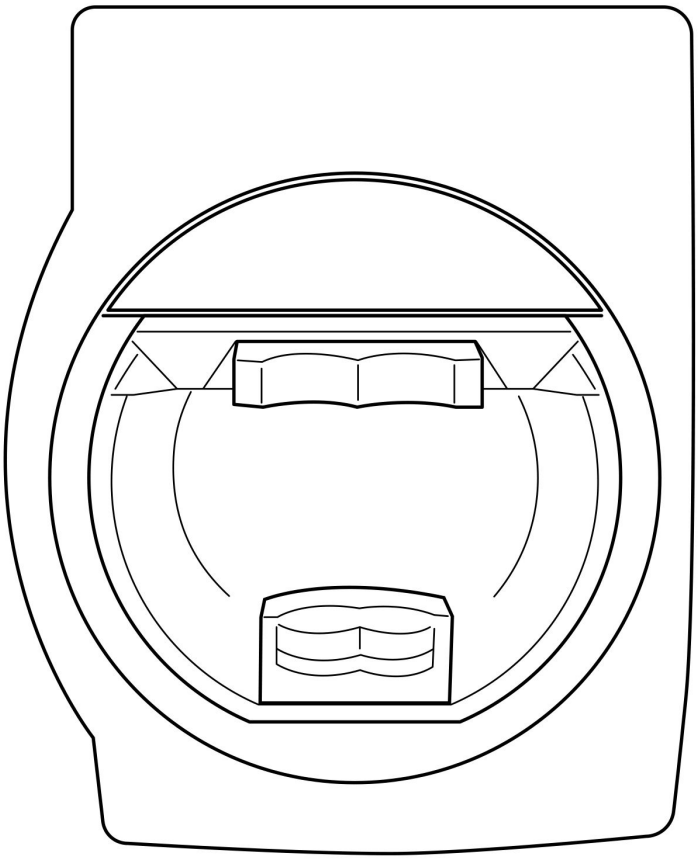
PERIMETER

Operation Manual



Dear Users:

Thank you very much for choosing **EPR-1800** automatic computer perimeter manufactured by us.

For your security and benefit, please read the <Operation Instruction> as well as all the datum of the instrument carefully before using it.

If you do not operate the instrument according to the Operation Instruction, we shall not take any responsibility.

About <Operation Instruction> of this Instrument

The copyright of the operation instruction belongs to us;

The content of the operation instruction is written according to the physical goods;

If you can not understand some of the content or clause, or if you meet technical problems when using it, please do not hesitate to contact us,

We have the right of interpreting and revising this operation instruction.

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Content

1. Introduction

1.1 Brief Introduction

The system of EPR-1800 fully automatic perimeter is a new generation based on the old generation. It has two examination resource colors, kinds test program and strategy. It has the characteristics of full-function, high precision and speed. Besides the above characteristics, the whole system also has the characteristic of high dependability and steady performance.

1.2 Registering Information

- Name: EPR-1800 perimeter

1.3 Purpose of Instrument

This instrument is used for examining the change of visual field which may be hurt by glaucoma, visual disease, disease of brain surgery and disease of retina.

2. Notes

2.1 Caution:

The local voltage must measure up to the standard voltage required by us. If the voltage is not steady, please install a steady- voltage instrument. We shall not take any responsibility for the damage due to the unstable voltage.

2.2 Notes:

To avoid being damaged by the environment (Damp, Dusty, Liquid, under the sun and so on), the instrument should be putted at the dry place.

Do not let the liquid or any other small objects run into the instrument, otherwise these objects may make the inner parts of the instrument short-circuit, and even make the users get an electric shock or even cause a fire hazard.

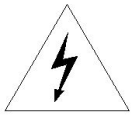
2.3 Caution:

Without the permission of us, do not open the box of the instrument,or we will not take the consequences.

2.4 Notes:

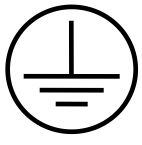
The instrument can only be installed in the dark room. And it can only be operated by those who have been trained by engineers of us, or our authorized distributor.

It belongs to BF common instrument according to the degree of protecting voltage



Dangerous Voltage

Notes！Look through the file



Earth wire

3. Technical Service of the Parameter

3.1 Transport and Storage

Prevent the instrument from damp, being inverted and being shaken violently. Keep it in the room in which the relative humidity is less than or equal to 85 percent, the environment temperature is between ： 5℃-40℃, the scope of air pressure: 760 hPa～1060 hPa and well ventilated without corrosion gases.

If the instrument need moving or transporting in a short distance, you should take apart all the connection wires and be transported by single. If the instrument must be transported in a long distance, re-pack it into its packaging box and then transport it.

3.2 Performance of Perimeter Scanner

3.2.1 Radius of stimul

3.2.2 ator: 30cm

3.2.3 Stimulating source of white LED. fixing spot is green.

3.2.4 Stimulating intensity :0 db-40 db

3.2.5 Intensity of background illumination: 31.5asb

3.2.6 Rear projection, and the diameter of light spot is Goldman III.

3.2.7 The number of stimulating and the stimulating time:

A.390 spots;

B: Stimulating retention time: 0.2s/Adaptive

C: Stimulating spacing interval: 0.2s/Adaptive

Window of eye-position tracking: White-black CCD, directly tracking the testing eye;

3.2.8 0°～90°scope can be tested in one time

3.2.9 The trip of chin rest: up-down: ≥60mm; right-left ≥30mm;

3.3 Working Environment of the Perimeter

3.1 Environment temperature: 5degree –40degree

3.2 Relative humidity: ≤85%

3.3 Atmospheric pressure: 700hPa--1060hPa

3.4 Power: AV 100~240V ; Frequency: 50~60Hz

3.5 Input power: ≤400VA

3.4 Characteristics

3.4.1 The instrument belongs to type I, BF Model common instrument

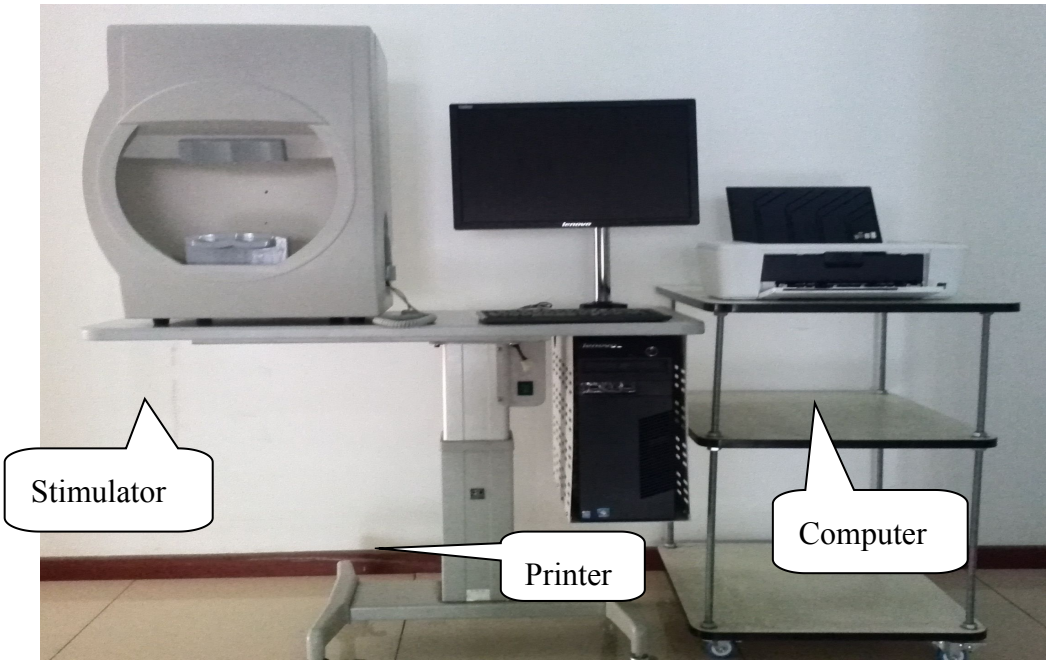
3.4.2 The instrument is supplied by single-phase net power

3.4.3 The form of the instrument is intermittent working form

4. Installation

4.1 Hardware

4.1.1 Picture of the Whole Instrument



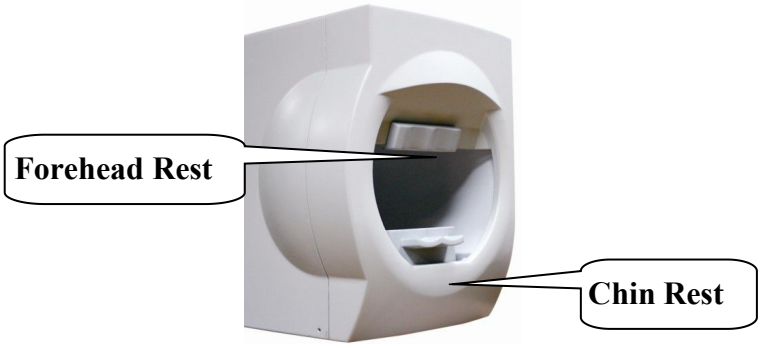
4.1.2 Introduction of Hardware

-Perimeter stimulus unit.

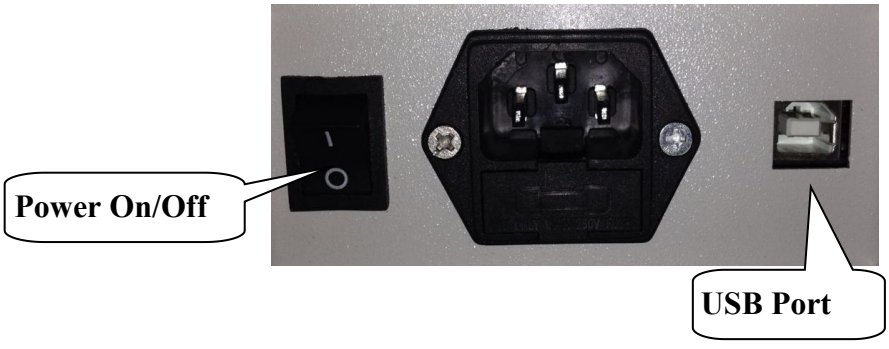
-Laptop computer with large capability memory and hard disk**,** CD-ROM driver, USB ports and one combination-port.

- Laser-jet printer

▲ The Front Picture of the Stimulator



▲ The Back Picture of the Stimulator



▲ **Main Spare-Parts**

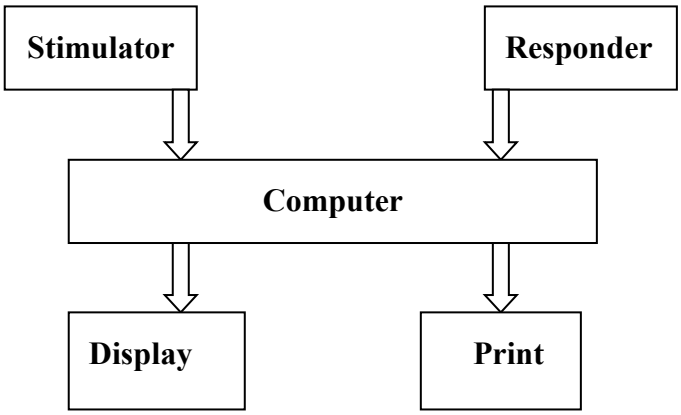
Printer

Responder

Serial Port Wire

Power wire

Structure Flowchart



4.2 Installation Environment

4.2.1 The instrument must be installed in the flat ground with no slope;

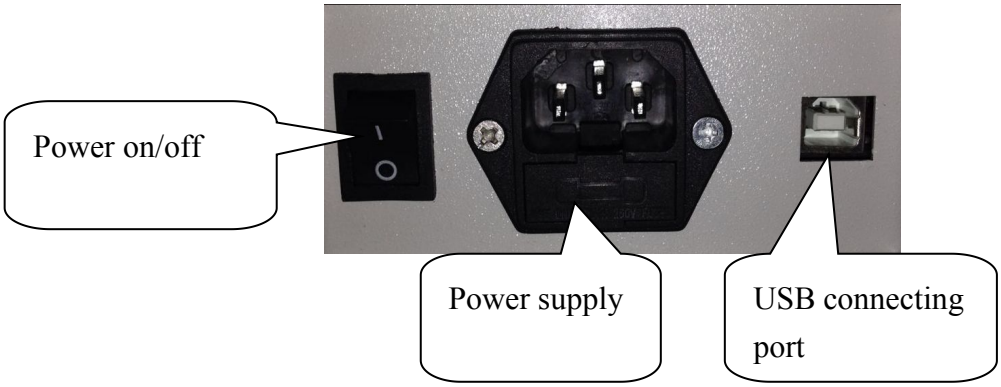
4.2.2 The instrument must be installed in the clean, quiet and dry room;

4.2.3 The instrument must be installed in the dark room where nothing can be seen within one meter.

4.2.4 The instrument must be installed with special ground wire;

4.3 Hardware Setup

4.3.1 Connect Perimeter and Computer with the new USB Serial Port Wires we provide.



4.3.2 Connect the Power of the Perimeter.

4.3.3 Take out the fixed foam inside the Perimeter. Fix the Responder into the connector.

4.4 Software Setup

4.4.1 Windows System Requirements

English/ Simplified Chinese Version Window XP 32 bit Professional

English/ Simplified Chinese Version Windows 7 32bit/ 64bit Professional

English/ Simplified Chinese Version Windows 7 32bit/ 64bit Ultimate

or English/ Simplified Chinese Version Windows 8 32bit/64bit Professional

PS: Our perimeter software only support English/ Simplified Chinese Version Windows system, if user running others language Windows system, there will be unreadable code showed during install procedure and on software, or other unpredictable error will be occur. Please use relevant system we recommended.

4.4.2 Hardware Requirements

Before you install PERIMETER V-2.0, make sure your computer meets the following minimum requirements:

***CPU**

Mainboard: Intel chipset

Processor：≥1.7Ghz

multicore：Dual core，4 threaded.

*** Memory minimum：**≥2GB

*** Hard disk**

Rotational Speed：≥7200 RPM (Solid-state drives without this parameter）

Caching：≥2MB

Space：≥500GB

***Display**

Supporting 1440 * 900 resolution or greater，1440 * 900 recommended.

Perimeter software show normally on resolution of：1440*900，1600*900，1920*1080.

*** USB 2.0 Port**

▲Make sure there are at least 2 partition “C:” and “D:” existing in the hard disk, Otherwise the software will run error. Software will go wrong;

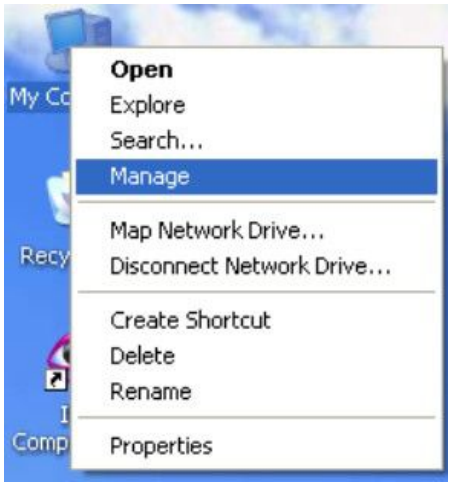
▲Make sure there is at least 5GB free space for data storage in partition “D”, otherwise the software will go wrong.

4.4.3 After you install the computer system software, Insert install disk we provided into CD-ROM and copy all the files we provide to your computer’s “D” partition, After the installation, **please Do keep the disc well !**

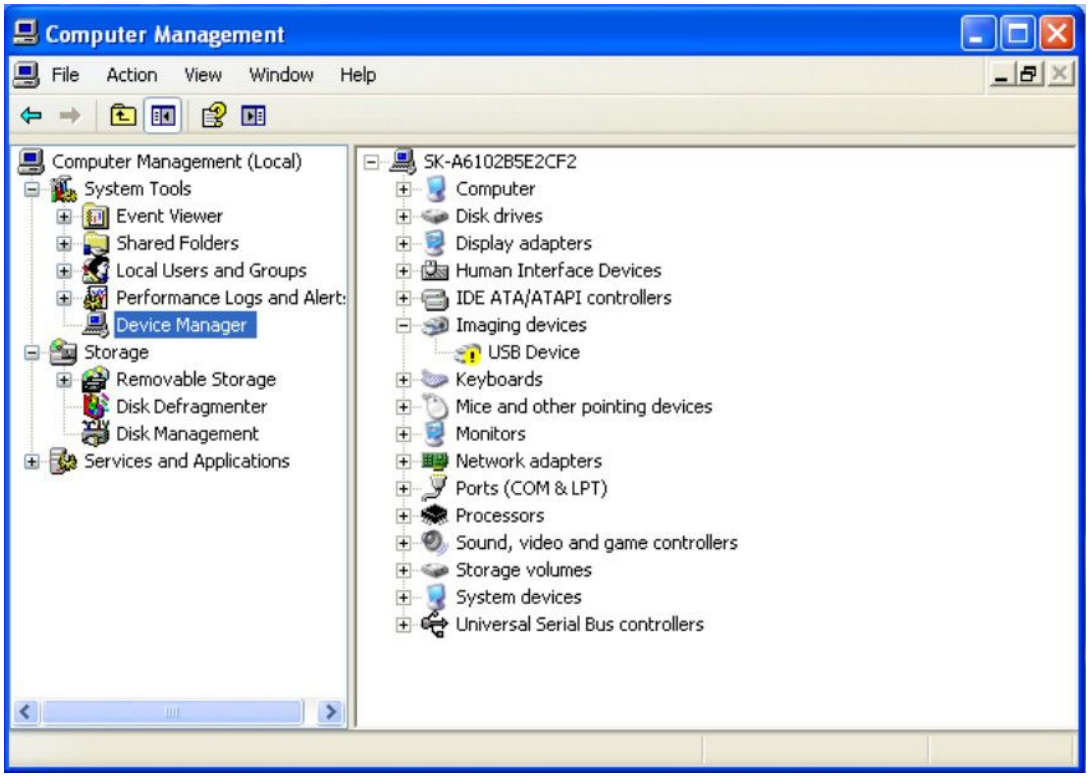
4.4.4 Software installation procedure

4.4.4.1 Install USB capture card driver for computer

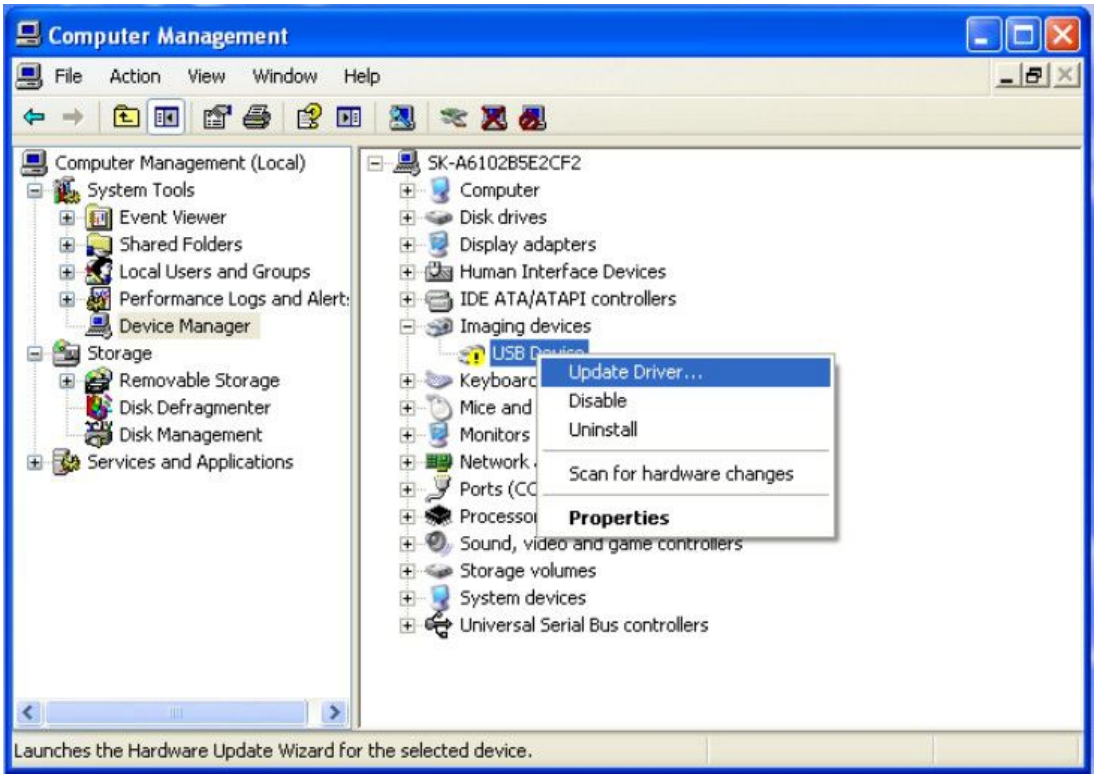
A:If you run **Win XP system**,please install the capture card driver as followed steps:
(1) Right click at [My computer],select [Manage] and enter in [Computer Management]



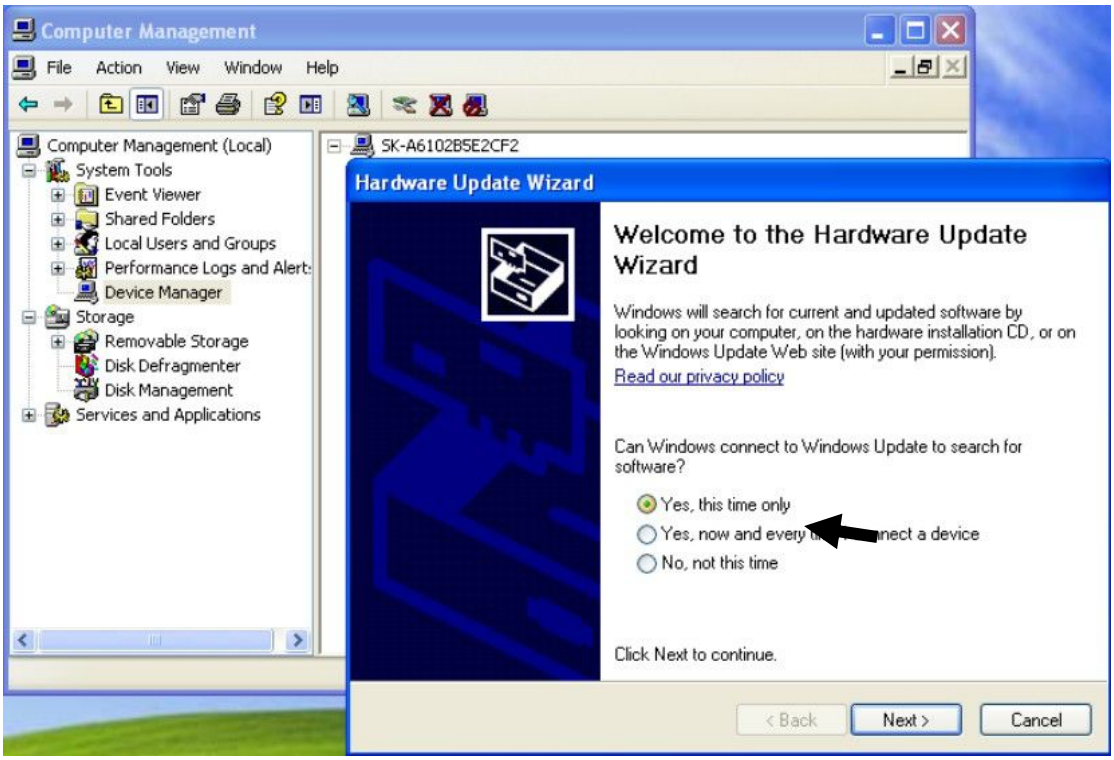
(2) Click at [Computer Management], And select [Imaging devices] in the right window.



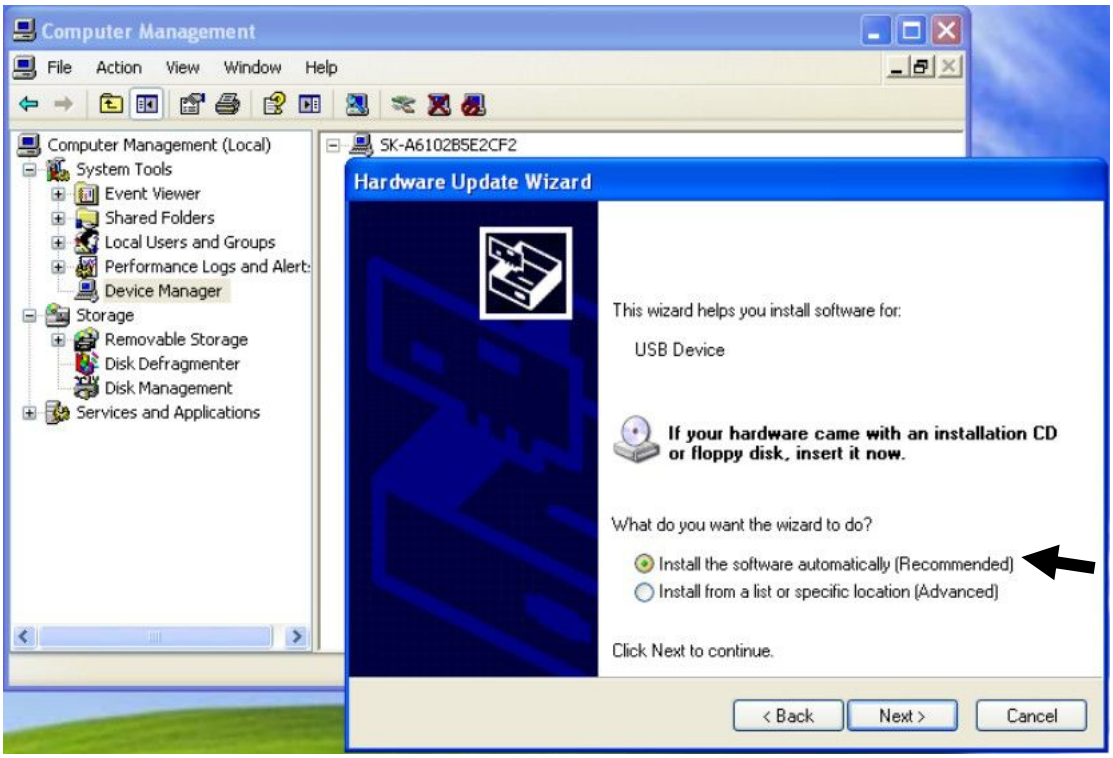
(3) Right click at [USB Driver] and Click at“Update Driver”as followed pic.



(4) A window will pop-up,select [Yes this time only],and continue by clicking [Next].



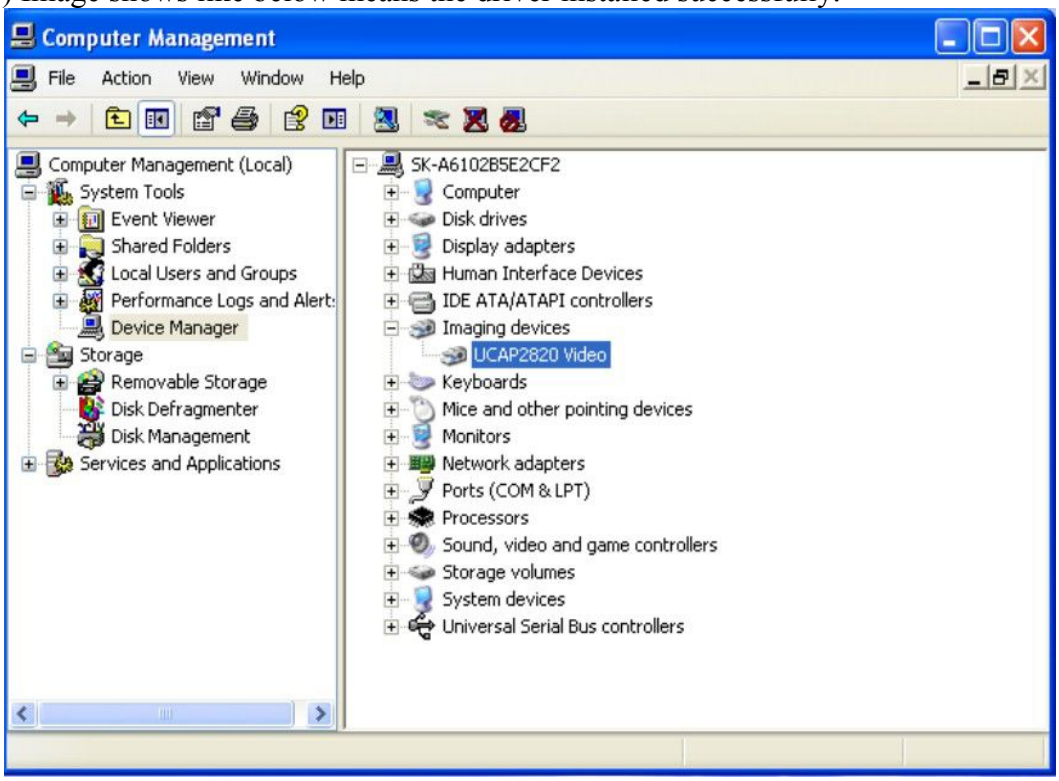
(5) A window [Hardware Update Wizard] will pop-up,select {Install the software automatically [Recommended]},then click [Next]



(6) A window pop-up like bellow,select [Continue Anyway]

(7) Click [Finish] to end the installation

(8) Image shows like below means the driver installed successfully.



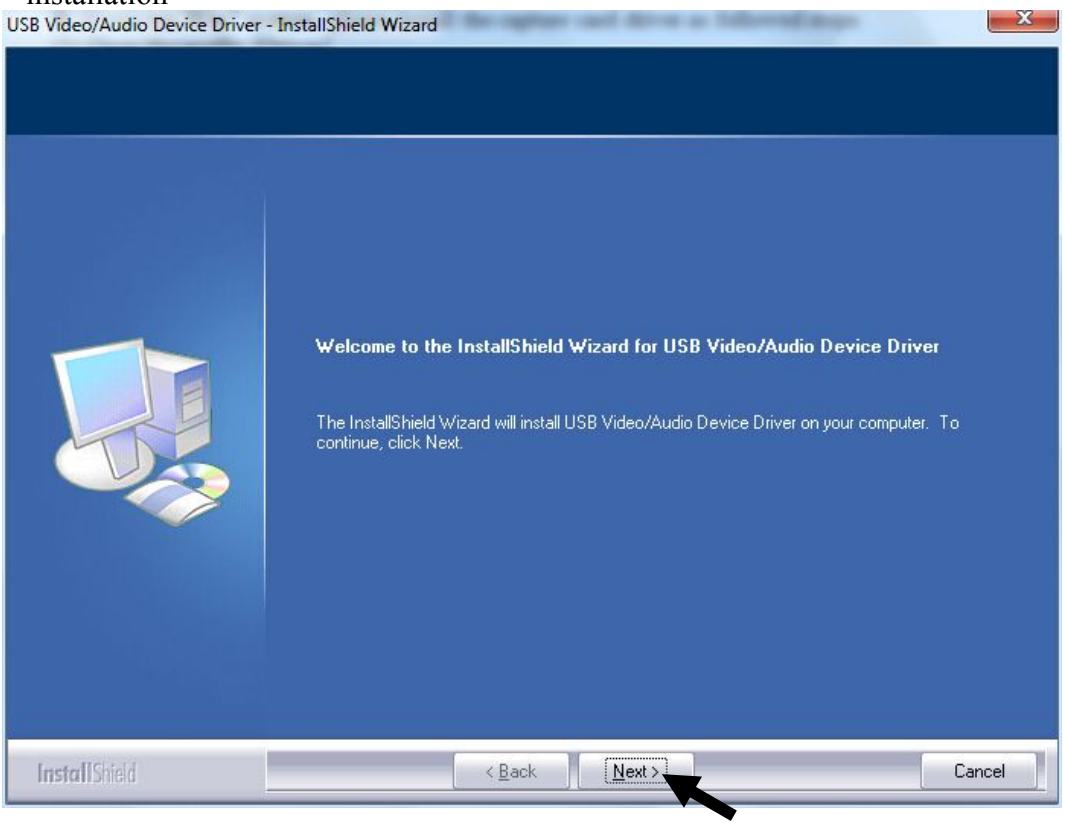
B: If you run **Win7 system**, please install the capture card driver as followed steps:

(1) Open the profile [Driver]

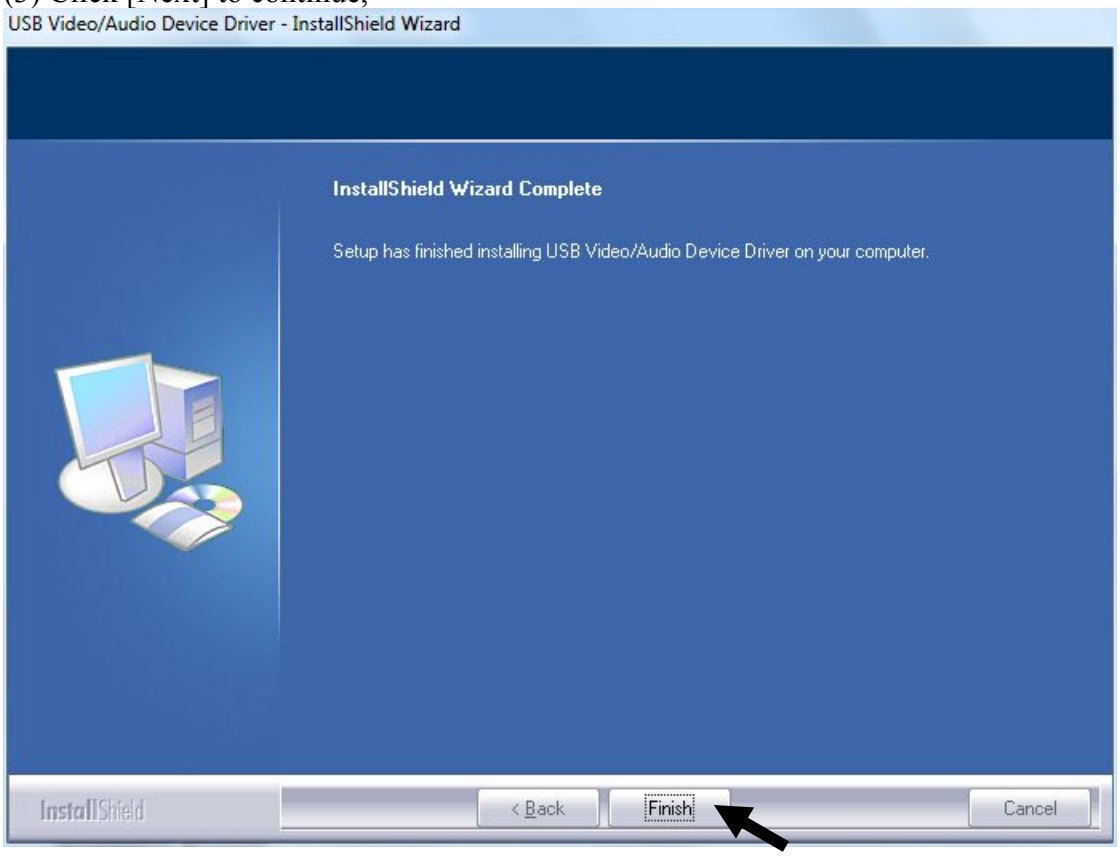
(2) Double click at profile 

to open it and double click at 

to start installation

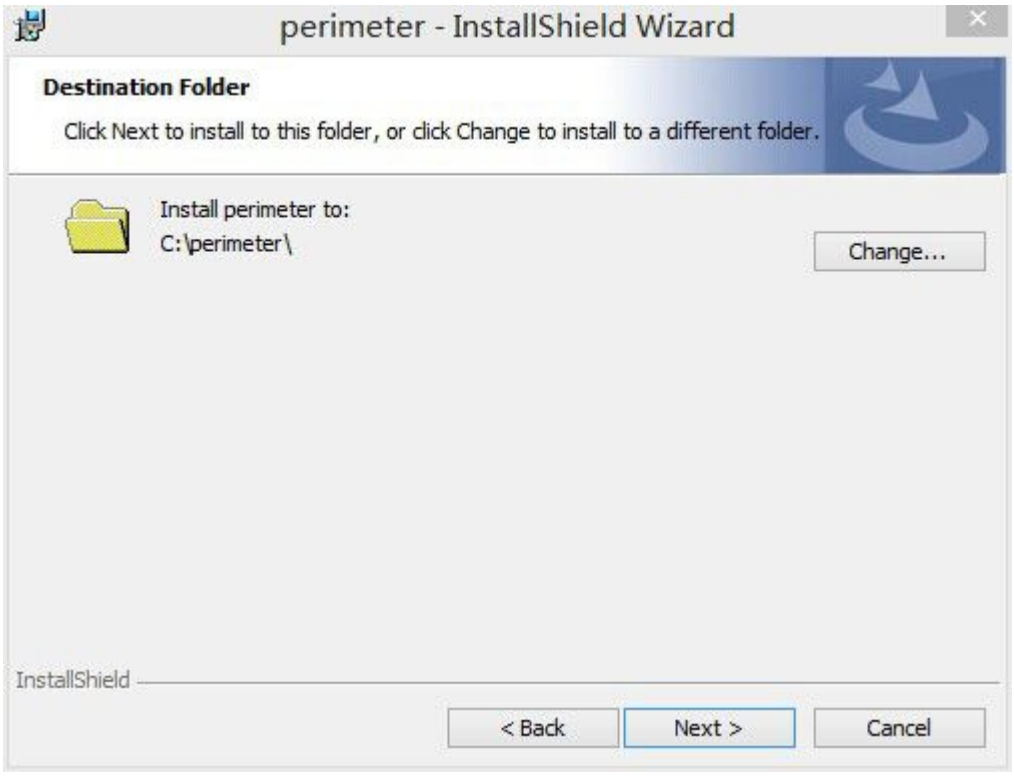


(3) Click [Next] to continue,

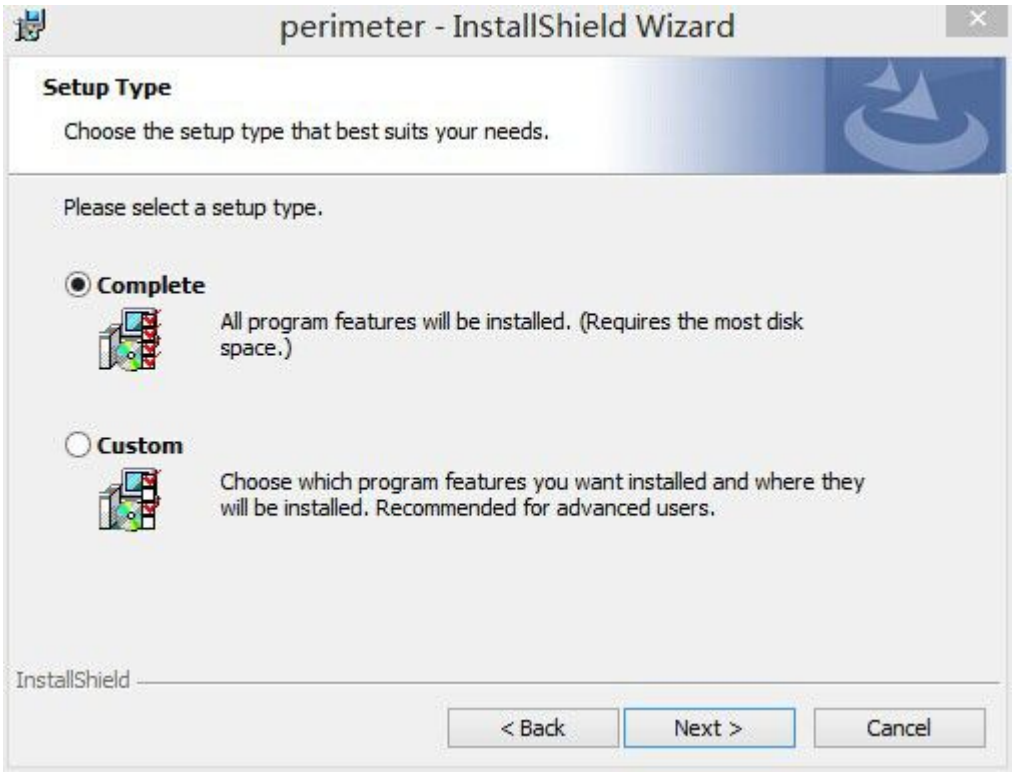


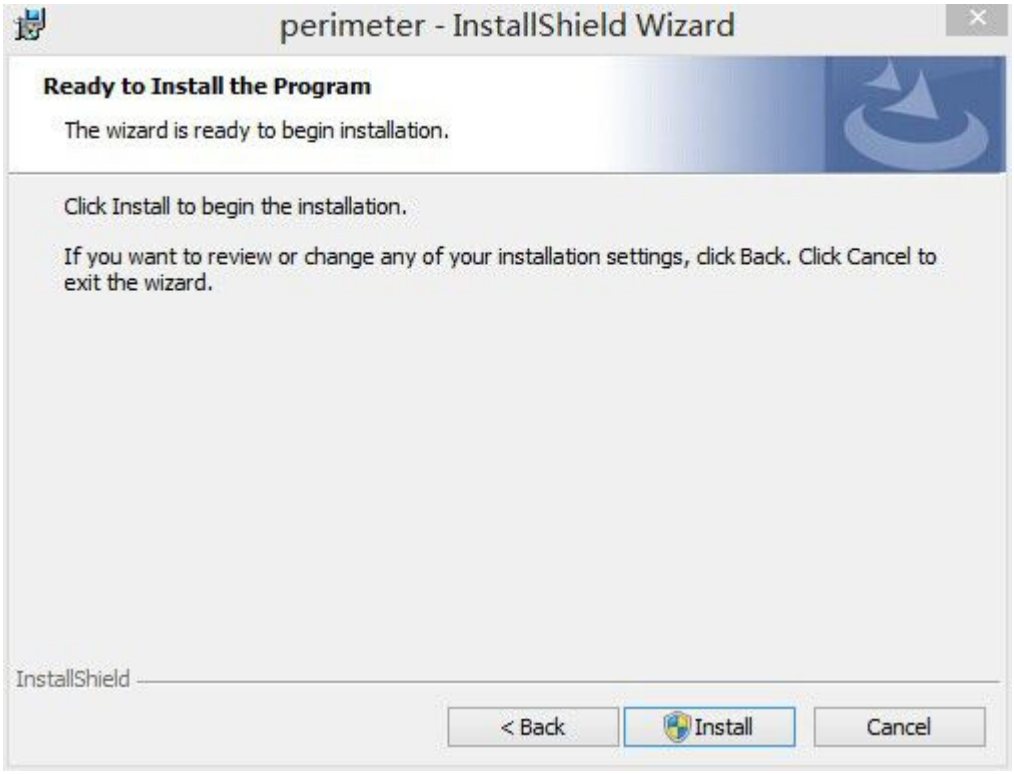
(4).Click [Finish] icon, restart the computer.

4.4.4.2 Open the file and double click on icon  to start the installation process.



Relocate the file path, recommend Disc D:/ for patient data security.




perimeter - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel


perimeter - InstallShield Wizard
InstallShield Wizard Completed
The InstallShield Wizard has successfully installed perimeter. Click Finish to exit the wizard.
< Back
Finish
Cancel

5. Function of the Software

5.1 Main Function of the Software

5.1.1 Visual Checking

The main functions of this module are for: visual checking, statistic analysis of the checking result, storing the data and printing;

5.2.2 File Management

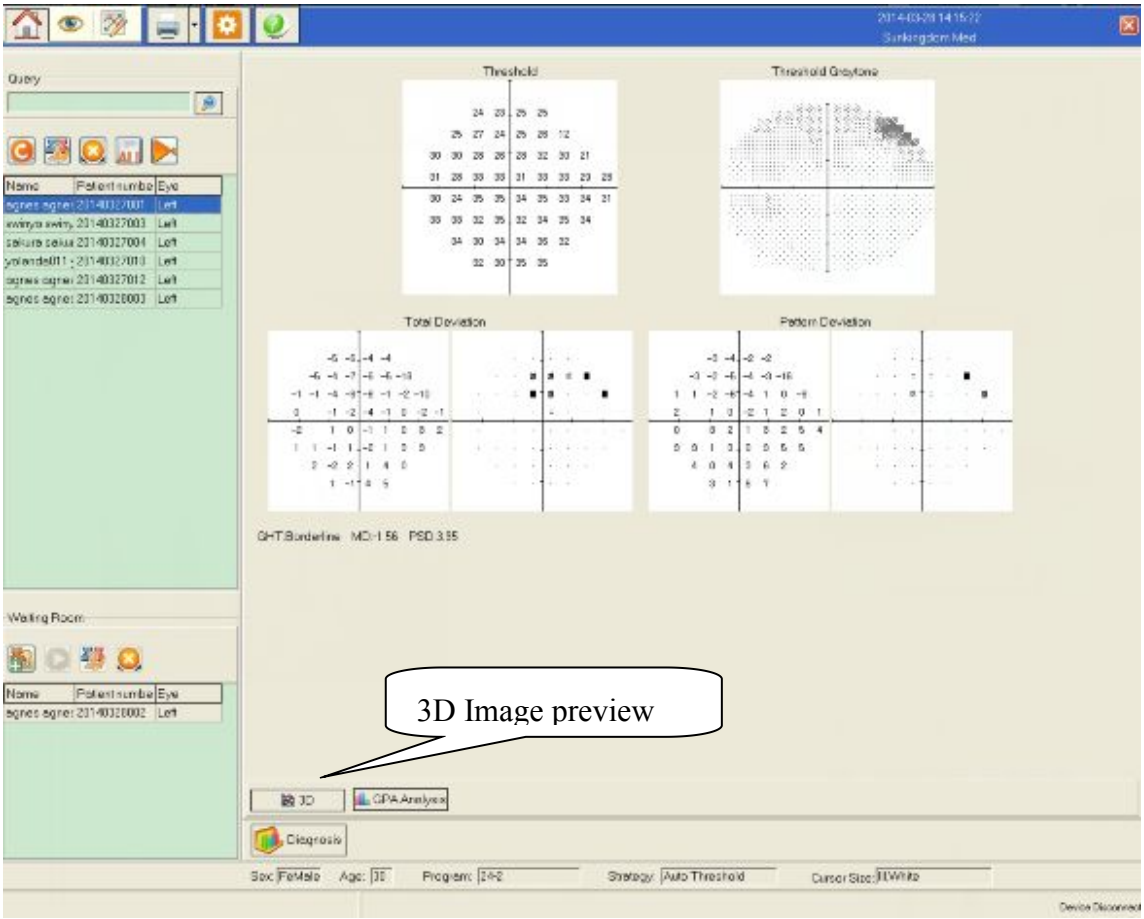
The main functions are: file searching, report comparison and printing, document deleting;

5.2 Introduction of the Operation System

Click the “ 

” twice continuously on desktop to start the software， it will enter the software directly

There are five interface of EPR-1800 software.

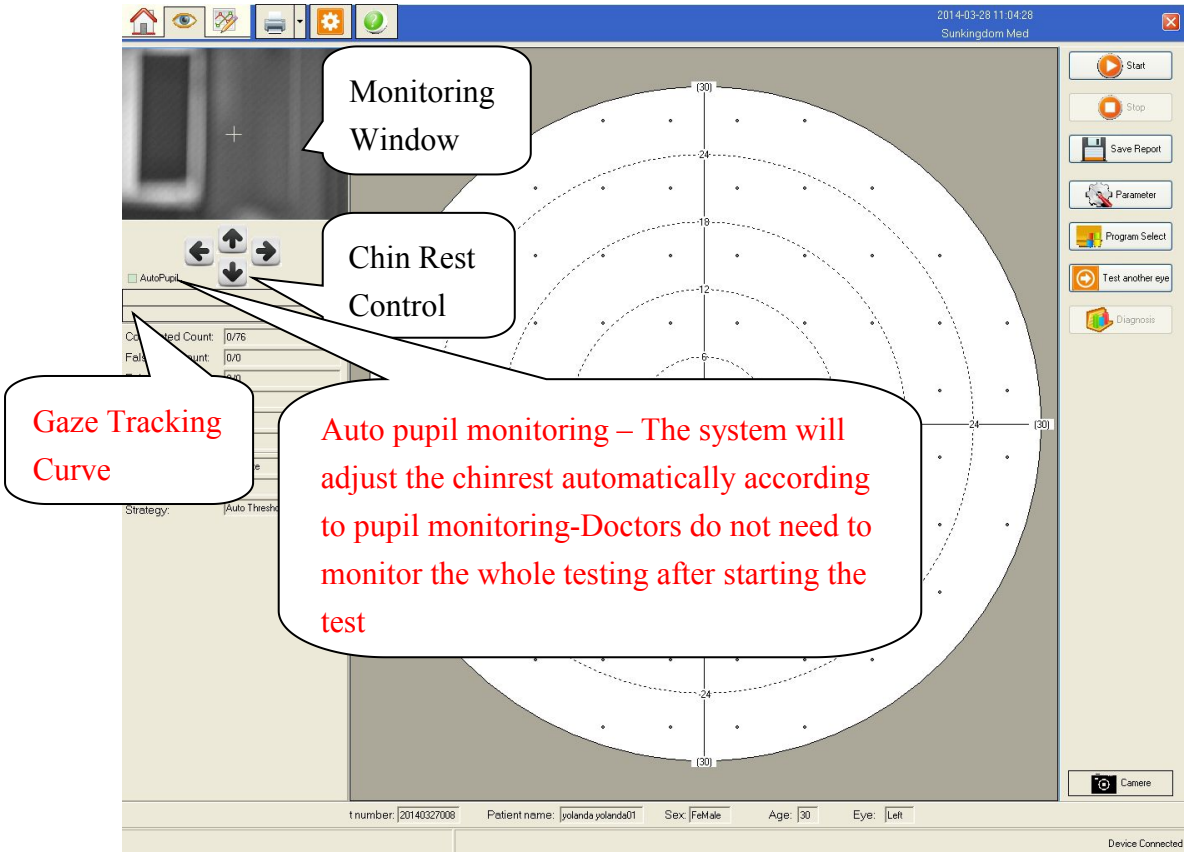


Home interface

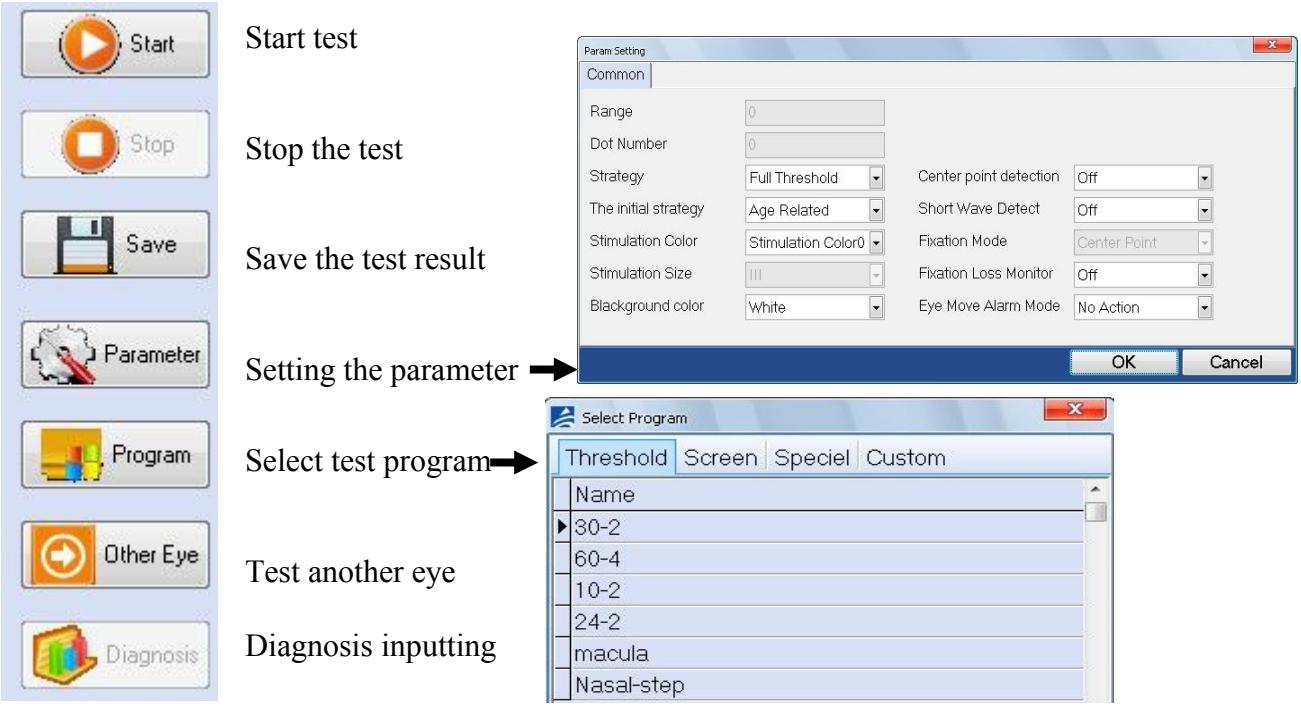

Interface Bar: Back to Home interface, Back to Examination interface, User-define test interface, Printing, System setting and About us


Patient info area: Recheck (the same eye of same patient) , Edit, Delete(Selected patient data), All patient list, Last record

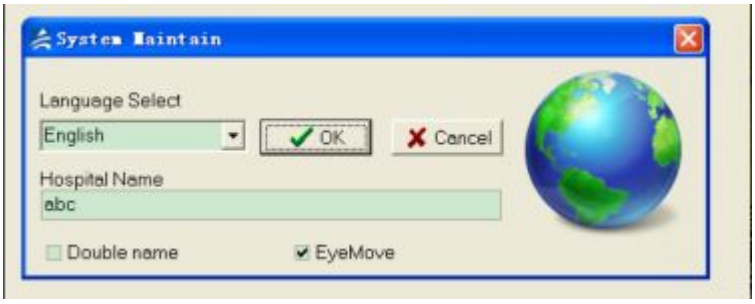

Waiting area: Register new patient, Start check, Edit, Delete



Testing interface

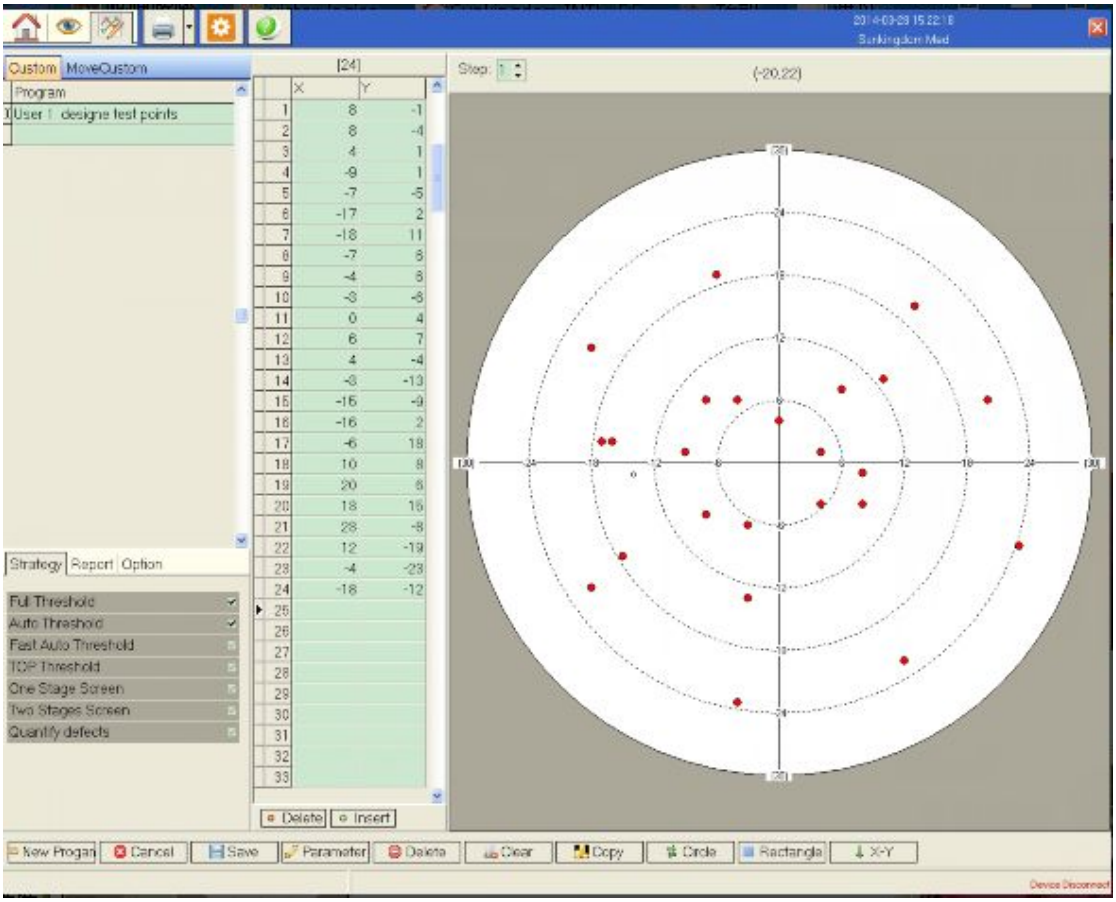


System setting interface



Double Name: For EU,USA and AUS etc market which need the first name and family name inputting.

Gaze Tracking/EyeMove: Tick on for activating the gaze tracking function which will generate gaze tracking curve and Auto pupil measurement function.

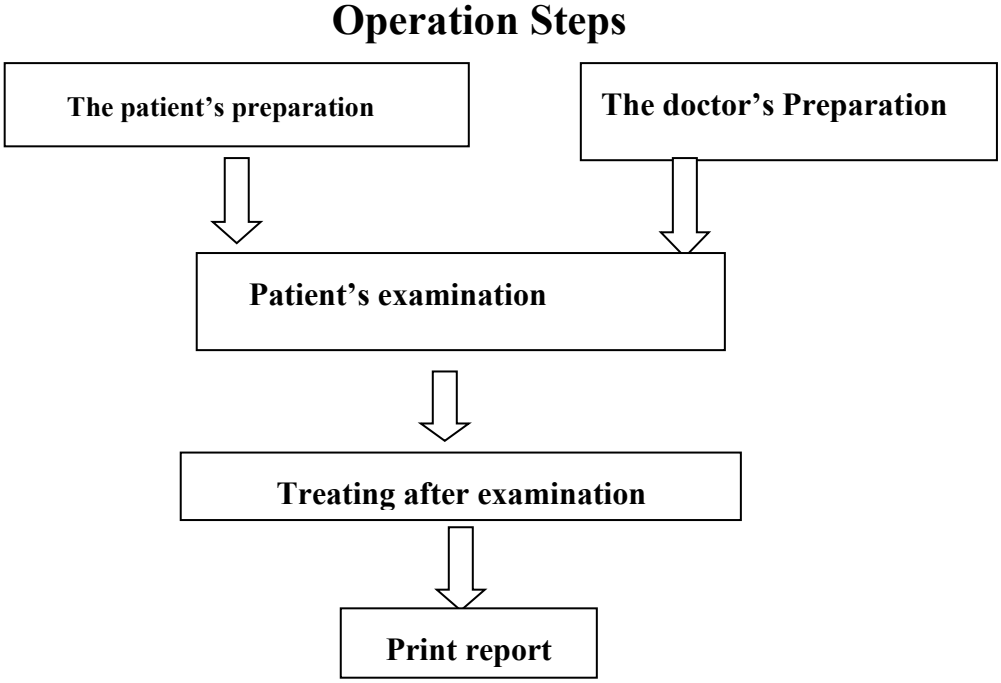


User-defined test interface

5.3 Several important programs and parameters of visual testing

First choose a Testing Program (threshold test, screen test, special, custom). Once the program is selected, go to the Parameter to choose a Strategy (full threshold, auto threshold, fast auto threshold) accordingly.

6. Operation Steps



6.1 Patient's Preparation

6.1.1 Perimeter examination should be done in the dark room, or the result is not precise;

6.1.2 Before examination, the patient should be relaxed and know the whole examination process

6.1.3 Automatic perimeter will adjust itself and control the testing stimulus light automatically according to the operator's requirement (Through the parameters setup);

Note: As most of the ophthalmic patients are old men whose comprehension may be not very good, we should tell them the whole examining process carefully before the examination so that they will not be nervous and in a state of a totally relaxation during the process of examination. Since the patient should stare at the fixing spot for a long time and another hand will also became nervous, they will be likely to feel fatigue. If this happened, the patient would not see things clearly, which may influence the examination result. So during the examination process, let the patient relax and tell them the right reaction. This is very important for a successful examination.

6.2 Doctor's Preparation

6.2.1 Power on the perimeter and Enter into the perimeter system as the way in **5.2**;

Notes:

After powering on the perimeter, it will take 3~4 minutes for a self-checking by running the stimulus lights automatically. This will guarantee the test accuracy. Do not treat it as an system error and do not enter into testing procedure while self-checking in processing, the system will not run correctly. Enter the testing only after self-checking finished.

6.2.2 Input the patient's information;

6.2.3 Operator should inform patient the examination process before the examination:

1) The patient should be familiar with the responder: demonstrate him the right way of responding, the way of clicking the responder, and make him relax as soon as possible.

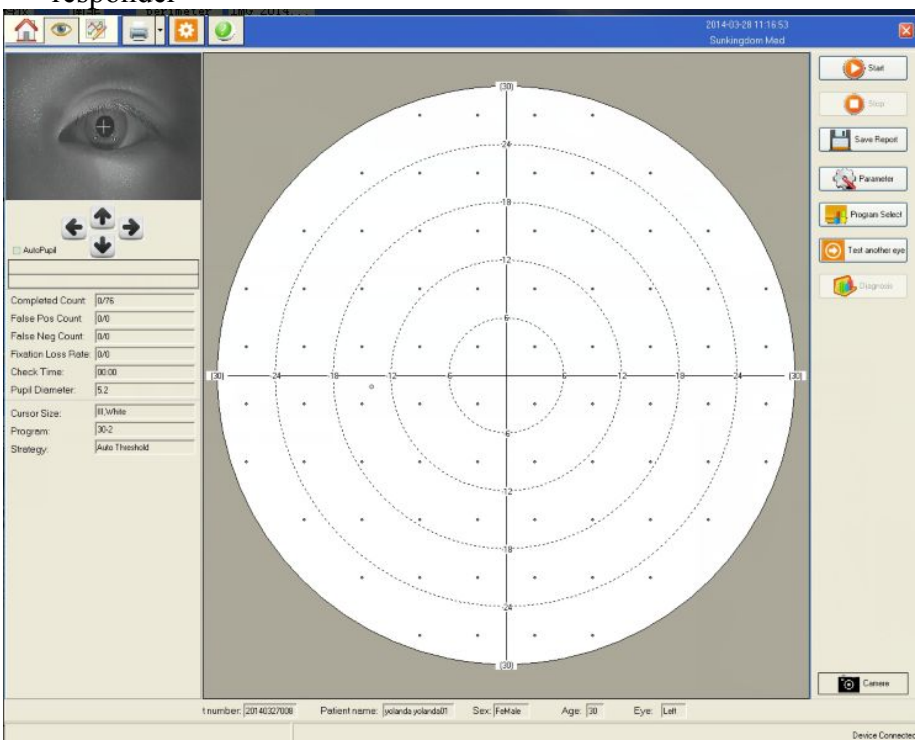
2) Demonstration him the fixing sight

3) Cover the patient's eye which will not be tested with an eye shroud.

4) Put the patient's jaw on the right side of the chin rest when examining the left eye; put the patient's jaw on the left of the chin rest when examining the right eye. If the patient testing Esterman binocular program, patient can either put their chin on left or right chinrest, but doctor need to adjust the cross in monitoring window aimed at center of patient's nose bridge.

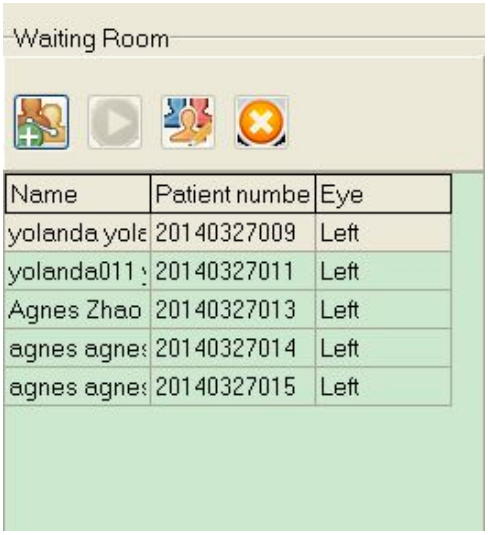
5) Put his forehead on the ribbon of the forehead bracket slightly.

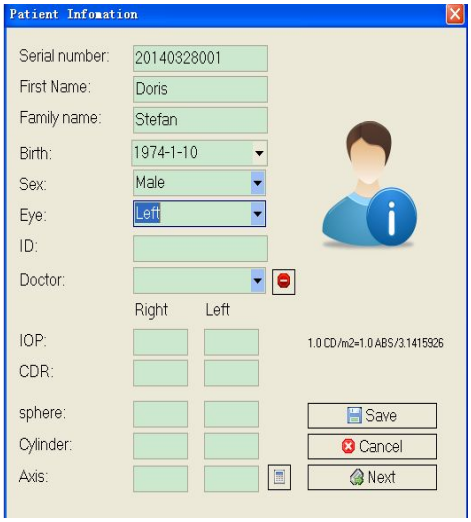
6) The eyeball shall stare at the center fixation light, and cannot move, only glance to perceive the stimulus light and respond to it by pressing the responder



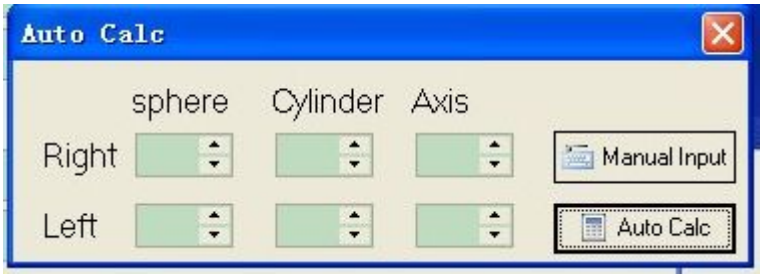
6.3 **Starting Checking**

6.3.1 Before you start the test, you should Click the Register[ ] icon on the main interface to setup the patient profile and input the info of patient, a patient profile will be saved automatically after you clicking [Save] .



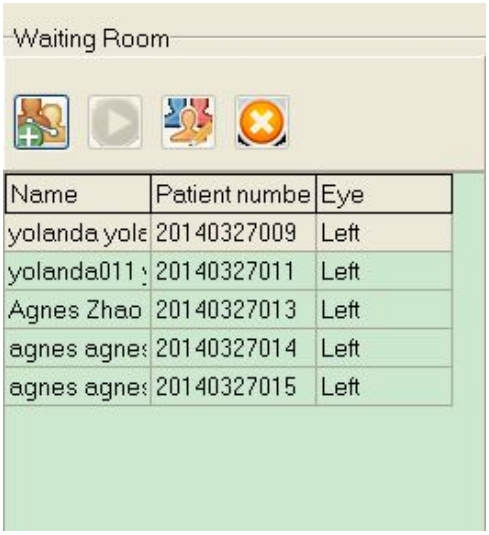


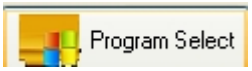
Patient with myopia, hyperopia and astigmatism will need to correct their diopter before starting the testing,our perimeter set trial lens holder for this function. Click on the icon of [ ] and putting patient's real refractive diopter, then click on the [Auto Calc] to get the corrected lens you need to put on perimeter trial lens holder.



For example, if we inputting -5.0D under Sphere of Right eye, click on Auto Calc, the system will generate the corrected lens need to adapt for patient is -1.75D. Doctor should test the patient with a -1.75D corrected lens.

6.3.2 After save patient data, you can find the patient record at [Waiting Room].

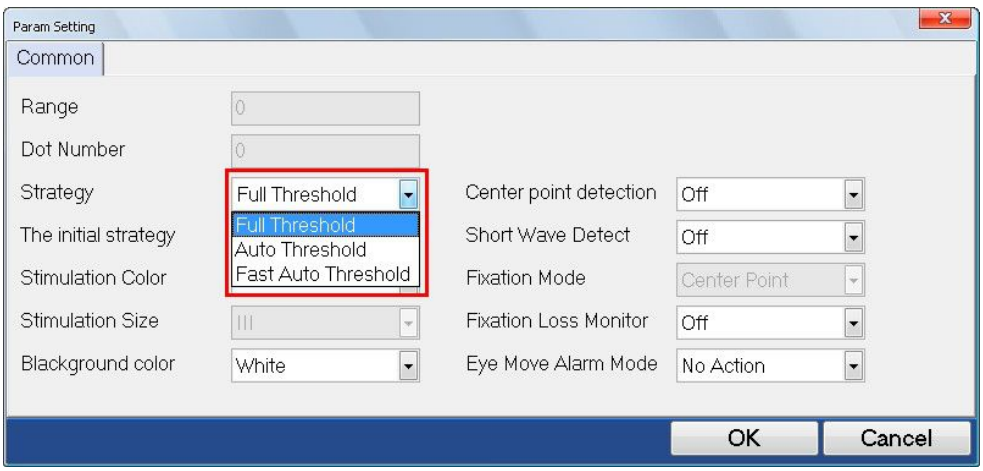


Click on the patient colume you wish to enter, and click on [] enter the testing interfaceThe default testing program is 30-2,and strategy is auto threshold, if you want to change to other program, click at the 

, select the program you want to use as following image.

Or, if you want to change the strategy, click at 

and choose as below



Notes: The program and strategy will automatically resume to default value once currently testing finished. System will not memory your last program and strategy setting. Operator need to proceed this process if default value needed to be

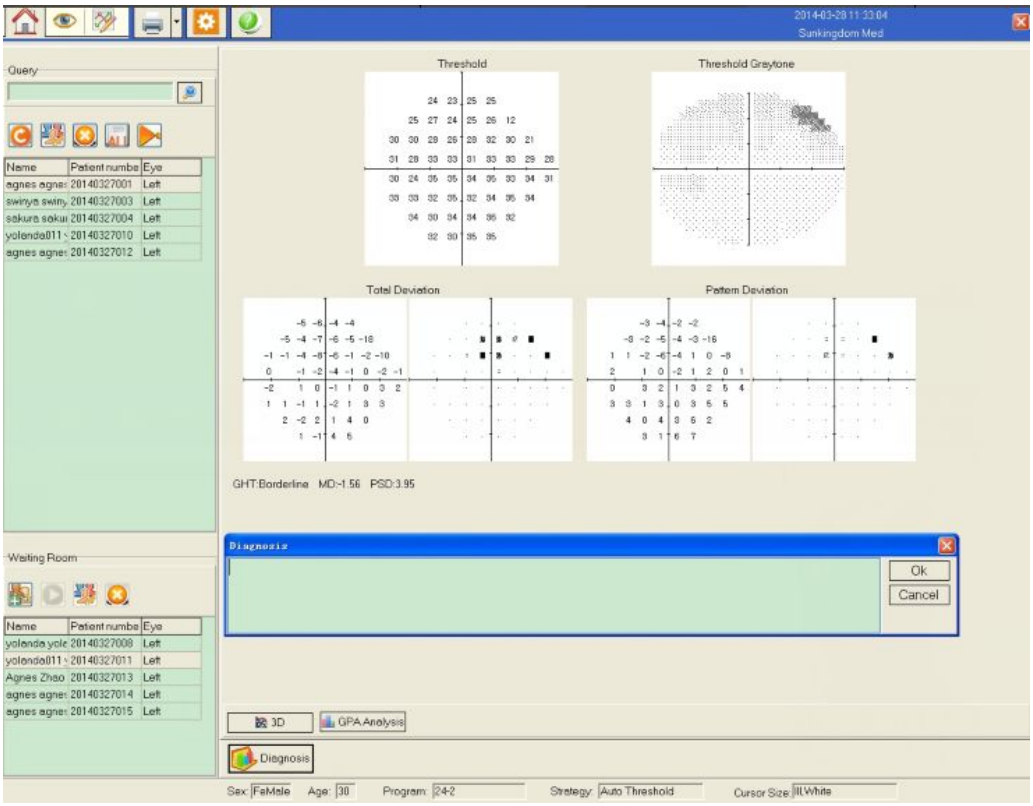
changed.

6.3.3 Then click 

to start testing. During the testing, doctor can use the function of [Auto Puil] monitoring so that do not need to monitor the whole process personally. The system will adjust the chinrest the headrest automatically.

6.3.4 After testing, you should save the test result by clicking at 

and then you can diagnosis.



6.3.3 Click at the  , choose the test report you need and preview. There are Single, 3in1, and Overview test report optional.

6.3.4 If your patient have come to you and test for several times, you should use the Overview report to see the progressing of patient.

For doing more than one test with a same patient, you should click  to proceed.

For GPA analysis, at least 3 reports of (24-2 or 30-2) of same client shall be generated before running this function.

6.3.5 Patient List

Through this section, you can delete a patient profile by clicking the icon of  ,and find/recall a patient profile by clicking the icon of  after you inputting the keywords

7. Maintenance

7.1 Common Problems

Breakdown	Cause	Treating methods
Can't start system or system doesn't work	Failed to setup USB device	Re-set USB device
	Voltage isn't enough or too high	Replace power
	Memory lost or damaged	Insert again or replace the computer memory card
	Infect virus	Use anti-virus software to scan virus
	Crashes while working or show that the program is wrong.	Open too many application programs, re-start the computer
	Hard disk is damaged	Replace the hard disk
Nothing in the screen when opening it	LCD monitor doesn't display any image	Properly connect the wire, switch on power
The responder does not work	Connection wire is damaged	Replace the Connection wire
	Pressing button is damaged	Replace the pressing key
	The controlling card in the stimulator does not work	Replace or maintain the controlling card

7.2 Maintenance

7.2.1 You should firstly turn on the power switch of the monitor and then turn on the power switch of the main frame when opening the machine. When closing it, you should firstly log out, and then turn off the power supply of the monitor and the main frame.

7.2.2 Scan disk and arrange pieces in a certain period.

7.2.3 Keep air clean, dry; use air-conditioner if possible

7.2.4 If the instrument has not been used for a long time, you should supply power for the main frame at intervals. (Usually three times a week, four hours one time)

7.2.5 If there is something wrong with the instrument, please contact us immediately

or ask the special maintainers to maintain.

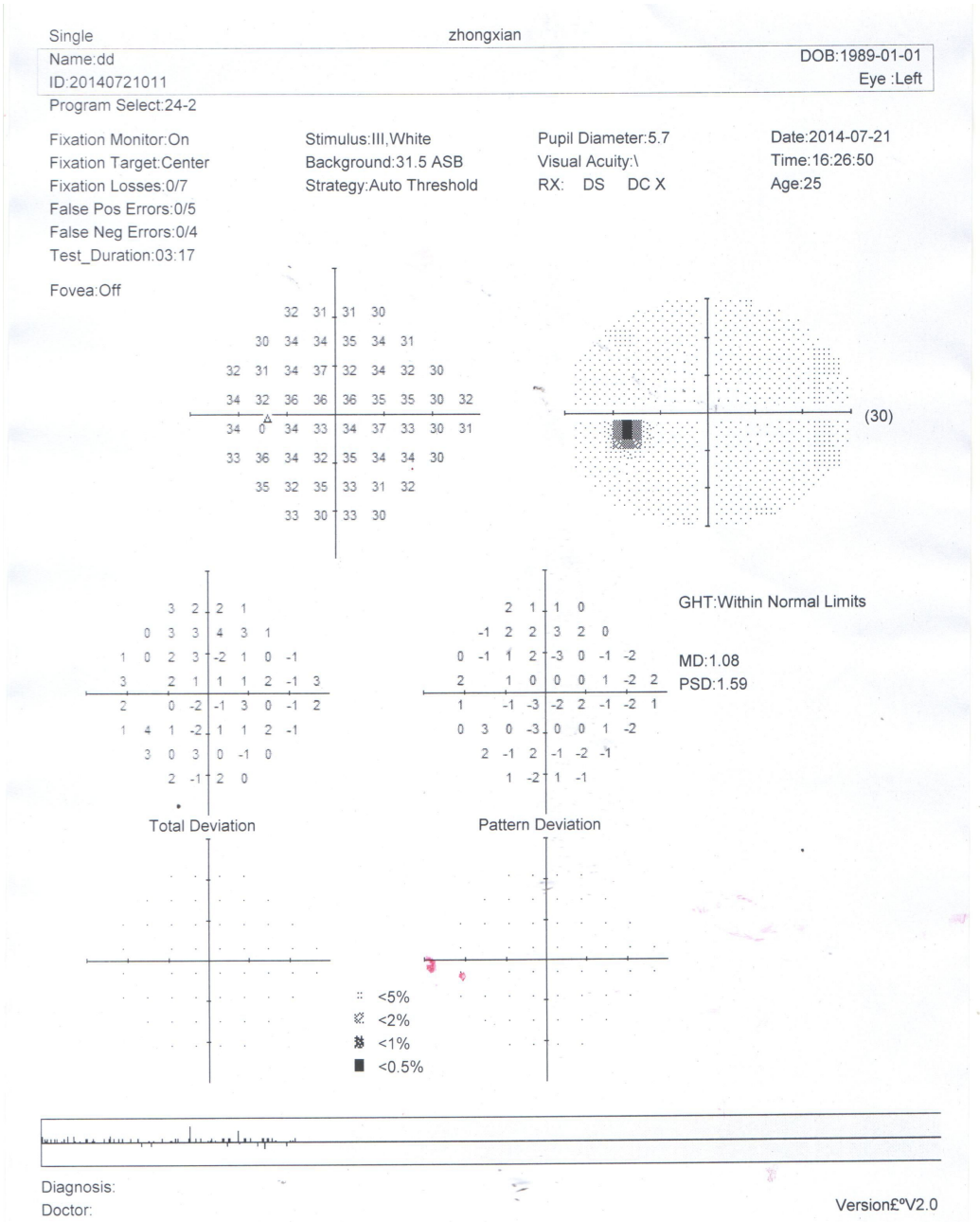
Notes: You should clean the chin rest before and after each time you use it.

7.3 Fusing Parts:

Model of fuse: φ5×20mm, T2A L250V

Replace the fuse: Screw off the cover of fuse, replace it with a new good fuse, then cover again (see the picture of the perimeter)

8. Interpretation of the report



1. False Negative Errors (False NEG Errors):

False Negative errors occur when the patient does not respond to a suprathreshold stimulus in an area where the threshold has already been measured. The interpretation of false-negative errors is not as clear as that of false-positive ones, because they can be produced by a variety of sources. Visual field test results of patients whose false negative errors exceed 33% are not considered reliable.

2. False Positive Errors (False POS Errors):

False positive errors occur if patients respond when no stimulus is presented. For the purposes of this study, we define a false positive response as randomly occurring, independent of stimulus presentation, and hence independent of any monitored response window. The system will count it and if it's over 20%, the test report will be treated as unreliable. . Visual field test results of patients whose false positive errors exceed 33% are not considered reliable.

3. Fixation Loss

Fixation losses occur when the patient's eye wanders from the fixation target. Visual field test results of patients whose fixation losses exceed 20% are not considered reliable.

4. Percentage(Expressed as Letter P)

 Less than 5 people within 100 people have this kind of visual situation

 Less than 2 people within 100 people have this kind of visual situation

 Less than 1 people within 100 people have this kind of visual situation

 Less than 0.5 people within 100 people have this kind of visual situation

5. Total deviation

The difference between a patient's threshold sensitivity and the age-corrected normal sensitivity from the perimeter's internal normative database at each tested location of the visual field.

6. Pattern deviation (PD)

The localized loss at each tested point, after the removal of the effects of any generalized loss; pattern deviation decibel (dB) values are the total deviation values minus the general value.

7.Pattern standard deviation (PSD)

It is a measurement of the degree which the shape of the patient's measured field or hill of vision departs from the "NORMAL" age-corrected reference field model. The value is expressed in decibels and any value of 2dB or greater will have a (P) value next to it indicating the significance of the deviation

8. Glaucoma Hemifield Test (GHT):

It is for automated evaluation of single static threshold visual field test results in glaucoma. It is also constructed to detect field loss that is symmetric around the horizontal meridian.

- Outside normal limits. The GHT is described as “outside normal limits” when differences between a matched pair of corresponding zones exceeds the difference found in 99% of the normal population, or when both members of a pair of zones are more abnormal than 99.5% of the individuals with the normative population.

- Borderline. The GHT is described as borderline when matched pairs of zones are abnormal at the 97th percentile within the normative database

- General reduction of sensitivity. Visual Fields (VF) are described to have generalized reduction of sensitivity when both conditions for “outside normal limits” are not met, and the best region of the VF is depressed to a level at the 99.5th percentile within individuals of the normative database.

- Abnormally high sensitivity. The GHT is described as having abnormally high sensitivity when the overall sensitivity in the affected region of the VF is better than 99.5% of individuals within the normative population.

- Within normal limits. VFs are described as being within normal limits when none of the above conditions are met.

9.Bebie Curves:

Bebie curves. Bebie, or cumulative defect, curves are useful in detecting diffuse depression of the visual field. The curve is a graphic ranking of the defect (the difference between the measured threshold and the age-corrected normal threshold) for each point in the visual field. The x axis represents the rank of the defect from smallest (left side) to largest (right side). The y axis represents the magnitude of the defect.

10.Mean Defects: (MD):

The average of the examination value of all spots minus normal value, it shows the condition of the patient's vision sensitivity comparing with those of the same age.

11. Short Floating (SF):

It shows the light sensitivity deviation appearing in one perimeter examination process; it shows the reaction consistency in the course of examining. The bigger the value is, the worse the cooperation the patient shows. The short wave will become height in the scope of abnormal visual field. When more scope in the visual field become abnormal or the degree of abnormal increases, the whole wave will become higher.

12.Decibel (dB)

In perimetry, the intensity of a stimulus expressed as 0.1 log-unit of attenuation of the maximal available stimulus; the higher the dB, the dimmer the stimulus intensity.

13.Fixation monitoring

Assessing the ability of the patient to maintain gaze by the experimenter's observation.

9.Introduction of test parameter

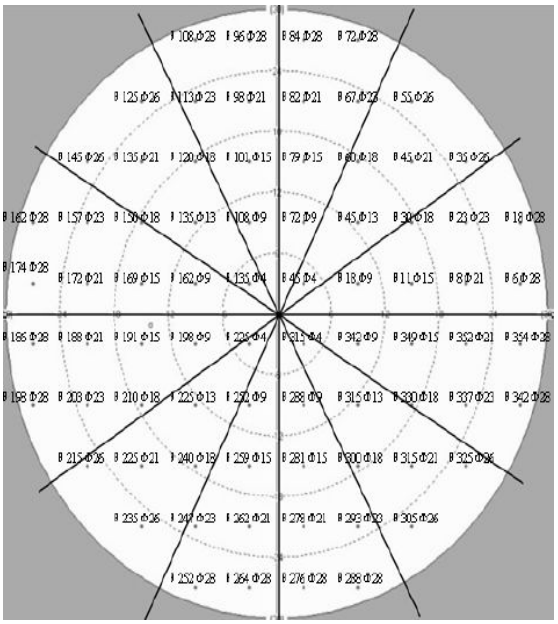
1. Threshold test program:

（1）30-2（recommend）

Main applications：Common test, glaucoma, optic nerve disease, retinal disease

Test Range：0°～30°

Test points：76 dots

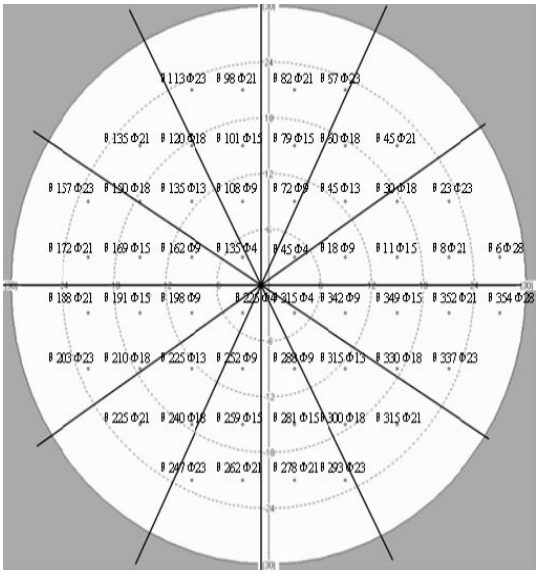


（2）24-2

Main applications：Common test, glaucoma, optic nerve disease

Test Range：0°～24°

Test points：54 dots

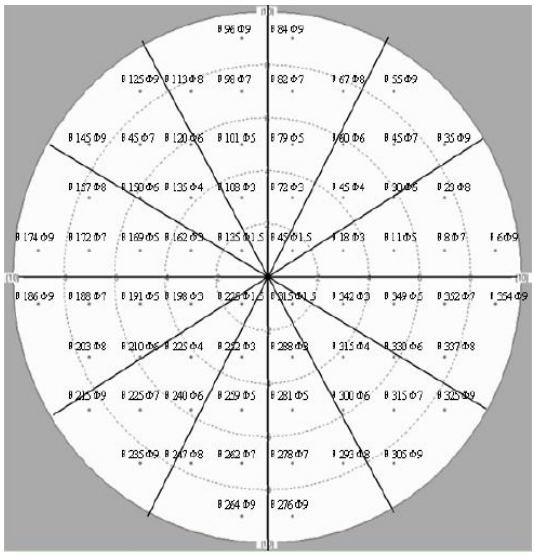


（3）10-2

Main applications：Macular disease, retinal disease, optic nerve disease, advanced glaucoma

Test Range：0°～10°

Test points：68 dots

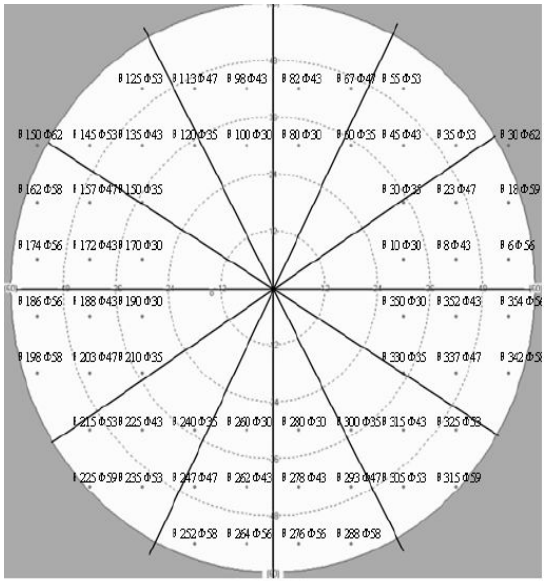


（4）60-4

Main applications：Retinal disease, glaucoma

Test Range：30°～60°

Test points：60 dots

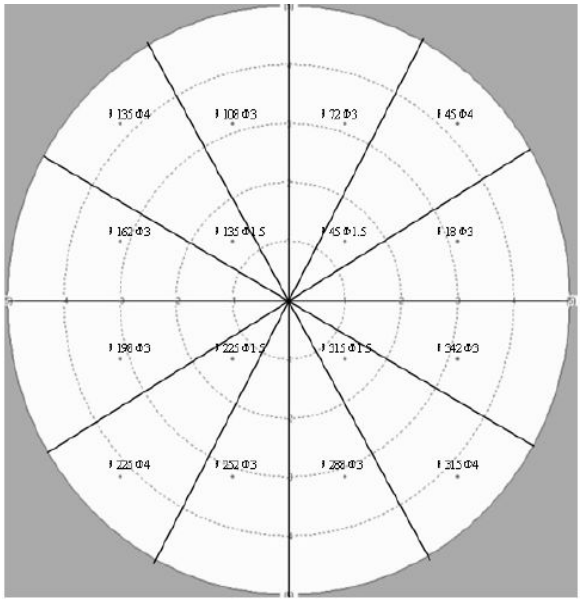


(5) Macula program:

Main applications：Macular disease

Test Range：0°～5°

Test points：16 dots

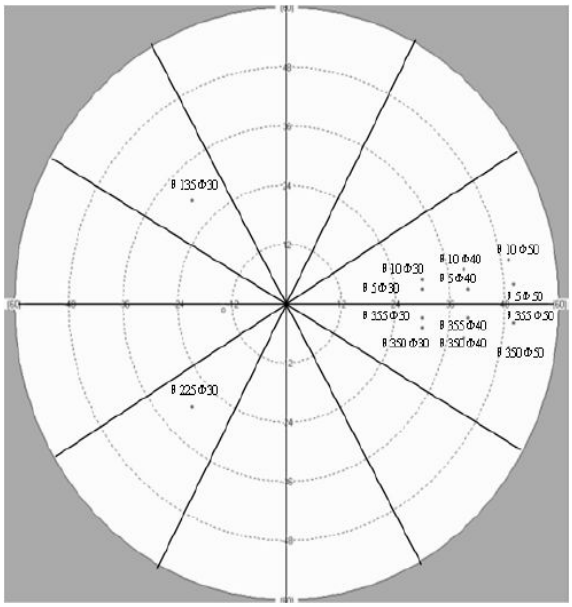


(6) Nasal step program：

Main applications：Glaucoma

Test Range：30°～50°

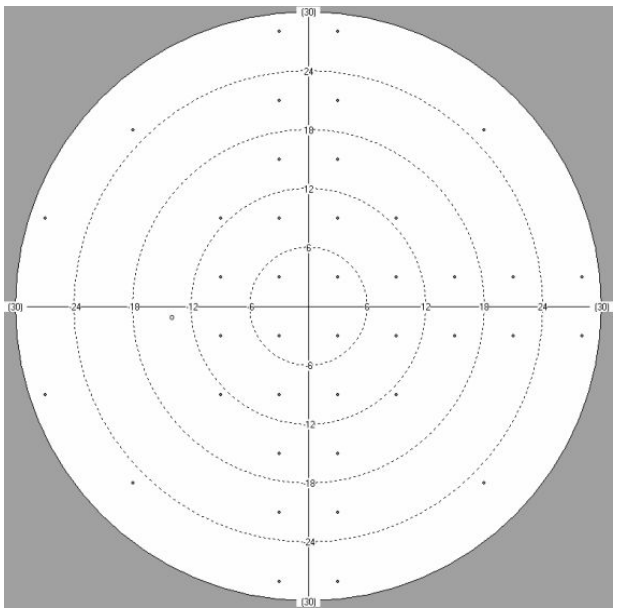
Test points：14 dots



2. Screening test program

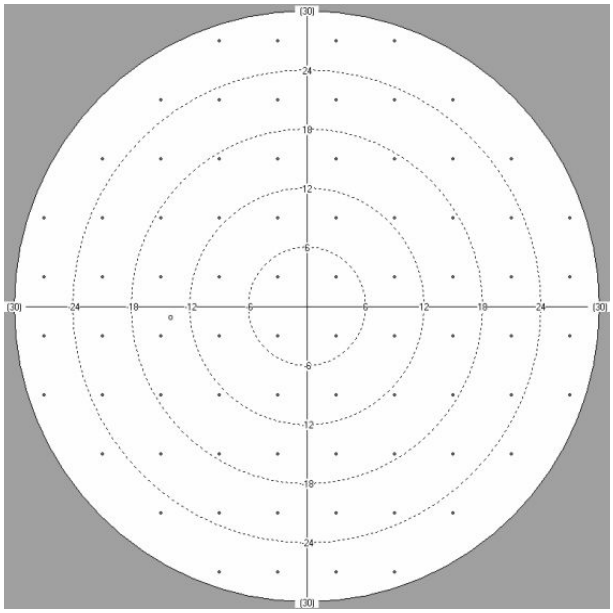
(1) C-40

Main applications：Common test
Test Range：0°～30°
Test points：40 dots



(2) C-76

Main applications：Common test, glaucoma, optic nerve disease
Test Range：0°～30°
Test points: 76 dots

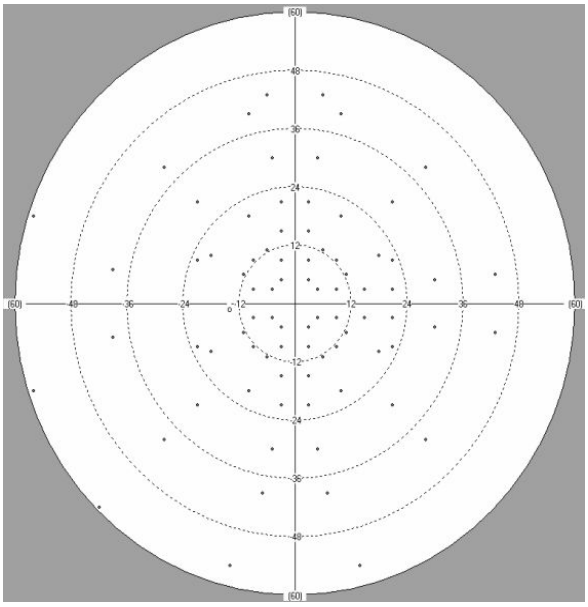


(3) FF-81

Main applications:Full-field screening test, retinal disease, glaucoma, optic nerve disease

Test Range：0°～60°

Test points：81 dots

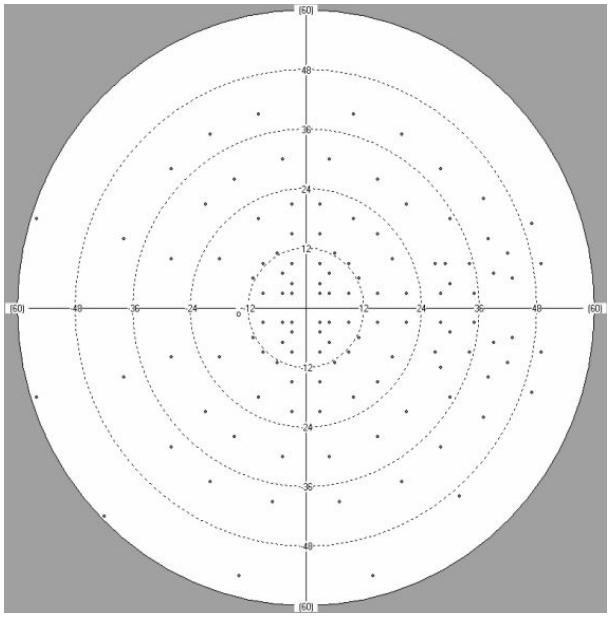


(4) FF-120

Main applications：Full-field screening test, retinal disease, glaucoma, optic nerve disease

Test Range：0°～60°

Test points：120 dots

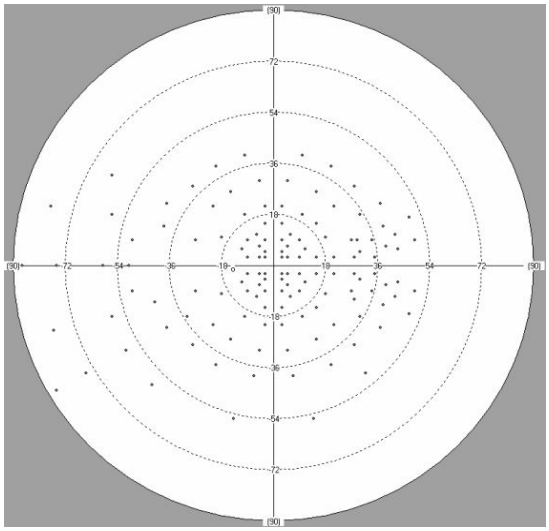


(5)FF-135

Main applications：Full-field screening test

Test Range：0°～55°，Temporal side 87°

Test points：135 dots



3. Specialty test program

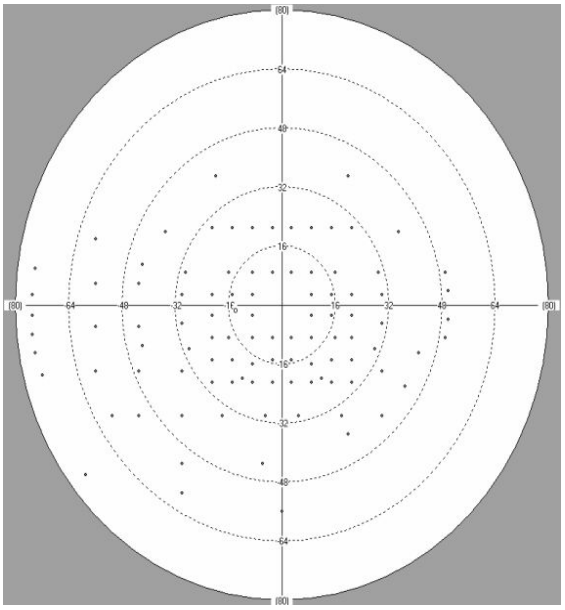
（1）Esterman monocular

Main applications：Driver test for single eye

Test Range：0°～60°，

Temporal side 75°

Test points：100 dots

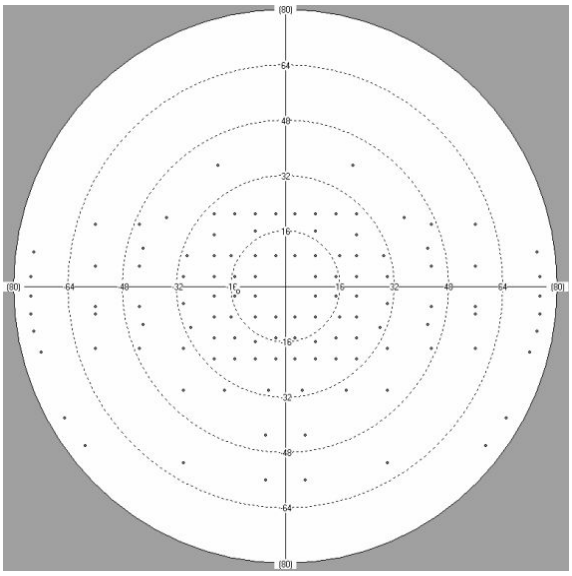


(2) Esterman binocular

Main applications：Driver test for double eyes

Test Range：Double temporal side 150°

Test points：120 dots



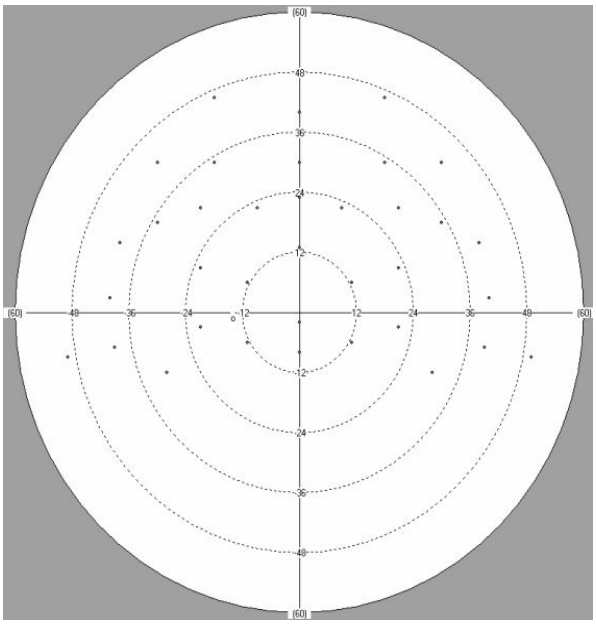
(3) Superior 36

Main applications：Screening upper visual field

Main applications：

upper visual field 60°

Test points：36 dots



10. Declarations

We can provide you with the information of those parts need maintained.

1. We will provide maintenance and enquiry free for one life.
2. We will maintain the machine for free for one year since the date of purchasing if the machine is operated according to the operation instruction.
3. During the maintenance, we will charge fee for the maintenance under the following conditions

- Do not use, maintain, store the instruments according to operation instruction;
- Take apart or amend the instruments without the permission of us, which cause damage;
- Damages is caused by accidents, use wrongly or caused by other major nature factors.
- Please forgive us for not informing you if the design or the assigned type changes.

PERIMETER

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