

---

# Content

Introduction.....	2
Capability.....	2
Characteristics and parameter.....	2
Instrument Components.....	3
Theory and Function.....	4
Contraindications.....	5
Classification.....	5
Symbol.....	5
Precaution.....	5
Environment Requirement.....	6
Install and Connection.....	7
Introduction of the Interface and Setting.....	8
1. Interface Introduction.....	8
2. Setting.....	9
2.1 Input ID, patient's name and operator's name.....	9
2.2 Left/right eye setting.....	10
2.3 Corneal V and Eye Pressure Setting.....	10
3. Bias Setting.....	11
Measure.....	12
1. Preparation.....	12
2. Single Mode.....	13
3. Map mode.....	14
4. Print.....	15
5. System Criteria Testing.....	16
Change print paper.....	17
Daily Maintenance.....	18
Package and Transportation.....	19
Trouble Shooting.....	20
Appendix Test Of Probe Voice-output.....	21

---

This User's Guide is designed as a training and reference manual. We recommend you to read carefully and follow the steps in this guide to ensure that the machine would have optimal performance.

## **Capability**

Pachymeter SW-1000P is composed of main unit, probe, and so on. The probe contacts the cornea and sends out ultrasound of 20MHz. The echo waves from front and back surface of cornea are detected. The signal is processed and then we get the thickness of the cornea. The data are displayed on the color LCD screen through output interface, or stored in the machine, or printed out.

## **Characteristics and parameter**

- P scan probe: 20MHZ, angle of 45 degrees makes easier operation;
- P scan precision:  $\pm 0.01\text{mm}$ ;
- Measuring range: 0.3mm~1.2mm;
- Each ID can save 10 groups of data, and each group is the average of

- 
- 20 measures;
  - ID could be input and easy to check;
  - Output: Internal thermal printer;
  - Indication: Big size chromatic LCD;
  - Input: Touch screen;
  - Gain adjusting: 0-127db;
  - Power Supply: **AC 220 V ± 10%, 50 Hz ± 2%;**
  - Power: **30W+15%;**
  - 
  - Specification of protective tube: **F1AL250V φ 4 × 12mm;**
  - Test results comply with **GB9706.1-1995 Class I Type B and GB9706.9.**

## Instrument Components



Pic.1 Front view of SW-1000P



Pic.2 Back view of SW-1000P



Pedal



Probe

## Theory and Function

This instrument is designed for detecting thickness of cornea, which is easy to use. It can continuously take measure in the same spot or different spots and calculate the average. The pachymeter is widely used in the examination before the refraction correcting operations, such as Lasik, and the evaluation of the operation.

---

## Contraindications

1. Infective eye disease, such as Keratitis and so on.
2. Open eye damage, such as avulsion or perforation of cornea
3. Children under 5 years old that could not cooperate with the examination

## Classification

SW-1000P is classified as **Class I, Type B** instrument.

Waterproof Level: Pedal: **IPX4**; Probe:**IPX1**.

This product has got **ISO9001**.

## Symbol

IPX1	Protected from drop
IPX4	Protected from splash
	Protective grounding
	POWER
	TYPE B
	Warning, May cause hurt or damage
	Attention May do harm to machine and accessories
	Hint, how to use it better

## Precaution

 This instrument requires the power supply of AC 90~230V, 50HZ±2%.

The power socket indoors should have ground line. If the local power net could not fit the requirement, then we recommend you to use regulated power supply. Improper power supply may cause instrument damage or person injury.

- 
-  All the accessories should be well kept. If anything is missing, the instrument could not be warranted.
  -  The instrument should be installed indoors with good ventilation and avoid direct sun irradiation, and kept away from strong magnetic or electric field or other strong disturbance sources.
  -  The probe is key, delicate and expensive. Do not stress it, knock it or Drop it from high place. Don't dip it into alcohol to perform disinfection. Don't twist or pull the leading line violently.
  -  It is not permitted that user himself disassembles the main unit or probe. If there are any problems, please contact after-sales of Suowei Company.
  -  When the ambient temperature is under 10 °C , the instrument should warm up for 5 minutes before it begins to work.
  -  As to the safety and effective result caused by ignoring the declaration above, our company does not take the responsibility.

## Environment Requirement

### 1. Work Environment

- Ambient temperature: +10°C ~ +40°C
- Relative moisture: ≤ 80%
- Power Supply: AC 220V ± 10%, 50 Hz ± 2%
- Power: 30W+15%
- Atmosphere pressure: 700hPa~1060hPa
- Keep away from strong magnetic or electronic field.
- Warm-up time: 5min

### 2. Transports and Storage

- Ambient temperature: -40°C~55°C

- 
- Relative moisture:  $\leq 95\%$ ;
  - Atmosphere pressure: 500hPa~1060hPa

## Install and Connection

1. Check the package to see if anything missing. (Reference to Appendix: package list)
2. Hold the figured part of the connector, align the red dot to the one on the socket, and plug it in gently. When you hear a “Click”, the plug is locked and OK.



Pic.3 Plug and pull the probe

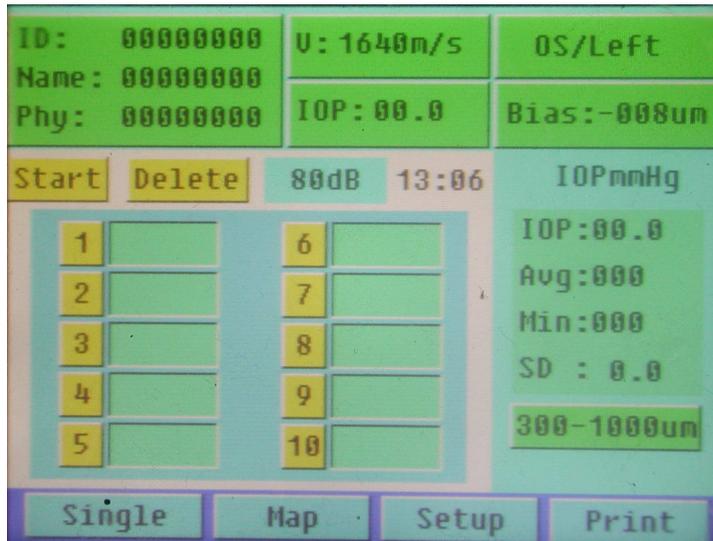
- ➔ The probe must be treated gently following the steps above; otherwise it may be damaged by improper operation.
  - ⚠ The probe must be connected before power on. Don't plug or pull the probe when power is on.
3. Power line: Connect the main unit and power socket with power line.
  4. After all the parts have been connected, switch on the power. After a beep, the machine automatically enters the measure mode.
- ➔ Do not turn on and turn off the power too swiftly. Otherwise random pictures will appear on the screen.

---

# Introduction of the Interface and Setting

## 1. Interface Introduction

The “**Single**” mode is default interface when turn on the unit. Refer to Pic.4.



Pic.4 measure interface

1.1 On the upper part is the setting menu. Press the items to begin setting.

ID: Case number

Name: Patient's name

Phy: Operator's name

OD/Right: right eye; OS/Left: left eye

Start: Start to measure

Delete: Delete unsatisfied data

Corneal V: The velocity of sound thru the cornea. Default: 1640m/s. User could define it.

Actual/Bias: Actual is the actual measure data ; Bias is to add bias into the data. Bias could be expressed in  $\mu m$  or %

IOP: Value of eye pressure. Unite: mmHg

1.2 On the right is reading window displaying the result of measurement.

---

Avg: average of measure data ; Min: The minimum of measure data

SD: The standard deviation

300~1000um: Measure range.

There are 3 ranges: 150~350um, 300~1000um and 900~1500um. The default is 300~1000um.

1.3 On the lower part is the mode menu.

Single: measuring mode

Data: Displaying mode

Map: corneal topography measuring mode

Print: Press it in Data mode and it will print data automatically.

1.4 On the middle is the main window displays 10 groups of measured data. Each group is the average of multiple measures up to 10.

## 2. Setting

### 2.1 Input ID, patient's name and operator's name



Pic.5 Setting Interface

Press the **ID** item in the setting menu. The interface will change into

---

**Setting** mode. (See Pic.5) And the numbers begin to blink.

Press the number keys on the screen by touch pen to input ID. Then press “**Enter**” to confirm the input. Then the system automatically enters the **Name** setting mode. Click the letter icons to input the name of patient. Then click “**Enter**” to confirm. And the system automatically enters the “**Phy**” setting mode. The setting of “**Phy**” is the same with the Name. Press “**Enter**” alone could switch among **ID**, **Name** and “**Phy**” setting modes.

➡ Touch screen is very sensitive. Don't press it with much strength.

➡ After finished measurement, if one revises the ID, then the data of former ID will be deleted.



If you want to reenter the items, press “**Enter**” to switch to the item you want to correct. Then you can reset the item.

## 2.2 Left/right eye setting

Press the “**OD/right**” in up-right of main window, it will switch between “**OS/left**” and “**OD/right**”.

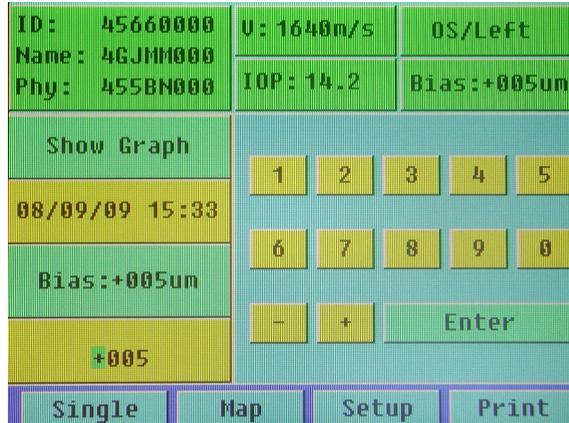
## 2.3 Corneal V and Eye Pressure Setting

After power on, the corneal velocity is displayed in the upper center of the screen. Click it to enter the Corneal V setting mode. The default is 1640m/s. After setting, click “**Enter**” to confirm.

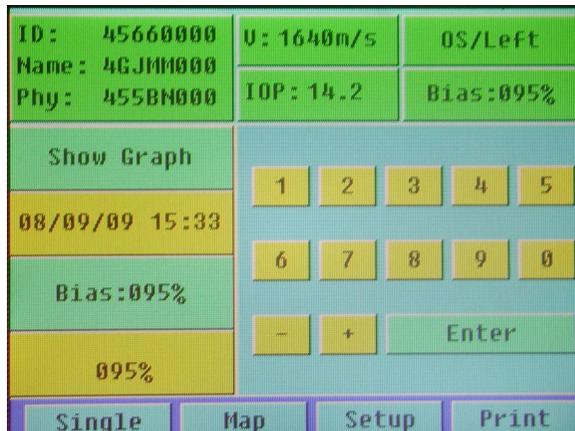
Click **IOP** to enter Eye Pressure setting mode. Click the corresponding numbers to input eye pressure which is measured with tonometer. Click eye setting to switch between “**OS/left**” and “**OD/right**”.

---

### 3. Bias Setting



Pic.6



Pic.7

If you want to set **Bias**, click the “**Actual**” key to switch to Bias input mode. “**Actual**” means the measure is the actual result without any bias. While “**Bias**” means that the result is adjusted by certain bias, which is set according to doctor’s experience.

In “**Bias**” mode, there are two ways to display: % and **um**. Click the “**um**” key under the “**Bias**” to switch to “%”. See Pic.6 and Pic.7. Click the number keys to set **Bias** and press “**Enter**” to confirm. After all the

---

parameters have been set, click the icon “**Map**” or “**Single**” in the bottom of the screen to enter measure mode.

Time setting: Click icon “**Time**” to input time and then “**enter**” to confirm it. Click “**Show Graph**” to observe the waveform when measuring. Click “**No Graph**” to conceal the waveform. After set all parameter you need, click the “**Single**” or “**Map**” and begin to measure.

➡ To avoid error, please finish all parameter setting before measuring.

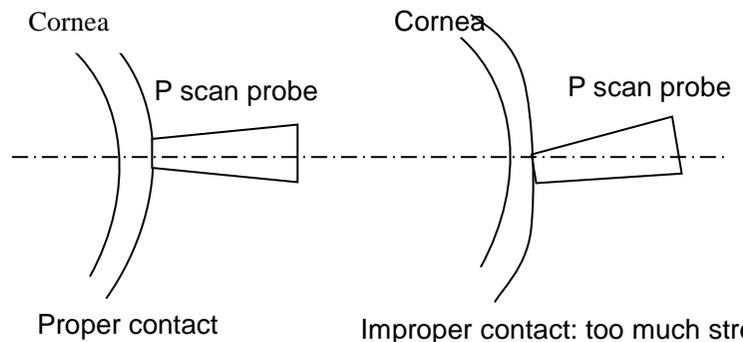
## Measure

### 1. Preparation

- ➡ The surface of the probe contacting the cornea should be sterilized by alcohol tampon before measurement. The probe can be used only after the alcohol has completely evaporated. Don't dip the A scan probe into the alcohol to perform disinfections.
- ➡ Let the patient lie in supine posture on the bed. Perform the anaesthesia of the cornea. Make the probe tip perpendicular to the center of the cornea and touch the surface of cornea tenderly. Don't apply too much stress lest of measure error caused by deforming of cornea.

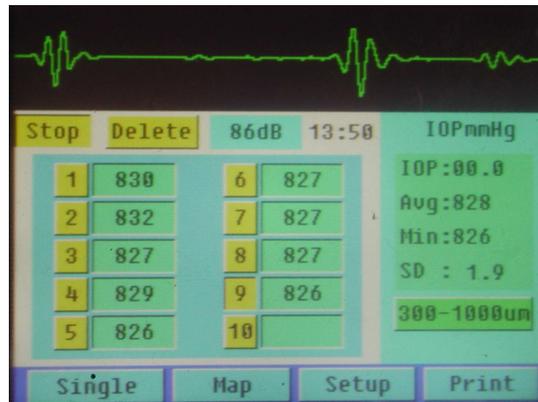


Pic.23 tip of probe

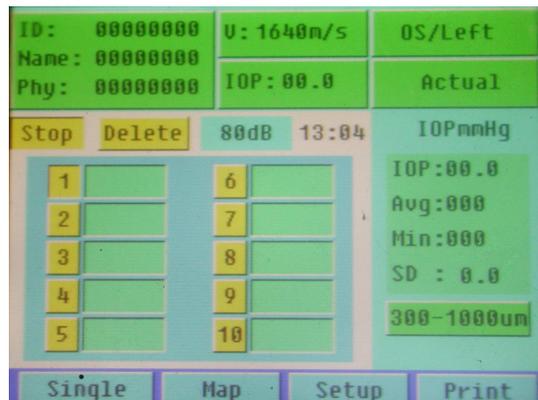


Pic.24 Proper and improper contact

## 2.Single Mode



Pic.8 Show Graph



Pic.9 NO Graph

Click “**Single**” below after setting the parameters to enter measure mode. Press pedal to begin measuring.

➡ Select measure ranges: 150~350um , 300~1000um ( default ) or 900~1500um. Click the lower right key on the screen to set.

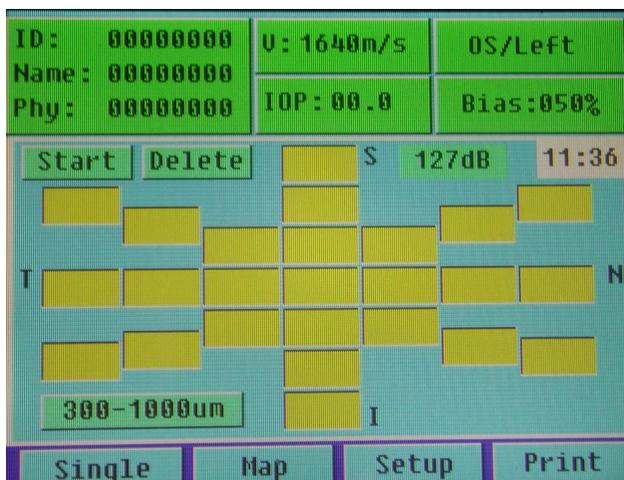
➡ Make preparation as above-mentioned. Perform disinfections and anesthesia. Contact the probe to the cornea surface and the machine will automatically take measure. After each measure, the machine will give a beep to indicate. Each group could take 20 measures at most.

The displayed value is the average of the measured data. When it reaches the maximum of measure times or when the probe leaves the surface of cornea, the machine will beep twice to indicate that a group is finished and enter the next group automatically. Ten groups of data could be taken and displayed. On the right of the screen displays the average, minimum and SD of the measured groups and real IOP value.

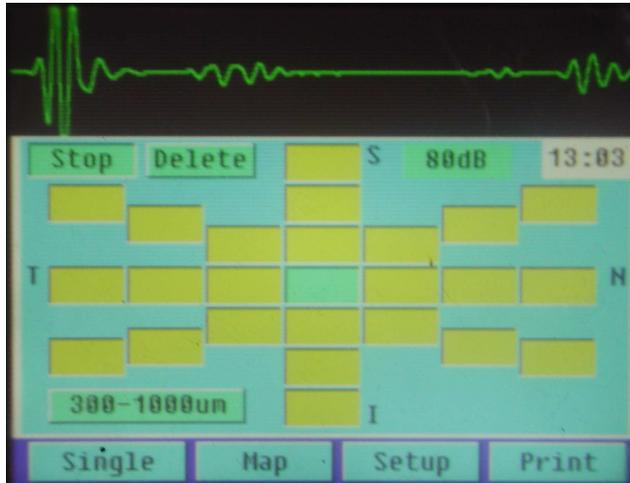
➡ After measure is finished, if there is unsatisfied result, you could click it to set it to zero, then measure again.

➡ If the data is beyond the setting range, the machine will not record this data and “**Out of range**” will appear on the lower part of the screen. Then the operator needs to adjust his posture or set a new range.

### 3. Map mode



Pic.10 NO Graph



Pic.11 Show Graph

- Press **“Map”** in the lower part to enter into measure mode.
- It shows the map of cornea, press pedal to enter measure mode, it will measure the thickness of all the spots on the map. If you want to measure only some of the spots, choose the spot first, and then press pedal to measure.
- Choose measuring range : this instrument has three measuring ranges:150~350 $\mu\text{m}$ , 300~1000 $\mu\text{m}$  (default) and 900~1500 $\mu\text{m}$ . Press the button on the right lower part to switch them.
- If there are some measure data are unsatisfied, select it and press **“delete”** to delete it and re-measure.

#### 4. Print

In **“Single”** or **“Map”** mode, press **“Print”** and it could print the case automatically after finish measurement. The printed report includes ID, patient’s name, operator’s name, left/right eye, value of eye pressure, ten groups of data and the average, minimum and SD and IOP. (See Pic.29)

P-Scan  
 Date: 08/09/09 13:08  
 ID : 55678907  
 Name: SDxcvv  
 Phy : CcgXcvxc  
 Corneal U: 1640m/s  
 Actual  
 IOP(Measure):23.5mmHg  
 IOP(Real):03.4mmHg  
 Eye :OD/Right

SINGLE  
 1:833 6 :831  
 2:831 7 :830  
 3:832 8 :831  
 4:833 9 :831  
 5:831 10:831

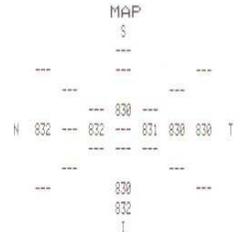
Avg:831 Min:830 SD: 1.0

Corneal U: 1640m/s  
 Actual  
 IOP(Measure):12.3mmHg  
 IOP(Real):00.0mmHg  
 Eye :OS/Left

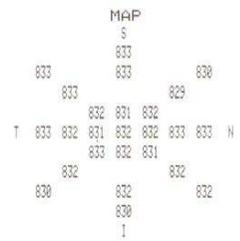
SINGLE  
 1:831 6 :831  
 2:-- 7 :831  
 3:831 8 :831  
 4:831 9 :--  
 5:831 10:832

Avg:831 Min:831 SD: 0.3

P-Scan  
 Date: 08/09/09 13:09  
 ID : 55678907  
 Name: SDxcvv  
 Phy : CcgXcvxc  
 Corneal U: 1640m/s  
 Actual  
 IOP(Measure):23.50mmHg  
 Eye :OD/Right



Corneal U: 1640m/s  
 Actual  
 IOP(Measure):12.30mmHg  
 Eye: OS/Left

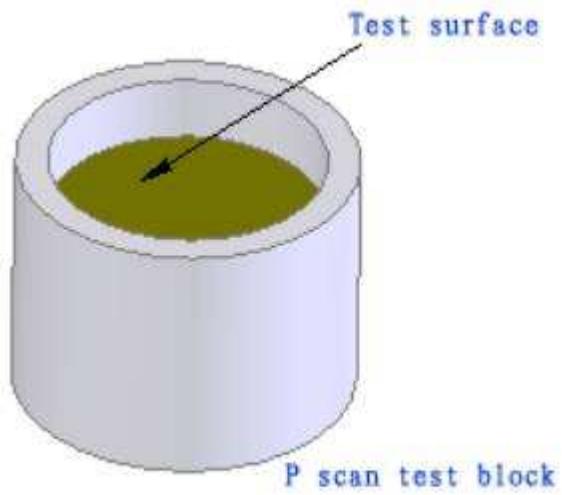


Pic.12 Printing Result

### 5. System Criteria Testing

There is a test block as showed picture. It stimulates reflecting surface of human eye. It is used to check if the P scan is working normally.

1. Test temperature : 25°C  
 Dip the probe tip with distilled water.
2. In "Single" mode (V=1640m/s), select "Show Graph".  
 Gain: adjust the gain to 20~60.
3. Slightly place the probe perpendicularly against the surface of test block and begin to measure. After finish measurement and get the average of thickness of test block, compare it to the standard data (830µm) marked at the test block. If precision is within ±10µm, then the P scan is working normally.



Pic.13 Test Block

## Change print paper



Open the cover



Take out the roller



Press S/L to clear paper end



Change new paper, see paper end



Press S/L to roll the paper to 2cm, and press to stop

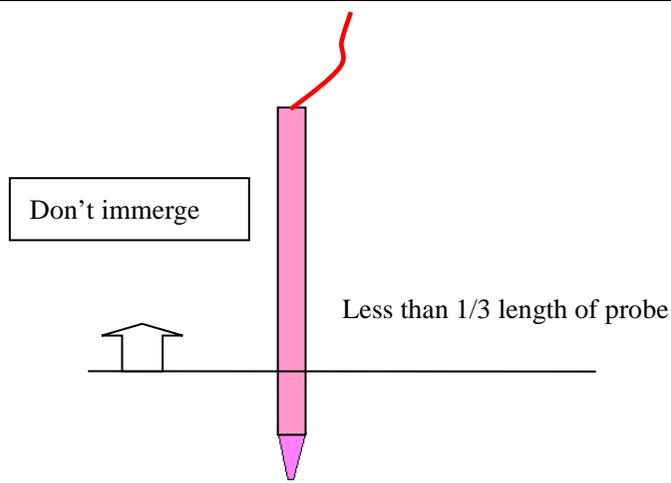


Close the cover

## Daily Maintenance

1. In moist season, if the machine hasn't been put into use for a long time, it should be powered up for about one hour each month to drive the moisture away.
2. When the ambient temperature is under 10 °C , the machine should be warmed up for 5 minutes before measuring.
3. Don't use any causticize cleanser when cleaning the device. Avoid water or any other liquid running into the keyboard or shell. You can clean with mild cleaner and soft tissue.
4. The lead and connector of the probe must be checked regularly. Any disjunction or loose will influence the quality of the image and even cause the danger of electric leakage.
5. Keep the surface of probe clean. You can wipe the tip by alcohol tampon, but don't dip the probe into alcohol or other disinfects liquid to perform disinfection.
6. The part above the probe line could not touch the liquid. See the pictures below:

---



Don't immerse

The diagram shows a vertical pink probe with a red cable at the top and a purple tip at the bottom. A horizontal line represents the ground level. A box labeled 'Don't immerse' is positioned to the left of the probe, above the ground line. A small house icon is also shown to the left of the ground line. To the right of the probe, the text 'Less than 1/3 length of probe' is written, indicating the maximum depth of immersion.

Less than 1/3 length of probe

P Scan Probe

## Package and Transportation

Transportation vehicles can transport the packed instrument. The instrument must not be transported together with goods that are easy to burn, explode, or corrode. Also it should be protected from shock and moisture.

The instrument should be stored in the environment with ambient temperature from  $-40\text{ }^{\circ}\text{C}$  to  $55\text{ }^{\circ}\text{C}$ , with the relative humidity under 95%, where there is no corrosive gas, strong mechanical vibration, shock or magnetic effect. The room in which the instrument stored should be with good ventilation and avoid direct sun radiation.

## Trouble Shooting

<b>PHENOMENA</b>	<b>REASONS</b>	<b>METHODS</b>
Could not power on the machine	Bad connection of the power plug	Re-insert the plug to connect it well with the socket
No data acquisition during normal operation	The mode of the instrument is not correct.	Choose the mode again to make the instrument under measuring mode.
	Wrong posture, the probe didn't contact the cornea	Adjust the posture
	The data is beyond the setting range	Change the range
Irregular display on the screen	Disturbance nearby	Keep the machine away from disturbance
	Something wrong with the machine	Note down the details and contact us
The screen is lit up after power on, but there is no interface	Something wrong with the machine	Note down the details and contact us