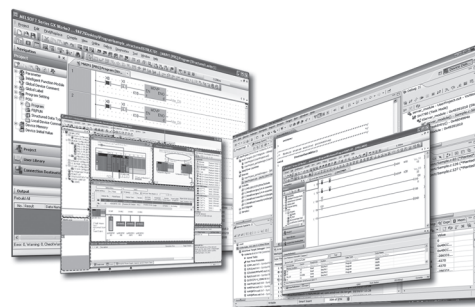




Engineering Software

CW Workbench 4 Operating Manual

-SW1DND-CWW4-E



Powered by
WIND RIVER

CW Workbench 4 was jointly developed by Mitsubishi and
Wind River Systems, Inc.



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. For the safety precautions for the system, refer to the user's manual for the module used.

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

- When performing the following operations and controlling external devices, configure an interlock circuit in a user program to ensure that the entire system will always operate safely.
 - (1) Changing data on the running MELIPC by connecting the development environment (personal computer) to the MELIPC
 - (2) Changing the operating status
 - (3) Operating the MELIPC from the development environment (personal computer)

Especially, in the above mentioned operations that are performed from an external device to a remote MELIPC, any problems on the MELIPC may not be dealt with promptly due to an abnormal data communication.

To prevent this, configure an interlock circuit in a user program, and determine corrective actions to be taken between the external device and the MELIPC in case of a communication failure.

[Startup and Maintenance Precautions]

WARNING

- When performing the following operations and controlling external devices, configure an interlock circuit in a user program to ensure that the entire system will always operate safely.
 - (1) Changing data on the running MELIPC by connecting the development environment (personal computer) to the MELIPC
 - (2) Changing the operating status
 - (3) Operating the MELIPC from the development environment (personal computer)Especially, in the above mentioned operations that are performed from an external device to a remote MELIPC, any problems on the MELIPC may not be dealt with promptly due to an abnormal data communication.
To prevent this, configure an interlock circuit in a user program, and determine corrective actions to be taken between the external device and the MELIPC in case of a communication failure.
-

[Startup and Maintenance Precautions]

CAUTION

- Before performing online operations (especially, program change, forced output, and operation status change) for the running MELIPC from an external device connected, read the manual for the MELIPC carefully and ensure the safety. Improper operation may damage machines or cause accidents.
-

CONDITIONS OF USE FOR THE PRODUCT

(1) Mitsubishi industrial PC ("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 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'S 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 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 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 representative in your region.

INTRODUCTION

Thank you for purchasing CW Workbench 4.

This manual describes the procedures for operation, system configuration, and troubleshooting required for using CW Workbench 4.

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance to handle CW Workbench 4 correctly.

Please make sure that the end users read this manual.

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RELEVANT MANUALS

Manual name [manual number]	Description	Available form
CW Workbench 4 Operating Manual [SH-081940ENG] (this manual)	Explains the system configuration, specifications, functions, and troubleshooting of CW Workbench 4.	e-Manual PDF

Point

e-Manual refers to the Mitsubishi 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.
- Hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
C Controller module dedicated function	A dedicated function library used for controlling a MELIPC.
CW Workbench 4	An abbreviation for the engineering tool for Mitsubishi Electric Industrial PC, CW Workbench 4.
Dedicated function library	A generic term for C Controller module dedicated function and MELSEC data link function.
Existing CW Workbench	A generic term for the following engineering tools for C Controller modules. CW Workbench 3.2 CW Workbench 3.3
Fan module	An abbreviation for a fan module for Mitsubishi Electric Industrial PC, MI5FAN.
Main module	An abbreviation for a main module for Mitsubishi Electric Industrial PC, MI5122.
MELIPC	An abbreviation for Mitsubishi Electric Industrial PC, MI5122-VW It comprises a main module, a power supply module, and a fan module.
MELSEC data link function	A dedicated function library used for accessing another station on a network.
MI Configurator	A generic product name for SWnDNN-MICONF ('n' indicates its version.)
Power supply module	An abbreviation for a power supply module for Mitsubishi Electric Industrial PC, MI5A1P.
Virtual Ethernet	A virtual network that connects the Windows part and VxWorks part in a MELIPC.
VxWorks	A product name for a real-time operating system manufactured by Wind River Systems, Inc.
VxWorks part	A device in which a real-time operating system VxWorks is embedded. The information acquired from a programmable controller CPU or a CC-Link IE Field Network connected device via CC-Link IE Field Network can be processed in this section.
Wind River Workbench	A generic term for Wind River Workbench manufactured by Wind River Systems, Inc.
Windows part	A device in which Windows is embedded. Applications for processing complex calculations, such as data analysis, to process various information can run in this section.

MEMO

PART 1

FUNDAMENTALS OF CW Workbench 4

This part explains the basic specifications and procedures for using CW Workbench 4.

1 LICENSE FORMAT

2 SYSTEM CONFIGURATION

3 SOFTWARE SPECIFICATIONS

4 DEVELOPMENT PROCEDURE FOR USER PROGRAM

1 LICENSE FORMAT

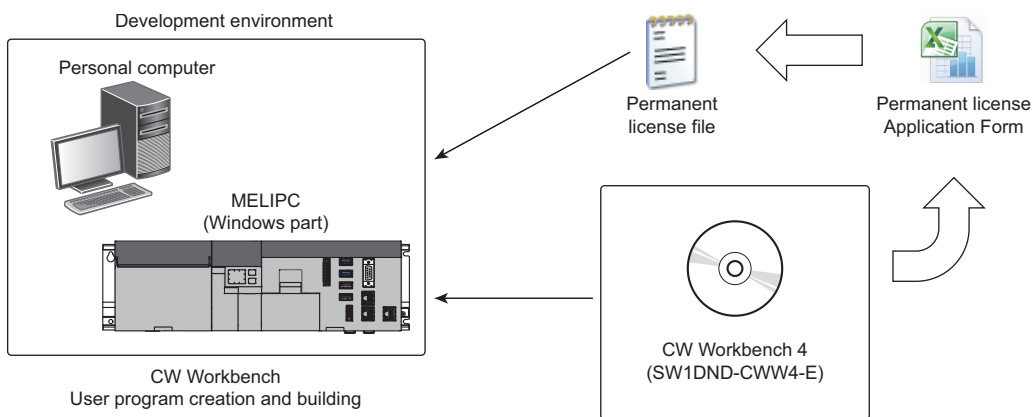
This chapter shows the license format of CW Workbench 4.

Depending on the current installation status of conventional CW Workbench and CW Workbench 4, a license that must be obtained differ.

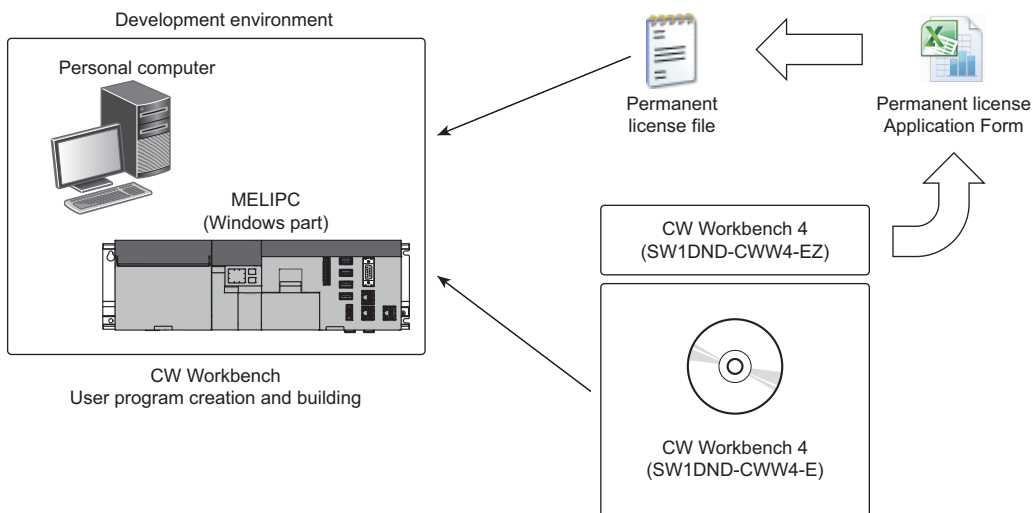
1.1 Newly Purchasing CW Workbench 4

When newly purchasing CW Workbench 4, a permanent license is required for each development environment (personal computer or MELIPC) used. If additional permanent license is required, purchase the additional license product for the number of development environments used.

Product with license



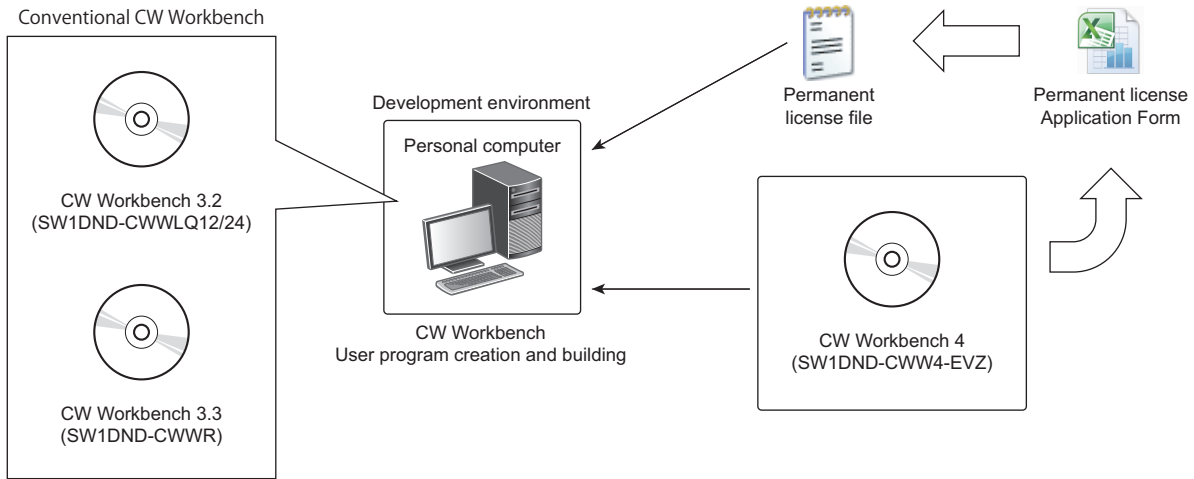
Additional license product



1.2 When conventional CW Workbench is employed

When conventional CW Workbench has already been employed, obtain CW Workbench 4 update license product.

Update license product



Precautions

Conventional CW Workbench and CW Workbench 4 must be installed in different folders. Additionally, they cannot be opened simultaneously.

Conventional CW Workbench

The conventional CW Workbench applications for which an update license is required are as follows.

■MELSEC iQ-R series

- CW Workbench 3.3 (SW1DND-CWWR)

■MELSEC-Q series

- CW Workbench 3.2 (SW1DND-CWWLQ12/24)

2 SYSTEM CONFIGURATION

This chapter shows the system configuration of CW Workbench 4.

2.1 Development Configuration

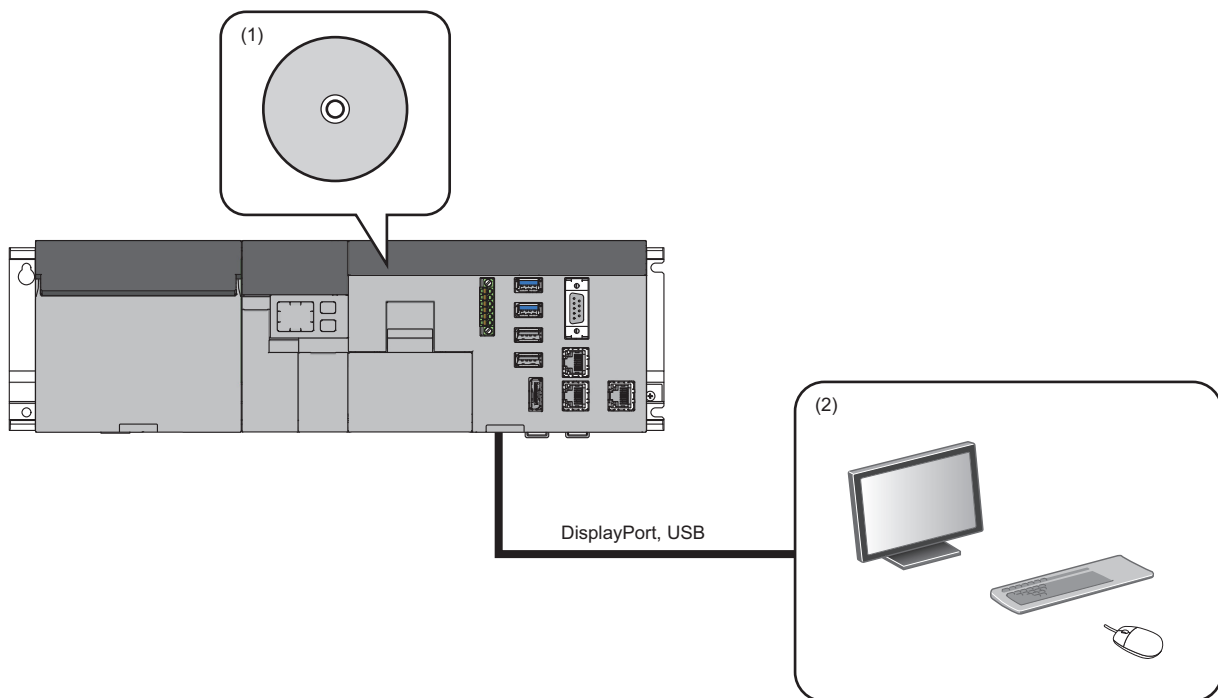
This section shows the configurations for development in CW Workbench 4.

Standalone development configuration

In a standalone development configuration, install CW Workbench 4 on the Windows part of a MELIPC, and develop a user program for the VxWorks part.

The operation of the user program can be checked after compilation without preparing another personal computer for checking the operation.

This configuration is effective when developing a user program of a MELIPC and debugging it in the same machine.



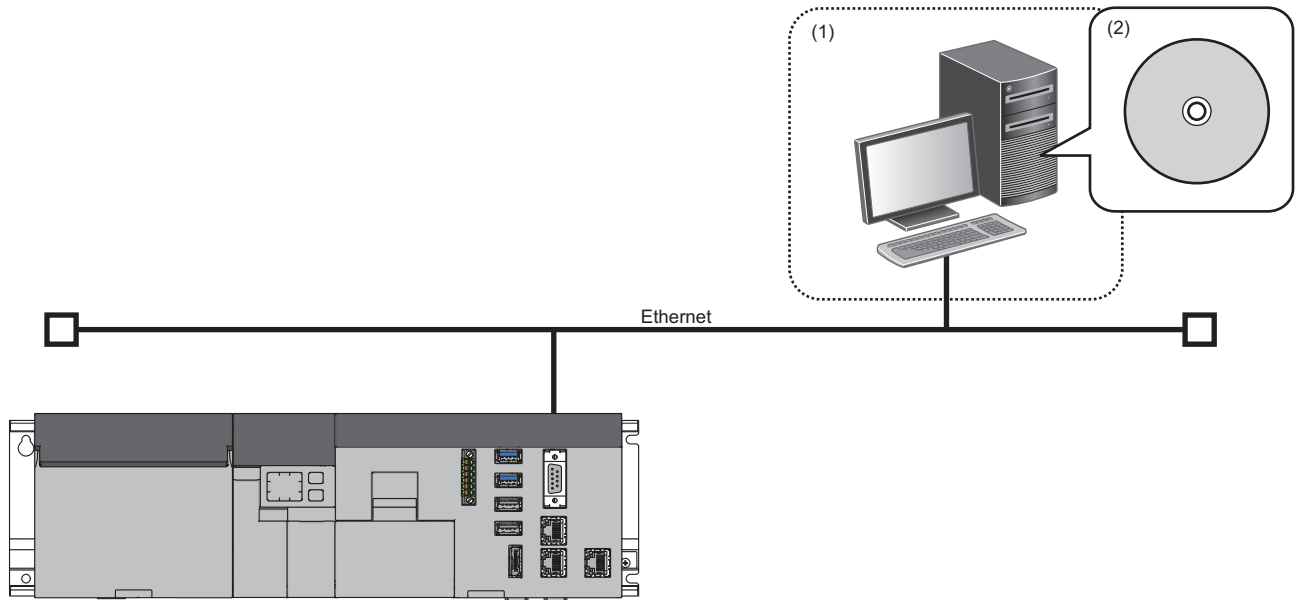
(1) CW Workbench 4

(2) Peripheral devices (such as a monitor, keyboard, and mouse)

Cross development configuration

In a cross development configuration, install CW Workbench 4 on another development environment than MELIPC mainly used, and develop a user program for the VxWorks part.


This configuration is optimum for developing embedded programs. Moreover, the licenses of development tools can be stored on the same development personal computer.



(1) Development environment (personal computer)
(2) CW Workbench 4

Point

To develop a user program on the VxWorks part of a MELIPC, CW Workbench 4 is necessary; therefore, in a standalone development configuration, a license of CW Workbench 4 is required for the number of MELIPCs used. When not to debug a user program on the MELIPC or when operating the same program on multiple MELIPCs, develop a user program in a cross development configuration.

Depending on the development environment, the number of required licenses for CW Workbench 4 differs. Either of the development configurations above which is suitable for the actual development scale should be applied. ( Page 12 LICENSE FORMAT)

2.2 Operating Environment

This section shows the operating environment of CW Workbench 4.

Standalone development configuration

The following shows the operating environment for a standalone development configuration.



In a standalone development configuration, CW Workbench 4 operates on a MELIPC.

For the specifications of MELIPCs, refer to the following manual.

MELIPC MI5000 Series User's Manual (Startup)

Item	Description
Personal computer	MELIPC
Free hard disk space	<ul style="list-style-type: none">• Installed size: 6 GB or more• Execution size: Virtual memory 512 MB or more
Display	Resolution 1024 × 768 dots or more
Disk drive	DVD-ROM drive
Interface	Ethernet (10BASE-T/100BASE-TX/1000BASE-T)
OS*1,*2,*3,*4 (Japanese/English/Chinese)	Windows® 10 IoT Enterprise (64-bit version)

*1 When installing or uninstalling CW Workbench 4, log on as a user with Administrator privileges.

*2 To use CW Workbench 4, TCP/IP must be installed.

*3 The following functions cannot be used.

Application startup in Windows compatibility mode

Remote desktop

Windows Touch or Touch

*4 In the following case, the screen of this product may not work properly.

The size of the text and/or other items on the screen is default (such as 96 DPI, 100%, and 9 pt).

Cross development configuration

The following shows the operating environment for a cross development configuration.

When installing CW Workbench 4 on a personal computer

Item	Description
Personal computer	A personal computer on which Windows® operates
CPU	Intel® Core™ 2 Duo 2 GHz or more
Memory requirements	<ul style="list-style-type: none">• 64-bit version operating system: 2 GB or more• 32-bit version operating system: 1 GB or more (2 GB or more recommended)
Free hard disk space	<ul style="list-style-type: none">• Installed size: 6 GB or more• Execution size: Virtual memory 512 MB or more
Display	Resolution 1024 × 768 dots or more
Disk drive	DVD-ROM drive
Interface	Ethernet (10BASE-T/100BASE-TX/1000BASE-T)
OS ^{*1,*2,*3,*4} (Japanese/English)	Windows 10 (Home, Pro, Enterprise, IoT Enterprise ^{*5}) Windows 8.1, Windows 8.1 (Pro, Enterprise) Windows 8, Windows 8 (Pro, Enterprise) Windows 7 (Professional, Ultimate, Enterprise)

*1 When installing or uninstalling CW Workbench 4, log on as a user with Administrator privileges.

*2 To use CW Workbench 4, TCP/IP must be installed.

*3 The following functions cannot be used.

- Application startup in Windows compatibility mode
- Fast user switching
- Remote desktop
- Windows XP Mode
- Windows Touch or Touch

*4 In the following case, the screen of this product may not work properly.

The size of the text and/or other items on the screen is default (such as 96 DPI, 100%, and 9 pt).

*5 Only 64-bit version is supported.

When installing CW Workbench 4 on a MELIPC

When installing CW Workbench 4 on a MELIPC, refer to the operating environment described in the following section.

☞ Page 16 Standalone development configuration

2.3 Contents of a DVD-ROM

The installer DVD-ROM contains the following data.

Folder path	Content	Description
\	Installation execution file	A file used for installing CW Workbench 4.
	Permanent License Application Form	An application form for obtaining a permanent license.
\docs	Wind River Workbench manuals	A relevant manual for Wind River Workbench (PDF).
\manual	CW Workbench 4 Operating Manual	A manual for CW Workbench 4 (e-Manual).
\manual\e-Manual Viewer	Installation execution file (setup.exe)	A file for installing the tool for browsing e-Manual.
\brand \repos \yum.repos	CW Workbench 4 installation data file	A set of data files required for installing CW Workbench 4, which is provided by Wind River Systems, Inc.
\include\MI5122-VW	<ul style="list-style-type: none">• C Controller module dedicated function (CCPUFunc.h)• MELSEC data link function (MDFunc.h)	Header files for each dedicated function library.
\VxWorks	readme.txt	A file containing explanation for each file stored in the 'MI5122-VW' folder.
\VxWorks\MI5122-VW\XX*1	MI5122-VW_VSB_PRJ.zip	A VSB project file for MELIPCs.

*1 XX: The version of the stored VSB project for a MELIPC (MI5122-VW_VSB_PRJ.zip) is displayed.

2.4 Supported Module

The following product supports CW Workbench 4.

Product name	OS type	Supported Wind River Workbench
MI5122-VW	VxWorks 7	Wind River Workbench 4

3 SOFTWARE SPECIFICATIONS

This chapter shows the specifications of CW Workbench 4.

Item	Specifications
Supported host operating system	☞ Page 16 Operating Environment
Supported target operating system	VxWorks 7.0
Framework	Based on Wind River Workbench 4 (Eclipse 4.6.3)
Project creation and management	VxWorks Downloadable Kernel Module Project
Building	GNU compiler (GCC 4.8.1)

4 DEVELOPMENT PROCEDURE FOR USER PROGRAM

This chapter shows the procedure for developing a user program

1. Obtain a permanent license. (☞ Page 24 OBTAINING OF PERMANENT LICENSE)

Point

A trial version of this product can be used (for 30 days) by obtaining a temporary license without obtaining a permanent license. A temporary license can be obtained in the Product Maintenance menu at the installation of CW Workbench 4 or at the completion of the installation of CW Workbench 4.

2. Install CW Workbench 4. (☞ Page 26 INSTALLATION)
Install CW Workbench 4 on a MELIPC or a development personal computer.
3. Apply the permanent license. (☞ Page 33 APPLICATION OF PERMANENT LICENSE)
4. Apply a patch. (☞ Page 86 PATCH APPLICATION)
If there is a patch available for CW Workbench 4, apply it to CW Workbench 4.
5. Create a project. (☞ Page 36 PROJECT CREATION)
6. Build a user program. (☞ Page 54 BUILDING)
7. Debug the user program. (☞ Page 58 DEBUGGER)

MEMO

PART 2

INSTALLATION

This part explains the procedure for installing and uninstalling CW Workbench 4.

5 OBTAINING OF PERMANENT LICENSE

6 INSTALLATION

7 APPLICATION OF PERMANENT LICENSE

5 OBTAINING OF PERMANENT LICENSE

To use CW Workbench 4 perpetually, a permanent license is required.

5.1 Obtaining of a Permanent License

The following shows the procedure for obtaining a permanent license.

1. Obtain the Permanent License Application Form.

It can be obtained from the DVD-ROM of CW Workbench 4, or MITSUBISHI ELECTRIC FA Global Website.

2. Obtain the host information of the development environment where CW Workbench 4 is to be used.

For the method for obtaining the host information of the development environment, refer to the Permanent License Application Form (sample).

3. Fill out the Permanent License Application Form.

Directly enter the information on the Permanent License Application Form, 'PermanentLicenseApplicationForm.xls'.

Point 


For an update license, enter the same host information as the one registered to acquire the permanent license previously.

4. Send the Permanent License Application Form.

Attach it to an e-mail and send to the address written on the form.

5. A permanent license file is sent by e-mail from Mitsubishi Electric Corporation.

The e-mail will be replied within five working days.

6. Apply the permanent license. ( Page 33 APPLICATION OF PERMANENT LICENSE)

5.2 Obtaining of a Permanent License (Host Machine Transfer)

A new permanent license is required for a new development environment due to reasons such as when the development environment where CW Workbench 4 has been installed crashed.

The following shows the procedure for obtaining a permanent license again.

- 1.** Uninstall CW Workbench 4 from the personal computer if it is working. (☞ Page 111 Uninstallation)
- 2.** Delete the current permanent license. (☞ Page 110 Deletion of Permanent License)
Delete a permanent license file saved as a backup file as well.
- 3.** Obtain the License Transfer Certification Agreement Form.
It can be obtained from the DVD-ROM of CW Workbench 4, or MITSUBISHI ELECTRIC FA Global Website.
- 4.** Obtain the host information of the development environment where CW Workbench 4 is to be used.
For the method for obtaining the host information of the development environment, refer to the Permanent License Application Form (sample).
- 5.** Fill out the License Transfer Certification Agreement Form.
Directly enter the information on the License Transfer Certification Agreement Form, 'PermanentLicenseApplicationForm.xls'.
- 6.** Send the License Transfer Certification Agreement Form.
Fax the License Transfer Certification Agreement Form with your signature to your local Mitsubishi service center or representative where you purchased the product.
- 7.** A permanent license file is sent by e-mail from Mitsubishi Electric Corporation.
The e-mail will be replied within five working days.
- 8.** Install CW Workbench 4. (☞ Page 26 INSTALLATION)
- 9.** Apply the permanent license. (☞ Page 33 APPLICATION OF PERMANENT LICENSE)

Point

If you have lost the License Agreement and do not know the Product ID, contact your local Mitsubishi service center or representative and give them information filled out on the Permanent License Application Form.

- Company name, department name, and name of the representative person
 - E-mail address
 - Target CPU
-

6 INSTALLATION

This chapter shows the considerations for installation and procedure for installation.


6.1 Considerations for Installation


This section shows the considerations for installing CW Workbench 4.

- When installing CW Workbench 4, log on as a user with Administrator privileges.
- When inserting a DVD-ROM to a development environment, the installer runs automatically. When the AutoPlay dialog appears, select "RUN wscript.exe". If it does not start automatically, double-click 'setup.vbs' on the DVD-ROM to run the installer. Do not run multiple 'setup.vbs' files; otherwise, the installation may not complete successfully. In that case, run 'setup.vbs' again after uninstalling CW Workbench 4.
- CW Workbench 4 and conventional CW Workbench (CW Workbench 3.2 or CW Workbench 3.3) can be installed on the same development environment. Note that, when installing CW Workbench 4 on a personal computer where conventional CW Workbench is installed, install CW Workbench 4 to a different folder from the one where conventional CW Workbench is installed. Additionally, CW Workbench 4 and conventional CW Workbench cannot run at the same time.
- Do not install CW Workbench 4 on a personal computer where Wind River Workbench has already been installed. When installing CW Workbench 4, uninstall Wind River Workbench, or install CW Workbench 4 on another personal computer.
- CW Workbench 4 cannot be overwritten on a personal computer where CW Workbench 4 has already been installed. To install CW Workbench 4 again, uninstall CW Workbench 4 first, then install it again.
- For an installation destination folder name, do not use the character other than alphanumeric characters, hyphen (-), and underscore (_). (A space cannot be used.)
- If a permanent license is yet to be obtained, obtain a permanent license. If you do not have the Permanent License Application Form, obtain the application form from MITSUBISHI ELECTRIC FA Global Website, Mitsubishi representative, or overseas distributor.
- When installing CW Workbench 4 on Windows 7 or later, a screen to enable or disable User Account Control appears. Click "Allow" or the [Yes] button to proceed with the installation.

Installation with a temporary license

Before installing CW Workbench 4 with a temporary license, make sure that the development environment is connected to the Internet in order to obtain a temporary license file from the Internet. When a proxy server is used to connect to the Internet, setting an IP address and port number is required in the middle of the installation. Check the IP address and port number in advance.

When CW Workbench 4 is installed with a temporary license, CW Workbench 4 can be used for 30 days as a trial version. A full functional license is issued by obtaining a permanent license, then apply the permanent license. ( Page 24 OBTAINING OF PERMANENT LICENSE)

After the 30 days trial period, a license error message will appear. CW Workbench 4 can be used continuously by clicking the [Cancel] button; however, project creation, compilation, building, and debug function are not available. ( Page 84 LICENSE ERROR)

Installation with an update license

Enter the License Authorization Code, which is written on the License Agreement of the updated license product, to the LAC on the User Information.

6.2 Installation Procedure

This section show the procedure for installing CW Workbench 4.

Point

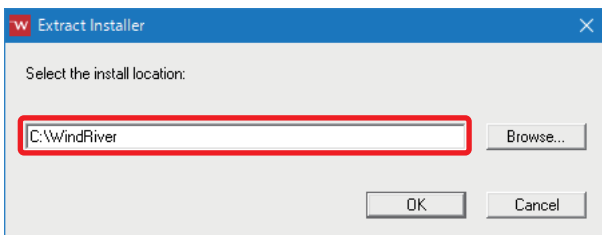
- To install CW Workbench 4 on a MELIPC, an external DVD drive is required.
- During the installation, a confirmation dialog box for user account control may appear. Read the message, and click "Allow" or the [Yes] button to proceed with the installation.

1. Insert the DVD-ROM to the DVD drive to start installation.

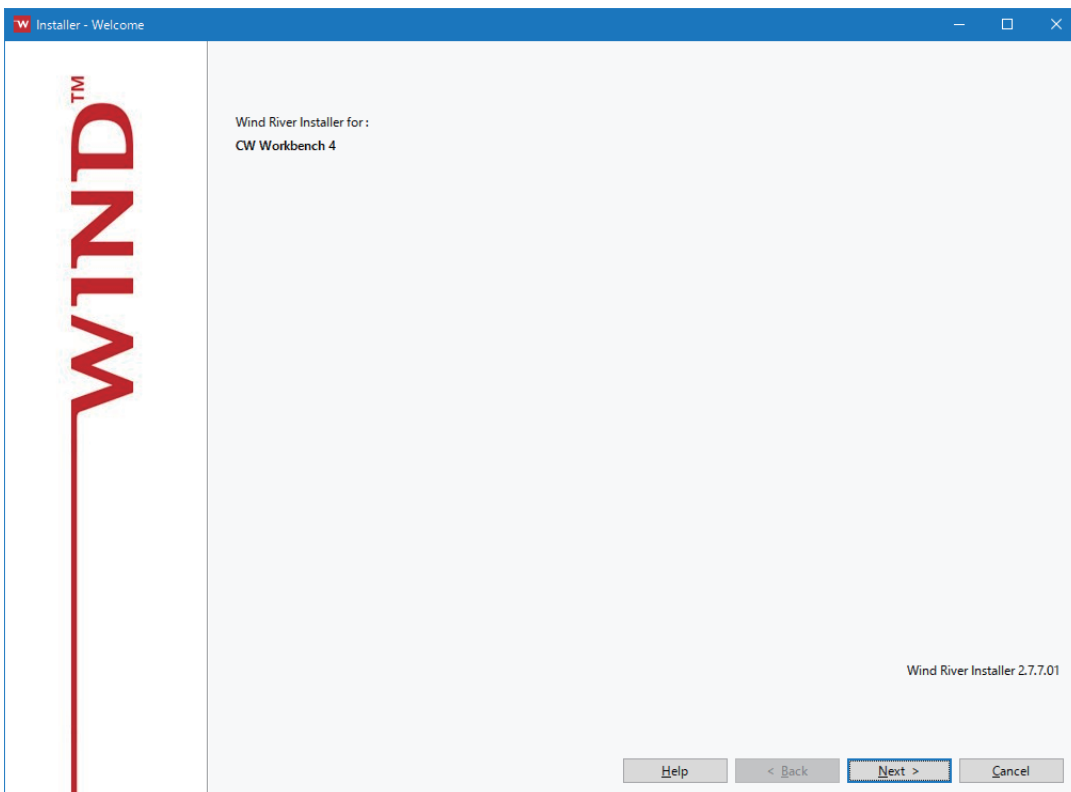
If the installer does not start automatically, double-click 'setup.vbs' on the DVD-ROM

2. Enter an installation destination folder name, and click the [OK] button.

A folder can be selected by clicking the [Browse] button and selecting a folder in the tree.

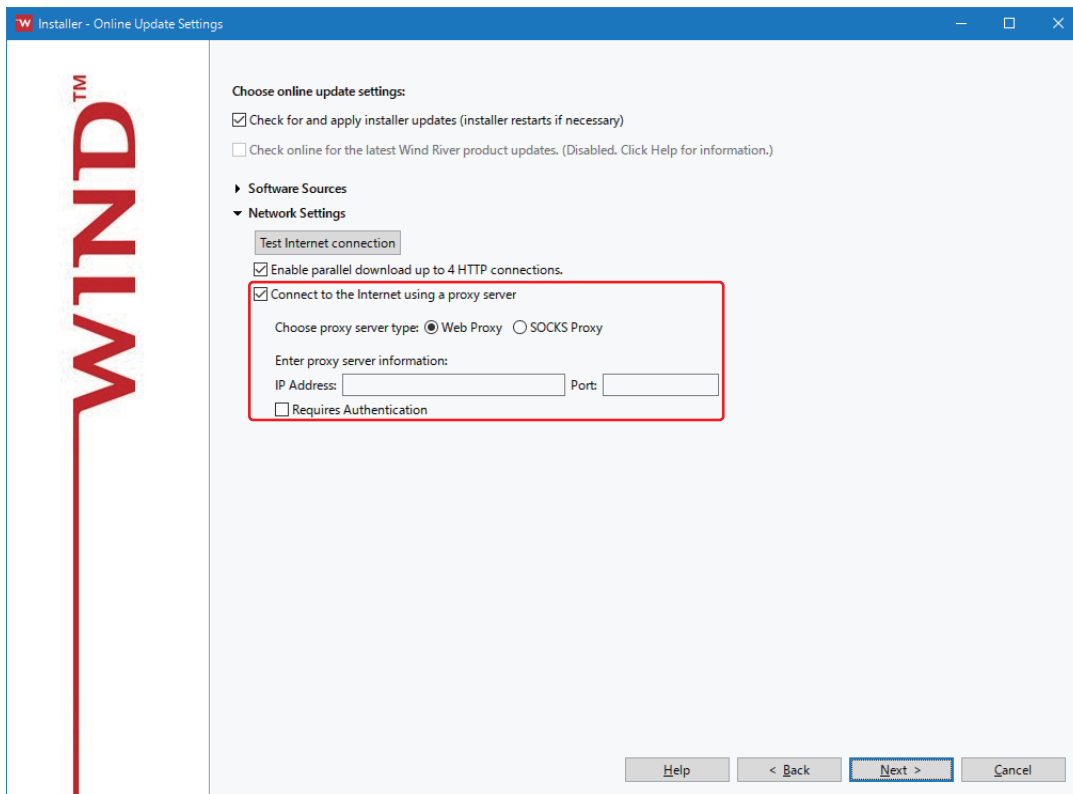


3. Click the [Next] button.



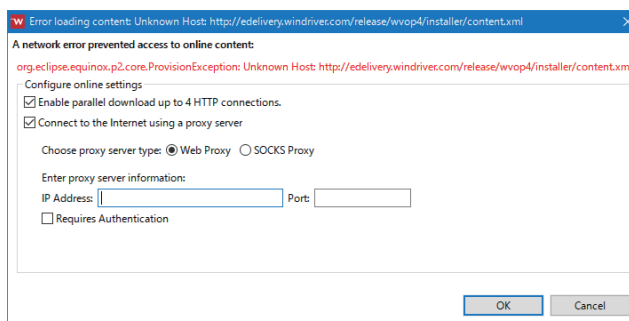
4. Click the [Next] button.

When the personal computer is connected to the Internet via a proxy server, select the checkbox of "Connect to the Internet using a proxy server" and configure the proxy server that was set for the Internet connection.



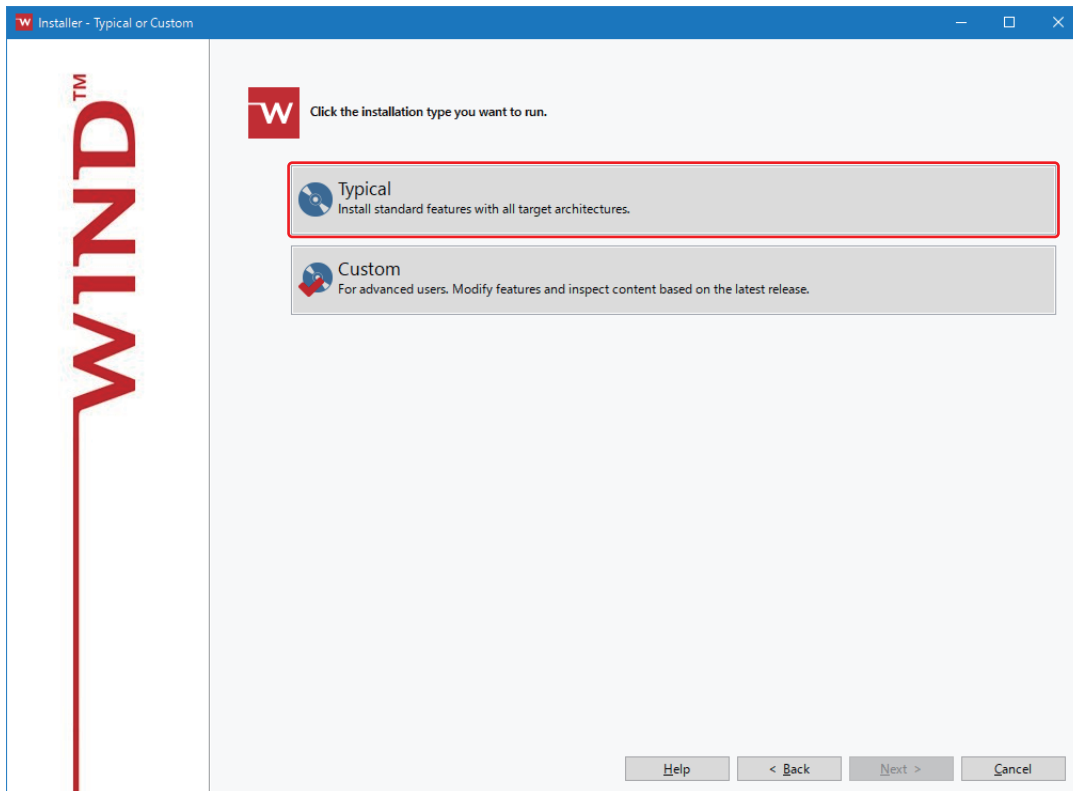
Point

- To update the installer, select the checkbox of "Check for and apply installer updates (installer restarts if necessary)". The most recent installer is downloaded from the Internet and the installer is updated. If the Internet connection failed, the screen below will appear. Check the network connection and connection setting of Internet, and then click the [OK] button. The internet connection is successfully completed and the installation starts. When not to update the installer, click the [Cancel] button.

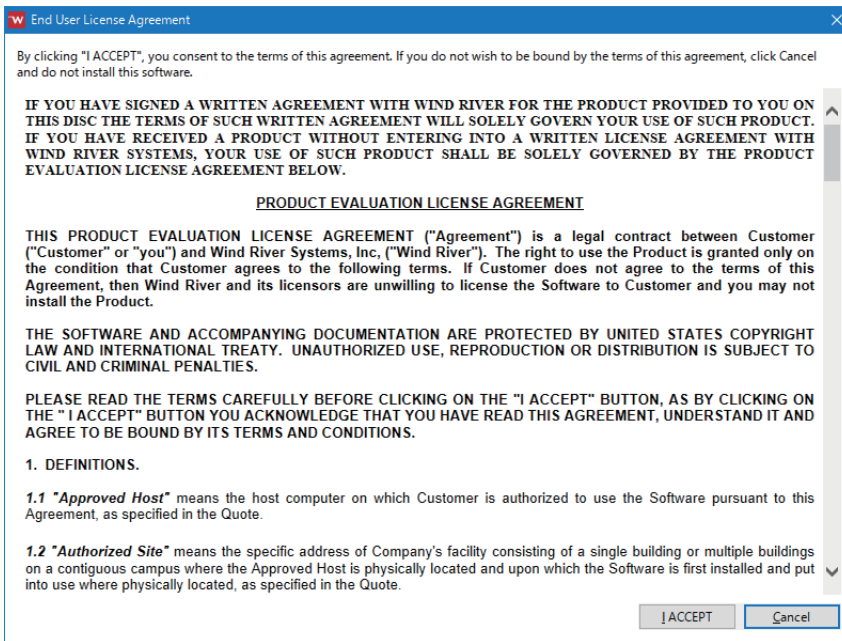


- To update this product, perform online update from 'Product Maintenance'. This product is downloaded and updated online. (Page 92 Online Update)

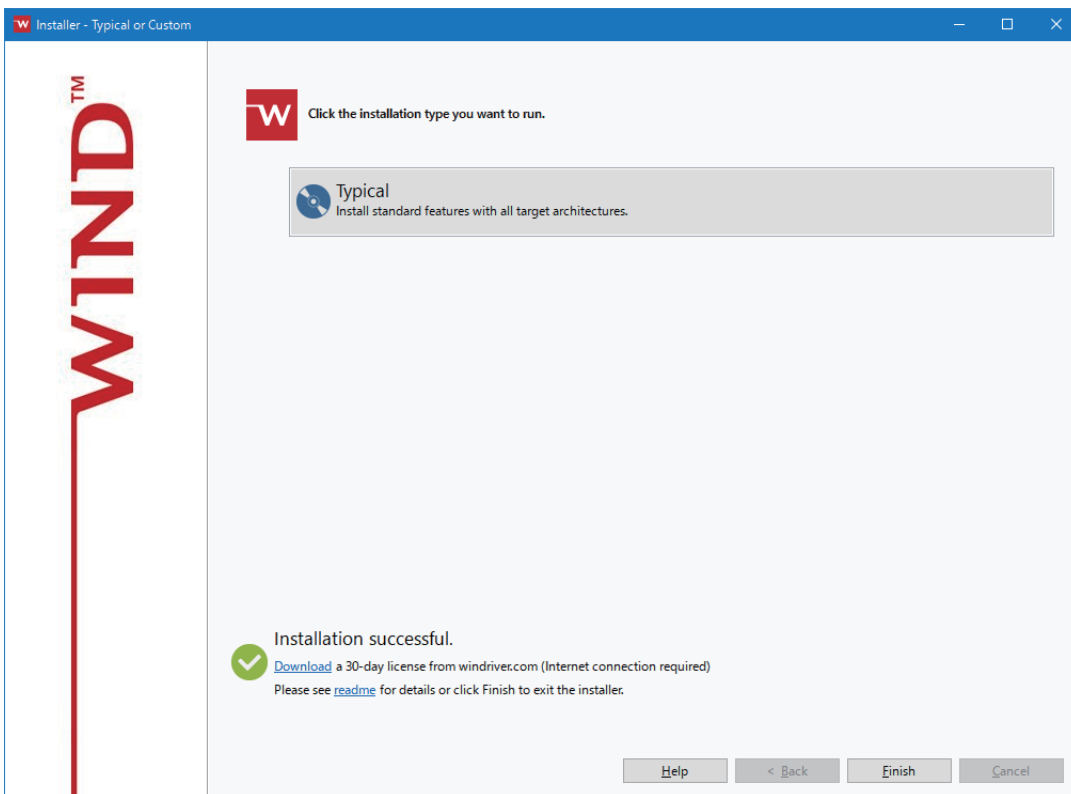
5. Select "Typical".



6. A license agreement screen appears. Click the [I ACCEPT] button.



7. Click the [Finish] button.



Point

When the development environment is connected to the Internet, obtain a temporary license by clicking "Download" in the bottom of the screen. With this license, a trial version of this product can be used (for 30 days). After the installation is complete, it can also be obtained from the [Product Maintenance] menu. (Page 104 Obtaining of a Temporary License)

6.3 Environment After Installation

This section shows the environment after installing CW Workbench 4, such as menus and sample programs.

Menus to be registered

After CW Workbench 4 is installed, [CW Workbench 4] is added in the Windows Start^{*1} and the following menus will be available.

*1 Select [All apps] in the Start screen or [Start] ⇒ [All Programs]/[All apps].

Menu	Description
[CW Workbench 4]	To start CW Workbench 4.
[Product Maintenance]	To uninstall or update CW Workbench 4, obtain a temporary license, and apply a patch to CW Workbench 4.

Sample programs to be registered

When CW Workbench 4 is installed, sample programs provided by Wind River Systems, Inc. are also installed. The sample programs can be checked in [File] ⇒ [New] ⇒ [Example...] in CW Workbench 4.

For details on the sample programs, refer to the Wind River Workbench document, which is stored in the following path, provided by Wind River Systems, Inc.

Storage location: (installation destination folder)\vxworks-7\samples\dkm\ (sample project name)\sample.txt

7 APPLICATION OF PERMANENT LICENSE

This chapter shows the procedure for applying a permanent license.

A permanent license must be applied to the development environment that was specified in 'Host Information' on the Permanent License Application Form.

Point

If a permanent license is yet to be obtained, obtain a permanent license in advance.

 Page 24 OBTAINING OF PERMANENT LICENSE

Operating procedure

1. Before applying the permanent license, end CW Workbench 4.
2. Copy the obtained permanent license file to the 'license' folder of CW Workbench 4.

The 'license' folder is in the following location if CW Workbench 4 is installed without changing the installation destination folder.

- C:\WindRiver\license

Point

- When applying a permanent license, do not store the license file in a folder other than the one specified above.
 - For updated license product, when more than one permanent license files have been acquired, overwrite all of the files.
-

3. Start CW Workbench 4.

MEMO

PART 3

PROGRAMMING

This part explains the procedure for creating and building a project in CW Workbench 4.

8 PROJECT CREATION

9 BUILDING

8 PROJECT CREATION

This chapter shows the procedure for creating a CW Workbench 4 project.

Point

For details on the project creation, refer to the Wind River Workbench document provided by Wind River Systems, Inc. in the following menu.

- [Help] ⇒ [Help Contents] ⇒ [Eclipse Platform] ⇒ [Eclipse Workbench Basics] ⇒ [Tasks] ⇒ [Working with projects, folders and files] ⇒ [Creating a project] in CW Workbench 4

Project type (build type)

A project type supported by CW Workbench 4 is as follows.

Project type (build type)	Description
DKM (Downloadable Kernel Module)	A project for creating a download image that can be linked dynamically at execution. It can be executed in the Kernel Mode.

Restriction

Only 'DKM (Downloadable Kernel Module)' is supported by this product.

If a project type (build type) other than that is selected, the operation is not guaranteed.

8.1 Preparation Before Creating a Project

This section shows the tasks to be completed before creating a project.

Preparation for a build configuration file (VSB project file)

Before creating a project, copy the build configuration file stored in a MELIPC to the development environment.

■ Procedure for obtaining a build configuration file

A build configuration file can be obtained using the FTP function.

For details on the FTP function, refer to the following manual.

📖 MELIPC MI5000 Series User's Manual (Application)

1. Access a MELIPC using the FTP function.

The default settings of a user name and password required for accessing a MELIPC are as follows.

- User name: target
- Password: password

If the user name and/or password has been changed from the default, enter the changed one.

2. Copy the build configuration file stored in the MELIPC system memory to a local folder on the development environment.

- Storage location: /SYSTEMROM/VSB_PRJ/MI5122-VW_VSB_PRJ_XX.zip^{*1}

^{*1} XX: Upper two digits of the MELIPC product information (16 digits)

3. Open the build configuration file copied to the development environment.

Precautions

A build configuration file must be copied to a folder where double-byte characters and single-byte katakana are not included in their name.

■ Build configuration file

A build configuration file includes project setting information for the target product. It is required when creating a DKM project that operates on the target.

A build configuration file includes:

- h/config/vsbConfig.h
- h/config/autoconf.h
- h/config/auto.conf
- krnl/cdf/empty.cdf
- krnl/h/public/*
- krnl/tags/dkm.tags
- vsb_defs.mk
- vsb.config
- vsbdefs.tcl
- VSB_PRJ.wpj

8.2 Creating a Project

This section shows the procedure for creating a new project.

Point

A project created in CW Workbench 4 can be used in Wind River Workbench 4.
For the method for importing a created project, refer to the following section.
Page 48 Importing a Project

1. Select [CW Workbench 4] ⇒ [CW Workbench 4] from Windows Start*¹.

*¹ Select [All apps] in the Start screen or [Start] ⇒ [All Programs]/[All apps].

Point

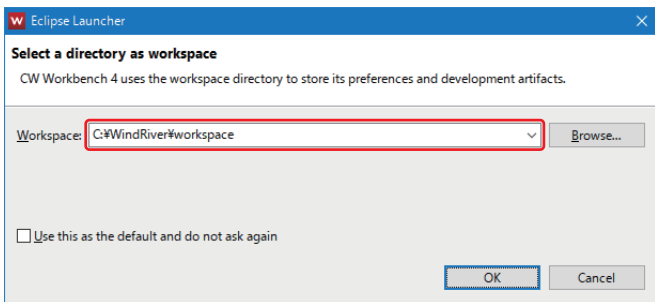
Do not manually close the command prompt screen which is displayed right after selecting the start menu of CW Workbench 4.

2. Specify a folder to save a workspace for "Workspace", and click the [OK] button.

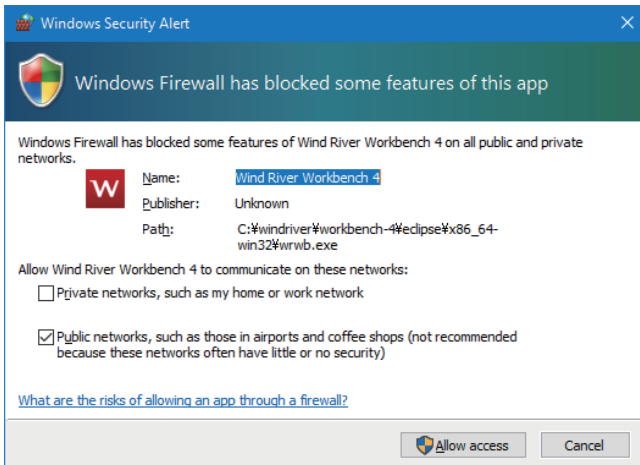
A save destination folder can be selected in the "Select a Folder" screen displayed by clicking the [Browse] button.

Point

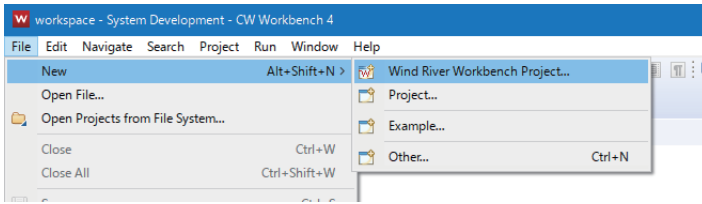
For "Workspace", select a folder name or a path which does not include double-byte characters.



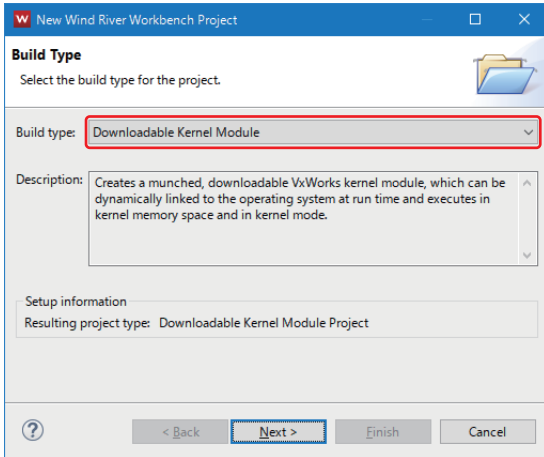
- If the "Windows Security Alert" screen appears, click the [Allow Access] button.



3. Select [File] ⇒ [New] ⇒ [Wind River Workbench Project].



4. Select "Downloadable Kernel Module" from the combo box of "Build type", and click the [Next] button. A list of project types which are supported by CW Workbench 4 are displayed in the combo box of "Build type".

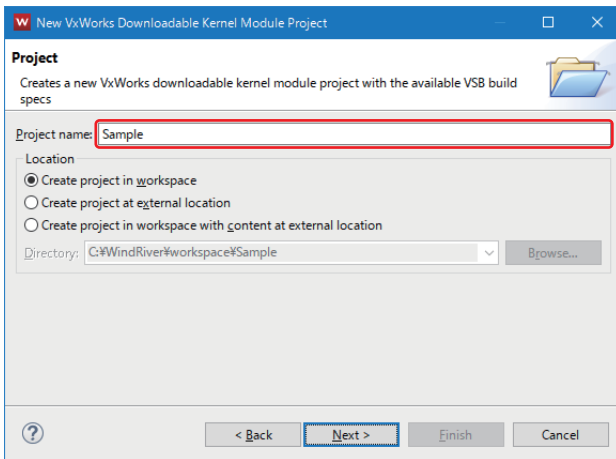


Point

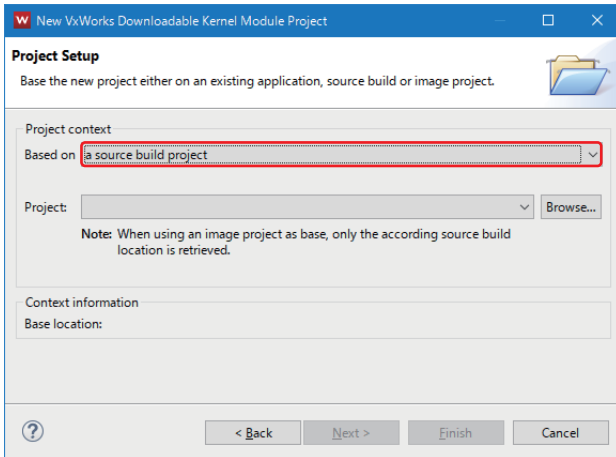
A project type (build type) supported by CW Workbench 4 is as follows.

- Downloadable Kernel Module

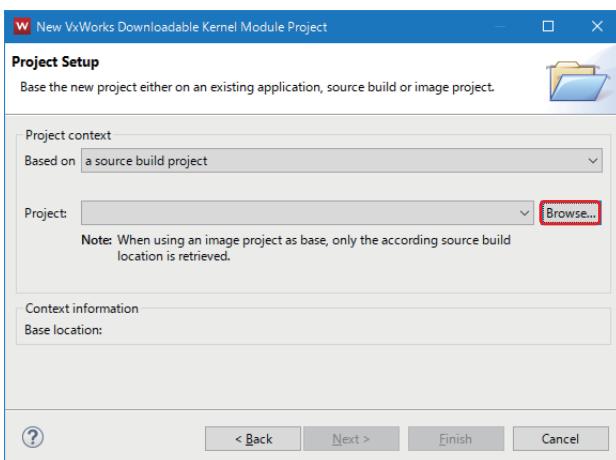
5. Enter a project name to create for "Project name", and click the [Next] button.



6. Select "a source build project" from the combo box of "Based on".



7. Click the [Browse] button next to the "Project" column.



8. Select a project configuration file.

Select a project configuration file (vsb.config) stored in the build configuration file, which was copied to the local folder. For details on the project configuration file, refer to the following section.

 Page 37 Preparation Before Creating a Project

9. Click the [Finish] button.

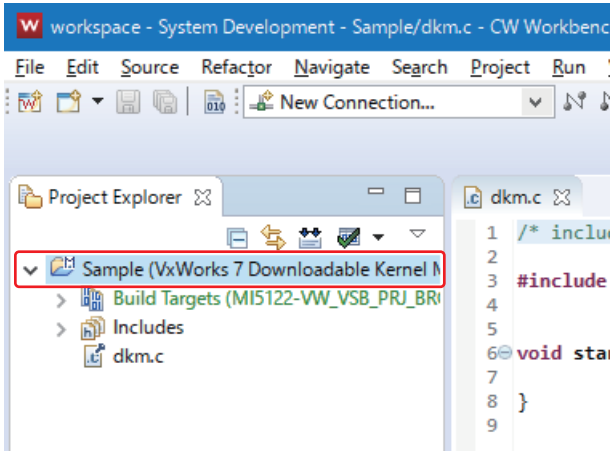
Point

- If unavailable character (` , = , ! , # , \$, % , ^ , * , (,) , { , } , \ , | , ; , : , ' , " , . , < , > , / , ? , double-byte character, single-byte katakana, or when a space is used except at the end of the project name) or existing project name is entered, an error text appears in the header of the screen, and the [Finish] button will be disabled.
- In addition, a space entered at the end of the project name is dropped.

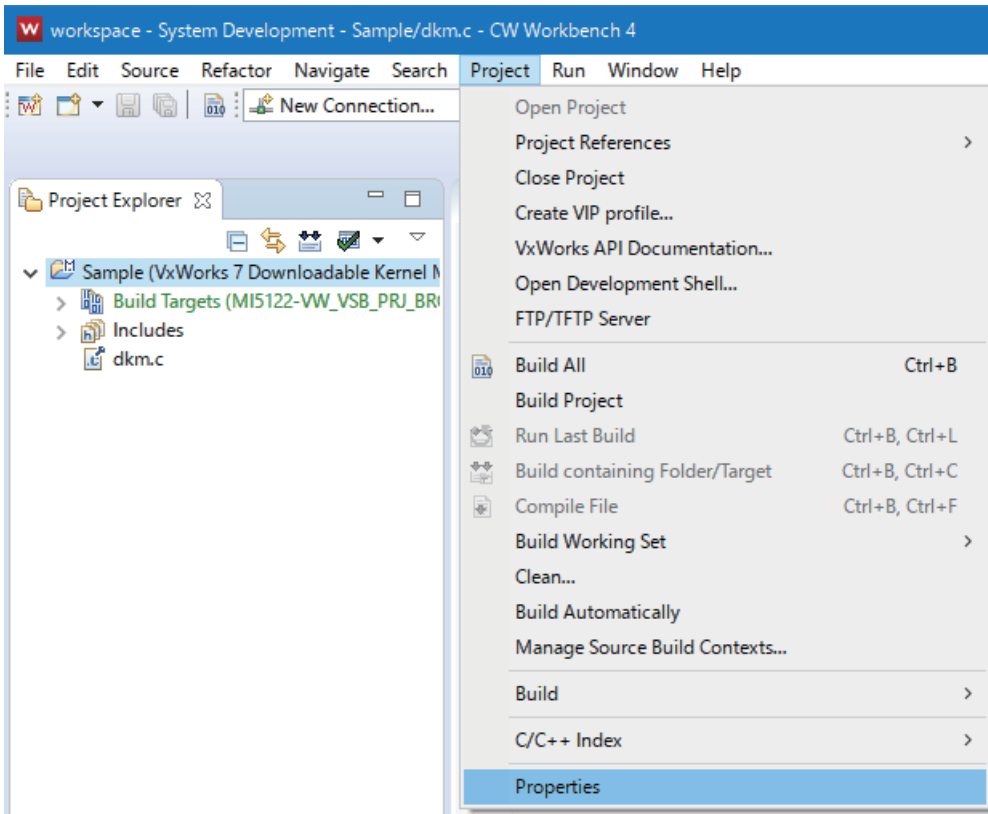
Setting Properties

The following shows the procedure for setting a compiler used for a project and include path.

1. Select a project to set properties in the "Project Explorer" window.

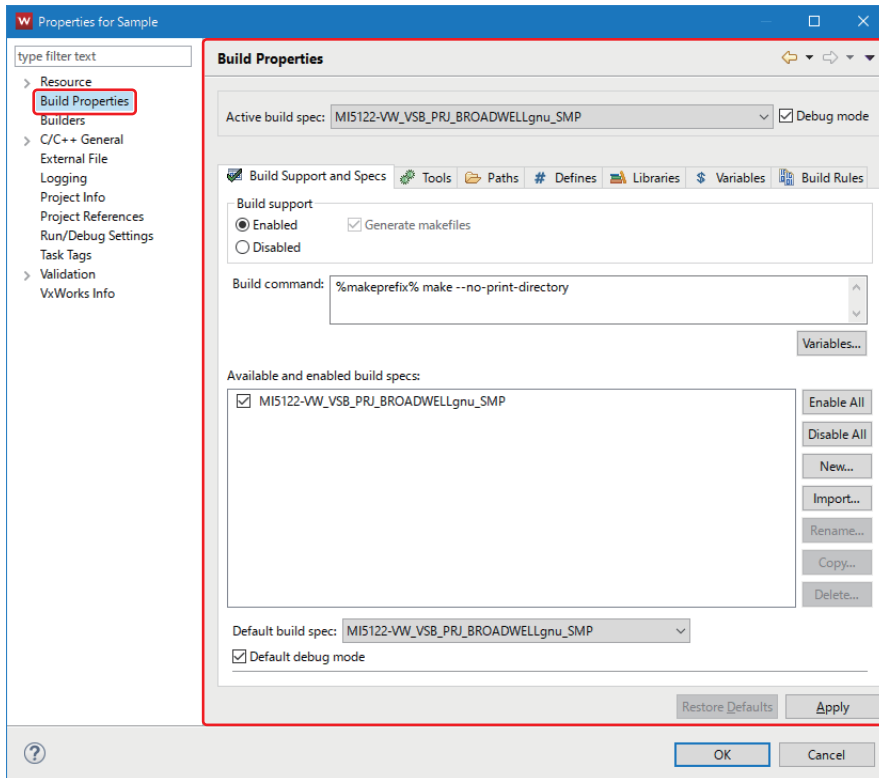


2. Select [Project] ⇒ [Properties].



3. Select "Build Properties" in the tree of the property screen.

When "Build Properties" is selected, the "Build Properties" screen appears on the right side of the property screen.

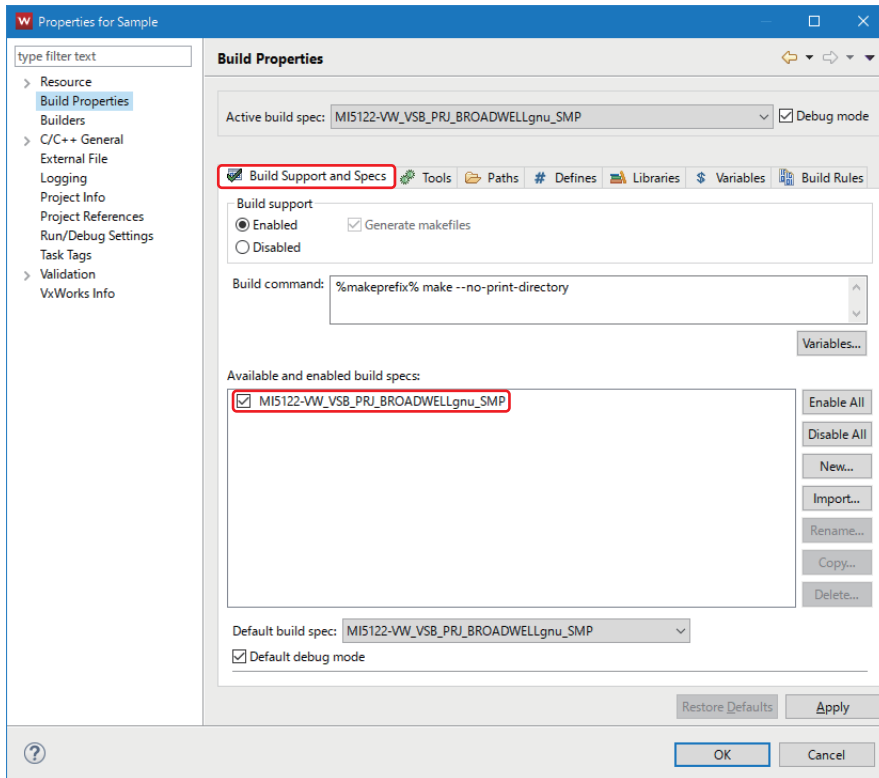


Build settings can be configured in each tab of the "Build Properties" screen.

Tab name	Setting content
Build Support and Specs	<ul style="list-style-type: none"> • To enable or disable debugging • To select a build specification • To set for debugging and releasing
Tools	To set flags for compilation
Paths	Setting an include path
Defines	To define macro definitions used for building
Libraries	Setting an import library
Variables	Setting variables

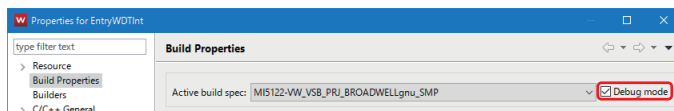
4. Select the [Build Support and Specs] tab.

Check that only "MI5122-VW_VSB_PRJ_BROADWELLgnu_SMP" is selected in "Available and enable build specs".

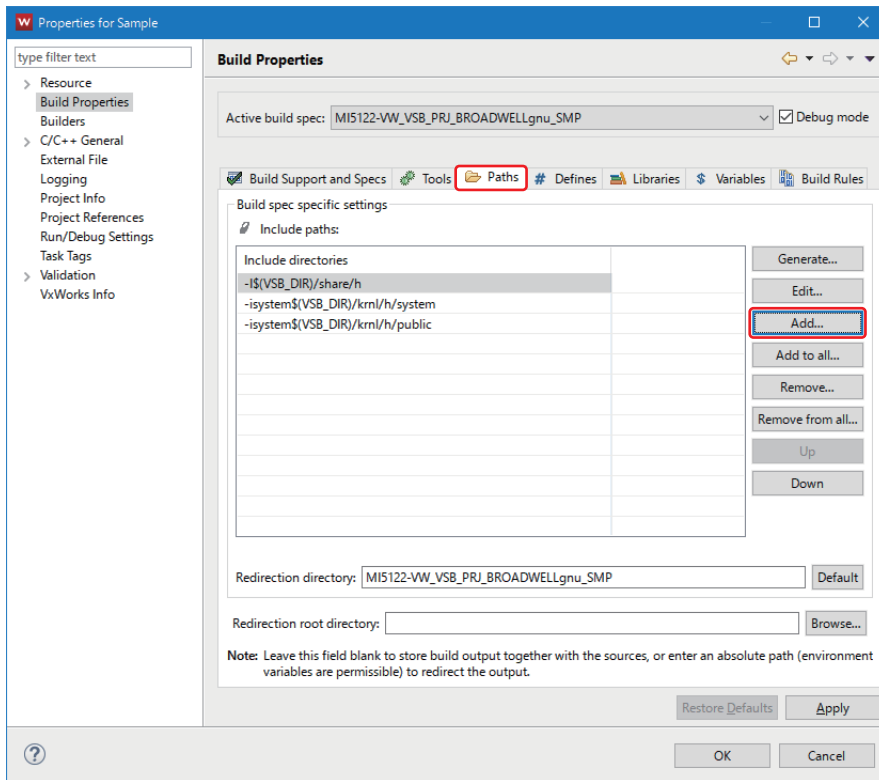


Point

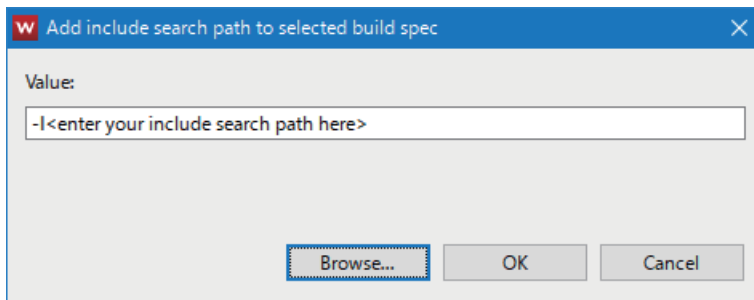
- When a project is imported, the option other than "MI5122-VW_VSB_PRJ_BROADWELLgnu_SMP" may appear in "Available and enable build specs". CW Workbench 4 only supports "MI5122-VW_VSB_PRJ_BROADWELLgnu_SMP"; therefore, in that case, unselect other options than that.
- A project is built in the debug mode by the default. When applying the project to the actual system, deselect "Default Debug mode".



5. Select the [Paths] tab, and click the [Add] button.



6. Click the [Browse] button.



7. Select an include folder to add.

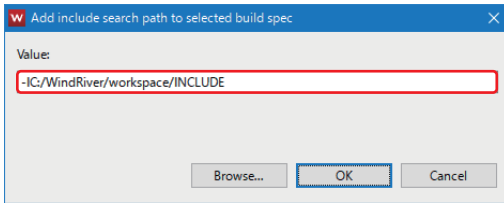
Copy an include file from any of the following location to a local folder on the development environment to use the include file.

- MELIPC for development environment: \SYSTEMROM\INCLUDE
- DVD-ROM of CW Workbench 4: \Include (📄 Page 18 Contents of a DVD-ROM)

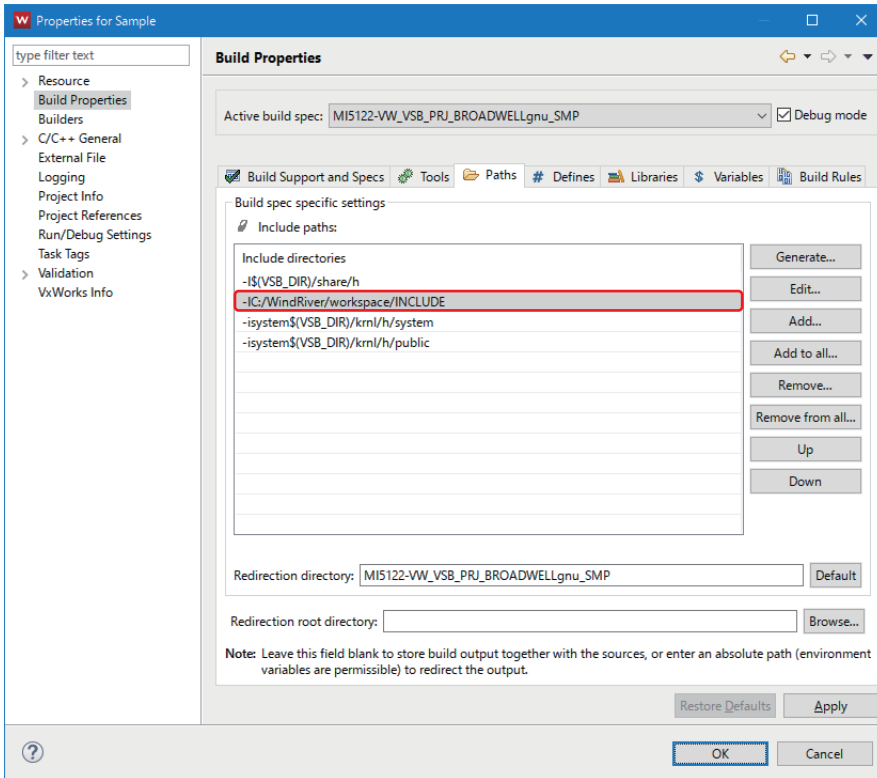
Point

The include file stored on a MELIPC should be used. If you do not have a MELIPC, use the file stored on the DVD-ROM of CW Workbench 4. (📄 Page 115 Version of MELIPC Supporting Include Files)

8. Check that the selected include folder is set for "Value", and click the [OK] button.

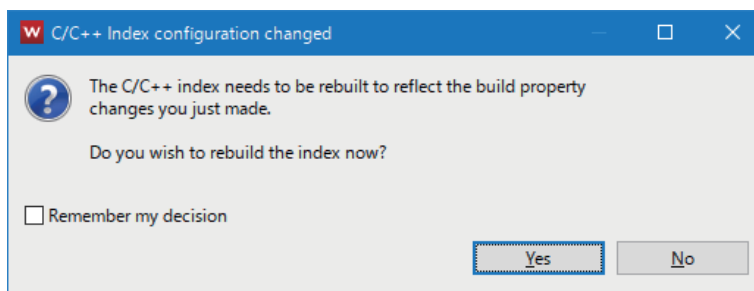


9. Check that the include path of the include folder added is set for "Include directories" under "Include paths", and click the [OK] button.



Point

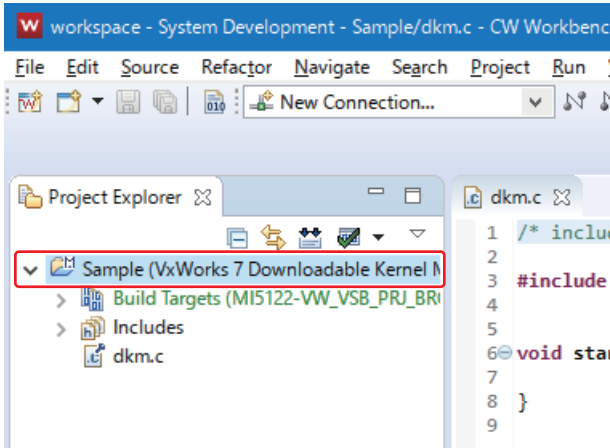
If the following screen appears, click the [Yes] button.



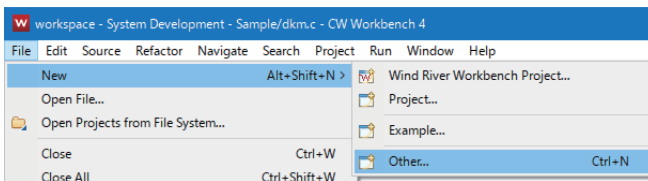
Adding a file

The following shows the procedure for adding a new file to a project.

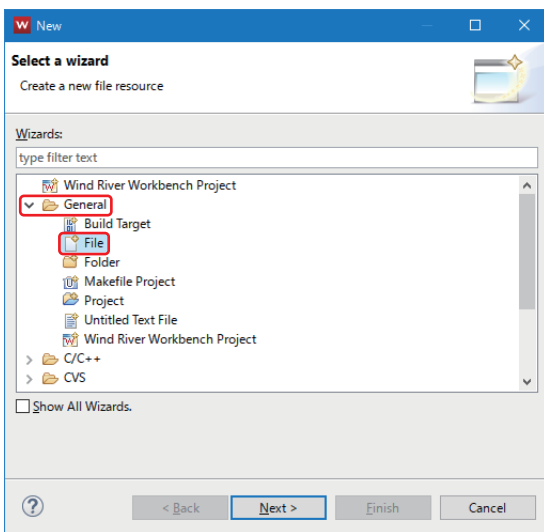
1. Select a project to add a new file in the "Project Explorer" window.



2. Select [File] ⇒ [New] ⇒ [Other].

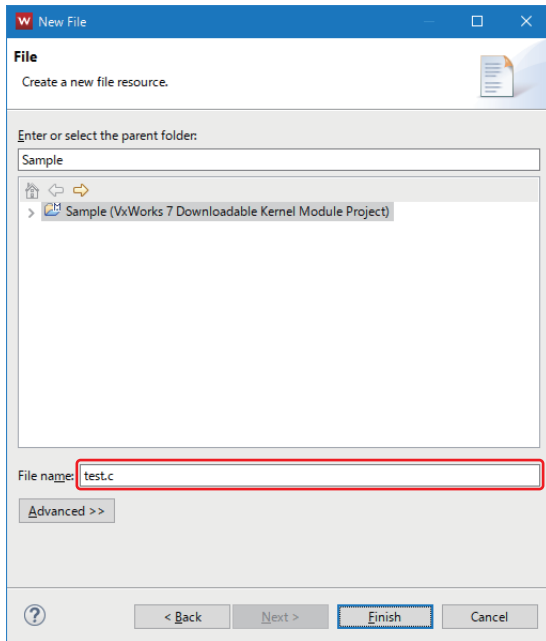


3. Select "General" ⇒ "File", and click the [Next] button.



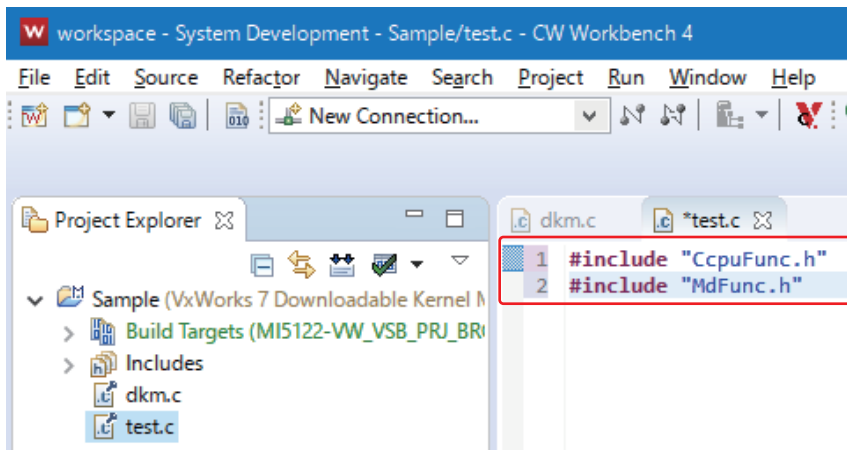
4. Enter the name of a file to add for "File name", and click the [Finish] button.

- The name is 'test.c'



5. Include an include file to the added file.

- C Controller module dedicated function: CcpuFunc.h
- MELSEC data link function: MdFunc.h



Point

- Enter a file name with an extension (.c, .h, .cpp, .hpp) for "File name".
- If unavailable character in Windows (\, /, :, *, ?, ", <, >, |) is entered, an error text appears in the header of the screen, and the [Finish] button will be disabled.
- If unavailable character (#, \$, &, ', (,), ;, =, `, double-byte characters, single-byte katakana) is used for a file name, a compilation error will occur at the execution of compilation. (Page 80 A build error, "xxx.sh: syntax error near unexpected token 'yyy_partialImage/Debug/Objects/nnn'", "xxx.sh: cannot execute binary file", "Makefile:xxx: *** missing separator. Stop", or "yy.o: command not found...No such file or directory" occurs.)

8.3 Importing a Project

In CW Workbench 4, a conventional CW Workbench project can be imported.

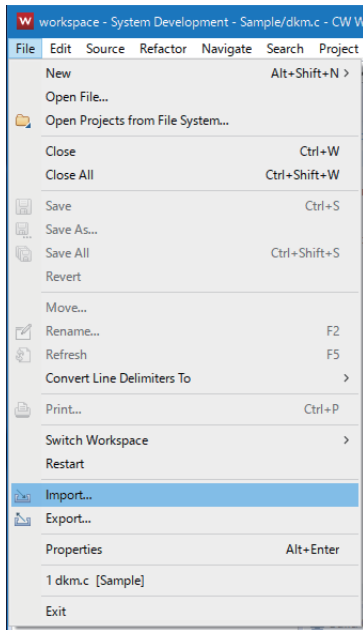
Point

Store the project to import to a folder or a path which does not include double-byte characters.

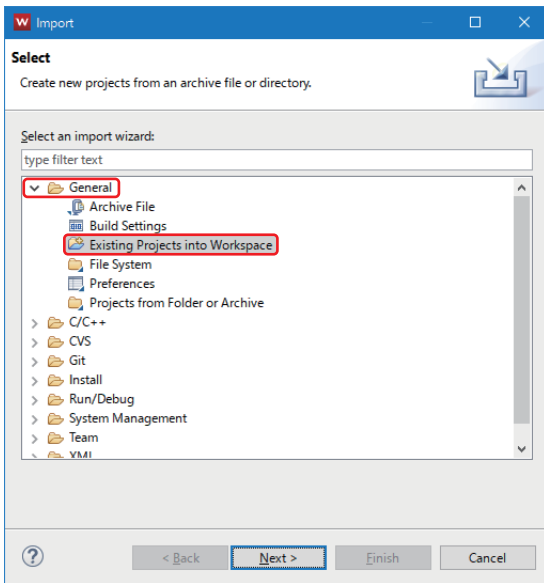
Restriction

In Wind River Workbench 4, a project created with a conventional product cannot be imported.

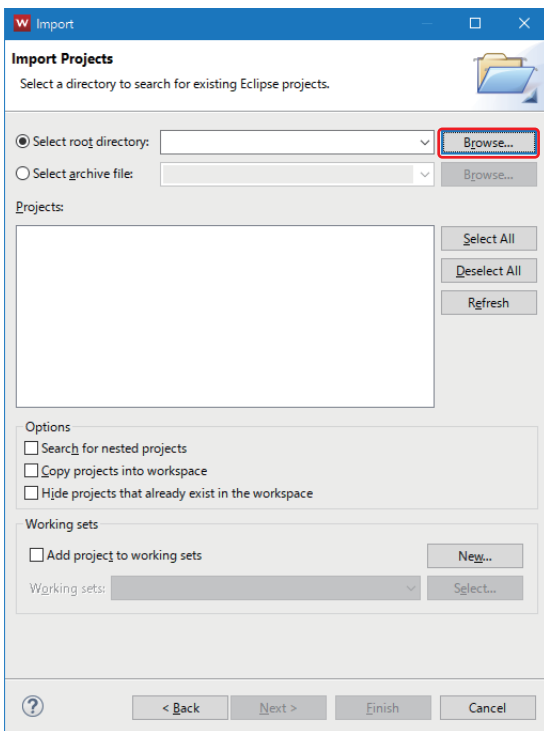
1. Open the "Folder Options" screen.
 - ☞ Windows Start*¹ ⇒ [Control Panel] ⇒ [Appearance and Personalization] ⇒ [Folder Options]*²
 - *1 Select [All apps] in the Start screen or [Start] ⇒ [All Programs]/[All apps].
 - *2 Windows 10: [File Explorer Options]
2. Select the checkbox of "Show hidden files, folders, and drives" in the "Folder Options" screen, and click the [OK] button.
 - ☞ [View] ⇒ [Show hidden files, folders, and drives]
3. Select the '.wrproject' file to import in the Explorer, and right-click and select [Properties] in the shortcut menu.
4. Unselect "Hidden" in the properties screen, and click the [OK] button.
5. Select [File] ⇒ [Import] in CW Workbench 4.



6. Select "General" ⇒ "Existing Projects into Workspace", and click the [Next] button.



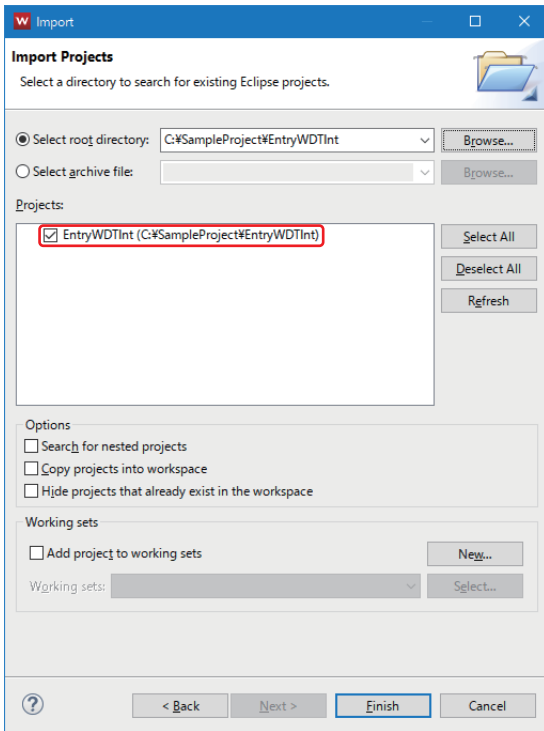
7. Select "Select root directory" and click the [Browse] button.



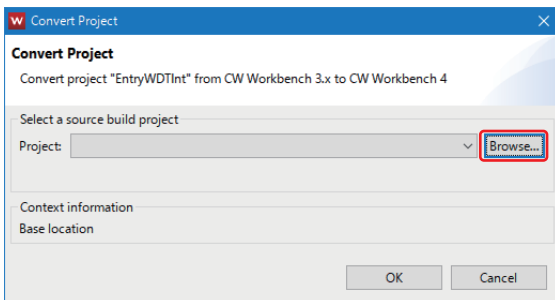
8. Select the folder where a project to import is stored, and click the [OK] button.

9. Check that the project to import is selected, and click the [Finish] button.

A list of projects stored in the folder and subfolders specified for "Select root directory" is displayed in "Projects".



10. Click the [Browse] button next to the "Project" column.



11. Select a project configuration file.

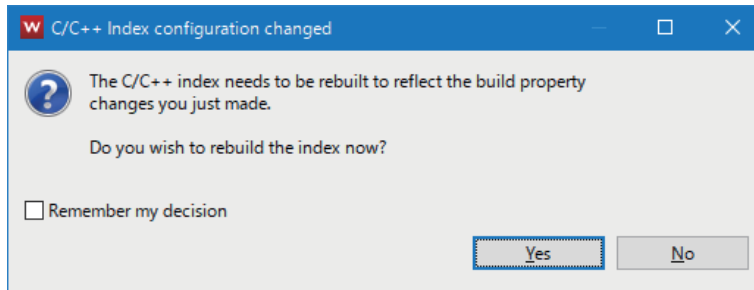
Select a project configuration file (vsb.config) stored in the build configuration file, which was copied to the local folder. For details on the project configuration file, refer to the following section.

☞ Page 37 Preparation Before Creating a Project

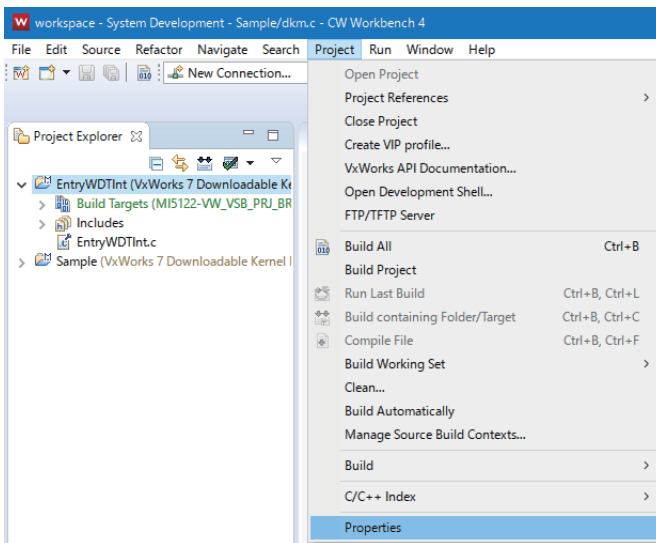
12. Click the [OK] button.

Point

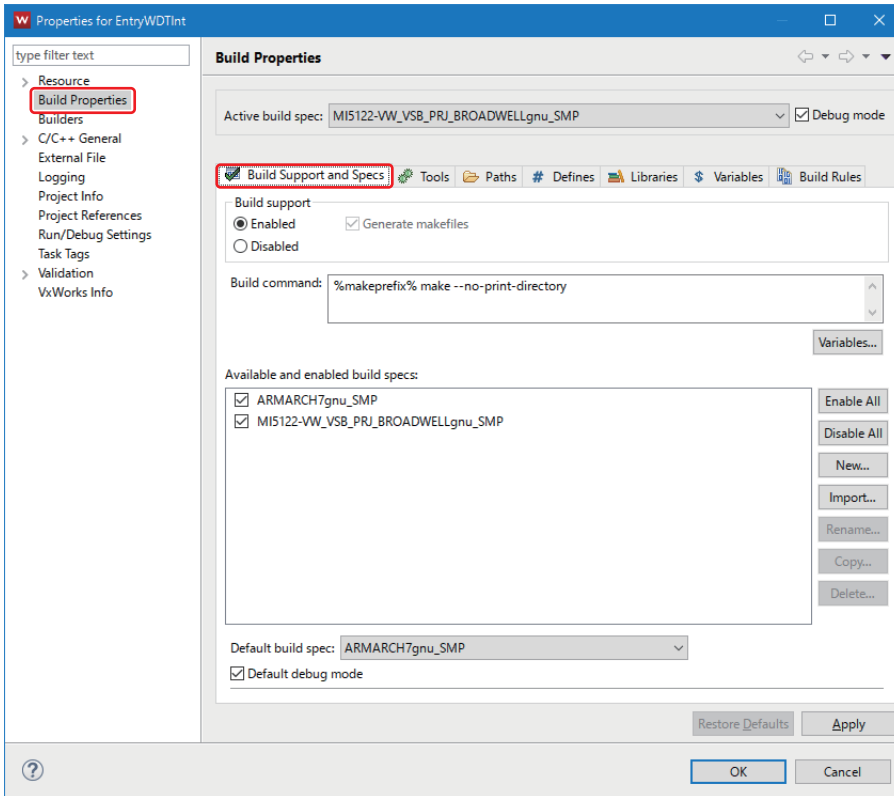
If the following screen appears, click the [Yes] button.



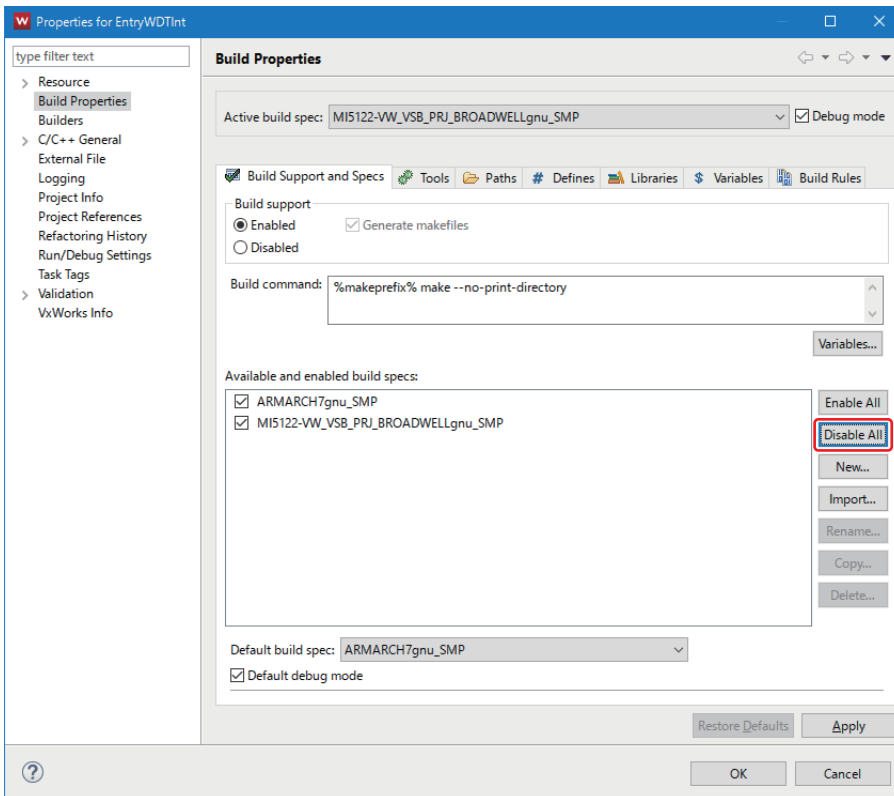
13. Select the imported project, and select [Project] ⇒ [Properties].



14. Select "Build Properties" from the tree on the left in the screen, and select the [Build Support and Specs] tab.

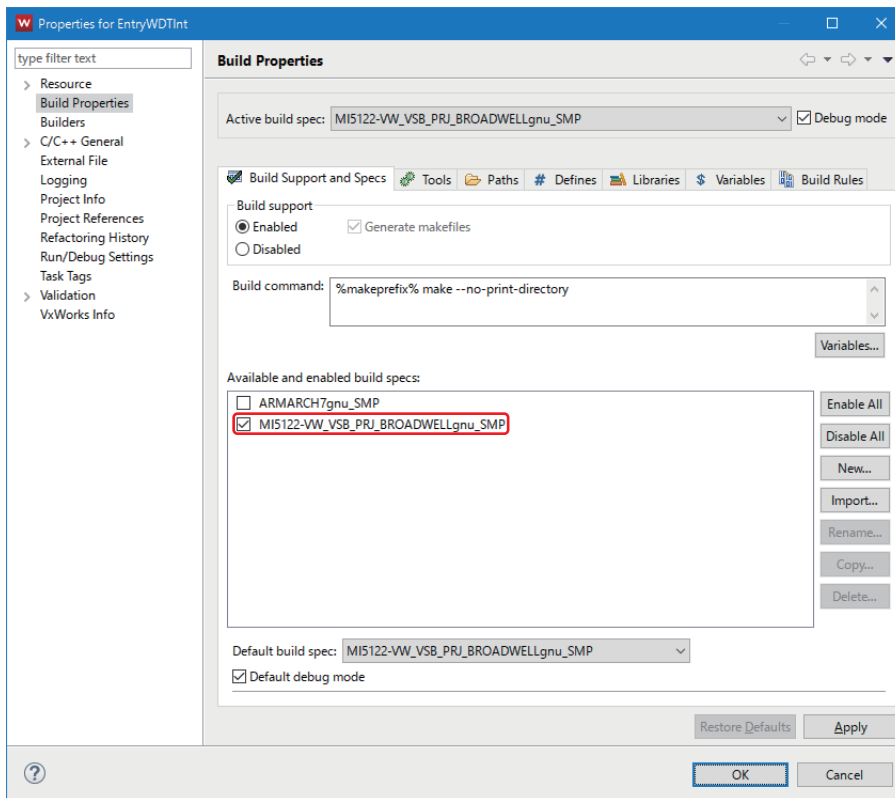


15. Click the [Disable All] button.



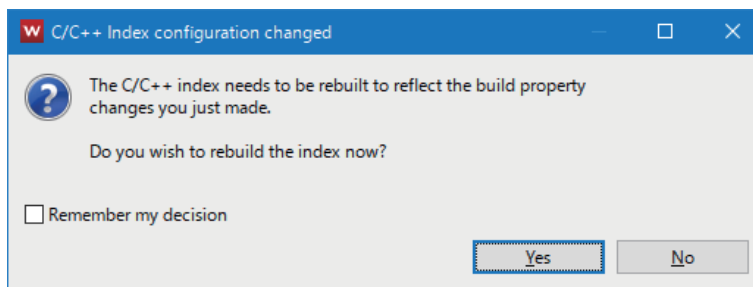
16. Select "MI5122-VW_VSB_PRJ_BROADWELLgnu_SMP", and click the [OK] button.

A project created in conventional CW Workbench can be imported. Set properties as necessary. (👉 Page 41 Setting Properties)



Point 🔍

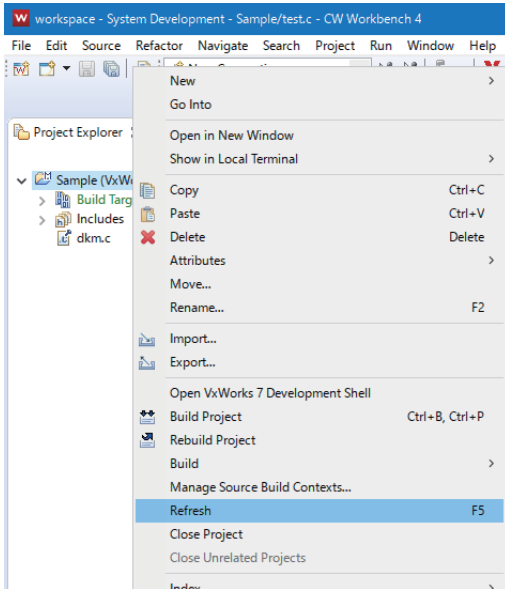
If the following screen appears, click the [Yes] button.



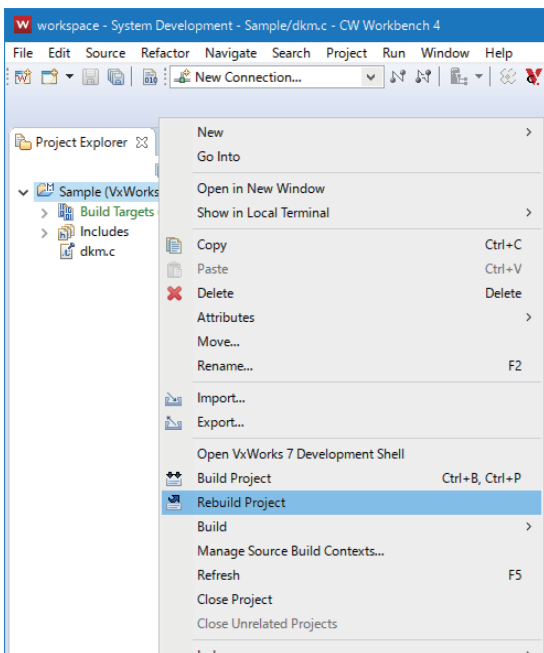
9 BUILDING

This section show the procedure for building a project.

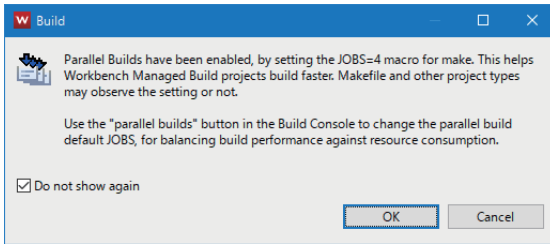
1. Select the name of a project to build in the "Project Explorer" window, and right-click and select [Refresh] in the shortcut menu.



2. Select the name of a project to build in the "Project Explorer" window, and right-click and select [Rebuild Project] in the shortcut menu.

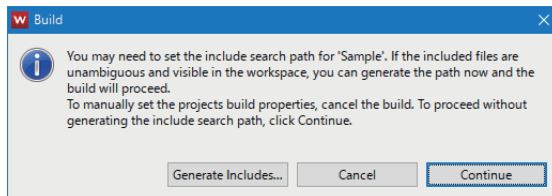


3. Click the [OK] button.



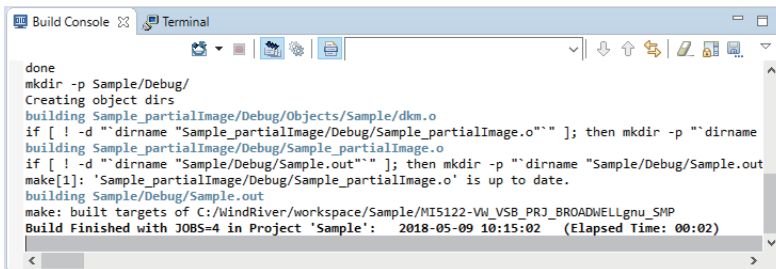
Point

If the following screen appears, click the [Continue] button.



4. Check the build result.

The process of the building and the result is displayed in the "Build Console" window.



Build is completed normally

"Build Finished..." appears in the "Build Console" window.

Check that an error message is not displayed in the "Build Console" window.

Build is completed abnormally

An error message and "Build Finished..."(in red) appears in the "Build Console" window.

Modify and build the program repeatedly until the error is removed.

Point

- Error information (source file name, line number, error description) is displayed in red in the "Build Console" window. The mouse cursor can be jumped to the error location by double-clicking the line where a source file name or row number is displayed in red.
- If an error "command not found" occurs, unsupported compiler may be used. Check that 'MI5122-VW_VSB_PRJ_BROADWELLgnu_SMP' is selected in "Build Properties" in the [Build Support and Specs] tab. If the item other than 'MI5122-VW_VSB_PRJ_BROADWELLgnu_SMP' is selected, unselect the checkbox of the item. (👉 Page 41 Setting Properties)

5. Check that an execution file was created.

After the build is successfully completed, a file (.out) is stored in the following folder.

- For Debug mode: (installation destination folder)\(work space name)\(project name)\MI5122-VW_VSB_PRJ_BROADWELLgnu_SMP\Debug
- For Release Mode: (installation destination folder)\(work space name)\(project name)\MI5122-VW_VSB_PRJ_BROADWELLgnu_SMP\NonDebug

If a user program is created in an imported project, the locations above may vary depending on the project configuration or the folder where the imported project is stored. For a folder path where a created user program is to be stored, check the path in the imported project.

Point 

- The file name of a user program will be '(project name).out'.
 - If an error occurs while building a program, an execution file is not generated.
-

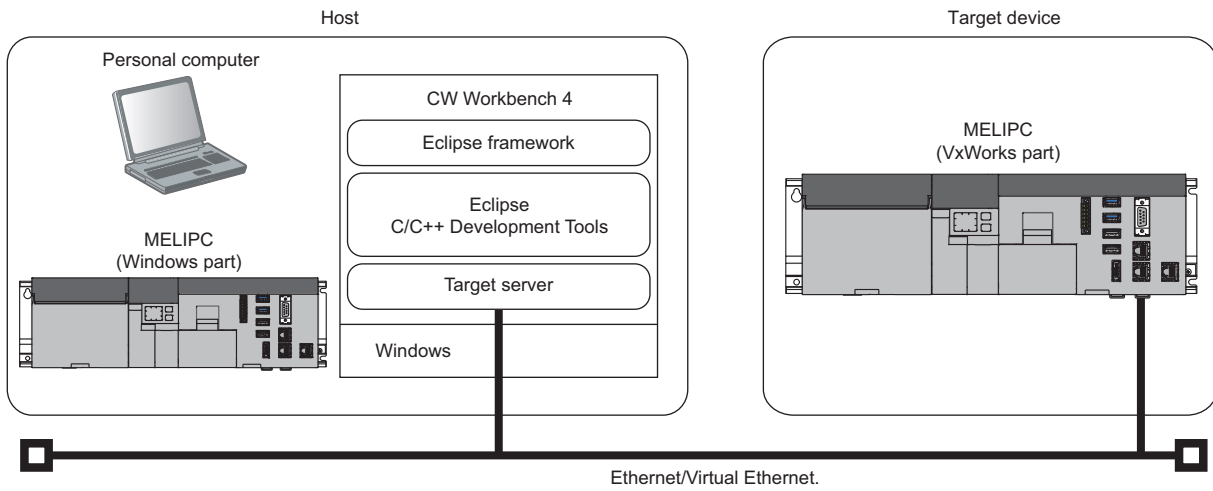
PART 4 DEBUGGER

This part explains how to use the debugger.

10 DEBUGGER

10 DEBUGGER

This chapter shows the procedure for debugging programs in CW Workbench 4 that is connected to a MELIPC (actual device) using the debugger function.



Point

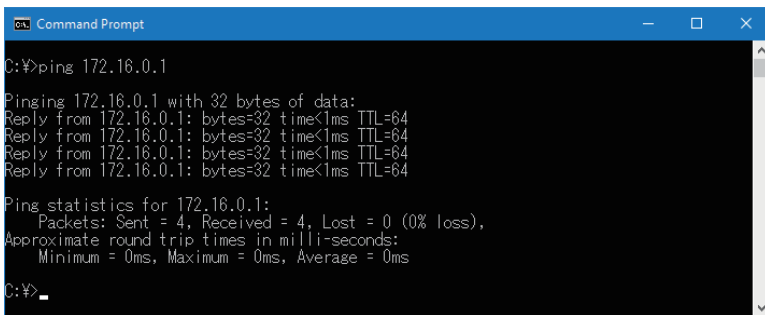
Before debugging, set the connection target device so that it can activate successfully.

10.1 Preparation Before Debugging

Before start debugging, check the network connections with a target.

1. Connect the development environment where CW Workbench 4 is installed and a target with a network.
 - Standalone development configuration: Windows part and VxWorks part are connected with a virtual Ethernet.
 - Cross development configuration: Connect the Ethernet port (CH1) of the MELIPC and development environment with an Ethernet cable.
2. Start the MELIPC.
3. Check that the target is connected to the network using the Ping command in the Command Prompt.

- 🔗 Windows Start *1 ⇒ [Accessories] *2 ⇒ [Command Prompt]
- *1 Select [All apps] in the Start screen or [Start] ⇒ [All Programs]/[All apps].
 - *2 Windows 10: [Windows Administrative Tools]



The following table shows the default IP address and subnet mask of a MELIPC. If the value has been changed from the default, enter the changed one.

Development configuration	IP address and subnet mask
Standalone development configuration	The IP address and subnet mask of the virtual Ethernet (VxWorks part) are as follows. <ul style="list-style-type: none">• IP address: 172.16.0.1• Subnet mask: 255.240.0.0
Cross development configuration	The IP address and subnet mask of the Ethernet port (CH1) are as follows. <ul style="list-style-type: none">• IP address: 192.168.3.3• Subnet mask: 255.255.255.0

10.2 Target Server Setting

Set the following in CW Workbench 4 when connecting a target server and a target.

- VxWorks image file
- Target server connection

Point

A VxWorks image file to be set in CW Workbench 4 and the VxWorks image file stored in the system drive (/SYSTEMROM/OS_IMAGEFILE) of the target server must be the same.

If no image file exists in the development environment or the VxWorks image file does not match, obtain a VxWorks image file from the target.

Setting a VxWorks image file

This section shows the procedure for setting a VxWorks image file.

Obtaining a VxWorks image file

Obtain a VxWorks image file following the procedure below.

1. Access a MELIPC using the FTP function.

For details on the FTP function, refer to the following manual.

 MELIPC MI5000 Series User's Manual (Application)

Point

The default settings of a user name and password required for accessing a MELIPC are as follows.

- User name: target
- Password: password

If the user name and/or password has been changed from the default, enter the changed one.

2. Copy the VxWorks image file stored in the MELIPC to a folder in the development environment.

- Storage location in MELIPC: /SYSTEMROM/OS_IMAGEFILE
- VxWorks image file (MI5122-VW): MI5122-VW_OS_IMAGE_XX^{*1}

*1 XX: Indicates the upper two digits of the MELIPC product information (16-digit).

For details on the product information, refer to the following manual.

 MELIPC MI5000 Series User's Manual (Startup)

Precautions

A VxWorks image file must be copied to a folder and path where double-byte characters and single-byte katakana are not included in the name.

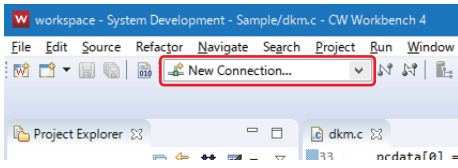
Checking consistency of VxWorks image file

Check that the name of the VxWorks image file stored in the target matches with the one which is to be set for CW Workbench 4.

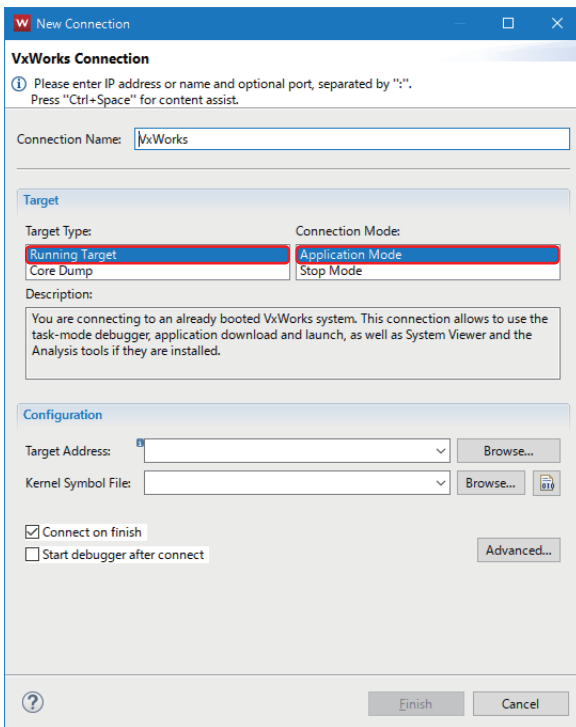
Setting target server connection

The following shows the procedure for setting target server connection.

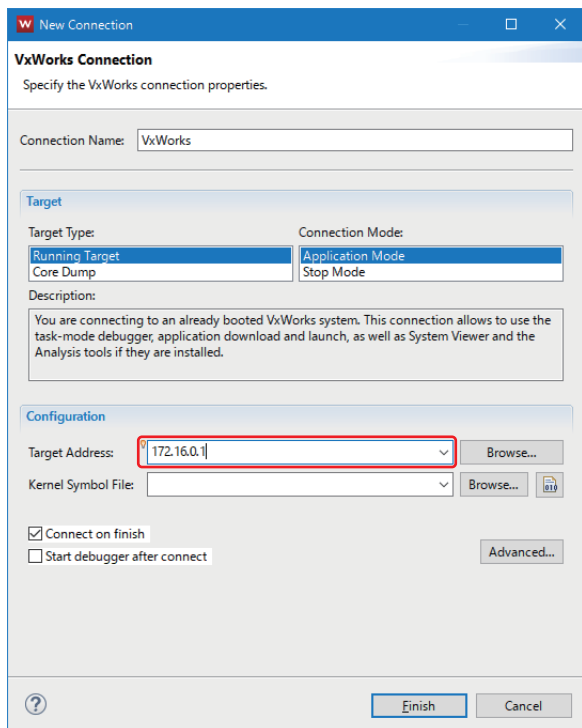
1. Click "New Connection" in the CW Workbench 4 toolbar.



2. Set the following items in "Target Type" and "Connection Mode" under "Target".
 - "Target Type": Select "Running Target".
 - "Connection Mode": Select "Application Mode".



3. Set the IP address of a target device for "Target Address" in "Configuration".

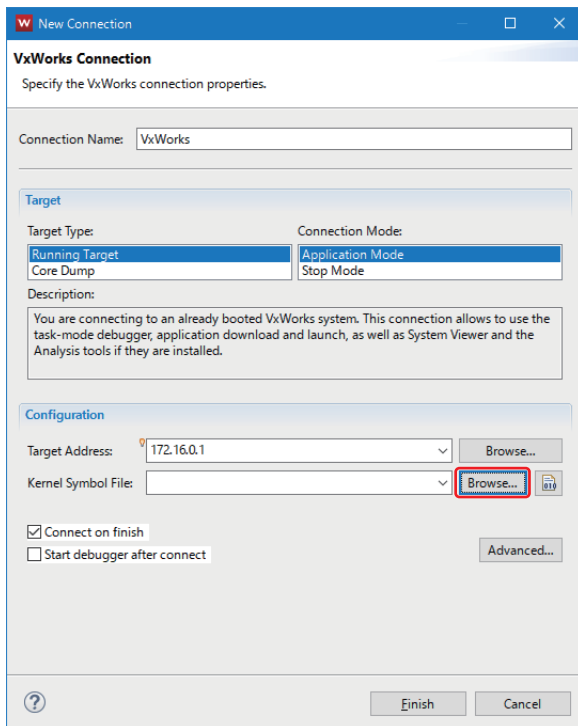


The default IP address of a MELIPC is shown below.

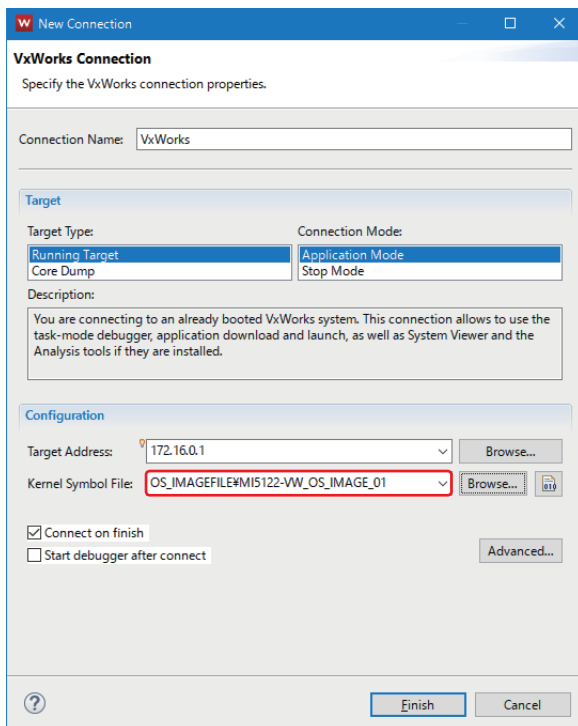
Development configuration	IP address
Standalone development configuration	The IP address of the virtual Ethernet (VxWorks part) is as follows. • IP address: 172.16.0.1
Cross development configuration	The IP address of the Ethernet port (CH1) is as follows. • IP address: 192.168.3.3 If the value has been changed from the default, enter the changed one.

4. Click the [Browse] button of "Kernel Symbol File" in "Configuration" to specify a VxWorks image file.
For the method for obtaining a VxWorks image file and checking file consistency, refer to the following section.

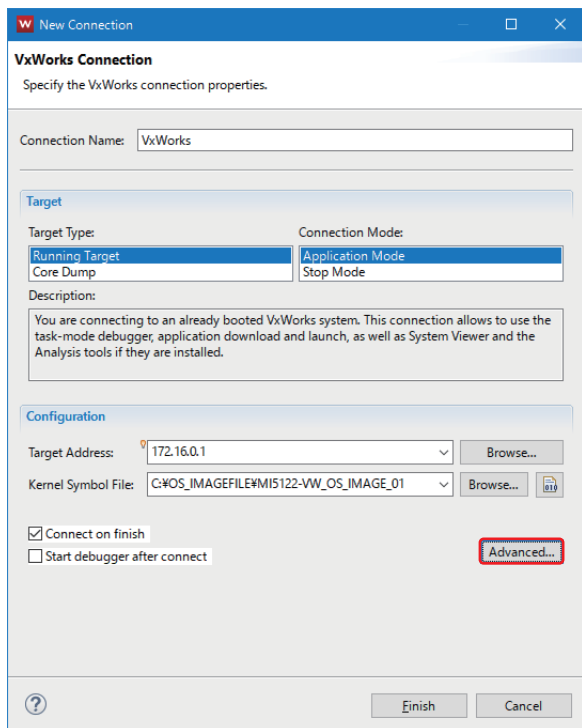
☞ Page 60 Setting a VxWorks image file



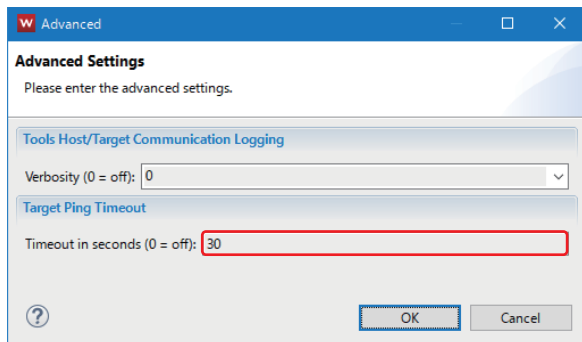
5. Check that the VxWorks image file specified for "Kernel Symbol File" in "Configuration" is entered.



6. Click the [Advanced] button.

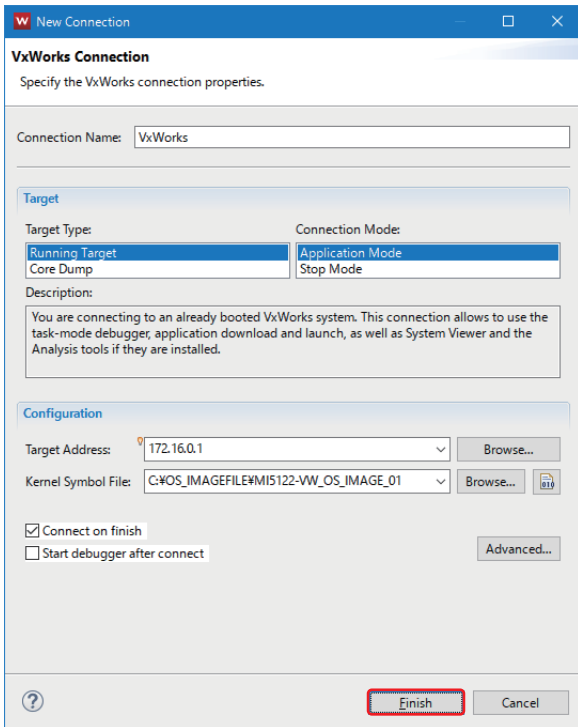


7. Change the value of "Timeout in seconds (0 = off)" under "Target Ping Timeout" to '30', and click the [OK] button.

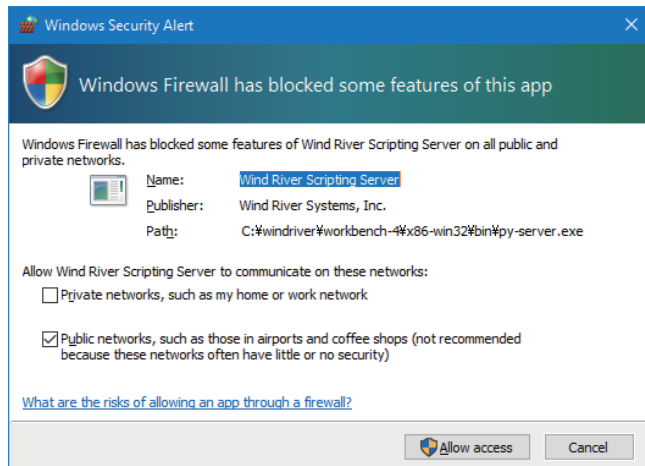
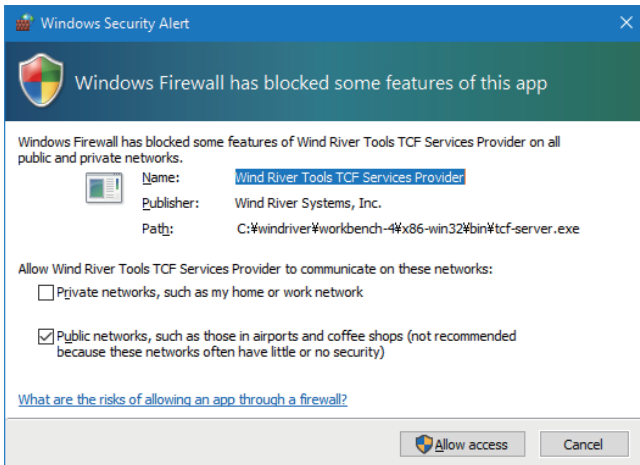


8. Click the [Finish] button.

The connection with the target server is started.

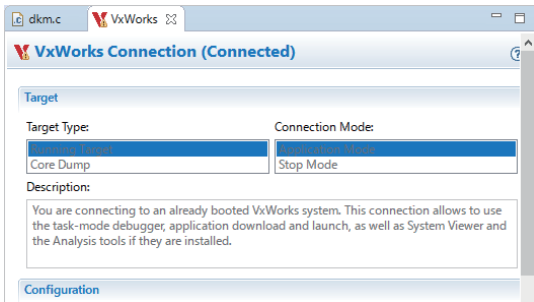


- If the "Windows Security Alert" screen appears, click the [Allow Access] button.



9. Check that the MELIPC is connected to a target.

When the connection is successfully completed, the connection information of "VxWorks Connection" is displayed.



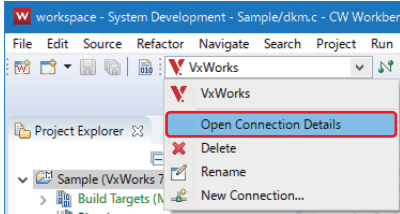
Point

The "Notification" screen with a warning message 'Checksum mismatch' appears when connecting to a target. Follow the procedure below to clear the warning. (☞ Page 67 Countermeasure for the warning, 'Checksum mismatch'.)

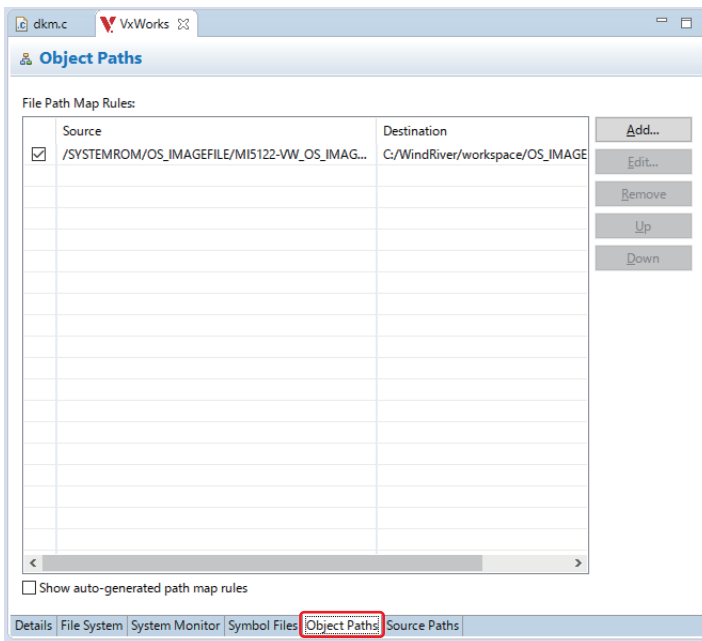
Countermeasure for the warning, 'Checksum mismatch.'

The following shows the procedure to register the mapping information of the MELIPC system module to clear the warning, 'Checksum mismatch'.

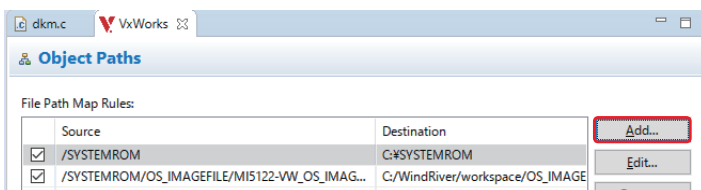
1. Copy all the files stored in the target system drive (/SYSTEMROM) to a local folder on the development environment.
2. Select [Open Connection Details].



3. Select the [Object Paths] tab.




4. Click the [Add] button, and register the mapping information of the system drive (/SYSTEMROM) that was copied to the target system drive (/SYSTEMROM) and a local folder on the development environment.



10.3 Connection and Disconnection of Communications

After setting the connection with a target server, connect or disconnect the communications with the target with the following operation.

- Select the added target server and click .

After connecting a target server, the tasks running on the target server are displayed in the "Debug" window by starting a debug. ( Page 69 Starting of Debugging)

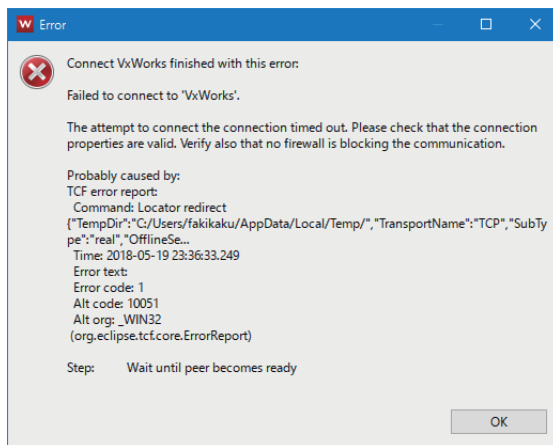
Precautions

■ Status of connection with a target

Even if the target is powered OFF, the connection is not disconnected without executing "Disconnect". When the target is powered ON again, the target server is connected automatically.

■ Error that will occur when connecting with a target


If the target is not running or a network is not connected with the target, the following error message will appear.



If the above error occurred, check the following:

- The target server is powered ON and is running properly.
- The target server can be connected.

Point

After starting a target server and completing the connections, Debug Shell can be used by selecting the connected target server. ( Page 114 Startup of Debug Shell)

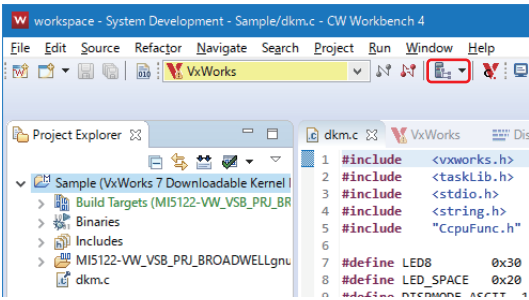
For details on Shell, refer to Help in the following menu.

- [Help] ⇒ [Help Contents] ⇒ [Wind River Documentation] ⇒ [Workbench 4] ⇒ [Debug Shell] ⇒ [hostShell Migration] in CW Workbench 4

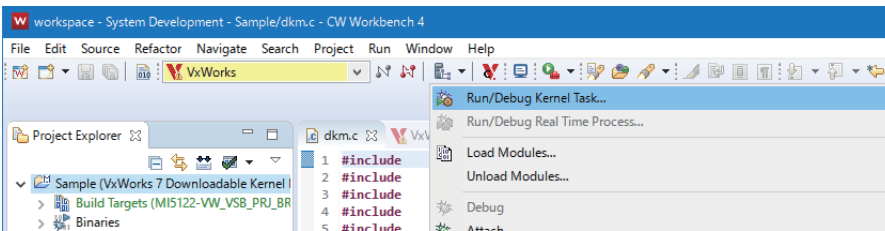
10.4 Starting of Debugging

The following shows the procedure for starting debugging.

1. Select a debuggee project in the "Project Explorer" window, and click [▼] of the debug icon () in the toolbar.



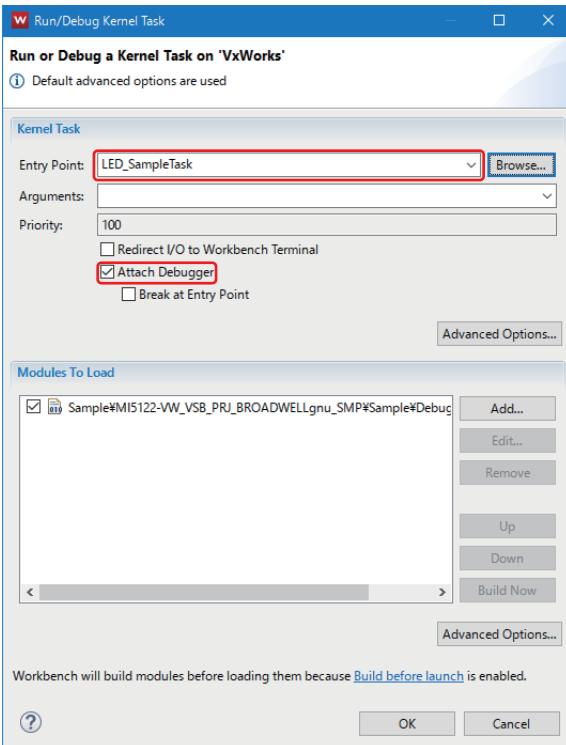
2. Select [Run/Debug Kernel Task] in the menu.



Point

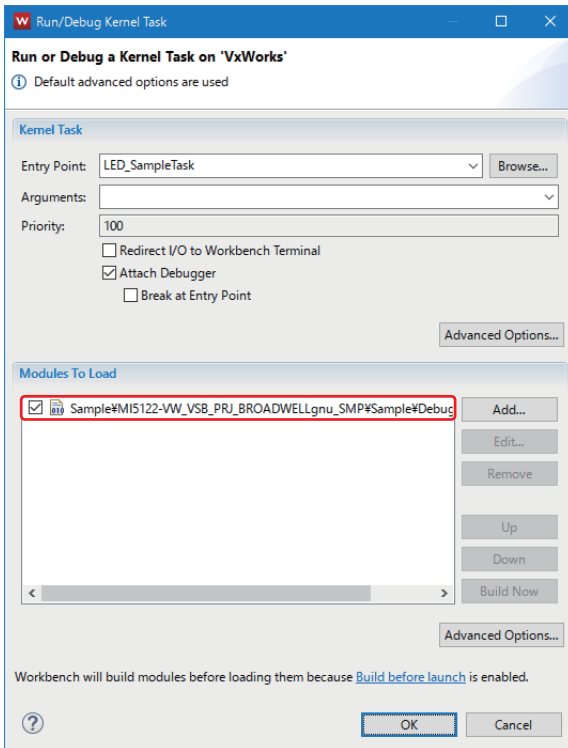
A debuggee project can be selected by selecting a project in the "Project Explorer" window, and right-clicking and selecting [Run/Debug Kernel Task] in the shortcut menu.

3. Set the following items in "Kernel Task".
 - "Entry Point": Specify a function to start debugging from.
 - "Attach Debugger": Select this item.



- To make the status 'Suspend' at the head of the specified function, select the checkbox of "Break at Entry Point".
- To start debugging after entering an argument, enter "Arguments" for an argument. Multiple arguments can be entered by delimiting each argument with a space.

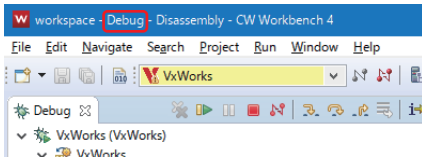
4. Check that the execution file (.out) to download is specified for "Modules To Load", and click the [OK] button. If no execution file (.out) is specified, click the [Add] button and specify the execution file (.out) to download.



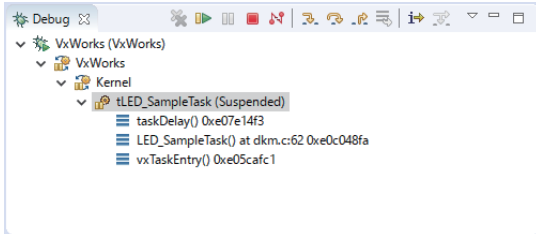
For details on downloading, refer to the 'Loading and Running the Kernel Application Using Workbench 4' section in the following Wind River Workbench manual provided by Wind River Systems, Inc. that is stored on the DVD-ROM of CW Workbench 4. (👉 Page 18 Contents of a DVD-ROM)

- vxworks_7_kernel_application_tutorial_workbench4.pdf

5. When debugging is started, the display in the header of the window is changed as "System Development"→"Debug".



6. Debug entry information is displayed in the "Debug" window.



Point

- When the checkbox of "Break at Entry Point" is selected in the "Run/Debug Kernel Task" window, the status will be 'Suspend' at the head of the specified function. (☞ Page 69 Starting of Debugging)
The line displayed in green in the following screen indicates the position where the program is currently in a 'Suspend' (stopped) state.



- When the debug execution status is changed to stop (Suspend state) by using 'Breakpoint' or pressing the [Suspend] button, the watch expression with variables is displayed by placing a mouse cursor to the variable in the "Editor" window. The value can be edited in the same window. (☞ Page 72 Inserting a breakpoint)

7. Check the operation of the task by using tool buttons in the "Debug" window. (☞ Page 72 Debug operations)

The operation statuses of a task when each of (Resume), (Suspend), and (Terminate) is enabled/disabled are as follows.

Button state	Task operation status
	RUN state (running)
	Suspended state (stopped)
	Termination state (debugging terminated)

Point

When debugging is suspended, values in each window can be referenced and changed. (☞ Page 76 Windows used for debugging)




8. After checking the operation of the task, click in the "Debug" window.

10.5 Operations for Debugging

This section shows the methods for debugging a project.

Debug operations

The tool buttons available for debug operations are as follows.

Button	Description
 (StepInto)	■ Step execution (Step Into) Performs debugging in one step unit. It continues step execution within the function.
 (StepOver)	■ Step execution (Step Over) Performs debugging in one step unit. It continues execution in a unit of function without stepping into the function.
 (StepReturn)	■ Execute up to Return It continues execution until the current subroutine completes.

Inserting a breakpoint

1. Double-click the leftmost of the line to stop the task operation.

```
23  
24 for(i = 0; i < 20; i++){  
25  
26     sRet = CCPU_SetDotMatrixLED(DISPHODE_ASCII, &pcdata[0]);  
27     if(i%10 == 0) printf
```

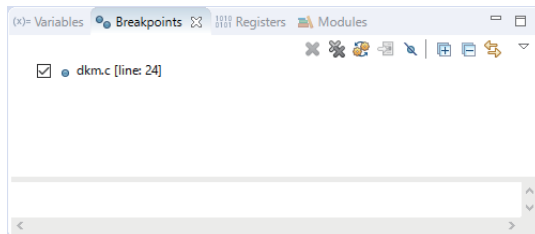
2. A breakpoint is inserted.

To release the inserted breakpoint, double-click the leftmost of the line again.

```
23  
24 for(i = 0; i < 20; i++){  
25  
26     sRet = CCPU_SetDotMatrixLED(DISPHODE_ASCII, &pcdata[0]);  
27     if(i%10 == 0) printf
```

Point

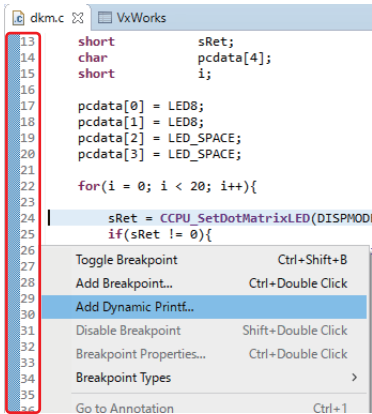
The inserted breakpoint can be checked in the "Breakpoints" window. To prevent the program from stopping temporarily, deselect the checkbox of the line in the "Breakpoints" window.



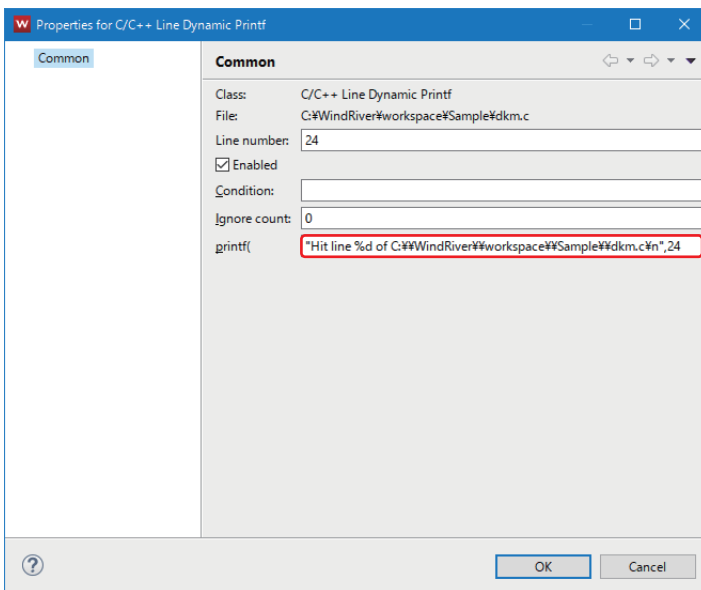
Dynamic Printf

Dynamic Printf is a function to dynamically insert or release a print statement with the same method as for a breakpoint during debugging, without inserting a printf function to a source code.

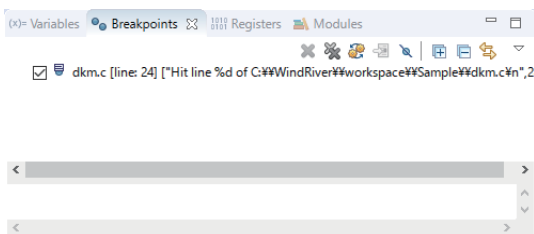
1. Open a debuggee source file in the "Editor" window.
2. Select the leftmost column, and right-click and select [Add Dynamic Printf] in the shortcut menu. The "Properties for C/C++ Line Dynamic printf" screen appears.



3. Enter the statement to display during debugging with the same text format as the argument to be written in the printf function the program for "Printf(". Click the [OK] button.



4. The print statement described in "printf(" is added to the "Breakpoints" window. The execution result is displayed in the "Console" window.

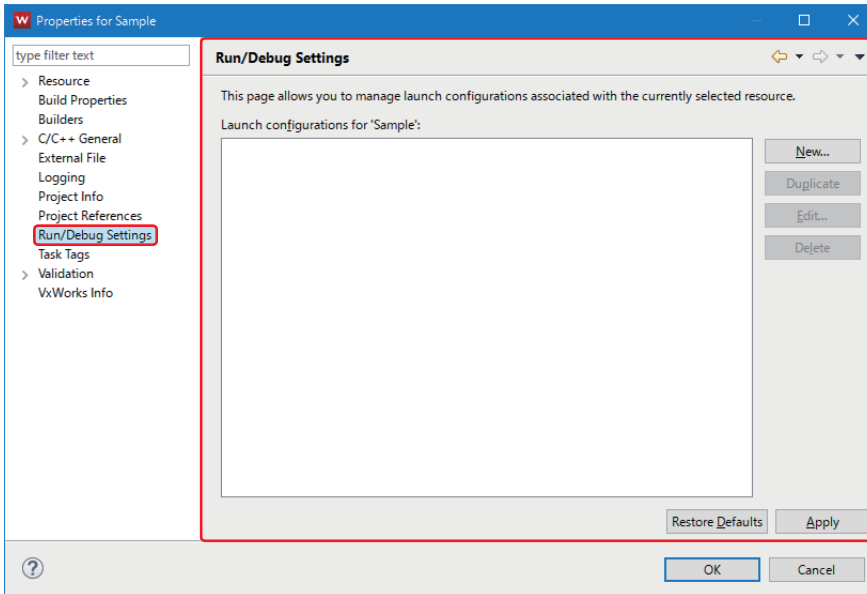


■When Dynamic Printf does not appear in the "Console" window

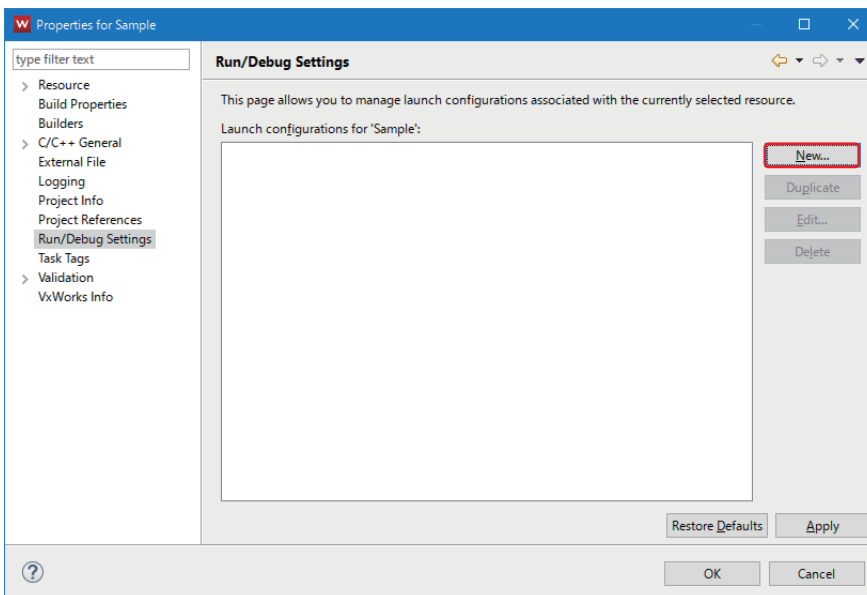
Set the following items.

1. Open a properties screen of a target project. (👉 Page 41 Setting Properties)
2. Select "Run/Debug Settings" in the tree of the properties screen.

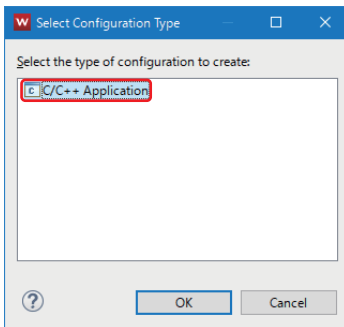
After "Run/Debug Settings" is selected, the "Run/Debug Settings" screen appears on the right side of the screen.



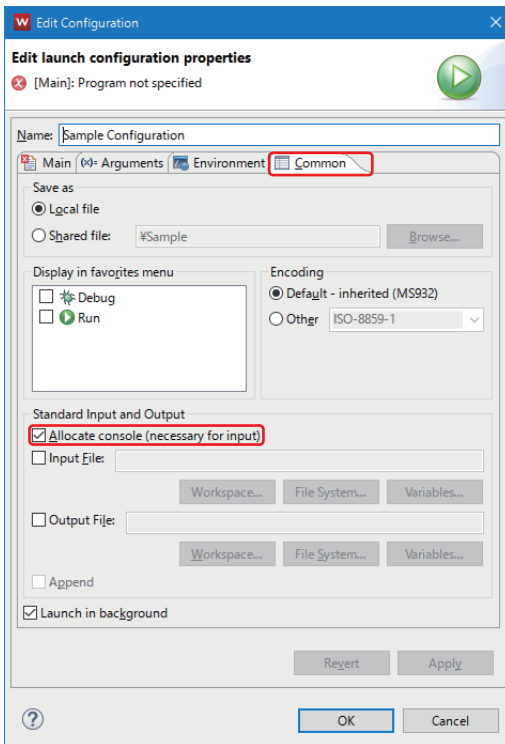
3. Click the [New] button.



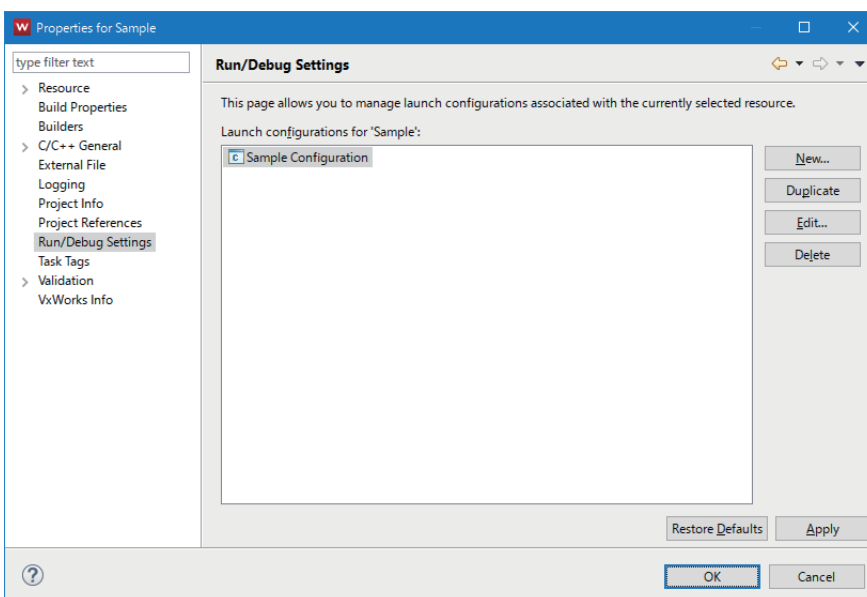
4. Select "C/C++ Application" in the "Select Configuration Type" screen, and click the [OK] button.



5. Select the checkbox of "Allocate console (necessary for input)" in the [Common] tab, and click the [OK] button.



6. Click the [OK] button.



Windows used for debugging

When a task is in a 'Suspend' state, the values can be checked and changed in the following windows, and that leads to effective debugging.


Item	Description
"Variables" window	Displays the current values of local variables.
"Registers" window	Displays the current values of each register.
"Expressions" window	Displays the current values registered in a Watch window.
"Memory Browser" window	Displays memory blocks on a target.

APPENDIX

Appendix 1 Troubleshooting

The following shows the errors that will occur in this product, and their causes and corrective actions.

Point

For troubleshooting on MELIPCs, refer to the following manual.
 MELIPC MI5000 Series User's Manual (Startup)

Troubleshooting by symptom

The following shows the troubleshooting that will occur in this product by symptom.

Category	Description
Basic operation	Page 78 The installation process has stopped halfway or has terminated suddenly before completion.
	Page 78 The message "The install root of your Wind River Workbench installation could not be located!" appears and CW Workbench 4 cannot be started.
	Page 78 The message "Workspace in use or cannot be created, choose a different one." appears and CW Workbench 4 cannot be started.
	Page 78 A patch has been applied, but the display does not change.
	Page 79 A menu to install a plug-in software cannot be found.
	Page 79 CW Workbench 4 does not start.
	Page 79 CW Workbench 4 does not operate properly.
License	Page 79 Not aware of the usage of the acquired permanent license file.
	Page 79 Not aware of the method for deleting permanent license file.
	Page 79 An error message with a title of "License Not Found" appears when CW Workbench 4 is started or being operated.
Building	Page 80 An error "command not found" occurs and the build is not executed.
	Page 80 An error such as "no input files", "No Such file", or "No such file or directory" has occurred.
	Page 80 An error, "Build target "/yyy/nnnn_partialImage" used in build target "yyyy" not found" has occurred and the build is not executed.
	Page 80 A build error, "xxx.sh: syntax error near unexpected token 'yyy_partialImage/Debug/Objects/nnn'", "xxx.sh: cannot execute binary file", "Makefile:xxx: *** missing separator. Stop", or "yy.o: command not found...No such file or directory" occurs.
	Page 80 The '.out' file is not created. The build is terminated with a message "Generation of makefiles started."
Target connection	Page 81 CW Workbench 4 cannot be connected with a target.
	Page 81 An error occurs and the 'Connect' fails (Failed to Connect to Target) when 'Connect' is executed in the "Remote Systems" window. OR, the connection status of the 'Remote Systems' is suddenly changed from connected to disconnected.
	Page 81 The selected Target Connection setting is not imported.
Downloading	Page 82 Failed to download the 'out.' file to the target.
	Page 82 The '.out' file sometimes cannot be downloaded to the target.
Command-line interface	Page 82 Two multi-byte characters are displayed for 'Terminal' in 'Development Shell'
Debugging	Page 83 An error, "Failed to launch kernel task" occurs and the debugging cannot be executed.
	Page 83 A warning, "xxxxxxx has unresolved symbol(s)" occurs.
	Page 83 During the execution of a StepOver, the screen transits to the "Disassembly" screen.

Basic operation

The following shows the errors that will occur in the basic operations, and their causes and corrective actions.

■The installation process has stopped halfway or has terminated suddenly before completion.

Cause	Corrective action
Characters other than single-byte alphanumeric characters, an underscore '_', or a hyphen '-' is used for the installation destination folder name.	Use the following characters for naming the installation and/or reinstallation of CW Workbench destination folder. <ul style="list-style-type: none">• Single-byte alphanumeric characters (a single-byte space cannot be used.)• Underscore '_', hyphen '-'

■The message "The install root of your Wind River Workbench installation could not be located!" appears and CW Workbench 4 cannot be started.

Cause	Corrective action
Characters other than single-byte alphanumeric characters, an underscore '_', or a hyphen '-' is used for the installation destination folder name.	Use the following characters for naming the installation and/or reinstallation of CW Workbench destination folder. <ul style="list-style-type: none">• Single-byte alphanumeric characters (a single-byte space cannot be used.)• Underscore '_', hyphen '-'

■The message "Workspace in use or cannot be created, choose a different one." appears and CW Workbench 4 cannot be started.

Cause	Corrective action
The folder of the Workspace specified at the startup of CW Workbench 4 is being used by another CW Workbench 4.	<ul style="list-style-type: none">• Click the [OK] button, and select a different folder on the displayed Workspace folder specification screen.• End the running CW Workbench 4.

■A patch has been applied, but the display does not change.

Cause	Corrective action
Old data remained in the cache.	When starting CW Workbench 4, specify '-clean' to an argument.

Operating procedure

How to specify '-clean'

1. Select the CW Workbench 4 shortcut on the desktop. Select and right-click [Properties] in the shortcut menu.
2. Enter a space at the end of the target entered for "Target:" in the "CW Workbench 4 Properties" screen. Enter '-clean' after the single-byte space, and click the [OK] button.

Point

After CW Workbench 4 is started by specifying '-clean', delete the '-clean' from the start argument. Otherwise, it may take time to start CW Workbench 4.

How to delete '-clean'

1. Select the CW Workbench 4 shortcut on the desktop. Select and right-click [Properties] in the shortcut menu.
2. Delete '-clean' and the single-byte space entered in the step 2 in 'How to specify' above.

■A menu to install a plug-in software cannot be found.

A plug-in software can be installed from [Help] ⇒ [Install New Software] in CW Workbench 4.

■CW Workbench 4 does not start.

Cause	Corrective action
The command prompt screen, which is displayed right after selecting the start menu of CW Workbench 4, was manually closed.	Do not manually close the command prompt screen which is displayed right after selecting the start menu of CW Workbench 4.

■CW Workbench 4 does not operate properly.

The following symptoms occur and CW Workbench 4 does not operate properly.

- The mouse cursor disappears when placing the cursor on CW Workbench 4.
- A project cannot be created.
- The process of a building does not end after executing the build.

Cause	Corrective action
A double-byte character may be used in the storage path of a workspace or project.	Do not use a double-byte character in the storage path of a workspace or project.


License

■Not aware of the usage of the acquired permanent license file.


Store the obtained permanent license file in the 'license' folder on the personal computer where CW Workbench 4 is installed.

( Page 33 APPLICATION OF PERMANENT LICENSE)

■Not aware of the method for deleting permanent license file.

Delete all the files in the 'license' folder on a personal computer where CW Workbench 4 is installed. ( Page 110 Deletion of Permanent License)

■An error message with a title of "License Not Found" appears when CW Workbench 4 is started or being operated.

An error occurs in the license file used in CW Workbench 4. ( Page 84 LICENSE ERROR)

Building



■An error "command not found" occurs and the build is not executed.

Cause	Corrective action
A compiler that is not supported by CW Workbench 4 is set..	Check that any unsupported compilers are not set.


Operating procedure

1. Select [Project] ⇒ [Properties] to display the property screen.
2. Select "Build Properties" from the tree on the left in the screen, and select the [Build Support and Specs] tab.
3. Check that any unsupported compilers have not been selected for "Available and enabled build specs".

■An error such as "no input files", "No Such file", or "No such file or directory" has occurred.

Cause	Corrective action
A source file is not registered in the build target project.	Create a new file with extension of '.c' or '.cpp' or change the file extension to '.c' or '.cpp'. Execute the build after registering the file to the build project. <ul style="list-style-type: none">• Creating new project:  Page 36 PROJECT CREATION• Changing file name: Select a file name to change, and right-click and select "Rename". Alternatively, press the  key.

■An error, "Build target "/yyyy/nnnn_partialImage" used in build target "yyyy" not found" has occurred and the build is not executed.

Cause	Corrective action
The file with the same name as the project name has been renamed.	Create a new project and move the source file from the project where an error occurs. ( Page 36 PROJECT CREATION)

Point

When deleting a project in which an error occurs, a confirmation message appears. Check whether the checkbox is selected or unselected, and be sure not to delete the necessary file by mistake.

- Unselected: The project is deleted from the workspace. The file is left on the hard disk.
- Selected: The project is deleted from the work space as well as a hard disk. (The deleted file cannot be recovered.)

■A build error, "xxx.sh: syntax error near unexpected token 'yyy_partialImage/Debug/Objects/nnn'", "xxx.sh: cannot execute binary file", "Makefile:xxx: *** missing separator. Stop", or "yy.o: command not found...No such file or directory" occurs.

Cause	Corrective action
Unavailable character is included in the source file name.	Remove the following unavailable symbols and characters from the file name within the error message 'nnn' and from the name of the source file added to the project: <ul style="list-style-type: none">• #, \$, &, ', (,), :, =, double-byte character, single-byte katakana Remove the following symbols that cannot be used for file names on Windows: <ul style="list-style-type: none">• \, /, :, *, ?, ", <, >,

■The '.out' file is not created. The build is terminated with a message "Generation of makefiles started."

Cause	Corrective action
'\$' is included in the source file name.	Delete '\$' from the source file name.

Target connection

■ CW Workbench 4 cannot be connected with a target.

- Case 1

Symptom	Cause	Corrective action
The following message appears. • [Log Console] message "Differences for module"xxxxxxx" segment's address..."	The VxWorks image file does not match with the target and CW Workbench 4.	Match the VxWorks image file between the target and CW Workbench 4. (Page 61 Setting target server connection)

- Case 2

Symptom	Cause	Corrective action
The following message appears. • "Failed to Connect to Target"	The network between the target and CW Workbench 4 is not connected, or IP address setting is in correct.	Check the following statuses: <ul style="list-style-type: none"> • The power supply for the target is ON. • The target is operating properly. (No error has occurred.) • The Ethernet cable connector connecting the personal computer to the target is fully inserted into the Ethernet port. • The Ethernet cable is connected. In addition, the LEDs for each Ethernet port turn ON. • The IP addresses of the personal computer and the target are set properly.

Point

If the problem is not solved by applying the corrective actions shown above, delete the cache folder and restart CW Workbench 4. (It may take time to startup at the first time after deleting the cache folder.)

Cache folder: 'C:\users\User name\.workbench_xxxxxxxx'

- User name: The user name currently logged on
- x: A value added automatically

- Other causes

Cause	Corrective action
The host name of the personal computer where CW Workbench 4 is installed may have only one character or more than 15 characters, or may have a double-byte character or single-byte katakana.	Set the host name of the personal computer within 2 to 15 single-byte alphanumeric characters.

■ An error occurs and the 'Connect' fails (Failed to Connect to Target) when 'Connect' is executed in the "Remote Systems" window, OR, the connection status of the 'Remote Systems' is suddenly changed from connected to disconnected.

Cause	Corrective action
'Connect' was executed on the "Remote Systems" window of CW Workbench 4 from multiple personal computers to one target.	Do not execute 'Connect' on multiple personal computers to one target at the same time.
'Connect' was executed on the "Remote Systems" window of CW Workbench 4 from one personal compute to one target.	Do not execute multiple 'Connect' commands from the "Remote Systems" window of CW Workbench 4 to one target.

■ The selected Target Connection setting is not imported.

Cause	Corrective action
The multiple Target Connection settings of CW Workbench 4 are selected and imported.	Import the Target Connection settings one by one which are not imported.

Downloading

■Failed to download the '.out.' file to the target.

Cause	Corrective action
An unavailable character or symbol is used for the path of the specified '.out' file or file name. <ul style="list-style-type: none">• [Problem Occurred] message "Launch step finished with this error: File not found:"	Specify a '.out' file path or file name in which the following characters or symbols are not included, and download it again. <ul style="list-style-type: none">• ', * ; : ; , , < , > , / , ? , single-byte space, double-byte character, single-byte katakana

■The '.out' file sometimes cannot be downloaded to the target.

Cause	Corrective action
Double-byte characters or single-byte katakana is included in the path of the VxWorks image file specified in the target server setting.	Remove the double-byte character or single-byte katakana from the VxWorks image file path. (☰ Page 61 Setting target server connection)

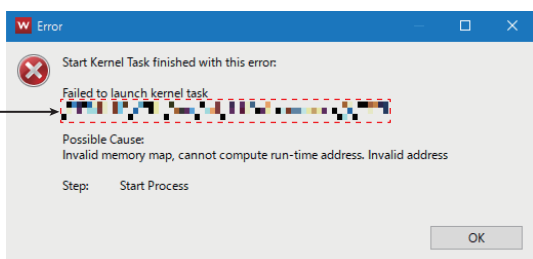
Command-line interface

■Two multi-byte characters are displayed for 'Terminal' in 'Development Shell'

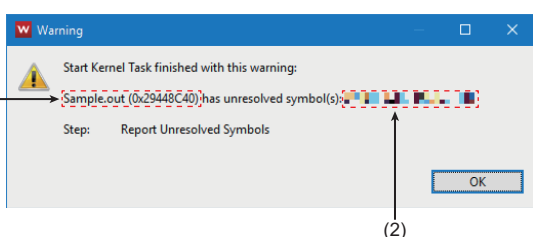
Cause	Corrective action
CW Workbench 4 is running on Windows 10.	Follow the procedure below, set the command prompt to "Use legacy console", and then start Development Shell. <ol style="list-style-type: none">(1) Open the command prompt.(2) Right-click the title bar of the command prompt window, and select [Properties] in the shortcut menu.(3) In the properties screen, select the checkbox of "Use legacy console", and click the [OK] button.

Debugging

■An error, "Failed to launch kernel task" occurs and the debugging cannot be executed.

Cause	Corrective action
<p>A task that is specified for the Entry Point fails to open.</p>  <p>(1)Entry Point name</p>	<p>Update the object file that will be specified for the target connection to the same file as the one stored on the connection target for debugging. (Establish an FTP connection to connect to the target, and copy the necessary object files to a local folder.)</p>

■A warning, "xxxxxxx has unresolved symbol(s)" occurs.

Cause	Corrective action
<p>Symbols such as 'function' and 'macro' that are included in 'Download File Name' are not found.</p>  <p>(1)Download File Name (2)function or macro name etc</p>	<p>After performing the following corrective action, build the project again, and then perform debugging.</p> <p>(1) Match the entity of the function name, such as the type, name, and prototype with the one described in 'function or macro name etc'.</p> <p>(2) If the header file of CCPUFunc.h or MDFunc.h is included, establish an FTP connection to connect to the target to obtain the header file, and then perform building using the obtained header file.</p>

■During the execution of a StepOver, the screen transits to the "Disassembly" screen.

Cause	Corrective action
<p>After executing a StepOver during the debugging of the source code, the screen may change from the "Disassembly" screen to the one for assembler debugging.</p>	<p>'Checksum mismatch' warning may occur. In the target connection settings, register the mapping information of the module that has been loaded to VxWorks for "Object Paths". (Page 67 Countermeasure for the warning, 'Checksum mismatch'.)</p>

A

Appendix 2 LICENSE ERROR

This section explains the license error occurs when starting and running CW Workbench 4.

License error

If a license error occurs when starting and running CW Workbench 4, perform any of the following operation in the license error message.

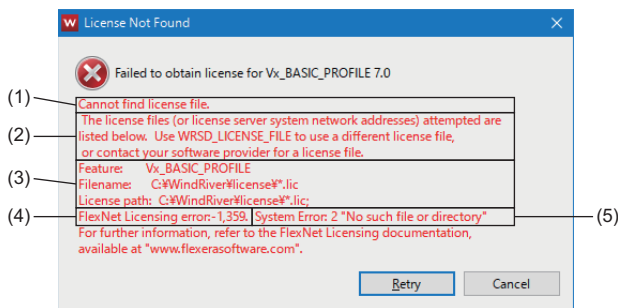
- Click the [Retry] button: The license check is repeated.
- Click the [Cancel] button: The license check is terminated, and CW Workbench 4 continues to operate. However, some of the CW Workbench 4 functions shown below will be disabled.

Unavailable function	Available function
<ul style="list-style-type: none"> • Project creation • Building • Target connection • Downloading • Debugging 	<ul style="list-style-type: none"> • Editor functions (create, edit, save, search) • Importing • Exporting

License error message

The following message appears when a license error occurs. Check the error contents.

Window



Displayed items

No.	Item	Description
(1)	Error text	Displays an error summary.
(2)	Error details ^{*1}	Displays error details, solutions, and measures to avoid errors.
(3)	Support information ^{*1}	Displays information such as a license file name and path information
(4)	FlexNet Licensing error information	Displays the error number and minor number of a license error cause. A number used when a vendor provides support. Example) FlexNet Licensing error: -1,359. <ul style="list-style-type: none"> • Error number: -1 • Minor number: 359
(5)	System error information ^{*1}	Displays the number of a current error occurred in the operating system and error text at a license error occurrence.

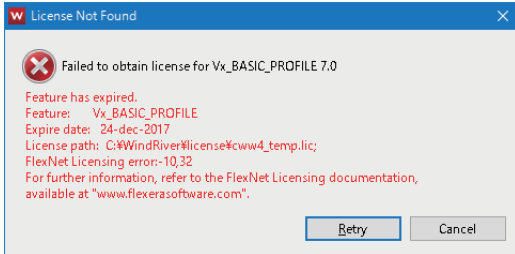
*1 Not displayed in some errors.

Main license error messages and recovery procedures

This section explains license errors that may occur during operations of CW Workbench 4 and how to recover from errors.

Trial period expiration

When CW Workbench 4 is installed with a temporary license, the following message appears after 30 days of installation.

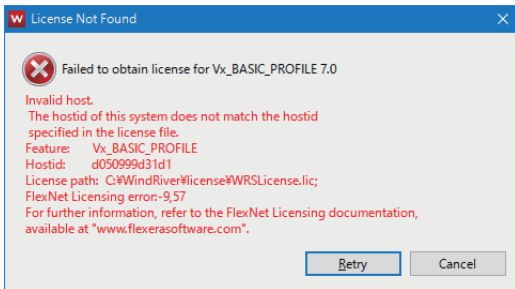


How to recover from the error

Obtain a permanent license and overwrite the temporary license file to use CW Workbench 4.

Invalid license

If the host information that was registered for obtaining a permanent license is incorrect, the following message appears.



Restriction

When 'DISK' is selected in 'Host Information' and a volume serial number other than the one on the C drive is specified for 'Host ID', this error also occurs. Specify a volume serial number on the C drive for 'Host ID'. When there are multiple drives on the personal computer in use, do not specify a volume serial number other than the one on the C drive for 'Host ID'.

How to recover from the error

Check the Host ID of the personal computer where CW Workbench 4 is installed again.

Item	Corrective action
Host ID is incorrect.	Apply for license transfer using License Transfer Certification Agreement Form (PermanentLicenseApplicationForm.xls) stored on the DVD-ROM. The Host ID to enter is as follows: <ul style="list-style-type: none"> • Previous License: Enter the incorrect Host ID registered last time. • New License: Enter a new Host ID to register this time.
Host ID is correct.	Consult your local Mitsubishi representative from which the CW Workbench 4 was purchased.



Appendix 3 PATCH APPLICATION

This section show the procedure for applying a patch released for CW Workbench 4.

How to obtain a patch

The following shows the method for obtaining a patch.

1. Download a patch file from the following site.

MITSUBISHI ELECTRIC FA Global Website (URL: www.MitsubishiElectric.com/fa)

2. Extract the downloaded file, and store the file with the extension 'rpm' to the following folder.

When the installation destination of CW Workbench 4 is "C:\WindRiver", a patch will be stored in the following path.

- C:\WindRiver\maintenance\patch.rpms

Patch application procedure

The following shows the procedure for applying a patch.

Point

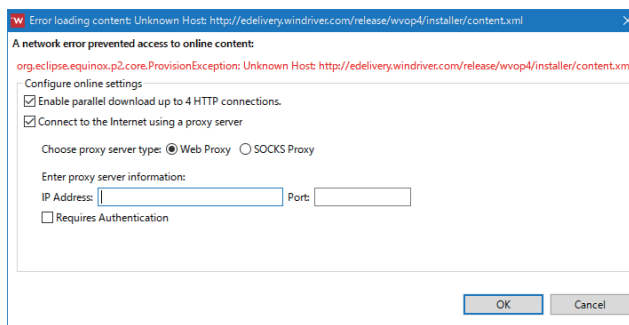
- When applying a patch for CW Workbench 4, log on as a user with Administrator privileges.
- Before applying a patch, end CW Workbench 4.
- During patch application, do not stop the processing.
- During a patch application, a confirmation dialog box for user account control may appear. Read the message, and click "Allow" or the [Yes] button to proceed with the patch application.

1. Select [CW Workbench 4] ⇒ [Product Maintenance] from Windows Start*¹.

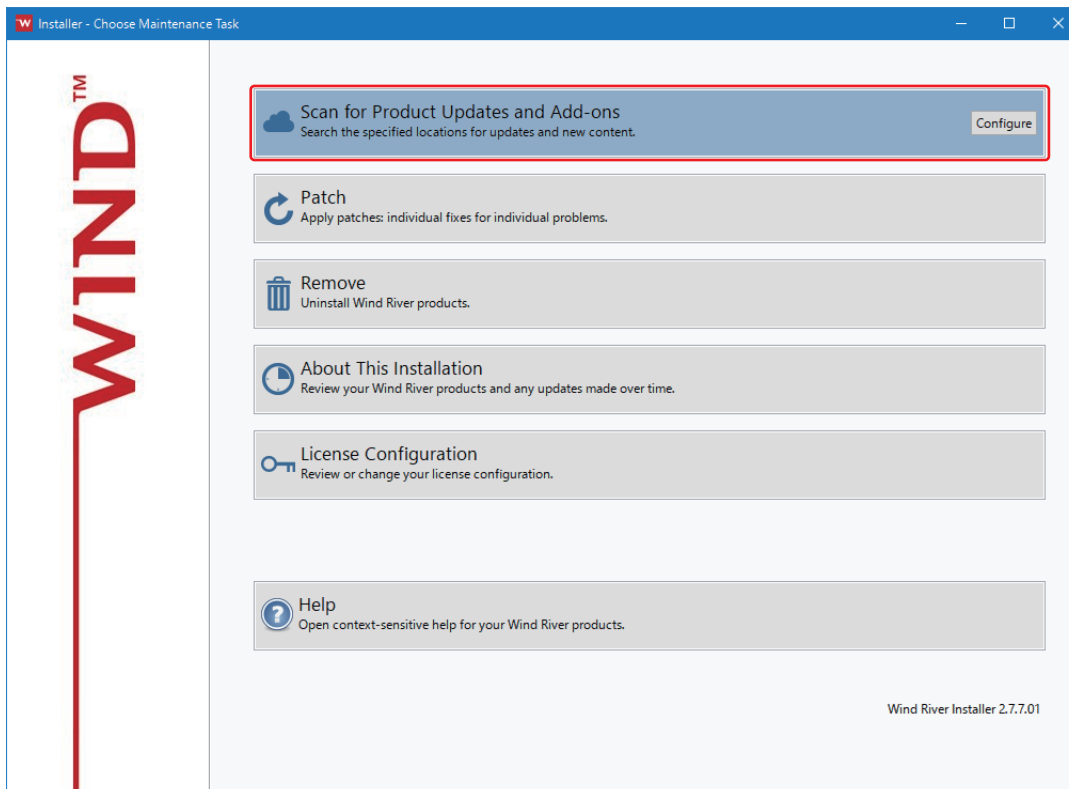
*1 Select [All apps] in the Start screen or [Start] ⇒ [All Programs]/[All apps].

Point

If a connection to the Internet cannot be established, the following screen appears. Internet connection is not necessary for patch application. Click the [Cancel] button.

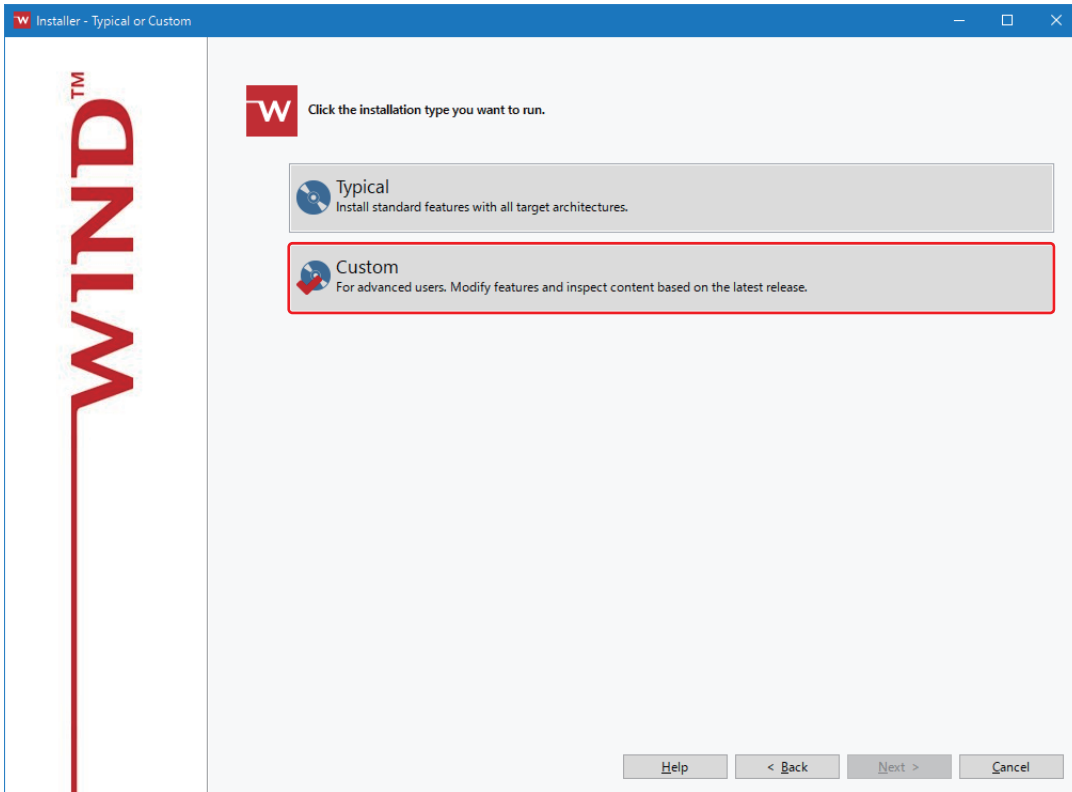


2. Select "Scan for Product Updates and Add-ons".

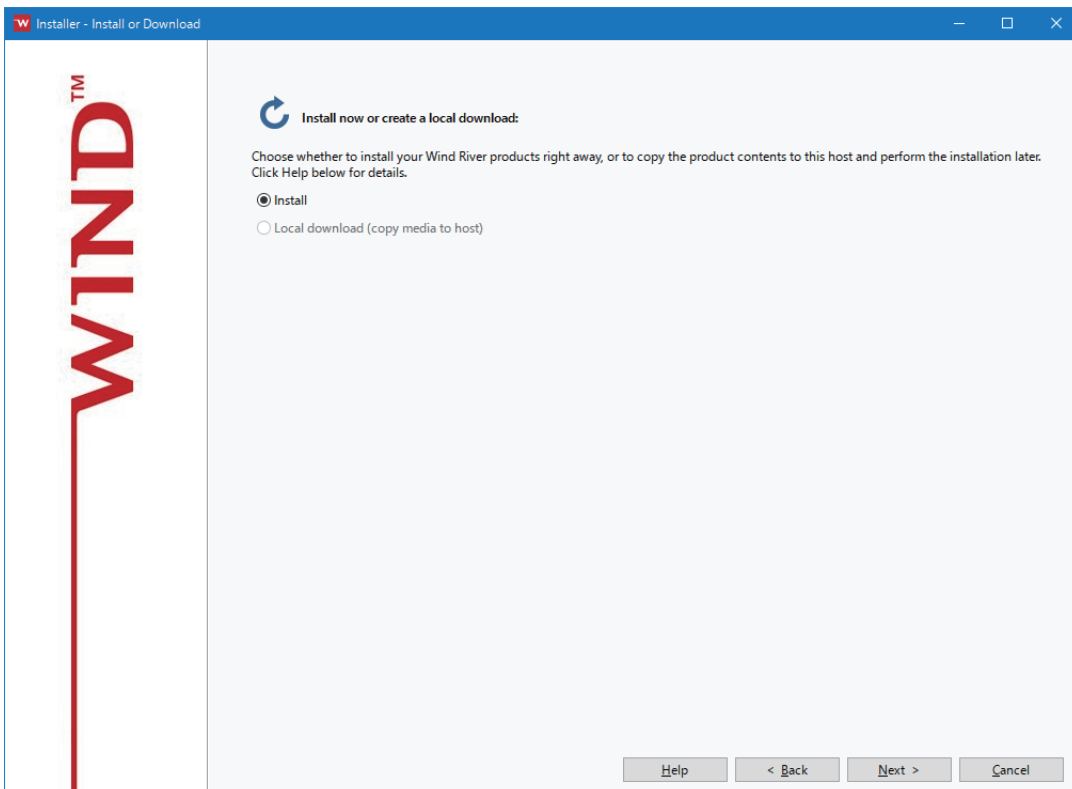


A

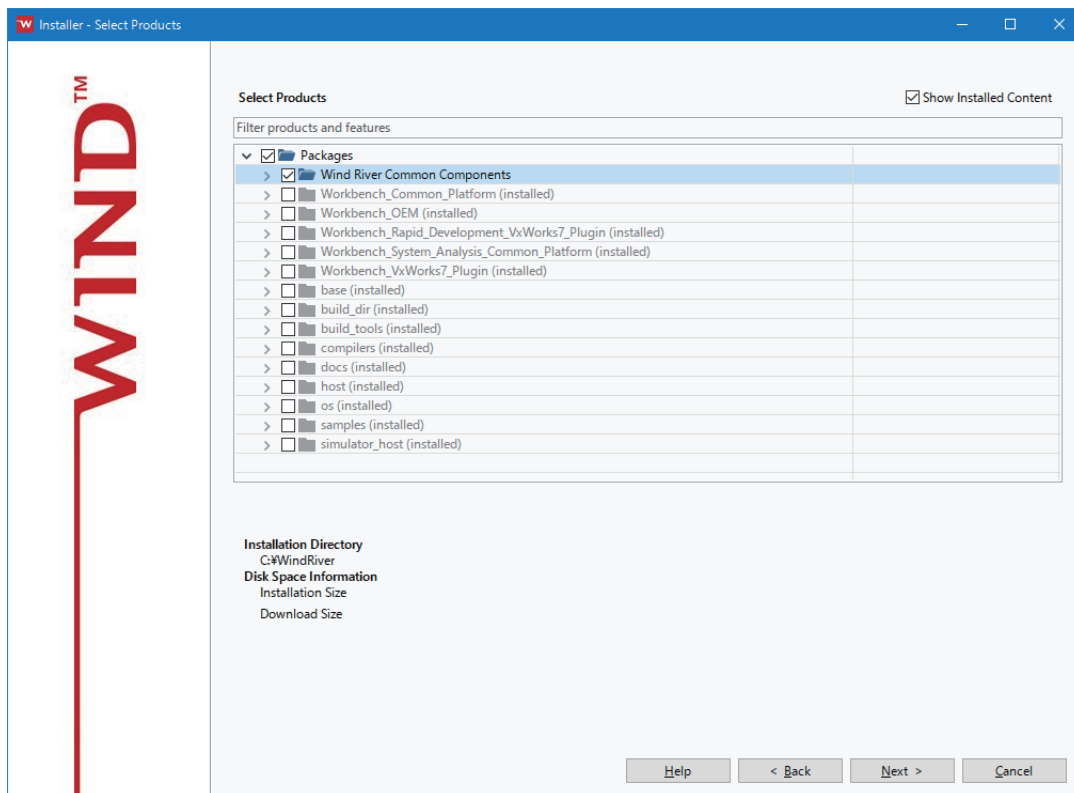
3. Select "Custom".



4. Click the [Next] button.



5. Check that a patch to install is selected, and click the [Next] button.



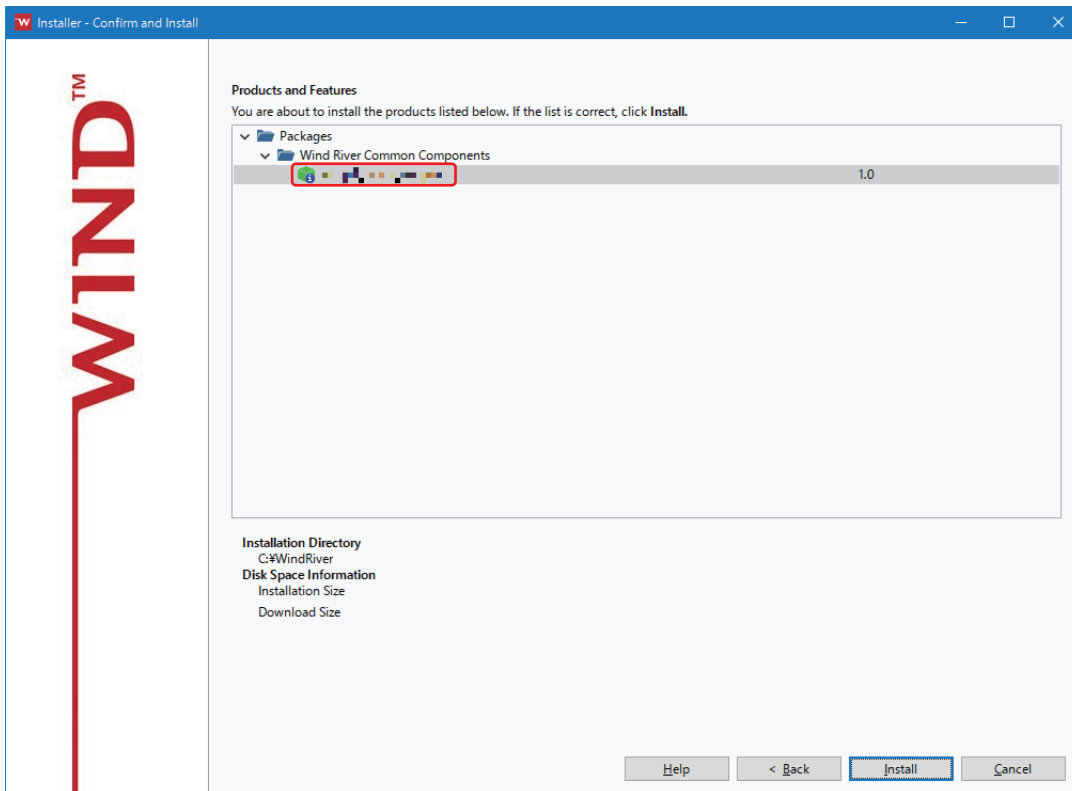
Point

Depending on the patch, a screen for license authentication may appear.

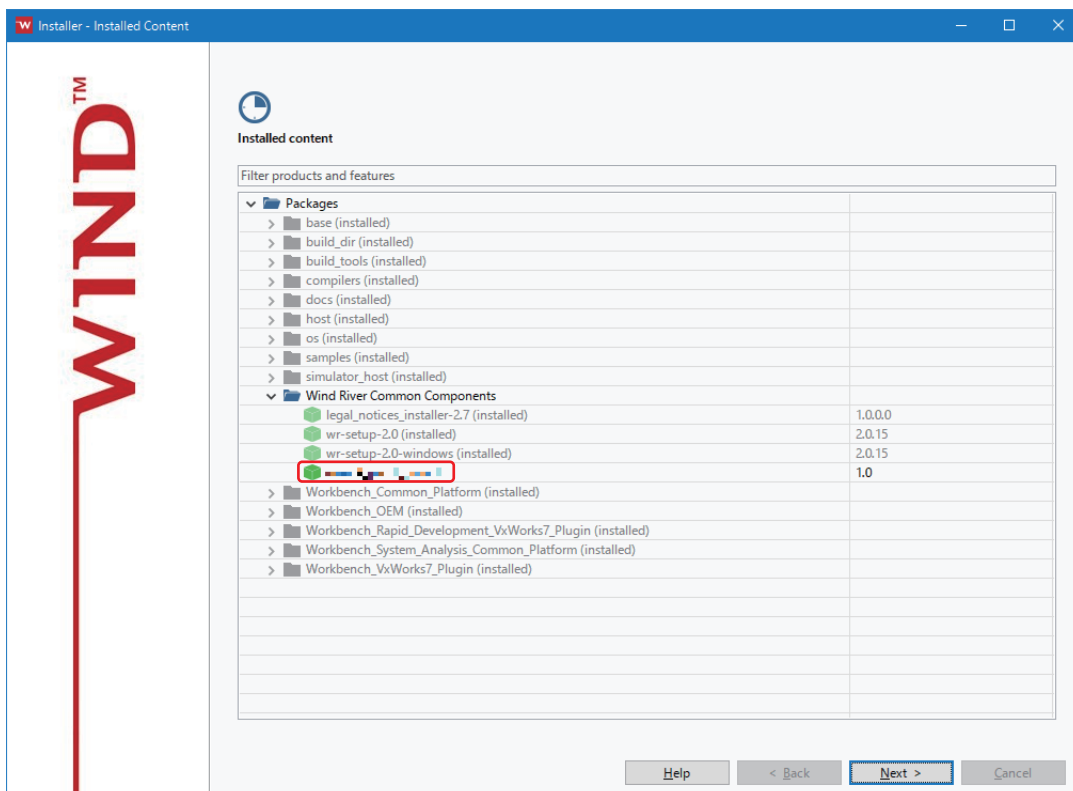
When a screen for license authentication appears, select "I ACCEPT the terms of this license agreement." and click the [Next] button.

A

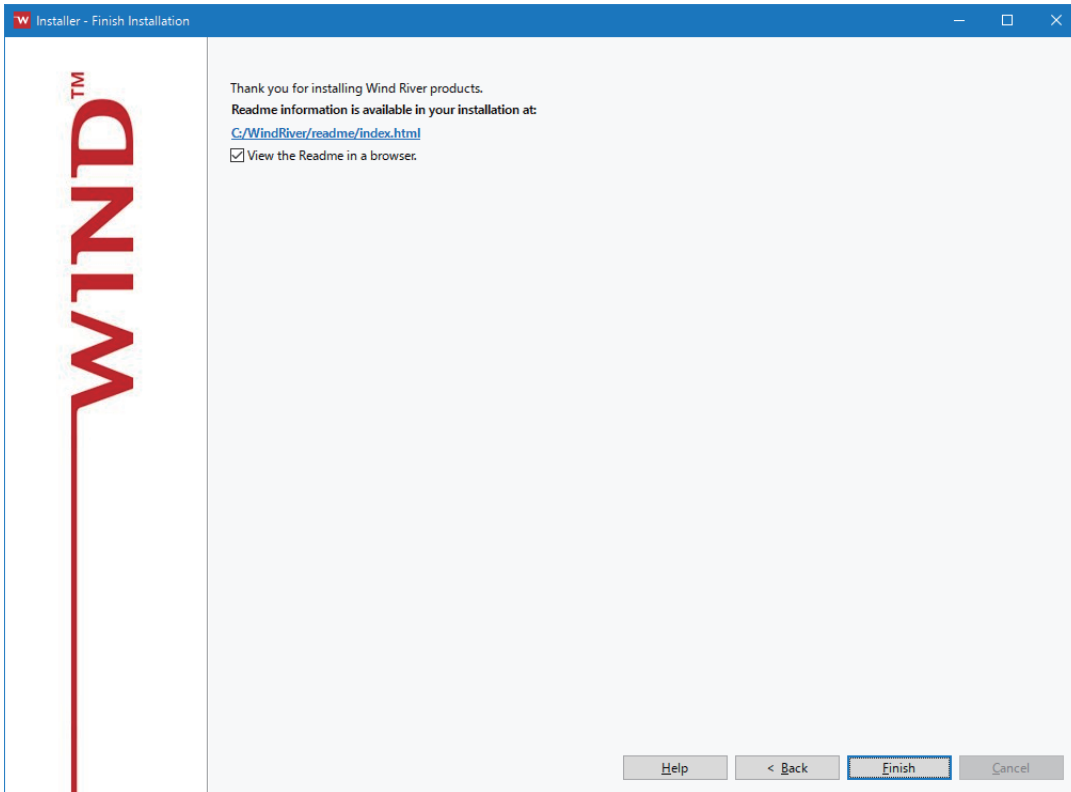
6. Check that a patch to install is correct, and click the [Install] button.



7. Click the [Next] button.



8. Click the [Finish] button.



Appendix 4 Online Update

This section show the procedure for updating this product online.

Point

During the online update, a confirmation dialog box for user account control may appear. Read the message, and click "Allow" or the [Yes] button to proceed with the online update.

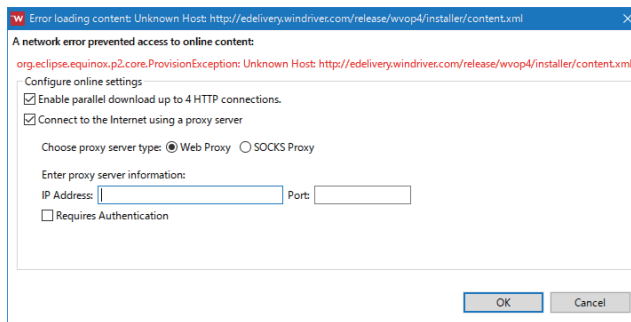
Operating procedure

1. Select [CW Workbench 4] ⇒ [Product Maintenance] from Windows Start*¹.

*¹ Select [All apps] in the Start screen or [Start] ⇒ [All Programs]/[All apps].

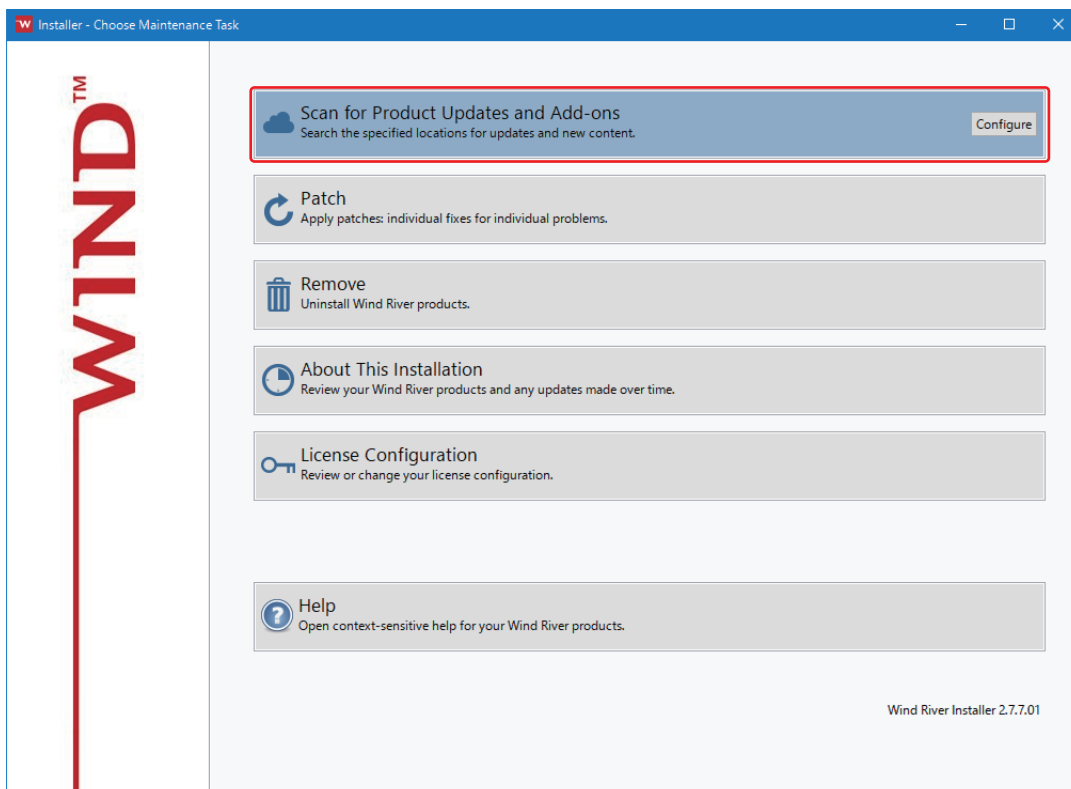
Point

If a connection to the Internet cannot be established, the following screen appears. After checking the network connection and network connection settings, click the [OK] button. When the connection to the Internet is successfully established, the Product Maintenance screen appears. If clicking the [Cancel] button, setting the network connection described in step 2 is required.

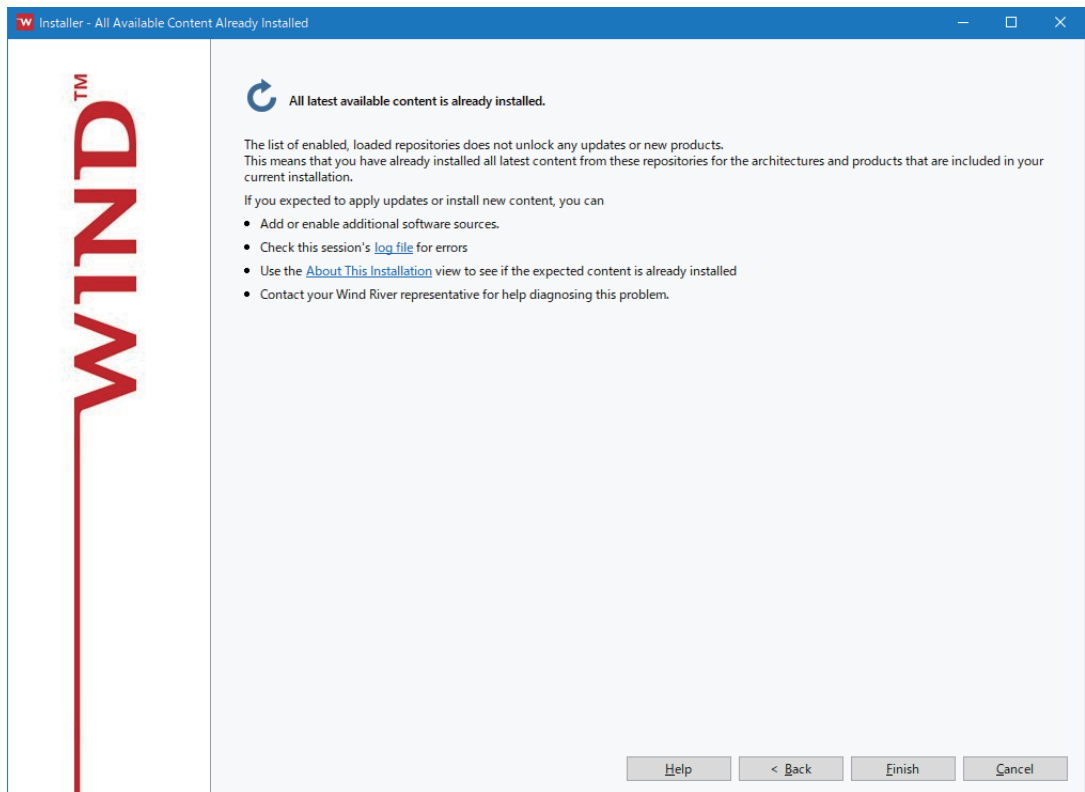


2. Select "Scan for Product Updates and Add-ons".

When the personal computer is connected to the Internet via a proxy server, click the [Configure] button in "Scan for Product Updates and Add-ons", and configure the proxy server that was set for the Internet connection. (Proxy server setting)

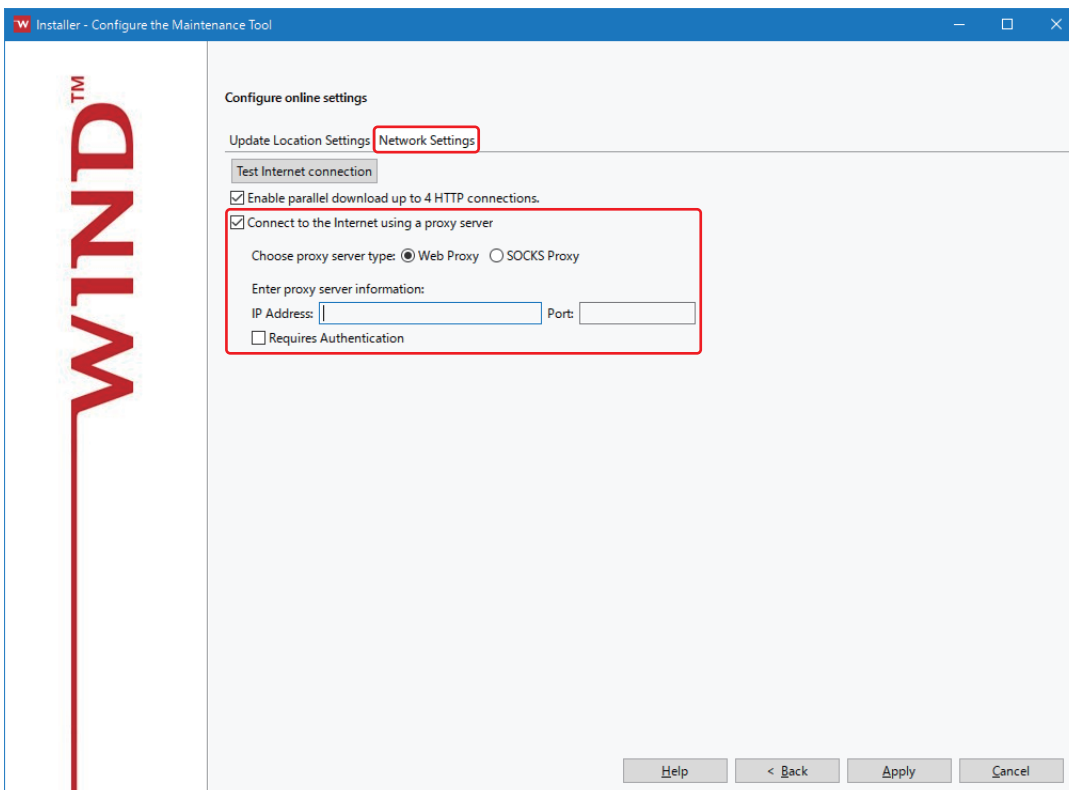


When the most recent product is installed, the following screen appears. Click the [Finish] button to end the online update.

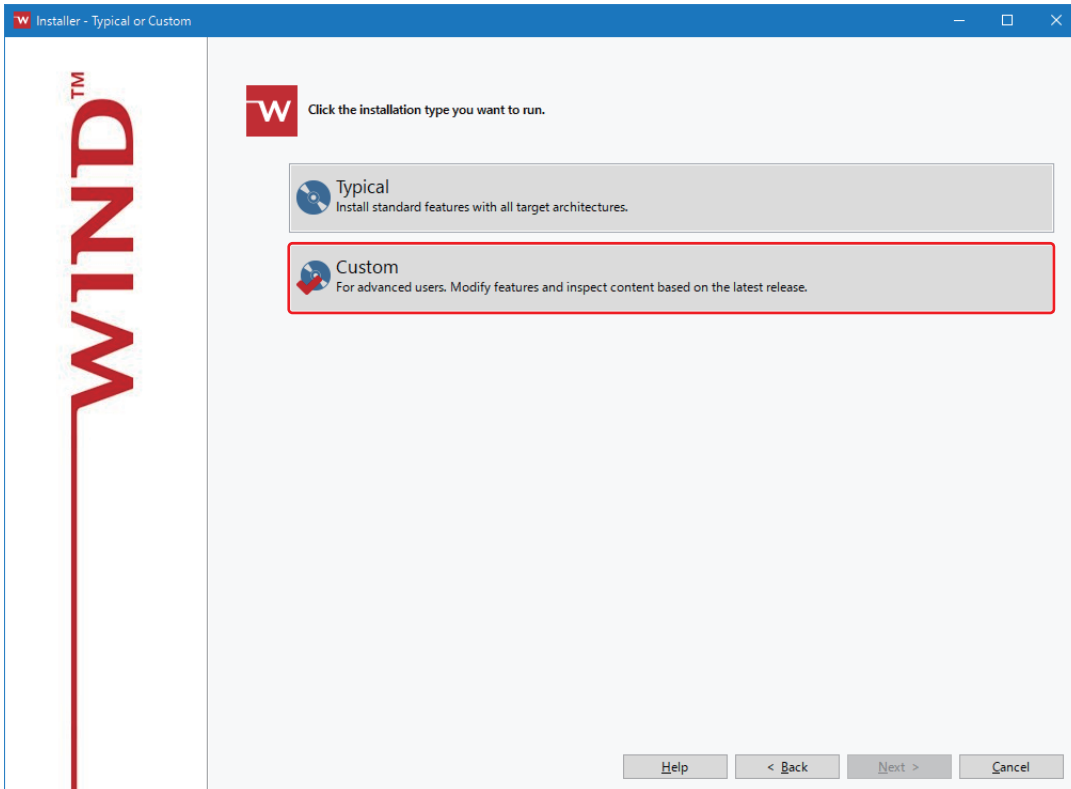


• Proxy server setting

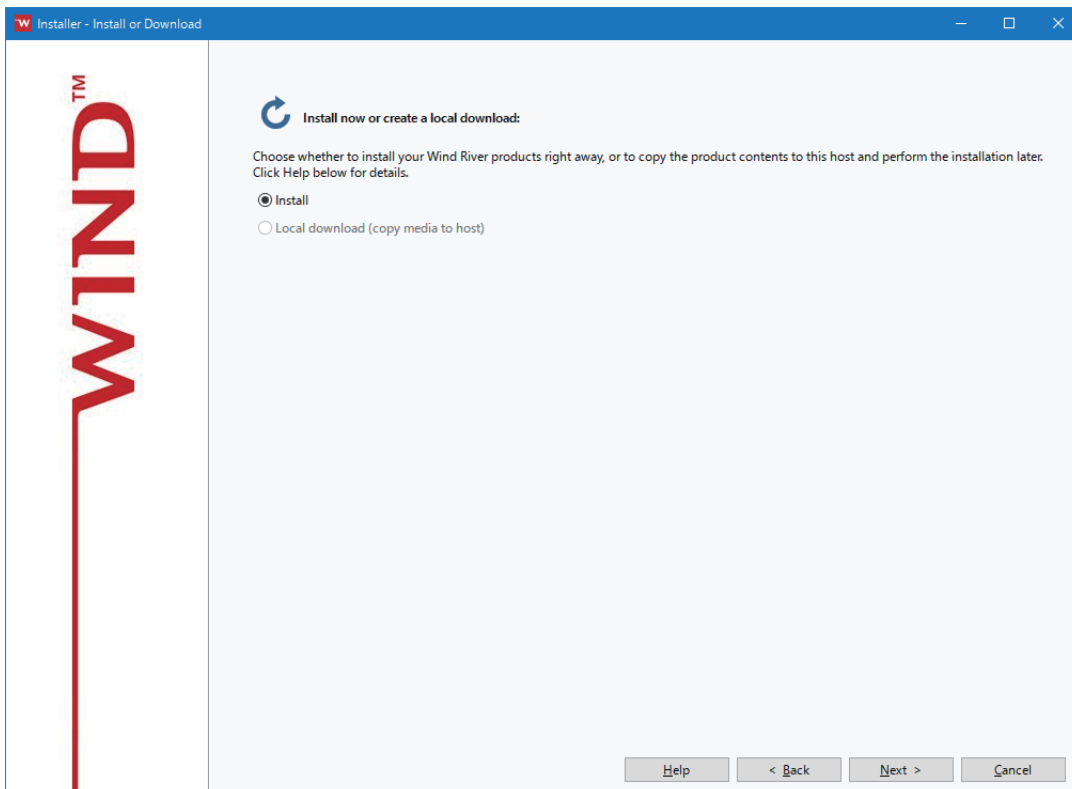
Select the checkbox of "Connect to the Internet using a proxy server" in the [Network Settings] tab, set the proxy server which was set for the Internet connection, and click the [Apply] button.



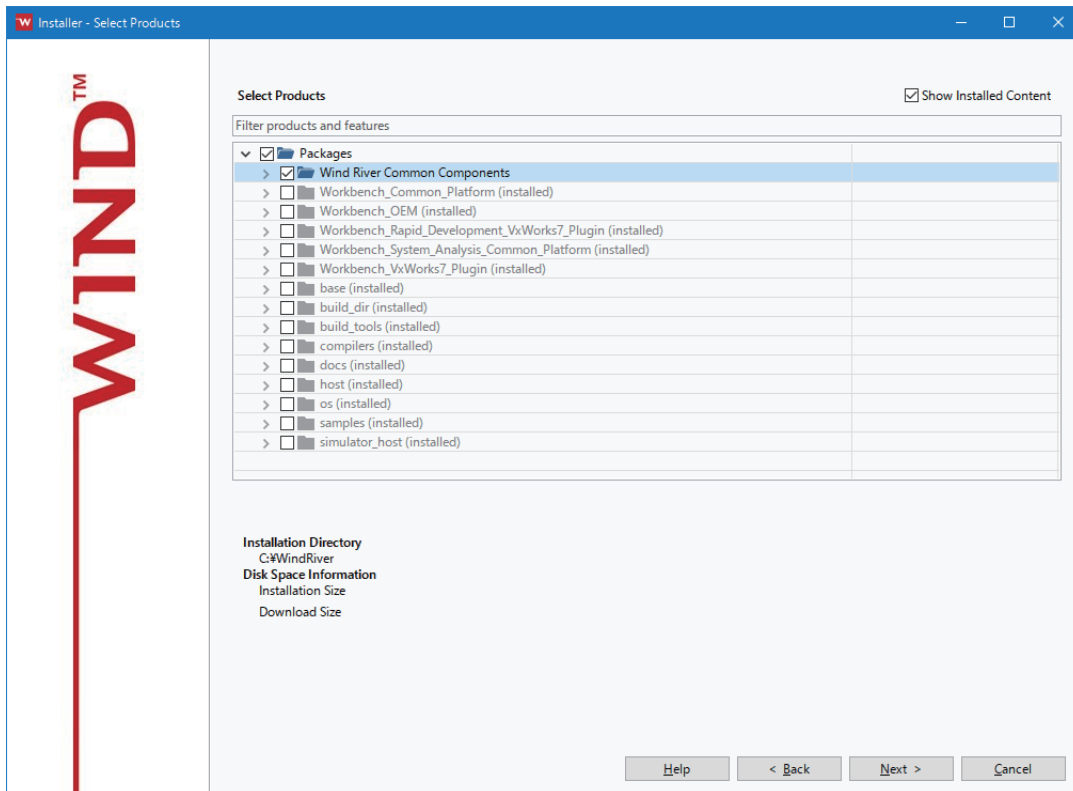
3. Select "Custom".



4. Click the [Next] button.



5. Check that a patch to install is selected, and click the [Next] button.



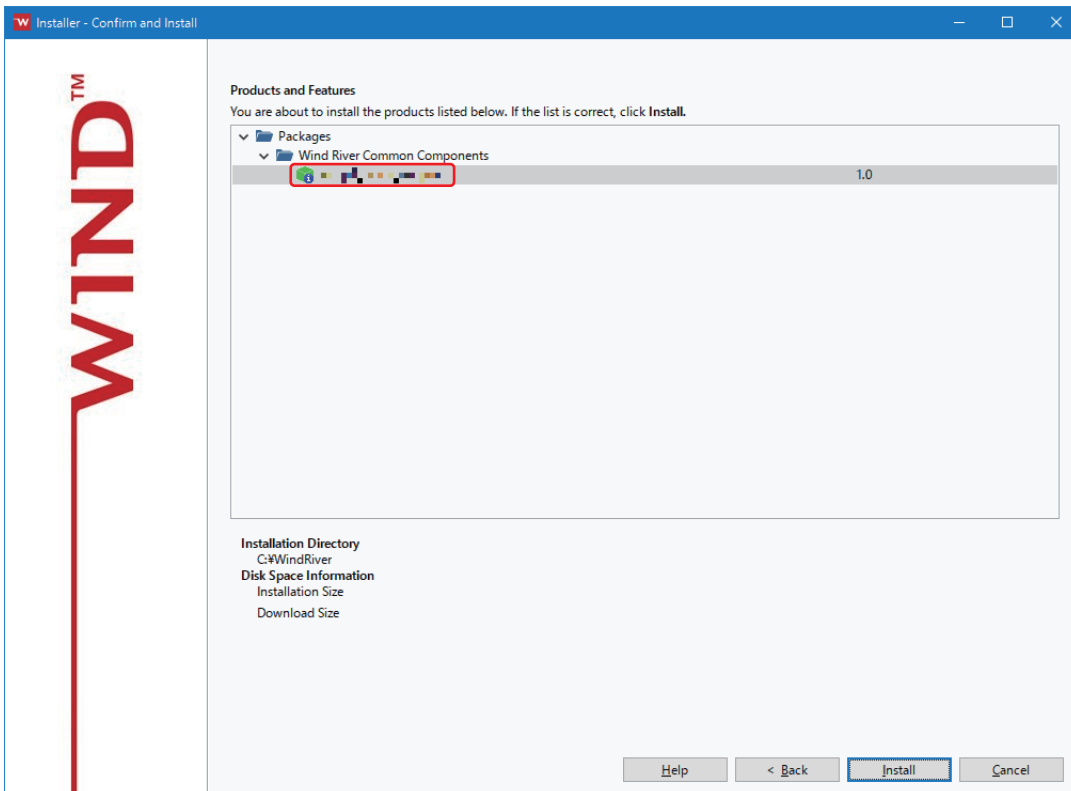
Point

Depending on the patch, a screen for license authentication may appear.

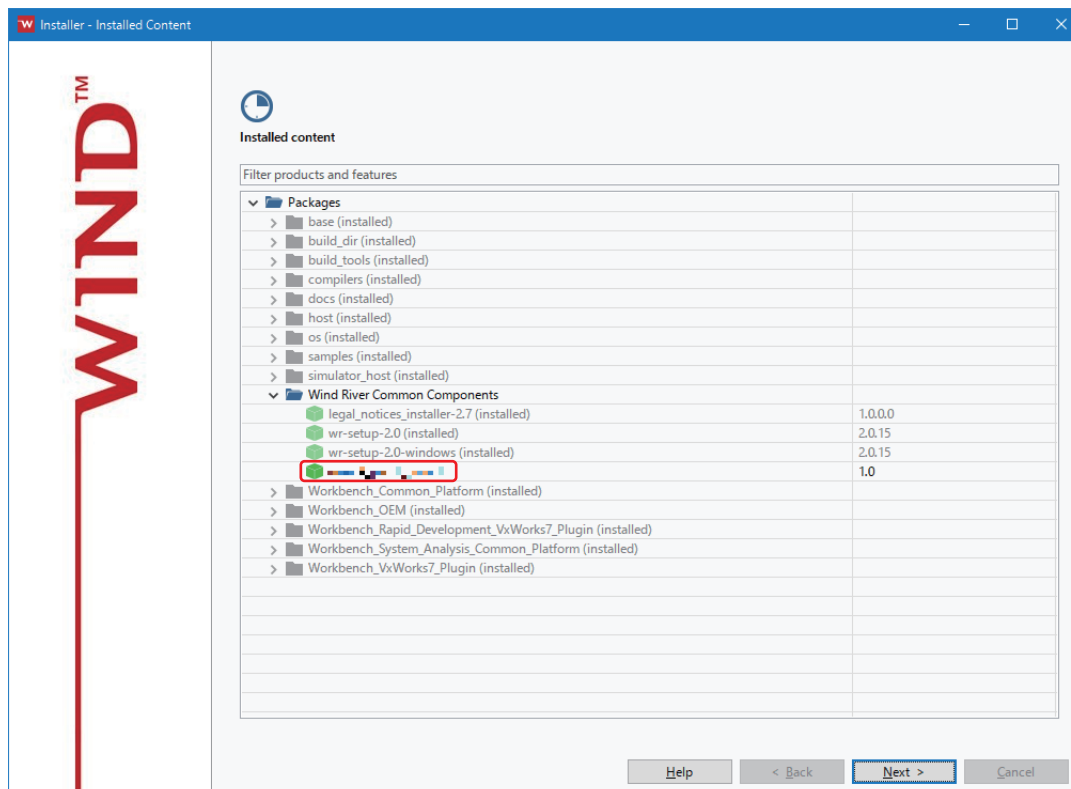
When a screen for license authentication appears, select "I ACCEPT the terms of this license agreement." and click the [Next] button.

A

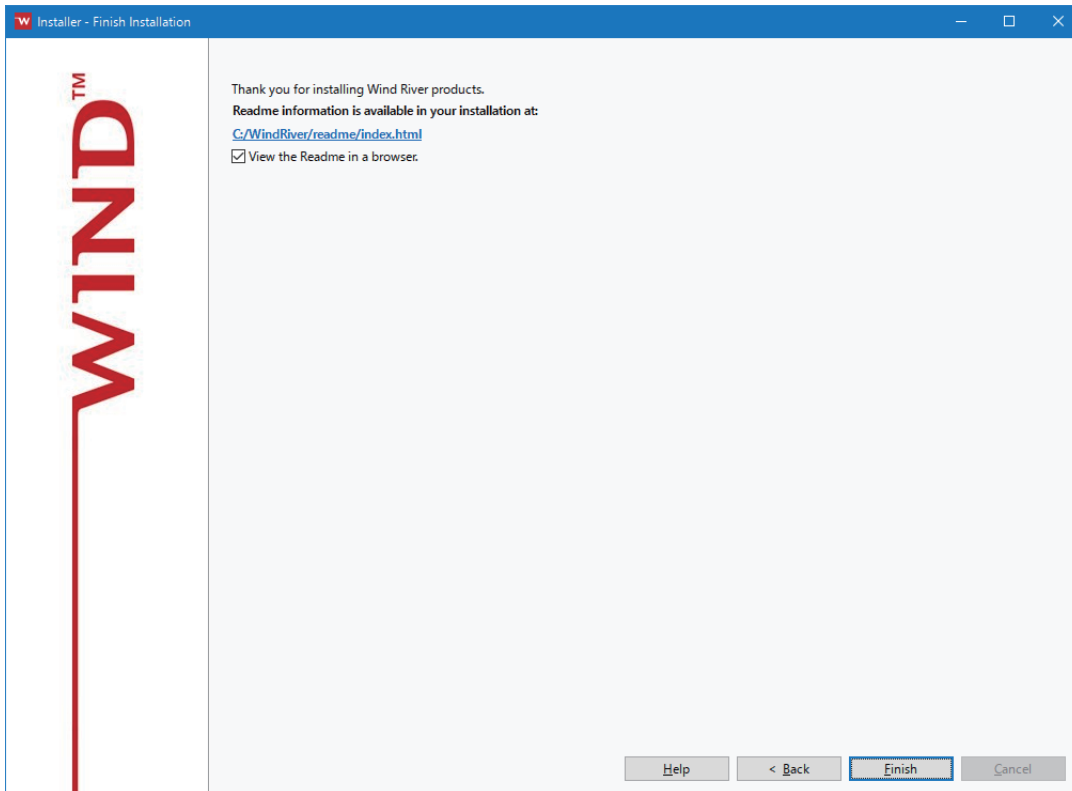
6. Check that a patch to install is correct, and click the [Install] button.



7. Click the [Next] button.



8. Click the [Finish] button.



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Appendix 5 Function Expansion with Plug-In Software

This section shows the method for installing plug-in software, which expands functions of CW Workbench 4.

Point

For details on the plug-in functions, refer to the Wind River Workbench document, which can be opened in the following menu, provided by Wind River Systems, Inc.

- [Help] ⇒ [Help Contents] ⇒ [Eclipse Platform] ⇒ [Eclipse Workbench Basics] ⇒ [Tasks] ⇒ [Updating and installing software] in CW Workbench 4.

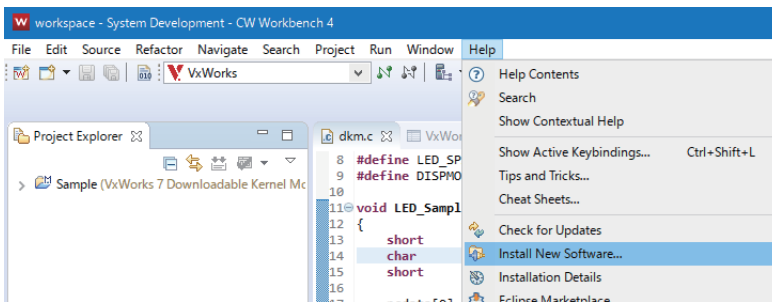
Installation procedure

The following shows the procedure for installing plug-in software.

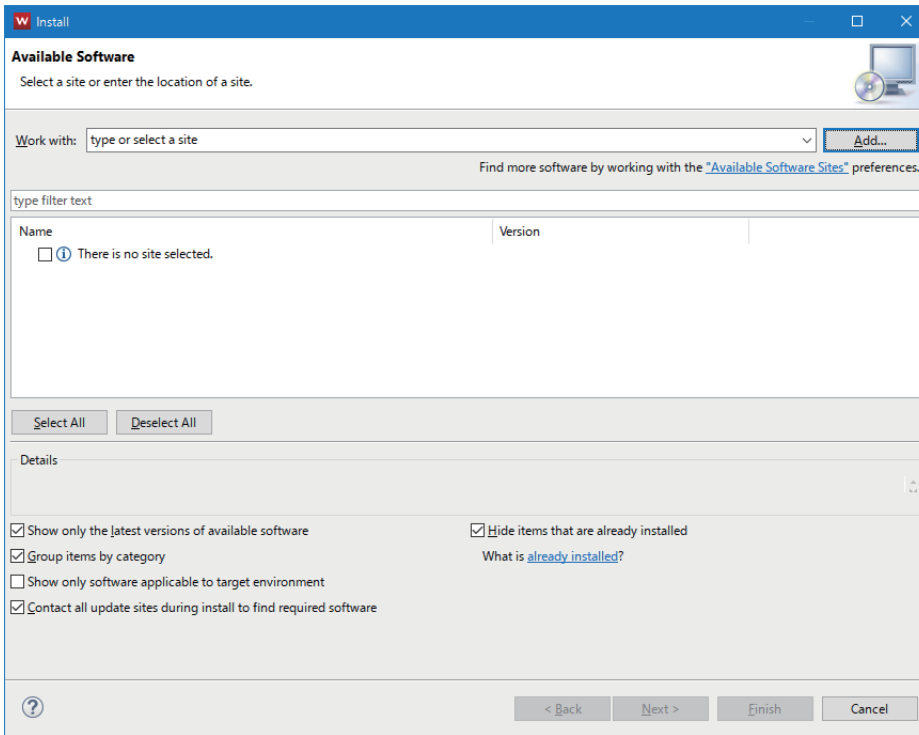
Point

- The installation method of a plug-in software described in this manual is a general method using Eclipse 4.6. For the installation for each plug-in software, follow the installation procedure released by each plug-in software manufacturer.
- For details on how to use the plug-in software installed, contact the plug-in software vendor.
- If the plug-in software does not run properly, check if the plug-in software runs on Eclipse 4.6 on the public operating environment provided by the vendor.

1. Select [Help] ⇒ [Install New Software].



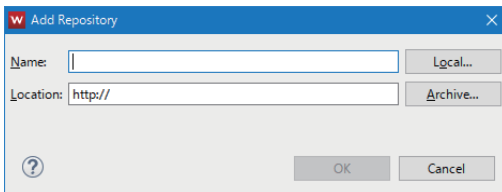
2. Click the [Add] button in the "Install" screen.



3. Enter information for "Name" and "Location", and click the [OK] button. A website from which a plug-in software is downloaded is added.

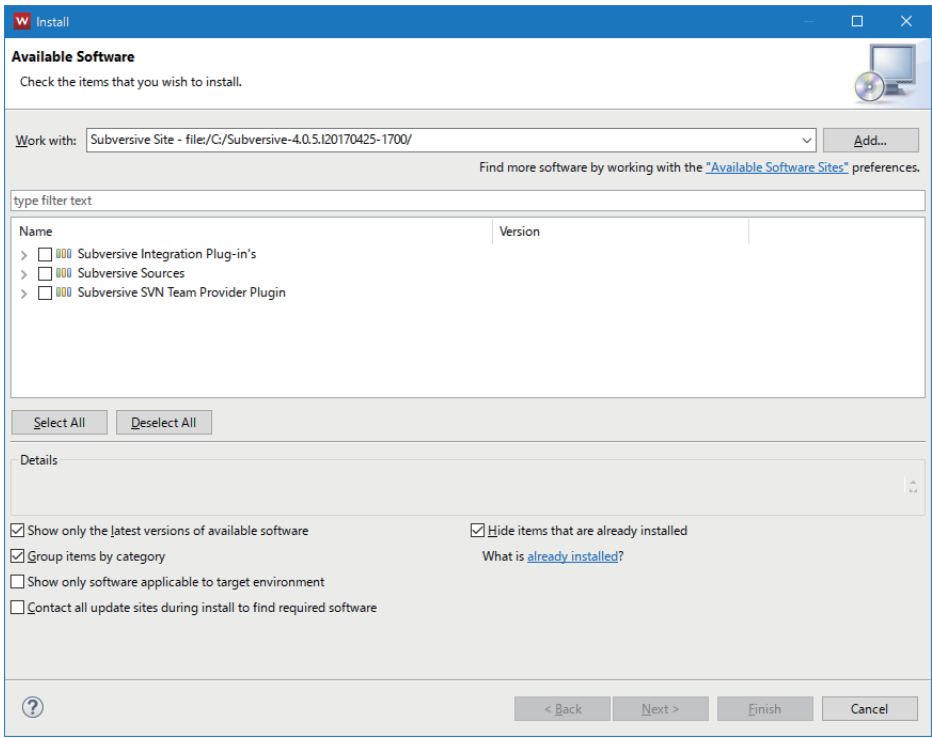


An Archive file downloaded from the website can also be specified for "Location" by clicking the [Archive] button.

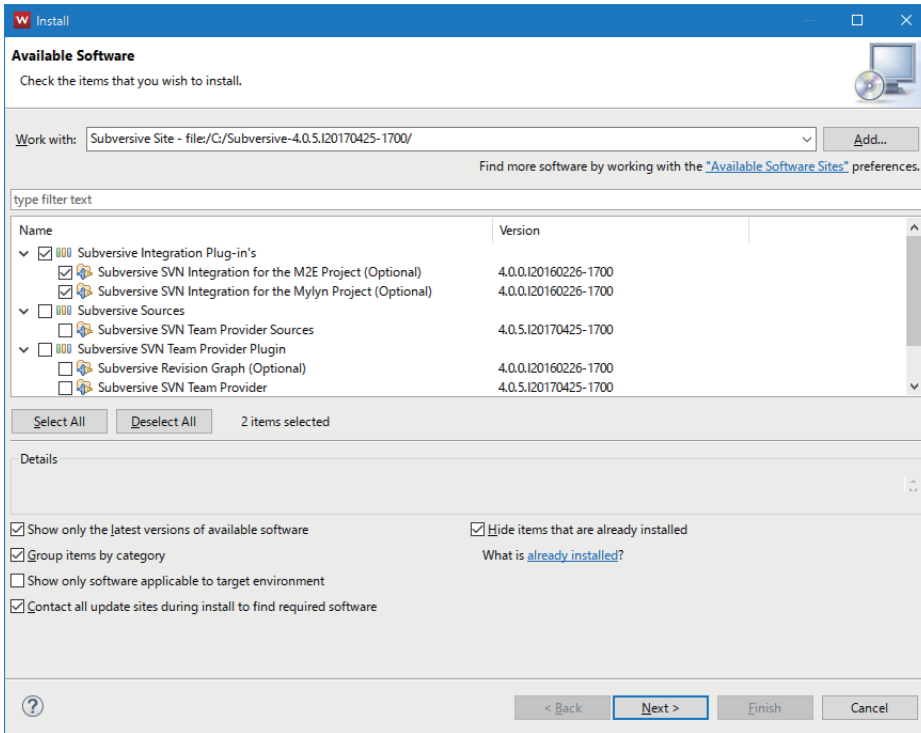


4. The information of the software package that can be installed from the added Location is acquired. "Pending" is displayed while the information is being obtained. After the completion of obtaining the information of the software package that can be installed, software package names are displayed.



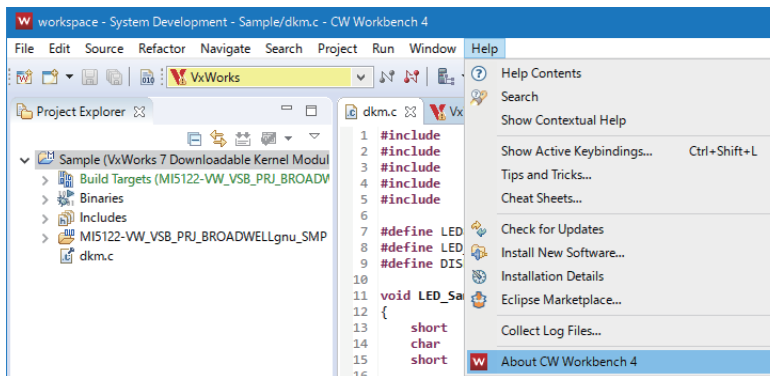


5. Select a software package to install, and click the [Next] button.

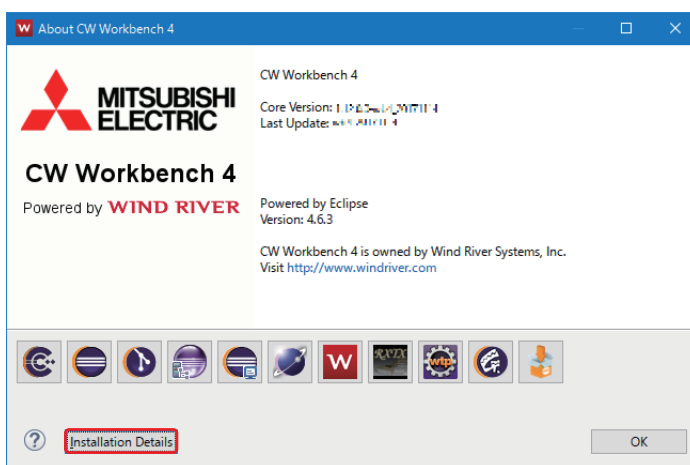


Uninstallation procedure

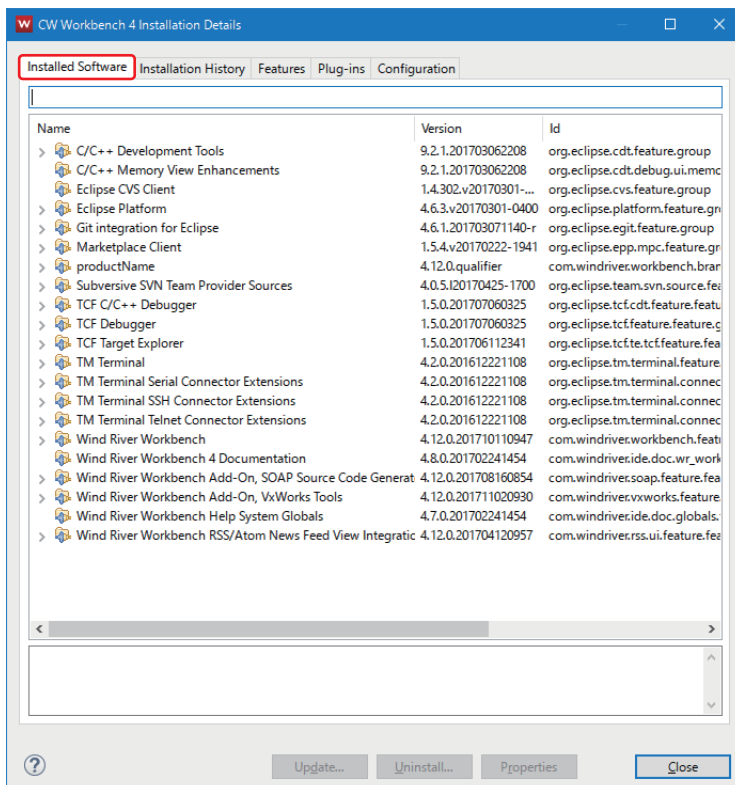
1. Select [Help] ⇒ [About CW Workbench 4].



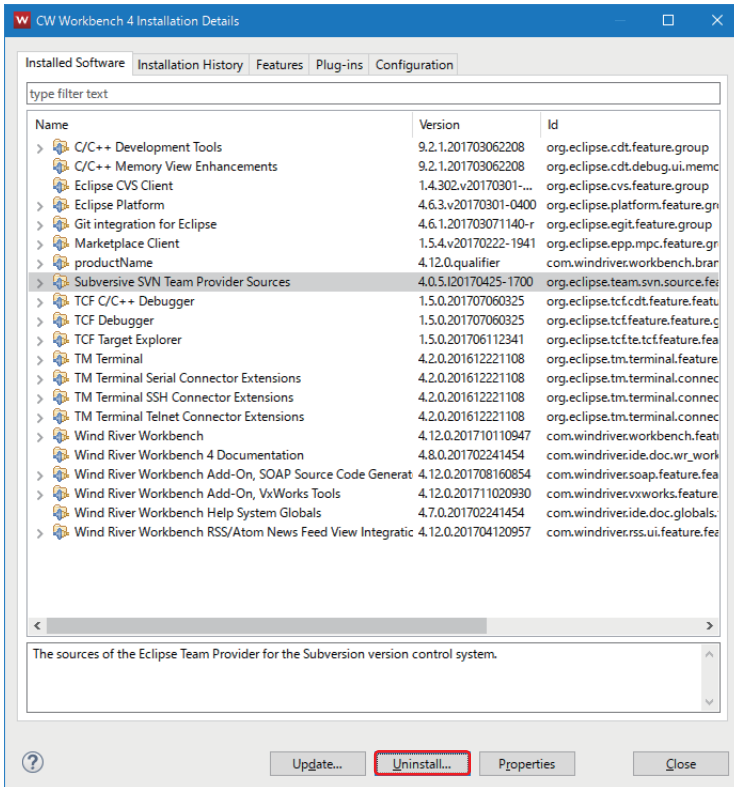
2. Click the [Installation Details] button in the "About CW Workbench 4" screen.



3. Select the [Installed Software] tab.



4. Select a software package to delete, and click the [Uninstall] button.



Appendix 6 Obtaining of a Temporary License

The following shows the procedure for obtaining a temporary license.

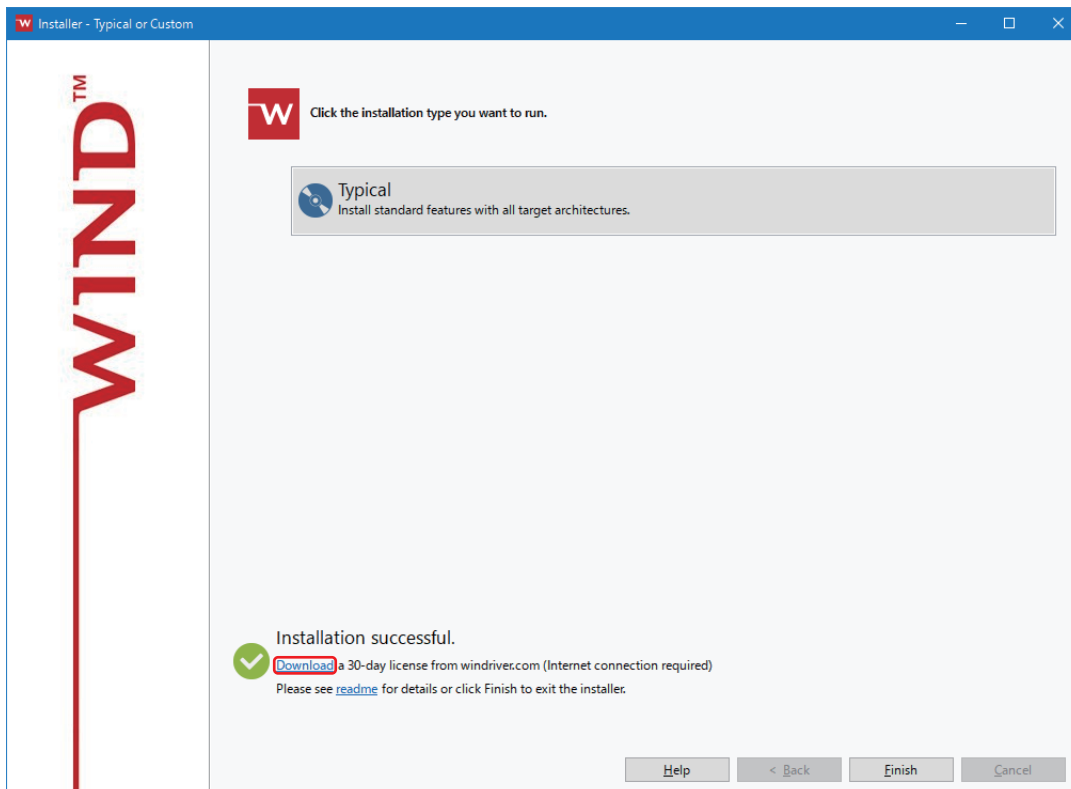
Point

During the obtaining of a temporary license, a confirmation dialog box for user account control may appear. Read the message, and click "Allow" or the [Yes] button to proceed with obtaining of the license.

To obtain a license at installation

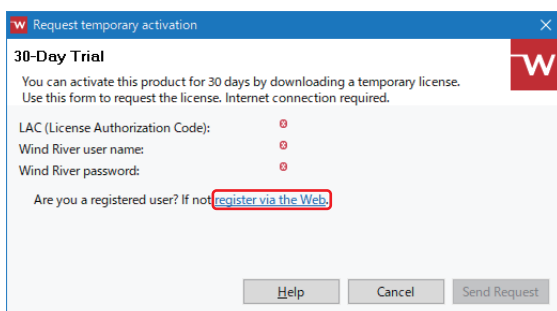
The following shows the procedure for obtaining a temporary license when installing this product.

1. Click "Download" on the bottom of the screen.



2. Click "register via the Web."

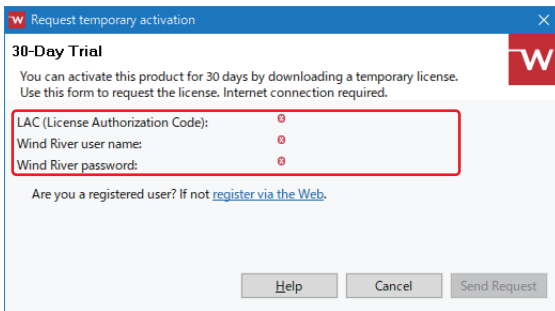
A web browser opens. The user registration page on the Wind River Systems, Inc. website is displayed.



3. Enter the following items, and click the [Submit] button.

Item	Description	
Personal Information	First Name	User name (first name)
	Last Name	User name (last name)
	Adress1	Address (town, street address)
	Adress2	Building name, etc. (can be left blank)
	Country	Country
	State	State
	City	City
	Zip	Zip code
	Phone	Phone number
	Company	Company name
Account Information	E-mail	E-mail address
	Password	Password
	Confirm Password	Password (for confirmation)
License Information	License Number	681830
	LAC	681830-Y54F-Q86B9

4. Enter the items in the table below, and click the [Send Request] button.



Item	Description
LAC (License Authorization Code)	681830-Y54F-Q86B9
Wind River user Name	A mail address entered for "E-Mail" in "Account Information"
Wind River password	A password entered for "Password" in "Account Information"



To obtain a license after installation

The following shows the procedure for obtaining a temporary license after installing this product on the development environment.

1. Select [CW Workbench 4] ⇒ [Product Maintenance] from Windows Start*1.

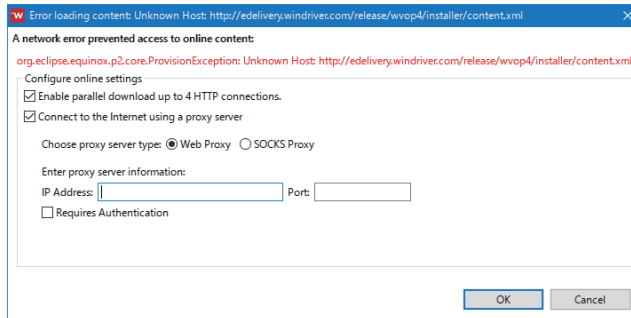
*1 Select [All apps] in the Start screen or [Start] ⇒ [All Programs]/[All apps].

Point

If a connection to the Internet cannot be established, the following screen appears.

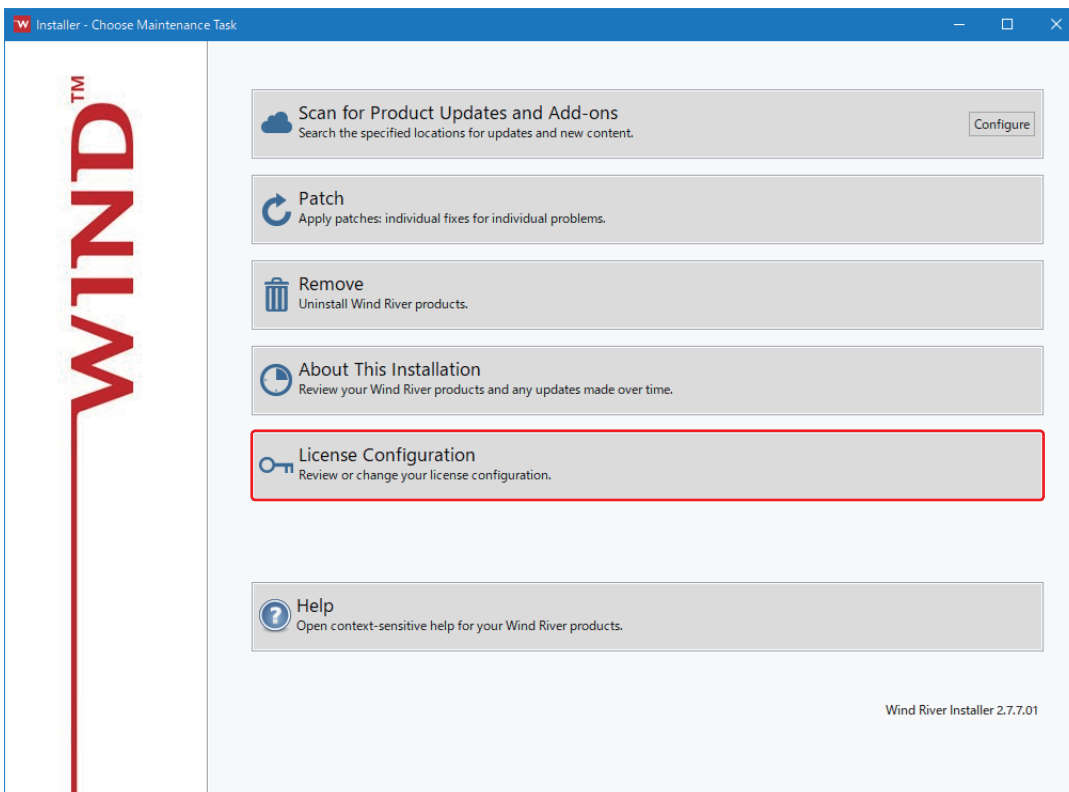
After checking the network connection and network connection settings, click the [OK] button. When the connection to the Internet is successfully established, the Product Maintenance screen appears.

If clicking the [Cancel] button, setting the network connection described in step 2 is required.



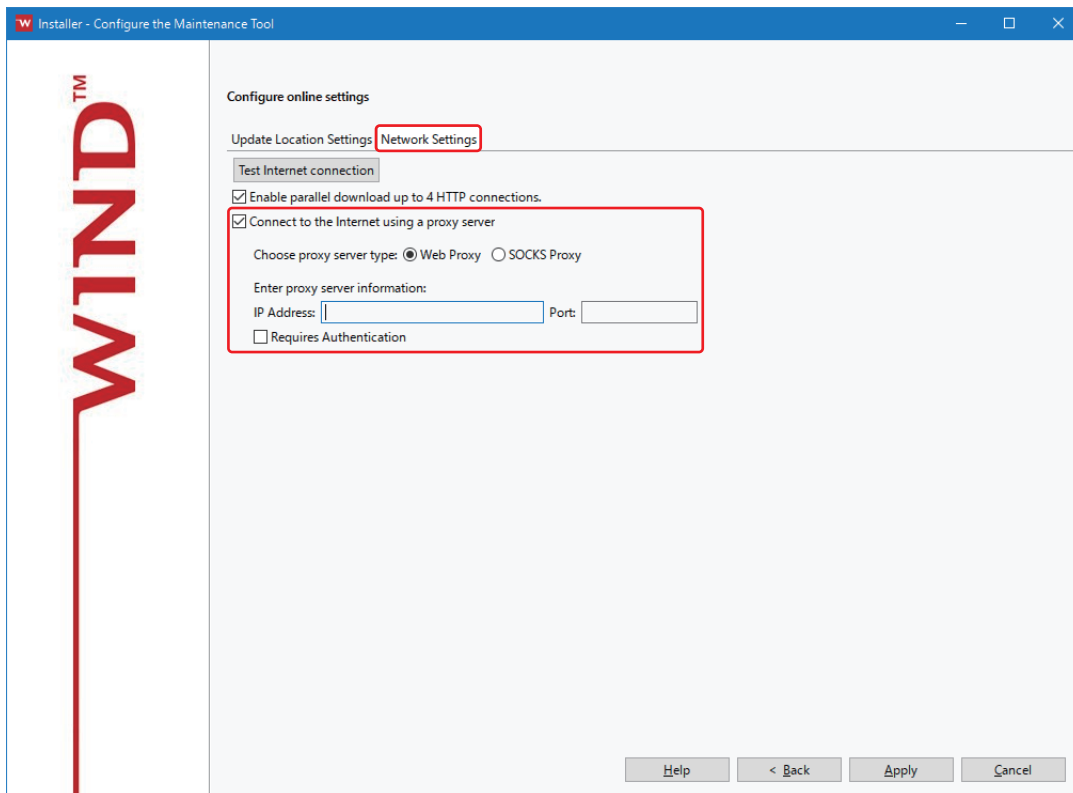
2. Select "License Configuration".

When the personal computer is connected to the Internet via a proxy server, click the [Configure] button in "Scan for Product Updates and Add-ons", and configure the proxy server that was set for the Internet connection. (Proxy server setting)

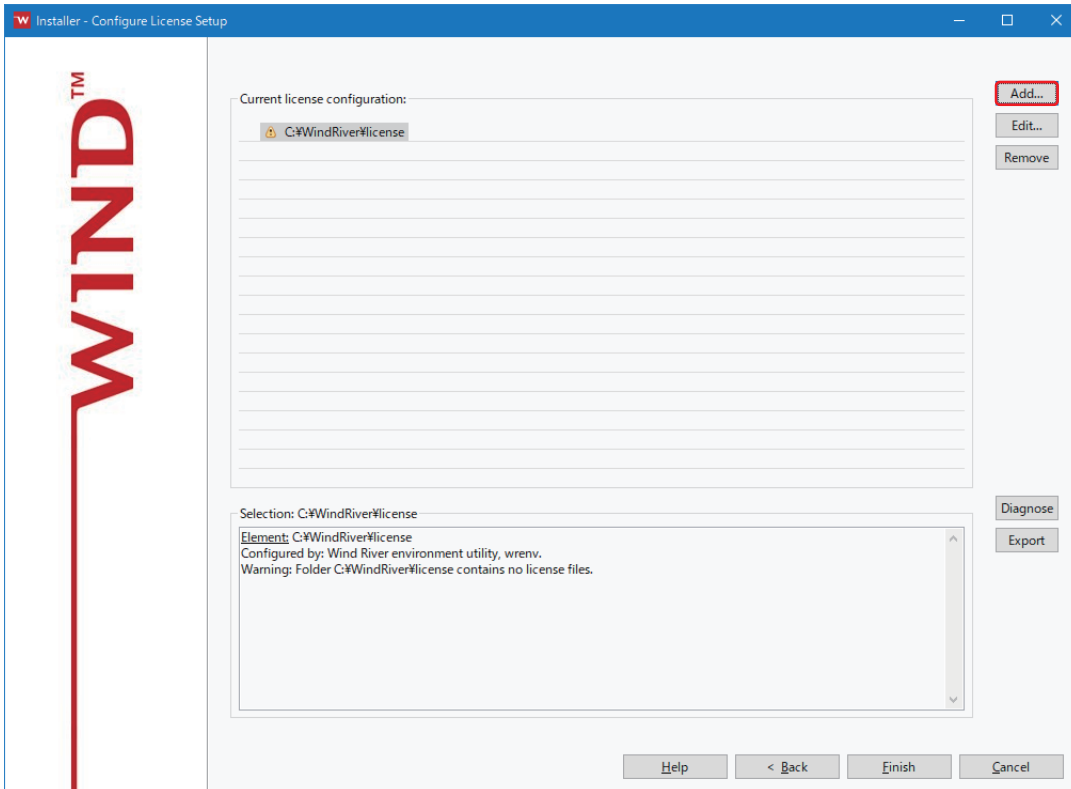


- Proxy server setting

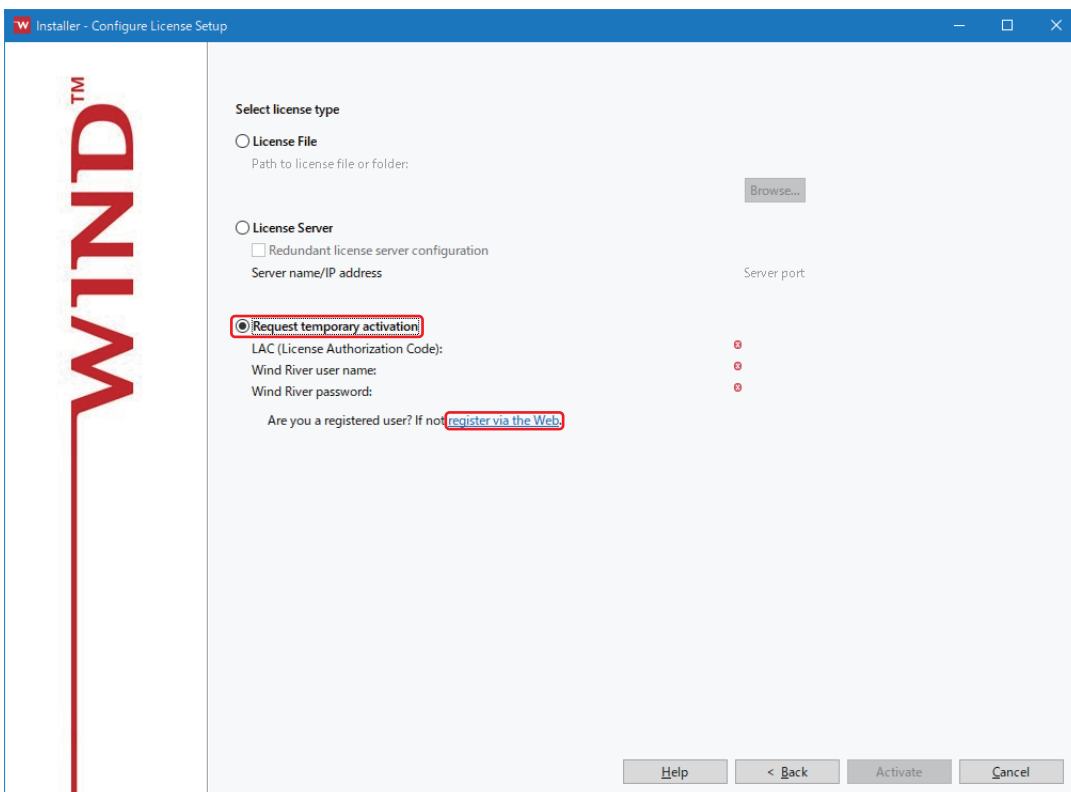
Select the checkbox of "Connect to the Internet using a proxy server" in the [Network Settings] tab, set the proxy server which was set for the Internet connection, and click the [Apply] button.



3. Click the [Add] button.



4. Select the checkbox of "Request temporary activation", and click "register via the Web".
A web browser opens. The user registration page on the Wind River Systems, Inc. website is displayed.

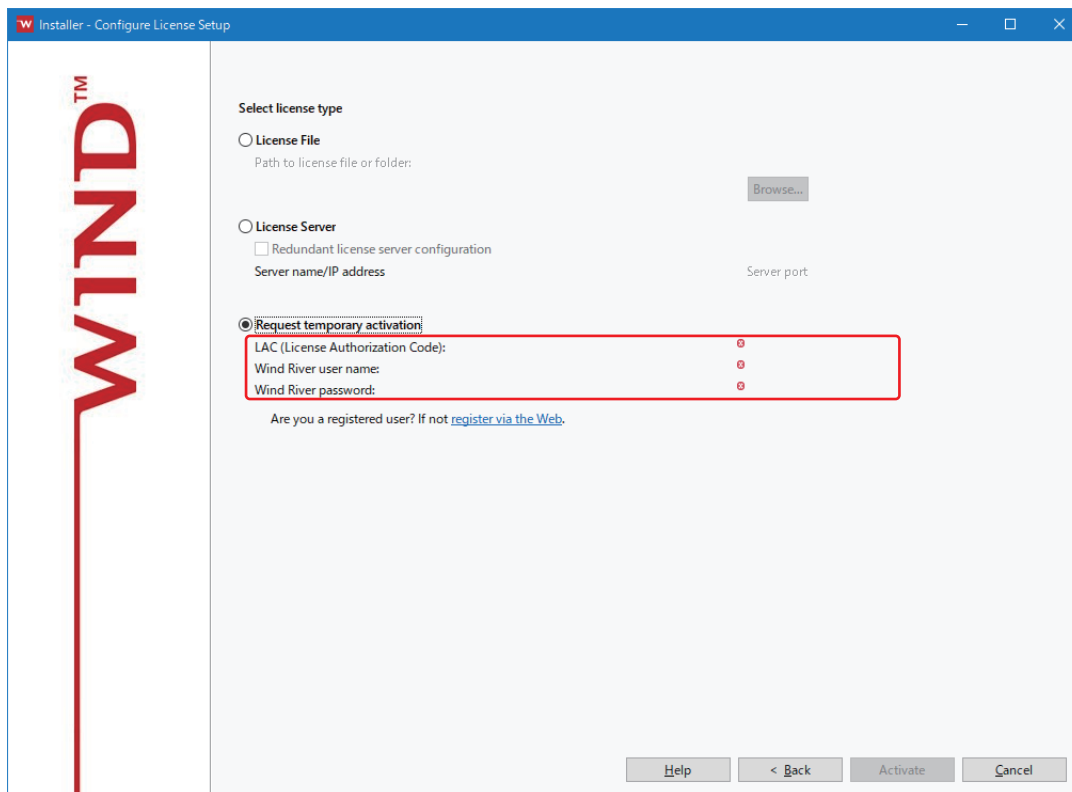


5. Enter the following items, and click the [Submit] button.

Item	Description	
Personal Information	First Name	User name (first name)
	Last Name	User name (last name)
	Adress1	Address (town, street address)
	Adress2	Building name, etc. (can be left blank)
	Country	Country
	State	State
	City	City
	Zip	Zip code
	Phone	Phone number
	Company	Company name
Account Information	E-mail	E-mail address
	Password	Password
	Confirm Password	Password (for confirmation)
License Information	License Number	License number
	LAC	License authorization code ^{*1}

*1 Enter the LAC code written on 'License Agreement'.

6. Enter the items in the table below, and click the [Active] button.



Item	Description
LAC (License Authorization Code)	License authorization code ^{*1}
Wind River user Name	A mail address entered for "E-Mail" in "Account Information"
Wind River password	A password entered for "Password" in "Account Information"

*1 Enter the LAC code written on 'License Agreement'.



Appendix 7 Deletion of Permanent License

The following shows the procedure for deleting a permanent license.

Operating procedure

1. End CW Workbench 4 if it is activated.
2. Completely delete a permanent license from the personal computer where CW Workbench 4 is installed.*1

*1 Delete a permanent license file saved as a backup file as well.

The 'license' folder is in the following location if CW Workbench 4 is installed without changing the installation destination folder.

- C:\WindRiver\license

Appendix 8 Uninstallation

This section shows the considerations for uninstallation and procedure for uninstalling CW Workbench 4.

Considerations for uninstalling CW Workbench 4

The following shows the considerations for uninstalling CW Workbench 4.

- Log on as a user with Administrator privileges when uninstalling CW Workbench 4 from a development environment.
 - Before uninstalling CW Workbench 4, end the application.
 - Do not terminate the uninstallation process. If it is terminated, uninstall the product again.
If the uninstallation process fails after it is terminated, install CW Workbench 4 again then uninstall it again. (🔍 Page 26 INSTALLATION)
 - Uninstall the product from Product Maintenance.
This application cannot be uninstalled from "Add or Remove Programs"*1 in the Control Panel.
- *1 [Uninstall a program] appears on Windows 8 or later.

Uninstallation procedure

The following shows the procedure for uninstalling CW Workbench 4.

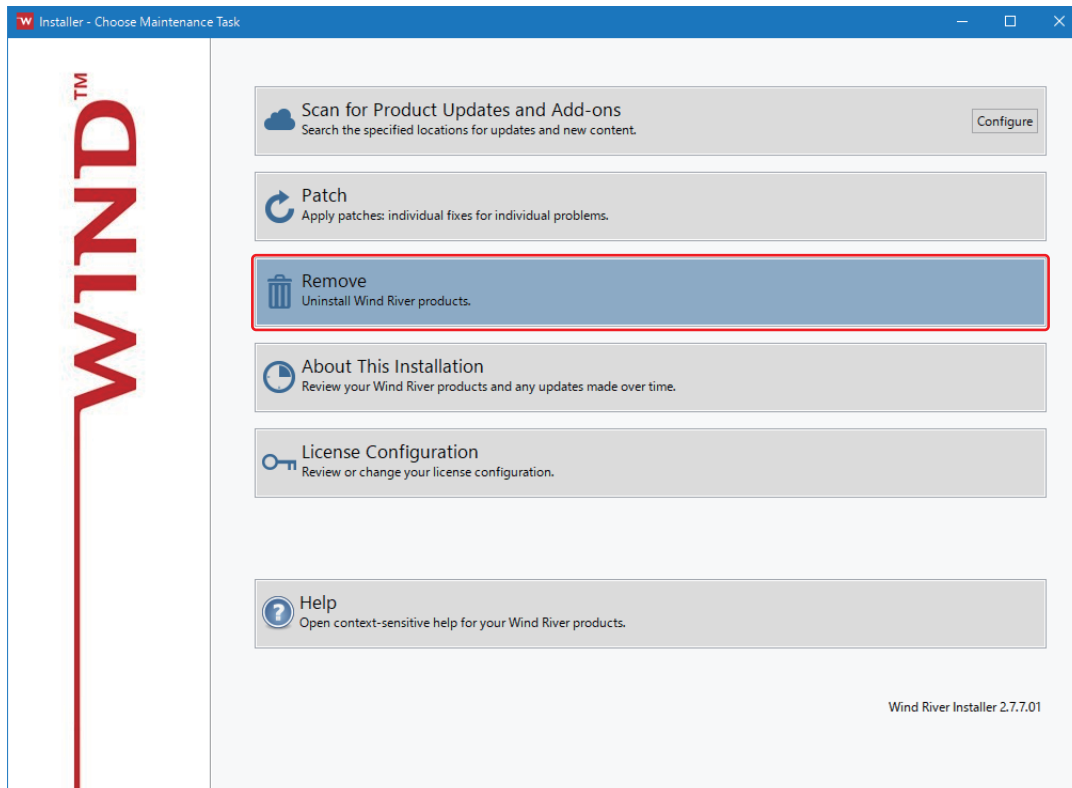
Point

- Log on as a user with Administrator privileges when uninstalling CW Workbench 4.
- During the uninstallation, a confirmation dialog box for user account control may appear. Read the message, and click "Allow" or the [Yes] button to proceed with the uninstallation.

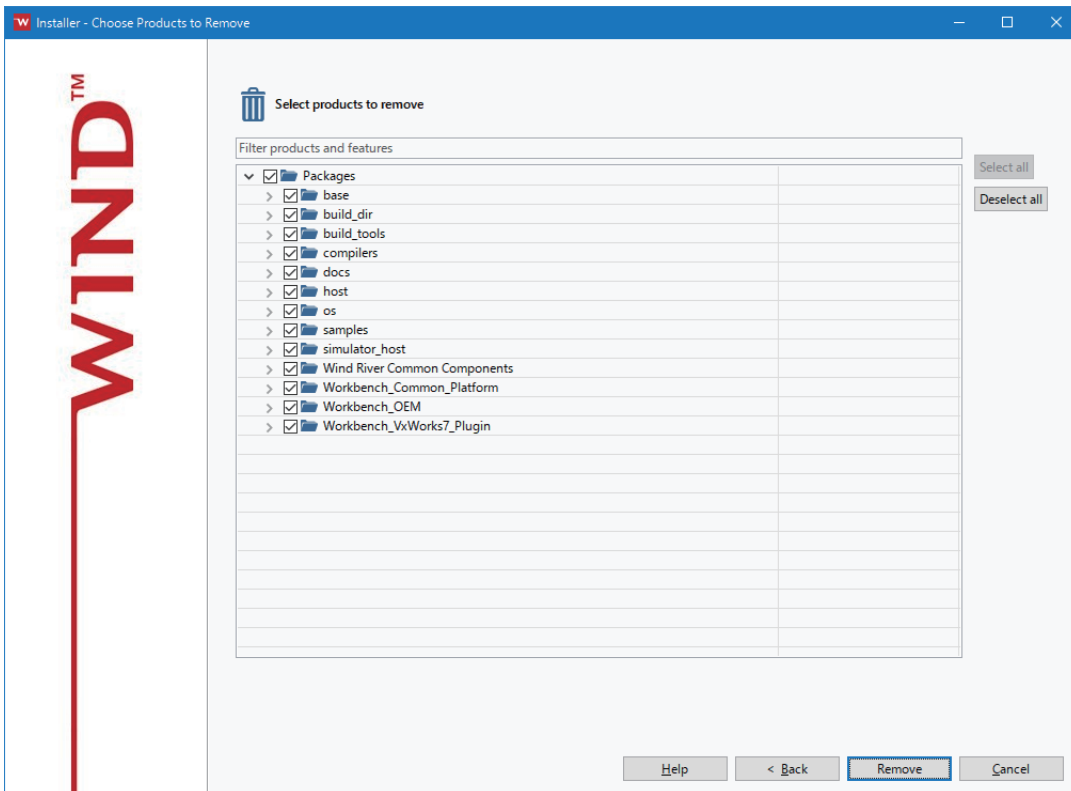
1. Select [CW Workbench 4] ⇒ [Product Maintenance] from Windows Start*1.

*1 Select [All apps] in the Start screen or [Start] ⇒ [All Programs]/[All apps].

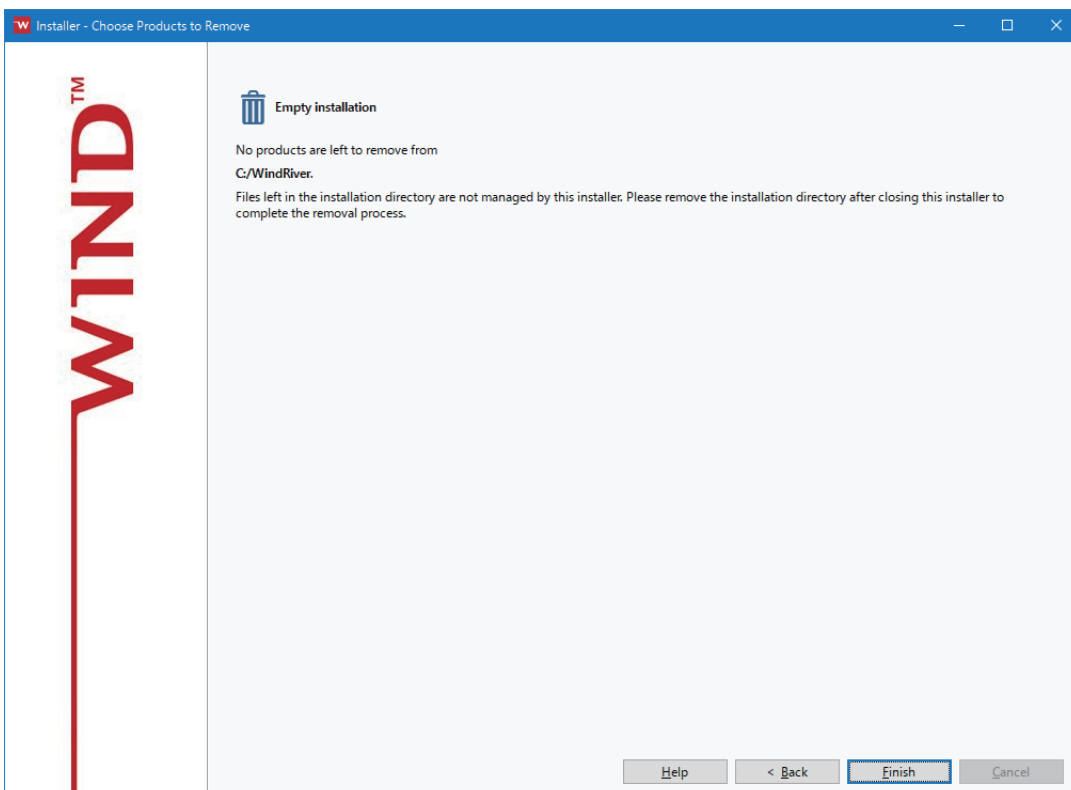
2. Select "Remove".



3. Check that the items to uninstall are selected, and click the [Remove] button.



4. Click the [Finish] button.



Environment after uninstallation

After uninstalling CW Workbench 4, some folders and files remain in the installation folder.

The remaining files and files are left to start the installer quickly when the product is installed again.

The files can be directly deleted from Explorer if they are not necessary.

Appendix 9 Startup of Debug Shell

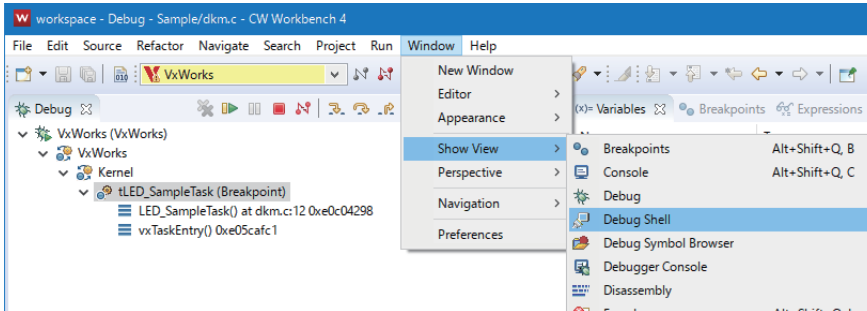
Debug Shell can be started from the target server that is in connection and in debugging.

Point

For details on Debug Shell, refer to the document that can be opened from the following menu.

- [Help]⇒[Help Contents]⇒[Wind River Documentation]⇒[Workbench 4]⇒[Debug Shell] in CW Workbench 4.

1. Select "Window" ⇒ "Show View" ⇒ "Debug Shell".

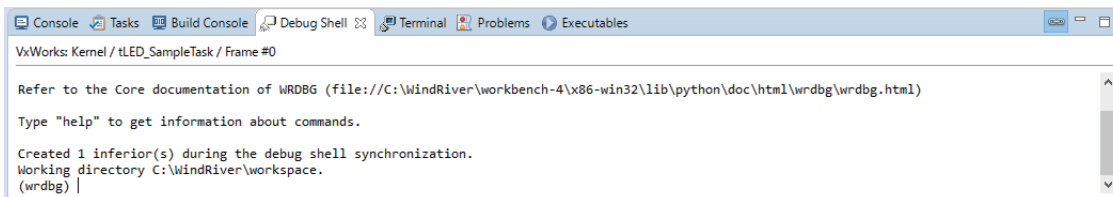


Point

When a perspective for C or C++ is used, open Debug Shell with the following procedure.

- "Window"⇒"Show View"⇒"Other"⇒"Debug"⇒"Debug Shell"

2. The "Debug Shell" window appears, and Shell opens.



Appendix 10 Version of MELIPC Supporting Include Files

This section shows the firmware version of the MELIPC supporting include files stored on the DVD-ROM of CW Workbench 4.


Point

For the storage location of the include files, refer to the following section.

 Page 18 Contents of a DVD-ROM

For the functions supported by each firmware version of a specific MELIPC, refer to the following manuals.

 MELIPC MI5000 Series User's Manual (Startup)

 MELIPC MI5000 Series User's Manual (Application)

CW Workbench 4		MELIPC
Software version ^{*1}	Include file	Firmware version
Ver. 'A' or later	<ul style="list-style-type: none">• CCPUFunc.h• MDFunc.h	'01' or later

*1 Check the software version with the last alphabetic character of the text written in the DATE column on the DVD-ROM.
(Example: '1804AA' indicates that the software version is 'A'.)

Appendix 11 Comparison with Wind River Workbench

The following table shows the comparison between CW Workbench 4 and Wind River Workbench 4.

○: Supported, ×: Not supported

Item		Description	CW Workbench 4	Wind River Workbench 4
Framework	Eclipse	Workbench basic function	Ver.4.6.3	Ver.4.6.3
Compiler	BROADWELLgnu_SMP	Compiler for MELIPC	○	○
Project system and build system (Project creation and management)	VxWorks Downloadable Kernel Module Project	A project used for normal application development. Applications which are executed in the kernel mode of VxWorks 7 can be created.	○	○
Debugger	Target connection agent	A function to establish communication with a target for debugging.	○	○
	Downloading	A function to download a debuggee file to the target in order to have it ready for debugging.	○	○
	Debug operation	A function to debug a source code by the operations such as start or stop debugging and step execution.	○	○
Command-line interface	Target shell	A command-line interface which operates on the operating system of target.	○	○
Runtime analysis tool	Memory Analyzer	Identifies memory leaks by monitoring the memory usage.	×	○
	System Viewer	Analyzes task execution order and deadlock by monitoring interrupt task status or CPU utilization, etc.	×	○
	Analysis tools	Checks which code segment is executed during the code testing phase.	×	○
Extended functions		Extends functions by installing plug-ins for a third-party provided function.	○	○

Appendix 12 Support

Technical assistance service regarding CW Workbench

For technical assistance service regarding MELIPCs, refer to the table below.

If the type to which your inquiry belongs is not sure, please consult your local Mitsubishi representative. Please note that any inquiries other than MELIPC related products may not be able to be answered.

Type	Inquiry	Contact
Operating system	<ul style="list-style-type: none">• Functions and specifications of VxWorks, API functions provided by VxWorks, and general inquiries regarding programming related to VxWorks• Functions and specifications of Wind River Workbench and Tornado	Wind River Systems, Inc. URL: www.windriver.com
Plug-in software	<ul style="list-style-type: none">• Plug-in software used with CW Workbench or Wind River Workbench	Plug-in software manufacturer

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REVISIONS

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

Revision date	*Manual number	Description
May 2018	SH(NA)-081940ENG-A	First edition
May 2018	SH(NA)-081940ENG-B	Partial correction

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