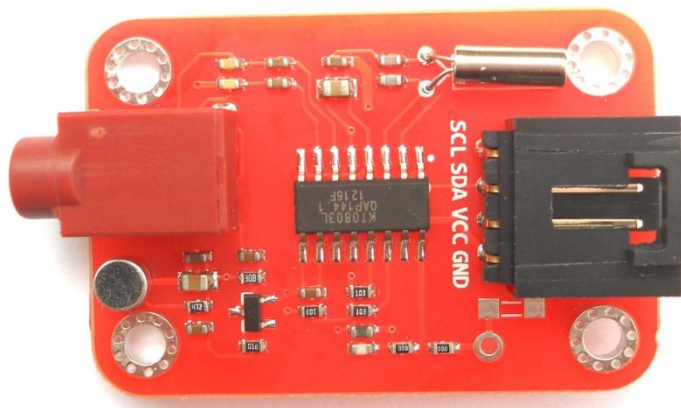


# FM Radio Transmitter Module Manual

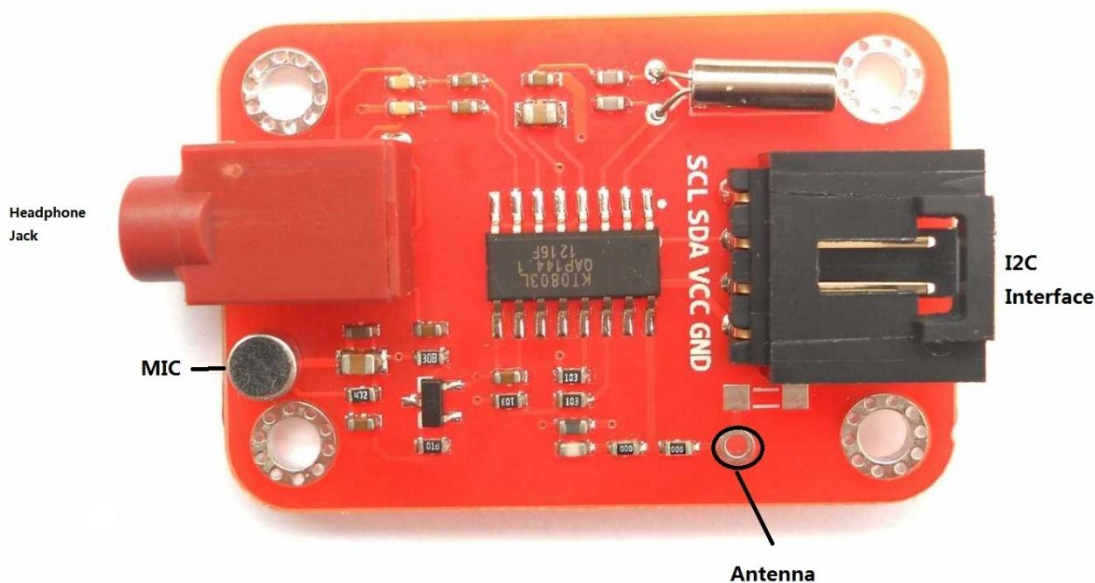
## Introduction

It would be cool to build a radio station yourself. Think about it. You build a small Radio station in your house and share your music with others. Pretty cool, right?

This module could modulate your voice on the FM radio. And if you have a radio device, you could receive it. This module communicates with Arduino or other MCU through I2C interface. All commands are sent through I2C interface. We also create a library for Arduino to control it.



## Interface



The anti-reverse 4pin header is I2C interface. And the headphone jack is the red one, through which you could input the audio signal. Beside the jack, there is a small MIC. You could speak to it and your voice will be modulated on FM radio.

## I2C

VCC is 5V. TTL level of I2C interface is also 5V. With anti-reverse header, never have to worry about connecting in the wrong way if you have [4pin anti-reverse cable](#).

## Headphone Jack

Standard 3.5mm earphone jack. Audio could be input through this jack. Along this product, the recording line will come. You could plug one head into this jack and another into your MP3 player.

## Antenna

On the picture, the hole marked with Antenna is where you connect or solder the antenna. Any metal line could serve as an antenna. Here is an instruction on [how to calculate the length antenna](#). Theoretically the antenna length for 100Mhz is 75cm.

On this module, we don't connect antenna on other components. External antenna is a necessity. You have to connect an antenna to the pad.

In the test we made a very simple antenna:

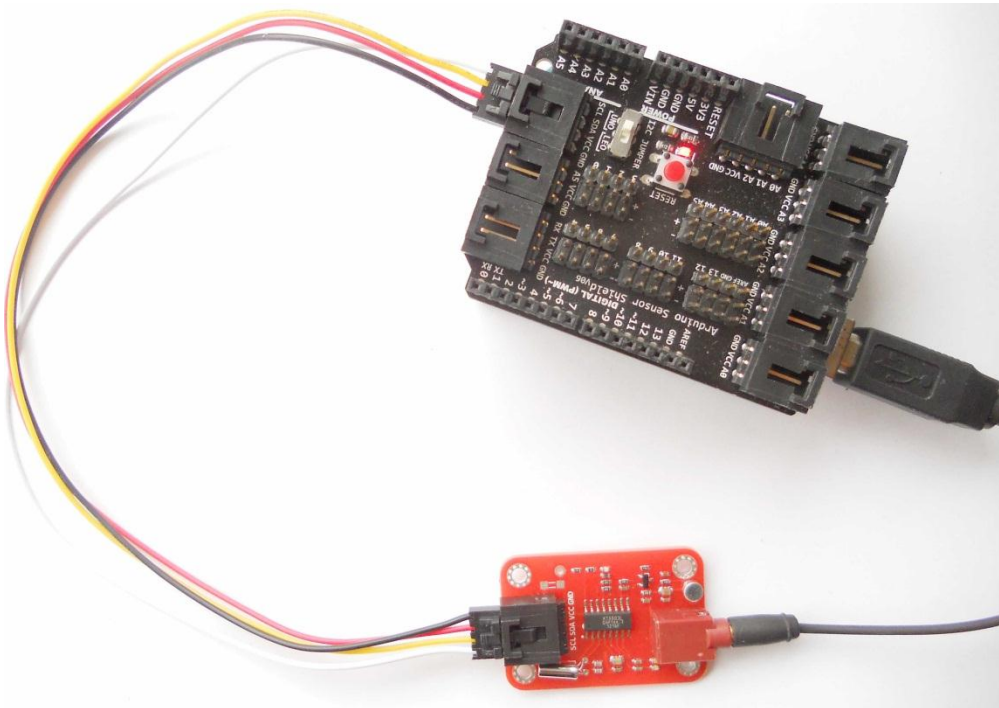


## MIC

If no headphone or recording line is plugged into the jack, this MIC works. You could speak to it. Plugging in headphone into the jack will disable this MIC.

## Connection

If you have our [Arduino Sensor Shield V6](#), you could plug and play as the following picture:



If you don't have sensor shield, you could wire them in the following way:

Arduino		Tmp006 Module
GND	-----	GND
5V	-----	VCC
SDA	-----	SDA
SCL	-----	SCL

## Code

Click here to [download the library](#).

```
#include <FMTX.h>

float fm_freq = 90; // Here set the default FM frequency
void setup(void)
{
    Serial.begin(9600);
    Serial.print("FM-TX Demo\r\n");
    /**
    Initial, set FM channel and select your area:
    USA
    EUROPE
    JAPAN
    AUSTRALIA
    CHINA
    */
    fmtx_init(fm_freq, USA);
    Serial.print("Channel:");
    Serial.print(fm_freq, 1);
    Serial.println("MHz");
}

void loop(void)
{
    /** check for data setting new frequency. Users could input data from Serial monitor. Data
```

must start with '&' and followed by 4 numbers, such as &8000. The first 3 numbers is the integer part (Unit: MHz), and the last one is the decimal part. And the channel must between 70MHz and 108MHz. For example, &0756 is 75.6MHz, and &0666 is out of range.

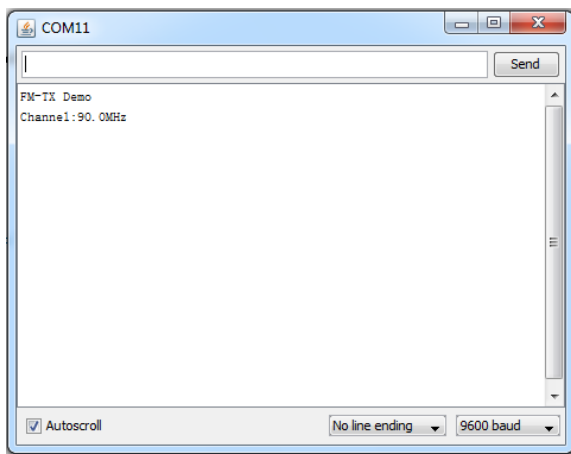
```

*/
if(Serial.available()){
  switch(Serial.read()){
    case '&':
      u8 i,buf[4];
      float ch;
      i=0;
      delay(30);
      while(Serial.available()&&i<4){
        buf[i]=Serial.read();
        if (buf[i]<= '9' && buf[i]>= '0') {
          i++;
        }
        else{
          i=0;
          break;
        }
      }
      if (i==4){
        ch = (buf[0]-'0')*100+(buf[1]-'0')*10+(buf[2]-'0')*1+0.1*(buf[3]-'0');
        if(ch>=70&&ch<=108){
          Serial.print("New Channel:");
          Serial.print(ch, 1);
          Serial.println("MHz");
          fmtx_set_freq(ch);
        }else{
          Serial.println("ERROR:Channel must be range from 70Mhz to 108Mhz.");
        }
      }else{
        Serial.println("ERROR:Input Format Error.");
      }
    }

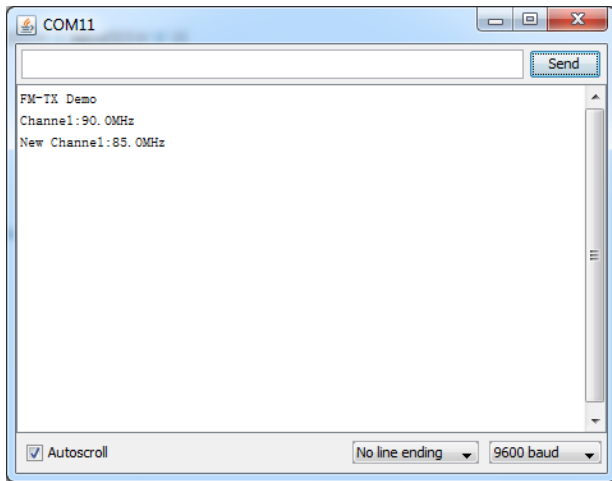
    while(Serial.available()){
      Serial.read();
    }
    break;
  }
}
}
}

```

Upload the code to Arduino and open Serial Monitor:



Then you could input data through Serial Monitor to change the frequency. To change the frequency to 85.0MHZ, I send &0850:



Then turn out your radio device and listen to FM 85.0Mhz. You could hear your own station.

### Warn

In most countries, it is illegal to build personal radio station if your radio station signal covers a large area. Without any external amplifier and with our simple antenna, this module could transmit about 50m in open area. We test it in a building. And we adjust the module's antenna and location to make sure it would not interfere with neighbors.

### Useful Link

- [Library for Arduino](#)
- [Datasheet](#)
- [Schematic and Dimension in PDF](#)

### Where to buy

[FM Transmitter Module -- build radio station](#)

### Disclaimer and Revisions

The information in this document may change without notice. If you have any problem about it, please visit [www.elechouse.com](http://www.elechouse.com) or email to

Revision History

Rev.	Date	Author	Description
A	Oct. 31 <sup>st</sup> , 2012	Wilson	Initial version