深圳市捷深纳科技有限公司
SHENZHEN JIESHENNA TECHNOLOGY CO .,LTD.

JSN-SR04T-V3.3 Integrated Ultrasonic Ranging Instruction Manual

- one,Features:

JSN-SR04T-V3.3Ultrasonic ranging modules can provide23cm-500cmIts non-contact distance sensing function can achieve ranging accuracy up to [high level].3mmThe module consists of an integrated ultrasonic sensor and control circuitry. (Mode)0The usage of this is consistent with our company'sHC-SR04The module is flexible, which improves product stability. Version 3.3's main improvements include: 1. Added temperature distance compensation for more accurate ranging. 2. Built-in co-frequency interference technology for more stable signal. 3. Resolved interference issues from various flyback DC-DC step-down power supplies. 4. Improved ranging sensitivity. 5. Adjustable ranging angle, available in small angle (for sewer pipes) and standard angle (factory default). This requirement must be confirmed before shipment.

This product adopts an industrial-grade integrated ultrasonic probe design, is waterproof, has stable performance, and is compatible with all MCUs on the market.

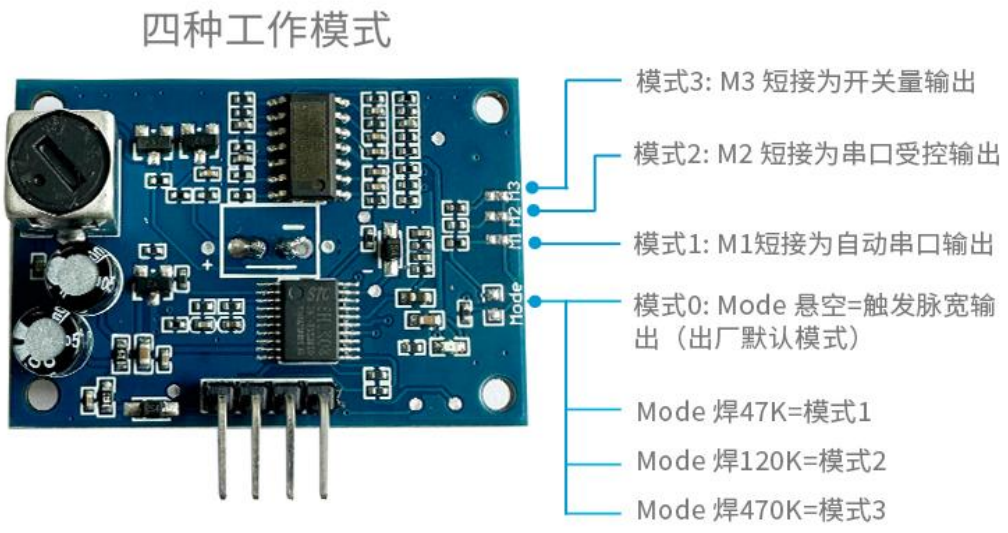
1. **Small size and easy to use**
2. **Wide power supply range, low power consumption**
3. **High measurement accuracy and high resolution**
4. **Smaller detection blind zone, longer range**
5. **It offers diverse output options, including pulse width output, serial port output, and digital output.**

- two,Actual product image:

- three,**Specifications**:

	Pulse width output	Serial port output	Switch output
Operating voltage	DC:3.3-5V		DC:3.3-5V
Operating current	Less than8mA		Less than8mA
probe frequency	40kHz		40kHz
Longest range	500cm		150CM
Closest range	23cm		0
Long-distance accuracy	±(1+S*0.5%)		-
resolution	3mm		-
Measuring angles	60Spend		60Spend
Temperature compensation	have		have
Input trigger signal	1,10uSThe aboveTTLpulse 2Serial port command transmission0X55		The period is200MS
Output echo signal	Output pulse width level signal, orTTL		high and low levels
Wiring method	3.3-5V (positive power supply) Trig (control terminal) RX Echo (output) TX GND (negative power supply terminal)		3.3-5V (positive power supply) Trig (low-level output) Echo (high-level output) GND (negative power supply terminal)
Product Dimensions	L42*W29*H12 mm		
Operating temperature	-20℃—+70℃		
Product Color	The PCB board is blue.		

- Four**Function Description:**



以上只能工作在其中一个模式，不能同时短接或是焊电阻

This module offers four working modes to choose from, allowing customers to select the mode that best suits their needs.

Switch applications or experiments.

- model0: Mode=Floating high level (PWM) pulse width output

(1Pin Definitions

Serial Number	label	Pin Description	**Remark**
2	Trig	Trigger control pin	
3	Echo	High-level pulse width output	

1Basic working principle:

(1) Use the IO port TRIG to trigger ranging and give a high-level signal of at least 10us.

(2) The module automatically sends eight 40kHz square waves and automatically detects whether there is a signal return;

(3) When a signal is returned, a high level is output through the ECHO port of the IO port. The duration of the high level is the time from the emission to the return of the ultrasonic wave. The test distance at room temperature = (high level time * speed of sound (348M/S))/2; (4) After the module is triggered to measure distance, if no echo is received (because the measurement range is exceeded or the probe is not facing the object being measured), the ECHO port will automatically go low after 40MS, indicating the end of the measurement, regardless of whether it was successful or not.

(5) The LED does not light up when powered on, and only lights up after the TRIG pin is given a trigger signal. The flashing frequency of the LED is synchronized with the trigger period, indicating that the module has received the correct instruction and entered the working state.

2. Ultrasonic timing diagram:

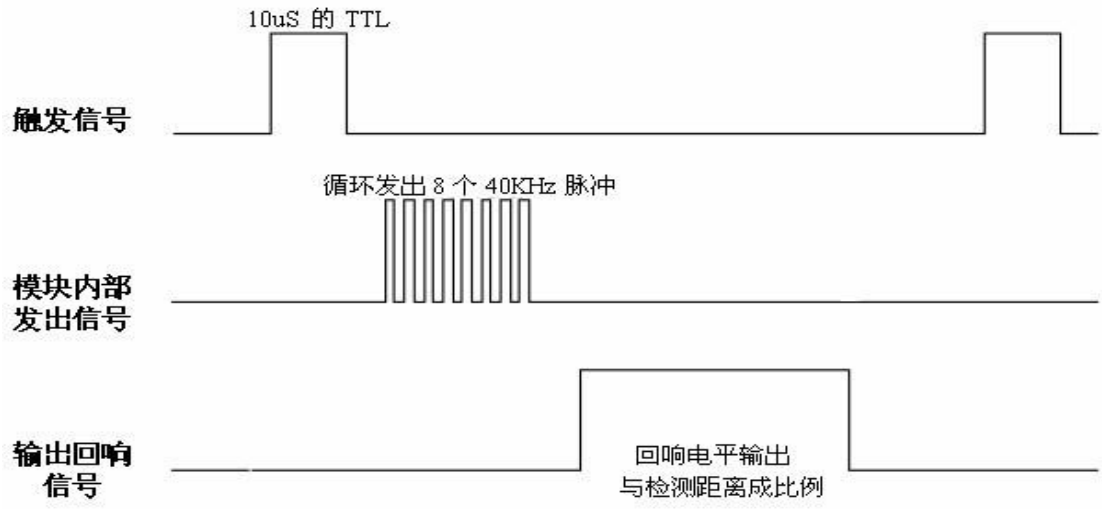


Figure 3. Ultrasonic timing diagram

The sequence diagram above shows that you only need to provide one.10uSThe above pulse trigger signal will be emitted internally by this module. 8indivual40kHzThe system operates at a periodic level and detects echoes. Once an echo signal is detected, an echo signal is output. The pulse width of the echo signal is proportional to the measured distance. Therefore, the distance can be calculated from the time interval between the transmitted signal and the received echo signal. Formula:uS/57.5=centimeters oruS/148=Inches; or: Distance = High-level time * Speed of sound (348M/S)/2The recommended measurement cycle is...50msThe above measures are to prevent the transmitted signal from affecting the echo signal.

- model1: Mode=47K (Or directly short-circuit M1)UARTAutomatic output

The UART automatic output mode outputs the measured distance value (hexadecimal number) in the UART communication format. This mode does not require an external trigger signal. The module can automatically measure once every 100ms, and output the measured distance value on the TX pin after each measurement.

(1Pin Definitions

Serial Number	label	Pin Description	**Remark**
2	TX	UART output pin	
3	RX	none	

(2) Communication Protocol

UART	**baud rate**	**Check bit**	**Data bits**	**Stop bit**
TTL	9600 bps	N	8	1

(3) Format instructions

Frame data	illustrate	byte
Frame header	Fixed as0XFF	1 byte
H_DATA	Distance data height8Bit	1 byte
L_DATA	Low distance data8Bit	1 byte
SUM	Data checksum	1 byte

Note: The checksum only retains the lower 8 bits of the accumulated value.

For example:

Product Response FF 07 A1 A7

Where the checksum SUM=A7=(0x07+0xA1+0Xff)&0x00ff, and 0x07 is the high-order byte of the distance;

0xA1 represents the low-order bits of the distance;

The distance value is 0x07A1; converted to decimal, it is 1953; the unit is millimeters.

Note: The module outputs the closest distance value within the dead zone, approximately 21cm. If the module cannot measure data or exceeds the distance range, it outputs 0. The LED automatically flashes at 100ms after power-on and entering working mode.

- model2: Mode=120K (Or directly short-circuit M2)UARTControlled output

The UART controlled output mode outputs the measured distance value (hexadecimal number) according to the UART communication format. This mode requires a trigger command signal (0x55) to the RX pin. The module performs a measurement once each time it receives a command, and outputs the measured distance value on the TX pin after each measurement. The command trigger period must be greater than 60ms.

(1Pin Definitions

Serial Number	label	Pin Description	Remark
2	TX	UART output pin	
3	RX	UART controlled receiver pin (Instruction 0X55)	

(2) Communication Protocol

UART	baud rate	Check bit	Data bits	Stop bit
TTL	9600 bps	N	8	1

(3) Format instructions

Frame data	illustrate	byte
Frame header	Fixed as0XFF	1 byte
H_DATA	Distance data height8Bit	1 byte
L_DATA	Low distance data8Bit	1 byte
SUM	Data checksum	1 byte

Note: The checksum only retains the lower 8 bits of the accumulated value.

For example:

Product Response FF 07 A1 A7

Where the checksum SUM=A7=(0x07+0xA1+0Xff)&0x00ff, and 0x07 is the high-order byte of the distance;

0xA1 represents the low-order bits of the distance;

The distance value is 0x07A1; converted to decimal, it is 1953; the unit is millimeters.

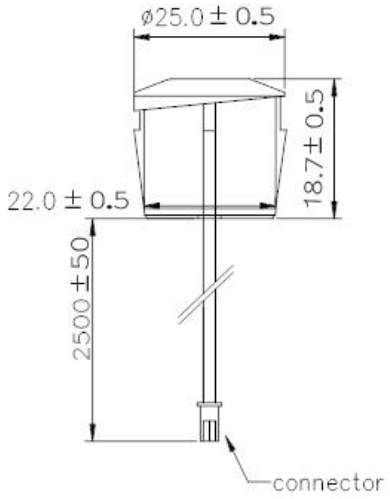
Note: The module outputs the nearest distance value of approximately 21cm within the blind zone. If the module cannot measure data or the distance is outside the range, it outputs 0. The LED will flash once after each command is triggered.

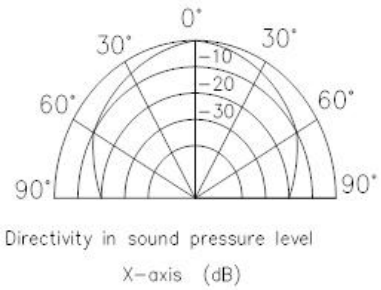
- model3: Mode=470K ((Or directly short-circuit M3) Switch output

The module is factory-set with a threshold value, defaulting to 1.5 meters. The module measures distance every 200ms. When the detected target distance is less than the set threshold, the Echo pin outputs a high level; when the detected distance is greater than the set threshold, the Echo pin outputs a low level. To improve stability, by default, two consecutive detections of target distances less than the set threshold are considered a valid indication that the target distance is less than the set threshold. The module's Echo pin only outputs high and low level signals and has no driving capability. In application, a transistor should be added to drive a relay, etc. If there are special requirements requiring modification of the threshold value or other settings, this must be specifically specified during procurement.1Pin Definitions

Serial Number	label	Pin Description	Remark
2	Trig	Switch output pin (low/high level)	An obstacle is represented by L, and an obstacle is represented by H.
3	Echo	High-level output pin of switch quantity	H represents an obstacle, and L represents an obstacle-free area.

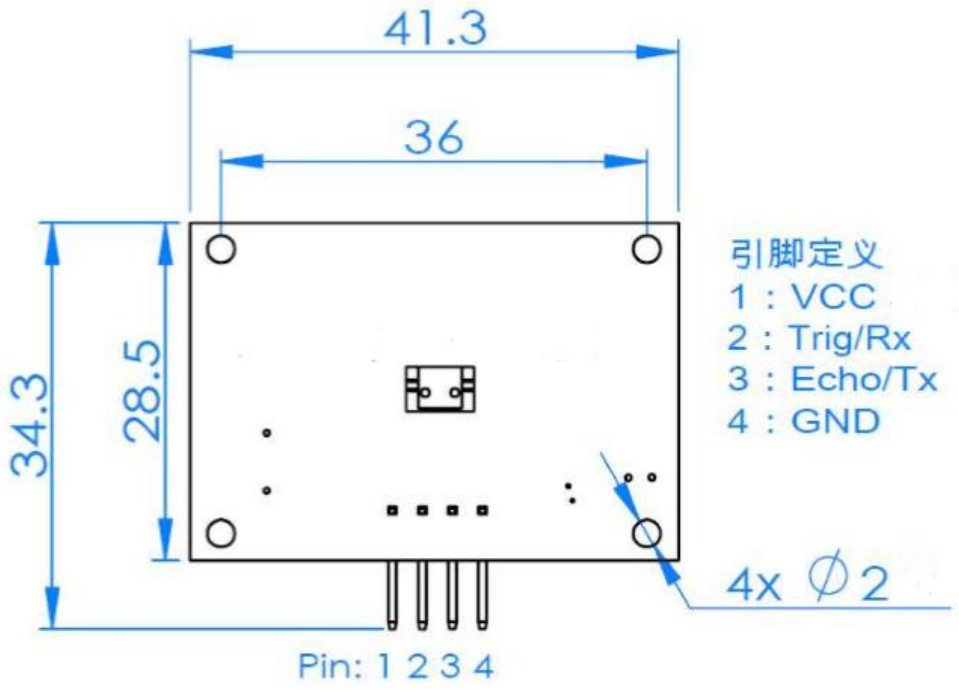
6. Physical Specifications: Dimension & Directivity





Directivity in sound pressure level
X-axis (dB)

Module specifications:



5. Product Application

1. High-precision long-range ranging
2. Obstacle avoidance, automatic control
3. When an object approaches, its presence is detected.
4. Artificial intelligence, scientific research experiments
5. Transportation, security, industrial control

Note:1This module should not be connected while powered on. If a live connection is necessary, first ensure the module is properly powered on.GNDConnect the end first, otherwise it will affect the module.

The block is functioning normally.

2When measuring distance, the area of the object being measured shall not be less than [amount missing].0.5The area should be square meters, and the surface should be as flat as possible; otherwise, it will affect the measurement results

fruit

The serial port mode can be used via the host computer software in the folder.USBchangeTTLnumber

Test according to the line.