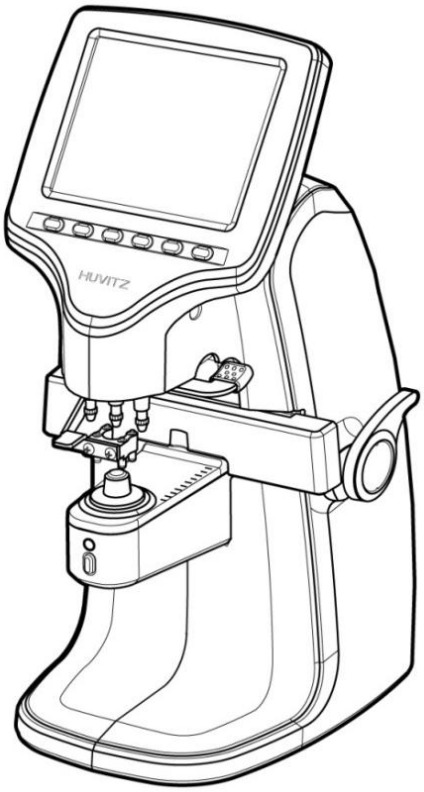
ENG

Huvitz

Auto-Lensmeter

HLM-1

USER MANUAL



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. (Please keep at least 30cm)
We believe that the contents in this User 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 User Manual.
Huvitz reserves right to modify product or product features at all times without notification, and these modifications might not be reflected on this document.

CE

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(2025.03.19)

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CONTENT

1. INTRODUCTION 6

1.1. Equipment Summary 6

1.2. Classifications 6

1.3. Intended Use 6

1.4. Contraindications 6

1.4. Patient Requirement 6

1.5. Applied Standard List 7

2. SAFETY INFORMATION 8

2.1. Introduction 8

2.2. Safety Symbols 9

2.3. Environmental Symbol 12

2.4. Safety Precaution 14

3. FEATURE 17

4. INSTRUCTIONS FOR USE 17

5. DEVICE CONFIGURATION AND OPERATION FLOW 18

5.1. Device Configuration - Main Parts 18

5.2. Device Configuration - Standard Accessories 20

5.3. Operation Flow 21

6. EQUIPMENT INSTALLATION AND PREPARATION 22

6.1. Parts Inspection 22

6.2. Start-up Test 22

6.3. Screen Saver 23

7. BUTTON COMPOSITION 24

7.1. Button Composition According to Measuring Mode 24

7.2. Use of Buttons 24

8. SCREEN COMPOSITION 27

8.1. Measurement Screen 27

8.1.1. Specifics 27

8.2. PROGRESSIVE LENS SCREEN 29
8.2.1. Specifics 29
8.3. AUTO DETECT MODE 30
8.3.1. Specifics 30
8.4. CONTACT LENS SCREEN 31
8.4.1. Specifics 31
8.5. SETUP SCREEN 32
8.5.1. Specifics 32

9. MEASUREMENT 40

9.1. GENERAL LENS 40
9.2. EYEGLASS LENS 43
9.3. PROGRESSIVE MULTIFOCAL LENS 45
9.3.1. Structure of Progressive Multifocal Lens 45
9.3.2. Judgment of Progressive Multifocal Lens 46
9.3.3. Distance Viewing Zone Measurement 47
9.3.4. Near Viewing Zone Measurement 49
9.3.5. Troubleshoot during Progressive Lens Measurement (Auto Detect Mode) 50
9.4. GENERAL MULTIFOCAL LENS (BIFOCAL LENS / TRIFOCAL LENS) 52
9.4.1. Structure of General Multifocal Lens 52
9.4.2. Measurement on General Screen 53
9.4.3. Measurement on Progressive Screen 53
9.5. CONTACT LENS 54
9.5.1. measurement 54
9.6. MEASURING POINT MARKING 56
9.6.1. Without Astigmatism 56
9.6.2. With Astigmatism 56
9.7. PRISM 56
9.8. MEASUREMENT DATA TRANSMISSION USING SERIAL 57
9.8.1. Connection 57
9.8.2. Operating procedure 57
9.9. PRINT (HRK PRINT) 58

10. SELF-DIAGNOSIS AND MAINTENANCE/REPAIR 61

10.1. BEFORE CALLING A SERVICEMAN 61

10.2. FUSE REPLACEMENT 62
10.3. STORAGE 62
10.4. DISPOSAL 63
10.5. VARIOUS MESSAGES 64
10.6. HOW TO CLEAN PINHOLE 65
10.7. HOW TO CLEAN THE LENS 66
11. MAJOR SPECIFICATION 67
12. EMC INFORMATION 68
13.SERVICE INFORMATION 70

1

Introduction

1.1. Equipment Summary

Auto Lensmeter HLM-1 is a machine to generate Sph, Cyl and Axis information of lens by measuring refraction of the lens. Auto Lensmeter HLM-1 can 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. Classifications

- Classification: Class I according to Annex VIII (Rule 13) of the Medical Device Regulation 2017/745(MDR)
- 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

1.3. Intended Use

An Auto Lensmeter HLM-1, HLM-7000P is intended for measuring the refractive power of lenses and gives the spherical, cylindrical and axis of the lenses.

1.4. Contraindications

Not applicable, there is no any contraindication.

1.5. Patient Requirement

Not applicable, there is no any patient requirement.

1.6. Applied Standard List

- IEC/EN 60601-1: MEDICAL ELECTRICAL EQUIPMENT- Part 1: General requirements for safety
- IEC/EN 60601-1-2: Medical electrical equipment Part1: General requirements for safety- Collateral Standard: Electromagnetic Compatibility-Requirements and tests
- ISO15004-1: Ophthalmic instruments- Fundamental requirements and test methods
  General Requirements applicable to all Ophthalmic instrument
- ISO 8598-1: Optics and optical instruments – Focimeters – Part 1: General purpose instruments

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 User 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 User 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 User 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.

“Warning” signifie un danger qui peut entraîner des blessures graves, la mort ou des dommages matériels graves si vous ne faites pas attention.

⚠ NOTE

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

“Note” signifie des informations importantes sur l'installation, le fonctionnement ou la maintenance
qui peuvent conduire à une catastrophe en cas de négligence.

⚠ CAUTION

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

“Caution” signifie une association avec une catastrophe qui peut causer des blessures mineures ou des dommages matériels si elle n'est pas prudente.

⚠ INFORMATION

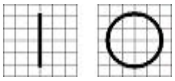
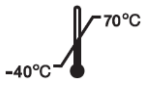
“Information” is to generate information needed on each page that is appropriate at the phase.

“Information” consiste à générer sur chaque page les informations nécessaires à la phase.

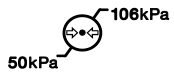
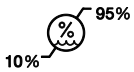
2.2. Safety Symbols

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 represent ON and OFF respectively. (O sur l'interrupteur d'alimentation représentent respectivement ON et OFF.)
	This symbol identifies a safety note. Ensure you understand the function of this control before using it. Control function is described in the appropriate User's or Service Manual. (Ce symbole identifie une note de sécurité. Assurez-vous de comprendre la fonction de ce contrôle avant de l'utiliser. La fonction de contrôle est décrite dans le manuel d'utilisation ou d'entretien approprié.)
	It indicates the year of manufacture and the manufacturer. (Il indique l'année de fabrication et le fabricant.)
	Manufacturer (Fabricant)
	Authorised Representative in the European Community (Représentant autorisé dans la Communauté européenne)
	Identifies the point where the system safety ground is fastened to the chassis. Protective earth connected to conductive parts of Class I equipment for safety purposes. (Identifie le point où la terre de sécurité du système est fixée au châssis. Terre de protection connectée aux parties conductrices des équipements de classe I à des fins de sécurité.)
	Alternating Current (Courant alternative)
	Temperature Limitation (Limitation de température)

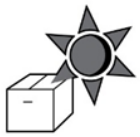
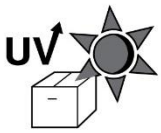
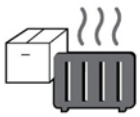
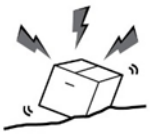
	Keep DRY (Garder au sec)
	The United States and Canada have mutual-recognition agreements. Therefore, if certified using a Canadian specification (CSA) for UL, the certification mark for the product will be a C-UL certification mark which means CSA specification compliance as follows. (Les États-Unis et le Canada ont conclu des accords de libre-échange. Par conséquent, si l'on obtient une certification au moyen d'une spécification canadienne (CSA) pour l'AMT, la marque de certification pour le produit sera une marque de certification C-UL, ce qui signifie la conformité de la spécification CSA comme suit.)
	WEEE mark Disposal of your old appliance When this crossed-out wheeled bin symbol is attached to a product it means the product is covered by the European Directive 2002/96/EC. All electrical and electronic products should be disposed of separately from the municipal waste stream via designated collection facilities appointed by the government or the local authorities. The correct disposal of your old appliance will help prevent potential negative consequences for the environment and human health. 4. For more detailed information about disposal of your old appliance, please contact your city office, waste disposal service or the shop where you purchased the product. (Mise au rebut de votre ancien appareil Lorsque ce symbole de poubelle barrée est joint à un produit, cela signifie que le produit est couvert par la directive européenne 2002/96 / CE. Tous les produits électriques et électroniques doivent être éliminés séparément du flux des déchets municipaux via des installations de collecte désignées par le gouvernement ou les autorités locales. L'élimination correcte de votre ancien appareil aidera à prévenir les conséquences négatives potentielles sur l'environnement et la santé humaine. 4. Pour plus d'informations sur l'élimination de votre ancien appareil, veuillez contacter votre mairie, le service d'élimination des déchets ou le magasin où vous avez acheté le produit.)
	CE Mark (Marque CE)

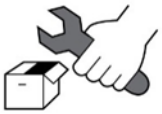
CE RoHS	CE for RoHS RoHS Directive Compliance 2011/65/EU (CE pour RoHS Conformité à la directive RoHS 2011/65 / UE)
	Atmospheric pressure limitation (Limitation de pression atmosphérique)
	Humidity limitation (Limite d'humidité)
	Stack direction (Direction de la pile)
	Fragile , handle with care (Fragile, manipuler avec soin)
	Keep away from sunlight (Tenir à l'écart de la lumière du soleil)
	Stack layer limitation (Limiter la couche de pile)
	Use no hooks (N'utilisez aucun crochet)
	Consult instructions for use (Consulter les instructions d'utilisation)
	Serial Number Symbol (Symbole du numéro de série)
	Authorised Representative in Switzerland (Représentant autorisé dans las Suisse)

MD	To indicate this product is Medical device (Pour indiquer que ce produit est un dispositif medical)

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 where the equipment can be exposed to direct sunlight.
	A place where the equipment can be exposed to direct ultraviolet.
	A place with rapid temperature fluctuation. Optimal temperature for normal operation is at 10℃ ~ 35℃, and humidity at 30% ~ 90%.
	A place nearby a heating apparatus.
	A place where the equipment can be exposed to water. Do not operate the equipment with wet hand
	A place where the equipment can be exposed to excessive pressure or vibration.
	A place where the equipment can be exposed to chemical substances or flammable gas.

	Watch out for dust, especially metal pieces from entering the equipment.
	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.
	Always pull the power cord holding the plug and not the cord.

1. Operation
- An ambient temperature range of 10℃ ~ 35℃ (50°F ~ 95°F)
- A relative humidity range of 30% ~ 90% (with non-condensing)
- An atmospheric pressure range of 800 ~ 1060hpa

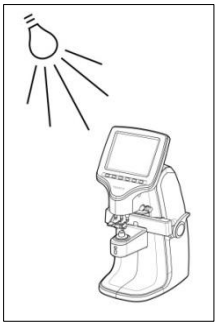
2. Transportation
- An ambient temperature range of -40℃ ~ 70℃ (-40F ~ 158°F)
- A relative humidity range of 10% ~ 95%
- An atmosphere pressure range of 500 ~ 1060hpa

3. Storage
- An ambient temperature range of -10℃ ~ 55℃ (14°F ~ 131°F)
- A relative humidity range of 10% ~ 95% (with non-condensing)
- An atmosphere pressure range of 700 ~ 1060hpa

Avoid environments where the equipment is exposed to excessive shocks or vibrations.
Do not expose products or packing to environmental conditions outside of those specified above.

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 30% ~ 90% 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 User 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 User 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.)

21. In the event of a serious incident involving the device, the user shall report it to the manufacturer and the competent authority of the Member State in which the user and/or patient are established.

22. When packing box is unintentionally open before use or damaged, please call A/S center.

23. Don't transmit data to other device when you find viruses in other device. Don't connect HLM-1 to other device when you find viruses in other device.

24. Subsequent changes to the IT-NETWORK could introduce new RISKS and require additional analysis. Changes to the IT-NETWORK include:

1) changes in IT-NETWORK configuration
2) addition of items (hardware platforms or software applications) to the IT-NETWORK
3) removal of items from the IT-NETWORK
4) update of hardware platforms or software applications on the IT-NETWORK
5) upgrade of hardware platforms or software applications on the IT NETWORK.

⚠ 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.

3

Feature

1. Quick and convenient measurement of refraction and center of a lens.
2. Wide range of measurement from –25D to +25D.
3. More precise measurement with unit as small as 0.01D.
4. Quick and convenient measurement of progressive multifocal lens and general multifocal lens.
5. Various and splendid screen through color LCD.

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. Remove power plug and consult with a dealer when smoke, unusual smell or noise is detected during operation.
9. Do not turn off screen saver without any apparent reasons. This equipment protects its screen through screen saver.

5

Device Configuration and Operation Flow

5.1. Device Configuration - Main Parts

1. LCD Screen

   : Display the lens measurement screen.

2. Lens Holder Lever

   : Used to operate the lens holder.

   - To secure a lens: Lift once and lower gently.
   - To release a lens: Lift until it clicks.

3. Lens Cap

   : A lens to be measured is placed on the lens cap. This is the base point for measurements.

4. MEM Button (Save Button)

   : Used to read measured data.

   This button locks in the measurement data on the screen to be saved in the memory.

5. Operation Buttons

   : Selecting of functions

6. Marking Lever

   : Used to mark a lens by pushing the lever down.

7. Lens Table Lever

   : Moves the lens table forward and backward.

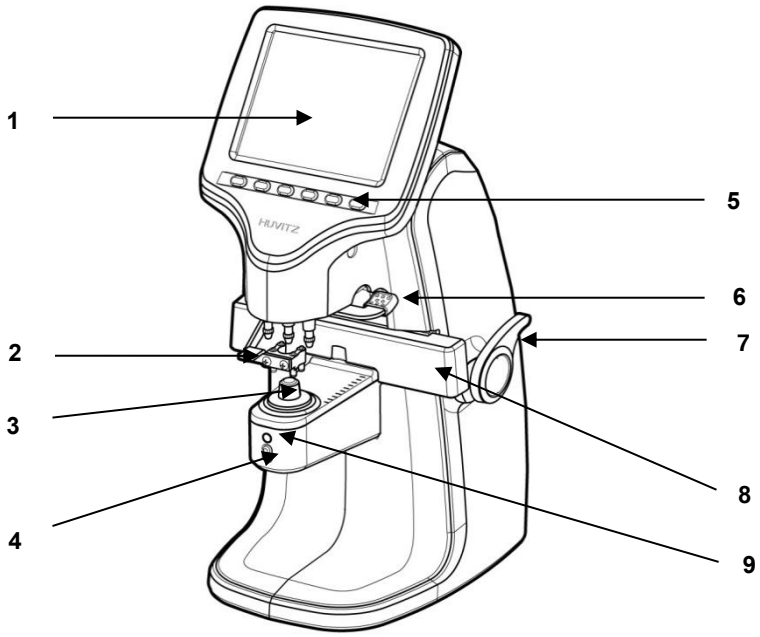
8. Lens Table

   : Touched to the bottom of the lens frames. (To display an uncut lens diameter, place the lens so that its edge comes into contact with the lens table)

9. LED Lamp

   : Indicates On, Off or blinking of the power to the device.

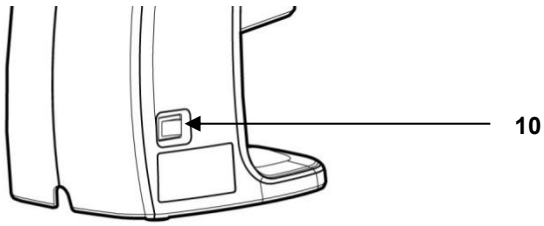
   - LED ON (Power turned on)
   - LED OFF (Power turned off)
   - LED Blinking (Screen save mode on)



[Names of parts (I) - Front]

10. Power Switch

    : Switch for power on, off.



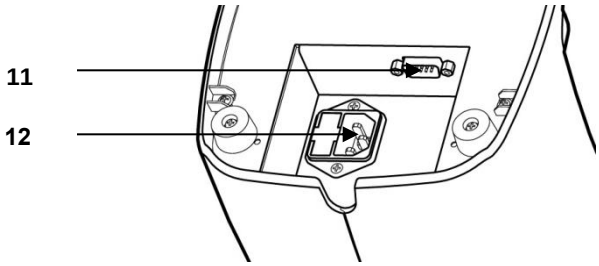
[Names of parts (II) - Back]

11. RS-232 Connector

    : A terminal connecting to the exterior equipment

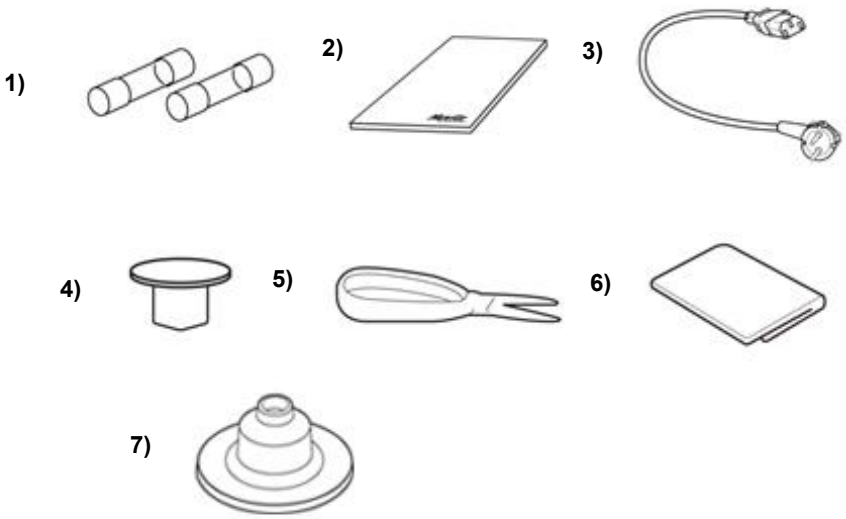
12. Power Connector

    : Used to connect a removal power cord.



[Names of parts (III) - Bottom]

5.2. Device Configuration - Standard Accessories



1. Fuse (250V T3.15AL) : (2)
2. User Manual: Operation guide for users
3. Power Cable (180cm) : (1)
4. Dust Preventive Cap: a cap to prevent dust from entering : (1)
5. Contact lens tweezer: a tool to pick up contact lenses
6. Dust Cover: a plastic cover to prevent dust from entering
7. Contact lens support (Contact lens Cap): (1)

5.3. Operation Flow

Power on	6. Equipment Installation and Preparation	Page.20
▼		
Measurement (Print)	7. Button Composition	Page.22
	8. Screen Composition	Page.25
	8.1. Measurement Screen	Page.25
	8.2. Progressive lens Screen	Page.27
	8.3. Auto Detect Mode	Page.28
	8.4. Contact lens Screen	Page.29
	8.5. Setup Screen	Page.30
	9. Measurement	Page.37
	9.1. General lens	Page.37
	9.2. Eyeglass lens	Page.40
	9.3. Progressive Multifocal lens	Page.42
	9.4. General Multifocal lens	Page.49
	9.5. Contact lens	Page.51
	9.9. Print (HRK Print)	Page.55
▼		
Measuring Point Marking	9. Measurement	Page.37
	9.6. Measuring Point Marking	Page.51
▼		
Data Transmission	9. Measurement	Page.37
	9.8. Measurement Data Transmission Using Serial	Page.54
▼		
Power off	10. Self-Diagnosis and Maintenance/Repair	Page.57
	10.1. Before Calling a Serviceman	Page.57
	10.2. Fuse Replacement	Page.58
	10.3. Storage	Page.58
	10.4. Disposal	Page.59
	10.5. Various Messages	Page.60
	10.6. How to Clean Pinhole	Page.61

6

Equipment Installation and Preparation

6.1. Parts Inspection

1. Inspect supplementary articles.

   Open the box and make sure all articles are there (dust cover, User Manual and etc.).

2. Remove protection tapes.

   Remove protection tapes on lens holder, lens cap, marking lever.

6.2. Start-up Test

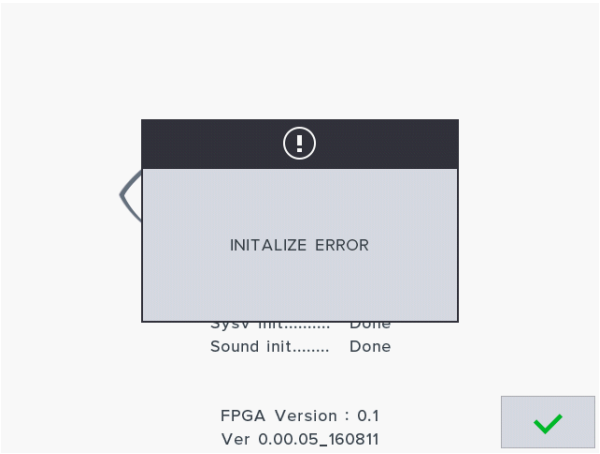
1. Connect power cable.

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

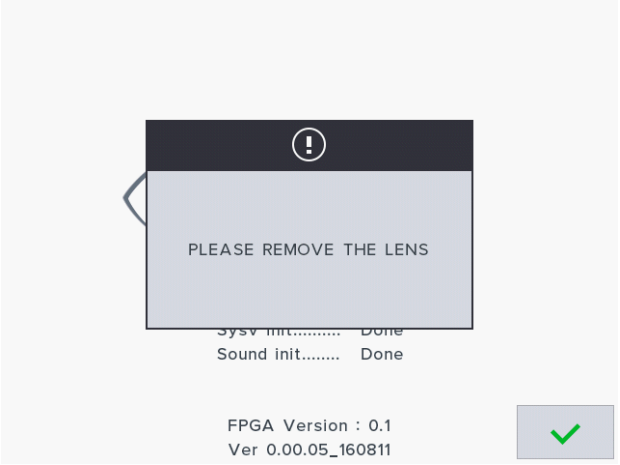
2. Inspect initial state.

   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, LCD 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:



[Screen showing an initialize error (1)]



[Screen showing an initialize error (2)]

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: Screen showing an initialize error (1)], check to see there are any objects placed on the lens cap or pinhole, and remove if there is any. Press “V” 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: Screen showing an initialize error (2)], remove the lens from the lens cap, and press “V” button to enter to measurement screen.

d. If S, C and A are not 0, clean the pinhole (Refer to Chapter 10.6 ‘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

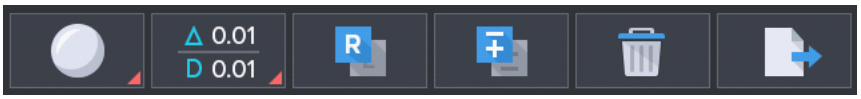
Screen saver will start automatically after a few minutes of non-operation. Screen saver protects display unit by constantly changing the screen. Press 1~6 button or press MEM button (save button) to go back to measurement screen. Do not turn off screen saver from Set up screen without any apparent reason.

7

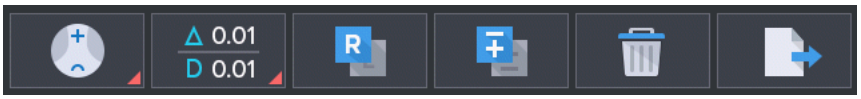
Button Composition

7.1. Button Composition According to Measuring Mode

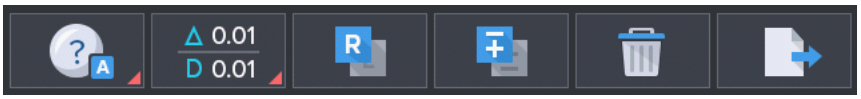
- General Lens Measurement Screen Buttons



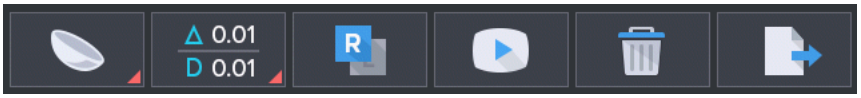
- Progressive Lens Measurement Screen Buttons



- Auto Detect Mode(General/ Progressive Lens) Screen Buttons



- Contact Lens Measurement Screen Buttons



[Screen change according to button selection]

7.2. Use of Buttons



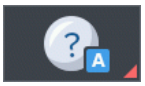
General Lens

Screen to measure general lens (including lens for sunglasses)



Progressive Lens

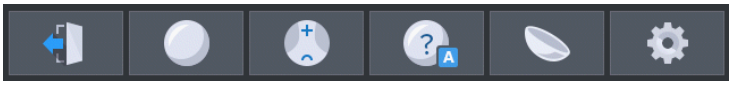
Screen to measure progressive multifocal lens

 **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**

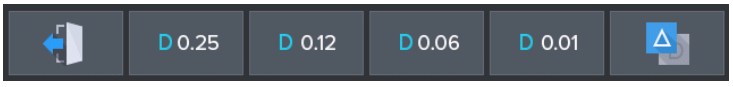
Screen to measure contact lens

 **Change the mode**

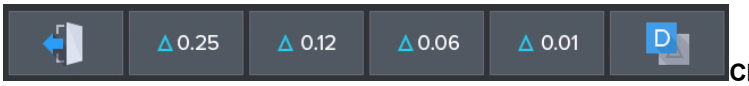
Change screen to general lens measurement mode, progressive lens measurement mode, auto detect mode, contact lens measurement mode, User Setup mode.

 **STEP**

Display the Prism (Δ), Diopter (D) step. (0.25, 0.12, 0.06, 0.01)

 **Change the Diopter Step**

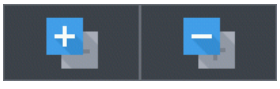
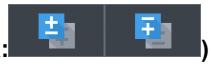
You can change the diopter(S, C, ADD) value (unit: 0.25, 0.12, 0.06, 0.01) without entering the user setup screen, immediately.

 **Change the Diopter Step**

You can change the prism(S, C, ADD) value (unit: 0.25, 0.12, 0.06, 0.01) without entering the user setup screen, immediately.

 **S→ R**

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

 **TRNS (mix:**  **)**

Reverse signs on cylinder value

 **CLEAR**

Initialize data

 **DATA TRANS**

Transmit the stored data. and deletes the data.

 **START / STOP**

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

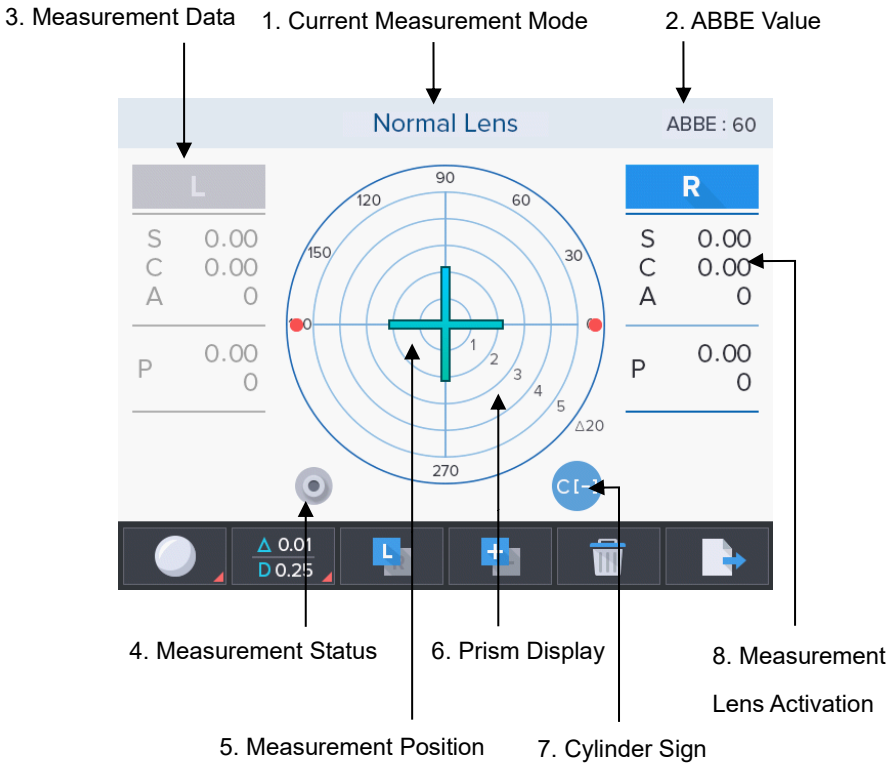
MEM (Save) Button

Save current measurement.

8

Screen Composition

8.1. Measurement Screen



[Basic screen composition]

8.1.1. Specifics

1. Current Measurement Mode

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

2. ABBE Value

   Current ABBE setting is marked.

3. Measurement Data

   Measurement data is marked. Each article signifies the below.
   - S : Basic refraction
   - C : Cylinder
   - A : Cylinder axis
   - P : Prism X, Prism Y
   - ADD (for Bi focal lens) : Progressive power 1, Progressive power 2

4. 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.

5. Measurement Position

   The position currently being measured is marked with a cross mark.
   -  (Orange color): Center is aligned within 0.6 prisms.
   -  (Bluish green color): Center is precisely aligned, and measuring point can be marked after angle adjustment.
   -  (Purple color): Indicates a place being measured.

6. Prism Display

   Display the prism zone on screen.

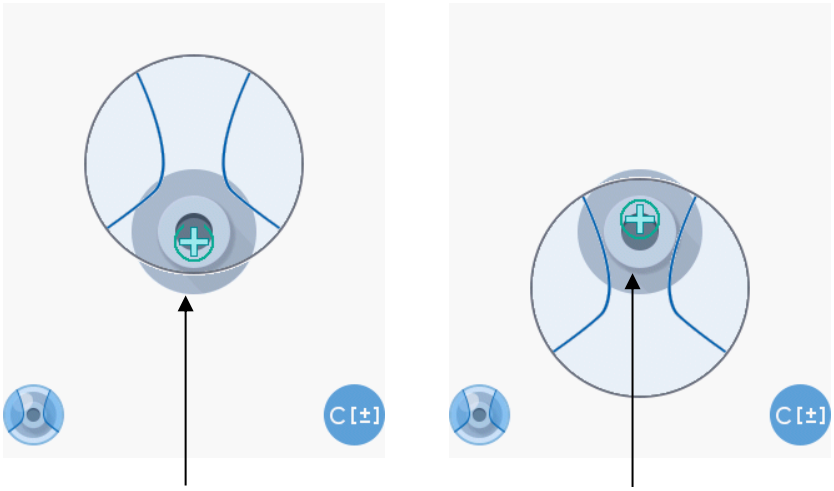
7. Cylinder Sign

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

8. Measurement Lens Activation

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

8.2. Progressive Lens Screen



1. Distance Viewing Zone Measurement Position

2. Near Viewing Zone Measurement Position

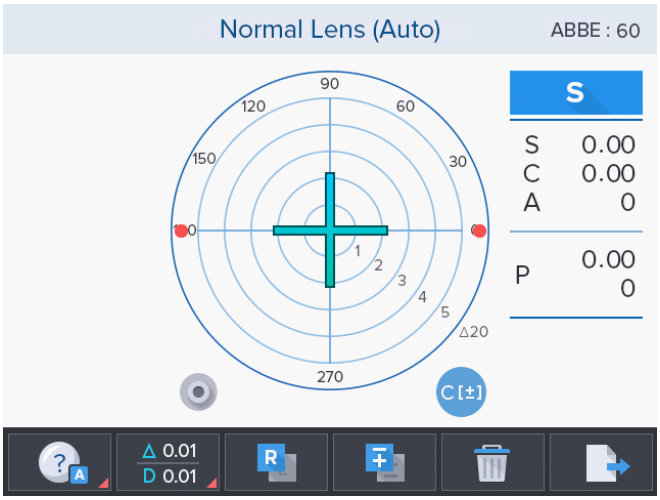
[Progressive lens screen composition]

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

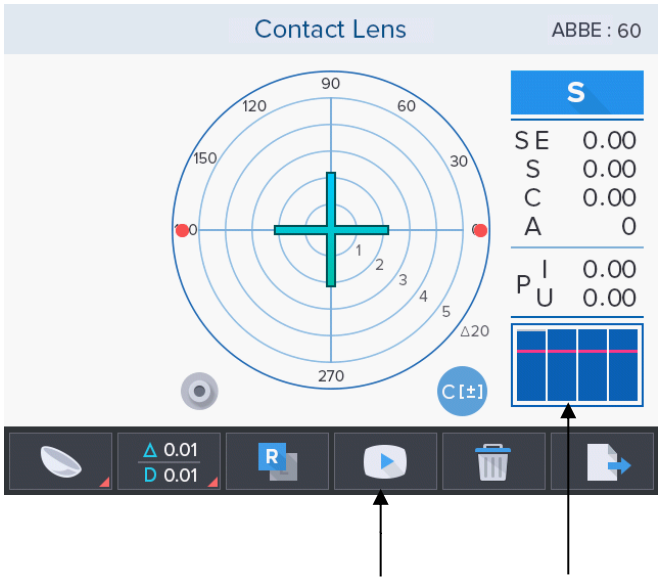


[Auto detect mode screen composition]

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



[Contact lens screen composition]

8.4.1. Specifics

1. Start/Finish Saving

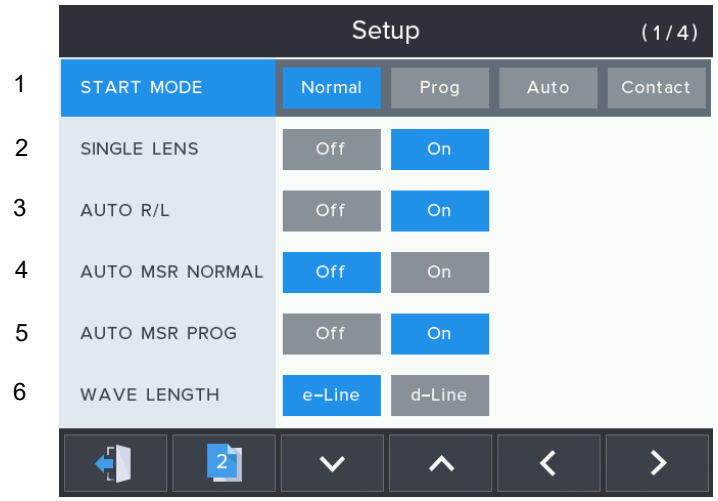
   Start recording results of consecutive measurement. Start saving button will change its shape to finish saving button after pressing it. (Finish: Average of all measurement results are calculated and saved.)

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. Setup Screen

8.5.1. Specifics



[Setup screen composition (1/4 page)]

1. START MODE

   Select the initial measurement mode.
   - Normal: Select the initial measurement mode to normal lens measurement mode.
   - Prog: Select the initial measurement mode to progressive lens measurement mode.
   - Auto: Select the initial measurement mode to auto detect mode.
   - Contact: Select the initial measurement mode to contact lens measurement mode.

2. SINGLE LENS

   Enable a single lens measurement mode.
   - Off: Disable the function.
   - On: Enable the function.

3. AUTO R/L

   Choose to enable auto-determination of left/right lens function.
   - Off: Disable the function.
   - On: Enable the function.

   (Initial mode is right lens measurement mode. However, if the single lens is on, initially state is a single lens mode state.)

4. AUTO MSR NORMAL

Choose to enable a function to automatically save lens data when the center of the lens is aligned on normal lens measurement mode.

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

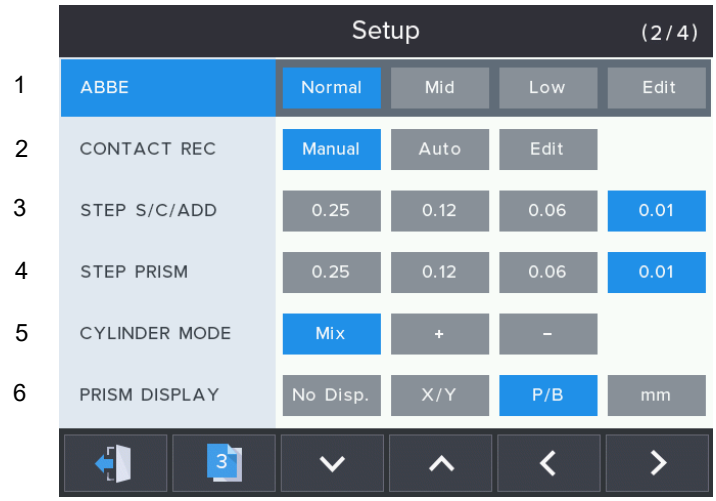
5. AUTO MSR PROG

Choose to enable a function to automatically save lens data when the center of the lens is aligned on progressive lens measurement mode.

- Off: Disable the function.
- On: Enable the function. (Both distance viewing zone and near viewing zone data will be saved.)

6. WAVE LENGTH

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

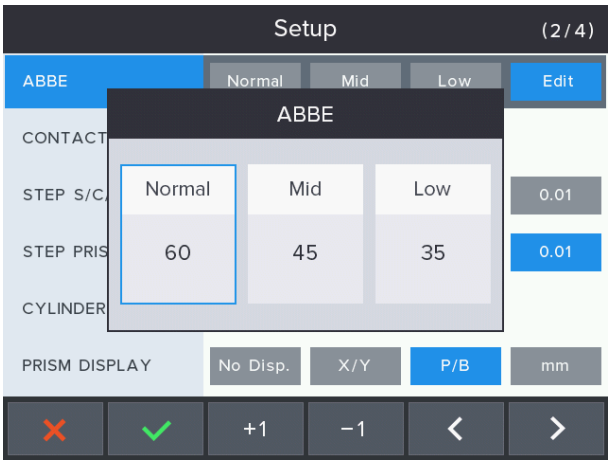


[Set up screen composition (2/4 page)]

1. 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)
- Edit: Mark ABBE constant Normal, Mid, Low. (Refer to Picture ABBE)

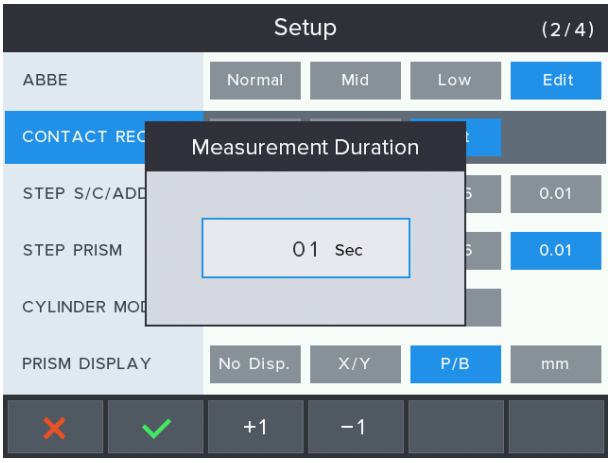


[Set up screen composition – ABBE (ABBE: Edit)]

2. 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.
- Auto: Start/stop contact lens measurement during the duration user has set (unit: second).
- Edit: Duration setting for consecutive measurement can be done on Edit screen. (Refer to Picture Measurement Duration)



[Set up screen composition – Measurement Duration (CONTACT REC: Edit)]

3. STEP S/C/ADD

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

4. STEP PRISM

Set 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.

5. 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.

6. 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.



[Set up screen composition (3/4 page)]

1. PRISM DIRECTION

   Set direction of cross mark movement on measurement screen.
   - Comfort (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.

2. SLEEP MODE

   Enable/disable screen saver function.
   - Off: Disable the function.
   - 3min: Set the function with 3minute.
   - 5min: Set the function with 5minute.
   - 10min: Set the function with 10minute.

3. LANGUAGE

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

4. RS-232C (COM)

   Set RS-232C (COM) (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.

5. BPS

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

6. COMM PRINT

   Set to print out by connecting with HRK series.
   - Off: Disable the function.
   - On: Enable the function.



[Set up screen composition (4/4 page)]

1. 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.

2. COLOR SETTING

   Adjust color temperature of LCD display.
   - Edit: COOL ~ WARM.

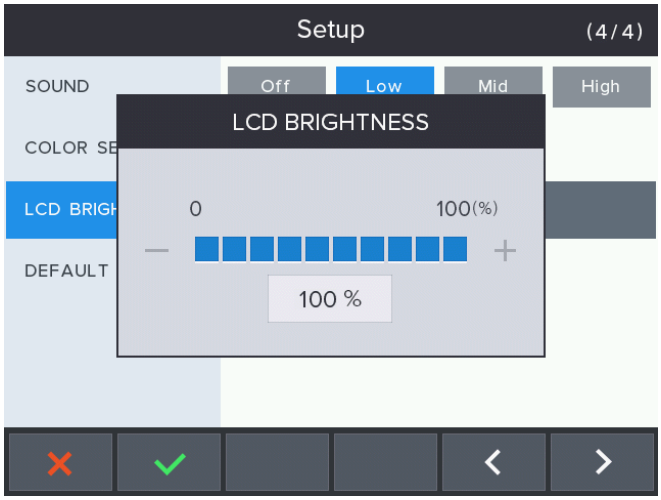


[Set up screen composition – COLOR SETTING (Color Setting: Edit)]

3. LCD BRIGHTNESS

Adjust brightness of LCD display.

- Edit: 10% ~ 100%.

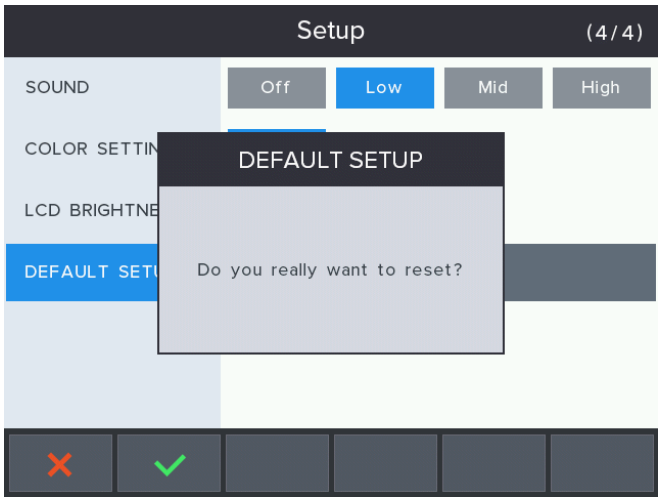


[Set up screen composition – LCD BRIGHTNESS (LCD Brightness: Edit)]

4. DEFAULT SETUP

Initialize the user setup data to default value.

- Reset: Do you really want to reset?



[Set up screen composition – DEFAULT SETUP (Default Setup: Reset)]

5. QR CODE

Set the measured data to be displayed on the screen as a QR Code.

- Off: Disable the function.
- On: Enable the function.
  (The QR CODE is displayed as WaveLine type (one-way communication protocol).)

```
$
LM2RK   No=00073   R: S=-06.00 C=-01.00 A=161
PX=+00.13 PY=+02.38 PD=00.0 ADD=+0.00 UR=  0
L: S=-06.00 C=-01.00 A=138 PX=-00.13 PY=-00.13
PD=00.0 ADD=+0.00 UL=  0   E
$
```

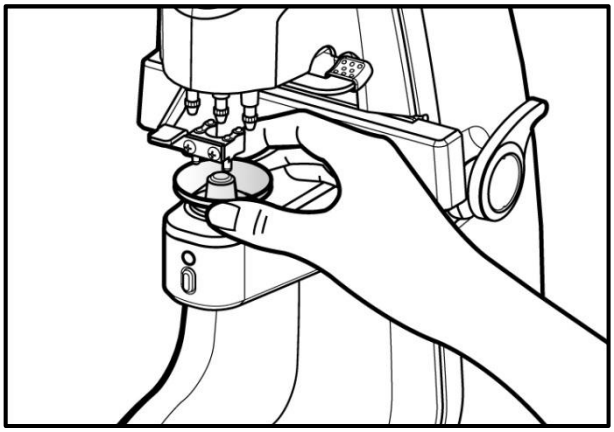
- On-View: Enable the function.
  (The QR code is displayed in the same way as printed on paper when scanned with the QR/Barcode APP on the phone.)

```
NAME:
NO.00073
DATE/TIME:
LENS:NORMAL

 <RIGHT>
SPH: -0.75
CYL: -0.75
AXS:120
PSM:  0.75
      248

 <LEFT>
SPH: -0.75
CYL: -0.75
AXS:135
PSM:  0.25
      252

=========================
     HLM-1
   Huvitz Co.,Ltd.
    +82-31-442-8868
```

9

Measurement

9.1. General Lens

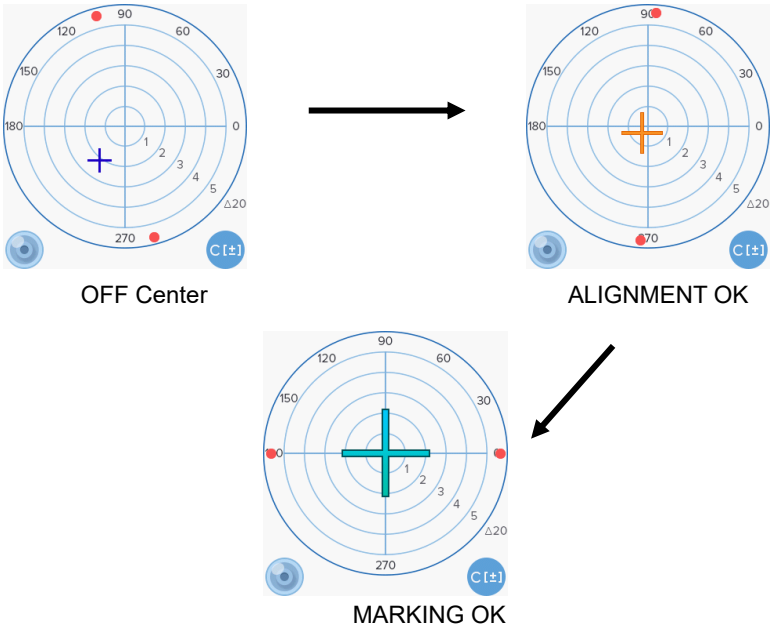


[How to measure a general lens]

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 ‘SINGLE LENS’ function is set to ‘Off’ 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.
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.



[Focus adjustment]

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.

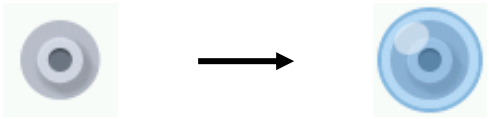
INFORMATION

‘AUTO MSR NORMAL’ 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

[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

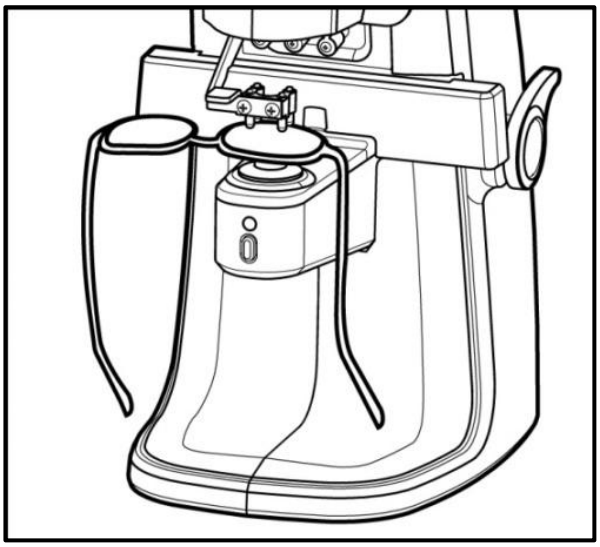
A drawing of the lens cap with a lens will be displayed on the bottom left corner of the screen when a lens with power is placed.

CAUTION

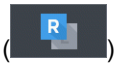
After placing a lens on the lens cap, do not apply sudden pressure towards the downside, or make a rapid movement to avoid damaging/breaking the lens. Move the lens slowly and carefully.

Après avoir placé un objectif sur le capuchon de l'objectif, n'appliquez pas de pression soudaine vers le bas ou ne faites pas de mouvement rapide pour éviter d'endommager / casser l'objectif. Déplacez l'objectif lentement et avec précaution.

9.2. Eyeglass Lens



[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

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

1. L'écran de résultat des données activées indique l'objectif actuellement mesuré, et l'écran inactivé indique l'objectif latéral opposé.

2. When Measuring, the lens direction should be measured in the same direction as [Picture: Eyeglass lens measurement] above, incorrect direction may give wrong result.

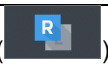
2. Lors de la mesure, la direction de l'objectif doit être mesurée dans la même direction que [Image: mesure de l'objectif de lunettes] ci-dessus, une direction incorrecte peut donner un résultat incorrect.

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

4. ‘Adjust focus until ‘MARKING OK’ is displayed. Press ‘MEM’ button to save the measurement.

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

CAUTION

When ‘SINGLE LENS’ function is On, press ‘S->R’ button () to select a lens to measure.

Lorsque la fonction ‘LENTILLE SIMPLE’ est activée, appuyez sur le bouton ‘S-> R’ () pour sélectionner un objectif à mesurer.

6. Adjust focus until ‘MARKING OK’ is displayed. Press ‘MEM’ button to save the measurement.

CAUTION

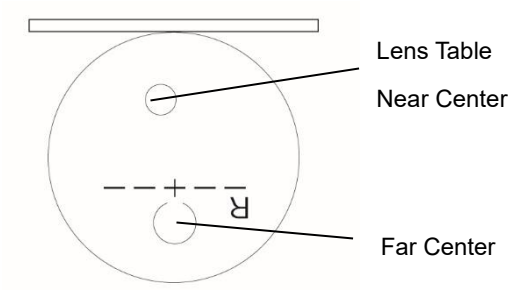
If ‘AUTO RL’ function enabled to On, make sure the ‘no lens’ icon is displayed on the bottom left corner of the screen after right lens measurement is completed before placing the left lens for Auto RL function to work properly.

Si la fonction «AUTO RL» est activée, assurez-vous que l'icône «pas d'objectif» s'affiche dans le coin inférieur gauche de l'écran une fois la mesure de l'objectif droite terminée avant de placer l'objectif gauche pour que la fonction Auto RL fonctionne correctement.

9.3. Progressive Multifocal Lens

9.3.1. Structure of Progressive Multifocal Lens

< A lens before processing >



[Structure of single progressive lens]

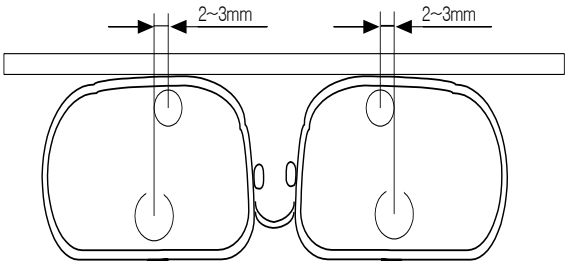
INFORMATION

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

INFORMATION

As shown on the [Picture: Structure of single progressive lens] above, distance viewing zone of the lens shall be placed near the lens table.

< Framed Lens >



[Structure of framed progressive lens]

INFORMATION

Sizes of progressive multifocal lenses vary according to manufacturers.

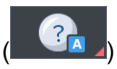
INFORMATION

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.

INFORMATION

If lensmeter is operated with sensitive measuring when put on the progressive lens using auto measurement, The best way of progressive measurement is that putting on the lens in () with using lens holder.

9.3.2. Judgment of Progressive Multifocal Lens

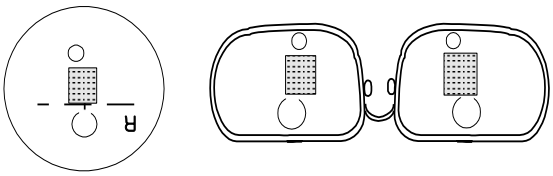
1. Make sure the icon on the bottom left of the screen is the same as the picture on the right.



2. Place the lens on the lens cap and wait for 1~2 seconds.

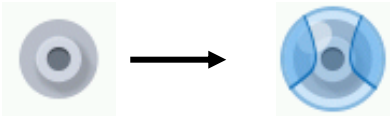
INFORMATION

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



[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.



[Change of status icon]

INFORMATION

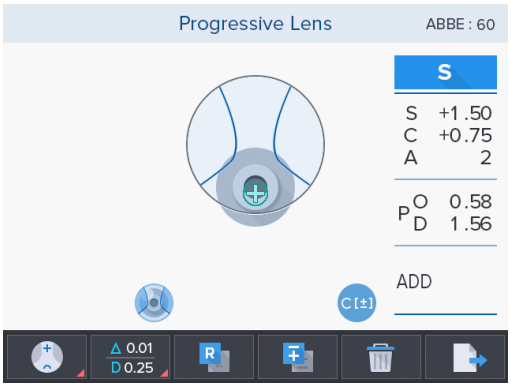
When progressive power is smaller than 1D, automated judgment might not work. In such cases, press current Measurement Mode button () to change to progressive lens measurement mode manually.

INFORMATION

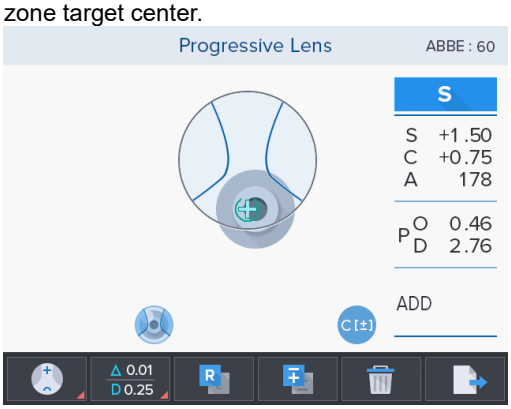
If the lens was not placed properly on 2, it will be displayed as general lens on 3.
In such cases, move the lens to progressive band, and it will be converted to progressive lens measurement screen.

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

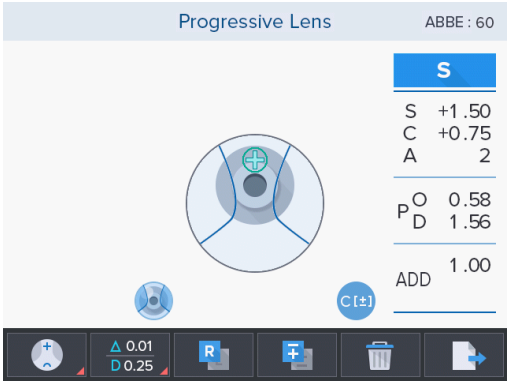
If the lens was not placed properly on 2, it will be displayed as general lens on 3.
In such cases, move the lens to progressive band, and it will be converted to progressive lens measurement screen.

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.



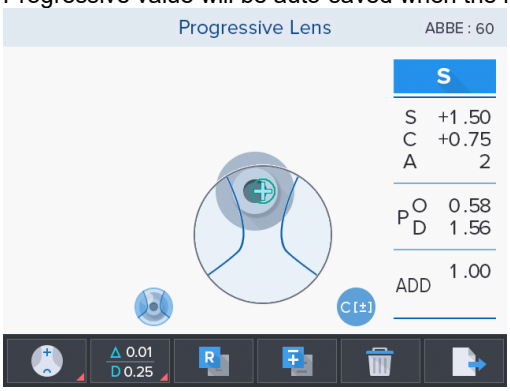
INFORMATION

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.

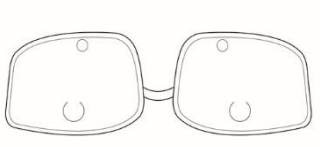


INFORMATION

(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 : Small eyeglass lens])

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 : Small eyeglass lens])



Case 1 Case 2

[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.

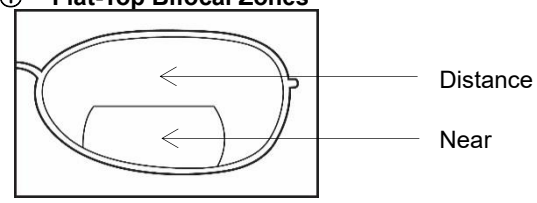
Cause 1	It can be because distance viewing zone center was measured incorrectly.
Countermeasure	Measure the distance viewing zone center again.

9.4. General Multifocal Lens (Bifocal Lens / Trifocal Lens)

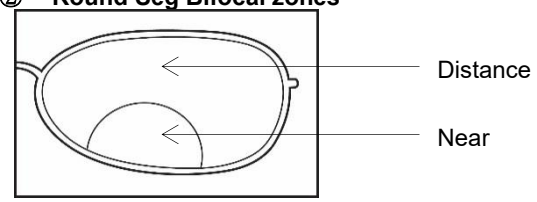
9.4.1. Structure of General Multifocal Lens

BIFOCAL LENS

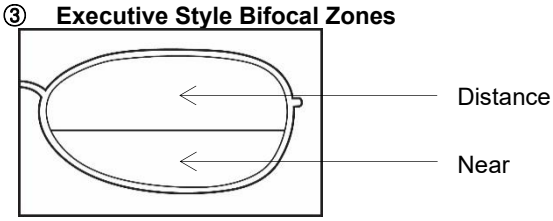
① **Flat-Top Bifocal Zones**



② **Round Seg Bifocal zones**

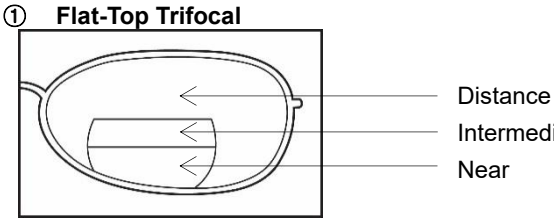


③ **Executive Style Bifocal Zones**

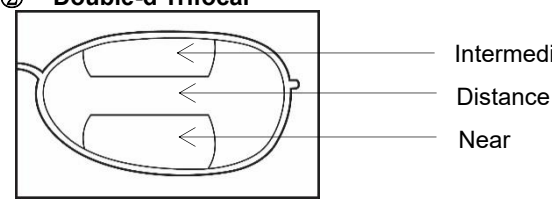


TRIFOCAL LENS

① **Flat-Top Trifocal**

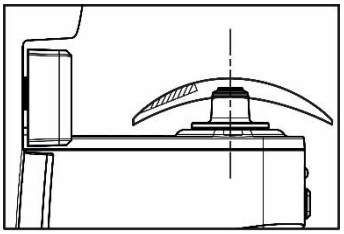


② **Double-d Trifocal**

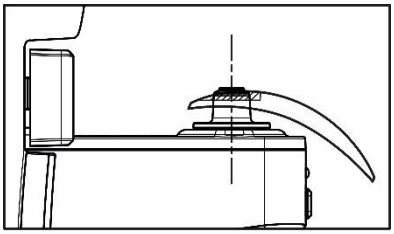


9.4.2. Measurement on General Screen

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



2. Place a lens on the second focal center. 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. You wish to set second ADD value, press ‘MEM’ button.

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

INFORMATION

It is not necessary to align lens again when you measure Multifocal Lens.
Measure the near add power without removing the Multifocal Lens from lens support.

9.4.3. 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

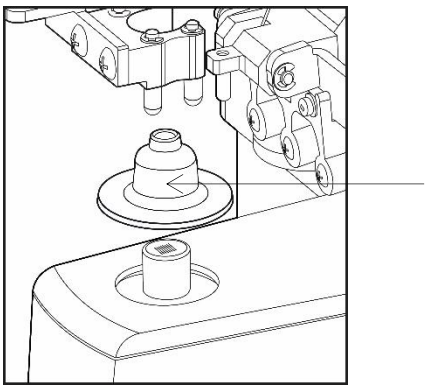
If auto-measurement does not work on each stage, or if you want to measure manually, press 'MEM' button to progress to the next step.

9.5. Contact Lens

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

9.5.1. measurement

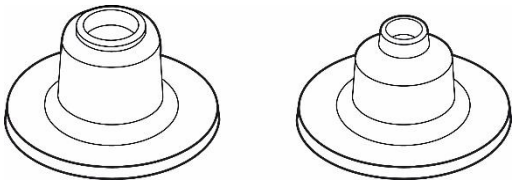
1. Replace the lens support for Contact lenses.



INFORMATION

- There are two types of lens supports as shown below. Use it according to the purpose.

- Normal Lens support and Contact lens support can be divided into the hole size on top.



<For Normal Lens> <For Contact Lens>

2. Remove moisture of contact lens using a clean lens towel.
   In the case of Soft Contact Lens, It can be torn easily. So, remove moisture with touches lightly.

3. Place the lens on the Contact Lens Support. The convex surface shall face the top.

4. Adjust so the cross mark on the screen is located on the center of the concentric circle.
   Push or Pull the end of Contact lens lightly with tweezers or hands.

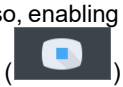
INFORMATION

- If moisture is left on the contact lens, moisture can cause measurement data errors.

- If you measure within 5 seconds after removing the contact lens moisture, you can increase the measurement accuracy.

5. 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.

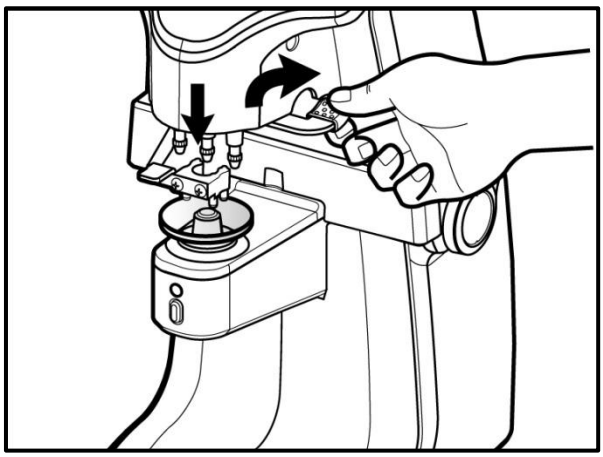
9.6. Measuring Point Marking

9.6.1. 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.



[How to mark a measuring point]

9.6.2. 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.

9.7. Prism

1. Change to prism display format (X/Y, P/B, 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

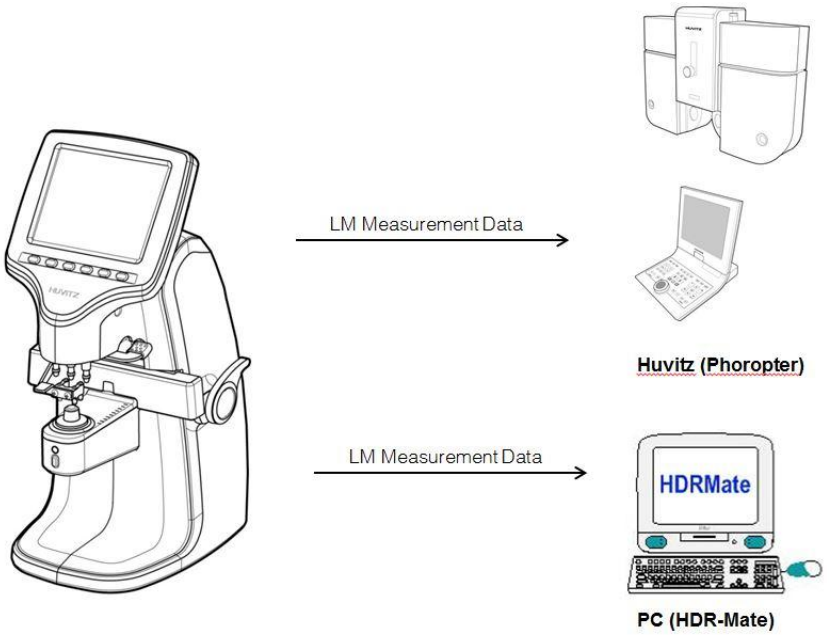
9.8. Measurement Data Transmission using Serial

The measured data can be transmitted externally via the serial communication and can be transmitted to HDR (phoropter), HRK (Ref/Keratometer) and PC using HDR-Mate.

You can use the transferred data on PC side using HDR-Mate (optional).

9.8.1. Connection

1. HLM → Connection using RS232 serial cable → HDR (phoropter), HRK (Ref/Keratometer).
2. HLM → Connection using RS232 serial cable(HLM) and serial to USB gender(PC) → HDR (phoropter)



9.8.2. Operating procedure

After measurement, you can press 6 key to operate as follows.

1. RK Print

When the RK Print option is set to "On", the data for printing is transmitted with HRK (Ref/Keratometer).

In this case, you do not send additional data by setting "Off" of RS232 option.

* HRK products supporting RK print: HRK-1, HRK-9000, HRK-8000, HRK-7000, HRK-7000a

2. Data Transmission

It transmits data to the connected device by the protocol selected in RS232 option. In this case, you do not perform additional RK print operation by setting "Off" of RK Print option.

3. RK Print + Data Transmission

For HRK-1, both RK print and data transmission functions can be supported using Y-cable (optional). In this case, you need to set the RK Print option "On" and set the RS232 option to the desired protocol. Please refer to HRK-1 manual (p. 64~65) for more information using Y-cable.

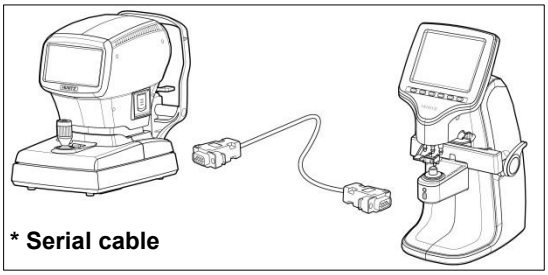
9.9. Print (HRK Print)

It is possible to print measured data using the printer of the connected HRK.
Connectable devices: HRK-1, HRK-9000A, HRK-8000A, HRK-7000/7000A

```
DATE : 2000/01/00   00:03

[RIGHT]            [LEFT]
 -5.00      SPH     -5.00
  0.00      CYL      0.00
    0       AXS        0
  1.88      PSM      1.86
    40                 65

          HLM-1
```

[Sample]

1. Connect the HRK to the serial connector of the HLM-1 with the serial cable.



[Connecting procedures]

CAUTION

Be sure to turn off each device before connecting the serial cable, etc.

Connecting the cable with power on may cause malfunction.

Assurez-vous d'éteindre chaque appareil avant de connecter le câble série, etc.
Le branchement du câble sous tension peut entraîner un dysfonctionnement.

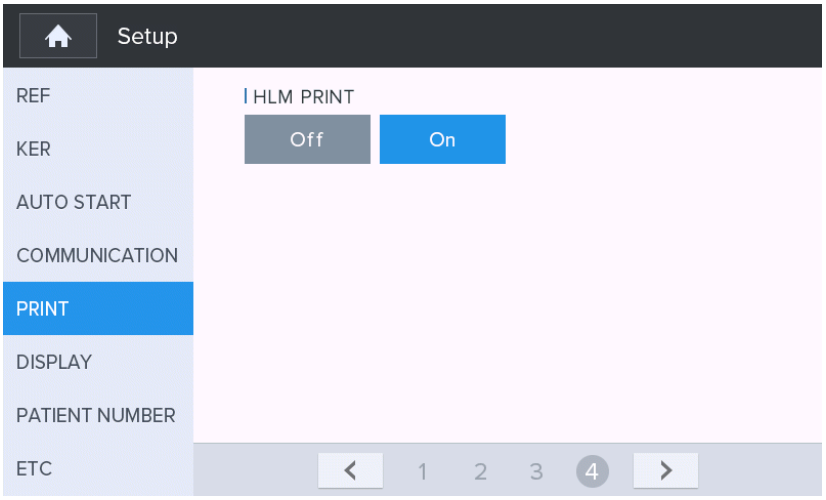
<Setup procedures>

Set the following parameters on the HLM-1 and HRK.

1. Set the following parameters related to communications on the HLM-1.
   - RS-232C (COM): LMTORK, BPS: 115200, COMM PRINT: On



2. Set the following parameters on the HRK.
   - HLM PRINT: On


Setup
REF
KER
AUTO START
COMMUNICATION
PRINT
DISPLAY
PATIENT NUMBER
ETC
HLM PRINT
Off
On
1
2
3
4

10

Self-diagnosis and maintenance/repair

10.1. Before 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 “V” 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 “V” button to enter to measurement screen.

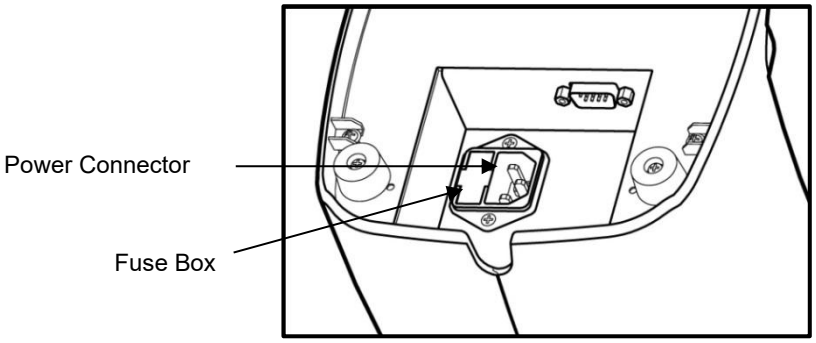
2. Message during measurement

Message	Root causes	Measures
Measuring Error	Indicates when the signal of the measurement is poor. - It is displayed when there is no signal. - It is displayed when there is out of range signal.	Clean the lens cap or pinholes, and be measured again.

3. Message when data transmitting

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

10.2. Fuse Replacement



[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-1 uses a 250V, T3.15AL fuse.

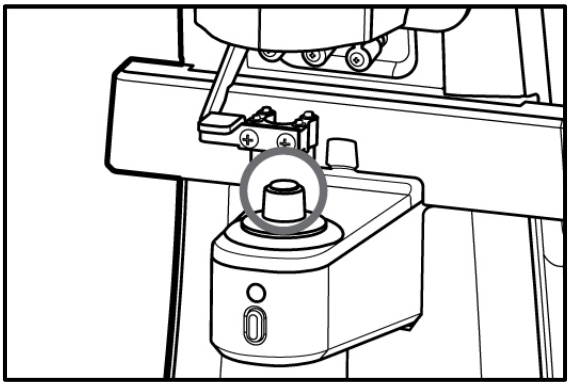
10.3. Storage

While not use, cover up the device with the dust cover as shown in [Picture: How to store while not use] for storage.



[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: For long-term storage].



[For long-term storage]

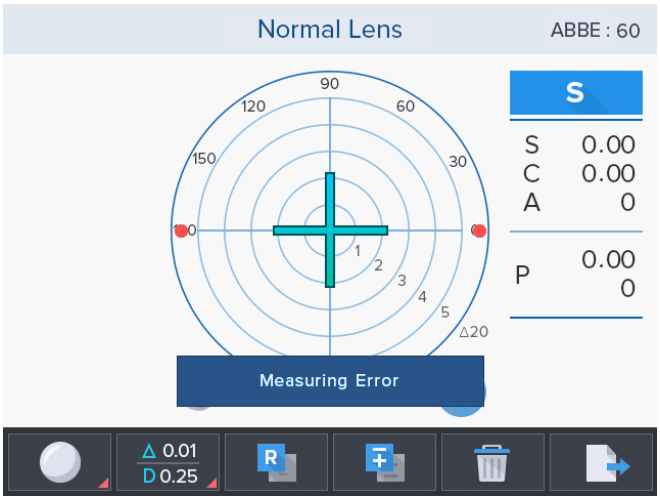
10.4. Disposal

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.

10.5. Various Messages

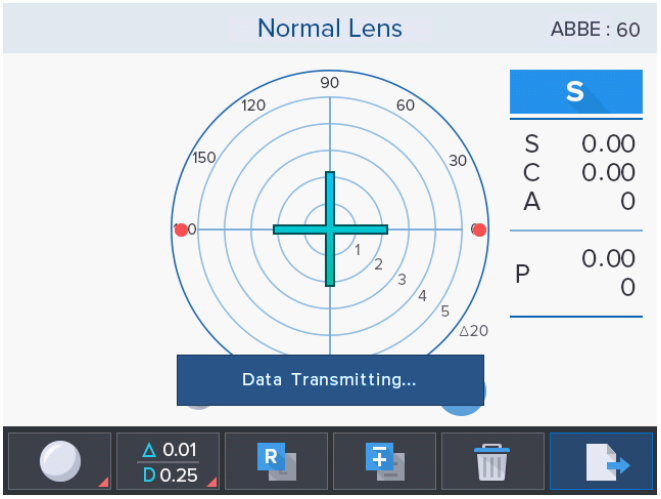
Message box shows information when you are measuring or this instrument is out of order.



[Measuring Error screen]

Measuring Error

- It is displayed when there is no signal.
- It is displayed when there is out of range signal.



[Data Transmitting… screen]

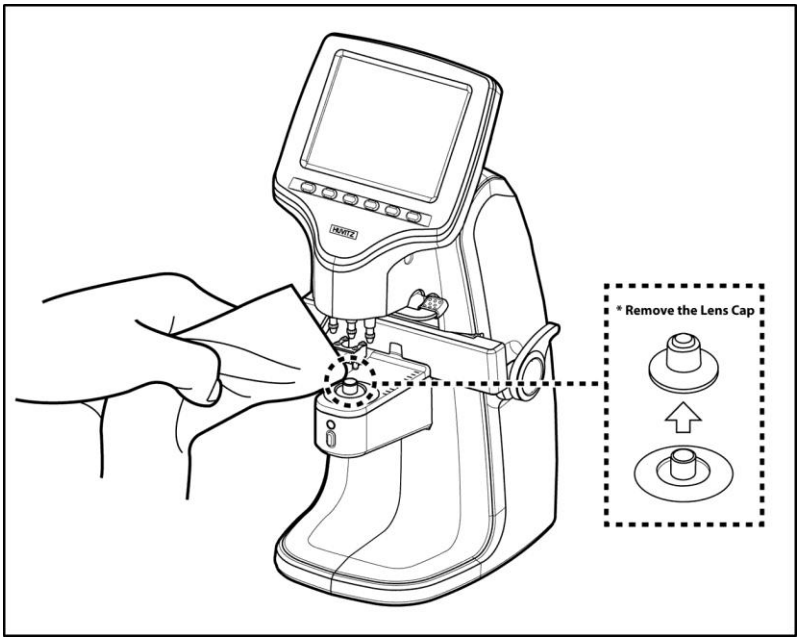
Data Transmitting…

- It shows a state while the data transmission.

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

10.6. 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: How to clean the pinhole]. Do not use liquid such as alcohol or acetone.



[How to clean the pinhole]

⚠ CAUTION

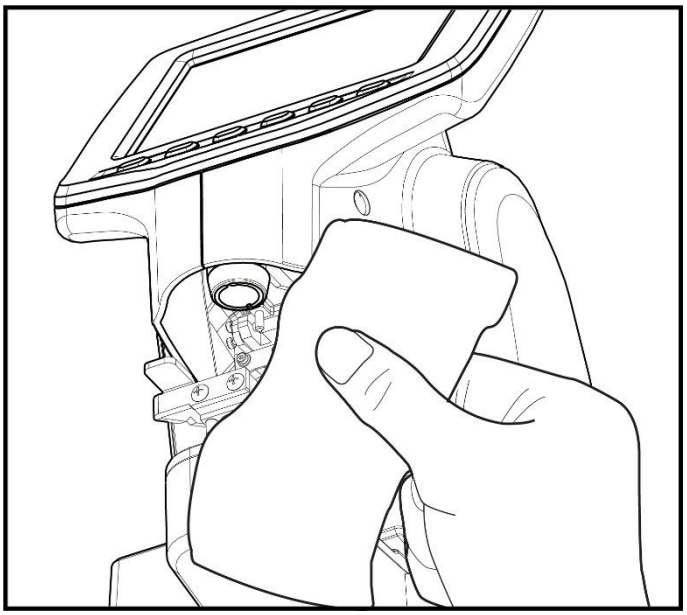
Do not use liquid such as alcohol or acetone as it can dissolve the adhesive on the pinhole.

N'utilisez pas de liquide tel que de l'alcool ou de l'acétone car cela peut dissoudre l'adhésif sur le trou d'épingle.

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

10.7. How to Clean the Lens

If the S, C and A values are not 0 when the equipment starts up, clean the Lens. Wipe using a clean lens towel as sown in [Picture: How to clean the Lens]. Do not use liquid such as alcohol or acetone.



[How to clean the Lens]

⚠ CAUTION

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

N'utilisez pas de liquide tel que de l'alcool ou de l'acétone car cela peut dissoudre l'adhésif.

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

11

Major Specification

- **Measurement Range**

Spherical Power	0D ~ ±25D (0.25/0.12/0.06/0.01)
Cylinder Power	0D ~ ±10.00D (0.25/0.12/0.06/0.01)
Cylinder Axis	0° ~ 180° (1° step)
Progressive Power	0 ~ 10D (0.25/0.12/0.06/0.01)
Prism	0 ~ 20Δ (0.25/0.12/0.06/0.01)

- **Measurement Mode**

Cylinder	±, + , -
Prism	Rectangular / Pole / Displacement
LED wave	525 nm (Green)
Contact Lens	Hard / Soft Contact Lens
Abbe value	Manual Revision
Wave	e-Line, d-Line
Screen	5.7”Color LCD Panel (640*480)
Interface	RS-232
Communication Speed (BPS)	9600, 57600,115200 bps
Product Size	182(W) x 235(D) x 415(H) mm
Product Weight	4.0Kg
Power Supply	AC 100 - 240 V ~, 50/60Hz, 0.3-0.2A

12

EMC Information

Manufacturer announcement – electromagnetic waves trouble

- **Electromagnetic waves trouble**

  HLM-1 should be used in the below mentioned electromagnetic wave environment. HLM-1 purchaser or user needs to confirm whether HLM-1 is used in this type of environment.

Trouble test	Question of appropriateness
RF emissions CISPR 11	Group 1
RF emissions CISPR 11	Class B
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-1 is to be used in the below designated electromagnetic wave environment. HLM-1 customer and user need to guarantee that the HLM-1 will be used in this type of environment.

Tolerance test	IEC 60601 test level	Appropriateness level
Electrostatic discharge(ESD) IEC 61000－4－2	contact ±8 kV in the air ±15 kV	contact ±8 kV in the air ±15 kV
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
Surge IEC 61000－4－5	between lines ±1 kV between line and grounding ±2 kV	differential mode ±1 kV common mode ±2 kV

Voltage dip, instantaneous interruption, voltage fluctuation at the power input line IEC 61000－4－11	For 0.5 cycle < 5 %*U*T(*UT's* > 95 % decrease) For 5 cycle 40 %*U*T(*UT's* 60 % decrease) For 25 cycle 70 %*U*T(*UT's* 30 % decrease) For 5 seconds < 5 % *U*T(*UT's* > 95 % decrease)	For 0.5 cycle < 5 %*U*T(*UT's* > 95 % decrease) For 5 cycle, 40 % *U*T(*UT's* 60 % decrease) For 25 cycle, 70 %*U*T(*UT's* 30 % decrease) For 5 seconds, < 5 %*U*T(*UT's* > 95 % decrease)
Power frequency magnetic field (50/60 Hz) IEC 61000－4－8	30 A/m	30 A/m
Other *U*T is the a.c. power voltage for before approving the test level.		

- **Electromagnetic waves tolerance**

  HLM-1 is to be used in the below mentioned electromagnetic wave environment. HLM-1 purchaser or user needs to confirm whether HLM-1 is sued at this environment.

Tolerance test	IEC 60601 test conditions	Appropriateness level
Conductivity RF electromagnetic field IEC 61000－ 4－6	3 Vrms 150 kHz~80 MHz	3 Vrms
Radioactivity RF electromagnetic field tolerance IEC 61000－4－3	10 V/m 80 MHz~2.7 GHz scope	10 V/m

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.

Date of 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.

■ **How to Contact Huvitz Co., Ltd.**

■ **Huvitz Co., Ltd.**

38, Burim-ro 170beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 14055, Republic of Korea

Tel: +82-31-428-9100 Fax: +82-31-477-9022(F/A)

E-mail : svc@huvitz.com website : www.huvitz.com