



WEL-COME TO CoiNel Technology Solutions LLP

Presentation on

How to Program and Debug programs in Rowley CrossWorks



Rowley
CrossWorks

Creating Contents...
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Getting Started

To start Rowley CrossWorks,

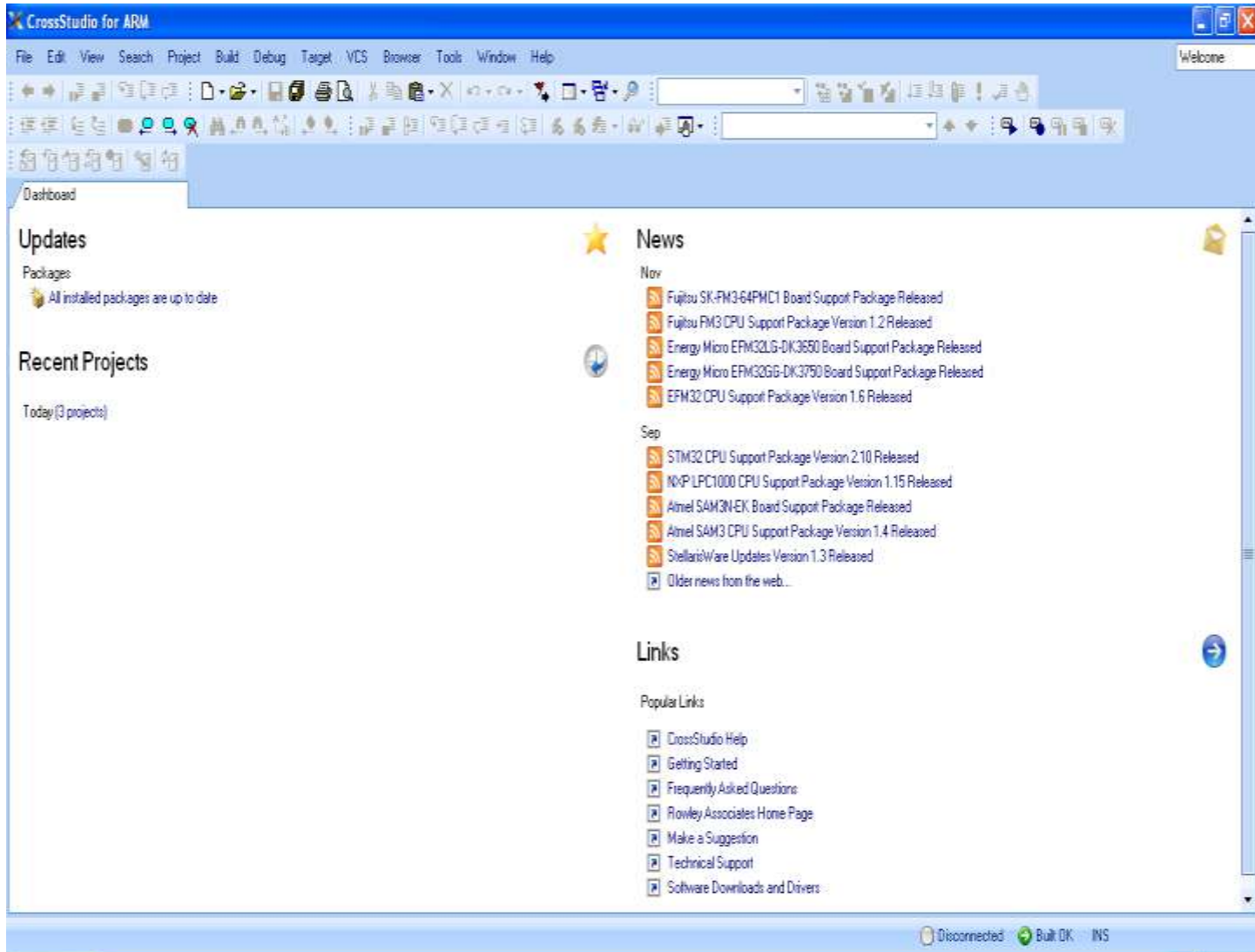
Click on Start button on Task bar,
on the pull up menu, go to

Programs → Rowley Associates
Limited → Cross Works for ARM 2.1
→ Cross studio for ARM 2.1





Rowley's First Page

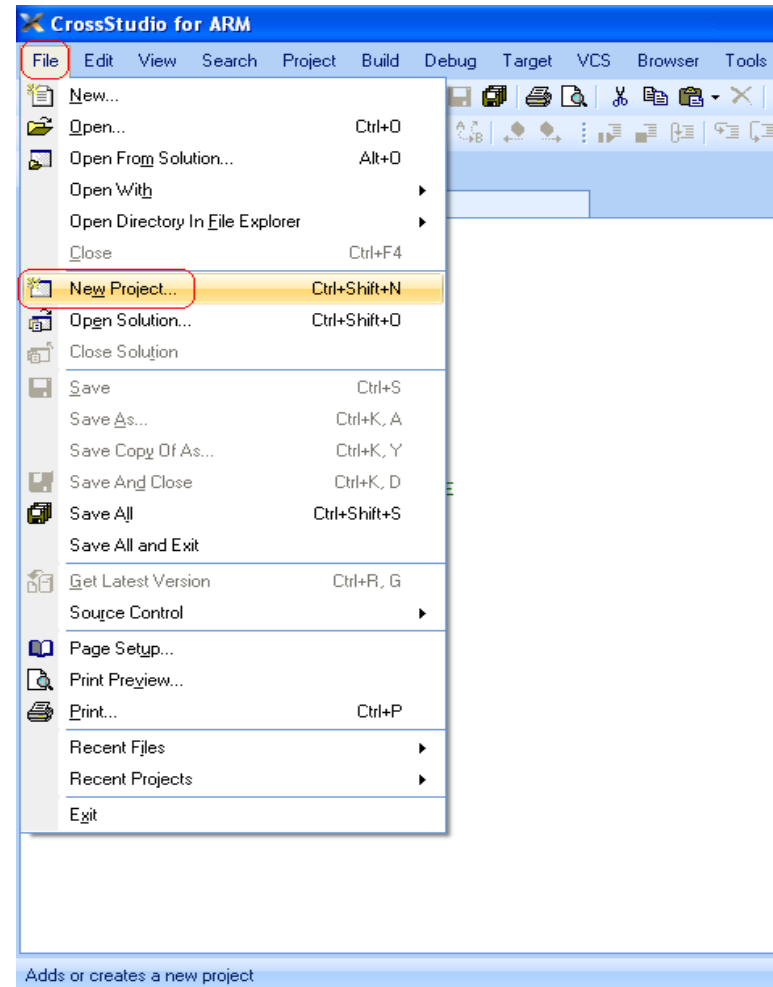




Creating a Project

To Create a project,

Click on File menu → New Project

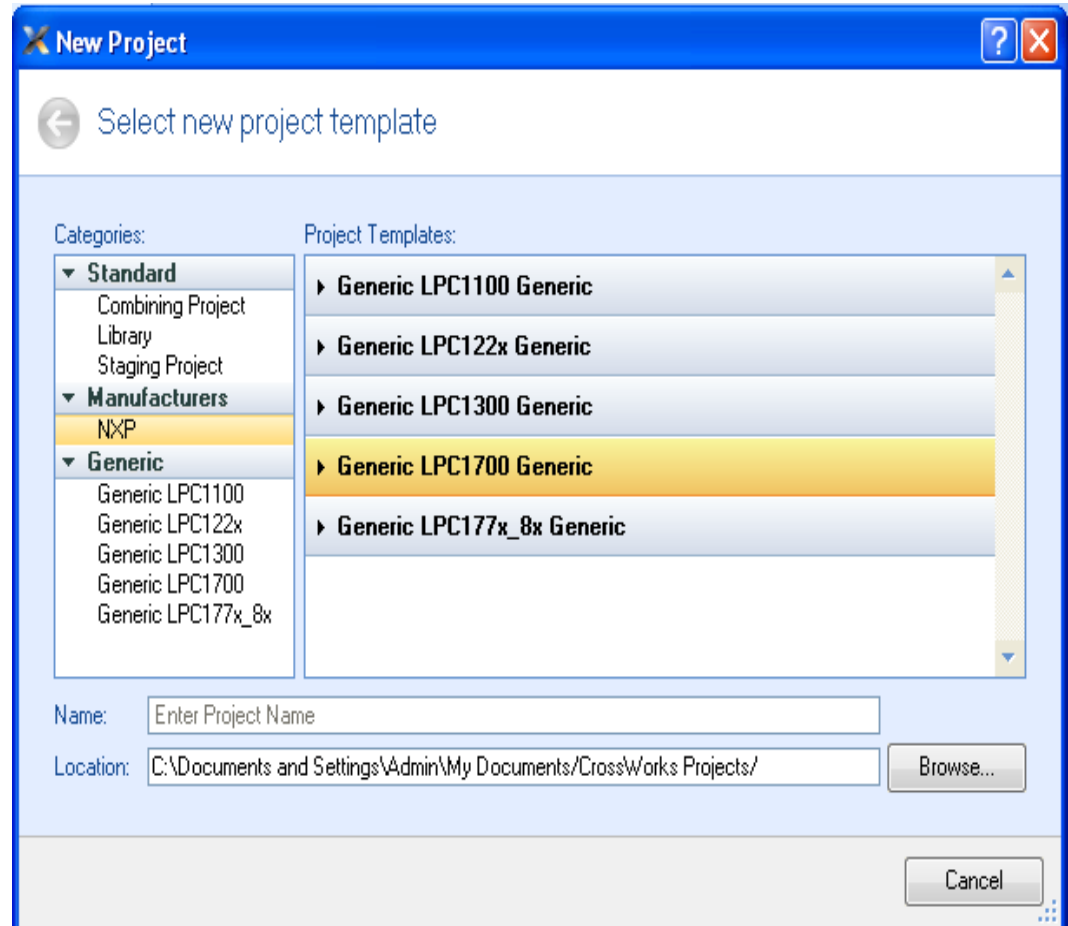




New Project Dialog box

New Project dialog box displays, set of project types & project templates.

Select NXP > Generic LPC1700 Generic, in categories pane.



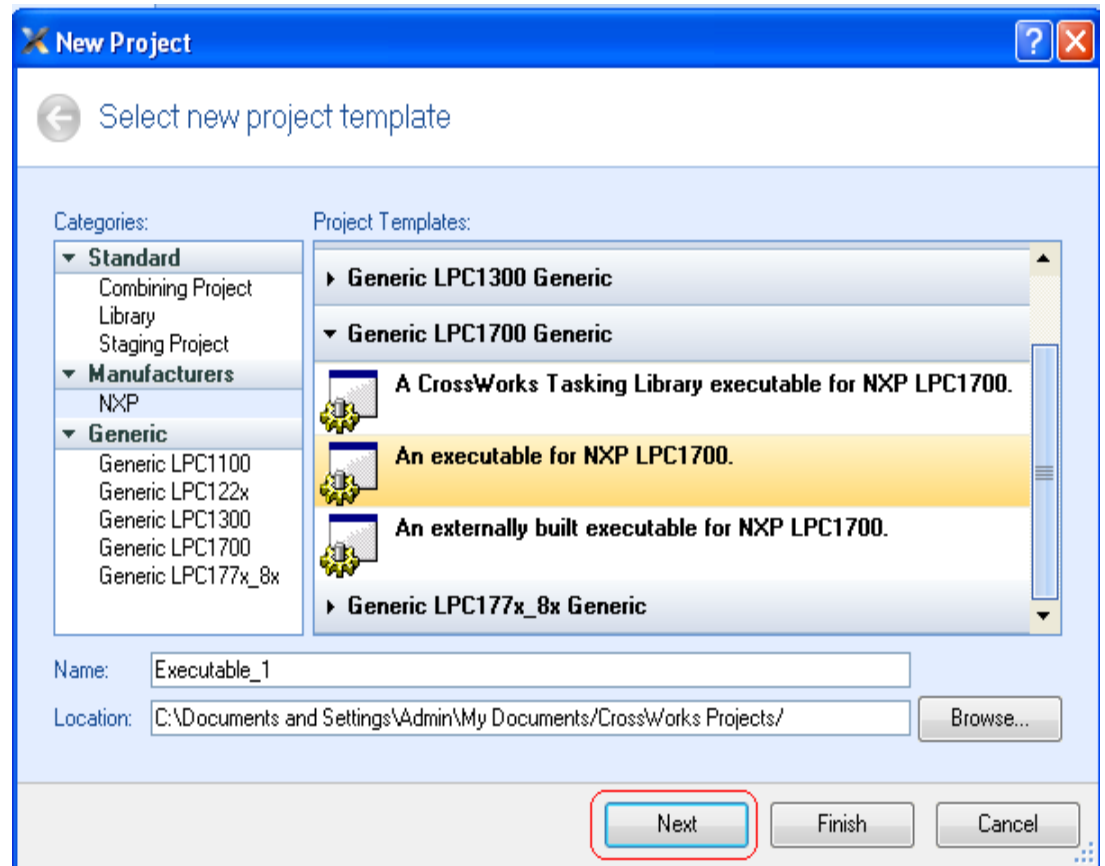


Selecting Controller

In Generic LPC1700
Generic option,

Select An executable for
NXP LPC1700 as shown
in image.

Click on Next button.





Saving Your Project

After selecting LPC1700 option,

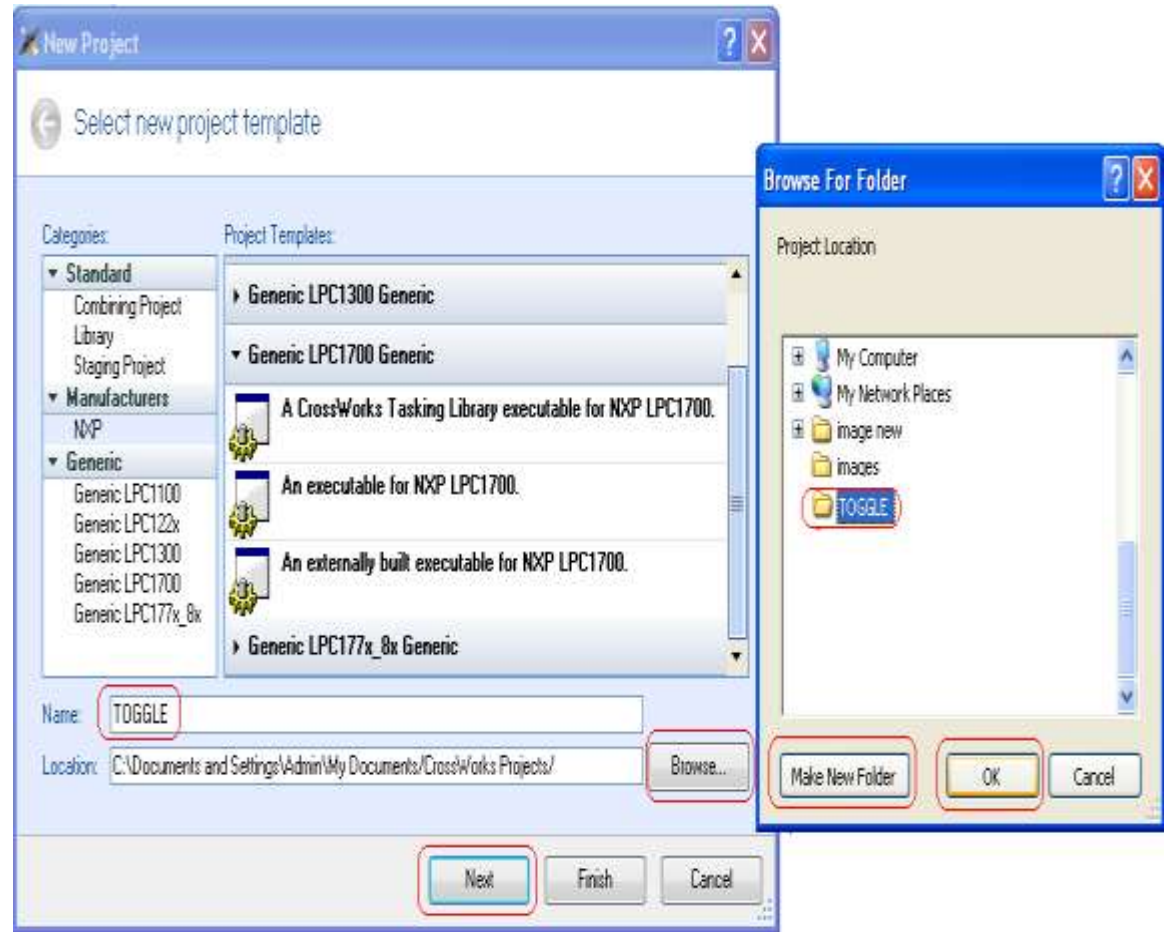
Give your Project name in the Name edit box.

You can also browse for the location to save your project file by clicking on browse button.

Create project folder & save as shown in second image.

Click on Next button.

NOTE: Also copy the folder COMMON supplied to you, with project folder on your saving location.





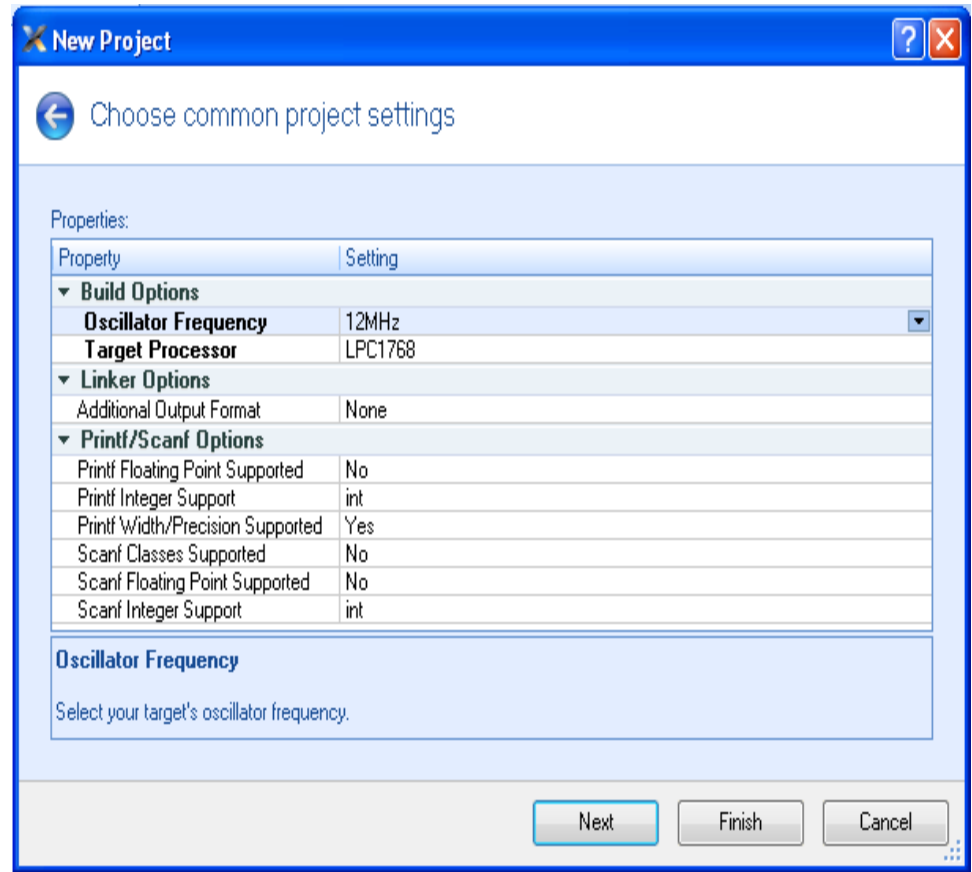
Common Project Settings

Once created project setup wizard prompts you to set some common options for the project.

Here you can customize the project by altering project properties.

You can also change these settings after project is created using project explorer.

Clicking Next displays the files that will be added to the project.

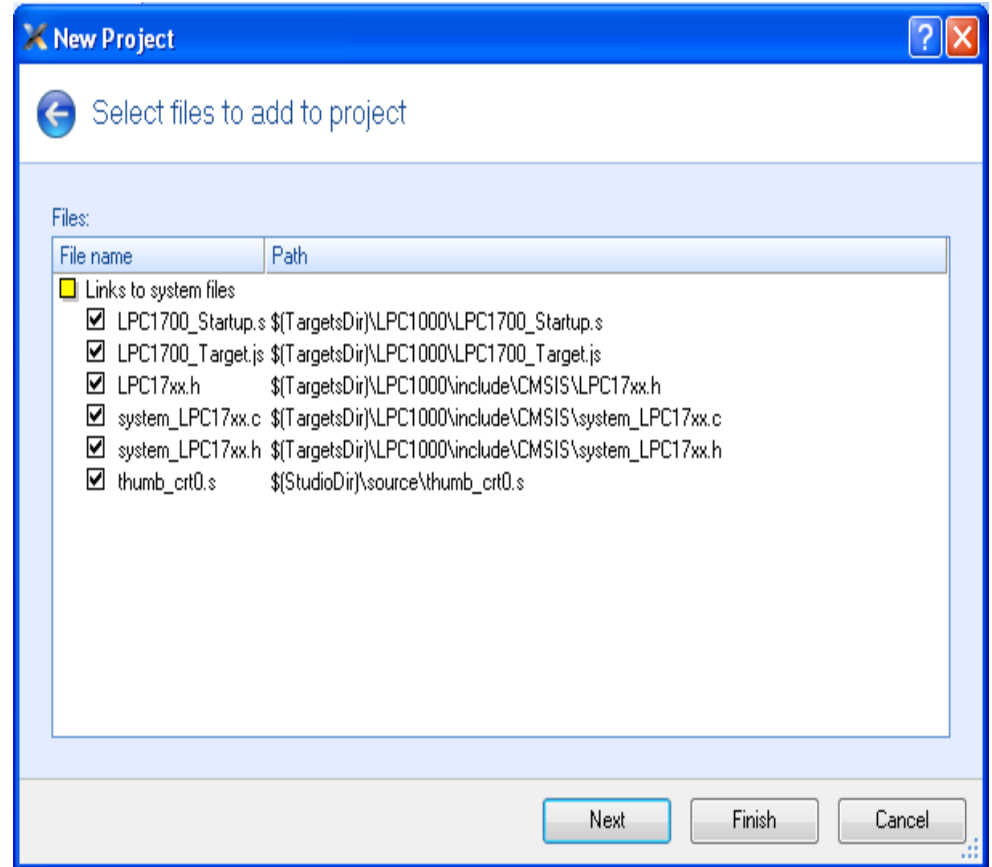




Adding Files to Project

The Links to system files group shows the links that will be created in the project to Cross Studio system files. As these files are links they will, by default, be shared with other projects so modifying one will effect all projects containing similar links.

Clicking Next displays the configurations that will be added to the project.

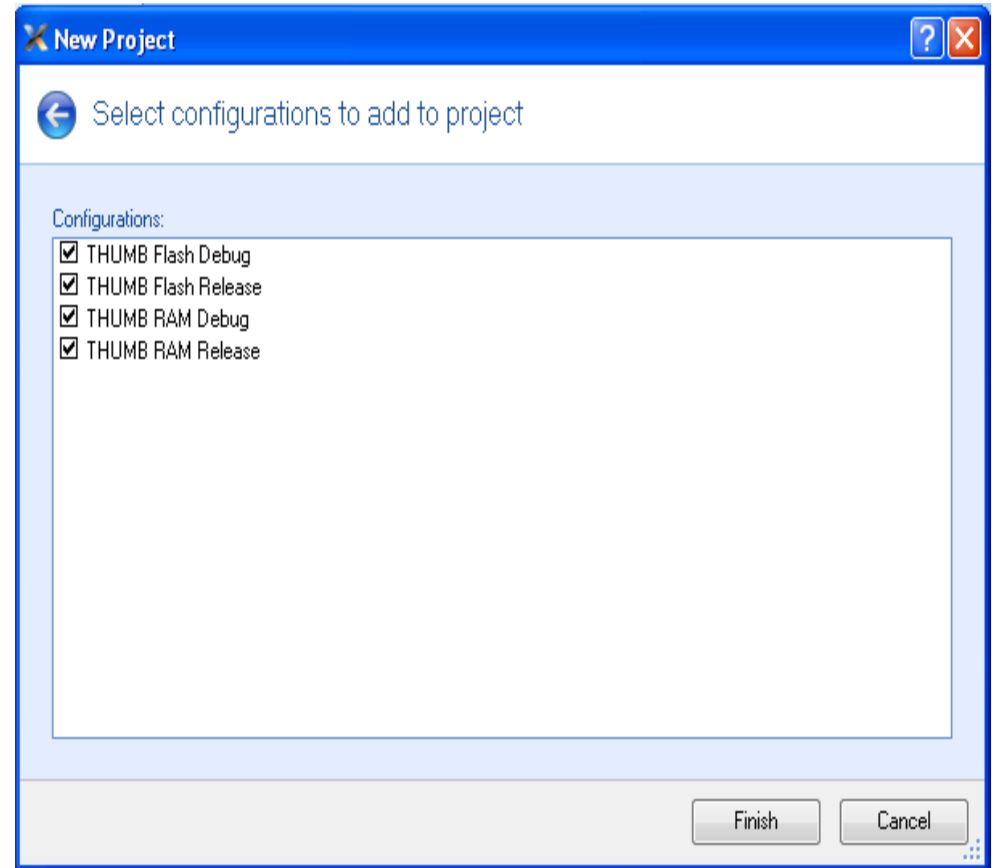




Configurations to Add to Project

Here you can specify the default configurations that will be added to the project.

Complete the project creation by clicking Finish.





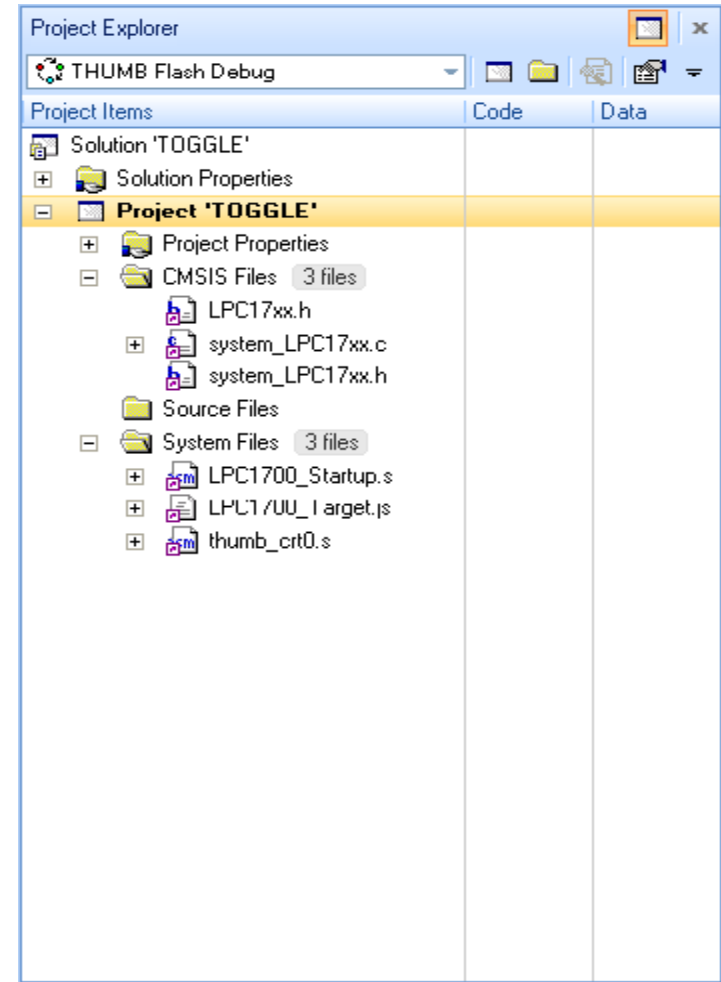
Project Explorer

The Project Explorer shows the overall structure of your project.

To see the project explorer,

From the View menu, click Project Explorer.

You'll notice that the project name is shown in bold which indicates that it is the active project.





Adding New Files to Project

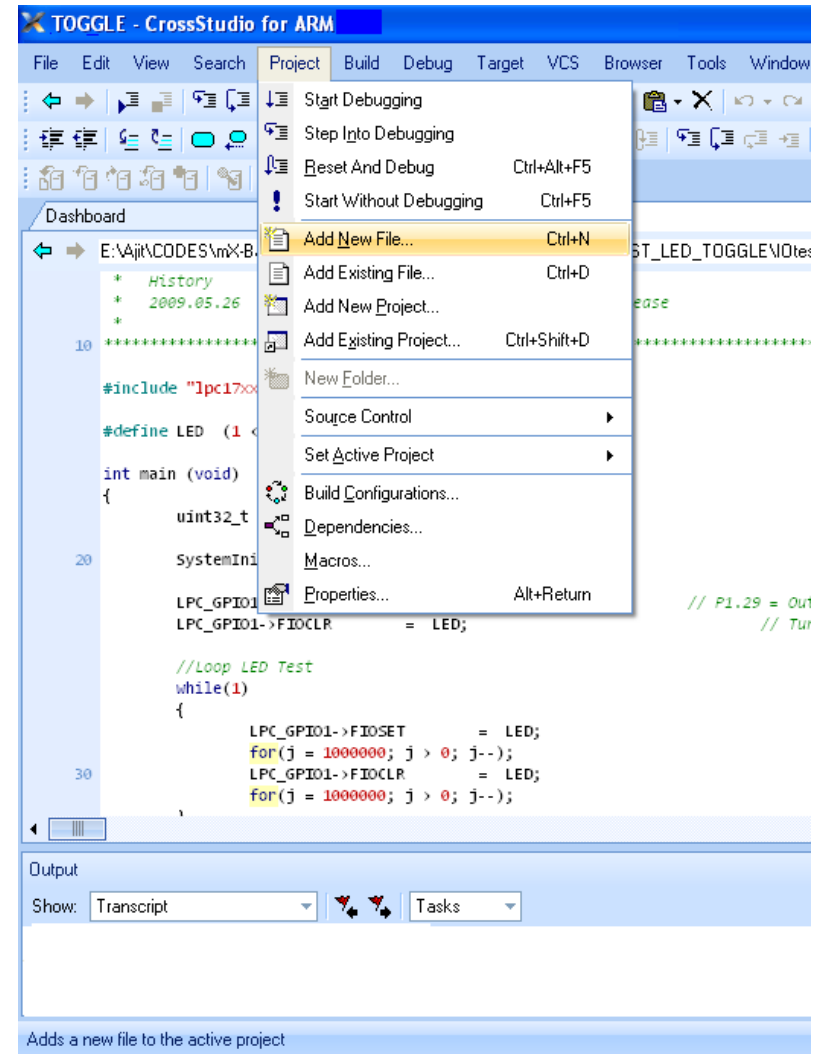


To add a new file to the project, do the following:

From the Project menu, click Add New File.

In the Project Explorer, right click the TOGGLE node.

From the context menu, click Add New File





New File Dialog Box

The New File dialog appears after you click on Add New File option.

Ensure that the C File (.c) icon is selected.

In the Name edit box, type main.c.

Click OK to add the new file.

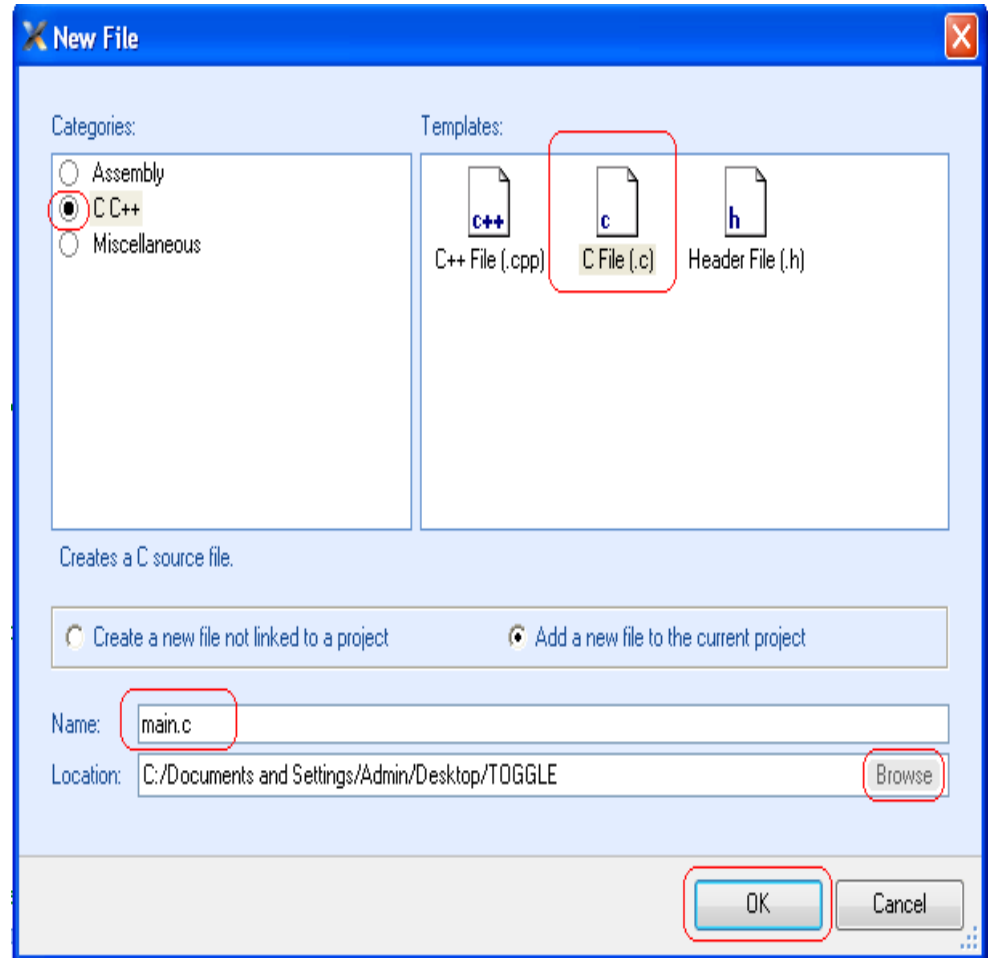




Image After Adding main.c File

Your main.c file should now look like this as in image.

```
TOGGLE - CrossStudio for ARM
File Edit View Search Project Build Debug Target VCS Browser Tools Window
Dashboard Browser main.c
C:\documents and settings\admin\Desktop\TOGGLE\main.c
10 *****
#include "lpc17xx.h"
#define LED (1 << 29)
int main (void)
{
    uint32_t j;
20    SystemInit();
    LPC_GPIO1->FIODIR   |= LED;           // P1.29 = Outputs
    LPC_GPIO1->FIOCLR   = LED;           // Turn-OFF LED
    //Loop LED Test
    while(1)
    {
        LPC_GPIO1->FIOSET   = LED;       // Turn-ON LED
        for(j = 1000000; j > 0; j--);
        LPC_GPIO1->FIOCLR   = LED;       // Turn-OFF LED
        for(j = 1000000; j > 0; j--);
30    }
34 }
```

Output
Show: Transcript Tasks

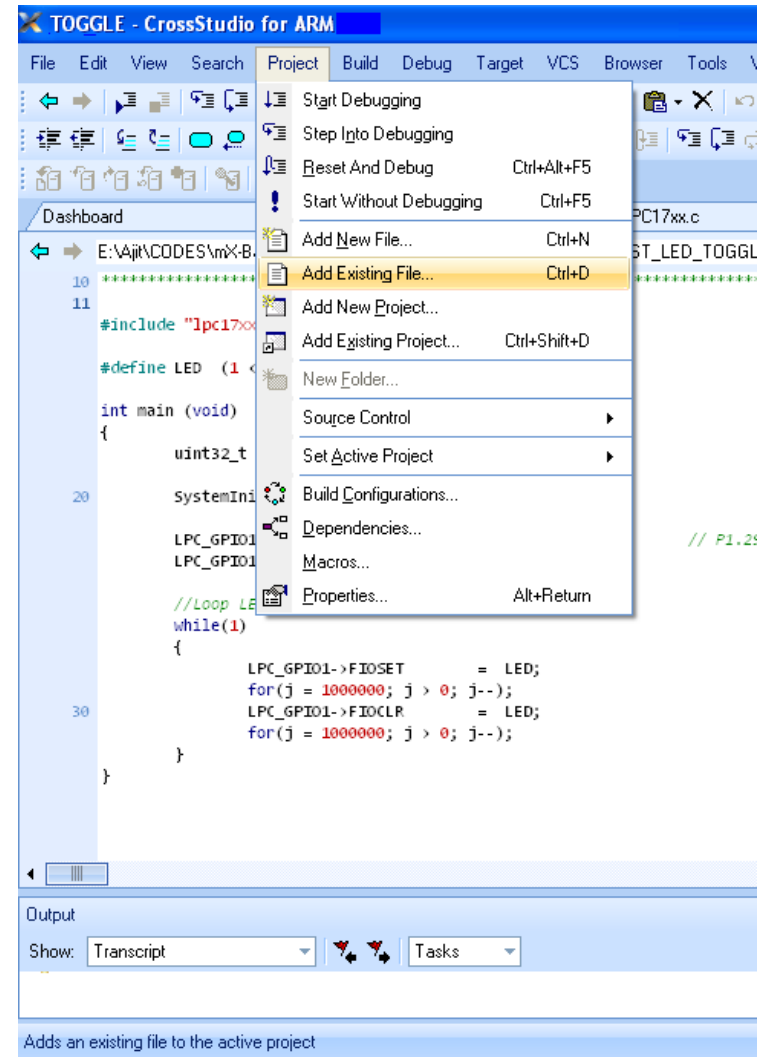


Adding Existing Files To Project

To add an existing file to the project, do the following:

From the Project menu, click Add Existing File.

Choose this option, only if you are opting to add existing files into your project.





Adding Existing Items

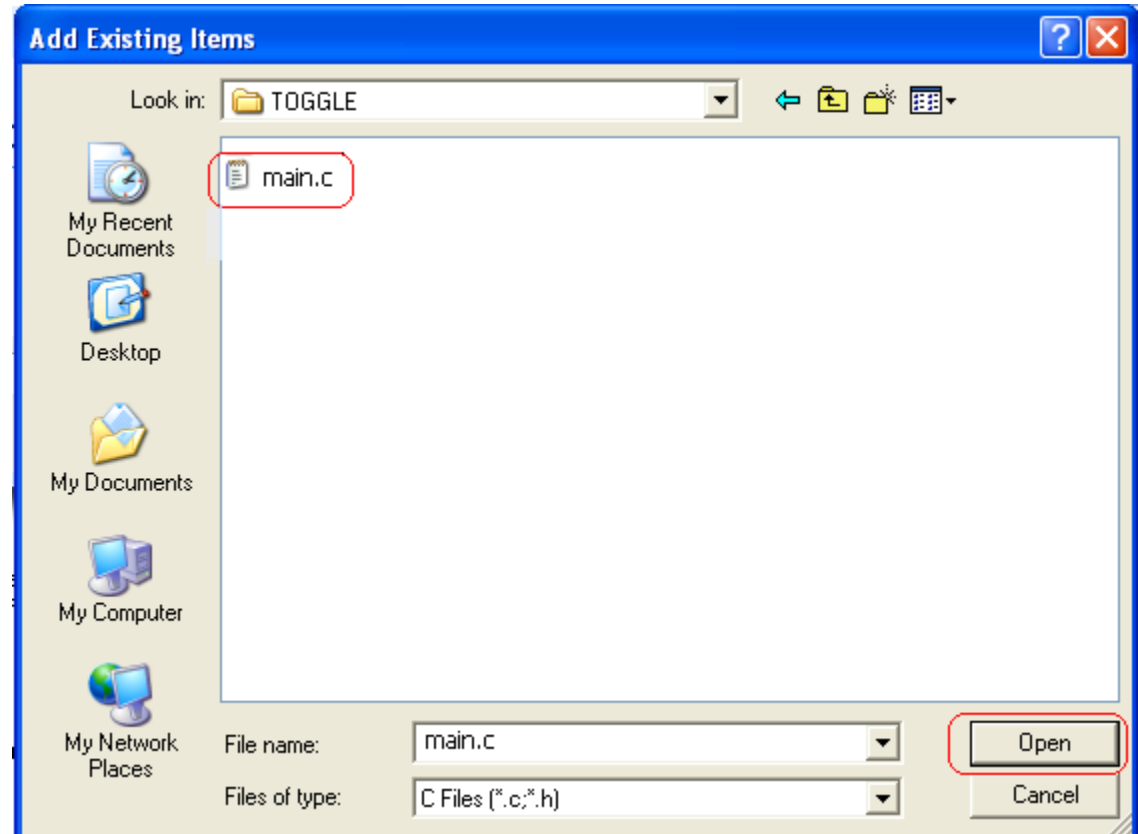
After Selecting Add Existing option,

Add Existing Items dialog box appears.

Select the file you want to add.

Then click Open to add the file to the project.

In the image we have shown adding main.c file.





Building Projects

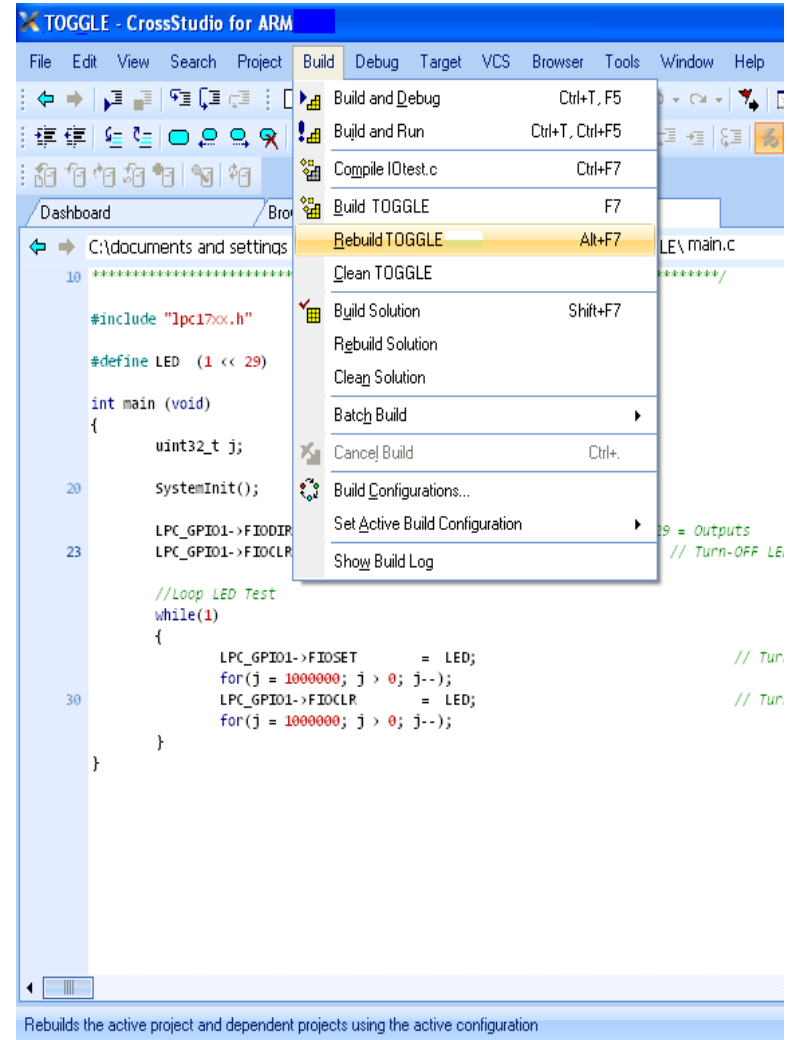
To build the project, do the following:

From the Build menu, click Rebuild TOGGLE.

Alternatively, to build the TOGGLE project using a context menu, do the following:

In the Project Explorer, right click the TOGGLE project node.

Select Build or Rebuild from the context menu.





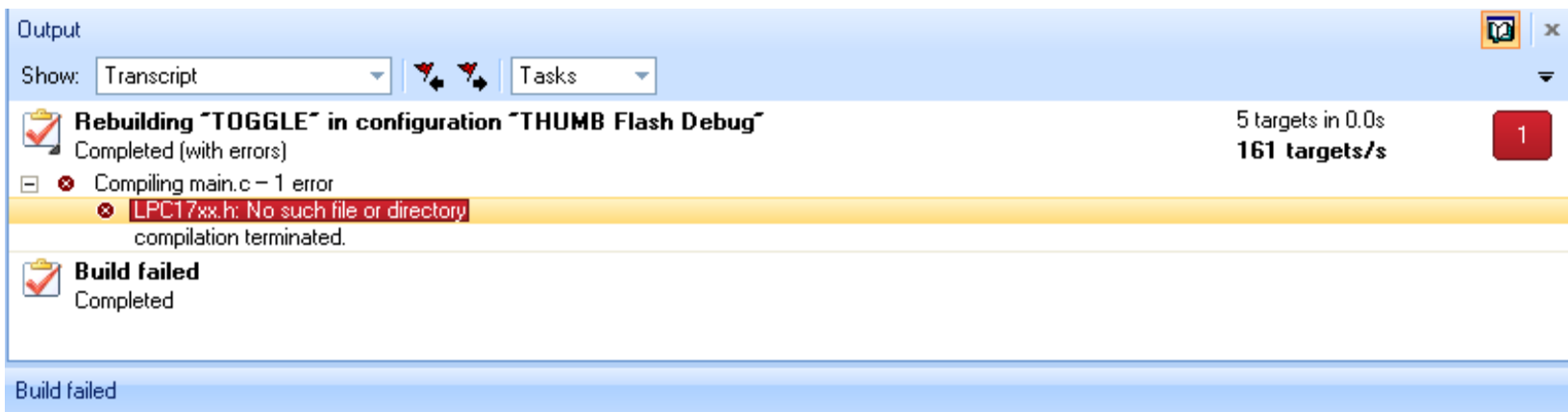
Building Failed

Cross Studio starts compiling the project files but finishes after detecting an error. The Output Window shows the Build Log which contains the errors found in the project:

Image below is an instance when an error occurred when include files were not added.

Hence add your files to project correctly, else your code wont be compiled.

To see how to include files, see successive slides.

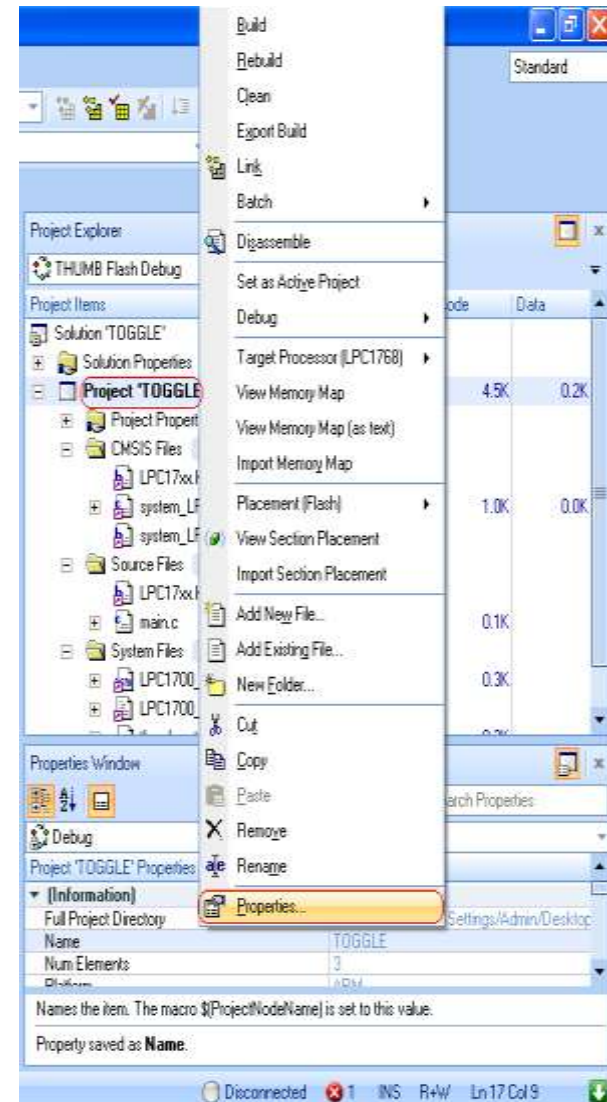




Adding Include Files ...(1)

To add include files,

Right click on Project “TOGGLE” in Project Explorer window & a pull up menu appears as shown in image.





Adding Include Files ...(2)

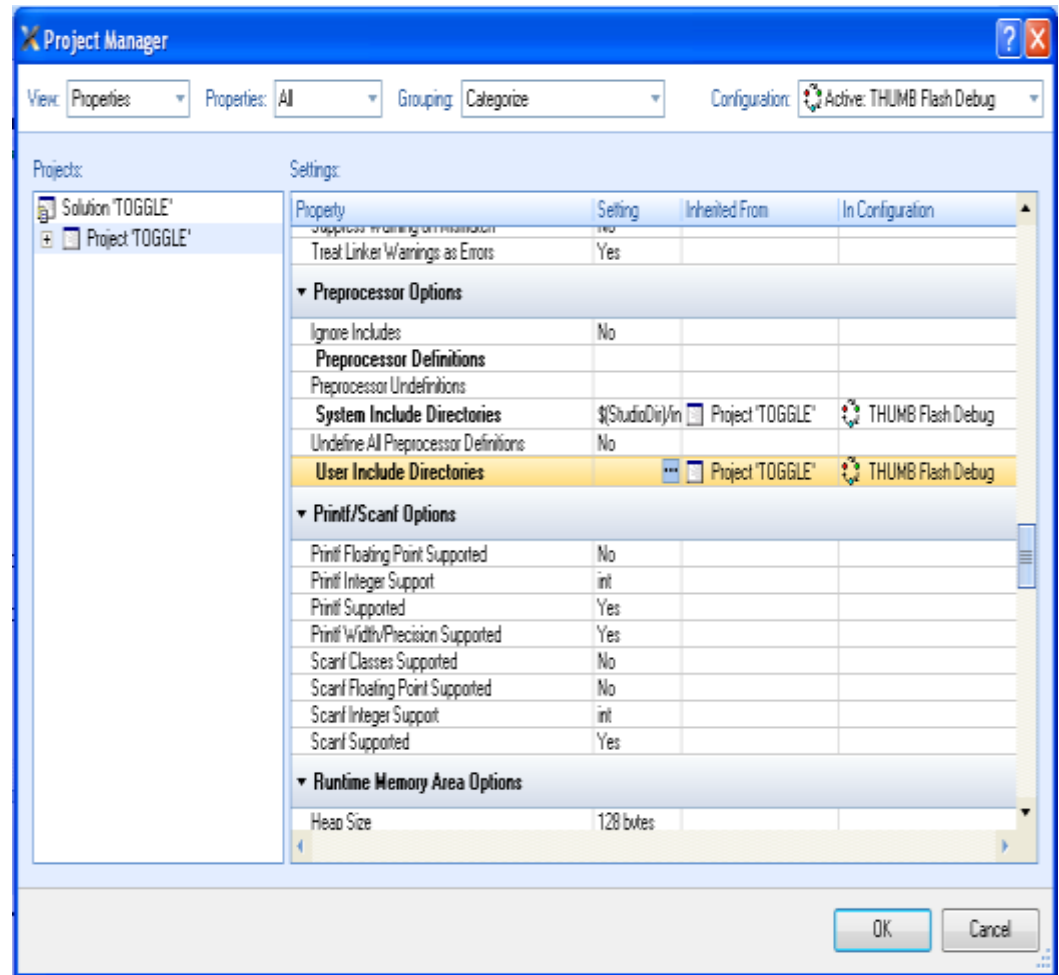
Contd., from previous slide

Project Manager dialog box appears, after you select,

Properties option in the pull up menu as shown in previous slide.

Go to Preprocessor options.

Select User Include Directories option as shown in the image.





Adding Include Files ... (3)

Contd., from previous slide

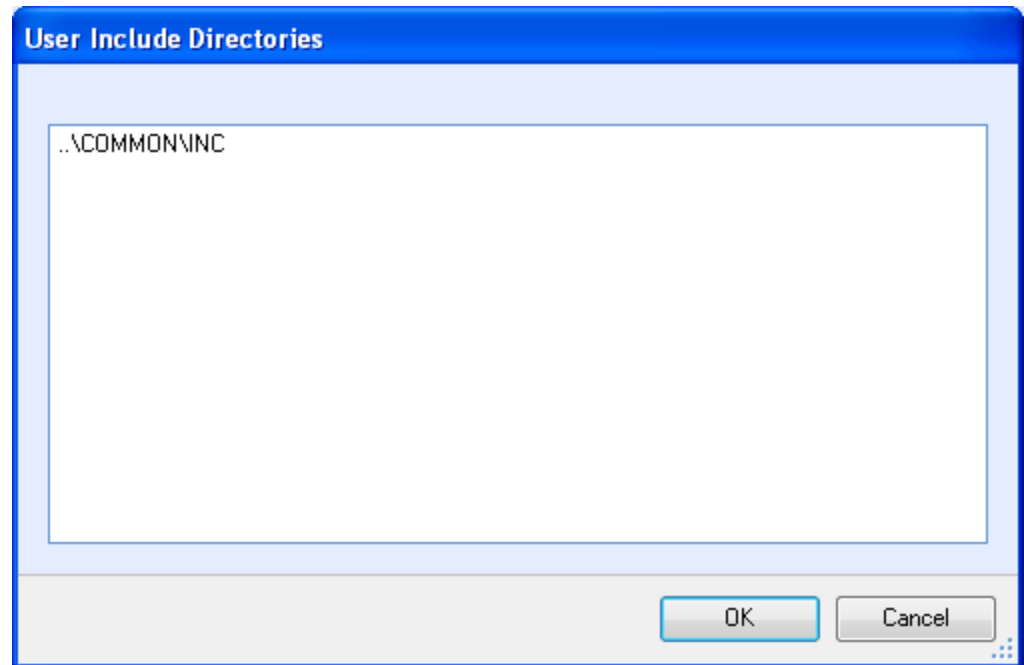
This dialog appears after you,

User Include Directories option
as shown in previous slide.

*Include & source files are saved
in folder named COMMON.*

Type in as shown in image if
your Project folder is with
COMMON folder.

Click OK.





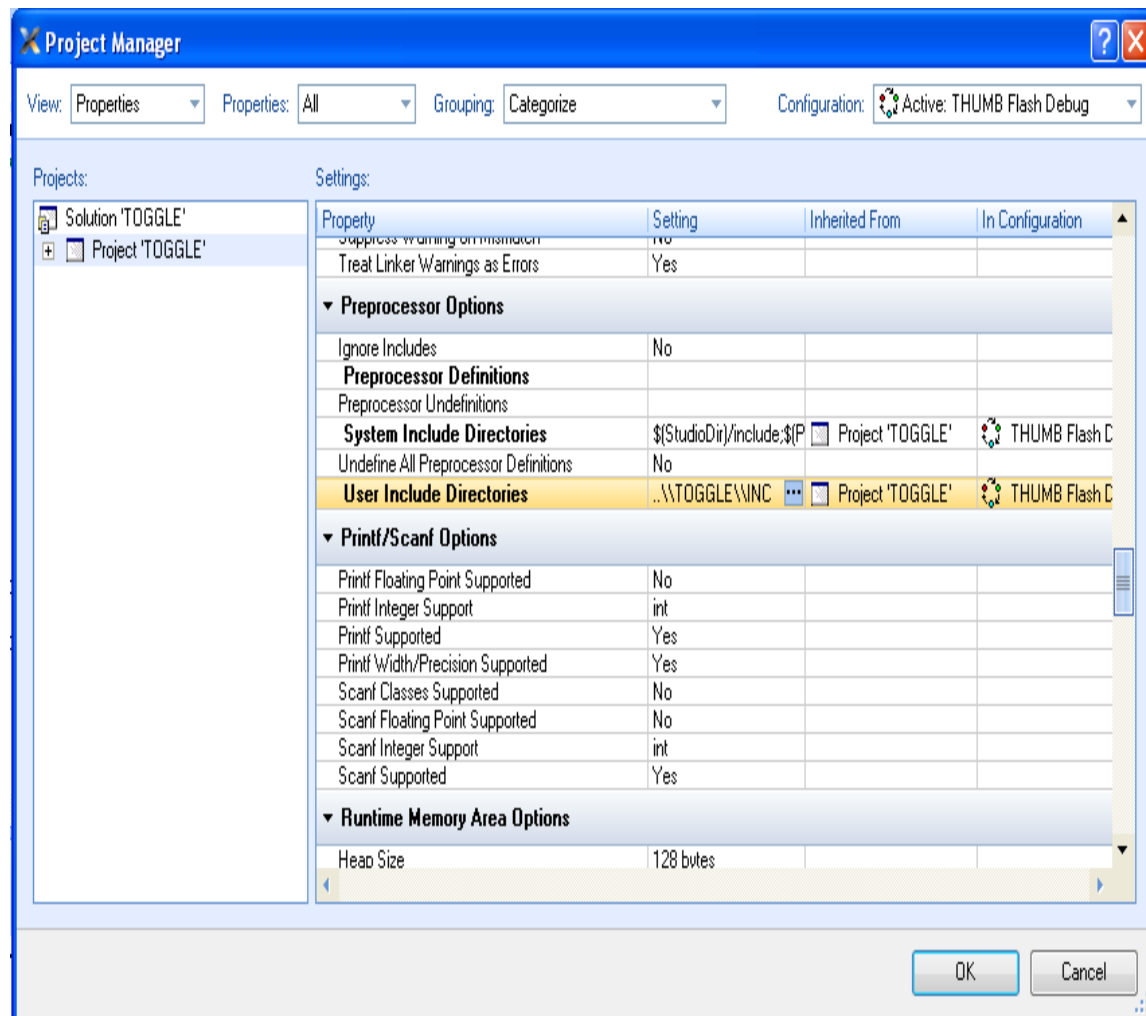
Adding Include Files ... (3)

Contd., from previous slide

This is how it looks after you type in your include files as shown in the highlighted area of the image.

Click OK.

And then rebuild your Project by clicking on Build menu → Rebuild TOGGLE.





Building Projects... (3)

This is how your Output window looks like when your project is compiled with no errors.

Task	Duration	Speed	Action
Rebuilding "TOGGLE" in configuration "THUMB Flash Debug"	5 targets in 0.2s	18 targets/s	OK
Build complete	1 projects in 0.2s	3 projects/s	OK

Resource	Usage	Summary	Percentage
FLASH	4.9 KB	5,068 FLASH	0%
RAM	0.2 KB	264 RAM	0%

Build complete

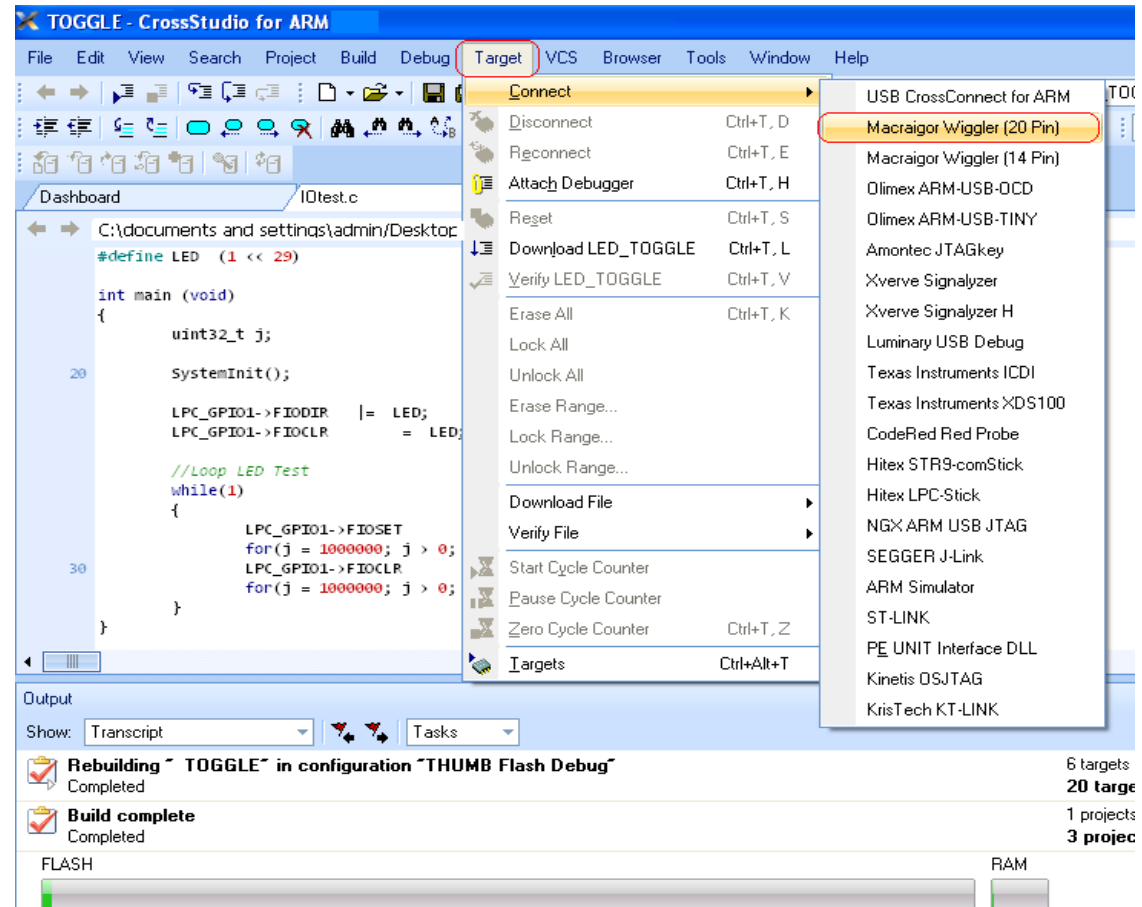


Targeting Board using 20pin Wiggler

To connect with your target board,

Click on Target → Connect → Macraigor Wiggler (20 Pin)

Here programming is through Parallel Port JTAG





Programming the Target

To program your target,

Click on Debug & then Go.

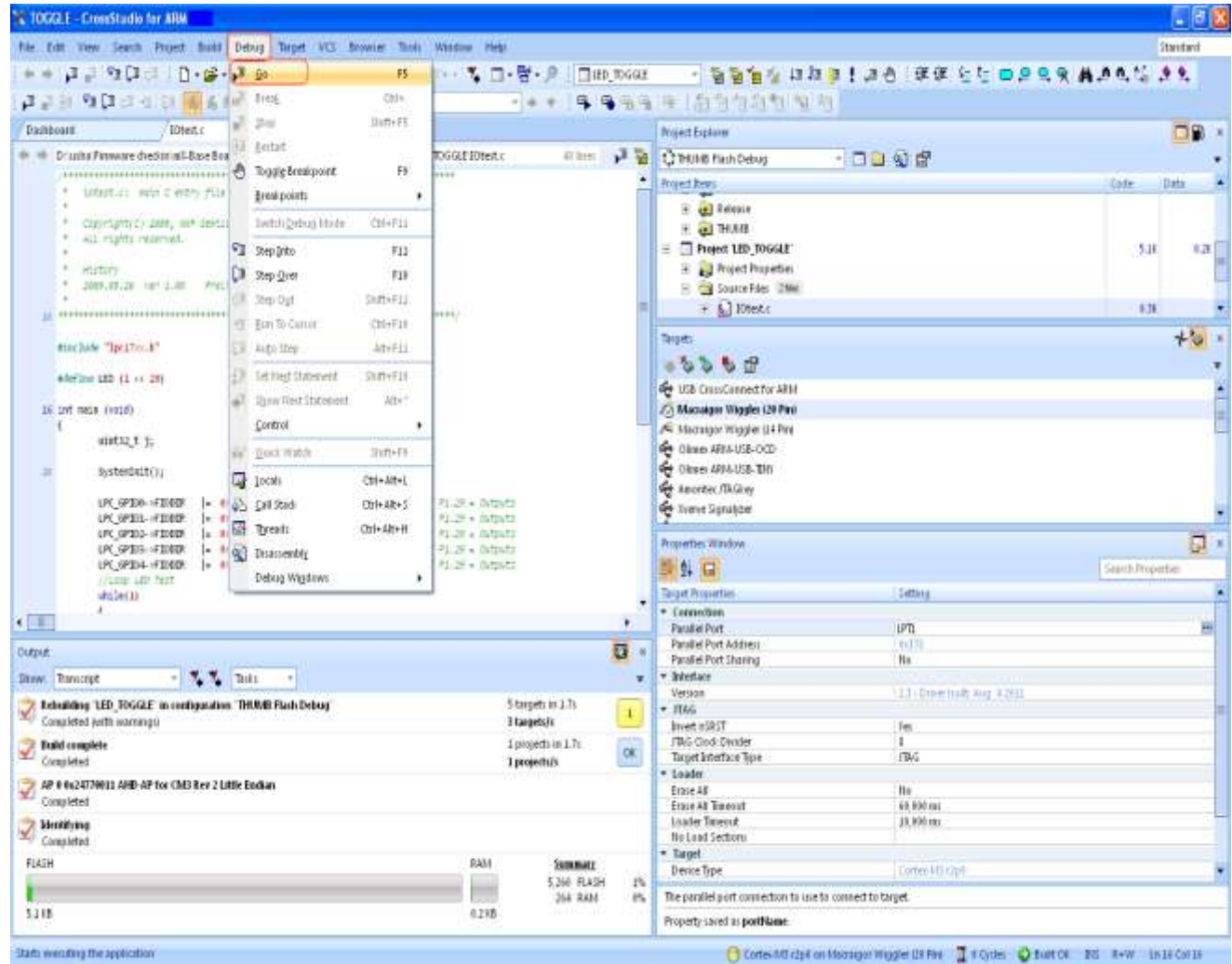




Image seen in Output window when programmed

This is how it looks in the output window after your press Debug → Go

Task Description	Completion Status	Timing & Speed	Action
Checking "TOGGLE" in configuration "THUMB Flash Debug"	Completed	5 targets in 0.0s 161 targets/s	OK
Preparing target for download	Completed	Completed in 0.6s	OK
Downloading "Loader_rpc.elf" to Macraigor Wiggler (20 Pin)	Completed	2.6 KB in 0.6s 3.8 KB/s	OK
Verifying "Loader_rpc.elf" on Macraigor Wiggler (20 Pin)	Completed	2.6 KB in 0.6s 4.1 KB/s	OK
Erasing "LED_TOGGLE.elf" to Macraigor Wiggler (20 Pin)	Completed	5.1 KB in 1.6s 3.0 KB/s	OK
Downloading "TOGGLE.elf" to Macraigor Wiggler (20 Pin)	Completed	5.1 KB in 0.0s 342.4 KB/s	OK
Verifying "TOGGLE.elf" on Macraigor Wiggler (20 Pin)	Completed	5.1 KB in 0.0s 160.5 KB/s	OK
Preparing target for user application	Completed	Completed in 0.6s	OK



Debugging the Code

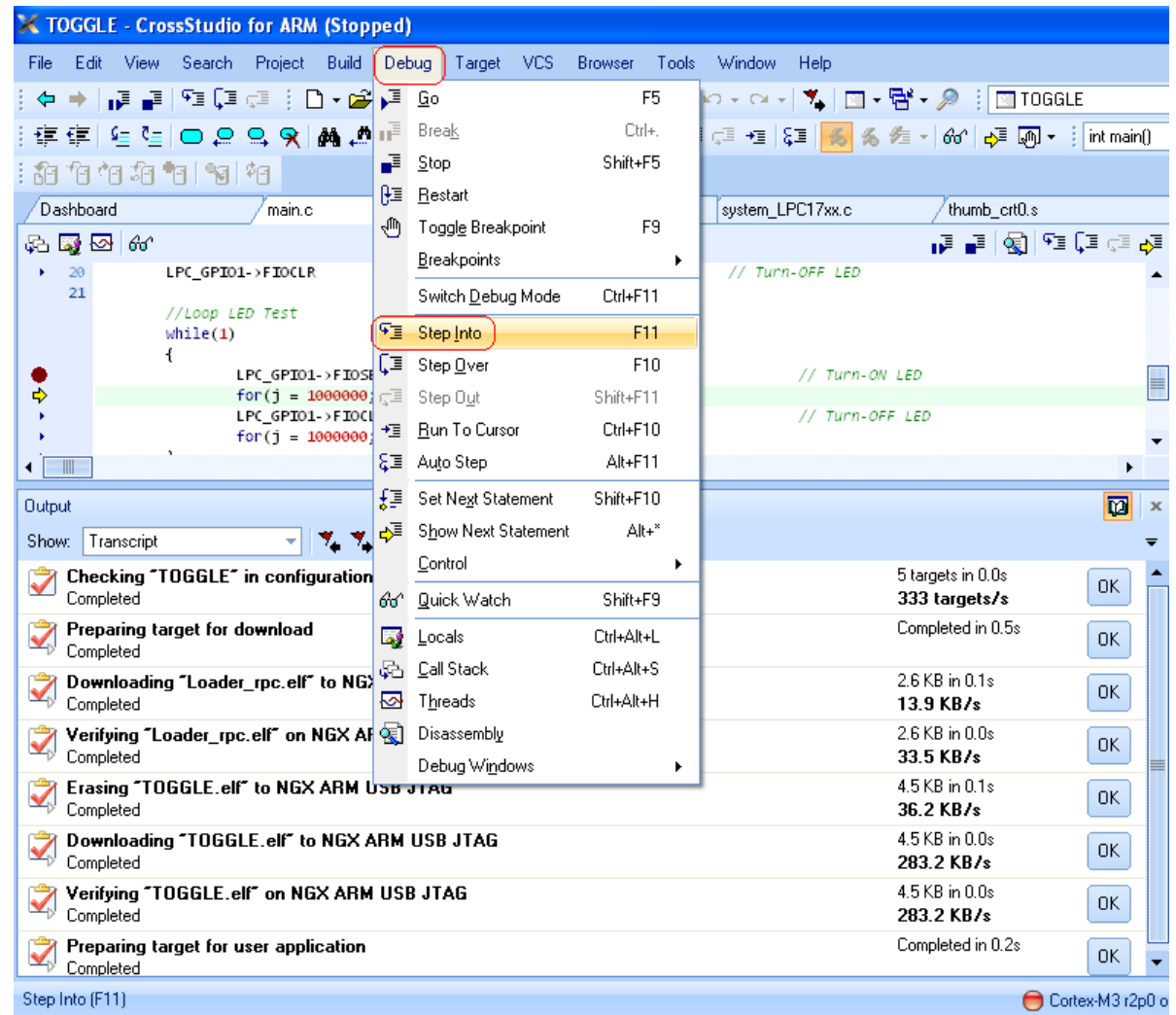
You can also debug your code line by line by,

Going to debug menu → Step Into option as shown in the image.

Step Into is used to check line by line of your code.

Step Over Makes you to come out of the code.

Let your target board be connected & powered up when you are debugging your code.





Thank You!!!

For any technical queries,

mail us @: info@coineltech.com

Technical Forum: www.coineltech.com/forums

You can check the complete video tutorial [here](#)