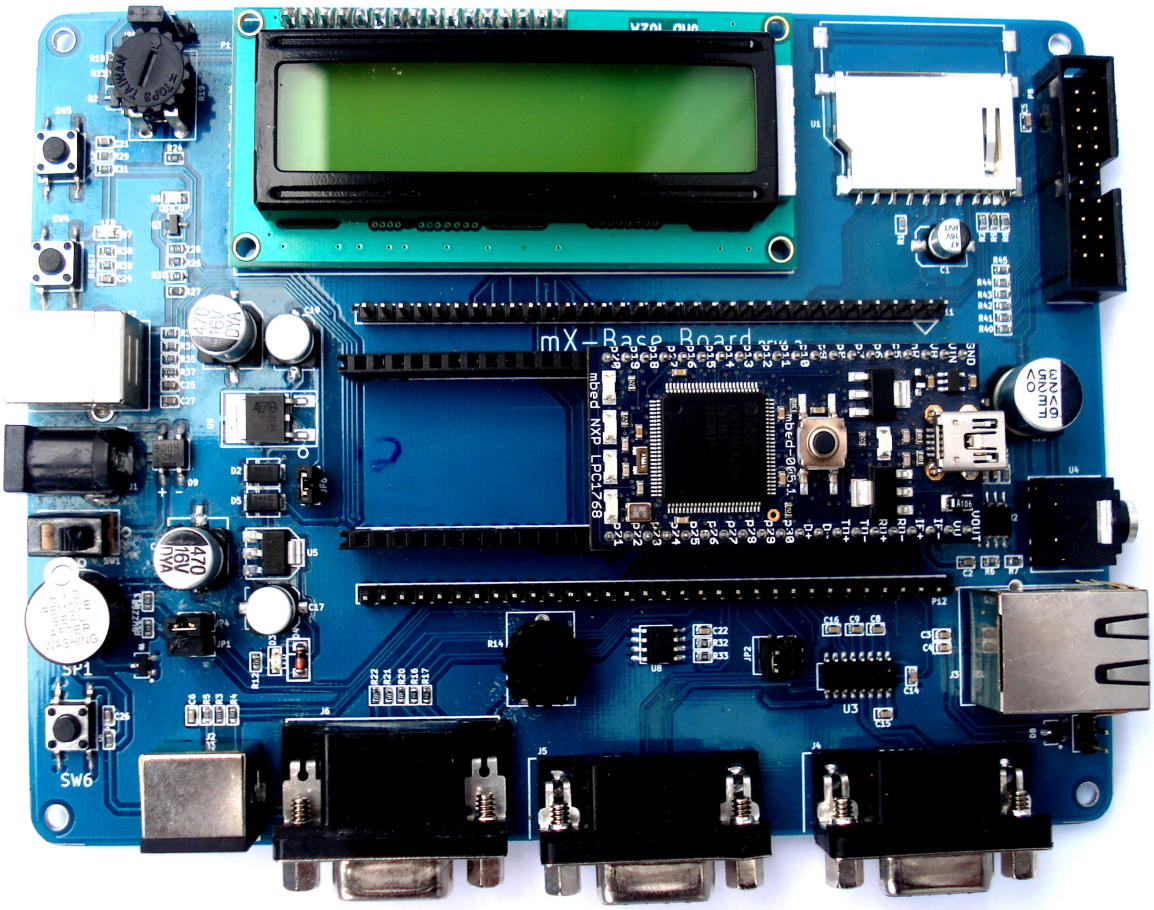
mX-BaseBoard with mbed



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 mbed board. The mbed board is a stamp for LPC 1768. 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

- Audio Jack
- Ethernet Connector
- 20 pin JTAG header

- PS/2
- VGA
- Serial Connector 0
- Serial Connector 1
- Preset for ADC
- On board EEPROM

Note: Features are dependent on the stamp.

Getting Started

Before starting you would need the following things handy and ready.

Requirement

The requirement is put in two sections.

Hardware

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

Software

- PC with Linux OS / Windows XP OS
- Use minicom as terminal software / HyperTerminal
- mbed binaries from NGX Technologies

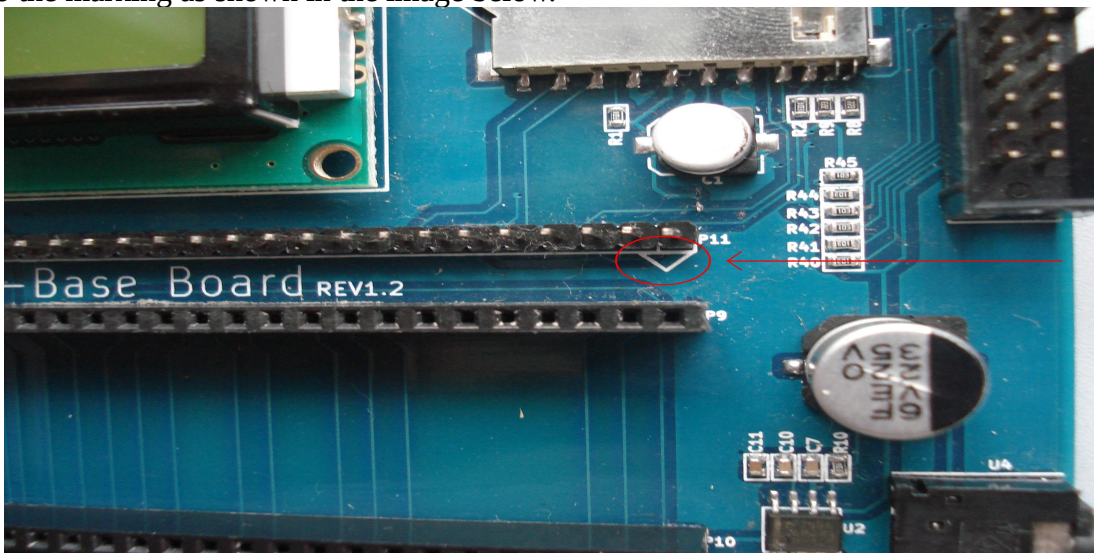
Setup

Mounting the mbed Board

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

Note: Improper mounting of the mbed board on mX-BaseBoard may damage the mbed board and / the mX-BaseBoard.

The GND pin on mbed board should be aligned with the pin 1 of P9 female header on BaseBoard. Refer to the marking as shown in the image below.



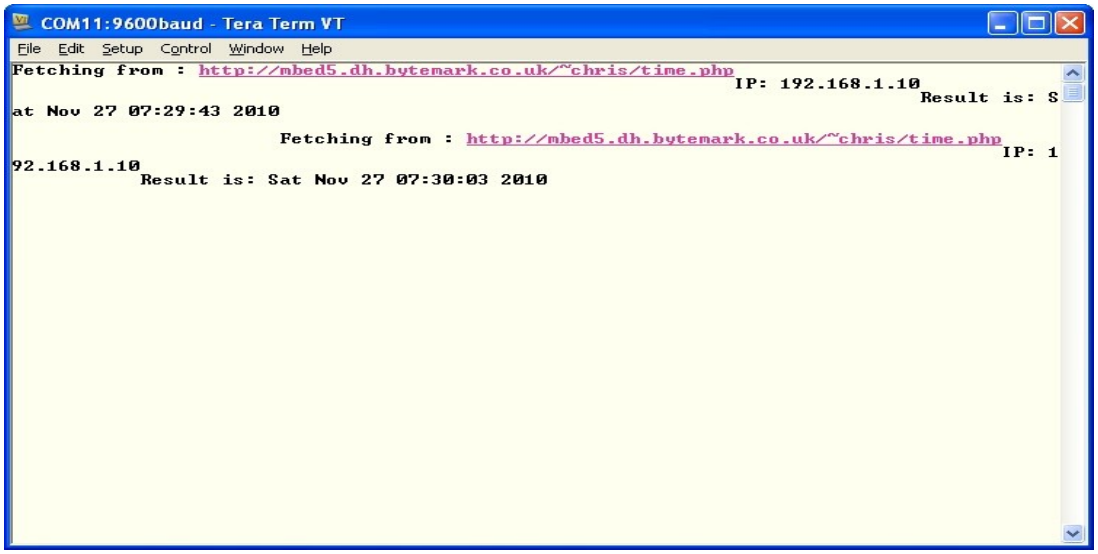
The mbed NXP LPC1768 board comes with a USB boot loader. Refer to the mbed device documentation for usage. Use the binaries from NGX Technologies to validate the mX-BaseBoard.

Validating the mX-BaseBoard

Download the binaries as .zip form *here*. For source code refer to README.txt in .zip file.

Ethernet

Copy the mX_Ethernet_LPC1768.bin to mbed board. Connect the Ethernet cable to the board and reset the board. (It is assumed you are connecting it to router with internet connection) The firmware will look for a particular site and display the time. See the screen-shot below.



Audio

Copy the mX_audio_LPC1768.bin to mbed board. For this you need a SD card with FAT file system and set up a terminal for the USB com port. Copy the file forest.wav (available in the directory with the binaries) to the SD card. Insert the SD card and reset the board. Connect speaker or headphones to hear sound.

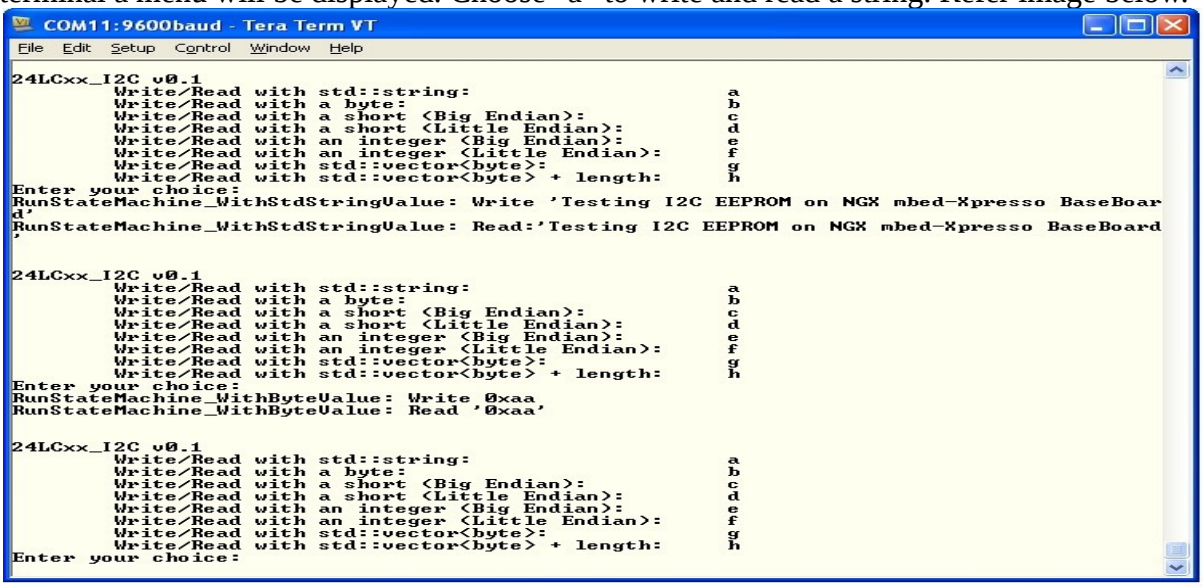
SD card

Copy the mX_SD_card_LPC1768.bin file to mbed board. For this test you need a SD card with FAT file system and set up a terminal for the USB com port. Insert SD card and reset the board. Once in the terminal you see “Hello World! Goodbye World! ”, remove the SD card and read its content. It should contain a file named sdtest.txt --> “Hello fun SD Card World!”. If the SD card is not there “Could not open file for write” will be displayed in the terminal.

I^2C

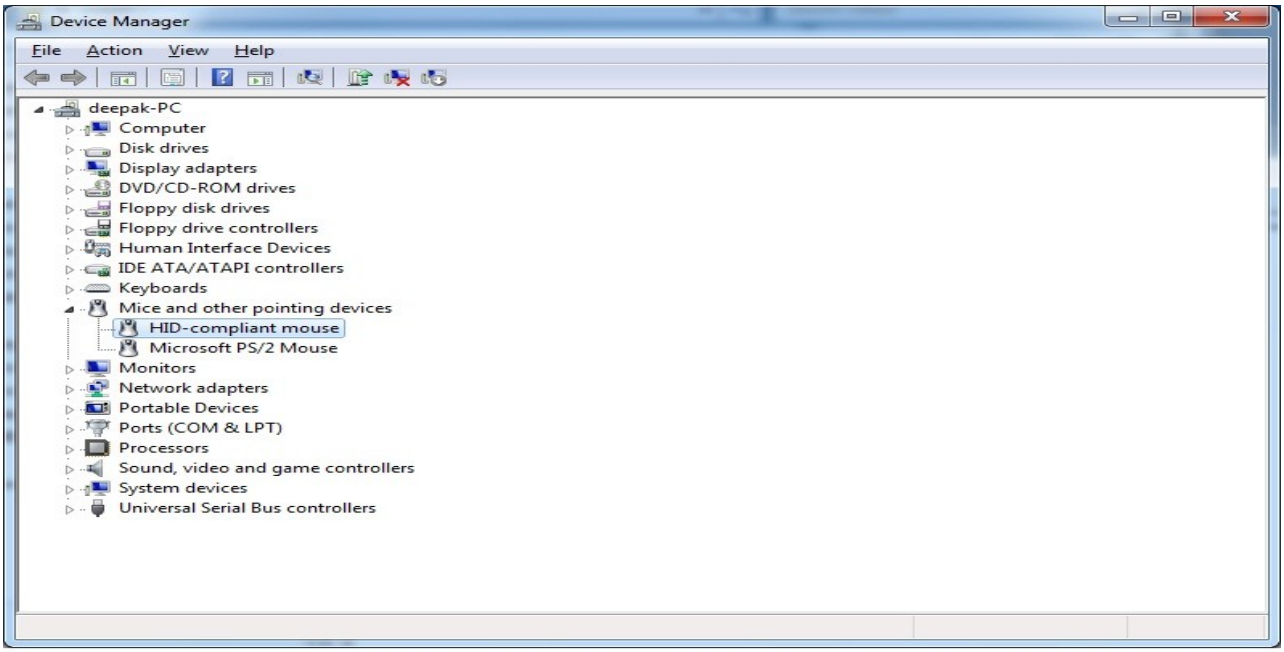
Copy the mX_I2C_24LCxx_LPC1768.bin to the mbed board and reset the board. In the

terminal a menu will be displayed. Choose “a” to write and read a string. Refer image below.



USB

Copy the mX_USB_HID_LPC1768.bin to the mbed board and reset the board. Connect a USB cable to connector J7 with PC. In the device manager in Windows it should be HID-compliant mouse detected.



UART0

Copy the mX_UART0_LPC1768.bin to the mbed board and reset the board. Connect the serial cable to J4 and PC serial port. Open a terminal and press 'a'. It will reply with “Hello World” .

If any other key is pressed it displays “Press 'a'”.

UART1

Copy the mX_UART1_LPC1768.bin to the mbed board and reset the board. Connect the serial cable to J5 and PC serial port. Open a terminal and press 'b'. It will reply with “Hello World” . If any other key is pressed it displays “Press 'b'”

Buzzer

Copy the mX_buzzer_LPC1768.bin file to mbed board and reset the board. A tone is heard on the buzzer. The jumper JP1 should be inserted.

Ext Int

Copy the mX_ext_int_LPC1768.bin file to mbed board and reset the board. The LED1 keeps blinking. When the button SW6 is pressed the LED 4 glows.

ADC

Copy the mX_ADC_LPC1768.bin file to mbed board and reset the board. Changing the preset R14 the LED 1, 2, 3 and 4 glow in increasing sequence.

LCD

Note: Using LCD some o the functions on the stamp (multiplexed pins) will not be available, namely CAN, I^2C and some pins of PWM.

For the LCD to work you need to make some connections using burg wires. Copy the mX_LCD_LPC1768.bin mbed board and reset the board. Refer to table below.

Stamp pins	LCD pins
p24	RS
p25	RW
p26	E
p27	D4
p28	D5
p29	D6
p30	D7

VGA

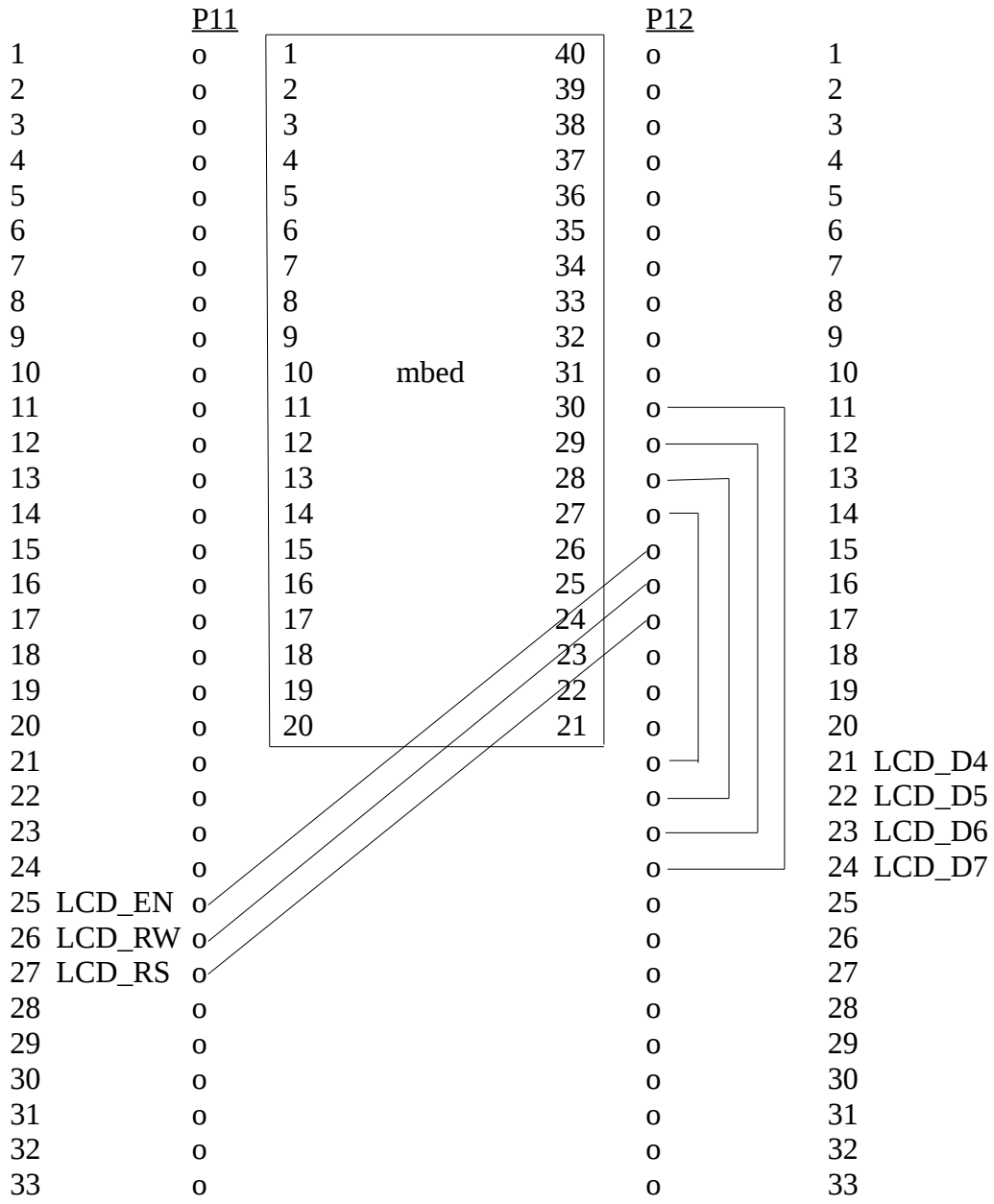
Work in progress

PS/2

Work in progress

Appendix

LCD Connection Diagram



Information

Revision History

*version: v*1.0 *author:* Milind Kakati

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