

# **J.BAUER Electronics**

## ***LaserBee™ II***

### **3.2 Watt HOBBYIST LASER POWER METER**

The **3.2 Watt (3200mW) LaserBee™ II Laser Power Meter** was designed to enable the hobbyist technician to test higher power lasers and laser diodes. It was designed for people like ourselves that needed to know the output power of the numerous lasers we had in the shop. It needed to check a wide range of lasers up to 3200mW.

We didn't want to spend \$1000.00 to \$4,000.00 to get a commercial Laser Power Meter. We just wanted to know which laser was stronger than another and needed to know approximately how many milliwatts of output power each laser had.

With the emergence of the Green DPSS Modules/Lasers, the Blu-Ray Laser Diodes and the 445nm Blue Laser Diodes in the past few years, we needed to check these as well.

We also needed a way of testing different Laser Wavelengths without needing to use a correction factor chart needed with Optical LPMs for optical correction.

In addition we needed to be able to Data Log (record) the readings over time. The new LaserBee™ II has that feature available. The LaserBee™ II's **EagleEye™** Data Logging feature comes on a CD with the User Instructions and drivers. The LaserBee™ II PC Interface Software is only available in Windows versions.

The 3.2W LaserBee™ II LPM uses a Thermopile Sensor and Microcontroller electronics that are pre-calibrated against a recently calibrated Newport Model 1825-C LPM using a Newport 818T-10 Thermopile sensor head. The output of the LaserBee™ II is displayed on an 8x2 Backlit LCD screen.

Just attach a standard 9Volt battery or 9Volt DC adapter and shine your Laser's beam on the Thermopile Sensor to get readings in 0.1 mW increments to 1000mW then in 1mW increments to 3200mW.

**NOTE:- DO NOT** connect a 5Volt power source to the the PCB directly an LDO regulator is onboard.

The readings of the LaserBee™ II LPM start at 3mW and go to 3200mW. Below 3mW the LCD Display will read 0mW.

For consistent accurate readings, make sure that all measurements are taken at the same distance between the Sensor and the Laser being tested. (10" to 20") and that the entire Laser's beam falls on the Sensor of the 3.2W LaserBee™ II LPM.

**It is very important NOT to collimate the laser beam to a pin point as this may damage the Thermopile coating using higher powered Lasers.** We have tested these sensors to 3400mW with a beam diameter of 3.0mm and the sensors broadband coating showed no sign of degradation.

**DO NOT use the Thermopile Sensor to adjust the focus of your Laser.**

It is also important to note that the entire laser beam should fall on the Sensor and the Laser's beam should be adjusted accordingly (an acceptable/usable beam diameter would be **3.0mm to 7.0mm**, the larger, the better).

**DO NOT USE A BEAM DIAMETER OF LESS THAN 3.0mm** with high powered Lasers.

## **User Instructions**

The 3.2W LaserBee™ II LPM is very easy to use. Attach the Thermopile Sensor cable to the Microcontroller circuit board Screw Terminal Block just left of the push button switches. The Left and Center screws are Ground and the Right hand screw is Signal (see drawings). If you have a Deluxe LaserBee™ II you can disregard this instruction (just plug the Thermopile Sensor connector to the right hand side of the meter case). Then plug the other end of the sensor cable to the Thermopile connector.

Attach a fresh 9Volt Battery or 9Volt adapter to the Battery Clip. The LCD display will show the two start-up splash screens then go to the default mW screen. With no laser beam on the Sensor the reading should be 0.0 mW with 0 Max on the second line of the LCD display. The display will show 0.1mW increments up to 1000mW then shows 1mW increments for greater than 1000mW.

If the Sensor does not give a reading with a laser beam shining on it... then reverse the Sensor connections to the Terminal Block. If you have a Deluxe LaserBee™ II you can disregard this instruction (the Thermopile plug is pre-wired).

To turn OFF the LCD Backlight... hold the Down (DN) button for ~4 seconds. To turn ON the LCD Backlight... hold the UP (UP) button for ~4 seconds.

To the left of the 3 screw Terminal Block is a 9 pin RS-232 DB9 (F) connector for the Data Logging feature cable when using the LaserBee™ II **EagleEye™** Data Logging Software that is included on the supplied CD. The Deluxe LaserBee™ II has a 9 pin RS-232 DB9 (F) connector on the left hand side of the meter case. A Serial to USB Converter cable is supplied.

The second line of the LCD display shows the Peak Power detected since the last reset. To reset the Peak reading at any time momentarily press the Enter (EN) button and the Peak reading will Reset to Zero.

## **DATA LOGGING FEATURE**

Connect a standard DB9 RS232 Serial extension cable (not a NULL Modem Cable) to the LaserBee™ II's DB9 female connector. Connect the other end of the DB9 RS232 extension cable into your computer's Serial Port.

Once you have read the entire LaserBee™ II instructions on the CD, install the **EagleEye™** software found on the same CD and turn ON your LaserBee™ II. Setup the **EagleEye™** Software to the Communications Port (Com Port) that your computer uses. The **EagleEye™** Software is self explanatory and easy to use (see .PDF File). You must go to the Windows Device Manager to see which Com Port number your Computer is using.

If your computer only has a USB port but not an RS232 Serial port, you can use the included USB to RS232 Converter Cable to connect between the LaserBee™ II's RS232 Connector and your computer's USB port. Just follow the USB to RS232 Converter manufacturer's instructions to install the USB Driver. Again, Setup the **EagleEye™** Software to the Communications Port (Com Port) that your computer assigned to the USB converter cable. You must go to the Windows Device Manager to see which Com Port # your Computer has assigned to the USB Port.

If you have purchased a LaserBee™ II without the Data Logging Option and would like to upgrade to the Data Logging Option, you must also get a Firmware change for the PCB mounted Microcontroller. Without this Firmware Update the Data Logging Option will not function. You may contact us for the details of the Firmware Upgrade and a copy of the **EagleEye™** software at:-

[sales@bauer-ee.com](mailto:sales@bauer-ee.com)

### **NOTE:**

**DO NOT TOUCH THE SENSOR SURFACE AT ANY TIME FOR ANY REASON**

The Thermopile Sensor detects heat on its surface. Since it requires time to heat and cool the Sensor... When taking a power reading... you must wait for the reading on the LCD to stabilize. Once stabilized the reading can be taken. At 1000mW the stabilized reading time is aprox.10-15 seconds or a 95% full scale reading time of ~4 seconds.

The Thermopile Sensor is very sensitive to heat. It can pickup the heat of your hands. The testing area should be free of high intensity lights giving off heat. The testing area should also be free of air currents that may be detected by the Sensor. Just gently blowing on the sensor will change its temperature and therefore its output.

For the most accurate readings... let the Thermopile Sensor acclimate to the test area's ambient temperature.

**DO NOT** mount the Thermopile Sensor Head into an enclosure... doing so will not allow the Thermopile radiator to dissipate the laser beam's heat properly. We are dealing with very small heat differential values.

When physically adjusting the position of the Thermopile Head, care must be taken to not touch the Thermopile Head's heatsink directly with your fingers as this will transfer your finger's heat to the Heatsink and create variations in the readings.

Use a non heat conducting tool, when/if changing the Thermopile Head's position. A wooden or plastic clothes pin works well.

The actual Sensor surface (the small 8mm x 8mm block) should **NEVER** be touched with your fingers or any chemicals. The oil from your fingers will cause the sensor to reflect more of the lasers beam and re-coating and/or re-calibration may become necessary. Cleaning of the Sensor should only be done by gently blowing **dry** air over its surface. Remember, your breath is **very moist**...

### **Legal TradeMark/Copyright Notice:**

*If posting Graphs or Screen Shots produced by the included EagleEye™ Software in any public venue... the name of the EagleEye™ Software at the top and/or bottom of the images must be visible or credit must be given for the software that created the Image.*

*By using the included EagleEye™ Software you agree to these terms. If you do not agree to these terms you may send back the EagleEye™ Software to J.BAUER Electronics at any time.*

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### **NOTE/Warning-**

*It is not advised or recommended to use any 3<sup>rd</sup> Party Firmware or any 3<sup>rd</sup> Party Software with your LaserBee™ LPM product that has not been approved by J.BAUER Electronics.  
Doing so can unconditionally Void any outstanding warranty and any future Customer Service for your LaserBee™ product.*

## **Specifications**

Power Supply:	7-12 Volts DC (9Volt Battery recommended)
Sensor Type:	Thermopile (J.BAUER Electronics)
Sensor Area:	8.0mm x 8.0mm (64 square mm)
Response time 100%:	~10-15 seconds
Response time 95%:	~4 seconds
Sensor Cable Length:	18.0"
Thermopile Dimensions:	1.65" x 1.50" x 1.00"
Power Range:	3mW to 3200mW
Power consumption:	5 milliamps @ 9vdc (PCB)
Power consumption:	17-60 milliamps @ 9vdc (PCB + Backlight)
Total Dimensions Standard:	2.55: x 1.90" x 0.95" (Including LCD)
Total Dimensions Deluxe:	5.50" x 3.125" x 1.50"
EagleEye™ Interface Software:	on CD

## **Calibration**

The 3.2Watt LaserBee™ II 3.2 LPM comes shop calibrated for the Thermopile Sensor included.

If you feel that you need to re-calibrate your LaserBee™ product you may send it back to the shop to have it properly re-calibrated and/or have the Thermopile Sensor re-coated .

You must contact us for an RMA if you feel that you need re-calibration or re-coating service. Note that re-coating of the sensor automatically requires re-calibration.

Recoating of the Thermopile Sensor ..... \$35.00

Re-Calibration of the 3.2W Laserbee II ..... \$65.00

All Shipping costs to be paid by the customer.

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