	<h1>SSE-300 MPS3</h1> <h2>BSP Pack User Guide</h2>
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Introduction

This document is a general guide to use the SSE-300 MPS3 BSP pack. The CMSIS pack is to be used with the Corstone-300 platform MPS3 FVP model or AN547 FPGA (AN547: Arm Corstone™ SSE-300 with Ethos™-U55 Example Subsystem for MPS3). The pack contains necessary source files, a linker script file, and a specification document to kick start development for the Corstone-300 MPS3 platform, and a reference secure-side Blinky example to enable a user to understand uVision project configuration. The pack also provides a System View Description (SVD) file for the platform to be used with the uVision debugger.

This document specifies system prerequisites and explains how to build and run the reference Blinky example on the SSE-300 MPS3 FVP model and on the AN547 FPGA.

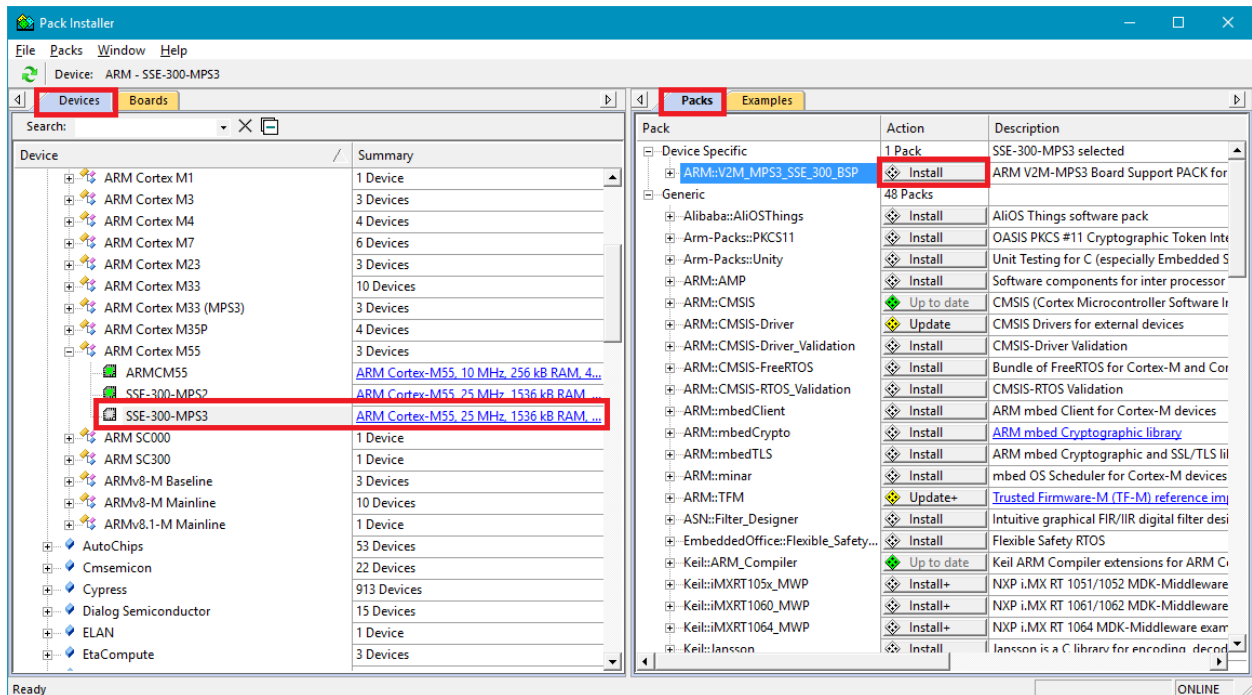
Prerequisites

Note: At time of creating this document, the FVP model is only available for Linux, but expected to be available for Windows soon. Because of this, the debug and run part refers to a state when the model is available. Until then, the build is possible on Windows, but run and debug on FVP is only supported on Linux.

- (Windows) Minimum [Keil MDK v5.30](#)
- (Windows FVP) Download and install [Corstone SSE-300 MPS3 FVP](#) model.
- (Windows FPGA) Download and install [AN547: Arm Corstone™ SSE-300 with Ethos™-U55 Example Subsystem for MPS3](#) FPGA files.
- (Linux) Minimum [Arm Development Studio 2020.1](#).
- (Linux) Minimum [Arm Compiler 6.14.1](#).

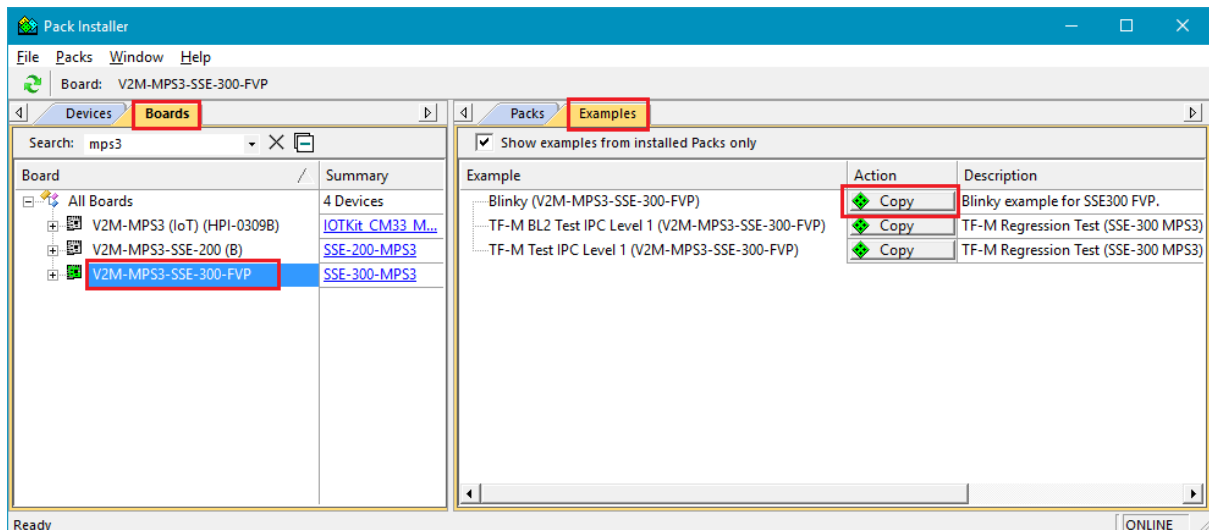
Pack Installation – Keil MDK

Install ARM::V2M_MPS3_SSE_300_BSP using the Pack Installer. The pack can be browsed by selecting SSE-300-MPS3 device under ARM Cortex M55 Devices.



Import and build the example Blinky project – Keil MDK

Copy the Blinky project using the Pack Installer. The example project can be found by searching and selecting V2M-MPS3-SSE-300-FVP Board under the Boards section.



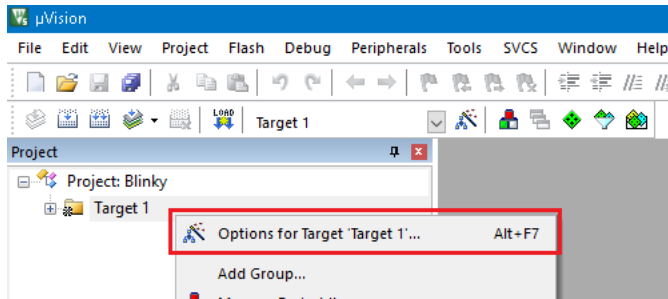
Once copied, open the Blinky project using the uVision and simply build the Target1 listed inside Project Explorer.

Run and debug Blinky example (FVP) – Keil MDK

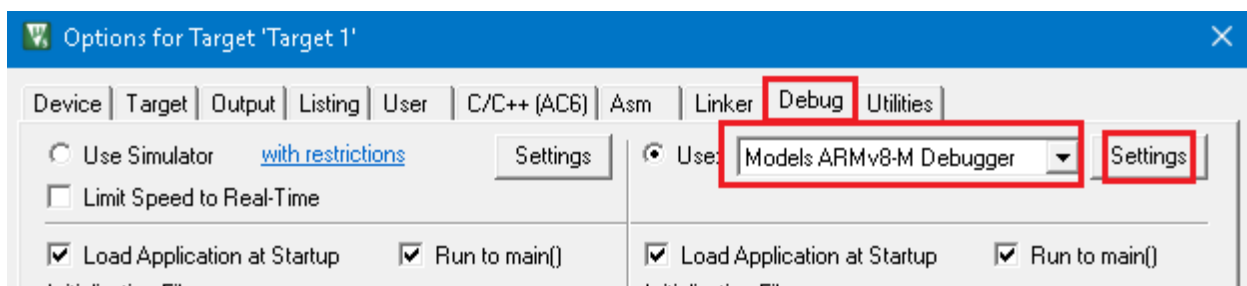
This section explains how to run the Blinky example on the Corstone SSE-300 FVP model. First, download and install the SSE-300 FVP from the link provided in the prerequisite section.

To run and debug the example using the FVP, follow the steps below inside the uVision software.

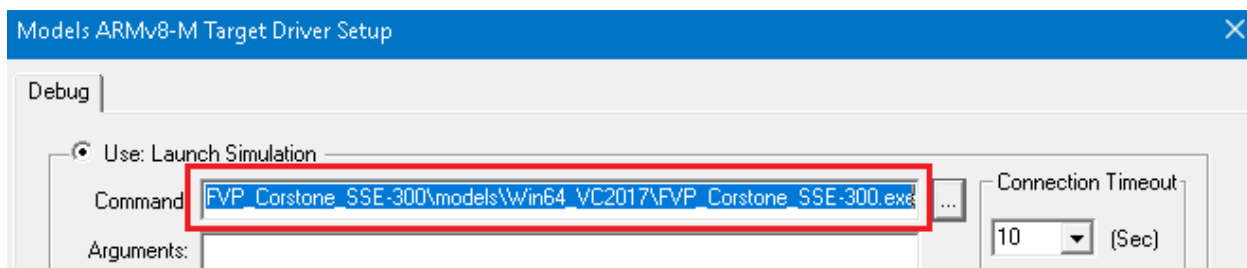
Right click on the Target1 and click on “Options for Target ...”.



Click the Debug tab to open the debug settings. In the drop-down selection for the debugger, select “Models ARMv8-M Debugger”, then click the Settings button next to it.



You should have the “Models ARMv8-M Target Driver Setup” box open. Browse to the SSE-300 FVP executable which is present inside the installation directory.



Click OK and save the changes.

Build the target if it is not built, and then click the debug button at the top to start a debug session.



The FVP window should pop up with code stopped at the entry breakpoint. On starting code execution, the LEDs in the FVP display can be seen to blink cyclically. You can use the debugger to stop, step, and set breakpoints inside the code.

Run and debug Blinky example (FPGA) – Keil MDK

After building the Blinky example, locate the Blinky.axf in the project output folder. To create binary file for the FPGA, the fromelf utility can be used, which is by default, located in the Keil install directory (C:\Keil_v5\ARM\ARMCLANG\bin\fromelf.exe).

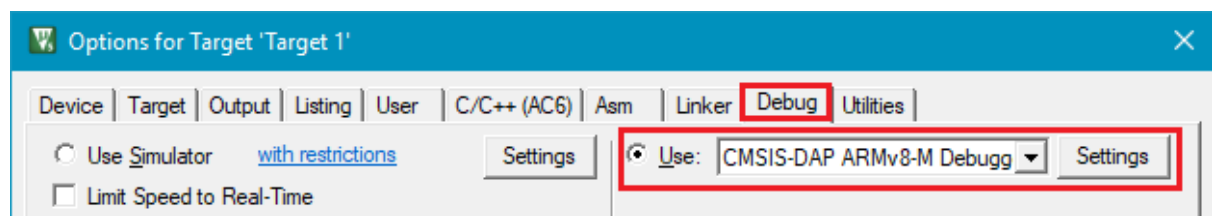
For the blinky example, use this command:

```
fromelf.exe --bincombined --output Blinky.bin Blinky.axf
```

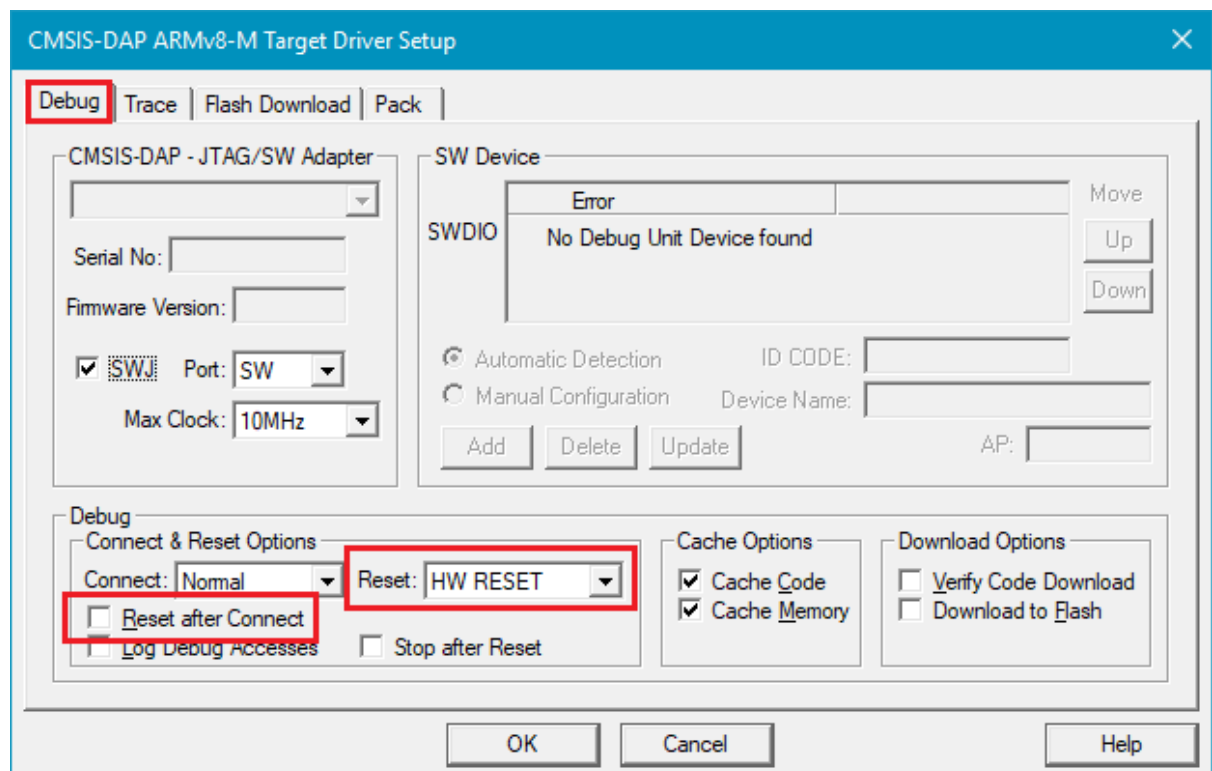
Copy the binary to the FPGA's SD card (x:\SOFTWARE) and set the address in images.txt (x:\MB\HBI0309C\AN547\images.txt) to 0x00000000, then restart the FPGA.

```
IMAGE0ADDRESS: 0x00000000      ;  
IMAGE0UPDATE:  AUTO           ;  
IMAGE0FILE:  \SOFTWARE\Blinky.bin ;
```

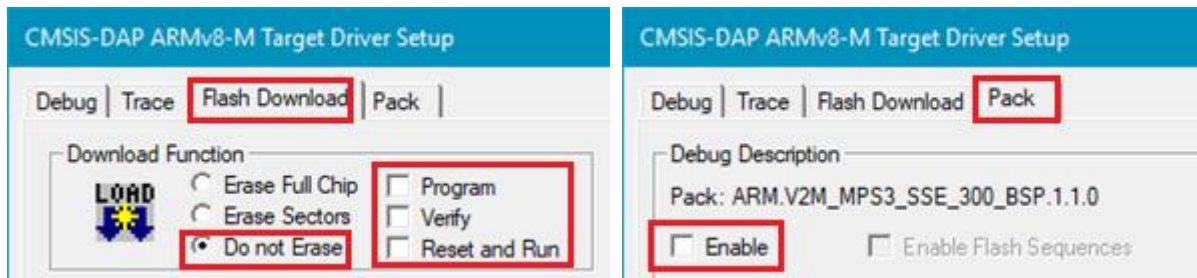
In the IDE, in the “Options for Target ...”, in the Debug tab, Use: “CMSIS-DAP ARMv8-M Debugger” is selected. Depending on your setup, you can also use “ULINK Pro ARMv8-M Debugger”.



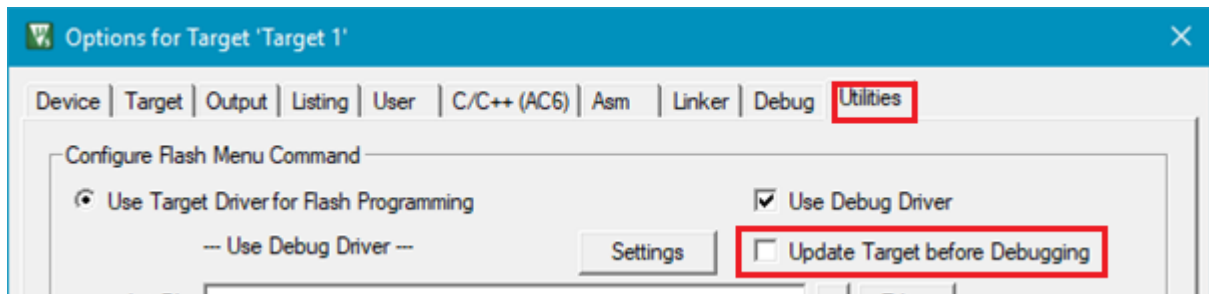
Click Settings. Make sure that on Debug tab, at Debug section, Reset after Connect is unchecked and Reset is set to HW RESET.



In Flash Download tab, Do not Erase is selected and none of the checkboxes are checked and on Pack tab, Enable is unchecked.



Click OK. At Utilities tab, make sure that Update Target before Debugging is unchecked.



Click the debug button at top to start a debug session.

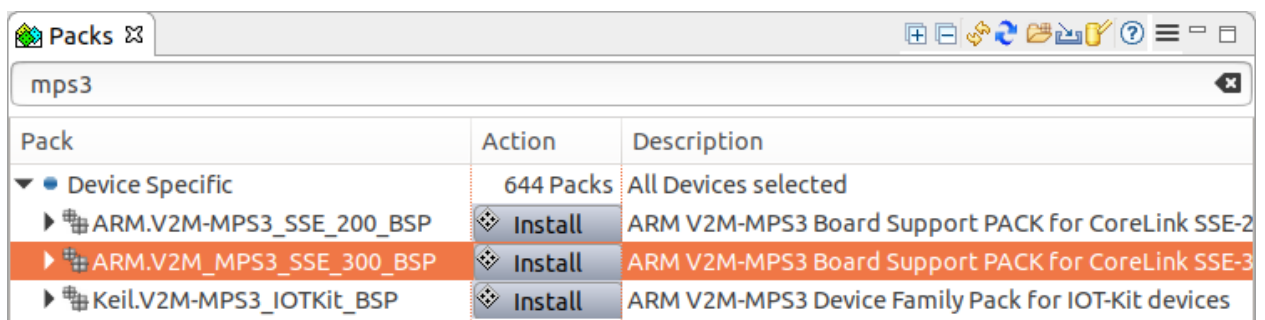


After connection, Reset is only possible when the target is running. If you wish to Reset the target, make sure to Run the target before pressing Reset.

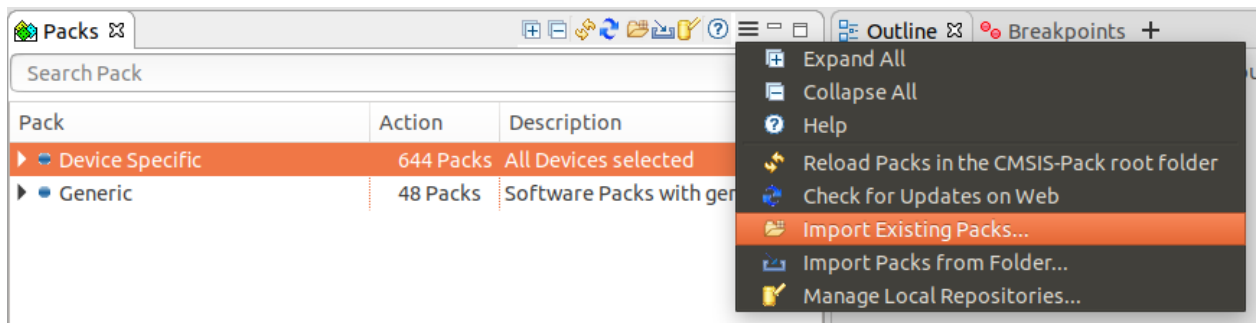


Pack Installation – Arm Development Studio

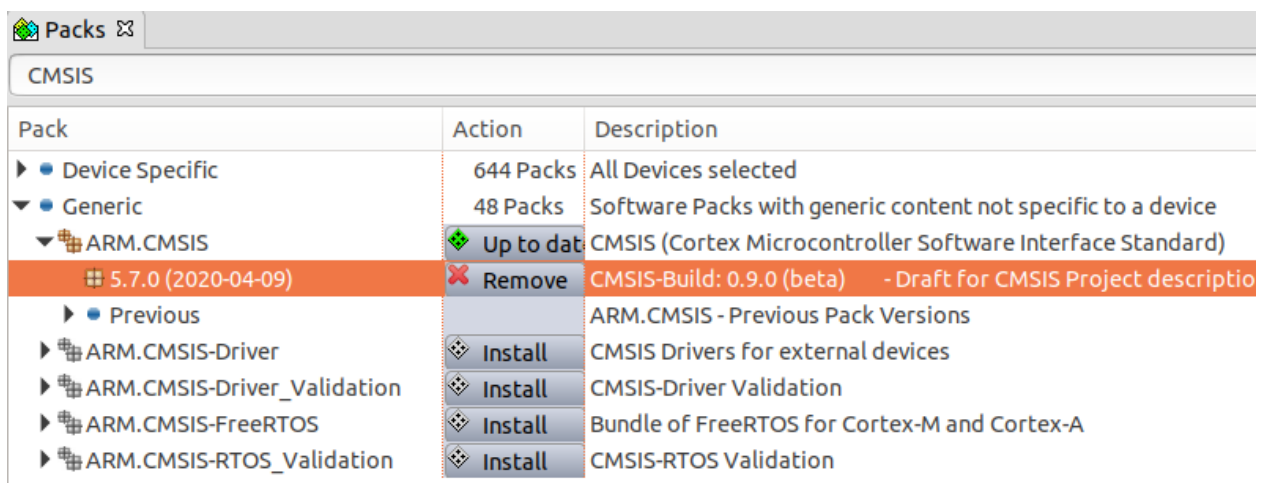
You can Install ARM.V2M_MPS3_SSE_300_BSP using the Packs window. The pack can be found easily by searching for mps3.



If the pack is not available in the list, download the Arm V2M-MPS3-SSE-300-FVP pack, from [Keil](#). Use the Packs window -> menu -> Import Existing Packs... option. Browse the downloaded pack file, then install it as shown in the previous step.

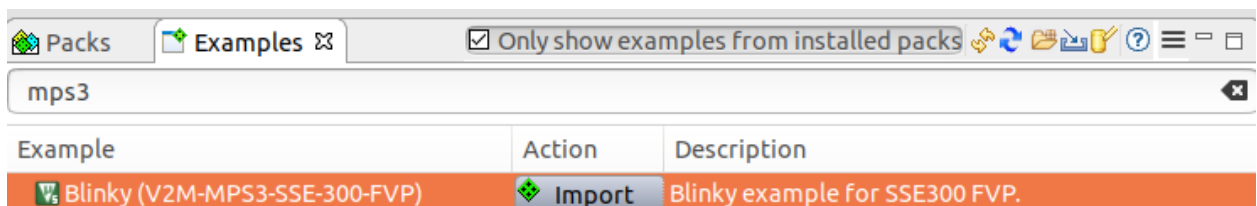


Within the same window, ensure that ARM.CMSIS 5.7.0 Pack is installed. If it is installed, there will be a Remove button, if it is not installed there will be an Install button.



Import and build the example Blinky project – Arm Development Studio

Import the Blinky project using the Examples window. The example project can be found by searching 'mps3' and clicking import on Blinky (V2M-MPS3-SSE-300-FVP).



A window will pop up, please select Target 1 and click Finish.

To build the project, there is a Makefile provided. Open a terminal, go to the project directory, then build with the command 'make'. The results will be generated to the 'build' directory.

Note: If the Arm Development Studio is not installed to the default location, it might be necessary to provide the keil pack folder path to the Makefile, for example:

```
make PACK_DIR=/home/$USER/.cache/arm/packs
```

Run and debug Blinky example – Arm Development Studio

Open a terminal, go to the project directory. Build the example project if not done previously.

The FVP can be launch with the command:

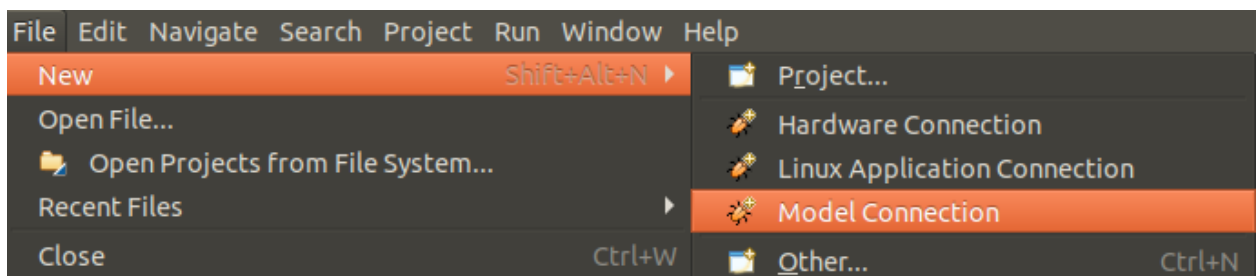
```
<path_to_fvp>/FVP_Corstone_SSE-300_Ethos-U55 -a build/Blinky.axf
```

To start it with debug server:

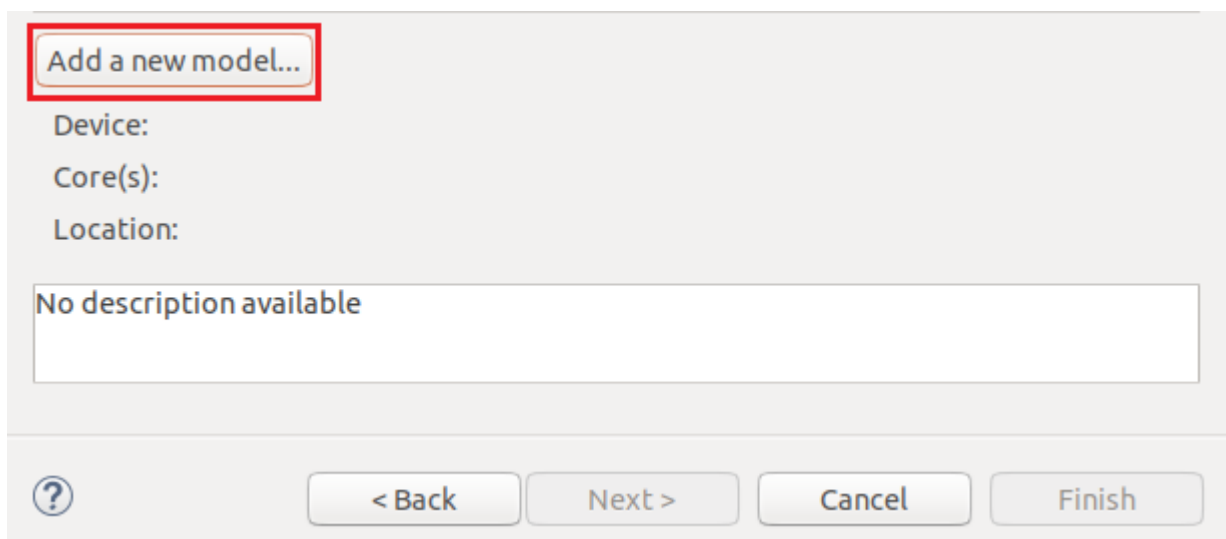
```
<path_to_fvp>/FVP_Corstone_SSE-300_Ethos-U55 -a build/Blinky.axf -I  
-p
```

When launched with a debug server, it is possible to connect the FVP from Arm Development Studio. First, start the FVP with the debug server.

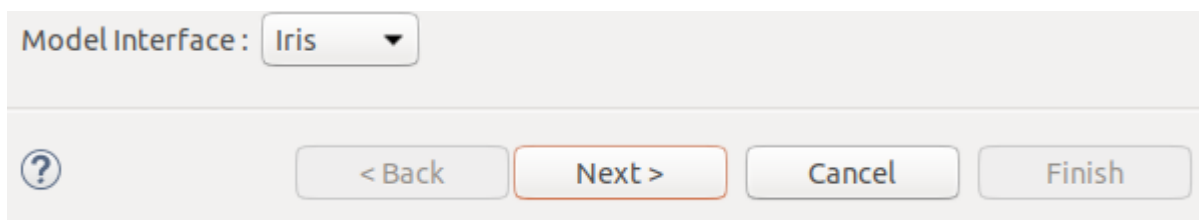
Create a new Debug Connection (File -> New -> Model Connection). Give it a name and click Next.



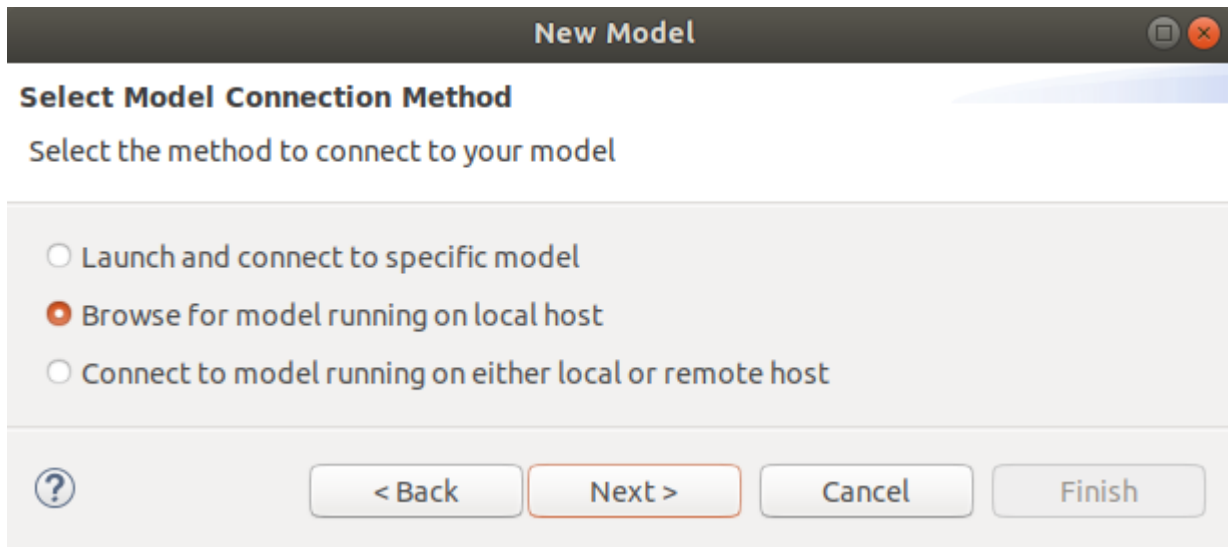
At Target Selection, click Add a new model...



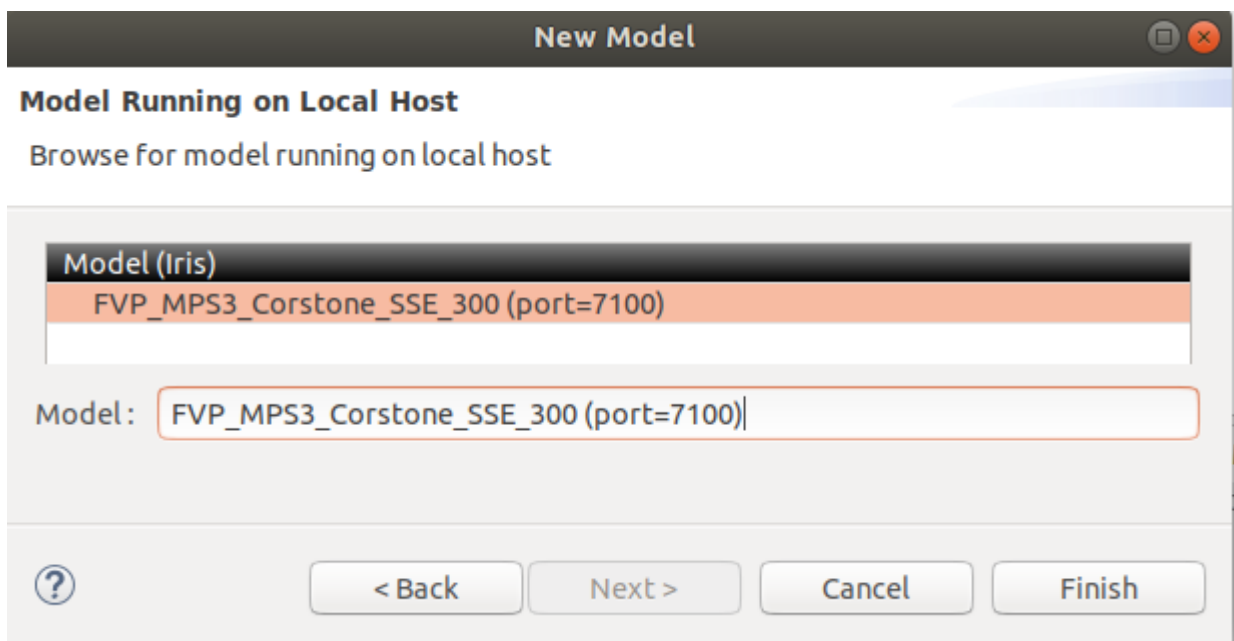
In the popup window, select Model Interface : Iris, then click Next:



Select Browse for model running on local host:




Select FVP_MPS3_Corstone_SSE_300 (port=7100) from the list and click Finish:



The window will close. Click on the Finish button in the parent window. In the next window, the debug configuration can be fine-tuned, but it is ready for debug in its current form. You can click Debug to connect to the FVP and start to debug:

Edit Configuration

Edit configuration and launch.



Name: FVP_MPS3_Corstone_SSE_300

ConnectionFilesDebuggerOS AwarenessArgumentsEnvironmentExport

Select target

This debug configuration is associated with Imported / FVP_MPS3_Corstone_SSE_300. Select which debug operation to use.

Currently selected: Bare Metal Debug / ARM_Cortex-M55

▼ Imported

▼ FVP_MPS3_Corstone_SSE_300

▼ Bare Metal Debug

ARM_Cortex-M55

Arm Debugger will connect to an FVP to debug a bare metal application. The specified FVP is not installed as part of Arm DS. Please ensure it has been installed and is running. Alternatively you can include its location in your PATH environment variable and Arm DS will launch the FVP.

Connections

Bare Metal Debug

☐ Launch a new model

Model parameters

☒ Connect to an already running model

Connection address127.0.0.1:7100

DTSL Options

Edit...

Configure trace or other target options. Using "default" configuration options

Revert

Apply

?

Close

Debug

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