

## SKU:SEN0413 (<https://www.dfrobot.com/product-2281.html>)

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(<https://www.dfrobot.com/product-2281.html>)

### Introduction

This is a low-cost single-point TOF (Time of Flight) IR distance sensor for short-to-medium range distance measurement within 0.2m~12m. It adopts 850nm LED light source and unique designs of optical system, structure, and circuit. The integrated filtering algorithm could greatly reduce the measurement noise. The ranging module supports both I2C and UART communication, easy to be integrated into end products. Besides, it offers single passive measurement and continuous active measurement for meeting various requirements in actual use.



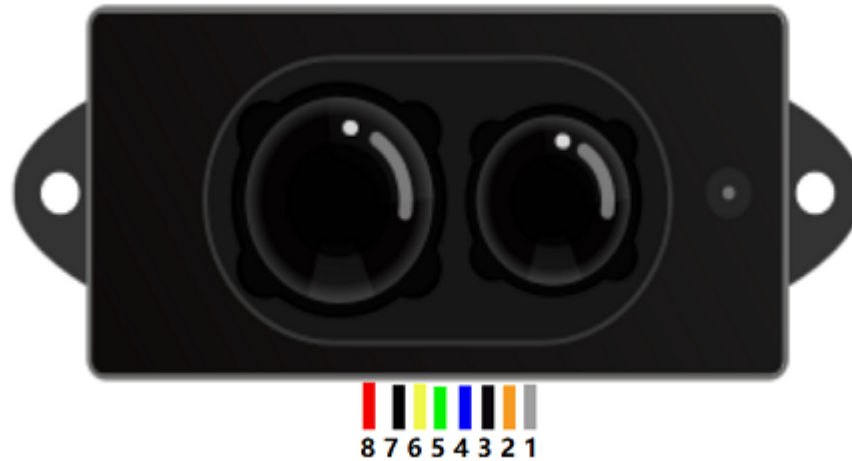
### Specification

- Measurement Range: 0.2m~12m (Indoor 90% reflectivity)
- Power Supply: 4.8-5.2V
- Communication: UART, I2C
- Measuring Accuracy: 20-350cm( $\pm 5$ cm) 351-1200cm( $\pm 1.5\%$ cm)
- Receiving View Angle: half-angle  $1^\circ$
- Transmitting View Angle: half-angle  $2^\circ$
- Minimum Resolution: 1mm
- Test Frame Rate: Max 500Hz
- Ambient Light Immunity: 15Klux
- Exposure Time: 5us-5000us

- Signal Amplitude: 3400LSB-7000LSB
- Operating Temperature: -10°C-60°C

Note: besides all kinds of mainboards, the module can also be directly used on the Host. The related software and tutorials are attached at the end of this page.

## Board Overview



Num	Label	Description
1	SCL	I2C Communication Clock Line
2	SDA	I2C Communication Data Line
3	GND_LED	Light Source Power Supply -
4	VCC_LED	Light Source Power Supply +
5	TX	UART Data transmitting line
6	RX	UART Data receiving line

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Num	Label	Description
7	GND	Module Power Supply -
8	VCC	Module Power Supply +

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## Tutorial

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### Requirements

- **Hardware**
  - DFRduino UNO R3 (<https://www.dfrobot.com/product-838.html>) (or similar) x 1
  - TOF IR Distance Sensor (0.2~12m) x1
  - Sensor Connector
- **Software**
  - Arduino IDE (<https://www.arduino.cc/en/Main/Software>)
  - Download and install the **DFRobot LIDAR07 Library** ([https://github.com/DFRobot/DFRobot\\_LIDAR07](https://github.com/DFRobot/DFRobot_LIDAR07)) (About how to install the library? (<https://www.arduino.cc/en/Guide/Libraries#.UxU8mdzF9H0>))

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# I2C Connection Diagram

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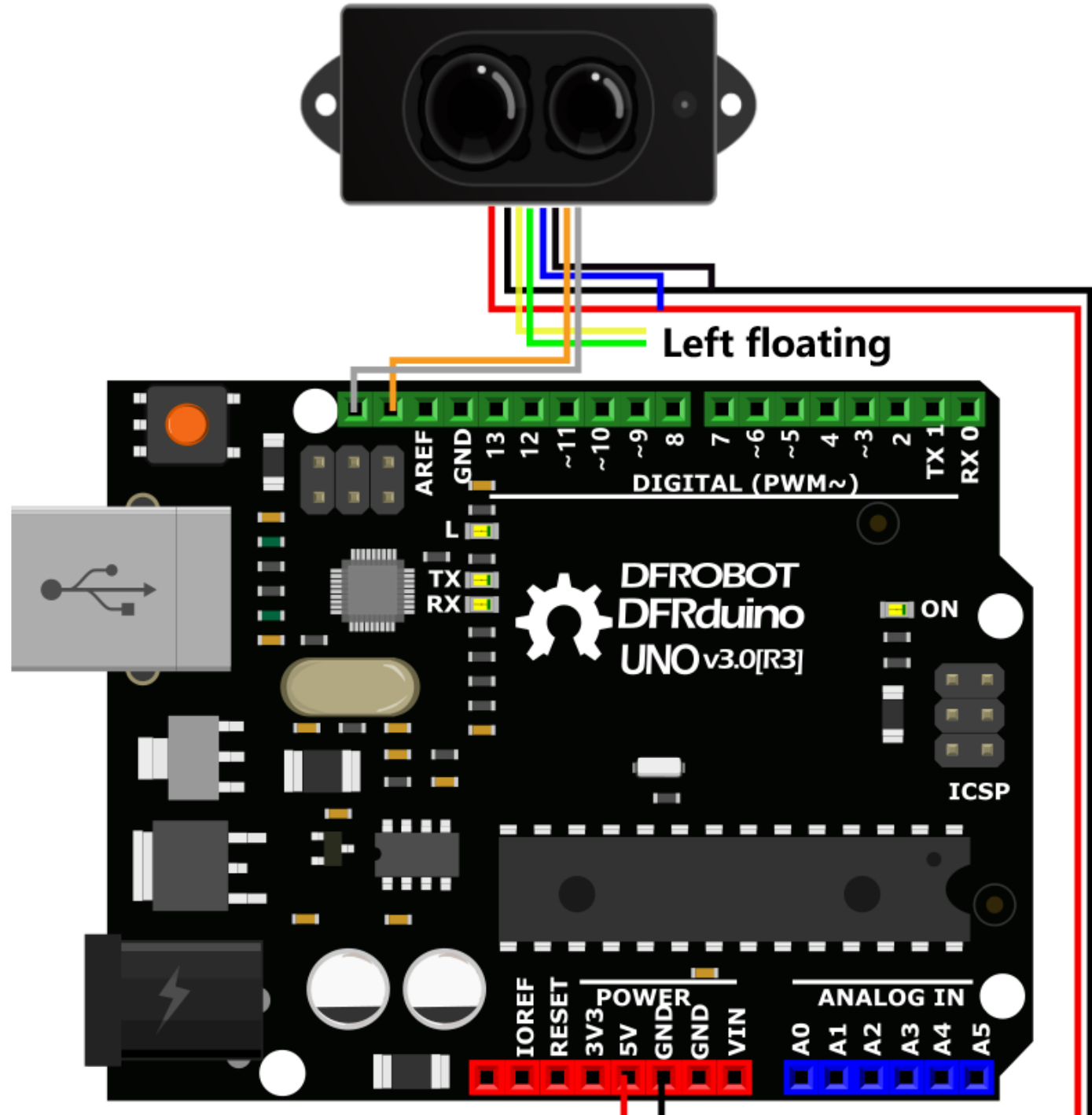
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## Sample Code

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```

/**
 * @file measureDistance.ino
 * @brief This example demonstrated the basic distance measuring function of LIDAR07, the ran
 * @n Connection rules: PIN1-PIN8 are in the front of the sensor from right to left.
 * @n      PIN1-----SCL-----Maincontroller SCL (IIC mode)
 * @n      PIN2-----SDA-----Maincontroller SDA (IIC mode)
 * @n      PIN3-----Light source power supply ground-----Mainco
 * @n      PIN4-----Light source power supply(5V)-----Maincontroller
 * @n      PIN5-----TX-----Maincontroller RX pin, which
 * @n      PIN6-----RX-----Maincontroller TX pin, which
 * @n      PIN7-----Module main power supply ground-----Maincontr
 * @n      PIN8-----Module main power supply(5V)-----Maincontroller VCC
 * @copyright Copyright (c) 2010 DFRobot Co.Ltd (http://www.dfrobot.com)
 * @licence The MIT License (MIT)
 * @author [yangfeng]<feng.yang@dfrobot.com>
 * @version V1.0
 * @date 2021-04-16
 * @get from https://www.dfrobot.com
 * @url https://github.com/DFRobot/DFRobot_LIDAR07
 */
#include"DFRobot_LIDAR07.h"

//If using IIC mode, please enable macro USE_IIC
//#define USE_IIC
#ifdef USE_IIC
DFROBOT_LIDAR07_IIC LIDAR07;
#endif

//If using UART mode, please enable macro USE_UART. The USE_UART is enabled by default. The t
#define USE_UART
#ifdef USE_UART

#if defined(ESP8266)||defined(ARDUINO_AVR_UNO)

```

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>

```
#include <SoftwareSerial.h>
SoftwareSerial mySerial(4,12); //GPI04 is corresponding to RX on main control board, GPI012 is TX
/**
 * The TX of esp32 Serial1 is GPI010, and the RX is GPI09
 * The TX of mega2560 Serial1 is GPI018, and the RX is GPI019
 * The TX of M0 Serial1 is GPI01, and the RX is GPI00
 * The TX of leonardo Serial1 is GPI01, and the RX is GPI00
 */
#endif
DFROBOT_LIDAR07_UART LIDAR07;
#endif

void setup() {
  uint32_t version;
  Serial.begin(115200);
#ifdef USE_IIC
  while(!LIDAR07.begin()){
    Serial.println("The sensor returned data validation error");
    delay(1000);
  }
#endif

#ifdef USE_UART
#if defined(ESP8266) || defined(ARDUINO_AVR_UNO)
  mySerial.begin(115200);
  while(!LIDAR07.begin(mySerial)){
    Serial.println("The sensor returned data validation error");
    delay(1000);
  }
#else
  Serial1.begin(115200);
  while(!LIDAR07.begin(Serial1)){
    Serial.println("The sensor returned data validation error");
    delay(1000);
  }
#endif
#endif
}
```



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```
#endif

version = LIDAR07.getVersion();
Serial.print("VERSION: ");
Serial.print((version>>24)&0xFF,HEX);
Serial.print(".");Serial.print((version>>16)&0xFF,HEX);
Serial.print(".");Serial.print((version>>8)&0xFF,HEX);
Serial.print(".");Serial.println((version)&0xFF,HEX);

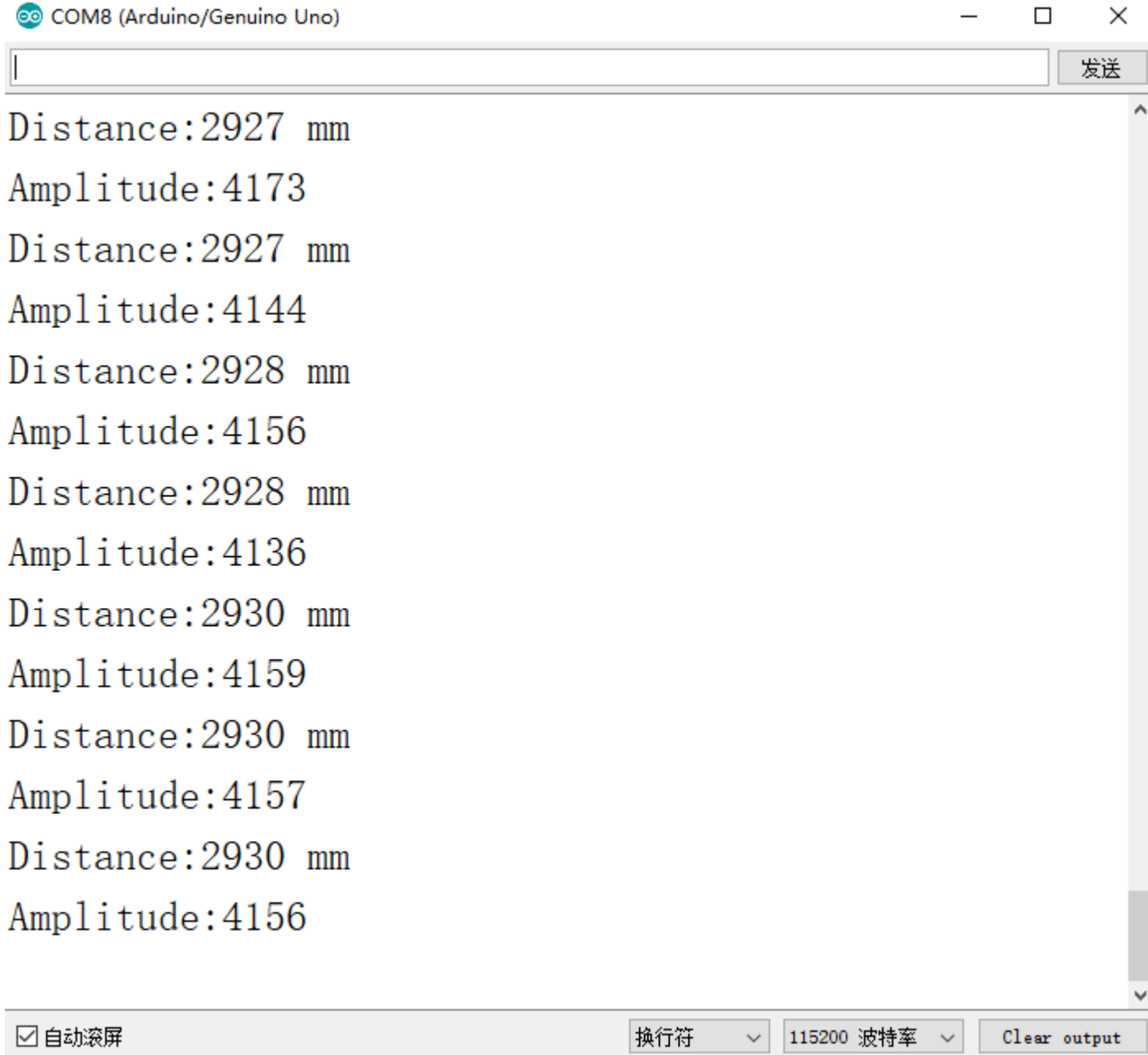
LIDAR07.startFilter(); //After enabling the filter, it can be stopped by calling LIDAR07.s
}

void loop() {
  int errinfo;
  while(!LIDAR07.startMeasure()){
    Serial.println("Incorrect data was returned");
    delay(1000);
  }
  Serial.print("Distance:");Serial.print(LIDAR07.getDistanceMM());Serial.println(" mm");
  Serial.print("Amplitude:");Serial.println(LIDAR07.getSignalAmplitude());
  delay(1000);
}
```

&gt;

## Expected Results

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The screenshot shows a serial monitor window titled "COM8 (Arduino/Genuino Uno)". The window contains a text input field at the top with a "发送" (Send) button. Below the input field, the serial output displays the following data in a monospaced font:

```
Distance:2927 mm
Amplitude:4173
Distance:2927 mm
Amplitude:4144
Distance:2928 mm
Amplitude:4156
Distance:2928 mm
Amplitude:4136
Distance:2930 mm
Amplitude:4159
Distance:2930 mm
Amplitude:4157
Distance:2930 mm
Amplitude:4156
```

At the bottom of the window, there are several controls: a checked checkbox for "自动滚屏" (Auto scroll), a dropdown menu for "换行符" (Line feed) set to "\n", a dropdown menu for "波特率" (Baud rate) set to "115200", and a "Clear output" button.

## Compatibility

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- I2C

MCU	Work Well	Work Wrong	Untested	Remarks
Arduino UNO	√			
FireBeetle ESP32	√			
FireBeetle ESP8266	√			
FireBeetle M0	√			
Leonardo	√			
Micro:bit		√		Voltage unsupported, large data error
Arduino Mega2560	√			

- UART

MCU	Work Well	Work Wrong	Untested	Remarks
Arduino UNO		√		Unstable when software serial port baud rate is 115200

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MCU	Work Well	Work Wrong	Untested	Remarks
FireBeetle ESP32	√			
FireBeetle ESP8266	√			
FireBeetle M0	√			
Leonardo	√			
Micro:bit				Not support
Arduino Mega2560	√			

## FAQ

For any questions, advice or cool ideas to share, please visit the **DFRobot Forum** (<https://www.dfrobot.com/forum/>).

## More Documents

- LiDAR Specification (<https://dfimg.dfrobot.com/nobody/wiki/1840a7b7b14e02f3566e0cef5b51e9ba.pdf>)
- Host Software (<https://dfimg.dfrobot.com/nobody/wiki/bcaba0f8e215104f0e2d9d8e2b9b7741.rar>)
- Software Manual (<https://dfimg.dfrobot.com/nobody/wiki/248b12f271cb22daaa2b07c2b2cfe7c7.pdf>)

 [DFshopping\\_car1.png Get TOF IR Distance Sensor \(0.2~12m\)](https://www.dfrobot.com/product-2281.html) (<https://www.dfrobot.com/product-2281.html>) from DFRobot Store or **DFRobot Distributor**. (<https://www.dfrobot.com/distributor>)

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