AI Navigator v1.3.0

Release Note

Introduction

This document describes the contents of AI Navigator v1.3.0, such as changes from the previous version, restrictions and so on. Please read it before using this tool.

For the installation and use, please also read the AI Navigator Quick Start Guide.

Contents

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.

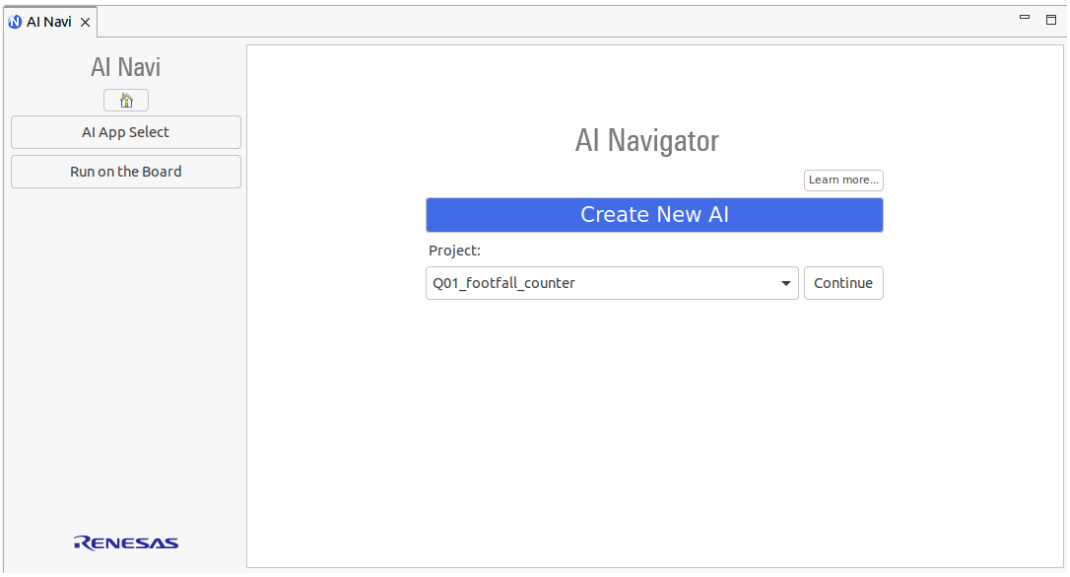

Figure 1-1 AI Navigator Home

The features of AI Navigator are as follows:

- 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 Navigator provides the transfer learning function. This allows the users to customize AI models in Renesas AI applications with their own datasets.
- AI Navigator also provides conversion of AI models to executable files. For RZ/V, the tool allows conversion to DRP-AI executable code using TVM.

1.2 Target Plugin

- Renesas AI Navigator plugin v1.3.0
- AI Transfer Learning Tool plugin v1.3.0 *Plugin for Transfer Learning Tool
  AI Model Conversion Tool plugin v1.3.0 *Plugin for AI Model Conversion Tool

Note: From here on, each of the above plugin names is described as follows.
- AI Navigator Plugin
- AI TLT Plugin
- AI Model Conversion Tool Plugin

1.3 Supported Environment

- 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

1.4 Supported MCU, MPU

RZ family

- RZ/V Series RZ/V2H, RZ/V2L, and RZ/V2N group

1.5 AI Navigator Quick Start Guide

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

(URL) https://renesas-rz.github.io/rzv_ai_sdk/latest/ainavi_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 (v1.2.0)	**This version (v1.3.0)**
Plugin version	AI Navigator Plugin v1.2.0	AI Navigator Plugin v1.3.0
Removed a note	(3.1.11 [AI Navigator Plugin] Notes on the Run on the Board) If you click the [Create a bootable disk] on the Run on the Board screen without specifying the directory path where the RZ/V AI SDK zip is downloaded in the AI App view, you will be prompted to specify the download destination directory path. After specifying the directory path, click the [Create a bootable disk...] button again. After specifying the directory path, click the [Create a bootable disk...] button again.	Removed the note described on the left. No longer requires clicking [Create a bootable disk...] again after specifying the RZ/V AI SDK path.
Help page for AI Navigator	-	Updated for v1.3.0.
Filtering function	AI applications are filtered using comma-separated keywords entered in the selection view.	AI Applications are now displayed if they include any of the keywords entered in the filter.

2.2 AI TLT Plugin

Table 2-2 Changes (AI TLT Plugin)

Items	Change details	
	Previous version (v1.2.0)	**This version (v1.3.0)**
Plugin name & version	AI Transfer Learning Tool Plugin v1.2.0	AI Transfer Learning Tool Plugin v1.3.0
Improved RZ/V AI TLT version update functionality	When installing a new RZ/V AI TLT via [Start Settings...], the old version of Docker container must be manually removed beforehand.	When installing a new RZ/V AI TLT via [Start Settings...], users can choose whether to proceed with the installation. If accepted, the previous version of Docker container will be removed, and the new RZ/V AI TLT will be installed.
Removed a note	(3.1.3 [AI TLT Plugin] Operation when reinstalling RZ/V AI TLT) After installing the RZ/V AI TLT from the AI Navigator, clicking [Start Settings...] will start the reinstallation process, but an error will occur due to the installation of the Docker container. If the reinstallation is interrupted, the operation of the RZ/V AI TLT is not affected.	Removed the note described on the left. No error occurs regarding the existing Docker container when installing RZ/V AI TLT newly via [Start Settings…].
Removed a note *partly	(3.1.4 [AI TLT Plugin] Individual installation) When installing RZ/V AI TLT by clicking [Start Settings...] or launching RZ/V AI TLT using [Transfer Learning...] on AI Navigator, installation and starting may not be successful if RZ/V AI TLT itself has already been installed separately. If you have already installed RZ/V AI TLT individually, please remove the existing Docker container.	(3.1.3 [AI TLT Plugin] Individual installation) If RZ/V AI TLT has already been installed individually, there is no need to remove the Docker container manually. When [Start Settings…] is clicked, the AI TLT plugin detects the existing RZ/V AI TLT and allows the user to choose whether to reinstall it for use with AI Navigator. If [OK] is selected, the existing Docker container will be automatically removed and replaced with a new installation.

2.3 AI Model Conversion Tool Plugin

Table 2-3 Changes (AI Model Conversion Tool Plugin)

Items	Change details	
	Previous version (v1.2.0)	**This version (v1.3.0)**
Plugin version	AI Model Conversion Tool plugin v1.2.0	AI Model Conversion Tool plugin v1.3.0
Supported RZ/V AI SDK	-	The following RZ/V AI SDKs are now supported: - RZ/V2N AI SDK V5.00 - RZ/V2L AI SDK V5.00
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 v1.3.0.

3. Notes / Restrictions

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

3.1 Notes

The following are new or updated notes for this release.

- 3.1.3 [AI TLT Plugin] Individual installation
- 3.1.9 [AI Model Conversion Tool Plugin] Sample code generation

3.1.1 [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.

3.1.2 [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.

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.

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.

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/5.10/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.

3.1.7 [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.

3.1.8 [AI Model Conversion Tool Plugin] 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.)

3.1.9 [AI Model Conversion Tool Plugin] 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.

3.2 Functional Restrictions

The following are new or updated functional restrictions for this release.

-
- 3.1.9 [AI Model Conversion Tool Plugin] Sample code generation

3.2.1 [AI Model Conversion Tool Plugin] 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

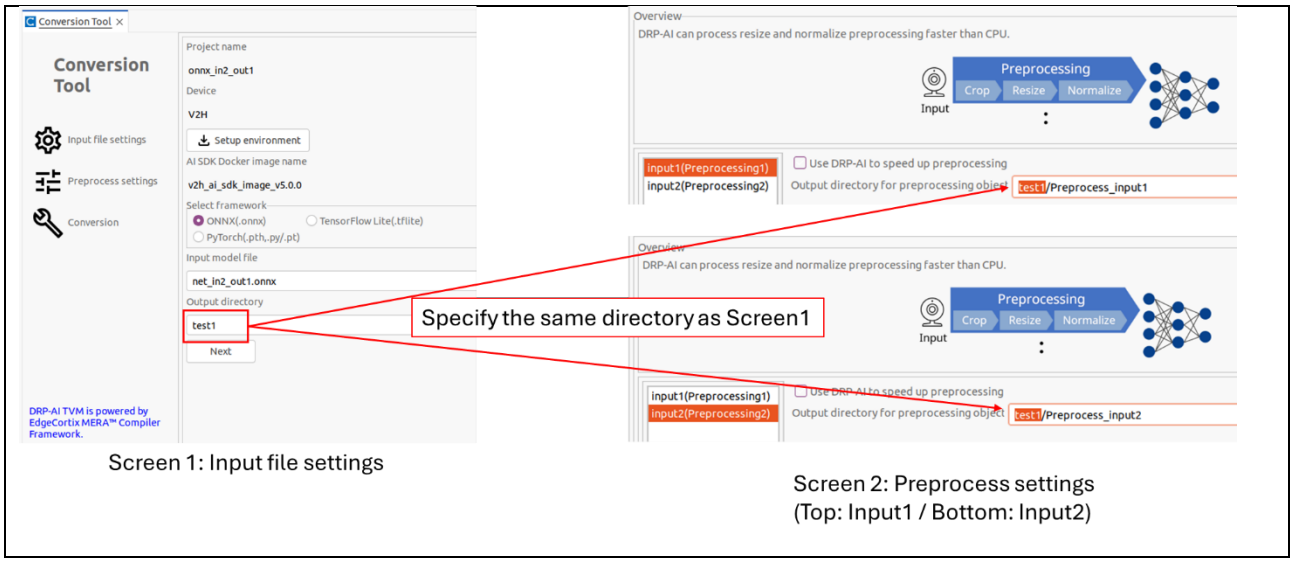

Figure 3-1 Workaround for 3.2.1

3.2.2 [AI Model Conversion Tool Plugin] 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.

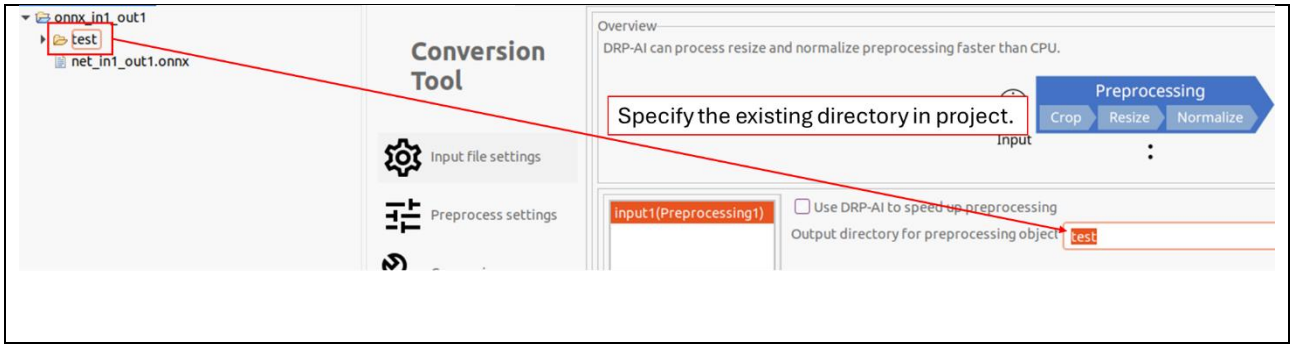

Figure 3-2 Workaround for 3.2.2

Revision History

Rev.	Date	Description	
		Page	Summary
1.20	Oct 11, 2024	–	Issued for AI Navigator v1.2.0.
1.30	May 9, 2025	–	Issued for AI Navigator v1.3.0.

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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