

J.BAUER Electronics

LaserBee I (T3D-T3N) **1 Watt HOBBYIST LASER POWER METER**

The LaserBee I 1 Watt (1000mW) 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 lasers up to 1000mW.

We didn't want to spend \$500.00 to \$3,000.00 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 and the newer Blu-Ray 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 for optical correction.

In addition we needed to be able to Data Log (record) the readings over time. The new LaserBee I has that feature available as an Option. The LaserBee I's Data Logging Option comes on a CD. The LaserBee I PC Interface Software is available in a Windows version.

The LaserBee I 1 Watt HLPM uses a Thermopile Sensor and Microcontroller electronics that are pre-calibrated against a Newport Model 1825-C LPM using a Newport 818T-10 Thermopile sensor head. The output of the LaserBee I is shown on an 8x2 Backlit LCD display.

Just attach a standard 9Volt battery and shine your Laser's beam on the Thermopile Sensor to get readings in 1 mW increments.

DO NOT connect a 5Volt power source to the 5 pin Data Cable connector on the PCB.

The readings of the LaserBee I start at 5mw and go to 1050mW. Below 5mW the LCD Display will read 0mW.

For consistent readings, make sure that all measurements are taken at the same distance between the Sensor and the Laser being tested. (1" to 6") and that the entire Laser beam falls on the Sensor of the LaserBee I 1 Watt HLPM.

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 1200mW with a beam diameter of 1.0mm and the sensors showed no sign of degradation.

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 1.0mm to 5mm).

User Instructions

The LaserBee I 1 Watt HLPM is very easy to use. Attach the Thermopile Sensor 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 I you can disregard this instruction.

Attach a fresh 9 Volt Battery to the Battery Clip. The LCD display will show the start-up screen then go to the default mW screen. With no laser beam on the Sensor the reading should be 0 mW with 0 mW on the second line of the LCD display.

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 I you can disregard this instruction.

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 5 pin inline male header. This header is for the Data Logging Option cable using the Windows LaserBee I Software that is supplied on the Data Logging Option CD. If you Have a Deluxe LaserBee I you can disregard this instruction.

The second line of the LCD display shows the Peak Power detected since the last reset. To reset the Peak reading at any time... Press and hold the Enter (EN) button until the Peak reading is Reset.

DATA LOGGING OPTION

Connect the supplied Data Cable to the LaserBee I's 5pin connector. The connector has been designed to be connected in either direction.

Connect the DB9 (F) connector to an RS232 extension cable and plug that cable into your computer's Serial Port.

Once you have downloaded the LaserBee I instructions from our website. Install the PC Interface software found on the CD and turn ON the LaserBee I. Setup the PC Interface Software to the Communications Port (Com Port) that your computer uses. The Interface Software is self explanatory and easy to use.

Once in the PC Interface program, click [Config] and make sure the "Gain" is set to (1) and "Units" is set to (mW) for both channels.

If your computer only has a USB port but not an RS232 Serial port, you can purchase a USB to RS232 Converter Cable to connect between the LaserBee I's Data Cable and your computer's USB port. Just follow the USB to RS232 Converter manufacturer's instructions.

If you have purchased a LaserBee I 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. Contact us for the details of the Firmware Upgrade at:-

sales@bauer-ee.com

NOTE:

DO NOT TOUCH THE SENSOR SURFACE AT ANY TIME

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 500mW the stabilizing time is approx.15-20 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 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 Sensor, care must be taken to not touch the Thermopile's Heatsink directly with your fingers as this will transfer your finger's heat to the Heatsink and may create variations in the readings.

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

The actual Sensor surface (the small 6mm 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 laser's 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. (Not with your humid breathe).

The LaserBee I's Peak Power feature (Max reading)...can be reset by pressing the ENTER [EN] button at any time.

Specifications

Power Supply:	6-12 Volts DC (9Volt Battery recommended)
Sensor Type:	Thermopile (J.BAUER Electronics)
Sensor Area:	8.5mm x 6.2 mm (53 square mm)
Sensor Cable Length:	12.0"
Thermopile Dimensions:	1.65" x 1.50" x 1.00"
Power Range:	5mW to 1050mW
Power consumption:	12 milliamps @ 9vdc (PCB + Pwr LED)
Power consumption:	66 milliamps @ 9vdc (PCD + Pwr LED + Backlight)
Total Dimensions:	2.55: x 1.90" x 0.95" (Including LCD)
RS232 Cable Length:	10" (only included with Data Logging Option)
PC Interface Software:	on CD (only included with Data Logging Option)
Firmware Update:	(only included with Data Logging Option)

Calibration

The LaserBee I 1 Watt HLPM comes shop calibrated to the Thermopile Sensor included. If you need to re-calibrate the Sensor you must do so at your own risk. You MUST have a known stable calibrated Laser between 200mW – 600mW and a calibrated Laser Power Meter.

If you do not have this equipment.....

DO NOT RE-CALIBRATE THE 1 Watt LASER POWER METER

(Remember... it will cost you Shipping both ways with Insurance plus \$50.00 for J.BAUER Electronics to re-calibrate your Laser Bee I 1 Watt HLPM.)

The calibration sequence is as follows:-

- 1) power up the LaserBee I 1 Watt HLPM (attach a 9Volt battery)
- 2) shine your known stable 100mW – 600mW calibrated laser onto the Sensor
- 3) let the reading on the LCD stabilize
- 4) (for Ver T2D-T2N) once stabilized... press the [EN] , [DN] and [UP] buttons simultaneously
- 5) (for Ver T3D-T3N) once stabilized... press the [EN] button for at least 15 seconds
- 6) using the [UP] & [DN] buttons adjust the mW on the LCD to the exact calibrated Laser power (only adjustable from 100mW to 600mW)
- 7) when done... press [EN] to see the new scaling factor... then press [EN] again to record it and exit.
- 8) the 1 Watt HLPM is now re-calibrated

Note: while performing this calibration, the laser beam must be on the Thermopile sensor at all times while giving a constant stable maximum reading.

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