



# USER MANUAL

Pronto Series for High Power | Touchscreen Laser Probes

121-203542

**gentec-e**  
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  
Email: [service@gentec-eo.com](mailto:service@gentec-eo.com)  
Web: [www.gentec-eo.com](http://www.gentec-eo.com)

### Lifetime Warranty

Gentec-EO will guarantee any PRONTO High Power 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 High Power if the device looks damaged, or if you suspect that the PRONTO High Power is not operating properly.

The user must wait for a while before handling these detectors after power is applied. Surfaces of the detector's head 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 HIGH POWER SERIES HANDHELD LASER PROBE

### 1.1 INTRODUCTION

Gentec-EO introduces the PRONTO High Power Series of touchscreen laser probes. These portable devices allow for quick yet precise measurements of laser power up to 10 000 W (depending on the model) with very short cooling time between two measurements. The series also includes the PRONTO-500-IPL model, which measures the energy of individual pulses of light up to 350 J. All models include a detector head with a surface absorber that is designed for use at high average power densities and the heads are connected by a 1.5m-long flexible cable to a monitor with user-friendly touchscreen controls. Other useful features include data-logging and data transfer to a PC via USB.

PRONTO High Power detectors can be supplied with a stand (optional).

The various PRONTO High Power detectors can be operated in different modes, depending on the model: Single Shot Power mode (SSP), Single Shot Energy mode (SSE) and Continuous Power mode (CWP). Basic operating instructions for each mode are presented in the next section

PRONTO-500: Single Shot Power mode (SSP) and Continuous mode (CWP).

PRONTO-500-IPL: Single Shot Energy mode (SSE).

PRONTO-3K/6K/10K: Single Shot Power mode (SSP).

If the desired wavelength is outside the calibrated spectral range, you can use the “*Correction Factor*” function to adjust the displayed measures. Correction factors are given in your *Personal Wavelength Correction (PWC)* Certificate.

Call your nearest Gentec-EO distributor to repair and/or to recalibrate the PRONTO. For Gentec-EO’s nearest office contact information, see p. II, **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.

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.

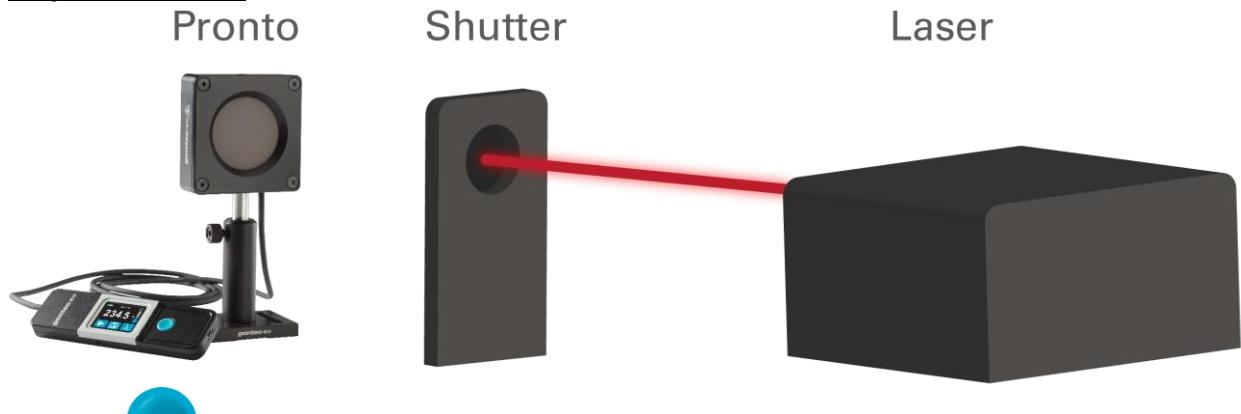
I am aware and responsible of safely dealing with any back reflections.  
I will not use the detector in violation of any local, state or federal law, and I understand that it is my responsibility to know and abide by those laws relating to the ownership and use of the detector in my jurisdiction

### 1.3 BASICS OPERATING INSTRUCTIONS (PRONTO-500/3K/6K/10K)

#### 1.3.1 Basics operating instructions for Single Shot Power mode (SSP), available on all models (except PRONTO-500-IPL)

In the SSP mode, the PRONTO High Power takes a single measurement of laser power in a few seconds.

##### A) Prepare the device



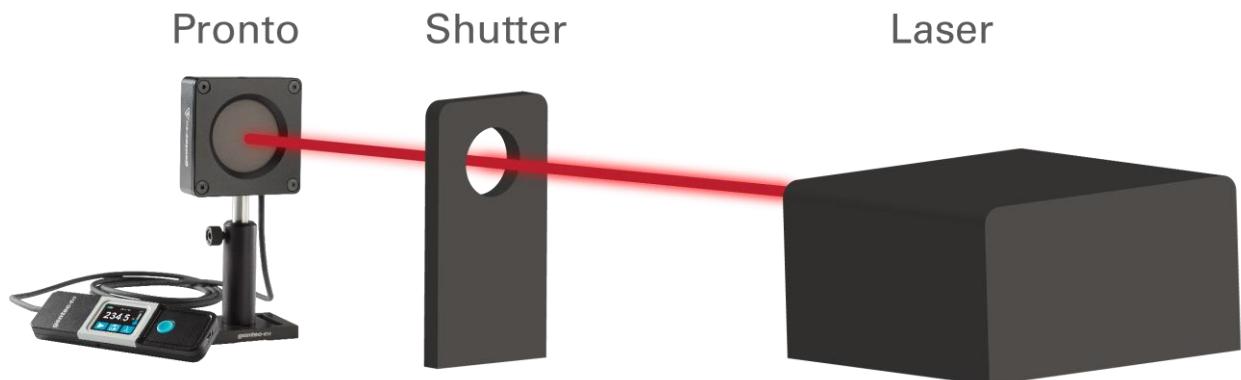
Press the  home button to turn ON the device

Set the PRONTO in SSP mode

Make sure that the laser is off or the laser beam is blocked

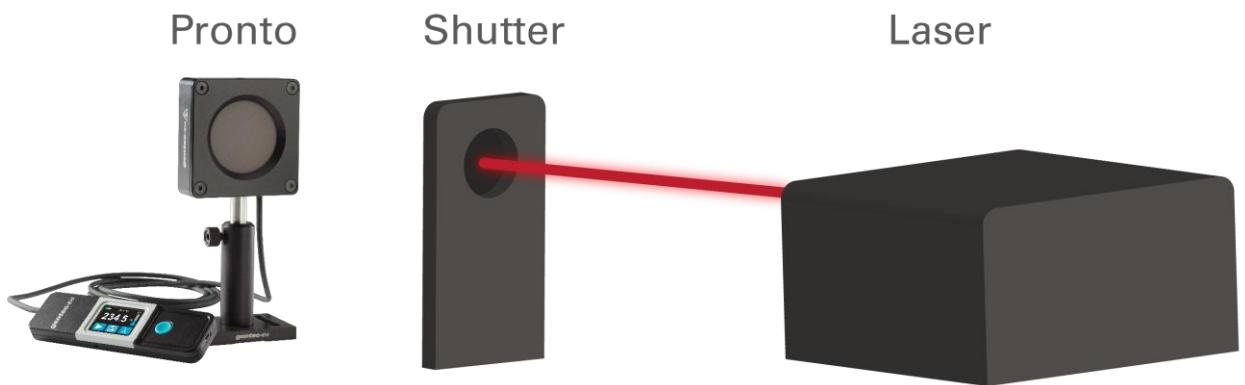
Press the  play button to start a new measurement

##### B) Expose the device to the laser beam



Aim the laser at the center of the absorber.

Turn on the laser beam and allow an exposure at least as long as the response time of the PRONTO

**C) Read the measurement**

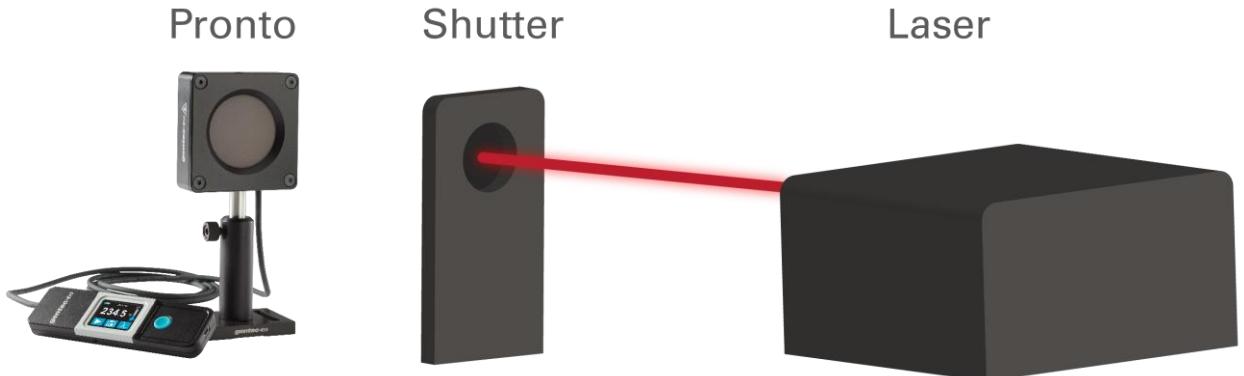
Turn off or block the laser beam and read the power measurement on the PRONTO screen.

More details about the operating instructions are explained in Section 2.

### 1.3.2 Basic operating instructions for Single Shot energy mode (SSE) only available on PRONTO-500-IPL

In the SSE mode, the PRONTO-500-IPL takes single measurements of the energy contained in a short pulse of light.

#### A) Prepare the device

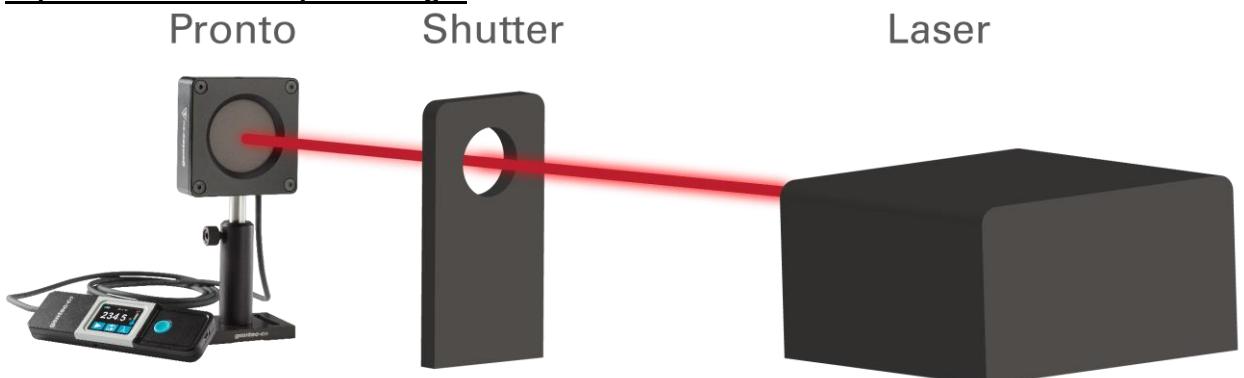


Press the home button to turn ON the device

Set the PRONTO in SSE mode

Set the trigger level as desired

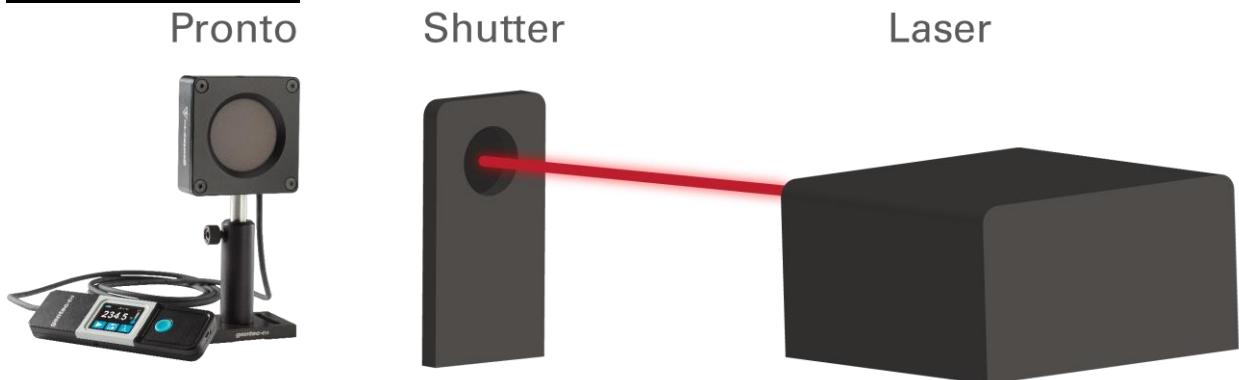
#### B) Expose the device to a pulse of light



Aim the light at the center of the center of the absorber

Turn on the light source and allow the PRONTO to be exposed to a single pulse

The PRONTO will detect automatically when it receives a pulse

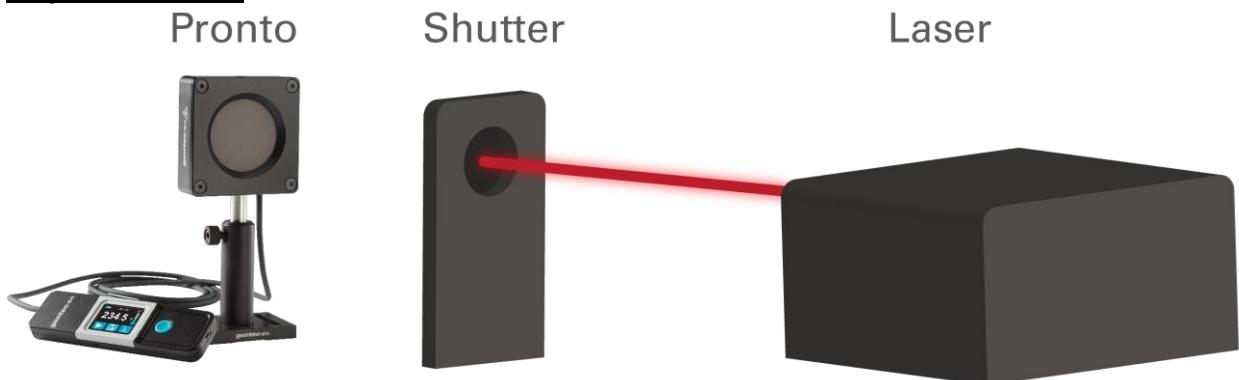
**C) Read the measurement**

Turn off or block the light source and read the energy measurement on the PRONTO screen.

More details about the operating instructions are explained in Section 3

**1.3.3 Basic operating instructions for Continuous mode (CWP)  
only available on PRONTO-500**

In the Continuous mode, the PRONTO-500 continually updates the laser power measurement (valid for lower laser powers than the SSP mode).

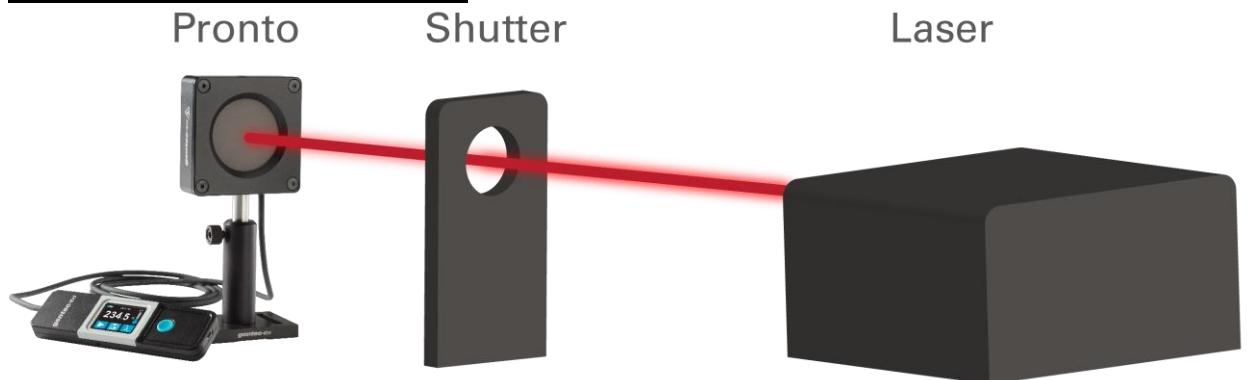
**A) Prepare the device**

Press the home button to turn ON the device

Set the PRONTO in CWP mode

Make sure that the laser is off or the laser beam is blocked

Zero the device by pressing the button

**B) Expose the device to the laser beam**

Aim the laser at the center of the absorber

Turn on the laser beam and allow an exposure at least as long as the response time of the PRONTO

**C) Read the measurement**

In CWP mode the measured power is updated continuously, so you do not need to block the laser between measurements.

## 1.4 PRONTO HIGH POWER SERIES SPECIFICATIONS

### 1.4.1 Power detectors

These products have a calibration at 1064 nm (YAG) and can be calibrated at 10.6  $\mu\text{m}$  ( $\text{CO}_2$ ) on custom demand only. They also have a traceable wavelength correction to complete the calibrated spectral range.

The following specifications are based on a one-year calibration cycle, an operating temperature of 15 to 28°C (59 to 82°F) 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%.

Specifications are subject to change without notice

	PRONTO-500 <sup>1</sup>	PRONTO-3K	PRONTO-6K	PRONTO-10K
<b>Aperture</b>	55 mm Ø			
<b>Spectral range</b>	0.19-20 $\mu\text{m}$			
<b>Calibrated Spectral Range<sup>2</sup></b>	0.248 - 2.5 $\mu\text{m}$ and 10.6 $\mu\text{m}$			
<b>Programmed Spectral Range<sup>3</sup></b>	0.193 – 10.6 $\mu\text{m}$			
<b>Power Range in SSP mode</b>	1 – 500 W	5 – 3000 W	20 – 6000 W	30 – 10 000 W
<b>Power Range in CWP mode</b>	0.1 – 40 W	N/A		
<b>Typical Response time</b>	5 s (2 s in CWP mode)	10 s	5 s	5 s
<b>Measurement Accuracy</b>	$\pm 3\%$ ( $\pm 2.5\%$ in CWP mode)	$\pm 5\%$	$\pm 5\%$	$\pm 5\%$
<b>Noise Level in SSP mode</b>	0.1 W	5 W	20 W	30 W
<b>Damage Thresholds &amp; Laser Limits</b>				
<b>Maximum Average Power Density (1064nm CW)</b>				
At 100 W average power	25 kW/cm <sup>2</sup>			
At 500 W average power	5.0 kW/cm <sup>2</sup>	7.0 kW/cm <sup>2</sup>	8.0 kW/cm <sup>2</sup>	7.0 kW/cm <sup>2</sup>
At 3000 W average power		5.0 kW/cm <sup>2</sup>	7.0 kW/cm <sup>2</sup>	5.5 kW/cm <sup>2</sup>
At 6000 W average power				
At 10000 W average power				
<b>Maximum Allowable Absorber Temperature</b>	65°C	65°C	75°C	75°C

<sup>1</sup> The PRONTO-500-IPL has the same specifications as the PRONTO-500 except for the measurement accuracy and wavelength range

<sup>2</sup> PRONTO High Power standard units are calibrated at one wavelength and have a NIST-traceable wavelength correction factor to cover the complete calibrated spectral range. PRONTO High Power units can also be calibrated at 10.6  $\mu\text{m}$  on custom demand only.

<sup>3</sup> Available wavelengths in the user interface.

<b>Maximum number of readings (in SSP mode) before probe must be cooled assuming an exposure of 8s</b> <b>[for 25°C starting temp. see section 4.4 for more information]</b>	100W	25	0.5kW	6	1kW	6	1kW	10						
	200W	12	1kW	3	2kW	3	2kW	5						
	300W	8	1.5kW	2	3kW	2	5kW	2						
	500W	5	3kW	1	6kW	1	10kW	1						
	<b>Physical Characteristics</b>													
<b>Dimensions [mm] (Head)</b>	88 x 88 x 32		88 x 88 x 43		88 x 88 x 36		88 x 88 x 46							
<b>Dimensions [mm] (Monitor)</b>	41W x 140L x 16D													
<b>Cable Length [m]</b>	1.5													
<b>Weight [g]</b>	680		1015		1215		1910							
<b>Monitor Mounting Holes</b>	1 x 8-32													
<b>Operating Conditions</b>	10 to 40 °C < 80% Relative humidity													
<b>Storage Conditions</b>	10 to 60 °C < 90% Relative humidity													
<b>Battery Type</b>	USB rechargeable Li-ion													
<b>Battery Life</b>	17 hours or 4200 measurements (with brightness set at 25%) Charge time: 7.5 hours when totally empty													
<b>Maximum Battery Cycle Count</b> (Number of charge cycles before the battery loses its efficiency)	Approximatively 500 full charges (0-100%)													
<b>User Interface</b>														
<b>Interface</b>	Touchscreen													
<b>Display</b>	Color LCD 28 X 35 mm (128 x 160 pixels)													
<b>Data Acquisition and Transfer</b>	Maximum of 50 000 measurements													
<b>Screen Personalization</b>	4 screen orientations and 4 brightness levels													
<b>Saved Settings</b>	Screen Orientation, Screen Brightness, Wavelength, Correction Factor and Trigger Level													
<b>Display Numerical Resolution</b>	4 digits <sup>1</sup>													
<b>Avalaible Measurement Modes</b>	SSP and CWP		SSP		SSP		SSP							

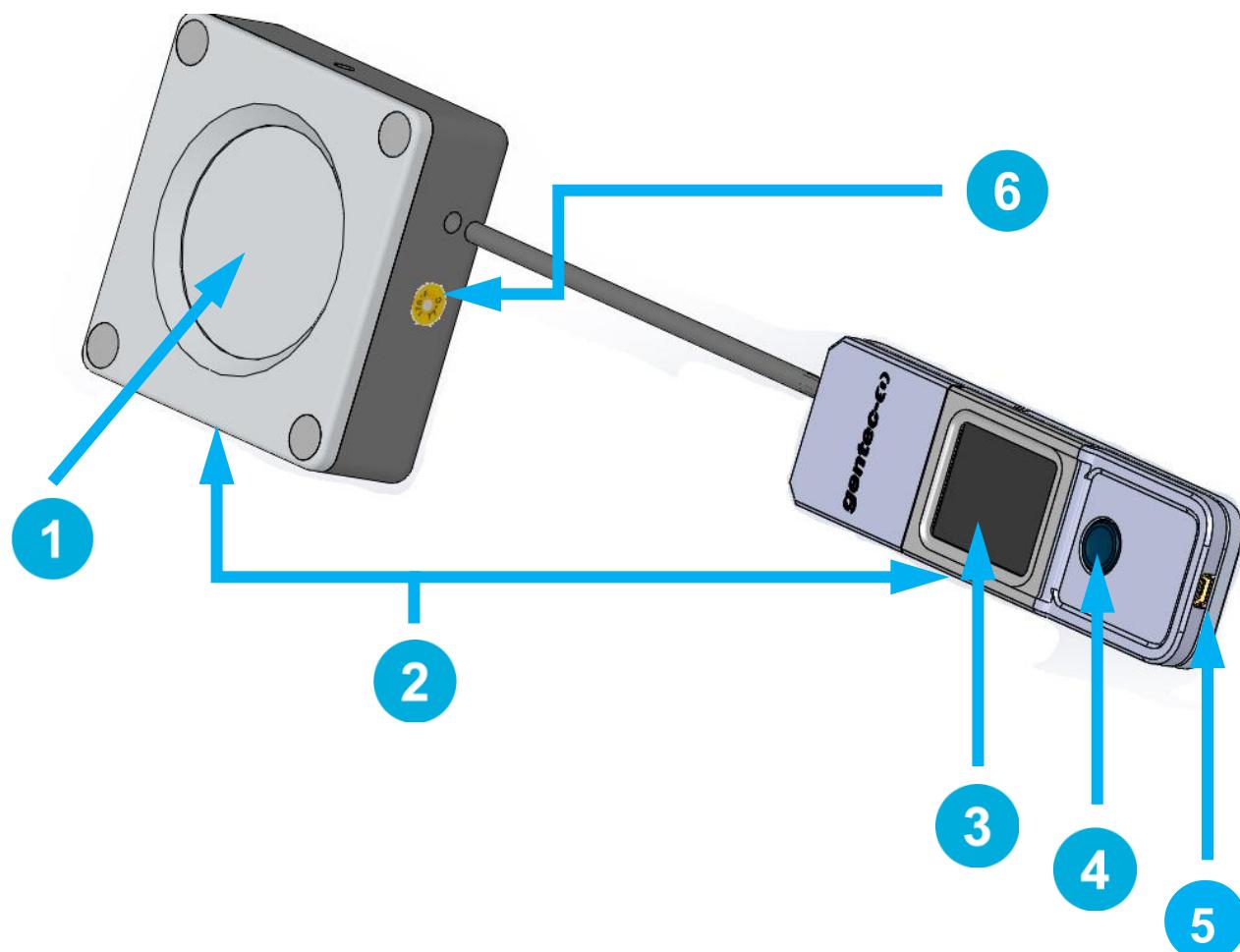
<sup>1</sup> For values above 10 kW, the numerical resolution is 0.1 kW

### 1.4.2 Energy detectors

See the PRONTO-500 specifications for operating and storage temperature ranges, well as physical characteristics and the user interface.

	Unit	PRONTO-500-IPL
<b>Spectral Range</b>	$\mu\text{m}$	0.19-2.5
<b>Calibrated Wavelength</b>	nm	1064
<b>Optical Aperture</b>	$\text{cm}^2$	23.76
	mm	$\varnothing$ 55
<b>Typical Sensitivity</b>	mV/J	0.013
<b>Response Time</b>	s	2
<b>Minimum Repetition Period</b>	s	15
<b>Maximum Pulse Width</b>	ms	433
<b>Energy Range (1064 nm ; 10ms pulse)</b>	J	2 - 350
<b>Maximum Average Power Density (1064nm CW @ 10W)</b>	kW/cm <sup>2</sup>	45
<b>Pulsed Laser Damage Thresholds (10ms)</b>	J/cm <sup>2</sup>	175
<b>Noise Equivalent Energy</b>	mJ	500
<b>Accuracy</b>	%	$\pm$ 5
<b>Avalaible Measurement Mode</b>		SSE

### 1.4.3 Mechanical Description



#### **1** Absorber

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

#### **2** Mounting Holes

There is a 8-32 mounting hole on monitor and two 1/4-20 mounting holes on the head to fit the device on a post for a safe use during the measurements.

#### **3** Touchscreen Display and Controls

The touchscreen interface controls the device.

#### **4** On/Off/Settings Button

This button is used to power 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.

#### **6** Overheating Indicator

The central part of the yellow sticker on the rear face turns to black when the temperature of the device exceeds 65 °C (150 °F). This indicates that the detector was probably damaged due to overheating. In this case, contact your local Gentec-EO representative.

## 2 OPERATING INSTRUCTIONS

### 2.1 USER INTERFACE

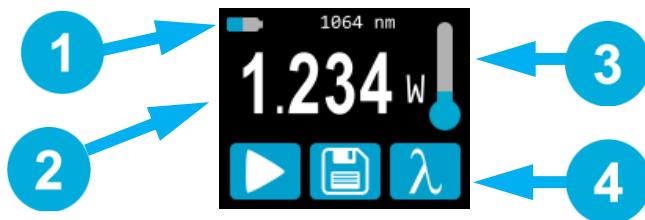


Figure 1 User Interface

#### 1 Device State

The top portion of the display shows the battery level and selected wavelength. In the PRONTO-500, the top portion also indicates the measurement mode. Its default mode is SSP, which works like the PRONTO-3K/6K/10K.

#### 2 Measured Value

The central part of the display shows the last measured value. In the PRONTO-500/500-IPL, this section also serves as a button to access the scales menu in CWP and SSE modes.

#### 3 Temperature

The thermometer icon shows the head temperature.

**!** If the thermometer is red and the screen displays HOT, block the laser IMMEDIATELY and let the instrument cool down.

#### 4 Controls

The first button at the bottom of the display is specific to the measurement mode. In SSP mode, this button (Play) is used to get the device ready to make a measurement. The second button (Save) is for data acquisition, and the third button (Wavelength) opens the Wavelength menu.

### 2.2 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 power on and stay on until it is manually turned off or unplugged.

### 2.3 CHANGING THE SETTINGS

#### 2.3.1 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.

### 2.3.2 Settings Icons

The following icons are presented in the Settings menu. The measurement mode options are only available with the PRONTO-500, since PRONTO-3K/6K/10K always works in Single-Shot Power mode and PRONTO-500-IPL always works in Single-Shot Energy mode.

ICON	NAME	DESCRIPTION
	<b>Screen Orientation</b>	Indicates the <b>Screen Orientation</b> (4 options) Press → Toggles to the next orientation
	<b>Brightness</b>	Indicates the screen's <b>Brightness</b> level (4 options) Press → Toggles to the next brightness level
	<b>Correction Factor</b>	Press → Opens the <b>Correction Factor</b> (User Calibration) menu
	<b>About</b>	Press → Opens the <b>About</b> menu
<b>FOR PRONTO-500 ONLY</b>		
	<b>More</b>	Press → Switches to the secondary menu
	<b>Single Shot Power</b>	Press → Goes to <b>Single Shot Power</b> Mode
	<b>Continuous Power</b>	Press → Goes to <b>Continuous Power</b> Mode
	<b>Single Shot Energy</b>	N/A

### 2.3.3 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.

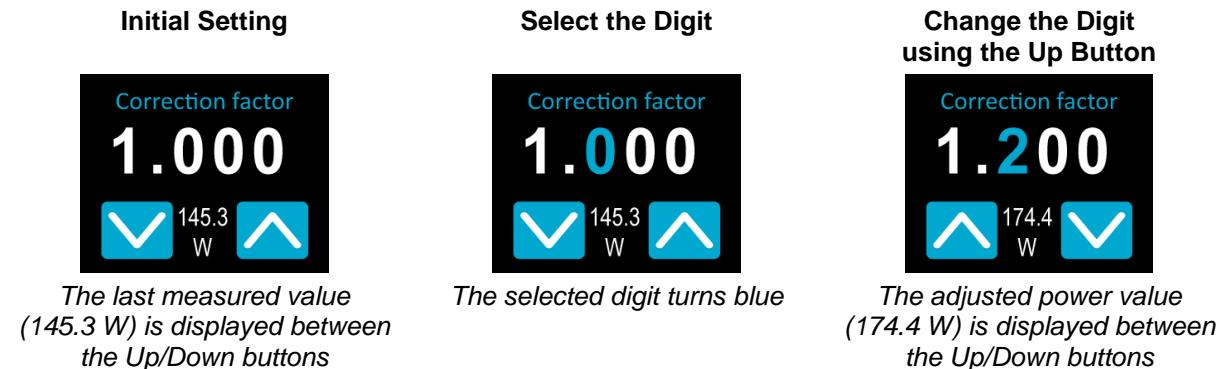
### 2.3.4 Changing the BRIGHTNESS of the Screen

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.

### 2.3.5 Adjusting the CORRECTION FACTOR

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 **Correction Factor** 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.

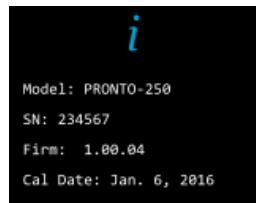
The 4 digits of the correction factor are changed individually. For example, if the **Correction Factor** is 1.000 and you want to change it to 1.200, just press the first 0 (make sure it turns blue, like this **1.000**) and then increment it twice with the Up button.



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

### 2.3.6 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**.



**Figure 2** The About menu shows information about the device

Press the On/Off/Settings button to exit the menu and go back to the measurement screen.

### 2.4 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 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:

1. Select the units. Make sure they turn blue **10.60 $\mu$ m** and use the Up or Down button to change them to nm
2. Select the 1st number. Make sure it turns blue **1060nm** and use the Down button to reduce it to 0
3. Select the 2nd number. Make sure it turns blue **0060nm** and use the Up button to increase it to 5
4. Select the 3rd number. Make sure it turns blue **0560nm** and use the Down button to reduce it to 3
5. Select the 4th number. Make sure it turns blue **0530nm** and use the Down button to reduce it to 2
6. 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*

## 2.5 MAKING A MEASUREMENT (SSP MODE ONLY)

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



**Tip**

We recommend placing the device on an optical stand or on a horizontal surface when making a measurement.

Be careful to conform to all the recommended specifications for beam size, placement and laser power

1. Turn the device ON.

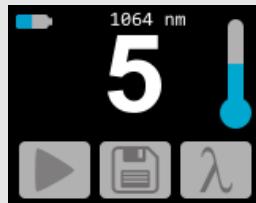
2. Press the PLAY button, a sequence of dots will appear. This indicates that the device is waiting for a laser beam to trigger the measurement.



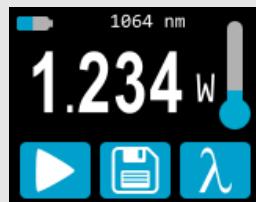
*NOTE: At any time during the measurement sequence, you can press the STOP button. The device will stop the measurement process and go back to its initial state (displaying the last measured value).*

3. Place the device in the laser beam path, with the laser beam centered on the absorber.

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.

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

## 2.6 ACQUIRING, TRANSFERRING AND DELETING DATA

### 2.6.1 Acquiring 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 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 .

### 2.6.2 Transferring Data

To retrieve the data, you must connect the PRONTO 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 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**.

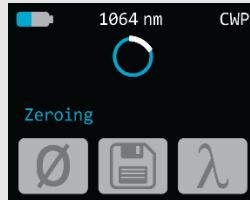
### 2.6.3 Deleting Data

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

## 3 OPERATING INSTRUCTION (PRONTO-500 AND PRONTO-500-IPL)

### 3.1 ZEROING, (CWP MODE ON PRONTO-500 ONLY)

1. Block off any laser radiation to the detector.
2. To set the zero, wait until the reading has stabilized. The power read by the device when no laser beam is incident on the sensor may not be exactly zero if the device is not thermally stabilized. Wait until the reading without laser power is stable for several minutes. Half an hour warm-up is recommended for measuring low powers precisely.
3. Press the ZERO button . While the device is busy, the control buttons are inactive.



When the process is complete, the device returns to the measurement screen and you are now ready to make an accurate measurement.

When the offset is applied to the measurement, the **Zero** button is white . The offset stays active until the **Zero** button is pressed again or until the PRONTO is turned off.

### 3.2 SETTING THE SCALE (CWP & SSE MODES ONLY)

To access the **Range** menu, you must press on the measured value (the central part of the touchscreen) for approximately 3 seconds. The Up/Down arrows scroll through the available ranges and AUTO, which is the default, automatic range setting.



**Figure 4** In the **Range** menu, use the Up and Down buttons to set the manual range or to go back to the default “Auto” range setting.

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

### 3.3 SETTING THE TRIGGER LEVEL (SSE MODE ON PRONTO-500-IPL ONLY)

In SSE mode, it is possible to control the trigger level. To access the **Trigger Level** menu, simply press the **TRIG** button at the bottom of the measurement screen. Accepted values are between 0.1% and 99.9%. The default value is 2.0%.

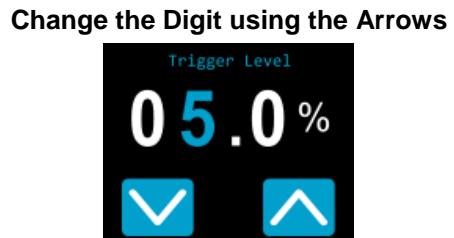
The 3 digits of the trigger level are changed individually. For example, if the **Trigger Level** is 2.0% and you want to change it to 5.0%, just press the 2 (make sure it turns blue) and then increment it three times with the Up button.



*The default value is 2.0%*



*The selected digit turns blue*



*The adjusted level is saved automatically when exiting this screen*

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

### 3.4 MAKING A MEASUREMENT

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



#### Tip

We recommend placing the device on an optical stand or on a horizontal surface when making a measurement.

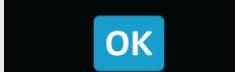
Be careful to conform to all the recommended specifications for beam size, placement and laser power.

#### 3.4.1 SSP Mode

Instructions for this mode are detailed in Section 2.5.

#### 3.4.2 CWP mode

1. Turn the device ON.
2. The PRONTO displays a warning (40W maximum), press OK.



Entering  
Continuous Power Mode  
8W MAX

OK

3. For maximum accuracy, adjust the reading to zero before making measurements (see Section **Erreur ! Source du renvoi introuvable.**). For low energy measurements, the sensor must be protected from ambient light and temperature fluctuations.
4. Place the device in the laser beam path, with the laser beam centered on the absorber.
5. The device will automatically display and update the power value.

### 3.4.3 SSE mode on PRONTO-500-IPL

1. Turn the device ON.
2. Place the device in the laser beam path, with the laser beam centered on the absorber.
3. As soon as the device detects a laser pulse, it will automatically measure its energy.
4. The TRIGGER LEVEL button  turns gray  every time a pulse is detected.
5. For accurate results, do not touch the screen while taking measurements and conform to the specifications for laser pulse width and repetition rate.

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

## 4 GENERAL INFORMATIONS

### 4.1 GENERAL INFORMATIONS

To ensure a long lifetime of accurate measurements, the PRONTO High Power detectors should be maintained within the following ambient conditions:

Storage environment temperature: 10 to 60°C, RH < 90%

Operating environment temperature: 10 to 40°C, RH < 80%.

It is possible to store and operate your Gentec-EO PRONTO High Power detectors 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 face. The beam diameter on the sensor should ideally be the same size as the beam diameter of the original calibration, which corresponds to >98% encircled power centered on 50% of the sensor's surface (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 SAFETY OPERATION NOTES

**Diffusive surfaces :** When using a PRONTO High Power be aware of the diffused back reflection ~ 5-15%.

**Specular surfaces :** When using the PRONTO-500-IPL, be aware of the diffused back reflection ~ 8-10%.

As on any diffusive surface, the light on the sensor coating is scattered more or less uniformly as a Lambertian diffuser. It is recommended to use the head with a black protective sleeve to limit wide-angled diffused reflections.

**Safety laser glasses recommended.**

**Detector temperature while in operation:** During usage, the detector head can become hot enough to cause burns.

### 4.3 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 from section 1.4 of this manual.

The PRONTO High Power series can measure up to 10kW. The beam diameter should always be as large as possible to avoid damage to the absorber. **We recommend between 70% and 90% of the nominal head aperture**, e.g. 4.6-5.2 cm in diameter for the PRONTO High Power power meters.

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

The damage threshold is decreasing with the laser beam power. The following table calculates the diameter corresponding to the damage threshold for a Gaussian beam profile. The "minimum 1/e<sup>2</sup> 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.

**Yag 1.064 µm**

Laser	PRONTO-500		PRONTO-3K	
Beam Power [kW]	Damage Threshold <sup>1</sup> [kW/cm <sup>2</sup> ]	Min. 1/e <sup>2</sup> Beam Diam. <sup>2,3,4</sup> [cm]	Damage Threshold <sup>1</sup> [kW/cm <sup>2</sup> ]	Min. 1/e <sup>2</sup> Beam Diam. <sup>2,3,4</sup> [cm]
0.1	25	0.2		
0.5	5	0.8	7.0	0.9
1			6.5	1.0
2			5.7	1.4
3			5.0	1.9
PRONTO-6K		PRONTO-10K		
3	8.0	1.9	7.0	2.6
6	7.0	2.6	5.5	3.3
10				

**CO<sub>2</sub> 10.6 µm**

Laser	PRONTO-500		PRONTO-3K	
Beam Power [kW]	Damage Threshold <sup>1</sup> [kW/cm <sup>2</sup> ]	Min. 1/e <sup>2</sup> Beam Diam. <sup>2,3,4</sup> [cm]	Damage Threshold <sup>1</sup> [kW/cm <sup>2</sup> ]	Min. 1/e <sup>2</sup> Beam Diam. <sup>2,3,4</sup> [cm]
0.1	8.3	0.4		
0.5	1.7	1.5	2.3	2.4
1			2.2	2.6
2			1.9	3.7
3			1.7	5.0
PRONTO-6K		PRONTO-10K		
3	2.6	2.5	2.3	3.5
6	2.3	3.5	1.8	5.0
10				

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.

**In the event of major damage to the coating, the PRONTO High Power Series sensors can be recoated. Contact your local Gentec-EO representative for information on repair and recalibration. See p. // Contacting Gentec Electro-Optics Inc.**

#### 4.4 NOT EXCEEDING THE MAXIMUM SENSOR TEMPERATURE

The PRONTO has a built-in thermometer to monitor the sensor's temperature. In order to avoid damaging the sensor, its temperature must not exceed the maximum allowable absorber temperature as in the specification. For temperatures of 25°C or lower, the thermometer's bulb will be filled as shown in the picture at the right of this text. When making a measurement, the sensor's temperature will gradually rise and the thermometer icon will fill up too.

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.



<sup>1</sup> Peak Intensity.

<sup>2</sup> Including a security factor of 50%

<sup>3</sup> Diameter of a circle corresponding to 86% of the entire beam power.

<sup>4</sup> Including a security factor of 50%



**!** 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.

**WARNING:**

**WHEN "HOT" APPEARS ON THE SCREEN, TURN OFF THE LASER BEAM IMMEDIATELY TO PREVENT DAMAGING THE DETECTOR.**

**Be careful not to exceed the maximum levels and densities stated in the specifications.**

**The handle on the PRONTO High Power is for carrying purposes only. It is not recommended for the user to hold the PRONTO High Power during measurements. Extreme caution must be taken during laser power measurement.**

**Gentec-EO is not responsible for any damage or injury caused by misuse.**

## 5 MAINTENANCE

### 5.1 FREE FIRMWARE UPDATE

As new and improved versions of the device's firmware are created, it is in your best interest to update your PRONTO. 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 and follow our simple, easy to use instructions.

## 6 DECLARATION OF CONFORMITY

Application of Council Directive(s): 2014/30/EU EMC Directive



Manufacturer's Name: Gentec Electro Optics, Inc.  
 Manufacturer's Address: 445 St-Jean Baptiste, suite 160  
 Québec, QC, 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: Laser Power Meter  
 Model No.: PRONTO High Power  
 Year of test & manufacture: 2015

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

Standard	Description	Performance Criteria
CISPR 11	Limits and methods of measurement of radio interference characteristics of information technology equipment. Testing and measurements of radiated emission.	Class B
EN 61000-4-2	Electromagnetic compatibility (EMC) – Part 4: Testing and measurements techniques- Section 4.2: Electrostatic discharge.	Class A
EN 61000-4-3	Electromagnetic compatibility (EMC) – Part 4: Testing and measurements techniques- Section 3: Radiated, Radio Frequency immunity.	Class A
ENV 50204	Radiated Electromagnetic field from digital radio telephones- immunity test 900MHz pulsed	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 : July 14, 2016

(President)

## **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 Instruction manual
- 1 Calibration certificate

### **Separation:**

Paper : Calibration Certificate

Printed circuit board: Inside the Detector,

Aluminum: Detector casing.

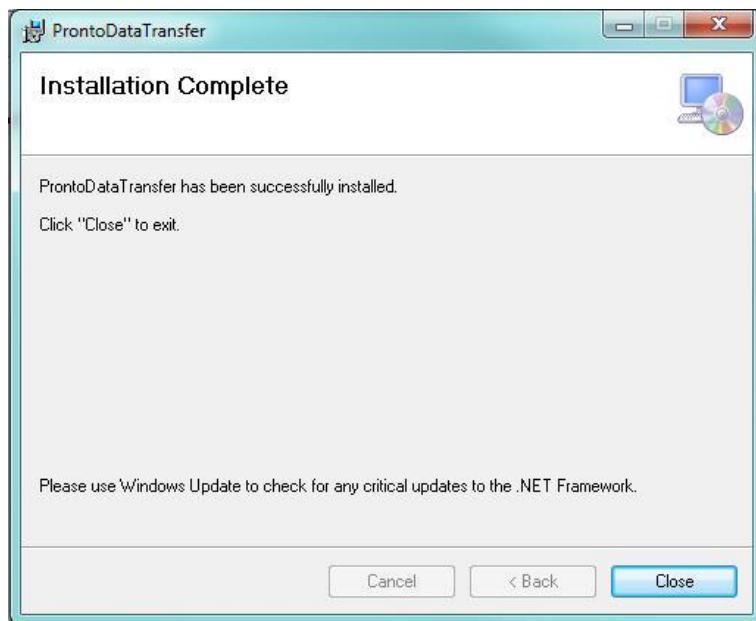
Plastic: Parts inside the Detector.

## 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.



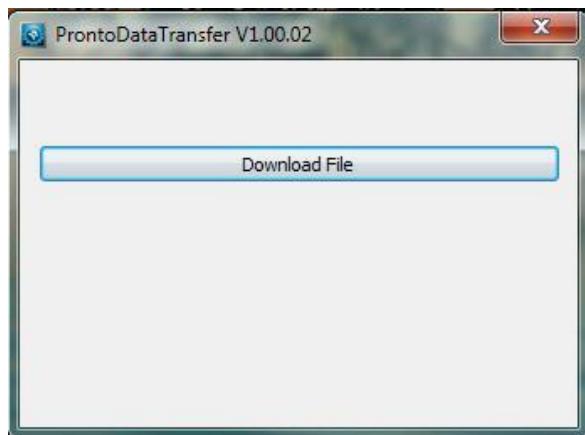
4. Choose the folder for the installation and click Next until the installation is complete. Then click Close.



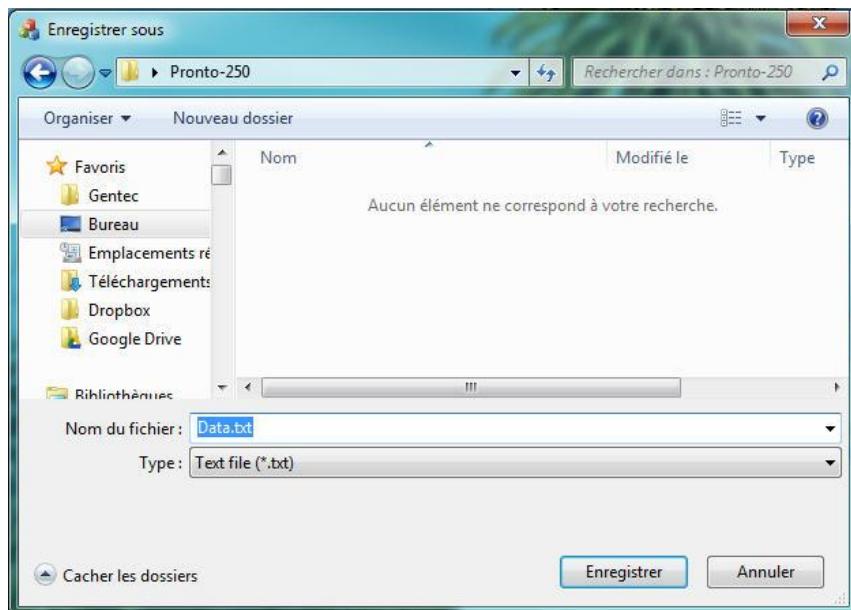
5. Once the software is installed, locate it on your computer and start the program by clicking the

PRONTODataTransfer icon

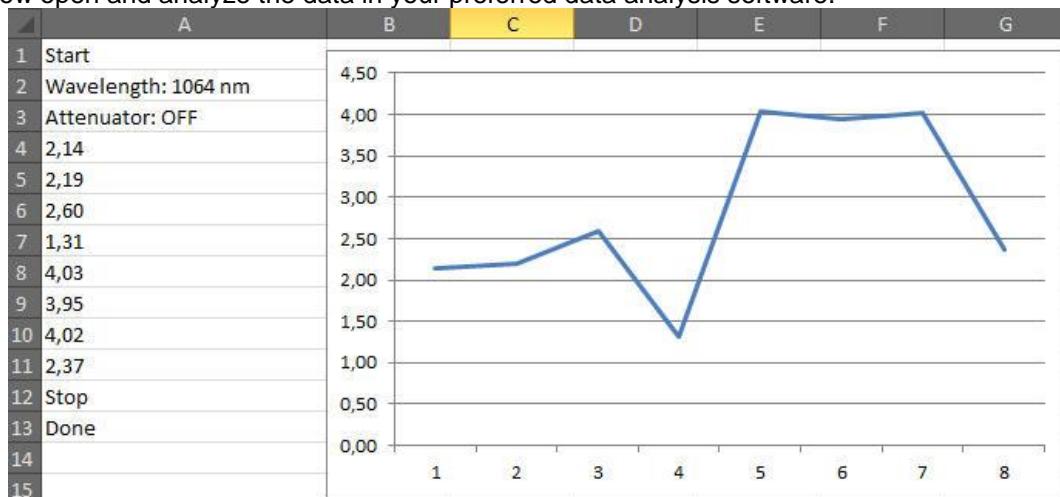
6. A download window appears with a **Download File** button.



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.



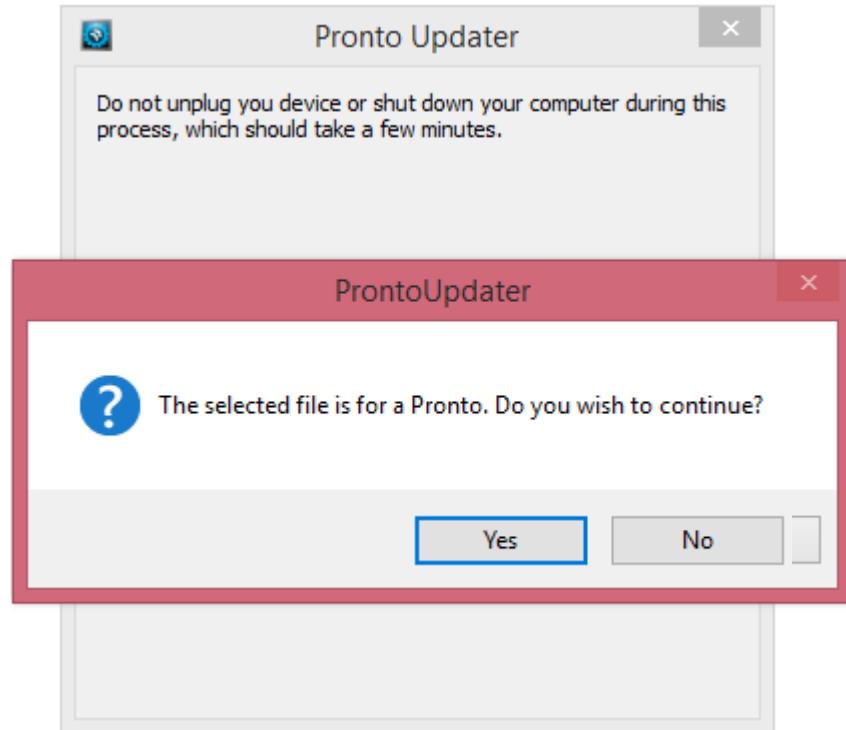
## Appendix C: Updating the PRONTO Firmware

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.



Do not unplug the PRONTO or turn off 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.

# LEADER IN LASER BEAM MEASUREMENT SINCE 1972

## POWER & ENERGY METERS



## BEAM PROFILING



## TERAHERTZ MEASUREMENT



### CANADA

445 St-Jean-Baptiste, Suite 160  
Quebec, QC, G2E 5N7, Canada  
T (418) 651-8003  
F (418) 651-1174  
1 (888) 5GENTEC (Canada and USA only)  
[info@gentec-eo.com](mailto:info@gentec-eo.com)

### UNITED STATES

5825 Jean Road Center  
Lake Oswego, OR, 97035, USA  
T (503) 697-1870  
F (503) 697-0633  
1 (888) 5GENTEC (Canada and USA only)  
[info@gentec-eo.com](mailto:info@gentec-eo.com)

### CALIBRATION CENTERS

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Quebec, QC, G2E 5N7, Canada  
Werner von Siemens Str. 15  
82140 Olching, Germany  
1-11-14, Kasuga, Bunkyo-ku,  
Tokyo 112-0003, Japan