

DK-CSC Series Corrosion-resistant Ultrasonic Sensors - Quick Start

- Small blind spot
- Corrosive environment use
- Proximity Fine Inspection



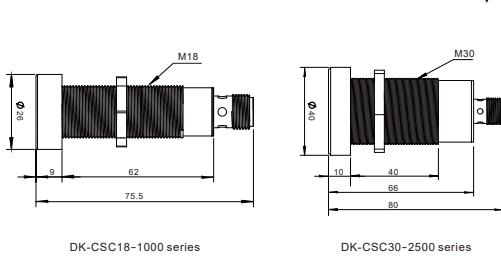
Precautions

- Please read the operating instructions of DADISICK before commissioning.
- Connection, installation and configuration must be carried out by trained DADISICK specialists.
- During debugging, the equipment should be protected from moisture and contamination.
- This device does not constitute a safety component according to the corresponding machine safety standards.
- Do not allow moisture or water to enter the internal components of the sensor and the output contacts of the wiring board.
- Protected against use in explosive atmospheres.
- Do not use solvents, paraffin, propylene glycol, gasoline or other chemically active substances to clean the sensor.
- The sensor should be installed away from moisture, water droplets, dust, corrosive and harmful substances, as well as high temperature, discharge and vibration.
- Do not use the sensor in corrosive environments where the atmosphere contains acids, alkalis, and other corrosive substances.
- In the process of operation and maintenance, DADISICK professionals recommend that you abide by the requirements of "User Electrical Equipment Technical Operation Regulations" and "Labor Protection Regulations in Electrical Equipment Operation". Before connecting the sensor, you must ensure that all connections are correct and that the power and signal lines must not be mixed, otherwise the sensor may be damaged or personnel may be injured.
- Sensors that have reached the end of their useful life should be disassembled and DADISICK recommends disposing of them through a facility that recycles ferrous and non-ferrous metals.

Packaged content

Sensor	1 pcs
Mounting Nut	2 pcs
Manual	1 pcs

Dimensions



Model range	
Working Distance 60...1000 mm	DK-CSC18-1000-J55
Working Distance 150...2500 mm	DK-CSC30-2500-J60
Output type	
Analog output: 4...20 mA	I
Analog output: 0...10 V	U
Digital output :RS-485(Modbus RTU)	R4

parameter

Operating medium	Air (velocity ≤16 m/s)
Resolution	0.2-0.5mm
Repeatability	±0.15%
Absolute Accuracy	±1mm
Response time	160ms
Output type	Analog/RS485
Power-Up Timer	< 500ms
Operating Voltage	DC 10...30 V
Overload protection	200mA
load impedance	I ~300 Ohm, U > 1 kOhm
No-load current consumption	≤ 30mA
Shell material	Stainless steel + PDPE
Protection level	IP67
Connector	5-pin M12
Ambient temperature	-25...+70°C
Atmospheric pressure	460...918mm p.s.l
Storage temperature	-40...+85°C
Weight	180g

Electrical connection

Symbol/Connection : (I analog output)	Connection method
	1.BN DC 10...30V
	2.WH teaching information
	3.BU GND
	4.BK Analog output 4...20 mA
Symbol/connection : (U analog output)	Connection method
	1.BN DC 10...30V
	2.WH teaching information
	3.BU GND
	4.BK Analog voltage 0...10V
Symbol/Connection : (RS485 output)	Connection method
	1.RD DC 10...30V
	2.YE Signal A (RS-485)
	3.BK 0 volts DC
	4.GN Signal B (RS-485)

Instructions

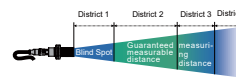


Figure2-Ultrasonic sensor operating range

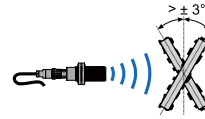


Figure 3 - Detecting non-smooth objects

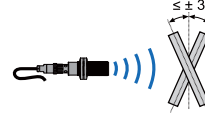
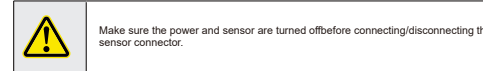


Figure 4 - Detecting smooth objects



Installation instructions

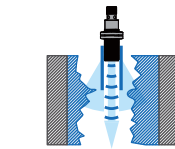


Figure 5 - Applying Ultrasonic Sensors

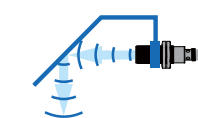


Figure 6 - Apply Reflector Diagram

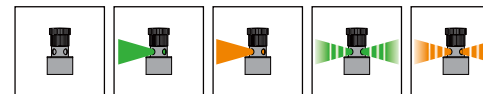


Figure 7 - Allowed distance operation between sensors

Transport and storage

DADISICK sensors are transported and stored in independent factory packaging at an ambient temperature of +0~85°C, a relative humidity of 35~95%, and no condensation to prevent the packaging from being affected by atmospheric precipitation. DADISICK reminds you not to store the sensor in a room containing corrosive gases and other harmful impurities (acid, alkali).

Indicator status



LEDs on the sensor housing indicate the status of the sensor. (DADISICK professionals remind: switch product overload protection green light, red light are on at the same time)

- Off- the sensor is off;
- Green - object detected;
- Red light on - no object detected;
- Green light flashes - the sensing range of the object is set;
- Blinking red light - complete setup for no object sensing range.

RS485 digital output operating mode

Sensors with RS-485 digital output can be included in MODBUS industrial network. Factory default network settings are used to communicate with sensors:

- ModBus RTU operating mode (8 data bits, 1 stop bit, no parity);
- Sensor address in ModBus network: 01, baud rate: 9600 (default)
- There are two sets of registers available for operation: reading and recording.

Read the registry			
Address	Data	Pattern	Unit
00	Measure distance		
0	Internal temp		
	Ultrasonic transit time		s

- The data in the read register is stored in HEX format. In order to read the result, the received value must be converted to decimal format.

To read registers, the 04 command must be used. For example:

- To read the measured distance, a command 01 04 00 00 01 31 ca must be sent. The sensor will respond to this request: 01 04 02 07 01 7A 8B. The number 701 in hexadecimal corresponds to the number 1793 in decimal. Therefore, the measured distance is 179.3 mm.
- To read the internal temperature, send the command 01 04 00 01 00 01 60 0A. The sensor will reply to the request: 01 04 02 00 17 B9 3A. The value 17 in hexadecimal format corresponds to the number 23 in decimal format. This means that the internal temperature of the sensor is 23°C.
- To read the time, the following command must be sent 01 04 00 02 00 01 90 0A. The sensor will reply to this request: 01 04 02 04 92 3A 5D. The hexadecimal value 492 corresponds to the decimal number 1170. Therefore, the propagation time of ultrasonic waves is 1170µs

Record registration:		
Address	Data	Value
0	External temperature command (0...100 OC)	0 64
0	Select temperature compensation type	0: Via internal temperature sensor 1: Via external temperature sensor
0	ModBus network communication speed (240...256000)	0 0B
h	Sensor address in the ModBus network (01...256)	0 100

These write registers are used to configure the operation of the sensor.

- The operating mode and communication parameters for thermal compensation can be configured by the user. When running thermal compensation in a mode using an external temperature sensor, the reading from that sensor must be written to a register. To run thermal compensation in a mode using an external temperature sensor, the reading from that sensor must be written to register 00h and the appropriate operating mode selected in register 01h. Use command 06 to record.

Example using record registers:

- To log the measured distance, send the following command 01 06 00 00 01 1E 09 C2. The sensor will reply with this command: 01 06 00 00 01 1E 09 C2. The value 1E in hexadecimal format corresponds to 30 in decimal format. This means that the sensor will store a value of 30 °C.
- To select temperature compensation mode via an external temperature sensor, send: 01 06 00 01 00 01 19 CA. The sensor will respond to this command: 01 06 00 01 00 01 19 CA. By default, the register is set to 0 - temperature compensation via built-in temperature sensor.
- To record the baud rate, send the following command: 01 06 00 02 00 09 E8 0C. The sensor will reply: 01 06 00 02 00 09 E8 0C. A value of 9 is equivalent to a baud rate of 115 200. There are 11 speeds to choose from.
- To write the sensor address, send the command: 01 06 00 1F 00 10 B9 C0. The sensor will reply: 01 06 00 1F 00 10 B9 C0. The value 10 is equivalent to the decimal number 16. Therefore, the sensor address in the ModBus network will become 16.

0	00	0	1 0	0	11 0
0	00	0	3 00	0	1 00
0	00	0	5 00	0	25 00
0	1 00	0	00		

Influencing factors

The measurement accuracy and working range of the sensor are affected by the following factors:

- Object surface temperature. If the air temperature changes suddenly (for example, if you are measuring the distance to hot metal), the ultrasonic waves will be refracted at the junction of cold and warm air and will not return to the sensor at right angles.
- Object surface material. Porous and sound-absorbing objects (such as wool, foam rubber, foam, feathers) reflect ultrasonic waves poorly. Due to the damping effect of the sound waves, the working range of the transducer is reduced.
- Environmental conditions. Air temperature and humidity, air velocity, air velocity and atmospheric pressure affect the speed and attenuation of sound waves.
- Object position. In order to operate stably on a smooth surface, the position of the sensor should be perpendicular to the object surface, and the allowable deviation from the vertical plane should not exceed 3°.
- If the surface of the object is uneven (such as gravel, gravel), the perpendicularity of the sensor is allowed to deviate not more than 3°.
- Formation and attachment of foreign matter on the sensor PE. During sensor operation, water, dust, or other substances will form on the sensor surface, limiting sensor performance. DADISICK recommends that you protect the sensor from external influences, clean the sensor or use a reflector (for mounting the sensor on an angle).

Transport and storage

- DADISICK sensors are transported and stored in independent factory packaging at an ambient temperature of +0~85°C, a relative humidity of 35~95%, and no condensation to prevent the packaging from being affected by atmospheric precipitation.
- DADISICK reminds you not to store the sensor in a room containing corrosive gases and other harmful impurities (acid, alkali).

Warranty

- Running Warranty - 12 months from date of sale*
- On the premise that the user abides by DADISICK's transportation, storage, installation, operation and maintenance rules: if the sensor falls during the warranty period, DADISICK promises to repair or provide technical support for free
- Conditions under which DADISICK Enterprises terminates its warranty obligations: internal components showing signs of opening and handling, chemical or mechanical damage.- dated on the delivery note (SDP) / promissory note