



# LCD Keypad Shield (DFR0009)

D-Robotics UK ([www.droboticsonline.com](http://www.droboticsonline.com))

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

**D-Robotics**  
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# LCD Keypad Shield

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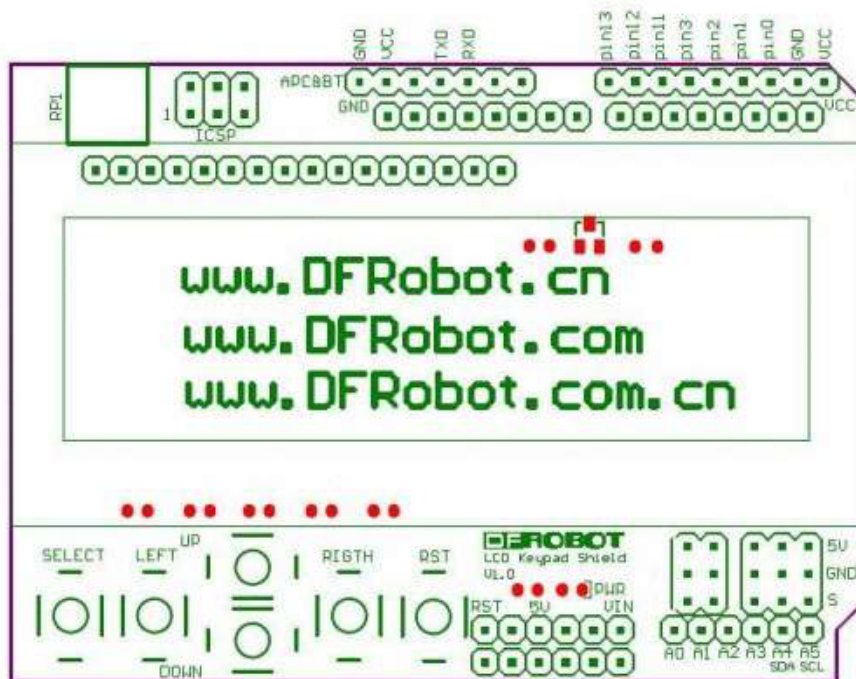
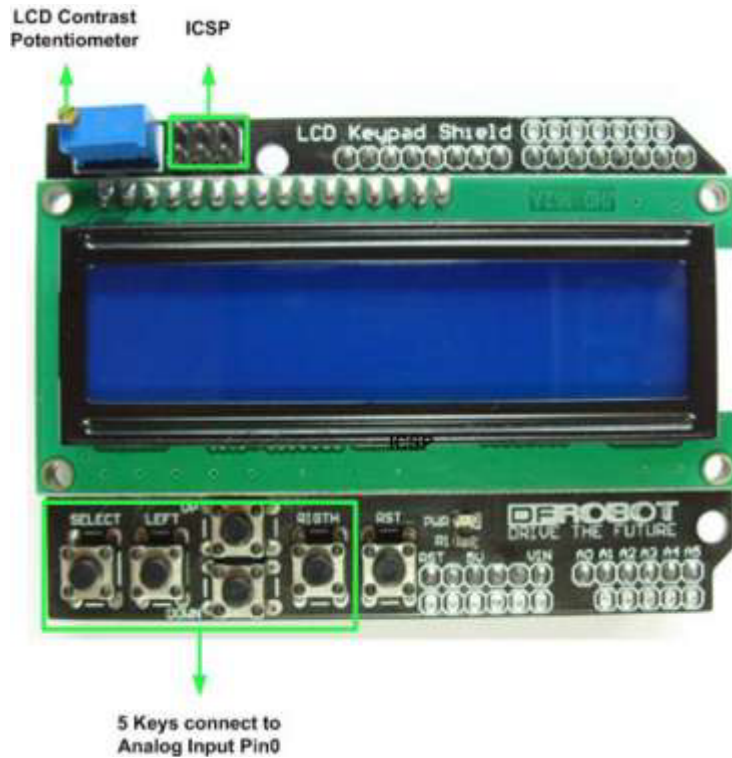
## 1. Introduction

This DFRobot LCD Keypad Shield is 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
<b>Analog 0</b>	Button (Select Up, Right, Down and Left)
<b>Digital 4</b>	DB4
<b>Digital 5</b>	DB5
<b>Digital 6</b>	DB6
<b>Digital 7</b>	DB7
<b>Digital 8</b>	RS (Data or Signal Display Selection)
<b>Digital 9</b>	Enable
<b>Digital 10</b>	Backlit Control

## 5. Sample Code

### 5.1 Example use of LCD4Bit\_mod library

Download Link: [http://droboticsonline.com/ebaydownloads/LCD4Bit\\_mod.zip](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.println("KEYPAD testing... pressing");
25 }
26 void loop()
27 {
28   adc_key_in = analogRead(0); // read the value from the sensor
```

```

29 digitalWrite(13, HIGH);
30 key = get_key(adc_key_in); // convert into key press
31 if (key != oldkey) // if keypress is detected
32 {
33     delay(50); // wait for debounce time
34     adc_key_in = analogRead(0); // read the value from the sensor
35     key = get_key(adc_key_in); // convert into key press
36     if (key != oldkey)
37     {
38         oldkey = key;
39         if (key >= 0){
40             lcd.cursorTo(2, 0); //line=2, x=0
41             lcd.println(msgs[key]);
42         }
43     }
44 }
45 digitalWrite(13, LOW);
46 }
47 // Convert ADC value to key number
48 int get_key(unsigned int input)
49 { int k;
50   for (k = 0; k < NUM_KEYS; k++)
51   {
52       if (input < adc_key_val[k])
53       { return k; }
54   }
55   if (k >= NUM_KEYS)
56       k = -1; // No valid key pressed
57   return k;
58 }

```

## 5.2 Example use of LiquidCrystal library

```

1 //Sample using LiquidCrystal library
2 #include <LiquidCrystal.h>
3
4 /*****
5
6 This program will test the LCD panel and the buttons
7 Mark Bramwell, July 2010
8
9 *****/
10
11 // select the pins used on the LCD panel
12 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](http://droboticsonline.com/ebaydownloads/LCDKeypad_by_Fj604.zip)

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

#### Declaim:

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