# Embedded Target V6.04.00

Release Note

## Contents

# 1. Point for caution

This chapter describes limitations and points to note when using Embedded Target.

## 1.1 Installing MATLAB® and Embedded Target

When MATLAB® and Embedded Target are installed on Windows 10, use other folders than “<system drive>: \Program Files” or “<system drive>:\Program Files (x86)” which is the target for the UAC (User Account Control). If they are installed in the target folder for the UAC, problems such that MEX cannot be built or setting of the MATLAB® path cannot be saved will occur and Embedded Target is not usable.

## 1.2 Using Embedded Target in other MATLAB® Versions

This package recommends MATLAB® R2021a to R2022b. When Embedded Target is used in R2021a or earlier version and R2022b or later version, ask whether the version is supported or not.

## 1.3 Following defined code generation procedure

Inappropriate configurations can lead to abnormal operations during the PIL Simulation. For these cases, re-create the Simulink® Models to get default configuration defined by MATLAB®/Simulink® and follow the procedure defined procedure for Code Generation.

## 1.4 Character String Available for Paths or Block Names

Do not use 2-byte characters (e.g., Japanese), spaces, forward slashes, line feeds, and hyphens for a path where the Simulink® model has been stored or a block name required for code generation. If 2-byte characters (e.g., Japanese) are used for a block name for code generation, the character string of MATLAB® will be replaced. If hyphens or spaces are used for a block name, the subsequent character string will be omitted. A series of operations of Embedded Target is enabled but cannot be guaranteed.

## 1.5 Long path to code generation folder

Windows platform has a constraint about the length of path to files, directories. CS+/e$^2$ studio is also affected by this constraint. When the path to code generation folder, which contains the source code generated by embedded models, is stored in a long path, CS+/e$^2$ studio cannot build the project. In this case, use shorter path to code generation folder. Or save source files in the absolute path by setting “Yes” in [Property] page – [File Information] – [Save with absolute path], the [Property] page can be opened by right clicking on the source file and choosing Property item.

## 1.6 Handling of double-Type Data

In the Simulink® model, the double type is handled as 8-byte data. In CS+/e$^2$ studio, RX/RA handle the double type as 8-byte data as well as in the Simulink® model.

When you use the double type in RX, select [RX] for [Hardware Implementation] in the Configuration Parameters dialog box. Specify [Handles in double precision (-dbl_size=8) for the property of CS+/e$^2$ studio. Be sure to match the settings of the Configuration Parameters dialog box and the property of CS+/e$^2$ studio.

On the otherhands, RL78 do not support 8-byte data. Make sure that the setting in the Simulink® model did not contain 8-byte data. The miss-match of data size can cause failure in PIL simulation.

## 1.7 Handling of Endian

Little endian and big endian can be selected in RX. Since little endian is set for each tool by default, make the following settings when big endian is selected.

Select [Big Endian] for [Hardware Implementation]- [Byte ordering] in the Configuration Parameters dialog box.

Set [Big-endian data (-endian=big)] for the property of CS+/e$^2$ studio. Be sure to match the settings of the Configuration Parameters dialog box and the property of CS+/e$^2$ studio.

## 1.8 Selecting a Device in the Configuration Parameters Dialog Box

An error dialog box appears if correct information on the CS+/e$^2$ studio installation folder path has not been specified when a device is selected by clicking on the [Select Device Name] button in the Configuration Parameters dialog box or information on a device list is updated by clicking on the [Device List Update] button.

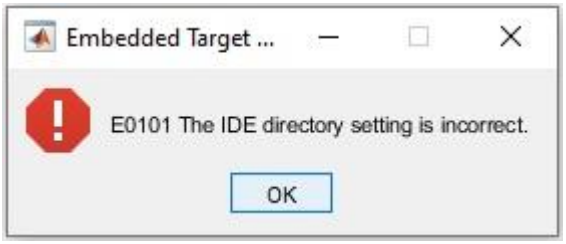


**Figure 1-1. Error Dialog Box**

When an information list of selectable devices is shown in the dialog box, information on the CS+/e$^2$ studio installation folder path must be correctly specified in [IDE install directory] because the device-dependent information file for the CS+/e$^2$ studio environment needs be referenced.

## 1.9 Overwriting Model Files

When a Subsystem block is the target of code generation and a test environment is generated in the model window, the contents of the model file are overwritten. Save the model file as another name after generating a test environment or generate a test environment using the "ecpils_build" command in the MATLAB® command window. The "ecpils_build" command does not overwrite the original model file because it generates a test environment using the copied model file.

## 1.10 Insufficient Memory Capacity of the Model Selection Device

If a build error occurs in CS+/e$^2$ studio or an error occurs in downloading to the debug tool, the memory size of the device in use will be insufficient. Select a device with larger memory size.

## 1.11 Memory Area for PIL Simulation Used in the Model Target Program

Embedded Target sends and receives a part of data for PIL simulation in the target program. Currently, 3000-byte memory for storing the data for PIL simulation is reserved in the target program by default. Since the sizes of blocks for code generation and data for inputting or outputting the model are required, if 3000-byte memory is insufficient/too big or memory size must be controlled, modify the value of “3000” of “#define BUFFER_SIZE 3000” that has been defined in “<Embedded Target installation folder>\ecpils\renesas_rtiostream_define.tlc”.

In generally, the RL78 series has the hardware factor quite small compare with RX series. Some big/complicated models can not be built and executed PIL in RL78 series due to lack of RAM size. The lower limit on the size of the target RAM area used by the tool during PILS execution is about: “768 byte + using memory size of user’s model-block”.

## 1.12 Setting Breakpoints

When the execution time is measured in algorithm verification, Embedded Target automatically sets breakpoints. Users are prohibited to delete or newly set the breakpoint because it may cause an abnormal operation in PIL simulation. In particular, the execution time cannot be correctly measured. In such a case, terminate MATLAB® and CS+/e$^2$ studio and regenerate the test environment.

Remarks Breakpoints that have been automatically set by Embedded Target are automatically deleted after PIL simulation ends.

If the execution time is not measured, Embedded Target does not set breakpoints.

## 1.13 Synchronizing Data Communications

During PIL simulation, it is prohibited to set a breakpoint or step, start and stop a program in the CS+/e$^2$ studio side after simulation is paused in the Simulink® side. If such an operation is performed in the CS+/e$^2$ studio side, PIL simulation will operate abnormally. In such a case, terminate MATLAB® and CS+/e$^2$ studio and regenerate the test environment.

## 1.14 Reading a Model Created by the Previous Embedded Target

In the current version of Embedded Target, when a model file that has been created in the old Embedded Target version is opened, the following warning message may be output in the MATLAB® command window.

This is because the specifications of items selected in the Configuration Parameters dialog box were changed. After the model file is overwritten in the environment for this version, that message will not appear, and you need not take any measures for the warning.

Warning: <model name>, <line number> line: Value '<String1>' and parameter '<Parameter>' are conflicted.

## 1.15 PIL Simulation Error

During PIL simulation, if an error occurs in the target that operates on CS+/e$^2$ studio, the following MATLAB® error dialog box may be output. For the error, some reasons will be considered. For example, when PIL simulation is run, if the size of data sent from the target on CS+/e$^2$ studio to MATLAB® exceeds that of the communications buffer, communications will be disabled. In this case, modify the value of “3000” of “#define BUFFER_SIZE 3000” that has been defined in
“<Embedded Target installation folder>\ecpils\renesas_rtiostream_define.tlc”.

## 1.16 Problem of PIL Simulation due to Generation of Resets

During PIL simulation, a problem may occur for PIL simulation due to generation of reset signals. Stop the WDT or mask the reset signals in [Debug Tool Settings] – [Mask for Input Signal] of the CS+/e$^2$ studio debug tool.

## 1.17 Execution Time Measurement Result

There is the range of time measurement in the debug tool of CS+/e$^2$ studio. If the execution time for Embedded Target is shorter than the minimum measurement time of the debug tool of CS+/e$^2$ studio, the measurement result will be 0 ns.

## 1.18 Running Embedded Target in the Same Folder

On running Embedded Target by placing the Subsystem model and the reference or top-level model in the same folder, when the reference or top-level model is executed after building the Subsystem, delete the old working folder slprj, and then start simulation.

## 1.19 Model for Handling Complex Data

Embedded Target does not support code generation in the MATLAB®/Simulink® model (Subsystem) which handles complex data.

## 1.20 Insufficient memory buffer area of MATLAB®

In an error happens during code generation, MATLAB® cannot acquire enough memory buffers for operation due to the limitation of the size assigned for MATLAB® application on Windows platform. In such a case, type “help memory” on MATLAB® command window, and follow the instructions.

## 1.21 Failure in CS+/e$^2$ studio initialization

In some cases, if CS+/e$^2$ studio can’t perform actions regarding build and download Load Module, re-generate the test environment.

## 1.22 Insufficient linking libraries during code generation of PIL Simulation

In some cases, during code generation of PIL Simulation, the MEX compiler can’t compile generated source code generated by MATLAB® due to mismatch of rtIOStream built-in libraries in MATLAB®, remove them and re-generate test environment again.

## 1.23 Confirming Information Provided by MathWorks

Embedded Target uses the structure of PIL for MATLAB®/Simulink® and Embedded Coder. Accordingly, use Embedded Target after confirming information (help, release notes, etc.) provided by the MathWorks, Inc.

## 1.24 Using RL78 series with e$^2$ studio

The RL78 series can only support from e$^2$ studio version 2021-07 and above. Using e$^2$ studio version less than 2021-07 can cause error when creating project.

## 1.25 Using RA series with e$^2$ studio

The RA series can only support from e$^2$ studio version 2022-04 and above and do not support for CS+ IDE. Using e$^2$ studio version less than 2022-04 or CS+ IDE can cause error when creating project.

## 1.26 Using RX Big Endian devices with J-Link Emulator

The original release of e$^2$ studio has a bug in GDB server and it makes PIL Simulation on Big Endian devices can not be run. This issue affects to the using of RX device in Big Endian Mode with J-Link emulator. This bug was fixed in e$^2$ studio 2022-07 official release.

## 1.27 Using other FSP and GCC ARM Embedded version when creating RA project on e² studio

When creating project for RA device family on e² studio, there is a case that version of FSP or GCC ARM Embedded is difference with the packages included with e² studio. If the default version of FSP and GCC ARM Embedded do not correct, the project creation will be failed. To specify the correct version, modify the value of “FSP_Version” or “GCC_Version” in “<Embedded Target installation folder>\et\ projectgen_ra.ini”.

# 2. Restrictions

This chapter explains the restrictions of Embedded Target V6.04.00 version.

## 2.1 Running PIL simulation on Subsystem block targets with BigEndian setting can produce an error on MATLAB® R2021a or higher

The original release of MATLAB® R2016a version has a bug in PIL Simulation on Big Endian devices. Therefore, this issue affects to the RX Big Endian usage. MathWorks announced the bug information and workaround solution. Follow the link to get information:
http://www.mathworks.com/support/bugreports/1404465

## 2.2 Running PIL simulation on Subsystem block targets with BigEndian setting can cause transit/receive error on MATLAB® R2021a and higher

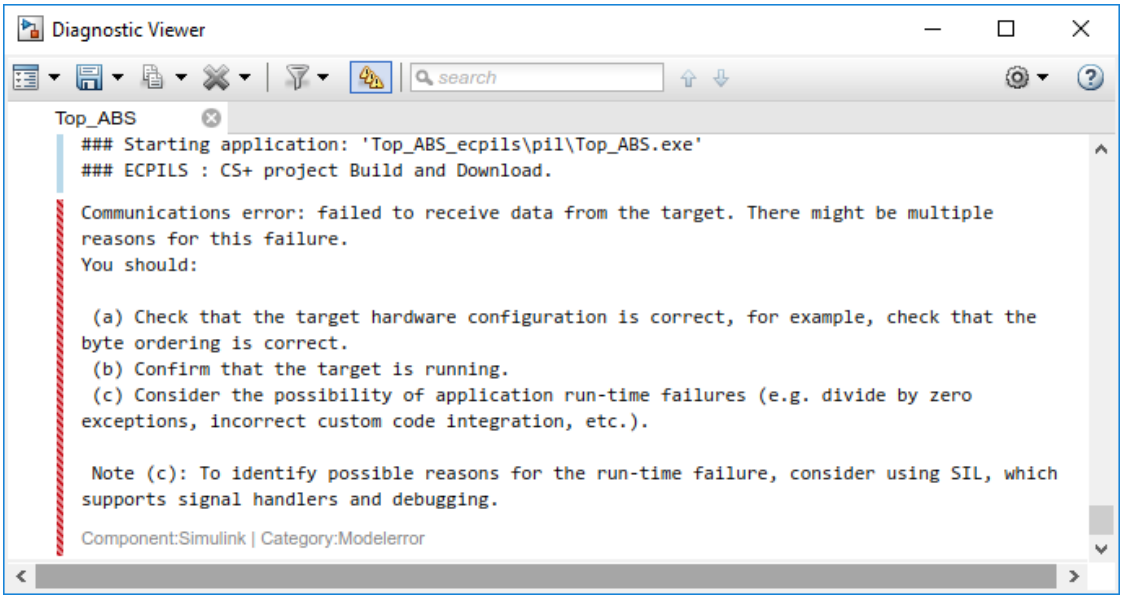


**Figure 2-1. Error messages occurs during PIL Simulation**

## 2.3 Can not support measuring execution time

Embedded Target V6.04.00 does not support “Measure execution time” feature in these cases:

When IDE target is “CS+” and Debug tool is “EZ Emulator”.

When IDE target is “CS+” or “e² studio” and Debug tool is “COM Port”

## 2.4 Can not run PIL simulation with Big Endian mode when using RX device and J-Link Emulator

Refer to section “1.26 Using RX Big Endian devices with J-Link Emulator ” in POINTS FOR CAUTION for more detail.

## 2.5 Can not run PIL simulation with COM Port and e² studio in Windows 10 (build version 19043 or later) or Windows 11

The COM Port works very slow when using e² studio in Windows 10 (build version 19043 or later) or Windows 11. If it is used for PIL simulation, the communication channel cannot be opened, and an error occurs. This is also fixed in e² studio 2023-01 and later.

## Revision History

| Rev. | Date | Description | |
|---|---|---|---|
| | | Page | Summary |
| 1.00 | Feb. 01. 23 | All | First Edition issued |
| | | | |

# 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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