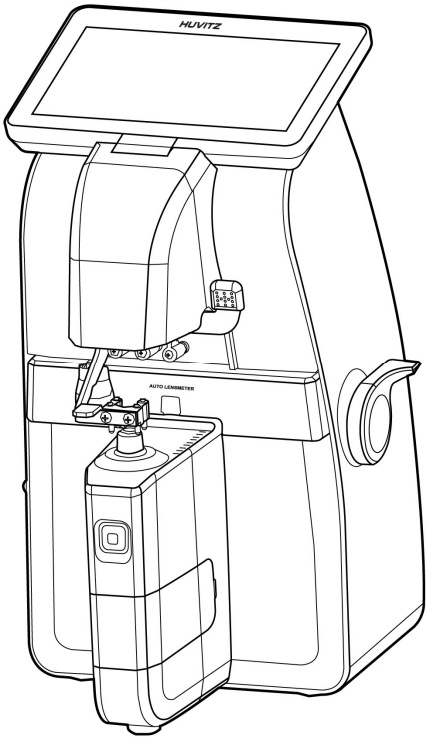
Operator's Manual

Auto Lensmeter HLM-9000



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Important Notice

Electronic wave from cellular phones, radio, remote controller and etc. can cause system malfunction on this product. Keep them away from the product.

We believe that the contents in this Operator's Manual were carefully examined and overall precise. However, Huvitz will not be held responsible for any potential errors or omissions caused from the use of information in this Operator's Manual.

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(HQ) 298-29 Gongdan-ro, Gunpo-si, Gyeonggi-do 435-862

Manufacturer: Huvitz Co., Ltd.

91-beongil 16-17(Hogye-dong), LS-ro, Dongan-gu, Anyang-si, Gyeonggi-do 431-848

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1. Introduction

1.1. Equipment Summary

Auto Lensmeter HLM-9000 is a machine to generate Sph, Cyl and Axis information of lens by measuring refraction of the lens. Auto Lensmeter HLM-9000 also has functions to measure PD (=pupillary distance) and UV, BLUE transmission. Auto Lensmeter HLM-9000can measure both unprocessed single lens and eyeglass lens with frames. Bi-focal lens or progressive lens can be examined using this equipment as well.

1.2. Class ifications

- Classification Under the Provision if 93/42/EEC (MDD): Class I
- Protection Against Electrical Shock: Class I
- Protection against harmful ingress of water: Ordinary, IPX0
- Pollution Degree : II
- Degree of safety in the presence of a flammable anesthetics mixture with air or with oxygen or with nitrous oxide: Not suitable for use in the presence of a flammable anesthetics mixture with air or with oxygen or with nitrous oxide.
- Mode of Operation: Continuous

2. Safety Information

2.1. Introduction

Safety is primary responsibility for all people. Safe use of this equipment is a concern for installer, user, operator and administrator. Any person shall be familiarized with the contents of this Operator's Manual before installing, using, cleaning, repairing or adjusting this equipment and its supplementary items. It is most advisable for user to fully understand all contents in this Operator's Manual, and operate safely on both patients and user. Thus, this chapter is dedicated to cautionary information and safety information. All users, operators and administrators shall be familiar to all information under "WARNING" and "CAUTION" in this Operator's Manual, and pay special attention to them.

⚠ WARNING

"Warning" signifies a danger that can cause severe personal injury, death or serious property damage if not careful.

NOTE

"Note" signifies important information about installation, operation or maintenance that can lead to a disaster when under negligence.

⚠ CAUTION

"Caution" signifies an association with disaster that can cause minor injury or property damage if not careful.

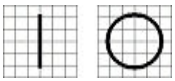
⚠ INFORMATION

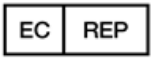
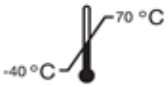
"Information" is to generate information needed on each page that is appropriate at the phase.

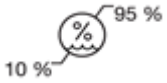
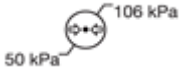
2.2. Safety Symbols

The International Electrotechnical Commission (IEC) has established a set of signs on medical electronic devices by classifying caution or association of electronic danger. These classifications and signs are as the following.

Signs that Calls for Caution

	I and O on power switch signify for connection and disconnection of power.
	This symbol signifies safety precaution. Users shall precisely understand the function of this symbol before using the product. The function is properly described on user or service instruction.
	European Conformity
 UL60601-1 CAN/CSA C22.2	MEDICAL EUIPMENT WITH RESPECT TO ELECTRIC SHOCK FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 2601-1, AND CAN/CSA C22.2 NO.601.1

	Consult instructions for use.
	Signifies year of production and producer.
	Manufacturer
	Authorized Representative in the European Community
	It signifies a safe earthing point where safe earth is fixated on sash. For safety, connect protective earth to conductive part of class I apparatus.
	Alternating Current
	Direct Current.
	Serial Number

	Humidity Limitation
	Atmospheric Pressure Limitation
	This side up
	Fragile , handle with care
	Do not use hand hooks
	Keep DRY
	Stacking Limit by Number
	Keep away from sunlight

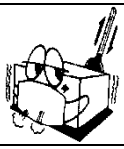
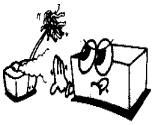
Huvitz	Huvitz Symol

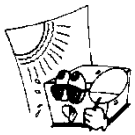
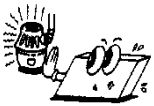
Other Sign

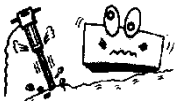
COM	External series connection port. User can transmit saved data to other equipment of Huvitz or other devices such as a PC.

2.3. Environmental Symbol

Avoid following environments for operation or storage of this equipment.

	A place where the equipment can be exposed to water. Do not operate the equipment with wet hand.
	A place with rapid temperature fluctuation. Optimal temperature is at 10°C ~ 40°C, and humidity at 50% ~ 80%.
	A place with extreme moisture. A place with ventilation issue.
	A place where the equipment can be exposed to chemical substances or flammable gas.

	A place where the equipment can be exposed to direct sunlight.
	A place nearby a heating apparatus.

	Do not disassemble the product. Huvitz will not be held responsible for any negligence regarding such action.
	Do not connect the AC power adapter before all parts are fully assembled. It can lead to a malfunction.
	A place where the equipment can be exposed to excessive pressure or vibration.
	Watch out for dust, especially metal pieces from entering the equipment.
	Always pull the power cord holding the plug and not the cord.

Avoid places with temperature lower than 10℃ or higher than 40℃ during normal operation. Avoid places with temperature lower than -5℃ or higher than 50℃ (14

°F-104°F) during transportation or storage. Humidity shall be maintained around 50%~80% during normal operation, transportation and storage. Avoid environments where the equipment can be exposed to excessive pressure or vibration.

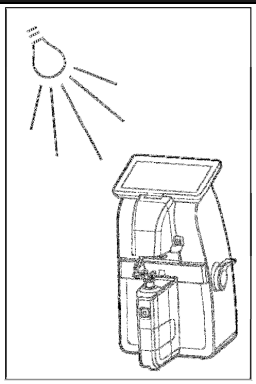
Assured temperature and humidity for equipment during operation or non-operation are as the following:

Operation: Linear decline at temperatures between +10°C ~ +31°C and 80% humidity, +31°C ~ +40°C and 50%.

Storage : Linear decline at temperatures between -5°C ~ +40°C and 90% humidity, and +40°C ~ +50°C and 30%.

NOTE

- Avoid installing the device on a place where it is exposed to direct sunlight or near the illumination.
In particular, ensure that the device is not illuminated by a spot light from the upper front.



- Before putting the device on a light-reflecting surface such as a glass showcase or a shiny table, put a cloth on it.
Reflected light such as illumination may adversely affect measurements.

2.4. Safety Precaution

This equipment was developed and inspected according to domestic and international safety standards. It guarantees a high safety grade for this equipment. Manufacturer is legally bound to provide users with a sufficient explanation on safety concerns of the equipment. Precise operation is necessary for safe operation. Thus, please read all instructions safely before operating the equipment. For more specific information, please inquire with our customer service department or authorized dealers.

1. This equipment shall not be used in places with danger of explosion or near flammable, explosive and/or volatile chemical substances such as alcohol and benzene.

2. Do not store or operate the equipment in humid places. Humidity shall be maintained at 50% ~ 80% during normal operation. Do not place the equipment in places where water can splash, drop or sprinkled. Do not place an object containing liquid or gas above the equipment.

3. This equipment shall be operated by or under supervision of a well-trained and capable person.

4. Repair of this equipment shall be handled by service personnel at Huvitz or a person with equivalent certification.

5. Customer's care over this equipment shall be done only according to the Operator's Manual and Service Instruction. Any other maintenance shall be done by service personnel at Huvitz or a person with equivalent certification.

6. Manufacturer shall be held responsible for safety, reliability and completion of this equipment when the following requirements are met: (1) Electrical installation in each room is in accordance with specifications in this instruction. (2) This equipment is used, operated and maintained according to this Instruction and Service Instruction.

7. Manufacturer will not be held responsible for damages by unauthorized alteration. Such alteration is a threat to customers' rights specified in warranty.

8. This equipment shall be used with supplementary articles provided by Huvitz. If a customer intends to use supplementary articles of other manufacturers, user safety of those articles shall be inspected and certified by Huvitz or manufacturers of those articles.

9. Only persons with appropriate training and education can be certified for capability to install, use, operate and maintain this equipment.

10. Please keep Operator's Manual and Service Instruction in an easily accessible place.

11. Do not apply excessive pressure on cable connection. If the cable does not connect, check to see if the plug is appropriate for socket. Damaged cable plug and socket shall be repaired by certified service technician.

12. Do not pull the cable. Always hold and pull plug when removing the cable.

13. This equipment can be used as other international purposes for general examination of lenses in accordance with this instruction.

14. Always conduct a visual examination of the equipment and inspection for proper functioning before operation.

15. Do not block the air grafting or holes.

16. Immediately turn off the power and remove plug when smoke, flame, unusual noise or smell is detected from the equipment.

17. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

A. Reorient or relocate the receiving device

B. Increase the separation between the equipment
C. Connect the equipment into an outlet on a circuit different from that to which the other device(s) are connected
D. Consult the manufacturer or field service technician for help

18. "External equipment intended for connection to signal input, signal output or other connectors, shall comply with relevant IEC standard (e.g., IEC 60950 for IT equipment and IEC 60601 series for medical electrical equipment). In addition, all such combinations - systems - shall comply with the standard IEC 60601-1-1, Safety requirements for medical electrical systems. Any person who connects external equipment to signal input, signal output or other connectors has formed at system and is therefore responsible for the system to comply with the requirements of IEC60601-1-1. If, in doubt, contact qualified technician or your local representative." (Or some cases, for example LCD Monitor, "This device is intended to connect to the medical device only, which complies with standards of IEC 60601 series.")

19. To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth

20. Do not position the equipment so that it is difficult to operate the disconnecting device (disconnecting device: power cord, appliance inlet, etc.)

⚠ CAUTION

For use of equipment in rated voltage less than 125Vac,minimum 6A,Type SJT or SVT , 18/3AWG,10A, max 3.0m long : One end with Hospital Grade Type, NEMA 5-15P Other end with appliance coupler. For use of equipment in rated voltage less than 250Vac,minimum 6A,Type SJT or SVT , 18/3AWG,10A, max 3.0m long : One end terminated with blade attachment plug(HAR) Type, NEMA 6-15P.

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provide with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

3. Feature

1. Quick and convenient measurement of refraction and center of a lens.

2. When measuring an eyeglass, single/both PD are measure automatically with refraction of each lens.

3. Measurement of UV and Blue transmission of a lens.

4. Wide range of measurement from –25D to +25D.

5. More precise measurement with unit as small as 0.01D.

6. Quick and convenient measurement of progressive multifocal lens and general multifocal lens.

7. Various and splendid screen through color LCD.

8. Provide customers with measurement results using printing function.

4. Instructions for Use

1. Do not hit or drop the equipment. Strong pressure might damage the equipment. Strong pressure can affect the function of the equipment. Thus, always handle with care.

2. Install the equipment in a stable place without vibration to maintain normal condition.

3. Direct sunlight or bright lighting can affect measurement results.

4. Consult with dealers before connecting this equipment to other gears.

5. Rapid heating in a cold place will cause water vapor condensation on optical parts and lens inside the equipment. In such cases, wait for condensed water vapor to disappear.

6. Always keep the equipment clean for precise results. Dust can cause a equipment failure. Always turn off the power and cover with dust cover after use.

7. Do not use organic matters such as thinner or benzene to wipe the equipment as they can affect the equipment. Use clean cloth or towel.

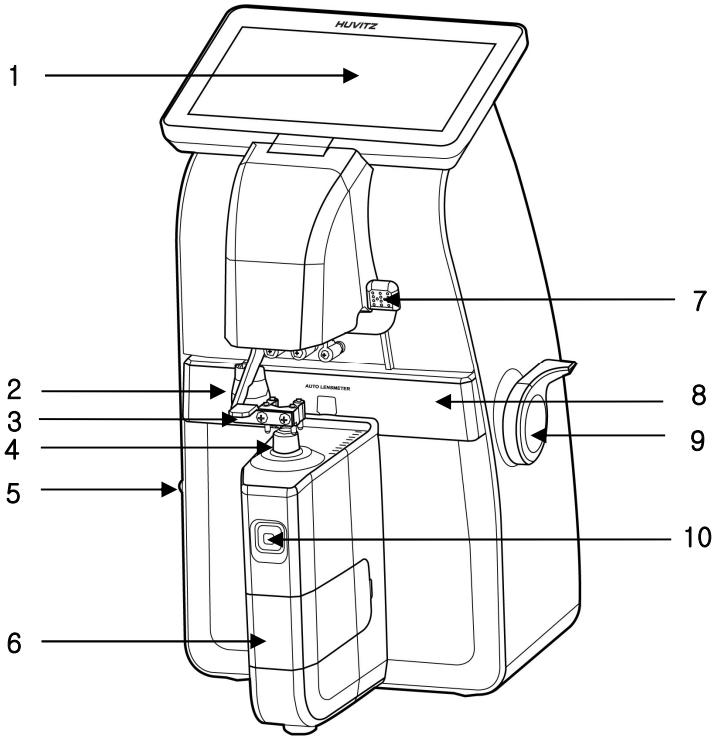
8. Use of improper battery might lead to an explosion. Always use batteries of proper standard.

9. Remove power plug and consult with a dealer when smoke, unusual smell or noise is detected during operation.

10. Do not turn off screen saver without any apparent reasons. This equipment protects its screen through screen saver.

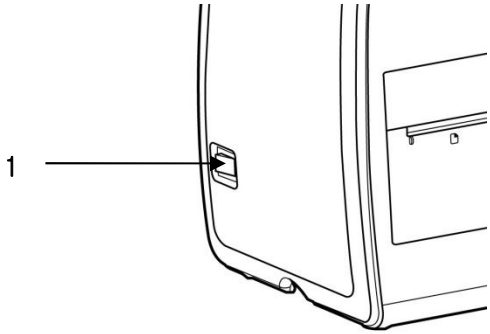
5. Composition

5.1. Main Parts

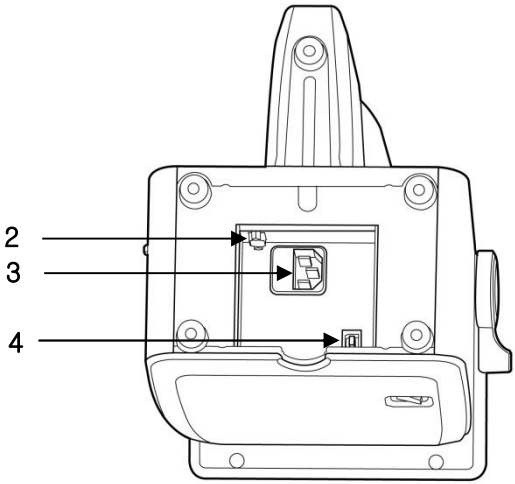


[Picture 5-1. Names of parts (I)]

1. Touch LCD Screen
2. PD Sensor
3. Lens Holder Lever
4. Lens Cap
5. Printer
6. UV, BLUE Cover
7. Marking Lever
8. Lens Table
9. Lens Table Lever
10. MEM Button (Save Button)



[Picture 5-2. Names of Parts (II)]



[Picture 5-3. Names of parts (III)]

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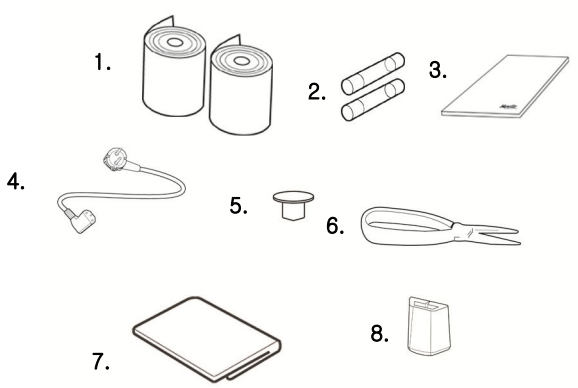
1. Power Switch
2. RS-232 Connector
3. Power Connector
3. USB Connector

5.2. Supplementary Articles

1. Printing Paper: 2 roll of paper for printing
2. Fuse (250V 3.15A): (2)
3. Operator's Manual: Operation guide for users
4. Power Cable (1.5m)
5. Dust Preventive Cap: a cap to prevent dust from entering (1)
6. Contact lens tweezer: a tool to pick up contact lenses
7. Dust Cover: a plastic cover to prevent dust from entering
8. Small PD rubber: to measure PD on eyeglass frames for children



[Picture 5-4. Supplementary articles]

6. Equipment Installation and Preparation

6.1. Parts Inspection

① Inspect supplementary articles.

Open the box and make sure all articles are there (printing paper, dust cover, lens towel, Operator's Manual and etc.).

② Remove protection tapes.

Remove protection tapes on lens holder, lens cap, marking lever and UV, Blue cover.

6.2. Start-up Test

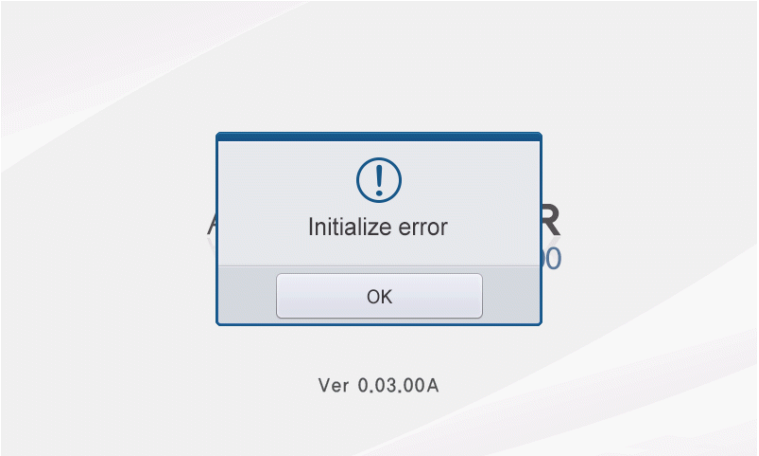
① Connect power cable.

Connect the cable to the power consent on the bottom parts of equipment to provide power.

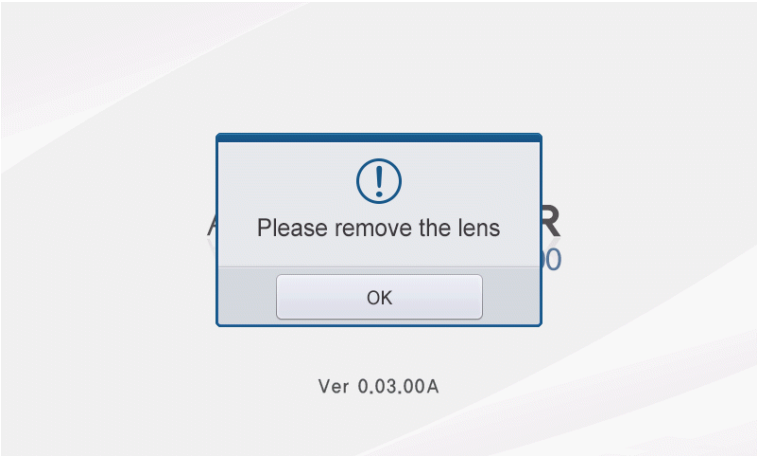
② Inspect initial state.

Make sure the equipment operates properly after turning on the power switch. While the equipment is starting up, check to see of there are not any objects placed on the lens cap. If a problem occurs during start up, LDC screen will display the message below:

When an error message appears as the below, check the lens cap or pinhole. Inspection process during start up is as the following:



[Picture 6-1. Screen showing an initialize error]



[Picture 6-2. Screen showing an initialize error]

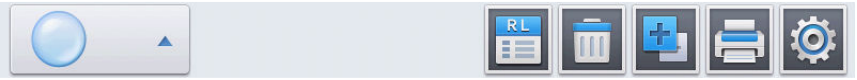
a. Turn on the equipment, and make sure there are not any objects on the lens cap.
b. If a message that says, "Initialize error" is displayed as shown in [Picture 6-1], check to see there are any objects placed on the lens cap or pinhole, and remove if there is any. Press "OK" button and enter to measurement screen. If the problem continues, inquire with authorized seller or manufacturer.
c. If a message that says, "Please remove the lens" is displayed as shown in [Picture 6-2], remove the lens from the lens cap, and press "OK" button to enter to measurement screen.
d. If S, C and A are not 0, clean the pinhole (refer to Chapter 10.7 'How to Clean Pinhole'), turn off the equipment and turn it back on. If the problem continues, inquire with authorized seller or manufacturer.

6.3. Screen Saver

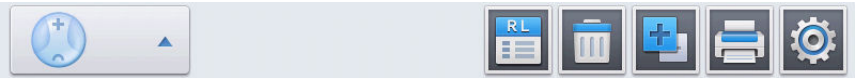
Screen saver will start automatically after a few minutes of non-operation. Screen saver protects display unit by constantly changing the screen. Touch the screen or press MEM button (save button) to go back to measurement screen. Do not turn off screen saver from Set up screen without any apparent reason.

7. Button Composition

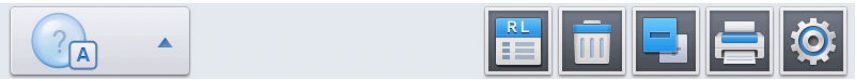
7.1. Button Composition According to Measuring Mode



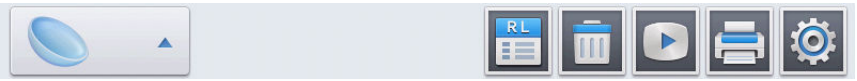
General Lens Measurement Screen Buttons



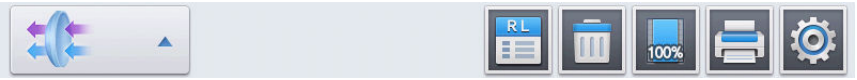
Progressive Lens Measurement Screen Buttons



Auto Detect Mode(General/ Progressive Lens) Screen Buttons



Contact Lens Measurement Screen Buttons



UV, BLUE Lens Measurement Screen Buttons

[Picture 7-1. Screen change according to button selection]

7.2. Use of Buttons

General Lens

Screen to measure general lens (including lens for sunglasses)

Progressive Lens

Screen to measure progressive multifocal lens

Auto Detect Mode

Determine the type of lens (general or progressive) currently being measured, and then convert to progressive lens measurement screen automatically if the lens is a progressive lens.

Contact Lens

Screen to measure contact lens

UV, BLUE Lens

Screen to measure UV, BLUE lens

S→R

Change to left/right lens or left/right of an eyeglass on single eye lens.

R/L→S

Change from left/right lens of eyeglass to single eye lens mode.

CLEAR

Initialize data.

TRNS

Reverse signs on cylinder value.

PRINT

Print out current data and delete data information.

SETUP

Change screen to settings.

START / STOP

Start/stop measuring current data on contact lens measurement screen and save the average.

CAL

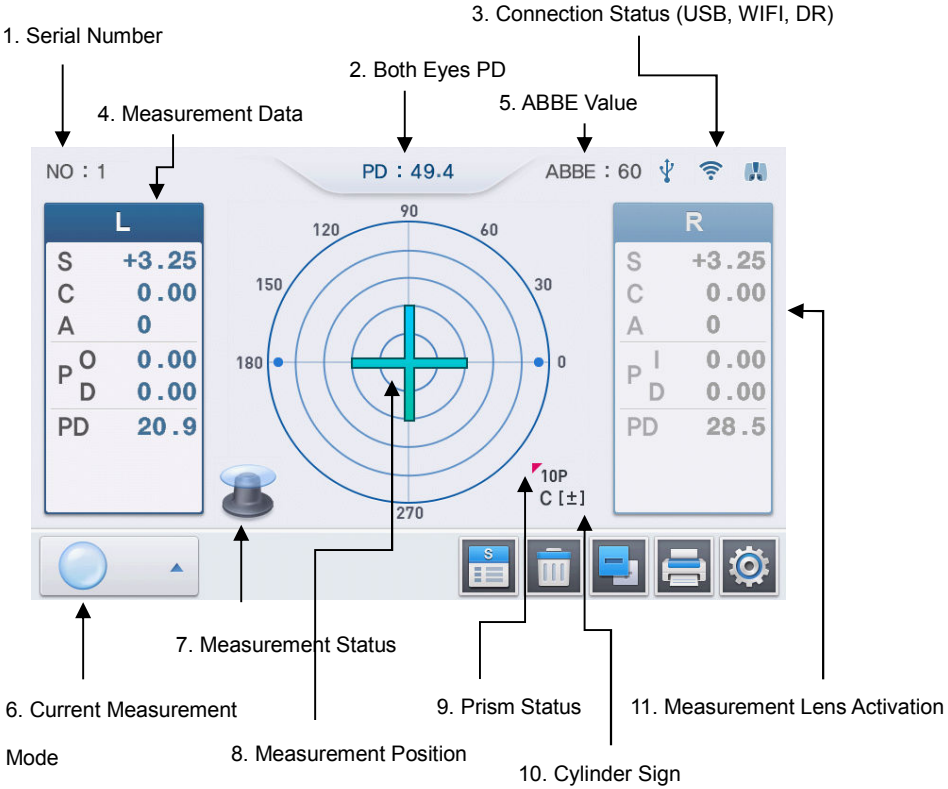
Adjust current transmission to 100% on UV, BLUE measurement screen.

MEM (Save) Button

Save current measurement.

8. Screen Composition

8.1. Measurement Screen



[Picture 8-1. Basic screen composition]

8.1.1. Specifics

① Serial Number

Serial number is marked for customer identification.

② Both Eyes PD

Both Eyes PD, a sum of left PD and right PD is marked.

③ Connection Status (USB, WIFI, DR)

USB, WIFI and DR (phoropter) connection statuses are marked.

④ Measurement Data

Measurement data is marked. Each article signifies the below.

- S: Basic refraction
- C: Cylinder
- A: Cylinder axis
- P: Prism X, Prism Y
- PD: RPD or LPD
- ADD (for Bi focal lens): Progressive power 1, Progressive power 2

⑤ ABBE Value

Current ABBE setting is marked.

⑥ Current Measurement Mode

Indicates the type of lens (general, progressive multifocal, Auto detect mode, contact or UV, BLUE) currently being measured.

⑦ Measurement Status

A drawing of lens cap without a lens indicates that no lens has been placed for measurement, and a drawing of lens cap with a lens indicates that a lens has been placed for measurement.

INFORMATION

Curved lens indicates a general lens has been placed on the lens cap.

⑧ Measurement Position

The position currently being measure is marked with a cross mark.

- : Center is aligned within 0.5 prisms.
- : Center is precisely aligned, and measuring point can be marked after angle adjustment.
- : Indicates a place being measured.

⑨ Prism Status

Select among 5 prisms, 10 prisms, 15 prisms and 20 prisms on screen.

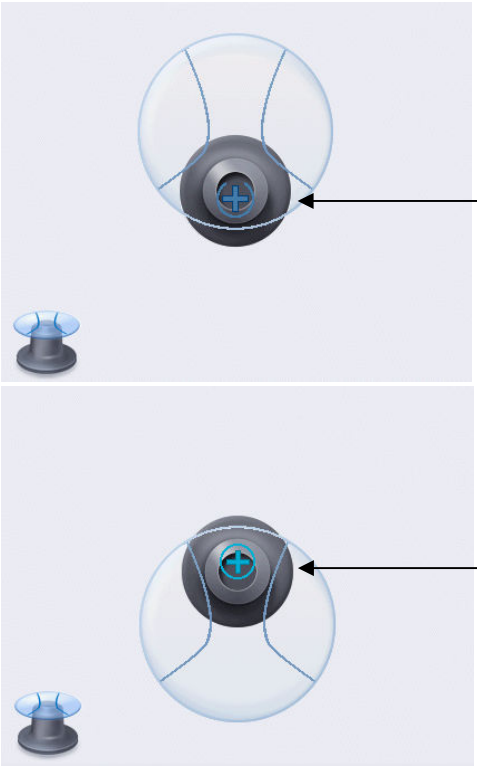
⑩ Cylinder Sign

Current cylinder sign is marked as ±, + or - .

⑪ Measurement Lens Activation

Indicates the type of lens (single lens, left or right) currently being measured.

8.2. Progressive Lens Screen



[Picture 8-2. Progressive lens screen composition]

8.2.1. Specifics

① Distance viewing zone Measurement Position

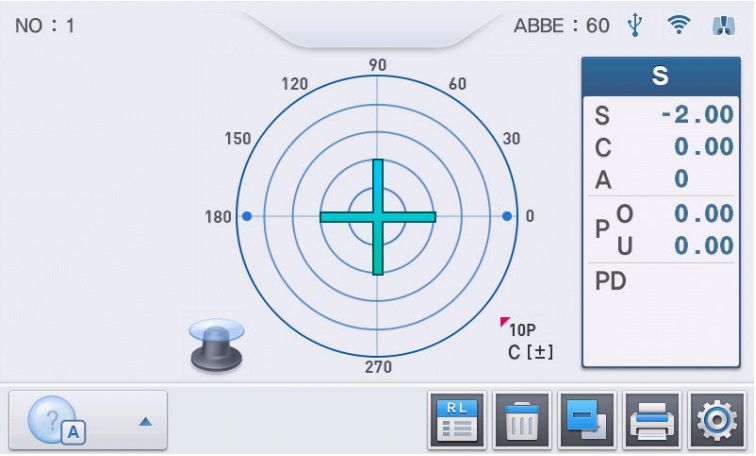
Position of current measurement is indicated while searching for the center of

distance viewing zone.

② Near viewing zone Measurement Position

Position of current measurement is indicated while searching for the center of near viewing zone.

8.3. Auto Detect Mode

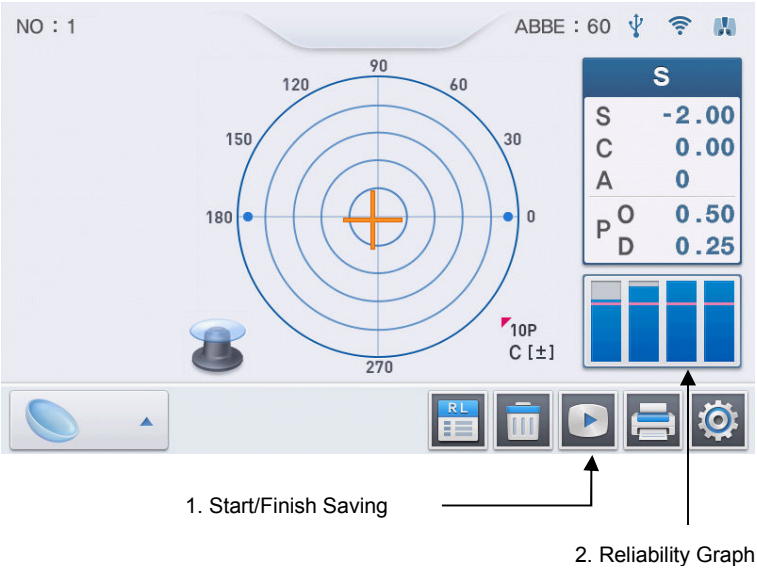


[Picture 8-3. Auto detect mode screen composition]

8.3.1. Specifics

Automatically determine the type of lens (general or progressive) currently being measured, and then convert to progressive lens measurement screen automatically if the lens is a progressive lens.

8.4. Contact Lens Screen



[Picture 8-4. Contact lens screen composition]

8.4.1. Specifics

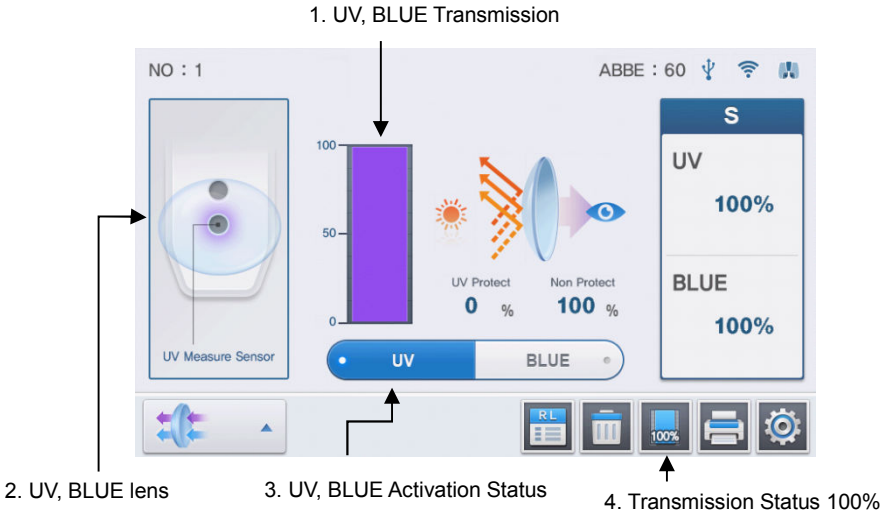
① Start/Finish Saving

Start recording results of consecutive measurement. Start saving button will change its shape to finish saving button after pressing it. (Finish: Average of all measurement results are calculated and saved.)

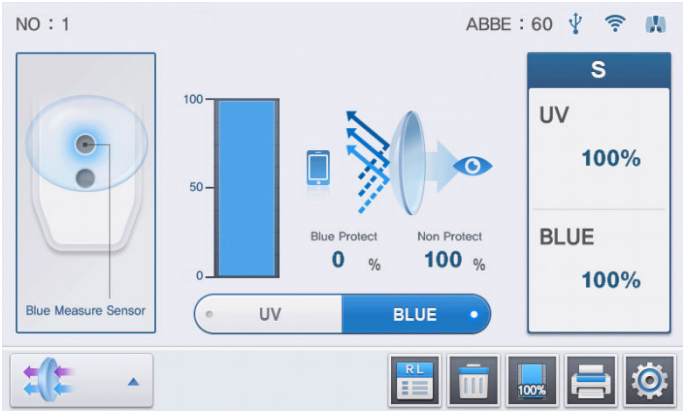
② Reliability Graph

It will show the sizes of recognized dots proportionally. If any one of the dots is lower than the baseline, the measurement value at the moment will not be considered.

8.5. UV, BLUE Screen



[Picture 8-5-1. UV screen composition]



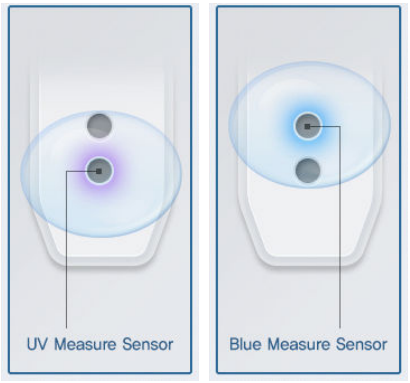
[Picture 8-5-2. BLUE screen composition]

8.5.1. Specifics

① UV, BLUE Transmission

UV, BLUE transmission of lens is indicated in a bar graph and percentage.

② UV, BLUE lens measurement position guide



[UV] **[Blue]**

[Picture 8-5-3. UV, BLUE screen composition]

③ UV, BLUE Activation Status

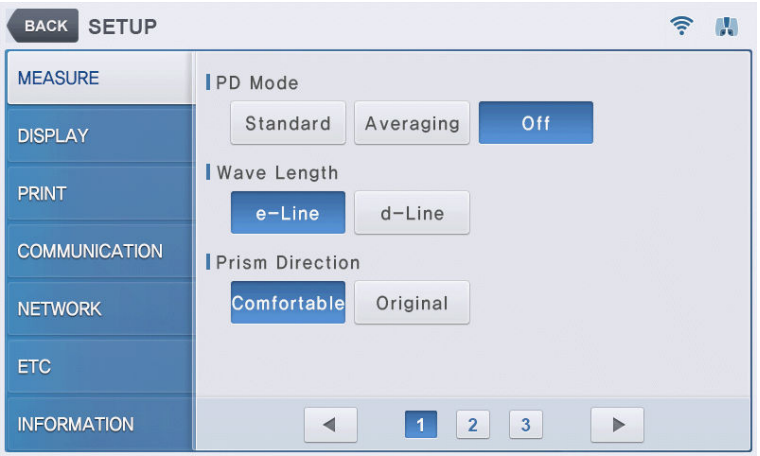
Select to measure UV transmission or BLUE transmission.

④ Transmission Status 100%

Adjust current transmission status to 100%.

8.6. Setup Screen

8.6.1. Specifics



[Picture 8-6-1. Setup screen composition - MEASURE]

PD Mode

Choose to enable PD function.

- Standard: Enable the function.
- Averaging: Set to equalize RPD and LPD when the difference between RPD and LPD is less than 3mm.
- Off: Disable PD function.

Wave Length

- e-Line: Mark refraction based on e-Line.
- d-Line: Mark refraction based on d-Line.

Prism Direction

Set direction of cross mark movement on measurement screen.
- Comfortable: Set cross mark to move in the direction of lens movement for user convenience. (Prism Display: Prism angle and cross mark position on screen might not accord during PB setting.)
- Original: Set cross mark to move in the basic prism direction.

Storage Mode

Choose to enable a function to automatically save lens data when the center of the lens is aligned.
- Auto Full: Auto-save the data from both general and progressive lenses.
- Auto Nrm.: Auto-save the data from general lenses.
- Auto Prg.: Auto-save the data from progressive lenses. (Both distance viewing zone and near viewing zone data will be saved.)
- Manual: Disable the function.

Side Allocation

Choose to enable auto-determination of left/right lens function.
- Auto SRL: Enable the function.
(Initial mode is single lens measurement mode.)
- Auto RL: Enable the function.
(Initial mode is right lens measurement mode.)
- Manual: Disable the function.

Abbe

Set Abbe constant value.

- Normal: Mark ABBE constant Normal. (=50~60)

- Mid: Mark ABBE constant Mid. (=40~49)

- Low: Mark ABBE constant Low. (=30~39)

Contact Rec.

Choose to start/stop contact lens measurement during the duration user has set (unit: second) on contact lens measurement mode.

- Manual: User will start measurement by pressing [START] button, and stop by pressing [STOP] button.
- Automatic: Start/stop contact lens measurement during the duration user has set (unit: second). (Duration setting for consecutive measurement can be done on USER SETUP screen.)

[Picture 8-6-2. Set up screen composition - DISPLAY]

Step SPH/CYL/ADD

Set S, C and ADD value indication units.
- 0.25D: Set S, C and ADD value indication unit to 0.25.
- 0.12D: Set S, C and ADD value indication unit to 0.12.
- 0.06D: Set S, C and ADD value indication unit to 0.06.
- 0.01D: Set S, C and ADD value indication unit to 0.01.

Step Prism

Set P (Prism) value indication unit.
- 0.25: Set prism value indication unit to 0.25.
- 0.12: Set prism value indication unit to 0.12.
- 0.06: Set prism value indication unit to 0.06.

- 0.01: Set prism value indication unit to 0.01.

Cylinder Mode

Set how to indicate cylinder sign.
- Mix: Mark cylinder sign as (+) when average power is (+).
  Mark cylinder sign as (−) when average power is (−).
- +: Mark cylinder sign as (+) at all times.
- -: Mark cylinder sign as (-) at all times.

Prism Display

Set how to display prism.
- No Display: Do not display prism information.
- X Y: Display prism information using X and Y coordinate.
- P B: Display prism information using absolute distance and angle.
- mm: Display prism information using (x, y) coordinate in mm units by center deviation.

Prism Mode

Set prism display unit.
- 5P: Display based on 5 prisms.
- 10P: Display based on 10 prisms.
- 15P: Display based on 15 prisms.
- 20P: Display based on 20 prisms.

Blue Display Step

Set how to display Blue Step.
- 0-100: Display based on 0~100.
- 50-100: Display based on 50~100.
  (Less than 50% will only display data, the graph does not show on the screen.)

No. Display

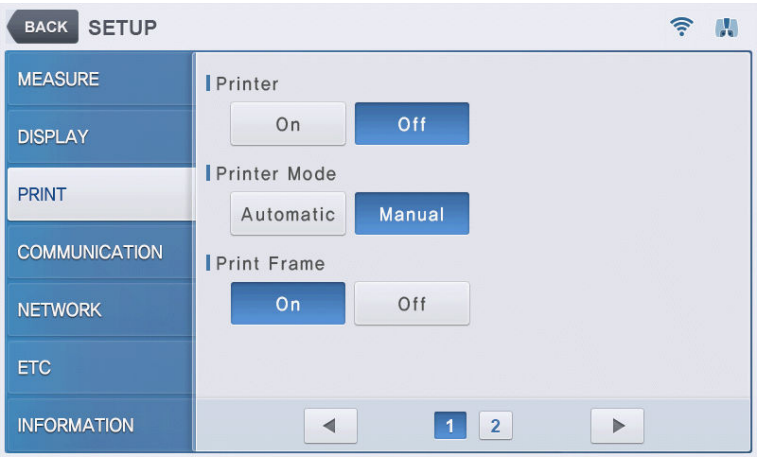
Choose whether to display customer's serial number on screen.
- On: Display on screen.
- Off: Do not display on screen.

Measure Display

Set how to display data.
- SCA: Set data to be displayed as S, C, A.
- S.E: Set data to be displayed as S.E.

Language

Select language to display user setting menu.
- English: Display menu in English.
- Chinese: Display menu in Chinese.
- French: Display menu in French.



[Picture 8-6-3. Set up screen composition - PRINT]

Printer

Set whether to use printing function.

- On: Enable the function.

- Off: Disable the function.

Printer Mode

Choose to use a function to print automatically after measurement.

- Automatic: Results will be printed automatically after measuring right and left lenses and the lens is removed from the lens cap.

- Manual: Disable the function.

INFORMATION

Perfect auto-measurement function can be used when 'Storage Mode', 'Printer Mode', 'RS 232C' and 'Printer' functions are enabled.

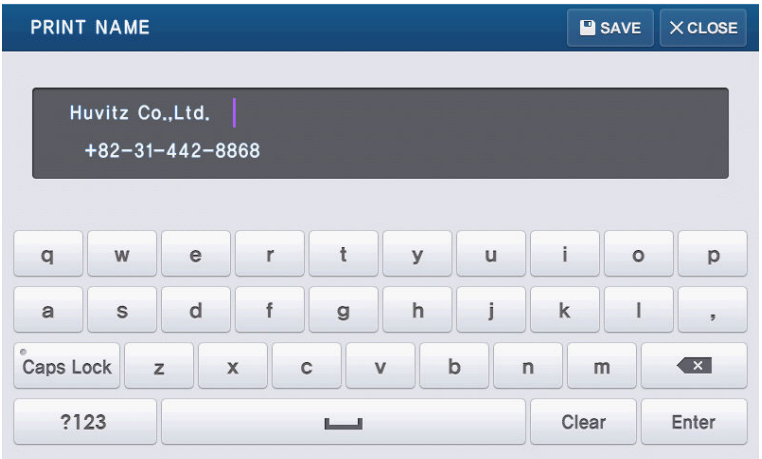
Print Frame

Choose whether to include the eyeglass drawing on paper when printing.

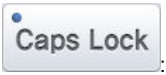
- On: Enable the function.
- Off: Disable the function.

Name

Enter name and phone number to print out.



[Picture 8-6-3-1. Name and phone number entry screen]



: Convert between upper case/lower case

: Delete all texts.

: (Back Space) delete one letter in front of the cursor.

: Change position of cursor from first line to and from second line.

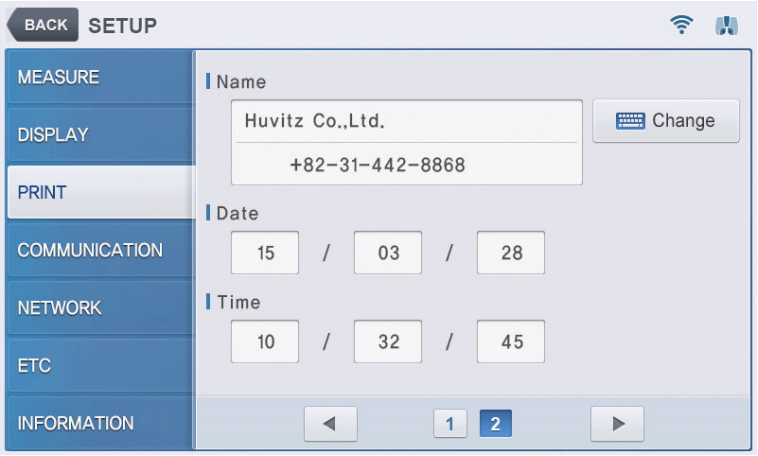
: Save modified texts (name and phone number).

Date

Choose and change date (year/month/day).

Time

Choose and change time (hour/minute/second).



[Picture 8-6-3-2. Date and time setting screen]

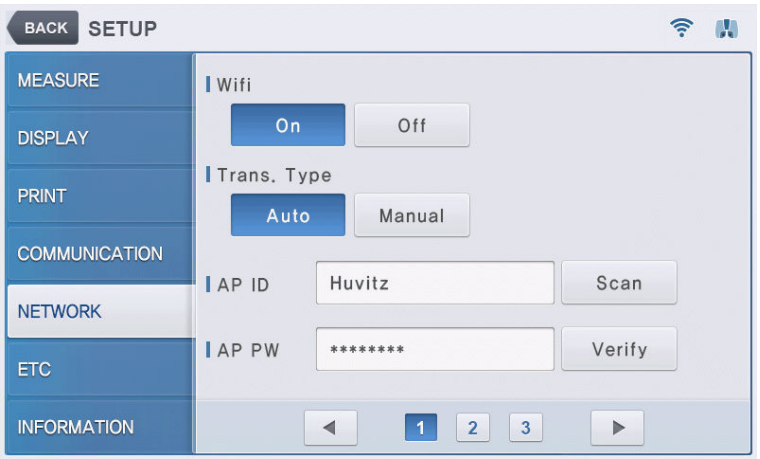
[Picture 8-6-4. Set up screen composition - COMMUNICATION]

RS 232C

Set RS-232C (external) communication protocol.
- OFF: Disable the function.
- Wave Line: Enable single direction communication protocol function between HLM and HRK, HDR.
- LMTORK: Enable bi-direction communication protocol function between HLM and HRK, HDR.

BPS

Set communication speed with outside.
- 9600: Set communication speed to 9600.
- 19200: Set communication speed to 19200.
- 38400: Set communication speed to 38400.
- 57600: Set communication speed to 57600.
- 115200: Set communication speed to 115200.



[Picture 8-6-5. Set up screen composition - NETWORK]

Wifi

Choose to enable/disable data transfer function through wireless communication

using Wifi.
- On: Enable the function.
- Off: Disable the function.

Trans. Type

Select data transfer type for wireless communication data transfer using Wifi.
- Auto: Transfer data to all currently connected devices without consulting with user, and display the result.
(Connected devices can be selected using IP address on User Set Up screen -> NETWORK -> 2, 3 Page, and maximum four IP addresses can be selected.)
- Manual: Show connection information of selected devices, and user will manually choose which device(s) to transfer data.

AP ID

Enter a name for access point needed during the WPA2-PSK authorization process to connect to Wifi network.

AP ID - Scan

Automatically search for access point(s) currently available on the device, and choose from the list.

AP PW

Enter a password of access point needed during WPA2-PSK authentication to connect to Wifi network (letters of password will be displayed as * on screen.)

AP PW – Verify

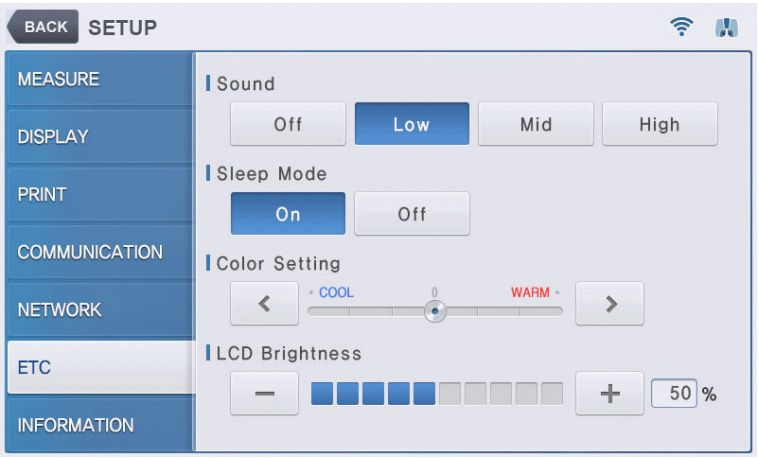
Currently entered name and password of access point will be verified. Wifi connection will be disconnected during verification.
- Verifying password…: Password is being verified.
- PASSWORD IS VERIFYED: Entered password is correct, and the device can be connected to the access point.
- INVALID PASSWORD: Password is incorrect.
- UNKNOWN ERROR: There was an error during connection process because the signal strength was too low or the access point is instable.

IP ROOM NAME/IP Address 1 ~ 5

- ☑: Select opponent device(s) to transfer wireless communication data using Wifi (maximum four can be selected among 1~10 previously registered IP addresses.)
- ROOM: Touch on the name of opponent device to change its name for easier distinction.
- IP Address: Touch on the IP address of opponent device to change it IP address.

IP ROOM NAME/IP Address 6 ~ 10

- ☑: Select opponent device(s) to transfer wireless communication data using Wifi (maximum four can be selected among 1~10 previously registered IP addresses.)
- ROOM: Touch on the name of opponent device to change its name for easier distinction.
- IP Address: Touch on the IP address of opponent device to change it IP address.



[Picture 8-6-6. Set up screen composition - ETC]

Sound

Enable/disable sound function and adjust volume.
- Off: Disable sound.
- Low: Enable sound and set volume to low.

- Mid: Enable sound and set volume to medium.
- High: Enable sound and set volume to high.

Sleep Mode

Enable/disable screen saver function.
- On: Enable the function.
- Off: Disable the function.

Color Setting

Adjust color temperature of LCD display.
- COOL ~ WARM

LCD Brightness

Adjust brightness of LCD display.
- 10% ~ 100%

[Picture 8-6-7. Set up screen composition - INFORMATION]

No. Reset

Reset customer serial number to 1.

8.7. Measurement Data Transmission using WiFi

Measurement data can be transmitted to Huvitz Co. Ltd, phoropter using a WiFi network. Data can be transmitted without direct data cable connection using this function. Thus, it does not require any additional installations or take up installation spaces as it uses wireless network. Therefore, operations such as to install two equipment in different rooms on different floors are possible.

Maximum 10 phoropters can be registered, and up to four phoropters can be selected and used concurrently. Data can be transmitted to all connected phoropters or to selected phoropters according to user settings.

Transmittable data are as the following.

- Serial number.
- Lens measurement data
  (Spherical, Cylinder, Axis, Prism, PD, Add)

INFORMATION

When Wifi access attempts, if you do not continue to attempt to access, the operation may not be smooth.

8.7.1. WiFi Environment Setting

① Set the Access Point (AP) to provide WiFi network.

AP setting can vary in different manufacturers. Thus, set as the below referring to manual of each product.

- Use Protocol: IEEE 802.11b

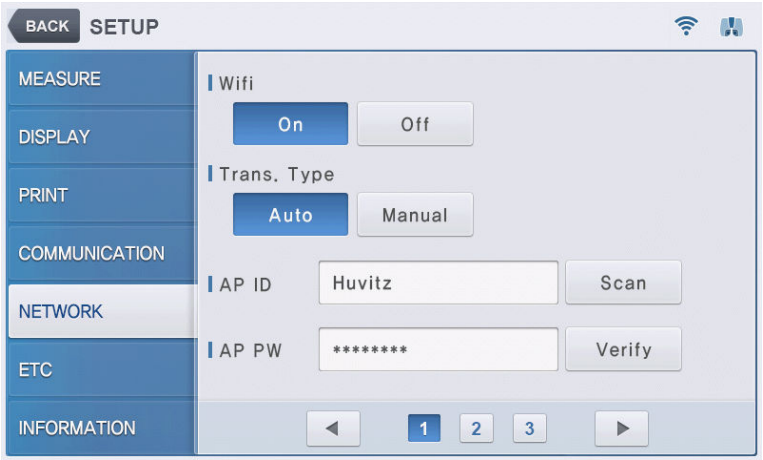
- IP Assignment Mode: DHCP
- Encryption Method: WPA2-PSK
- AP SSID: A name to distinguish AP. Set as you like.
- AP PASSWORD: Password. Set as you like.

After setting, please remember the AP SSID and AP PASSWORD to connect to WiFi network.

② WiFi Network Setting for Phoropter

Set up environment to connect to AP set on ① by referring to the manual of a phoropter. After setting up the environment, please remember the assigned IP address.

③ WiFi Network Setting for lensmeter



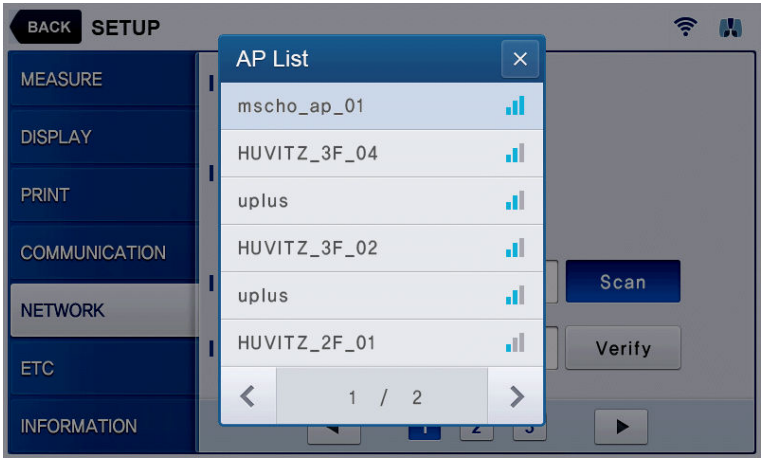
[Figure 8-7-1. WiFi Network Setting Screen]

1. Convert to User SETUP Mode, and select WIFI on page 2.

2. Turn on WiFi to use transmission function.

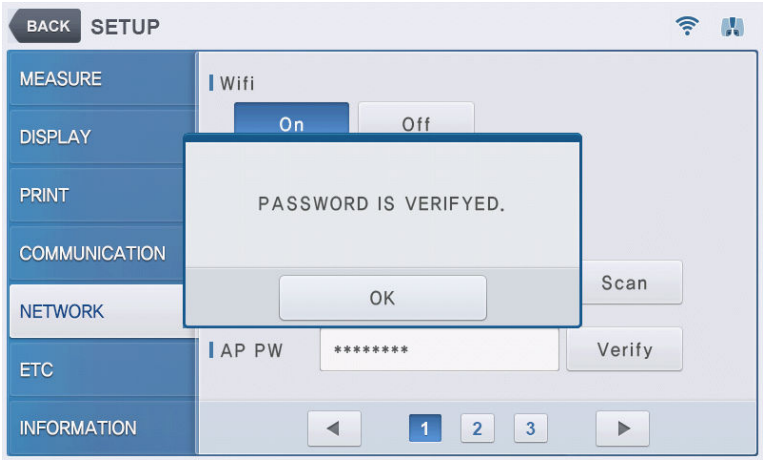
3. Set TRANSFER TYPE to set up data transmission method.

4. Press on the AP SSID entry window to enter SSID. When SSID is not known, press SCAN button on the right to select from available AP SSID.



[Figure 8-7-2. WiFi AP Scan Result Screen]

5. Press on the AP PASSWORD entry window to enter password. Press VERIFY button on the right to confirm the password. Password verification takes up less than 10 seconds, and the result will be shown on the screen.



[Figure 8-7-3. WiFi AP Password Verification Result Screen]

④ Phoropter Connection Setting for lensmeter

[Figure 8-7-4. WIFi Phoropter Connection Setting Screen]

1. Convert to User SETUP Mode, and select page 2 on network tab.

2. Enter r information for phoropter to connect on each field.

- : Select if phoropter will use the data transmission function.
-

: Enter a name for the phoropter.
-

:

  Enter the IP address of the phoropter. (Refer to ②.)

If there are more than five phoropters to enter, additional phoropters can be entered under page 3. Maximum 10 of phoropters can be registered. Up to four phoropters can be selected to use the transmission function concurrently

8.7.2. Check WiFi Network Status

Current WiFi network status can be checked through the icons on the upper right of the screen.

(1) : Connected to AP normally.

(2) : Not connected to AP.

(3) : AP connection process is in progress.

(4) : Connected to all selected phoropters normally.

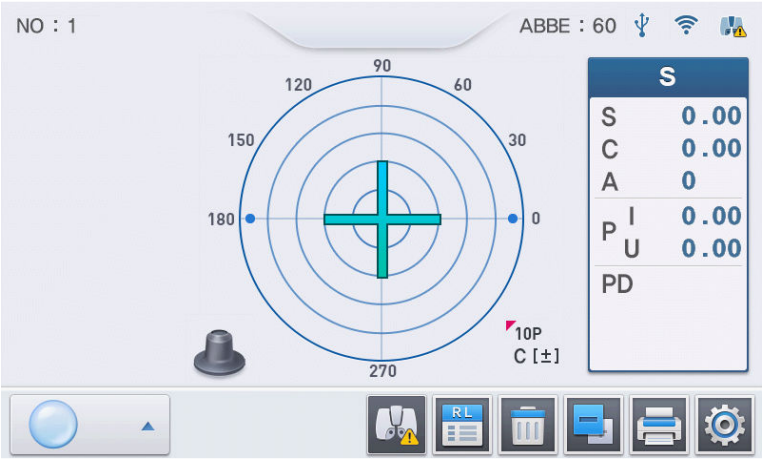
(5) : Connection failure to one or more selected phoropters.

(6) : Phoropter connection process is in progress.

For user convenience, the machine will operate to make attempts to connect to AP automatically while the power is on if it is not connected to AP. Thus, user does not have to go through the AP connection process.

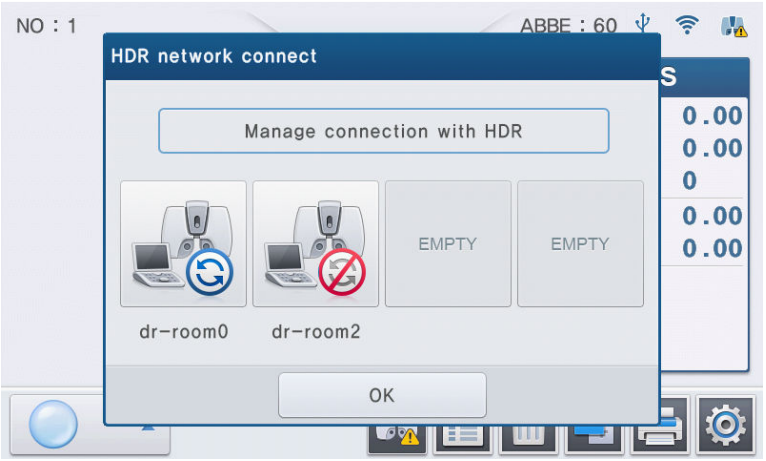
Also, the machine is set to make attempts to connect to all selected phoropters one by one automatically after connecting to AP.

If there is a phoropter connection failure after automated connection attempt or if there is a connection error during operation, button will appear on the bottom of the main measurement mode screen.



[Figure 8-7-5. Phoropter Connection Error Screen]

Pressing the button will bring up the phoropter connection status screen.



[Figure 8-7-6. Phoropter Connection Status Screen]

Status of each phoropter will be shown graphically on the four windows. Under the windows are the names of phoropters set by user. Graphic indications are described below.

(1) : Connected to phoropter normally.

(2) : Not connected to phoropter.

(3) : Data transmission is complete. (At times of data transmission)

(4) : Data transmission was unsuccessful. (At times of data transmission)

(5) : There is not a phoropter selected.

If there is a connection error and the current status is on (2), try connecting again by pressing on the phoropter window. Connection takes up to 10 seconds depending on the environment, and the icon will change to (1) if the connection attempt was successful.

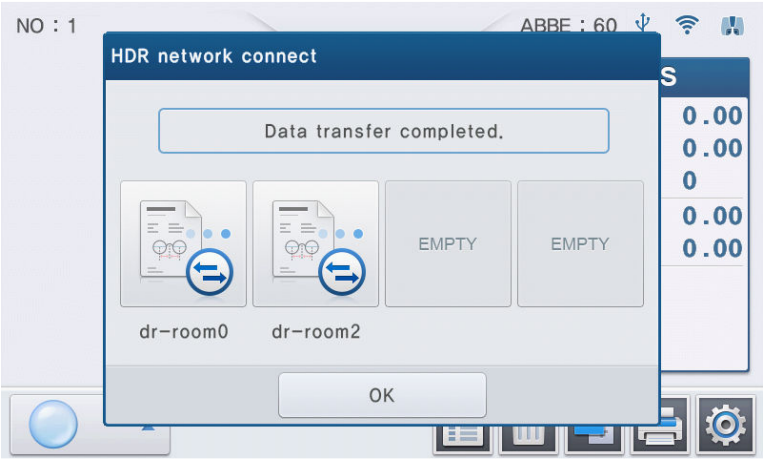
Turn off the status screen by pressing OK button on the bottom.

8.7.3. Measurement Data Transmission

After measuring lens data, the data can be transmitted to a phoropter through WiFi by pressing Print button on the front. Operations can vary depending on the TRANSFER TYPE set on the User SETUP.

① If it was set to AUTO

The data will be transmitted to all phoropters selected currently. After transmission, status screen (refer to 8.7.2) will appear, and user can confirm the transmission result through the graphical indications of phoropters (refer to 8.7.2).



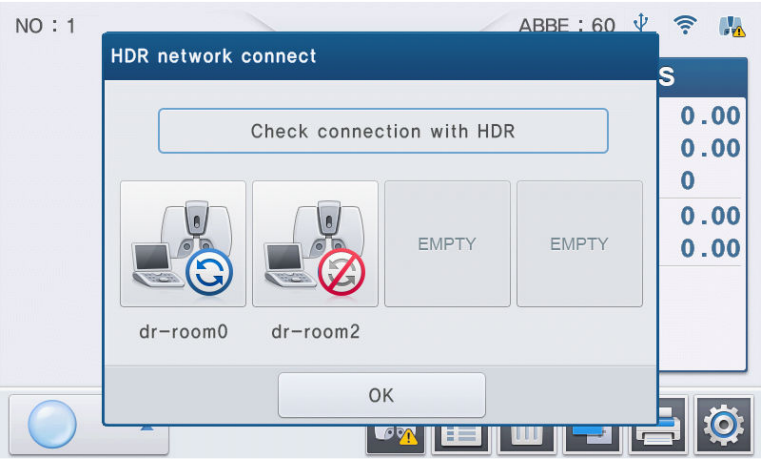
[Figure 8-7-7. Transmission Complete on AUTO Mode]

After confirming the result, press OK to turn off the status screen.

If there are connection errors on one or more phoropters, the setting will be converted to MANUAL without transmitting the data.

② If it was set to MANUAL

The data will not be transmitted immediately, and current phoropter connection status screen will appear.



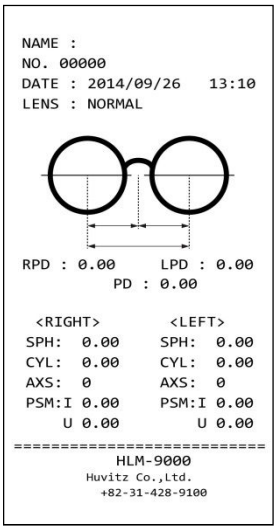
[Figure 8-7-8. Current Phoropter Connection Status Screen on MANUAL Mode]

Transmit data to a phoropter of user's choice by pressing on the phoropter window. If the phoropter is not connected, try to reconnect by pressing the window as shown in 8.7.2. After connecting to the phoropter, press on the window once again to transmit the data.

After completing the data transmission to the phoropter of user's choice, turn off the status screen by pressing OK button.

8.8. Print Format

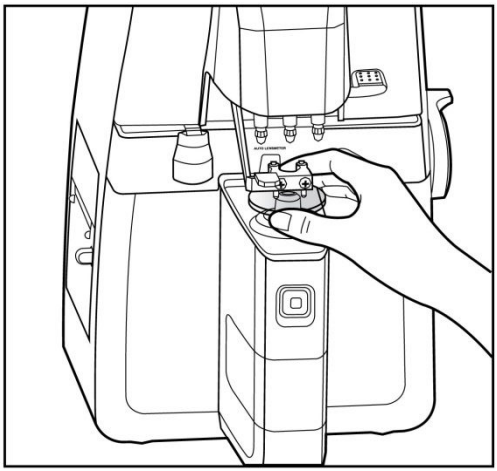
Print format is as the below.



[Picture 8-8. Print format for eyeglass lens]

9. Measurement

9.1. General Lens

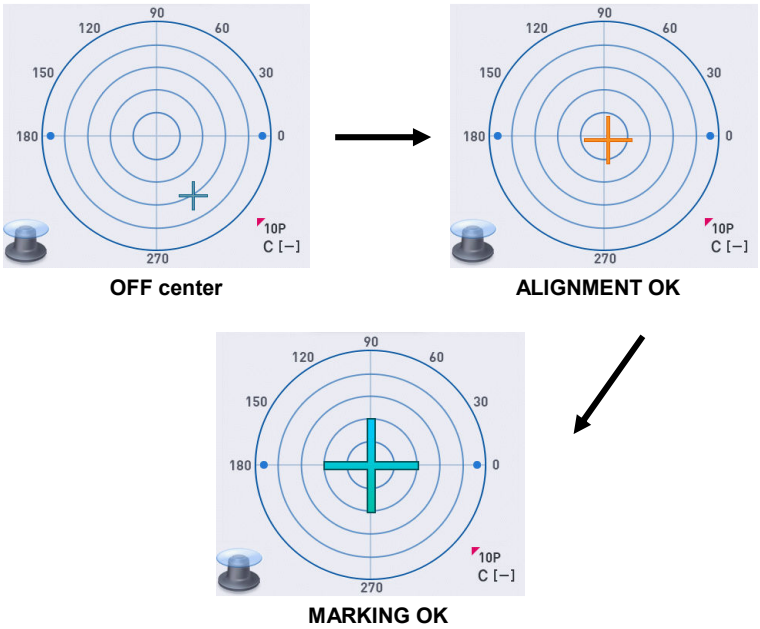


[Picture 9-1. How to measure a general lens]

① Reset measurement status by pressing 'CLEAR' button ( ). Set measurement lens on the top right corner of the screen to 'S'. (However, 'R' will be displayed if 'Side Allocation' function is set to Auto RL on User Set Up screen.

② Place a lens on the lens cap and slightly move the lens holder upward and down.

③ Move the lens so the prism cross mark is placed on the center of the concentric circle.



[Picture 9-2. Focus adjustment]

④ For a lens with astigmatism power, rotate the lens so the astigmatism angle is 180°.

INFORMATION

There is no need to adjust astigmatism angle to 180° when the lens is without astigmatism power or when there is no need to mark astigmatism focus and cylinder axis.

⑤ Press 'MEM' button to save the measurement. Data will be fixated after saving the data. Pressing 'MEM' button once again will save and fixate modified measurement.

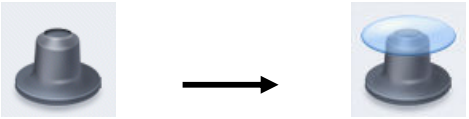
INFORMATION

'Storage Mode' function is to save measurement automatically 1 second after 'MARKING OK' display when the function is enabled in User Set Up screen.

⑥ Press 'PRINT' button to print out the measurement.

INFORMATION

The drawings below will be displayed on the bottom left corner of the screen according to presence of a lens.



No lens has been placed A lens has been placed

[Picture 9-3. Measurement status display]

INFORMATION

A drawing of the lens cap without a lens will be displayed on the bottom left corner of the screen when a lens is not placed. If a drawing of the lens cap with a lens is displayed even when there is not a lens placed on the actual lens cap, restart the equipment to operate automated set up to readjust zero point.

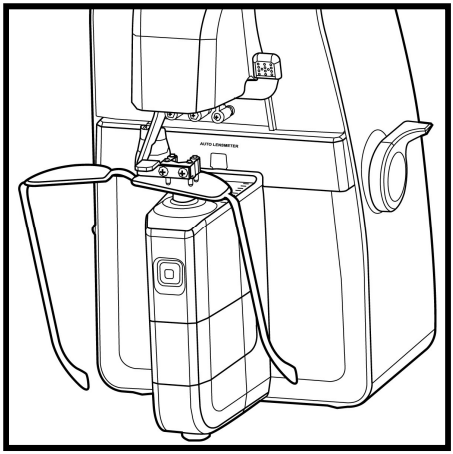
INFORMATION

A drawing of the lens cap with a lens will be displayed on the bottom left corner of the screen when a lens with power is placed.

CAUTION

After placing a lens on the lens cap, do not apply sudden pressure towards the downside, or make a rapid movement to avoid damaging/breaking the lens. Move the lens slowly and carefully.

9.2. Eyeglass Lens



[Picture 9-4. Eyeglass lens measurement]

① Press 'S->R' button ( ) to enter eyeglass lens measurement environment. 'L' and 'R' will be displayed on the top of the screen.

CAUTION

Activated data result screen indicates the lens currently being measured, and inactivated screen indicates the opposite side lens.

② Place the right lens on the lens cap and pull down the lens holder.

③ After PD function is on, place the PD position censor on the center of the eyeglass frame.

④ Press 'MEM' button to save the measurement.

⑤ Pull up the lens holder and place the left lens.

CAUTION

Left/right lens will be automatically determined if PD function is enabled according to the positioning of PD censor. This lens determining function is prioritized before the lens selection function using 'S->R' button ( ), and the selection made using 'S->R' button ( ) will be ignored.

CAUTION

When PD function is unavailable or disabled, or when side allocation function is manual, press 'S->R' button (

) to select a lens to measure.

⑥ Adjust focus until 'MARKING OK' is displayed. After PD function is on, place the PD position censor on the center of the eyeglass frame.

⑦ Press 'MEM' button to save the measurement, and press 'PRINT' button ( ) to print out the measurement.

INFORMATION

When PD value is not wanted, lens table can be used as horizontal support without using the PD position censor. In this case, PD position censor must be pulled over entirely to avoid interference between the lens and PD position censor.

CAUTION

If 'Side Allocation' function enabled to Auto SRL or Auto RL while PD function is disabled, make sure the 'no lens' icon is displayed on the bottom left corner of the screen after right lens measurement is completed before placing the left lens for Auto SRL or Auto RL function to work properly.

INFORMATION

When measuring PD on children's eyeglass frame, change to "small PD rubber" before measurement.

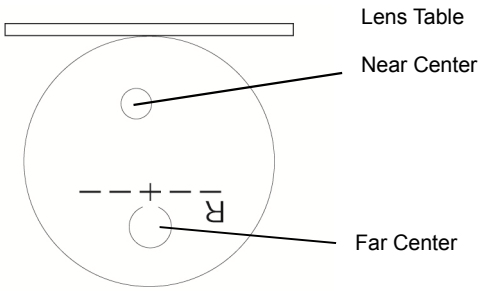
NOTE

For cylinder-only lenses, or sharply warped frames, the PD measurement accuracy may be lowered.

9.3. Progressive Multifocal Lens

9.3.1. Structure of Progressive Multifocal Lens

A lens before processing



[Picture 9-5. Structure of single progressive lens]

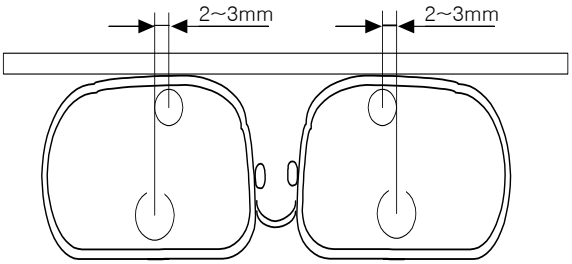
INFORMATION

Horizontal line of a lens shall be placed parallel to the lens table.

INFORMATION

As shown on the picture above, distance viewing zone of the lens shall be placed near the lens table.

Framed Lens



[Picture 9-6. Structure of framed progressive lens]

INFORMATION

Sizes of progressive multifocal lenses vary according to manufacturers.

INFORMATION

Some of the old type progressive lenses do not comply with 2~3mm standard toward the frame center.

INFORMATION

Do not pick up the lens during measurement. Fixating angle of lens holder must be maintained. During measurement, lens shall be moved left-right or forward-backward. Picking up the lens might result in incorrect measurement.

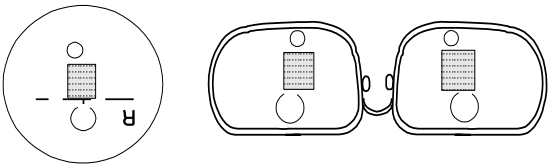
9.3.2. Judgment of Progressive Multifocal Lens

① Make sure the icon on the bottom left of the screen is the same as the picture on the right.

② Place the lens on the lens cap and wait for 2~3 seconds.

INFORMATION

It is advisable to place lens holder on the marked (▨) region (progressive band).



[Picture 9-7. Progressive band for autonomous judgment]

③ The icon on the bottom left of the screen will change as the below ('no lens' → 'progressive lens').

Then, the screen will automatically convert to progressive lens measurement screen.

[Picture 9-8. Change of status icon]

INFORMATION

When progressive power is smaller than 1D, automated judgment might not work. In such cases, press current Measurement Mode button ( ) to change to progressive lens measurement mode manually.

INFORMATION

If the lens was not placed properly on ②, it will be displayed as general lens on ③.
In such cases, move the lens to progressive band, and it will be converted to progressive lens measurement screen.

9.3.3. Distance Viewing Zone Measurement

① Move then lens to distance viewing zone. For an eyeglass lens, push till the leg on lens holder reaches the upper frame of the eyeglass.

② Adjust the lens left-right or upward-downward so the cross mark is located on the distance viewing zone target center.

③ Distance viewing zone power will be auto-saved when the cross mark reaches the distance viewing zone target center, and it will move on to near viewing zone measurement.

INFORMATION

It is difficult to auto-determine the distance viewing zone center for a lens with progressive band expanded to distance viewing zone. In such cases, move the cross mark near the distance viewing zone target center, and press 'MEM' button on a part with small distance viewing zone power fluctuation to set a distance viewing zone center forcibly.

INFORMATION

Both single lens and eyeglass lens shall be placed parallel to the lens table.

9.3.4. Near Viewing Zone Measurement

① Move the lens to near viewing zone. For an eyeglass lens with erased marker, push until the leg on the lens holder reaches the bottom frame of the eyeglass.

INFORMATION

For an eyeglass lens, it is advisable to pull the lens using the lens table while maintaining parallel to the lens table.

INFORMATION

If the horizontal indicator is incorrect, move slightly to right for a right lens or to left for a left lens since near viewing zone center is moved 2~3 mm toward the frame center as mention in the framed lens structure.

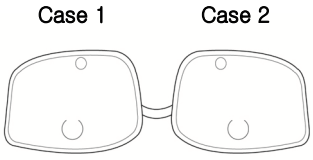
② Pull the lens till the near viewing zone horizontal indicator reaches the near viewing zone target. Progressive value will be auto-saved when the indicator reaches the target.

INFORMATION

(Case 1) For eyeglass lens with small frame, pull up the lens holder and pull a little more to find the near viewing zone center since the near viewing zone center is nearby the bottom frame. ([Picture 9-9])

INFORMATION

(Case 2) For eyeglass glass lens with very small frames, near viewing zone center is cut off sometimes. For such cases, press 'MEM' button at the point where the horizontal indicator is minimized while abiding in the horizontal allowance to set a near viewing zone center forcibly. ([Picture 9-9])



[Picture 9-9. Small eyeglass lens]

INFORMATION

Some of the old type progressive lenses do not comply with 2~3mm standard toward the frame center.

9.3.5. Troubleshoot during Progressive Lens Measurement (Auto Detect Mode)

① When a progressive lens has failed to be auto-determined.

Cause 1: The lens might not be placed on progressive band.

Countermeasure: General lens icon is displayed on the bottom left corner of the screen. Move the lens to progressive band. Progressive lens icon will be displayed, and measurement screen will convert automatically.

Cause 2: If progressive power is smaller than 1D, it cannot be auto-determined.

Countermeasure: Move the lens near the near viewing zone- parts with largest progressive fluctuation. If it still cannot be determined automatically, press current Measurement Mode button to manually convert to progressive measurement screen.

② When a general lens was determined as a progressive lens.

Cause 1: A general lens with intense aberration can be misjudged as a progressive lens.

Countermeasure: Measured in the general lens mode.

③ When it is difficult to find distance viewing zone.

Cause 1: If progressive area is expanded into distance viewing zone, it is difficult to find the distance viewing zone.

Countermeasure: Place the cross mark as close as to distance viewing zone target center, and press 'MEM' button.

Cause 2: If distance viewing zone is near the upper frame, it is difficult to find.

Countermeasure: Pull up the lens holder, and find the distance viewing zone center while pulling the frame.

④ When it is difficult to find near viewing zone.

Cause 1: If near viewing zone is located near the bottom frame, it is difficult to find.

Countermeasure: Pull up the lens holder, and find the near viewing zone center while pulling the frame.

Cause 2: If the progressive area continues after the near viewing zone center, it is difficult to find.

Countermeasure: Adjust so the value minimized, and save by pressing 'MEM' button when progressive power reaches maximum. (Measurement can be slightly different with actual values.)

⑤ When progressive measurement is incorrect. (Especially when near viewing zone power is higher by more than –4D.)

Cause 1: It can be because the lens was picked up during measurement.

Countermeasure: Pull down the lens holder to fixate the lens and maintain the angle. Move the lens left-right or upward/downward.

⑥ When it is difficult to adjust horizontal position during near viewing zone measurement.

Cause 1: It can be because distance viewing zone center was measured incorrectly.

Countermeasure: Measure the distance viewing zone center again.

9.4. General Multifocal Lens

9.4.1. Measurement on General Screen

① Place a lens on the first focal center, and press 'MEM' button.

② Place a lens on the second focal center, and press 'MEM' button. First 'ADD' value will be displayed on screen.

③ This ADD value is not a fixed value. Thus, if you are confident that this value is a true value, press 'MEM' button again.

④ If you wish to set second ADD value, press 'ADD' button ( ).

⑤ Place the lens on the third focal center, and press 'MEM' button. Second 'ADD' value will be saved.

9.4.2. Measurement on Progressive Screen

① To convert to progressive lens measurement screen, press Current Measurement Mode button ( ), and select Progressive Measurement Mode ( ).

② Move the lens to the first focal center.
Progressive measurement will be conducted automatically.

③ Move the lens to the second focal center, and progressive value will be measured automatically.

INFORMATION

If auto-measurement does not work on each stage, or if you want to measure manually, press 'MEM' button to progress to the next step.

9.5. Contact Lens

① Press Measurement Mode button ( ), and select Contact Lens Measurement Mode ( ).

② Remove moist using a clean lens towel. Soft contact lens can tear up easily, and remove moist with light touches before waiting 5 seconds for lens to recover its curved shape.

③ Pick up the soft contact lens using a tong provided as a supplementary article, and place the lens on the "lens cap for contact lenses." The convex surface shall face the bottom.

④ Connect the measurement apparatus to the pinhole housing. Adjust two handles so the cross mark on the screen is located on the center of the concentric circle.

⑤ Make sure the height of the reliability graph on the bottom right corner of the screen is above the baseline. If not, move the lens using a contact lens tong.

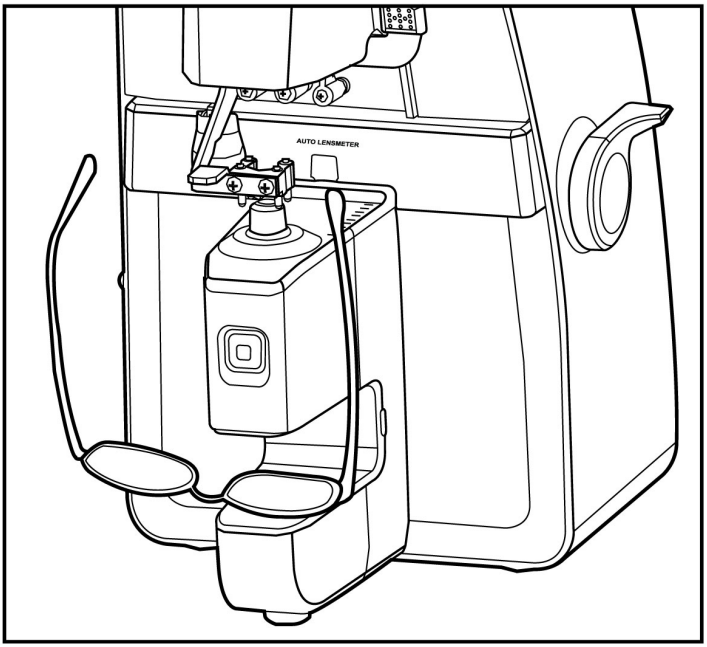
⑥ For consecutive measurement, press 'START' button ( ), and press 'STOP' button ( ) after few seconds.

INFORMATION

Measurement duration can be set in User Set Up screen. Also, enabling 'AUTO REC' function on settings will eliminate the need to press 'STOP' button ( ) to stop consecutive measurement because it will stop automatically after set duration.

⑦ Press 'PRINT' button ( ) to print out.

9.6. UV, BLUE Transmission



[Picture 9-10. How to measure UV, BLUE transmission]

① Press Measurement Mode button ( ), and select 'UV, BLUE' lens measurement mode ( ).

② Pull out the UV, BLUE cover.

③ Press UV button on the screen, and select to activate the UV measurement area. (To measure BLUE, press BLUE button to activate the BLUE measurement area.)

④ When UV or BLUE transmission is not 100% without a lens, press 'CAL' button (

) to readjust UV or BLUE transmission to 100%.

⑤ Place a lens on the UV, BLUE optic unit.

⑥ Press 'MEM' button to save UV or BLUE transmission, and press 'PRINT' button (
) to print out the measurement.

NOTE

UV transmission is measured based on a plate without refraction, and there can be errors when measuring lenses with refraction.

NOTE

When UV or BLUE transmission is not 100% without a lens, press 'CAL' button (

) to readjust UV or BLUE transmission to 100%.

NOTE

Blue lens measuring light is in wavelength range of visible light, so measuring light is influenced by surrounding rays.
When measurement is conducted under conditions that direct interference of surrounding rays occurs, measurement shall be conducted under 1,000 lux.

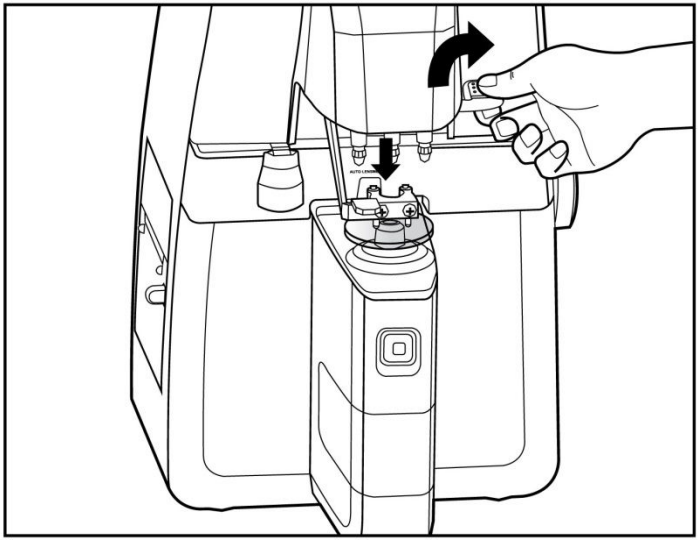
9.7. Measuring Point Marking

9.7.1. Without Astigmatism

① Place a lens on the lens cap, and move the lens until 'MARKING OK' is displayed.

② Tilt the marking lever to reach 90° to horizontal.

③ Pull down the marking lever to mark.



[Picture 9-11. How to mark a measuring point]

9.7.2. With Astigmatism

① Place a lens on the lens cap, and move until 'MARKING OK' is displayed.

② Adjust lens to the angle on the prescription while maintaining 'MARKING OK'.
③ Tilt the marking lever to 90^{o} to horizontal and mark.

9.8. Prism

① Change to prism display format (XY, PB, mm) on the prescription. Display format can be modified on User Setup Screen (Prism Display).

② Adjust lens so the prism display value on the screen accords with the prism value on the prescription.

10. Self-diagnosis and maintenance/repair

10.1. Prior to calling a serviceman

Warning appears on the screen when there is a problem or when this device malfunctions. Take the following measures in case of the following.
Contact a sales distributor after turning off the power when the device does not resume normal operation even after taking the following measures.

① When power switch is turned on

Message	Root causes	Measures
Initialize error	Check to see there are any objects placed on the lens cap or pinhole.	Check to see there are any objects placed on the lens cap or pinhole, and remove if there is any. Press "OK" button and enter to measurement screen. If the problem continues, inquire with authorized seller or manufacturer
Please remove the lens	Check the lens on the lens cap.	Remove the lens from the lens cap, and press "OK" button to enter to measurement screen.

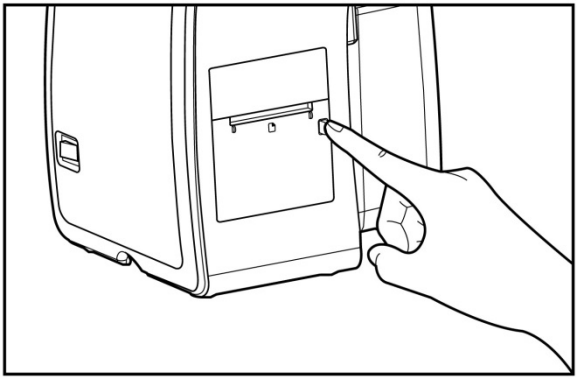
② Message during measurement

Message	Root causes	Measures
Measuring Error	Indicates when the signal of the measurement is poor.	Clean the lens cap or pinholes, and be measured again.

③ Message when printing

Message	Root causes	Measures
Data Transmitting…	State for transmitting data.	Wait until the data transfer is complete.

10.2. Printing Paper Replacement



[Picture 10-1. How to replace printing paper]

① Press the button on the side to open the cover.

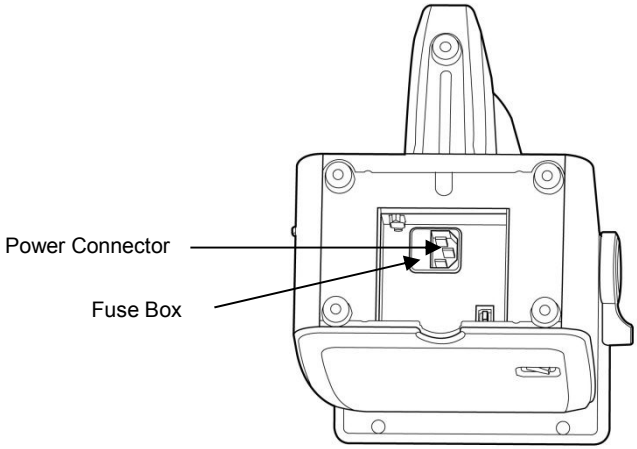
② Cut off the paper clamped in the paper, and take out the paper roll.

③ Place a new paper roll in the printer case.

④ Fixate the paper in the printer. Adjust the length so the paper is mounted between the paper outlets.

⑤ Place the end of the paper through the hole on the cover and close the cover.

10.3. Fuse Replacement



[Picture 10-2. Fuse replacement]

① Pull the fuse box to remove.

② Replace with a new fuse.

③ Place the new fuse box in the fuse location.

INFORMATION

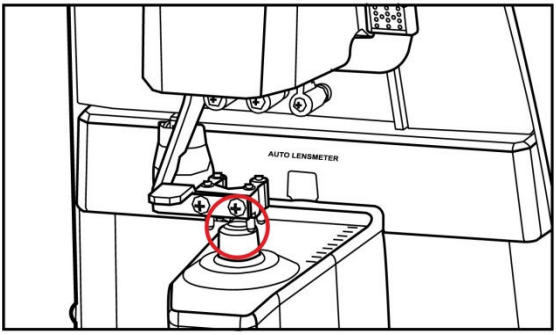
Auto Lensmeter HLM-9000 uses a 250V, T3.15AL fuse.

10.4. Storage

While not use, cover up the device with the dust cover as shown in Picture 10-3 for storage.

[Picture 10-3. How to store while not use]

If you do not plan to use the device for more than a week, place the dust cap on lens cap as shown in Picture 10-4.



[Picture 10-4. For long-term storage]

10.5. Disposal

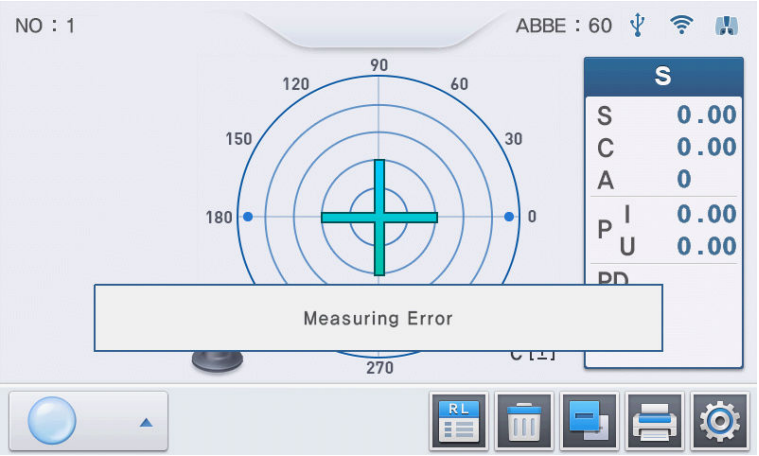
NOTE

Please obey the law relating to the equipment and its part to discard the equipment or its part(s). For example, discarding a lithium battery is a threat to the environment.

When discarding packaged part(s), disassemble the part(s) and obey the law and recycling regulations.

10.6. Various Messages

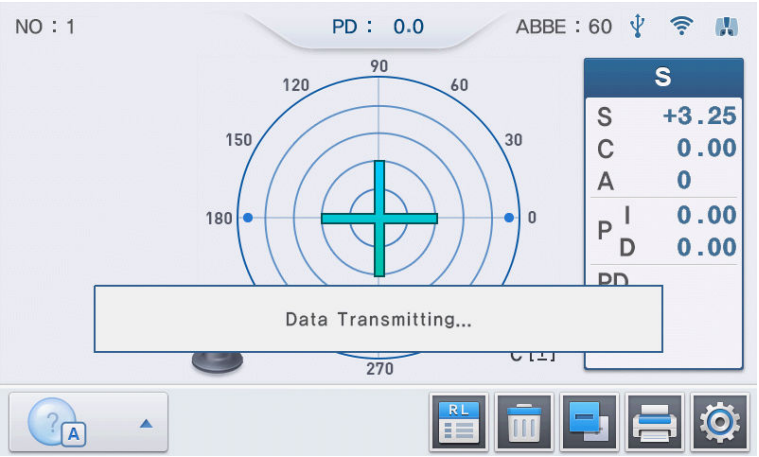
Message box shows information when you are measuring or this instrument is out of order.



[Picture 10-5. Measuring Error screen]

Measuring Error:

- Is displayed when there is no signal.
- Is displayed when there is out of range signal.
- Contact lens measurement, when signal is bad, appear.



[Picture 10-6. Data Transmitting screen]

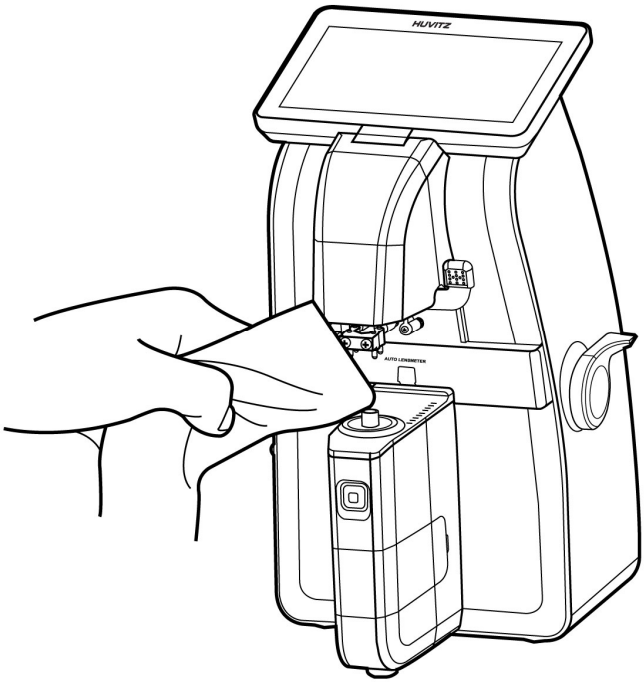
Data Transmitting…:

- Shows a state in which the data transmission.

  (If you set the setup mode COMMUNICATION->RS 232C->LMTORK)

10.7. How to Clean Pinhole

If the S, C and A values are not 0 when the equipment starts up, clean the pinhole. Remove the lens cap and wipe using a clean lens towel as sown in Picture 10-7. Do not use liquid such as alcohol or acetone.



[Picture 10-7. How to clean the pinhole]

CAUTION

Do not use liquid such as alcohol or acetone as it can dissolve the adhesive on the pinhole.

If the S, C and A values are not 0 after cleaning the pinhole, please inquire with an authorized dealer or Huvitz Service Department.

11. Major Specification

Measurement Range	
Spherical Power	0D ~ ±25D (0.25/0.125/0.06/0.01)
Cylinder Power	0D ~ ±10.00D (0.25/0.125/0.06/0.01)
Cylinder Axis	0° ~ 180° (1° step)
Progressive Power	0 ~ 10D (0.25/0.125/0.06/0.01)
Prism	0 ~ 20Δ (0.25/0.125/0.06/0.01)
Wireless I/F	
Protocol	IEEE802.11b WiFi
Security mode	WPA2-PSK
IP configuration	DHCP mode
Measurement Mode	
Cylinder	±, + , -
Prism	Rectangular / Pole / Displacement
LED wave	545 nm (Green)
Contact Lens	Hard/Soft Contact Lens
Abbe value	Manual Revision
Wave	e-Line, d-Line

Screen	85° Tiltable 7"Color LCD IPS Panel (800*480) Touch panel
Printer	Auto cutter Printer
Interface	RS-232, Wifi (802.11b, 2.4GHz) USB A Port (service)
Communication Speed (BPS)	9600,19200,38400,57600,115200 bps
Product Size	222(W) x 240(D) x 370(H) mm
Product Weight	5.4Kg
Power Supply	AC 100 - 240 V ~, 50/60Hz, 0.5-0.3A

12. EMC Information

Manufacturer announcement – electromagnetic waves trouble

Electromagnetic waves trouble		
HLM-9000 should be used in the below mentioned electromagnetic wave environment. HLM-9000 purchaser or user needs to confirm whether HLM-9000 is used in this type of environment.		
Trouble test	**Question of appropriateness**	**Electromagnetic wave environment – guideline**
RF emissions CISPR 11	Group 1	The HLM-9000 uses RF energy only for its internal functions. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class B	The HLM-9000 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply grid that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker IEC 61000-3-3	Complies	

Manufacturer announcement – electromagnetic waves tolerance

electromagnetic waves tolerance			
HLM-9000 is to be used in the below designated electromagnetic wave environment. HLM-9000 customer and user need to guarantee that the HLM-9000 will be used in this type of environment.			
Tolerance test	**IEC 60601 test level**	**Appropriateness level**	**Electromagnetic wave environment – guideline**
Electrostatic discharge(ESD) IEC 61000 – 4 – 2	contact ±6 kV in the air ±8 kV	contact ±6 kV in the air ±8 kV	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electric rapid transients/bust IEC 61000 – 4 – 4	power supplying line ±2 kV input/output line ±1 kV	power supplying line ±2 kV input/output line ±1 kV	Mains power quality should be that of typical commercial or hospital environments.
Surge IEC 61000 – 4 – 5	between lines ±1 kV between line and grounding ±2 kV	differential mode ±1 kV common mode ±2 kV	Mains power quality should be that of typical commercial or hospital environments.
Voltage dip, instantaneous interruption, voltage fluctuation at the power input line IEC 61000 – 4 – 11	For 0.5 cycle < 5 %*UT*(*UT's* > 95 % decrease) For 5 cycle 40 %*UT*(*UT's* 60 % decrease) For 25 cycle 70 %*UT*(*UT's* 30 % decrease) For 5 seconds < 5 % *UT*(*UT's* > 95 % decrease)	For 0.5 cycle < 5 %*UT*(*UT's* > 95 % decrease) For 5 cycle, 40 % *UT*(*UT's* 60 % decrease) For 25 cycle, 70 %*UT*(*UT's* 30 % decrease) For 5 seconds, < 5 % *UT*(*UT's* > 95 % decrease)	Mains power quality should be that of typical commercial or hospital environments. If the user of the HLM-9000 requires continued operation during power mains interruptions, it is recommended that the HLM-9000 be powered from an uninterruptible power supply or a battery.
Power frequency magnetic field (50/60 Hz) IEC 61000 – 4 – 8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Other *UT* is the a.c. power voltage for before approving the test level.			

Electromagnetic waves tolerance
HLM-9000 is to be used in the below mentioned electromagnetic wave environment. HLM-9000 purchaser or user needs to confirm whether HLM-9000 is sued at this environment.

Tolerance test	IEC 60601 test conditions	Appropriateness level	Electromagnetic wave environment－guideline
Conductivity RF electromagnetic field IEC 61000－4－6	3 Vrms 150 kHz～80 MHz	3 Vrms	Portable and mobile RF communications equipment should be used no closer to any part of the HLM-9000, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1.2\sqrt{P}$ $d = 1.2\sqrt{P}$ 80 MHz～800 MHz $d = 2.3\sqrt{P}$ 800 MHz～2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,a should be less than the compliance level in each frequency range.b Interference may occur in the vicinity of equipment marked with the following symbol.
Radioactivity RF electromagnetic field tolerance IEC 61000－4－3	3 V/m 80 MHz～2.5 GHz scope	3 V/m	
Note 1: At 80 MHz and 800 MHz, the separation distance of the higher frequency range applies. Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

a
Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the HLM-9000 is used exceeds the applicable RF compliance level above, the HLM-9000 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the HLM-9000.
b
Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

Recommended separation distances between portable and mobile RF communications equipment and the HLM-9000

The HLM-9000 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the HLM-9000 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the HLM-9000 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	**Separation distance suitable for transmitter frequency**		
	150 kHz～80 MHz $d = 1.2\sqrt{P}$	80 kHz～800 MHz $d = 1.2\sqrt{P}$	800 MHz～2.5 GHz $d = 2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.
Note 1: At 80 MHz and 800 MHz, the separation distance of the higher frequency range applies.
Note 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

Electromagnetic waves tolerance

HLM-9000 is to be used at the electromagnetic wave environment designated below. HLM-9000 customer and user need to guarantee that the HLM-9000 will be used at this environment.

Tolerance test	IEC 60601 testing conditions	Appropriateness level	Electromagnetic wave environment－guideline
Conductivity RF electromagnetic field IEC 61000－4－6	3 Vrms 150 kHz～80 MHz	3 Vrms 150 kHz～10 MHz	HLM-9000 has minimum RF shield effect. As for each cable that comes into the shielded location, it should be used only at the shielded location; 80 dB at 10 MHz～20 MHz frequency range, frequency range of 100 dB, 80 MHz～100 MHz at 20 MHz～80 MHz frequency range. Minimum value at the 20 MHz that has 80 dB minimum RF filter decrease is 100 dB. Minimum value at 80 MHz is 80 dB. This is fixation RF transmitter that is determined through electromagnetic wave environment field inspection. Electric intensity at the outside of the shielded location should be 3 V/m or less a. Trouble may result near the medical device where the following symbol is indicated.
Radioactivity RF electromagnetic field tolerance IEC 61000－4－3	3 V/m 80 MHz～2.5 GHz	3 V/m 100 MHz～2.5 GHz	
Other 1 This guideline cannot be applied to all situations because diffusion of electromagnetic waves are affected by absorption and reflection by structure, object and human beings. Other 2 It is important to verify and to confirm whether actual shield effect and filter decrease of the shielded location satisfy the minimum specs.			
It is not easy to carry out precise theoretical forecasting when it comes to the electric intensity that results from the fixation transmitter such as a wireless phone(vehicle phone/phone with no code)'s base station, land mobile wireless, amateur wireless, AM and FM broadcast, TV broadcast. In order to evaluate the electromagnetic wave environment with fixation RF transmitter, field inspection is required. If the electric intensity used by the HLM-9000 that is measured at the outside of the shielded location exceeds 3 V/m, then it is necessary to observe and verify whether HLM-9000 operates normally. If abnormal operation is observed, then re-place HLM-9000 or use other shielded location that has increasingly higher RF shield effect and filter decrease. Likewise, other additional measures may be needed.			

13. Service Information

Service Instruction: If a problem occurs on the equipment, follow the below instruction.

- First, follow the instruction in Chapter 10 Self-diagnosis and maintenance/repair according to a type of the problem.
- If the problem continues, contact the place of purchase.
- Before contacting the place of purchase, it is advisable to prepare information of the equipment such as model number and serial number. Thus, write down the information on the table below immediately after making a purchase so you can always have access to the information. Serial number can be found on the back of the equipment. Each product comes with a serial number of its own. Please keep this instruction booklet as a record of purchase. Please keep the receipt as a proof of purchase as well.

Dateof Purchase: _____

Name of Seller: _____

Seller Address: _____

Seller Phone: _____

Model Number: _____

Serial Number: _____

If you have trouble contacting the place of purchase, contact the service department at Huvitz directly using the addresses and phone numbers below.

Huvitz Co., Ltd.

(HQ)
298-29 Gongdan-ro, Gunpo-si, Gyeonggi-do 435-862

Tel: 031-428-9100 (Primary)
Fax: 031-477-9022(C/S)
http://www.huvitz.com
e-mail: svc@huvitz.com

(Manufacturer)
91-beongil 16-17(Hogye-dong), LS-ro, Dongan-gu, Anyang-si, Gyeonggi-do 431-848

Tel: 031-428-9100
Fax: 031-477-8618

EU Representative

Medical Device Safety Service GmbH (MDSS)

Schiffgraben 41, 30175 Hannover, Germany

Tel: +49-511-62628630
Fax: +49-511-62628633