I'm not robot

Jsn- sr04t v2. 0 datasheet

Jsn-sr04t. Jsn-sr04t-v3.0 datasheet. Jsn-sr04t datasheet.

JSN SR-04T Waterproof Ultrasonic Sensor JSN-SR0T4 is a waterproof ultrasonic distance measurement sensor module with a range of 25cm-450cm non-contact distance measurement. It is very similar to the ultrasonic sensors which are found in car bumpers. It works with a nominal 4.5V to a maximum of 5.5 VDC supply voltage. However, it typically works with 5.0V DC voltage and requires a maximum of 30mA current. Pin Description of JSN SR-04T S. NO. Pin Name Pin Description 1 5V Positive supply pin of the sensor 2 Trig Input pin of sensor. This pin has to be kept high for 10us to initialize measurement by sending ultrasonic waves. 3 Echo Output pin sensor. This pin goes high for a period that will be equal to the time taken for the ultrasonic wave to return to the sensor. 4 GND This pin is connected to the Ground of the system. Features and Specification of JSN SR-04T Operating voltage: DC 5V Quiescent current: 5mA Total current draw: 30mA Frequency: 40khz Range: 25cm to 450cm Beam Angle: less than 50 degrees Working temperature: -10 ~ 70 Celsius Storage temperature: -20 ~ 80 Celsius Small size, easy to use Low voltage, low power consumption Strong anti-jamming Integrated with wire enclosed waterproof probe, suitable for wet, harsh measurement occasions Note: Complete technical details can be found in the JSN SR-04T Waterproof Ultrasonic Sensor Datasheet linked at the bottom of this page. Equivalent to JSN SR-04T HC-SR04 Ultrasonic Sensor Alternative for JSN SR-04T US transmitter-Receiver pair, IR sensor module, IR sensor pair, IR Analog distance sensor JSN SR-04 Ultrasonic Sensor - Working JSN SR-04 Sensor's working is same as HC-SR04. But JSN SR-04 sensor has only one transducer that is connected through a 2.5 Meter cable. This sensor module comes in two separate parts; one being the transducer, which is the sensing element, and the other being the control board. The sensor works with the simple high school formula- Distance = Speed × Time The Ultrasonic transmitter transmits an ultrasonic wave. This wave travels in air and when it gets objected by any material, it gets reflected back toward the sensor, this reflected wave is observed by the Ultrasonic receiver module. Now, to calculate the distance using the above formulae, we should know the Speed and time. Since we are using the Ultrasonic wave, we know the universal speed of US wave at room conditions which is 330m/s. The circuitry inbuilt on the module will calculate the time taken for the US wave to come back and turns on the echo pin high for that same particular amount of time. This way, we can also know the time taken. Now simply calculate the distance using a microcontroller or microprocessor. How to use the JSN-SR04 Waterproof Ultrasonic Sensor As mentioned earlier, this sensor's Pin-out and working are similar to the HC-SR04 distance sensor. It can be interfaced with microcontrollers like Arduino, ARM, PIC, Raspberry Pi, etc. Power the Sensor using a regulated +5V through the VCC ad Ground pins of the sensor. The Trigger and the Echo pins are both I/O pins and hence they can be connected to the I/O pins of the microcontroller. To start the measurement, the trigger pin has to be made high for 15uS and then turned off. This action will trigger an ultrasonic wave at a frequency of 40Hz from the transmitter and the receiver will wait for the wave to return. Once the wave is returned after it getting reflected by any object, the Echo pin goes high for a particular amount of time which will be equal to the time taken for the wave to return back to the sensor. The amount of time during which the Echo pin stays high is measured by the MCU/MPU as it gives information about the time taken for the wave to return back to the Sensor. Using this information, the distance is measured as explained in the above heading. Applications of JSN-SR04 This sensor can be used in: Horizontal Ranging Obstacle Avoidance Automated Control Monitoring of objects and their movement 2D Model of JSN SR-04T Dimensions for the JSN SR-04T are given below. It can be used to design custom footprints of the module. In this article, I will show you how to use the waterproof ultrasonic sensor JSN-SR04T with an ESP32 microcontroller. The JSN-SR04T sensor is used in various applications, including autonomous driving, crash avoidance, motion detection, and more. The additional waterproof features make it an outdoor-friendly sensor enabling you to build even more projects without limiting the scope of applications. You will learn everything about the JSN-SR04T sensor, and I will teach you how to connect it to an ESP32, provide a working code to test the sensor with ESP32, and also answer the most frequently asked questions about it too. You will find basic working principles, electrical characteristics, applications, tips, and tricks about the projects involving JSN-SR04T. Let's get started! How to Install ESP32 Core on Arduino IDE Makerguides.com is a participant in the Amazon Services LLC Associates Program, an affiliate advertising program designed to provide a means for sites to earn advertising fees by advertising and linking to products on Amazon.com. Let us understand the basic working principle, features, pinouts, and applications of the waterproof Ultrasonic sensor JSN-SR04T. Knowing these details makes you confident in building long-term projects. By the end of this article, you will be confident in building and debugging JSN-SR04T ultrasonic sensor projects. Commonly available JSN-SR04T sensors are shown in the image below. The sensor is not a part of CB directly but is detachable. It allows you to comfortably place the sensor (vehicle bumper) and protect the PCB from harsh environments. JSN-SR04T sensor module The sensor is waterproof, allowing you to seal it in harsh wet conditions. The JSN-SR04T sensor is unique. It supports multiple modes of operation. One of the modes is the famous HC-SR04 mode, which accepts a trigger signal and provides an echo signal pulse corresponding to the time the sound takes to travel and bounce back any object. You can use the below reference to refer to the JSN-SR04T waterproof ultrasonic sensor module pinouts quickly. JSN-SR04T sensor module pinout The JSN-SR04T also supports other modes, as the section below explains. In Mode 0, the sensor mimics the operation of the HC-SR04 ultrasonic sensor. This is the default mode the PCB arrives in. How about an ultrasonic sensor that will calculate the distance by itself and tell you the measured value serially? That is what Mode 1 does. No pressure on the ESP32. Nothing to be calculated. Just receive the measured distance from the sensor directly over the serial port. To activate Mode 1, short the small pads related to the M1 pad. HeaderData 1Data 0Checksum0xFF, indicates the start of the block dataHigher byte of 16-bit dataLower byte of 16-bit dataSum of all three bytes This mode is the same as mode 1. In this case, the data is not sent automatically by the sensor. You have to send a request over the serial port. To activate Mode 2, short the small pads related to the M2 pad. Mode 3 is the same as Mode 1 (HC-SR04 Mode). Here it won't wait for the trigger signal from the host (ESP32). It will auto-trigger every 200 ms and give you the pulse on the echo input. To activate Mode 3, place a 200 K ohms resistor on the "mode" pad. Mode 4 is the same as Mode 1 (HC-SR04 Mode) with ultra-low power consumption. To activate Mode 4, place a 360 K ohms resistor on the "mode" pad. Mode 5 acts like a preconfigured switch. The echo pin will toggle when the sensor detects any object within a 1.5 m distance. To activate Mode 5, place a 470 K ohms resistor on the "mode" pad. Here are the features of the JSN-SR04T sensor summarized in a table. ParameterRangeOperating VoltageDC 3 V to 5.5 VWorking currentLess than 8 mAProbe frequency40 kHzFarthest Range600 cmRecent Range20 cmDistance Accuracy10 mmResolution1 mmMeasurement angle75°Operating Temperature-20 °C to 70 °C Ultrasonic sensors are used in various applications. The sensors help save power, improve user experience, and add comfort and safety. Here are some common applications: Measure distance: Distance measurement is a crucial feature of the ultrasonic sensor, which is helpful in parking assistance, robotics navigation, and automation in industries. Object detection: You can use the JSN-SR04T sensor to detect objects, pets' movements, security systems to detect people in restricted places, etc. Level measurement: You can use the sensor to detect liquid level measurements in tanks, industrial boilers, and the number of items left in containers. For example, you can build an intelligent dustbin that can open the lid automatically. You can also have ultrasonic sensors mounted on your desk table to detect your presence. If you get up and go away, it can automatically turn off table lamps and fans! The possibilities with the JSN-SR04T are many – what are you building? Let me know in the comments section below. I will show you how to build a project using ESP32 and the JSN-SR04T ultrasonic distance sensor. Let's get started with the hardware connections. Connecting JSN-SR04T to ESP32 The ultrasonic sensor module JSN-SR04T has a 4-pin connector option to interface with microcontrollers. The connections are also simple to understand and follow, as shown in the diagram above. Always start with the ground connections. Power the entire system only after completing all the connections. Here is the connection summary between ESP32 and the JSN-SR04T sensor. Connect the GND pin of the sensor to the ESP32 GND pins. Connect Sensor's VCC pin to the ESP32 5V pin. Connect the GPIO5 pin of the ESP32 to the TRIG pin of the sensor. The ECHO pin of the sensor goes to the GPIO18 of the ESP32. JSN-SR04T Ultrasonic Sensor PinsESP32 PinsVCC5VTRIGGPIO5ECHOGPIO18GNDGND I am using GPIO5 and GPIO18 for TRIG and ECHO pins, respectively, in my example. You can choose other pins on the ESP32 pin. If you have to use other pins, edit the code accordingly. Follow the next step to understand the code implementation. You can use the code below to test the ESP32 module and the connected JSN-SR04T ultrasonic sensor. Please follow our guide to install the ESP32 core on the Arduino IDE. #define echoPin 18 // attach pin GPIO18 to pin Echo of JSN-SR04 #define trigPin 5 // attach pin GPIO5 ESP32 to pin Trig of JSN-SR04 long duration; // Time taken for the pulse to reach the receiver int distance; void setup() { pinMode(trigPin, OUTPUT); pinMode(echoPin, INPUT); Serial.begin(9600); Serial.println("Distance measurement using JSN-SR04T"); delay(500); } void loop() { digitalWrite(trigPin, LOW); delayMicroseconds(2); digitalWrite(trigPin, HIGH); // turn on the Trigger to generate pulse delayMicroseconds(10); // keep the trigger "ON" for 10 ms to generate pulse digitalWrite(trigPin, LOW); // Turn off the pulse trigger to stop pulse // If pulse reached the receiver echoPin // become high Then pulseIn() returns the // time taken by the pulse to reach the receiver duration = pulseIn(echoPin, HIGH); distance = duration * 0.0344 / 2; Serial.print("Distance: "); Serial.print(distance); Serial.println(" cm"); delay(100); } Let's walk through the code. You will measure the distance between the obstacle and the ultrasonic sensor sensing element of JSN-SR04T in this example. Let's begin! #define echoPin 18 // attach pin GPIO18 of ESP32 to pin Echo of JSN-SR04 #define trigPin 5 // attach pin GPIO5 of ESP32 to pin Trig of JSN-SR04 The lines used to connect the JSN-SR04T sensor to ESP32 are The echoPin is used to receive the echo signal from the sensor, and trigPin is used to trigger the sensor to send an ultrasonic pulse. long duration; int distance; Declare two variables: duration, and distance. duration is used to store the time it takes for the ultrasonic signal to bounce back to the sensor distance is used to store the calculated distance in cm. the setup() function, is called once when the program starts. In this function, the trigPin is set as an output pin, and the echoPin is set as an input pin. Serial.begin(9600) initializes the serial communication at a baud rate of 9600 and the following Serial.println() statement is used to print a message to the serial monitor. The delay(500) function waits for 500 ms before proceeding to the loop() function. The loop() function is called repeatedly throughout the program. This code starts by sending a low signal to the trigPin for 2 us. Then it sends a high signal to the trigPin for 10 microseconds to generate a pulse for 10 ms. After the pulse is generated, the trigPin is turned off. The pulseIn() function is then used to calculate the duration of the pulse. This function waits for the pulse to reach the echoPin and then measures the time it takes for the pulse to return. duration = pulseIn(echoPin, HIGH); distance = duration * 0.0344 / 2; You can convert the delay into distance using the speed of sound information. (approximately 344 m/s). Serial.print("Distance: "); Serial.print(distance); Serial.println(" cm"); delay(100); Finally, the distance value is printed on the serial monitor. The program then waits for 100 ms. The entire operation will be repeated. I have included a list of the most frequently asked questions about projects built using the ESP32 and the JSN-SR04T sensors: The JSN-SR04T is a waterproof ultrasonic sensor. You can use it to measure distances between objects. It works by sending out high-frequency sound waves and measuring the time it takes to return. The JSN-SR04T ultrasonic sensor operates on a voltage of 5 V DC. Please refer to the datasheet of the module you buy to be on the safer side. The maximum detection range of the JSN-SR04T sensor is about 4 m. Some variants provide an even further range at the cost of low accuracy. The JSN-SR04T sensor can be used outdoors. The JSN sensor is waterproof. The sensor can be used in wet and harsh environments. The other operations are similar to that of HC-SR04 sensors. It has an accuracy of about 3 mm. You can calibrate the sensor once for the particular environment for better results. The accuracy will depend on temperature, humidity, and other environmental factors too. Yes, the JSN-SR04T sensor can work in different lighting conditions, as it does not rely on visible light. It works on the principle of time taken by sound to travel an appropriate distance. The JSN-SR04T sensor has dimensions of 45 mm x 20 mm x 15 mm. The sensor extension comes with a cable length of 2.5 m. It might vary too. This article has covered all the essential information about the JSN-SR04T sensors. I have given you complete information on the working of the JSN-SR04 sensor and the applications for which we can use it. The basic working principle and a few tips and tricks on JSN-SR04T usage should help you to confidently use the sensor in your next project. I have also shared an ESP32 wiring connection guide and example code with explanation. If you have further questions about the ultrasonic sensors, please post them in the comments section. . Let us know if there's anything else you'd like me to cover in future articles. I am Puneeth. I love tinkering with open-source projects, Arduino, ESP32, Pi and more. I have worked with many different Arduino boards and currently I am exploring, Arduino powered LoRa, Power line communication and IoT. You can't perform that action at this time.