

INDUSTRIAL PRODUCT DATASHEET

Grove - Ultrasonic Distance Sensor

Grove - Ultrasonic Distance Sensor: single-wire ultrasonic ranging from 3cm to 350cm with 3.3V/5V support and plug-and-play Grove connectivity for water tank monitoring, parking assistance, obstacle avoidance, and proximity detection.

SKU

101020010

UPDATED

2026-08-24 03:29:11

PRICE

\$4.50(Excl. VAT)



Overview



The Grove - Ultrasonic Distance Sensor measures distances from 3cm to 350cm using a single GPIO pin and supports both 3.3V and 5V systems for direct connection to Raspberry Pi, Arduino, and Seeed Studio XIAO. It features a Grove plug-and-play connector and includes full documentation and libraries for Arduino, Python, and Codecraft, making it suitable for water tank level monitoring, parking assistance, robot obstacle avoidance, and contactless distance measurement.

Key Features

- **Save GPIO Resources with Single-Wire Communication:** Traditional ultrasonic sensors require separate trigger and echo pins. This module combines both signals into a single GPIO pin, reducing wiring complexity and freeing up I/O resources for other sensors.
- **Wide Measurement Range for Real-World Applications:** Measures distances from 3cm to 350cm, suitable for water tank level monitoring, parking assistance, and robotic obstacle avoidance.
- **Works Directly with 3.3V and 5V Systems:** Compatible with Raspberry Pi, Seeed Studio XIAO, Arduino, and other popular development platforms without requiring external voltage conversion circuits.
- **Grove Plug-and-Play Ecosystem:** Standard Grove connector enables fast, reliable connections with minimal wiring errors during prototyping.
- **Optimized for Rapid Development:** Comprehensive documentation, example code, and libraries help makers, educators, and developers get started quickly.
- **Full documents and libraries provided** for Arduino, Python, and Codecraft

The Grove - Ultrasonic Distance Sensor is an ultrasonic transducer that utilizes ultrasonic waves to measure distance. It can measure from 3cm to 350cm with an accuracy of up to 2mm. It is a perfect ultrasonic module for distance measurement, proximity sensors, and ultrasonic detectors.

This module has an ultrasonic transmitter and an ultrasonic receiver so you can consider it an ultrasonic transceiver. Familiar with sonar, when the 40KHz ultrasonic wave generated by the transmitter encounters the object, the sound wave will be emitted back, and the receiver can receive the reflected ultrasonic wave. It is only necessary to calculate the time from the transmission to the reception, and then multiply the speed of the sound in the air(340 m/s) to calculate the distance from the sensor to the object.

How does the ultrasonic distance sensor work?

Here is a simple example of how an ultrasonic sensor works to measure distance:

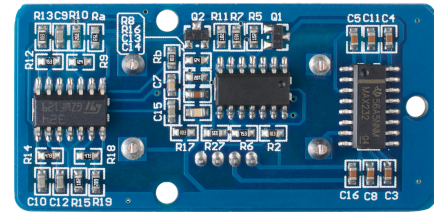
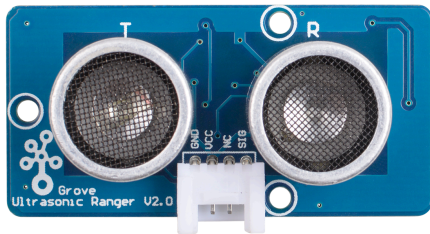
- Firstly, the transmitter (trig pin) sends a sound wave
- The object picks the wave up, reflecting it back to the sensor.
- The receiver (echo pin) picks it up

Why Choose Grove Ultrasonic Distance Sensor instead of HC-SR04?

Compared with traditional ultrasonic modules **HC-SR04**, the Grove - Ultrasonic Distance Sensor integrates a single-chip microcomputer, and the transmitting signal and the receiving signal share one pin by time-division multiplexing, so only one I/O pin is occupied. Another difference is that HC-SR04 only supports 5v voltage, while Grove - Ultrasonic Distance Sensor supports 5v and 3.3v. As we know, the Raspberry pi I/O only supports 3.3v. Therefore, Grove - Ultrasonic Distance Sensor can be directly connected to the I/O of the Raspberry Pi, but HC-SR04 needs to use a voltage conversion circuit.

What's more, we provide full documents and libraries for Arduino, Python, and Codecraft so that you can use the Grove - Ultrasonic Distance Sensor with Arduino and Raspberry pi easily. Wide voltage range, single I/O pin, plug and play Grove connector, we try our best to make this module easier to use and reduce your work.

Product Gallery



Applications

- **Water Tank Level Monitoring:** Monitor water levels remotely without opening the tank or performing manual inspections.
- **Garage Parking Assistant:** Detect vehicle position and trigger visual or audio alerts when the car reaches the desired parking distance.
- **Smart Trash Bin Monitoring:** Track remaining capacity and receive notifications when bins are approaching full capacity.
- **Robot Obstacle Avoidance:** Enable robots and autonomous vehicles to detect and avoid obstacles in real time.
- **Contactless Distance Measurement:** Measure the distance to objects in industrial, educational, and DIY projects.
- **Presence and Proximity Detection:** Detect nearby objects or movement for automation, security, and interactive installations.

Part List

Grove - Ultrasonic Ranger	1
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Compliance & Logistics



HSCODE	9031900090
USHSCODE	9031808085
UPC	841454107484
EUHSCODE	9013101000
COO	CHINA

Resource Links

- <https://www.seeedstudio.com/Grove-Ultrasonic-Distance-Sensor.html>
- [Download Wiki PDF](#)
- [Grove_Ultrasonic Ranger Schematic](#)
- [Ceramic Ultrasonic Sensor NU40C16T/R-1](#)
- [Grove_Ultrasonic Ranger library](#)
- [CDC File](#)
- [Example_Measure_distance_and_led_display](#)
- [Example_Measure_and_display_the_distance](#)

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