

Personal Computer Embedded Type Servo System Controller

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

- MR-SWVG16-U
- MR-SWVG32-U
- MR-SWVG64-U
- MR-SWVG128-U
- MR-SWVG16N1-U
- MR-SWVG32N1-U
- MR-SWVG64N1-U
- MR-SWVG128N1-U

SAFETY PRECAUTIONS

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product only.

In this manual, the safety precautions are classified into two levels: "⚠️ WARNING" and "⚠️ CAUTION".

 WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
 CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠️ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

WARNING

- Configure safety circuits externally to ensure that the entire system operates safely even when a fault occurs in the personal computer. Failure to do so may result in an accident due to an incorrect output or malfunction.
 - (1) Configure external safety circuits, such as an emergency stop circuit, protection circuit, and protective interlock circuit for forward/reverse operation or upper/lower limit positioning.
 - (2) If an incorrect home position return direction is set, motion control may continue without deceleration. To prevent machine damage caused by this, configure an external interlock circuit.
 - (3) When this product detects an error, the motion slows down and stops or the motion rapidly stops, depending on the stop setting in parameter. Set the parameter to meet the specifications of the positioning control system. In addition, set the home position return parameter and positioning data within the specified setting range.
 - For the operating status of each station after a communication failure, refer to manuals for the network used. Incorrect output or malfunction due to a communication failure may result in an accident.
 - When modifying control while this product is running, configure an interlock in the program to ensure that the entire system always operates safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change (status control)), read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents. Determine corrective actions to be taken by the system in case of a communication failure.
 - Especially, when a remote system is controlled, immediate action cannot be taken if a problem occurs due to a communication failure. To prevent this, configure an interlock in the program, and determine corrective actions to be taken by the system in case of a communication failure.
-

[Design Precautions]

WARNING

- If a communication cable is disconnected, the network may be unstable, resulting in a communication failure of multiple stations. Configure an interlock in the program to ensure that the entire system will always operate safely even if communications fail. Failure to do so may result in an accident due to an incorrect output or malfunction.
 - If safety standards (ex. robot safety rules, etc.) apply to the system using the servo amplifier and servomotor, make sure that the safety standards are satisfied.
 - Construct a safety circuit external to each remote station if the abnormal operation of the remote stations to be connected to this product differs from the safety directive operation in the system.
-

[Design Precautions]

CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100 mm or more between them. Failure to do so may result in malfunction due to noise.
 - After the personal computer is powered on or rebooted, the time taken for the system to enter the RUN status varies depending on the system configuration and/or performance of the personal computer. Design circuits so that the entire system will always operate safely, regardless of the time.
-

[Security Precautions]

WARNING

- To maintain the security (confidentiality, integrity, and availability) of the system against unauthorized access, denial-of-service (DoS) attacks, computer viruses, and other cyberattacks from external devices via the network, take appropriate measures such as firewalls, virtual private networks (VPNs), and antivirus solutions.
-

[Wiring Precautions]

CAUTION

- Ground the controllers in which this product is installed, servo amplifiers, and servo motors with a ground resistance of 100 ohm or less. Do not use a common grounding with other equipment.
 - Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100 mm or more between them. Failure to do so may result in malfunction due to noise.
 - Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the cables or malfunction due to poor contact.
 - Check the interface type and correctly connect the cable. Incorrect wiring (connecting the cable to an incorrect interface) may cause failure of the external device.
 - When disconnecting the cable, do not pull the cable by the cable part. Pulling the cable may result in malfunction or damage to the cable.
 - Prevent foreign matter such as dust or wire chips from entering the personal computer. Such foreign matter can cause a fire, failure, or malfunction.
 - For Ethernet cables to be used in the system, select the ones that meet the specifications in the user's manual. If not, normal data transmission is not guaranteed.
-

[Startup and Maintenance Precautions]

WARNING

- Shut off the external power supply (all phases) used in the system before cleaning. Failure to do so may result in electric shock or malfunction.
 - Do not connect or disconnect any communication cable while power is on. Failure to do so may cause malfunction.
-

[Startup and Maintenance Precautions]

CAUTION

- When modifying control while this product is running, configure an interlock in the program to ensure that the entire system will always operate safely. For other forms of control (such as program modification, parameter change, forced output, or operating status change (status control)), read the relevant manuals carefully and ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents. Determine corrective actions to be taken by the system in case of a communication failure.
 - Especially, when a remote system is controlled, immediate action cannot be taken if a problem occurs due to a communication failure. To prevent this, configure an interlock in the program, and determine corrective actions to be taken by the system in case of a communication failure.
 - Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25 cm away in all directions from the Simple Motion board. Failure to do so may cause malfunction.
 - Maintenance must be performed by qualified maintenance personnel with knowledge.
 - Before testing the operation, set a low speed value for the speed limit parameter so that the operation can be stopped immediately upon occurrence of a hazardous condition.
 - Confirm and adjust the program and each parameter before operation. Unpredictable movements may occur depending on the machine.
 - When using the absolute position system function, on starting up, and when the absolute position motor has been replaced, always perform a home position return.
 - Before starting the operation, confirm the brake function.
 - Do not perform a megger test (insulation resistance measurement) during inspection.
 - After maintenance and inspections are completed, confirm that the position detection of the absolute position detection function is correct.
 - Extreme adjustments and changes may lead to unstable operation, so never make them.
-

[Operating Precautions]

CAUTION

- When modifying control (such as data modification, program change, or operating status change (status control)), read relevant manuals carefully and ensure the safety before operation. Incorrect change or modification may cause system malfunction, damage to the machines, or accidents.
 - Do not go near the machine during test operations. Doing so may lead to injuries.
-

CONDITIONS OF USE FOR THE PRODUCT

(1) Mitsubishi Motion Control Software ("the PRODUCT") shall be used in conditions;

- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
- ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY THE PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.

("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above restrictions, Mitsubishi Electric may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi Electric and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi Electric representative in your region.

(3) Mitsubishi Electric shall have no responsibility or liability for any problems involving Motion control software trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

INTRODUCTION

Thank you for purchasing Motion Control Software SWM-G.

This manual describes the required procedures and settings for installing Motion Control Software SWM-G in a personal computer.

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the Motion control software SWM-G to handle the product correctly.

Relevant products

MR-SWMG16-U, MR-SWMG32-U, MR-SWMG64-U, MR-SWMG128-U, MR-SWMG16N1-U, MR-SWMG32N1-U, MR-SWMG64N1-U, MR-SWMG128N1-U

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RELEVANT MANUALS

Manual name [manual number]	Description	Available form
Motion Control Software SWM-G User's Manual (Installation) [IB-0300561ENG] (this manual)	This manual explains the required procedures and settings for installing Motion Control Software SWM-G in a personal computer.	e-Manual PDF
Motion Control Software SWM-G User's Manual (Startup) [IB-0300562ENG]	This manual explains the specifications, procedures before operation, and settings of Motion Control Software SWM-G.	e-Manual PDF
Motion Control Software SWM-G Operating Manual (SWMOS) [IB-0300563ENG]	This manual explains the system configuration, parameter settings, and online function operations of Motion Control Software SWM-G.	e-Manual PDF
Motion Control Software SWM-G Operating Manual (EcConfigurator) [IB-0300617ENG]	This manual explains the methods for diagnosing and managing EtherCAT networks of Motion Control Software SWM-G.	e-Manual PDF

Point

e-Manual refers to the Mitsubishi Electric FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- The hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.
- Sample programs can be copied to an engineering tool.

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
I/O size	The number of I/O points. It is expressed in bytes.
MR Configurator2	The product name of the servo setup software.
MR-J5(W)-G	A generic term for MR-J5-□G(-RJ), MR-J5W□-□G, MR-J5-□G(-RJ)N1, MR-J5W□-□G-N1, MR-JET-□G and MR-JET-□G-N1 servo amplifiers.
MR-J5-G	An MR-J5-□G□(-RJ) servo amplifier.
MR-J5W-G	An MR-J5W□-□G servo amplifier.
MR-J5-G-N1	An MR-J5-□G(-RJ)N1 servo amplifier.
MR-J5W-G-N1	An MR-J5W□-□G-N1 servo amplifier.
MR-JET-G	An MR-JET-□G servo amplifier.
MR-JET-G-N1	An MR-JET-□G-N1 servo amplifier.
NIC	A network interface card for Ethernet connection.
RTX	An extension function that operates Windows in real time, which is developed by IntervalZero.
RTX64	RTX64 is compatible with 64-bit natively.
SWM-G	A generic product name for Motion Control Software SWM-G and Motion Control Software SWM-G (CC-Link IE TSN edition).
SWM-G-N1	A generic product name for Motion Control Software SWM-G-N1 (CC-Link IE TSN + EtherCAT edition).
SWM-G engine	A task on RTX64 that performs management of SWM-G modules, axis management, and API processing.
SWMOS	A generic product name for the engineering tool SWM-G Operating Station.
Device	An object for the communication between a user application and the SWM-G engine or each module.
Personal computer	A generic term for personal computers where Windows® operates.
Platform	A generic term for network connection functions to be loaded to RTX64. CC-Link IE TSN and a simulator are available as modules.
Module	A generic term for modules to be loaded to RTX64. A file with the extension "rtdll".
User unit	A unit of the position defined by the user (such as 1 mm and 1 μs). It is abbreviated as "U". The speed is expressed as "U/s", the acceleration is expressed as "U/s ² ", and the jerk is expressed as "U/s ³ " in user unit.

1 OVERVIEW

1.1 Product Configuration

This section describes the product configuration of Motion Control Software SWM-G.

Motion control software SWM-G (CC-Link IE TSN edition)

■ Licensed product

Purchase the following licensed product.

When you purchase the licensed product, the following products are included.

Model	Product name	Quantity
MR-SWMG□-U*1	Before Using the Product	1
	License Certificate	1
	USB key	1

*1 □= Number of axes (16, 32, 64, 128)

Precautions

When operating SWM-G, use the USB key (RTX Runtime license) purchased from Mitsubishi Electric.

SWM-G cannot be operated using an RTX Runtime license purchased independently by the user.

■ Download module (SWM-G installer)

For using SWM-G, download a download module from the Mitsubishi Electric Factory Automation Global Website, and install it.

The download module contains the following products.

Model	Product name
sw1dnn-swmg-m_****.zip*1	Before Using the Product
	END-USER SOFTWARE LICENSE AGREEMENT
	SWM-G product data (SWM-Ginstaller)

*1 **** = SWM-G version

Motion control software SWM-G-N1 (CC-Link IE TSN + EtherCAT edition)

■ Licensed product

Purchase the following licensed product.

When you purchase the licensed product, the following products are included.

Model	Product name	Quantity
MR-SWGM□N1-U* ¹	Before Using the Product	1
	License Certificate	1
	USB key	1

*1 □ = Number of axes (16, 32, 64, 128)

Precautions

When operating SWM-G, use the USB key (RTX Runtime license) purchased from Mitsubishi Electric.

SWM-G cannot be operated using an RTX Runtime license purchased independently by the user.

■ Download module (SWM-G-N1 installer)

For using SWM-G, download the download module from the Mitsubishi Electric Factory Automation Global Website, and install it.

The download module contains the following products.

Model	Product name
sw1dnn-swmgn1-m_****.zip* ¹	Before Using the Product
	END-USER SOFTWARE LICENSE AGREEMENT
	SWM-G-N1 product data (SWM-GN1installer)

*1 **** = SWM-G-N1 version

1.2 Operating Environment

This section describes the SWM-G operating environment.

Item		Description	
Personal computer (body)	Personal computer	Personal computer where Microsoft® Windows® operates	
	CPU	Requirement	Intel® Atom™ (2 GHz, 2 cores) or more required ^{*1*2}
		Recommended	Intel® Core™ i (4 cores or more) recommended ^{*3}
	Required memory	Requirement	2 GB or more required
Recommended		4 GB or more recommended	
Hard disk free space		At installation: Hard disk free space 5 GB or more	
OS		Windows 10 (Pro, Enterprise, Education, IoT Enterprise LTSC ^{*4}) 64-bit version ^{*5}	
RTOS		RTX64 3.7	
Communication interface		Ethernet port ^{*6*7}	

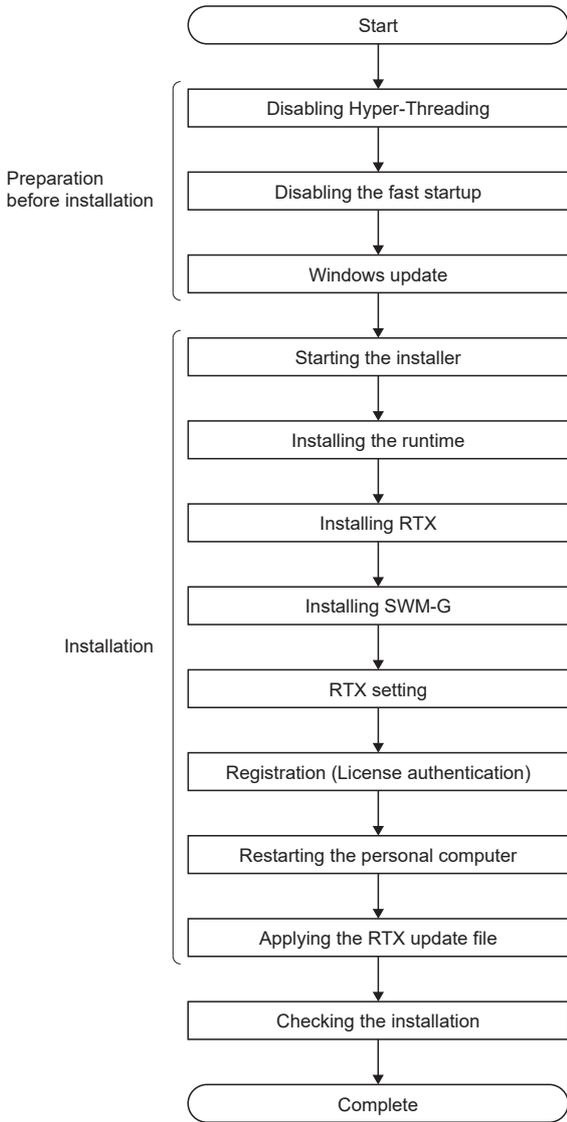
- *1 By using a faster CPU, the number of controllable axes can be increased or the communication cycle can be shortened. Because the dedicated CPU core needs to be assigned to RTX, two or more CPU cores excluding the virtual core of Hyper-Threading are required. Some CPU generations are not supported by RTX64. For details, refer to the following website of IntervalZero, the developer of RTX. For further information, contact our sales representative.
www.intervalzero.com/windows-10-updates-support/
- *2 Intel® CPU 11th generation and later are not supported.
- *3 In an environment where a 2-core CPU is used and 1-core is allocated each to RTX and Windows, the basic Windows system processing may use a large amount of CPU resources. If this is the case, Windows UI operations and the SWM-G engine startup can be significantly slow.
- *4 Windows 10 IoT Enterprise LTSC is recommended.
- *5 Depending on the installed Windows Update, installing the RTX64 update is required. For details, refer to the following website of IntervalZero, the developer of RTX.
www.intervalzero.com/windows-10-updates-support/
- *6 The following shows the NICs that can be used.

Device name
Intel I210 (Vendor ID: 0x8086, Device ID: 0X1533)
Intel I350 (Vendor ID: 0x8086, Device ID: 0X1521)
Intel I211-AT (Vendor ID: 0x8086, Device ID: 0X1539)

- *7 Specifications of the Ethernet cable used
 - Category 5e or more, double shielded · STP
 - Straight cable

2 SETUP

Follow the procedure below to install SWM-G.



Precautions

- When installing SWM-G-W (trial version), make sure that SWM-G (full version) is uninstalled.
- When installing SWM-G (full version), make sure that SWM-G-W (trial version) is uninstalled.
- When SWM-G is uninstalled, the configuration files are not deleted. Thus when SWM-G is reinstalled, the configuration file information from before the uninstallation will be used.

2.1 Preparation Before Installation

Perform the following operations before installing SWM-G.
Disable the Windows functions not supported by RTX.

Disabling Hyper-Threading

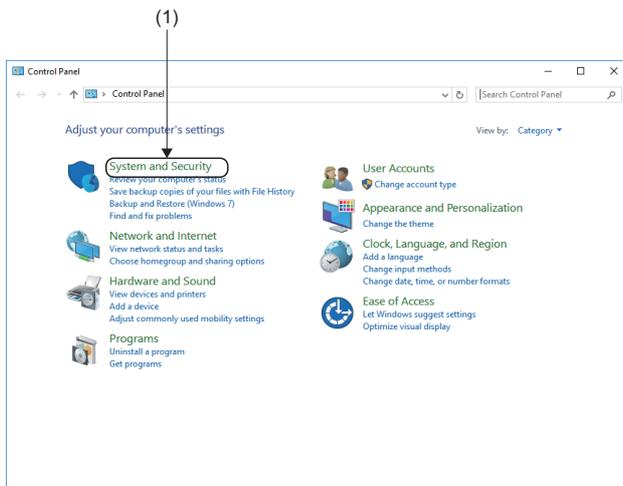
Enter the BIOS setting screen at the startup of the personal computer, and disable "CPU Hyper Threading".
Disable "Hyper-Threading" before installing SWM-G.

Point

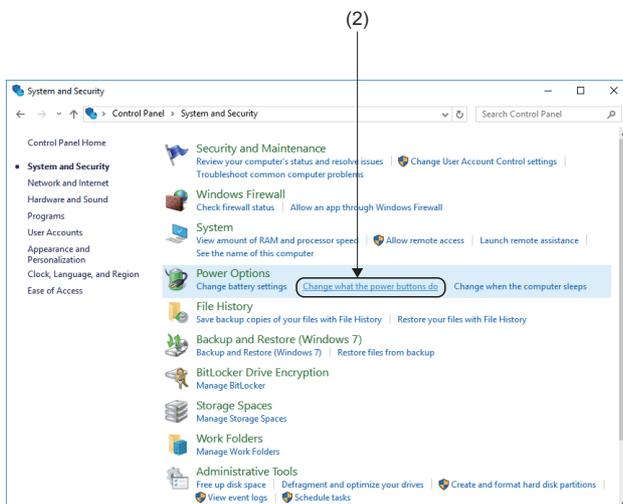
- The setting items for "Hyper-Threading" may differ depending on the personal computer used. For details, refer to the operating manual of the personal computer used.
-

Disabling the fast startup

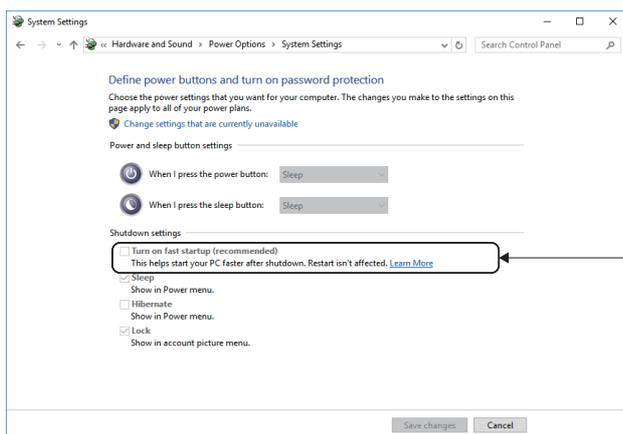
Disable the fast startup in Control Panel.



1. Select [System Tools] ⇒ [Control Panel] from the Windows start menu to display the "Control Panel" window.
2. Click [System and Security] (1).



3. The "System and Security" window appears. Click [Change what the power buttons do] (2) in [Power Options].



4. The "System Settings" window appears. Deselect [Turn on fast startup] (3) in [Shutdown settings].

Windows update (Windows 10)

Check the version compatible with Windows update from the IntervalZero website below.

Perform Windows update other than the one not supported by SWM-G. After the update is completed, install SWM-G.

www.intervalzero.com/windows-10-updates-support/

Point

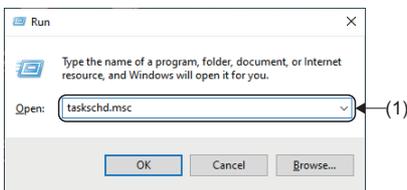
- If an error occurs in RTX after Windows update is performed, uninstall RTX once and then install it again.
- RTX may not be compatible with Windows update depending on its version. Therefore, it is recommended to disable the Windows10 automatic update.

Disabling Windows update (Windows 10)

Perform the following four operations to disable Windows update.

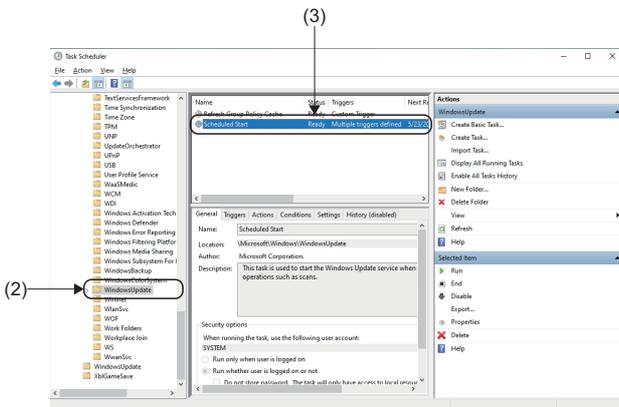
- Log on to the personal computer as an "Administrator".

Task scheduler

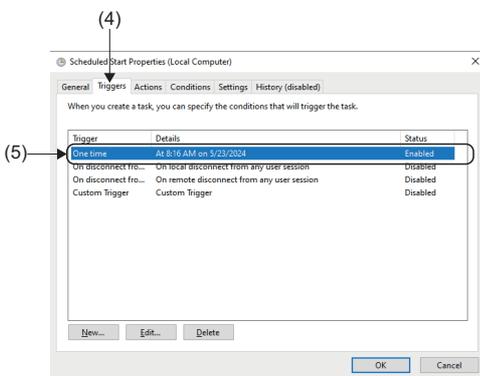


1. Right-click on the Windows start button, and select [Run].

2. The "Run" window appears. Enter "taskschd.msc" into (1), and click the [OK] button.

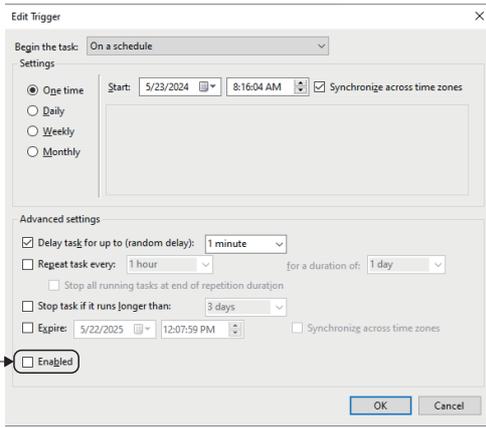


3. The "Task Scheduler" window appears. Under the [Task Scheduler Library] tree, select [Microsoft] ⇒ [Windows] ⇒ [WindowsUpdate] (2), and double-click on [Scheduled Start] (3).



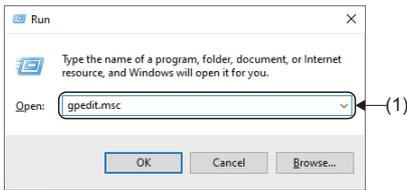
4. The "Scheduled Start Properties" window appears. Select the [Triggers] tab (4) from the "Scheduled Start Properties" window.

5. Select "One time" (5) and click the [Edit] button.

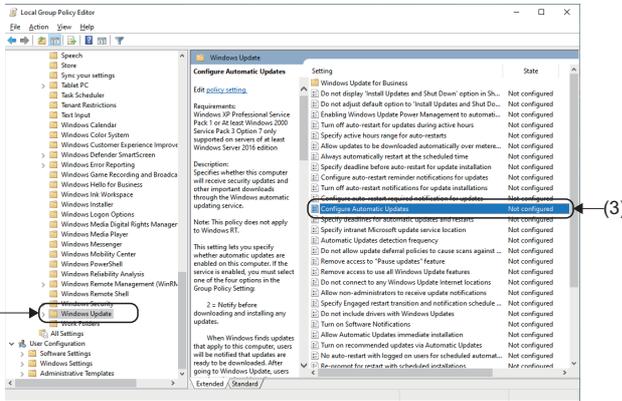


- The "Edit Trigger" window appears. Uncheck [Enabled] (6) under [Advanced settings], and click the [OK] button.

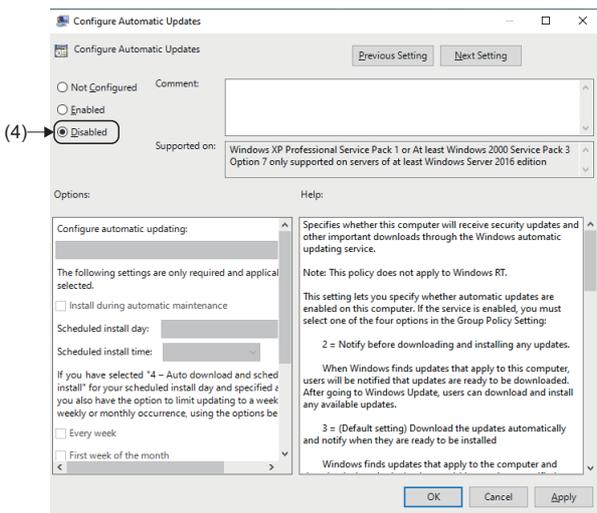
Automatic updates



- Right-click on the Windows start button, and select [Run].
- The "Run" window appears. Enter "gpedit.msc" into (1), and click the [OK] button.

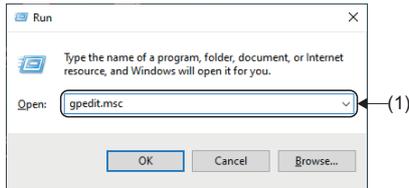


- The "Local Group Policy Editor" window appears. Under the [Computer Configuration] tree, select [Administrative Templates] => [Windows Components] => [Windows Update] (2), and double-click on [Configure Automatic Updates] (3).

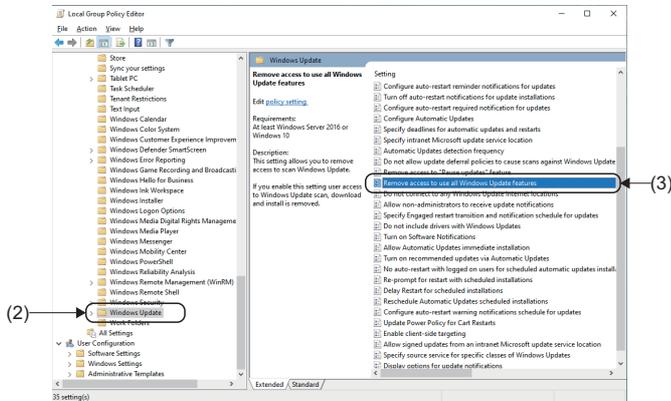


- The "Configure Automatic Updates" window appears. Select "Disabled" (4), and click the [OK] button.

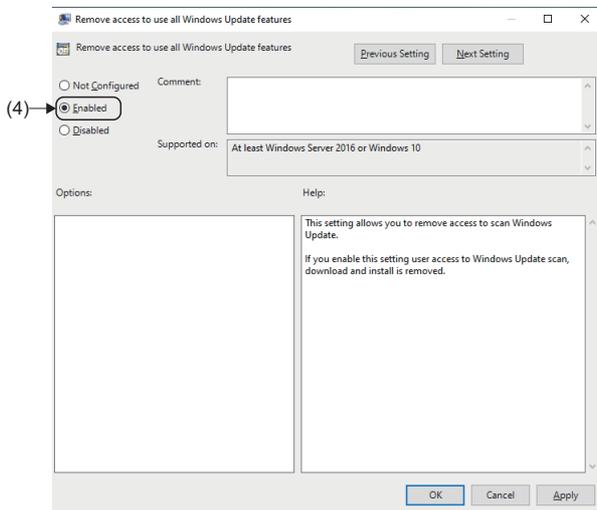
■ Access to Windows update functions



1. Right-click on the Windows start button, and select [Run].
2. The "Run" window appears. Enter "gpedit.msc" into (1), and click the [OK] button.

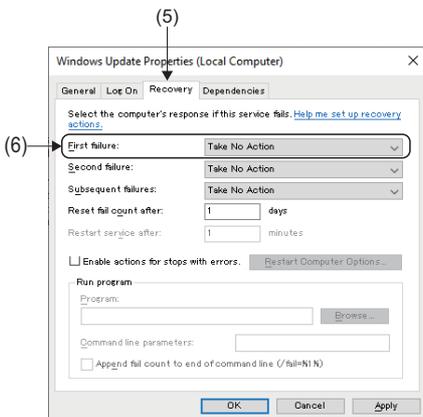
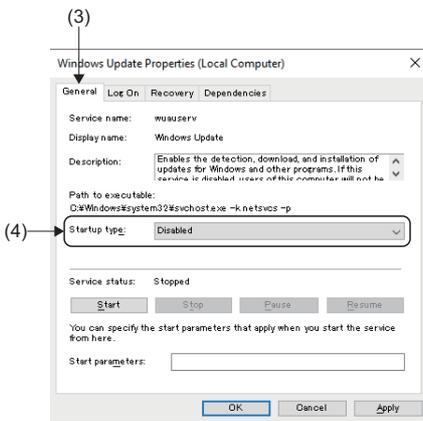
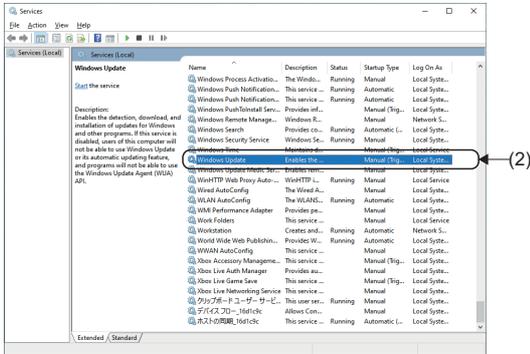
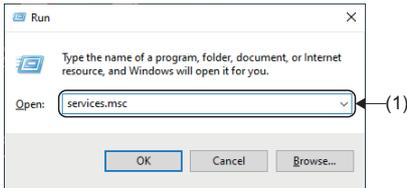


3. The "Local Group Policy Editor" window appears. Under the [Computer Configuration] tree, select [Administrative Templates] ⇒ [Windows Components] ⇒ [Windows Update] (2), and double-click on [Remove access to use all Windows Update features] (3).



4. The "Remove access to use all Windows Update features" window appears. Select "Enabled" (4), and click the [OK] button.

Windows services



1. Right-click on the Windows start button, and select [Run].
2. The "Run" window appears. Enter "services.msc" into (1), and click the [OK] button.
3. The "Services" window appears. Select [Services (Local)] from the tree, and double-click on [Windows Update] (2).
4. The "Windows Update Properties (Local Computer)" window appears. Select the [General] tab (3) from the "Windows Update Properties" window.
5. Select "Disabled" (4) from the "Startup type" pull-down list.
6. Select the [Recovery] tab (5) from the "Windows Update Properties" window.
7. Select "Take No Action" (6) from the "First failure" pull down list, and click the [OK] button.

Point

- If the local group policy editor cannot be used in your environment, check whether the versions applied in subsequent Windows updates are included in the supported versions of Windows.
- In addition to the above, Windows updates can be prevented by not physically connecting to the network.

2.2 Installation Procedure

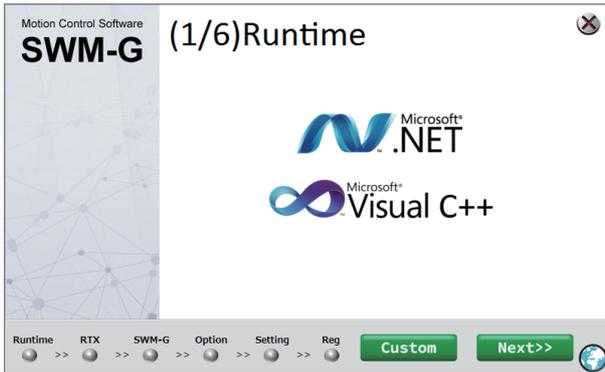
The following describes the procedures for installing SWM-G.

Check before installation

- Log on to the personal computer as an "Administrator" user.
- Before installation, close all the operating applications. If SWM-G is installed while other applications are operating, it may not operate normally.

Starting the installer

Start the installer.



1. Unzip the download module in a place and double-click "SWM-G Installer.exe" in the "sw1dnn-swmg-m_*****1" folder ⇒ "SWM-Ginstaller" folder.

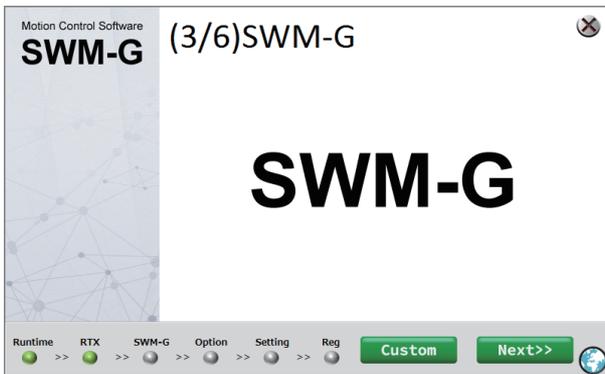
*1: **** = SWM-G version

2. The SWM-G installation window appears.

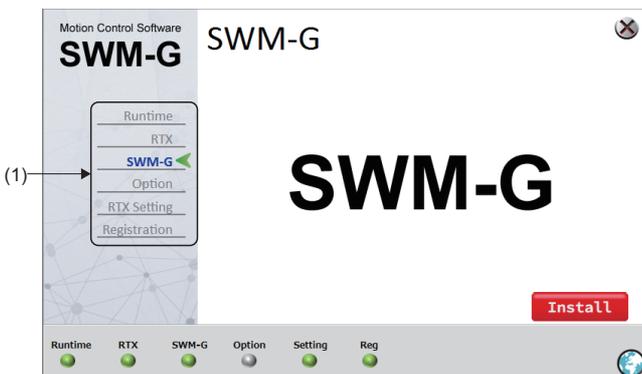
Installation

■ When the software is already installed

When the SWM-G-related software has already been installed, the startup screen which is displayed when the installer is started differs depending on the installation status. The software to be installed can be selected on the installer startup window.



1. When the installer is started, the step window of the software that has not been installed appears.
2. To start the installation on the displayed step screen, click the [Next>>] button.
3. To select the item to be installed, click the [Custom] button.

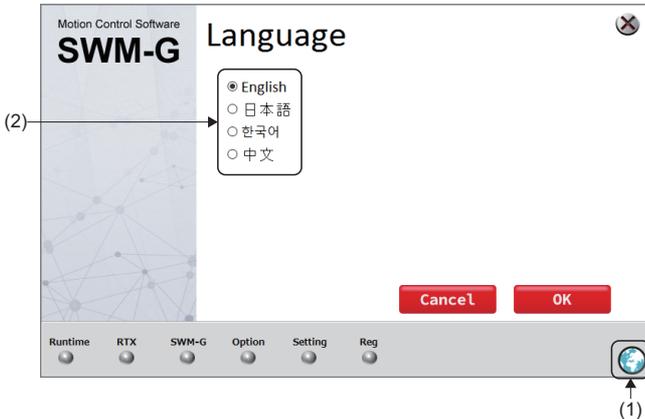


4. The installation item selection window appears. Select the software to be installed in the menu (1) on the left, and click the [Install] button to start installation.

When all the processes before "RTX Setting" have been completed, the installation item selection window appears at the startup of the installer. Click the menu on the left side of the screen to select the item to be installed. Even if the installation is proceeding in order, clicking the [Custom] button switches the window to the installation item selection window.

Switching the language

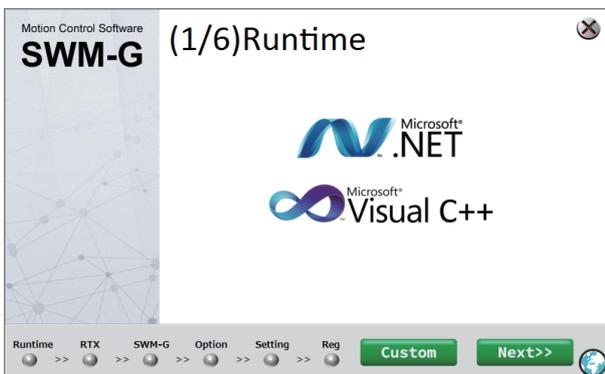
Switch the language to be displayed on the installer display.



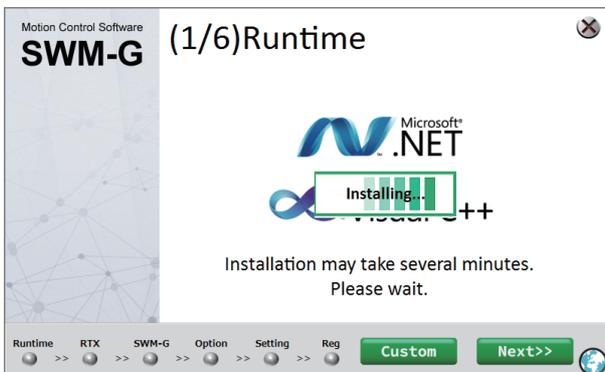
1. Click  (1) on the right side of the window to display the "Language" window.
2. Select the language to be used (2), and click the [OK] button to switch the language.

Installing the runtime

Install the runtime.



1. The "(1/6)Runtime" window appears. Click the [Next>>] button.



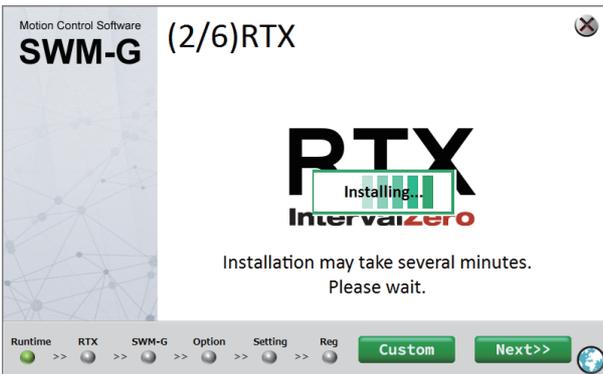
2. Installation of the runtime starts.
When the installation is completed, proceed to the next step (2/6).

Installing RTX

Install RTX.



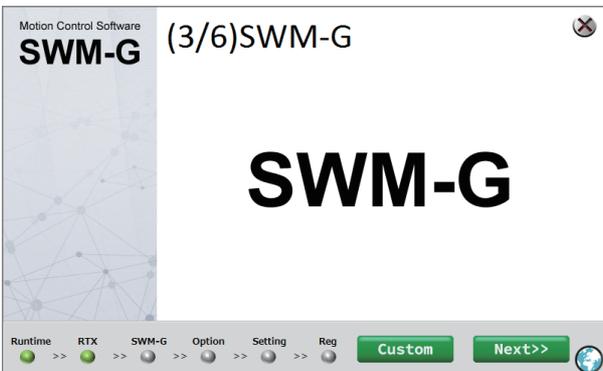
1. The "(2/6)RTX" window appears. Click the [Next>>] button.



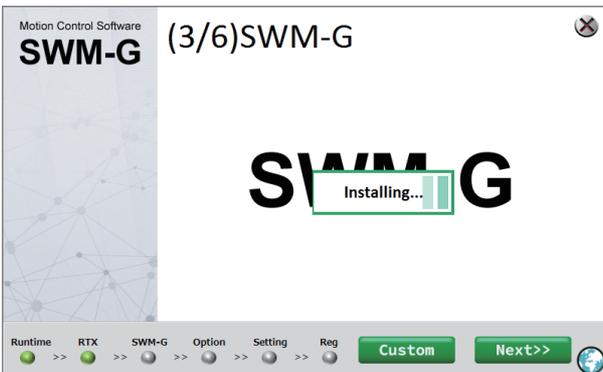
2. Installation of RTX starts. When the installation is completed, proceed to the next step (3/6).

Installing SWM-G

Install SWM-G.



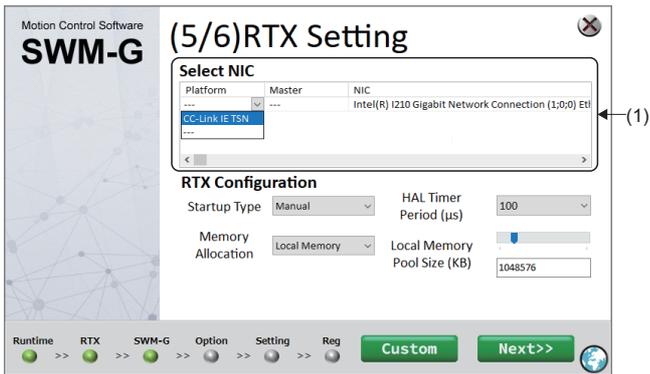
1. The "(3/6)SWM-G" window appears. Click the [Next>>] button.



2. Installation of SWM-G starts. When the installation is completed, proceed to the next step (5/6).

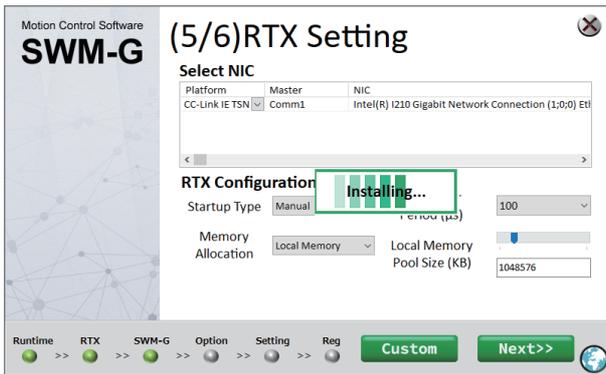
RTX setting

Update the parameter settings of RTX, NIC driver, and "RtxTcplp.ini" file.



1. The "(5/6)RTX Setting" window appears. Select the following from the Platform and Master pull-down lists in [Select NIC] (1), and click the [NEXT>>] button.
 - Platform (communication method): CC-Link IE TSN, EtherCAT*1
 - Master (connection port): Comm1 or Comm2*2

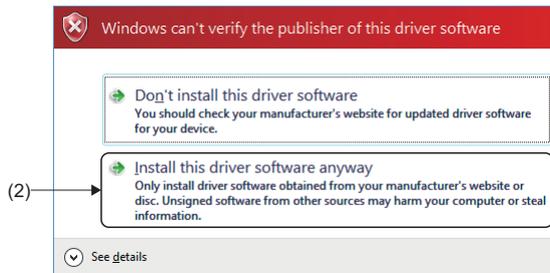
*1: EtherCAT can only be selected for SWM-G-N1.
*2: Comm2 can be selected when NIC driver is used with two ports.



2. Setting of the NIC driver starts.
3. When the setting is completed, proceed to the next step (6/6).

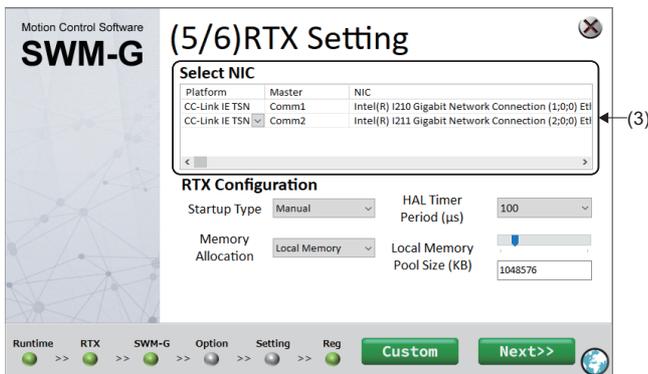
Point

- When the driver signature enforcement is enabled, the following warning message may appear. Click [Install this driver software anyway] (2). For how to disable the driver signature enforcement, refer to the following.
 - ☞ Page 33 How to Disable "Driver Signature Enforcement" in Windows

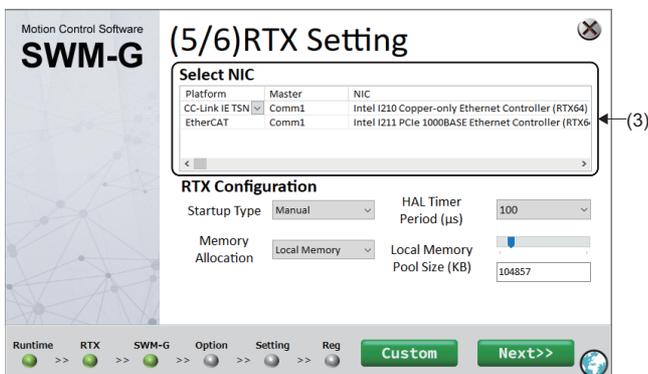


NIC driver selection

- Up to two NIC drivers can be assigned. When there are multiple NIC drivers that can be used with SWM-G, the available NIC drivers are displayed in [Select NIC] (3). Set Platform (CC-Link IE TSN) and Master (Comm1 or Comm2) for the NIC drivers to be used respectively.



- When using SWM-G-N1, "CC-Link IE TSN" or "EtherCAT" can be selected for the Platform (communication method). Assign a connection port starting from "Comm1" for each set communication method.

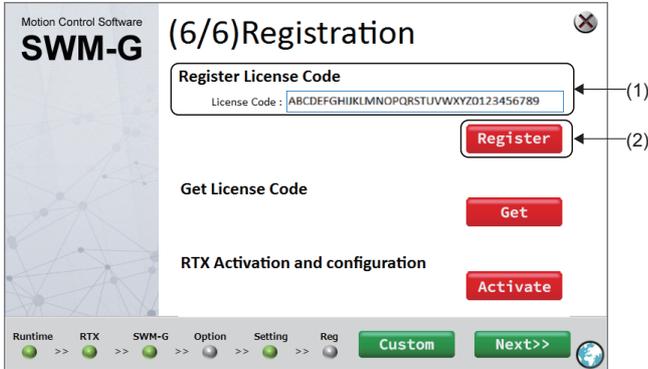


Registration

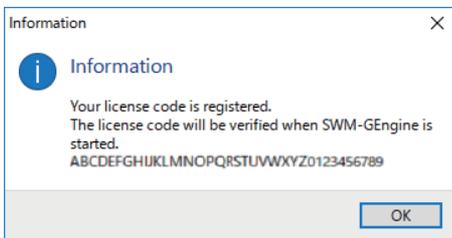
Register the license.

License authentication of SWM-G

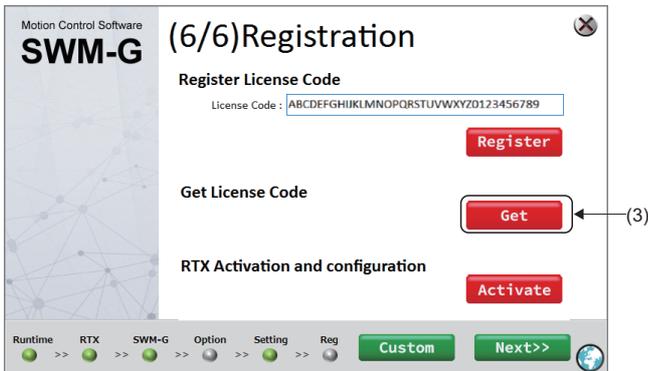
Enter the license code described in the license agreement, authenticate the license of SWM-G, and save the registration file where the information required for support is recorded.



1. The "(6/6)Registration" window appears. Enter the license code in [License Code] (1) under [Register License Code], and click the [Register] button (2).



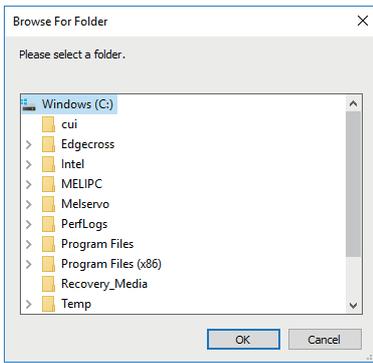
2. When the license has been registered, a registration completion message appears. Click the [OK] button.



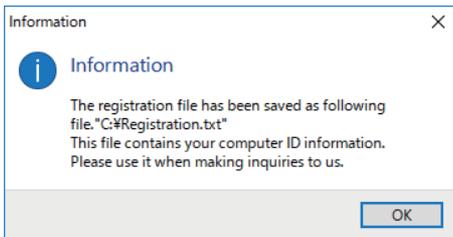
3. The "(6/6)Registration" window appears. Insert the USB key to the USB port in the personal computer, and click the [Get] button (3).



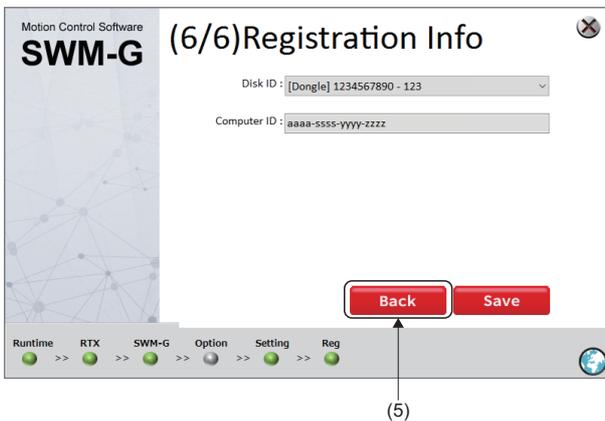
4. The "Registration Info" window appears. When the USB key is authenticated, the information of the USB key is displayed. Click the [Save] button (4).



5. The "Browse For Folder" window appears. Select the saving destination of the registration file, and click the [OK] button.



6. When the registration file is saved, a saving completion message appears. Click the [OK] button.
 - *: The registration file is saved in the saving destination with the following file name.
 - Registration.txt



7. The window returns to the "Registration Info" window. Click the [Back] button (5).

CAUTION

- The saved registration file (Registration.txt) contains the information required for support. Keep it in a safe place by the customer.
-

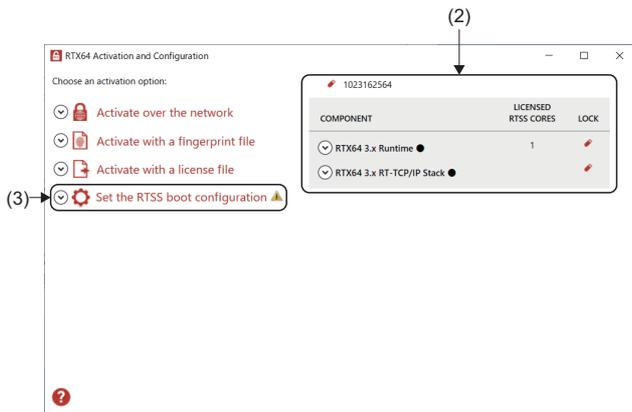
License authentication of RTX and core assignment

Authenticate the license of RTX with the USB key.



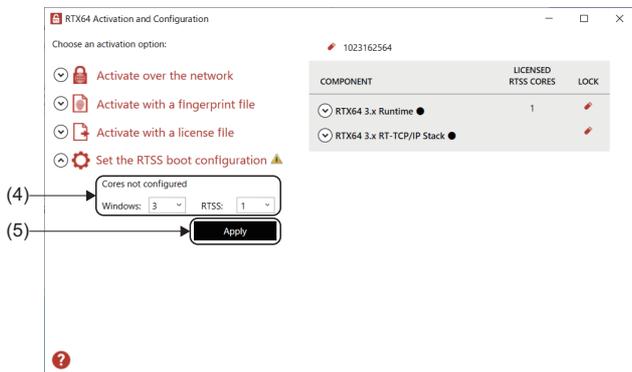
1. Insert the USB key to the USB port in the personal computer, and click the [Activate] button (1).

2



2. The "Activation and Configuration" window appears. When the USB key inserted to the personal computer is authenticated, the information of the USB key (2) is displayed.

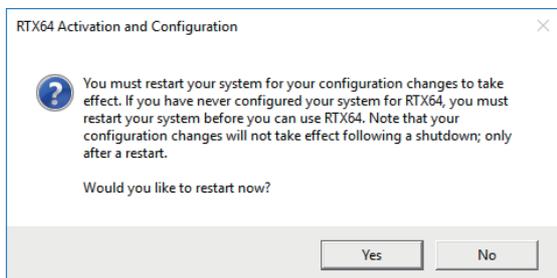
3. Click [Set the RTSS boot configuration] (3).



4. The setting item (4) of [Set the RTSS boot configuration] is displayed. Check the number of CPU cores of the personal computer used, and set "1" in [RTSS], and assign remaining cores to Windows.

*1: The window on the left shows a setting example when the number of CPU cores is "4".

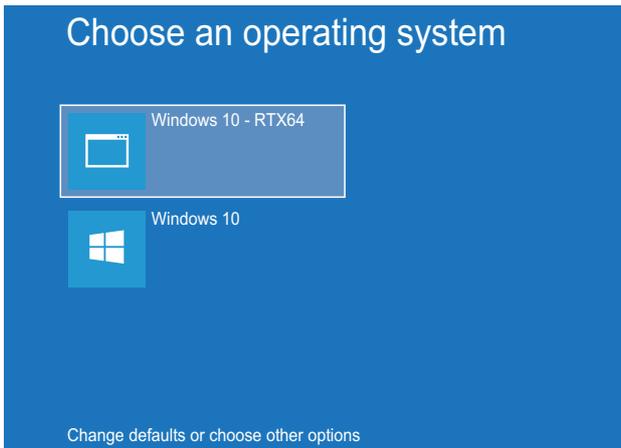
5. When the setting is completed, click the [Apply] button (5).



6. A restart confirmation message appears. Click the [Yes] button to restart the personal computer.

Restarting the personal computer

After authenticating the license, select the operating system which is used after the restart of the personal computer.

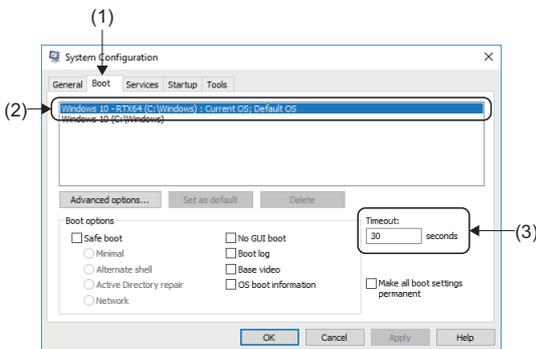


1. When the personal computer is restarted, the "Choose an operating system" window appears. Click [Windows 10 - RTX64].

*1: To use SWM-G, always select [Windows 10 - RTX64].

How to adjust the "Choose an operating system" window

Setting the time to display the "Choose an operating system" window can adjust the display time at the startup.



1. Select [Windows Administrative Tools] ⇒ [System Configuration] from the Windows start menu to display the "System Configuration" window. Select the [Boot] tab (1) in the "System Configuration" window.
2. Select "Windows 10 - RTX64 (C:\WINDOWS)" (2) and enter the time to timeout to be set in [Timeout] (3).
3. Click the [Apply] button to set the time to timeout.

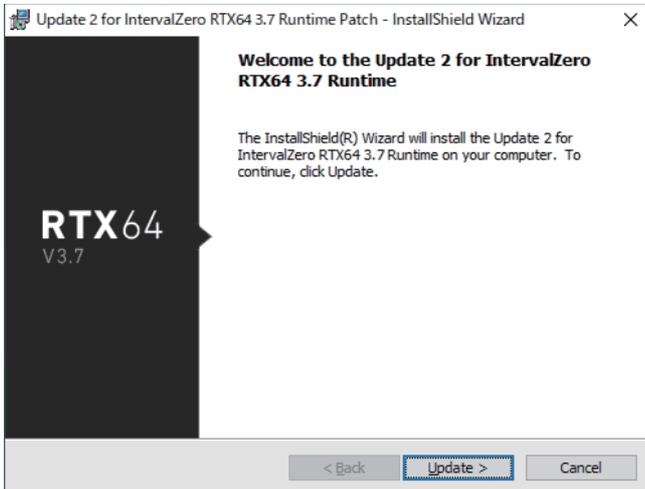
Applying the RTX update file

Apply the RTX update module to perform update.

Point

If the setup file of "Update_□_for_RTX64_###_Runtime_Setup.exe" exists in the "RTX" folder, perform the update.

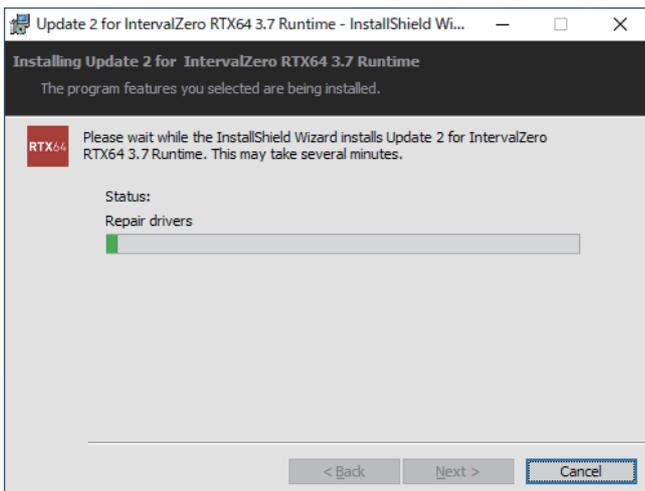
If the file does not exist in the "RTX" folder, the update is not required.



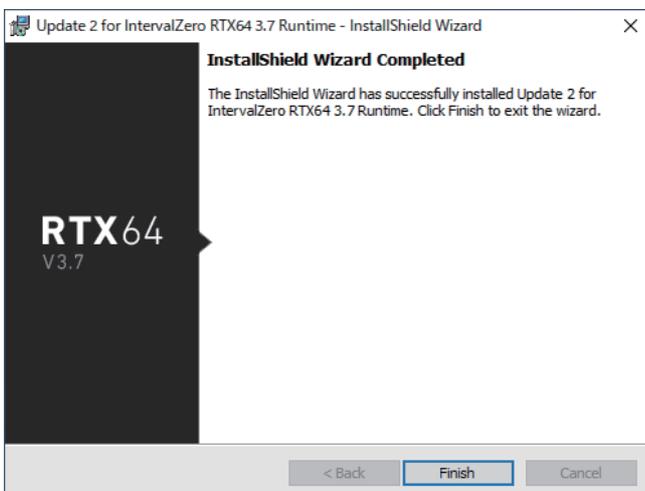
1. Select the "sw1dnn-swmg-m_****^{*1}" folder ⇒ "SWM-Ginstaller" folder ⇒ "RTX" folder of the download module, and double-click "Update_□_for_RTX64_###_Runtime_Setup.exe^{*2}_{^{*3}}".

^{*1}: **** = SWM-G version
^{*2}: □ = RTX update module version
^{*3}: ### = RTX version

2. The RTX installation window appears. Click the [Update] button.



3. The RTX update starts.



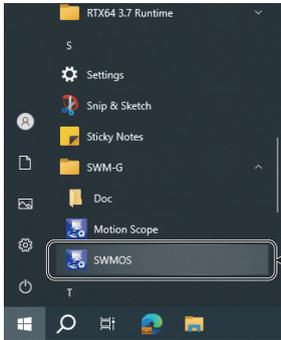
4. When the update is completed, the "InstallShield Wizard Completed" window appears.
5. Click the [Finish] button to end the update.

Checking the installation

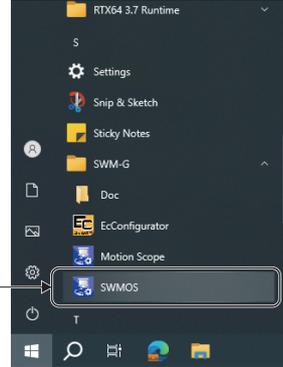
After SWM-G is installed, it is registered in the start menu.

■SWM-G

<When using SWM-G>



<When using SWM-G-N1>

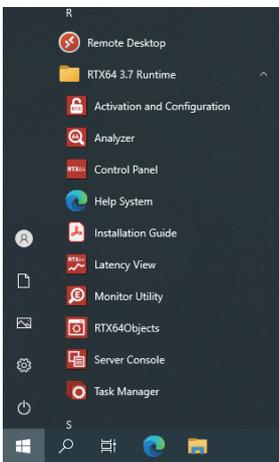


1. Check that "SWM-G" and "RTX64 ### Runtime^{*1}" have been registered in the Windows start menu.

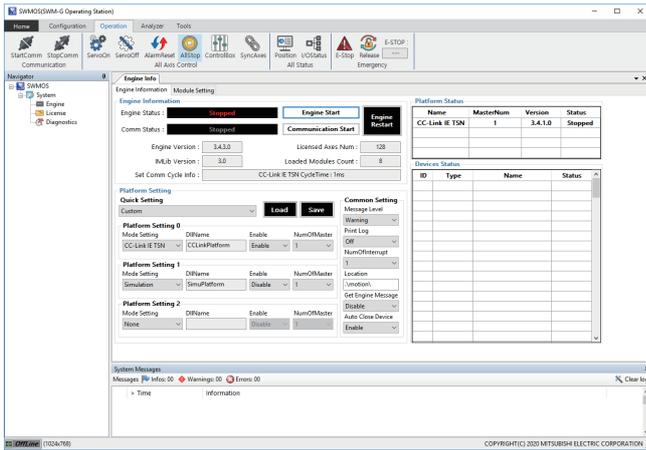
*1: ### = RTX version

2. Select [SWM-G] ⇒ [SWMOS] (1) from the Windows start menu to start SWMOS.

■RTX64 ### Runtime^{*1}



"SWMOS" window



- When SWMOS is started, the "Getting started" window and "RtxServer" window appear at the same time as the "SWMOS" window.

"SWMOS" window

Configure the settings in SWMOS.

"Getting started" window

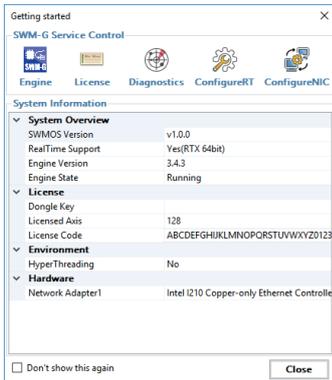
The system version and license information are displayed.

- *: If you select "Don't show this again" and click the [Close] button to close the window, the "Getting started" window will not be displayed at the next startup.

"RtxServer" window

The SWMOS status is displayed.

"Getting started" window

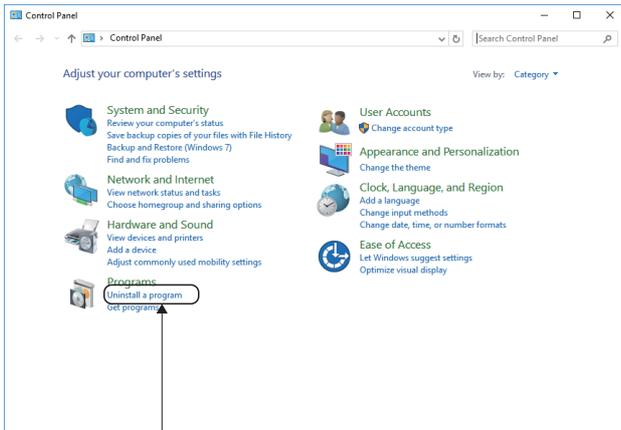


"RtxServer" window

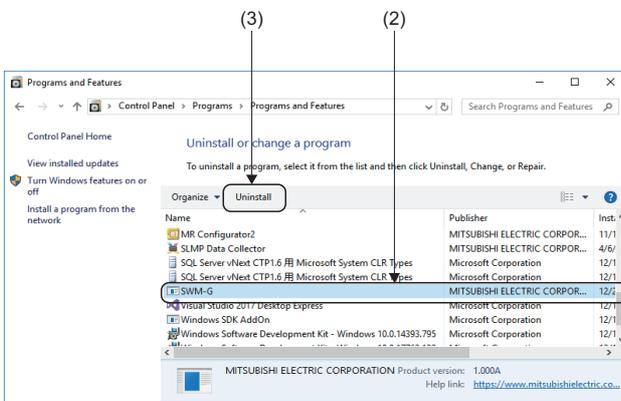


2.3 Uninstallation Procedure

Uninstall SWM-G.



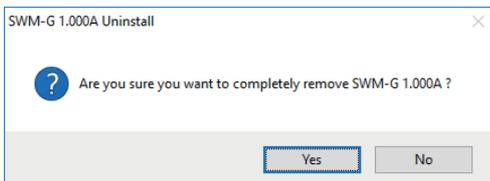
(1)



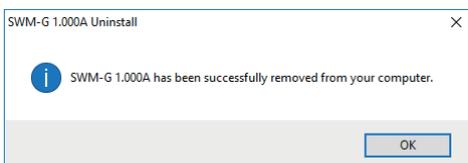
1. Select [System Tools] ⇒ [Control Panel] from the Windows start menu to display the "Control Panel" window.
2. Click [Uninstall a program](1) in [Programs].

3. The "Programs and Features" window appears. Select "SWM-G" (2) in the list of "Uninstall or change a program", and click [Uninstall] (3).

*1: For uninstalling RTX, select "IntervalZero RTX64 ###Runtime*2".
*2: ### = RTX version



4. An uninstallation confirmation message appears. Click the [Yes] button to start the uninstallation.



5. When the uninstallation is completed, a completion message appears. Click the [OK] button to end the uninstallation.

3 TROUBLESHOOTING

This section describes errors that may occur during installation and actions to be taken.

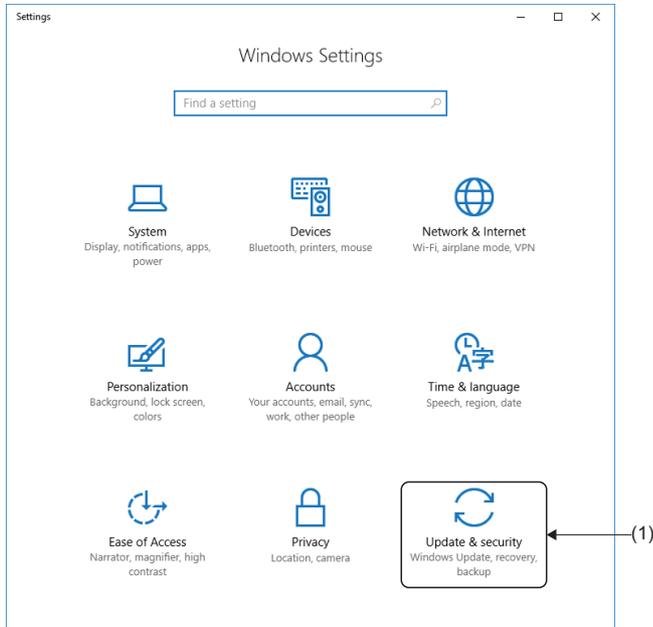
Description	Cause	Action
Installation fails. The installer stops halfway, or the installer suddenly ends during the installation.	The free space in the hard disk is insufficient.	Increase the free space in the hard disk, and then retry the installation.
The USB key authentication fails.	The Windows license authentication has not been completed.	Authenticate the Windows license, and then retry the authentication with the USB key.
	The USB key has not been inserted to the personal computer.	Check if the USB key is inserted to the personal computer. If the USB key is already inserted, remove the USB key from the personal computer and then insert it again.
The SWM-G license authentication fails.	The license code is incorrect.	Check the license and input the license code again.

MEMO

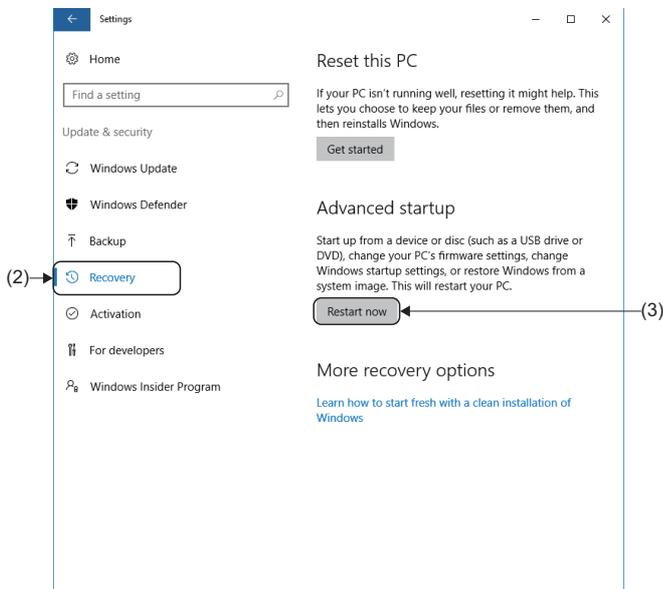
APPENDIX

Appendix 1 How to Disable "Driver Signature Enforcement" in Windows

When the driver signature enforcement is enabled, follow the procedure below to change the Windows settings.

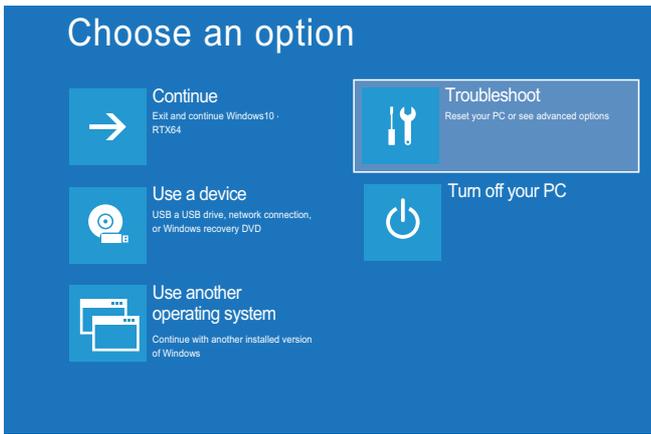


1. Click [Settings] from the Windows start menu. The "Windows Settings" window appears.
2. Click "Update & security" (1).

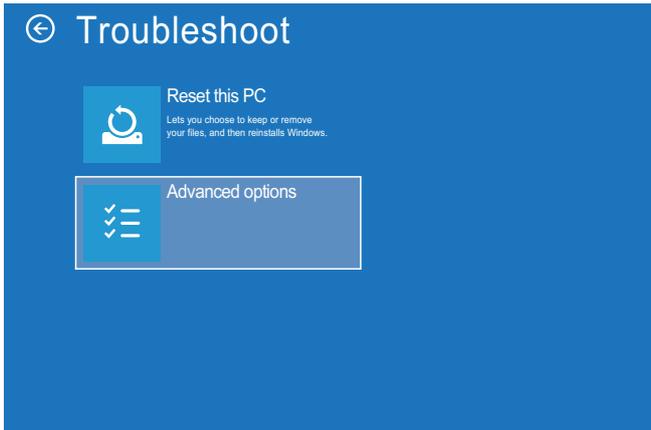


3. Click "Recovery" (2) from the menu on the left to display the recovery setting items.
4. Click the [Restart now] button (3) in "Advanced startup" to restart the personal computer.

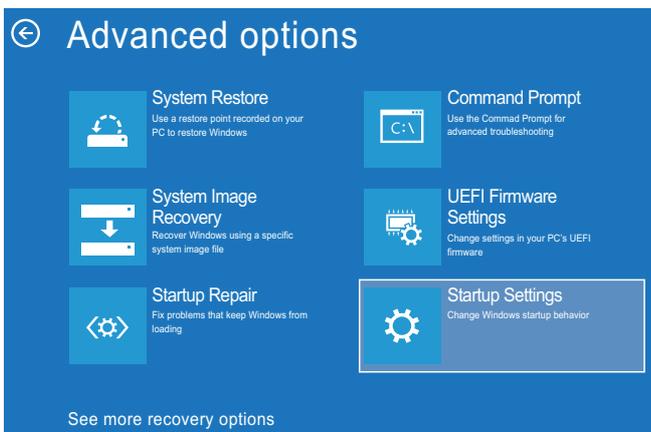




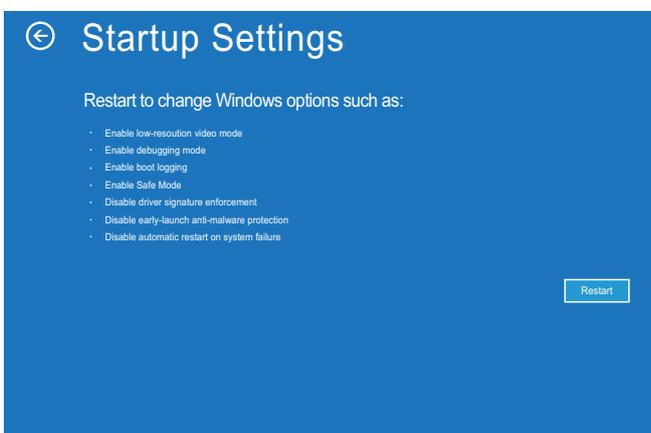
5. After the restart, the "Choose an option" window appears. Click "Troubleshoot".



6. The "Troubleshoot" window appears. Click [Advanced options].



7. The "Advanced options" window appears. Click [Startup Settings].



8. The "Startup Settings" window appears. Click the [Restart] button to restart the personal computer.

Startup Settings

Press a number to choose from the options below:

Use number keys or functions keys F1-F9.

- 1) Enable debugging
- 2) Enable boot logging
- 3) Enable low-resolution video
- 4) Enable Safe Mode
- 5) Enable Safe Mode with Networking
- 6) Enable Safe Mode with Command Prompt
- 7) Disable driver signature enforcement
- 8) Disable early launch anti-malware protection
- 9) Disable automatic restart after failure

Press F10 for more options

Press Enter to return to your operating system

9. The "Startup Settings" window appears. Press 7.

10. When the setting is completed, Windows starts.

Appendix 2 Profile (CSP+) of the Remote Station

Precautions

- A profile is data that stores information of a connected device (such as the model). Profiles that can be used with SWM-G are automatically added at installation. Profiles can be added manually, but if a profile of a version not supported by SWM-G is added, it will not operate normally. For the supported profiles, contact our sales representative.

Appendix 3 Procedure for Changing from SWM-G to SWM-G-N1

This section describes the procedure for changing to SWM-G-N1 after installing SWM-G.

When SWM-G is already installed, only SWM-G-N1 can be selected from the select install window.

Refer to Product Configuration (Page 8 Product Configuration), and prepare the following license and download module for installing SWM-G-N1.

License	Product name
License	MR-SWGM□N1-U ^{*1}
Download module	sw1dnn-swmgn1-m_****.zip ^{*2}

*1 □ = Number of axes (16, 32, 64, 128)

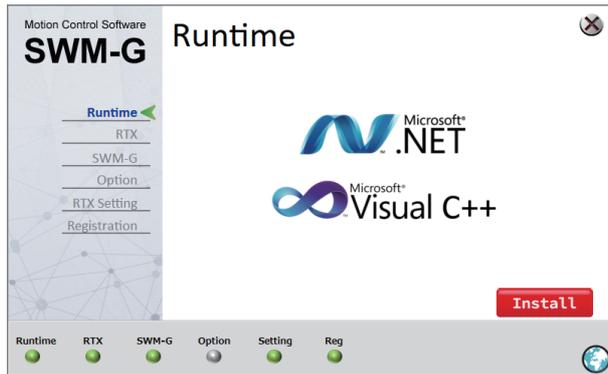
*2 **** = SWM-G-N1 version

Point

It is also possible to change from SWM-G-N1 to SWM-G. Follow the same procedure using the SWM-G license and download module.

Starting the installer

Start the installer.



1. Unzip the download module to any location on the personal computer and double-click "SWM-G Installer.exe" in the "sw1dnn-swmgn1-m_****^{*1}" folder ⇒ "SWM-GN1installer" folder.

*1: **** = SWM-G-N1 version

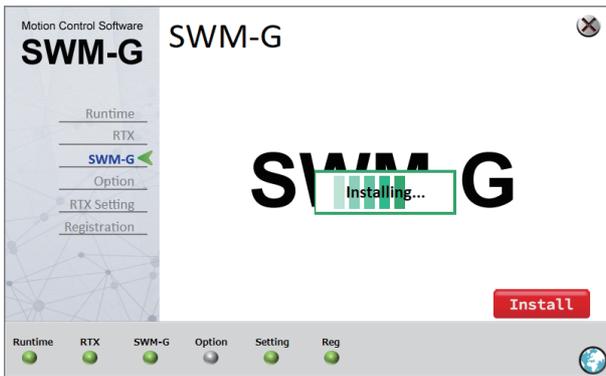
2. The SWM-G-N1 installation window appears.

Installing SWM-G-N1

Install SWM-G-N1.



1. Select "SWM-G" (1) from the menu on the left in the Select Install window.
2. The "SWM-G" window appears. Click the [Install] button (2).



3. Start the SWM-G install.

Precautions

- When uninstalling SWM-G is required, the following warning message appears. Click the [Yes] button, and this will start uninstalling the installed SWM-G. When the uninstall has completed, SWM-G-N1 will automatically install.



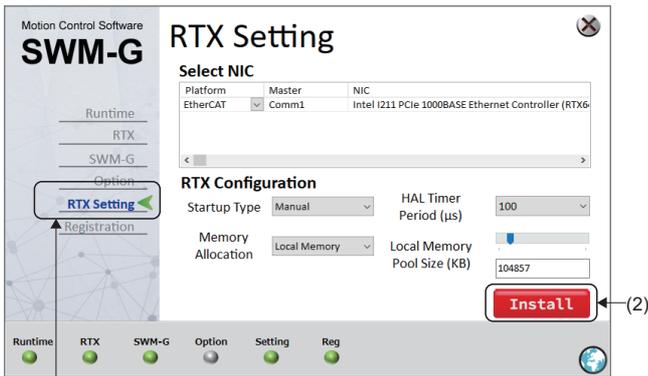
- The following folders and files will not be updated or deleted when installing or uninstalling. If the following folders and files do not exist when installing, they will be newly created upon installation.

Folder name/File name	Description
SWM-G	SWM-G installation folder
module.ini	Module setting file
module.ini.bak	Module setting backup file
CSPP	CC-Link IE TSN profile folder
ESI ^{*1}	EtherCAT profile folder
Platform	Platform related folder
CCLink	CC-Link IE TSN related folder
cclink_network.def	Network setting file
RtxTcplp.ini	NIC setting file
RtxTcplp.ini.bak	NIC setting backup file
EtherCAT ^{*1}	EtherCAT related folder
ec_network.def ^{*1}	Network setting file
RtxTcplp.ini ^{*1}	NIC setting file
RtxTcplp.ini.bak ^{*1}	NIC setting backup file
Simu	Simulation related folder
simu_network.def	Network setting file
SWMOS	SWMOS related folder
SWMOSPack	SWMOS parameter related folder
ConfigureNIC_DeviceList_CCLink.ini	NIC device list

*1 SWM-G-N1 only

RTX setting

Update the parameter settings of RTX, NIC driver, and "RtxTcplp.ini" file.

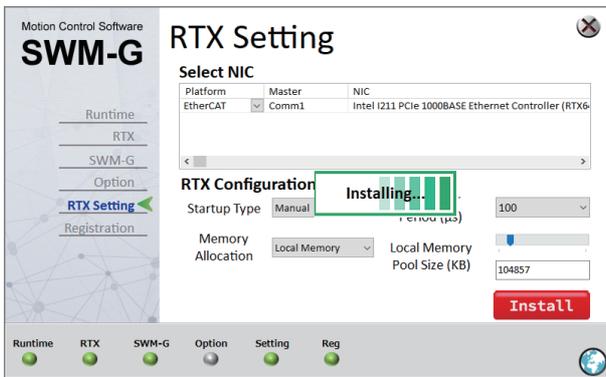


(1)

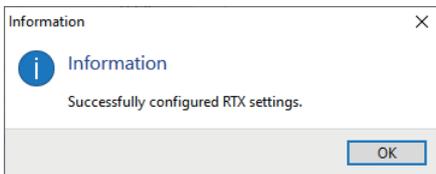
1. Select "RTX Setting" (1) from the menu on the left of the select install window.
2. The "RTX Setting" window appears. Configure the RTX settings, and click the [Install] button (2).

For RTX setting, refer to the following.

➔ Page 21 RTX setting



3. Setting of the NIC driver starts.

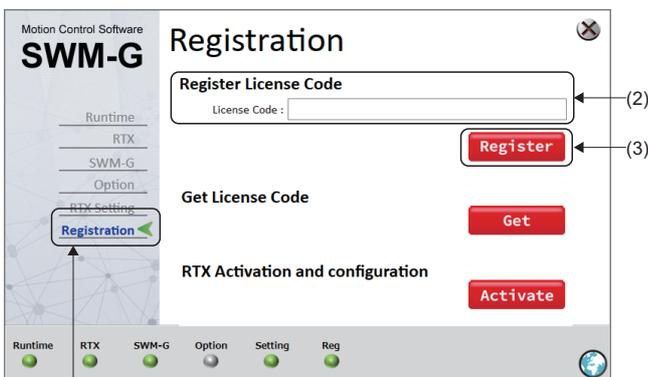


4. When the setting is completed, a configuration completed message appears. Click the [OK] button.



Registration

Register the SWM-G-N1 license.



(1)

1. Select "Registration" (1) from the menu on the left of the select install window.
2. The "Registration" window appears. Register the license. Enter the license code in [License Code] (2) under [Register License Code] and click the [Register] button (3).

For license registration, refer to the following.

➔ Page 23 License authentication of SWM-G

REVISIONS

*The manual number is given on the bottom left of the back cover.

Revision date	*Manual number	Description
February 2021	IB(NA)-0300561ENG-A	First edition
October 2021	IB(NA)-0300561ENG-B	■Added or modified parts Section 1.2, 2.2
June 2022	IB(NA)-0300561ENG-C	■Added or modified parts Section 1.2, 2.2
January 2023	IB(NA)-0300561ENG-D	■Added or modified parts Section 1.2, 2.2, Appendix 2
May 2023	IB(NA)-0300561ENG-E	■Added or modified parts Section 1.1
August 2024	IB(NA)-0300561ENG-F	■Added or modified parts INTRODUCTION, RELEVANT MANUALS, TERMS, Section 1.1, 1.2, Chapter 2, Section 2.1, 2.2, Appendix 3

Japanese manual number: IB-0300558-F

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

For terms of warranty, please contact your original place of purchase.

[Gratis Warranty Range]

- (1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
- (2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
 1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
 2. Failure caused by unapproved modifications, etc., to the product by the user.
 3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
 4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
 5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
 6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
 7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

- (1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
- (2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:

- (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
- (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
- (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
- (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

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MODEL: SWMG-U-INS-E

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