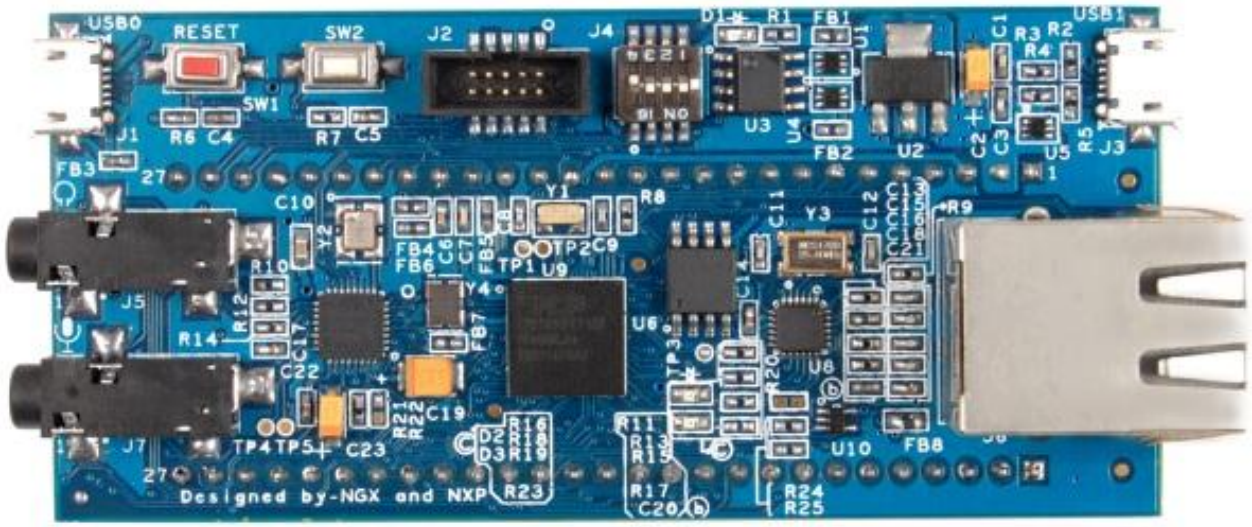
LPC1830-Xplorer



About NGX Technologies

NGX Technologies is a premier supplier of development tools for the ARM7, ARM Cortex M0, M3 and M4 series of microcontrollers. NGX provides innovative and cost effective design solutions for embedded systems. We specialize in ARM MCU portfolio, which includes ARM7, Cortex-M0, M3 & M4 microcontrollers. Our experience with developing evaluation platforms for NXP controller enables us to provide solutions with shortened development time thereby ensuring reduced time to market and lower development costs for our customers. Our cost effective and feature rich development tool offering, serves as a testimony for our expertise, cost effectiveness and quality.

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CE certification:

NGX Technologies LPC1830-Xplorer board has been tested for radiated emission as per EN55022 class a standard. The device is under the limits of the standard EN55022 class A and hence CE marked. No other test have been conducted other than the radiated emission (EN55022 class A standard). The device was tested with the ports like USB, Serial, and Power excluding the GPIO ports. Any external connection made to the GPIO ports may alter the EMC behavior. Usage of this device under domestic environment may cause unwanted interference with other electronic equipment's. User is expected to take adequate measures. The device is not intended to be used in and end product or any subsystem unless the user re-evaluates applicable directive/conformance.

Table of Contents

1.0 INTRODUCTION

This document is the 'User Manual' for LPC1830-Xplorer; a cost effective evaluation platform for NXP's LPC18xx MCU. This document reflects its contents which include system setup, debugging, and software components. This document provides detailed information on the overall design and usage of the board from a systems perspective.

Before proceeding further please refer the quick start guide for Xplorer features, Xplorer Unboxing and Xplorer verification.

Before proceeding further please refer the Quick Start Guide for Xplorer features, Xplorer Unboxing and Xplorer verification. Kindly refer to the product page for the latest information.

Note: To restore the Factory Default for 'LPC1830 Xplorer Board' kindly refer to section 4.0

2.0 LPC1830-Xplorer Development Tool Setup

2.1 LPC-link and LPCXpresso

NGX's MCU evaluation platforms are not coupled tightly with any one particular combination of IDE and debugger. The following sections will explain the setup for LPCXpresso and NXP LPCLink as the IDE and debugger respectively.

2.2 Installation & Configuration of LPCXpresso software

For installation and configuration of LPCXpresso Click here.

2.3 Setup for NXP LPCLink and LPC1830 Xplorer Board

The Xplorer board has on board '10-pin SWD/JTAG box', the 10-pin ribbon cable is not a part of the LPC1830 Xplorer package and the user needs to buy 10-pin ribbon cable separately.

To run the LPCXpresso examples you will need the following and the image shown the each component:

- NXP LPC-Link
- 10-pin ribbon cable
- LPC1830 Xplorer Board
- One USB AM to Micro B cable

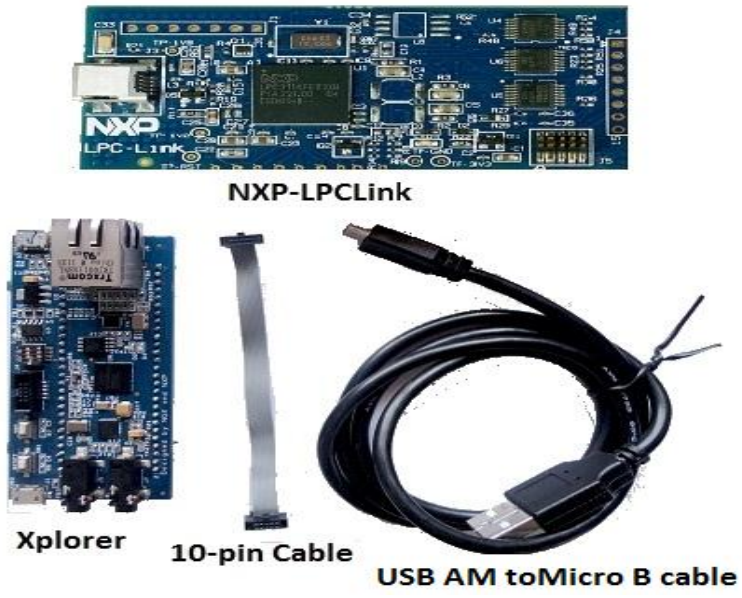


Fig.1

Steps to setup the LPC-Link and LPC1830 Xplorer Board:
(Note: Please refer keil knowledgebase article for Connecting 10-pin ribbon cable to NGX Xplorer)

Step 1: Connect one end of 10-pin ribbon cable to 'LPCLink 10-pin connector'; the 10-pin ribbon cable header notch should facing towards the 'NXP LPCLink' mark as shown in the following image.

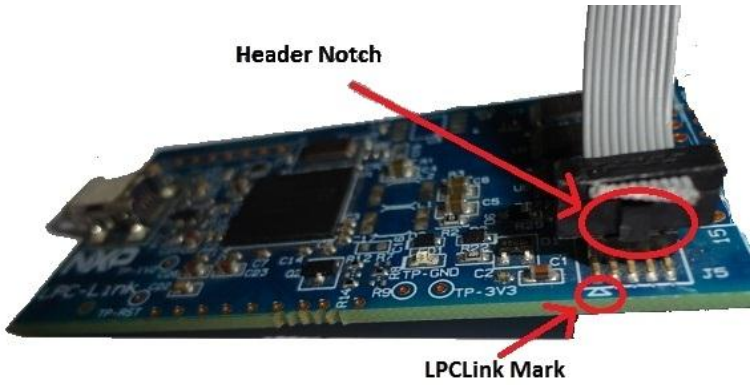


Fig.2

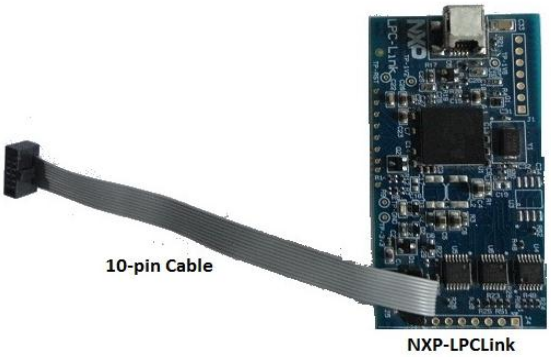


Fig.3

Step 2: Connect other end of 10-pin ribbon cable to '10-pin box header' of the LPC1830 Xplorer board and connect one end of 'USB AM to Micro B' cable to LPC1830 Xplorer board and other end to computer, then connect one end of 'USB type mini B' to LPCLink and other end to computer.

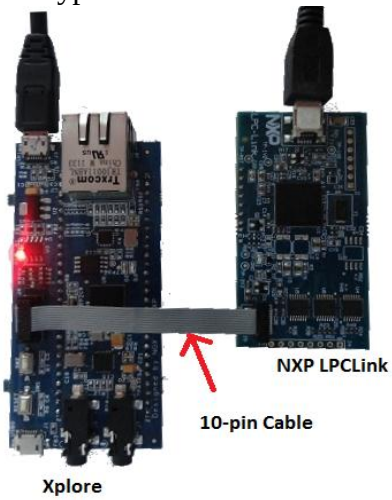


Fig.4

Step 4: The setup is now ready to be used for development with **LPCXpresso** and **NXP LPCLink**.

3.0 LPC1830 Xplorer firmware Development

3.1 Executing the sample projects in LPCXpresso

Please note that the sample programs are available to download once the product is registered.

Steps to execute the sample project:

Step 1: Open LPCXpresso; Browse the folder which contains **lpc1830_Xplorer_LPCXpresso.zip** project and click OK.

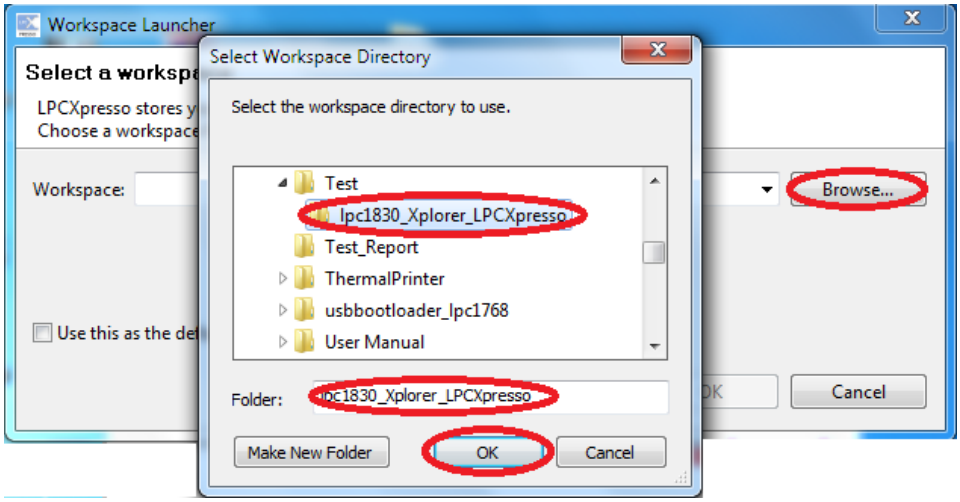


Fig.5

Step 2: Click on ‘Import and Export’ then click on ‘Import archived projects (zip)’.

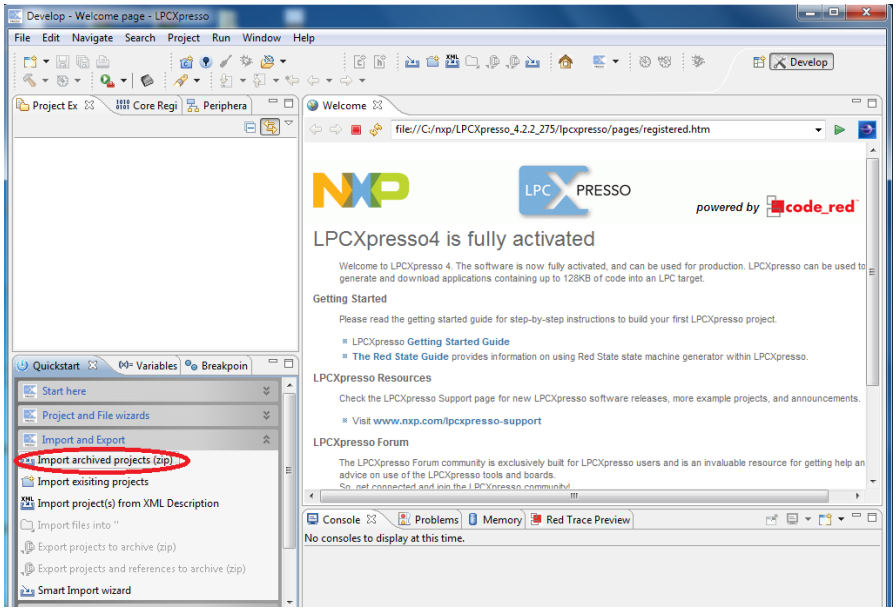


Fig.6

Step 3: Click on Browse to select an archived project (zip) and click on Open.

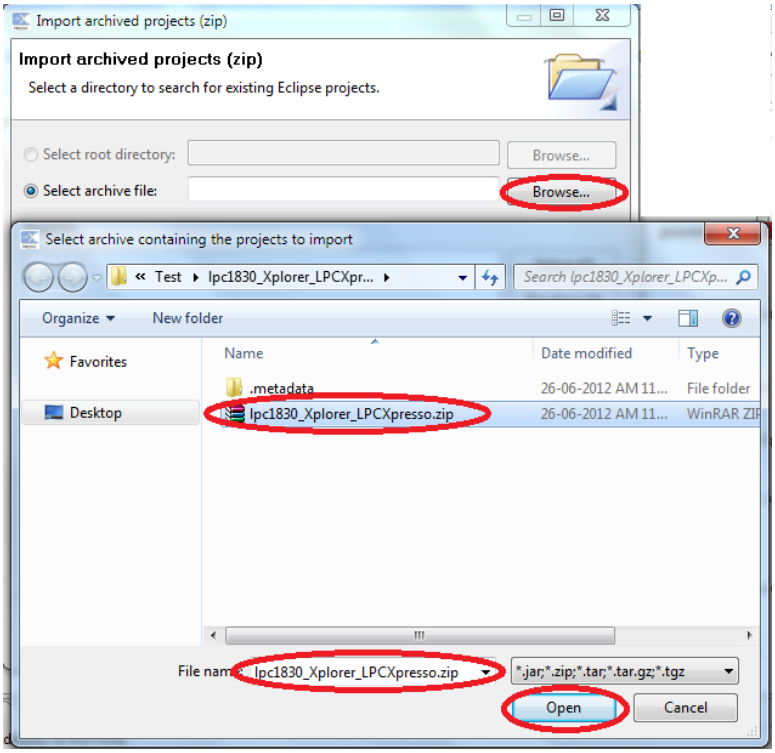


Fig.7

Step 4: Click Finish.

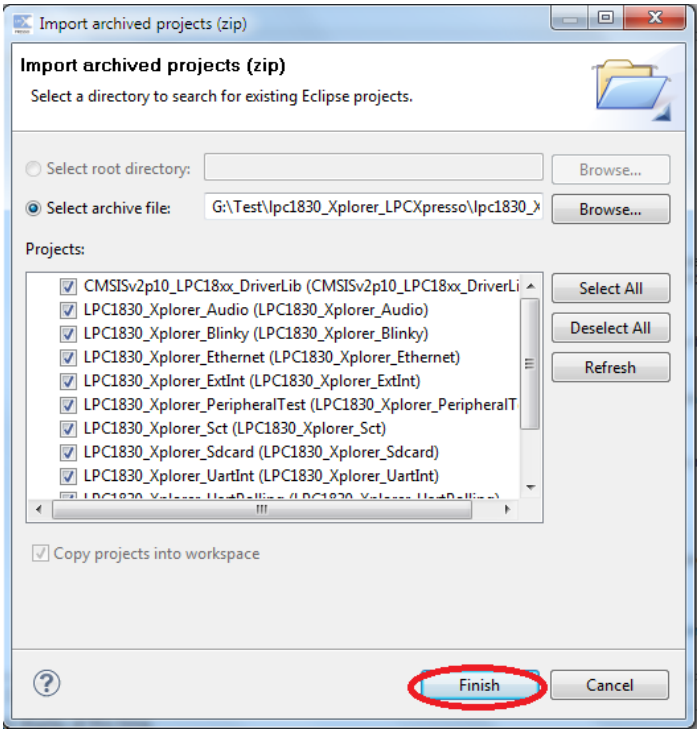


Fig.8

Step 5: Right click on “LPC1830_Xplorer_Blinky” and left click on ‘Build Project’.

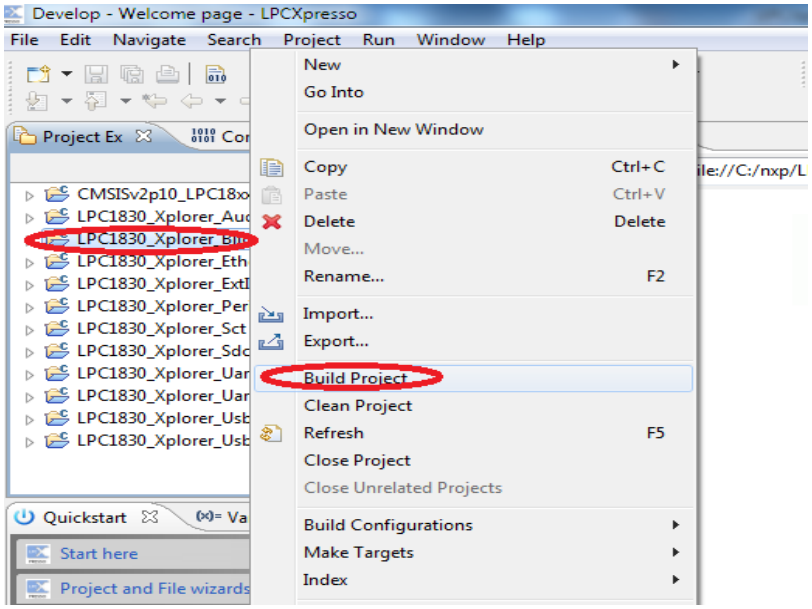


Fig.9

Step 6: The default ‘Debug Option’ will be JTAG (If user needs to debug from JTAG skip the following steps and continue from Step 8), for selecting a SWD debug option, right click on LPC1830_Xplorer_Blinky project, go to ‘Lunch Configurations’ then select ‘Open Current Launch Configurations’.

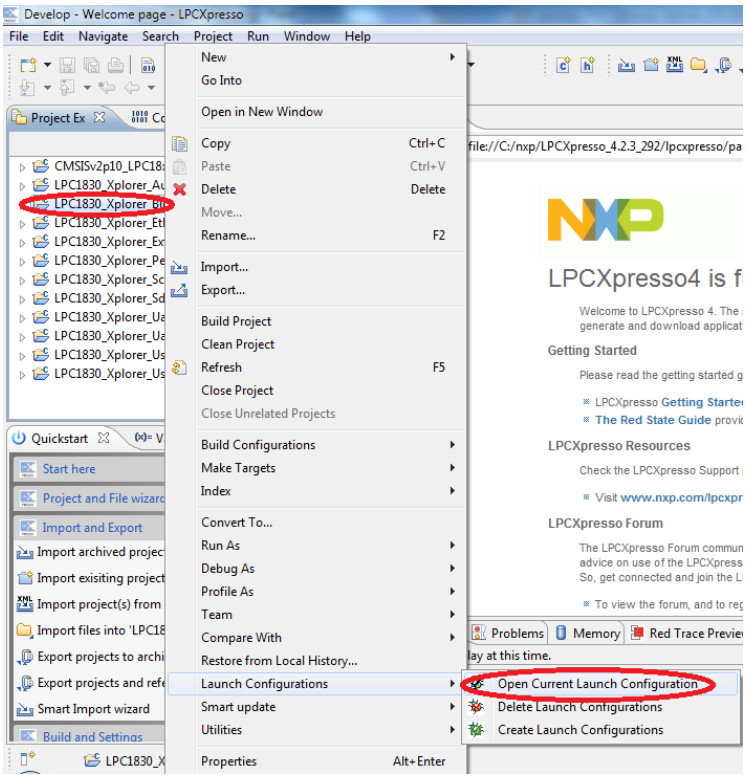


Fig.10

Step 7: Select 'LPC1830_Xplorer_Blinky Debug' then select Debugger and select 'NXP LPC18xx (SWD) option' and click on Apply.

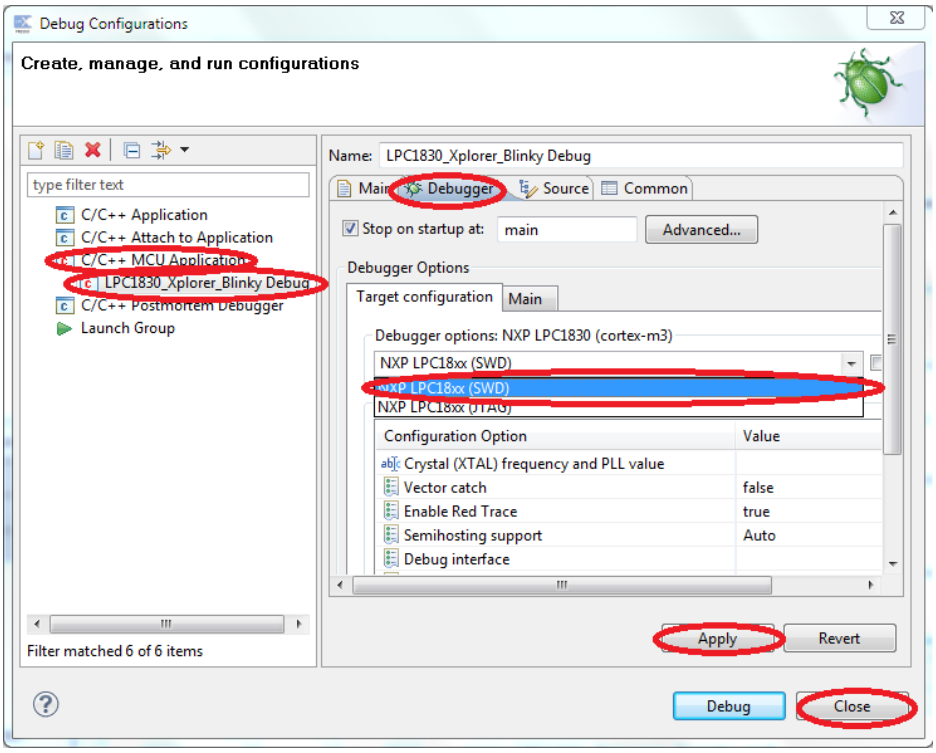


Fig.11

Step 8: After building project click on Debug.

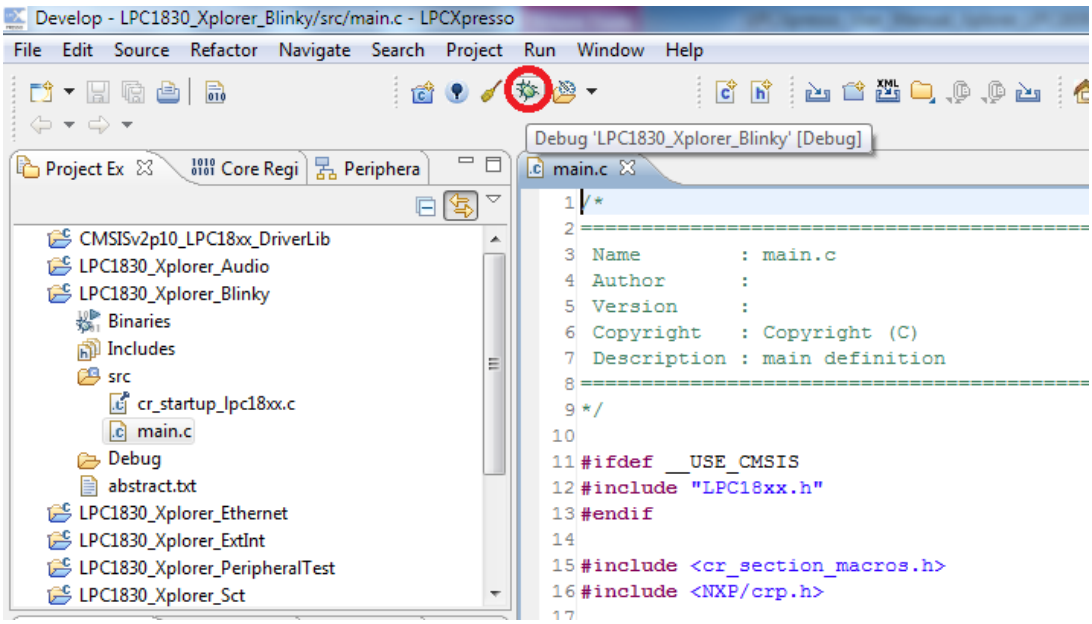


Fig.12

Step 9: Click Run and select Resume (F8) to start debugging the project. The two LED's (D2 and D3) start blinking on Xplorer.

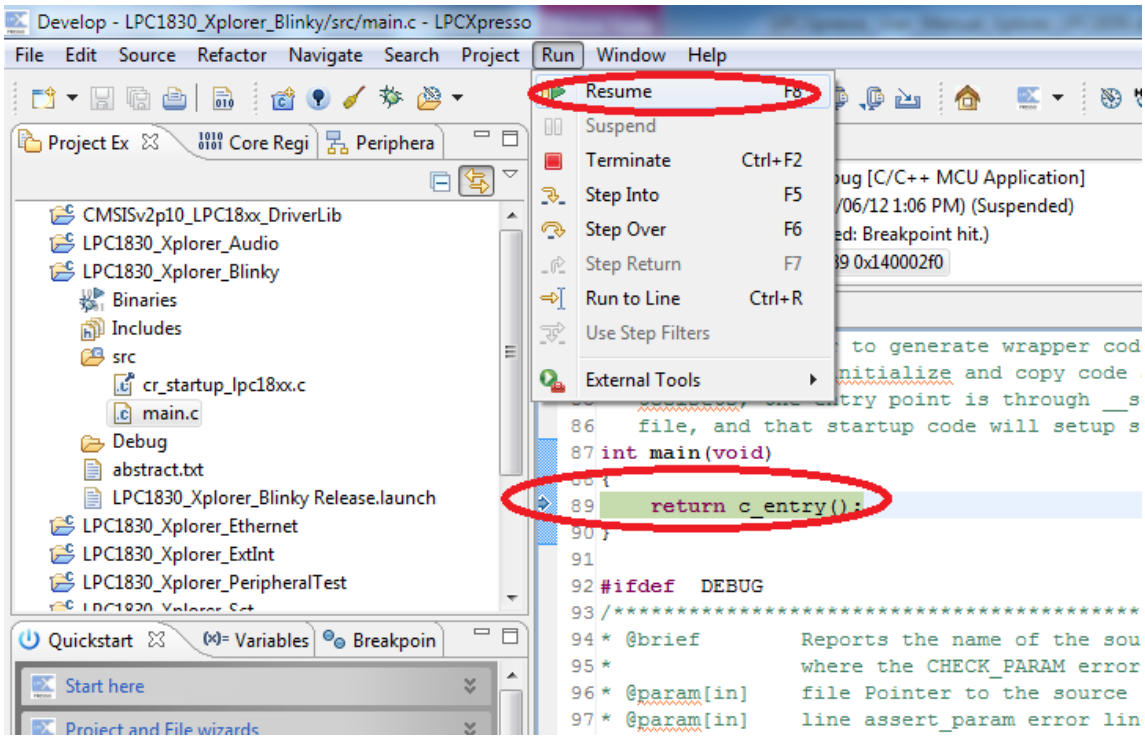


Fig.13

3.2 Creating the sample (Blinky) project in LPCXpresso

Step 1: Open an LPCXpresso v4.2.3_292 or higher version.

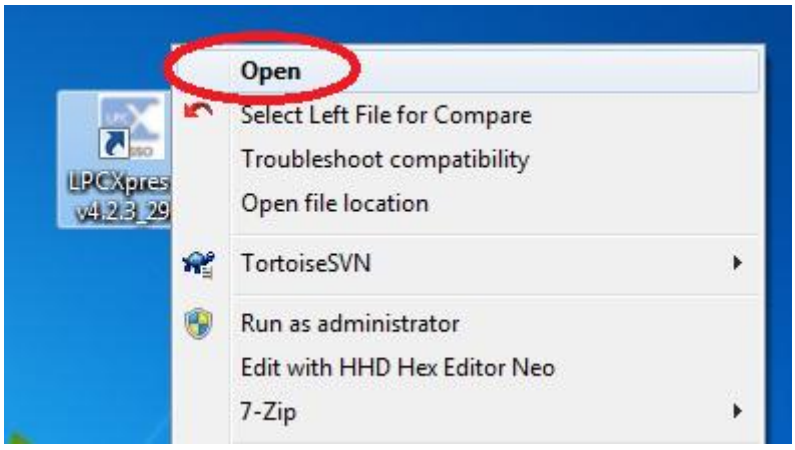


Fig.14

Step 2: Click Browse.. as shown below.

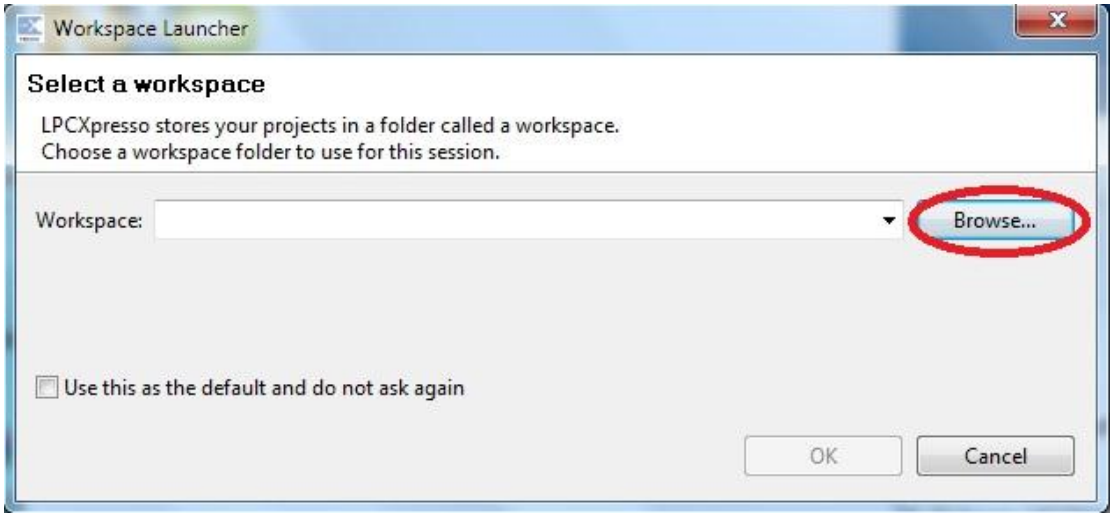


Fig.15

Step 3: Please select lpc1830_Xplorer_LPCXpresso folder which downloaded from website and click OK as shown in the following image.

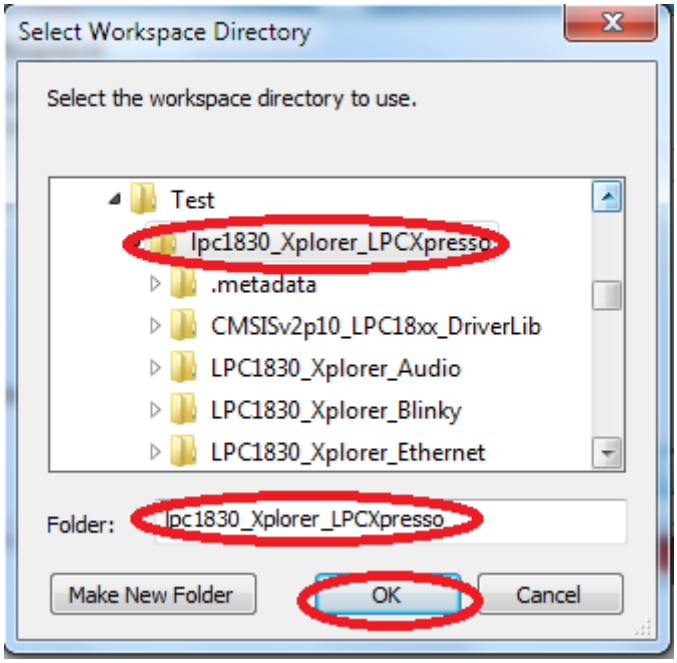


Fig.16

Step 4: Click OK.

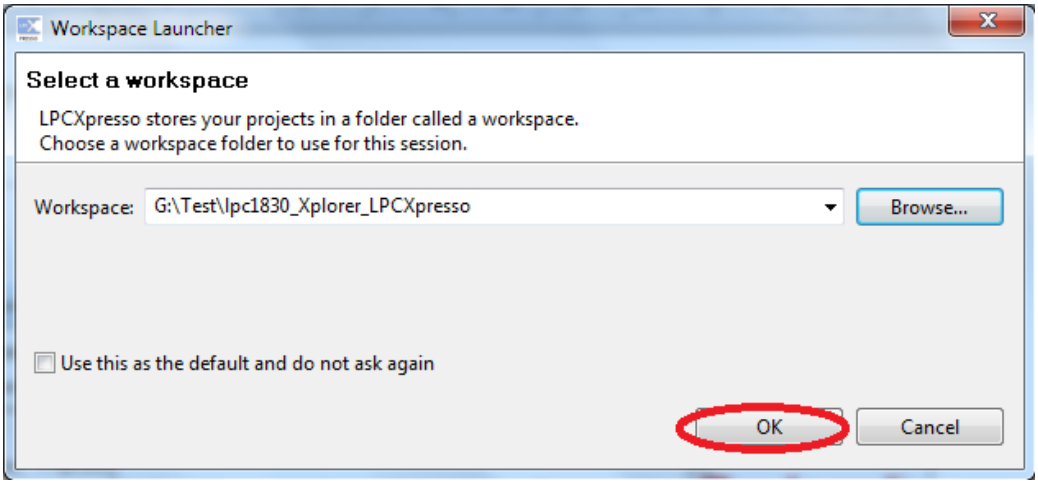


Fig.17

Step 5: Click on File -> New -> Project… as shown below image.

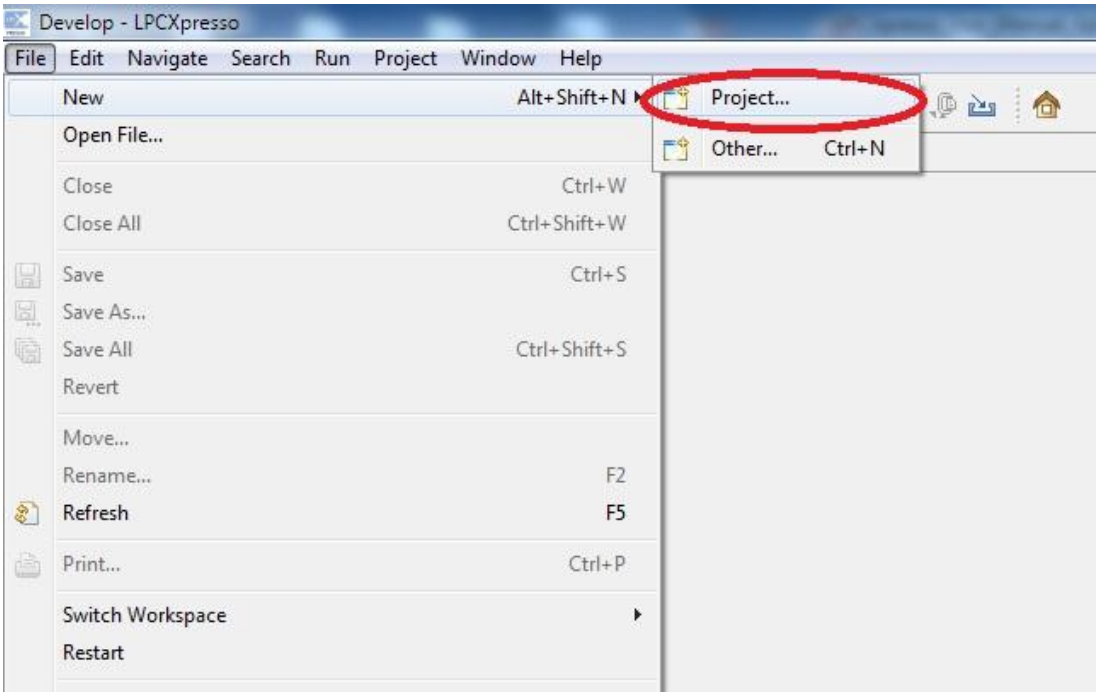


Fig.18

Step 6: Select ‘LPCXpresso C Project’ and click Next as shown in the following image.

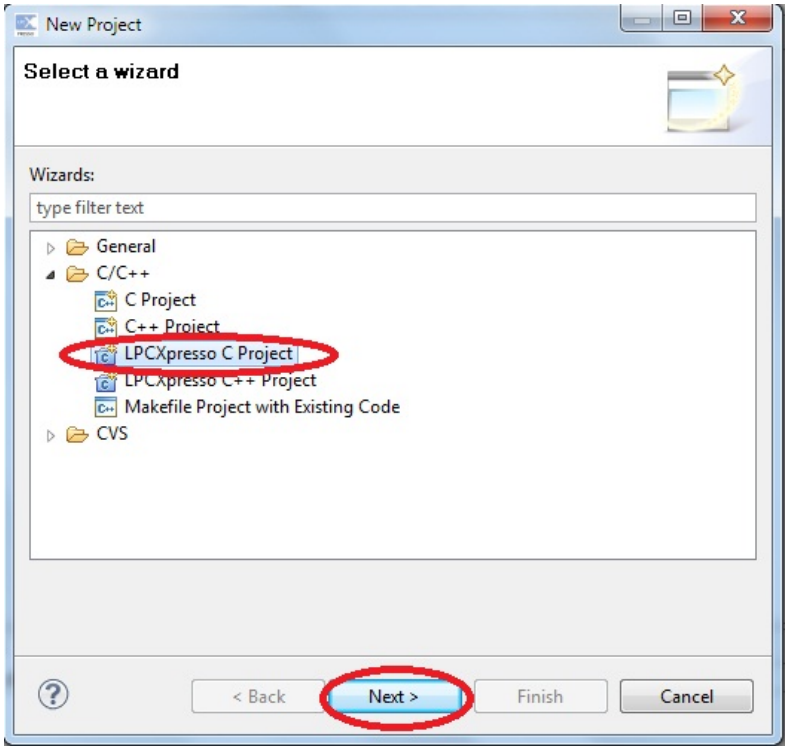


Fig.19

Step 7: Select NXP LPC1800 projects -> ‘C Project’ and click Next as shown in the following image

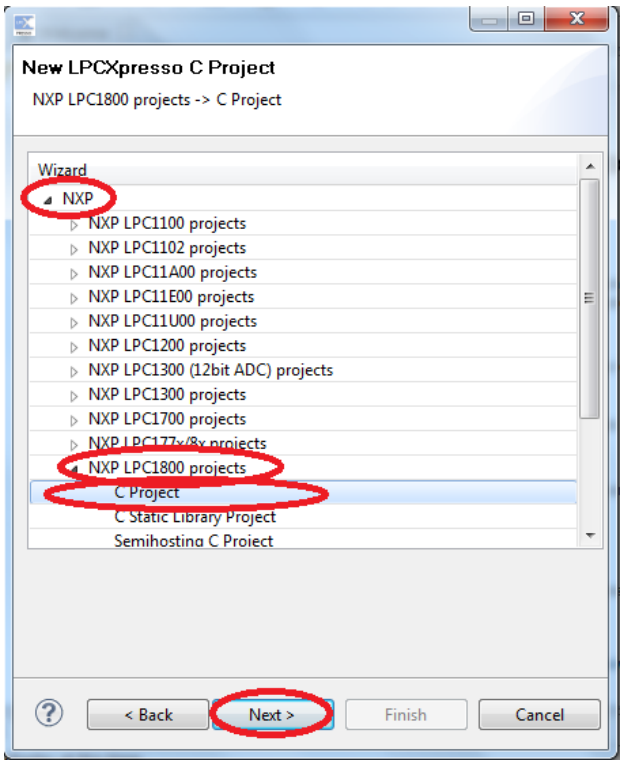


Fig.20

Step 8: Give project name (example: Blinky) and click Next.

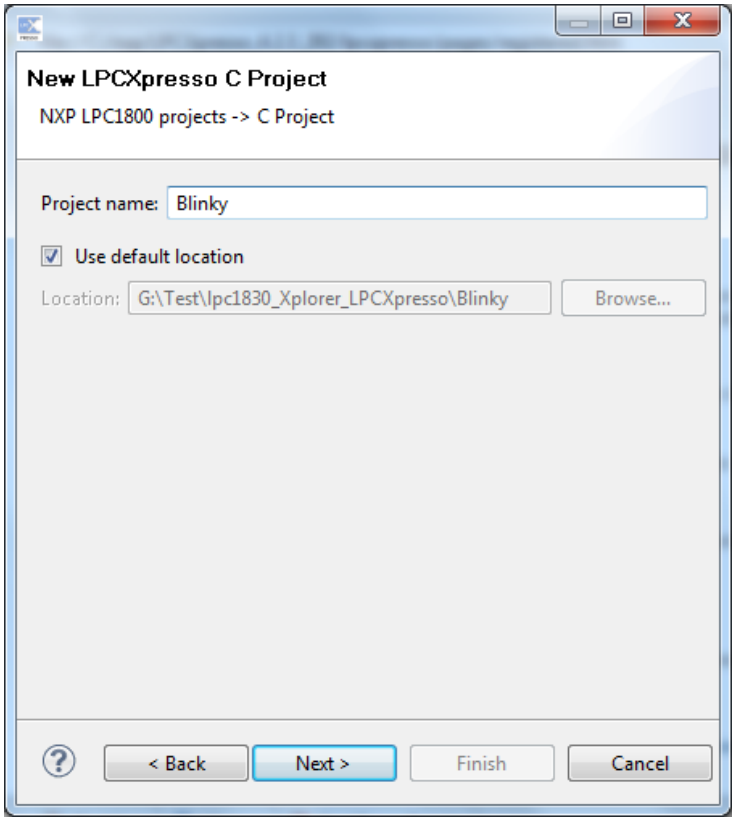


Fig.21

Step 9: Select the target MCU is LPC1830 and click Next as shown in the following image.

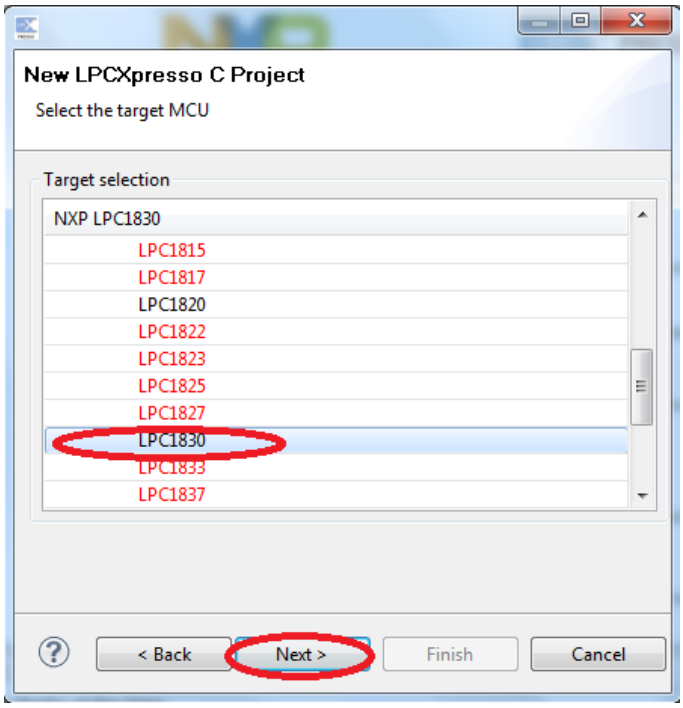


Fig.22

Step 10: Click Next.

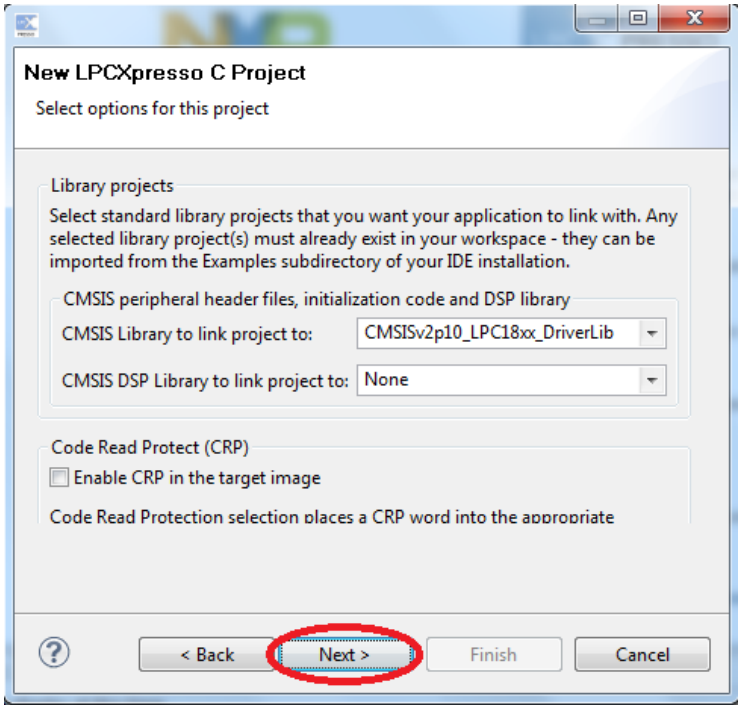


Fig.23

Step 11: Click Finish.

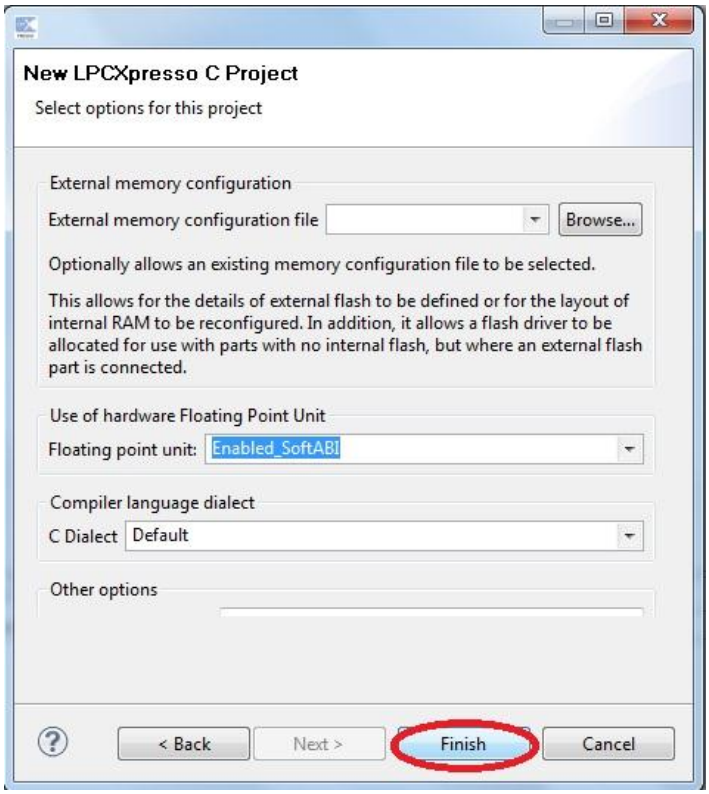


Fig.24

Step 12: The new blinky project is created, double click on main.c file as shown in the following image.

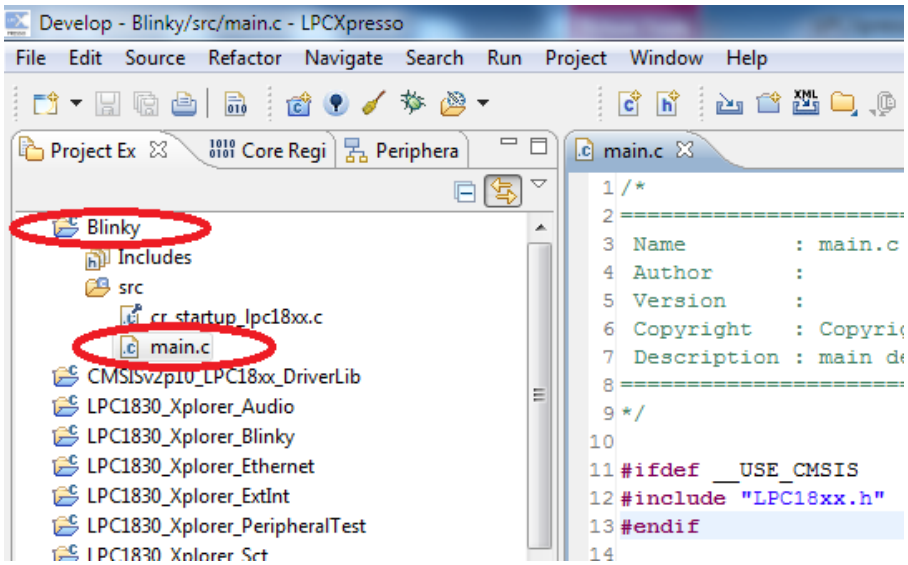


Fig.25

Step 13: After double click the main.c file will open in LPCXpresso as shown in the following image.

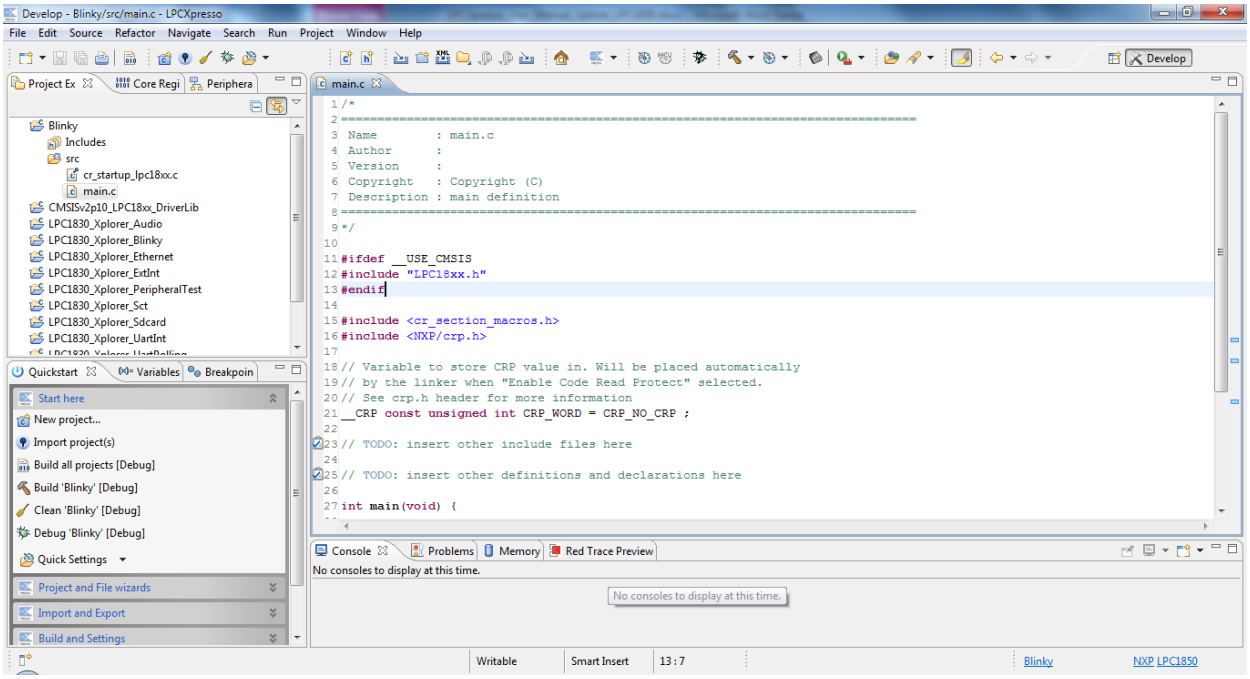


Fig.26

Step 14: Implement the C instructions need to blink a LED on Xplorer and click on Save.
(Note: Please refer Downloaded LPC1830_Xplorer_Blinky example)

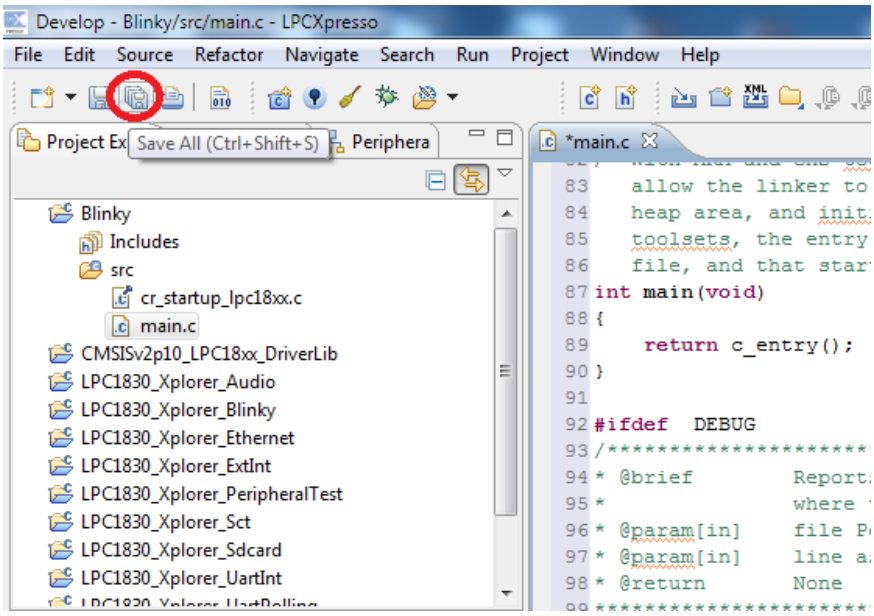


Fig.27

Step 15: To add an 'External SPIFI flash' driver right click on 'Blinky Project' and click on properties.

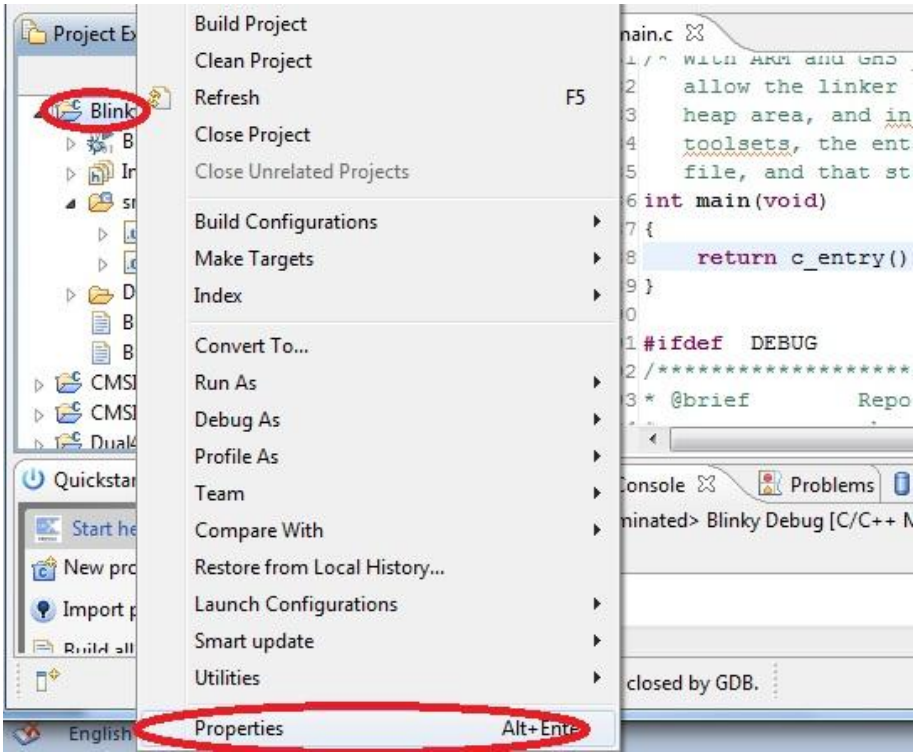


Fig.28

Step 16: Select C/C++ Build -> 'MCU settings' and click Edit.. as shown in the following image.

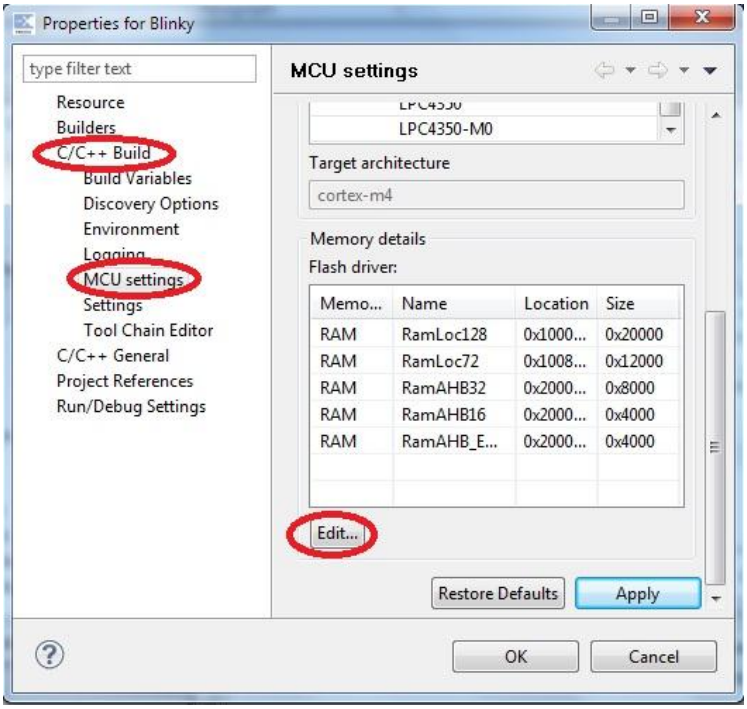


Fig.29

Step 17: Click 'Add Flash', rename 'new_Flash' to SPIFlash, edit Location to 0x14000000 and size to 0x40000 then click Browse.. as shown in the following image.

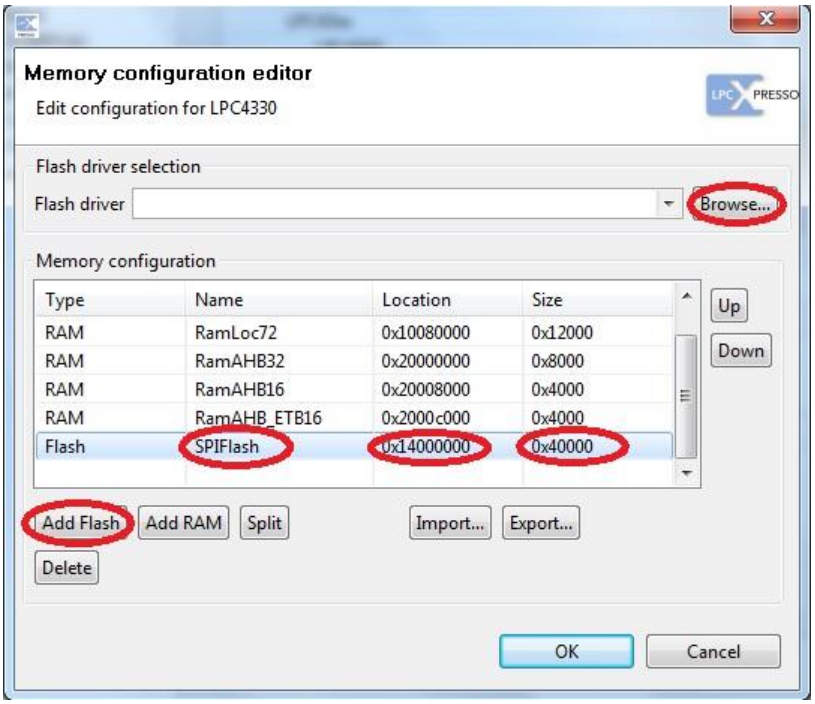


Fig.30

Step 18: Select the 'LPC1850A_4350A_SPIFI.cfx file', the 'LPC1850A_4350A_SPIFI.cfx file' is normally found at LPCXpresso installation folder (here is the path: **'C:\nxp\LPCXpresso_4.2.3_292\lpcxpresso\bin\Flash'**) click Open.

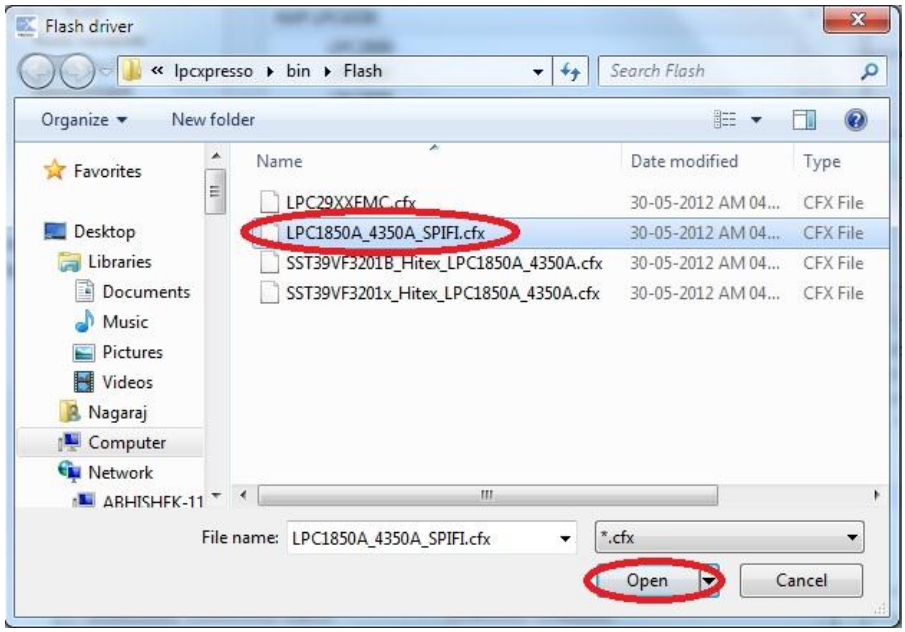


Fig.31

Step 19: Select Flash and click on Up button until it reach first position, then click OK.

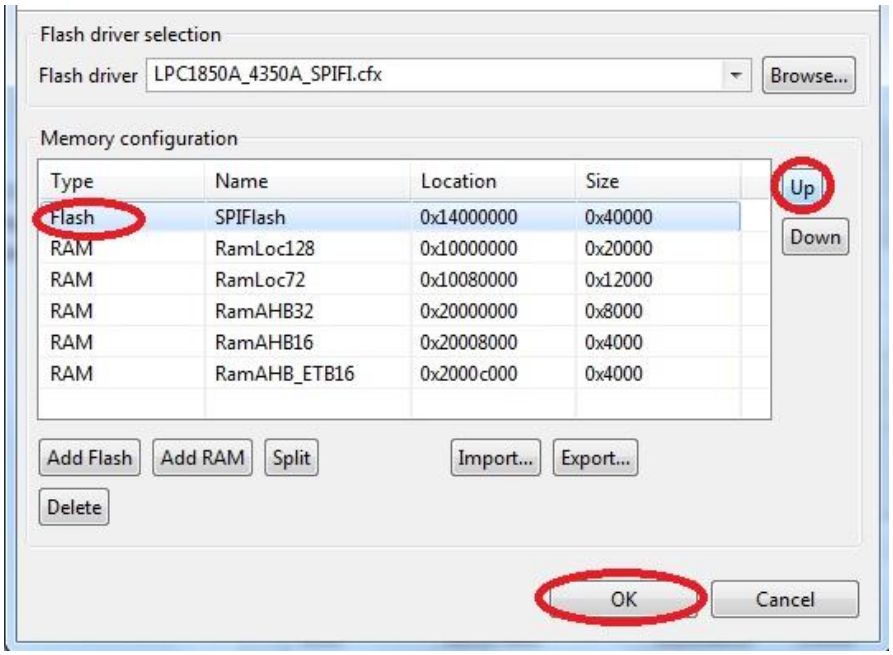


Fig.32

Step 20: Click Apply, OK and OK to completing ‘SPIFI flash driver’.

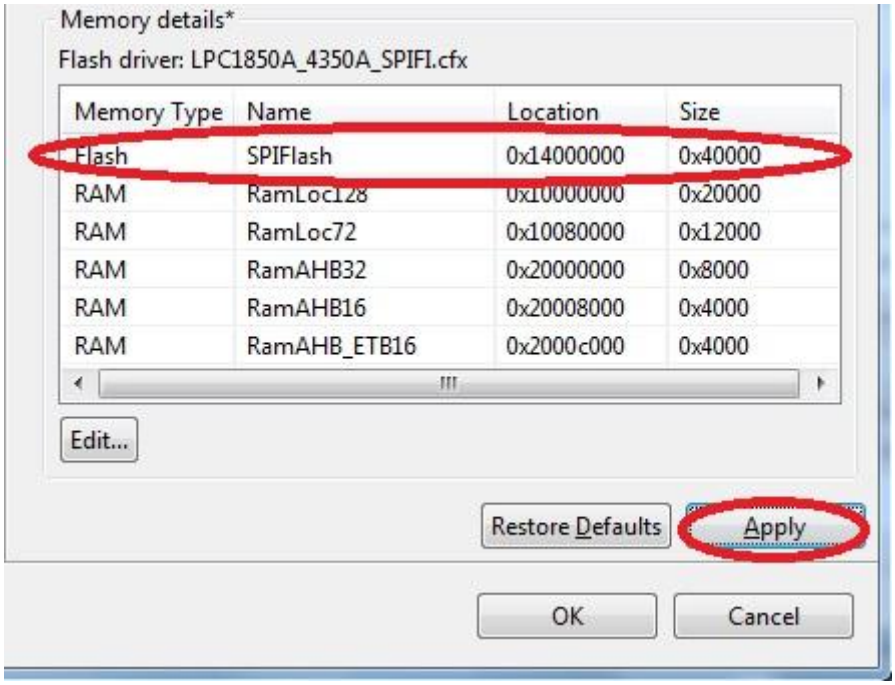


Fig.33

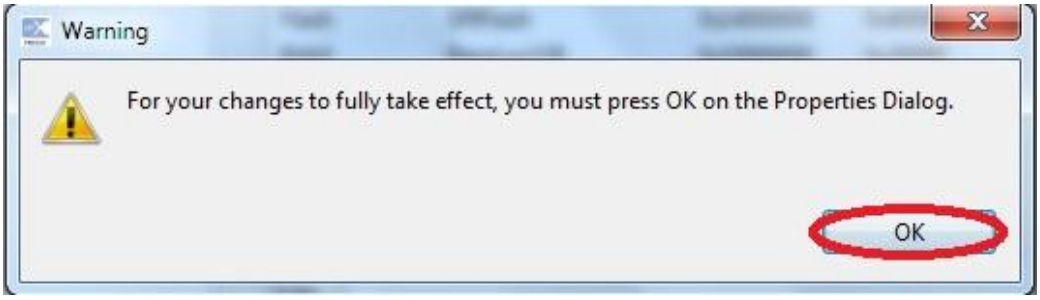


Fig.34

Step 21: Right click on ‘Blinky Project’ and click on ‘Build Project’, build must be error free.

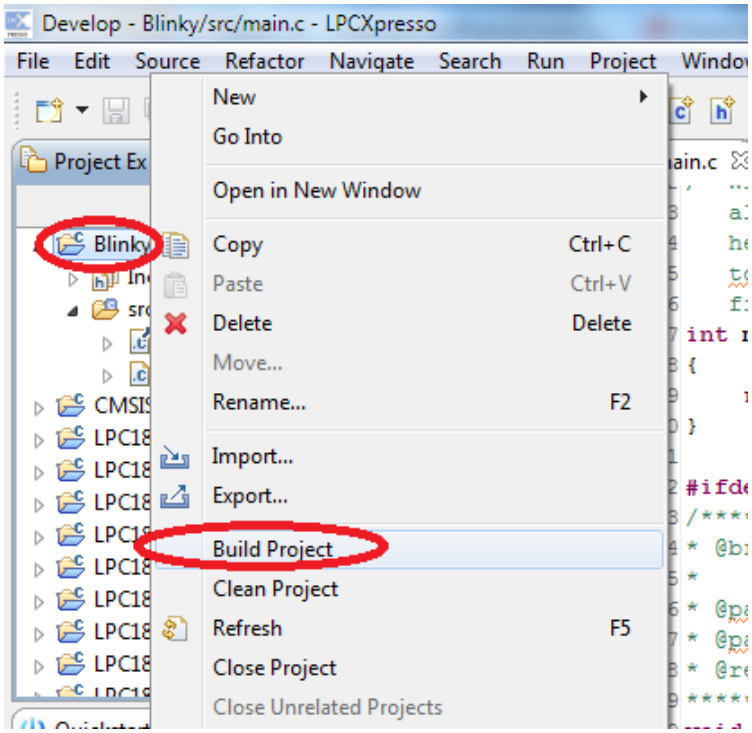


Fig.35

Step 22: After successful build, click on Debug as shown in the following image.

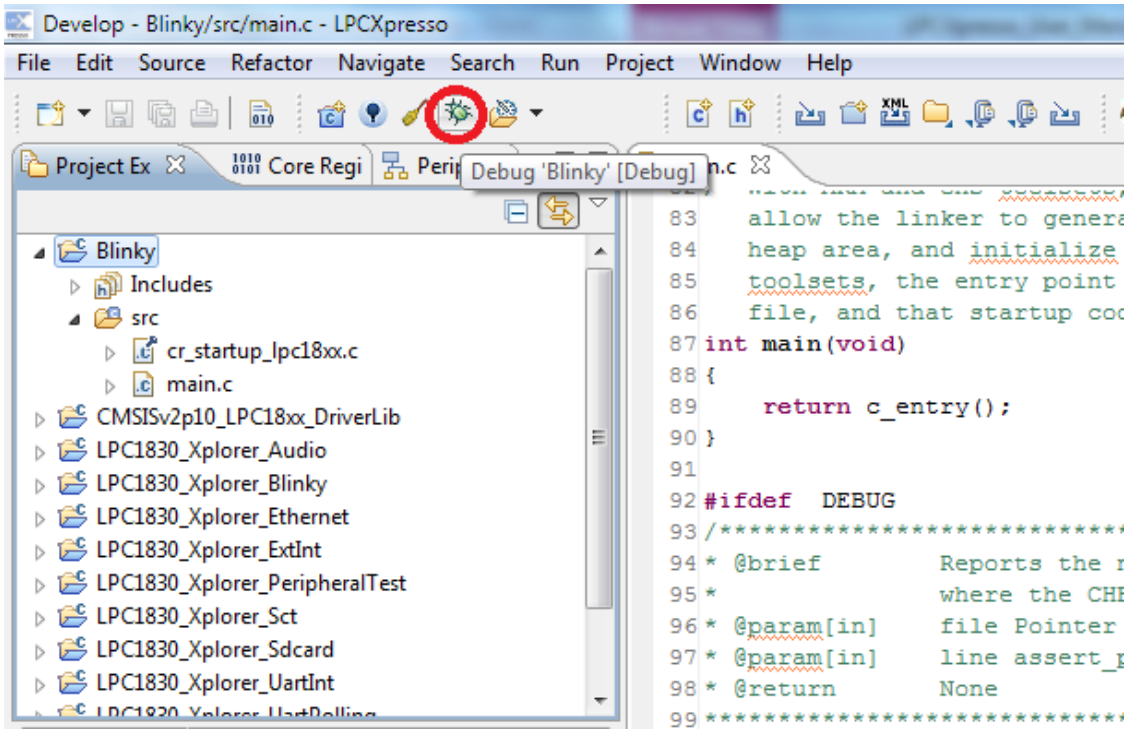


Fig.36

Step 23: Click Resume for free running, the LED D2 and D3 are start blinking on Xplorer.

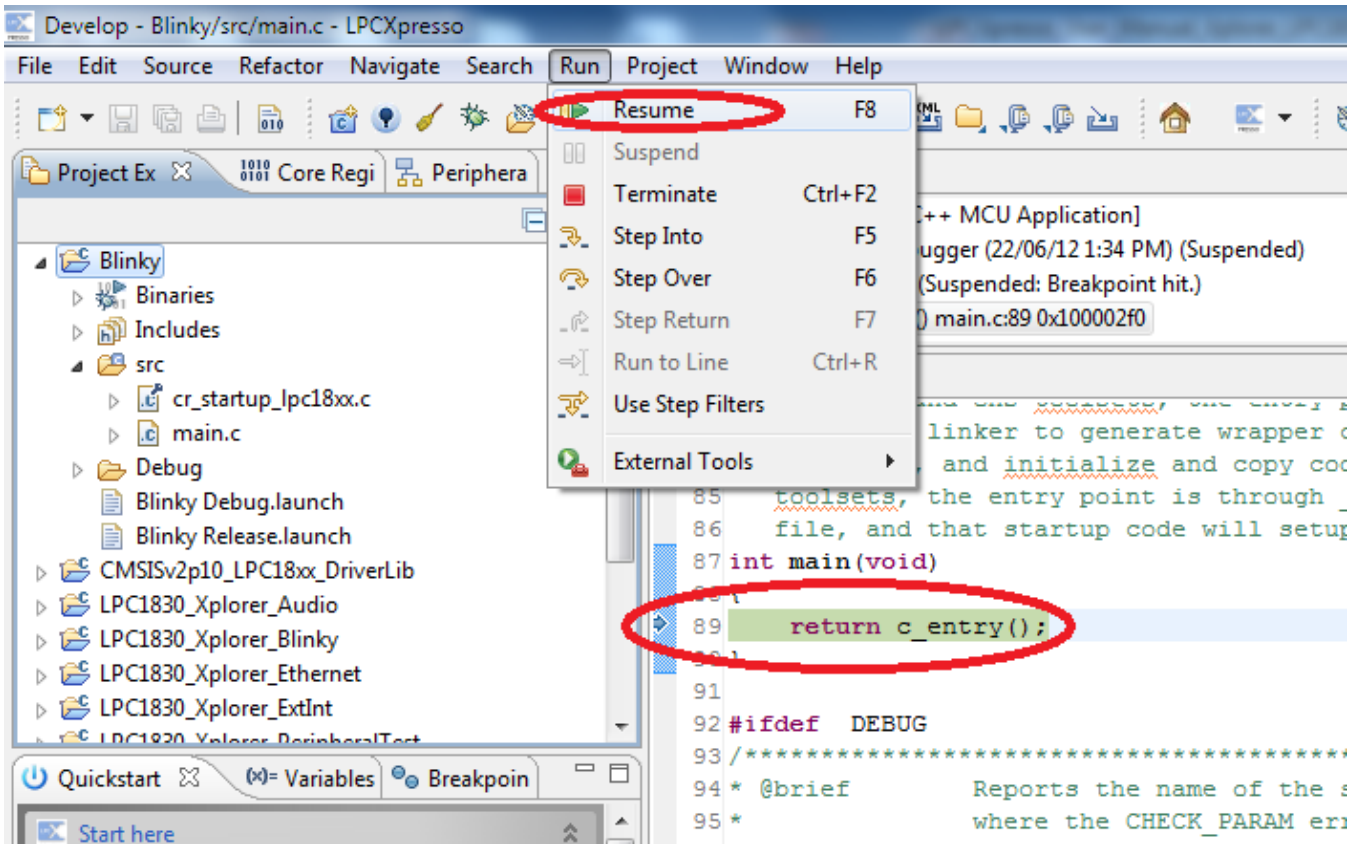


Fig.37

4.0 Restoring Xplorer to Factory Defaults

4.1 LPCLink and LPCXpresso

Download the binary files from the NGX website and unzip file to restore the factory defaults for the Xplorer; the user needs to flash **LPC1830_Xplorer_PeripheralTest.bin** file in Xplorer and RESET the board.

Steps to restore the factory defaults for Xplorer:

Step 1: Open LPCXpresso and click on 'Program Flash'.

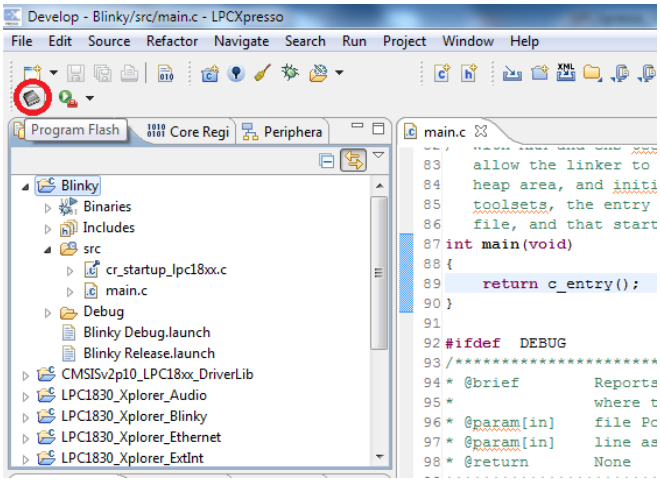


Fig.38

Step 2: Click on Browse.

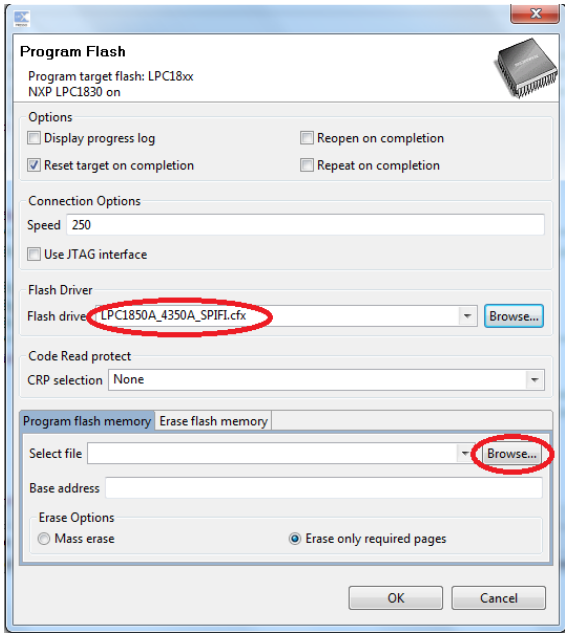


Fig.39

Step 3: Unzip the downloaded binary zip file, select the 'Bin files' folder and select *.bin extension.

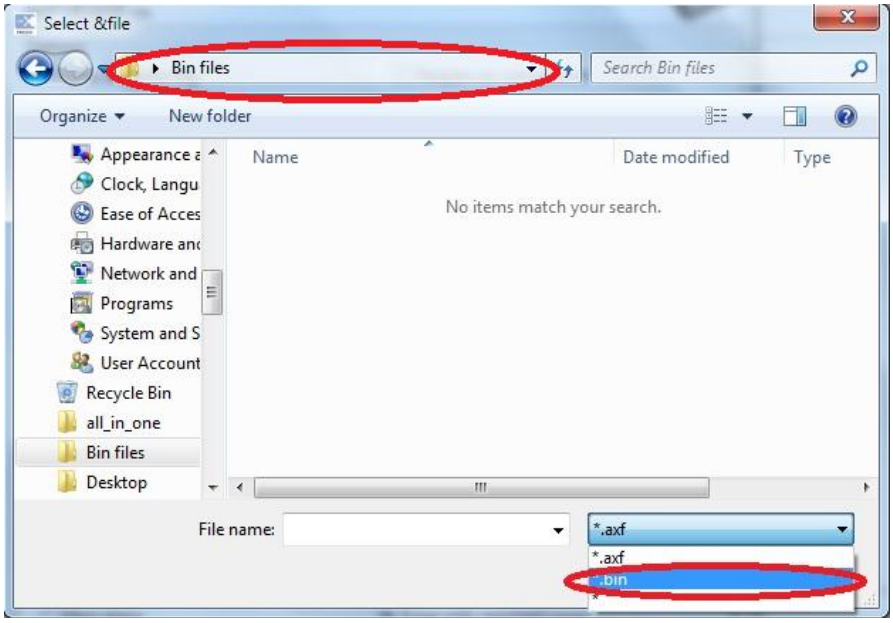


Fig.40

Step 4: Select **LPC1830_Xplorer_PeripheralTest.bin** file and click Open.

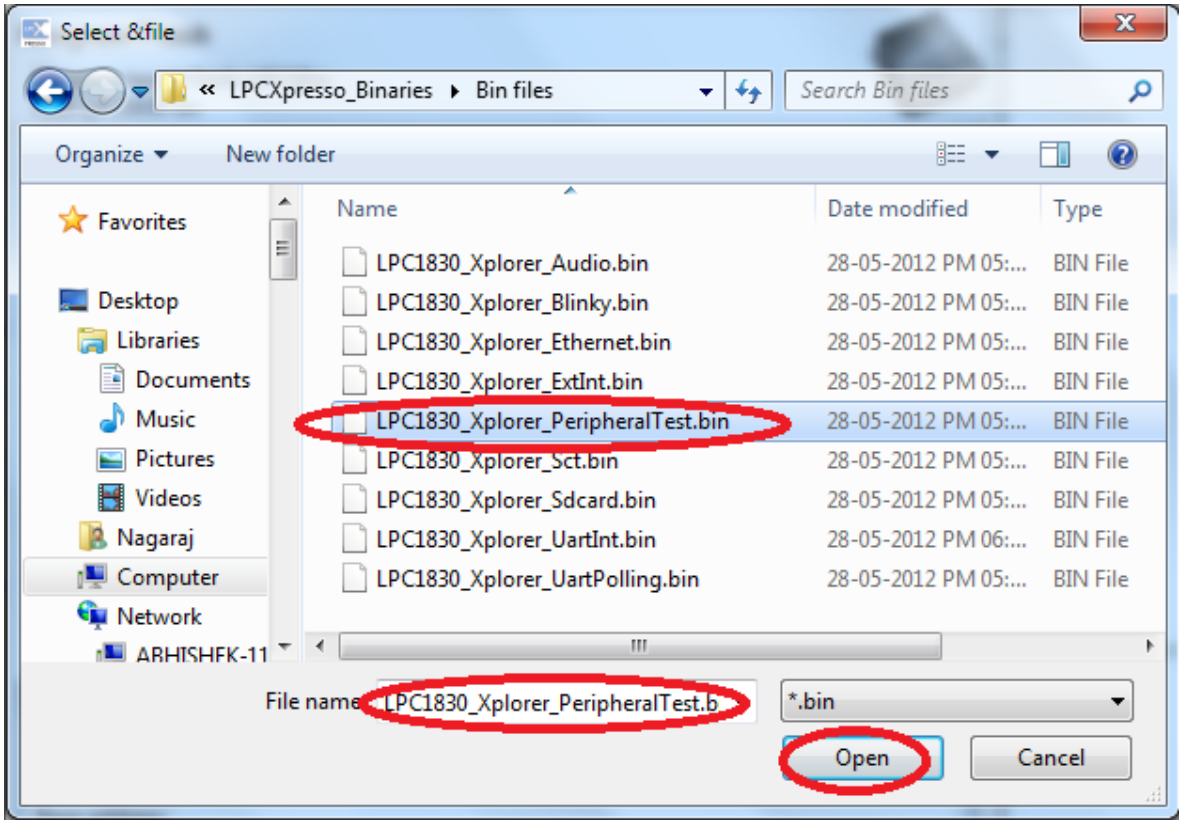


Fig.41

Step 5: The base address should be 0x14000000 and click OK.

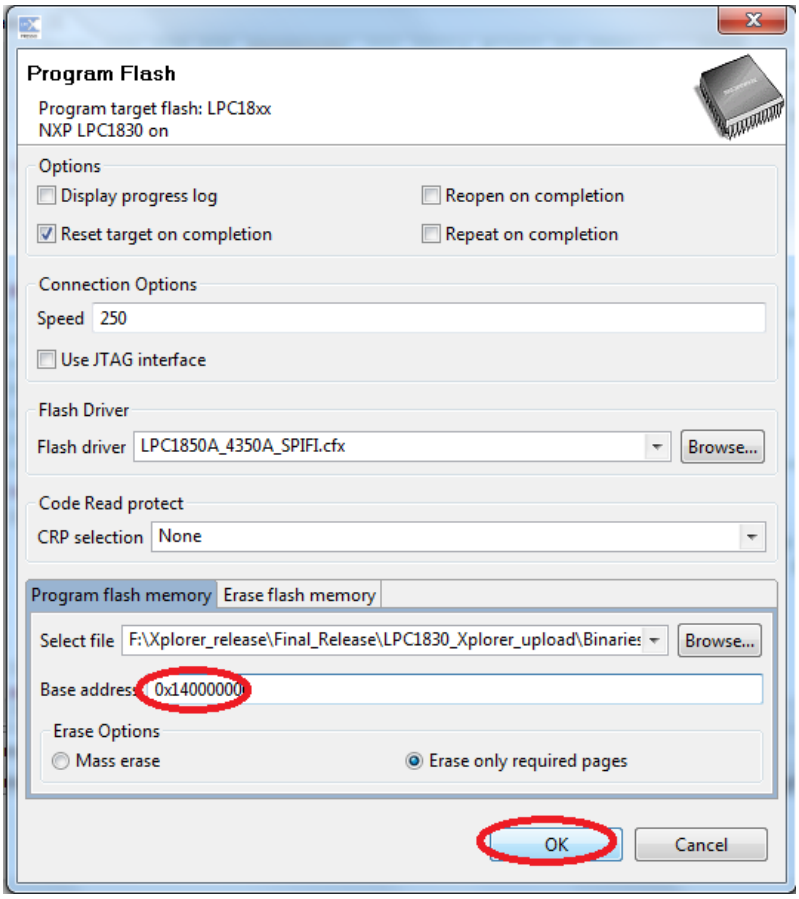


Fig.42

Step 6: Wait till the download process is completed then RESET Xplorer twice to restore the 'Xplorer factory defaults'.

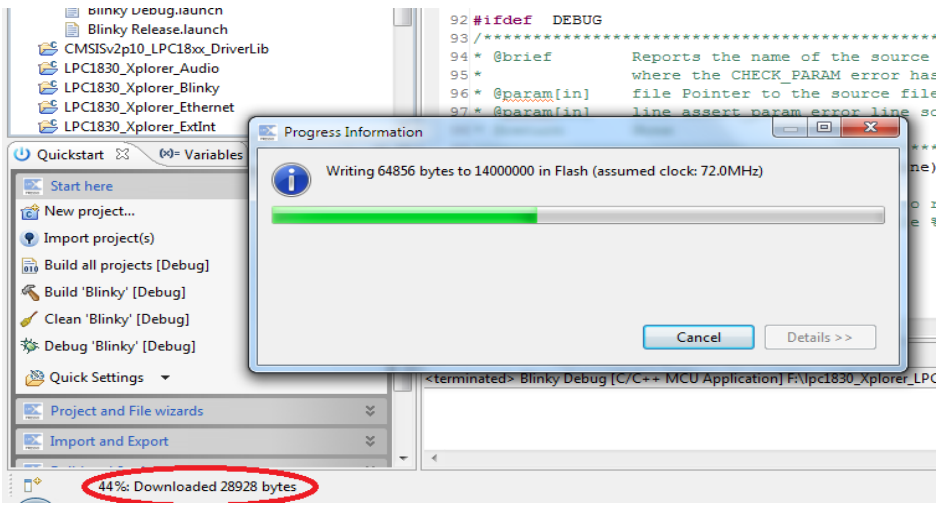


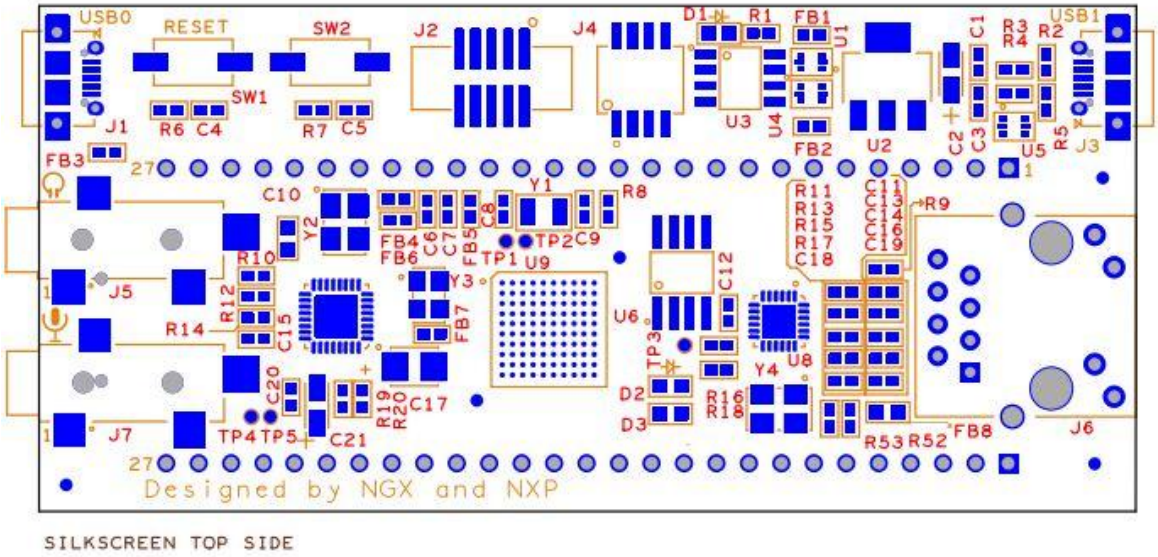
Fig.43

5.0 Schematic & Board Layout

5.1 Schematic

This manual will be periodically updated, but for the latest documentations please check our website for the latest documents. The Board schematic and sample code are available after the product has been registered on our website.

5.2 Board layout



SILKSCREEN TOP SIDE

Fig.44

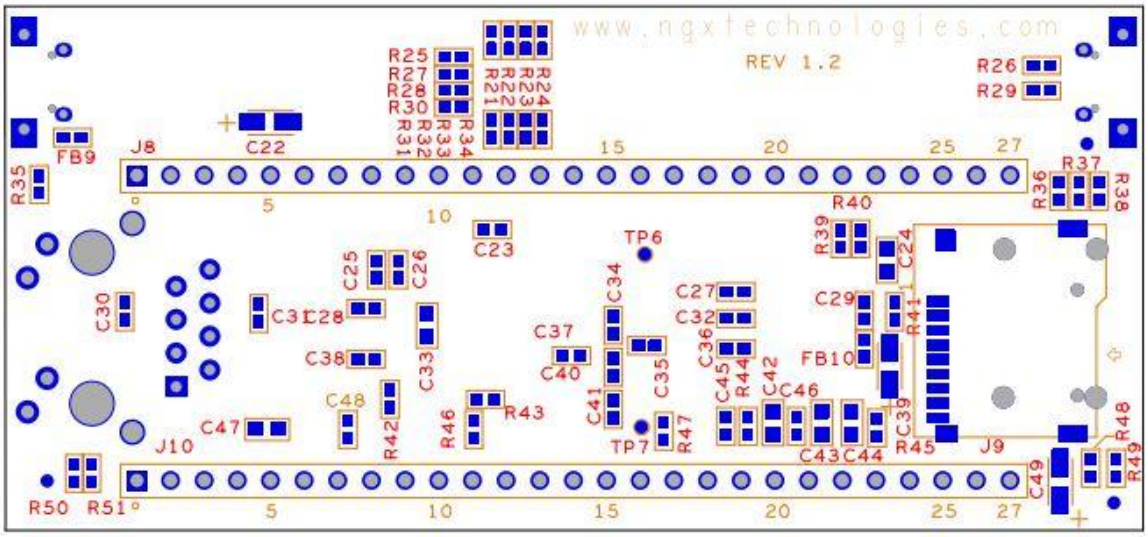


Fig. 45

6.0 CHANGE HISTORY

6.1 Change History

Rev	Changes	Date (dd/mm/yy)	By
1.0	Initial release of the manual	29/03/2012	Ashwin Athani
1.1	• Added section for Restoring Xplorer to factory defaults in LPCXpresso • Added section for setting up LPCXpresso for LPC1830	10/04/2012	Nagaraj Baddi
1.2	• Creating a sample Blinky Project is added	12/06/2012	Nagaraj Baddi

About this document:

Revision History

Version: V1.1 author: Nagaraj Baddi

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