

Grove - 125KHz RFID Reader



This Grove-125KHz RFID Reader is a module used to read uem4100 RFID card information with two output formats: Uart and Wiegand. It has a sensitivity with maximum 7cm sensing distance. There is also [the electronic brick version](#) of this module. It can help you with project like internet of thing and access control system.

Version

Grove - 125KHz RFID Reader V1.0 Initial Oct 2015

Specifications

Voltage	4.75-5.25V
Working Frequency	125 KHz
Sensing Distance(Max)	70mm
TTL Output	9600 baudrate, 8 data bits, 1 stop bit, and no verify bit
Wiegand Output	26 bits Wiegand format, 1 even verify bit, 24 data bits, and 1 odd verify bit

Tip

More details about Grove modules please refer to [Grove System](#)

Platforms Supported



Caution

The platforms mentioned above as supported is/are an indication of the module's software or theoretical compatibility. We only provide software library or code examples for Arduino platform in most cases. It is not possible to provide software library / demo code for all possible MCU platforms. Hence, users have to write their own software library.

Getting Started

Note

If this is the first time you work with Arduino, we firmly recommend you to see [Getting Started with Arduino](#) before the start.

Play With Arduino

Hardware

- **Step 1.** Prepare the below stuffs:



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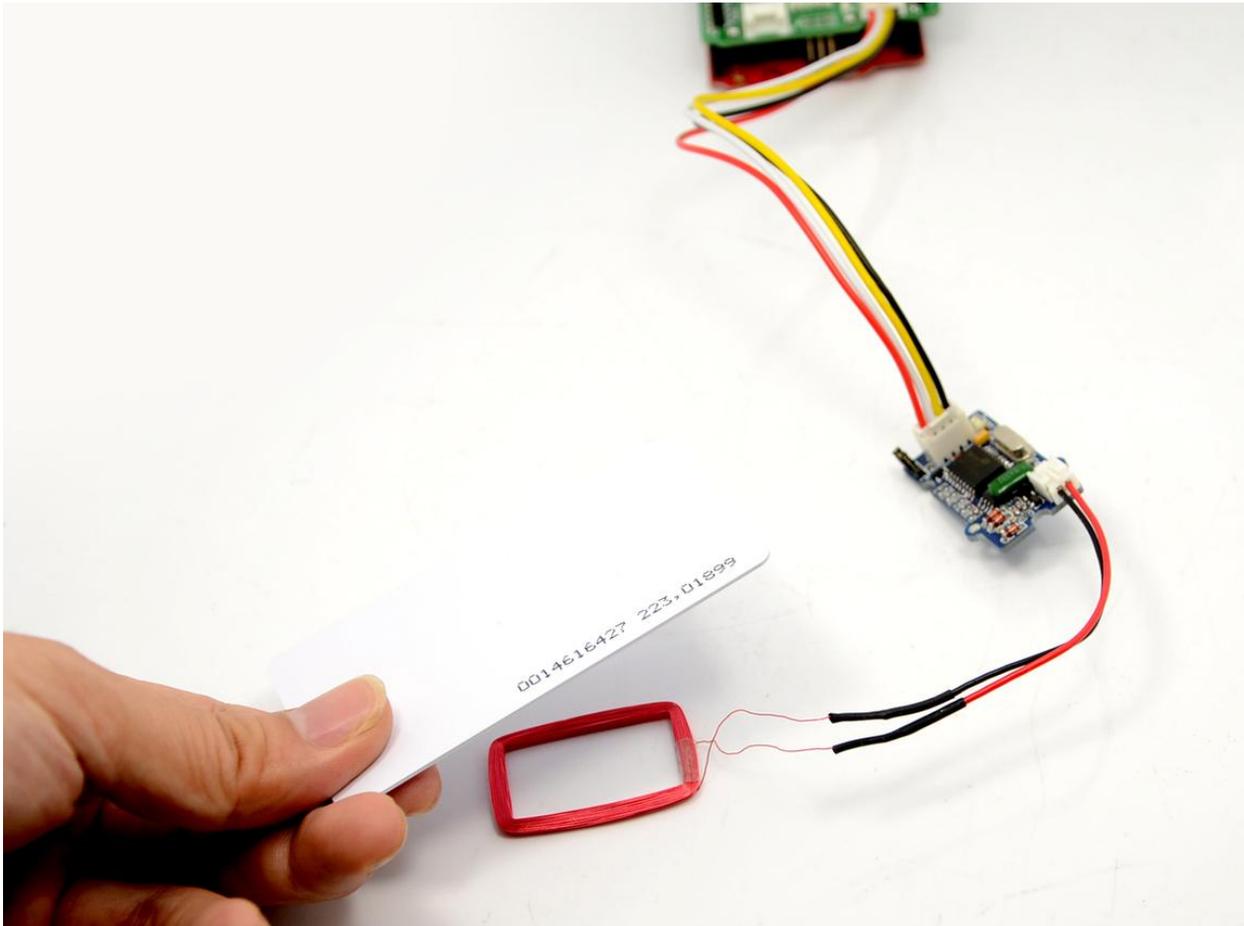
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- **Step 2.** Connect Grove - 125KHz RFID Reader to port **D2** of Grove-Base Shield.
- **Step 3.** Plug Grove - Base Shield into Seeeduino.

- **Step 4.** Connect Seeeduino to PC via a USB cable.



Note

If we don't have Grove Base Shield, We also can directly connect Grove_Ultrasonic_Ranger to Seeeduino as below.

5V	Red
GND	Black
D3	White
D2	Yellow

Software

- **Step 1.** Copy the code into Arduino IDE and upload. If you do not know how to upload the code, please check [how to upload code](#).

/*

link between the computer and the SoftSerial Shield
at 9600 bps 8-N-1
Computer is connected to Hardware UART

SoftSerial Shield is connected to the Software UART:D2&D3
*/

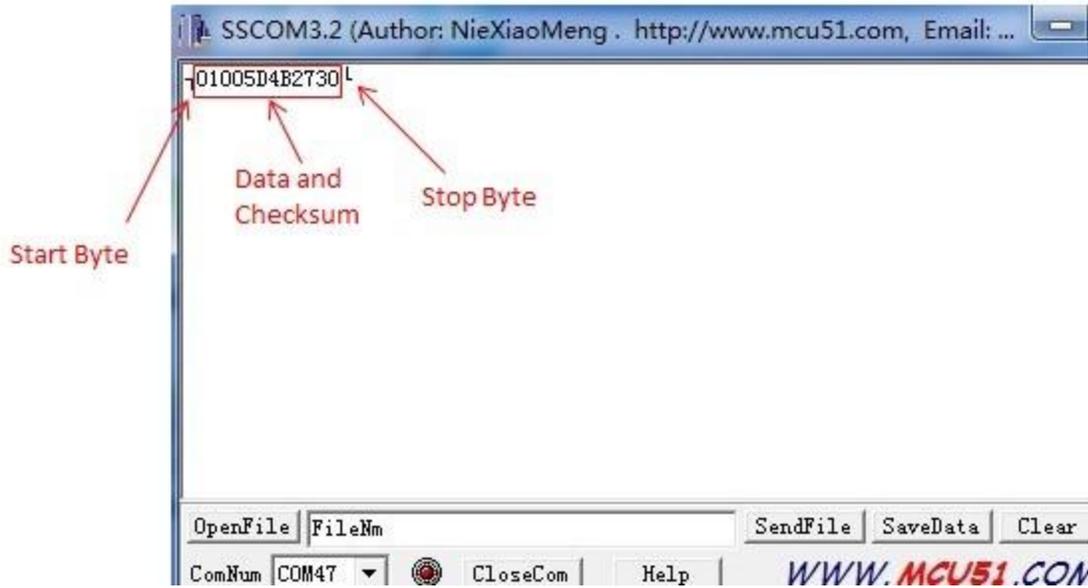
```
#include <SoftwareSerial.h>
```

```
SoftwareSerial SoftSerial(2, 3);  
unsigned char buffer[64]; // buffer array for data receive over serial port  
int count = 0; // counter for buffer array
```

```
void setup()  
{  
  SoftSerial.begin(9600); // the SoftSerial baud rate  
  Serial.begin(9600); // the Serial port of Arduino baud rate.  
}
```

```
void loop()  
{  
  // if date is coming from software serial port ==> data is coming from SoftSerial shield  
  if (SoftSerial.available())  
  {  
    while(SoftSerial.available()) // reading data into char array  
    {  
      buffer[count++] = SoftSerial.read(); // writing data into array  
      if(count == 64)break;  
    }  
    Serial.write(buffer, count); // if no data transmission ends, write buffer to hardware serial port  
    clearBufferArray(); // call clearBufferArray function to clear the stored data from the array  
    count = 0; // set counter of while loop to zero  
  }  
  if (Serial.available()) // if data is available on hardware serial port ==> data is coming from PC  
  or notebook  
  SoftSerial.write(Serial.read()); // write it to the SoftSerial shield  
  }  
  void clearBufferArray() // function to clear buffer array  
  {  
    // clear all index of array with command NULL  
    for (int i=0; i<count; i++)  
    {  
      buffer[i]=NULL;  
    }  
  }
```

- **Step 2.** Open the Serial Monitor, the card information can be displayed as shown below:



Wiegand Mode

(Jumper Set to the Right two Pins) You would need to select the jumper to "W" to enter this mode. The [Wiegand demo code](#) for Seeeduino is designed to read Wiegand data in interrupt mode.

In Wiegand Mode, output data is formatted with 26bits including 24bits card info and 2 bits parity.

bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
-	PE	D														
-	-	E													0	
-	-	D2[7..0]							D1[7..0]							

- PE is even bit, PO is odd bit;
- E is the data bit which was involved in even, O is the data bit which was involved in odd;
- DX[7..0] is the data bit which correspond to Mifare@ Standard & Light card read only ID;

FAQs

Q1: How to convert the output to Card Number?

A1: Please follow below steps.

- Take ID: 0009776930 for example:

- Card Number ID: 0009776930 ----- Decimalism [Start Bit(00) + Card Number(8 numbers)]
- Output: 0700952F229F ----- Hex [[Start Bit(07h) + Card Number(8 numbers) + Checksum]
- The calculator for decimal and hex numbers is available online.

Q2: How to read tags continuously?

A2: The RFID reader can read tags continuously without any setting. Keep the tag 2.5-4 cm from the antenna, and the reader can read data continuously. And if the distance is below 2.5cm, the reader reads data once if not moving tags away.

Resources

- **[Demo]** [Grove - 125KHz RFID Reader Demo](#)
- **[PDF]** [Declaration of conformity](#)
- **[PDF]** [Test Report](#)