arm CHINA

Application Note

Getting Started with STAR CMSIS-Pack (DFP) in IAR EW

Version 1.0
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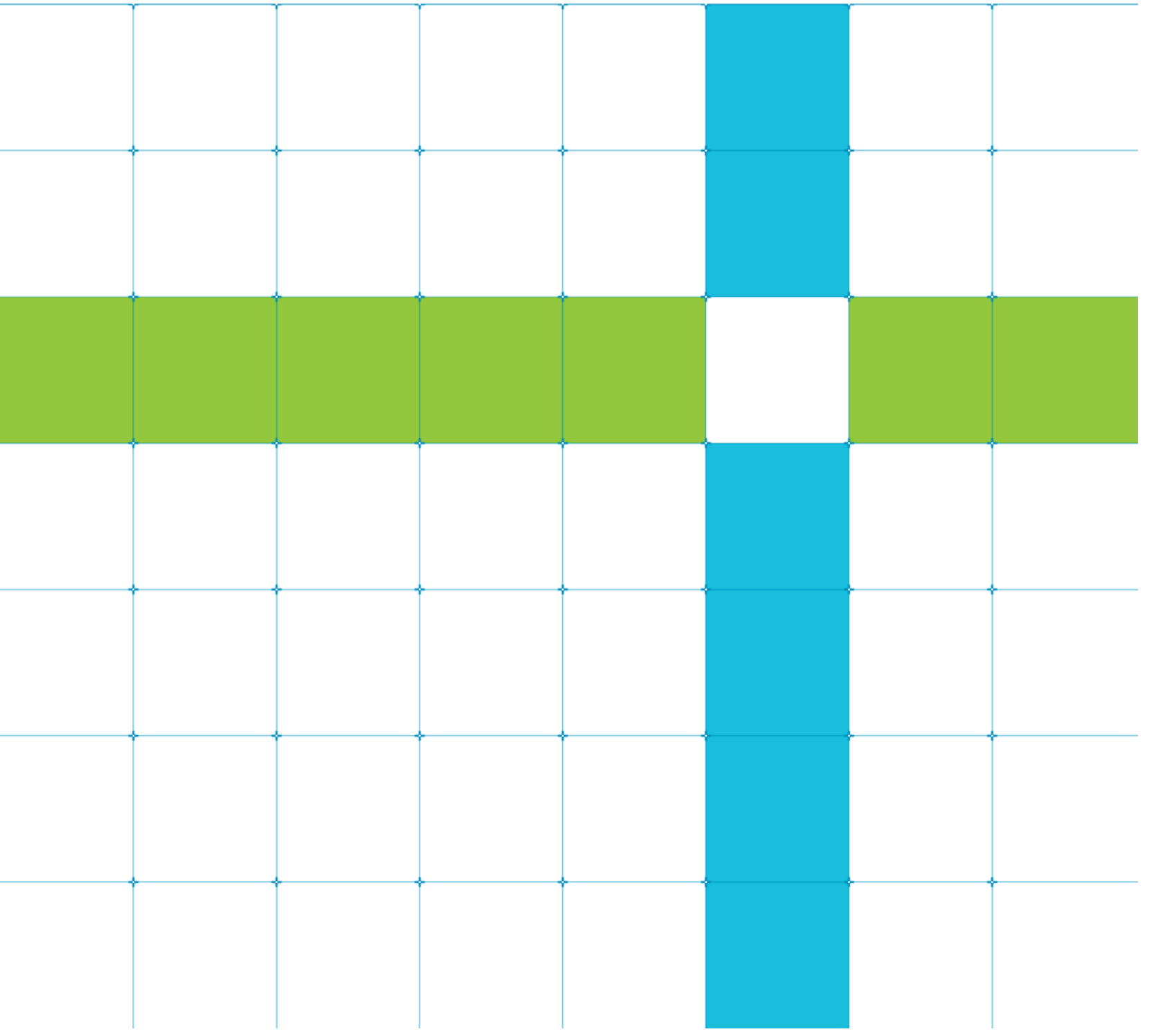
Non-Confidential



Non-Confidential Proprietary Notice

Release Information

Document History

Issue	Date	Confidentiality	Change
A	**25/12/2020**	**Non-Confidential**	**Initial draft**

Contents

1 About this document

This Application Note is intended for developers/programmers/users who use the Arm China STAR *Device Family Pack* (DFP). This Application Note gives you a basic understanding of the STAR DFP and describes how to install and use it in IAR *Embedded Workbench* (EW).

1.1 References

Reference	Document number	Title
-	-	-

1.2 Terms and abbreviations

This document uses the following terms and abbreviations.

Term	Meaning
CMSIS	Cortex Microcontroller Software Interface Standard
DFP	Device Family Pack
IAR EW	IAR Embedded Workbench. The IAR EW toolchain provides a complete *Integrated Development Environment* (IDE) with powerful development tools such as editor, compiler, and debugger. The IAR Embedded Workbench for arm-based devices is also called IAR EWARM.

1.3 Conventions and feedback

The following describes the typographical conventions and how to give feedback:

Convention	Meaning
monospace	denotes text that can be entered at the keyboard, such as commands, file and program names, and source code.
monospace	denotes a permitted abbreviation for a command or option. The underlined text can be entered instead of the full command or option name.
monospace italic	denotes arguments to commands and functions where the argument is to be replaced by a specific value.
monospace bold	denotes language keywords when used outside example code.
italic	highlights important notes, introduces special terminology, denotes internal cross-references, and citations.
bold	highlights interface elements, such as menu names. Also used for emphasis in descriptive lists, where appropriate, and for Arm China processor signal names.

1.3.1 Feedback on this product

If you have any comments and suggestions about this product, contact your supplier and give:

- Your name and company.
- The serial number of the product.
- Details of the release you are using.
- Details of the platform you are using, such as the hardware platform, operating system type and version.
- A small standalone sample of code that reproduces the problem.
- A clear explanation of what you expected to happen, and what actually happened.
- The commands you used, including any command-line options.
- Sample output illustrating the problem.
- The version string of the tools, including the version number and build numbers.

1.3.2 Feedback on documentation

If you have comments on the documentation, e-mail errata@armchina.com. Give:

- The title.
- The number, [Document ID Value], [Issue].
- If viewing online, the topic names to which your comments apply.
- If viewing a PDF version of a document, the page numbers to which your comments apply.
- A concise explanation of your comments.

Arm China also welcomes general suggestions for additions and improvements.

Arm China periodically provides updates and corrections to its documentation on the Arm China Information Center, together with knowledge articles and ***Frequently Asked Questions*** (FAQs).

1.3.3 Other information

- Arm Glossary, http://infocenter.arm.com/help/topic/com.arm.doc.aeg0014-/index.html.

2 Introduction

2.1 CMSIS

The *Cortex Microcontroller Software Interface Standard* (CMSIS) is a vendor-independent hardware abstraction layer for microcontrollers.

The CMSIS defines generic tool interfaces and enables consistent device support.

The CMSIS provides:

- Simple software interfaces to processor and peripherals.
- A common approach to interface to peripherals, real-time operating systems, and middleware components.

2.2 STAR DFP

For CMSIS compliant toolchains such as Keil MDK and IAR EW, additional software components and support for microcontroller devices are provided by Software Packs.

A DFP is one of the CMSIS Software Packs. It indicates that a Software Pack contains support for microcontroller devices.

A DFP provides essential support for the software target on a specific device, such as ‘startup’, ‘system’, linker scripts, and debug configuration.

The STAR processor is the first processor in the Arm China STAR series processor family.

STAR is a fully featured microcontroller class processor based on the Armv8-M mainline architecture with Arm TrustZone technology (depending on the actual core).

3 Preparations

This section describes how to set up the IAR toolchain environment and install the STAR CMSIS DFP.

3.1 Installing IAR EW

Before you can use the STAR DFP in IAR EW, you need to:

- Download and install IAR EW (v8.42 or later).
  https://netstorage.iar.com/SuppDB/Protected/PRODUPD/015021/EWARM-CD-8509-33462.exe
- Apply for a license for IAR EW.
  You can register and apply for an evaluation license for a free trial. The evaluation license is completely free of charge and allows you to try the integrated development environment and evaluate its efficiency and ease of use.

  After installation, you can choose the 30-day time-limited evaluation option to activate the tool.

  Restrictions to the 30-day time-limited evaluation:

  - The 30-day time-limited evaluation edition is a fully functional edition but with a 30-day time limitation.
  - Source code for runtime libraries is not included.
  - No support for MISRA C.
  - C-RUN is size-limited to 12 Kbytes of code, excluding constant data.
  - Limited technical support.
  - Must not be used for product development or any other kind of commercial use.

  If you are going to buy the tool, choose the standard edition or Arm Cortex-M edition which is also called EWARM and EWARM-CM respectively.

	Functional Safety	Standard	Cortex-M	Cortex-M0
Core support	Arm Cortex-M0, M0+, M1, M3, M4, M7, M23, M33,R4, R5, R7, R8, R52, A5, A7, A8, A9, A15 and Arm11, Arm9, Arm7, SecurCore	Arm Cortex-M0, M0+, M1, M3, M4, M7, M23, M33, R4, R5, R7, R8, R52, A5, A7, A8, A9, A15 and Arm11, Arm9, Arm7, SecurCore, STAR	Arm Cortex-M0, M0+, M1, M3, M4, M7, M23, M33, STAR	Arm Cortex-M0, M0+, M1, M23

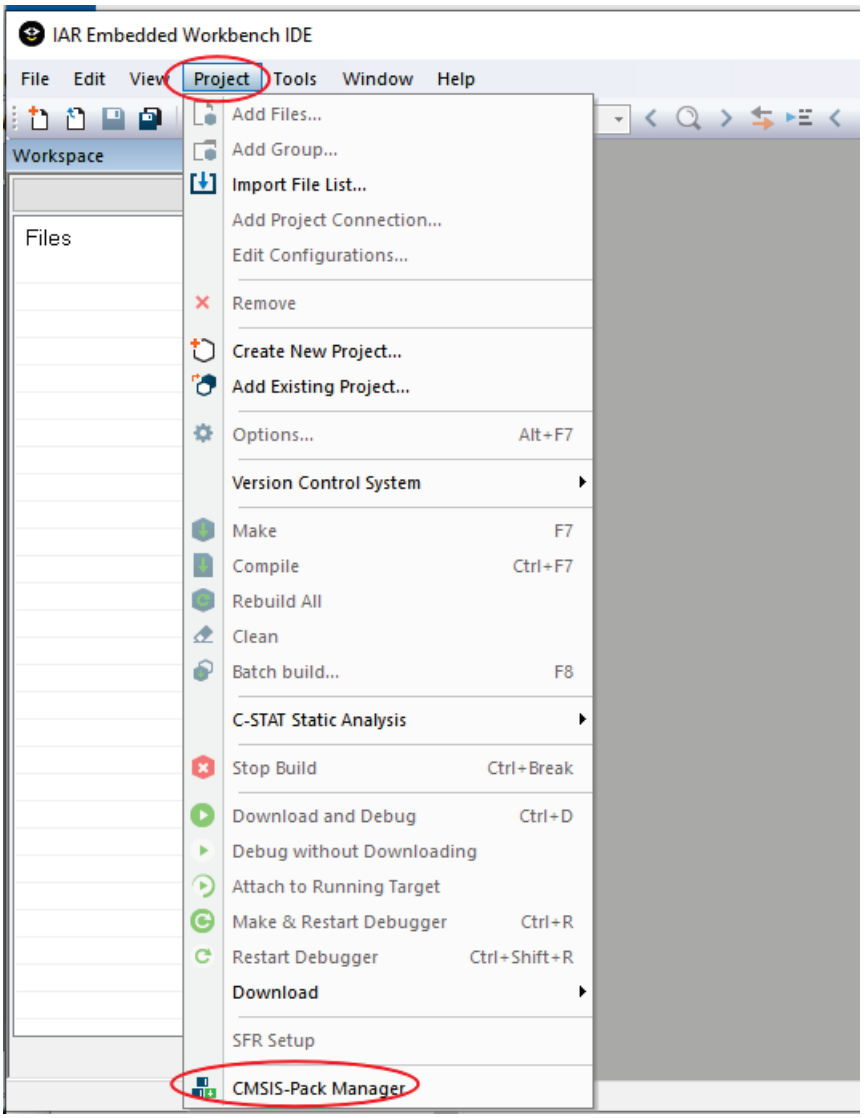
  For more information about IAR products, visit https://www.iar.com/.

3.2 Downloading STAR DFP

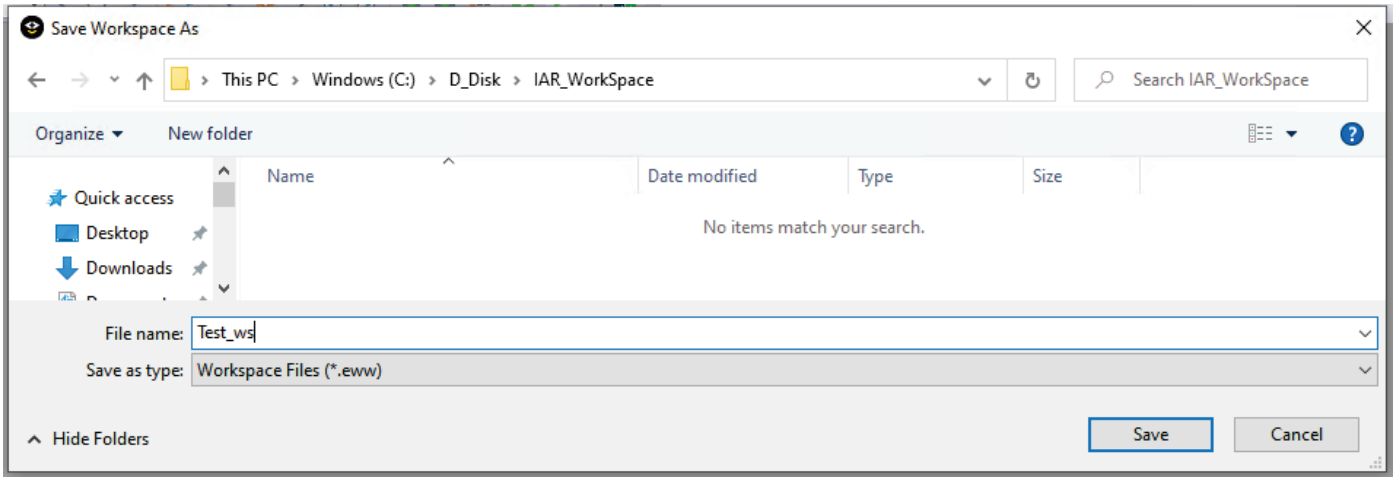
Download STAR CMSIS-Pack v1.1.0 at https://www.armchina.com/STAR/tools&software.html.

3.3 Installing STAR DFP into IAR EW

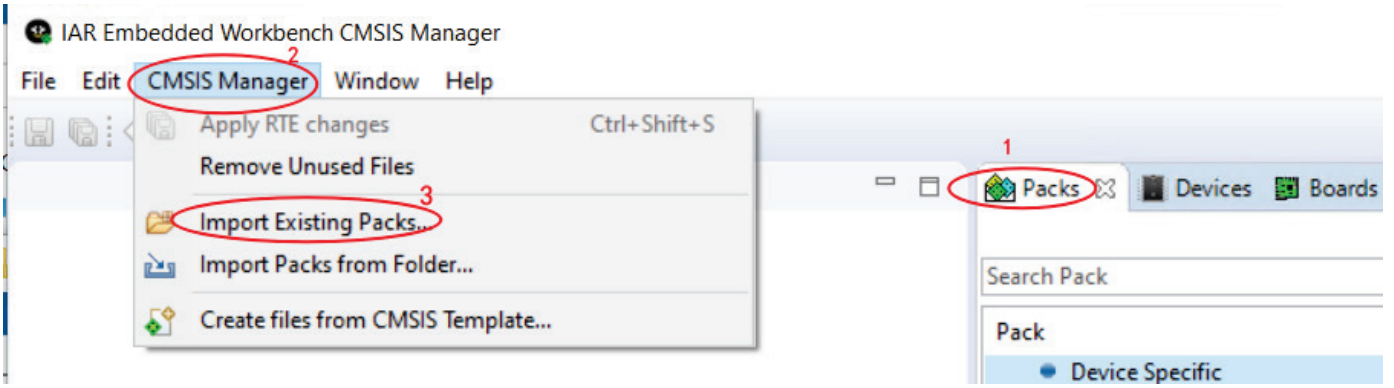
1. Start the IAR Embedded Workbench IDE.
2. Click **Project** > **CMSIS-Pack Manager**.



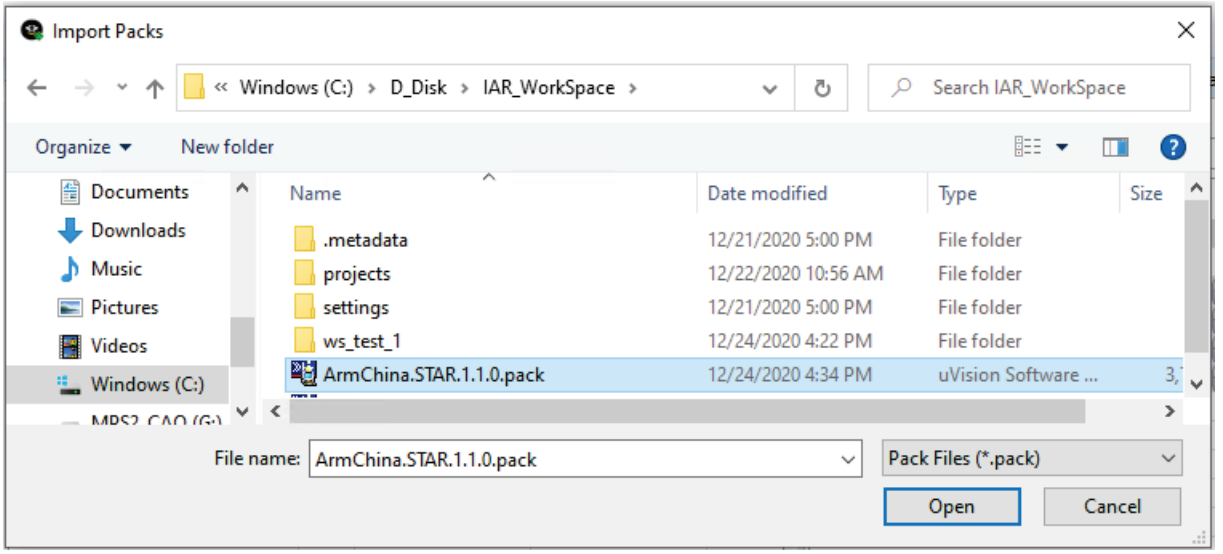
3. In the dialog box that appears, select a directory to save the new workspace and enter the workspace name, then click **Save**.



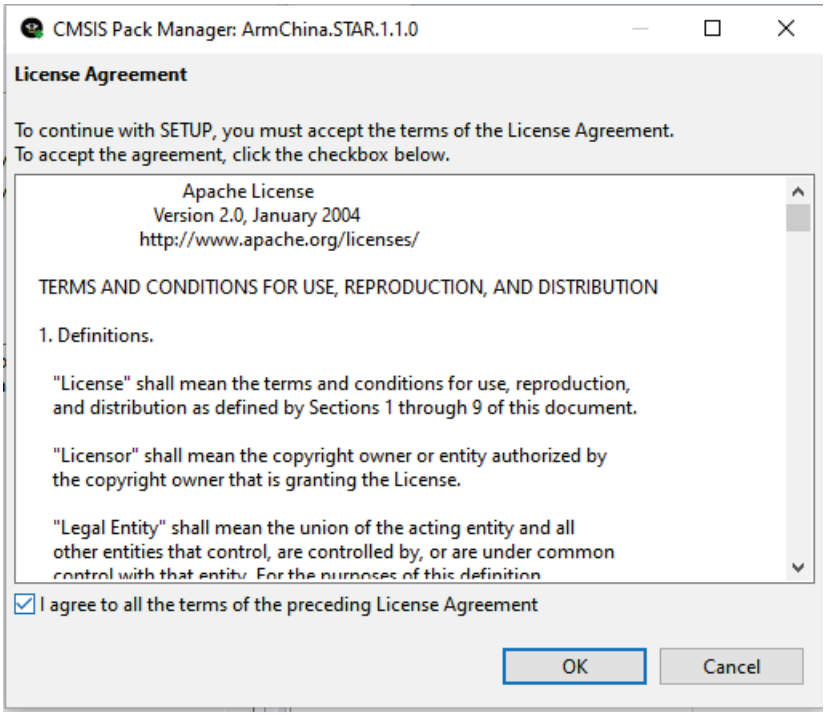
4. Ensure that the **Packs** tab is active, and then click **CMSIS Manager** > **Import Existing Packs**.



5. Select the pack file that you want to install and click **Open**.

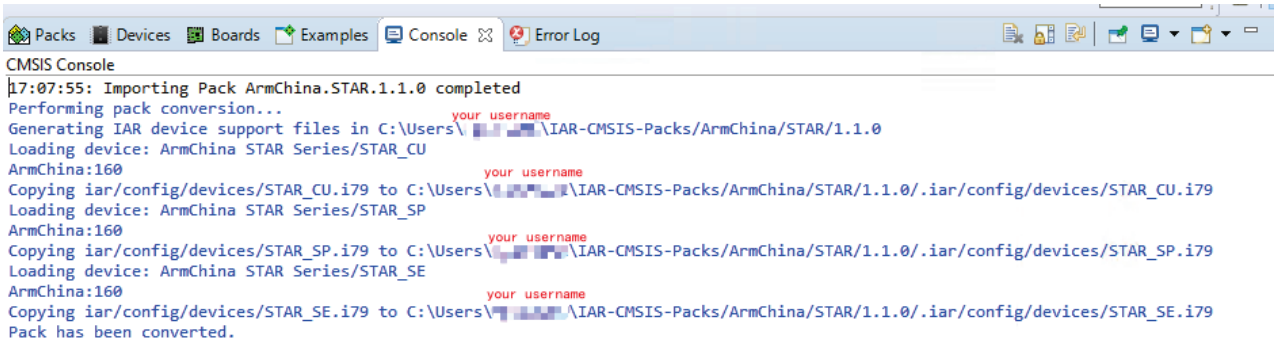


6. In the **License Agreement** dialog box, select **I agree to all the terms of the preceding License Agreement** and then click **OK** to start the pack installation.

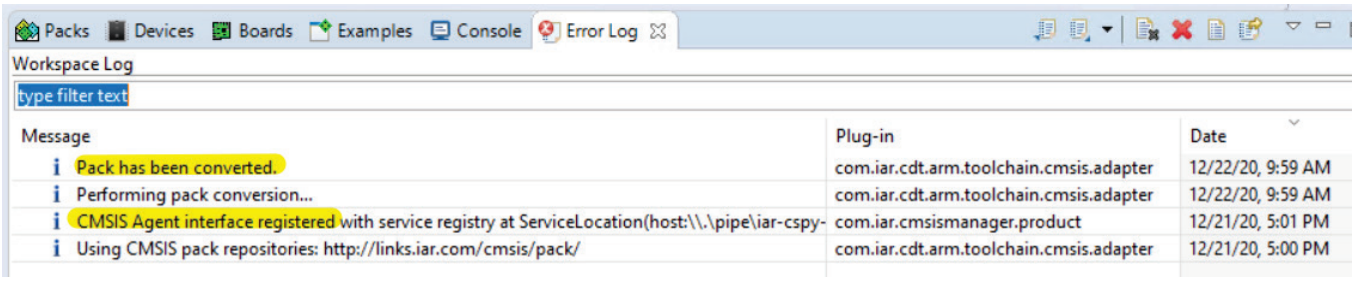


7. To verify that the pack is installed successfully, do the following:

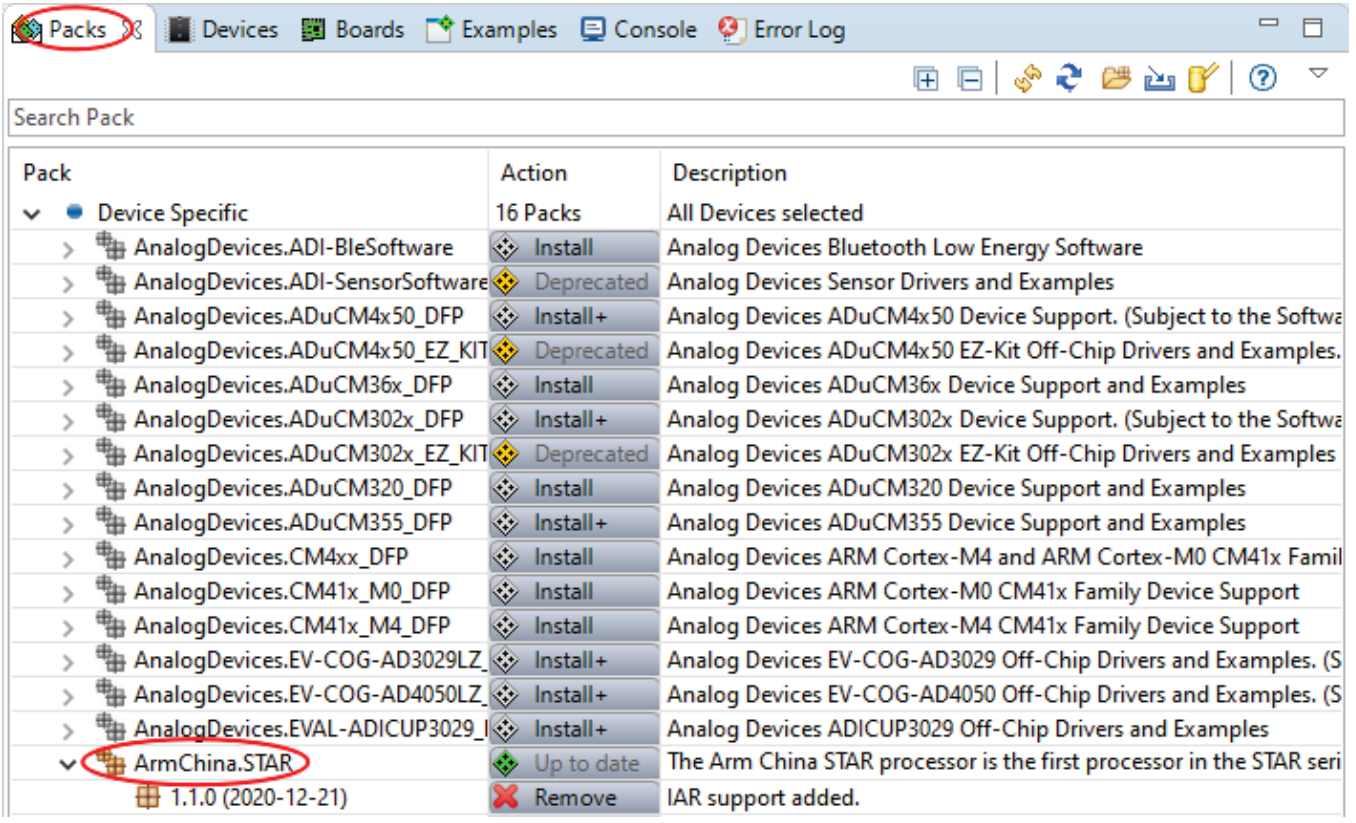
- On the **Console** tab, verify that 'Pack has been converted' is displayed. You can also check the pack files in your local directory.



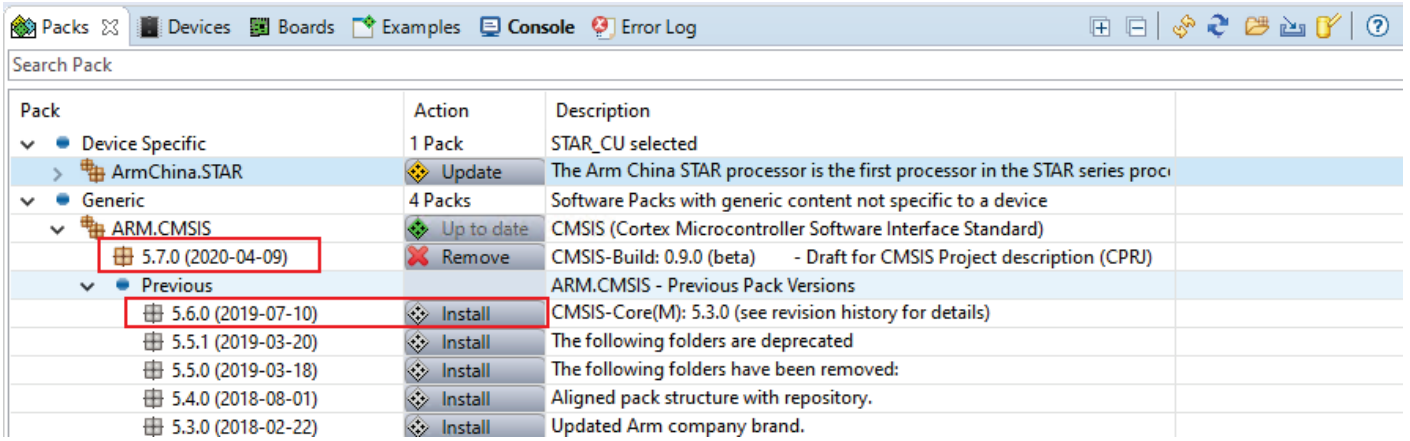
- On the **Error Log** tab, verify that there is no error reported.



- On the **Packs** tab, check the corresponding version of the pack in the Pack list.



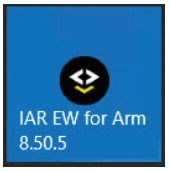
8. Ensure that the ARM.CMSIS pack is already available in the CMSIS Manager. If not, you can click **Install** to install the corresponding version of ARM.CMSIS. Note that the STAR DFP requires ARM.CMSIS 5.6.0 or later.



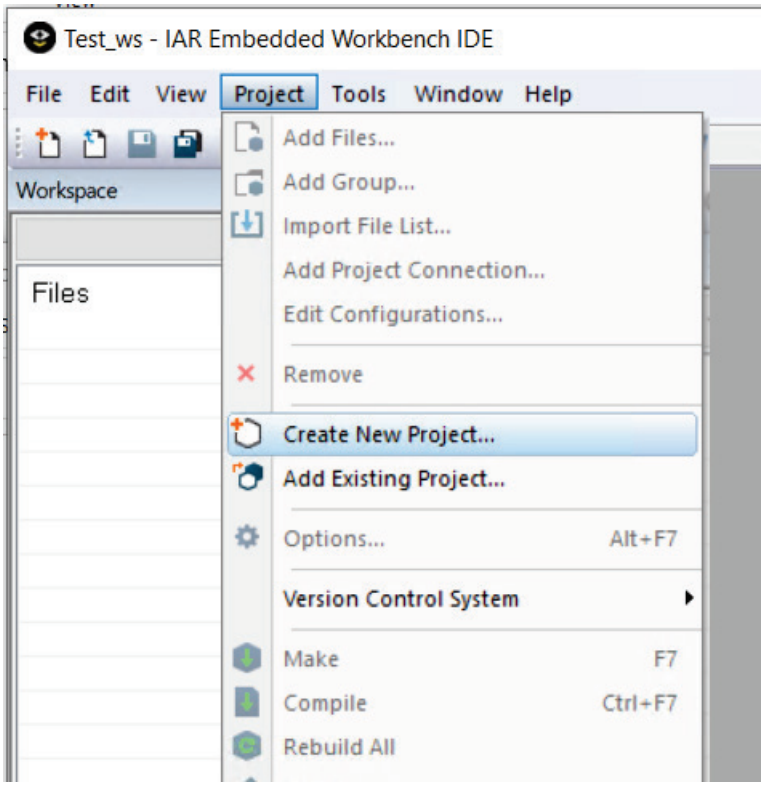
4 Working with STAR DFP in IAR EW

Follow these steps to get started with the STAR DFP in the IAR toolchain environment:

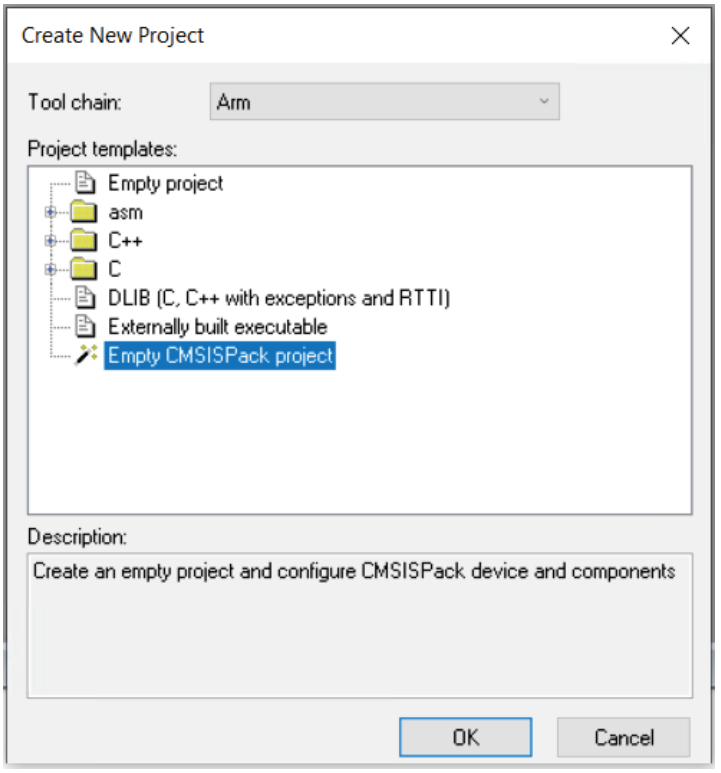
1. Start IAR EW for Arm.
   By default, the last workspace is opened. (If this is the first time to use IAR EW, a new workspace is generated by default. You need to save this workspace as described in *3.3 Installing STAR DFP into IAR EW*.) The following steps take the 'Test_ws' workspace created in the preceding section as an example.



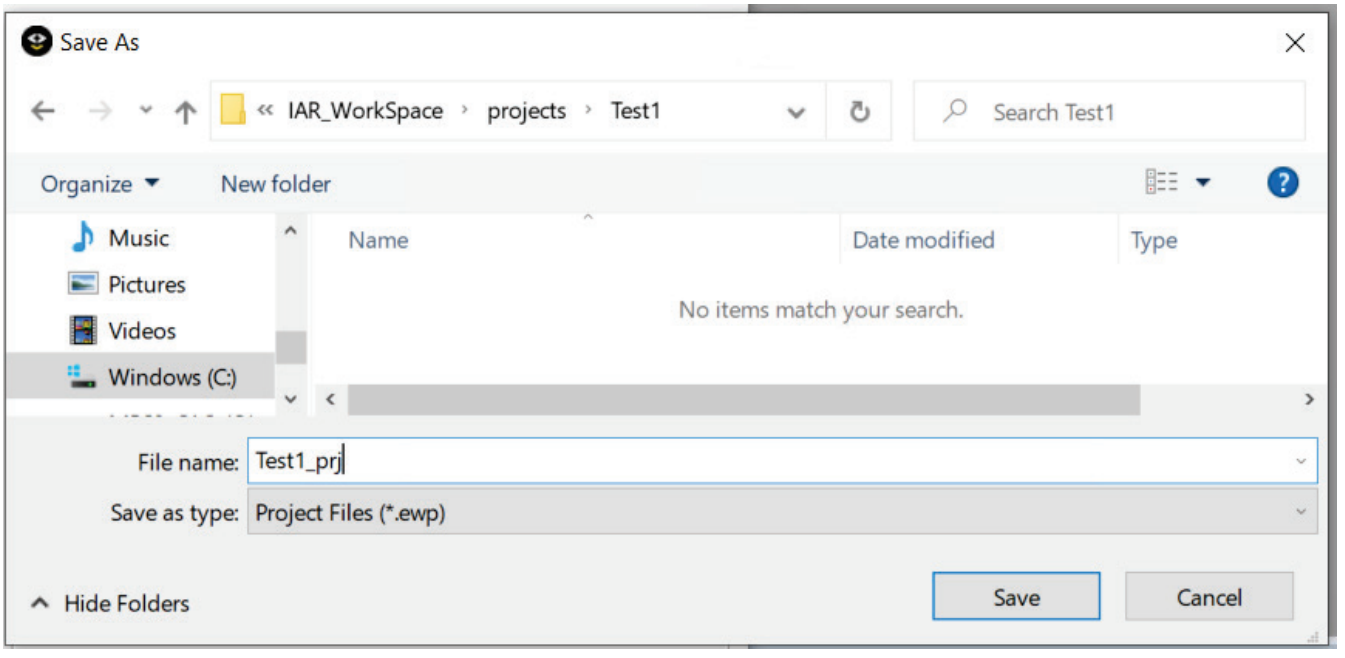
2. Click **Project** > **Create New Project**.



3. In the **Create New Project** dialog box that appears, select **Empty CMSISPack project** and then click **OK**.

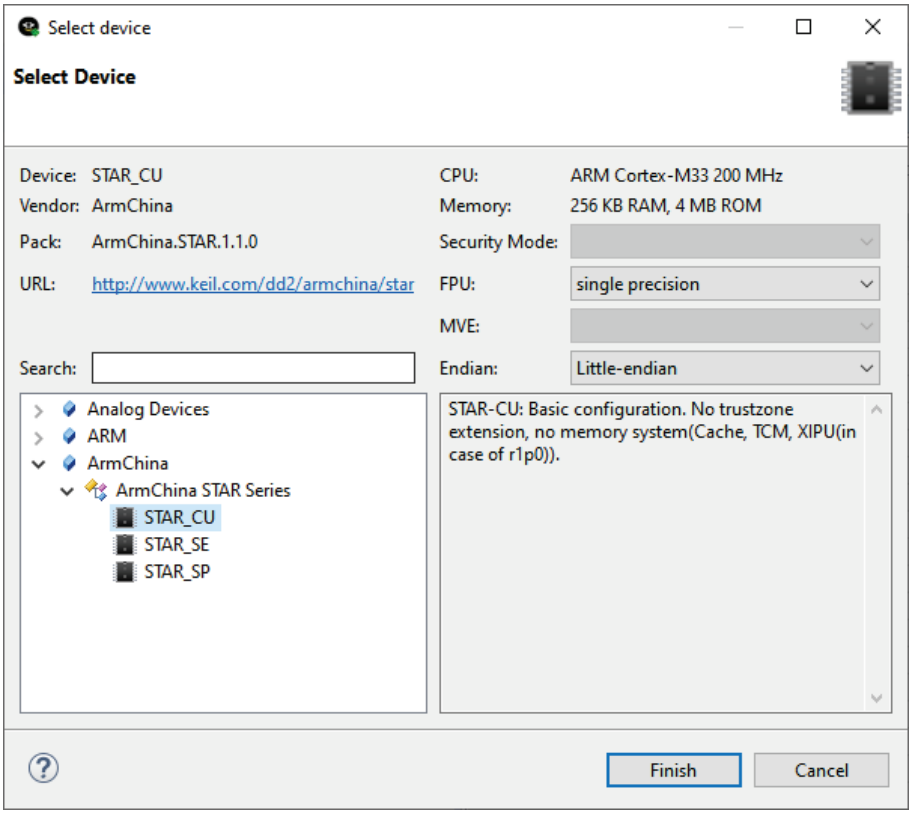


4. Create a new directory (`./projects/Test1`) for the project in the workspace directory. Enter the project name (for example, `Test1_prj`) and click **Save**.

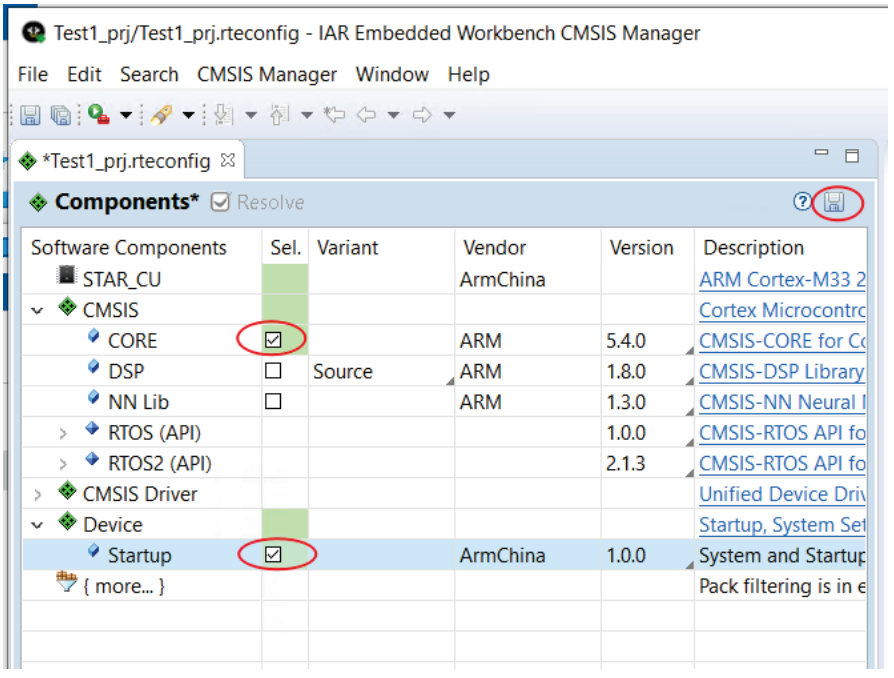


The CMSIS Manager starts automatically.

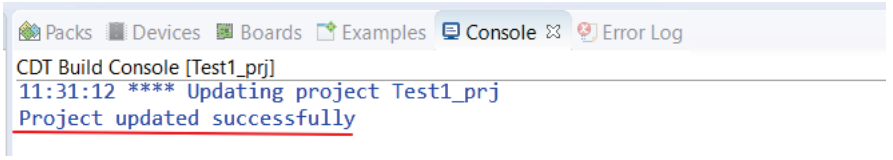
5. In the **Select device** dialog box that appears, select one of the three available devices—**STAR_CU**, **STAR_SE**, **STAR_SP** (for example, **STAR_CU)** according to your licensed product type and then click **Finish**.



6. On the **Components** tab, select the essential Software Components **CORE** and **Startup** by clicking the corresponding check box, and then click the **Save** icon.

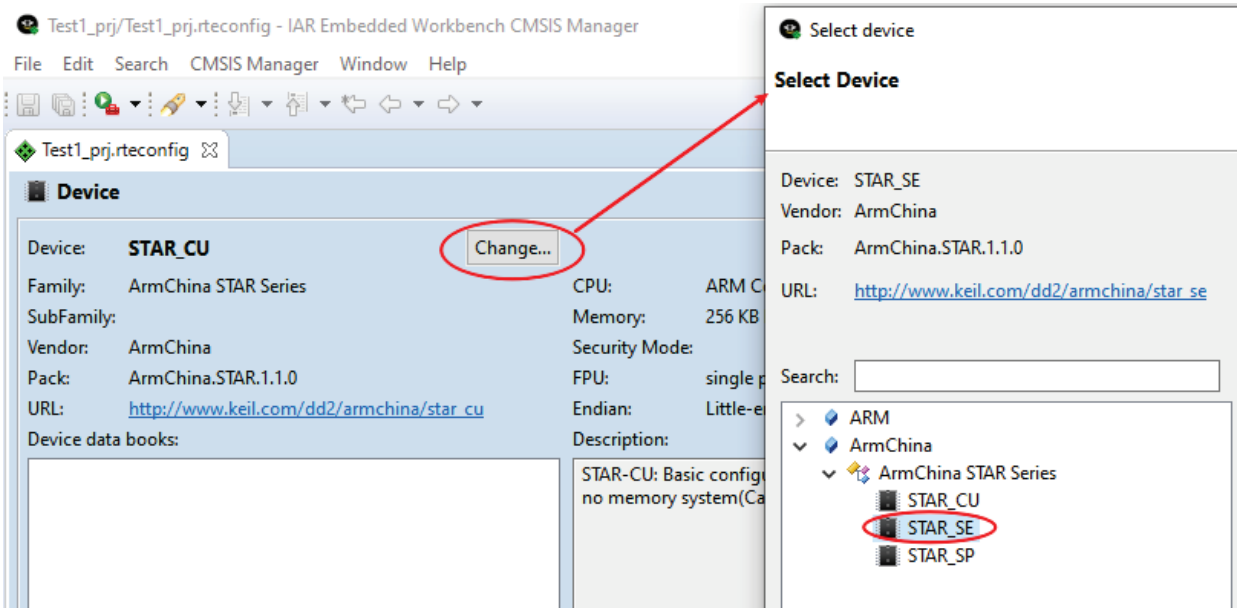


7. Check the message on the **Console** tab to ensure that the configuration in the CMSIS Manager has been updated to the project.

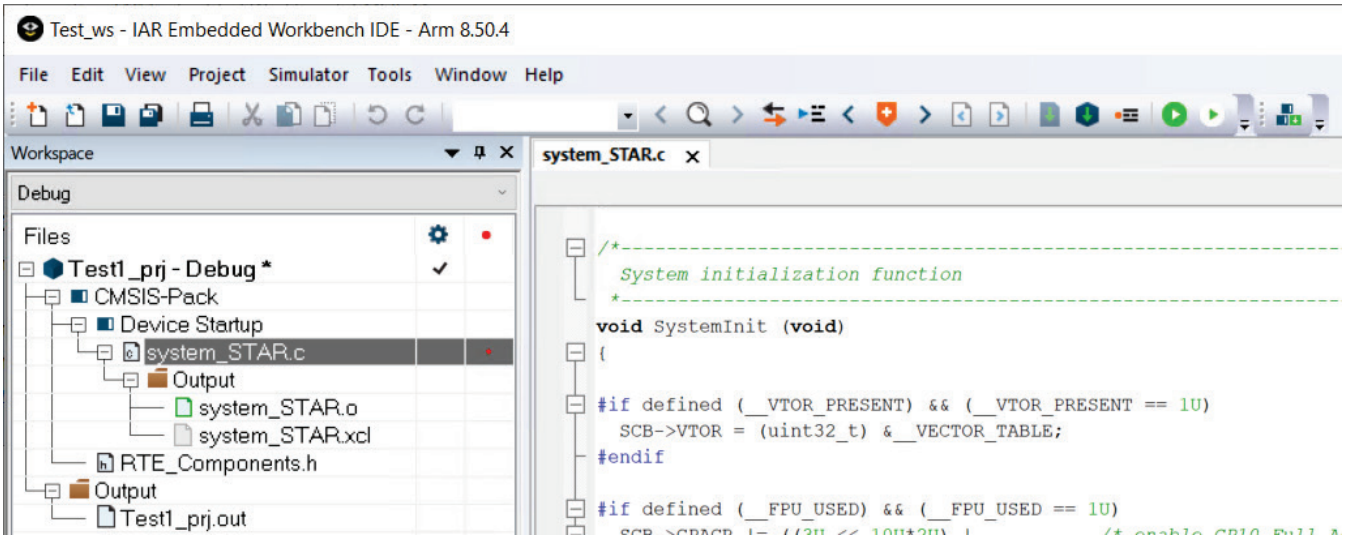


The software project target for STAR_CU is created.

Note that you can also change the device on the Device tab of the CMSIS Manager as shown in the following figure.



8. Return to the IAR Embedded Workbench IDE. You can view the source code provided by STAR CMSIS-Pack such as `system_STAR.c` as shown in the following figure.



Now the project is a STAR CMSIS based project.

You can add your application code to the project and start STAR-based software development in the IAR toolchain environment.