mbed application shield (/cookbook/mbed-application-shield)

The new application shield has been designed to enable the maximum number of potential experiments with Arduino form factor development boards, keeping as much in common with the mbed application board as possible.

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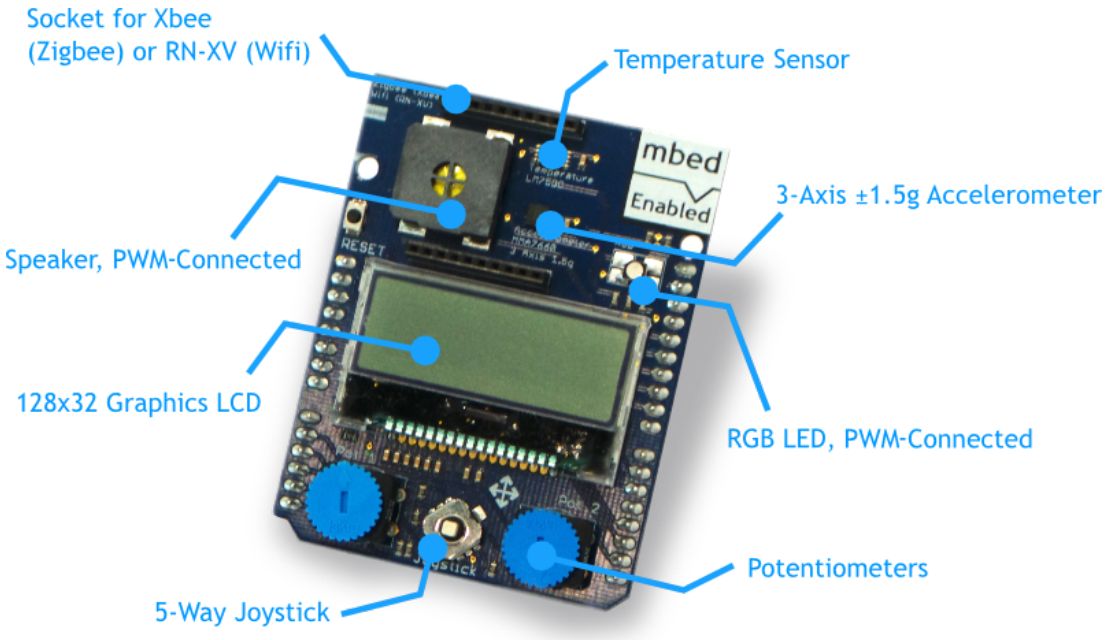

Although that there are 2x20 way headers for the mbed for jumper wiring pins off-board, it's a fairly well encapsulated platform.

Where to buy

Feature list

1. 128x32 Graphics LCD
2. 5 way joystick
3. 2 x Potentiometers
4. Speaker, PWM Conencted
5. 3 Axis +/1 1.5g Accelerometer
6. RGB LED, PWM connected
7. Temperature sensor
8. Socket for for Xbee (Zigbee) or RN-XV (Wifi)

1. 128x32 LCD

Recent changes (/cookbook/Special:

PID (/cookbook/PID)

LoRa (/cookbook/LoRa)

LoRaWAN (/search/?q=LoRaWAN&type=)

NTP Client (/cookbook/NTP-Client)

TMP102 Temperature Sensor (/cookbook/TMP102-Temperature-Sensor)

TMP102 (/search/?q=TMP102&type=)

SRF08 Ultrasonic Ranger (/cookbook/SRF08-Ultrasonic-Ranger)

distance (/search/?q=distance&type=)

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, SRF08 (/search/?q=SRF08&type=)

, ultrasonic (/search/?q=ultrasonic&type=)

ADXL345 Accelerometer (/cookbook/ADXL345-Accelerometer)

MMA7660 Accelerometer (/cookbook/MMA7660-Accelerometer)

accelerometer (/search/?q=accelerometer&type=)

, lab-board (/search/?q=lab-board&type=)

, MMA7660 (/search/?q=MMA7660&type=)

An example program to print text and variables to the LCD

Import program (https://os.mbed.com/compiler/#import:/users/chris/code/app-shield-LCD/)

(/users/chris/code/app-shield-LCD/docs/tip/main_8cpp_source.html) (/users/chris/code/app-shield-LCD/docs/tip/main_8cpp_source.html)app-shield-LCD - main.cpp (/users/chris/code/app-shield-LCD/docs/f8ef5e45e488/main_8cpp_source.html)

```
#include "mbed.h"
#include "C12832.h"

// Using Arduino pin notation
C12832 lcd(D11, D13, D12, D7, D10);

int main()
{
    int j=0;
    lcd.cls();
    lcd.locate(0,3);
    lcd.printf("mbed application shield!");

    while(true) {   // this is the third thread
        lcd.locate(0,15);
        lcd.printf("Counting : %d",j);
        j++;
        wait(1.0);
    }
}
```

C12832 **Import library (https://os.mbed.com/compiler/#import:/users/chris/code/C12832/;mode:lib)**

(/users/chris/code/C12832/)

C12832 LCD with generic interface

Last commit 05 Feb 2014 (05 Feb 2014) by (/users/chris/) Chris Styles (/users/chris/)

2. Joystick

An example program for the mbed application board that uses the joystick button. RGB LEDs light in sequence with up, down, left, right, and pushing the button lights them all (as a 80's computer gamer, I want to call this "fire!")

Import program (https://os.mbed.com/compiler/#import:/users/chris/code/app-shield-joystick/)

(/users/chris/code/app-shield-joystick/docs/tip/main_8cpp_source.html) (/users/chris/code/app-shield-joystick/docs/tip/main_8cpp_source.html)app-shield-joystick - main.cpp (/users/chris/code/app-shield-joystick/docs/ff19aac2a59c/main_8cpp_source.html)

```
#include "mbed.h"

DigitalOut red_led(D5);
DigitalOut blue_led(D8);
DigitalOut green_led(D9);

DigitalIn up(A2);
DigitalIn down(A3);
DigitalIn left(A4);
AnalogIn right(A5);
DigitalIn fire(D4);


int main()
{

    while (1) {
        red_led =  !up && ! fire;
        blue_led = !down;
        green_led= !left && !right;
    }
}

```

3. 2 x Potentiometers

Example that prints the pot values onto the LCD screen

Import program (https://os.mbed.com/compiler/#import:/users/chris/code/apps-shield-pots/)

(/users/chris/code/apps-shield-pots/docs/tip/main_8cpp_source.html) (/users/chris/code/apps-

Documenting a Library (/cookbook/Documenting-a-Library)

documentation (/search/?q=documentation&type=), doxygen (/search/?q=doxygen&type=), libraries (/search/?q=libraries&type=), wiki (/search/?q=wiki&type=)

Ethernet RJ45 (/cookbook/Ethernet-RJ45)

deadmbed (/cookbook/deadmbed)

broken (/search/?q=broken&type=), deadmbed (/search/?q=deadmbed&type=)

Student Projects (/cookbook/Student-Projects)

design projects (/search/?q=design projects&type=), mbed (/search/?q=mbed&type=), projects (/search/?q=projects&type=), student (/search/?q=student&type=)

shield-pots/docs/tip/main_8cpp_source.html)apps-shield-pots - main.cpp (/users/chris/code/apps-shield-pots/docs/f0eb984c583d/main_8cpp_source.html)

```
#include "mbed.h"
#include "C12832.h"

C12832 lcd(D11, D13, D12, D7, D10);

AnalogIn pot1 (A0);
AnalogIn pot2 (A1);

int main()
{
    while(1) {
        lcd.cls();
        lcd.locate(0,3);
        lcd.printf("Pot 1 = %.2f", (float)pot1);
        lcd.locate(0,14);
        lcd.printf("Pot 2 = %.2f", (float)pot2);
        wait(0.1);
    }
}
```

4. Speaker

A frequency sweep. Press the fire button to to play it again!

Import program (https://os.mbed.com/compiler/#import:/users/chris/code/app-shield-speaker/)

(/users/chris/code/app-shield-speaker/docs/tip/main_8cpp_source.html) (/users/chris/code/app-shield-speaker/docs/tip/main_8cpp_source.html)app-shield-speaker - main.cpp (/users/chris/code/app-shield-speaker/docs/b141db62c34a/main_8cpp_source.html)

```
#include "mbed.h"

DigitalIn fire(D4);
PwmOut spkr(D6);

int main()
{
    while (1) {
        for (float i=2000.0; i<10000.0; i+=100) {
            spkr.period(1.0/i);
            spkr=0.5;
            wait(0.02);
        }
        spkr=0.0;
        while(!fire) {}
    }
}
```

5. 3 Axis Accelerometer

app-shield-accelerometer (/users/chris/code/app-shield-accelerometer/)

Import program (https://os.mbed.com/compiler/#import:/users/chris/code/app-shield-accelerometer/)

Test program for the accelerometer on the app shield

Last commit 08 Jun 2016 (08 Jun 2016) by (/users/chris/) Chris Styles (/users/chris/)

MMA7660 (/users/Sissors/code/MMA7660/)

Import library (https://os.mbed.com/compiler/#import:/users/Sissors/code/MMA7660/;mode:lib)

Library for the MMA7660 triple axis accelerometer

Last commit 13 May 2014 (13 May 2014) by (/users/Sissors/) Erik Olieman (/users/Sissors/)

6. RGB LED

An example program that cycles the on board RGB LED through various colours.

Information

The RGB LED is common anode, so that "0" is on, and "1" is off. For PWM, the closer to 0.0 the brighter, the closer to 1.0 the dimmer. use (1.0 - value) to invert.

Import program (https://os.mbed.com/compiler/#import:/users/chris/code/app-shield-RGB/)

(/users/chris/code/app-shield-RGB/docs/tip/main_8cpp_source.html) (/users/chris/code/app-shield-RGB/docs/tip/main_8cpp_source.html)app-shield-RGB - main.cpp (/users/chris/code/app-shield-RGB/docs/78710087f088/main_8cpp_source.html)

```
#include "mbed.h"

PwmOut r (D5);
PwmOut g (D8);
PwmOut b (D9);

int main()
{
    r.period(0.001);
    while(1) {
        for(float i = 0.0; i < 1.0 ; i += 0.001) {
            float p = 3 * i;
            r = 1.0 - ((p < 1.0) ? 1.0 - p : (p > 2.0) ? p - 2.0 : 0.0);
            g = 1.0 - ((p < 1.0) ? p : (p > 2.0) ? 0.0 : 2.0 - p);
            b = 1.0 - ((p < 1.0) ? 0.0 : (p > 2.0) ? 3.0 - p : p - 1.0);  ;
            wait (0.01);
        }
    }
}
```

7. LM75B Temperature sensor

An example program to read the current temperature from the LM75B and display it on the LCD

app-shield-LM75B (/users/chris/code/app-shield-LM75B//docs/tip/main_8cpp_source.html) **Import program (https://os.mbed.com/compiler/#import:/users/chris/code/app-shield-LM75B/)**

No documentation found.

LM75B (/users/chris/code/LM75B/) **Import library (https://os.mbed.com/compiler/#import:/users/chris/code/LM75B/;mode:lib)**

A simply library for the LM75B I2C temperature sensor

Last commit 26 Oct 2012 (26 Oct 2012) by  (/users/chris/) Chris Styles (/users/chris/)

8. Xbee socket

Needs some work doing!

Details

Form factor	55mm x 86mm x 19mm (with mbed)
128x32 Graphics LCD, SPI Interface	Newhaven C12332A1Z (http://www.newhavendisplay.com/specs/NHD-C12832A1Z-FSW-FBW-3V3.pdf) MOSI:p5 nRESET:p6 SCK:p7 A0:p8
3 Axis +/1 1.5g Accelerometer,I2C Interface	Freescale MMA7660 (http://cache.freescale.com/files/sensors/doc/data_sheet/MMA7660FC.pdf) SCL:p27 SDA:p28 Address:0x98
Temperature sensor	LM75B (http://www.nxp.com/documents/data_sheet/LM75B.pdf) SCL:p27

	SDA:p28 Address:0x90
5 way Joystick	ALPS (http://www.alps.com/WebObjects/catalog.woa/E/HTML/MultiControl/Switch/SKRH/SKRHADE010.html) SKRHADE010 Down:p12 Left:p13 Centre:p14 Up:p15 Right:p16
2 x Potentiometers	Iskra PNZ10ZA, 10k Pot 1 (left) :p19 Pot 2 (right):p20
RGB LED, PWM connected	Cree Inc CLV1A-FKB (http://www.cree.com/~/media/Files/Cree/LED%20Components%20and%20Modules/HB/Data%20Sheets/CLV1AFKB(874).pdf) Red:p23 Green:p24 Blue:p25
Speaker, PWM Connected	MULTICOMP MCSMT-8030B-3717 (http://uk.farnell.com/multicomp/mcsmt-8030b-3717/magnetic-buzzer-transducer/dp/1801082) p26

Schematics

- mbed-016.1.pdf (/media/uploads/MACRUM/mbed-016.1.pdf)