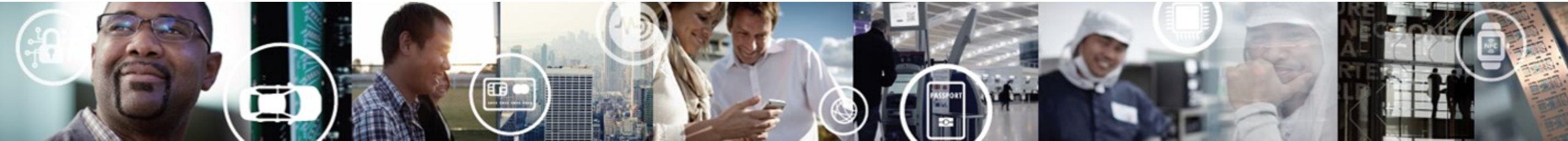


S32R274RRUEVB AND S32R372RRSEVB SOFTWARE INTEGRATION GUIDE (SWIG)

Ultra-Reliable MCUs for Industrial and Automotive Applications

www.nxp.com/S32DS



EXTERNAL USE



SECURE CONNECTIONS
FOR A SMARTER WORLD

S32 DESIGN STUDIO IDE FOR POWER ARCHITECTURE

www.nxp.com/S32DS

- To develop an application, one needs an Integrated Development Environment (IDE)
- S32 Design Studio IDE meets the need!
- S32DS v2017.R1 is the latest (Aug 2018)
- This document provides stepwise tutorial on “How to use S32 Design Studio IDE” to build an application and uses images from the S32DS for Power v1.2 installation process, but the installation steps apply for later versions as well

Contents

- S32 Design Studio IDE for Power Architecture Supported Devices
- Installing S32 Design Studio IDE for Power Architecture
 - Download and Install the new IDE
- Getting started with a New Project
 - Create, build and debug the new project
- Making Projects from built-in Examples

S32 Design Studio IDE for Power Architecture v2017.R1

Supported Devices

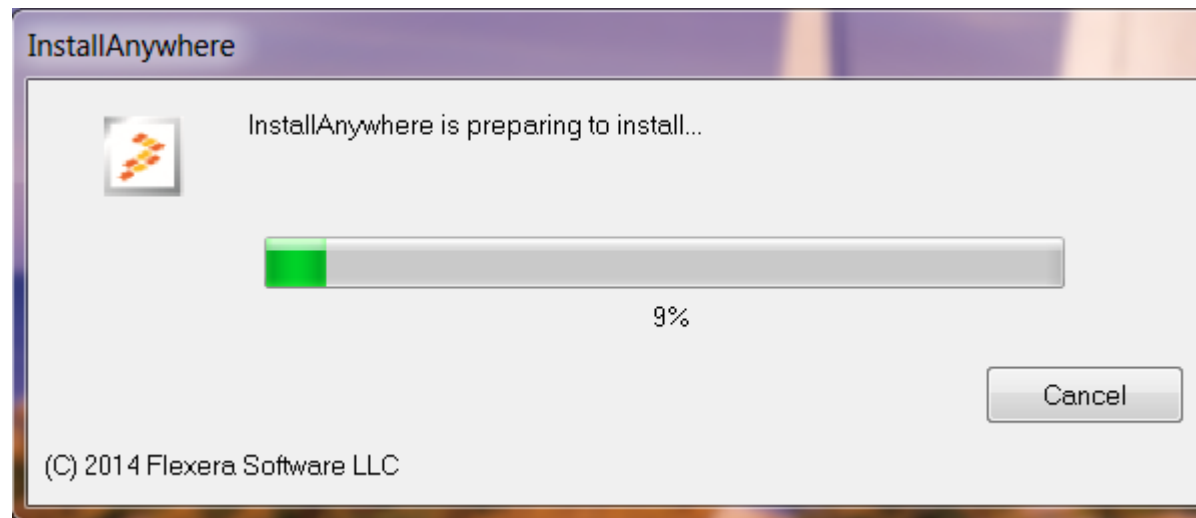
- MPC560xB/C/D Family
- MPC560xE Family
- MPC560xP Family
- MPC560xS Family
- MPC564xA Family
- MPC564xB Family
- MPC564xC Family
- MPC564xL Family
- MPC567xR Family
- MPC563xM Family
- MPC5674F
- MPC567xK Family
- MPC574xB/C/D Family
- MPC574xG Family
- MPC577xK Family
- MPC574xP Family
- MPC574xR Family
- MPC5777C
- MPC5777M
- MPC5775B/E
- S32R274
- S32R372

INSTALLING S32 DESIGN STUDIO IDE FOR POWER ARCHITECTURE



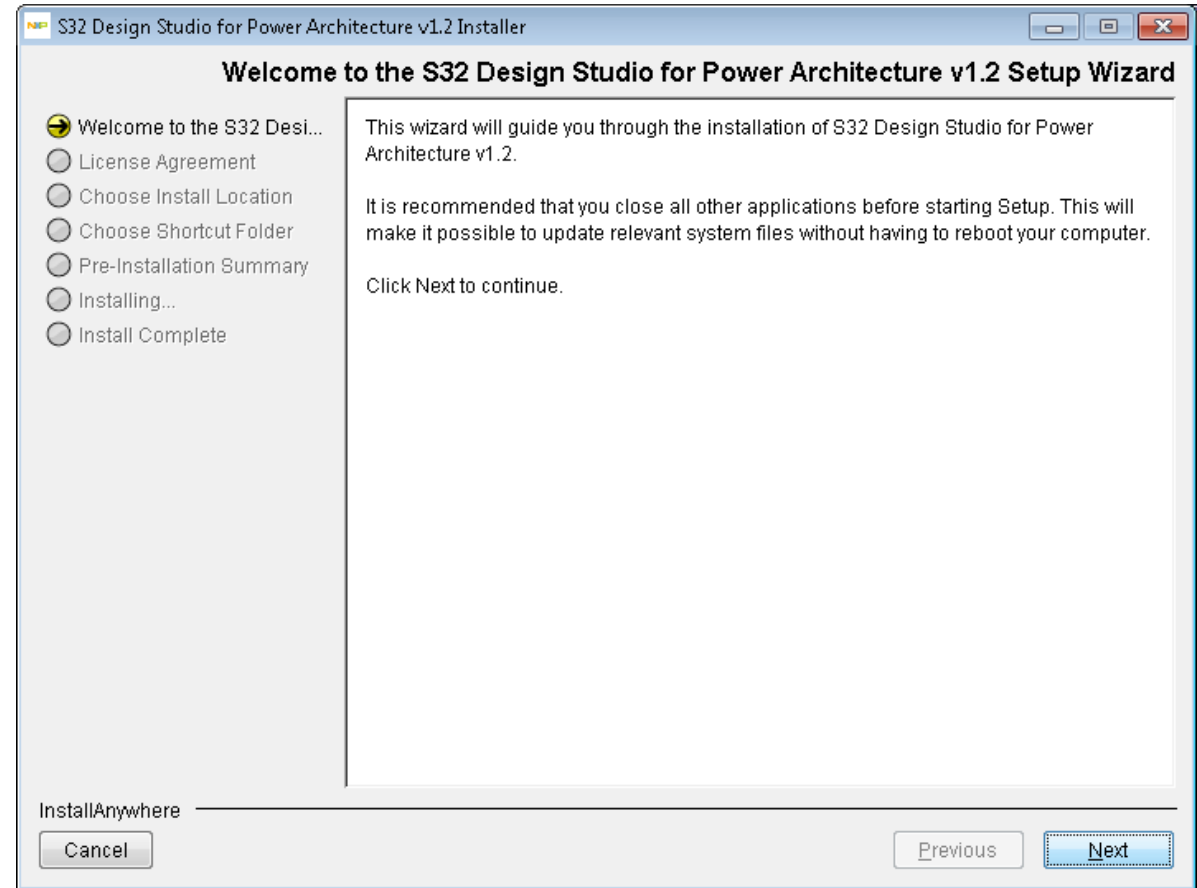
Step-1

- Go to www.nxp.com/S32DS to download latest version of S32DS
- From Downloads folder, run the installation file
- Click on **Run** if any administrative privilege issues result from unknown software publisher
- The “preparing to install” dialogue box will appear



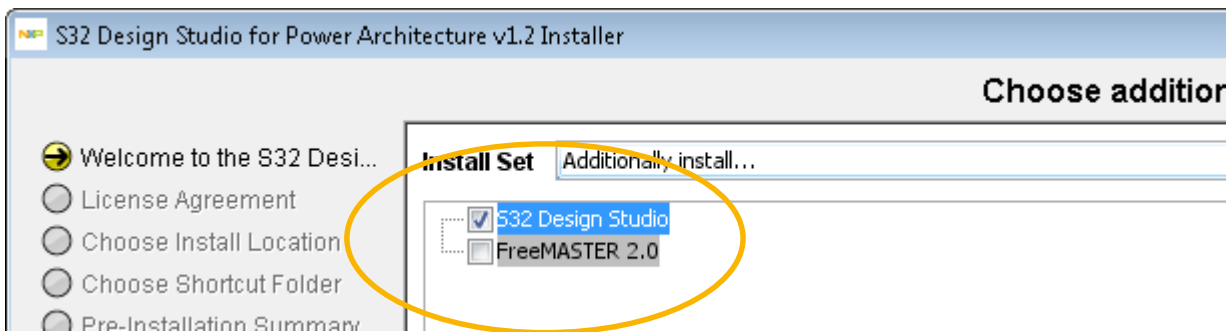
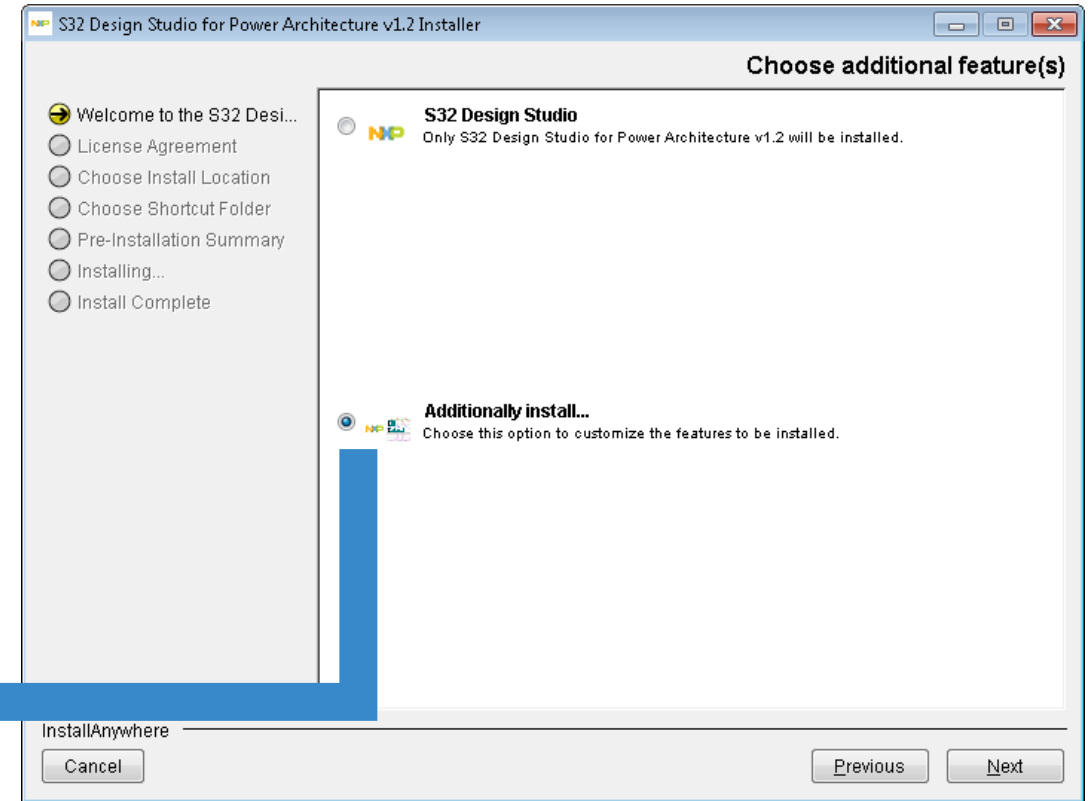
Step-2

- An Installer welcome window will be displayed, click Next to continue



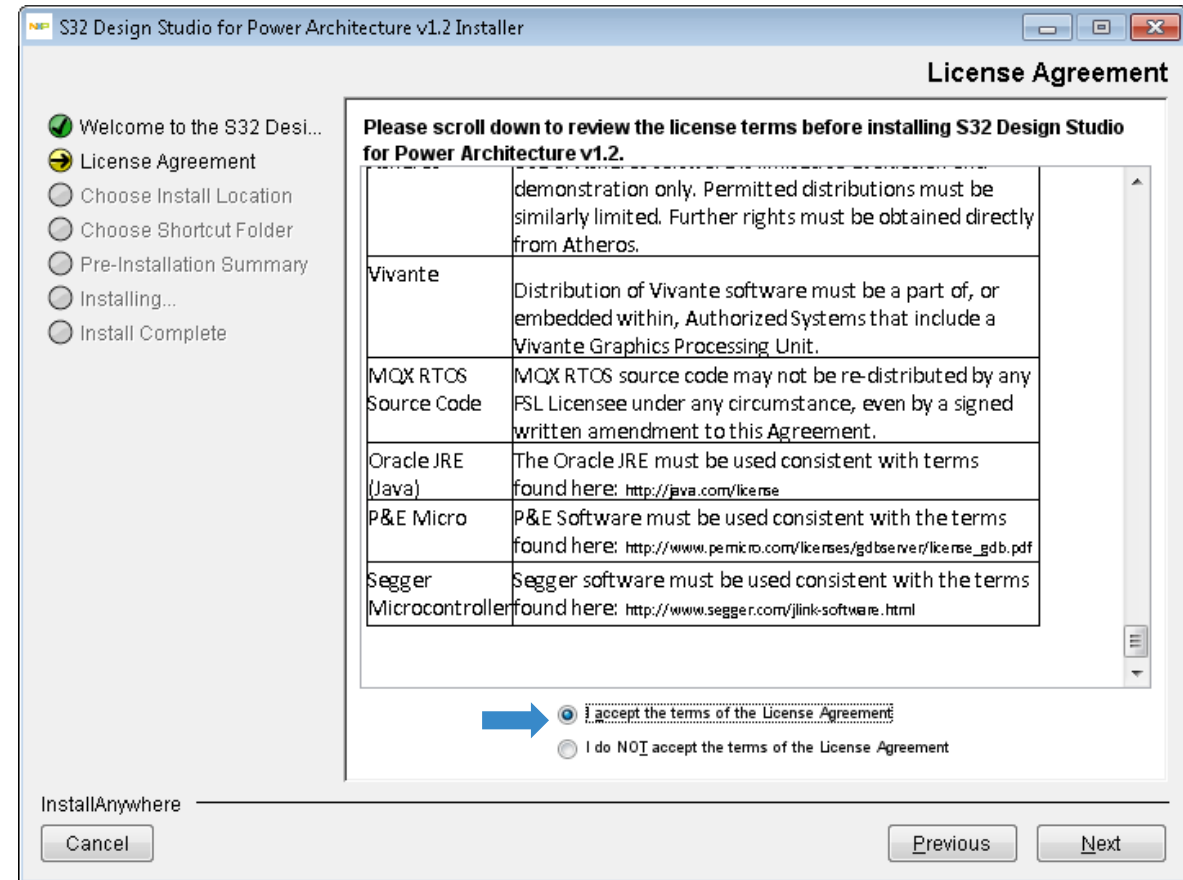
Step-3

- Choose additional Features
 - Selecting “S32 Design Studio” option will only install S32 Design Studio
 - Selecting “Additionally install...” will allow you to install other software too
- Click on Next



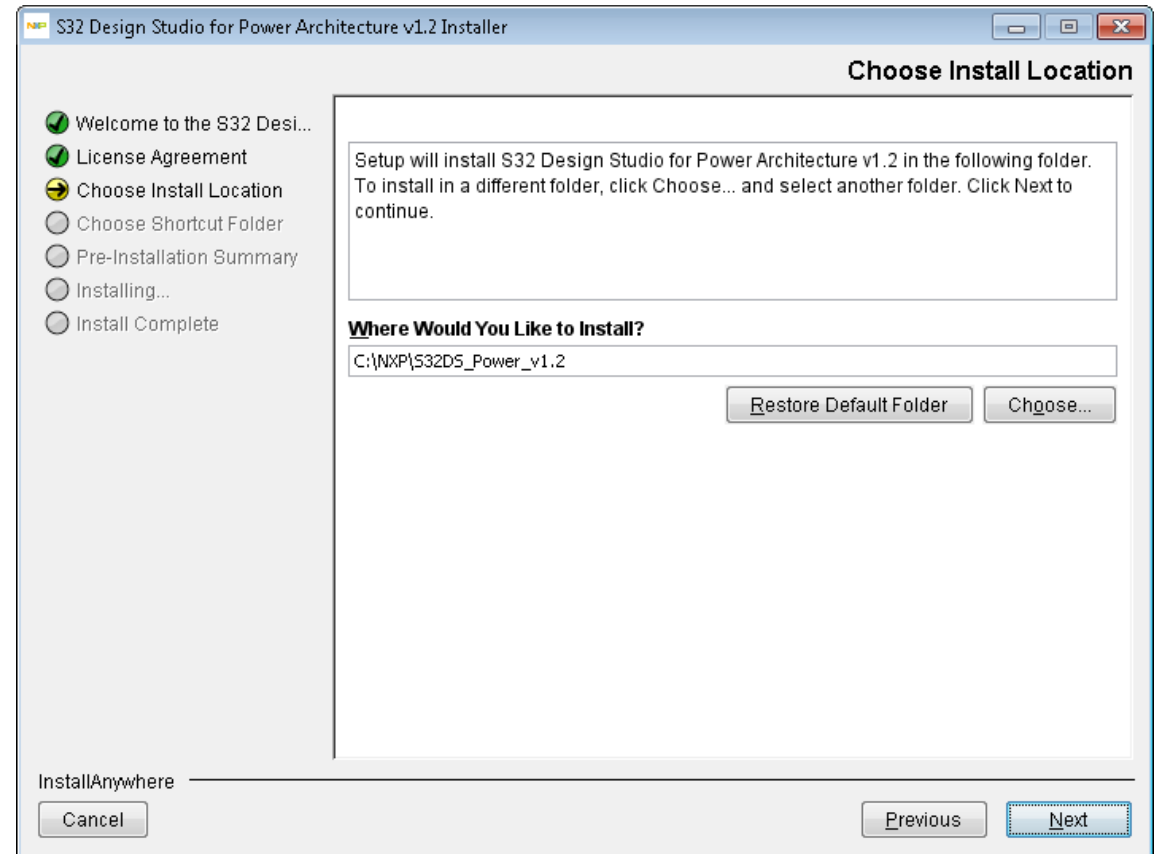
Step-4

- Scroll down the text and read the license agreement.
- Select the radio button acknowledging the license agreement terms and click **Next** to continue.



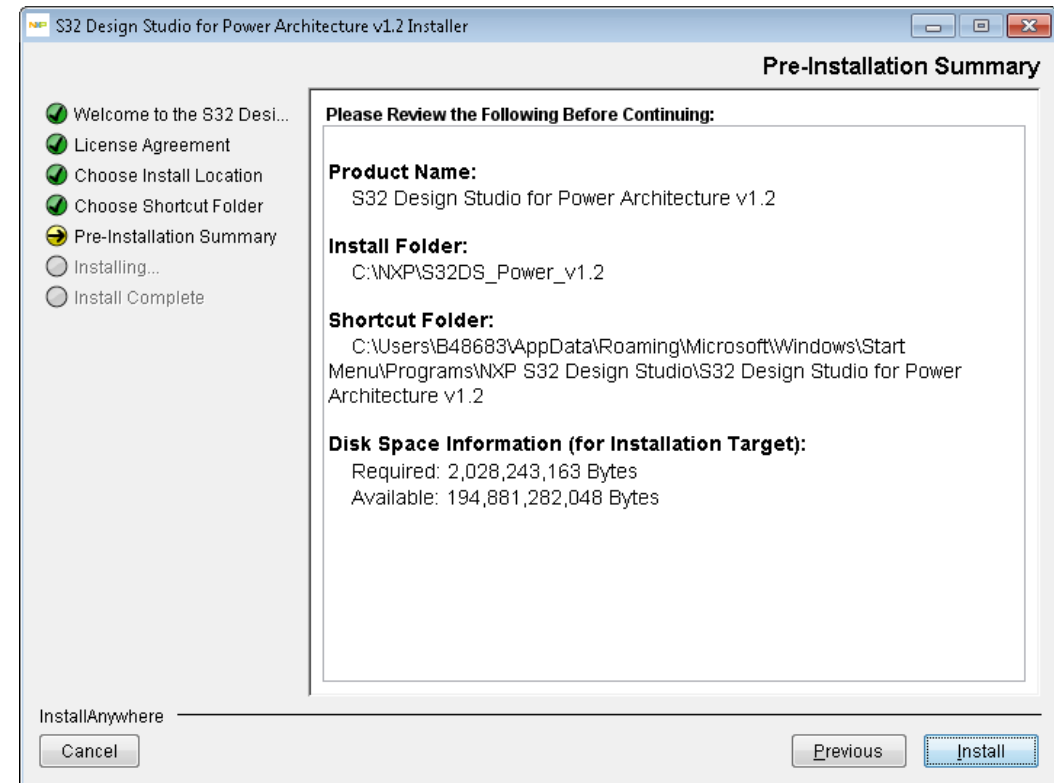
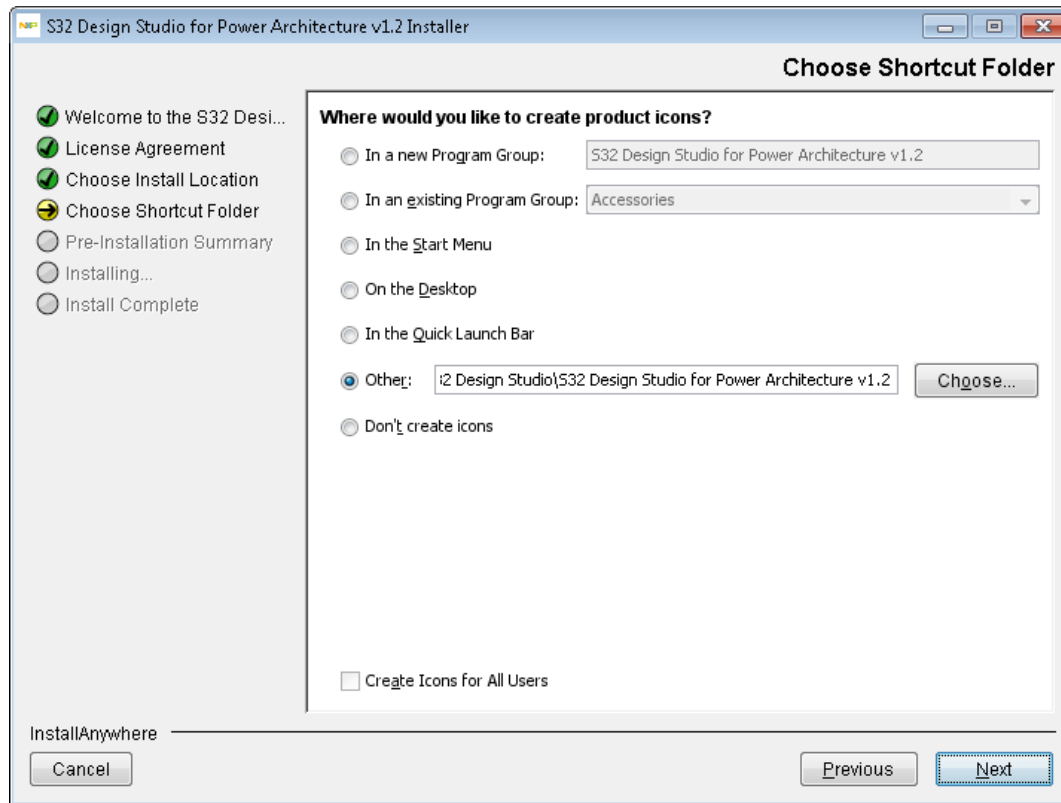
Step-4

- Click **Next** to accept the default installation location (could be changed, but recommended to install into path without spaces).



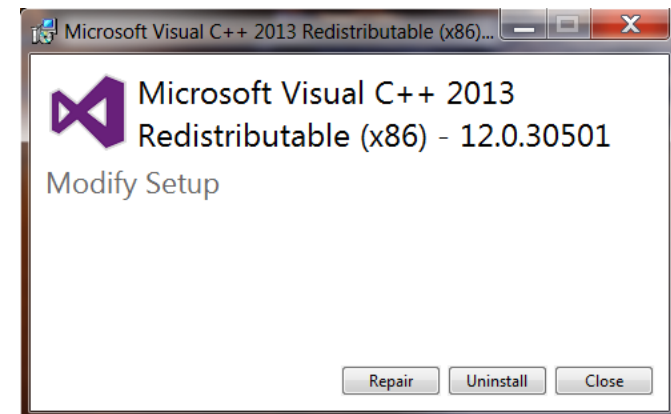
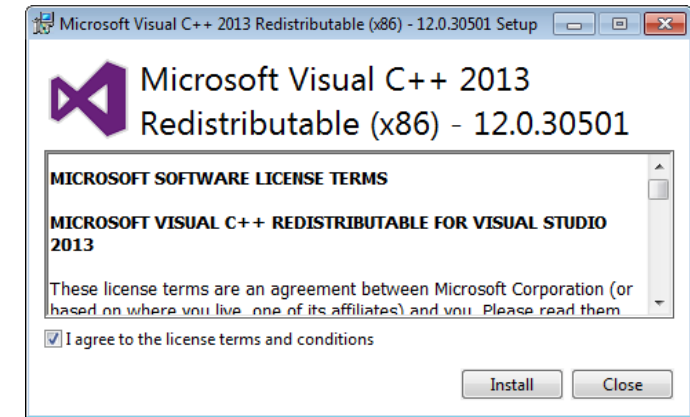
Step-5

- Select folder where you want to generate a Shortcut and click on **Next** to continue.
- Verify settings on “**Pre-Installation Summary**” tab and click **Install** to start Installation



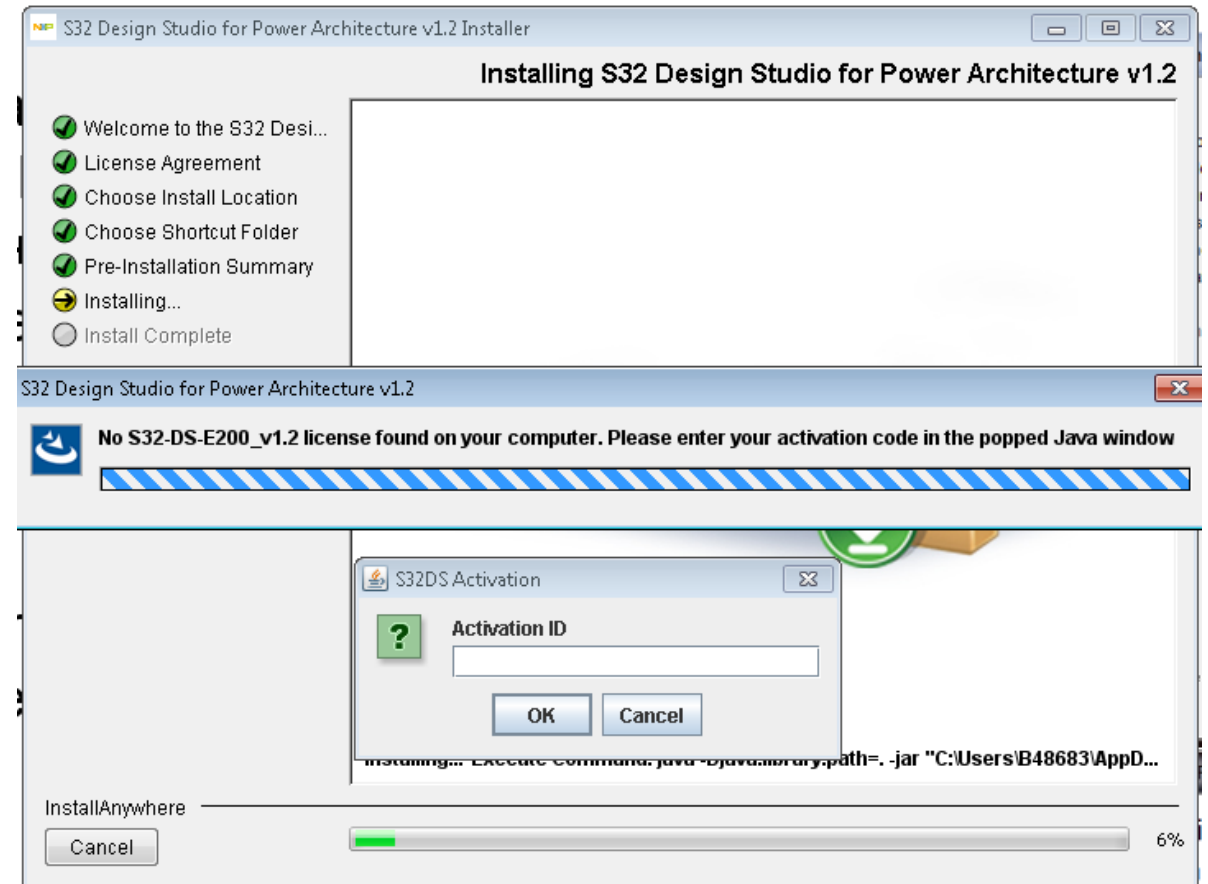
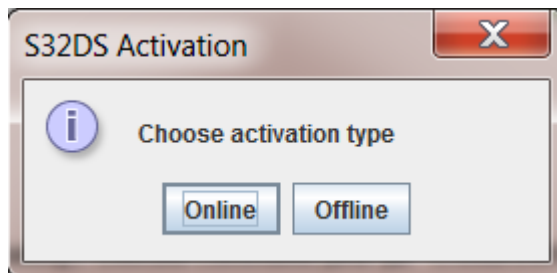
Step-7

- The installation starts by installing required libraries from the Microsoft Visual C++ 2013 package. Read the license terms and select **I agree...** option and hit the **Install**
- If the libraries of the Visual C++ 2013 package were already installed on the system then the **Modify Setup** dialog box appears. Now click on **Repair** to continue



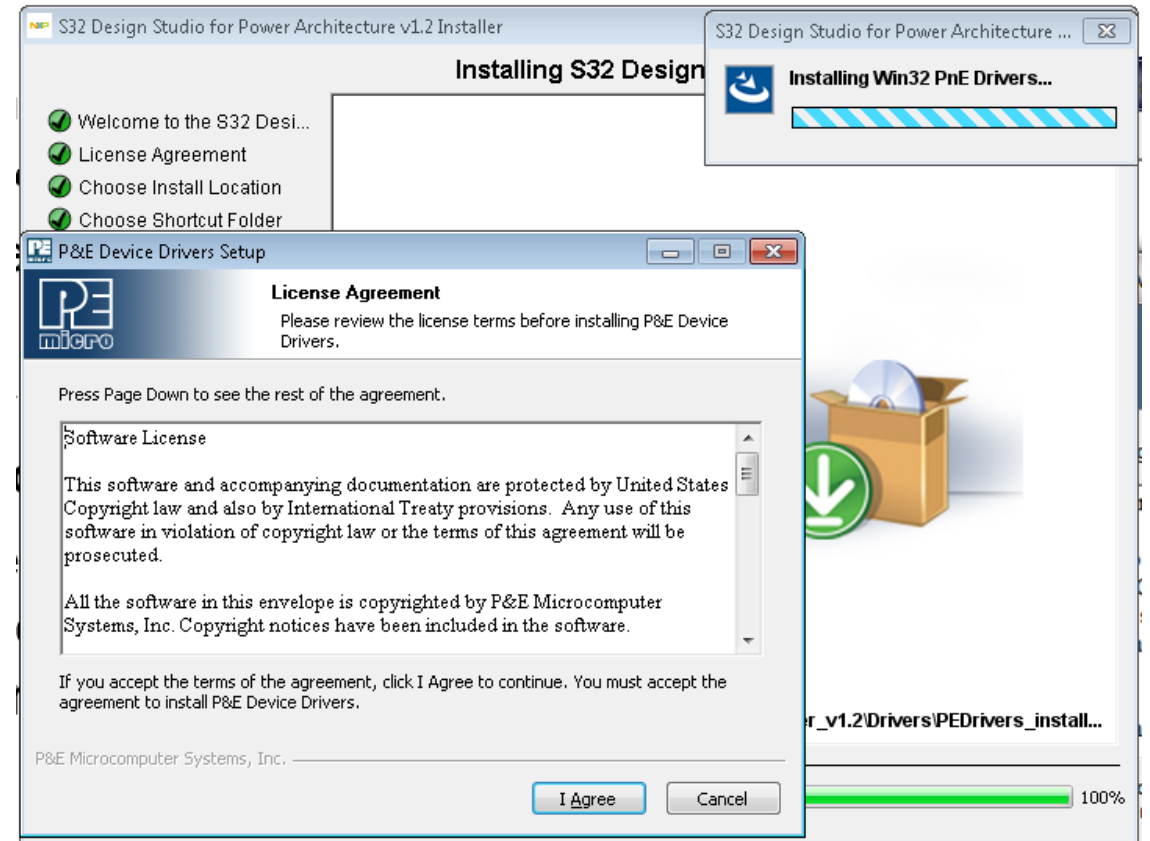
Step-8

- When asked for Activation ID, copy and past the key from the Download page
- Then click on **OK**.
- Next: In activation type window. Click on **Online**



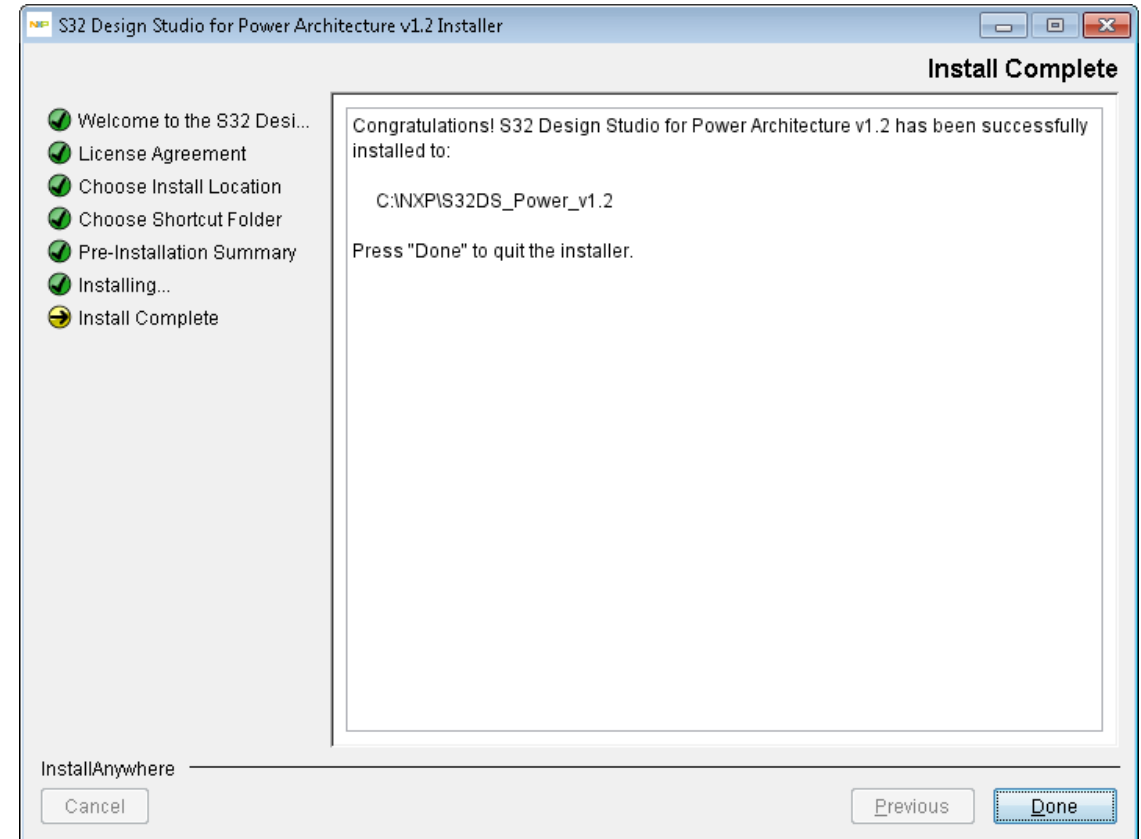
Step-9

- During the Installation it may ask you to install P&E Device Drivers
- Read license agreement and Click on **I Agree**.
- In next window Select the destination folder and click **Install**
- Once the installation is done. Click on **Close** to close the P&E Device Driver Setup window.



Step-10

- Once the installation is completed click on **Done** to exit the installation wizard.



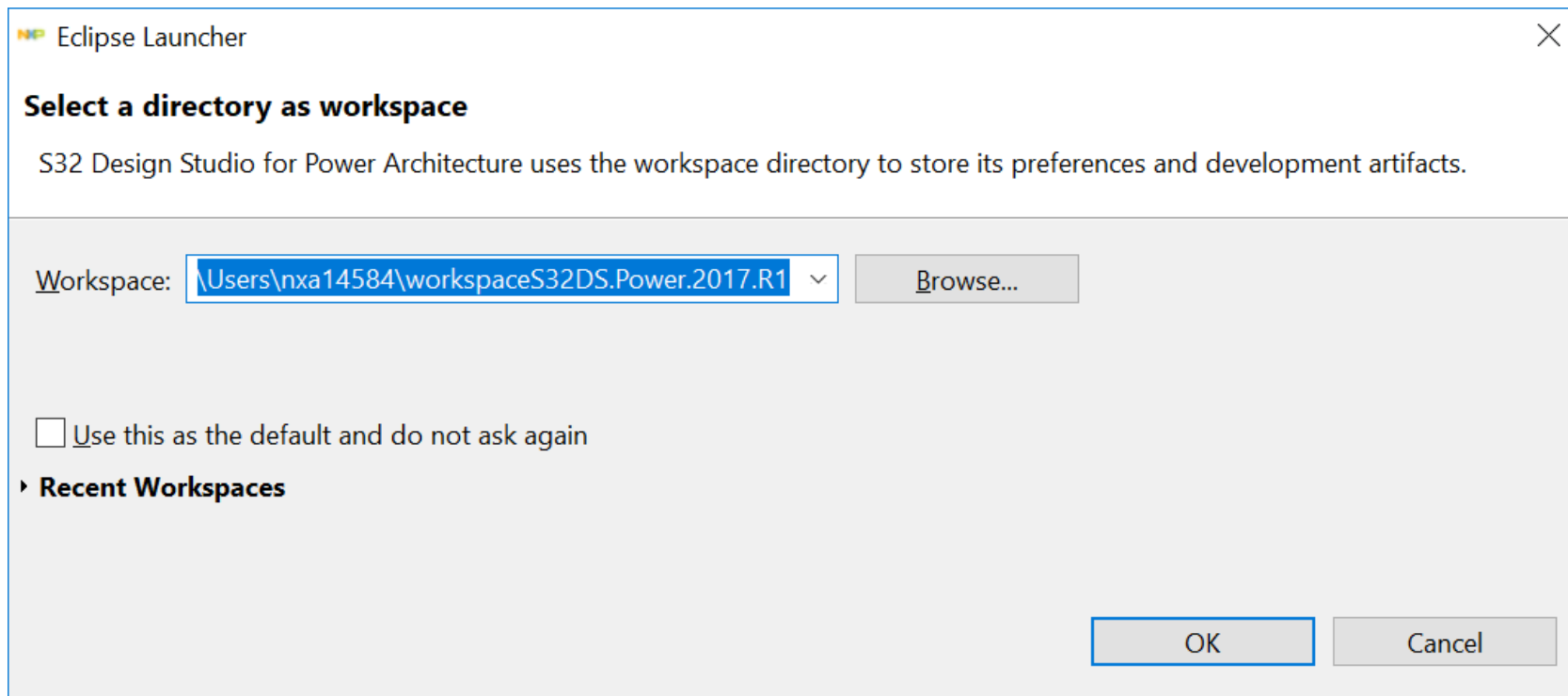
GETTING STARTED WITH A NEW PROJECT



Create a new project

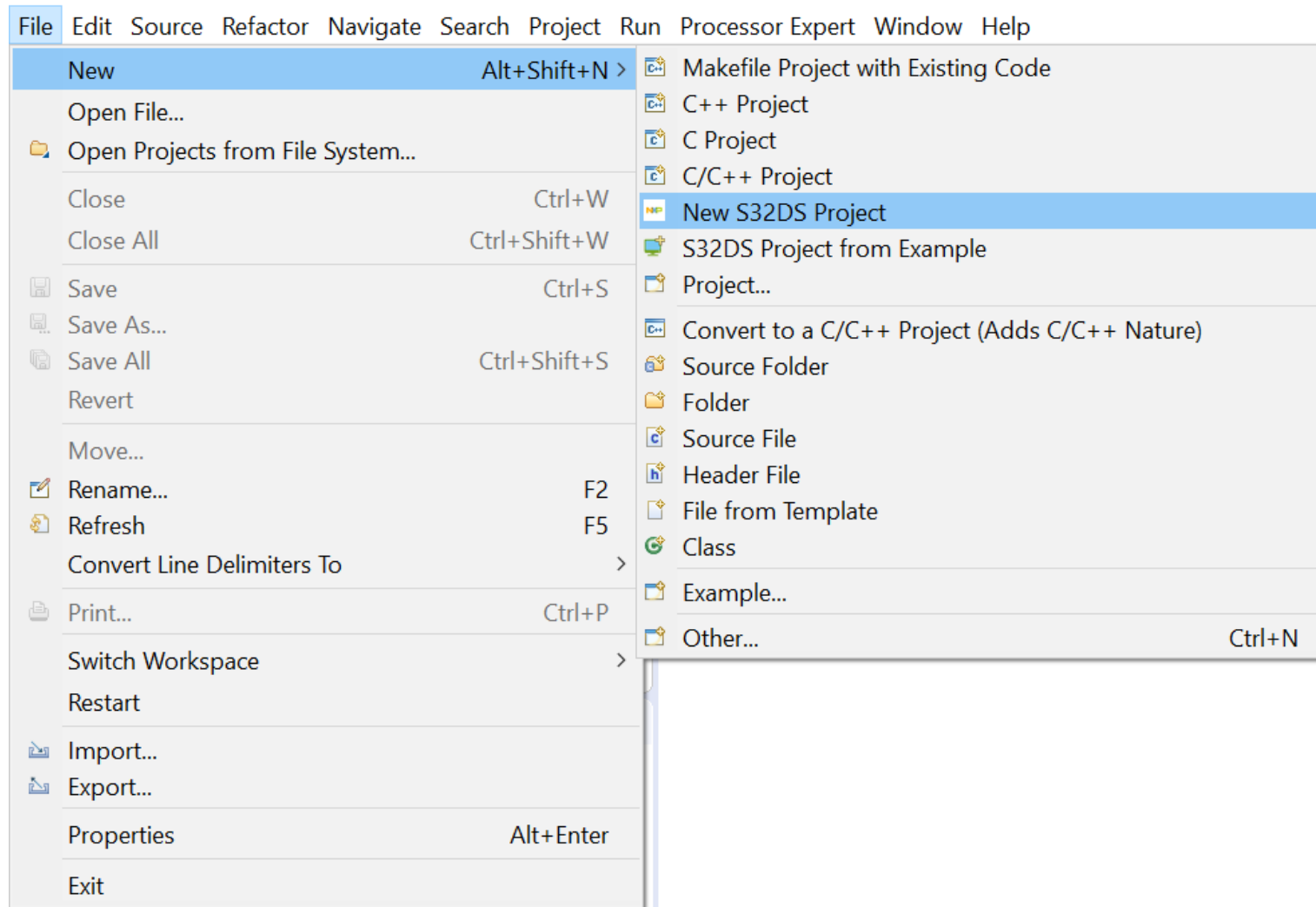
1 of 5

- Start program: Click on “S32 Design Studio for Power Architecture *[version]*” icon
- Select workspace:
 - Choose default or specify new one
 - Suggestion: Uncheck the box “Use this as the default and do not ask again”
 - Click **OK**



Create a new project

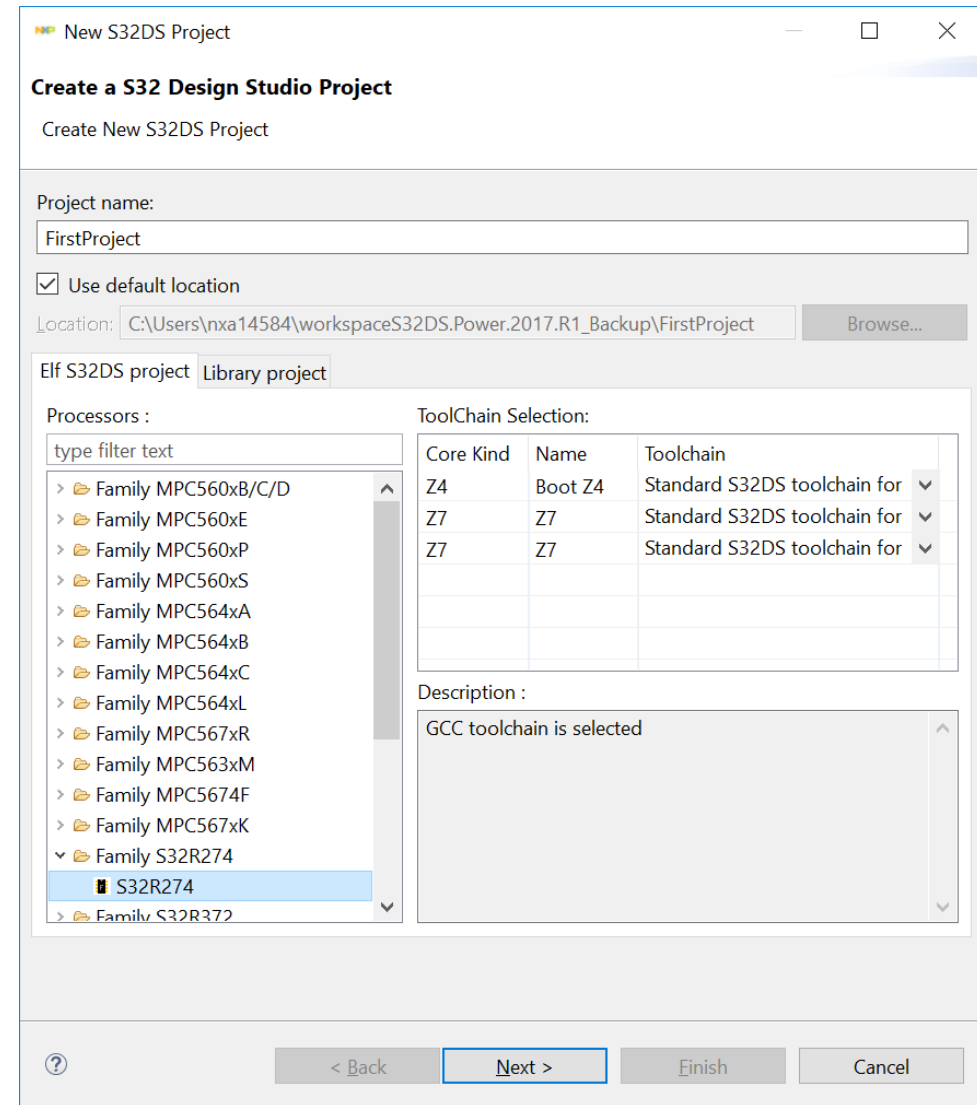
- Go to: File – New – New S32DS Project



Create a new project

3 of 5

- Project Name:
 - Example: FirstProject
- Project Type:
 - Recommended: use Elf S32DS Project
- Select Controller:
 - Example: S32R274



Create a new project

- Select cores
- Select Flash and RAM size
- Select Programming Language
- Select the Library
- Select the Debugger
- Recommended: use Default settings (for beginners)

4 of 5

New S32DS Project

New S32DS Project for S32R274

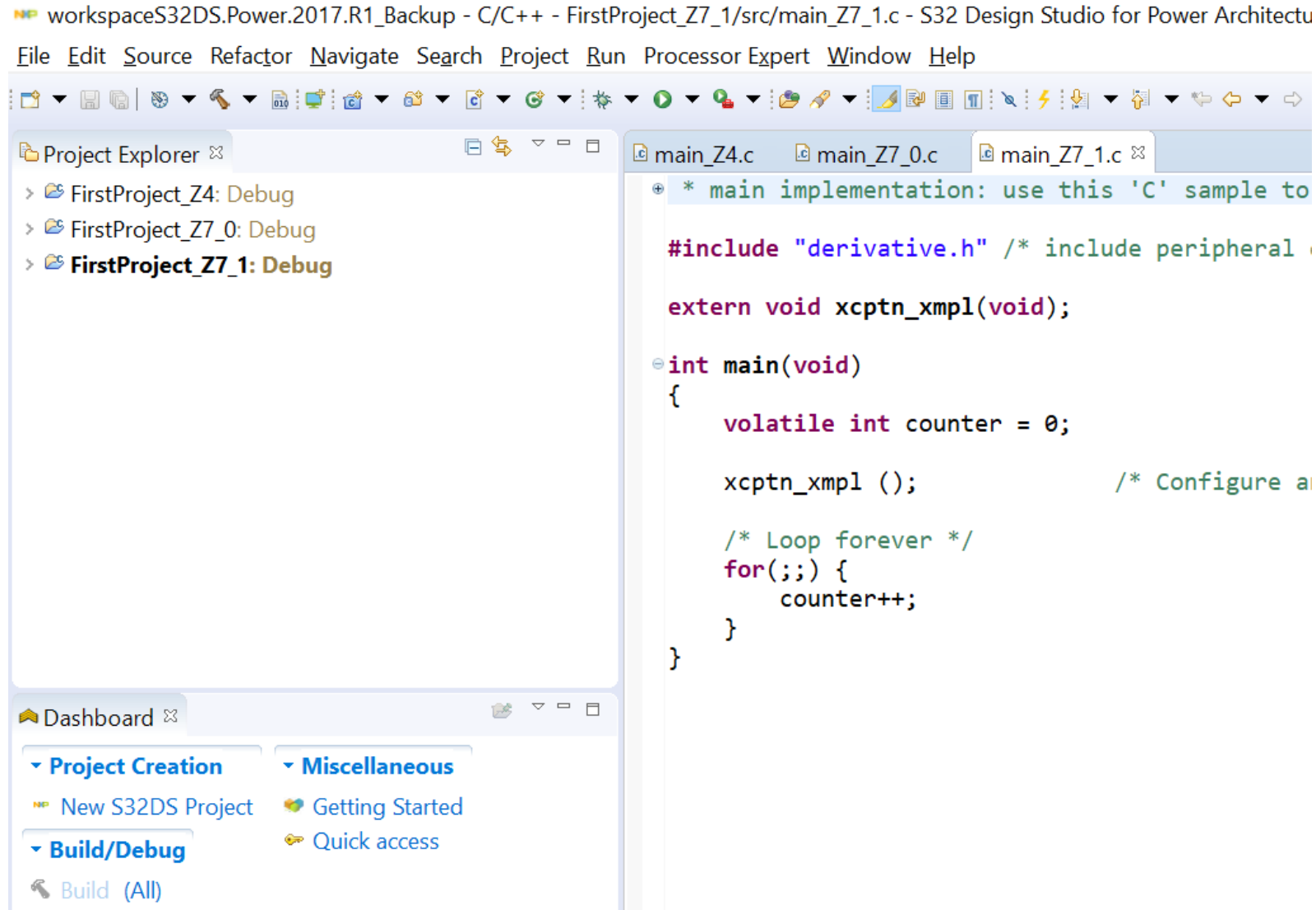
Select required cores and parameters for them.

	FirstProject_Z4	FirstProject_Z7_0	FirstProject_Z7_1
Project Name	FirstProject_Z4	FirstProject_Z7_0	FirstProject_Z7_1
Core	<input checked="" type="checkbox"/> Boot Z4	<input checked="" type="checkbox"/> Z7	<input checked="" type="checkbox"/> Z7
FLASH Start Address	0x1000000	0x1080000	0x1100000
FLASH Size, KB	512	512	512
Unused FLASH, KB	0		
RAM Start Address	0x40000000	0x4006a800	0x400d5000
RAM Size, KB	426	426	426
Unused RAM, KB	2		
Language	C	C	C
SDKs
Library	EWL	EWL	EWL
Debugger	PE Micro GDB server		
Enable Graph for SPT2	<input type="checkbox"/>		

? < Back Next > Finish Cancel

Create a new project

5 of 5

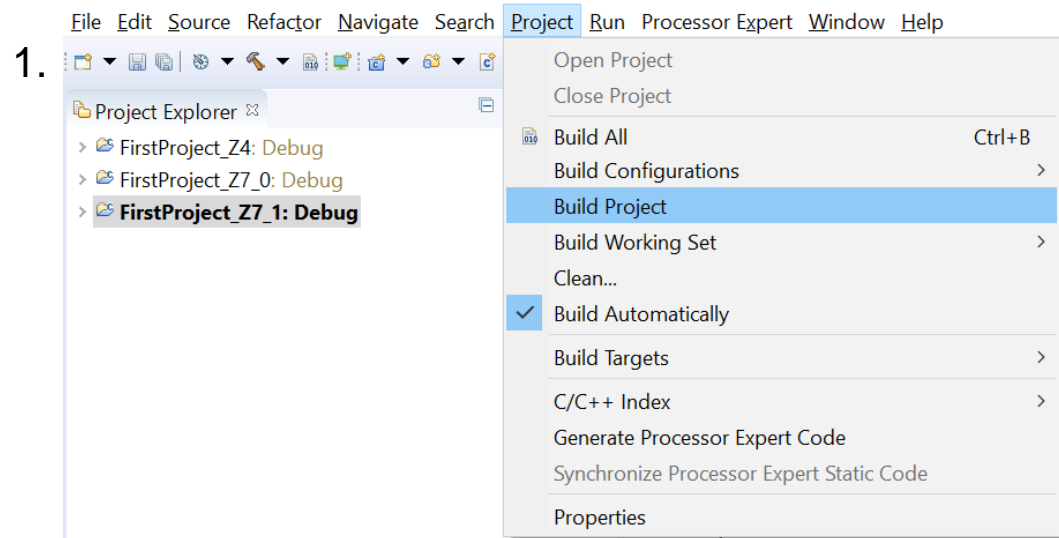



- A project will be created for every core the device has.
- S32R274 has three



Build a Project

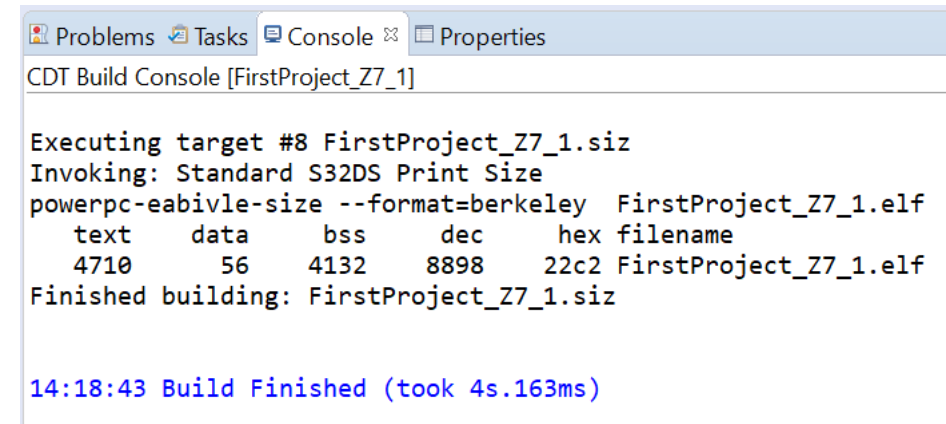
- To build a project follow one of the methods below:
- If project is built successfully, following message will be displayed on the Console



2.  Click on hammer symbol to build that project

 - Click on page symbol to build all projects

Console




```
CDT Build Console [FirstProject_Z7_1]

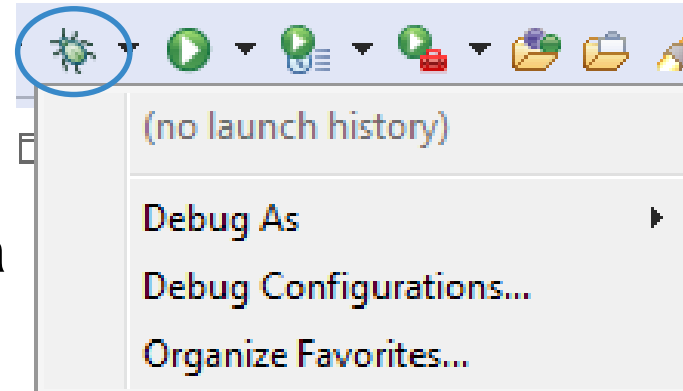
Executing target #8 FirstProject_Z7_1.siz
Invoking: Standard S32DS Print Size
powerpc-eabivle-size --format=berkeley FirstProject_Z7_1.elf
  text  data  bss   dec   hex filename
  4710   56   4132  8898  22c2 FirstProject_Z7_1.elf
Finished building: FirstProject_Z7_1.siz

14:18:43 Build Finished (took 4s.163ms)
```

Debug a Project

1 of 4

- Connect a debugger to both, the board and the PC
 - S32R274RRUEVB supports JTAG. Use a JTAG debugger such as P&E Micro USB Multilink
- Click on arrow in the  icon
- And Open [Debug Configurations...](#)

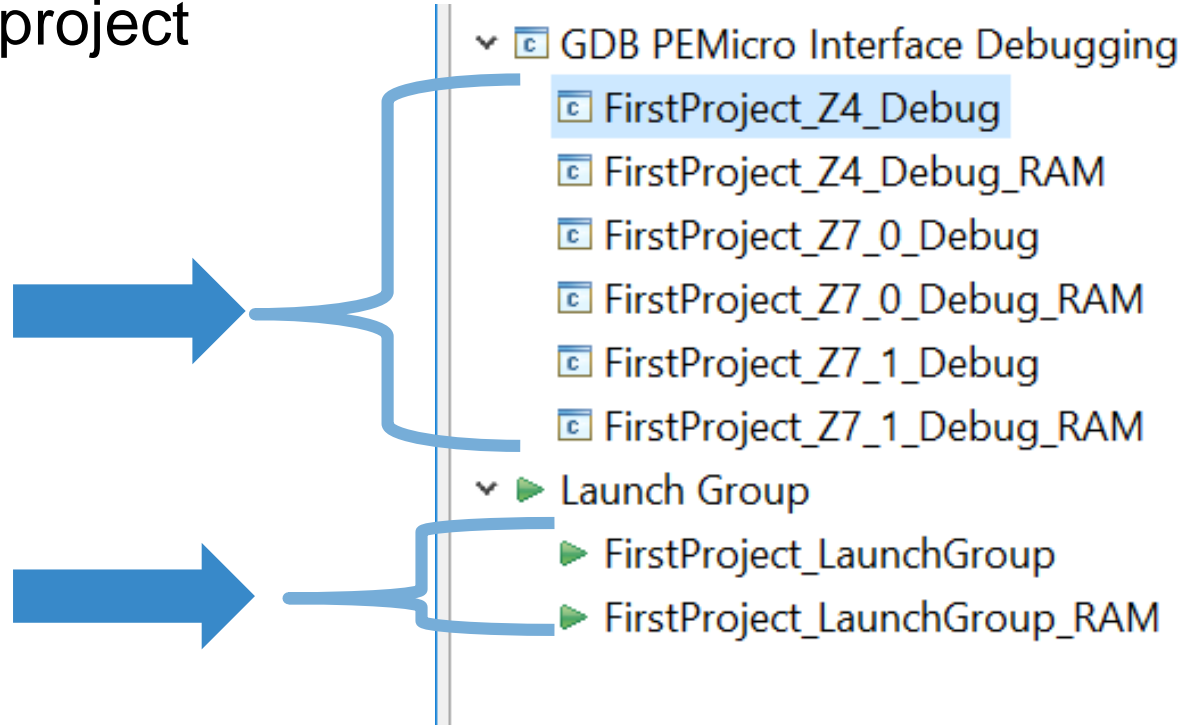


Debug a Project

- Each core is represented by a project

- Debug each core individually
OR

- All cores at once



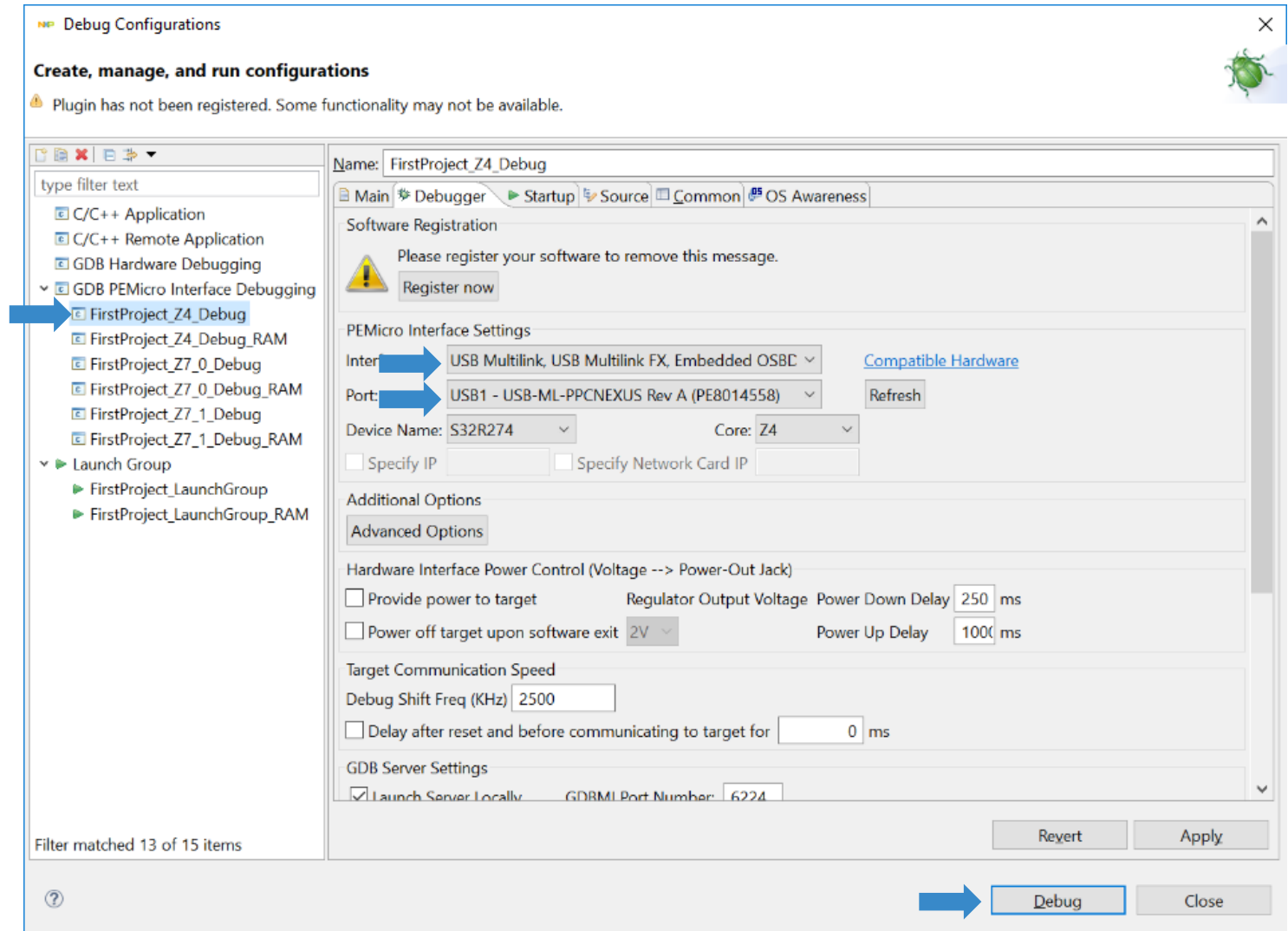
- Debug = Program to Flash

- Debug_RAM = Program to RAM (more on this later)

Debug a Project (Single Core)

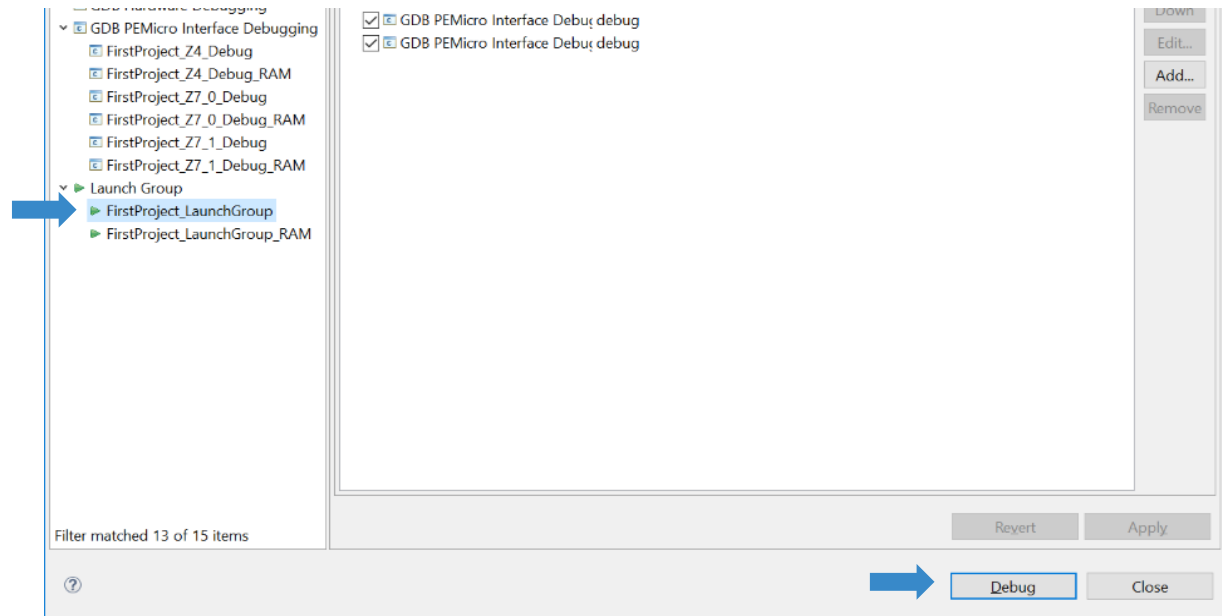
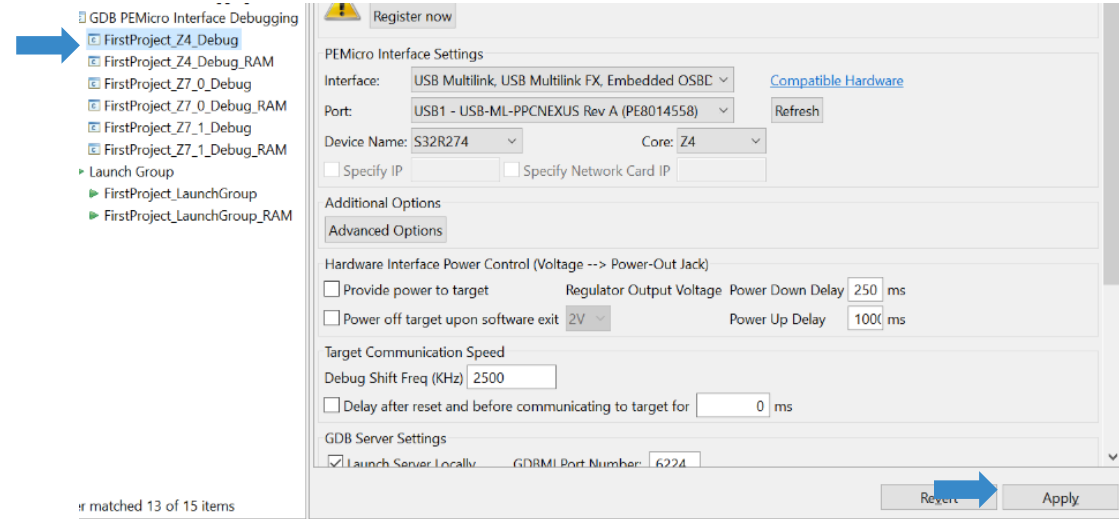
3 of 4

- Select Project:
 - Example: FirstProject_Z4_Debug
- Select Interface:
 - Example: USB Multilink
- Click on **Debug** to start debugging



Debug a Project (All Cores)

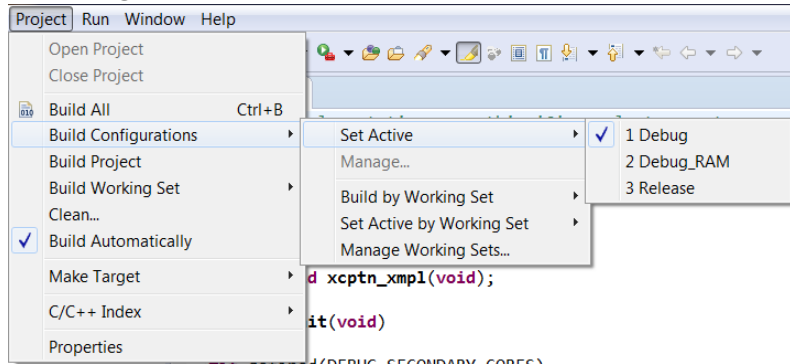
- Select boot core project:
 - Example:
FirstProject_Z4_Debug
- Configure port and interface like with single core debug
- Click **Apply**
- Select launch group:
 - Example:
FirstProject_LaunchGroup
- Click on **Debug** to start debugging



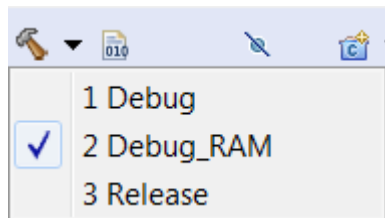
Debug a Project from RAM

- Firstly, Configure a project to debug from RAM
Follow one of the Steps:

1. Project – Build Configurations – Set Active – Debug_RAM

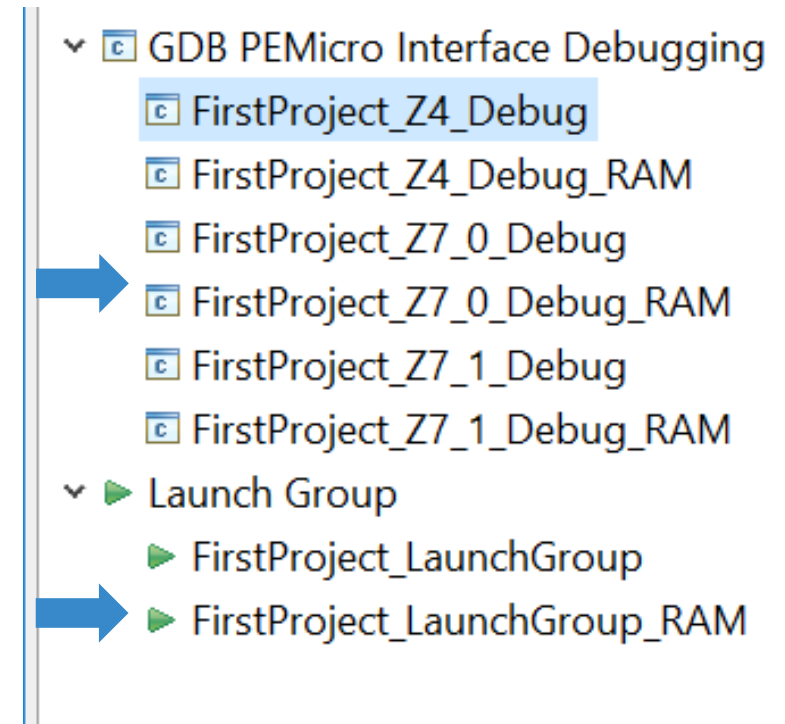


2. Select Debug_RAM by clicking Down Arrow next to hammer



- Repeat above for all related projects.
- Follow the steps shown on “Build a Project” Page

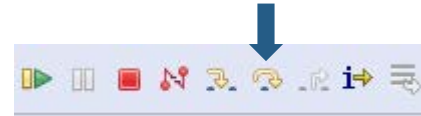
- Lastly, to debug from RAM select the RAM related session/launch group while debugging



- Follow the Steps shown on Debug a Project pages

Debug Basics: Step, Run, Suspend, Resume

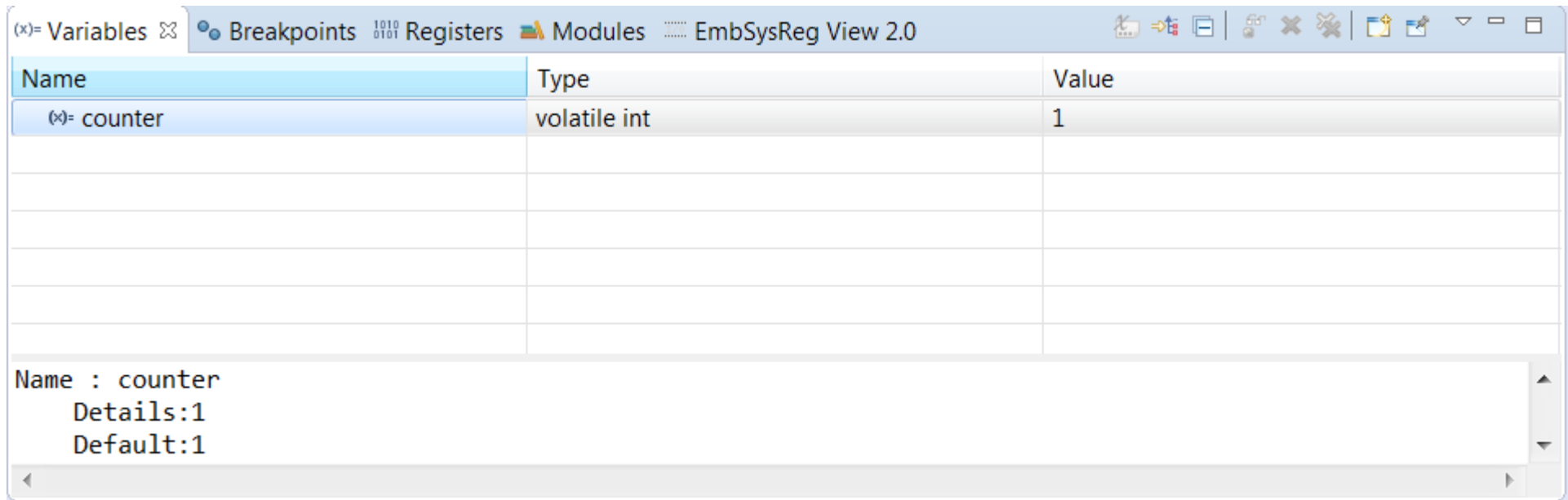
- Step Into (F5)
- Step Over (F6)
- Run
- Suspend
- Resume (F8)
- Terminate (Ctrl+F2)



Debug Basics: View & Alter Variables

1 of 2

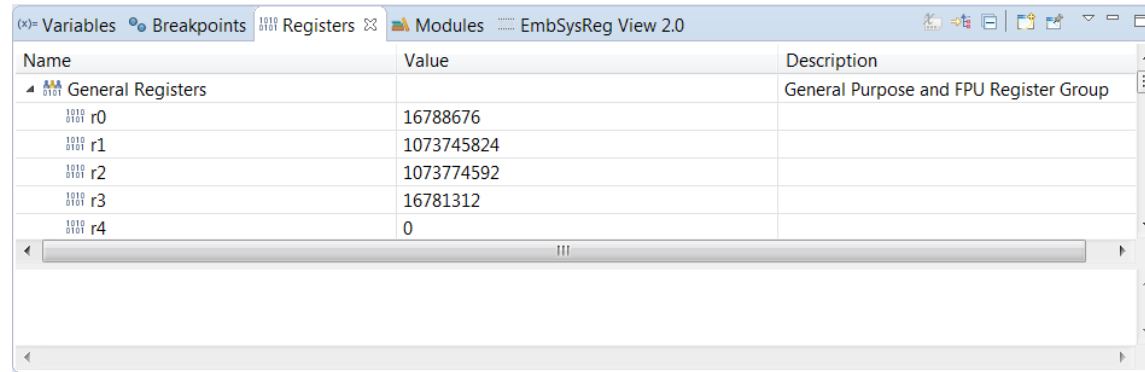
- View variables in “Variables” tab.
- Click on a value to allow typing in a different value.



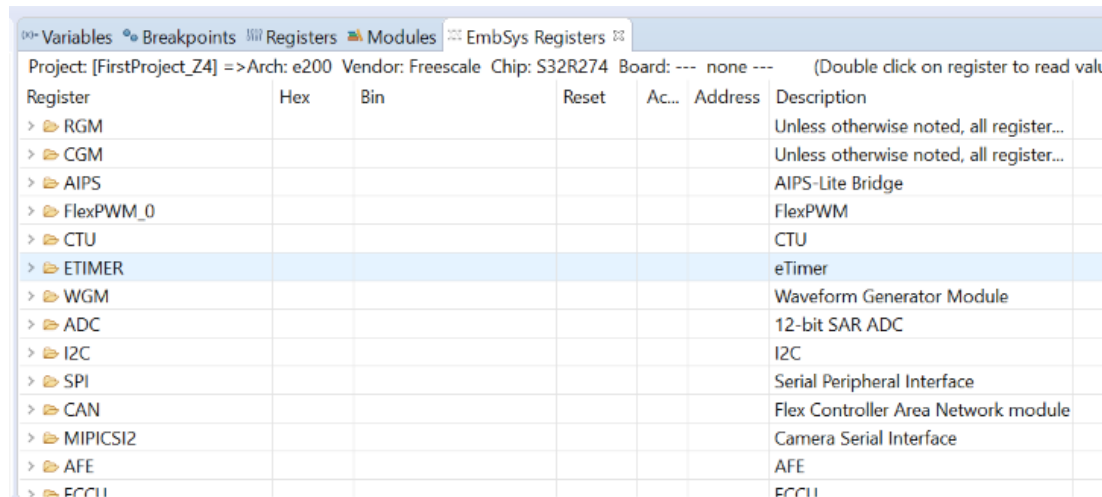
Debug Basics: View & Alter Registers

2 of 2


- View CPU registers in the “Registers” tab
- Click on a value to allow typing in a different value

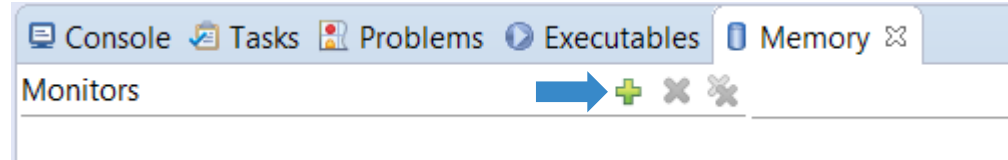


- View peripheral registers in the EmbSysReg tab

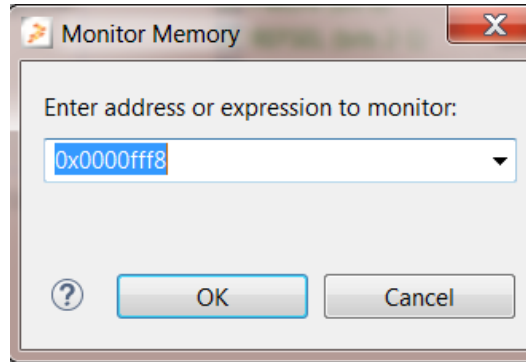


Debug Basics: View Memory

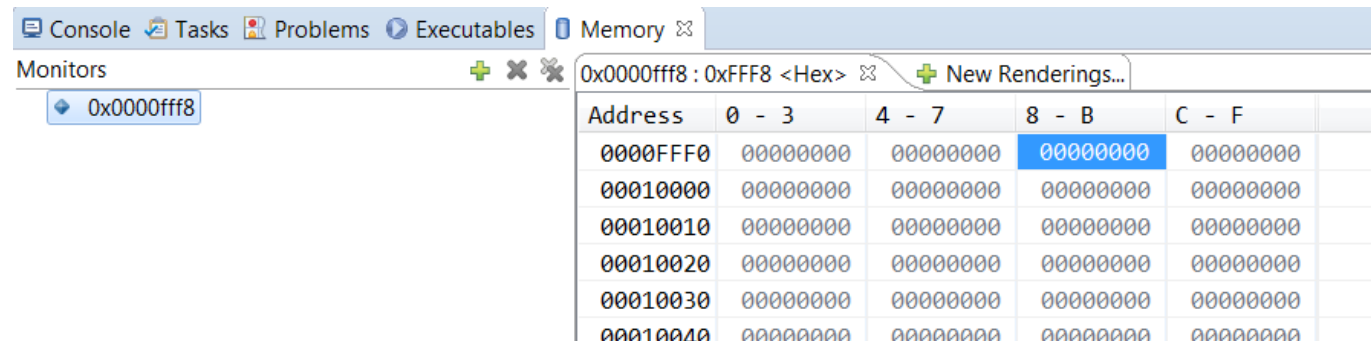
- Add Memory Monitor
 - Click on  icon



- Select Base Address
 - Example : 0x0000fff8

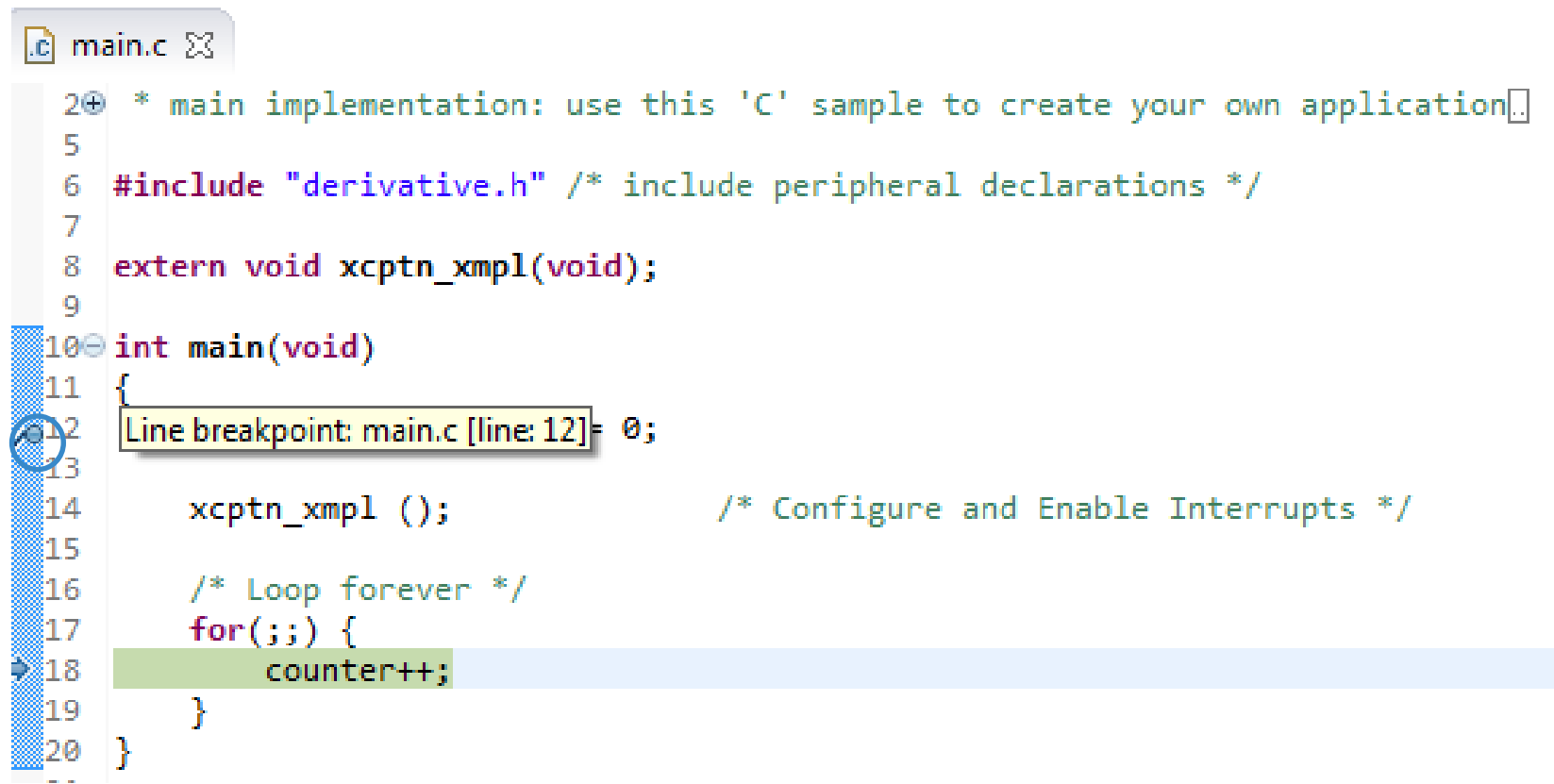


- View Memory



Debug Basics: Breakpoints

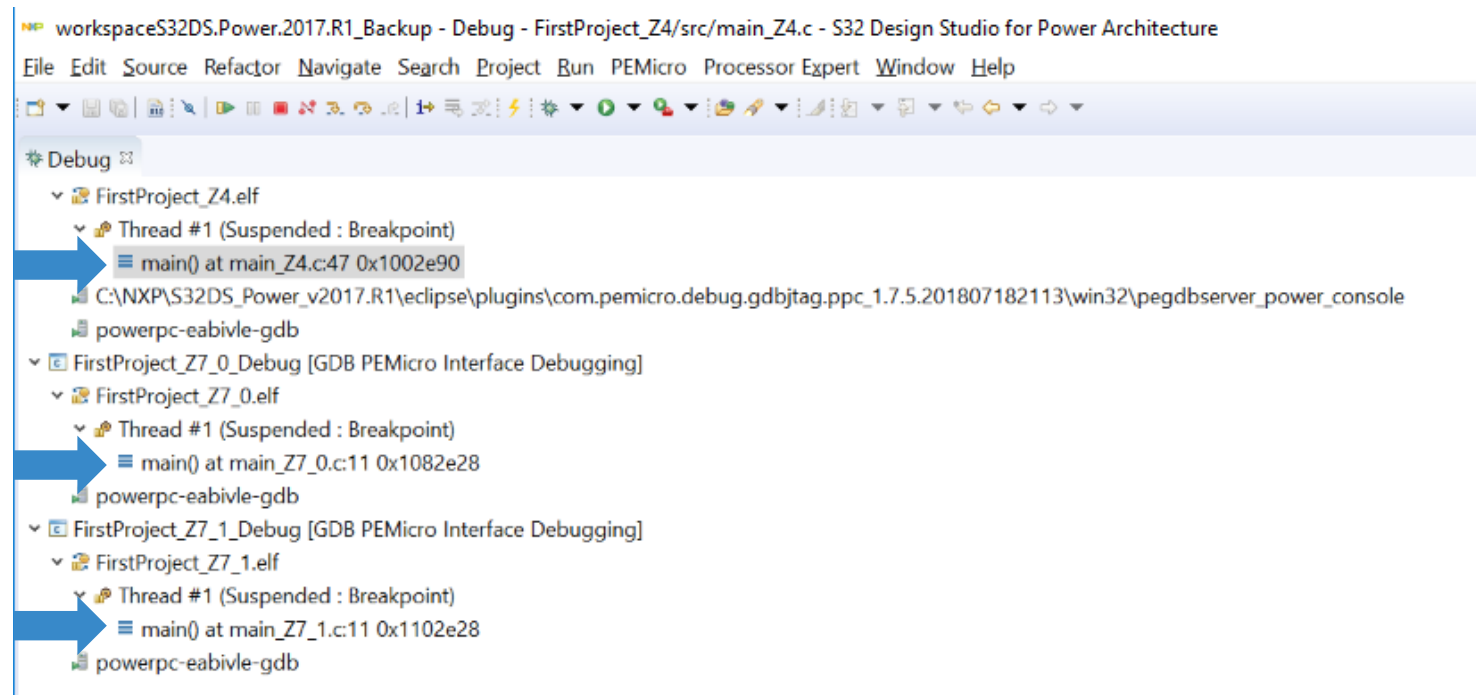
- Add Breakpoint: Point mouse pointer at circled area and Double Click there
 - Light blue dot will pop up that represents debugger breakpoint



```
.c main.c X
2⊕ * main implementation: use this 'C' sample to create your own application.
5
6 #include "derivative.h" /* include peripheral declarations */
7
8 extern void xcptn_xmpl(void);
9
10⊖ int main(void)
11 {
12 Line breakpoint: main.c [line: 12] = 0;
13
14     xcptn_xmpl ();          /* Configure and Enable Interrupts */
15
16     /* Loop forever */
17     for(;;) {
18     counter++;
19     }
20 }
```

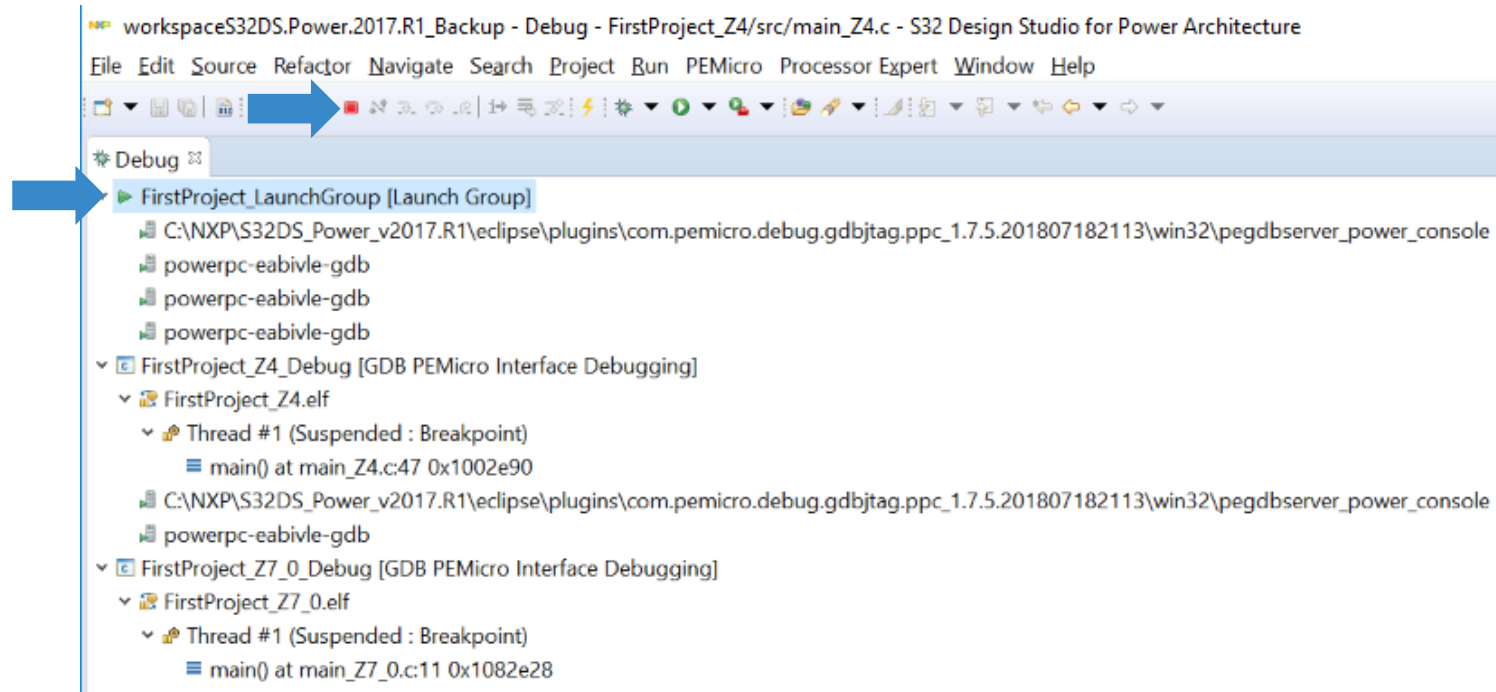

Switching Context (Multicore Debug)

- When debugging multiple cores, each core project creates its own debug context which shows what each particular core is executing
- Debug controls only affect the current selected context
- Switch between the contexts in the *Debug* window



Terminating a Session (Multicore Debug)

- To terminate debug on all cores at once, go to `<Project_Name>_LaunchGroup` in the *Debug* window
- Click on the “terminate” icon
- All cores will close at the same time

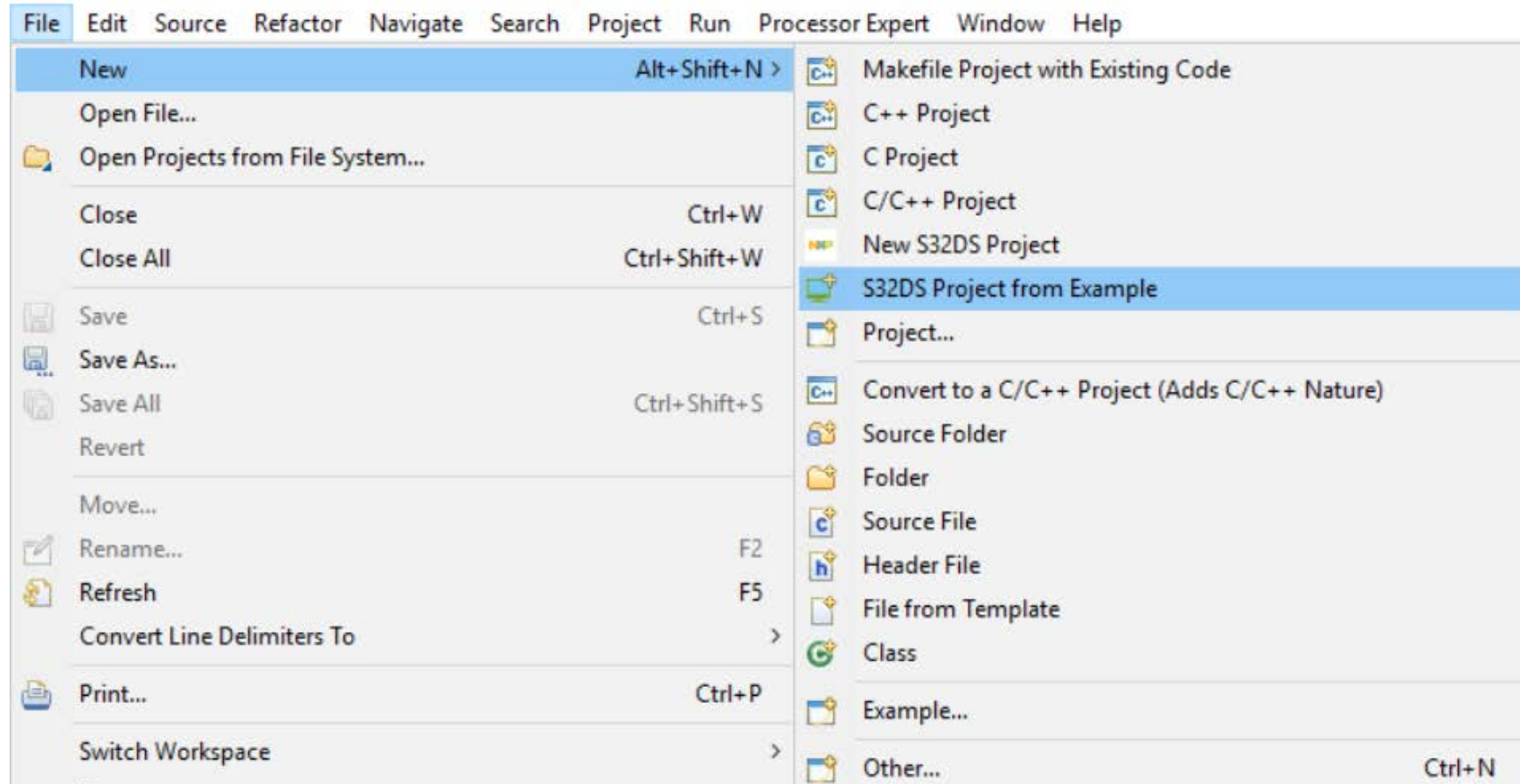


MAKING PROJECTS FROM BUILT-IN EXAMPLES



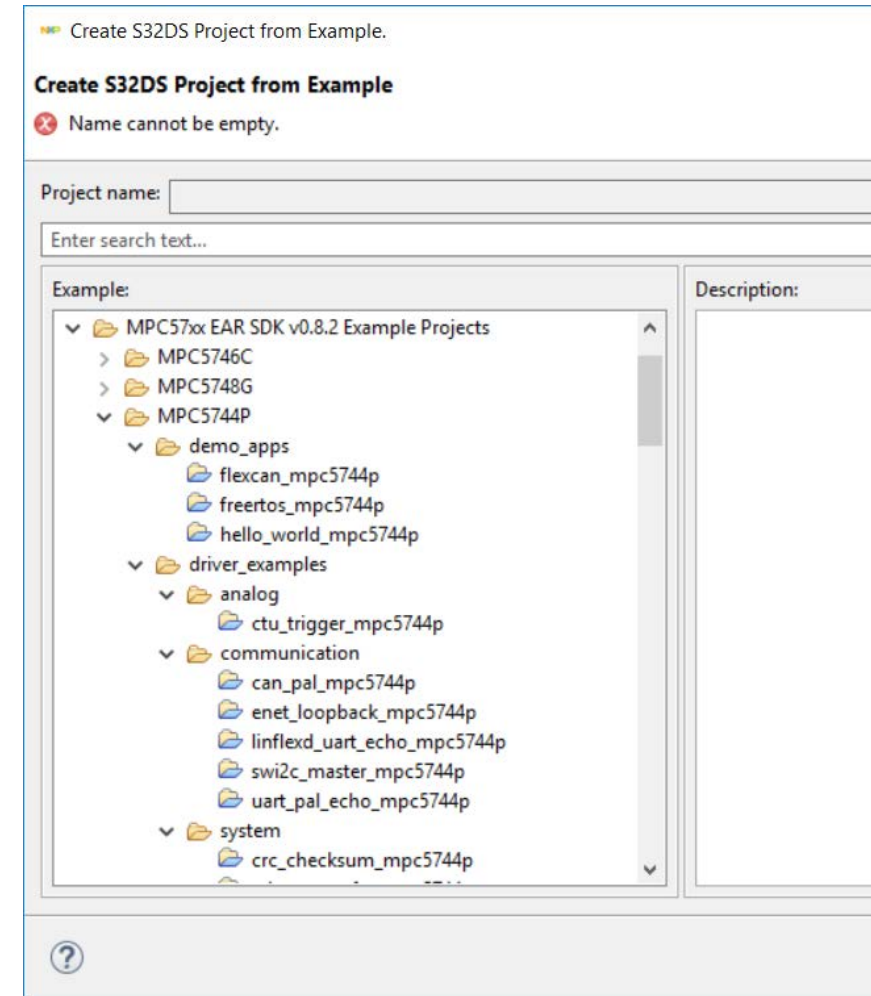
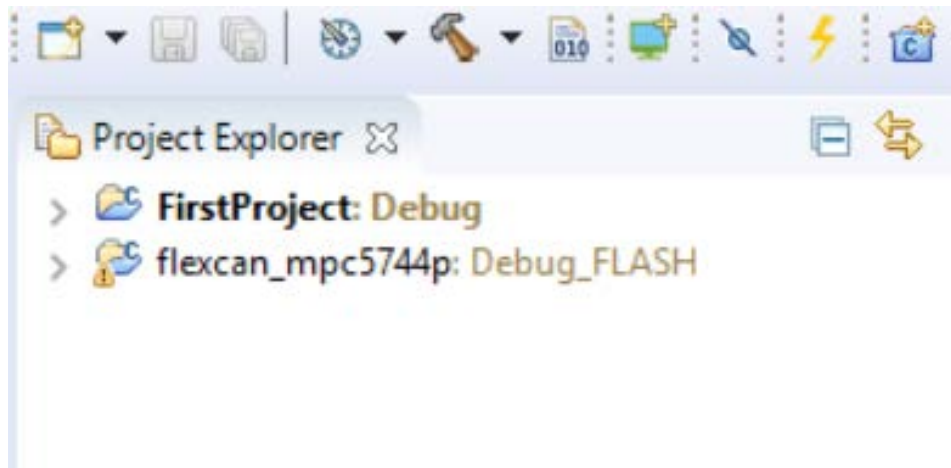
Step-1

- Go to: File – New – New S32DS Project from Example



Step-2

- Select the built-in project of your choice*
- Click on **Finish**
- Project will be copied to the active workspace as shown below



*As of time of writing (Aug 2018), S32R prebuilt examples not included. S32R274 SDK support will be released Q3 2018. Screenshots use MPC5744P.

IMPORTING PROJECTS



Step-1

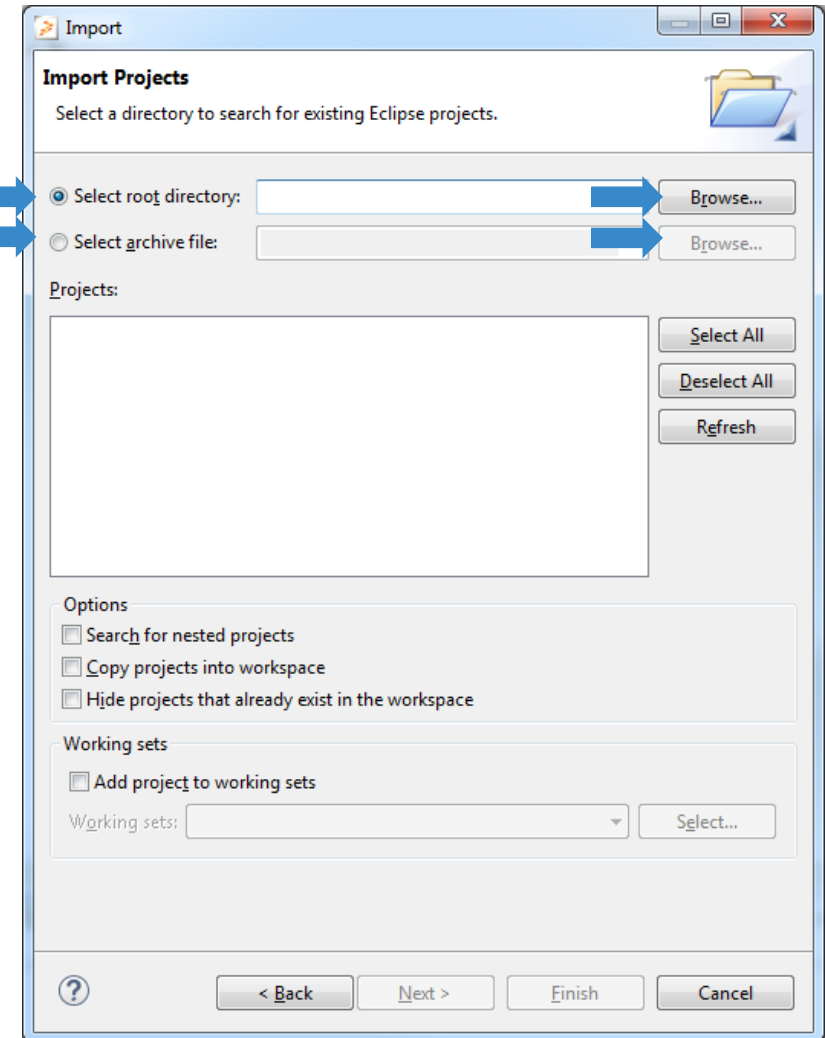
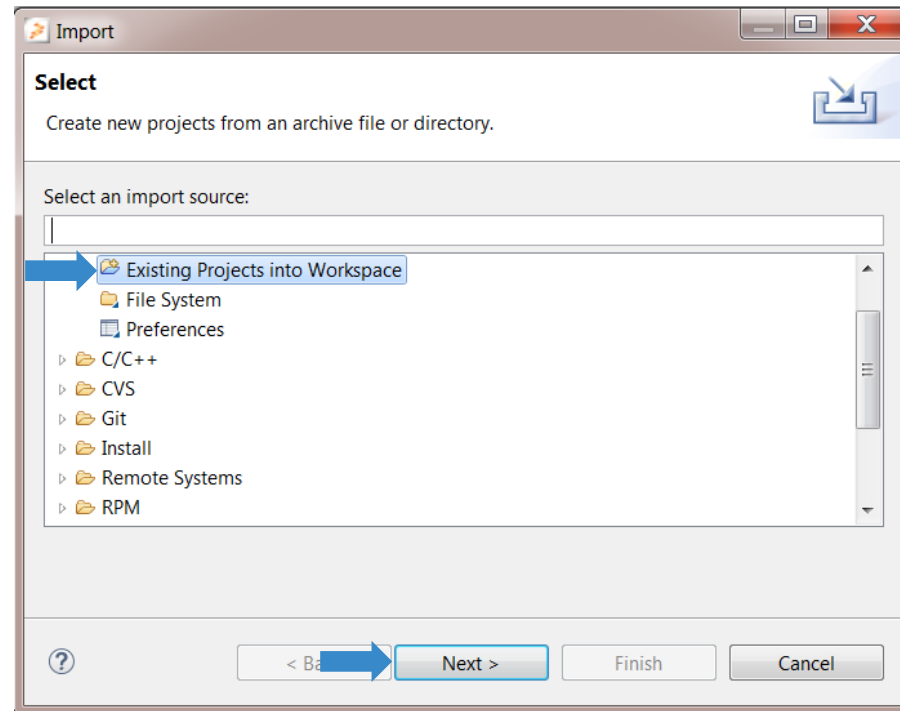
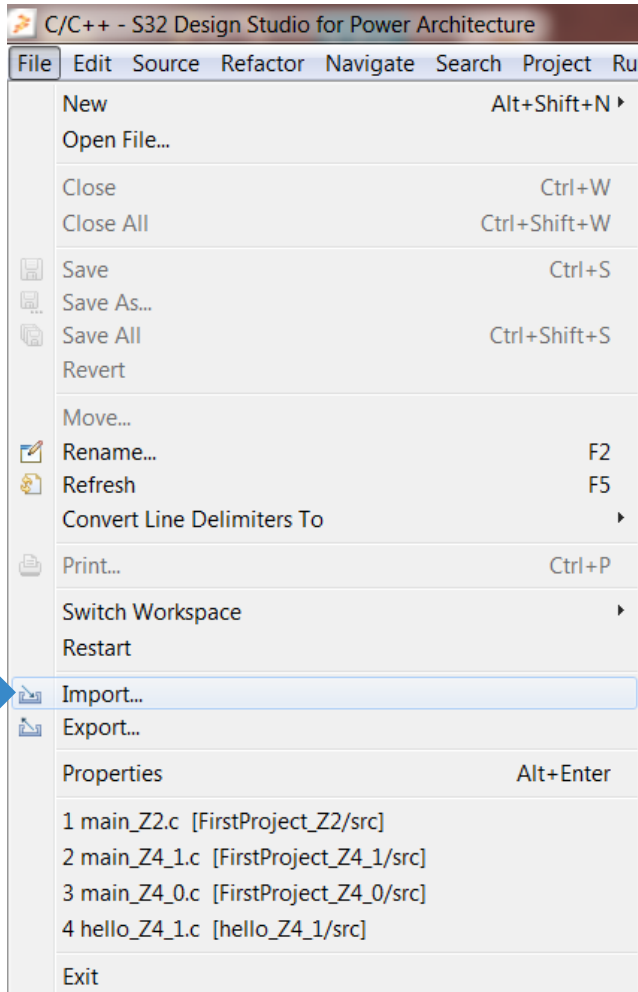
- Go to: File – Import



- Click on: “Existing Projects into Workspace” – Hit Next

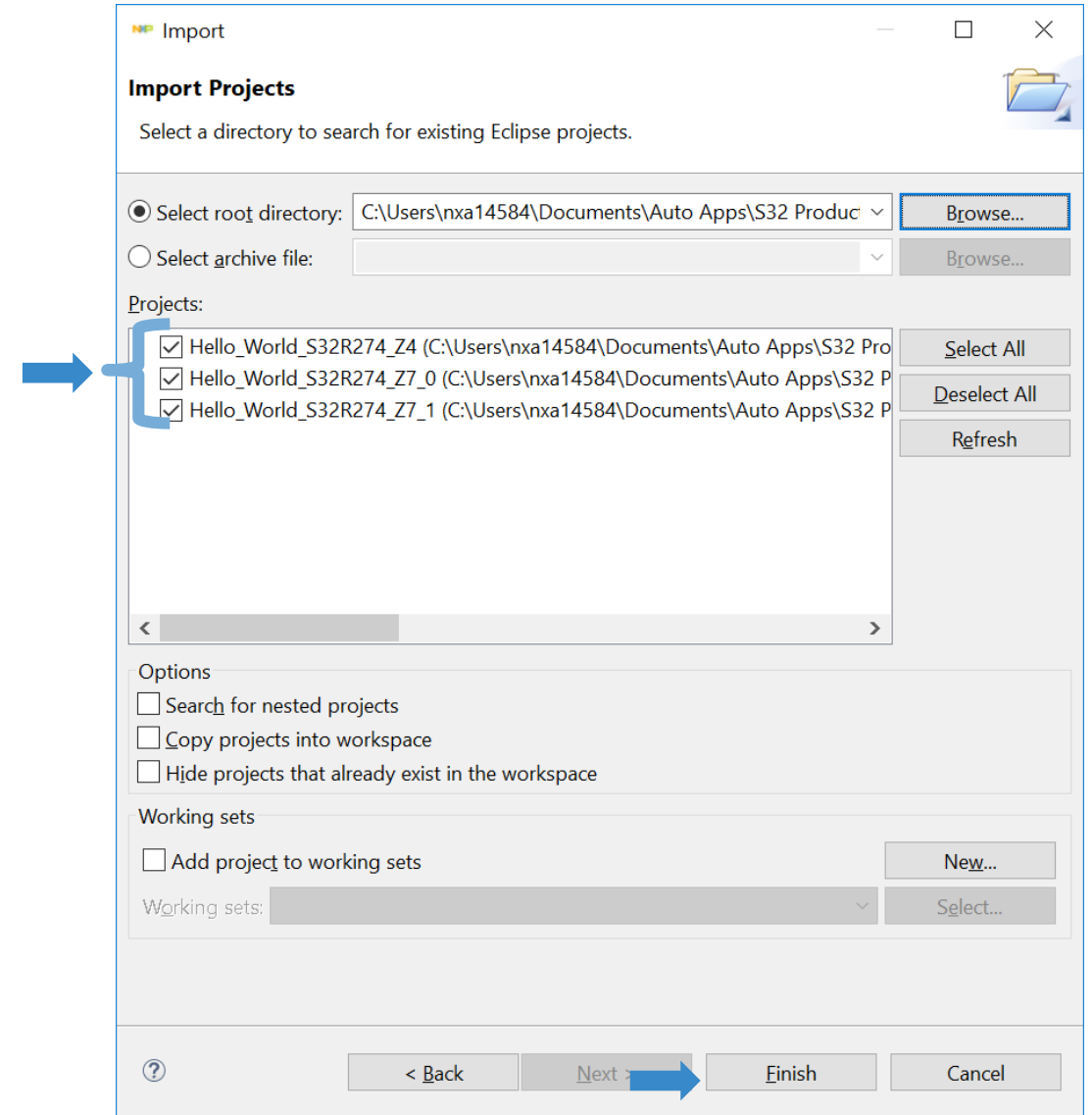
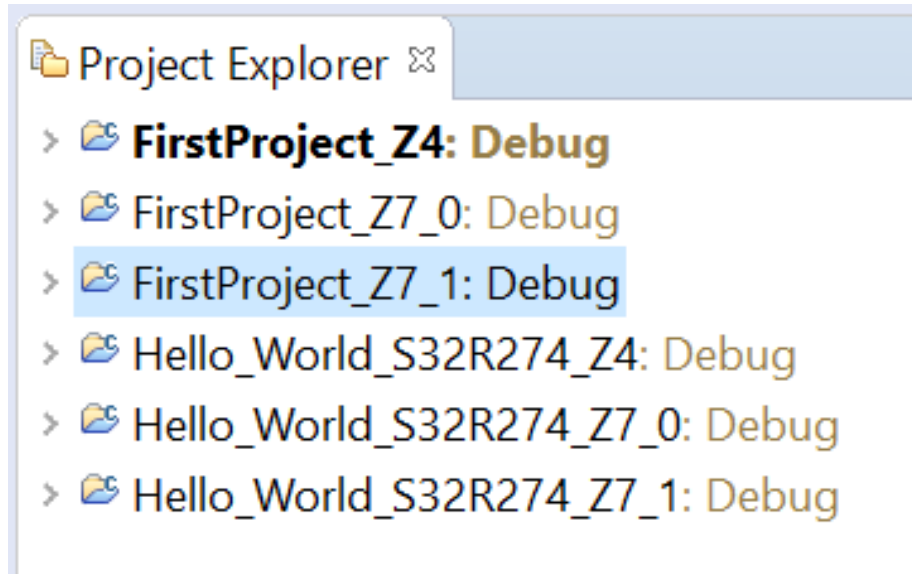


- Click on: Browse & Select Example Folder



Step-2

- Select the Project
- Click on Finish to Import a Project into Workspace



MORE INFORMATION.....

- For more information about S32DS go to
[Start – All Programs – NXP S32 Design Studio – S32 Design Studio for power Architecture \[version\] – Quick Start/Documentation](#)
- Also Visit www.nxp.com/community to post questions about S32DS



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