AI Navigator v2.0.0

Release Note

Introduction

This document describes the contents of AI Navigator v2.0.0, 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.
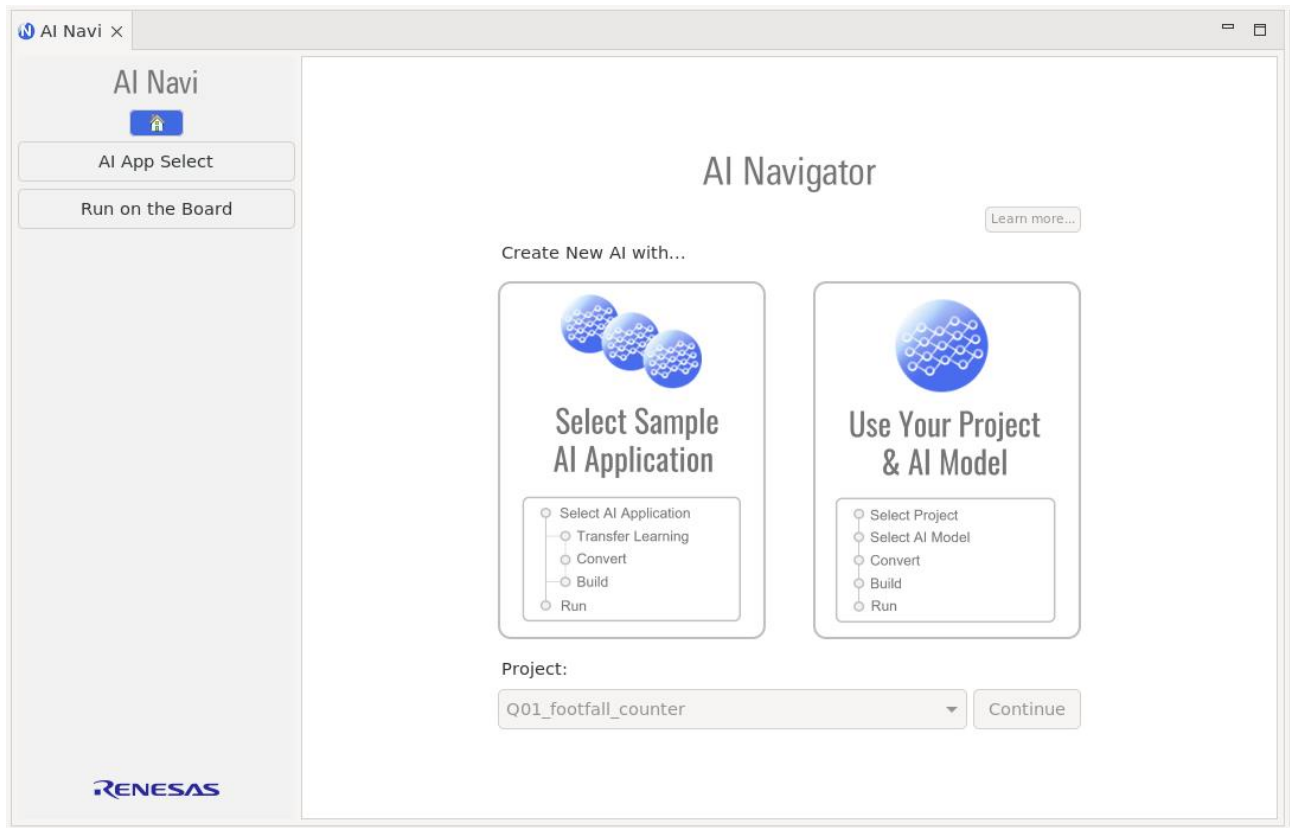

Figure 1-1   AI Navigator Home

1.2   Supported Features

This version supports the following new features.

- Support for RA8P1
- User project

AI Navigator provides the following features:

- Sample AI application
  Select the AI application from Renesas AI Application Zoo and download the corresponding e^2 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 TVM.
    - RA8P1: Convert an AI model into executable code for Arm® Ethos™-U55 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 e^2 studio.
  *Note: Available on RA8P1 (Windows environment) only in this version.

1.3   Target Plugin

- Renesas AI Navigator plugin v2.0.0
- AI Model Conversion Tool plugin v2.0.0 *Plugin for AI Model Conversion Tool
- AI Transfer Learning Tool plugin v2.0.0 *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

- 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 2025-04.1 for Windows
    *Download it from the link below.
    https://www.renesas.com/document/uid/e-studio-2025-041-installer-windows
  - RA Flexible Software Package (FSP) v6.0.0 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 RA8P1 group

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
- RA8P1: Read "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 (v1.3.0)	**This version (v2.0.0)**
Plugin version	AI Navigator Plugin v1.3.0	AI Navigator Plugin v2.0.0
Support for RA8P1	-	Added support for RA8P1. The following features are available: ● Import and run RA8P1 Sample AI Applications ● The implementation of the converted AI model source code generated by RUHMI. ● User project

Operating environment	Ubuntu 20.04 LTS only.	The operating environment is different for each device.
		● Windows 10 / Windows 11
		  - RA8P1
		● Ubuntu 20.04 LTS
		  - RZ/V2H
		  - RZ/V2N
		  - RZ/V2L

User project (User Your Project & AI Model)	-	Added a feature that allows users develop AI applications using their own projects that includes any AI model on e^2 studio. Accordingly, some parts of the design on AI Navi view have been changed.
AI Navigator Help page	-	Updated for v2.0.0.

2.2　AI Model Conversion Tool Plugin

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

Items	Change details	
	Previous version (v1.3.0)	**This version (v2.0.0)**
Plugin version	AI Model Conversion Tool plugin v1.3.0	AI Model Conversion Tool plugin v2.0.0
Support for RUHMI AI Compiler	-	Added support for the following AI Compiler: - RUHMI AI Compiler (for RA8P1) Accordingly, some parts of the design on Conversion Tool view have been changed.
Halt function during AI model conversion	AI model conversion cannot be forcibly stopped.	AI model conversion cannot be forcibly stopped.
AI Model Conversion Tool Help page	-	Updated for v2.0.0.

2.3   AI TLT Plugin

Table 2-3 Changes (AI TLT Plugin)

Items	Change details	
	Previous version (v1.3.0)	**This version (v2.0.0)**
Plugin name & version	AI Transfer Learning Tool Plugin v1.3.0	AI Transfer Learning Tool Plugin v2.0.0
Removed a note	3.1.2 [AI TLT Plugin] Interruption during RZ/V AI TLT installation If the [Cancel] button is clicked while installing RZ/V AI TLT via the [Start Settings...] button on AI Navigator, the installation will be interrupted, but the progress up to that point will be retained. Please click [Start Settings...] again to complete the installation.	Removed the note on the left. When the installation of RZ/V AI TLT is interrupted by [Cancel] button, any files that have already been installed and RZ/V AI TLT Docker image will be automatically cleaned up.
Removed a note	3.1.3 [AI TLT Plugin] Individual installation If RZ/V AI TLT was installed independently without the e^2 studio environment, it may not start properly via [Start Settings...] on AI Navigator. Please reinstall RZ/V AI TLT via [Start Settings...] on AI Navigator with the e^2 studio.	Removed the note on the left. If RZ/V AI TLT is already installed on the machine and an installation is attempted again, the RZ/V AI TLT plugin will display a message confirming reinstallation. To proceed with reinstallation and integrate with the e^2 studio, click [Yes].
Removed a note	3.1.4 [AI TLT Plugin] End of transition learning tools through dialogue If you click the cancel button in the modal dialog while the RZ/V AI TLT is being started by clicking [Cancel], the RZ/V AI TLT will also be terminated. In addition, the function for automatically inputting the ONNX model obtained as a result of transfer learning by the RZ/V AI TLT into the AI Model Conversion Tool Plugin may not work.	Removed the note on the left. If the [Cancel] button is clicked on the modal dialog while RZ/V AI TLT is running, a warning dialog will appear indicating that unexpected behavior may occur due to forced termination. Click [Yes] to proceed.

3.   Notes / Restrictions

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

3.1   Notes

No new or updated notes in this release.

3.1.1   [AI Model Conversion Tool Plugin] 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] 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.)

3.1.3   [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.

3.1.4   [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.

3.1.5   [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.

3.1.6   [AI TLT Plugin] Launching e^2 studio from the terminal

When starting the e^2 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] [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

Workaround:

Specify the same directory in the preprocess setting of view 2.

(e.g.)

・ Output directory in view 1:
  test1

・ Output directory in view 2:
  input 1: **test1**/Preprocess_input1
  input 2: **test1**/Preprocess_input2
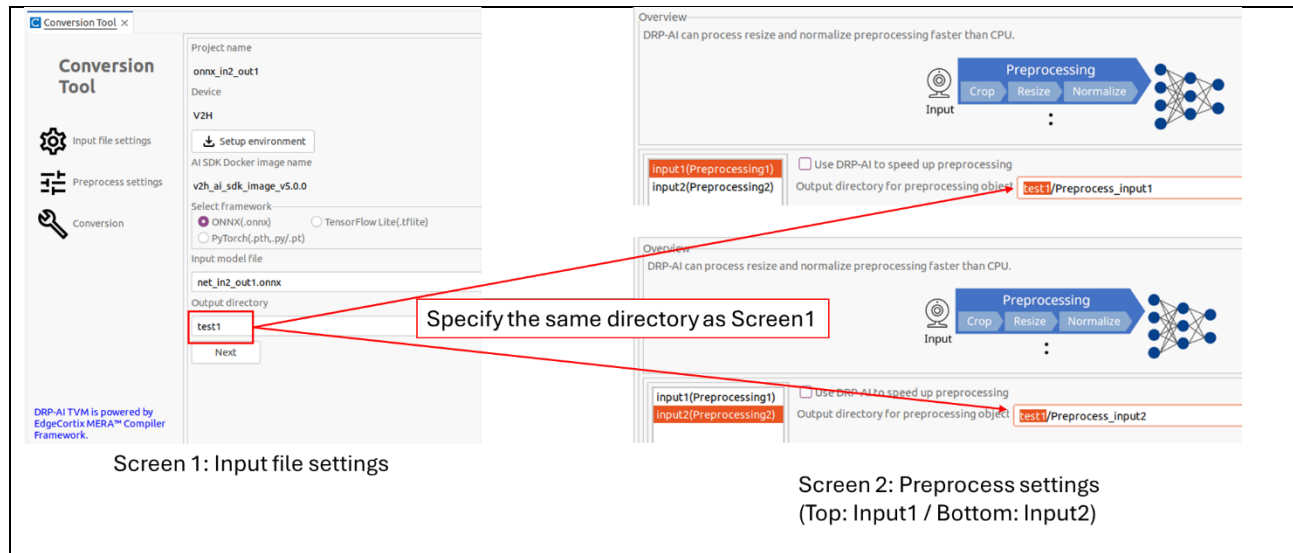
Figure 3-1 Workaround for 3.2.1

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".

Workaround:

Specify the existing directory in the preprocess setting of view 2.

Figure 3-2 Workaround for 3.2.2

Revision History

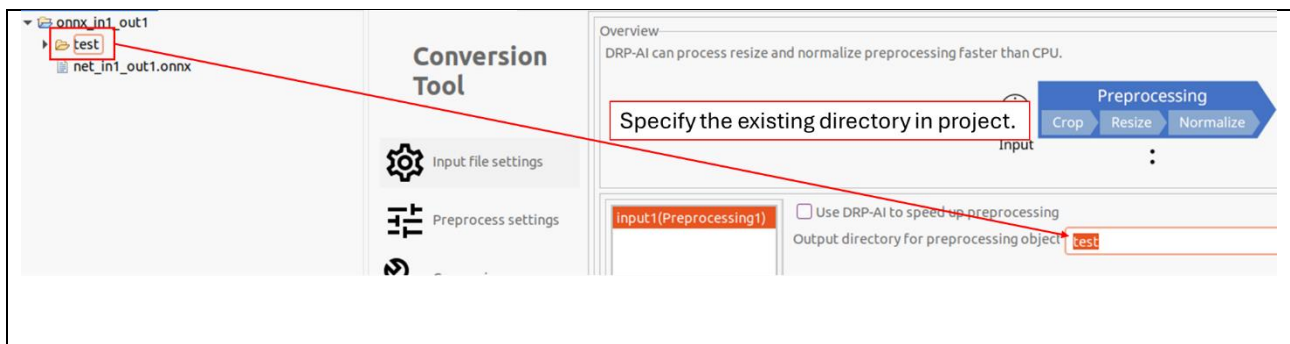| Rev.	Date	Description	
		Page	**Summary**
1.00	Jul 01, 2025	−	Issued for AI Navigator v2.0.0.

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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