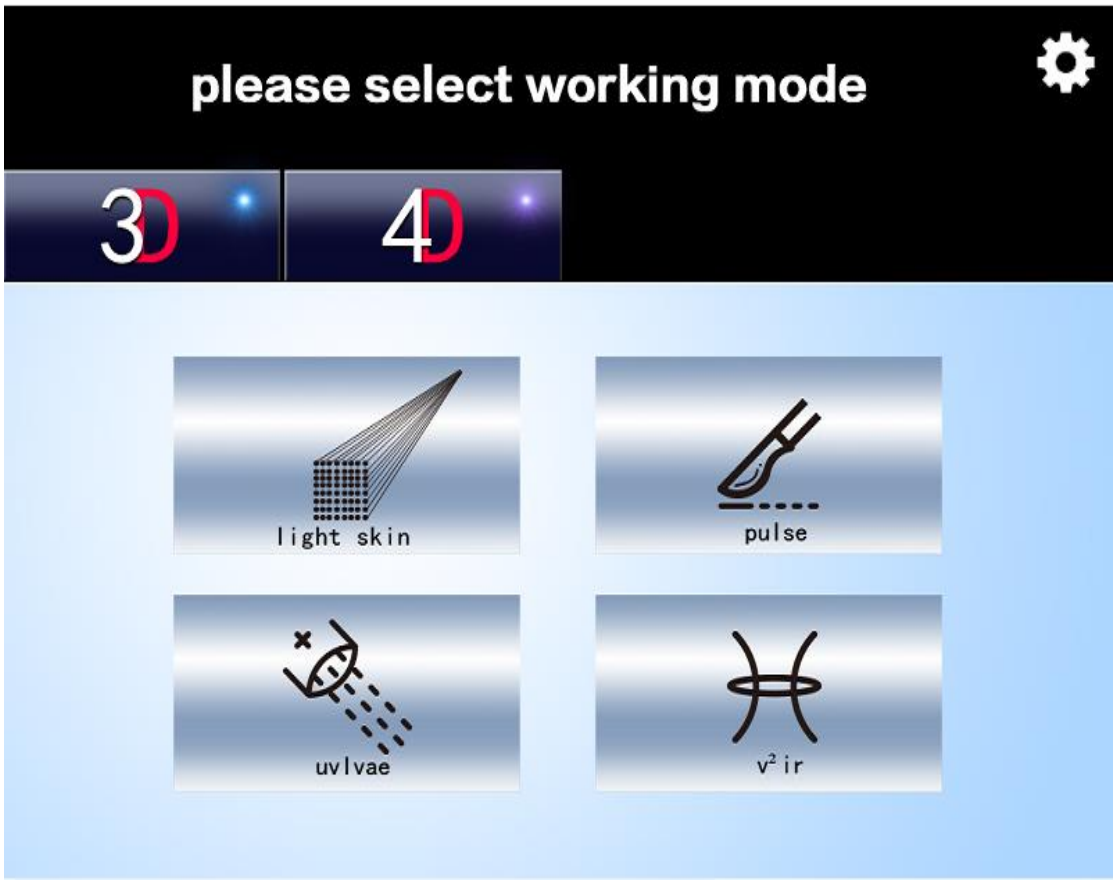
Fractional （CO2）Laser System

User Manual



Content

Company Profile

LIANGZHOU TECHNOLOGY CO., LTD. dedicated to enterprise and product research and development production of laser power. Company's main CO_2 fractional medical system, and industrial galvanometers and a variety of related components and so on. Our products are mainly sold to Europe, America and Southeast Asia and other country's medical beauty institutions, large and medium-sized industrial plants, etc., obtained the customer's wide acclaim from all walks of life.

LIANGZHOU just is a growing friend with you, and always concentrates on innovative laser scanning systems. We are honored that our company is supported by the people who are working for it. Reaching a goal requires a flexible, powerful, dynamic team that reacts on work together as one unit. We aspire for the majority of people experience perfect beauty!

Introduction

Fractional laser technology is the latest hot nearly two years in the United States, is also the most focus in global skin skin beauty with the latest technology, is between invasive and noninvasive a minimally invasive treatment. Fractional theory of laser treatment of English is called Fractional Photothermolysis (matrix decomposition) of field theory, by the laser medical expert at Harvard University, Dr. Rox Anderson, first published in 2004, immediately get all over the world experts agree and rapidly applied to clinical therapy.

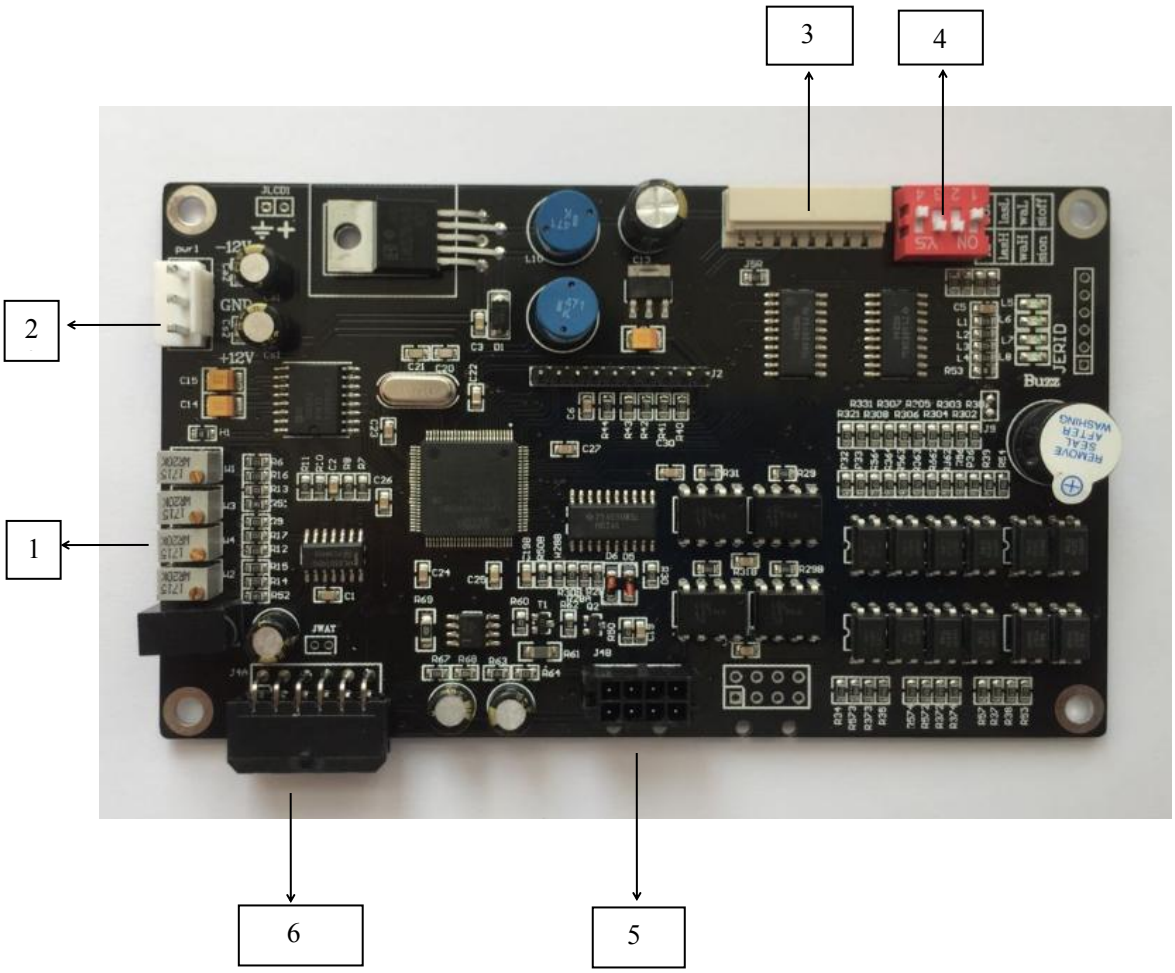
CO_2 Fractional Medical System at the same time with the super pulse and laser scanning output function; it can rapidly and accurately for a variety of fine laser surgery, especially suitable for plastic body and facial plastic surgery. System equipped with high speed graphics scanners, scan output different shapes of graphics, according to the requirements of different patients, provide personalized treatment options.

CO_2 Fractional Medical System adopts laser scanning Fractional way, formed in the skin by a laser dot matrix and interval of burning zone, each laser point is composed of a single or several high-energy laser pulses, can directly penetrate to the dermis, gasification off wrinkles or

scar tissue in a flash, at the same time stimulate collagen hyperplasia, and then start the tissue repair, collagen rearrangement and a series of skin reactions. Collagen fibers under the action of laser generated about a third of the contract, the tiny wrinkles is flattening, becomes shallow depth of the wrinkles and skin becomes compact luster.

Production Hardware Conflguration

Medical controller system include the controller board , touth screen, power suply and cables .



1: w1 used X drift adjust. w2 used Y drfit adjust. W3 used X ratio adjust. W4 used Y ratio adjust.

2: Power supply socket.

3: screenm communication.

4: State selector switch

5: System indicator light

6: Controll port

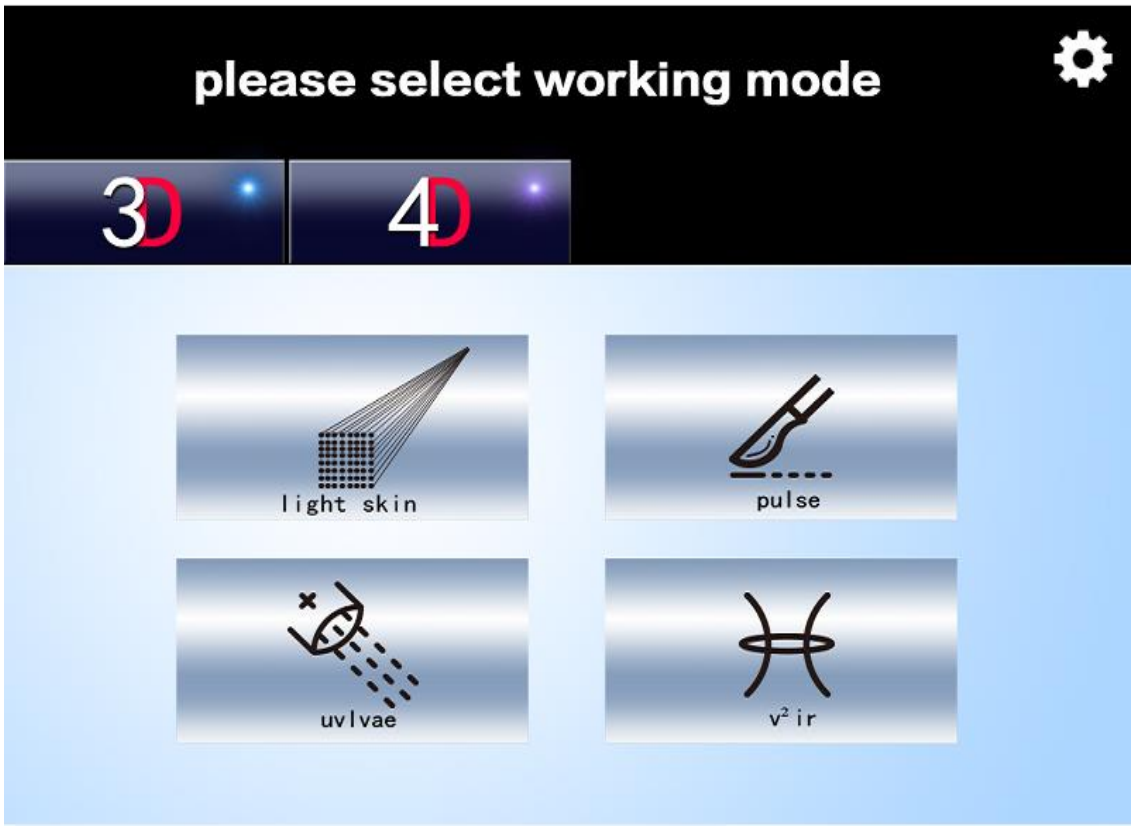
Production Softeware　Operation

1.Boot interface

The system will start up after turn on it with 5 seconds, screen light on and then enter into boot screen. The following figure.

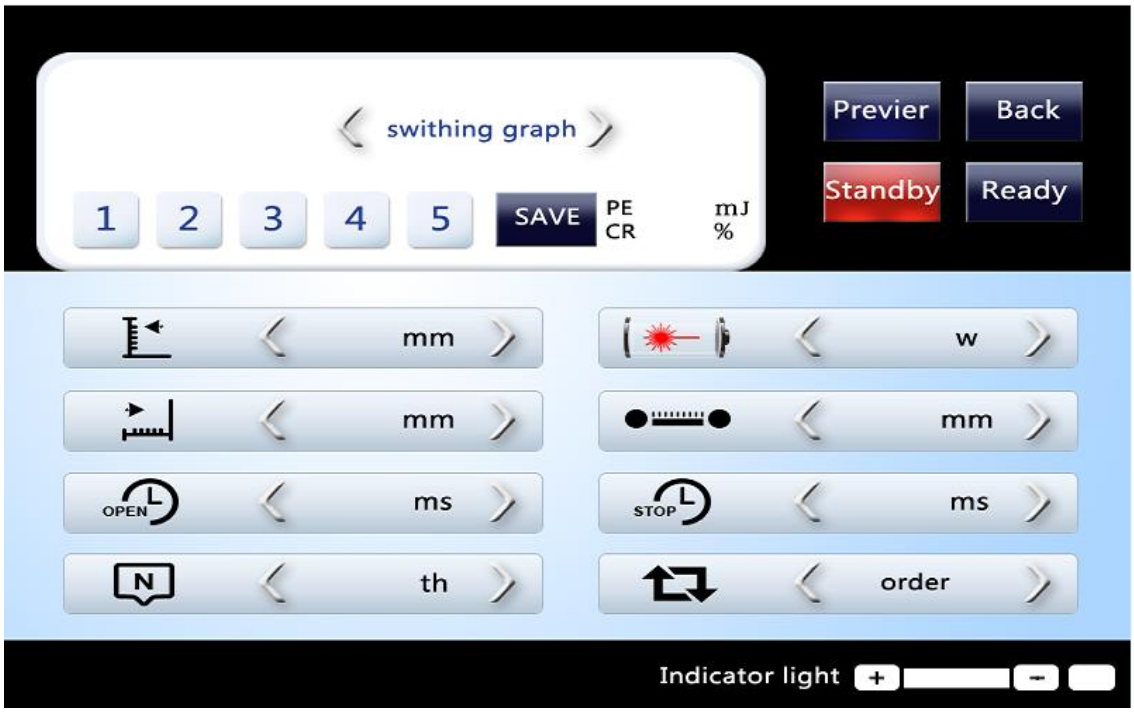
2.The main interface

System enter into the boot screen after 3 seconds automatically enter the main interface. Main interface including fractional mode, v²ir mode, pulse mode，vuluae mode and system settings. The following figure.



3. Fractional mode

Fractional mode mainly includes the basic graphic selection, parameter save and read, image size adjustment and point coverage adjustment,setting time adjustment, scanning pattern adjustment, scanning frequency and time interval adjustment. The following figure.



Basic graphics options include a square, circle, triangle and rectangle, click on the graphic design choice needed graphics, graphical display selected swithing graph .

Parameters save and read function contains 1-5 key figures and save, when parameter save, first press a numeric keys, and then adjust other parameters, when press save after the number keys to save the current all the parameters. If after entering this interface do not choose any number keys, are the interface display of parameters for the last time

out of the interface.

Point energy is the average energy of each point in the fractional model, equals to laser power multiplied by the residence time of point, adjust point energy by adjusting the residence time of point, the longer residence time of point, the greater the point energy.

Image size adjustment is used for adjusting the size of the basic graphics, regulating range is 4 mm to 20 mm, each step is 0.1 mm.

Point coverage adjustment is used as adjusting the density of points in the current graphics, adjusting range is 1% to 100%, the greater the coverage, the higher density.

Point stay adjustment is used for adjusting the action time of each point on the laser, the longer time, the more energy the laser effect at each point. Adjust the range is 0 to 10 ms, each step is 0.1 ms.

The scan mode include sequence, freedom and middle. Sequential scans: a vertex sequential scans from bitmap graphics to the finish line. middle scan mode: fractional graphics from the middle separated into four quadrants, dot is going through each quadrant of the first point first, again ordinal play four quadrant of the second point, until each quadrant of the last point.Free scanning mode: scan is not complete in a

certain order.

Scanning frequency adjustment is used for adjustment of fractional graphics dot, graphics all points in the play as a complete rbis. The adjusting range from 1 to 20 times.

Time interval adjustment for adjustment when scanning number greater than 1 time, time interval between adjacent two dot complete process.

Indicator light adjustment used for adjusting the brightness of the red light.

Edit key, when press the edit button then we can adjust the system

parameters, when the press preview and preparation, edit status automatically exit, the system parameters can't adjust at that time, the edit key auto lift for the press effect.

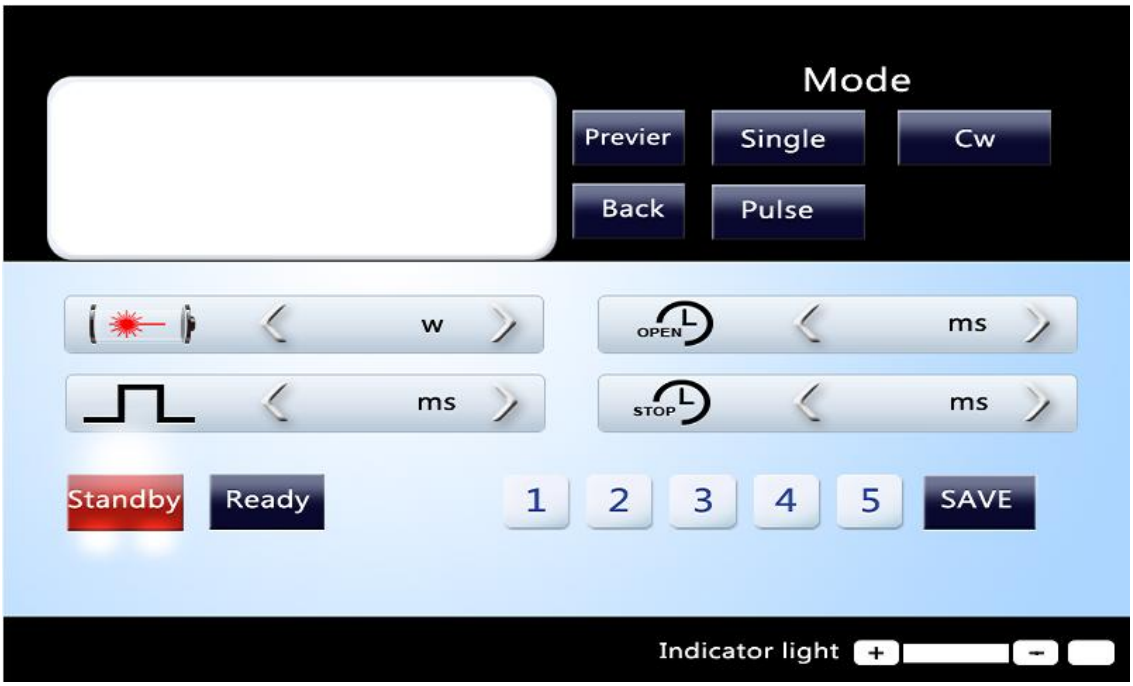
Preview button, the system parameters cannot be adjusted when press the preview button. entering the preview mode, the fractianl handpiece scan an outline of the current graphic, this outline is dot laser scope,user can confirm the position where scanning handpiece placed on through outline.

Prepare keys, when press prepare keys then systems exit parameter unadjustable state, into the preview mode and prepared mode. Pedal switch is closed only when prepared mode laser is a light, the system will only get set up. When in a complete process of lift the foot, then closed again pedal system still then just dot interrupt the process to complete the rest of the process.

Return key, press the return key to exit the current interface, to return to the interface of the last time.

4. Pulse mode

Pulse mode includes laser control signal waveform feature simulation, laser mode selection, pulse width adjustment, power regulation, interval time adjustment, parameters, save and read functions. The following figure,



Laser control signal waveform simulation is to simulate laser signal form, displays the current control simulation shows the information such as pulse width, and time interval. This system uses a laser control signal envelope structure, control signal cycle has been set, the user shall not transfer, namely single laser control signal cycle and pulse width is adjustable. User adjustable pulse width is each group of laser beam time and interval time, power regulation is to regulate analog control signal level of high and low voltage power and duty ratio of PWM control signal single cycle.

Mode selection including pulsed mode and super pulse mode, single and continuous. The pulse and pulse laser is two kinds of working mode, laser pulse mode in the form of a pulse laser, every time a light pulse width is longer, working frequency is lower than the super pulse mode, is the most commonly used laser working mode. Super pulse mode is a faster, more narrow pulse

width of laser work mode, because of faster and more narrow pulse width, pulse mode laser emission of the laser pulse is more short more energy and more penetrating, but not all laser can achieve super pulse mode of the light frequency, that not all laser under high frequency control signal response.

Point energy is a group of laser power, equals to laser energy mutiplied by pulse width.

Pulse width is each group of laser beam, in this time contains a lot of single laser cycle. This range of pulse width is from 1 mS to 100mS, users can distinguish the time of the role of pulse width, and a single laser cycle is millisecond time, users can't distinguish it.

Interval time means each group of laser beam interval time. When this interval time reduce to zero, which did not have the time interval between each group of laser beam, users can work separately for the laser mode.

Power adjusting the laser power. According to different types of laser, laser power has two kinds of control mode, it is used in the simulation of the glass tube laser power control voltage signal (to control the size of the power level of high and low) and PWM control signals for the solid radio frequency laser (duty ratios to PWM signal control power size).

Prepare keys, when press prepare keys then systems exit parameter unadjustable state, into the preview mode and prepared mode. Pedal switch is closed only when prepared mode laser is a light, the system will only get set up. When in a complete process of lift the foot, then closed again pedal system still

then just dot interrupt the process to complete the rest of the process.

Return key, press the return key to exit the current interface, to return to the interface of the last time.

5. V²ir mode

Gynae mode mainly includes the basic graphic selection, parameter save and read, point coverage adjustment, point residence time adjustment, scanning frequency and time interval adjustment. The following figure.

Basic graphics options include the round。

Parameters save and read function contains 1 -5 key figures and save, parameter save first press a numeric keys, and then adjust other parameters,

when press save then the number keys will save the all the current parameters. Parameters red by pressing any key figures, the number keys last saved parameters will be out, covering all the current parameters. If entering this interface do not choose any number keys, are the interface display of parameters for the last time out of the interface.

Point stay adjustment is used for adjusting the action time of each point on the laser, the longer time, the more energy the laser effect at each point. Adjust the range is 0 to 10 ms, each step is 0.1 ms.

Displacement and reset button is used for adjusting the position of red light and a laser in the field of vision, make the graphics in the center of the field of vision, points up and down or so four direction adjustment.

Indicator light adjustment used for adjusting the brightness of the red light.

Edit key, when press the edit button then we can adjust the system parameters, when the press preview and preparation, edit status automatically exit, the system parameters can't adjust at that time, the edit key auto lift for the press effect.

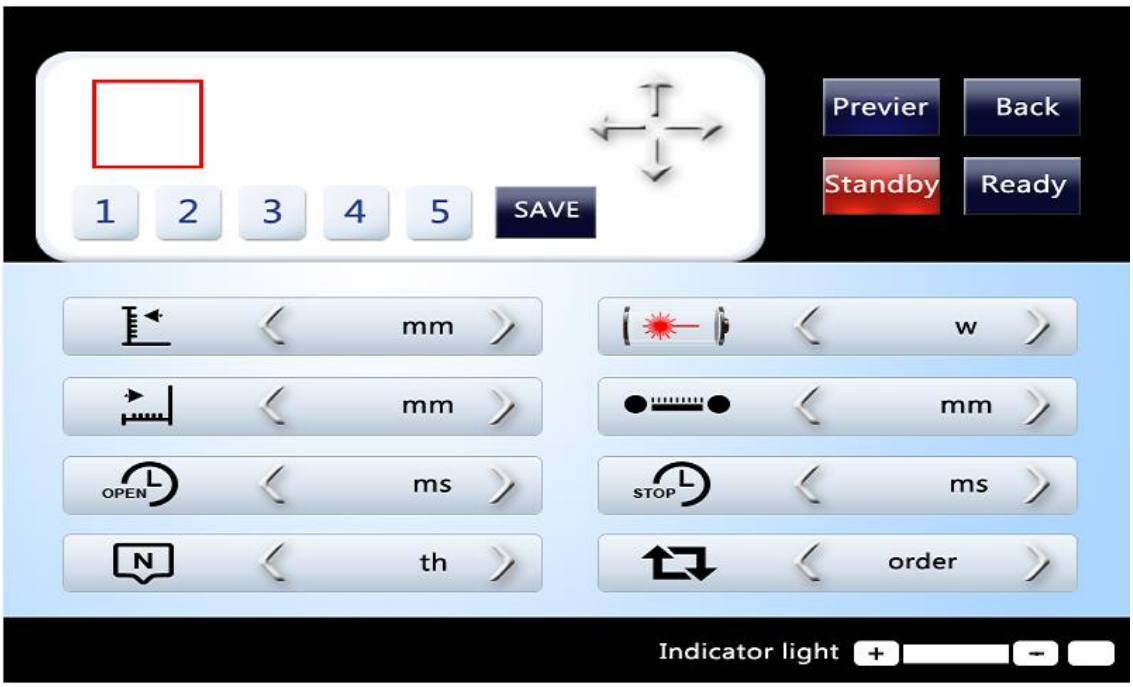
Preview button, the system parameters cannot be adjusted when press the preview button. entering the preview mode, the fractianl handpiece scan an outline of the current graphic, this outline is dot laser scope,user can confirm

the position where scanning handpiece placed on through outline.

Prepare keys, when press prepare keys then systems exit parameter unadjustable state, into the preview mode and prepared mode. Pedal switch is closed only when prepared mode laser is a light, the system will only get set up. When in a complete process of lift the foot, then closed again pedal system still then just dot interrupt the process to complete the rest of the process.

Return key, press the return key to exit the current interface, to return to the interface of the last time.

6.Vulva mode



Choosing Vulva Mode, Pls using the vaginal handle with vulva probe, At this time, the focal length is 152mm. The interface also includes basic graphics selection, parameter saving and reading, point coverage adjustment, point dwell time adjustment, number of scans and interval adjustment. As follow.

Basic graphic selection includes square .

The parameter save and read function contains 1-5 numeric keys and save. When the parameter is saved, press a number key, and then adjust the other parameters. When you press Save, the number key will save all the current parameters. When the parameter is read, press any number key. The last parameter saved by this number key will be called out and overwrite all the

current parameters. If you do not select any number keys after entering this interface, the parameters displayed at this time are the last parameter when you exit this interface.

The adjustment of the energy of the point is adjusted by the dwell time. The larger the dwell time is, the greater the energy is.

The point stay adjustment is used to adjust the time of action of the laser at each point, and the longer the time, the more energy the laser acts at each point. The adjustment range is 0-1 0ms and the step is

0.1ms.

Scanning the number of adjustments used to adjust the fractional graphics RBI times, all the points in the graphics to finish a complete RBI. Adjust the range of 1-10 times, when the choice of 10 times the system for the infinite number of RBI, that is, after depressing the foot if you do not lift the pedal has been RBI.

The interval time adjustment is used to adjust the time interval between two adjacent dots when the number of scans is more than one. Adjustment range is 1ms-5000ms.

Indicator light adjustment is used to adjust the brightness of the red light.

The displacement and reset keys are used to adjust the position of the red light and the laser in the field of view, so that the graph is in the center of the field of view, adjust the four directions up and down,and left and right.

Edit key, when you press the edit key when the system parameters can be adjusted, when you press the preview and preparation, the editing status automatically exit, that is, the system parameters can not be adjusted at this time, the edit key is automatically raised as a non-pressing effect.

Preview key, when you press the preview button ,the system exit parameter adjustable the state, enter the preview mode, then fractional scanner scan out the outline of the current graphics, this profile is the profile of laser action, the user based on profile to determine the scan the position on the patient's skin.

Prepare key, when you press the prepared key, the system exits the parameter adjustable the state to enter the preview and standby mode. Only in the standby mode, closing foot switch, the laser will work.the system will RBI. When the foot switch is lifted in a complete RBI, and closed again,the system will continue the RBI to complete the rest of the process.

Return key, press the return button to exit the current interface, return to the previous interface.

7. System settings

System settings includes fractional model calibration, private calibration, switch power and laser calibration in both Chinese and English. The following figure

Fractional model calibration matrix used for calibration of graphic proportion and the origin position, click on this button after entering the fractional model calibration interface, contains the percentage of the graphic size zero adjustment, the origin position adjustment and displacement, adjust the parameters and then click the save button to

save the current calibration parameters, don't return it would not save the current calibration parameters.

Private model calibration matrix is used for calibration of graphic proportion and the origin position, click on this button after entering the fractional model calibration interface, contains the percentage of the graphic size zero adjustment, the origin position adjustment and displacement, adjust

the parameters and then click the save button to save the current calibration parameters, don't return it would not save the current calibration parameters.

Switch button is used for selecting system in both English and Chinese languages, choose Chinese or English languages the exit system settings interface, the system automatically enter into the selected language.

Power calibration is used for calibration of the laser power.

Application

1. CO2 Fractional Medical System mainly can be used to:

1.Laser skin surgery

2.Laser anti-wrinkle operation

3.The laser trimming scar

4.The laser blepharoplasty

5.Other applications: pigmented nevus, chloasma, freckles, age spots, warts, seborrheic keratosis, vulvar syringomas, porokeratosis, millet papules, eyelid yellow tumour, amyloidosis, callosity, such as the laser skin graft.

2. Case Report

1) Female Neck 54-years old female Settings: 20 W, 500 u m, 500 u s Nr. of treatments: 3

Before the treatment Two month after 3 times treatment

2) Combined Treatment:

Pulsed Light and CO2 Fractional Resurfacing 38-years

old female Pulsed light settings: 1 5 J/cm2, 10 ms Nr.

of treatments: 3

CO2 settings: Full face: 20 W, 800 u m, 700 u s

Periorbital: 15 W, 500 u m, 500 us Nr. of treatments: 3

Before the treatment After 3 times treatment

30-years old male

Settings: Power 20 W Spacing 500 u m Dwell Time 1 500 u s Smart Stack 3

Nr. of treatments: 2

Before the treatment Forty days after 2 times treatment