

藍牙收發技術資料

電機科 2016/01/20

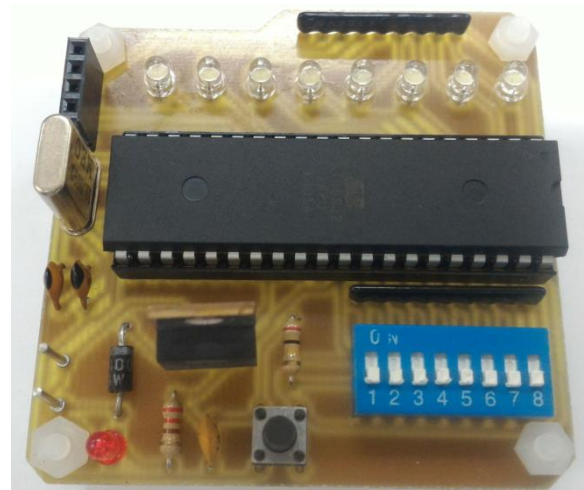
1. 電路功能【手機 APP(BTRT)與 89S51 藍牙通訊測試】

甲、手機端

- i. BT Device List: 選取藍牙裝置
- ii. 連線: 連線藍牙裝置
- iii. 終止連線: 終止連線藍牙裝置
- iv. 連線狀態: 顯示連線狀態及提示
- v. 傳送資料:
 - 1. 按鍵 0 ⇒ 8 個 LED 全滅、89S51 回傳"OFF"字串、手機收到資料顯示"OFF"
 - 2. 按鍵 1 ⇒ 8 個 LED 全亮、89S51 回傳"ON"字串、手機收到資料顯示"ON"
 - 3. 按鍵 2 ⇒ 單燈左移、89S51 回傳"LEFT"字串、手機收到資料顯示"LEFT"
 - 4. 按鍵 3 ⇒ 單燈右移、89S51 回傳"RIGHT"字串、手機收到資料顯示"RIGHT"
 - 5. 按鍵 4 ⇒ 8 燈閃爍 3 次、89S51 回傳"FLASH"字串、手機收到資料顯示"FLASH"
- vi. 收到資料: 顯示 89S51 透過藍牙傳送回來之資料
- vii. 指撥狀態: 顯示指撥開關(LED)之資料(二進制)
- viii. 指撥數值: 顯示指撥開關(LED)之資料(十進制)



手機 APP 畫面

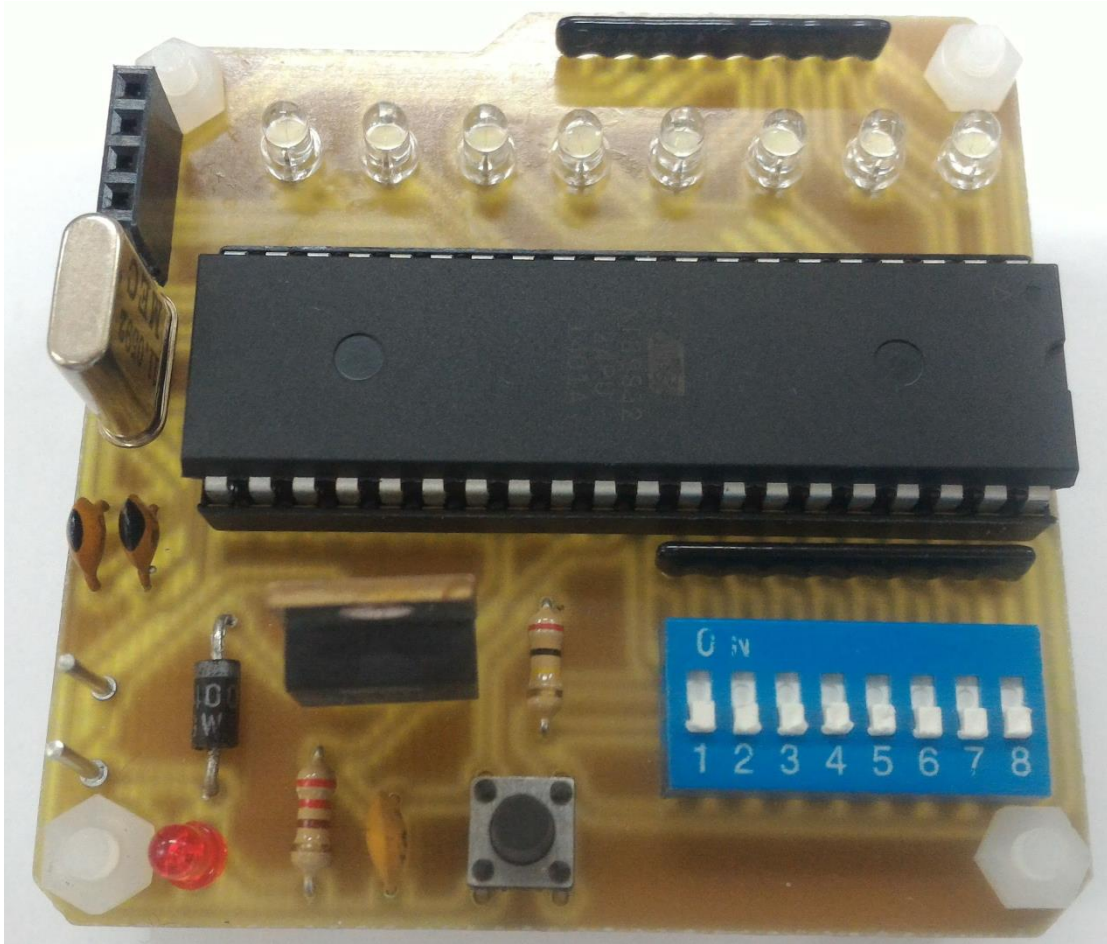


89S51 電路

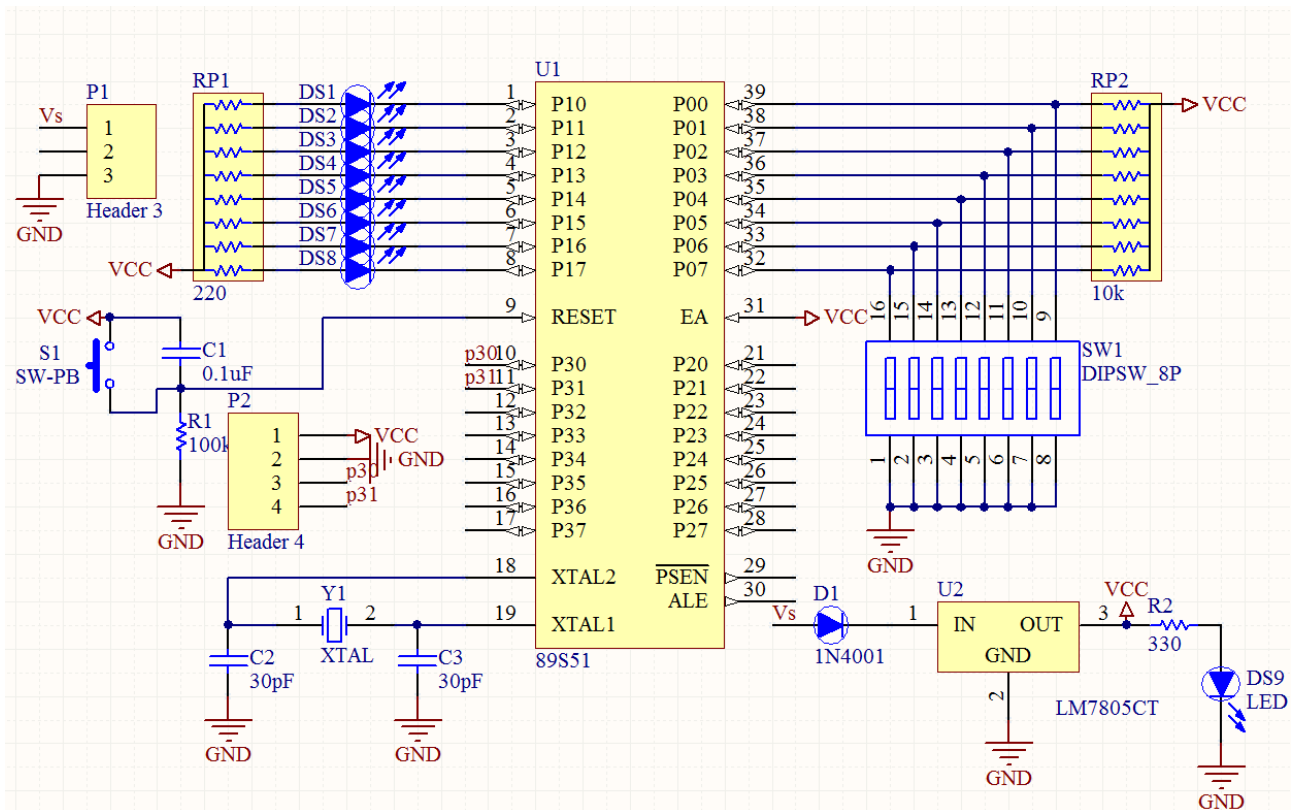
乙、電路端

- i. 指撥開關對應控制 LED
- ii. 指撥開關切換透過藍牙即時傳送資料至手機顯示(二進制與十進制)

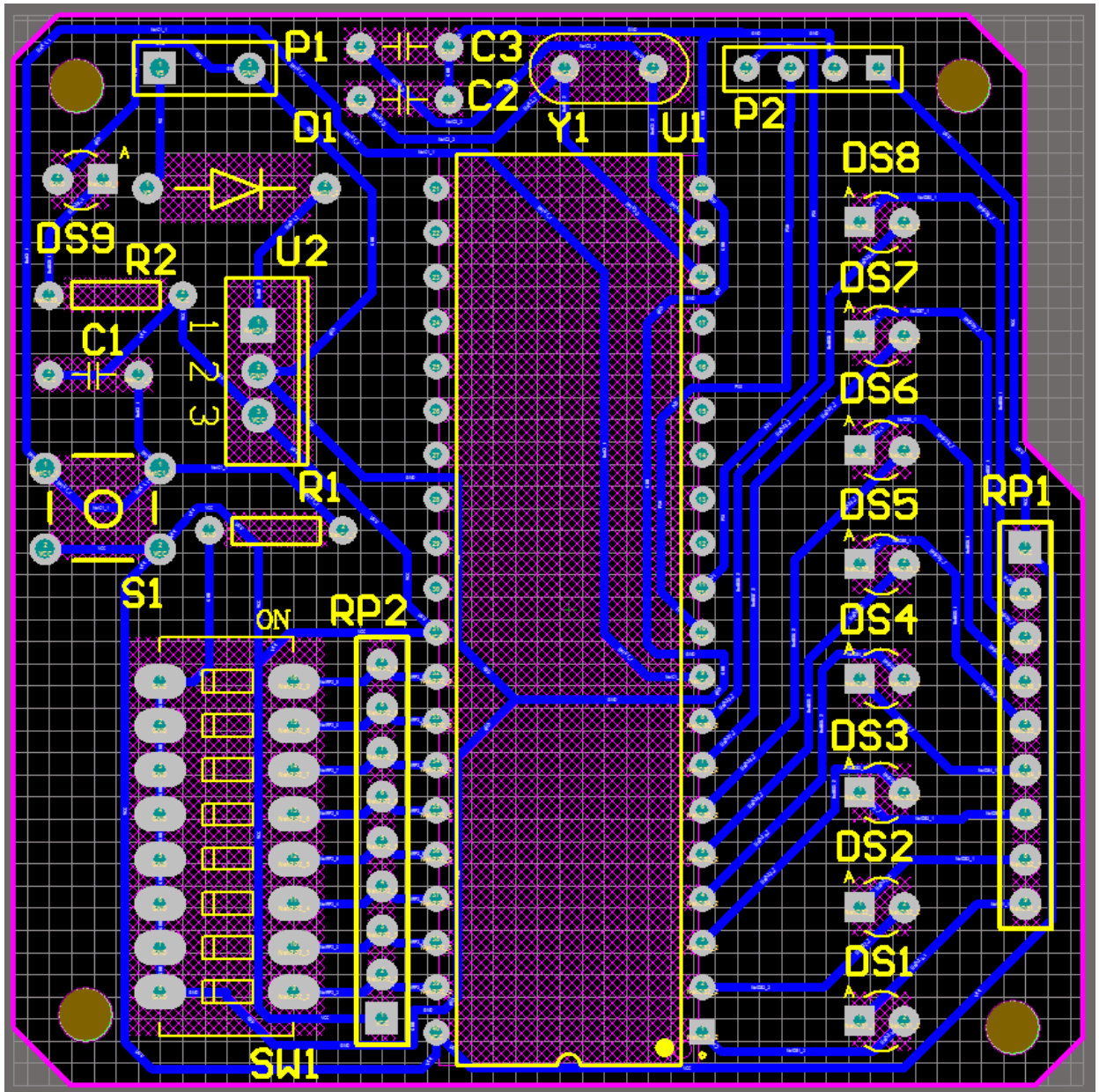
2. 電路成品



3. A.D.電路圖



4. A.D.佈線圖



5. 89S51 程式

```

#include<reg51.h>
#define LED P1
#define SW_now P0
char OFF[]={ 'O', 'F', 'F', '#' };
char ON[]={ 'O', 'N', '#' };
char LT[]={ 'L', 'E', 'F', 'T', '#' };
char RT[]={ 'R', 'I', 'G', 'H', 'T', '#' };
char FH[]={ 'F', 'L', 'A', 'S', 'H', '#' };
void delay(int);
void left(void);
void right(void);
char inst=0;
unsigned int SW=0;
//=====
main()
{
    LED=0xff;
    EA=ES=1;
    SCON=0x50; //mode1
    TMOD|=0x20; //T1 mode2
    PCON&=0x7f; //SMOD 0
    TH1=TL1=0xFD; //9600bps
    TR1=1;
    while(1)
    {
        if(SW_now!=SW)
        {
            SW=SW_now;
            LED=SW;
            SBUF=(~SW);
        }
    }
}
//=====
void delay(int x)
{
    int i,j;
    for(i=0;i<x;i++)
        for(j=0;j<120;j++);
}
//=====
void left(void)
{
    int i;
    LED=0xfe;
    for(i=0;i<8;i++)
    {
        delay(100);
        LED=(LED<<1)|0x01;
    }
    delay(100);
}
//=====
void right(void)
{
    int i;
    LED=0x7f;
    for(i=0;i<8;i++)
    {
        delay(100);
        LED=(LED>>1)|0x80;
    }
    delay(100);
}
//=====
void Serial(void) interrupt 4
{
    int i;
    if(TI==1)
        TI=0;
}

```

```

if(RI==1)
{
    RI=0;
    inst=SBUF;
    switch(inst)
    {
        case '0':
        {
            for(i=0;i<4;i++)
            {
                SBUF=OFF[i];
                while(TI==0);
                TI=0;
            }
            LED=0xff;
            break;
        }
        case '1':
        {
            for(i=0;i<3;i++)
            {
                SBUF=ON[i];
                while(TI==0);
                TI=0;
            }
            LED=0x00;
            break;
        }
        case '2':
        {
            for(i=0;i<5;i++)
            {
                SBUF=LT[i];
                while(TI==0);
                TI=0;
            }
            left();
            break;
        }
        case '3':
        {
            for(i=0;i<6;i++)
            {
                SBUF=RT[i];
                while(TI==0);
                TI=0;
            }
            right();
            break;
        }
        case '4':
        {
            for(i=0;i<6;i++)
            {
                SBUF=FH[i];
                while(TI==0);
                TI=0;
            }
            for(i=0;i<3;i++)
            {
                LED=0x00;
                delay(200);
                LED=0xff;
                delay(200);
            }
            break;
        }
    }
}
}
}

```

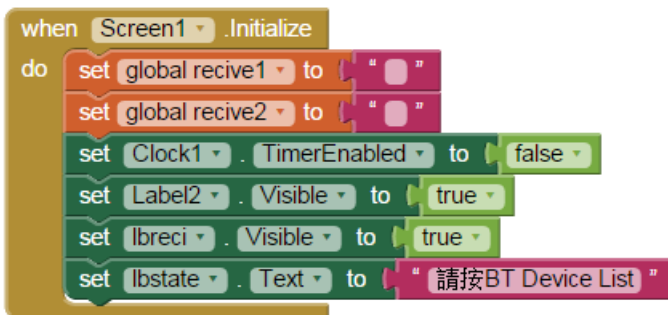
6. APP



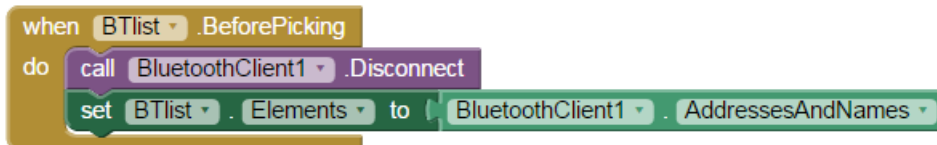
A. 設定全域變數



B. 初始化設定



C. 搜尋藍牙位址及名稱



D. 選擇的藍牙裝置

```
when BTlist .AfterPicking
do
  set global btdevice to BTlist . Selection
  set BTlist . Text to get global btdevice
  set lbstate . Text to "請按連線按鈕進行連線"
```

E. 呼叫按鍵程序

```
when btsend0 .Click
do
  call procedure x "0"

when btsend1 .Click
do
  call procedure x "1"

when btsend2 .Click
do
  call procedure x "2"

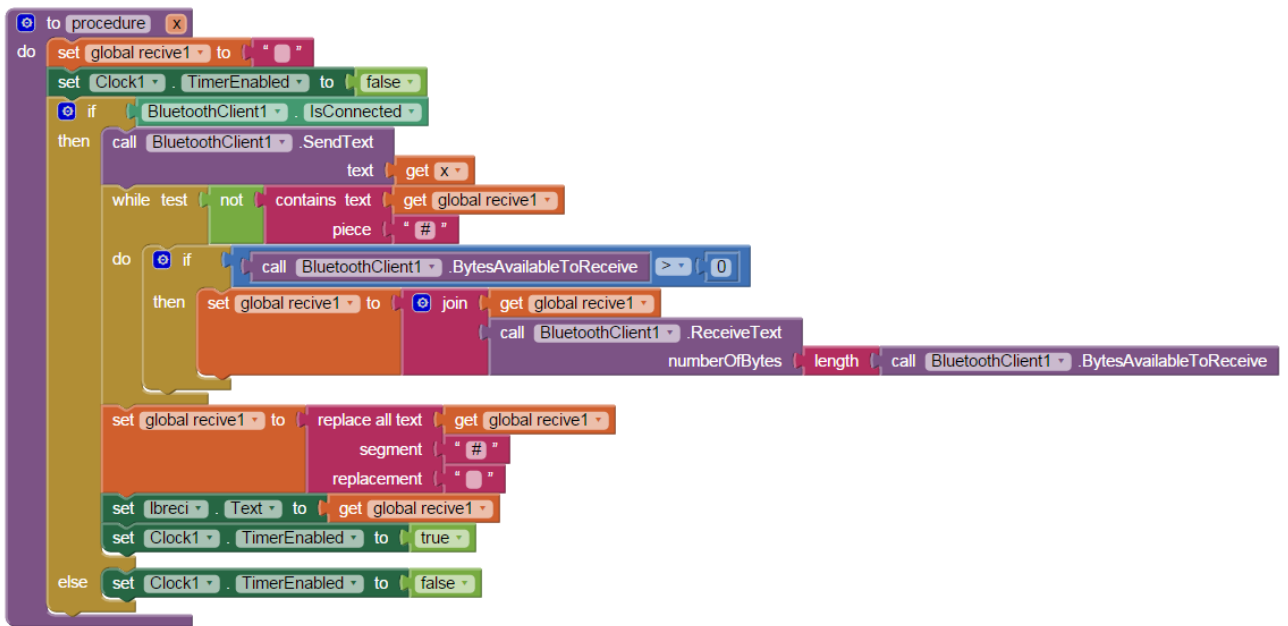
when btsend3 .Click
do
  call procedure x "3"

when btsend4 .Click
do
  call procedure x "4"
```

F. 藍牙連線

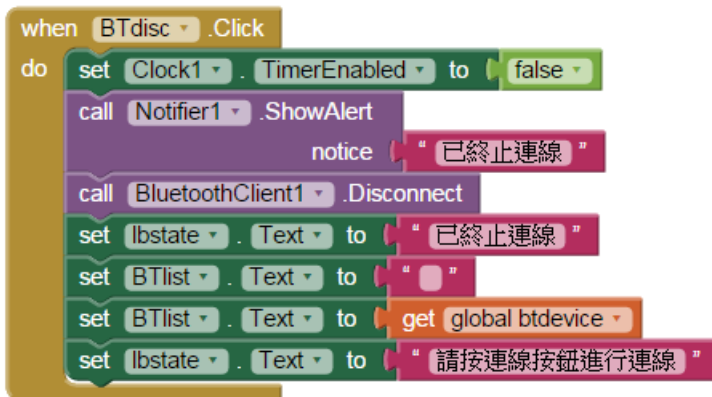
```
when BTconn .Click
do
  set Clock1 . TimerEnabled to false
  if length get global btdevice > 0
  then
    if call BluetoothClient1 .Connect
      address get global btdevice
    then
      set BTlist . Text to get global btdevice
      call Notifier1 .ShowAlert
        notice "連線成功"
      set lbstate . Text to "連線成功"
      set Clock1 . TimerEnabled to true
    else
      call Notifier1 .ShowAlert
        notice "未連線"
      set lbstate . Text to "未連線"
```

G. 按鍵程序



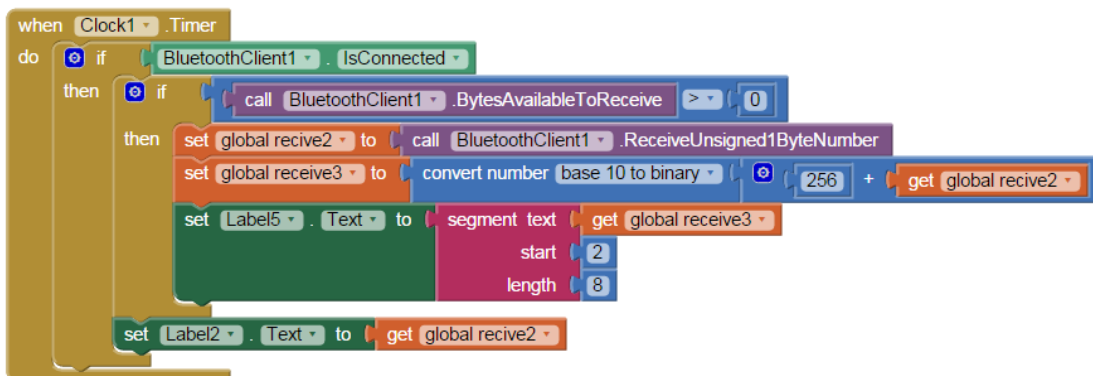
```
to procedure x
do
  set global receive1 to ""
  set Clock1.TimerEnabled to false
  if BluetoothClient1.IsConnected
  then
    call BluetoothClient1.SendText
    text get x
    while test not contains text get global receive1
    piece "#"
    do
      if call BluetoothClient1.BytesAvailableToReceive > 0
      then
        set global receive1 to join get global receive1
        call BluetoothClient1.ReceiveText
        numberOfBytes length call BluetoothClient1.BytesAvailableToReceive
        set global receive1 to replace all text get global receive1
        segment "#"
        replacement ""
        set lbreci.Text to get global receive1
        set Clock1.TimerEnabled to true
      else
        set Clock1.TimerEnabled to false
```

H. 藍牙離線



```
when BTdisc.Click
do
  set Clock1.TimerEnabled to false
  call Notifier1.ShowAlert
  notice "已終止連線"
  call BluetoothClient1.Disconnect
  set lbstate.Text to "已終止連線"
  set BTlist.Text to ""
  set BTlist.Text to get global btdevice
  set lbstate.Text to "請按連線按鈕進行連線"
```

I. 定時輪詢接收



```
when Clock1.Timer
do
  if BluetoothClient1.IsConnected
  then
    if call BluetoothClient1.BytesAvailableToReceive > 0
    then
      set global receive2 to call BluetoothClient1.ReceiveUnsigned1ByteNumber
      set global receive3 to convert number base 10 to binary 256 + get global receive2
      set Label5.Text to segment text get global receive3
      start 2
      length 8
      set Label2.Text to get global receive2
```