SYNACORP TRADING & SERVICES
No.9, 1st Floor, Lorong 1/SS2, Bandar Tasek Mutiara, 14120 Simpang Ampat, S.Prai (S), Penang
Tel : +604.502.1726 Hunting Line : 012.403.3474 Fax : +604.502.1726
(Website) http://www.synacorp.my (Email) sales@synacorp.com.my

Cloning RFID 1k card Using Arduino and RC522 Card Reader Module

Introductions:

This RW RFID 1K card cloning card has a special function that we can rewrite or copy the UID of the standard RFID card. What is UID? Basically UID is the the first 4 bytes from 16 bytes in the sector 0 block 0 that available on all RFID card. UID also known as the card Serial Number or Identity. With this Cloning card we can duplicate the original RFID card by cloning/copy the entire bytes from sector 0 block 0. **(*Notes that Standard RW RFID card cannot modify the UID sector 0 block 0*)**

Diagram below shows the meaning of each bytes:-

Example Sector 0 Block 0 Data			
02 33 54 3C 59 08 04 00 01 6F 01 6D 45 68 F8 1D			
02 33 54 3C	59	08 04 00	01 6F 01 6D 45 68 F8 1D
UID	BCC Check Sum	TAG IDENTIFICATION	MANUFACTURER SPECIFIC DATA
4-bytes	1-bytes	3-bytes	8-bytes

Objectives:

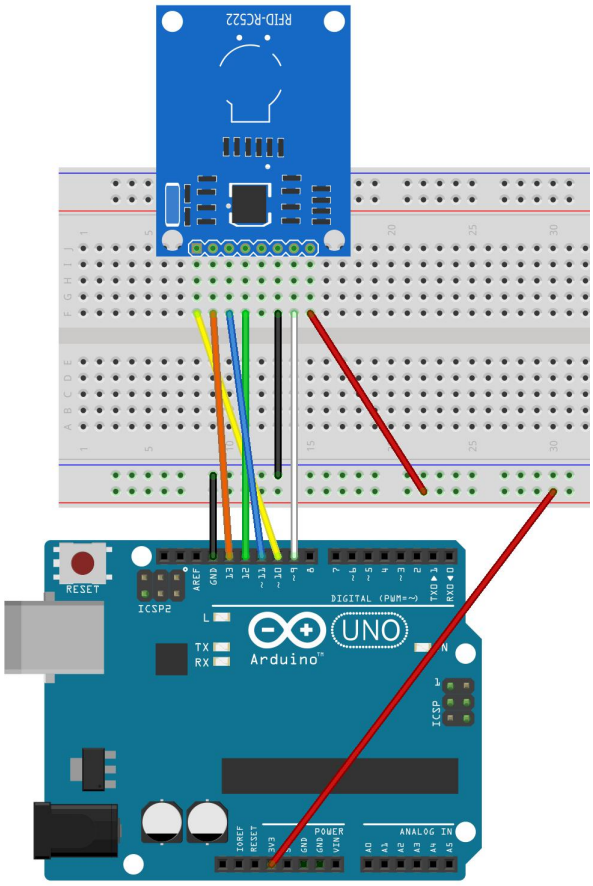
To copy the entire 16 bytes sector 0 block 0 data from Standard RW RFID card to the Cloning card using Arduino and RC522 Card Reader Module.

Component Needed:

1. Arduino Uno (Mega and Nano compatible)
2. RFID-RC522 Card Reader Module
3. RFID 1k RW Standard card
4. RFID 1k RW cloning card
5. Breadboard
6. Few jumper wire

Procedures:

1. Connect the Arduino and the RFID-RC522 Card Reader Module based on the picture and table given below:-

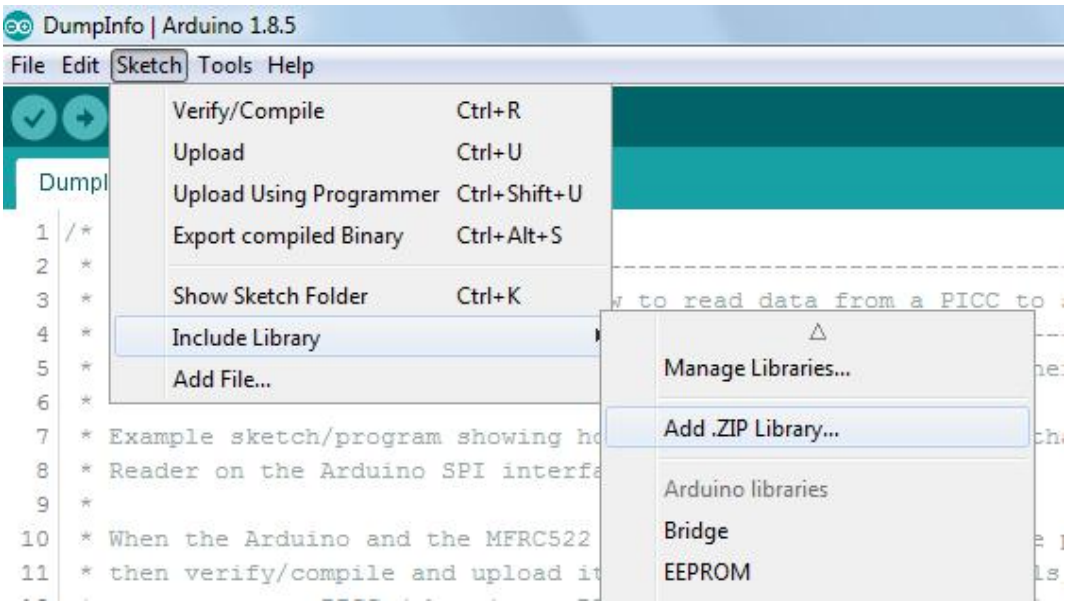


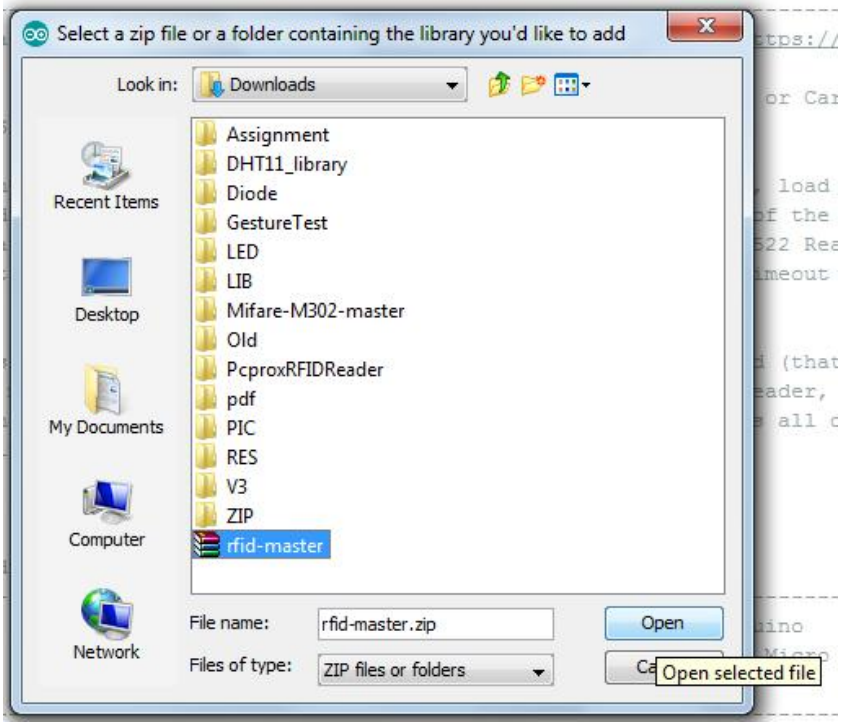
Arduino	RC522
9	RST
10	SDA
11	MOSI
12	MISO
13	SCK
3.3V	3.3V
GND	GND

2. Download the provided library and Notepad++ application from the link given below:-

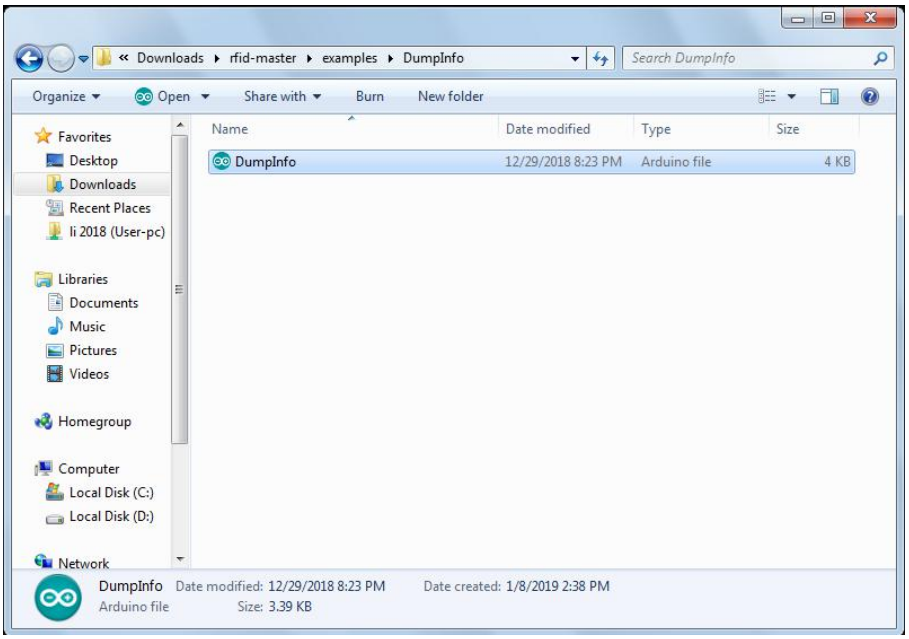
- RC522 Library - https://codeload.github.com/miguelbalboa/rfid/zip/master
- Notepad++ - https://notepad-plus-plus.org/download/v7.6.2.html

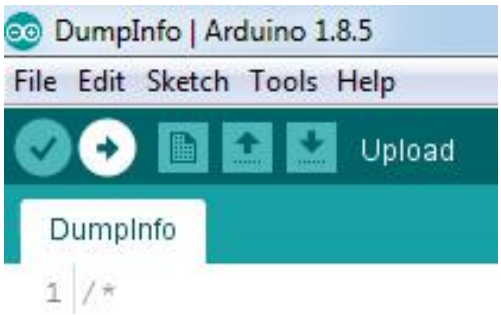
3. Installing the **RC522 Library** into **Arduino IDE**. Open **Arduino IDE** click on ***Sketch > Include Library > Add .ZIP Library***.. Then, navigate and select the library that has been downloaded before by clicking ***Open*** button.



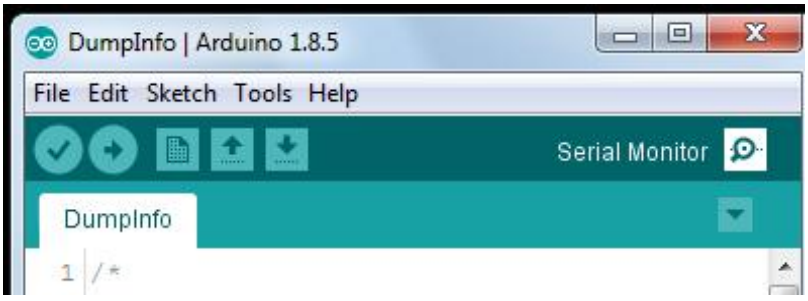


4. Navigate and open **DumpInfo.ino** file in the Arduino IDE default Library *(C:\Users\user\Documents\libraries\rfid-master\examples\DumpInfo).* Connect the Arduino to the PC click on ***Verify*** and then ***Upload***.





5. After complete uploading the program to the Arduino open the **Serial Monitor** tab (by holding Ctrl + Shift + M) and put the Standard RW RFID 1k card on the RC522 Card Reader Module to get the Serial 0 Block 0 data. **Copy the last one bytes and paste it temporary at Notepad or Word.** Repeat the same process with Clone RW RFID 1k Card to get the data.



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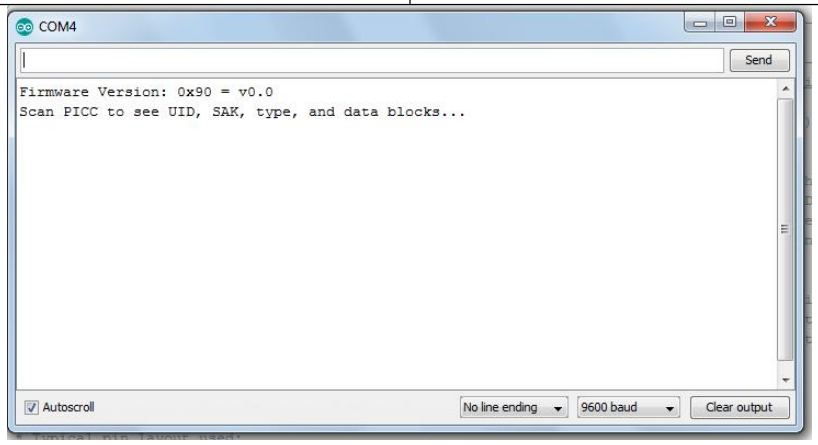
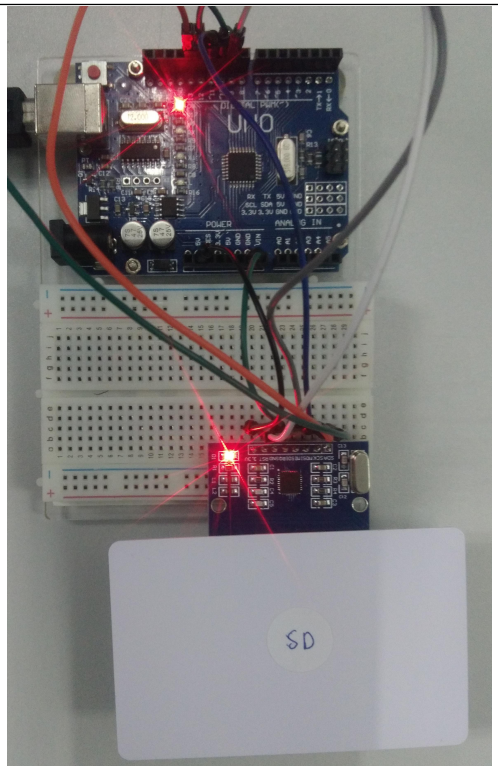
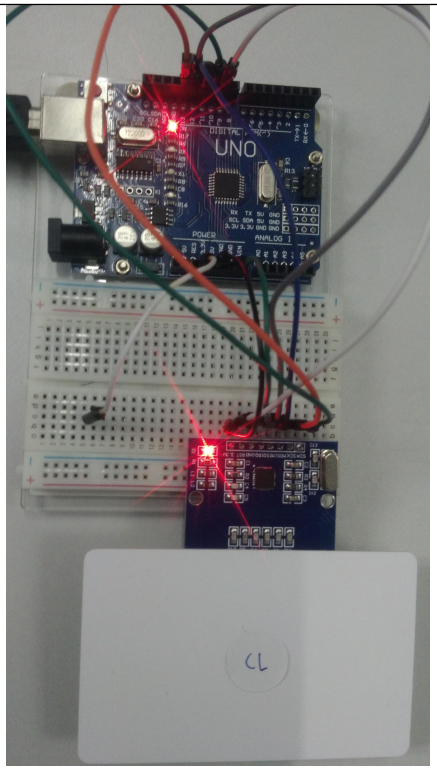
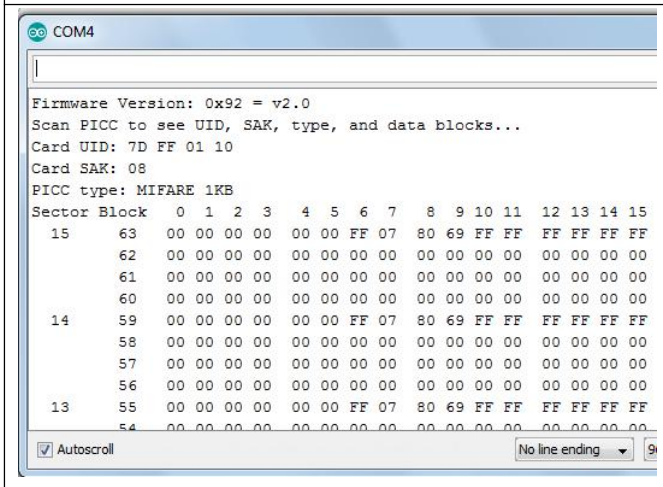
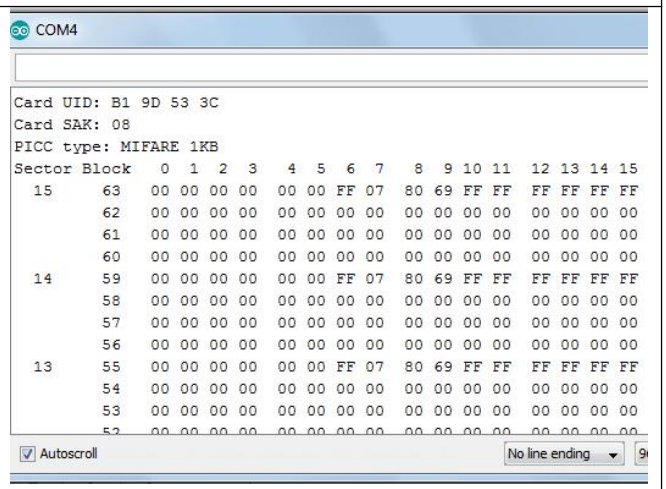
Standard Card Reading	Clone Card Reading











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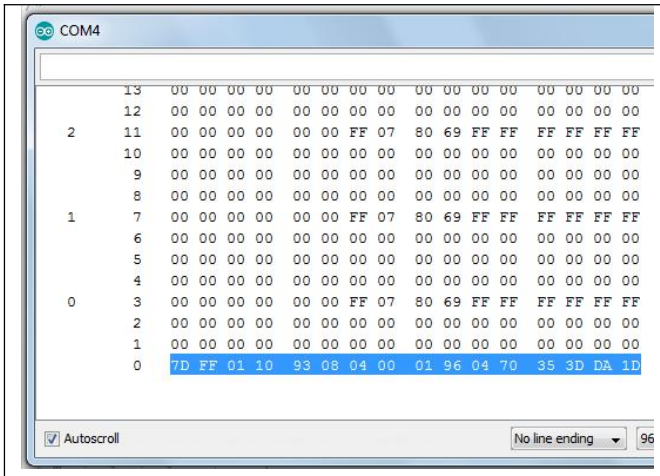
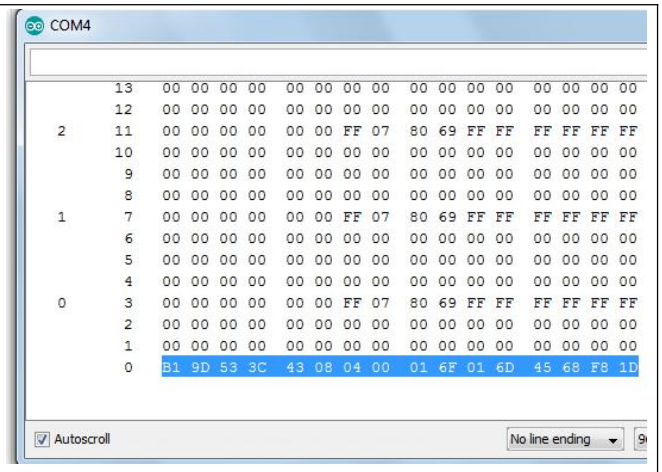
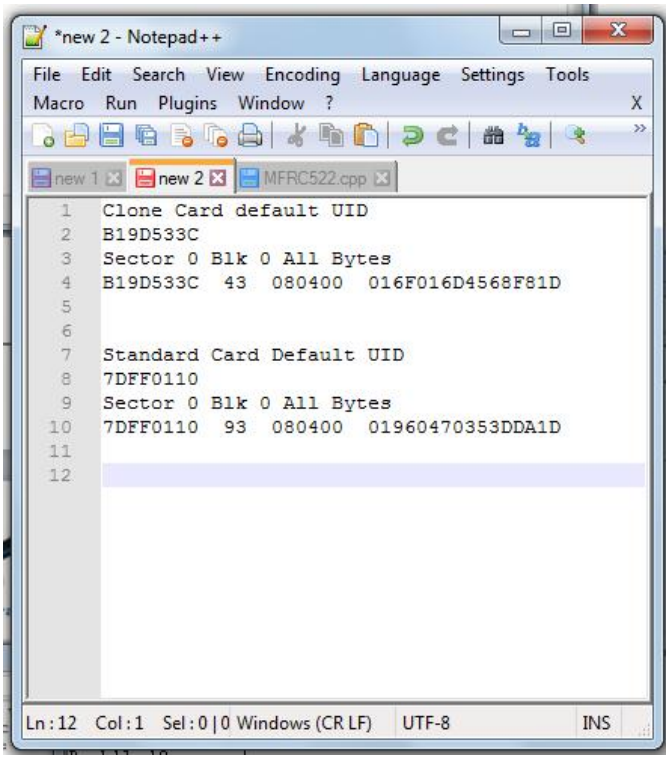


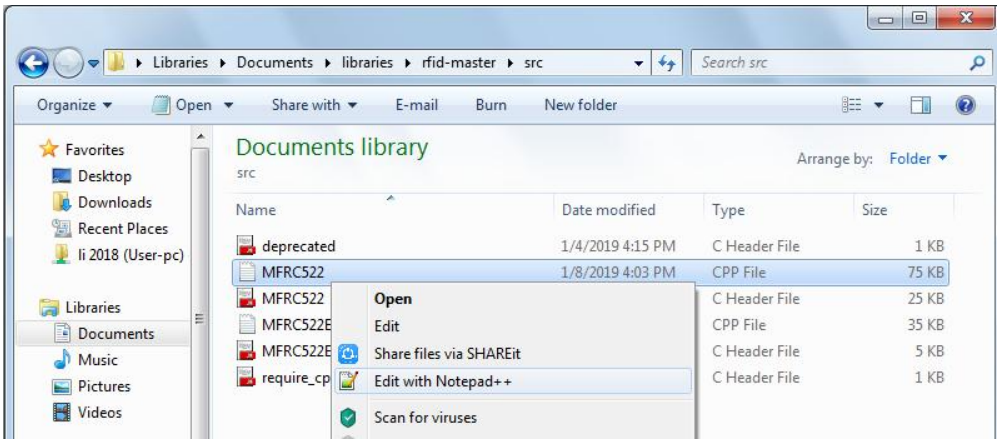
7DFF0110 93 080400 01960470353DDA1D



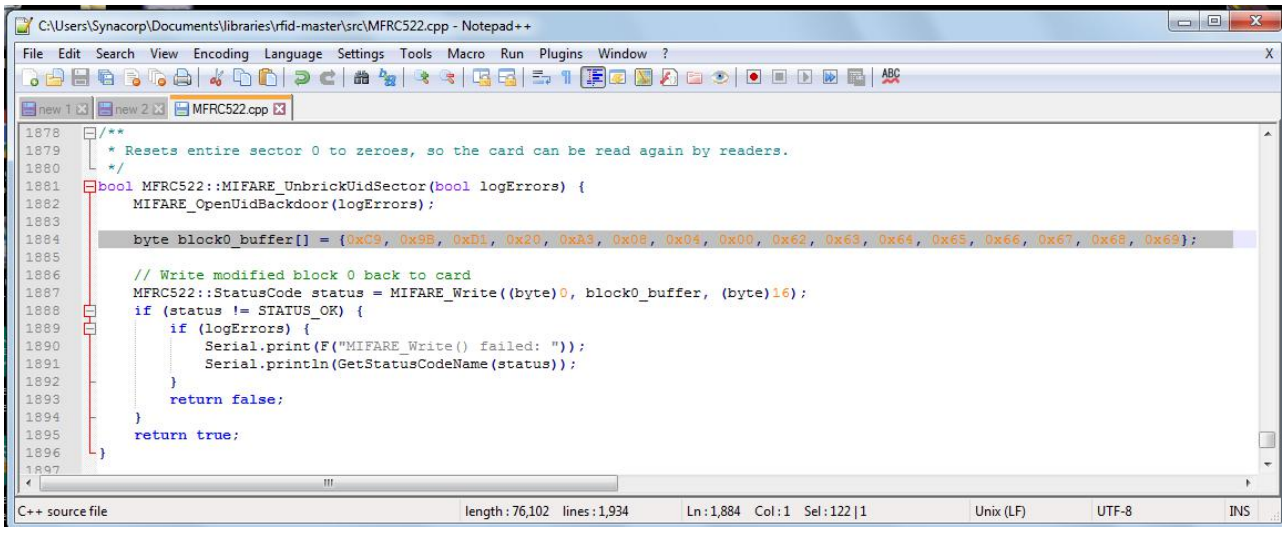
B19D533C 43 080400 016F016D4568F81D



6. Navigate to the **MFR522.cpp** file in the Arduino IDE default Library *(C:\Users\user\Documents\libraries\rfid-master\srcr\MFR522.cpp)* ***right click*** and click on the ***Edit with Notepad++*** options. Then the application will open and shows the C++ Source file.



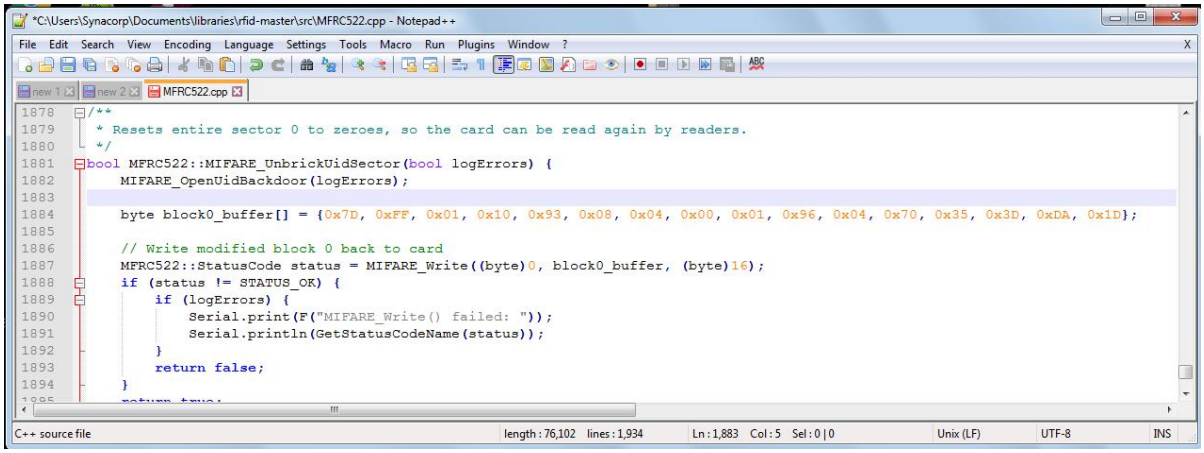
7. **Scroll to the line 1884** and try to search for this line " **byte block0_buffer[] = {0x01, 0x02, 0x03, 0x04, 0x04, 0x08, 0x04, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00};** " or refer to picture below.



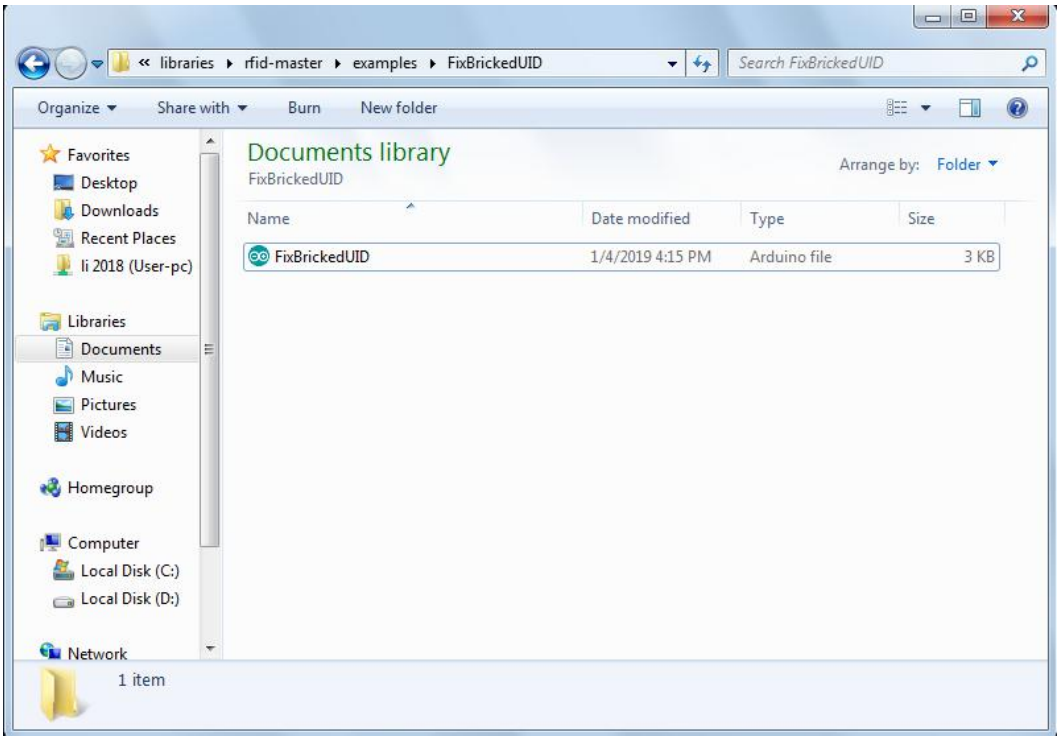

```
byte block0_buffer[] = {0xC9, 0x9B, 0xD1, 0x20, 0xA3, 0x08, 0x04, 0x00, 0x62, 0x63, 0x64, 0x65, 0x66, 0x67, 0x68, 0x69};
```

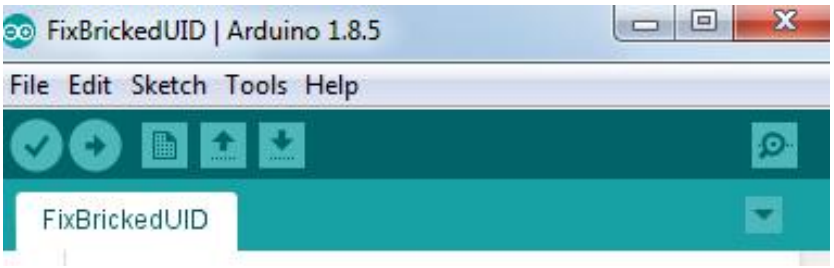
8. Replace the highlighted digit with Standard RFID card reading values to change the Clone card Sector 0 Block 0 based on example table and picture below. Click on **Save** button after changing digit completed.

{0x01, 0x02, 0x03, 0x04, 0x04, 0x08, 0x04, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00}
{0x7D, 0xFF, 0x01, 0x10, 0x93, 0x08, 0x04, 0x00, 0x01, 0x96, 0x04, 0x70, 0x35, 0x3D, 0xDA, 0x1D}

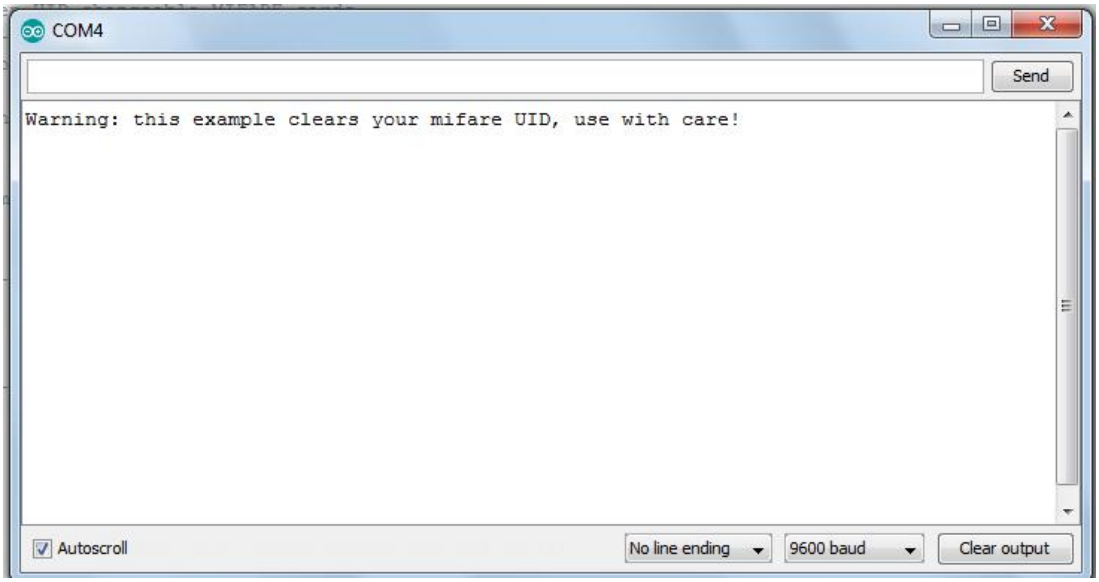


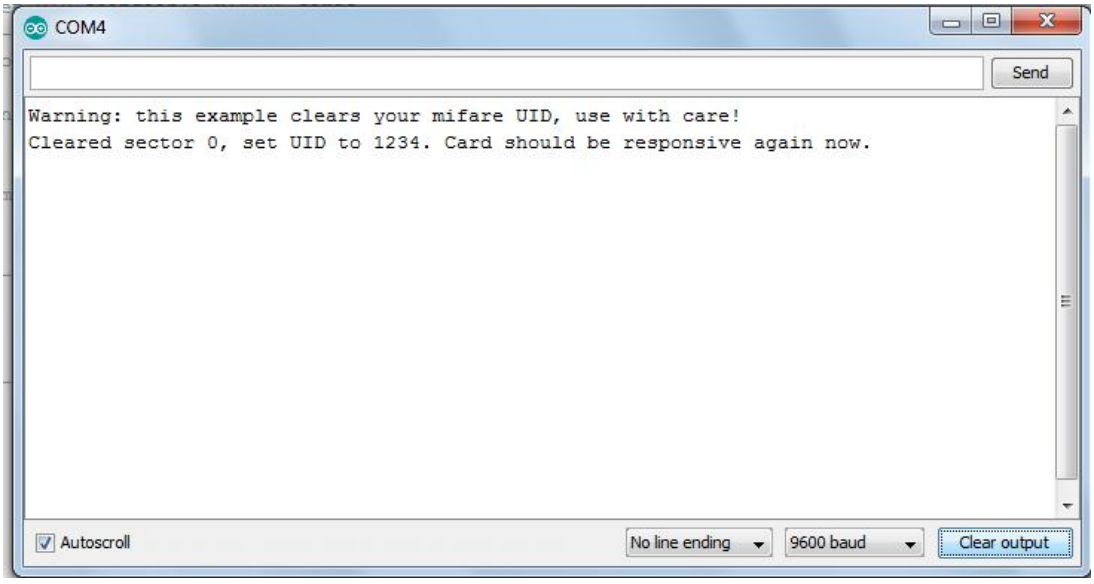
9. Navigate and open the **FixBrickedUID.ino** file in the Arduino IDE default Library *(C:\Users\user\Documents\libraries\rfid-master\examples\FixBrickedUID)*. Connect the Arduino to the PC click on ***Verify*** and then ***Upload***.



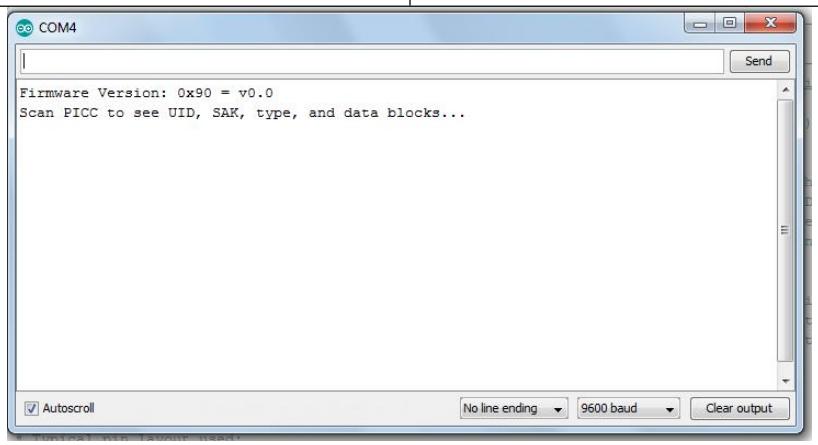
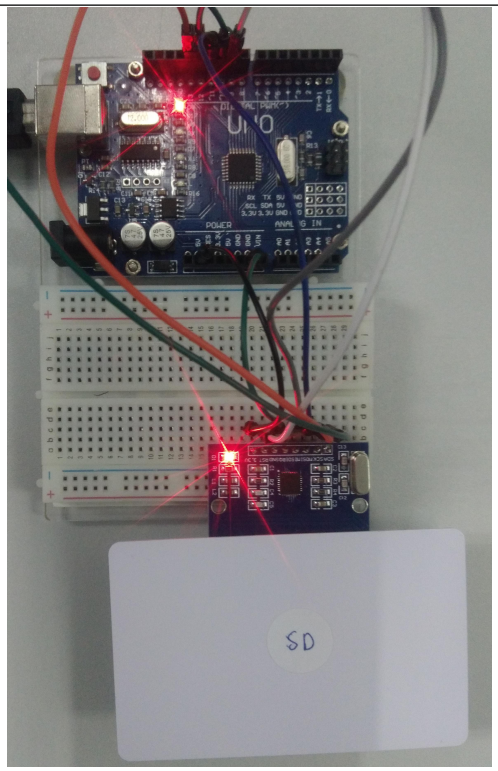
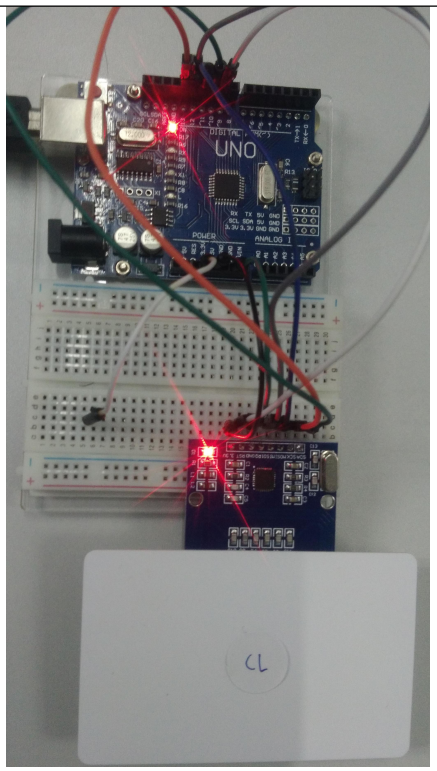


10. After complete uploading the program to the Arduino, open the **Serial Monitor** tab *(by holding Ctrl + Shift + M)* and put the Clone RW RFID 1k card on the RC522 Card Reader Module to rewrite the Serial 0 Block 0 data based on values that has been changed in Step 8.





11. Done! **Repeat Step 4 & 5 to check** the new data of Sector 0 block 0 on the Clone RFID 1k Card. The data should be same as the Standard RFID 1k Card.

Standard Card Reading	Clone Card Reading
	
	

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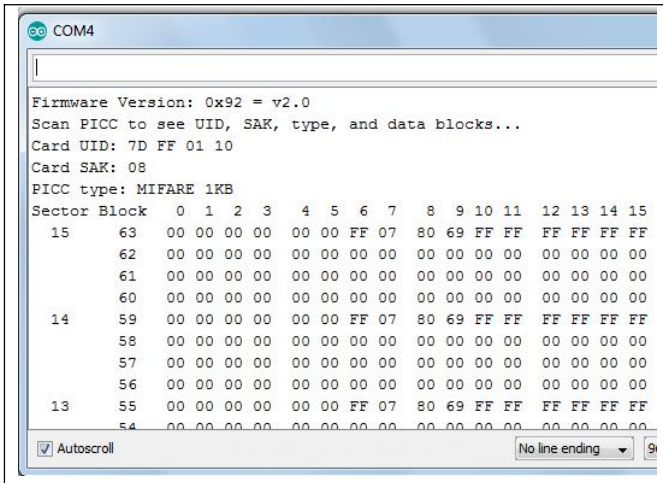

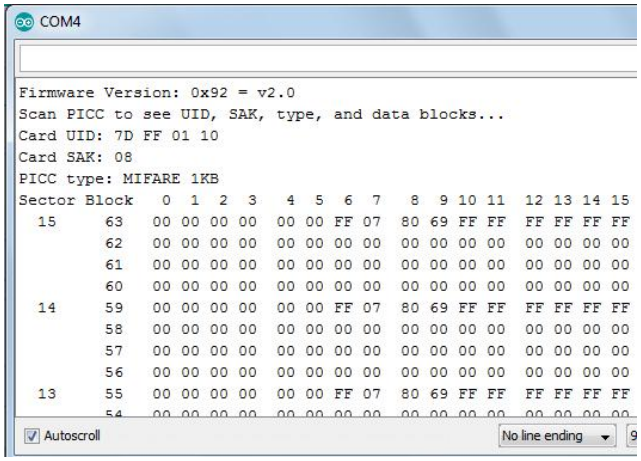

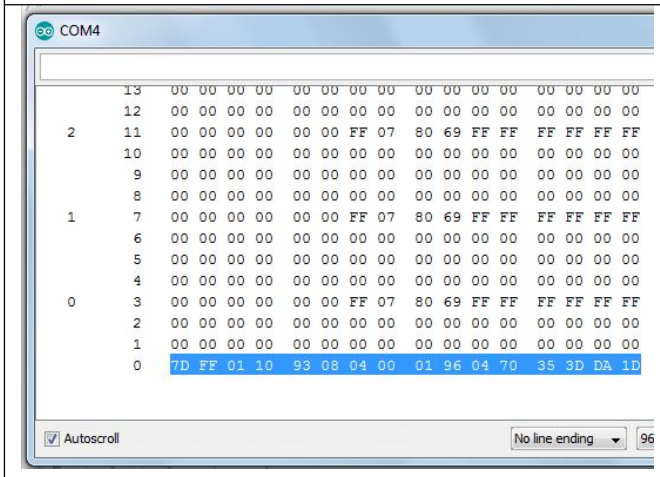

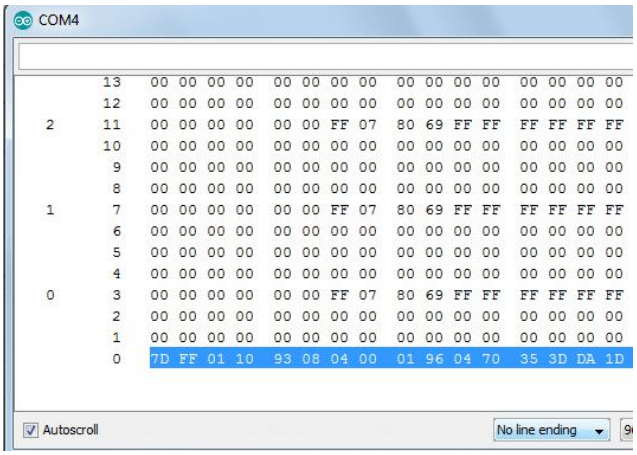

7DFF0110 93 080400 01960470353DDA1D

7DFF0110 93 080400 01960470353DDA1D