

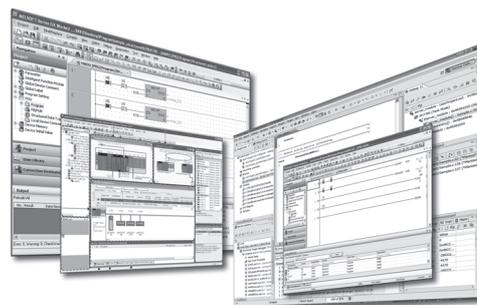


Engineering Software

# CW Workbench/CW-Sim Operating Manual

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-SW1DND-CWWR-E  
-SW1DND-CWSIMR-EZ  
-SW1DNC-CWSIMSAR-E



Powered by  
**WIND RIVER**

CW Workbench and CW-Sim were jointly developed by Mitsubishi and  
Wind River Systems, Inc.



# SAFETY PRECAUTIONS

---

(Read these precautions before using this product.)

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

The precautions given in this manual are concerned with this product only. For the safety precautions for the programmable controller system, refer to the user's manual for the module used and MELSEC iQ-R Module Configuration Manual.

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

---

## **WARNING**

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.

---

## **CAUTION**

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

---

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

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

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

## [Design Precautions]

---

### **WARNING**

- When handling external devices and performing the following operations, configure an interlock circuit in a user program to ensure that the entire system will always operate safely.

- (1) Changing data of the running C Controller module and C intelligent function module from the connected personal computer
- (2) Changing the operating status
- (3) Operating from a personal computer

Especially, in the case of a control from an external device to a remote C Controller module and C intelligent function module, immediate action cannot be taken for a problem on the C Controller module and C intelligent function module due to a communication failure.

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

---

## [Security Precautions]

---

### **WARNING**

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

## [Startup and Maintenance Precautions]

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### **WARNING**

---

- When handling external devices and performing the following operations, configure an interlock circuit in a user program to ensure that the entire system will always operate safely.
    - (1) Changing data of the running C Controller module and C intelligent function module from the connected personal computer
    - (2) Changing the operating status
    - (3) Operating from a personal computerEspecially, in the case of a control from an external device to a remote C Controller module and C intelligent function module, immediate action cannot be taken for a problem on the C Controller module and C intelligent function module due to a communication failure.  
To prevent this, configure an interlock circuit in a user program, and determine corrective actions to be taken between the external device and C Controller module and C intelligent function 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) connect the peripheral devices to the running C Controller module, read relevant manuals, and ensure the safety. Improper operation may damage machines or cause accidents.
  - When connecting any external device during operations of CW-Sim and CW-Sim Standalone, ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.
-

# CONDITIONS OF USE FOR THE PRODUCT

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- (1) MELSEC programmable controller ("the PRODUCT") shall be used in conditions;
- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
  - ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.
- (2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries. MITSUBISHI ELECTRIC SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI ELECTRIC USER'S, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
- ("Prohibited Application")
- Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
  - Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
  - Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.
- Notwithstanding the above restrictions, Mitsubishi Electric may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi Electric and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi Electric representative in your region.
- (3) Mitsubishi Electric shall have no responsibility or liability for any problems involving programmable controller trouble and system trouble caused by DoS attacks, unauthorized access, computer viruses, and other cyberattacks.

# INTRODUCTION

---

Thank you for purchasing CW Workbench and CW-Sim.

This manual describes the procedures for operations, system configurations, and troubleshooting when using CW Workbench and CW-Sim.

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

Note that the menu names and operating procedures may differ depending on an operating system in use and its version.

When reading this manual, replace the names and procedures with the applicable ones as necessary.

Please make sure that the end users read this manual.

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# RELEVANT MANUALS

Manual name [manual number]	Description	Available form
CW Workbench/CW-Sim Operating Manual [SH-081373ENG] (this manual)	System configuration, specifications, functions, and troubleshooting of CW Workbench/CW-Sim	e-Manual PDF
CW Configurator Operating Manual [SH-081382ENG]	System configuration, parameter settings, and operation methods for the online function of CW Configurator	e-Manual PDF
MELSEC iQ-R C Controller Module User's Manual [SH-082558ENG]	Procedures before operation, specifications, devices, memory, functions, parameters, and troubleshooting of a C Controller module	Print book e-Manual PDF
MELSEC iQ-R C Intelligent Function Module User's Manual (Startup) [SH-081566ENG]	Specifications, procedure before operation, wiring, and operation examples of a C intelligent function module	Print book e-Manual PDF
MELSEC iQ-R C Intelligent Function Module User's Manual (Application) [SH-081567ENG]	Functions, input/output signals, buffer memory, parameter setting, and troubleshooting of a C intelligent function module	Print book e-Manual PDF
MELSEC iQ-R C Controller Module Programming Manual [SH-081371ENG]	Programming specifications and dedicated functions of a C Controller module	e-Manual PDF
MELSEC iQ-R C Intelligent Function Module Programming Manual [SH-081568ENG]	Programming specifications and dedicated functions of a C intelligent function module	e-Manual PDF
MELSEC iQ-R C Controller Module/C Intelligent Function Module Programming Manual (Data Analysis) [SH-081756ENG]	Programming specifications and dedicated function library for analyzing the data of a C Controller module and a C intelligent function module	e-Manual PDF



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

e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- Hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.

# TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
C Controller module	A generic term for MELSEC iQ-R series C Controller modules
C Controller module dedicated function	A dedicated function library offered by a C Controller module. It is used to control the C Controller module.
C intelligent function module	A generic term for MELSEC iQ-R series C intelligent function modules
C intelligent function module dedicated function	A dedicated function library offered by a C intelligent function module. It is used to control a C intelligent function module.
CW Configurator	A generic product name for SWnDND-RCCPU ('n' indicates its version.)
CW Workbench	An abbreviation for a C Controller module and C intelligent function module engineering tool, CW Workbench
CW-Sim	An abbreviation for VxWorks simulator that can operate and debug a C Controller module and C intelligent function module program on a personal computer with CW Workbench installed, without connecting to an actual device (target)
CW-Sim Standalone	An abbreviation for VxWorks simulator that can operate a C Controller module and C intelligent function module program even on a personal computer without CW Workbench installed
Data analysis function	A dedicated function library offered by a C Controller module and a C intelligent function module. It is used for data analysis processing.
Dedicated function library	A generic term for C Controller module dedicated functions, C intelligent function module dedicated functions, MELSEC data link functions, MELSEC iQ-R series data link functions, data analysis functions, and statistical analysis functions
Eclipse	An open-source integrated development environment written in Java
Existing CW Workbench	A generic term for engineering tool CW Workbench for C Controller modules used for Q24DHCCPU-V, Q24DHCCPU-VG, and Q12DCCPU-V <ul style="list-style-type: none"> <li>• For Q24DHCCPU-V and Q24DHCCPU-VG SW1DND-CWWLQ24-E, SW1DND-CWWLQ24-EZ, and SW1DND-CWWLQ24-EVZ</li> <li>• For Q12DCCPU-V SW1DND-CWWLQ12-E, SW1DND-CWWLQ12-EZ, and SW1DND-CWWLQ12-EVZ</li> </ul>
GX Works3	A generic product name for SWnDND-GXW3 ('n' indicates its version.)
Installation key file	A file to install CW Workbench/CW-Sim with no license. It is stored in the DVD-ROM of CW Workbench/CW-Sim.
MELSEC data link function	A dedicated function library offered by a C Controller module. It is used to access another CPU module as a connection target via network or in a multiple CPU system.
MELSEC iQ-R series data link function	A dedicated function library offered by a C intelligent function module. It is used to access an own station or modules on the network.
R12CCPU-V	An abbreviation for an R12CCPU-V C Controller module
RD55UP06-V	An abbreviation for an RD55UP06-V C intelligent function module
RD55UP12-V	An abbreviation for an RD55UP12-V C intelligent function module
RTP	An abbreviation for Real Time Process Project; that is one of the project types of Wind River's Workbench. A technology capable of executing an application in a user space.
Statistical analysis function	A dedicated function library offered by a C Controller module and a C intelligent function module. It is used for statistical analysis processing.
Target	A generic term for C Controller modules and C intelligent function modules
VxSim	A generic term for the VxWorks simulator functions of Wind River Workbench
VxWorks	A product name for a real-time operating system manufactured by Wind River Systems, Inc.
Wind River Workbench	A generic term for Wind River Workbench manufactured by Wind River Systems, Inc.

# PART 1

# FUNDAMENTALS OF CW Workbench/CW-Sim

This part explains the features and system configuration of CW Workbench and CW-Sim.

1 BEFORE USING PRODUCTS

---

2 SYSTEM CONFIGURATION

---

# 1 BEFORE USING PRODUCTS

---

This chapter explains the overview of CW Workbench, CW-Sim, and CW-Sim Standalone.

## 1.1 CW Workbench

---

CW Workbench is a product to develop user programs that operate on C Controller modules and C intelligent function modules.

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 3.3.

### Features

---

CW Workbench has the following features:

#### **Integrated development environment**

CW Workbench provides an integrated development environment to perform operations such as project management, source code editing, building, and debugging. Therefore, an effective user program for C Controller modules and C intelligent function modules can be developed.

#### **Same specifications as those of Wind River Workbench 3.3**

The specifications of CW Workbench regarding displays and operations for the function are same as Wind River Workbench 3.3.

#### **Windows<sup>®</sup>-supported operating system of personal computer**

CW Workbench is supported by Windows 10 and Windows 11. Some 64-bit version operating systems are also supported.

For more details, refer to the following:

☞ Page 21 Operating Environment

#### **Extended functions using plug-in software**

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

## 1.2 CW-Sim and CW-Sim Standalone

CW-Sim and CW-Sim Standalone are products which allow to simulate the programs of VxWorks on a personal computer. CW-Sim is used as an add-on to CW Workbench.

CW-Sim Standalone is a runtime environment that enables the VxWorks simulation function on a personal computer on which CW Workbench has not been installed.

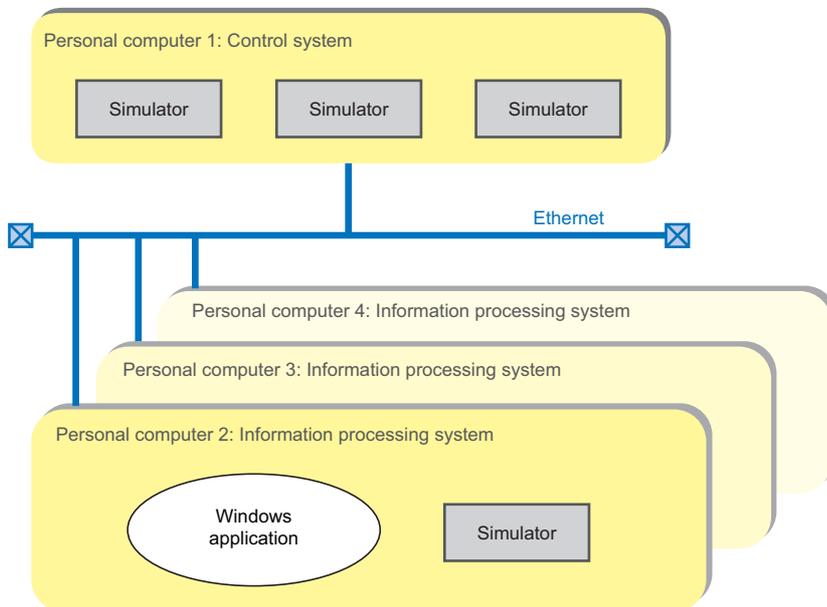
CW-Sim and CW-Sim Standalone are OEM products of Wind River Systems, Inc. The product has only basic functions (VxSim) required for simulation, as a subset product of Wind River Workbench 3.3.

The specifications regarding displays and operations of the common functions are all the same as those for Wind River Workbench.

### Features

CW-Sim/CW-Sim Standalone has the following features:

- VxWorks system can be simulated without C Controller modules and C intelligent function modules.
- The program quality and device safety can be improved before actual operations.
- It can be used for training or debugging of a system consisting of more than one personal computer.



#### Point

Since CW-Sim and CW-Sim Standalone do not support the system functions of the dedicated function library provided by C Controller modules and C intelligent function modules, it is required to create a system function stub according to the application or delete the caller of the system function.

To debug any program which contains a dedicated function library, create a stub by the customer.

The sample stub programs are stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD).

# 1.3 Procedure Overview

The following shows the operating procedure from installation up to debugging.

## CW Workbench

**1.** Acquire a permanent license.

☞ Page 29 Acquiring/Reacquiring Permanent License

**2.** Install CW Workbench.

Permanent license file: Present	Install CW Workbench using a permanent license.
Permanent license file: Absent Internet connection: Present	Install CW Workbench using a temporary license.
Permanent license file: Absent Internet connection: Absent	Install CW Workbench using an installation key file.

☞ Page 31 Installation

**3.** Apply a permanent license.

When installing CW Workbench using a temporary license or an installation key file, apply a permanent license which will be sent later to a personal computer.

☞ Page 42 Applying Permanent License

**4.** Apply a patch.

Please contact your local Mitsubishi Electric sales office or representative to obtain a patch file.

☞ Page 43 Applying Patch

**5.** Create a project.

☞ Page 54 Creating New Projects

**6.** Build a user program.

☞ Page 67 Building a Project

**7.** Connect with a Target.

☞ Page 71 Setting Target Server

**8.** Download user program to Target.

☞ Page 77 Downloading Module for Debugging

**9.** Debug a user program.

☞ Page 79 Debugging User Programs

## CW-Sim

### 1. Acquire a permanent license.

☞ Page 29 Acquiring permanent license

### 2. Install CW-Sim. (CW-Sim is installed at the same time as the installation of CW Workbench.)

Permanent license file: Present	Install CW Workbench using a permanent license.
Permanent license file: Absent Internet connection: Present	Install CW Workbench using a temporary license.

☞ Page 31 Installation

### 3. Apply a permanent license.

When installing CW-Sim using a temporary license, apply a permanent license which will be sent later to a personal computer.

☞ Page 42 Applying Permanent License

### 4. Apply a patch.

Please contact your local Mitsubishi Electric sales office or representative to obtain a patch file.

☞ Page 43 Applying Patch

### 5. Create a project.

☞ Page 54 Creating New Projects

### 6. Build a user program.

☞ Page 67 Building a Project

### 7. Connect to CW-Sim.

☞ Page 85 Setting VxWorks Network Daemon

☞ Page 90 Starting VxWorks Network Daemon

☞ Page 91 Starting Simulator

### 8. Debug a user program.

☞ Page 79 Debugging User Programs

# CW-Sim Standalone

---

## 1. Install CW-Sim Standalone.

Copy an execution file from the CD-ROM to the local folder on a personal computer.

☞ Page 45 Installation

## 2. Create a project.

☞ Page 54 Creating New Projects

## 3. Build a user program.

☞ Page 67 Building a Project

## 4. Connect to CW-Sim Standalone.

☞ Page 85 Setting VxWorks Network Daemon

☞ Page 95 Starting VxWorks Network Daemon

☞ Page 96 Starting Simulator

## 5. Execute a user program.

☞ Page 79 Debugging User Programs

# 2 SYSTEM CONFIGURATION

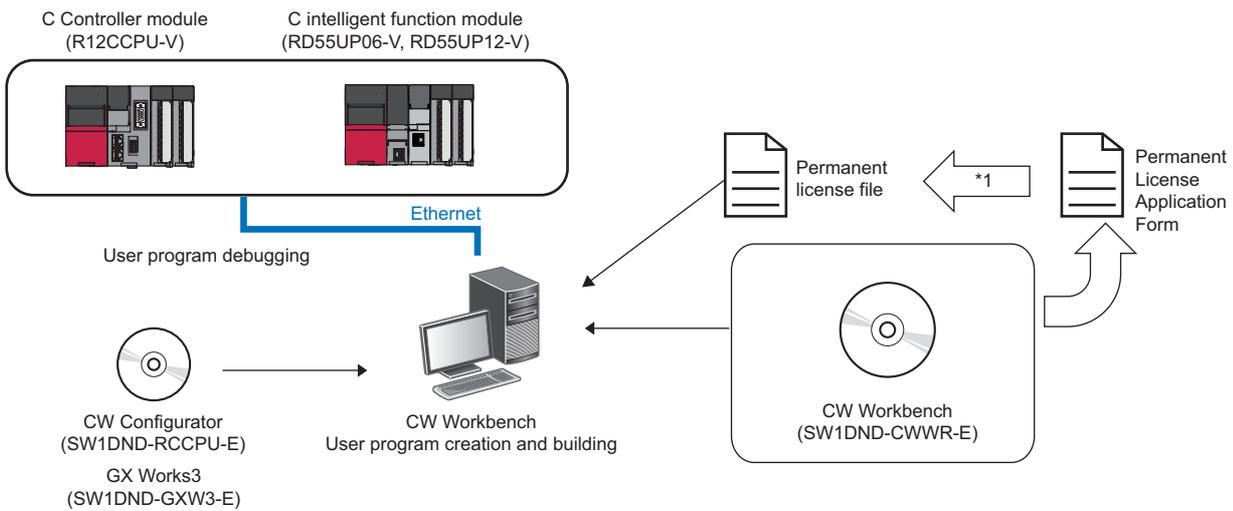
This chapter explains the system configuration of CW Workbench, CW-Sim, and CW-Sim Standalone.

## 2.1 Configurations

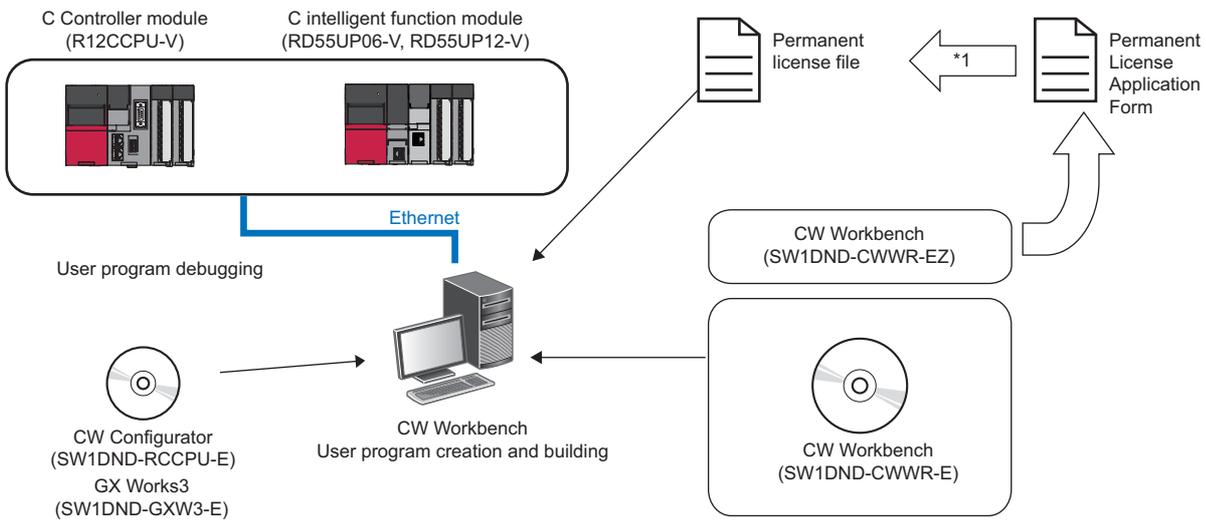
### CW Workbench

The following shows the environment for developing user programs with CW Workbench.

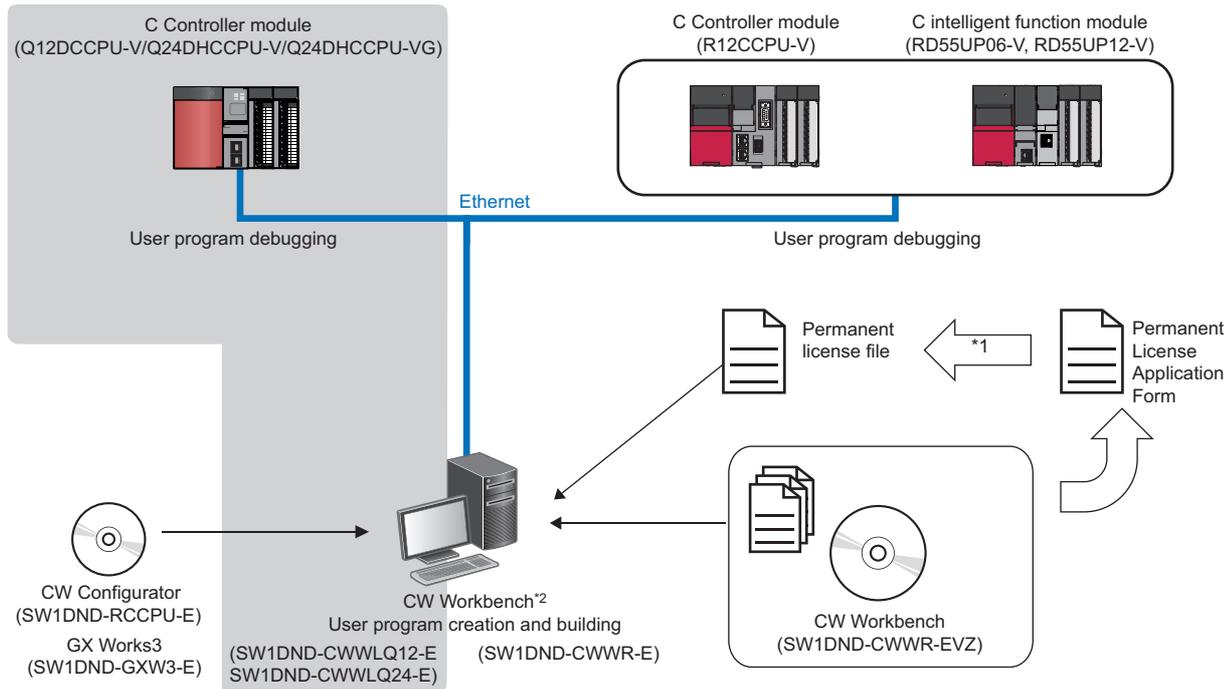
#### Product with license



#### Additional license product



## Updated license product



\*1 A permanent license is required to install CW Workbench.

\*2 Install SW1DND-CWWR-E in a different folder from the one with SW1DND-CWWLQ12-E/SW1DND-CWWLQ24-E. Note that SW1DND-CWWLQ12-E/SW1DND-CWWLQ24-E and SW1DND-CWWR-E cannot be started at the same time.

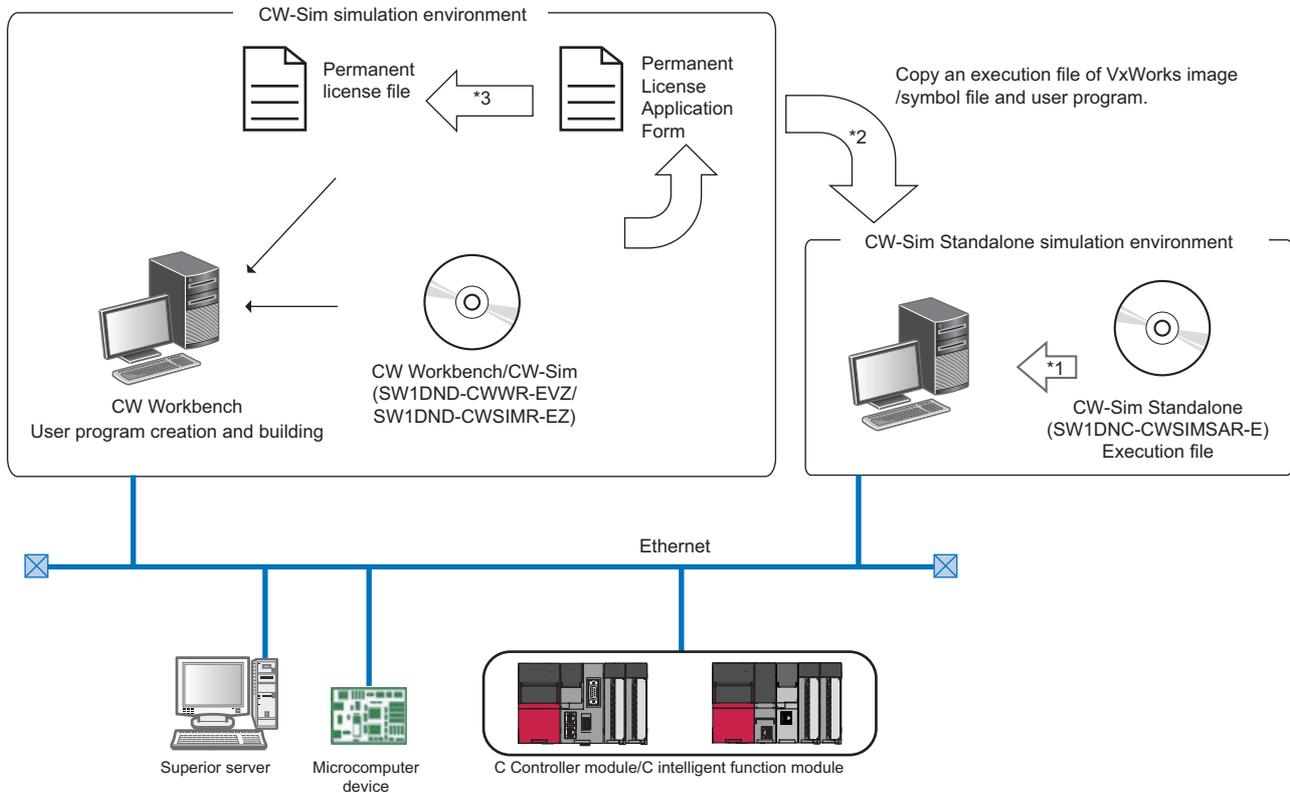
### Point

If the CPUs, which are to be used after update, are not described in "Target CPU" of the Permanent License Application Form, please contact your local Mitsubishi Electric sales office or representative.

## CW-Sim and CW-Sim Standalone

The simulation environment of CW-Sim is established by installing CW Workbench/CW-Sim on a personal computer. The simulation environment of CW-Sim Standalone is configured with the execution file of CW-Sim Standalone\*<sup>1</sup> and VxWorks image/symbol files\*<sup>2</sup>.

Programs running on the simulator can be interlocked with superior server, microcomputer device, C Controller module, and C intelligent function module via Ethernet.



\*1 The execution file of CW-Sim Standalone can be copied from the CW-Sim Standalone CD-ROM (SW1DNC-CWSIMR-ECD).

\*2 VxWorks image/symbol files can be copied from the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD).

\*3 Permanent licenses are required for each of CW Workbench and CW-Sim.

## Available communication routes for CW-Sim/CW-Sim Standalone

Windows applications running on the simulator communicate via the virtual network of the simulator or Ethernet.

The following information with figure explains the communication routes available for applications running on the simulator.

### ■ Between the simulators on the same personal computer

Ex.

The route (1) in the figure below

### ■ Between the simulator and another application on the same personal computer

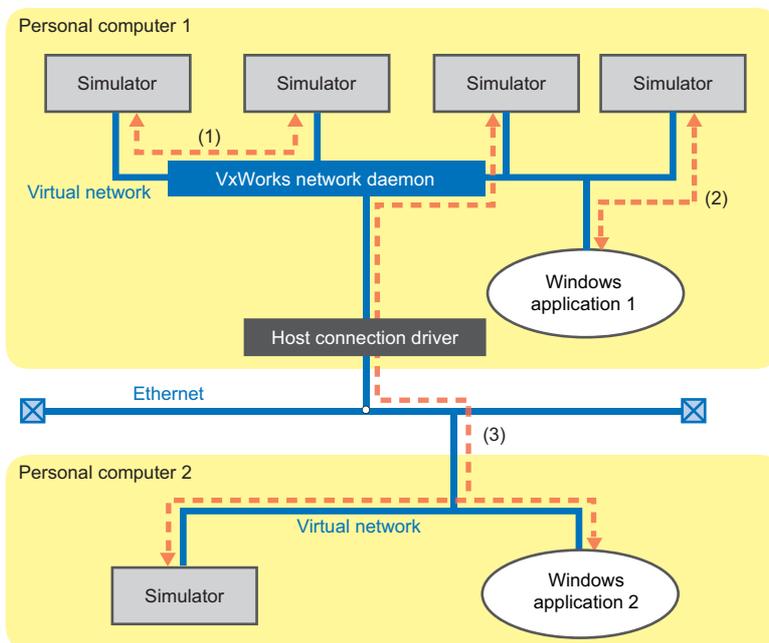
Ex.

The route (2) in the figure below

### ■ Between the simulator and another application on another personal computer (including a simulator)

Ex.

The route (3) in the figure below



Item	Description
VxWorks network daemon	Software (vxsimnetd) to establish the virtual network between the simulators
Host connection driver	Software that is a gateway to connect the virtual network established using the VxWorks network daemon to Ethernet

### Point

The specifications of the sample programs stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD) are as follows:

- Four programs are simulated on a single personal computer.
- A program communicates with other programs via the virtual network.
- Simulate the dedicated function library called from a program by executing the function in the stub (CCPU\_Simulator and CCTL\_Simulator). (Page 97 USAGE EXAMPLE OF CW-SIM USING SAMPLE PROGRAM)

## 2.2 Supported Modules

CW Workbench, CW-Sim, and CW-Sim Standalone support the following modules.

Module name	Operating system type
R12CCPU-V	VxWorks 6.9
RD55UP06-V	
RD55UP12-V	

2

## 2.3 Operating Environment

The following table shows the operating environment of a personal computer on which CW Workbench, CW-Sim, and CW-Sim Standalone can run.

Item	Description	
Personal computer	A personal computer on which Microsoft® Windows® operates	
CPU	Windows 11	2 or more cores on a compatible 64-bit processor or System on a Chip (SoC)
	Windows 10	Intel® Core™ 2 Duo 2 GHz or more recommended
Memory requirements	Windows 11	4 GB or more recommended
	Windows 10	64-bit OS: 2 GB or more 32-bit OS: 1 GB or more (2 GB or more recommended)
Hard disk space	Install size	HDD 4 GB or more
	Executable size	Virtual memory 512 MB or more
Display	Resolution 1024 × 768 pixels or higher	
Disk drive	DVD-ROM drive	
Interface	Ethernet 10BASE-T/100BASE-TX/1000BASE-T	
OS*1*2*3*4*5 (Japanese/English)	<ul style="list-style-type: none"> <li>• Windows 11 (Home, Pro, Enterprise, Education)</li> <li>• Windows 10 (Home, Pro, Enterprise, Education, IoT Enterprise 2016 LTSP*6)</li> </ul>	

\*1 To install/uninstall CW Workbench/CW-Sim, log on as a user with administrative privileges.

\*2 TCP/IP is required to be installed.

\*3 When the following functions are used, this product may not run properly.

- Application start-up in Windows compatibility mode
- Fast user switching
- Remote desktop
- Touch function
- Tablet mode
- Virtual desktop
- Text cursor indicator

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

The size of the text and other items in the screen is other than 100% (96 DPI, 9 pt etc.).

\*5 The FTP server included in CW Workbench/CW-Sim cannot be used. For using the FTP server, use Microsoft® Internet Information Services.

\*6 64-bit version only.

## 2.4 Specifications

Item	Specifications		
	CW Workbench	CW-Sim	CW-Sim Standalone
Supported host operating system	Page 21 Operating Environment		
Supported C Controller module	R12CCPU-V		
Supported C intelligent function module	RD55UP06-V, RD55UP12-V		
Supported target operating system	VxWorks 6.9		None
Framework	Wind River Workbench 3.3 base (Eclipse3.6)		None
Project creation and management	VxWorks Downloadable Kernel Module Project	None	None
Building	GNU compiler (GCC for ARM Cortex A9)	GNU compiler (SIMNTgnu_SMP)	None
Debugger	<ul style="list-style-type: none"> <li>• Debugging execution restart</li> <li>• Debugging execution forced stop</li> <li>• Breakpoints</li> <li>• Step execution</li> <li>• Variables/structure variables reference and editing</li> <li>• Register value reference and editing</li> <li>• Memory block reference and editing</li> <li>• Target connection agent</li> <li>• Dynamic Printf</li> </ul>	None	None
License format	Node locked	Node locked	Runtime
Document	Wind River Workbench 3.3 Help document	Wind River VxWorks Simulator Help document	

### Differences between C Controller modules and C intelligent function modules

A particular attention is required while developing a user program in CW-Sim/CW-Sim Standalone and the differences between C Controller modules and C intelligent function modules are as follows.

#### Floating point function

The hardware floating point function is not supported.  
Use the following ANSI floating point function.

#### ■ Available ANSI floating point functions

acos, asin, atan, atan2, cos, cosh, exp, fabs, floor, fmod, log, log10, pow, sin, sinh, sqrt, tan, tanh  
If any ANSI floating point function other than those listed above is used, a symbol error occurs in loading.

#### Dedicated function library

Any dedicated function libraries (C Controller module dedicated functions, C intelligent function module dedicated functions, MELSEC data link functions, MELSEC IQ-R series data link functions, data analysis functions, and statistical analysis functions) cannot be simulated. To debug a program containing these functions, create a stub or delete the caller. Sample stub programs are stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD).



For more information, refer to the manual stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD). (Wind River VxWorks Simulator User's Guide)

## 2.5 Contents of DVD-ROM/CD-ROM

This section shows the contents in a DVD-ROM of CW Workbench/CW-Sim and the ones in a CD-ROM of CW-Sim Standalone.

### Precautions

If using an RD55UP12-V, use files stored in the folders for an RD55UP06-V.

### CW Workbench/CW-Sim DVD-ROM

The CW Workbench/CW-Sim DVD-ROM stores the following items:

Folder path	Content	Description
\	Installation execution file	An installation file of CW Workbench and CW-Sim.
	Permanent License Application Form	An application form for acquiring a permanent license.
	Installation key file	A file to be used as an installation key when Internet is not connected and a permanent license file has not been acquired. If CW Workbench is installed using an installation key file (Install_ARM.txt), CW Workbench will operate with no license.
\images	Installation image file	An installation image file of CW Workbench and CW-Sim.
\docs	Wind River Workbench manuals	Relevant manuals for VxWorks Simulator and Wind River Workbench 3.3 (PDF).
	VxWorks Simulator manuals	
\manual	CW Workbench/CW-Sim Operating Manual	A manual for MELSEC iQ-R CW Workbench/CW-Sim (e-Manual).
\e-Manual Viewer	Installation execution file (setup.exe)	An installation file of the browsing tool for e-Manual.
\3rd_party_license_notices	OS (vxworks-6.9.pdf) Communication protocols (mipc-2.2.pdf) Compiler (wrcompiler-5.9.1.pdf) Installer (installer-2.5.pdf)	A license notice (PDF) of the third party product used in CW Workbench and CW-Sim.
\src	CW Workbench open source file	An open source file of CW Workbench.
\include\R12CCPU-V	C Controller module dedicated function (CCPUFunc.h)	A header file of a dedicated function library.
	MELSEC data link function (MDFunc.h)	
	Data analysis function/statistical analysis function (DANLFunc.h)	
	Motion module dedicated class header file (MCFBFunc.h)	
\include\RD55UP06-V \include\RD55UP12-V	C intelligent function module dedicated function (CITLFunc.h)	
	MELSEC iQ-R series data link function (MDRFunc.h)	
	Data analysis function/statistical analysis function (DANLFunc.h)	
\VxWorks\R12CCPU-V \VxWorks\RD55UP06-V	vxWorks_6_9_SMP vxWorks_6_9_SMP.sym	A VxWorks image file*1 and a symbol file.
	vxWorks_6_9_SMP_V2 vxWorks_6_9_SMP_V2.sym	
\Samples\R12CCPU-V \Samples\RD55UP06-V	Execution file, script file, batch file	Sample programs for each simulator.

\*1 The VxWorks image file contains Telnet and FTP services. To access these services, use the following account. (Account(s) can be added by using the loginUserAdd() function.)

User name: target  
Password: password

# CW-Sim Standalone CD-ROM

The CW-Sim Standalone CD-ROM stores the following items:

Folder path, file name	Content	Description
\CWSIMSA	Execution file	An execution file of CW-Sim Standalone.
\readme.txt	—	How to acquire CW Workbench/CW-Sim Operating Manual is described.
\3rd_party_licensor_notices	OS (vxworks-6.9.pdf)	A license notice (PDF) of the third party product used in CW-Sim.
\Samples\R12CCPU-V	Sample programs	Sample programs for each simulator.
\Samples\RD55UP06-V		

# PART 2

# INSTALLATION AND UNINSTALLATION

This part explains how to install and uninstall CW Workbench, CW-Sim, and CW-Sim Standalone.

3 INSTALLING CW Workbench/CW-Sim

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4 INSTALLING CW-Sim Standalone

---

5 UNINSTALLING CW Workbench/CW-Sim

---

6 UNINSTALLING CW-Sim Standalone

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# 3 INSTALLING CW Workbench/CW-Sim

This chapter explains how to install CW Workbench and CW-Sim.

## 3.1 Preparation for Installation

Before installing CW Workbench and CW-Sim, prepare the following items.

For preparation	Description
Development environment (personal computer)	<ul style="list-style-type: none"><li>• For information on the operating specifications of a personal computer, refer to the section for operating environment. (☞ Page 21 Operating Environment)</li><li>• Set the host name for the personal computer within 2 to 15 alphanumeric characters.</li><li>• To install CW-Sim, prepare a personal computer with CW Workbench installed.</li></ul>
CW Workbench/CW-Sim DVD-ROM	<ul style="list-style-type: none"><li>• Prepare the DVD-ROM included with the product with license (SW1DND-CWWR-E).</li><li>• The Permanent License Application Form stored in the DVD-ROM is used to apply for the permanent license.</li></ul>
License Agreement	<p>An LAC (License Authorization Code) described on the License Agreement is required to install the products by using a temporary license.</p> <p>An LAC and a product ID described on the License Agreement are also required to apply for a permanent license. Prepare the License Agreement included with CW Workbench/CW-Sim.</p>
Permanent license file	<p>A permanent license file is required to install CW Workbench/CW-Sim by using a permanent license. The permanent license file must be acquired in advance by filling the Permanent License Application Form stored in the DVD-ROM and sending it to Mitsubishi Electric Corporation.</p> <p>☞ Page 29 Acquiring/Reacquiring Permanent License</p>
Internet connection	<p>An Internet connection is required to install CW Workbench/CW-Sim by using a temporary license. A 31-day temporary license can be acquired via the Internet.</p>

## 3.2 Considerations for Installation

### Restriction

- CW Workbench 3.3 (this product), CW Workbench 3.2 (conventional CW Workbench), and CW Workbench 4 can be installed on the same development environment. Note that, when installing CW Workbench 3.3 (this product) on a personal computer where CW Workbench 3.2 (conventional CW Workbench) or CW Workbench 4 is installed, install it to a different folder from the one where CW Workbench 3.2 (conventional CW Workbench) or CW Workbench 4 is installed. Additionally, CW Workbench 3.3 (this product), CW Workbench 3.2 (conventional CW Workbench), and CW Workbench 4 cannot be started at the same time.
- Do not install CW Workbench on a personal computer where Wind River Workbench has been already installed. To install CW Workbench, uninstall the Wind River Workbench or prepare another personal computer.

- Log on as a user with administrator authority.
- Stop all other applications running in Windows before installation.
- The installer may not operate 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 and CW-Sim can be installed at the same time. However, the permanent license for each of them is required.
- Install CW Workbench and CW-Sim in the same installation destination. Otherwise, CW Workbench and CW-Sim may not operate properly.
- When installing CW Workbench and CW-Sim separately, installation with different license format is not allowed. For example, when CW Workbench was installed by using the permanent license, install CW-Sim by using the permanent license as well.
- An overwrite installation of CW Workbench or CW-Sim cannot be performed to a personal computer. Uninstall it first for re-installation.
- Note the following when installing the updated license product:  
Enter the LAC (License Authorization Code) described on the License Agreement of the updated license product to LAC in the user information.
- While processing one "setup.exe", do not run other "setup.exe". Otherwise, the installation may not be completed properly. If the installation failed, uninstall CW Workbench and run "setup.exe" again.
- The confirmation screen of user account control appears. Click "Allow" or the [Yes] button to continue the installation.

## Installation using temporary license

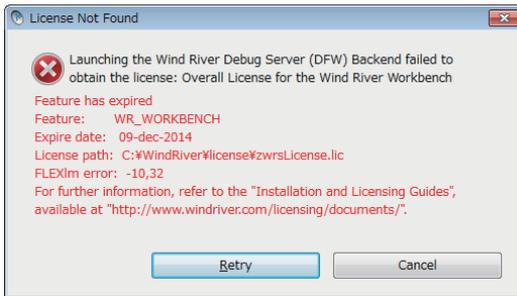
---

To install CW Workbench and CW-Sim by using a temporary license, check whether the personal computer can be connected to the Internet since a temporary license file is acquired via the Internet.

In addition, check the IP address and port number, which are acquired to be set during the installation, if the personal computer is connected to the Internet via a proxy server.

Once CW Workbench and CW-Sim are installed by using a temporary license, they operate for 31 days for trial. Apply the issued regular license by acquiring a permanent license. (  Page 29 Acquiring/Reacquiring Permanent License)

If CW Workbench and CW-Sim are used with the temporary license for more than 31 days, a license error message appears. They continue to operate by clicking the [Cancel] button; however, the project creation, compiling/ building, and debug functions cannot be used.



[License error message]  
Error text: "Feature has expired"  
Error code: -10

---

### Restriction

When using the installer with software version "H" or earlier, a temporary license cannot be acquired. For installation, use the latest installer with a temporary license acquired, an installation key file, or a permanent license.

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## 3.3 Acquiring/Reacquiring Permanent License

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A permanent license is required to use CW Workbench and CW-Sim for unlimited duration.

### Acquiring permanent license

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The following shows the procedure for obtaining a permanent license.

**1.** Acquire a Permanent License Application Form on the DVD-ROM.

**2.** Acquire the host information of the personal computer on which CW Workbench and CW-Sim are used.

For how to acquire a host information, refer to the Permanent License Application Form (sample) included with the product.

**3.** Fill out the Permanent License Application Form.

Enter the information directly on the Permanent License Application Form (PermanentLicenseApplicationForm.xlsx) stored on the DVD-ROM. For how to fill out the form, refer to the Permanent License Application Form (sample) included with the product.

#### Point

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For the updated license product, enter the same host information as the one which has been registered to acquire the permanent license previously on the Permanent License Application Form .

---

**4.** Send the application form to the address described on the form by attaching to e-mail.

**5.** A permanent license file will be e-mailed.

**6.** When CW Workbench and CW-Sim have been installed using a temporary license or installation key on the DVD-ROM, apply a permanent an installation key file to a personal computer.

 Page 42 Applying Permanent License

## Reacquiring permanent license (replacement of host machine)

---

A new permanent license is required for a new personal computer after the replacement due to the reason such as crash of a personal computer on which CW Workbench and CW-Sim have been installed.

Reapply the permanent license according to the following procedure to replace the host machine.

**1.** When the personal computer operates properly, uninstall CW Workbench and CW-Sim.

 Page 48 Uninstallation

**2.** Delete the current permanent license file. (Delete the permanent license file saved as a backup file as well.)

 Page 47 Deleting Permanent License

**3.** Acquire a License Transfer Certification Agreement Form on the DVD-ROM.

**4.** Acquire the host information of the personal computer on which CW Workbench and CW-Sim are used.

For how to acquire a host information, refer to the Permanent License Application Form (sample) included with the product.

**5.** Fill out the License Transfer Certification Agreement Form.

Enter the information directly on the License Transfer Certification Agreement Form (PermanentLicenseApplicationForm.xlsx) stored on the DVD-ROM.

**6.** Fax the License Transfer Certification Agreement Form with your signature to your local Mitsubishi Electric sales office or representative.

**7.** A permanent license file will be e-mailed.

**8.** Install CW Workbench and CW-Sim on the new personal computer using the new permanent license.

 Page 31 Installation

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### Point

If the License Agreement has been lost and the Product ID is unknown, contact your local Mitsubishi Electric sales office or representative with the following information which was filled in on the Permanent License Application Form.

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

# 3.4 Installation

This section shows the installation procedure and operation method of CW Workbench and CW-Sim.

## Installation procedure

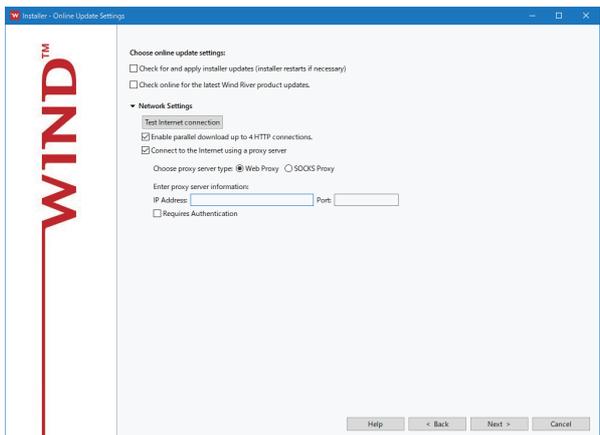
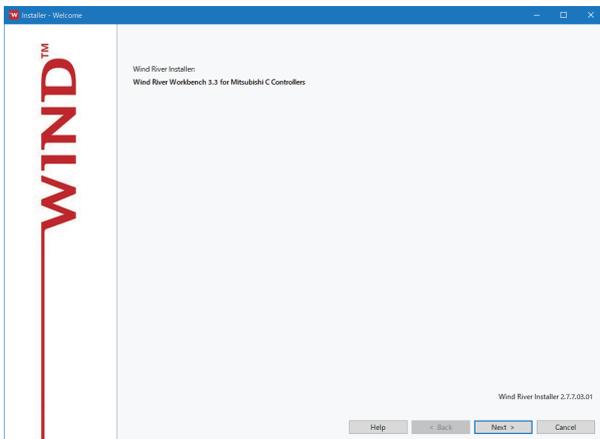
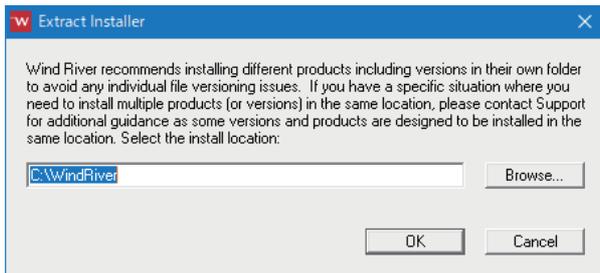
### Operating procedure

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

If the installer is not started automatically, double-click "setup.exe" in the DVD-ROM.

For the contents of the DVD-ROM, refer to the following:

☞ Page 23 Contents of DVD-ROM/CD-ROM



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

An installation destination folder can also be selected from the tree view by clicking the [Browse] button.

The following characters can be used for an installation destination folder name:

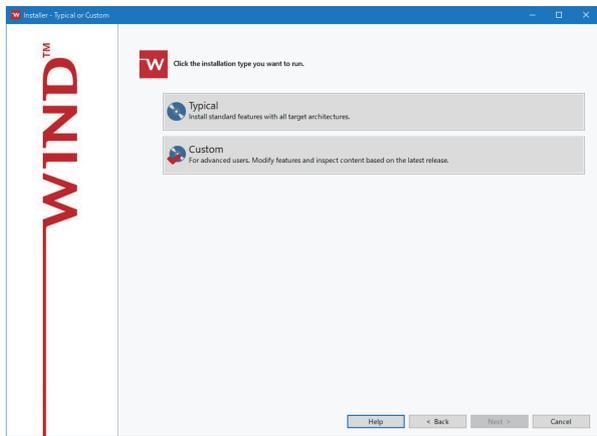
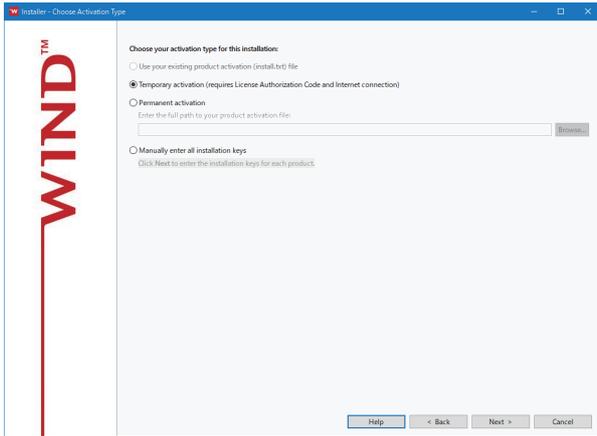
- Alphanumeric characters (Space cannot be used)
- Hyphen "-"
- Underscore "\_"

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

3. Click the [Next] button.

4. Click the [Next] button.

- To update the installer, select the checkbox of "Check for and apply installer updates (installer restarts if necessary)". The latest installer is downloaded and updated online.
- When the personal computer is connected to the Internet via a proxy server, click "Network Settings" and select the checkbox of "Connect to the Internet using a proxy server", and configure the proxy server set for the Internet connection. In addition, the Internet connection status can be checked by clicking the [Test Internet connection] button.



5. When the permanent license file is acquired, select "Permanent activation", and click the [Browse] button. Then, select the permanent license file of the product to be installed from the tree.

If the permanent license file has not been acquired, perform either of the following procedures:

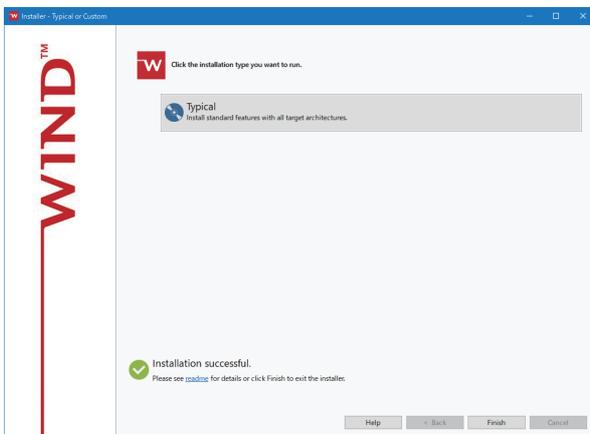
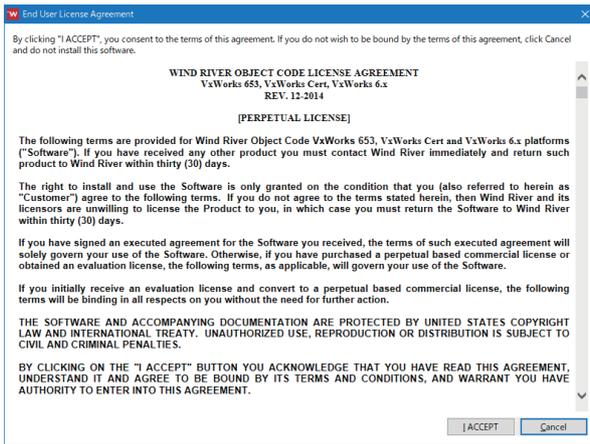
- For environment where Internet connection is available:  Page 37 Installation with a temporary license
- For environment where Internet connection is not available:  Page 39 Installation using installation key file

6. Click the [Next] button.

7. Perform either of the following procedures:

- Page 33 When selecting "Typical"
- Page 34 When selecting "Custom"

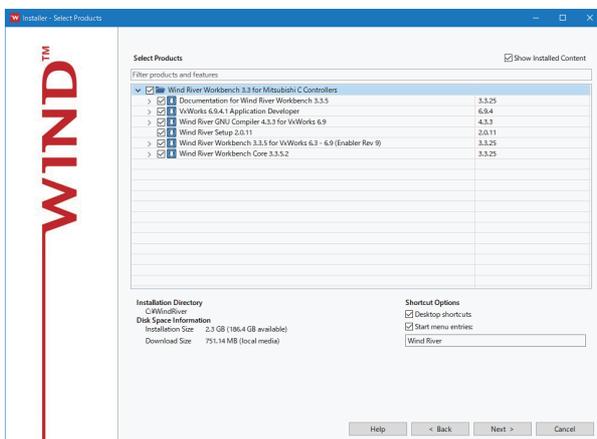
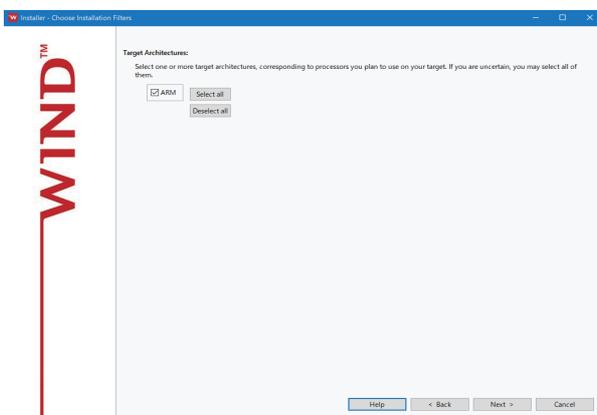
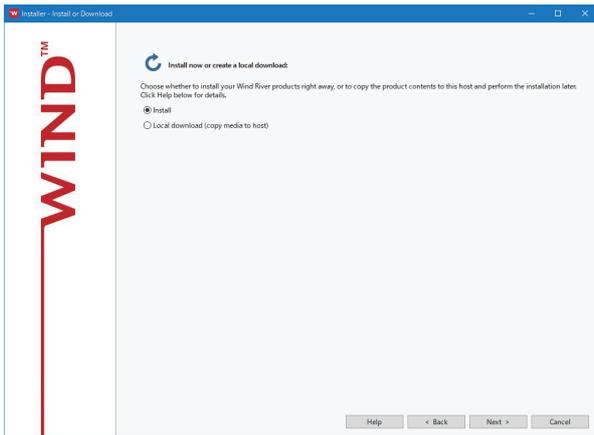
## ■ When selecting "Typical"



1. Click the [I ACCEPT] button.

2. Click the [Finish] button.

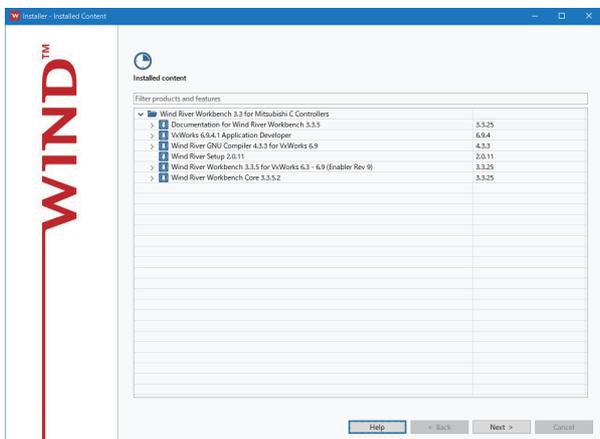
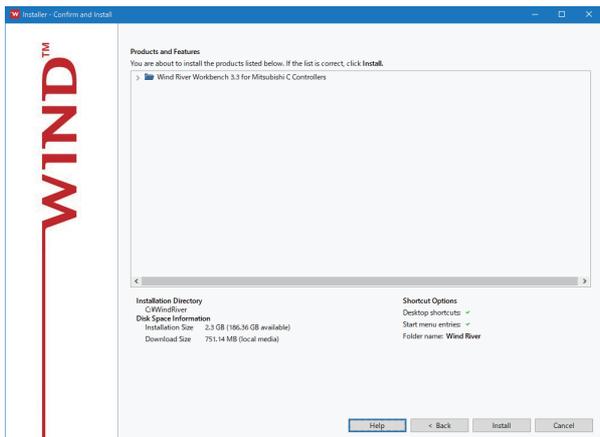
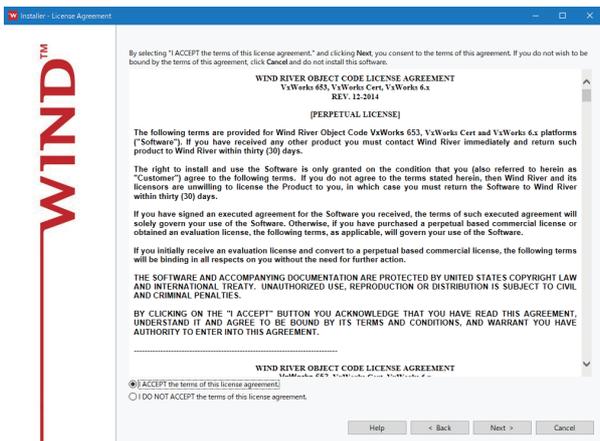
## ■ When selecting "Custom"



1. Check that "Install" is selected, and click the [Next] button.

2. Check that the checkbox of "ARM" is selected, and click the [Next] button.

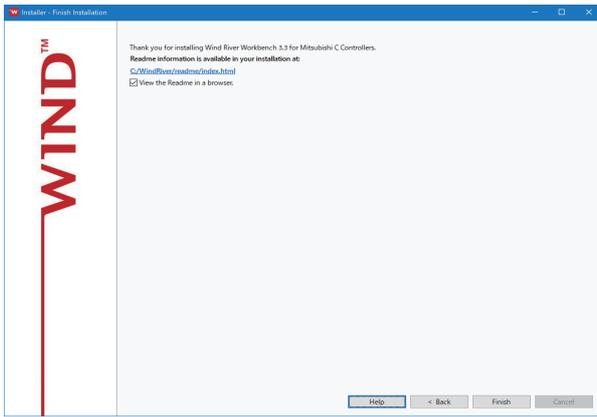
3. Check that the checkboxes of all items are selected, and click the [Next] button.



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

5. Click the [Install] button.

6. Click the [Next] button.

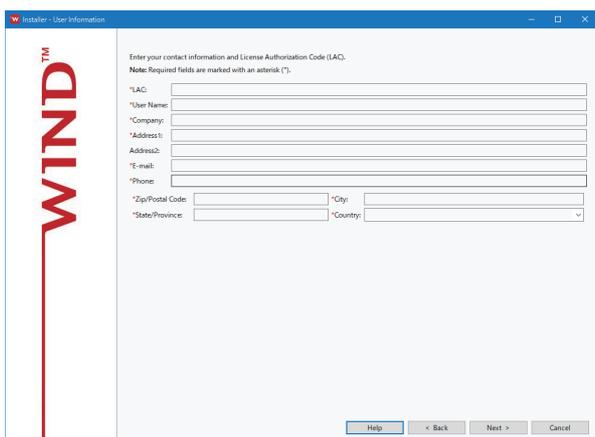
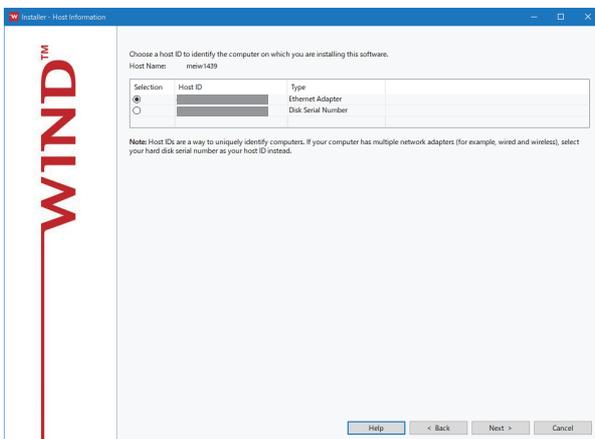
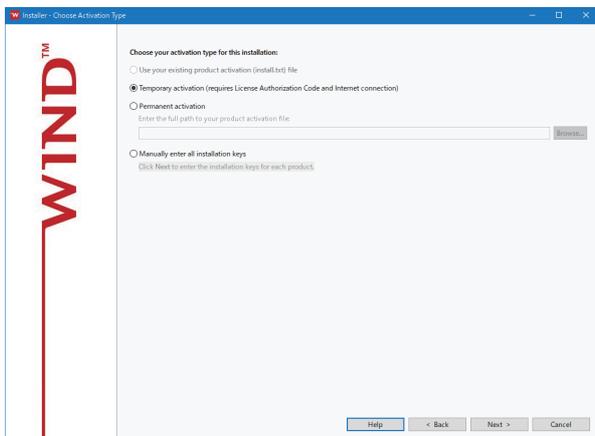


7. Click the [Finish] button.

## Installation with a temporary license



CW Workbench and CW-Sim use a common temporary license.



1. Select "Temporary activation (requires License Authorization Code and Internet connection)" and click the [Next] button.

2. Check the content of "Note". Then, select either "Ethernet Adapter" or "Disk Serial Number" for "Host ID" and click the [Next] button.

3. Enter a License Authorization Code (LAC) and user information, click the [Next] button.

Page 38 LAC and user information

4. Proceed to the following step 7.

Page 31 Installation procedure

When selecting "Temporary activation (requires License Authorization Code and Internet connection)", an Internet environment is required to acquire a temporary license. 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 Installation procedure, step 4)

If "Temporary activation (requires License Authorization Code and Internet connection)" is selected without configuring the proxy server setting, installation does not proceed.

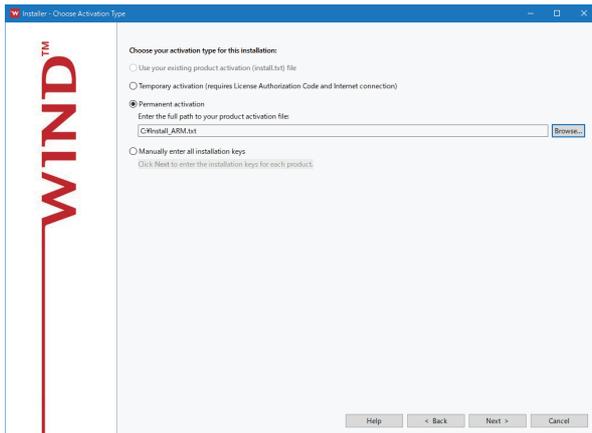
### ■ LAC and user information

Use alphanumeric characters for the LAC and user information.

Items with a \* mark in the window must be entered.

Item	Description
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)
E-mail	E-mail address
Phone	Phone number
Zip/Postal Code	Zip code
City	City
State/Province	State
Country	Country

## Installation using installation key file



1. Select "Permanent activation", and click the [Browse] button. Then, specify the installation key file (Install\_ARM.txt) file stored in the DVD-ROM.
2. Click the [Next] button.
3. Proceed to the following step 7.  
➔ Page 31 Installation procedure

3

### Point

If CW Workbench is installed by specifying the installation key file, it is installed with no license, and only the following functions can be used.

- Editor function (create, edit, save, search)
- Import/export

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

➔ Page 29 Acquiring/Reacquiring Permanent License

➔ Page 42 Applying Permanent License

# Environment and operation after installation

The following explains the menus, sample programs, and others after CW Workbench and CW-Sim are installed.

## Menus to be registered

Once CW Workbench and CW-Sim are installed, "Wind River" is added on Windows Start, and the following menus can be selected.

Menu	Description
CW Workbench 3.3	To start CW Workbench.
Registry	To start Wind River Registry for Workbench 3.3. When CW Workbench is started, Wind River Registry for Workbench 3.3 also starts unless it has been running already. The icon is registered on the task tray.
CW Workbench Debug Mode 3.3	To run an already created project with debug mode CW Workbench.
FTP Server <sup>*1</sup>	To start WFTPD.
Product Maintenance <sup>*2</sup>	To uninstall and update CW Workbench and apply a patch.
Accessing Documentation	To open the PDF describing the way to access the manuals provided by Wind River Systems, Inc.
Wind River VxWorks Simulator User's Guide	VxWorks 6.9 document. "Wind River VxWorks Simulator User's Guide, 6.9" is registered only when installing CW-Sim.
VxWorks COMx	To start HyperTerminal for Telnet connection. This menu cannot be used when HyperTerminal is not installed.
VxWorks Development Shell	To start a command line Shell that can use the GNU compiler.

\*1 For Windows XP only

\*2 When installing this product on the environment where CW Workbench 3.2 (conventional CW Workbench) is installed, the menu name is changed to 'Product Maintenance-0'.

To judge a target product, select "About This Installation" of Product Maintenance and check "Installed Content".

For CW Workbench 3.3 (this product) or CW Workbench 3.2 (conventional CW Workbench), the target product is displayed as follows:

-CW Workbench 3.2: Wind River Workbench 3.2 for Mitsubishi C Controllers

-CW Workbench 3.3: Wind River Workbench 3.3 for Mitsubishi C Controllers

## Sample programs to be registered (CW Workbench)

When CW Workbench is installed on a personal computer, sample programs provided by Wind River Systems, Inc. are installed. To check the installed sample programs, start CW Workbench, and select [File]⇒[New]⇒[Example].

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

🔗 CW Workbench menu [Help] ⇒ [Help Contents] ⇒ "Wind River Documentation" ⇒ "Workbench, 3.3" ⇒ "Wind River Workbench User's Guide, 3.3" ⇒ "Projects" ⇒ "Building and Debugging a Sample Project"

## Copying VxWorks image/symbol files (CW-Sim)

To use CW-Sim, copy the VxWorks image/symbol files stored in the "VxWorks" folder in the DVD-ROM to the local folder. (☞ Page 23 Contents of DVD-ROM/CD-ROM)

**Ex.**

Copy destination local folder

C:\CCPUSIM\vxWorks\_6\_9\_SMP

C:\CCPUSIM\vxWorks\_6\_9\_SMP.sym

### Point

To use CW-Sim to perform a simulation in an environment close to the actual devices, copy the following the VxWorks image/symbol files to a local folder.

- vxWorks\_6\_9\_SMP\_V2
- vxWorks\_6\_9\_SMP\_V2.sym

## Registering to the exception list of Windows Firewall (CW-Sim)

Before using CW-Sim, check the Windows Firewall setting.

If Windows Firewall is enabled, refer to the following and check the settings.

☞ Page 117 Communication with the simulator cannot be established.

## 3.5 Applying Permanent License

---

Apply the acquired permanent license file to the personal computer on which CW Workbench and CW-Sim have been installed using a temporary license or an installation key file.

Apply it to the personal computer that was specified for 'Host Information' on the Permanent License Application Form by following the procedure below.

1. End CW Workbench if it is open.
2. Copy the acquired permanent license file to the 'license' folder of CW Workbench.

The 'license' folder is in the following path when CW Workbench is installed without changing the folder of the installation destination.

- C:\WindRiver\license

Do not store the license file in folders other than the one specified above when applying the license file to a personal computer.

---

### **Point**

For updated license product, when more than one permanent license files have been acquired, overwrite all of the files.

---

3. Start CW Workbench.

## 3.6 Applying Patch

This section shows how to apply a patch released for CW Workbench and CW-Sim.

### Point

- Log on as a user with administrator authority when applying a patch to CW Workbench and CW-Sim.
- Terminate the running CW Workbench and CW-Sim before applying a patch.
- Do not cancel the process during patch application.
- The confirmation screen of user account control appears. Click "Allow" or the [Yes] button to continue the patch application.

3

## How to acquire a patch

### Operating procedure

1. Acquire a patch file.

For information on acquiring a patch, please contact your local Mitsubishi Electric sales office or representative.

2. Decompress the acquired file, and store it in the 'updates' folder.

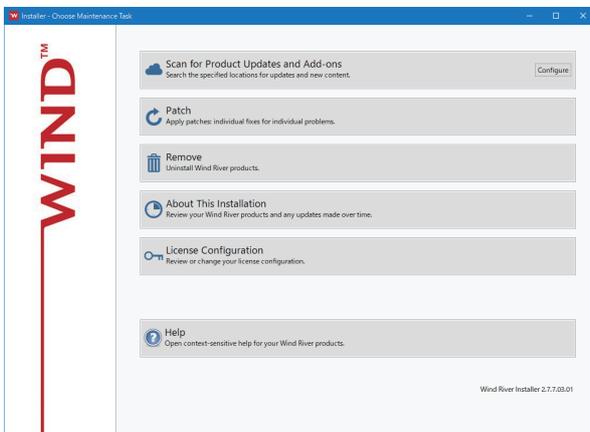
When the installation destination of CW Workbench is C:\WindRiver, the storage destination of the patch will be C:\Windriver\updates.

## How to apply patch

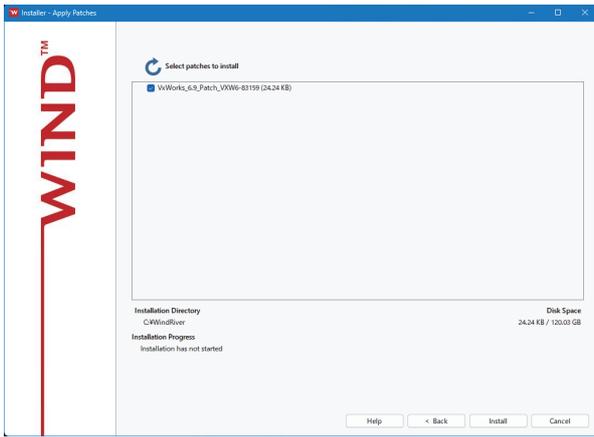
### Operating procedure

The following shows the procedure for applying a patch.

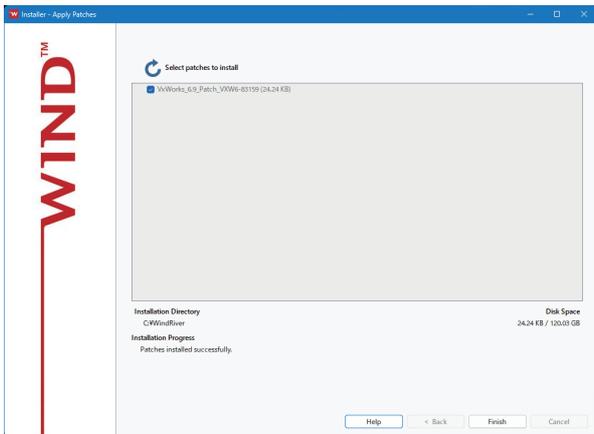
1. Start Product Maintenance from "Wind River" in Windows Start.



2. Select "Patch".



3. Check that the checkbox of a patch to be installed is selected, and click the [Install] button.



4. Click the [Finish] button.

#### Point

If the patch to be installed is not displayed, check if the storage destination of the patch file is correct.  
Patch file storage destination: <Installation destination folder of CW Workbench>\updates

# 4 INSTALLING CW-Sim Standalone

This chapter explains how to install CW-Sim Standalone.

For the considerations on installation, refer to the following:

☞ Page 27 Considerations for Installation

## 4.1 Preparation for Installation

Before using CW-Sim Standalone, prepare the following items.

For preparation	Description
Development environment (personal computer)	<ul style="list-style-type: none"><li>• For information on the operating specifications of a personal computer, refer to the section for operating environment. (☞ Page 21 Operating Environment)</li><li>• Set the host name for the personal computer within 2 to 15 alphanumeric characters.</li></ul>
CW-Sim Standalone CD-ROM	<ul style="list-style-type: none"><li>• Prepare the CD-ROM included with the product with license (SW1DNC-CWSIMSAR-E).</li></ul>

4

## 4.2 Installation

The installer is not supplied with CW-Sim Standalone.

Copy "CWSIMSA" and "Samples" folders from the CD-ROM to the local folder.

**Ex.**

Copy destination local folder

C:\CCPUSIM



# 5 UNINSTALLING CW Workbench/CW-Sim

---

This chapter explains how to uninstall CW Workbench/CW-Sim.

## 5.1 Preparation for Uninstallation

---

- Log on as a user with administrator authority.
- Terminate the running CW Workbench before uninstalling.
- Uninstall the product from "Product Maintenance". The product cannot be uninstalled from "Uninstall a program" on the control panel.
- Do not cancel the uninstallation process. If the uninstallation process is canceled midway, uninstall the product again. If the uninstallation process failed after the uninstallation has been canceled, reinstall the product, then uninstall it again. (☞ Page 111 Uninstallation process is cancelled in the halfway.)
- The confirmation screen of user account control appears. Click "Allow" or the [Yes] button to continue the uninstallation.

## 5.2 Deleting Permanent License

---

To delete the current permanent license for replacement of a host machine, delete it by following the procedure below.

1. End CW Workbench if it is open.
2. Delete the permanent license file from the 'license' folder of CW Workbench completely.

Delete the permanent license file saved as a backup file as well.

The 'license' folder is in the following path when CW Workbench is installed without changing the folder of the installation destination.

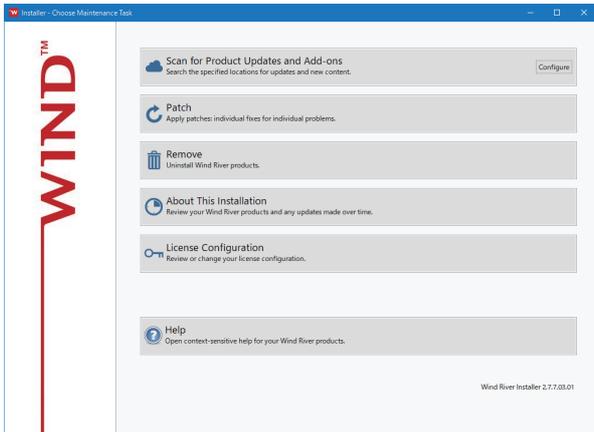
- C:\WindRiver\license

# 5.3 Uninstallation

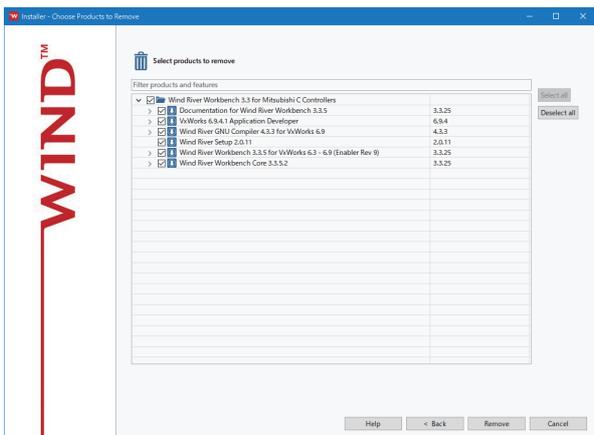
The following shows the uninstallation procedure and its method of CW Workbench. Note that if CW Workbench is uninstalled, CW-Sim is uninstalled at the same time.

## Operating procedure

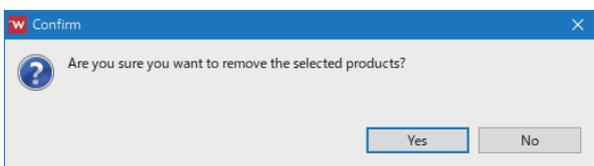
1. Start Product Maintenance from "Wind River" in Windows Start.



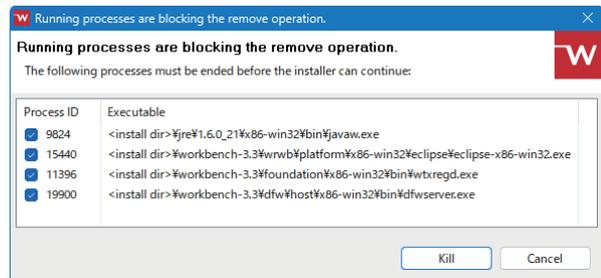
2. Select "Remove".



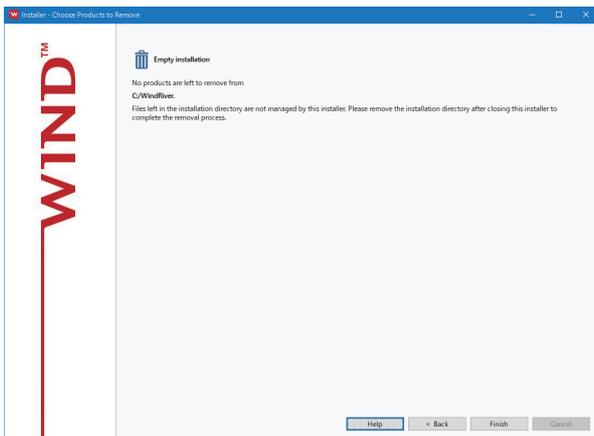
3. Check that the checkboxes of items to uninstall are selected, and click the [Remove] button.



4. Click the [YES] button. When the following screen appears, click the [Kill] button.



5. Click the [Finish] button.



## Environment after uninstallation

Even when CW Workbench and CW-Sim are uninstalled, some folders and files are not deleted.

Those folders and files are not deleted or removed as it will speed-up the installer startup during the re-installation of CW Workbench and CW-Sim.

The non removed folders and files can be deleted directly from explorer if those are not required.

- Data not to be deleted

Some files (folders) including Workspace folders and image files under the path of "<installation destination folder>".



# 6 UNINSTALLING CW-Sim Standalone

---

This chapter explains how to uninstall CW-Sim Standalone.

## 6.1 Uninstallation

---

CW-Sim Standalone does not have an uninstaller.

Delete all files copied to the local folder during installation.



This part explains how to create programs and build projects, how to connect to target or CW-Sim, and how to debug programs.

7 CREATING AND BUILDING PROJECT

---

8 CONNECTING AND DEBUGGING TARGET

---

9 CONNECTING CW-Sim AND DEBUGGING PROGRAMS

---

10 CONNECTING CW-Sim Standalone AND DEBUGGING PROGRAMS

---

11 USAGE EXAMPLE OF CW-SIM USING SAMPLE PROGRAM

---

# 7 CREATING AND BUILDING PROJECT

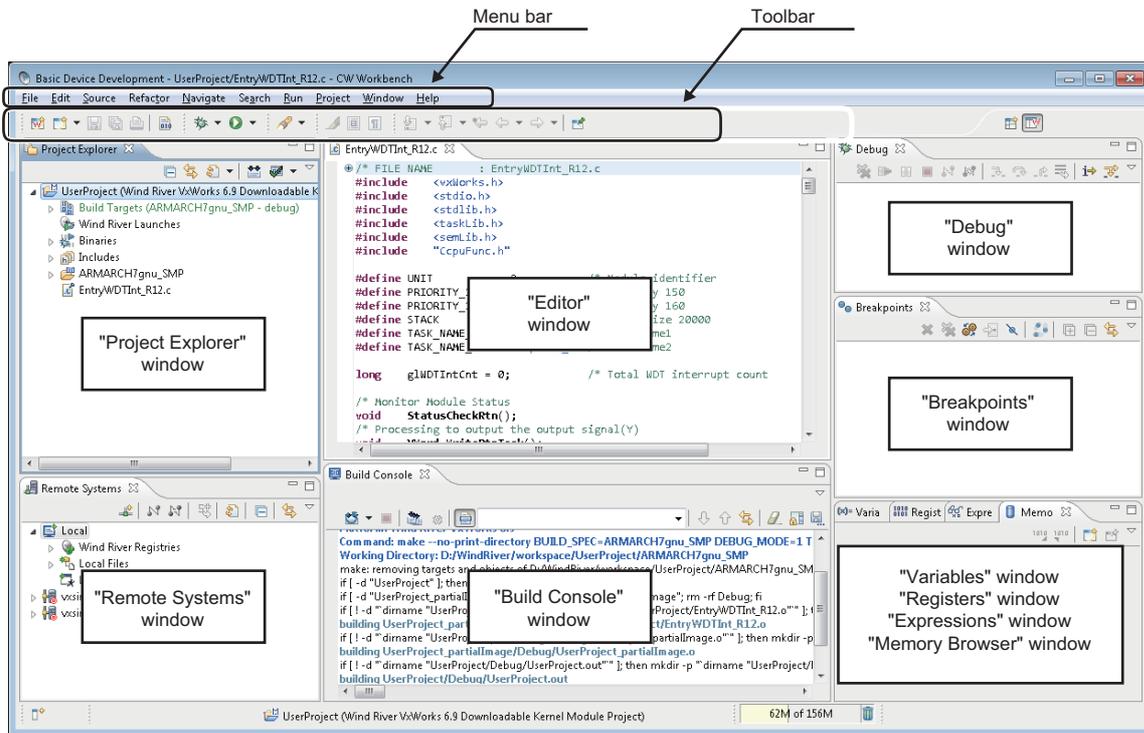
This chapter explains the project creation and building in CW Workbench.

## Screen configuration of CW Workbench

The following shows the screen configuration of CW Workbench.

The layout of the windows shown below is default status.

The layout of each window can be changed by dragging with the mouse.



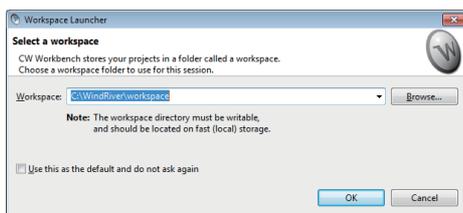
## 7.1 Creating New Projects

Create a new project.

### How to create a new project

#### Operating procedure

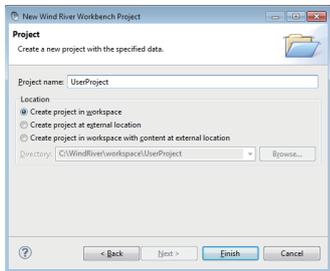
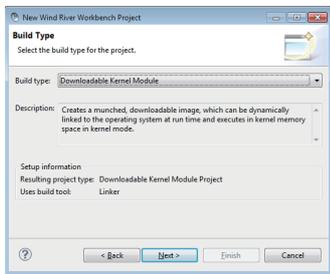
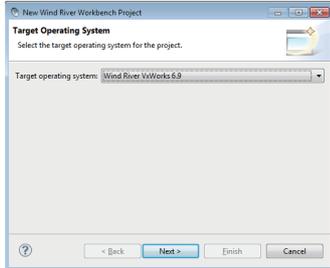
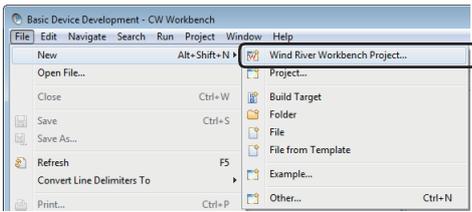
1. Start CW Workbench 3.3 from "Wind River" in Windows Start.



The "Workspace Launcher" screen appears.

2. Enter a folder of save destination of workspace to "Workspace" and click the [OK] button.

A save destination can be also selected from the tree by clicking the [Browse] button.



CW Workbench is started.

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

The "New Wind River Workbench Project" screen appears.

4. Select "Wind River VxWorks 6.9" for "Target operating system", and click the [Next] button.

5. Select "Downloadable Kernel Module" for "Build type", and click the [Next] button.

6. Enter a project name for "Project name", and click the [Finish] button.

The project is added to the "Project Explorer" window. If any of the following characters and symbols or a project name that is already used is entered for "Project name", an error text appears on the header of the window and the [Finish] button is disabled.

- ` , = , ! , # , \$ , % , ^ , \* , ( , ) , { , } , \ , | , ; , : , ' , " , . , < , > , / , ? , two-byte characters, katakana, or when a space is used except at the end of the project name

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

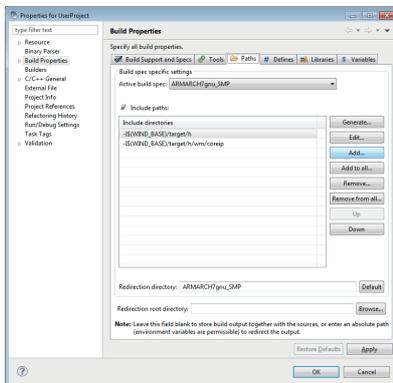
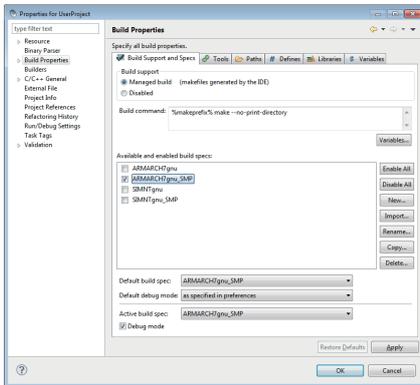
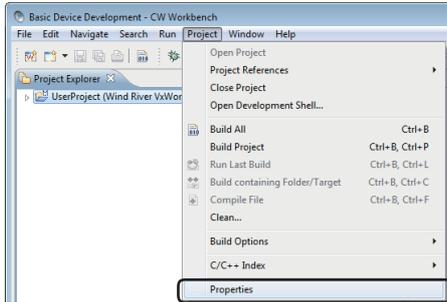
**Point**

For the considerations when creating user programs in conjunction with the target, refer to the following:

- 📖 MELSEC iQ-R C Controller Module User's Manual
- 📖 MELSEC iQ-R C Intelligent Function Module User's Manual (Startup)

# How to set the property

## Operating procedure



1. Select a project to which property is to be set, and select [Project] ⇒ [Properties] in the "Project Explorer" window.

The "Properties for (project name)" screen appears.

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

3. Check that only the following item is selected in "Available and enabled build specs".

- For a project to be downloaded to target: "ARMARCH7gnu\_SMP"
- For a project to be simulated with CW-Sim or CW-Sim Standalone: "SIMNTgnu\_SMP"

The "Debug mode" is selected by default.

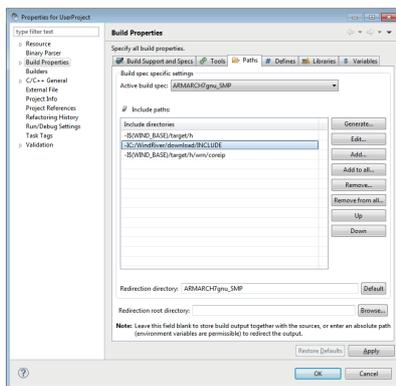
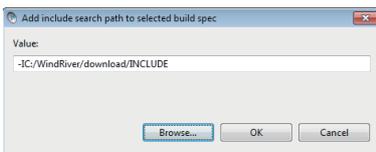
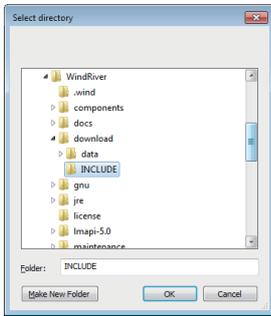
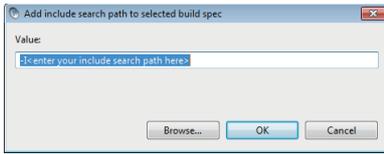
Unselect "Debug mode" for the practical operation (Non Debug mode).

4. For a project to be downloaded to the target (when "ARMARCH7gnu\_SMP" is selected in the step 3), set the property described in the following sections depending on the programming language used.

-  Page 59 For C program language
-  Page 59 For C++ program language

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

The "Add include search path to selected build spec" screen appears.



6. Click the [Browse] button.

The "Select directory" screen appears.

7. Select the include folder to be added, and click the [OK] button.

The include files are stored on the DVD-ROM of R12CCPU-V, RD55UP06-V, RD55UP12-V, and CW Workbench. Copy the include files of the module used in any of the storage locations below, then paste them to the include folder on the personal computer.

R12CCPU-V

- R12CCPU-V: \SYSTEMROM\INCLUDE
- DVD-ROM: \Include\R12CCPU-V

RD55UP06-V

- RD55UP06-V: \SYSTEMROM\INCLUDE
- DVD-ROM: \Include\RD55UP06-V

RD55UP12-V

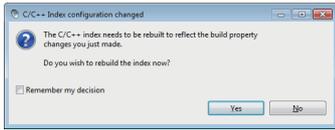
- RD55UP12-V: \SYSTEMROM\INCLUDE
- DVD-ROM: \Include\RD55UP12-V

**Point**

Use the include file stored in a module to be used. When using the include file stored in the DVD-ROM of CW Workbench, check the firmware version of a module supporting the file. (Page 133 Versions of Modules Supporting Include Files)

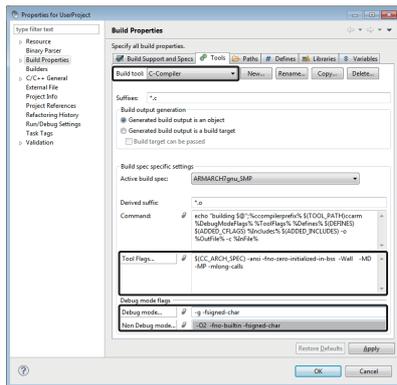
8. Check that the include folder specified in the step 6 is selected, and click the [OK] button.

9. Check that the added include folder is displayed in the "Include directories" column in "Include paths", and click the [OK] button.



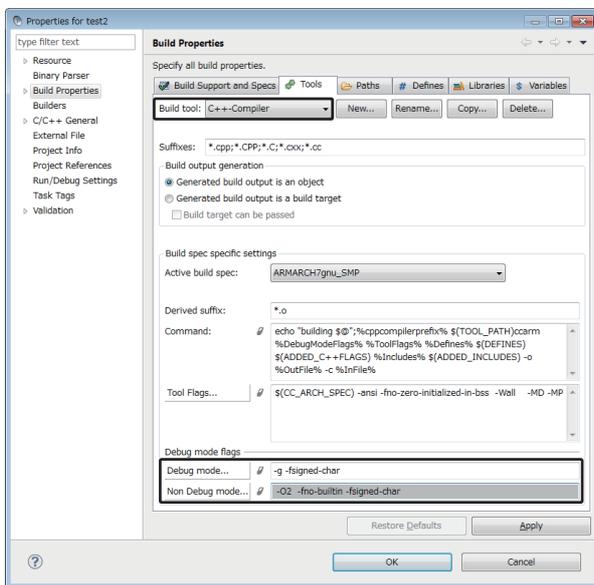
**10.** If the message shown on the left appears, click the [Yes] button.

## For C program language



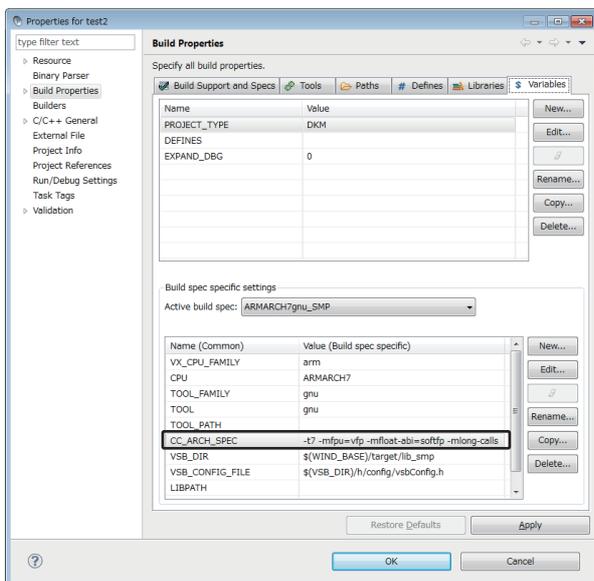
1. Select the [Tools] tab.
2. Check that "C-Compiler" is set for "Build tool".
3. Enter "-mlong-calls" at the end of [Tool Flags].
4. Enter "-fsigned-char" at the end of [Debug mode] and [Non Debug mode] under "Debug mode flags".

## For C++ program language



1. Select the [Tools] tab.
2. Check that "C++-Compiler" is set for "Build tool".
3. Enter "-fsigned-char" at the end of [Debug mode] and [Non Debug mode] under "Debug mode flags".

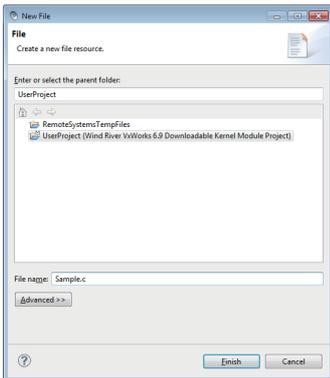
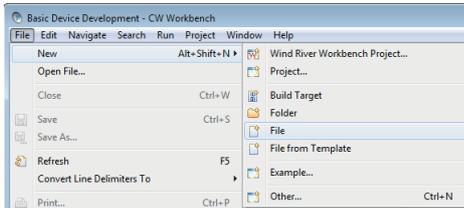
7



4. Select the [Variables] tab.
5. Enter "-mlong-calls" at the end of "CC\_ARCH\_SPEC".

# How to add new files

## Operating procedure



1. Select a project to which a new file is to be added from the "Project Explorer" window, and select [File] ⇒ [New] ⇒ [File].

"New File" screen appears.

2. Enter a file name in "File name", and click the [Finish] button.

Enter a file name with extension (.c, .h, .cpp, .hpp) for "File name:"

3. Edit the source files in the "Editor" window and include the following include file:

- For C Controller modules:  
C Controller module dedicated function: "CCPUFunc.h"  
MELSEC data link function: "MDFunc.h"  
Data analysis function/statistical analysis function:  
"DANLFunc.h"
- For C intelligent function modules:  
C intelligent function module dedicated function:  
"CITLFunc.h"  
MELSEC iQ-R series data link function: "MDRFunc.h"  
Data analysis function/statistical analysis function:  
"DANLFunc.h"

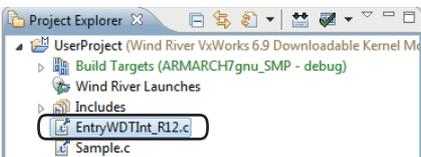
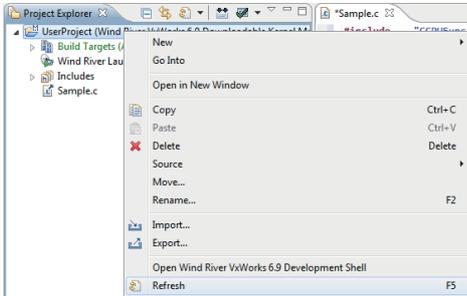
### Point

- If characters that cannot be used in Windows is entered for "File name", an error text appears on the header of the window and the [Finish] button is disabled.
  - Do not use the following characters and symbols for "File name". Otherwise, a compilation error occurs at compilation.  
#, \$, &, ', (, ), :, =, `, two-byte characters, katakana
- ☞ Page 109 A build error, "xxx.sh: syntax error near unexpected token `yyy\_partialImage/Debug/Objects/nnn'", "xxx.sh: cannot execute binary file", "Makefile:xxx: \*\*\* missing separator. Stop", or "yy.o: command not found...No such file or directory" has occurred.

# How to add source files

## Operating procedure

1. Copy the created source file to the current folder of the project to be added on the explorer.



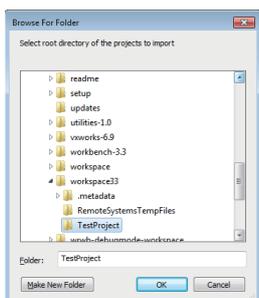
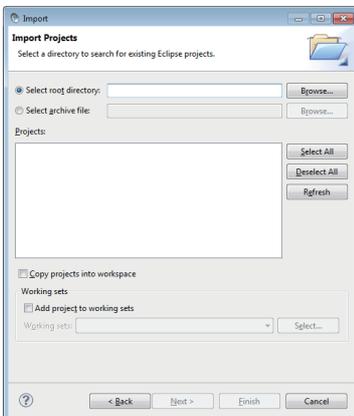
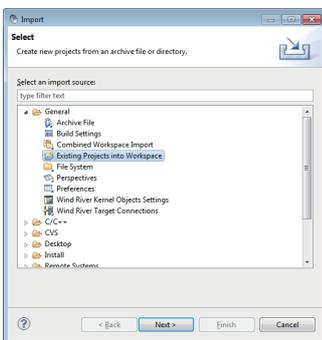
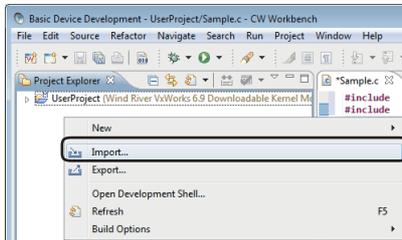
2. Select the project to which the source file is to be added from the "Project Explorer" window, and right-click ⇒ [Refresh] from the shortcut menu.

The source file copied in the step 1 is added to the project.

## 7.2 Adding a Project

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

### Operating procedure



1. Right-click in the "Project Explorer" window and select [Import] from the shortcut menu.

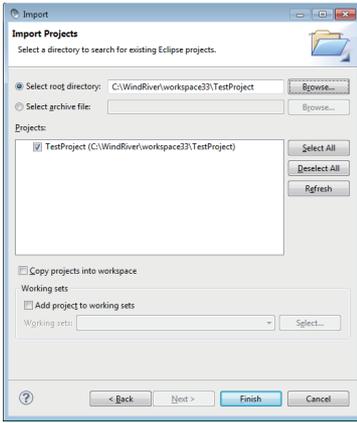
The "Import" screen appears.

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

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

The "Browse For Folder" screen appears.

4. Select the folder in which the project to be imported is stored, and click the [OK] button.



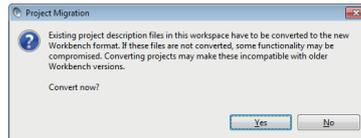
A list of the projects stored in the folder (including subfolders) specified in "Select root directory" is displayed in "Projects".

5. Check that the project to be imported is selected, and click the [Finish] button.

The specified project is imported to the workspace.



When importing a project created in Wind River Workbench 2.6 or earlier, the following message appears. Click the [Yes] button.

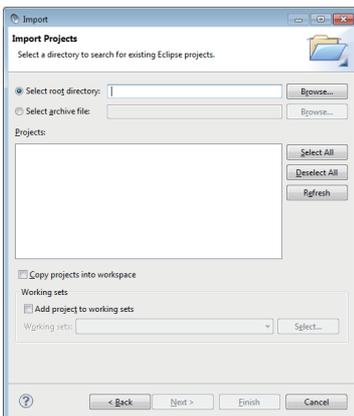
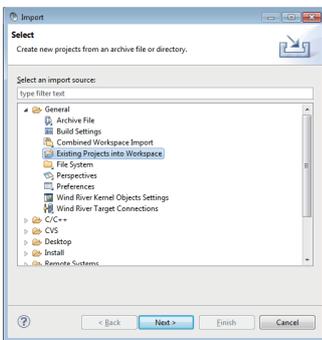
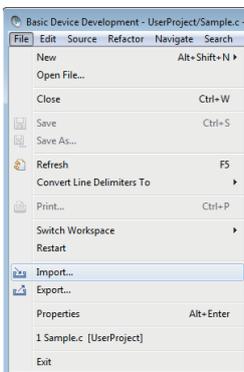


## Importing projects created in the existing CW Workbench

### Operating procedure

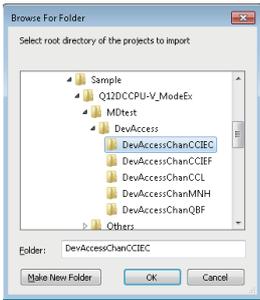
1. Select "Appearance and Personalization" ⇒ "File Explorer Options" in the control panel of Windows.  
↓
2. On the [View] tab in the "File Explorer Options" screen, select "Files and Folders" ⇒ "Hidden files and folders" ⇒ "Show hidden files, folders, and drives", and click the [OK] button.  
↓
3. Select the '.wrproject' file in the import target project folder on the explorer. Right-click and select [Property] from the shortcut menu.  
↓
4. Unselect "Hidden" and click the [OK] button.  
↓

5. Select [File] ⇒ [Import] in CW Workbench.



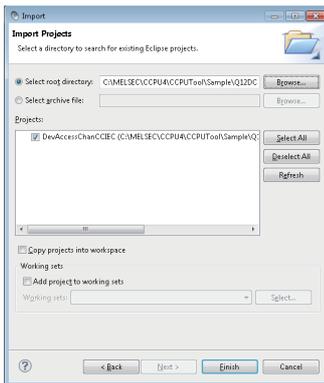
The "Import" screen appears.

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



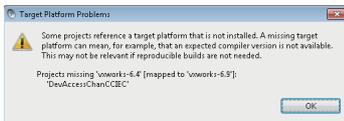
The "Browse For Folder" screen appears.

8. Select the folder in which the project to be imported is stored, and click the [OK] button.

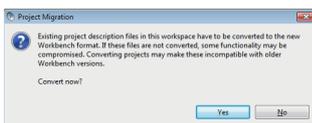


A list of the projects stored in the folder (including subfolders) specified in "Select root directory" is displayed in "Projects".

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

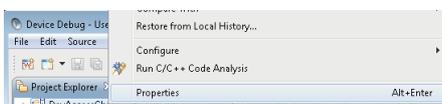


10. If the message shown on the left appears, click the [OK] button.

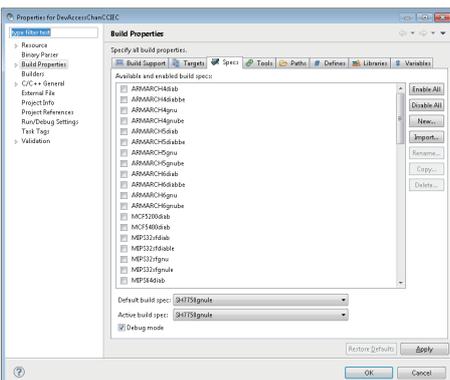


The message shown on the left is displayed.

11. Click the [Yes] button.

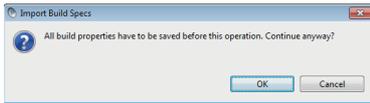


12. Select the imported project, and select [Project] ⇒ [Properties].



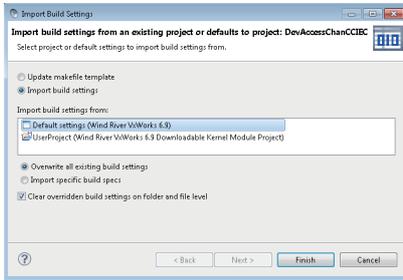
The "Properties for (project name)" screen appears.

13. Select "Build Properties" from the tree on the left on the screen, and select the [Build Support and Specs] tab or the [Specs] tab.
14. Click the [Import] button of "Available and enabled build specs".



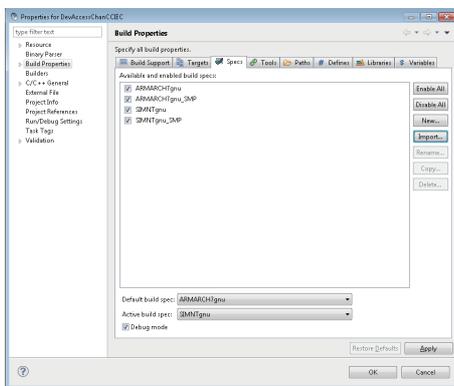
The message shown on the left is displayed.

**15.** Click the [OK] button.



The "Import Build Settings" screen appears.

**16.** Select "Default settings (Wind River VxWorks 6.9)" and click the [Finish] button.



**17.** Click the [Disable All] button.

**18.** Select "ARMARCH7gnu\_SMP" and click the [OK] button.

The import of the project created in the existing CW Workbench is completed.

Set the property as necessary.

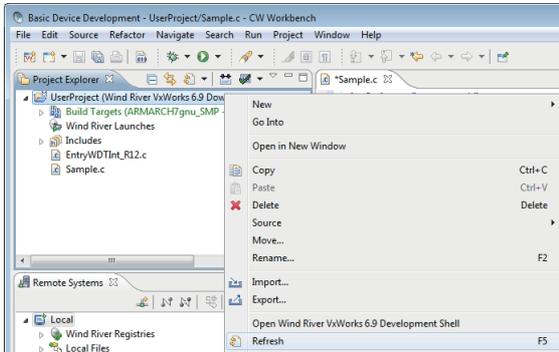
Page 56 How to set the property

# 7.3 Building a Project

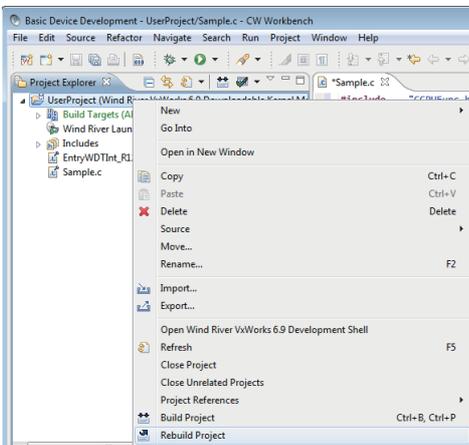
Build a project.

## Operating procedure

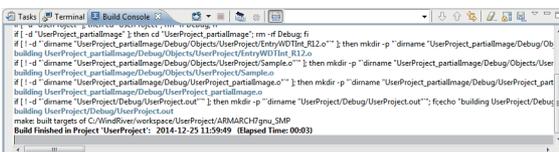
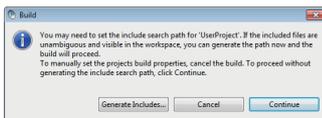
1. Select the project name to be built in the "Project Explorer" window, and right-click ⇒ [Refresh] from the shortcut menu.



2. Select the project name to be built in the "Project Explorer" window, and right-click ⇒ [Rebuild Project] from the shortcut menu.



3. If the message shown on the left appears, click the [Continue] button.



After the build is completed, execution file (user program) to be used in a target is created.

A file name of the user program is "(project name).out".

If an error occurs during the build, a user program is not created.

---

Folders when a user program is to be created after the build is completed normally are as follows:

- In Debug mode:

(Workspace folder)\(Project name folder)\ARMARCH7gnu\_SMP\(Project name folder)\Debug

- In Non Debug mode:

(Workspace folder)\(Project name folder)\ARMARCH7gnu\_SMP\(Project name folder)\NonDebug

When a user program is created on the imported project, the folders above may differ depending on the configurations of folders and projects in which the imported project exists.

Check the folders in which a user program is created on the imported project.

---

## Precautions

### ■If the build result has an error

Error information (source file name, line number, and error details) is displayed in red in the "Build Console" window.

Double-click the column in which source file name and line number are displayed in red to jump to the corresponding error location in the source file.

Modify and rebuild source codes until all the error information (red) is cleared.

### ■If an error "command not found" occurs

Unsupported compiler may be used.

Check that "ARMARCH7gnu\_SMP" is selected in the [Build Support and Specs] tab of "Build Properties".

Do not select the items other than "ARMARCH7gnu\_SMP".

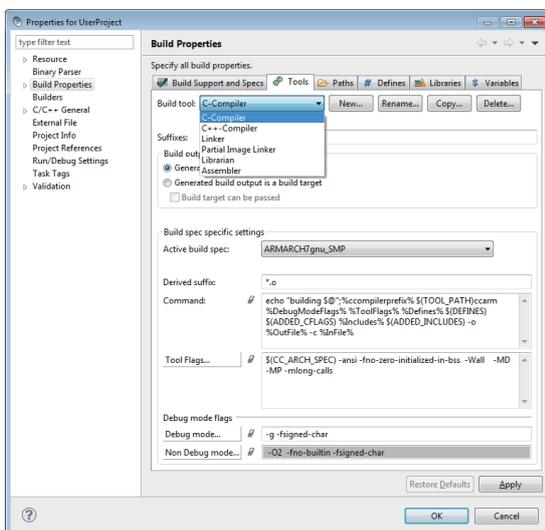
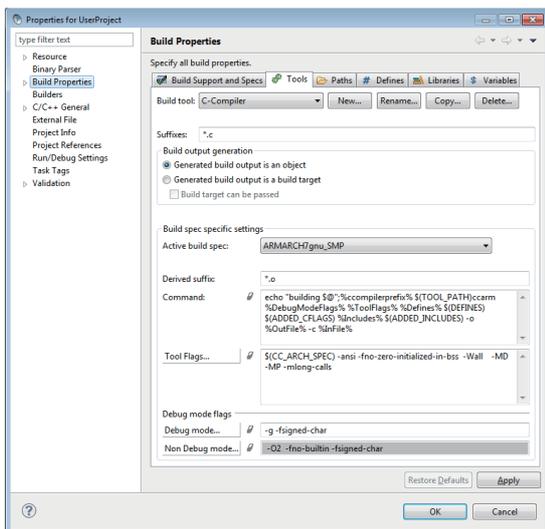
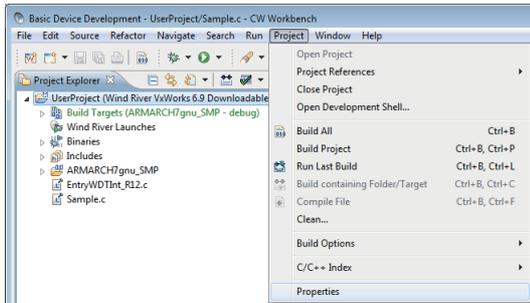
# Setting optimization option

The following shows how to set an optimization option that prioritizes the processing speed.



Set an optimization option when using in Non Debug mode. Using in Debug mode may result in improper debugging.

## Operating procedure



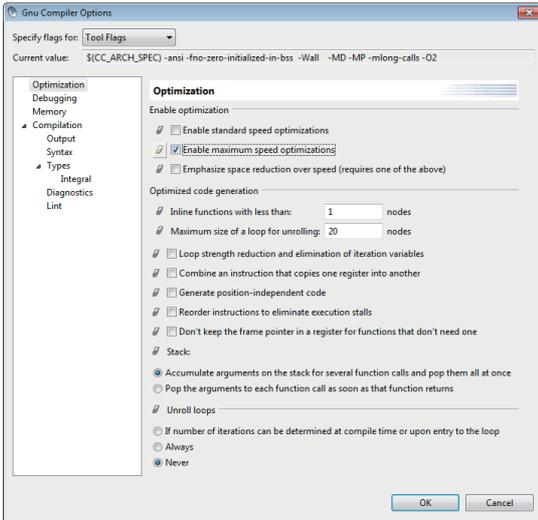
1. Select a project to which the optimization option is to be set, and select [Project] ⇒ [Properties].

The "Properties for (project name)" screen appears.

2. Select "Build Properties" from the tree on the left on the screen, and click the [Tools] tab.

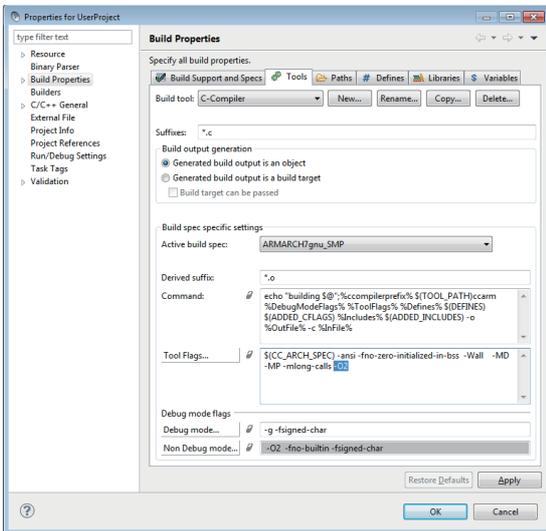
3. Select "C-Compiler" from "Build tool", and click the [Tool Flags] button.

For C++, select "C++-Compiler".



The "Gnu Compiler Options" screen appears.

4. Select "Optimization" from the tree on the left on the screen, and select "Enable maximum speed optimizations".
5. Check that "-O2" has been added to "Current value", and click the [OK] button.



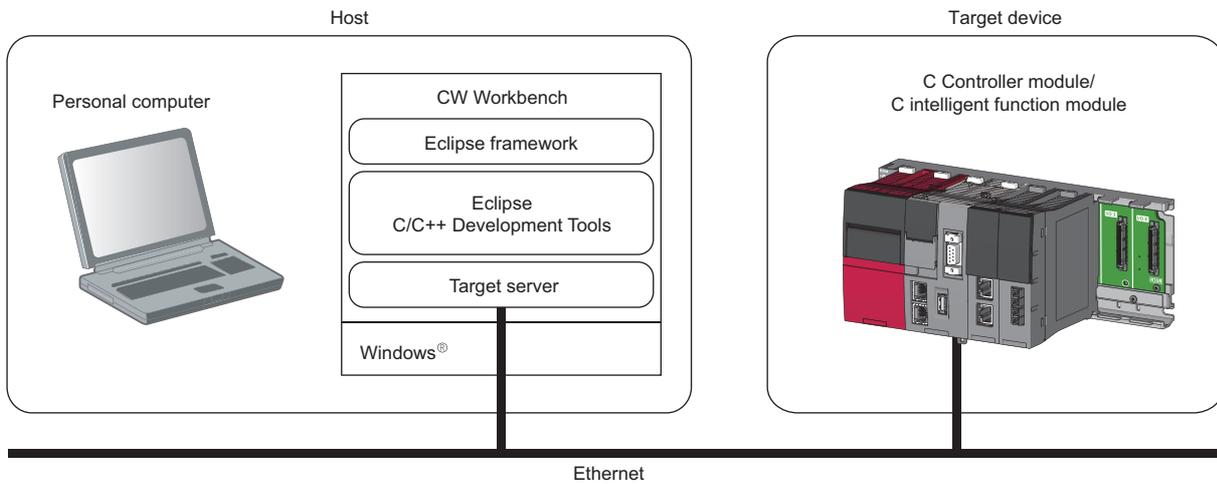
6. Check that "-O2" is added in the box next to the [Tool Flags] button in "Build Properties", and click the [OK] button.



To cancel the optimization option, select "Optimization" from the tree on the left in the "Gnu Compiler Options" screen. Then, click the button (  ) in "Enable optimization", or unselect the check box. Check that the button is changed to cancel (  ) and "-O2" is deleted from "Current value".

# 8 CONNECTING AND DEBUGGING TARGET

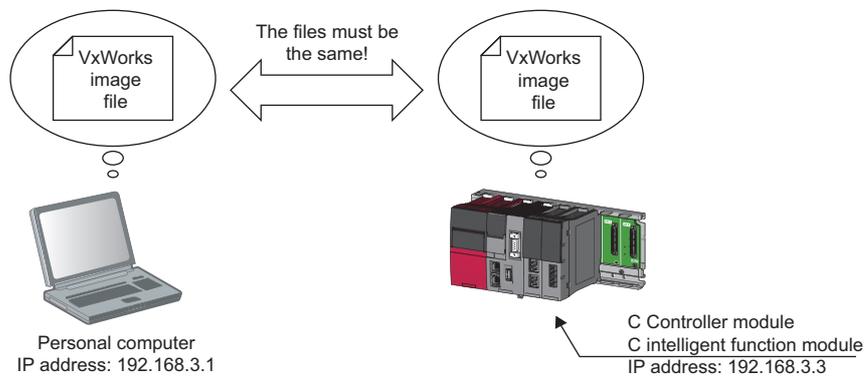
This chapter explains the settings of target server to establish communication between the host (target server) and target (C Controller module and C intelligent function module), connect/disconnect communication, and procedure for debugging.



## 8.1 Setting Target Server

Configure the following settings to CW Workbench to establish connection between a target server and a target.

- IP address of the target
- VxWorks image file



### Point

The VxWorks image file set to CW Workbench and the VxWorks image file in the system memory (/SYSTEMROM/OS\_IMAGEFILE) of the target should match.

When VxWorks image file does not exist in the personal computer or the VxWorks image file does not match, acquire a VxWorks image file from the target and set it to CW Workbench.

## Checking method for VxWorks image file consistency

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

- R12CCPU-V: \SYSTEMROM\OS\_IMAGEFILE\R12CCPU-V\_XX\*<sup>\*1</sup>
- RD55UP06-V: \SYSTEMROM\OS\_IMAGEFILE\RD55UP06-V\_XX\*<sup>\*1</sup>
- RD55UP12-V: \SYSTEMROM\OS\_IMAGEFILE\RD55UP12-V\_XX\*<sup>\*1</sup>

\*1 'XX' indicates the firmware version.

For details on the method of checking the firmware version, refer to the following:

 MELSEC iQ-R C Controller Module User's Manual

 MELSEC iQ-R C Intelligent Function Module User's Manual (Startup)

## Acquisition method of VxWorks image file

Copy a VxWorks image file on the target to an arbitrary folder on the personal computer using FTP.

Do not copy the VxWorks image file to a path or a folder that uses two-byte characters and katakana.

The default user name and password to connect to target are as follows:

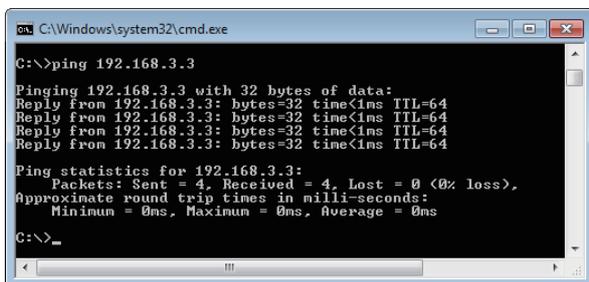
- User name: target
- Password: password

When the default user name and password have been changed, use the user name and password before the change.

## Checking network connection

Using a ping command, check the network connection between the targets, which is a connection destination of the target server and a personal computer.

### Operating procedure



```
C:\Windows\system32\cmd.exe
C:\>ping 192.168.3.3
Pinging 192.168.3.3 with 32 bytes of data:
Reply from 192.168.3.3: bytes=32 time<1ms TTL=64

Ping statistics for 192.168.3.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>_
```

1. Start the command prompt from Windows Start.
2. Execute the ping command and check that the target is connected to the network.

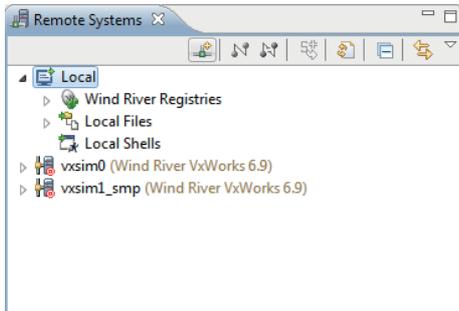
Specify the IP address of the target by the argument of ping command.

The default IP address of a target is 192.168.3.3.

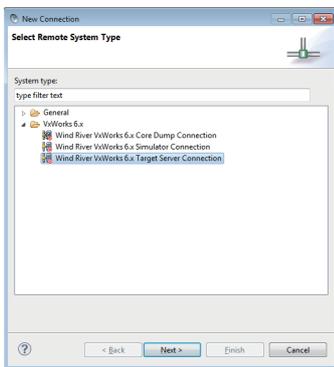
3. Execute an exit command and end the command prompt.

# How to set the target server connection

## Operating procedure

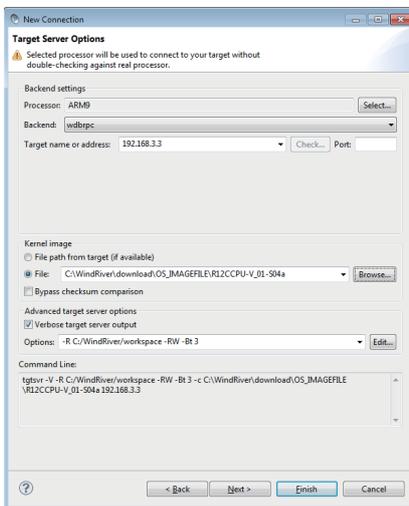


1. Click  on the toolbar of "Remote Systems" window.



The "New Connection" screen appears.

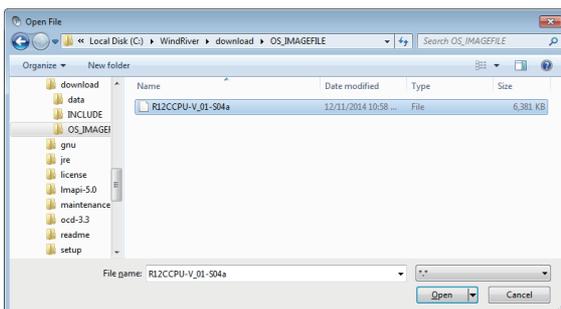
2. Select "Wind River VxWorks 6.x Target Server Connection" and click the [Next] button.



3. Set the target connection information.

- Processor: ARM9
- Backend: wdbrpc
- Target name or address: 192.168.3.3 (default)
- Port: Blank

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



The "Open File" screen appears.

5. Select the VxWorks image file and click the [Open] button.

Specify the VxWorks image file that matches with the target to be connected.

6. Click the [Finish] button.

The connection with the target is started.

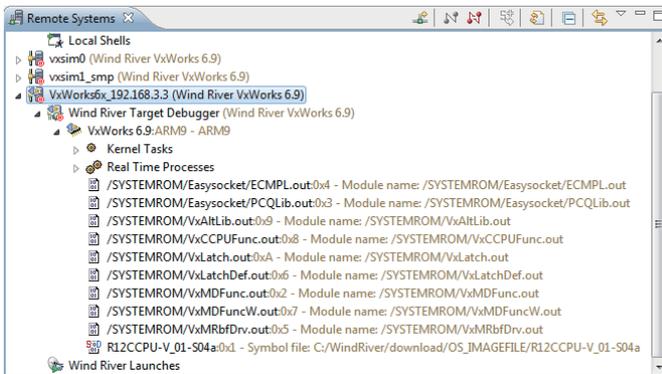
## 8.2 Connecting and Disconnecting Communication

After setting the target server, connect/disconnect the communication with target with any of the following operations.

- Select the added target server and click  / .
- Select the added target server, and right-click and select [Connect]/[Disconnect] from the shortcut menu.

After the target server is connected to target successfully at "Connect", "Connected - Target server running" is displayed at the bottom of the main window.

After the target server is disconnected from target successfully at "Disconnect", "Unconnected" is displayed at the bottom of the main window.



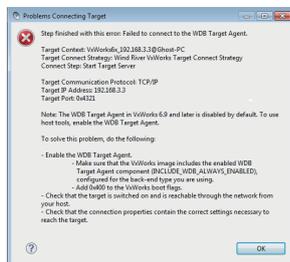
### Precautions

#### ■ Connection state of target

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

#### ■ An error occurs at "Connect"

The following error message appears if the target is not running or if the network is not connected with the target server.



If the error shown above occurs, check the following:

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

### Point

Select the connected target server to use the Host Shell.

For how to start the Shell, refer to the following:

 Page 76 Starting Shell

For details on Shell, refer to the following:

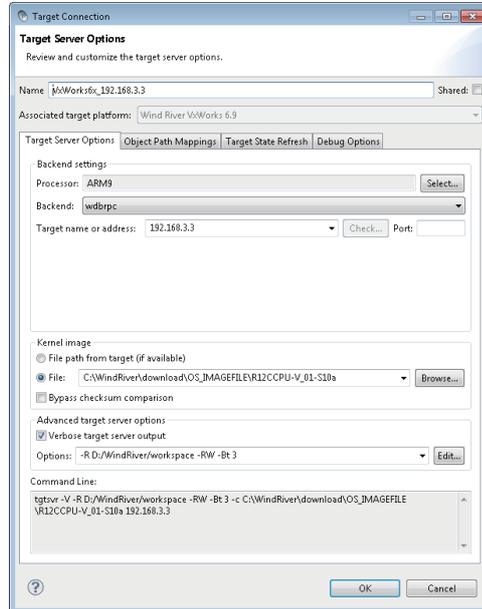
[Help] ⇒ [Help Contents] ⇒ "Wind River Documentation" ⇒ "Workbench, 3.3" ⇒ "Wind River Workbench Host Shell User's Guide, 3.3"

# How to check connection settings

If the target server cannot be connected to the target, check and change the connection settings by the following procedure.

## Window

Select the target server in the "Remote Systems" window. Right-click and select [Properties] from the shortcut menu.



Check that the settings are configured as shown in the following table.

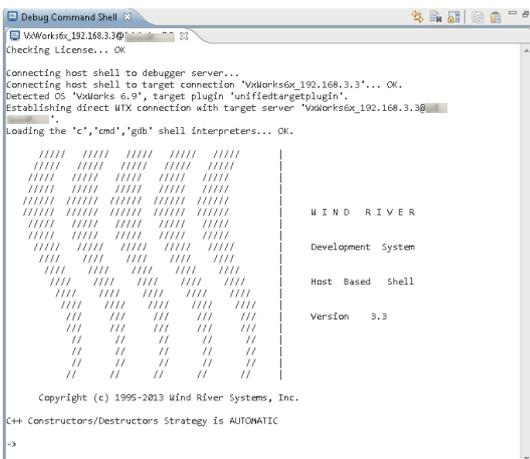
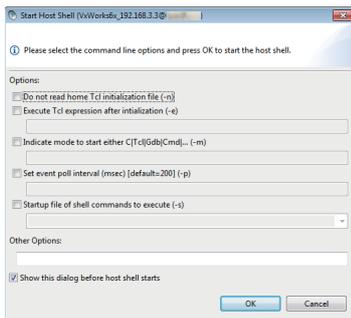
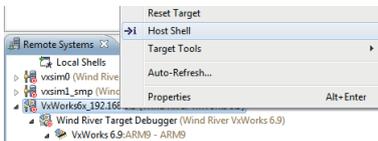
Item	Connection information
Processor	ARM9
Backend	wdbrpc
Target name or address	192.168.3.3 (If the IP address of the target is default)
Kernel image	Set the VxWorks image file in "File".

Do not change the "Advanced target server options" setting.

## 8.3 Starting Shell

Start up a Shell from the target server connected to target.

### Operating procedure



1. Select the target server connected to the target in the "Remote Systems" window. Right-click⇒select [Host Shell] from the shortcut menu.

The "Start Host Shell" screen appears.

2. Click the [OK] button.

The "Debug Command Shell" window appears, and the Shell starts.

# 8.4 Downloading Module for Debugging

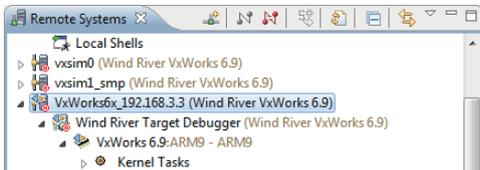
Download an execution file (.out) onto the target.

Downloading a module for debugging means to download an execution file (user program) on the target memory.

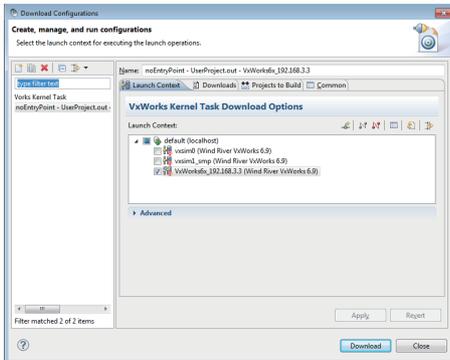
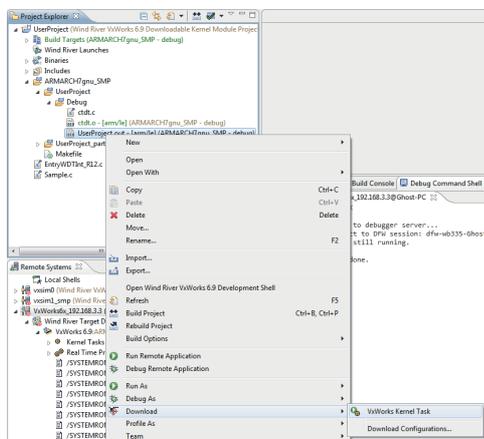
The downloaded execution file is used for activating a task from Shell.

## Operating procedure

1. In the "Remote Systems" window, select the target server in which the execution file is to be downloaded. Select the target server connected to the target.



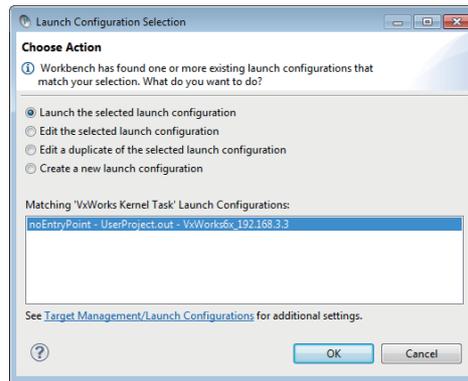
2. Select the execution file to be downloaded from the "Project Explorer" window. Right-click and select [Download] => [VxWorks Kernel Task] from the shortcut menu.



The "Download Configurations" screen appears.

3. Click the [Download] button. The selected execution file is downloaded onto the target.

The following screen appears during or after the second operation.  
Select the starting method (Launch configuration) and click the [OK] button.



# 8.5 Debugging User Programs

This section shows how to debug a user program of C Controller module. As an example, sample program 'EntryWDTInt\_R12.c' is used.

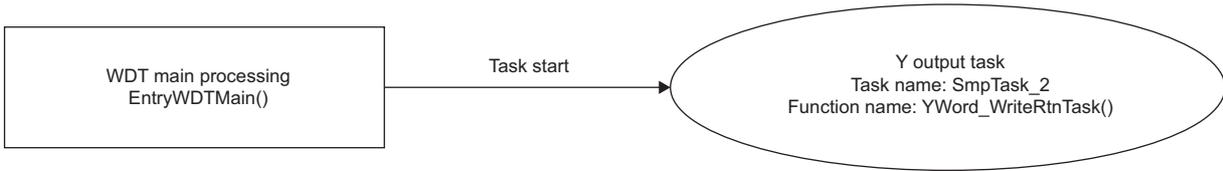


For details on sample programs, please contact your local Mitsubishi Electric sales office or representative.

## Precautions

To debug on CW Workbench, it is necessary to build the execution module in the Debug mode.

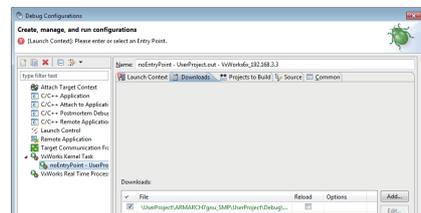
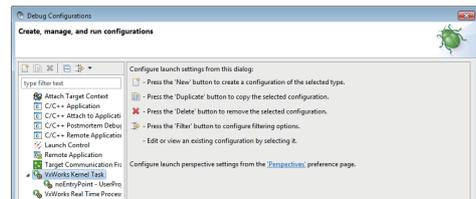
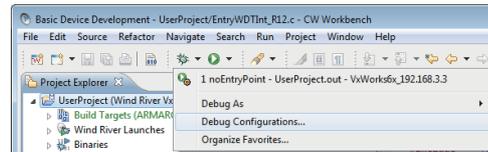
Page 56 How to set the property



## Debugging of single task

The following shows the procedure from downloading the target file up to debugging on C Controller module. Connect the C Controller module and CW Workbench before debugging a task.

### Operating procedure



1. In the "Project Explorer" window, select a project to be debugged. Select [Debug Configurations] in the pull-down list of on the toolbar.

The "Debug Configurations" screen appears.

2. Double-click "VxWorks Kernel Task" in the tree on the left on the screen.

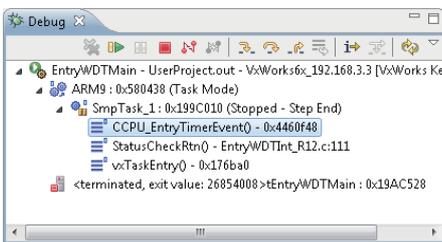
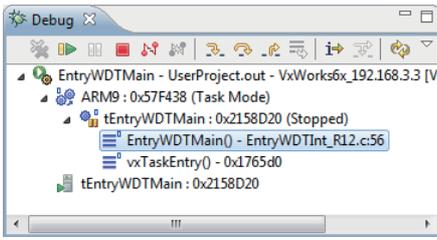
A new debug configuration is created under "VxWorks Kernel Task".

3. Select the created debug configuration and check the '.out' file to be downloaded in the [Downloads] tab.

The '.out' file of the project which is selected in the step 1 has been registered.

If the '.out' file is not registered, click the [Add] button and specify the '.out' file to be downloaded.





8. Click .

The task operation is restarted.

The task operation is suspended at the position of the breakpoint inserted in the step 7.

9. Check the operation of the task by using , , or .

 Page 82 Debug operation

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

The debugging is completed.

**Point** 

To debug the task again, select the created debug configurations in the pull-down list of  on the toolbar. The steps from 1 to 6 can be skipped.

## Task operation status

The following table shows the status of the task operations based on enabled or disabled status of the three buttons:

 (Resume),  (Suspend), and  (Terminate).

Button state	Task operation status
	Run state (during execution)
	Suspended state (during suspension)
	Termination state (debugging terminated)

## Debug operation

The tool buttons used for the debugging operations are as follows:

Button	Description
	Step Into Performs debugging in one step units. For the function steps, step execution is continued with into the called function.
	Step Over Performs debugging in one step units. For the function steps, step execution is continued in function units without into the called function.
	Step Return Continues execution at the end of the function in which the current step exists.

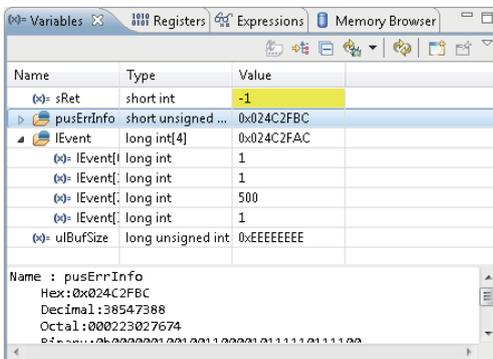
## Windows used for debugging

By checking and changing the values using the window below at Suspend status, debugging can be performed efficiently.

The color of a cell is displayed in yellow if the value has been changed from the previous value by step execution. At the "Memory Browser" window, the color of value is displayed in green.

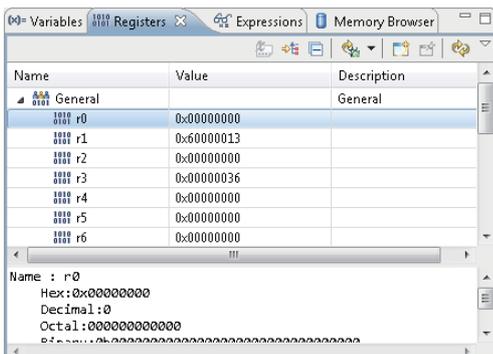
### ■ "Variables" window

Displays the current values of local variables.



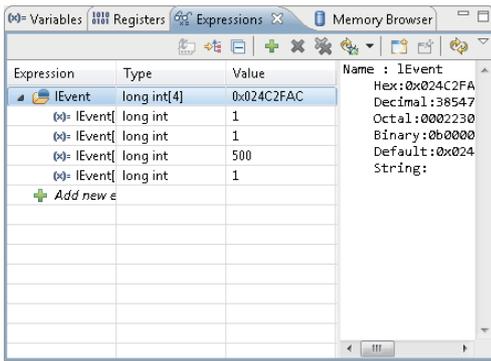
### ■ "Registers" window

Displays the current values of registers.



## ■ "Expressions" window

Displays the current values of variables registered on the Watch window.

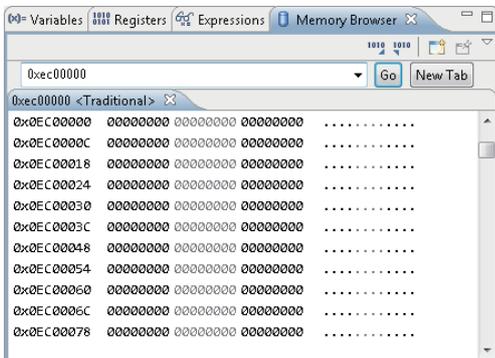


## ■ "Memory Browser" window

Displays the memory dumps on the C Controller module.

Timing to refresh values can be selected.

Right-click on the [Memory Browser] tab and select [Update Mode]⇒[Always]/[On Breakpoint]/[Manual] from the shortcut menu.



# Debugging of multiple tasks

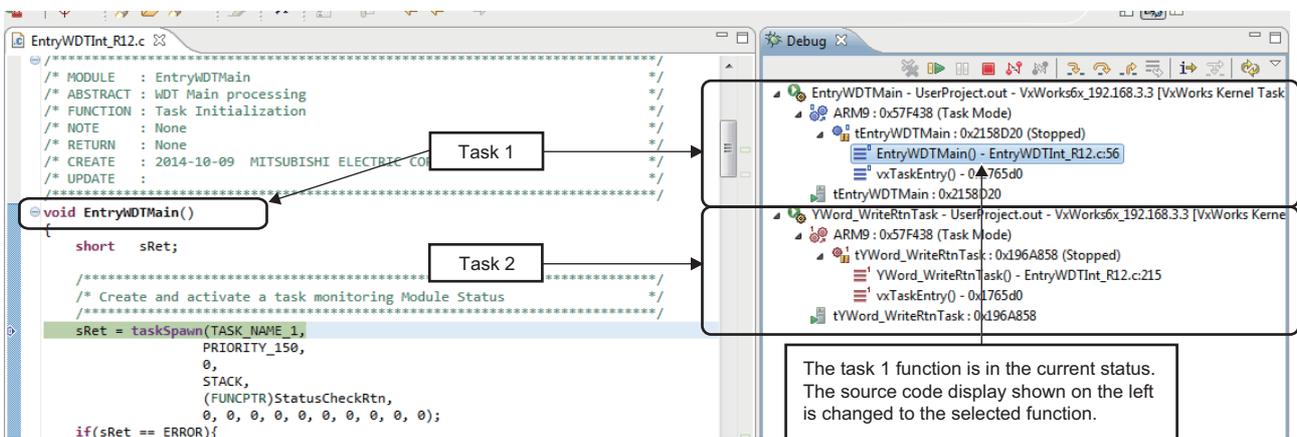
## Operating procedure

1. Repeat the procedure from the step 1 to step 6 described in "Debugging of single task". (☞ Page 79 Debugging of single task)

Multiple tasks can be started.

- The executed task is displayed in the "Debug" window.
- The tasks can be switched by selecting a function in the "Debug" window.

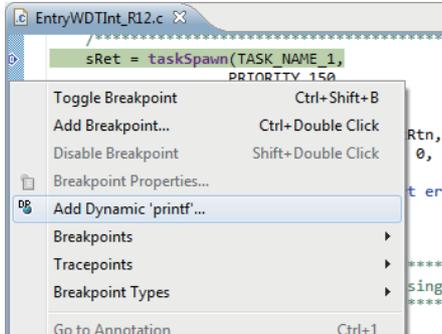
Multiple tasks can be debugged with switching the tasks.



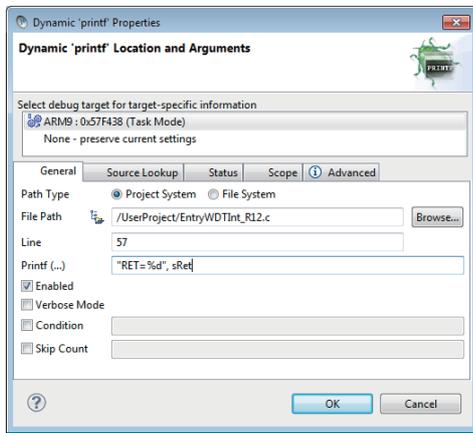
# Dynamic Printf

This function is used to insert or cancel the printf statement dynamically during debugging of program, there is no need to add printf function to the source code and the operation is similar to that of the breakpoint.

## Operating procedure

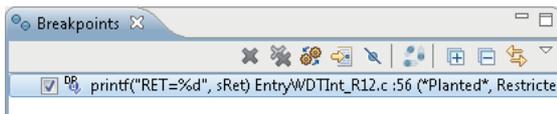


1. Open the source file to be debug in the "Editor" window.
2. Select the left edge part (█). Right-click and select [Add Dynamic 'printf'] from the shortcut menu.



The "Dynamic 'printf' Properties" screen appears.

3. Enter the statement to be displayed during debugging the program at "Printf(...)". It has the same text format as the argument to be written in the printf function. Click the [OK] button.



The print statement entered at "Printf (...)" is added in the "Breakpoints" window.

The execution result is displayed in the "Console" window. If the result of Dynamic Printf is not displayed in the "Console" window, select "Allocate console (necessary for input)" in the [Common] tab in the "Debug Configurations" screen.

# 9 CONNECTING CW-Sim AND DEBUGGING PROGRAMS

This chapter explains how to connect CW-Sim and debug the programs.

For details on the available communication route for CW-Sim, refer to the following:

☞ Page 20 Available communication routes for CW-Sim/CW-Sim Standalone

## Point

For program to be debugged, select "SIMNTgnu\_SMP" on the [Build Support and Specs] tab of "Build Properties" in the property setting for a project, and build it.

There are other necessary property settings. For more details on the property settings, refer to the following:

☞ Page 56 How to set the property

## 9.1 Setting VxWorks Network Daemon

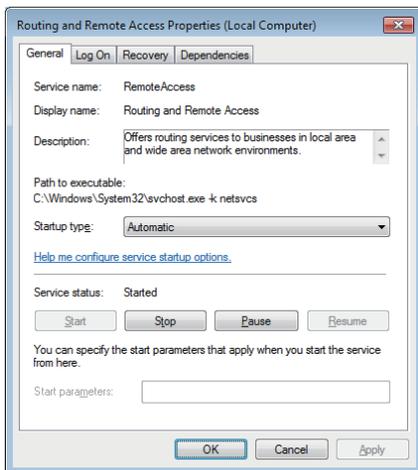
Configure the following three settings to use VxWorks network daemon on the simulator.

- Setting Routing and Remote Access service
- Setting network driver
- Setting TCP/IP

### Setting Routing and Remote Access service

#### Operating procedure

1. Select [System and Security] ⇒ [Administrative Tools] ⇒ [Services] in the control panel of Windows.
2. Double-click "Routing and Remote Access".



The "Routing and Remote Access properties" screen appears.

3. Select "Automatic" for "Startup type" and click the [Apply] button.
4. Click the [Start] button.
5. When the "Service status" becomes "Start", click the [OK] button.

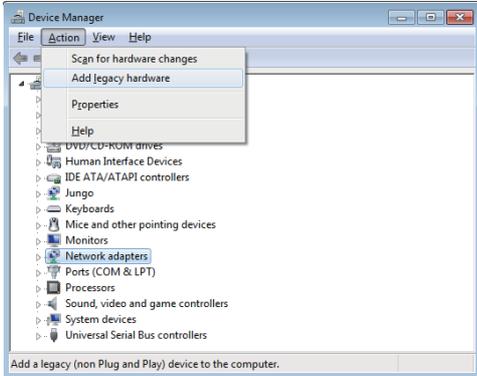
## Point

When communicating with applications that operate on the same personal computer as the simulator (including the simulator), this setting is not necessary. It needs to be configured only when communicating with applications that operate on another personal computer (including the simulator). Note that this setting cannot be configured without the network connection.

# Setting network driver

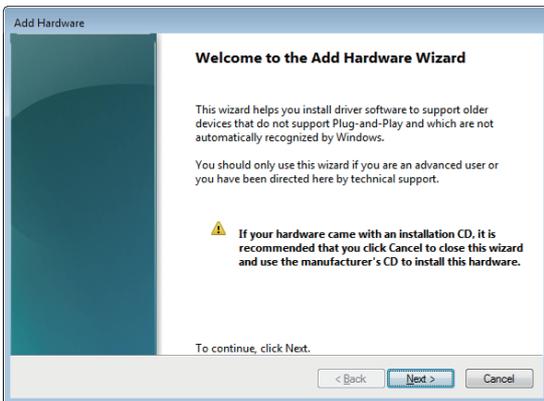
## Operating procedure

1. Select [Hardware and Sound] ⇒ [Device Manager] in the control panel of Windows.



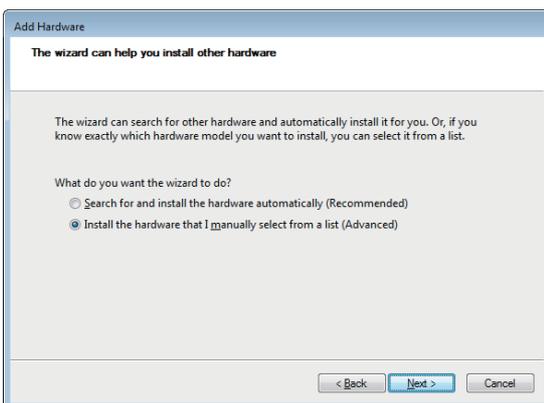
The "Device Manager" screen appears.

2. Select "Network adapters" and select [Action] ⇒ [Add legacy hardware].



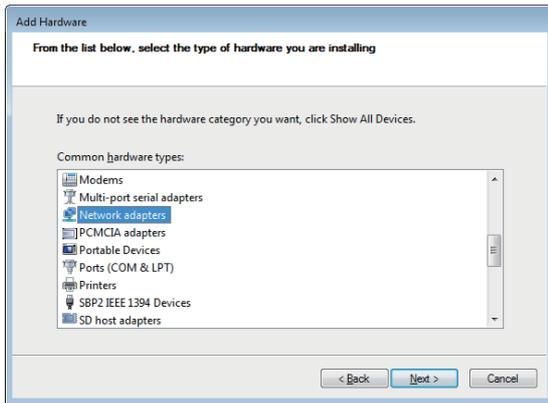
The "Add Hardware" screen appears.

3. Click the [Next] button.

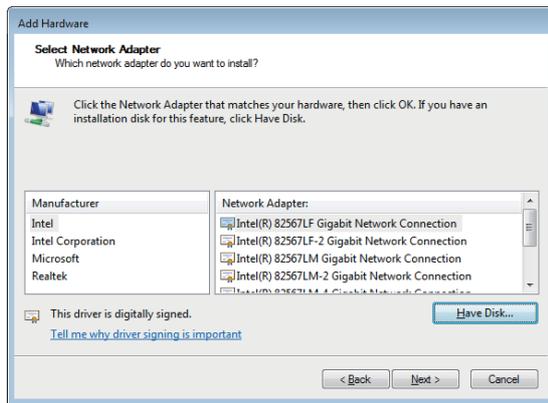


4. Select "Install the hardware that I manually select from a list (Advanced)" and click the [Next] button.

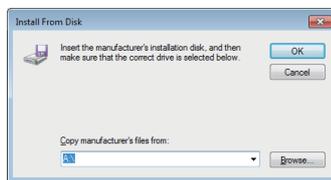




5. Select "Network adapters" and click the [Next] button.

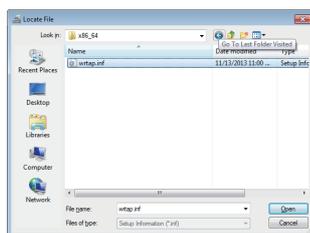


6. Click the [Have Disk] button.



The "Install From Disk" screen appears.

7. Click the [Browse] button.



The "Locate File" screen appears.

8. Select "wrtpap.inf" and click the [Open] button.

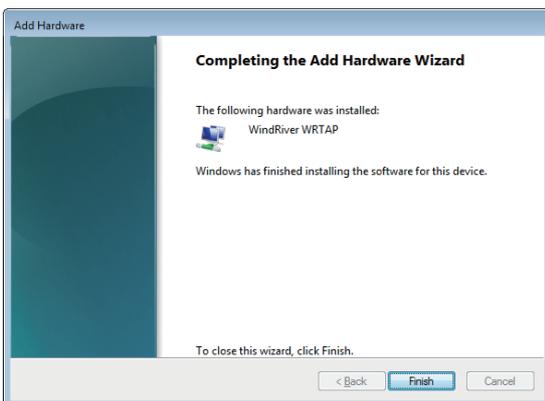
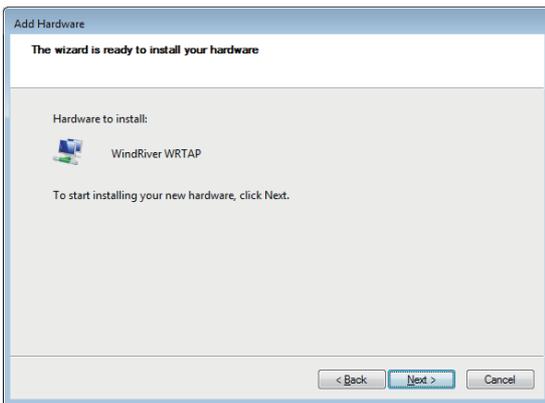
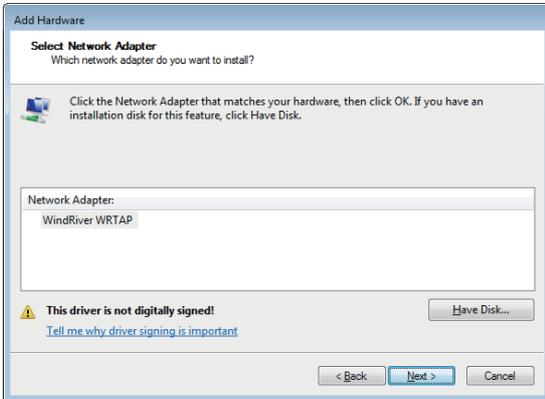
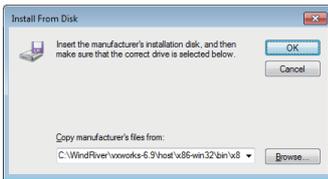
If the folder in which CW-Sim is installed is "C:\WindRiver", the folder for "wrtpap.inf" is as follows:

- 32-bit version operating system  
C:\WindRiver\vxworks-6.9\host\x86-win32\bin
- 64-bit version operating system  
C:\WindRiver\vxworks-6.9\host\x86-win32\bin\x86\_64

If the folder in which CW-Sim Standalone is copied is "C:\CCPUSIM", the folder for "wrtpap.inf" is as follows:

- 32-bit version operating system  
C:\CCPUSIM\CWSIMSA\vxsimnetd
- 64-bit version operating system  
C:\CCPUSIM\CWSIMSA\vxsimnetd\x86\_64





9. Click the [OK] button.

10. Select "WindRiver WRTAP" and click the [Next] button.

11. Click the [Next] button.

If the following message appears, click "Install".



12. Click the [Finish] button.

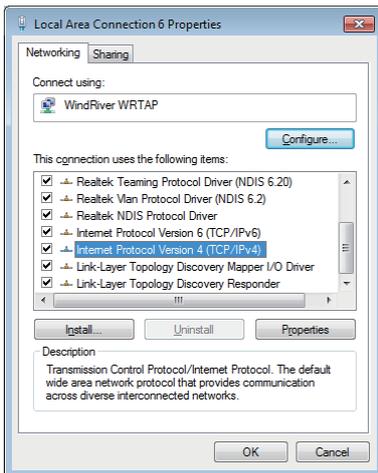
# Setting TCP/IP

## Operating procedure

1. Select [View network status and tasks] ⇒ [Change adapter settings] in the control panel of Windows.

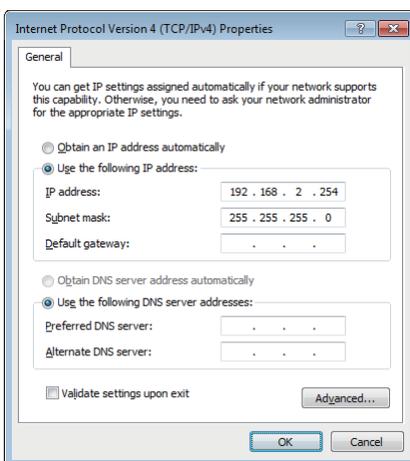


2. Right-click the local area connection with device name "WindRiver WRTAP", and select [Properties] from the shortcut menu.



The "Local Area Connection Properties" screen appears.

3. Select "Internet Protocol Version 4 (TCP/IPv4)" and click the [Properties] button.



The "Internet Protocol Version 4 (TCP/IPv4) Properties" screen appears.

4. Select "Use the following IP address", and set "IP address" and "Subnet mask".
5. Click the [OK] button.

## 9.2 Starting VxWorks Network Daemon

This section explains the startup procedure of VxWorks network daemon after CW Workbench and CW-Sim are installed to "C:\WindRiver".

### Creating VxWorks network configuration file

**Ex.**

Create a text file 'vxsimnetd.conf' in "C:\CCPUSIM".

Content of "vxsimnetd.conf" is as follows:

```
SUBNET_START sub2 {  
    SUBNET_ADDRESS = "192.168.2.0";  
    SUBNET_EXTERNAL = yes;  
    SUBNET_EXTPROMISC = yes;};
```

Modify the contents of "vxsimnetd.conf" as necessary by referring the following document and checking the contents.

 WindRiver VxWorks Simulator User's Guide

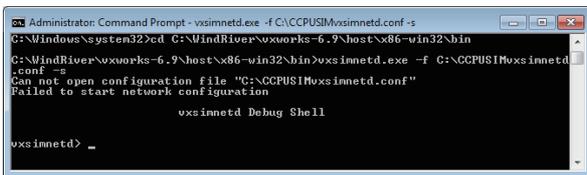
**Point** 

A sample of "vxsimnetd.conf" is stored in the folder "\Samples\English" on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD).

### Starting VxWorks network daemon

Start VxWorks network daemon once after the personal computer boots successfully.

#### Operating procedure



```
Administrator: Command Prompt - vxsimnetd.exe -f C:\CCPUSIM\vxsimnetd.conf -s  
G:\Windows\system32>cd G:\WindRiver\vxworks-6.9\host\x86-win32\bin  
G:\WindRiver\vxworks-6.9\host\x86-win32\bin>vxsimnetd.exe -f C:\CCPUSIM\vxsimnetd  
i.conf -s  
Can not open configuration file "C:\CCPUSIM\vxsimnetd.conf"  
Failed to start network configuration  
vxsimnetd Debug Shell  
vxsimnetd> _
```

1. Start the command prompt from Windows Start. Execute the command prompt as an administrator.
2. Enter the following command to change the current directory to the folder in which CW-Sim is installed.
  - cd C:\WindRiver\vxworks-6.9\host\x86-win32\bin
3. Enter the following command to start the VxWorks network daemon.
  - vxsimnetd.exe -f C:\CCPUSIM\vxsimnetd.conf -s

**Point** 

Do not close the command prompt on which VxWorks network daemon is started during debugging. Otherwise, the VxWorks network daemon will be terminated.

## 9.3 Starting Simulator

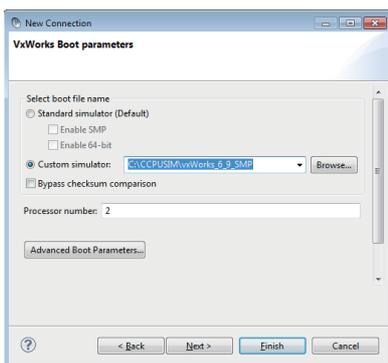
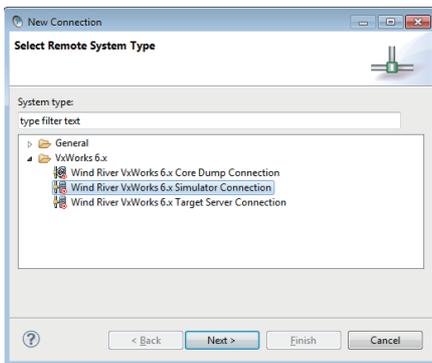
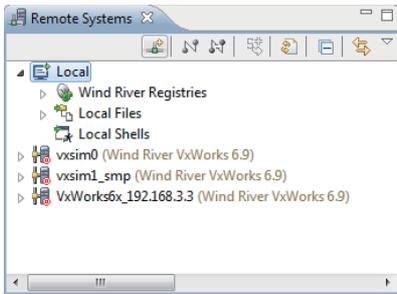
This section explains how to start the simulator.

In the 'Operating procedure', as an example, the setting of the following virtual network is described.

IP address: 192.168.2.1

Default gateway: 192.168.2.254

### Operating procedure



1. Click  in the "Remote Systems" window.

The "New Connection" screen appears.

2. Select the "Wind River VxWorks 6.x Simulator Connection", and click the [Next] button.

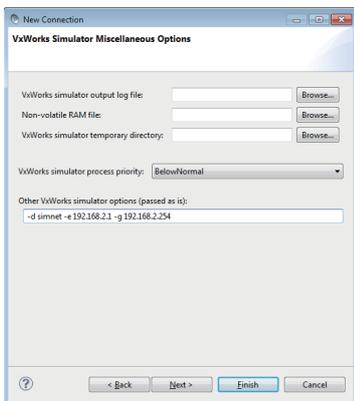
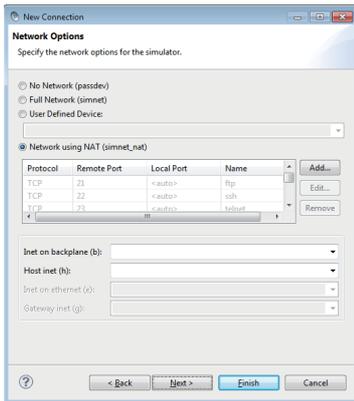
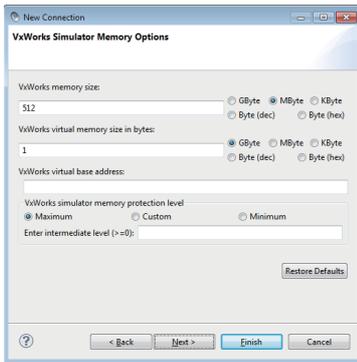
3. Select "Custom simulator" under "Select boot file name", and enter the path to the VxWorks image file and file name.

The example of a path to the VxWorks image file and file name is as follows:

- C:\CCPUSIM\vxWorks\_6\_9\_SMP

 Page 41 Copying VxWorks image/symbol files (CW-Sim)

4. Click the [Next] button.

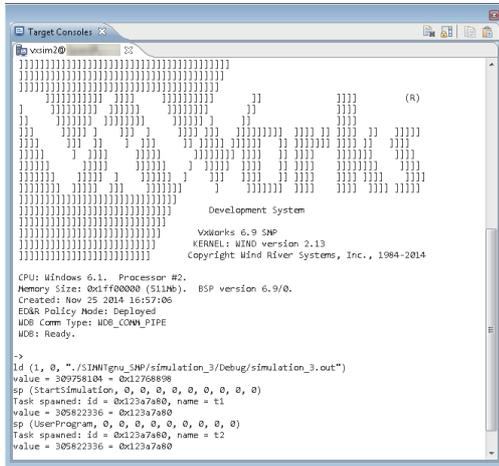
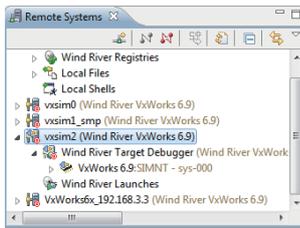


5. Click the [Next] button.

6. Click the [Next] button.

7. Set the IP address and default gateway of the virtual network in "Other VxWorks simulator options".  
-d simnet -e 192.168.2.1 -g 192.168.2.254

8. Click the [Finish] button.



When the connection to the simulator is established, the tree on the left appears in the "Remote Systems" window, and the "Target Consoles" screen appears.

## 9.4 Debugging Tasks

The debugging can be performed using the same procedure as when connecting to the target.

Start the simulator in advance.

Refer to the following:

 Page 79 Debugging User Programs

# 10 CONNECTING CW-Sim Standalone AND DEBUGGING PROGRAMS

---

This chapter explains how to connect to CW-Sim Standalone and debug the programs.

For details on the available communication route for CW-Sim Standalone, refer to the following:

 Page 20 Available communication routes for CW-Sim/CW-Sim Standalone

## **Point**

For program to be debugged, select "SIMNTgnu\_SMP" on the [Build Support and Specs] tab of "Build Properties" in the property setting for a project, and build it.

There are other necessary property settings. For more details on the property settings, refer to the following:

 Page 56 How to set the property

---

## 10.1 Setting VxWorks Network Daemon

---

Configure the following three settings to use VxWorks network daemon on the simulator.

- Setting Routing and Remote Access service
- Setting network driver
- Setting TCP/IP

For the setting methods, refer to the following:

 Page 85 Setting VxWorks Network Daemon

## 10.2 Starting VxWorks Network Daemon

This section explains the startup procedure of VxWorks network daemon after CW-Sim Standalone is installed to "C:\CCPUSIM".

### Creating VxWorks network configuration file

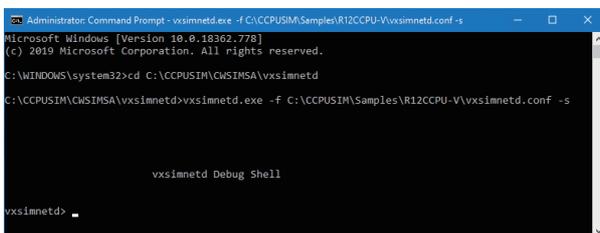
For the creation methods, refer to the following:

📖 Page 90 Creating VxWorks network configuration file

### Starting VxWorks network daemon

Start VxWorks network daemon once after the personal computer boots successfully.

#### Operating procedure



```
Administrator: Command Prompt - vxsimnetd.exe -f C:\CCPUSIM\Samples\R12CCPU-V\vxsimnetd.conf -s
Microsoft Windows [Version 10.0.18362.778]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>cd C:\CCPUSIM\CWSIMSA\vxsimnetd
C:\CCPUSIM\CWSIMSA\vxsimnetd>vxsimnetd.exe -f C:\CCPUSIM\Samples\R12CCPU-V\vxsimnetd.conf -s

vxsimnetd Debug Shell

vxsimnetd> _
```

1. Start the command prompt from Windows Start. Execute the command prompt as an administrator.
2. Enter the following command to change the current directory to the installation folder of CW-Sim Standalone.
  - cd C:\CCPUSIM\CWSIMSA\vxsimnetd
3. Enter the following command to start the VxWorks network daemon.
  - R12CCPU-V:  
vxsimnetd.exe -f C:\CCPUSIM\Samples\R12CCPU-V\vxsimnetd.conf -s
  - RD55UP06-V or RD55UP12-V:  
vxsimnetd.exe -f C:\CCPUSIM\Samples\RD55UP06-V\vxsimnetd.conf -s

#### Point

Do not close the command prompt on which VxWorks network daemon is started during simulation. Otherwise, the VxWorks network daemon will be terminated.



# 11 USAGE EXAMPLE OF CW-SIM USING SAMPLE PROGRAM

This chapter explains the usage of CW-Sim using a sample program.

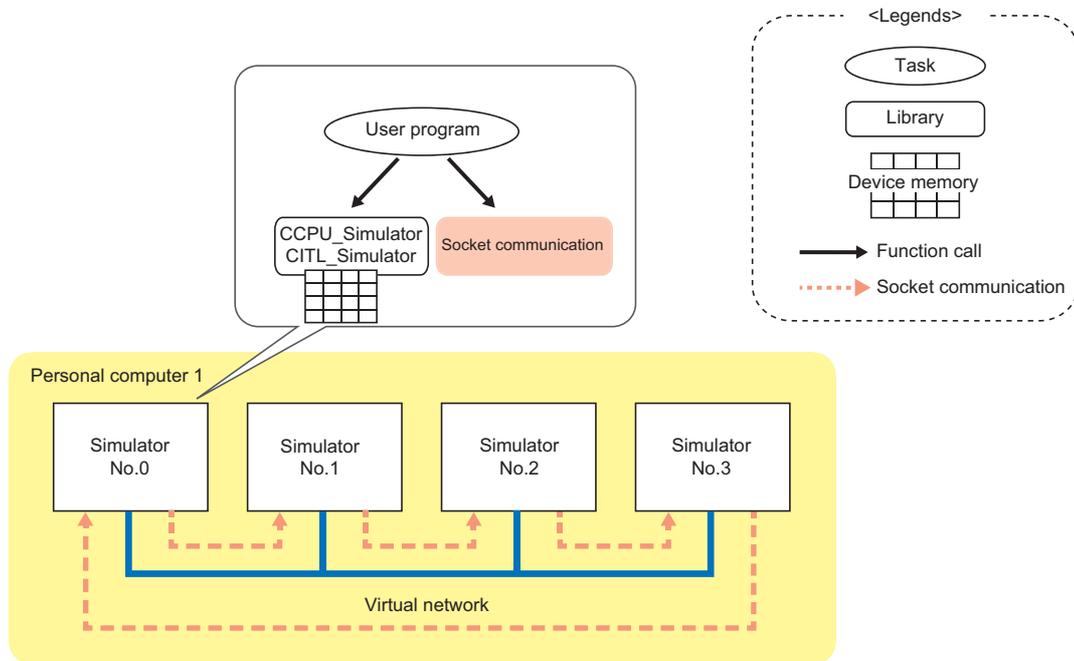
## 11.1 Features of Sample Program

This section explains the features of sample program.

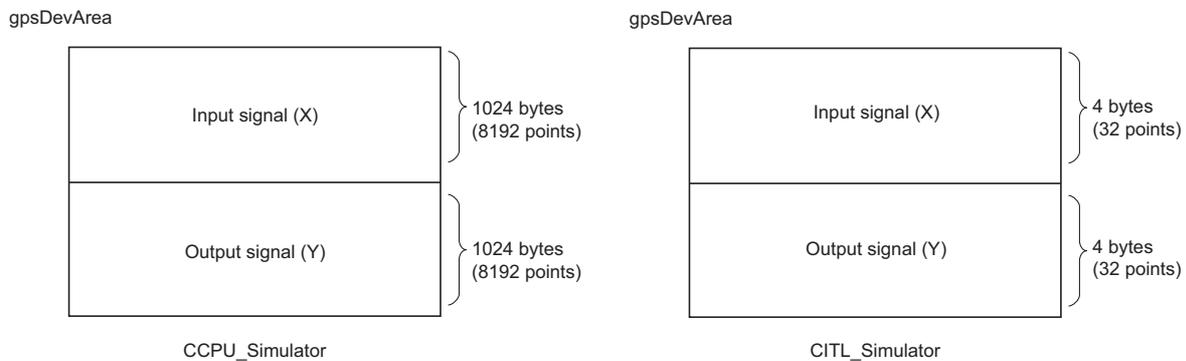
### Configuration of sample program

The following information explains and figure shows the sample programs stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD) and the system configuration at execution of the sample program.

- The system consists of four simulators, and each of which is connected to a virtual network.
- On each simulator, C Controller module dedicated functions or C intelligent function module dedicated functions in the dedicated function library stub (CCPU\_Simulator or CITL\_Simulator), and user programs which use socket communication are running.



CCPU\_Simulator and CITL\_Simulator simulate the following device memory.



# Operation of the sample program

## CCPU\_Simulator

### ■ Simulator No.0

1. Establish the TCP/IP connections with the previous (No.3) and next (No.1) simulators.
2. Monitor X0 to X8191, when X device is turned ON then, Y device data same device number as X device is turned ON.
3. Send the device number of X device of which ON status is detected in the step 2 to the next simulator (No.1) with the socket communication.
4. When the ON notification of X device is received from the previous simulator (No.3), inversely output the data to Y device with the same device number as ON-notified X device number.
5. Read the data of ON-notified X device number and transfer the same data to the next simulator (No.1) if the status is ON.
6. Repeat the steps from 1 to 5.

The Y device turns ON and OFF repeatedly by the above operation.

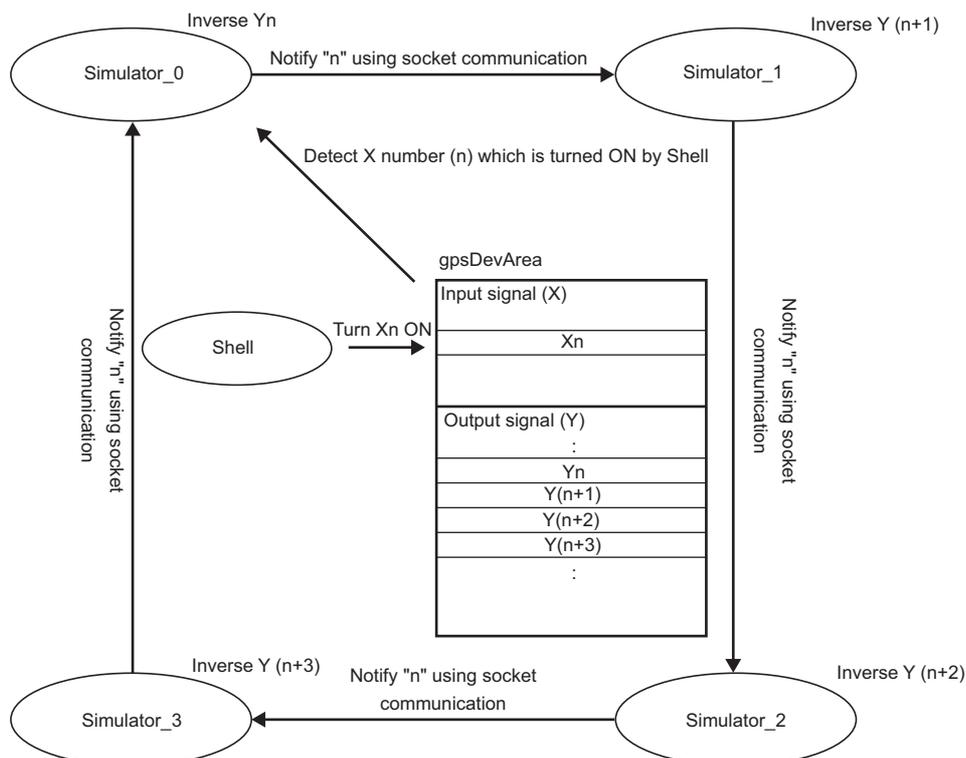
### ■ Simulators from No.1 to No.3

1. Establish the TCP/IP connections with the previous and next simulators.
2. If the ON notification of X device is received from the previous simulator, inversely output the data to the following Y device.
  - No.1: Y device with the ON notified device number + 1
  - No.2: Y device with the ON notified device number + 2
  - No.3: Y device with the ON notified device number + 3
3. Transfer the ON notification received in the step 2 to the next simulator.
4. Repeat the step 2 and step 3.

The Y device turns ON and OFF repeatedly by the above operation.

### ■ Operation of sample program

For the operation of the sample program, refer to the following figure.



■ Simulator No.0

1. Establish the TCP/IP connections with the previous (No.3) and next (No.1) simulators.
2. Monitor Y0 to Y31, when Y device is turned ON then, X device data same device number as Y device is turned ON.
3. Send the device number of Y device of which ON status is detected in the step 2 to the next simulator (No.1) with the socket communication.
4. When the ON notification of Y device is received from the previous simulator (No.3), inversely output the data to X device with the same device number as ON-notified Y device number.
5. Read the data of ON-notified Y device number and transfer the same data to the next simulator (No.1) if the status is ON.
6. Repeat the steps from 1 to 5.

The X device turns ON and OFF repeatedly by the above operation.

■ Simulators from No.1 to No.3

1. Establish the TCP/IP connections with the previous and next simulators.
2. If the ON notification of Y device is received from the previous simulator, inversely output the data to the following X device.
  - No.1: X device with the ON notified device number + 1
  - No.2: X device with the ON notified device number + 2
  - No.3: X device with the ON notified device number + 3

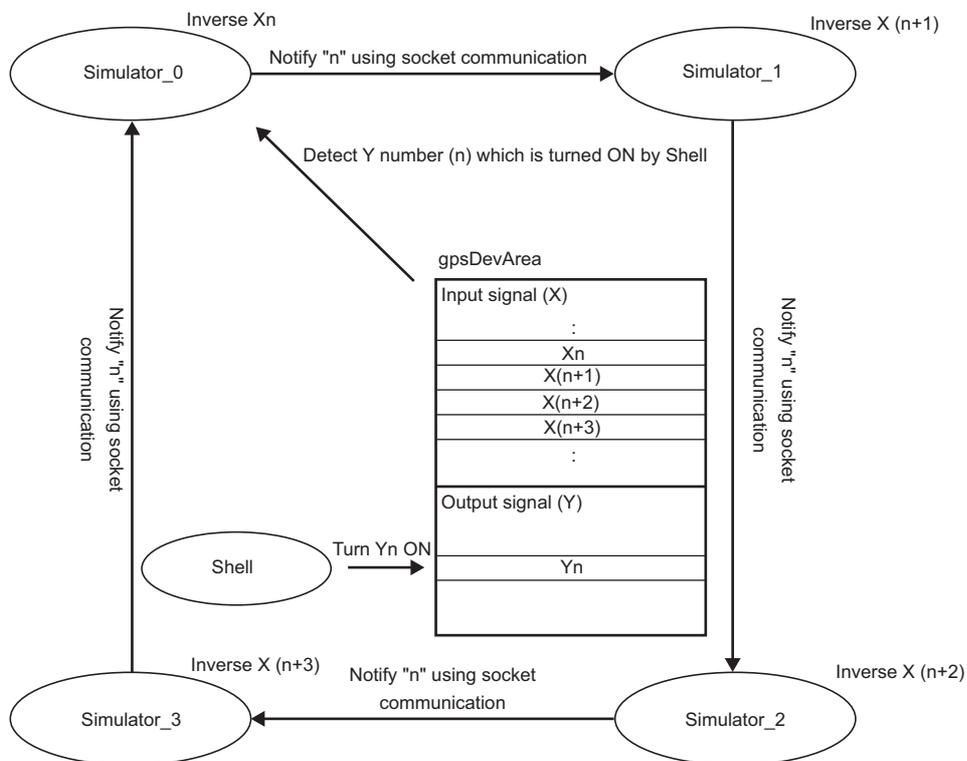
3. Transfer the ON notification received in the step 2 to the next simulator.

4. Repeat the step 2 and step 3.

The X device turns ON and OFF repeatedly by the above operation.

■ Operation of sample program

For the operation of the sample program, refer to the following figure.



# 11.2 Utilizing Sample Program

This section explains the procedure for utilizing the sample program for a C Controller module.

## Preparing the sample program

Copy the sample program stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD) to a local folder. For the storage destination of the sample program, refer to the following:

☞ Page 23 Contents of DVD-ROM/CD-ROM

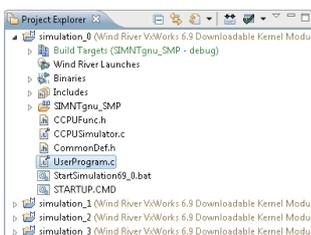
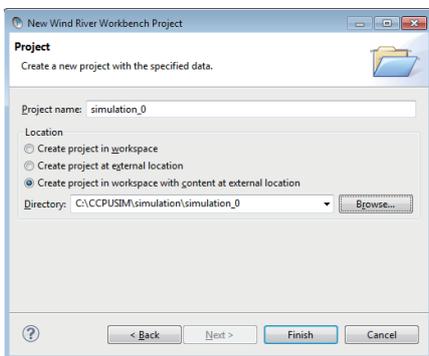
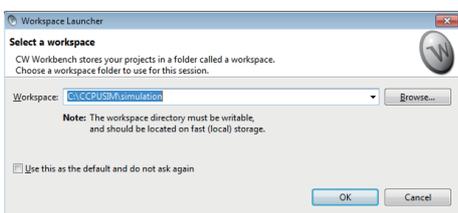
**Ex.**

Copy destination local folder  
C:\CCPUSIM

## Opening the sample program

### Operating procedure

1. Start CW Workbench 3.3 from "Wind River" in Windows Start.



The "Workspace Launcher" screen appears.

2. Specify the folder in which the sample program has been copied to "Workspace:".

A folder can also be selected by clicking the [Browse] button.

3. Click the [OK] button.

CW Workbench is started.

4. Create a new project as shown in the procedure from step 4 to 6 below.

☞ Page 54 How to create a new project

The following four projects are the projects to be newly created.

- simulation\_0
- simulation\_1
- simulation\_2
- simulation\_3

5. Set the property of each project by following the procedure shown in the section below.

☞ Page 56 How to set the property

6. Double-click the sample program, "UserProgram.c" in the "Project Explorer" window to display and edit the sample program.

In this sample program, the stub for some C Controller module dedicated functions is defined in "CCPUFunc.h". Add a stub as necessary.

## 11.3 Building Project

---

The section explains the procedure to build a project in which the sample program is used.

For details on errors displayed after the completion of building a project and execution files to be generated, refer to the following:

 Page 67 Building a Project

### Operating procedure

1. Select the project to be built in the "Project Explorer" window. Right-click and select [Refresh] from the shortcut menu.
2. Select the project to be built in the "Project Explorer" window. Right-click and select [Rebuild Project] from the shortcut menu.

### Point

Perform [Refresh] and [Rebuild Project] for the following four projects included in the sample program.

- simulation\_0
  - simulation\_1
  - simulation\_2
  - simulation\_3
- 

## 11.4 Starting VxWorks Network Daemon

---

For more details on how to set and start VxWorks network daemon, refer to the following:

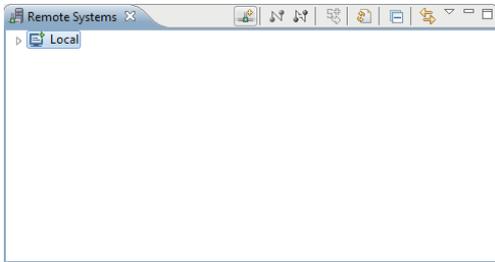
 Page 85 Setting VxWorks Network Daemon

 Page 90 Starting VxWorks Network Daemon

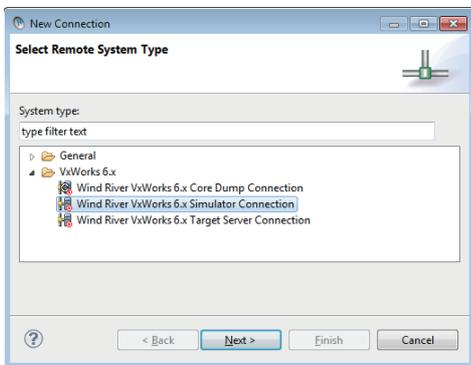
# 11.5 Creating Simulator

In the sample program, four simulators (vxsim0 to vxsim3) are used. Perform the following operations four times to create the simulators (vxsim0 to vxsim3).

## Operating procedure

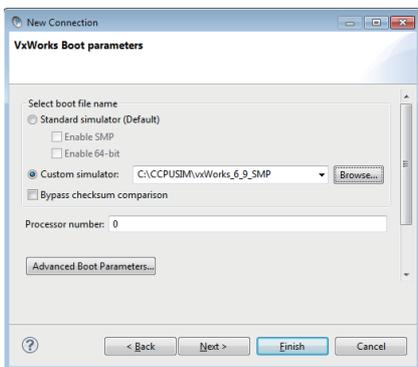


1. Click  in the "Remote Systems" window.



The "New Connection" screen appears.

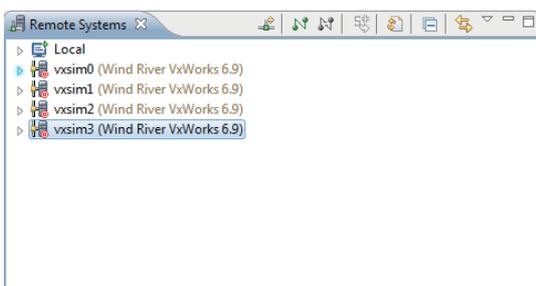
2. Select "Wind River VxWorks 6.x Simulator Connection" and click the [Next] button.



3. Select "Custom simulator" under "Select boot file name", and enter the path to the VxWorks image file and file name.

The example of a path to the VxWorks image file and file name is as follows:

- C:\CCPUSIM\vxWorks\_6\_9\_SMP
-  Page 41 Copying VxWorks image/symbol files (CW-Sim)
4. Click the [Finish] button.



When the connection to the simulator is established, the tree on the left appears in the "Remote Systems" window, and the "Target Consoles" screen appears.

5. Click  in the "Remote Systems" window and close the "Target Consoles" screen.

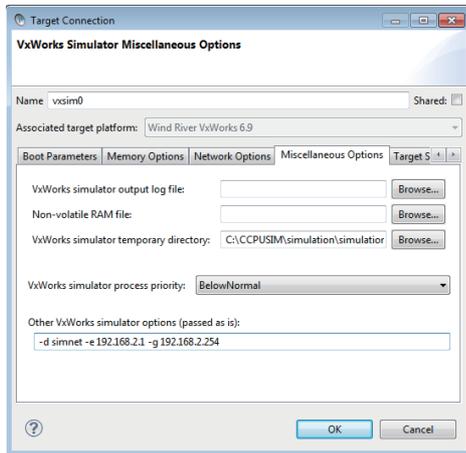
# 11.6 Setting Simulator

Perform the following operations four times to configure the settings for the simulators (vxsim0 to vxsim3).

## Operating procedure

1. Select each simulator (vxsim0 to vxsim3) in the "Remote Systems" window. Right-click and select [Properties] from the shortcut menu.

The "Target Connection" screen appears.



2. Specify the save folder of the "STARTUP.CMD" file for "VxWorks simulation temporary directory" in the [Miscellaneous Options] tab.

For the project to be debugged, leave the settings blank.

Example) When the sample program has been saved in "C:\CCPUSIM\simulation", the settings of each "VxWorks simulation temporary directory" are as follows:

- vxsim0: "C:\CCPUSIM\simulation\simulation\_0"
- vxsim1: "C:\CCPUSIM\simulation\simulation\_1"
- vxsim2: "C:\CCPUSIM\simulation\simulation\_2"
- vxsim3: "C:\CCPUSIM\simulation\simulation\_3"

3. Set the IP address and default gateway of the virtual network for "Other VxWorks simulator options".

Example) When the gateway is "192.168.2.254", the setting of "Other VxWorks simulator options" is as follows:

- IP address of vxsim0 (No.0) "192.168.2.1": "-d simnet -e 192.168.2.1 -g 192.168.2.254"
- IP address of vxsim1 (No.1) "192.168.2.2": "-d simnet -e 192.168.2.2 -g 192.168.2.254"
- IP address of vxsim2 (No.2) "192.168.2.3": "-d simnet -e 192.168.2.3 -g 192.168.2.254"
- IP address of vxsim3 (No.3) "192.168.2.4": "-d simnet -e 192.168.2.4 -g 192.168.2.254"

4. Click the [OK] button to complete the settings of CW-Sim.

### Point

After changing the setting of IP address, change the IP address definitions in the sample program as well and rebuild the project.

# 11.7 Executing Sample Program

## Operating procedure

1. In the "Remote Systems" window, select each simulator (vxsim0 to vxsim3) and click  to start CW-Sim. Startup CW-Sim in the following order:

- vxsim3 (No.3)
- vxsim2 (No.2)
- vxsim1 (No.1)
- vxsim0 (No.0)

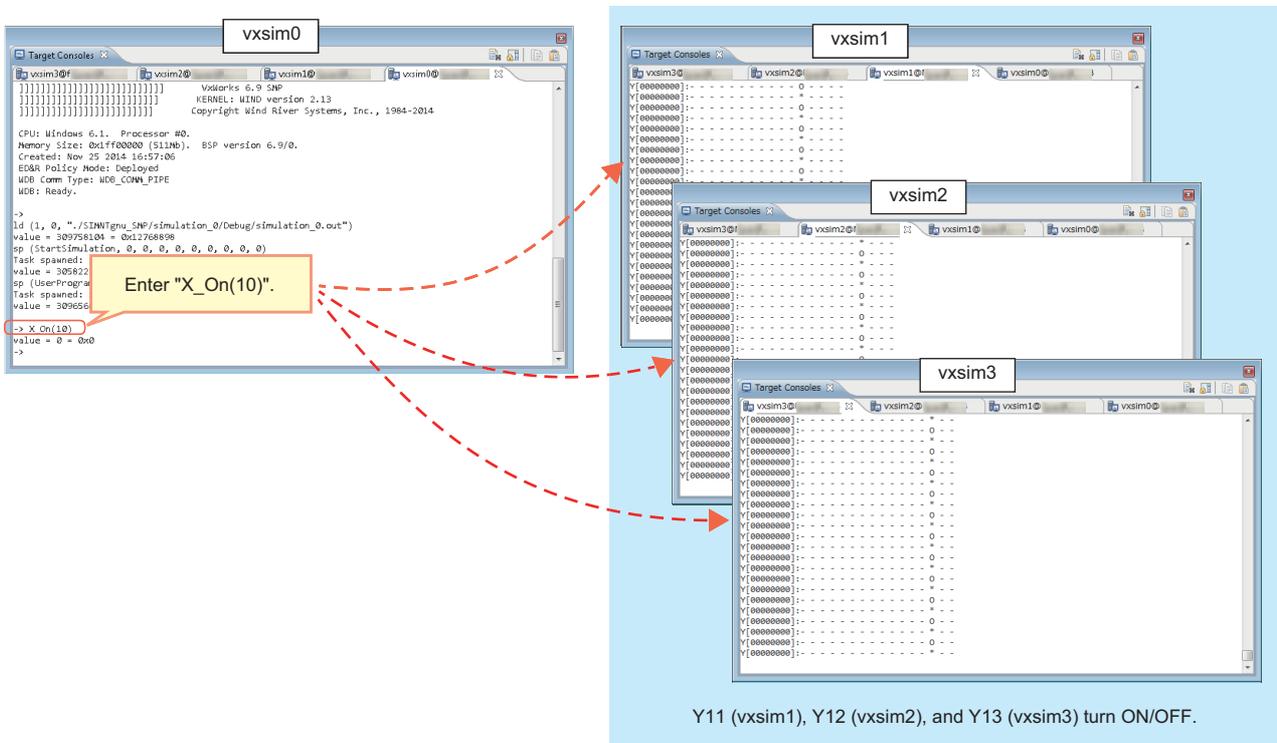
2. Execute the X\_On function\*1 in the "Target Consoles" screen of the vxsim0 to run the sample program.

\*1 For CRTL\_Simulator, execute the Y\_On function.

For example, when "X\_On(10)" is entered, X10 turns ON, and Y device turns ON/OFF.

ON/OFF status of Y devices is displayed in the "Target Consoles" screen of the simulators (vxsim1 to vxsim3) as follows:

- "\*" = ON
- "0" = OFF
- "-" = Not displayed



This part explains the errors which may occur when using CW Workbench or CW-Sim, and their troubleshooting.

12 TROUBLESHOOTING

---

13 LICENSE ERRORS

---

# 12 TROUBLESHOOTING

This chapter explains the cause(s) of error(s) which may occur during the use of CW Workbench and CW-Sim, with their respective corrective action(s).

## 12.1 Common Troubleshooting

### Error description

The following table shows the common errors which may occur on CW Workbench and CW-Sim.

Category	Problem/Reference
Installation	Page 106 The installation process has stopped halfway or has terminated suddenly before completion.
Installation (temporary license)	Page 107 An error message appears and installation does not proceed further in case of LAC and User information is provided and clicked [Next] button.
License	Page 107 Not aware of usage of the acquired permanent license file. Page 107 Not aware of the method for deleting permanent license file.
Startup	Page 107 CW Workbench does not start when message "Workspace in use or cannot be created, choose a different one" appears. Page 107 The displayed contents do not change after patch has been applied. Page 108 Product Maintenance does not exist in "Wind River" in Windows Start. Page 108 The help of the FTP server does not open.
Building	Page 108 An error, "command not found" has occurred and the build is not executed. Page 108 An error such as "no input files", "No Such file", or "No such file or directory" has occurred. Page 108 An error, "Build target "/>tbody>

### Corrective action

The cause(s) of errors and their respective corrective action(s) are explained below.

#### Installation

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

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

## Installation (temporary license)

■ An error message appears and installation does not proceed further in case of LAC and User information is provided and clicked [Next] button.

Error message	Cause	Corrective action
HTTP Server: Bad Gateway	The access target HTTP server is not responding properly.	Wait for a while, and try to install the products again. If the problem still remains, install the products another day.
Unknown Host:	The personal computer in use is connected to the Internet via a proxy server.	Click the [Back] button to return to the "Online Update Settings" screen. Then, select "Connect to the Internet using a proxy server", and configure the proxy server setting.
Unable to read repository at Unable connect to repository* <sup>1</sup>	The personal computer could not connect to Internet.	Check if the personal computer can connect to Internet, and install the products on the personal computer connected to the Internet. When the personal computer is connected via a proxy server, take corrective actions shown with the error message (Unknown Host).
HttpComponents connection error response code 500.	A temporary license may be expired on the personal computer in use.	Perform the installation with an installation key file or a permanent license. If the problem persists, please contact your local Mitsubishi Electric sales office or representative.

\*1 Only when CW-Sim is used.

## License

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

Store the acquired permanent license file in the license folder of personal computer on which CW Workbench is installed.

☞ Page 42 Applying Permanent License

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

Delete all the files in the license folder of personal computer on which CW Workbench is installed.

☞ Page 47 Deleting Permanent License

## Startup

■ CW Workbench does not start when message "Workspace in use or cannot be created, choose a different one" appears.

Cause	Corrective action
The Workspace folder specified during the startup of CW Workbench is being used by other instance of CW Workbench.	<ul style="list-style-type: none"> <li>Click the [OK] button, and select a different folder on the displayed Workspace folder specification screen.</li> <li>Terminate the running CW Workbench.</li> </ul>

■ The displayed contents do not change after patch has been applied.

Cause	Corrective action
Old data is stored in the cache.	When starting CW Workbench, specify "-clean" to the argument.

- How to specify "-clean"

### Operating procedure

1. Select the shortcut of CW Workbench on the desktop. Right-click and select [Properties] from the shortcut menu.
2. Enter a space at the end of "Target:" in the "CW Workbench Properties" screen. Enter "-clean" after the space and click the [OK] button.

### Point

Delete "-clean" argument after use, because keeping argument "-clean" slows the startup of CW Workbench.

- How to delete "-clean"

In the step 2 above, delete a space and "-clean", and then click the [OK] button.

## ■Product Maintenance does not exist in "Wind River" in Windows Start.

Cause	Corrective action
The existing CW Workbench and newly installed CW Workbench may have the same installation folder.	Uninstall CW Workbench as explained below, and install CW Workbench in a different folder from the one with the existing CW Workbench.  Page 111 Uninstallation process is cancelled in the halfway.

## ■The help of the FTP server does not open.

Cause	Corrective action
"Failed to launch help" appears even when selecting [HELP] on the menu of the FTP server included in CW Workbench/CW-Sim.	The operating system does not support it. Use Microsoft® Internet Information Services.

## Building

### ■An error, "command not found" has occurred and the build is not executed.

Cause	Corrective action
An unsupported compiler has been set to CW Workbench.	Check that any unsupported compilers have not been specified.

- How to check

### Operating procedure

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

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

Cause	Corrective action
The source file has not been registered in the project to be built.	Create a new file with extension of '.c' or '.cpp' or change the file extension to '.c' or '.cpp'. Execute the build after registering the file to the build project. <ul style="list-style-type: none"><li>• Creating new project:  Page 54 Creating New Projects</li><li>• Change of file name: Select the file name to be changed. Right-click and select [Rename] from the shortcut menu, or press .</li></ul>

### ■An error, "Build target "/yyy/nxxx\_partialImage" used in build target "yyyy" not found" has occurred and the build is not executed.

Cause	Corrective action
The file with the same name as the project name has been renamed.	Create a new project and move the source file from the project where an error occurs.  Page 54 Creating New Projects

### Point

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

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

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

Cause	Corrective action
A character that cannot be used is included in the source file name.	Remove the following symbols that cannot be used from the file name shown in 'nnn' in the error message, and from the source file name added to the project. • #, \$, &, ', (, ), :, =, `, two-byte characters, katakana Remove the following symbols that cannot be used in Windows for file names. • \, /, :, *, ?, ", <, >,

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

Cause	Corrective action
The source file name contains "\$".	Remove "\$" from the source file name.

■A build error "expected expression before '/' token" occurs.

Cause	Corrective action
'/' may be commented out in the source code.	Configure the setting to comment out '/'.

### Operating procedure

Configure the setting by following the procedure below so that single line comments can be compiled.

1. Select a project to which property is to be set, and select [Project] ⇨ [Properties] in the "Project Explorer" window.
2. Select "Build Properties" from the tree on the left on the screen, and click the [Tools] tab.
3. Check that "C-Compiler" is set for "Build tool:".
4. Delete "-ansi" from "Tool Flags...".

**Point** 

This setting needs to be configured for each project. If there are multiple target projects, apply the same setting to all the projects.

# 12.2 CW Workbench Troubleshooting

## Error description

The errors that may occur when using CW Workbench are shown below.

Category	Problem/Reference
Installation	Page 110 The install menu of the plug-in software cannot be found.
	Page 110 Only Product Maintenance is installed in "Wind River" in Windows Start.
Uninstallation	Page 111 Uninstallation process is cancelled in the halfway.
	Page 111 Uninstallation process has suddenly stopped before completion.
Startup	Page 111 CW Workbench does not start when message "The install root of your Wind River Workbench installation could not be located!" appears.
License	Page 112 An error message "License Not Found" appears when CW Workbench is started or being operated.
	Page 112 An error message "License Upgrade" appears when CW Workbench is started or being operated.
Target connection	Page 114 CW Workbench cannot be connected to target.
	Page 114 An error occurs and the connection fails (Failed to Connect to Target) when 'Connect' is executed in the "Remote Systems" window, OR, the connection status of the Remote Systems is suddenly changed from 'connected' to 'disconnected'.
	Page 114 The selected "Target Connection" settings are not imported.
	Page 114 The screen to select "Target platform" appears when configuring the target server connection setting.
Downloading	Page 115 The '.out' file fails to download to the target.
	Page 115 The '.out' file sometimes cannot be downloaded to the target.
	Page 115 The '.out' file fails to download to the target when the message "Relocation offset too large" appears.
Firewall	Page 115 A firewall warning message appears when CW Workbench is being operated.

## Corrective action

The cause(s) of errors and their respective corrective action(s) are explained below.

### Installation

#### ■The install menu of the plug-in software cannot be found.

Select [Help] ⇒ [Install New Software] to install the plug-in software.

If [Install New Software] cannot be found, CW Workbench is in the "Basic Device Development" display mode. Change the current display mode to "Advanced Device Development".

The display mode of CW Workbench is displayed on the title bar.

- How to change the display mode

### Operating procedure

1. Select [Window] ⇒ [Open Perspective] ⇒ [Advanced Device Development].

Or, click the Open Perspective icon (  ) at the upper right corner of CW Workbench, and select [Advanced Device Development] from the displayed menu.

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

3. Select [Help] ⇒ [Install New Software] to install the plug-in software.

#### ■Only Product Maintenance is installed in "Wind River" in Windows Start.

Reinstall CW Workbench using a permanent license file for CW Workbench.

## Uninstallation

### ■ Uninstallation process is cancelled in the halfway.

Use either of the methods given below to complete the uninstallation:

- Execute the <installation destination folder>\maintenance\wrInstaller\x86-win32\wrInstaller.exe to uninstall.
- Delete the installation destination folder manually.

### ■ Uninstallation process has suddenly stopped before completion.

Try the uninstallation again.

☞ Page 48 Uninstallation

If CW Workbench still cannot be uninstalled, refer to the following troubleshooting.

☞ Page 111 Uninstallation process is cancelled in the halfway.

## Startup

### ■ CW Workbench does not start when message "The install root of your Wind River Workbench installation could not be located!" appears.

Cause	Corrective action
Characters other than alphanumeric characters, an underscore "_", or a hyphen "-" is used for the installation destination folder name.	At first, uninstall CW Workbench, then use the following characters for naming the installation and/or reinstallation of CW Workbench destination folder. <ul style="list-style-type: none"><li>• Alphanumeric characters (A space cannot be used.)</li><li>• Underscore "_", hyphen "-"</li></ul>

## License

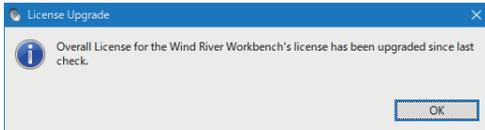
### ■ An error message "License Not Found" appears when CW Workbench is started or being operated.

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

📖 Page 118 LICENSE ERRORS

### ■ An error message "License Upgrade" appears when CW Workbench is started or being operated.

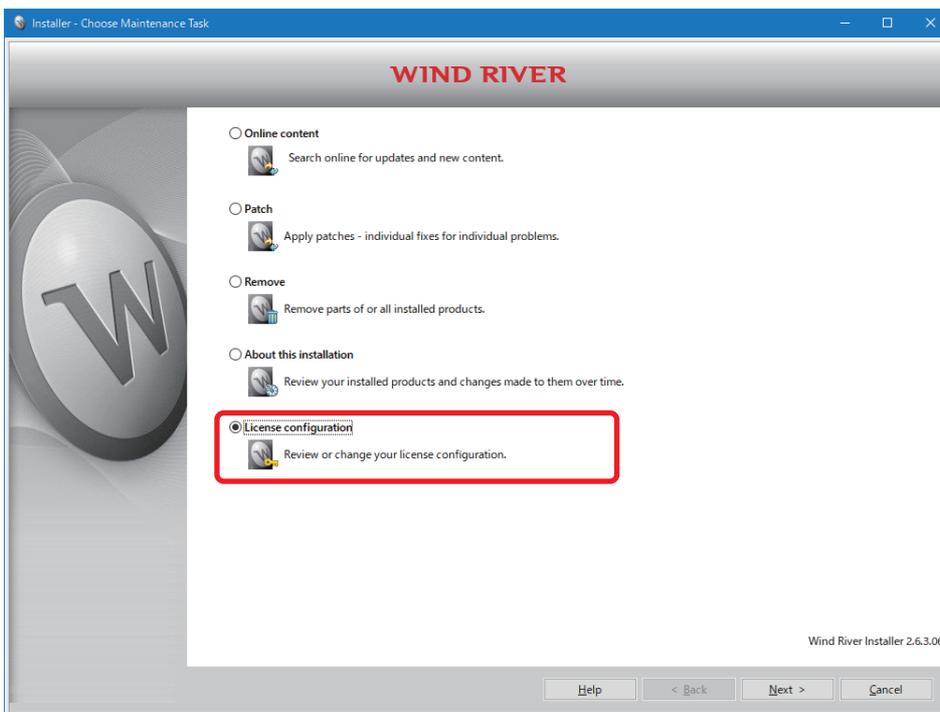
If the message appears, click the [OK] button.



If the message appears repeatedly, perform the following operations:

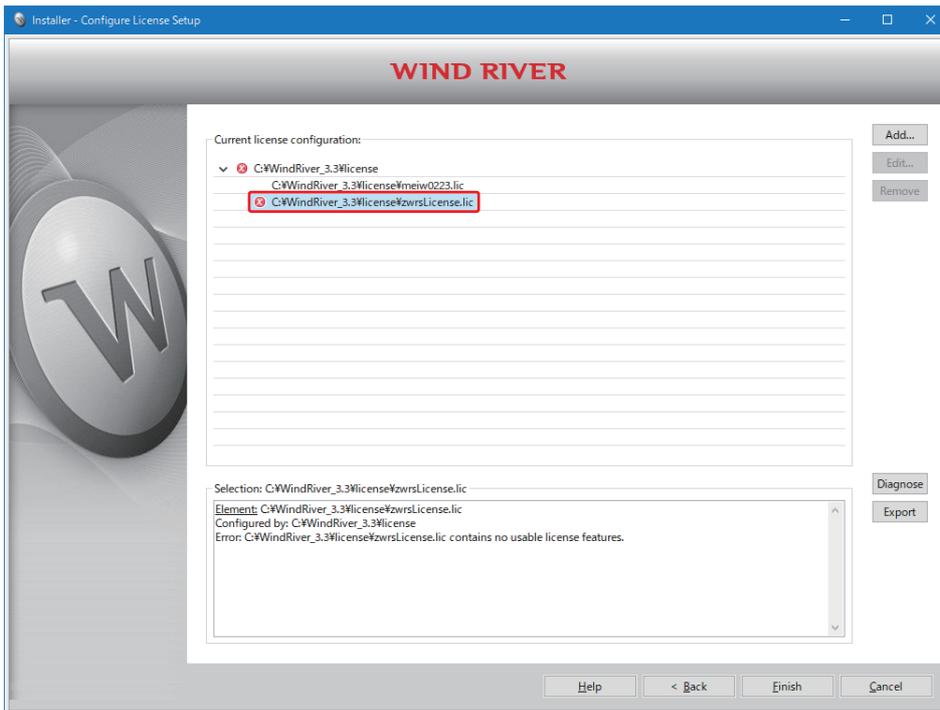
### Operating procedure

1. Start Product Maintenance from "Wind River" in Windows Start.  
If the confirmation screen of user account control appears, click the [Yes] button.
2. Select the checkbox of "License configuration."



3. Click the [Next] button.

4. Delete the file that has "×" next to its name on the explorer.



5. Click the [Finish] button.

## Precautions

Only delete the file with "×" in the license configuration screen.

## Target connection

### ■CW Workbench cannot be connected to target.

Symptom	Cause	Corrective action
[Log Console] A message, "Differences for module "xxxxxxx" segment's address" appears.	The VxWorks image file does not match with the target and CW Workbench.	Match the VxWorks image files to be used between target and CW Workbench.  Page 71 Setting Target Server
A message, "Failed to Connect to Target" appears.	The target is not connected to the CW Workbench network, or the IP address setting is wrong.	Check the following status: <ul style="list-style-type: none"> <li>• The power supply for the target is ON.</li> <li>• The target is operating properly. (No error has occurred.)</li> <li>• The Ethernet cable connector connecting the personal computer to the target is fully inserted into the Ethernet port.</li> <li>• The Ethernet cable is connected. In addition, the LEDs for each Ethernet port turn ON.</li> <li>• IP addresses of the personal computer and the target have been set properly.</li> </ul>
Others	The host name of the personal computer on which CW Workbench has been installed is set with only one character or 16 or more characters, or two-byte characters or katakana are included.	Set the host name for the personal computer within 2 to 15 alphanumeric characters.

#### Point

If the error still persists after taking the corrective actions shown above, delete the cache folder, and restart CW Workbench. (It may take time to startup for the first time after the cache folder was deleted.)

Cache folder: "C:\Documents and Settings\*(user name)*\.workbench-3.3.x.xxxxxxx-xxxx"

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

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

Cause	Corrective action
'Connect' has been executed in the "Remote Systems" window of CW Workbench from multiple personal computers for one target.	Do not execute 'Connect' on multiple personal computers to one target at the same time.
'Connect' has been executed on two or more "Remote Systems" windows of CW Workbench from one personal computer for one target.	Do not execute 'Connect' multiple times from the "Remote Systems" window of CW Workbench to one target.

### ■The selected "Target Connection" settings are not imported.

Cause	Corrective action
Import operation was performed with the multiple "Target Connection" settings selected.	Import the "Target Connection" settings individually those are not imported.

### ■The screen to select "Target platform" appears when configuring the target server connection setting.

Cause	Corrective action
The existing CW Workbench and newly installed CW Workbench may have the same installation folder.	Uninstall CW Workbench as explained below, and install CW Workbench in a different folder from the one with the existing CW Workbench.  Page 111 Uninstallation process is cancelled in the halfway.

## Downloading

### ■The '.out' file fails to download to the target.

Cause	Corrective action
Unavailable characters or symbols are used for the path of the specified '.out' file or file name. <ul style="list-style-type: none"> <li>• Displayed message</li> </ul> "Problem Occurred" message "Launch step finished with this error: File not found."	Specify the '.out' file or file name in which the following characters or symbols are not included, and download it again. <ul style="list-style-type: none"> <li>• Unavailable characters and symbols: ' , * , ; , : , &lt; , &gt; , / , ? , space, two-byte characters, katakana</li> </ul>

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

Cause	Corrective action
A two-byte character or katakana is included in the path of VxWorks image file specified in the target server setting.	Remove the two-byte characters or katakana from the path of VxWorks image file.  Page 71 Setting Target Server

### ■The '.out' file fails to download to the target when the message "Relocation offset too large" appears.

Cause	Corrective action
"-mlong-calls" is not specified in the property setting for the project.	Add "-mlong-calls" in the property setting for the project.  Page 56 How to set the property

## Firewall

### ■A firewall warning message appears when CW Workbench is being operated.

A warning message indicating that a function of CW Workbench is blocked may be displayed by the Windows Firewall.

Allow the access by following the procedure below:

### Operating procedure

1. Check whether the file name displayed in "Path" of the warning message is an execution file in the execution file list. If so, allow the access.

- Execution file list

Execution file name	Path
javaw.exe	(Installation destination folder)\jre\1.6.0_21\x86-win32\bin
hostShell.exe	(Installation destination folder)\workbench-3.3\foundation\x86-win32\bin
tgtsvr.exe	(Installation destination folder)\workbench-3.3\foundation\x86-win32\bin
wrproxy.exe	(Installation destination folder)\workbench-3.3\foundation\x86-win32\bin
wrtclserver.exe	(Installation destination folder)\workbench-3.3\foundation\x86-win32\bin
wrtConsole.exe	(Installation destination folder)\workbench-3.3\foundation\x86-win32\bin
wtxregd.exe	(Installation destination folder)\workbench-3.3\foundation\x86-win32\bin
wtxregds.exe	(Installation destination folder)\workbench-3.3\foundation\x86-win32\bin
eclipse-x86-win32.exe	(Installation destination folder)\workbench-3.3\wrwb\platform\x86-win32\eclipse
wrwb-x86-win32.exe	(Installation destination folder)\workbench-3.3\wrwb\platform\x86-win32\eclipse
dfwserver.exe	(Installation destination folder)\workbench-3.3\dfw\host\x86-win32\bin
dfwserver.exe	(Installation destination folder)\workbench-3.3\dfw\x86-win32\bin
vxsim.exe	(Installation destination folder)\vxworks-6.9\host\x86-win32\bin
vxsimnetd.exe	(Installation destination folder)\vxworks-6.9\host\x86-win32\bin
vxsimnetd_inst.exe	(Installation destination folder)\vxworks-6.9\host\x86-win32\bin
vxsimnetds.exe	(Installation destination folder)\vxworks-6.9\host\x86-win32\bin
vxsim-64.exe	(Installation destination folder)\vxworks-6.9\host\x86-win32\bin\x86_64
wrtapInstaller.exe	(Installation destination folder)\vxworks-6.9\host\x86-win32\bin\x86_64

2. Select the checkbox of the network type being connected (private or public network).
3. Click the [Allow access] button.

## 12.3 CW-Sim Troubleshooting

### Error description

The following shows errors that may occur when using CW-Sim.

Category	Problem/Reference
Installation	Page 116 When selecting a license file, the message, "Your Product Activation File does not have a valid install key for any Products on Disk. Please re-enter a new Product Activation File." appears, and the installation fails.
License	Page 117 Simulator does not start when message "Checking License...ERROR" appears during startup. Page 117 Simulator does not start when message "Step finished with this error" appears during startup.
Simulator startup	Page 117 CW-Sim does not start when message "Windows cannot find 'vxsim'. Make sure you typed the name correctly, and then try again." is displayed. Page 117 Virtual network is not enabled in case of during startup of VxWorks network daemon, the warning message "WARNING: subnet(***)external configuration failed (can't find a WRTAP network connection to use).", or the error message, "[SC] OpenSCManager FAILED 5: Access denied" appears. Page 117 Communication with the simulator cannot be established.

### Corrective action

The cause(s) of errors and their respective corrective action(s) are explained below.

#### Installation

■ **When selecting a license file, the message, "Your Product Activation File does not have a valid install key for any Products on Disk. Please re-enter a new Product Activation File." appears, and the installation fails.**

An error has occurred in license file checking during CW-Sim installation.

Cause	Corrective action
The specified file is not a license file for CW-Sim. (A license file for a different product such as CW Workbench has been specified.)	Check the license file, and apply the license file for CW-Sim.
CW-Sim has been already installed.	Uninstall CW Workbench and CW-Sim to delete the license files, and then reinstall CW Workbench and CW-Sim.
An invalid license is used. (The host information registered at the time of permanent license acquisition is incorrect.)	Check the host information registered at the time of permanent license acquisition, and correct the Host ID if incorrect.
"MAC" is used as a host information for permanent license application.	Check the Host ID of the personal computer on which CW-Sim is actually used, and correct the Host ID if incorrect.
When "DISK" is used as the host information for permanent license application, a volume serial number other than the C drive has been specified as Host ID.	Specify the volume serial number of the C drive as Host ID.

- How to correct Host ID

Apply for license transfer using License Transfer Certification Agreement Form "PermanentLicenseApplicationForm.xlsx" stored in the DVD-ROM. (  Page 29 Acquiring/Reacquiring Permanent License)

Cause	Corrective action
Host ID is incorrect.	Fill the following Host ID. • "Current license": The wrong Host ID registered previously • "New license": The correct Host ID to be registered
Host ID is correct.	Please contact your local Mitsubishi Electric sales office or representative from which the CW-Sim was purchased.

## License

### ■ Simulator does not start when message "Checking License...ERROR" appears during startup.

An error has occurred in license file checking during CW-Sim startup.

Cause	Corrective action
When using CW-Sim with a temporary license, 31 days have passed since CW-Sim was installed.	Acquire the permanent license and overwrite the existing temporary license file.
An invalid license is used. (The host information registered at the time of permanent license acquisition is incorrect.)	Refer to the following: ☞ Page 116 When selecting a license file, the message, "Your Product Activation File does not have a valid install key for any Products on Disk. Please re-enter a new Product Activation File." appears, and the installation fails.

### ■ Simulator does not start when message "Step finished with this error" appears during startup.

An error has occurred in license file checking during CW-Sim startup.

Cause	Corrective action
The LAC entered at the time of CW-Sim installation is not correct.	Use the correct LAC, and reinstall CW-Sim.

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## Simulator startup

### ■ CW-Sim does not start when message "Windows cannot find 'vxsim'. Make sure you typed the name correctly, and then try again." is displayed.

Cause	Corrective action
CW Workbench and CW-Sim were installed in different folders.	Install CW Workbench and CW-Sim in the same folder.

### ■ Virtual network is not enabled in case of during startup of VxWorks network daemon, the warning message "WARNING: subnet(\*\*\*)external configuration failed (can't find a WRTAP network connection to use).", or the error message, "[SC] OpenSCManager FAILED 5: Access denied" appears.

Execute commands on the command prompt as an administrator.

To execute commands as an administrator, start the command prompt by following the procedure below.

#### Operating procedure

Right-click the command prompt in Windows Start, and select [Run as administrator] from the shortcut menu.

### ■ Communication with the simulator cannot be established.

When the Windows Firewall is enabled and communication with "VxSim Network Daemon" is not allowed, a timeout may occur. To allow the communication, refer to the following:

☞ CW Configurator Operating Manual

☞ GX Works3 Operating Manual

To allow the communication with "VxSim Network Daemon" according to the setting procedure in the above manuals, click the [Browse] button in the "Add an app" screen and select "vxsimnetd.exe".

When using other software with a firewall function, refer to the manual for the software used and allow the communication with "VxSim Network Daemon".

#### Point

When the installation destination of CW Workbench and CW-Sim is "C:\WindRiver", the folder for "vxsimnetd.exe" is stored in the following destination:

- "C:\WindRiver\vxworks-6.9\host\x86-win32\bin"

For CW-Sim Standalone, the folder is stored in the local folder to which the files are copied.

- When the local folder is "C:\CCPUSIM": "C:\CCPUSIM\CWSIMSA\vxsimnetd"

# 13 LICENSE ERRORS

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

## 13.1 License Errors

If a license error occurs when CW Workbench is started or being used, perform either of the following operations on the license error message.

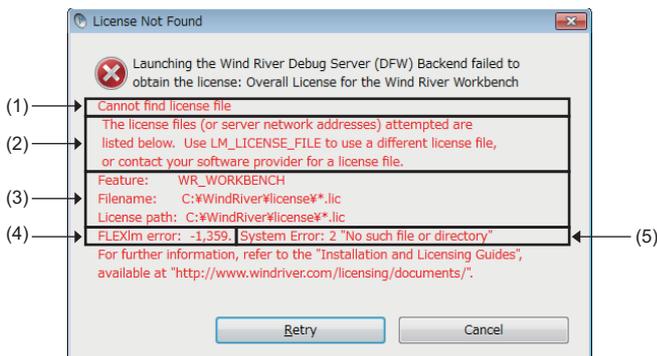
- Click the [Retry] button: The license check is repeated.
- Click the [Cancel] button: The license check is terminated, and CW Workbench continues to operate. However, some of the CW Workbench functions shown below will be disabled.

Functions that cannot be used	Available functions
<ul style="list-style-type: none"><li>• Project creation</li><li>• Building</li><li>• Target connection</li><li>• Downloading</li><li>• Debugging</li></ul>	<ul style="list-style-type: none"><li>• Editor function (create, edit, save, and search)</li><li>• Importing</li><li>• Exporting</li></ul>

## 13.2 License Error Message

The error message, "License Not Found" shown below appears when a license error occurs. Check the error details.

### Window



### Displayed items

No.	Item	Description
(1)	Error text	Displays an error outline.
(2)	Error details* <sup>1</sup>	Displays error details, solutions, and measures to avoid errors.
(3)	Support information* <sup>1</sup>	Displays 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 cause. A number used when an FLEXlm vendor provides support. Example) FLEXlm error: -1,359. <ul style="list-style-type: none"><li>• Error number: -1</li><li>• Minor number: 359</li></ul>
(5)	System error information* <sup>1</sup>	Displays an error number and error text at a license error occurrence.

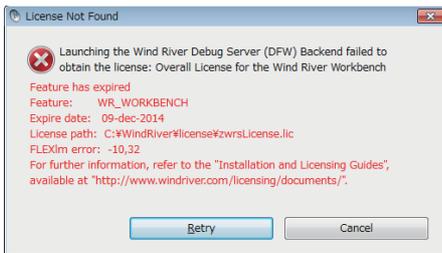
\*1 Not displayed in some errors.

# 13.3 Main License Error Messages and Recovery Procedures

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

## Trial period expiration

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



### How to recover from the error

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

## Using an invalid license

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



### Restriction

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

### How to recover from the error

Recheck the Host ID of the personal computer on which CW Workbench is used.

#### ■ Host ID is incorrect

Apply for license transfer using License Transfer Certification Agreement Form (PermanentLicenseApplicationForm.xlsx) stored in the DVD-ROM. The Host ID to enter is as follows:

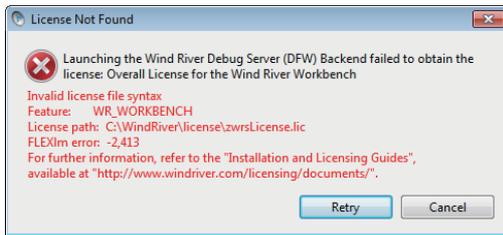
- Previous License: Enter the wrong Host ID registered last time.
- New License: Enter a new Host ID to be registered this time.

#### ■ Host ID is correct

Please contact your local Mitsubishi Electric sales office or representative from which the CW Workbench was purchased.

## Using an installation key file

When CW Workbench has been installed using an installation key file, the following message is displayed at the startup of CW Workbench.



### How to recover from the error

Acquire a permanent license and apply the license file to the personal computer.



# APPENDIX

## Appendix 1 Installation and Uninstallation of Plug-in Software

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

### Point

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

[Help] ⇒ [Help Contents] ⇒ "Eclipse Platform" ⇒ "Eclipse Workbench Basics" ⇒ "Tasks" ⇒ "Updating and installing software"

### Installation procedure

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

Before installing the plug-in software, ensure that CW Workbench is in the "Advanced Device Development" mode.



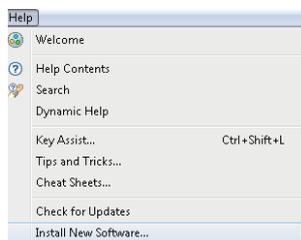
If "Basic Device Development" is displayed on the title bar, change it to "Advanced Device Development" by any of the following methods:

- Select [Window] ⇒ [Open Perspective] ⇒ [Advanced Device Development].
- Click the Open Perspective icon (  ) at the upper right corner of CW Workbench, and select [Advanced Device Development] from the displayed menu.

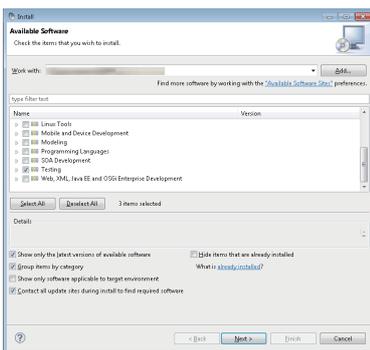
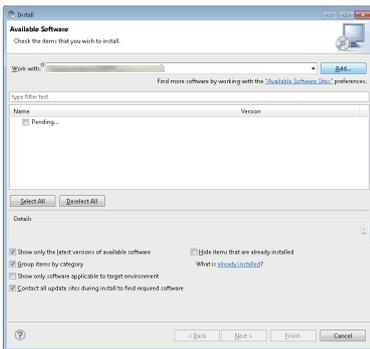
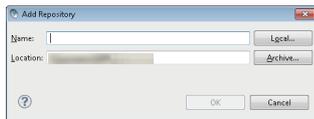
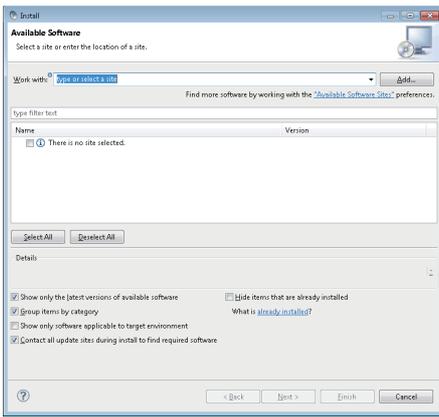
### Precautions

- The installation method of the plug-in software explained in this section is a general installation method using Eclipse3.6. Follow the 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 operate properly, check if the plug-in software can be operated in Eclipse3.6 on public operating environment provided by the plug-in software manufacturer.

### Operating procedure



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



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

3. Enter information for "Name" and "Location" field. Click the [OK] button.

A path of website, from which the plug-in software can be downloaded, is added.

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

4. The information of the software package that can be installed from the added Location is acquired.

"Pending" is displayed as shown on the left while the information is being acquired.

After the completion of acquiring the information of the software package that can be installed, software package names are displayed.

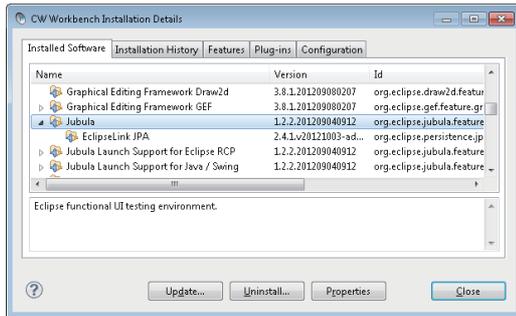
5. Select a software package to be installed, and click the [Next] button to install the plug-in software.



# Uninstallation

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

## Operating procedure



1. Select [Help] ⇒ [About CW Workbench] to display "About CW Workbench" screen. Click the [Installation Details] button.
2. Select the [Installed Software] tab and select the software packages to be deleted.
3. Click the [Uninstall] button.  
The plug-in software is uninstalled.

# Appendix 2 Comparison with Wind River Workbench

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

○: Supported, ×: Unsupported

Item			CW Workbench	Wind River Workbench 3.3
Framework	Eclipse	Workbench basic function	Ver.3.6	Ver.3.6
Compiler	ARMARCH7gnu_SMP	A compiler for C Controller modules and C intelligent function modules (GCC for ARM Cortex A9 compiler)	○	○
	SIMNTgnu_SMP	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	Target connection agent	A function to establish the communication with target for debugging.	○	○
	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.	×	○
	Download	A function to download a file to be debugged to target in order to have it ready for debugging.	○	○
	Debug operation	A function to debug the source code by the operations such as start or stop debugging and step execution.		
	Dynamic Printf	A function to dynamically insert or cancel the printf statement when debugging the program without adding the printf function to the source code with the similar operation as that of the breakpoint.		
Command-line interface	Target shell	A command-line interface which operates on the operating system of target.	○	○
Runtime analysis tool	Memory Analyzer	Identifies memory leaks by monitoring the memory usage.	×	○
	Performance Profiler	Analyzes bottleneck of tasks by conducting statistical analysis on coding status.		
	Data Monitor	Analyzes memory leaks by monitoring variables and data structures in real time.		
	System Viewer	Analyzes task execution order and deadlock by monitoring interrupt task status or CPU utilization, etc.		
	Code Coverage Analyzer	Checks which code segment is executed during the code testing phase.		
Extended functions	Extends function by installing plug-ins for a third-party provided function.		○	○



# Appendix 3 Function Comparison among CW-Sim, CW-Sim Standalone, and VxSim

The comparison of functions among CW-Sim, CW-Sim Standalone, and VxSim are shown in the following table.

○: Available, —: Unavailable

Item	Function	Description	CW-Sim	CW-Sim Standalone	VxSim
Introduction and management	Install and uninstall	Installs or uninstalls with a wizard.	○*1	—	○
	License management	Authenticates with license key.	○	—	○
Compiler	Diab compiler	Builds with SIMNTdiab as Wind River compiler.	—	—	○
	GNU compiler	Builds with SIMNTgnu_SMP as Wind River GNU compiler.	○	—	○
Debug	Source code debugging	Performs step execution or references and modifies variables.	○	—	○
Startup	Script startup	Executes a script at startup.	○	○	○
VxWorks function	Real Time Process (RTP)	Executes programs in a user space.	—	—	○
	Multitasking	Uses system functions such as task management, inter-task communication, and event transmission/reception.	○	○	○
	POSIX standard interface	Uses interface specified for IEEE Std 1003.1 (base standard).	○	○	○
	I/O system	Uses standard interfaces for the access to various devices.	○	○	○
	Local file system	Uses MS-DOS-compatible file system (dosFs).	○	○	○
	Error detection and reporting	Performs debugging software failure.	○	○	○
	Shared data area	Shares memory mutually between processes.	—	—	○
	Shared library	Uses shared library which contains codes and data.	—	—	○
	VxMP (Shared memory object)	Uses shared memory that realizes high-speed synchronization/communication between tasks executed on different CPUs.	—	—	○
	VxFusion (Distributed message queue)	Uses dispersion mechanism on different CPUs based on VxWorks message queue.	—	—	○
	Wind River System Viewer	Uses System Viewer command server of VxWorks.	—	—	○
Simulated hardware	VxWorks console	Uses shell console by VxWorks system tasks.	○	○	○
	System timer	Uses timer generated from core clock used in VxWorks.	○	○	○
	Memory Management Unit (MMU)	Manages virtual memory independent of MMU architecture of CPUs.	○	○	○
	Virtual disc support	Simulates disc block devices.	○	○	○
	Time stamp driver	Displays time axis using Wind River System Viewer.	—	—	○
	Real time clock	Manages the updates of the time and calendar.	○	○	○
	Virtual network	Links to virtual network and external network by network daemon.	○	○	○

\*1 CW-Sim is also uninstalled by uninstalling CW Workbench.

# Appendix 4 List of VxWorks Components Differences between target and CW-Sim

This section shows the components of which operations run differently on CW-Sim and CW-Sim Standalone among VxWorks components implemented on target.

## Point

For all VxWorks components implemented on target, refer to the following:

 MELSEC iQ-R C Controller Module User's Manual

 MELSEC iQ-R C Intelligent Function Module User's Manual (Application)

## C Controller module

The following table shows the differences from the components implemented on a C Controller module.

### VxWorks 6.9

Difference	Description	Name
Addition	direct access to host filesystem	INCLUDE_PASSFS
	enable guardpages for interrupt stack	INCLUDE_PROTECT_INTERRUPT_STACK
	FTP Server	INCLUDE_IPFTPS
	Interface#1 configuration	INCLUDE_IPNET_IFCONFIG_1
	IPCOM RAM Disk Support	INCLUDE_IPCOM_USE_RAM_DISK
	kernel hardening features	INCLUDE_KERNEL_HARDENING
	Light CPU Power Management (default)	INCLUDE_CPU_LIGHT_PWR_MGR
	pass-through filesystem symbol table (default)	INCLUDE_PASSFS_SYM_TBL
	ROMFS file system	INCLUDE_ROMFS
	Symmetric Multiprocessing (SMP) Demos	INCLUDE_SMP_DEMO
	triggering library	INCLUDE_TRIGGERING
	VxSim IntCtrl driver	DRV_INTCTLR_VXSIM
	VxSim virtual disk to emulate a VxWorks disk driver	INCLUDE_VIRTUAL_DISK
	WDB simulator pipe connection (default)	INCLUDE_WDB_COMM_PIPE
write-protect vector table	INCLUDE_PROTECT_VEC_TABLE	
Deletion	__thread variables support	INCLUDE_TLS
	AIM MMU Show Routines	INCLUDE_AIM_MMU_SHOW
	Altera Dw EMAC Enhanced Network Driver	INCLUDE_ALT_SOC_GEN5_DW_END
	Altera QSPI support	INCLUDE_ALT_SOC_GEN5_QSPI
	Altera SoC Gen 5 DesignWare I2C support	INCLUDE_ALT_SOC_GEN5_DW_I2C
	Altera SoC Gen 5 Fpga Manager support	DRV_ALT_SOC_GEN5_FPGA_MGR
	Altera SoC Gen 5 timer driver	INCLUDE_ALT_SOC_GEN5_TIMER
	ARM Generic Interrupt Controller driver	DRV_ARM_GIC
	built-in symbol table (default)	INCLUDE_STANDALONE_SYM_TBL
	cfiamdmt	INCLUDE_MTD_CFIAMD
	Core NFS client	INCLUDE_CORE_NFS_CLIENT
	Dos FS Cache Handler	INCLUDE_DOSFS_CACHE
	EHCI	INCLUDE_EHCI
	EHCI Init	INCLUDE_EHCI_INIT
	ftllite	INCLUDE_TL_FTL
	Generic PHY driver	INCLUDE_GENERICPHY
	Highly Reliable File System (default)	INCLUDE_HRFS
	HRFS Default Write Mode (default)	INCLUDE_HRFS_DEFAULT_WRITE_MODE
	HRFS File System Consistency Checker	INCLUDE_HRFS_CHKDSK
	HRFS Format	INCLUDE_HRFS_FORMAT

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Difference	Description	Name
Deletion	I2C generic device vxBus driver	DRV_I2C_GENERIC_DEV
	INCLUDE_APOLLO_COMMON	INCLUDE_APOLLO_COMMON
	INCLUDE_QSERIES_COMPATIBLE	INCLUDE_QSERIES_COMPATIBLE
	INCLUDE_R12CCPU	INCLUDE_R12CCPU
	Intel ICH SATA Controller	INCLUDE_DRV_STORAGE_INTEL_ICH
	Intel ICH SATA Controller Show Routines	INCLUDE_DRV_STORAGE_INTEL_ICH_SHOW
	Intel PRO/1000 VxBus Enhanced Network Driver (default)	INCLUDE_GEI825XX_VXB_END
	Inter-Integrated Circuit Bus	INCLUDE_I2C_BUS
	MII bus controller module	INCLUDE_MII_BUS
	NFS client All	INCLUDE_NFS_CLIENT_ALL
	NFS server	INCLUDE_CORE_NFS_SERVER
	NFS server All	INCLUDE_NFS_SERVER_ALL
	NFS server v2	INCLUDE_NFS2_SERVER
	NFS server v3	INCLUDE_NFS3_SERVER
	NFS v2 client	INCLUDE_NFS2_CLIENT
	NFS v3 client	INCLUDE_NFS3_CLIENT
	PCI Bus legacy Auto Configuration Routines	INCLUDE_PCI_OLD_CONFIG_ROUTINES
	PCI Bus Show Routines	INCLUDE_PCI_BUS_SHOW
	Peripheral Component Interconnect Bus	INCLUDE_PCI_BUS
	SD Host Controller driver	DRV_STORAGE_SD
	simple banner containing VxWorks version & creation date	INCLUDE_SIMPLE_BANNER
	Sio Channel Utilities	INCLUDE_SIO_UTILS
	software fpp support	INCLUDE_SW_FP
	SYNOPSIS HCI	INCLUDE_SYNOPTSHCI
	SYNOPSIS HCI Init	INCLUDE_SYNOPTSHCI_INIT
	TrueFFS Flash File System	INCLUDE_TFFS
	TrueFFS Show Routines	INCLUDE_TFFS_SHOW
	UART support for ns16550-compatible devices	DRV_SIO_NS16550
	USB Common Stack	INCLUDE_USB
	USB Common Stack Init	INCLUDE_USB_INIT
	USB GEN2 Helper Init	INCLUDE_USB_GEN2_HELPER
	USB GEN2 Mass Storage	INCLUDE_USB_GEN2_STORAGE
	USB GEN2 Mass Storage Init	INCLUDE_USB_GEN2_STORAGE_INIT
	USB Host Class Driver Init	INCLUDE_USB_HOST_CLASS_INIT
	USB Host Controller Start	INCLUDE_HCD_BUS
	Vector Floating Point	INCLUDE_VFP
	vxBus Aux Clk Support	INCLUDE_VXB_AUX_CLK
	VxBus Legacy Interrupt Support	INCLUDE_VXB_LEGACY_INTERRUPTS
	vxBus Sys Clk Support	INCLUDE_VXB_SYS_CLK
	vxBus Timer Support	INCLUDE_TIMER_SYS
	VxBus Timestamp Support	INCLUDE_VXB_TIMESTAMP
	WDB network connection	INCLUDE_WDB_COMM_NETWORK

## VxWorks 6.9(Ver.2)

Difference	Description	Name
Addition	direct access to host filesystem	INCLUDE_PASSFS
	enable guardpages for interrupt stack	INCLUDE_PROTECT_INTERRUPT_STACK
	FTP Server	INCLUDE_IPFTPS
	Interface#1 configuration	INCLUDE_IPNET_IFCONFIG_1
	IPCOM RAM Disk Support	INCLUDE_IPCOM_USE_RAM_DISK
	kernel hardening features	INCLUDE_KERNEL_HARDENING
	Light CPU Power Management (default)	INCLUDE_CPU_LIGHT_PWR_MGR
	pass-through filesystem symbol table (default)	INCLUDE_PASSFS_SYM_TBL
	ROMFS file system	INCLUDE_ROMFS
	Symmetric Multiprocessing (SMP) Demos	INCLUDE_SMP_DEMO
	triggering library	INCLUDE_TRIGGERING
	VxSim IntCtrl driver	DRV_INTCTRL_VXSIM
	VxSim virtual disk to emulate a VxWorks disk driver	INCLUDE_VIRTUAL_DISK
	WDB simulator pipe connection (default)	INCLUDE_WDB_COMM_PIPE
	write-protect vector table	INCLUDE_PROTECT_VEC_TABLE
Deletion	AIM MMU Show Routines	INCLUDE_AIM_MMU_SHOW
	Altera Dw EMAC Enhanced Network Driver	INCLUDE_ALT_SOC_GEN5_DW_END
	Altera QSPI support	INCLUDE_ALT_SOC_GEN5_QSPI
	Altera SoC Gen 5 DesignWare I2C support	INCLUDE_ALT_SOC_GEN5_DW_I2C
	Altera SoC Gen 5 Fpga Manager support	DRV_ALT_SOC_GEN5_FPGA_MGR
	Altera SoC Gen 5 timer driver	INCLUDE_ALT_SOC_GEN5_TIMER
	ARM Generic Interrupt Controller driver	DRV_ARM_GIC
	built-in symbol table (default)	INCLUDE_STANDALONE_SYM_TBL
	cfiamdmt	INCLUDE_MTD_CFIAMD
	EHCI	INCLUDE_EHCI
	EHCI Init	INCLUDE_EHCI_INIT
	ftllite	INCLUDE_TL_FTL
	INCLUDE_APOLLO_COMMON	INCLUDE_APOLLO_COMMON
	INCLUDE_QSERIES_COMPATIBLE	INCLUDE_QSERIES_COMPATIBLE
	INCLUDE_R12CCPU	INCLUDE_R12CCPU
	Intel ICH SATA Controller	INCLUDE_DRV_STORAGE_INTEL_ICH
	Intel ICH SATA Controller Show Routines	INCLUDE_DRV_STORAGE_INTEL_ICH_SHOW
	Intel PRO/1000 VxBus Enhanced Network Driver (default)	INCLUDE_GEI825XX_VXB_END
	SD Host Controller driver	DRV_STORAGE_SD
	simple banner containing VxWorks version & creation date	INCLUDE_SIMPLE_BANNER
	Sio Channel Utilities	INCLUDE_SIO_UTILS
	software fpp support	INCLUDE_SW_FP
	SYNOPSIS HCI	INCLUDE_SYNOPTSHCI
	SYNOPSIS HCI Init	INCLUDE_SYNOPTSHCI_INIT
	TrueFFS Flash File System	INCLUDE_TFFS

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Difference	Description	Name
Deletion	UART support for ns16550-compatible devices	DRV_SIO_NS16550
	USB Common Stack	INCLUDE_USB
	USB Common Stack Init	INCLUDE_USB_INIT
	USB GEN2 Helper Init	INCLUDE_USB_GEN2_HELPER
	USB GEN2 Mass Storage	INCLUDE_USB_GEN2_STORAGE
	USB GEN2 Mass Storage Init	INCLUDE_USB_GEN2_STORAGE_INIT
	USB Host Class Driver Init	INCLUDE_USB_HOST_CLASS_INIT
	USB Host Controller Start	INCLUDE_HCD_BUS
	Vector Floating Point	INCLUDE_VFP
	vxBus Aux Clk Support	INCLUDE_VXB_AUX_CLK
	vxBus Sys Clk Support	INCLUDE_VXB_SYS_CLK
	vxBus Timer Support	INCLUDE_TIMER_SYS
	VxBus Timestamp Support	INCLUDE_VXB_TIMESTAMP
	WDB network connection	INCLUDE_WDB_COMM_NETWORK

## C Intelligent function module

The following table shows the differences from the components implemented on a C intelligent function module.

### VxWorks 6.9

Difference	Description	Name
Addition	direct access to host filesystem	INCLUDE_PASSFS
	Interface#1 configuration	INCLUDE_IPNET_IFCONFIG_1
	pass-through filesystem symbol table (default)	INCLUDE_PASSFS_SYM_TBL
	VxSim IntCtrl driver	DRV_INTCTRL_VXSIM
	VxSim virtual disk to emulate a VxWorks disk driver	INCLUDE_VIRTUAL_DISK
	WDB simulator pipe connection (default)	INCLUDE_WDB_COMM_PIPE
Deletion	_thread variables support	INCLUDE_TLS
	AIM MMU Show Routines	INCLUDE_AIM_MMU_SHOW
	Altera Dw EMAC Enhanced Network Driver	INCLUDE_ALT_SOC_GEN5_DW_END
	Altera QSPI support	INCLUDE_ALT_SOC_GEN5_QSPI
	Altera SoC Gen 5 DesignWare I2C support	INCLUDE_ALT_SOC_GEN5_DW_I2C
	Altera Soc Gen 5 Fpga Maneager support	DRV_ALT_SOC_GEN5_FPGA_MGR
	Altera SoC Gen 5 timer driver	INCLUDE_ALT_SOC_GEN5_TIMER
	ARM Generic Interrupt Controller driver	DRV_ARM_GIC
	builit-in symbol table	INCLUDE_STANDALONE_SYM_TBL
	cfiamdmt	INCLUDE_MTD_CFIAMD
	ftllite	INCLUDE_TL_FTL
	Intel PRO/1000 VxBus Enhanced Network Driver	INCLUDE_GEI825XX_VXB_END
	Sio Channel Utilities	INCLUDE_SIO_UTILS
	software fpp support	INCLUDE_SW_FP
	trueFFS Flash File System	INCLUDE_TFFS
	UART support for ns16550-compatible devices	DRV_SIO_NS16550
	Vector Floating Point	INCLUDE_VFP
	vxBus Aux Clk Support	INCLUDE_VXB_AUX_CLK
	vxBus Sys Clk Support	INCLUDE_VXB_SYS_CLK
	vxBus Timer Support	INCLUDE_TIMER_SYS
	VxBus Timestamp Support	INCLUDE_VXB_TIMESTAMP
	WDB network connection	INCLUDE_WDB_COMM_NETWORK

## VxWorks 6.9(Ver.2)

Difference	Description	Name
Addition	direct access to host filesystem	INCLUDE_PASSFS
	Interface#1 configuration	INCLUDE_IPNET_IFCONFIG_1
	pass-through filesystem symbol table (default)	INCLUDE_PASSFS_SYM_TBL
	VxSim IntCtrlr driver	DRV_INTCTLR_VXSIM
	VxSim virtual disk to emulate a VxWorks disk driver	INCLUDE_VIRTUAL_DISK
	WDB simulator pipe connection (default)	INCLUDE_WDB_COMM_PIPE
Deletion	AIM MMU Show Routines	INCLUDE_AIM_MMU_SHOW
	Altera Dw EMAC Enhanced Network Driver	INCLUDE_ALT_SOC_GEN5_DW_END
	Altera QSPI support	INCLUDE_ALT_SOC_GEN5_QSPI
	Altera SoC Gen 5 DesignWare I2C support	INCLUDE_ALT_SOC_GEN5_DW_I2C
	Altera Soc Gen 5 Fpga Maneager support	DRV_ALT_SOC_GEN5_FPGA_MGR
	Altera SoC Gen 5 timer driver	INCLUDE_ALT_SOC_GEN5_TIMER
	ARM Generic Interrupt Controller driver	DRV_ARM_GIC
	builti-in symbol table	INCLUDE_STANDALONE_SYM_TBL
	cfiamdmt	INCLUDE_MTD_CFIAMD
	ftllite	INCLUDE_TL_FTL
	Intel PRO/1000 VxBus Enhanced Network Driver	INCLUDE_GEI825XX_VXB_END
	Sio Channel Utilities	INCLUDE_SIO_UTILS
	software fpp support	INCLUDE_SW_FP
	trueFFS Flash File System	INCLUDE_TFFS
	UART support for ns16550-compatible devices	DRV_SIO_NS16550
	Vector Floating Point	INCLUDE_VFP
	vxBus Aux Clk Support	INCLUDE_VXB_AUX_CLK
	vxBus Sys Clk Support	INCLUDE_VXB_SYS_CLK
	vxBus Timer Support	INCLUDE_TIMER_SYS
	VxBus Timestamp Support	INCLUDE_VXB_TIMESTAMP
	WDB network connection	INCLUDE_WDB_COMM_NETWORK

# Appendix 5 Versions of Modules Supporting Include Files

This section shows the firmware versions of the modules supporting include files stored on the DVD-ROM of CW Workbench.

## Point

For the storage location of the include files, refer to the following:

 Page 23 Contents of DVD-ROM/CD-ROM

For the functions supported by each firmware version of a specific module, refer to the following:

-  MELSEC iQ-R C Controller Module User's Manual
-  MELSEC iQ-R C Intelligent Function Module User's Manual (Application)

Software version of CW Workbench*1	Include files on DVD-ROM	Firmware version		
		R12CCPU-V	RD55UP06-V	RD55UP12-V*2
Ver.'A'	• CCPUFunc.h	'01' or later	—	—
Ver.'B'	• MDFunc.h	'04' or later		
Ver.'C'	• CCPUFunc.h		'01' or later	
Ver.'D'	• MDFunc.h			
Ver.'E'	• CITLFunc.h • MDRFunc.h		'03' or later	
Ver.'F'	• CCPUFunc.h	'07' or later	'05' or later	
Ver.'G'	• MDFunc.h			
Ver.'H' or later	• CITLFunc.h • MDRFunc.h • DANLFunc.h	'09' or later	'06' or later	

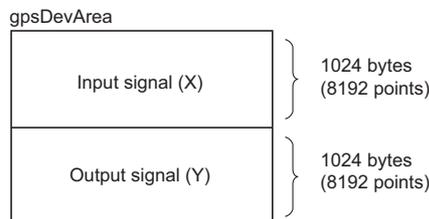
\*1 Check the software version with the last alphabetic character of the text written in the DATE column on the DVD-ROM disc. (Example: 1712AH indicates that the software version is "H".)

\*2 For an RD55UP12-V, use the include files stored in the module.

# Appendix 6 CCPU\_Simulator C Controller Module Dedicated Functions (Stub)

This section explains the stub provided in the sample program.

Instead of accessing to actual input signals (X) or output signals (Y), this function performs simulation by using variables in the sample program (gpsDevArea).



Function name	Description	Reference
CCPU_X_In_BitEx	To simulate reading an input signal (X) in bit (1-point) units.	☞ Page 134 CCPU_X_In_BitEx
CCPU_X_In_WordEx	To simulate reading input signals (X) in word (16-point) units.	☞ Page 134 CCPU_X_In_WordEx
CCPU_Y_Out_BitEx	To simulate writing an output signal (Y) in bit (1-point) units.	☞ Page 135 CCPU_Y_Out_BitEx
CCPU_Y_Out_WordEx	To simulate writing output signals (Y) in word (16-point) units.	☞ Page 135 CCPU_Y_Out_WordEx
CCPU_Y_In_BitEx	To simulate reading an output signal (Y) in bit (1-point) units.	☞ Page 135 CCPU_Y_In_BitEx
CCPU_Y_In_WordEx	To simulate reading output signals (Y) in word (16-point) units.	☞ Page 136 CCPU_Y_In_WordEx

## CCPU\_X\_In\_BitEx

This function simulates reading an input signal from the memory (gpsDevArea) in bit units.

### ■Argument

Argument	Description	IN/OUT
sFlg	Dummy	IN
usXno	Input number (X)	IN
pusData	Read data (0: OFF, 1: ON)	OUT

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)

## CCPU\_X\_In\_WordEx

This function simulates reading input signals from the memory (gpsDevArea) in word units.

### ■Argument

Argument	Description	IN/OUT
sFlg	Dummy	IN
usXno	Start input number (X)	IN
usSize	Number of read words	IN
pusDataBuf	Read data	OUT
usBufSize	Data storage area (pusDataBuf) size (in word units)	IN

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)
-204	Abnormal end (I/O access size error)
-210	Abnormal end (read area size error)

## CCPU\_Y\_Out\_BitEx

This function simulates writing an output signal to the memory (gpsDevArea) in bit units.

### ■Argument

Argument	Description	IN/OUT
sFlg	Dummy	IN
usYno	Output number (Y)	IN
usData	Write data (0: OFF, 1: ON)	IN

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)

## CCPU\_Y\_Out\_WordEx

This function simulates writing output signals (Y) to the memory (gpsDevArea) in word units.

### ■Argument

Argument	Description	IN/OUT
sFlg	Dummy	IN
usYno	Start output number (Y)	IN
usSize	Number of written words	IN
pusDataBuf	Write data	IN
usBufSize	Dummy (Fixed to '0')	IN

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)
-204	Abnormal end (I/O access size error)

## CCPU\_Y\_In\_BitEx

This function simulates reading an output signal from the memory (gpsDevArea) in bit units.

### ■Argument

Argument	Description	IN/OUT
sFlg	Dummy	IN
usYno	Output number (Y)	IN
pusData	Read data (0: OFF, 1: ON)	OUT

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)

## CCPU\_Y\_In\_WordEx

This function simulates reading output signals from the memory (gpsDevArea) in word units.

### ■Argument

Argument	Description	IN/OUT
sFlg	Dummy	IN
usYno	Start output number (Y)	IN
usSize	Number of read words	IN
pusDataBuf	Read data	OUT
usBufSize	Data storage area (pusDataBuf) size (in word units)	IN

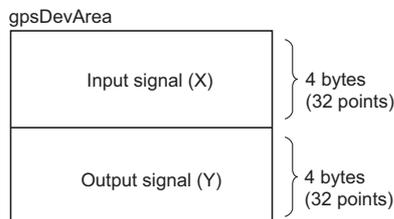
### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)
-204	Abnormal end (I/O access size error)
-210	Abnormal end (read area size error)

# Appendix 7 CITL\_Simulator C Intelligent Function Dedicated Functions (Stub)

This section explains the stub provided in the sample program.

Instead of accessing to actual input signals (X) or output signals (Y), this function performs simulation by using variables in the sample program (gpsDevArea).



Function name	Description	Reference
CITL_X_In_Bit	To simulate reading an input signal (X) in bit (1-point) units.	☞ Page 137 CITL_X_In_Bit
CITL_X_In_Word	To simulate reading input signals (X) in word (16-point) units.	☞ Page 137 CITL_X_In_Word
CITL_X_Out_Bit	To simulate writing an input signal (X) in bit (1-point) units.	☞ Page 138 CITL_X_Out_Bit
CITL_X_Out_Word	To simulate writing input signals (X) in word (16-point) units.	☞ Page 138 CITL_X_Out_Word
CITL_Y_In_Bit	To simulate reading an output signal (Y) in bit (1-point) units.	☞ Page 138 CITL_Y_In_Bit
CITL_Y_In_Word	To simulate reading output signals (Y) in word (16-point) units.	☞ Page 139 CITL_Y_In_Word

## CITL\_X\_In\_Bit

This function simulates reading an input signal from the memory (gpsDevArea) in bit units.

### Argument

Argument	Description	IN/OUT
usXno	Input signal (X)	IN
pusData	Read data (0: OFF, 1: ON)	OUT

### Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O signal error)

## CITL\_X\_In\_Word

This function simulates reading input signals from the memory (gpsDevArea) in word units.

### Argument

Argument	Description	IN/OUT
usXno	Start input signal (X)	IN
usSize	Number of read words	IN
pusDataBuf	Read data	OUT
usBufSize	Data storage area (pusDataBuf) size (in word units)	IN

### Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O signal error)
-204	Abnormal end (I/O access size error)
-210	Abnormal end (read area size error)



## CITL\_X\_Out\_Bit

This function simulates writing an input signal to the memory (gpsDevArea) in bit units.

### ■Argument

Argument	Description	IN/OUT
usXno	Input signal (X)	IN
usData	Write data (0: OFF, 1: ON)	IN

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O signal error)

## CITL\_X\_Out\_Word

This function simulates writing input signals to the memory (gpsDevArea) in word units.

### ■Argument

Argument	Description	IN/OUT
usXno	Start input signal (X)	IN
usSize	Number of written words	IN
pusDataBuf	Write data	IN
usBufSize	Dummy (Fixed to '0')	IN

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O signal error)
-204	Abnormal end (I/O access size error)

## CITL\_Y\_In\_Bit

This function simulates reading an output signal from the memory (gpsDevArea) in bit units.

### ■Argument

Argument	Description	IN/OUT
usYno	Output signal (Y)	IN
pusData	Read data (0: OFF, 1: ON)	OUT

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O signal error)

## CITL\_Y\_In\_Word

This function simulates reading output signals from the memory (gpsDevArea) in word units.

### ■Argument

Argument	Description	IN/OUT
usYno	Start output signal (Y)	IN
usSize	Number of read words	IN
pusDataBuf	Read data	OUT
usBufSize	Data storage area (pusDataBuf) size (in word units)	IN

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O signal error)
-204	Abnormal end (I/O access size error)
-210	Abnormal end (read area size error)

# Appendix 8 Support

## Technical support assistance service regarding C Controller modules and C intelligent function modules

For technical support assistance service regarding C Controller modules and C intelligent function modules, refer to the following table.

If the type to which your inquiry belongs is not sure, please contact your local Mitsubishi Electric sales office or representative. Please note that any inquiries other than MELSEC related products may not be able to be answered.

Type	Inquiry	Contact
MELSEC	<ul style="list-style-type: none"><li>• Functions and specifications of C Controller modules and C intelligent function modules</li><li>• Specifications and usage of the dedicated function library provided by Mitsubishi Electric Corporation</li><li>• Functions and specifications of GX Works3, CW Configurator, CW Workbench, CW-Sim, and CW-Sim Standalone.</li><li>• Functions and specifications of the Mitsubishi products (modules and MELSOFT products) to be used with C Controller modules and C intelligent function modules</li></ul>	For further information and services, please contact your local Mitsubishi Electric sales office or representative.
Operating system	<ul style="list-style-type: none"><li>• Functions and specifications of VxWorks, API functions provided by VxWorks, and general inquiries regarding programming related to VxWorks</li><li>• Functions and specifications of Wind River Workbench and Tornado</li></ul>	Wind River Systems, Inc. URL: <a href="http://www.windriver.com">www.windriver.com</a>
Plug-in software	<ul style="list-style-type: none"><li>• Plug-in software which is to be used with CW Workbench or Wind River Workbench</li></ul>	Plug-in software manufacturer

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# MEMO

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# REVISIONS

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