

# SDG laser sensor operating instruction



warn

Use of this product without following the instructions may cause personal injury or property damage.



warn

- The light source of this product is visible semiconductor laser. It is prohibited for laser beam to enter the eye directly or indirectly from reflected objects. If laser beam enters the eye, it may cause the risk of blindness.
- This product does not have explosion-proof structure. It is prohibited to use in flammable, explosive gas or explosive liquid environment.
- Do not disassemble or modify this product, as it is not designed to automatically shut off the laser when the body is opened. Unauthorized disassembly or modification by the client may cause personal injury, fire, or electric shock risks.

Use of controls, adjustments or operational steps other than those specified here may result in hazardous radiation leakage.



warn

- It is extremely dangerous to connect or disconnect interfaces when the power is on. Always turn off the power before operating.
- May cause failure when installed at the following locations:
  1. Places covered with dust or steam.
  2. Where corrosive gas is generated.
  3. Where you will be directly exposed to splashing water or oil.
  4. Places subjected to severe vibration or impact.
- This product is not suitable for outdoor use.
- Do not use this sensor in the unstable state of the power supply shortly after it is turned on (about 15 minutes of warm-up time).
- When using a switching power supply, ensure the ground terminal is properly grounded.

★ Do not connect to high-voltage cables or power lines. Failure to do so may cause induced or damaged faults.  
Because each product is different, the detection characteristics of the workpiece may vary slightly.

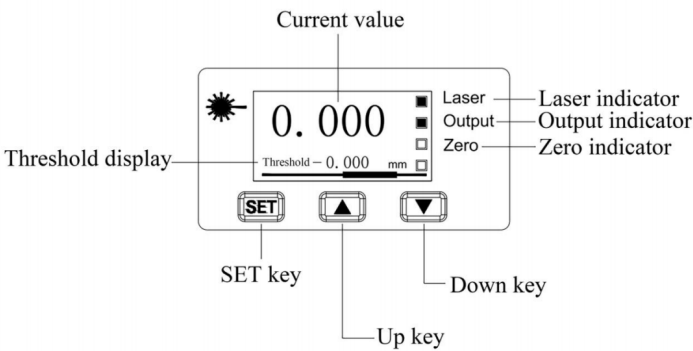
Do not use this product in water.

- Do not disassemble, repair or modify this product without authorization, otherwise it may cause electric shock, fire or human injury.
- Wipe away dust from the transmitting or receiving components to ensure accurate detection. Additionally, avoid direct impact of foreign objects on this product.
- Operate within rated range



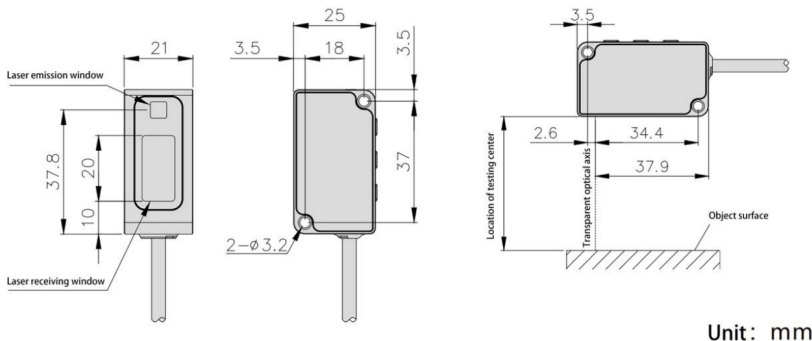
This product cannot be used as a safety device to protect the human body

## Display/Control section



## Product dimensions

- When installing this product, use M3 screws (available separately). Apply a tightening torque of 0.5N·m.



| Product Specifications           |   |                          |                           |
|----------------------------------|---|--------------------------|---------------------------|
| kind                             | rate center<br>30mm type                          | rate center<br>50mm type | rate center<br>100mm type |
| model : NPN+ analog<br>quantity  | SDG-30N-A   | SDG-50N-A                | SDG-100N-A                |
| model : NPN+485<br>communication | SDG-30N-485                                       | S D G - 5 0 N - 4 8 5    | SDG-100N-485              |
| model :<br>PNP+ analog quantity  | SDG-30P-A   | SDG-50P-A                | SDG-100P-A                |
| model : PNP+485<br>communication | SDG-30P-485                                       |                          | SDG-100P-485              |
| Measure distance                 | 30mm  | 50mm                     | 100mm                     |
| measuring range                  | +5mm  | ± 15mm                   | ±35mm                     |
| repeatability precision          | 5um   | 30um                     | 70um                      |
| linear pattern                   | ±0.1%F.S.   |                          |                           |
| temperature characteristic       | 0.3%F.S./°C                                       |                          |                           |
| illuminant                       | Red semiconductor laser, Class 2 laser, 655nm     |                          |                           |
| beam diameter                    | Approximately 50μm, 70μm, 120μm, 300μm, and 500μm |                          |                           |
| supply voltage                   | 12V-24V DC ±10% ripple, P-P10%                    |                          |                           |
| Power consumption                | ≤40mA @24V  |                          |                           |

|                          |   |
|--------------------------|---|
| Control output           | NPN or PNP output<br>Open drain collector transistor output<br>Maximum current: 50mA<br>External voltage: less than 30V DC<br>Remaining voltage: less than 1.5V<br>Leakage current: less than 0.1mA |
| output action            | Always on/always off can be switched  |
| short-circuit protection | Auto-restore  |
| Analog voltage output    | Output range: 0-5V (5.2V alarm)<br>Output impedance: 100 ohms   |
| Analog signal output     | Output range: 4-20mA (0mA for alarm)<br>Output impedance: 300 ohms maximum  |
| reaction time            | 1.5ms, 5ms, 10ms available  |
| external input           | NPN contactless input   |
| protection architecture  | IP67  |
| Use ambient temperature  | -10°C~+45°C (do not condense or freeze)   |
| Use ambient humidity     | 35%~85%RH   |
| Use ambient lighting     | Incandescent lamp: illumination below 3000lux on the light-receiving surface  |
| Use elevation            | Below 2000m   |
| cable                    | 5-core composite cable 2m   |
| material quality         | Aluminum parts  |
| quality                  | About 100g  |

(Note 1): If no measurement conditions are specified, the following conditions apply: Power supply voltage: 24V DC, ambient temperature: +20°C, reaction time: 10ms, and the analog output value of the measurement center distance. Object: white ceramic.

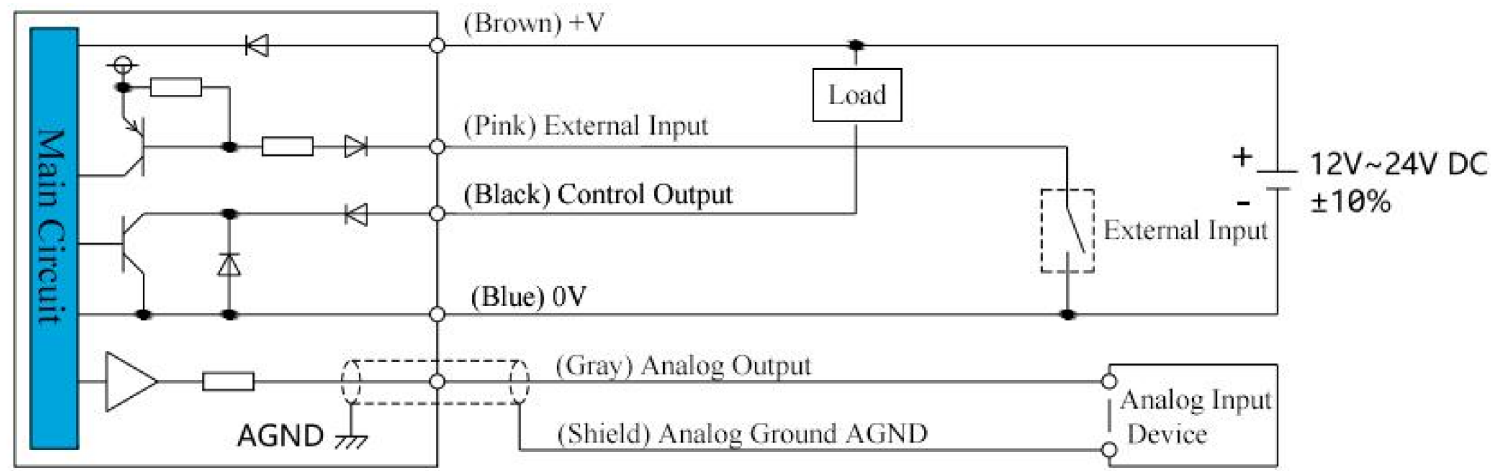
(Note 2): In accordance with FDA Rule 50 (Laser Notice No.50), comply with the FDA regulations.

(Note 3): The measurement of the center distance is defined by 1/e of the central light intensity (approximately 13.5%).

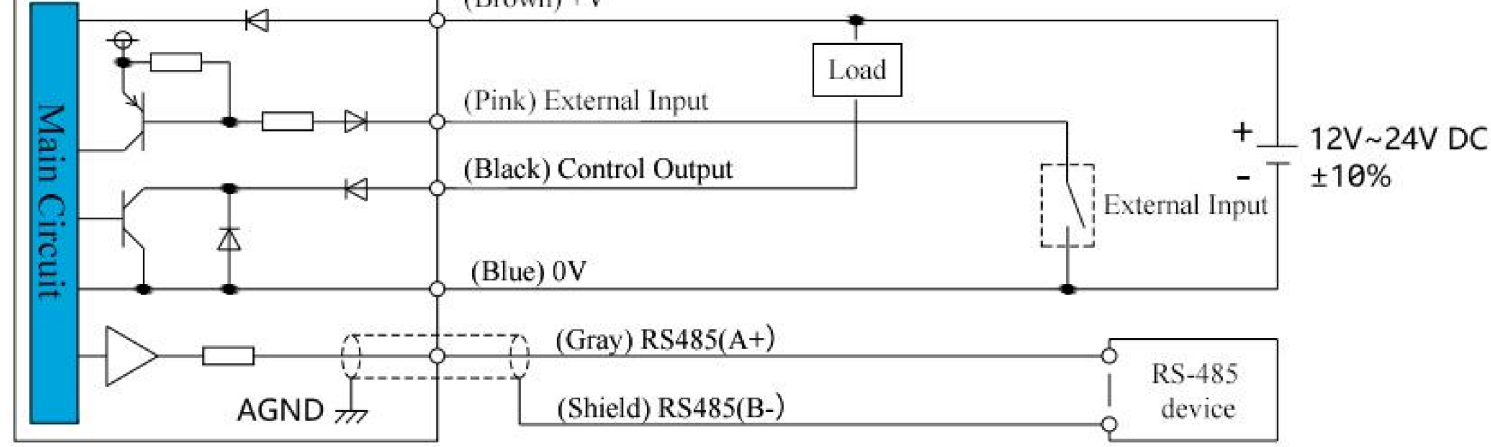
If there is light leakage outside the defined area and strong reflections around the detection point are higher than the detection point itself, the measurement results may be affected.

## Input/Output Circuit Diagram

● NPN+ Analog Output Type



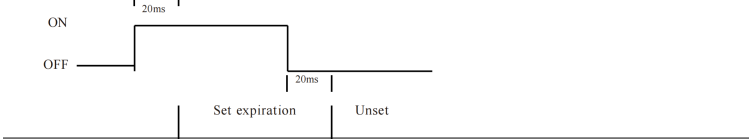
● NPN+RS485 output type



The key lock function prevents accidental changes to preset parameters by disabling key operations. Press both the "M" and "▼" keys simultaneously to activate the lock.  
Press both the "M" and "▼" keys to unlock the buttons.

Pink line-External input

- In the menu "External Input", select: Zero Save, Teach, Stop Laser, or Zero Without Save.
- When the pink MF line connects to the power negative terminal, triggering is activated; disconnecting the power negative terminal stops triggering.

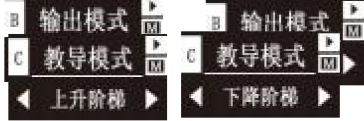


Function menu

1. Response time: high-speed, standard, high-precision



2. Output mode: normally open, normally closed



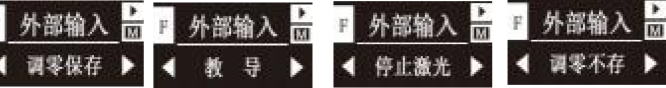
4. Simulation: Current, Voltage



5. Off-duty: flexible scheduling



6. External inputs: Save zero, teach, stop laser, zero without save



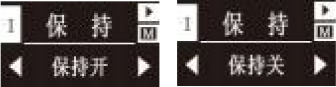
7. Timer: No timer, extended output, delayed output, no timer



8. Display modes: Normal, Inverted, Offset



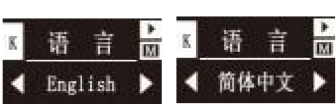
9. Keep: Closed, Open



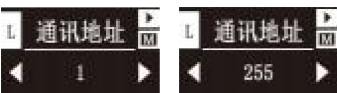
10. Environmental protection, environmental protection



11. Simplified Chinese, English



12. Mailing address: 1-255 flexible adjustment



13. 波特率: 9600/19200/38400/57600/115200/256000



14. Initialization: Start initialization or skip initialization



RS485 MODBUS protocol

communicational parameter

Using the MODBUS/RTU mode, CRC16/ Modbus x 16 + x 15 + x2 + 1;  
Default serial port configuration: baud rate 115200, 1 start bit, 8 data bits, no parity check.  
Check, 1 stop bit;

- Read register data (Function code 03H)

| Address code (1 byte) | Function code (1 byte) | Start address (2 bytes) | Number of registers (2 Bytes) | CRC(2Bytes) |
|-----------------------|------------------------|-------------------------|-------------------------------|-------------|
|-----------------------|------------------------|-------------------------|-------------------------------|-------------|

respond :

|                    |                       |                        |                         |                            |             |
|--------------------|-----------------------|------------------------|-------------------------|----------------------------|-------------|
| No error response: | Address code (1 byte) | Function code (1 byte) | Byte count (1 byte)     | Register value (N*2 bytes) | CRC(2Bytes) |
| Error response:    | Address code (1 byte) | Error code (1 byte)    | Abnormal code (2 bytes) | CRC(2Bytes)                |             |

Error code: 0x83 (function code + 0x80)  
Abnormal code: 0x01: Function code abnormal 0x03: Register quantity abnormal 0x04: Register value abnormal 0x05: CRC abnormal

- Write multiple register settings (Function code 10H)

| Addres s code (1 byte) | Functi on code (1 byte) | Start address (2 bytes) | Number of registers (2 Bytes) | Bytes (1 Byte) | Register value (N*2 bytes) | CRC (2Bytes) |
|------------------------|-------------------------|-------------------------|-------------------------------|----------------|----------------------------|--------------|
|------------------------|-------------------------|-------------------------|-------------------------------|----------------|----------------------------|--------------|

respond :

|                    |                       |                        |                         |                               |             |
|--------------------|-----------------------|------------------------|-------------------------|-------------------------------|-------------|
| No error response: | Address code (1 byte) | Function code (1 byte) | Start address (2 bytes) | Number of registers (2 Bytes) | CRC(2Bytes) |
| Error response:    | Address code (1 byte) | Error code (1 byte)    | Abnormal code (1 byte)  | CRC(2Bytes)                   |             |

Error code: 0x90 (function code + 0x80)  
Abnormal code: 0x01: Function code abnormal 0x03: Register quantity abnormal 0x04: Register value abnormal 0x05: CRC abnormal

communicating protocol

- Read inputregister(functioncode03H) to obtain sensor measurement data(00H)

|  |     |  |     |
|--|-----|--|-----|
| Host command 01 03 00 00 00 02 C4 0B     |     | Device response 01 03 04 00 00 49 E6 4C 29 |     |
| address code                             | 01H | address code                               | 01H |
| FC                                       | 03H | FC   | 03H |
| Access the first address of the register | 00H | Data byte length                           | 04H |
|  | 00H | Data byte 1 high 8 bits                    | 00H |
| Data byte length                         | 00H | Data byte 1 low 8 bits                     | 00H |
|  | 02H | Data byte 2 high 8 bits                    | 49H |
| CRC (Low 8 bits)                         | C4H | Data byte 2 low 8 bits                     | E6H |
| CRC (high 8 bits)                        | 0BH | CRC (Low 8 bits)                           | 4CH |
|  |     | CRC (high 8 bits)                          | 29H |

explain :  
1. Accessing the register's base address 0000H reads the current measurement data.  
2. Data word length 0002H indicates reading 2 data words;  
3. The read measurement data is 4 bytes, with the high byte sent first;

The displacement sensor measurement data (000049E6H) is converted to 18918 (um) in decimal, corresponding to an actual displacement length of 18.918mm; the sensor address (01H) is obtained.

|  |     |                                      |     |
|--|-----|--------------------------------------|-----|
| Host command 01 03 00 01 00 01 D5 CA     |     | Device response 01 03 02 00 01 79 84 |     |
| address code                             | 01H | address code                         | 01H |
| FC                                       | 03H | FC                                   | 03H |
| Access the first address of the register | 00H | Data byte length                     | 02H |
|  | 01H | Data byte 1 high 8 bits              | 00H |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 01H |
|  | 01H | CRC (Low 8 bits)                     | 79H |
| CRC (Low 8 bits)                         | D5H | CRC (high 8 bits)                    | 84H |
| CRC (high 8 bits)                        | CAH |                                      |     |



- explain :
1. Accessing the register's first address 0001H reads the current sensor address.
  2. Data word length 0001H indicates reading one data word;
  3. The read measurement speed is 2 Bytes, with the high byte sent first. 0001H is the 01 address.

Get sensor baud rate (02H)

|  |     |  |     |                  |
|--|-----|--|-----|------------------|
| Host command 01 03 00 02 00 02 65 CB     |     | Device response 01 03 04 00 01 C2 00 FA 93 |     |                  |
| address code                             | 01H | address code                               | 01H |                  |
| FC                                       | 03H | FC   | 03H |                  |
| Access the first address of the register | 00H | Data byte length                           | 04H |                  |
|  | 02H | Data byte 1 high 8 bits                    | 00H | Sensor baud rate |
| Data byte length                         | 00H | Data byte 1 low 8 bits                     | 01H |                  |
|  | 02H | Data byte 2 high 8 bits                    | C2H |                  |
| CRC (Low 8 bits)                         | 65H | Data byte 2 low 8 bits                     | 00H |                  |
| CRC (high 8 bits)                        | CBH | CRC (Low 8 bits)                           | FAH |                  |
|  |     | CRC (high 8 bits)                          | 93H |                  |

- explain :
1. Accessing the register's starting address 0002H enables reading the sensor's baud rate.
  2. Data word length 0002H indicates reading 2 data words;
  3. The read baud rate is 4 Bytes, with the high byte sent first. The baud rates are 9600 (00002580H) and 19200 (00004B00H).
- 0009600H is 38400,0000E100H is 57600,0001C200H is 115200,0003E800H is 256000;

Get threshold 1 (03H)

|  |     |  |     |             |
|--|-----|--|-----|-------------|
| Host command 01 03 00 03 00 02 34 0B     |     | Device response 01 03 04 00 00 49 E6 4C 29 |     |             |
| address code                             | 01H | address code                               | 01H |             |
| FC                                       | 03H | FC   | 03H |             |
| Access the first address of the register | 00H | Data byte length                           | 04H |             |
|  | 02H | Data byte 1 high 8 bits                    | 00H | threshold 1 |
| Data byte length                         | 00H | Data byte 1 low 8 bits                     | 00H |             |
|  | 02H | Data byte 2 high 8 bits                    | 49H |             |
| CRC (Low 8 bits)                         | 65H | Data byte 2 low 8 bits                     | E6H |             |
| CRC (high 8 bits)                        | CBH | CRC (Low 8 bits)                           | 4CH |             |
| explain :                                |     | CRC (high 8 bits)                          | 29H |             |

- explain :
1. Accessing the first register address 0003H sets the read threshold to 1;
  2. Data word length 0002H indicates reading 2 data words;
  3. The detected pattern is 4 bytes, with the high byte sent first;
  4. In the case, the sensor threshold 1 data (000049E6H) is converted to decimal: 18918 (um), and the corresponding threshold is 18.918mm;

Get threshold 2 (04H)

|  |     |  |     |                |
|--|-----|--|-----|----------------|
| Host command 01 03 00 04 00 02 85 CA     |     | Device response 01 03 04 00 00 49 E6 4C 29 |     |                |
| address code                             | 01H | address code                               | 01H |                |
| FC                                       | 03H | FC   | 03H |                |
| Access the first address of the register | 00H | Data byte length                           | 04H |                |
|  | 04H | Data byte 1 high 8 bits                    | 00H | threshold<br>2 |
| Data byte length                         | 00H | Data byte 1 low 8 bits                     | 00H |                |
|  | 02H | Data byte 2 high 8 bits                    | 49H |                |
| CRC (Low 8 bits)                         | 85H | Data byte 2 low 8 bits                     | E6H |                |
| CRC (high 8 bits)                        | CAH | CRC (Low 8 bits)                           | 4CH |                |
| explain :                                |     | CRC (high 8 bits)                          | 29H |                |

- explain :
1. Accessing the first address of the register 0004H indicates reading threshold 2;
  2. Data word length 0002H indicates reading 2 data words;
  3. The read measurement data is 4 bytes, with the high byte sent first;

**4. The case's displacement sensor threshold value 2 (000049E6H) converts to 18918 (um) in decimal, with the corresponding threshold set to 18.918mm. The zero adjustment value (05H) is obtained.**

|  |     |  |     |              |
|--|-----|--|-----|--------------|
| Host command 01 03 00 05 00 02 D4 0A     |     | Device response 01 03 04 00 00 49 E6 4C 29 |     |              |
| address code                             | 01H | address code                               | 01H |              |
| FC                                       | 03H | FC   | 03H |              |
| Access the first address of the register | 00H | Data byte length                           | 04H |              |
|  | 05H | Data byte 1 high 8 bits                    | 00H | Zero setting |
| Data byte length                         | 00H | Data byte 1 low 8 bits                     | 00H |              |
|  | 02H | Data byte 2 high 8 bits                    | 49H |              |
| CRC (Low 8 bits)                         | D4H | Data byte 2 low 8 bits                     | E6H |              |
| CRC (high 8 bits)                        | 0AH | CRC (Low 8 bits)                           | 4CH |              |
|  |     | CRC (high 8 bits)                          | 29H |              |

- explain :
1. Accessing the register's first address 0005H indicates reading the current storage mode.
  2. Data word length 0002H indicates reading 2 data words;
  3. The read measurement data is 4 bytes, with the high byte sent first;

**4. The current sensor zero adjustment value (000049E6H) in the case is converted to 18918 (um) in decimal, with a corresponding threshold of 18.918mm; the output timing time (06H) is obtained.**

|  |     |                                      |     |                |
|--|-----|--------------------------------------|-----|----------------|
| Host command 01 03 00 06 00 01 64 0B     |     | Device response 01 03 02 00 05 78 47 |     |                |
| address code                             | 01H | address code                         | 01H |                |
| FC                                       | 03H | FC                                   | 03H |                |
| Access the first address of the register | 00H | Data byte length                     | 02H |                |
|  | 09H | Data byte 1 high 8 bits              | 00H | Scheduled time |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 05H |                |
|  | 01H | CRC (Low 8 bits)                     | 78H |                |
| CRC (Low 8 bits)                         | 64H | CRC (high 8 bits)                    | 47H |                |
| CRC (high 8 bits)                        | 0BH |                                      |     |                |

- explain :
1. Accessing the first register address 0006H reads the current timing value.
  2. Data word length 0001H indicates reading one data word;
  3. The read measurement speed is 2 bytes, with the high byte sent first, and 0005H takes 5ms;



Get laser status (07H)

|  |     |                                      |     |              |
|--|-----|--------------------------------------|-----|--------------|
| Host command 01 03 00 07 00 01 35 CB     |     | Device response 01 03 02 00 00 B8 44 |     |              |
| address code                             | 01H | address code                         | 01H |              |
| FC                                       | 03H | FC                                   | 03H |              |
| Access the first address of the register | 00H | Data byte length                     | 02H |              |
|  | 07H | Data byte 1 high 8 bits              | 00H | Laser status |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 00H |              |
|  | 01H | CRC (Low 8 bits)                     | B8H |              |
| CRC (Low 8 bits)                         | 35H | CRC (high 8 bits)                    | 44H |              |
| CRC (high 8 bits)                        | CBH |                                      |     |              |

explain :

1. Accessing the register's first address 0007H indicates reading the laser status;
2. Data word length 0001H indicates reading one data word;
3. The read laser status is a 2-byte value, with the high byte sent first. 0000H indicates laser on, while 0001H indicates laser off.

Get laser status (08H)

|  |     |                                      |     |               |
|--|-----|--------------------------------------|-----|---------------|
| Host command 01 03 00 08 00 01 05 C8     |     | Device response 01 03 02 00 01 79 84 |     |               |
| address code                             | 01H | address code                         | 01H |               |
| FC                                       | 03H | FC                                   | 03H |               |
| Access the first address of the register | 00H | Data byte length                     | 02H |               |
|  | 08H | Data byte 1 high 8 bits              | 00H | response time |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 01H |               |
|  | 01H | CRC (Low 8 bits)                     | 79H |               |
| CRC (Low 8 bits)                         | 05H | CRC (high 8 bits)                    | 84H |               |
| CRC (high 8 bits)                        | C8H |                                      |     |               |

explain :

1. Accessing the first register address 0008H reads the current response time;
2. Data word length 0001H indicates reading one data word;
  3. The read measurement speed is 2 bytes, with the high byte sent first. 0000H indicates low-speed high-precision measurement, 0001H standard measurement, and 0002H high-speed measurement.

Get output mode (09H)

|  |     |                                      |     |             |
|--|-----|--------------------------------------|-----|-------------|
| Host command 01 03 00 09 00 01 54 08     |     | Device response 01 03 02 00 00 B8 44 |     |             |
| address code                             | 01H | address code                         | 01H |             |
| FC                                       | 03H | FC                                   | 03H |             |
| Access the first address of the register | 00H | Data byte length                     | 02H |             |
|  | 09H | Data byte 1 high 8 bits              | 00H | Output Mode |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 00H |             |
|  | 01H | CRC (Low 8 bits)                     | B8H |             |
| CRC (Low 8 bits)                         | 54H | CRC (high 8 bits)                    | 44H |             |
| CRC (high 8 bits)                        | 08H |                                      |     |             |

explain :

1. Accessing the register's first address 009DH indicates reading the current output mode.
2. Data word length 0001H indicates reading one data word (2 bytes per word);
3. The output signal is 2 bytes, with the high byte sent first. 0000H is normally open, while 0001H is normally closed.

Get tutorial mode (10H)

|  |     |                                      |     |               |
|--|-----|--------------------------------------|-----|---------------|
| Host command 01 03 00 10 00 01 85 CF     |     | Device response 01 03 02 00 00 B8 44 |     |               |
| address code                             | 01H | address code                         | 01H |               |
| FC                                       | 03H | FC                                   | 03H |               |
| Access the first address of the register | 00H | Data byte length                     | 02H |               |
|  | 10H | Data byte 1 high 8 bits              | 00H | Teaching Mode |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 00H |               |
|  | 01H | CRC (Low 8 bits)                     | B8H |               |
| CRC (Low 8 bits)                         | 85H | CRC (high 8 bits)                    | 44H |               |
| CRC (high 8 bits)                        | CFH |                                      |     |               |

explain :

1. Accessing the register's initial address 0010H enables reading the current instruction mode.
2. Data word length 0001H indicates reading one data word;
3. The read instruction pattern is 2 bytes, with the high byte sent first. The values 0000H for normal detection, 0001H for single-point instruction, 0002H for two-point instruction, 0003H for three-point instruction, 0004H for ascending step, and 0005H for descending step.

Get the variance value (11H)

|  |     |  |     |        |
|--|-----|--|-----|--------|
| Host command 01 03 00 11 00 02 94 0E     |     | Device response 01 03 04 00 00 00 14 FA 3C |     |        |
| address code                             | 01H | address code                               | 01H |        |
| FC                                       | 03H | FC   | 03H |        |
| Access the first address of the register | 00H | Data byte length                           | 04H |        |
|  | 11H | Data byte 1 high 8 bits                    | 00H | Offset |
| Data byte length                         | 00H | Data byte 1 low 8 bits                     | 00H |        |
|  | 02H | Data byte 2 high 8 bits                    | 00H |        |
| CRC (Low 8 bits)                         | 94H | Data byte 2 low 8 bits                     | 14H |        |
| CRC (high 8 bits)                        | 0EH | CRC (Low 8 bits)                           | FAH |        |
|  |     | CRC (high 8 bits)                          | 3CH |        |

explain :

1. Accessing the register's starting address 0011H reads the current offset.
2. Data word length 0002H indicates reading 2 data words (each 2 bytes).
3. The read differential value is 4 bytes, with the high byte sent first. In the example, 00000014H represents a differential value of 0.020mm.

Get external input (12H)

|  |     |                                      |     |
|--|-----|--------------------------------------|-----|
| Host command 01 03 00 12 00 01 24 0F     |     | Device response 01 03 02 00 01 79 84 |     |
| address code                             | 01H | address code                         | 01H |
| FC                                       | 03H | FC                                   | 03H |
| Access the first address of the register | 00H | Data byte length 02H                 |     |
|  | 12H | Data byte 1 high 8 bits              | 00H |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 01H |
|  | 01H | CRC (Low 8 bits) 79H                 |     |
| CRC (Low 8 bits)                         | 24H | CRC (high 8 bits) 84H                |     |
| CRC (high 8 bits)                        | 0FH |                                      |     |

explain :  
1. Accessing the register's first address 0012H enables external input functionality.  
2. Data word length 0001H indicates reading one data word;  
3. The external input function read is 2 bytes, with the high byte sent first. 0000H sets zero without saving, 0001H sets zero with saving, 0002H instructs, and 0003H stops the laser.

Get timer configuration (13H)

|  |     |                                      |     |
|--|-----|--------------------------------------|-----|
| Host command 01 03 00 13 00 01 75 CF     |     | Device response 01 03 02 00 00 B8 44 |     |
| address code                             | 01H | address code                         | 01H |
| FC                                       | 03H | FC                                   | 03H |
| Access the first address of the register | 00H | Data byte length 02H                 |     |
|  | 13H | Data byte 1 high 8 bits              | 00H |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 00H |
|  | 01H | CRC (Low 8 bits) B8H                 |     |
| CRC (Low 8 bits)                         | 75H | CRC (high 8 bits) 44H                |     |
| CRC (high 8 bits)                        | CFH |                                      |     |

explain :  
1. The access register's initial address 0013H is used to read the current timer status.  
2. Data word length 0001H indicates reading 1 data;  
3. The read timer status is a 2-byte value, with the high byte sent first. 0000H indicates no timer, 0001H means extended output, 0002H denotes delayed output, and 0003H represents single-shot output.

Get display mode (14H)

|  |     |                                      |     |
|--|-----|--------------------------------------|-----|
| Host command 01 03 00 14 00 01 C4 0E     |     | Device response 01 03 02 00 00 B8 44 |     |
| address code                             | 01H | address code                         | 01H |
| FC                                       | 03H | FC                                   | 03H |
| Access the first address of the register | 00H | Data byte length 02H                 |     |
|  | 14H | Data byte 1 high 8 bits              | 00H |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 00H |
|  | 01H | CRC (Low 8 bits) B8H                 |     |
| CRC (Low 8 bits)                         | C4H | CRC (high 8 bits) 44H                |     |
| CRC (high 8 bits)                        | 0EH |                                      |     |

explain :  
1. Accessing the register's starting address 0014H enables reading the current display mode.  
2. Data word length 0001H indicates reading one data word (2 bytes per word);  
3. The read-held mode is 2 bytes, with the high byte sent first. 0000H indicates normal display, 0001H inverted display, and 0002H offset display.

Get retention (15H)

|  |     |                                      |     |
|--|-----|--------------------------------------|-----|
| Host command 01 03 00 15 00 01 95 CE     |     | Device response 01 03 02 00 01 79 84 |     |
| address code                             | 01H | address code                         | 01H |
| FC                                       | 03H | FC                                   | 03H |
| Access the first address of the register | 00H | Data byte length 02H                 |     |
|  | 15H | Data byte 1 high 8 bits              | 00H |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 01H |
|  | 01H | CRC (Low 8 bits) 79H                 |     |
| CRC (Low 8 bits)                         | 95H | CRC (high 8 bits) 84H                |     |
| CRC (high 8 bits)                        | CEH |                                      |     |

explain :  
1. Accessing the register's initial address 0015H reads the current hold status.  
2. Data word length 0001H indicates reading one data word (2 bytes per word);  
3. The read-held mode is 2-byte, with the high byte sent first. 0000H indicates the held state is on, while 0001H indicates it is off.

Get screen protection (16H)

|  |     |                                      |     |
|--|-----|--------------------------------------|-----|
| Host command 01 03 00 16 00 01 65 CE     |     | Device response 01 03 02 00 01 79 84 |     |
| address code                             | 01H | address code                         | 01H |
| FC                                       | 03H | FC                                   | 03H |
| Access the first address of the register | 00H | Data byte length 02H                 |     |
|  | 16H | Data byte 1 high 8 bits              | 00H |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 01H |
|  | 01H | CRC (Low 8 bits) 79H                 |     |
| CRC (Low 8 bits)                         | 65H | CRC (high 8 bits) 84H                |     |
| CRC (high 8 bits)                        | CEH |                                      |     |

explain :  
1. Accessing the first register address 0016H indicates whether energy-saving mode is currently enabled.  
2. Data word length 0001H indicates reading one data word (2 bytes per word);  
3. The energy-saving mode read is 2 bytes, with the high byte sent first. 0000H indicates environmental protection on, while 0001H indicates environmental protection off.

Get Language (17H)

|  |     |                                      |     |
|--|-----|--------------------------------------|-----|
| Host command 01 03 00 17 00 01 34 0E     |     | Device response 01 03 02 00 00 B8 44 |     |
| address code                             | 01H | address code                         | 01H |
| FC                                       | 03H | FC                                   | 03H |
| Access the first address of the register | 00H | Data byte length 02H                 |     |
|  | 17H | Data byte 1 high 8 bits              | 00H |
| Data byte length                         | 00H | Data byte 1 low 8 bits               | 00H |
|  | 01H | CRC (Low 8 bits) B8H                 |     |
| CRC (Low 8 bits)                         | 34H | CRC (high 8 bits) 44H                |     |
| CRC (high 8 bits)                        | 0EH |                                      |     |

explain :  
1. Accessing the register's first address 0017H indicates reading the current language;  
2. Data word length 0001H indicates reading one data word (2 bytes per word);  
3. The read data is 2 bytes, with the high byte sent first. 0000H indicates Simplified Chinese, while 0001H indicates English.

●Configure multiple registers (Function Code 10H) to set distance transmission mode (00H)

|   |     |   |                       |
|---|-----|---|-----------------------|
| Host command 01 10 00 00 00 01 02 00 00 A6 50 |     | Device response 01 10 00 00 00 01 01 C9 |                       |
| address code                                  | 01H | address code                            | 01H                   |
| FC  | 10H | FC                                      | 10H                   |
| Register first address                        | 00H | Register first address                  | 00H                   |
|   | 00H |   | 00H                   |
| Number of registers                           | 00H | Number of registers                     | 00H                   |
|   | 01H |   | 01H                   |
| Byte count                                    | 02H | CRC (Low 8 bits)                        | 01H                   |
|   | 00H |   | CRC (high 8 bits) C9H |
| Set parameter values                          | 00H |   |                       |
| CRC (Low 8 bits)                              | A6H |   |                       |
| CRC (high 8 bits)                             | 50H |   |                       |

explain :  
1. Set the first register address 0000H to configure the distance transmission mode;  
2. Register number 0001H indicates the configuration of one data word.  
3. Byte count: 02H indicates 2-byte configuration.  
4. The example configuration sets parameter 0000H for single-distance measurement and 0001H for continuous sensor output (not suitable for multiple 485 slave devices).

Set sensor address (01H)

|   |     |   |                       |
|---|-----|---|-----------------------|
| Host command 01 10 00 01 00 01 02 00 01 66 41 |     | Device response 01 10 00 01 00 01 50 09 |                       |
| address code                                  | 01H | address code                            | 01H                   |
| FC  | 10H | FC                                      | 10H                   |
| Register first address                        | 00H | Register first address                  | 00H                   |
|   | 01H |   | 01H                   |
| Number of registers                           | 00H | Number of registers                     | 00H                   |
|   | 01H |   | 01H                   |
| Byte count                                    | 02H | CRC (Low 8 bits)                        | 50H                   |
|   | 00H |   | CRC (high 8 bits) 09H |
| Set parameter values                          | 01H |   |                       |
| CRC (Low 8 bits)                              | 66H |   |                       |
| CRC (high 8 bits)                             | 41H |   |                       |

explain :  
1. Set the first register address 0002H to set the sensor address;  
2. Register count: 0001H indicates the configuration of one data word.  
3. Byte count: 02H indicates 2-byte configuration.  
4. The parameter value 0001H in the above example indicates that the sensor address is set to 1.

Set baud rate (02H)

|   |     |   |                       |
|---|-----|---|-----------------------|
| Host command 01 10 00 02 00 02 04 00 01 C2 00 72 D6 |     | Device response 01 10 00 02 00 02 E0 08 |                       |
| address code  | 01H | address code                            | 01H                   |
| FC  | 10H | FC                                      | 10H                   |
| Register first address                              | 00H | Register first address                  | 00H                   |
|   | 02H |   | 02H                   |
| Number of registers                                 | 00H | Number of registers                     | 00H                   |
|   | 02H |   | 02H                   |
| Byte count  | 04H | CRC (Low 8 bits)                        | E0H                   |
|   | 00H |   | CRC (high 8 bits) 08H |
| Set parameter values                                | 01H |   |                       |
|   | C2H |   |                       |
|   | 00H |   |                       |
| CRC (Low 8 bits)                                    | 72H |   |                       |
| CRC (high 8 bits)                                   | D6H |   |                       |

explain :  
1. The initial register address 0002H is designated for configuring the baud rate.  
2. Register count: 0002H indicates the configuration of two data words.  
3. The byte count 04H is configured for 4 bytes of data.  
4. The parameter values 0001C200H,00002580H,00004B00H,00009600H,0001C200H, and 0003E800H in the above example settings represent baud rates of 115200,9600,19200,38400,115200, and 38400, respectively. 256,000;



Set threshold 1 (03H)

|   |     |   |     |
|---|-----|---|-----|
| Host command 01 10 00 03 00 02 04 00 00 49 E6 05 A0 |     | Device response 01 10 00 03 00 02 B1 C8 |     |
| address code  | 01H | address code                            | 01H |
| FC  | 10H | FC                                      | 10H |
| Register first address                              | 00H | Register first address                  | 00H |
|   | 03H |   | 03H |
| Number of registers                                 | 00H | Number of registers                     | 00H |
|   | 02H |   | 02H |
| Byte count  | 04H | CRC (Low 8 bits)                        | B1H |
| Set parameter values                                | 00H | CRC (high 8 bits)                       | C8H |
|   | 00H |   |     |
|   | 49H |   |     |
|   | E6H |   |     |
| CRC (Low 8 bits)                                    | 05H |   |     |
| CRC (high 8 bits)                                   | A0H |   |     |

explain :  
1. Set the first register address 0003H to represent threshold 1;  
2. Register count: 0002H indicates the configuration of two data words.  
3. The byte count: 04H is configured for 4 bytes;  
4. The parameter value 000049E6H in the above example is converted to 18918 (um) in decimal, corresponding to threshold 1 of 18.918mm;

Set threshold 2 (04H)

|   |     |  |     |
|---|-----|--|-----|
| Host command 01 10 00 04 00 02 04 00 00 49 E6 44 46 |     | Device response 001 10 00 04 00 02 00 09 |     |
| address code  | 01H | address code                             | 01H |
| FC  | 10H | FC                                       | 10H |
| Register first address                              | 00H | Register first address                   | 00H |
|   | 04H |  | 04H |
| Number of registers                                 | 00H | Number of registers                      | 00H |
|   | 02H |  | 02H |
| Byte count  | 04H | CRC (Low 8 bits)                         | 00H |
| Set parameter values                                | 00H | CRC (high 8 bits)                        | 09H |
|   | 00H |  |     |
|   | 49H |  |     |
|   | E6H |  |     |
| CRC (Low 8 bits)                                    | 44H |  |     |
| CRC (high 8 bits)                                   | 46H |  |     |

explain :  
1. Set the first register address 0004H to represent the threshold value 2;  
2. Register count: 0002H indicates the configuration of two data words.  
3. The byte count: 04H is configured for 4 bytes of data.  
4. The parameter value 000049E6H in the above example is converted to 18918 (um) in decimal, corresponding to threshold 1 of 18.918mm; set zero (05H)

|   |     |   |     |
|---|-----|---|-----|
| Host command 01 10 00 05 00 01 02 00 01 67 C5 |     | Device response 01 10 00 05 00 01 11 C8 |     |
| address code                                  | 01H | address code                            | 01H |
| FC  | 10H | FC                                      | 10H |
| Register first address                        | 00H | Register first address                  | 00H |
|   | 05H |   | 05H |
| Number of registers                           | 00H | Number of registers                     | 00H |
|   | 01H |   | 01H |
| Byte count                                    | 02H | CRC (Low 8 bits)                        | 11H |
| Set parameter values                          | 00H | CRC (high 8 bits)                       | C8H |
|   | 01H |   |     |
|   | 67H |   |     |
| CRC (Low 8 bits)                              | 67H |   |     |
| CRC (high 8 bits)                             | C5H |   |     |

explain :  
1. Set the first register address 0005H to represent zero setting;  
2. Register number 0001H indicates the configuration of one data word.  
3. Byte count: 02H indicates 2-byte configuration.  
4. The parameter values in the above example settings: 0001H enables forced zeroing for current distance, 0000H cancels zeroing, and 0001H resets to current distance zeroing.

Set the timer (06H)

|   |     |   |     |
|---|-----|---|-----|
| Host command 01 10 00 06 00 01 02 00 05 66 35 |     | Device response 01 10 00 06 00 01 E1 C8 |     |
| address code                                  | 01H | address code                            | 01H |
| FC  | 10H | FC                                      | 10H |
| Register first address                        | 00H | Register first address                  | 00H |
|   | 06H |   | 06H |
| Number of registers                           | 00H | Number of registers                     | 00H |
|   | 01H |   | 01H |
| Byte count                                    | 02H | CRC (Low 8 bits)                        | E1H |
| Set parameter values                          | 00H | CRC (high 8 bits)                       | C8H |
|   | 05H |   |     |
|   | 66H |   |     |
| CRC (Low 8 bits)                              | 66H |   |     |
| CRC (high 8 bits)                             | 35H |   |     |

explain :  
1. Set the first register address 0006H to configure the timing period.  
2. Register number 0001H indicates the configuration of one data word.  
3. Byte count: 02H indicates 2-byte configuration.  
4. The parameter value 0005H in the above example indicates a 5ms timeout setting.

Set laser status (07H)

|   |     |   |     |
|---|-----|---|-----|
| Host command 01 10 00 07 00 01 02 00 00 A7 E7 |     | Device response 01 10 00 07 00 01 B0 08 |     |
| address code                                  | 01H | address code                            | 01H |
| FC  | 10H | FC                                      | 10H |
| Register first address                        | 00H | Register first address                  | 00H |
|   | 07H |   | 07H |
| Number of registers                           | 00H | Number of registers                     | 00H |
|   | 01H |   | 01H |
| Byte count                                    | 02H | CRC (Low 8 bits)                        | B0H |
| Set parameter values                          | 00H | CRC (high 8 bits)                       | 08H |
|   | 00H |   |     |
|   | A7H |   |     |
| CRC (Low 8 bits)                              | A7H |   |     |
| CRC (high 8 bits)                             | E7H |   |     |

explain :  
1. Set the register's initial address 0007H to configure the laser status;  
2. Register number 0001H indicates the configuration of one data word.  
3. Byte count: 02H indicates 2-byte configuration.  
4. The parameter values in the above example settings are: 0000H for laser on, 0001H for laser off.

Set response time (08H)

|   |     |   |     |
|---|-----|---|-----|
| Host command 01 10 00 08 00 01 02 00 01 66 D8 |     | Device response 01 10 00 08 00 01 80 0B |     |
| address code                                  | 01H | address code                            | 01H |
| FC  | 10H | FC                                      | 10H |
| Register first address                        | 00H | Register first address                  | 00H |
|   | 08H |   | 08H |
| Number of registers                           | 00H | Number of registers                     | 00H |
|   | 01H |   | 01H |
| Byte count                                    | 02H | CRC (Low 8 bits)                        | 80H |
| Set parameter values                          | 00H | CRC (high 8 bits)                       | 0BH |
|   | 01H |   |     |
|   | 66H |   |     |
| CRC (Low 8 bits)                              | 66H |   |     |
| CRC (high 8 bits)                             | D8H |   |     |

explain :  
1. Set the first register address 0008H to indicate the setup response time;  
2. Register number 0001H indicates the configuration of one data word.  
3. Byte count: 02H indicates 2-byte configuration.  
4. The parameter values in the above example settings are: 0001H for standard speed, 0000H for low-speed high-precision, 0001H for standard speed, and 0002H for high-speed measurement.

Set output mode (09H)

|   |     |   |     |
|---|-----|---|-----|
| Host command 01 10 00 09 00 01 02 00 00 A6 C9 |     | Device Response 01 10 00 09 00 01 D1 CB |     |
| address code                                  | 01H | address code                            | 01H |
| FC  | 10H | FC                                      | 10H |
| Register first address                        | 00H | Register first address                  | 00H |
|   | 09H |   | 09H |
| Number of registers                           | 00H | Number of registers                     | 00H |
|   | 01H |   | 01H |
| Byte count                                    | 02H | CRC (Low 8 bits)                        | D1H |
| Set parameter values                          | 00H | CRC (high 8 bits)                       | CBH |
|   | 00H |   |     |
|   | A6H |   |     |
| CRC (Low 8 bits)                              | A6H |   |     |
| CRC (high 8 bits)                             | C9H |   |     |

explain :  
1. Set the first register address 0009H to configure the output mode;  
2. Register number 0001H indicates the setting of one data word;  
3. Byte count: 02H indicates 2-byte configuration data.  
4. The parameter value 0000H in the above example setting represents normally open output, where 0000H is normally open and 0001H is normally closed.

Set tutorial mode (10H)

|   |     |   |     |
|---|-----|---|-----|
| Host command 01 10 00 10 00 01 02 00 00 A4 C0 |     | Device response 01 10 00 10 00 01 00 0C |     |
| address code                                  | 01H | address code                            | 01H |
| FC  | 10H | FC                                      | 10H |
| Register first address                        | 00H | Register first address                  | 00H |
|   | 10H |   | 10H |
| Number of registers                           | 00H | Number of registers                     | 00H |
|   | 01H |   | 01H |
| Byte count                                    | 02H | CRC (Low 8 bits)                        | 00H |
| Set parameter values                          | 00H | CRC (high 8 bits)                       | 0CH |
|   | 00H |   |     |
|   | A4H |   |     |
| CRC (Low 8 bits)                              | A4H |   |     |
| CRC (high 8 bits)                             | C0H |   |     |

explain :  
1. Set the first register address 0010H to configure the output mode;  
2. Register number 0001H indicates the setting of one data word;  
3. Byte count: 02H indicates 2-byte configuration data.  
4. The parameter values 0000H,0001H,0002H,0003H,0004H, and 0005H in the above example settings represent the following modes: 0000H for general detection, 0001H for single-point guidance, 0002H for two-point guidance, 0003H for three-point guidance, 0004H for ascending step, and 0005H for descending step.

Set the offset value (11H)

|   |     |   |     |
|---|-----|---|-----|
| Host command 01 10 00 11 00 02 04 00 00 00 14 33 60 |     | Device response 01 10 00 11 00 02 11 CD |     |
| address code  | 01H | address code                            | 01H |
| FC  | 10H | FC                                      | 10H |
| Register first address                              | 00H | Register first address                  | 00H |
|   | 11H |   | 06H |
| Number of registers                                 | 00H | Number of registers                     | 00H |
|   | 02H |   | 02H |
| Byte count  | 04H | CRC (Low 8 bits)                        | 11H |
| Set parameter values                                | 00H | CRC (high 8 bits)                       | CDH |
|   | 00H |   |     |
|   | 00H |   |     |
|   | 14H |   |     |
| CRC (Low 8 bits)                                    | 33H |   |     |
| CRC (high 8 bits)                                   | 60H |   |     |

- explain :
1. Set the first register address 0011H to indicate the setting difference;
  2. Register number 0002H indicates the configuration of two data words.
  3. Byte count: The 04H setting requires 4 bytes of data.
  4. The parameter value 00000014H in the above example sets the differential to 0.020mm.

Set external input (12H)

|   |                  |   |     |
|---|------------------|---|-----|
| Host command 01 10 00 12 00 01 02 00 00 A5 22 |                  | Device response 01 10 00 08 00 01 80 0B |     |
| address code                                  | 01H              | address code                            | 01H |
| FC  | 10H              | FC                                      | 10H |
| Register first address                        | 00H              | Register first address                  | 00H |
|   | 12H              |   | 12H |
| Number of registers                           | 00H              | Number of registers                     | 00H |
|   | 01H              |   | 01H |
| Byte count                                    | 02H              | CRC (Low 8 bits)                        | A1H |
| Set parameter values                          | 00H              | CRC (high 8 bits)                       | CCH |
|   | 00H              |   |     |
|   | CRC (Low 8 bits) |   |     |
|   | A5H              |   |     |
| CRC (high 8 bits)                             | 22H              |   |     |

- explain :
1. Set the register's initial address 0012H to enable external input functionality.
  2. Register number 0001H indicates the setting of one data word;
  3. Byte count: 02H indicates 2-byte configuration data.
  4. The parameter values in the above example settings: 0000H (zero adjustment without saving), 0001H (zero adjustment with saving), 0002H (teaching mode), and 0003H (stop laser).

Set timer (13H)

|   |                  |   |     |
|---|------------------|---|-----|
| Host command 01 10 00 13 00 01 02 00 00 A4 F3 |                  | Device response 01 10 0 0 13 0 0 01 F0 0C |     |
| address code                                  | 01H              | address code                              | 01H |
| FC  | 10H              | FC  | 10H |
| Register first address                        | 00H              | Register first address                    | 00H |
|   | 13H              |   | 13H |
| Number of registers                           | 00H              | Number of registers                       | 00H |
|   | 01H              |   | 01H |
| Byte count                                    | 02H              | CRC (Low 8 bits)                          | F0H |
| Set parameter values                          | 00H              | CRC (high 8 bits)                         | 0CH |
|   | 00H              |   |     |
|   | CRC (Low 8 bits) |   |     |
|   | A4H              |   |     |
| CRC (high 8 bits)                             | F3H              |   |     |

- explain :
1. Set the first register address 0013H to configure the timer.
  2. Register number 0001H indicates the setting of one data word;
  3. Byte count: 02H indicates 2-byte configuration data.
  4. The parameter values in the above example settings: 0000H indicates no timing, 0000H means no timing, 0001H denotes extended output, 0002H indicates delayed output, and 0003H represents single-output mode.

Set display mode (14H)

|   |                  |   |     |
|---|------------------|---|-----|
| Host command 01 10 00 14 00 01 02 00 00 A5 44 |                  | Device Response 01 10 00 14 00 01 41 CD |     |
| address code                                  | 01H              | address code                            | 01H |
| FC  | 10H              | FC                                      | 10H |
| Register first address                        | 00H              | Register first address                  | 00H |
|   | 14H              |   | 14H |
| Number of registers                           | 00H              | Number of registers                     | 00H |
|   | 01H              |   | 01H |
| Byte count                                    | 02H              | CRC (Low 8 bits)                        | 41H |
| Set parameter values                          | 00H              | CRC (high 8 bits)                       | CDH |
|   | 00H              |   |     |
|   | CRC (Low 8 bits) |   |     |
|   | A5H              |   |     |
| CRC (high 8 bits)                             | 44H              |   |     |

- explain :
1. Set the first register address 0014H to configure the display mode;
  2. Register number 0001H indicates the setting of one data word;
  3. Byte count: The 02H setting uses 2 bytes.
  4. The parameter values in the above example settings: 0000H for normal display, 0001H for inverted display, and 0002H for offset display.

Keep settings (15H)

|   |                  |   |     |
|---|------------------|---|-----|
| Host command 01 10 00 15 00 01 02 00 01 65 55 |                  | Device response 01 10 00 15 00 01 10 0D |     |
| address code                                  | 01H              | address code                            | 01H |
| FC  | 10H              | FC                                      | 10H |
| Register first address                        | 00H              | Register first address                  | 00H |
|   | 15H              |   | 15H |
| Number of registers                           | 00H              | Number of registers                     | 00H |
|   | 01H              |   | 01H |
| Byte count                                    | 02H              | CRC (Low 8 bits)                        | 10H |
| Set parameter values                          | 00H              | CRC (high 8 bits)                       | 0DH |
|   | 01H              |   |     |
|   | CRC (Low 8 bits) |   |     |
|   | 65H              |   |     |
| CRC (high 8 bits)                             | 55H              |   |     |

- explain :
1. Set the first register address 0015H to indicate whether to maintain the setting;
  2. Register number 0001H indicates the setting of one data word;
  3. Byte count: The 02H setting is configured as 2 bytes.

The parameter values in the above example are set as follows: 0001H for holding off, 0000H for holding on, and 0001H for holding off again. The screen eco mode (16H) is also configured.

|   |                  |   |     |
|---|------------------|---|-----|
| Host command 01 10 00 16 00 01 02 00 01 65 66 |                  | Device response 01 10 00 15 00 01 10 0D |     |
| address code                                  | 01H              | address code                            | 01H |
| FC  | 10H              | FC                                      | 10H |
| Register first address                        | 00H              | Register first address                  | 00H |
|   | 16H              |   | 16H |
| Number of registers                           | 00H              | Number of registers                     | 00H |
|   | 01H              |   | 01H |
| Byte count                                    | 02H              | CRC (Low 8 bits)                        | E0H |
| Set parameter values                          | 00H              | CRC (high 8 bits)                       | 0DH |
|   | 01H              |   |     |
|   | CRC (Low 8 bits) |   |     |
|   | 65H              |   |     |
| CRC (high 8 bits)                             | 66H              |   |     |

- explain :
1. Set the first register address 0016H to indicate whether to set the energy-saving mode;
  2. Register number 0001H indicates the setting of one data word;
  3. Byte count: 02H indicates 2-byte configuration data.
  4. The parameter values in the above example settings are: 0001H for environmental protection off, 0000H for environmental protection on, and 0001H for environmental protection off.

Set language (17H)

|   |                  |   |     |
|---|------------------|---|-----|
| Host command 01 10 00 17 00 01 02 00 00 A5 77 |                  | Device Response 01 10 00 17 00 01 B1 CD |     |
| address code                                  | 01H              | address code                            | 01H |
| FC  | 10H              | FC                                      | 10H |
| Register first address                        | 00H              | Register first address                  | 00H |
|   | 17H              |   | 17H |
| Number of registers                           | 00H              | Number of registers                     | 00H |
|   | 01H              |   | 01H |
| Byte count                                    | 02H              | CRC (Low 8 bits)                        | B1H |
| Set parameter values                          | 00H              | CRC (high 8 bits)                       | CDH |
|   | 00H              |   |     |
|   | CRC (Low 8 bits) |   |     |
|   | A5H              |   |     |
| CRC (high 8 bits)                             | 77H              |   |     |

- explain :
1. Set the first register address 0017H to indicate whether to configure the language;
  2. Register number 0001H indicates the setting of one data word;
  3. Byte count: 02H indicates 2-byte configuration data.
  4. The parameter value 0000H in the above example represents Simplified Chinese, with 0000H for Simplified Chinese and 0001H for English.

Restore factory settings (18H)

|   |                  |   |     |
|---|------------------|---|-----|
| Host command 01 10 00 18 00 01 02 00 00 A5 88 |                  | Device response 01 10 00 18 00 01 81 CE |     |
| address code                                  | 01H              | address code                            | 01H |
| FC  | 10H              | FC                                      | 10H |
| Register first address                        | 00H              | Register first address                  | 00H |
|   | 18H              |   | 18H |
| Number of registers                           | 00H              | Number of registers                     | 00H |
|   | 01H              |   | 01H |
| Byte count                                    | 02H              | CRC (Low 8 bits)                        | 81H |
| Set parameter values                          | 00H              | CRC (high 8 bits)                       | CEH |
|   | 00H              |   |     |
|   | CRC (Low 8 bits) |   |     |
|   | A5H              |   |     |
| CRC (high 8 bits)                             | 88H              |   |     |

- explain :
1. Set the first register address 0018H to reset the product;
  2. Register number 0001H indicates the setting of one data word;
  3. Byte count: The 02H setting is configured as 2 bytes.
  4. The parameter value 0000H in the above example indicates that the sensor has been restored to factory settings.





# Siman

## Relative to the direction of the moving object

### Material and color difference

- When measuring, install the moving object in the direction shown in the figure on the right when the material and color of the object are extremely different, so as to minimize the measurement error.

### Measure rotating objects

- When measuring rotating objects, install them in the direction shown in the figure on the right to suppress the effects of vertical vibration and position shift of the object.

### When there is a gap

- When the moving object has a step, install it according to the method shown in the right figure to suppress the influence of the step edge.

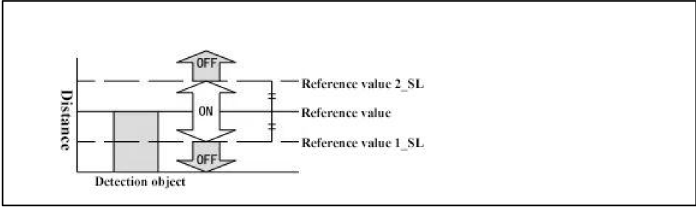
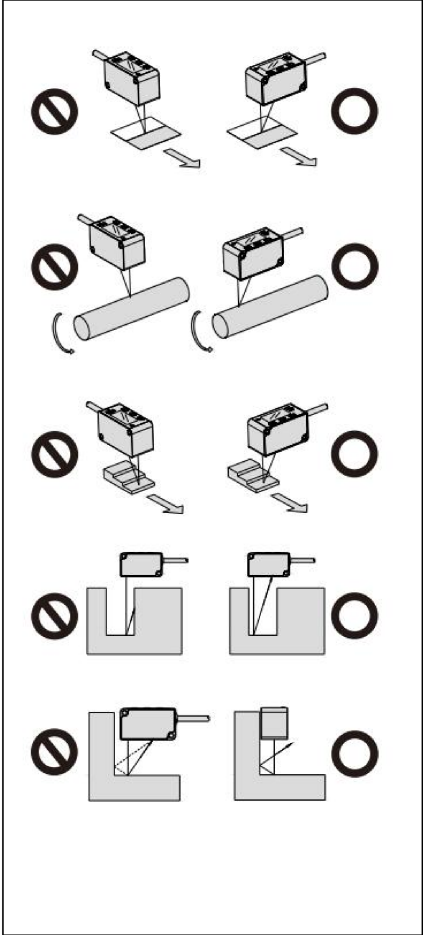
### Take measurements in narrow areas and recesses

- When measuring in narrow spaces or holes, ensure the light path from the light source to the light receiver is not obstructed during installation.

### When installing the sensor unit on the wall

- Follow the installation method shown in the right figure to prevent multiple reflections from the wall from entering the light-receiving area. Additionally, if the wall has high reflectivity, switching to matte black can yield better results.

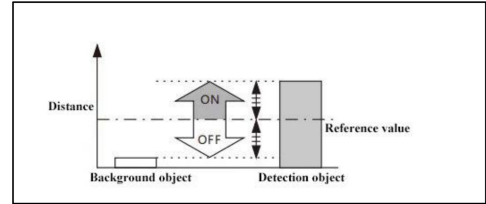
- It is very convenient to use this teaching method when there are small objects and background.



- When an object is present, press the "SET" button twice.
- Teach to complete.

## Two Points of Instruction

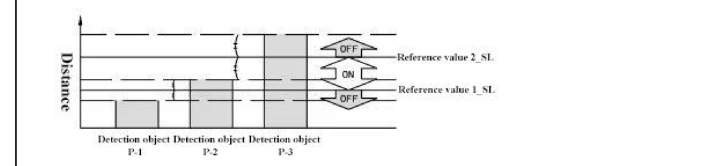
- Implement two-point guidance and establish a baseline value range.
- To apply the 3-point guidance (window comparison mode), set the menu detection output to [3-point guidance (window comparison mode)] in advance.
- When conducting instruction, use objects with continuously varying distances (P-1, P-2)



- When object P-1 is detected, press the "SET" button for the first time.
- When the object P-2 is detected, press the "SET" button for the second time.
- Complete the calibration.

## Three-point instruction (window comparison mode)

- Implement the three-point (P-1, P-2, P-3) instruction as shown in the figure below, with the baseline value 1\_SL set between the first and second steps. A method for setting a reference value 2\_SL between the second and third measurements, along with its corresponding range.
- To apply the 3-point guidance (window comparison mode), set the menu detection output to [3-point guidance (window comparison mode)] in advance.
- After the instruction, P-1, P-2, and P-3 will automatically sort in ascending order



- When object P-1 is detected, press the "SET" button for the first time.
- When the object P-2 is detected, press the "SET" button for the second time.
- When the object P-3 is detected, press the "SET" button for the third time.
- Complete the calibration.

## Step adjustment for ascending or descending step patterns

- Cancel mitigation of measurement value changes. Use this mode when detecting sharp changes in measurement values.
- When using the ascending or descending ladder mode, set the teaching mode to "Ascending Ladder" or "Descending Ladder" in advance. The baseline value can be set using the baseline value fine-tuning function.

## Threshold fine-tuning

- You can fine-tune the threshold in the measurement screen.
- You can also fine-tune the baseline value after training.

### Default detection mode:

Press the up or down key to fine-tune the threshold, or hold to adjust quickly.

### Window mode:

Press the up or down keys to fine-tune the threshold, or hold to adjust quickly. Press both the SET and up keys to switch between threshold 1 and threshold 2.

## Zeroing function

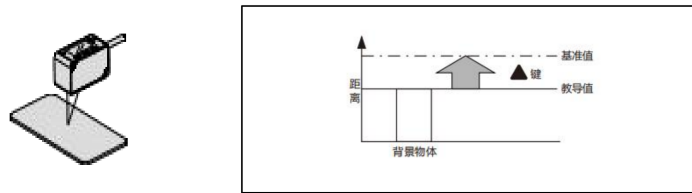
The zero adjustment function is designed to forcibly reset the measurement value to zero. When setting the zero, the zero adjustment indicator light is lit.

Press both the "▲" and "▼" keys to set the zero.

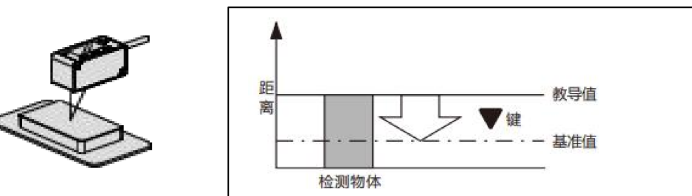
Press both the "▲" and "▼" keys to cancel the zero adjustment.

## Terch

### Using the background as a reference



### When the test item is the reference



- Press the "SET" button when there are background objects or detected objects.
- When the background object is the reference, press the "▲" key to set the reference value in the sensor. When the detected object is the reference, press the "▼" key to set the value in the detected object.
- Complete the calibration.

## One-point tutorial (window comparison mode)

- When the distance between the detection object and the reference plane is not within the specified range, the system applies a square-shaped control pattern instead of a single-point guidance. Method. Use this feature to determine within the upper and lower limits.
- To apply the 3-point guidance (window comparison mode), set the menu detection output to [3-point guidance (window comparison mode)] in advance.