

# DIGITAL LENSMETER MANUAL

**DLR-800**



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# 1 Product introduction

DLR-800 can measure the degree of single vision lens, double vision lens, three visions lens and progressive lens (PPL) quickly and precisely.

This machine has LCD touch screen, on which can show the measured data and PD of left and right eyes. And it also can show the centering by diagram marks on the screen and it can help to adjust the optical center of lens quickly. The 7-inch high-resolution TFT touch screen can show everything smooth and fine.

There is brief menu. Just pressing the keys on the screen, the graphs will show their functions accurately.

DLR-800 is the auto lens meter which is specialized for lens measurement. The Implementation of the enterprise standard Q31/0113000121C001-2016, which is in the line with the national metrological verification procedures lens meter JJG 580—2005.

The max degree of this machine:  $\pm 25.00D$ .

## The function direction of DLR-800

Model	DLR-800
Sphere	√
Cylinder	√
Prism	√
Progressive	√
Color lens	√
PD, PH	√
Print	√
Remarks	With PD,PH and Print

## 2 Safe Notice

In this manual, the following marks mean the safe notice, please refer to the follow:



Notice: there will be dangerous. If not avoid, it can cause damage.



Notice: there will be dangerous, if not avoid, it can cause damage to the function of machine.

### 2.1 Notice in operation



Notice:

- Don't open or touch the inner part of machine if not necessary, or it may cause electric shock or make problem to machine.
- To use the stipulated voltage, if too high or too low, it will influence the operation or even cause damage to machine or result in electric shock.
- Don't put the wires under machine, or it will break the wires and cause cutting-out, fire disaster or electric shock.
- If the metal core of wires is exposed, it should be exchanged right away, otherwise, it will cause fire disaster or electric shock.

## 2.2 Notice in storage

Notice:

- Don't put the machine at some place humid or poisonous or with corrosive liquid or air.
- Don't put machine under the sunshine. To keep the suitable temperature and humidness.
- Notice: if the change of the outside temperature is too big, it will influence the operation of machine. Then it just need to put machine under the stable temperature for 3-10 hours, then it can be operated normally.

## 2.3 Notice in moving

- Don't pull the wires or cable, which will damage the machine or hurt people.
- Don't take machine by seizing the LCD screen when moving machine. You should hold the base by hands. Or it will hurt people or damage machine.

## 2.4 Notice in assembling



Notice:

- Don't put machine in humid place. Any water into machine will cause electric shock or other machine problem.
- To put machine at smooth place. Any shake during operation will make machine fall down and may hurt people or damage machine.

Notice:

- Don't operate machine under sunshine or near filament lamp. Don't install machine on the place that the surface with strong light reflect, like glass show box, mirror or polishing desk. Otherwise, these situation will influence the operation or make error.
- Don't operate machine at the place against electric fans or air conditioner, otherwise the dust will be flowed into machine which will influence the preciseness of measured data.
- Don't operate the machine at the place with dust or humid and hot, which will influence operation.

## 2.5 Notice in wires connection



Notice:

- Don't put too many plugs on one power socket, which will make it too hot and cause fire disaster.
- There must be ground connection to the power supply to protect the security of people and machine.

## 2.6 Notice after operation



Notice:

- To cut off power supply when not run the machine, and put on the dust cover. Long time connection to power supply will short the usage life of machine. And without dust for long time, the falling dust will influence the preciseness of machine.
- Not operate machine for long time, please pull the plug out from power socket, in case to prevent from fire disaster.

## 2.7 Notice in maintenance



Notice:

- If there is any problem with machine and need to take down the machine for check, please contact with our agent or our branch office. You need to take all the responsible to any damage to machine from your personal action to it.
- Don't scrape the protecting lens which under the lens base, otherwise it will very influence the preciseness of measured data.

## 2.8 Notice in accident



Notice:

- If the LCD screen broken, to knock it into pieces and wash and sweep them away by alcohol, then to burn them down. If hands touch the liquid crystal, then to wash hands with water right away.

## 2.9 Marks on machine

Please read the manual carefully.

- It means that the power supply be cut off.
- | It means that the power supply closed.

### 3 Introduction of machine

#### 3.1 Lens meter



Figure 3.1 Outlook of main body

- lens fixing frame: when fixing the lens, to up the frame and down it with gentle. When take down lens, to up the frame till there is a sound like “ka”, then the frame will be locked.
- Sliding nose frame: which used for measuring PD. To put the nose pad on the frame and move the frame, the PD will be measured out automatically.

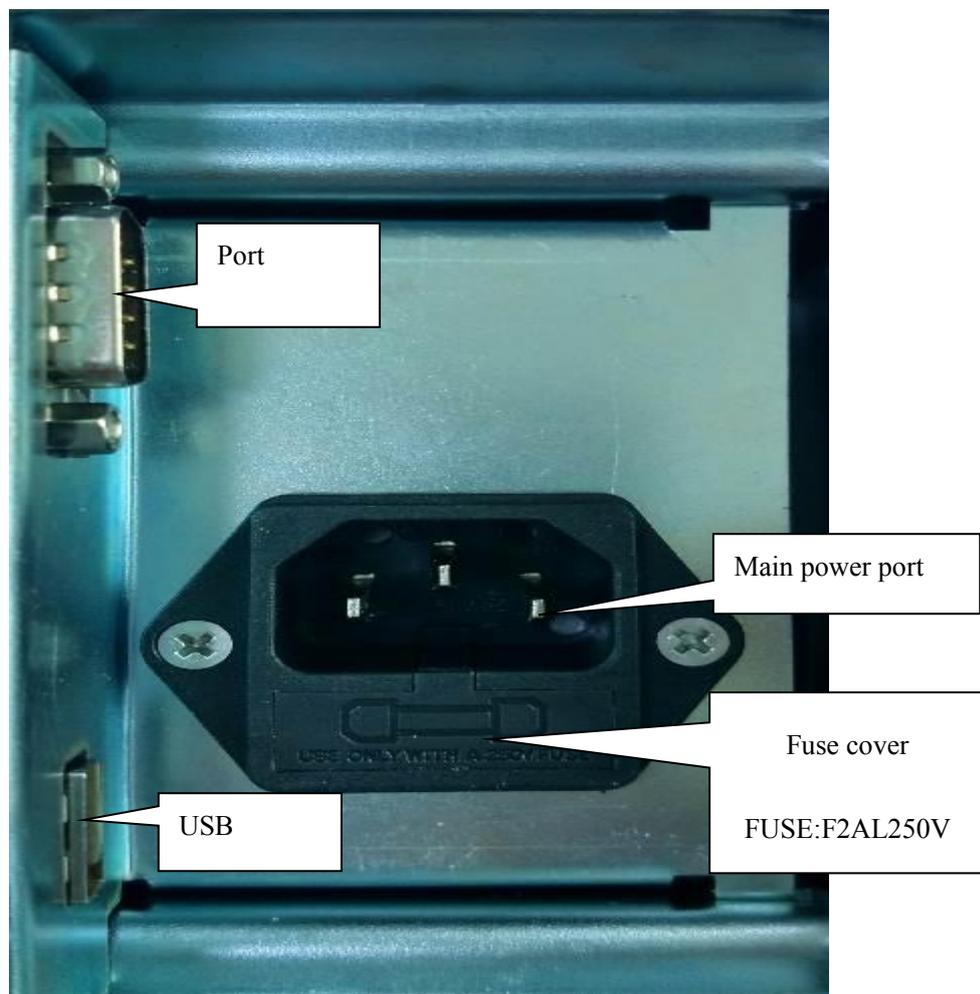


Figure 3.2 Port on the back of machine

- Lens base: which used for putting lens and as the basic point of measurement. Dust cover: which used for protecting machine from dust. Before operating machine, please take down the dust cover.

- Switch : short-time press to turn on machine, and longer press to turn off machine.
- Point button: to mark the center of lens and the optical axis of astigmatism glasses.
- Lens table button: to dolly moves lens and measure the diameter of lens (the diameter can be read out by the degree scale under the button.)
- lens table: to fix the direction of lens frame. To put the bottom of lens frame on the lens table when make the measurement. Don't move the lens table directly, but just moving it by lens table knob.
- Printer: to print the measured data.

Note: no operation for some time, machine will turn to screen saver mode. The time of this mode can be set in Menu. Back to measure mode, just gentle touching on the screen.

### 3.2 Operation panel

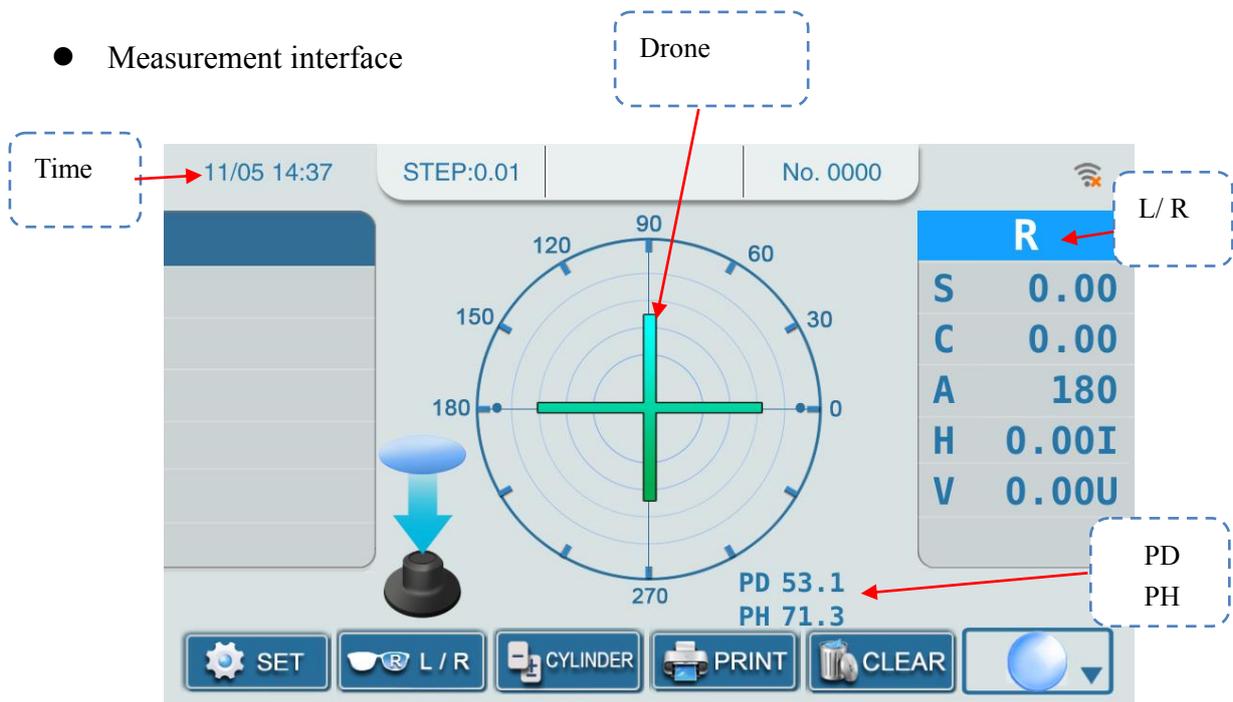


Figure 3.3 measurement interface

Showed degree: 0.01、0.12、0.25D

Astigmatism mode: +、+ / —、—

- Drone

To show the measured point when measure lens.

The shape of drone will change as follow when focusing:

⊕: Off center

⊕: close to center( within  $0.5\Delta$  ) and it will be showed in screen.

⊕: focused on center (mark point) and it will be showed on screen.

- L/ R

When the left side or right side (L/ R) has been set and the mark showed up, the degree of the side will be showed under the mark.

S means to measure one side lens.

- PD

To show PD(LPD: left PD; RPD: right PD) and the PD of glasses.

Marks: functions are showed as marks

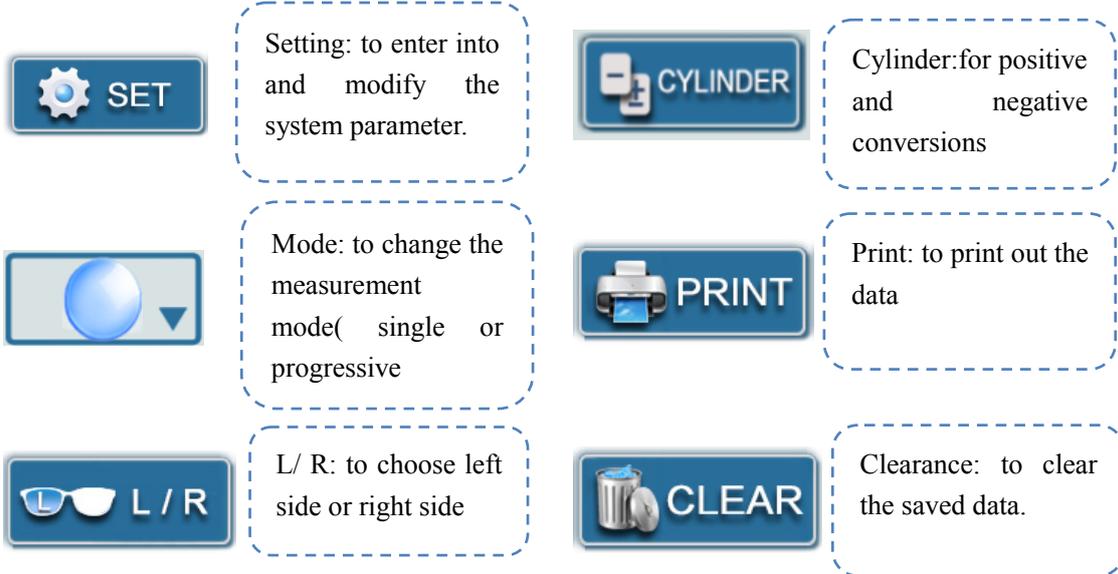


Figure 3.4 function of marks on measurement interface

Menu shows:

After entering into Menu, to press the corresponding button to change the menu options, then back by pressing “exist”.

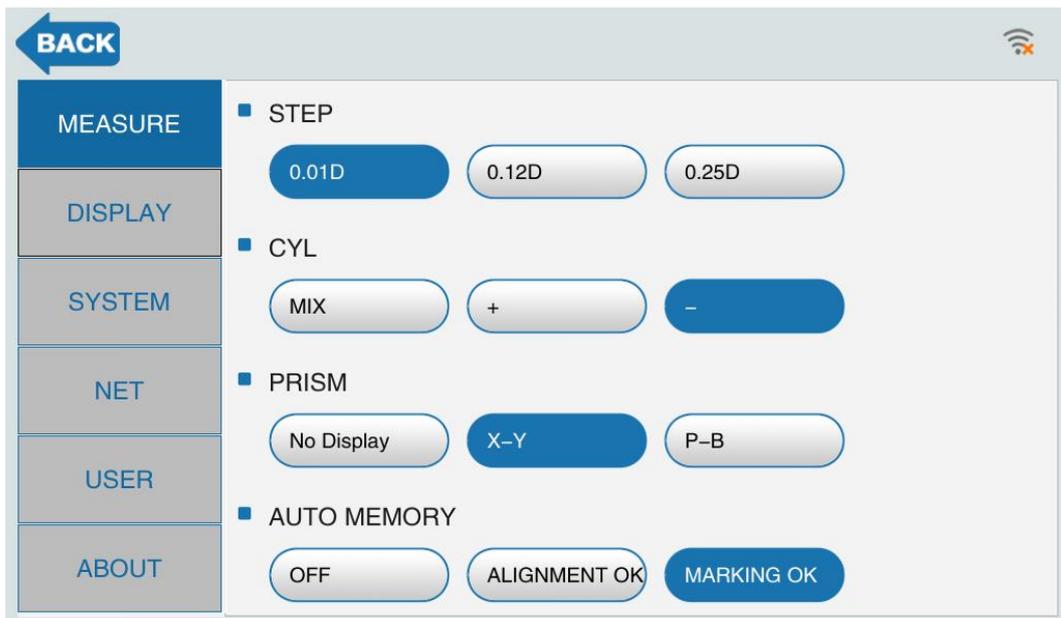


Figure3.5 mark setting menu

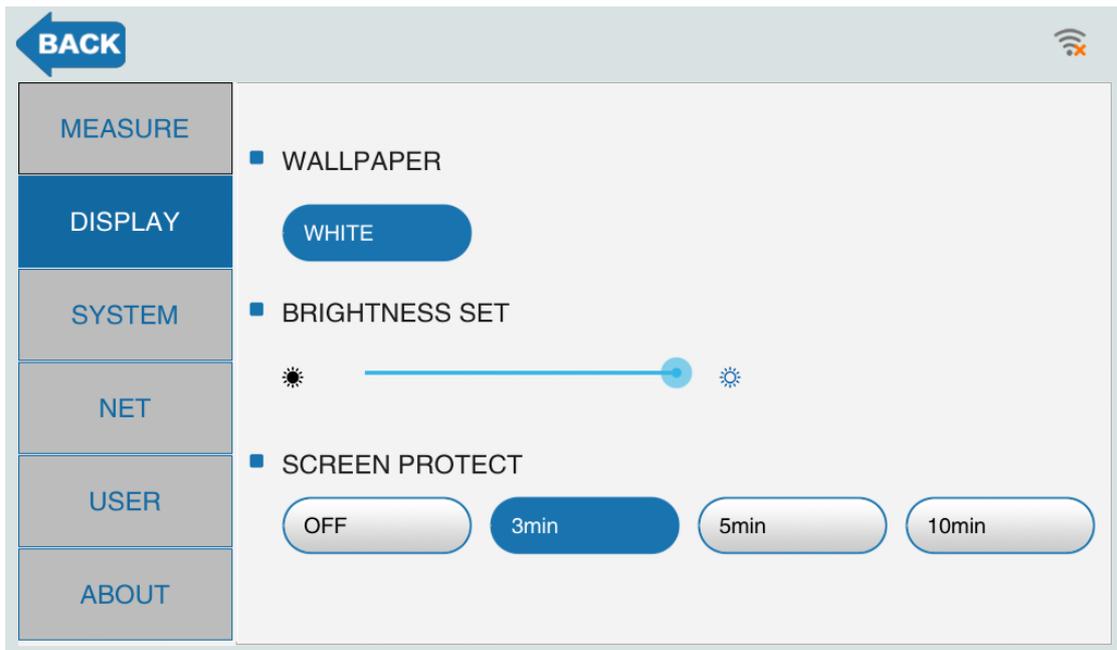


Figure3.6 display setting menu



Figure3.7 system setting menu

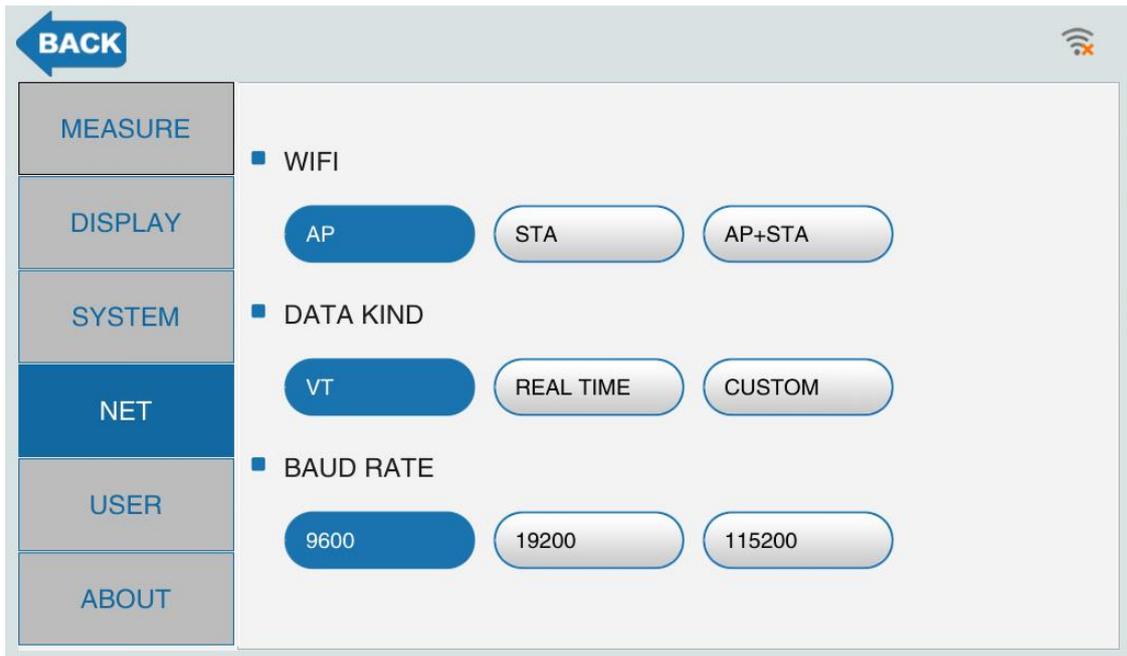


Figure3.8 network setting menu

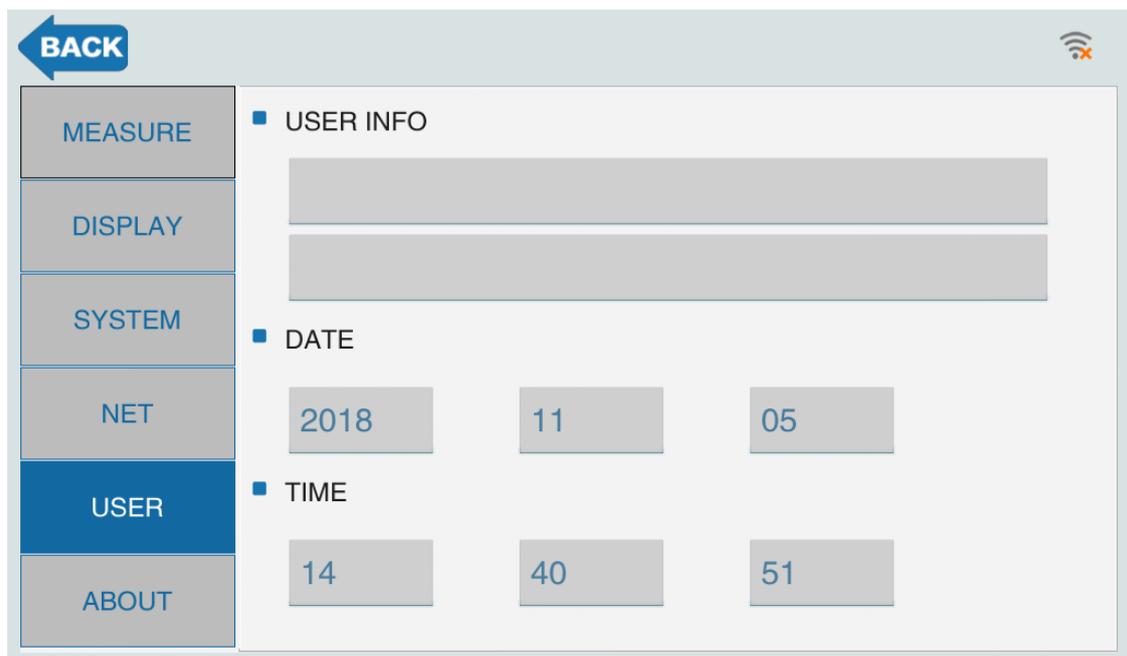


Figure3.9 user setting menu

User setting menu can set user information and time, like company name and company address

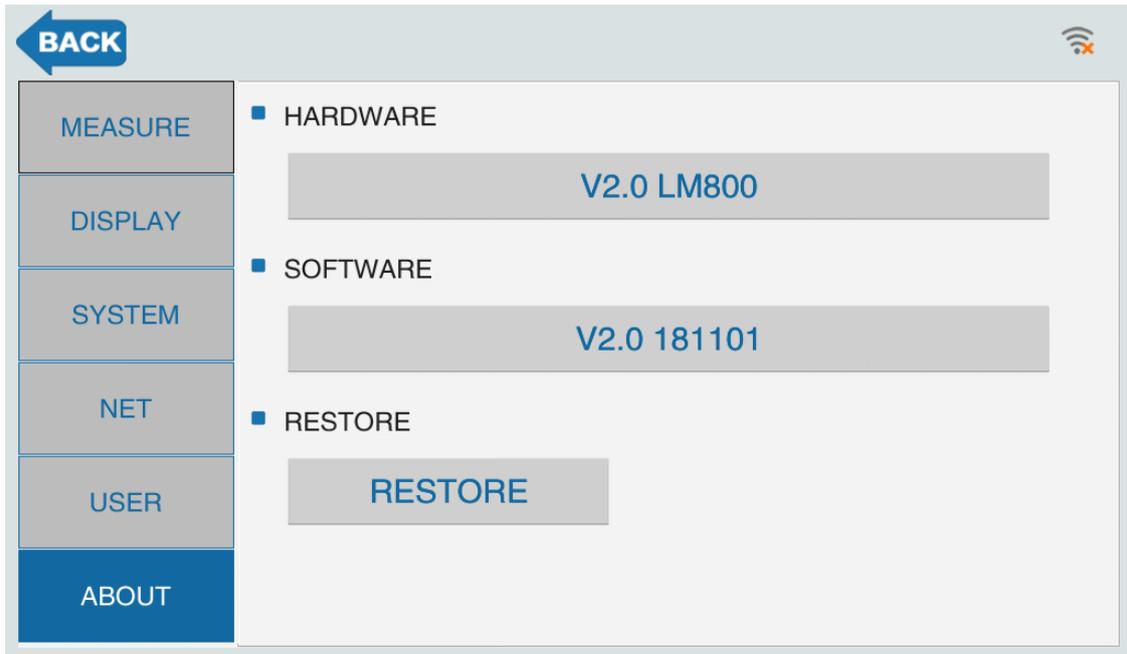


Figure3.10 about setting menu

This menu shows the hardware version and software version, “reset” menu is for factory reset.

Mode choose:

Below icons will be displayed after pressing mode menu



Figure3.11 about setting menu

From the left: (1) Dioptric profile mode (2) UV and blue light measurement mode, (3) PD meter measurement mode, (4) auto identification mode, (5) progressive lens measurement mode (6) normal lens measurement mode;

## 4. Operation

### 4.1 Installation

- (1) To check the attached parts: after opening the package, to check all the attached parts (according to the attached list).
- (2) To find a smooth place without direct sunshine and put down machine well.
- (3) To connect with power supply: to plug the power output injection of adapter to the power injection at the back of machine.
- (4) To put the grounding terminal well.

### 4.2 Test

- (1) to turn on the power switch, just gentle touching on switch.
- (2) the test data should be 0D without any lens. To turn on the power so check if everything is OK.

Note: if all the data showed on measurement menu are not 0, then it means that the protecting glass is dirty, which is in lens base. To blow off the dust by the balloon. If it is still dirty, then to wipe it with lens cloth. It should be cleaned every short time. Be sure to move lens base up while the protecting lens is in cleaning.

### 4.3 Operation

#### 4.3.1 Lens settings

1、 To clarify the left side and right side of lens:

- No PD measurement, the sliding nose pad frame should be move to left side. L/ R keys will be workable.
- In PD measuring, the sliding nose pad frame will direct the left or right side and it will measure out the PD of left or right while the L/ R keys are not workable.

- If no need for choosing left or right side, there will be S showed on the right up corner of measurement interface.

## 2、 Lens settings

To put the lens on the lens base, and the convexity upward.

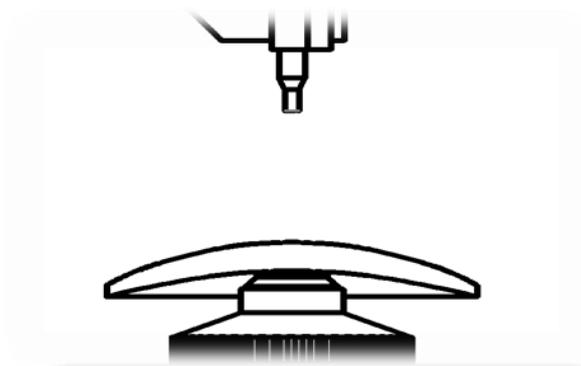


Figure 4.1 to put the measured lens

## 3、 Lens fixing

To put the lens fixing frame on lens.

### 4.3.2 Lens measurement

#### 1、 Single vision lens measurement

(1) to focus the drone on the center

To move lens to make the drone(+) to the center. When the distance between the drone and center less than  $0.5\Delta$  , the shape of the drone will be as a cross (+); When the drone at the very place at center, the shape of the drone will be a thicker cross(⊕). There are two ways to confirm the measured data:

A: to press the memory key and the data will be saved. When data be saved, the direction type of astigmatism +/- can be changed. To press clear key, then it will restart the measurement.

B: automatical memory settings, the data will be saved automatically according to the settings, then there is no need to press memory key anymore, and the direction type of astigmatism +/- can be

changed. To press clear key, then it will restart the measurement.

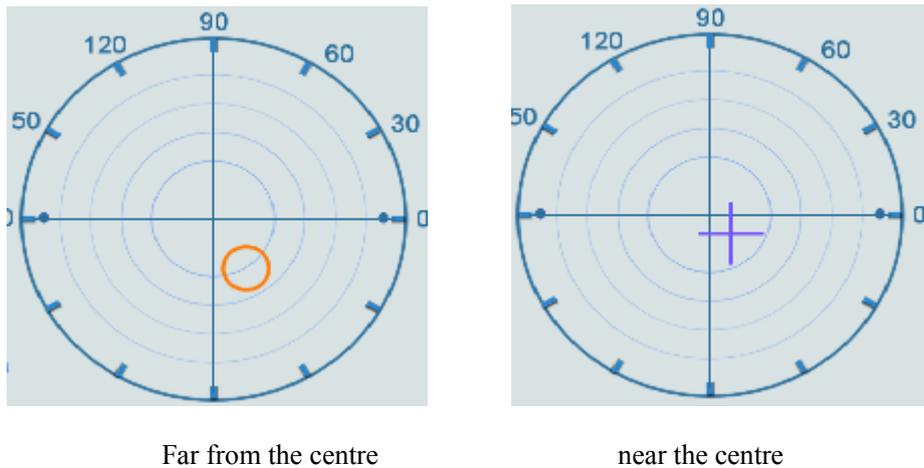


Figure 4.2 measurement of cursor move on lens



Figure 4.3 measurement of center focusing

## 2、 measurement to lens with frame

Normal measurement

(1) to press L/ R key to move the drone (+) to the center. When the distance between the two less than  $0.5\Delta$  , the shape of the drone will be as a cross(+); When the drone is just at the very point of center, the shape will be a thicker cross (⊕). To press memory key (or automatical memory set before) , the measured data will be saved.

(2) to press L/ R key to measure the other lens, and repeat action(1).



Figure 4.4 measurement of finished lens and save the data of left side

PD measurement: (no such function in Model A) The change of left or right side should be done by the move of sliding nose pad frame.

(3) to rotate the lens table knob to move the lens table till touch the bottom of lens frame, and move sliding nose pad frame to the center of lens frame. To move the lens to make the drone(+) close to the center, when the distance between the two less than  $0.5\Delta$ , the shape of the drone will be as a cross(+); When the drone is just at the very point of center, the shape will be a thicker cross(+). To press memory key (or automatical memory set before), the measured data will be saved.



Figure 4.5 measurement of finished lens and save the data of left and right side

(4) to check the other lens, to move the sliding nose pad frame along with the lens frame. Action as (1).

### 3、 measurement of high index lens:

This machine is manufactured with standard green light source. There is no need to set the Abbe number when measure the high index lens. The measured data showed on the screen will be the correct one.

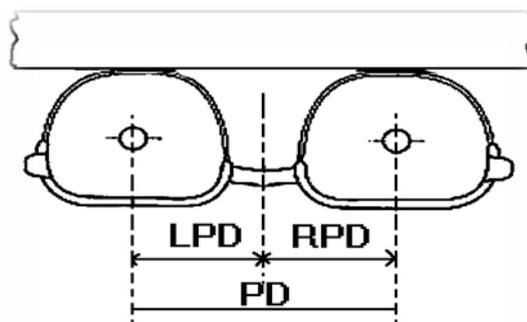


Figure 4.6 PD of lens with frame

4、 to press print, then the machine will print out the data.

One side

Two side

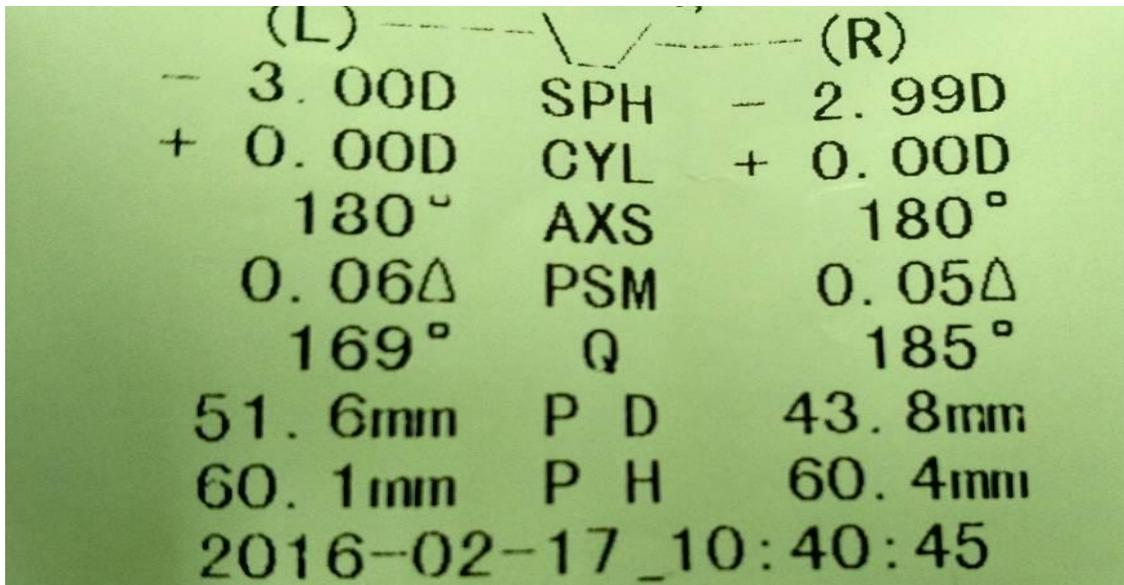


Figure 4.7 print of measured data

5、 Measurement of double vision lens:

There are two keys used in this measurement, a. Memory; b.Mode

(1) To put the far vision part(far vision range) of lens on the lens base.

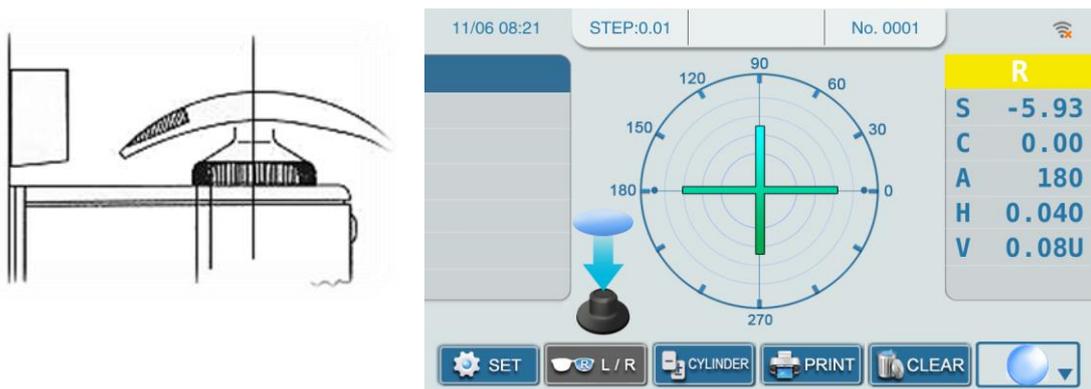


Figure 4.8 measurement of far vision range and measured data saving

(2) Measurement of far vision degree

When the shape of the drone as (+)or (+), to press the Memory key, then the measured data of far vision degree will be confirmed.

### (3) ADD of double vision lens

To move the lens toward yourself till the near vision part(near vision range) of the lens on the lens base. To press Mode, there will be AD1 on the screen. When the notice showed under the drone as “close to the center”(there is no need to focus the center perfectly), to press the Memory , then the measured data of near vision part will be confirmed. And the measurement finished.

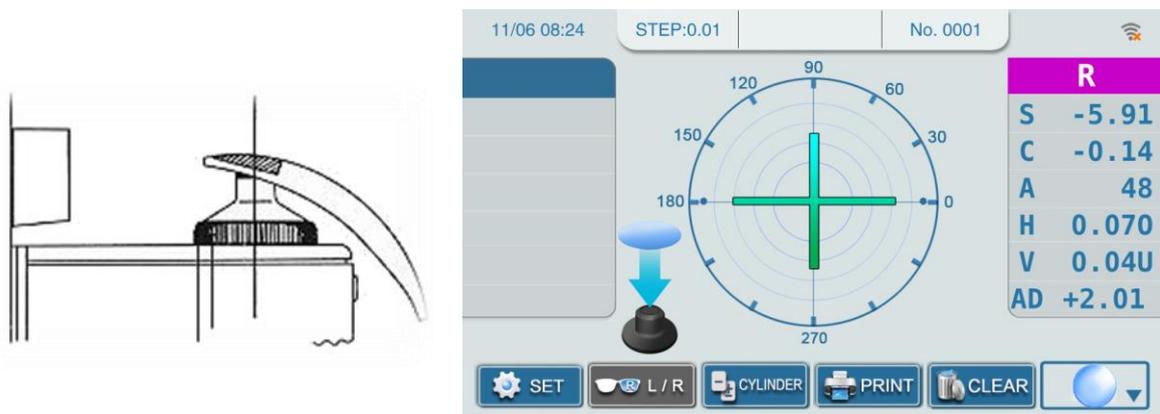


Figure 4.9 to save the measured data of near vision range

### 6、 Measurement of progressive lens (PPL)

To press the lens mode exchange key to enter into the PPL measuring mode. During this measurement, the Memory key should be used. There are two PPL measurement: non-edgered lens and lens with frame.

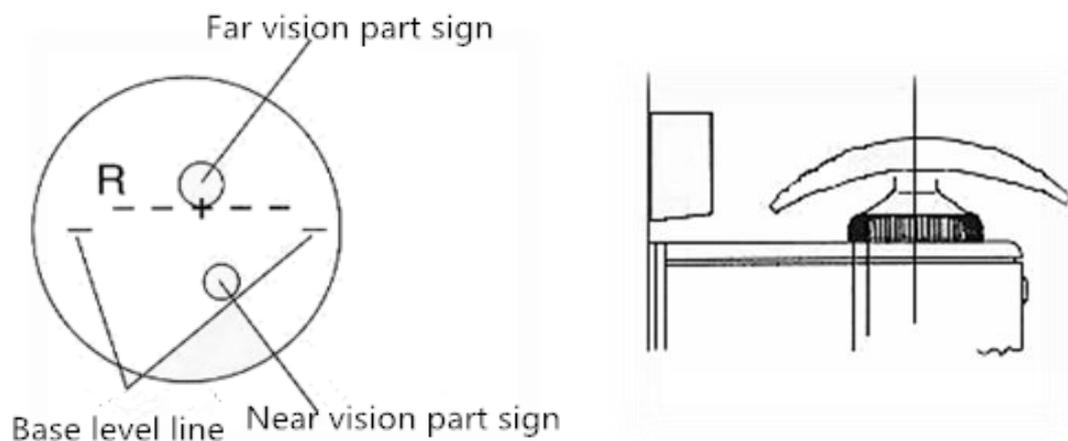


Figure 4.10 diagram of progressive lens

● Measurement of non-edgered lens

To mark the lens with the special eyes ports supplied by manufacturer and make the lens convexity upward. In the near vision range, to keep the horizontal reference line in horizontal and lock the lens. To measure the far vision range first, and to move the lens up and down and from left to right to make the drone just on the center of the cross line. When the drone as the thicker cross (+), and to press the Memory key, the data of far vision range be confirmed. Then to move lens till the near eyes ports on the lens base, there will be ADD and measured data showed on screen, just to press Memory to save it.



Figure 4.11 center focusing of far vision range

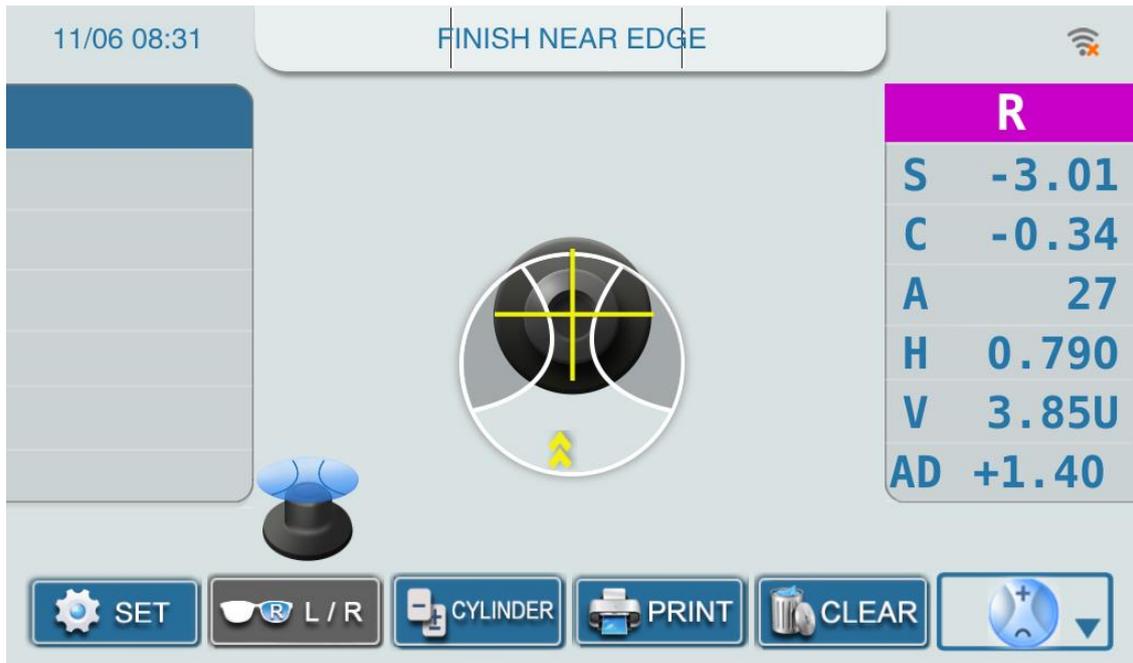


Figure 4.12 the biggest data, ADD of near vision range

- measurement of lens with frame

There is no marks for range on lens when measure with the progressive screen. So be careful during the operation.

(1) to put the lens with frame well

(2) to measure the parameter of the far vision range. The center of far vision range is close to the center of the frame. The measuring way is same as that of item 6 above.

(3) then to measure the parameter in near vision range.

To move the lens with frame by moving the knob and dam-board outward. The optical center of near vision range is close to the center of frame, to find the optical center of near vision range by moving it from left to right. Watching the ADD on the screen, to press the Memory key when it shows the maximum.

## 7、 The Prism Lens measurement

The prism lens measurement

- (1) mark the center of the pupil: ask the customer to look away with glasses, and mark the center of the pupil on each lens.

Note: the diameter of the mark should be less than 1mm. If the mark is too large, it will interfere with the measurement.

- (2) Determine left and right lenses: press the left and right keys to determine the left or right lenses.

- (3) Select the prism representation type

Rectangular coordinate system (X-Y): 1 5.00cm/m

Polar coordinates system(P-B): 1.00cm/m

D 0.03cm/m 0°

- (4) Place the lens

Place the lens on the lens holder as shown. Convexity side up.

- (5) Fix lens on holder

- (6) Place an eye mark on the center of the lens holder (unnecessary to point to the center).

- (7) Press the memory key. (note: if the data was wrong, indicate that the mark is just on the measuring light path, and slightly move the lens to get the measured data).

## 8、 Optical center Marking

Determine the optical center and horizontal direction of the lens to fit into the frame.

- (1) Moving the lens make the target to align with the center intersection line, and the shape of the target changes from (+) to (⊕). Move the lens supporter so it can near the bottom of the frame.

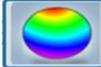
- (2) Set axis value as prescription: through the display of the axis (A XIS), rotate the lens until

the value on the prescription appears. If (+) changes to (⊕), the center needs to be realigned.

(3)Set the prescription value of lens with prism degree: the prism's selection in the menu enables the prism display to allocate mirror prescription in the same way. When rectangular coordinates are selected, the letters "I" are displayed on the screen to indicate the base is inward, "O" means the base is outward, "u" means the base is upward, and "D" means the base is downward. Place the pending lens on the lens holder. Rotate properly. Make the prism base the same direction as the prescription.

(4)Lens marking: rotate the dot knob to mark three points on the lens that are level with the lens platform. Remove the lens, lift the stationary holder of the lens until you hear a "click" and remove the lens. Don't touch the mark, otherwise the mark will be erased. The mark is not clear.

### 9、Dioptric profile measurement

press “” button , enter the menu “” , select “” to enter dioptric profile measurement mode, When measuring the progressive film, click the real memory key and the following picture will appear

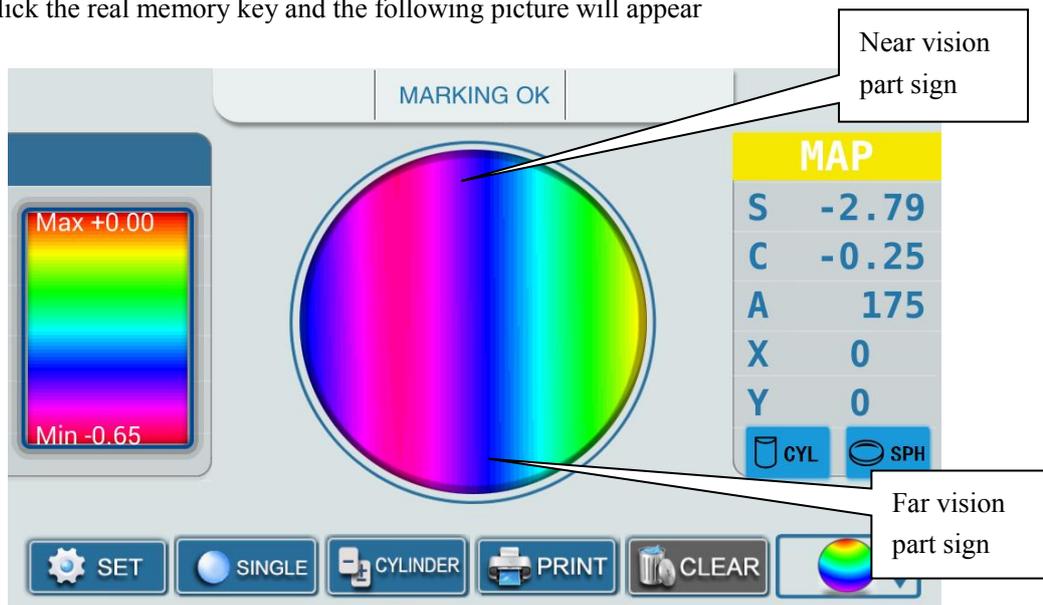


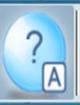
Figure 4.13 Dioptric profile measurement

This figure can be used to judge the far and near area of the progressive lens. When the color of the figure below is consistent with the color of the left figure, it indicates that the direction of the lens measurement is correct when the progressive sheet is measured. Conversely, turn the lens 180 direction and measure again



Figure 4.14 Diopter distribution color chart

### 9、UV and blue light measurement

Press “” button, , enter the menu “     ”, select “” to enter the UV and blue light measurement mode, like the following picture:

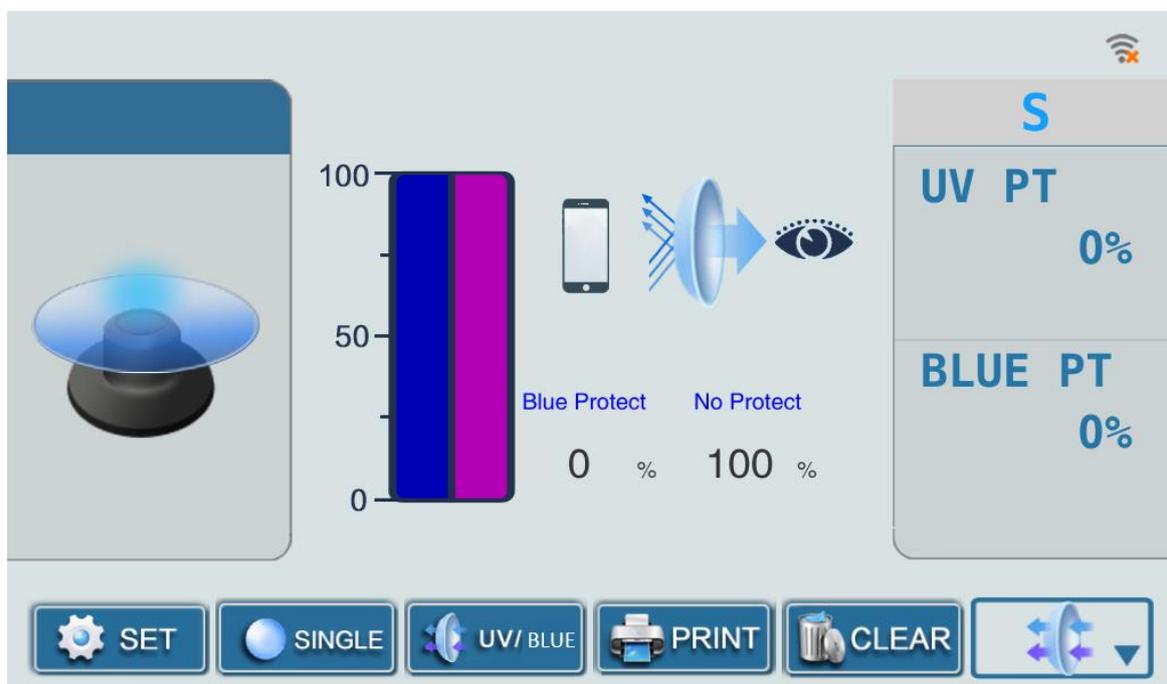


Figure 4.15 Initial UV and blue light measurement interface

If the bar like this picture  not full when no lens was tested, click  to reset and then test.

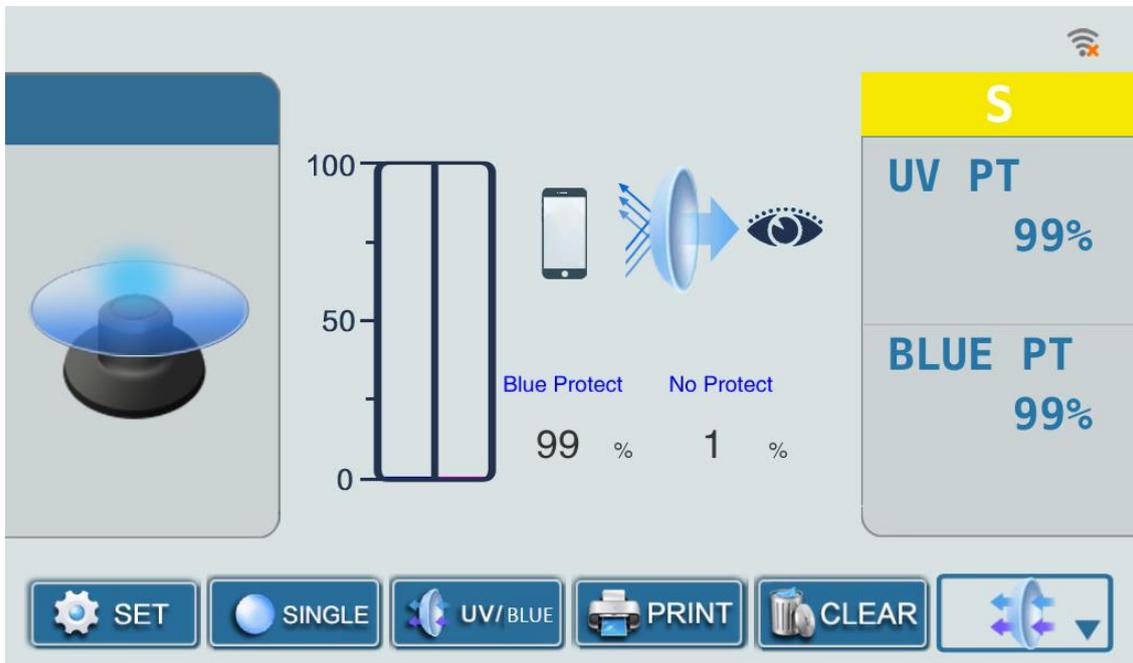


Figure 4.16 Interface of UV and blue light measurement done

#### 10、PD measurement

Click  button, enter the menu , select  the PD PH measurement like the following picture: :

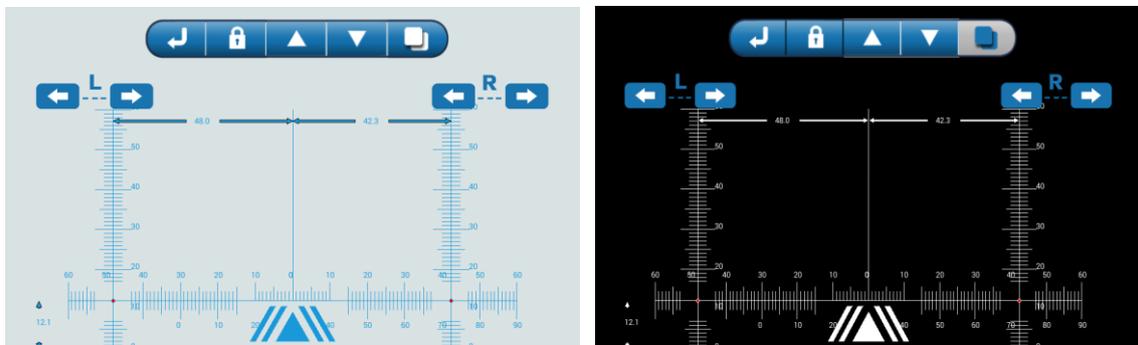
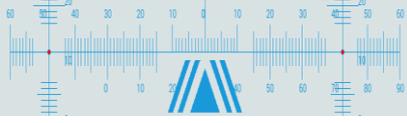


Figure 4.17 PD measurement model

Sign , can choose white or black lens measurement model. Take an example of white lens

PD measurement: Press  or  to adjust PD left and right,  can lock the result. Then click  or  to adjust.

PH measurement: press  to adjust PH,  can lock the result. Then click  or  to adjust.

## 5 Maintenance

### 5.1 Daily maintenance

- (1) Sun exposure is strictly prohibited;
- (2) It is strictly forbidden to put heavy objects on the instrument to avoid damage to the machine cover;
- (3) Please keep the equipment and surrounding air clean;
- (4) Please keep the equipment clean and do not use volatile solutions, diluents or organic solutions such as benzene.
- (5) If the machine will be stocked for a long time, please turn off the power switch and pull out the power cord;
- (6) When not in use, please cover the instrument with a dust cover to prevent dust accumulation.

## 5.2 Replacement of materials

### 5.2.1 Exchange the printing paper

(1) Open the printing cover, put into the printing paper and close the cover.

## 5.3 machine clean

(1) when machine is dirty, please wipe machine with soft dry cloth. If there is any dirty spot, to wipe by cloth with neutral detergent then clean with soft dry cloth.

(2) to clean the protecting glass by balloon to blow away the dust. If it is still dirty, to wipe it with clean dry cloth. To clean the protecting glass regularly and move up the lens base when clean it.

Note: don't scratch the glass, it will influence the preciseness.

(3) Don't use alcohol, gas, ether or acetone to wipe machine.

(4) to clean the light transfer glass regularly.

The lens base should be taken down while turning off machine and clean the light transfer glass, then to put on the lens base and turn on machine to calibrate again (Below is the clean to the light transfer glass after taking down the lens base.)

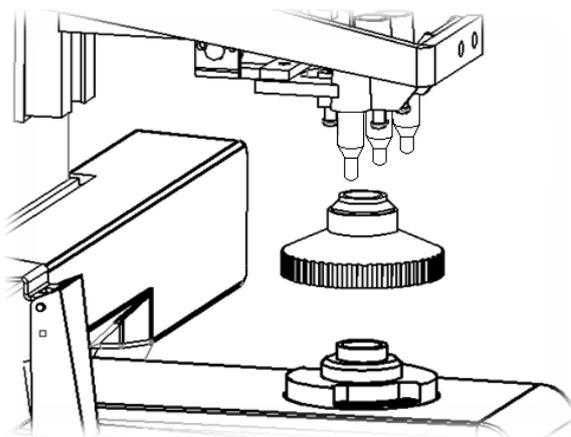


Figure 5.2 the protecting glass

## 5.4 Notice in moving

- (1) to cut off power switch;
- (2) to pull out the plug;
- (3) to hold machine by hands from the base of machine and move machine;
- (4) handle with care, and to put on a smooth table.

## 5.5 Service information

### (1)Repair

Anything problem with machine can not be settle according to the manual, please contact with the after sales services office

Please offer us with following information about machine:

Model No.: DLR-800

Serials number: the number on the sticker

Problem: please try to be detailed(picture and video are the better choice )

### (2)The range of maintenance:

We will offer maintenance to machine for the whole usage life to maintain the function

### (3) About the useless machine

- Don't throw it everywhere, the machine and the parts with pollution;
- Before your action with the useless machine, please contact with the professional waste disposal company or the agent.

## 6 Simple fault phenomenon and solution

### 6.1 solution to general problem

No.	fault	problem	Solution
1	No reaction from screen when turn on machine	There power wires are not connected well, or turn off machine not correctly	To check the wires if in good condition, and cut off the power then turn on it after a while.
2	The screen doesn't show anything suddenly.	The screen protection has been set.	To touch screen and enter into Menu to set a reasonable time for screen protection.
3	There data is not 0 when there is no lens.	The light is too strong or the protecting glass is dirty	To avoid the strong light or clean the glass
4	Not reaction when press the print	No measured data saved.	The data should be saved then can be printed.
5	The marks on lens not clear	There is problem with the pen.	To change the pen
6	Measured data not correct	Need to calibrate the data again	Enter into the interface for calibration

## 7 Performance parameter

The range of measurement	
Sphere	$0\text{m}^{-1}$ to $\pm 25\text{m}^{-1}$
Cylinder	$0\text{m}^{-1}$ to $\pm 10.00\text{m}^{-1}$
Add	$0\text{m}^{-1}$ to $\pm 10.00\text{m}^{-1}$
Astigmatism	$0^\circ$ to $180^\circ$
Prism basal Angle measurement range	$0^\circ$ to $360^\circ$
Prism	Horizontal 10cm/m, Vertical 15cm/m
The accuracy of measurement	
Dioptric	$(0.01/0.12/0.25) \text{m}^{-1}$
Prism	$(0.01/0.12/0.25) \text{cm/m}$
Mode of measurement	
Cylinder	+, $\pm$ , -
Prism	X-Y, P-B
Speed of measurement	0.2 second
Diameter of measurable lens	18 to 110mm
Other parameters	
Display	1024*600 TFT and touch screen
Printer	Thermal printer
Size	255 (W) x 212 (L) x 473 (H) mm
Weight	About 5.1kg
Power supply	AC100~240V 50/60Hz
Power	25VA

## 8 Attached list (packing parts)

- |     |                  |         |
|-----|------------------|---------|
| (1) | Lens meter       | 1 unit  |
| (2) | Print paper      | 1 rol   |
| (3) | Inkpad oil       | 1 box   |
| (4) | Dust cover       | 1 piece |
| (5) | Power cable      | 1 piece |
| (6) | Operation manual | 1 piece |