LCD Keypad Shield (DFR0009)

D-Robotics UK (www.droboticsonline.com)

This is a very popular LCD Keypad shield for Arduino or Freeduino board

D-Robotics
6/25/2011

LCD Keypad Shield

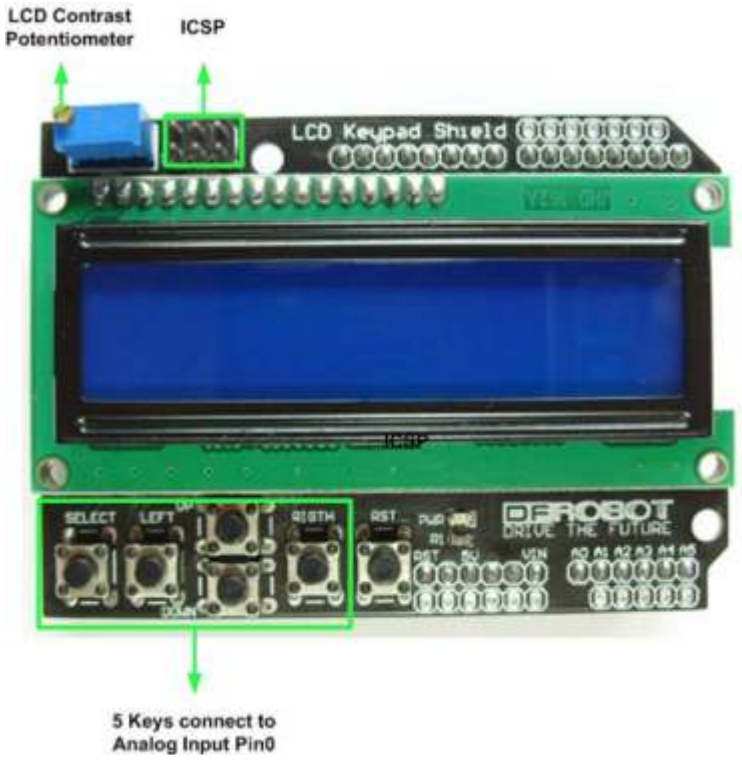
1. Introduction

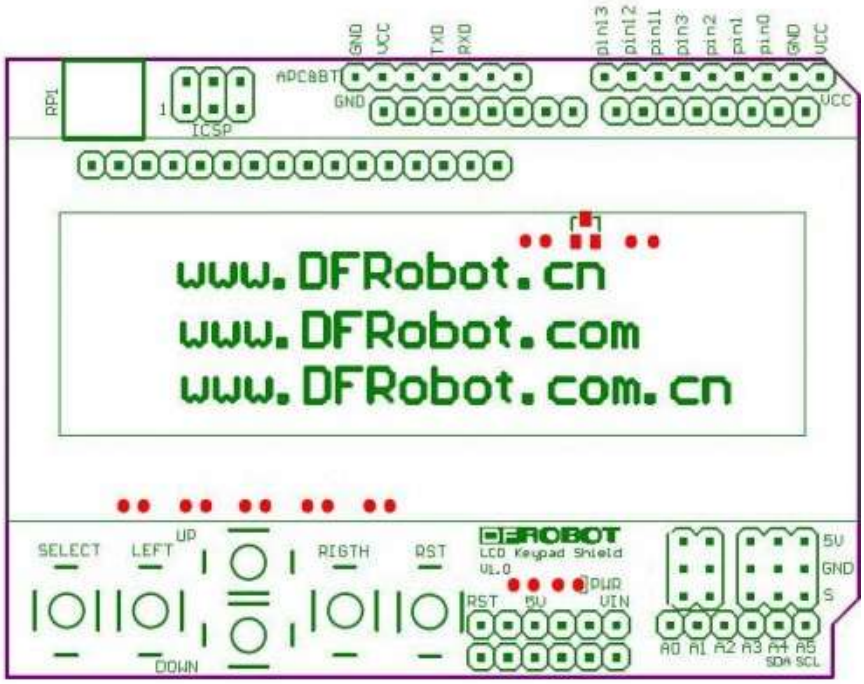
This DFRobot LCD Keypad Shield a very popular shield for Arduino or Freeduino board. The *LCD Keypad shield* is developed for Arduino compatible boards, to provide a user-friendly interface that allows users to go through the menu, make selections etc. It consists of a 1602 white character blue backlight LCD. The keypad consists of 5 keys — select, up, right, down and left. To save the digital IO pins, the keypad interface uses only one ADC channel. The key value is read through a 5 stage voltage divider.

2. Specifications

- Operating Voltage:5V
- 6 Push buttons
- Expanded Analog Pinout with standard DFRobot configuration.

3. Diagram





4. Pin Allocations

Pin	Function
Analog 0	Button (Select Up, Right, Down and Left)
Digital 4	DB4
Digital 5	DB5
Digital 6	DB6
Digital 7	DB7
Digital 8	RS (Data or Signal Display Selection)
Digital 9	Enable
Digital 10	Backlit Control

5. Sample Code

5.1 Example use of LCD4Bit_mod library

Download Link: http://droboticsonline.com/ebaydownloads/LCD4Bit_mod.zip

```
1  //
2  #include <LCD4Bit_mod.h>
3  //create object to control an LCD.
4  //number of lines in display=1
5  LCD4Bit_mod lcd = LCD4Bit_mod(2);
6  //Key message
7  char msgs[5][15] = {"Right Key OK ",
8                      "Up Key OK    ",
9                      "Down Key OK  ",
10                     "Left Key OK  ",
11                     "Select Key OK" };
12 int  adc_key_val[5] ={30, 150, 360, 535, 760 };
13 int NUM_KEYS = 5;
14 int adc_key_in;
15 int key=-1;
16 int oldkey=-1;
17 void setup() {
18   pinMode(13, OUTPUT);  //we'll use the debug LED to output a heartbeat
19
20   lcd.init();
21   //optionally, now set up our application-specific display settings, overriding whatever the lcd did in lcd.init()
22   //lcd.commandWrite(0x0F);//cursor on, display on, blink on.  (nasty!)
23    lcd.clear();
24   lcd.printIn("KEYPAD testing... pressing");
25 }
26 void loop()
27 {
28 adc_key_in = analogRead(0);    // read the value from the sensor
```

```
digitalWrite(13, HIGH);
key = get_key(adc_key_in);    // convert into key press
   if (key != oldkey) // if keypress is detected
   {
   delay(50);     // wait for debounce time
   adc_key_in = analogRead(0);    // read the value from the sensor
   key = get_key(adc_key_in);    // convert into key press
   if (key != oldkey)
   {
     oldkey = key;
     if (key >=0){
     lcd.cursorTo(2, 0);  //line=2, x=0
   lcd.printIn(msgs[key]);
     }
   }
 }
  digitalWrite(13, LOW);
}
// Convert ADC value to key number
int get_key(unsigned int input)
{   int k;
   for (k = 0; k < NUM_KEYS; k++)
   {
      if (input < adc_key_val[k])
      {  return k;  }
   }
   if (k >= NUM_KEYS)
      k = -1;     // No valid key pressed
   return k;
}
```

5.2 Example use of LiquidCrystal library

```
//Sample using LiquidCrystal library
#include <LiquidCrystal.h>

/*********************************************************

This program will test the LCD panel and the buttons
Mark Bramwell, July 2010

*********************************************************/

// select the pins used on the LCD panel
LiquidCrystal lcd(8, 9, 4, 5, 6, 7);
```

```
13
14  // define some values used by the panel and buttons
15  int lcd_key     = 0;
16  int adc_key_in  = 0;
17  #define btnRIGHT  0
18  #define btnUP     1
19  #define btnDOWN   2
20  #define btnLEFT   3
21  #define btnSELECT 4
22  #define btnNONE   5
23
24  // read the buttons
25  int read_LCD_buttons()
26  {
27   adc_key_in = analogRead(0);      // read the value from the sensor
28   // my buttons when read are centered at these valies: 0, 144, 329, 504, 741
29   // we add approx 50 to those values and check to see if we are close
30   if (adc_key_in > 1000) return btnNONE; // We make this the 1st option for speed reasons since it will be the
     most likely result
31   if (adc_key_in < 50)   return btnRIGHT;
32   if (adc_key_in < 195)  return btnUP;
33   if (adc_key_in < 380)  return btnDOWN;
34   if (adc_key_in < 555)  return btnLEFT;
35   if (adc_key_in < 790)  return btnSELECT;
36   return btnNONE;  // when all others fail, return this...
37  }
38
39  void setup()
40  {
41   lcd.begin(16, 2);            // start the library
42   lcd.setCursor(0,0);
43   lcd.print("Push the buttons"); // print a simple message
44  }
45
46  void loop()
47  {
48   lcd.setCursor(9,1);           // move cursor to second line "1" and 9 spaces over
49   lcd.print(millis()/1000);      // display seconds elapsed since power-up
50
51
52   lcd.setCursor(0,1);           // move to the begining of the second line
53   lcd_key = read_LCD_buttons();  // read the buttons
54
55   switch (lcd_key)              // depending on which button was pushed, we perform an action
56   {
57     case btnRIGHT:
58       {
59       lcd.print("RIGHT ");
```

```
60      break;
61      }
62    case btnLEFT:
63      {
64      lcd.print("LEFT   ");
65      break;
66      }
67    case btnUP:
68      {
69      lcd.print("UP    ");
70      break;
71      }
72    case btnDOWN:
73      {
74      lcd.print("DOWN  ");
75      break;
76      }
77    case btnSELECT:
78      {
79      lcd.print("SELECT");
80      break;
81      }
82      case btnNONE:
83      {
84      lcd.print("NONE  ");
85      break;
86      }
87   }
88
89  }
```

5.3 Example use of Enhanced LiquidCrystal_I2C library

This library inherits LiquidCrystal and adds another method: button - to read button pushed on a keypad.

Library download Link: http:/droboticsonline.com/ebaydownloads/LCDKeypad_by_Fj604.zip

Discussion about this library: http://www.dfrobot.com/forum/index.php?topic=31.0

Declaim:

This manual is provided by the manufacturerl. Although the due care has been taken during the translation, D-Robotics is not responsible for the accuracy of the information contained in this document. D-Robotics: www.droboticsonline.com; Email contact: d_robotics@hotmail.co.uk