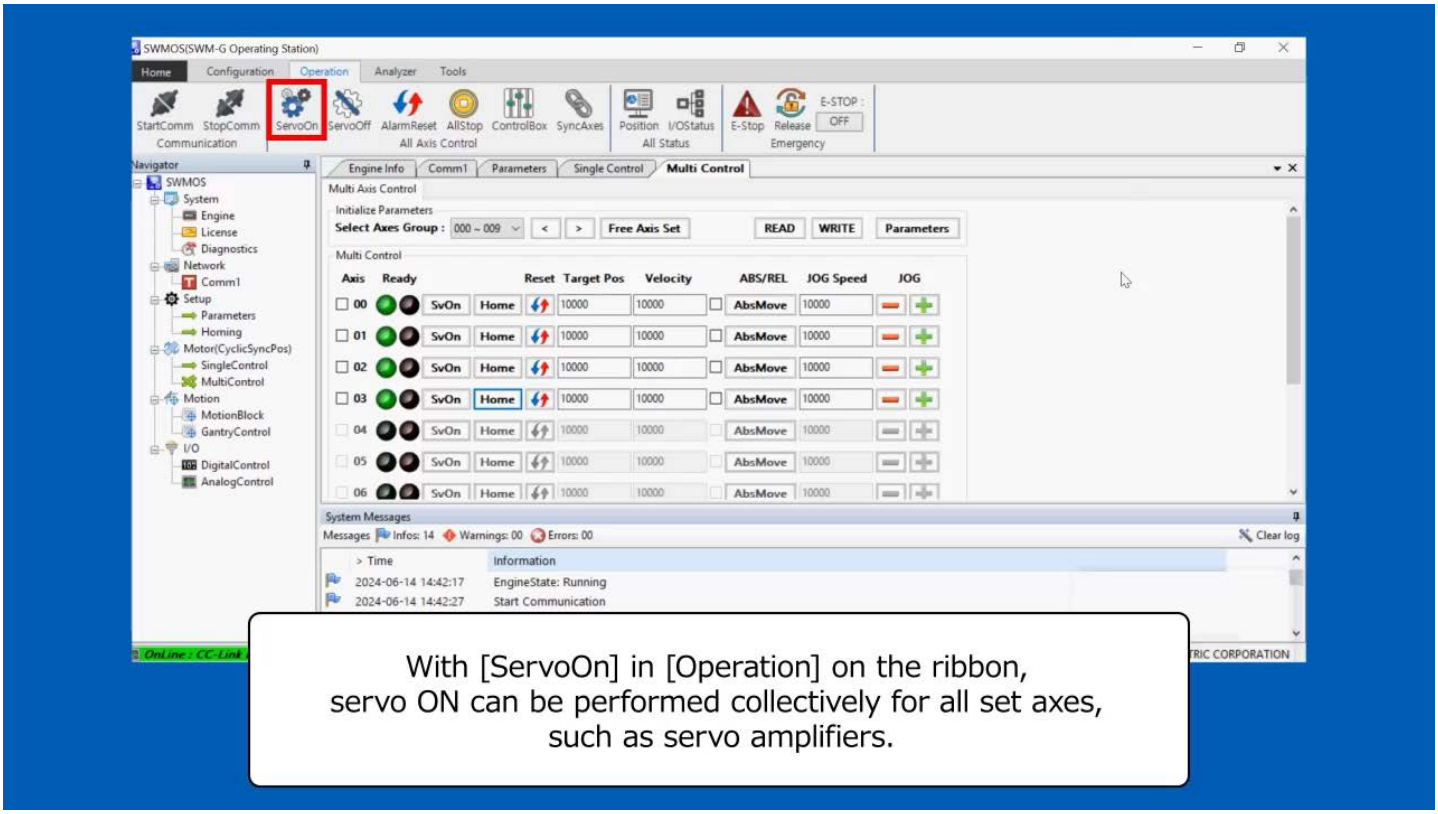
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



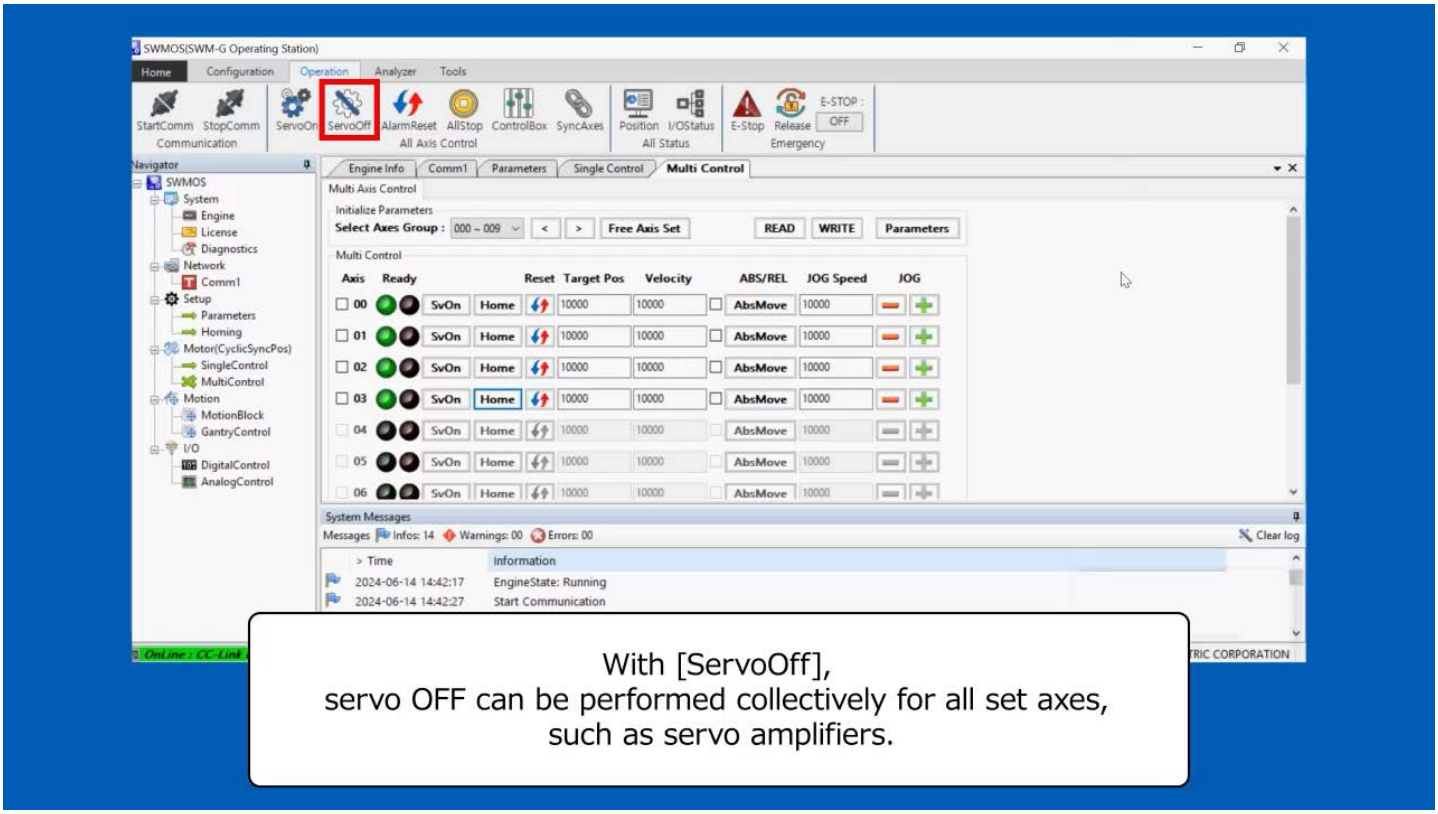
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



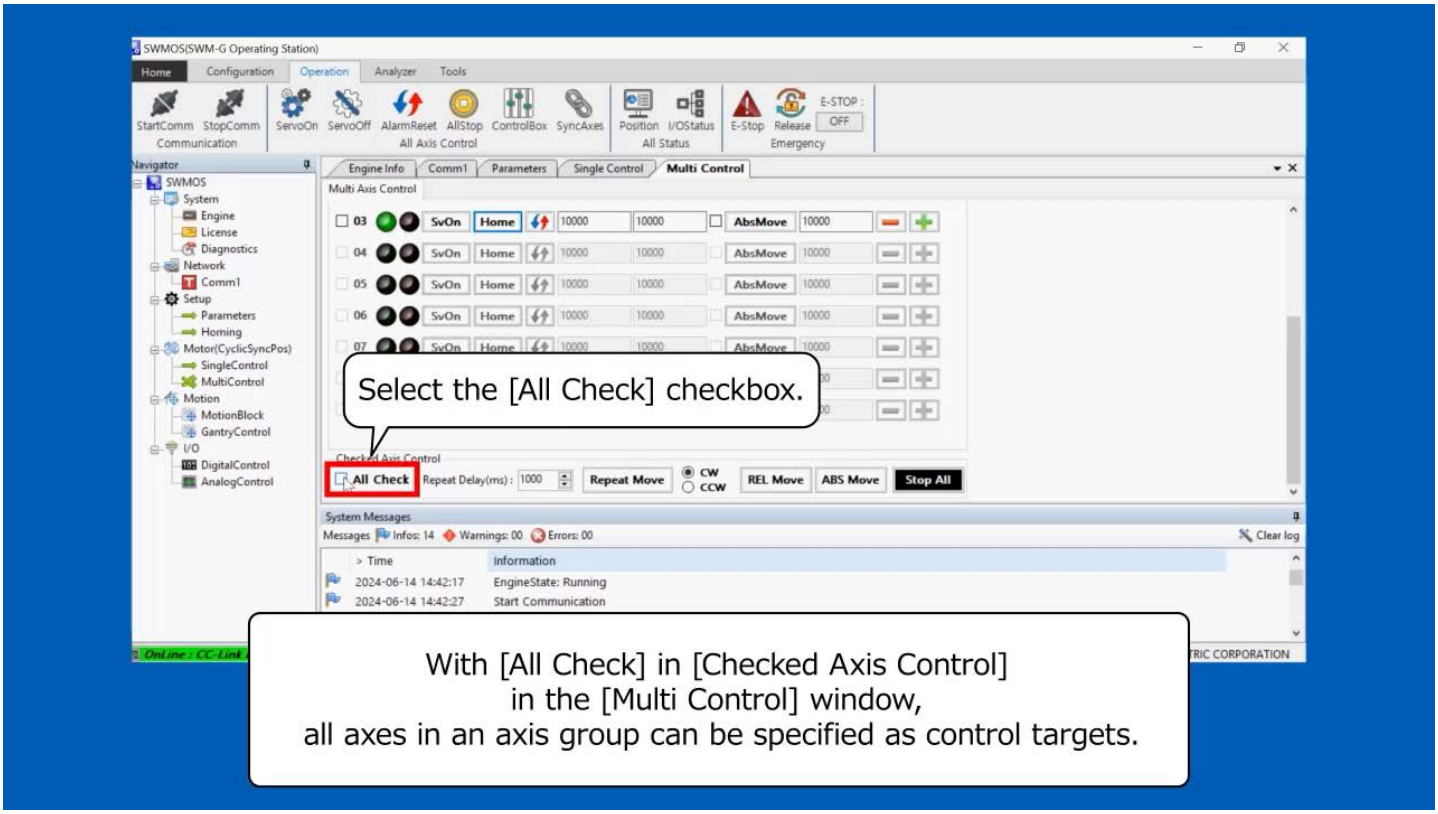
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



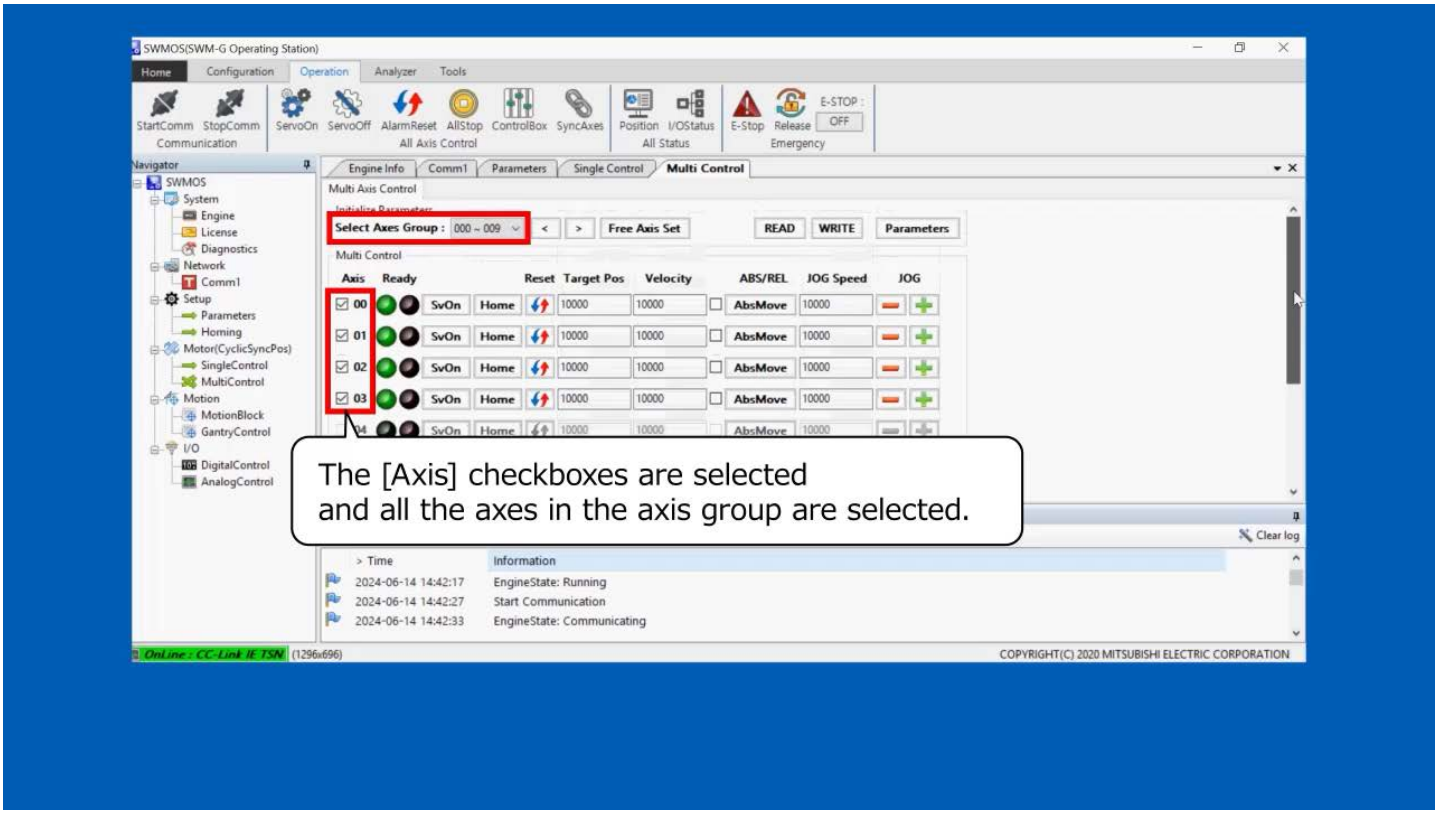
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



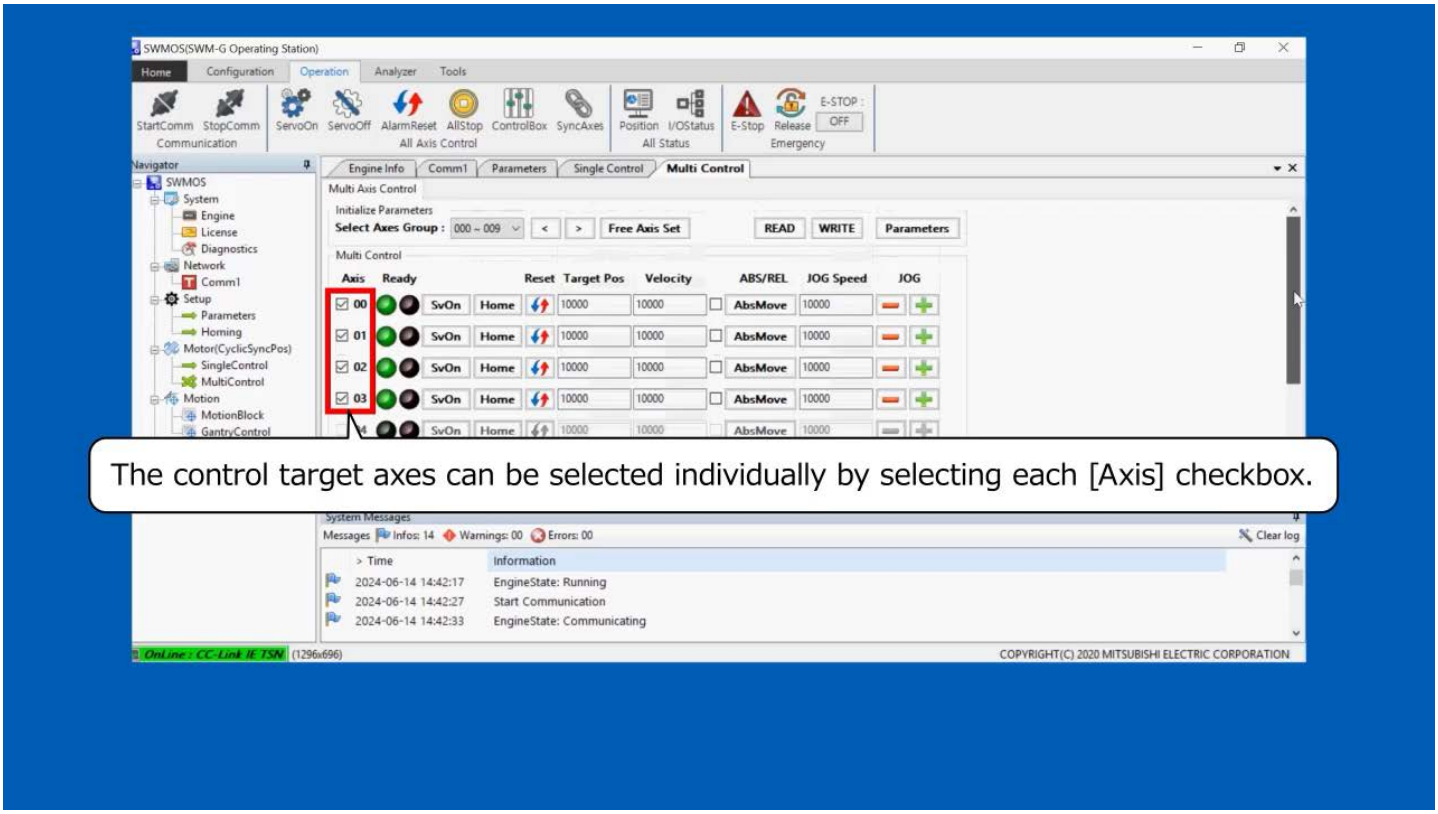
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



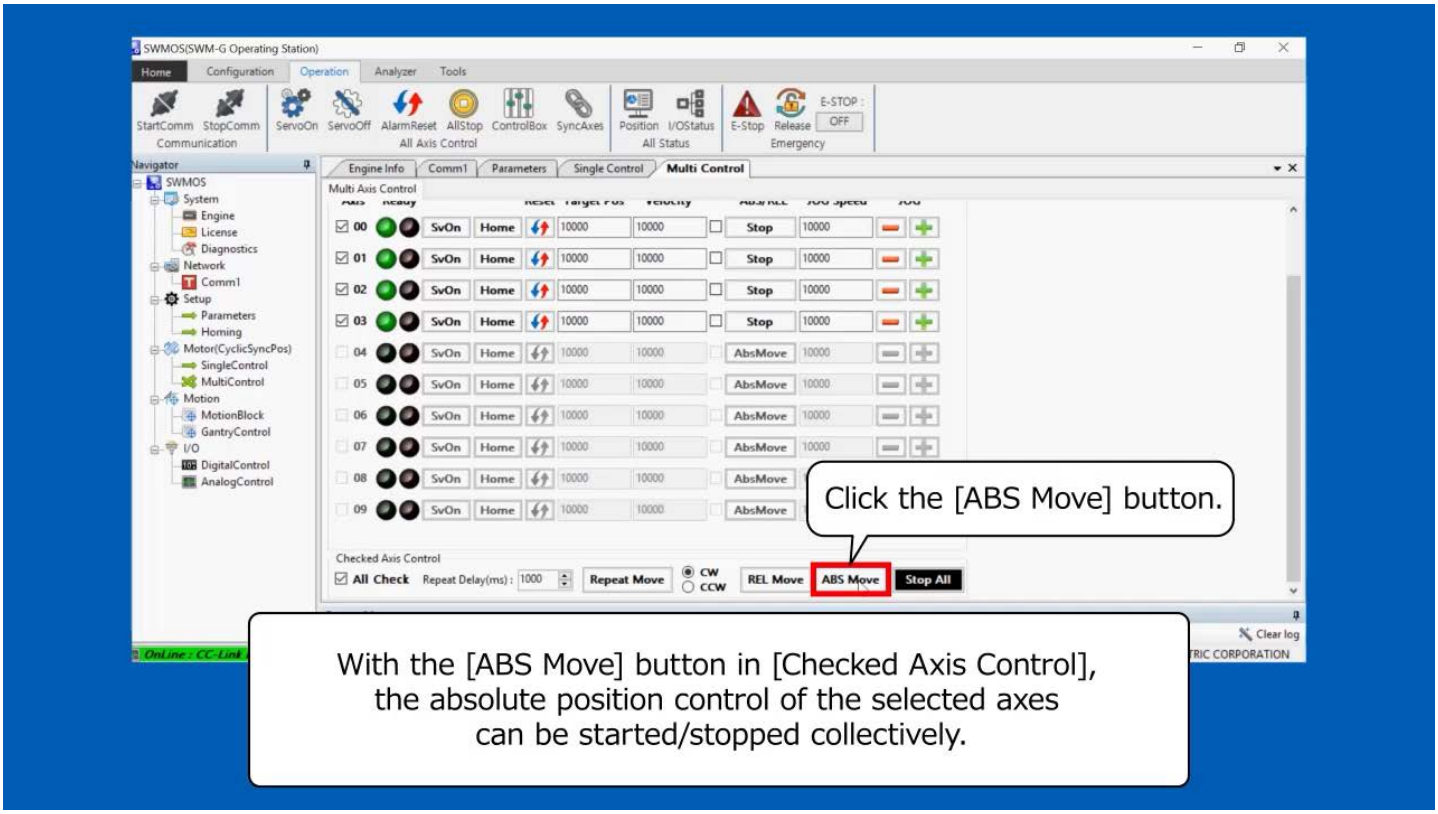
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



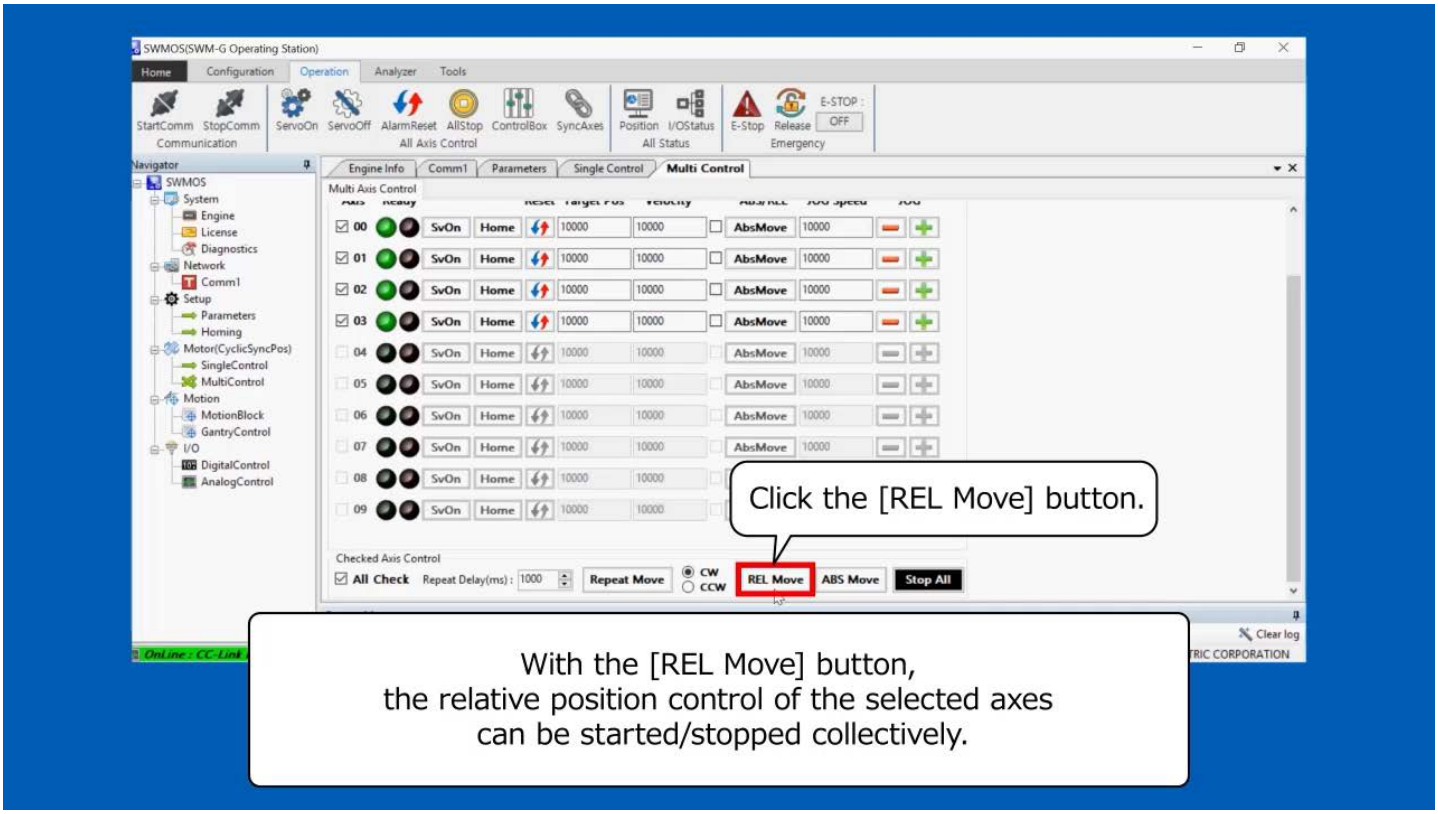
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



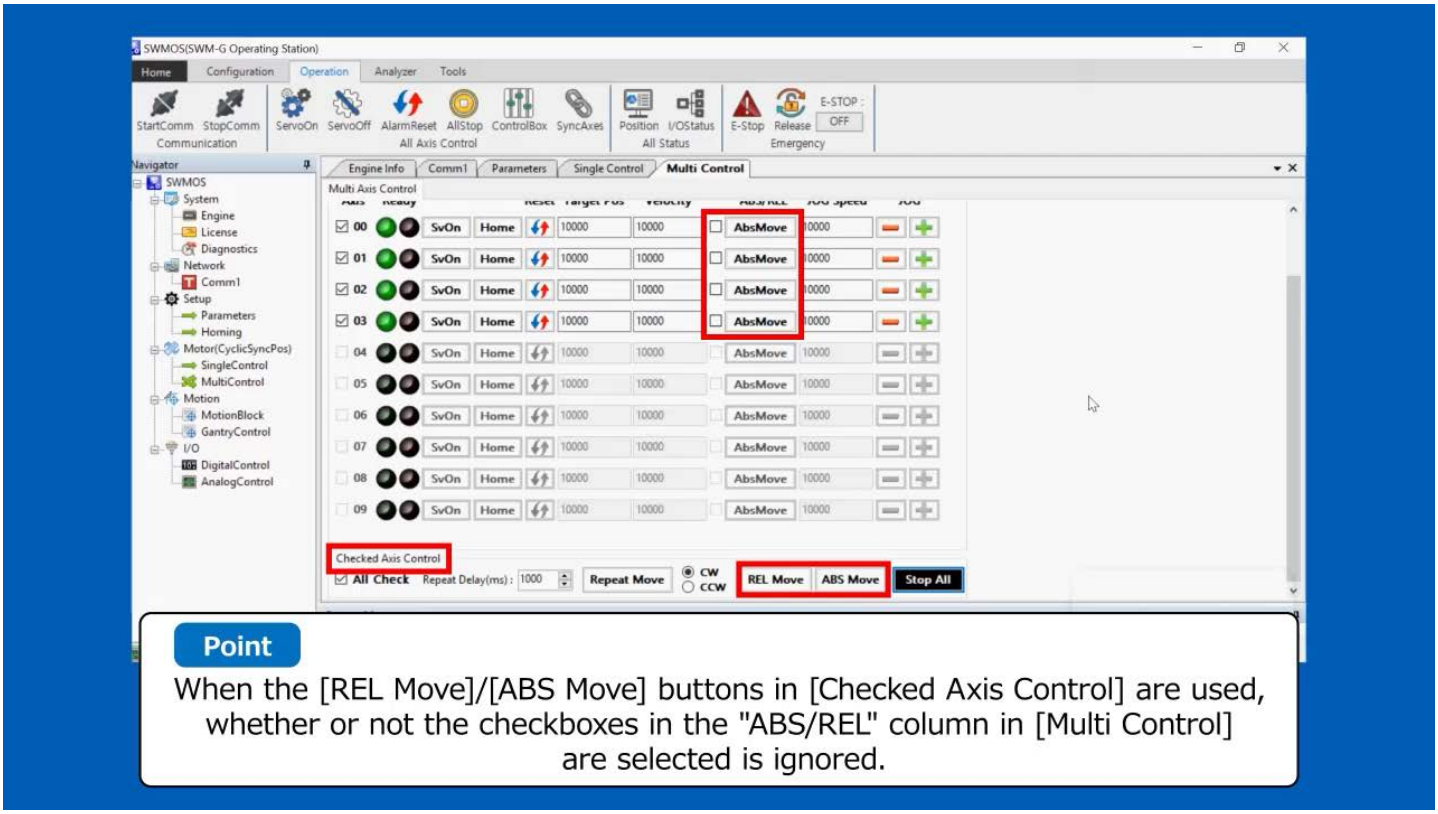
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



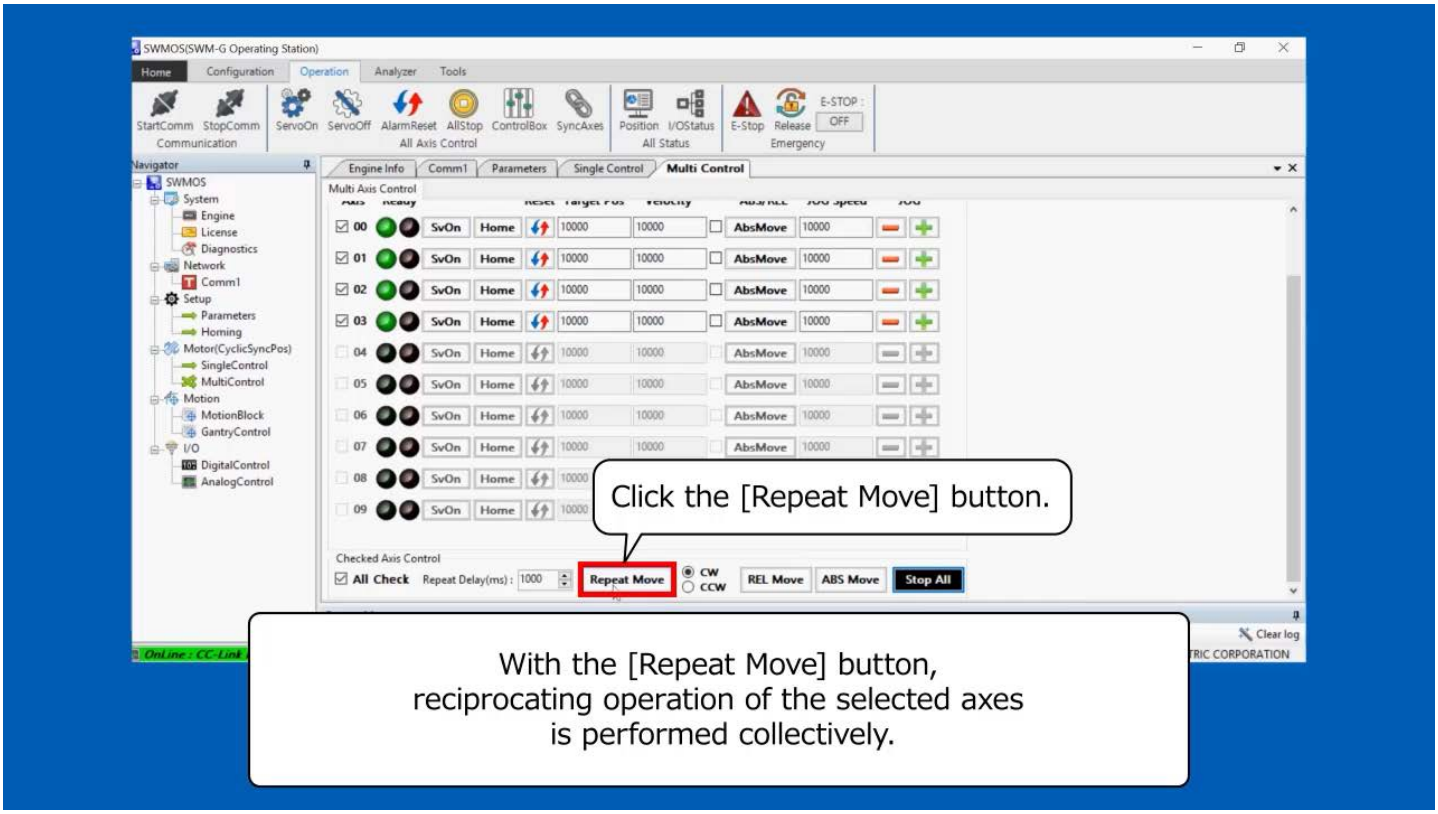
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



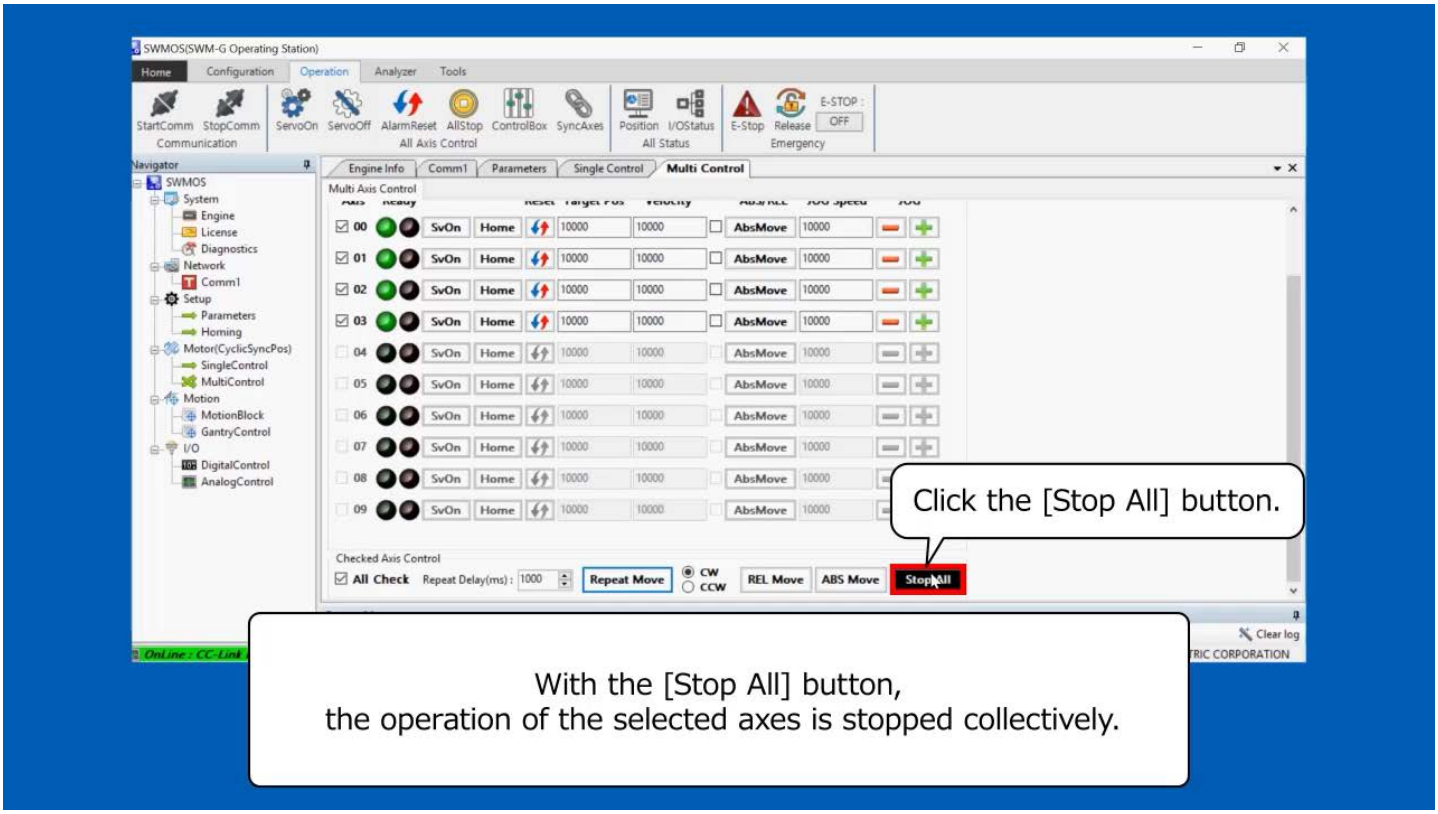
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



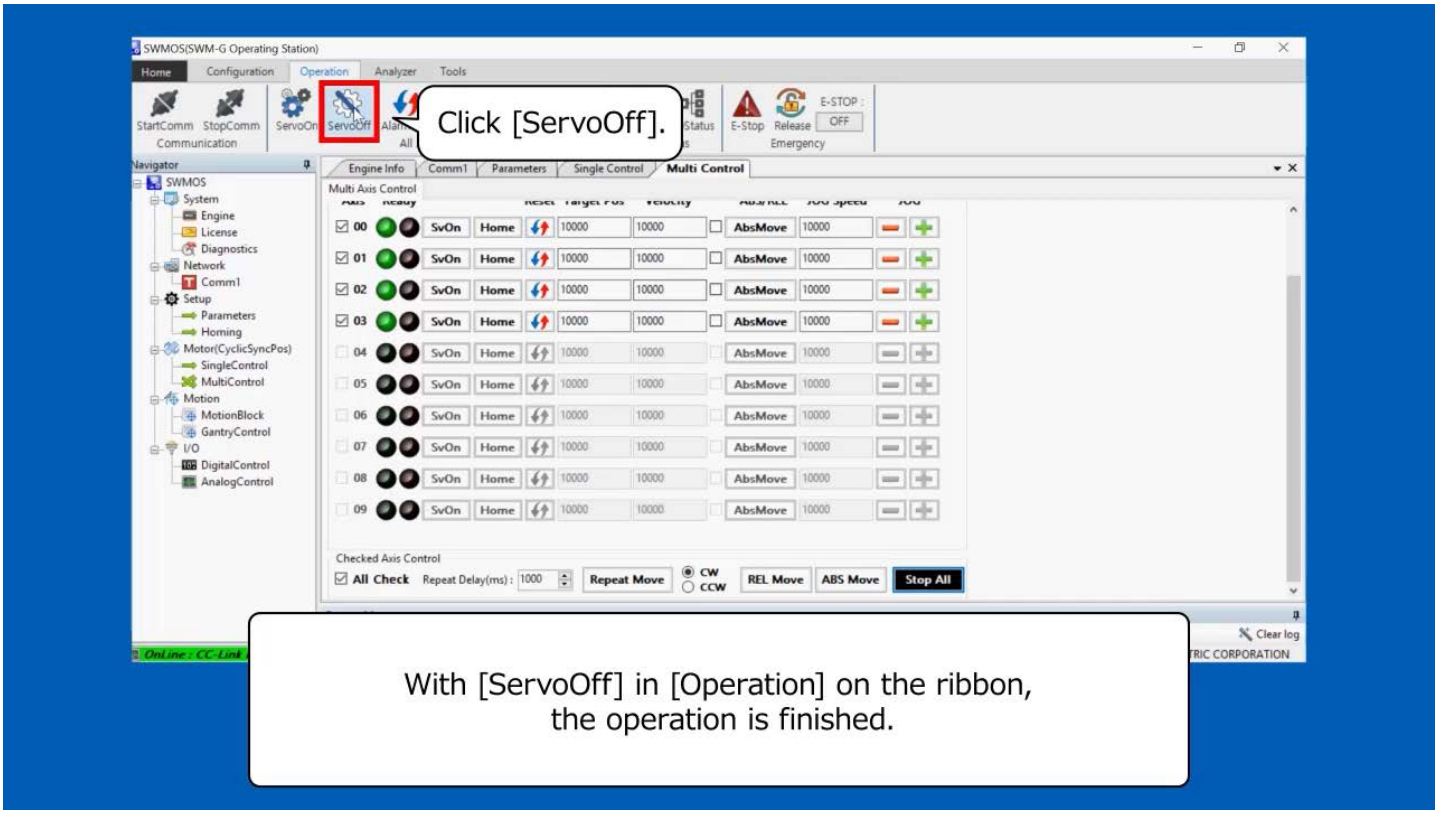
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



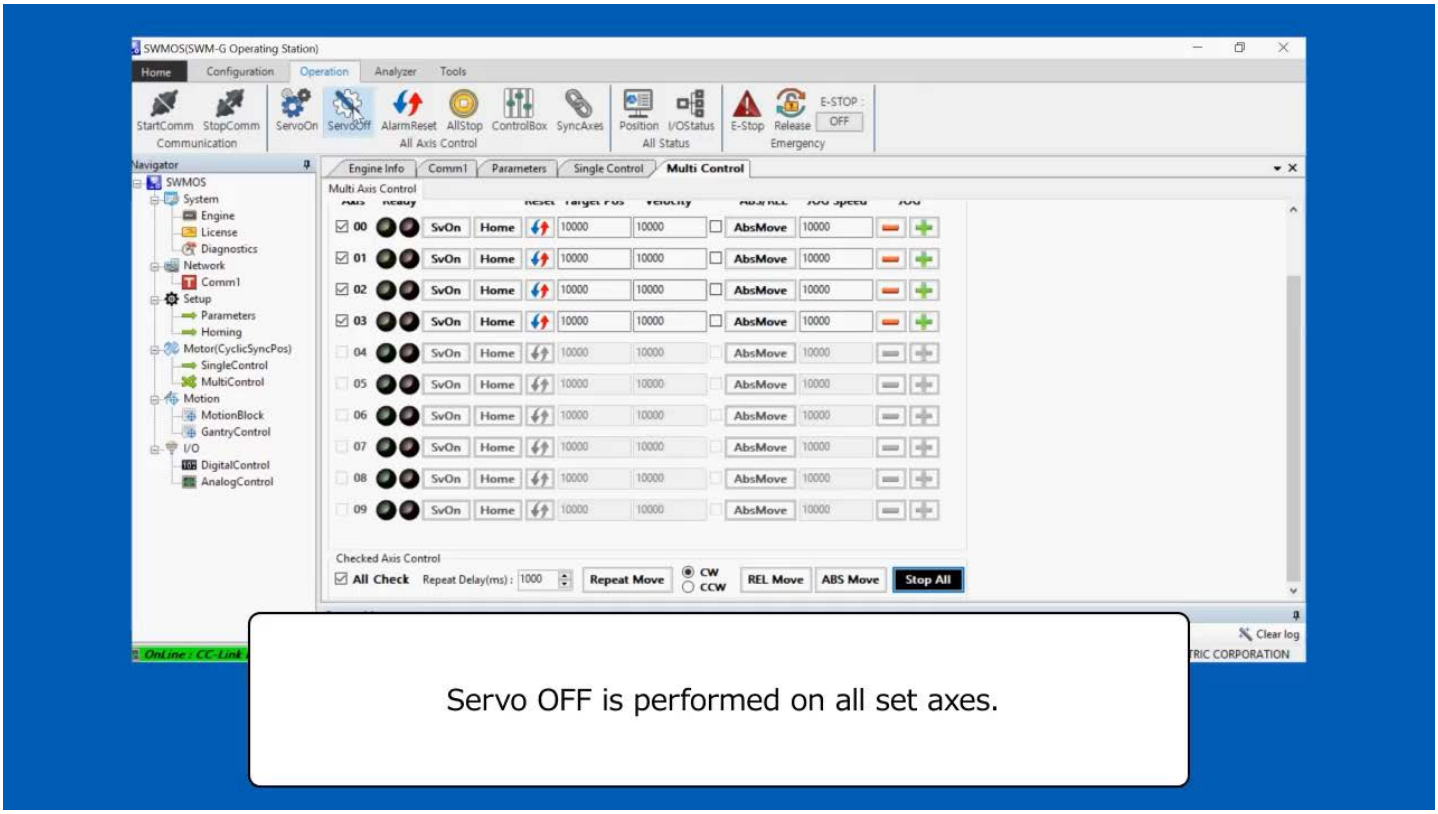
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



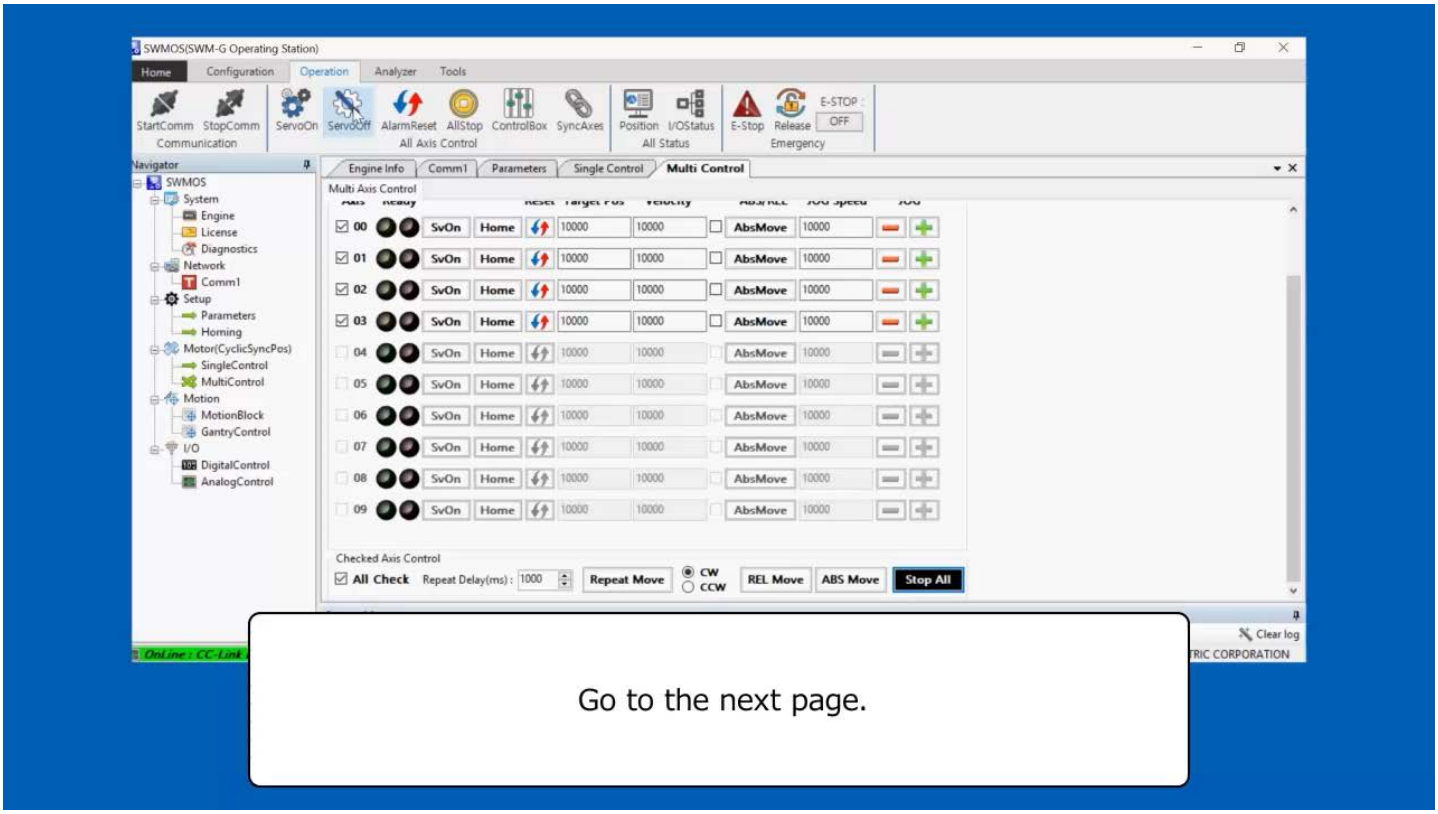
2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



2.7 Multi-Axis Control

This chapter describes the multi-axis control. To control multiple axes at once, configure the settings in [MultiControl]. For the procedure, see the video below.



2.8 Summary of This Chapter

In this chapter, you have learned:

- System Configuration
- Platform Selection
- Master Setting
- Remote Station Setting
- Parameter Setting
- Single-Axis Control
- Multi-Axis Control

Point

System Configuration	The target system in this Chapter consists of a personal computer, 1-axis servo amplifier, 3-axis servo amplifier, and others.
Platform Selection	Platform selection is the setting required for communication between the personal computer and the CC-Link IE TSN remote station.
Master Setting	Master setting is one of the settings required to configure a network. Mainly, set the communication cycle and IP address.
Remote Station Setting	In the remote station setting, set the devices that configure the network. The remote station setting can be configured using the automatic detection function or additional function.
Parameter Setting	In the parameter setting, set the basic parameters such as the operation mode, gear ratio, and home position return setting of the axis. Write the set parameters to the SWM-G engine. In addition, the parameter setting can be exported and imported.
Single-Axis Control	In the single-axis control, the test operation of position control, speed control, and torque control can be performed. In this chapter, you have learned the servo ON of the position control, home position return, JOG operation, and positioning operation.
Multi-Axis Control	In the multi-axis control, the test operation of multiple axes can be performed simultaneously. All axes can be controlled at once or any axis can be controlled individually.

Chapter 3 Operation Check Using a Sample Project

This chapter describes the programming procedures and basic programs using a sample project. It also describes the requirements to use the sample project. When using the program examples described in this chapter in an actual system, fully verify that there are no control problems with the system.

3.1 Construction of the Target System
3.2 Parameter Setting
3.3 Operation Details of the Sample Program
3.4 Opening the Sample Program
3.5 Parameter and Positioning Data Setting
3.6 Executing the Build
3.7 Executing the Program
3.8 Summary of This Chapter

■ Supplementary document

For how to check the SWM-G manuals (SWM-G User Manual (HELP), user's manual, and operating manual) and the explanation of the sample program "03.Basic Motion" included in SWM-G, refer to the separate PDF. It can be downloaded from the following link.

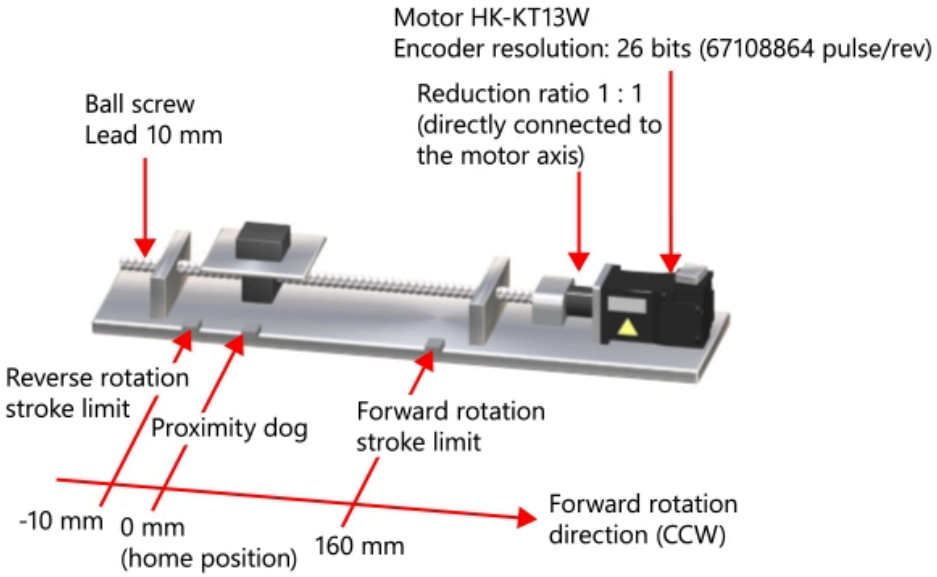
How to check the SWM-G manuals
Explanation of the sample program "03.Basic Motion"

3.1 Construction of the Target System

This section describes the hardware configuration of the target system.

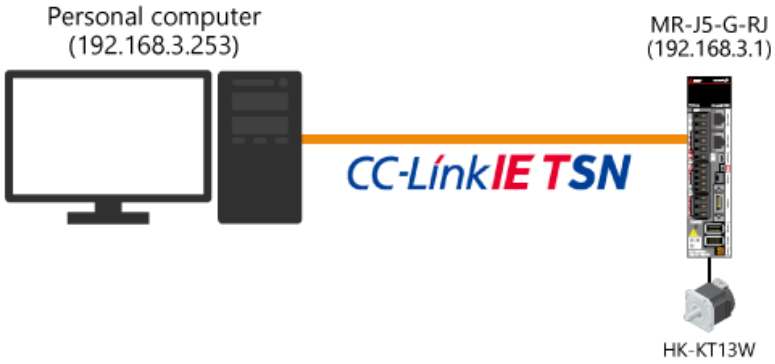
3.1.1 Machine configuration

Use a 1-axis ball screw mechanism. The specification of the machine is as follows.



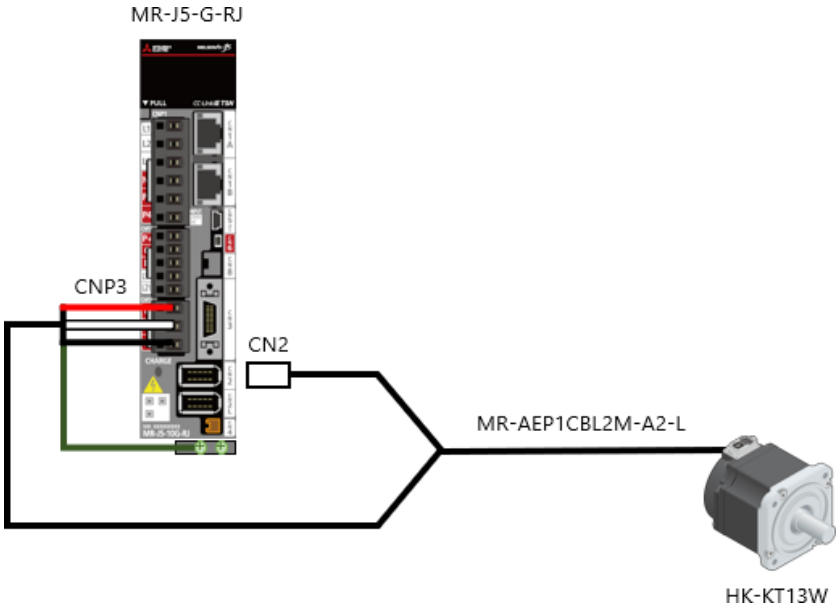
3.1.2 System configuration

The configuration of the target system is as follows.



3.1.3 Connection between the servo motor and servo amplifier

A single cable type option MR-AEP1CBL2M-A2-L is used for the power cable and encoder cable of the servo motor.

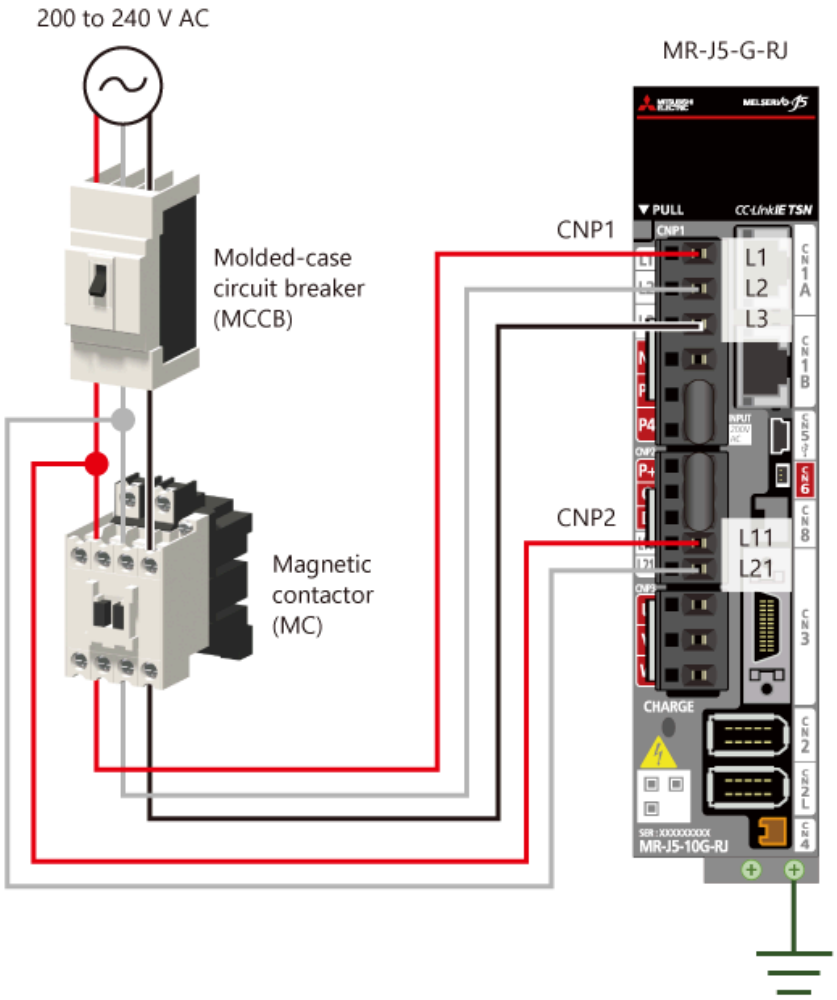


3.1.4 Connection between the power supply and servo amplifier

Wire the power supply to the main circuit power supply (L1, L2, L3) and control circuit power supply (L11, L21) of the servo amplifier.
The following shows a schematic diagram. The actual wiring and applicable cable size differ depending on the capacity. For details, refer to the user's manual (hardware) of the servo amplifier.

- Use a molded-case circuit breaker (MCCB) with the input cables of the main circuit power supply.
- Always connect a magnetic contactor (MC) between the main circuit power supply and the L1/L2/L3 contacts of the servo amplifier.

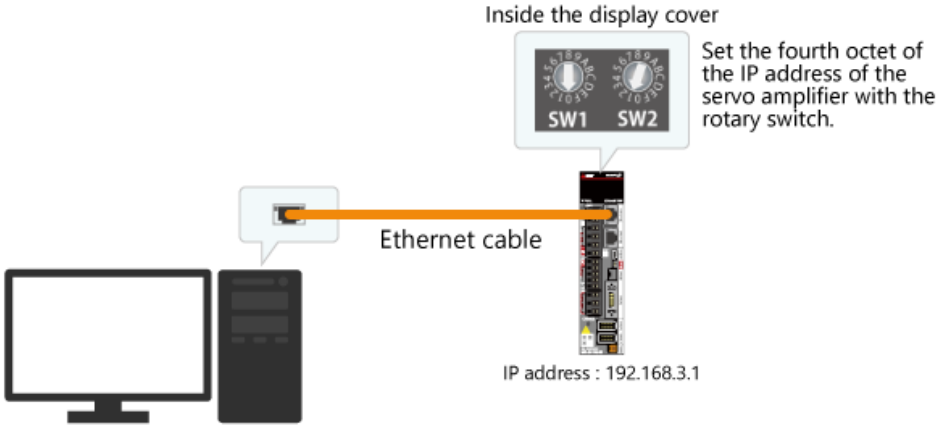
User's manual (Hardware) of the servo amplifier to be used



3.1.5 Wiring of network cables

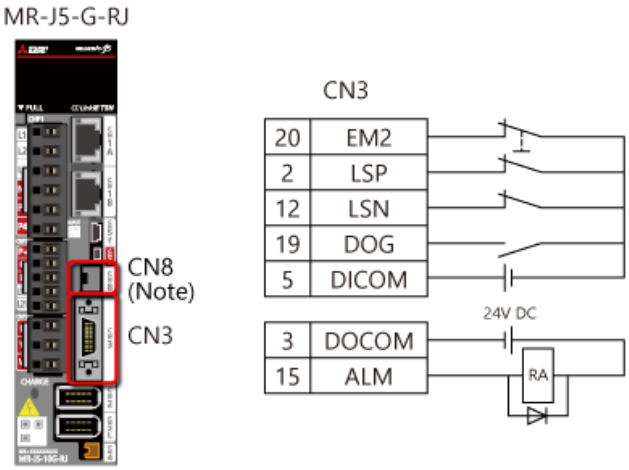
Wire the network cables (Ethernet cables).
Use the Ethernet cables that meet the following standards.

Communication speed	Ethernet cable	Connector	Standard
1Gbps	Category 5e or higher, (double shielded/STP) straight cable	RJ45 connector	Cable that meets the following standards. • IEEE802.3(1000BASE-T) • ANSI/TIA/EIA-568-B (Category 5e)



3.1.6 Wiring of the I/O circuit of the servo amplifier

Wire the I/O circuit of the servo amplifier as shown below.
Wire the proximity dog, forward/reverse rotation limits, and forced stop.
In addition, configure the circuit so that the magnetic contactor is turned off by the ALM output.



(Note) Since the STO function is not used in this course, do not remove the CN8 short-circuit connector attached with the servo amplifier.

3.2 Parameter Setting

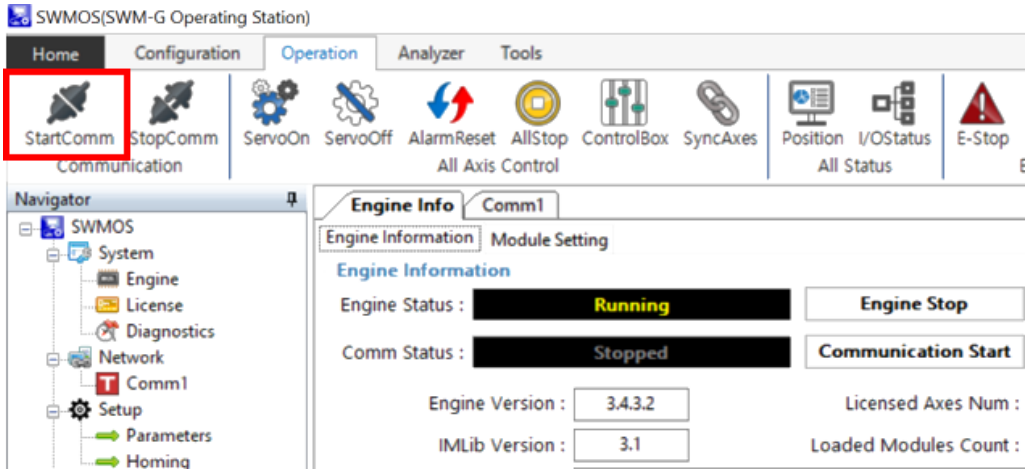
This section describes the procedures for the parameter setting of the servo amplifier (servo parameter setting).
Configure the servo parameter setting using MR Configurator2.
Install MR Configurator2 in the personal computer to be used in advance.
For details of how to use MR Configurator2, refer to the following help.

MR Configurator2 Help

3.2.1 How to use the IP communication function

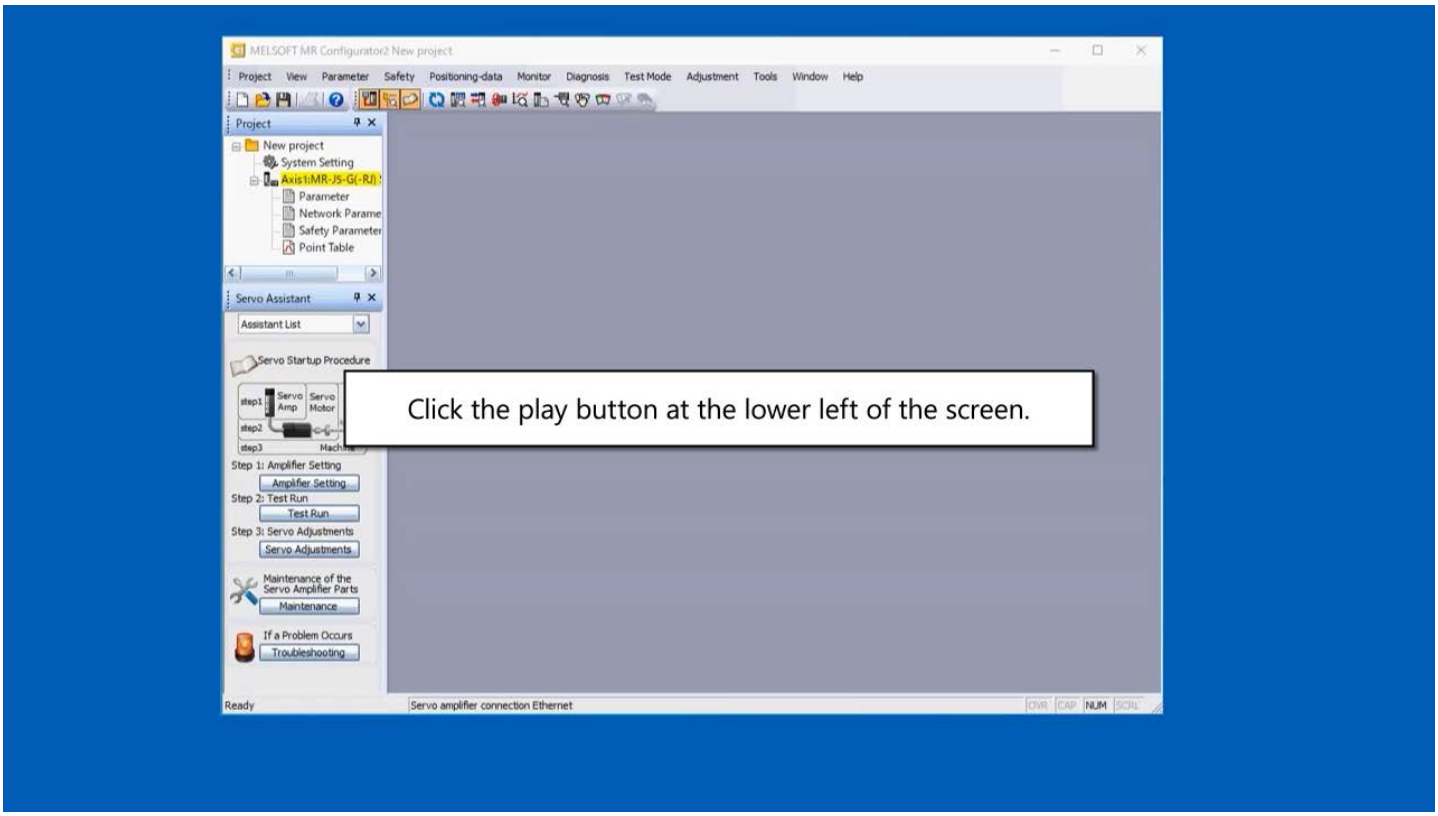
This section describes how to use the IP communication function of MR Configurator2.
The IP communication function enables the communications with devices on the CC-Link IE TSN network via the SWM-G engine.
Servo parameters can be set via the CC-Link IE TSN network.

1. Start SWMOS of SWM-G.
2. Click [Operation] → [StartComm] in the ribbon.
   • The communication starts.



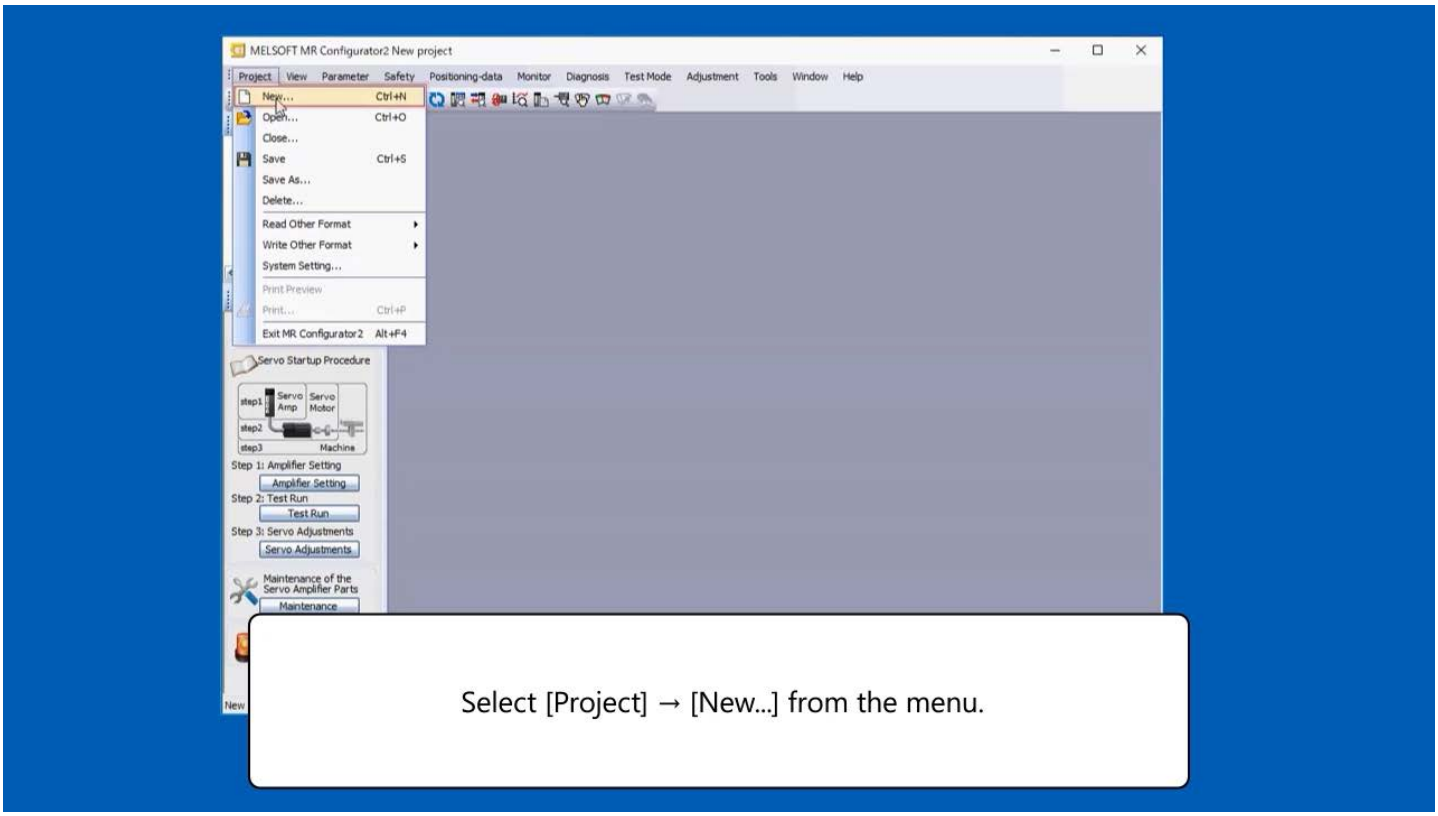
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



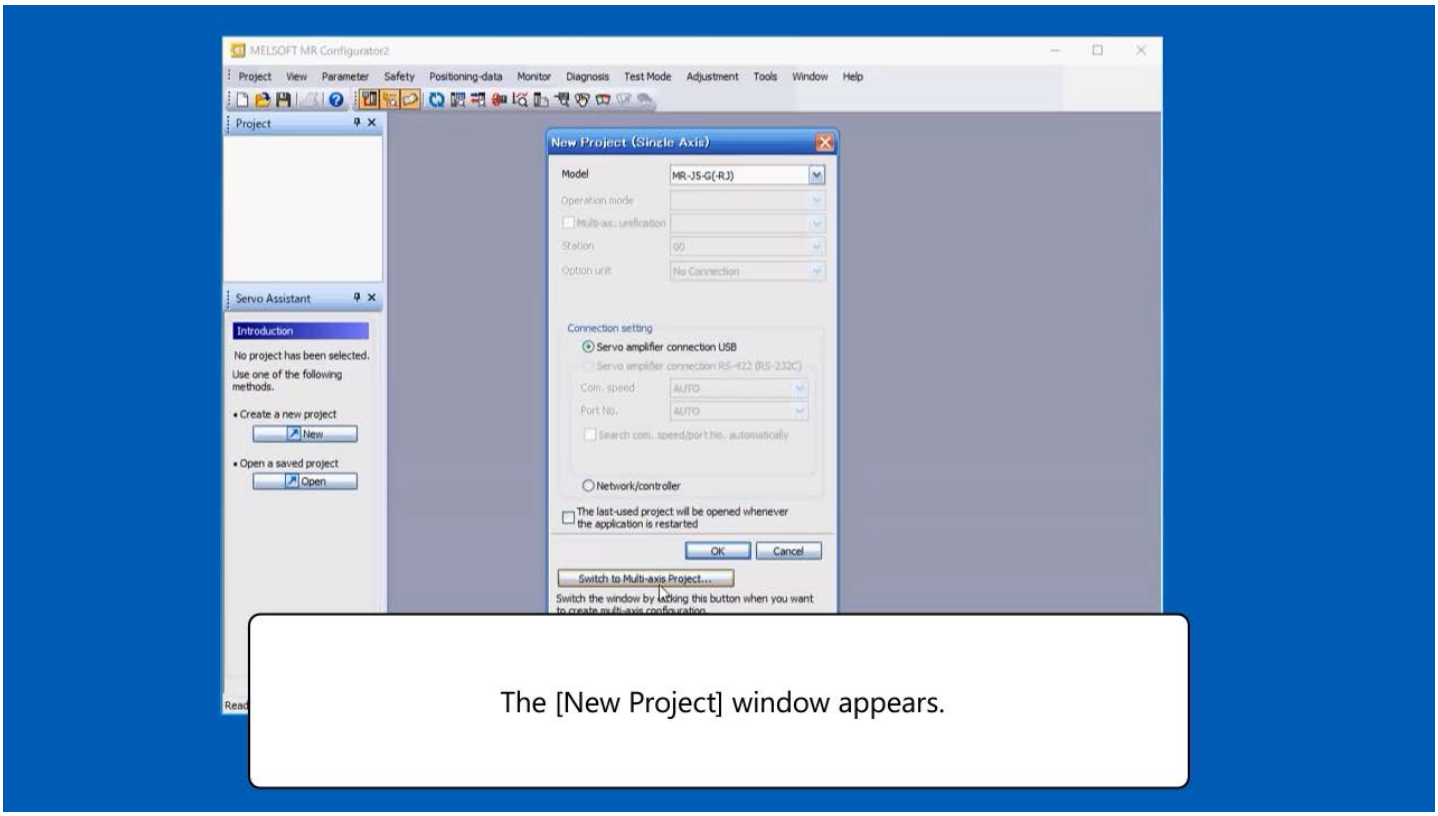
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



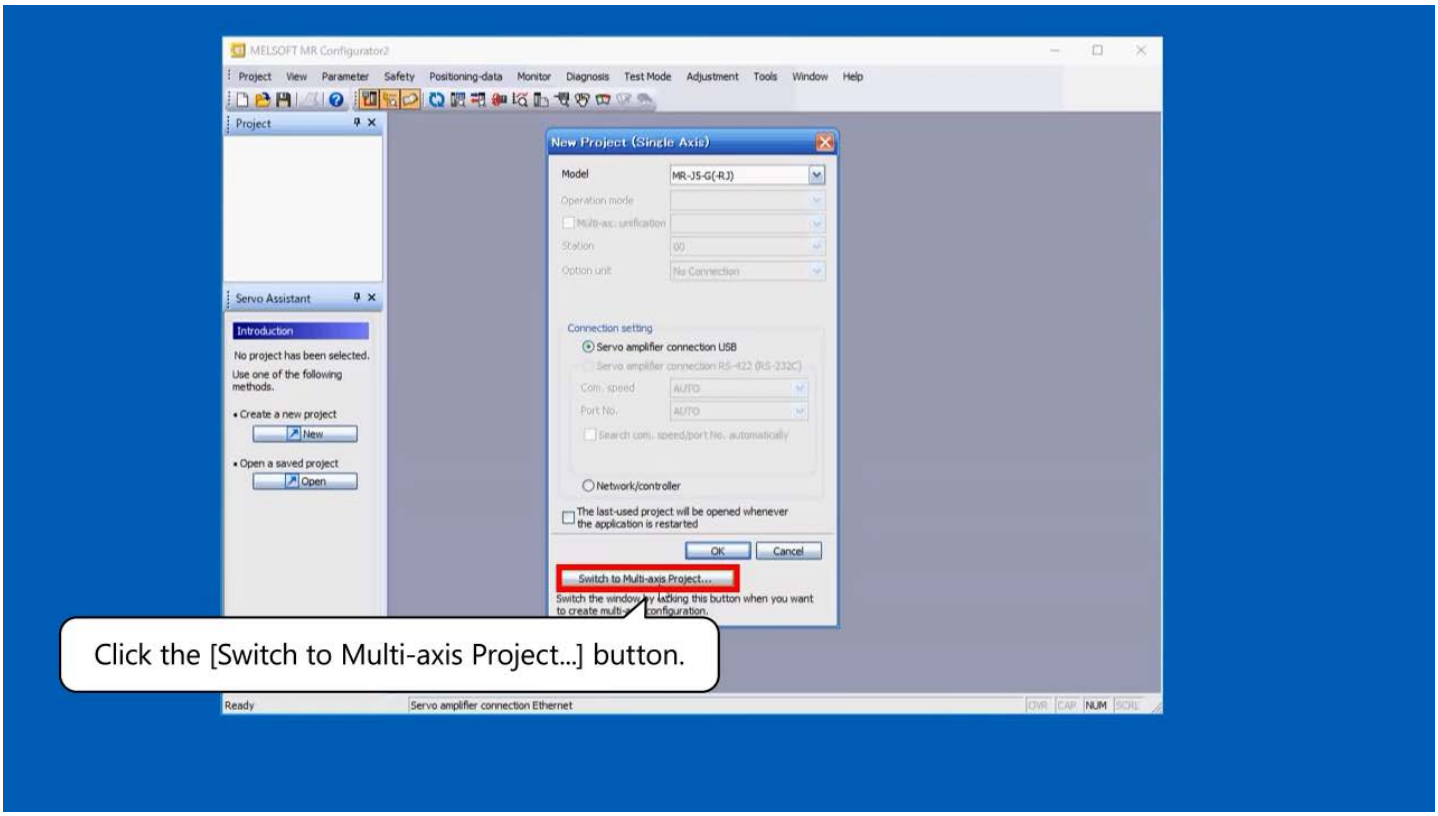
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



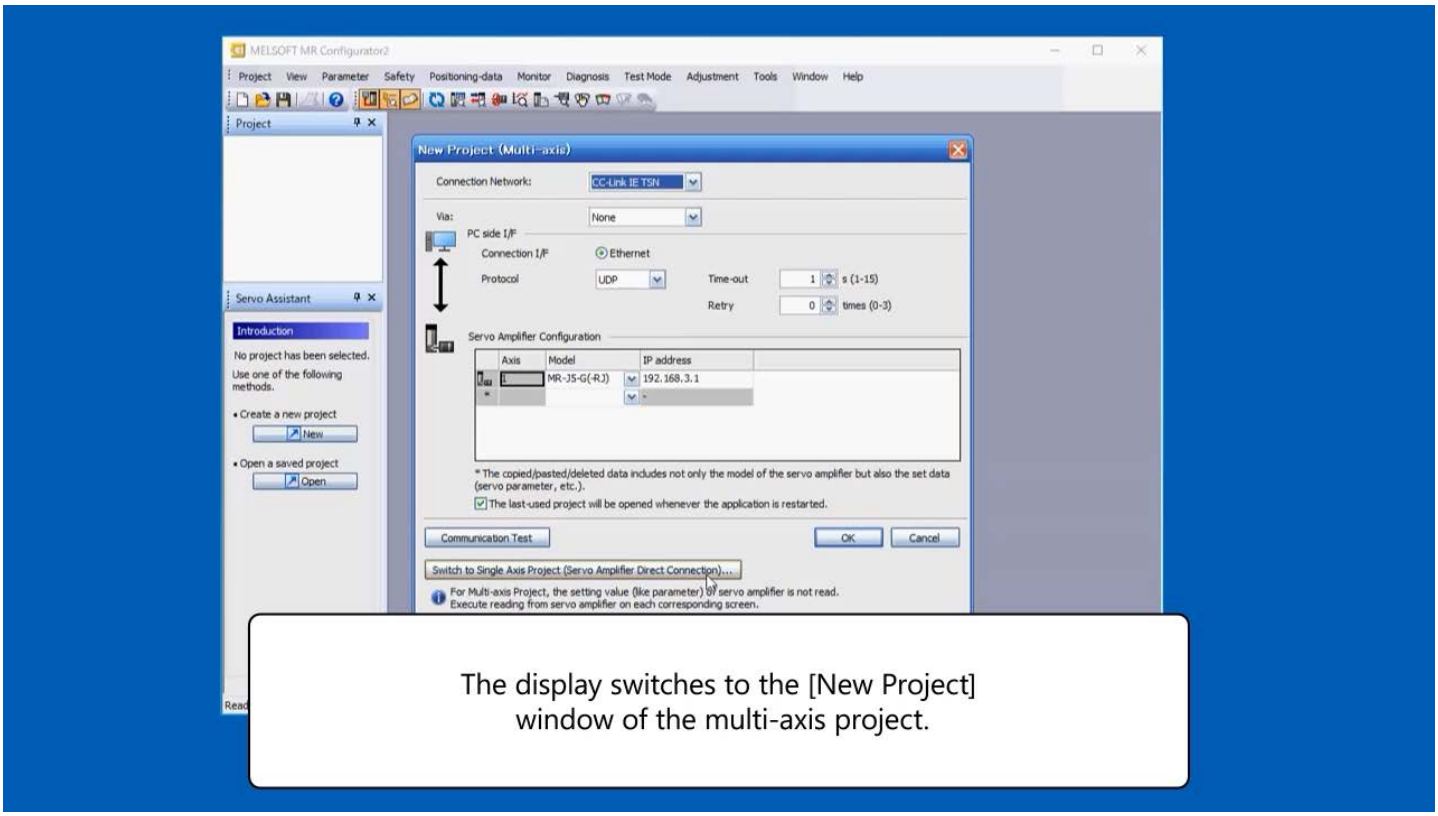
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



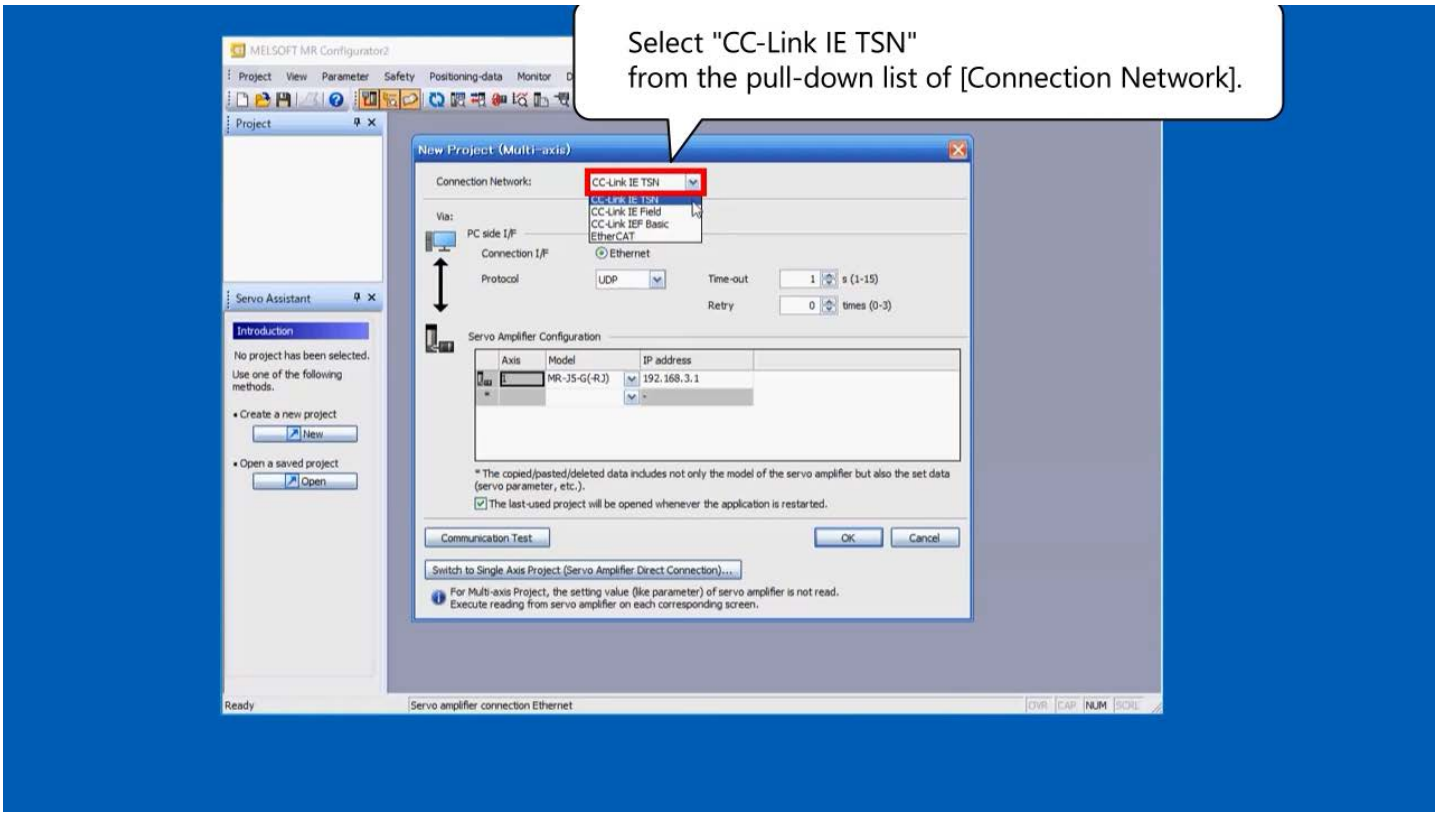
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



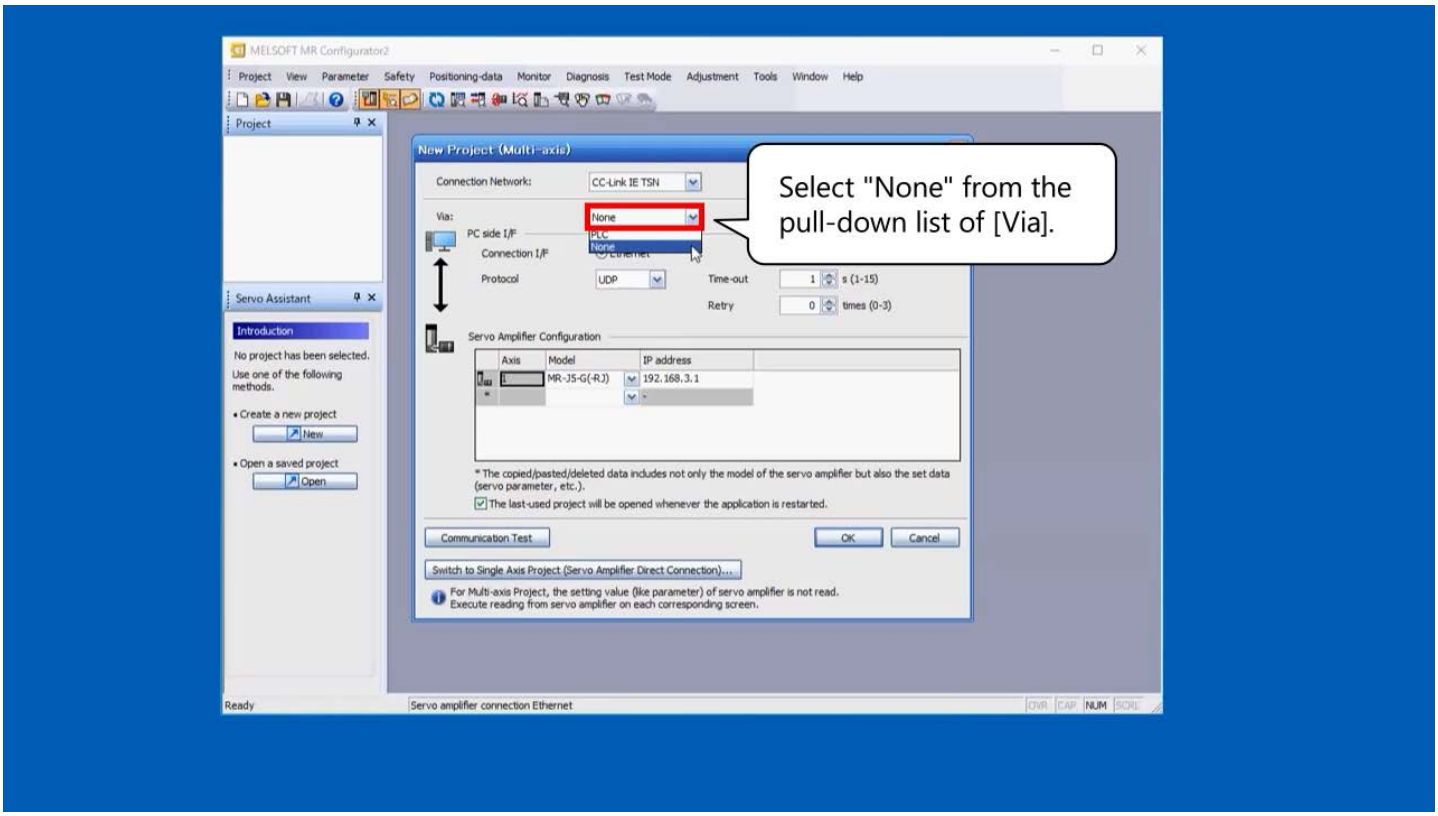
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



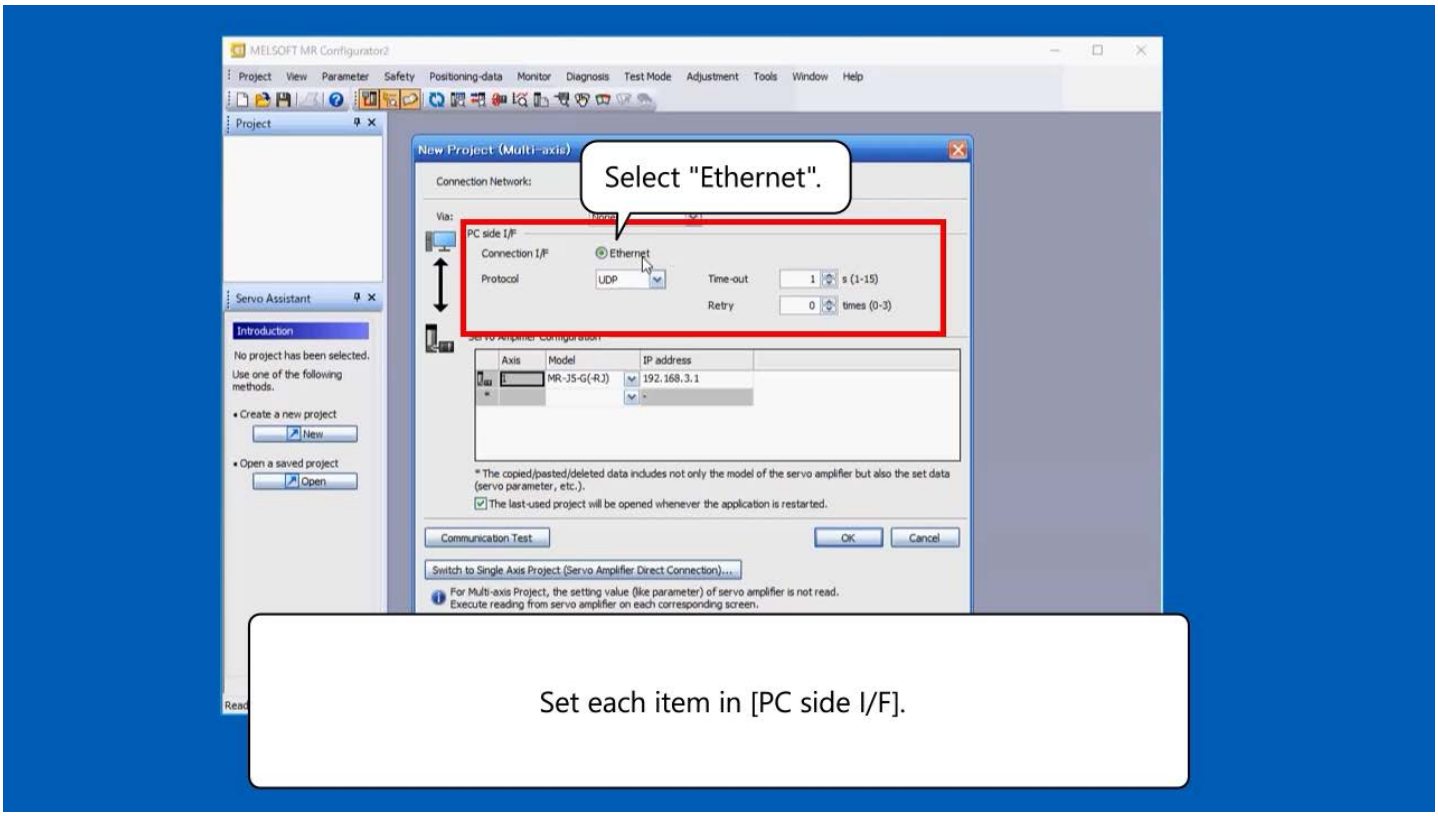
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



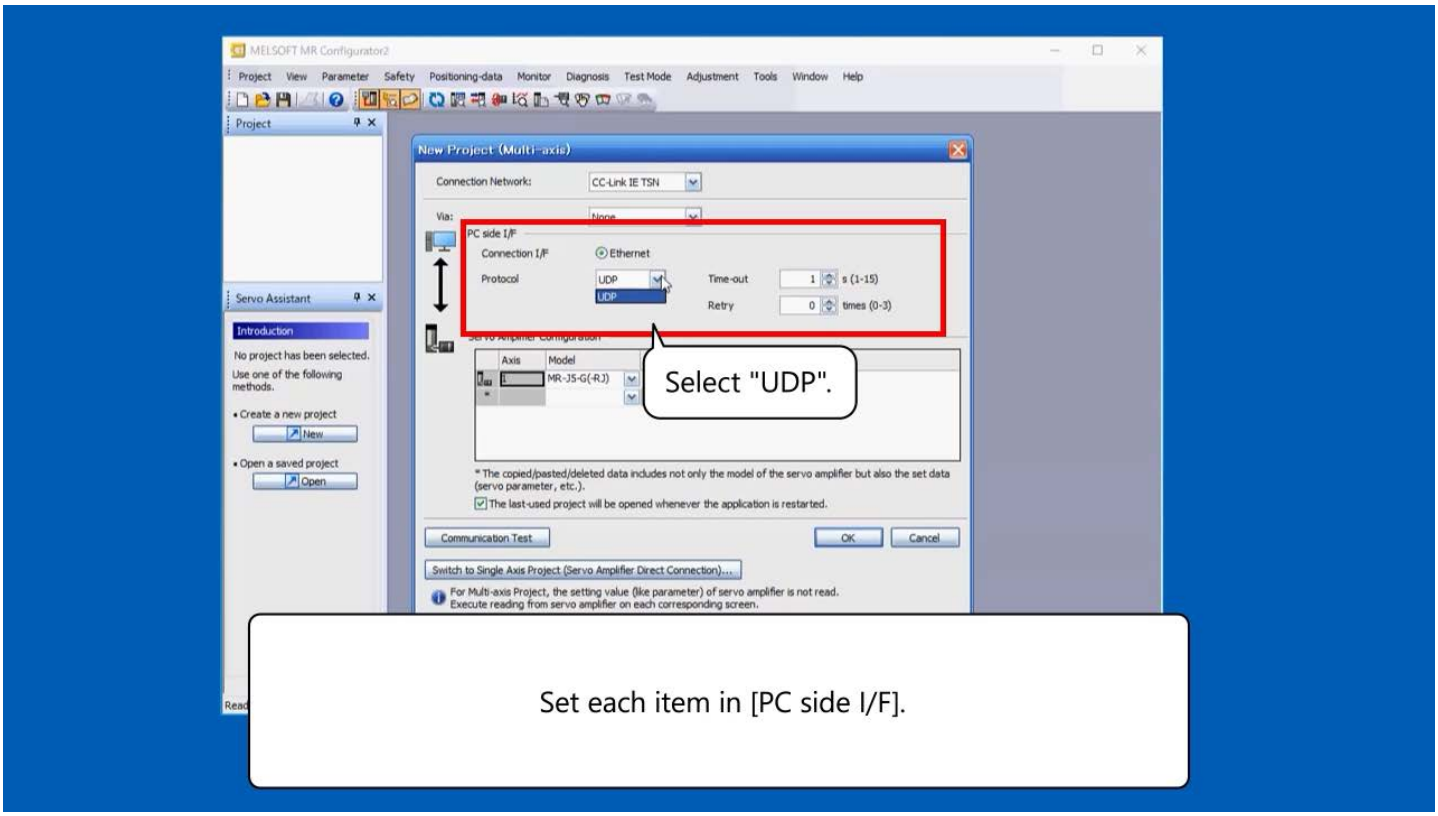
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



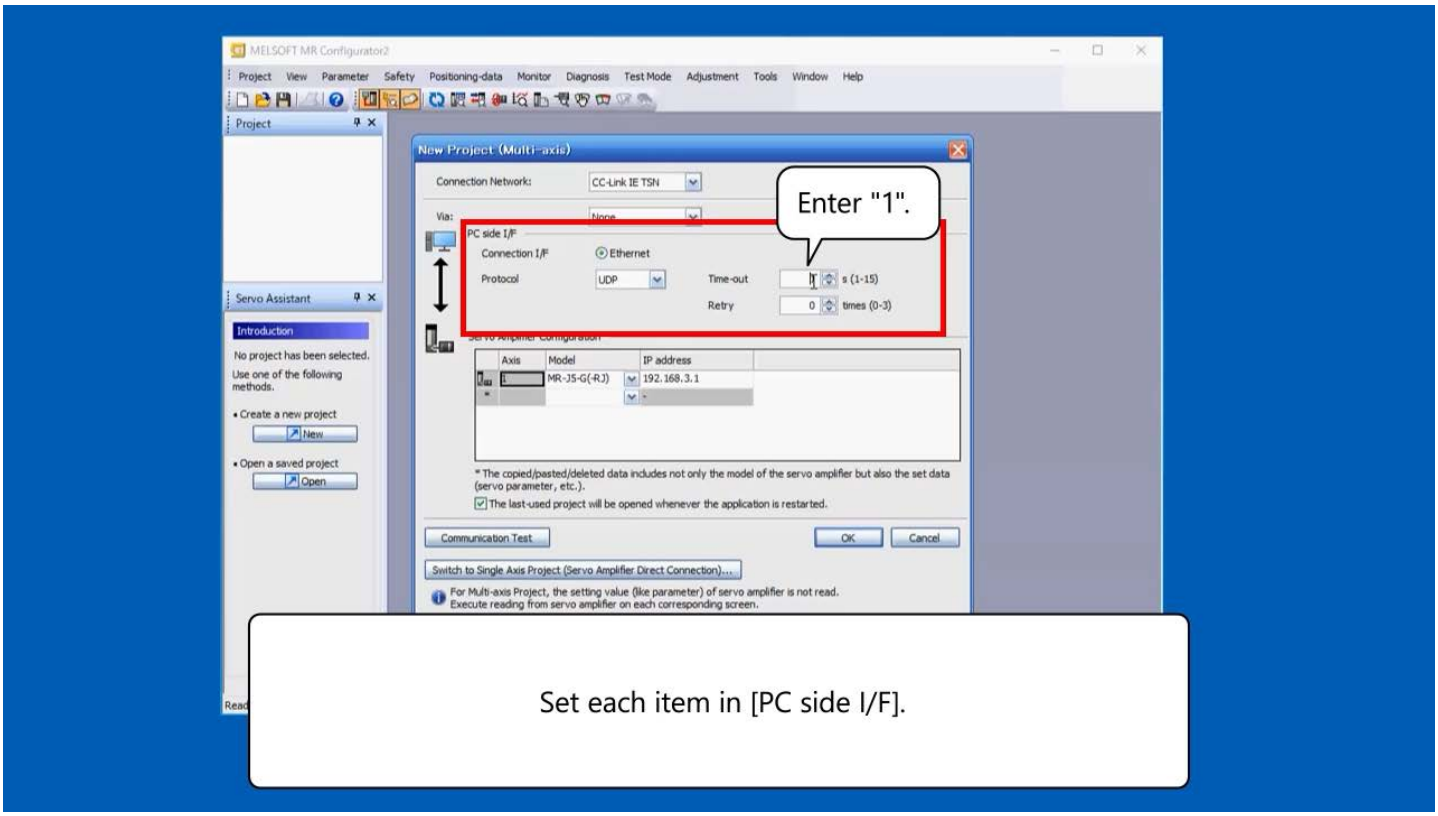
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



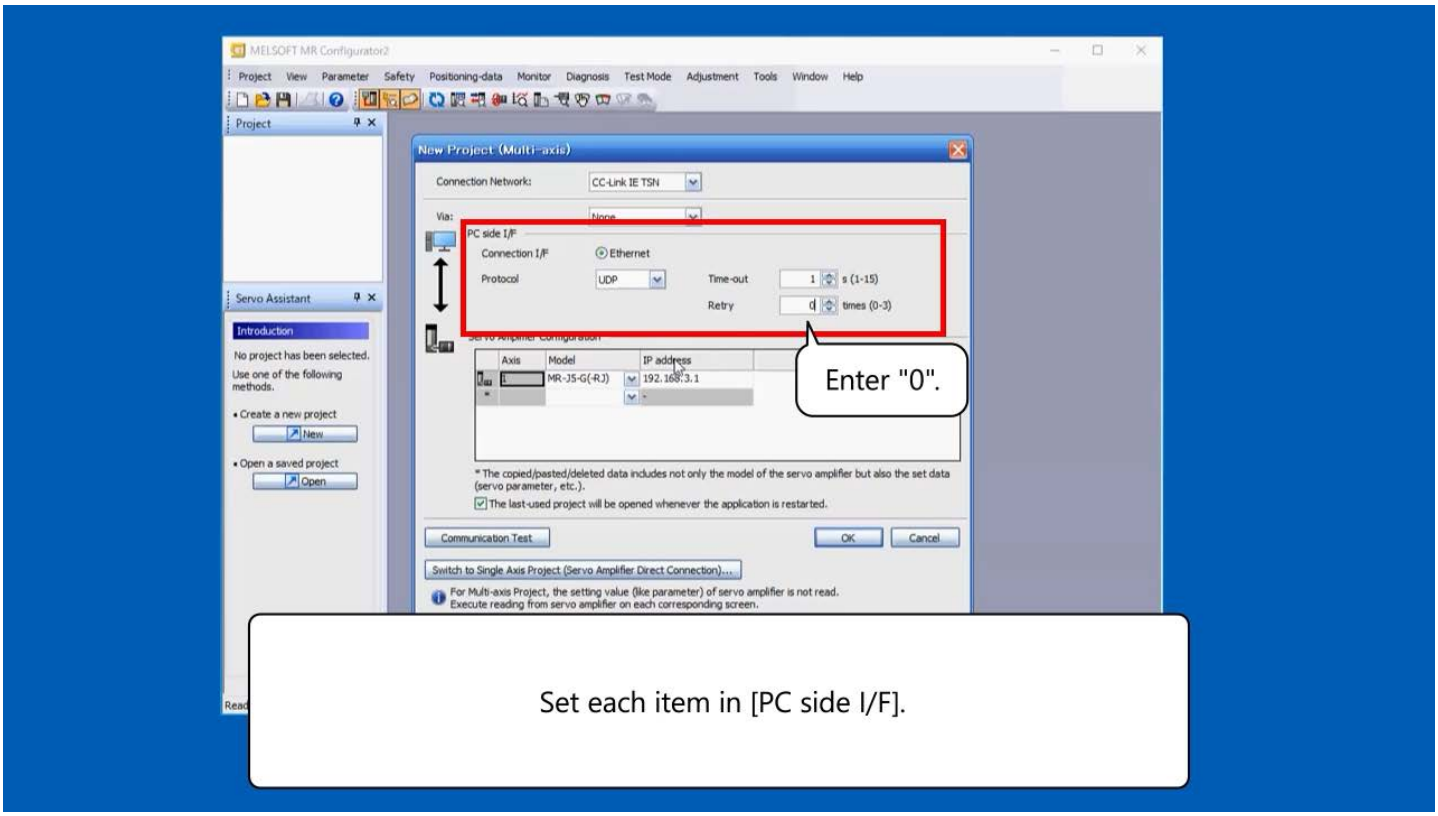
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



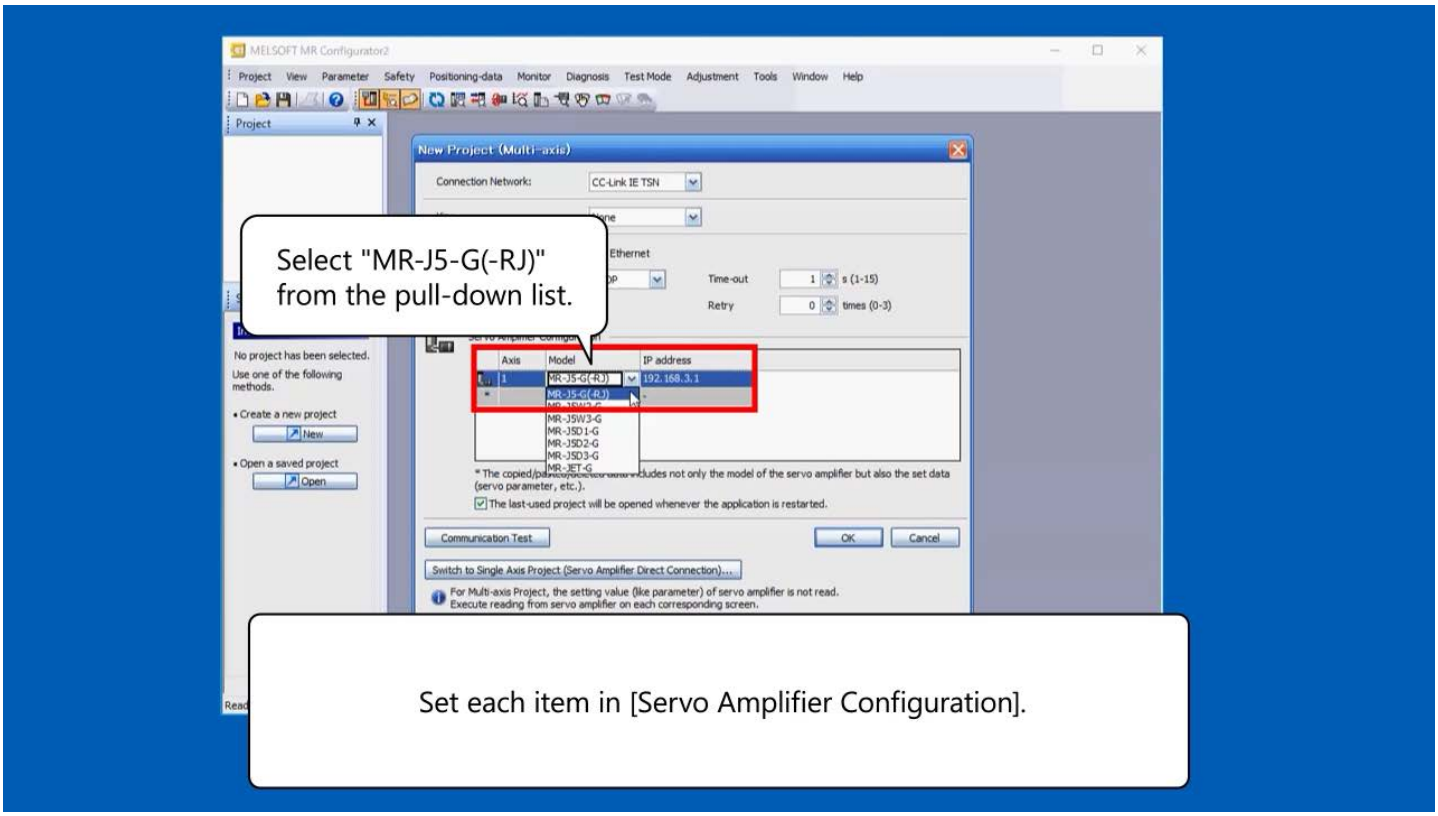
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



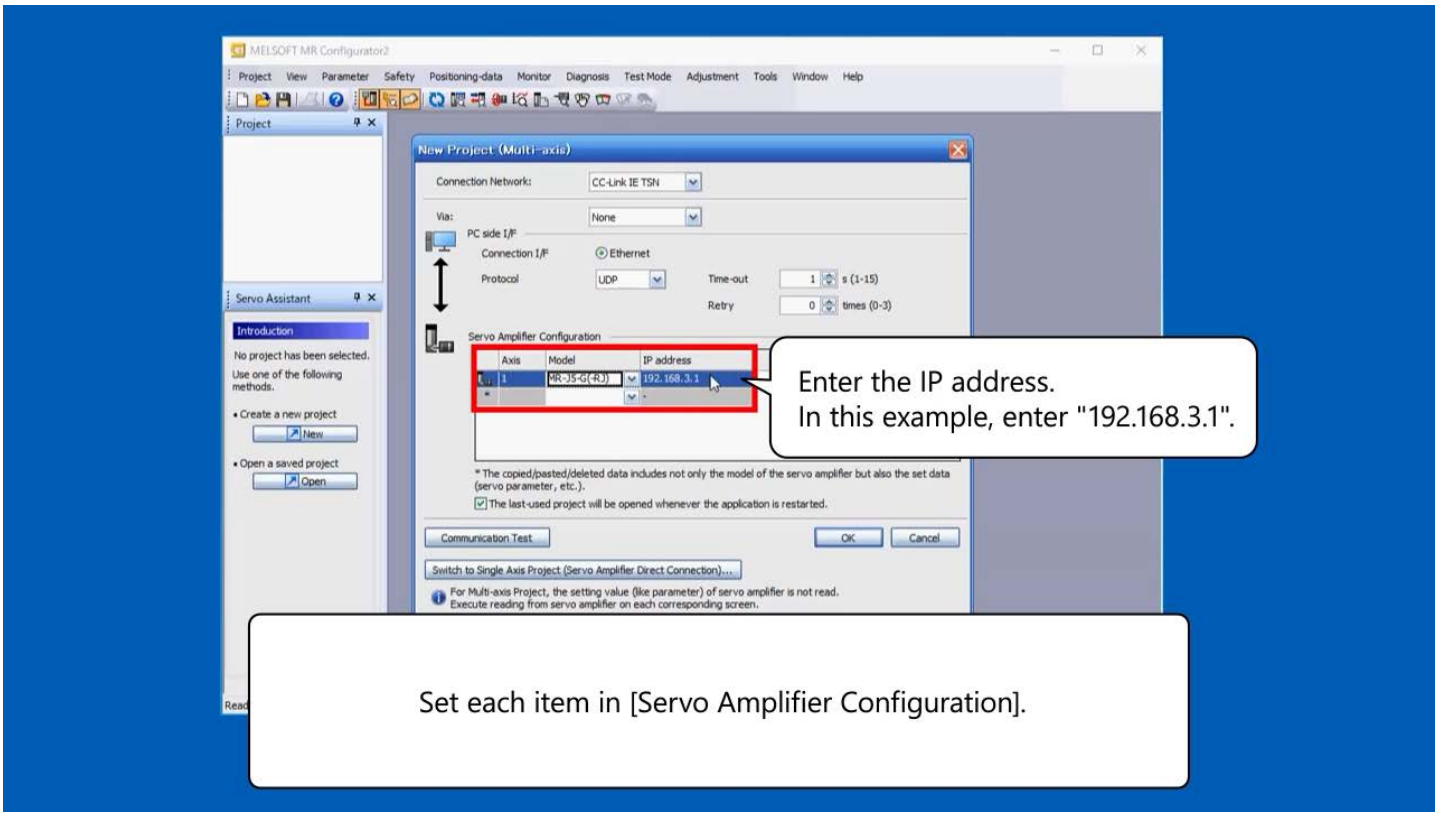
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



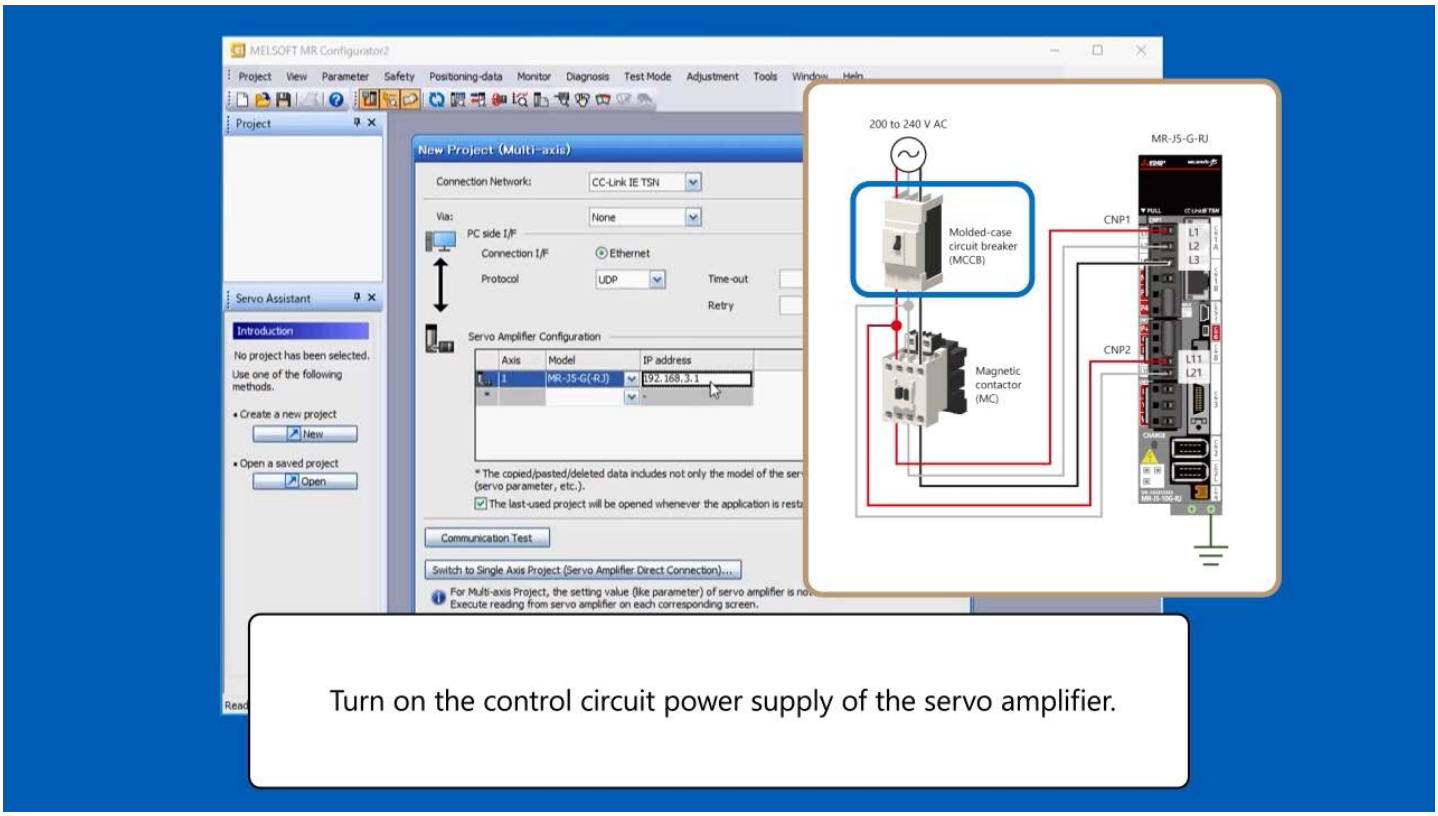
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



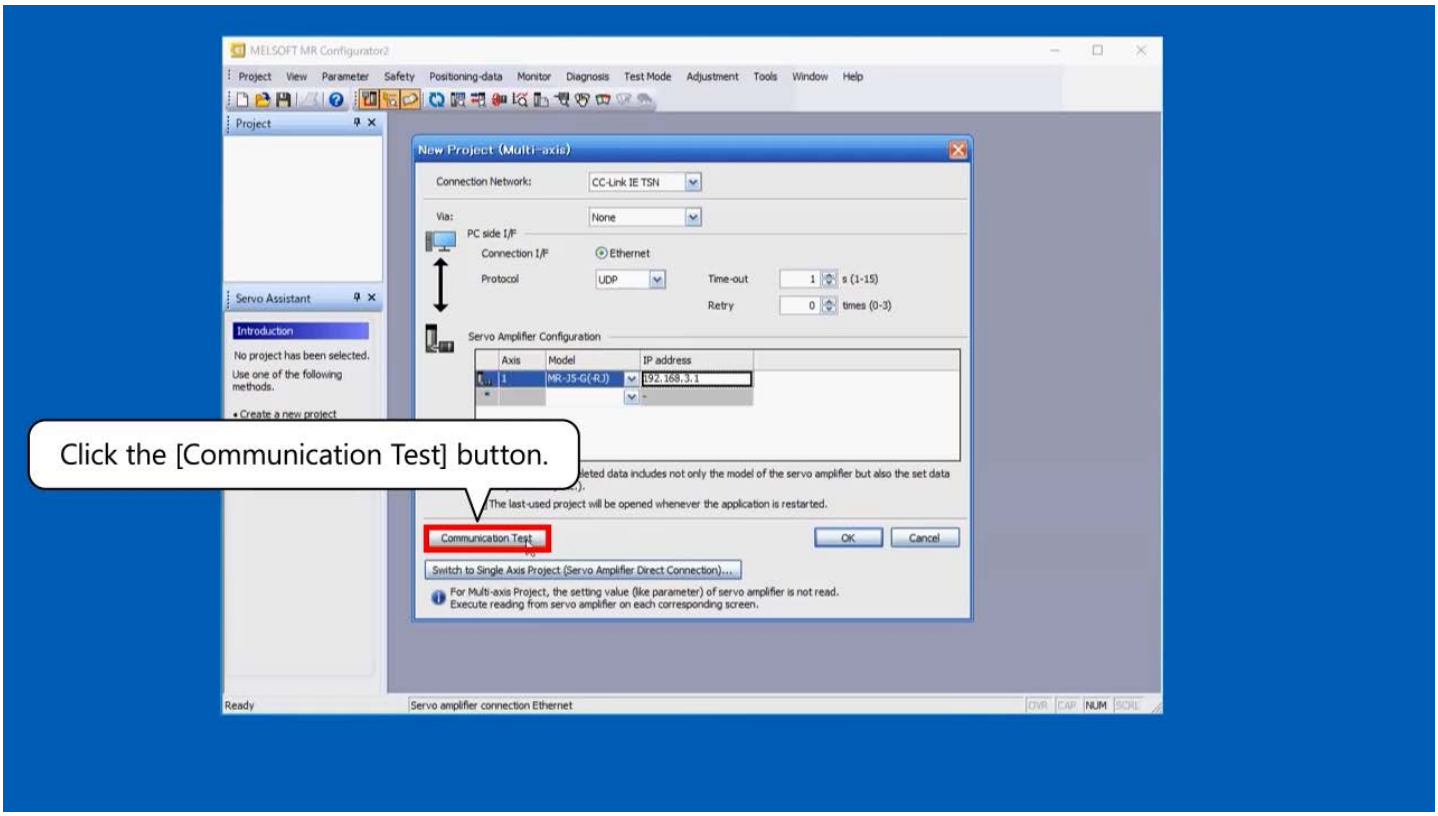
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



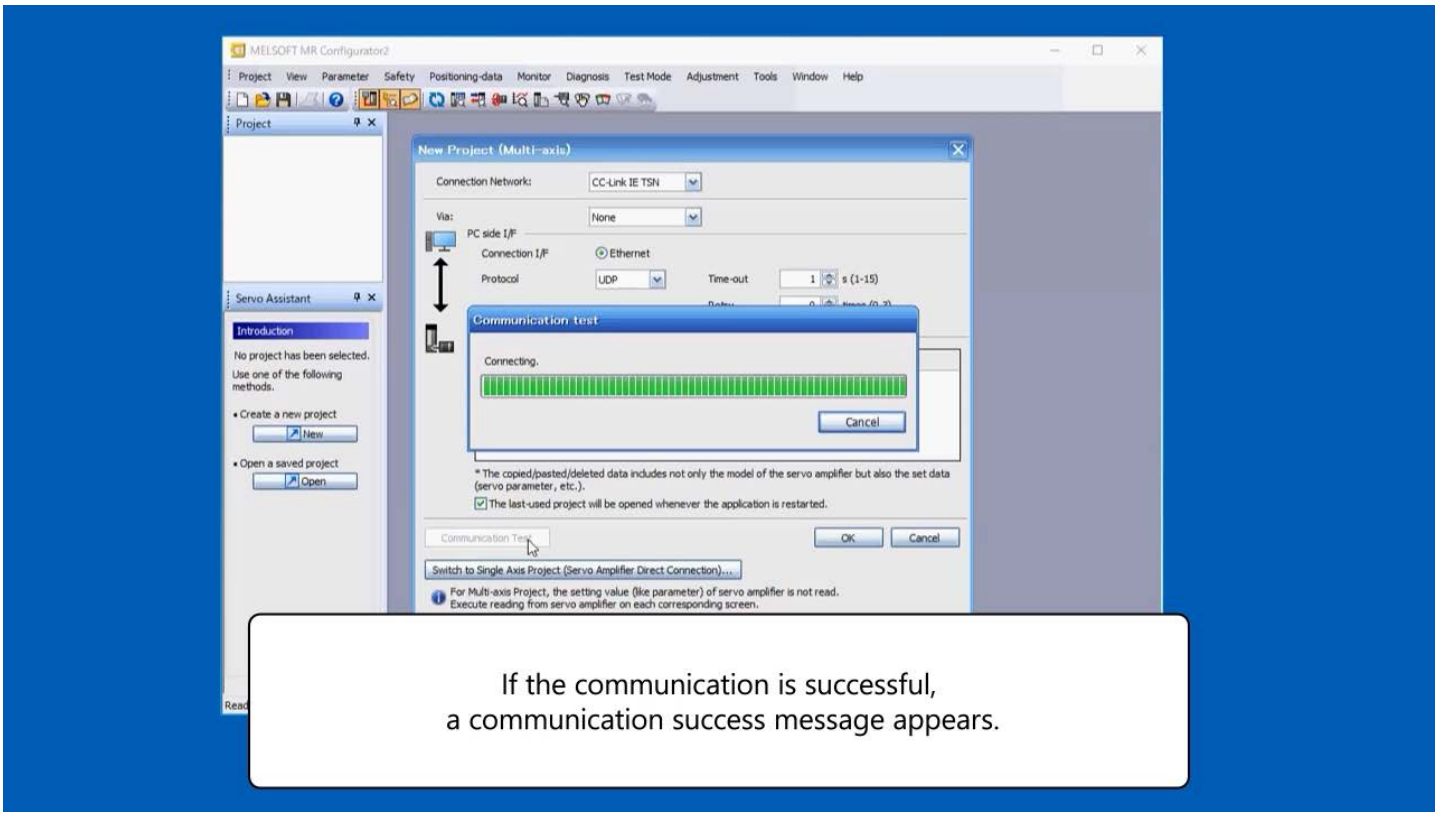
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



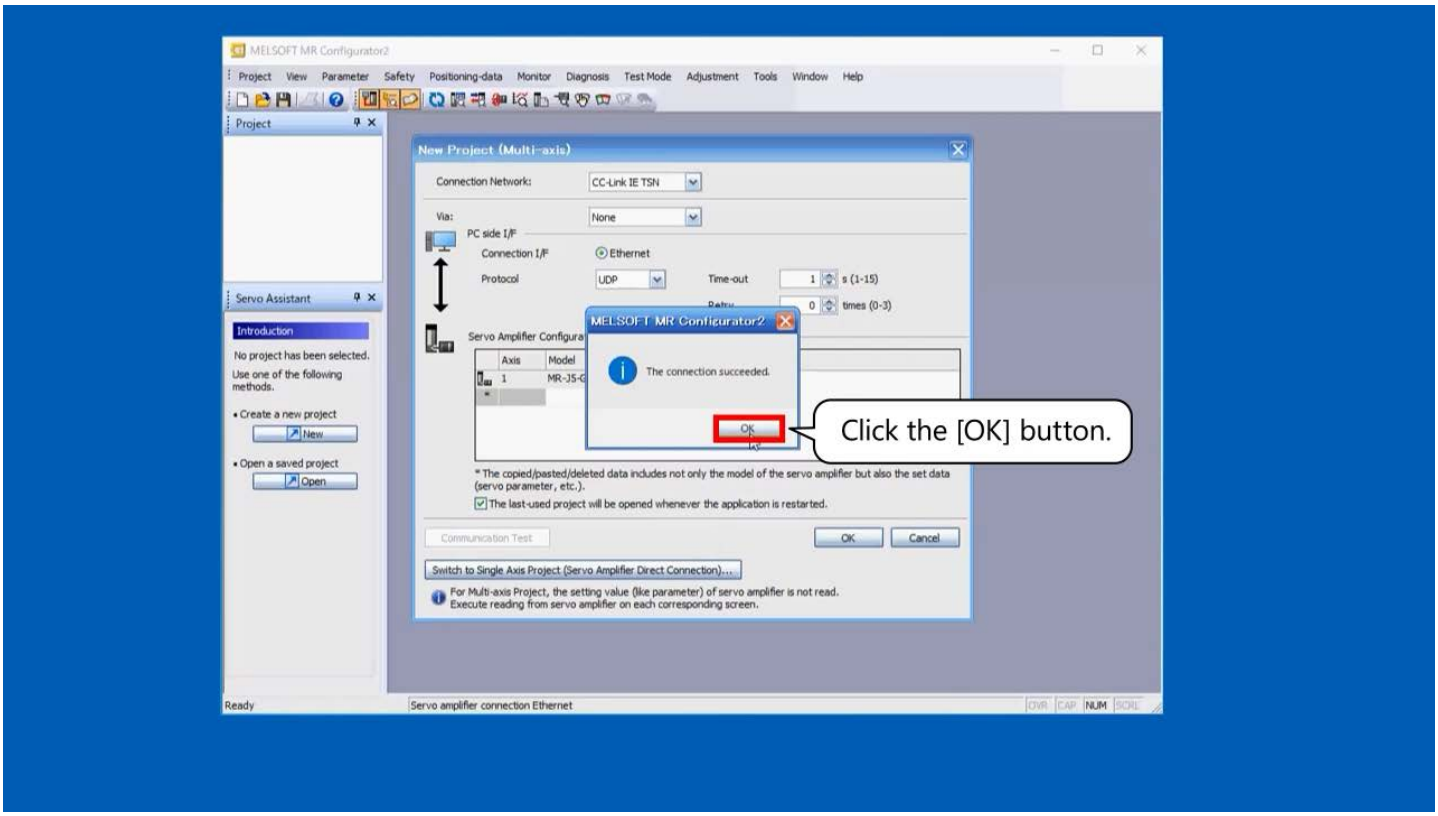
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



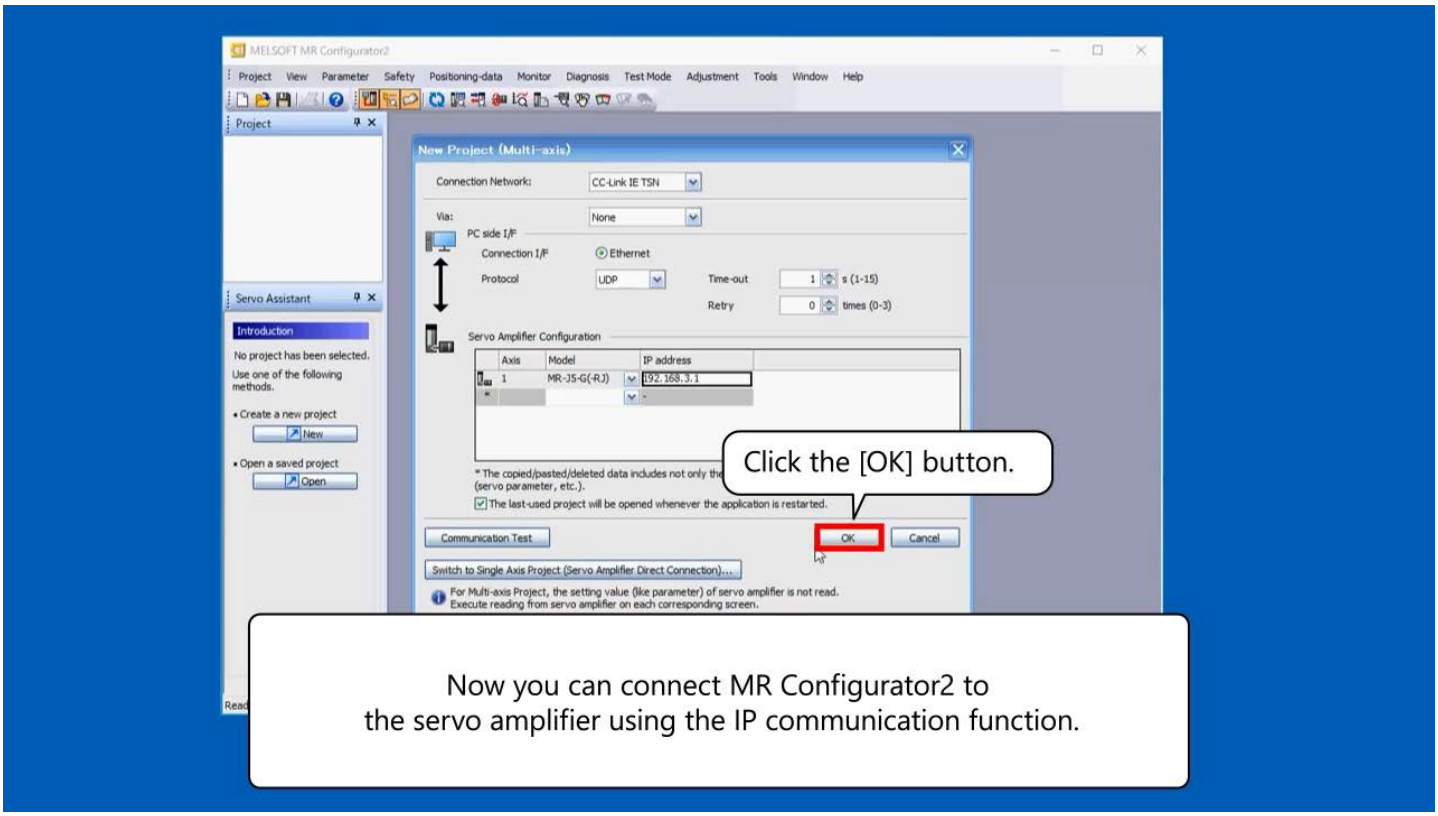
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



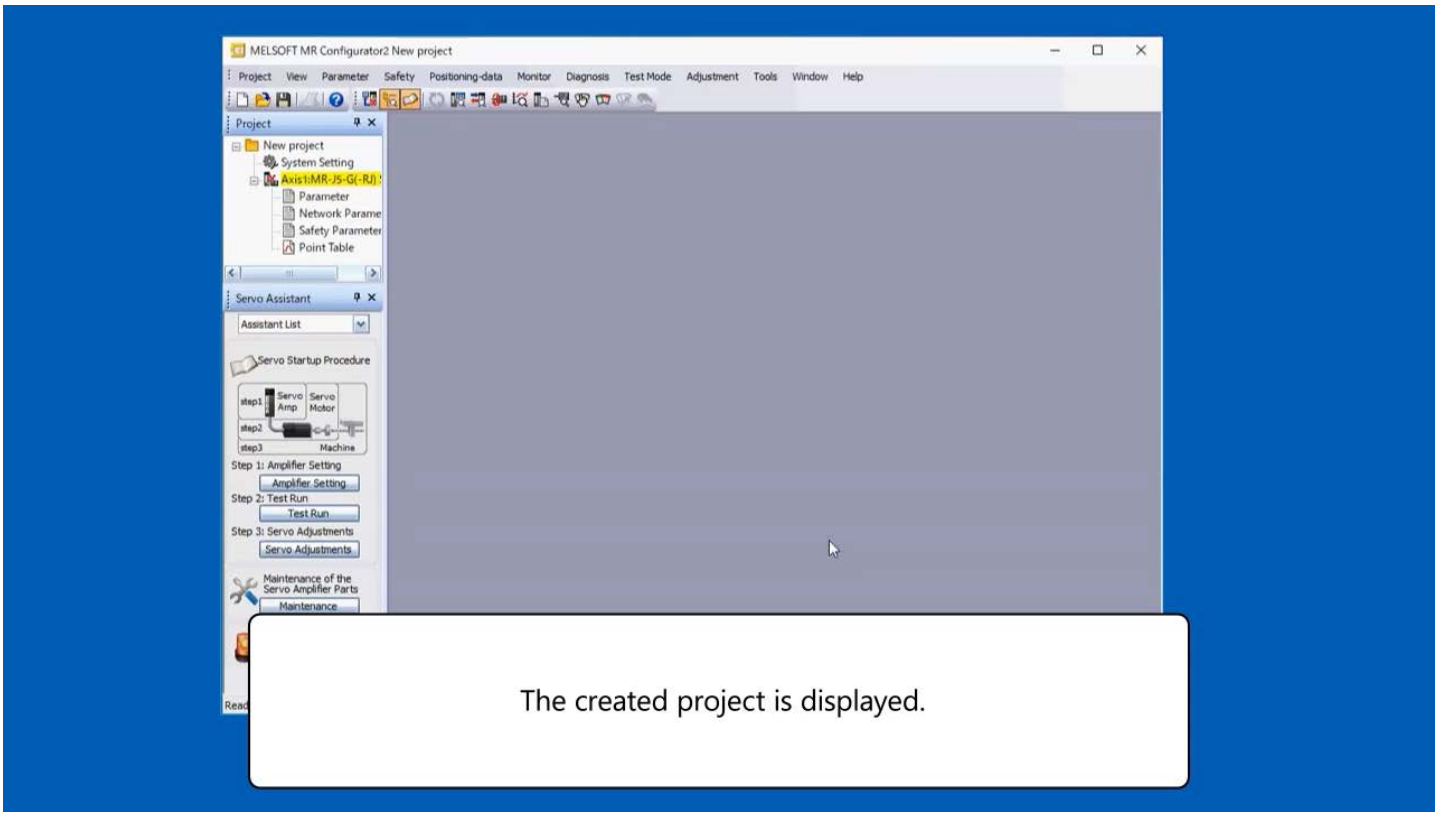
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



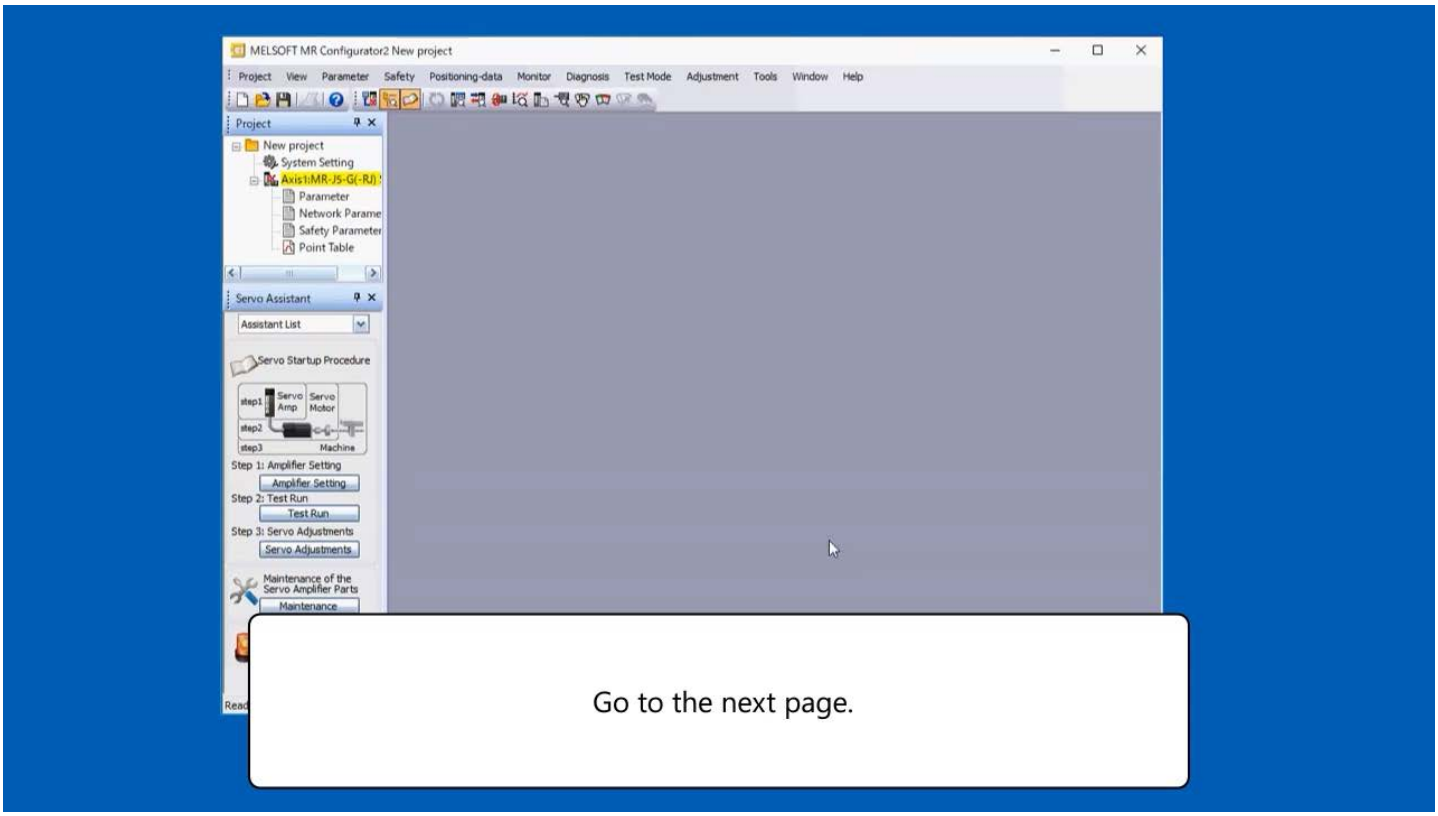
3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



3.2.2 Connection between MR Configurator2 and the servo amplifier

This section describes the procedure for connecting MR Configurator2 to the servo amplifier using the IP communication function.
Start MR Configurator2 by clicking the "MR Configurator2" icon on the Windows desktop.
For the procedure, see the video below.



3.2.3 Parameter setting procedure 1

Next, set the following parameters of the servo amplifier using MR Configurator2.
The setting procedures are described in the following section.

■ Parameter

No.	Name	Setting value
PA04.2	Servo forced stop selection	1: Disabled (The forced stop input EM1 and EM2 are not used)
PD01.2	Input signal automatic ON selection	■Forward rotation stroke end (LSP) 1: Automatic on ■Reverse rotation stroke end (LSN) 1: Automatic on
PT01.1	Speed/acceleration/deceleration unit selection	1 (Speed: Command unit/s, Acceleration/deceleration: Command unit/s2)*

* The command unit is fixed to pulse. Therefore, the speed unit is not "r/min" but "pulse/s".

<Precautions>

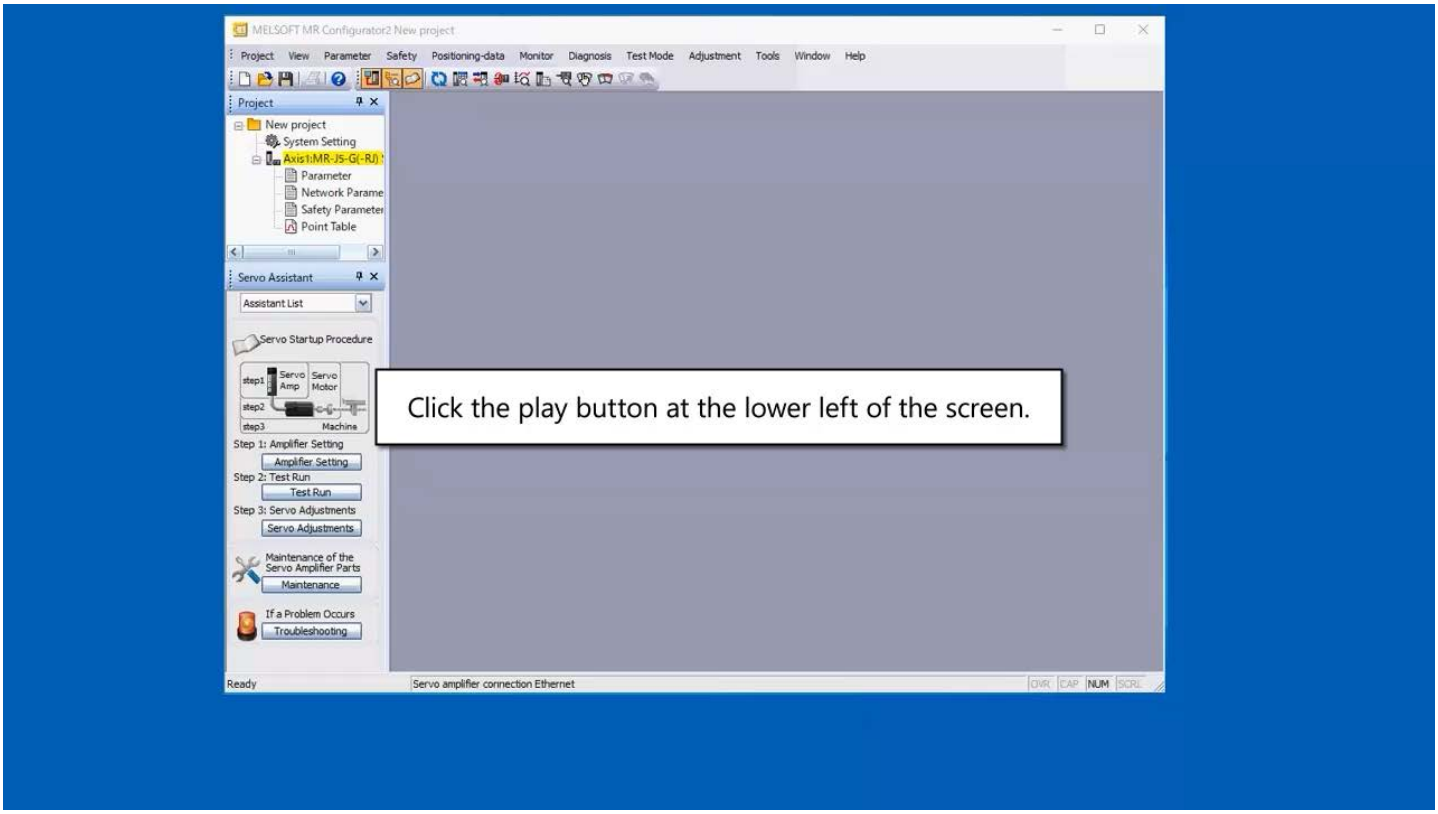
- In the parameter change example, the input signal of the servo amplifier is not used.
  Configure the settings according to the safety measures required for the customer's intended use.
- The parameters of the servo amplifier are not managed in SWM-G.
- When the servo parameter [PT01.1 (Speed/acceleration/deceleration unit selection)] is set to "1: (Speed: Command unit/s, acceleration/deceleration: command unit/s2)", the digits may overflow since the command unit is 32-bit. In that case, adjust it using the gear on the servo amplifier side.

[Point]

- MR Configurator2 is software for servo parameter setting, graph measurement/display, test operation, and others.
- Configure the parameter setting for all the connected axes.

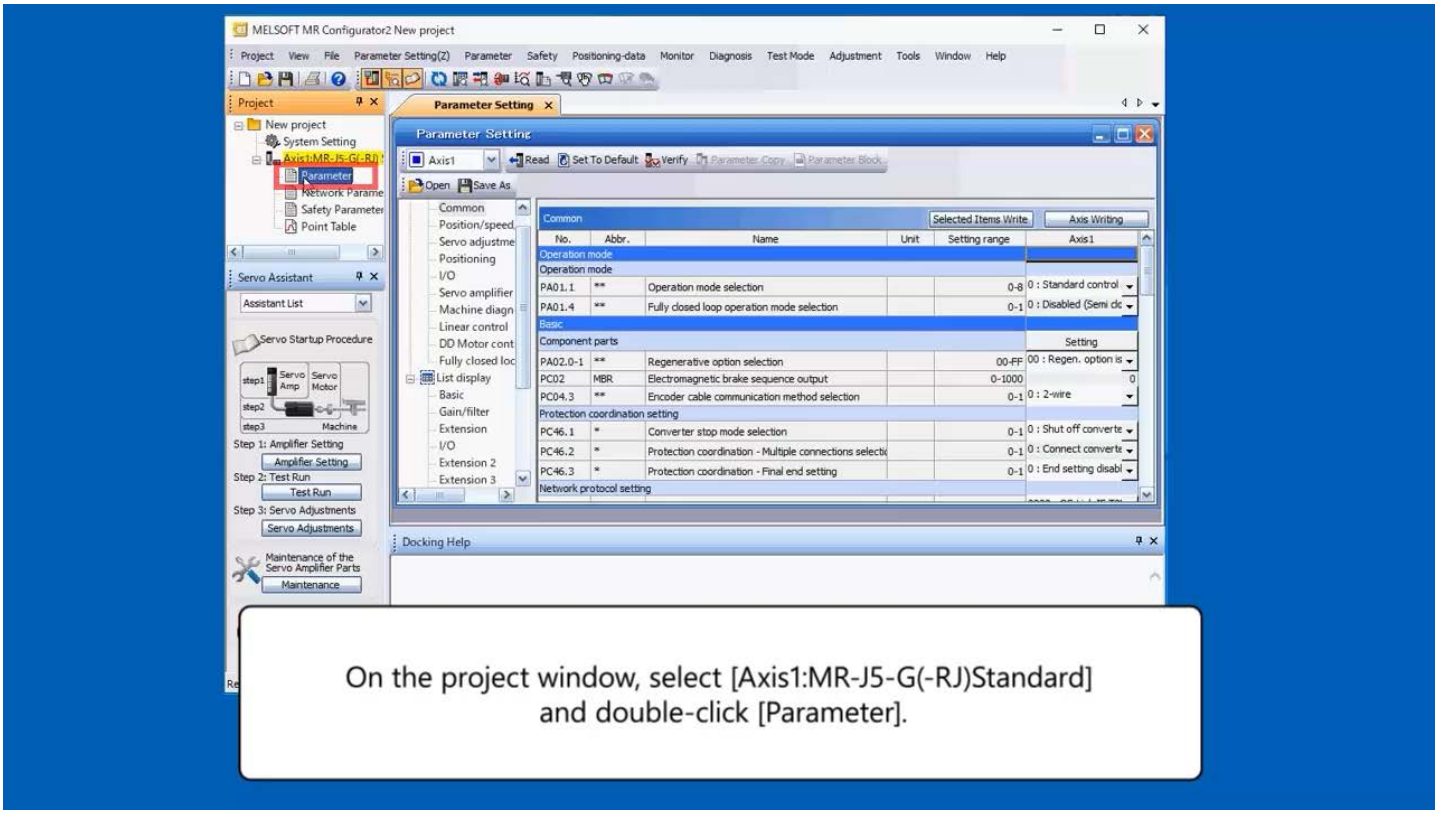
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



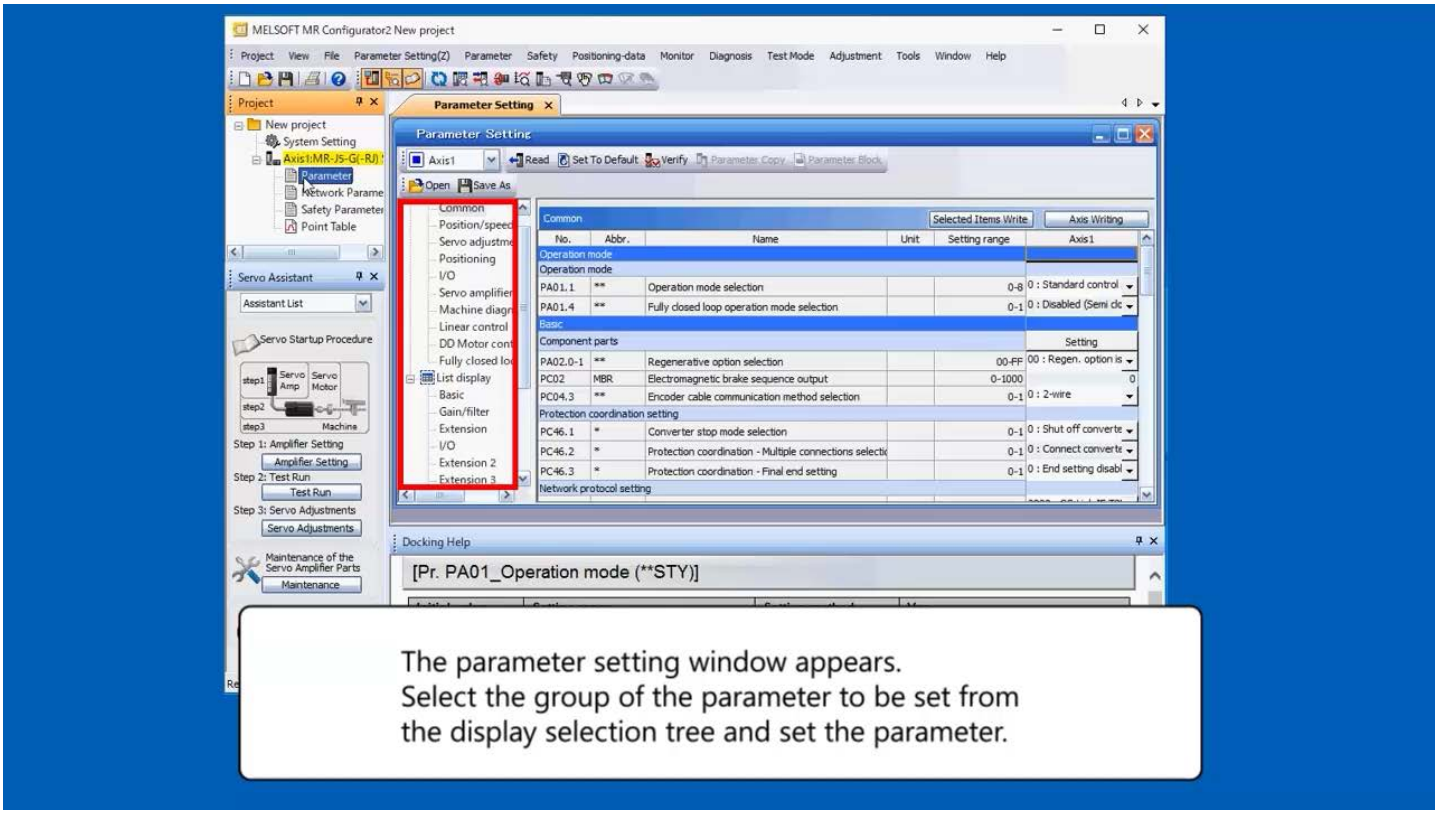
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



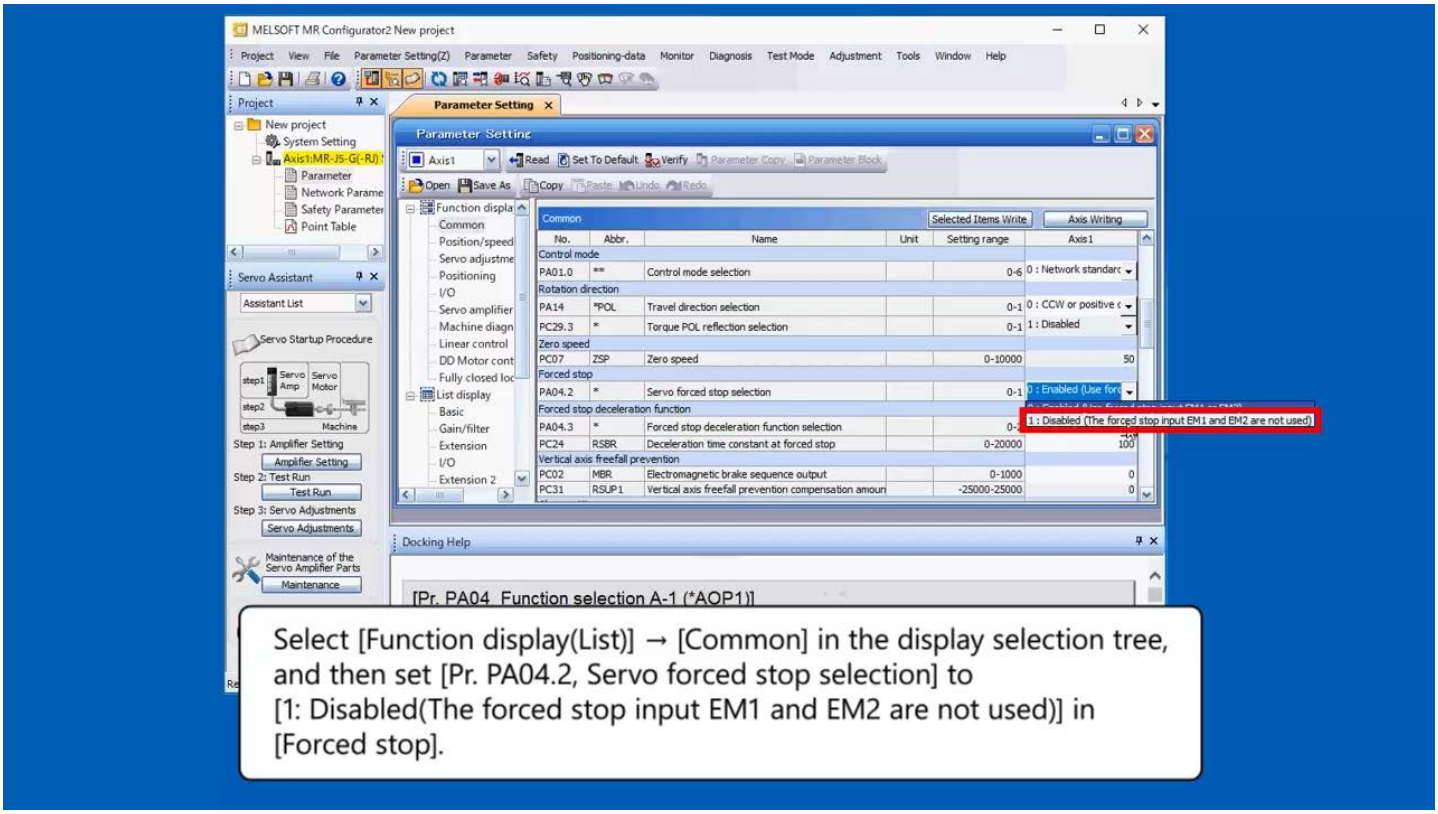
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



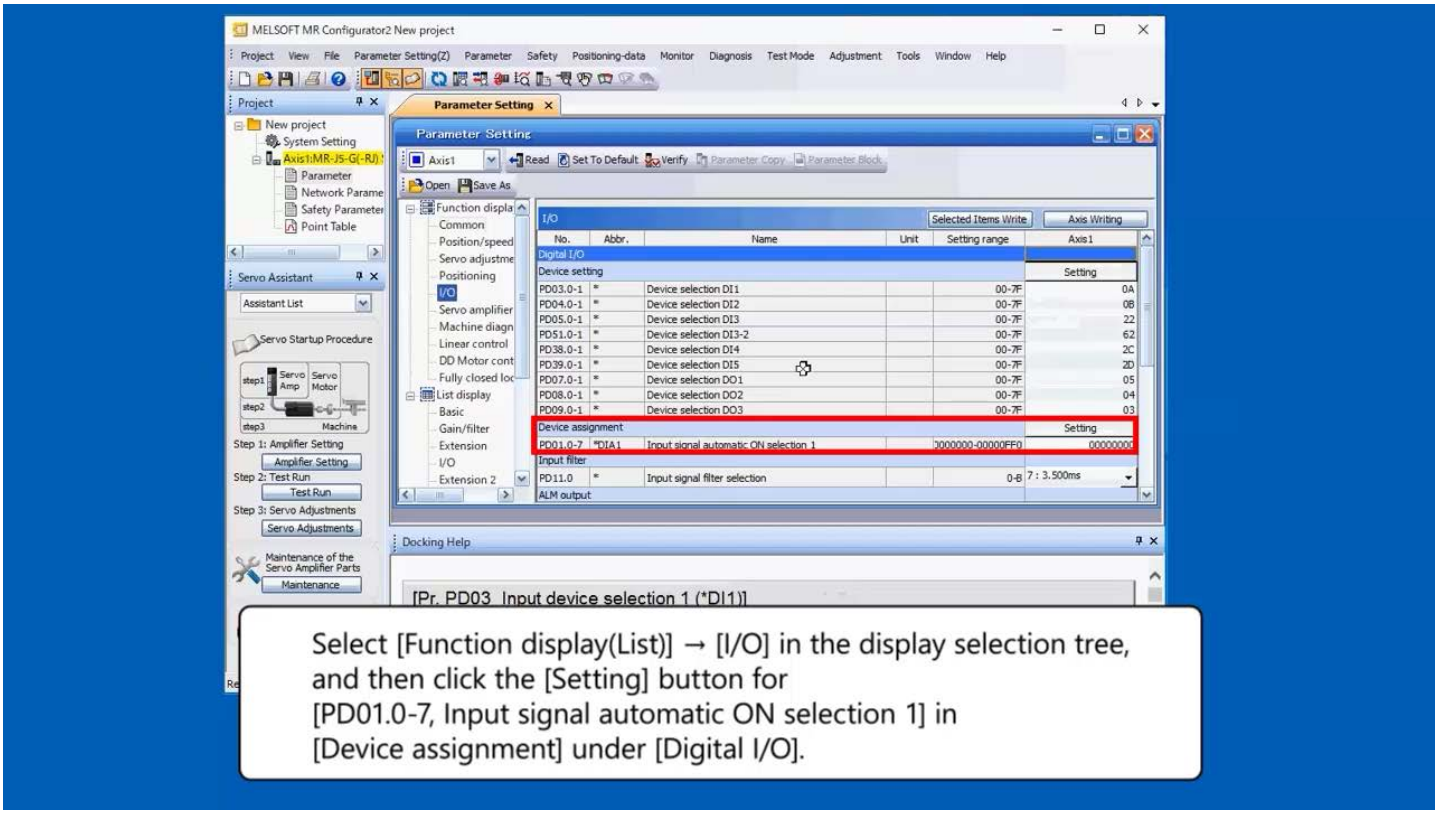
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



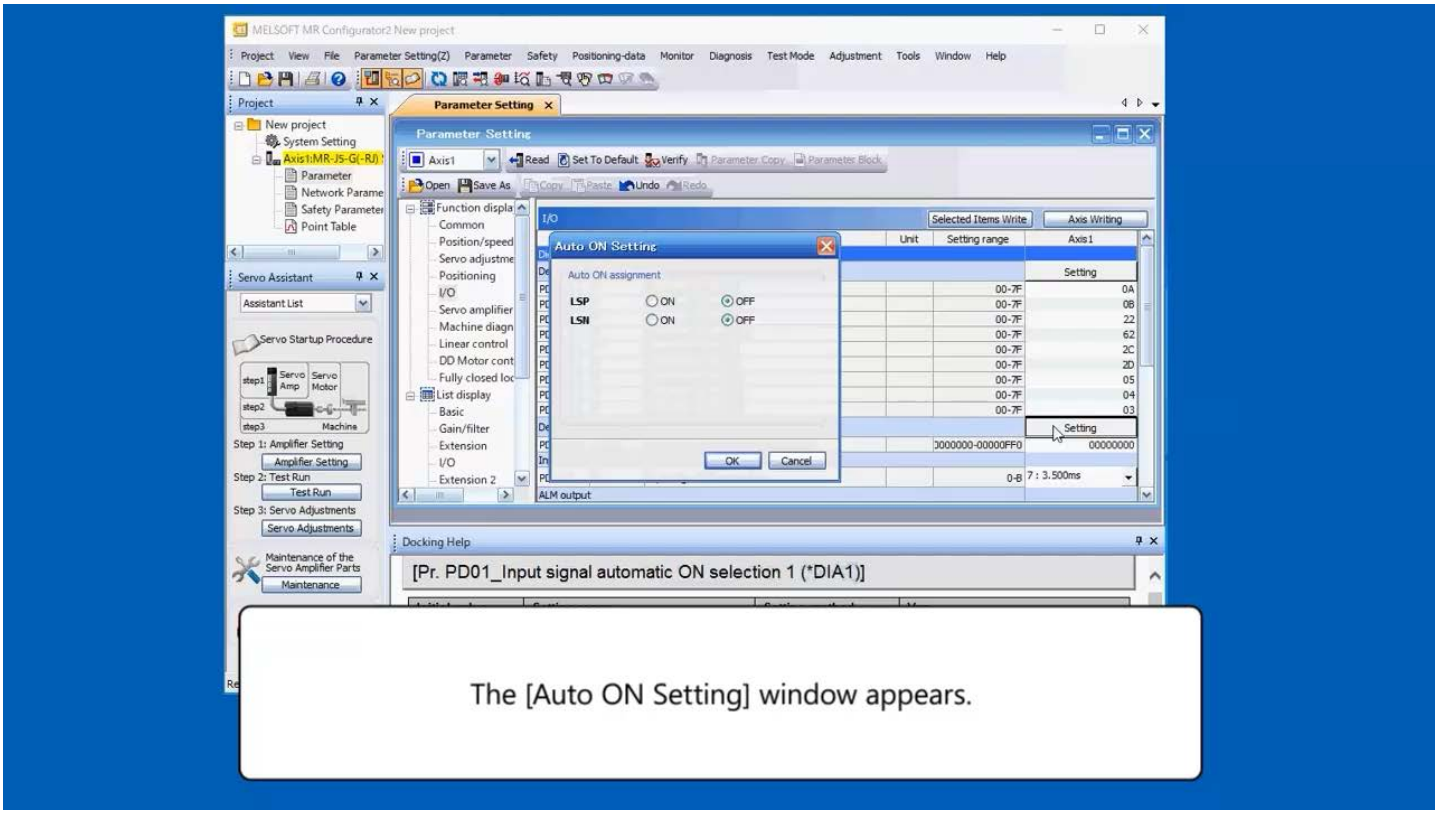
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



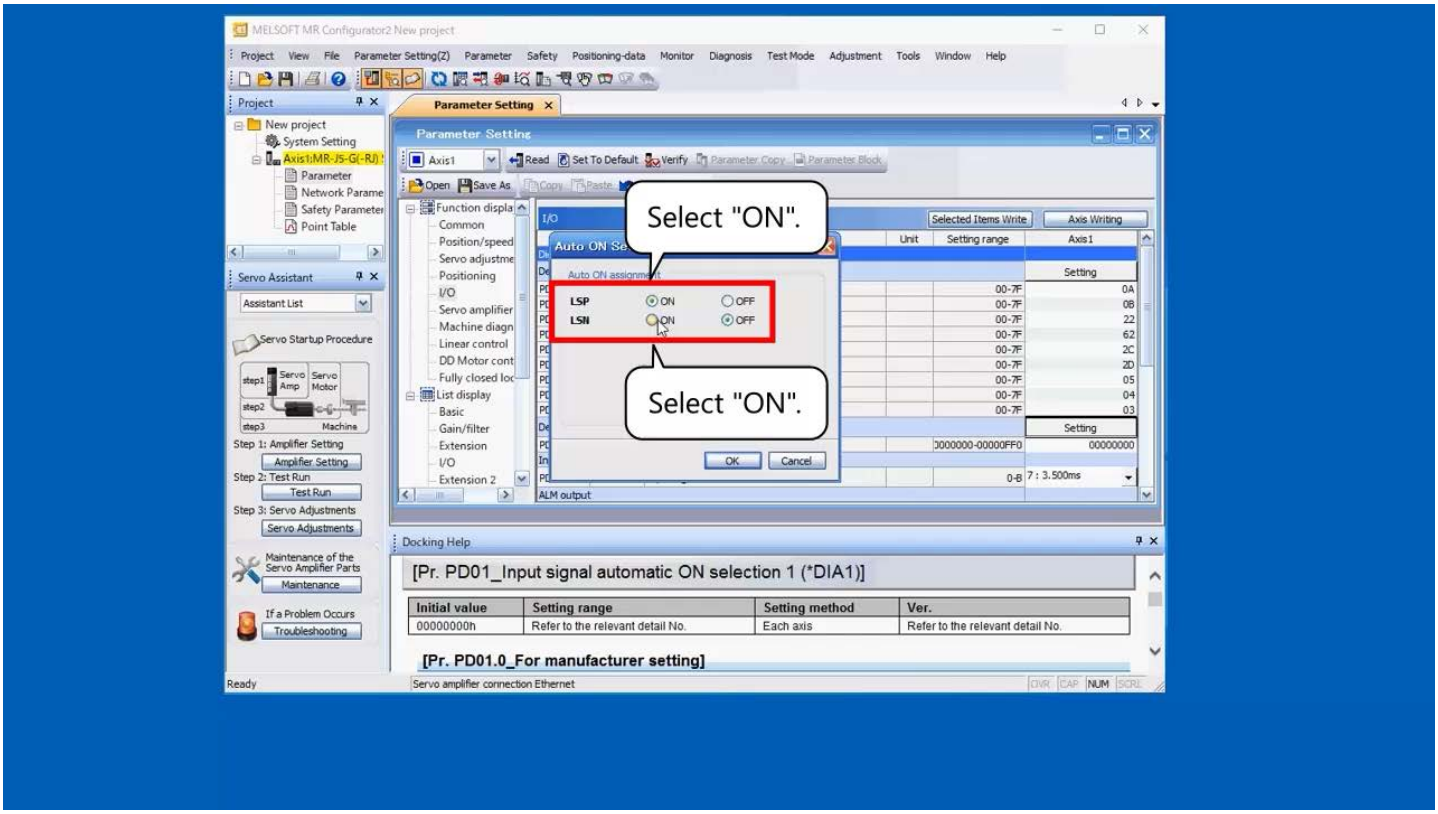
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



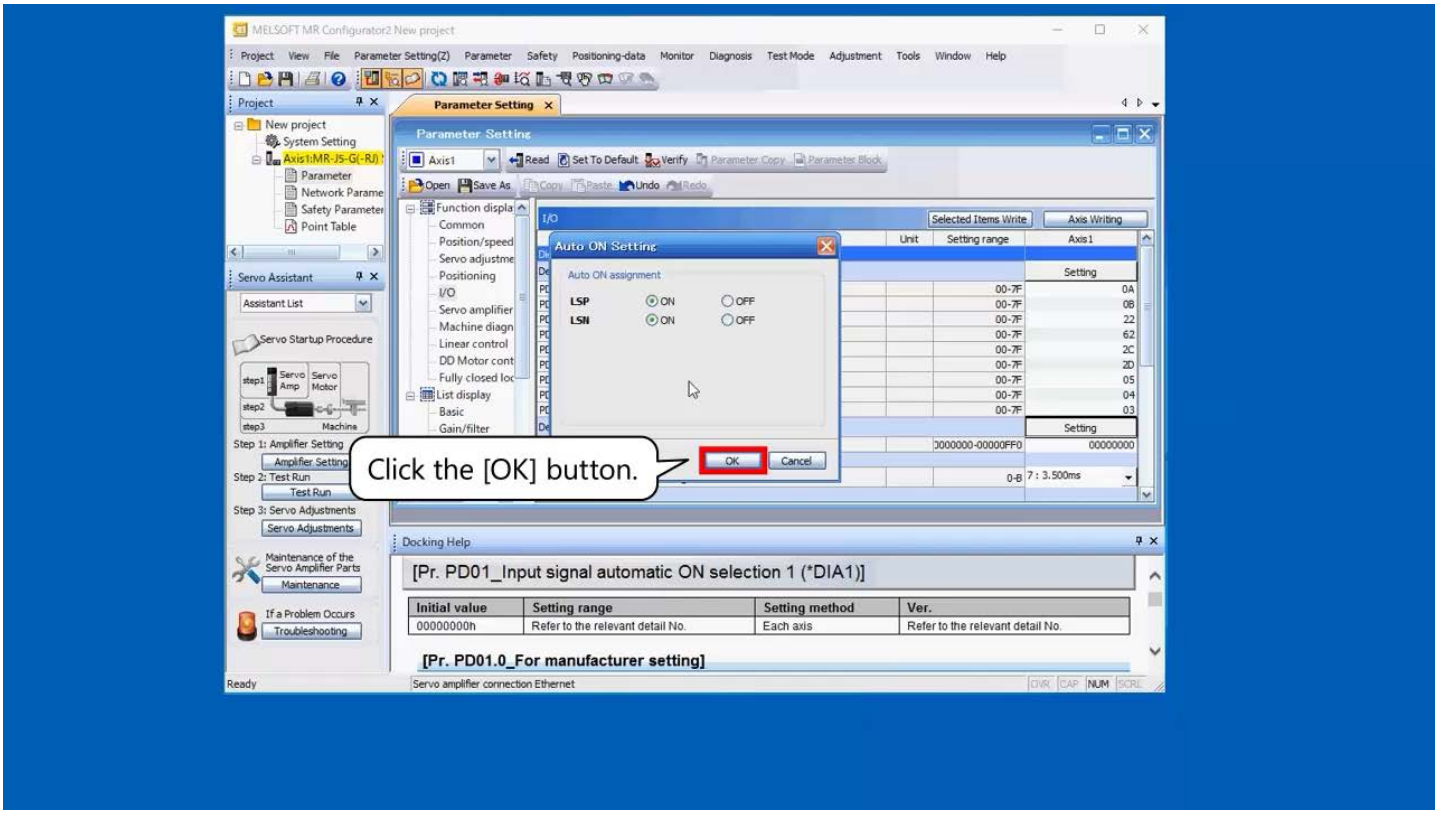
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



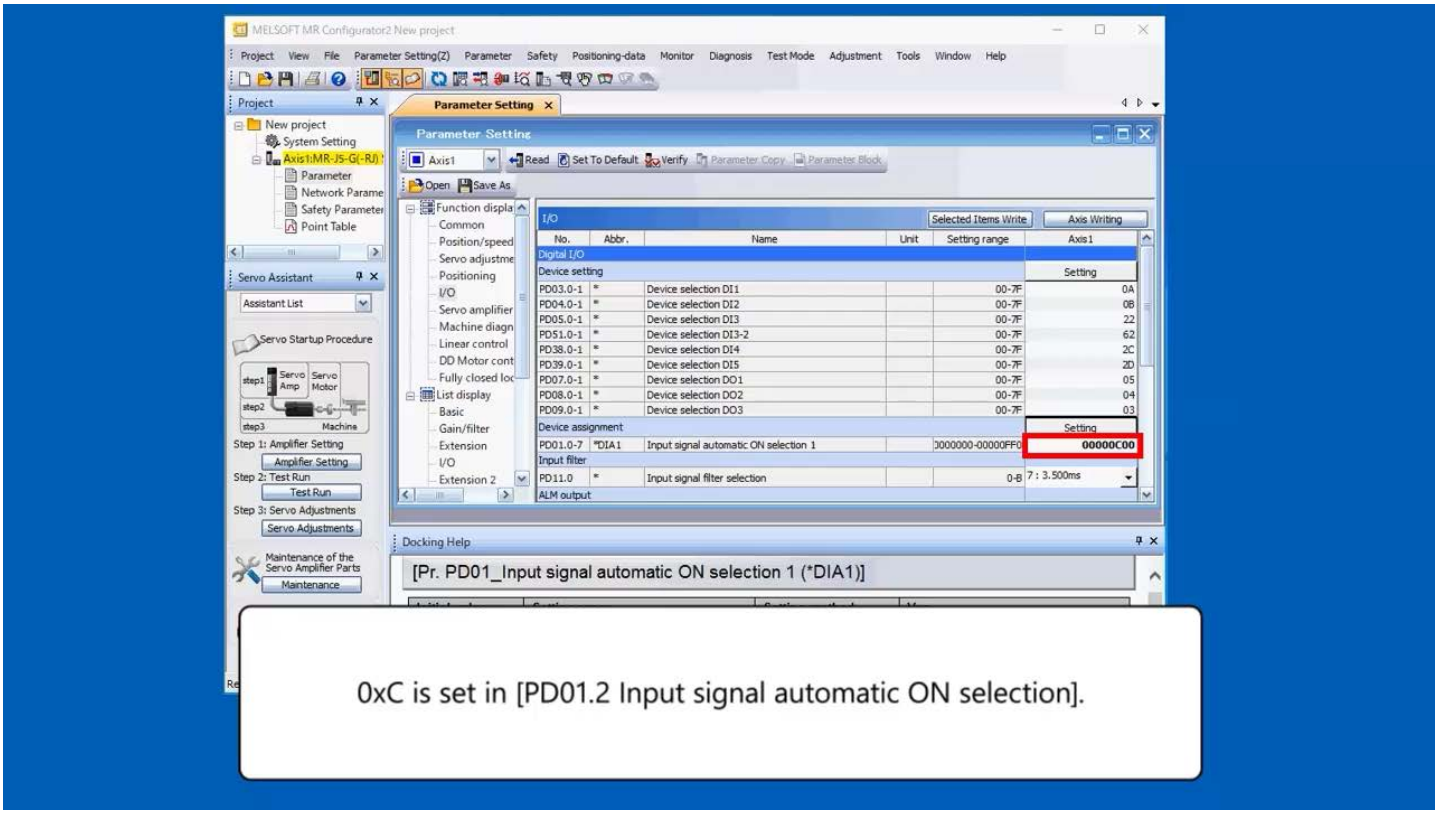
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



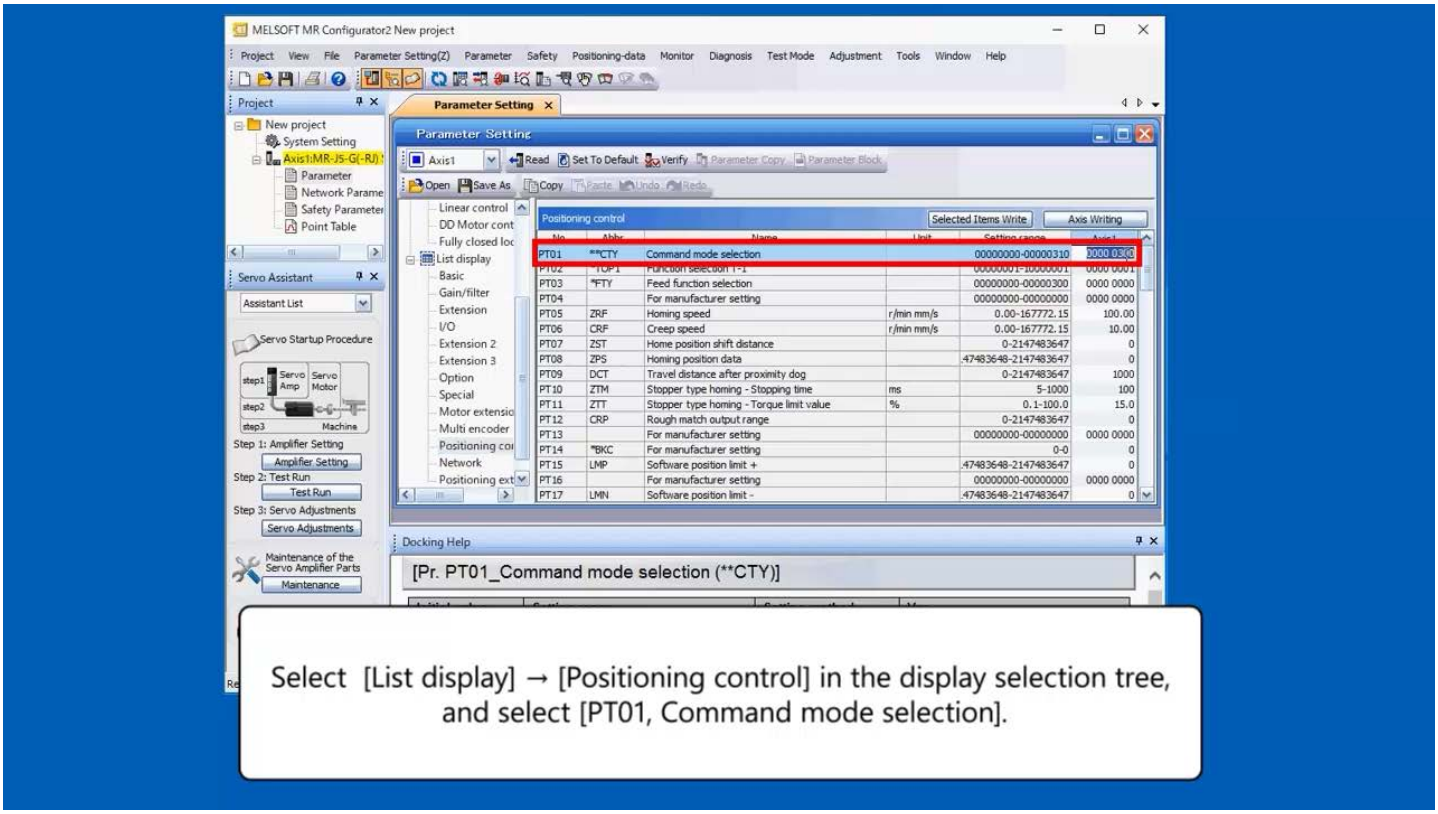
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



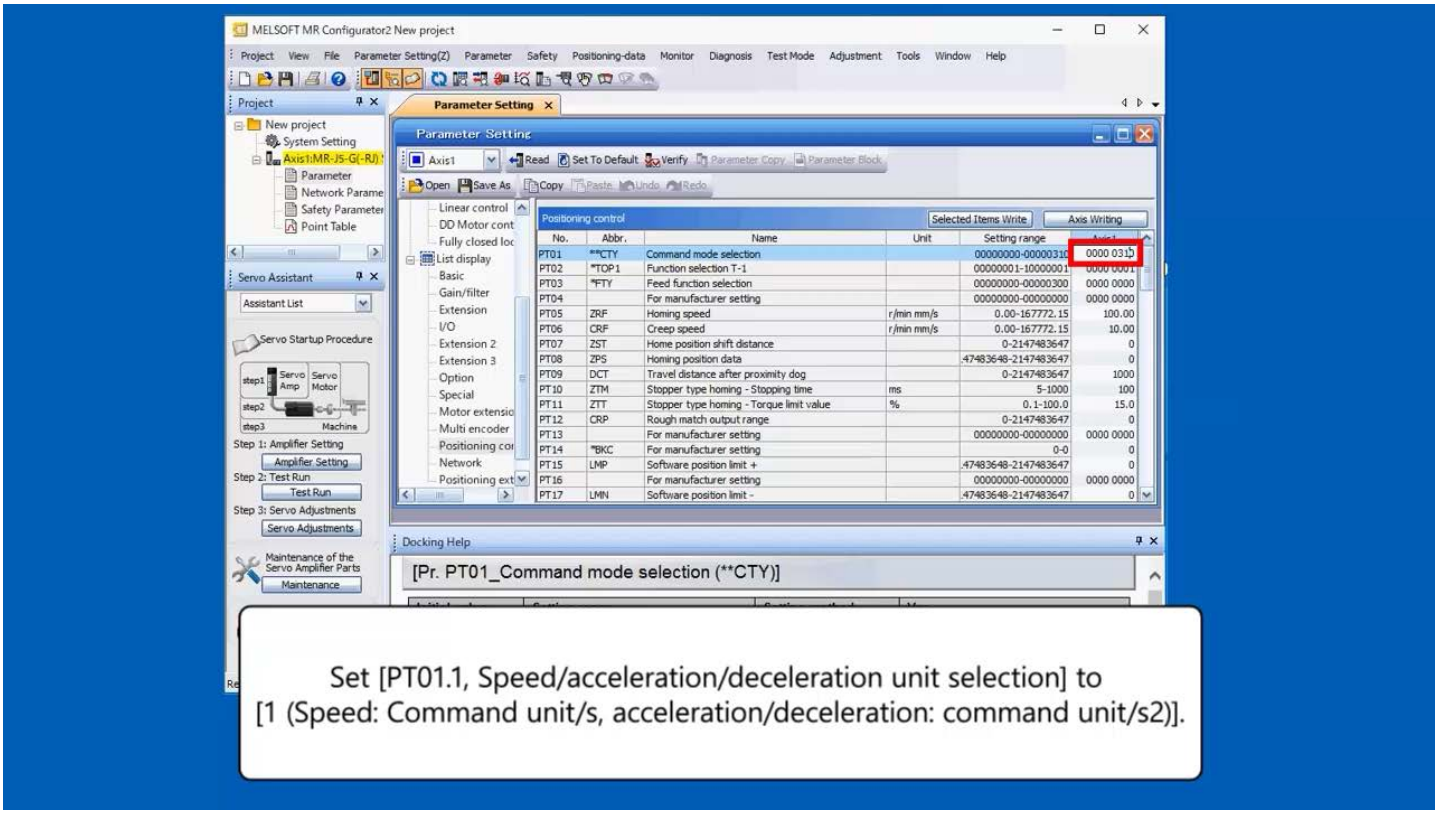
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



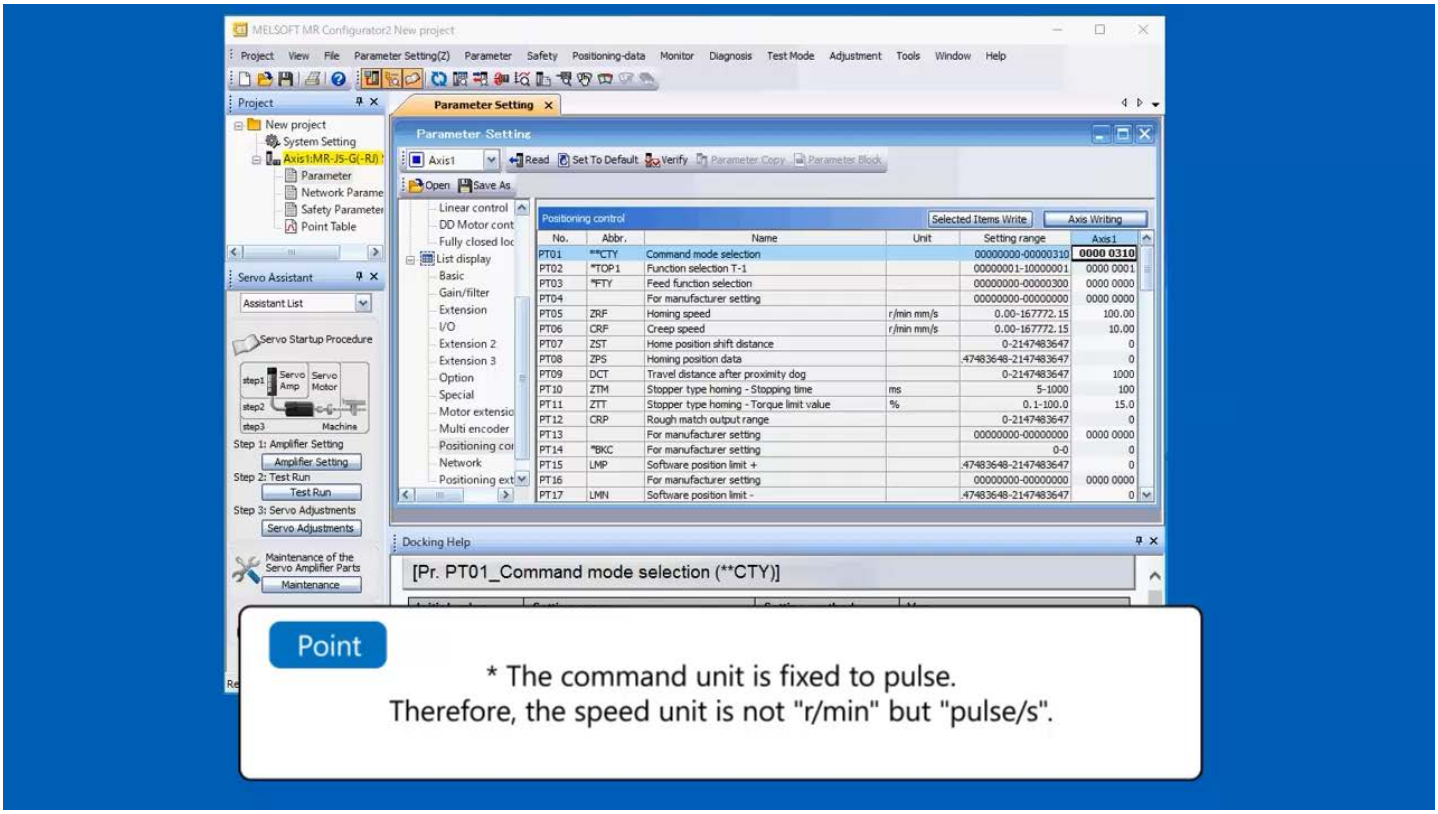
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



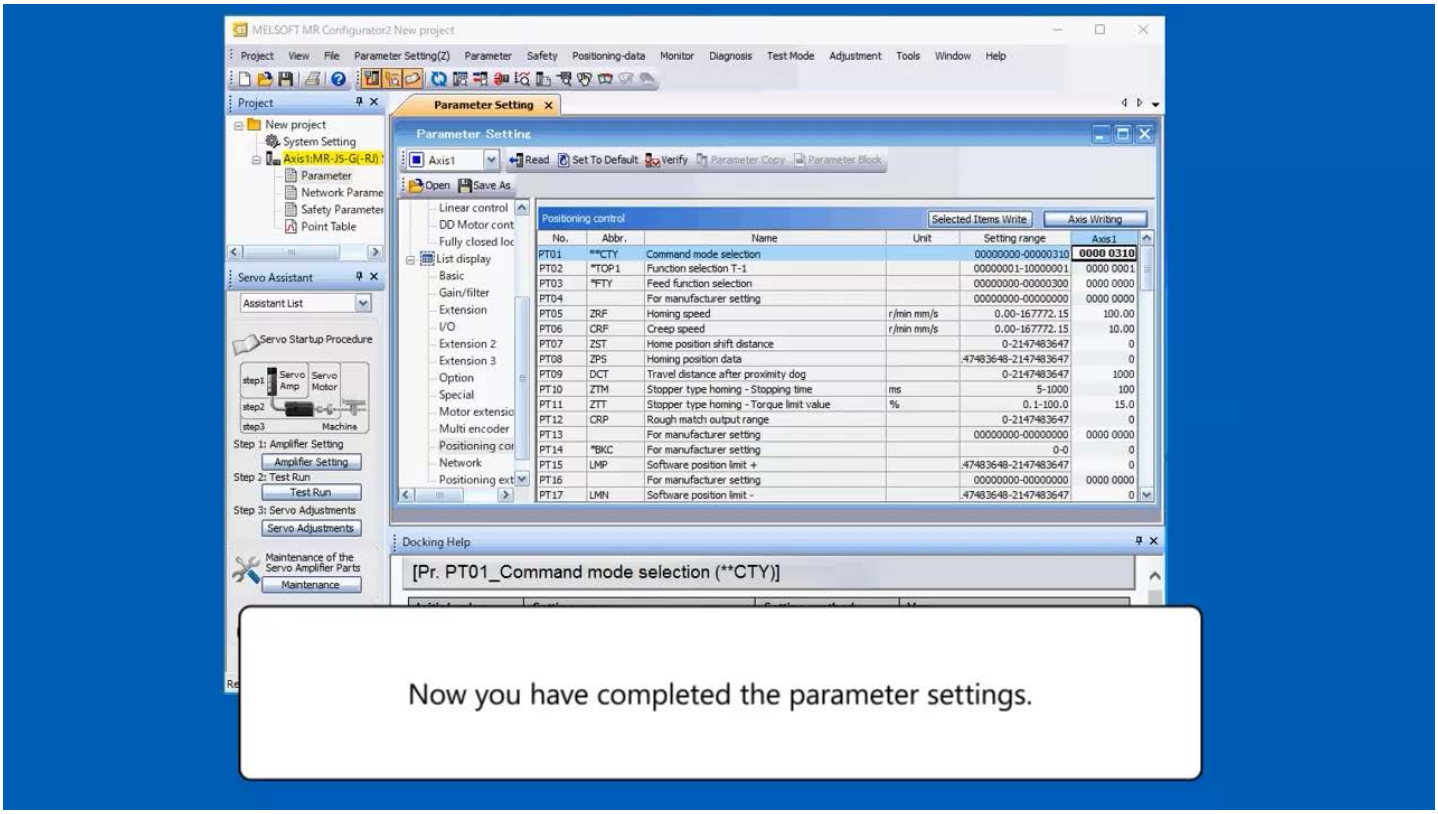
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



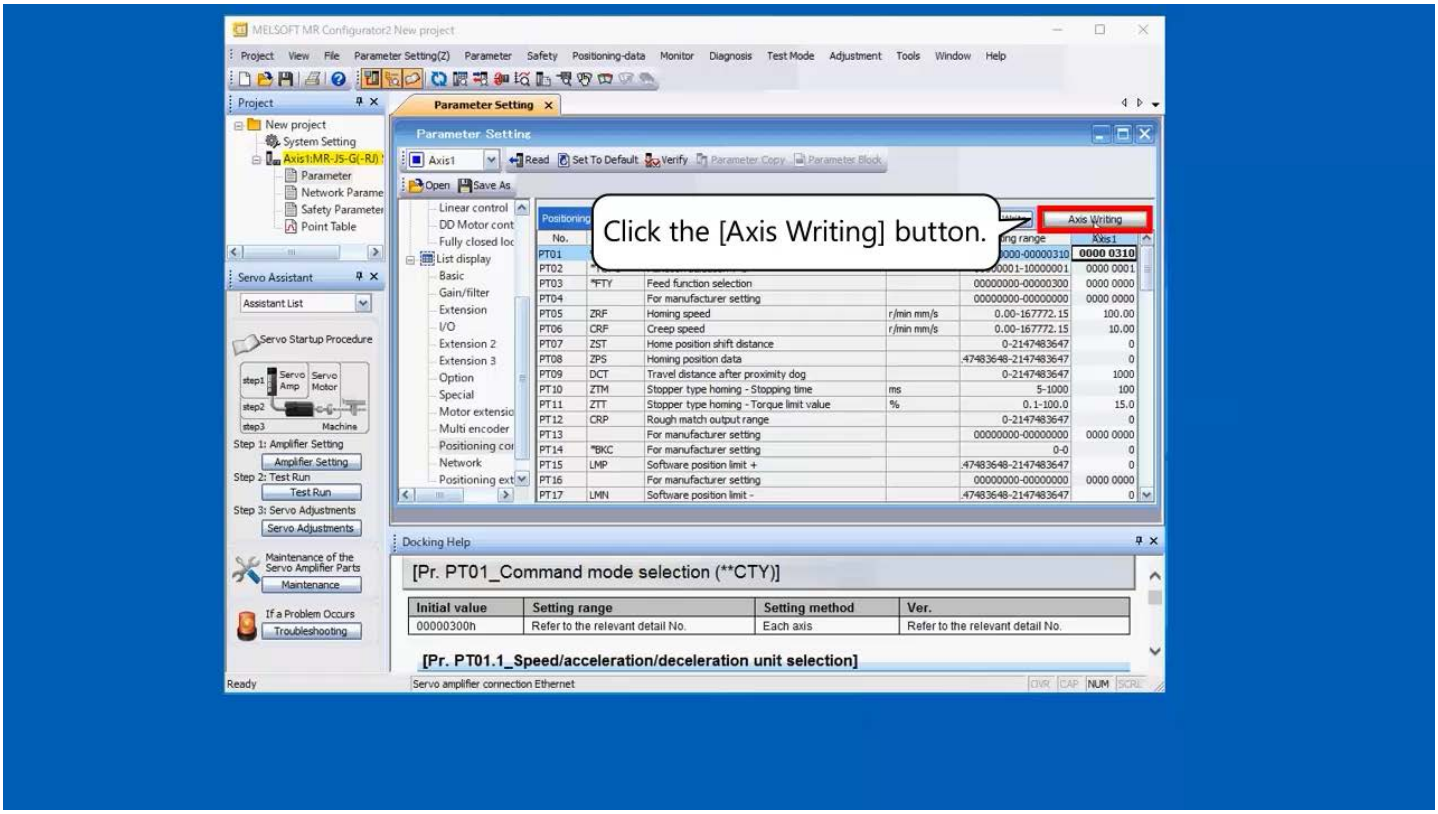
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



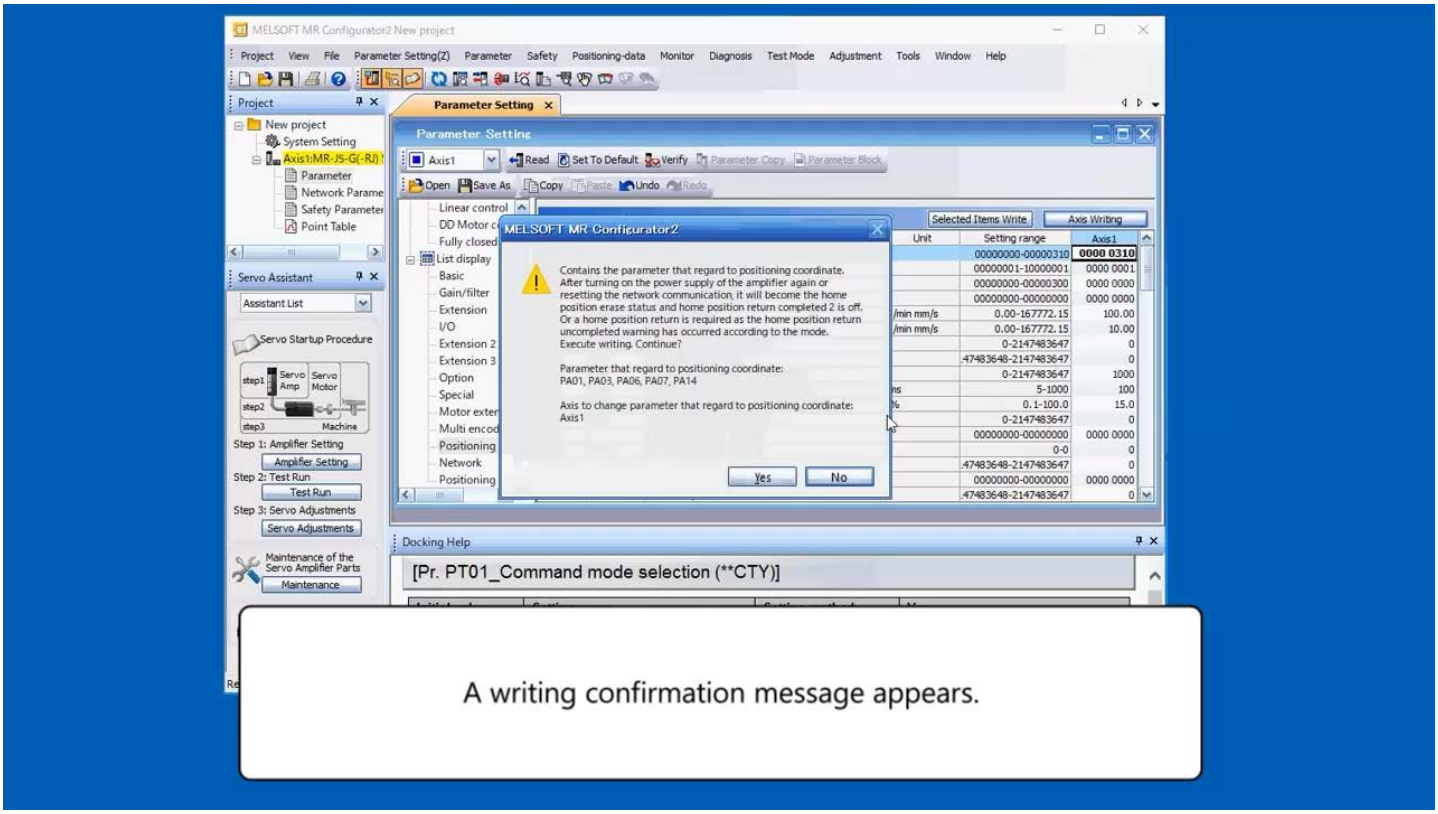
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



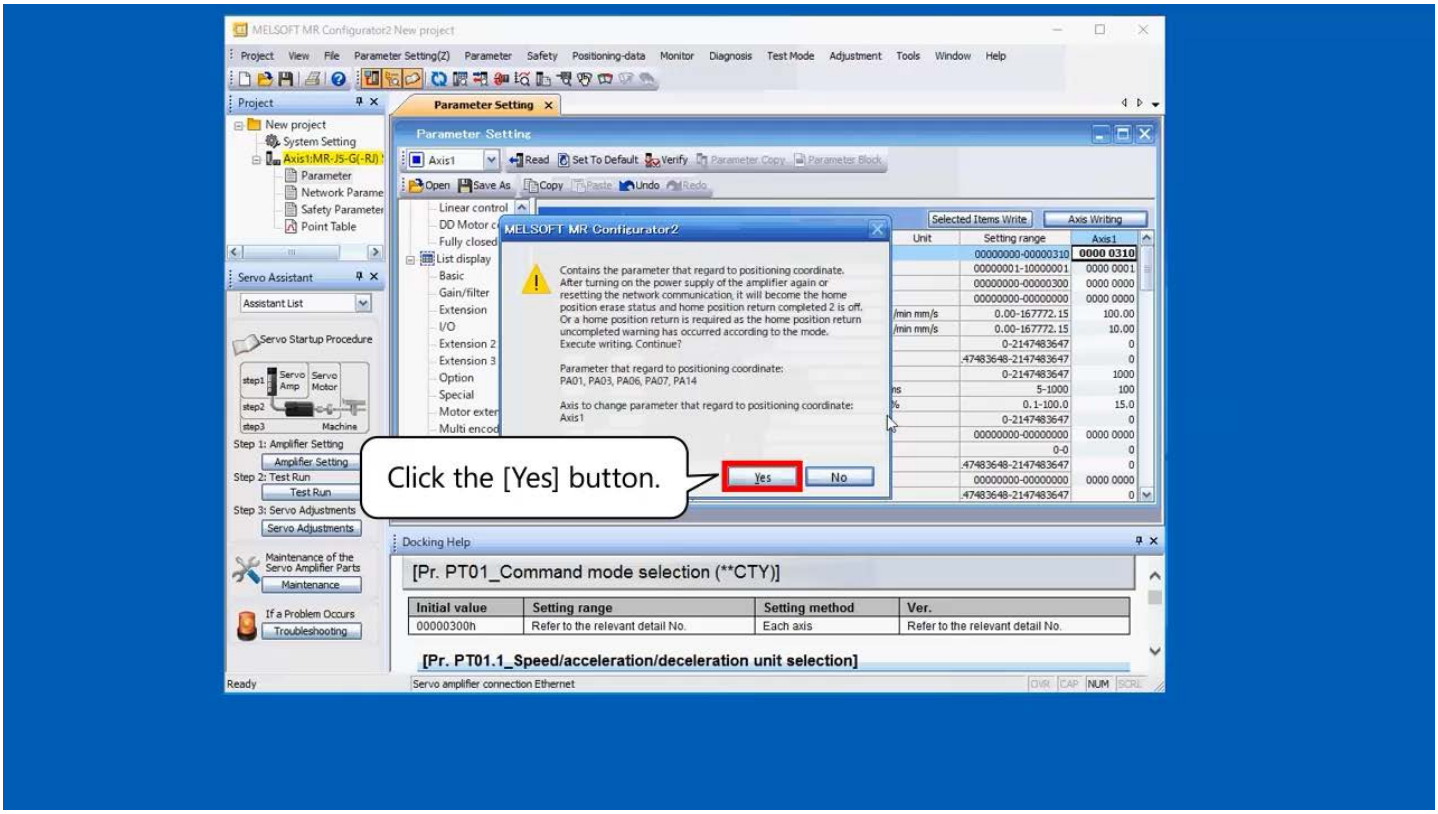
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



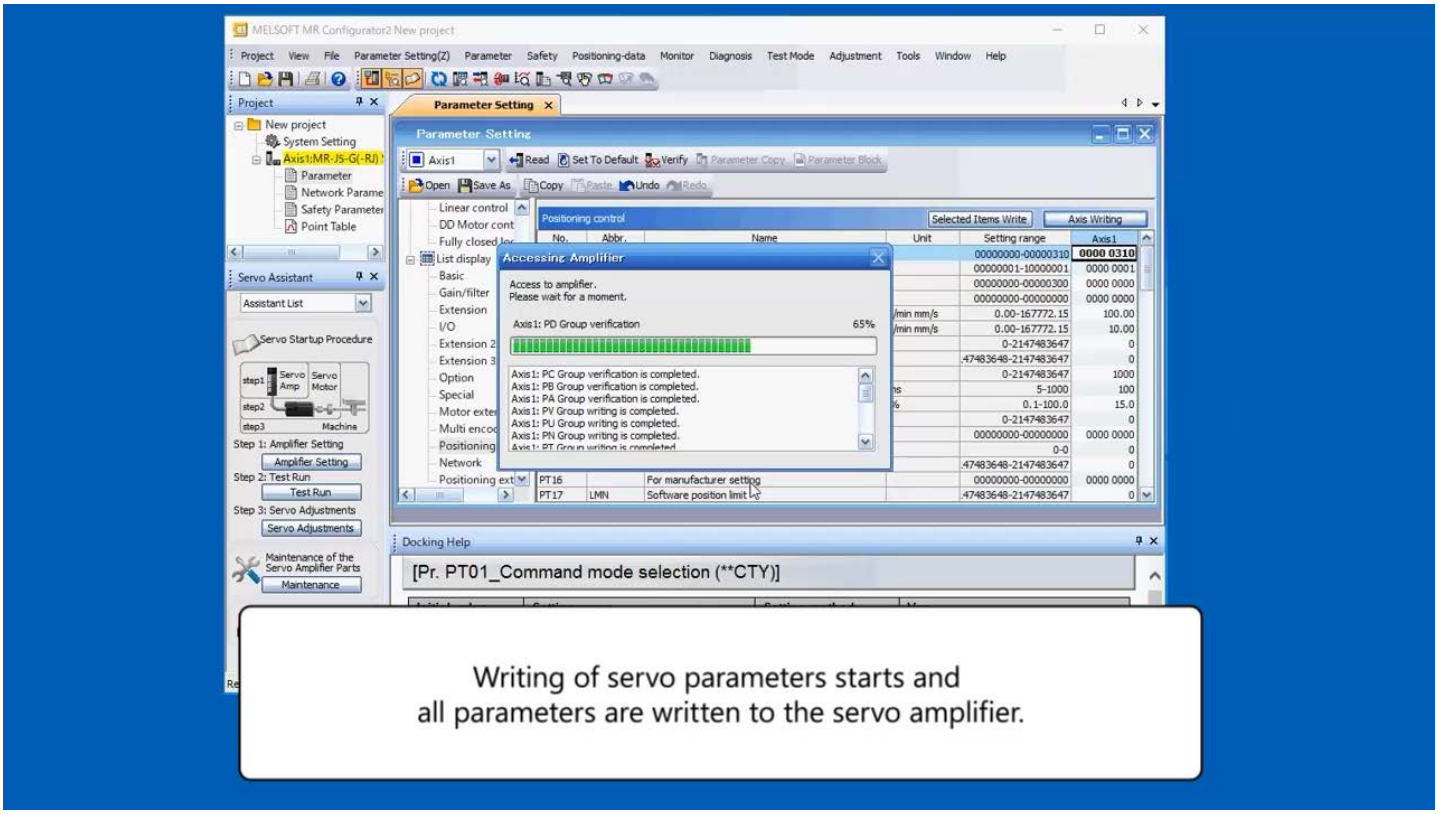
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



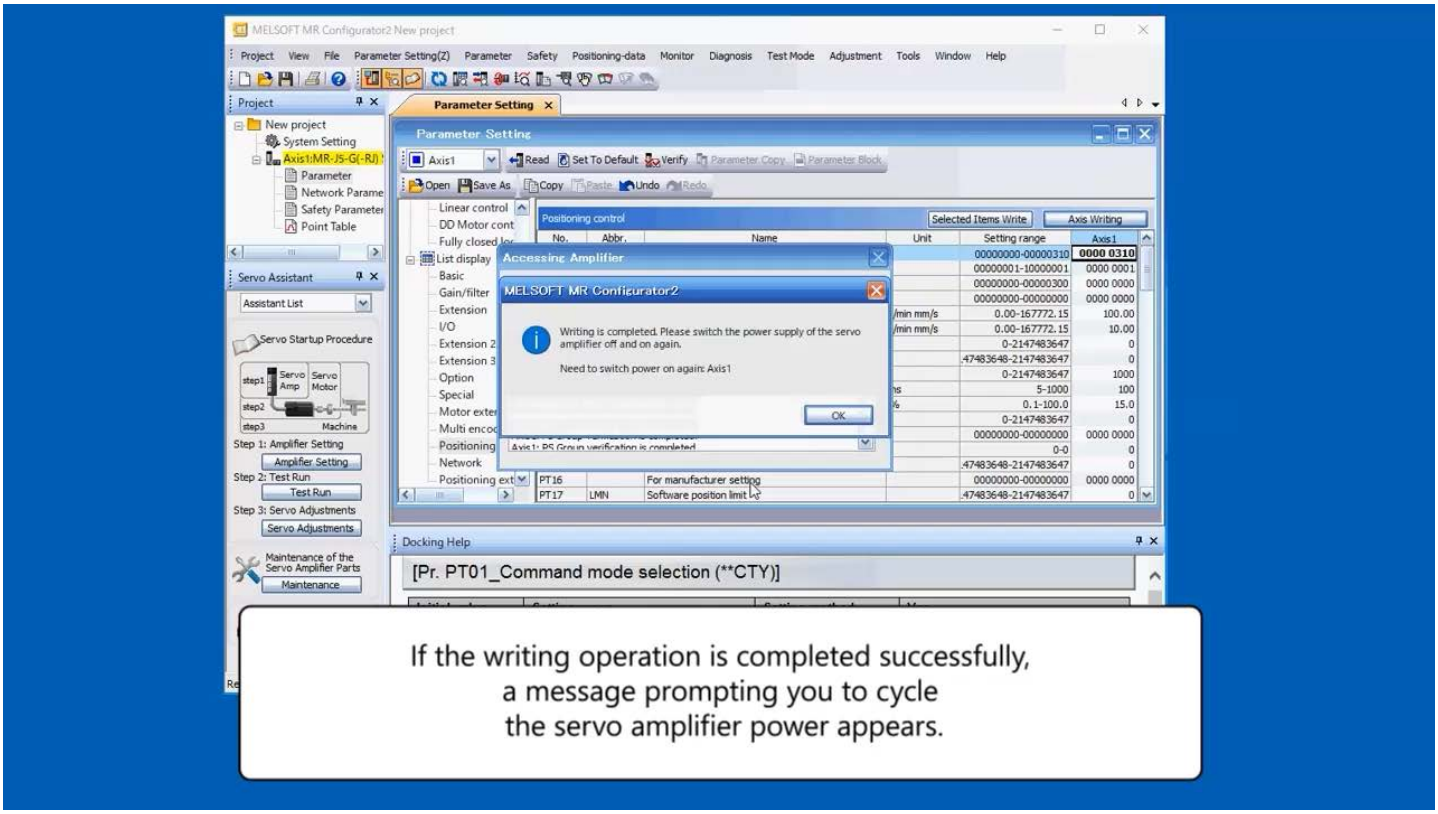
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



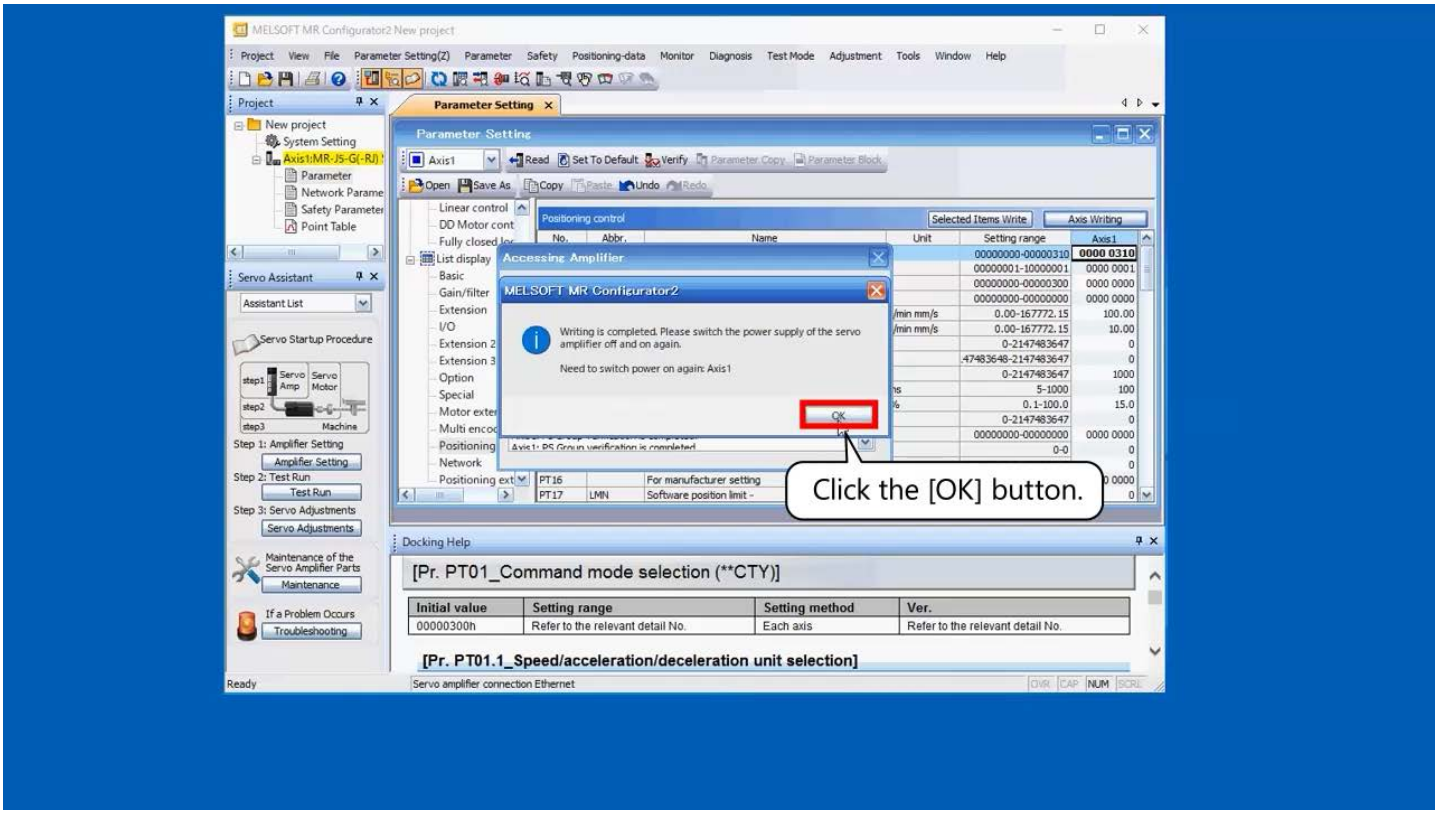
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



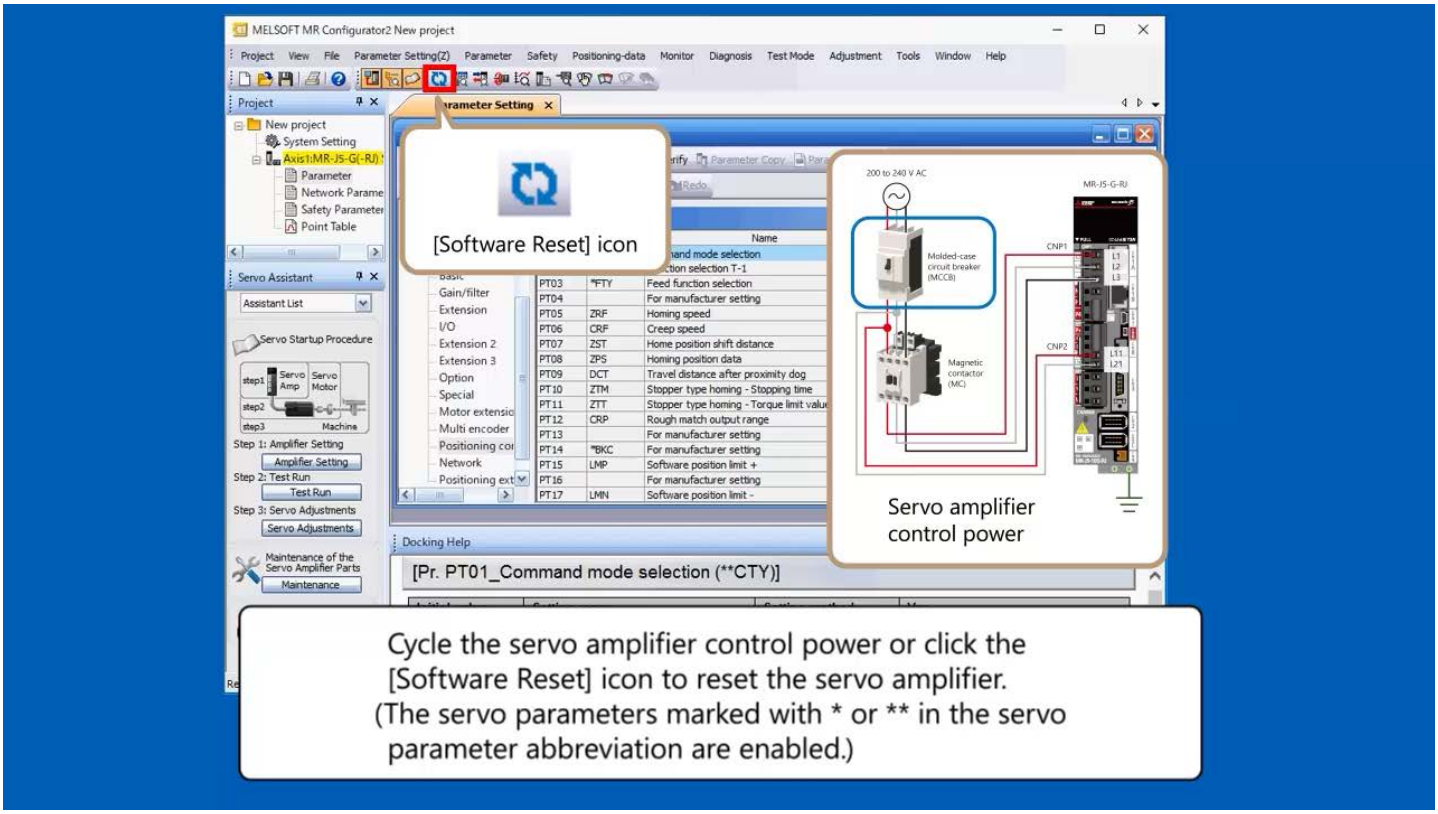
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



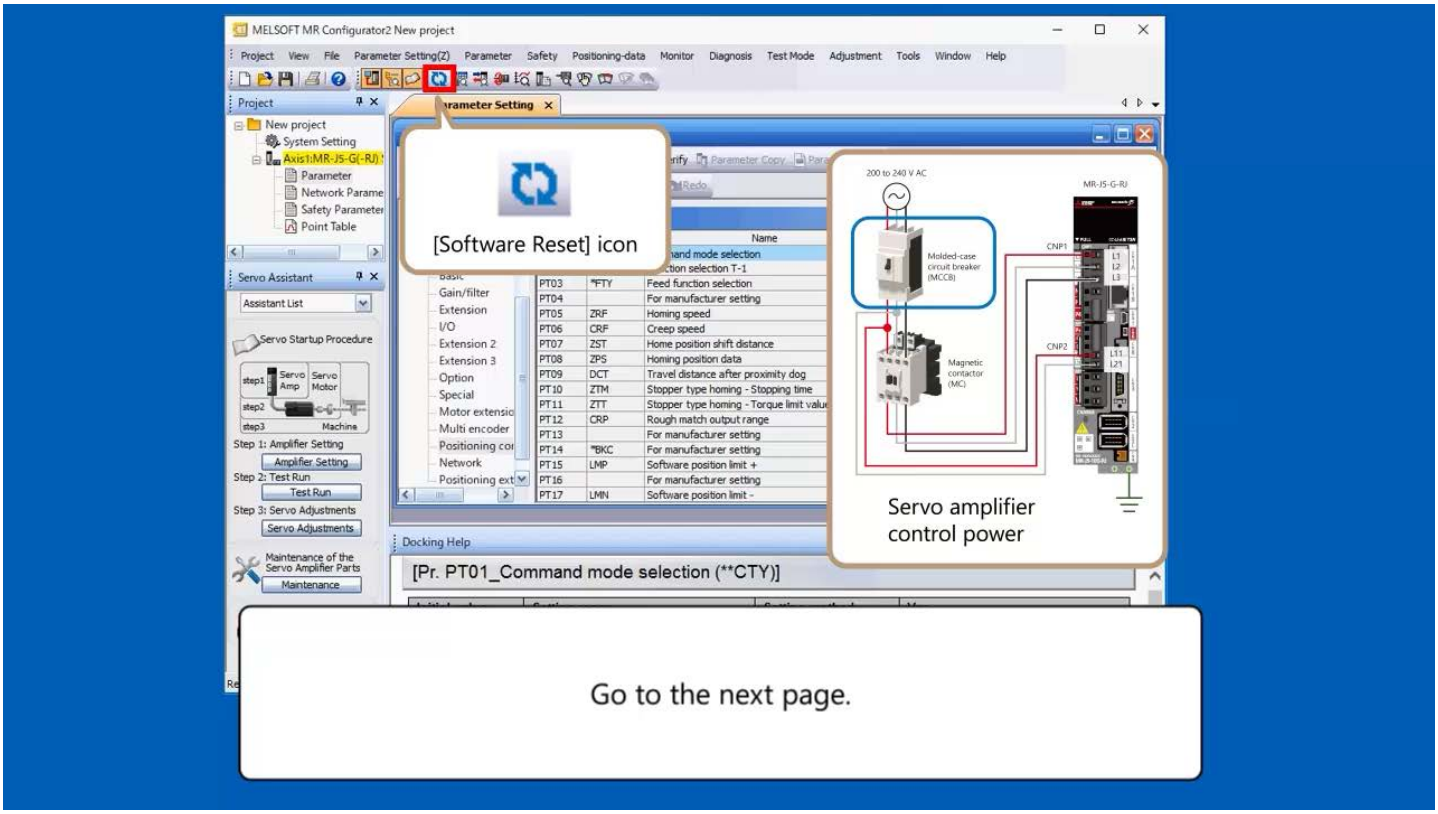
3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



3.2.4 Parameter setting procedure 2

For the parameter setting procedure of the servo amplifier using MR Configurator2, see the video below.
Before the operation, check that the project created in Section 3.2.2 is displayed.



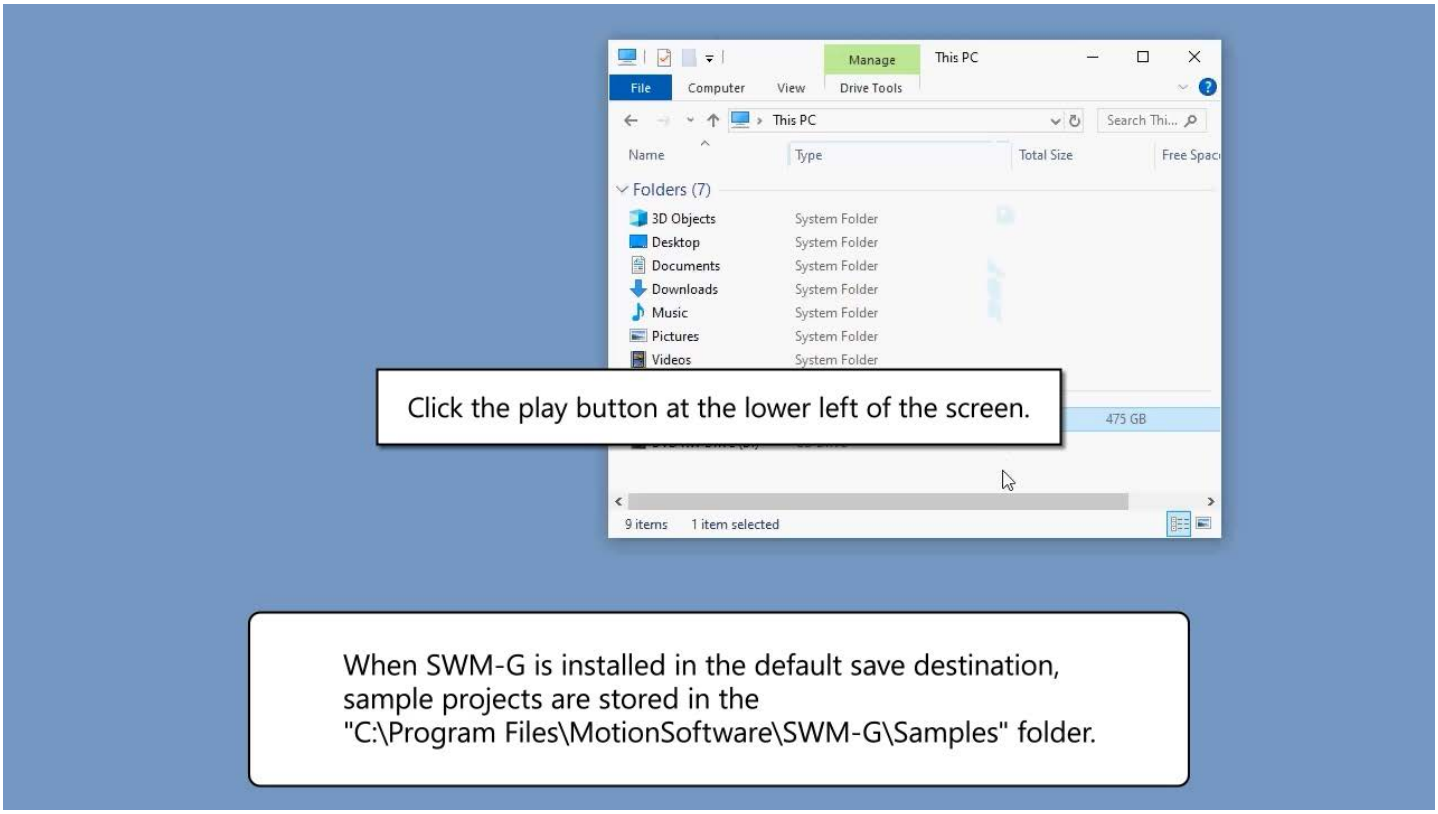
3.3 Operation Details of the Sample Program

This section describes the processing order of the sample program that is used to perform the basic operation of the servo axis. The basic program flow is as follows. Preparation processing → Application processing → End processing

Processing status	Processing order	Description	Detail
Preparation processing	1	Device creation	A device is an object of the SSCApi class that opened the communication channel with the SWM-G engine. Applications using the SWM-G library call the CreateDevice function at the start.
	2	Communication start	The communication with the platform where the engine is operating is started with the StartCommunication function.
Application Processing	3	Servo ON	Many motion functions are arranged in the CoreMotion module. The SetServoOn function in the CoreMotion module is called to perform the servo ON.
	4	Home position return	The home position return parameter is read with GetHomeParam. The home position return type is changed to the current position (CurrentPos), and the home position return parameter is set with the SetHomeParam function. The home position return is performed with the StartHome function.
	5	Positioning operation	The motion profile is specified to perform the positioning operation with the StartMov function. The motion profile determines the movement speed from the current position to the target position, acceleration, and jerk shape.
	6	Servo OFF	The servo OFF is performed with the SetServoOn function.
End processing	7	Communication stop	When the communication is started with StartCommunication, the device must be closed after the communication is stopped with StopCommunication.
	8	Device closing	The application calls the CloseDevice function before the end.

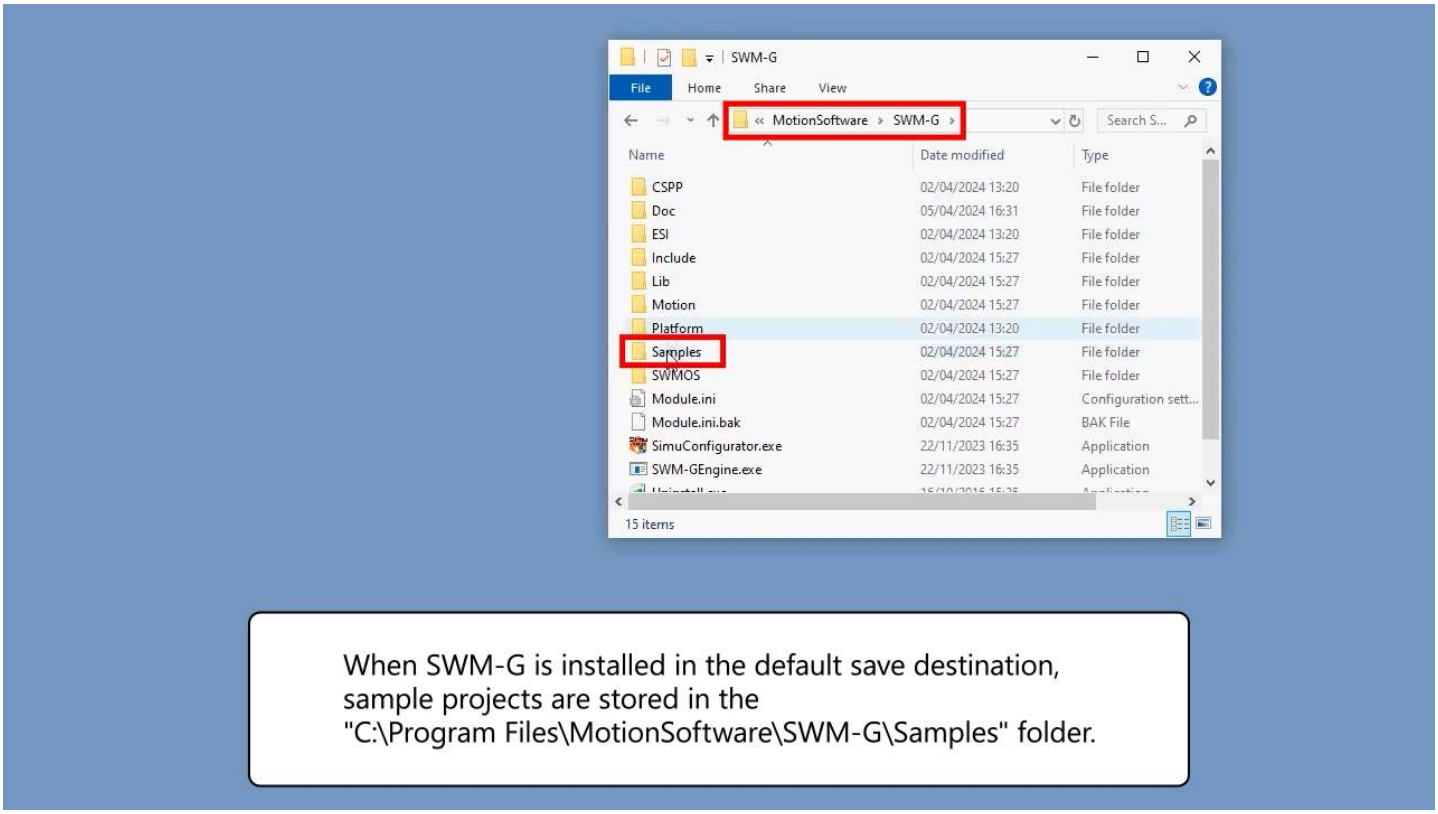
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



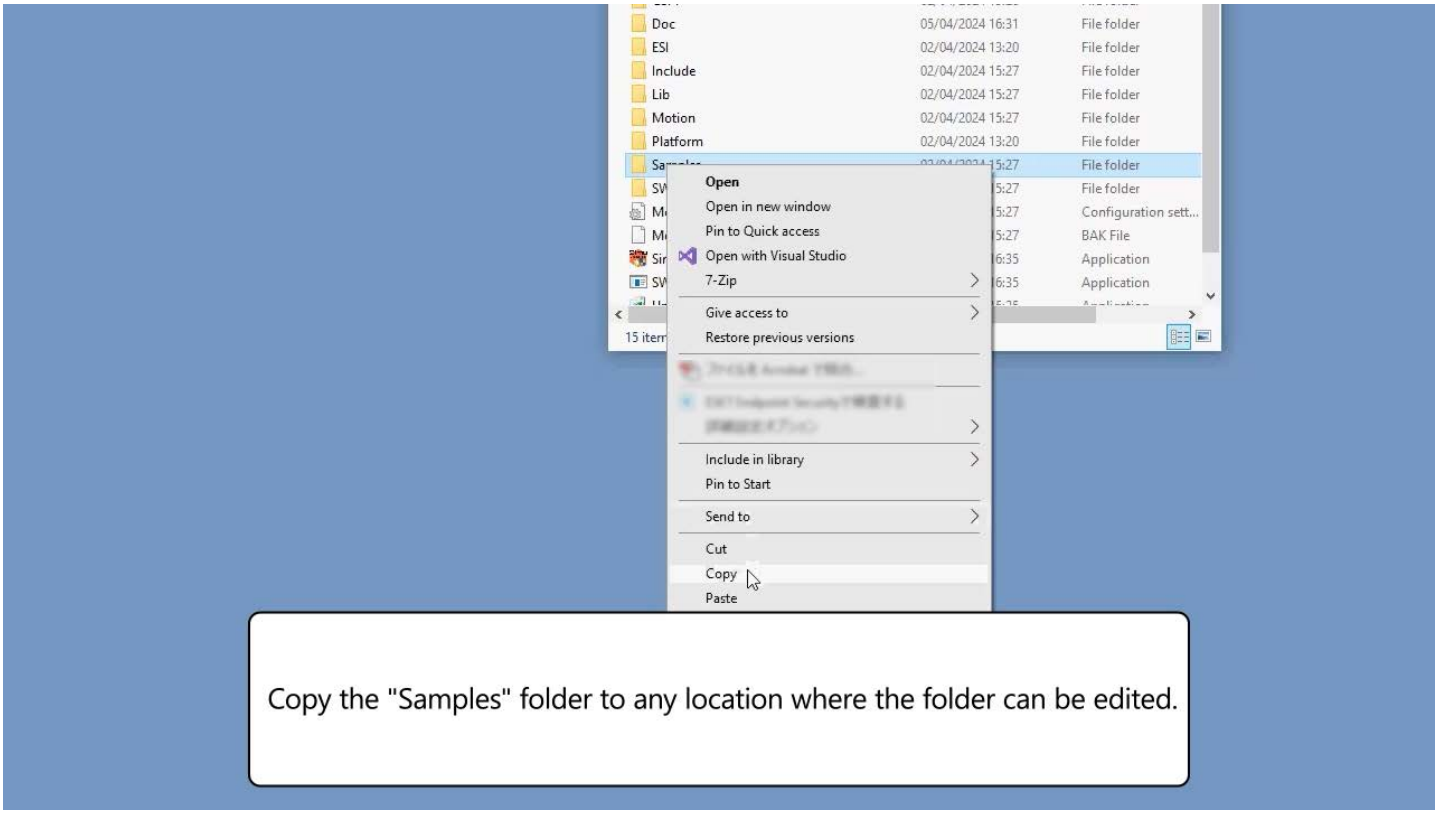
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



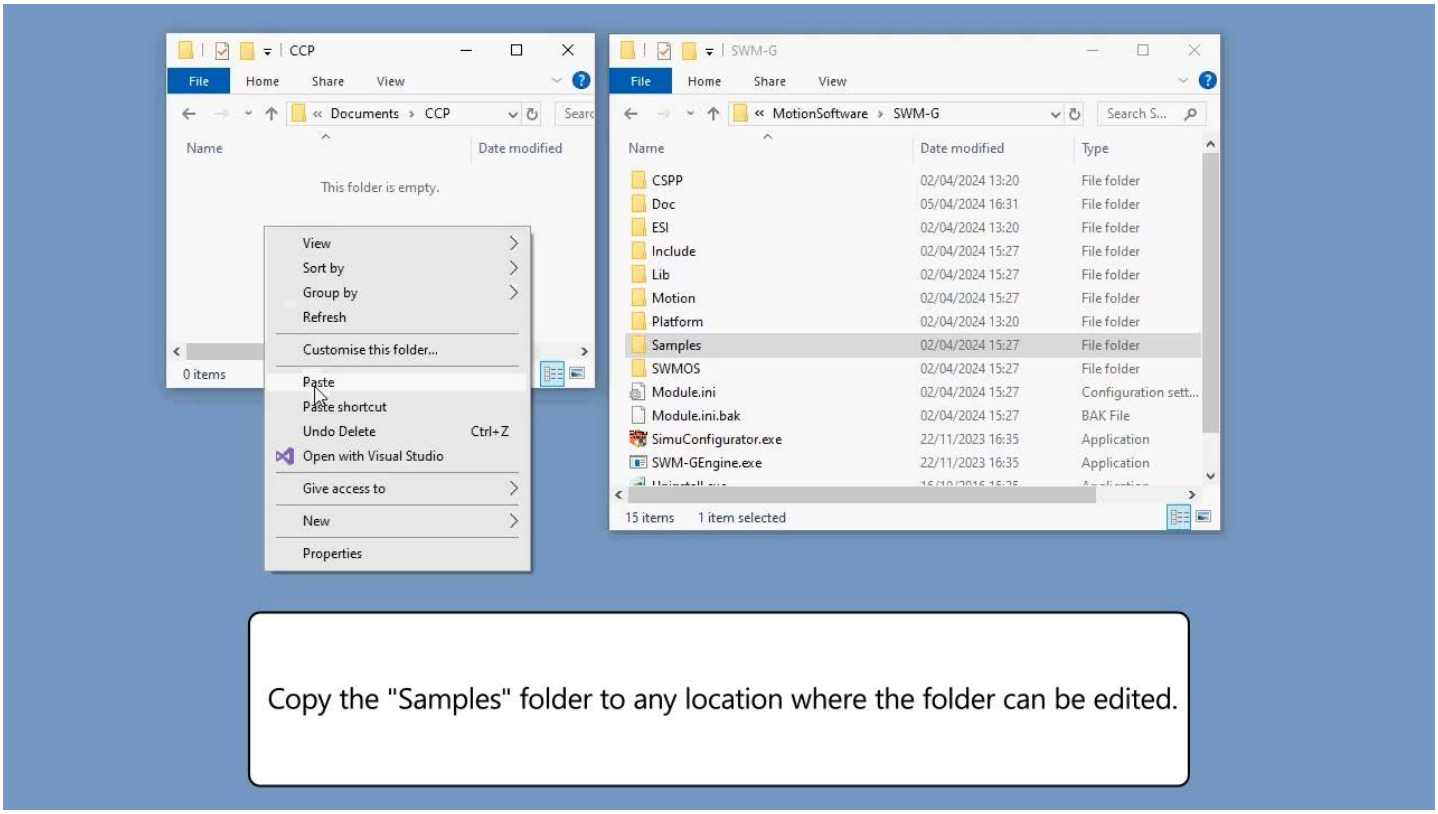
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



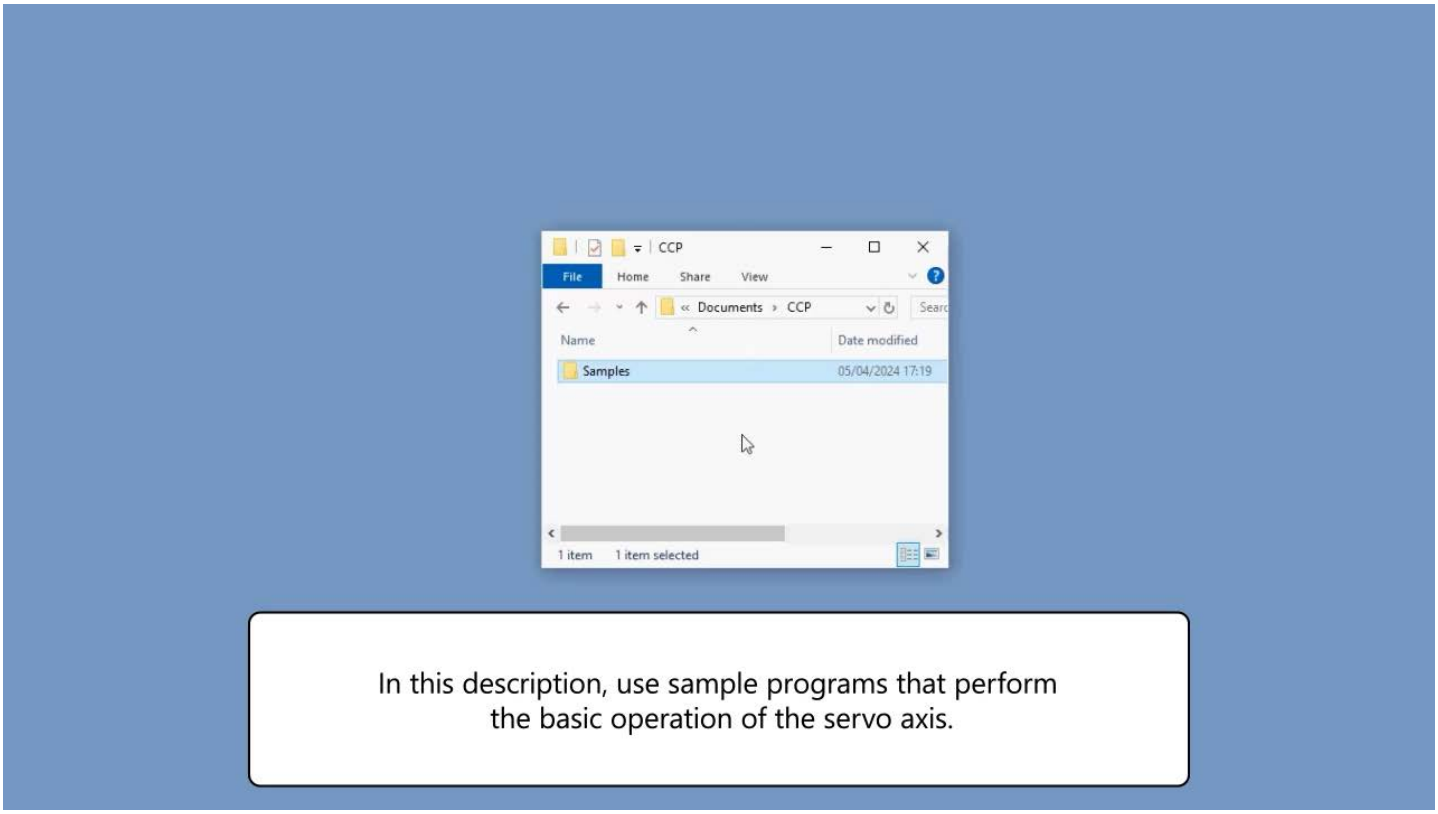
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



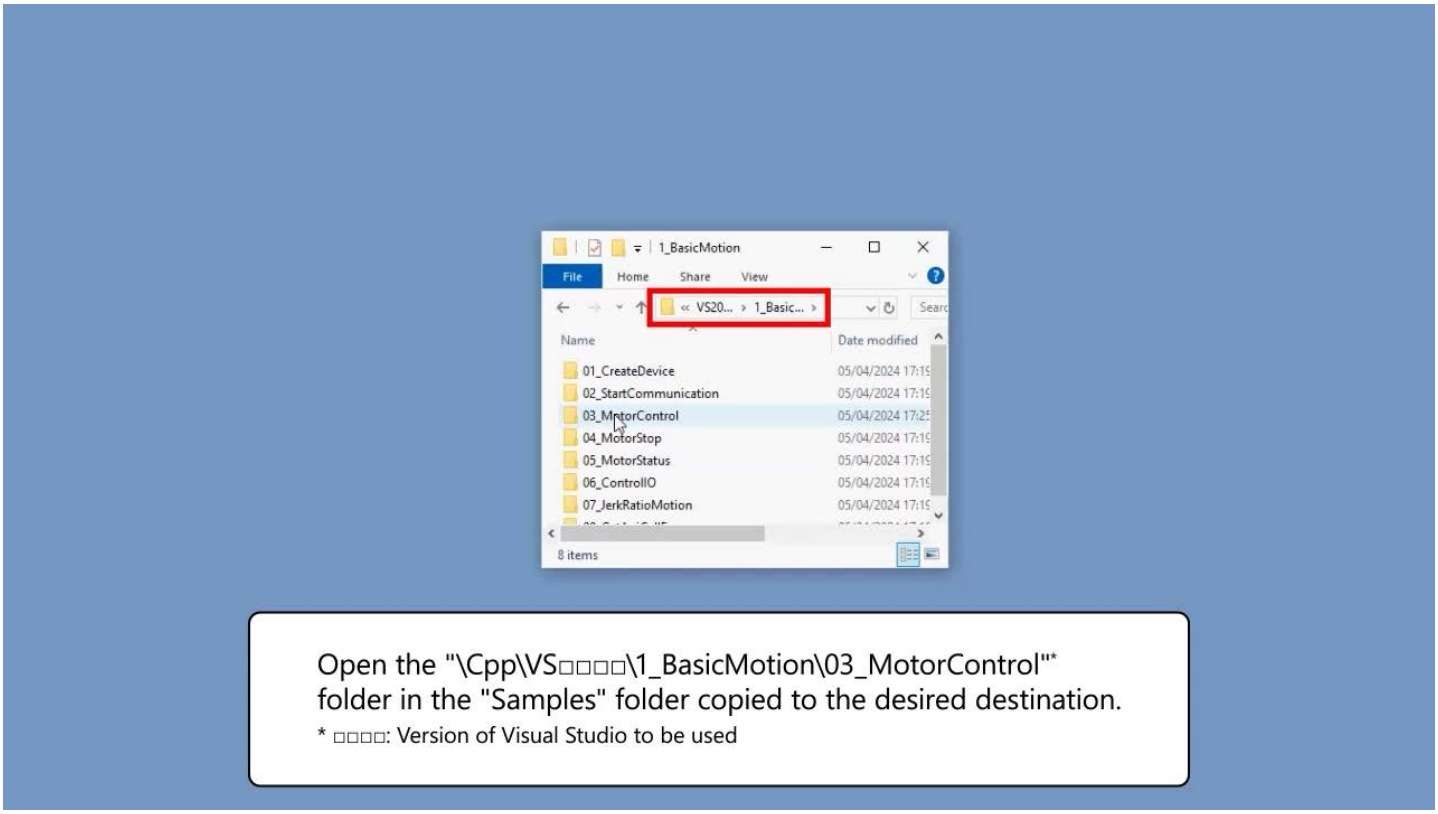
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



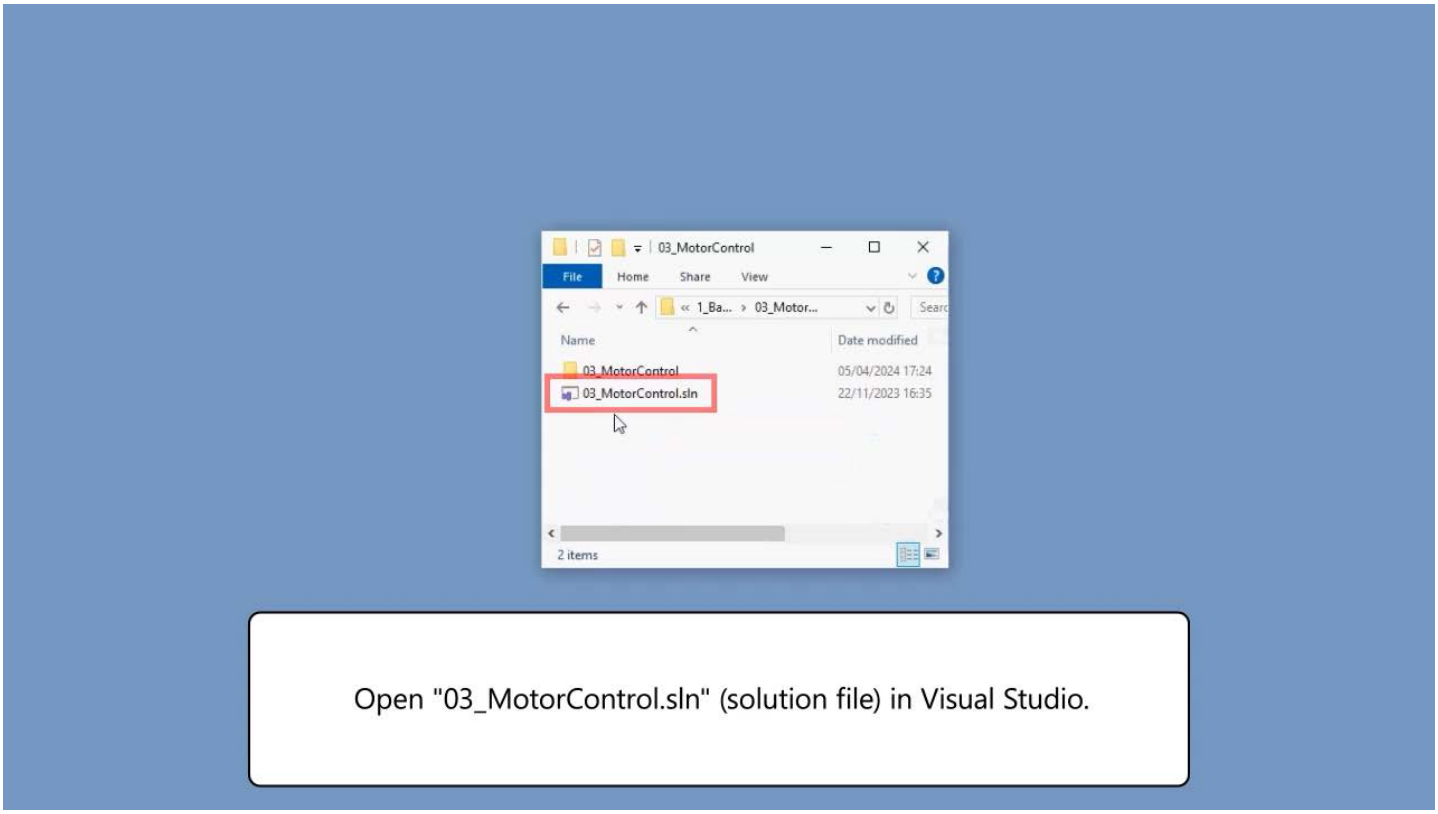
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



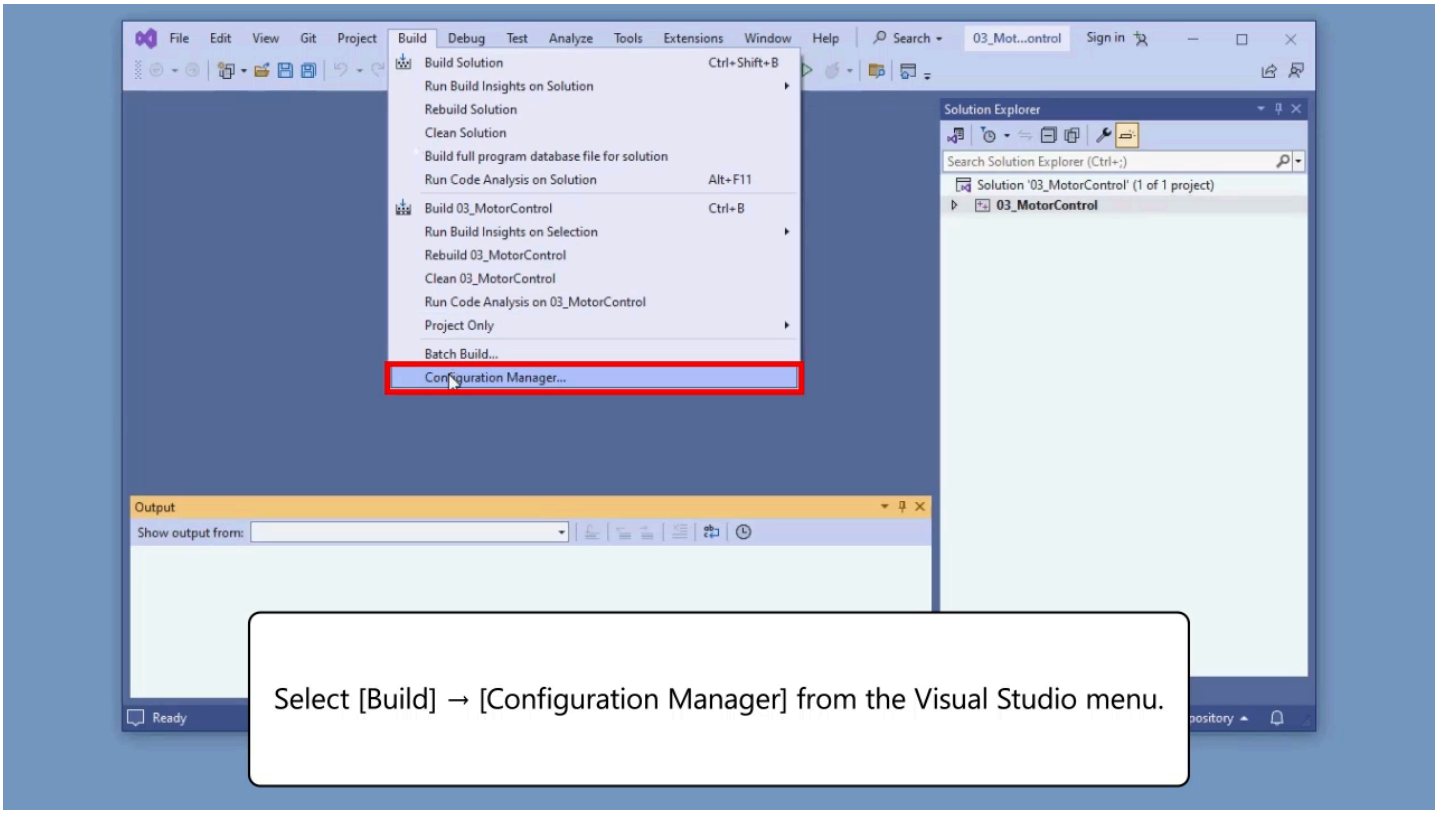
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



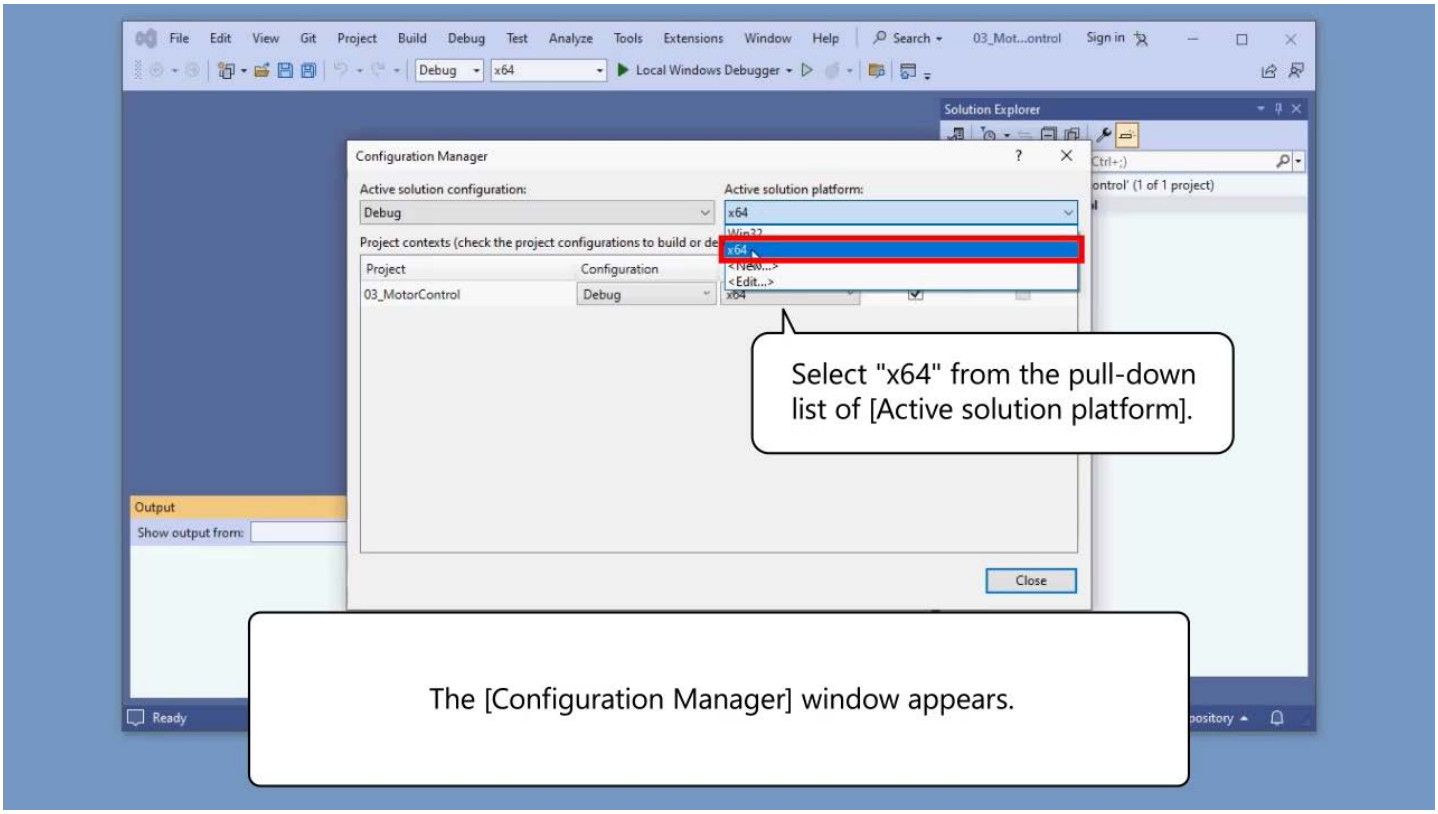
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



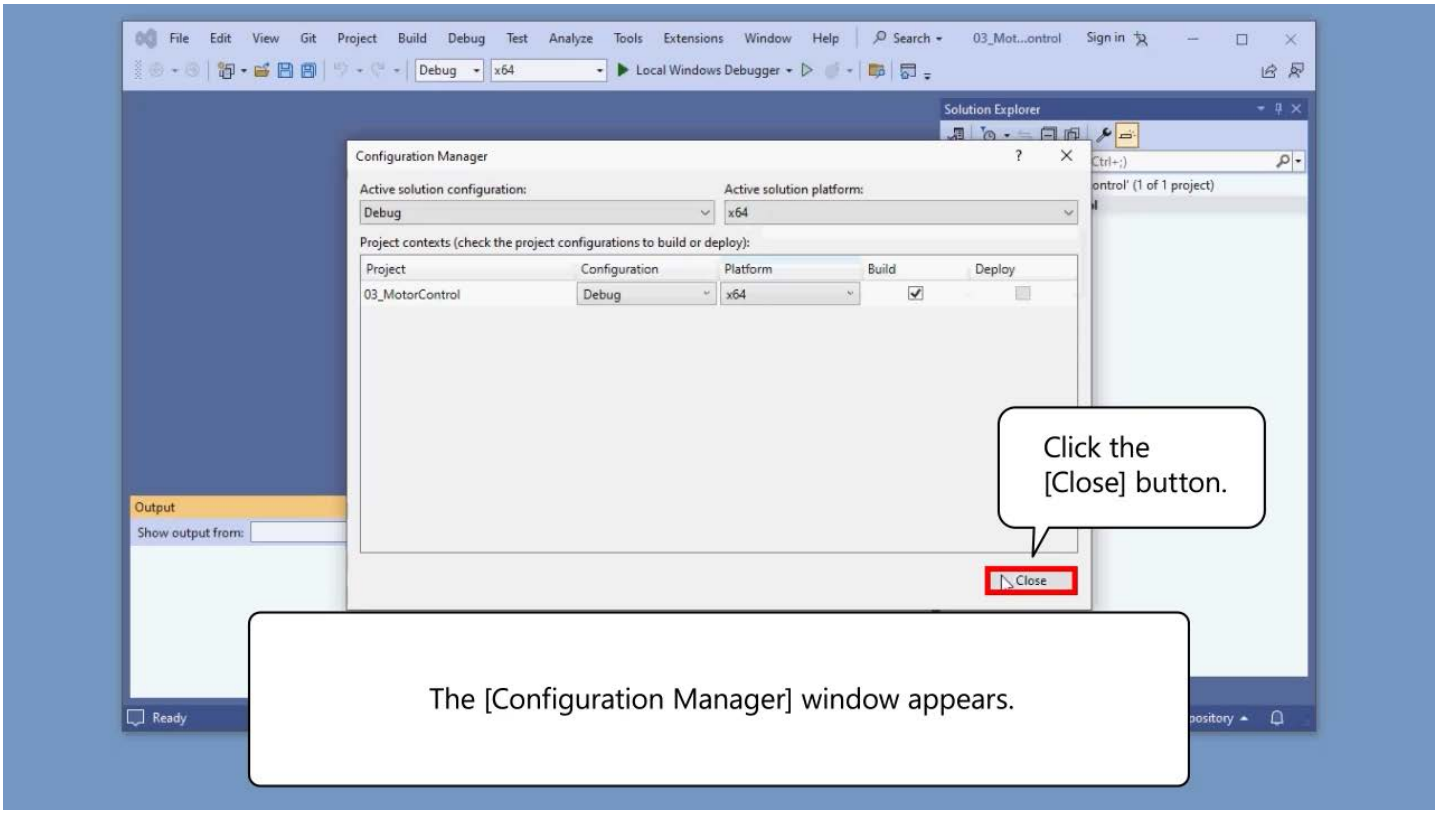
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



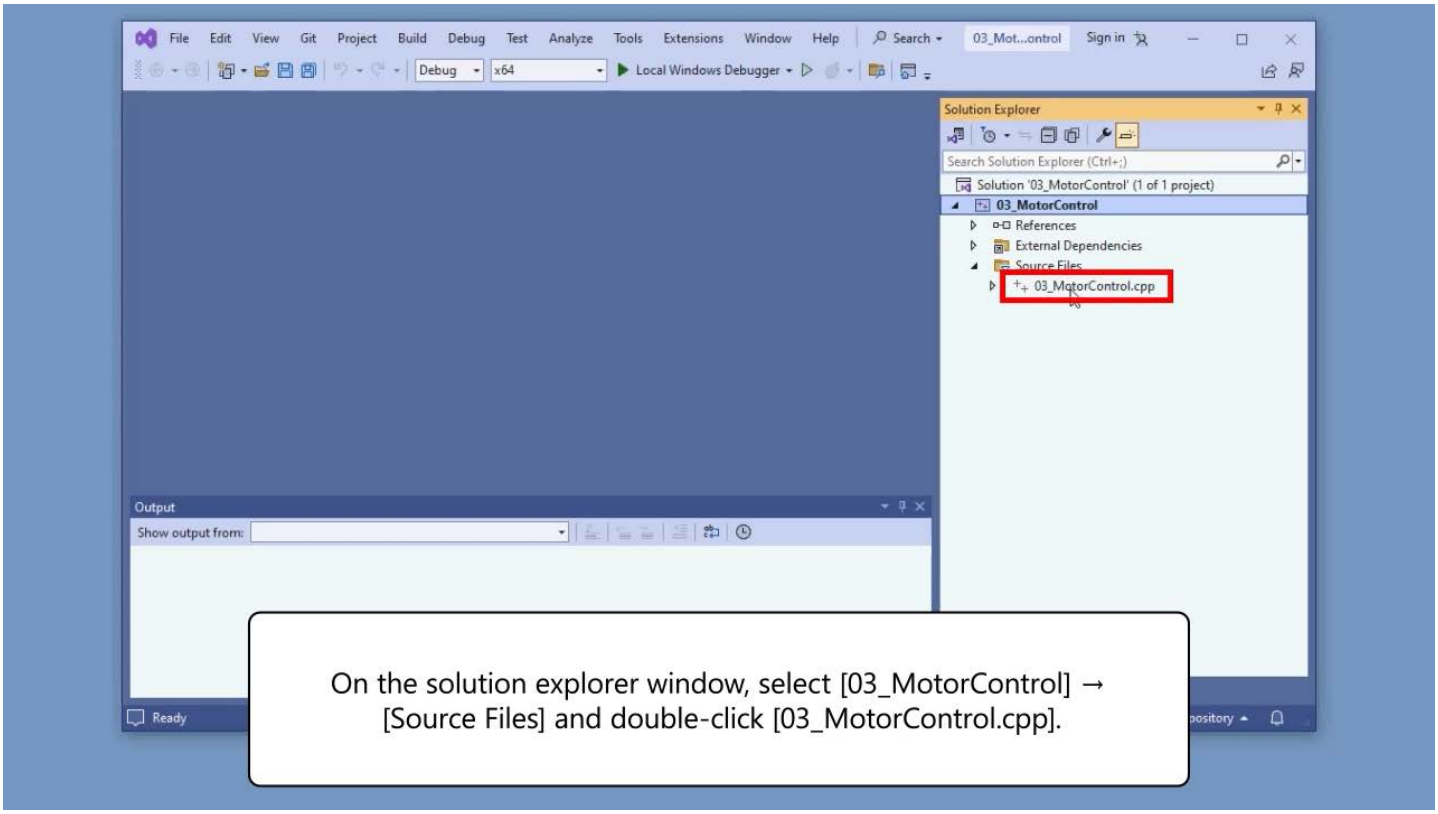
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



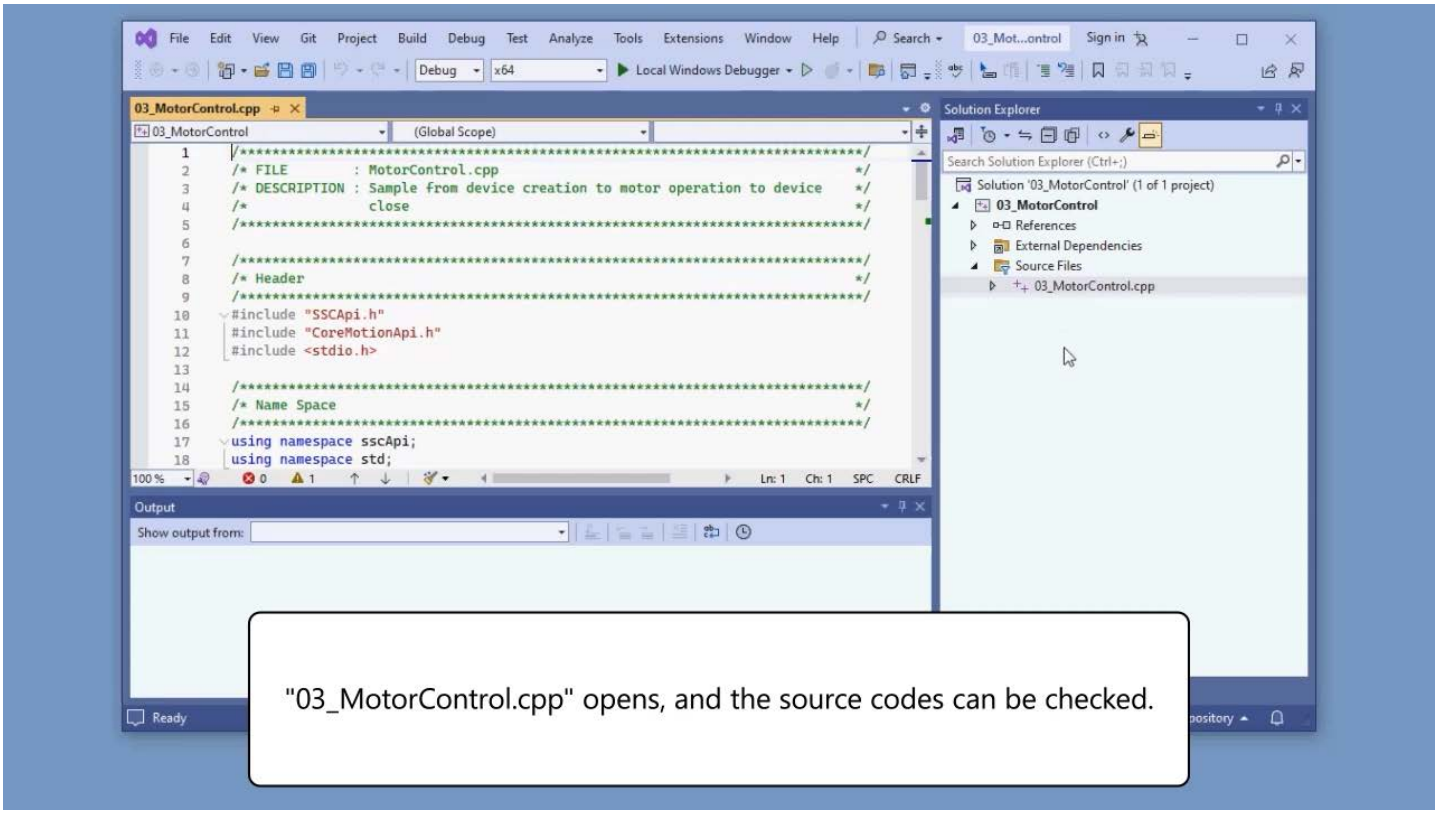
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



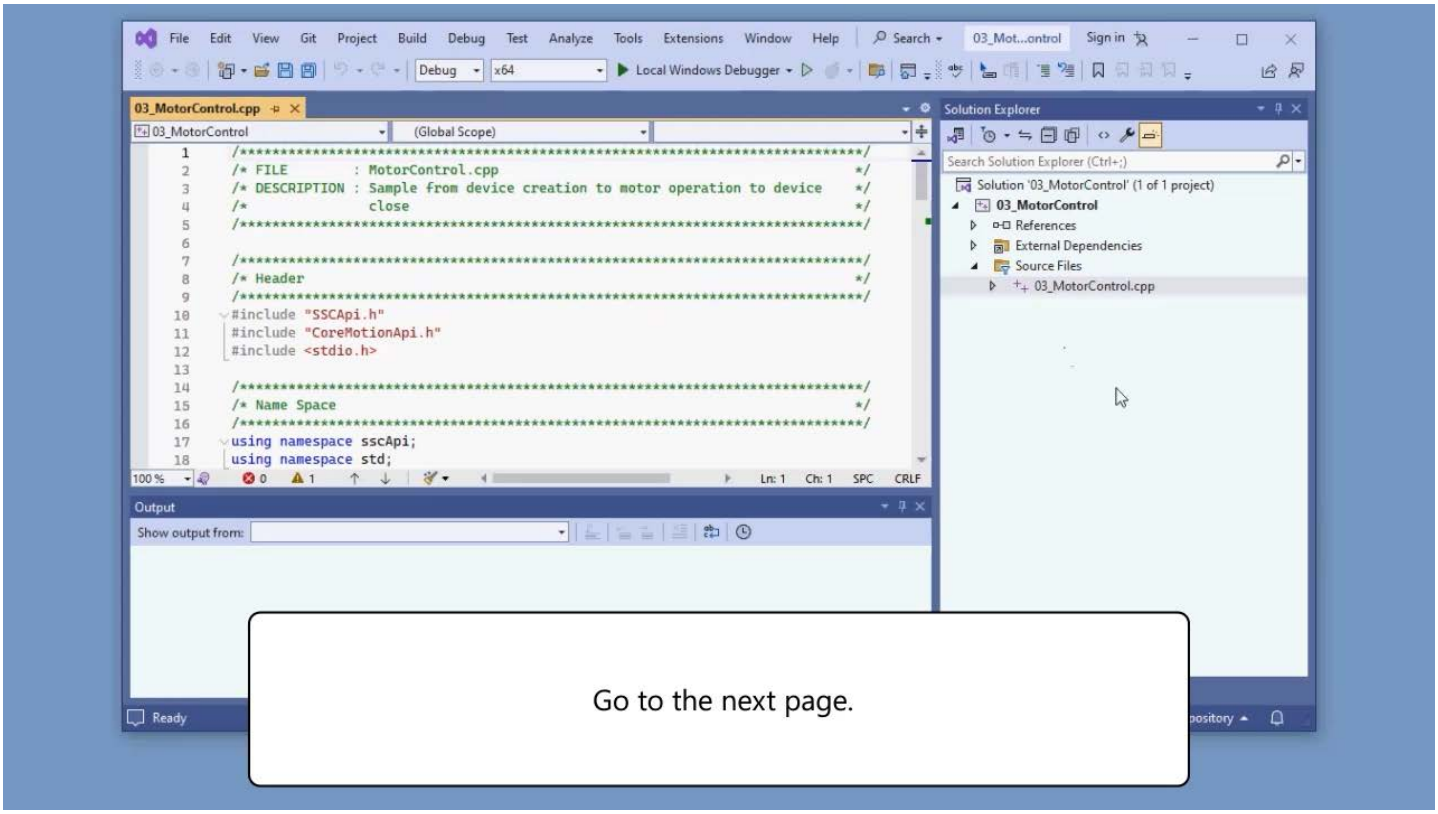
3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



3.4 Opening the Sample Program

This section describes the procedure for opening the sample program.
In this description, Visual Studio 2019 is used. For the procedure, see the video below.



3.5 Parameter and Positioning Data Setting

This section describes the parameter and positioning data setting.
The sample project is designed to run with the default parameters.
In this description, the data is modified for the following gear setting and positioning operation setting.
The setting procedures are described in the following sections.

■ Gear setting

Parameter name	Setting value
Gear ratio Numerator	67108864
Gear ratio Denominator	1000

■ Positioning operation setting

Item	Description
Motion profile	Trapezoid
Axis number	Axis0
Target position	100000[μm]
Target speed	25000[μm/s]
Acceleration	100000[$\mu m/s^2$]
Deceleration	100000[$\mu m/s^2$]

3.5.1 Gear setting

This section describes the gear setting.

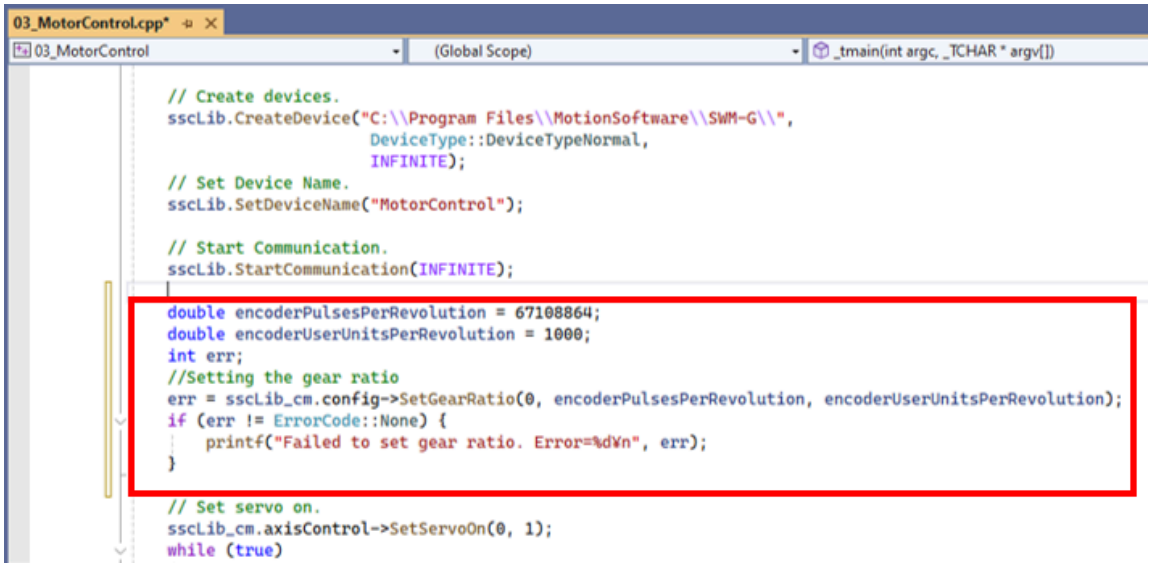
■ Enter the following code after the 46th line of the "03_MotorControl.cpp" file opened in the previous section.

- If the gear setting fails, the message appears and the processing continues without setting.

Code to be entered

double encoderPulsesPerRevolution = 67108864;
double encoderUserUnitsPerRevolution = 1000;
int err;
// Set the gear ratio.
err = sscLib_cm.config->SetGearRatio(0, encoderPulsesPerRevolution, encoderUserUnitsPerRevolution);
if (err != ErrorCode::None) {
printf("Failed to set gear ratio. Error=%d\n", err);
}

[Code entry example]
The codes in the 47th to 55th lines in the following figure are the entered codes.



3.5.2 Positioning data modification

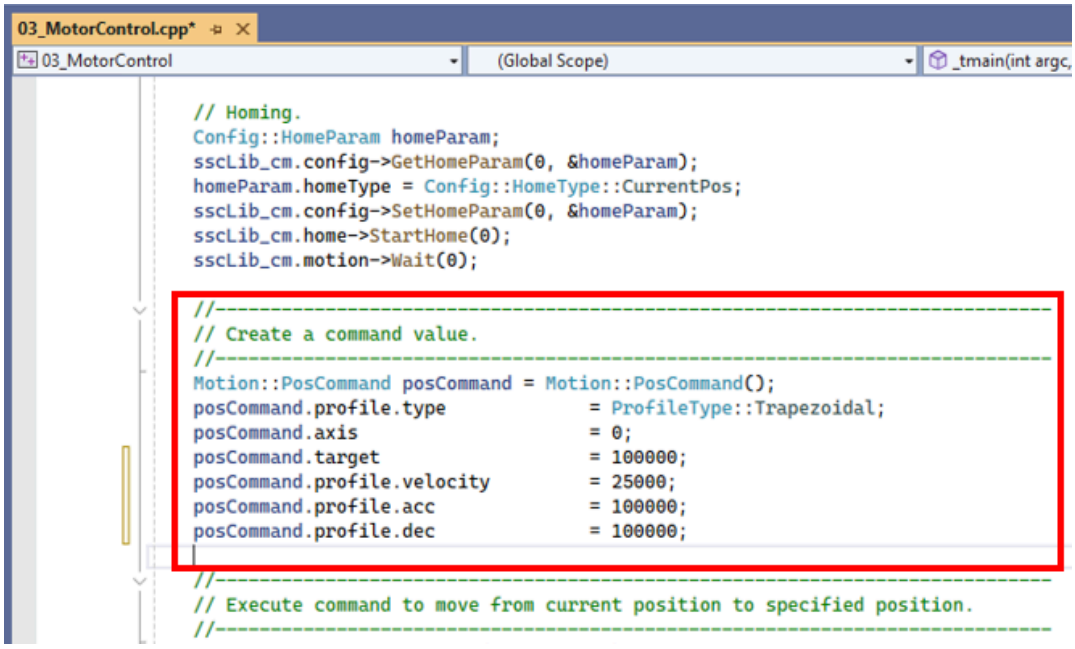
This section describes the modification of the positioning data.

■ Modify the codes in the 78th line and after of the "03_MotorControl.cpp" file edited in the previous section as follows.

Code after the modification

//---
// Create a command value.
//---
Motion::PosCommand posCommand = Motion::PosCommand();
posCommand.profile.type = ProfileType::Trapezoidal;
posCommand.axis = 0;
posCommand.target = 100000;
posCommand.profile.velocity = 25000;
posCommand.profile.acc = 100000;
posCommand.profile.dec = 100000;

[Code modification example]
The codes in the 78th to 87th lines in the following figure are the modified codes.



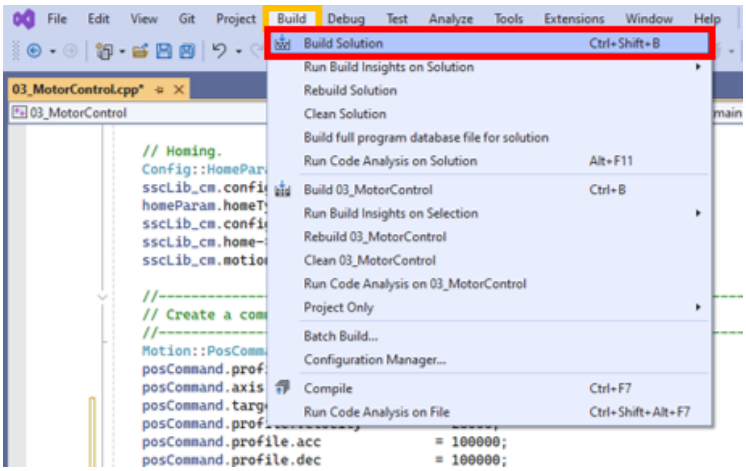
3.6 Executing the Build

This section describes the procedure for executing the build.

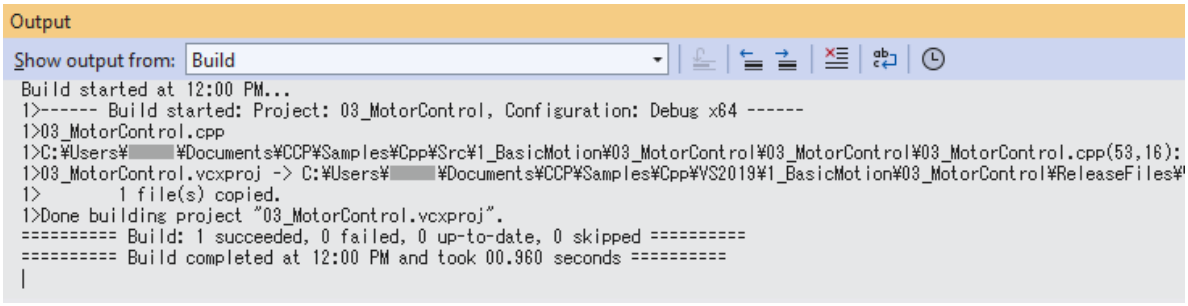
■ Execute the build.

Select [Build] → [Build Solution] from the Visual Studio menu.

• The build is executed.



• When the build is completed, the output results are displayed in the output window of Visual Studio.

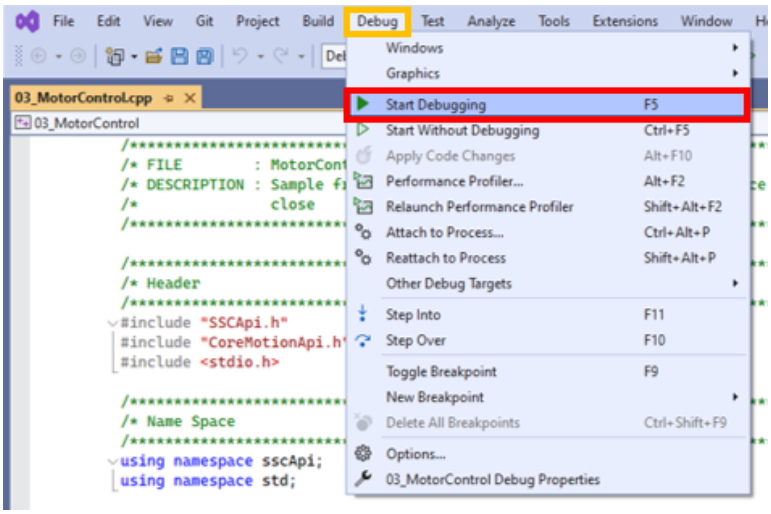


3.7 Executing the Program

This section describes the procedure for executing the program.

■ Execute the program.

Select [Debug] → [Start Debugging] from the Visual Studio menu to run the program.
• The debug starts.



3.8 Summary of This Chapter

In this chapter, you have learned:

- Construction of the Target System
- Parameter Setting
- Operation Details of the Sample Program
- Opening the Sample Program
- Parameter and Positioning Data Setting
- Executing the Build
- Executing the Program

Point

Construction of the Target System	The target system in this Chapter is a 1-axis ball screw that consists of a personal computer, 1-axis servo amplifier, servo motor, and others.
Parameter Setting	In the parameter setting, set the parameters of the servo amplifier. In this section, the parameters are set via the CC-Link IE TSN network using MR Configurator2.
Operation Details of the Sample Program	You have learned the flow of the program that is used to perform the basic operation of the servo axis.
Opening the Sample Program	You have learned the procedure for opening the sample program in Visual Studio.
Parameter and Positioning Data Setting	In the parameter and positioning data setting, you have learned how to edit the default sample program based on the gear and positioning operation setting examples.
Executing the Build	You have learned the procedure for executing the build of the edited sample program.
Executing the Program	You have learned the procedure for executing the program using the debug function.

Test Final Test

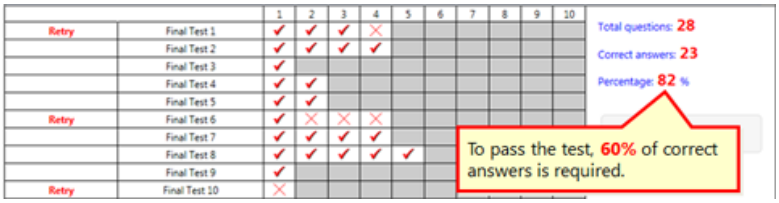
Now that you have completed all of the lessons of the **Motion Control Software SWM-G Basics** Course, you are ready to take the final test. If you are unclear on any of the topics covered, please take this opportunity to review those topics.

There are a total of 5 questions (9 items) in this Final Test.

You can take the final test as many times as you like.

Score results

The number of correct answers, the number of questions, the percentage of correct answers, and the pass/fail result will appear on the score page.



Test **Final Test1**

Select the correct word to fill in the blank ( ) to complete the sentences below.

If the BIOS in the personal computer to be used supports (Q1), disable it.
Before installing SWM-G, update (Q2) and disable the update.
After registering the license of SWM-G, save (Q3) to a file. Keep this file in a safe place as it will be required for support.

Q1 -- Select --

Q2 -- Select --

Q3 -- Select --

Q1:
- 1：Hyper-Threading
- 2：Fast startup
- 3：Hyper-V

Q2:
- 1：Installer
- 2：RTX
- 3：Windows

Q3:
- 1：Dongle ID
- 2：License code
- 3：Registration information

Test **Final Test2**

Select the correct sentence from the following. (You may select multiple answers.)

- [ ] **Download module used for installing SWM-G is available for download at Mitsubishi Electric Factory Automation Global Website.**
- [ ] **Windows 10 update program supporting RTX can be checked at the IntervalZero website.**
- [ ] **The RTX license is granted upon registration of the SWM-G license.**
- [ ] **RTX does not need to be updated as the latest version will be installed.**
- [ ] **The number of cores obtained by subtracting 1 from the number of cores of the CPU is assigned to RTX.**

Test **Final Test3**

Select the correct sentence for SWMOS. (You may select multiple answers.)

- [ ] **Once the master and remote station settings have been configured, SWM-G can be used.**
- [ ] **Before exporting parameter settings, click the "Apply" button to apply the parameters to the SWM-G engine.**
- [ ] **In the remote station setting, PDO that is sent and received via cyclic communication can be manually added.**
- [ ] **When SWMOS is restarted, the settings from the last time SWMOS was exited are automatically loaded.**
- [ ] **In single axis control, multiple axes cannot be controlled simultaneously.**

Test **Final Test4**

Select the correct word to fill in the blank ( ) to complete the sentences below.

When setting the axis No. to the servo amplifier, set an integer value from (Q1) to "Number of licensed axes - 1".
When using SWMOS for the first time, check and set (Q2) as the default setting.
To add a PDO object to the TXPDO mapping setting and assign an input address, start with (Q3).

Q1 -- Select --

Q2 -- Select --

Q3 -- Select --

Q1:
- 1：-1
- 2：0
- 3：1

Q2:
- 1：Platform setting
- 2：Master setting
- 3：Remote station setting

Q3:
- 1：RXPDO
- 2：IoInputAssignment
- 3：IoOutputAssignment

Test Final Test5

Select the correct sentence from the following. (You may select multiple answers.)

- [ ] **To perform IP communication with the devices on the CC-Link IE TSN network, start the network communication of SWM-G first.**
- [ ] **By configuring the servo parameter settings and axis data writing using MR Configurator2, the servo parameters are enabled.**
- [ ] **SWM-G User Manual does not describe API Reference or tutorial.**
- [ ] **The sample program is designed to run with the default parameters.**

Test **Final Test1**

Select the correct word to fill in the blank ( ) to complete the sentences below.

If the BIOS in the personal computer to be used supports (Q1), disable it.
Before installing SWM-G, update (Q2) and disable the update.
After registering the license of SWM-G, save (Q3) to a file. Keep this file in a safe place as it will be required for support.

Q1	Hyper-Threading
Q2	Windows
Q3	Registration information

Q1:
- 1：Hyper-Threading
- 2：Fast startup
- 3：Hyper-V

Q2:
- 1：Installer
- 2：RTX
- 3：Windows

Q3:
- 1：Dongle ID
- 2：License code
- 3：Registration information

Test Final Test2

Select the correct sentence from the following. (You may select multiple answers.)

- [x] **Download module used for installing SWM-G is available for download at Mitsubishi Electric Factory Automation Global Website.**
- [x] **Windows 10 update program supporting RTX can be checked at the IntervalZero website.**
- [ ] **The RTX license is granted upon registration of the SWM-G license.**
- [ ] **RTX does not need to be updated as the latest version will be installed.**
- [ ] **The number of cores obtained by subtracting 1 from the number of cores of the CPU is assigned to RTX.**

Test Final Test3

Select the correct sentence for SWMOS. (You may select multiple answers.)

- [ ] Once the master and remote station settings have been configured, SWM-G can be used.
- [x] Before exporting parameter settings, click the "Apply" button to apply the parameters to the SWM-G engine.
- [x] In the remote station setting, PDO that is sent and received via cyclic communication can be manually added.
- [ ] When SWMOS is restarted, the settings from the last time SWMOS was exited are automatically loaded.
- [ ] In single axis control, multiple axes cannot be controlled simultaneously.

Test **Final Test4**

Select the correct word to fill in the blank ( ) to complete the sentences below.

When setting the axis No. to the servo amplifier, set an integer value from (Q1) to "Number of licensed axes - 1".
When using SWMOS for the first time, check and set (Q2) as the default setting.
To add a PDO object to the TXPDO mapping setting and assign an input address, start with (Q3).

Q1 0

Q2 Platform setting

Q3 IoInputAssignment

Q1:
- 1：-1
- 2：0
- 3：1

Q2:
- 1：Platform setting
- 2：Master setting
- 3：Remote station setting

Q3:
- 1：RXPDO
- 2：IoInputAssignment
- 3：IoOutputAssignment

Test **Test Score**

You have completed the Final Test. You results area as follows.
To end the Final Test, proceed to the next page.

		1	2	3	4	5	6	7	8	9	10
	Final Test 1	✓	✓	✓							
	Final Test 2	✓									
	Final Test 3	✓									
	Final Test 4	✓	✓	✓							
	Final Test 5	✓									

Total questions: **9**

Correct answers: **9**

Percentage: **100** %

Clear

You have completed the "Motion Control Software SWM-G Basics" Course.

Thank you for taking this course.

We hope you enjoyed the lessons and the information you acquired in this course is useful for configuring systems in the future.

You can review the course as many times as you want.

Review

Close