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USER MANUAL

DELUXE | Digital Power Meter

WARRANTY

The Edmund Optics DELUXE Single Channel Laser Power, Energy and Power/Energy Meter carries a one-year warranty (from date of shipment) against material and/or workmanship defects, when used under normal operating conditions. The warranty does not cover damages related to battery leakage or misuse.

Edmund Optics Inc. will repair or replace, optionally, any DELUXE that proves to be defective during the warranty period, except in the case of product misuse.

Any attempt by an unauthorized person to alter or repair the product voids the warranty.

The manufacturer is not liable for consequential damages of any kind.

In case of malfunction, contact your local Edmund Optics distributor or nearest Edmund Optics Inc. office to obtain a return authorization number. The material should be returned to:

Edmund Optics, Inc
101 E. Gloucester Pike
Barrington, NJ 08007

P: 1-800-363-1992

F: 1-856-573-6295

E: techsup@edmundoptics.com

Web: www.edmundoptics.com

CLAIMS

To obtain warranty service, contact your nearest Edmund Optics agent or send the product, with a description of the problem, transportation and insurance prepaid, to the nearest Edmund Optics agent. Edmund Optics Inc. assumes no risk for the damage in transit. Edmund Optics Inc. will, at its option, repair or replace the defective product free of charge or refund your purchase price. However, if Edmund Optics Inc. determines that the failure is caused by misuse, alterations, accident or abnormal condition of operation or handling, you will be billed for the repair and the repaired product will be returned to you, transportation prepaid.

SAFETY INFORMATION

Do not use a DELUXE meter if the device or the detector looks damaged, or if you suspect that it is not operating properly.

Appropriate installation must be done for water-cooled and fan-cooled detectors. Refer to the specific instructions for more information. The user must wait for a while before handling these detectors after power is applied. Surfaces of the detectors get very hot and there is a risk of injury if they are not allowed to cool down.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Caution: Changes or modifications not expressly approved in writing by Edmund Optics Inc. may void the user's authority to operate this equipment.

TABLE OF CONTENTS

1	THE DELUXE SINGLE CHANNEL LASER POWER METER.....	4
1.1	INTRODUCTION.....	4
1.2	SPECIFICATIONS	5
1.3	FRONT PANEL DESCRIPTION	6
1.4	CONNECTOR DESCRIPTION.....	7
2	GETTING STARTED.....	8
2.1	POWER MEASUREMENT PROCEDURE	8
2.2	DISPLAY DESCRIPTION	9
3	BATTERIES.....	10
3.1	BATTERY SELECTION.....	10
3.2	BATTERY INSTALLATION.....	10
3.3	BATTERY REMOVAL.....	10
4	DECLARATION OF CONFORMITY.....	11
5	APPENDIX	12
5.1	RECYCLING AND SEPARATION PROCEDURE	12
5.2	SEPARATION.....	12
5.3	DISMANTLING PROCEDURE	12

LIST OF ILLUSTRATIONS

FIG. 1-1	DELUXE FRONT PANEL.....	6
FIG. 1-2	DELUXE CONNECTORS	7
FIG. 1-3	DELUXE LCD DISPLAY.....	9

1 THE DELUXE SINGLE CHANNEL LASER POWER METER

1.1 INTRODUCTION

To obtain full performance from the DELUXE, we recommend that you read this manual carefully. The DELUXE is a large display laser power monitor that features outstanding efficiency, ease of use and battery life.

Unpacking

Each Edmund Optics DELUXE is thoroughly tested and calibrated prior to shipment.

Visually inspect every DELUXE unit after removing it from the shipping containers. If you see any damage, retain all packaging materials and shipping receipts. Any damage claim should be made promptly to the shipping company. Notify the nearest Edmund Optics representative concerning the claim, so that any repair or replacement can be arranged as soon as possible.

1.2 SPECIFICATIONS

The following specifications are based on a one-year calibration cycle, an operating temperature of 18 to 28°C (64 to 82°F) and a relative humidity not exceeding 80%.

Table 1-1 List of Specifications

	POWER METER SPECIFICATIONS
Power Range	10 nW to 10 kW
Power Scales (Photo Detector)	autoscale
Power Scales (Thermopile)	Single wide range scale
Digital Resolution (Photo Detector)	1 pW
Digital Resolution (Thermopile)	1 mW
Digital Resolution (EO12-3S-H2)	1 μ W
Monitor Accuracy	$\pm 1\%$ $\pm 5\ \mu$ V
Response Time (Accelerated)¹	1 sec
Sampling Frequency	16.7 Hz
Digital Display	76 x 57 mm LCD
Display Rate	2 Hz
Dimensions	210 mm(W) x 122 mm (H) x 44 mm (D)
Weight (including batteries)	0.47 kg
Batteries (included)	4 Alkaline AA batteries
Battery life (with a thermopile)	670 hours (estimated)

¹ Varies with detector head.

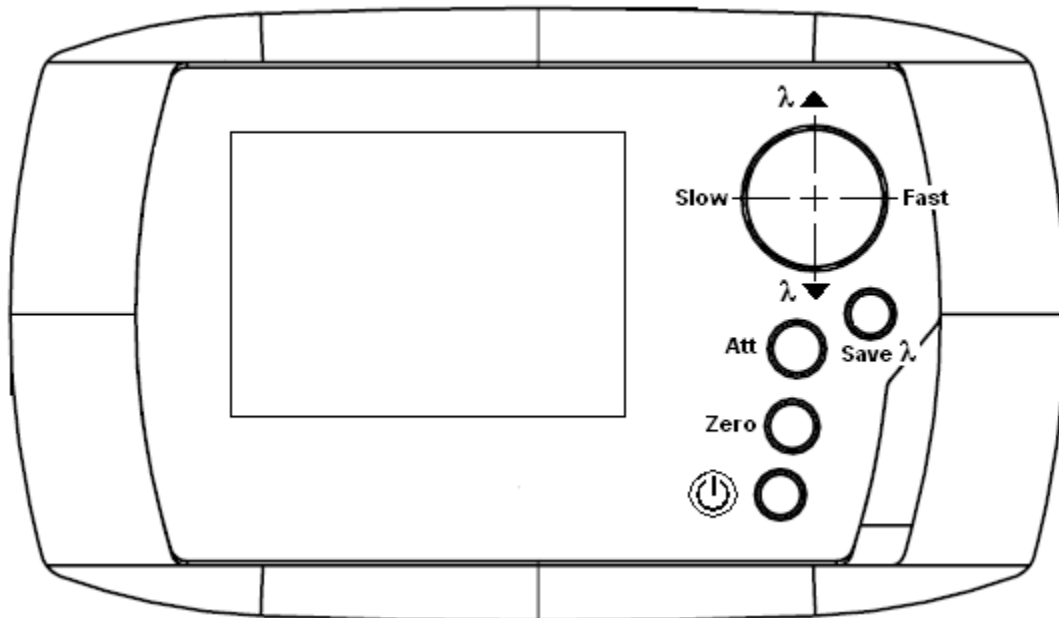


Fig. 1-1 DELUXE Front Panel

1.3 FRONT PANEL DESCRIPTION

- 1- **⏻ control key.**
DELUXE on and off.
- 2- **Zero / dBm control key.**
Cancels electronic offset, detector offset and ambient light on the detector. This key should be pressed before taking measurements. Refer to p.7 adjusting the zero (steps 8 and 9). The hidden dBm function is available by pressing more than 2 seconds on the Zero control key. The DELUXE will convert the displayed number in dBm (dB referenced to 1mW) and will display "dBm" unit. To get back to the previous display in Watt, press again more than 2 seconds on the Zero control key.
- 3- **Att control key.**
Photodetectors can be calibrated with and without attenuator. This key allows the user to select the proper configuration and wavelength. The ATT LCD annunciate indicates whether the attenuator sensitivity is activated.
- 4- **Save λ control key.**
After selecting the proper wavelength using the **λ up** and **λ down** control keys, pressing the **Save λ** control key stores the wavelength in non-volatile memory and returns to the measurements with the corresponding sensitivity.
- 5- **λ up and λ down control keys.**
Allows the user to select the appropriate wavelength.
- 6- **Fast and Slow control keys.**
These keys are only useful with thermal detector heads. The fast mode enables anticipation, which shortens the natural response time of the detector. The slow mode disables anticipation. By default, the monitor is in Fast mode. This setting is not stored in non-volatile memory and therefore returns to Fast mode on every power-up.

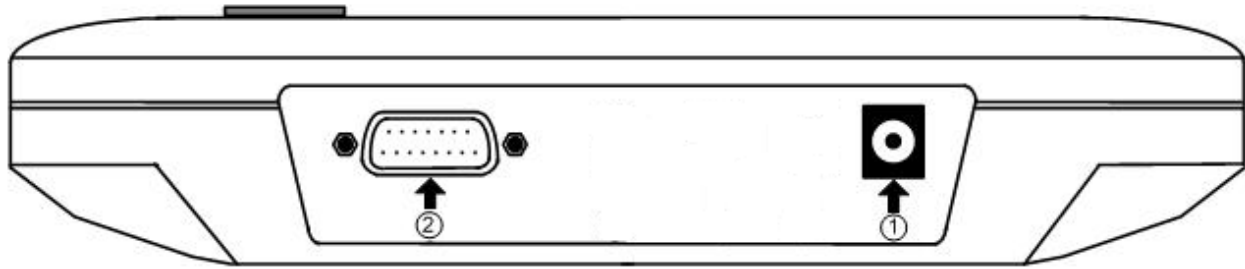


Fig. 1-2 DELUXE Connectors

1.4 CONNECTOR DESCRIPTION

1- EXTERNAL POWER SUPPLY INPUT JACK.

Input voltage required: 9 VDC/100 mA. The external power supply does not charge the batteries; it allows the use of the monitor without batteries, with dead batteries or simply to avoid discharging the batteries inside the monitor.

2- PROBE INPUT JACK.

The DELUXE uses a DB-15 female connector to mate with the detector heads (probes). The DELUXE works with all Edmund Optics power detectors currently sold. It automatically recognizes every power detector head, which ensures accurate auto-calibration. More importantly, it can take advantage of our *Personal wavelength correction™*. It reads the memory in the *Smart Interface* connector to provide a wavelength correction that is based on spectral data measured from that specific detector.

2 GETTING STARTED

This section contains important information concerning the installation and operation of the DELUXE. The DELUXE is delivered ready to use. Just install the 4 AA batteries, insert a detector head in the Probe Input Jack (#2 in Figure 1-2) and press the **I/O** key.

2.1 POWER MEASUREMENT PROCEDURE

- 1- Install the power detector on its optical stand.
- 2- First, slide the connector latch to the right to unlock the connector.
- 3- **Turn the DELUXE off** and connect a power detector head to the DELUXE using the **PROBE INPUT JACK** (see Fig. 1-2). It is recommended to turn the DELUXE off before connecting a new head in order to prevent any loss of information from the detector head's EEPROM.
- 4- Slide the latch to the left to lock the connector into place.
- 5- Switch the DELUXE ON using the **I/O** key. The DELUXE displays the current wavelength for a moment before displaying measurements. If this wavelength is not the wavelength of the laser, go to step 6, otherwise proceed to step 7.
- 6- Select the proper wavelength using the **λ up** and **λ down** control keys. Then press the **Save λ control key** to store the wavelength in non-volatile memory and return to the measurement mode.

Adjusting the zero (steps 7 to 11)

- 7- Remove the detector's protective cover.
Put the detector into the laser beam path. The entire laser beam must be within the sensor aperture. Do not exceed maximum specified densities, energies or powers. For the most accurate measurement, spread the beam across 60% to 80% of the sensor area. Leave it there until the detector has reached its equilibrium temperature.
- 8- Block off laser radiation to the detector.
The power read by the DELUXE when no laser beam is incident on the detector may not be exactly zero. This is because the detector is not thermally stabilized OR there was a heat source in the detector's field of view when you turned on the DELUXE, OR from the internal electronic offset of the DELUXE.
- 9- To reset the zero, wait until the reading has stabilized and press the Zero button on the front panel. The DELUXE will display "ZERo" for a moment and then return to the normal measurement. You are now ready to make an accurate measurement. Pressing the **ZERO Button** again will not undo the zero, it will redo it.
- 10- When you select **ATT** you must enter a wavelength and then press **Save λ** to exit.
- 11- Apply the laser beam to the detector. The laser must be CW for photodetectors.

Notes:

- Refer to the specific power detector documentation for complete installation and operating instructions.
- The power detectors are thermal sensors sensitive to temperature variations.

For high-precision measurements, it is recommended to:

- Allow the power detector's temperature to stabilize before zeroing the DELUXE.
- Do not touch the detector itself when handling the power detector. Touch only the stand.
- Avoid forced airflow or drafts around the detector.

2.2 DISPLAY DESCRIPTION



Fig. 1-3 DELUXE LCD Display

The LCD provides measurement information, wavelength information, attenuator selection and other useful messages.

When the batteries are discharged enough to compromise the measurement, the DELUXE displays “LO” instead of the measurement. Refer to the battery maintenance section to replace the batteries.

The ATT field indicates if the detector sensitivity used takes into account the presence of the attenuator that the detector was calibrated with.

Error messages can also be displayed:

- E-05 indicates that no detector is present on power-up.
- E-07 appears after pressing the ATT control key with a detector that does not have attenuator calibration. The message disappears a few seconds after pressing the control key.
- E-08 indicates that the detector is not supported or that the detector calibration EEPROM is corrupted. It can also appear if the DB15 is poorly secured or is worn out.
- E-09 appears after pressing the FAST or SLOW control key with a detector that does not have anticipation (photodetectors). The message disappears a few seconds after pressing the control key.

Any other error message indicates a malfunction and should be reported.

3 BATTERIES

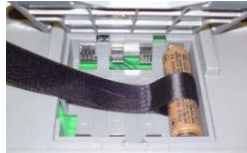
3.1 BATTERY SELECTION

To avoid leakage and poor autonomy, it is highly recommended that only good quality, new and identical alkaline batteries be put into the DELUXE. Good quality rechargeable batteries can also be used with the DELUXE and recharged with an external charger.

The batteries need to be replaced if the DELUXE displays “LO” on its digital display or if it does not power-up when the I/O control key is pressed.

3.2 BATTERY INSTALLATION

- Put the DELUXE face down on a flat surface.
- Lift the kickstand.
- Open and remove the battery door.
- Insert one battery in the nylon strap (to ease removal) and insert it at one extremity of the DELUXE battery compartment with the right polarity. To avoid intermittent contact and involuntary disconnection, firmly insert the batteries. Insert the other batteries over the nylon strap with the right polarity so that pulling on the strap will pull every battery out of the DELUXE.



- Put the battery door back in place.

3.3 BATTERY REMOVAL

- Put the DELUXE face down on a flat surface.
- Lift the kickstand.
- Open and remove the battery door.
- Hold down the DELUXE and slowly pull on the nylon strap to remove the batteries. Do not use a pointed tool to remove the batteries, since that could puncture them. The batteries need a firm pull to be removed in order to have a reliable contact.

4 DECLARATION OF CONFORMITY



Application of Council Directive(s): 2004/108/EC EMC Directive

Manufacturer's Name: Gentec Electro Optics, Inc.
 Manufacturer's Address: 445 St-Jean Baptiste, suite 160
 Québec (Québec), Canada G2E 5N7

European Representative's Name: Laser Components S.A.S.
 Representative's Address: 45 bis Route des Gardes
 92190 Meudon (France)

Type of Equipment: Laser Power/Energy Meter
 Model No.: DELUXE
 Year of test & manufacture: 2011

Standard(s) to which Conformity is declared:
 EN 61326-1: 2006 Emission generic standard

Standard	Description	Performance Criteria
CISPR11 :2009 A1 :2010	Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement	Class A
EN 61000-4-2 2009	Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques- Electrostatic discharge.	Class B
EN 61000-4-3 2006+ A2:2010	Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques- Radiated, Radio Frequency, electromagnetic field immunity test	Class A
EN61000-4-4 2004+A1:2010	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques- Electrical fast transient/burst immunity test.	Class B
EN 61000-4-5 2006	Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques- Surge immunity test.	Class B
EN 61000-4-6 2009	Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurements techniques- Immunity to conducted Radio Frequency.	Class A
EN 61000-4-11 2004	Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques- Voltage dips, short interruptions and voltage variations immunity tests	Class B Class B Class C Class C
EN 61000-3-2:2006 +A1:2009	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A per phase)	Class A

I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).

Place: Québec (Québec)

Date : May 4, 2011

(President)

5 APPENDIX

5.1 RECYCLING AND SEPARATION PROCEDURE

This section is used by the recycling center when the monitor reaches its end of life. Breaking the calibration seal or opening the monitor will void the DELUXE warranty.

The complete Monitor contains

- 1 Monitor
- 4 AA Alkaline Batteries
- 1 Instruction manual
- 1 Calibration certificate

5.2 SEPARATION

- Paper: manual and certificate.
- Plastic: stand, connector plate, battery door, monitor enclosure, keypad.
- Wires.
- AA batteries: inside battery compartment.
- Metal battery clips.
- Printed circuit board: inside the monitor featuring a liquid crystal display less than 100 cm².

5.3 DISMANTLING PROCEDURE

- Remove batteries.
- Remove the posts on each side of the DB15 connector using pliers.
- Open monitor by removing the Phillips head screws in the 4 corners.
- Cut the wires on the PCB side and battery clips side with cutters.
- Remove battery clips with pliers.



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