艾鍗 Raspberry Pi I/O Shield v3.0 子板規格

- Power
  - Power LED (藍光)
  - 5v,3.3v 均加入保險絲 Fuse
  - J15:電源座 (5V,GND)
- USB Console port (PL2303 Serial to USB)
- I2C bus
  - EEPROM (24LC16B) 0x50
  - G-Sensor (ST LIS3DH) 0x19
  - I2C 連接座 x4(3.3V,SDA,SCL,GND)
- SPI bus
  - AD ch1~ch8 連接座
    - Ch1 已接至 TH1 座，可直接插光敏電組測試
    - 使用 ADC 晶 MCP3008: 連接 CE0
  - 2.4G RF 模組連接座
    - nRF24L01 連接 CE1
  - SPI 連接座 x1: 連接 CE1
- PWM (for Servo Motor)
  - PWM 連接座 x2 (PWM,PWR,GND)
    - PWM0: GPIO18 (Pi's pin 12)
    - PWM1: GPIO19 (Pi's pin 35)
    - J12 Jumper 可決定 PWR 使用 Pi 的 5V 或外部電源
- DC Motor
  - DC Motor 連接座 x2 (PWM, PWR,GND)
  - 共用 PWM0 及 PWM1,並連接電晶體作為開關
- GPIO
  - Button x2
  - LED x5
  - Relay x1+ 3P 端子台
  - 2P DIP Switchx1
  - IR Transmitterx1
  - IR Receiverx1
  - Buzzer x1
  - GPIO 連接針角 2x4

簡易 C Sample Code (使用 BCM2835 library)

```
#include<bcm2835.h>
#include <stdio.h>
#define LED1  5
#define LED2  6
#define LED3  13
#define LED4  26
#define LED5 12
#define COM 22
#define RELAY 27
#define PWM0 18
#define PWM1 19
#define IR_TX 25
#define IR_RX 17
#define DIP1 20
#define DIP2 21
#define BUTTON1 24
#define BUTTON2 23
#define BUZZER 16

int main(int argc, char **argv)
{
  int i;
  int value1,value2,value3,value4;
    int led_array[]={LED2,LED4,LED3,LED5};
  int n=sizeof(led_array)/sizeof(led_array[0]);
    if (!bcm2835_init())
      return 1;

    // Set the p5in to be an output
       bcm2835_gpio_fsel(COM, BCM2835_GPIO_FSEL_OUTP);
       bcm2835_gpio_write(COM, HIGH);

        bcm2835_gpio_fsel(LED1, BCM2835_GPIO_FSEL_OUTP);
      bcm2835_gpio_fsel(BUZZER, BCM2835_GPIO_FSEL_OUTP);
       bcm2835_gpio_write(BUZZER, LOW);
```

```
        //DIP. button setup as input
       bcm2835_gpio_fsel(DIP1, BCM2835_GPIO_FSEL_INPT);
       bcm2835_gpio_fsel(DIP2, BCM2835_GPIO_FSEL_INPT);
       bcm2835_gpio_fsel(BUTTON1, BCM2835_GPIO_FSEL_INPT);
       bcm2835_gpio_fsel(BUTTON2, BCM2835_GPIO_FSEL_INPT);

      for (i=0;i<n;i++) {
       bcm2835_gpio_fsel(led_array[i], BCM2835_GPIO_FSEL_OUTP);
        bcm2835_gpio_write(led_array[i], LOW);
    }
    i=0;
    // Blink
    while (1)
    {

     value1= bcm2835_gpio_lev(DIP1);
      value2= bcm2835_gpio_lev(DIP2);
      value3= bcm2835_gpio_lev(BUTTON1);
      value4= bcm2835_gpio_lev(BUTTON2);
      printf("DIP1=%d,DIP2=%d,BUTTON1=%d,BUTTON2=%d\n",
value1,value2,value3,value4);



      // led blinking
      bcm2835_gpio_write(led_array[i], HIGH);
      bcm2835_delay(100);
      bcm2835_gpio_write(led_array[i], LOW);
    i=(i+1)%n;

           //check led1
      if (value1==0 && value2==0)
           bcm2835_gpio_write(LED1, HIGH);
       else
            bcm2835_gpio_write(LED1, LOW);

      //check buzzer
      if (value3==0 && value4==0)
           bcm2835_gpio_write(BUZZER, HIGH);
```

```
        else
             bcm2835_gpio_write(BUZZER, LOW);
       bcm2835_delay(100);
    }
    bcm2835_close();
    return 0;
}
```