

AL700

Automatic Lensometer®

User's Guide

Reichert
TECHNOLOGIES

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Introduction

Congratulations on the purchase of your new AL700 Automatic Lensometer®.

The AL700 will provide you with fast, accurate and reliable measurements of eyeglass lenses for many years. The instrument has an innovative microprocessor controlled lens measurement system that reduces operator error and provides precise, repetitive measurements for single, multifocal, and progressive lenses. The AL700 also allows you to take Pupillary Distance and Ultraviolet Light Transmittance measurements.

This User's Guide is designed as a training and reference manual for operation, maintenance and trouble-shooting. To ensure optimum performance of your new AL700, we recommend that you read the manual carefully prior to use and follow the instructions.

Note: Words in all capital letters reference menu choices.

Note: Words in initial capital letters reference parts shown in the Parts Identification section of this manual. Also initial capitals are used when referencing menu options on the LCD Screen.

Note: Underlined words reference a specific section of this manual.

Please retain this manual for future reference and to share with other users. To obtain additional copies, contact your authorized Reichert, Inc. dealer, or the Reichert Customer Service Department at:

- Tel: (716) 686-4500
- Toll Free: (888) 849-8955
- Fax: (716) 686-4545
- E-mail: info@reichert.com

Warnings and Cautions

Reichert, Inc. (Reichert) is not responsible for the safety and reliability of this instrument when:

- Assembly, disassembly, repair or modification is made by unauthorized dealers or persons.
- Instrument is not used in accordance with this User's Guide.

WARNING: AN INSTRUCTION THAT DRAWS ATTENTION TO RISK OF INJURY OR DEATH.



WARNING: DO NOT LOOK DIRECTLY INTO THE UV MEASUREMENT LENS AS IT MAY CAUSE PERMANENT EYE DAMAGE.

WARNING: THE AL700 AUTOMATIC LENSOMETER® SHOULD BE USED IN STRICT ACCORDANCE WITH THE INSTRUCTIONS OUTLINED IN THIS USER'S GUIDE. THE PERFORMANCE OF THE INSTRUMENT CANNOT BE GUARANTEED IF USED IN A MANNER NOT SPECIFIED BY REICHERT, INC.

WARNING: IN ORDER TO ENSURE THAT CORRECT OPERATION OF THE INSTRUMENT IS MAINTAINED, AND TO GUARANTEE THE SAFETY AND RELIABILITY OF THE INSTRUMENT, ANY REPAIR OR SERVICE MUST BE PERFORMED BY REICHERT, INC. OR AN AUTHORIZED SERVICE AGENT OF REICHERT, INC.

WARNING: DO NOT APPLY INPUT POWER THAT EXCEEDS THE RATINGS GIVEN ON THE DATA PLATE, OR DAMAGE TO THE INSTRUMENT MAY OCCUR.

CAUTION: AN INSTRUCTION THAT DRAWS ATTENTION TO THE RISK OF DAMAGE TO THE PRODUCT.



CAUTION: ANY REPAIR OR SERVICE TO THE AL700 MUST BE PERFORMED BY EXPERIENCED PERSONNEL OR DEALERS WHICH ARE TRAINED BY REICHERT SO THAT CORRECT OPERATION OF THE AL700 IS MAINTAINED.

CAUTION: DO NOT INSTALL ANY ADDITIONAL SOFTWARE OTHER THAN WHAT WAS SUPPLIED WITH THE AL700. INSTALLATION OF ADDITIONAL SOFTWARE MAY CAUSE UNEXPECTED OPERATION OF THE AL700, RESULTING IN MALFUNCTION OF THE AL700.

CAUTION: DO NOT REMOVE THE OUTSIDE COVERS OF THE UNIT OR ATTEMPT TO REPAIR ANY INTERNAL PARTS. REPAIR AND SERVICE OF THE UNIT MUST BE PERFORMED BY EXPERIENCED PERSONNEL OR DEALERS WHO ARE TRAINED BY REICHERT.

CAUTION: MAKE SURE THAT THE VOLTAGE APPLIED TO THE UNIT IS THE SAME AS THE VOLTAGE WHICH IS GIVEN ON THE DATA PLATE NEXT TO THE INPUT CORD RECEPTACLE OR DAMAGE TO THE UNIT MAY OCCUR.

CAUTION: PORTABLE AND MOBILE RF COMMUNICATIONS EQUIPMENT CAN AFFECT MEDICAL ELECTRICAL EQUIPMENT.

CAUTION: THIS INSTRUMENT HAS ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (ESDS) WHICH ARE SENSITIVE TO STATIC HIGH VOLTAGES STORED IN AND TRANSFERRED BY THE HUMAN BODY. OBSERVE CORRECT ESDS PRECAUTIONS OR PREMATURE MALFUNCTION OF THIS INSTRUMENT WILL OCCUR.

CAUTION: THIS INSTRUMENT MUST BE PLUGGED INTO AN OUTLET WITH AN EARTH GROUND WHICH IS CONNECTED TO THE RECEPTACLE OR DAMAGE TO THE UNIT MAY OCCUR. DO NOT DISABLE OR REMOVE THE GROUND PIN.

CAUTION: THIS INSTRUMENT IS NOT SUITABLE FOR USE IN THE PRESENCE OF FLAMMABLE ANESTHETIC MIXTURES, SUCH AS OXYGEN OR NITROUS OXIDE.

CAUTION: DO NOT USE SOLVENTS OR STRONG CLEANING SOLUTIONS ON ANY PART OF THIS INSTRUMENT OR DAMAGE TO THE UNIT MAY OCCUR.

CAUTION: USE OF ALCOHOL OR AN AMMONIA BASED PRODUCT ON THE LIQUID CRYSTAL DISPLAY (LCD) MAY CAUSE DAMAGE TO THE DISPLAY.

Symbol Information



WARNING - The lightning bolt with the arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of “dangerous voltage” within the unit’s enclosure that may be of sufficient magnitude to constitute risk of electrical shock.



CAUTION - Indicates that important operating and maintenance instructions are included in this User’s Guide.



OFF (Supply) - Indicates the Power switch is set to OFF.

ON (Supply) - Indicates the Power switch is set to ON.



Alternating Current - Indicates that this instrument operates on alternating current.



Protective Earth - Indicates that a protective earth ground is connected where the symbol is located.



Date of Manufacture.



Waste of Electrical and Electronic Equipment.



Consult Instructions for Use - Indicates that important operating and maintenance instructions are included in this User’s Guide.

Instrument Setup

Unpacking Instructions

The AL700 and its accessories are packaged so as to protect them from damage during shipment. The outer box holds an inner box that contains the AL700 instrument and an accessory box.

To unpack the AL700, follow these steps:

1. Remove the Packaging Straps from the Outer Box and cut the tape to access the inside of the box. Refer to Figure SU-1.

2. Lift the Inner Box out of the Outer Box and cut the packaging straps on the Inner Box.

3. Cut the tape to access the contents of the Inner Box. Refer to Figure SU-2.

4. Lift out the flat piece of cardboard and the Top Tray and then remove the packing form and the Accessory Box from the Inner Box. Refer to Figure SU-3.

5. Carefully remove the AL700 from the box and remove the plastic cover that protects the instrument from dirt, contaminants and cosmetic damage.

6. Remove the accessories from the Accessory Box. This box contains the following items:

    - Power cord
    - Dust cover
    - Printer Paper Roller
    - Spare printer paper
    - Three Marking Pens
    - Contact Lens Cover (for measuring contact lenses.)
    - Lens Cleaning Cloth (for cleaning the Nosepiece lens.)

Note: If any accessories are missing, please contact Reichert, Inc. at the telephone numbers listed in the Introduction section of this manual.

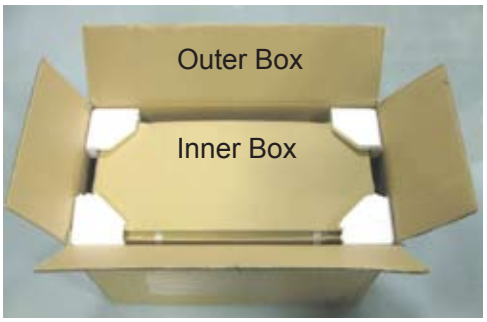


Figure SU-1 Outer Box Open

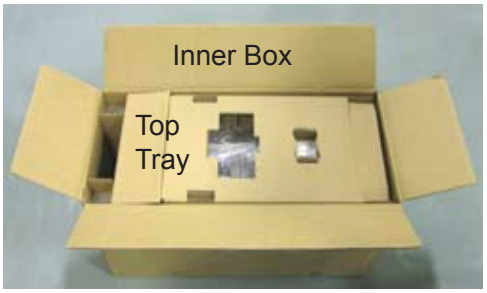


Figure SU-2 Inner Box Open



Figure SU-3 Inner Box Contents

Note: Place the packaging materials in a safe storage location in case you need to transport the unit.

Note: Please read the User's Guide before operating the AL700 so that you will be familiar with its operation.

Instrument Setup (continued)

Parts Identification

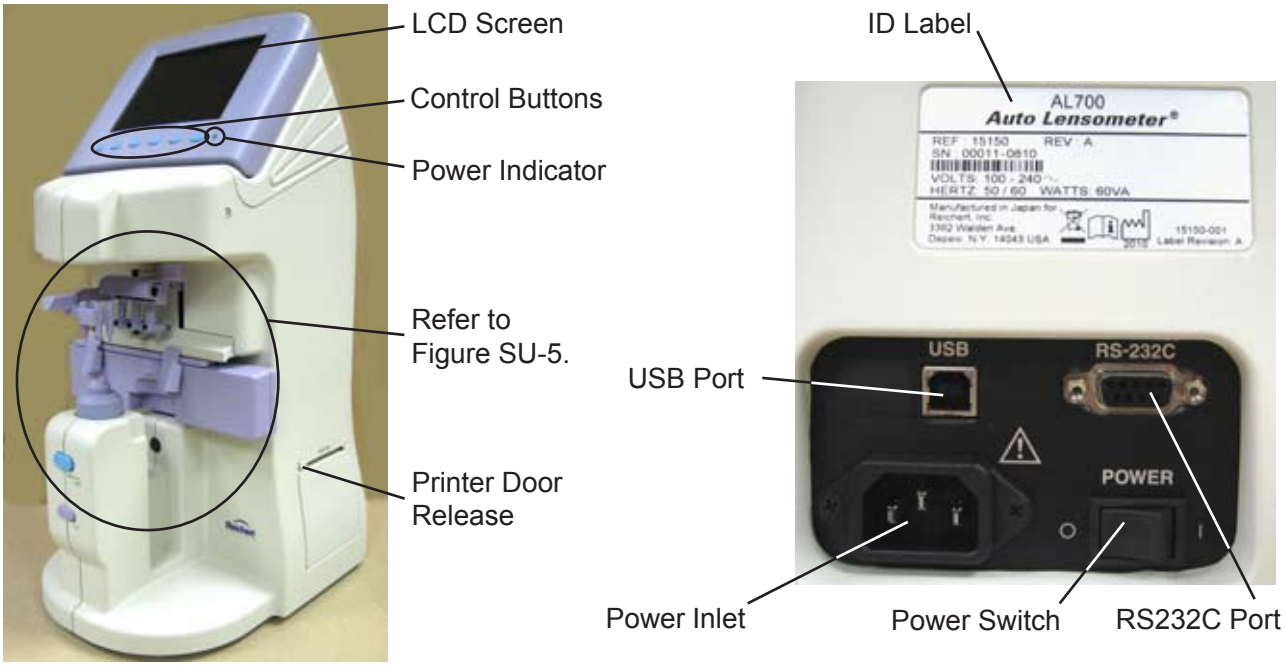


Figure SU-4 AL700 Front and Sides

LCD Screen:
Displays measurement data, operating functions, and screens.

Power Indicator:
Green LED light illuminates when you turn ON the Power switch.

Printer Door Release:
Press this button to open the Printer Door and replace the Printer Paper.

Control Buttons:
Press one of these buttons to select the corresponding icon on the LCD Screen.

ID Label:
Displays the input power requirements, Model Name and Number, Serial Number, and Reichert address.

RS-232C Port:
Attach an RS232C cable here to send patient data to a computer or other data interface using the RS232C protocol.

USB Port:
Attach a USB connector here to send patient data to a computer using the USB protocol.

Power Inlet:
Attach the power cord here.

Power Switch:
Press this switch to turn the AL700 power ON and OFF.

Instrument Setup (continued)

Parts Identification (continued)

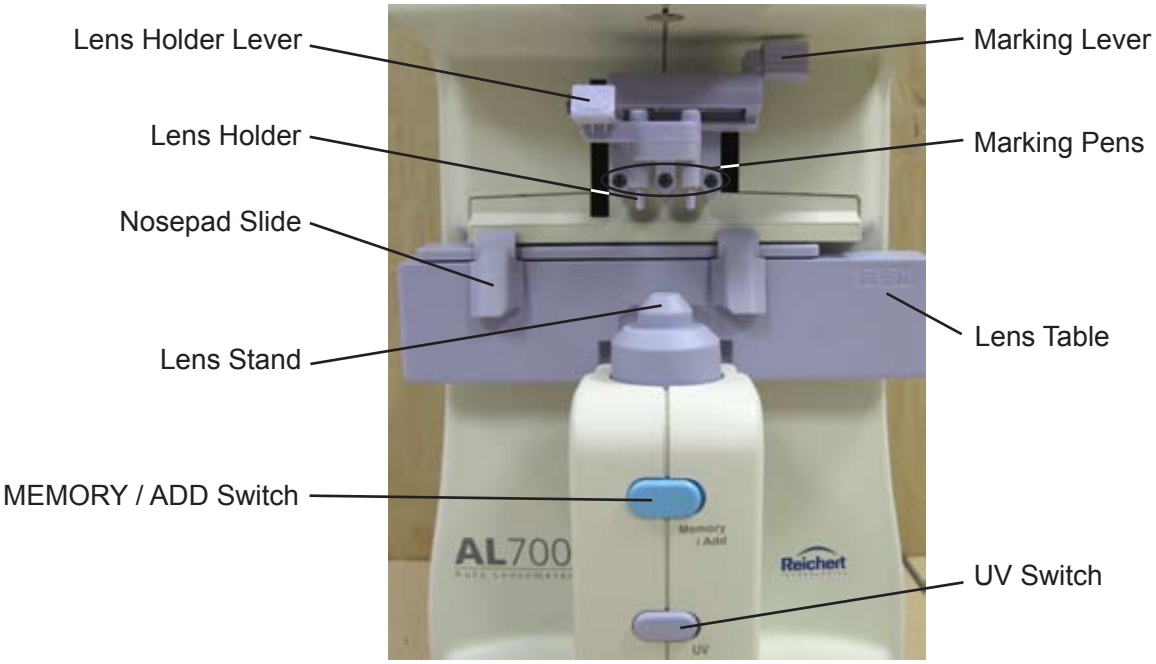


Figure SU-5 Measurement Area

Lens Holder Lever:
Use this lever to position the lens holder on the lens.

Marking Lever:
Use this lever to raise or lower the Marking Pens on the lens.

Lens Holder:
Secures the lens to the Lens Stand.

Marking Pens:
Use these pens to place ink marks on the lens.

Nosepad Slide:
Move this slide to align a nosepad with the frame being measured.

Lens Stand:
Install this cover on the Nosepiece to measure eyeglass lenses.

Contact Lens Cover:
Install this cover on the Nosepiece to measure contact lenses. (Refer to page 31.)

Lens Table:
Adjust this table against the bottom edge of the lens to help position it.

MEMORY/ADD switch:
Press this switch to manually store measurement values and to create new ADD values.

UV Measurement Switch:
Use this switch to open and close the UV Measurement Screen on the LCD display, and to turn off the UV Measurement lens.

Instrument Setup (continued)

Initialization

WARNING: DO NOT APPLY INPUT POWER THAT EXCEEDS THE RATINGS GIVEN ON THE DATA PLATE, OR DAMAGE TO THE INSTRUMENT MAY OCCUR.

Before turning on the power to the AL700, perform the following checks:

- Read the data plate located above the Input Power Panel. Verify that the available input power to the AL700 is within the listed voltage range.
- Connect the power cord to the AL700 and then connect the other end to the power source.
- Set the Power switch to the ON position (pushed in on the “I” side).
- Check the operation of the Marking Pens. Verify that the pens do not block the optical path of the measuring system, which could generate an error message.
- Adjust the LCD Screen for the optimum viewing angle.
- Install the Printer Roller and the Printer Paper as indicated in the Maintenance section of this manual.

Instrument Setup (continued)

Icons - Measurement and Progressive Screens

Icon Descriptions

The AL700 incorporates a user-friendly icon/menu-based operating system that increases the speed of measurements, training and use. The following icons appear on the Measurement and/or Progressive Screens, depending on which features have been enabled.



Left Eye Icon: Indicates that AL700 is ready to measure the left lens.



Abbe Number Icon: Displays the current Abbe number setting for the AL700.



Cylinder Icon: Displays the current cylinder measurement mode for the AL700 ("–" for minus, "+" for plus and "±" for plus/minus).



Step Icon: Displays the current measurement step setting for the AL700 (0.25D for 1/4 diopter, 0.12D for 1/8 diopter).



Lens Icon: Displays N (Normal) for non-contact lens, H for hard contacts, and S for soft contacts.



Single Lens Icon: Indicates that AL700 is ready to measure a single lens.



Right Eye Icon: Indicates that AL700 is ready to measure the right lens.



PD Left Lens: When feature is enabled, it indicates that the AL700 is ready to measure the pupillary distance for the left lens.



PD Right Lens: When feature is enabled, it indicates that the AL700 is ready to measure the pupillary distance for the right lens.



S: Spherical measurement.



C: Cylindrical measurement.



A: Axis measurement.



Px: Prism X measurement.



Py: Prism Y measurement.



PD: Pupillary Distance (PD) measurement.



Ad1: The first near point measurement.



Ad2: The second near point measurement.

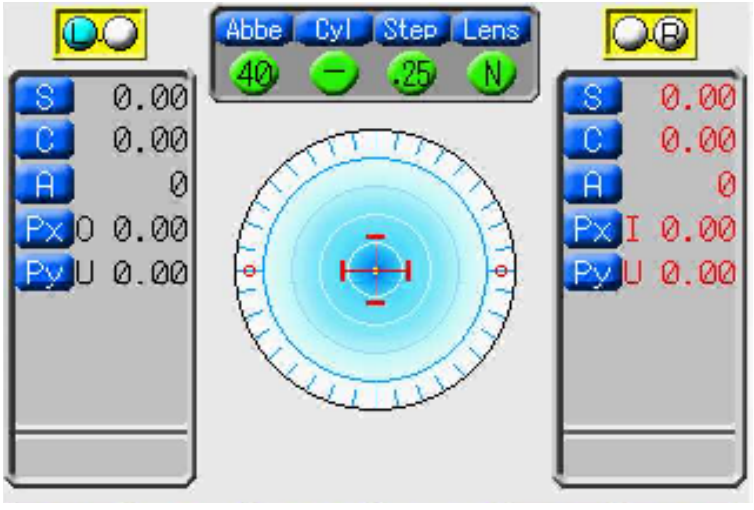


Figure SU-6 Measurement Screen Icons

Instrument Setup (continued)

Icon Definition

Control Buttons and Icons

The control buttons are a set of six buttons located below the LCD screen. Each button corresponds to an icon directly above it on the screen. To activate the icon feature, press the control button.

Note: The icons above the control buttons will change, depending on the screen that is open and on the features that are enabled.

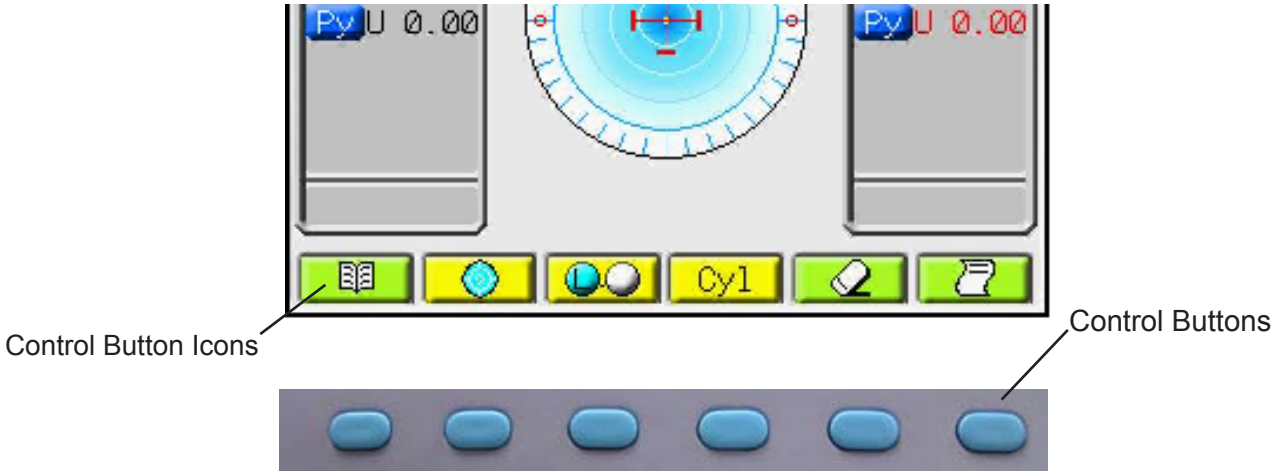


Figure SU-7 Control Buttons for Measurement Screen

The S/R/L control button, which is set in the menu, is associated with three icons:

Single Lens Icon - Press this button to measure a single lens.

Right Lens Icon - Press this button to measure the right lens of the frame.

Left Lens Icon - Press this button to measure the left lens of the frame.

The Progressive/Single/Multifocal control button is associated with two icons:

Progressive Icon - Press this button to open the Progressive Screen and measure progressive lenses. (The menu must be set to the Progressive selection.)

Single/Multifocal Icon - Press this button to reopen the Measurement Screen and measure single, bifocal, or multifocal lenses.

Erase Icon - Press this button to delete saved lens measurements from the screen.

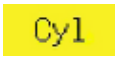
Menu Icon - Press this button to open the Set-up Screen.

Instrument Setup (continued)

Icon Definition (continued)

Control Buttons and Icons (continued)

The Custom control button is associated with four icons. (To set the Custom button to a different icon, you must open the Setup Screen and change the setup under “Custom”.)



Cyl - Press this button to change the Cyl setting to minus, plus, or plus/minus (–, +, or ± mode) at the top of the screen.



Step - Press this button to change the Step setting to 0.25, 0.12, or 0.01 at the top of the screen.



PRO.A - Press this button to activate the Progressive Auto feature, which automatically detects a progressive lens and opens the Progressive Screen. The Measurement Screen displays the white Progressive icon when this feature is enabled.



Lens - Press this button to change the Lens setting to H (Hard Contacts), S (Soft Contacts) or N (Normal lenses) at the top of the screen.

Note: The Output Switch control button activates one of the following three features: PRINTER, USB, or IOIO (RS232C). To change icons, you must open the Setup Screen.



USB Icon - Press this button to send your saved patient data to a computer, using the USB port.



IOIO Icon - Press this button to send your patient data to a computer, using the RS232C port.



PRINTER Icon - Press this button to send your patient data to the AL700 printer.

Instrument Setup (continued)

Icons - Setup and Other Screens

When you open the Setup Screen or the system screens, you will see the following icons for the control buttons. Refer to Figures SU-8 and SU-9.

Down Icon - Press this button to move down the screen or go to a different page.

Up Icon - Press this button to move up the screen or to a different page.

Left Icon - Press this button to move left on the screen.

Right Icon - Press this button to move right on the screen.

Enter Icon - Press this button to enter a command.

Plus Icon - Press this button to increase a highlighted number on the screen.

Minus Icon - Press this button to decrease a highlighted number on the screen.

Exit Icon - Press this button to exit the current screen and display the preceding screen.

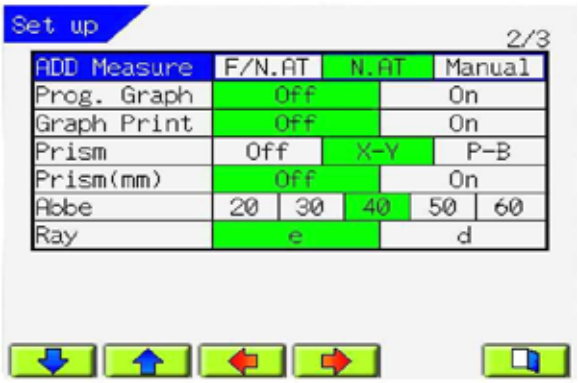


Figure SU-8 Control Button Icons for Setup screen

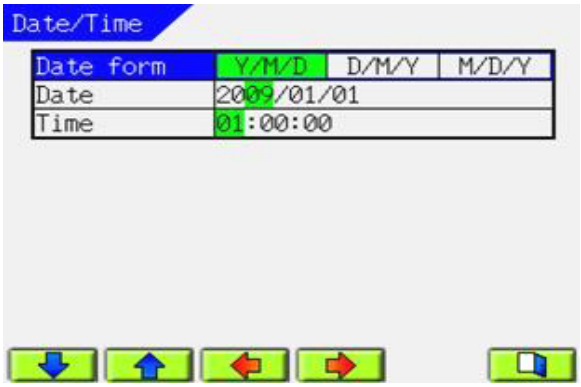


Figure SU-9 Control Button Icons for Date/Time Screen

Instrument Setup (continued)

Instrument Settings

Setup Screen

The Setup Screen of the AL700 displays three pages of default parameters that you can change to accommodate your preferences. The current default values are highlighted in green. Refer to Figures SU-10, SU-11, and SU-12.

Press the UP or DOWN buttons to find a category, then press the RIGHT or LEFT buttons to change the parameter in that category. You can then scroll to a different category and change that parameter.

When you are finished, press the EXIT button (open door icon) to save your changes and return to the previous screen.



Figure SU-10 Page 1, Setup Screen

The first page of the Setup Screen contains the following categories:

Custom Sets a control button to Cyl, Step, Pro.A, or Lens. For example, if you select “Cyl”, the Measurement Screen displays the Cyl icon.

Cyl Changes the default value for the cylinder mode to “-”, “+”, or “±”.

Step Changes the default rounding mode for refractive measurements to 0.25, 0.12 or 0.01 diopters.

Prog Auto **OFF:** Disables the Progressive Auto feature.
ON: Enables the Progressive Auto feature, which automatically opens the Progressive Screen if the AL700 detects a progressive lens.

Lens Changes the default setting to hard contact lens (H cont), or soft contact lens (S cont), or (Normal).

Auto Memory **OFF:** Disables the AUTO MEMORY feature. To manually save data, press the MEMORY/ADD switch.
ON: Enables the Auto Memory feature, which automatically saves all your lens data.

Lens Switch **S/R/L:** When enabled, pressing the S/R/L button opens the single lens, right lens, or left lens modes.
R/L: When enabled, pressing the S/R/L button opens the right lens or left lens modes only.

PD Measure **OFF:** Disables the Pupillary Distance (PD) Measurement feature.
ON: Enables the PD Measurement feature, which displays the pupillary distance data for the left and right lenses on the Measurement or Progressive Screens.

Instrument Setup (continued)

Instrument Settings (continued)

Setup Screen (continued)

The second page of the Setup Screen contains the following categories:

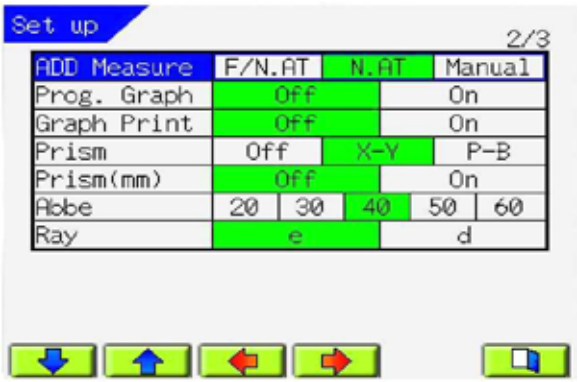


Figure SU-11 Page 2, Setup Screen

ADD Measure **F/N.AT:** Automatically saves both the far point and near point measurements.
N.AT: Automatically saves the near point measurements. To manually save the far point measurements, press the MEMORY/ADD switch.
Manual: Disables the automatic saving of both far point and near point measurements.

Prog. Graph **OFF:** Removes the progressive graph from the Progressive Screen.
ON: Displays the progressive graph when you are measuring a progressive lens.

Graph Print **OFF:** Removes the progressive graph from the patient printout.
ON: Includes the progressive graph in the patient printout.

Prism **OFF:** Disables the prism mode and removes prism values from the Measurement and Progressive Screens.
X-Y: Enables the prism mode and displays prism data in millimeters in the Px and Py formats (I=in, O=out, U=up, D=down) on the Screen.
P-B: Enables the prism mode and displays prism data in diopters and degrees on the screens.

Prism(mm) **OFF:** Removes the prism data box from the Measurement Screen.
ON: Displays the prism data box at the center of the alignment mark on the Measurement Screen (X-Y in millimeters, P-B in diopters).

Abbe Sets AL700 to Abbe 20, 30, 40, 50, or 60 to match the abbe value of the lens. This allows you greater accuracy in your measurements.

Ray **e:** Sets AL700 to measure the lens at the e-line, at a wavelength of 546 nm.
d: Sets AL700 to measure the lens at the d-line, at a wavelength of 587 nm (default value.)

Instrument Setup (continued)

Instrument Settings (continued)

Setup Screen (continued)

The third page of the Setup Screen contains the following categories:

Stand-by Sets AL700 to wait 3, 5, or 10 minutes before entering Sleep mode. In Sleep mode, the LCD Screen turns OFF, but the green LED (at the bottom right of the LCD) remains on. To disable Sleep mode, select OFF.

Language Selects the operating language of the AL700 to English (EN), French (FR), Spanish (ES), Italian (IT), Portuguese (PT), German (DE), or Chinese (中).

Brightness Adjusts the brightness of the LCD Screen in percentages. Press the RIGHT button to increase the brightness, press the LEFT button to decrease the brightness.

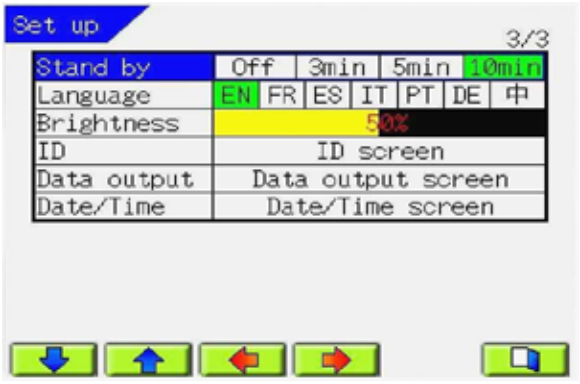


Figure SU-12 Page 3, Setup Screen

When you move to the ID, Data Output, and Date/Time categories, the red RIGHT and LEFT icons disappear and the blue ENTER icon appears on the Setup Screen.

ID Press the ENTER button to open the ID Screen, which allows you to add names or messages to a printout. Refer to Figures SU-13 and SU-14.

Data Output Press the ENTER button to open the Data Output Screen, which allows you to set the AL700 to print patient data or send it to a computer. Refer to Figures SU-17 and SU-18.

Date/Time Press the ENTER button to open the Date/Time Screen, which allows you to set the date and time formats. Refer to Figures SU-15 and SU-16.

Note: A set of typical settings for the AL700 includes the following parameters (factory default):

Step = 0.25	Cyl = "–"	Lens = Normal
Prog Auto = ON	ADD Measure = Auto	Prog Graph = ON
Graph Print = OFF	Prism = P-B	Prism(mm) = ON
Abbe = 60	Ray = d	Standby = 10

Instrument Setup (continued)

Instrument Settings (continued)

ID Screen

The ID Screen allows you to enter a business name or other message that will automatically print with the patient data.

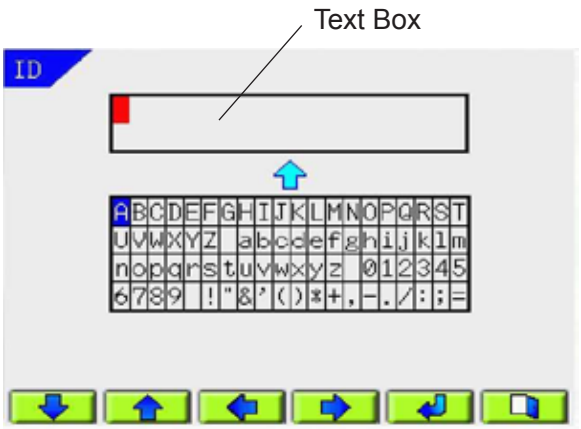


Figure SU-13 ID Screen



Figure SU-14 Icon Changes

Creating a Message

1. On the ID Screen, press the blue UP, DOWN, RIGHT, or LEFT buttons to highlight the first character from the grid that you want to appear in the text box.

2. Press the ENTER button. The selected character displays in the text box.
   Refer to Figure SU-13.

3. Repeat Step 1 and 2 until you finish your message.

4. When you are finished, press the EXIT button to save your message and return to the Setup Screen. Your message will print out with the patient data.

Editing Characters in a Message

1. On the ID Screen, press and hold the MEMORY/ADD switch. The icons change at the bottom of the screen. Refer to Figure SU-14.

2. While still holding the MEMORY/ADD switch, press the red LEFT, RIGHT, UP, or DOWN buttons to highlight the character you want to change in the text box. Refer to Figure SU-14.

3. Release the MEMORY/ADD switch. USE the blue UP, DOWN, RIGHT, or LEFT buttons to highlight a replacement character from the grid, then press the ENTER button.
   Refer to Figure SU-13.

4. To erase a character, press the MEMORY/ADD switch, highlight the character, then replace it with a blank space.

5. Repeat steps 1 through 3 for each character that you need to change.

Deleting Characters in a Message

1. On the ID Screen, press and hold the MEMORY/ADD switch. The icons change at the bottom of the screen. Refer to Figure SU-14.

2. While still holding the MEMORY/ADD switch, press the red LEFT, RIGHT, UP, or DOWN buttons to locate the characters or words in the text box that you want to delete. Then press the ERASE button.

3. When you are finished deleting characters, release the MEMORY/ADD switch.

Instrument Setup (continued)

Instrument Settings (continued)

Time/Date Screen

The Date/Time Screen allows you to enter the correct time and date for your patient printout and to change the date format.

1. To change the date format on the Date/Time Screen, press the UP or DOWN button to reach the Date Form field. Press the RIGHT or LEFT buttons to select a date format.
   Refer to Figure SU-15.

   Your options include:
   Y/M/D - Year, Month, Date
   D/M/Y - Date, Month, Year
   M/D/Y - Month, Date, Year

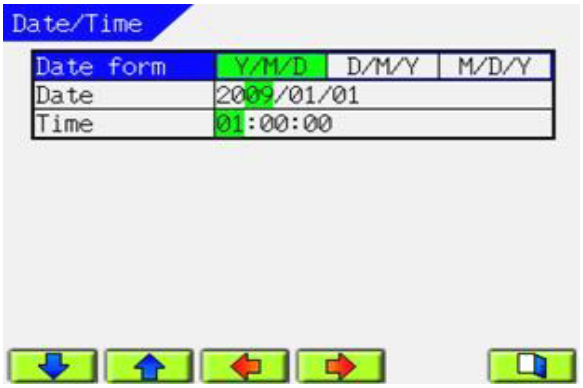


Figure SU-15 Date/Time Screen

2. To change the current date, press the RIGHT or LEFT buttons in the Date Field to highlight the date values (month, day, or year) you want to change, then press and hold the MEMORY/ADD switch. The icons at the bottom of the screen change.
   Refer to Figure SU-16.



Figure SU-16 Icon Changes

3. Press the PLUS (+) or MINUS (-) buttons to change the date values, then release the MEMORY/ADD switch to return to the Date/Time Screen. Refer to Figure SU-16.

4. To change the current time, press the RIGHT or LEFT buttons in the Time field to highlight the time values (hours, minutes, or seconds) you want to change, then press and hold the MEMORY/ADD switch. The icons at the bottom of the screen change.

5. Press the PLUS (+) or MINUS (-) buttons to change the values, then release the MEMORY/ADD switch.

6. When you are finished, press the EXIT button to save your changes and return to the Setup Screen.

Instrument Setup (continued)

Instrument Settings (continued)

RS232C Screen

The RS232C Screen allows you to specify whether you want patient data sent directly to a printer, or to a computer using the RS232C port.

Note: If your AL700 is connected to the computer with a USB cable, the instrument will automatically send patient data through the USB port. The USB Screen will appear instead of the RS232C Screen.

1. On the Setup Screen, press the UP or DOWN buttons to find the Data output category, then press the ENTER button. The RS232C Screen opens. Refer to Figure SU-17.

2. Change your parameters:

Output Device: **Print:** Enables the AL700 printer. If you press the Printer Icon on the LCD Screen, the patient data goes to the AL700 printer.
RS232C: Enables the RS232C port. If you press the IOIO icon on the LCD Screen, the patient data goes to your computer.

Auto Comm: **OFF:** Disables Auto Communication.
ON: Enables Auto Communication, which continuously sends patient date to the computer.

Baud Rate: Select a Baud rate of 115200, 38400, or 9600.

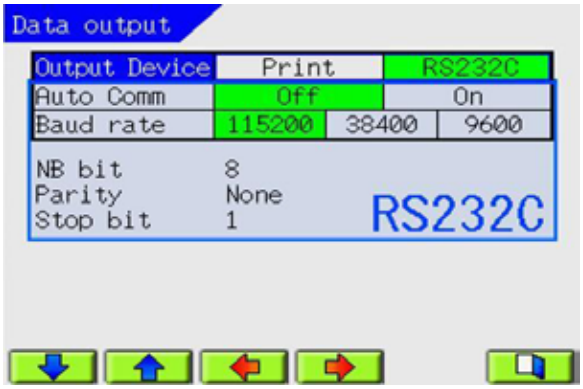


Figure SU-17 RS232C Screen

Note: If you set “Output Device” to “Print”, it will disable the Auto Communication feature.

3. After you finish, press the EXIT button to save your settings and reopen the Setup Screen.

Note: To view the RS232C wiring interface protocol, refer to Appendix A of this manual.

Instrument Setup (continued)

Instrument Settings (continued)

USB Screen

The USB Screen allows you to specify whether you want patient data sent directly to a printer, or to a computer using the USB port.

Note: If your AL700 is connected to the computer with a USB cable, the instrument will automatically send patient data through the USB port.

1. On the Setup Screen, press the UP or DOWN buttons to find the Data output category, then press the ENTER button. The USB Screen opens. Refer to Figure SU-18.

2. Change your parameters:

Output Device: **Print:** Enables the AL700 printer. If you press the Printer Icon on the LCD Screen, the patient data goes to the AL700 printer.
USB: Enables the USB port. If you press the USB icon on the LCD Screen, the patient data goes to your computer.

Auto Comm: **OFF:** Disables the Auto Communication feature.
ON: When enabled, the Auto Communication feature continuously sends patient data to the computer.

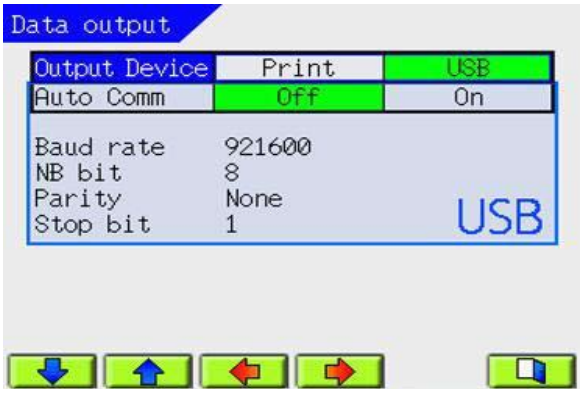


Figure SU-18 USB Screen

Note: If you set “Output Device” to “Print”, it will disable the Auto Comm feature.

3. After you finish, press the EXIT button to save your settings and reopen the Setup Screen.

Instrument Setup (continued)

Instrument Settings (continued)

Auto Memory

When enabled, the Auto Memory feature automatically saves your lens measurements.

After you move the lens on the lens holder and achieve alignment, the AL700 beeps, displays the message “Marking OK”, and displays your saved measurements in red. You do not have to press the MEMORY/ADD switch.

Note: If you enable the Prism (mm) feature on the Set-up Screen, the AL700 disables Auto Memory.

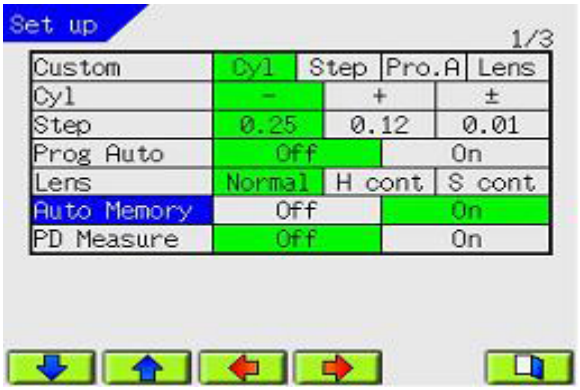


Figure SU-19 Auto Memory, Setup Screen

To enable Auto Memory:

1. On the Setup Screen, press the UP or DOWN buttons to find the Auto Memory category, then press the RIGHT button to highlight “Auto Memory”. Refer to Figure SU-19.

2. When you are finished, press the EXIT button to save your setting and open the previous screen.

Sleep Mode

When enabled, the Sleep mode turns off the measuring light and the LCD Screen after several minutes of non-use.

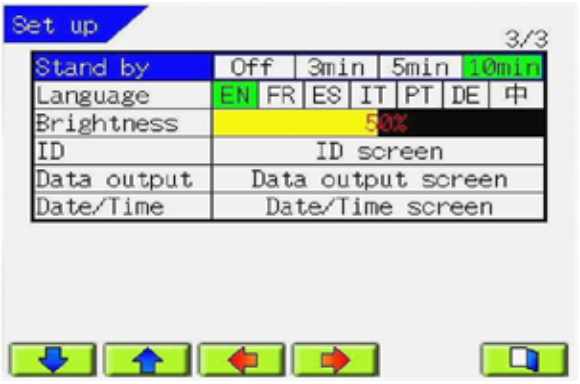


Figure SU-20 Standby, Setup Screen

To enable Sleep mode:

1. On the Setup Screen, press the UP or DOWN buttons to find the Standby category. Refer to Figure SU-20.

2. Using the RIGHT or LEFT buttons, select the time interval that you want to lapse before Sleep mode activates. Select 3, 5, or 10 minutes.

3. When you are finished, press the EXIT button to save your setting and open the previous screen.

The AL700 will enter Sleep mode whenever the period of inactivity exceeds your setting. To use the instrument again, press any button or switch.

Operation

Measurement Mode

The AL700 allows you to measure single lenses and eyeglass frames; bifocal, multifocal, and progressive lens. You can also take prism measurements and pupillary distance (PD) Measurements, and check the ultraviolet (UV) light transmittance.

Note: Before you measure a lens, verify that the instrument lens under the Lens Stand is clean. Use the Lens Cleaning cloth or a soft, dry, clean cotton cloth to clean it.

Note: For instructions on using the Marking Pens, refer to the Marking Lenses section of this manual.

Note: For instructions on placing and measuring contact lenses, refer to the Contact Lens Measurement section of this manual.

Lens Placement

1. Place the lens (oriented up) on the top of the Lens Stand, with the bottom edge of the lens facing the Lens Table. Refer to Figure OP-1.
2. Adjust the Table so that it touches the bottom edge of the lens. This ensures a correct axis orientation.
3. Move the Nosepad Slide to position a nosepad between the lenses.
4. Raise and then lower the Lens Holder Lever to secure the lens to the Lens Stand.
5. When you are finished, raise the Lens Holder Lever to release the lens.



Figure OP-1 Placing Lens on Lens Stand

Note: When adjusting the Lens Table, press the Table only on the top right location marked “PUSH”.

Operation (continued)

Measurement Mode (continued)

Single and Frame Lens

Note: After you place your lens on the Lens Stand, the AL700 automatically starts displaying lens data. However, to receive accurate data, you must **first** use the Measurement Screen to position your lens correctly.

Note: To prevent loss of patient measurements, do not erase your data until it appears in red on the Measurement Screen. Red means the data is saved and black means the data is not saved.

Note: If you are measuring an eyeglass frame, you can start with either the right or left lens.

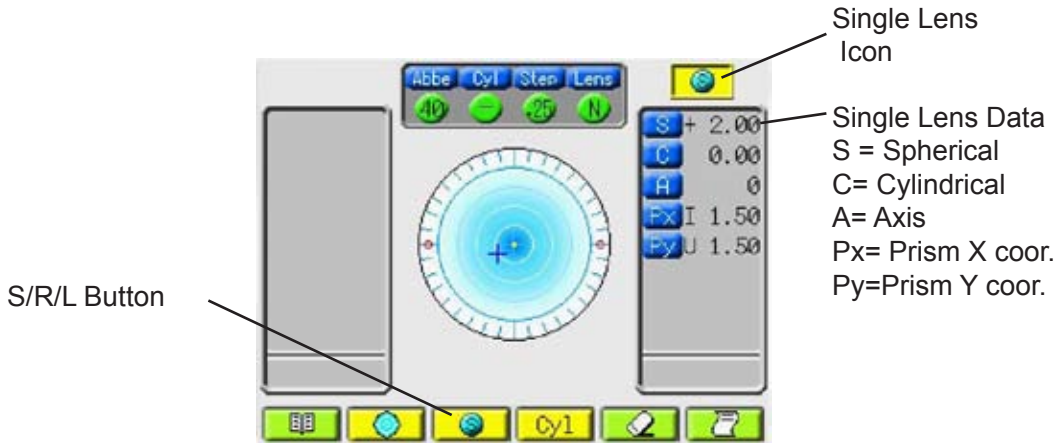


Figure OP-2 Single Lens Mode

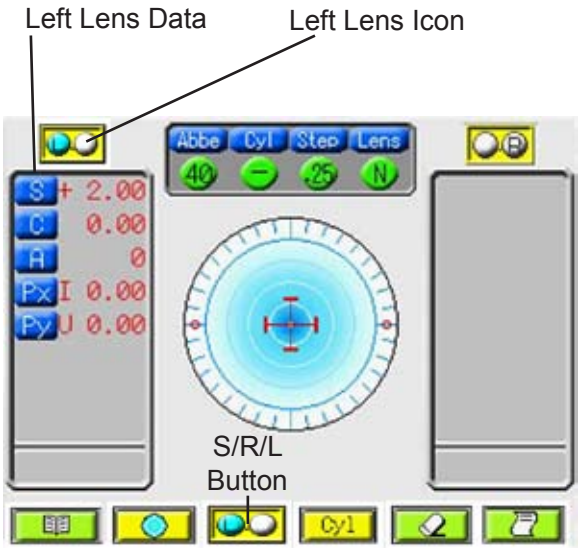


Figure OP-3 Left Lens Mode

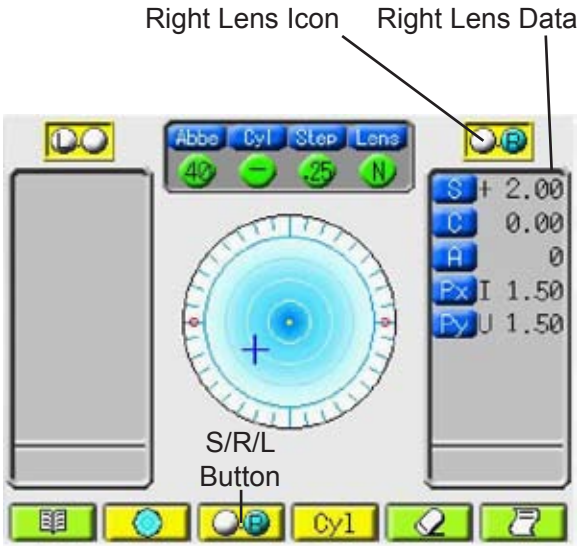


Figure OP-4 Right Lens Mode

Operation (continued)

Measurement Mode (continued)

Single and Frame Lens (continued)

1. Press the S/R/L button to display the SINGLE LENS, RIGHT LENS, or LEFT LENS icon at the top of the Measurement Screen. The default setting is single lens.

Note: If you are measuring a single lens or the right lens of a frame, the data appears on the right side of the screen. If you are measuring a left lens, the data appears on the left side.

2. Locate the distance (or far point) segment of the lens.

   A. The center of the Measurement Screen displays a blue cross on a blue target. As you move your lens on the Lens Stand, the blue cross will move around the target. Your objective is to place the blue cross on the center of the target. Refer to Figure OP-5.

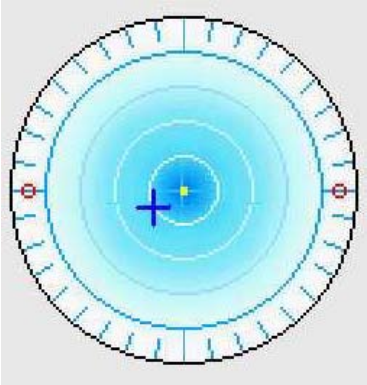


Figure OP-5 Target Area

   B. When you reach the center, the blue cross turns red and the message “Marking OK” displays. Refer to Figure OP-6.

   C. When you hear a beep and the data turns red, it indicates that the AL700 automatically saved the far point measurement. Refer to Figure OP-6.

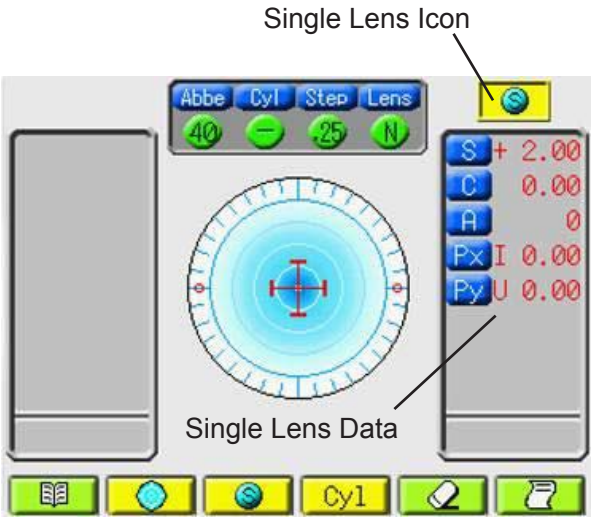


Figure OP-6 Single Lens Saved

Note: You can disable this ADD Measure feature in the Setup Screen. This allows you to manually save your far point measurements by pressing the MEMORY/ADD switch.

Note: If you are unable to align the blue cross with the vertical line, center the lens horizontally and then measure approximately five mm from the top of the lens.

3. If you are measuring a frame, repeat Steps 1 through 3 to measure the second lens.

4. When you finish both lenses, press the PRINTER button to print the patient data or press the USB or IOIO (RS232C port) buttons to send the data to a computer.

5. Press the ERASE button to clear the Measurement Screen so that you can measure new lenses.

Note: For instructions on measuring bifocal or multifocal lenses, see the Bifocals and Multifocals section of this manual.

Operation (continued)

Measurement Mode (continued)

Bifocals and Multifocals

The AL700 allows you to easily measure bifocal and multifocal lenses.

Note: After you place your lens on the Lens Stand, the AL700 automatically starts displaying lens data. However, to receive accurate data, you must **first** use the Measurement Screen to position your lens correctly.

Note: For instructions on measuring progressive lenses, refer to the Progressive Lenses section of this manual.

1. Place your lens on the Lens Stand.

Note: For instructions on placing the lens, refer to the Lens Placement section of this manual.

2. Find and save the far point measurement for your lens. Refer to Steps 1 through 3 in the Single and Frame Lens section of this manual.

3. Press the MEMORY/ADD switch. The Ad1 icon appears on the Measurement Screen. Refer to Figure OP-7.

4. Adjust the lens so that the near point section is in the center of the Lens Stand. When the lens is positioned correctly, the blue cross will align with the center of the target on the Measurement Screen.

5. When the AL700 beeps, the message “Marking OK” appears and the near point data turns red, it indicates that the near point measurement is saved.

Note: You can disable this ADD Measure feature in the Setup Screen. This allows you to manually save your near point measurements by pressing the MEMORY/ADD switch.

6. If you have a second ADD segment, press the MEMORY/ADD switch. The Ad2 icon appears on the Measurement Screen. Repeat Steps 3 and 4 to measure and save the second segment.

7. If you are measuring a frame, press the S/R/L button to change to the left or right lens.



Figure OP-7 Right Lens Near Point Segment Values

Operation (continued)

Measurement Mode (continued)

Progressive Lens

The AL700 provides automatic and manual modes for detecting progressive lenses.

Pro A mode As you measure all your patients' lenses, the AL700 is constantly looking for progressive lenses. When it detects a progressive lens, the Progressive Screen opens. You can then measure the progressive lens. Refer to Figure OP-8.

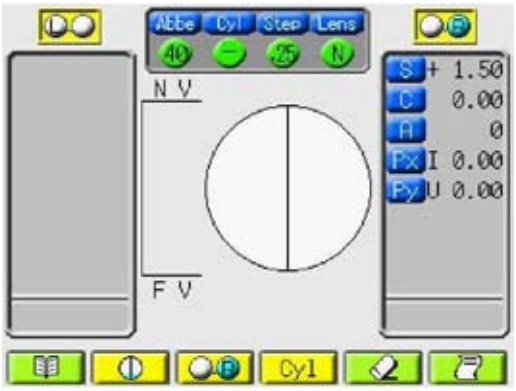


Figure OP-8 Progressive Measurement Screen

Manual mode When you manually detect a progressive lens, press the Prog A button to open the Progressive Measurement Screen and measure the lens.

1. Place your lens on the Lens Stand.

Note: For information on placing a lens on the AL700, refer to the Lens Placement section of this manual.

2. If the AL700 detects a progressive lens, the Progressive Measurement Screen opens. If Prog A. is disabled, press the Single/Multifocal button to open this screen.

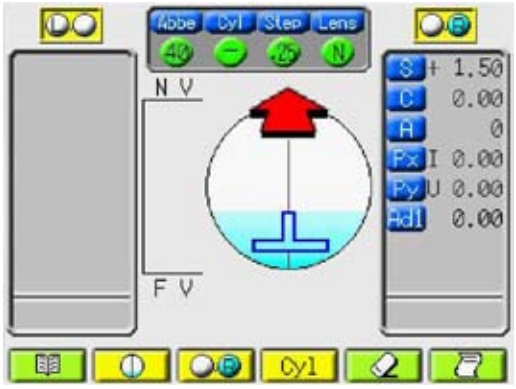


Figure OP-9 Progressive Lens Detected on Screen

3. Find the progressive section of the lens. Slowly move the lens right and left on the Lens Stand. When you find the progressive section, the Progressive Screen displays a red arrow icon and an irregular blue cross icon. Refer to Figure OP-9.

Note: If the AL700 cannot detect the progressive area because the ADD value is small etc., press the MEMORY/ADD switch. The screen shifts to far point measurement.

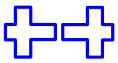
4. Measure the far point of the lens. Your objective is to move the lens around the Lens Stand until the blue cross aligns along the vertical line in the clear area and becomes symmetrical. Use the red arrow icons to direct your movements.



Straight red arrows indicate you are following the correct path to the far point.



Slanted red arrows indicate you have moved past the progressive section. When you return to the progressive section, the arrows become straight again.



Irregular blue crosses on their sides also indicate that you are outside the progressive section of the lens.



A symmetrical blue cross indicates you have located the far point.

Operation (continued)

Measurement Mode (continued)

Progressive Lens (continued)

Note: If the blue cross does not align with the vertical line, center the lens horizontally and measure the lens approximately five mm from the top of the lens, then press the MEMORY/ADD switch.

5. When you find the far point, the symmetrical blue cross turns green. When you hear a beep, the message “Marking OK” appears and the data turns red, your far point measurement is automatically saved. Refer to Figure OP-10.

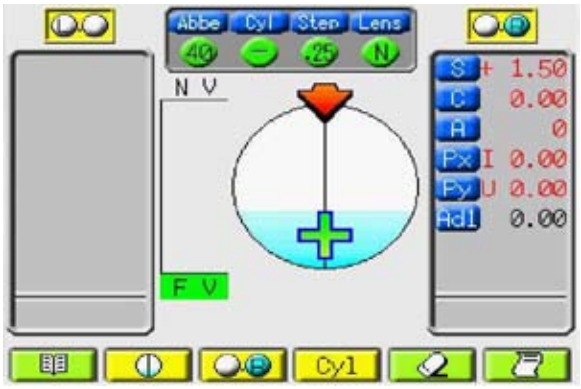
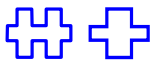


Figure OP-10 Far Point Saved

Note: You can disable the ADD Measure feature and manually save your far point measurements by pressing the MEMORY/ADD switch.

6. Find the near point of the lens. Follow the directions in Step 4 for moving the lens to find the near point.



An irregular blue cross indicates that you have moved outside the progressive section of the lens.



A symmetrical blue cross indicates you have located the near point.



Figure OP-11 Near Point Saved

Note: As you approach the near point, the blue cross turns red.

7. When you find the near point, the near point cross turns yellow-green (the far point cross remains solid green).

8. When you hear a beep, the message “Marking OK” appears, and the data turns red, your near point data is automatically saved. Refer to Figure OP-11.

9. If you need to measure a second ADD segment, press the MEMORY/ADD switch. Repeat Steps 6 through 8.

10. Press the PRINT button (or the USB or RS232C buttons to transmit the data to a computer).

Note: You can set the AL700 in the Setup Screen to include the progressive graph in the patient data printout.

Note: The AL700 does not transmit the progressive graph to a computer.

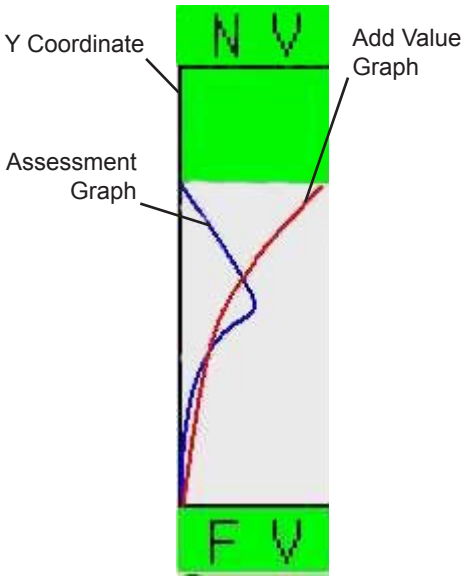


Figure OP-12 Progressive Graph

11. Press the ERASE button to clear the measurement data and measure the next lens.

Operation (continued)

Measurement Mode (continued)

Prism Measurement

To obtain prism measurements for a marked lens, measure at the indicated measurement point on the lens. To obtain prism measurements for an unmarked lens, follow these steps:

1. Apply an ink dot to the lens at the point where the patient's distance vision is focused (aligned with the center of the pupil). If the lens contains an ADD segment, apply a second dot to facilitate the ADD reading. Refer to Figure OP-13.

Note: If the Prism feature is not enabled, open the Setup Screen and find the Prism category. Select either the X-Y (X, Y displacement in mm) format, or the P-B (prism in diopters) format.

Note: Be sure to use non-permanent ink when marking the lens.

2. Place the first lens on the Lens Stand.

Note: For information on placing a lens on the AL700, refer to the Lens Placement section of this manual.

3. Position the lens. Use the red dot on the lens to find the alignment point on the Measurement Screen.

Note: For information on positioning and measuring a lens on the AL700, refer to the Lens Measurement section of this manual.

4. Record the prism, sphere, cylinder, and axis measurements, based on the position of the far point red dot. If you need to measure an ADD segment, position the lens using the near point red dot.

Note: For information on measuring ADD segments, refer to the Lens Measurement section of this manual.

Note: If you set the Prism option to ON, the AL700 displays a box on the Measurement Screen that shows the distances from the optical center (X-Y in millimeters, P-B in diopters).

5. Repeat Steps 1 to 4 for the next lens in the frame.

6. When you finish saving your lens measurements, press the PRINTER button to print the patient data or press the USB or IOIO (RS232C port) buttons to send the data to a computer. Press the ERASE button to clear the Measurement Screen so that you can measure a new lens.



Figure OP-13 Measuring from the Red Dot



Figure OP-14 Prism Box on Screen

Operation (continued)

Measurement Mode (continued)

Pupillary Distance (PD) Measurement

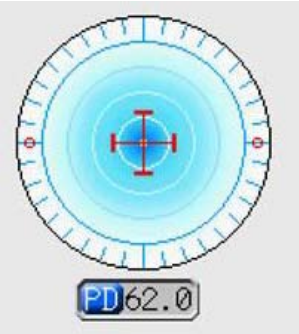


Figure OP-15 PD Measurement Target

The AL700 allows you to measure the pupillary distance for a frame.

1. Open the Setup Screen, find the PD Measure category, and verify that the setting is ON. Verify that the Measurement Screen is displaying the PD RIGHT LENS icon.

2. Place the right lens on the Lens Stand.

Note: For PD measurements, always measure the right lens first.

Note: For information on placing a lens on the AL700, refer to the Lens Placement section of this manual.

3. Position the right lens. The center of the Measurement Screen displays a red cross on a blue target. As you move your lens on the Lens Stand, the blue cross will move around the target. Your objective is to place the blue cross on the center of the target. As the Nosepiece Slide moves with your lens, the PD measurements will change on the screen. Refer to Figure OP-15.

4. Once you center the blue cross, the cross turns red. When you hear a beep, the message “Marking OK” appears, and the data turns red, your near point data is automatically saved. Refer to Figure OP-16.

Note: You can disable the ADD Measure feature in the Setup Screen and manually save your near point measurements by pressing the MEMORY/ADD switch.

5. Repeat Steps 2 and 3 for the left lens. The Measurement Screen automatically displays the PD LEFT LENS icon. After the AL700 measures your left lens, a combined PD measurement for both lenses appears in the middle of the screen.

6. Press the PRINTER button (or the USB or RS232C buttons to transmit the data to a computer). Press the ERASE button to clear the measurement data for the next lens.

7. If you are finished with PD Measurement, reopen the Setup Screen, find the PD Measure category and change the setting to OFF.

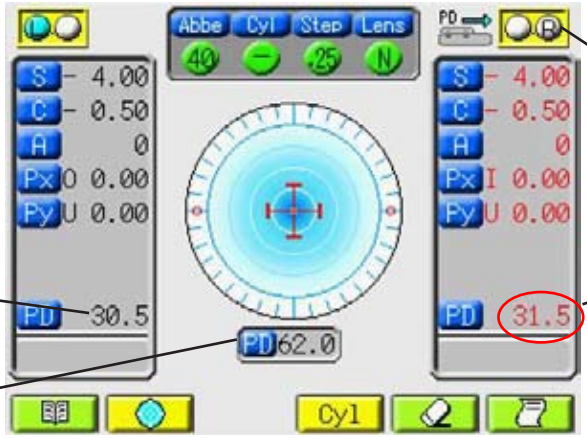


Figure OP-16 Right PD Measurement Saved

Operation (continued)

Measurement Mode (continued)

Contact Lens Measurement

The AL700 allows you to measure either hard or soft contact lenses.

CAUTION: TO AVOID INCORRECT CONTACT LENS MEASUREMENTS, CLEAN THE NOSEPIECE LENS ON THE LENS HOLDER.

CAUTION: FOR MORE INFORMATION, REFER TO THE MAINTENANCE SECTION OF THIS MANUAL.

To measure contact lenses, follow these steps:

1. Remove the Lens Stand from the Nosepiece.

2. Open the Setup Screen and find the Lens category. Change the Lens parameter to either the hard contact mode (H cont) or the soft contact mode (S cont). When you are finished, press EXIT to save your new setting.

Note: The soft contact mode displays the Measurement data in the spherical equivalent format of (SPH EQU = Sphere + Cyl / 2). The hard contact mode displays the measurement data in the sphere, cylinder and axis format.

3. Rest the Contact Lens Cover on top of the Nosepiece. Unlike the Lens Stand, it does not snap on the Nosepiece. Refer to Figure OP-18.

4. Center the contact lens in the concave top section of the Contact Lens Cover.

Note: Due to its lens characteristics, accurate measurement of a soft contact lens can be difficult. For best results, follow these practices:

- Remove any moisture from the lens.
- Avoid distorting the lens when you place it on the Lens Cover.
- When the alignment is set, take your measurements quickly before the lens shifts.

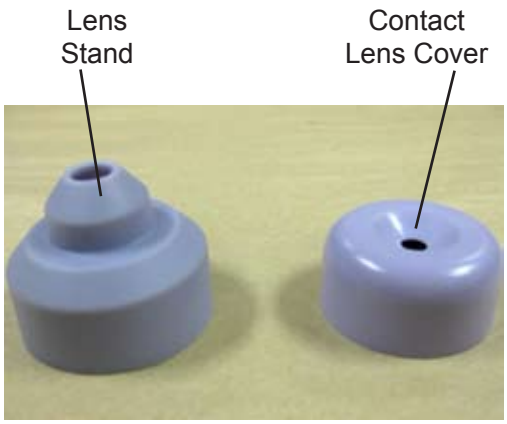


Figure OP-17 Lens Stand and Contact Lens Cover



Figure OP-18 Placing Contact Lens Cover

Operation (continued)

Measurement Mode (continued)

Contact Lens Measurement (continued)

5. Raise and then lower the Lens Holder Lever until it secures the Contact Lens Cover.

6. Adjust the Contact Lens Cover until you align the optical center of the lens on the Measurement Screen. The center of the Measurement Screen displays a blue cross on a blue target.

7. As you move your lens on the lens cover, the blue cross will move around the target. Your objective is to place the blue cross on the center of the target.

8. When you reach the center point, the cross turns red and message "Marking OK" appears. Refer to Figure OP-19.

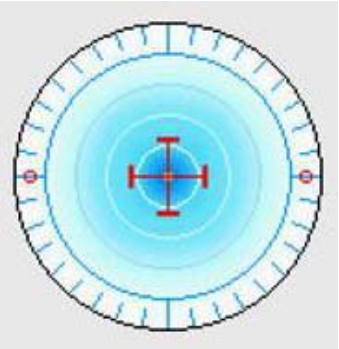


Figure OP-19 Target Area

9. When you hear a beep and the data turns red, it indicates that the AL700 automatically saved your near point data. Refer to Figure OP-16.

Note: You can disable this ADD Measure feature in the Setup Screen. This allows you to manually save your near point measurements by pressing the MEMORY/ADD switch.

10. Press the PRINT button (or the USB or RS232C buttons to transmit the data to a computer.) Press the ERASE button to clear the measurement data for the next lens.

Note: The AL700 does not measure bifocal contact lenses.

When you finish measuring a set of contact lenses:

1. Remove and clean the Contact Lens Cover.

2. Clean the Nosepiece lens. Refer to Figure OP-20.

Note: For more information on maintaining the AL700, refer to the Maintenance section of this manual.

3. Reinstall the Lens Stand. Refer to Figure OP-17.

4. If you are measuring an eyeglass lens, press the LENS button to change its setting or open the Setup Screen.

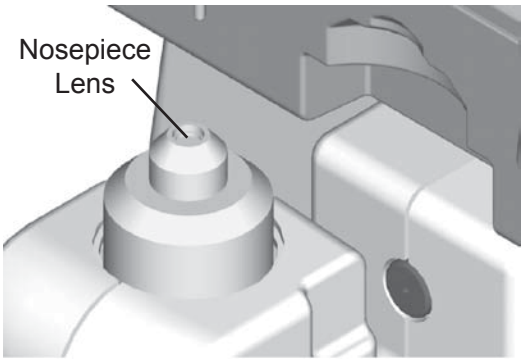


Figure OP-20 Nosepiece Lens

Operation (continued)

Measurement Mode (continued)

Ultraviolet (UV) Light Transmittance

This feature measures the UV light transmittance of a lens and checks the lens' UV protection. The light wavelength for UV transmittance measurement is 375 nm. The AL700 does not measure the transmittance of a whole area of UV light.

WARNING: NEVER LOOK DIRECTLY INSIDE THE UV LENS AS IT MAY CAUSE PERMANENT EYE DAMAGE.

1. On the front of the AL700, press the UV Measurement switch. Refer to Figure OP-21.

2. The UV Measurement Screen opens. Refer to Figure OP-22.

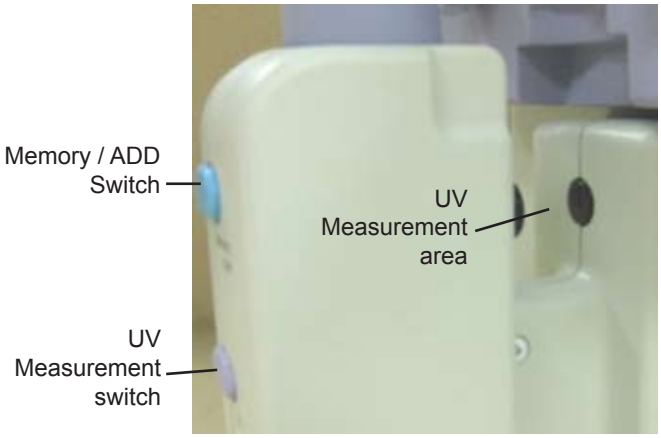


Figure OP-21 UV Measurement Area

3. Hold the lens on the UV Lens Stand with the outside of the lens facing the black UV lens.

Note: If you are starting with the left lens, verify that the Left Lens icon is displayed on the UV Measurement Screen.

4. The UV measurement of the right lens appears in black on the bottom right side of the UV Measurement Screen. Refer to Figure OP-22.

5. Press the MEMORY/ADD switch to save your measurement. The right lens data turns red.

Note: The AL700 does not automatically save UV measurements.

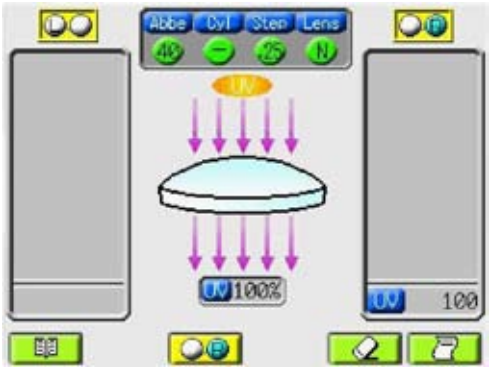


Figure OP-22 UV Measurement Screen

6. Press the S/R/L button to measure the left lens.

7. Repeat Steps 2 to 4 to measure the left lens. When you are finished, a combined UV measurement for both lenses appears in the center of the screen.

8. Press the PRINTER button to print the patient data (or the USB or IOIO button to transmit it to a computer.) Press the ERASE button to clear the measurements from the screen. To exit the UV Measurement Screen, press the UV Measurement switch.

Note: If the AL700 does not sense a new UV measurement within three minutes, it automatically re-opens the Measurement Screen.

Operation (continued)

Marking Lenses

The AL700 allows you to accurately mark lenses.

1. Place your lens on the Lens Stand.

Note: For information on placing a lens on the AL700, refer to the Lens Placement section of this manual.

2. Position your lens using the Measurement Screen.

   A. For a lens without astigmatism, move the lens until the red cross appears at the center of the blue target.

   B. For a lens with astigmatism, there are two methods for aligning the lens:

      a. Move the lens until the axis value on the Measurement Screen equals the axis value in the patient prescription. Refer to Figure OP-23.

      or

      b. Move the lens until the axis value on the Measurement Screen equals “0”. Refer to Figure OP-24.



Figure OP-23 Axis Value = 90 (Prescription Value = 90)



Figure OP-24 Axis Value = 0

3. When the lens is properly aligned, turn and hold the Marking Lever.

4. While holding the Marking Lever, gently lower the Marking Pens to the lens surface.

5. Release the Marking Lever. The Marking Pens automatically return to their original positions.

Note: For information on setting up the AL700 for prism measurement, refer to the Prism Measurement section of this manual.

Note: To prolong usage of the Marking Pens, avoid applying them more than once to the same lens location.

Note: To prevent damage to the Marking Pens, follow these practices:

- Avoid touching the pen tips with your fingers.
- Do not lower the pens without first placing a lens on the Lens Stand.
- Mark your lenses gently.

Operation (continued)

Printing Patient Data

The AL700 allows you to print out your patient data by pressing the Printer control button.
Refer to Figure OP-25.

Note: If the Printer icon does not appear on the LCD Screen, it means that the print option is disabled. Open the Setup Screen, highlight the Data Output category, and press the ENTER button.

When the USB or RS232C Screens open (depending on your configuration), select “Print”. Press the EXIT button to save your settings and reopen the previous screen. The Measurement and Progressive Screens will display the Printer icon.

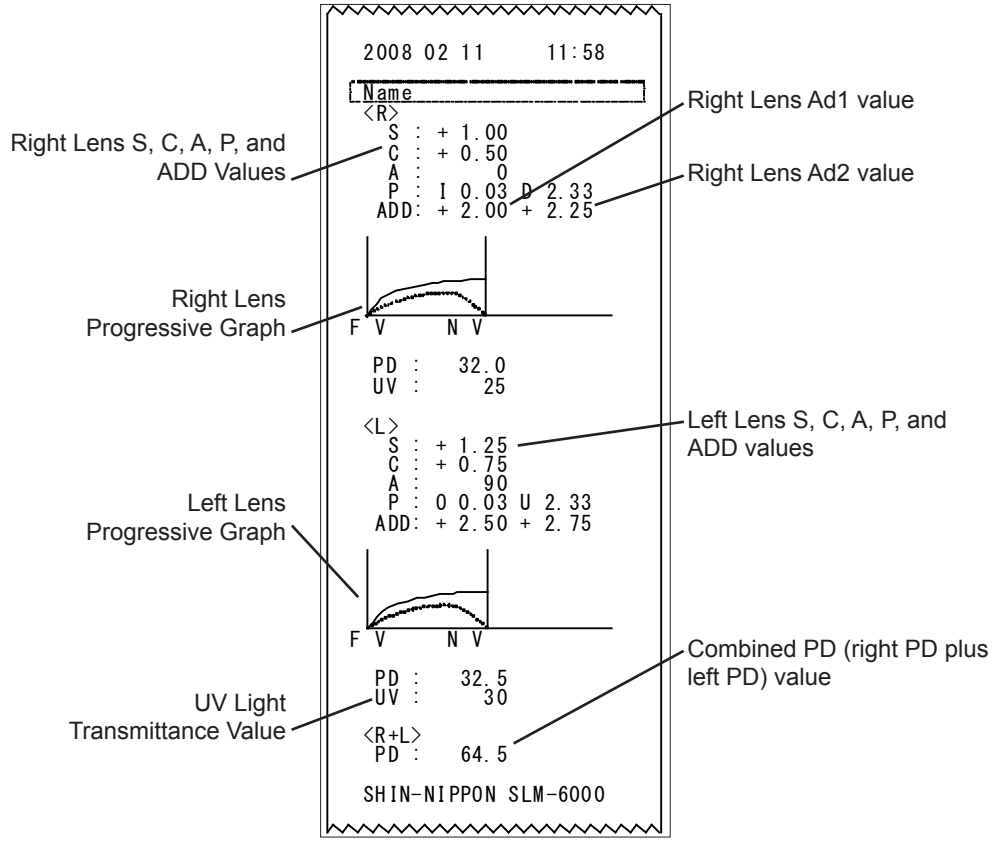


Figure OP-25 Sample Patient Data Printout

Maintenance

Due to its advanced design, the AL700 requires very little routine maintenance. If you have any maintenance questions, contact your local dealer or the Reichert Customer Service Department as indicated in the Introduction section of this manual.

CAUTION: ANY REPAIR OR SERVICE TO THE AL700 MUST BE PERFORMED BY EXPERIENCED PERSONNEL OR DEALERS WHO ARE TRAINED BY REICHERT SO THAT CORRECT OPERATION OF THE AL700 IS MAINTAINED.

Cleaning

Main Unit

When the Main Unit, LCD Cover, and Operation Panel are dirty, wipe them with a clean, dry cloth. If there are stains that are hard to remove, moisten the soft cloth with a mild soap solution (1 cc of liquid dish soap to one liter of clean, filtered water (filtered below 5 microns)).

CAUTION: DO NOT USE ALCOHOL OR ANY SOLVENTS ON ANY EXTERNAL SURFACE OF THE INSTRUMENT OR DAMAGE TO THE PAINTED OR COATED SURFACE MAY OCCUR.

Optical Unit

Clean only the parts called out in Figure MM-1. Using canned air, blow dust and particles off of the Lens. If it is still dirty, wipe it lightly and evenly with a soft cloth moistened with a thinned alcohol solution. Then wipe again with a soft, dry cloth.

CAUTION: DO NOT USE A SOLVENT LIKE THINNER FOR CLEANING. CLEAN CAREFULLY TO AVOID DAMAGING THE SURFACE OF THE OPTICAL PARTS. WHEN THE SURFACE IS DAMAGED, MEASUREMENTS MAY NOT BE CARRIED OUT ACCURATELY.

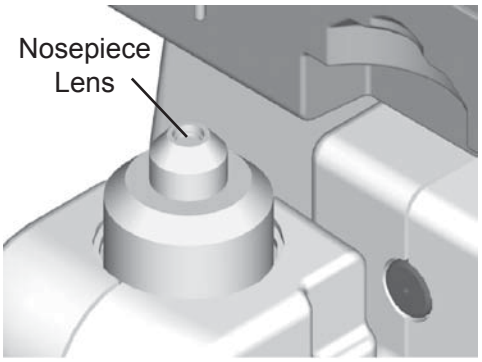


Figure MM-1 Nosepiece Lens



Figure MM-2 Door Release Button

Printer Paper Replacement

1. Press the Door Release button to open the Printer door. Refer to Figure MM-2.
2. Place the new roll of Printer Paper on the Printer Rod.
3. Unroll a small amount of paper and install the roll in the printer compartment. Refer to Figure MM-3.
4. Close the Printer Door and tear off the excess paper.



Figure MM-3 Printer Paper Installation

Maintenance (continued)

Part Replacements

Marking Pen Replacement

CAUTION: WHEN REMOVING THE MARKING PEN SCREWS, BE CAREFUL NOT TO MISPLACE THE SPRING BETWEEN THE MARKING PEN AND THE PEN MOUNT.

Note: Only use Marking Pens that are designed for use with the AL700.

1. Loosen and remove the screw (M2 x 5L) and the flat washer at the top of the Marking Pen. Refer to Figure MM-4.
2. Remove the Marking Pen and the spring from inside the Pen Mount. Refer to Figure MM-5.
3. Install the spring onto the new Marking Pen with the flat end toward the screw.
4. Install the new Marking Pen and spring into the Pen Mount.
5. Secure the Marking Pen(s) with the screw and tighten it to 3 in•lbs (0.34 N•m).
6. Repeat Steps 1 through 4 for each Marking Pen being replaced.



Figure MM-4 Marking Pen Removal



Figure MM-5 Marking Pen Disassembly

Lens Stand Replacement

1. Pull the Lens Stand straight up and off the Nosepiece. Refer to Figure MM-6.

Note: If you have difficulty removing the Lens Stand, gently pry it off with a wooden stick (e.g., tongue depressor).

2. Install a new Lens Stand. Ensure that the Cover is fully seated down on its metal support.



Figure MM-6 Lens Stand Replacement

Troubleshooting

Troubleshooting Chart

The following chart details common problems and solutions for the AL700.

ERROR	MESSAGE	REMEDY
SYSTEM	AL700 has no power. LCD Screen is blank.	Turn on the Power switch. Press any button or switch - AL700 may be in sleep mode.
		Problem is damaged internal fuse or circuits. Contact Reichert for service; fuses are **not** user replaceable.
	Inaccurate readings.	Clean the Nosepiece Lens.
	Printer does not feed paper.	Check printer to verify it contains paper. Enable printer in the Data Output category on the Setup Screen.
	Data does not print on the paper.	Check paper; it may be installed in printer upside down. Check printer to verify it contains thermal paper.
	Pens do not mark lenses.	Replace the Marking Pens. **Note:** For instructions, refer to Maintenance section of the manual.
	Buttons do not respond.	Press the buttons more slowly.
MESSAGES	Measure Error.	Remove obstruction from the optical path.
	Paper Empty.	Replace the Printer Paper.
	Printer Cover Open.	Close the Printer Cover.
	SPH/CYL/PRISM/ADD Over.	Measurement range exceeded.
	Retry Error.	Problem is inconsistent light beam to the camera.
	No Target Error.	Clean eyeglass lens or the AL700 Nosepiece lens. Remove obstruction from the optical path. Turn Power switch to OFF, then to ON.
	Printer Heat Over.	Problem is printer is overheating. Allow printer time to cool off.
	EEPROM Fault.	Abnormality of memory.
	Sensor Error.	Abnormality of sensor.
	Errors # 100-141 Displays with a three-digit number.	Abnormality of electronic parts on the Control circuit board.

Note: If problems still persist, contact Reichert as indicated in the Introduction section of this manual.

Note: Circuit diagrams, component parts list descriptions and calibration instructions are available only to qualified personnel trained by Reichert.

Specifications

General Specifications

Sphere	-25D to +25.00D (0.01D, 0.12D, 0.25D steps)
Cylinder	0D to ±10.00D (0.01D, 0.12D, 0.25D steps)
Axis	0^0 thru 180^0 (1^0 steps)
Addition	0D to ±10.00D (0.01D, 0.12D, 0.25D steps)
Prism	0 to 10Δ
UV Transmittance Measurement	0 to 100% (1% steps)
Pupillary Distance Measurement	45mm to 85mm (0.5mm steps)
Lens Power Measuring Wavelength	630 nm
UV Transmittance Measuring Wavelength	375 nm

Measurable Lens

Unprocessed lens (diameter: 100mm) and Frame lens	Single Lens, multifocal lens, progressive lens
Hard contact lens and soft contact lens	A special accessory is required

Measurement Accuracy

Sphere	0D to ±10.00D = ±0.25D, else 0.50D
Cylinder	±0.25D

Physical Data

Height	20.0 in. (508mm)
Depth	11.0 in. (280mm)
Width	8.6 in. (218mm)
Weight, unpacked	15 lbs. (6.8 kg)
Printer	Thermal printer - paper width 2.3 in. (58mm)
Monitor	Color LCD monitor - 4.75 in x 3.5 in (121mm x 89mm)

Electrical Data

Voltage (nominal)	100 - 240 VAC
Consumption	60VA
Current	1.0 Amp
Frequency	50/60 Hz
Fuses	3 Amp, 250VAC (T3A, L 250V), Not User Replaceable

Specifications (continued)

Transportation & Storage

This instrument can withstand the following conditions while packed for transportation or storage:

- an atmospheric pressure range of 760 mmHg (101 kPa) thru 528 mmHg (70.4 kPa)
- an ambient temperature range from +14° F thru +140° F (-10° C thru +60° C)
- a relative humidity range of 30% to 95%HR (no dew condensation allowed)

Note: Operating conditions are recommended from +50° F thru +104° F (+10° C thru +40° C) at a relative humidity of up to 90%HR (no dew condensation allowed).

Note: The above extreme high or low storage conditions should not exceed 15 weeks.

Disposal

This product does not generate any environmentally hazardous residues. At the end of the product life, follow local laws and ordinances regarding proper disposal of this equipment.

Applicable Laws and Standards

Law	Electromagnetic Compatibility Directive 2004/108/EC Low Voltage Directive 2006/95/EC
Standard	Safety of a device - EN 61010-1: 2001

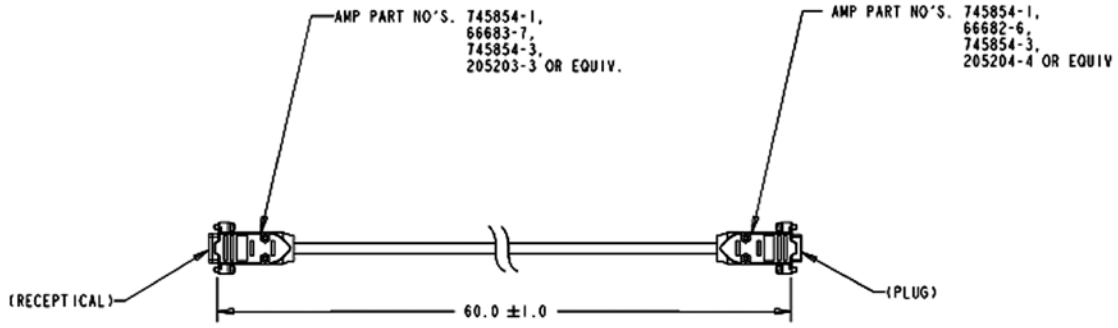
Appendix

RS232C Connection

Connections from the AL700 to a computer are possible using the following settings:

Baud Rate: 384000, 9600, or 2400 bps (bits per second)
Character (word): 8 or 7
Parity: Odd, Even, or None
Stop Bits: 2 or 1

Use a shield wire for a connecting cable to protect the output data from noise. When the measurement is output using RS232C, use a straight cable (D-sub 9 pins: male / D-sub 9 pins: female) for connection. The connections from the AL700 to the computer are shown in the following diagram :



D-SUB 9 pin (male)

D-SUB 9 pin (female)

WIRING DIAGRAM

PLUG (SOCKETS)			PLUG (SOCKETS)
1	N/C	N/C	1
2	RX	RX	2
3	TX	TX	3
4	DTR	DTR	4
5	GND	GND	5
6	DSR	DSR	6
7	RTS	RTS	7
8	CTS	CTS	8
9	N/C	N/C	9

Notes

Warranty

This product is warranted by Reichert, Inc. (Reichert) against defective material and workmanship under normal use for a period of one year from the date of invoice to the original purchaser. (An authorized dealer shall not be considered an original purchaser.) Under this warranty, Reichert's sole obligation is to repair or replace the defective part or product at Reichert's discretion.

This warranty applies to new products and does not apply to a product which has been tampered with, altered in any way, misused, damaged by accident or negligence, or which has the serial number removed, altered or effaced. Nor shall this warranty be extended to a product installed or operated in a manner not in accordance with the applicable Reichert instruction manual, nor to a product which has been sold, serviced, installed or repaired other than by a Reichert factory, Technical Service Center, or authorized Reichert, Inc. dealer.

Lamps, bulbs, charts, cards and other expendable items are not covered by this warranty.

All claims under this warranty must be in writing directed to the Reichert factory, Technical Service Center, or authorized instrument dealer making the original sale and must be accompanied by a copy of the purchaser's invoice with serial numbers. Any product returned for service must have a Return Material Authorization (RMA) and be packed in factory packaging.

This warranty is in lieu of all other warranties implied or expressed. All implied warranties of merchantability or fitness for a particular use are hereby disclaimed. No representative or other person is authorized to make any other obligations for Reichert. Reichert shall not be liable for any special, incidental, or consequent damages for any negligence, breach of warranty, strict liability or any other damages resulting from or relating to design, manufacture, sale, use or handling of the product.

PATENT WARRANTY

If notified promptly in writing of any action brought against the purchaser based on a claim that the instrument infringes a U.S. Patent, Reichert will defend such action at its expense and will pay costs and damages awarded in any such action, provided that Reichert shall have sole control of the defense of any such action with information and assistance (at Reichert's expense) for such defense, and of all negotiation for the settlement and compromise thereof.

PRODUCT CHANGES

Reichert reserves the right to make changes in design or to make additions to or improvements in its products without obligation to add such to products previously manufactured.

CLAIMS FOR SHORTAGES

We use extreme care in selection, checking, rechecking and packing to eliminate the possibility of error. If any shipping errors are discovered:

1. Carefully go through the packing materials to be sure nothing was inadvertently overlooked when the unit was unpacked.
2. Call the dealer you purchased the product from and report the shortage. The materials are packed at the factory and none should be missing if the box has never been opened.
3. Claims should be filed within 30 days.

CLAIMS FOR DAMAGES IN TRANSIT

Our shipping responsibility ceases with the safe delivery in good condition to the transportation company. Claims for loss or damage in transit should be made promptly and directly to the transportation company.

If, upon delivery, the outside of the packing case shows evidence of rough handling or damage, the transportation company's agent should be requested to make a "Received in Bad Order" notation on the delivery receipt. If within 48 hours of delivery, concealed damage is noted upon unpacking the shipment and no exterior evidence of rough handling is apparent, the transportation company should be requested to make out a "Bad Order" report. This procedure is necessary in order for the dealer to maintain the right of recovery from the carrier.



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