

HighFinesse
The Standard of Accuracy

HighFinesse Tutorial

Control lasers with the HighFinesse Multichannel Laser Controller (MCLC)

How to ...

... set up the HighFinesse Multichannel Laser Controller (MCLC)

This tutorial is intended to give you a brief overview of how to configure the HighFinesse Multichannel Laser Controller. The tutorial does not replace reading the manual. Make sure you have read and understood it (especially section 3.1 and 3.2) before you start the regulation. Setting voltage bounds incorrectly might cause damage to your laser.

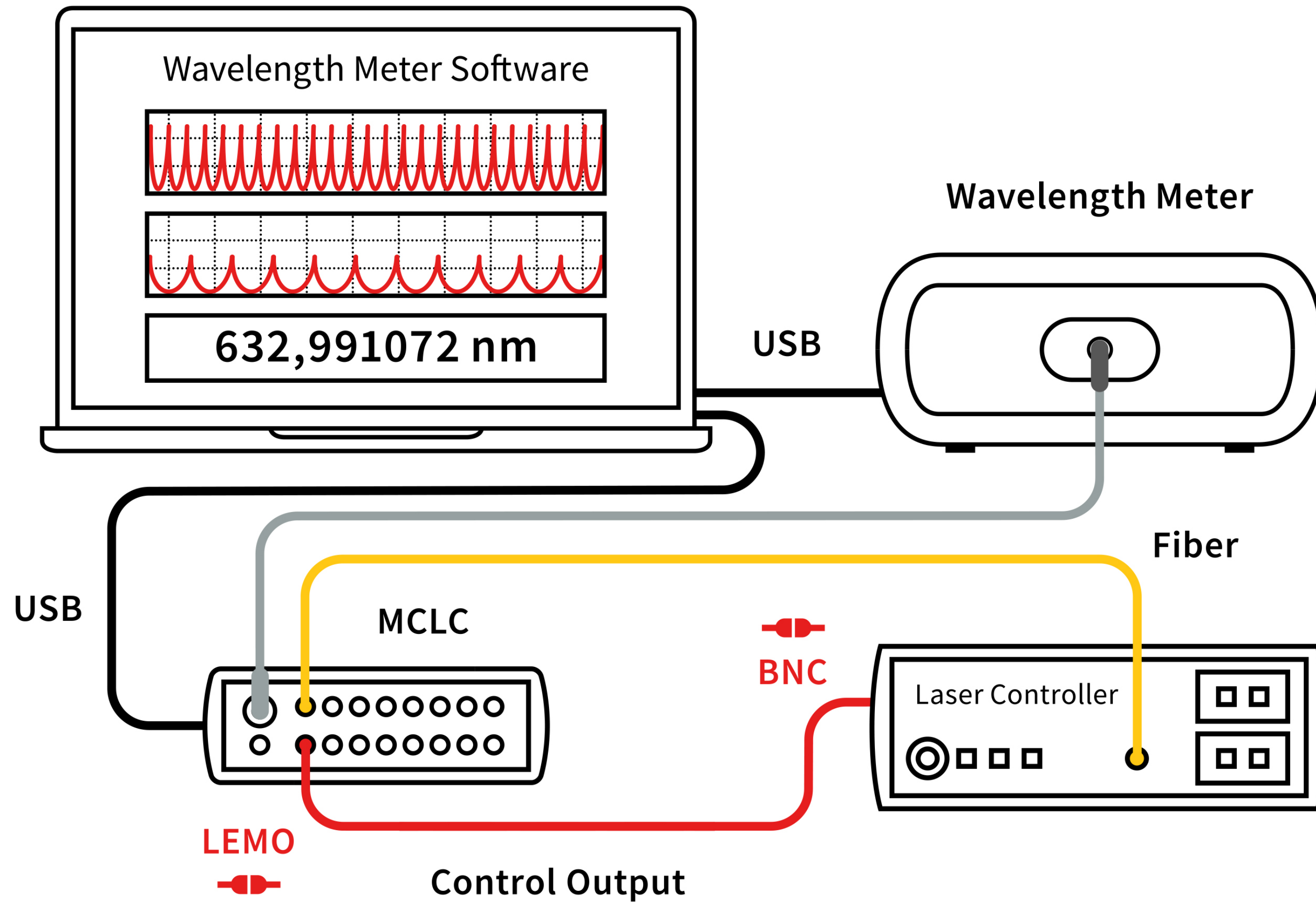
Here we assume that the laser is already successfully connected with a fiber to the MCLC, the MCLC is connected to the wavemeter and laser control outputs are connected to the respective laser controllers. For more information check the quickstart guide. If you have any questions about that refer to the quickstart guide “HighFinesse Multichannel Laser Controller”.



Quick Start Guide
HighFinesse Wavelength Meter

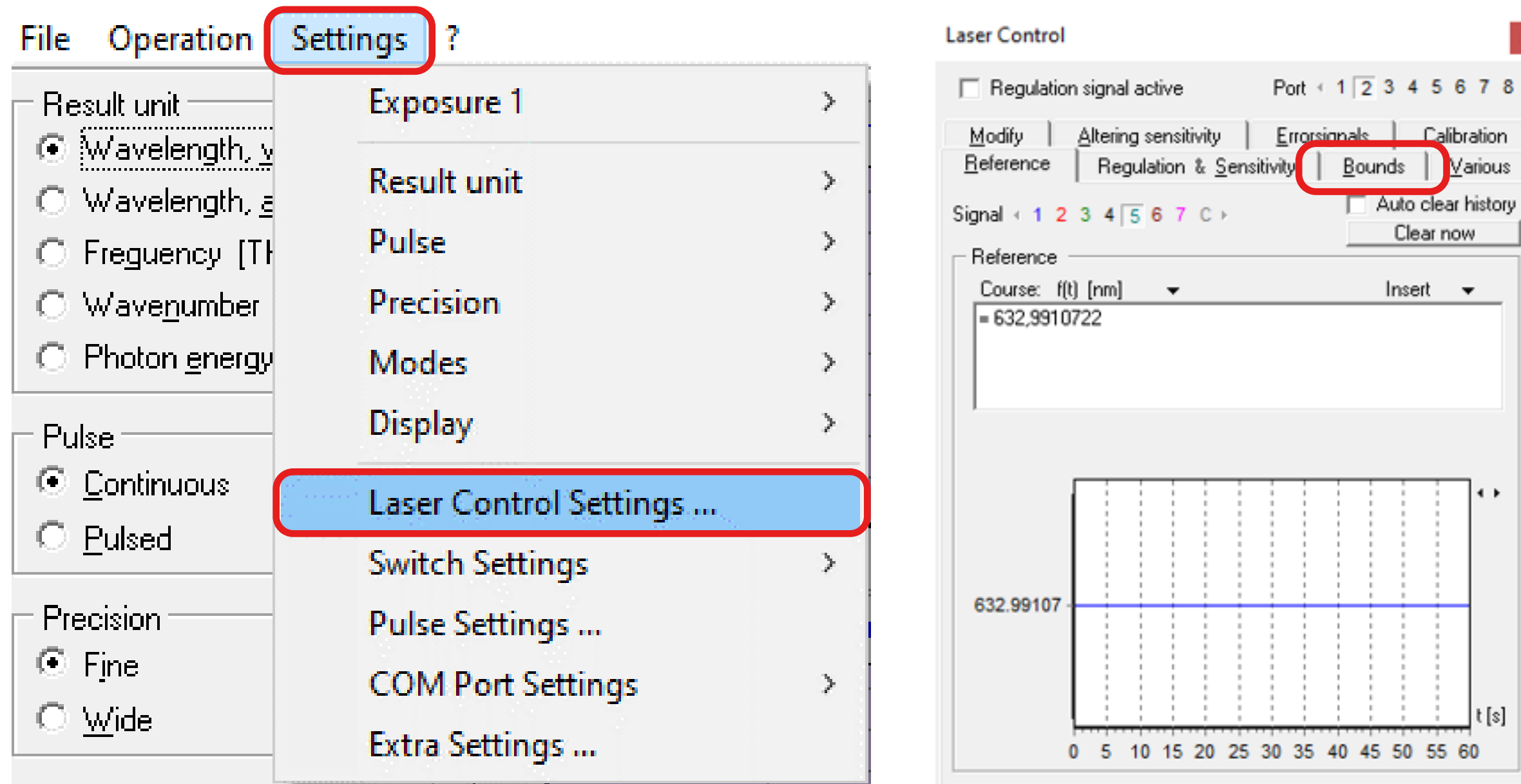
<https://www.highfinesse.com/en/support/quick-start-guide.html>

1



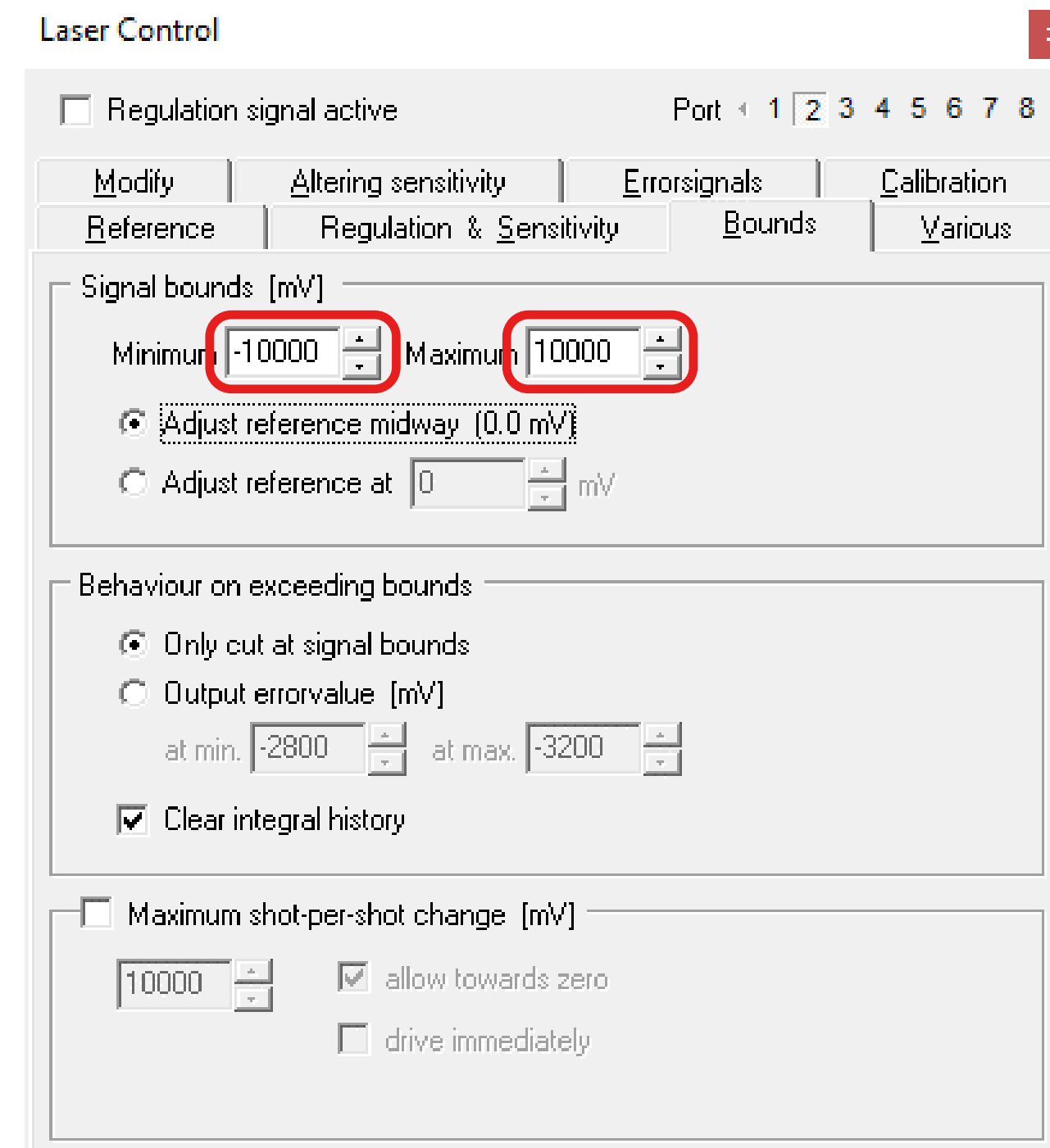
- 1a Connect the laser to the MCLC input. —
- 1b Connect the MCLC output fiber to the wavelength meter. —
- 1c Connect the MCLC laser control output to the laser controlling unit. —
- 1d Connect the wavelength meter and MCLC to the computer via the USB cable and Install the wavelength meter software. —

2



Start the software and set the voltage bounds in the Laser Control Menu in order to avoid damage to your laser and make sure the output range is suitable (e.g. as defined by a mode-hop-free scanning range).

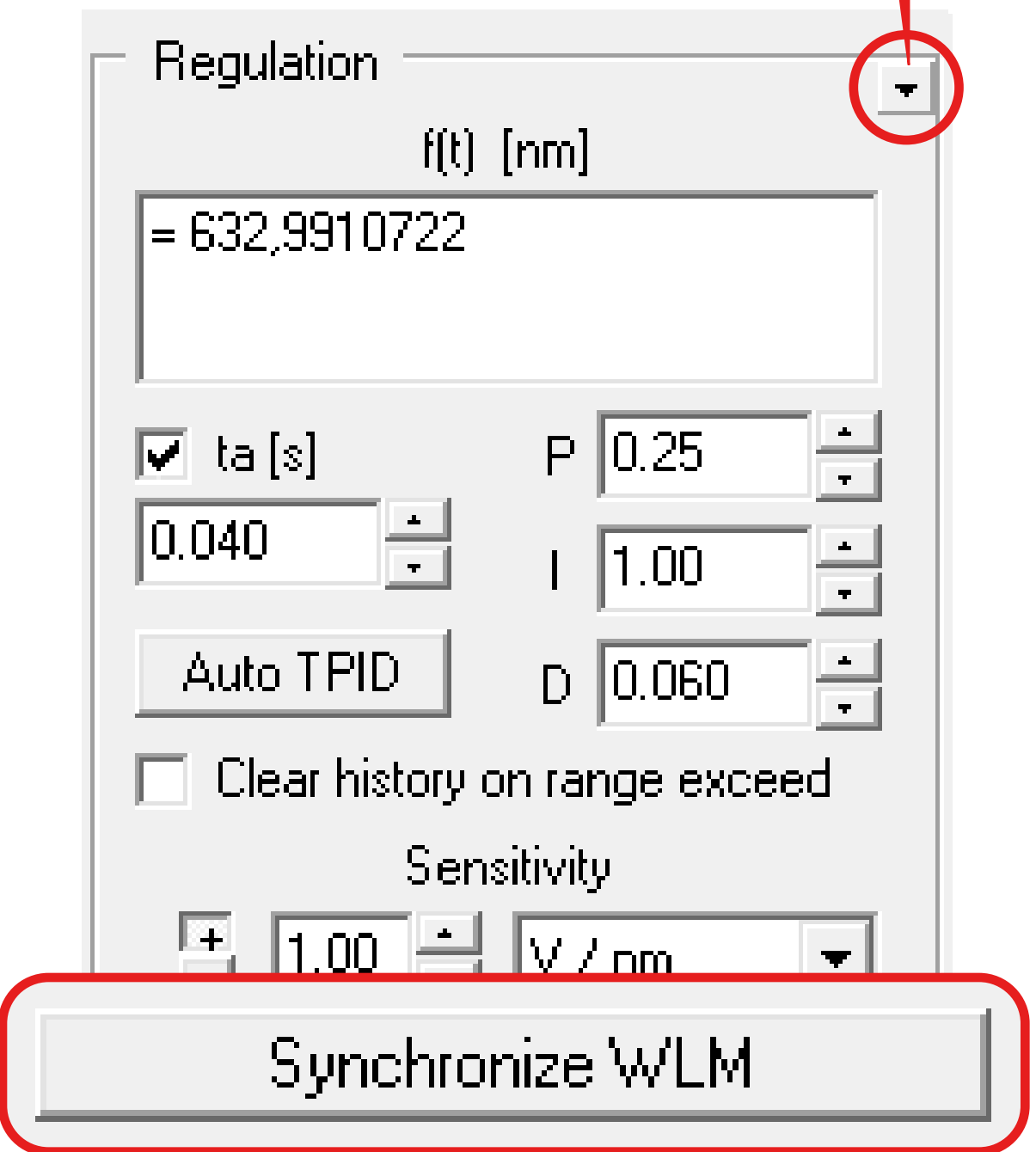
3



Move to the frame Bounds to enter the minimum and maximum value (correctly).

8

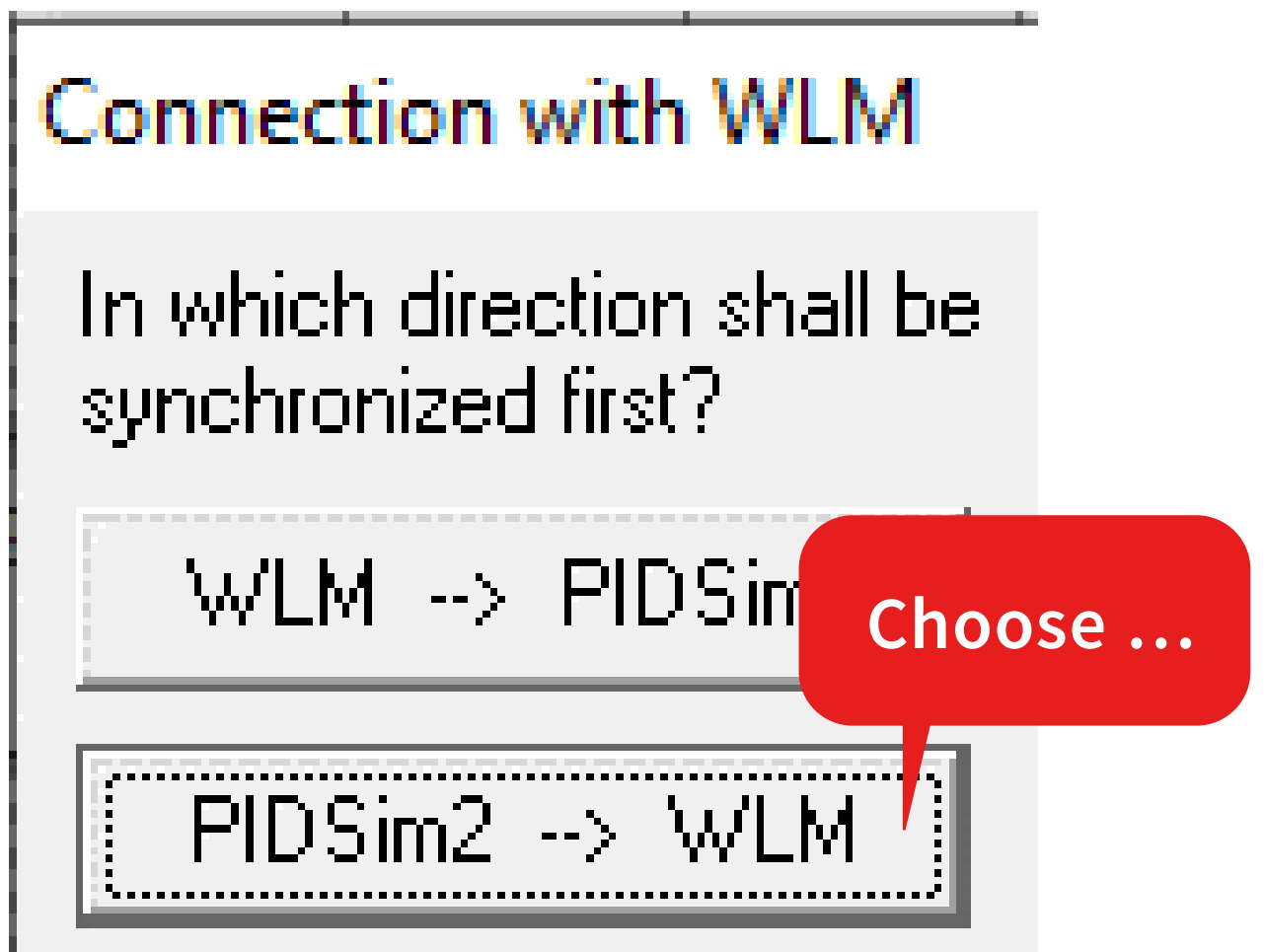
Show more settings ...



The tool can be used as a **pure simulation** tool or **synchronized to the wavelength meter software** running in parallel.



8a

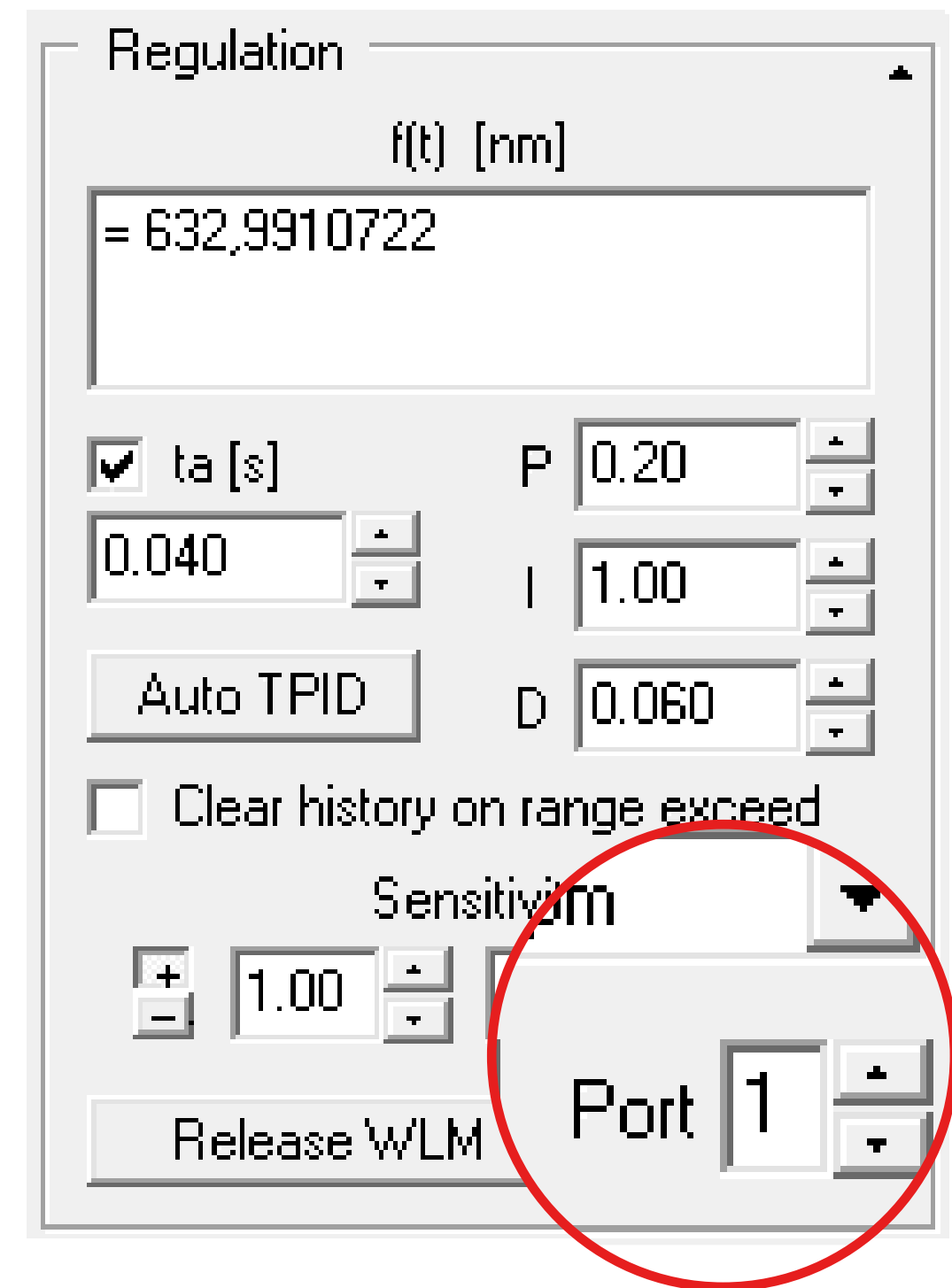


Choose to **synchronize the PIDSim2** in the section regulation.

Choose **PIDSim --> WLM**.

You can **alternatively also transfer all settings** you have made from the wavelength meter to the PIDSim2 tool.

8b



After that **set the port** that you would like to adjust.

9

Click on the blue triangles to enter the bounds **9a** (range should be smaller or equal to the bounds in 1.) and number of collection points used for calculation.

Then click on the red dot **9b** to automatically determine the sensitivity. Once this is determined transfer the result to the frame “Regulation” and enter it as the “Sensitivity” of the laser.

Caution: this will vary the output voltage, so a safe choice for the bounds is important.

Amplification settings x

Collection points per cycle	<input type="text" value="900"/>	<input type="button" value="↑"/> <input type="button" value="↓"/>
Upper voltage border [mV]	<input type="text" value="1250"/>	<input type="button" value="↑"/> <input type="button" value="↓"/>
Lower voltage border [mV]	<input type="text" value="-1250"/>	<input type="button" value="↑"/> <input type="button" value="↓"/>

Laser ▲

1 / Amplification

<input type="button" value="+"/> <input type="button" value="-"/>	<input type="text" value="1.00"/>	<input type="button" value="↑"/> <input type="button" value="↓"/>	<input type="text" value="V / pm"/>	<input type="button" value="⬇"/> <input type="button" value="⬆"/>
0 V Wavelength	<input type="text" value="632.991075"/>	<input type="button" value="↑"/> <input type="button" value="↓"/>	<input type="button" value="⬇"/> <input type="button" value="⬆"/>	

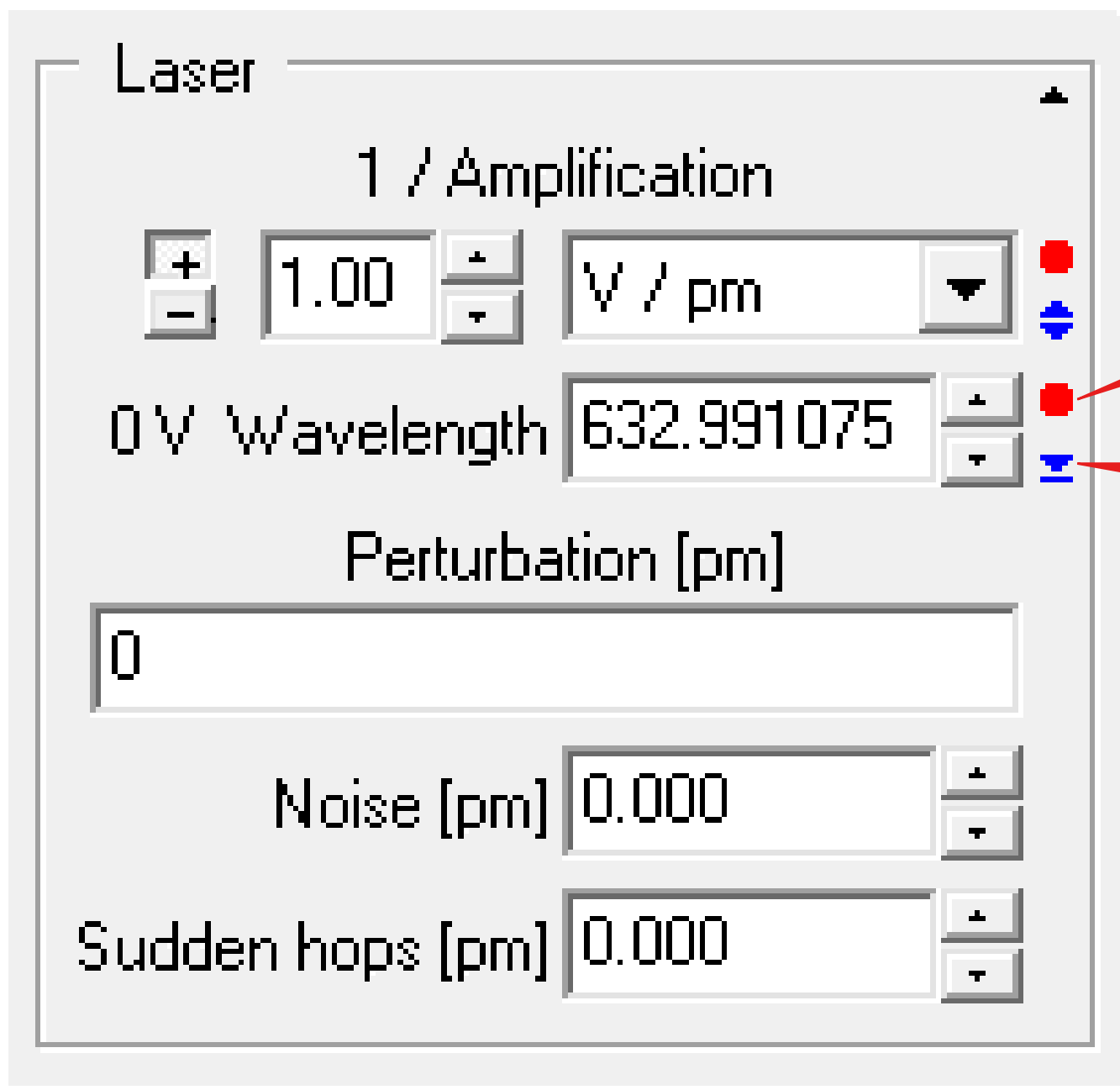
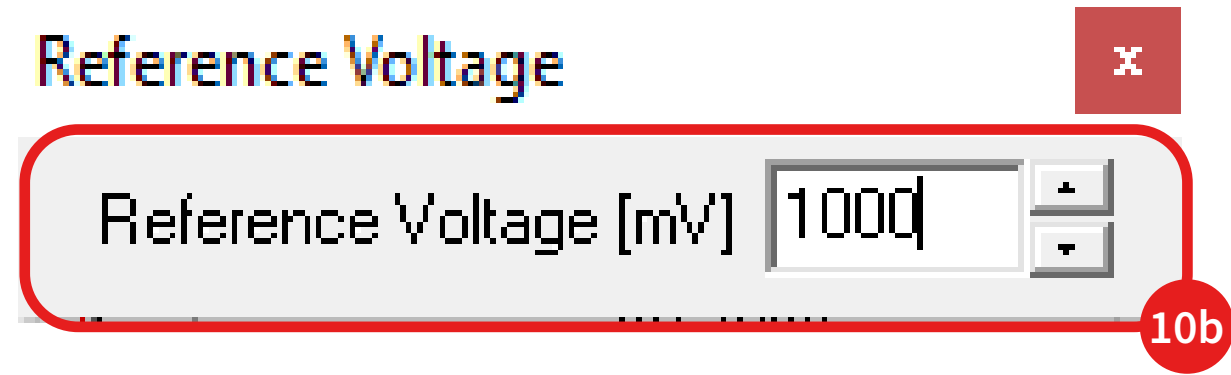
Perturbation [pm]

Noise [pm]	<input type="text" value="0.000"/>	<input type="button" value="↑"/> <input type="button" value="↓"/>
Sudden hops [pm]	<input type="text" value="0.000"/>	<input type="button" value="↑"/> <input type="button" value="↓"/>

9b Click to determine the sensitivity ...

9a Click to enter the bounds ...

10



10c Get the current wavelength

10a Click to enter the current voltage ...

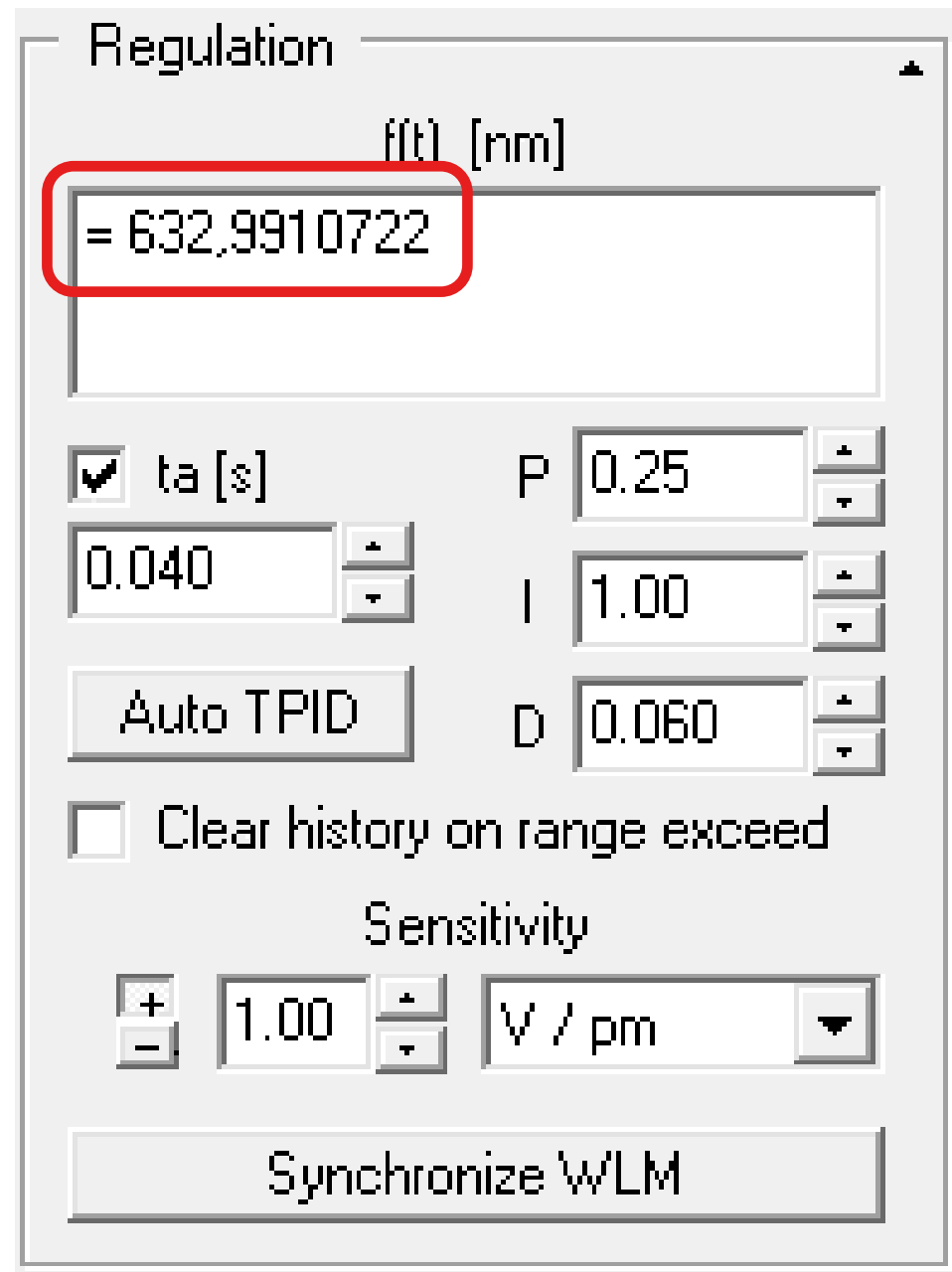
Click on the blue triangle 10a.

Enter the current voltage 10b.

Get the corresponding wavelength by clicking on the red dot 10c.

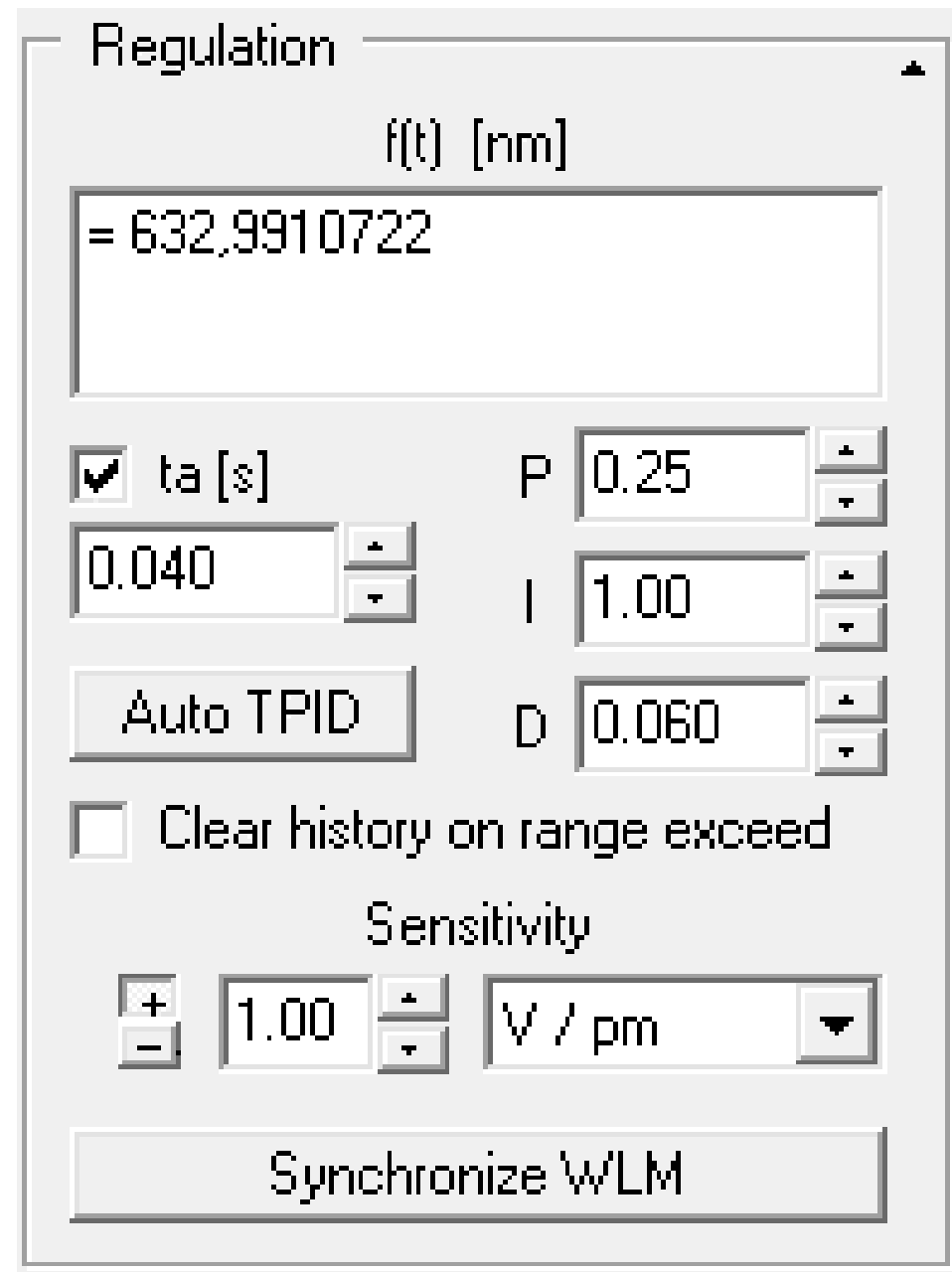


11



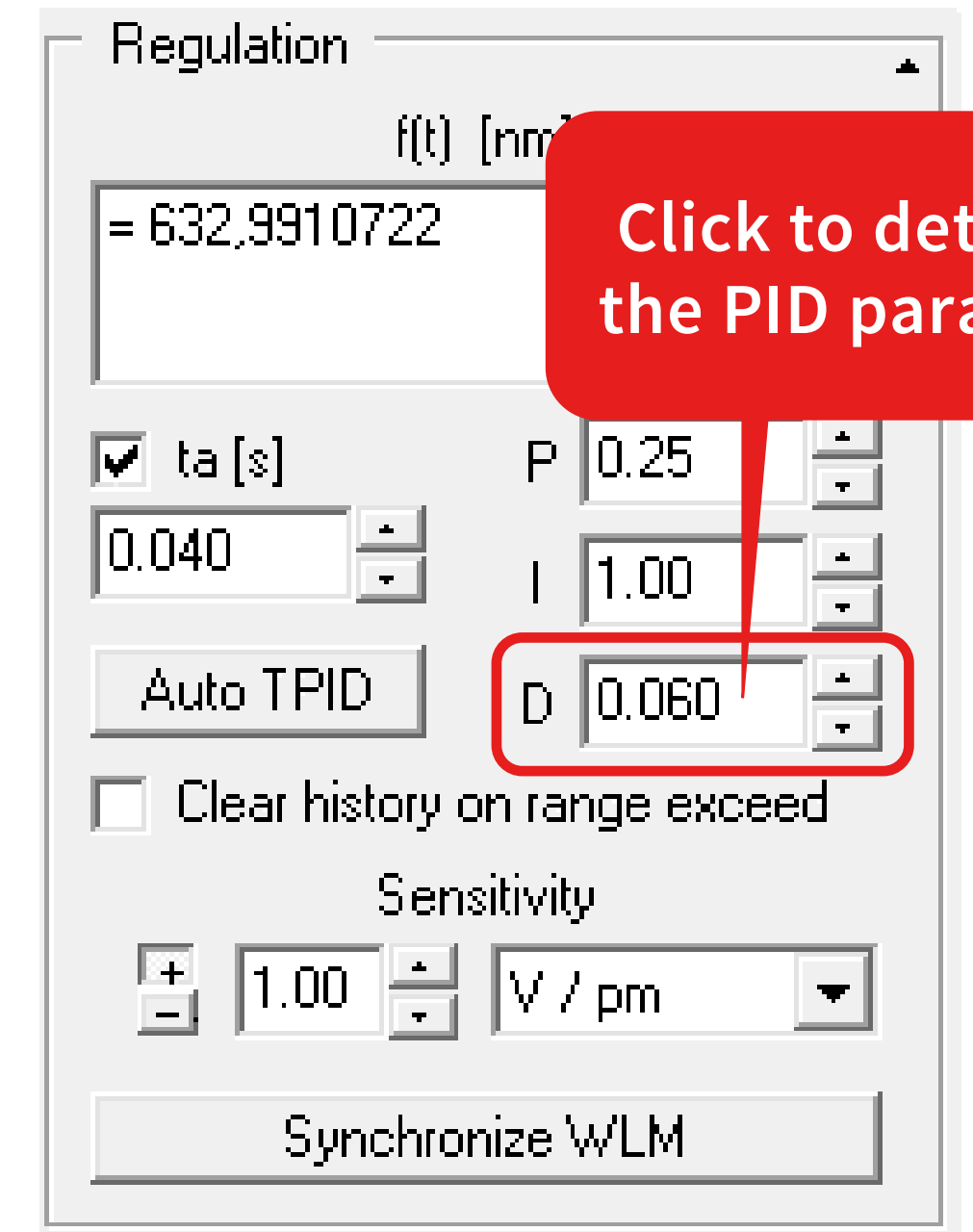
Enter a target wavelength or a function.

11a

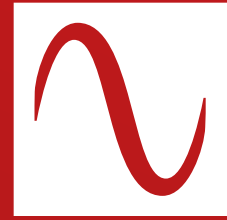


In this example the laser should be stabilized at 632.9910722 nm.

11b



Press "Auto TPID" to determine the PID parameters. Finally, you can close the PIDSIM2. Now the system should be ready for a test.



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