arm CHINA

Application Note

Installing and Using STAR CMSIS PACK (DFP)

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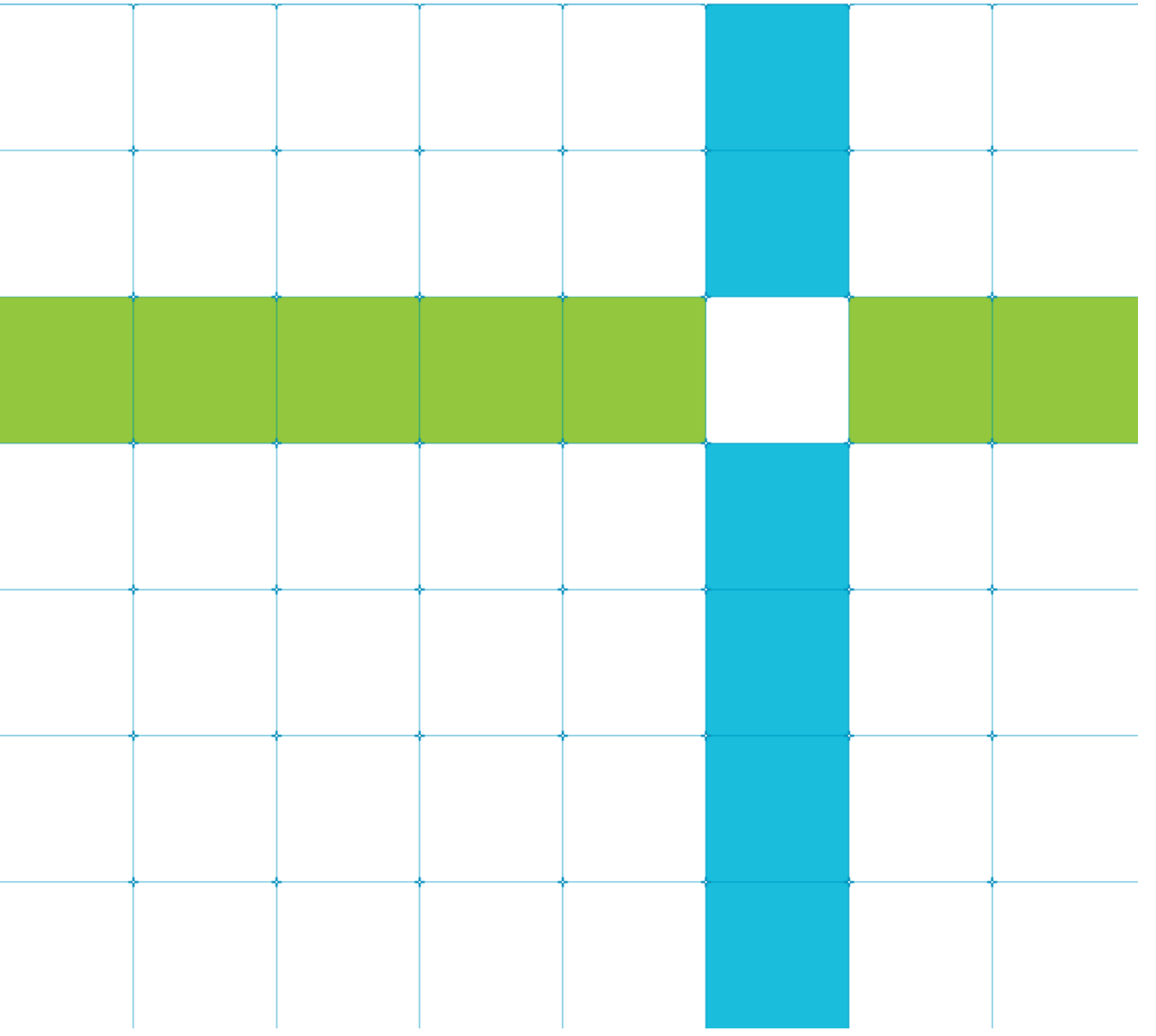
Non-Confidential



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Release Information

Document History

Issue	Date	Confidentiality	Change
A	**10/11/2020**	**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.

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

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

2.2. STAR DFP

For Keil MDK, 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’ and linker scripts.

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 Installing and using STAR DFP

This section describes how to install the STAR CMSIS DFP and how to use it with Keil MDK.

3.1. Prerequisites

Before you install and use the STAR DFP, ensure that you have:

- Installed MDK (v5.28 or later).

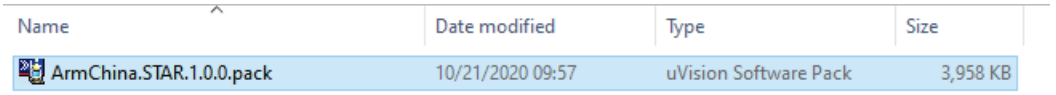
  http://www2.keil.com/mdk5/install

- Downloaded STAR CMSIS PACK v1.0.0.

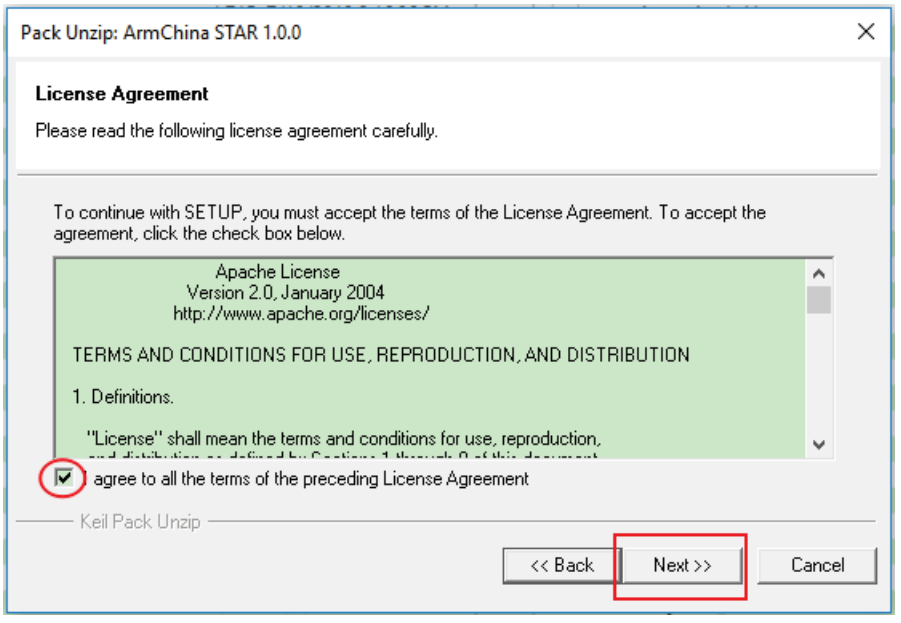
  https://www.armchina.com/STAR/tools&software.html

3.2. Installing STAR DFP

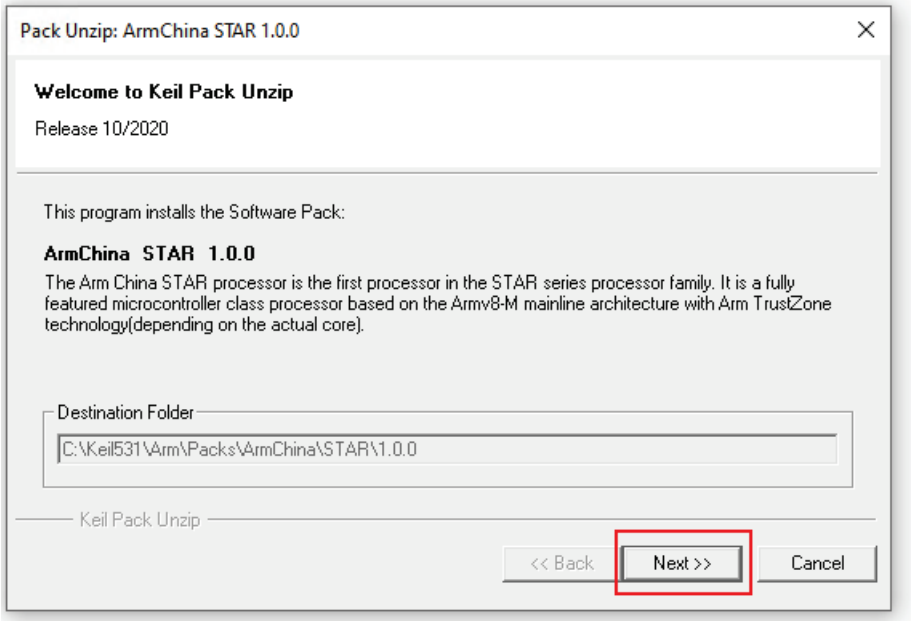
1. Double-click the pack.



2. In the License Agreement dialog box, select **I agree to all terms of the preceding License Agreement** and click **Next.**

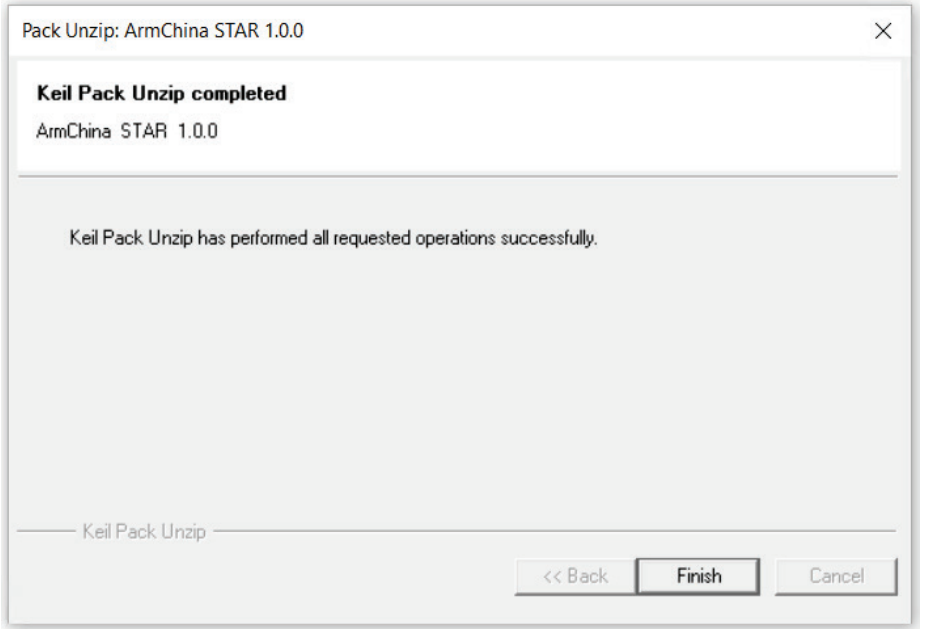


3. Keep the default destination folder and click **Next**.

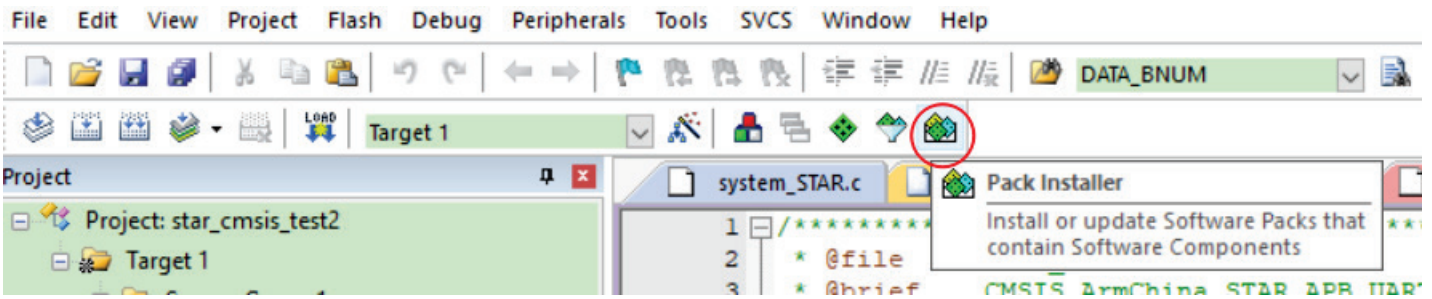


The pack will be automatically unpacked and installed to the existing Keil installation directory.

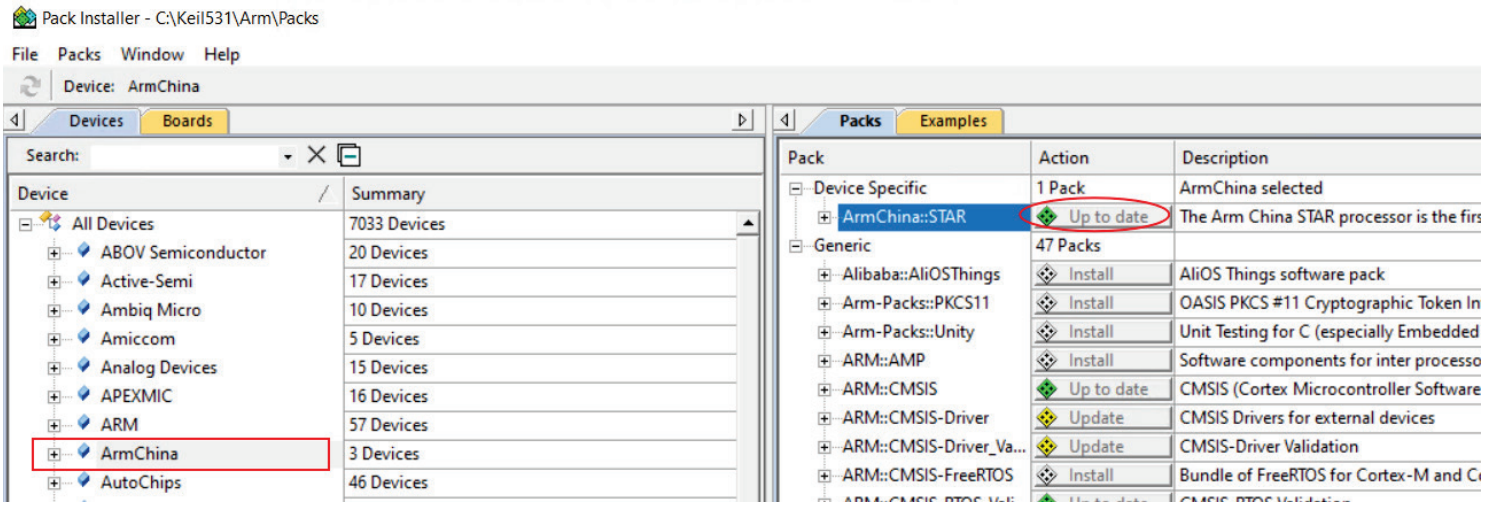
4. In the Keil Pack Unzip completed dialog box that appears, click **Finish** to complete the installation.



5. To verify the pack installation, click the **Pack Installer** icon on the tool bar.



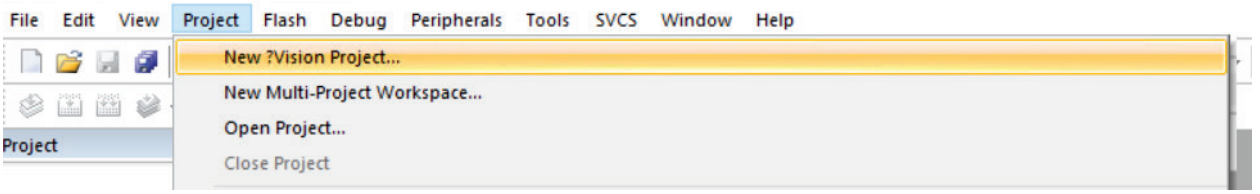
- On the Devices tab in the left pane, you can see the new vendor 'ArmChina' in the Device list.
- On the Packs tab in the right pane, the corresponding icon is green and the status is Up to date, which indidates that the pack installation is successful.



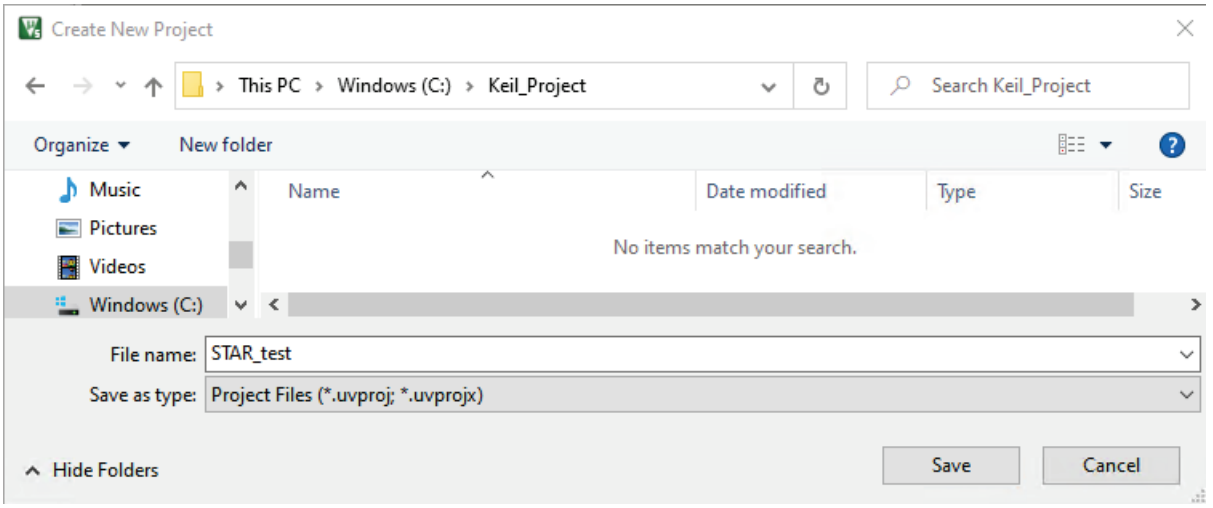
3.3. Using STAR DFP

1. Start Keil uVision5.

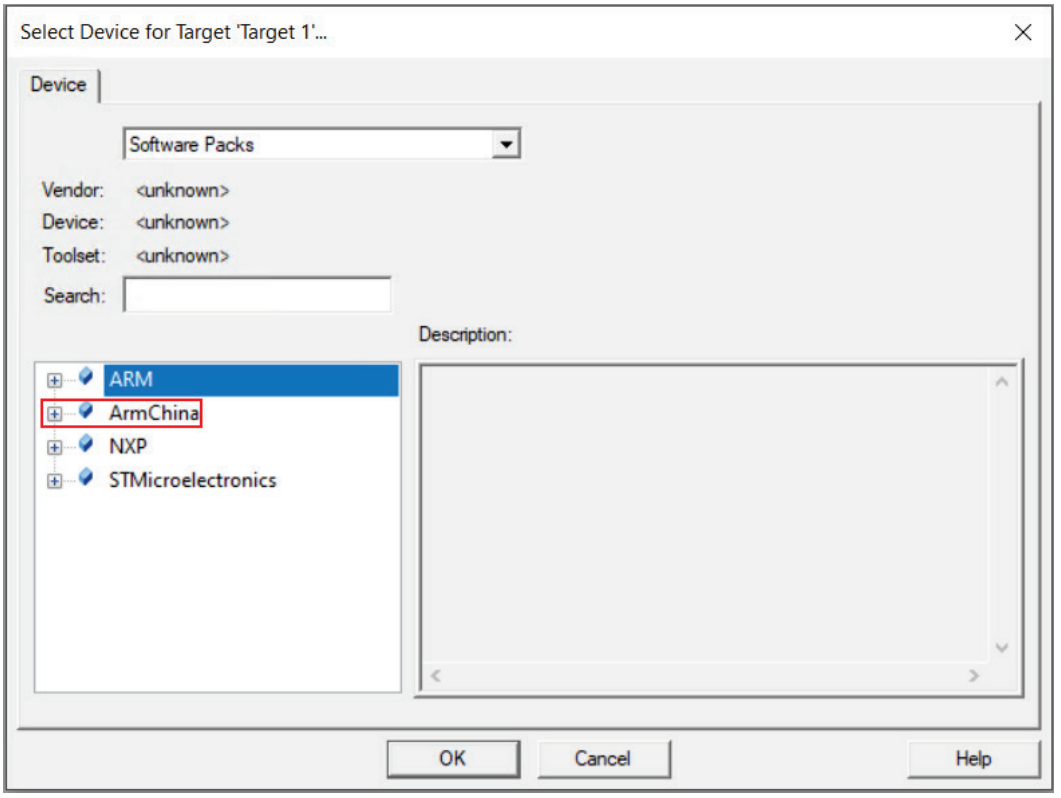
2. In the Project menu, select New uVision Project.



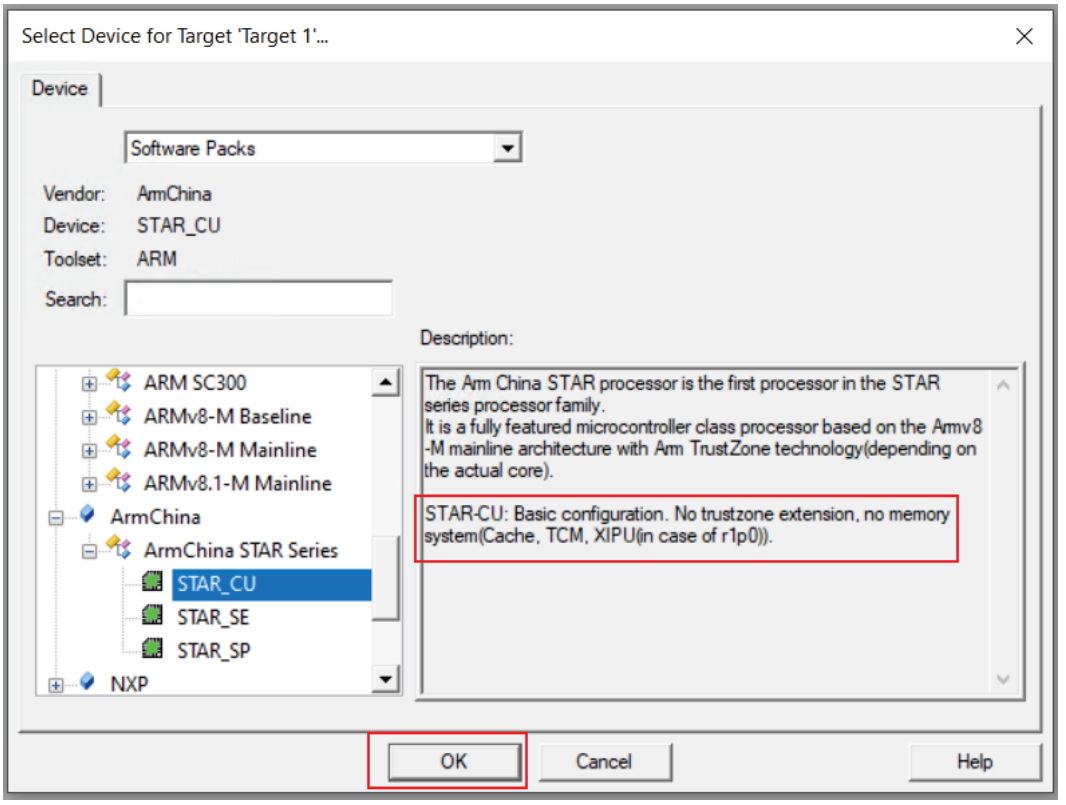
3. In the Create New Project dialog box that appears, select a directory and enter the project name (for example, STAR_test).



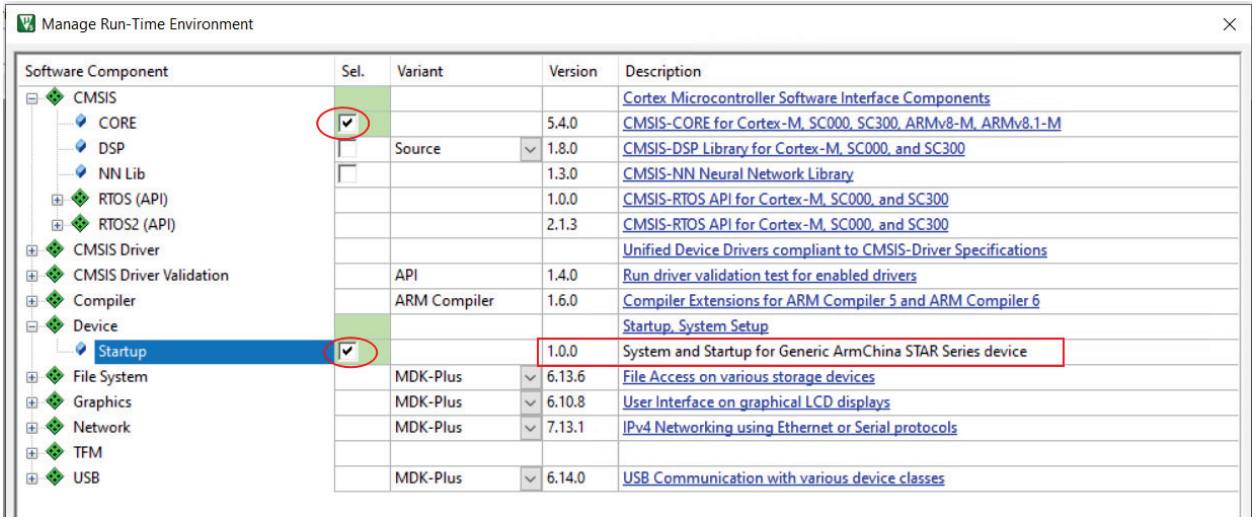
4. Click **Save**.
   The Select Device for Target 'Target 1' dialog box appears. You can see 'ArmChina' in the list.



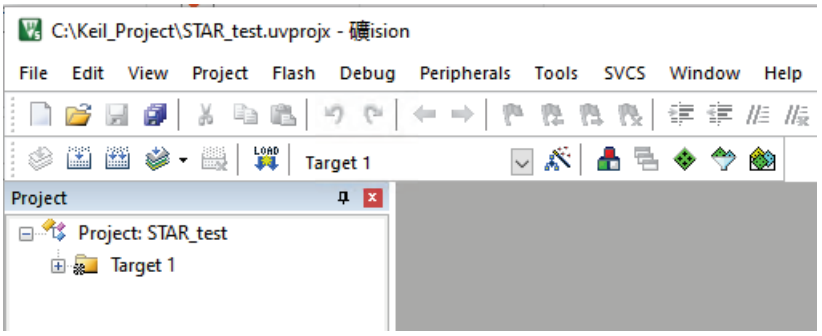
5. According to your licensed product type, select one of the three available devices—**STAR_CU**, **STAR_SE**, **STAR_SP** (for example, **STAR_CU)** and click **OK**.



6. In the Manage Run-Time Environment dialog box that appears, select the essential Software Components **CORE** and **Startup** by clicking the corresponding check box.

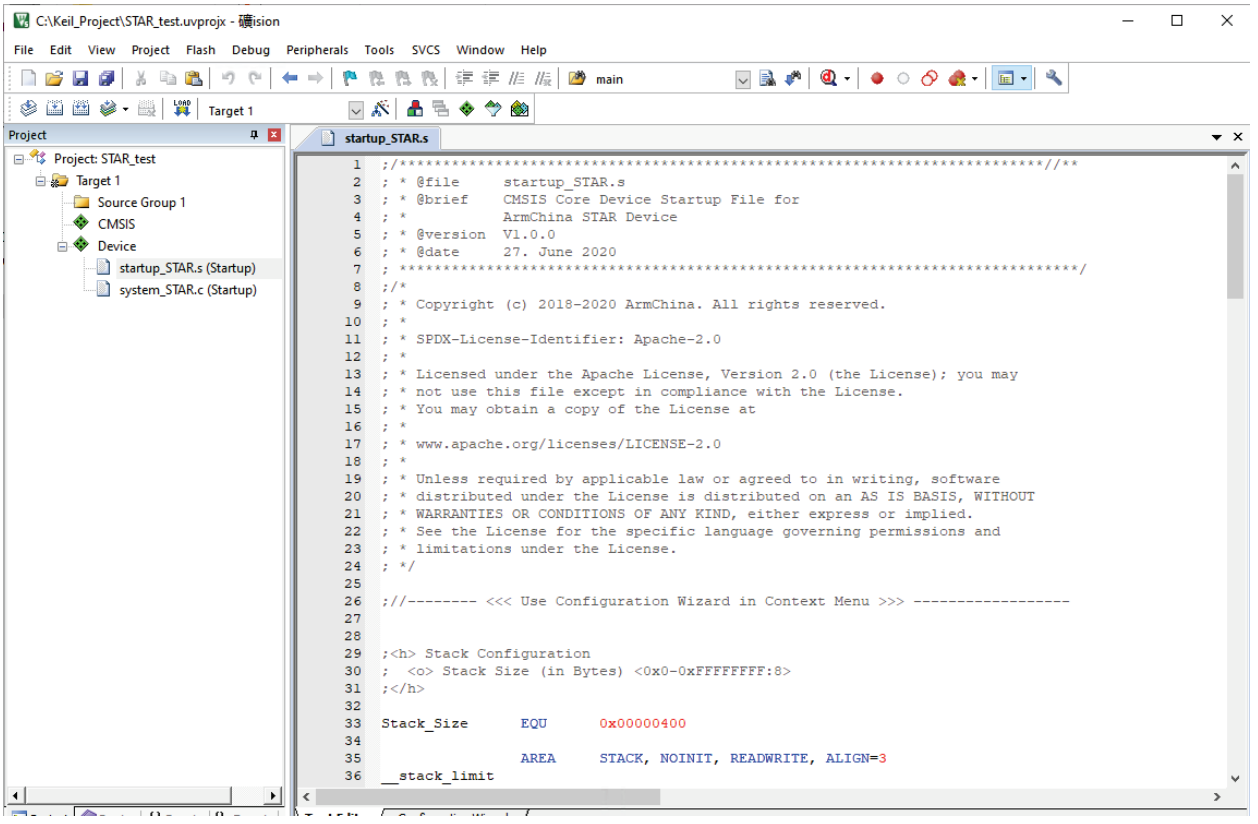


Then, the software project target on STAR_CU is created.



The startup file and the system file have been included in the project.

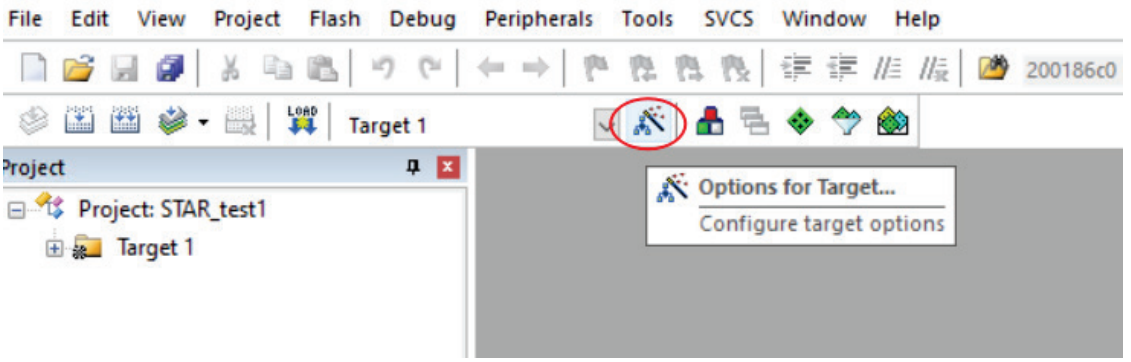
You can view the source code of `startup_STAR.s` and `system_STAR.c` in the uVision editor.



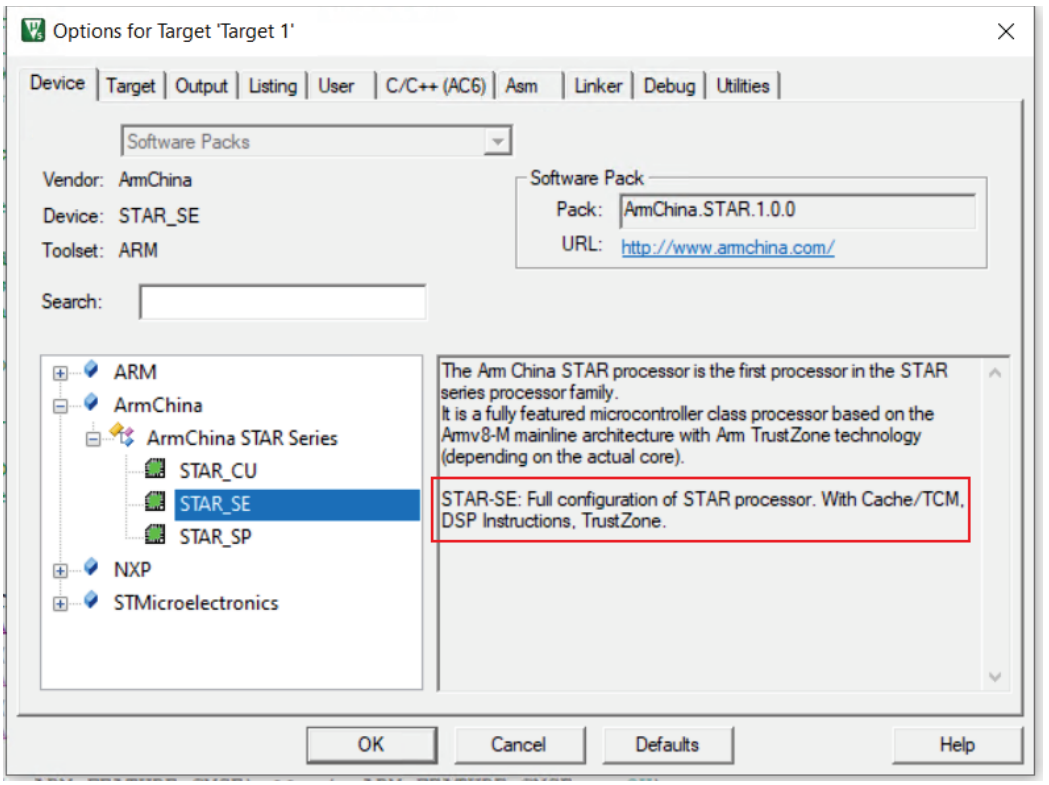
You can also change the device in the target option configuration dialog box.

To change the device:

1. Click the **Options for Target** icon.

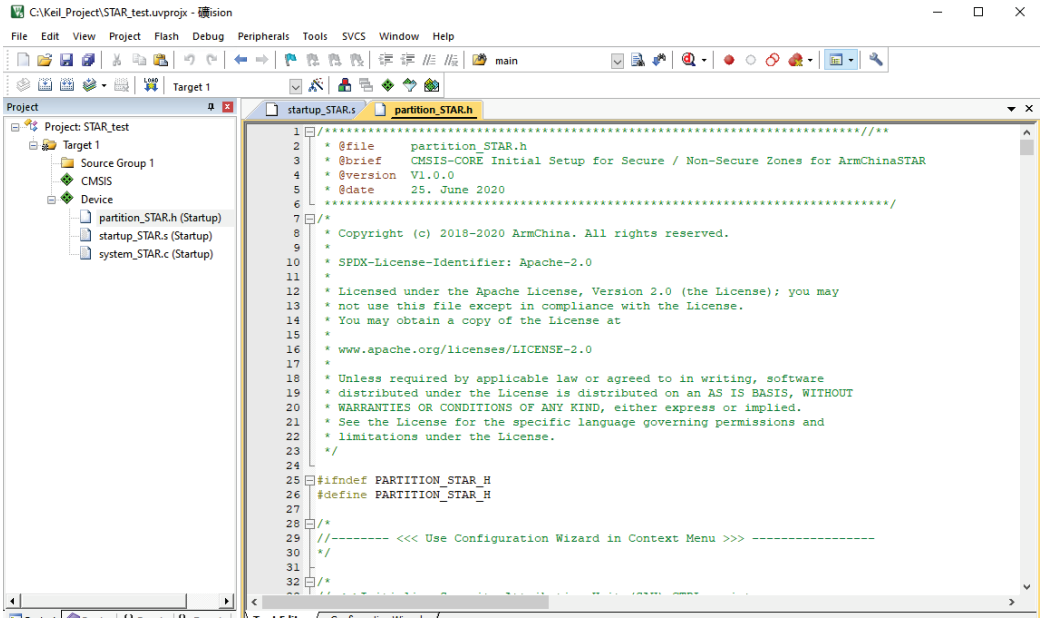


2. On the Device tap, select **STAR_SE**, and then click **OK**.



The new file `partition_STAR.h` is added into the project.

Because STAR_SE has TrustZone supported, partitioning is required to manage the secure and non-secure zones.



Now the project has essential files which support STAR-based devices.

You can start STAR-based software development in the project.