[ALC08]RFID-RC522_Funduino_實驗

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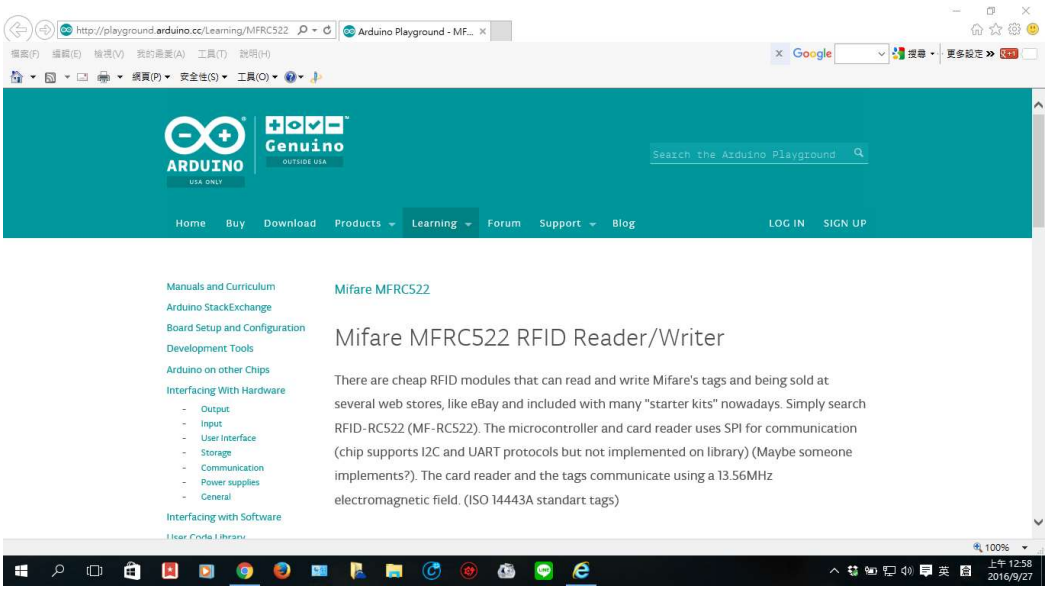
RFID(Radio Frequency IDentification) 是一種以 RF 無線電波辨識物件的自動辨識技術,利用讀取機讀取貼附或植入在物件上的電子標籤(Tag 或又稱 Transponder)
市面上可以在電料行買到的是如下圖的 RFID 模組, RFID-RC522 讀取器上的 IC 是採用 NXP 的 RC522 , 那麼 Jason 就以這個型號來進行實作測試

套件中總共有三個元件,一為讀取器電路板, 一個鑰匙扣,一張卡片

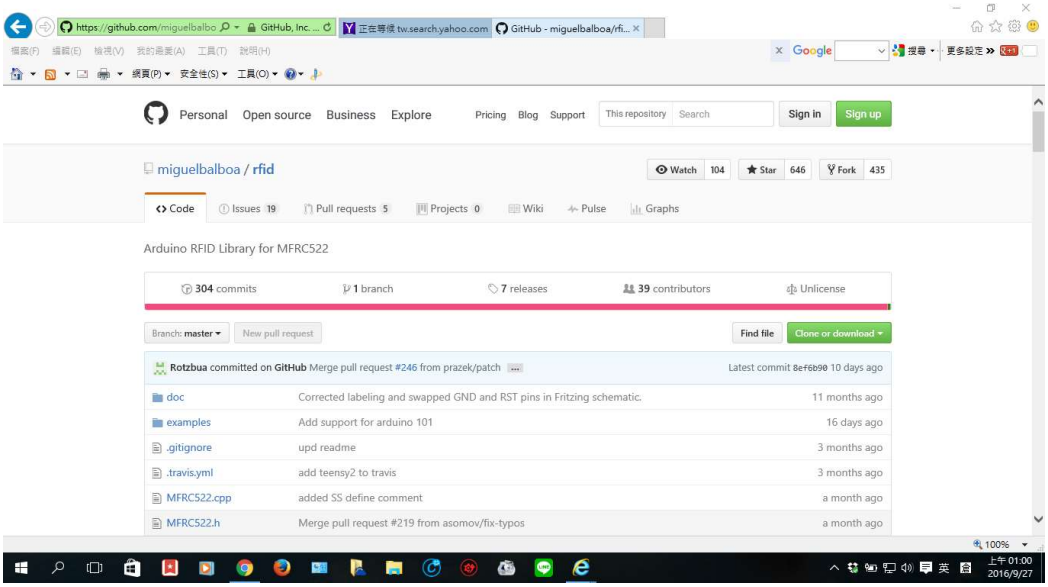
威棋學習網 https://www.weichess.tw

威棋布落格 https://www.weichess.tw/wordpress/

先到 Arduino 官網上去找有關 RFID 的 Library (rfid-master.zip)



將 Library (rfid-master.zip)下載,並安裝到 Arduino 目錄中的 Libraries 子目錄中



硬體的接線方式,如下圖,由於 Jason 用的是 Arduion UNO,所以參考 UNO 那欄的接法即可

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*	MFRC522	Arduino	Arduino	Arduino	Arduino	Arduino
*	Reader/PCD	Uno/101	Mega	Nano v3	Leonardo/Micro	Pro Micro
* Signal	Pin	Pin	Pin	Pin	Pin	Pin
*						
* RST/Reset	RST	9	5	D9	RESET/ICSP-5	RST
* SPI SS	SDA(SS)	10	53	D10	10	10
* SPI MOSI	MOSI	11 / ICSP-4	51	D11	ICSP-4	16
* SPI MISO	MISO	12 / ICSP-1	50	D12	ICSP-1	14
* SPI SCK	SCK	13 / ICSP-3	52	D13	ICSP-3	15

如下是詳細的程式

```
/*
 * ----------------------------------------------------------------------------------------------------------
 * Example sketch/program showing how to read data from a PICC to serial.
 * ----------------------------------------------------------------------------------------------------------
 * This is a MFRC522 library example; for further details and other examples see: https://github.com/miguelbalboa/rfid
 *
 * Example sketch/program showing how to read data from a PICC (that is: a RFID Tag or Card) using a MFRC522 based RFID
 * Reader on the Arduino SPI interface.
 *
 * When the Arduino and the MFRC522 module are connected (see the pin layout below), load this sketch into Arduino IDE
 * then verify/compile and upload it. To see the output: use Tools, Serial Monitor of the IDE (hit Ctrl+Shft+M). When
 * you present a PICC (that is: a RFID Tag or Card) at reading distance of the MFRC522 Reader/PCD, the serial output
 * will show the ID/UID, type and any data blocks it can read. Note: you may see "Timeout in communication" messages
 * when removing the PICC from reading distance too early.
 *
 * If your reader supports it, this sketch/program will read all the PICCs presented (that is: multiple tag reading).
 * So if you stack two or more PICCs on top of each other and present them to the reader, it will first output all
 * details of the first and then the next PICC. Note that this may take some time as all data blocks are dumped, so
 * keep the PICCs at reading distance until complete.
 *
 * @license Released into the public domain.
 *
 * Typical pin layout used:
 * -----------------------------------------------------------------------------------------
 *             MFRC522      Arduino       Arduino     Arduino     Arduino          Arduino
 *             Reader/PCD   Uno/101        Mega        Nano v3     Leonardo/Micro   Pro Micro
 * Signal      Pin          Pin           Pin         Pin         Pin              Pin
```

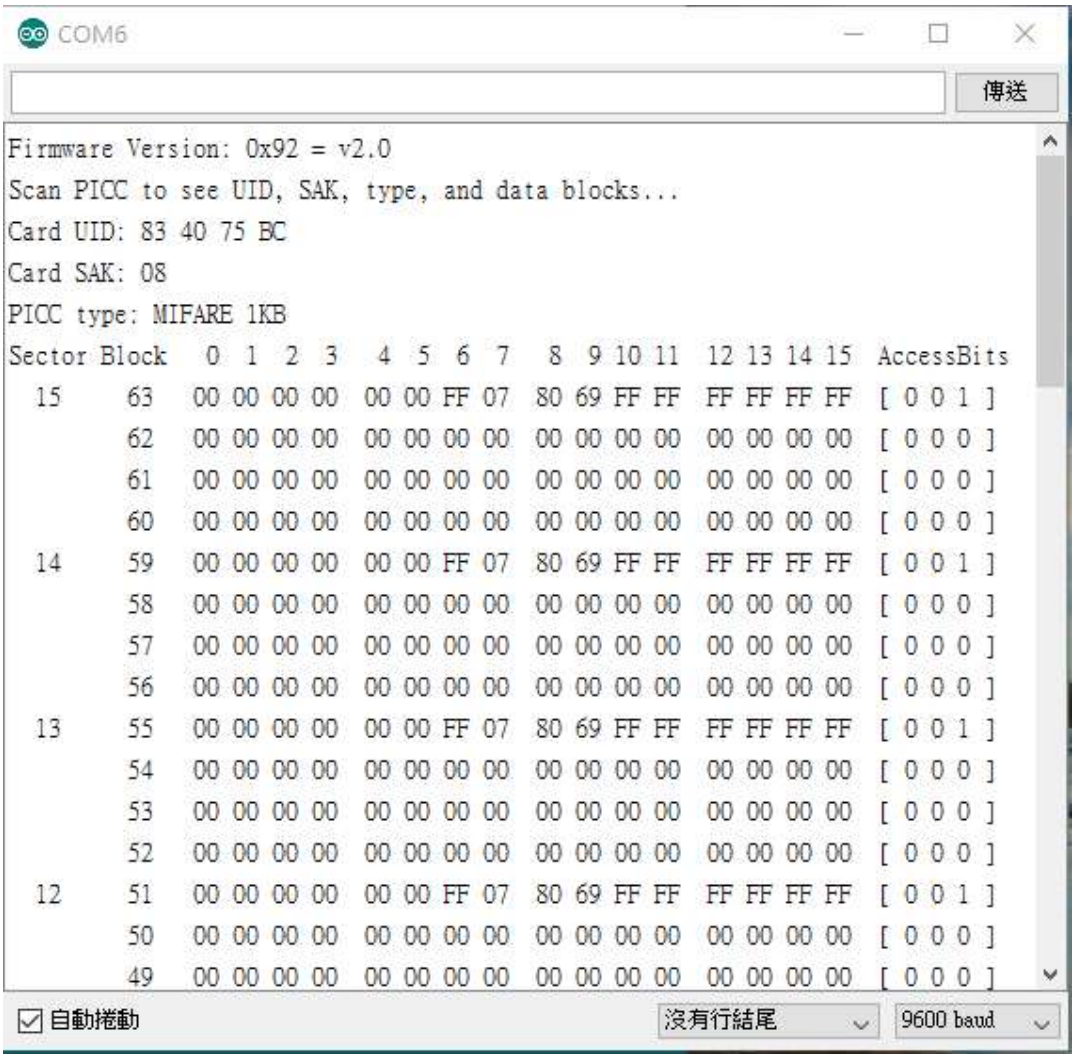
```
 * ------------------------------------------------------------------------------------
 * RST/Reset     RST           9             5          D9          RESET/ICSP-5     RST
 * SPI SS        SDA(SS)       10            53         D10         10               10
 * SPI MOSI      MOSI          11 / ICSP-4   51         D11         ICSP-4           16
 * SPI MISO      MISO          12 / ICSP-1   50         D12         ICSP-1           14
 * SPI SCK       SCK           13 / ICSP-3   52         D13         ICSP-3           15
 */

#include <SPI.h>
#include <MFRC522.h>
#define RST_PIN         9           // Configurable, see typical pin layout above
#define SS_PIN          10          // Configurable, see typical pin layout above
MFRC522 mfrc522(SS_PIN, RST_PIN);   // Create MFRC522 instance

void setup() {
    Serial.begin(9600);     // Initialize serial communications with the PC
    while (!Serial);    // Do nothing if no serial port is opened (added for Arduinos based on
ATMEGA32U4)
    SPI.begin();            // Init SPI bus
    mfrc522.PCD_Init();         // Init MFRC522
    mfrc522.PCD_DumpVersionToSerial();  // Show details of PCD - MFRC522 Card Reader details
    Serial.println(F("Scan PICC to see UID, SAK, type, and data blocks..."));
}

void loop() {
    // Look for new cards
    if ( ! mfrc522.PICC_IsNewCardPresent()) {
        return;
    }
    // Select one of the cards
    if ( ! mfrc522.PICC_ReadCardSerial()) {
        return;
    }
    // Dump debug info about the card; PICC_HaltA() is automatically called
    mfrc522.PICC_DumpToSerial(&(mfrc522.uid));
}
```

如下是執行的結果,經過實測,鑰匙扣型的大約在接近讀取器 3cm 距離內,卡片在 5cm 距離內,才可被讀取良好,經由 monitor 畫面如下:



以下是實作的相片,供讀者參考,謝謝