

INTELLIGENT

Laser Intrusion Detector

User Manual

Features

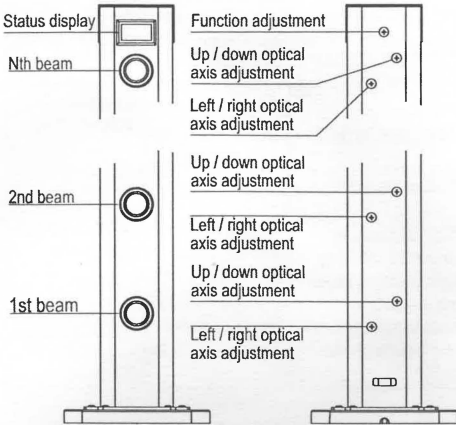
- 1) Support intelligent frequency conversion technology. Each beam has a unique transmitting and receiving frequency, which effectively reduces mutual light interference between beams.
- 2) Detection distance 0~1000m.
- 3) Using four-digit digital tube display, real-time display of small changes in each beam.
- 4) Support setting alarms for blocking any one beam, two beams or multiple beams, suitable for various environmental applications.
- 5) Support switching between working mode and debugging mode, optimizing complex operations on alignment.
- 6) The design of non-visible laser light source makes the product more concealed and safer.
- 7) Imported original laser head, service life > 150,000 hours.
- 8) The level of the laser light source is Class 1. Under normal circumstances, the eyes will not be exposed to harmful optical radiation.
- 9) Laser penetration is stronger, which can effectively suppress the interference of harsh natural environments such as wind, frost, rain, snow, and fog, and has better stability.
- 10) Each beam support vertical, horizontal angle adjustment; the optical axis adjustment angle: horizontal $\pm 15^\circ$, vertical $\pm 15^\circ$.
- 11) The bracket accessory interface is reserved on the top of the laser detector, and can be installed with infrared cameras, alarm lights and searchlights.
- 12) The distance between each beam of light is 15cm, which can effectively reduce false positives and false negatives (different beam intervals can be customized according to requirement).
- 13) Alarm trigger response time is 50ms / 100ms / 300ms / 700ms optional (different alarm trigger response times can be customized according to requirement).
- 14) The IP rating is IP67, and it can work normally even when immersed in a water depth of 1 meter.
- 15) Each Laser beam able to ON/OFF separately, able to adapt with all extremely environments.

Parameter

- Outdoor detection distance: 0~1000m
- Detection method: block adjacent 2 laser beams (default)
- Laser wavelength: 650nm, 830nm, 980nm
- Laser light source level: Class I
- MTBF: > 120000 hours
- Distance between two beams: 15cm
- Transmitter divergence angle: <8'
- Receiver receiving angle: >10°
- Optical axis adjustment angle: horizontal $\pm 15^\circ$ vertical $\pm 15^\circ$
- Response time: 50ms/100ms/300ms/700ms adjustable
- Alarm time: 1~30s optional
- Beam frequency: Each beam has a unique frequency
- Power supply voltage: DC/AC12V~24V
- Working current: 90~150mA
- Alarm output: NC and NO optional; contact capacity AC125V/ 0.5A, DC24V/1A max
- Material: housing, 304 stainless steel; center support column, aluminum alloy; base, die-cast aluminum
- IP rating: IP67
- Working environment: temperature -25°C~70°C / humidity: 95% max
- Mounting hole size: 4 ϕ 10 holes evenly distributed
- Installation position: indoor/outdoor, wall/pole installation

Description of product

1. Product layout



Up and down optical axis adjustment buttons: The angle of the upper and lower optical axis of the laser transmitter is adjusted by the knobs, and the angle is $\pm 15^\circ$

Left and right optical axis adjustment buttons: The angle of the left and right optical axis of the laser transmitter is adjusted by the knobs, and the angle is $\pm 15^\circ$

1st to Nth beams: laser beams 1 to 12 (according to the actual beam of the product).

Status display: The status display is the status display of the laser beam working status. The display area is LED and digital tube display.

Function adjustment button: The function adjustment button is a function setting button for laser beam detector which can set the working mode, alignment mode etc.

2.LED and digital tube display

Transmitter: The digital tube displays the normal working state of the transmitter or the parameter setting state in alignment mode. the details are as follows:

8. 8. 8. 8

1st digit 2nd digit 3rd digit 4th digit

	1st digit	2nd digit	3rd digit	4th digit	Way of enter	Way of exit
Normal working condition	0000 means normal working condition				Enter normal working mode when no operation or exit operation	
Debugging alignment model	Display C	01-12 indicates the current beam. If 01 is displayed, it means that the current aligning beam is the 1st beam, and so on.		Display 0	Press the function adjustment button for more than 3 seconds to enter the alignment mode	Press again to exit when last beam is displayed

Receiver: The digital tube displays the normal working state of the receiver or the parameter setting state in the alignment mode. the details are as follows:

8. 8. 8. 8

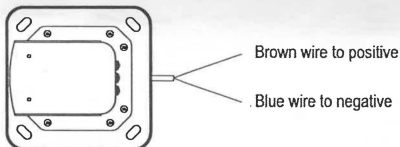
1st digit 2nd digit 3rd digit 4th digit

	1st digit	2nd digit	3rd digit	4th digit	Way of enter	Way of exit
Normal working condition	Display 0	1~12 indicates the current beam. If 1 is displayed, the beam with the lowest signal is 1 or the current 1 beam is triggered.		0 ~ 9 indicates the current beam signal intensity, 9 is the strongest signal, and 0 is the weakest signal.	Enter normal working mode when no operation or exit operation	
Debugging alignment mode	Display C	01-12 indicates the current beam. If 01 is displayed, it means that the current aligning beam is the first beam, and so on			Press the function adjustment button for more than 3 seconds to enter the alignment mode	Press again to exit when last beam is displayed

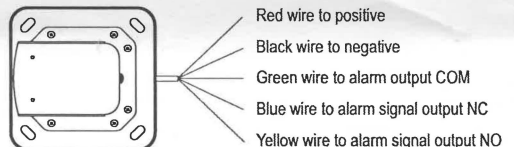
Trigger condition setting	Display E	001~012 indicate the current trigger conditions. If 001 is displayed, it means that the current trigger condition is to block 1 beam to trigger the alarm, and so on. If the current display is 003 when setting, it means that the current trigger condition is to block 3 beams to trigger the alarm.	Press the function adjustment button 2 times to enter this mode	Automatically save and exit after 5 seconds without any operation, return to normal working mode
Response time setting	Display F	050, 100, 300, and 700 indicate that the alarm response time is 50ms, 100ms, 300ms and 700ms. If 50 is displayed, the trigger response time is currently set to 50ms, and so on.	Press the function adjustment button 3 times to enter this mode	
Bypass Laser Beam setting	Display H	(1) 01~12: The current laser beam which need ON/OFF bypass. After into programming, it will auto play from 01 beam to 12beams till exit.(2) Digit display of beam number blinking, means that beam is bypass status.(3) Digit display of beam number keeping lighting,means that beam is activated mode.(4) If need change the laser beam status, just click the function button once when auto playing the beams on the LED Digital display.	Keep pressing function button >10seconds, and then into bypass mode.	Detector will auto play from 01 beam to the last beam and then auto exit.

Receiver LED status display: the receiver's LED light has no display under normal working conditions. When the laser beam is blocked but the trigger condition is not reached, the LED flashes, and the device does not alarm; when the laser beam is blocked and reach trigger condition, the LED light is always on, and the device alarm.

3.Terminal description



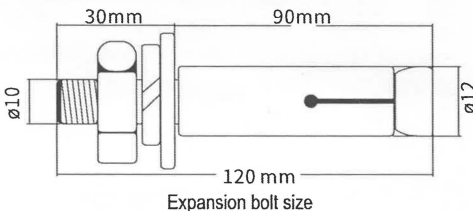
Transmitter wiring diagram



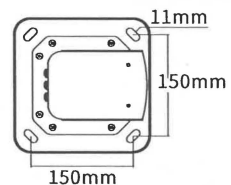
Receiver wiring diagram

Installation Notes

Laser beam detector support installation methods such as ground, wall, bracket mounting, etc. When installing, confirm the installation position firstly, make a positioning mark, then drill the hole with the M10 drill bit at the positioning mark, punch the M10 explosion screw, and finally fix the detector.



Expansion bolt size



Mounting dimensions of base

1. Installation Precautions

Please avoid installing this detector in the following situation:

- The mounting base or surface is unstable.
- Ensure that there is no obstruction between transmitter and the receiver during installation (such as wall lights, tree branches, or other buildings)
- Avoid aerial wiring

2. Regular installation

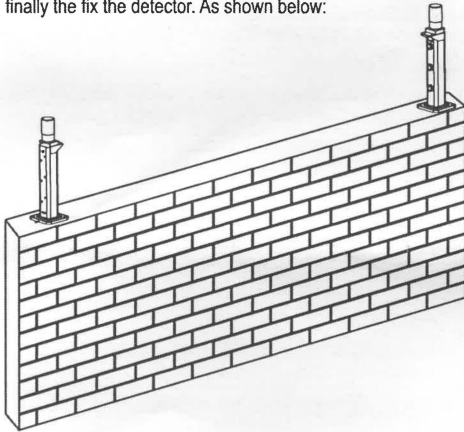
2.1 Ground mounting

Confirming the installation position where make a positioning mark, and then drill the hole with the M10 drill bit at the positioning mark, insert the explosion screw of M10, and finally the fix the detector. As shown on the right:



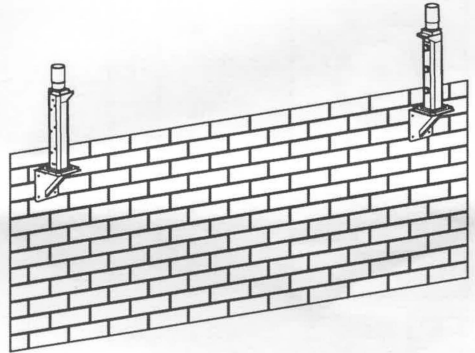
2.2 Wall mounting

Confirming the installation position where make a positioning mark, and then drill the hole with the M10 drill bit at the positioning mark, insert the explosion screw of M10, and finally the fix the detector. As shown below:



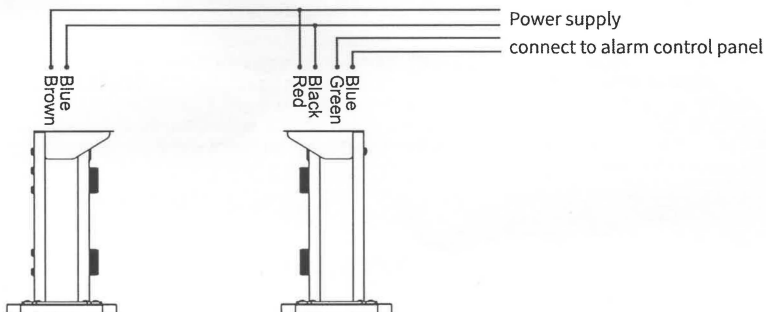
2.3 Bracket mounting

Confirming the installation position, mark the bracket installation positioning, drill the hole with the M10 drill bit, and use the M10 explosion screw to fix the detector. As shown below:

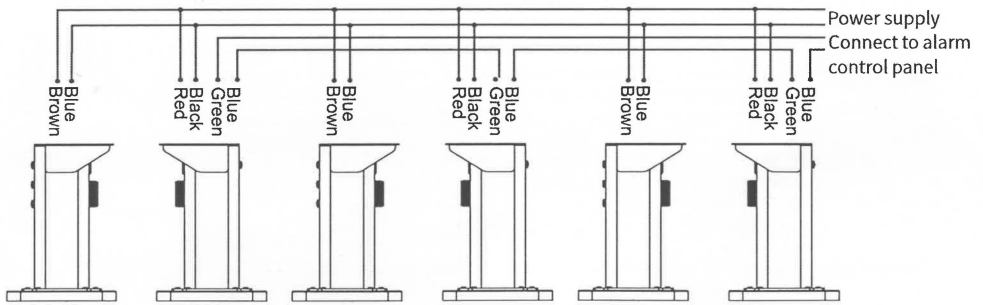


Wiring example

Wiring example one: 1 pair installation: the transmitter and receiver are connected in parallel, using a switching power supply, the alarm output is NC, as shown below:

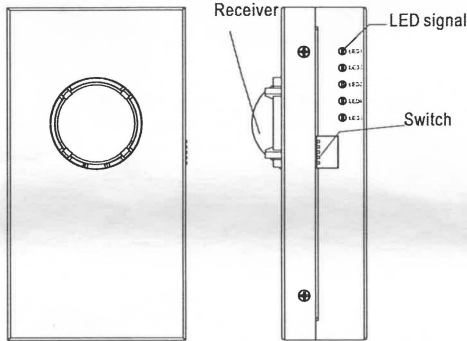


Wiring example two: Multiple pairs of continuous installation: The transmitter and receiver are connected in parallel, using a switching power supply, the alarm output is NC and the signal is connected in series, as shown below:



Laser detector aligner

1. Aligner usage



1.1) LED signal display instructions

LED1 indicates signal is weak and LED5 indicates signal is strong. the more LED is on, the more signal is strong.

1.2) Buzzer description

The buzzer sound slowly to quickly. When the strength of the received signal is stronger, the buzzer sounds quickly.

1.3) Dip switch instructions

5 DIP switch:

<input type="checkbox"/>	5	S	L, S: Select for signal brightness, S stand for low, L stand for high , and S, L are turned on at the same time for ultra high brightness.
<input type="checkbox"/>	4	L	
<input type="checkbox"/>	3	BUZZER	BUZZER: Select switch for buzzer.
<input type="checkbox"/>	2	FRE	FRE: Spare
<input type="checkbox"/>	1	POWER	POWER: Power switch.

2. Alignment

During laser beam alignment, two people need to cooperate to achieve the best alignment effect. When beam is aligning, one is on the beam transmitting end, get ready for a walkie-talkie, mobile phone or other communication equipment, screwdriver and a flat screwdriver (screwdriver is used to open the sealing screw at the function adjustment position and the sealing screw at the vertical, horizontal, left and right optical axis adjustment, and a flat screwdriver is used to adjust the angle of the vertical, horizontal, and left optical axis). opening each sealing screw, enter the detector alignment. specific operation steps as follows:

- (1). Confirm that the transmitter is connected correctly and power is on. After the transmitter is started, press and hold the transmitter's function adjustment button for more than 3 seconds. The transmitter enters the debugging mode. The display window shows C010, indicating that it is currently the first beam alignment status (if C020 is displayed, means the current alignment beam is the second beam, and so on. there are up to 12 beams. the display states C010 ~ C120 represent the current beam is 1 ~ 12.
- (2). Turn on the POWER and BUZZER switches, and turn on S and L at the same time. in front of the transmitter at 3m, hold the aligner and point the lens to the transmitter. Move up-down, left-right in sequence. when the buzzer sounds and the LED1 ~ 5 signal lights are on, it proves that the aligner receive the laser emitted by the transmitter. The speed of the buzzer and the changes in the LED1 ~ 5 signal lights represent the position of the central axis and the position of the remaining light. When the buzzer sound quickly and the LED1 ~ 5 signal lights are on at the same time, it means that the aligner is at the central position of the light and it is the best light source at this time.
- (3). After confirming the light source, if the direction of the light emitted by the transmitter deviates, please instruct the debugger of the transmitter through the communication equipment to adjust the angle of the optical axis of the transmitter, and inform the other party of the adjustment angle in the vertical or horizontal direction, such as upward adjust, right adjust, etc.
- (4). After completing the previous step, repeat steps (2) and (3) at 20m, 30m or more, until the light source of the transmitter is correctly transmitted to the receiver.
- (5). Perform walk test or block test, and confirm that the alarm status is normal. If cannot alarm, please repeat the above operation steps. If fail to align, see troubleshooting.

Alarm test

After the alignment of all beams is completed, switch it to the normal working mode, and use a thick cardboard or other non-transparent object to block and trigger at 10m, 30m or the middle position from the laser beam test and observe whether a normal alarm is triggered. If the alarm can be triggered normally, it means that the detector is working normally; if there is no alarm, please confirm whether the current position is within the prevention area.

Troubleshooting

Failure (phenomenon)	Cause	Countermeasure
Indicator is off after power on	1. No voltage on power line	1. Check the power adapter
	2. Open or short circuit	2. Check the line
	3. Exceeding the specified voltage	3. Replace the adapter
	4. The power line exceeds the specified length	4. Replace the power line
The alarm indicator does not turn on after the beam is completely blocked, and no alarm output.	1. There are reflectors or other transmitters entering the receiver	1. Remove reflectors or turn off other emitters and realign
	2. The beam is not blocked	2. Ensure the beam is completely blocked
	3. The blocking time is setting too long	3. Reduced blocking time
	4. Alarm output wiring is incorrect	4. Check the receiver terminals and output wiring
The beam is not blocked, the alarm indicator is always on, and there is alarm output	1. Beams are not aligned and the optical axes do not coincide	1. Recalibrate the optical axis
	2. between transmitter and receiver	2. Check the obstacles
	3. The transmitter or receiver housing is very dirty or covered with snow, frost, or ice	3. Clean the cover
	4. No transmitter output	4. Check the transmitter power supply current and wiring
False alarm	1. Wiring or power supply fluctuations, line corrosion	1. Replace power supply, current and wiring
	2. There are moving obstacles, such as birds, newspapers, leaves, etc.	2. Change installation location
	3. The installation base is unstable	3. Reinforce the base or choose a solid installation base
	4. Not perfectly aligned	4. Recalibrate the optical axis