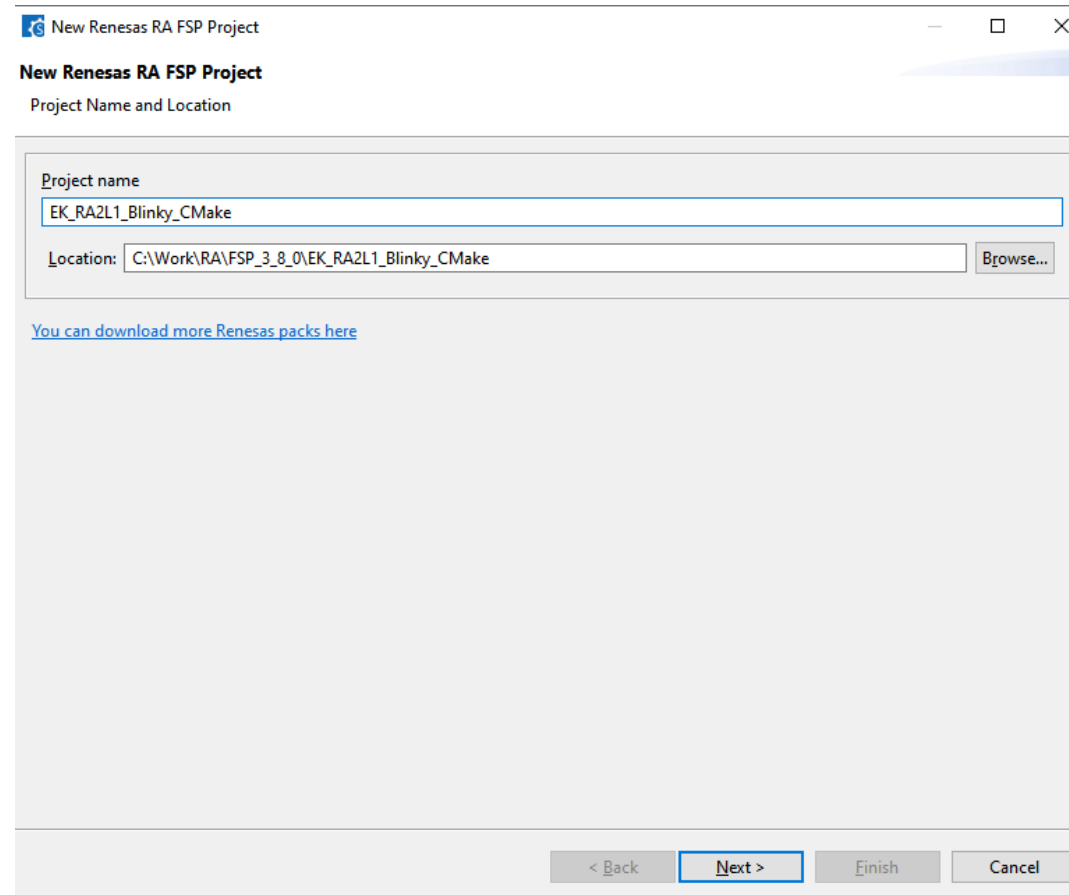


USING CMAKE

WITH RASC

CREATING A CMAKE PROJECT WITH RASC

- Start RASC (instructions for 2022-04, FSP 3.8.0)



FSP PROJECT

New Renesas RA FSP Project

New Renesas RA FSP Project
Device and Tools Selection

Device Selection

FSP Version: 3.8.0

Board: EK-RA2L1

Device: R7FA2L1AB2DFP

Core: CM23

Language: ☒ C ☐ C++

Board Description

Evaluation kit for RA2L1 MCU Group

Visit <https://www.renesas.com/ra/ek-ra2l1> to get kit user's manual, quick start guide, errata, design package, example projects, etc.

Device Details

TrustZone	No
Pins	100
Processor	Cortex-M23

IDE Project Type

CMake

Toolchains

GCC Toolchain for ARM

< Back Next > Finish Cancel

NO RTOS

New Renesas RA FSP Project

New Renesas RA FSP Project

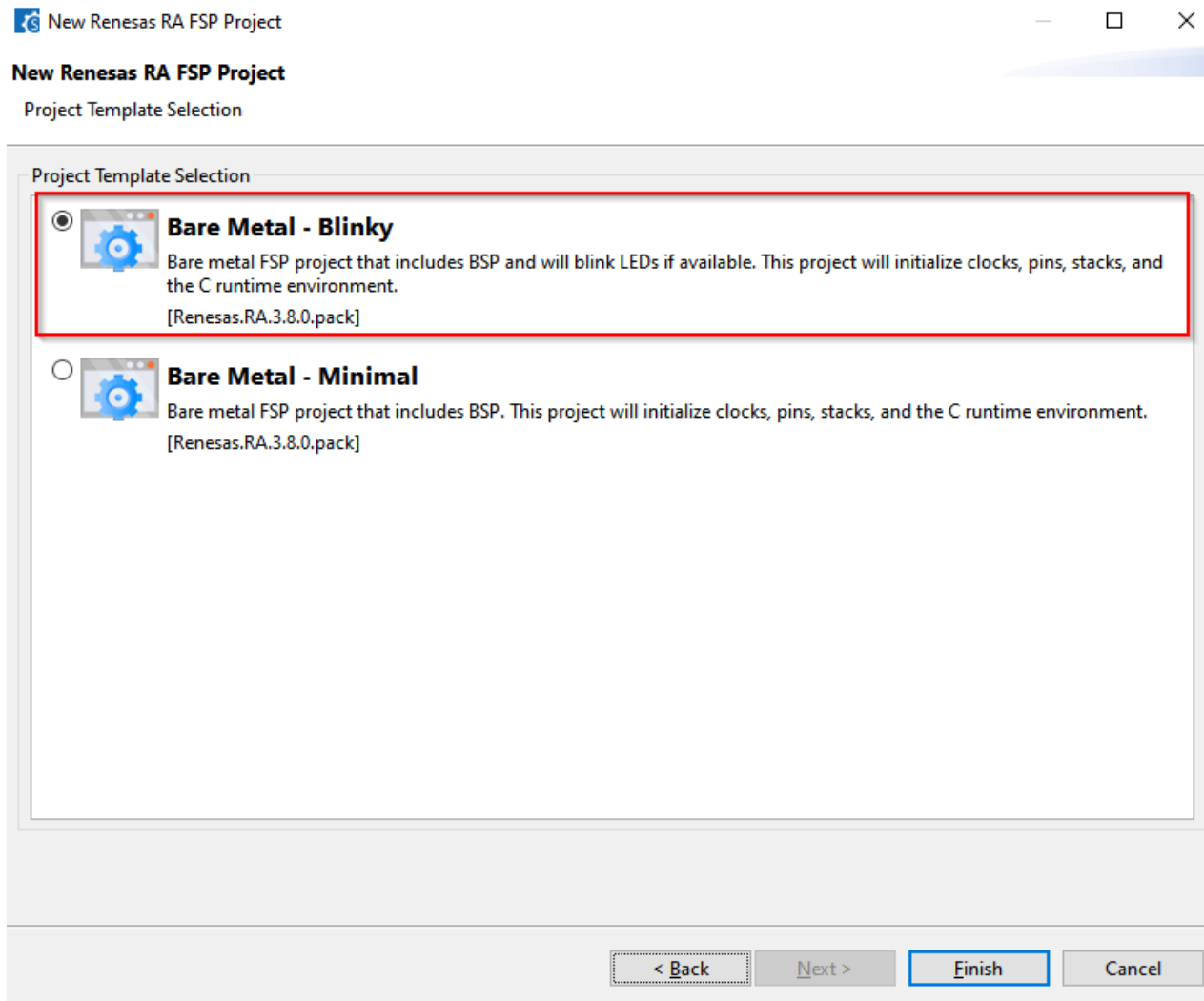
RTOS Selection

RTOS Selection

No RTOS

< Back Next > Finish Cancel

BLINKY PROJECT



GENERATE PROJECT CONTENT



OPEN PROJECT LOCATION

DDSC Smart Configurator

File Help Run

[EK_RA2L1_Blinky_CMake] FSP Configuration X

Summary

Generate Project Content


Project Summary

Board: EK-RA2L1

Device: R7FA2L1AB2DFP

FSP Version: 3.8.0

Project Type: Flat

Location: C:/Work/RA/FSP_3_8_0/EK_RA2L1_Blinky_CMake 

Selected software components

Simple application that blinks an LED. No RTOS included. v3.8.0

Board Support Package Common Files v3.8.0

I/O Port v3.8.0


Arm CMSIS Version 5 - Core (M) v5.9.0+renesas.0.fsp.3.8.0

Board support package for R7FA2L1AB2DFP v3.8.0

Board support package for RA2L1 v3.8.0


Board support package for RA2L1 - FSP Data v3.8.0

RA2L1-EK Board Support Files v3.8.0



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Page 7

BIG IDEAS FOR EVERY SPACE 

EDIT CONFIG.CMAKE

The screenshot shows a file explorer window with the address bar set to `C:\Work\RA\FSP_3_8_0\EK_RA2L1_Blinky_CMake`. The file list includes `.settings`, `.vscode`, `cmake`, `ra`, `ra_cfg`, `ra_gen`, `script`, `src`, `.api.xml`, `.secure_azure`, `.secure.xml`, `buildinfo.json`, `CMakeLists.txt`, `Config.cmake`, `configuration.xml`, `memory_regions.ld`, and `R7FA2L1AB2DFP.pincfg`. The `Config.cmake` file is selected.

The code editor displays the content of `Config.cmake`. The initial state shows the root path setting commented out:

```
# Configuration file for user settings
# This file should include the path for toolchain and other settings that user would like to override.
# Example toolchain path definitions
# set(CMAKE_FIND_ROOT_PATH "C:/GNUArmEmbeddedToolchain/9-2020-q2-update/bin")
```

A callout box with a blue border contains the following text:

Edit Config.cmake to uncomment the setting of the root path to the tools.
Change the path for your system making sure the correct slash "/" type is used.

The final state of the code editor shows the root path setting uncommented and updated with the correct path:

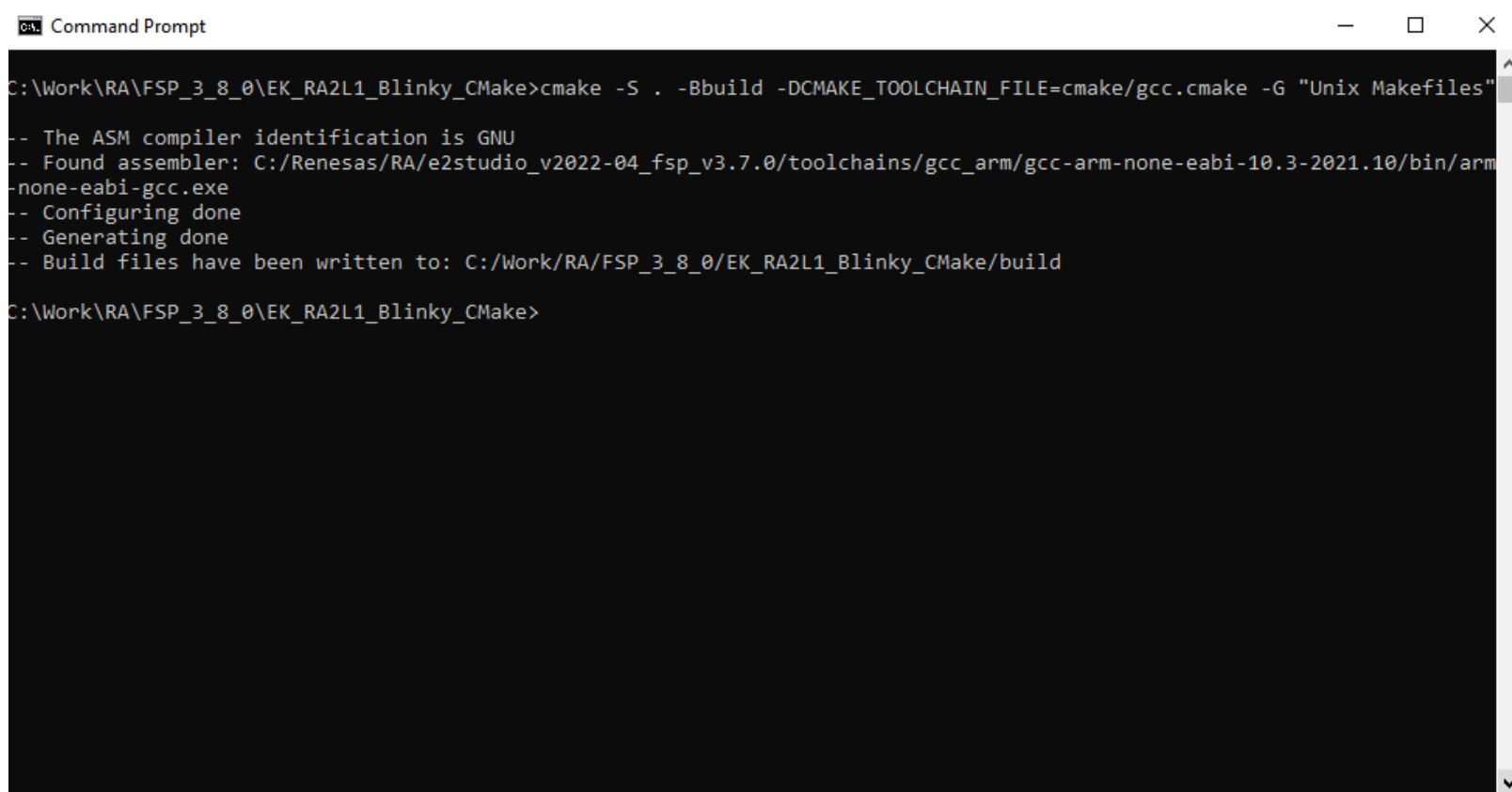
```
# Configuration file for user settings
# This file should include the path for toolchain and other settings that user would like to override.
# Example toolchain path definitions
set(CMAKE_FIND_ROOT_PATH "C:/Renesas/RA/e2studio_v2022-04_fsp_v3.7.0/toolchains/gcc_arm/gcc-arm-none-eabi-10.3-2021.10/bin")
```


OPEN A COMMAND WINDOW IN THE PROJECT ROOT FOLDER



RUN CMAKE TO GENERATE A MAKEFILE

```
cmake -S . -Bbuild -DCMAKE_TOOLCHAIN_FILE=cmake/gcc.cmake -G "Unix Makefiles"
```

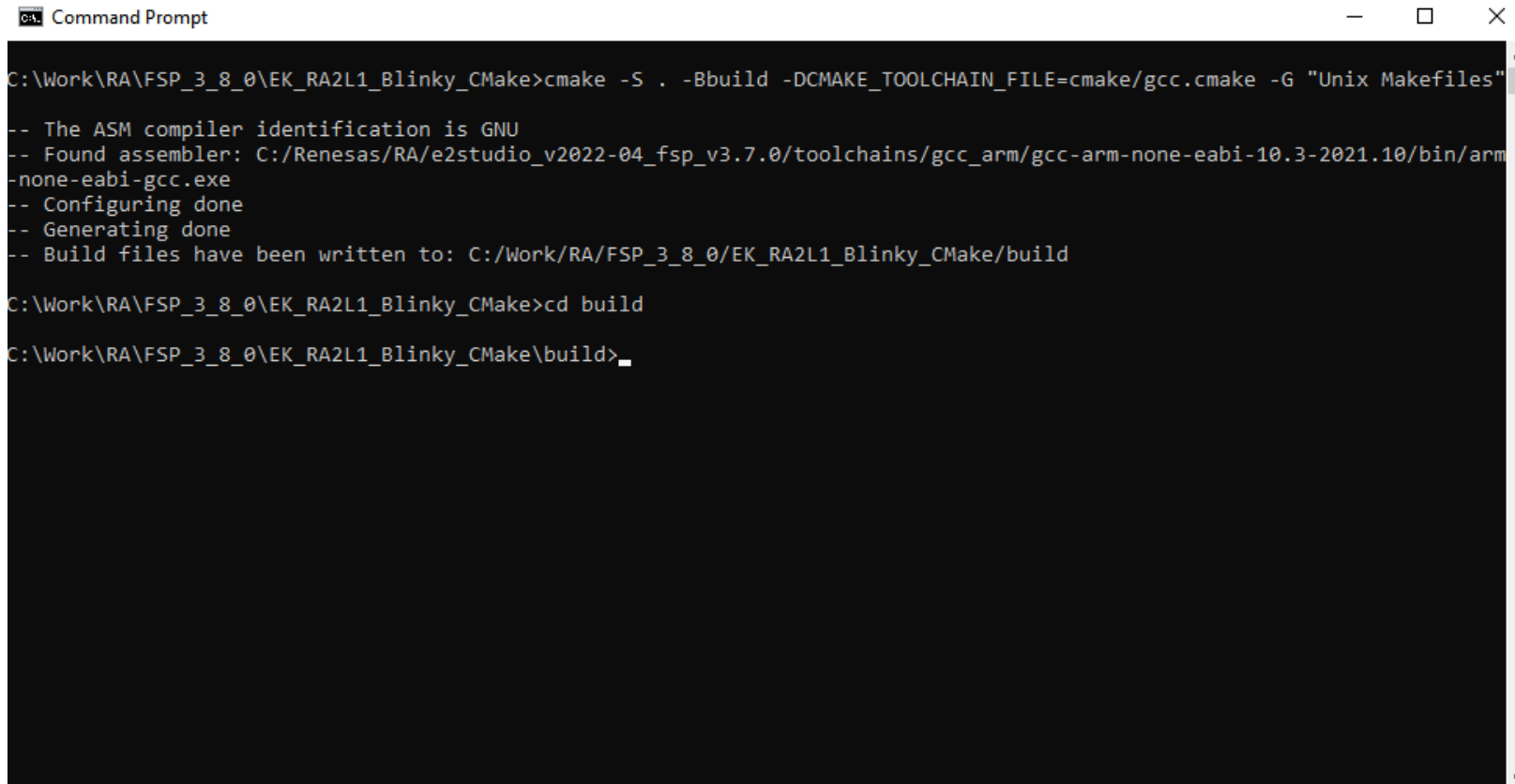


The screenshot shows a Windows Command Prompt window titled "Command Prompt". The command entered is `cmake -S . -Bbuild -DCMAKE_TOOLCHAIN_FILE=cmake/gcc.cmake -G "Unix Makefiles"`. The output shows the configuration process: identifying the GNU compiler, finding the assembler at `C:/Renesas/RA/e2studio_v2022-04_fsp_v3.7.0/toolchains/gcc_arm/gcc-arm-none-eabi-10.3-2021.10/bin/arm-none-eabi-gcc.exe`, and confirming that the build files have been written to `C:/Work/RA/FSP_3_8_0/EK_RA2L1_Blinky_CMake/build`.

```
Command Prompt
C:\Work\RA\FSP_3_8_0\EK_RA2L1_Blinky_CMake>cmake -S . -Bbuild -DCMAKE_TOOLCHAIN_FILE=cmake/gcc.cmake -G "Unix Makefiles"
-- The ASM compiler identification is GNU
-- Found assembler: C:/Renesas/RA/e2studio_v2022-04_fsp_v3.7.0/toolchains/gcc_arm/gcc-arm-none-eabi-10.3-2021.10/bin/arm-none-eabi-gcc.exe
-- Configuring done
-- Generating done
-- Build files have been written to: C:/Work/RA/FSP_3_8_0/EK_RA2L1_Blinky_CMake/build
C:\Work\RA\FSP_3_8_0\EK_RA2L1_Blinky_CMake>
```

CHANGE TO THE “BUILD” FOLDER

```
cd “build”
```



```
C:\Work\RA\FSP_3_8_0\EK_RA2L1_Blinky_CMake>cmake -S . -Bbuild -DCMAKE_TOOLCHAIN_FILE=cmake/gcc.cmake -G "Unix Makefiles"
-- The ASM compiler identification is GNU
-- Found assembler: C:/Renesas/RA/e2studio_v2022-04_fsp_v3.7.0/toolchains/gcc_arm/gcc-arm-none-eabi-10.3-2021.10/bin/arm-none-eabi-gcc.exe
-- Configuring done
-- Generating done
-- Build files have been written to: C:/Work/RA/FSP_3_8_0/EK_RA2L1_Blinky_CMake/build

C:\Work\RA\FSP_3_8_0\EK_RA2L1_Blinky_CMake>cd build

C:\Work\RA\FSP_3_8_0\EK_RA2L1_Blinky_CMake\build>
```

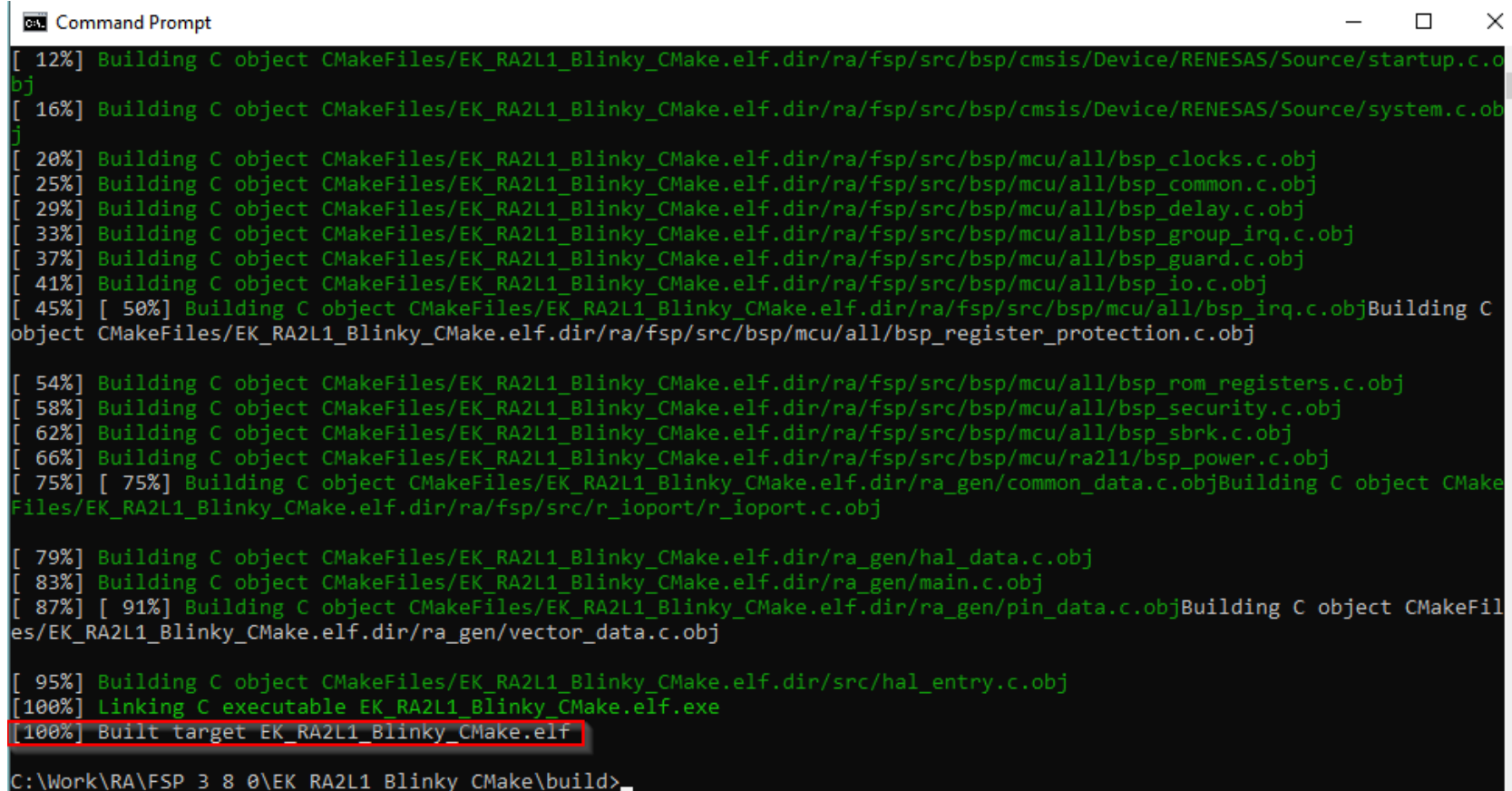
RUN MAKE

make -j8

‘-j [jobs]’

‘--jobs[=jobs]’

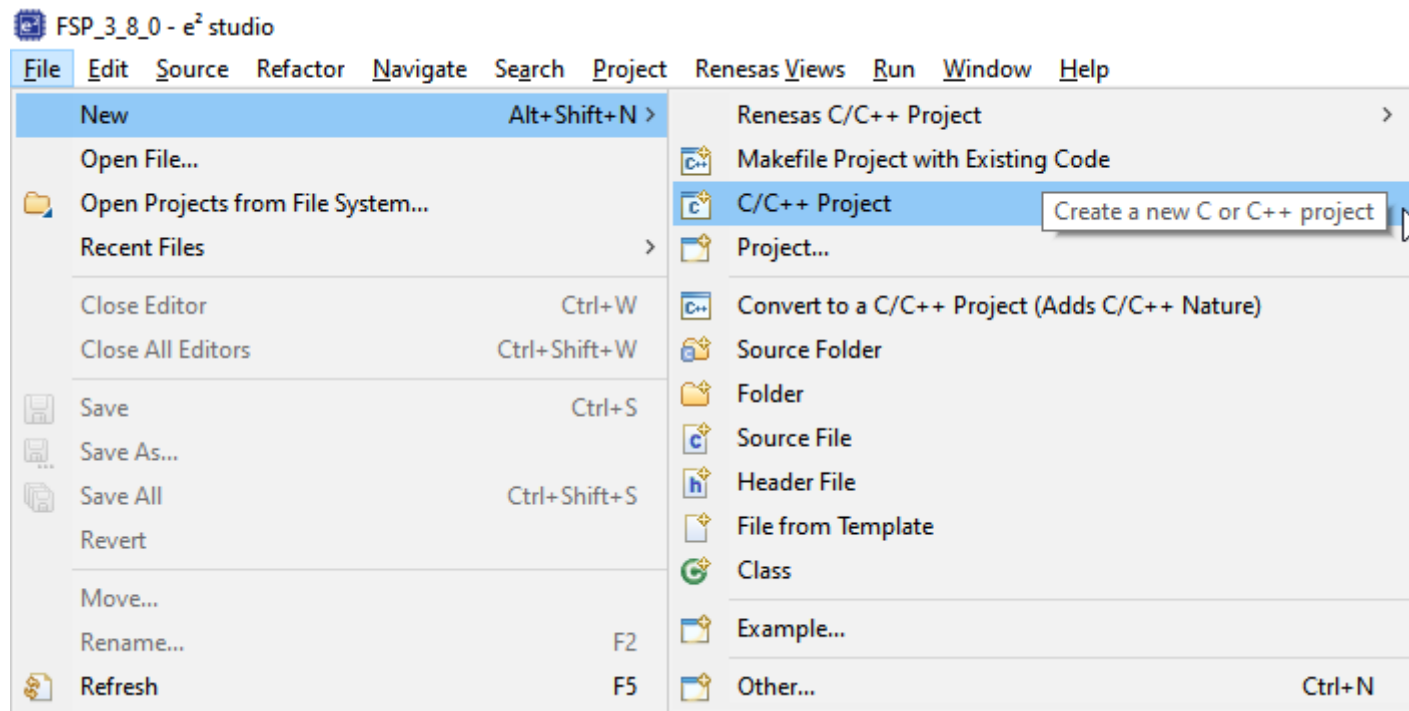
Specifies the number of recipes (jobs) to run simultaneously. With no argument, make runs as many recipes simultaneously as possible. If there is more than one ‘-j’ option, the last one is effective. See [Parallel Execution](#), for more information on how recipes are run. Note that this option is ignored on MS-DOS.



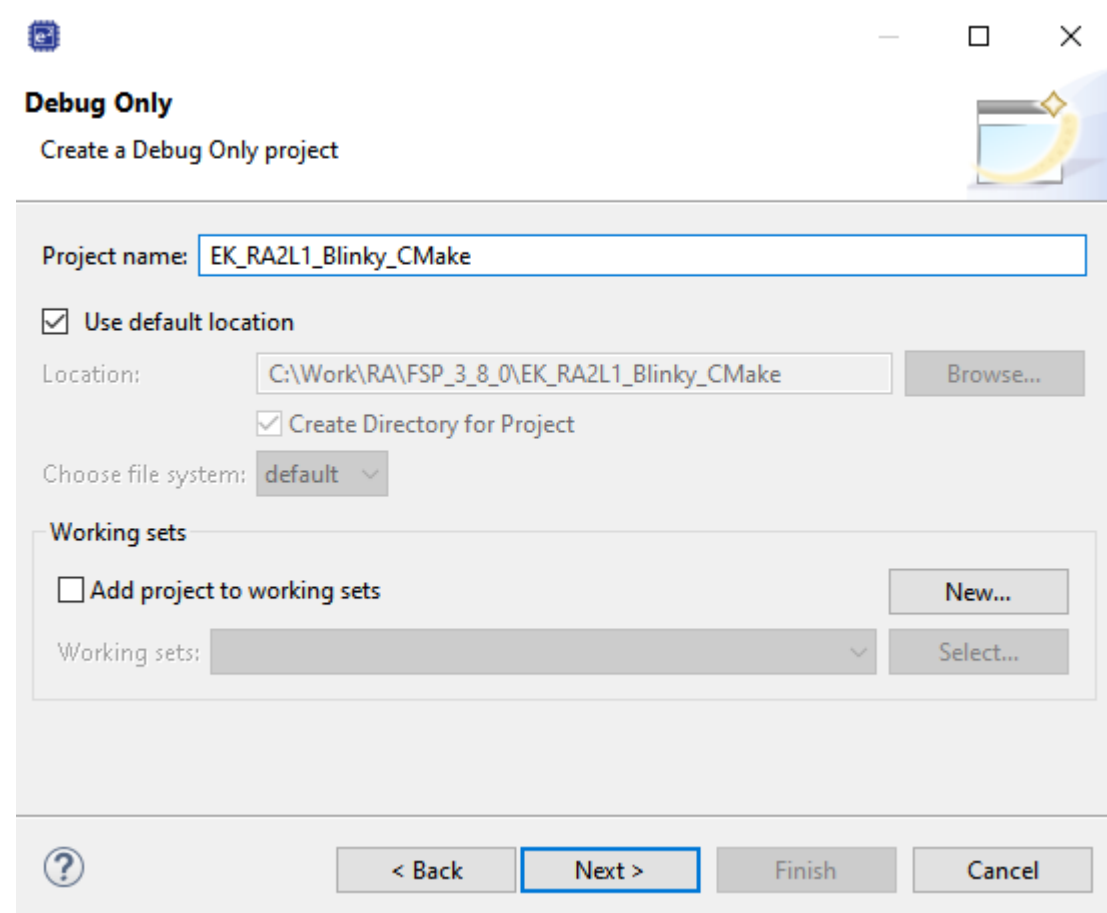
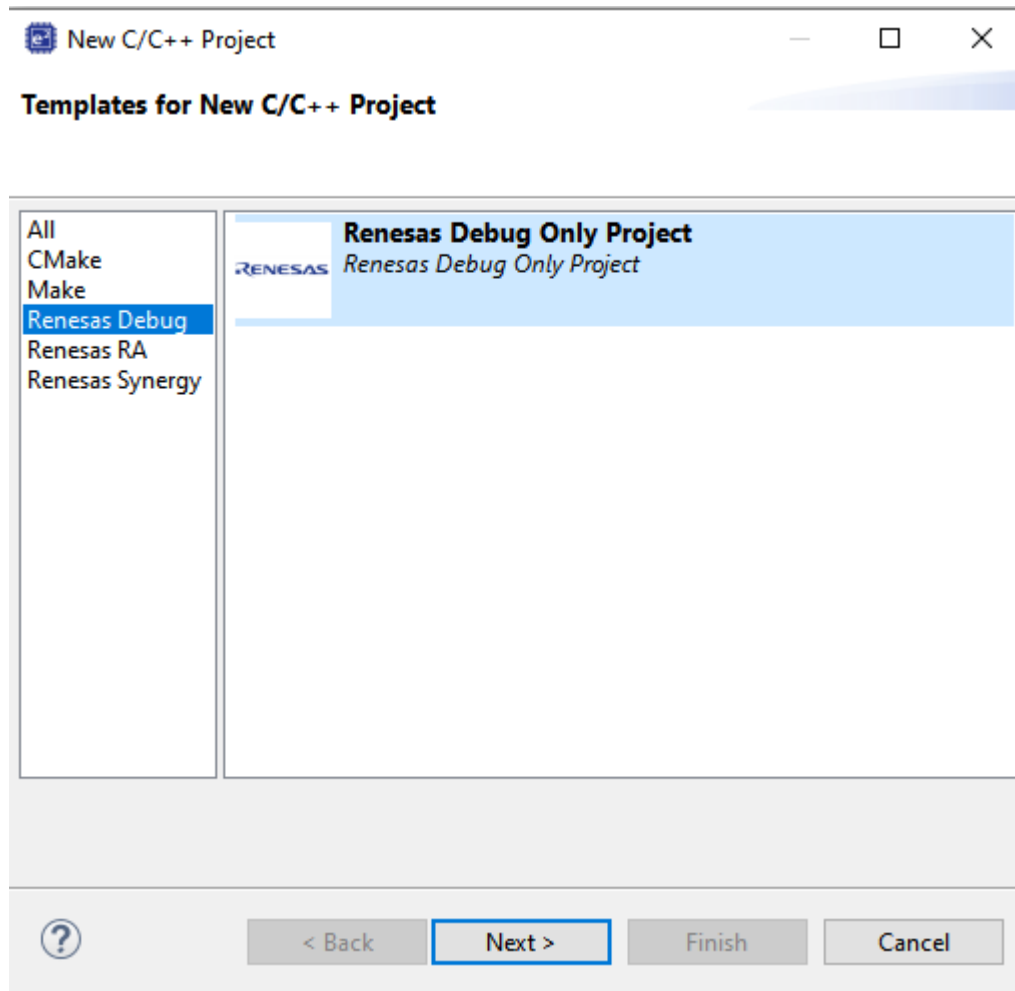
```
Command Prompt
[ 12%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/cmsis/Device/RENESAS/Source/startup.c.obj
[ 16%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/cmsis/Device/RENESAS/Source/system.c.obj
[ 20%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_clocks.c.obj
[ 25%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_common.c.obj
[ 29%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_delay.c.obj
[ 33%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_group_irq.c.obj
[ 37%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_guard.c.obj
[ 41%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_io.c.obj
[ 45%] [ 50%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_irq.c.objBuilding C
object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_register_protection.c.obj
[ 54%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_rom_registers.c.obj
[ 58%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_security.c.obj
[ 62%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/all/bsp_sbrk.c.obj
[ 66%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/bsp/mcu/ra2l1/bsp_power.c.obj
[ 75%] [ 75%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra_gen/common_data.c.objBuilding C object CMake
Files/EK_RA2L1_Blinky_CMake.elf.dir/ra/fsp/src/r_ioport/r_ioport.c.obj
[ 79%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra_gen/hal_data.c.obj
[ 83%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra_gen/main.c.obj
[ 87%] [ 91%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/ra_gen/pin_data.c.objBuilding C object CMakeFil
es/EK_RA2L1_Blinky_CMake.elf.dir/ra_gen/vector_data.c.obj
[ 95%] Building C object CMakeFiles/EK_RA2L1_Blinky_CMake.elf.dir/src/hal_entry.c.obj
[100%] Linking C executable EK_RA2L1_Blinky_CMake.elf.exe
[100%] Built target EK_RA2L1_Blinky_CMake.elf
C:\Work\RA\FSP_3_8_0\EK_RA2L1_Blinky_CMake\build>
```

DEBUGGING WITH E2STUDIO

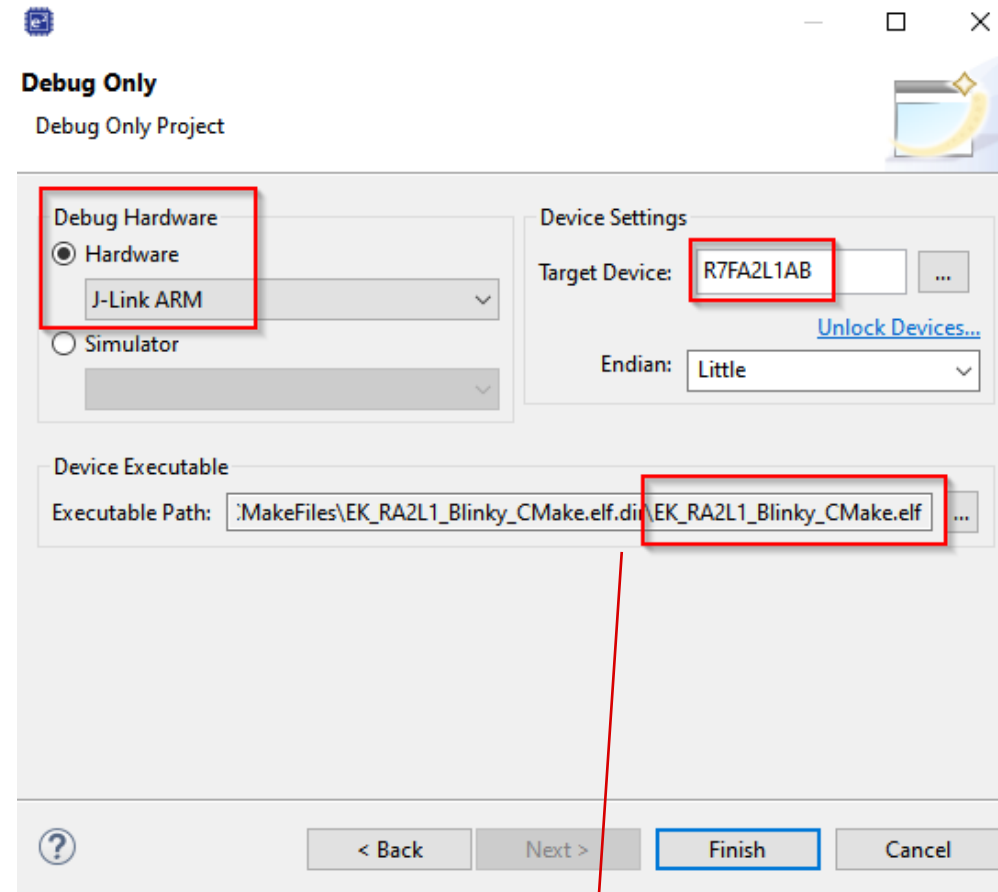
E2STUDIO



E2STUDIO



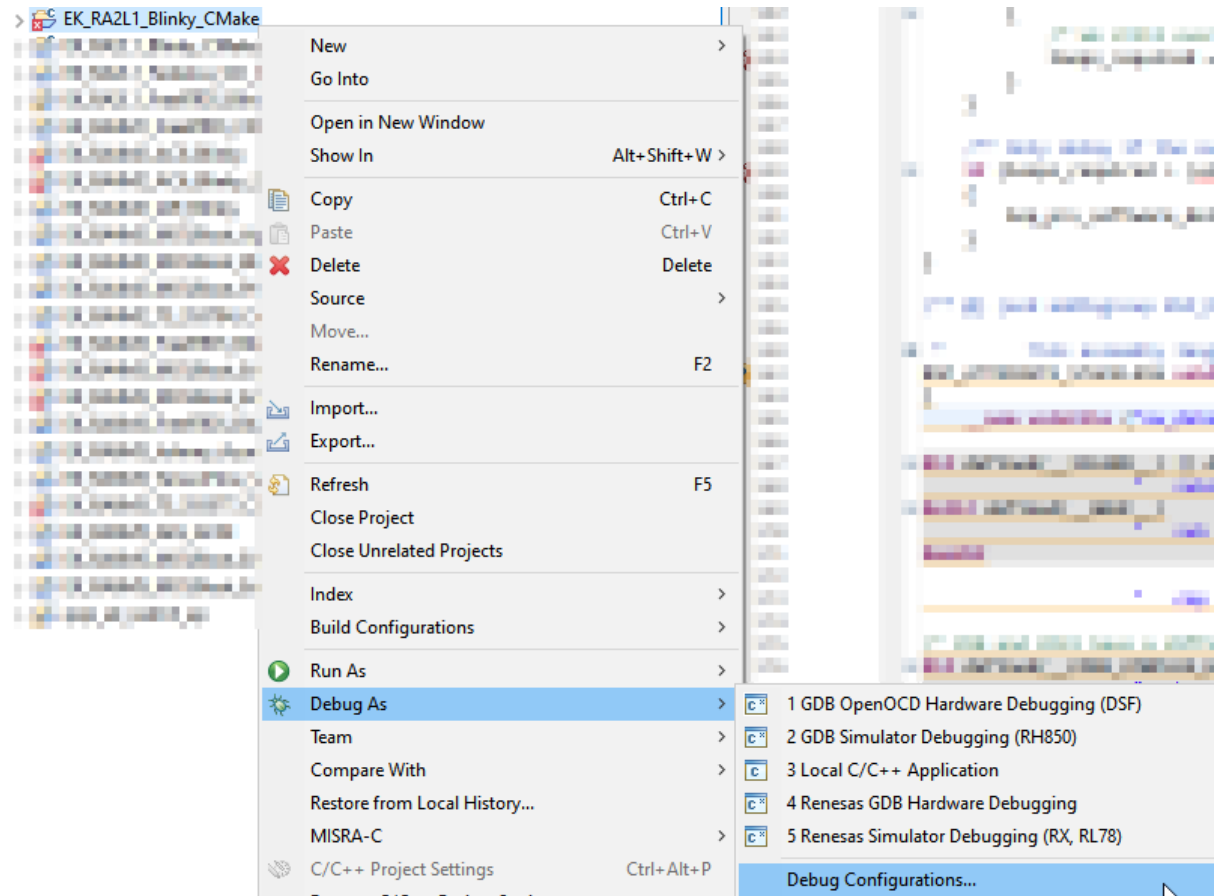
DEBUG SETTINGS



C:\Work\RA\FSP_3_8_0\EK_RA2L1_Blinky_CMake\build\CMakeFiles\EK_RA2L1_Blinky_CMake.elf.dir\EK_RA2L1_Blinky_CMake.elf

DEBUG CONFIGURATIONS

- Right-click debug project and select “Debug As -> Debug Configurations”

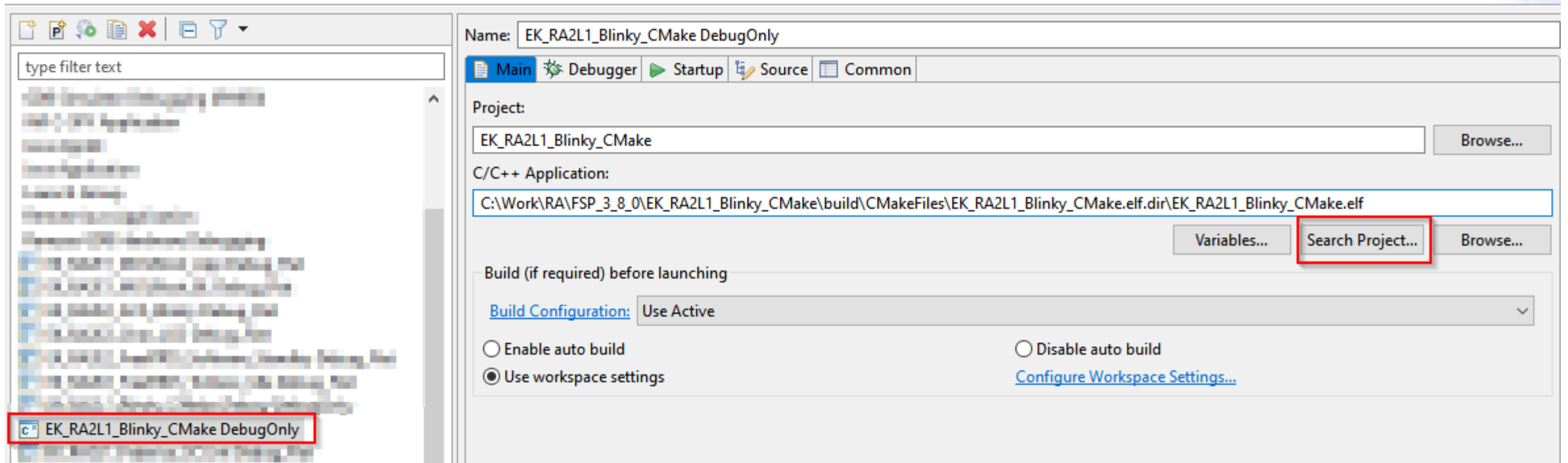


RESELECT FILE TO CHANGE SLASH DIRECTION

- Select the “EL_RA2L1_Blinky_CMake DebugOnly” project.
- Click “Search Project...”

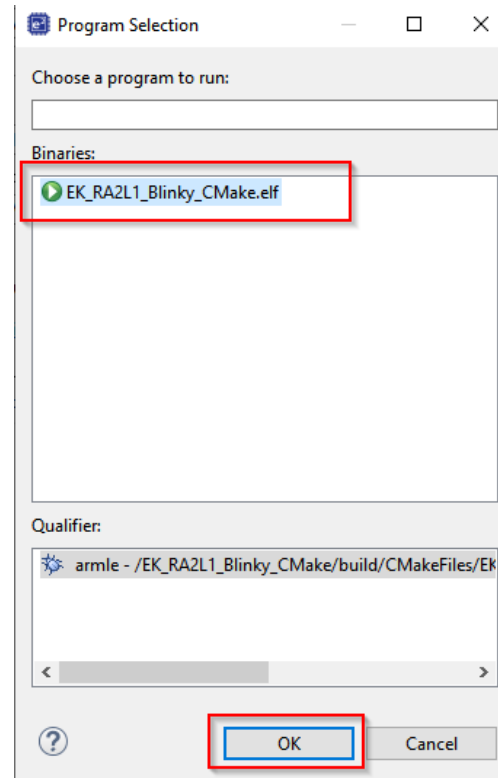
 Debug Configurations

Create, manage, and run configurations



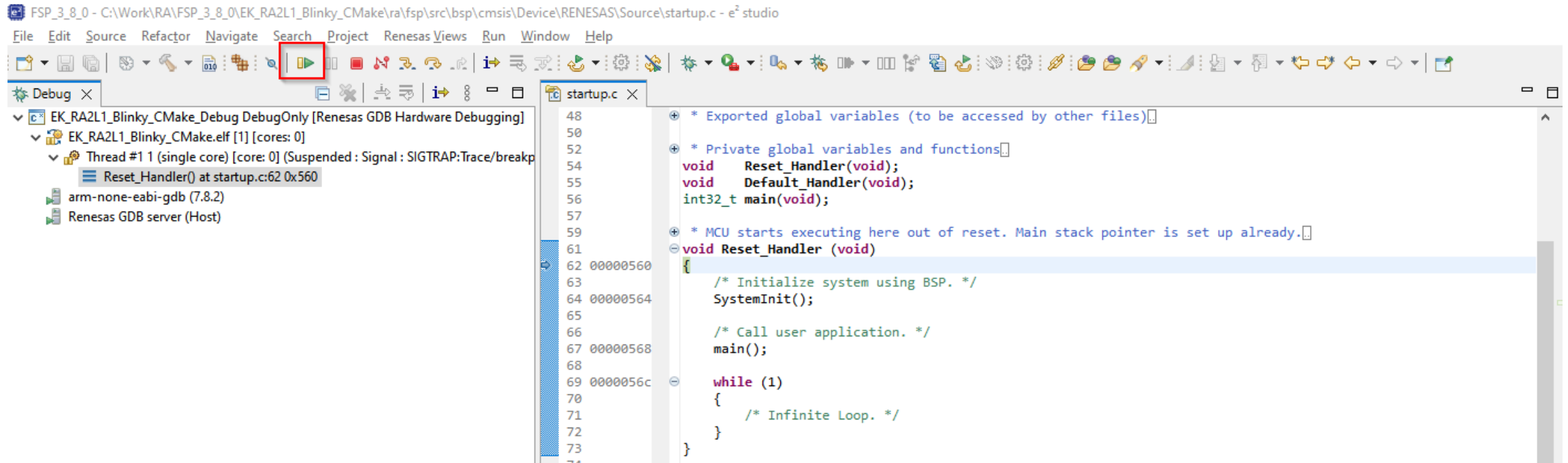
RESELECT FILE TO CHANGE SLASH DIRECTION

- Select “EK_RA2L1_Blinky_CMake.elf” – needed to change the direction of the slashes
- Click “OK”



CLOSE DEBUG CONFIGURATION

- Click “Apply”
- Connect a USB cable between the host PC and J10 on the EK-RA2L1
- Click “Debug”
- Press the Resume button to start the application, press it a second time. LEDs will flash.



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