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# Digital Display Integrated Contact Displacement Sensor Instruction Manual

## I. Notes to be Observed

When using this instrument, please follow the specifications, functions and usage precautions recorded in the manual. Using it beyond the specified range will affect the safety performance of this instrument.

## II. Product Content Introduction



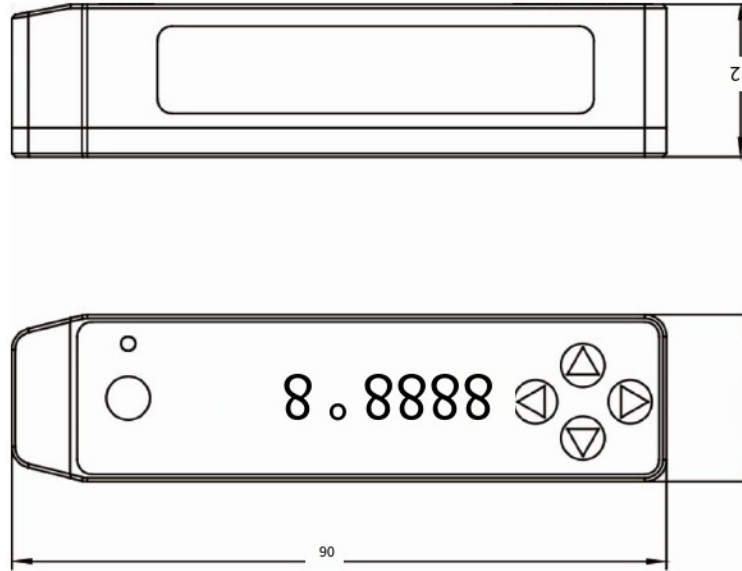
The digital display integrated contact displacement sensor can be used for measuring displacement, vibration, thickness and runout. The sensor data can be displayed in real time on the screen. It is equipped with a standard MODBUS protocol RS485 interface and IO interface.

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### III. Technical Specifications

Product type	Digital display integrated contact displacement sensor
Compatible with sensor range	Rebound type: 2mm / 5mm / 10mm, air-pushed type: 10mm, reed type, etc.
Resolution	1um
Repeatability accuracy	1um
Supply voltage	DC24V
Working temperature	-10 to 60 degrees Celsius
Storage temperature	-20 to 70 degrees Celsius
Product dimensions	90 × 23 × 21 (mm)
Length of the line	2m + 1m (1m output line)
Installation form	Standard DIN rail
Note	If you need sensors with other ranges, please communicate with the sales team in advance.

## IV. Dimension and Wire Sequence Description



Unit: mm

Display box size

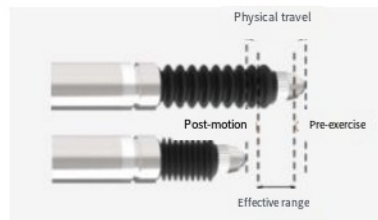
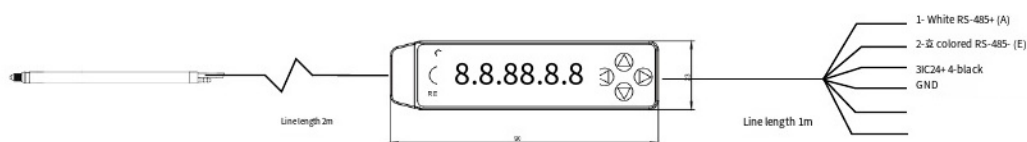


Illustration of sensor stroke dimensions

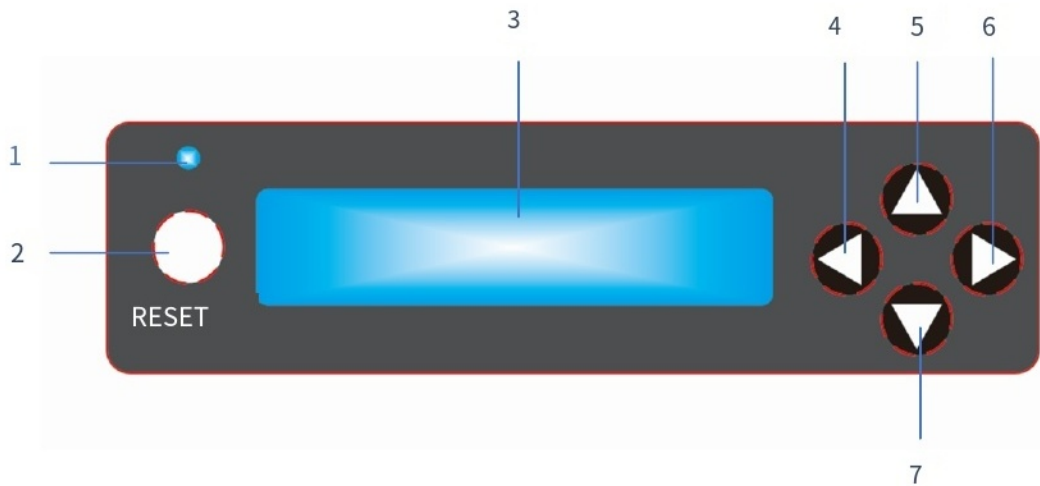
According to the tolerance of the workpiece to be measured, select the appropriate range. The physical stroke of the sensor is available in specifications such as 2mm, 5mm, and 10mm. During measurement, the sensor needs to be pre-compressed, with a pre-compression stroke of approximately 0.3mm to 0.5mm.



Sensor line sequence diagram

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## V. Key Introduction



Status light: Indicates the detection status.

2. RESET Key: Zero sensor data / Save upper and lower tolerance and correction values / Switch measurement functions

3. Data Window: Displays the measured or set value (unit:  $\mu\text{m}$ )

4. Left arrow key: Set the digital left shift

5. Up key: Upper tolerance setting mode / tolerance increment, increasing by 1 each time

6. Right arrow key: Set digit right shift

7. Down key: Enter lower tolerance setting mode / Decrease tolerance, by 1 each time

## VI. Application of Key Combinations

### 1. Measurement function switch:

In real-time measurement mode, a short press of the RESET button will cause the status light to flash and enter the extreme value measurement mode. The data display window will show the real-time displacement value (including the correction value). Press the RESET button again to complete the extreme value measurement. The status light will remain on, and the data window will display the range value (maximum value - minimum value). Press the RESET button once more to exit the extreme value measurement mode.

In the value measurement mode, the status light remains on constantly. Entering the real-time measurement mode, the data window displays the real-time displacement value (including the corrected value).

## 2. Tolerance/Correction Value Setting:

Press and hold the Up key to enter the upper tolerance setting mode. The data window will display the upper tolerance value. At this time, press the Enter key briefly.

When the value of the current data bit increases, press briefly. When the value of the current data bit decreases, press briefly / to move leftward/rightward respectively.

Move the data bit, 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 will display the lower tolerance value. At this time, press the "OK" key briefly.

When the value of the previous data bit increases, press briefly. When the value of the current data bit decreases, press briefly. This can shift leftward/rightward respectively.

Press the "RESET" key to save the dynamic data bit. After 3 seconds, it will return to the real-time measurement mode.

Long press the right mouse button to enter the correction value setting mode. The data window will display the correction value. At this time, short press the current one.

Short press to add 1 to the current data bit value, and short press to subtract 1 from the current data bit value. They can be moved leftward/rightward respectively.

Press the "RESET" key to save the data bit. The device will return to the real-time measurement mode after 3 seconds.

## VII. Lead Wire Definitions

### 1) RS-485 Signal and Pin Description

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

### 2) Serial port interface settings

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Baud rate: 9600 (default factory setting)

Data bit: 8

Stop bit: 1

Parity check: None

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## VIII. MODBUS-RTU Protocol

Modbus 485 Application Notes:

### 1. Read data from a single-channel collector

The host (PLC) sends 01 03 00 01 00 01 D5 CA.

01	Slave communication module address (configurable)
03	Read register function code
00 01	Starting address of the collector
00 01	To read the number of registers to be retrieved
D5 CA	CRC check code

The response data from the slave device: 01 03 02 0B 8A 3E D3

01	Slave communication module address
03	Read register function code
02	Return the number of bytes of the measurement data.
0B 8A	Displacement value ( $\mu\text{m}$ ) measurement
3E D3	CRC check code

Data parsing: 2 bytes represent the data of 1 channel. The original data is in hexadecimal: 0B 8A; converted to decimal: 2954  $\mu\text{m}$

## 2. Read data

### 0X03 Read Holding Registers

Address	Data	Note
1	Real-time data	Hexadecimal data format, unit: $\mu\text{m}$
3	maximum value	Hexadecimal data format, unit: $\mu\text{m}$
5	Minimum value	Hexadecimal data format, unit: $\mu\text{m}$
7	difference	Hexadecimal data format, unit: $\mu\text{m}$

### 3. 0x06 Write to a Single Retention Register

Address	Data	Note
16	Channel 1 reset to zero	0 = No operation, 1 = Reset to zero, 2 = Start measurement 3 = End measurement, 4 = Resume

### 4. General Configuration Instruction Set (RS-485 Communication)

AT Command Format	Normal feedback	Meaning of the instruction
AT+UCAL?	AT+UCAL=OK	Query fitting parameters: AT+UCOL=parameter value
AT+UCOL=	AT+UCOL= Fitting parameter value	Modify the fitting parameters
AT+UART?	AT+UART=1,115200,	Query the station number and baud rate.
AT+UART=	AT+UART=station number, baud rate,	Modify the station number and baud rate.
AT+UVER?	AT+UVER=1.0	Query version number

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5. Application steps for maximum value, minimum value, and difference collection:

Start the measurement. The sensor modifies its status to "measurement in progress" (the value at register address 16 is rewritten as 2).

2) During equipment operation, the sensor collects the maximum value, minimum value and difference in real time.

3) After the measurement is completed, the sensor modifies its status to indicate the end of measurement (the value at register address 16 is rewritten as 3).

4) The maximum value, minimum value and difference data are stored in the corresponding register addresses.