Digital Display Integrated Contact Displacement Sensor Instructions

1. Notes

When using this instrument, please comply with the specifications, functions and precautions in the instruction manual. Exceeding the scope of use will affect the safety performance of the instrument.

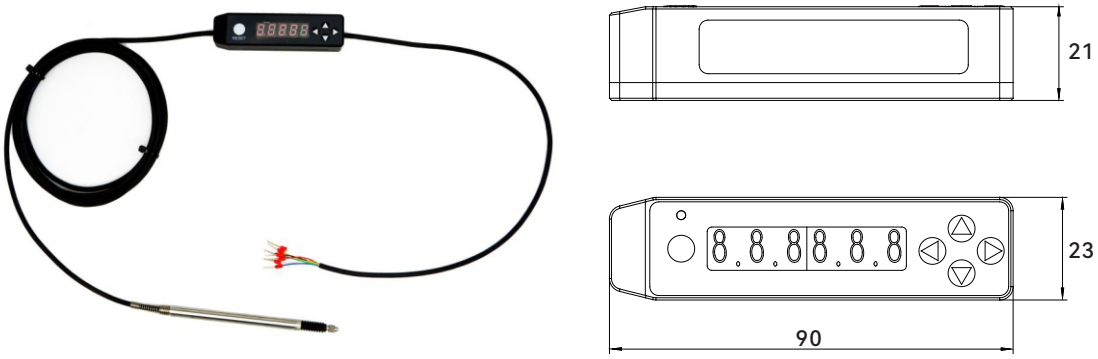
2. Product content introduction

The digital integrated contact displacement sensor can be used for the measurement of displacement, vibration, thickness and runout. The sensor data can be displayed on the screen in real time. It is equipped with MODBUS protocol RS485 interface and IO interface as standard.

3. Technical specifications

Product Type	Digital integrated contact displacement sensor
Compatible Sensor Range	Rebound type 2mm/ 5mm/10mm/air push type 10mm reed type, etc.
Resolution	0.1μm
Repeat Accuracy	< 1μm
Linearity	±0.1%
Supply Voltage	DC24V
Power consumption	1W
Operating Temperature	-10~60℃
Storage Temperature	-20~70℃
Product Size	90x23x21(mm)
Installation Method	Standard DIN rail
Remarks	If you need other range sensors, please communicate with sales in advance

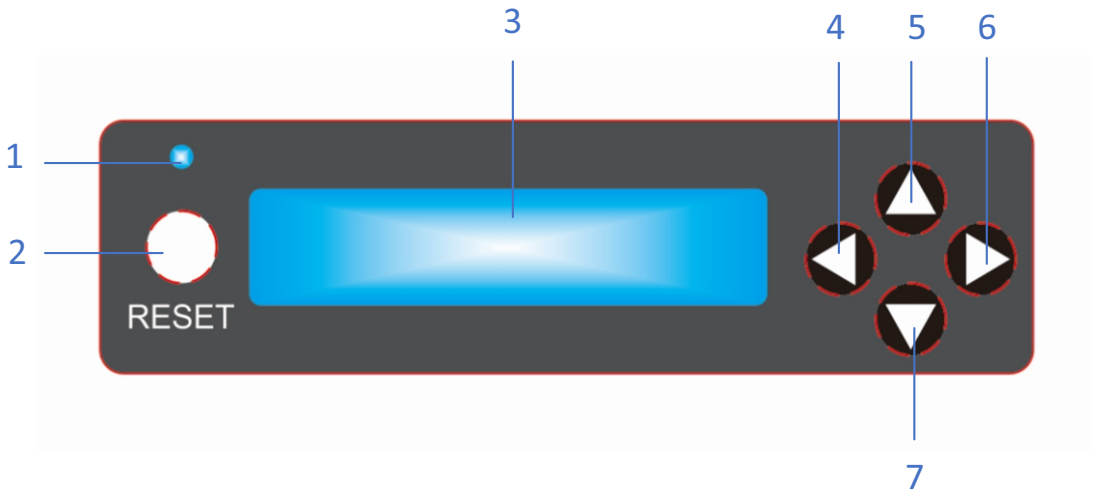
4. Size



Display box size

Unit: mm

5. Button Introduction



1. Status light: Displays the detection status;

2. RESET key: Sensor data reset/upper and lower tolerance and correction value settings and save/measurement function switching;

3. Data window: Displays the measured value or set value (in μm);

4. Left key: Set the digit to shift left/turn on the out-of-tolerance buzzer alarm;

5. Up key: Upper tolerance setting mode/tolerance increment, plus 1 each time;

6. Right key: Set the digit to shift right/turn off the out-of-tolerance buzzer alarm;

7. Down key: Lower tolerance setting mode/tolerance decrement, minus 1 each time.

6. Key combination application

1. Switching the measurement function:

In the real-time measurement mode, short press the RESET key, the status light flashes, and the extreme value measurement mode is entered. The data display window displays the real-time displacement value (including the correction value); short press the RESET key again to complete the extreme value measurement, the status light is always on, and the data window displays the extreme value (maximum value - minimum value); short press the RESET key again to exit the extreme value measurement mode, the status light is always on, and the real-time measurement mode is entered. The data window displays the real-time displacement value (including the correction value).

2. Tolerance/correction value setting:

Press and hold the ▲ up key to enter the upper tolerance setting mode. The data window displays the upper tolerance value. At this time, short press ▲ to increase the current data value, short press ▼ to decrease the current data value, short press ◀/▶ to move the data position to the left/right respectively, press the RESET key to save, and return to the real-time measurement mode after 3 seconds.
Press and hold the ▼ up key to enter the lower tolerance setting mode. The data window displays the lower tolerance value. At this time, short press ▲ to increase the current data value, short press ▼ to decrease the current data value, short press ◀/▶ to move the data position to the left/right respectively, press the RESET key to save, and return to the real-time measurement mode after 3 seconds.
Long press the right button ▶ to enter the correction value setting mode. The data window displays the correction value. At this time, short press ▲ to add 1 to the current data digit value, short press ▼ to subtract 1 from the current data digit value, short press ◀/▶ to move the data digit left/right respectively, press RESET to save, and return to real-time measurement mode after 3 seconds.

3. Buzzer on and off

In real-time measurement mode, press ◀ to turn on the buzzer function, and press ▶ to turn off the buzzer function. When the buzzer alarm is turned on, the status light is green and there is no buzzer within the tolerance range. Outside the tolerance range, the status light is red and there is a buzzer. Note: The buzzer alarm function needs to be turned on again after power failure (if necessary).

7. Lead Definition

1) RS-485 signal and pin description

1- White	RS-485+ (A)
2- Blue	RS-485- (B)
3- Red	Power positive (24V+)
4- Black	Power negative (GND)
5- Green	O1 (lower tolerance out-of-tolerance signal output)
6- Yellow	O2 (upper tolerance out-of-tolerance signal output)

2) Serial port settings

Baud rate: 9600 (factory default configuration)

Data bits: 8

Stop bits: 1

Parity check: None

8. MODBUS-RTU protocol

Modbus 485 application instructions:

1. Read the data of the channel collector

The host (PLC) sends 01 03 00 00 00 02 C4 0B

01	Slave communication module address (configurable)
03	Read register function code
00 00	Collector start address
00 02	Number of registers to be read
C4 0B	CRC check code

Slave response data: 01 03 04 CE B5 45 74 E7 8A

01	Slave communication module address
03	Read register function code
04	Return the number of bytes of measured data
CE B5	32float Measured displacement value 0.1um
45 74	
E7 8A	CRC check code

Data analysis: 4 bytes are the data of 1 channel. First, swap the high and low bits.

The actual data is: 45 74 CE B5. Converted into 32-bit float, it is: 3916.9um

2. Read data

0X03 Read holding register

Address	Data	Remark
0	Channel 1, converted data 32-bit float high 16 bits	Float type converted data, unit um
1	Channel 1, converted data 32-bit float lower 16 bits	
2	Maximum value, high 16 bits of converted 32-bit float data	Float type converted data, unit um
3	Maximum value, lower 16 bits of converted 32-bit float data	
4	Minimum value, high 16 bits of converted data 32-bit float	Float type converted data, unit um
5	Minimum value, lower 16 bits of converted data 32-bit float	
6	Difference, high 16 bits of converted 32-bit float data	Float type converted data, unit um
7	Difference, lower 16 bits of converted 32-bit float data	
50	Channel 1, voltage value data 32bit, low 16bit of float	Float type converted data, unit V
51	Channel 1, voltage value data 32bit, high 16bit of float	

3. 0x06 Write a holding register

Address	Data	Remark
16	Channel 1 clear	0 = No operation, 1 = Clear, 2 = Start measurement, 3 = End measurement, 4 = Resume

4. General configuration instruction set (RS-485 communication)

AT command format	Normal feedback	Command meaning
AT+UCAL?	AT+UCAL=OK	Query fitting parameters: AT+UC0L=parameter value
AT+UCOL=	AT+UC0L=fitting parameter value	Modify fitting parameters
AT+UART?	AT+UART=1,115200,	Query station number and baud rate
AT+UART=	AT+UART=station number, baud rate,	Modify station number and baud rate
AT+UVER?	AT+UVER=1.0,	Query version number

5. Maximum, minimum and difference acquisition application steps:

1) Start measurement, the sensor changes the state to start measurement (register address 16 is rewritten to 2);

2) The device is running, and the sensor collects the maximum, minimum and difference values in real time;

3) After the measurement is completed, the sensor changes the state to end measurement (register address 16 is rewritten to 3);

4) The corresponding register address stores the maximum, minimum and difference data.