mX-BaseBoard with mX-LPC1114-S
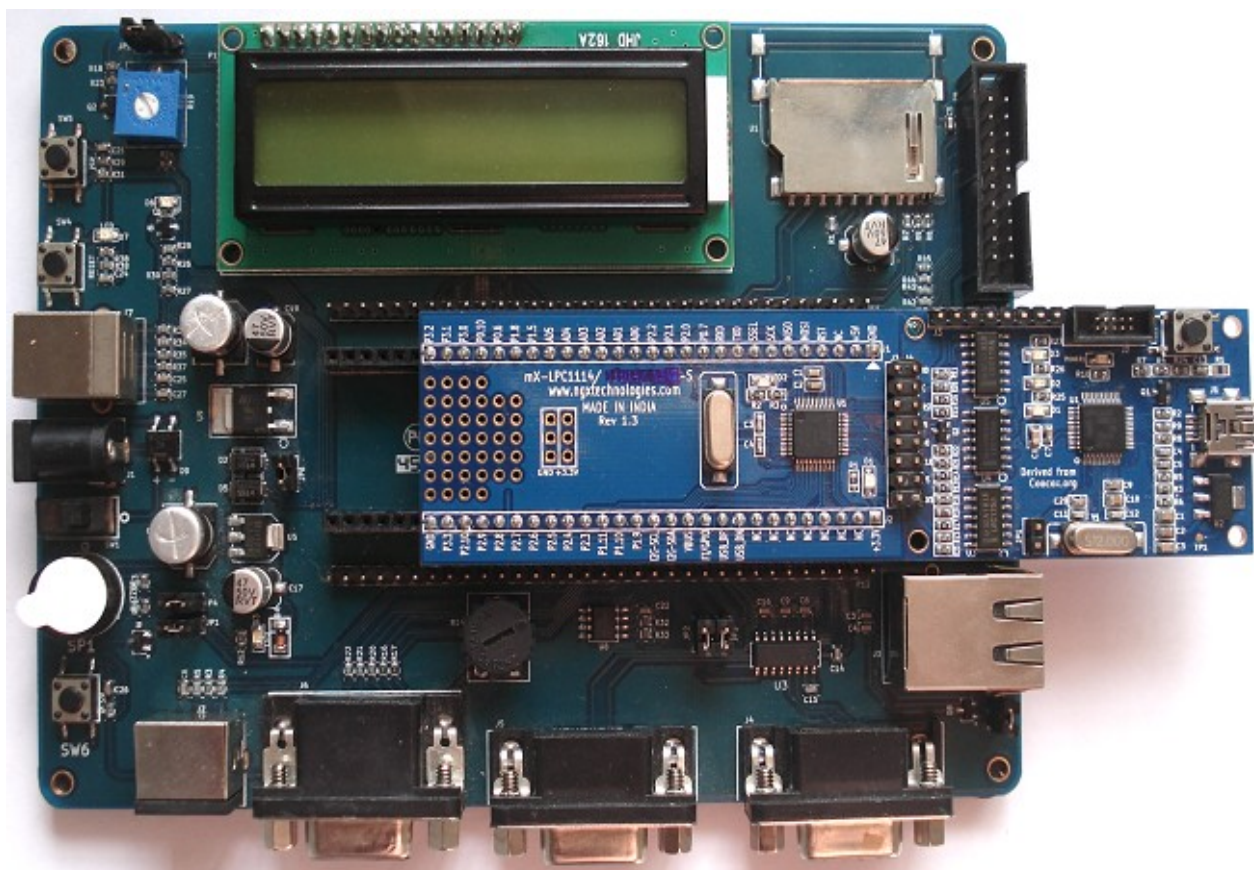
USER MANUAL

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Introduction

mX-BaseBoard is a new addition to the BlueBoard line from NGX Technologies. This board is intended to extend the functionality of the mX-LPC1114-S board. The board is a stamp for LPC 1114. mX-BaseBoard can be used to extend the features of the stamp by providing connectors and interface to various peripherals of the stamp and provide power to the peripheral interface.

Features

- 2x16 with contrast control & back light

- SD Card connector

- Power Jack

- Power Switch

- Reset Button

- ISP Button

- External Interrupt Button

- Buzzer

- PS/2

- Serial Connector 0

- Preset for ADC

- On board EEPROM

Getting Started

Before starting you would need the following things handy and ready. For compiling and debugging programs refer to ***CoIDE User Guide***. The CoIDE User Guide is for Nuvton, the same procedure follows for NXP. The user needs to select the appropriate part number. Make sure that you have read the CoIDE user guide carefully before you proceed further.

Requirement

The requirement is put in two sections.

Hardware

- Power adapter – rating 7.5 V, 1 AMP
- SD card
- USB mini cable
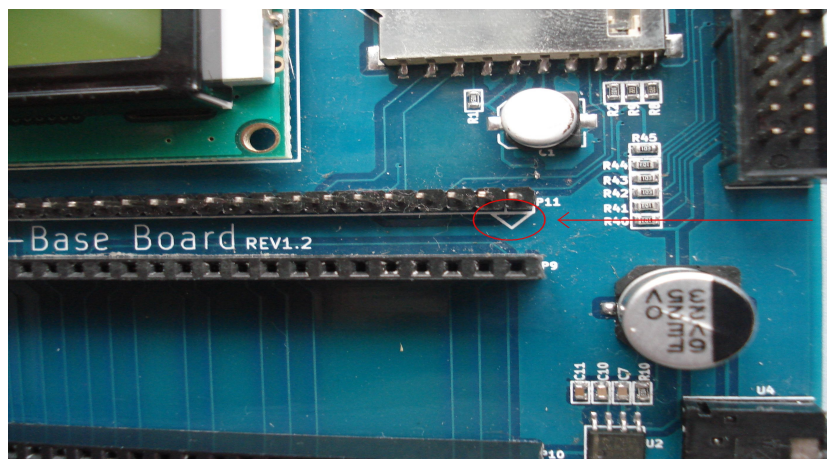- Serial cable
- PS/2 Keyboard

Software

- PC with Windows OS
- Use HyperTerminal as terminal software
- mX-LPC1114-S CoIDE workspace from NGX Technologies
- Flash Magic

Setup

Mounting the mX-LPC1114-S Board

The mX-LPC1114-S board should be mounted on the mX-BaseBoard with a particular alignment.

 Improper mounting of the mX-LPC1114-S board on mX-BaseBoard may damage the mX-LPC1114-S board and / the mX-BaseBoard.

       The GND pin on mX-LPC1114-S board should be aligned with the pin 1 of P9 female header on BaseBoard. Refer to the marking as shown in the image above.

Validating the mX-BaseBoard

Download the workspace as .zip form *here*.
Download the Binary as .zip form *here*.
For flashing the Binary files please refer to ***CooCox CoFlash Quick Start with GUI***.

 1. *You need to flash the mX-LPC1114-S board with the required firmware according to the functionality.*

2. *The CooCox CoFlash Quick Start with GUI is for Nuvton, the same procedure follows for NXP also.*

Led Blink

PORTS used → PORT0

PINS used → PIO0_7

Schematic net name → D2

A sample program to blink is provided, flash the **'mX-LPC1114_blinky.bin'** file onto mX-LPC1114-S and RESET. The LED (D2) should start blinking.

LCD

PORTS used → PORT2 for Data lines and PORT3 for Control lines.

PINS used → PIO2_6, PIO2_7, PIO2_8 and PIO2_9 for Data lines and PIO3_0, PIO3_1 and PIO3_2 for Control lines

Schematic net name → LCD_D4, LCD_D5, LCD_D6, LCD_D7, LCD_EN, LCD_RW and LCD_RS.

A sample program to LCD is provided, flash the **'mX-LPC1114_lcd.bin'** file onto mX-LPC1114-S and RESET. The LCD should display "NGX TECHNOLOGIES".

SD card

PORTS used → PORT0 for MOSI,MISO and SSEL, PORT2 for SCK.

PINS used → PIO0_9,PIO0_8,PIO2_11 and PIO0_2.

Schematic net name → MOSI, MISO, SSEL and SCK.

A sample program to SD-card is provided, flash the **'mX-LPC1114_sdcard.bin'** file onto mX-LPC1114-S, insert a SD card and RESET.

On the LCD it should display "SD card - PASS".

Remove the card and RESET, on the LCD should display "SD card - FAIL".

I²C

PORTS used → PORT0 for I2C-SDA and I2C-SCL.

PINS used → PIO0_5 and PIO0_4.

Schematic net name → I2C-SDA and I2C-SCL.

A sample program to I²C is provided, flash the **'mX-LPC1114_i2c.bin'** file onto mX-LPC1114-S and RESET. The LCD should displays "I²C - PASS". Connected to the I²C lines is an EEPROM device. The program writes and reads back a piece of data to test.

UART

PORTS used → PORT1 for TXD and RXD.

PINS used → PIO1_7 and PIO1_6.

Schematic net name → TXD and RXD.

A sample program to UART is provided, flash the **'mX-LPC1114_uart.bin'** file onto mX-LPC1114-S and RESET, Connect the serial cable to J4 and PC serial port. Open a HyperTerminal with 115200 baud, 8N1. The typed characters on the keyboard are echoed on the HyperTerminal.

Buzzer

PORTS used → PORT1 for BUZZER.

PINS used → PIO1_11.

Schematic net name → BUZZER.

A sample program to BUZZER is provided, flash the **'mX-LPC1114_buzzer.bin'** file onto mX-LPC1114-S and RESET,on the mX-BaseBoard a tone is heard from the buzzer. The jumper JP1 should be inserted.

Ext Int

PORTS used → PORT0 for EXT_SW.

PINS used → PIO0_7.

Schematic net name → EXT_SW.

A sample program to BUZZER is provided, flash the **'mX-LPC1114_exint.bin'** file onto mX-LPC1114-S and RESET, on the mX-BaseBoard the BUZZER toggles between ON and OFF when the button SW6 is pressed.

ADC

PORTS used → PORT1 for ADC.

PINS used → PIO1_4.

Schematic net name → ADC.

A sample program to ADC is provided, flash the **'mX-LPC1114_adc.bin'** file onto mX-LPC1114-S and RESET, vary the pot R14 on the mX-BaseBoard . The change in value is displayed on the LCD.

PS/2

PORTS used → PORT2 for PS2-DATA and PS2-CLK.

PINS used → PIO3_4 and PIO3_5.

Schematic net name → PS2-DATA and PS2-CLK.

A sample program to PS/2 is provided, flash the **'mX-LPC1114_ps2.bin'** file onto mX-LPC1114-S and RESET, connect a PS/2 keyboard to mX-BaseBoard. Type the keys on the keyboard and the corresponding characters are displayed on the LCD.
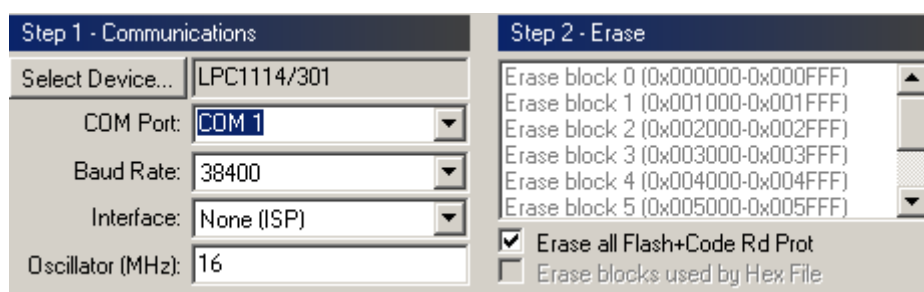
ISP Programming

On the mX BaseBoard press and hold the ISP switch (SW5), then press and release reset switch (SW4), then release ISP switch (SW5). This put the micro-controller in ISP programming mode. Using flash magic flash the device. Refer below for settings in screen shots.
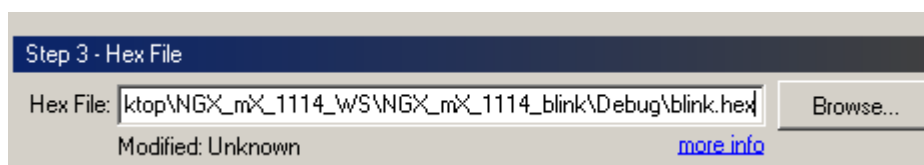
Start the Flash Magic tool.
Step 1: As in the screen shot select the device as "LPC 1114/301". Select the com port to which the device is connected. Here it is "COM 1". Set the baud rate to "38400". Interface to "None (ISP)". Set Oscillator MHz to "16".
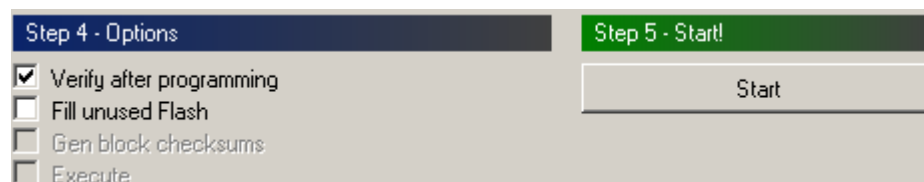Step 2: Tick mark "Erase all Flash+Code Rd Prot"

Step 3: Select the path for the .hex file. Download ***mX-LPC1114_blinky.zip***
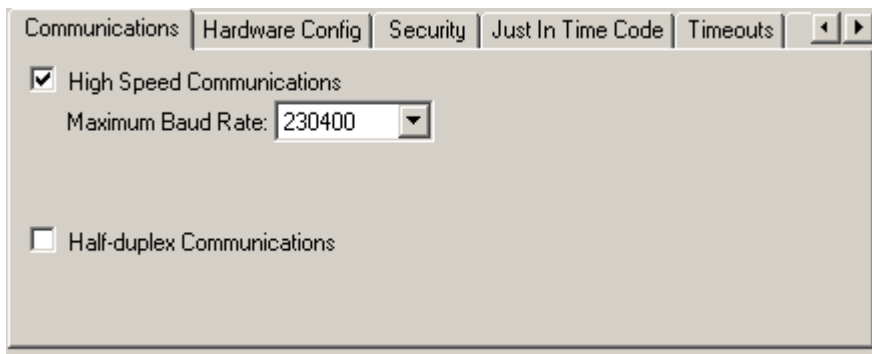

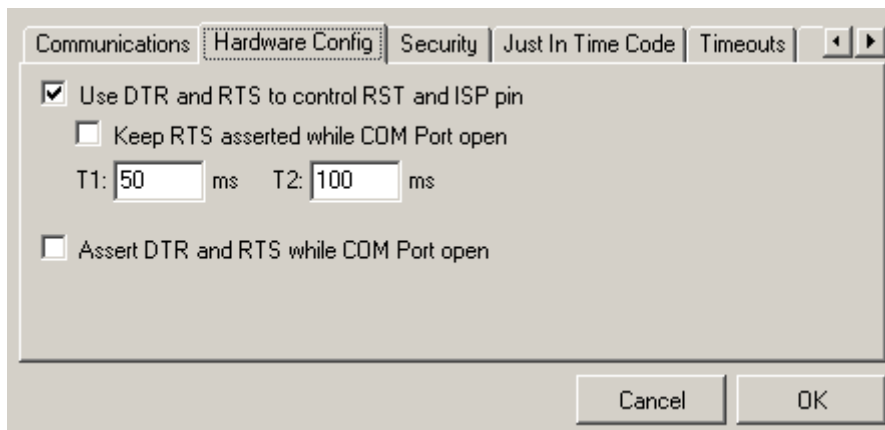Step 4: Tick mark "Verify after programming"

Before starting to program in the Options → Communications tab

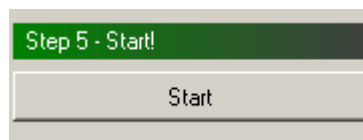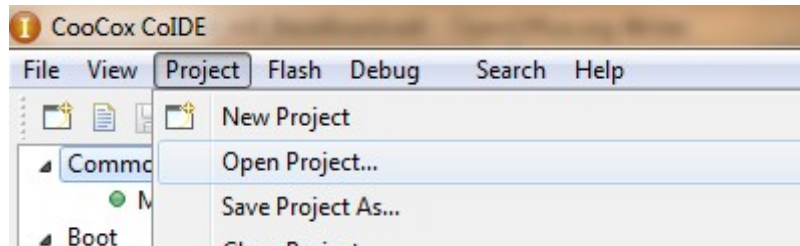Tick mark "High Speed Communications"

Options → Hardware config

Tick mark "Use DTR and RTS to control RST and ISP pin".

Step 5: After this start the programming.

Compiling the Workspace

Download the workspace from *__here__* *and* unzip it. Start the CoIDE and Click Project to open a directory path where the work space is unzipped and open a blinky workspace.

In CoIDE click on the build(or press F7) to build the project.
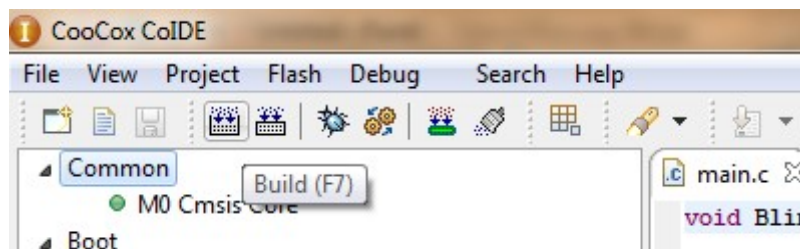
After building the project initiate debug to download the program to the target. Press F5 to run the program execution. This blinks the D2 on mX-LPC1114-S board.
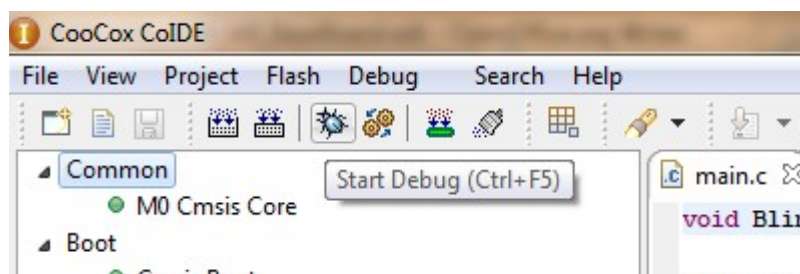
Schematics

mX BaseBoard

mX-LPC1114-S

Appendix

Project .bin files	Ports Used	Pins Used	Remarks
mX-PC1114_blinky.bin	PORT0	PIO0_7	LED (D2) should start blinking on mX-LPC1114-S.

Information

Revision History

*version: v*1.0 *author:* Nagaraj. M. Baddi

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