

AI Navigator v2.1.0

Release Note

Introduction

This document describes the contents of AI Navigator v2.1.0, such as changes from the previous version, restrictions and so on. Please read it before using this tool.

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1. About AI Navigator

1.1 Summary

AI Navigator is a set of plugins for e² studio which is an integrated development environment (IDE) for Renesas devices.

AI Navigator makes it possible to integrate and operate the various functions required for AI embedded system development. This helps the development period shorter.

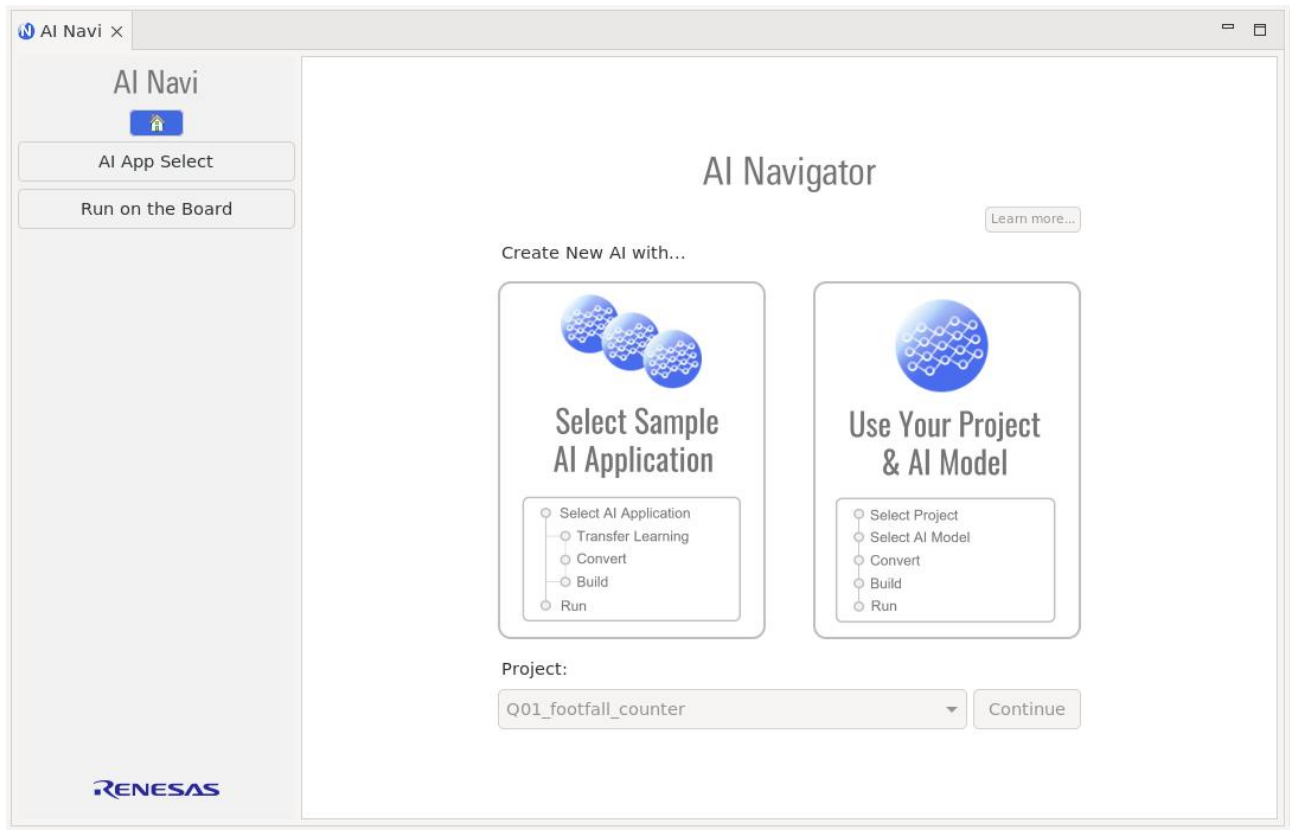


Figure 1-1 AI Navigator Home

1.2 Supported Features

This version supports the following new features.

- [RA, Windows] RUHMI Framework (hereafter, RUHMI) Auto-Installation
RUHMI can now be installed automatically via a button in the Conversion Tool.
- [RA, Windows] ExecuTorch Format Support
Conversion Tool supports conversion of models in ExecuTorch format.
- [RA, Windows] RA8 Series Support
Sample AI applications for RA8D1 are available, enabling the development of AI applications based on this sample.
- [RZ/V, Linux] RZ/V AI TLT v6.00 support
AI model training is supported with the latest version of the RZ/V AI Transfer Learning Tool.

AI Navigator provides the following features:

- Sample AI application
Select the AI application from Renesas AI Application Zoo and download the corresponding e² studio projects. This makes it easy to start AI development.
- AI model conversion
Convert AI models into an executable format suitable for the device's AI accelerator.
 - RZ/V: Convert an AI model into executable code for DRP-AI using DRP-AI TVM.
 - RA8P1: Convert an AI model into executable code for Arm® Ethos™-U55 or CPU using RUHMI.
- Transfer learning*
This feature allows the users to customize AI models in Renesas AI applications with their own datasets.
*Note: Available on RZ/V (Linux environment) only in this version.
- User project*
Develop an AI application with a user project that includes any AI model on e² studio.
*Note: Available on RA8P1 (Windows environment) only in this version.

1.3 Target Plugin

- Renesas AI Navigator plugin v2.1.0
- AI Model Conversion Tool plugin v2.0.1 *plugin for AI Model Conversion Tool
- AI Transfer Learning Tool plugin v2.0.1 *plugin for Transfer Learning Tool, Linux only in this version.

Note: From here on, each of the above plugin names is described as follows.

- AI Navigator plugin
- AI Model Conversion Tool plugin
- AI TLT plugin

1.4 Supported Environment

- RZ/V
 - Ubuntu 20.04 LTS
 - Renesas e² studio 2025-01 Linux Host

*Download it from the link below.
<https://www.renesas.com/document/uid/e-studio-2025-01-installer-linux>
- RA8P1
 - Windows 10 / Windows 11
 - Renesas e² studio 2025-10 or later
 - RA Flexible Software Package (FSP) v6.1.0 or later

<https://www.renesas.com/software-tool/flexible-software-package-fsp>
<https://github.com/renesas/fsp>

1.5 Supported MCU, MPU

RZ family

RZ/V Series (RZ/V2H, RZ/V2N, and RZ/V2L group)

RA family

RA8 Series*

* Refer to the “Related Boards & Kits” on the [AI Navigator webpage](#) for information on which boards have been confirmed to operate with AI Navigator.

1.6 AI Navigator Quick Start Guide

Please read the AI Navigator Quick Start Guide to learn how to install and use AI Navigator.

- RZ/V: https://renesas-rz.github.io/rzv_ai_sdk/latest/ainavi_quick_start_guide
- RA8: [“Renesas RUHMI AI Compiler Quick Start Guide”](#).

2. Changes

This chapter explains the changes of each plugin from the previous version.

2.1 AI Navigator Plugin

Table 2-1 Changes (AI Navigator plugin)

Items	Change details	
	Previous version (v2.0.1)	This version (v2.1.0)
Plugin version	AI Navigator plugin v2.0.1	AI Navigator plugin v2.1.0
[RA, Windows] Newly added RA8 series devices	-	- RA8D1 Sample AI Applications are available, executed on EK-RA8D1. - Expanded support for RA8 series devices in "Use Your Project & AI Model". Enables development of AI applications using your own AI models for RA8 series.

2.2 AI Model Conversion Tool Plugin

Table 2-2 Changes (AI Model Conversion Tool plugin)

Items	Change details	
	Previous version (v2.0.0)	This version (v2.1.0)
Plugin version	AI Model Conversion Tool plugin v2.0.0	AI Model Conversion Tool plugin v2.1.0
[RA, Windows] RUHMI Framework automatic installation	-	Added RUHMI Framework automatic installation feature.
[RA, Windows] Added support for additional convertible model formats	-	Conversion of AI models in ExecuTorch format is supported.
[RA, Windows] Added support for model conversion targeting RA8 series	-	Model conversion for RA8 series CPUs is supported.
AI Model Conversion Tool Help page	-	Updated for v2.1.0.
Remove notes	(3.1.2 [AI Model Conversion Tool plugin] [DRP-AI TVM] Open and Close AI Model Conversion Tool GUI) Open the AI Model Conversion Tool GUI only when converting AI models with it. If you keep this GUI open during another process, the correct directory/file path may not be set in this GUI. (For example, RZ/V AI SDK directly downloaded path and the trained AI model file path from RZ/V AI TLT.)	Removed.
Remove functional restrictions	(3.2.1 [AI Model Conversion Tool plugin] [DRP-AI TVM] Sample code generation with multiple inputs model) The sample code generation with multiple inputs may fail in the following case: The output directory in view 1 differs from that in view 2. (e.g.) - Output directory in view 1: test1 - Output directory in view 2: input 1: test2/Preprocess_input1 input 2: test2/Preprocess_input2	Removed.

Remove functional restrictions	(3.2.2 [AI Model Conversion Tool plugin] [DRP-AI TVM] Output Directory for Preprocessed Objects) Specifying a non-existent folder in view 2 may cause the preprocessed object to be output to an unexpected location. (e.g.) 1. In view2 (preprocess setting view), set the output directory to "test1/preprocess". At this point, "test1/preprocess" directory does not exist. 2. Proceed to view 3. 3. The preprocess object is output to "test1/", instead of "test1/preprocess".	Removed.
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2.3 AI TLT Plugin

Table 2-3 Changes (AI TLT plugin)

Items	Change details	
	Previous version (v2.0.0)	This version (v2.1.0)
Plugin name & version	AI Transfer Learning Tool plugin v2.0.0	AI Transfer Learning Tool plugin v2.1.0
Supported status of RZ/V AI TLT	Supported up to RZ/V AI TLT v4.00.	Supported RZ/V AI TLT v6.00.
Language	English.	English and Japanese.

3. Notes / Restrictions

This section describes the notes and restrictions for each plugin in this release.

3.1 Notes

There are no new or updated notes in this version.

3.1.1 [AI Model Conversion Tool Plugin] [DRP-AI TVM] Setup the environment

If you click [Start Settings...] without specifying the directory path of the downloaded RZ/V AI SDK zip file, the warning window indicates that the directory path has not been specified appears. Click [Start Settings...] again after specifying the directory path.

Also, setting up the environment for AI Model Conversion Tool plugin may take some time depending on network conditions.

3.1.2 [AI Model Conversion Tool Plugin] [DRP-AI TVM] Sample code generation

In the sample code generation function for RZ/V, the input model must be in image format. Other format input models, such as multi-layer perception (1D and other models), are not supported.

3.1.3 [AI Model Conversion Tool Plugin] Model file name and workspace path

If the model file name or workspace path contains spaces, errors may occur during quantization or conversion. Please replace spaces with underscores (" _ ") or other suitable characters.

(e.g.1) Model file name

- Convertible: input model.onnx
- Unconvertible: input_model.onnx

(e.g. 2) Workspace path

- Convertible: C:\Work space
- Unconvertible: C:\Work_space

3.1.4 [AI Model Conversion Tool Plugin] [RUHMI] Environment variables CONVERSION_TOOL_E2STUDIO_PLUGIN_PYTHON_VENV_LOC

If the following error occurs, please try one of the following tips.

[ERROR] Failed to find the environment variable:
"CONVERSION_TOOL_E2STUDIO_PLUGIN_PYTHON_VENV_LOC"
[ERROR] Set the Python virtual environment path as environment variable:
"CONVERSION_TOOL_E2STUDIO_PLUGIN_PYTHON_VENV_LOC"
[ERROR] If it is already set, restart e2studio to reload the environment variables.

- Check the environment variables
Please confirm that "CONVERSION_TOOL_E2STUDIO_PLUGIN_PYTHON_VENV_LOC" is defined in User Environment Variables in Windows.
When using PowerShell, run the following command to check.

```
PS > $env:CONVERSION_TOOL_E2STUDIO_PLUGIN_PYTHON_VENV_LOC  
C:\Users\<User name>\env // The environment variables will be displayed.
```

- Restart e² studio
To ensure the environment variables are applied, please restart e² studio. If e² studio is launched from a console, restart the console as well.

3.1.5 [AI TLT Plugin] Installation time of RZ/V AI TLT

Installation of the RZ/V AI Transfer Learning Tool (hereafter referred to as RZ/V AI TLT) may take some time depending on network conditions.

3.1.6 [AI TLT Plugin] AI applications RZ/V AI TLT supports

Please refer to the following web page for the AI applications supported by the RZ/V AI TLT.

(URL) https://renesas-rz.github.io/rzv_ai_sdk/5.20/howto_retrain.html

When you click [Transfer Learning...] in these application projects, the error message "No executable transfer learning plug-ins were found" is displayed. RZ/V AI TLT may support these applications in the future.

3.1.7 [AI TLT Plugin] Launching e² studio from the terminal

When starting the e² studio from the terminal, you may need to enter your root password to start RZ/V AI TLT after clicking [Transfer Learning...] in the AI Navigator.

3.2 Functional Restrictions

No new or updated functional restrictions in this release.

3.2.1 [AI Model Conversion Tool Plugin] Renaming Projects

When using the AI Model Conversion Tool plugin, you cannot rename the project. For example, the following operations will result in a CT_ERR_SCREEN_FILE_002 error:

- Example 1: Renaming an imported Sample AI Application project in e2 studio
- Example 2: After selecting your own project in the Conversion Tool, renaming it in e2 studio

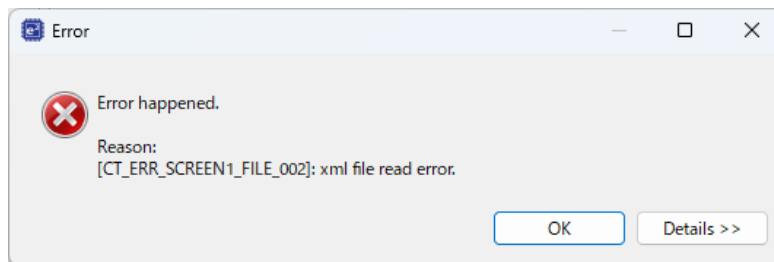


Figure 3-1 Error image

(Workaround)

1. Right-click the renamed project or the imported project.
2. Click "Command Prompt" to open the terminal.

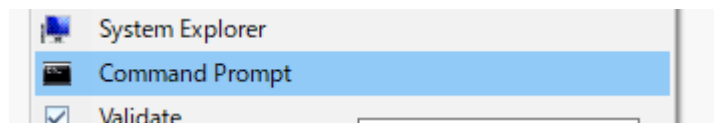


Figure 3-2 Error image

3. To delete the configuration files in the project, run the following command.

Windows:

```
powershell -Command "Remove-Item -Path '.settings\plugin\com.renesas.ai.translator' -Recurse -Force"
```

Linux:

```
rm -r .settings/.plugin/com.renesas.ai.translator
```

4. Close the terminal.

3.3 Notes on Integrated Tools

This section provides important notes on the tools integrated with the AI Navigator.

3.3.1 RUHMI Framework

Refer to the following link for the supported input and output model formats of the RUHMI Framework. The supported formats may differ depending on the version.

- Conversion options in [renesas/ruhmi-framework-mcu \(GitHub\)](https://github.com/renesas/ruhmi-framework-mcu)

The AI Model Conversion Tool plugin operates independently of the RUHMI Framework version.

Within the plugin, users can select model formats that may not be supported by a specific version of the RUHMI Framework.

Please note that using unsupported formats may result in errors or undefined behavior in the RUHMI Framework.

3.4 e² studio workarounds and information related to plugins

This section describes the e² studio workarounds related to the released plugins.

Regarding all the e² studio workarounds and information, please refer to the release note for each version of e² studio.

- <https://www.renesas.com/en/software-tool/e-studio>

3.4.1 [e² studio 2025-10] Help page may be blank

When clicking [Learn more...] button on AI Navigator Home page, AI Navigator help page may be blank as below.

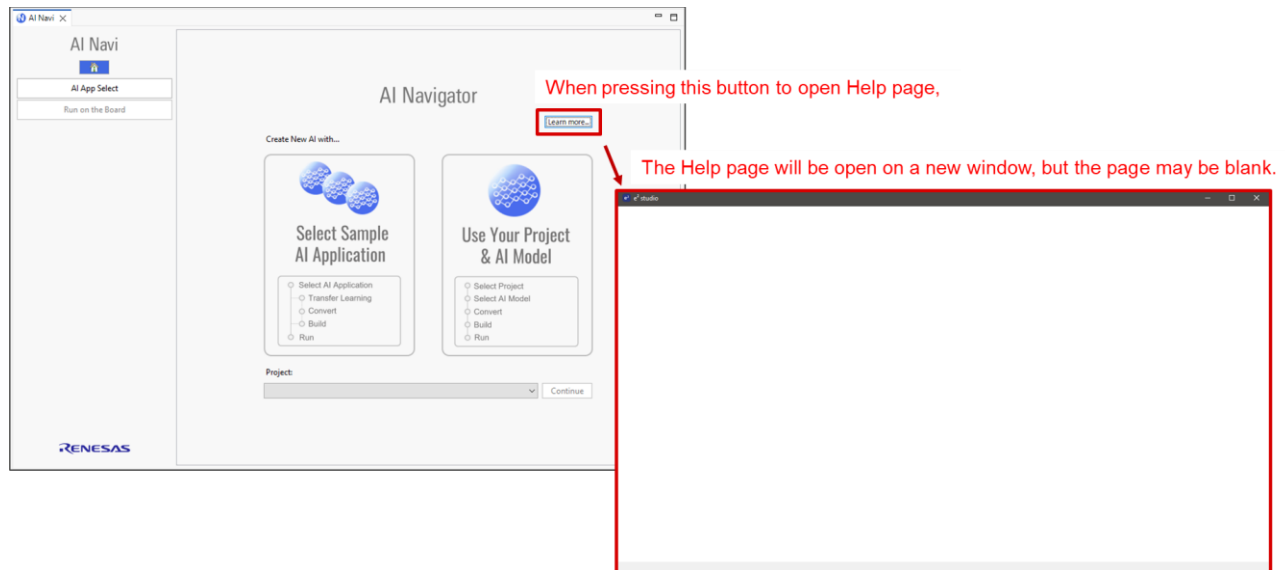


Figure 3-3 Example of the behavior when clicking the [Learn more...] button

If closing & reopening the view does not fix the issue, then the line "chromium.integration.eclipse.disable=true" should be added to the end of "configuration/config.ini" in the install directory of e² studio.

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Oct 31, 2025	–	Issued for AI Navigator v2.1.0.

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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