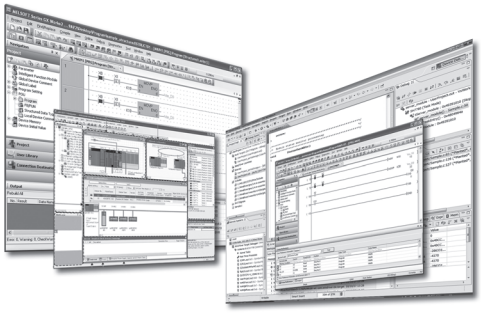
MITSUBISHI ELECTRIC

Engineering Software

CW Workbench Operating Manual

-SW1DND-CWWLQ12-E
-SW1DND-CWWLQ24-E



Powered by WIND RIVER | CW Workbench 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 of the programmable controller system, refer to the user's manual for the CPU 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 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

- For the following controls, configure an interlock circuit in the user program to ensure that the entire system will always operate safely.
  (1) Changing data of the running C Controller module from the development environment (personal computer) connected
  (2) Changing the operating status
  (3) Operation from the development environment (personal computer)
  Especially, in the case of a control from an external device to a remote C Controller module, immediate action cannot be taken for a problem on the C Controller module due to a communication failure.
  To prevent this, configure an interlock circuit in the user program, and determine corrective actions to be taken between the external device and C Controller module in case of a communication failure.

[Startup and Maintenance Precautions]

⚠WARNING

- For the following controls, configure an interlock circuit in the user program to ensure that the entire system will always operate safely.
  (1) Changing data of the running C Controller module from the development environment (personal computer) connected
  (2) Changing the operating status
  (3) Operation from the development environment (personal computer)
  Especially, in the case of a control from an external device to a remote C Controller module, immediate action cannot be taken for a problem on the C Controller module due to a communication failure.
  To prevent this, configure an interlock circuit in the user program, and determine corrective actions to be taken between the external device and C Controller module in case of a communication failure.

[Startup and Maintenance Precautions]

⚠CAUTION

- Before performing online operations (especially, program modification, forced output, and operation status change) for the running C Controller module from the peripheral connected, read relevant manuals carefully and ensure the safety.
  Improper operation may damage machines or cause accidents.

●CONDITIONS OF USE FOR THE PRODUCT●

(1) Mitsubishi C Controller system ("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.
This manual explains about the product.

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

RELEVANT MANUALS

The manuals related to the product are listed below.
Please place an order as needed.

Manual <Manual No. and model code>	Description
C Controller Module User's Manual (Hardware Design, Function Explanation) <SH-080766ENG, 13JZ17>	The manual describes the system configuration, specifications, functions, handling methods, wiring, and troubleshooting of Q12DCCPU-V (Basic mode) and Q06CCPU-V.
C Controller Module User's Manual (Utility Operation, Programming) <SH-080767ENG, 13JZ18>	The manual describes the installation/uninstallation, utility operation, instructions, and programming of Setting/Monitoring Tools for the C Controller Module (SW3PVC-CCPU).
MELSEC-Q C Controller Module User's Manual <SH-081130ENG, 13JZ75>	The manual describes the system configuration, specifications, functions,handling methods, wiring, troubleshooting, and programming and function of C Controller module (Q24DHCCPU-V, Q24DHCCPU-VG, Q24DHCCPU-LS, Q26DHCCPU-LS, and Q12DCCPU-V (Extended mode)).
Setting/Monitoring Tools for the C Controller Module Operating Manual <SH-081131ENG, 13JU76>	The manual describes the system configuration and operation method of Setting/Monitoring Tools for the C Controller Module (SW4PVC-CCPU).
CW-Sim Operating Manual <SH-081159ENG, 13JU77>	The manual describes the system configuration, specifications, functions, and troubleshooting of CW-Sim.
Wind River Workbench 3.2 manuals	The manuals describe specifications, usage methods, troubleshooting, and relevant documents of Wind River Workbench 3.2 that is the base for this product. Refer to the manuals for the same functions as Wind River Workbench. A PDF file of the manuals is stored on the DVD-ROM disc of the product.

CONTENTS

SAFETY PRECAUTIONS 1
CONDITIONS OF USE FOR THE PRODUCT 3
INTRODUCTION 4
RELEVANT MANUALS 5
MANUAL PAGE ORGANIZATION 9
GENERIC TERMS AND ABBREVIATIONS 11
TERMS 12
PRODUCT ORGANIZATION 12

CHAPTER 1 OVERVIEW 13

1.1 Features 13

CHAPTER 2 SYSTEM CONFIGURATION 14

2.1 Environment Configuration for Each License Type 14
2.2 Relevant Module 16
2.3 Operating Environment 16
2.4 Specifications 17

CHAPTER 3 PACKING LIST 18

3.1 Packing List 18
3.2 Things to Prepare 19

CHAPTER 4 PROCEDURE OVERVIEW 20

4.1 From Installation to Debugging 20

CHAPTER 5 PERMANENT LICENSE 22

5.1 Obtaining Permanent License 22
5.2 License Transfer 23
5.3 Applying Permanent License 25
5.4 Deleting Permanent License 26

CHAPTER 6 INSTALLATION AND UNINSTALLATION 27

6.1 Installation 27
6.1.1 Preparation before installation 27
6.1.2 How to install CW Workbench 30
6.1.3 After installation 39
6.2 Uninstallation 41
6.2.1 Preparation before uninstallation 41
6.2.2 How to uninstall CW Workbench 43
6.2.3 After uninstallation 47
6.3 Update 48
6.3.1 How to update CW Workbench 48
6.3.2 After update 53

CHAPTER 7 APPLYING PATCH 54

7.1 How to Obtain Patch 55
7.2 How to Apply Patch 55

CHAPTER 8 CREATING AND BUILDING USER PROGRAM 57

8.1 Creating Project 58
8.2 Adding Project 67
8.3 How to Build Project 71
8.4 Setting Optimization Option 74

CHAPTER 9 CONNECTING CW WORKBENCH TO THE C CONTROLLER MODULE 77

9.1 Setting Target Server 77
9.1.1 Preparing for target server setting 78
9.1.2 How to set target server connection 80
9.2 Starting and connecting the target server 82
9.3 How to Check and Change Connection Settings 84

CHAPTER 10 HOW TO DEBUG PROGRAM 85

10.1 How to Connect CW Workbench to the C Controller Module 85
10.2 Starting Shell 85
10.3 Downloading Module 86
10.4 How to Debug Program 88
10.4.1 Debugging one task 88
10.4.2 Debugging multiple tasks 95
10.5 How to Execute Dynamic Printf 96

CHAPTER 11 TROUBLESHOOTING 98

11.1 Basic Operation 99
11.2 License 103
11.3 Building 104
11.4 Target Server Connection 107
11.5 Downloading 109
11.6 Installation using a temporary license 110

APPENDIX 111

Appendix 1 Installation and Uninstallation of the Plug-in Software 111
Appendix 1.1 Installation 111
Appendix 1.2 Uninstallation 114
Appendix 2 License Errors 115
Appendix 2.1 License errors 115
Appendix 2.2 License error message 116
Appendix 2.3 Main license error messages and recovery procedures 117

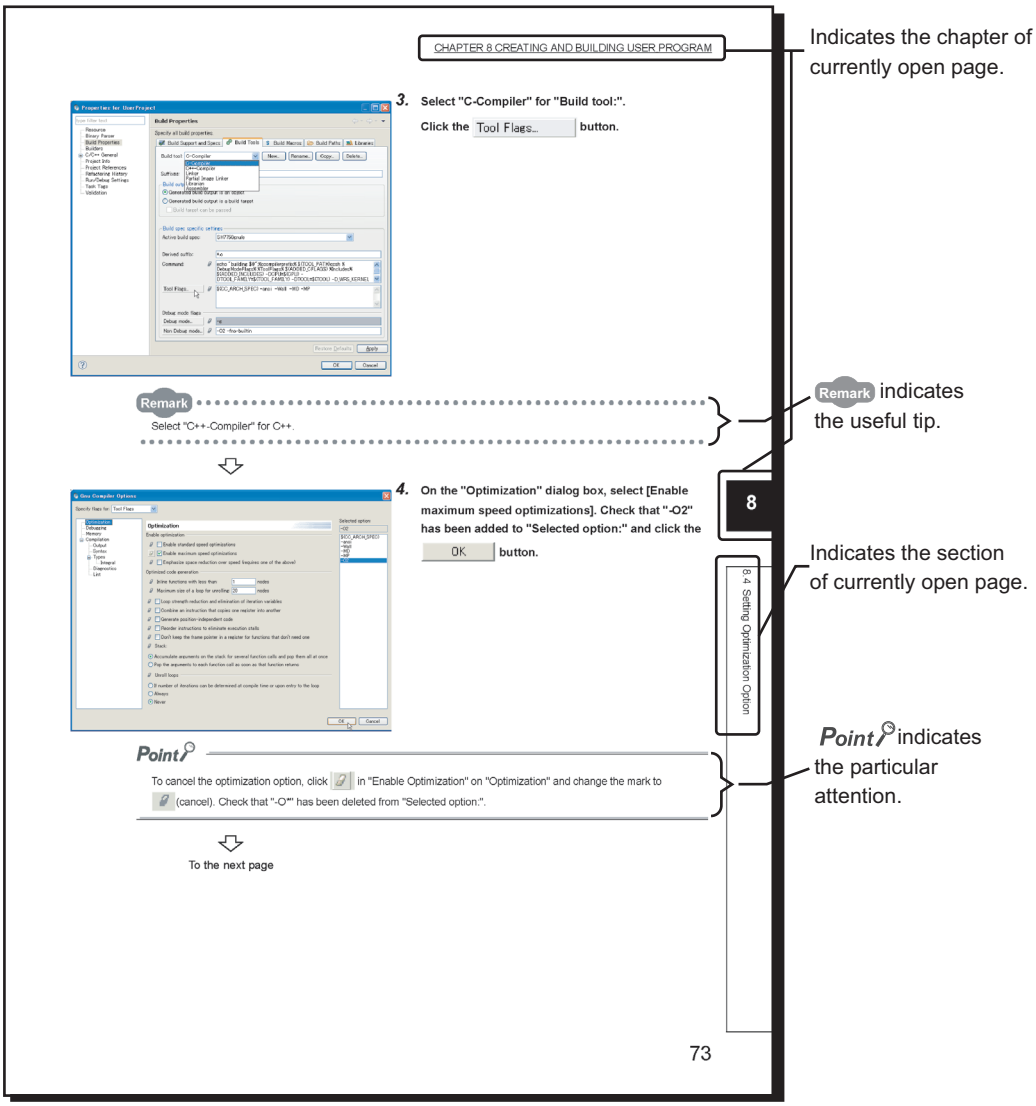
Appendix 3 Comparison with Wind River Workbench. 120
Appendix 3.1 Comparison with SW1DND-CWWLQ12-E 120
Appendix 3.2 Comparison with SW1DND-CWWLQ24-E 121
Appendix 4 Support. 122
Appendix 4.1 Technical support assistance service regarding C Controller module 122

INDEX 123

REVISIONS 124
TRADEMARKS 126

MANUAL PAGE ORGANIZATION

The following illustration is for explanation purpose only, and should not be referred to as an actual documentation.



Operating procedures

Three styles of descriptions are used in this manual as below:

(1) When there is only one operation

Menu bar [Help] ⇨ [Help Contents]

(2) When there are steps

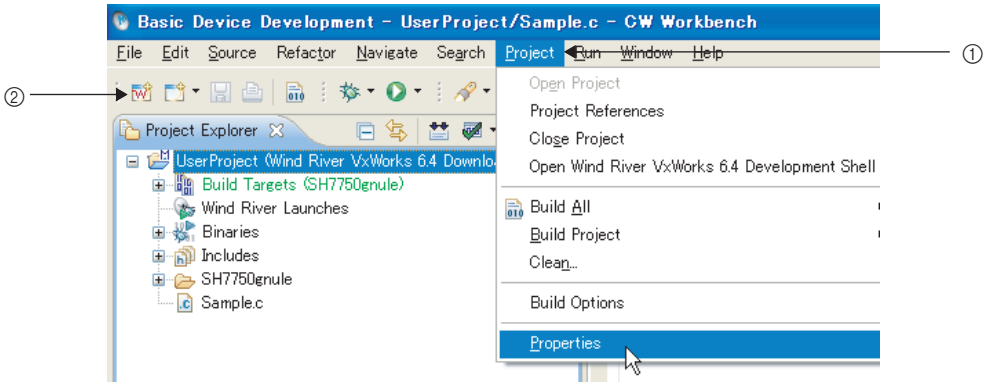
1. **Copy the created source file to the current folder of a project to be added.**
2. **Select the project to be added on the "Project Explorer" window.**

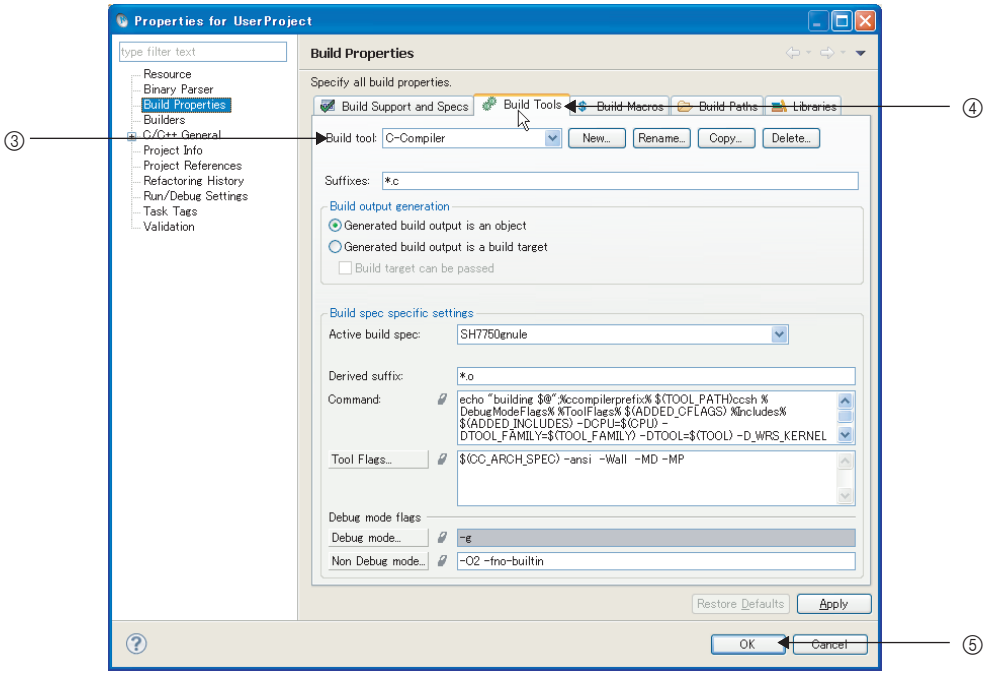
(3) When there are multiple operations

- Enter a folder name of the installation location and click the OK button.
- A folder can be selected by clicking the Browse... button.

Symbols used in this manual

The following shows the symbols used in this manual with descriptions and examples.





No.	Symbol	Description	Example
①	[ ]	Menu name on a menu bar	[Project]
②		Toolbar icon	
③	" "	Screen name or item name on a screen	"Build tool:"
④	<< >>	Tab name on a screen	<<Build Tools>>
⑤		Button on a screen	
–		Keyboard key	
–		Reference page	-
–		Reference manual	-

GENERIC TERMS AND ABBREVIATIONS

Unless otherwise specified, this manual uses the following generic terms and abbreviations.

Generic term/abbreviation	Description
Q24DHCCPU-V	The abbreviation for Q24DHCCPU-V C Controller module.
Q24DHCCPU-VG	The abbreviation for Q24DHCCPU-VG C Controller module.
Q12DCCPU-V	The abbreviation for Q12DCCPU-V C Controller module.
Q12DCCPU-V (Basic mode)	Status that Q12DCCPU-V is initialized with the basic mode For Q12DCCPU-V (Basic mode), refer to the following manual. C Controller Module User's Manual (Hardware Design, Function Explanation)
Q12DCCPU-V (Extended mode)	Status that Q12DCCPU-V is initialized with the extended mode For Q12DCCPU-V (Extended mode), refer to the following manual. MELSEC-Q C Controller Module User's Manual
C Controller module	The generic term for Q24DHCCPU-V, Q24DHCCPU-VG, and Q12DCCPU-V.
Setting/monitoring tools for the C Controller module	The generic term for Setting/monitoring tools for the C Controller module shown below. • Q24DHCCPU-V, Q24DHCCPU-VG, and Q12DCCPU-V (Extended mode) SW4PVC-CCPU • Q12DCCPU-V (Basic mode) SW3PVC-CCPU
VxWorks	The real-time operating system manufactured by Wind River Systems, Inc.
Wind River Workbench	The generic term for Wind River Workbench manufactured by Wind River Systems, Inc.
CW Workbench	The engineering tool for C Controller module. The generic term for OEM products of Wind River without the runtime analysis tool and simulation functions (VxSim) of Wind River Workbench; a subset of Wind River Workbench. • Q24DHCCPU-V and Q24DHCCPU-VG SW1DND-CWWLQ24-E, SW1DND-CWWLQ24-EZ, SW1DND-CWWLQ24-EVZ • Q12DCCPU-V SW1DND-CWWLQ12-E, SW1DND-CWWLQ12-EZ, SW1DND-CWWLQ12-EVZ
VxSim	The generic term for the VxWorks simulator functions of Wind River Workbench.
CW-Sim	The abbreviation for the VxWorks simulator that can operate the C Controller module program on a personal computer with CW Workbench installed, without connecting to the actual machine (target).
CW-Sim Standalone	The abbreviation for the VxWorks simulator that can operate C Controller module program even on a personal computer without CW Workbench installed.
Windows® 7 or later	The generic term for Windows® 7, Windows® 8, Windows® 8.1, Windows® 10
Windows® 8 or later	The generic term for Windows® 8, Windows® 8.1, Windows® 10
Personal computer	The generic term for personal computers where Windows® operates

TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
Dedicated function library	The generic term for bus interface function, MELSEC data link function, and C Controller module dedicated function.
Bus interface function	Dedicated function library offered by C Controller module. This function is used when executing the following: • Input from or output to I/O modules controlled by the C Controller module • Access to the buffer memory of an intelligent function module • The readout or control of the C Controller module status
MELSEC data link function	Dedicated function library offered by C Controller module. This function is used when writing to/reading from a device of other programmable Controller CPUs connected via network or configured with multiple CPUs.
C Controller module dedicated function	Dedicated function library that controls C Controller module. This function is used when reading the C Controller module status, controlling LED, and accessing to resources such as time and battery backup RAM. This function can be used for Q24DHCCPU-V and Q24DHCCPU-VG C Controller modules. It can not be used in Q12DCCPU-V C Controller module.
URL	The abbreviation for Uniform Resource Locator. This address indicates a location of information resources (such as text and images) on the Internet.
Eclipse	An open source software development environment comprising an integrated development environment written in Java

PRODUCT ORGANIZATION

The following shows the C Controller-compatible software.

○: Applicable, ×: Not applicable

Supported software	C Controller			
	Q24DHCCPU-V Q24DHCCPU-VG	Q12DCCPU-V		
	-	"15102" or later *1		Earlier than "15102" *1
	-	Extended mode	Basic mode *2	
SW1DND-CWWLQ24-E	○	×	×	×
SW1DND-CWWLQ12-E	×	○	○	○

*1 First five digits of serial number

*2 For Q12DCCPU-V earlier than "15102", the mode cannot be changed. Q12DCCPU-V earlier than "15102" is regarded as the basic mode in this manual.

CHAPTER 1 OVERVIEW

CW Workbench is a product for customers who develop a user program that operates on the C Controller module. CW Workbench is an OEM product of Wind River Systems, Inc. The product has only basic functions required for user program development, such as coding, building, and debugging, as a subset product of Wind River Workbench 3.2.

1.1 Features

Engineering tool for C Controller, CW Workbench, is software to offer dedicated integrated development environment for the Mitsubishi C Controller module.
CW Workbench has the following features:

(1) Software to offer dedicated integrated development environment for the C Controller module

This product is an integrated development environment to execute the following operations: project management, source code editing, building, and debugging. A user program for the C Controller module can be effectively developed.

(2) The same specifications as those of Wind River Workbench 3.2

Displays and operations of CW Workbench are the same specifications as those of Wind River Workbench 3.2 for common functions.

(3) Extended functions using plug-in software

The third party plug-in software can be easily added, which allows functions to be easily extended.

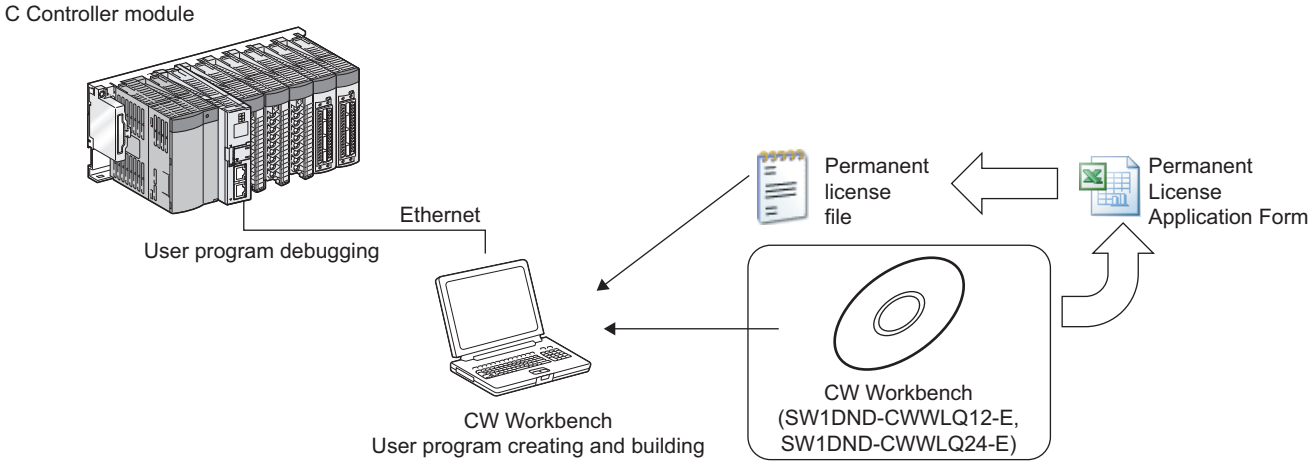
CHAPTER 2 SYSTEM CONFIGURATION

2.1 Environment Configuration for Each License Type

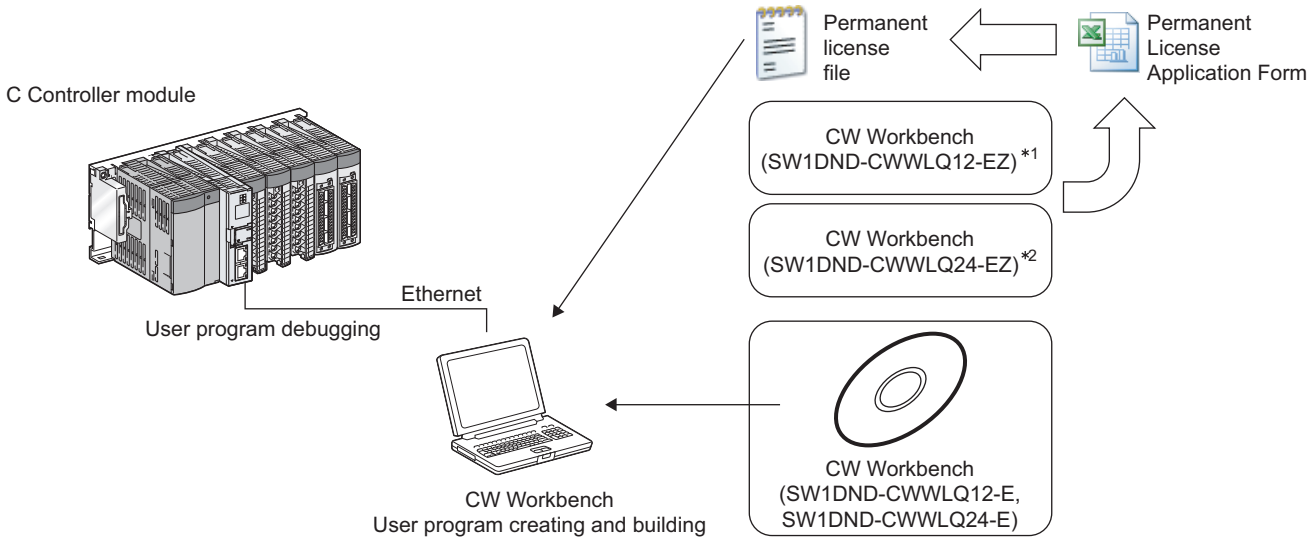
This section explains the environment for developing user programs in CW Workbench.

A permanent license is required to install CW Workbench. (☞Page 22, Section 5.1)

(1) Product with license



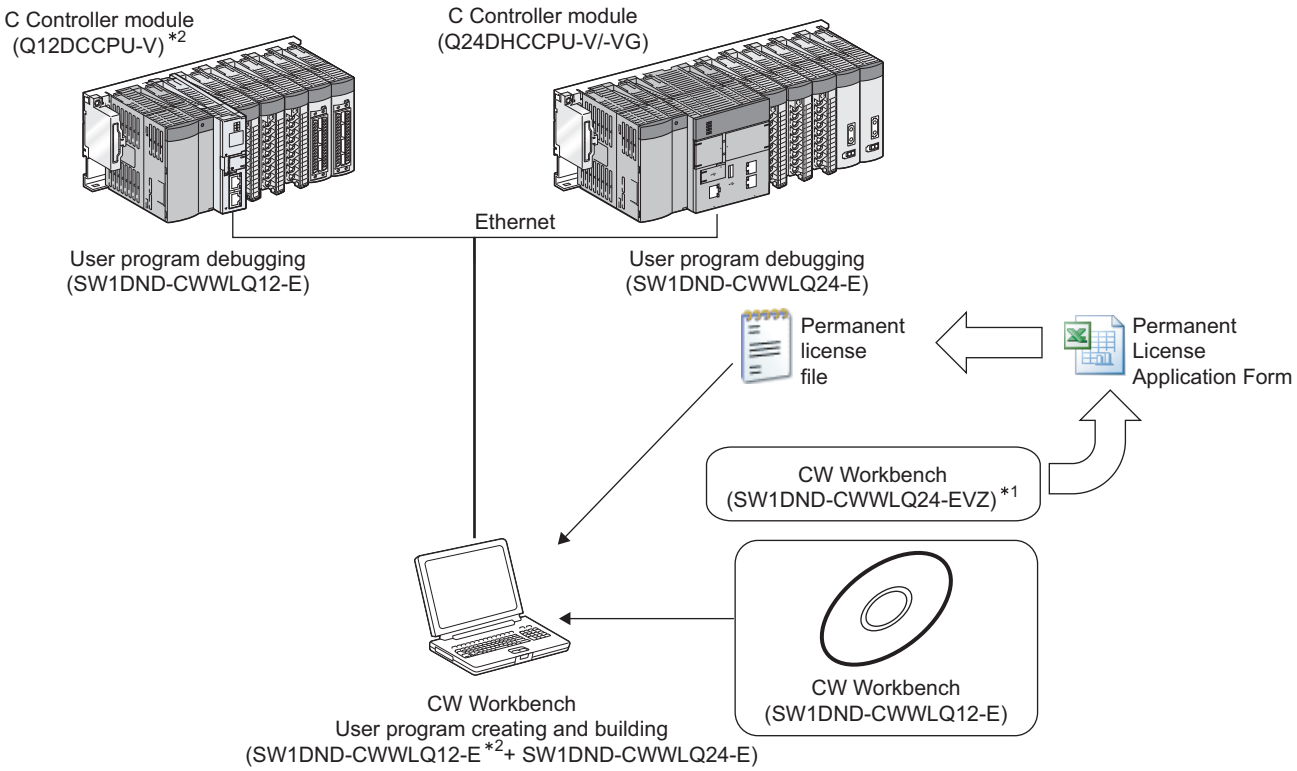
(2) Additional license product



*1 The DVD-ROM is not included with the CW Workbench additional license product (SW1DND-CWWLQ12-EZ). To install CW Workbench, the DVD-ROM included with the CW Workbench product with license (SW1DND-CWWLQ12-E) is required.

*2 The DVD-ROM is not included with the CW Workbench additional license product (SW1DND-CWWLQ24-EZ). To install CW Workbench, the DVD-ROM included with the CW Workbench product with license (SW1DND-CWWLQ24-E) is required.

(3) Updated license product



*1 The DVD-ROM is not included with the CW Workbench updated license product (SW1DND-CWWLQ24-EVZ). To install CW Workbench, the DVD-ROM included with the CW Workbench product with license (SW1DND-CWWLQ12-E) is required.

*2 The configuration before installing the updated license product (SW1DND-CWWLQ24-EVZ) is indicated.

Point

If the CPUs to be used after update are not written in "Target CPU" of Permanent License Application Form, please consult your local Mitsubishi representative.

2.2 Relevant Module

CW Workbench is compatible with the following C Controller module:

Model	Operating System	Relevant software package
Q24DHCCPU-V	VxWorks 6.8	SW1DND-CWWLQ24-E SW1DND-CWWLQ24-EZ SW1DND-CWWLQ24-EVZ
Q24DHCCPU-VG		
Q12DCCPU-V	VxWorks 6.4	SW1DND-CWWLQ12-E SW1DND-CWWLQ12-EZ SW1DND-CWWLQ12-EVZ

2.3 Operating Environment

Below is a list of the operating environment of a personal computer where CW Workbench can be operated.

Item		Description
Computer		PC/AT-compatible personal computer in which the following operating systems can be operated.
	CPU	Intel® Core™2 Duo 2GHz or higher is recommended.
	Memory requirements	1G byte or more (2G bytes or more is recommended)
Hard disk space		Install size: HDD 4G bytes or more Executable size: Virtual memory 512MB or more
Display		1024-by-768 resolution or higher
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, Education, IoT Enterprise 2016 LTSB*5)*6,*7 • Windows 8.1, Windows 8.1 (Pro, Enterprise)*6,*7 • Windows 8, Windows 8 (Pro, Enterprise)*6,*7 • Windows 7 (Professional, Ultimate, Enterprise)*6,*8 • Windows Vista® (Ultimate, Business, Enterprise)*8 • Windows XP® (Professional SP3 or later)*8

*1 When the following functions are used, this product may not run properly.
- Application start-up in Windows compatibility mode
- Fast user switching
- Remote desktop
- Windows XP Mode
- Windows Touch or Touch
- Tablet mode
- Virtual Desktops

*2 In the following cases, the screen of this product may not work properly.
- The size of the text and/or other items on the screen are changed to values other than default values (such as 96 DPI, 100%, and 9 pt).

*3 Log on as a user with the Administrator attribute when installing and uninstalling CW Workbench.

*4 TCP/IP is required.

*5 64-bit version only.

*6 The FTP server included in CW Workbench cannot be used.
For using the FTP server, use Microsoft Internet Information Services.

*7 The operating systems support CW Workbench with software version "F" or later.
Check the software version with the alphabet at end of the character string written in the DATE column of a DVD-ROM.
(Example: 1710AF indicate that the software version is "F".)

*8 32-bit version only.

2.4 Specifications

Below are specifications of CW Workbench.

Item	Specifications	
Product name	CW Workbench	
Operating system of applicable host machine	Refer to "Operating environment"(☞ Page 16, Section 2.3)	
Applicable C Controller module	Refer to "Relevant Module".(☞ Page 16, Section 2.2)	
Applicable operating system	Q24DHCCPU-V	VxWorks 6.8
	Q24DHCCPU-VG	
	Q12DCCPU-V	VxWorks 6.4
Framework	Wind River Workbench 3.2 base (Eclipse3.5)	
Project creation and management	VxWorks Downloadable Kernel Module Project	
Building	Q24DHCCPU-V	GNU compiler (GCC 4.1.2 for Intel Atom Z5xx)
	Q24DHCCPU-VG	
	Q12DCCPU-V	GNU compiler (GCC 3.4.4 for SH-4A)
Debugger	• Debugging execution restart • Debugging execution forced stop • Breakpoints • Step through execution • Variables/structure variables reference and editing • Register value reference and editing • Memory block reference and editing • Target connection agent • Dynamic Printf (Q24DHCCPU-V/-VG only)	
License format	Node locked	
Document	Wind River Workbench 3.2 Help document	

CHAPTER 3 PACKING LIST

3.1 Packing List

The following items are included with CW Workbench. Check that all the items are included before use.

(1) Items included with CW Workbench

Model name	Item	Qty.
(Product with license) SW1DND-CWWLQ12-E SW1DND-CWWLQ24-E	DVD-ROM(☞ Page 18, Section 3.1 (2))	1
	"Before Using the Product"	1
	License Certificate	1
	End-User Software License Agreement	1
	Permanent License Application Form (sample)	1
(Additional license product*1) SW1DND-CWWLQ12-EZ SW1DND-CWWLQ24-EZ (Updated license product*1) SW1DND-CWWLQ12-EVZ SW1DND-CWWLQ24-EVZ	"Before Using the Product"	1
	License Certificate	1
	End-User Software License Agreement	1
	Permanent License Application Form (sample)	1

*1 The DVD-ROM is not included with the CW Workbench additional license product or updated license product. To install CW Workbench, the DVD-ROM included with the CW Workbench product with license is required.

(2) Contents of CW Workbench DVD-ROM

Content	Description	Storage location
CW Workbench install image	An install image file of CW Workbench	\ \images
Relevant document	Relevant manuals of VxWorks and Wind River Workbench 3.2 (PDF)	\docs
	A license notice (PDF) of the third party used in CW Workbench	\3rd_party_licensor_notices
Manual	CW Workbench Operating Manual (PDF)	\manual
Permanent License Application Form	An application form for a permanent license and a license transfer. (PermanentLicenseApplicationForm.xls) Use the form when applying for a permanent license and a license transfer.	\
Install key file	A file to be used as an install key when you do not have a permanent license file and do not have the Internet. CW Workbench operates with no license when having been installed using an install key file (Install_SH_IA.txt).	\
CW Workbench open source file	A CW Workbench open source file	\src

3.2 Things to Prepare

The following lists things to prepare before using CW Workbench.

(1) Development environment (personal computer)

Prepare a personal computer to install and use CW Workbench.

Point

Enter the host name within 2 to 15 alphanumeric characters for a personal computer to be used as a development environment (personal computer).

Operating Environment for operating specifications of a personal computer.(☞ Page 16, Section 2.3)

(2) CW Workbench DVD-ROM

Prepare a CW Workbench DVD-ROM included with the product with license (SW1DND-CWWLQ12-E, SW1DND-CWWLQ24-E).

The DVD-ROM is required to install CW Workbench. Apply for a permanent license using an application form stored on the DVD-ROM.

(3) License Agreement

An LAC described in the License Agreement is required to install CW Workbench by using a temporary license.

An LAC and a product ID described in the License Agreement are also required to apply for a permanent license.

Prepare the License Agreement included with CW Workbench.

(4) Permanent license file

A permanent license file is required to install CW Workbench by using a permanent license.

To acquire a permanent license file, use a Permanent License Application Form stored on the DVD-ROM and send us the Form.

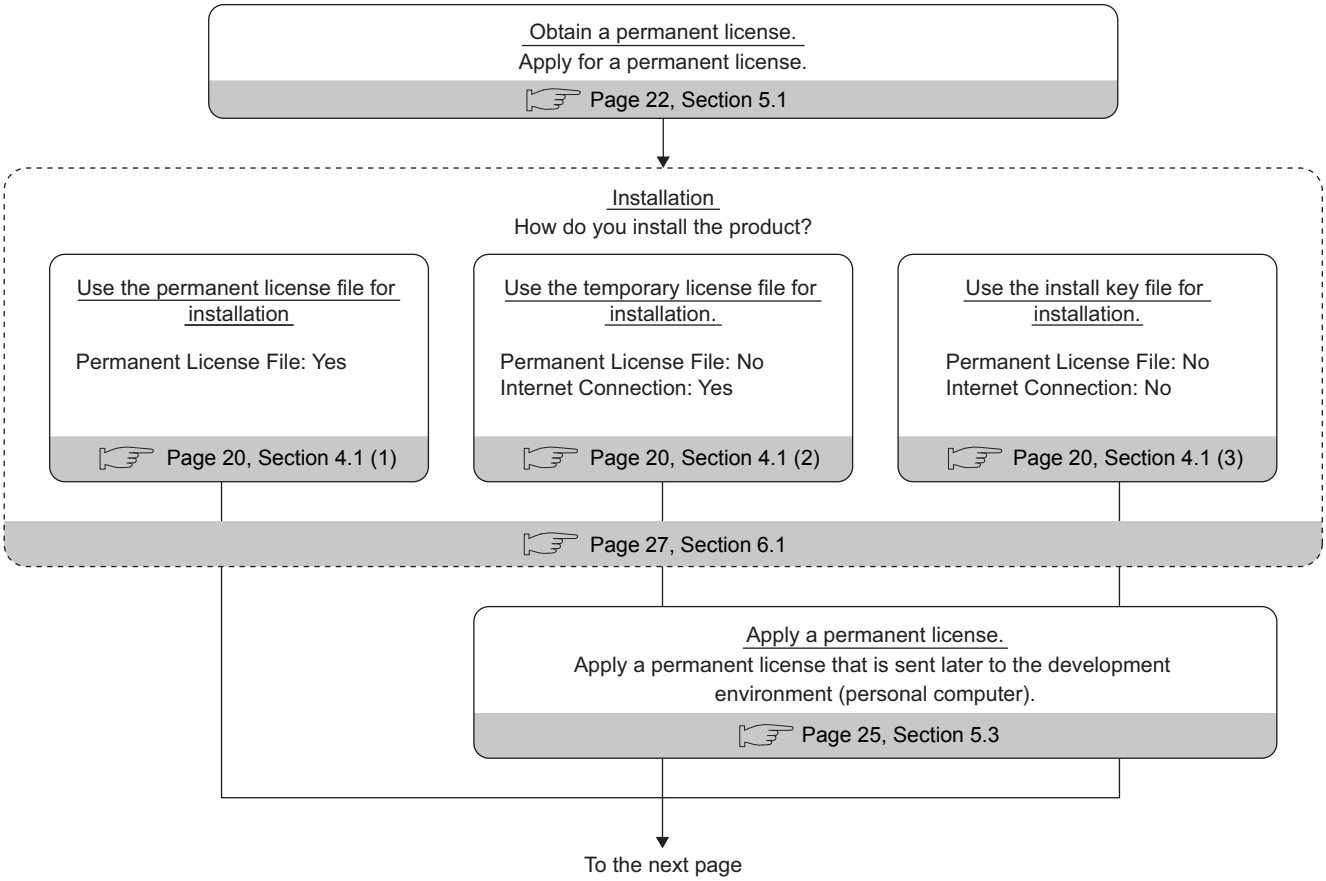
(5) Internet connection

An Internet connection is required to install CW Workbench by using a permanent license.

Acquire a 31-day temporary license via the Internet.

CHAPTER 4 PROCEDURE OVERVIEW

4.1 From Installation to Debugging



(1) Installation using a permanent license

This installation is for users with a permanent license (regular license). All the functions of CW Workbench can be used for unlimited duration.

(2) Installation using a temporary license

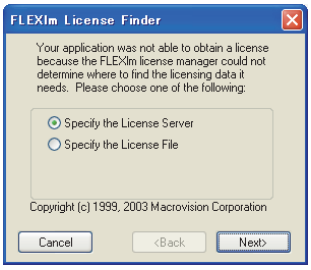
This installation is for users with a temporary license acquired on the Internet. All the functions of CW Workbench can be used for 31 days after the installation.

(3) Installation using an install key on the DVD-ROM

This installation is for users having neither permanent license nor Internet connection.
Only the editor, import, and export functions of CW Workbench can be used. The build, compile, or debug functions cannot be used.
Note that for SW1DND-CWWLQ24-EVZ, the installation using the following install key files cannot be executed.

- Install_SH4.txt of SW1DND-CWWLQ12-E
- Install_SH_IA.txt of SW1DND-CWWLQ24-E

The dialog box shown to the right appears when CW Workbench is started up with no license.
Click Cancel to continue the operation.



From the previous page

Apply a patch.
Information and services
For further information and services, please consult your local Mitsubishi representative.
Page 54, CHAPTER 7

Create a project.
Create a user program project and perform programming.
Page 57, CHAPTER 8

Build.
Build a user program.
Page 71, Section 8.3

Connect the target.
Connect CW Workbench to the C Controller module.
Page 77, CHAPTER 9

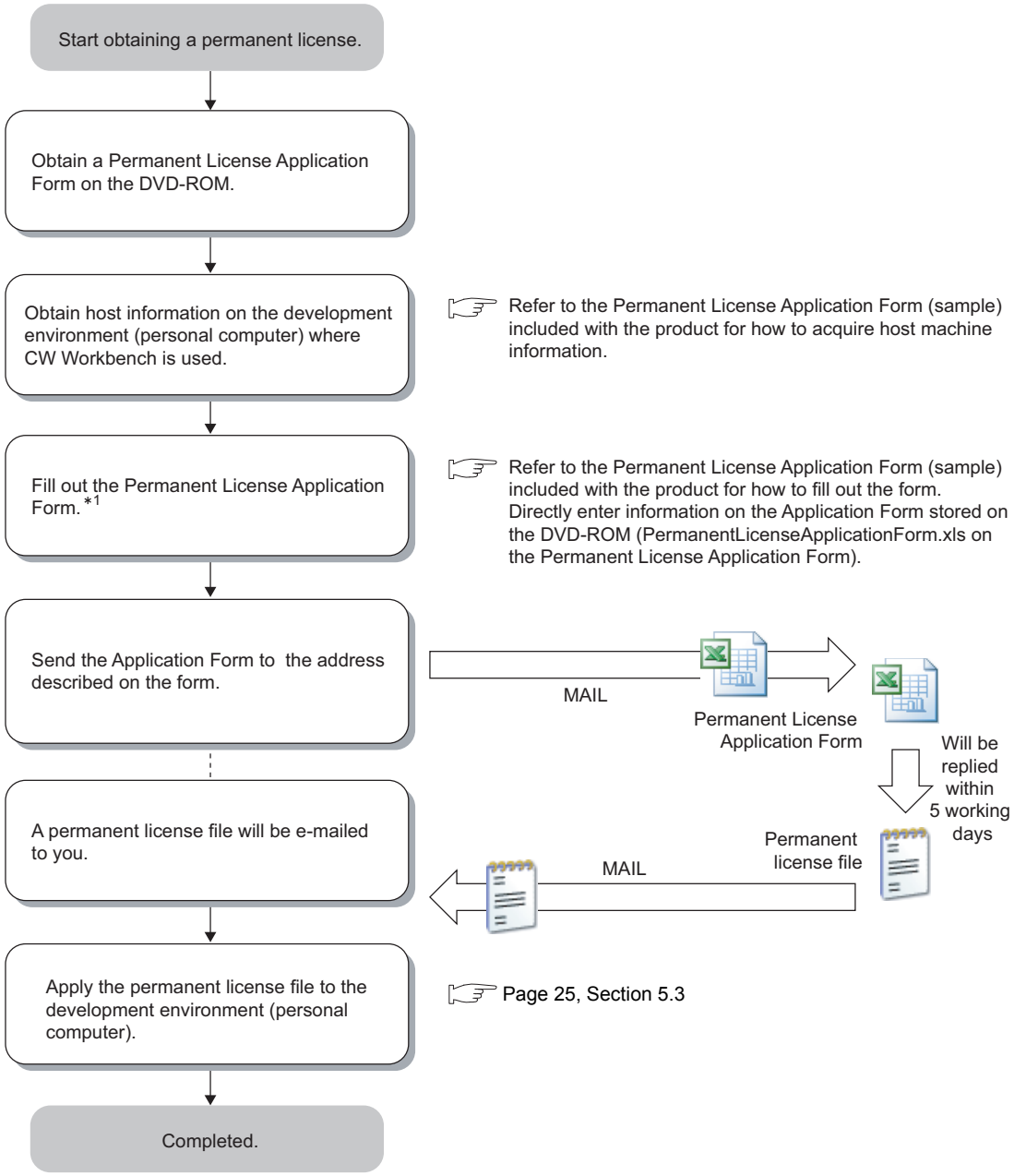
Download.
Download the user program on the C Controller module.
Page 85, CHAPTER 10

Debug.
Debug the user program.
Page 85, CHAPTER 10

CHAPTER 5 PERMANENT LICENSE

5.1 Obtaining Permanent License

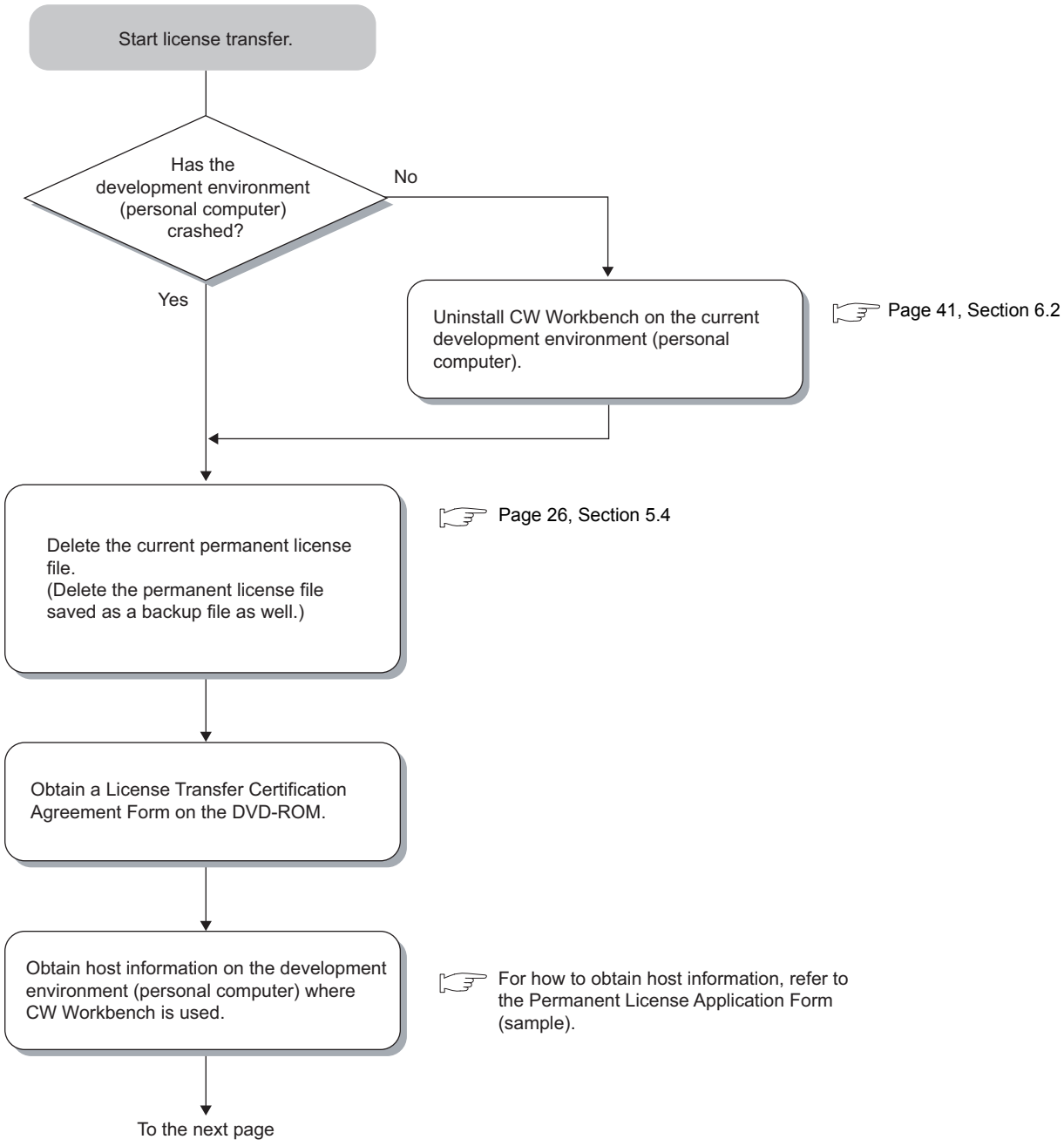
A permanent license is required to use CW Workbench for unlimited duration. Follow the instructions shown below to obtain a permanent license.

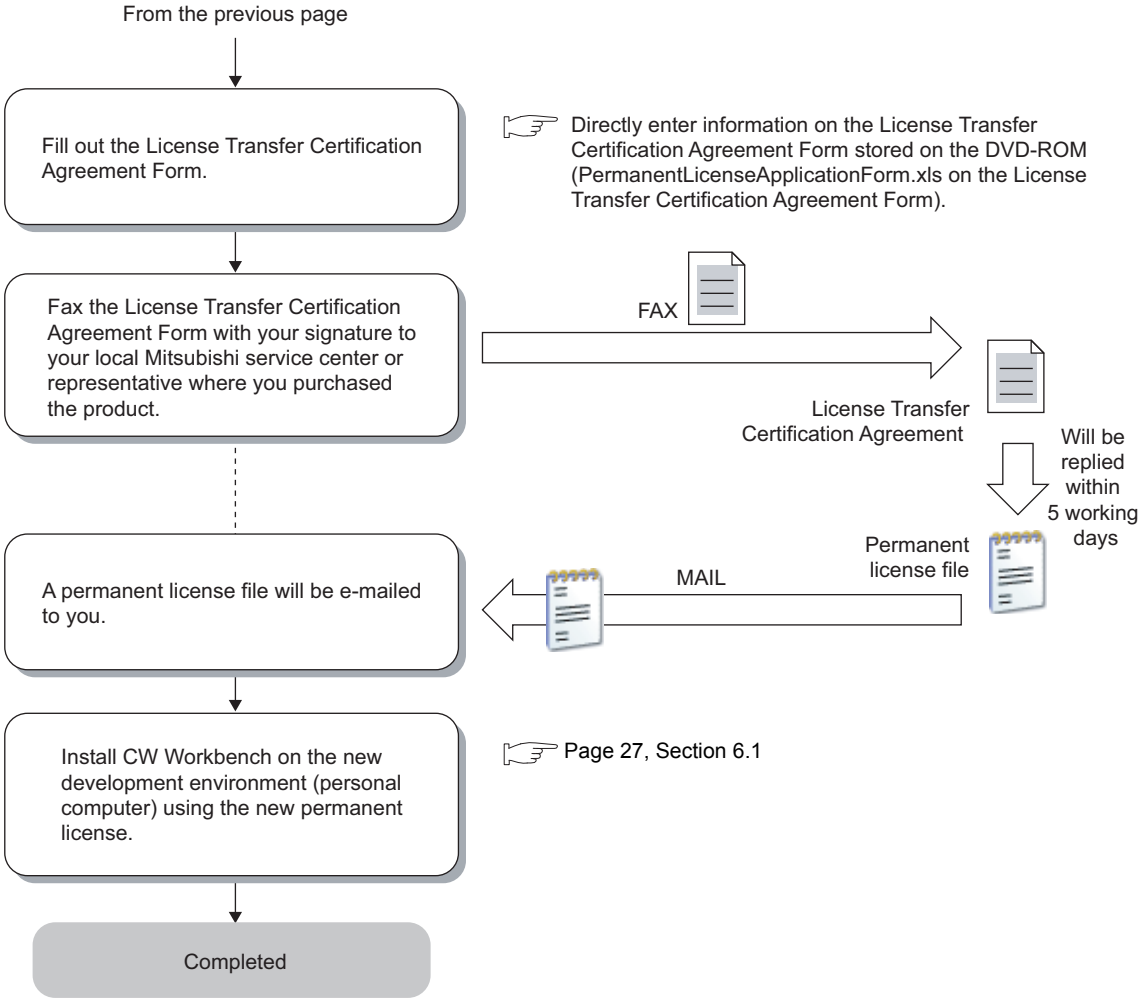


*1 For the development environment (personal computer) information on the Permanent License Application Form for the updated license product, enter the same information as the one registered to acquire the permanent license previously.

5.2 License Transfer

Another permanent license is required on a new development environment (personal computer) for license transfer due to reasons such as when the development environment (personal computer) where CW Workbench has been installed crashed.
Follow the instructions shown below for license transfer.





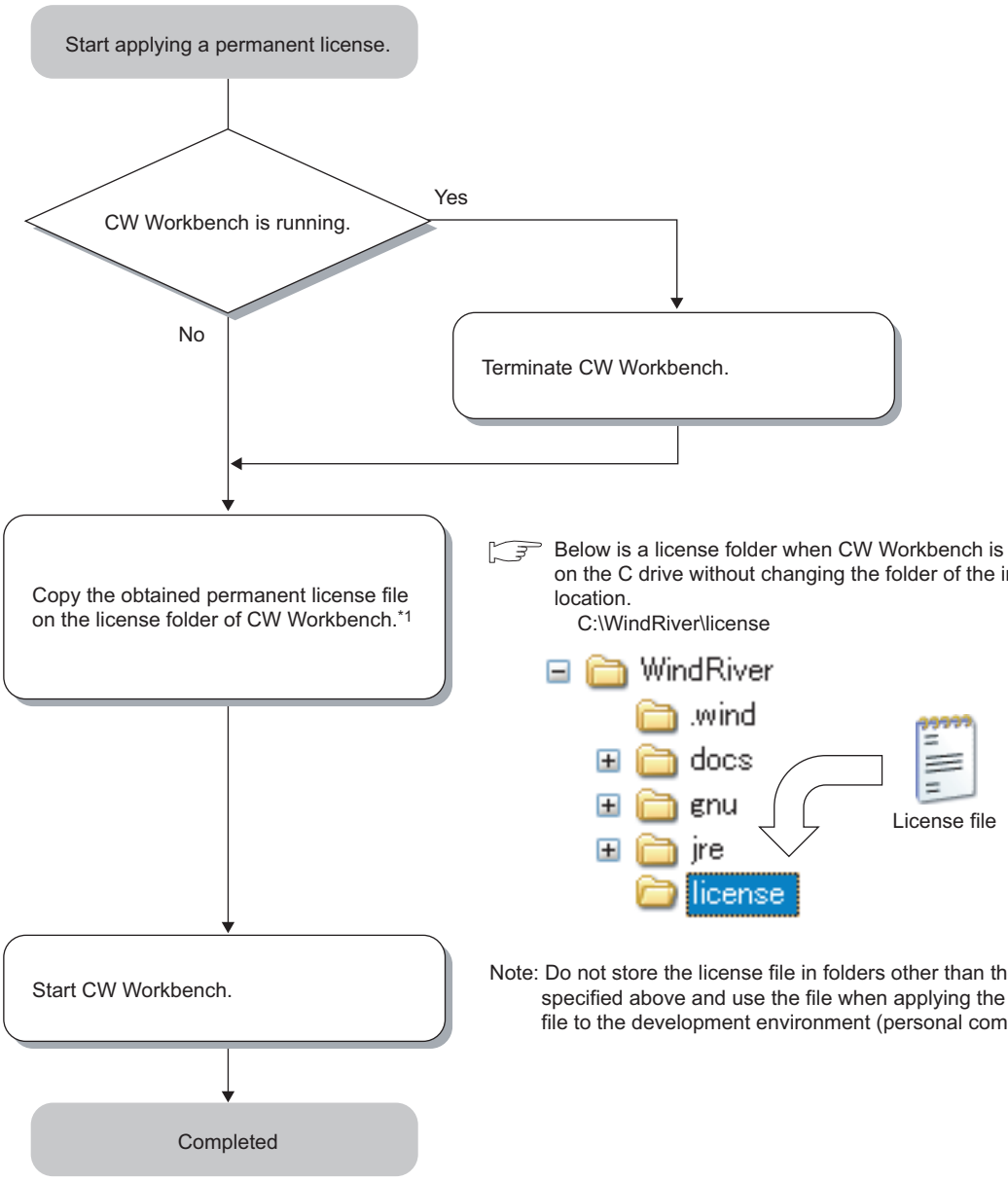
Remark

If you have lost the License Agreement and do no know the Product ID, contact your local Mitsubishi service center or representative and give them information filled out on the Permanent License Application Form.

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

5.3 Applying Permanent License

Apply the acquired permanent license file to the development environment (personal computer) specified for "Host machineinformation" on the application form.
Follow the instructions shown below to apply the permanent license file.



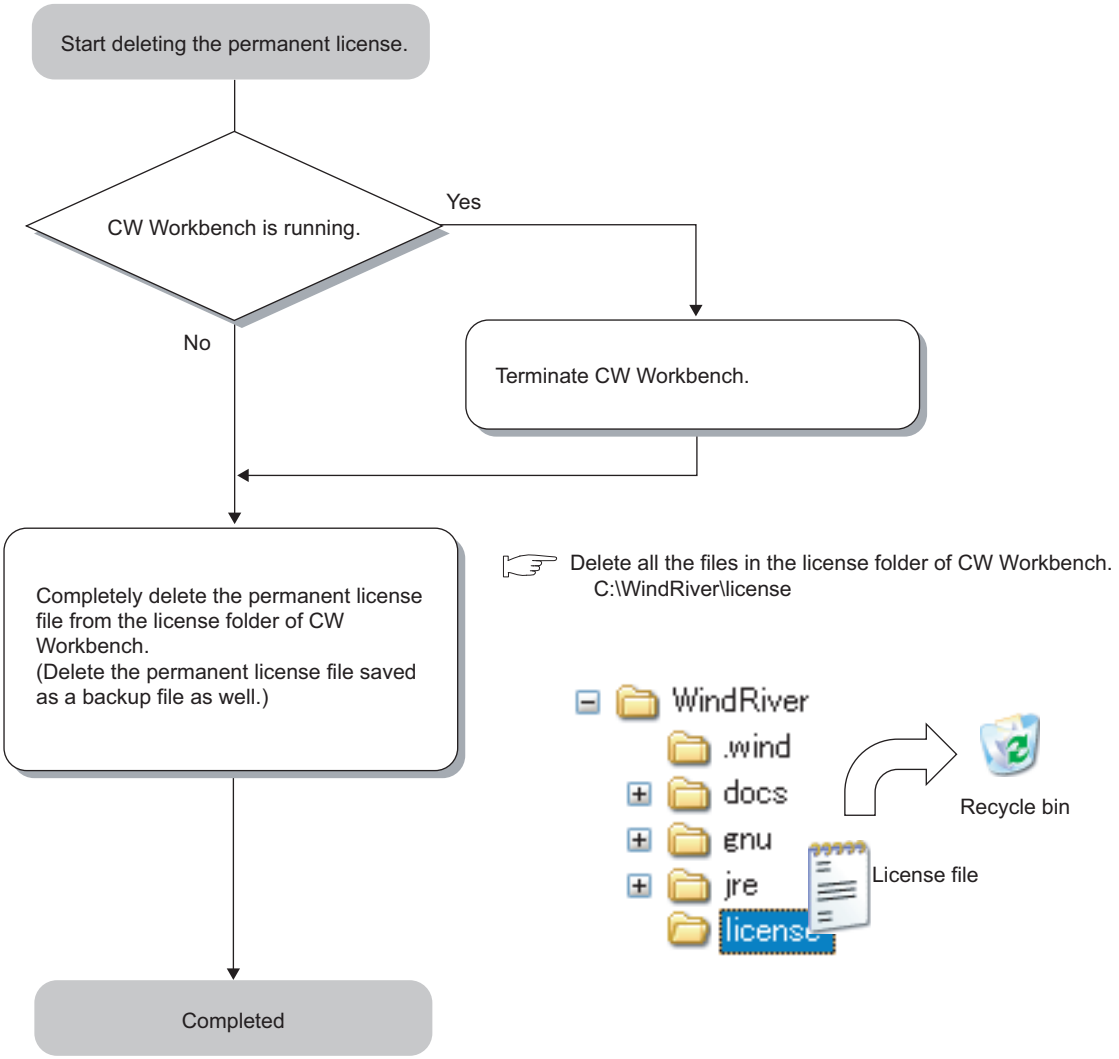
Below is a license folder when CW Workbench is installed on the C drive without changing the folder of the installation location.
C:\WindRiver\license

Note: Do not store the license file in folders other than the one specified above and use the file when applying the license file to the development environment (personal computer).

*1 When two or more permanent license files are obtained with the updated license product, overwrite all files.

5.4 Deleting Permanent License

Follow the instructions shown below to delete the current permanent license for license transfer.



CHAPTER 6 INSTALLATION AND UNINSTALLATION

6.1 Installation

This section explains how to install the product, how to operate, and precautions.

Unless operations differ depending on the operating system, windows and dialog boxes of Windows® XP are used for explanations.

6.1.1 Preparation before installation

(1) Log on as a user with the Administrator attribute when installing the product on the development environment (personal computer).

(2) Insert the DVD-ROM into the development environment (personal computer), the installer automatically starts.

Point

For CW Workbench with the software version "F" or earlier, "Install.vbs" is not contained in a DVD-ROM. Run "setup.exe" to install CW Workbench.
For details on the software version and supported operating systems, refer to the following section.
Page 16

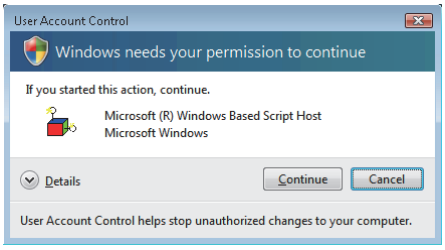
When a screen to play DVD automatically appears, select "Run wscript.exe"*1.
If the installer does not automatically start, double-click "Install.vbs" on the DVD-ROM to start it.
Do not execute more than one "Install.vbs" at the same time, or the product may not be properly installed. If the installation was not completed properly, uninstall the product and execute "Install.vbs" again.

*1 For CW Workbench whose software version is "F" or earlier, "Run setup.exe" appears.

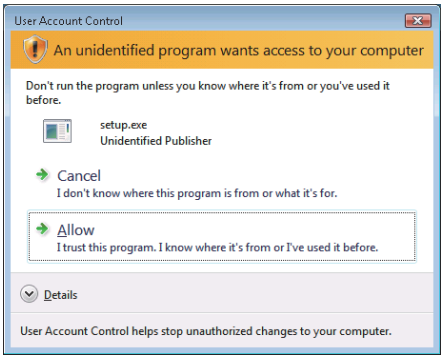
(3) For installation on Windows Vista® or Windows® 7 or later, a dialog box asking whether to enable or disable User Account Control appears.

Click "Allow" or "Yes" to continue the installation.

- For Windows Vista®
  - Installed with "Install.vbs"



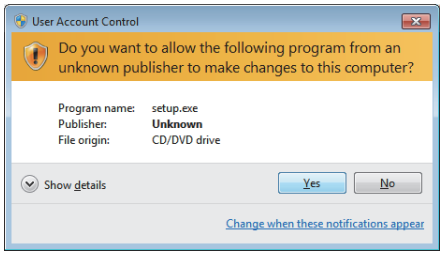
  - Installed with "setup.exe"



Click "Allow" or "Continue".

- For Windows® 7 or later
  - Installed with "Install.vbs"

  - Installed with "setup.exe"



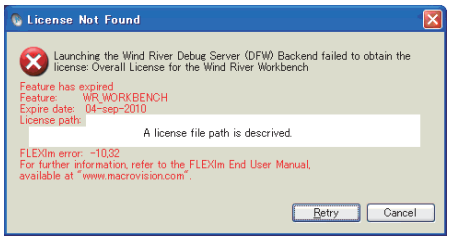
Click the Yes button.

(4) Acquire a permanent license file.

If you require the Permanent License Application Form, or if you have purchased the updated license product, please consult your local Mitsubishi representative.

Point

- Stop all other applications running on Windows® before installation.
- The installer may not operate the functions properly due to the automatic start of update programs of the operating system or any other software, such as Windows® Update or Java Update. Change the setting to disable the automatic start of update programs before installation.
- CW Workbench cannot be over-installed on the development environment (personal computer) where CW Workbench has been already installed. Uninstall the product before reinstallation.
- Do not install the product on the development environment (personal computer) where Wind River Workbench has been already installed. To install the product, uninstall Wind River Workbench or prepare another development environment (personal computer).
- When the product is installed by using a temporary license, the product operates for 31 days. A regular license is issued after a permanent license is obtained. Use the permanent license to start the product.

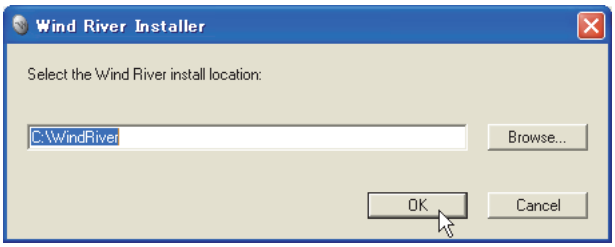


The license error message shown below appears after 31 days. The product continues to operate by clicking the Cancel button, but the project creation, compiling/building, and debug functions cannot be used.
[License error message]
Error text: "Feature has expired"
Error code: -10

- To install CW Workbench using a temporary license, it can be obtained via the Internet. Before installation, check that the personal computer can be connected to the Internet.
  If the personal computer is connected to the Internet via a proxy server, check the IP address and port number in advance. They are required to be set during installation.
- Note the following when installing the updated license product.
  - Enter the LAC (License Authorization Code) written on the License Agreement of updated license product to LAC on the User Information window.
  - The updated license product (SW1DND-CWWLQ24-EVZ) cannot be installed with the install key file (Install_SH4.txt) of the product with license (SW1DND-CWWLQ12-E).

6.1.2 How to install CW Workbench

Start installing CW Workbench



Insert the CW Workbench DVD-ROM into the DVD drive to start the installer.

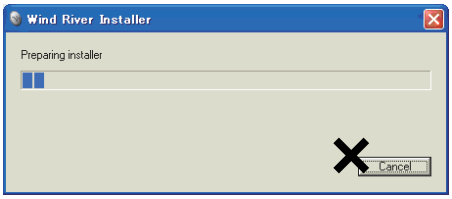
1. **After the installer is started, execute one of the following operations and click the** OK **button:**

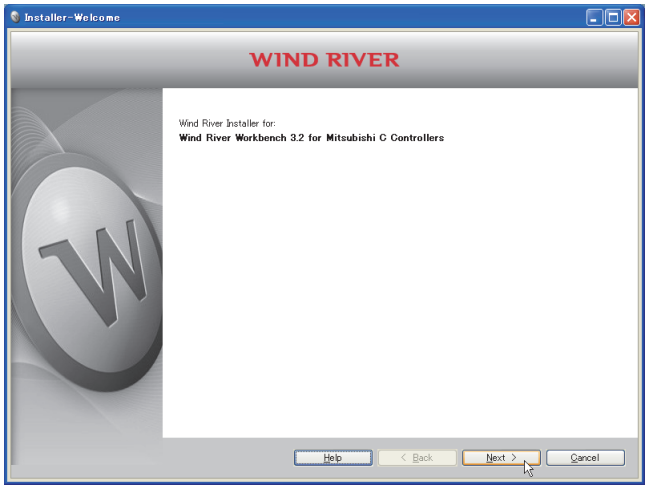
- Enter a folder name of the installation location.
- Click the Browse... button to select a folder of the installation location from the tree view.

Point

- The following characters can be used for a folder name of the installation location: (Space cannot be used.)
  - Alphanumeric characters
  - Hyphen "-"
  - Underscore "_"

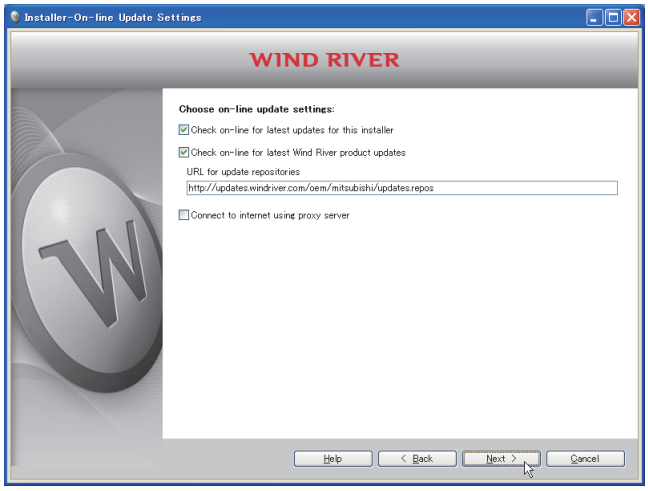
  The product cannot be properly installed if characters other than those described above are used for a folder name.
- The dialog box shown below may appear after the OK button is clicked. Clicking the Cancel button does not cancel the operation.





2. **Click the** Next > **button.**

To the next page

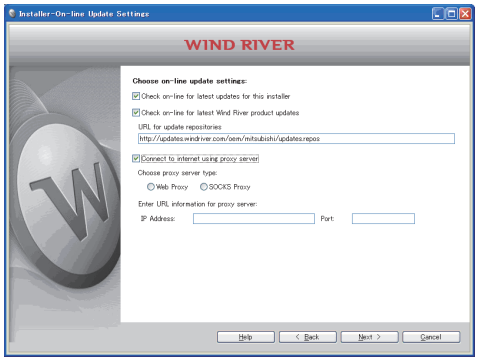


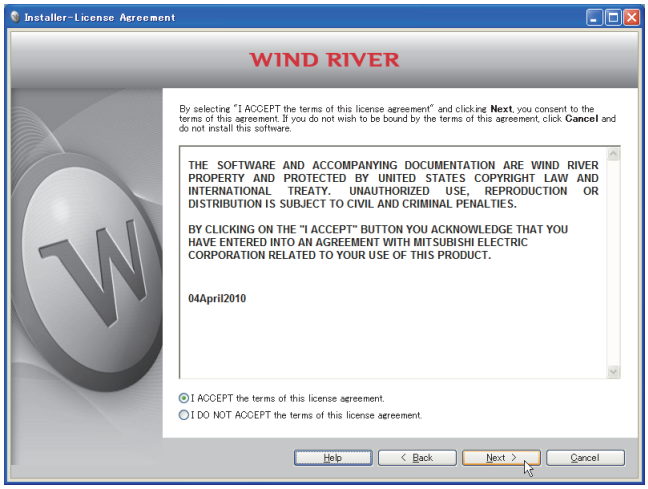
3. Click the Next > button.

To update the installer or this product, select the checkboxes of “Checkon-line for latest updates for this installer” and “Checkon-line for latest Wind River product updates”. The latest installer or the product is downloaded and updated.

Point

If the personal computer is connected to the Internet via a proxy server, check the box of "Connect to internet using proxy server" and configure the proxy server setting set for the Internet connection on the personal computer.





4. Select "I ACCEPT the terms of this license agreement." and click the Next > button.

To the next page

5. **To continue the installation, select one of the following procedures:**

If the permanent license file is not obtained

- Installation using a temporary license (a personal computer can be connected to the Internet):

  ⇨ (1)(2)(3) ☞ Page 33

- Installation using an install key on the DVD-ROM (a personal computer cannot be connected to the Internet):

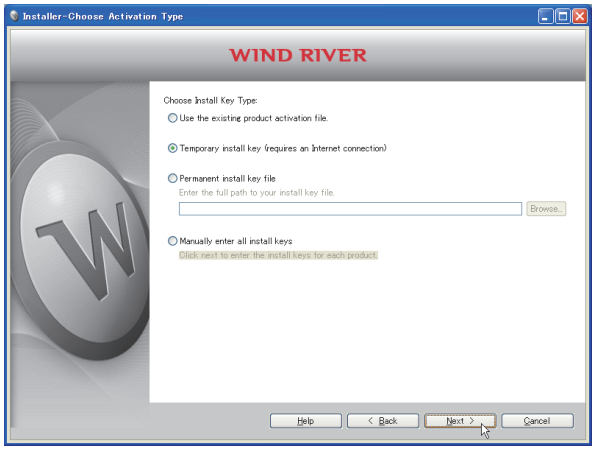
  ⇨ (4) ☞ Page 35

If the permanent license file is obtained

- Installation using a permanent license

  ⇨ (5) ☞ Page 36

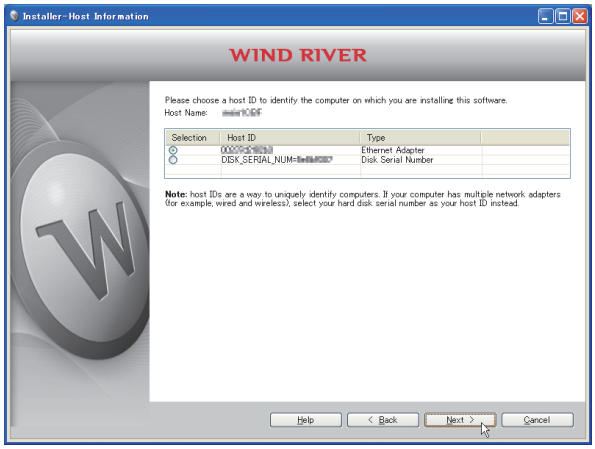
Installation using a temporary license



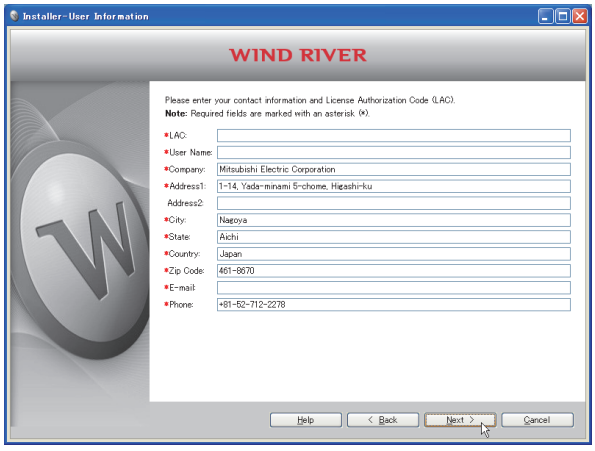
(1) Select "Temporary install key (requires an Internet connection)" and click the Next > button.

Point

- If "Temporary install key" is selected, the Internet is required to acquire "Temporary install key". Execute the installation on a personal computer connected to the Internet.
- If the personal computer is connected to the Internet via a proxy server, configure the proxy server setting. (☞ Page 31 Point)
  If "Temporary install key" is selected without configuring the proxy server setting, installation does not proceed.



(2) Check the content of "Note" on the window. Select either "Ethernet Adapter" or "Disk Serial Number" for the Host ID and click the Next > button.



(3) Enter a License Authorization Code (LAC) and user information listed below and click the Next > button.

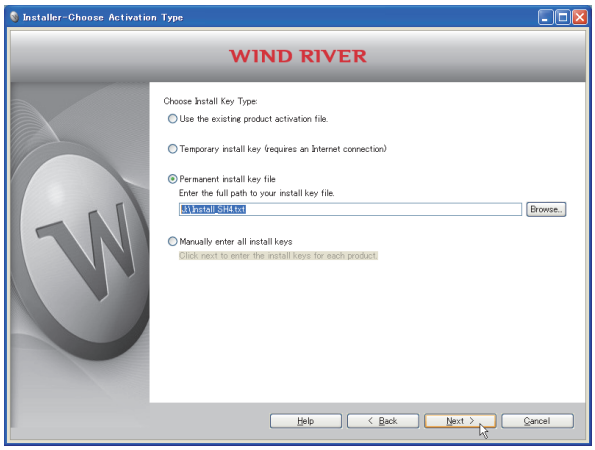
Point

Use alphanumeric characters for the LAC and user information.
(Items with a * mark on the window must be entered correctly.)

LAC:	License Authorization Code (described in the License Agreement included with CW Workbench)
User Name:	User name
Company:	Company name
Address1:	Address (such as town name and block number)
Address2:	Building name, etc. (can be left blank)
City:	City
State:	State
Country:	Country
Zip Code:	Zip code
E-mail:	E-mail address
Phone:	Phone number

Go to the step 6 (☞ Page 37)

Installation using an install key on the DVD-ROM



(4) Select "Permanent install key file", click the Browse... button, specify the following install key file stored on the DVD-ROM, and click the Next > button.

⇨ For Q24DHCCPU-V/-VG: "Install_SH_IA.txt"

⇨ For Q12DCCPU-V: "Install_SH4.txt"

Point

When the installation is executed with specifying the install key file, CW Workbench is installed without license and only the following functions can be used:

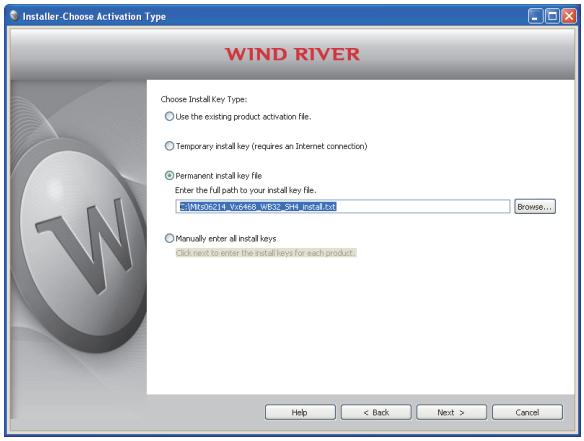
- Editor function (such as creation, editing, saving, and searching)
- Import/Export

To use all the functions of CW Workbench, obtain and apply a permanent license.

Page 22, Section 5.1
Page 25, Section 5.3

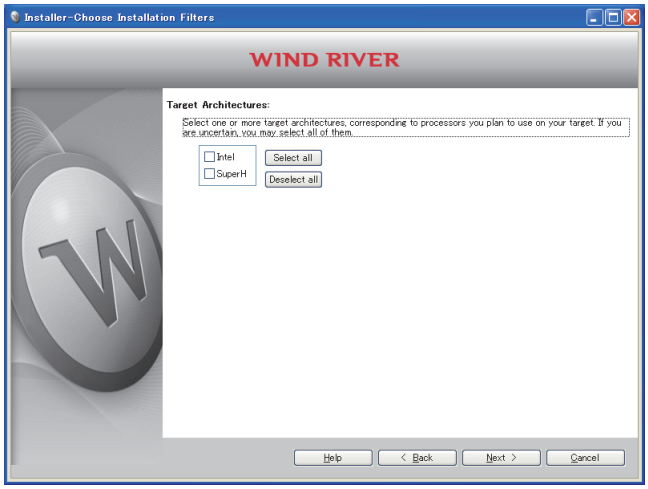
Go to the step 6 (Page 37)

Installation using a permanent license



(5) Select "Permanent install key file" and click the Browse... button.
Select the permanent license of the product to be installed from the tree view. Then click the Next > button.

Go to the step 6 (☞ Page 37)

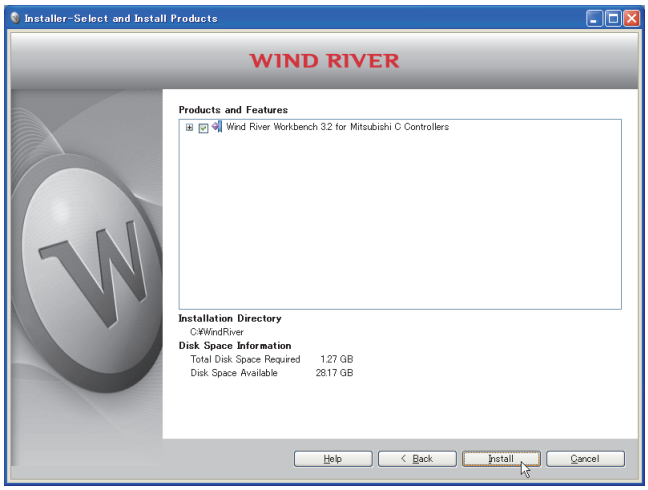


6. **Click the** Deselect all **button.**

Select the following items, and click the Next > **button.**

➪ For Q24DHCCPU-V/-VG: "Intel"

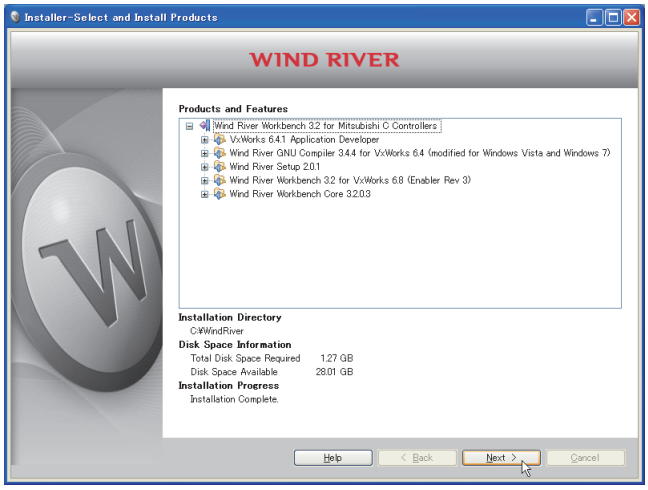
➪ For Q12DCCPU-V: "SuperH"



7. **Check that "Wind River Workbench 3.2 for Mitsubishi C Controllers" has been selected.**

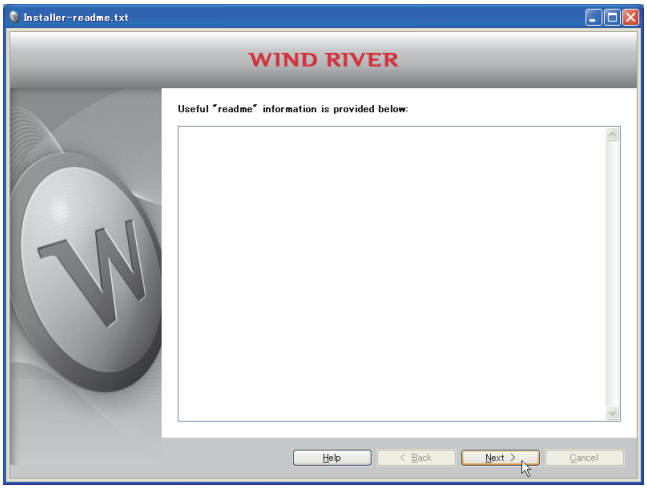
Click the Install **button.**

If the check box is ☐ or ☐, keep clicking the box until it changes to ☑.

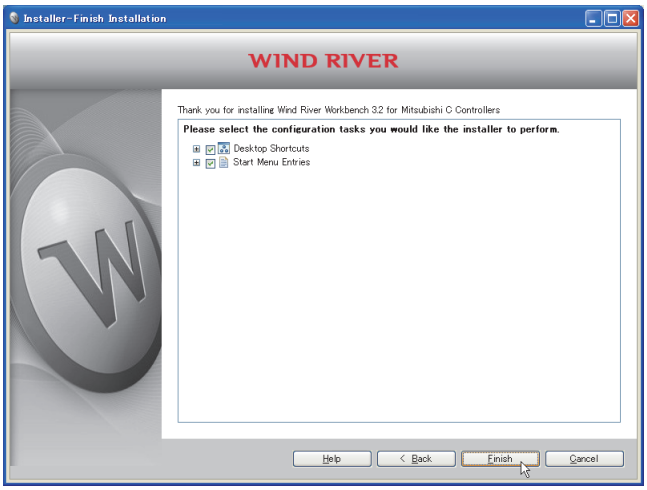


8. **Click the** Next > **button.**

To the next page



9. Click the Next > button.



10. Click the Finish button.

Completed

6.1.3 After installation

This section explains an icon registration, sample programs, and a patch application after the product is installed.

(1) How to start CW Workbench

After the product is installed, [Wind River] is added on Windows® Start[*1], and the following menus can be selected.

Start the product from "CW Workbench" in the "CW Workbench" menu.

*1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

Menu		Description
[CW Workbench][*3]	CW Workbench	Starts CW Workbench.
	Registry[*5]	Starts Wind River Registry for Workbench 3.2. When CW Workbench is started, Wind River Registry for Workbench 3.2 also starts, except when it is running already. An icon is registered on the task tray.
[Documentation][*3]	Workbench 3.2[*3]	Wind River Workbench 3.2 document
	VxWorks 6.8[*3]	VxWorks 6.8 document
[Product Maintenance][*3]	Installation at X YYYY	Uninstalls and updates CW Workbench and applies a patch. (X: drive name, Y: folder name of the installation location)
[VxWorks 6.8.1 Application Developer][*1,*3] or [VxWorks 6.4.1 Application Developer][*2,*3]	FTP Server[*4]	Starts WFTPD. For available operating systems, refer to the following section. ☞ Page 16, Section 2.3
	VxWorks COMx[*4]	Starts HyperTerminal for Telnet connection. VxWorks COMx cannot be used on the operating system, such as Windows Vista® and Windows®7 or later, where HyperTerminal is not installed.
	VxWorks Development Shell[*4]	Starts a command line Shell in which the Gnu compiler can be used.

*1: For SW1DND-CWWLQ24-E

*2: For SW1DND-CWWLQ12-E

*3: Does not appear in Windows® 8 or later.

*4: When CW Workbench is installed on a personal computer runnning Windows® 8 or later, the names of the menus are changed depending on the version of VxWorks.

VxWorks 6.4	VxWorks 6.8
FTP Server,6.4	FTP Server,6.8
VxWorks COMx,6.4	VxWorks COMx,6.8
VxWorks Development Shell,6.4	VxWorks Development Shell,6.8

*5: When CW Workbench is installed on a personal computer runnning Windows® 8 or later, the names of the menus are changed depending on the version of Wind River Registry for Workbench.
For Wind River Registry for Workbench 3.2: Registry,3.2

(a) Sample programs to be registered

Sample programs provided by Wind River Systems, Inc. are installed when the product is installed on the development environment (personal computer). To check the sample programs to be installed, start the product and select from the file menu [New] ⇨ [Example...].

For details on the sample programs, refer to the Wind River Workbench document provided by Wind River Systems, Inc.

[Help]in the menu bar⇨[Help Contents]⇨"Wind River Documentation" → "Guides" → "Host Tools" → "Wind River Workbench By Example(VxWorks 6 Version), 3.2"

If the SW4PVC-CCPU or SW3PVC-CCPU has been already installed on the development environment (personal computer), the sample programs for the C Controller module can be imported to the product and used.

6.2 Uninstallation

This section explains how to uninstall CW Workbench and precautions.

Unless operations differ depending on the operating system, windows and dialog boxes of Windows® XP are used for explanations.

6.2.1 Preparation before uninstallation

(1) Log on as a user with the Administrator attribute when uninstalling the product on the development environment (personal computer).

(2) Terminate the product before uninstallation.

(3) Uninstall the product in [Product Maintenance].

The product cannot be uninstalled from "Add or Remove Programs" in the Control Panel.

[Product Maintenance] can be executed as follows: [Wind River] ⇨ [Product Maintenance]*2 ⇨ [Installation at X YYYY] from Windows® Start*1

*1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

*2 Does not appear in Windows® 8 or later.

Remark

X and YYYY of [Installation at X YYYY] mean as below:
X: The drive to which the product has been installed
YYYY: The folder to which the product has been installed
If the folder of the installation location selected upon installation is C:\WindRiver, the menu name is [Installation at C WindRiver].

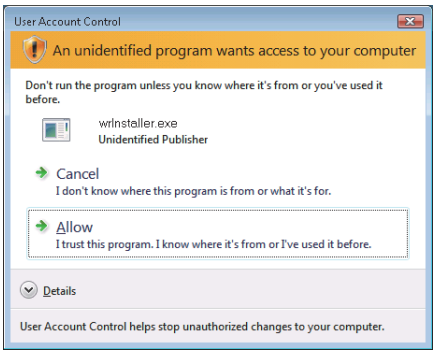
(4) Do not stop the processing during uninstallation. If the processing has been stopped, uninstall the product again.

If the uninstallation processing has failed after the uninstallation processing has been stopped, reinstall the product. Then uninstall the product again.

(5) For uninstallation on Windows Vista® or Windows® 7 or later, a dialog box asking whether to enable or disable User Account Control appears.

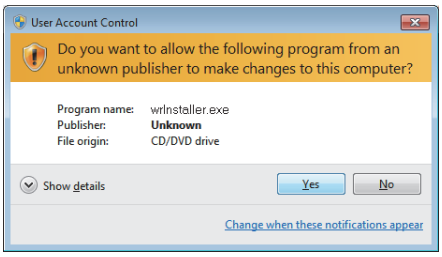
Click "Allow" or "Yes" to continue the uninstallation.

- For Windows Vista®



Click "Allow".

- For Windows® 7 or later



Click the Yes button.

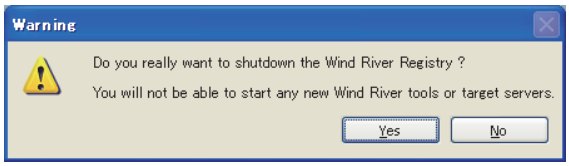
6.2.2 How to uninstall CW Workbench

Start uninstalling CW Workbench

⇩

1. If the "Wind River Registry for Workbench 3.2" icon ( ) exists on the task tray of Windows®, select "Shutdown" in the menu that pops up by right-clicking the icon.

Click Yes after the following dialog box appears to terminate "Wind River Registry for Workbench 3.2".



⇩

2. Select one of the following procedures:

- When a patch has been applied
  ⇨ (1)(2)(3)(4) ☞ Page 44
- When a patch has not been applied
  ⇨ (3)(4) ☞ Page 45

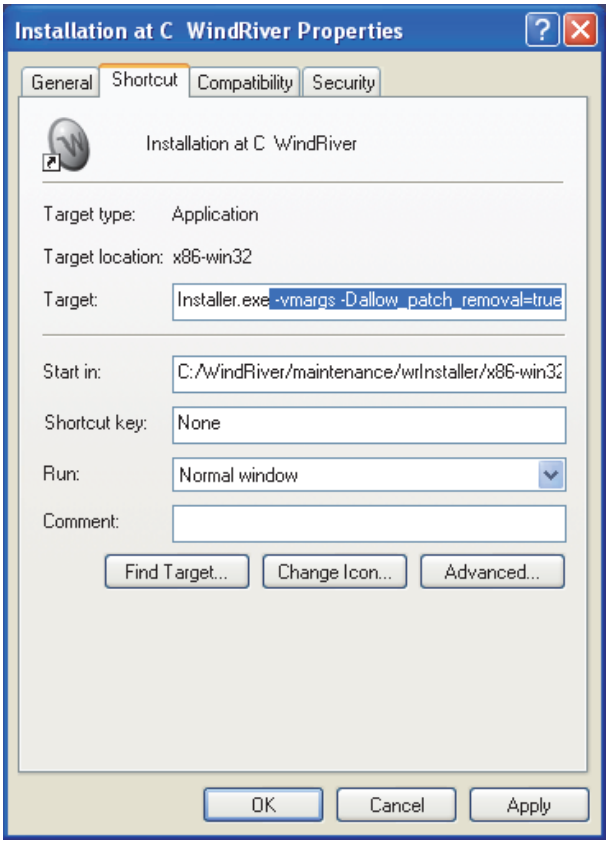
(1) Select [Start] ⇨ [All Programs] ⇨ [Wind River] ⇨ [Product Maintenance] ⇨ [Installation at X YYYY]. In the menu that pops up by right-clicking, select "Properties".

• For Windows® 8 or later

Select [Wind River] ⇨ [Installation at C Windriver] from Windows® Start*1. In the menu that pops up by right-clicking, select "Open file location".

Select Installation at C Windriver from the shortcut. In the menu that pops up by right-clicking, select "Properties".

*1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].



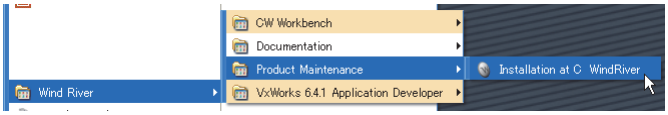
(2) At the end of the "Target" field on the <<Shortcut>> tab, add the following argument, then click the OK button.

[Argument] -vmargs -Dallow_patch_removal=true

Point

When a patch has been applied and uninstallation is executed without the argument, the [Wind River] ⇨ [Product Maintenance] ⇨ [Installation at X YYYY] menu is not uninstalled and remains.
Uninstalling CW Workbench following the steps described earlier can delete the remaining menu.

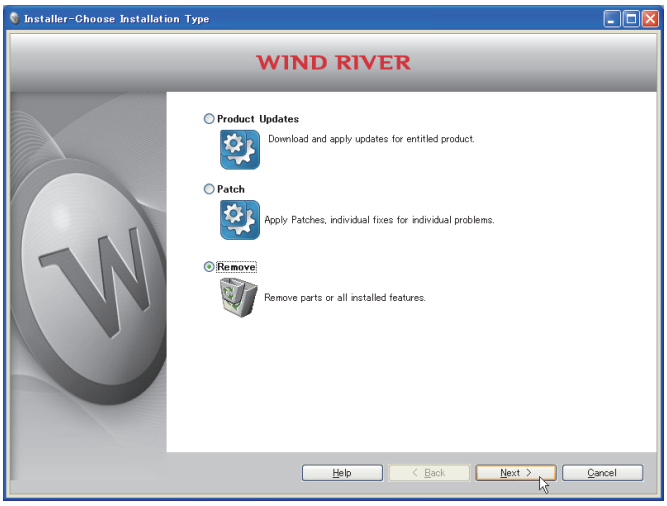
To the next page



(3) Select [Wind River] ⇨ [Product Maintenance][*2] ⇨ [Installation at X YYYY] from Windows® Start[*1].

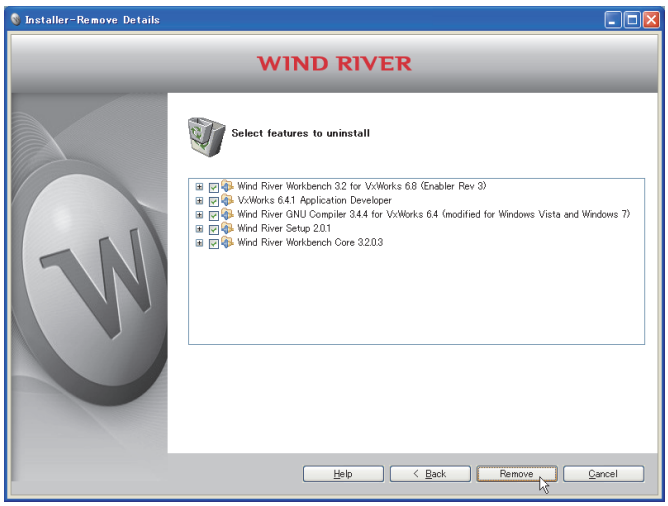
*1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

*2 Does not appear in Windows® 8 or later.



(4) Select "Remove" and click the Next > button.

Go to the step 3 (☞ Page 46)

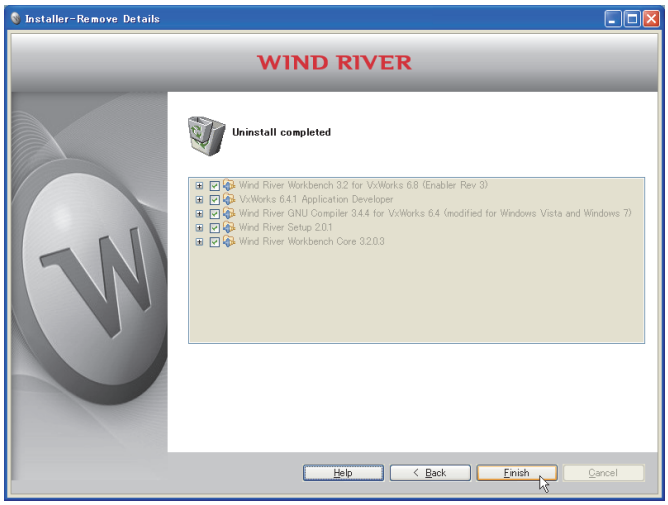


3. **Check that items to be uninstalled have been selected.**

Click the Remove **button to start the uninstallation.**

Point

If the argument to uninstall the patch has been added in the step 2 (2), select all the items, not only the patch, for uninstallation.
Note that uninstalling only the patch may lead to improper operation.



4. **Click the** Finish **button.**

Completed

6.2.3 After uninstallation

After uninstalling CW Workbench, some menus, folders, or files may remains in the Start menu or installation folder.

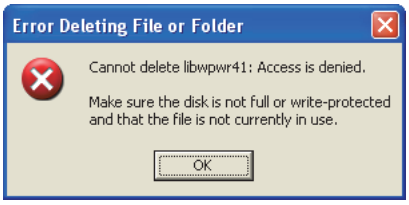
(1) Data not to be deleted

The remaining files and files are left to speed up the start-up of the installer when the product is installed again. There is no problem even if the remaining folders and files are directly deleted from Explorer if they are not necessary.

- Data not to be deleted
  Some files including Workspace folders and image files in <Folder of the installation location>.

Remark

After uninstallation, a deletion error dialog box shown below may appear when a folder of the installation location is deleted. Click the OK button. Restart the development environment (personal computer) and delete the folder of the installation location again.



(2) Menus that remain

The following menus remain when CW Workbench is installed on a personal computer runnning Windows® 8 or later.

- [FTP Server,6.4]/[FTP Server,6.8]
- [VxWorks COMx,6.4]/[VxWorks COMx,6.8]
- [VxWorks Development Shell,6.4]/[VxWorks Development Shell,6.8]
- [Registry,3.2]

For the menus registered at installation, refer to the following section.

☞Page 39

By following the procedure below, delete the shortcut in the installation folder.

1. **Select the menu to be deleted from [Wind River] from Windows® Start*1, and select "Open file location" in the menu that pops up by right-clicking.**
   *1: Select [All apps] on the Start screen or [Start][All Programs]/[All apps].
2. **Delete the shortcut menu.**

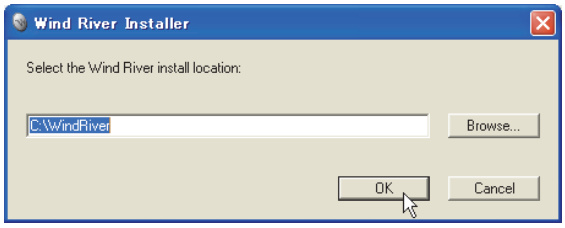
6.3 Update

This section explains how to install the updated license product (SW1DND-CWWLQ24-EVZ), how to operate, and precautions.

Unless operations differ depending on the operating system, windows and dialog boxes of Windows® XP are used for explanations.

6.3.1 How to update CW Workbench

Start installing CW Workbench



Insert the CW Workbench (SW1DND-CWWLQ12-E) DVD-ROM into the DVD drive to start the installer.

1. After the installer is started, execute one of the following operations, and click the OK button:

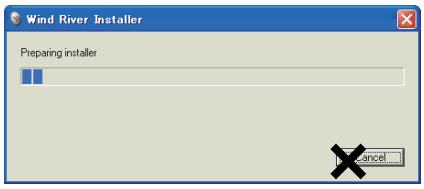
- Enter a folder name of the installation location.
- Click the Browse... button to select a folder of the installation location from the tree view.

Point

- The following characters can be used for a folder name of the installation location:
  - Alphanumeric characters (space cannot be used.)
  - Hyphen "-"
  - Underscore "_"

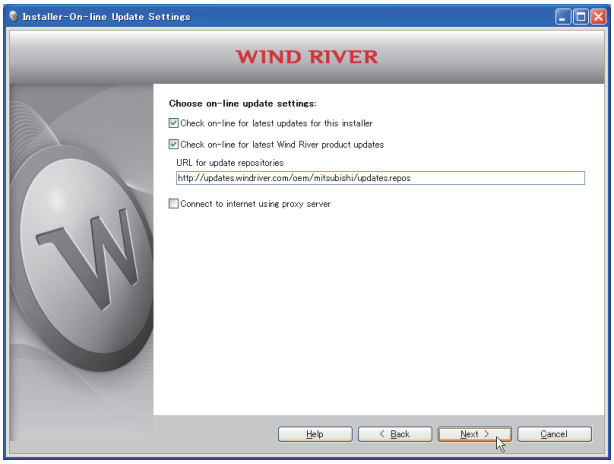
  The product cannot be properly installed if characters other than those described above are used for a folder name.

- The dialog box shown below may appear after the OK button is clicked, however, clicking the Cancel button does not cancel the operation.



2. Click the Next > button.

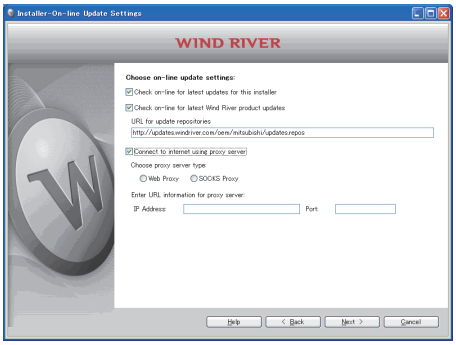
To the next page

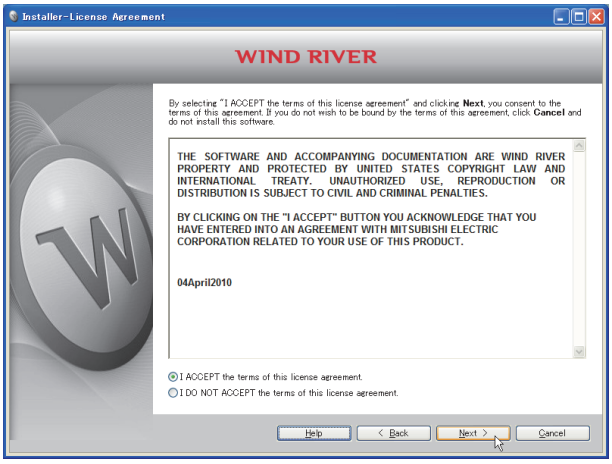


3. Click the Next > button.

Point

If the personal computer is connected to the Internet via a proxy server, check the box of "Connect to internet using proxy server" and configure the proxy server setting set for the Internet connection on the personal computer.





4. Select "I ACCEPT the terms of this license agreement." and click the Next > button.

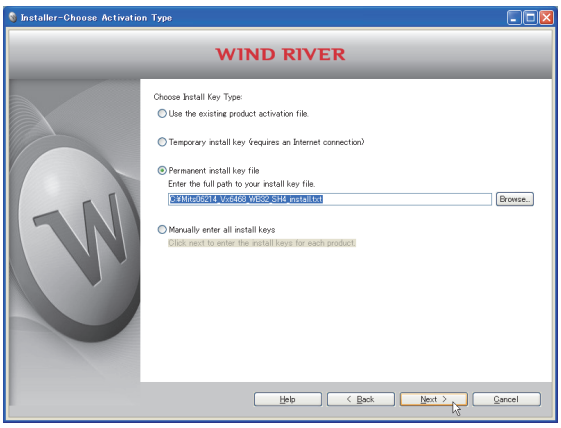
To the next page

5. To continue the installation, select one of the following procedures:

If the permanent license file is not obtained

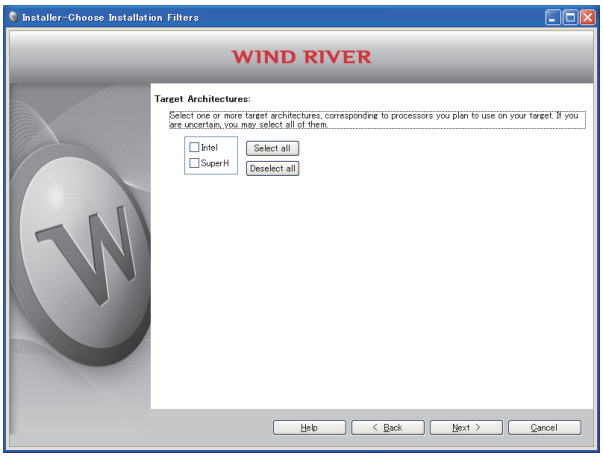
- Installation using a temporary license (a personal computer can be connected to the Internet)
  It is the same installation procedure as the one for temporary license using product with license.
  (☞ Page 33)
  Enter the LAC (License Authorization Code) written on the License Agreement of updated license product to LAC on the User Information window.
- Installation using an install key on the DVD-ROM (a personal computer cannot be connected to the Internet)
  Note that the installation using the following install key files cannot be executed.
  - Install_SH_IA.txt of SW1DND-CWWLQ24-E
  - Install_SH4.txt of SW1DND-CWWLQ12-E

If the permanent license file is obtained



Select "Permanent install key file" and click the Browse... button.
Select the permanent license file from the tree view. Then click the Next > button.

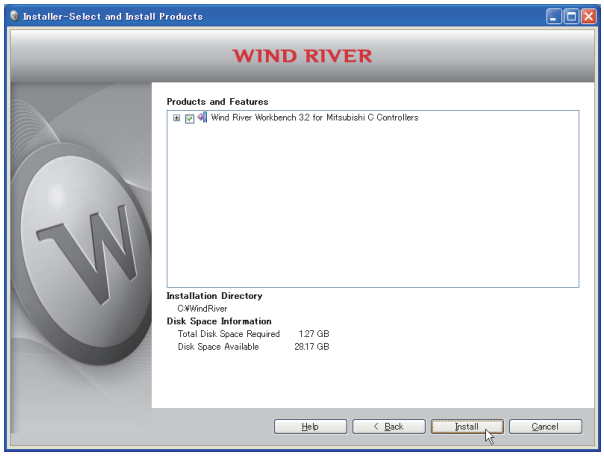
Go to the step 6 (☞ Page 51)



6. **Select the following items, and click the Next > button.**

➪ For Q24DHCCPU-V/-VG: "Intel"

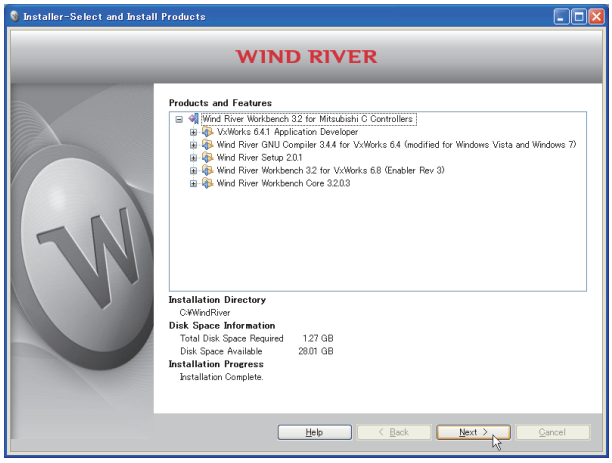
➪ For Q12DCCPU-V: "SuperH"



7. **Check that "Wind River Workbench 3.2 for Mitsubishi C Controllers" has been selected.**

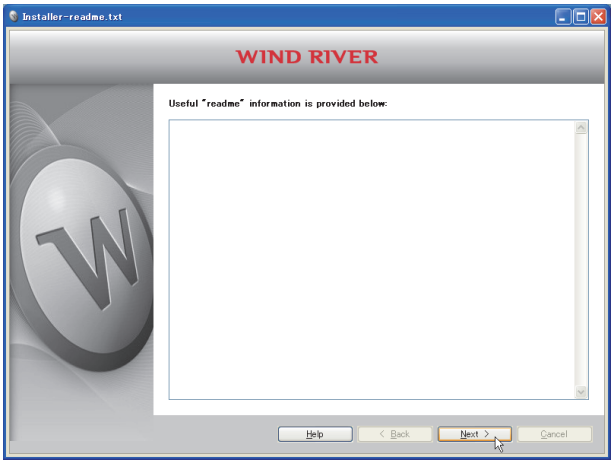
Click the Install button.

If the check box is ☐ or ☐, keep clicking the box until it changes to ☑.

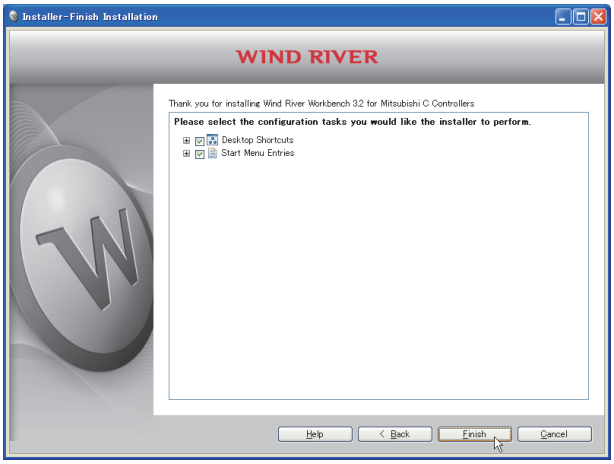


8. **Click the Next > button.**

To the next page



9. **Click the** Next > **button.**



10. **Click the** Finish **button.**

Completed

6.3.2 After update

This section explains an icon registration, sample programs, and a patch application after the product is installed with the updated license product (SW1DND-CWWLQ24-EVZ).

(1) How to start CW Workbench

After the product is installed, [Wind River] is added on Windows® Start*1, and the following menus can be selected.

Start the product from "CW Workbench" in the "CW Workbench" menu.

*1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

Menu		Description
[Product Maintenance]*1	Installation at X YYYY	Uninstalls and updates CW Workbench and applies a patch. (X: drive name, Y: folder name of the installation location)
[CW Workbench]*1	CW Workbench	Starts CW Workbench.
	Registry*3	Starts Wind River Registry for Workbench 3.2. When CW Workbench is started, Wind River Registry for Workbench 3.2 also starts, except when it is running already. An icon is registered on the task tray.
[Documentation]*1	Workbench 3.2*1	Wind River Workbench 3.2 document
	VxWorks 6.8*1	VxWorks 6.8 document
[VxWorks 6.8.1 Application Developer]*1	FTP Server*2	Starts WFTPD. For available operating systems, refer to the following section. ☞ Page 16, Section 2.3
	VxWorks COMx*2	Starts HyperTerminal for Telnet connection. VxWorks COMx cannot be used on the operating system, such as Windows Vista® and Windows®7 or later, where HyperTerminal is not installed.
	VxWorks Development Shell*2	Starts a command line Shell in which the Gnu compiler can be used.

*1: Does not appear in Windows® 8 or later.

*2: When CW Workbench is installed on a personal computer runnning Windows® 8 or later, the names of the menus are changed depending on the version of VxWorks.

VxWorks 6.4	VxWorks 6.8
FTP Server,6.4	FTP Server,6.8
VxWorks COMx,6.4	VxWorks COMx,6.8
VxWorks Development Shell,6.4	VxWorks Development Shell,6.8

*3: When CW Workbench is installed on a personal computer runnning Windows® 8 or later, the names of the menus are changed depending on the version of Wind River Registry for Workbench.
For Wind River Registry for Workbench 3.2: Registry,3.2

CHAPTER 7 APPLYING PATCH

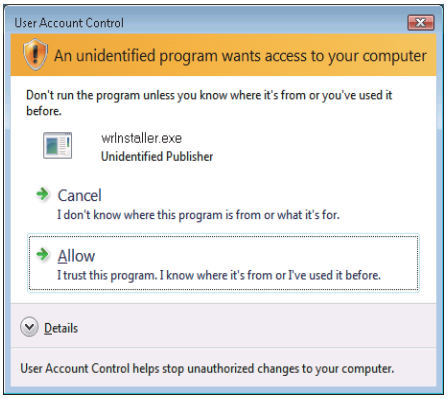
This section explains how to apply a patch in case it is released in the future.

Unless operations differ depending on the operating system, windows and dialog boxes of Windows® XP are used for explanations.

Point

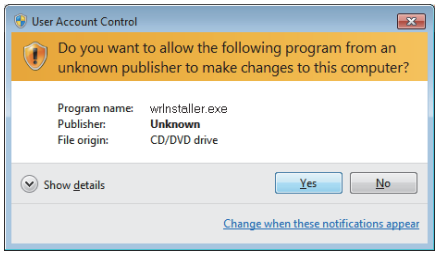
- Log on as a user with the Administrator attribute when applying a patch to the product on the development environment (personal computer).
- Terminate the product before applying a patch.
- Apply a patch in [Product Maintenance].
  [Product Maintenance] can be executed as following: [Wind River] ⇨ [Product Maintenance]*2 ⇨ [Installation at X YYYY] from Windows® Start*1
  - X and YYYY of [Installation at X YYYY] mean:
    X: The drive to which the product has been installed
    YYYY: The folder to which the product has been installed

  If the folder of the installation location specified at the time of installation is C:\WindRiver, the menu name is [Installation at C WindRiver].
- Do not stop the processing during patch application.
  Apply the patch again if the processing has been stopped.
- When a patch is applied on Windows Vista® or Windows® 7 or later, a dialog box appears to enable or disable User Account Control. Click "Allow" or "Yes" to continue the application of the patch.
  - For Windows Vista®



Click "Allow".

  - For Windows® 7 or later



Click the Yes button.

*1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

*2 Does not appear in Windows® 8 or later.

7.1 How to Obtain Patch

(1) Download a patch file from the site described below.

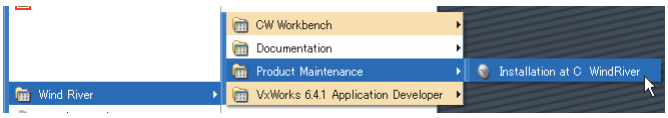
☞ Information and services

For further information and services, please consult your local Mitsubishi representative.

(2) Extract the downloaded file and store it in the updates folder in the folder of the installation location of CW Workbench.

Ex. When the installation location of CW Workbench is C:\WindRiver, the storage location of the patch is C:\WindRiver\updates.

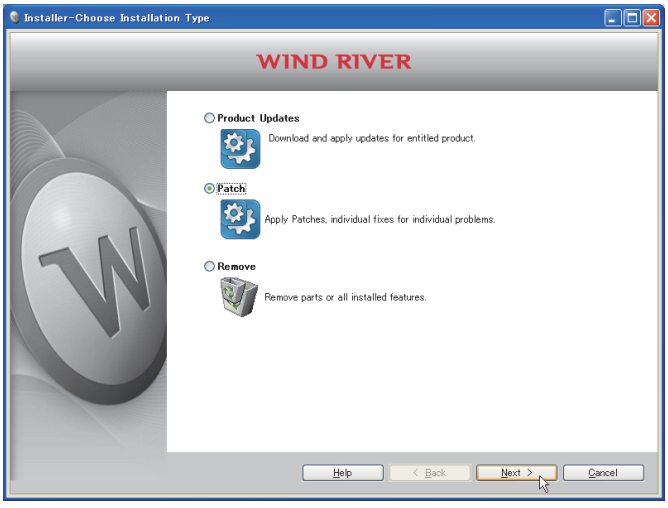
7.2 How to Apply Patch



1. **Select [Wind River] ⇨ [Product Maintenance]*2 ⇨ [Installation at X YYYY] from Windows® Start*1.**

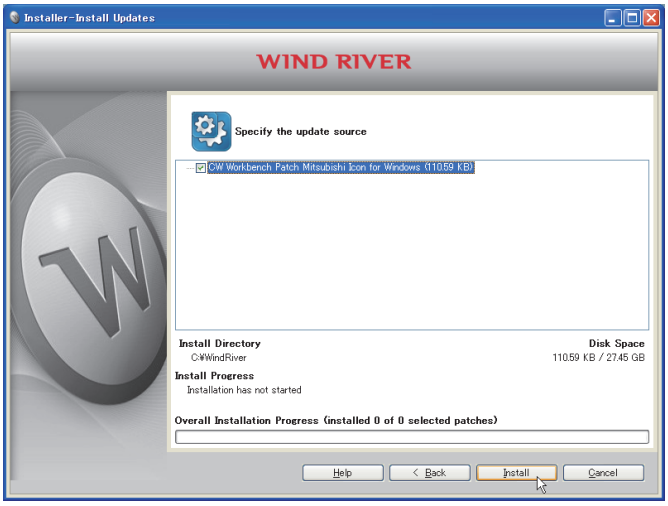
*1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

*2 Does not appear in Windows® 8 or later.



2. **Select "Patch" and click the Next > button.**

To the next page



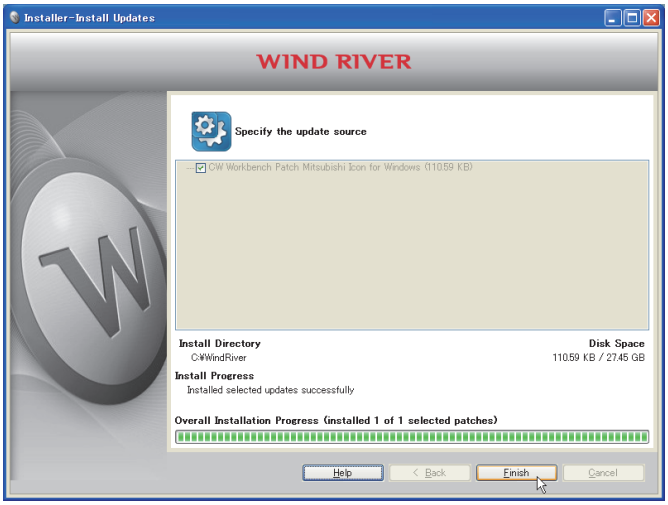
3. **Check that the patch to be installed has been selected.**

Click the Install **button.**

Point

If the patch to be installed is not displayed, check whether the storage location of the patch file is correct.

- Patch file storage location
  <Install folder>\updates

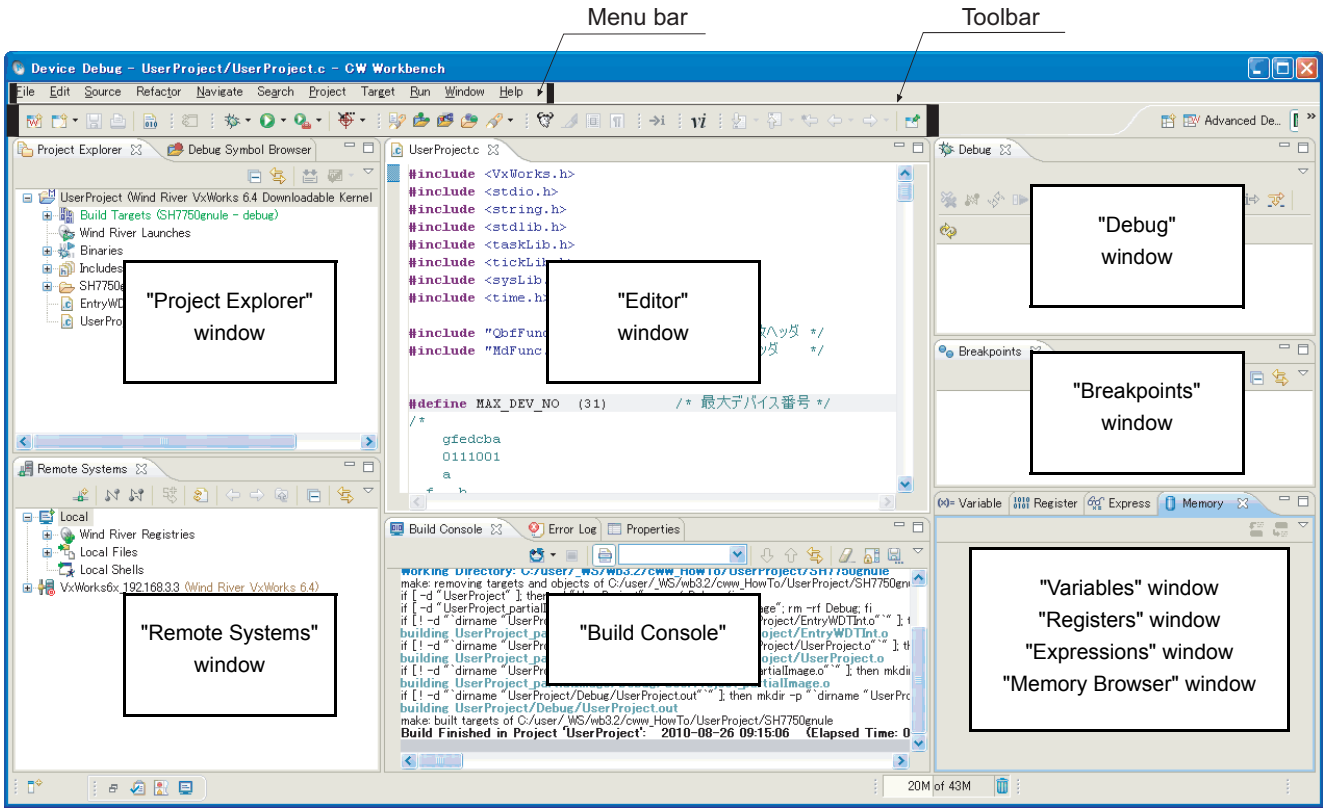


4. **Click the** Finish **button.**

Completed

CHAPTER 8 CREATING AND BUILDING USER PROGRAM

The layout of CW Workbench is shown below.



The layout of each window can be changed by dragging with the mouse. The layout shown above is the default layout.

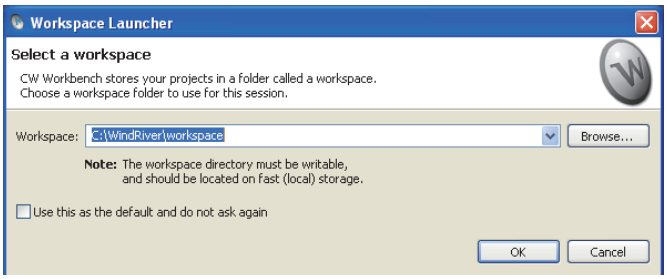
8.1 Creating Project

(1) How to create a project

1. **To start CW Workbench, select [Wind River] ⇨ [CW Workbench]*2 ⇨ [CW Workbench] from Windows® Start*1.**

*1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

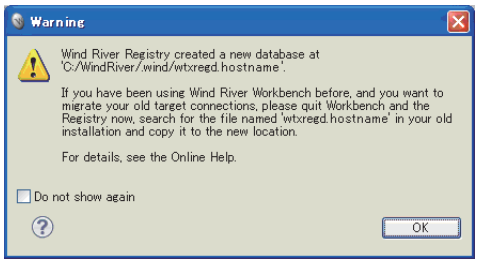
*2 Does not appear in Windows® 8 or later.

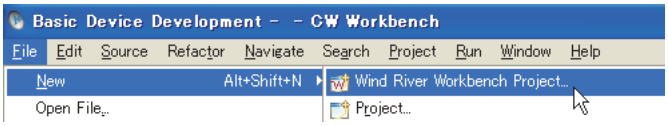


2. **Enter a folder of storage location of workspace for "Workspace:".(A folder can be also selected from the tree view by clicking the Browse... button.) Clicking the OK button starts CW Workbench.**

Remark

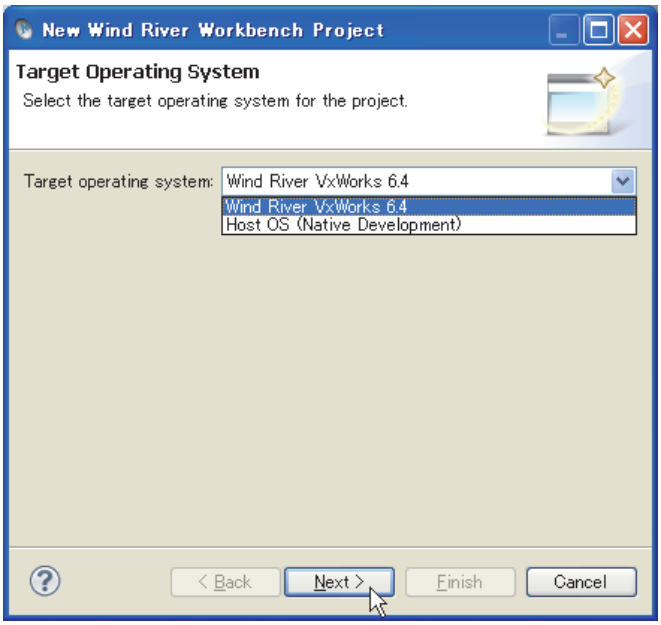
A message box shown below may appear. Click the OK button.





3. **Select from the menu bar [File] ⇨ [New] ⇨ [Wind River Workbench Project...].**

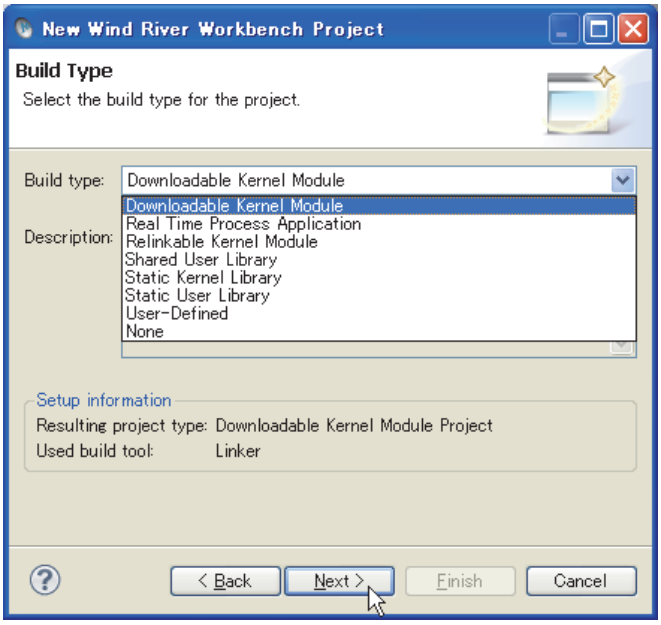
To the next page



4. **Select the following item for "Target operating system:". Click the** Next > **button.**

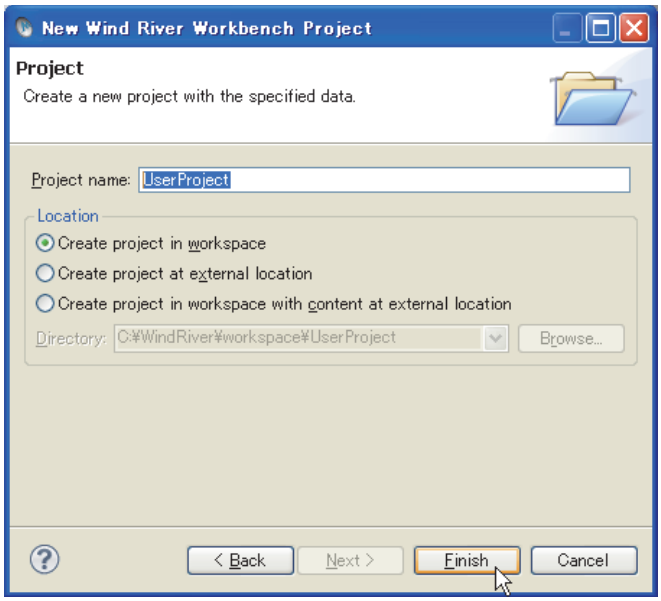
➪ For Q24DHCCPU-V/-VG:
"Wind River VxWorks 6.8"

➪ For Q12DCCPU-V:
"Wind River VxWorks 6.4"



5. **Select "Downloadable Kernel Module" for Build type:". Click the** Next > **button.**

To the next page

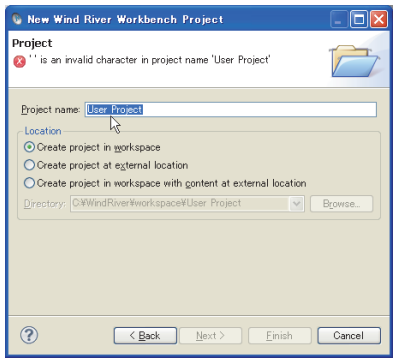


6. **Enter a project name for "Project name:" and click the Finish button.**
"UserProject" has been entered here as an example.

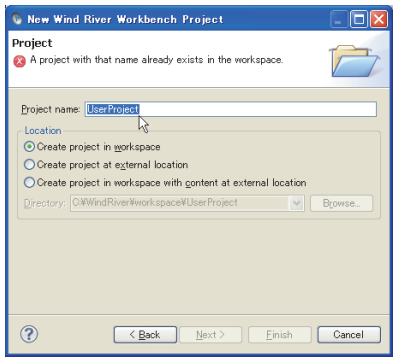
Point

If characters that cannot be used or a project name that is already used are entered for "Project name:", an error text appears on the header of the window and the Finish button becomes disabled.

- If space is included in the "Project name:", the following error message appears.



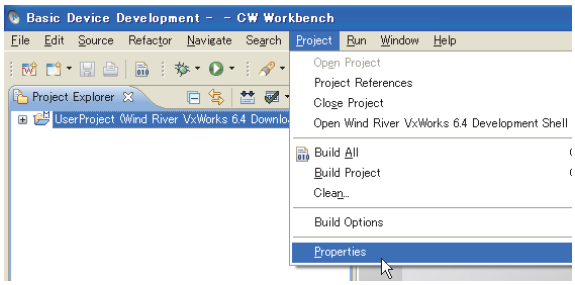
- If a project name that is already used is entered for "Project name:", the following error message appears.



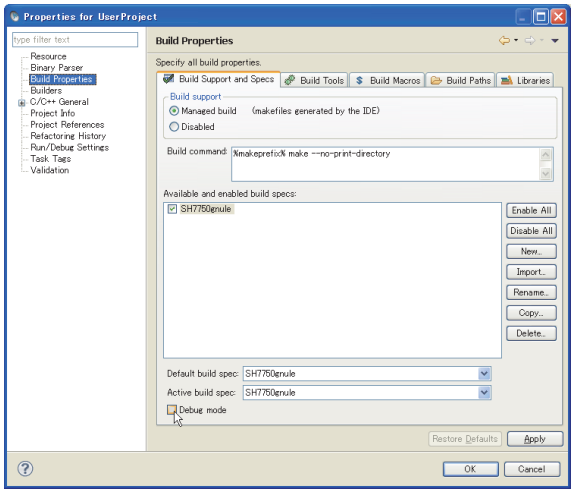
In addition, a space entered at the end of the project name is dropped.

Ex. "UserProject "→ "UserProject"

To the next page



7. **On the "Project Explorer" window, select a project where properties should be set. With the project selected, select from the menu bar [Project] ⇨ [Properties].**



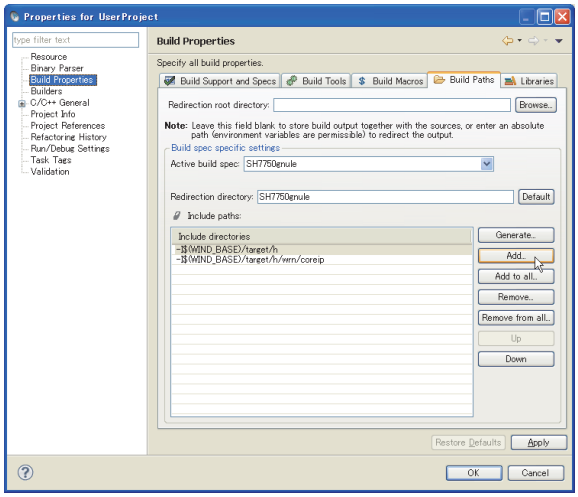
8. **Select [Build Properties] from the tree view to the left on the window, and click the <<Build Support and Specs>> tab. Check that the following item has been selected for "Available and enable build specs:".**

⇨ For Q24DHCCPU-V/-VG:
"PENTIUM4gnu"

⇨ For Q12DCCPU-V:
"SH7750gnule"

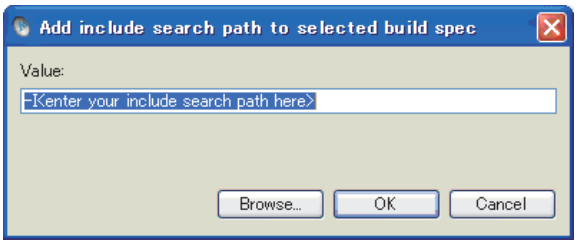
Point

- When the project has been imported, unsupported build specifications may be displayed for "Available and enable build specs:".
  Since this product supports only the following build specifications, clear the check boxes other than the following build specifications.
  ⇨ Q24DHCCPU-V/-VG: "PENTIUM4gnu"
  ⇨ Q12DCCPU-V: "SH7750gnule"
- The default is in the debug mode. Clear the "Debug mode" check box during operation.

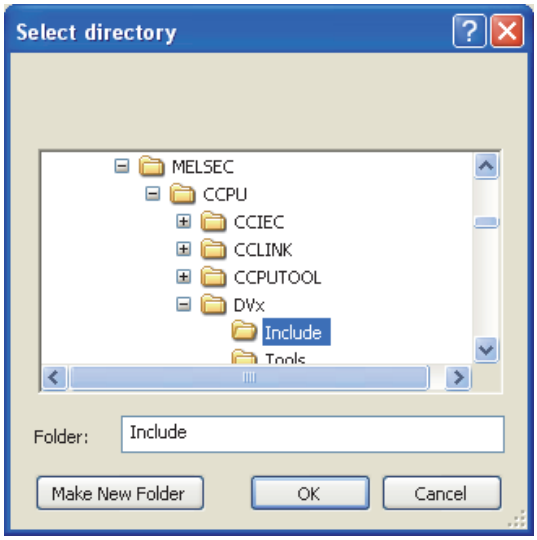


9. **Select "Build Properties" from the tree on the left of the window.**
Open the <<Build Paths>> tab and click the Add... **button.**

To the next page



10. **Click the** Browse... **button.**



11. **Select the include folder on the "Select directory" window.**

Click the OK **button.**

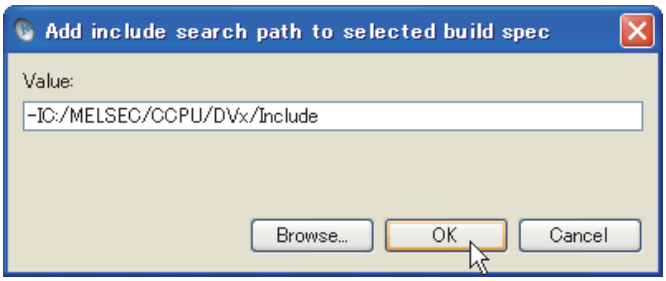
Remark

The include folders differ depending on the C Controller module or Setting/monitoring tools for the C Controller module to be used. For details, refer to the following table.

C Controller module	Setting/monitoring tools for the C Controller module	Include folder *1
Q24DHCCPU-V	SW4PVC-CCPU	C:\MELSEC\CCPU4\Q24DHCCPU-V\Include
Q24DHCCPU-VG		
Q12DCCPU-V (Extended mode)		C:\MELSEC\CCPU4\Q12DCCPU-V\Include
Q12DCCPU-V (Basic mode)	SW3PVC-CCPU	C:\MELSEC\CCPU\DVx\Include

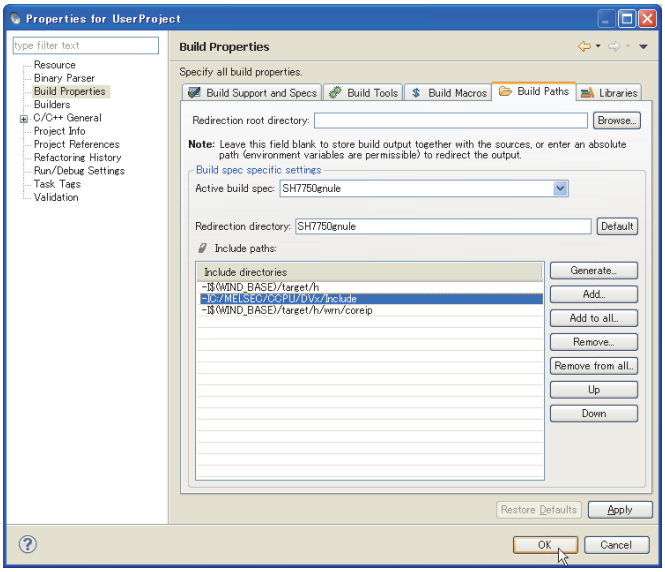
*1 When Setting/monitoring tools for the C Controller module is installed in "C:\MELSEC".

To the next page



12. **Check that the folder specified on the "Select directory" window has been selected.**

Click the OK **button.**

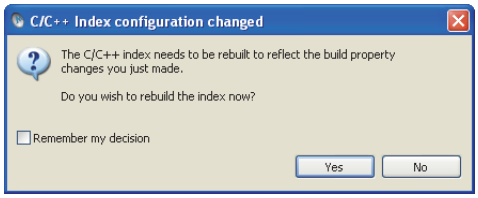


13. **Check that the include path of MELSEC added to "Include directories" in [Include paths:] appears.**

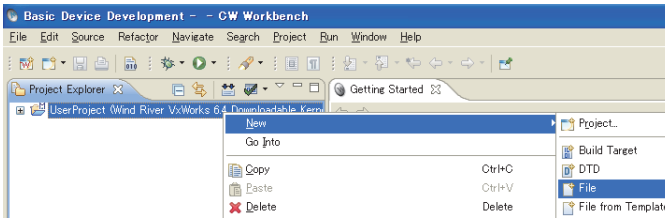
Click the OK **button.**

Point

Click the OK button. If the following message box appears, click the Yes button.



To the next page

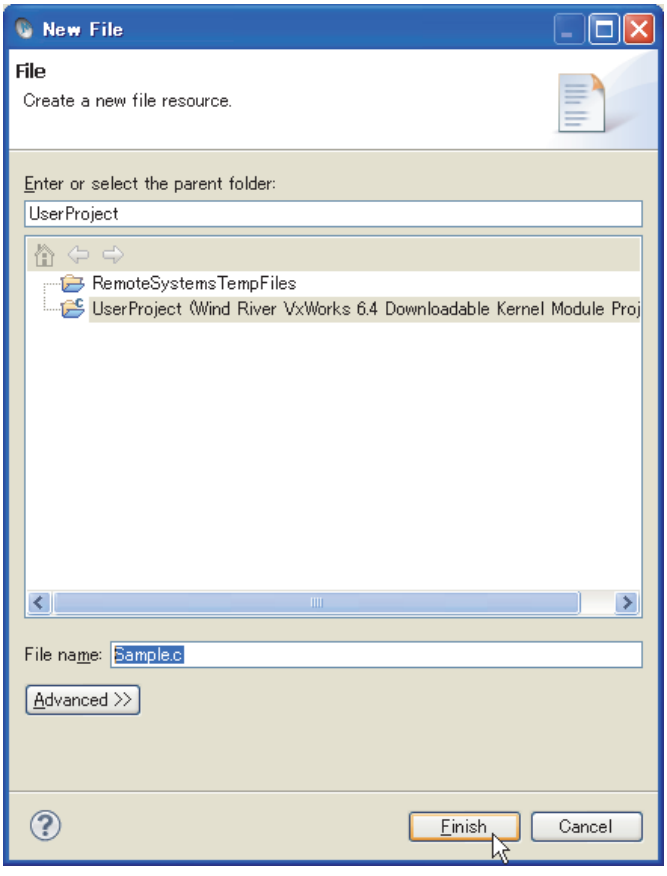


14. **On the "Project Explorer" window, right-click a project where a file is added. Select from the pop-up menu [New] ⇨ [File].**

Point

Various files can be added to the project using the new file addition function ([File] ⇨ "New" ⇨ "File") or "Refresh". However, note the following before adding files to the project:

- Do not add projects with the same name as the project name.
- If a file with the same name as the project name exists in the project, do not use the "Rename" function of CW Workbench for the file.
  - Delete the file from the project if possible. (Note that the file is also deleted from the hard disk.)
  - Change the file name on the Explorer if the file cannot be deleted. After changing the file name on the Explorer, execute "Refresh" in the pop-up menu of the project.
  - If a file name is the same as a project name and is changed using "Rename" of CW Workbench, the build cannot be executed.

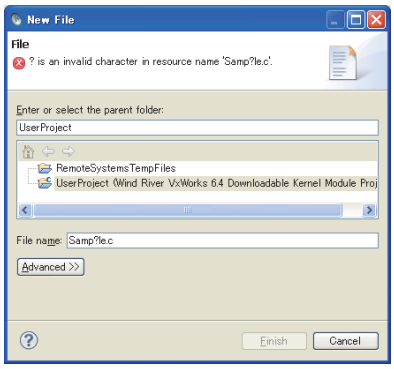


15. **Enter a file name of a source file for "File name:". Click the Finish button. "Sample.c" has been entered here as an example.**

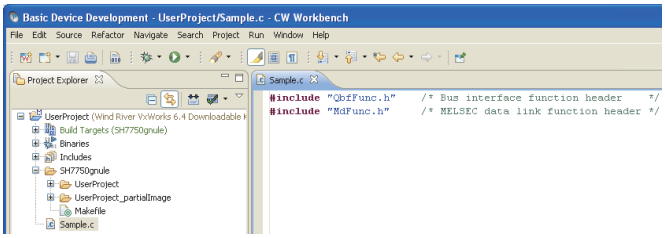
To the next page

Point

- Enter a file name with extension (.c, .h, .cpp, .hpp) for "File name:"
- Do not use two-byte characters for a file name. Do not execute the compile for a file that has a name including two-byte characters, or a compile error occurs.
- If characters that cannot be used or a project name that is already used are entered for "File name:", an error text appears on the header of the window and the Finish button becomes disabled.



⇩



⇩

Completed

16. **Edit the source files on the "Editor" window and include the following include files:**

⇨ For Q24DHCCPU-V/-VG

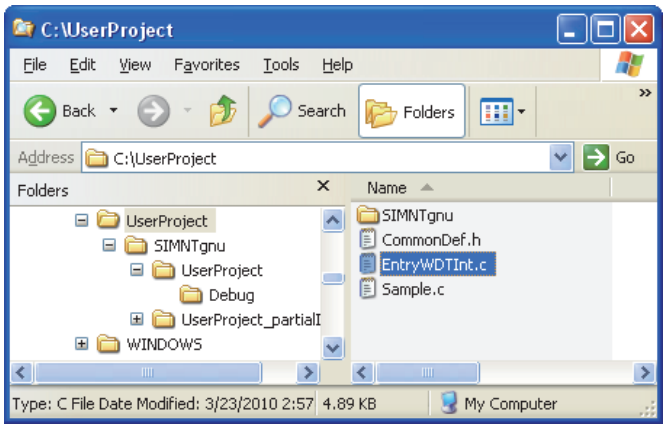
- Bus interface function: "QbfFunc.h"
- MELSEC data link function: "Mdfunc.h"
- C Controller module dedicated function: "CcpuFunc.h"

⇨ For Q12DCCPU-V

- Bus interface function: "QbfFunc.h"
- MELSEC data link function: "Mdfunc.h"

(2) Adding source file

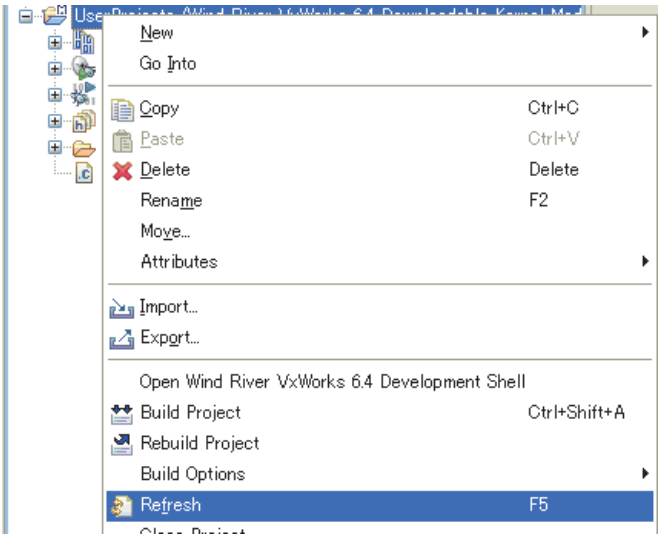
Follow the instructions below to add a source file that has been already created to the project.



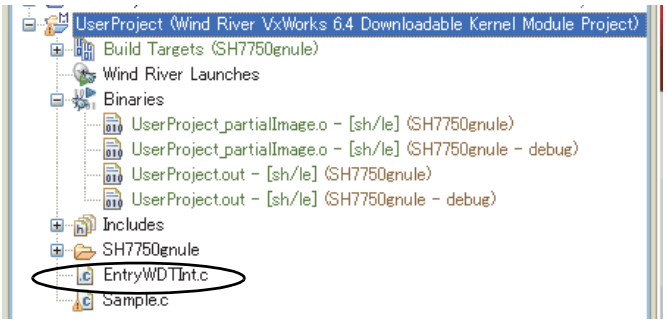
1. **Copy the created source file to the current folder of a project to be added.**

Ex.

Copy EntryWDTInt.c to the current folder of the project to be added (UserProject) on the Explorer.



2. **Select the project to be added on the "Project Explorer" window. Select "Refresh" in the pop-up menu.**



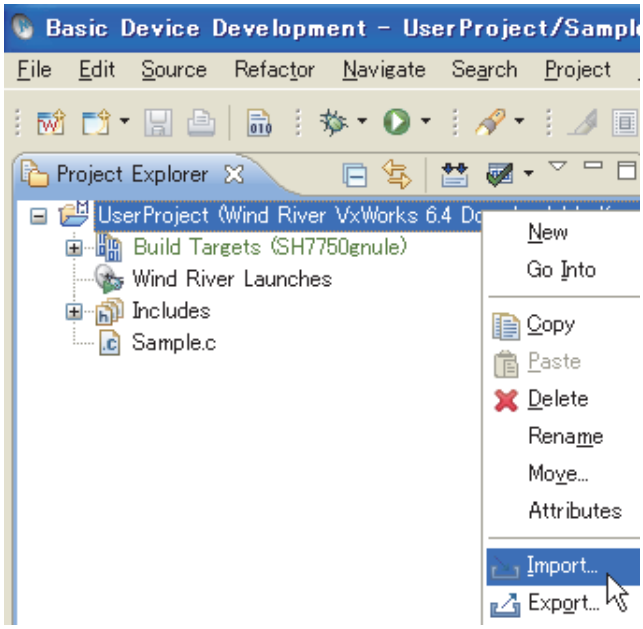
3. **The file "EntryWDTInt.c" copied in the step 1 has been added to the project.**

Completed

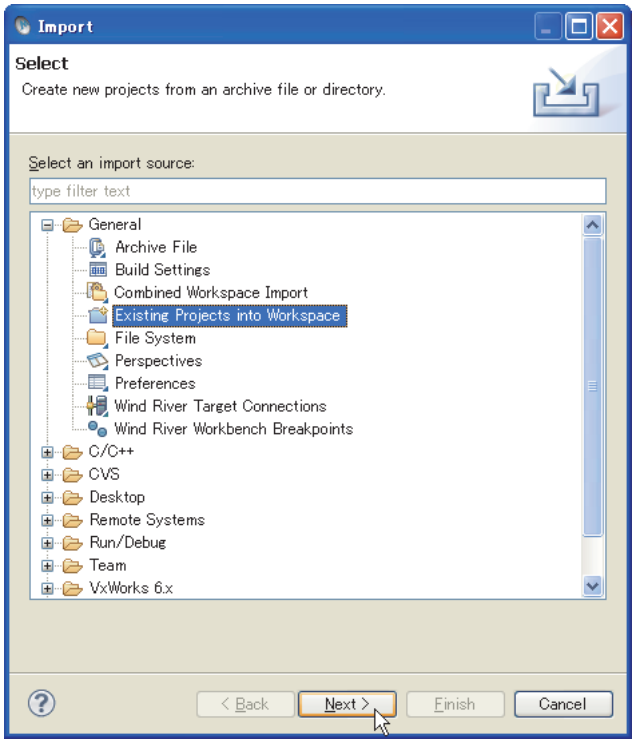
8.2 Adding Project

In CW Workbench, multiple projects can be managed on the same workspace by adding other projects following the instructions below.

Ex. Adding a C Controller module sample project (EntryWDTInt)



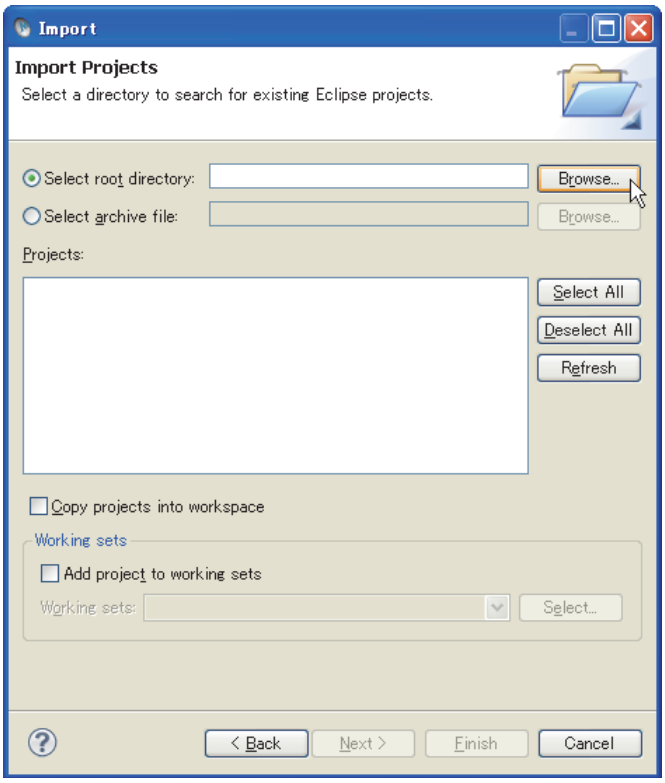
1. **Right-click on the "Project Explorer" window and select "Import...".**



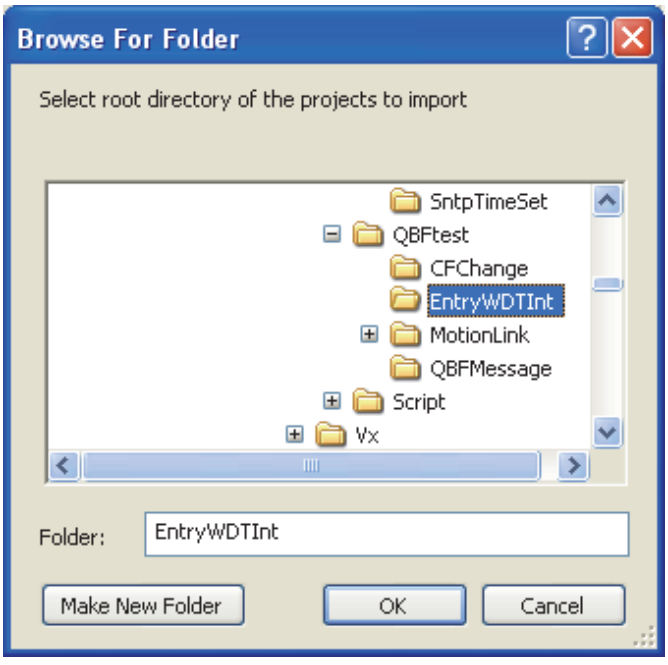
2. **Select "General" ⇨ "Existing Projects into Workspace".**

Click the Next > **button.**

To the next page

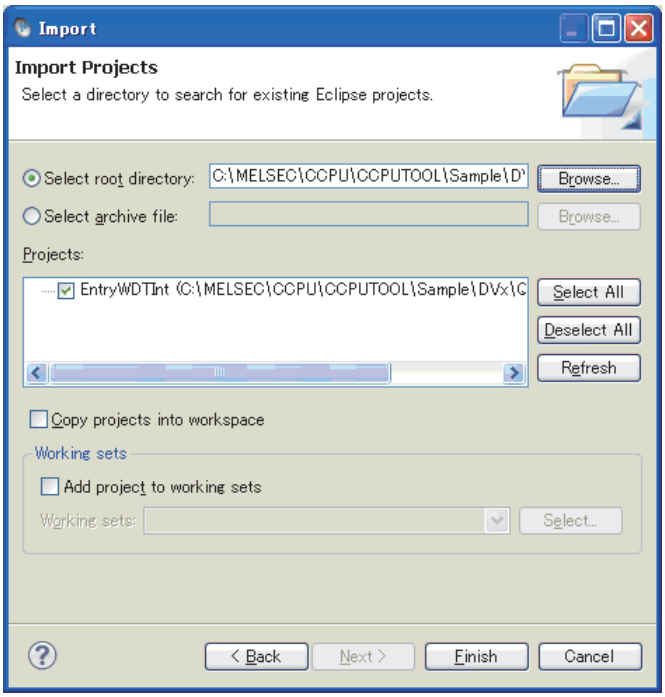


3. **Select "Select root directory:" radio button and click the Browse... button.**



4. **Select the folder where the project to be imported is stored and click the OK button.**

To the next page



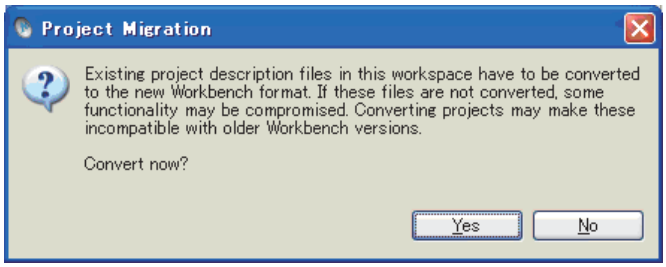
5. **A list of the projects stored in the folder (including subfolders) specified in "Select root directory:" is displayed in "Projects:". Check that the project to be imported has been selected.**

Click the Finish **button.**

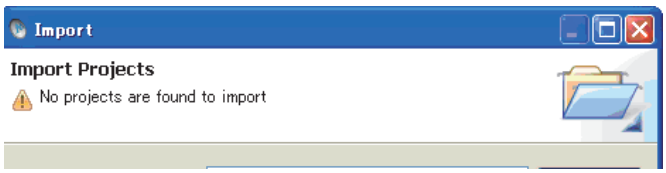
Point

When a project created in Wind River Workbench 2.6.1 is imported, the following message appears.

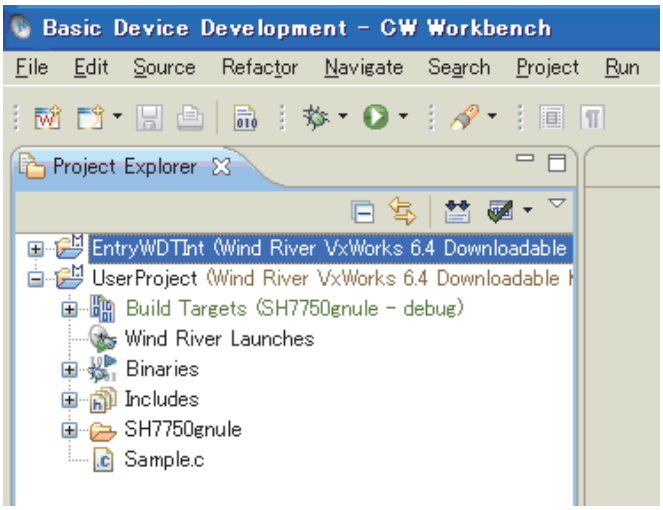
Click the Yes button.



The following warning message appears on the header of the window when there is no project that can be imported in the specified folder.



To the next page

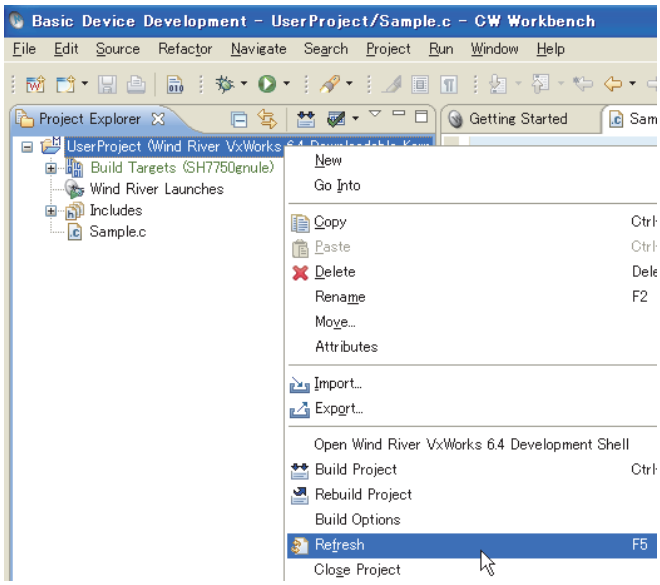


Completed

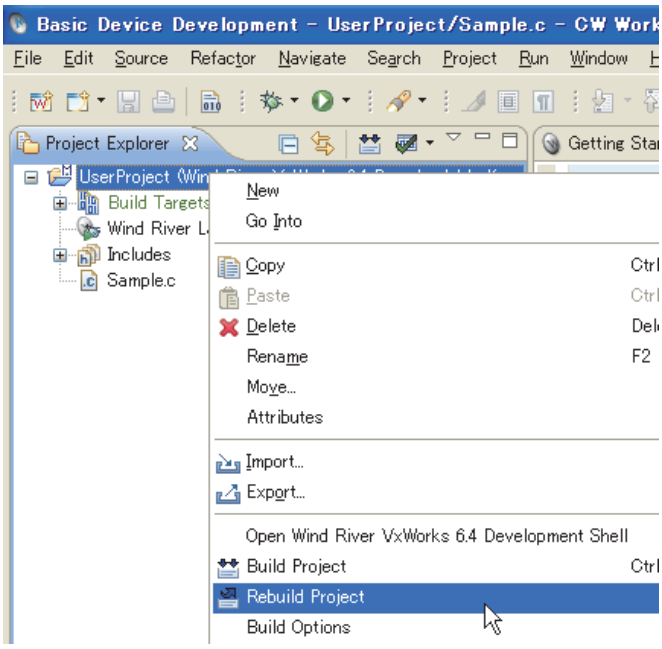
6. **The specified "EntryWDTInt" project has been imported to the workspace.**

8.3 How to Build Project

Follow the instructions below for how to build the project.

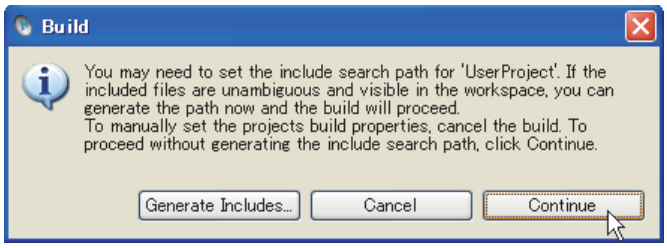


1. **On the "Project Explorer" window, right-click on a project name to be built. In the menu that pops up, select [Refresh].**

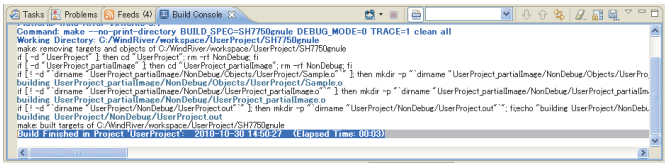


2. **On the "Project Explorer" window, right-click on a project name to be built. In the menu that pops up, select [Rebuild Project].**

To the next page



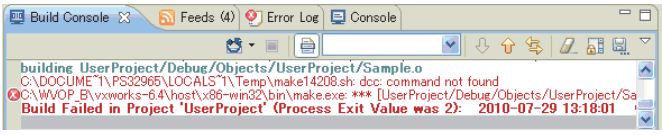
3. **If the message shown to the left appears, click the Continue button.**



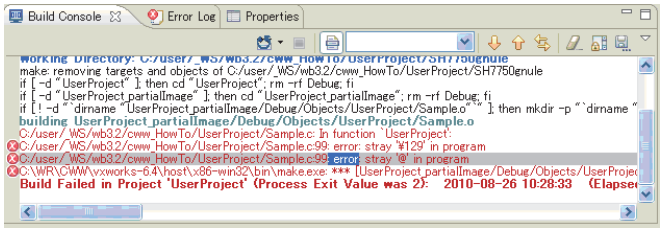
4. **The build process is displayed on the "Build Console" window.**
"Build Finished..." is displayed after the build is completed. Check for error indication (red) on the "Build Console" window.

Point

- If the following error "command not found" occurs for the build result, an unsupported compiler may have been used. Check that only the following build specification has been selected for the <<Build Support and Specs>> tab in [Build Properties] of the project. If check boxes of build specifications other than the following have been selected, clear them. (☞ Page 58, Section 8.1)
  - ➪ Q24DHCCPU-V/-VG: "PENTIUM4gnu"
  - ➪ Q12DCCPU-V: "SH7750gnule"

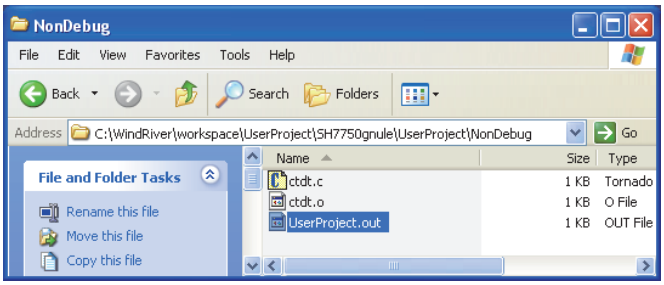


- If the build result has an error, error information (source file name, line number, and error details) is displayed in red. Correct source codes in the error part.
  Execute the build again after correction. Repeatedly correct and build the source codes until the build result is not colored red.



Double-clicking the error line where a source file name and a line number are displayed jumps to the error location of the source file.

To the next page



5. **After the build is completed, execution file (user program) to be used on the C Controller module is created.**
If an error occurs during the build, a user program is not created.
A file name of the user program is "<Project name.out>".

Remark

Folders where a user program is created:

- In Debug Mode:
  ⇨ For Q24DHCCPU-V/-VG:
  <Workspace folder>\<Project name folder>\PENTIUM4gnu\<Project name folder>\Debug
  ⇨ For Q12DCCPU-V:
  <Workspace folder>\<Project name folder>\SH7750gnule\<Project name folder>\Debug
- In Release Mode:
  ⇨ For Q24DHCCPU-V/-VG:
  <Workspace folder>\<Project name folder>\PENTIUM4gnu\<Project name folder>\NonDebug
  ⇨ For Q12DCCPU-V:
  <Workspace folder>\<Project name folder>\SH7750gnule\<Project name folder>\NonDebug

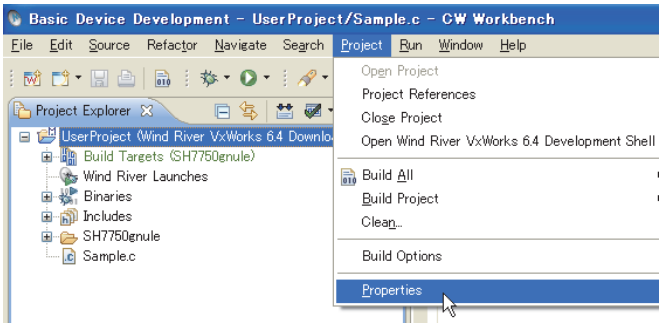
When a user program is created on a project imported, the folders above change depending on structures of folders and projects where the imported project exists.
Check the folders where a user program is created on the imported project.

⇩

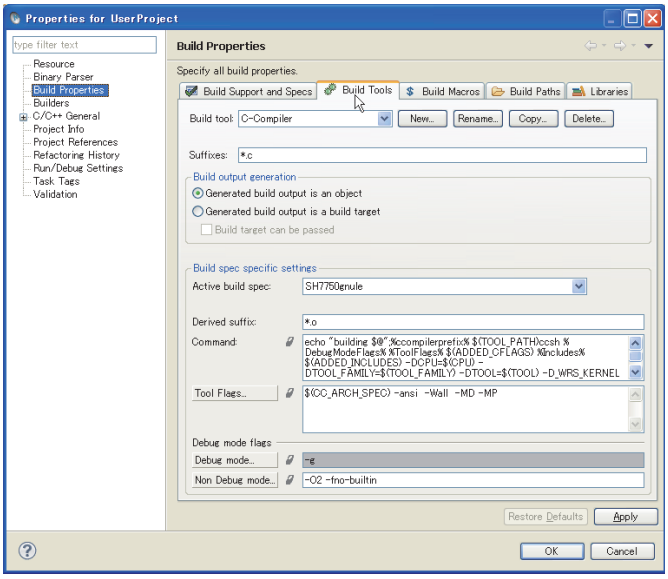
Completed

8.4 Setting Optimization Option

This section explains how to set an optimization option that prioritizes the processing speed.

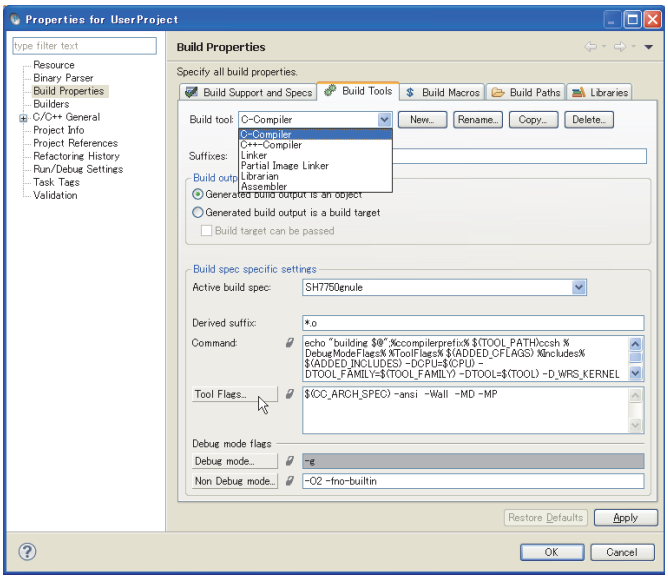


1. **Select a project where the optimization option is set. Select from the menu bar [Project] ⇨ [Properties].**



2. **Select [Build Properties] from the tree view to the left on the window.**
Click the <<Build Tools>> tab.

To the next page

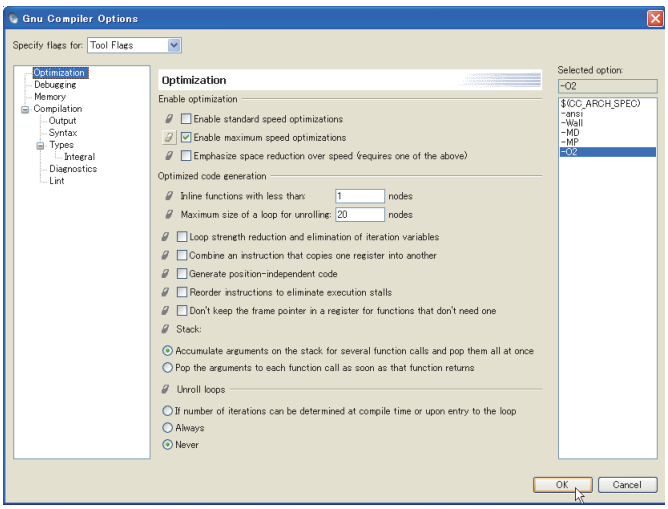


3. **Select "C-Compiler" for "Build tool:".**

Click the Tool Flags... **button.**

Remark

Select "C++-Compiler" for C++.

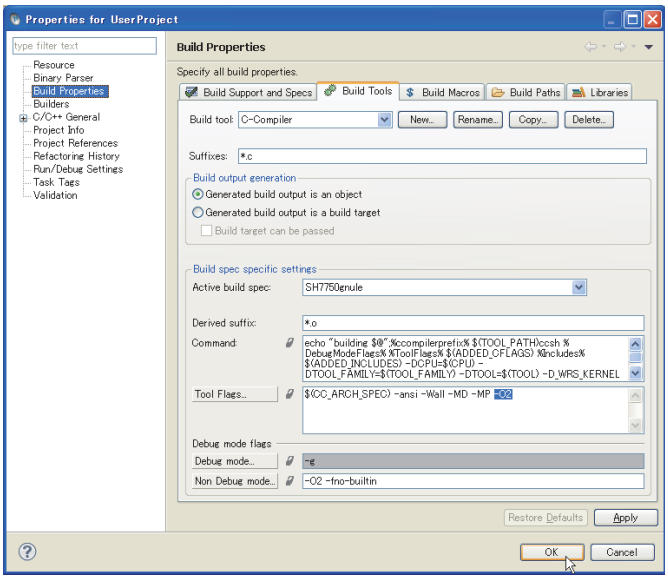


4. **On the "Optimization" dialog box, select [Enable maximum speed optimizations]. Check that "-O2" has been added to "Selected option:" and click the** OK **button.**

Point

To cancel the optimization option, click in "Enable Optimization" on "Optimization" and change the mark to (cancel). Check that "-O*" has been deleted from "Selected option:".

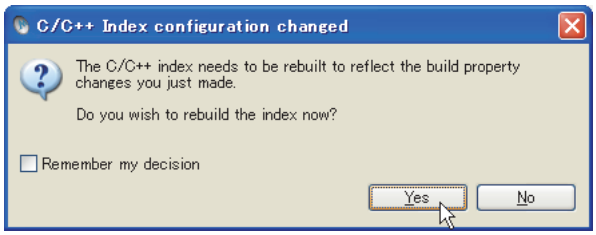
To the next page



Completed

5. **Check that "-O2" has been added to [Tool Flags...] in "Build Properties" and click the** OK **button.**

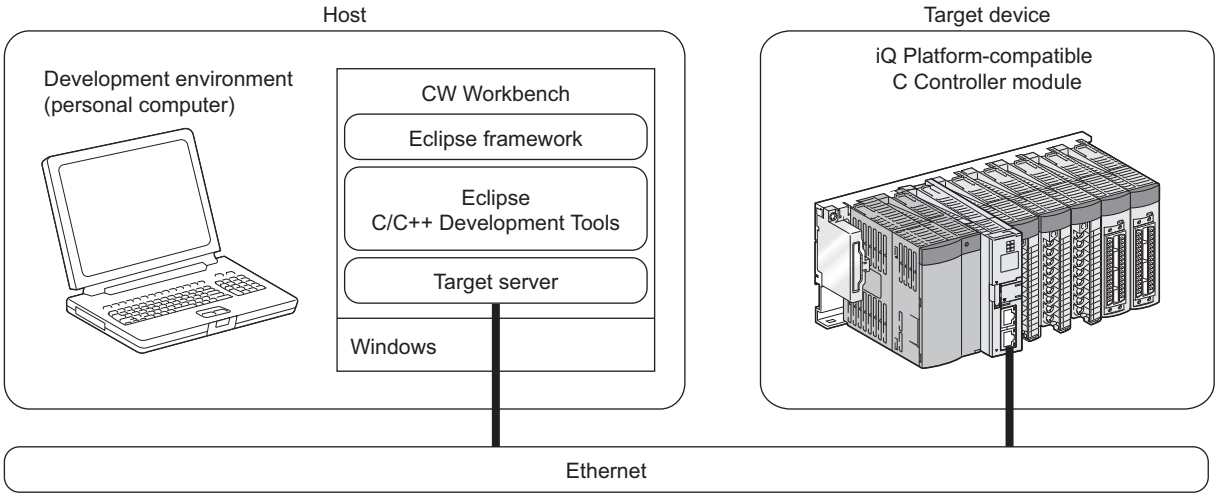
After the OK button is clicked, the following message appears. Click the Yes button.



CHAPTER 9 CONNECTING CW WORKBENCH TO THE C CONTROLLER MODULE

9.1 Setting Target Server

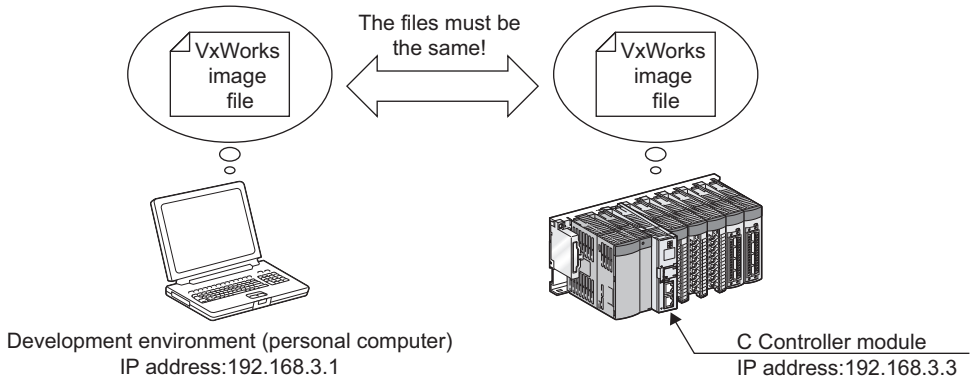
The host (CW Workbench) and the target device (C Controller module) communicate through the target server (on the CW Workbench) and the C Controller module.
Below is a setting procedure to establish communication.



9.1.1 Preparing for target server setting

The following settings are required for CW Workbench to connect to the C Controller module through the target server:

- Setting an IP address of the C Controller module
- Setting a VxWorks image file



Point

VxWorks image files are required to be copied from C Controller module to the development environment (personal computer).

(1) How to acquire a VxWorks image file from the C Controller module

Use the FTP to copy a VxWorks image file on the C Controller module to a folder on the development environment (personal computer).
Do not copy the VxWorks image file to a path or a folder that has two-byte characters and katakana.

A VxWorks image file of the C Controller module is stored in "/SYSTEMROM/OS_IMAGEFILE".

⇨ For Q24DHCCPU-V:

/SYSTEMROM/OS_IMAGEFILE/Q24DHCCPU-V_XXXXX-Y *1

⇨ For Q24DHCCPU-VG:

/SYSTEMROM/OS_IMAGEFILE/Q24DHCCPU-VG_XXXXX-Y *1

⇨ For Q12DCCPU-V (Extended mode):

/SYSTEMROM/OS_IMAGEFILE/Q12DCCPU-V_XXXXX-Y_ModeEX *1

⇨ For Q12DCCPU-V (Basic mode):

/SYSTEMROM/OS_IMAGEFILE/Q12DCCPU-V_XXXXX-Y *1

*1 XXXXX: First five digits of the serial number of the C Controller module
Y: Function version of the C Controller module
For how to check serial numbers and function versions, refer to the following manual.

- For Q24DHCCPU-V/-VG and Q12DCCPU-V (Extended mode) :
  MELSEC-Q C Controller Module User's Manual
- For Q12DCCPU-V (Basic mode):
  C Controller Module User's Manual (Hardware Design, Function Explanation)

Below are the default user name and password to connect CW Workbench to the C Controller module using the FTP:

- User name: target
- Password: password

If the default user name and password have been changed, use the user name and the password acquired.

(2) When VxWorks image files are not identical

When the VxWorks image file of the development environment (personal computer) is not identical with that of the C Controller module, copy the image file from the C Controller module to the development environment (personal computer). (☞Page 78, Section 9.1.1 (1))

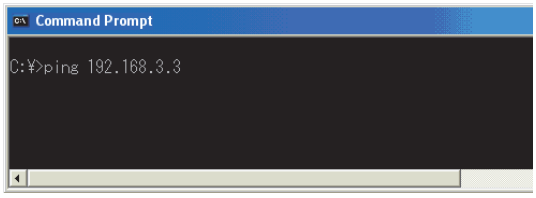
(3) Checking the network connection

Before setting the target server connection, use the ping command to check that the C Controller module, a destination of the target server, is connected to the development environment (personal computer) by following the instructions below.

1. **Start [Command Prompt] from Windows® Start*1 on the development environment (personal computer).**

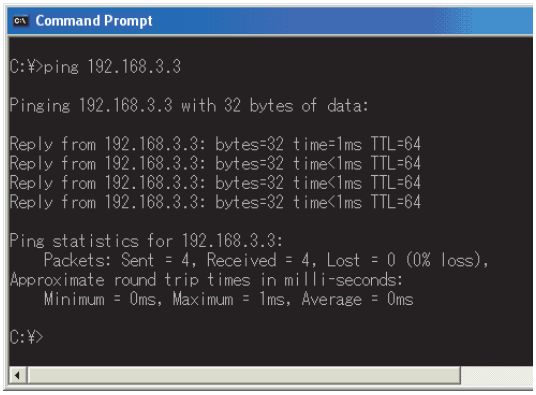
*1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

⇩



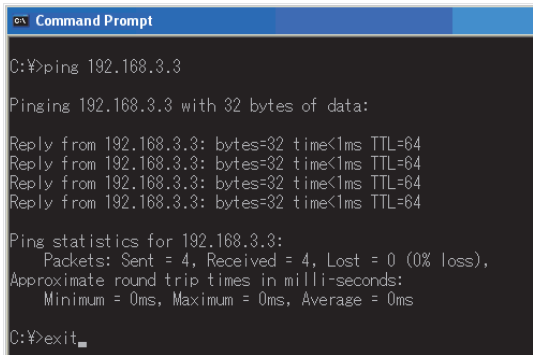
⇩

2. **Execute the ping command.**
Use the IP address of the C Controller module for the IP address specified for an argument in the ping command.
The default IP address of the C Controller module is 192.168.3.3 if not changed.



⇩

3. **Check that the development environment is network-connected to the C Controller module.**



⇩

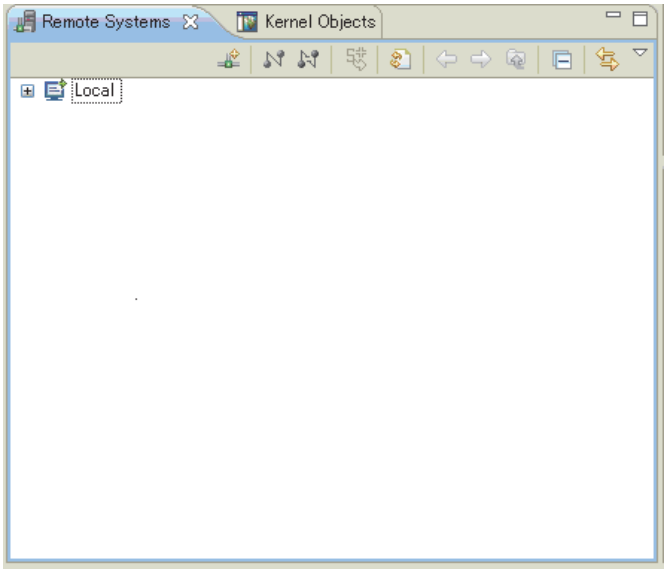
4. **Execute the exit command to terminate the Command Prompt.**

⇩

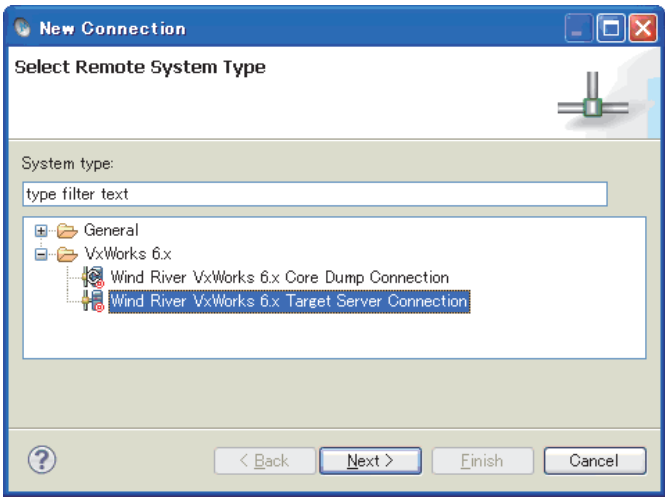
Completed

9.1.2 How to set target server connection

Follow the instructions below to set the target server connection.

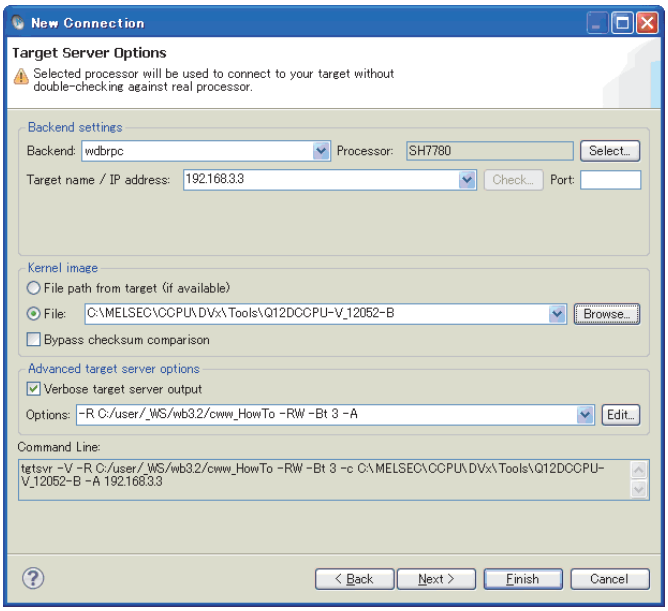


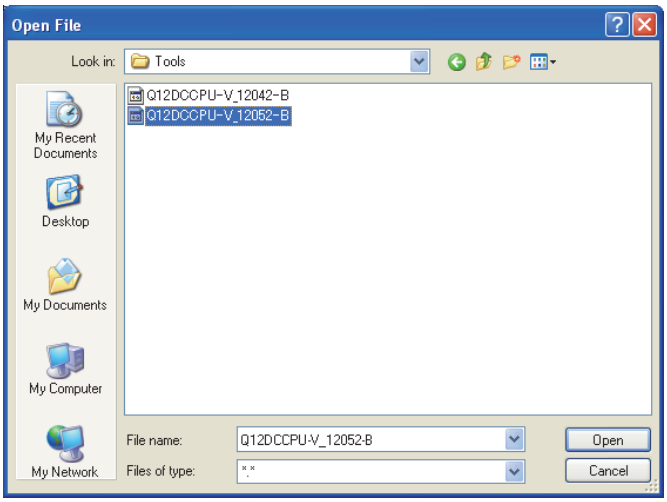
1. **Click the button on the toolbar of "Remote Systems".**



2. **Select "Wind River VxWorks 6.x Target Server Connection" and click the Next > button.**

To the next page





Completed

3. Set the target connection information for "Backend settings" as shown in the list below.

Item	Connection information	
	Q24DHCCPU-V Q24DHCCPU-VG	Q12DCCPU-V
Backend	wdbrpc	
Processor	Z5xx	SH7780
IP Address	192.168.3.3(default) (If the default IP address of the C Controller module has been changed, set the IP address acquired.)	

Select the "File" radio button in "Kernel image" and click the [Browse...] button.

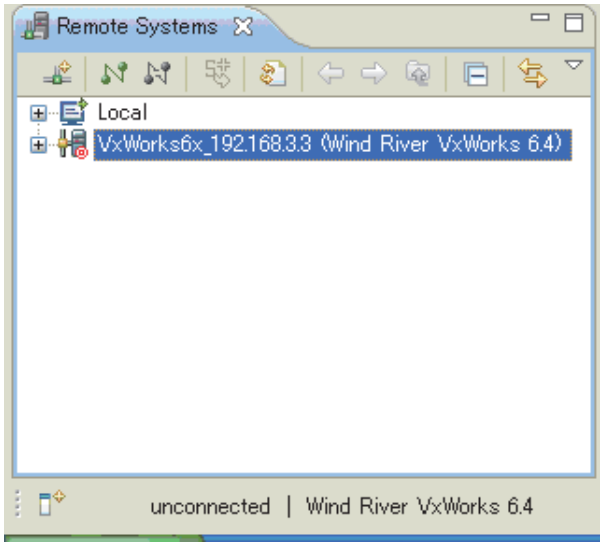
Select the VxWorks image file and click the [Open] button.
The VxWorks image file specified here should be the same file as that of the C Controller module.
Acquire the VxWorks image file from C Controller module using FTP. (Page 78, Section 9.1.1 (1))

Click the [Finish] button to start connecting with the C Controller module.

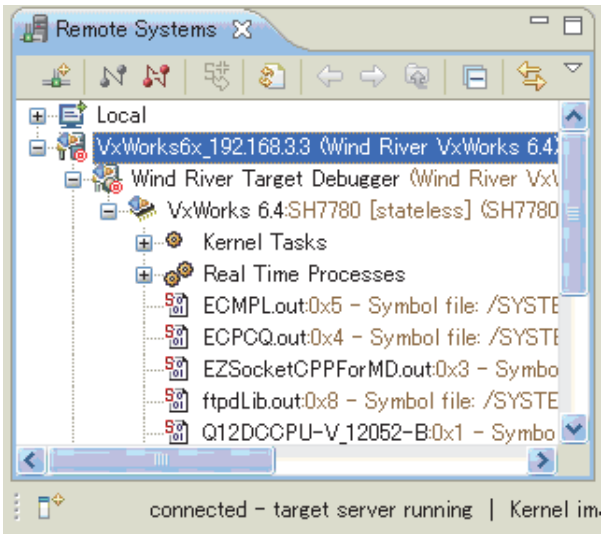
9.2 Starting and connecting the target server

After setting the target server, select the added target server on the "Remote Systems" window. Connection and disconnection can be executed for the C Controller module by clicking the "Connect"( ) or "Disconnect"( )button.

Ex. Below is an example of the window when "VxWorks6x_192.168.3.3 (Wind River VxWorks 6.4)" is selected.

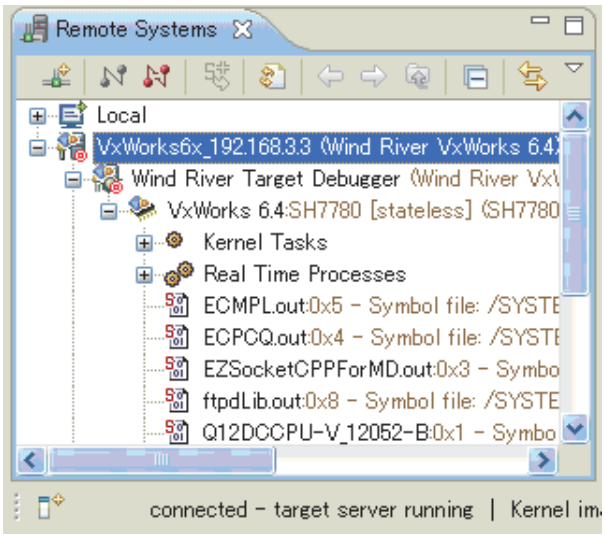


Or select the added target server with the mouse and right-click. Select "Connect" or "Disconnect" from the menu.
Under "Connect", "connected - target server running" is displayed at the bottom of the main window after the target server is started and connected.
Under "Disconnect", "unconnected" is displayed at the bottom of the main window after the target server is disconnected.



Point

Once the target server is started, the C Controller module is automatically reconnected to the target server after the module is normally started even if the power supply of the module is turned off and on.
To disconnect the target server, select the connected target server on the "Remote Systems" window and click the "Disconnect" button.



Remark

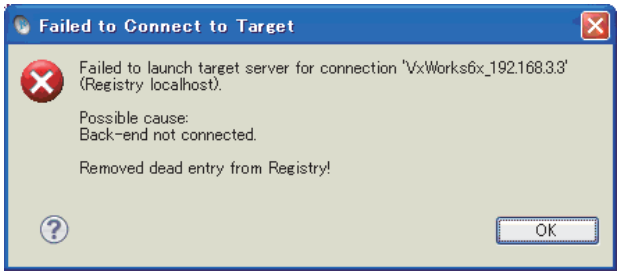
The indication of the "Connect" and "Disconnect" buttons switches between enabled and disabled, depending on the status of connection to the C Controller module.

During disconnection: "Connect"( ) for enabled and "Disconnect"( )for disabled

During connection: "Connect"( ) for disabled and "Disconnect"( )for enabled

Point

The following error message appears if the C Controller module is not running or if the network is not connected while the target server is under "Connect".



If the error shown above occurs, check the following:

- The C Controller module is powered on and is running properly.
- The target server is connected to the C Controller module. (Page 79, Section 9.1.1 (3))

Remark

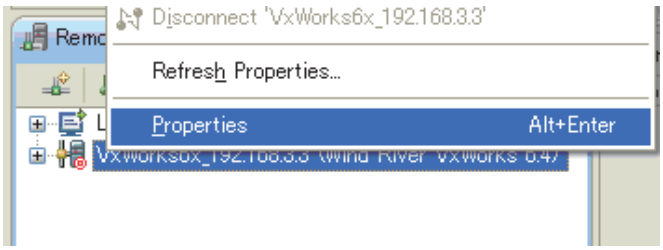
After the target server is started and connected, select the connected target server to use the Host Shell.
For how to start the shell, refer to the following section.

Page 85, Section 10.2

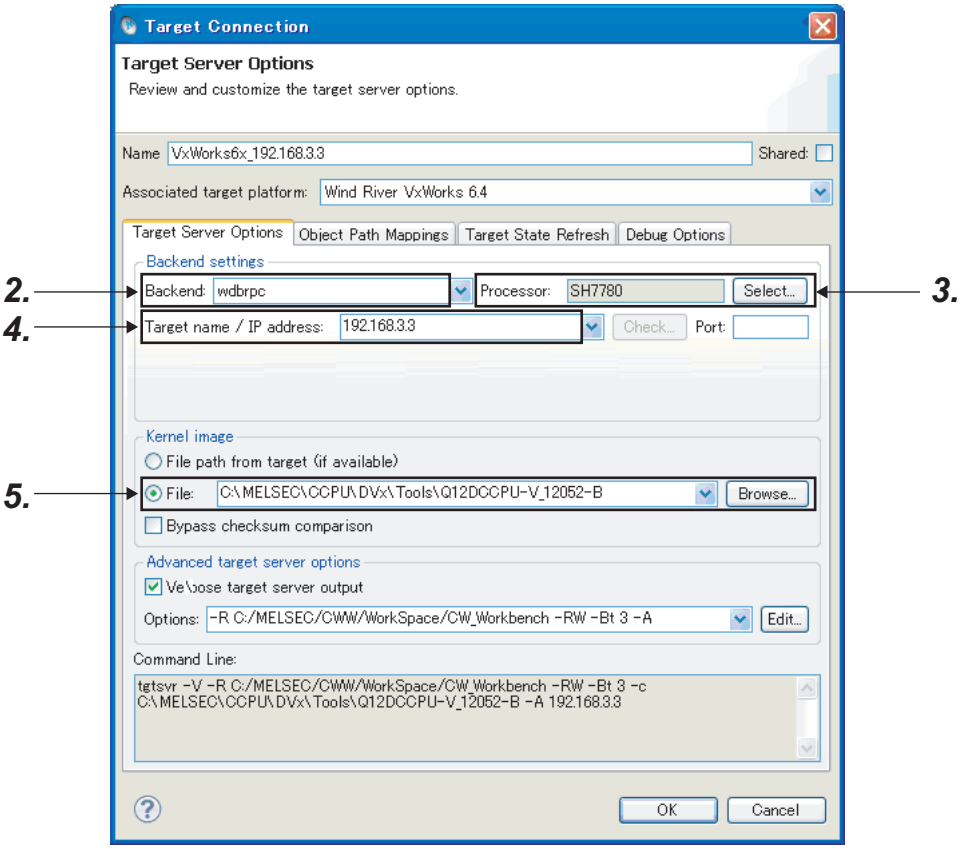
For details on Shell, refer to the following document by selecting [Help] in the menu bar ⇨ [Help Contents] ⇨ "Wind River Documentation" ⇨ "Guides" ⇨ "Host Tools" ⇨ "Wind River Workbench Host Shell User's Guide, 3.2".

9.3 How to Check and Change Connection Settings

If the target server cannot be connected to the C Controller module, follow the instructions below to check and change the connection setting.



1. **Select the target server on the "Remote Systems" and right-click to open the pop-up menu. Select [Properties].**



2. **Check the Backend field.**
Enter "wdbrpc" for "Backend".

3. **Check the Processor field.**
Set "Z5xx" (for Q24DHCCPU-V/-VG) or "SH7780" (for Q12DCCPU-V) for "Processor".

4. **Check the IP address of the target device (C Controller module).**
Set the IP address of the C Controller module for "Target name/IP address".
The default IP address is 192.168.3.3.

5. **Check the Kernel image.**
Set the correct VxWorks image file.(☞ Page 78, Section 9.1.1)

Do not change the "Advanced target server options" setting. (The default value is recommended.)

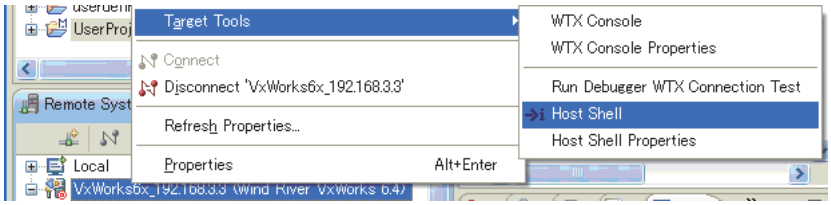
CHAPTER 10 HOW TO DEBUG PROGRAM

10.1 How to Connect CW Workbench to the C Controller Module

- Set the target server.(☞Page 77, Section 9.1)
- Start and connect the target server.(☞Page 82, Section 9.2)

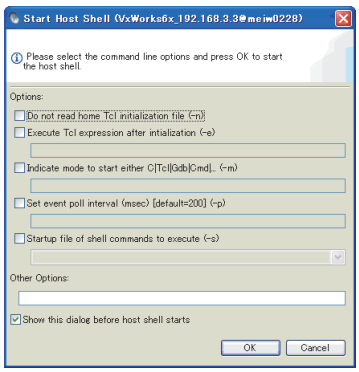
10.2 Starting Shell

On the "Remote Systems" window, select the target server connected to the C Controller module where the shell is started. In the menu that pops up by right-clicking, select [Target Tools] ⇨ [Host Shell] to start the shell.



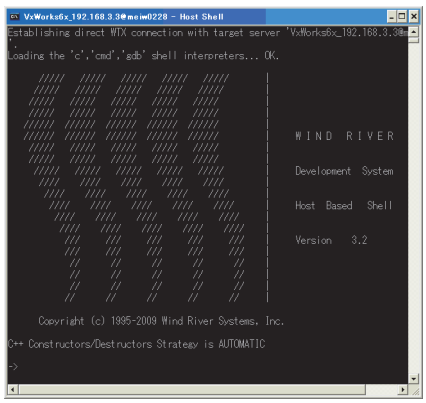
⇩

1. **Click the** OK **button.**



⇩

2. **Shell starts.**

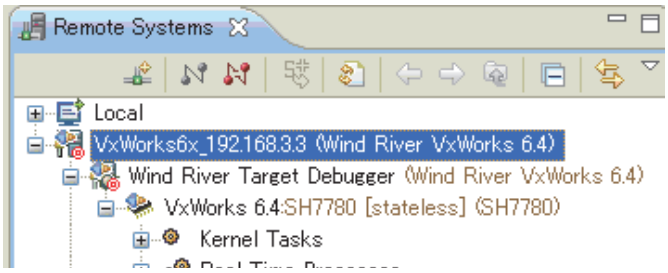


⇩

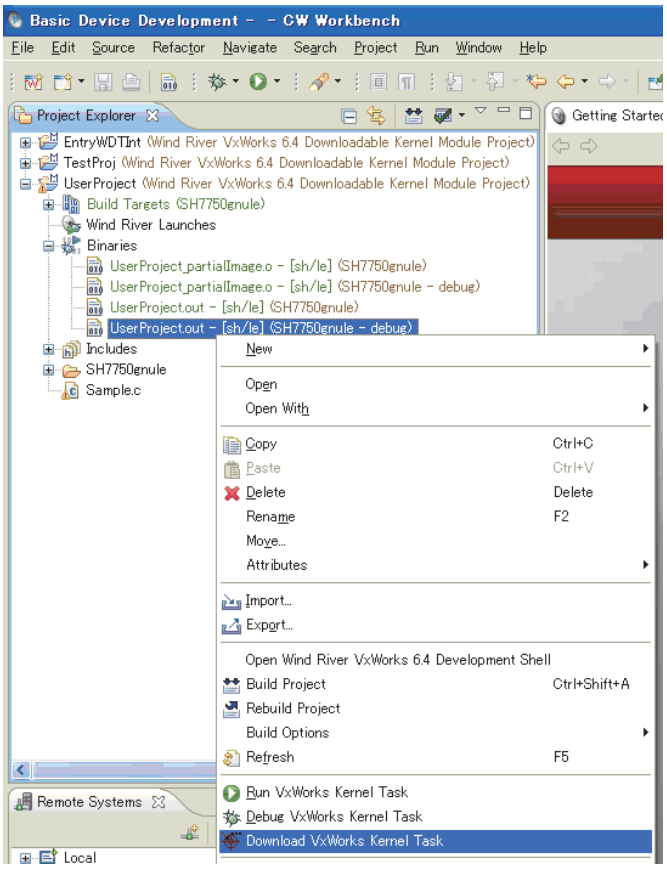
Completed

10.3 Downloading Module

Follow the instructions below to download a module file on the C Controller module.
The module is used for an application, such as to download a file on the memory on the C Controller module and start a task from the shell.



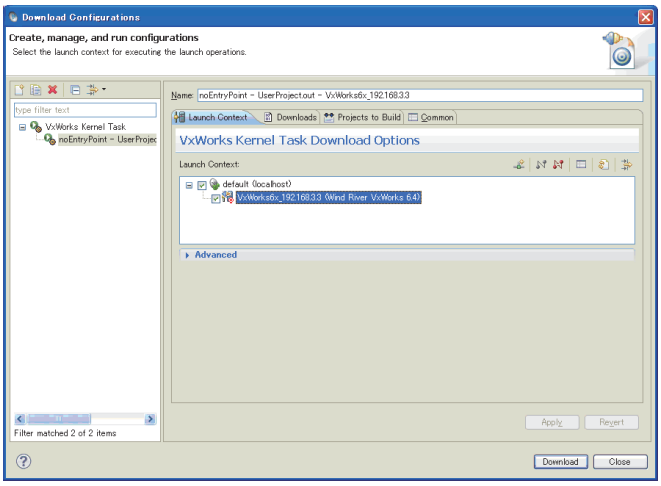
1. **On the "Remote Systems" window, select the target server where the module file is downloaded.**
Select the target server connected to the C Controller module for the target server.



2. **On the "Project Explorer" window, select the module file to be downloaded. In the menu that pops up by right-clicking, select [Download VxWorks Kernel Task].**

"UserProject.out" has been selected for the module file here as an example.

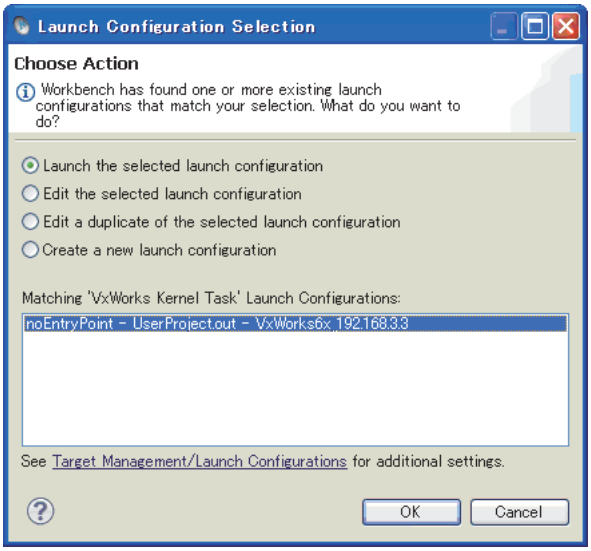
To the next page



3. Click the Download button.

The module file "UserProject.out" selected in the step 2 has been downloaded on the C Controller module, which is a destination of the target server selected in the step 1.

The following window appears on and after the second operation.
Select "Launch the selected launch configuration" and click the OK button.



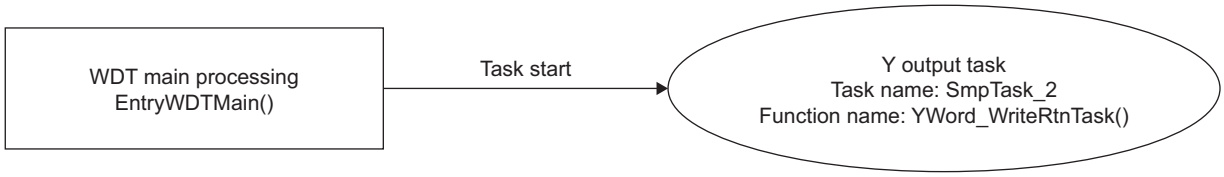
⇩
Completed

10.4 How to Debug Program

This section explains how to debug a program by using a sample program (EntryWDTInt.c) of the C Controller module as an example.

(1) Note:

The executing module needs to be built in "Debug Mode" when a project is debugged on CW Workbench.

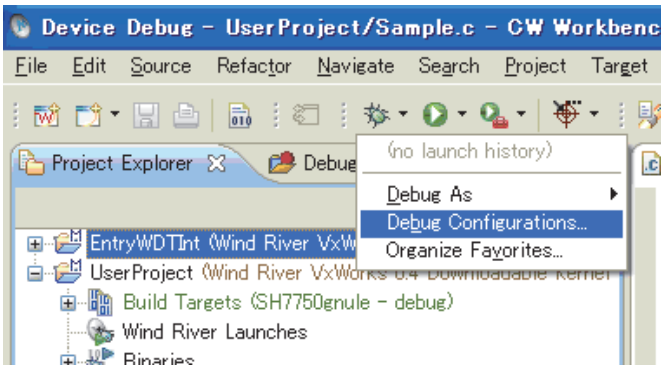


10.4.1 Debugging one task

Connect the C Controller module to CW Workbench.

For details,(☞ Page 77, Section 9.1,Page 82, Section 9.2).

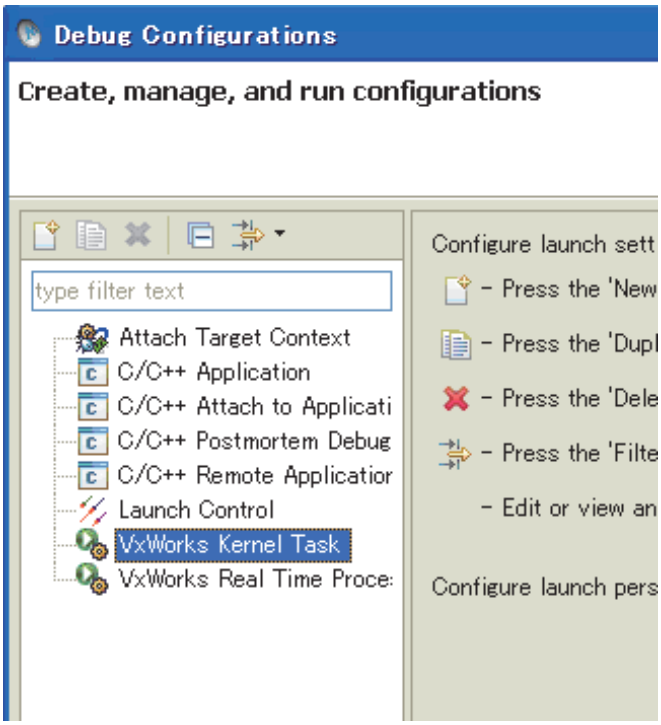
⇩



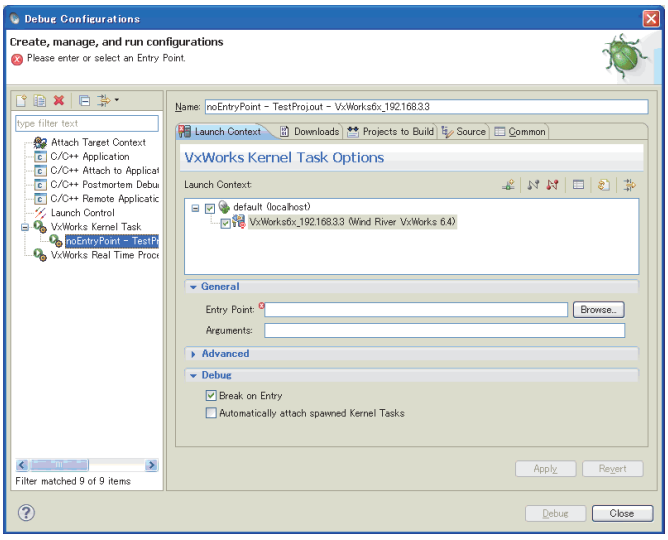
1. **On the "Project Explorer" window, select a project to be debugged. Click the ▼ mark on the right side of a debug icon( ) on the toolbar and select [Debug Configurations...] from the pop-up menu.**

⇩

To the next page

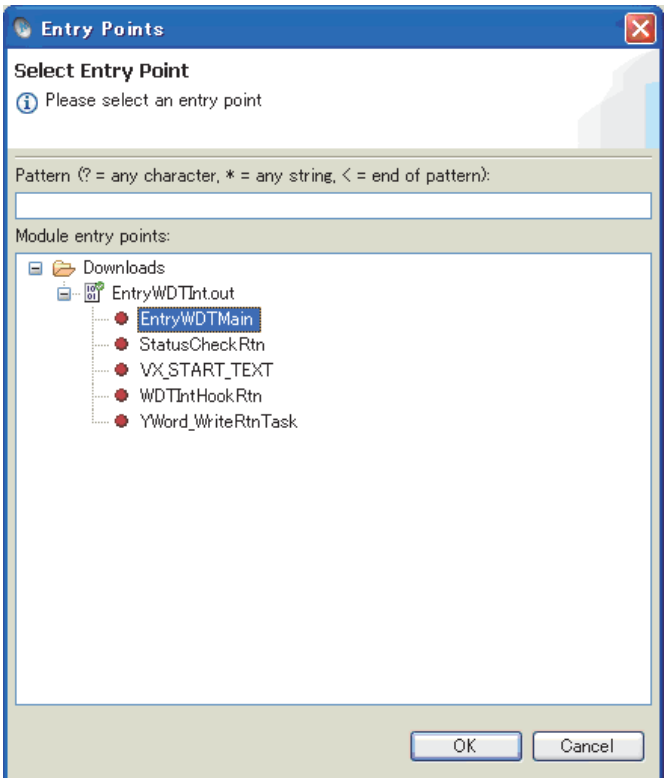


2. **Double-click "VxWorks Kernel Task" to create a new debug configuration.**

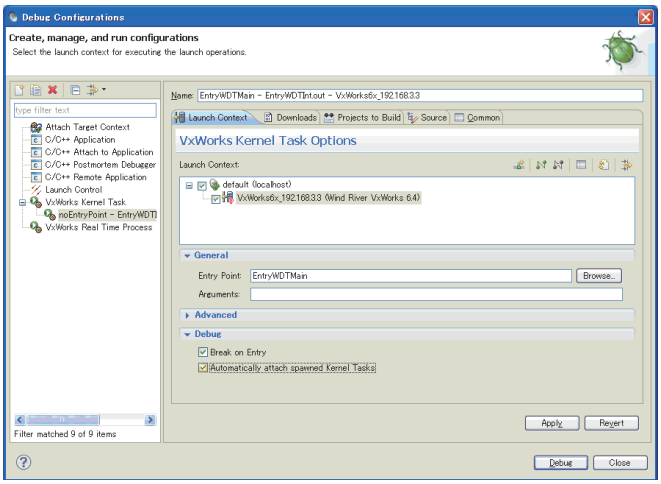


3. **Check that the target server connected to the C Controller module to be debugged has been selected. Click the** Browse... **button.**

To the next page



4. **Select the function (Entry Point) where debugging starts. Click the OK button.**



5. **Check that the function name selected in the step 4 has been selected for "Entry Point:".**

Click the Debug button.

Point

To debug a task created (taskSpawn) from the function specified in "Entry Point:", "Automatically attach spawned Kernel Tasks" at the bottom middle of the dialog box also needs to be selected.

To the next page

EntryWDTInt.c

```
/*  Y output task                                          */
void        YWord_WriteRtnTask();

/*********************************************************/
/*          WDT Main processing                          */
/*********************************************************/
void EntryWDTMain()
{
    short   ret;

    /*  Start the module status monitor task              */
    ret = taskSpawn(TASK_NAME_1,
                    PRIORITY_150,
                    0,
                    STACK,
                    (FUNCPTR)StatusCheckRtn,
                    0, 0, 0, 0, 0, 0, 0, 0, 0, 0);
    if(ret == ERROR){
        printf("StatusCheckRtn task start error  ret = %hd ( %hxH )\
        return;
    }

    /* Start Y output task                                */
    ret = taskSpawn(TASK_NAME_2,
                    PRIORITY_160,
                    0,
                    STACK,
                    (FUNCPTR)YWord_WriteRtnTask,
                    0, 0, 0, 0, 0, 0, 0, 0, 0, 0);
    if(ret == ERROR){
```

6. At first, debugging starts at the beginning of the function specified for "Entry Point:" in the Suspend status.

← The function specified for "Entry Point:"

← The location being suspended is highlighted in green. The display is in the same form as that of when a task is suspended at a breakpoint described in the step 9.

EntryWDTInt.c

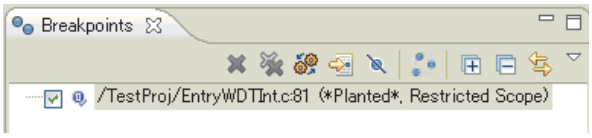
```
    return;
}

/*********************************************************/
/*  Module status monitor processing                     */
/*********************************************************/
void        StatusCheckRtn()
{
    short   ret;
    long    path;
    long    plInfo[15];
    long    event[4];
    unsigned long   ulBufSize;

    /*  Execute QBF_Open                                  */
    ret = QBF_Open(UNIT, &path);
    if(ret != 0){
        printf("QBF_Open error  ret = %hd ( %hxH )\n", ret, ret);
        return;
    }
```

7. Insert the breakpoint to a place where a task operation needs to be suspended.

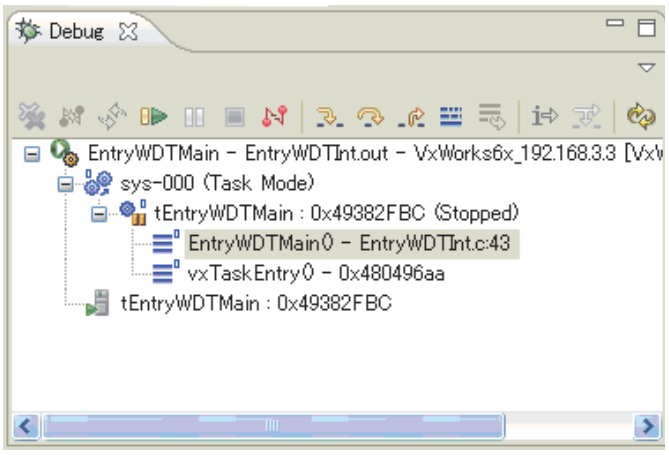
Adding the breakpoint displays breakpoint information inserted on the "Breakpoint" window.
Clearing the check box of the breakpoint information on the "Breakpoints" window disables the breakpoint being inserted without canceling the breakpoint.



Remark

To add a breakpoint, double-click on the left edge of the edit window, at the line where the breakpoint is to be set.
The breakpoint can be removed by a double click once more.

To the next page

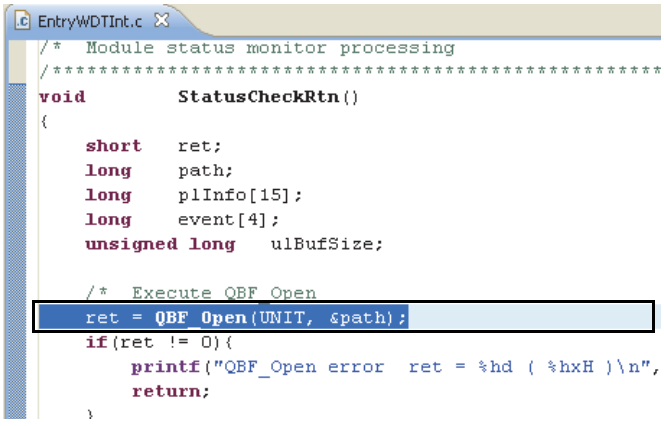


8. Click the ( ) button to restart the task operation.

How to see the status of the task operation

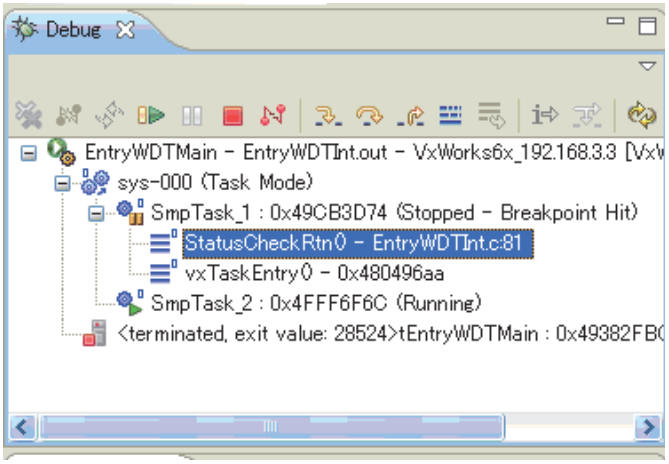
The following table lists how to see the status of the task operation based on enabled or disabled status of the three buttons: Resume ( ), Suspend ( ), and Terminate ( ).

Button status	Task operation status
No.1	Suspended status (during suspension) Click the button → turns to the status of No.2. Click the button → turns to the status of No.3.
No.2	Resume status (during execution) Click the button → turns to the status of No.1. Click the button → turns to the status of No.3.
No.3	Termination status (debugging terminated)



9. The task operation goes into the Suspended status at the point where the breakpoint was inserted in the step 7, and the operation has stopped.

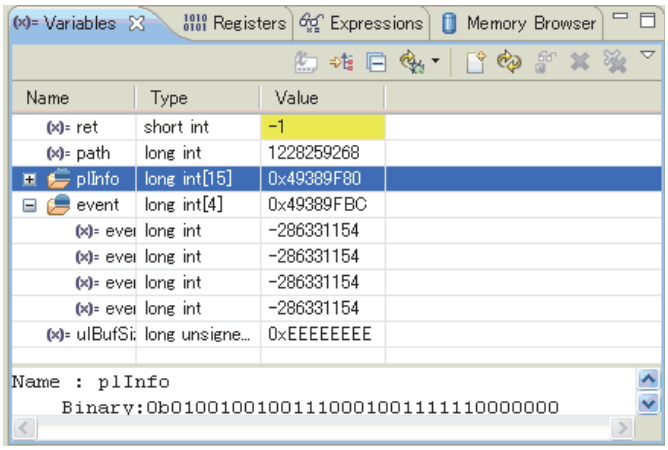
Continue debugging by operations such as checking variables with step through execution and changing variables.

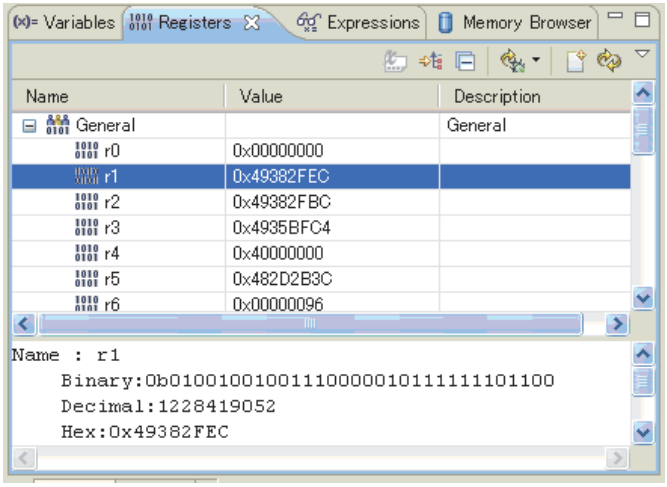


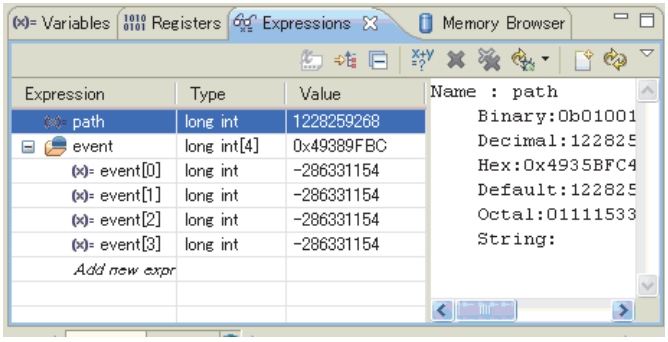
10. Use the following step execution buttons on the tool button on the "Debug" window to continue debugging.

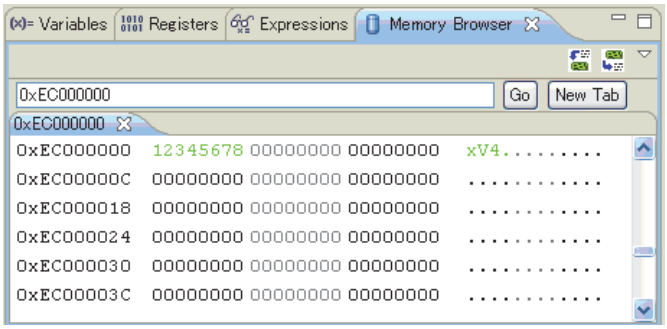
Icon	Description
	Step Into Steps into the called function and stops at the first line of the function.
	Step Over Executes the current line of the function and then stops at the next line of the function.
	Step Return Continues execution until the current function has returned to its caller.

To the next page









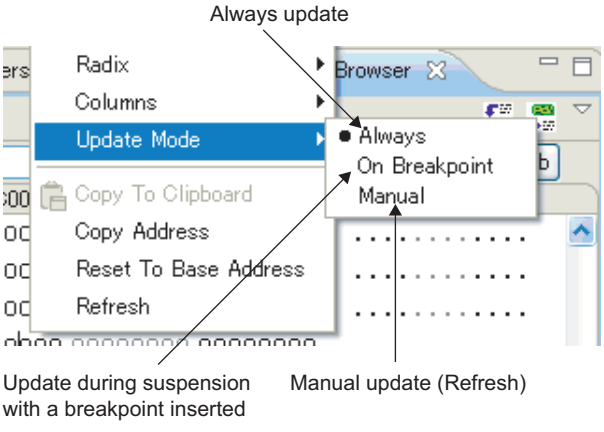
To the next page

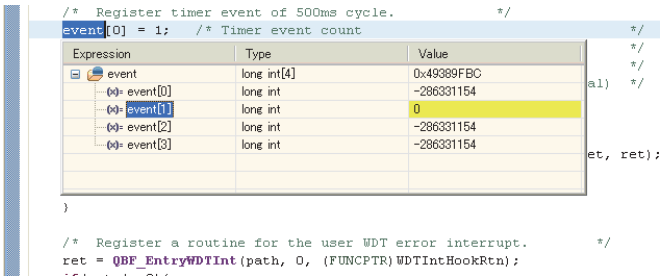
11. **Clicking the <<Variables>>, <<Registers>>,<<Expressions>>, and <<Memory Browser>> tabs during suspension of tasks displays each window. Checking and changing values allows efficient debugging.**

"Variables"
Displays the current values of local variables.
"Registers"
Displays the current values of registers.
"Expressions"
Displays the current values of variables in the Watches window.
"Memory Browser"
Displays the memory dumps on the C Controller module.

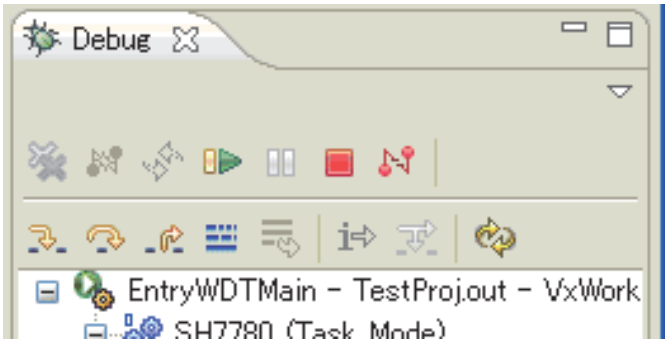
The color of cell changes to yellow when the value has changed from the previous value by step through execution or when the value has been changed.
On "Memory Browser", the color of cell does not change, but the color of font changes to green.

On "Memory Browser", timing to refresh values can be selected unlike other windows.
Right-click on the "Memory Browser" window. Select [Update Mode] from the pop up menu.





12. **Placing the mouse over a variable for a certain period of time displays the current value of the variable in a balloon.**
The value displayed in the balloon can be also changed like on the "Variables" window.

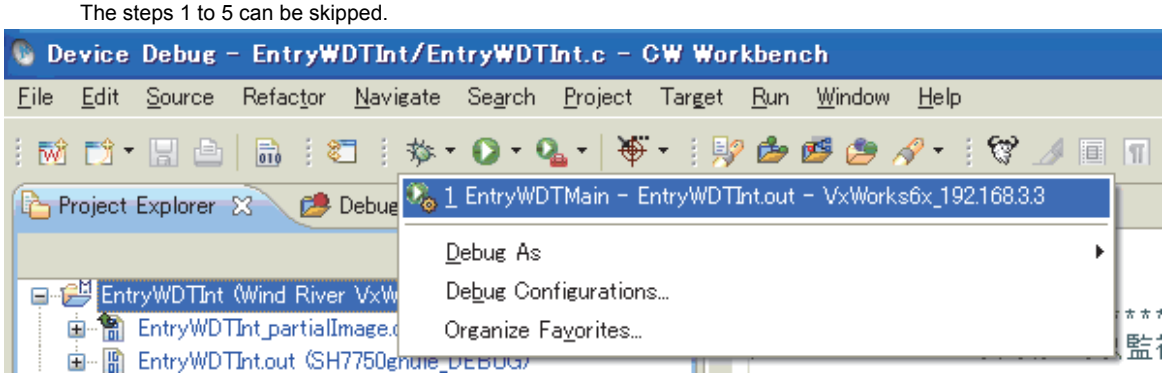


13. **Click the Terminate ( ) button on the "Debug" window to terminate the debugging session.**

Completed

Point

To debug the task again, click the ▼ mark on the right side of the debugging icon ( ) on the toolbar and select the created debug configurations at the top of the pop-up menu.
The steps 1 to 5 can be skipped.

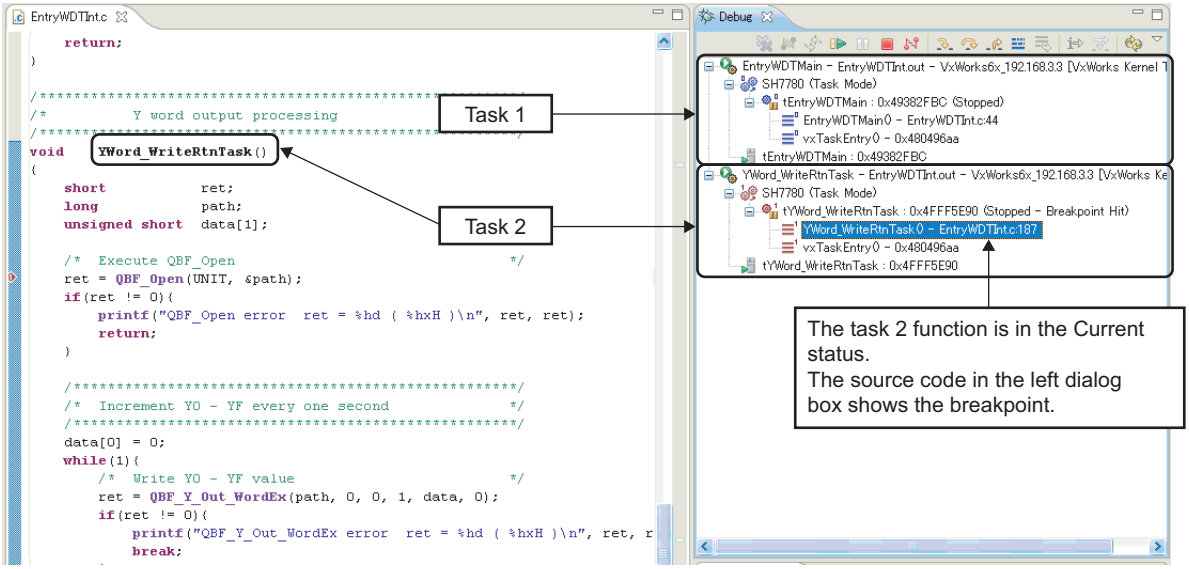


10.4.2 Debugging multiple tasks

(1) To debug multiple tasks, execute steps 1 to 5 in "Section 10.4.1. Debugging one task" as many times as the number of tasks to be started.

(2) The "Debug" window displays the executed tasks.

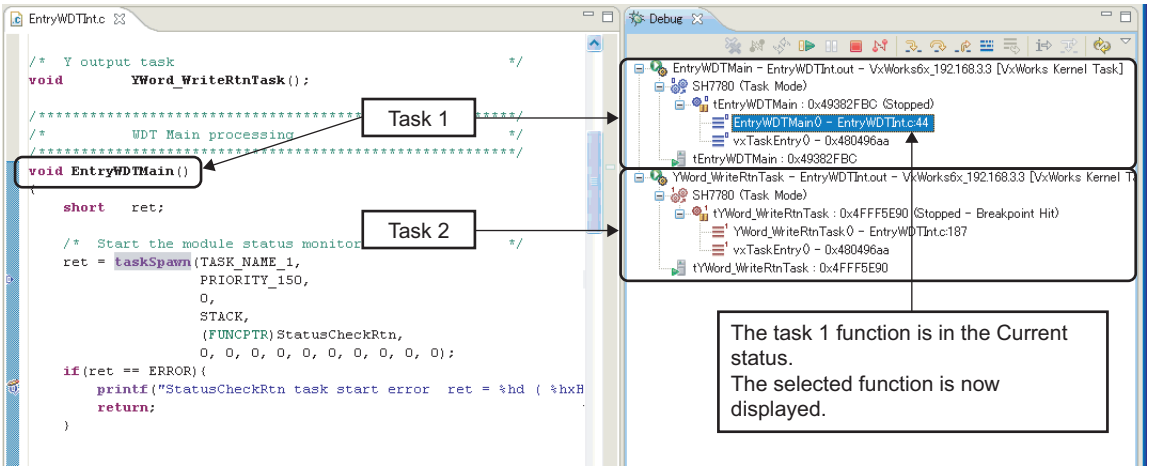
Ex. An example of when two tasks have been started



(3) To debug another task, use the mouse to select another function on the "Debug" window.

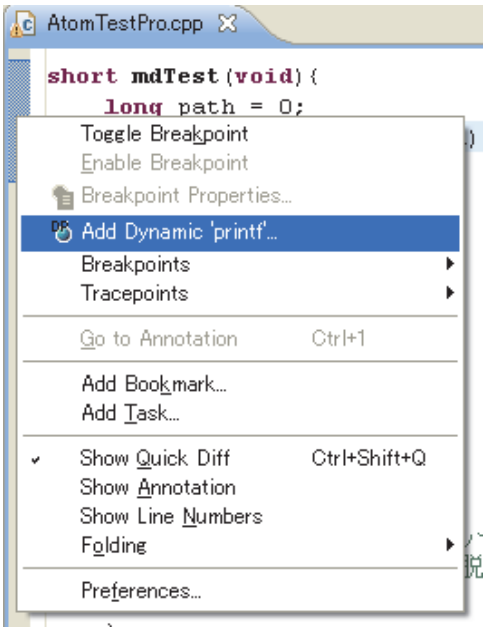
Switch tasks while multiple tasks are being debugged.

An example of when switching from the task 2 to task 1

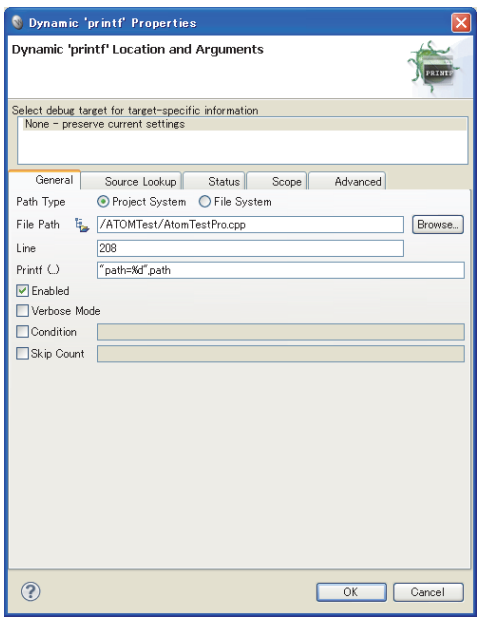


10.5 How to Execute Dynamic Printf

This section explains how to execute Dynamic Printf.
Dynamic Printf is a function to dynamically insert or cancel the printf statement when debugging the program without embedding the printf function to the source code with the similar operation as that of the breakpoint.
Dynamic Printf is only compatible with Q24DHCCPU-V/-VG.

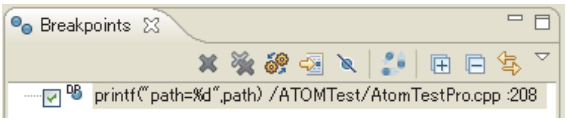


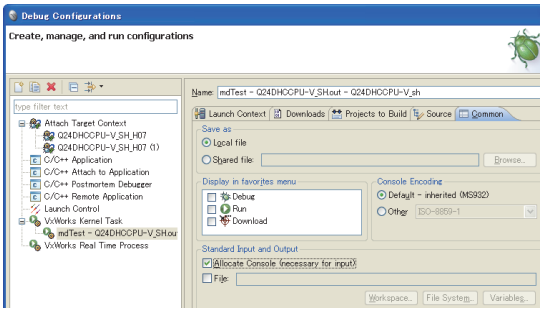
1. **On the "Editor" window, open the source file which is a target for debugging, and right-click the left edge section ( ) to open the pop-up menu.**
Select [Add Dynamic 'printf'...] from the pop-up menu.



2. **The "Dynamic 'printf' Properties" dialog box appears.**
Enter the printf statement to be displayed when debugging the program for "Printf (...)" with the same text format as the argument to be written in the printf function, and click the OK **button.**

To the next page





3. **The printf statement entered for "Printf (...)" is added on the "Breakpoints" window.**

The execution result is displayed on the "Console" window.

⇨To display the result of Dynamic Printf on the "Console" window, select "Allocate Console (necessary for input)" on the <<Common>> tab of the "Debug Configurations" dialog box.

CHAPTER 11 TROUBLESHOOTING

The following table lists errors that occur during use of CW Workbench and their solutions.

Category	Problem	Reference
Basic operation	The CW Workbench installer has stopped working half way through. Or the installer has terminated suddenly during installation.	Page 99, Section 11.1 (1)
	A message "The install root of your Wind River Workbench installation could not be located!" appears and CW Workbench cannot be started.	Page 99, Section 11.1 (2)
	A message "Workspace in use or cannot be created, choose a different one." appears and CW Workbench cannot be started.	Page 99, Section 11.1 (3)
	A patch has been applied, but the display does not change.	Page 100, Section 11.1 (4)
	The install menu of the plug-in software cannot be found.	Page 101, Section 11.1 (5)
	Help on an FTP server does not open.	Page 102, Section 11.1 (6)
	The message "The application was unable to start correctly (0xc0000142). Click OK to close the application." appears and the debug function cannot be used.	Page 102, Section 11.1 (7)
	Two shortcut menus with the same name are displayed in the Start menu.	Page 102, Section 11.1 (8)
	The GNU compiler of VxWorks 6.8 cannot be used in a command line Shell.	Page 102, Section 11.1 (9)
License	You have received a permanent license file, but do not know how to use it.	Page 103, Section 11.2 (1)
	You do not know how to delete a permanent license file.	Page 103, Section 11.2 (2)
	An error message with a title of "License Not Found" appears when CW Workbench is started or being operated.	Page 103, Section 11.2 (3)
Building	An error "command not found" has occurred and the build is not executed.	Page 104, Section 11.3 (1)
	An error "no input files", "No Such file", or "No such file or directory" has occurred.	Page 105, Section 11.3 (2)
	An error "Build target "/yyyy/nnnn_partialImage" used in build target "yyyy" not found" has occurred and the build is not executed.	Page 105, Section 11.3 (3)
	The following build errors have occurred: "xxx.sh: syntax error near unexpected token `yyy_partialImage/Debug/Objects/nnn'" "xxx.sh: cannot execute binary file" "Makefile:xxx: *** missing separator. Stop" "yy.o: command not found **...** No such file or directory"	Page 106, Section 11.3 (4)
	.out file is not created. The build terminates with a message "Generation of makefiles started."	Page 106, Section 11.3 (5)
Target server connection	CW Workbench cannot be connected to the C Controller module.	Page 107, Section 11.4 (1)
	When "Connect" is executed on the "Remote Systems" window, an application error occurs and CW Workbench cannot be connected to the C Controller module.(Failed to Connect to Target) The connection status of the Remote Systems suddenly changes from "Connected" to "Disconnected".	Page 108, Section 11.4 (2)
	The selected target connections are not imported.	Page 108, Section 11.4 (3)
Downloading	.out file cannot be downloaded on the C Controller module.	Page 109, Section 11.5 (1)
	.out file sometimes cannot be downloaded on the C Controller module.	Page 109, Section 11.5 (2)
Installation using a temporary license	After an LAC code and user information are entered and the button is clicked, an error message appears and the installation does not progress.	Page 110, Section 11.6 (1)

11.1 Basic Operation

(1) The CW Workbench installer has stopped working half way through. Or the installer has terminated suddenly during installation.

This problem occurs when characters other than alphanumeric characters, an underscore "_", and a hyphen "-" have been used for the folder name of the installation location specified at first on the CW Workbench installer.

- Action

  Use the following characters for the folder name of the installation location and reinstall CW Workbench:
  - Alphanumeric characters
  - underscore "_", hyphen "-" (Space cannot be used)

(2) A message "The install root of your Wind River Workbench installation could not be located!" appears and CW Workbench cannot be started.

This problem occurs when characters other than alphanumeric characters, an underscore "_", and a hyphen "-" have been used for the folder name of the installation location on CW Workbench.

- Action

  Uninstall CW Workbench. Use the following characters for the folder name of the installation location and reinstall CW Workbench:
  - Alphanumeric characters
  - underscore "_", hyphen "-" (Space cannot be used)

(3) A message "Workspace in use or cannot be created, choose a different one." appears and CW Workbench cannot be started.

This message appears if the folder of the workspace specified at first is being accessed by another CW Workbench.

- Action

  Click the OK button. Select a different folder for the Workspace folder displayed again or terminate the CW Workbench that is operating already.

(4) A patch has been applied, but the display does not change.

Old data may be in the cache.

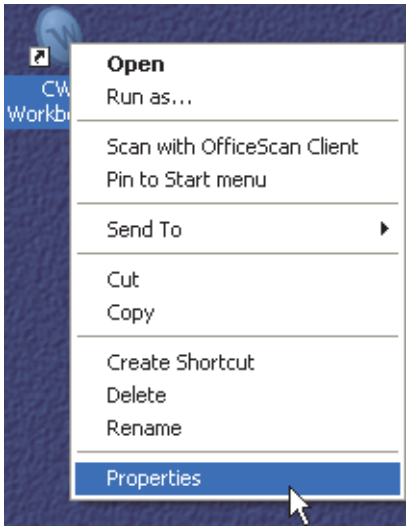
- Action

  When starting CW Workbench, specify "-clean" in the argument.

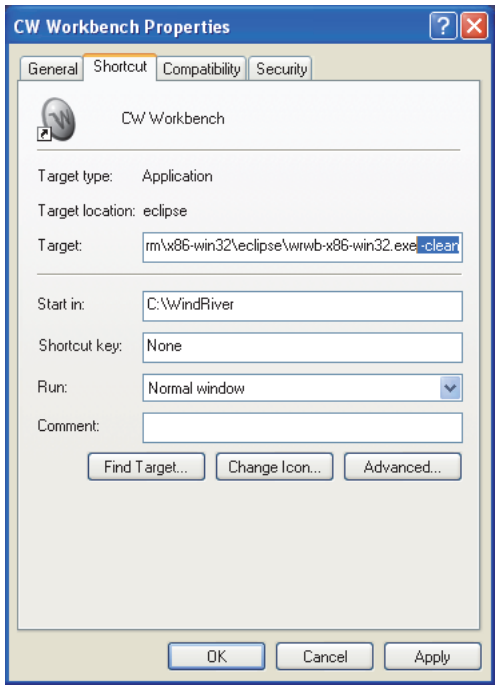
  After CW Workbench has been started with "-clean" specified, delete "-clean" from the boot argument.

  (Keeping "-clean" being specified slows the startup of CW Workbench.)

(a) How to specify "-clean"



1. **Select the CW Workbench shortcut on the desktop. In the menu that pops up by right-clicking on the shortcut, select [Properties].**



2. **Enter a space at the end of "Target:" on the CW Workbench Properties. Enter "-clean" after the space and click the** OK **button.**

(b) How to delete "-clean"

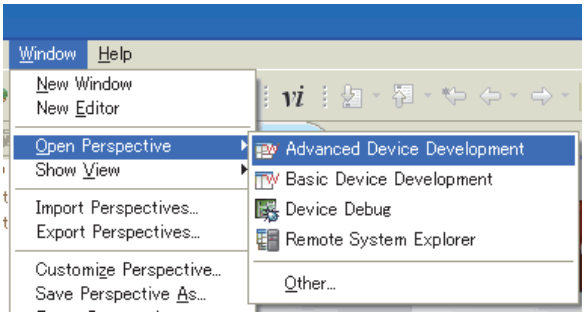
In the step 2 of [How to specify "-clean"], delete the space and "-clean". Click the OK button.

(5) The install menu of the plug-in software cannot be found.

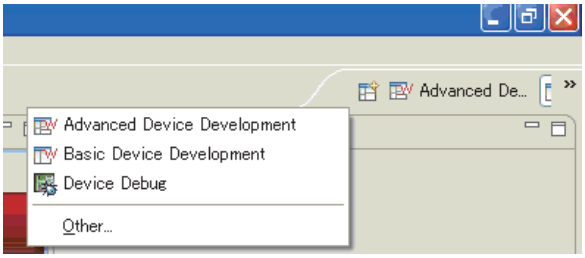
To install the plug-in software, select from the menu bar [Help]⇨[Install New Software...].
If [Install New Software...] cannot be found on the Help menu, the display mode of CW Workbench is "Basic Device Development".
Check the current display mode of CW Workbench on the title bar.

- Action
  Change the display mode of CW Workbench to "Advanced Device Development".

(a) How to change the display mode

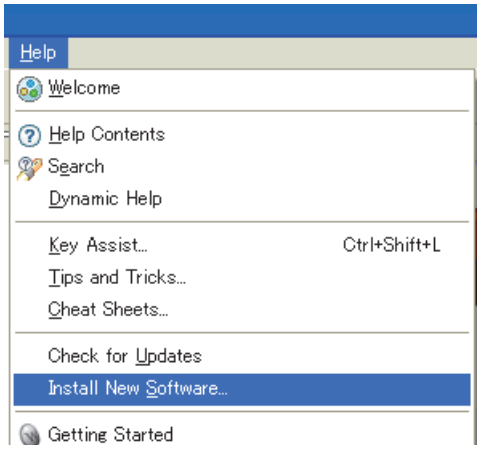


1. Select from the menu bar [Window] ⇨ [Open Perspective] ⇨ [Advanced Device Development].



Another way to change the display mode is click the Open Perspective icon ( ) at the upper right corner of CW Workbench and select "Advanced Device Development" from the menu displayed.

2. **Check that the title display of CW Workbench has been changed to "Advanced Device Development".**



3. **To install the plug-in software, select from the menu bar [Help]⇨[Install New Software...].**

(6) Help on an FTP server does not open.

'Failed to launch help' is displayed and Help does not open even when 'HELP' is selected in the menu of the FTP server included in this product.

The currenly used operating system may not support the FTP server included in this product.

- Action

  Check if the currently used operating system supports the FTP server included in this product.

  ☞Page 16, Section 2.3

(7) The message "The application was unable to start correctly (0xc0000142). Click OK to close the application." appears and the debug function cannot be used.

This symptom occurs when using Windows 10 version 1703 (Creators Update), and the following functions cannot be used.

- Target connection function (The connection with a target cannot be performed.)
- Debugging function (Debug cannot be executed.)
  - Action

    Apply Windows update KB4025342(OS Build 15063.483) for Windows 10 version 1703 (Creators Update) for a personal computer.

(8) Two shortcut menus with the same name are displayed in the Start menu.

- When "setup.exe" is executed on a personal computer running Windows® 8 or later, one or more [Registry], [FTP Server], or [VxWorks COMx] shortcut menus may be displayed under [Wind River] of Windows® Start*1.

  *1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

  - Action

    Uninstall CW Workbench first, then execute "Install.vbs" to install CW Workbench again.(☞Page 27)

- CW Workbench whose software version is not supported by Windows® 8 or later is installed.
  - Action

    Use the installer of CW Workbench whose software version is "F" or later.(☞Page 16)

(9) The GNU compiler of VxWorks 6.8 cannot be used in a command line Shell.

- When CW Workbench is installed using "setup.exe" on Windows® 8 or later, [VxWorks Development Shell] starts command line Shell of VxWorks6.4.The GNU complier of VxWorks6.8 cannot be used.

  Select [Wind River] ⇨ [VxWorks Development Shell] from Windows® Start*1

  *1 Select [All apps] on the Start screen or [Start] ⇨ [All Programs]/[All apps].

  - Action

    Uninstall CW Workbench first, then execute "Install.vbs" to install CW Workbench again.(☞Page 27)

- CW Workbench whose software version is not supported by Windows® 8 or later is installed.
  - Action

    Use the installer of CW Workbench whose software version is "F" or later.(☞Page 16)

11.2 License

(1) You have received a permanent license file, but do not know how to use it.

Store the obtained permanent license file in the license folder in the personal computer where CW Workbench has been installed.

☞ Page 25, Section 5.3

(2) You do not know how to delete a permanent license file.

Delete all the files in the license folder in the personal computer where CW Workbench has been installed.

☞ Page 26, Section 5.4

(3) An error message "License Not Found" appears when CW Workbench is started or being operated.

An error has occurred with the license file being used for CW Workbench.

☞ Page 115, Appendix 2

11.3 Building

(1) An error "command not found" has occurred and the build is not executed.

A compiler that cannot be used on CW Workbench has been selected.

- Action

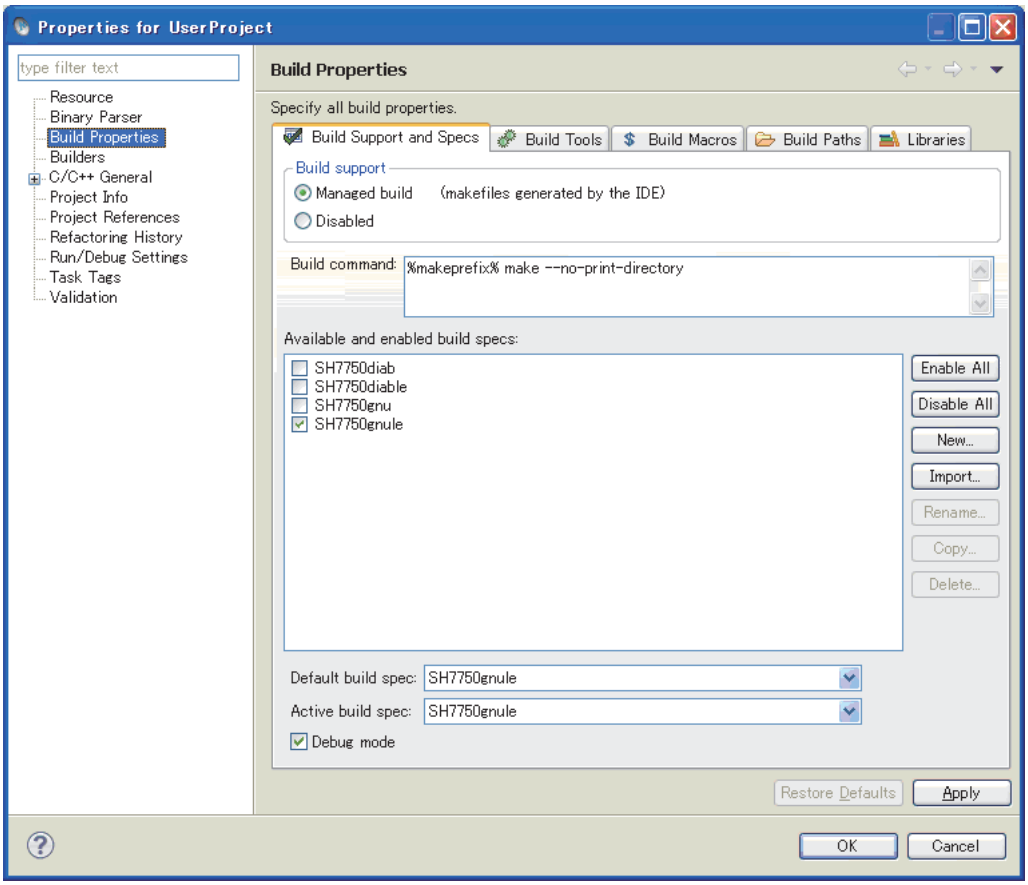
  From the tree view to the left on the "Properties" window on the "Project" menu, select "Build Properties" and click the<<Build Support and Specs>>tab. (The window shown below is the one that appears when the project name is "UserProject".)

  Check that the compilers that cannot be used have not been selected for "Available and enabled build specs:".

  Since the "Available and enabled build specs:" supports only the following build specifications, clear the check boxes other than the following build specifications.

  ⇨ For Q24DHCCPU-V/-VG: "PENTIUM4gnu"

  ⇨ For Q12DCCPU-V: "SH7750gnule"



(2) An error "no input files", "No Such file", or "No such file or directory" has occurred.

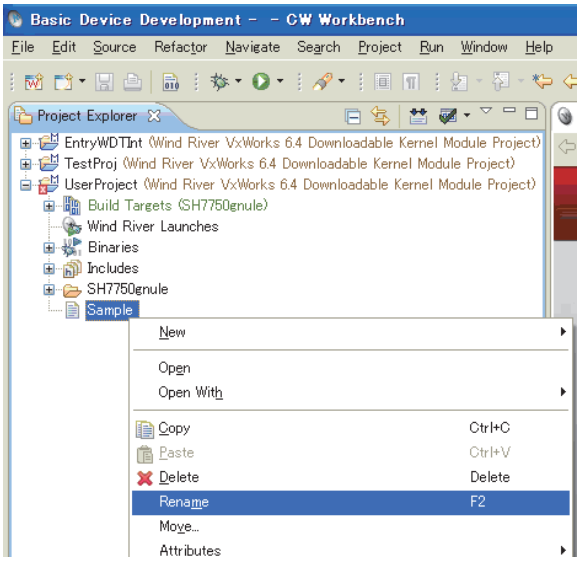
The source file may not have been registered in the build project.

- Action

  Create a file with extension of ".c" or ".cpp" or change the file name to the one with extension of ".c" or ".cpp". Register the file in the build project and execute the build.

  ☞ Page 57, CHAPTER 8

  Follow the instruction below to change the file name.



- With "Sample" selected, select [Rename] from the menu that pops up by right-clicking.
- Select "Sample" and press the F2 key.

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

The file with the same name as the project name may have been renamed.

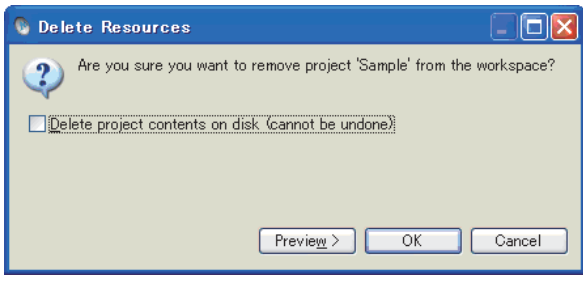
- Action

  Create a project and move the source file from the project where an error occurs.

  ☞ Page 57, CHAPTER 8

Point

The following message appears when the project where an error occurs is deleted. Check if the box is selected or cleared. Do not delete the necessary file by mistake.



Clicking the OK button with the box cleared (☐) deletes the project from the workspace. The file remains on the hard disk.

Clicking the OK button with the box selected (☑) deletes the project from the workspace. The file is deleted from the hard disk at the same time. (The deleted file cannot be recovered.)

(4) The following errors occur:

"xxx.sh: syntax error near unexpected token `yyy_partialImage/Debug/Objects/nnn'"

"xxx.sh: cannot execute binary file"

"Makefile:xxx: *** missing separator. Stop"

"yy.o: command not found...No such file or directory"

The source file name may have symbolic-characters.

- Action

  Remove the following symbols and characters that cannot be used from the file name with an error message nnn and from the name of the source file added to the project.

Symbols/characters that cause a build error	
#	Sharp sign
&	Ampersand
'	Apostrophe
(	Parenthesis
)	Parenthesis
;	Semicolon
=	Equality sign
`	Grave accent
Two-byte characters	
Katakana	

The following symbols that cannot be used for file names on Windows also cannot be used for the source file.

Symbols that cannot be used for file names on Windows©	
\	Backslash
/	Slash
:	Colon
*	Asterisk
?	Question mark
"	Quote
<	Less than
>	Greater than
|	Pipe

(5) .out file is not created.

The build terminates with a message "Generation of makefiles started."

The source file name may have a dollar sign "$".

- Action

  Remove "$" from the source file name.

11.4 Target Server Connection

(1) CW Workbench cannot be connected to the C Controller module.

(a) Case 1: [Log Console] A message "Differences for module "xxxxxxx" segment's address" appears.

The VxWorks image file of the C Controller module is not the same as that of CW Workbench.

- Action

  The VxWorks image file of the C Controller module must be the same as that of CW Workbench.

  ☞Page 77, Section 9.1

(b) Case 2: A message [Failed to Connect to Target] appears.

The C Controller module may not be connected to the CW Workbench network or the IP address setting may be wrong.

- Action

  Check the following items:

  - The C Controller module is on.
  - The C Controller module is properly operating. (There is no error.)
  - The LAN cable connector connecting the development environment (personal computer) to the C Controller module has been fully inserted into the LAN socket.
  - LEDs of all the LAN ports to which LAN cables are connected are lit.
  - IP addresses of the development environment (personal computer) and the C Controller module have been set properly.

Point

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

- Cache folder

  "C:\Documents and Settings\User name\.workbench-3.2.x.xxxxxxxx-xxxx"

  User name: The user name currently logged on

  x: A value added automatically

(c) Other causes

The host name of the development environment (personal computer) where CW Workbench has been installed may have only one character or more than 15 characters or may have two-byte characters or one-byte katakana.

- Action

  Set the host name of the development environment (personal computer) within 2 to 15 alphanumeric characters.

(2) When "Connect" is executed on the "Remote Systems" window, an error occurs and CW Workbench fails to be connected to the C Controller module.(Failed to Connect to Target)
The connection status of the Remote Systems suddenly changes from "Connected" to "Disconnected".

This error occurs when: "Connect" has been executed on the "Remote Systems" window of CW Workbench on multiple personal computers for one C Controller module, or "Connect" has been executed on the "Remote Systems" window of CW Workbench multiple times on one personal computer for one C Controller module.

- Action

  Do not execute "Connect" on multiple personal computers to one C Controller module at the same time.
  Do not execute "Connect" on the Remote Systems window of CW Workbench multiple times to one C Controller module.

(3) The selected target connections are not imported.

This error occurs when: the multiple target connections are selected, and the import operation is executed.

- Action

  Import the target connections one by one which are not imported.

11.5 Downloading

(1) .out file cannot be downloaded on the C Controller module.

[Problem Occurred] message

Possible Cause:

Download failed.

The path or the file name of the .out file to be downloaded has characters or symbols that cannot be used.

- Action

  Remove the following symbols and characters from the path or the file name of the .out file to be downloaded. Select the file again and download it.

Downloading fails if an .out file has the following symbols/characters for the path and the file name:	
'	Apostrophe
*	Asterisk
:	Colon
;	Semicolon
.	Period
<	Less than
>	Greater than
/	Slash
?	Question mark
Space	
Two-byte characters	
Katakana	

(2) .out file sometimes cannot be downloaded on the C Controller module.

The path of the VxWorks image file selected for the target server setting may have two-byte characters or katakana.

- Action

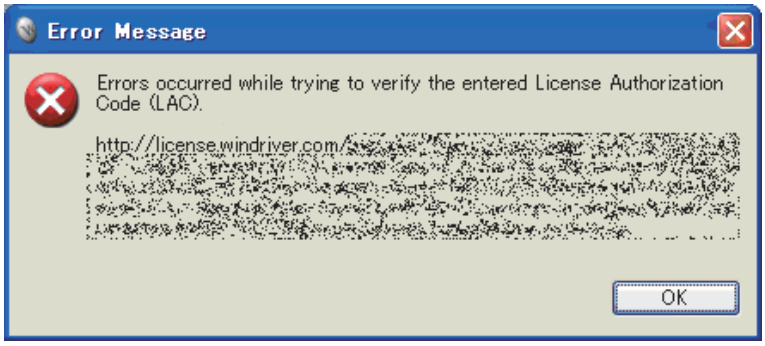
  Remove two-byte characters and katakana from the path of the VxWorks image file.

  ☞ Page 77, Section 9.1

11.6 Installation using a temporary license

(1) After an LAC code and user information are entered and the Next > button is clicked, an error message appears and the installation does not progress.

Error message



- Action

The following table describes how to respond to the error text displayed in the "Error Message" dialog box.

Error text	Action
HTTP Server: Bad Gateway	The HTTP server you are trying to access may not be responding properly. Try to install the product later. If the problem still remains, try to install the product another day.
Unknown Host:	The personal computer in use may be connected to the Internet via a proxy server. Use the < Back button and go back to the "Installer-Online Update Settings" window. Check the box of "Connect to internet using proxy server" and configure the proxy server setting.
Unable to read repository at	The personal computer in use may not be connected to the Internet. Check that the personal computer can be connected to the Internet. Install the product on the personal computer being connected to the Internet. When the personal computer is connected via a proxy server, conduct the measure of the error text (Unknown Host) above.

APPENDIX

Appendix 1 Installation and Uninstallation of the Plug-in Software

This section explains how to install and uninstall the plug-in software, an extended function of the product.

Remark

For details on the plug-in software functions, refer to the following Wind River Workbench document provided by Wind River Systems, Inc.

Click the menu bar [Help] ⇨ [Help Contents] ⇨ "Wind River Partners Documentation" → "Eclipse Workbench User Guide" → "Tasks" → "Updating and installing software"

Appendix 1.1 Installation

Follow the instructions below to install the plug-in software.

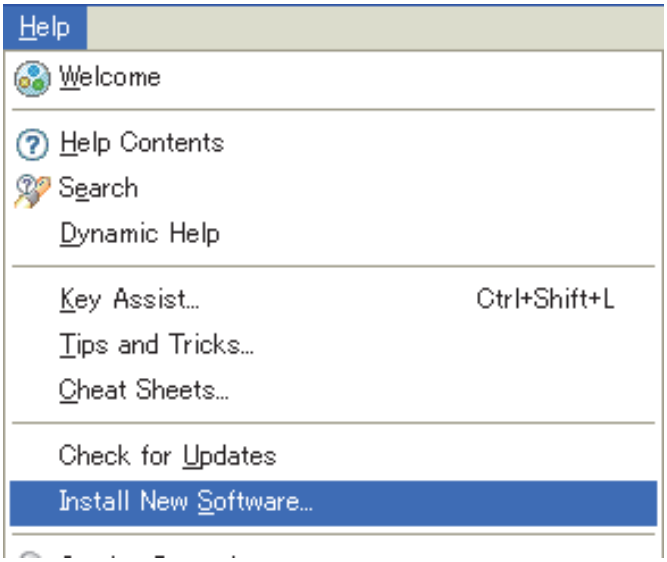
Point

- When installing the plug-in software, check that the product is in the "Advanced Device Development" mode.

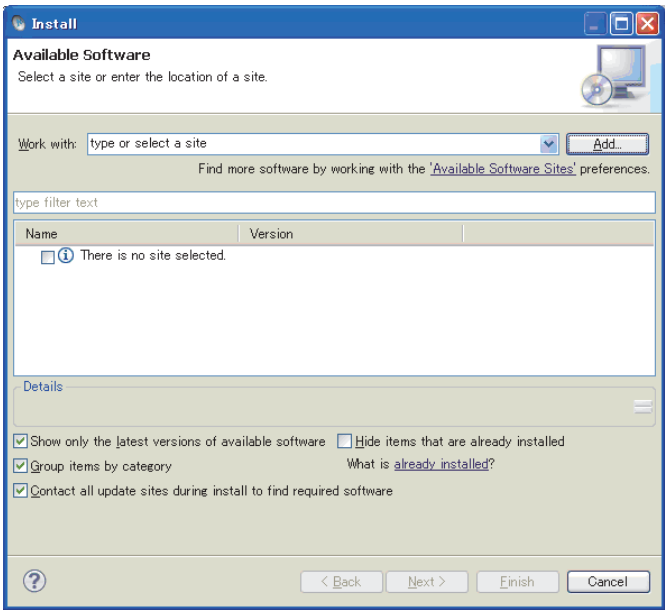
If "Basic Device Development" is displayed on the title bar, change it to "Advanced Device Development" by one of the following methods:

  - Select from the menu bar [Window] ⇨ [Open Perspective] ⇨ [Advanced Device Development].
  - From the menu that appears by clicking the Open Perspective icon ( ) at the upper right corner, select [Advanced Device Development].

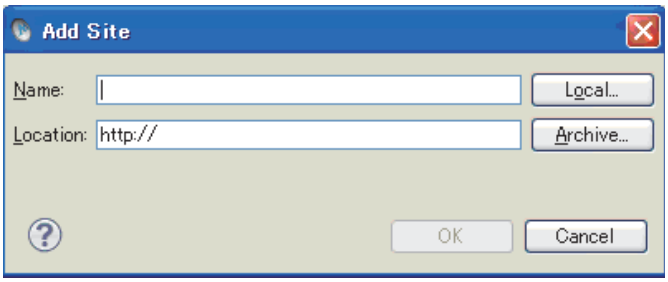
- The plug-in software install method explained in this chapter is the same as the general install method of Eclipse3.5. To install the plug-in software, follow instructions provided by plug-in software manufactures.
- For details on how to use the plug-in software installed, contact the plug-in software manufacturer.
- If the installed plug-in software does not properly operate, check if the software can be operated in Eclipse3.5 on public operating environment provided by the plug-in software manufacturer.



1. **To install the plug-in software, click the menu bar [Help] ⇨ [Install New Software...].**



2. **Click the Add... button on the Install window.**

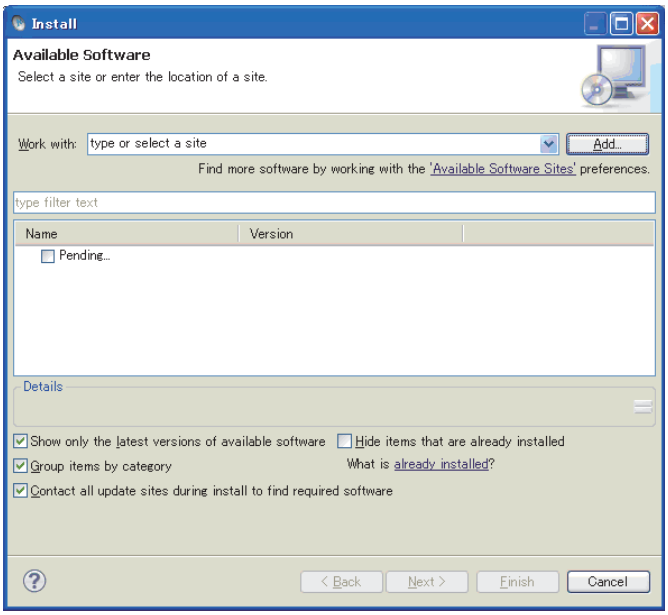


3. **Enter information for the Name and Location fields. Click the OK button. A web site where the plug-in is software installed is added.**

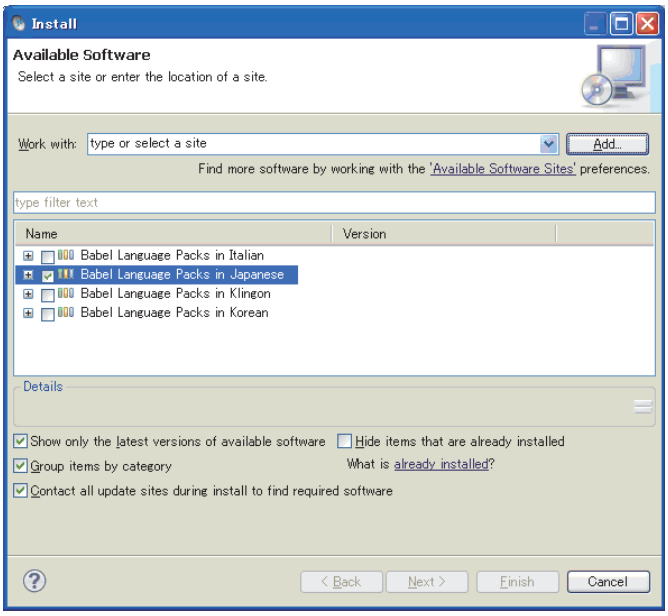
Remark

An Archive file downloaded from the web site can be also selected for the "Location" field by clicking the Archive... button.

To the next page



4. **Package that can be installed from the added Location is acquired.**
"Pending..." is displayed as shown on the window to the left while the information is being acquired.

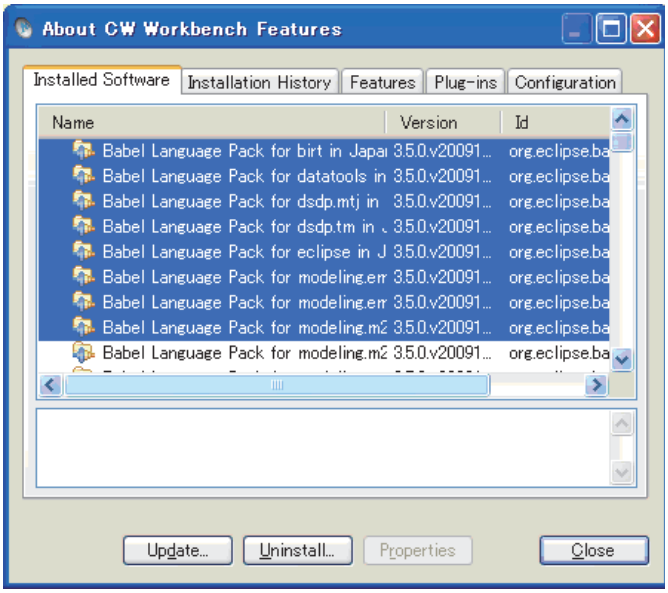


5. **When the package that can be installed has been acquired, package names are displayed.**
Select a package to be installed.
Click the Next > **button to install the plug-in software.**

Completed

Appendix 1.2 Uninstallation

Follow the instructions below to uninstall the plug-in software.



Completed

1. **Select the menu bar [Help] ⇨ [About CW Workbench Features].**

Click the Installation Details **button.**

2. **Open the <<Installed Software>> tab and select the packages to be deleted.**

Click the Uninstall... **button to uninstall the plug-in software.**

Appendix 2 License Errors

This section explains license errors that may occur when CW Workbench is started and being used.

Appendix 2.1 License errors

CW Workbench operates as below when a license error occurs at start-up and during use.

(1) Click the Retry button on the License Not Found dialog box.

- The license is repeatedly checked.

(2) Click the Cancel button on the "License Not Found" dialog box.

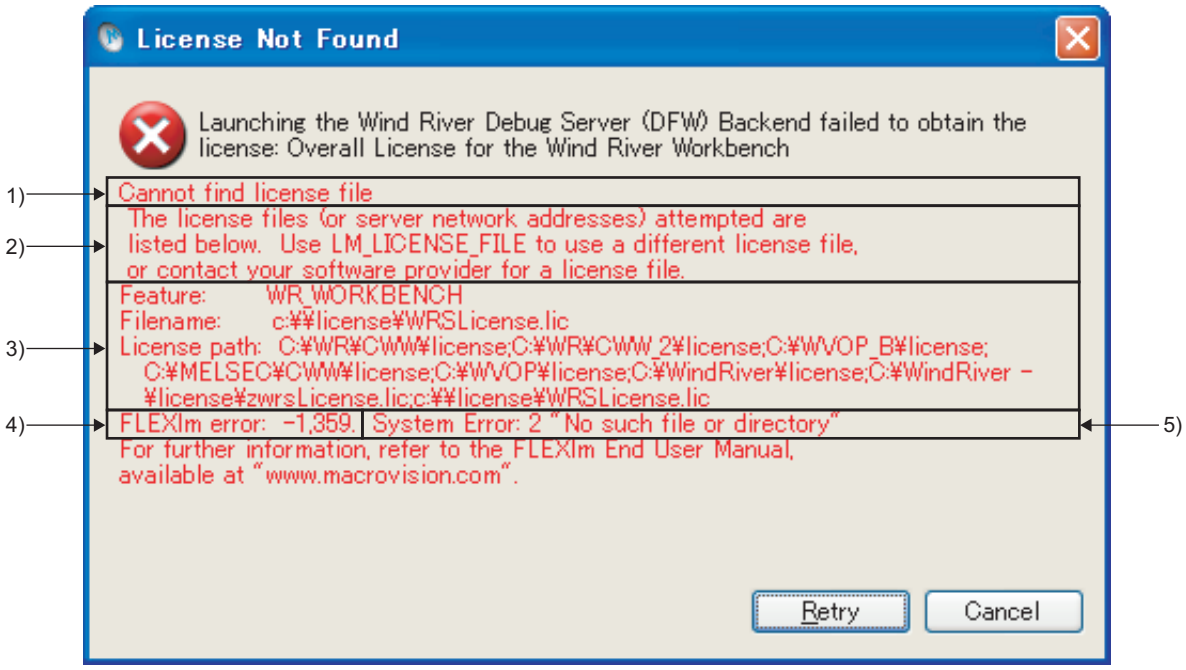
- The license check ends and CW Workbench continues to operate.

  If the Cancel button is clicked with license errors occurred and CW Workbench continues to operate, CW Workbench operates with the following functions disabled:

Functions that cannot be used when a license error occurs	Functions that can be used even when a license error occurs
• Project creation • Building • Target server connection • Downloading • Debugging	• Editor function (such as new creation, editing, saving, and searching) • Importing • Exporting

Appendix 2.2 License error message

When a license error occurs, an error message "License Not Found" shown below appears. Check error details based on an error number.



No.	Item	Description
1)	Error text	Displays an error outline within 80 characters.
2)	Error details*1	Displays error details and solutions/measures within 3 to 5 lines.
3)	Support information*1	Information such as a license file name and path information
4)	FLEXlm error information	Displays the error number and minor number of a license error case.(A number used when an FLEXlm vendor provides support. This guidebook omits explanations.) • FLEXlm error: □ , △ □ : Error number (-1 to negative number) △ : Minor number (1 to positive number) In the error message above (FLEXlm error: -1,359) Error number: -1 Minor number: 359
5)	System error information*1	Indicates the latest error number and error text of the operating system acquired before a license error.

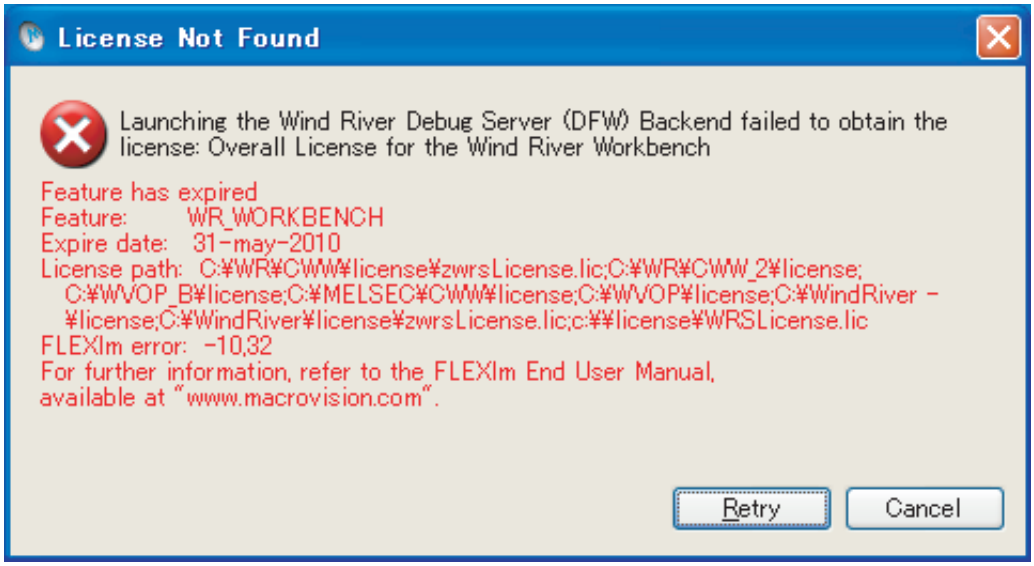
*1 These items are not displayed for the specific errors.

Appendix 2.3 Main license error messages and recovery procedures

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

(1) Trial period expiration

If CW Workbench is used with a temporary license, the following license error message appears after 31 days since installation.



(a) How to recover from the error

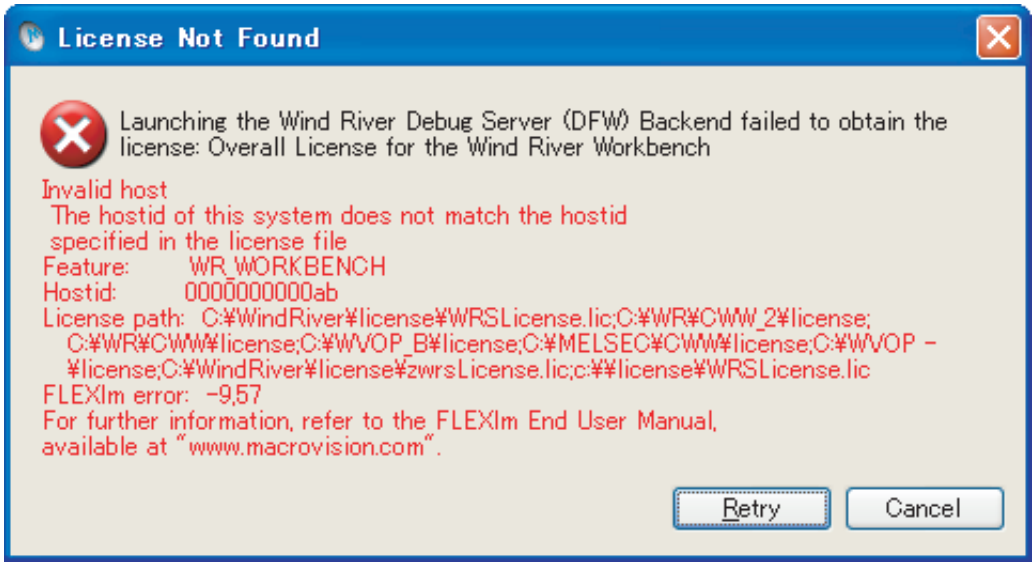
Acquire a permanent license and overwrite the file to use CW Workbench.

(2) Use of an illegal license

If there is an error in host information to be registered when a permanent license is acquired, the following license error message appears.

Point

When "DISK" is selected and a DISK serial number other than the one on the C drive is specified on the Permanent License Application Form, the same error occurs.
Enter a DISK serial number on the C drive for the Host ID.
When there are multiple drives on the development environment (personal computer) in use, do not enter a DISK serial number other than the one on the C drive for the Host ID.



(a) How to recover from the error

Recheck the Host ID of the personal computer where CW Workbench is being used.

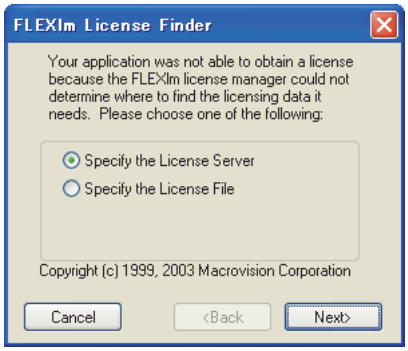
- If the Host ID is wrong:
  Apply for license transfer using License Transfer Certification Agreement Form in PermanentLicenseApplicationForm.xls stored in the DVD-ROM. The Host ID to enter here is as follows:
  Enter the wrong Host ID registered last time for "Previous License".
  Enter a new Host ID to be registered this time for "New License".
- If the Host ID is correct:
  Contact your local Mitsubishi service center or representative.

(3) Use of a file without license

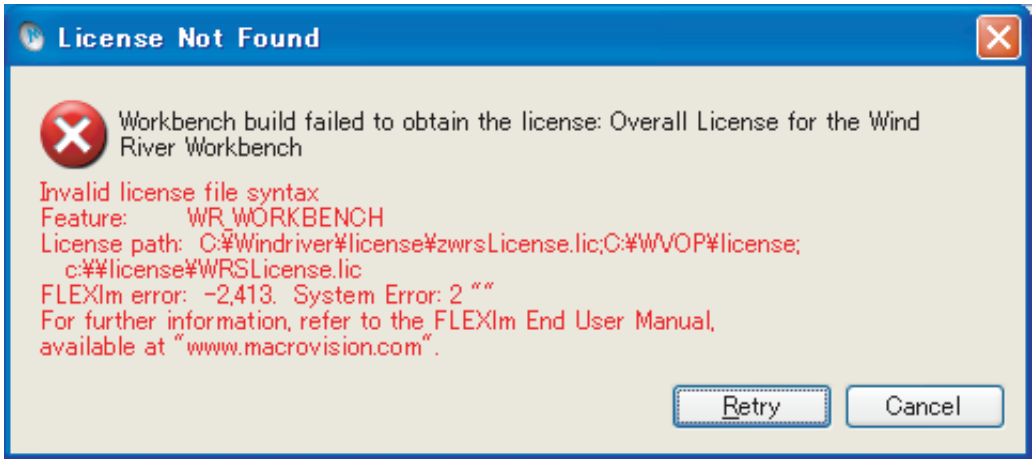
When CW Workbench has been installed using an install key, the following dialog box appears at the startup of CW Workbench.

Click the Cancel button to start CW Workbench. After the startup, the following license error message appears.

- Dialog box



- License error message



(a) How to recover from the error

Apply for a permanent license. After acquiring a permanent license file, apply it to the development environment (personal computer).

Appendix 3 Comparison with Wind River Workbench

The following table shows the comparison between this product (SW1DND-CWWLQ12-E, SW1DND-CWWLQ24-E) and Wind River Workbench.

Appendix 3.1 Comparison with SW1DND-CWWLQ12-E

○: Applicable, ×: Not applicable

Item		CW Workbench (SW1DND-CWWLQ12-E)	Wind River Workbench 2.6.1
Operating system	Windows 10 (Home, Pro, Enterprise, Education, IoT Enterprise 2016 LTSB)	○	×
	Windows 8.1, Windows 8.1 (Pro, Enterprise)		
	Windows 8, Windows 8 (Pro, Enterprise)		
	Windows 7 (Professional, Ultimate, Enterprise)		
	Windows Vista (Ultimate, Business, Enterprise)		
	Windows XP (Professional SP3) or later		○
Framework	Eclipse (Workbench basic function)	Ver.3.5	Ver.3.2
Compiler	SH7750gnule (Compiler for C Controller module (GCC for SH-4A Little Endian compiler)	○	○
	SIMNTgnu (Compiler for VxSim) (GCC for VxWorks Simulator Windows compiler))	×	○
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 6.x are created)	○	○
Debugger	Wind River VxWorks Simulator (A simulation function to execute debugging by running the Wind River VxWorks application on the operating system without the actual devices)	×	○
Runtime analysis tool	MemScope (Specify memory leaks by monitoring the memory usage.)	×	○
	ProfileScope (Analyze bottleneck of tasks by conducting statistical analysis on coding status.)		
	StethoScope (Analyze memory leaks by monitoring variables and data structures in real time.)		
	System Viewer (Analyze deadlock and task execution order by monitoring interrupt task status, CPU utilization, etc.)		

Appendix 3.2 Comparison with SW1DND-CWWLQ24-E

○: Applicable, ×: Not applicable

Item		CW Workbench (SW1DND-CWWLQ24-E)	Wind River Workbench 3.2
Operating system	Windows 10 (Home, Pro, Enterprise, Education, IoT Enterprise 2016 LTSB)	○	×
	Windows 8.1, Windows 8.1 (Pro, Enterprise)		
	Windows 8, Windows 8 (Pro, Enterprise)		
	Windows 7 (Professional, Ultimate, Enterprise)		○
	Windows Vista (Ultimate, Business, Enterprise)		
	Windows XP (Professional SP3) or later		
Framework	Eclipse (Workbench basic function)	Ver.3.5	Ver.3.5
Compiler	PENTIUM4gnu (Compiler for C Controller module (GCC for Intel Atom Z5xx compiler))	○	○
	SIMNTgnu (Compiler for VxSim (GCC for VxWorks Simulator Windows compiler))	×	○
Debugger	Wind River VxWorks Simulator (A simulation function to execute debugging by running the Wind River VxWorks application on the operating system without the actual devices)	×	○
	Dynamic Printf (A function to dynamically insert or cancel the printf statement when debugging the program without embedding the printf function to the source code with the similar operation as that of the breakpoint)	○	○
Runtime analysis tool	MemScope (Specify memory leaks by monitoring the memory usage.)	×	○
	ProfileScope (Analyze bottleneck of tasks by conducting statistical analysis on coding status.)		
	StethoScope (Analyze memory leaks by monitoring variables and data structures in real time.)		
	System Viewer (Analyze deadlock and task execution order by monitoring interrupt task status, CPU utilization, etc.)		

Appendix 4 Support

Appendix 4.1 Technical support assistance service regarding C Controller module

For technical support assistance service regarding C Controller module, refer to the table below.
If you are not sure which type the inquiry belongs to, please contact us. Please note that inquiries other than MELSEC-related inquiries may not be able to be answered.

Type	Inquiry	Where to contact
MELSEC-related	• Functions and specifications of C Controller module • Specifications and usage of the dedicated function library provided by Mitsubishi Electric Corporation • Setting/monitoring tools for the C Controller module, and functions and specifications of CW Workbench • Functions and specifications of the Mitsubishi products to be used with C Controller module (such as units and MELSOFT)	☞Information and services For further information and services, please consult your local Mitsubishi representative
Operating system-related	• 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: http://www.windriver.com
Plug-in software-related	• Inquiries regarding the plug-in software to be used with CW Workbench or Wind River Workbench	Plug-in software manufacturer

INDEX

A

Adding Project 67
Additional license product 14
Applying Permanent License 25

B

"Breakpoints" window 57
"Build Console" 57
Bus interface function 12

C

C Controller module 11,16
Creating Project 58
CW Workbench 11

D

Debug mode 61
DEBUG PROGRAM 85
"Debug" window 57
Deleting Permanent License 26
Documentation 39,53
Downloading Module 86
Dynamic Printf 96

E

Eclipse 12
"Editor" window 57

F

FTP Server 39,53

H

How to Apply Patch 55
How to Build Project 71
How to Obtain Patch 55

I

Install key file 18
Installation 27
Installation at X YYYY 39,53
Installation using a permanent license 20
Installation using a temporary license 20
Installation using an install key in the DVD-ROM . . . 20

L

LAC 33
License Errors 115
License Transfer 23

M

MELSEC data link function 12

O

Obtaining Permanent License 22
Operating Environment 16

P

Permanent License Application Form 18
Permanent License Application Form (sample) 18
Plug-in Software 111
Product Maintenance 39,53
Product with license 14
"Project Explorer" window 57

R

"Remote Systems" window 57

S

Sample programs 40
Setting Optimization Option 74
Setting Target Server 77
Shell 85
Specifications 17
Support 122

T

the installation location 30
TROUBLESHOOTING 98

U

Uninstallation 41
Updated license product 15
URL 12

V

"Variables" window "Registers" window "Expressions" window "Memory Browser" window 57
VxWorks 11
VxWorks 6.4.1 Application Developer 39
VxWorks 6.8.1 Application Developer 39,53
VxWorks COMx 39,53
VxWorks Development Shell 39,53

W

Wind River Registry for Workbench 3.2 39,43,53
Wind River Systems, Inc 11
Wind River Workbench 3.2 13

REVISIONS

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

Print date	*Manual number	Revision
Jan., 2011	SH(NA)-080982ENG-A	First edition
Dec., 2012	SH(NA)-080982ENG-B	Correction MANUAL PAGE ORGANIZATION, GENERIC TERMS AND ABBREVIATION, TERMS, Section 2.1, Section 2.2, Section 2.3, Section 2.4, Section 3.1, Section 3.2, Section 5.1, Section 6.1.1, Section 6.1.2, Section 6.1.3, Section 6.2.1, Section 6.2.2, Chapter 7, Section 8.1, Section 8.3, Section 9.1.1, Section 9.1.2, Section 11.3 Addition Section 6.3, Section 10.5, Appendix 3
May, 2013	SH(NA)-080982ENG-C	Correction Chapter 11, Section 11.4
Nov., 2013	SH(NA)-080982ENG-D	Correction RELEVANT MANUALS, GENERIC TERMS AND ABBREVIATION, Section 8.1, Section 9.1.1, Section 9.1.2 Addition PRODUCT ORGANIZATION
Jul., 2014	SH(NA)-080982ENG-E	Correction RELEVANT MANUALS, GENERIC TERMS AND ABBREVIATION, TERMS, PRODUCT ORGANIZATION, Section 2.1, Section 2.2, Section 2.4, Section 6.1.2, Section 6.1.3, Section 6.3.1, Section 8.1, Section 8.3, Section 9.1.1, Section 9.1.2, Section 9.3, Section 10.5, Section 11.3
Nov., 2017	SH(NA)-080982ENG-F	Correction RELEVANT MANUALS, GENERIC TERMS AND ABBREVIATION, Section 1.1, Section 2.3, Section 6.1.1, Section 6.1.3, Section 6.2.1, Section 6.2.2, Section 6.2.3, Section 6.3.2, Chapter 7, Chapter 11, Section 11.1, Appendix 3.1, Appendix 3.2
Jul., 2019	SH(NA)-080982ENG-G	Correction Section 2.3, Appendix 3.1, Appendix 3.2

Japanese Manual Version SH-080981-I

This manual confers no industrial rights or any rights of any other kind, nor does it confer any patent licenses.
Mitsubishi Electric Corporation cannot be held responsible for any problems involving industrial property rights which may occur as a result of using the contents noted in this manual.

© 2011 MITSUBISHI ELECTRIC CORPORATION

Memo

TRADEMARKS

Microsoft, Windows Vista, and Windows XP are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
Intel and Pentium are either registered trademarks or trademarks of Intel Corporation in the United States and/or other countries.
Oracle and Java are registered trademarks of Oracle and/or its affiliates.
VxSim, VxWorks, and Wind River are either registered trademarks or trademarks of Wind River Systems, Inc.
Adobe, Acrobat, and Reader are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.
The company names, system names and product names mentioned in this manual are either registered trademarks or trademarks of their respective companies.
In some cases, trademark symbols such as '™' or '®' are not specified in this manual.

SH(NA)-080982ENG-G(1907)KWIX
MODEL: SW1DND-CWWLQ12-O-E
MODEL CODE: 13JU71

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN

When exported from Japan, this manual does not require application to the Ministry of Economy, Trade and Industry for service transaction permission.

Specifications subject to change without notice.