电应普
BEST SENSOR

DATASHEET

DS1603 Series Sensor Module

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Product Description

1. General

The DS1603 series liquid level sensor breaks through the traditional installation method, realizes the real non-contact measurement of liquid level in the airtight container.

The sensor is installed directly below (bottom) of the container to detect the height of the liquid level. There is no need to open a hole in the container, the installation is simple.

It can accurately measure the level of various toxic substances, strong acids, strong alkalis and various pure liquids in high-temperature, high-pressure airtight containers. The liquid level sensor has no special requirements for the material of the liquid medium and container, and can be widely used.

2. Features

- Non-contact liquid level measurement, safe to use
- 3.3V～36V wide working voltage
- Real-time tracking of the whole range, no need to restart when refill container
- Installation and commissioning are greatly simplified
- UART, RS485, voltage analog, switch multiple output
- The center frequency of the sensor is 2MHz
- Working temperature -15℃ to +60℃
- Storage temperature -25℃ to +80℃
- Resolution 1mm
- With temperature compensation, the measured value can be automatically corrected according to the actual working temperature value
- Anti static design, in accordance with IEC61000-4-2 standard.

3. Advantages

Small size, easy to install
Strong anti-interference
Fast response time
Wide working temperature
High protection level
Stable and reliable output
Strong anti-static
High measurement accuracy

4. Applications

Real-time detection of liquid level in containers of dense materials such as steel, glass, iron, ceramics, and non-foamed plastics.

Real-time detection of the liquid level of pure single liquid or miscible mixed liquid without serious deposition.

Item	DS1603 AQ V1.0	DS1603 DAV1.0	DS1603 L V1.0	DS1603 NF V1.0	Unit	Remark
Operating voltage	10～36	10～36	3.3～12	10～36	V	DC
Average operating current	<25	<30	<35	<25	mA	(1)
Blind zone	≤50	≤50	≤50	≤50	mm	(2)
Measuring range	50～1000	50-2000	50-2000	50-2000	mm	(2)
Response time with liquid	2	2	2	2	s	(3)
Response time without liquid	2	2	10	2	s	
Output interface	Analog voltage	RS485	UART	Switch		
Resolution	1				mm	
Accuracy	±(10+S*1%)	±(5+S*1%)			mm	(4)
Probe frequency	2				MHz	
ESD	±4/±8				KV	(5)

Remark:

(1) Power supply 12V, 1S working cycle test data;

DS1603L V1.0 power supply 5.0V, 1S work cycle test data.

(2) 2mm thickness steel plate container at room temperature, 400mm diameter of the container, data obtained from water medium measurement;

The default analog value of DS1603AQ V1.0 is 1 meter.

(3) Under static environment of liquid level.

(4) Data obtained by measuring the water medium of a steel plate container with a thickness of 2mm

at room temperature, S represents the current liquid level.

a. S represents the current liquid level height.

b. 2mm thickness steel plate container at room temperature, data obtained by testing the water level of 2000mm height.

c. 2℃～65℃, 2mm thickness steel plate container, data obtained by testing the water level of 400mm height.

(5) The probe shell and terminal lead comply with the IEC61000-4-2 standard.

2.Environment

Item	Minimum value	Typical value	Max value	Unit	Remark
Storage Temp	-25	25	80	℃	
Storage Humidity		65%	90%	RH	(1)
Operating Temp	-15	25	60	℃	
Operating Humidity		65%	80%	RH	(2)

Remark:

(1) Environment temperature is 0-39℃, max humidity is 90%(Non-condensation)

(2) Environment is 40-50℃, max humidity is the highest at current temperature in nature.

3.Electronics

Item	Minimum value	Typical value	Max value	Unit	Remark
Operating voltage	3.3	5	12	V	DS1603L
	10	12	36	V	(1)
Peak current			60	mA	(1)
			100	mA	DS1603L
input ripple			50	mV	Peak value

3.Electronics

input ripple			100	mV	Peak value
ESD			±4K/±8K	V	(2)

Remark: (1) 5.0V power input of DS1603L, Rest are 12V
(2) Connect wire, pin in accordance with IEC61000-4-2 standard

Sensor Selection Instruction

The DS1603 module has a variety of output formats, and users can choose the corresponding model according to actual application needs.

Series	Model No.	Output interface
DS1603 Series	DS1603AQ V1.0	0-5V analog voltage output
	DS1603DA V1.0	RS485 output
	DS1603L V1.0	UART output
	DS1603NF V1.0	Switch output

Notice

1. At room temperature, containers of different materials, such as steel, glass, iron, ceramics, non-foamed plastics and other dense materials, have different detection limit distances.

2. For containers of the same material at room temperature, the detection limit distance will be different for different container thicknesses.

3. The detection liquid level exceeds the effective detection range of the module, and the detection liquid output is unstable.

4. Please pay attention to the evaluation of electromagnetic compatibility when designing. Unreasonable system design may cause malfunction of the module.

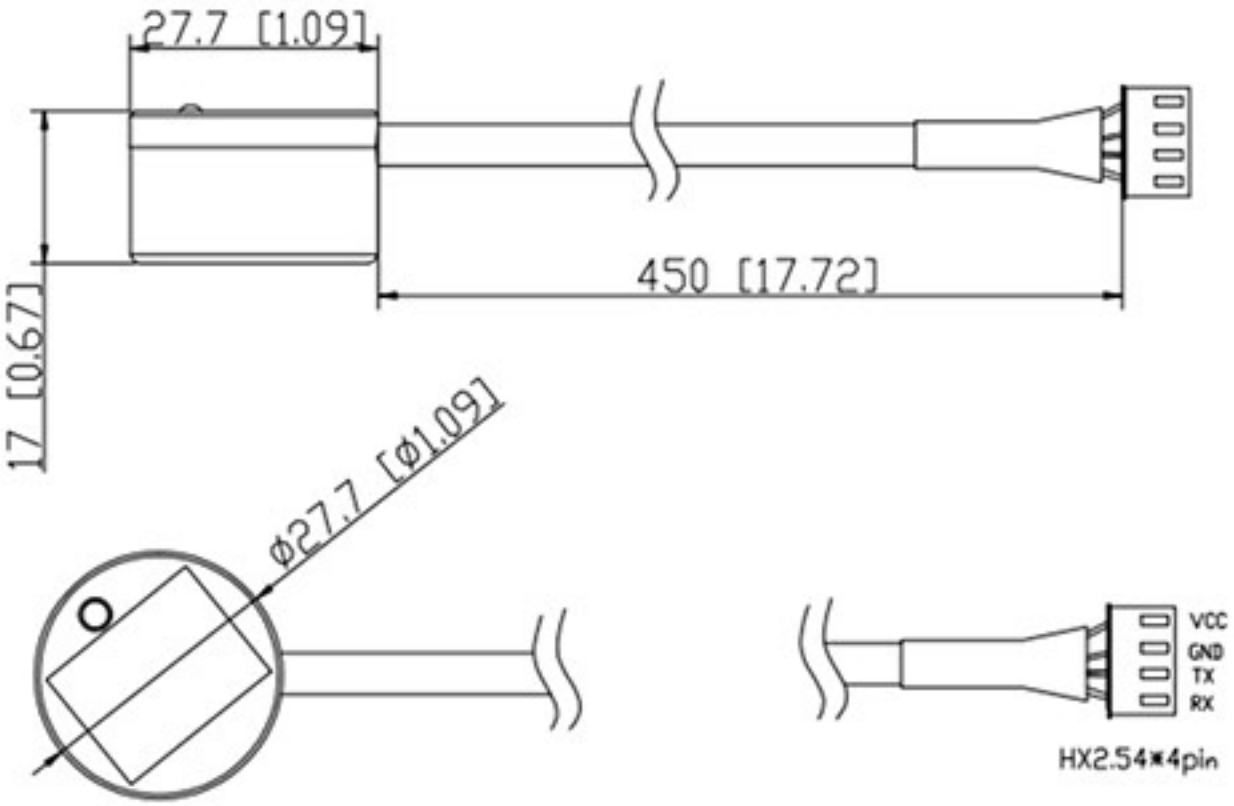
5. When the boundary application of the product limit parameter is involved, you can contact after sale service dept. to confirm the relevant precautions.

6. Please make sure that the product QR code is recognizable, otherwise, the factory data cannot be traced when the function or quality is abnormal.

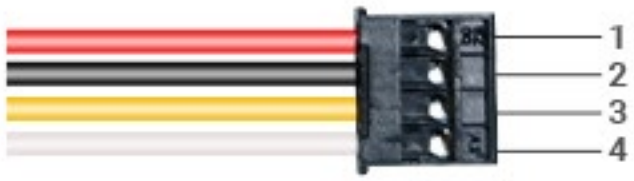
7. The company reserves the right to change this document and update the functions without prior notice.

Mechanics

1. Mechanical Dimensions (mm-inch)



2. Pin out



Pin No.	Mark	Description	Remark
①	VCC	Power Input	
②	GND	GND	
③	RX	Functional PIN	Different output modes have different functions
④	TX	Functional PIN	Different output modes have different functions

Remarks: The pin function corresponds to the output mode selected before ordering, and cannot coexist with the functions of other output modes