



# Leica PL800 Digital PD Meter

User's Guide



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## Introduction

Congratulations on your purchase of the Leica PL800 Digital PD Meter.

This User's Guide is designed as a training and reference manual. We recommend you carefully read and follow the steps in this guide to ensure optimum performance from your new instrument.

Please retain this guide for future reference and to share with other users. This guide is used with product catalog number 13401.

For additional copies or assistance with this product, contact:

- An authorized Leica Microsystems Inc., Ophthalmic Instruments Division dealer; or our
- Customer Service Department by telephone at (716) 686-4500, by fax at (716) 686-4545, or by e-mail at [info@reichert.com](mailto:info@reichert.com).

## Precautions



**WARNING:** The PL800 is not suitable for use in the presence of flammable anesthetic mixtures with air or with oxygen or nitrous oxide.



**CAUTION:** The PL800 is best situated in a cool, dry, dust-free environment.



**CAUTION:** Make sure patient window is clean — use a lens tissue or clean, dry, soft cloth to clean the window.



**CAUTION:** Do not use alcohol or other cleaning agents to externally clean the PL800's covers, patient window or screen, as damage may occur to the surface coatings.

Leica Microsystems Inc. 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.

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Ophthalmic Instruments Division

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## Instrument Components



### 1. Infrared Communications Port

The PL800 has an Infrared Communications Port which communicates with a compatible printer without the use of a data cable.

### 2. Measurement Slides

The Measurement Slides move to adjust the position of the Index Lines for accurate measurement of the total Inter-Pupillary Distance (PD) and Right/Left Nose-to-Pupil Distance (R/L NPD). During measurement, each Measurement Slide is positioned so that the index line is over the center of the corneal reflection light at the center of the patient's pupil.

**Note:** If a Measurement Slide is moved too far to the right or left, the Digital Display will show dashes blinking on and off. In this condition, the Measurement Slide is out of range and must be repositioned.

### 3. ON/OFF Button

This button turns the unit on or off. When pushed on, the unit starts an internal calibration routine. After the calibration routine has successfully completed, the PL800 is ready for operation.

### 4. Circular Dial

The Circular Dial modifies the measurement data to reflect short and medium fixation distances. It is set to infinity ( $\infty$ ) when measurement data is acquired, and then it is adjusted to display the short and middle range data.

### 5. Operator Viewing Window

The operator uses the Operator Viewing Window to look at the patient's eye. Through this window, the patient's eye, the index line and the corneal reflected light are visible.

### 6. Print Button

This button sends the measurement data out of the Infrared Communications Port.

### 7. Hold Button

The Hold Button captures the current measurement data on the Digital Display and does not allow it to change even if the Measurement Slides or the Circular Dial are moved. If pressed a second time, the Digital Display shows the current measurement data as set by the position of the Measurement Slides.

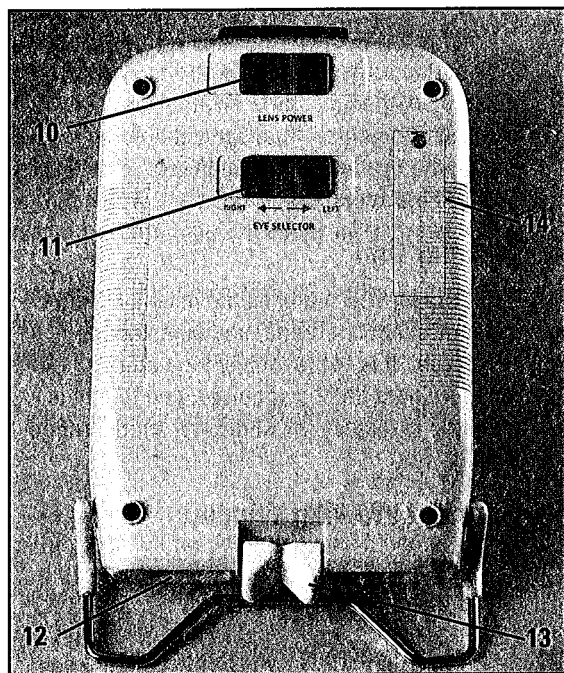
### 8. Digital Display

The LCD displays the measurement data at an angle that is easy to view without removing the instrument from the forehead of the patient. With this feature, comparison and verification of any difference between the left and right measurement data is possible during measurement.

### 9. Forehead Support

This component helps align the PL800 to the patient's forehead so that consistent measurement data is acquired.

## Instrument Components (cont.)



### 10. Lens Power Corrector

This feature will correct up to 3 diopters of presbyopia so that the operator has the choice of wearing or not wearing reading eyeglasses when operating the PD Meter.

### 11. Eye Selector

This feature enables occlusion of the Fixation Light from the patient's eyes (but allows the posture of both eyes to always be seen by the operator). The Eye Selector has three positions. The first two are the right and left positions which occlude the fixation light from one eye (right or left eye). The third position is the middle position which allows the patient to see the Fixation Light with both eyes.

### 12. Patient Window

This is the window that the patient looks through during the measurement process.

### 13. Nose Support

The Nose Support physically references the measurement system to the nose.

### 14. Battery Cover

The battery cover provides access to the battery when replacement is required.

## Special Features

### Fixation Light

The Fixation Light LED (Light Emitting Diode) that is inside the PL800 is used as a visual target for the patient during the measurement. This target is rectangular in shape and is continuously on during the measurement process. The LED will automatically turn off if the Measurement Slides or the Circular Dial are not moved for approximately 20 seconds. To turn the LED on again, move either of the Measurement Slides or the Circular Dial.

### Automatic Shut-Off

This special feature monitors activity of the measurement system and shuts the unit off after a period of inactivity. In addition, this feature conserves battery power to provide the longest possible battery life.

The automatic shut-off sequence starts when the unit is not used for approximately 20 seconds. After 20 seconds, the rectangular Fixation Light LED shuts off. This light will remain off until either of the Measurement Slides or the Circular Dial is moved. If the unit continues to be unused for a total of one minute and 15 seconds, it will disable power to the main circuit board and the PL800 will shut off.

### Low Voltage Indicator

The PL800 constantly monitors the battery.

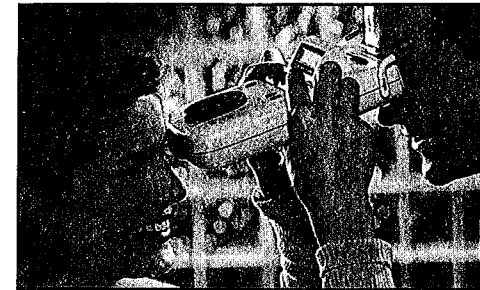
If input voltage is below a minimum confidence level, the instrument gives a low-voltage warning by displaying dashes across the Digital Display. When these dashes appear, it is time to install a new battery.

**Note:** Dashes across the Digital Display also indicate that the Measurement Slides may be out of range. Adjustment of the Measurement Slides is suggested before changing the battery.

## Instructions for Use

### Overview

The Leica PL800 Digital PD Meter measures total Inter-Pupillary Distance (PD) and Right/Left Nose-to-Pupil Distance (R/L NPD) for short, middle and long range viewing (fixation) distances.



### Basic Operation

Perform the following steps to operate the PL800:

1. Press the ON/OFF Button. The PD Meter immediately performs a self-test and the Digital Display will show "00000" as it checks the operation of the instrument. When it has successfully completed its self-test, the Digital Display will show pupillary distances as set by the actual position of the Measurement Slides.
2. Set the Circular Dial to infinity ( $\infty$ ).
3. Carefully place the Forehead Support against the patient's forehead and then set the Nose Support onto the patient's nose.
4. Set the Eye Selector to either the right or left position and instruct the patient to observe the rectangular fixation light with that eye.
5. Look through the Operator Viewing Window and observe the corneal reflected light on the center of the patient's cornea. Move the Measurement Slide until the index line is directly over the center of the corneal reflected light (see Figure 1, below).

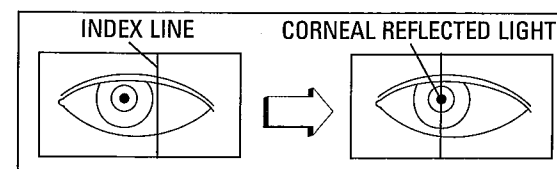


Figure 1

6. Set the Eye Selector to the opposite position and instruct the patient to observe the rectangular fixation light with the other eye.
7. Look through the Operator Viewing Window and observe the corneal reflected light on the center of the patient's cornea. Move the Measurement Slide until the index line is directly over the center of the corneal reflected light.
8. Observe the Digital Display and check the measurements on the Digital Display. The right and left measurements should be approximately equal, and the middle measurement should be the sum of the right and left measurements.

### Adjustable Viewing Distance

After the right and left measurements are taken, the measurements for medium and short ranges can be obtained for the viewing distances shown on the Circular Dial. To obtain these measurements, turn the Circular Dial and align the desired viewing distance with the arrow.

**Note:** If the Hold Button is pressed before the medium and short viewing distances are obtained, the data on the Digital Display will not change to reflect the shorter viewing distances.

### Hold Measurement Data

After measurement data is acquired, the Hold Button may be pressed to prevent the data on the Digital Display from changing if the Measurement Slides or the Circular Dial is accidentally moved. To exit the hold measurement data mode, press the Hold Button a second time.

## Maintenance

If the battery that supplies power is low (causing dashes to be displayed on the Digital Display) or it is rundown (unit does not turn on), perform the following steps:

1. Remove the screw that secures the battery cover and remove the cover.
2. Disconnect the battery from the connector and replace it with a new battery.
3. Install the battery cover into its original position and secure with the screw that was removed.

There is no other user maintenance that can be performed on the PL800. Refer all other maintenance-related inquiries to:

- An authorized Leica Microsystems Inc., Ophthalmic Instruments Division dealer; or
- Customer Service Department by telephone at (716) 686-4500, by fax at (716) 686-4545, or by e-mail at info@reichert.com.

## Cleaning

Clean the exterior surfaces of the PL800 with a mild soap solution. Perform the following steps:

**NOTE:** Do not use alcohol or other cleaning agents to clean the covers, patient window or screen, as damage may occur to the surface coatings.

**NOTE:** Do not immerse the PL800 in liquid or damage to the instrument will occur.

1. Apply a small amount of mild soap solution to a clean soft cloth and wipe the exterior of the PL800.
2. If necessary, apply a small amount of clean water to a clean, soft cloth to remove any residual soap solution.
3. Dry the exterior of the PL800 using a clean, dry, soft cloth.

## Troubleshooting

| PROBLEM   | SOLUTION   |
|---|--|
| PL800 does not turn on.   | Battery is bad or missing.   |
| Rectangular Fixation Light does not stay on.                                    | PL 800 has not been used for 20 seconds. Move the Measurement Slides or the Circular Dial. |
| Data does not change when the Measurement Slides or the Circular Dial is moved. | The Hold Button has been depressed. Press the Hold Button again.                           |
| Dashes flash on the Digital Display.  | The Measurement Slides are out of range, or the battery is weak. Change battery.           |

## Product Specifications

|               |  |
|---------------|--|
| Display       | Liquid Crystal Display   |
| Fixation      | Illuminated Rectangle  |
| Fixation Lamp | Red LED  |
| Occlusion     | Right or Left Eye  |
| Battery Type  | 9V Alkaline  |
| Measurement:  |  |
| Binocular     | 47.0 - 84.0 mm $\pm$ 0.5 mm                                    |
| Monocular     | 23.5 - 42.0 mm $\pm$ 0.5 mm                                    |
| Distance      | 30 mm - $\infty$ (infinity)                                    |
| Steps         | 30, 35, 40, 50, 65 cm<br>1.0, 2.0 m<br>and $\infty$ (infinity) |
| Dimensions:   |  |
| Height        | 2.63"/67 mm  |
| Width         | 6.06"/154 mm   |
| Depth         | 9.63"/244 mm   |
| Color         | Gray   |
| Weight        | 1.41 lbs/570 g   |

## Ordering Information

To order copies of this manual, other related information or a list of our authorized dealers, contact Leica Microsystems Inc., Ophthalmic Instruments Division at (USA) 716-686-4500.

### Other Leica Products

#### Ophthalmic Instruments Division

To complement your PL800 Digital PD Meter, please take a look at our other products:

KM250 Automated Keratometer

AR350 Automated Refractor

KR450 Automated Keratometer/Refractor

AP250 Automated Projector

CTEST™ (Contrast Sensitivity Test)

Keratometer

LENSCHEK™ Advanced Logic Lensometer®

LongLife™ Project-O-Chart

Non-Contact Tonometer (NCT) II

Selectra™ Project-O-Chart

Leica Phoroptor® Refracting Instrument

XCEL® Slit Lamps

XPERT® NCT *PLUS* Advanced Logic Tonometer



## Warranty

This product is warranted by Leica Microsystems Inc. ("Leica") 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, Leica's sole obligation is to repair or replace the defective part or product at Leica'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 Leica instruction manual, nor to a product which has been sold, serviced, installed or repaired other than by a Leica factory, Technical Service Center, or authorized Leica, Ophthalmic Instrument Division 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 Leica factory, Technical Service Center, or authorized instrument dealer making the original sale and must be accompanied by a copy of the purchaser's invoice.

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 Leica. Leica 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, Leica will defend such action at its expense and will pay costs and damages awarded in any such action, provided that Leica shall have sole control of the defense of any

such action with information and assistance (at Leica's expense) for such defense, and of all negotiation for the settlement and compromise thereof.

### PRODUCT CHANGES

Leica 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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