

Overview

The AJ-SR04M is a robust, industrial-grade waterproof ultrasonic distance sensor module designed for harsh environments. Unlike standard ultrasonic sensors with exposed transducers, the AJ-SR04M features a completely sealed, waterproof black housing connected via a 2.5-meter (2500mm) cable to a dedicated blue control board. This allows the sensing head to be mounted in damp, humid, or dusty areas (like a rainwater tank) while keeping the control circuit safely housed in a dry location.

Utilizing non-contact ultrasonic detection technology operating at 40kHz, it provides highly stable and accurate readings. It reliably detects planar objects from as close as 20cm up to 8 meters (800cm) under optimal conditions, with a precision resolution down to 1mm to 3mm.



Features

- Integrated waterproof ultrasonic probe suitable for outdoor, damp, and harsh environments.
- Generous 2.5m (2500mm) cable length between the probe and the control board.
- Wide operating voltage of 3V to 5.5V DC, compatible with 3.3V (ESP32, Raspberry Pi) and 5V (Arduino) microcontrollers.
- High accuracy with measuring distances ranging from 20cm up to 800cm (8 meters).
- Versatile operation with 5 different modes configurable via the 'R19' resistor pads.
- Low standby current (< 2mA), ideal for battery-operated devices.
- Single fully enclosed transducer handles both sending and receiving.

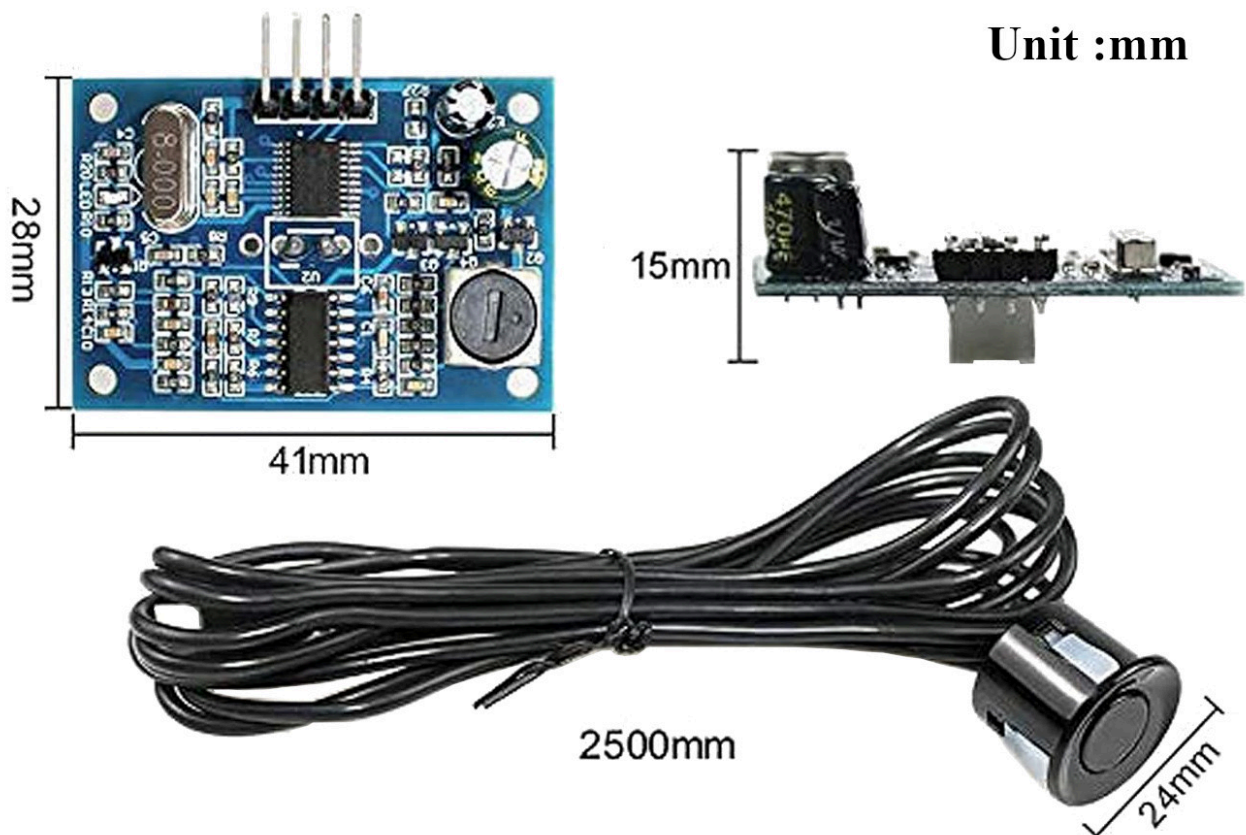
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Technical Specifications

Parameter	Specification
Model	AJ-SR04M
Operating Voltage	3V to 5.5V DC
Operating Current	~30mA to 40mA
Standby Current	< 2mA
Measuring Range	20cm to 800cm (8 meters)
Blind Zone (Dead Zone)	< 20cm
Operating Frequency	40 kHz
Measuring Angle	Approximately 50° to 75°
Accuracy / Resolution	~1mm to 3mm (under optimal conditions)
Cable Length	2500mm (2.5 meters)
Probe Diameter	24mm (Housing outer width)
PCB Dimensions	41mm x 28mm x 15mm
Waterproof Rating	Probe and cable are waterproof (Control board is NOT waterproof)

Dimensions



Pin Configuration

Pin Name	Function	Description
5V (VCC)	Power Supply	Connect to 3V - 5.5V DC (Compatible with 3.3V and 5V logic).
Trig (RX)	Trigger / Receive	Sends a 10µs HIGH pulse to trigger measurement (or RX in Serial modes).
Echo (TX)	Echo / Transmit	Outputs a pulse proportional to distance (or TX in Serial modes).
GND	Ground	Connect to system ground.

Operating Modes (R19 Resistor Config)

The AJ-SR04M is highly adaptable and features 5 distinct operating modes configurable by altering the 'R19' resistor pads on the front of the board:

- Mode 1 (R19 Open): Default factory mode. Operates identically to the classic HC-SR04 using standard Trigger (10µs pulse) and Echo pulses.
- Mode 2 (R19 = 300KΩ): Low Power Mode. Ideal for battery-operated devices needing minimal current draw.
- Mode 3 (R19 = 120KΩ): Automatic Serial Port Mode. Board continuously outputs measured distance over the TX (Echo) pin at 9600 baud.
- Mode 4 (R19 = 47KΩ): Low Power Serial Port Mode. Module sleeps until it receives a 0x01 trigger byte on the RX (Trig) pin, measures, reports distance via TX, and returns to sleep.
- Mode 5 (R19 = 0Ω / Bridged): Computer Printing Mode / Continuous Serial output mode.

Applications

- Rainwater harvesting systems and water tank level monitoring.
- Outdoor robotic obstacle avoidance in damp or dusty environments.
- Automated irrigation systems (soil or water levels).
- Smart parking management and outdoor vehicle detection.
- Marine and boat deck distance sensing (splash-prone conditions).
- Industrial automation requiring splash-proof non-contact sensing.

Important Notes

1. The blue circuit board is **NOT** waterproof. Only the black transducer probe and the cable are waterproof. Ensure the circuit board is placed in a dry enclosure.
2. The sensor needs a clear path through the air. It cannot measure through solid glass or plastic walls; it will measure the distance to the wall itself.
3. Maximum range is dependent on the target. Soft, angled, or small objects will reduce the maximum range to 800 cm.

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