GeraintW Online Blog

Information security professional blog

Thursday, 30 January 2014

RFID and Raspberry PI

SainSmart RFID-RC522 & Pi

My first blog about some hardware hacking I am looking at, this article describes connecting the SainSmart RFID-RC522 module with the Raspberry PI. It refers to work that others have done, please see the references at the end of the blog for the sources of information I have used. However by collecting together these sources and my own additions, this will help others.

The SainSmart RFID-RC522 module works with the Mifare RFID tags and uses the RC522 chip. SainSmart have provided a module that can be used as a RFID Reader Card Proximity Module. The module uses the SPI bus to communicate with a controller. For those using a Raspberry PI it is imoprtant to note module uses 3.3v and is compatible with the voltage inputs on the Raspberry PI.

The Serial Peripheral Interface bus (SPI) bus is a synchronous serial data link which the Raspberry PI supports through its GPIO, the PI supports two slave devices using the CE (Chip enable) pins.

Enable the SPI on the Raspberry PI

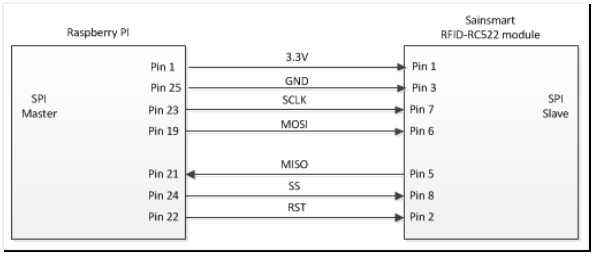
As the SPI is not enabled by default you will need to edit the raspi-blacklsit.conf in order to enable the SPI interface; this has been blacklisted as most users are not interested in it according to the comment in the file. There are only two devices in the file, the SPI and I2C.

sudo vi /etc/modprobe.d/raspi-blacklist.conf

Add '#' in front of the line spi-bcm2708 to comment it out of the blacklist. Save the file, and you will need to reboot the Raspberry PI, after which the lsmod command should show the spi device (spi_bcm2708) enabled.

Connection Diagram

Connecting the module to the PI is reasonably straight forward, as the wiring diagram shows, my breadboard set is also pictured.



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Geraint Williams

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Head of Technical Services at IT Governance Ltd. Managing the Penetration Testing, PCI and Cyber Essentials consultancy services.

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Wednesday 25 Feb 2015
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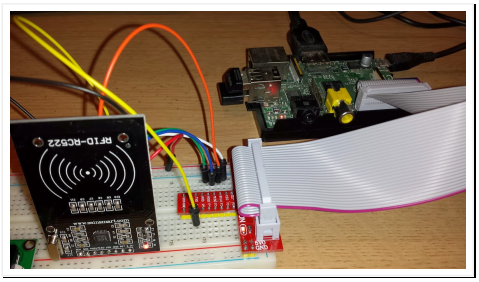

SPI Code

To use the module from Python, need to load a SPI wrapper, however we need to install 'python-dev' to enable us to install the SPI wrapper.

To install 'python-dev' :

sudo apt-get install python-dev

In order to read data from the SPI bus in Python we need a set of routines, a suitable set is SPI-Py, available form github.

To do the install, clone the SPI-Py git repository. This is the source code for the SPI python library we'll be using.

git clone https://github.com/lthiery/SPI-Py.git

Install the SPI-Py module by typing

cd SPI-Py
sudo python setup.py install

Sample Program

In order to test the module out they is a sample code which is a Python port of the example code for the NFC module MF522-AN and provides a small class object to interface with Moduleon the Raspberry Pi.

This is a Python port of the example code for the NFC module MF522-AN

sudo python MFRC522.py

If everything I working you should be able to read the tags that came with the SainSmart module.

Resources

http://www.sainsmart.com/sainsmart-mifare-rc522-card-read-antenna-rf-rfid-reader-ic-card-proximity-module.html
https://github.com/lthiery/SPI-Py
https://github.com/mxgxw/MFRC522-python

Posted by Geraint Williams at 21:45

Labels: RaspBerry Pi, RFID

18 comments:

Jean-Francois Auger 24 March 2014 at 20:03

hello nice tutorial, I follow every step without problem, except the last one:
sudo python MFRC522.py I got this result:

Card read UID: 131,80,231,164,144
Size: 8
AUTH ERROR!!
AUTH ERROR(status2reg & 0x08) != 0
AUTH ERROR

I don't understand why I can Authenticate.

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One thing, I have also install he bcm2835 library.

Reply

Replies

GeraintW 24 March 2014 at 20:15

Hi, It appears to a problem with the ported Python code, I am working on some corrections to the code which I will publish, however from the snippet you pasted I can see it read the Card UID

Afkham Azeez 25 May 2014 at 20:11

I too am facing the same problem. Is a fix available?

Thanks

Reply

zacy 31 March 2014 at 19:54

Please help. I have followed many tutorials on the internet but can't seem to find out how to make this work. I followed all the instructions but when I get to MFRC522.py it never seems to recognise any RFID cards I put next to it. I have tried re doing this many times. Could it be to do with a dodgy RFID reader?

Reply

Replies

zacy 18 April 2014 at 12:05

Oh it turned out it was a dodgy reader so they sent me another and now it works. :)

Reply

GeraintW 4 April 2014 at 19:37

I'm working on a new python code which will include some diagnostic information which may help. You need to make sure it is wired up correctly, also are there any error messages when you run the python script?

Reply

itsinitialflame 6 April 2014 at 12:27

Hello GeraintW!

Nice Tutorial! It helps me alot! I had a few Problems connecting the pins but with your Graphic and the Graphic of a Spanish Guy (http://fuenteabierta.teubi.co/2013/07/utilizando-el-lector-nfc-rc522-en-la.html) i solved it.

Now i can read the Card UID, but i get now the AUTH Error like the Previous.
When do you think is your PAtch ready for solving this Problem ?
Maybe you can explain how the Authentication Works?

Thank you!

Reply

Replies

Denis Martinez 2 April 2015 at 20:27

Hi! Did you solve this problem?

Reply

GeraintW 12 April 2014 at 16:20

Working on redoing the code, however away from home for work a lot at the moment and it may take away before I can publish. Will also try to explain how authentication works. Will try and post chunks of work as I develop it, hopeful it will help.

Reply

Millard Hiner 30 April 2014 at 14:24

I found your website perfect for my needs. Thanks for sharing the great ideas. Whole article is too good and well written.

Reply

Doug Jefferies 5 May 2014 at 00:33

Hi,
thanks for this, I also had the authentication errors.

at lines 305 and 400 my program sees a status of 2 when it is expecting a status of 0,

at line 307 there seems to be a double negative, the error goes away if I change the preceding "if" statement
from: if not (self.Read_MFRC522(self.Status2Reg) & 0x08) != 0:
to: if not (self.Read_MFRC522(self.Status2Reg) & 0x08) == 0:

Reply

TexTrace RFID Woven Label 8 May 2014 at 07:58

Hello! That's a great RFID tutorial. I have actually been able to follow each and every step mentioned in the post, and make it work for my business.

Reply

Horváth András 8 May 2014 at 12:05

This comment has been removed by the author.

Reply

Gaurav 7 July 2014 at 20:15

Hi.. I did everything according to your post... However.. After the last step i.e. running the python program... There was not output to be seen.. No output no error

Reply

Replies

Tudo online 11 July 2014 at 04:51

This comment has been removed by the author.

Reply

doncorso 2 February 2015 at 13:14

Hello, I used your tutorial to use my rc522-Modul but cannot get it to work. This is my equipment;

[*] Raspberry b+
[*] rc522 (this: http://www.ebay.de/itm/301466966558)
[*] I see spi_bcm2708 when typing lsmod
[*] Read.py from MFRC522-python tells me "Welcome", but does not to anything when bringing a card nearby

I tried:
[*] FOUR different rc522-devices from two different shops
[*] another Raspberry Pi (model B)
[*] 2A Power Adapter
[*] fresh install of raspbian on a fresh SD-card

I don´t think it is hardware-problem but I cannot find anything wrong...

Thanks for your help and greetings from germany.

Here ou can find some photos to show my problem:

http://i.imgur.com/ZaCu4Jc.jpg

http://i.imgur.com/b7cmwj1.jpg

http://i.imgur.com/TMchGNg.jpg

http://i.imgur.com/cpnROPR.jpg

Steffen

.

Reply

Replies

Rahul 12 February 2015 at 06:16

Steffen,

It seems you do not have SPI enabled. Go thro' raspi-config>Advance options and Enable the SPI.
Reboot your pi and it should work.

- Rahul Patil.

G Prathap 6 June 2015 at 13:57

Thank you so much :)

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