

# Portable laser obstacle remover

Seventh generation: Red Bank X10 series

## Operation and maintenance manual



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## 1 Copyright description

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## 2 quotation lead

You are welcome to use the portable laser obstacle cleaner produced by our company. In order to facilitate your better use and maintenance of your laser troubleshooter, we have organized personnel to compile this document. Due to the limited level of the editor itself and the short time of the compilation process, there will inevitably be some mistakes, please understand! Thank you again for using our products.

Before using the device, read the user manual provided by the company to familiarize yourself with how to operate and maintain the device. We strongly recommend that operators read the "Safety Information" section of the product manual before operating the equipment. This product user manual will be provided as an accompanying attachment to our current or potential customers with very important operational, safety and other information.

### 3 Characteristic specification

This product uses the latest generation of dedicated miniaturized fiber lasers.

This type of product has a measured ultra-long range of 350 meters. Using 500 times adjustable telescopic system, can observe the target at a distance, using precision steering head, 9 speed regulation, can accurately control the direction of the head, remote cleaning target.

This product is a class 4 laser instrument, laser has some unique characteristics, which may cause some safety hazards, so that it can not simply be regarded as other light sources, all operations

or close to the laser and laser beam personnel must pay attention to these special hazards. To ensure operation safety and optimal performance, strictly follow all warnings and safety tips in this manual when operating, maintaining, and servicing the device.

In order to ensure the safety of the operator, please do not disassemble the equipment at any time. This product has no parts, components and components that users can repair by themselves, and the equipment that has been disassembled without authorization will not be guaranteed.

### 4 safety information

#### 4.1 safety signs

As shown in the following figure, the focusing transmitter and the laser host have laser safety warning signs, indicating that laser radiation has potential harm to the human body, you need to follow certain procedures to operate, otherwise it may cause certain harm to your body or others. Do not violate the requirements of the warning signs during operation to ensure the personal safety of the operator or other personnel.

The company only provides the laser remote obstacle removal function of the obstacle removal equipment, the specific operation and use and security is controlled by the end user.



## 4.2 safety requirement

### 4.2 Safety Regulations

The following safety regulations should be observed when storing, transporting and using the laser obstacle remover:

- (1) During storage and transportation, the laser obstacle cleaner should be kept disconnected from the power supply; The power supply should be turned off.
- (2) Before the light, check whether the protective cover of the light outlet has been taken off. If not, remove the protective cover first;
- (3) Before the light, check whether the surrounding environment has fire and fire hazards, such as whether there are tall buildings and dry trees in the direction of laser light that may be damaged by laser or cause fire;
- (4) Before light, check the surrounding environment, and do not allow personnel to exist in the direction of light, in order to prevent personal injury accidents;
- (5) Because the laser is not visible when the light is used, it has a high energy, you must be extra vigilant to avoid or reduce specular reflection, that is, the laser should not be aimed at the target with specular reflection;
- (6) When the light is out, the direction of the laser can not be moved significantly to avoid causing accidents;
- (7) No one is allowed to appear in the direction of light during the process of light exit;
- (8) During operation, at least 2 professionals should be guaranteed to operate, respectively responsible for the operation of the host and controller, in order to stop the emergency light in special circumstances;
- (9) When connected to the power supply, do not look directly at or observe the laser light window;
- (10) The laser obstacle detector and its key and password should be kept by a special person to prevent loss or abuse;
- (11) Gas stations, forests, airports and other areas are strictly prohibited;
- (12) The user shall pay attention to fire prevention and disaster prevention, and undertake the corresponding safety protection work and responsibilities;
- (13) Please handle as gently as possible during handling;
- (14) Please do a good job of dust prevention when not in use for a long time

#### 4.3 Laser Protection Requirements

When operating laser equipment, it is recommended that you wear protective glasses with safety features for 1064nm and 532nm lasers.

#### 4.4 Optical Operation Instructions

It is strongly recommended that you complete the following operation points before operating the laser obstacle cleaner:

- (1) When the power supply is started, do not directly look at the optical hole of the laser equipment;
- (2) Avoid the laser emitting head at the same level as the human eye;
- (3) Ensure that the laser outlet protective cover is removed before the cleaner is opened, otherwise it will cause damage to the launcher window piece, which is not covered by the warranty;
- (4) Ensure that the characteristics of personal safety protective equipment can meet the protection requirements of 1064nm and 532nm lasers;
- (5) When installing the equipment, do not turn on the laser equipment. When debugging and calibration, please perform under low power conditions, and slowly increase to high power for testing and use after debugging;

(6) Do not turn on the laser, green light direction adjustment and other work;

(7) In any case, do not touch the laser output window, otherwise it may cause damage to the window lens;

(8) In any case, the laser output window should not be cleaned with water or water, and should be cleaned with special anhydrous alcohol or other laser lens cleaning agent

#### 4.5 Electrical Operation Requirements

- (1) Please ensure that the power cord plug is well connected to the socket;
  - (2) Each foot of the power output head is strictly prohibited from short circuit (3) It is strictly prohibited to use the power supply provided by the company
- External power supply products power the host to prevent damage to the host, which is not covered by the warranty
- (4) Do not disassemble the power supply without authorization to prevent accidents or damage to the power supply.

## 5 product description

### 5.1 Feature introduction

This type of portable laser obstacle clearing device is a new kind of obstacle clearing equipment based on the remote laser dynamic focusing and transmitting system. The laser focusing system is operated at a distance, and high-energy focusing laser is emitted, so as to vaporize and cut foreign bodies, and achieve the purpose of remote and rapid cleaning. The product is characterized by small size, light weight, can be carried in a backpack, and fast cutting speed

### 5.2 product formation

The device is composed of a laser host, a power supply, a control terminal, a transmission focusing device, a support head, a power charger, a power line and other accessories, wherein the control terminal, a support head and a transmission focusing device are placed in a storage bag or storage box.

The list of goods before delivery is shown in the following table:

serial number	item type	item name	unit	quantity
1	core component	Laser host	a	1
		Head tripod	a set of	1
3		control terminal	a	1
4		power supply	a	—
5		Transmitting focusing device	a set of	1
6	accessories	Head tripod box	an	1
7		Tablet charger	an	1
8		Tablet charging	a	1
9		mains charger	a	—
10		ACDC (220V AC to DC device)	a set of	option
11		Main engine pro	a set of	1
12		diastimeter	a	1
13	document	container loading list	a	1
14		Product operation and maintenance manual	a	1
15		delivery inspection report	a	1

(Note: Power supply and host protective box are configured according to user requirements)



Head tripod storage box:



Figure 1. Tool storage status



Figure 2. Tool storage status

- ① Focusing launcher ② support head  
③ Control terminal ④ ranging module

Power supply:



Note: The power supply uses a special high-power lithium battery, the output power is large, stable and reliable, the company strongly recommends that you do not use other power supplies to power this product, so as not to damage the equipment.



Figure 3. Power supply

- ① Power information display button ② power display  
③ output air jack ④ charging hole ⑤ handle

mainframe box:



Figure 4. The main box itself is protected by a metal case (Plastic protective box is optional)



top view



front view



side view

Figure 5. Three views of the host

- ① Power switch ② Key switch ③ emergency stop button  
④ Cable winding disk ⑤ Power input port

Focusing launcher:



Figure 6. Firing head

- ① Function optical output ② camera ③ laser input interface

Bracket head:



Figure 7. Head tripod

another accessory:



Figure 8. Power charger



Figure 9. Host load diagram (This function is optional)



Figure 10. Rangefinder (optional)

Working status when the installation is complete:



Figure 11. Working state of mobile power supply

## 5.3 Controller

### 5.3.1 Controller Operations

#### (1) Login page

You need to enter the authorized user name and password to start the software. The default user name and password are admin and 123456 respectively. (Configured according to user requirements)



Figure 12. Login page

#### (2) Interface functions



Figure 13. Controller operation interface

✓ Take photos: Click to take photos and save the real-time picture to the memory card;

✓ Full monitoring: full monitoring video (red dot flashing) Click stop monitoring to stop

✓ View: Click to view photo and video files;

✓ Power information: real-time monitoring power information;



Figure 14. Full surveillance video (red dots flashing)

✓ Night vision/Color: Use color mode during the day, switch to black and white mode at night;

✓ Zoom +/ Zoom - : Adjust the image clearly, generally from short distance low magnification to long distance high magnification, press focus +, vice versa;

✓ Zoom/zoom: Zoom or zoom the video image to facilitate the observation of targets of different distances and sizes. This system has 1-50 times optical zoom, 10 times digital zoom, and a maximum of 500 times zoom. In order to ensure the image is clear enough, it is recommended not to use too large zoom;

✓ Head speed adjustment:

◎ "Speed +" is to increase the rotating speed of the head, "speed -" is to reduce the rotating speed of the head;

◎ The speed is 1-9 adjustable, the larger the number, the faster the speed of the head, of which 9 speed is the fastest, suitable for a wide range of direction adjustment during the initial sighting, 1 speed is the slowest, the initial sighting time is recommended to use high gear, fine sighting is recommended to use 5-7 gear;

◎ When the speed drops to 1, continue to press "speed -" the speed will remain 1 level unchanged, when the speed is adjusted to 9, continue to press "speed +", the speed will remain 9 level unchanged;

✓ Head direction adjustment:

◎ When the speed is level 9, press the arrow key, move the head for 1 second, and then stop;

◎ When the speed is 1-8, press the arrow key and the head will continue to move, and then press any arrow key to stop the head from moving; This feature is highly recommended when making a low speed uniform cut on a remote target, and the longer the distance, the smaller the speed is recommended.

✓ Light out: Confirm whether the lens cover is open before light out, be sure to remove the cover to light out, otherwise the emitter head will be burned, after confirmation, long press the upper right corner button for 3-5 seconds, press the confirm button again to light out.



图15. 长按出光按钮可以进入确认页面 输入密码进入发射准备状态（根据用户需求配置）



图16. 再次确认进入发射状态 进入发射状态后 出光时间会开始计时

### 5.3.2 Controller Settings

- ✓ Account Settings: The user name and password can be modified when entering;
- ✓ Working mode monitoring: Enter to view the login time, operation process records and other working mode log information;
- ✓ Brightness adjustment: in different light conditions, you can drag the slider to adjust the brightness to better observe the target;
- ✓ Intrusion detection: You can switch whether to enable intrusion detection;
- ✓ Anti-tipping switch: you can switch whether to turn on the anti-tipping function;
- ✓ Red switch for factory debugging, users do not

Use Settings;

- ✓ Alarm sound switch: there is a beep warning sound by default when the light is emitted. It is recommended that the user open it. If you do not want to make a sound in some special environments, you can turn it off

Close;

- ✓ Calibration mode switch: This switch is used to adjust the cursor in factory Settings, do not use it during normal operation;
- ✓ Real-time parameters: laser state can be observed.



Figure 17. Controller Settings page

## 6 Detailed specification table

serial number	named parameter	unit	parameter values
1	Rated output power of the applied light	nm	1080± 3
2	Green indicates the peak wavelength of the laser	W	Multiple specifications are available
3	Green indicates laser output power	nm	532nm± 5nm
4	Maximum clearance distance	mW	≥22mW
5	Range of rotation Angle of the head motion system	angle	horizontal direction: 360° vertical direction: 360°
6	Maximum clearance distance	meter	≥350
7	Spot size at 100 meters	mm	≤6
8	Main engine weight	kg	≤23
9	Main engine volume	mm	Dimensions in all directions ≤ 190*510*465
10	Power supply weight	kg	≤13
11	Power supply volume	mm	Dimensions in all directions ≤ 370*210*110
12	Single power supply full load working time	H	≥1h
13	Power output	W	≥2500W
14	Supply output voltage	V	48V
16	Electronic telescopic aiming system	/	With electronic telescopic aiming system, zoom and focus mode for electric adjustment
17	The telescope multiplies	times	1-500x adjustable
18	Target video image resolution	pixel	1920*1080
19	Remote target video recording photo function	/	With remote target video, photo function
20	Zoom zoom mode	/	Electric mode controlled by software
21	Light sound and light alarm function	/	Audible and visual alarm function is available when light is emitted
22	Display dynamic cross cursor indicator function	/	With dynamic cross cursor indicating function, needleAccurate laser indication for foreign objects at different distancesSpot position



## 7 Disassembly and transportation guide

### 7.1 Installation Guide

When using the instrument, follow these steps to install it:

(1) Installation of a tripod; The foot lock fastener is opened, so that it extends to the appropriate height for the longest time and then locks, and then opens to the appropriate Angle;



Figure 18. Installed head

(2) Open the storage box, remove the launcher and ranging module from the storage box, and then insert the quick loading plate of the launcher into the quick loading plate slot of the head;



Figure 19. Opening the storage box



Figure 20. Insert the launch head mounting plate into the pZI mounting plate slot

(3) Clamp the buckle next to the quick loading plate;



Figure 21. Fastening the latch

(4) Take out the power cord in the suitcase and connect the host to the power supply;



Figure 22. Connecting the power cable



(5) Connect the host to the transmitting head;



Figure 23. Connecting the host to the emitter



Figure 24. Schematic diagram of the connection between the emitter and the optical cable



Figure 25. PTZ wiring

⚠ Note: When connecting the transmitting head, carefully check whether the green light at the front end is out of the light and determine whether the magnetic head is in place. When the cable head is inserted into the transmitter head, it will hear a clicking sound. After insertion, be sure to pull out to check whether it is stuck. If the transmitter head is not inserted in place, there is a risk of burning.

(6) Remove the protective cover of the emission light window;



Figure 26. Protective cover on the emitter exit window

(7) Open and start the controller, open the control tablet first connected to Laser\_XXX or MIFI wifi, and then start the targeting system software;

(8) First confirm whether the distance is set correctly. The shutter icon on the screen is the center of the camera, the green dot below is the green light position, and the cross cursor in the middle is the position of the laser light, aiming it at the target to enter the launch readiness state.



Figure 27. Position diagram of the power switch

## 7.2 Removal Guide

When the device is used, follow the following steps to disassemble and store the device:

- (1) Turn off the power switch on the laser host.
- (2) Remove the power cable and wrap the power cable on the optical cable winding tray on the side of the main box.
- (3) Unplug the spiral plug on the head;
- (4) Cover the shielding cover of the emitting head out light window
- (5) Hold down the button, pull out the cable from the launch head, and cover the sheath and protective bag disc to the side sandwich of the main machine;
- (6) Hold the launch head with one hand, loosen the fixing screw under the dovetail groove of the head with the other hand, and remove the launch head;



Figure 28. Removing the cable

- (7) Put the launch head, tablet computer and rangefinder back into the suitcase.

## 7.3 Storage and transportation

After use, it is necessary to cover the lens cover, the suitcase cover and buckle, the main machine strap can be left on the main machine to facilitate the next direct carrying operation.



Figure 29. Storage complete state  
(The main machine itself has a metal shell protective box is optional)

## 8 instructions

### 8.1 Controller Operation and Usage

#### 8.1.1 Initial Controller Settings

The controller has been set to correct parameters before delivery. Users should not modify the original parameters as much as possible. If the parameter values are changed accidentally, the communication with the transmitting head may fail.

### 8.2 Aiming

#### 8.2.1 Preparation of aiming

After installing the device and connecting the cable, first remove the protective cover at the laser outlet and click the icon of the aiming system on the desktop to start the control software. At this time, the image will be displayed on the display screen. Press the direction control key on the controller to adjust the direction, and the distant scene will be seen on the display screen of the handheld controller. When the green indicator light hits the object, the green indicator light spot can be seen in the display.

#### 8.2.2 Dynamic Cross Cursor

The cross cursor has an important auxiliary function, which effectively makes up for the lack of green indicating light under strong light.

After the software is opened, the interface is as shown below. Three ICONS will appear. The upper aperture icon of the middle two ICONS indicates the center of the camera, and the cross cursor at the bottom is the aiming point of the laser. The largest cross cursor in the upper

left corner is the auxiliary cursor, which is used to drag its auxiliary calibration combustion point when the cursor deviates.



Figure 30. Display status of the cross cursor during rough sighting


The position of the cursor will be automatically adjusted according to the magnification and target distance, so the target distance must be correctly measured by the rangefinder and entered into the software.

#### 8.2.3 Use of rangefinder



Figure 31. Remote rangefinder button illustration

The two function buttons of the remote rangefinder are the mode function key (the button on the left side of the diagram) and the ranging trigger key (the button on the right side of the diagram). In general, you only need to press the ranging trigger.

 Note: When ranging, use the back end of the rangefinder to align the light outlet of the transmitting head; When the tree cutting operation measurement needs to be measured several times (only one test will produce errors), inaccurate ranging will lead to focusing errors, and the tree cutting effect is not good.

#### 8.2.4 Aiming process

(1) Zoom button: The function of this button is to fine-tune the image display clearly in the case of multiple adjustment;

(2) Zoom/zoom button: magnify the image, it is recommended to adjust to low power observation at the beginning, at this time the field of view is wide, it is good to distinguish the target position, and then adjust the direction of the transmitting head with the direction key, so that the indicating light gradually approaches the target, and then gradually magnify, and continue to cycle this process until the target is targeted and the field of view is clear;

(3) PTZ speed adjustment: through "speed +" and "speed -" to adjust the speed, a total of 1-9 gears, 1 gear is the slowest, 9 gear is the fastest, when the launching parts need to quickly aim at the object, by controlling the PTZ fast movement to the green light in the field of view to the object, you can adjust to the satisfactory high gear by pressing "speed +". When the indicating light point hits the object, slowly cut off the part of the object winding on the overhead line, press "speed -" to reduce the speed, to achieve the purpose of accurate positioning;

(4) Direction adjustment of the head: the role of direction adjustment is to adjust the rotation of the head so that the indicator light emitted by the launching head is aimed at the target, and the direction rotation is controlled by the up and down left and right buttons on the controller panel;

The operation of aiming at the target is relatively simple, as long as the direction is controlled, the green indicator light in the field of vision can be hit on the target. Due to the longer focal length of the lens and the smaller field of view, it requires a certain amount of patience and skills in the process of adjustment, and it is necessary to adjust the focal length of the lens.

The focus of the telephoto lens is manual, and different focal lengths are adjusted according to different distances to achieve the clearest field of view.

When the green and red small cross cursor is aligned with the target, it is aimed at the target. If the target is transparent, the green indicator light will penetrate the target, and when not enough light is emitted back, the green indicator light will not be visible in the field of view, which is a normal physical phenomenon.

### 8.3 Optical Output

When the aim is good, the light can be emitted. The indicator will blink quickly when the light comes out. By default, the optical output is controlled by the tablet. You only need to press and hold the optical output button in the upper right corner for 3-5 seconds. For security reasons, the optical output power is low by default.



Figure 32. The green light flashes when the light comes out

### 8.4 Optical axis correction

The green indicator light is one of the most important functional components in the aiming system, due to temperature changes and strong vibration, which can cause the infrared laser and camera to deviate, at which time the optical axis needs to be corrected.

Under normal circumstances, the camera optical axis and the infrared laser optical axis of the transmitting head are parallel, so the correction is actually to correct the two optical axes parallel, the following is the calibration method:

- (1) Find a large flat target, place the laser at about 20 meters, measure the distance, and enter the actual distance in the plate;
- (2) Set up the equipment, aim the transmitter head at the target surface, turn on the laser key switch and power button, pay attention not to carry out light operation, at this time you will see a beam of red light shining on the wall;
- (3) By adjusting the wrench, adjust the camera up and down and left and right, so that the screen center cross cursor is aligned with the red light.



Figure 33. Schematic diagram of the camera adjustment hole

- ① Upper and lower adjustment holes for the camera
- ② left and right adjustment holes for the camera

## 9 common fault

serial number	fault handling	Fault performance and cause	solution
1	Host does not start	After opening the key switch and pressing the power button, the host fan does not turn to start, usually because the emergency stop button is not pressed	Gently turn the main engine to the right
2	The panel can't control the light	The tablet control software starts the light output, and the light is displayed on the tablet, but there is no light in fact. The green light on the host controller is off. There are several reasons for this situation : (1) the host is not turned on, and the command of the tablet is not sent successfully; (2) The communication receives temporary interference; (3) The device is in host control mode (4) The power setting is too low or the downtransmission is not successful	Drag the power setting bar to increase the power
3	High temperature protection	The ambient temperature is too high. As a result, the internal temperature of the laser reaches the safety threshold	Place the laser in a place where the sun can not be directly exposed, let the fan run for a period of time in the state of no light to dissipate the internal heat, and then start the device to work again
4	low-voltage protection	The battery voltage is too low. Procedure	Check the battery voltage or power, if less than 47V or capacity is less than 20%, should be charged in time
5	Indicating light deviation	Slight deviation of internal optical path due to temperature change or strong vibration	Light adjust Settings as instructed in 8.4
6	Directional control failure	Loose line	Check whether the RJ45 connector is tightly inserted. If the fault persists, remove the power supply from the magnetic connector of the launching connector and plug it in again to restart the launching connector

## 10 Service and maintenance

There are no repairable parts inside the equipment. Maintenance needs to be carried out by professionals with relevant qualifications of the company.

In order to ensure that all repairs or replacements within the scope of warranty can be carried out in a timely manner and better safeguard your interests, please be sure to contact the company as soon as possible after finding the fault, we will provide the corresponding maintenance or technical support solutions according to the actual situation.

The launch device of this model and the main optical cable can be disassembled, but only in the case of failure of the launch device, the company's technical personnel will guide the user to disassemble and decompose after understanding the fault situation, and the decomposed launch device can be sent back to our company separately for maintenance, and our company can provide backup launch devices within the scope of warranty.

## 11 Warranty Statement

The Company shall guarantee all products produced within the contract warranty period for any defects caused by materials and production processes, and guarantee that its products meet the relevant quality and specification requirements mentioned in the documents under normal use.

The company in the warranty period due to material or production process caused by the fault of the product, reasonable choice of repair or replacement. And all products within the scope of the warranty repair or replacement, still in accordance with the remaining warranty period of the original product warranty.

Many questions about the safety, setup, operation or maintenance of this product can be resolved by carefully reading this manual, however, if you have more questions about safety, setup, operation or maintenance, please call our company for support. If your problem is not resolved after a phone call or video conversation with a technician, you may need to send your product back to us for further investigation.

## 12 Warranty Restrictions

Products, parts or equipment are not covered under warranty if:

- (1) tampered with, opened, disassembled or transformed by personnel other than the Company;
- (2) Damage caused by improper use, negligence or accident;
- (3) Used outside the scope of product specifications and technical requirements;
- (4) due to incorrect installation, maintenance or other abnormal operating conditions not covered by this manual;
- (5) The lens of the light window is not properly protected and is soiled or damaged due to the failure to remove the protective cover, which is not within the scope of warranty;

- (6) The customer has the responsibility to understand the above information and operate in accordance with the instructions and specifications, otherwise the fault will not be covered by the warranty;

### One important note:

During the warranty period, the purchaser shall give feedback within 31 days of the discovery of the fault. The Company does not grant any third party (including the purchasing user or customer) the right to repair or replace parts, equipment or other products related to the Company.

## 13 Precautions

- (1) The lens protection cover must be well covered during transportation and preservation to prevent dust from entering;
- (2) Do not touch the lens with your hands;
- (3) Keep the lens clean, and do a good job of water-proof, dustproof and moisture-proof;
- (4) When there is dust on the lens, air blowing will be used to blow off the dust, and it is strictly prohibited to blow with the mouth to prevent saliva pollution of the lens;
- (5) When the lens is contaminated, it can be gently wiped with absorbent cotton ball dipped in anhydrous ethanol;

- (6) It is strictly forbidden to adjust the lens during the use of light
- (7) Be sure to check whether the lens is clean before use. Do not use the lens when there are stains or dust;
- (8) After the lens is polluted, once the light is out, the lens may be damaged, so please be sure to keep the lens clean;
- (9) Rain, snow, dust weather conditions may stain the laser output window lens, should avoid the use of this product in the above bad weather conditions.



#### 4.6 Operating environment requirements of the laser obstacle cleaner

- (1) The laser obstacle cleaner should not be exposed to high temperature and high humidity;
- (2) The laser obstacle cleaner should not work in the rain;
- (3) The laser obstacle detector should not work under dust conditions, otherwise the air cooling system will inhale too much sand and dust, affecting heat dissipation, resulting in failure or shortening of the life of the laser obstacle detector;

##### FCC WARNING

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum 20cm distance between the radiator and your body: Use only the supplied antenna.

- (4) When the laser obstacle remover is working, it should ensure the fire safety and personnel safety of the surrounding environment. In the place where fire accidents or personal safety may be caused by the laser emitted by the laser obstacle remover, the operation of the laser obstacle remover should be stopped, and the operation location or the target obstacle remover tools and methods should be replaced.