



QUICK START GUIDE FOR

Blink-HS

LASER ENERGY METER

(rev02 – 24-12-2019)

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1- INTRODUCTION

The **Blink-HS** line includes a series of instruments for the measurement of laser Energy that combine both the sensor (**Blink HS**) and the readout electronics (**Blink HSM**) connected via microwave cable.

Laser measurement is done by connecting directly the instrument to a PC via Ethernet cable.

The **Blink-HS** is supplied with LaserPoint user-friendly Graphics User Interface (GUI).

The platform is designed to measure the energy of pulsed light sources, from UV to far IR, in the range of 1 kHz to 1 MHz (depending on the model), and from μJ to mJ energy/pulse range.

The following sections describe the basic measurement functionality of **Blink HS sensor head** and **Blink HSM meter**, including the Graphic User Interface.

Before using any product from the **Blink-HS** line it is worth considering the following:

1. **Laser Source:** What specific laser has to be measured? Which sensor is the best suitable for that source, in terms of aperture, full scale, hardness of its absorber? What has to be measured: laser power or laser energy? Are the laser power, energy, and the power/energy densities exceeding the sensor ratings? (Please read carefully Blink HS specs and do not hesitate to contact our local distributor or directly LaserPoint at sales@laserpoint.it)
2. **Instrument Settings:** What settings have to be configured (for example, statistics, energy threshold, wavelength, and so on)?

2- SAFETY NOTES

Before operating the sensor head and its associated **Blink HS** electronics, carefully read the safety information to avoid both personal injuries and to prevent damage to the instruments.

Measuring a laser's Energy, as well as the operation of a laser, is potentially dangerous. The instruments object of this manual may operate at high Energies and at wavelengths that may include non-visible laser radiation.

WARNING: never touch the HS sensor head active area (accessible from Laser aperture, Figure 1)

- Proper operating practices, in accordance with laser manufacturer's recommendations, are crucial; to ensure that the correct operating procedures are followed, consult the laser manufacturer and your laser safety officer
- Eyewear and other personal protective equipment must be used in compliance with applicable laws and safety regulations



1. The user of this instrument must be trained in the use of lasers and their associated risks. LaserPoint is in no way liable for any damage resulting from misuse, carelessness, or use beyond the rated limits for the provided products.



2. Complete all the required safety procedures to work with laser beams and wear suitable appropriate personal protective equipment, such as laser goggles, protection glasses all the time while the laser is powered ON!



3. Before proceeding to measurements, check the cooling devices applied on the head.
 - On heads with water cooling: Verify that water is flowing (when applicable) with the specified flux and temperature. Wait for at least 5 minutes to achieve the thermal stabilization of detectors and the maximum stability of electronics.

- On heads with forced air cooling: first connect the fan (when applicable) to the 12V DC power supply and wait for at least 5 minutes, after turn-on, to achieve the thermal stabilization of detectors and the maximum stability of electronics. Even at powers far lower than the head full scale, the fan must be connected and active.

WARNING!

4. **Specular and diffused back reflections.** Always pay attention to the specular and diffused back reflections originating from laser absorbers. The percentage of absorption depends on each coating type and can vary between 30 % up to > 90 %, as a function of wavelength. The amount of radiation that is not absorbed is

reflected or scattered following the Lambert Cosine Law. To avoid dangerous back reflections that can be returned to the laser cavity, or are back-focused by lenses, it is recommended to position the head with a small angle relative to the optical axis. The beam path must be fully enclosed using appropriate light blocking enclosures.

5. External Sources. All thermal sensors, in particular those with broadband coatings that extend into IR, are very sensitive to heat regardless of its source. Extreme care must be taken to ensure that only the measured radiation reaches the sensor active surface.

Air currents, hands touching the detector, sun light, or other forms of heat will easily alter the measured value.

6. Detector temperature. Thermal heads, in particular those with convection-cooling, may become hot and cause burns if touched.

7. Do not operate the head and its associated meter in critical medical environments, in wet or damp conditions, or in an explosive atmosphere.

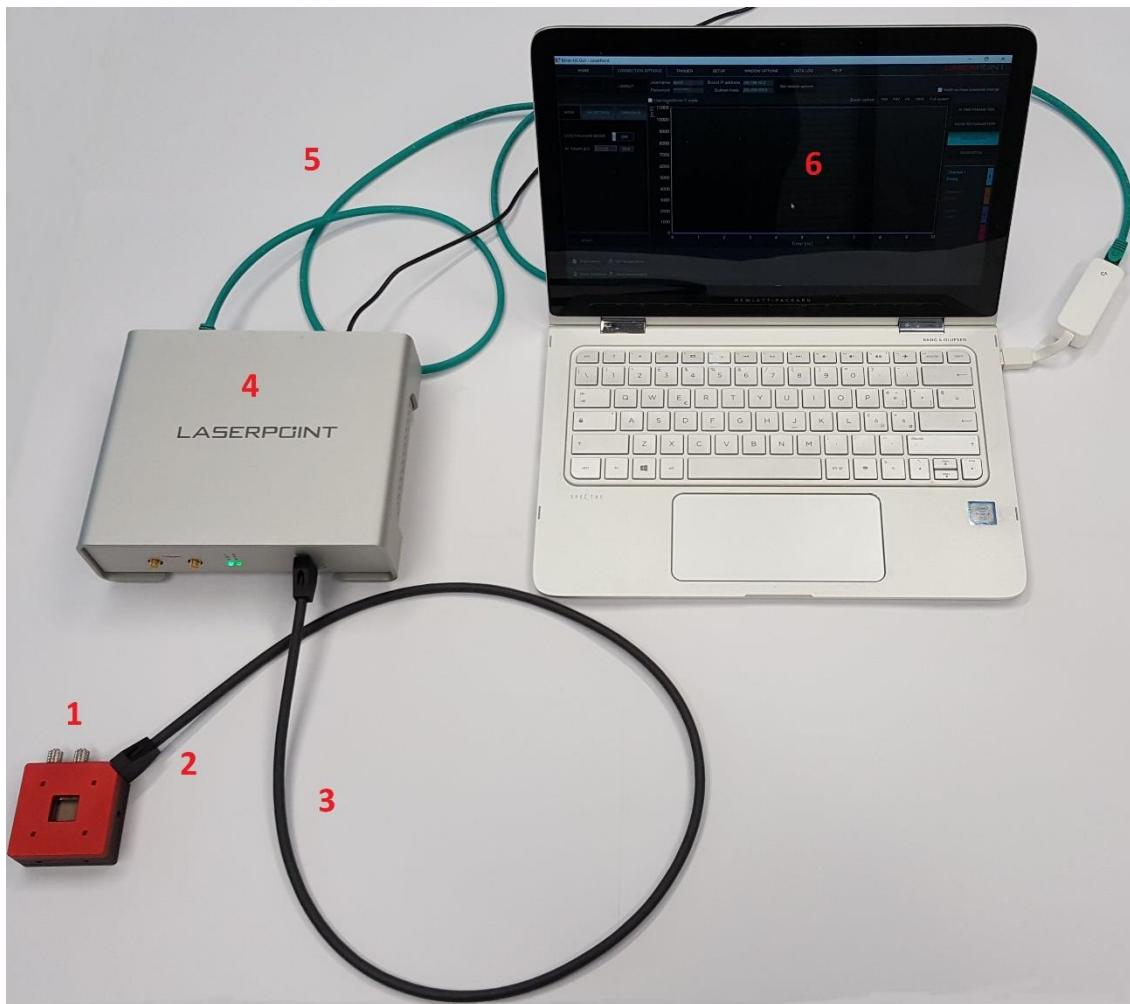
8. Do not operate the head and its associated meter if damage or potential failures are suspected to occur. Contact LaserPoint for a qualified service inspection or to repair damaged equipment.

9. Follow all laser safety procedures. The laser must be blocked or switched OFF before beginning the measurement procedures described in the following sections.

Operate all instruments only within their specified range.

10. Do not exceed the power/energy density limits specified for each sensor.

3- BLINK-HS OVERVIEW AND CONNECTIONS



1. Blink HS sensor head
2. Connector
3. Cable
4. Blink HSM meter
5. PC Ethernet cable and Ethernet-USB3 adapter (optional)
6. Graphic User Interface

4- INSTRUMENT SETUP

In order to setup the instrument ready for measurement please perform the following steps:

1. Connect HS sensor head to water hoses, water flow according to specs (Figure 1)
2. Connect the cable 3 to the HS sensor head 1 (Figures 1 and 2)

WARNING: the connector 2 has a wedge, please connect carefully the connector to the HSsensor head (the wedge should be up-right)

3. Connect the cable 3 to the HSM meter 4 (Figure 3)

WARNING: the connector 2 has a wedge, please connect carefully the connector to the HSM meter (the wedge should be down-left)

4. Plug the Power supply to the HSM meter 4 (Figure 4)
5. Connect the Ethernet cable to the HSM meter 4, PC connection (Figure 4)
6. Screw the Protection cap both on HS sensor head and HSM meter side
7. Power the HSM meter ON (Figure 4)
8. Wait until Status lights switch from RED to GREEN

The system is ready to be connected to the GUI (next paragraph) for normal operation

WARNING: never touch the HS sensor head active area (accessible from Laser aperture, Figure 1)

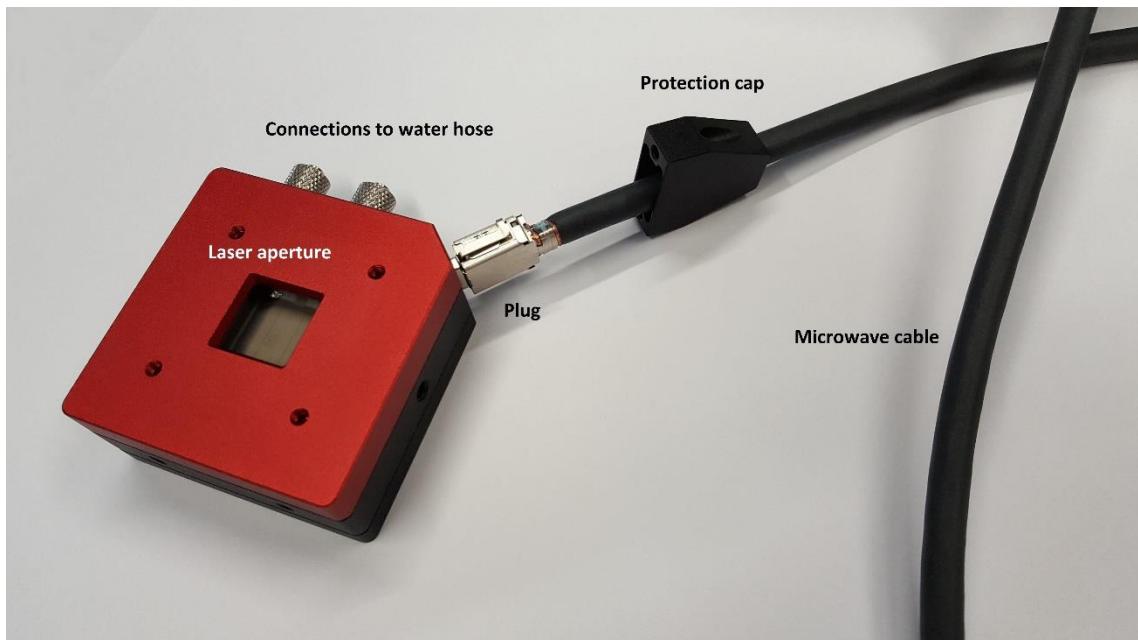


Figure 1: Blink HS sensor head with connection cable

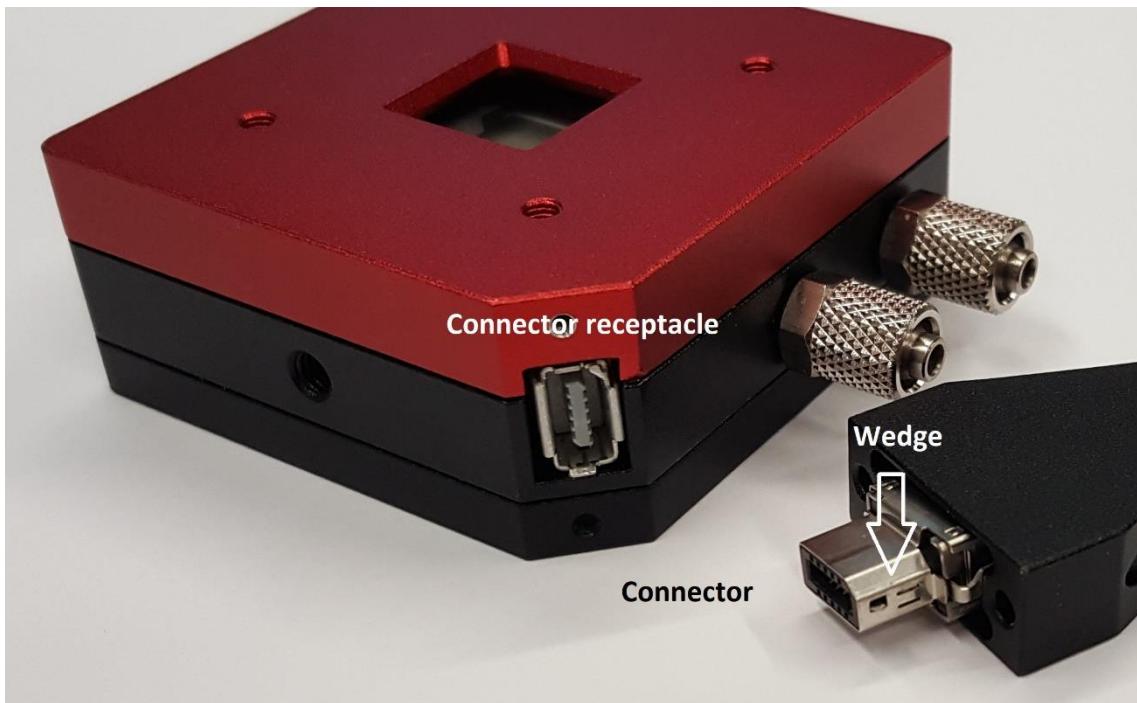


Figure 2: Blink HS connection side detail



Figure 3: Blink HSM meter front side



Figure 4: Blink HSM meter rear side

5- INSTALLATION OF THE GRAPHIC USER INTERFACE

In order to setup the instrument ready for measurement please perform the following steps:

1. Set the TCP/IPv4 according to figure 5
2. Install the Blink-HS GUI

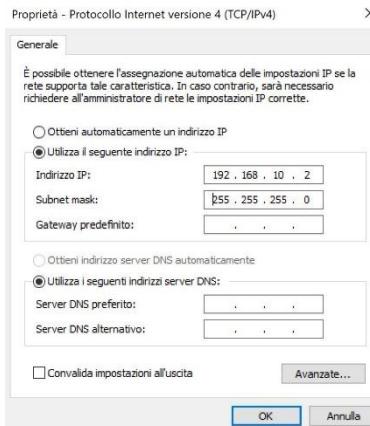
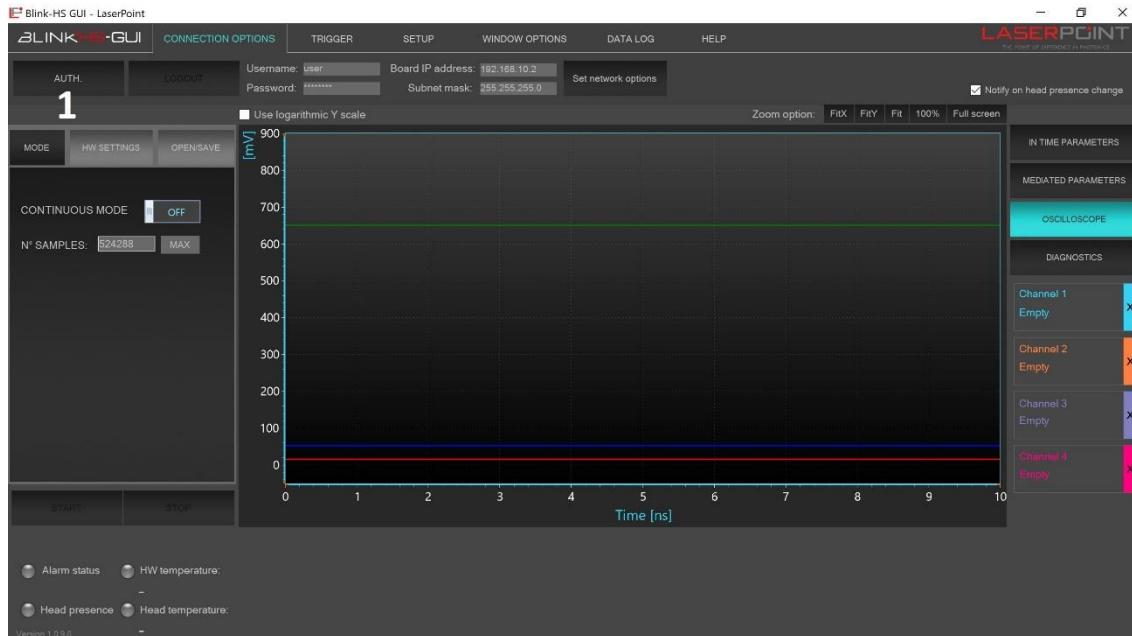


Figure 5: TCP/IPv4 settings

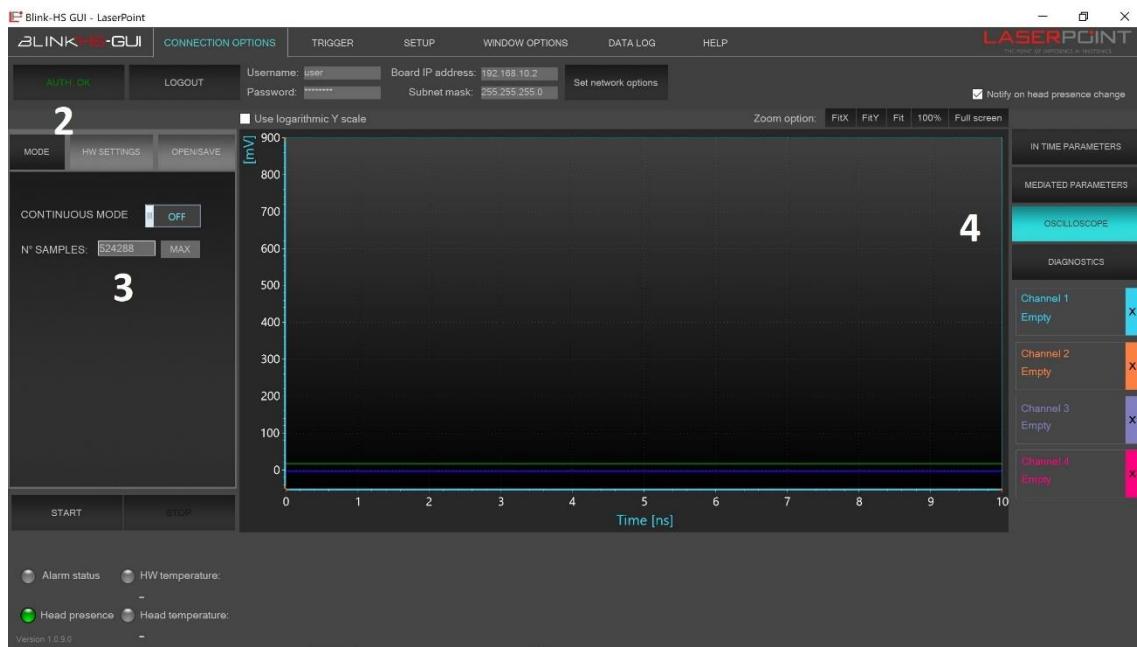
6- QUICK GUIDE TO MEASUREMENT

This section provides a quick guide to perform basic measurements with the **Blink.HS Sensor**.

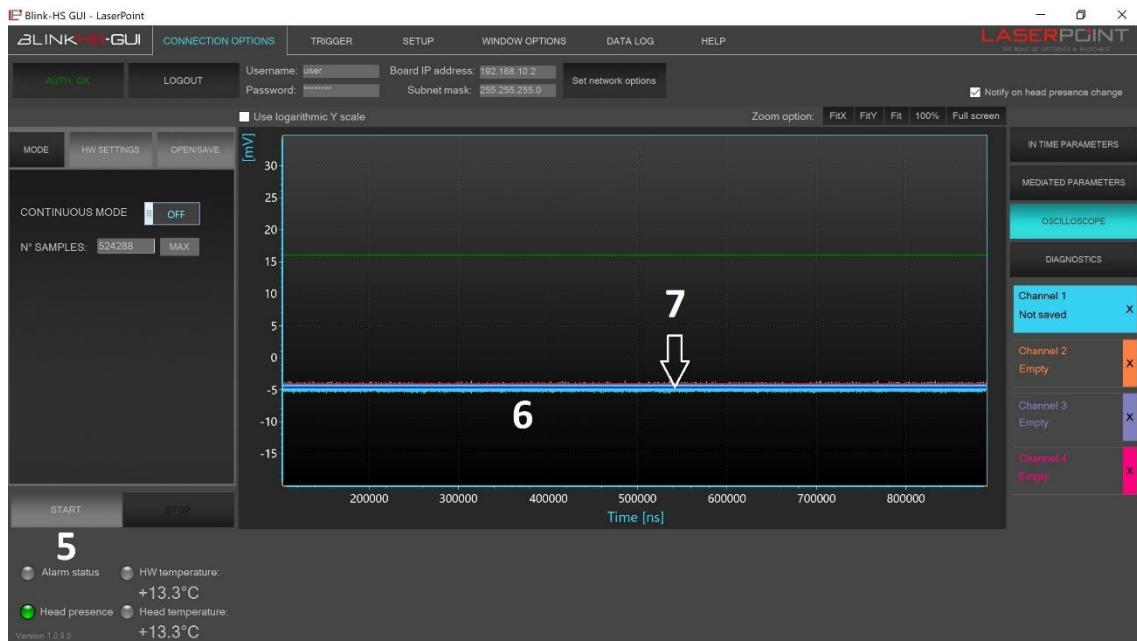
1. Run the Blink-HS-GUI



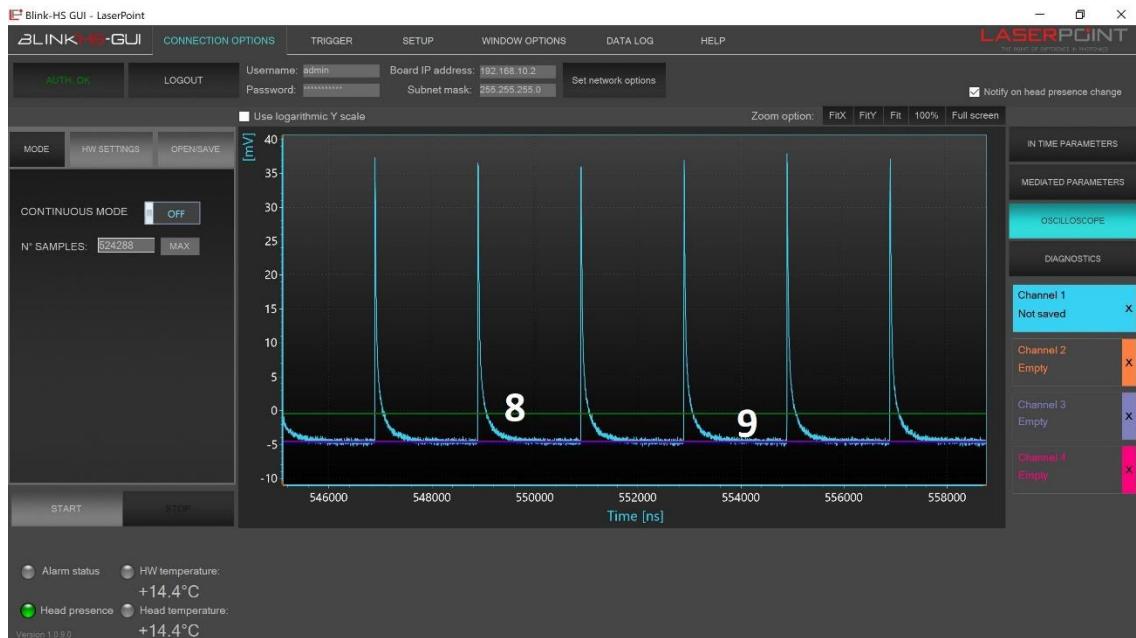
2. Press “AUTH” button (1)



3. Authentication performed when green label is on (2)
4. Select the number of samples (3) in oscilloscope mode (4) → 524288 samples equal to 1 ms time slot



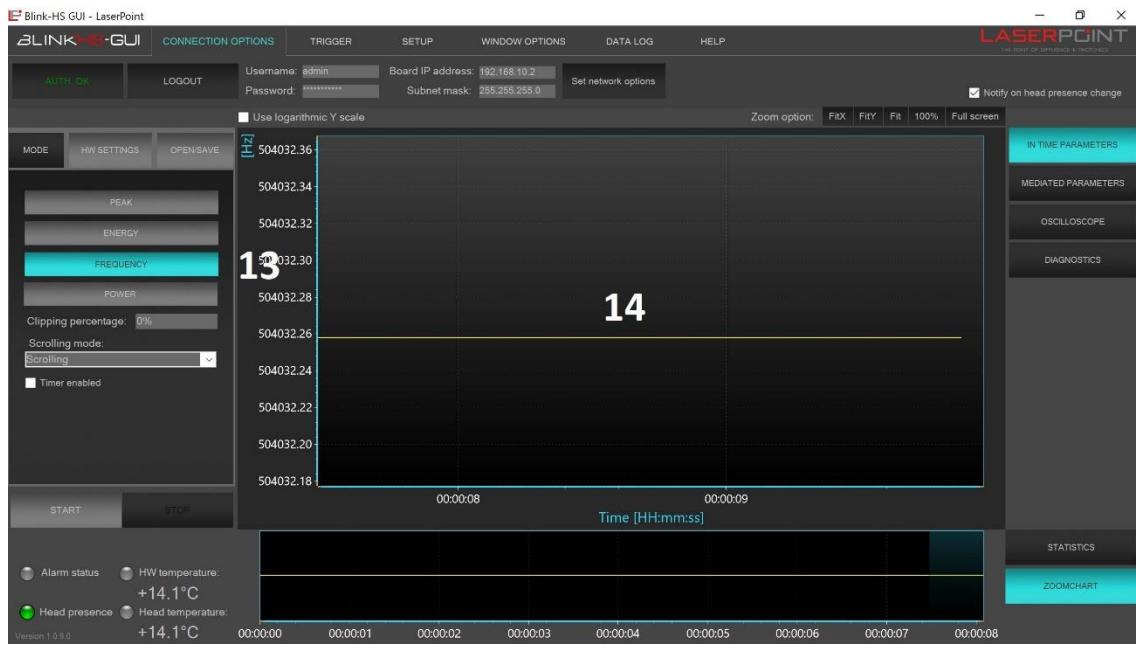
5. Laser OFF, start acquisition (5) of the background (6)
6. Adjust (right click) carefully the Baseline level (blue line, 7) to the middle of the background band



7. Laser ON, start acquisition (5) of laser pulse train
8. Adjust (right click) carefully the Trigger start (green line, 8) at least 3 times the peak to peak value of the Baseline
9. Adjust (right click) carefully the Trigger stop (red line, 9) typically close to the Baseline level



10. Switch to In Time Parameters (10)
11. Select Energy plot (11)
12. Display of the time evolution (12) of the Energy/pulse of the laser under measurement



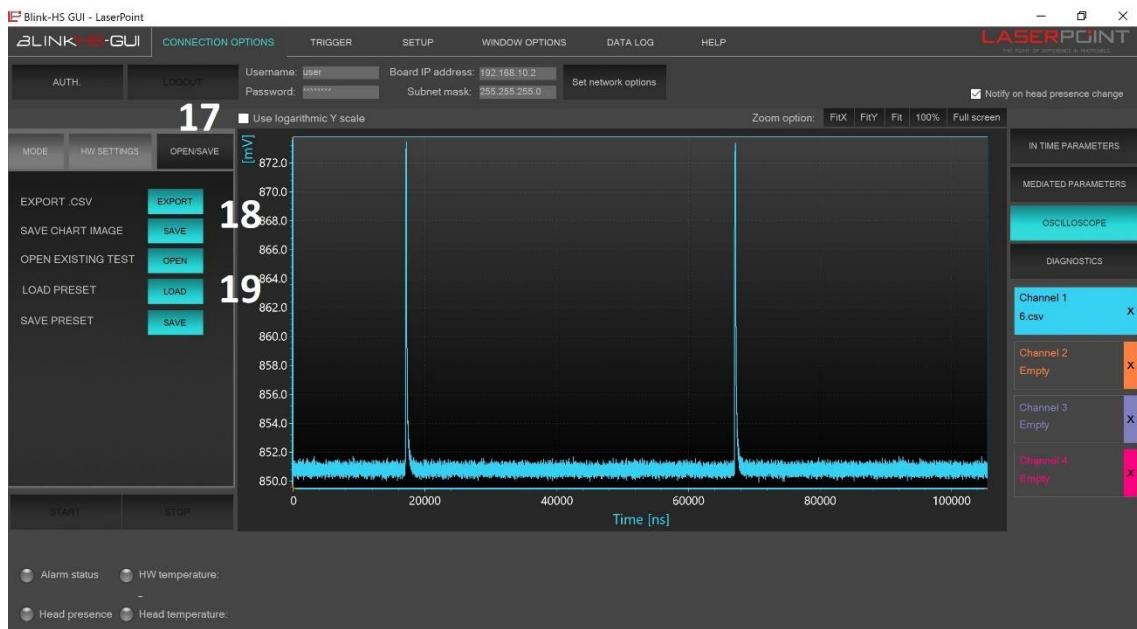
13. Select Frequency plot (13)

14. Display of the time evolution (14) of the Energy/pulse of the laser under measurement



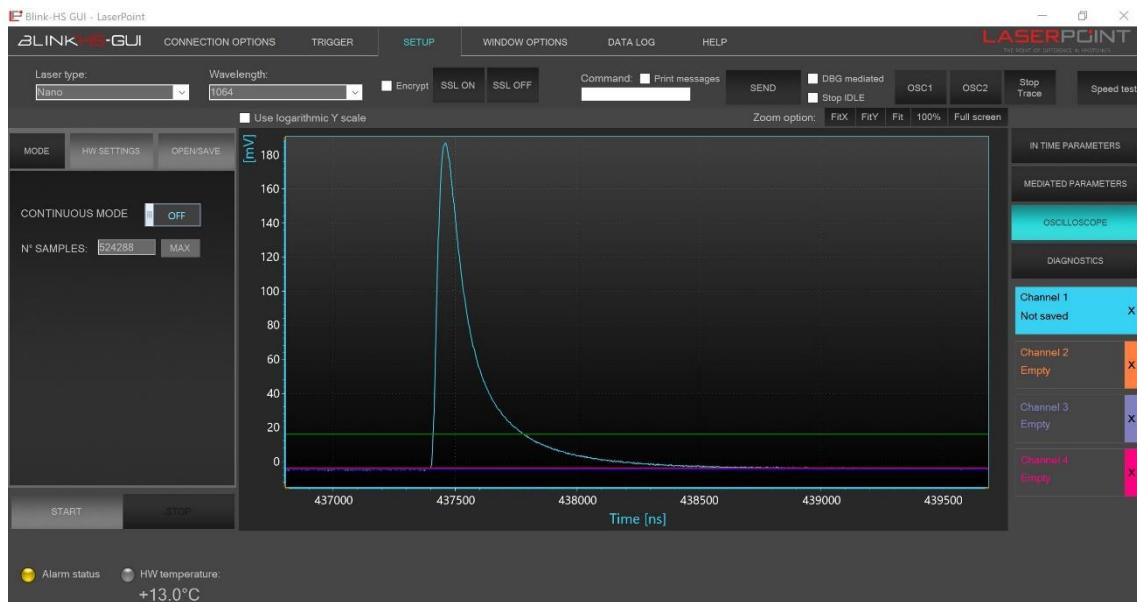
15. Select Power plot (15)

16. Display of the time evolution (16) of the average Power of the laser under measurement

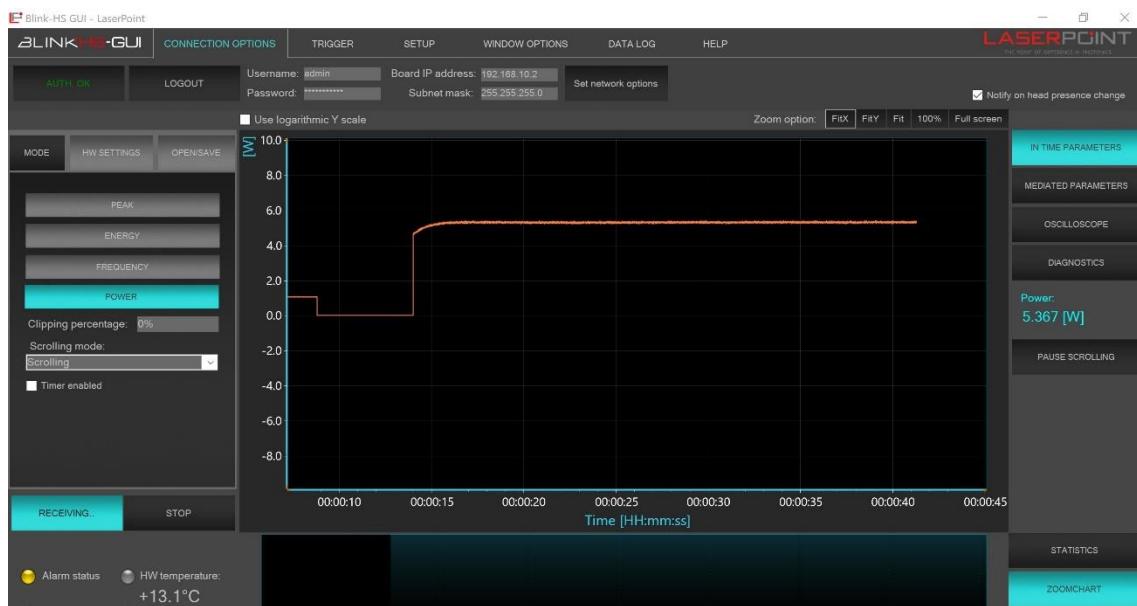


17. Save acquisition access the page OPEN/SAVE (17)
18. Export csv or acquisition image (18)
19. Load saved data (19)

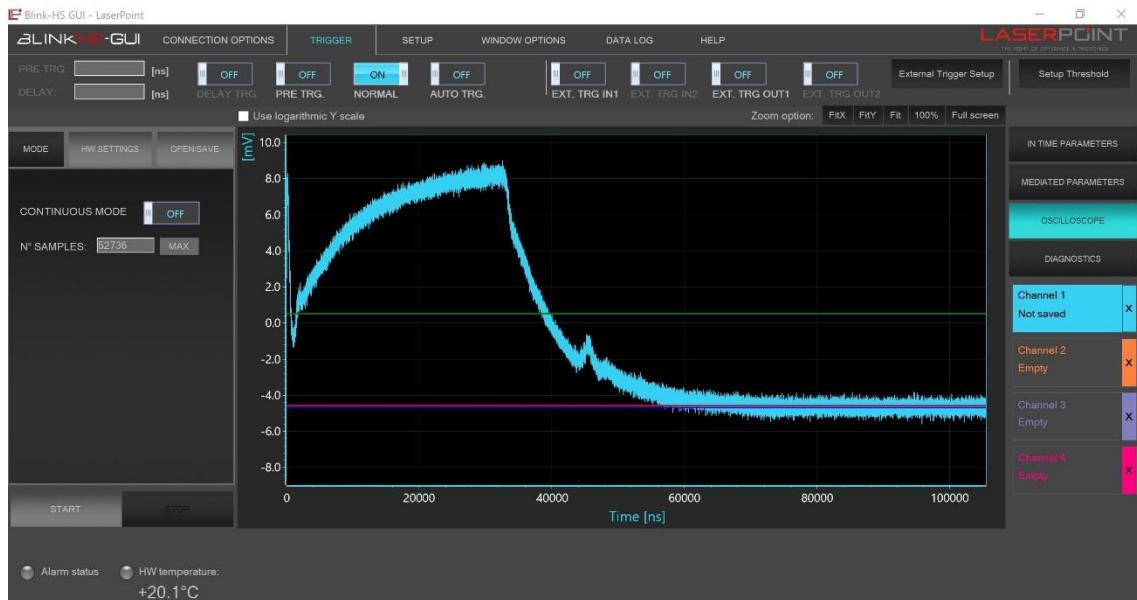
7- EXAMPLES OF UV AND CO2 LASER MEASUREMENT



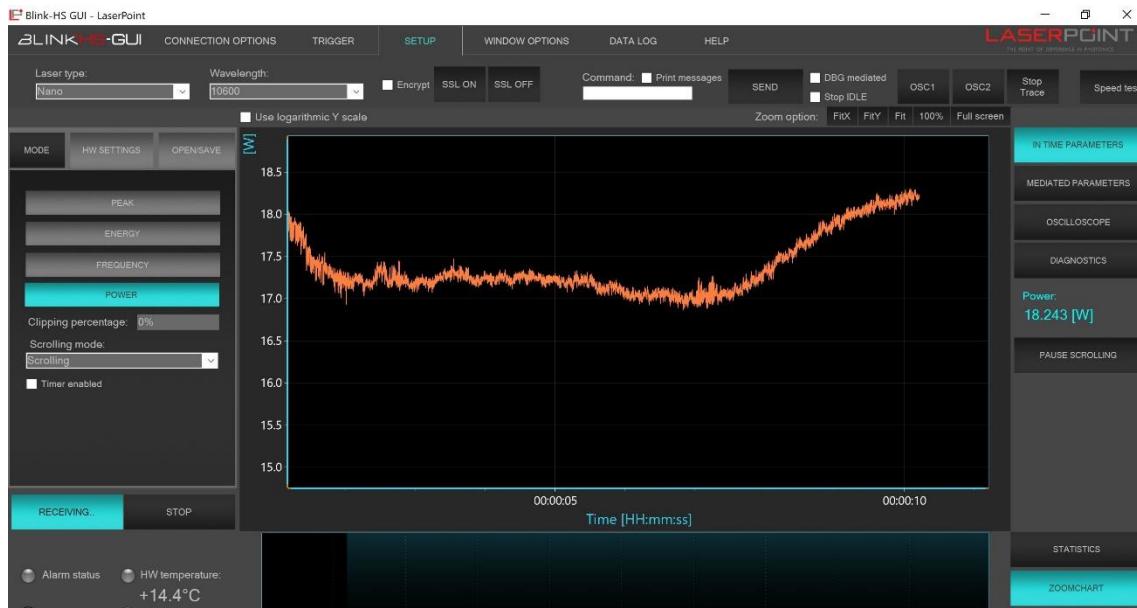
20. Pulse shape of 355 nm laser



21. Time evolution of average Power of 355 nm laser



22. Pulse shape of CO₂ laser



23. Time evolution of average Power of CO₂ nm laser

8- GRAPHIC USER INTERFACE SHORTCUT MENU

F11 → Enter fullscreen mode

Esc → (in fullscreen mode) Exit fullscreen mode

Ctrl+1 → (in fullscreen mode/parameters/mediated parameters) Show Peak value

Ctrl+2 → (in fullscreen mode/parameters/mediated parameters) Show Energy value

Ctrl+3 → (in fullscreen mode/parameters/mediated parameters) Show Frequency value

Ctrl+4 → (in fullscreen mode/parameters/mediated parameters) Show Power value

Ctrl+F → Chart zoom to fit

Ctrl+L → Enable/disable logarithmic scale

Ctrl+E → Export chart image in default folder (Log folder)

Ctrl+P → (while in time parameters acquisition) Pause/restart scrolling chart

9- COMPLIANCE TO ROHS DIRECTIVE (ROHS 2 DIRECTIVE 2011/65/EU)

The European (RoHS) Directive about Restriction of Hazardous Substances (RoHS 2 Directive 2011/65/EU) requires that certain hazardous substances (heavy metals such as lead, mercury, cadmium, and hexavalent chromium and flame retardants such as polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE)) are substituted by safer alternatives.

LaserPoint **Blink-HS** Energy meter is a product compliant to RoHS European Directive.

10- WASTE OF ELECTRICAL & ELECTRONIC EQUIPMENT

26.1-Information on Disposal of Electrical & Electronic Equipment (EUROPEAN UNION WEEE DIRECTIVE -WEEE 2012/19/EU)

This product bears the selective sorting symbol for waste electrical and electronic equipment (WEEE). This means that this product must be handled to the local collecting points or given back to retailer when you buy a new product, in a ratio of one to one pursuant to European Directive 2012/19/EU in order to be recycled or dismantled to minimize its impact on the environment.



Very small WEEE (no external dimension more than 25 cm) can be delivered to retailers free of charge to end-users and with no obligation to buy EEE of an equivalent type. For further information, please contact your local or regional authorities. Electronic products not included in the selective sorting process are potentially dangerous for the environment and human health due to the presence of hazardous substances. The unlawful disposal of the product carries a fine according to the legislation currently in force.

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