USER MANUAL

Pronto-250 | Pocket-Size 250 W Power Probe

gentec-ʒo
PARTNERS for ACCURACY

WARRANTY

First Year Warranty

The Gentec-EO thermal power detectors carry 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 recalibration, or damages related to misuse.

Gentec-EO will repair or replace at our option any Pronto which proves to be defective during the warranty period; except in the case of product misuse.

Any unauthorized alteration or repair of the product is also not covered by the warranty.

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

In the case of a malfunction, contact your local Gentec-EO distributor or the nearest Gentec-EO office to obtain a return authorization number. Return the material to the appropriate address below.

Contacting Gentec Electro-Optics Inc.

To help us answer your calls more efficiently please have the model number of the detector you are using ready before calling Customer Support.

Gentec Electro-Optics, Inc.
445, St-Jean-Baptiste, Suite 160
Québec, QC
Canada, G2E 5N7

Tel: (418) 651-8003
Fax: (418) 651-1174
E-mail: service@gentec-eo.com
Website: gentec-eo.com

Lifetime Warranty

Gentec-EO will guarantee any Pronto detector for its lifetime, as long as it has been returned for recalibration annually, from the shipment date. This warranty includes parts and labor for all routine repairs including normal wear under normal operating conditions.

Gentec-EO will inspect and repair the detector during the annual recalibration. Repairs at other times will be at Gentec-EO's option.

The cost of annual recalibration, or consequential damages from using the detector, is not included.

The only condition is that the detector must not have been subject to unauthorized service or damaged by misuse. Misuse would include, but is not limited to: laser exposure outside Gentec-EO's published specifications, physical damage due to improper handling, and exposure to hostile environments. Hostile environments would include, but are not limited to: excessive temperature, vibration, humidity, or surface contaminants; exposure to flame, solvents or water; and connection to improper electrical voltage.

SAFETY INFORMATION

Do not use the PRONTO if the device or the detector looks damaged, or if you suspect that the PRONTO 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 Gentec-EO Inc. may void the user's authority to operate this equipment.

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1. PRONTO-250 HANDHELD LASER PROBE

1.1. INTRODUCTION

The Pronto-250 Handheld Laser Probes from Gentec-EO can measure between 0.5 and 250 W. The high power surface absorber sensors are designed to be used at high average power densities. Pronto-250 detectors can be supplied with an optional stand and/or power supply.

For cases where the Pronto-250 detector is not calibrated at a specific wavelength, you can use your ''*Wavelength Correction Factor*'' to adjust the power you read for a particular wavelength using the self-calibration function.

Call your nearest Gentec-EO distributor to repair and/or to recalibrate the Pronto-250. To find the nearest Gentec-EO office or distributor in your country, refer to p. *//*, **Contacting Gentec Electro-Optics Inc.**

1.2. WARNINGS AND DISCLAIMER

Laser power detection is completely automatic. There is no need for an external timer.

Warnings

> WHEN **HOT** APPEARS ON THE SCREEN, REMOVE THE DEVICE FROM THE BEAM IMMEDIATELY TO AVOID DAMAGING THE SENSOR.
>
> Be careful not to exceed the maximum levels and densities stated in the specifications.
>
> The handle on the Pronto-250 is for carrying purposes only. The user must not hold the Pronto-250 during measurements. Extreme caution must be taken during laser power measurements.

In no event shall Gentec-EO or any of its affiliates be liable for any indirect, special, incidental or consequential injury to persons or damage to property caused by the use of any of our products, by purchasing from Gentec-EO or any of its affiliates, you hereby indicate that you understand and agree to the following :

Disclaimer

> I am fully responsible for the safe application and use of this detector and agreed to such by completing the sales process.
>
> I will not use a laser device without wearing approved laser safety goggles designed for such purpose.
>
> I am aware and responsible of safely dealing with any back reflections.
> I will not use the detector in violation of any local, state or federal law, and I understand that it is my responsibility to know and abide by those laws relating to the ownership and use of the detector in my jurisdiction.

1.3. SPECIFICATIONS

The following specifications are based on a one-year calibration cycle, an operating temperature of 15 to 28ºC (59 to 82ºF) and a relative humidity not exceeding 80%. Monitors must be stored in an environment between 10°C to 60°C (50 to 140°F) and a relative humidity not exceeding 90%.

	Pronto-250	
Interface	Touch Screen	
Display	Color LCD 28 X 35 mm (128 x 160 pixels)	
Measurement Controls	Wavelength Selection and User Calibration	
Data Acquisition and Transfer	On/Off Controls Maximum of 50 000 Measurements	
Screen Personalization	4 screen orientations and 4 brightness levels	
Saved Settings	Screen Orientation Screen Brightness Wavelength User calibration	
Effective Aperture Diameter	19 mm Ø	
Spectral Range	190 nm – 20 µm	
Calibrated Spectral Range	0.248 – 2.5 µm and 10.6 µm	
Power Noise Level	10 mW	
Response Time (0 - 100 %)	5 s	
Typical Sensitivity	0.23 mV/W	
Calibration Uncertainty	± 3 %	
Linearity with Power	± 2 %	
Repeatability (Precision)	± 0.5 %	
Maximum Power Resolution	1 mW	
Minimum Power	0.5 W	
Maximum Power	250 W (A maximum exposition of 6 sec is allowed at 250 W)	
Pulsed Laser Damage Thresholds 1.064 µm, 360 µs, 5 Hz 1.064 µm, 7 ns, 10 Hz 532 nm, 7 ns, 10 Hz 266 nm, 7 ns, 10 Hz	Max. Energy Density 9 J/cm^2 1.0 J/cm^2 0.6 J /cm^2 0.3J /cm^2	Peak Power Density 25 kW/cm^2 143 MW/cm^2 86 MW/cm^2 43 MW/cm^2
Minimum Frequency	15Hz	
Maximum Number of Readings before probe must be cooled [for 25°C starting temp.]	5 W: 50 25 W: 10 50 W: 5 125 W: 2 250 W: 1	
Maximum Exposure Time before probe must be cooled [for 25°C starting temp.]	5 W: 120 sec 25 W: 60 sec 50 W: 30 sec 125 W: 12 sec 250 W: 6 sec	
Maximum Device Temperature at Maximum Power	65°C	
Operating Conditions	Ambient temperature : 15-28°C Maximum Relative humidity : 80%	

Max. Power Density: **1.064 µm, CW** **10.6 µm, CW**	45 kW/cm^2 14 kW/cm^2
Dimensions	59.0W x 181.4L x 17.3D mm
Weight (head only)	210 g
Linearity vs Beam Dimension	± 0.5 %
Battery Type	USB Rechargeable Li-ion
Battery Life (Time before the battery needs to be charge via the USB port)	17 hours or 4200 measurements (with brightness set at 25%)
Battery Charge Time	7.5 hours (when totally empty)
Mounting Holes (for post)	2 x 8-32
Product Number	202917

Specifications are subject to change without notice

The following graphic shows the diameter corresponding to the damage threshold for a Gaussian beam profile. The "minimum 1/e² beam diameter" is calculated to obtain a peak intensity 50% lower than the damage threshold and should be considered as the "safe" minimum diameter.
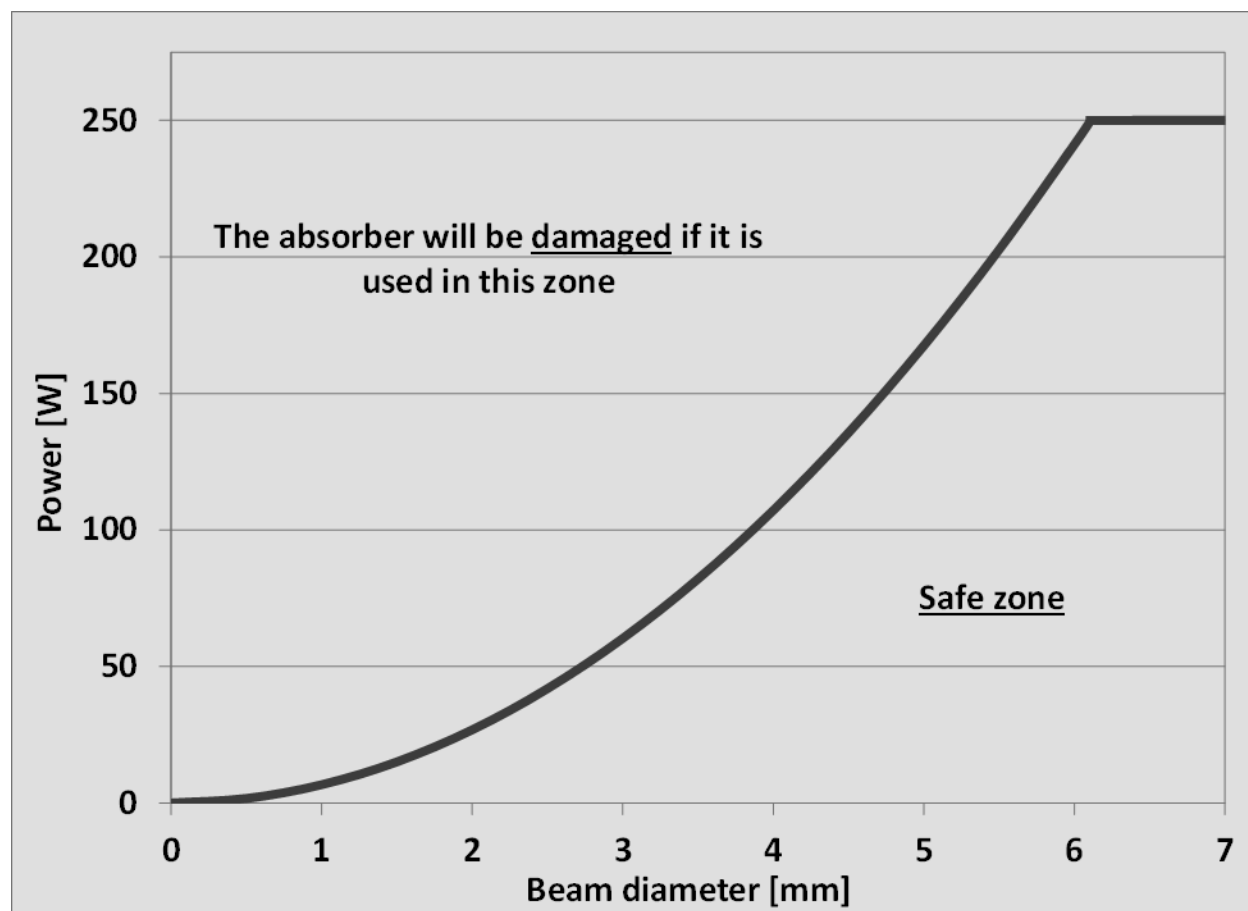
Figure 1 Minimum Beam Size for Pronto-250 Absorber at 1064 nm

1.4. MECHANICAL DESCRIPTION
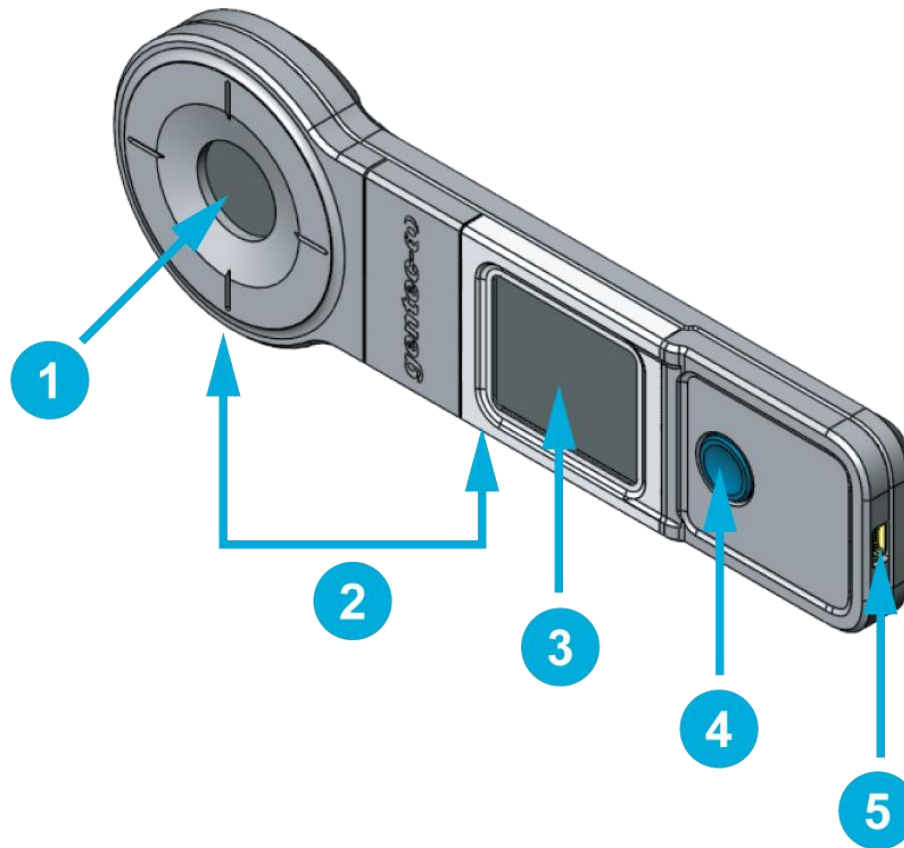
Figure 2 Pronto-250 Mechanics

1 **Absorber**
The laser must be centered on the absorber when making a measurement.

2 **Mounting Holes**
There are 2 8-32 mounting holes to fit the device on a post for a safe use during the measurements.

3 **Touch Screen Display and Controls**
The touch screen interface controls the device.

4 **On/Off/Settings Button**
This button is used to turn the device On (press when the device is Off) and Off (press and hold for 3 seconds when the device is On). It is also used to access the Settings menu (press when the device is On).
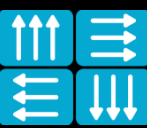
5 **USB Port**
The Mini-B USB2.0 port is used to transfer data from the device to a PC and to charge the battery.

2. USER INTERFACE
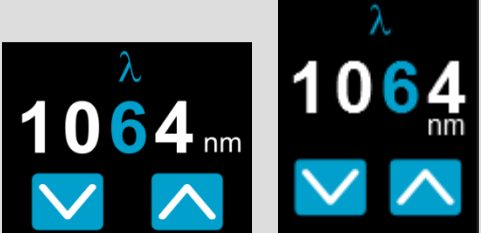
2.1. LIST OF ICONS
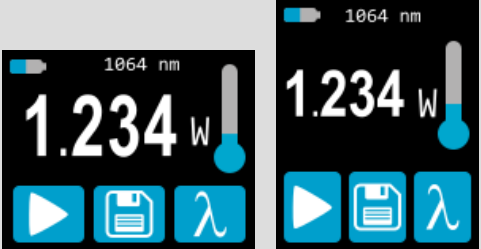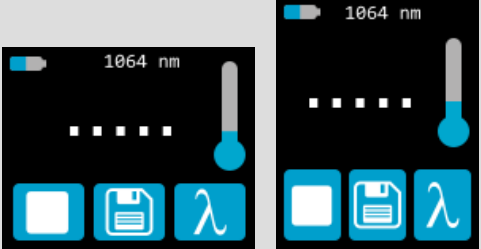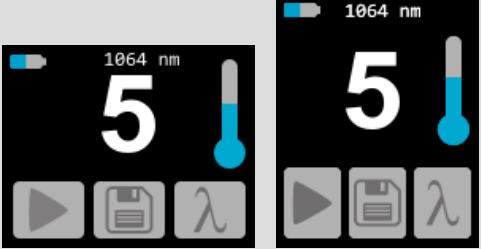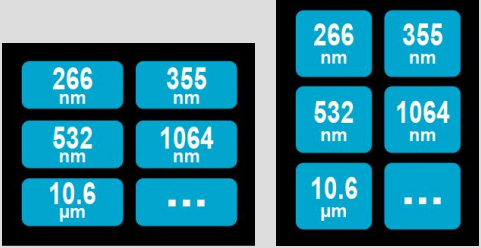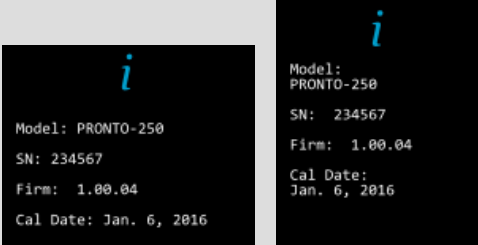
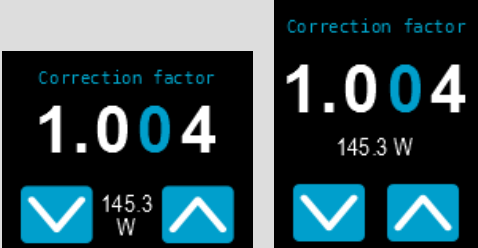| ICON	NAME	DESCRIPTION
	Battery	Indicates **Battery** level. If the battery icon is red, recharge immediately. The yellow lightning sign indicates the battery is charging.
	Play	Press → Goes to **Ready** mode If gray: Function is inactive
	Stop	Press → Interrupts **Ready** mode and goes to **Measured** value
	Wavelength	Press → Opens the **Wavelength** menu If gray: Function is inactive
	Data Acquisition	Press → Starts **Data Acquisition** Press → Stops **Data Acquisition** If gray: Function is inactive
	UP **DOWN**	Press → Increments the selected units Press → Decrements the selected units
	About	Press → Opens the **About** menu
	User Calibration	Press → Opens the **User Calibration** menu
	Screen Orientation	Indicates the **Screen Orientation** (4 options) Press → Toggles to the next orientation
	Brightness	Indicates the screen's **Brightness** level (4 options) Press → Toggles to the next brightness level
	Temperature	Indicates the sensor's **Temperature** ⚠️ *If the thermometer is red and the screen displays* **HOT***, block the laser IMMEDIATELY and let the instrument cool down.*

2.2. DESCRIPTION OF THE SCREENS

The battery level icon updates every 10 sec and the temperature icon every 1 sec.
At any moment, if the temperature of the head rises above 65°C, the Pronto will display **HOT**.

SCREEN	FUNCTIONS
Measured Value	
	▸ Displays the last valid **Measure**. ▸ Displays **Temperature** and **Battery** indicators.
Ready	
	▸ Dots appear in sequence while the device waits for a trigger signal. ▸ In this state, the **Zero** is continuously updated to ensure the accuracy of the measurement.
Countdown	
	▸ A live **Countdown** from 5 to 1 is displayed. ▸ The laser must stay ON for the entire duration of the countdown (5 sec). ▸ Gray icons indicate that the corresponding functions are unavailable.
Wavelength Menu	
	▸ Displays the **Wavelength** presets (see 3.2.1)
Set Wavelength	
	▸ Displays current the current **Wavelength** ▸ Displays the **Up/Down** controls to adjust the wavelength. ▸ Automatically saves the new settings upon exit.

SCREEN	FUNCTIONS
Settings	
	▶ Displays the **Settings** controls and menus. ▶ Automatically saves the new settings upon exit.
About	

	▶ Displays the following information:
	    • Model Name
	    • Serial Number
	    • Firmware
	    • Last Calibration Date

User Calibration	
	▶ Displays the current **Correction Factor** applied to the measurements and the corresponding corrected power to help the user adjust the value. ▶ Displays **Up/Down** controls to adjust the correction factor. ▶ Automatically saves the new settings upon exit.
HOT Warning	
	⚠ TURN OFF THE LASER BEAM IMMEDIATELY TO PREVENT DAMAGING THE DETECTOR ▶ The word "HOT" is displayed in bold and blinking red letters. ▶ Gray icons indicate that the corresponding functions are unavailable.

3. OPERATING INSTRUCTIONS

3.1. TURNING THE DEVICE ON AND OFF

Turn ON: Press the **On/Off/Settings** button

Turn OFF: Press and Hold the **On/Off/Settings** button   _for 3 seconds_

Tip

> The device will automatically turn off after 5 minutes of inactivity, except if data is being acquired. When the device is plugged into a PC via the USB cable, it will turn On and stay On until it is manually turned Off or unplugged.

3.2. CHANGING THE SETTINGS

3.2.1. Changing the WAVELENGTH

Before making a measurement, it is important that you adjust the calibration of the device to the wavelength of the source to be measured. To do so, press the **Wavelength** button λ to display a list of presets.

Figure 3 The 6 wavelength buttons can be customized by the user

There are 6 presets in the wavelength menu. The values can be set to any wavelength between 193 nm and 10.6 μm. To change a value, press it until the screen changes to the **Set Wavelength** menu. Each digit is changed individually by selecting it and pressing the Up/Down arrows. For example, if you want to change 10.6 μm to 532 nm, you need to do the following:

▸ Select the units. Make sure they turn blue **10.60μm** and use the Up or Down button to change them to nm

▸ Select the 1st number. Make sure it turns blue **1060nm** and use the Down button to reduce it to 0

▸ Select the 2nd number. Make sure it turns blue **0060nm** and use the Up button to increase it to 5

▸ Select the 3rd number. Make sure it turns blue **0560nm** and use the Down button to reduce it to 3

▸ Select the 4th number. Make sure it turns blue **0530nm** and use the Down button to reduce it to 2

▸ You're done! **0532nm**

Once the desired value is entered, press the On/Off/Settings button to exit the menu and automatically save your new settings.

3.2.2. Opening and Closing the SETTINGS Menu

When the device is ON, short-press the **On/Off/Settings** button to access the menu. Pressing the button again will close it and save whatever settings have been changed.

3.2.3. Changing the ORIENTATION of the Screen

There are 4 possible screen orientations: Up, Down, Left and Right. The button displays the current orientation, for example Up: . To change the orientation, simply press the button and the next choice will appear. The changes will be saved once you exit the Settings menu.
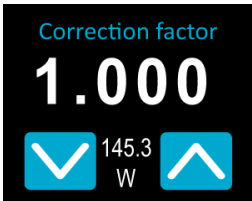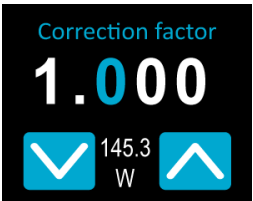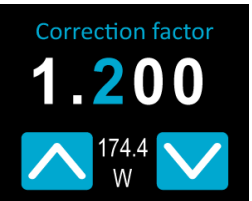
3.2.4. Changing the BRIGHTNESS of the Screen

There are 4 possible brightness levels: 100%, 75%, 50% and 25%. The button displays the current brightness, for example 75%: . To change the brightness, simply press the button and the next choice will appear. The changes will be saved once you exit the Settings menu.

3.2.5. Adjusting the CALIBRATION

It is possible to adjust the calibration of the device. You can do so by applying a **Correction Factor** to the measurements. To access the **Calibration** menu, simply press the CAL button . The number displayed is the multiplication factor that will be applied to the measurements. A factor of 1.000 keeps the calibration unchanged. You can enter any number between 0.500 and 2.500.

The 4 digits of the correction factor are changed individually. For example, if the **Correction Factor** is 1.000 and you want to change it to 1.200, just press the first 0 (make sure it turns blue, like this **1.000**) and then increment it twice with the Up button.

Initial Setting	Select the Digit	Change the Digit using the Up Button
The last measured value (145.3 W) is displayed between the Up/Down buttons	*The selected digit turns blue*	*The adjusted power value (174.4 W) is displayed between the Up/Down buttons*

Once the value is entered, press the On/Off/Settings button to exit the menu and automatically save your new settings.

3.2.6. Getting Information ABOUT the Device

Relevant information about the device are stored in the About menu . These information can be useful when returning the device for repairs or recalibration. These include, the Model Name, The Serial Number, the Firmware version and the Last Calibration Date.
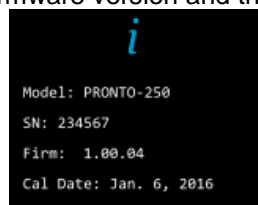
Press the On/Off/Settings button to exit the menu and go back to the measurement screen.

3.3. MAKING A MEASUREMENT

Once all the settings are adjusted, you are ready to make a measurement. Just follow the step-by-step instructions below.

---

1. Turn the device On.

2. Press the PLAY button, a sequence of dots will appear. This indicates that the device is waiting for a laser beam to trigger the measurement.
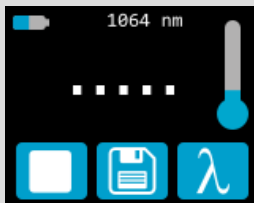

   NOTE: At any time during the measurement sequence, you can press the STOP button. The device will stop the measurement process and go back to its initial state (displaying the last measured value).

3. Place the device in the laser beam path. Be careful to conform to all the recommended specifications for beam size, placement and laser power.

4. As soon as the device detects a laser beam, it will automatically start the 5 seconds countdown for the measurement. Leave the device in the beam path for the entire countdown period, which will be indicated on the screen.
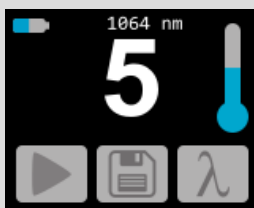
5. Once the countdown is finished, the measurement will appear. You can remove the device from the beam path.
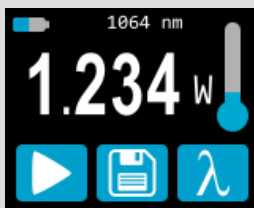
6. The reading will stay on the display until the next measurement, even if you turn the device Off and On again.

7. To make a new measurement, go back to Step 2.

3.4. ACQUIRING, TRANSFERRING AND DELETING DATA

3.4.1. Acquiring the Data

You can store the measurements done by the device simply by pressing the **Save** button ⊟. When pressed, the button turns white ⊟ to indicate that the data is being stored in the internal memory of the device. Once activated, the data acquisition will stay active until stopped, even if the device is turned Off and On. To stop the data acquisition, press the Save button again and it will revert to its original state ⊟.

3.4.2. Transferring the Data

To retrieve the data, you must connect the Pronto-250 to your computer with a USB cable and use the **ProntoDataTransfer** software . You can download our latest version of the software in the *Downloads* section of our website (https://gentec-eo.com/downloads). The data will be uploaded on your computer in a text format, which you can save to a known location on your computer and then open in your preferred analysis software.

⚠ Warning

> Once the data has been transferred to a computer, it is deleted from the internal memory of the device.

Complete installation and data transfer instructions can be found in **Appendix B: Installing the ProntoDataTransfer Software.**

3.4.3 Deleting the data

To delete the data from the internal memory, you must hold the **Save** button ⊟ approximatively 3 seconds. A text will appear and ask **Erase all data**. Hit the **YES** button than click **OK**.

4. SAFETY INSTRUCTIONS

4.1. GENERAL

To ensure a long lifetime of accurate measurements, the Pronto-250 power probe should be maintained within the following ambient conditions:

> Storage environment temperature: 10 to 60°C, RH < 90%
> Operating environment temperature: 15 to 28ºC, RH < 80%.

It is possible to store and operate your Pronto-250 power probe beyond this range. For any specific requirements, please contact your local Gentec-EO representative.

For the most accurate measurements, center the beam on the sensor. Ideally, the beam diameter should be the same as the one used during calibration. The beam diameter at calibration corresponds to >98% of the encircled power centered on 50% of the sensor's surface area. This complies with the International Electrotechnical Commission standard #1040: "Power and Energy Measuring Detector […]". Refer to the calibration certificate for the exact beam diameter used during calibration.

4.2. DAMAGE TO THE OPTICAL ABSORBER MATERIAL

Damage to the optical absorber material is usually caused by exceeding the manufacturer's specified maximum incident *Average Power Density.* Refer to the specifications table.

The Pronto-250 series can measure up to 250 W. The beam diameter should always be as large as possible to avoid damaging the absorber. **We recommend using a beam size diameter that covers 70% to 80% of the sensor's aperture**. For the Pronto-250, this corresponds to a diameter of 16-17 mm.

In any case, the beam's incident area should not be less than 10% of the detector's area. Please contact Gentec-EO to make measurements with smaller beams.

The damage threshold decreases with the laser power. Refer to the graphic in Figure 1 for the diameter corresponding to the damage threshold for a Gaussian beam profile. The "minimum 1/e² beam diameter" is calculated to obtain a peak intensity 50% lower than the damage threshold and should be considered as the "safe" minimum diameter. If there are "hot spots" in the beam profile, they must be considered in the calculation of the peak intensity.

Damage may also be caused if you use a detector with a contaminated absorber surface. Slight discoloration of the coating may occur, but this does not affect the calibration.

4.3. NOT EXCEEDING THE MAXIMUM SENSOR TEMPERATURE

The Pronto-250 has a built-in thermometer to monitor the sensor's temperature. In order to avoid damaging the sensor, its temperature should not exceed 65°C. When making measurements, the temperature of the sensor will gradually rise and it will be indicated on the screen with this icon:

If the temperature of the sensor gets close to the acceptable limit, the screen will display the mention HOT in bold red letters, the thermometer icon will be red and all functions will be disabled.

If this screen appears, it is essential that you remove the device from the laser beam path and allow it sufficient time to cool before attempting another measurement.

4.4. HOW TO PROPERLY HANDLE THE DEVICE

Laser radiation can heat the device very quickly. The entire body of the device can get hot, especially at higher powers. In addition to the standard safety precautions that should be taken when working with laser radiation, we recommend placing the device on an optical stand when making a measurement. For this use, the device is equipped with 2 mounting holes with an 8-32 thread (see Figure 2).

Figure 4 Recommended setup when making a measurement: install the device
on an optical stand before placing it in the laser beam path.

Gentec-EO offers a compatible stand for the Pronto-250, you can contact your local Gentec-EO representative for the exact model.

It is also possible to place the Pronto-250 on a horizontal surface and illuminate the sensor from above. The back of the device is flat so it will stay stable when placed on a horizontal surface.

Figure 5 Recommended setup when making a measurement: install the device
flat on a horizontal surface and illuminate from above.

5. MAINTENACE

5.1.FREE FIRMWARE UPGRADE

As new and improved versions of the device's firmware are created, it is in your best interest to update your PRONTO-250. The latest device firmware can be downloaded from the Gentec-EO website at https://gentec-eo.com/downloads. Go to the **Downloads** section. Find the file that corresponds to your PRONTO-250 and follow our simple, easy to use instructions.

6. DECLARATION OF CONFORMITY

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

$$\mathsf{C}\,\mathsf{E}$$

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

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

Type of Equipment: Optical Power Monitor
Model No.:   Pronto Series
Year of test & manufacture: 2015

Standard(s) to which Conformity is declared:

Emissions:

Product Standard	Test Standard	Description
EN 61326-1_Ed2:2013 (IEC 61326-1_Ed2:2012)	CISPR 11:+A1:2010 Class A	Radiated Emissions
EN 61326-1_Ed2:2013 (IEC 61326-1_Ed2:2012)	Radiated Emissions FCC part 15 2013) subpart B	Radiated Emissions

Immunity:

Product Standard	Test Standard	Description	Performance Criteria
EN 61326-1_Ed2:2013 (IEC 61326-1_Ed2:2012)	IEC 61000-4-2:2008Ed.2	Electrostatic Discharge Immunity	Criteria B
EN 61326-1_Ed2:2013 (IEC 61326-1_Ed2:2012)	IEC 61000-4-3:2006+ A1:2007+A2:2010	RF Conducted Immunity	Criteria A

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

Place: Québec (Québec)

Date :   7 July,   2015

APPENDIX A: WEEE DIRECTIVE

Recycling and separation procedure for WEEE directive 2002/96/EC

This section is used by the recycling center when the detector reaches the end of its life.   Removing the insulation or troubling the inside of the monitor will void the detector warranty.

The complete Detector contains:
>   1 Detector
>   1 cable
>   1 calibration certificate

Separation

Paper: Certificate
Printed Circuit Board: Inside the Detector
Aluminum: Detector Casing
Plastic: Parts Inside the Detector
Li-ion cell: Battery

APPENDIX B: INSTALLING THE PRONTODATATRANSFER SOFTWARE

1. Download and install the driver from our website.

2. Download the software file from our website.

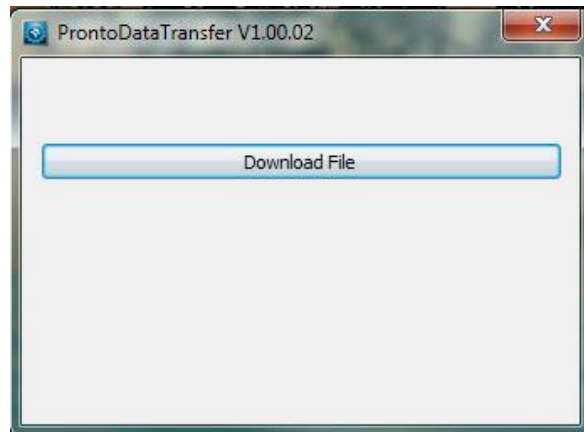3. Double-click the EXE file to start the installer.

4. Choose the folder for the installation and click Next until the installation is complete. Then click Close.
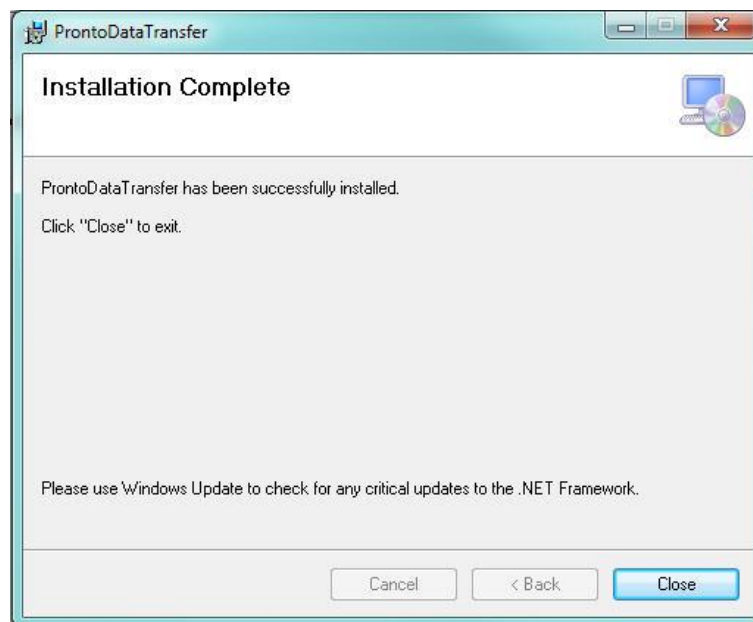
5. Once the software is installed, locate it on your computer and start the program by clicking the ProntoDataTransfer icon .
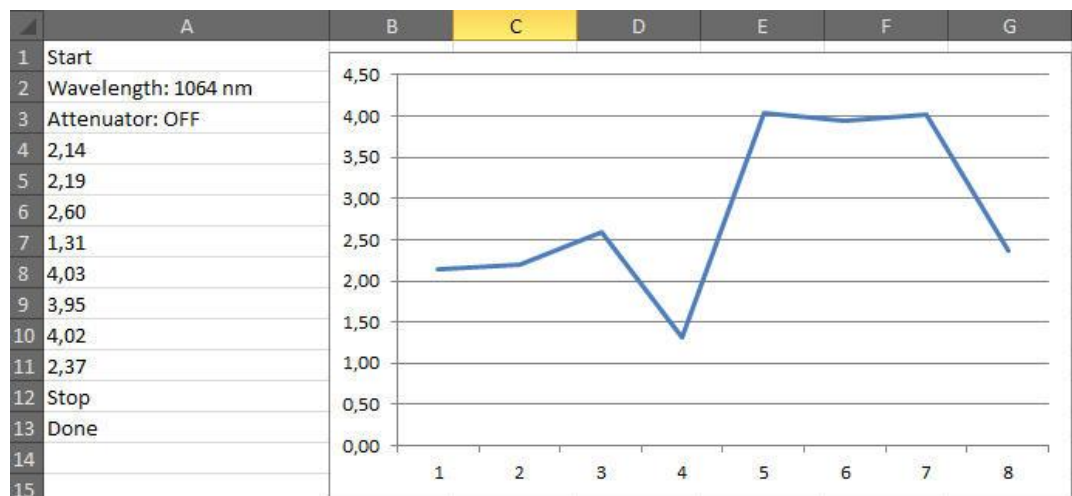
6. A download window appears with a **Download File** button.

7. Click the **Download File** button and select a known folder on your computer where you will save the data. Don't forget to also enter a file name. The file format is TXT.
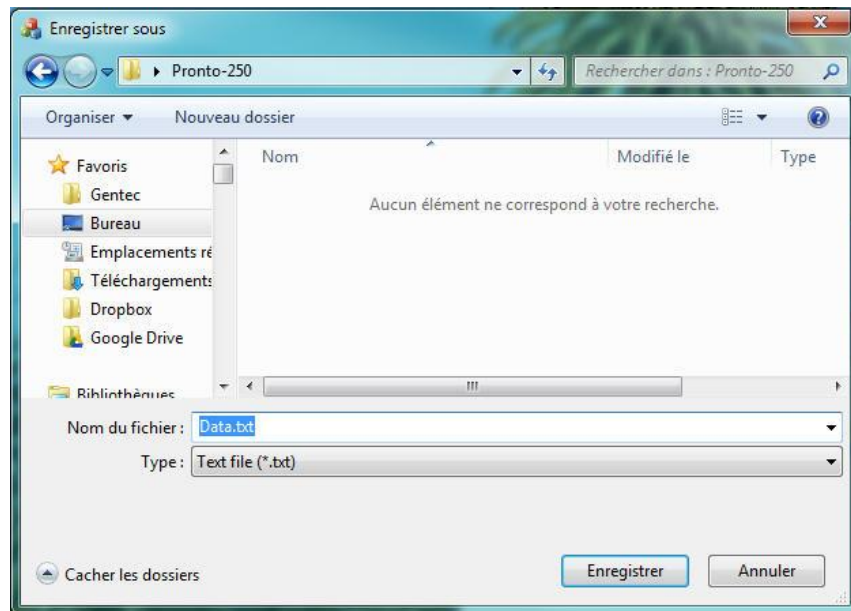
8. You can now open and analyze the data in your preferred data analysis software.

## APPENDIX C: UPDATING THE PRONTO-250 FIRMWARE

1. Before updating the firmware, transfer any saved data using the ProntoDataTransfer software.

2. Download the executable from our website.

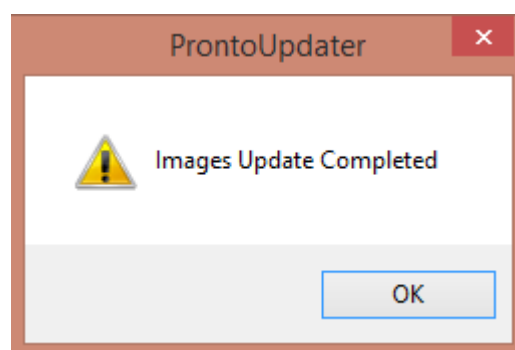3. Plug your Pronto to your computer using a USB cable.

⚠️ **Warning**

Do not unplug the Pronto or turn of your computer while you are updating your device.

4. Double-click the EXE file to start the updater. Click Yes to begin the update.
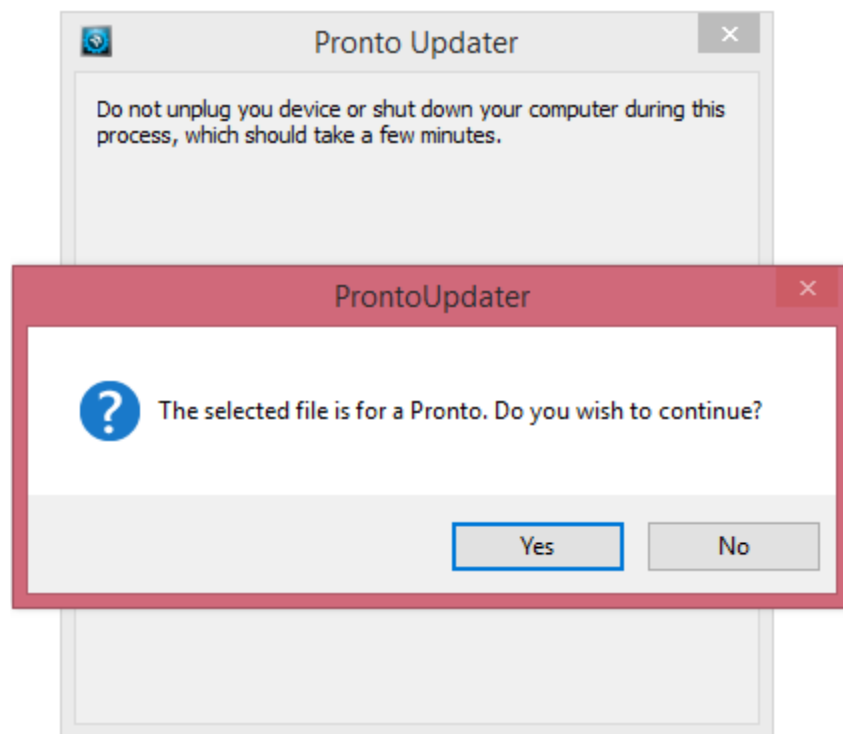
5. Once the update is done, you can unplug your device and continue using your Pronto as usual.

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