Integrated Development Environment e² studio

How to use IAR Systems compiler in e² studio

Introduction

When you will use IAR Eclipse plugins on the e² studio, you can create projects, set build options, and perform builds on the e² studio using the IAR Systems compilers.

This document describes the procedure for using the IAR Systems compiler on the e² studio.

Contents

1. Overview

1.1 Purpose

When you will use IAR Eclipse plugins on the e² studio, you can create projects, set build options, and perform builds on the e² studio using the IAR Systems compilers. Therefore, to use the IAR Systems compiler on the e² studio, you need to install IAR Embedded Workbench on your PC and then install the IAR Eclipse plugins on the e² studio.

This document describes the setup procedure for using IAR Systems compilers on the e² studio, as well as the procedures for creating a project, setting build options, and executing the build using IAR Systems compilers.

- As an example, the case of using IAR RX compiler on the e² studio is described.

- IAR Systems compiler supports various Renesas devices other than the RX family. Refer to the following page for supported devices and compilers.
  [IAR Embedded Workbench for Eclipse](#)

- The basic procedures are the same when using compilers for devices other than the RX family. When using a compiler for non-RX family devices, please read to replace the device name and compiler name.

- The e² studio configurator for embedding Flexible Software Packages (FSP) into your system does not support IAR Systems compilers. If you want to operate FSP project for RA family or RZ family, please use a combination of the Renesas Advanced Smart Configurator (RASC) and the IAR Embedded Workbench instead of the e² studio. For details such as installation procedures, please refer to the documentation on the FSP GitHub page for each device family.

[IAR Eclipse plugins]

IAR Eclipse plugins control IAR Systems compilers on the e² studio, allowing you to create projects, set build options, and execute builds of IAR Systems compilers on the e² studio.

1.2 Environment

This content is described based on the following environment:

[OS]

- OS   Windows10 64bits

[Tool]

- e² studio   2023-07

- IAR Eclipse plugins   IAR EW for Renesas RX 4.20.1

- IAR Embedded Workbench (include RX Compiler)

In advance, please install the e² studio to your PC.

Please note IAR Systems compilers are not evaluated with the e2 studio in Renesas.

The technical support is provided by IAR Systems compilers, IAR Eclipse plugins, and C-SPY debuggers. Please ask IAR Systems (and its distributors) for detailed specifications and usage of these products.

2.   Install IAR Embedded Workbench

Purchase or obtain IAR Embedded Workbench for Renesas RX (with RX compiler) from IAR Systems and install it.

You can download the evaluation version of IAR Embedded Workbench for Renesas RX including RX compile from IAR Systems web site (https://www.iar.com/). However, user registration is required to download.

If you want to create a project for devices other than the RX family, please purchase or obtain IAR Embedded Workbench for your device.

3. Install IAR Eclipse plugins

This chapter describes how to install IAR Eclipse plugins to the e² studio.

- If the installation of the IAR Eclipse plugins fails, please download plugins by yourself from IAR Embedded Workbench for Eclipse and install it referring to the following page.
  How to Install a Generic Eclipse Plug-in on e² studio | Renesas Customer Hub

1) Launch e² studio after finish installing IAR Embedded Workbench.

2) Select menu item [Help] > [IAR Embedded Workbench plugin manager…].

3) The [Progress Information] message is appeared, confirming the existing plugins.
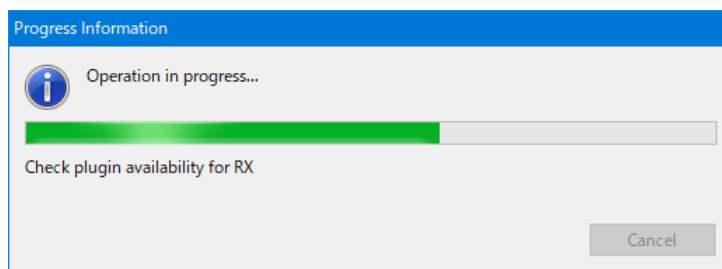

Figure 1 The [Progress Information] message

4) The [IAR Embedded Workbench plugin manager] dialog is appeared after finish confirming the existing plugins. Click the "RX (>=4.10)" in the [Supported targets], check the "4.20.1" checkbox in [Available IAR Embedded Workbench installations]. And press the [Install] button.
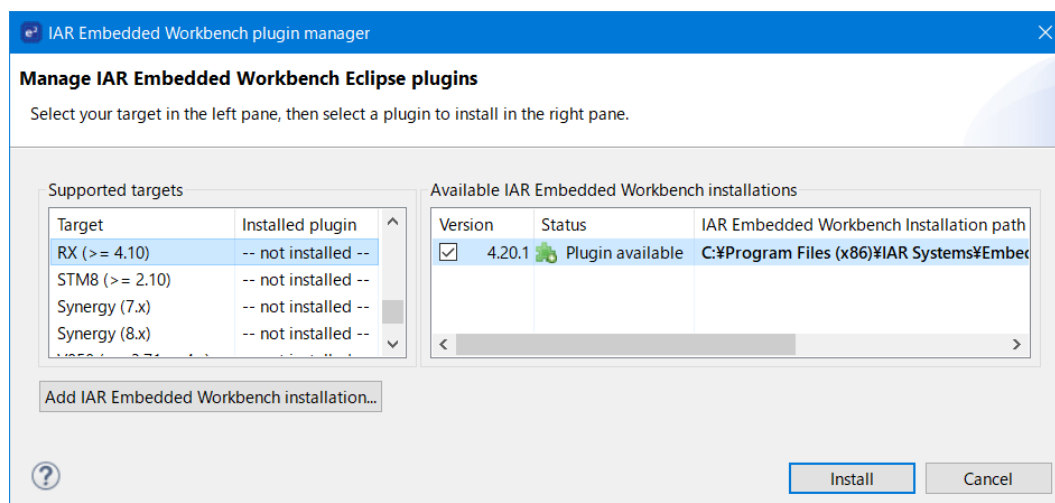
**Figure 2 The [IAR Embedded Workbench plugin manager] dialog**

5) Start the download of the plugins. The download will proceed in the background. And the progress will be displayed on the status bar. Press the [Shows background operations in Progress view] button, [Progress] view is opened.
Note: Download plugins takes time.
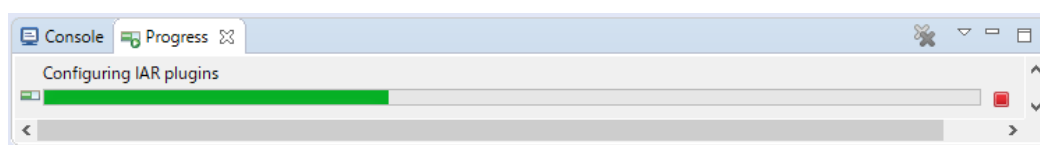
Figure 3 The [Progress] view

6) The [Install - Install] dialog is appeared after finish downloading plugins. Press the [Next >] button.
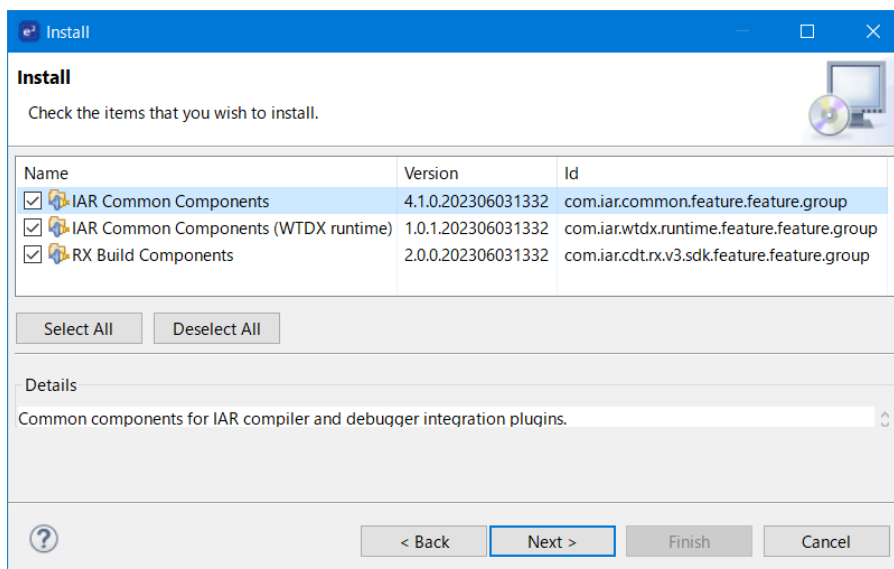
Figure 4 The [Install - Install] dialog

7) The [Install - Install Details] dialog is appeared. Press the [Next >] button.
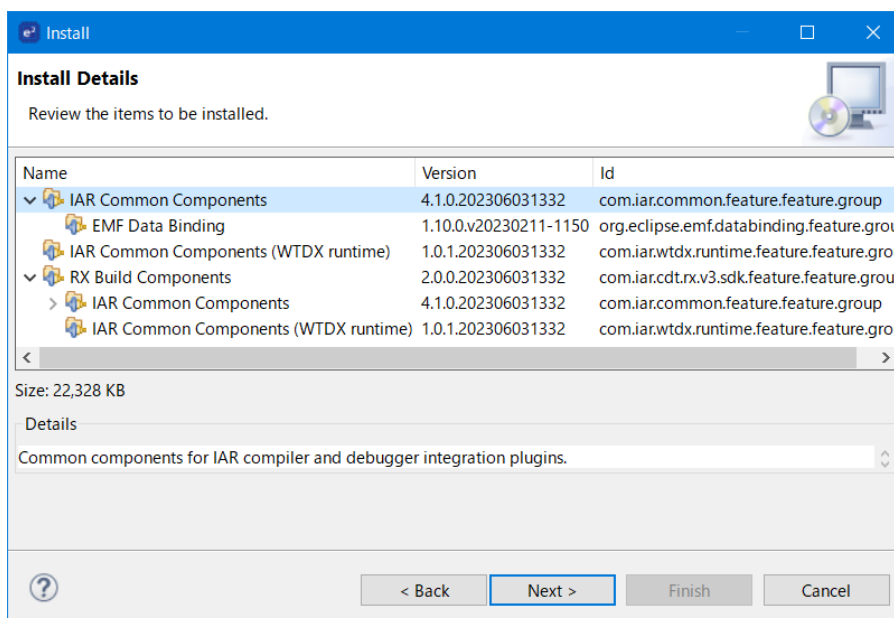

Figure 5 The [Install - Install Details] dialog

8) The [Install - Review Licenses] dialog is appeared. Accept terms of license agreement and press the [Finish] button in order to start the install of plugins.
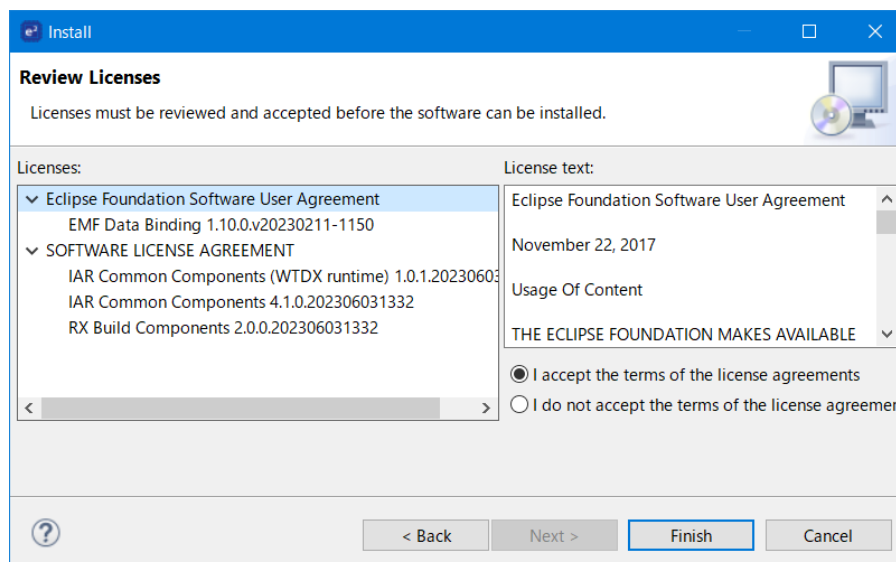
Figure 6 The [Install - Review Licenses] dialog

9) Start installing the plugins. The installation will proceed in the background.
    Note: Installing plugins takes time.

10) The [Trust] message may be appeared during installation. Check the "PCG" checkbox and press the [Trust Selected] button.
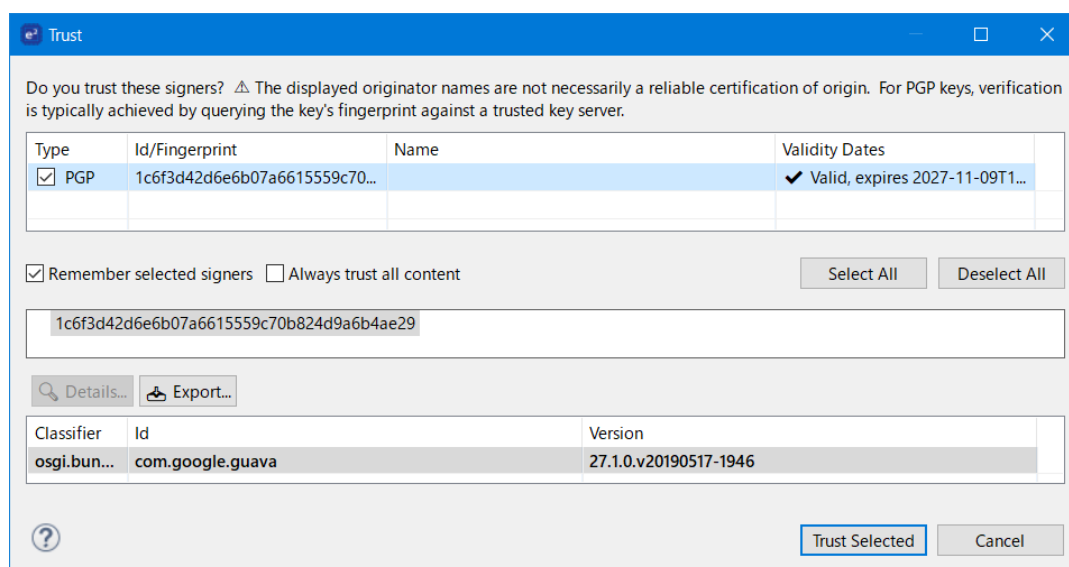
Figure 7 The [Trust] message

11) When the installation is completed, the following message is appeared. Press the [Restart Now] button.
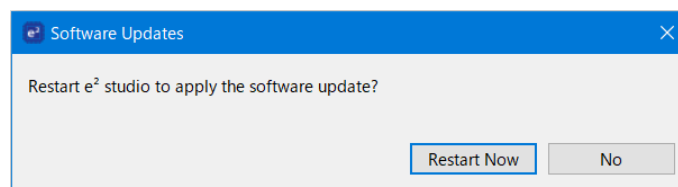
Figure 8 The [Software Updates] message

12) After restart e² studio, select menu item [Help] > [IAR Embedded Workbench plugin manager…] again. If the plugins have been successfully installed, version number is displayed. Press the [Cancel] button.

Figure 9 The [IAR Embedded Workbench plugin manager] dialog

4. Create a project

When IAR Eclipse plugins installation is complete, you can create a project for IAR Systems compiler, set Build options, and execute Build for that project.
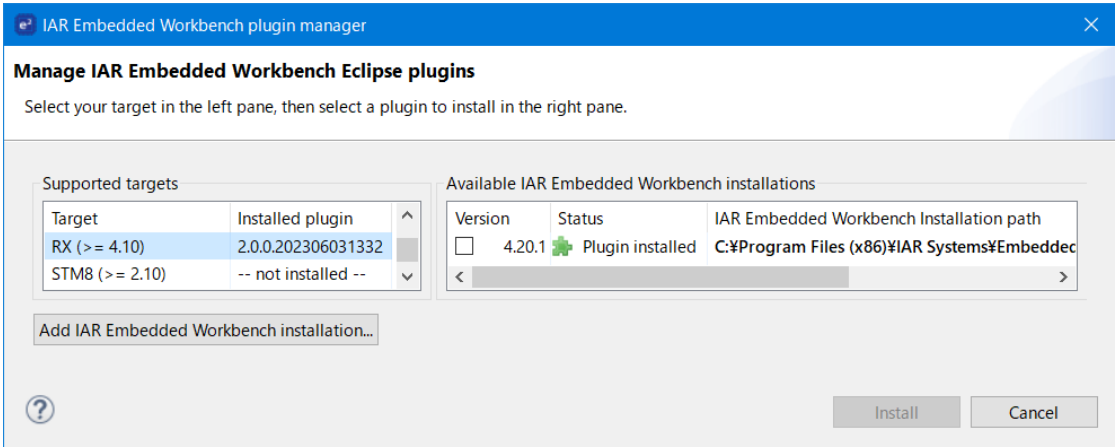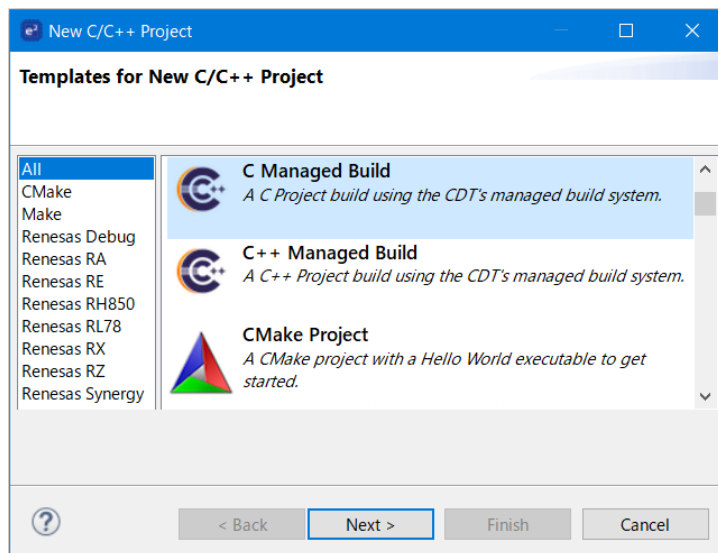
This chapter describes how to create a project.

1) Select the menu [File] > [New] > [C/C++ Project].

2) In the [New C/C++ Project - Templates for New C/C++ Project] dialog, select "All" at the left side, then select "C Managed Build" (or "C++ Managed Build") at the right side. Press the [Next >] button.

Figure 10 The [New C/C++ Project - Templates for New C/C++ Project] dialog

3) The [C Project] dialog is appeared. Select "Executable (IAR) > Empty Project" or "Executable (IAR) > Project with empty main()" or "Library (IAR) > Empty Project" in the [Project type], input project name in the [Project name:] textbox. And press the [Next >] button.

- "Executable (IAR) > Empty Project"
  This project is for generating an absolute file. In this project, there is no source file as default.

- "Executable (IAR) > Project with empty main()"
  This project is for generating an absolute file. One source file containing the main function will be generated as default.

- "Library (IAR) > Empty Project"
  This project is for generating a library file. In this project, there is no source file as default.
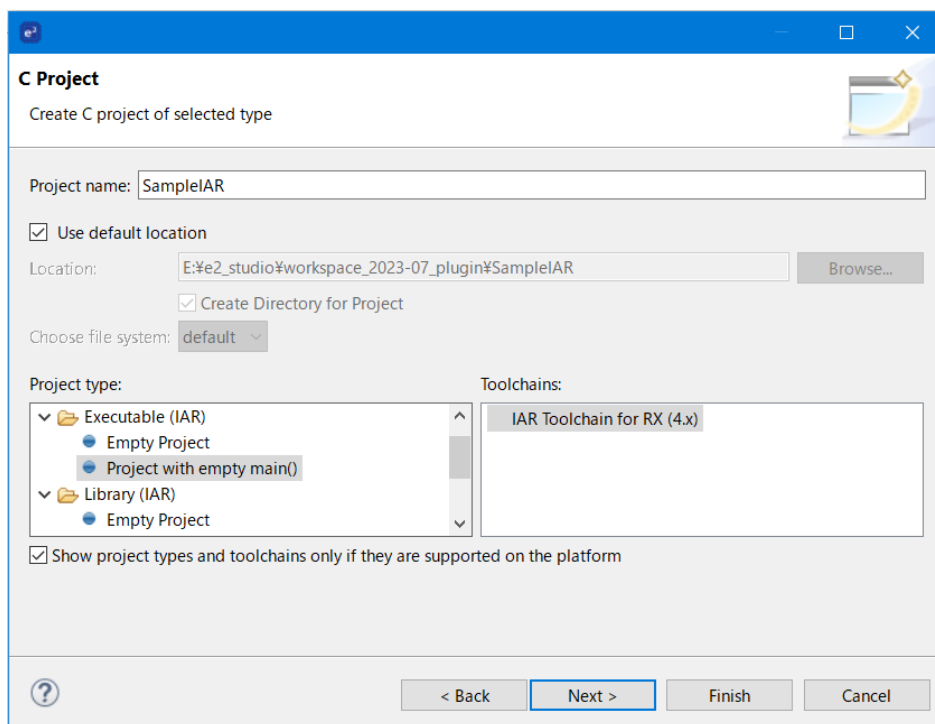
Figure 11 The [C Project] dialog

4) The [Select Configurations] dialog is appeared. Press the [Next >] button.
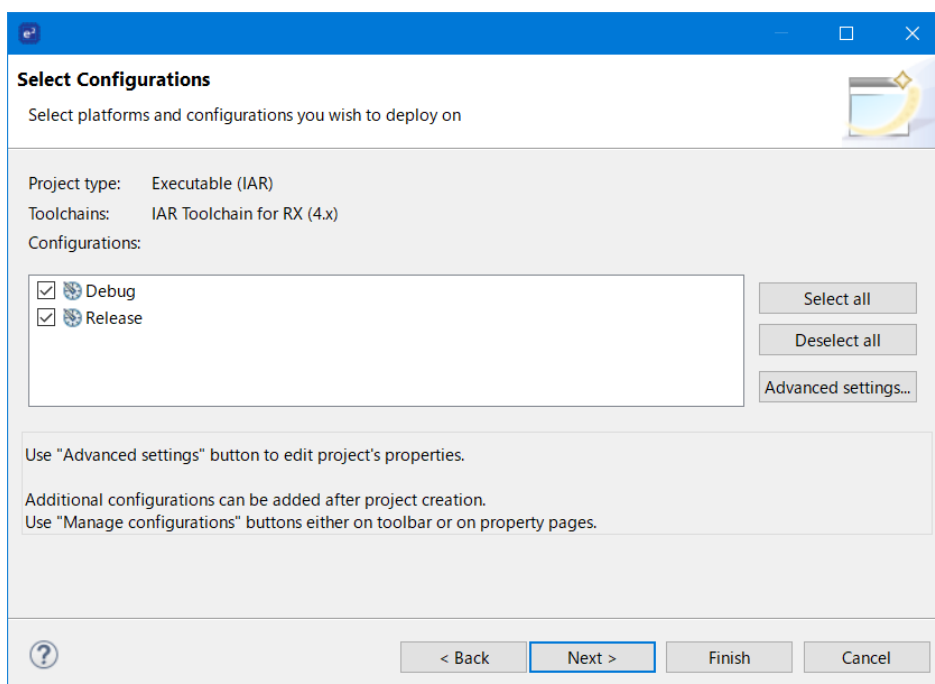
Figure 12 The [Select Configurations] dialog

5) The [IAR Device Selection] dialog is appeared. Press the [Browse…] button and select a device which you use in your project. Press the [Finish] button.
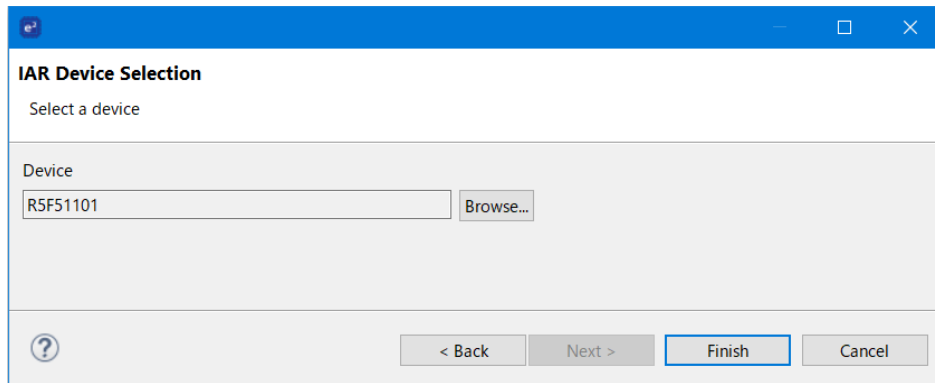
Figure 13 The [IAR Device selection] dialog

6) The created project is shown on the [Project Explorer] view.

5. Usage

To set Build options for the Compiler, Assembler, Linker, and more, select your project in the [Project Explorer] view and perform one of the following operations.

- Select the menu [Project] > [Properties].

- Select the context menu [C/C++ Project Settings].

- Select the context menu [Properties].

The [Properties] dialog is appered. Select "C/C++ Build > Settings" in the left side, click the [Tool Settings] tab. You can setup Build options.
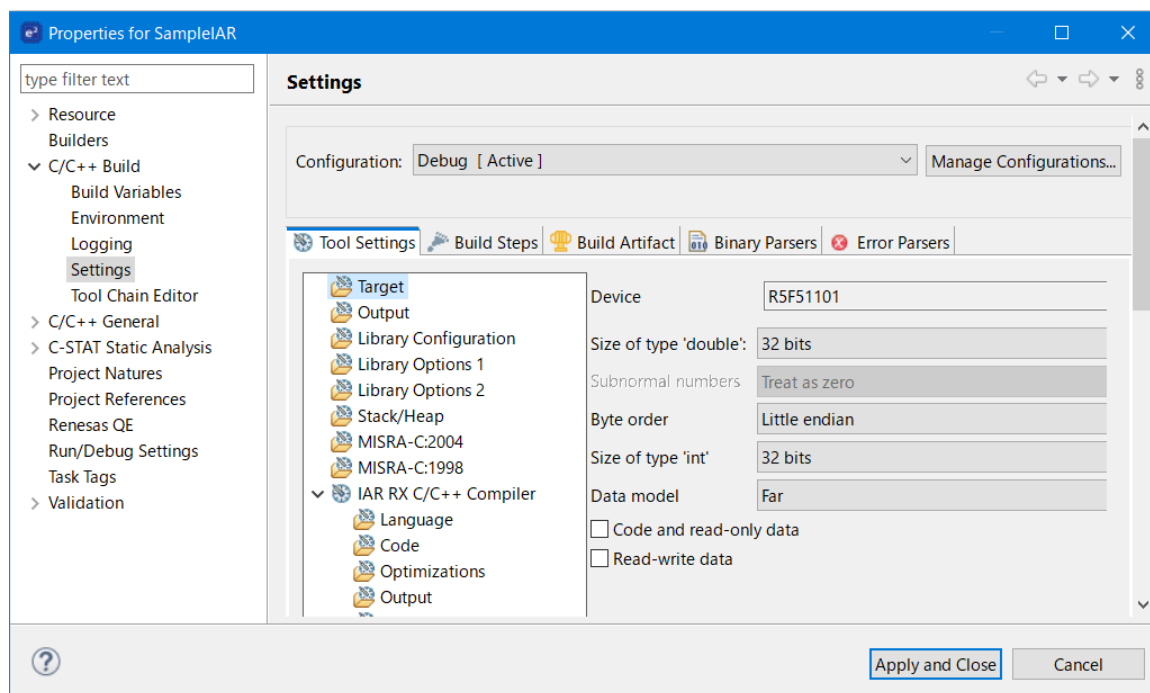
Figure 14 The [Properties: <project name>] dialog

To execute the Build, select your project in the [Project Explorer] view and perform one of the following operations.

- Select the [Build] button on the toolbar.

- Select the menu [Project] > [Build Project].

- Select the context menu [Build Project]

Notes:
To use IAR Systems compiler, you need to register a license. If the license is not registered, the following error will occur at execute Build time.

```
Fatal error[LMS001]: License check failed. Use the IAR License manager to resolve the problem.
```

Register the license from "IAR License Manager". "IAR License Manager" is installed together with "IAR Embedded Workbench".

6. Reference information

6.1 Web site

- IAR Systems
  https://www.iar.com/

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Oct.03.23	-	First edition

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

   A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.

2. Processing at power-on

   The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.

3. Input of signal during power-off state

   Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.

4. Handling of unused pins

   Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.

5. Clock signals

   After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.

6. Voltage application waveform at input pin

   Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).

7. Prohibition of access to reserved addresses

   Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.

8. Differences between products

   Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,
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