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# RLT-24 Veterinary Laser Therapy User Mannual

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RWD

RWD Life Science Co.,Ltd

# RLT-24

# Veterinary Laser Therapy

**User Manual** **C**

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# CONTENTS

# 1- Introduction

## 1.1 Overview

First of all, thank you for choosing the Veterinary Laser Therapy manufactured by RWD!
Before the installation and application of this product for the first time, please read all attached materials to help you use this product in a better way.
RWD is committed to continually improving product features and service quality, and reserves the right to make changes to the user manual and any product mentioned herein without prior notice.
For the latest product information, please call or write us or visit our website (***www.rwdstco.com***). For any inconsistency between the actual condition of the product and this manual during the use of the device, and for any questions or suggestions, please contact RWD.
This user manual applies to the following product:

- Veterinary Laser Therapy
- Model: RLT-24

## 1.2 Safety

When operating the system, please read the "***2-Important information and safety***" section carefully to avoid damages to operators and the system during application.
For any doubts or suggestions on safety, please contact the After-sales Service Department of us.

This device should be operated and managed by trained professionals!

This device is for veterinary medical treatment and scientific research only!

## 1.3 Product introduction

Laser therapy, also known as "photobiomodulation (PBM)", uses laser of specific wavelengths to reach therapeutic effects. These therapeutic effects include shortening the healing time, reducing pain, promoting microcirculation and reducing swelling and postoperative exudation. Laser therapy is a treatment without the needs of drugs and surgery.
Veterinary Laser Therapy is mainly used by veterinary hospitals, agricultural and forestry colleges and scientific research institutions, responsible for the diagnosis, treatment, and surgery of pet diseases, research on animal diseases, animal surgery, and for development of relevant veterinary clinical technology and clinical basic research. The product is designed to provide convenient, safe, cost-effective and portable Veterinary Laser Therapy for domestic and foreign veterinarians, meeting the treatment needs of most veterinarian users in the market.

## 1.4 Product features

- Smart protocols: more than 1300 built-in protocols, easy for veterinarians to operate
- Multiple modes: CW, pulsed, and ISP laser emission modes are supported. The multiple mode combinations improve treatment efficiency, reduce thermal burns, and increases the depth of laser treatment
- Higher power: The laser power can be up to 24W, which achieves a significant therapeutic effect, stable light output, safe and rapid
- Four wavelengths: 650nm, 810nm, 915nm and 980nm lasers can be formed in various combinations for different cases to ensure faster healing and better results
- Dual applications: it support both laser therapy and laser surgery. Equipping with the optional surgical accessory kit, the machine can be participated in a variety of surgical protocols including extracorporeal ablation, gingivectomy, endoluminal polypectomy and intraluminal tumor ablation.
- User-friendly design: high-definition touch screen; large rear fibre winding tray for easy storage and effective protection of the optical fibre, extending its service life
- Features: demo video for hands-on teaching, automatic saving of treatment records for traceability

## 1.5 Product parameters

| **Parameter** | **Description** |
|---|---|
| Casing Color | Black & White |
| Laser Source | High powered laser diode module |
| Screen Size | 7-inch LCD touch screen |
| Screen Pixels | 1024×600px |
| Device Size | 290×242×270mm |
| Package Size | 570×420×500mm |
| Net Weight | Not more than 4.5kg |
| Battery Capacity | 2600mAh |
| Aiming Beam Wavelength | 650nm |
| Aiming Beam Power | < 50mW |
| Transmission System | 600μm/400μm |
| Insulation Grade | Grade II, Class B |
| Frequency | 1~20,000Hz |
| Wavelength Combinations | 650nm, 810nm, 915nm, 980nm |
| Output Power | CW mode, the maximum average power is 24.2W<br>Pulse mode, the maximum average power is 12.2W<br>MAX mode, the peak power is 28W |

## 1.6 Product list

| Configuration | Items | Qty | Description |
|---|---|---|---|
| Standard | Device | 1 set | Veterinary Laser Therapy |
| Standard | Optical fibre handpiece | 1 pcs | For therapy. Laser transmission and control |
| Standard | Lens | 5 pcs. | Varying beam size for optimal and varied treatment.<br>◆ 1 x 50mm open-ended large spot lens<br>◆ 1 x 25mm massage type standard lens<br>◆ 1 ENT probe<br>◆ 1 50mm massage type large spot lens<br>◆ 1 25mm zoom flat lens |
| Standard | Goggles | 6 pcs | 3 pcs for human and animal use each. Used to reduce the risk of laser damage to the eyes. Applicable laser bands: 630-660nm OD2+ 800-1100nm OD5+ |
| Standard | Interlocking safety system | 1 pcs | Interlocks are installed at each entrance to the treatment room, and interlocking safety system are connected to the device to prevent anyone from entering the room and being exposed to the laser when it is fired |
| Standard | Power adapter | 1 pcs | Device power input |
| Standard | Toolbox | 1 pcs | For storage of the lens and optical fibre handpiece |
| Standard | Dust cover | 1 pcs | For potecting the complete laser therapy from dust |
| Optional | Surgical fibre | 1 pcs | For surgical application. Laser transmission and laser surgery |
| Optional | Surgical handpiece | 1 pcs | For fixing surgical fibers. Applicable for sterilization |
| Optional | Optical fibre stripper | 1 pcs | For stripping optical fibre coatings |
| Optional | Fibre cutter | 1 pcs | For cutting the optical fibre tip and removing unwanted fibre termination |
| Optional | Laser needle | 1 box | For fixing and guiding the optical fibre tip position. At least 10 pcs per box |
| Optional | Pedal | 1 pcs | For controlling the laser output in the surgical cutting |

## 1.7 Device environmental requirements

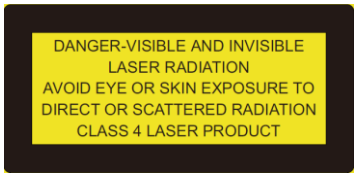
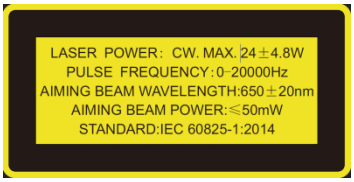
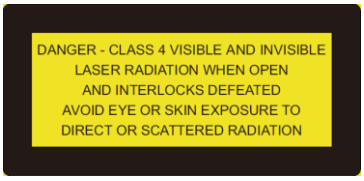
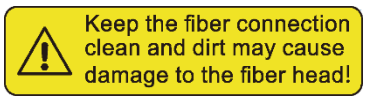
The device operating environment is prepared according to the conditions listed below to ensure the operability and safety of the system.

| | Description |
|---|---|
| Operating environment | Temperature: 18~30℃ |
| | Humidity: 30~75%RH |
| | Atmospheric pressure: 800~1060hPa |
| Storage environment | Temperature: -10~60℃ (package included) |
| | Humidity: ≦80%RH (package included) |
| | Atmospheric pressure: 800~1060hPa |
| Operating power | AC power: 100~240VAC, 50/60Hz, 2A<br>DC power: 20V, 7.5A |

# 2- Important information and safety

## 2.1 Product identification and safety symbols

The identifications and safety symbols of the Veterinary Laser Therapy are as follows. If you have any questions or suggestions on safety, please contact us for after-sales service support.

| Symbol | Description |
|---|---|
|  | Safety warning: laser hazard; optical fibre |
|  | Safety warning |
|  | Laser hazard |
|  | Emergency stop button |
|  | Optical fibre winding direction |
|  | Safety warning: class 4 laser product description |
|  | Safety warning: laser output and standard information recognition |
|  | Safety warning: interlock |
|  | Keep the fibre connection clean |

## 2.2 Safety precautions

⚠ **It is forbidden to emit laser directly through the handpiece before the lens has been installed! Exposure to direct laser emission through the handpiece may lead to serious damage, and may even cause scorched skin and flesh. Irradiating the cotton, wool or other flammable materials will cause smoke and scorch in a short time, or directly cause fire in a long time.**

Please read the safety instructions carefully. For the sake of safety, be sure to note the following requirements:

- **Connect the cable properly**
  Ensure that all connecting cables are connected to the device safely and securely.
- **Ensure no exposed electrical cables**
  Do not touch any electronic units or circuits in the device!
- **Shut down the device in case of suspected fault**
  Please contact authorized technical support personnel in case of safety problems or device failure.
- **Connect the device correctly**
  Please refer to the user manual for correct installation of device and connection of cables.

### 2.2.1 General safety

1) The device should be placed and operated in a stable, safe and well ventilated conditions, and should be protected from excessive dust, vibration, strong magnetic field, direct sunlight, ventilation, excessive humidity or huge temperature fluctuations. The device should be kept at least 20 cm away from the wall to ensure unblocked ventilation during operation.
2) Please follow the instructions of all safety warning and instruction labels on the device and in the manual.
3) Only trained professionals are allowed to use the device. We shall not be responsible for any device damage caused by any non-conforming operation, including the damage to a third party, personal injury and property.
4) Do not use any unauthorized parts or accessories to operate the device except for those specially designed for the product, such as interlocking safety system, finger switch, optical fibre and internal battery.
5) If the device fails to work properly, please contact the after-sales personnel of RWD immediately. Do not open the shell of the device without authorization. Unauthorized disassembly of the device may result in electric shock, serious personal injury or device damage.
6) Do not use the device in strong electromagnetic environment, otherwise it may cause harmful interference and prevent the device from fulfilling its intended purpose.
7) To prevent the risk of electric shock, the power adapter must be properly grounded.

### 2.2.2 Therapy room safety

1) Laser radiation warning signs meeting the requirements must be provided at obvious

position at the entrance of the laser therapy room.

2) Indoor walls and ceiling shall be made of incombustible diffuse reflective materials, and the window glass shall be covered with black curtains to prevent indoor appliances producing specular reflection of laser, so as to reduce the danger of specular laser reflection to personnel.
3) Anesthetics or gases used for treatment should be incombustible. Use of some materials such as cotton and wool that are flammable in oxygen enriched environment shall be also avoided. The laser device shall not be started before solvents and flammable solutions (such as alcohol) used for cleaning and disinfection volatilize completely.
4) An interlocking safety system shall be arranged at each entrance of the laser therapy room and connected with the interlocking safety system on the rear panel of the device, so that when the door of the therapy room is opened, the device will discontinue laser emission, so as to ensure that personnel are protected from radiation exposure during treatment.

### 2.2.3 Animal / personnel safety

1) Non-authorized personnel are prohibited from entering in the treatment area during laser treatment.
2) The device generates visible or invisible laser light during use. Animal or human eyes should avoid direct contact with laser radiation or scattered radiation, as this may cause irreversible eye damage.
3) All persons and animals on the site must wear safety goggles specified by RWD during the operation of the laser therapy device. Non-specified safety goggles may cause eye damage. Precautions for safety goggles:
    a) These safety goggles should not be used with other types of lasers, but only for wavelengths within the laser range described in this product.
    b) Do not look directly into the laser beam under any circumstances.
    c) Soapy water and special optical goggle cleaners are recommended for cleaning and disinfecting goggles.
    d) Do not put the safety goggles directly in a place with high temperature or direct sunlight;
    e) Note that if the laser safety goggles are damaged, scratched or discolored, stop using them immediately and replace them with new laser safety goggles;
    f) Note that there is still a risk of eye damage due to exposure to laser radiation due to reflections from optical components;
    g) Note that anyone should wear appropriate laser safety goggles in environments exposed to laser radiation;
    h) Laser safety goggles can last up to five years if properly protected, depending on maintenance such as cleaning, storage methods, etc.
4) The operator should adjust the handpiece, optical fibres and other components only when the device is powered off or in standby mode.
5) The operator should not remove their own or animal safety goggles until the device is returned to standby mode.
6) The operator is advised not to wear accessories such as watches and reflective jewelry during laser treatment to avoid laser reflection injuries.
7) Turn off the power switch, disconnect the power cord and store the device properly when the device is not in use or when no worker, professional operator or laser use instructor is present.
8) The device requires a four-digit login password (see the user manual). This password can be set by the user and can only be kept by designated and authorized personnel.

Do not disclose the password to others to avoid unpredictable damage.

9) If the device needs to be handled or moved, be sure to turn off the power and disconnect the power cord, and handle with care.
10) When the optical fibre is not in use, cover it with a dust cover to avoid contamination. Do not bend the optical fibre violently.

## 2.3 Safety classification

Laser radiation: Class-4 high-power laser and laser system
Electric shock protection type: Type B
Electric shock protection grade: Level 1
Waterproof and dustproof grade: IPX0

## 2.4 Safety functions

Veterinary Laser Therapy have a series of safety monitoring and safety functions for monitoring the system operating status and the emergency stop of laser output. When using the device, users should know the function and operation of these safety configurations.

| **Safety configuration** | **Function and operation** |
|---|---|
| Power switch | Used to separate the device from the power, "I"=on, "O"=off |
| Enter password | After the device is turned on, the login page will be prompted, and a 4-digit security password is required for permission identification |
| Emergency stop button | Used to stop laser emission output immediately. For any abnormality during the normal treatment (such as no display on the screen, abnormal optical fibre, etc.), press the emergency stop button immediately to stop the laser output; and users are allowed to release the emergency stop button |
| Interlocking safety system | Under normal circumstances, the interlocking safety system is connected to the interlock interface of the device. When the treatment room is opened, the signal of the interlock is reversed, and the laser is immediately interrupted or prohibited from emission after recognition by the device, and the screen will synchronously prompt that the interlock is not provided with an alarm. |
| Start Treatment (Standby/Ready) button | The power setting or program selection is allowed only when the device is in the standby state. When the device works well, press the Start Treatment button to switch the device from ‘standby’ mode to the ‘ready’ mode. Then, press the finger switch once to start emitting laser, press again to pause the laser emission. Repeat this operation twice at most, or otherwise the device will automatically return to the ‘standby’ state. |

| | |
|---|---|
| Monitoring system | Real-time monitoring of laser temperature, emergency stop button, interlock, finger switch and optical fibre status. If the device detects any related abnormalities or errors, the laser will stop output and provide warnings through sound and graphic texts on the screen to remind users that of such device abnormality. |
| Remind sound and indicator light | When the device is normally turned on and standby, the indicator light turns green; when the device emits laser, the indicator light turns yellow, and the laser emission is accompanied by a prompt; for device malfunction and alarm, the indicator light turns red and alarms, according to the different fault issued continuous or short alarm sound |
| Optical fibre detection system | The device is capable of automatically identifying whether the optical fibre is inserted. When it is not, the display screen will remind users to insert the fibre through a warning text. Only when the device detects that the fibre is inserted normally, can the laser be emitted |

# 3- Structure and Interfaces


图 3-1


图 3-2

| S/N | Part name | Function |
|---|---|---|
| 1 | USB port | Software update (Only USB flash drives with 3.0 or lower ports are supported) |
| 2 | Lens | Change the size of the laser beam |
| 3 | Finger switch | During normal operation, start/pause laser emission |
| 4 | Optical fibre handpiece | Laser transmission and control |
| 5 | Laser apeture | Connect optical fibre |
| 6 | Finger switch interface /Pedal interface (from surgical accessory kit ) | Connect optical fibre handpiece and receive the signal from the finger switch/pedal |
| 7 | Interlock interface | Connect the interlock to the device |
| 8 | Power switch | Turn on/off the device |
| 9 | Power inlet | Connect the power adaptor |
| 10 | Emergency stop button | Stop laser emission in emergency |

# 4- Installation and Use

Before unpacking, please check the outer packaging carefully. For any damage or bumps found, please contact RWD as soon as possible. After confirmation, you can proceed to the next step.

Take all items out of the shipping box and properly keep the original packaging for future transportation.

Please check whether the delivered materials and quantity are in line with the order, and carefully check the materials. For any damage or bumps found, please contact RWD as soon as possible. Using non-designated accessories may cause laser radiation and device damage. If any accessories are damaged or lost during use, please contact RWD.

Please choose a well-ventilated space for installation and placement of the device. The placement platform must be hard and not hinder the airflow at the bottom of the device. Enough space between the device and the wall is required, at least 20cm, to allow users to operate the power switch.

## 4.1 General accessories

1. Interlocking safety system installation

The Interlocking safety system interface is used to connect the Interlocking safety system and is located on the rear panel of the device. Align the red dot on the Interlocking safety system with the red dot on the Interlocking safety system connector and then plug the Interlocking safety system to the connector. Do not plug it with force but by aligning the red dots, otherwise the Interlocking safety system will be damaged. Pull it out directly instead of twisting it.

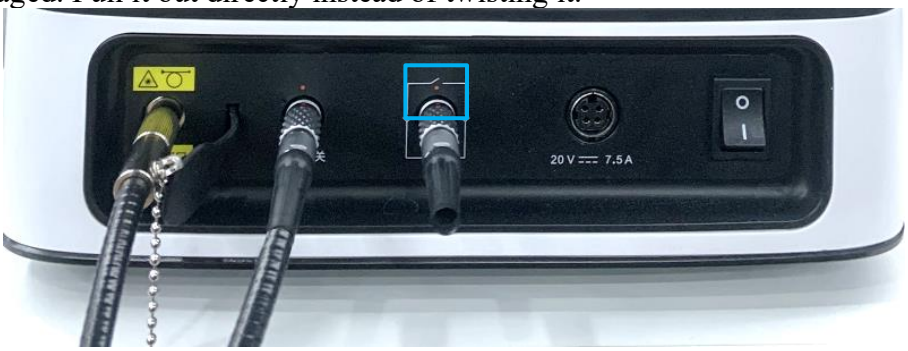



Figure 4-1

2. Power supply connection

This product is powered by either the internal battery or the power adapter. When the internal battery is low, plug the power adapter horizontally to the power connector.

Internal battery: When the internal battery is used, the device can be started directly. When the battery power is below 20% and 5%, the system will prompt you to connect to the power adapter.

3. Safety goggle

Safety goggles are divided into goggles for men and animals. Safety goggles for men are shown below (left), and safety goggles for animals are shown below (right).

Figure 4-2

## 4.2 Therapy accessories

1. Therapy toolbox. The box contains an optical fibre handpiece, interlocking safety system, and 5 lens.


Figure 4-3

Figure 4-4

Figure 4-5

2. Optical fibre handpiece and lens connection

Select the desired lens and plug it to the bottom of the handpiece.

Figure 4-6

3. Connect the therapy fibre to the laser apeture

The laser apeture is used to connect the output fibre and is located on the rear panel of the device. Remove the dust cover and plug the optical fibre connector horizontally to the laser apeture. It must be tightened, otherwise the device will not fire the laser and trigger an alarm.

**Warning:**

**Do not touch the laser apeture and fibre connector when plugging the optical fibre to the laser apeture. After removing the dust cover, prevent foreign objects such as dust and debris from entering the laser apeture. Optical fibres should not be bent hard.**


Figure 4-7

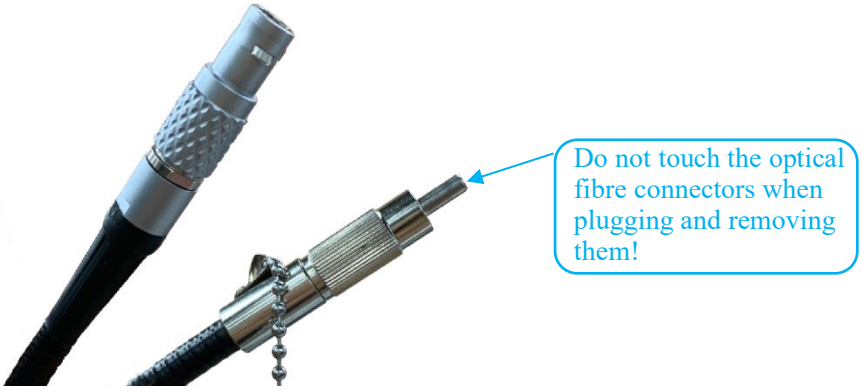



Figure 4-8


Figure 4-9

Connect the finger switch connector to the finger switch interface

The finger switch connector is used to connect the finger switch signal to the device and is located on the rear panel. Align the red dot of the finger switch connector with the red dot on the finger switch connector and then plug it to the connector. Do not plug it with force but by aligning the red dots, otherwise the connector will be damaged. Pull it out directly instead of twisting it.


Figure 4-10

## 4.3 Laser surgery mode accessory kit

**Note:** The laser surgery mode accessory kit is optional.

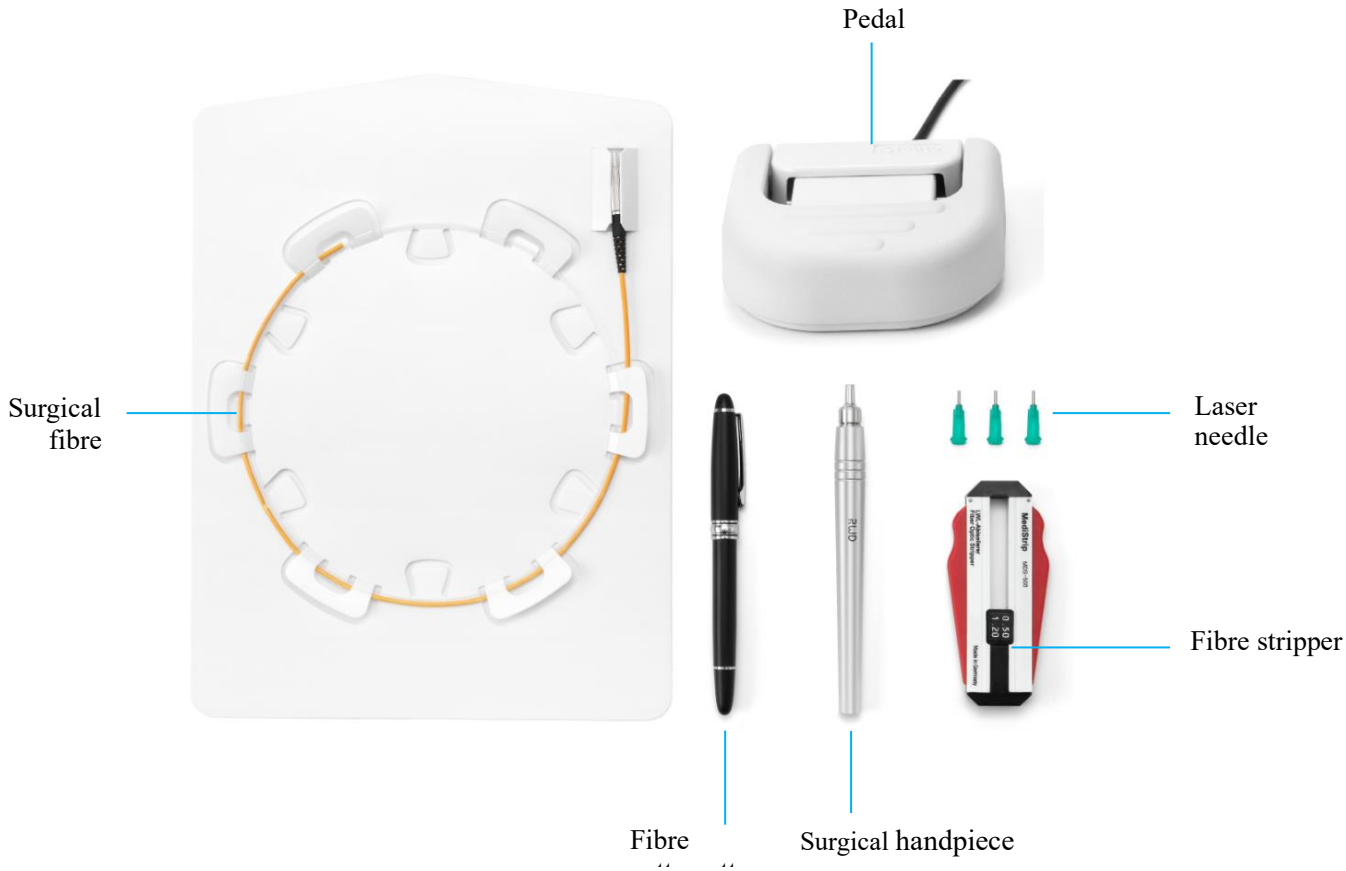



Figure 4-11

1. Install the surgical fibre in the same way as described above under "Connecting the Therapy fibre to the Laser apeture", i.e., plug the optical fibre connector horizontally to the laser apeture and tighten it;
2. Properly connect the pedal to the finger switch connector.
3. Connecting the surgical fibre to the surgical handpiece:

As shown in Figure 4-12, pass the surgical fibre through the handpiece, fixing block and laser needle in turn, and adjust the length of the exposed fibre at the front end to the recommended 1-2cm. Tighten the fixing block and then plug the laser needle

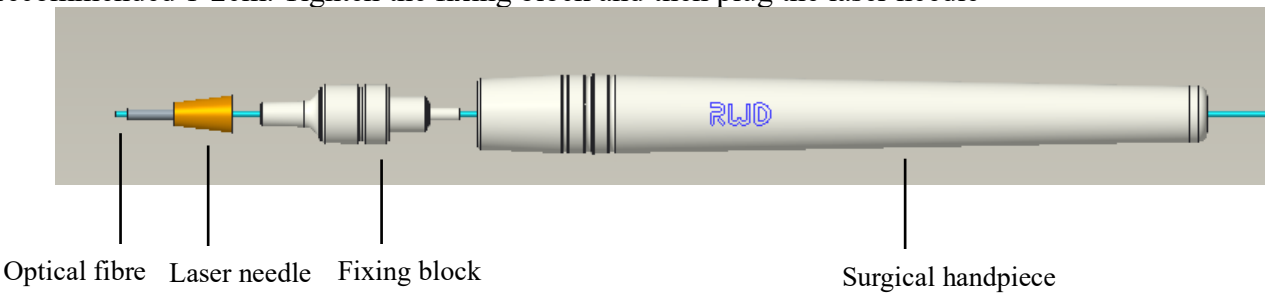



Figure 4-12

How to use the fibre stripper:

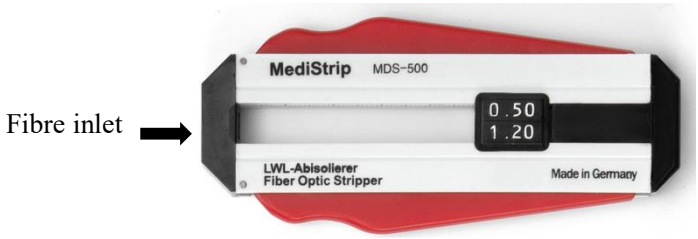



Figure 4-13

1) Hold the stripper, plug the optical fibre to be processed to the stripper from the small hole at the inlet end;
2) Estimate the stripping length according to the scale on the inner surface of the stripper.
3) Confirm the starting position of stripping, then press the red handle to clamp the optical fibre;
4) Clamp or grip one end of the optical fibre firmly with one hand while the other hand pulls the stripper outward towards the other end of the optical fibre until the optical fibre coating is stripped. Make sure that the optical fibre is not broken, not dull, and that the coating is completely stripped from the optical fibre to be cut. (**It is recommended to use a textured rubber material for firm gripping instead of the hand, otherwise it may cause minor breakage in the optical fibre.**)

**How to use the fibre cutter:**

**Note:** The fibre cutter should not be used to cut products other than bare fibre to avoid nicks.

**Note:** Make sure there are no pits on the front of the cutter before use.

1) Wipe the stripped fibre 3 times with a dust-free paper dipped in alcohol and confirm the position of the optical fibre to be cut;
2) Remove the protective cap of the cutter, place the optical fibre on your finger, and use the cutter to gently scratch the position to be cut. Be careful not to use too much force to avoid crushing the optical fibre;
3) Hold the front end of the optical fibre with the other hand and gently break the optical fibre. Note that you must use your hand to gently break the optical fibre so as to ensure the integrity of the optical fibre end.
4) Make sure that the cross-section of the optical fibre being cut is flat, smooth and free of burrs.

# 5- Operation Instruction

**Note:** The accessories of the standard configuration (laser therapy) and the extended configuration (laser surgery) cannot be mixed.

## 5.1 Standard

### 5.1.1 Initial start-up

Before starting the device, check the emergency stop switch to make sure it is unplugged. If the emergency stop switch is unplugged, press the power switch to the "I" position to start the device.

Unplugged. The device can be started normally

Pressed down. Power interruption

After starting the device, the system first enters the password interface, and the default password is 0000 when the device is powered on for the first time. For the password modification method, see section ***5.1.9 System Settings***.

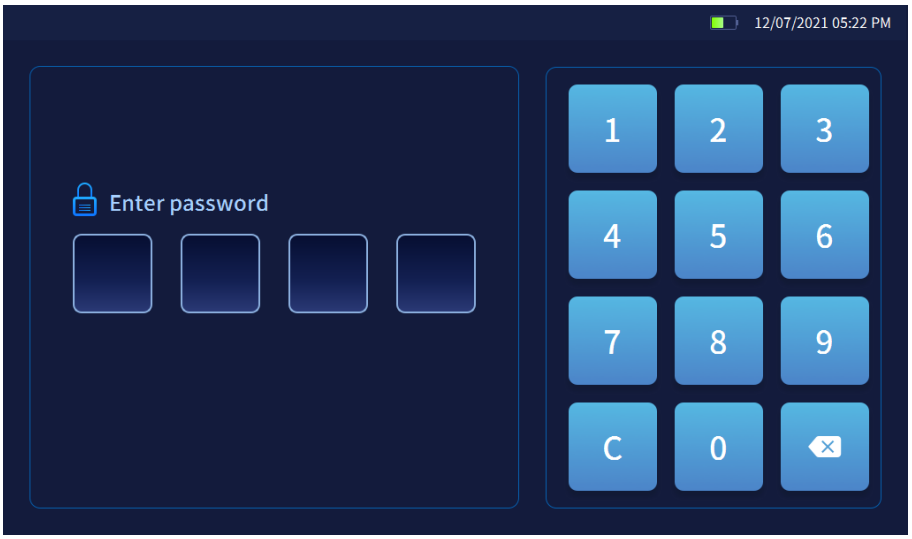



Figure 5-1

Enter the correct password to enter the main interface, as shown in Figure 5-2.

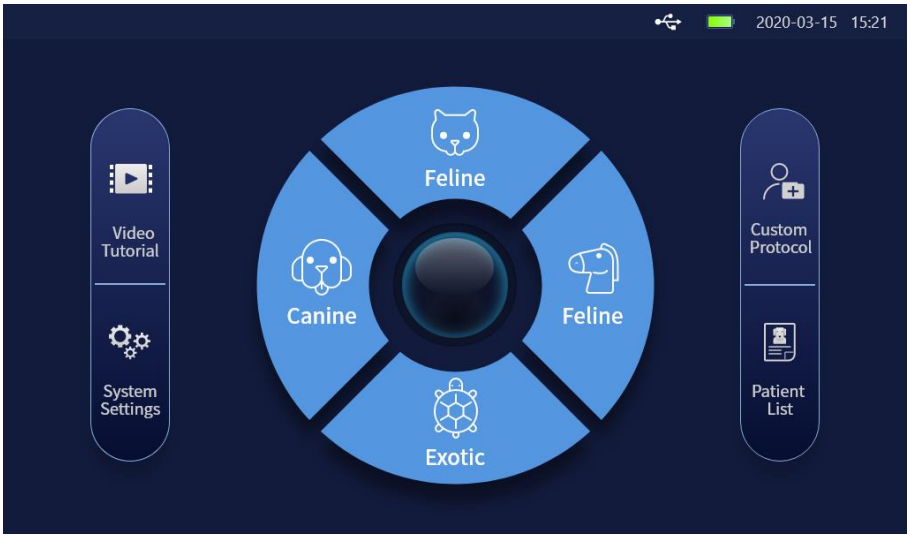



Figure 5-2

| Button name/icon | Description |
|---|---|
|  | Feline. Click to enter the [Protocol Selection] page for feline. Buttons for other species: canine, equine, exotic are operated the same as feline |
|  | Click to enter the [Custom Protocol] page. Add a custom protocol |
|  | Click to enter [Patient List] page. Including all patient files |
|  | Click to enter [Video Tutorial] page. Containing various tutorials for users to learn and as reference |
|  | Click to enter the [System Settings] page. Perform system settings of the laser therapy, including language, brightness, volume, animal weight measurement unit selection, etc. |

### 5.1.2 Select protocol

After selecting a category with a click, you can enter the [Protocol Selection] page for the animal species.

On the [Protocol Selection] page, the optional treatment parameters include: category, disease, body part, color, acute and chronic, weight range selection, treatment area, etc.

Select different parameter items according to the patient's condition. You can jump to the parameter interface of different levels, and click at most 7 times to go to the Ready for Treatment interface.

An example is as follows: Select [Canine] on the main interface to enter the category selection interface shown in Figure 5-3.


Figure 5-3

Select [Musculoskeletal] for the category to enter the condition selection interface shown in Figure 5-4.


Figure 5-4

Select [PostOP] for the disease, and then select the body part, animal color, disease acuity and chronicity, and weight range in turn. After all the steps of the protocol for this species are completed, you will enter the Ready for Treatment interface is entered as shown in Figure 5-5.


Figure 5-5

### 5.1.3 Ready for Treatment

In the Ready for Treatment interface, you can view the treatment parameters for different body parts at any phase, including total Joules, total time, countdown time, frequency, avg power, peak power, wavelengths, ISP, and beep.

Click the left /right page button to view the other phases of treatment parameters, as shown in Figure 5-5.

1) You can edit the treatment parameters of all phases of the current treatment area in the interface as shown in Figure 5-5.

| Treatment parameters | Description |
|---|---|
| Avg power | The − 25% / + 25% button increases or decreases the power by 25% for all treatment phases of the current treatment site, the − 25% / + 25% button can only be clicked twice in a row. |
| Total time | The − 25% / + 25% button increases or decreases the duration of all treatment phases of the current treatment area by 25%, the − 25% / + 25% button can only be clicked twice in succession |
| ISP | Click the OFF / ON button to turn off/on the ISP mode |
| Tone | Click the OFF / ON button to turn off/on the laser emission tone |

You can edit the treatment parameters for any phase of the current body part by clicking the Edit button in Figure 5-5 to enter the parameter editing interface as shown in Figure 5-6.


Figure 5-6

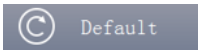
2) You can edit the treatment parameters of the current treatment phase by clicking on the treatment parameters in Figure 5-6.

| Treatment parameters | Description |
|---|---|
| Laser mode | CW, pulse, ISP, single selection |
| Wavelengths | 1) 810nm: turn on the wavelength; 980nm: turn off the wavelength<br>2) The average power setting ranges for each wavelength in different laser modes are<br>650 0.0-0.2 (CW) 0.0-0.2 (Pulse) 0.0-0.2 (ISP)<br>810 0.0-8.0 (CW) 0.0-4.0 (Pulse) 0.0-5.0 (ISP) |

| | |
|---|---|
| | 915 0.0-8.0 (CW) 0.0-4.0 (Pulse) 0.0-5.0 (ISP)<br>980 0.0-8.0 (CW) 0.0-4.0 (Pulse) 0.0-5.0 (ISP) |
| Phase time | Click [Phase Time] to edit. Click [Save]/[Save to All Phases] to make the duration parameter apply to all phases of the current treatment site, the duration range is 00:00 ~ (60:00 - total duration of other phases) |
| Pulse frequency | Click [Pulse Frequency] to edit, the setting range is 1~20,000Hz |

Click 

to discard the parameter change.

Click 

to restore the adjusted parameters to the original default values;

Click 

to bookmark the currently adjusted parameters, and a pop-up box to select the bookmark location pops up as shown in Figure 5-7. The current plan can be saved as a new custom protocol or an existing custom protocol.

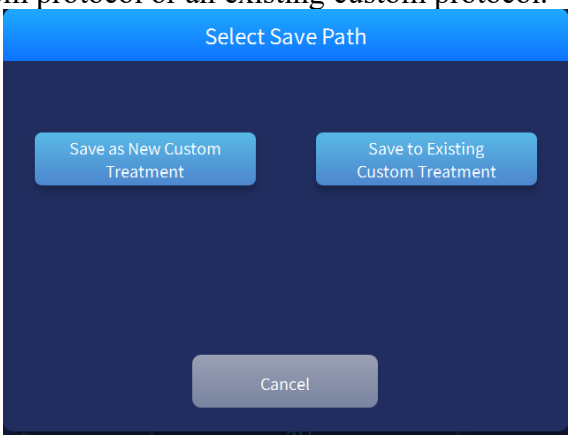



Figure 5-7

### 5.1.4 Start treatment

Click [Start Treatment] to first select the lens, see Figure 5-8.

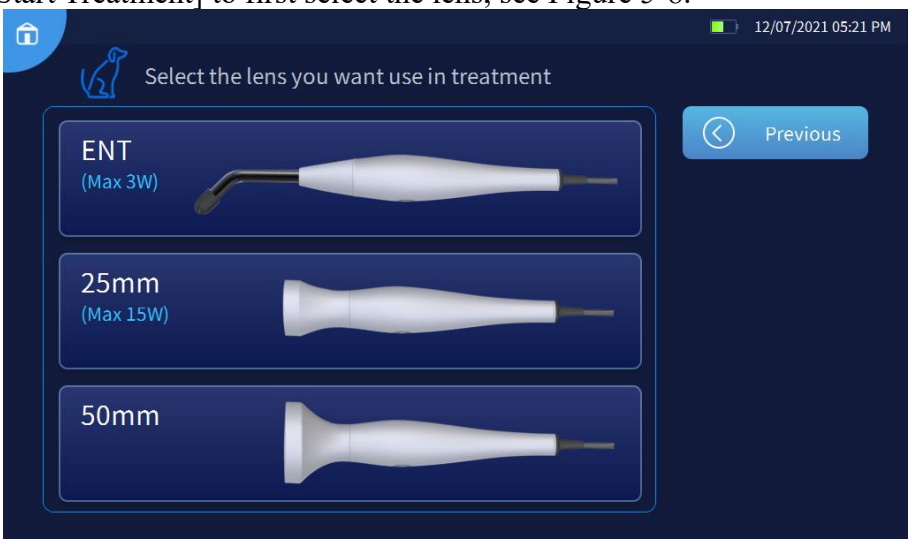



Figure 5-8

Select the corresponding lens by clicking on it in the Figure 5-8 screen according to the lens assembled on the device, and the following screen will pop up.

Warning: Always wear safety goggles! Do not point the light output towards the eyes.


Figure 5-9

Press the finger switch, and a few seconds later, it will enter the treatment interface as shown in Figure 5-10, and start the treatment.


Figure 5-10

### 5.1.5 Pause treatment

Click  or press the finger switch to pause the current laser emission, the pause screen is shown in Figure 5-11.




Figure 5-11

Click  to continue the treatment.



### 5.1.6 End treatment

1) Once the current treatment site has been treated, the laser output is paused and the interface is displayed as shown in Figure 5-12.
When multiple treatment sites are selected, press the finger switch to move to the next site.
To end the treatment, click [Cancel] to exit to the screen shown in Figure 5-5.

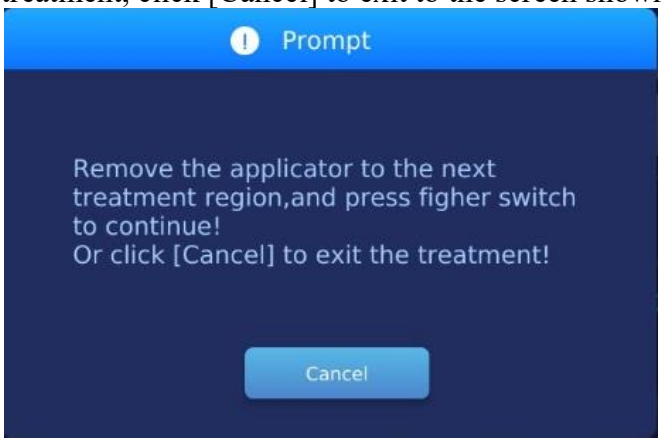



Figure 5-12

2) Once all treatment sites have been treated, the [Treatment Complete] dialog box pops up as shown in Figure 5-13 below, and you can click the button as needed.

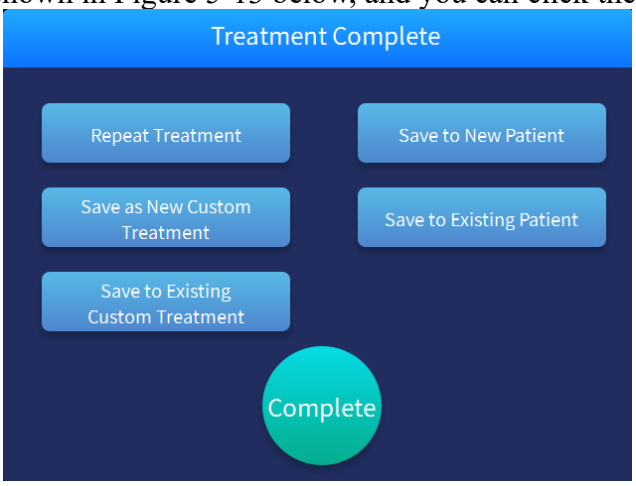
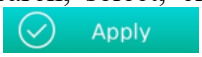



Figure 5-13

### 5.1.7 Custom Protocol

Click  to enter the custom protocol interface to view the built-in protocol, see Figure 5-14. You can search, select, create, delete, edit, rename, and use any of the custom protocols. Click 

to enter the Ready For Treatment interface, as shown in Figure 5-5, and start treatment.

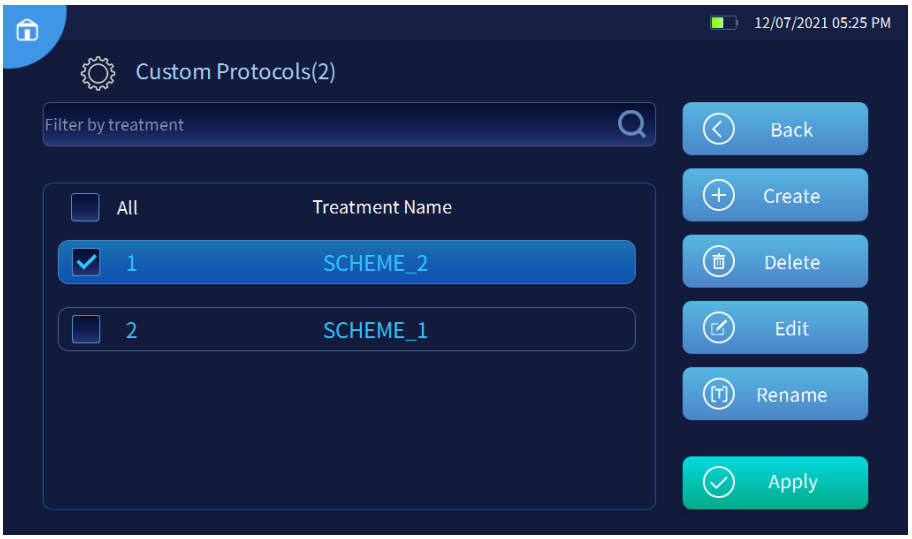



Figure 5-14

Once the treatment is complete, you can save the protocol to a new custom protocol or an existing custom protocol, see Figure 5-13.

### 5.1.8 Patient list

You can click  in Figure 5-2 to enter the patient list interface, as shown in Figure 5-15. You can search, create, edit, delete, view, or export any patient file via a USB flash drive.


Figure 5-15

To view patient files, you can view the treatment history of any patient by clicking Records or Start a new, see Figure 5-16.


Figure 5-16

Once the treatment is complete, you can save the treatment record to an existing patient or to a new patient, see Figure 5-13.

## 5.1.9 System Settings

Click to enter the System Settings interface, see Figure 5-17.

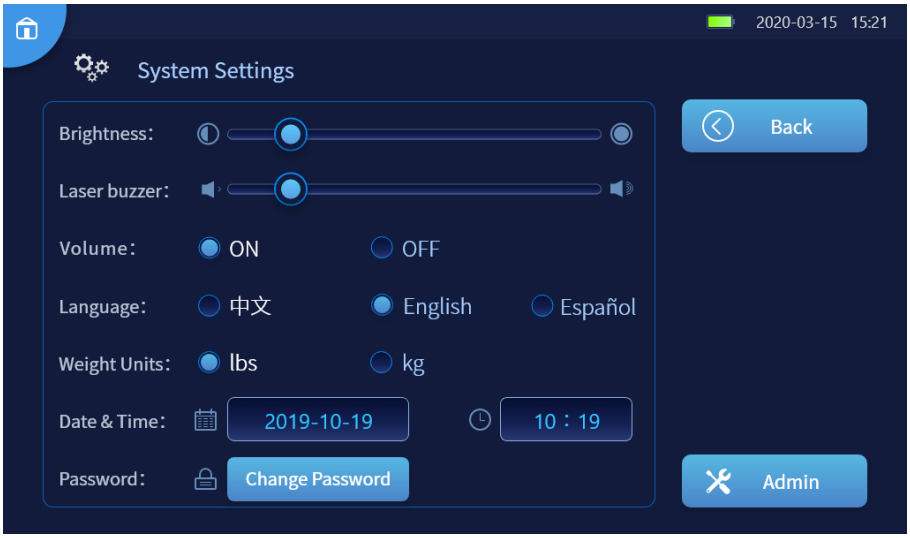



Figure 5-17

| Function items | Description |
|---|---|
| Screen Brightness | Adjust the sliders to dim or light up the display |

| | |
|---|---|
| Laser buzzer | Adjust the slider to increase or decrease the volume of the laser emission prompt tone during **therapy/surgery** |
| Volume | Click **On/Off** to turn the button tone on or off |
| System Language | Click to switch the system language between **Chinese/English/Spanish** |
| Weight units | Click to select lbs or kg to display the weight and change the weight unit of the built-in protocol |
| Date & Time | Click to edit the system time |
| Password setting | Modify the power-on password |
| Admin | For after-sales personnel system maintenance only |

## 5.2 Extended

The extended configuration adds surgical function (optional), which needs to be used with surgical accessories (optional). The operation procedures of therapy function are the same as that of the standard configuration (see section 5.1). The following mainly introduces the operation procedures of the surgical function.

Preparation before surgery:

1) Strip the surgical fibre off with a fibre stripper to about 2 cm of bare fibre in advance. After stripping, you may use alcohol to wipe the coating left on the optical fibre surface;
2) Use a fibre cutter to correct the optical fibre output end face;
3) Pack the surgical optical fibre, optical fibre cutter, laser needle, and surgical handpiece with surgical cotton cloth or sterilization bag, and place them in a sterilization pot for 15 minutes at 121 °C;
4) During surgery, remove the pre-sterilized surgical accessories for use.

**WARNING: Only physicians and professionals trained in the use of the product and its clinical application should use the therapy device for surgery.**

### 5.2.1 Initial start-up

Start the laser therapy, enter the correct password to enter the home page, as shown in Figure 5-18.

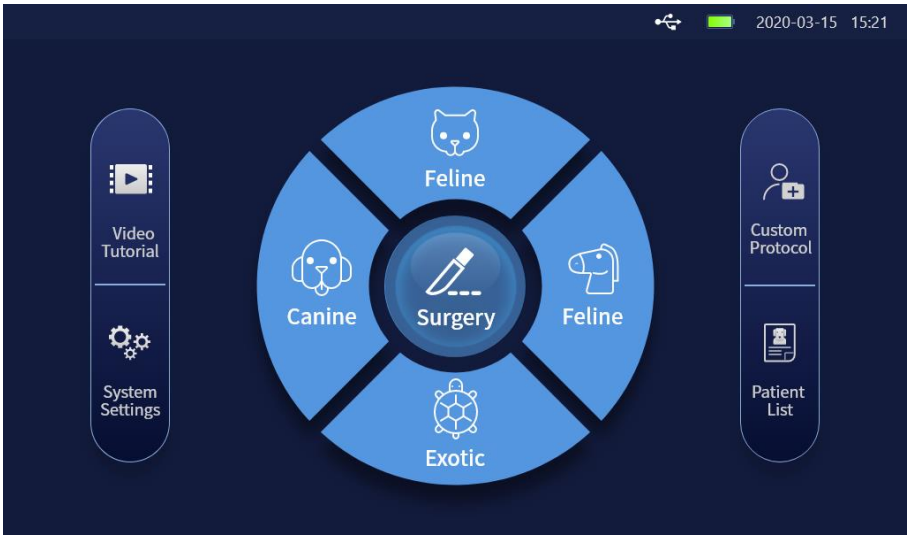



Figure 5-18

| Button name | Description |
|---|---|
|  | Click to enter the [Select Surgical Protocol] page and switch to the extended configuration |
|  | Feline. Click to enter the [Protocol Selection] page for feline. Buttons for other species: canine, equine, exotic are operated the same as feline |
|  | Click to enter the [Custom Protocol] page. Custom protocols can be added |
|  | Click to enter [Patient List] page. Including all patient files |
|  | Click to enter [Video Tutorial] page. Containing various tutorials for users to learn and as reference |
|  | Click to enter the [System Settings] page. Perform system settings of the laser therapy, including language, brightness, volume, animal weight measurement unit selection, etc. |

## 5.2.2 Select surgical protocol

Select the recommended surgical protocol according to your surgical needs. There are 4 surgical protocols to select from: extracorporeal ablation, gingivectomy, endoluminal polypectomy and intraluminal tumor ablation, as shown in Figure 5-19.

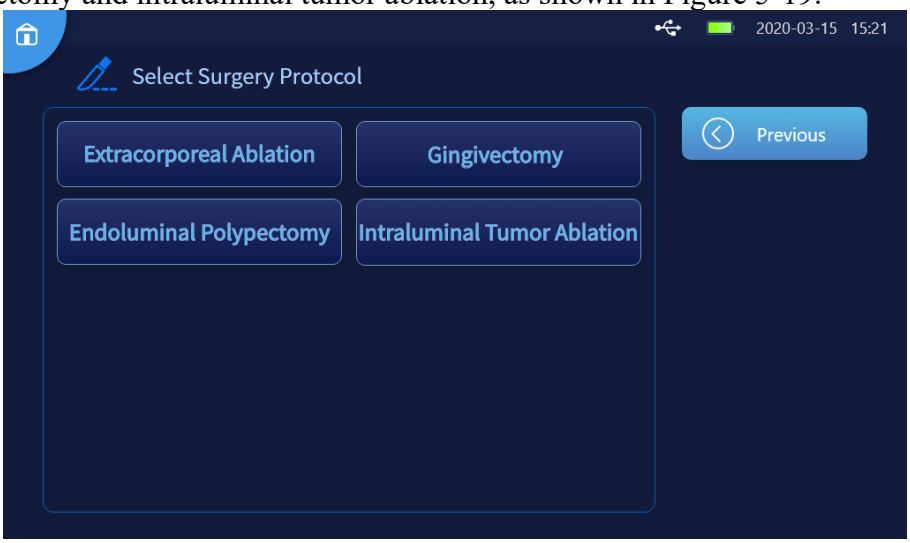



Figure 5-19

## 5.2.3 Start surgery

Select the required surgery plan recommendation according to the surgery needs and enter the appropriate surgery page, as shown in Figure 5-20.

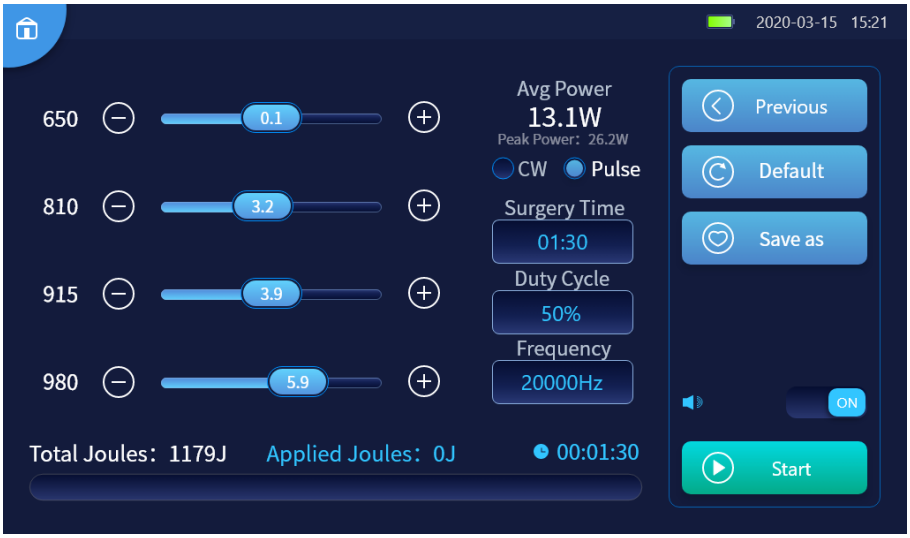



Figure 5-20

Modify the current surgical parameters on the surgical interface in Figure 5-20

| **Surgical parameters** | **Description** |
|---|---|
| Avg power | Calculate the total average power of the four wavelengths 650/810/915/980 |
| Surgical modes | Selectable modes: CW, Pulse. When [CW] mode is selected, [Duty Cycle] and [Pulse Frequency] are disabled |
| Surgery time | Click to edit the surgery time, the setting range is 00:00~60:00 |
| Duty cycle | Click to pop up the duty cycle setting window, the setting range is 10%~90% |
| Pulse frequency | Click to pop up the pulse frequency setting window, the setting range is 1~20,000Hz |

1) Function buttons on Surgery page

| **Button description** | **Description** |
|---|---|
| Previous | Click to return to the surgery plan selection page |
| Restore default | Click to restore the currently adjusted parameters to the system default value/restore to the original setting value |
| Save as | Click the pop-up window to select a favorite location. You can save the current surgical protocol as a new custom protocol or an existing custom protocol, as shown in Figure 5-21 |
| Start surgery | Click on the [Put On Safety Goggles] prompt box and step on the pedal to start the surgery, as shown in Figure 5-22. |


Figure 5-21

**Warning: Always wear safety goggles! Do not point the light output towards the eyes.**

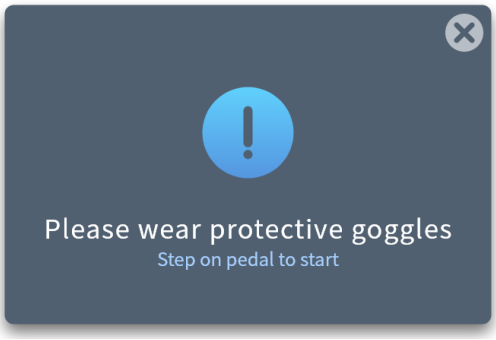



Figure 5-22

Step on the pedal and enter the surgery interface a few seconds later as shown in Figure 5-23 to start the surgery.


Figure 5-23

## 5.2.4 Pause surgery

Click the button 

or turn on the pedal to pause the current laser emission. The pause interface is shown in Figure 5-24. Click to continue the surgery.


Figure 5-24

### 5.2.5 Complete surgery

Once the surgery is complete, the [Complete] box pops up, as shown in Figure 5-25 below. You can click the button as needed.

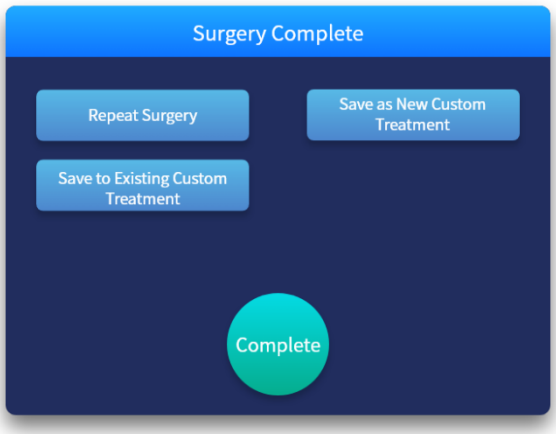



Figure 5-25

### 5.2.6 Custom Protocol

Click [Custom Protocol] to enter the custom protocol interface to view the built-in therapy plan or surgical protocol, as shown in Figure 5-26. You can search, select, create, delete, edit, rename, and use any custom protocol. Click 

to enter the corresponding Ready for Treatment interface or Surgery interface.


2020-03-15 15:21
Custom Protocol (40)
Filtrar:
Therapy
Surgery
Filter by name
All
Treatment Name
1
PLL4
2
PLL3
3
PLL2
4
PLL1
Back
Create
Delete
Edit
Rename
Apply

Figure 5-26

# 6- Indications

| | |
|---|---|
| Laser therapy (Standard configuration) | Pain management, arthritis, tendonitis, fractures, infected wound healing, acute and chronic incision healing, acupuncture, stomatitis, sinusitis, etc. |
| Laser surgery (Extended configuration) | Perianal tumor, breast tumor, Castration, declawing, melanoma, eyelid polyp, gum hyperplasia, stomatitis, etc. |

# 7- Alarm/Fault

This product has a built-in monitoring system that monitors the laser temperature, emergency stop button, interlocking safety system, finger switch, pedal and optical fibre status in real time, and provides warnings through acoustic and optic graphic texts on the display to remind users that of such device abnormality or fault.

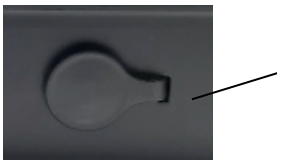
| **Alarm/fault** | **Solution** |
|---|---|
| Low battery, please plug in the power cord ! | Connect the power adaptor for charging and use it again |
| Device is about to power off, please connect the power adaptor ! | Connect the power adaptor for charging, or otherwise it will power off |
| Battery error, please check! | 1. Check if the battery connection is abnormal<br>2. If the alarm is not cleared after reconnecting the battery, please contact RWD after-sales for assistance |
| System overheat<br>Please do not use the device until the device cool down! | 1. Wait for the device to cool down before use<br>2. If the alarm information is not removed after the device has cooled down, please contact RWD after-sales personnel for handling |
| Low system temperature ! | 1. The device needs to be used in a permitted environment; please refer to section ***1.7-Device environmental requirements***<br>2. If the alarm information is not removed, please contact RWD after-sales personnel for handling |
| Laser stop<br>Release the emergency stop button to continue ! | 1. Pull out the emergency stop button manually<br>2.If the alarm information is not removed after manually pulling out, please contact RWD after-sales personnel for handling |
| Interlocking safety system is uninstalled ! | 1. Check the rear panel of the device to see whether the interlocking safety system has been correctly inserted into the device<br>2. If the alarm information is not removed after the interlocking safety system has been inserted into the device, please contact RWD after-sales personnel for handling |
| Optical fibre is unconnected ! | 1. Insert the optical fibre into the laser apeture<br>2. If the alarm information is not removed after the optical fibre has been inserted into laser apeture, please contact RWD after-sales personnel for handling |
| Handpiece or pedal is unconnected! | 1. Check if the handpiece/pedal connector has been correctly attached to the switch interface<br>2. If the handpiece/pedal connector has been correctly attached to the device, but the alarm is not cleared, contact RWD after-sales for assistance |
| Laser error, please contact the after-sales personnel! | Please contact RWD after-sales personnel |

# 8- Maintenance

⚠ **Warning:** This is a Class 4 laser product. You must wear protective goggles during maintenance to protect eyes from injury by laser.

## 8.1 Daily maintenance

1) After each surgery, the surgical fibre, fibre cutter, laser needle and surgical handpiece need to be cleaned with anhydrous alcohol in a timely manner.
2) The lens is fragile and should be handled with care to avoid impact;
3) Each time the surgical handpiece is cleaned and sterilized, the front fixing block should be removed in advance;
4) Do not use the optical fibre cutter for other objects;
5) Please do not knock hard or touch the screen with something sharp;
6) Do not bend the optical fibre violently;
7) Cover the handpiece with a dust cover to avoid contamination after removing the lens, and sterilize the dust cover with anhydrous alcohol;
8) Clean the surface of the device and the touch screen regularly; try to wipe the surface of the device with a dry cloth and wipe the touch screen with lens tissue. Chemical reagents is not allowed for cleaning;
9) Try to keep the device stable and prevent vibration or collision when moving it;
10) Do not disassemble the device without permission, and do not open the device shell without the authorization of RWD, otherwise it may cause electric shock or damage to the device;
11) Regularly clean the lens surface, and when determining the position of the contaminant, use the lens tissue dipped in a small amount of anhydrous ethanol to lift it up; for the contamination by fingerprint or grease, apply a small amount of cleaning liquid to a new lens tissue and gently wipe the lens surface with a spiral motion from the center to the rim. Inspect the optic and repeat if necessary, but only use each sheet of lens tissue once.
12) When the laser apeture is not in use, please cover the attached dust cover, as shown below.



## 8.2 Routine inspection on device

1) Check whether the interlocking safety system is in normal condition: When the treatment room is open, the display screen shows that the interlocking safety system is not installed, accompanied with an alarm sound;

2) Check whether the emergency stop button is in normal condition: when the emergency stop button is pressed, the laser emission will stop, accompanied with an alarm sound;

3) Check whether the finger switch is in normal condition: in ready mode, press the finger switch to start the laser emission, and press again to stop the laser emission;

4) Check whether the remind sound and indicator light are in normal condition;

5) For some parts to be replaced during the routine inspection, please contact the after-sales personnel of RWD.

## 8.3 Battery Replacement

1) Turn the therapy device over loosen the three screws at the bottom with a Phillips screwdriver to open the battery bottom plate, as in Figure 8-1. After opening the battery plate, you will see the battery, as in Figure 8-2.

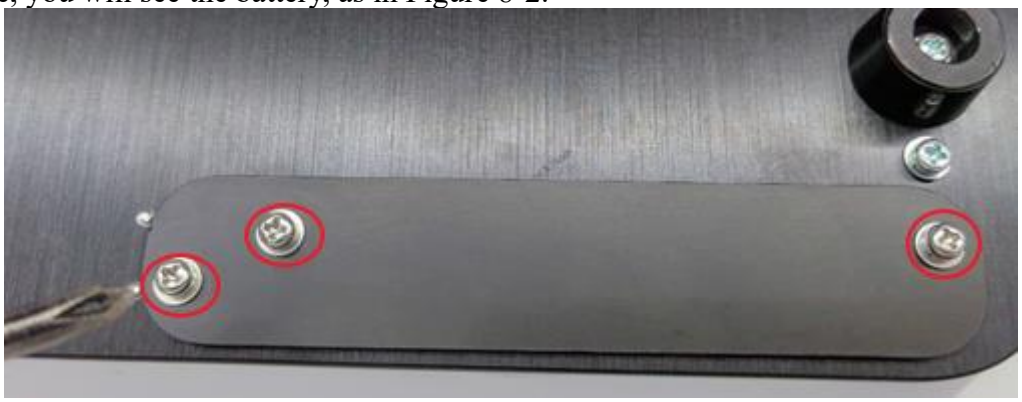


Figure 8-1

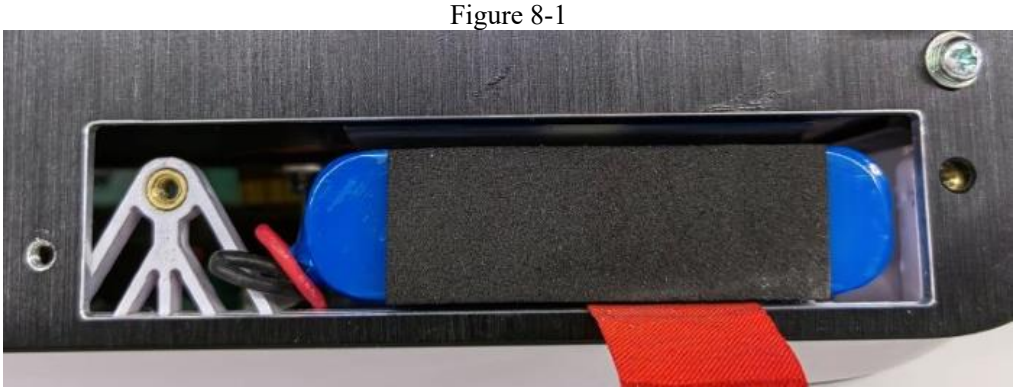


Figure 8-2

2) Pull the red ribbon outward to take out the battery, as shown in Figure 8-3.

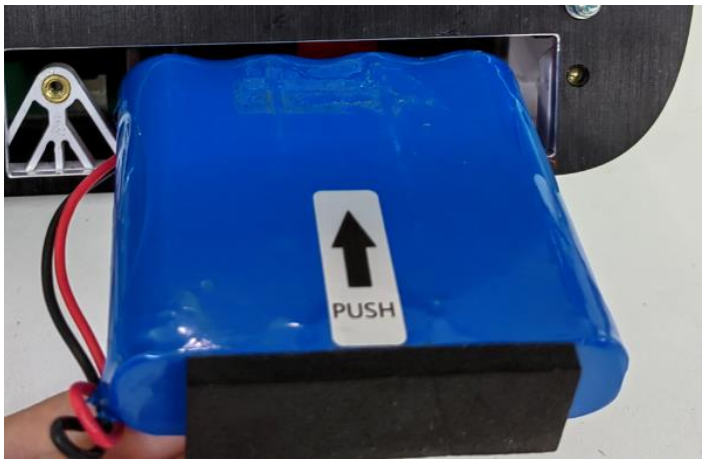



Figure 8-3

3) Remove the old battery from the cable card and connect the new battery cable to the cable card, as shown in Figure 8-4.

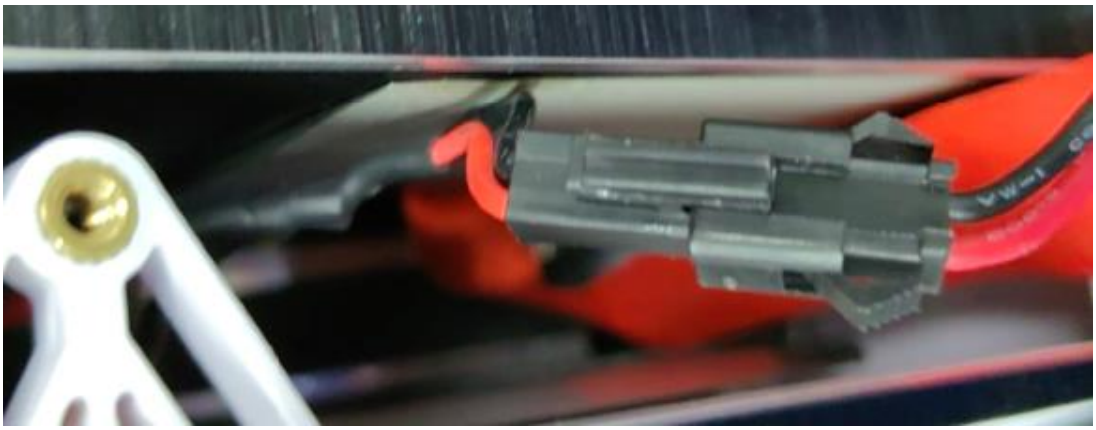


Figure 8-4

4) Push the battery into the battery compartment, pay attention to the PUSH label and the position and direction of the red ribbon, as shown in Figure 8-5

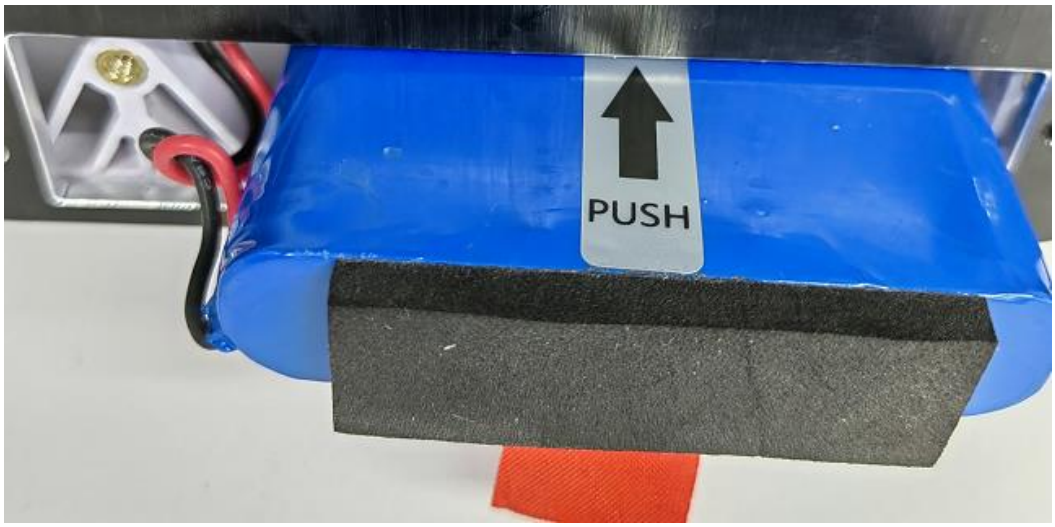



Figure 8-5

5) Lock the battery bottom plate, and the battery is replaced.

# 9- Waste disposal

Optical fibre handpiece, batteries and other waste products should be disposed in strict accordance with local policies and regulations for waste disposal.

# 10- Electromagnetic compatibility

- The Veterinary Laser Therapy should be used in the electromagnetic environment specified in this section. It's recommended to evaluate the electromagnetic environment before use.
- Electromagnetic communication units may affect the normal use of the Veterinary Laser Therapy, so measures should be taken in use to keep it away from strong electromagnetic interference such as mobile phones and microwave ovens.
- Do not use the device near a strong radiation source (such as unshielded RF source), otherwise it may interfere with the normal work of the device.
- Do not stack the laser therapy with other devices, otherwise it may interfere with the normal work of the device.
- Must use the accessories provided by RWD. Use of other accessories may lower the electromagnetic compatibility of the laser therapy.

## 10.1 Radio-frequency (RF) emission

| **RF emission** | |
|---|---|
| **Launch test** | **Compliance** |
| RF emission EN 55011 | Group 1 |
| RF emission EN 55011 | Class A |
| Harmonic emission EN 61000-3-2 | Class B |
| Flicker emission EN 61000-3-3 | Compliant |

## 10.2 Electromagnetic immunity

| **Immunity test** | **GB9706 test level** | **Compliance level** |
|---|---|---|
| Electrostatic discharge (ESD) EN 61000-4-2 | ±8kV contact discharge<br>±15kV air discharge | ±8kV contact discharge<br>±15kV air discharge |
| Electrical fast transient burst EN 61000-4-4 | ±2kV to power cord<br>±1kV to input/output line | Applicable |
| Surge EN 61000-4-5 | ±1kV line to line<br>±2kV line to earth | Applicable |
| Voltage sags, short interruptions and voltage changes on the power input line EN 61000-4-11 | <5% $U_T$ lasts for 0.5 cycles (at $U_T$, >95% sags)<br>40% lasts for 5 cycles (at $U_T$, 60% sags)<br>70% $U_T$ lasts for 25 cycles (at $U_T$, 30% sags)<br><5% $U_T$ lasts for 5s (at $U_T$, >95% sags) | Applicable |
| Power frequency magnetic field (50 Hz/60 Hz) | 3A/m | 3A/m |
| **Note:** $U_T$ refers to the AC grid voltage before the test voltage is applied. | | |
| RF conduction EN 61000-4-6<br><br>RF radiation EN 61000-4-3 | 3V (effective value) 150KHz-80MHz<br>3V/m (effective value)<br>80MHz-2.5GHz | 3V/m<br><br>3V/m |

# 11- Warranty

The warranty period of this device starts from the delivery date. During the warranty period, if the device cannot be used normally due to problems such as material and process defects, RWD is responsible for providing after-sales services such as device maintenance and parts replacement.

Device damages due to improper use or out-of-scope use of the device is beyond the warranty. In this case, expenses for maintenance or parts replacement will be borne by users.

When the device to be reworked arrives, if it has been dismantled without authorization from RWD, RWD will not provide after-sales services such as warranty, free maintenance and parts replacement.

The warranty statement (including its restrictions) is exclusively issued by RWD, covering all other warranty conditions.

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