BlueBoard-LPC1343

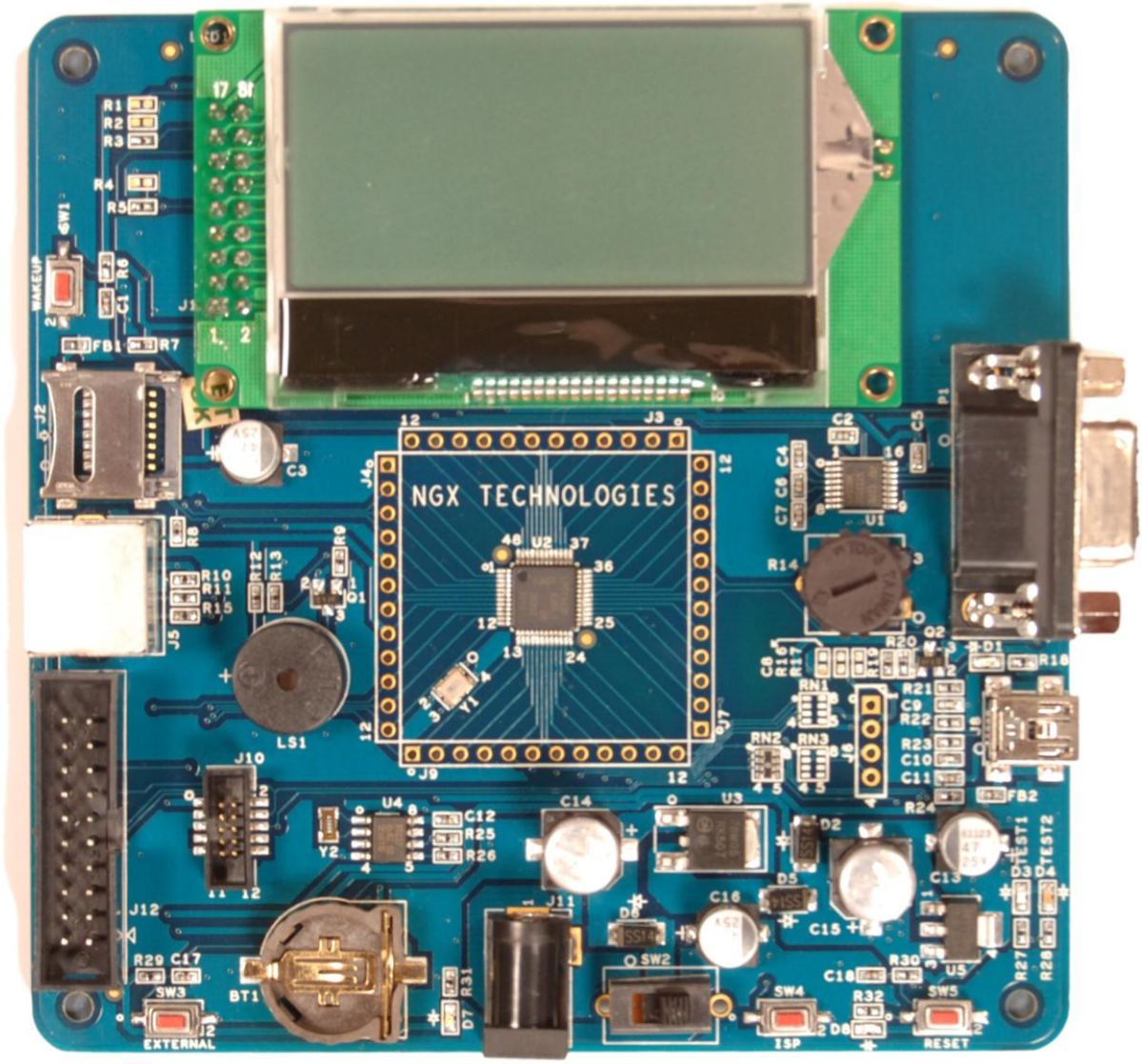

Fig. 1

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.

Contact Information:

NGX Technologies Pvt. Ltd.
No.216, 5th main Road, R.P.C. Layout,
Vijayanagar 2nd Stage,
Bangalore – 560 104
Phone : +91-80-40925507
email:sales@ngxtechnologies.com

CE certification

NGX Technologies BLUEBOARD-LPC1343 board have 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 behaviour. 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 the BLUEBOARD-LPC1343, a low cost ARM Cortex-M3 based board by NGX Technologies. 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 BLUEBOARD-LPC1343 features and BLUEBOARD-LPC1343 verification.

For BLUEBOARD-LPC1343 quick start guide Click here.

For the most updated information on the BLUEBOARD-LPC1343 board please refer to NGX' website.

2.0 BLUEBOARD-LPC1343 Development Tool Setup

2.1 IDE and debugger

As mentioned in the earlier section, 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 CoIDE and NGX CoLink as the IDE and debugger respectively.

2.2 Installation & Configuration of CoIDE software

The Installation of CoIDE software is explained below:

*Note: We have used **CoIDE 1.4.2** while creating the User manual for this evaluation kit. Please ensure that you are using version 1.4.2 and above.*

Step 1: Open CoIDE 1.4.2 setup

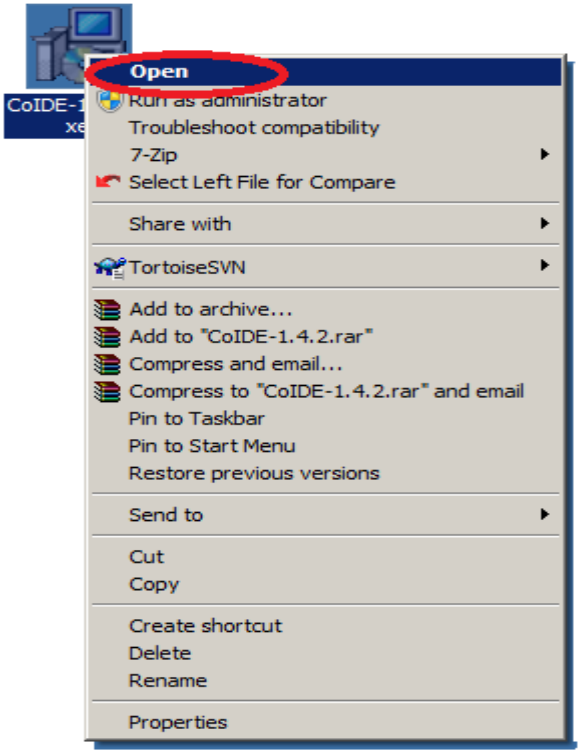

Fig. 2

Step 2: CoIDE 1.4.2 information Click on Next

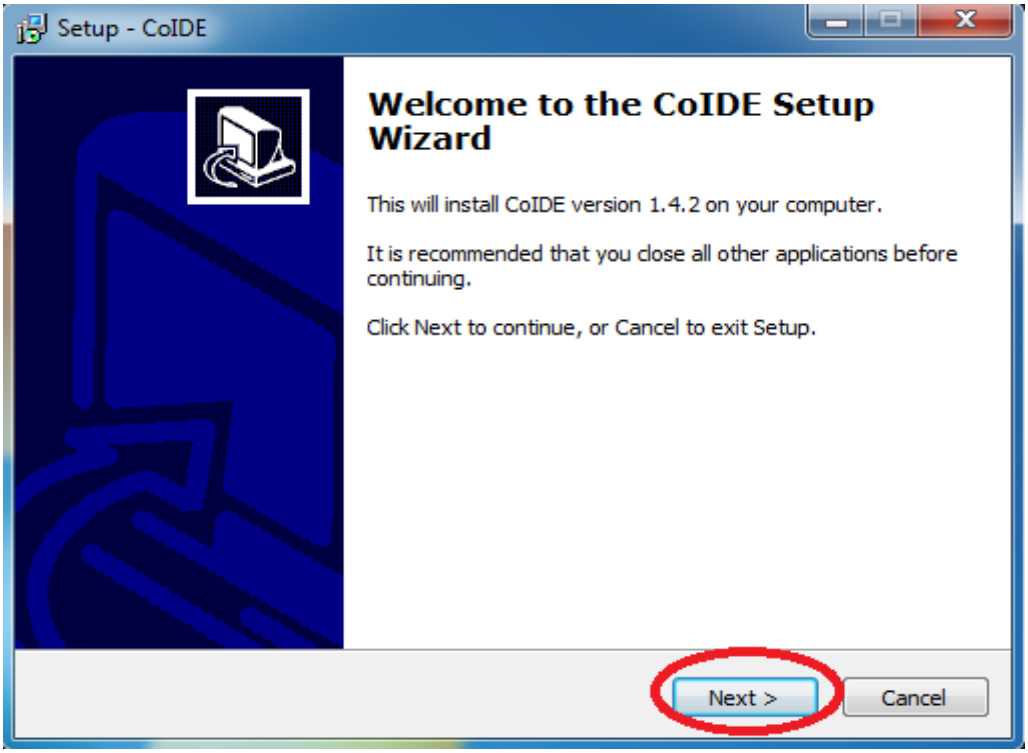

Fig. 3

Step 3: Provide the destination path as shown in below image and Click on Next.

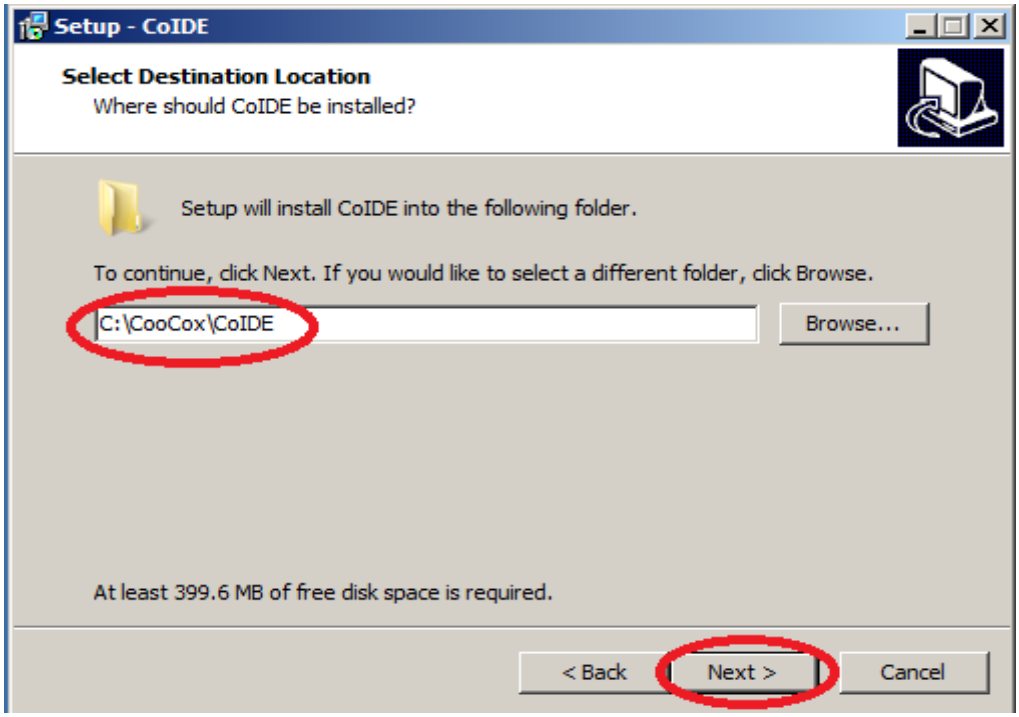

Fig. 4

Step 4: Click on Next.

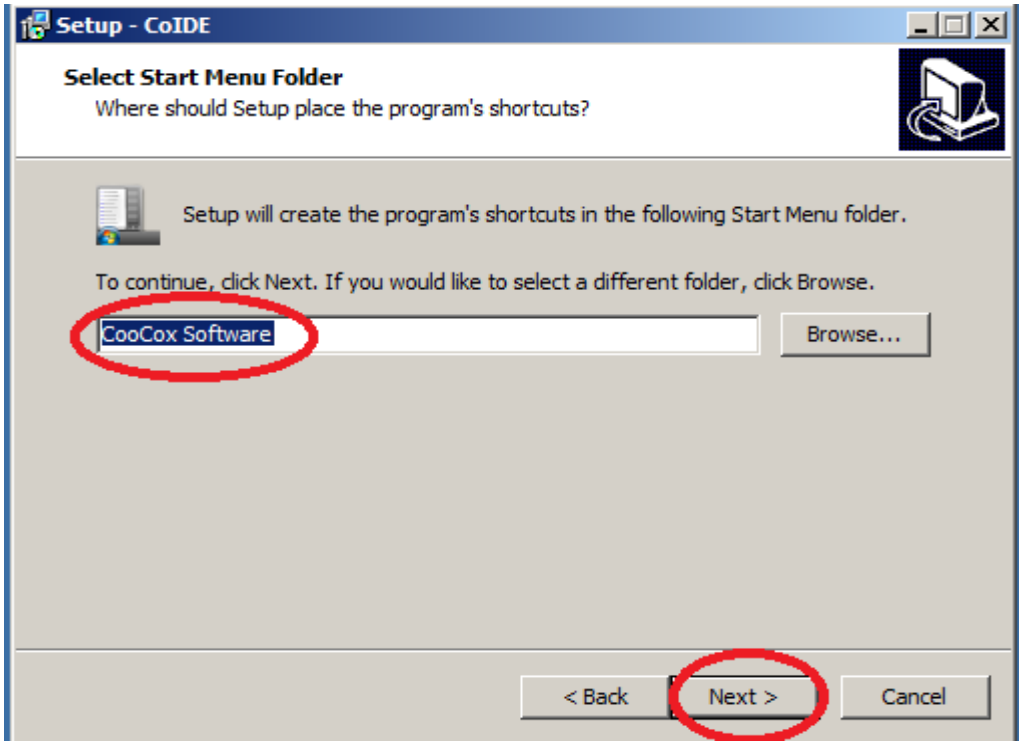

Fig. 5

Step 5**:**Click on Install.

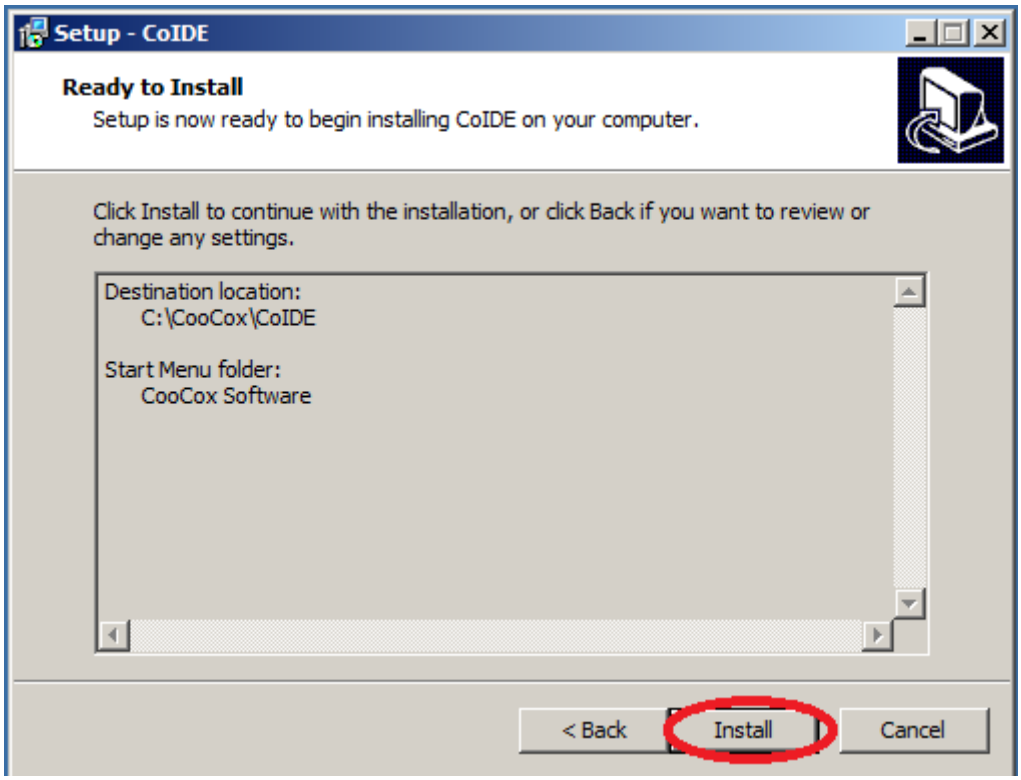

Fig. 6

Step 6: Click on Finish.

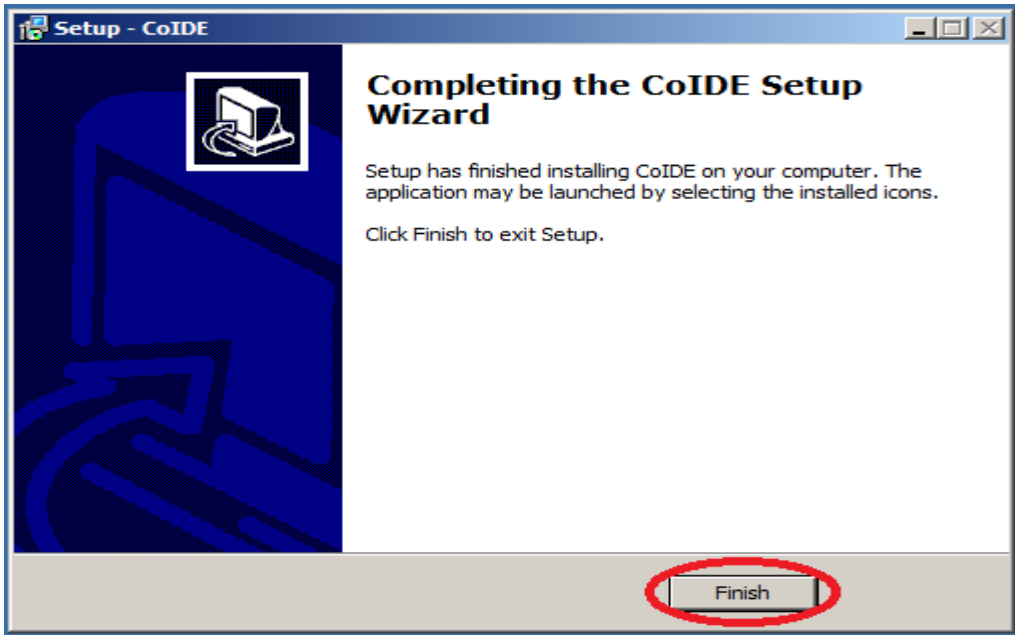

Fig. 7

2.3 Setup for NGX CoLink and BLUEBOARD-LPC1343 Board

The BlueBoard-LPC1343 board has on board 10 pin SWD box, the NGX CoLink is not a part of the BlueBoard-LPC1343 package, the user needs to buy it separately.

To run the BlueBoard-LPC1343 examples you need have the following components and the image shows the each components:

- NGX CoLink.
- BlueBoard-LPC1343 Board.
- Mini USB cable.

NGX CoLink with cable as shown in below image.

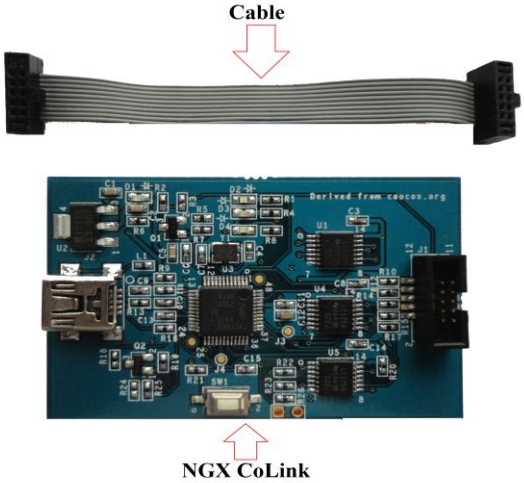

Fig. 8

Connections of components are shown in the below image.

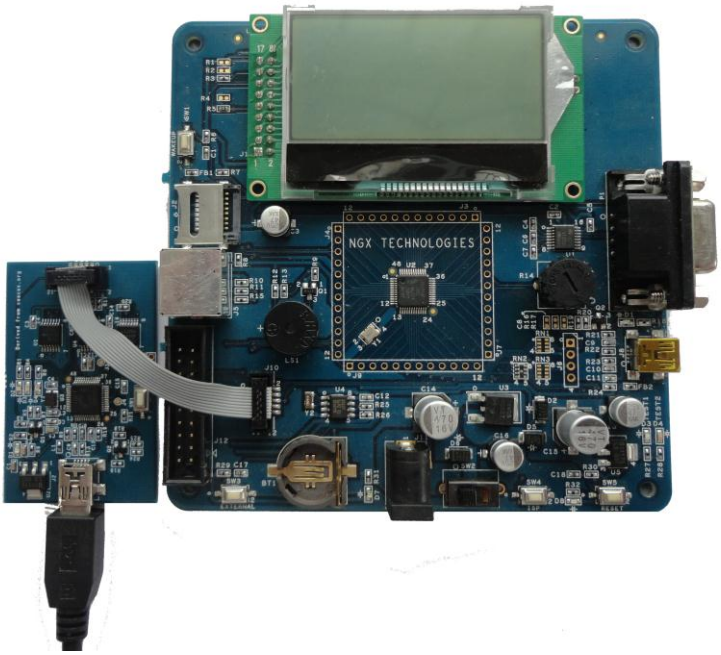

Fig. 9

The above setup is ready to use for development in CoIDE .

2.4 Configuration of NGX CoLink Debugger

The configuration flow of NGX CoLinkEx Debugger is explained below:

Before configuring the NGX CoLink select the tool chain path as **C:\CooCox\CoIDE\gcc\Sourcery G++ Lite\bin** as shown in the below images.

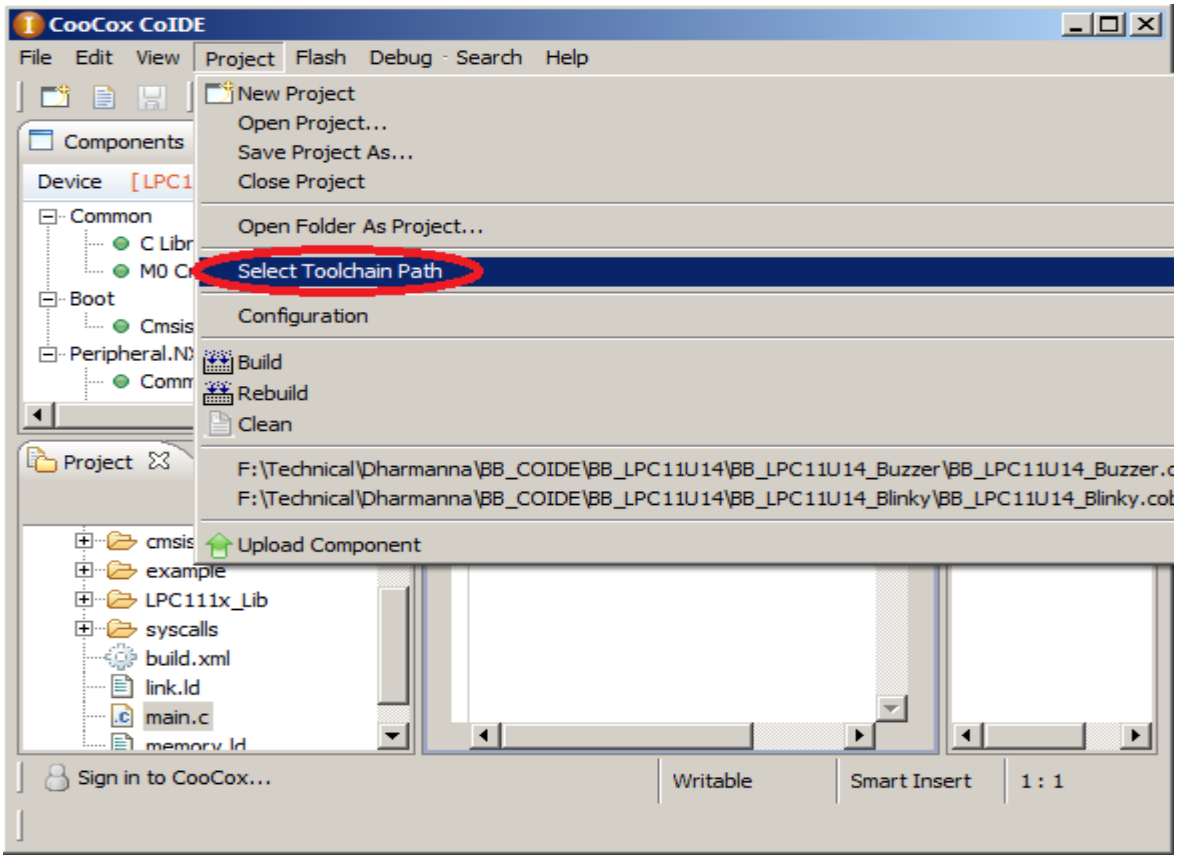
CooCox CoIDE
File Edit View Project Flash Debug Search Help
New Project
Open Project...
Save Project As...
Close Project
Open Folder As Project...
Select Toolchain Path
Configuration
Build
Rebuild
Clean
F:\Technical\Dharmanna\BB_COIDE\BB_LPC11U14\BB_LPC11U14_Buzzer\BB_LPC11U14_Buzzer.c
F:\Technical\Dharmanna\BB_COIDE\BB_LPC11U14\BB_LPC11U14_Blinky\BB_LPC11U14_Blinky.cob
Upload Component
Components
Device [LPC1
Common
Boot
Peripheral.NX
Project
example
LPC111x_Lib
syscalls
build.xml
link.ld
main.c
Sign in to CooCox...
Writable
Smart Insert
1 : 1

Fig. 10

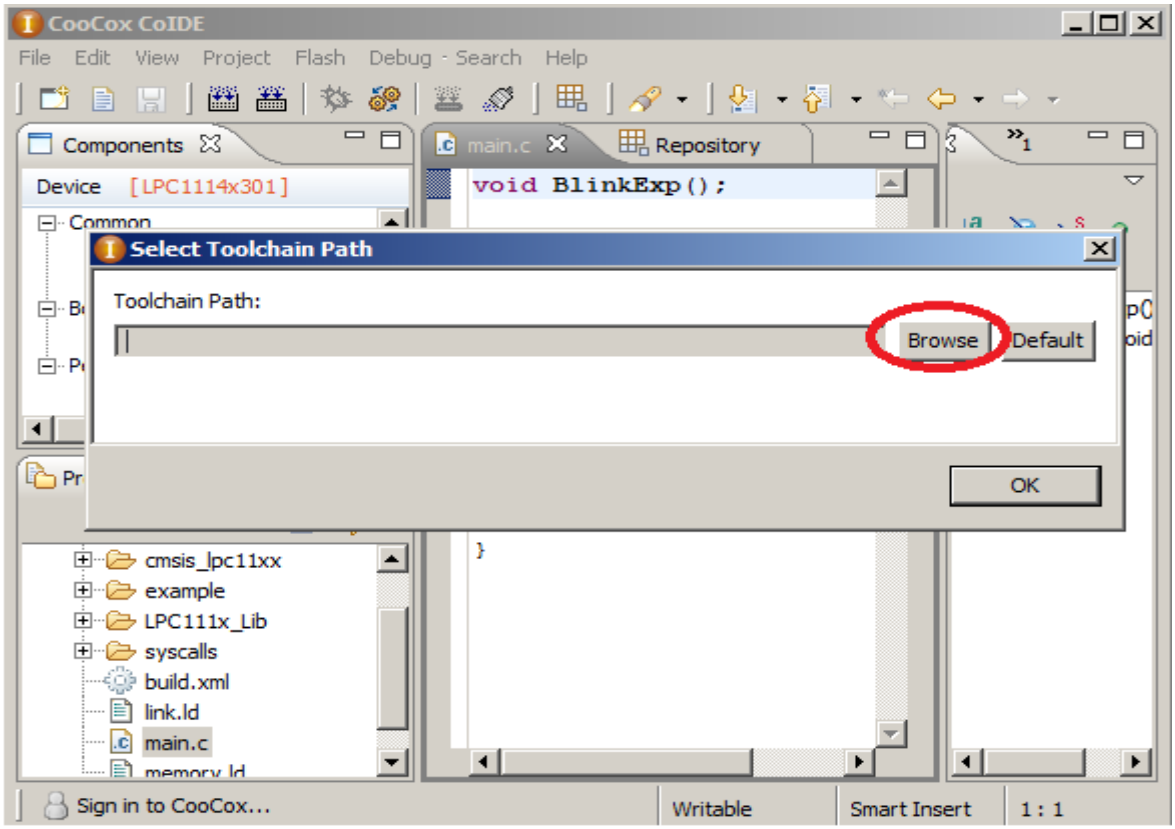
CooCox CoIDE
File Edit View Project Flash Debug Search Help
Components
Device [LPC1114x301]
Common
main.c
Repository
void BlinkExp();
Select Toolchain Path
Toolchain Path:
Browse
Default
OK
cmsis_lpc11xx
example
LPC111x_Lib
syscalls
build.xml
link.ld
main.c
Sign in to CooCox...
Writable
Smart Insert
1 : 1

Fig. 11

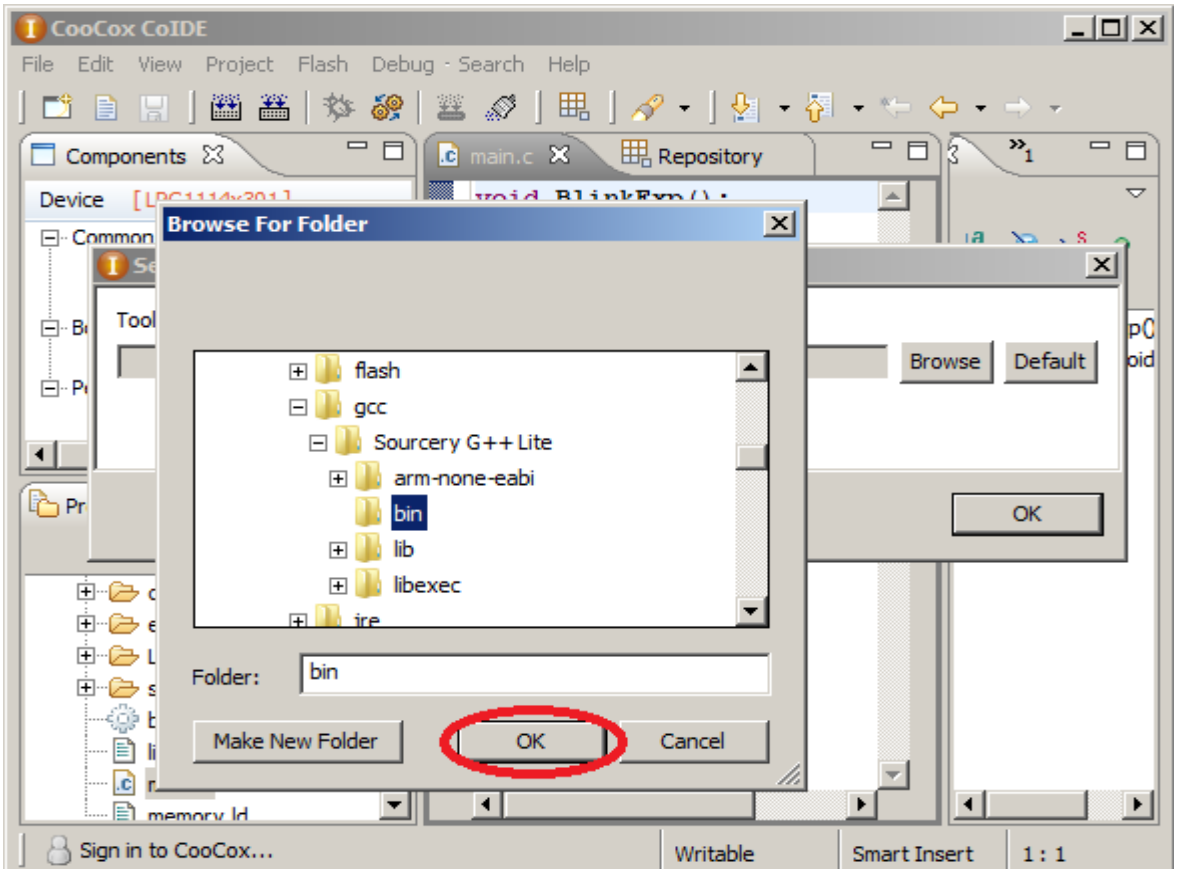
CooCox CoIDE
File Edit View Project Flash Debug Search Help
Components
Device
Common
main.c
Repository
Browse For Folder
flash
gcc
Sourcery G++ Lite
arm-none-eabi
bin
lib
libexec
ire
Folder:
bin
Make New Folder
OK
Cancel
Browse
Default
OK
Sign in to CooCox...
Writable
Smart Insert
1 : 1

Fig. 12

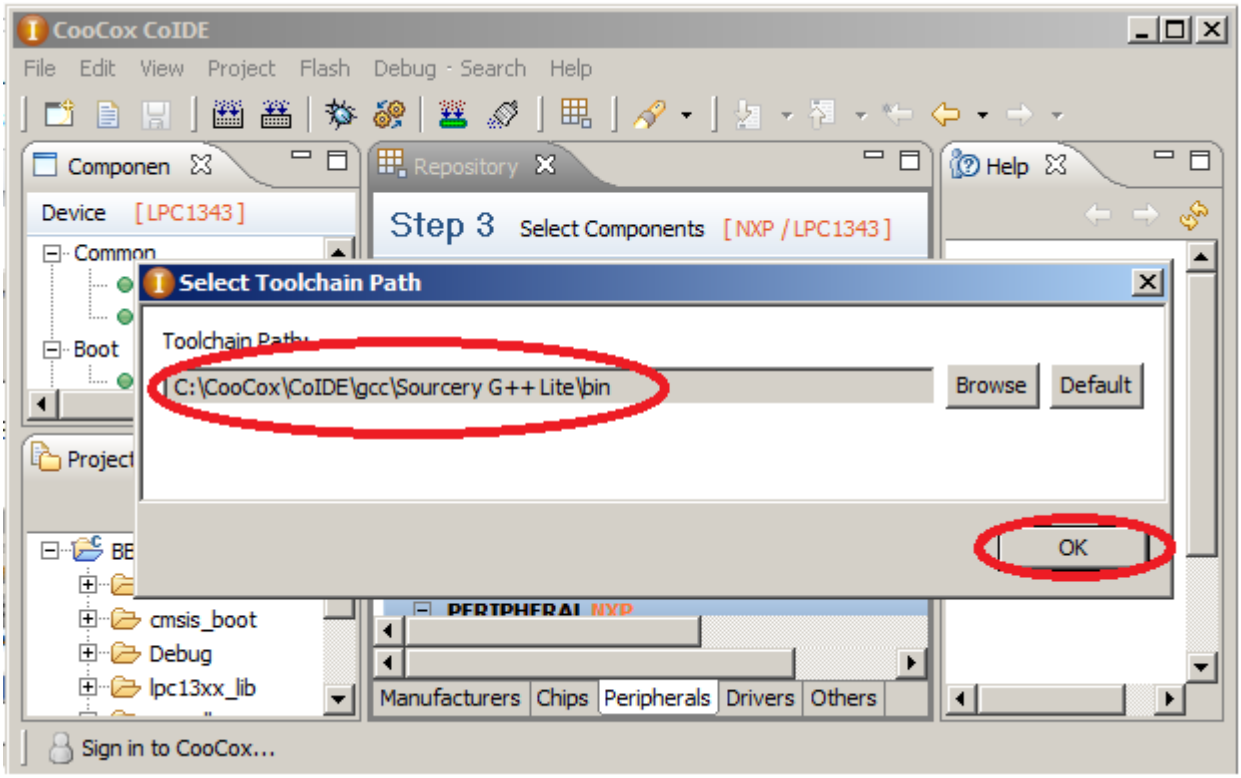
CooCox CoIDE
File Edit View Project Flash Debug Search Help
Componen
Device [LPC1343]
Common
Boot
Repository
Step 3 Select Components [NXP / LPC1343]
Help
Select Toolchain Path
Toolchain Path:
C:\CooCox\CoIDE\gcc\Sourcery G++ Lite\bin
Browse
Default
OK
Project
cmsis_boot
Debug
lpc13xx_lib
Manufacturers
Chips
Peripherals
Drivers
Others
Sign in to CooCox...

Fig. 13

Step 1: Open CoIDE project for example: BB_LPC1343_Blinky then click on Debug Configuration as shown in the below image.

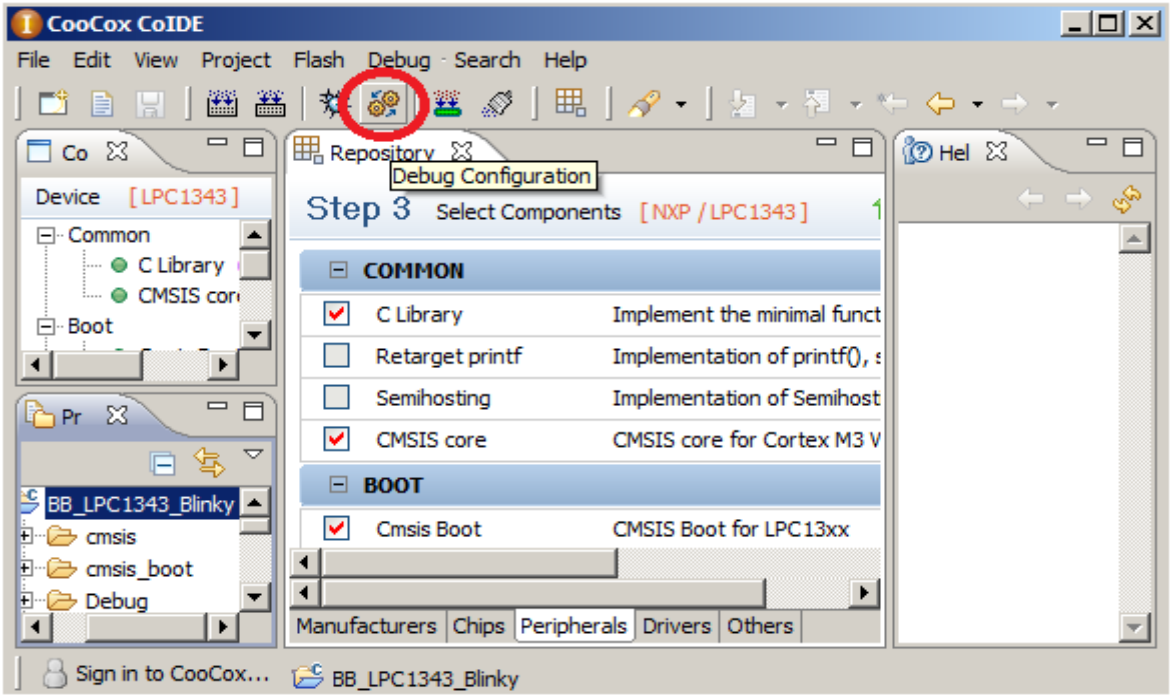

Fig.14

Step 2: Click on Example: BB_LPC1343_Blinky.configuration then select ColinkEx adapter, select SWD port and 1M Max Clock(Hz) as shown in the image below.

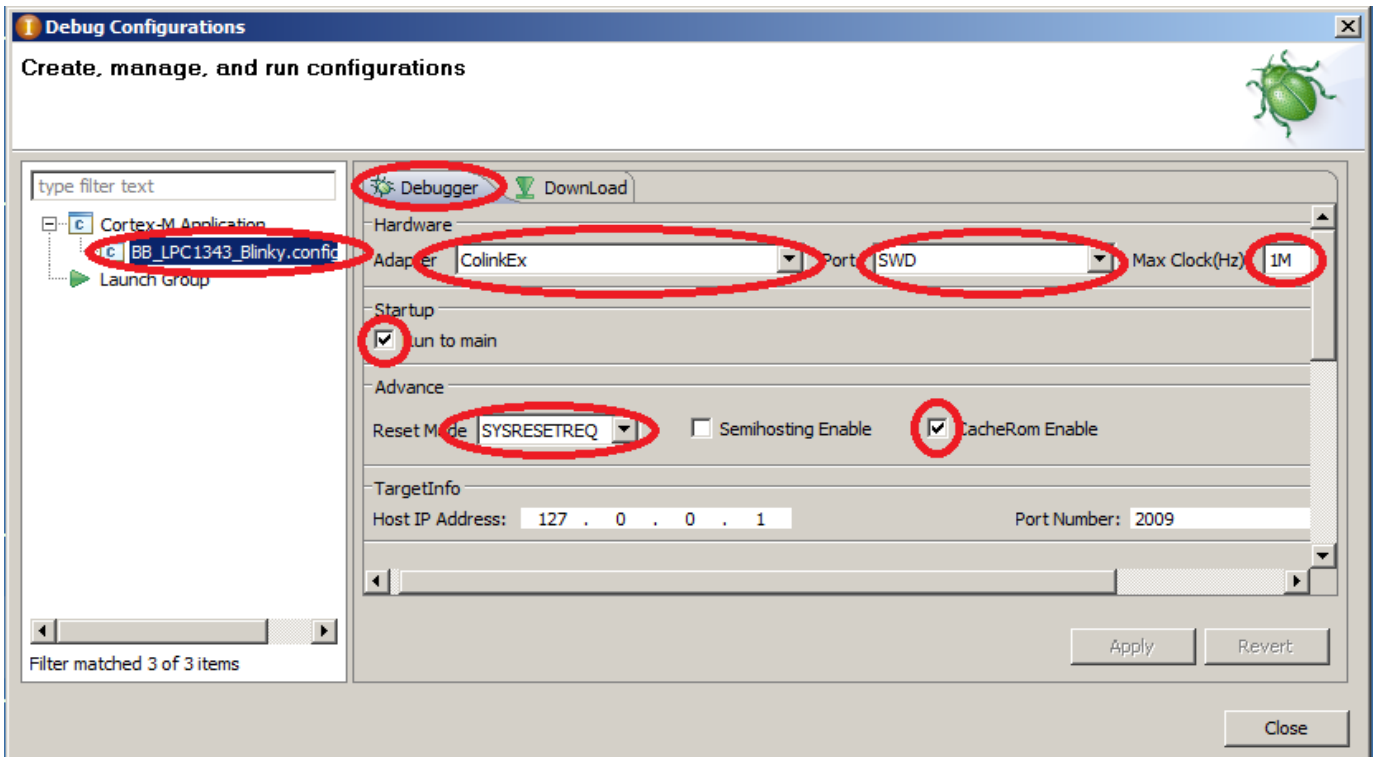

Fig.15

Step 3: Select Download option then click on default and apply then click on close as shown in image.

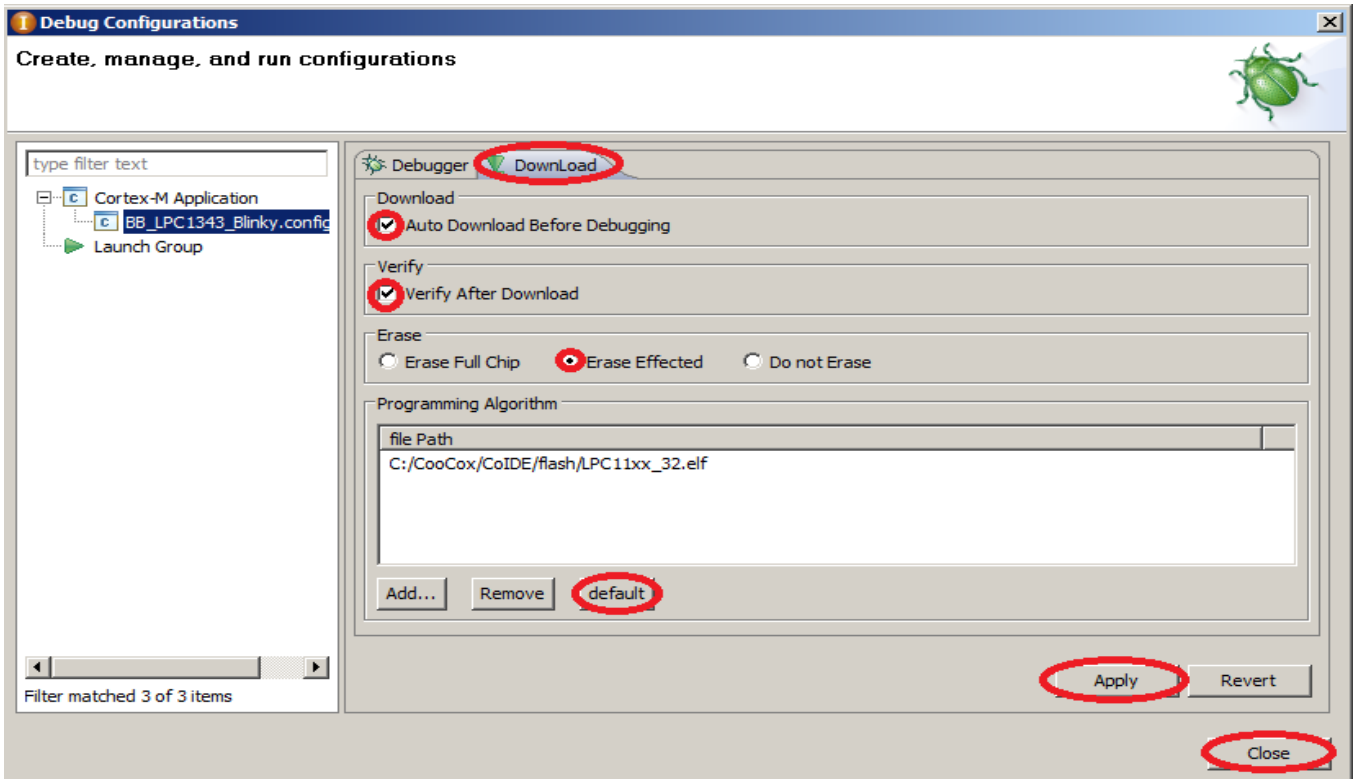

Fig.16

3.0 BLUEBOARD-LPC1343 Software Development

3.1 Executing the sample projects

The sample projects are provided with the available kit.
Steps to execute the sample projects:

1. Open the project folder.
2. Then open the file project_name.cob eg BB_LPC1343_Blinky.cob.

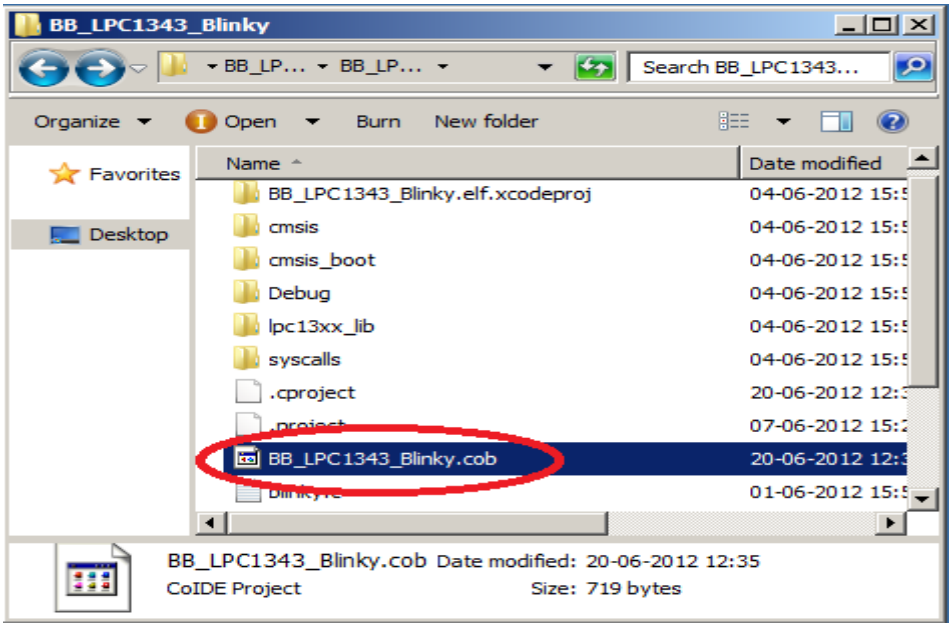

Fig. 17

3. This launches the IDE

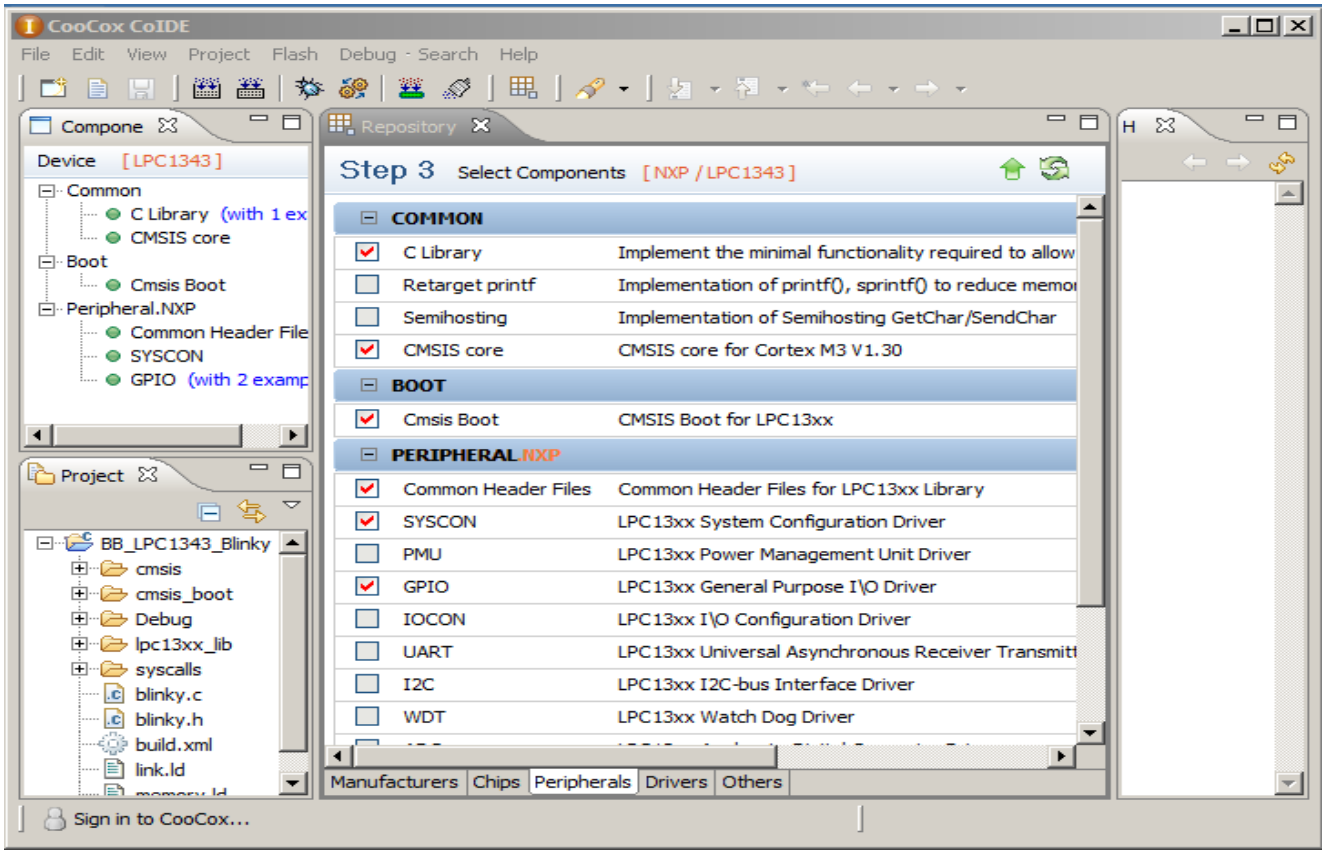

Fig. 18

4. Build the project as shown below image.

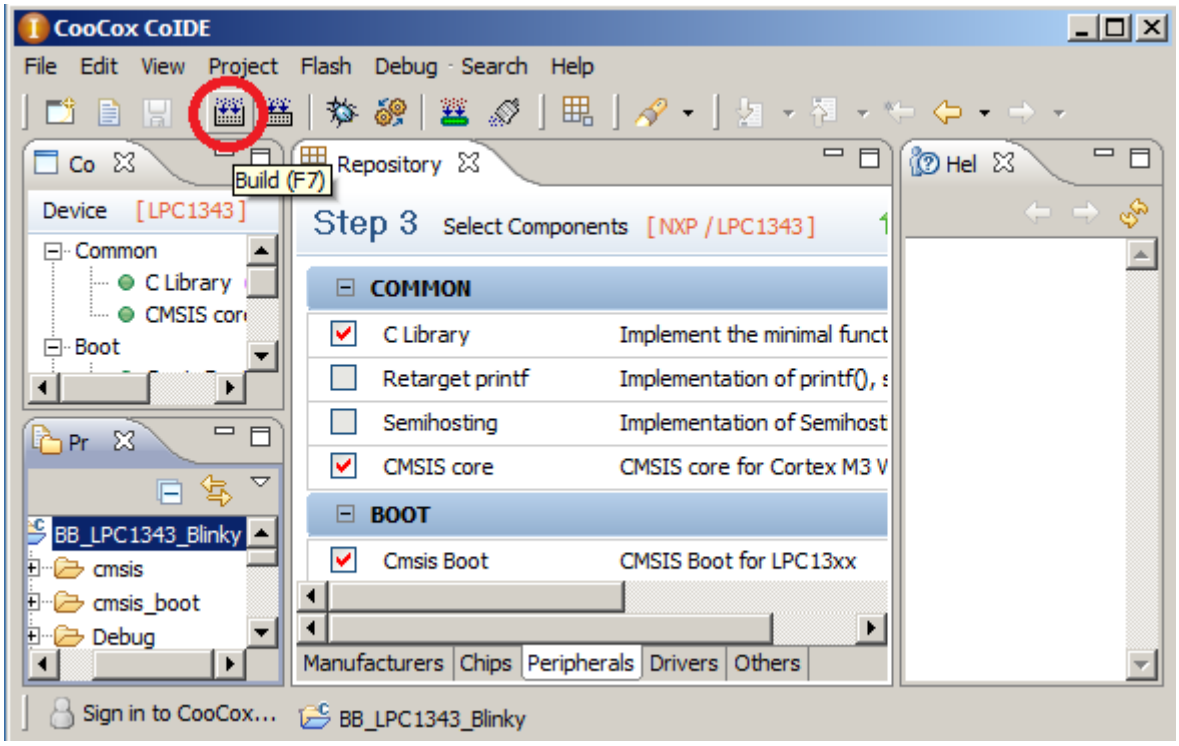

Fig. 19

5. Click the Debug button on the IDE and the project is loaded onto the controller and ready for debugging as shown in below image.

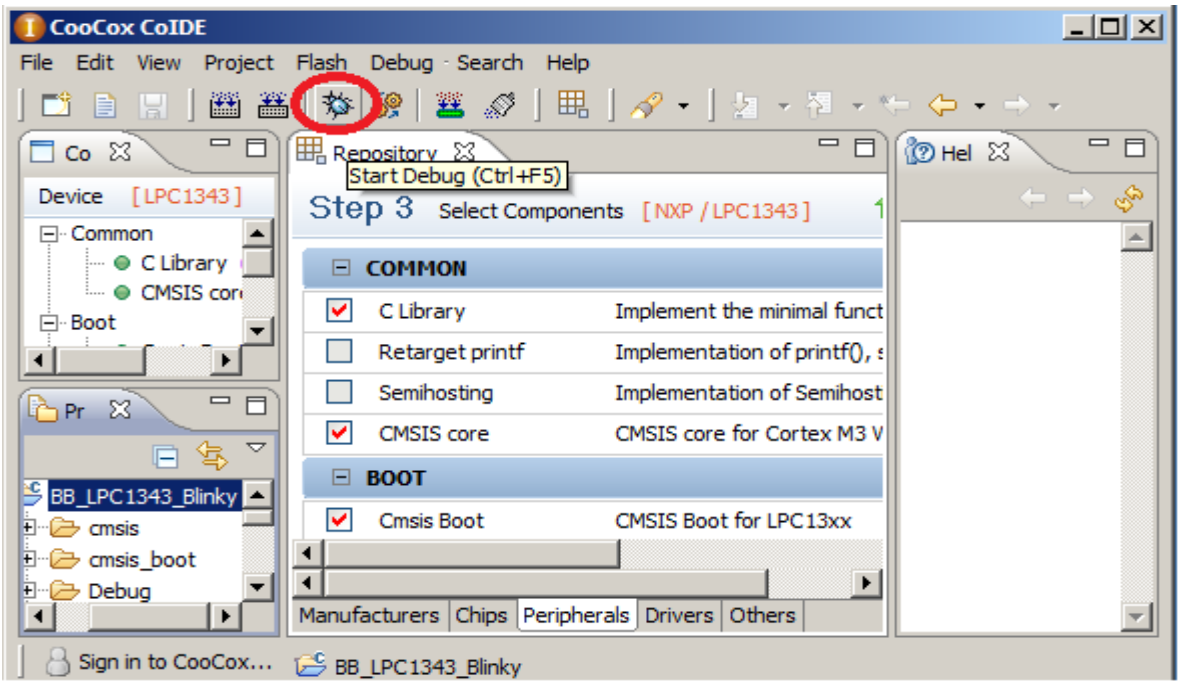

Fig. 20

3.2 Creating New project

Follow the below steps, for creating new project:

Step 1: After launching CooCox CoIDE, select manufacturer, for example: NXP as shown in image,

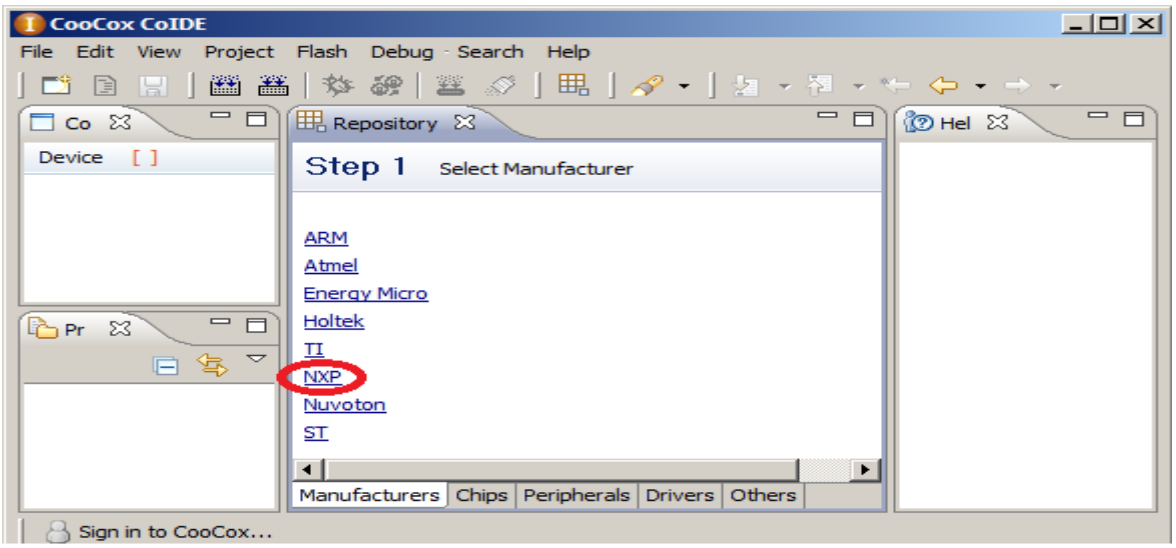

Fig. 21

Step 2: Select chip, for example:LPC1343x301, the right side of CoIDE will display the corresponding information of the chip as shown in below image.

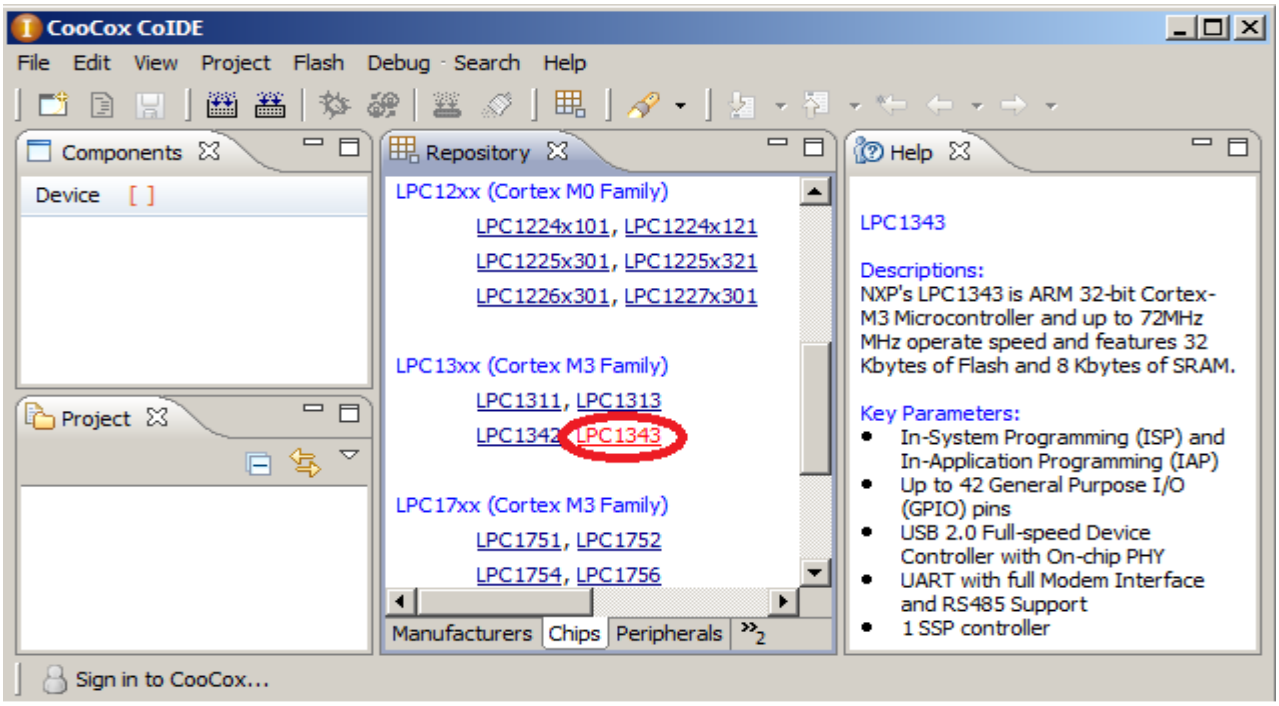

Fig. 22

Step 3: Check the components which you want to use, for example, check GPIO component. CoIDE will promote you to create a new project as shown in below image.

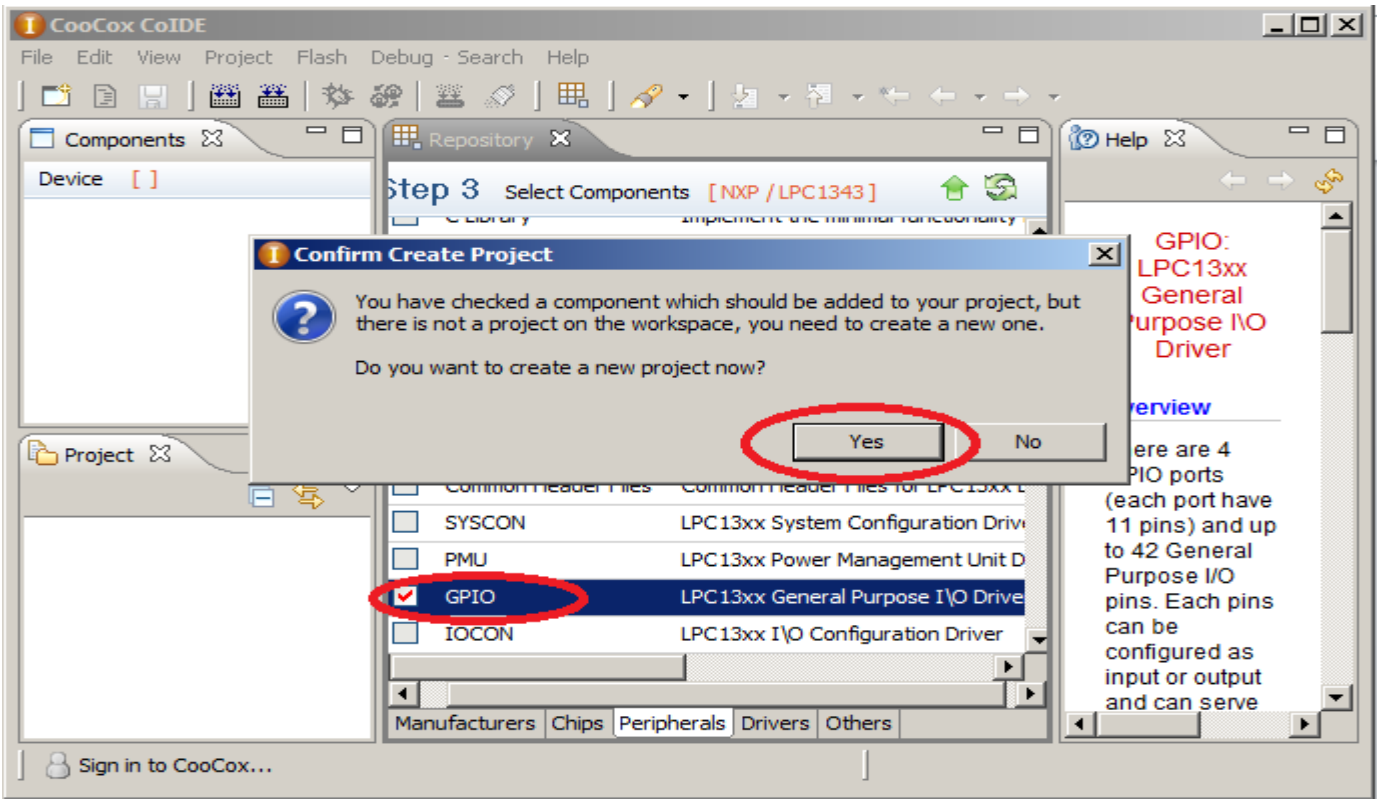

Fig. 23

Step 4: Input the project's name, CoIDE will create a project contained startup code and main.c file for you. The components you selected in third step will be added to your project, too as shown in image.

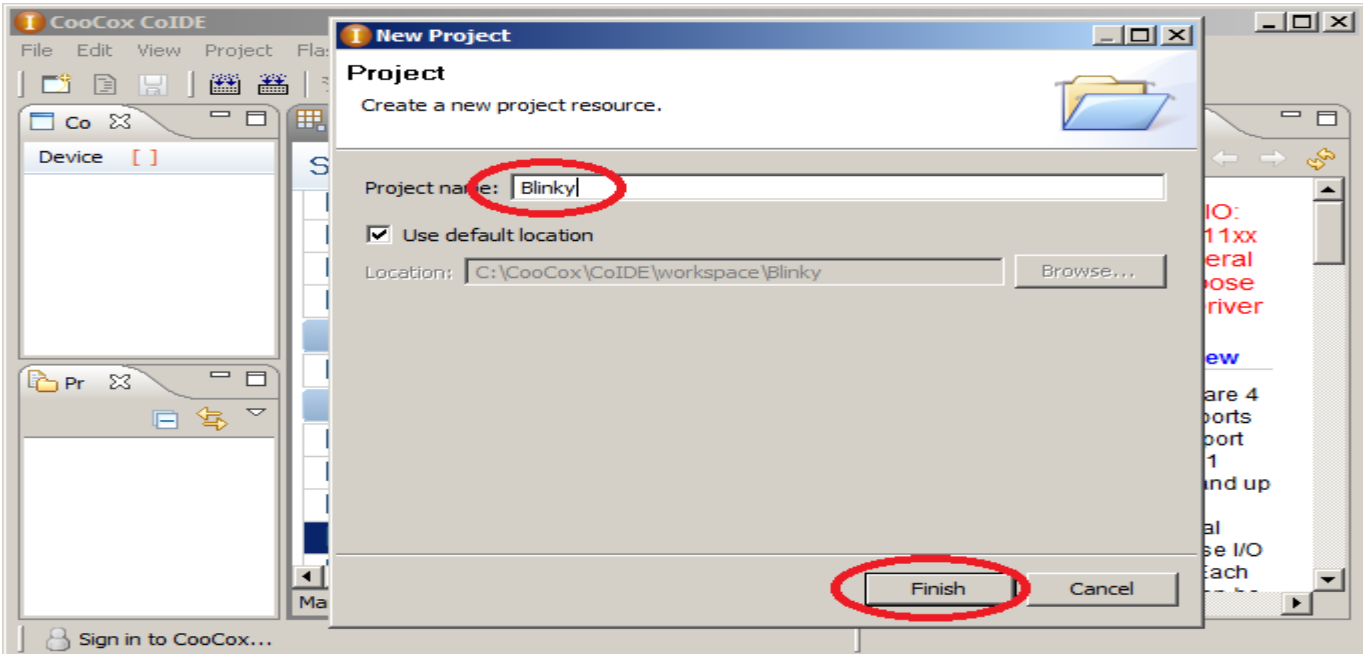

Fig. 24

Step 5: Start writing your code in main as shown in below image.

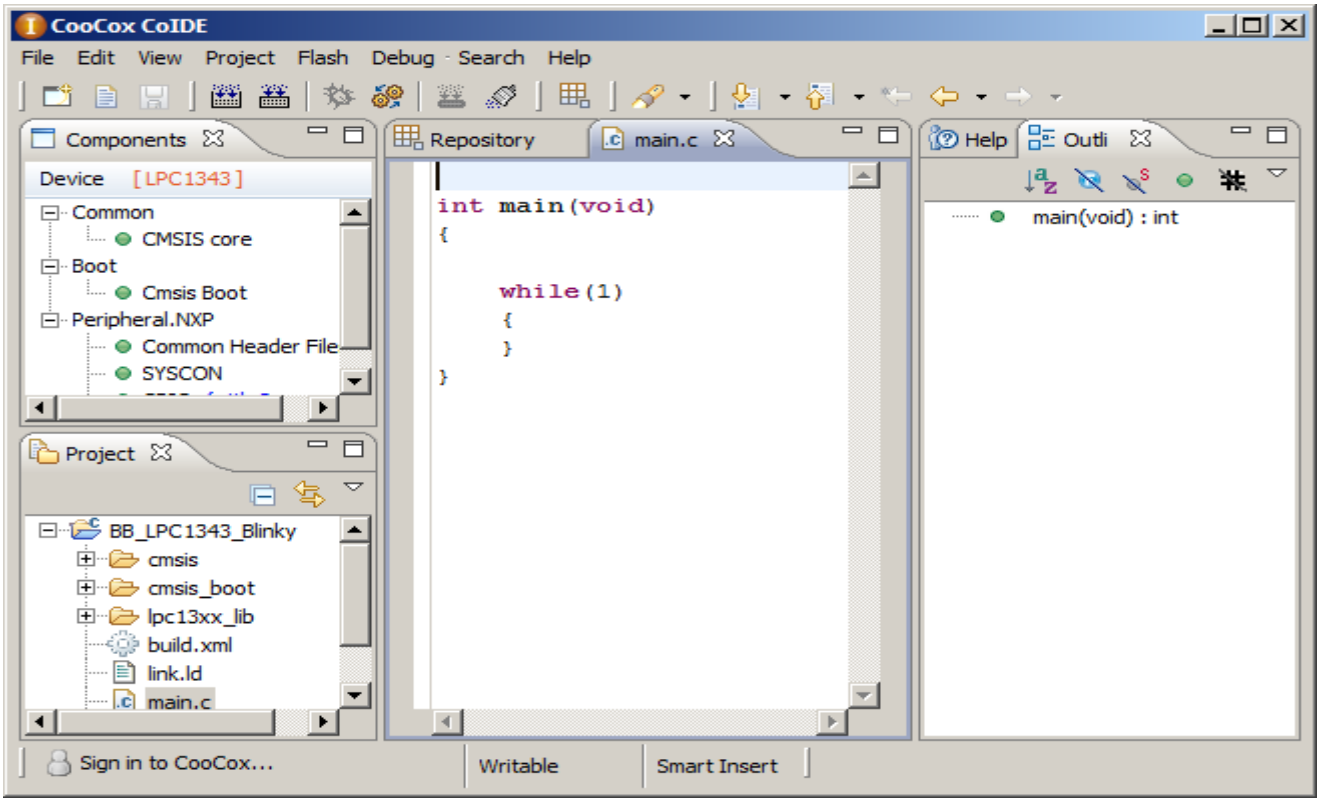

Fig. 25

Step 6: Build the project as shown below image.

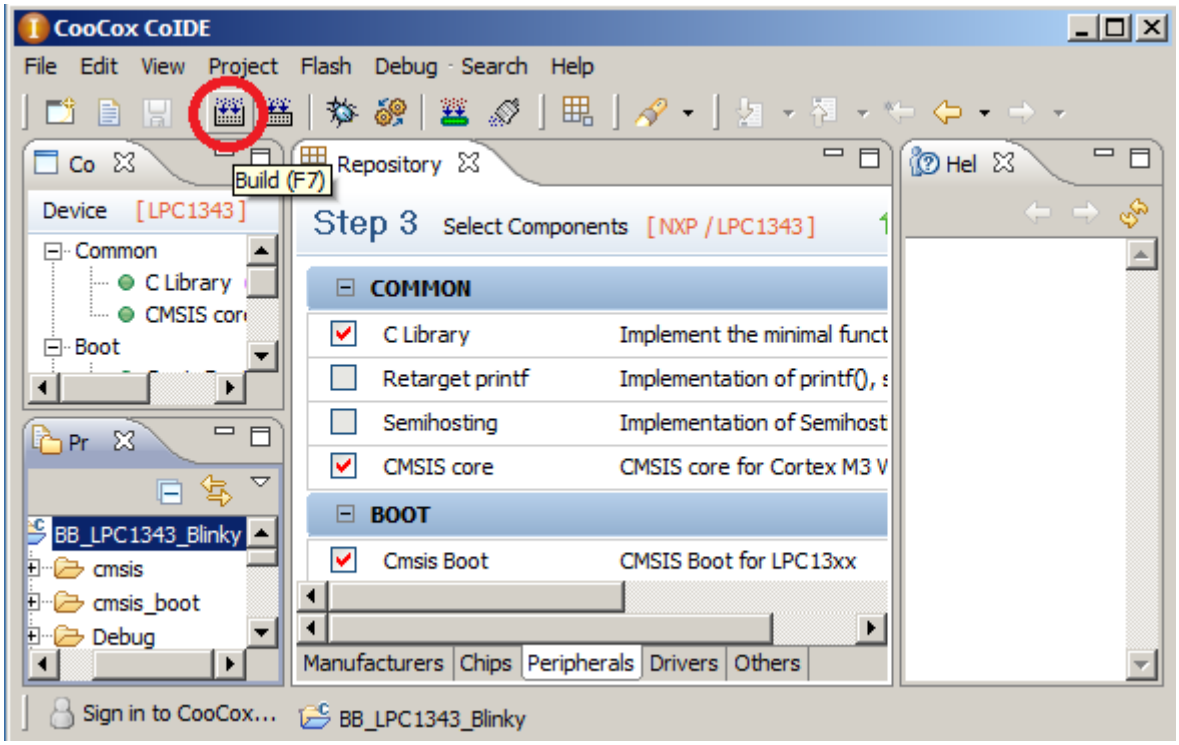

Fig. 26

Step 7: Click the Debug button on the IDE and the project is loaded onto the controller and ready for debugging as shown in below image.

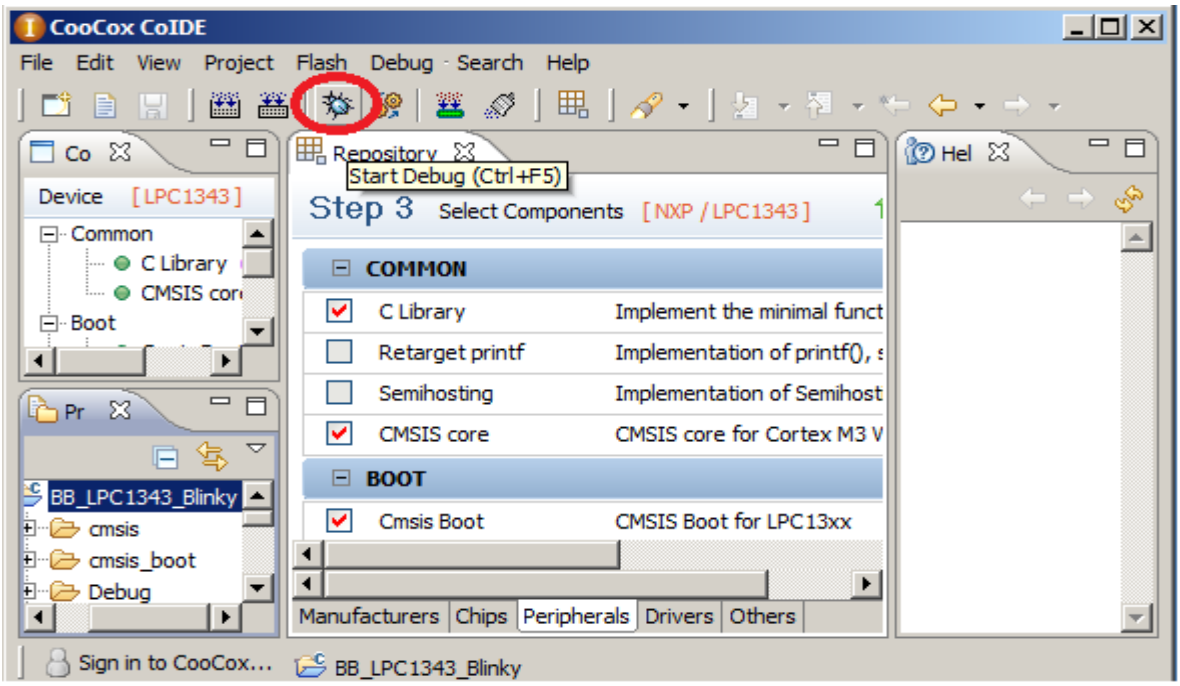

Fig. 27

3.3 Bin File

For bin file follow the below steps:

Step 1: Go to CoIDE workspace (project saved location) Open project folder.

Step 2: Open Debug folder in that two folders are there bin and obj folders.

Step 3:Open bin folder in that bin and hex files are there as shown in below image:

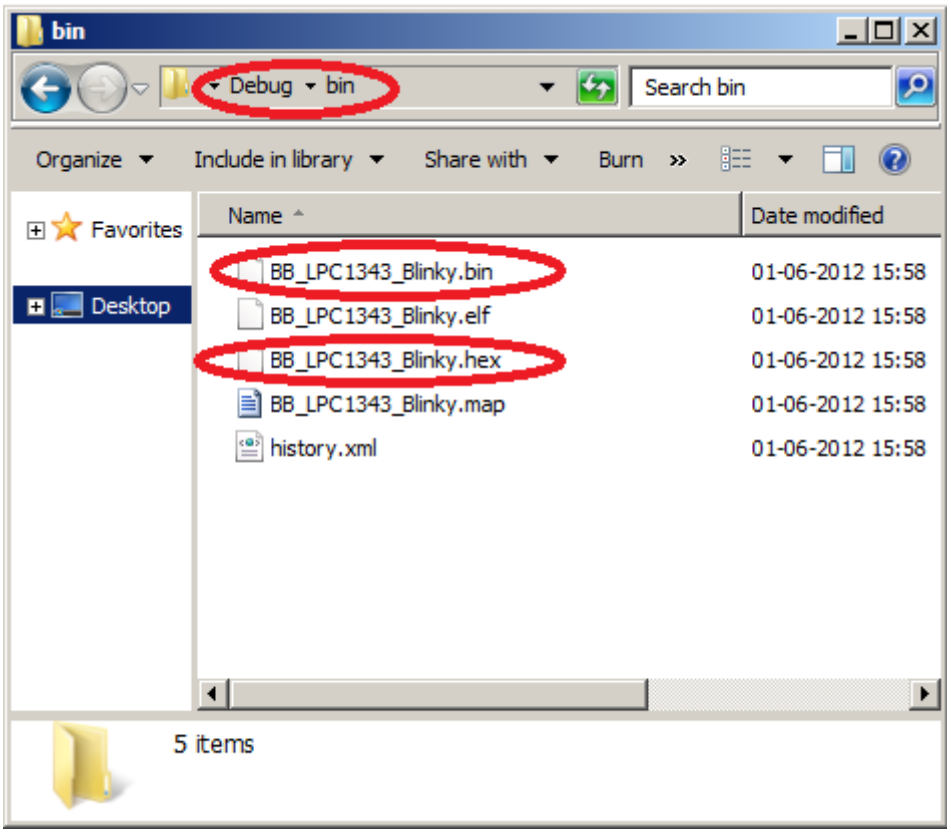

Fig. 28

4.0 BLUEBOARD-LPC1343 Programming

4.1 Programming options

BlueBoard-LPC1343 can be programmed using the

- On-chip bootloader (USB or UART)
- Debugger (NGX CoLink)

4.1.1 On-Chip bootloader (USB or UART)

In order to program the board either through USB or UART we need to get the board under programming mode.

Getting the board in programming mode:
Theory: The On-chip bootloader looks for a logic LOW to be present on a pre-defined PIN (ISP pin) during reset. If the ISP pin is held LOW and reset signal is provided to the MCU, the MCU enters into programming mode.

Practical:
On the BlueBoard-LPC1343 the RESET and ISP signals are connected to buttons provided on the board. Look for the RESET and ISP marking on the board. Therefore to enter into programming mode:

- **Press and hold** the ISP button
- Press the RESET button and release it
- Now release the ISP button
- The board is in the programming mode

We know that the on-chip bootloader can be used with USB or UART. Please note that if you have connected a USB cable to the board the USB bootloader is activated else the UART bootloader is activated. Meaning, if you have connected the USB cable as your power source then you cannot use UART bootloader, you need to use an alternate external power source (DC jack) to enable UART bootloader. If a particular MCU supports USB bootloading it is highly recommended to use the same for programming.

Programming through USB is the most convenient way to program the BlueBoard-LPC1343. The LPC1343 has an on-chip USB bootloader support which makes programming the board very simple. You don't require any PC application to program using USB bootloader. Once the board enters the programming mode it appears as a drive on your Windows machine and all you need to do is just drag-n-drop your binary to this drive.

Note: Not all NXP USB MCUs support USB boot loading. For example the LPC11U14 does not support USB bootloader although it has support for USB on the chip.

4.1.2 Flashing the board using USB

The pre-build binaries can be used to flashing onto to the board for each peripheral by using the USB bootloader as a Mass storage device. Press SW4, then SW5; release SW5, then SW4, the mass storage device will appear on your screen. On the board LED D1 glows. Remove firmware.bin file and then place your bin file and then press reset switch to execute the specific code written on to the flash.

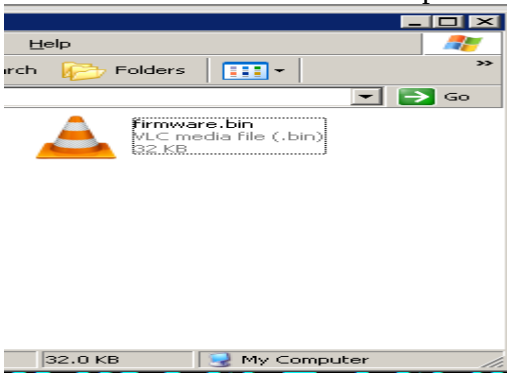

Fig. 29

Flashing the bin file(Drag & drop).

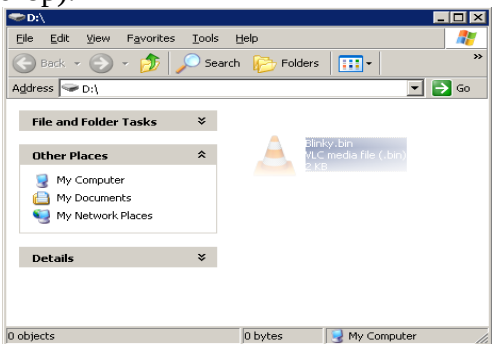

Fig. 30

4.2 Flashing the Hex file through UART

Step 1: Connect the serial cable to the PC as well as to the board UART and open the flash magic tool.

Step 2: Input all the parameters as shown in below Fig.

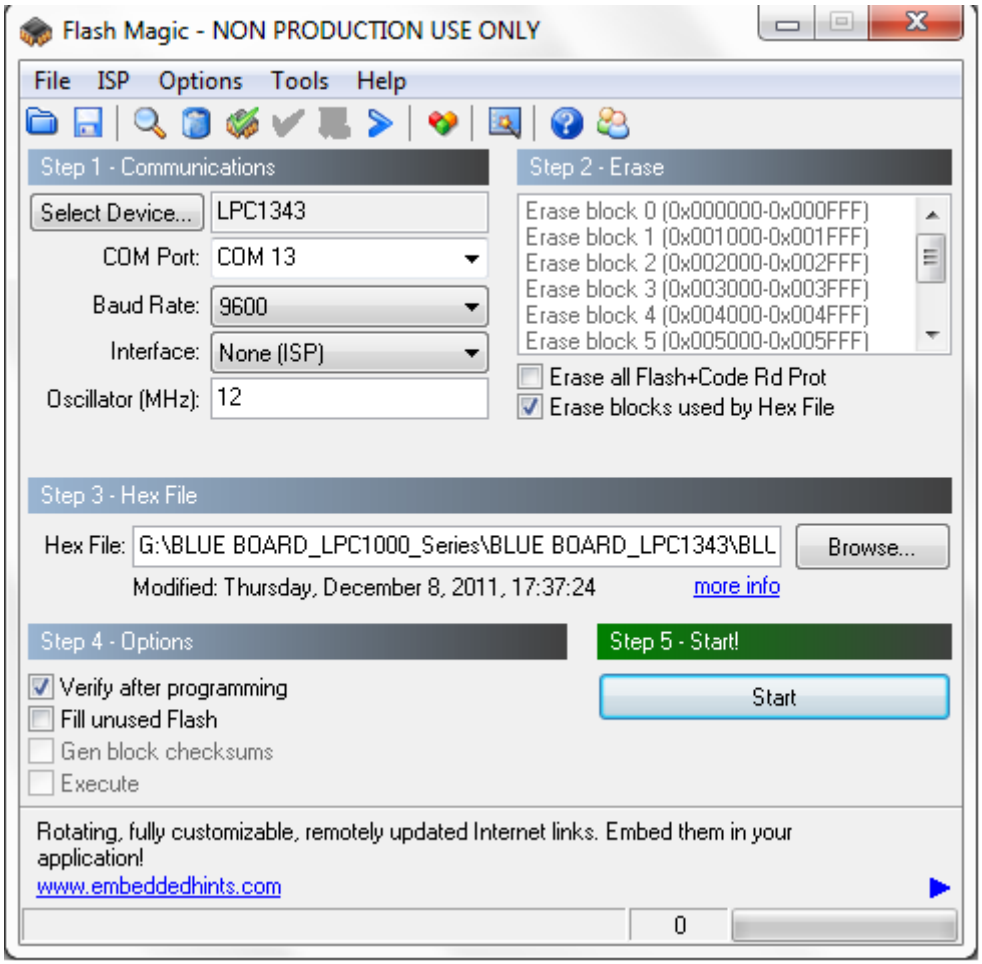

Fig. 31

Step 3: Click **Star**t to flash the hex file. Press Reset switch to run.
NOTE: Make sure that the Board is not powered through USB.

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

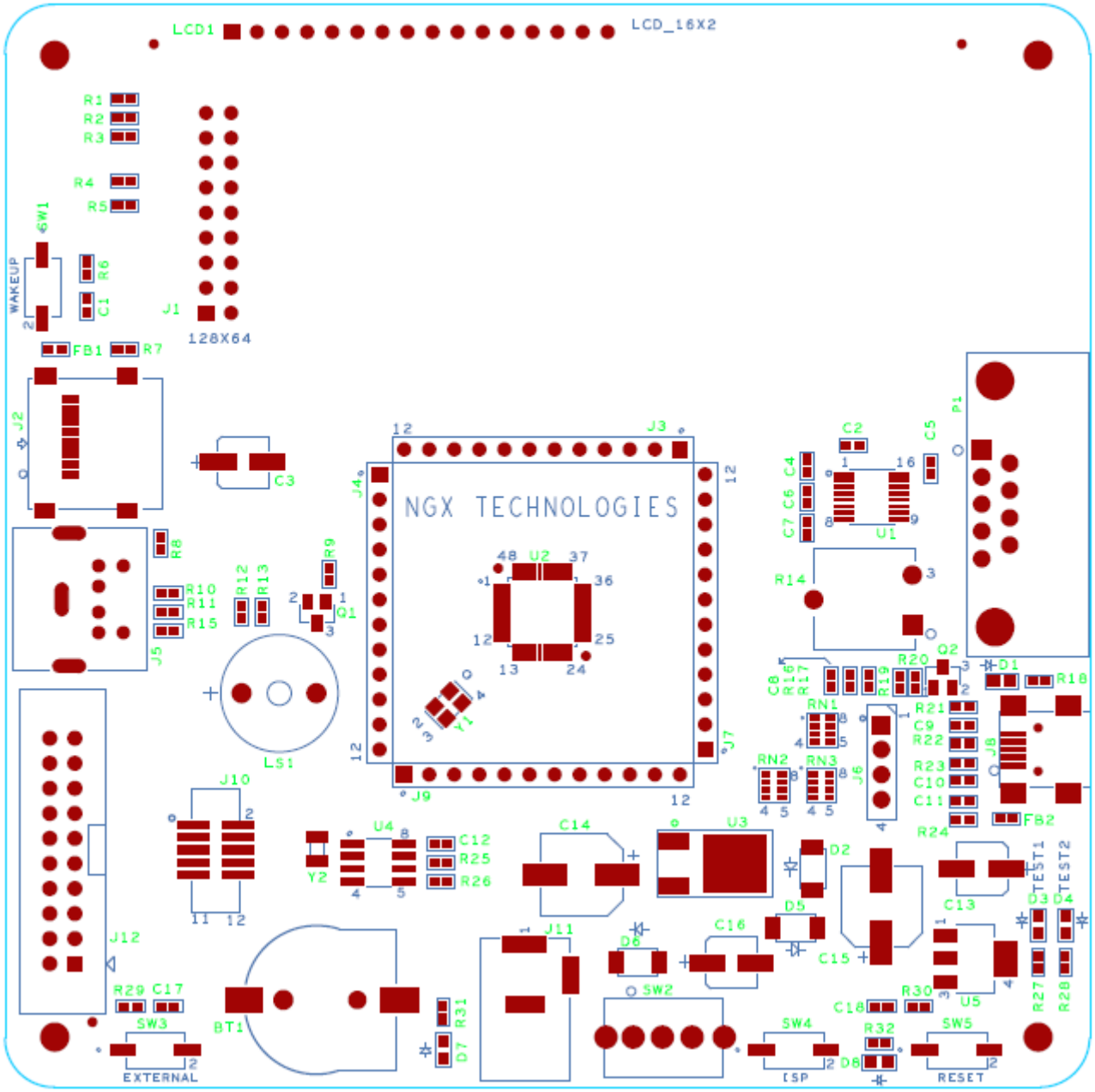

Fig. 32

6.0 Trouble Shooting

For newly created bin file you should update crc.

Unfortunately, the checksum generated is not correct and unless the checksum of the .bin file is modified, the firmware will be rejected by the USB bootloader. Thankfully, this is relatively easy to fix. There is free utility to fix the checksum. A pre-compiled version for Windows (named lpcrc.exe) is also located in the root folder. To fix the checksum, simply go into the command-line and go to the root folder where both the lpcrc.exe tool and your .bin file are located (the file will be named 'firmware.bin' unless you have modified the Makefile), and enter the following command:

Fixing the firmware.bin Checksum

lpcrc firmware.bin

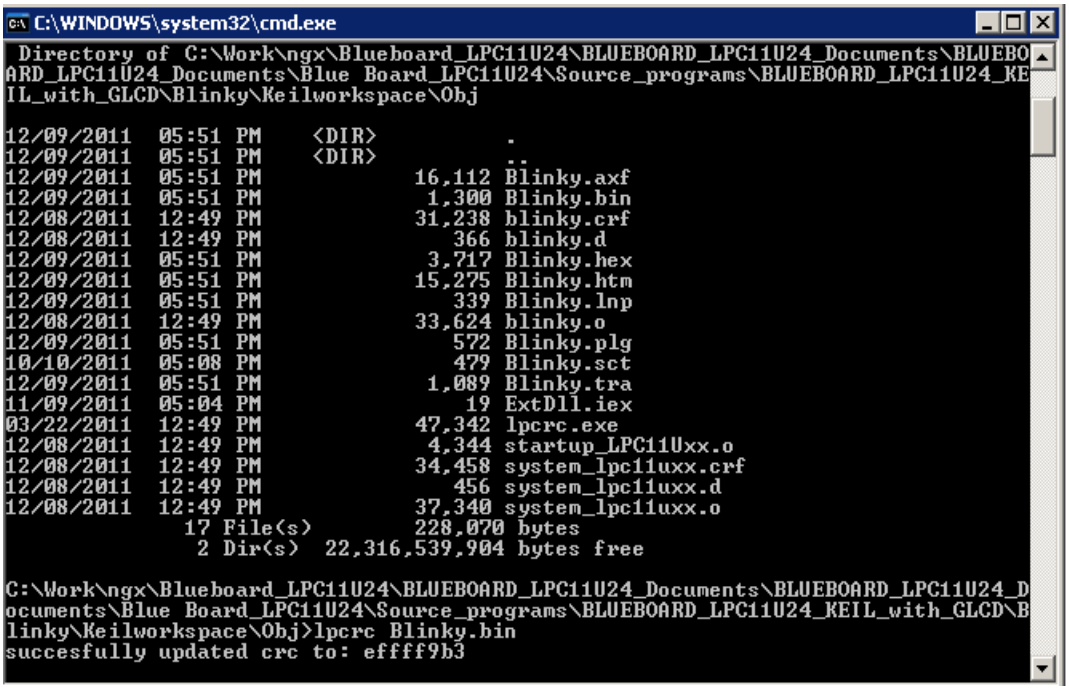

Fig. 33

7.0 CHANGE HISTORY

7.1 Change History

Rev	Changes	Date (dd/mm/yy)	By
1.0	Initial release of the manual	11/07/2012	Dharmanna Gaded

8.0 REFERENCES

In addition to this document, the following references are included on the NGX BLUEBOARD-LPC1343 product and can also be downloaded from www.ngxtechnologies.com:

- NGX BLUEBOARD-LPC1343 schematic for the Development board.

Additional references include:

- Information on development tool being used:
  - CoIDE 1.4.2, http://www.coocox.org/CooCox_CoIDE.htm
  - Flash magic, http://www.flashmagictool.com/

About this document:

Revision History

Version: V1.0 author: Dharmanna Gaded

Company Terms & Conditions

Legal

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