

# VIP<sup>®</sup>-400 Pupillometer

## Instructions For Use



NEUROPTICS<sup>®</sup>

# Introduction

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The NeurOptics® VIP®-400 Pupillometer offers clinicians quantitative infrared technology to objectively and accurately measure pupil size in an advanced design. The VIP-400 provides a comfortable ergonomic design, incorporated barcode scanner, wireless charging, and easy-to-read touchscreen LCD and graphics.

## Indications for Use

The VIP-400 Pupillometer is a handheld optical scanner which measures pupil size at different background illuminations. The results obtained from the VIP-400 scans are used for information only and are not to be used for clinical diagnostic purposes. The VIP-400 should only be operated by properly trained clinical personnel, under the direction of a qualified physician.

## Contraindications

Avoid use when the orbit structure is damaged, or surrounding soft tissue is edematous or has an open lesion.

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## Warnings and Cautions

### Warnings

Warnings and Cautions appear throughout this manual where they are relevant. The Warnings and Cautions listed here apply generally any time you operate the device.

- The VIP-400 is intended for use by trained clinical personnel, under the direction of a qualified physician.
- If a problem is recognized while operating the device, the device must be removed from use and referred to qualified personnel for servicing. Do not use the device if damage to the housing or internal optical components is apparent. Using an inoperative device may result in inaccurate readings.
- Electric shock hazard – Do not open the device or the charging station. There are no user serviceable parts.
- The battery in the VIP-400 is only replaceable by a qualified NeurOptics® service technician. Contact NeurOptics if you suspect an inoperable battery.
- Use only the NeurOptics VIP-400 Charging Station for charging the VIP-400.
- Risk of fire or chemical burn – This device and its components may present a risk of fire or chemical burn if mistreated. Do not disassemble, expose to heat above 100°C, incinerate, or dispose of in fire.
- Store and use the VIP-400 System in ambient environments with non-condensing humidity levels only. Using the VIP-400 with condensation on optical surfaces may result in inaccurate readings.

### Cautions

The following cautions apply when cleaning the device.

- The internal components of the VIP-400 are NOT compatible with sterilization techniques, such as ETO, Steam Sterilization, Heat Sterilization and Gamma.
- DO NOT submerge the device or pour cleaning liquids over or into the device.
- DO NOT use acetone to clean any surface of the VIP-400 or Charging Station.

### Electromechanical Compatibility (EMC) Notice

This device generates, uses, and can radiate radio frequency energy. If not set up and used in accordance with the instructions in this manual, electromagnetic interference may result. The equipment has been tested and found to comply with the limits set forth in EN60601-1-2 for Medical Products. These limits provide reasonable protection against electromagnetic interference when operated in the intended use environments (e.g. hospitals, research laboratories).

### Magnetic Resonance Imaging (MRI) Notice

This device contains components whose operation can be affected by intense electromagnetic fields. Do not operate the device in an MRI environment or in the vicinity of high-frequency surgical diathermy equipment, defibrillators, or short-wave therapy equipment. Electromagnetic interference could disrupt the operation of the device.

### Federal Communications Commission Compliance

This device complies with Part 15 of the Federal Communications Commission (FCC) Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference which may cause undesired operation.

## Classification

**Type of Equipment:** Medical Equipment, Class 1 886.1700

**Trade Name:** NeurOptics® VIP®-400 Pupillometer

### Manufactured by:



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## Patents, Copyright and Trademark Notice

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For details, visit: [www.NeurOptics.com/patents/](http://www.NeurOptics.com/patents/)

## Safety Information

- Please review the following safety information prior to operating the device.
- Please read these Instructions fully before attempting to use the VIP-400. Attempting to operate the device without fully understanding its features and functions may result in unsafe operating conditions and/or inaccurate results.
- If you have a question regarding the installation, set-up, operation, or maintenance of the device, please contact NeurOptics.

# Getting Started

## Unpacking the VIP-400 Pupillometer System

The NeuroOptics VIP-400 Pupillometer System is packaged with the following components (Ex. 1):

- VIP-400 Pupillometer (A)
- Eye Cups x 2 (D)
- Charging Station (B)
- Data Download Cable & Tool (E)
- Power Adapter and Plug (C)
- VIP-400 Pupillometer Quick Start Guide




Ex. 1

## Initial Set-Up

- To set up the VIP-400 for first-time use, please refer to the **Power Up** section below, ensuring the VIP-400 is fully charged and Date/Time are set accurately prior to use.

## Power Up

### Charging the VIP-400 Pupillometer

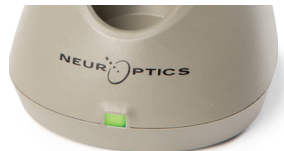
- Connect the VIP-400 Power Adapter to the VIP-400 Charging Station and plug into a power outlet. The indicator light at the base of the Charging Station will display a white color to indicate power has been established to the Charging Station (Ex. 2).
- Place the VIP-400 into the Charging Station. The Charging Station indicator light will turn **blue** (Ex. 3), and the LCD screen will display  within the battery icon, indicating the VIP-400 is charging. The indicator light will turn **green** when fully charged (Ex. 4).
- An **amber/orange** indicator light on the Charging Station indicates a charging malfunction, and the VIP-400 will not charge (Ex. 5). If this issue persists, please contact NeuroOptics Customer Service.



Ex. 2



Ex. 3



Ex. 4



Ex. 5

Indicator Light Color	Meaning
White	Charging Station is plugged into a power outlet, and power has been established. VIP-400 is out of Charging Station.
Blue	VIP-400 is placed in Charging Station and successfully charging.
Green	VIP-400 is fully charged.
Amber/Orange	Charging Malfunction – VIP-400 is not charging. If issue persists, please contact NeuroOptics Customer Service.

### The VIP-400 Pupillometer goes to sleep in the Charging Station to efficiently charge:

- The VIP-400 will initially turn ON (or remain on) upon being placed in the Charging Station.
- After 2 minutes in the Charging Station, the VIP-400 will go to sleep to efficiently charge. The screen will go dark (Ex. 6). If any button is pressed or the screen is touched within this 2-minute window, the time period before the VIP-400 goes to sleep is extended by an additional 2 minutes.
- To use the VIP-400 after it has gone to sleep in the Charging Station, simply remove from the Charging Station, and it will wake up automatically.
- If the VIP-400 does not turn on upon being placed in the Charging Station, the battery level may be too low for normal usage. The Charging Station indicator light should display a **blue** color, indicating the VIP-400 is charging. Leave the VIP-400 in the Charging Station until it powers on.




Ex. 6



## If the VIP-400 Pupillometer is not in the Charging Station, to conserve battery life it will:

- Go into sleep mode after 4 minutes. To turn ON, touch the screen or push any button.
- Power down after an additional 6 minutes.



## Turning On the VIP-400 Pupillometer

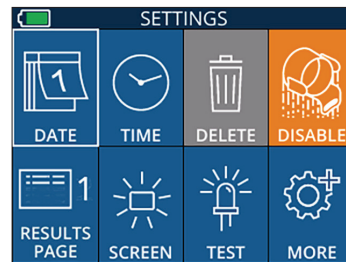
- If the VIP-400 is out of the Charging Station and has powered down, press (do not hold) the **On/Off** button  on the side of the device (Ex. 7).
- If the VIP-400 is in the Charging Station and has gone to sleep, simply remove from the Charging Station, and it will wake up automatically.



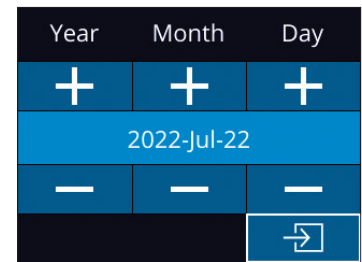
Ex. 7

## Setting Date and Time

To modify the date and time, from the Home Screen, select the **Settings** icon  and then select **Date** or **Time** (Ex. 8). Follow the prompts to input the current date (Ex. 9) and time (Ex. 10) using 24-hour time configuration and select .

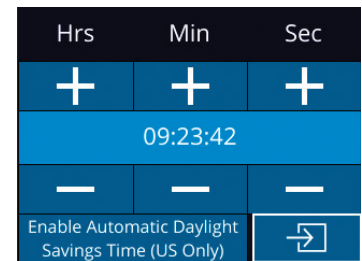


Ex. 8



Ex. 9

Customers in the United States have the option to enable **Automatic Daylight Savings Time (DST)** in the **Time** settings. Automatic DST is disabled by default. Automatic adjustments occur based only on US DST regulations and are not updated according to geographic location, as the VIP-400 is not connected to the internet or GPS.



Ex. 10

## Date and Time Maintenance

- Regular quarterly maintenance is necessary to ensure date and time are correct. The set date and time will affect the timestamp listed for subsequent patient pupil measurements on the VIP-400. Changing the date and time will not alter the timestamps on previous measurements.
- Immediately adjust the time after any time change if Automatic DST is disabled.

## Returning to the Home Screen

Press the **OD** or **OS** buttons (green circles) to return to the Home Screen (Ex. 11).



Ex. 11

## Measuring Pupils Using the VIP-400 Pupillometer

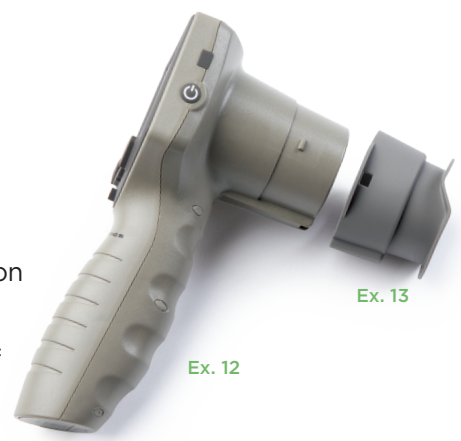
### Attaching the Eye Cup to the Pupillometer

Two components are required to initiate a pupil measurement:

- VIP-400 Pupillometer (Ex. 12)
- Eye Cup (Ex. 13)

The VIP-400 should not be used without the eye cup positioned correctly (Ex. 13). It is very important that the eye cup be correctly fitted. A snug fit helps reduce the possibility of stray light entering the eye while the scan is taking place. The eye cup has a tab in the rim which fits into the indentation in the lens shield of the Pupillometer.

Position the tab in the eye cup rim into the indentation in the lens shield of the Pupillometer and press into place. The tabs on either side of the lens shield should also snap into the holes on either side of the eye cup.



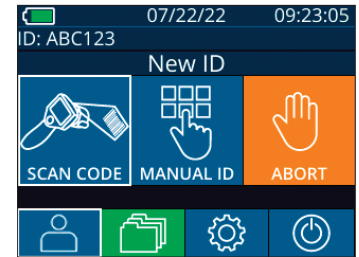
Ex. 13

Ex. 12

## Enter a New Patient ID



There are two options for associating the Patient ID to the Pupillometer:

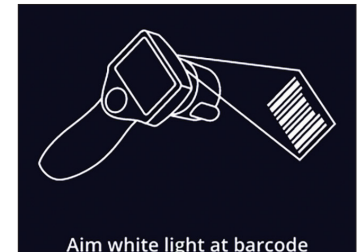
- 1) Scanning the patient's barcode using the VIP-400 Incorporated Barcode Scanner; or
- 2) Manually entering the Patient ID with either alpha or numeric characters.



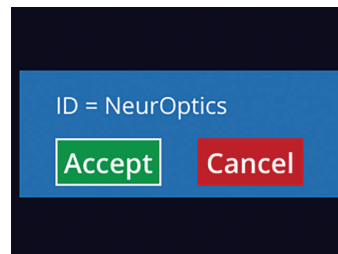
Ex. 14

### Scan Barcode Using Incorporated Barcode Scanner

From the Home Screen, select , then **Scan Code**  (Ex 14). The VIP-400 will emit a white light from the top of the device (Ex. 15). Center the light over the barcode until you hear an audible beep. The Patient ID will now appear on the VIP-400 touchscreen. Confirm the patient information is correct and select **Accept** (Ex. 16). The VIP-400 will display the Patient ID and read **Ready to Scan** (Ex. 17).



Ex. 15






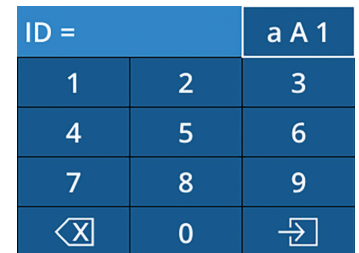
Ex. 16



Ex. 17



### Manual Entry of the Patient ID

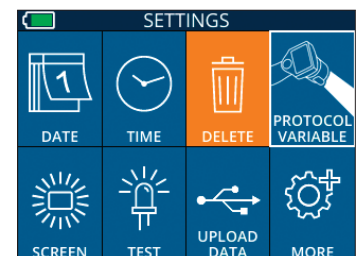
From the Home Screen, select , Select **Manual ID** . Using the touchscreen or keypad, enter the alpha or numeric Patient ID and select  (Ex. 18). Confirm the patient information on the screen is correct and select **Accept** (Ex. 16). The VIP-400 will display the Patient ID and read Ready to Scan (Ex. 17).



Ex. 18

## Set Measurement Protocol

From the Home Screen screen (Ex. 21), select the Settings icon  and then the top right icon  (Ex. 19) to toggle between Protocol **Light Off** and Protocol **Variable**.



Ex. 19

In the **Variable** mode, the eye is exposed to a sequence of three consecutive light backgrounds simulating **Scotopic**, **Low Mesopic**, and **High Mesopic** lighting conditions and the duration of the measurement is approximately 12 seconds. During Scotopic, the background is off. Low Mesopic (approximately 0.3 lux) simulates lighting conditions such as moon illumination, driving at night outside of urban areas, or a dimly lit room. High Mesopic (approximately 3 lux) simulates conditions such as moderate streetlights or early twilight. The patient should be dark adapted prior to taking a measurement in Variable mode. The **Light Off** mode is approximately 2 seconds and there is no light background.

## Patient and Environment Preparation

- Before initiating the measurement scan, turn off or reduce overhead lighting to ensure that the room is darkened (if maximum pupil size is desired).
- Instruct the patient to focus on a small target object (for example, a wall chart or a dim flashing light that is at least 10 or more feet [3 meters] away) with the eye that is not being tested. The operator should not stand in the line of sight between the patient and the distant target.
- Ask the patient to keep their head straight and both eyes wide open during both targeting and measurement. In some cases if targeting becomes a problem, it may be necessary to gently hold the patient's eye open with your finger.
- The operator should position the instrument at a right angle to the patient's axis of vision and any tilting of the instrument should be minimized (Ex. 20).
- It may be helpful for the operator to be at the same level as the patient when performing the scan to minimize tilting. If necessary, both patient and operator can sit down facing each other during targeting and measurement.



Ex. 20



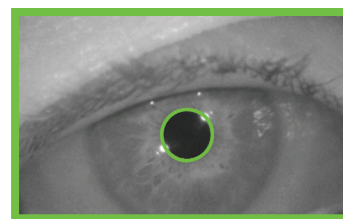
Ex. 21

Measurements must be taken when the Pupillometer is on the Home Screen screen (Ex. 21). The Home Screen shows the date and time, patient ID number, and which Protocol is active: **Variable** or **Light Off**. The screen should read "READY TO SCAN."

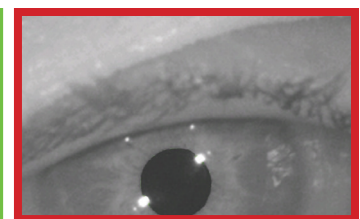
Press and hold either the **OD** (right eye) or **OS** (left eye) button until the pupil is centered on the touchscreen and the display shows a green circle around the pupil. A green frame around the screen indicates the pupil is properly targeted (Ex. 22), while a red frame indicates the pupil needs to be re-centered on the screen before the measurement is initiated (Ex. 23). Once the green frame appears, release the **OD** or **OS** button, holding the VIP-400 in place for approximately two seconds until the results screen is displayed.

When the pupil measurement is complete, pupil data are analyzed and then results are displayed. If the measurement was affected by a tracking problem (e.g., excessive blinks) then results are reported as **NA**. (Ex. 24) In this case, measurement results are not valid and should not be relied upon and the measurement should be repeated.

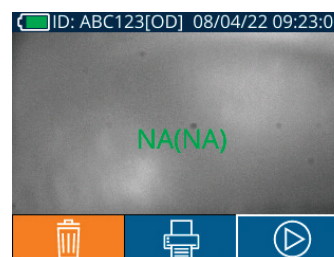
The results page in **Light Off** mode (Ex. 25) shows the mean diameter of the pupil in bold and in parentheses the standard deviation measured during the scan. It also includes the ID number of the subject, the date and time of the measurement, as well as which eye (OD or OS) was measured.



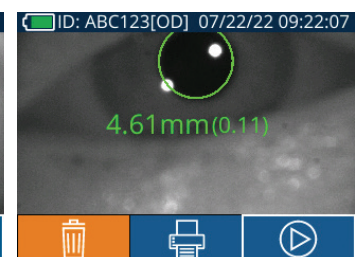
Ex. 22



Ex. 23




Ex. 24



Ex. 25








The results page in **Variable** mode (Ex. 26), which takes 12 seconds total, show the mean diameter of the pupil at each light level, the standard deviation, as well as the ID number of the subject, the date and time of the measurement, and which eye (OD or OS) was measured.

## Video Replay

From the Results screen, select the **Video** icon  to view the video playback of the reading. Only the last measurement's video can be played back. Once the VIP-400 has powered off, or if the OD or OS button is pressed during the scan, the last video is not accessible (Ex. 27).



## Browse Records

To review records stored on the VIP-400:

- From the Home Screen: Select the **Records** icon  (Ex. 28).
- To browse records by Patient ID, select the ID from the list or use the **UP**  and **DOWN**  arrows on the screen to browse additional IDs available in the list. The IDs of the most recent measurements taken on the VIP-400 will appear at the top of the list.
- To search for a specific Patient ID, select  (Ex. 29), then type in the Patient ID and select .
- To browse all pupil measurements stored on the VIP-400 in chronological order (including all Patient IDs), select the **All Records** icon  (Ex. 29) and press the **DOWN Arrow** button  on the keypad to scroll through all previous measurements stored on the VIP-400.
- When the **No more records** message appears, the earliest pupil measurement stored has been reached.

The pupillometer stores at least 1,200 measurement in its memory. Once the memory is full, it begins to write over the oldest measurements first.

## Download Data

From the Home Screen screen, select the Settings icon  then select **Upload Data** . Connect the USB cable to the pupillometer by removing the USB cover using the removal tool provided and plug the cable into the mini USB port of the pupillometer above the Power button (Ex. 30). A text message will appear on the screen instructing the user to “connect USB cable & copy R\_#####\_#####.xls.” Download Data to Laptop (Ex. 31). After plugging the other end of the cable into the USB port of the computer, the memory card of the pupillometer will show as “Neuroptics” on the computer. Open the Neuroptics folder and copy the file. Press “Done” in the small window on the pupillometer screen only after the copy has been completed, as the file will then be erased (Ex. 32).



Ex. 30

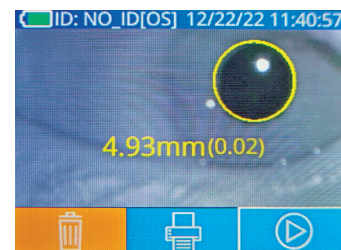


Ex. 31

Ex. 26

ID: NO_ID[OS] 12/22/22 11:30:22		
	Mean (mm)	Std (mm)
Scotopic	4.67	0.07
Low Mesopic	4.65	0.05
High Mesopic	4.72	0.08

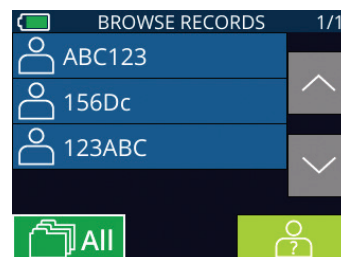
Ex. 26



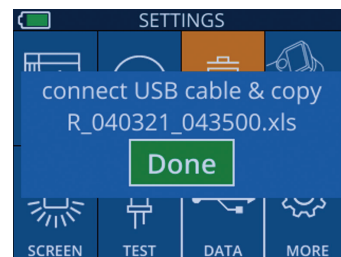
Ex. 27



Ex. 28




Ex. 29



Ex. 32



## Print Data

Attach the power supply to the printer as shown in Ex. 33. Turn the printer on and the green light will illuminate. The patient measurement result currently displayed in the results window (Ex. 34) can be printed by selecting the  at the bottom of the screen.

The system will only print a record when a measurement result is displayed on the screen. If you want to print a measurement other than the last measurement taken, refer to the “Browse Records” section above. Consult the printer’s instruction manual for specific printer operation instructions.



Ex. 33



Ex. 34



Neuroptics				
07/17/2024 04:44:42				
Patient ID: JEFFVIP [00]				
Device ID: VIP001				
Pupil Size Comparison				
	Scotopic	L. Mesopic	H. Mesopic	
Mean (mm)	4.61	3.12	2.87	
Std (mm)	0.09	0.11	0.10	

Variable Mode Sample Printout

Neuroptics				
07/17/2024 04:44:20				
Patient ID: JEFFVIP [00]				
Device ID: VIP001				
Pupil Size Comparison				
	Scotopic			
Mean (mm)	3.72			
Std (mm)	0.17			

Light Off Mode Sample Printout

## VIP-400 Pupillometer Navigation Guide


### Returning to the Home Screen

Press the **OD** or **OS** button (Ex. 35) to return to the Home Screen.



Ex. 35


### Settings

Using the touchscreen or keypad, select **Settings** icon  on (Ex. 36) from the Home Screen to navigate to the Settings Menu (Ex. 37).




#### Date and Time

See **Setting Date and Time** section on Page 5.


#### Delete Records

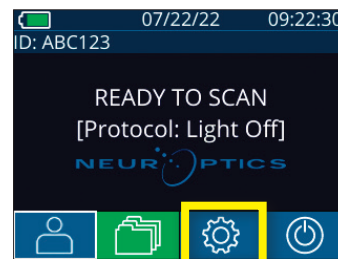
To delete records off of the device memory of the VIP-400, navigate to the Settings Menu and press **Delete**  then select **Yes** to proceed to delete record (Ex. 38). Records on the device can be deleted for a specific Patient ID or All Records.

#### LCD Screen Brightness

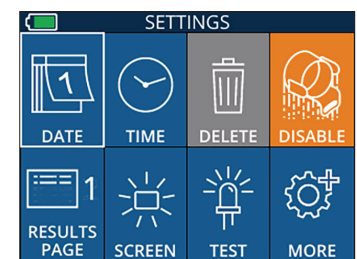
The VIP-400 is defaulted to maximum brightness of the LCD Screen. Adjust to medium brightness by pressing . Adjust to low brightness by pressing . To return to maximum brightness, simply press the  one more time.

#### Test LED

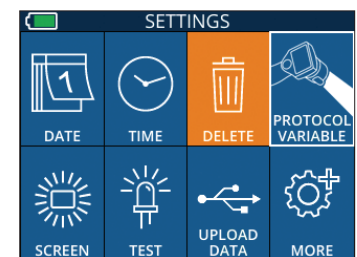
Pressing the Test icon  demonstrates a sample of the LED light that is emitted from the VIP-400 when taking a pupil measurement. The test should show LEDs lit up at 3, 6, 9 and 12 o'clock on the lens side. This test is for demonstration purposes only and does not affect usage of the device.



Ex. 36






Ex. 37

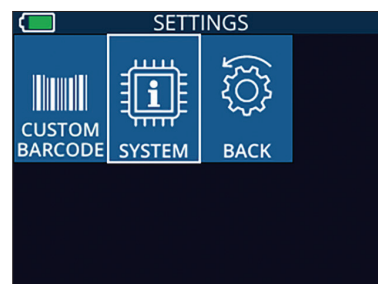


Ex. 38

## More Settings


### Customize Barcode Scanner

The VIP-400 Incorporated Barcode Scanner can be customized to truncate or expand the alpha or numeric characters read from a barcode, if required. The **Default** settings automatically adjust to read most types of 1D and 2D barcodes, and “Default” should remain selected unless a specific customization needs to be applied to all barcodes scanned by the VIP-400. Select **Settings** , more , **Custom Barcode**  (Ex. 39), then select **Scan Sample** to scan a sample barcode and program the required customizations (truncation or expansion) to be used for all future scans. Contact NeuroOptics for additional information.



Ex. 39

### System Information

Select **System**  (Ex. 37) to view the VIP-400’s system information, displaying the Serial Number, Software Application, and Firmware versions of the device.

## Troubleshooting



Issue	Possible Reason	Solution
1. VIP-400 Pupillometer will not turn on	Using incorrect Power Adapter	Use only Power Adapter provided with VIP-400. Check label on power adapter.
	Power cord is not fully plugged into the wall or the charging station	Check connections.
	Battery completely discharged	Charge the battery by placing the VIP-400 into the Charging Station.
2. Pupil measurement will not initiate after release of the OD or OS key	Too much blinking	Gently hold patient’s eye open with your finger during measurement.
	Device not held correctly	Hold eye cup at a 90-degree angle to patient’s face. Make sure patient’s pupil is centered on the screen.
3. VIP-400 returned to Home Screen while taking a measurement	VIP-400 was moved from position before measurement has been completed.	Repeat the scan, and keep the VIP-400 in place until the measurement is completed and measurement results are displayed.
4. Error message appears on the screen	Various	Reboot the VIP-400 by pressing and holding the ON/OFF button on the side of the device until it powers OFF and then power it back on. If the issue persists, call NeuroOptics Customer Service.
5. “NA” displayed following measurement	VIP-400 was moved from position before measurement has been completed	Repeat the scan and keep the VIP-400 in place until the measurement is completed and pupillary measurement results are displayed.
	Patient blinked excessively during measurement	Hold the patient’s eyelid open and repeat the scan.
6. Download not initiated or not completed	Cable not well seated inside the housing of the device	Verify that cable is fully connected to the VIP-400.
	Downloaded file does not appear on the destination computer	Copy the downloaded file to the computer before pressing “Done” on the VIP-400.


## Troubleshooting Continued

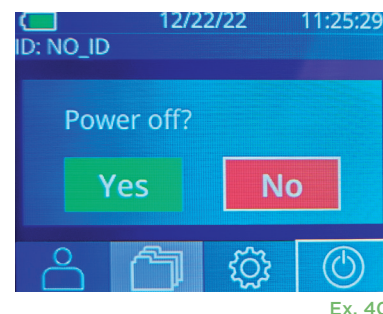
Issue	Possible Reason	Solution
7. Measurement results do not print	The VIP-400 is not close enough to the printer.	Make sure VIP-400 is $\leq 1\text{m}$ from the printer
	VIP-400 cannot “find” the printer.	Remove or turn off other devices which may be interfering with the connection.

## Power Off

To turn the VIP-400 Pupillometer OFF, either:

- Navigate to the Home Screen, and select the **Power** icon , then confirm **Yes** to power OFF (Ex. 40).
- Press and hold the **On/Off** button  on the side of the VIP-400 for about 3 seconds.

The VIP-400 may occasionally require a System Reboot. To reboot, simply press and hold the **On/Off** button  on the side of the VIP-400 until it powers OFF and then power it back on.



Ex. 40

## Handling, Cleaning and Maintenance

**Always** handle the VIP-400 Pupillometer and VIP-400 Charging Station with care because sensitive metal, glass, plastic and electronic components are contained inside. The VIP-400 and Charging Station can be damaged if dropped or by prolonged exposure to liquid or high humidity environments.

The VIP-400 and Charging Station do not require any regularly scheduled maintenance or calibration. If the VIP-400 and Charging Station are not working properly, or are believed to have been damaged, immediately contact NeurOptics Customer Service at **Toll Free North America:** 866.99.PUPIL (866-997-8745), international: +1-949-250-9792, or email: [Info@NeurOptics.com](mailto:Info@NeurOptics.com).

### Cleaning the VIP-400 Pupillometer, VIP-400 Charging Station and Eye Cup

Isopropyl alcohol (IPA)-based cleaning solutions, in formula concentrations up to 70% IPA, are recommended for use in cleaning the VIP-400, Charging Station, and eye cup. Do not use chemicals that can damage the VIP-400 and Charging Station surface. Some chemicals can weaken or damage plastic parts and may cause instruments to not operate as intended. Use all cleaning products per manufacturer's instructions, being careful to squeeze out excess liquid prior to wiping the VIP-400 and Charging Station and do not use an oversaturated cloth.

Wipe all exposed surfaces. Follow the cleaner's manufacturer instructions as to the time required to leave the solution on the device surface.

- **DO NOT** use an oversaturated cloth. Be sure to squeeze out excess liquid prior to wiping the VIP-400 or the Charging Station.
- **DO NOT** allow the cleaner to collect on the instrument.
- **DO NOT** use any hard, abrasive or pointed objects to clean any part of the VIP-400 or Charging Station.
- **DO NOT** immerse the VIP-400 or the Charging Station in liquid, or attempt to sterilize the product, as damage to the electronic and optical componentry could occur.

### Drying and Inspection Following Cleaning

Confirm the VIP-400 and Charging Station are thoroughly dry before placing the VIP-400 back into the Charging Station.

## Cleaning Considerations: VIP-400 Liquid Crystal Display (LCD) & Lens Cover Glass

For best protection of the liquid crystal display (LCD), and cover glass, use a clean, soft, lint-free cloth and up to 70% IPA to clean the VIP-400 optics. Occasional cleaning of the Incorporated Barcode Scanning Window (located just above the VIP-400 lens) is also recommended using a clean, soft, lint-free cloth and up to 70% IPA. Make sure the LCD, barcode scanning window and cover glass appear to be free of debris or water spots.

In instances where there is concern of exposure to highly resistant bacteria, viruses, fungi or spores (ie: Clostridium difficile, or “C. diff”), hospital protocols may require use of cleaning solutions containing sodium hypochlorite (bleach) when cleaning equipment. If products containing sodium hypochlorite (bleach) are used to clean the LCD of the VIP-400, the cleaning process should be followed by a second cleaning using a clean, soft, lint-free cloth and up to 70% IPA to ensure that all bleach residue is completely removed from the LCD.

## Customer Service

For technical support, or if you have a question regarding your product or order, please contact NeurOptics Customer Service at **Toll Free North America:** 866.99.PUPIL (866-997-8745), international: +1-949-250-9792, or email: [Info@NeurOptics.com](mailto:Info@NeurOptics.com).

## Ordering Information

VIP-400-SYS	VIP®-400 Pupillometer System
NEUR-2059-01	Eye Cup
CBL-0006-00	Data Download Cable
NEUR-PRTS445	Wireless Printer Kit

## Returned Goods Policy

Products must be returned in unopened packages, with manufacturer’s seals intact, to be accepted for credit, unless returned due to a complaint of product defect or mislabeling. Determination of a product defect or mislabeling will be made by NeurOptics, which determination will be final. Products will not be accepted for credit if they have been in the possession of the customer for more than 30 days.

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## Appendix A – Technical Specifications




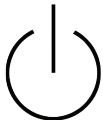



Parameter	Description	
Pupillometer Measurement Detection Threshold	Pupil diameter (minimum)	0.80 mm
	Pupil diameter (maximum)	10.00 mm
	Change in Size	0.03 mm (30 microns)
Size Accuracy	+/- 0.03 mm (30 microns)	
Degree of protection against electric shock	Pupillometer & Eyecup -Type BF Applied Part provided protection Charging Station & Power Adapter-Type B Applied Part provided protection	
Classification of the equipment against ingress of liquids	Ordinary equipment	
Degree of safety of application in the presence of flammable anesthetic mixture with air or with oxygen or nitrous oxide	The equipment is not an AP or APG category equipment	
Mode of Operation	On Demand battery operation	















## Appendix A – Technical Specifications Continued

Parameter	Description
Power Adapter	Input: 100-240 VAC +/- 8%
	Output: 6V, 2.8 Amps
	RF Wireless Charging Output: 5 W, Qi Compliant
Battery	3.6 V 11.70 Wh 3350 mAh/hour Li: Ion Cell
Operating Environment	Temperature Range: 0° C (32° F) to 40° C (104° F)
	Relative Humidity: Non-condensing at all times.
Transportation and storage environment	Temperature Range: -38° C (-36.4° F) to 70° C (158° F) Relative Humidity: Non-condensing at all times.
Dimensions	With Eye Cup = 7.5" H, 3.5" W, 4.5" D
	Without Eye Cup = 7.5" H, 3.5" W, 3.5" D.
Weight	344 grams +/- 10 grams
Classification	Class 1 LED product per IEC 62471

## Appendix B – International Symbol Definition

Symbol	Source/Compliance	Title of	Description of Symbol
	Standard: ISO 15223-1 Symbol Reference No: 5.4.4	Caution	Indicates that caution is necessary when operating the device or control close to where the symbol is placed, or that the current situation needs operator awareness or operator action in order to avoid undesirable consequences
	Standard: IEC 60417 Symbol Reference No: 5333	Type BF applied part	To identify a type BF applied part complying with IEC 60601-1
	Standard: IEC 60417 Symbol Reference No: 5840	Type B applied part	To identify a type B applied part complying with IEC 60601-1
	Standard: IEC 60417 Symbol Reference: 5009	Stand-by	To identify the switch or switch position by means of which part of the equipment is switched on in order to bring it into the stand-by condition, and to identify the control to shift to or to indicate the state of low power consumption
	Standard: ISO 15223-1 Symbol Reference No: 5.2.7	Non-sterile	Indicates a medical device that has not been subjected to a sterilization process
	Standard: ISO 15223-1 Symbol Reference No: 5.1.7	Serial number	Indicates the manufacturer's serial number so that a specific medical device can be identified
	Standard: ISO 15223-1 Symbol Reference No: 5.1.6	Catalog Number	Indicates the manufacturer's catalogue number so that the medical device can be identified

## Appendix B – International Symbol Definition Continued

Symbol	Source/Compliance	Title of	Description of Symbol
	Standard: BS EN 50419 Article 11(2) of the European Community Directive 2002/96/EC (WEEE)	Recycle: Electronic Equipment	Identifies product that is subject to the European Union's Waste Electrical and Electronic Equipment (WEEE) 2012/19/EU Directive for recycling of electronic equipment. Do not dispose of this product in unsorted municipal waste stream
	Standard: IEC TR 60417 Symbol Reference No: 6367	Coin Cell; Coin Battery	To provide information on packaging that it contains a small round cell or battery where the overall height is less than the diameter, and which contains non-aqueous electrolyte, for example a lithium cell or battery. To identify a device related to the power supply by such cell or battery, for instance a cover for the battery compartment
	U.S. 40 CFR 273.2 European Community Directive Article 21 of 2006/66/EC	Recycle. Battery contains Lithium	Dispose of according to local procedures for products containing lithium-ion batteries and products containing lithium perchlorate
	Standard: ISO 15223-1 Symbol Reference No: 5.1.1	Manufacturer	Indicates the medical device manufacturer
	Standard: ISO 15223-1 Symbol Reference No: 5.4.3	Consult instructions for use or consult electronic instructions for use	Indicates the need for the user to consult the instructions for use
	Standard: ISO 15223-1 Symbol Reference No: 5.3.4	Keep dry	Indicates a medical device that needs to be protected from moisture
	Standard: ISO 15223-1 Symbol Reference No: 5.3.7	Temperature limit	Indicates the temperature limits to which the medical device can be safely exposed
	Standard: ISO 15223-1 Symbol Reference No: 5.3.1	Fragile, handle with care	Indicates a medical device that can be broken or damaged if not handled carefully
	Standard: ISO 15223-1 Symbol Reference No: 5.7.7	Medical Device	Indicates the item is a medical device
	Standard: ISO 15223-1 Symbol Reference No: 5.7.10	Unique device identifier	Indicates a carrier that contains unique device identifier information
	Standard: IEC TR 60878 Symbol Reference No: 5140	Non-ionizing electromagnetic radiation	To indicate generally elevated, potentially hazardous, levels of non-ionizing radiation, or to indicate equipment or systems e.g. in the medical electrical area that include RF transmitters or that intentionally apply RF electromagnetic energy for diagnosis or treatment
	Standard: ISO 15223-1 Symbol Reference No: 5.7.8	Translation	Indicates that the original medical device information has undergone a translation which supplements or replaces the original information

## Appendix C – Wireless Printing Range and Frequency

Parameter	Description
Wireless Printing Range	Up to 100 cm
Wireless Printing low energy operation frequency	2.4 GHz



**NEUROPTICS®**

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