

Contact-Type Displacement Sensor GFJ series Controller User Manual



⚠ WARN

- This product does not have an explosion-proof structure. It is forbidden to use it in an environment with flammable, explosive gas or explosive liquid.
- Do not disassemble or modify this product, because it is not designed to automatically shut down the laser emission when the body is opened. If the client disassembles or modifies this product without permission, it may cause personal injury, fire or electric shock.
- Using controls, adjustments or operating procedures other than those specified here may result in dangerous radiation leakage.

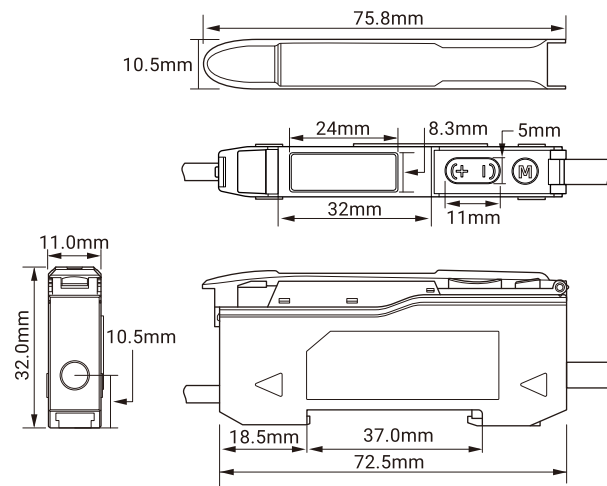
⚠ NOTICE

- It is very dangerous to perform wiring and connect/disconnect interfaces when the power is on. Be sure to turn off the power before operation.
- Installation in the following locations may cause malfunctions.
 - Dust or steam-filled areas
 - Corrosive gases are generated
 - Directly receive splashed water or oil
 - Severe vibration or shock
- This product is not suitable for outdoor use.
- Do not use this sensor in an unstable state shortly after the power is turned on (about 15 minutes warm-up time)
- If you must use a switching power regulator, ground the ground terminal. Do not connect to high-voltage cables or power lines. Failure to operate will result in induction or damage failures. Because each product is different, there may be slight differences in the detection characteristics of the workpiece.
- Do not use this product in water.
- Do not disassemble, repair or modify this product without authorization, otherwise it may cause electric shock, fire or injury to the human body. Wipe off dust on the transmitting or receiving element to maintain correct detection. Avoid direct impact of foreign objects on this product.
- Operate within the rated range.



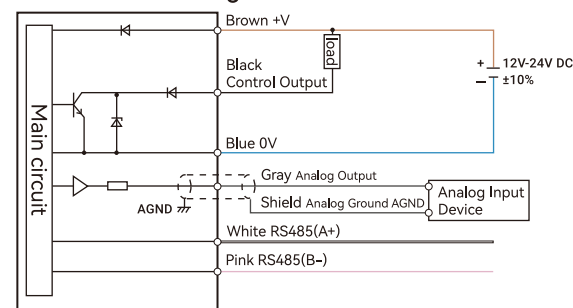
This product cannot be used as a safety device to protect the human body.

Dimensions

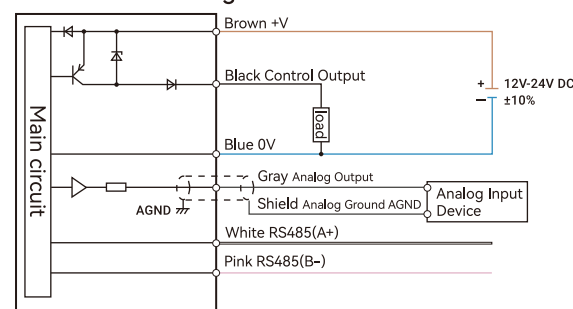


Circuit Diagram

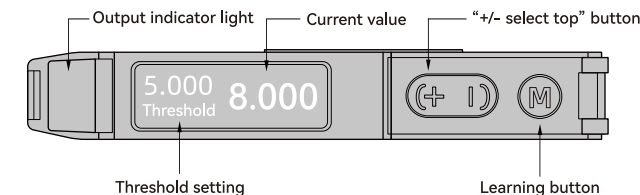
NPN+RS485+analog



PNP+RS485+analog



Panel Description



Menu Settings

In the distance display interface, press and hold the "M" key for 3 seconds to enter the menu setting mode.

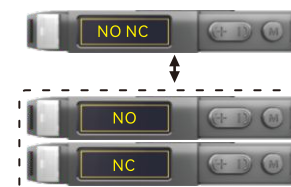
In the menu setting mode, press and hold the "M" key for 3 seconds to exit the menu setting mode.

In the menu setting mode, stop pressing any key for 20 seconds to automatically exit the menu setting mode.

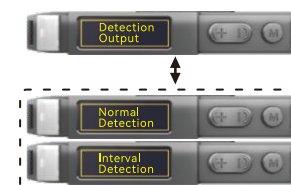
After entering the menu setting mode, press the "+" key or "-" key to switch the menu up and down.

Short press the "M" key to enter the corresponding menu item.

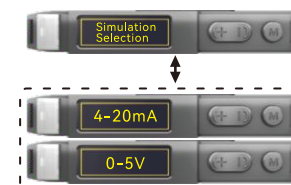
(1) Normally open and normally closed: press the "M" key to enter, NO, NC.



(2) Detection output: Interval detection is the conventional upper and lower limits. You can set an upper limit or a lower limit, and the output can be based on this interval.



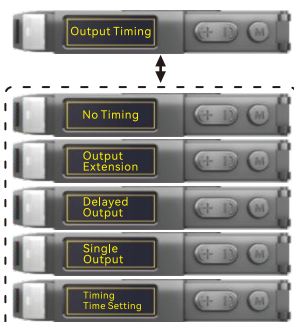
(3) Analog selection: 0-5V, 4-20mA.



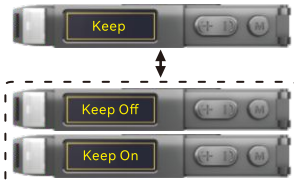
(4) Hysteresis: It is only valid for switch output and can adjust the distance at which the switch is disconnected.



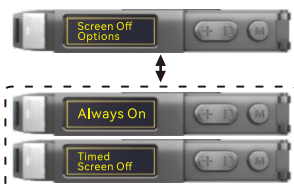
(5) Output timing: There are three types of output delay functions. The delay mode setting time can be within 10 seconds; the timing time setting setting time can be adjusted within 10 seconds.



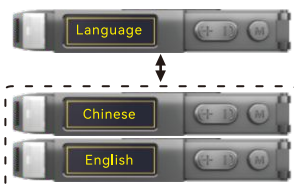
(6) Hold function: hold off, hold on.



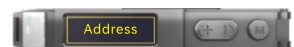
(7) Screen off options: always on, timed screen off.



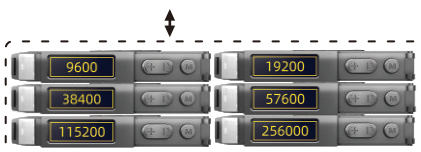
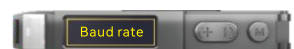
(8) Language: Two language options are available: "Simplified Chinese" and "English".



(9) Address: value range is 1-255.



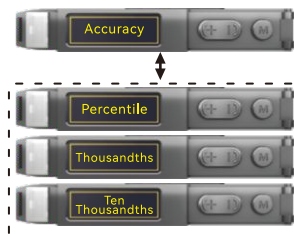
(10) Baud rate: 9600/19200/38400/57600/115200/256000 optional.



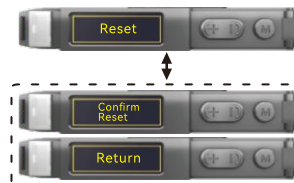
(11) Measuring range: 12.7, 25.4 optional.



(12) Working mode: Accuracy



(13) Reset: After selecting and confirming the reset, press the M key to display "Factory settings restored", indicating that the reset is successful.



Threshold Fine Tuning Function

Normal Detection Mode:

Press the "+" key or "-" key to change the threshold directly.

Window Comparison Mode:

Press the "+" key and "-" key at the same time to switch between threshold 1 and threshold 2.

Zeroing Function

Note: Zero adjustment can only be performed when the display mode is set to reverse or offset mode.

Zero adjustment function is the function of forcing the measured value to "zero". When setting zero adjustment, there is a vertical line on the screen, as shown in the right figure:

Press the "M" key and the "+" key at the same time to set zero adjustment



Press the "M" key and the "-" key at the same time to cancel zero adjustment



Key Locking Function

Press the "M" key and the "-" key at the same time to lock the key

Press the "M" key and the "-" key at the same time to unlock the key

Product Warranty

Normal Detection Mode:

When ordering our products with reference to product catalogs, unless otherwise specified in the quotation sheet, contract, specification, etc., the following warranty, disclaimer, and conditions of suitability for use shall apply. Please make sure to confirm the following before placing an order.

1. Shelf life

The shelf life is one year, starting from the date the product is sent to the place designated by the purchaser.

2. Warranty scope

If the purchased product fails due to the company's fault within the above warranty period, the company will be responsible for repairing the product free of charge.

However, if the failure is caused by the following reasons, it is not covered by the warranty:

- 1) Failure caused by use outside the conditions, environment, and usage methods described in our product manual;
- 2) Failure caused by reasons other than our company;
- 3) Failure caused by modifications and repairs not performed by our company;
- 4) Use outside the usage methods described by our company;
- 5) After the product is shipped, problems may arise due to unforeseen scientific levels;
- 6) Other failures caused by natural disasters, fires, and other factors other than our company.

At the same time, the above warranty only refers to our company's products themselves, and damage caused by failure of our company's products is excluded from the warranty.

3. Limitation of liability

- 1) The company does not assume any responsibility for special losses, indirect losses, and other related losses (equipment damage, loss of opportunity, loss of profit) caused by the company's products.
- 2) When using programmable devices, the company does not assume any responsibility for programming performed by non-company personnel or the consequences caused by it.

4. Suitable use and conditions

1) Our products are designed and produced for general products in general industries. Therefore, our products must not be used for the following applications and are not suitable for their use. If you need to use it in the following occasions, please consult with our sales staff, confirm the product specifications, and choose a product with a certain margin for rated performance. At the same time, you should consider various safety countermeasures, and even if a failure occurs, you can reduce the risk to the minimum safety circuit.

Facilities that have a serious impact on life and property, such as nuclear power control equipment, incineration equipment, railway, aviation, and vehicle equipment, medical equipment, entertainment equipment, safety devices, and equipment that must comply with special regulations of administrative agencies and individual industries.

Public utilities such as gas, water, and electricity supply systems, 24-hour continuous operation systems, and other equipment that requires high reliability.

Systems, equipment, and devices that may endanger personal and property.

Outdoor use under similar or similar conditions.

2) When users use our products in situations closely related to personal and property safety, they should clearly understand the danger of the entire system, adopt special redundant designs to ensure safety, and at the same time, according to the applicable purpose of our products in the system, make matching power distribution and settings, etc.

3) Please be sure to comply with all precautions and prohibitions on use to avoid improper use and damage caused by third parties.

5. Service scope

The price of our products does not include service fees such as the dispatch fee of technicians. If you have any needs in this regard, please contact us for negotiation.

DONGGUAN DADI ELECTRONIC TECHNOLOGY CO., LTD
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MODBUS PROTOCOL

Communication specifications

communication mode	RS485
Synchronization method	asynchronous
Baud	9.6/19.2/38.4/57.6/115.2/256kbps
Data length	8-bit
Stop bit	1-bit
Parity check	nothing

04H instruction (read input register)				
1. Communication frame format				
1byte	1byte	2byte	2byte	2byte
Address code	Function code	Register Address	Number of registers N	CRC code
2. Response frame format				
1byte	1byte	1byte	2N byte	2byte
Address code	Function code	Bytes 2N	Register value	CRC code
3. Error Frame Format				
1byte	1byte	1byte	2byte	
Address code	Error Code	Exception Code	CRC code	

● Dispatch orders

01 04 00 00 00 02 71 CB

Address code	Function code	Register Address	Number of registers N	CRC
01	04	0000	0002	71CB

● Feedback information

01 04 04 00 01 19 36 21 C2

Address code	Function code	Bytes	Register Value- Distance Value	Check digit
01	04	04	00 01 19 36	21 C2

Where 00 01 19 36 is distance information, unit: um, converted to Decimal, distance: 71990um=71.990mm

Communication example (default Baud is 115200)

● Dispatch orders

01 10 00 0E 00 02 04 00 00 25 80 69 13

Address code	Function code	Register Address	Number of registers	Bytes	Register value	CRC
0x01	0x10	0x000E	0x0002	0x04	0x00002580	0x6913

● Feedback information

01 10 00 0E 00 02 20 0B

Address code	Function code	Register Address	Number of registers	CRC
0x01	0x10	0x000E	0x0002	0x200B

Note: The sensor address code can be set in the function menu, and after the address code is changed, the CRC also needs to be changed at the same time.

Read data					
Address code	Function code	Register Address	Number of registers N	CRC	Function Description
0x01	0x04	0x0000	0x0002	0x71CB	Acquisition - Distance
0x01	0x04	0x0001	0x0001	0x600A	Acquisition - NO and NC
0x01	0x04	0x0002	0x0001	0x900A	Get - Detect Output
0x01	0x04	0x0003	0x0002	0x81CB	Get - Hysteresis
0x01	0x04	0x0004	0x0001	0x700B	Get - Output Timing
0x01	0x04	0x0005	0x0001	0x21CB	Get-Output Timing Time
0x01	0x04	0x0006	0x0001	0xD1CB	Get - Hold
0x01	0x04	0x0007	0x0001	0x800B	Get - Screen Off Selection
0x01	0x04	0x0008	0x0002	0xF009	Get - Zero Value
0x01	0x04	0x0009	0x0002	0xA1C9	Get - Threshold 1
0x01	0x04	0x000A	0x0002	0x51C9	Get - Threshold 2
0x01	0x04	0x000B	0x0002	0x0009	Get-Baud Rate
0x01	0x04	0x000C	0x0001	0xF1C9	Get-Maximum Range
0x01	0x04	0x000D	0x0001	0xA009	Get-Precision Display Digits

In response to					
Address code	Function code	Bytes 2N	Register value	CRC	Response description
0x01	0x04	0x04			Distance
0x01	0x04	0x02	0x0000	0xB930	Normally open
			0x0001	0x78F0	Normally closed
			0x0000	0xB930	Usually detected
0x01	0x04	0x02	0x0002	0x38F1	Interval two points insist
0x01	0x04	0x04			Hysteresis
0x01	0x04	0x02	0x0000	0xB930	No timing
			0x0001	0x78F0	Extended output
			0x0002	0x38F1	Delayed output
			0x0003	0xF931	Single output
					Timing time
0x01	0x04	0x02	0x0000	0xB930	Keep on
0x01	0x04	0x02	0x0001	0x78F0	Keep off
			0x0000	0xB930	Scheduled screen off
0x01	0x04	0x04	0x0001	0x78F0	Always on
					Zero value
0x01	0x04	0x04			Threshold 1
0x01	0x04	0x04			Threshold 2
0x01	0x04	0x04	0x000012C0		4800
			0x00002580		9600
			0x00009600		38400
			0x0001C200	0xFB24	115200
			0x0003E800		256000
0x01	0x04	0x02	0x0000	0xB930	Maximum range: 12.7
			0x0001	0x78F0	Maximum range: 25.4
0x01	0x04	0x02	0x0000	0xB930	Percentiles
0x01	0x04	0x02	0x0001	0x78F0	Thousands
0x01	0x04	0x02	0x0002	0x38F1	Ten-thousands

10H instruction (writing multiple holding registers)						
1. Communication frame format						
1byte	1byte	2byte	2byte	1byte	N*2 byte	2byte
Address code	Function code	Register Address	Number of registers N	Bytes 2N	Register value	CRC code
2. Response frame format						
1byte	1byte	2byte	2byte	2byte		
Address code	Function code	Register Address	Number of registers N	CRC code		
3. Error Frame Format						
1byte	1byte	1byte	2byte			
Address code	Error code	Exception code	CRC code			

Operating functions							
Address code	Function code	Register Address	Number of registers	Bytes	Register value	CRC	Function settings
0x01	0x10	0x0000	0x0001	0x02	0x0000	0xA650	Discontinuous output
0x01	0x10	0x0001	0x0001	0x02	0x0001	0x6790	Continuous output
					0x0000	0xA781	Normally open
					0x0001	0x6641	Normally closed
0x01	0x10	0x0002	0x0001	0x02	0x0000	0xA7B2	Common Tests
					0x0001	0x6672	One-point instruction
					0x0002	0x2673	Two-point instruction
					0x0003	0xE7B3	Three-point instruction
0x01	0x10	0x0003	0x0001	0x04			Hysteresis
0x01	0x10	0x0004	0x0001	0x02	0x0000	0xA7D4	No timing
					0x0001	0x6614	Output extension
					0x0002	0x2615	Delayed output
					0x0003	0xE7D5	Single output
0x01	0x10	0x0005	0x0001	0x02			Timing time
0x01	0x10	0x0006	0x0001	0x02	0x0000	0xA636	Keep on
0x01	0x10	0x0007	0x0001	0x02	0x0001	0x67F7	Keep off
					0x0000	0xA7E7	Scheduled screen off
0x01	0x10	0x0008	0x0001	0x02	0x0001	0x6627	Always on
							Zero - Current measurement value
0x01	0x10	0x0009	0x0002	0x04			Threshold - Input threshold 1
0x01	0x10	0x000A	0x0002	0x04			Threshold - Input threshold 2
0x01	0x10	0x000B	0x0002	0x04	0x00002580	0xA92C	9600
					0x00004B00	0x84EC	19200
					0x00009600	0xDDBC	38400
					0x0000E100	0xFA4C	57600
					0x0001C200	0xB2BC	115200
0x01	0x10	0x000C	0x0001	0x02	0x0003E800	0x0C1C	256000
					0x0000	0xA69C	Range -12.7
					0x0001	0x675C	Range -25.4
					0x0000	0xA74D	Accuracy Display - Hundreds
					0x0001	0x668D	Accuracy Display - Thousands
0x01	0x10	0x000D	0x0001	0x02	0x0002	0x268C	Accuracy Display - Millions
							Reset

In response to				
Address code	Function code	Register Address	Number of registers	CRC
0x01	0x10	0x0000	0x0001	0x01C9
0x01	0x10	0x0001	0x0001	0x5009
0x01	0x10	0x0002	0x0001	0xA009
0x01	0x10	0x0003	0x0002	0xB1C8
0x01	0x10	0x0004	0x0001	0x4008
0x01	0x10	0x0005	0x0001	0x11C8
0x01	0x10	0x0006	0x0001	0xE1C8
0x01	0x10	0x0007	0x0001	0xB008
0x01	0x10	0x0008	0x0001	0x800B
0x01	0x10	0x0009	0x0002	0x91CA
0x01	0x10	0x000A	0x0002	0x61CA
0x01	0x10	0x000C	0x0002	0x81CB
0x01	0x10	0x000D	0x0002	0xD00B
0x01	0x10	0x000E	0x0002	0xC1CA