

MPC5744P 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 is the solution to the need
- This document provides stepwise tutoring 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 steps apply for later versions as well

Contents

- S32Design 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 v1.2

Supported Devices

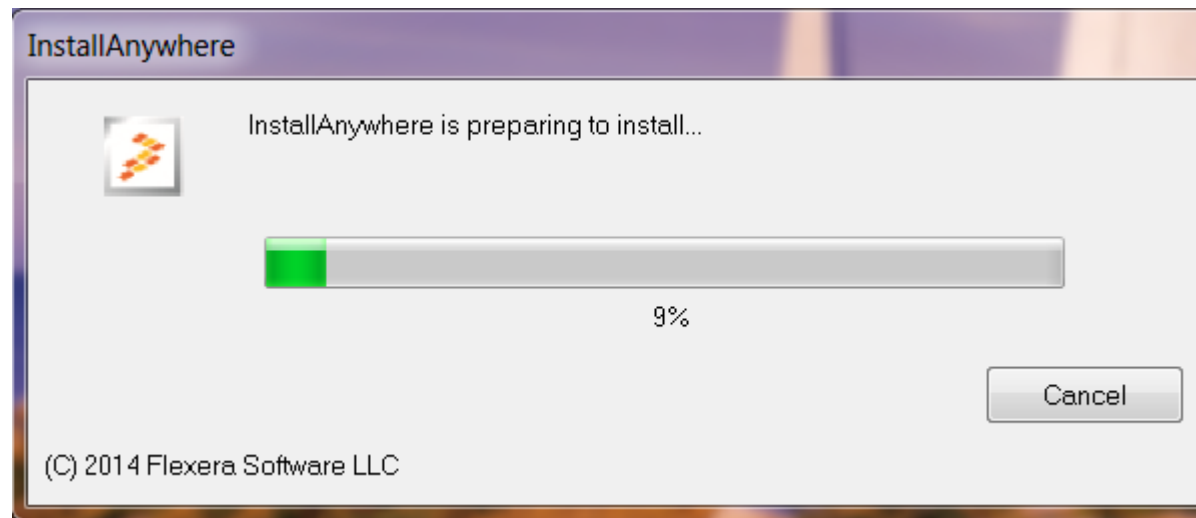
- MPC560xB/C/D Family
- MPC560xE Family
- MPC560xP Family
- MPC560xS Family
- MPC564xA Family
- MPC564xB Family
- MPC564xC Family
- MPC564xL Family
- MPC567xR Family
- MPC563xM Family
- MPC5674F
- MPC567xK Family
- MPC574xB/C/D Family
- MPC574xG Family
- MPC577xK Family
- MPC574xP Family
- MPC574xR Family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

INSTALLING S32 DESIGN STUDIO IDE FOR POWER ARCHITECTURE



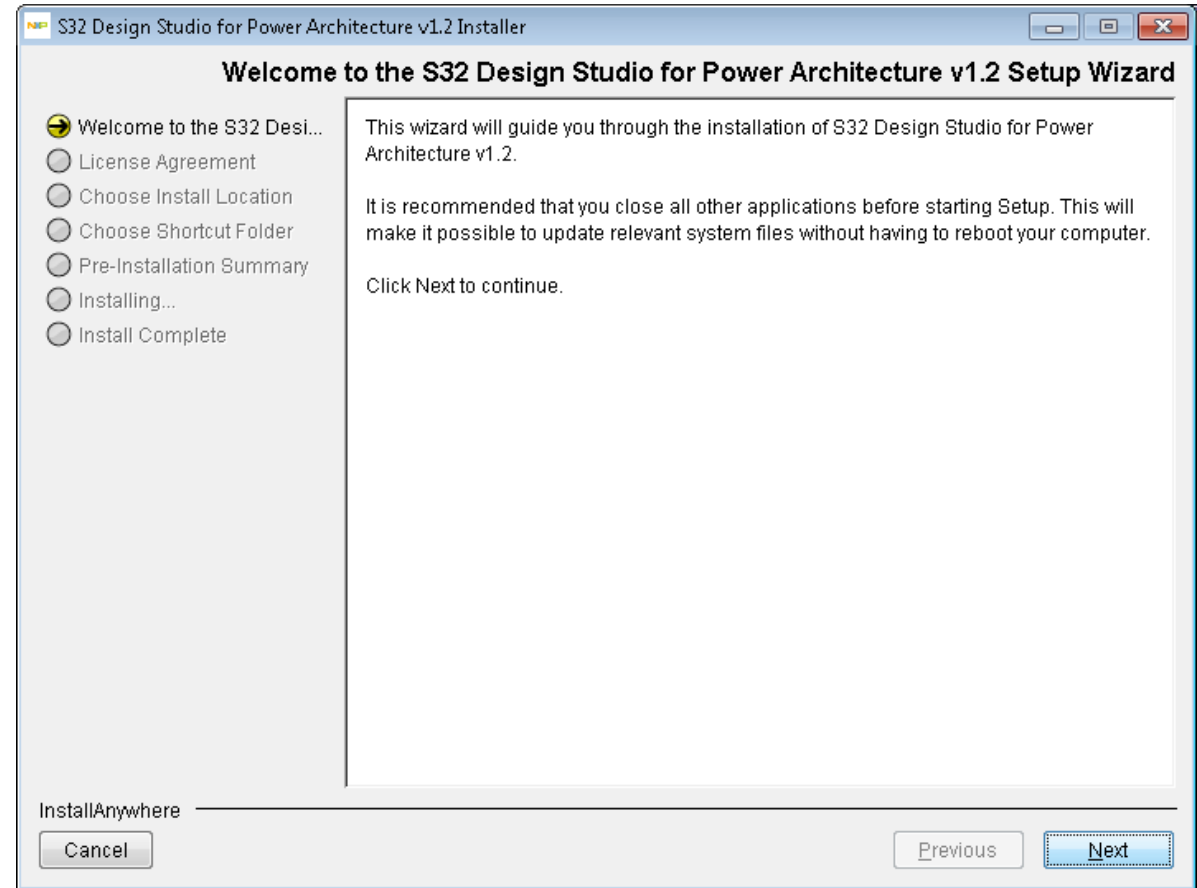
Step-1

- 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



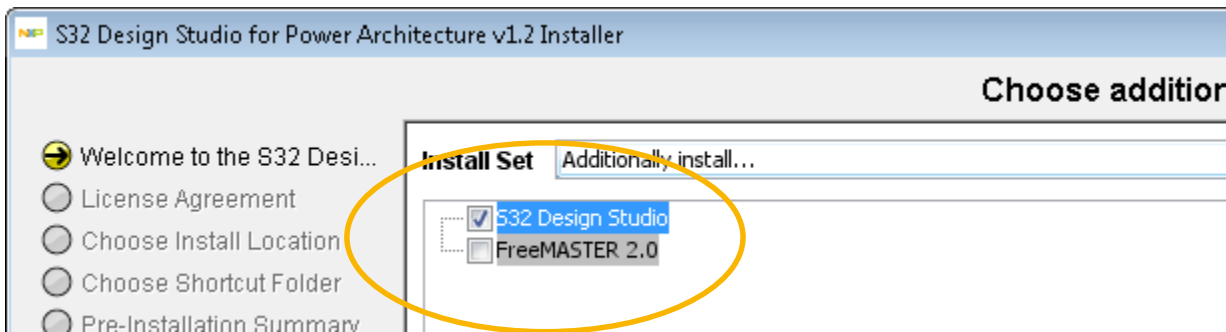
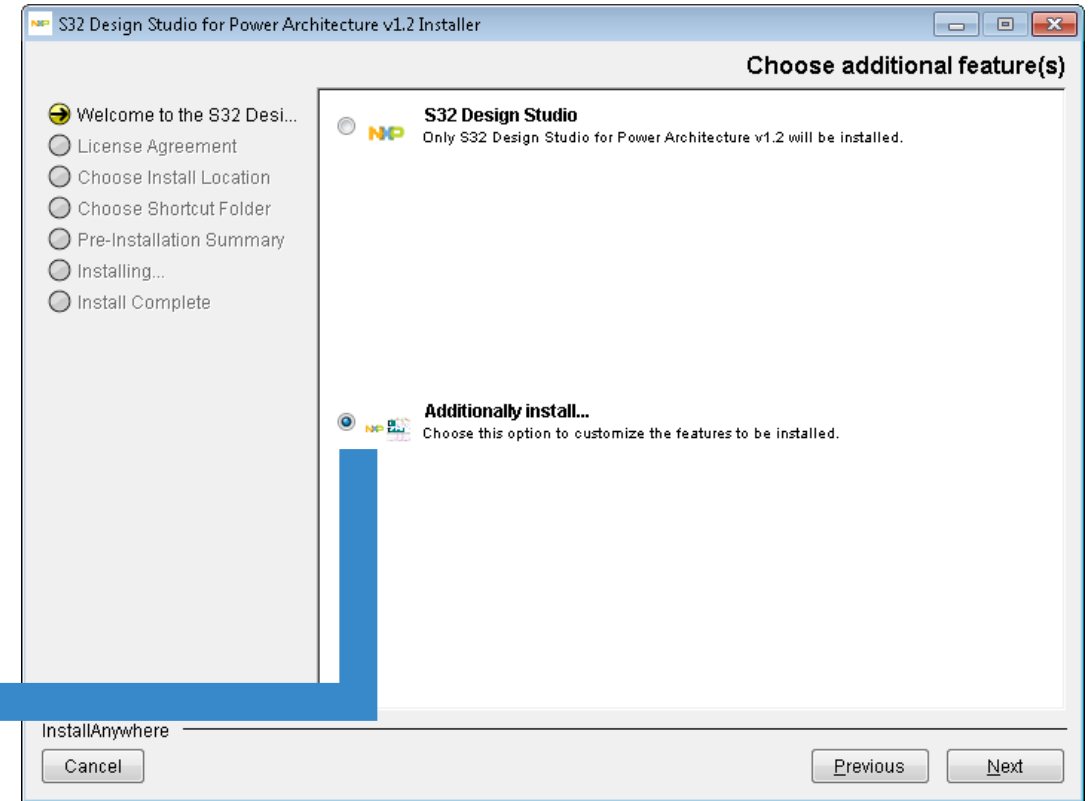
Step-2

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



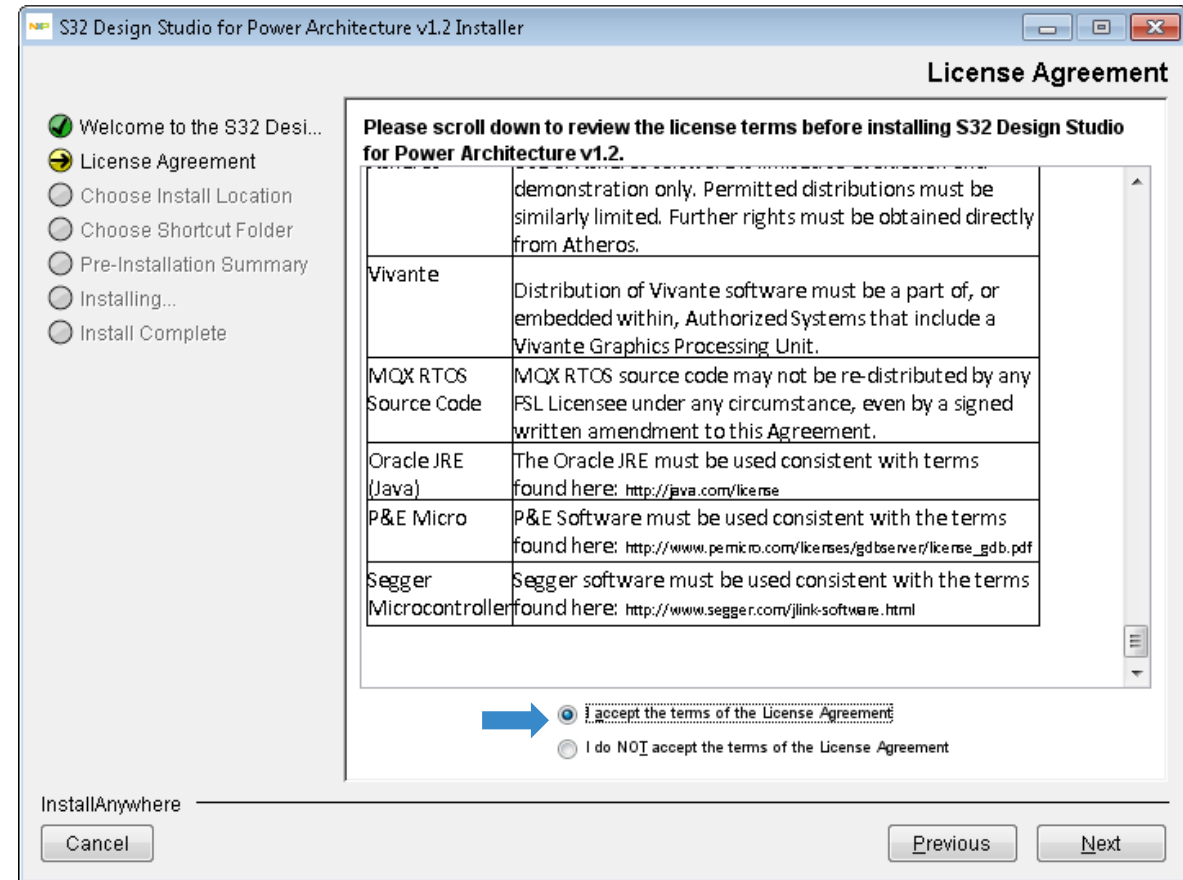
Step-3

- 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



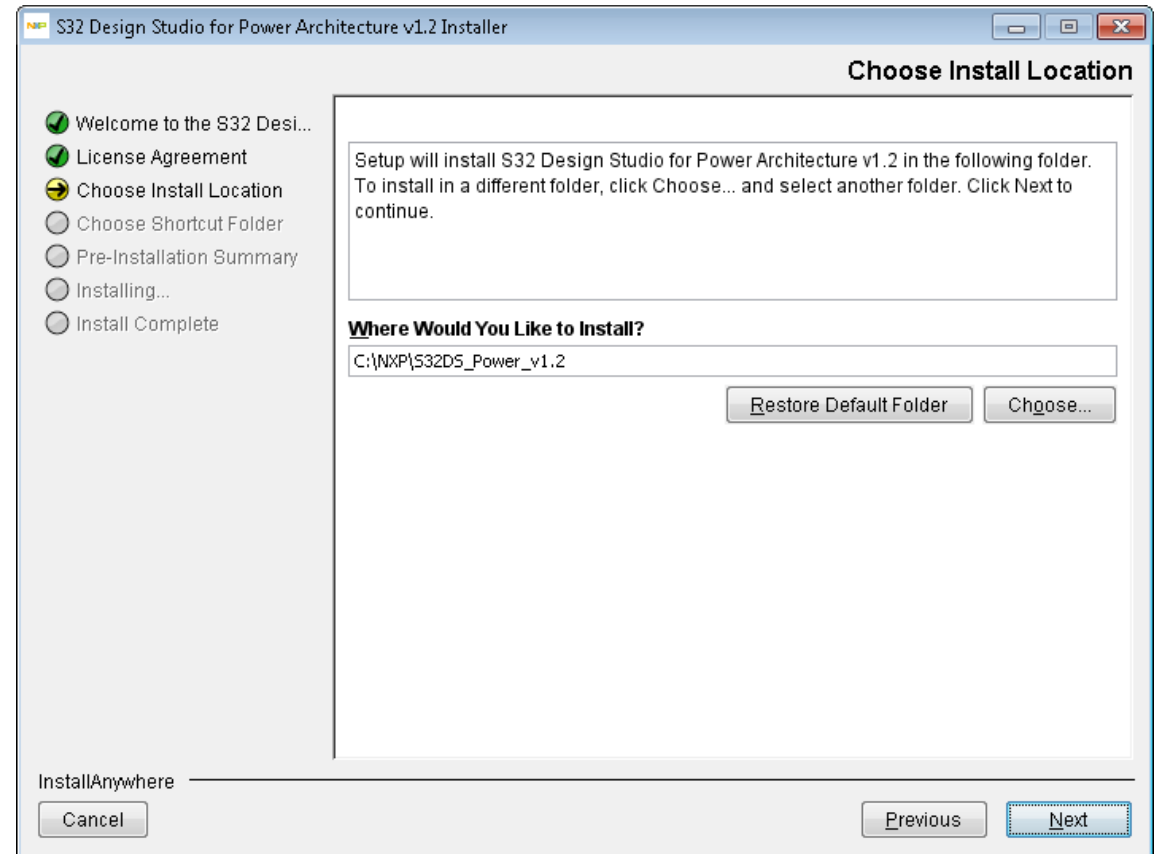
Step-4

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



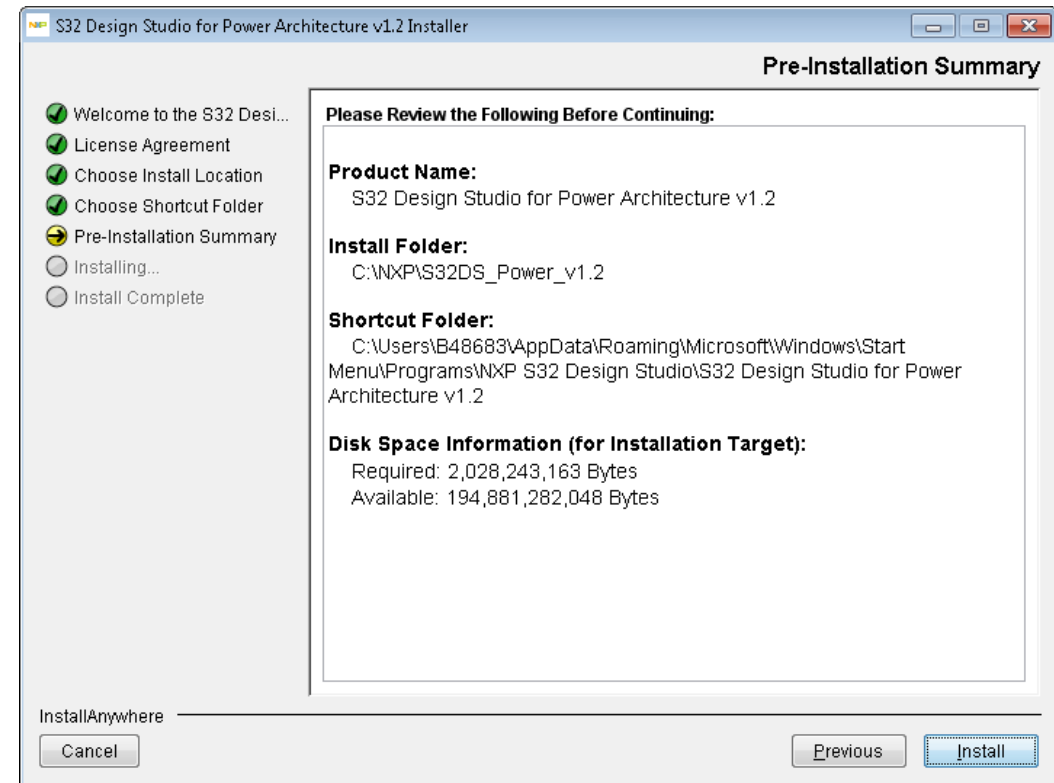
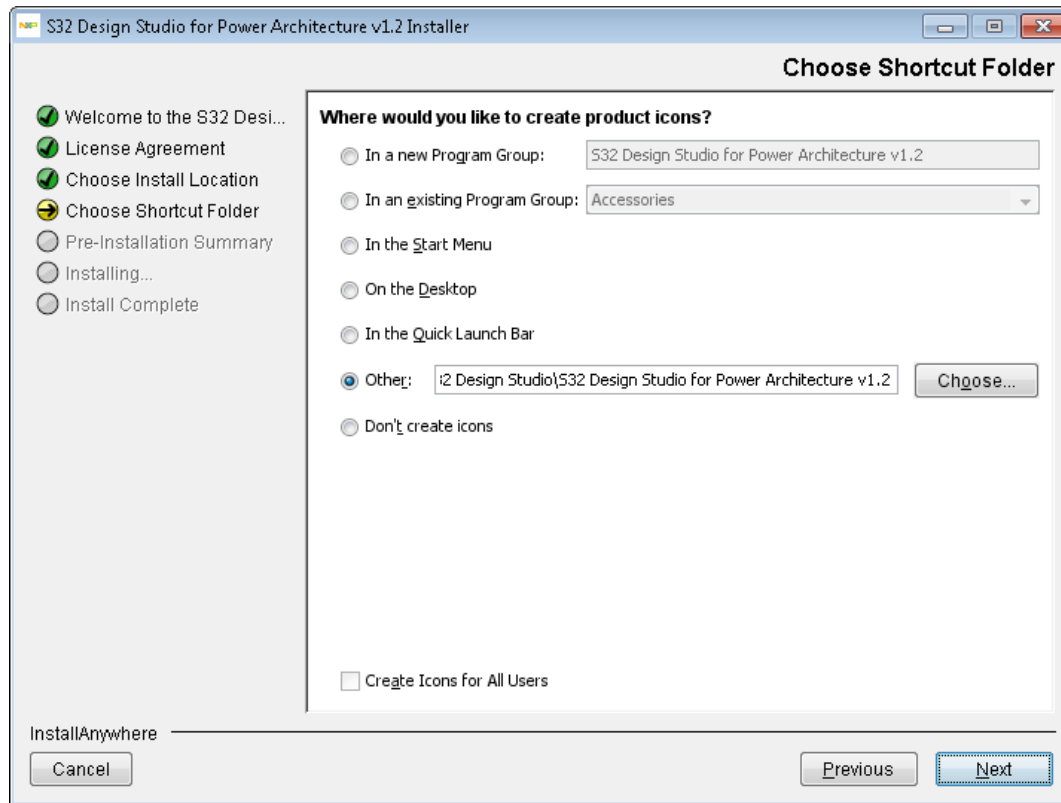
Step-4

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



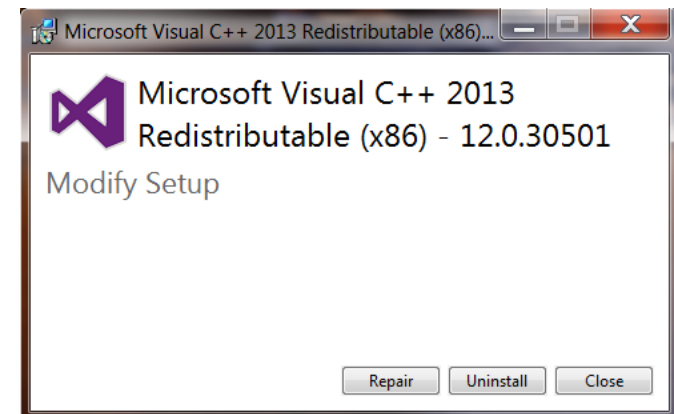
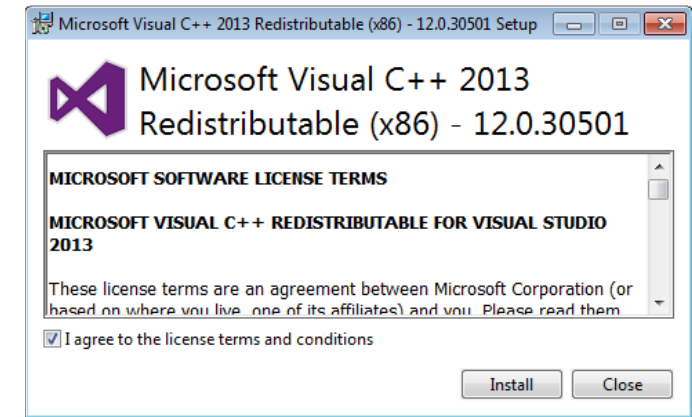
Step-5

- 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



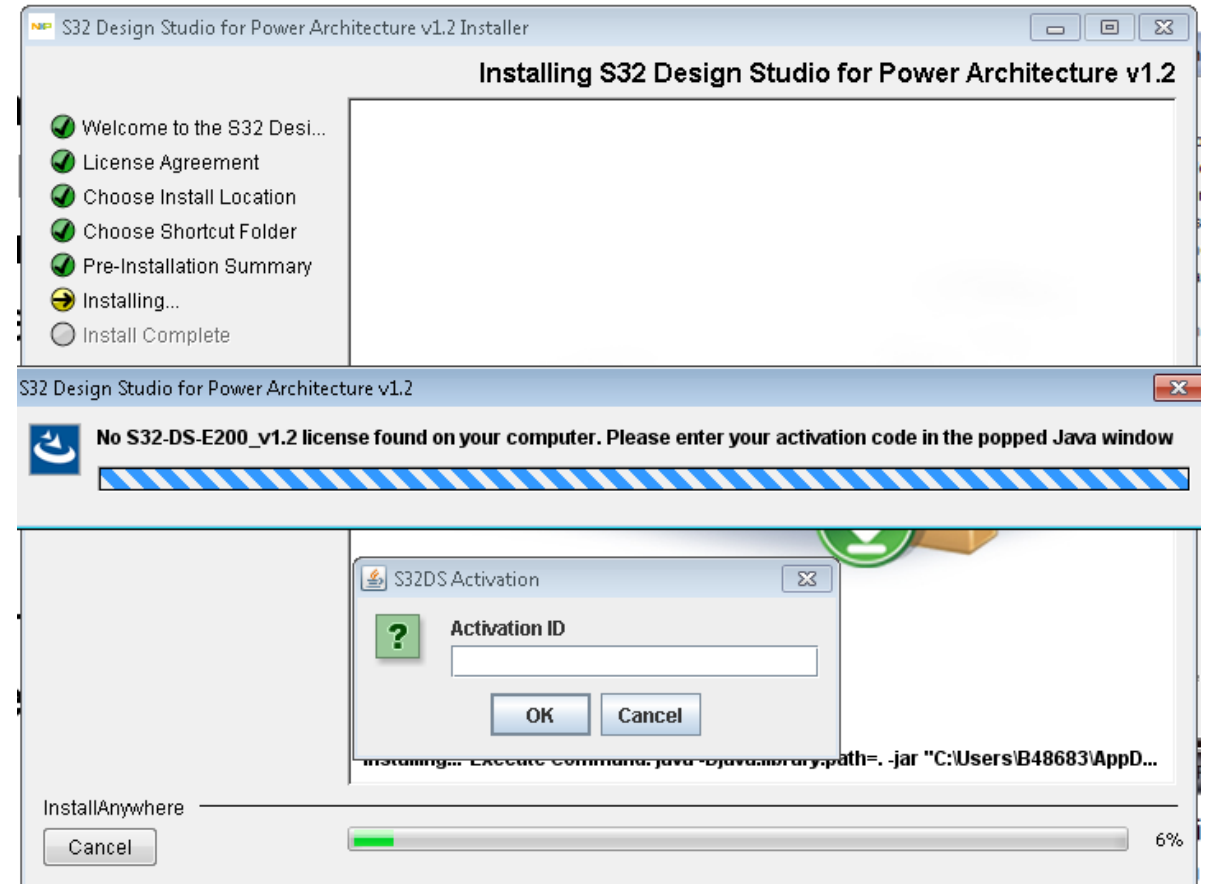
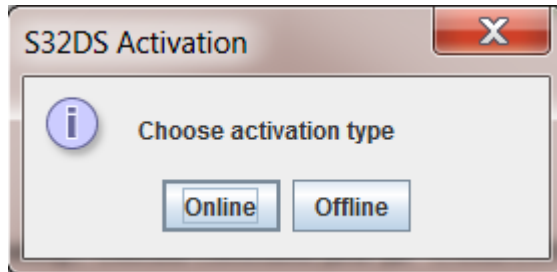
Step-7

- 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



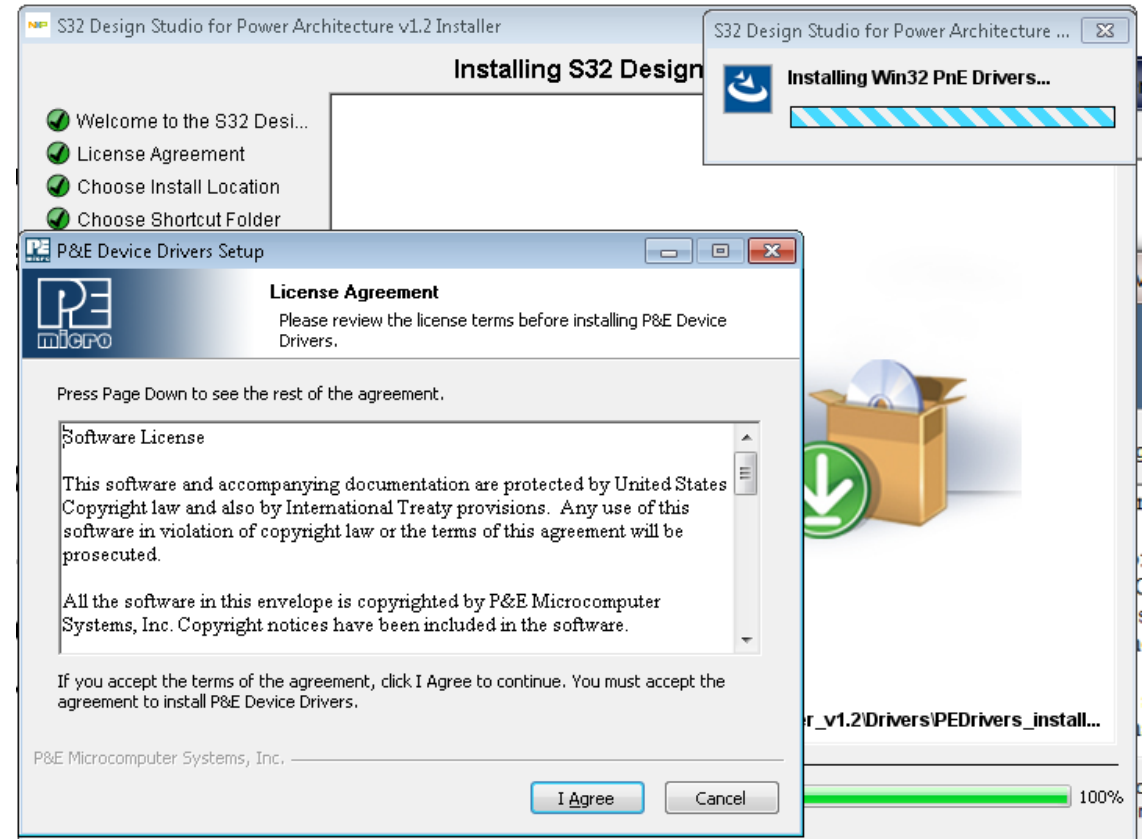
Step-8

- 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**



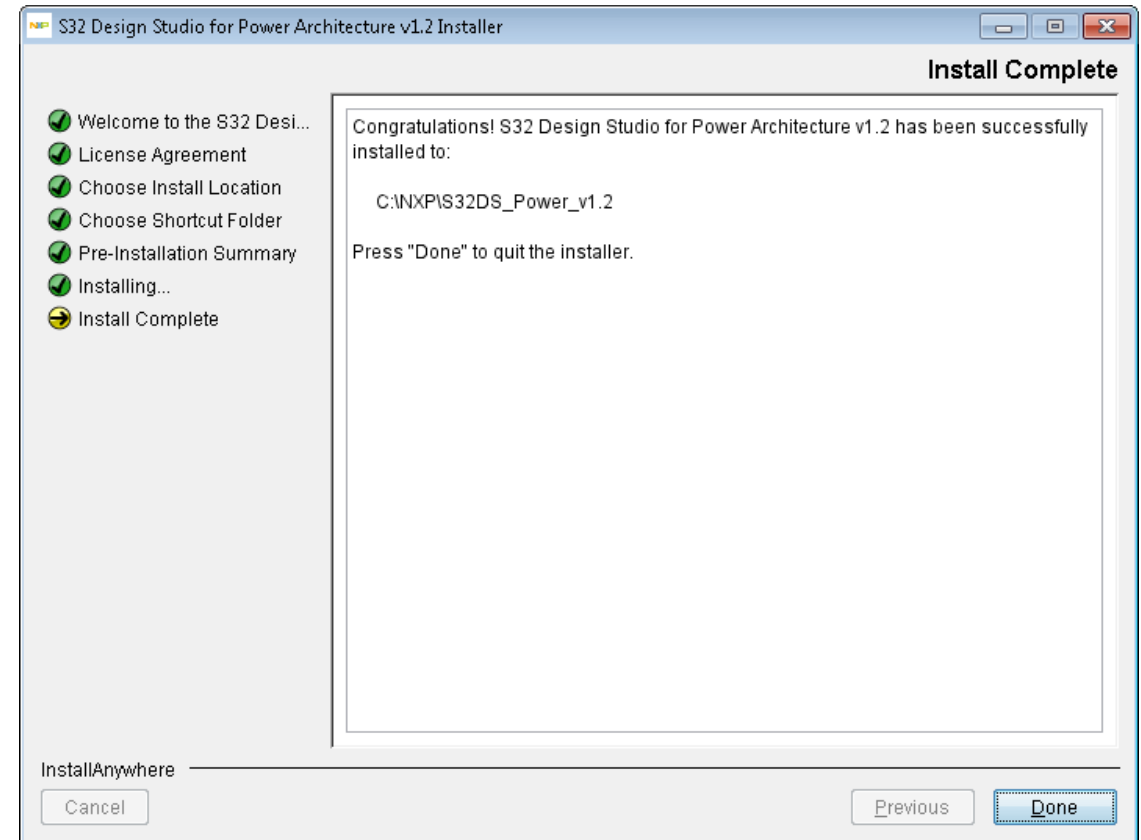
Step-9

- 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.



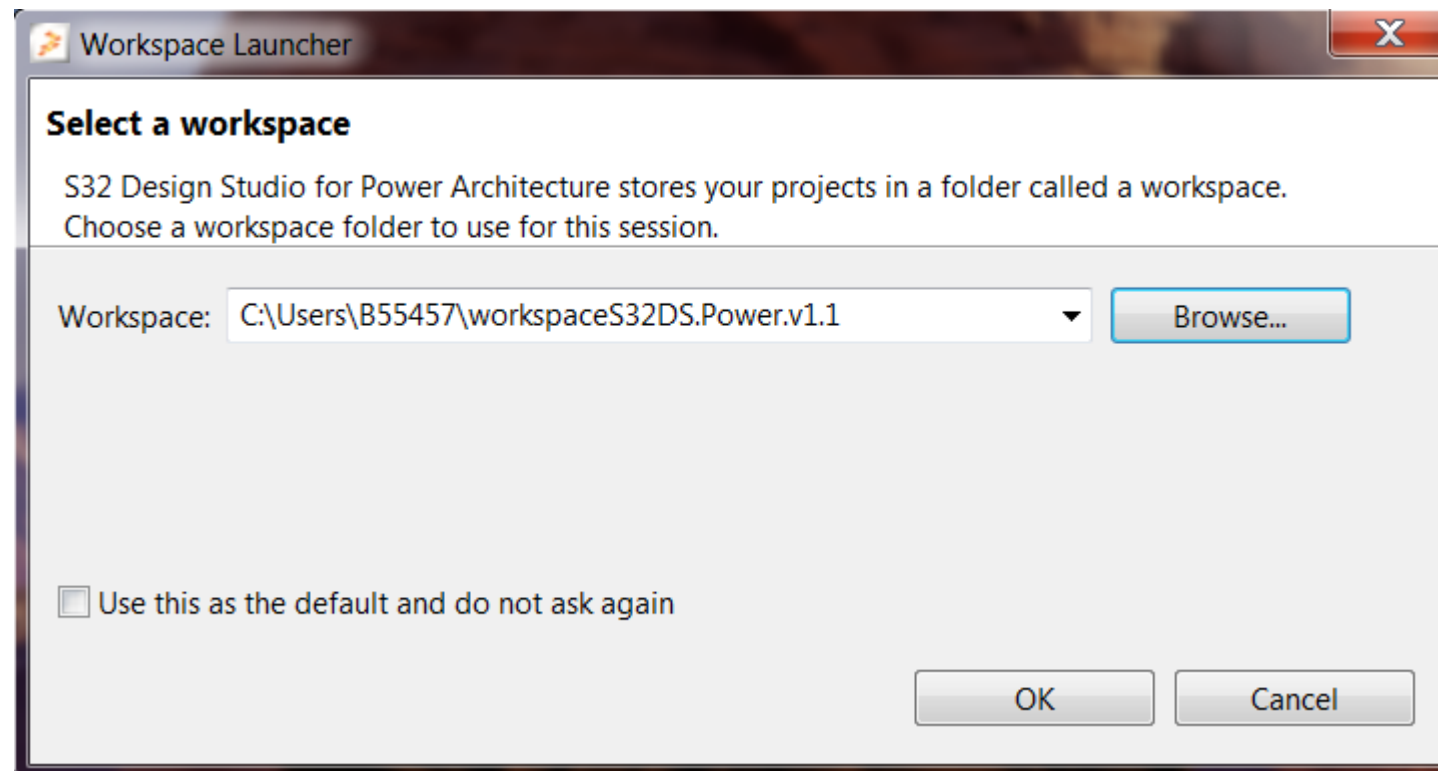
GETTING STARTED WITH A NEW PROJECT



Create a new project

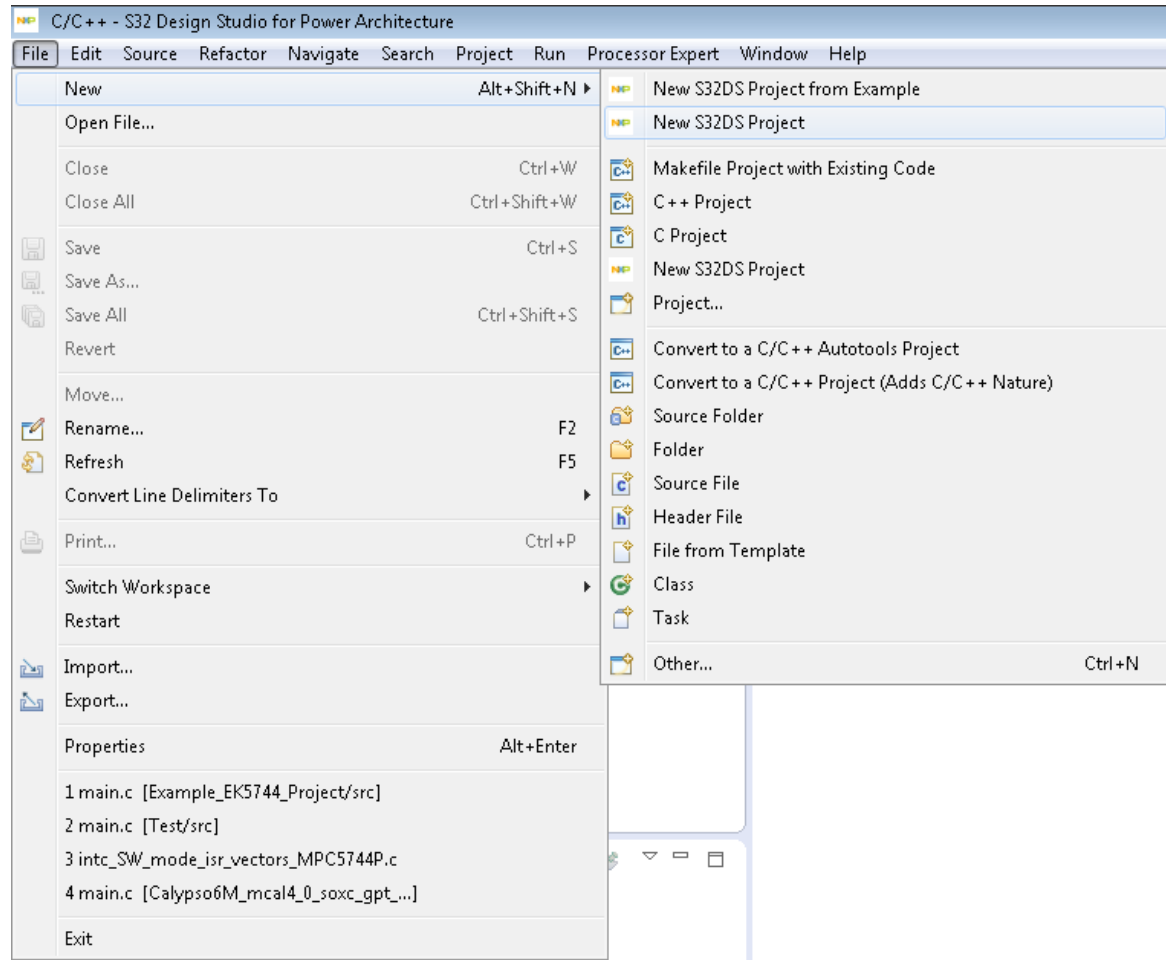
1 of 5

- 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

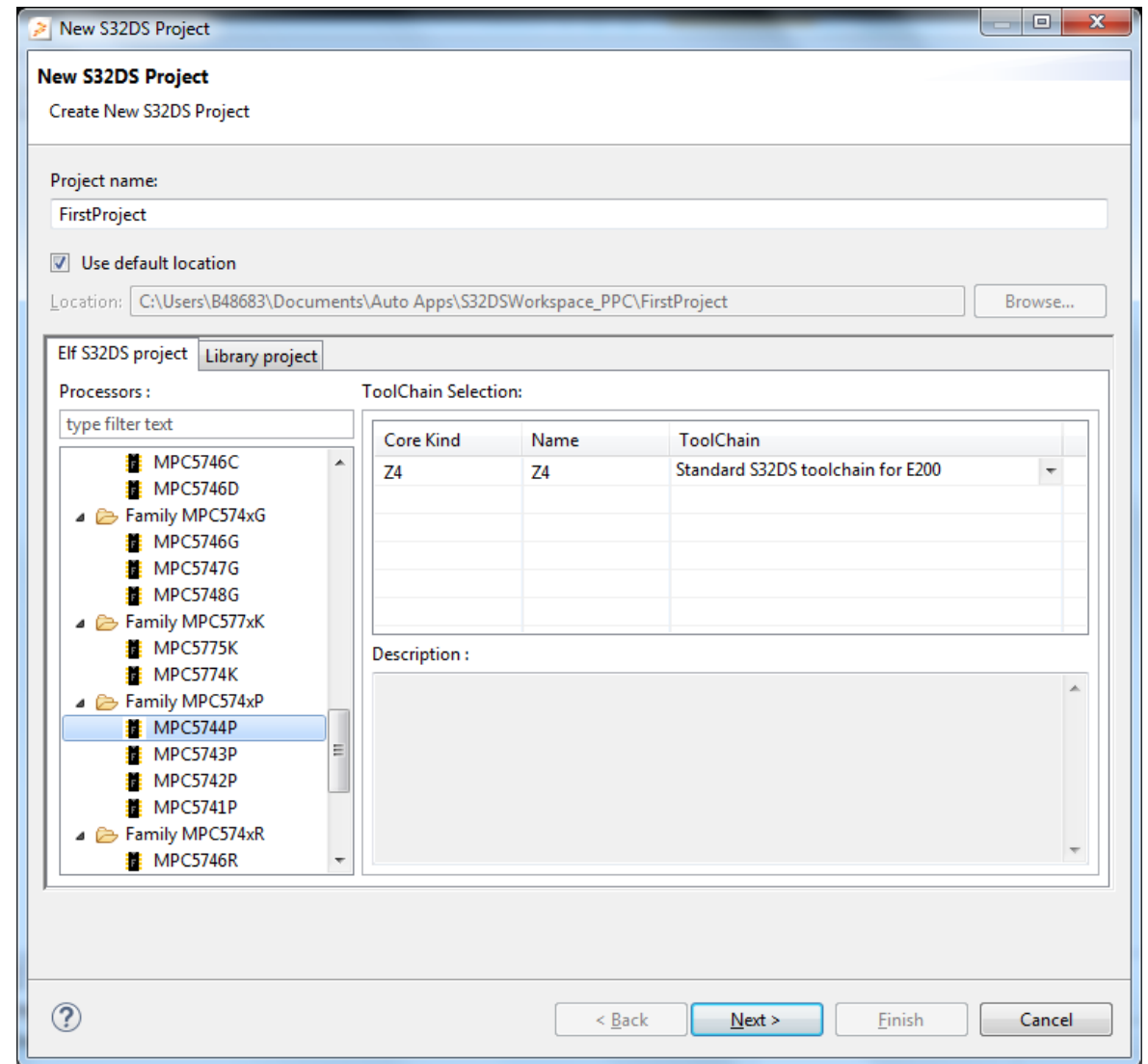
- Go to: File – New – New S32DS Project



Create a new project

3 of 5

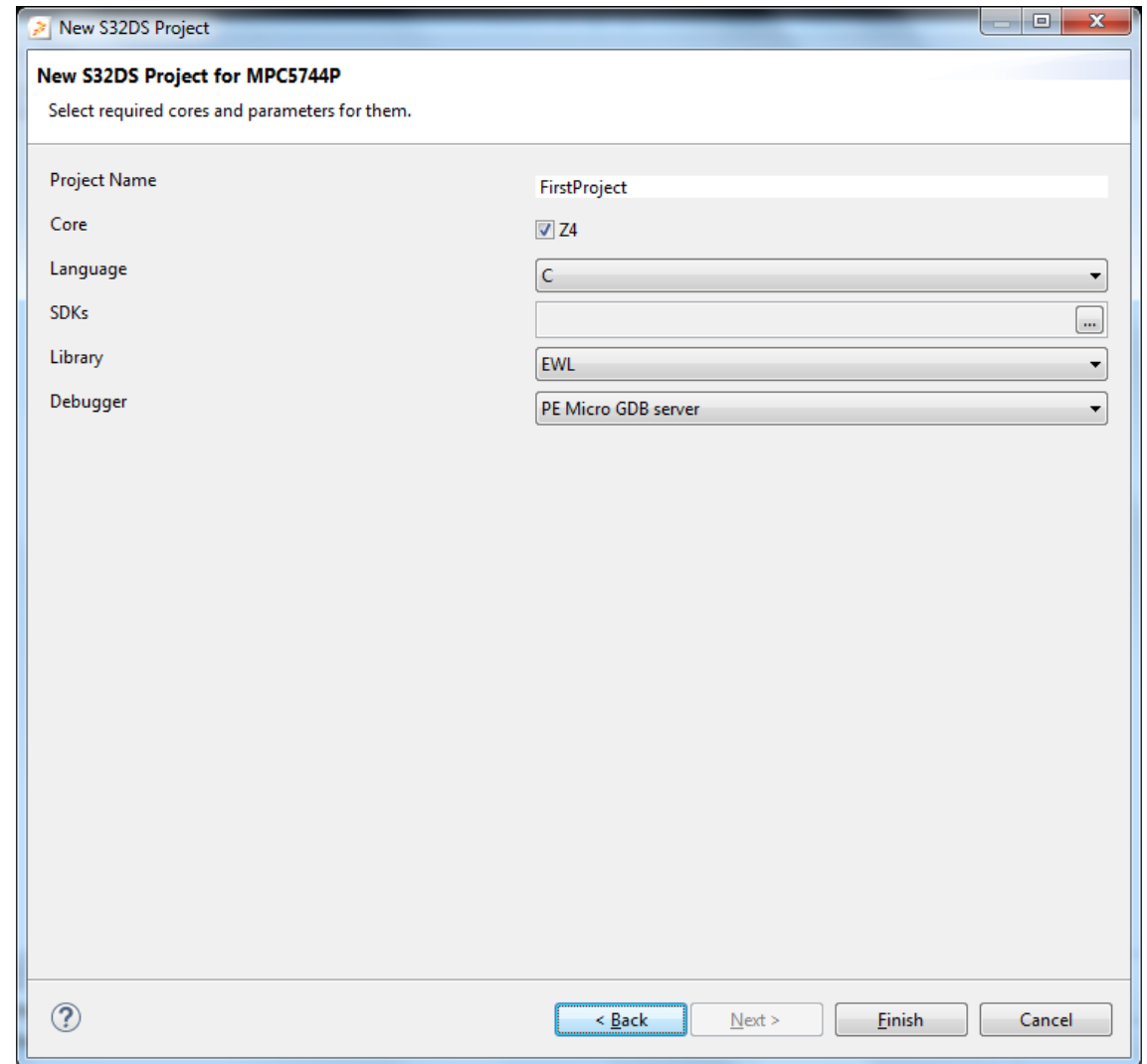
- Project Name:
 - Example: FirstProject
- Project Type:
 - Recommended: use Elf S32DS Project
- Select Controller:
 - Example: MPC5744P



Create a new project

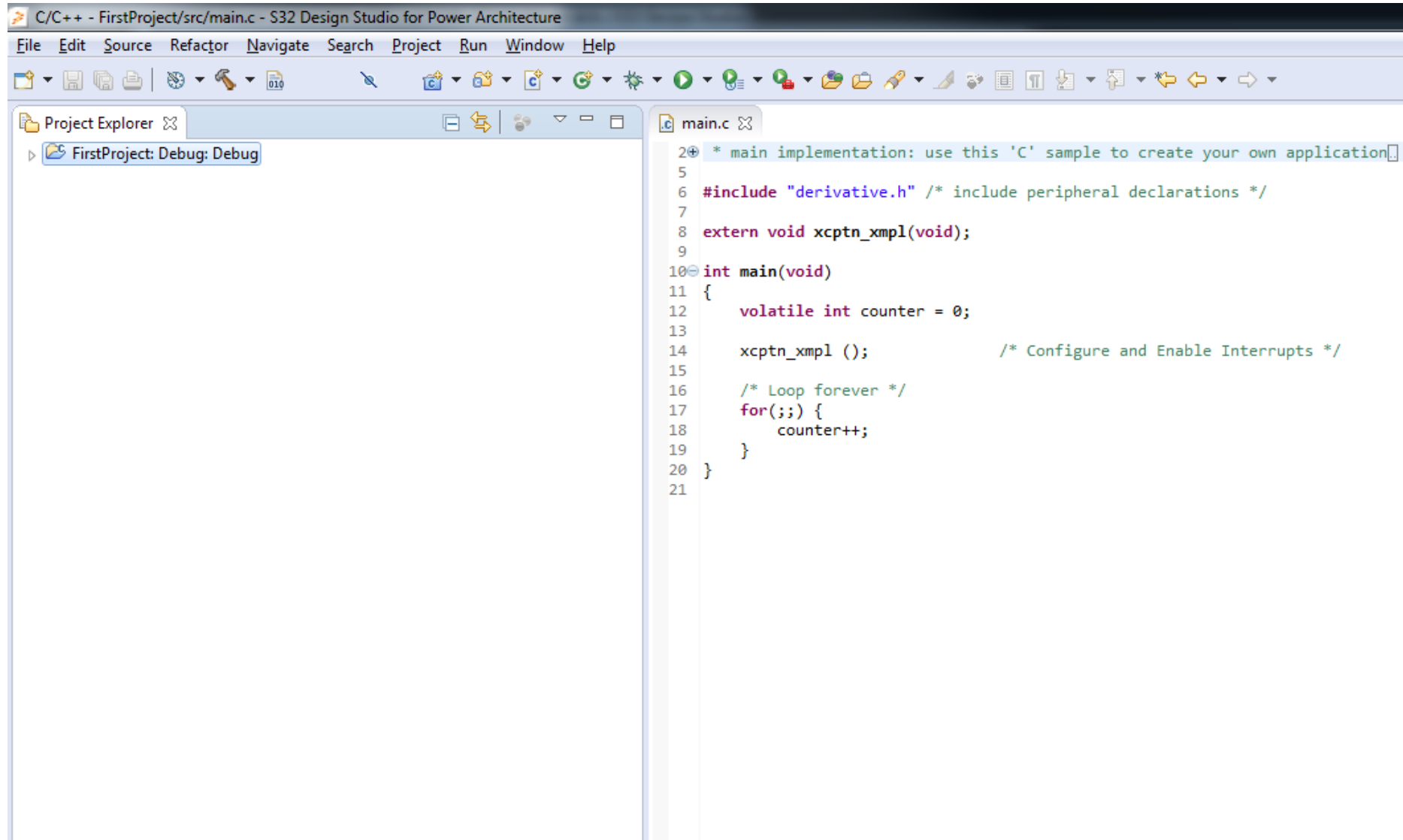
4 of 5

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



Create a new project

5 of 5



```
C/C++ - FirstProject/src/main.c - S32 Design Studio for Power Architecture
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
FirstProject: Debug: Debug
main.c
20 * 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     volatile int counter = 0;
13
14     xcptn_xmpl ();          /* Configure and Enable Interrupts */
15
16     /* Loop forever */
17     for(;;) {
18         counter++;
19     }
20 }
21
```

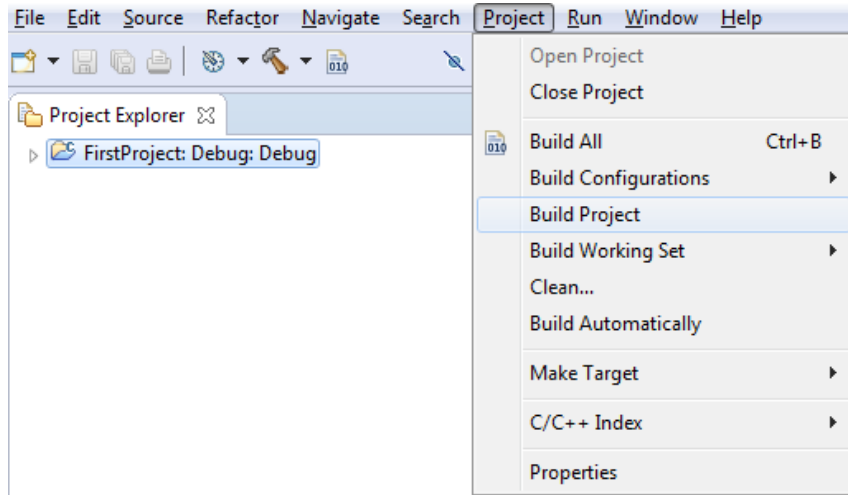
- A project will be created for every core the device has.
- MPC5744P has one




Build a Project

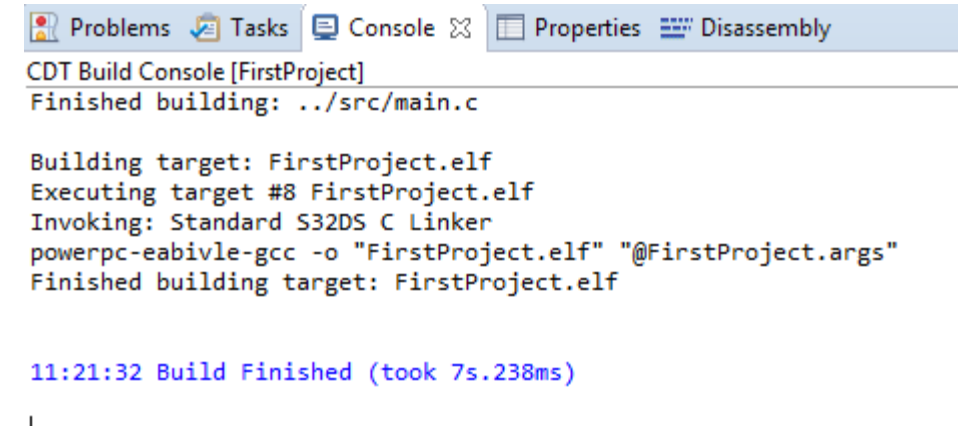
- To build a project follow one of the methods below:
- If project is built successfully, following message will be displayed on the **Console**

1. Project – Build Project




2.  Click on hammer symbol to build that project

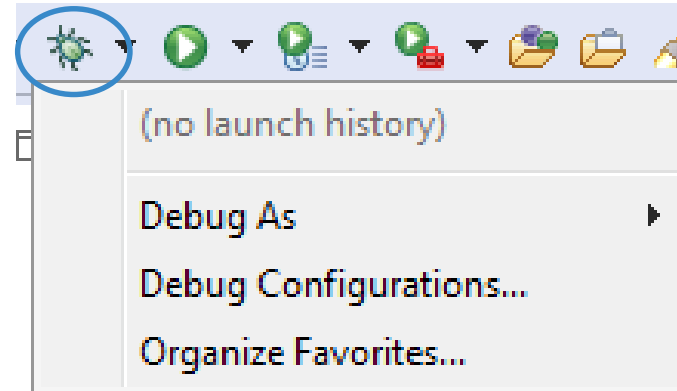
 - Click on page symbol to build all projects



Debug a Project

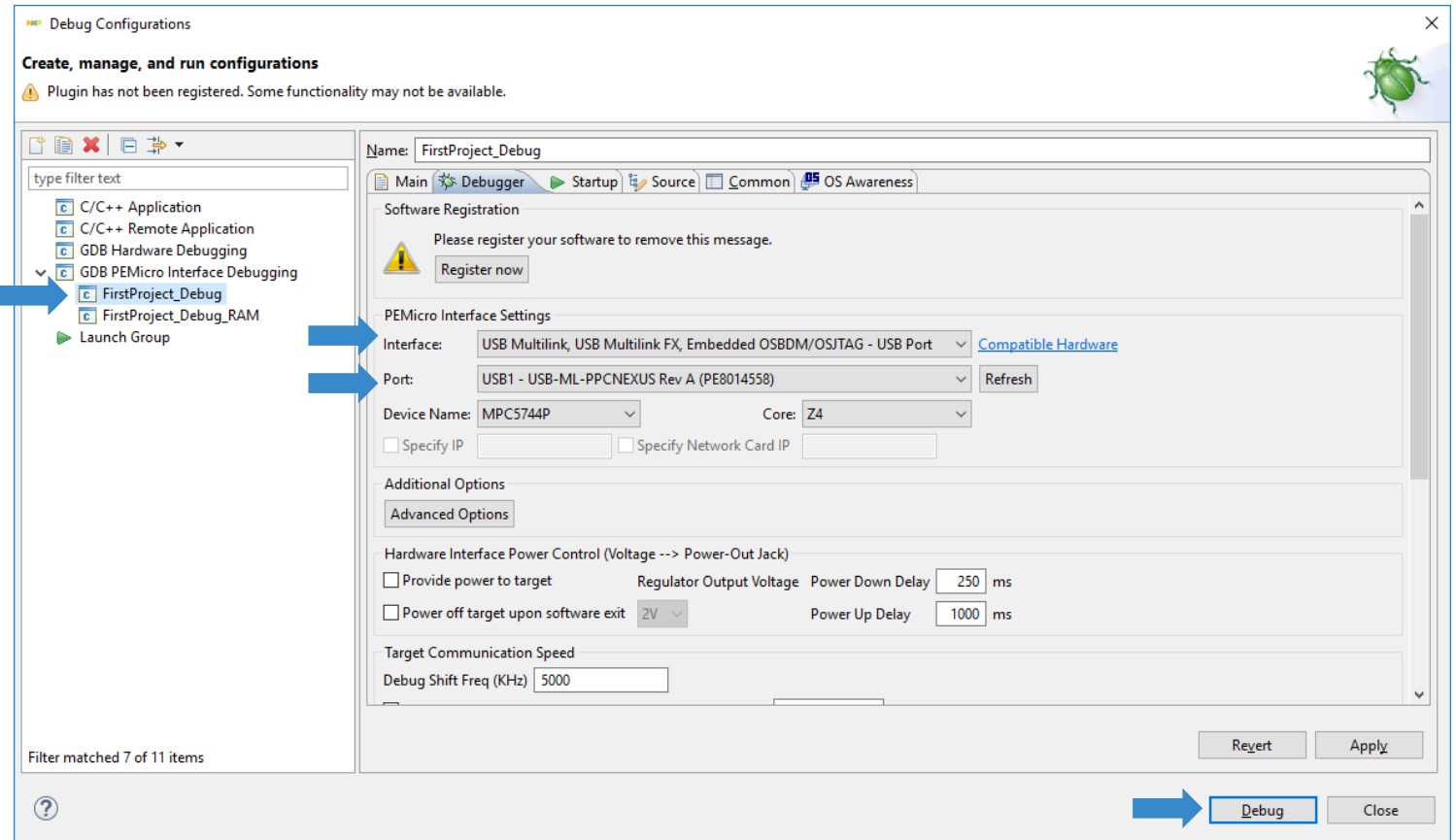
1 of 2

- Connect a debugger to both, the board and the PC
 - Miriac™-EK5744 uses JTAG debugger such as P&E Multilink
- Click on arrow in the  icon
- And Open [Debug Configurations...](#)



Debug a Project

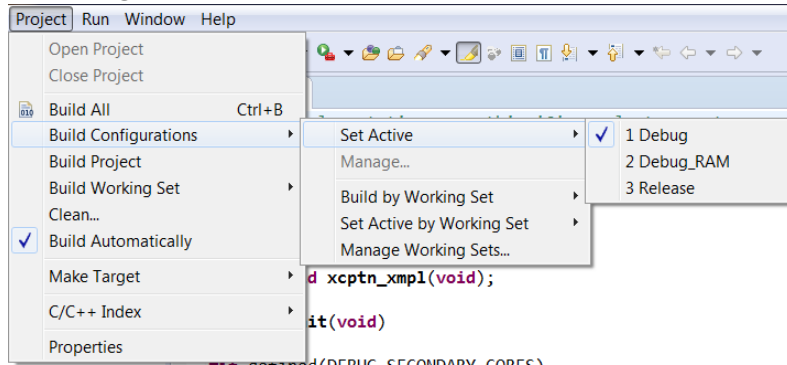
- Select Project:
 - Example: FirstProject_Debug
- Select Interface:
 - Example: USB Multilink for Miriac™-EK5744
- Click on **Debug** to start debugging



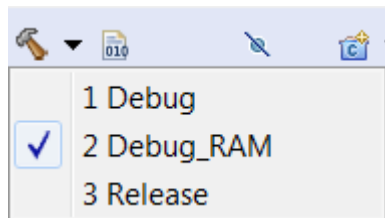
Debug a Project from RAM

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

1. Project – Build Configurations – Set Active – Debug_RAM

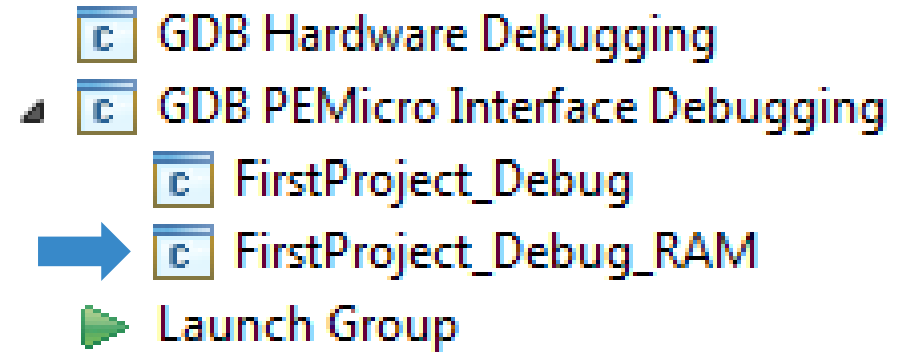


2. Select Debug_RAM by clicking Down Arrow next to hammer



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

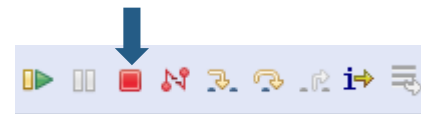
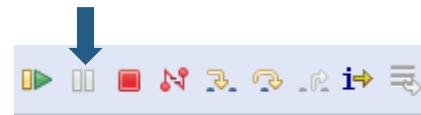
- Lastly, to debug from RAM select the RAM related session while debugging



- Follow the Steps shown on Debug a Project pages

Debug Basics: Step, Run, Suspend, Resume

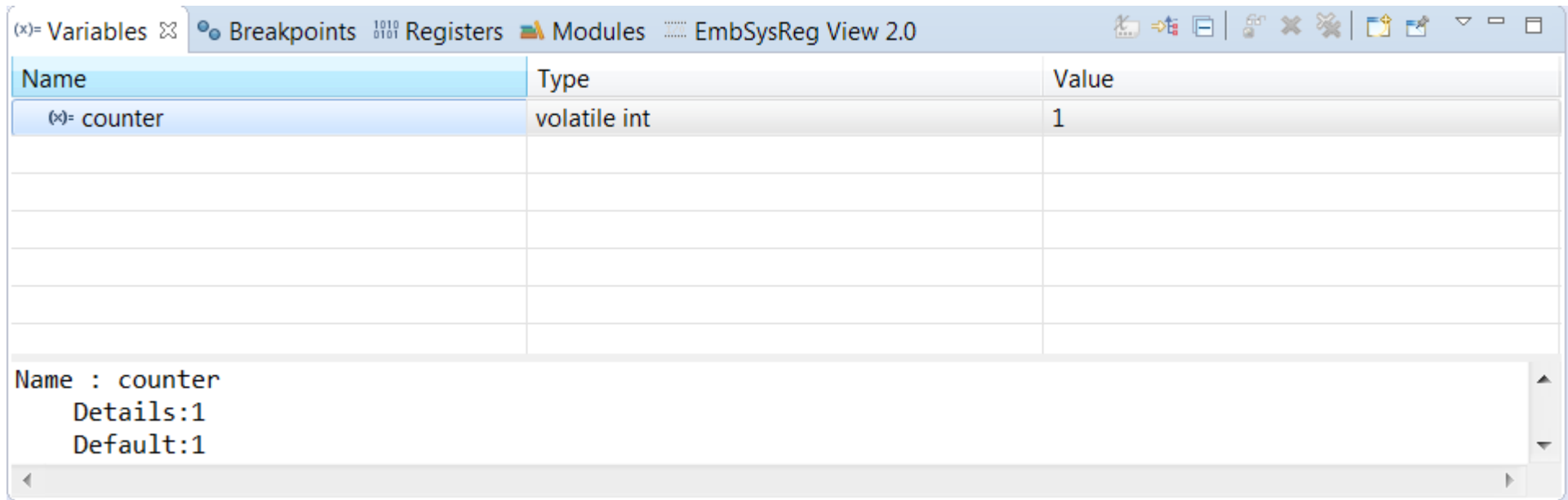
- Step Into (F5)
- Step Over (F6)
- Run
- Suspend
- Resume (F8)
- Terminate (Ctrl+F2)



Debug Basics: View & Alter Variables

1 of 2

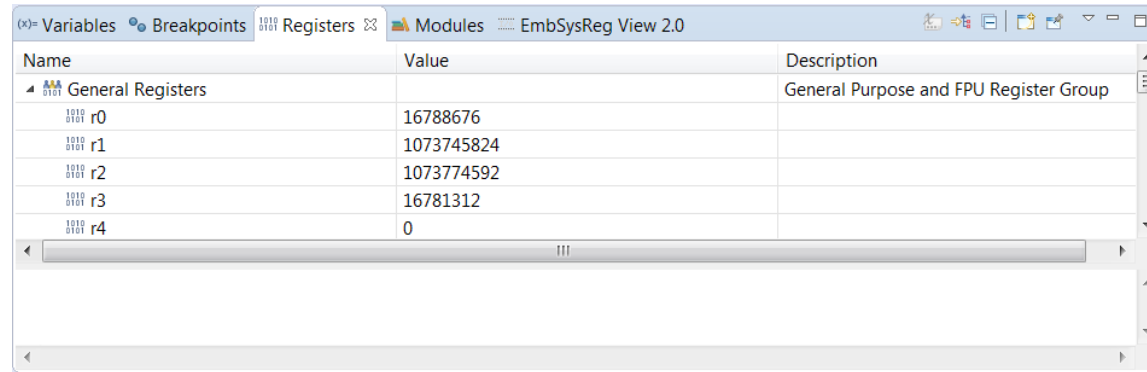
- View variables in “Variables” tab.
- Click on a value to allow typing in a different value.



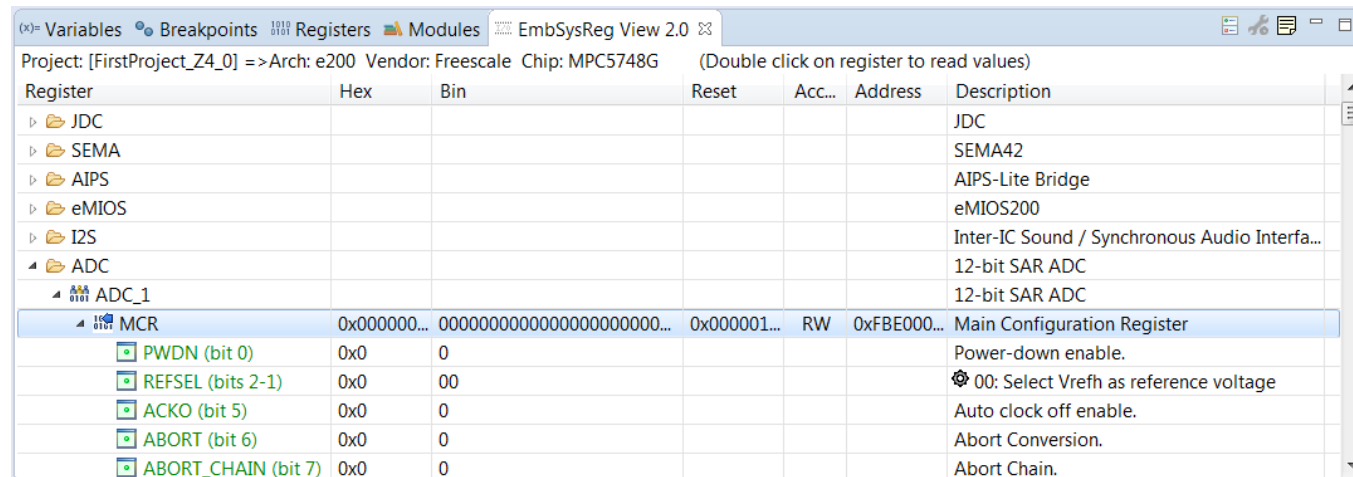
Debug Basics: View & Alter Registers

2 of 2


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

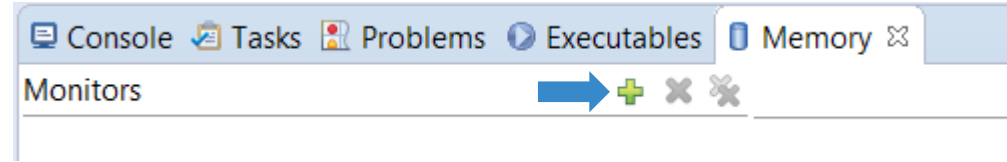


- View peripheral registers in the EmbSysReg tab

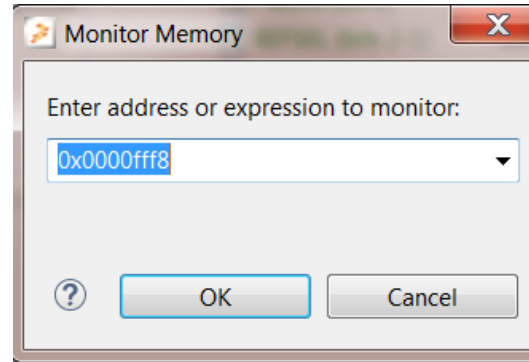


Debug Basics: View Memory

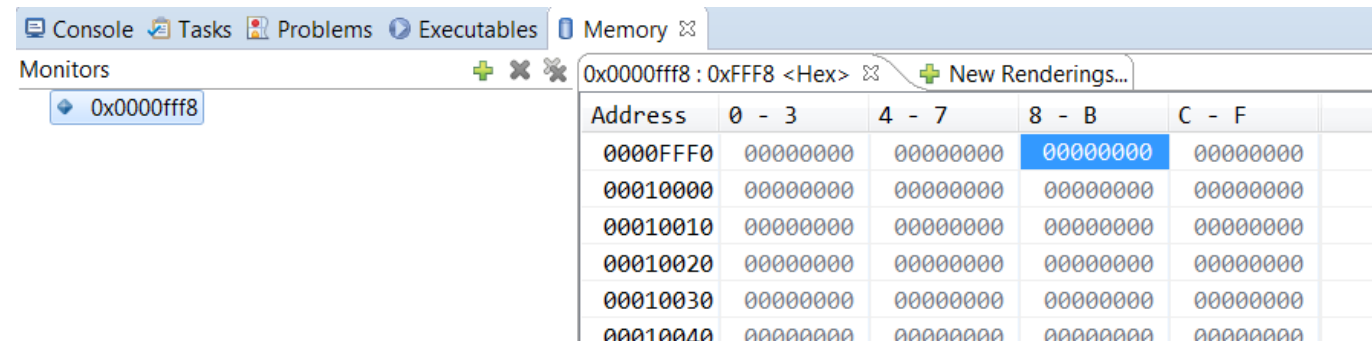
- Add Memory Monitor
 - Click on  icon



- Select Base Address
 - Example : 0x0000fff8

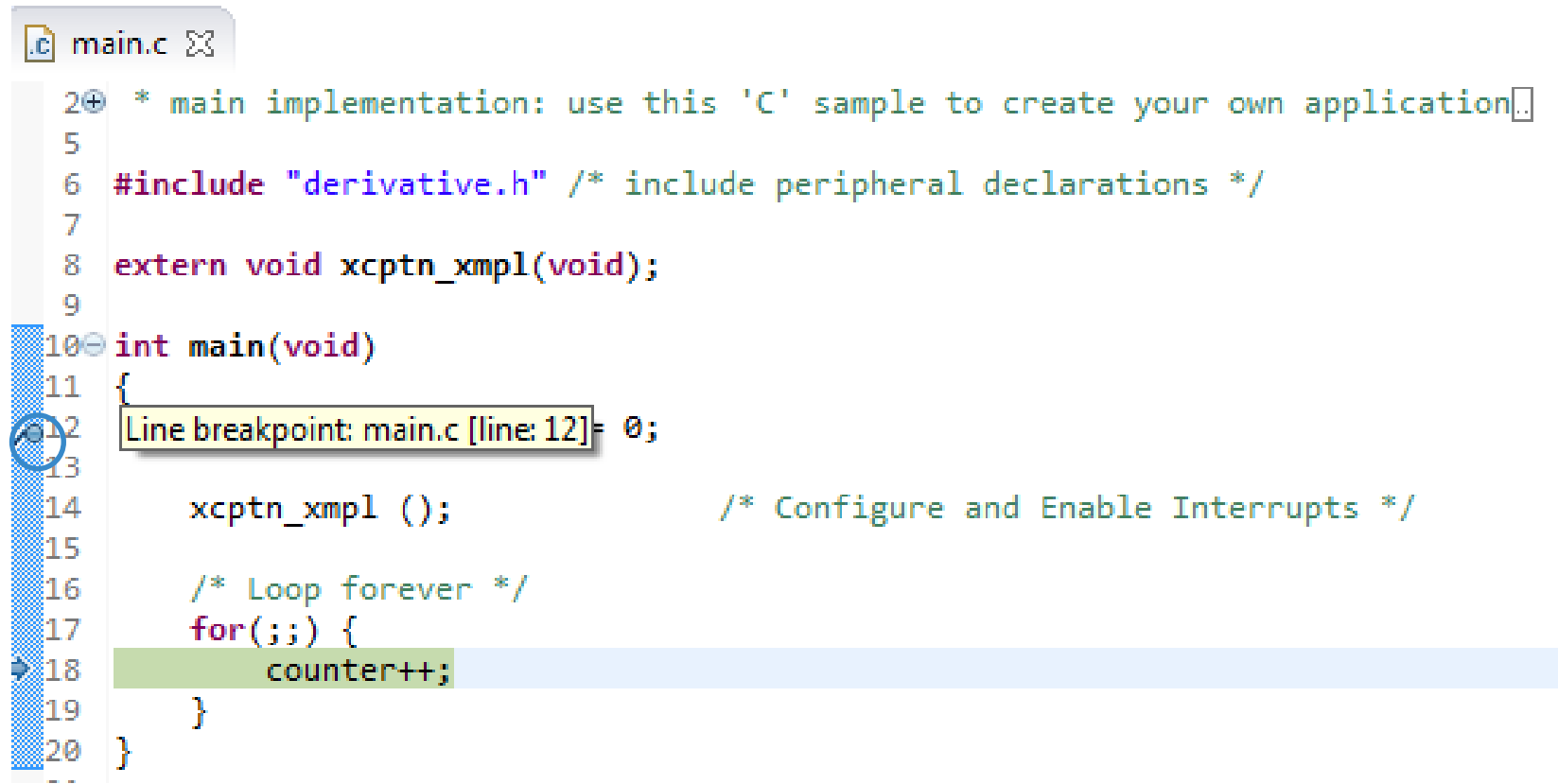


- View Memory



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



The screenshot shows a code editor window titled 'main.c'. The code is as follows:

```
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 }
```

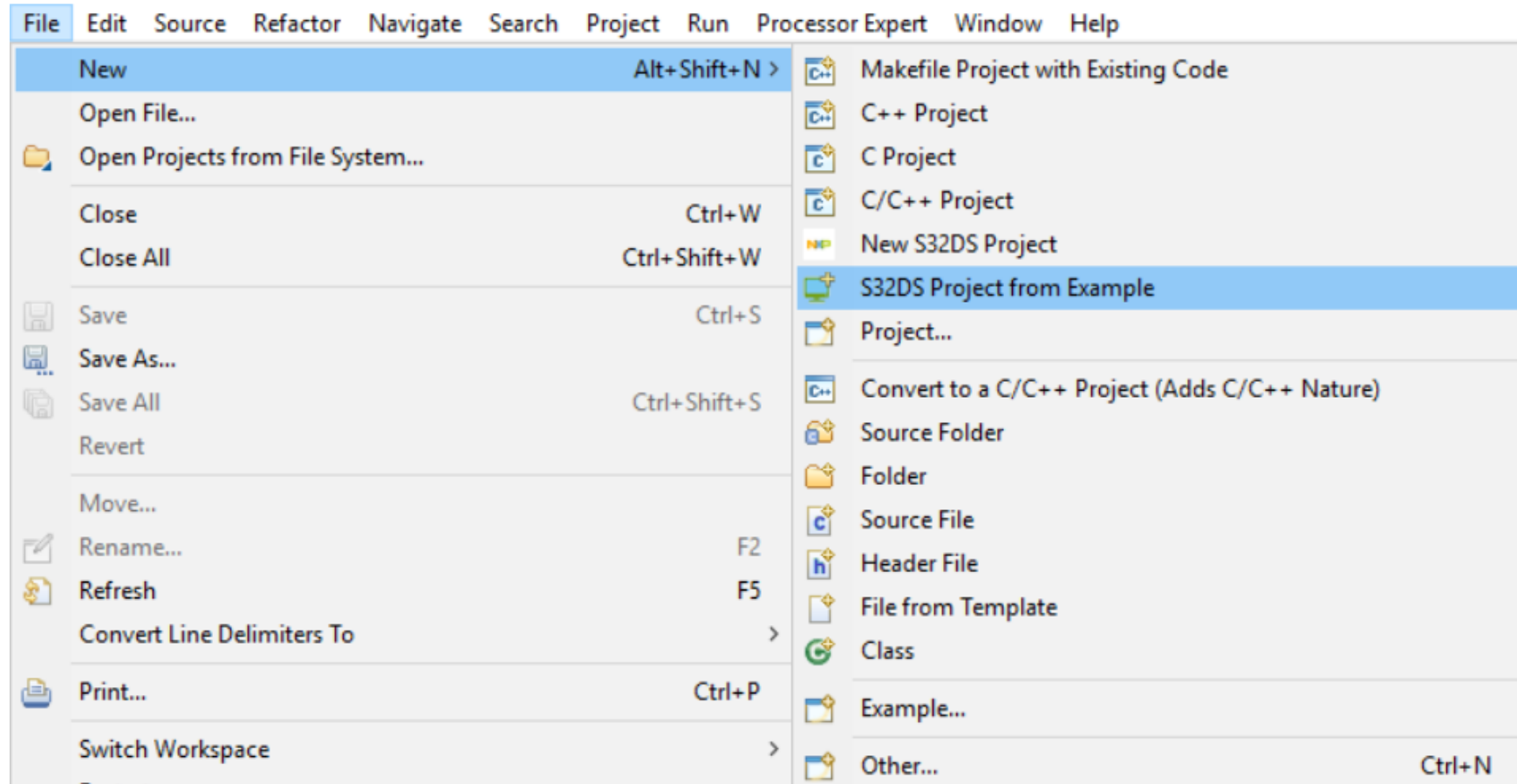
A light blue dot is visible on the left margin of line 12, indicating a breakpoint. A tooltip box is positioned over this dot, displaying the text 'Line breakpoint: main.c [line: 12] = 0;'. The line containing 'counter++;' is highlighted in green, and a blue arrow points to it from the left margin.

MAKING PROJECTS FROM BUILT-IN EXAMPLES



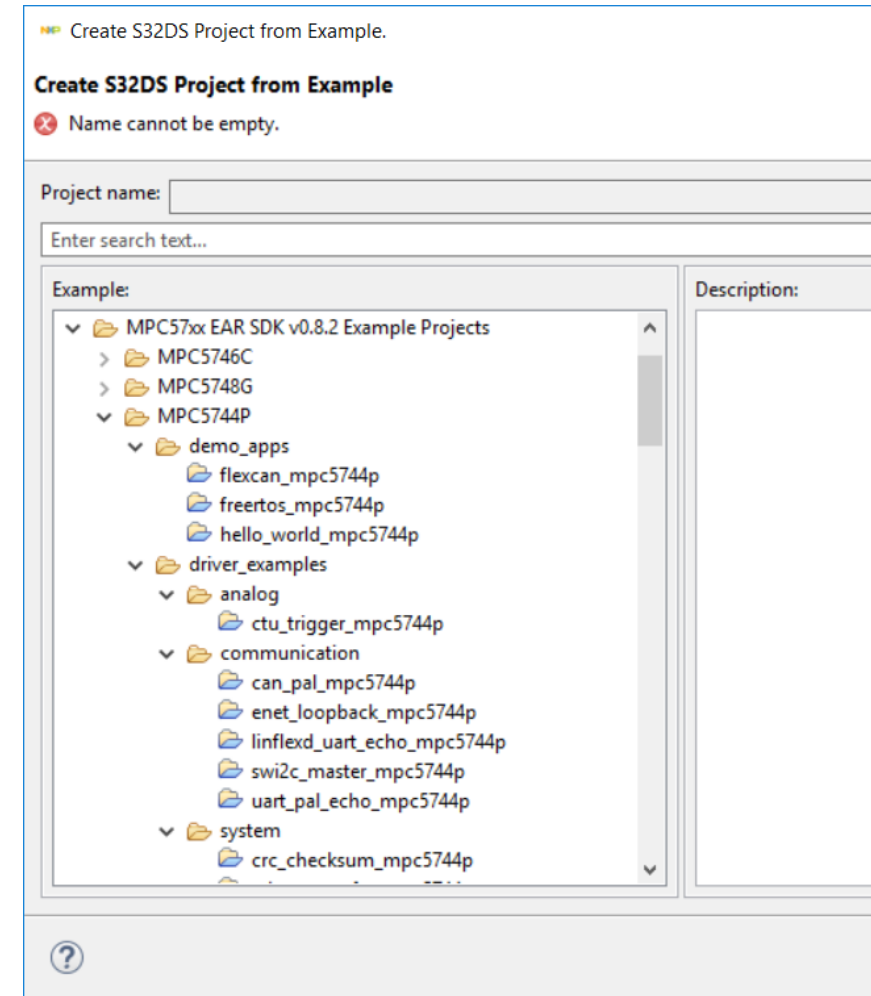
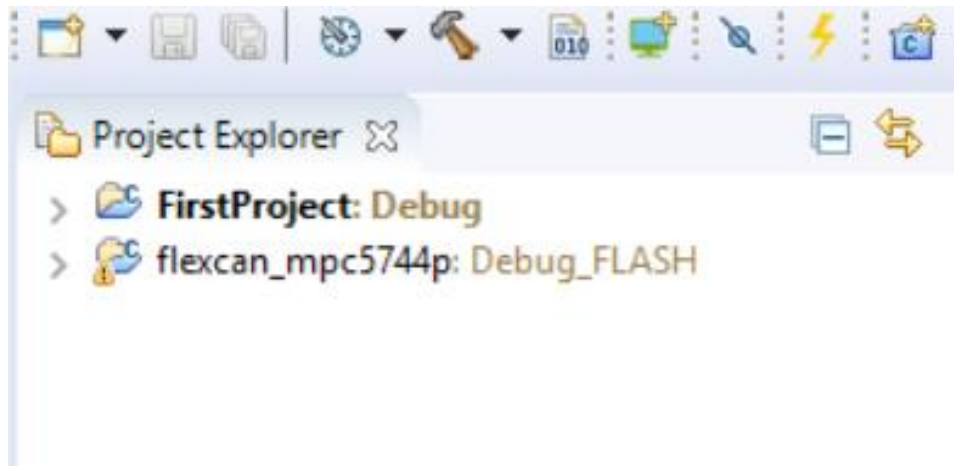
Step-1

- 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



IMPORTING PROJECTS



Step-1

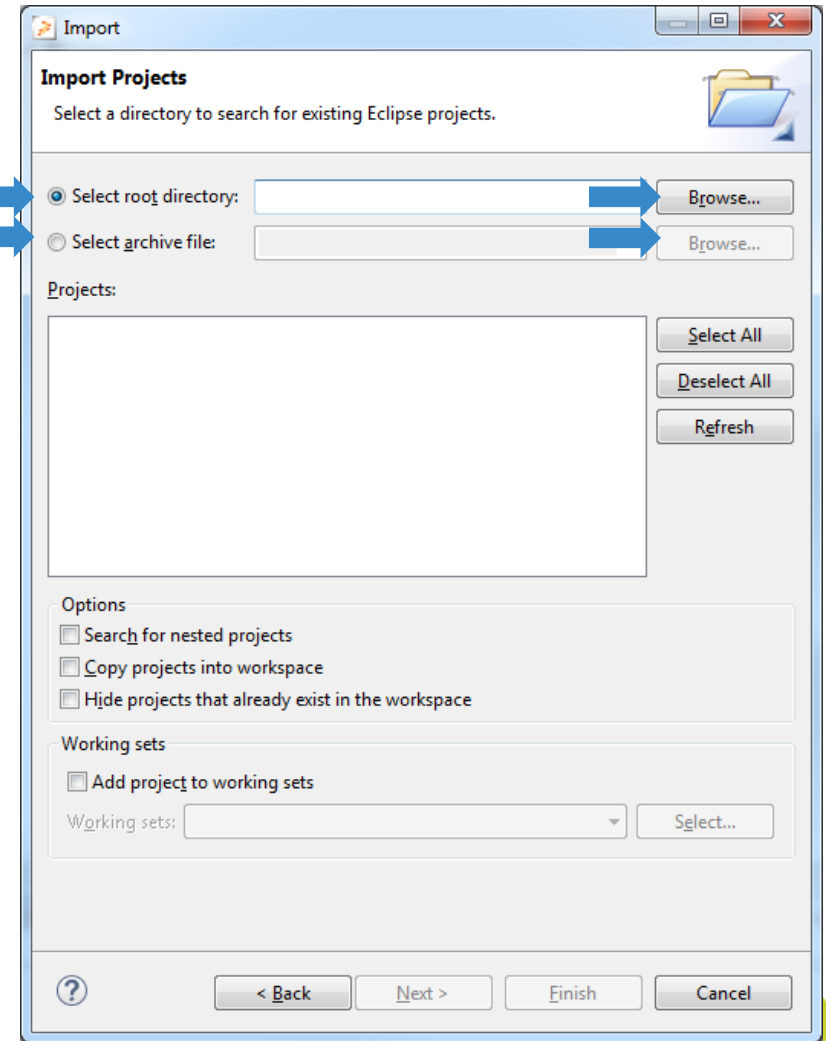
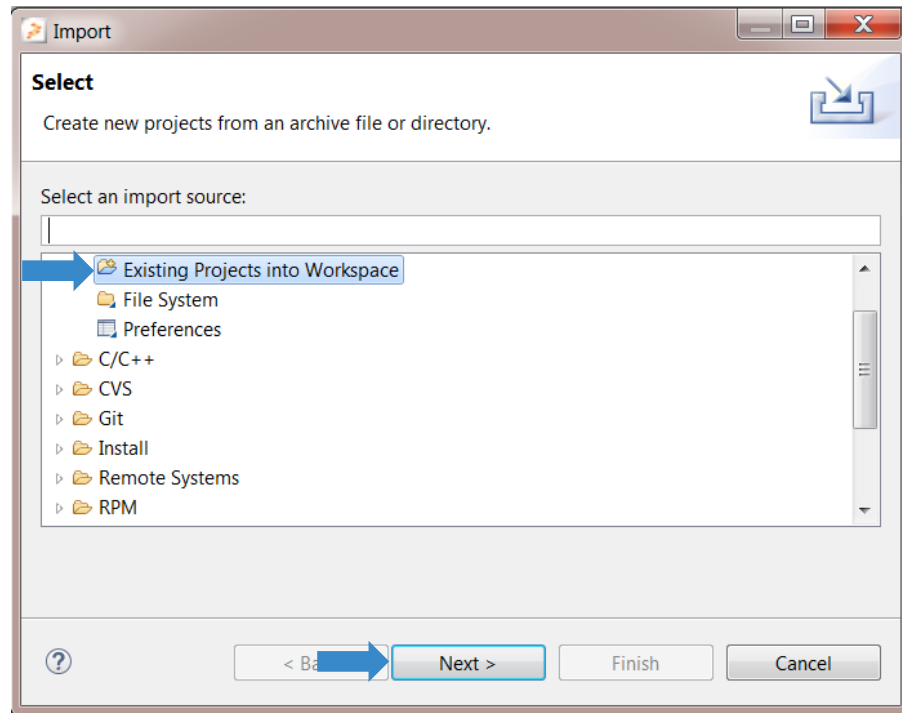
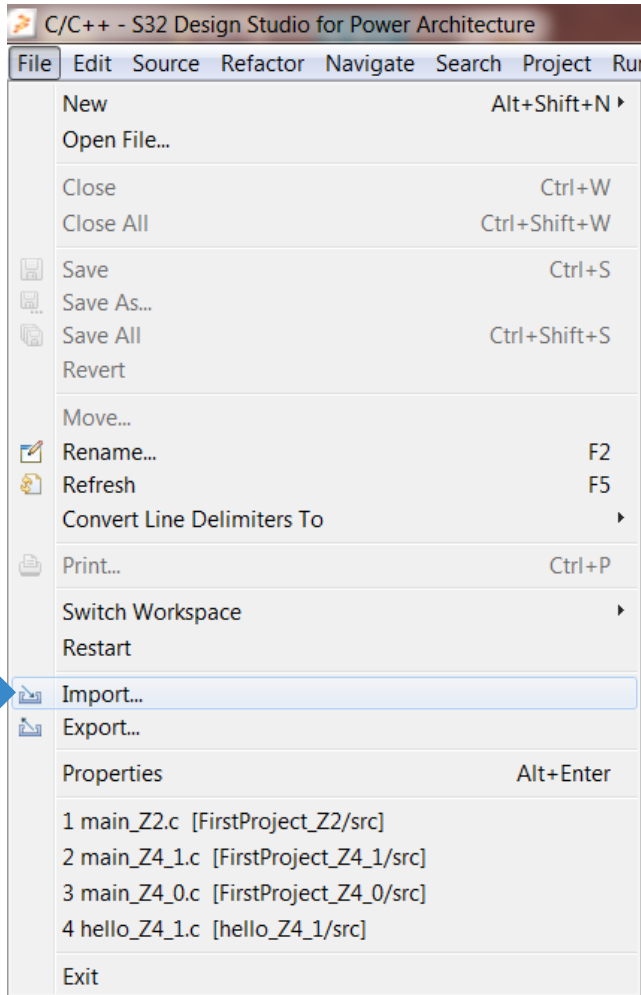
- Go to: File – Import



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

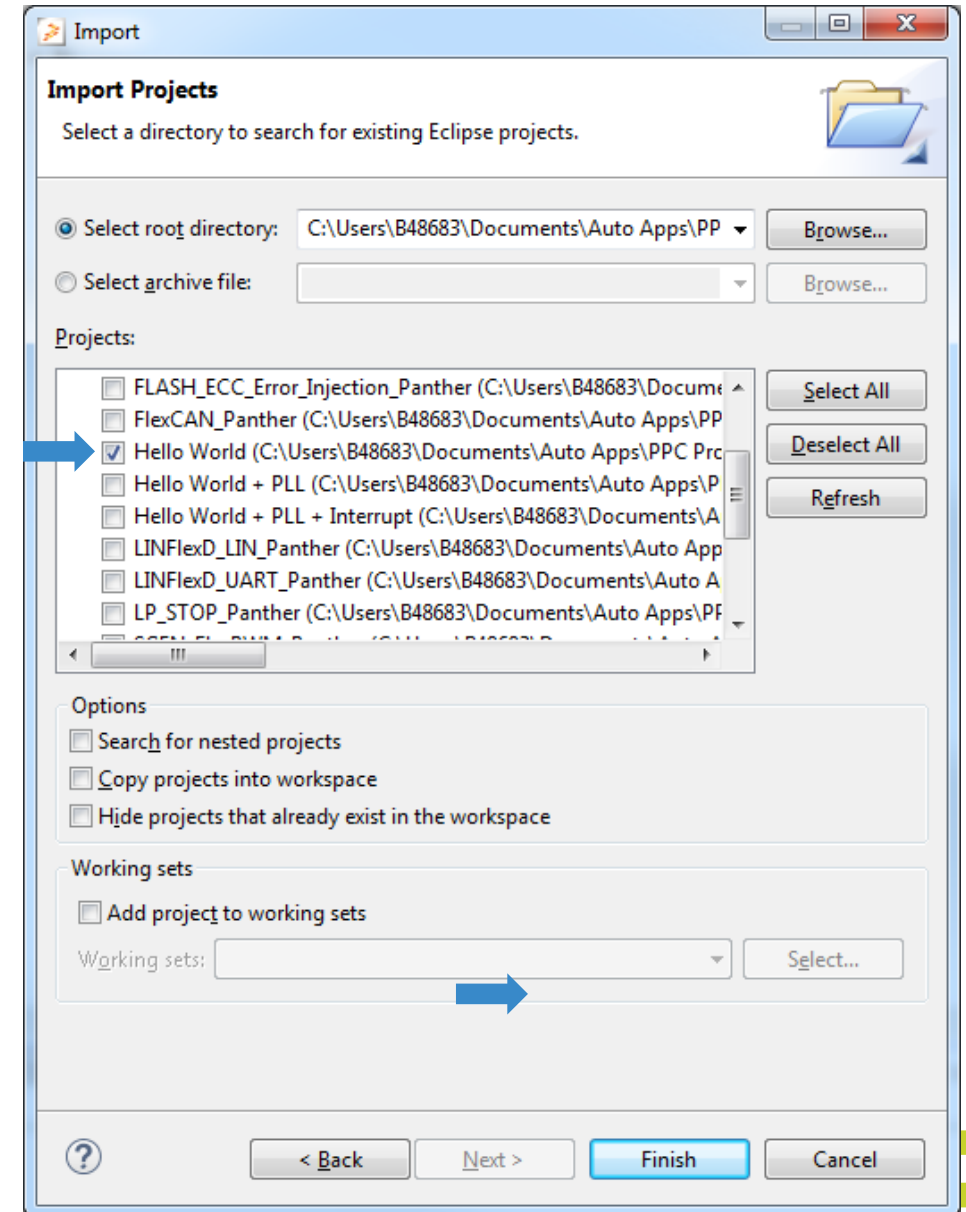
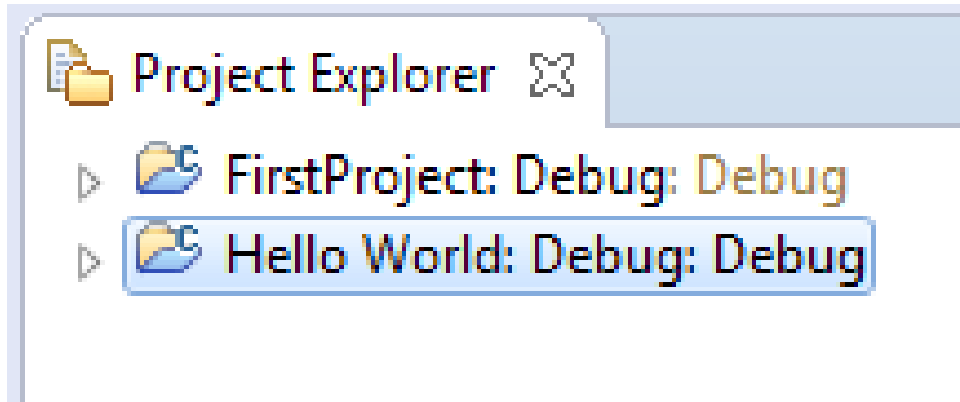


- Click on: Browse & Select Example Folder



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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