



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





## Infrared CO2 Sensor 0-50000ppm SKU: SEN0220



### Introduction

DFRobot released its latest wide range infrared CO2 sensor, which effective range is up to 0~50000ppm. This sensor is based on non-dispersive infrared (NDIR) technology and has good selectivity and oxygen-free dependency. It integrates temperature compensation and support UART communication mode. Most importantly, the product is easy to use; it is compatible with all types of microcontrollers with UART port, like Arduino, Raspberry Pi and other microcontrollers. Besides, it has a long service life, up to 5 years!

In addition, this UART Infrared CO2 Sensor is a high-performance sensor that combines technology of mature infrared absorption gas detection with precision optical circuit design as well as sophisticated circuit design. It has characteristics such as wide range detection, high sensitivity, high resolution, low power consumption, fast response, anti-water vapor interference, no poisoning, high stability and long life.

It can be widely used in HVAC refrigeration and indoor air quality monitoring, industrial process and safety monitoring, agricultural and animal husbandry production process monitoring, etc..

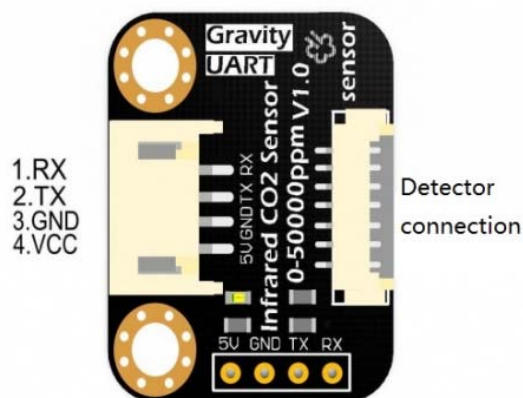
## Feature

- Wide Range
- High Sensitivity
- Low power consumption
- Excellent stability
- Temperature compensation
- Excellent linear output
- High cycle life
- Anti-water vapor interference
- No poisoning
- Need 5V power supply, even you are using a 3.3V microcontroller, like Genuino 101/ Raspberry Pi or anything else.

## Specification

- Gas Detection: Carbon Dioxide (CO<sub>2</sub>)
- Operating Voltage: 4.5 ~ 5.5V DC
- Average Current: <85mA
- Output Signal: UART/PWM/Analog output (the last two has not been developed)
- Measuring Range: 0 ~ 50000ppm
- Accuracy:  $\pm (50\text{ppm} + 5\% \text{ reading})$
- Preheating Time: 3min
- Response Time: T<sub>90</sub> < 30s
- Operating Temperature: 0 ~ 50 °C
- Operating Humidity: 0 ~ 95% RH (no condensation)
- Service Life: >5 years
- Board Dimension: 21 \* 27.11 mm/ 0.83 \* 1.06 inches
- Weight: 42 g

## Board Overview



SEN0220 CO<sub>2</sub> Sensor



Num	Label	Description
1	RX	RX
2	TX	TX
3	GND	GND
4	VCC	VCC
5	Detector connection	Detector connection

## Tutorial

Upload the code to Arduino Uno, open the serial monitor to check the CO2 concentration.

**NOTE:** The CO2 concentration during the preheating time in the serial monitor is not accurate, just ignore the result in the first 3 minutes (Preheating Time).

### Requirements

- **Hardware**

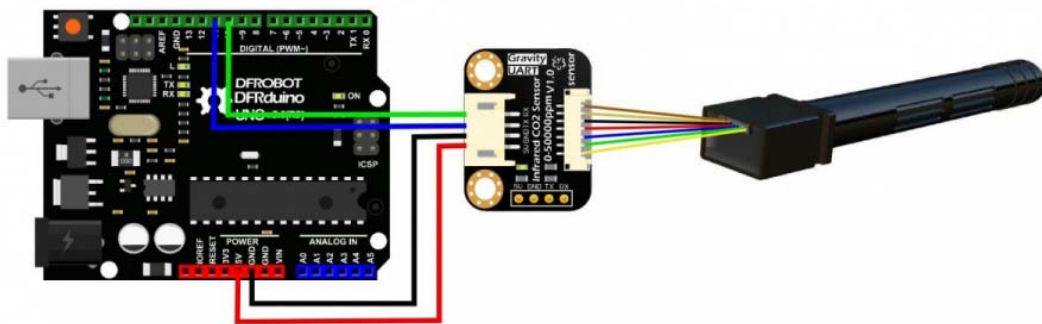
DFRduino UNO x 1

- Gravity UART Infrared CO2 Sensor  
DuPont cables

- **Software**

Arduino IDE [Click to Download Arduino IDE from Arduino®](https://www.arduino.cc/en/Main/Software%7C)  
<https://www.arduino.cc/en/Main/Software%7C>

### Connection Diagram



SEN0220\_Connection

## Sample Code

```
/******  
* Infrared CO2 Sensor 0-50000ppm(Wide Range)  
* *****  
* The follow example is used to detect CO2 concentration.  
  
* @author lg.gang(lg.gang@qq.com)  
* @version V1.0  
* @date 2016-6-6  
  
* GNU Lesser General Public License.  
* See <http://www.gnu.org/licenses/> for details.  
* All above must be included in any redistribution  
* *****/  
#include <SoftwareSerial.h>  
SoftwareSerial mySerial(10, 11); // RX, TX  
unsigned char hexdata[9] = {0xFF,0x01,0x86,0x00,0x00,0x00,0x00,0x00,0x79};  
//Read the gas density command /Don't change the order  
void setup() {  
  
    Serial.begin(9600);  
    while (!Serial) {  
  
    }  
    mySerial.begin(9600);  
  
}  
  
void loop() {  
    mySerial.write(hexdata,9);  
    delay(500);  
  
    for(int i=0,j=0;i<9;i++)
```

```
{
  if (mySerial.available()>0)
  {
    long hi,lo,CO2;
    int ch=mySerial.read();

    if(i==2){      hi=ch;    } //High concentration
    if(i==3){      lo=ch;    } //Low concentration
    if(i==8) {
      CO2=hi*256+lo; //CO2 concentration
      Serial.print("CO2 concentration: ");
      Serial.print(CO2);
      Serial.println("ppm");
    }

  }

}

}
```

## Expected Results

Open your IDE serial monitor and wait for about 3 minutes (preheat process), then you'll see the final data. (Indoor Temperature: 25°C)

