AI Navigator v2.2.0

Release Note

Introduction

This document describes the contents of AI Navigator v2.2.0, such as changes from the previous version, restrictions and so on. Please read it before using this tool.

Contents

1. About AI Navigator

1.1 Summary

AI Navigator is a set of plugins for e^2 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.

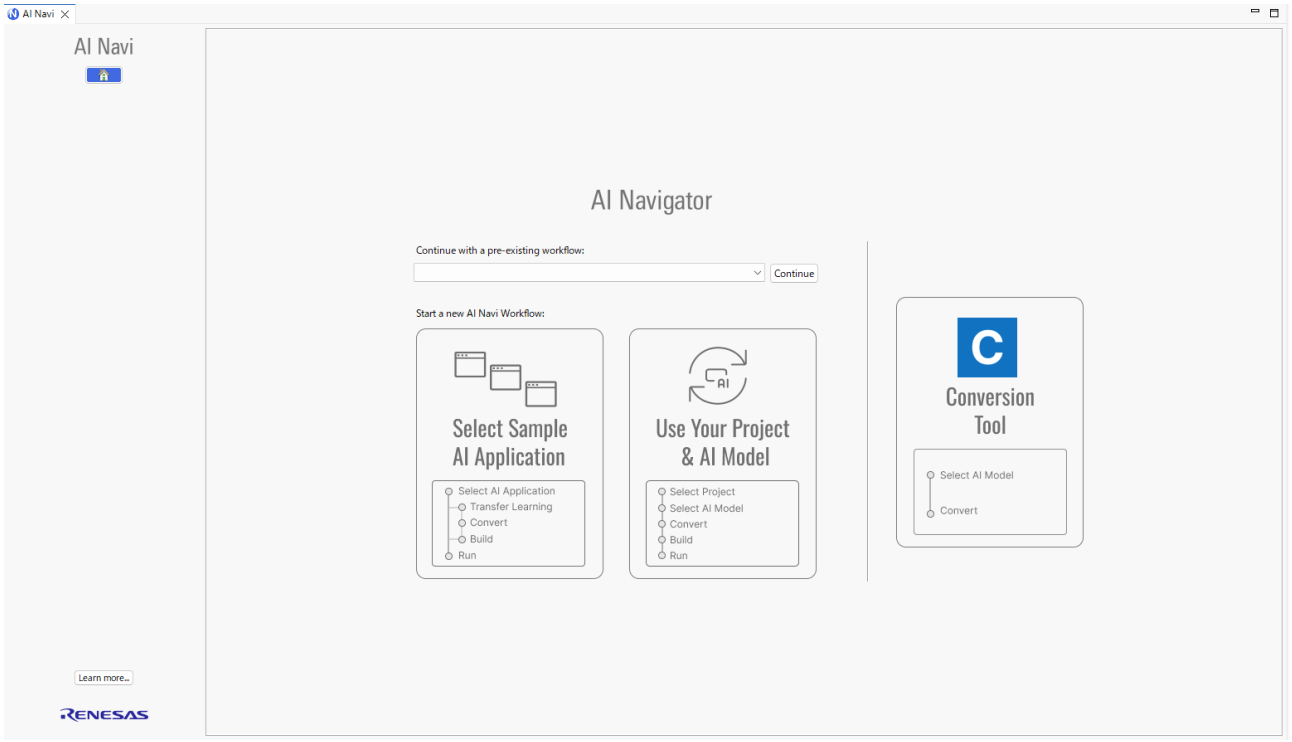

Figure 1-1 AI Navigator Home

1.2 Supported Features

This version supports the following new features.

- **Supported OS**
  AI Navigator can now be used for the RA8 series in a Linux (Ubuntu 22.04) environment.
  As with the Windows environment, sample applications can be executed, and model conversion using the RUHMI Framework for RA8 MCU (hereafter referred to as “RUHMI”) can be performed via the Conversion Tool.
  The supported OS for RZ/V has been updated to Ubuntu 22.04 LTS.
- **[RA8] Support for Model Visualizer**
  Model Visualizer is now supported on the Conversion Tool, allowing users to view and verify models after conversion.
- **[RZ/V, Linux] Support for the latest RZ/V AI Applications and AI SDKs**
  Support for RZ/V AI Application v7.10 has been added.
  The following AI SDKs are now supported:
  - RZ/V2H AI SDK v6.00 (DRP-AI TVM v2.5.1)
  - RZ/V2N AI SDK v6.00 and 6.30 (DRP-AI TVM v2.5.1)
  - RZ/V2L AI SDK v7.00 (DRP-AI TVM v2.6.1)
- **Direct Launching Conversion Tool**
  The Home view has been updated to allow direct launching of the Conversion Tool.

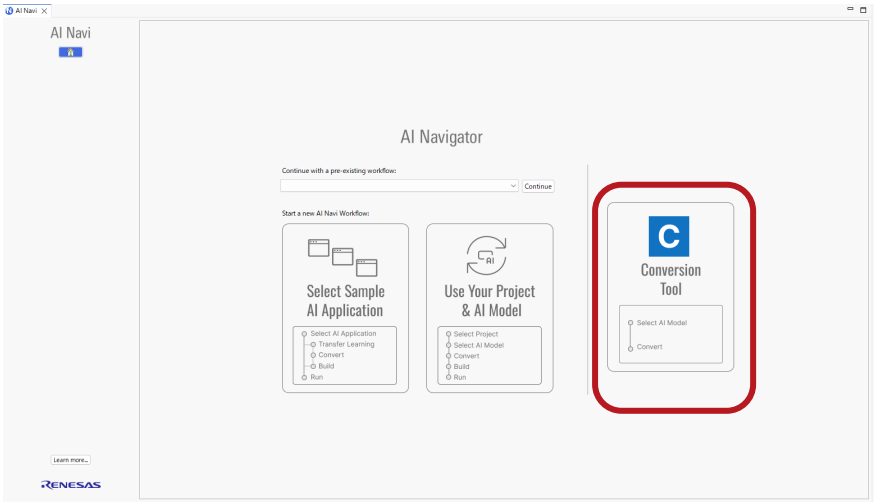

Figure 1-2 AI Navigator Home View

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 only in this version.
- User your project & AI model*
  Develop an AI application with a user project that includes any AI model on e² studio.
  *Note: Available on RA8 only in this version.

1.3 Target Plugin

- Renesas AI Navigator plugin v2.2.0
- AI Model Conversion Tool plugin v2.2.0 *plugin for AI Model Conversion Tool
- AI Transfer Learning Tool plugin v2.2.0 *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

Note: Please be aware that the supported e² studio versions differ between RA8 and RZ/V devices.

- RA8P1
  - Windows 11 64-bit, Ubuntu 22.04 LTS
  - Renesas e² studio 2026-04.2
  - 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
- RZ/V
  - Ubuntu 22.04 LTS
  - **Renesas e² studio 2025-12 Linux Host**
    *Download it from the link below.
    https://www.renesas.com/document/uid/e-studio-2025-12-installer-linux

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 (v2.1.0)	**This version (v2.2.0)**
Plugin version	AI Navigator plugin v2.1.0	AI Navigator plugin v2.2.0
Supported OS	Operating environment for RA8 series: - Windows 11 64-bit Operating environment for RZ/V: - Ubuntu 20.04 LTS	Operating environment for RA8 series: - Windows 11 64-bit - Ubuntu 22.04 LTS Operating environment for RZ/V: - Ubuntu 22.04 LTS
GUI design	-	The GUI design has been updated to improve usability. - Added a button on the Home page to directly launch the Model Conversion Tool. - Updated the menu button design. - Updated the design of the AI Information view.
[RZ/V] Supported AI Applications and AI SDK	-	Support for RZ/V AI Applications v7.10 has been added. The corresponding RZ/V AI SDKs are provided with each AI Application.
AI Navigator help page on e^2 studio	-	Updated for v2.2.0.

2.2 AI Model Conversion Tool Plugin

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

Items	Change details	
	Previous version (v2.1.0)	**This version (v2.2.0)**
Plugin version	AI Model Conversion Tool plugin v2.1.0	AI Model Conversion Tool plugin v2.2.0
[RA, Linux] Linux support	-	AI model conversion using RUHMI Framework for MCU is now also supported on Linux.
[RA, Linux/Windows] Model Visualizer Support	-	Support for Model Visualizer, which allows users to verify converted AI models, has been added.
[RZ/V, Linux] Supported AI SDKs	-	Supporting the following RZ/V AI SDKs additionally: — RZ/V2H AI SDK v6.00 (DRP-AI TVM v2.5.1) — RZ/V2N AI SDK v6.00 (DRP-AI TVM v2.5.1) — RZ/V2N AI SDK v6.30 (DRP-AI TVM v2.5.1) — RZ/V2L AI SDK v7.00 (DRP-AI TVM v2.6.1)
Project integration with e² studio	An e² studio project was required to perform model conversion.	Model conversion can be performed without an e² studio project.
GUI design	-	The menu button design has been updated.
AI Model Conversion Tool help page on e² studio	-	Updated for v2.1.0.
Remove functional restrictions	(3.2.1 [AI Model Conversion Tool Plugin] Renaming Projects) When using the AI Model Conversion Tool plugin, you cannot rename the project with CT_ERR_SCREEN_FILE_002 error.	Removed.

2.3 AI TLT Plugin

Table 2-3 Changes (AI TLT plugin)

Items	Change details	
	Previous version (v2.1.0)	**This version (v2.2.0)**
Plugin name & version	AI Transfer Learning Tool plugin v2.1.0	AI Transfer Learning Tool plugin v2.2.0
Minor improvements	Fixed an issue where certain error message dialogs could be displayed twice.	Improved an issue where the progress of certain progress bars was slow and could appear to be frozen.

3. Notes / Restrictions

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

3.1 Notes

The notes added and updated in this version are as follows:

- 3.1.4 [AI Model Conversion Tool Plugin] [RUHMI] Environment variables CONVERSION_TOOL_E2STUDIO_PLUGIN_PYTHON_VENV_LOC
- 3.1.5 [AI Model Conversion Tool Plugin] Deleting an e^2 studio project when “Associate with the e^2 studio project is selected”
- 3.1.7 [AI TLT Plugin] AI applications and models RZ/V AI TLT supports
- 3.1.8 [AI Navigator Plugin] Importing Sample AI Application

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.
  When using PowerShell, run the following command to check.

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

- When using bash, run the following command to check.

```
$ printenv CONVERSION_TOOL_E2STUDIO_PLUGIN_PYTHON_VENV_LOC
/home/<User name>/venv   // 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 Model Conversion Tool Plugin] Deleting an e² studio project when “Associate with the e² studio project is selected”

When an e² studio project is specified in "Associate with the e² studio project" in the Input File Settings view, and the project is then deleted in the Optimization or Conversion view, optimization or conversion errors will occur.

3.1.6 [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.

3.1.7 [AI TLT Plugin] AI applications and models RZ/V AI TLT supports

- The AI TLT plugin supports RZ/V AI TLT v6.00.
  For the AI applications and AI models supported by RZ/V AI TLT v6.00, refer to the following URL:
  https://renesas-rz.github.io/rzv_ai_sdk/6.00/howto_retrain.html#functions
- The AI applications supported by RZ/V AI TLT v6.00 are RZ/V AI Applications v6.00.
  Please note that the AI applications currently available for download on the AI Navigator plugin are RZ/V AI Applications v7.10 or later.

  If the AI model is the same across different versions, transfer learning using RZ/V AI TLT v6.00 can still be used. However, if the AI model has been updated in a newer version, RZ/V AI TLT v6.00 does not support transfer learning for the updated model.

  The following AI applications use AI models in AI Applications v7.10 that cannot be used for transfer learning with RZ/V AI TLT v6.00:

  - Q08_object_count_animal (EdgeYOLO)
  - Q08_object_counter_vehicle (EdgeYOLO)
  - 09_Human_gaze_detection (YOLOv3)
  - 10_Driver_monitoring_system (YOLOX-L)
  - 15_Road_lane_segmentation (Unet)

- When you click [Transfer Learning...] in AI Navigator, only AI models supported by RZ/V AI TLT v6.00 are displayed.
  If there are no supported AI models, the [Transfer Learning] menu is not displayed.

3.1.8 [AI Navigator Plugin] Importing Sample AI Application

When importing AI applications from "Select Sample AI Application", a network connection is required.

If the import screen does not appear, please check your network environment.

3.2 Functional Restrictions

The functional restrictions added and updated in this version are as follows:

- 3.2.1 [AI Model Conversion Tool] [RZ/V] Setting Up the Environment via AI Navigator

3.2.1 [AI Model Conversion Tool] [RZ/V] Setting Up the Environment via AI Navigator

When "Start Settings…" is clicked while a project for RZ/V is selected in AI Navigator, the Environment Setup dialog of the AI Model Conversion Tool may not appear.

(Workaround)

1. Click [Renesas Views] > [Renesas AI] > [Conversion Tool] to open the AI Model Conversion Tool.
2. Click the [Start Settings…] button in AI Navigator.

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.

- Legacy: Conversion options in ruhmi-framework-mcu/scripts at main · 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 or later] Help page may be blank

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

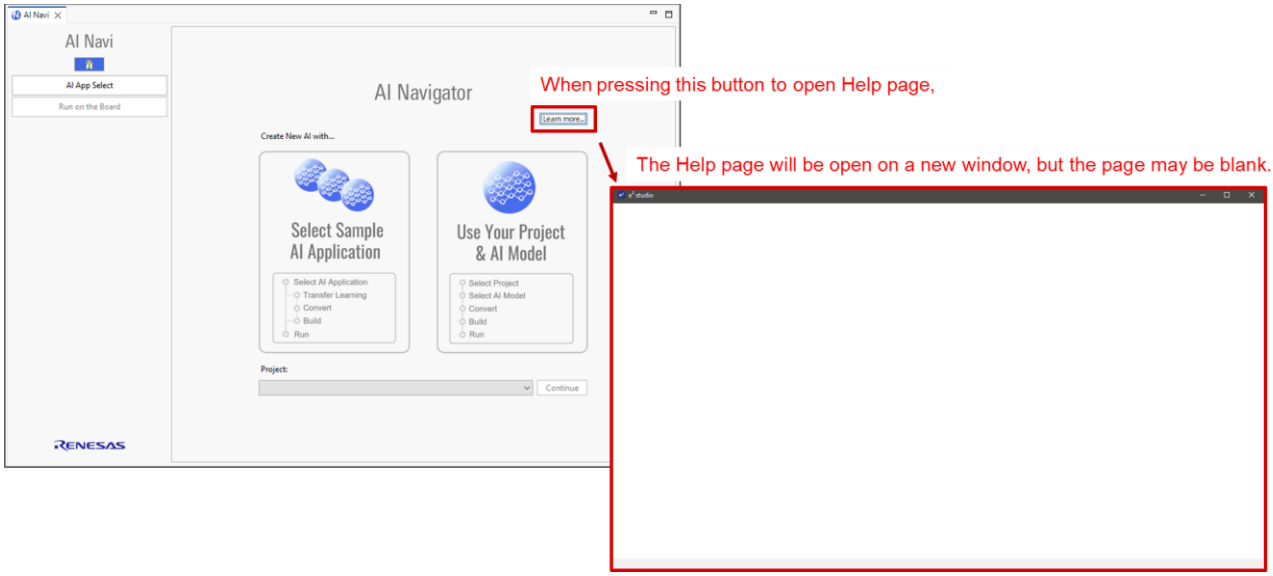

Figure 3-1 Example of the behavior when clicking the [Learn more…] button

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	Jun 5, 2026	–	Issued for AI Navigator v2.2.0.

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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