

Gravity: Capacitive Fingerprint Sensor

Overview

This is a capacitive fingerprint sensor with fingerprint collecting, processing, storing, and comparison integrated all-in-one. Taking ID809 high-performance processor and semiconductor fingerprint sensor as the core, the sensor is equipped with built-in IDfingerprint6.0 fingerprint algorithms that enable it to complete all the fingerprint recognition independently. When working with our Arduino Library, it is able to realize functions like fingerprint registration, fingerprint deletion, etc. Also, we provide upper computer software that helps users to operate this sensor.

This fingerprint sensor comes with round breathing LEDs and has a simple structure, small size, and delicate appearance. The sensor offers fast recognition speed and high security. What's more, it supports 360-degree arbitrary angle recognition and deep self-learning function, high performance and low power consumption.



Order Code

Order Code	Brand	Description
E37004-001	DFRobot	Gravity: Capacitive Fingerprint Sensor

Gravity: Capacitive Fingerprint Sensor



Specification

- Operating Voltage: 3.3V-5V
- Operating Current: <60mA
- Communication: I2C
- Storage Capacity: 80 fingerprints
- 1 : 1 verification time: 300~400ms
- Pixel Resolution: 508dpi
- Number of Pixels: 160x160
- Fingerprint Detection Area: 8.0mm x 8.0mm
- Working Environment: -40-60°C/<RH 90%
- Dimension: diameter 21mm/height 5mm
- Adapter Dimension: 22.5x32mm/0.89x1.26"

Gravity: Capacitive Fingerprint Sensor



Application

- Fingerprint door-lock
- Drawer Lock
- Identity Recognition
- Authorization”

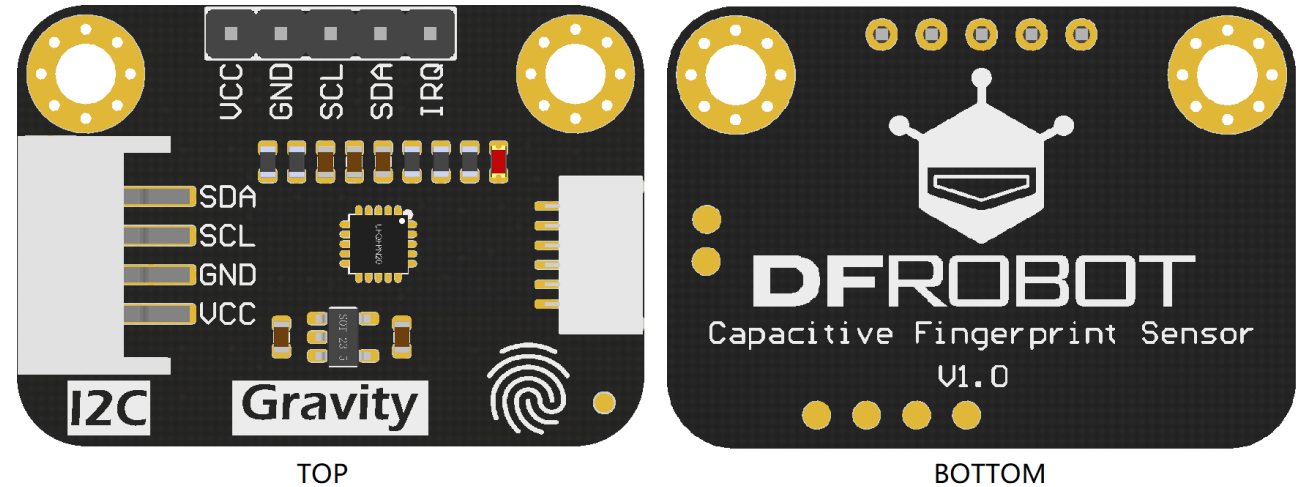
Feature

- 360-degree fingerprint entry and matching
- Self-learning function
- CNC metal ring, plus aperture

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Board Overview

Num	Label	Description
1	VCC	+
2	GND	Ground
3	SCL	I2C Clock line
4	SDA	I2C Data line
5	IRQ	Finger sensing output: active High
6	LED	On board LED only light up when the sensor was touched



The diagram illustrates the wiring for connecting a Gravity I2C module to a DFRobot I/O Expansion Shield V7. The Gravity module's I2C pins are connected to the expansion shield's I2C pins. The motor is connected to the shield's motor pins.

Gravity Module Pin	Expansion Shield Pin	Wiring
VCC	VCC	Red
GND	GND	Black
SCL	SCL	Blue
SDA	SDA	Green
IRQ	TX+	Yellow
	TX-	White
	VCC	Red
	GND	Black

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Tutorial

- [Arduino IDE](#)
- Download and install the [ID809 Library](#). ([About how to install the library?](#))
- [Click here to download API functions](#)
- [Click here to download sample code 1](#)
- Result

A screenshot of a serial monitor window titled 'COM3'. The window has a text input field at the top with a 'Send' button. The main area displays two identical blocks of sensor data, separated by a dashed line. The data includes module ID, security level, baud rate, self-learning function status, serial number, number of registered fingerprints, a list of registered user IDs, and the number of broken fingerprints. At the bottom, there are checkboxes for 'Autoscroll' (checked) and 'Show timestamp' (unchecked), along with dropdown menus for 'Newline' and '9600 baud', and a 'Clear output' button.

```
COM3

Module ID:1
Module security level:3
Module baud rate: 5
Module self-learning function: ON
Module serial number:
Number of registered fingerprints in the module:4
ID list of registered users: 1,2,3,4,
Number of broken fingerprints:0
-----
Module ID:1
Module security level:3
Module baud rate: 5
Module self-learning function: ON
Module serial number:
Number of registered fingerprints in the module:4
ID list of registered users: 1,2,3,4,
Number of broken fingerprints:0
-----

☒ Autoscroll ☐ Show timestamp Newline 9600 baud Clear output
```

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Tutorial

Sample Code 2 - Add Fingerprints

This sample automatically obtains the registrable ID, then collects the fingerprint three times, the yellow light flashes three times successfully. At last, save the fingerprint to the acquired unregistered ID, the green light is on for 1s, and then turns off.

[Click here it to download sample code 2](#)

Result:

A screenshot of a serial terminal window titled 'COM3'. The window has a text input field at the top with a 'Send' button. The main area displays the following text:

```
unregistered ID,ID=5
The fingerprint sampling of the1(th) is being taken
Please press down your finger
Sampling succeeds
Please release your finger
The fingerprint sampling of the2(th) is being taken
Please press down your finger
Sampling succeeds
Please release your finger
The fingerprint sampling of the3(th) is being taken
Please press down your finger
Sampling succeeds
Please release your finger
Saving succeed, ID=5
-----
unregistered ID,ID=6
The fingerprint sampling of the1(th) is being taken
Please press down your finger
```

At the bottom, there are controls: a checked 'Autoscroll' checkbox, an unchecked 'Show timestamp' checkbox, a 'Newline' dropdown menu, a '9600 baud' dropdown menu, and a 'Clear output' button.

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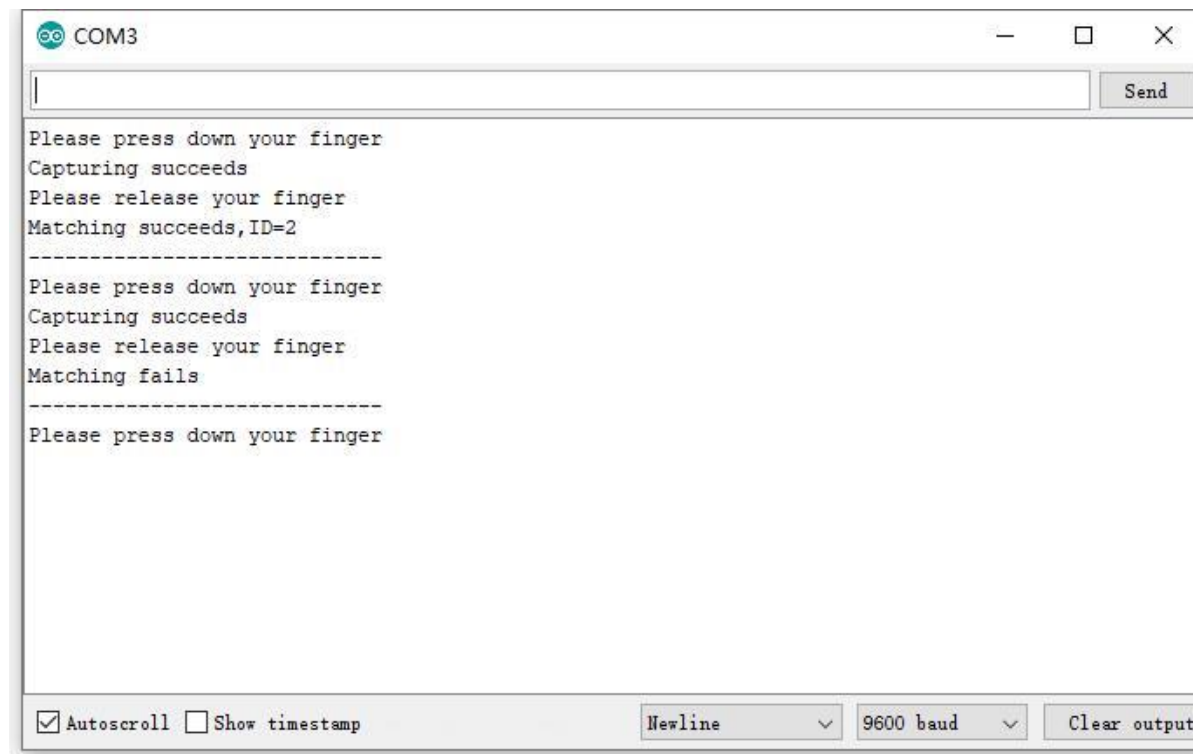
Tutorial

Sample Code 3 - Fingerprint Matching

Collect the fingerprint image and compare it with the fingerprints in the fingerprint library. If the comparison succeeds, the green light will be on and the ID number will be printed. If it fails, the red light will be on and the matching failure will be prompted.

[Click here to download sample code 3](#)

Result



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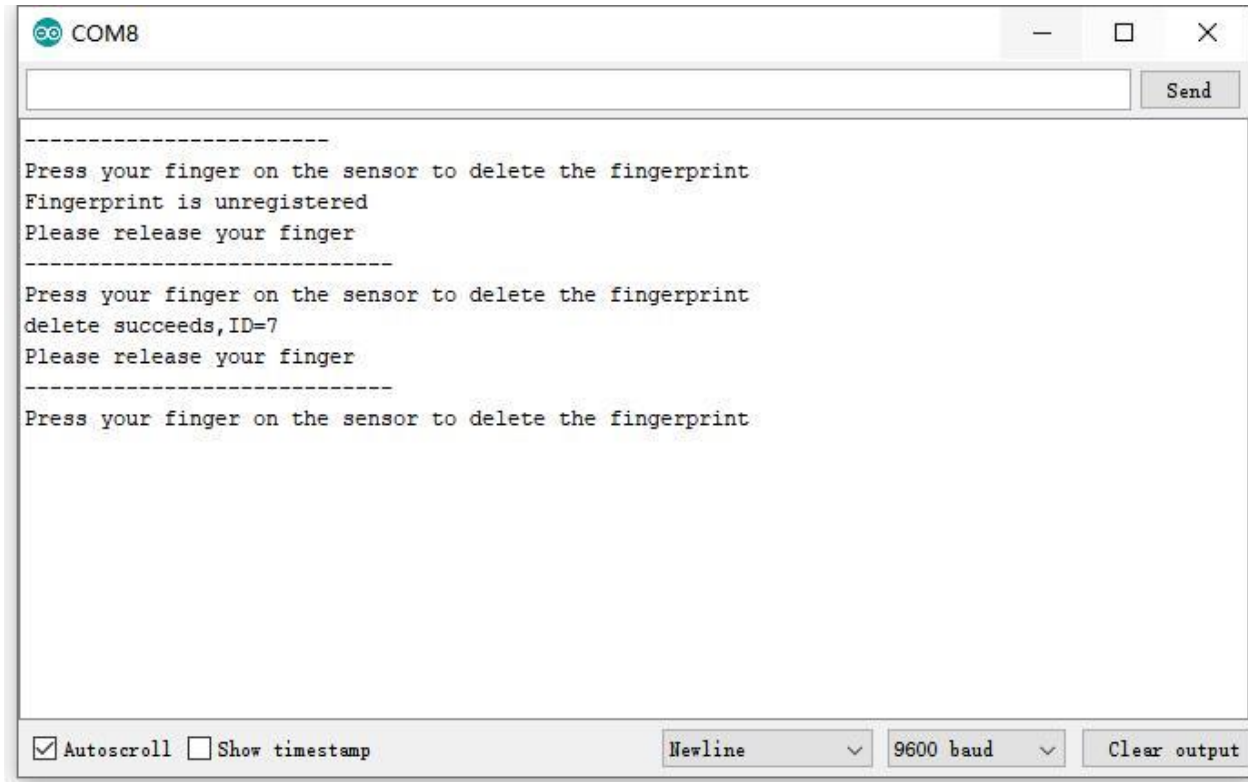
Tutorial

Sample Code 4 - Fingerprint Deletion

Run the codes, press your finger on the sensor to delete your fingerprint.

[Click here to download Sample Code 4](#)

Result

A screenshot of a serial monitor window titled 'COM8'. The window has a text input field at the top with a 'Send' button. The main area displays the following text: '-----', 'Press your finger on the sensor to delete the fingerprint', 'Fingerprint is unregistered', 'Please release your finger', '-----', 'Press your finger on the sensor to delete the fingerprint', 'delete succeeds,ID=7', 'Please release your finger', '-----', 'Press your finger on the sensor to delete the fingerprint'. At the bottom, there are checkboxes for 'Autoscroll' (checked) and 'Show timestamp' (unchecked), followed by dropdown menus for 'Newline' and '9600 baud', and a 'Clear output' button.

```
-----  
Press your finger on the sensor to delete the fingerprint  
Fingerprint is unregistered  
Please release your finger  
-----  
Press your finger on the sensor to delete the fingerprint  
delete succeeds,ID=7  
Please release your finger  
-----  
Press your finger on the sensor to delete the fingerprint
```

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Sample Code 5 - Comprehensive Examples

This example is a comprehensive application of fingerprint module, in which the module will enter into different modes according to the length of finger pressing time. When a finger pressed down, the blue light flashes 3 times to enter the fingerprint comparison mode; the yellow light flashes 3 times to enter the fingerprint registration mode; the red light flashes 3 times to enter the fingerprint deletion mode to delete the fingerprint. This experiment needs to connect IRQ pin to D6.

[Click here to download Sample Code 5](#)

Result:

A screenshot of a serial terminal window titled "COM3". The window has a text input field at the top with a "Send" button. The main area displays the following text:

```
Enter fingerprint comparison mode  
Successfully matched, ID=5  
-----  
Enter fingerprint registration mode  
Unregistered ID, ID=1  
The fingerprint sampling of the1(th) time is being taken  
Please press down your finger  
Capturing succeeds  
Please release your finger  
The fingerprint sampling of the2(th) time is being taken  
Please press down your finger  
Capturing succeeds  
Please release your finger  
The fingerprint sampling of the3(th) time is being taken  
Please press down your finger  
Capturing succeeds  
Please release your finger  
Saving succeed, ID=1  
-----  
Enter fingerprint deletion mode  
deleted fingerprint, ID=5  
-----
```

At the bottom, there are checkboxes for "Autoscroll" (checked) and "Show timestamp" (unchecked), followed by dropdown menus for "Newline" and "9600 baud", and a "Clear output" button.

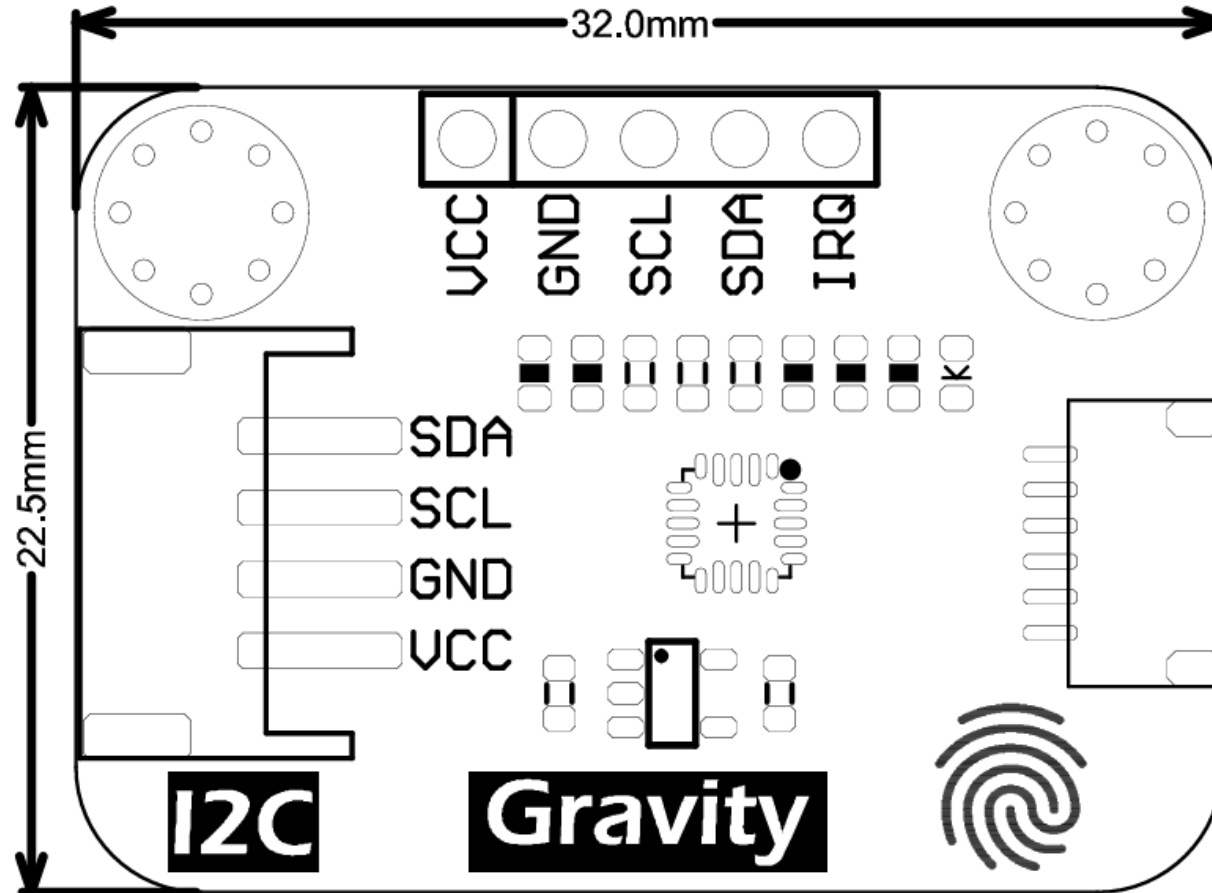
FAQ

Q1: I was able to scan the sensor address using the I2C scanner, but was unable to initialise the sensor after uploading the sample code.

A1: If you installed the library from the Arduino IDE library manager, please remove it completely and download the library from this [GitHub repo](#). And include the .zip library.

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Layout



PCB Information	Name:[SEN0359]V1.0	Thickness: 1.6mm
Engineer:lfwag_CD	Top SolderMask: Black	Bottom SolderMask: Black
Date:20200925	Top Silkscreen: White	Bottom Silkscreen: White

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Revision History

Date	Revision	Change description
30/10/2025	1.0	Initial release