

TFmini-Plus 在 Arduino 上的开发例程

本例程以 Arduino Uno 和 DUE 板作为示例，主要帮助客户快速熟悉我公司雷达，减少产品的研发周期。

关于 Arduino 的详细介绍请参考以下网站：

英文官网：www.arduino.cc

步骤一：硬件连接

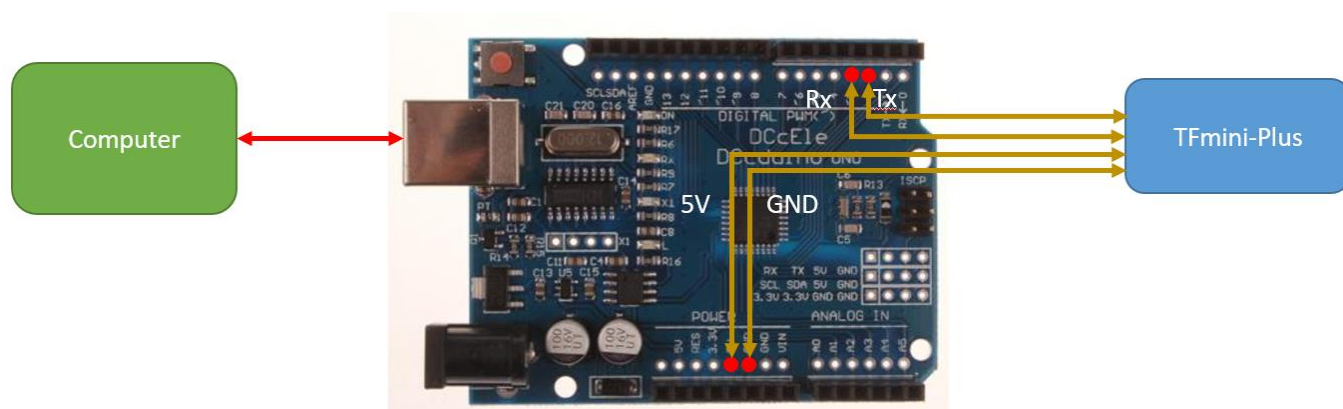


图 1 TFmini-Plus 与 Uno 板的接线图

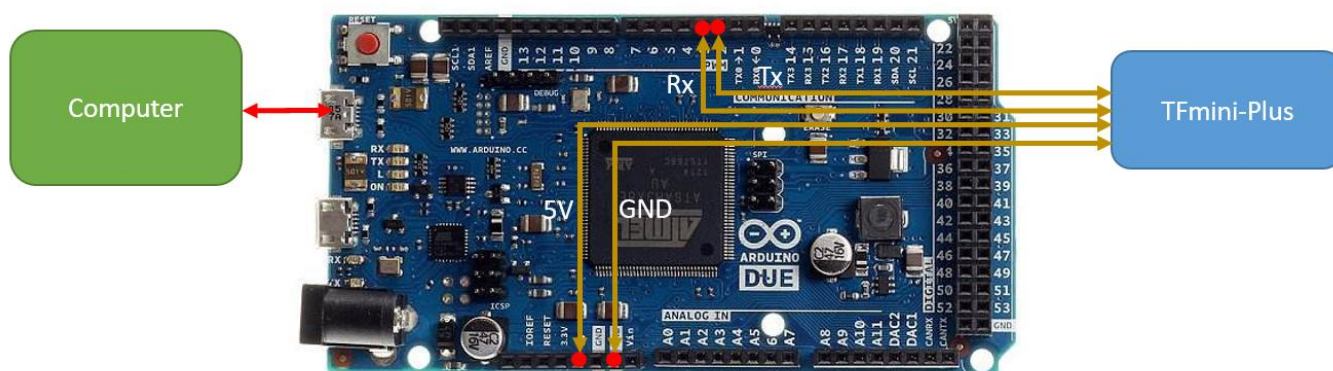


图 2 TFmini-Plus 与 DUE 板的接线图

步骤二：程序编写

该例程功能的实现至少需要 Arduino 的两个串口，一个接收雷达的数据，一个用于将数据输出到电脑端显示出来。可以复制以下代码粘贴到 IDE 程序编辑窗口，也可直接打开相应附件文件。

```
/*  
  
  This program is the interpretation routine of standard output protocol of TFmini-Plus product  
  on Arduino.  
  
  For details, refer to Product Specifications.  
  
  For Arduino boards with only one serial port like UNO board, the function of software visual  
  serial port is to be used.  
  
*/  
  
#include <SoftwareSerial.h> //header file of software serial port  
  
SoftwareSerial Serial1(2,3); //define software serial port name as Serial1 and define pin2 as RX and  
pin3 as TX  
  
/* For Arduinoboard with multiple serial ports like DUEboard, interpret above two pieces of code  
and directly use Serial1 serial port*/  
  
int dist; //actual distance measurements of LiDAR  
  
int strength; //signal strength of LiDAR  
  
float temprature;  
  
int check; //save check value  
  
int i;  
  
int uart[9]; //save data measured by LiDAR  
  
const int HEADER=0x59; //frame header of data package  
  
void setup() {  
  
  Serial.begin(9600); //set bit rate of serial port connecting Arduino with computer  
  
  Serial1.begin(115200); //set bit rate of serial port connecting LiDAR with Arduino  
  
}  
  
void loop() {  
  
  if (Serial1.available()) { //check if serial port has data input
```



```
if(Serial1.read() == HEADER) { //assess data package frame header 0x59
    uart[0]=HEADER;

    if (Serial1.read() == HEADER) { //assess data package frame header 0x59
        uart[1] = HEADER;
        for (i = 2; i < 9; i++) { //save data in array
            uart[i] = Serial1.read();
        }
        check = uart[0] + uart[1] + uart[2] + uart[3] + uart[4] + uart[5] + uart[6] + uart[7];
        if (uart[8] == (check & 0xff)){ //verify the received data as per protocol
            dist = uart[2] + uart[3] * 256; //calculate distance value
            strength = uart[4] + uart[5] * 256; //calculate signal strength value
            temprature = uart[6] + uart[7] *256;//calculate chip temprature
            temprature = temprature/8 - 256;
            Serial.print("dist = ");
            Serial.print(dist); //output measure distance value of LiDAR
            Serial.print('\t');
            Serial.print("strength = ");
            Serial.print(strength); //output signal strength value
            Serial.print("\t Chip Temprature = ");
            Serial.print(temprature);
            Serial.println(" celcius degree"); //output chip temperature of Lidar
        }
    }
}
}
```



步骤 3：数据查看

将程序下载到 Arduino 板, 打开串口监视器, 即可看到雷达实时探测的距离值和相应的信号强度, 如图 3:



```
dist = 90      strength = 1341  temprature = 34.00 celcius degree
dist = 91      strength = 1290  temprature = 34.00 celcius degree
dist = 90      strength = 1281  temprature = 34.00 celcius degree
dist = 90      strength = 1276  temprature = 34.00 celcius degree
dist = 91      strength = 1268  temprature = 34.00 celcius degree
dist = 86      strength = 4550  temprature = 34.00 celcius degree
dist = 87      strength = 4619  temprature = 34.00 celcius degree
dist = 83      strength = 4242  temprature = 34.00 celcius degree
dist = 81      strength = 4164  temprature = 34.00 celcius degree
dist = 80      strength = 4081  temprature = 34.00 celcius degree
dist = 78      strength = 3988  temprature = 34.75 celcius degree
dist = 74      strength = 3775  temprature = 34.50 celcius degree
dist = 63      strength = 3012  temprature = 35.00 celcius degree
dist = 58      strength = 2316  temprature = 35.00 celcius degree
dist = 58      strength = 2621  temprature = 35.00 celcius degree
dist = 58      strength = 2600  temprature = 35.00 celcius degree
dist = 58      strength = 2524  temprature = 35.00 celcius degree
dist = 58      strength = 2511  temprature = 35.00 celcius degree
dist = 59      strength = 2807  temprature = 35.00 celcius degree
```

图 3 雷达数据在串口监视器上的显示

另外也可以在串口绘图器上查看数据曲线, 但是要把上述有关串口打印的代码修改一下:

```
//Serial.print("dist = ");
Serial.print(dist); //output measure distance value of LiDAR
Serial.print(" ");
//Serial.print("strength = ");
Serial.print(strength); //output signal strength value
//Serial.print("\t Chip Temperature = ");
Serial.print(" ");
Serial.print(temprature);
Serial.println();
```

```
//Serial.println(" celcius degree");
```

重新编译下载到 Arduino 板, 打开串口绘图器即可看到代表 distance, strength 和 temperature 的三条曲线, 如图 4 所示:

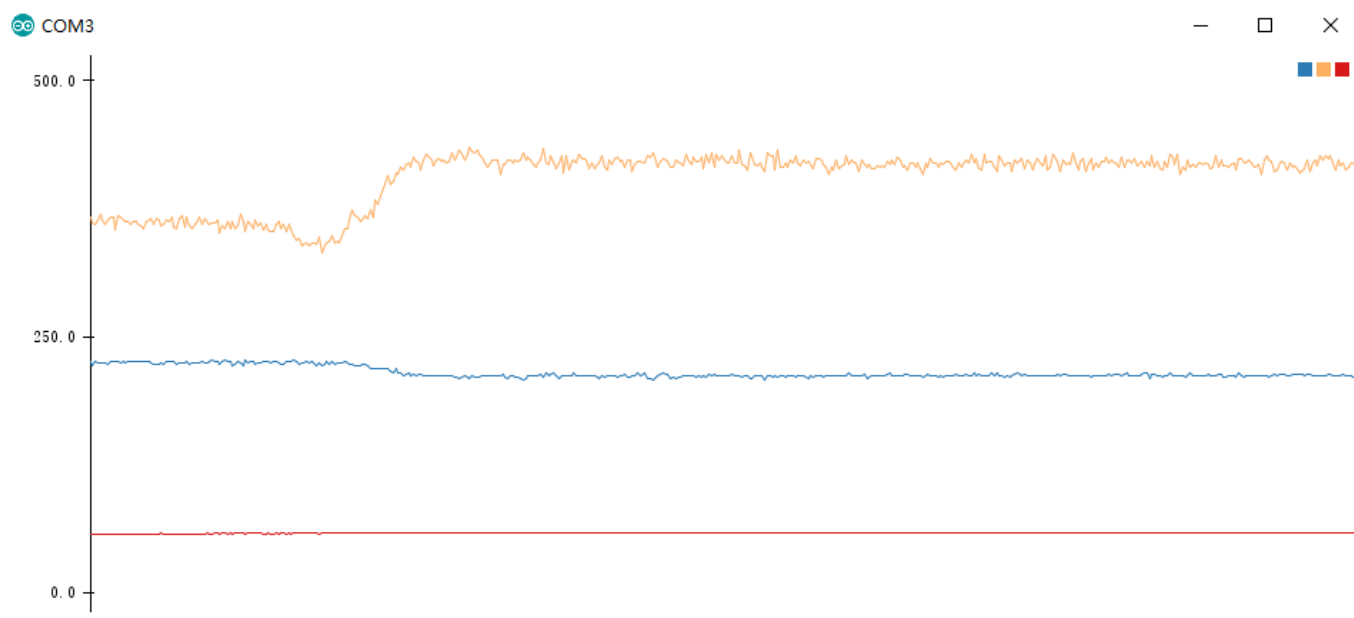


图 4 雷达数据在串口绘图器上的图像

