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I. Introduction

The *Lab Boy*TM Fiber-Optic Power Meter is a SpringboardTM compatible plug-in module for the HandspringTM Visor. In addition to the standard features of a fiber-optic power meter, this instrument offers enhanced functionality and an intuitive user interface.

In combination with the NLight software, the HandspringTM Visor, provides simultaneous three-way display and stores data for easy download to a PC. The instrument allows for user input via the Visor stylus or a user-configurable Hot Button.

This module has found popularity because it:

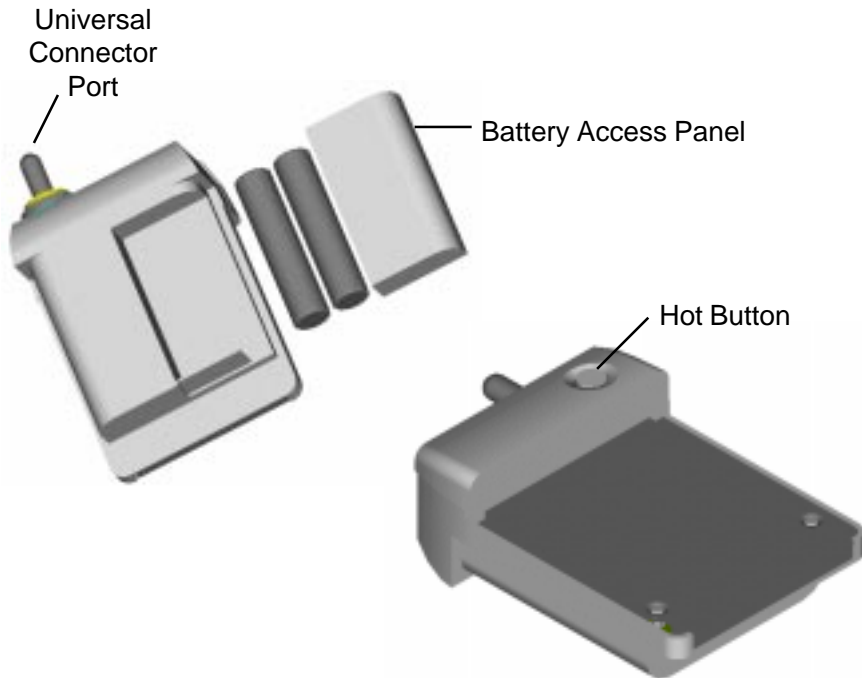
- **Logs data at 1, 10, or 60-second intervals**
- **Saves data to a spreadsheet file**
- **Graphs in real time**
- **Establishes a power reference easily**

The standard *Lab Boy*TM Fiber-Optic Power Meter has a universal connector that accepts any 2.5 mm ferrule, including FC, ST, SC, DIN and E2000 connectors. Custom modules for other wavelengths and connector types are available.

II. System Requirements

The NLight software has been optimized to operate with Palm OS Handspring™ Visor software. However, with the rapid development of the Visor product, certain software versions may be incompatible with our software. We therefore strongly recommend the customer purchase both the *Lab Boy*™ and the Handspring™ Visor from NOAH.

III. Module Diagram



IV. Key Buttons on the Handspring™ Visor



V. Getting Started

Installing the Batteries

To power the *Lab Boy*TM Fiber-Optic Power Meter, two (2) AAA batteries have been provided. Before inserting the batteries, make sure the module is not plugged-in to the HandspringTM Visor. Remove the battery access panel by sliding it away from the module. Match the + and - symbols on the batteries with the symbols in the battery compartment and then replace the battery access panel.

When the batteries in the *Lab Boy*TM have approximately five (5) hours of power remaining, a low-battery icon will appear on the Visor screen.

Starting the Program

Simply plug the *Lab Boy*TM Fiber-Optic Power Meter into the SpringboardTM expansion slot on the back of the Visor and the NLight application will start automatically. (NLight software is contained in the *Lab Boy*TM module, and does not need to be loaded into the Visor.)

Two additional ways to start the application are by selecting the NLight Icon from the Visor applications menu or by pressing the Hot Button on the front of the Lab Boy module. The Hot Button method is especially useful when the user is working in another application or when the Visor is turned off.

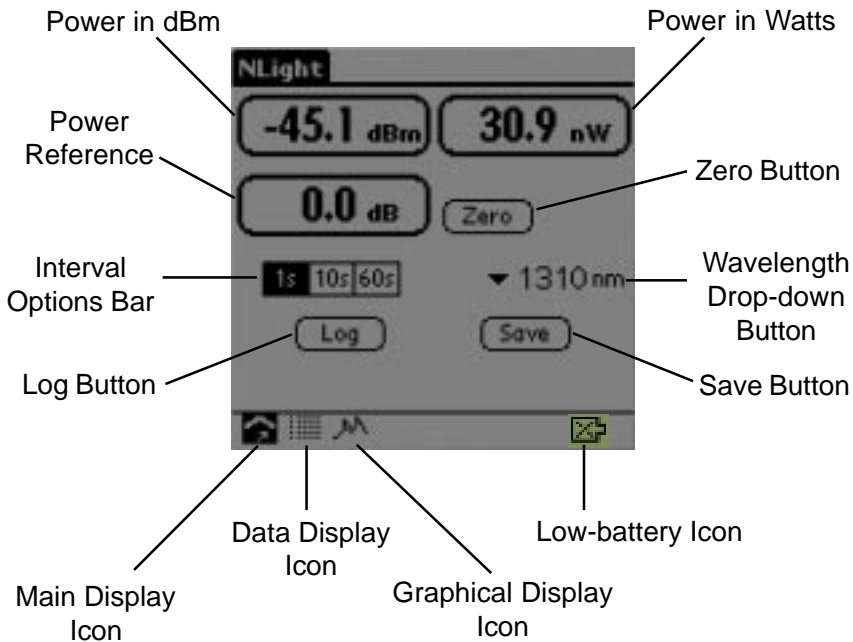
VI. Structure and Operation

Software Overview

The *Lab Boy*[™] Fiber-Optic Power Meter module supplies a full-function fiber-optic power meter with a variety of additional features. NLight software is included and provides three main interfaces, the Main, Data, and Graphical displays; each of these can be accessed from a button bar displayed at the bottom of the screen. The Main Display provides a three-way measurement in dBm, watt, and dB and provides access to controls for configuring the Hot Button and choosing logging intervals and wavelengths. The Data Display has two screens the user can toggle between to view the list of saved files or the details of a specific file. In file detail view, the user can choose to delete an entire record. The Graphical Display represents in graphical form the measurements currently being logged or the selected file data.

Main Display

Screen Overview



Main Display (con't.)

When starting the NLight software, the Visor screen will show the Main Display. This screen displays the optical power in dBm, Watt, and dB units. It also allows the user to select a wavelength, configure the Hot Button, establish a power reference, choose a logging interval, save a measurement, and start or stop data logging.

Wavelength Selection

The wavelength of the signal to be measured should be selected from the Wavelength Drop-down Button on the Main Display. The three calibrated wavelengths to choose from are 850 nm, 1310 nm, and 1550 nm.

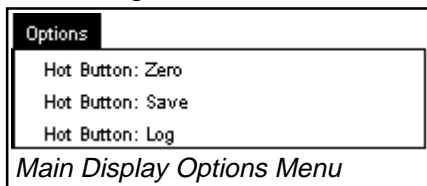
Main Display (con't.)

Hot Button

One of several special features this instrument offers is the configurable Hot Button on the front of the *Lab Boy™* module (see page 4). It can be configured to:

- Zero the dB scale
- Save the current measurement
- Start and stop a logging session

To reconfigure the Hot Button, select the desired function from the Options Menu which is accessible by tapping the Visor Menu Button (see page 5) while viewing the Main Display.



Establishing a Power Reference

The Main Display continuously shows optical power in dBm as well as in Watts. Additionally, a relative dB value is displayed. The reference can be set either by selecting the on-screen Zero Button or by physically pressing the Hot Button (refer to “Hot Button” section above).

Main Display (con't.)

Saving Measurements

Another unique function of the NLight application is its ability to save individual measurements. The save function stores the current measurement to a memo pad file with the name “NLight Data Points,” as illustrated on page 13. Each time the user selects the Save Button on the Main Display or presses the Hot Button (refer to “Hot Button” section on page 10), the current dBm and dB values are appended to the memo pad file, along with the date and time. Stored in comma-separated format, the file can easily be imported into spreadsheet and database programs. The default category for NLight files is “NLight.” See the “Data Display” section on page 13 for more information on viewing these files.



Main Display (con't.)

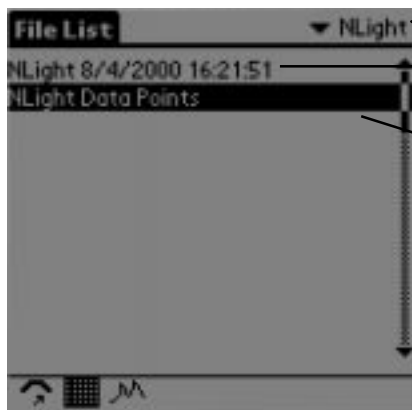
Logging Measurements

The log function stores measurements to a memo pad file at a user-selected interval of 1 second, 10 seconds, or 60 seconds. The desired rate can be selected from the Interval Option Bar on the Main Display. Logging is started by selecting the Log Button on the Main Display or by pressing the Hot Button (refer to the “Hot Button” section on page 10). This creates a memo pad file with the current date and time (“NLight <date> <time>”), as illustrated on page 13. At each logging interval, the relative time in seconds is written to the file along with the current optical power. To stop logging, select the Log Button or press the Hot Button. The maximum file size is 64 KB or approximately 5,000 samples. If the file size limit is reached during logging, the data file is automatically saved and logging is stopped.

Logged files are automatically stored in the “NLight” category. Categories can be changed on the Data Display using the Category Drop-down Button.

Data Display

Screen Overview



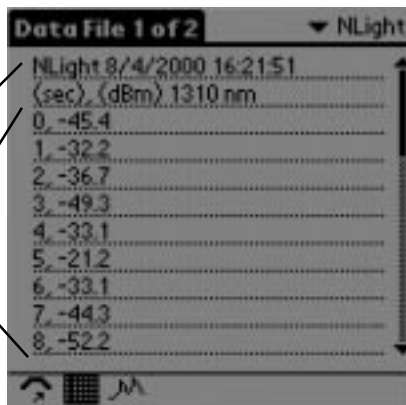
Category Drop-down Button

File of Logged Measurements

File of Saved Measurements

Name of File being Viewed

Details of Individual Log File



Structure and Operation

Data Display (con't.)

Viewing Stored Data

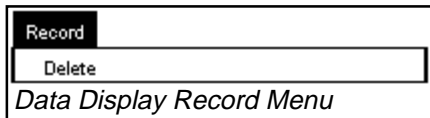
To view the contents of data files, select the Data Display Icon from the button bar shown on the bottom of the screen. Select a file to view from the File List. If a file has already been selected, that file will automatically be displayed. Select the Data Display Icon again to get back to the File List.

Using Memo Pad

The Memo Pad application on the Handspring™ Visor can also be used to view files, and in Memo Pad, the files can be edited. If the information is edited, however, it may no longer be in a valid file format for graphing.

Deleting a Record

The Record Menu, which is accessible from the File Details, gives the user the ability to delete entirely the record currently being viewed. Tap the Visor Menu Button (see page 5) to view the menu bar.



Data Display (con't.)

Using HotSync

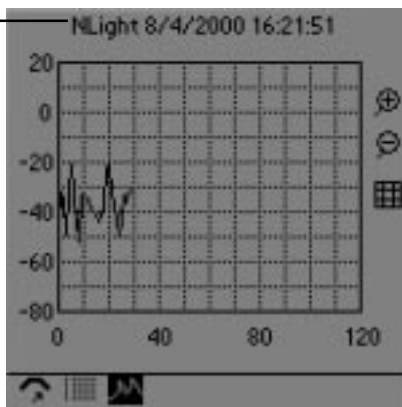
When the user HotSyncs the Visor to a PC, the data files will be uploaded to the Palm Desktop application. The data files may then be transferred to a spreadsheet or database program on the PC. See the Visor manual for details on HotSync.



Graphical Display

Screen Overview

Name of
File being
Viewed



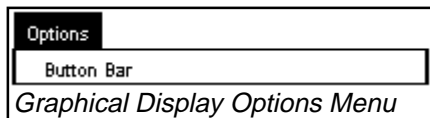
Magnifier Icon:
Zoom In

Magnifier Icon:
Zoom Out

Resize Icon

Graphical Display (con't.)

The most dynamic feature of the NLight software is its versatile graphing capability. The display can be seen by choosing the Graph Icon on the button bar located at the bottom of the screen. Continuous, real-time graphing can be viewed until the Hot Button is pressed to stop logging (refer to the “Hot Button” section on page 10). Also, the graphical display can show a plot of the data that has been saved in any NLight log file.



Tapping the Visor Menu Button (see page 5) while viewing the Graphical Display reveals the Options Menu that allows the user to remove the

button bar from the bottom of the screen and thus enlarge the graph to fill the entire viewing area. The Magnifier Icons allow the user to zoom in and out and the Resize Icon returns the graph to “normal” size.

Additional Notes

The NLight settings are stored and automatically recalled upon initialization, so the application can be terminated and will retain all previous settings when restarted.

For optimal performance, the Handspring™ Visor should be turned off before removing the Lab Boy™ module.

VII. Specifications

Parameter	Specification
Optical	
Detector Type	2 mm Germanium
Calibrated Wavelength	850, 1310, 1550 nm
Measurement Range	+7 to -65 dBm
Accuracy	± 0.25 dB
Resolution	0.1 dB
Display	dBm, Watts, dB
General	
Battery Life	30 hrs. typical (2 x AAA)
Optical Connector	Universal Connector Interface
Operating Temperature	0° to 50° C
Storage Temperature	-20° to 60° C