

Renesas RA Family

# Migrating Projects to New FSP Version

## Introduction

This section describes the steps to migrate an existing RA Project to a newer FSP pack version, and then build and run the example project. The procedure in this migration guide applies to all RA devices and evaluation kits, and all software listed in the Required Resources section.

## **Required Resources**

- An RA evaluation kit (for example, EK-RA6M3)
- A PC running Microsoft<sup>®</sup> 10 with the following Renesas software installed as required:
  - Flex Software Package (FSP) v1.0.0 or greater
  - e<sup>2</sup> studio ISDE v7.6.0 or greater
  - RA Smart Configurator (RASC) v7.6.0 or greater
  - IAR EW for ARM v8.50.1 or greater
  - Keil MDK (v5.29 or higher) and ARM compiler 6 (version 6.13 or higher)

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## 1. Installing Latest FSP Packs

#### A. e<sup>2</sup> studio

- This can be done in two ways:
- Download and install the latest FSP with e<sup>2</sup> studio Installer (for example,
  - $setup_fsp_x_x_e2s_x_x.exe$ ). This should be done if the  $e^2$  studio version has changed.
- Download and run the latest FSP pack installer (for example, FSP\_Packs\_x.x.exe) and browse to the folder where e<sup>2</sup> studio is installed.

| Choose Install Location<br>Choose the folder in which to install Renesas FSP                           |
|--|
| C:\Renesas\e2_studo). Please make sure e2 studo is dosed before installation.                          |
| Browse to folder where e2 studio is installed C: Renesas IRA le 2studio Browse Space required: 54.7 MB |
| Space available: 345.4 GB<br>< Back Install Cancel   |

Figure 1. Choosing Install Location in e<sup>2</sup> studio

#### B. Keil and IAR

This can be done in two ways:

- Download and install the new RASC (for example, setup\_fsp\_x\_x\_rasc\_x\_resc) with the latest FSP pack version.
- Download and run the latest FSP pack installer (for example, FSP\_Packs\_x.x.exe) and browse to the folder where RASC is installed.

| 💮 Renesas FSP — 🗆 🗙  |
|--|
| Choose Install Location<br>Choose the folder in which to install Renesas FSP v.  |
| The installation path must point to the root of the e2 studio installation (e.g.<br>C: Renesas/e2_studio). Please make sure e2 studio is closed before installation. |
| Browse to folder where e2 studio is installed C:Renesas RA/sc_v. Browse  |
| Space required: 54.7 MB<br>Space available: 345.4 GB   |
| < Back Install Cancel  |

Figure 2. Choosing Install Location in Keil and IAR

#### C. Additional steps:

- a. IAR: To use RASC with EWARM, latest RASC needs to be configured as a tool in EWARM by selecting the menu item Tools > Configure Tools.
   Command: Select Browse... and navigate to rasc.exe in the installed RA SC.
- b. Keil: Import the latest RA device pack. (for example, MDK\_Device\_Packs\_x.x.z.zip). Extract the archive file to locate the RA device pack. To import the RA device pack, launch the PackInstaller.exe from <keil\_mdk\_install\_dir>\UV4. Select the menu item File > Import... and browse to the extracted .pack file.



## 2. Migrating Project in e<sup>2</sup> studio

## 2.1 Migrating an Existing Project in e<sup>2</sup> studio

- 1. Start by opening  $e^2$  studio.
- 2. Follow the steps below to launch the workspace.
  - A. At the end of e<sup>2</sup> studio startup, you see the e<sup>2</sup> studio Launcher dialog box as shown in Figure 3.

| e <sup>2</sup> studio Launcher   | ×                                |
|--|----------------------------------|
| Select a directory as workspace  | rences and development artifacts |
|  |                                  |
| Workspace: C:\Users\Public\worksapce   | Browse                           |
|  |                                  |
| <ul><li>Use this as the default and do not ask again</li><li>Recent Workspaces</li></ul> |                                  |
|  | Launch Cancel                    |
|  |                                  |

Figure 3. e<sup>2</sup> studio Launcher Dialog Box

- B. If you do not see the dialog box, you might have turned it off. If this is the case, open your desired project and skip to step D. Otherwise, continue with the following steps.
- C. Enter a new workspace name in the **e<sup>2</sup> studio Launcher** dialog box.
- D. Click Launch.
- E. When the workspace is opened, you may see the **Welcome** window.
- 3. You are now in the workspace that you want to import the project into. Click File in the menu bar.



Figure 4. File Menu Bar in the Workspace

4. Click Import on the File drop-down menu.

| File          | Edit Source Refactor Navigate                                      | Search Project          |
|---------------|--|-------------------------|
| •             | New<br>Open File<br>Open Projects from File System<br>Recent Files | Alt+Shift+N >           |
|               | Close<br>Close All   | Ctrl+W<br>Ctrl+Shift+W  |
|               | Save<br>Save As<br>Save All<br>Revert                              | Ctrl+S<br>Ctrl+Shift+S  |
| <b>8</b><br>9 | Move<br>Rename<br>Refresh<br>Convert Line Delimiters To<br>Print   | F2<br>F5<br>><br>Ctrl+P |
| è             | Import   |                         |
|               | Export   |                         |
|               | Properties   | Alt+Enter               |
|               | Switch Workspace<br>Restart<br>Exit                                | >                       |

Figure 5. Selecting Import Option in the File Menu



5. In the **Import** dialog box shown in the figure below, select the **General** option, and then select **Existing Projects into Workspace** to import the project into the current workspace.

| Select an import wizard:<br>type filter text<br>CMSIS Pack<br>CMSIS Pack<br>Existing Projects into Workspace<br>File System<br>Preferences<br>Projects from Folder or Archive<br>Rename & Import Existing C/C++ Project into Workspace<br>Renesas CS+ Project for CA78K0R/CA78K0   | Create new projects from an archive file or directory  | 2 S |
|--|--|-----|
| Select an import wizard:<br>type filter text<br>General<br>CMSIS Pack<br>Existing Projects into Workspace<br>File System<br>Preferences<br>Projects from Folder or Archive<br>Rename & Import Existing C/C++ Project into Workspace<br>Renesas CS+ Project for CA78K0R/CA78K0  | create new projects non an arenne me of anectory.  |     |
| type filter text <ul> <li>General</li> <li>Archive File</li> <li>CMSIS Pack</li> <li>Existing Projects into Workspace</li> <li>File System</li> <li>Preferences</li> <li>Projects from Folder or Archive</li> <li>Rename &amp; Import Existing C/C++ Project into Workspace</li> <li>Renesas CS+ Project for CA78K0R/CA78K0</li> </ul> | elect an import wizard:  |     |
| <ul> <li>General</li> <li>Archive File</li> <li>CMSIS Pack</li> <li>Existing Projects into Workspace</li> <li>File System</li> <li>Preferences</li> <li>Projects from Folder or Archive</li> <li>Rename &amp; Import Existing C/C++ Project into Workspace</li> <li>Renesas CS+ Project for CA78K0R/CA78K0</li> </ul>                  | type filter text   |     |
|  | <ul> <li>Archive File</li> <li>CMSIS Pack</li> <li>Existing Projects into Workspace</li> <li>File System</li> <li>Preferences</li> <li>Projects from Folder or Archive</li> <li>Rename &amp; Import Existing C/C++ Project into Workspace</li> <li>Renesas CS+ Project for CA78K0R/CA78K0</li> </ul> | v   |

Figure 6. Selecting Workspace to Import Existing Projects

- 6. Click Next.
- 7. Click Select archive file or Select root directory if project is already extracted and click Browse.

| 🔁 Import  | ×            |
|---|--------------|
| Import Projects   | (market)     |
| Select a directory to search for existing Eclipse projects.   |              |
| O Select root directory:  | C Browse     |
| Select archive file:  | Browse_      |
| Projects:   |              |
|   | Select All   |
|   | Deselect All |
|   | Refresh      |
| Options Search for rested projects Copy projects into workspace Close newly imported projects upon completion Hide projects that already exist in the workspace |              |
| Working sets  |              |
| Add project to working sets   | New_         |
| Working sets:   | Select.      |
|   |              |
| < Back Next > /   | Cancel       |
|   |              |

Figure 7. Selecting Archive File or Root Directory

- 8. Browse to the folder where the zip/extracted file for the project you want to import is located.
- 9. Select the file for import. For the purpose of illustration gpt\_ek\_ra6m3\_ep.zip is used in this document.
- 10. Click Open.



11. Select the project to import from the list of projects.

| ✓ gpt_ek_ra6m3_ep | Projects:       |
|-------------------|-----------------|
|                   | gpt_ek_ra6m3_ep |
|                   |                 |

Figure 8. Selecting the Project to Import

- 12. Click Finish to import the project.
- 13. Now that the project has been successfully imported, you can start configuring the project to migrate for the hardware.
- 14. Open the RA Configuration, by double-clicking the configuration.xml file in the Project Explorer.





After clicking, a dialog box may appear to migrate the project to latest FSP version. Click **OK**.
 If not, click on **BSP** tab and choose the appropriate FSP version from drop down as shown.

| Board Sup     | oort Package Configuration | Generate Project Content |
|---------------|----------------------------|--------------------------|
|               |                            | Restore Defaults         |
| Device Select | on                         |                          |
| FSP version   | Board Details              |                          |
| Board:        | N. LEB                     |                          |
| Device:       | R/FA6M3AH3CFC              |                          |
| RTOS:         | No RTOS                    |                          |
|               |                            |                          |
|               |                            |                          |
|               |                            |                          |
|               |                            |                          |
|               |                            |                          |
|               |                            |                          |
|               |                            |                          |
|               |                            |                          |
|               |                            |                          |

Figure 10. Choosing the FSP Version from the BSP Tab



# 2.2 Generating the Project Files in e<sup>2</sup> studio

1. In the **RA Configuration** window, save the configuration and click the **Generate Project Content** button.

| Project Summa     | ry                         | 2        |   |
|-------------------|----------------------------|----------|---|
|                   | <b>EV. B. A. V.</b>        | - (ENESA | S |
| Board:            | EK-RA6M3                   |          |   |
| Device:           | R7FA6M3AH3CFC              |          |   |
| Toolchain:        | GCC ARM Embedded           |          |   |
| Toolchain Version | : !                        |          |   |
| FSP Version:      |                            |          |   |
| Selected software | components                 |          |   |
| RA6M3-EK Board    | d Support Files            |          |   |
| Board support pa  | ckage for R7FA6M3AH3CFC    |          |   |
| Board support pa  | ckage for RA6M3            |          |   |
| Board support pa  | ckage for RA6M3 - ESP Data |          |   |
| Arm CMSIS Vers    | ion 5 - Core (M)           |          |   |
| Board Support Pa  | ackage Common Files        |          |   |
| General PWM Tir   | mer                        |          |   |
| I/O Port          |                            |          |   |
|                   |                            |          |   |
|                   |                            |          |   |
|                   |                            |          |   |
|                   |                            |          |   |
|                   |                            |          |   |

#### Figure 11. Clicking the Generate Project Content Button

2. The project should resemble the folder structure and the project is ready to build.



Figure 12. Folder Structure for the Ready to Build Project

## 2.3 Building and Running the Project

Refer to the section "Tutorial: Your First RA MCU Project – Blinky" in <u>FSP Documentation</u> for steps on building and running the project.



# 3. Migrating a Project in Keil µVision

## 3.1 Migrating an Existing Project in Keil µVision

- 1. Start by unzipping the example project, gpt\_ek\_ra6m3\_ep.zip and open the project in file explorer.
- 2. Open the Keil project by double clicking the  $\mu$ Vision project file as shown in Figure 13.

| Name                     | 1 |
|--------------------------|---|
| .settings                |   |
| 📕 script                 | 8 |
| 📕 src                    | 8 |
| buildinfo.gpdsc          | 8 |
| 📔 configuration          | 8 |
| 🗋 apt ek ra6m3 ep.uvoptx | 8 |
| 🕎 gpt_ek_ra6m3_ep        |   |
| JLinkSettings            | 1 |
| R7FA6M3AH3CFC.pincfg     | 1 |
| ra_cfg                   | 1 |
| RA6M3-EK.pincfg          | 1 |
|                          |   |
|                          |   |

Figure 13. Opening the Keil Project

3. After opening the project, you should see the project structure as shown in Figure 14.

| Image: A market and A market | + →   + +<br>  % ▼ |
|---|--------------------|
| Project   | <b>Д</b>           |
| Project: gpt_ek_ra6m3_ep     Target 1     Darget 1     Darget 2     Source Group 1     Darget Renesas RA Smart Configurator     Def Flex Software   | Common Sources     |

Figure 14. Project Structure

4. Now click on 🔹 to open **Manage Run-time Environment** tab.



#### 5. Click the green run button next to RA Configuration in the Flex Software tree as shown in Figure 15.

| Software Component  | Sel. | Variant      | V      | /ersion | Description                                      |
|---------------------|------|--------------|--------|---------|--|
| 🕀 💠 CMSIS           |      |              |        |         | Cortex Microcontroller Software Interface Comp   |
| 🕀 💠 CMSIS Driver    |      |              |        |         | Unified Device Drivers compliant to CMSIS-Driv   |
| 🕀 💠 Compiler        |      | ARM Compiler |        |         | Compiler Extensions for ARM Compiler 5 and A     |
| 🕀 💠 Device          |      |              |        |         | Startup, System Setup                            |
| 🗄 🚸 File System     |      | MDK-Plus     | $\sim$ |         | File Access on various storage devices           |
| 🖃 💠 Flex Software   |      |              |        |         | Renesas Flex Software                            |
| Build Configuration |      |              |        |         |  |
| Generated Data      |      |              |        |         |  |
| Linker Script       |      |              |        |         |  |
| RA Configuration    |      |              |        |         | Renesas RA Configuration                         |
| 🖅 💠 Components      |      |              |        |         |  |
| 🗄 💠 Graphics        |      | MDK-Plus     | ~      |         | User Interface on graphical LCD displays         |
| 🕀 🚸 Network         |      | MDK-Plus     | ~      |         | IPv4 Networking using Ethernet or Serial protoc. |
| m 📥 LICD            |      | MDK Dive     | 1.1    |         |  |
| Validation Output   |      |              | Descri | ption   |  |
|                     |      |              |        |         |  |
|                     |      |              |        |         |  |
|                     |      |              |        |         |  |

#### Figure 15. Clicking the Green Button for RA Configuration in the Flex Software Tree

6. If multiple versions of RASC are installed, select the appropriate version of RASC to run.

| ultiple PA Smapt Configuration | s installed. |  |  |
|--------------------------------|--------------|--|--|
| · Version                      | s installed: |  |  |
| · Version                      |              |  |  |
| . VCI 31011                    |              |  |  |

Figure 16. Selecting the Appropriate Version of RASC to Run

- 7. RASC will be launched with project generator wizard.
- 8. A dialog box may appear to migrate the project to latest FSP version. Click **OK**.

| 💽 e2 s   | tudio   | ×  |  |
|----------|---|----|--|
| <u> </u> | FSP version is not installed. Version will be selected. |    |  |
|          |   | ОК |  |

Figure 17. Notification Regarding FSP Version



## 3.2 Generating the Project Files in Keil µVision

- 1. The configuration window opens once the project wizard is closed.
- 2. In the RA Configuration window, click the Generate Project Content button.

| Summary   |   | Generate Project Conter |  |
|---|---|-------------------------|--|
| Project Sur   | nmary   |                         |  |
| Board:<br>Device:<br>FSP Version:   | EK-RA6M3<br>R7FA6M3AH3CFC   | RENESAS                 |  |
| Selected soft   | ware components   |                         |  |
| Board supp<br>Board supp<br>Arm CMSIS<br>Board Supp<br>General PV<br>I/O Port | ort package for RA6M3<br>ort package for RA6M3 - FSP Data<br>Version 5 - Core (M)<br>ort Package Common Files<br><i>M</i> Timer |                         |  |
| Yau Tuba  |   |                         |  |

#### Figure 18. Clicking the Generate Project Content Button

3. After clicking **Generate Project Content** in the RA Smart Configurator, return to μVision. μVision offers a dialog box to import the changes and updates to the project made in RASC. Select **Yes** to import the updated project and the project is ready to build.

| μVision |   | < |
|---------|---|---|
| 2       | For the current project new generated code is available for<br>import.<br>Project:<br>C:\Dev_work\Keil_projects\lab_project\R7FA6M3AH3CFC\R7FA6<br>M3AH3CFC.uvprojx<br>Generated:<br>C:\Dev_work\Keil_projects\lab_project\R7FA6M3AH3CFC\buildi<br>nfo.gpdsc<br>Import Changes? |   |
|         | <u>Y</u> es <u>N</u> o  | 1 |

Figure 19. Importing Changes and Updates in the µVision Window

4. RASC will place the necessary FSP source code and header files into the project workspace.

# 3.3 Building and Running the Project

Refer to the section "Using RA Smart Configurator with Keil MDK" in <u>FSP Documentation</u> for steps on building and running the project.



## 4. Migrating Project in IAR EWARM

## 4.1 Migrating an Existing Project in IAR EWARM

- 1. Start by unzipping the example project,  $gpt_ek_ra6m3_ep.zip$ , and open the project in file explorer.
- 2. Open the IAR project by double clicking the IAR project file as shown in Figure 20.

|   | Name   |
|---|--|
|   | .settings  |
|   | 📕 script   |
|   | 📕 src  |
|   | buildinfo.ipcf   |
|   | Note: Second Sec |
|   | gpt_ek_ra6m3_ep.ewd  |
| - | gpt ek ra6m3 ep.ewp  |
|   | gpt_ek_ra6m3_ep  |
| - | R7FA6M3AH3CFC.pincfg   |
|   | ra_cfg   |
|   | RA6M3-EK.pincfg  |
|   |  |
|   |  |

#### Figure 20. Opening the IAR Project File

3. After opening the project, you should see the project structure as shown in Figure 21.

| Vorkspace                                       |   |
|---|---|
| Debug   |   |
| Files   | ф |
| ∃ ● gpt_ek_ra6m3_ep - De<br> ─⊕ 🖬 Flex Software | ~ |
| Duildinfo.ipcf                                  |   |

Figure 21. Project Structure

4. RASC can now be launched from EWARM using the menu item **Tools > RA Smart Configurator**.

| ٥  | Options  |
|----|--|
| 10 | Filename Extensions<br>Configure Viewers<br>Configure Custom Argument Variables<br>Configure Tools |
|    | IAR Project Converter  |
|    | RA Smart Configurator  |

Figure 22. Launching the RA Smart Configurator from EWARM



- 5. RASC will be launched with project generator wizard.
- 6. A dialog box will appear to migrate the project to latest FSP version.

| 📴 e2 studio   | ×  |
|---|----|
| FSP version is not installed. Version will be selected. |    |
|   | ОК |

Figure 23. Migrating the Project to the Latest FSP Version

7. Click **OK**.

## 4.2 Generating the Project Files in IAR EWAR

- 1. The configuration window opens once the project wizard is closed.
- 2. In the RA Configuration window, click the Generate Project Content button.

| Summary  | Generate Pr | )<br>oject Content |
|--|-------------|--------------------|
| Project Summary Board: EK-RA6M3 Device: R7FA6M3AH3CFC FSP Version: Selected software components RA6M3-EK Board Support Files Board support package for RA6M3 Board support package for RA6M3 Board support package for RA6M3 - FSP Data Arm CMSIS Version 5 - Core (M) Board Support Package Common Files General PWM Timer I/O Port | Renesas     |                    |
|  |             |                    |

Figure 24. Clicking the Generate Project Content

- 8. After clicking Generate Project Content in the RA Smart Configurator, return to IAR EWARM.
- 9. Changes to the RA configuration will be reflected in the EWARM project.

## 4.3 Building and Running the project

Refer to <u>FSP Documentation</u> for steps on building and running the project.



#### Website and Support

Visit the following vanity URLs to learn about key elements of the RA family, download components and related documentation, and get support.

RA Product Information RA Product Support Forum RA Flexible Software Package Renesas Support www.renesas.com/ra/forum www.renesas.com/FSP www.renesas.com/support



# **Revision History**

|      |           | Description |                        |  |
|------|-----------|-------------|------------------------|--|
| Rev. | Date      | Page        | Summary                |  |
| 1.00 | Sep.15.20 |             | First release document |  |



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