

NXShield + Arduino + Bluetooth Remote control

利用BBS2 I2C介面收發藍芽訊號

NXShield-D

Bank A

Bank B

M1 NXT Motor

NXT Motor M1

M2 NXT Motor

NXT Motor M2

BAS1 Hardware I2C
Software I2C
Analog (except
NXTLight)

Software I2C
Analog

BBS1

BAS2 Software I2C
Analog

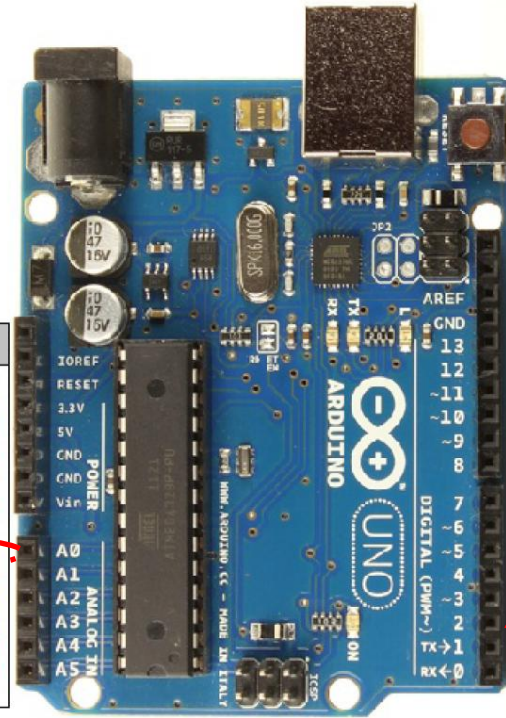
Software I2C
Analog

BBS2

Pin Usage

Available (shared) RESET
Available (shared) 3.3V
Available (shared) 5V
Available (shared) GND
Available (shared) GND
Available (shared) Vin

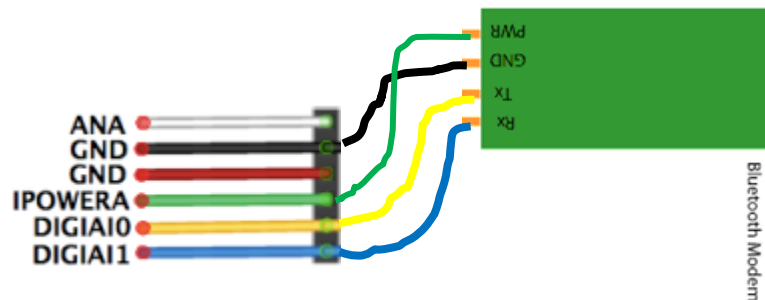
SDA_BAS2 A0
SDA_BBS1 A1
SDA_BBS2 A2
LED_GREEN, BTN_GO A3
SDA_BAS1 A4
SCL_BAS1 A5



Pin Usage

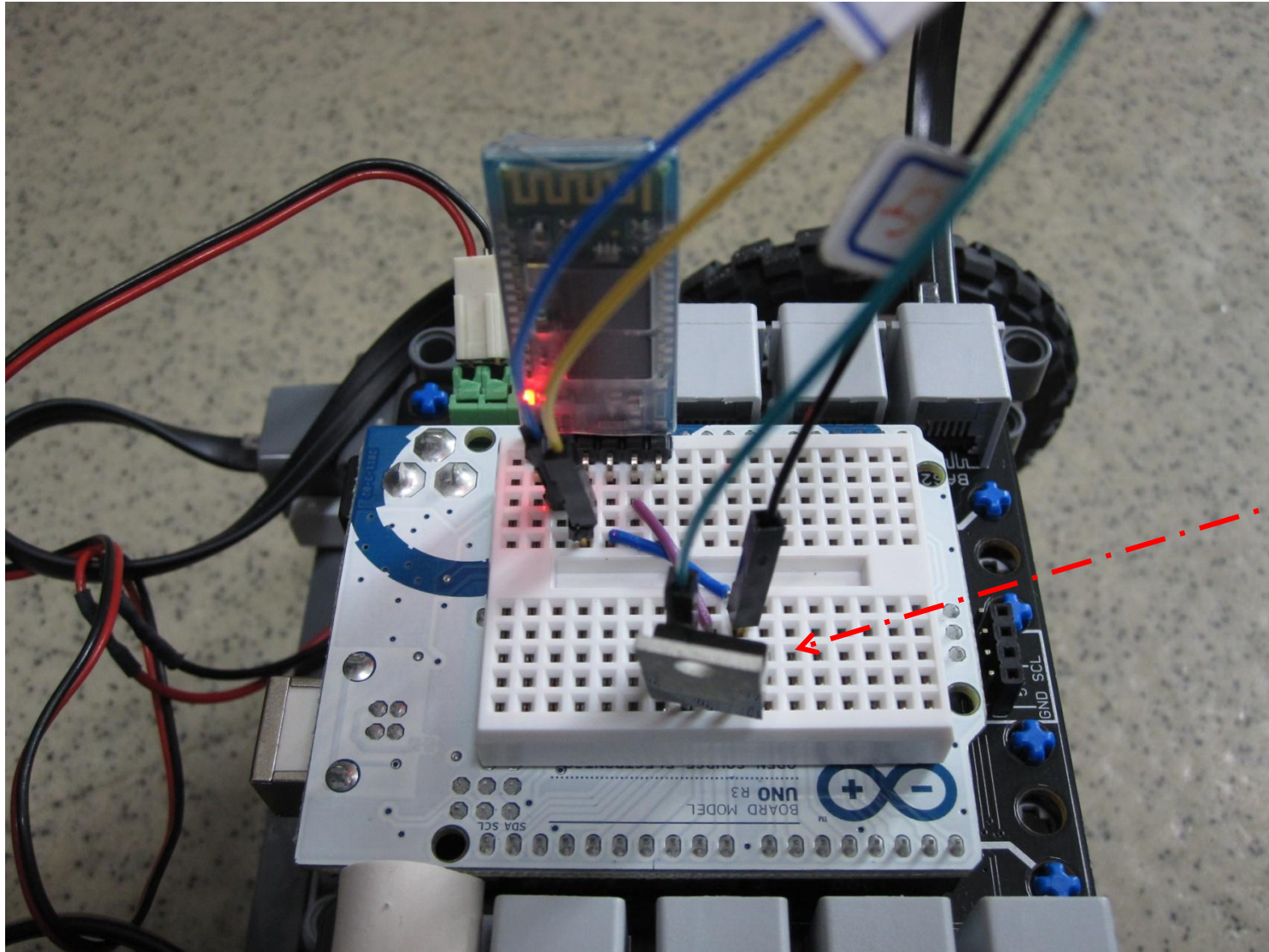
AREF Available(unconnected)
GND Available (shared)
13 Available(unconnected)
12 BTN_RIGHT, LED_BLUE
11 Routed to Surface
10 Routed to Surface
9 Routed to Surface
8 BTN_LEFT, LED_RED
7 SCL_BBS2
6 Routed to Surface
5 Routed to Surface
4 SCL_BBS1
3 Routed to Surface
2 SCL_BAS2
1 Available(unconnected)
0 Available(unconnected)

NXT訊號線 →



Bluetooth Module

在UNO背板貼上小塊麵包板，置放藍芽模組及接出的NXT訊號線



註：因為本藍芽模組吃3.3V，因此加上5V→3.3V整壓IC，若可直接吃5V就不需要。

Arduino 藍芽程式

```
This example code is in the public domain.  
*/  
#include <SoftwareSerial.h>  
#include <Wire.h>  
#include <NXShield.h>  
#define powera 50  
#define powerb 50  
  
NXShield    nxshield;  
  
SoftwareSerial I2CBT= SoftwareSerial(2, A0); //pin2 is RX, A0 is TX  
void setup() {  
  Serial.begin(9600);  
  I2CBT.begin(57600);  
  pinMode(A0, OUTPUT);  
  //pinMode(2, OUTPUT );  
  nxshield.init( SH_HardwareI2C );  
  // nxshield.init( SH_SoftwareI2C );  
  //  
  // Wait until user presses GO button to continue the program  
  //  
  Serial.println ("Press GO button to continue");  
  nxshield.waitForButtonPress(BTN_GO);  
}
```

使用軟體串列通訊(UART)

將Arduino 數位第2腳宣告為串列接收(RX)，
類比第0腳宣告為串列發射(TX)，此串列
通訊物件名為 I2CBT

配合藍芽模組baud rate設定，宣告軟體串列通訊baud rate

將類比輸入改為輸出屬性

Arduino 藍芽程式

```
void loop() {  
  //digitalWrite(2, HIGH);  
  byte cmm[20];  
  int insize;  
  while(1){  
    if ((insize=(I2CBT.available()))>0){  
      Serial.print("input size = ");  
      Serial.println(insize);  
      for (int i=0; i<insize; i++){  
        Serial.print(cmm[i]=char(I2CBT.read()));  
        Serial.println(" ");  
      }  
      switch (cmm[0]) {  
        case 102: //"f"  
          //Move Forward  
          Serial.println( "run unlimited Forward" );  
          nxshield.bank_a.motorRunUnlimited(SH_Motor_1, SH_Direction_Forward, powera);  
          nxshield.bank_b.motorRunUnlimited(SH_Motor_1, SH_Direction_Forward, powerb);  
          break;  
        case 98: //"b":  
          //Move Backward  
          Serial.println( "run unlimited Backward" );  
          nxshield.bank_a.motorRunUnlimited(SH_Motor_1, SH_Direction_Reverse, powera);  
          nxshield.bank_b.motorRunUnlimited(SH_Motor_1, SH_Direction_Reverse, powerb);  
          break;f  
      }  
    }  
  }  
}
```

判斷是否有資料經由藍芽模組傳入

將資料依序放入byte串列cmm

判斷由超級終端機送達之命令，f:前進，b:後退，l:左轉，r:右轉，其他鍵:停止

其他運用

- 若要將**NXShield**感測器資料傳出，只要用 **I2CBT.write(data);**指令即可。
- 另外**Arduino**也可藉由**NXT**訊號線，直接將外在訊號讀入，例如類比電壓，**RC Time**等。
- 其他透過**I2C**或**UART**介面的模組，例如**RFID**模組，也都可透過**NXT**訊號線加以控制及運用。
- 目前利用**PC+USB藍芽+超級終端機**送控制命令給**NXShield**→ **Arduino**
- 影片：<http://youtu.be/od3YqVtxA9I>

