

## Product Overview

The ATP analysis harnesses a naturally occurring, light-producing process to measure total microorganism concentration. The amount of light produced in the analysis is directly related to the quantity of microorganisms. To measure the light intensity and therefore microbiological activity, a luminometer is required.

LuminUltra supplies the **PhotonMaster Luminometer (EQP-PMT)** for this purpose. As a USB-operated and powered device, the PhotonMaster requires an external device to operate. The **PhotonMaster Bluetooth Module (EQP-PBM)** allows users the additional options of stand-alone offline operation through a keypad and screen, or pass-through operation on your mobile device via Bluetooth technology and is fully integrated with our [myLuminUltra](#) software so that you can get the most out of your data.



## Product Contents



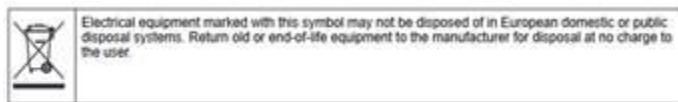
We recommend that every PhotonMaster Luminometer be stored and operated in its supplied carrying case, which also includes a space for the PhotonMaster Bluetooth Module and all the other equipment needed to carry out LuminUltra's test protocols. Contents normally include:

- PhotonMaster Luminometer c/w built-in USB cable;
- PhotonMaster Bluetooth Module c/w 6' USB charging cable;
- Micropipettors for reliable and accurate fluid transfer;
- Test tube racks for both reagent tubes and luminometer cuvettes.

This complete system can operate independently of [myLuminUltra](#) software; however, for the best user experience visit <https://my.luminultra.com/s/> to download the mobile app on your Android or iOS device or use your computer & web browser to access the software through the web.

## Compliance Information

- The PhotonMaster Luminometer has certifications for CE, FCC, and RMC.
- The PhotonMaster Bluetooth Module has certifications for CE, FCC, and RMC.
- For more information, refer to the bottom sticker on the PhotonMaster Luminometer & Bluetooth Module or the copy of the Declaration of Conformity from LuminUltra®.



## Product Specifications

### **PhotonMaster Luminometer (EQP-PMT)**

<b>Linear Dynamic Range (ATP):</b>	4 x 10 <sup>-12</sup> to 1 x 10 <sup>-6</sup> M ATP
<b>Linear Dynamic Range (RLU):</b>	0 to 10,000,000 RLU
<b>Assay Tube Chamber:</b>	φ12 x 55mm
<b>Detector:</b>	Photomultiplier Tube (PMT)
<b>Interface:</b>	USB, 3ft cord
<b>Power:</b>	USB 5-volt <120mA
<b>Control Methods:</b>	PhotonMaster Bluetooth Module, <a href="#">myLuminUltra</a> software
<b>Dimensions (mm):</b>	77W x 125D x 88H
<b>Weight:</b>	1.01lbs (460g)
<b>Storage Temperature:</b>	-10 to +50°C
<b>Operating Temperature:</b>	+5 to +35°C

### **PhotonMaster Bluetooth Module (EQP-PBM)**

<b>Battery:</b>	2600 mAh Lithium-Ion (1500 readings on full charge)
<b>Luminometer USB Connection:</b>	Type A Female; 100mA output
<b>PC/Power USB Connection:</b>	Type-B Micro Female; 500mA input
<b>Bluetooth Connection:</b>	Bluetooth Low Energy (BLE), Bluetooth Classic (BTC)
<b>Control Methods:</b>	Onboard, USB-to-PC, Bluetooth-to-mobile
<b>Dimensions (mm):</b>	130 x 70 x 26 (L x W x H)
<b>Weight:</b>	152g
<b>Storage Temperature:</b>	-10 to +50°C
<b>Operating Temperature:</b>	+5 to +35°C
<b>Measurements:</b>	1000+ measurements (from full charge)
<b>Low Battery Indicator:</b>	5 measurements (red battery LED will start to blink)
<b>Memory:</b>	1000 Sample Points (Notification to clear memory at 900 SP)

**NOTE:** The PhotonMaster is a sensitive laboratory device and while designed for field use, should be handled with care. Avoid operating the unit in excessive high or low temperatures, avoid operation in direct sunlight, and avoid exposure to physical shock. We recommend storing your PhotonMaster in its supplied field case at all times, especially during transportation.

### PBM Charging & Connection Instructions

The PhotonMaster Bluetooth Module uses an integrated high capacity Li-ion battery delivering enough power to perform more than 1000 readings on a single charge with a PhotonMaster luminometer. When the PBM is in standby mode (turned off) it draws a small current to maintain operational functionality, which over time will deplete the battery. The PBM can be charged from most common USB wall chargers (not supplied) or from a USB port on a computer. A full charge will take approximately 5 hours to complete based on a maximum 500mA power supply (common found on phone chargers). Connect the Micro USB to USB cable (supplied) to the PBM port labelled 'PC' and the opposite end to a USB charger or USB port on a computer. With the PBM turned ON and the charging cable connected, the red battery indicator light will illuminate to signify the unit is being charged. The battery is fully charged when the battery indicator light does not illuminate with the PBM turned ON.

**NOTE:** When charging a device with a completely dead battery, an initial charge may be required before the PBM responds. In such cases it is advised to allow 10-15 minutes charge time to allow sufficient charge before the unit will power on.



PBM USB Micro Port



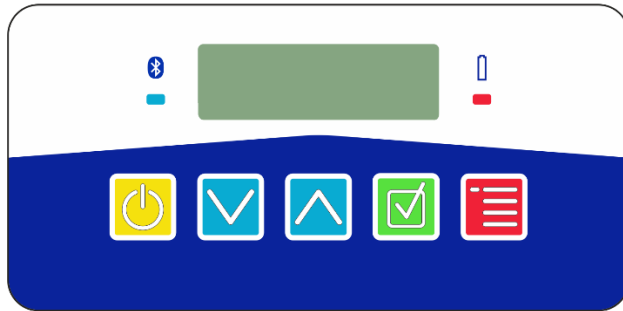
### Product Interface

The PhotonMaster luminometer is easy to use; simply plug in to the USB port of your PhotonMaster Bluetooth Module and start taking readings!



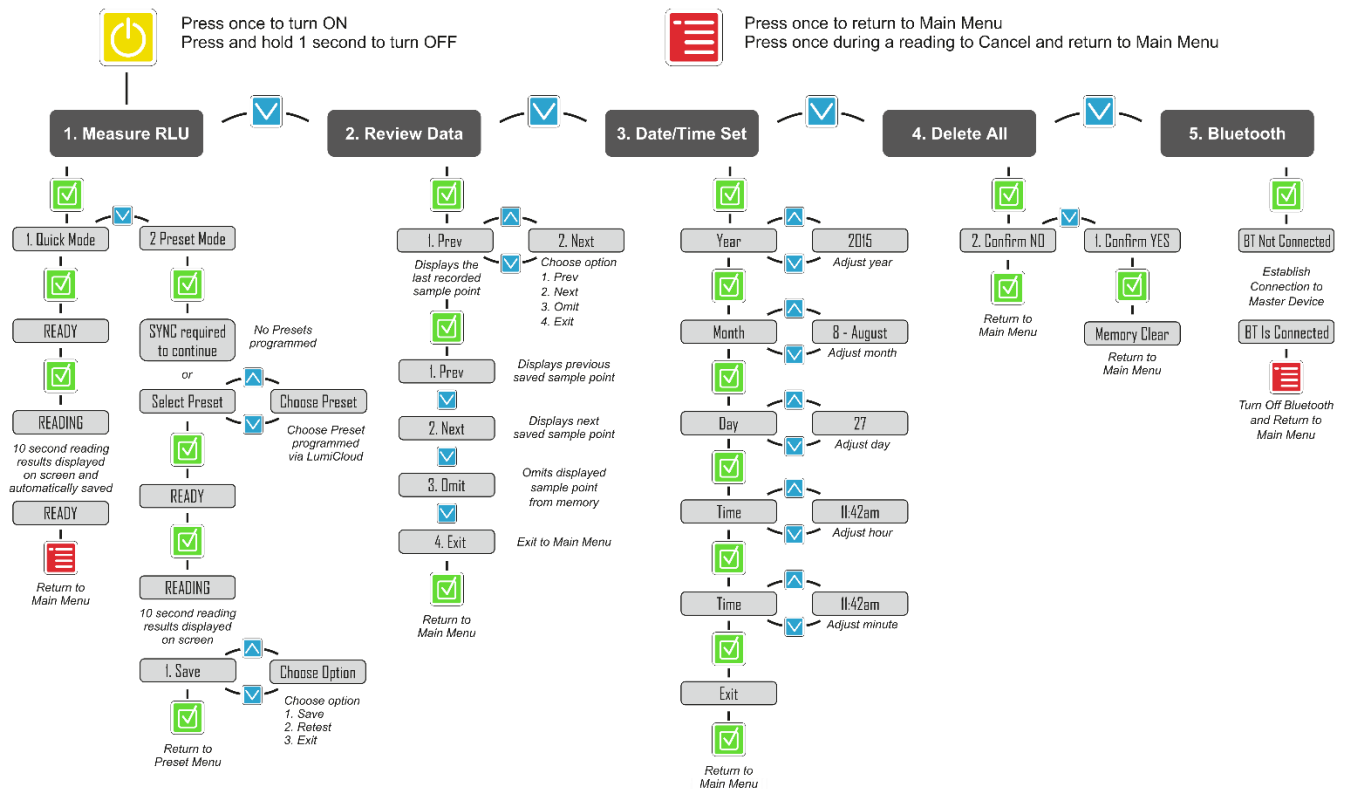
USB TYPE-A FEMALE  
POWER OUT

## Top View & Button/LED Descriptions



POWER		Press once to turn POWER ON Press and hold 3 sec to turn POWER OFF
NAVIGATE DOWN		Press once to scroll DOWN next item in menu list Press and hold to advance quickly through menu list
NAVIGATE UP		Press once to scroll UP next item in menu list Press and hold to advance quickly through menu list
SELECT		Press once to SELECT item in menu list
MENU/CANCEL		Press once to return to MAIN MENU Press during reading to CANCEL
BLUETOOTH INDICATOR		Blue LED OFF - No Bluetooth connection Blue LED FLASHING - Bluetooth discoverable Blue LED ON - Bluetooth connection made
BATTERY CHARGE INDICATOR		Red LED OFF - Battery not charging Red LED FLASHING - Battery level is LOW Red LED ON - Battery charging (connected through micro USB)

## User Interface Map



### Cleaning Instructions

There are several routine maintenance steps that are recommended to ensure that the PhotonMaster Luminometer remains in good condition and that you continue to obtain the most accurate testing results.

**If fluid has been spilled into the chamber**, immediately follow these steps:

1. Remove assay tube – do not depress shutter or reclose the lid!
2. Keep lid open and invert the PhotonMaster.
3. Let the unit sit on a flat, clean surface for one hour.

Do not expose PhotonMaster to bright light during this time, and do not perform these tasks in a dirty or dusty environment (e.g. outdoors).

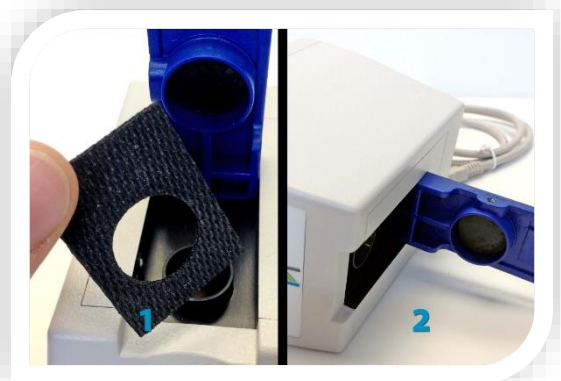
The number one cause of spillage in the PhotonMaster chamber is when assay tubes are left in the luminometer following testing. **Please be sure to remove used assay tubes from the luminometer immediately upon completion of your testing.**



LuminUltra recommends that the PhotonMaster be cleaned at least on an annual basis. Please use only the approved **Luminometer Cleaning Kit (LCK)** or **Luminometer Maintenance Kit (LMK)** that is furnished by LuminUltra, which includes 5 foam swabs and cleaning fluid. **Never** use sharp or abrasive materials for cleaning the PhotonMaster chamber, as this can compromise the sensitive optics of the device!

Disconnect your PhotonMaster from any USB connections before starting cleaning procedure.

1. Remove the rubber gasket from around the Counting Chamber.
2. Carefully lay the unit on its side with the lid open.
3. Using provided cleaning solution only; apply 6-8 drops to the swab. Using the dropper tip to spread the fluid around the swab to aid in absorption. Before inserting into the chamber.



4. Once cleaning fluid has thoroughly been absorbed by the swab, slowly insert into the chamber. Some fluid may be squeezed from the swab.
5. Insert the swab fully into the chamber until it stops. Turn the swab 6x clockwise while lifting the swab up and down within the chamber. Repeat 6x counter clockwise, lifting the swab up and down within the chamber to ensure complete coverage. If heavily soiled, apply more fluid and repeat steps.



**DRYING:** Using a new dry swab, repeat the 6x clockwise / counter clockwise motion. Pull the swab and feel for dampness. If damp, use a new swab and repeat twisting steps. Continue to use new clean swabs until the swab comes out dry. This usually requires three swabs.

Verify that cleaning was successful by testing the travel of the piston in the chamber (it should be smooth) and through visual inspection. If there is still visible debris in the chamber, perform cleaning again.

**NOTE:** To prevent damage, do not reuse swabs after cleaning

## Luminometer Linearity and Calibration Instructions

The PhotonMaster does not require re-calibration, but LuminUltra does recommend that you verify linearity on an annual basis using our **Luminometer Standardization Kit (LSK)** or **Luminometer Maintenance Kit (LMK)**.

For the best protection, we recommend that you clean your luminometer and verify linearity on an annual basis. Contact LuminUltra for details.

## Handling Instructions

Please note some other handling instructions to consider when Operating your PhotonMaster Luminometer & Bluetooth Module:

### PhotonMaster Luminometer

- Do not move or tilt the units during measurement and ensure you are working on a level surface. This may cause fluctuations in the measurement data.
- Always remove the cuvette after taking a measurement to prevent liquid spilling inside the chamber and causing a malfunction with the PhotonMaster Luminometer.
- Keep this unit at least 10 cm away from stirrers, mixers or any device that may generate electromagnetic noise.
- Do not expose this unit to liquids, reagents or organic solvents. Doing so may cause malfunction, discoloration or deformation. If the unit was exposed to such liquids, reagents or solvents, then wipe them away immediately.




- Avoid using this unit in locations: where the temperature fluctuates rapidly; directly exposed to steam; where excessive condensation occurs; where corrosive gases are generated; subject to vibration; with intense magnetic fields; or in locations exposed to excessive dust or debris.
- Before using this unit, wash your hands thoroughly. This unit is extremely sensitive, so the ATP (Adenosine Triphosphate) may become contaminated through contamination from hands.
- Do not leave this unit in unstable place or hazardous locations. Do not apply excessive shock to this unit and do not drop it. Doing so will cause permanent damage.
- Be careful to prevent electrostatic charge buildup on the sample tube. Static electricity may cause an increase the measurement data.

### PhotonMaster Bluetooth Module

- Do not leave this unit in unstable places or hazardous locations. Do not apply excessive shock to this unit and do not drop it. Doing so may cause permanent damage.
- Do not expose this unit to excessive water or submerge. This unit is not water-proof, excessive water or moisture may cause an internal short or damage to the operation of the device.
- Do not expose this unit to liquids, reagents or organic solvents. Doing so may cause malfunction, discoloration or deformation. If the unit was exposed to such liquids, reagents or solvents, then wipe them away immediately.
- Avoid using this unit in locations: where the temperature fluctuates rapidly; directly exposed to steam; where excessive condensation occurs; where corrosive gases are generated; subject to vibration; with intense magnetic fields; or in locations exposed to excessive dust or debris.
- Customers can return their used PBM for recycling by contacting us at [www.luminultra.com](http://www.luminultra.com) and use our contact form. Please provide date of purchase and serial number of the unit you wish to dispose of and a representative will contact you within 1-2 business days with further instructions. **Please do not return any items to us without prior written authorization.**




## Safety Precautions

The following warning symbols are used in this manual to designate the degree of hazard and damage that might occur if this product is used incorrectly.

	<b>Electrical shock hazard</b> This symbol indicates a risk of electrical shock.
	<b>Fire hazard</b> This symbol indicates a risk of smoke emission or fire.
	<b>Explosive hazard</b> This symbol indicates a risk of explosion.



The following safety precautions should be taken and considered when operating the PhotonMaster Luminometer and PhotonMaster Bluetooth Module.

  	<ul style="list-style-type: none"> <li>• If you notice abnormal operation such as a burning odor or smoke being emitted from this unit, then there is a risk of potential fire or internal explosion. After checking that the smoke has dissipated, please contact us or your local dealer. Never attempt to repair the problem yourself since this could be dangerous. Continued operation under abnormal conditions may lead to fire or electrical shock.</li> <li>• Do not use chemicals that may generate flammable gases and do not use in an atmosphere containing flammable gases. Doing so may cause gas explosion in this unit.</li> <li>• This unit contains high internal voltages, so improper handling may cause electrical shock, fire, or abnormal operation.</li> <li>• Never attempt to remove any cover of this unit or disassemble or repair any part of this product. Only our qualified service personnel are allowed to service this unit. This unit contains internal voltages, so improper handling may cause electrical shock, fire, or abnormal operation.</li> </ul>
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## Warranty Information

Your PhotonMaster luminometer and PhotonMaster Bluetooth module comes with a 2-year replacement warranty from date of purchase. To be eligible for this warranty, ensure that you fill out and return the warranty registration card provided with your PhotonMaster. Refer to this warranty form and statement for more information on the terms of this warranty.

## Ordering Information

New to 2<sup>nd</sup> Generation ATP technology? Start by ordering the PhotonMaster & PBM Equipment Set and the test kit(s) of choice. Already own a PhotonMaster Luminometer and looking to upgrade your existing equipment to leverage the advantages of the PhotonMaster Bluetooth module? Equipment is available in the following formats:

For...	Description	Part #
New Customer	PhotonMaster & PBM Equipment Set <ul style="list-style-type: none"> <li>• <i>PhotonMaster Luminometer</i></li> <li>• <i>PhotonMaster Bluetooth Module</i></li> <li>• <i>Equipment Case</i></li> <li>• <i>Fixed volume Micropipettors</i></li> <li>• <i>Test tube racks</i></li> <li>• <i>Test Kit Tote Bag</i></li> </ul>	EQP-PBM-PAC
New Customer	PhotonMaster & PBM <ul style="list-style-type: none"> <li>• <i>PhotonMaster Luminometer</i></li> <li>• <i>PhotonMaster Bluetooth Module</i></li> <li>• <i>Equipment Case</i></li> </ul>	EQP-PBM-PMT



Upgrade	PhotonMaster - PBM Full Upgrade Kit <ul style="list-style-type: none"> <li>• <i>PhotonMaster Bluetooth Module</i></li> <li>• <i>Equipment Case</i></li> <li>• <i>Fixed volume Micropipettors</i></li> <li>• <i>Test tube racks</i></li> <li>• <i>Test Kit Tote Bag</i></li> </ul>	EQP-PBM-UPGF
Upgrade	PhotonMaster - PBM Basic Upgrade Kit <ul style="list-style-type: none"> <li>• <i>PhotonMaster Bluetooth Module</i></li> <li>• <i>Equipment Case</i></li> </ul>	EQP-PBM-UPGB

**NOTE:** Please contact LuminUltra to inquire about purchasing individual components separately from the equipment sets above.

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For all other inquiries: [sales@luminultra.com](mailto:sales@luminultra.com)

Major credit cards (Visa, MasterCard, AMEX) are accepted. Contact LuminUltra by phone to place credit card orders. Orders generally ship within 3 business days. You will receive order confirmation via Email.

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