HighFinesse

The Standard of Accuracy

HighFinesse Tutorial

HighFinesse Analog PID Option (4 or 8 Channels): Laser Control

How to …

… set up the HighFinesse Analog PID Option (4 or 8 channels): Laser Control

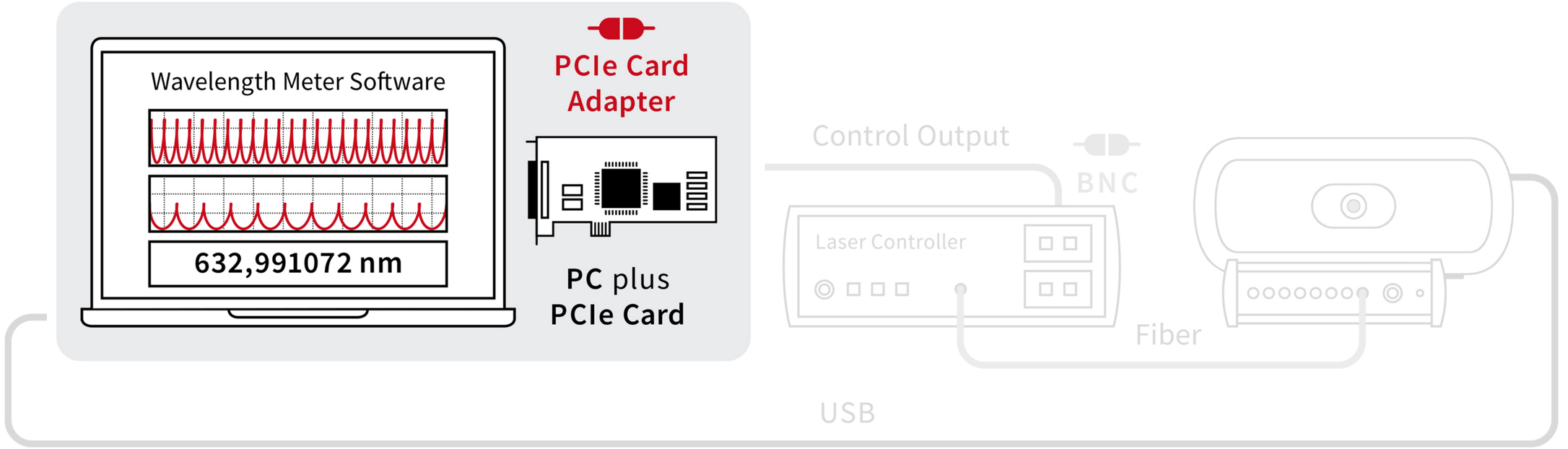
The PCIe card will provide up to ± 10 V for controlling the lasers. This tutorial is intended to give you a brief overview of how to configure the HighFinesse laser control settings. The tutorial does not replace reading the manual. Make sure you have read and understood it (especially section 3.5) before 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 wavelength meter. If you have any questions about that refer to the quickstart guide “HighFinesse Wavelength Meter”.

Quick Start Guide
HighFinesse Wavelength Meter

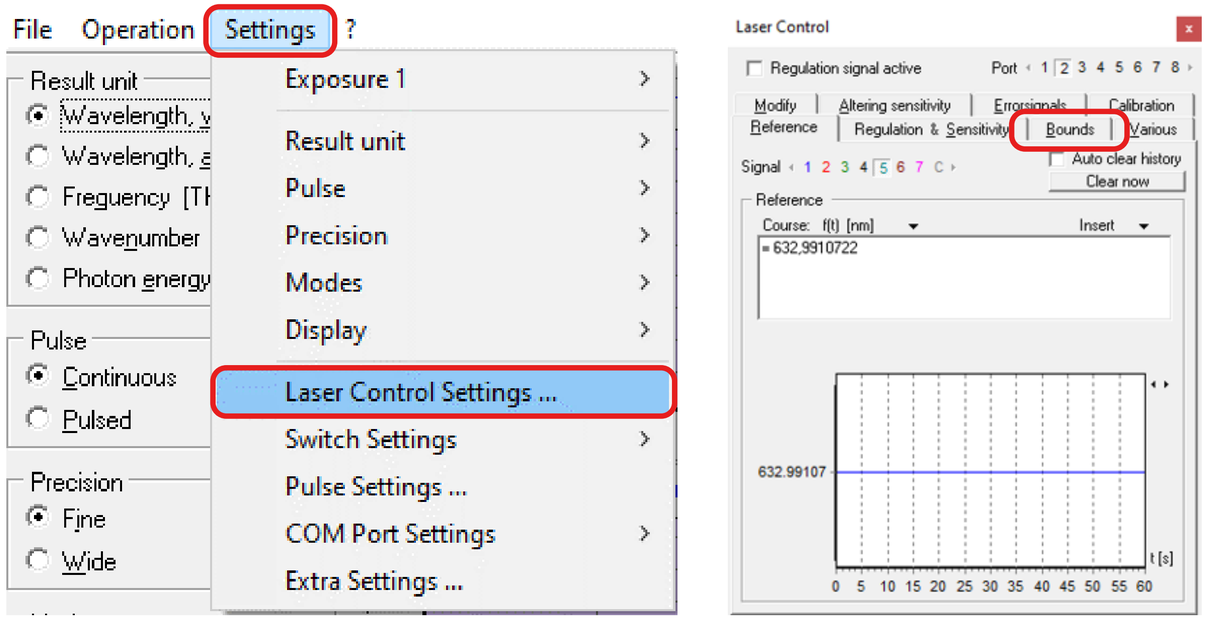
https://www.highfinesse.com
/en
/support
/quick-start-guide.html

1



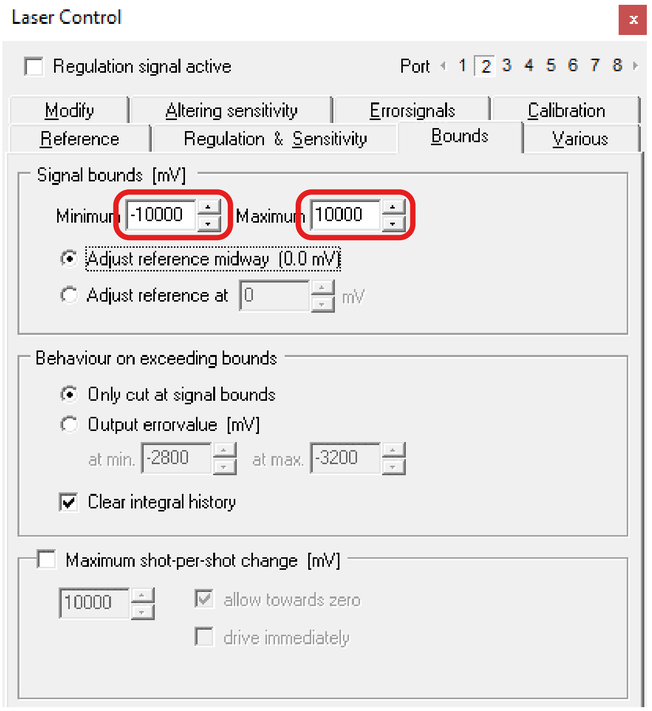
Insert the PCIe card to a suitable PCIe slot on your computer and **install the wavelength meter software** (which installs all drivers automatically).

2



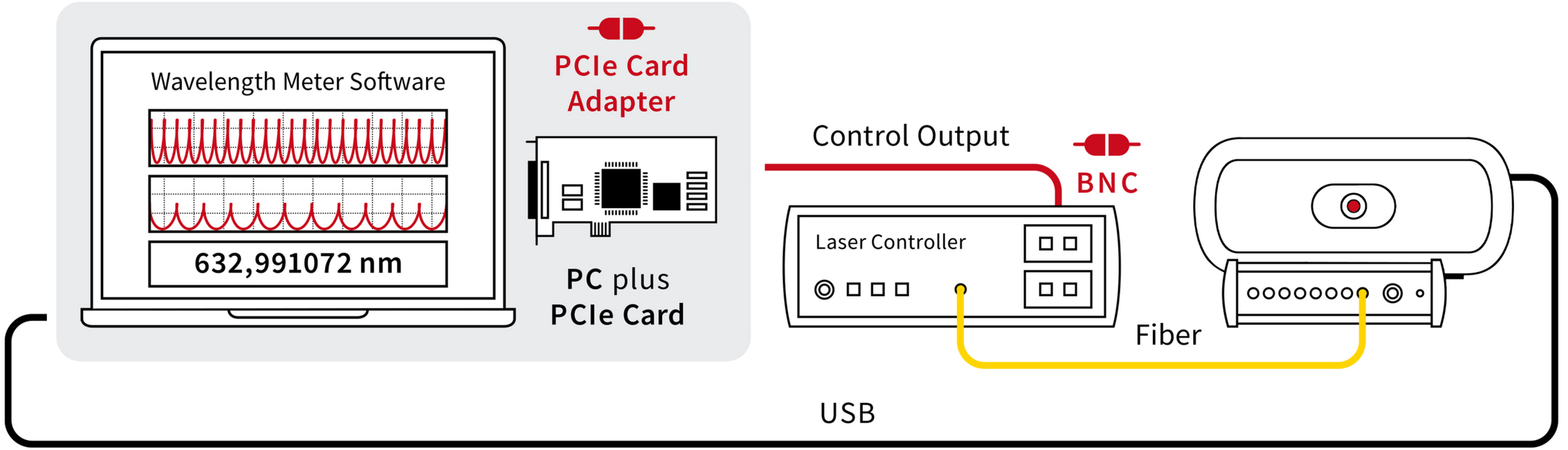
Start the software and set the **voltage bounds in the Laser Control Menu** such that you can exclude a damage to your laser and make sure the output range is suitable (e.g. as defined by a mode-hope-free scanning range).

3



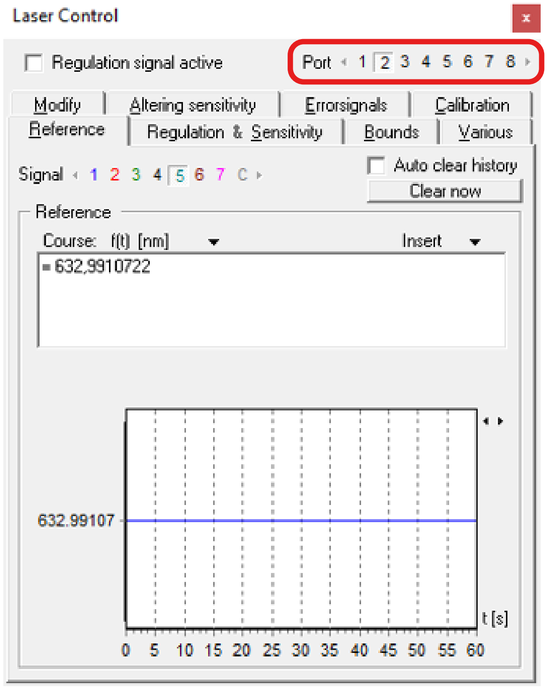
Move to the **frame bounds** to **enter them correctly.**

4



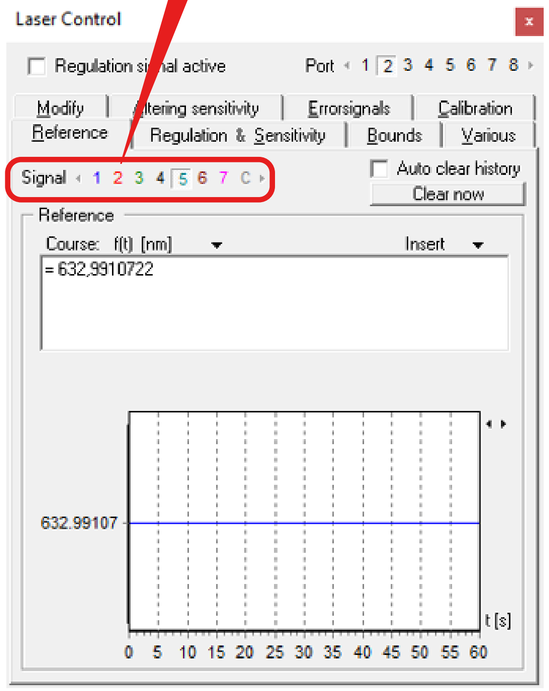
Connect the voltage output of the PCIe card to the input at the laser using the adapter cable (minimum impedance at the laser input 10 kOhm).

5 Using multiple channels simultaneously



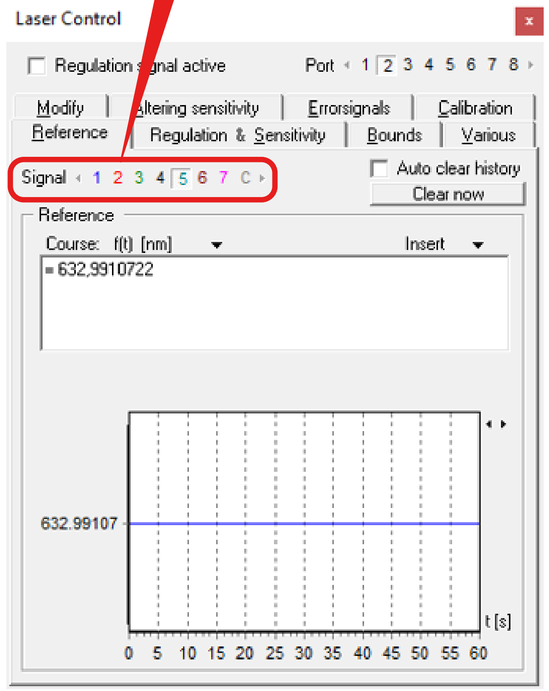
Choose the port where the voltage **will be put out** by clicking on the **black numbers.**

5a Click to assign …



Then **click on one of the colored numbers** to **assign the switch signal to the port.**

5b Click again to unassign …

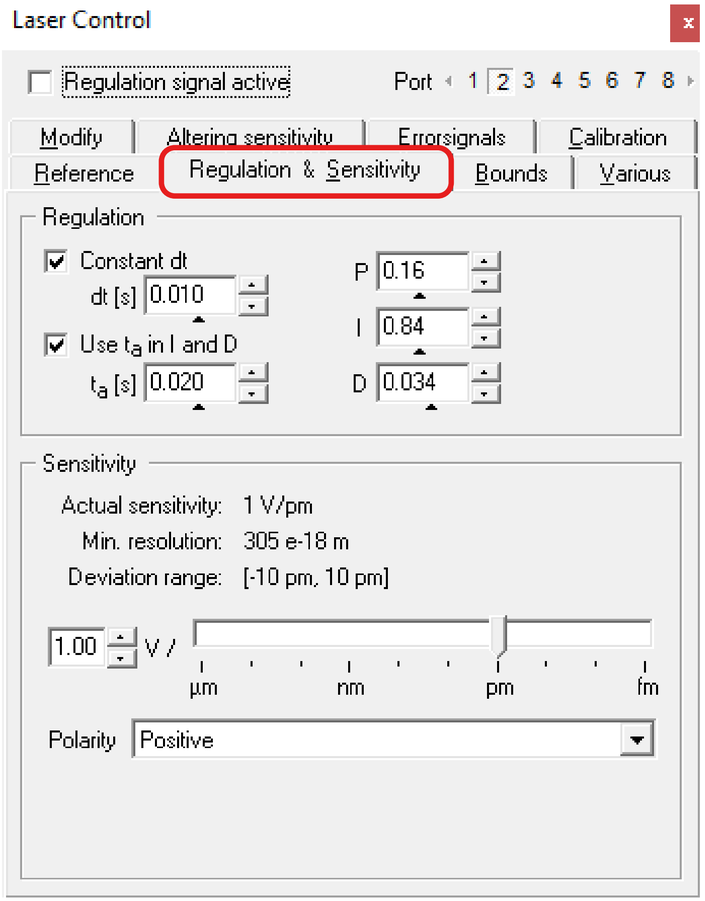


You can **unassign it by clicking on the same number again**. In the example the Switch signal 5 is assigned to port 2.

6

Use the **PIDSim2 Tool** to simulate good starting parameters.

Alternatively, you can set PID parameters manually in the laser control settings/frame: **“Regulation & Sensitivity”.**



7

Start …

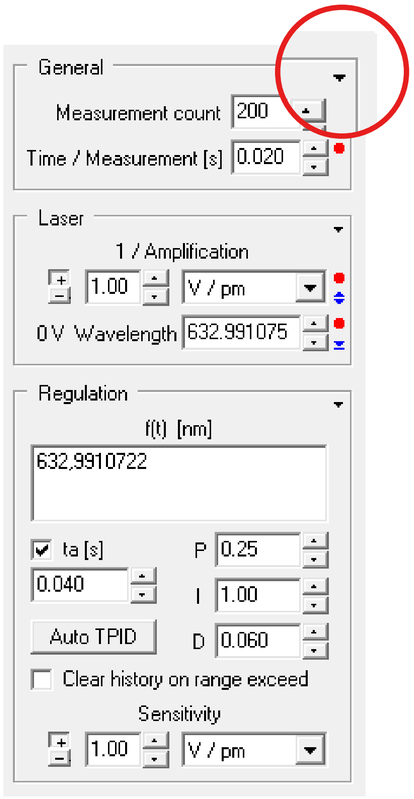
PIDSim2.exe
Type: Application

Start the PIDSim2 application located in the path …

Installation Path of the Wavelength Meter Software
\Tools
\PIDSim2.exe

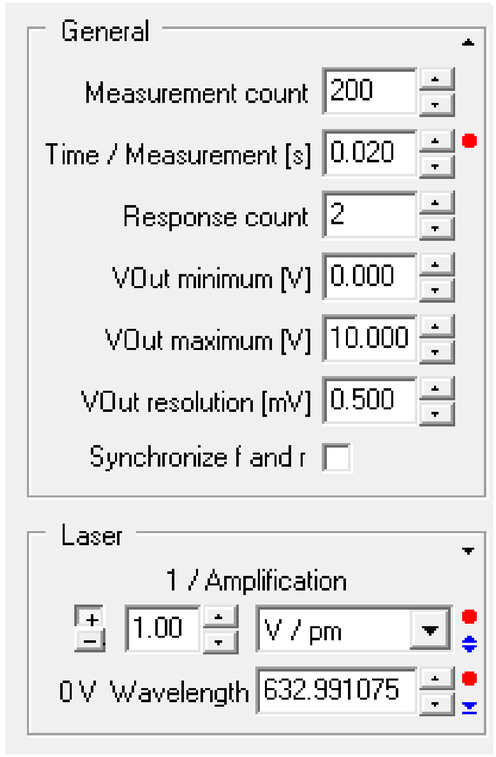
… and make sure you can measure.

8



Clicking on the **small black triangle** will enable more settings.

8a PIDSim2 Settings



Now you can **make your settings** for simulation.

Measurement count:
number of points in the simulation.

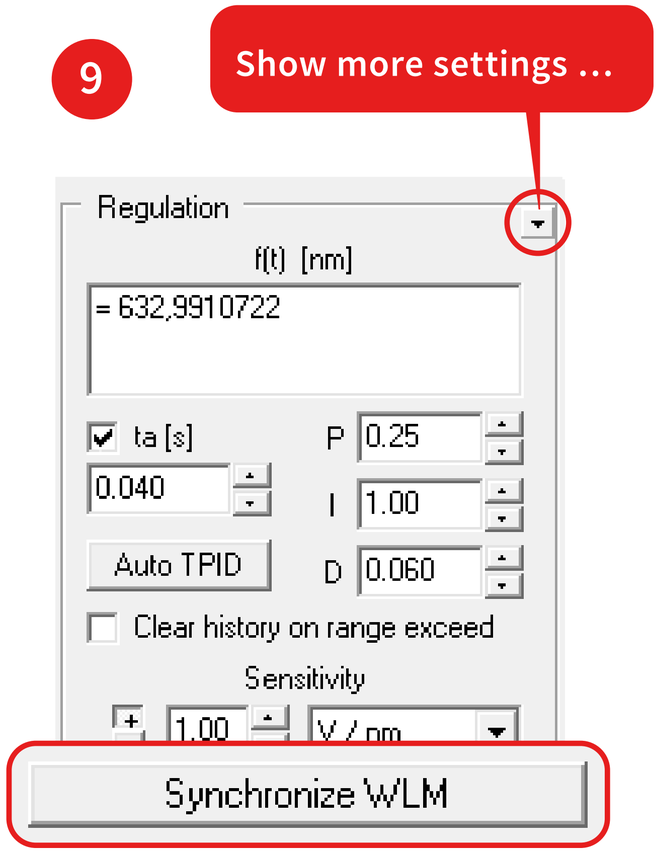
Time/Measurement [s]:
get this live from the wavelength meter by clicking on the red dot and confirm by clicking on the checkmark.

Response Count:
2 for single channel, 1 for multichannel measurements.

Set the **minimum and maximum output** according to your system (voltage bounds set in 1.).

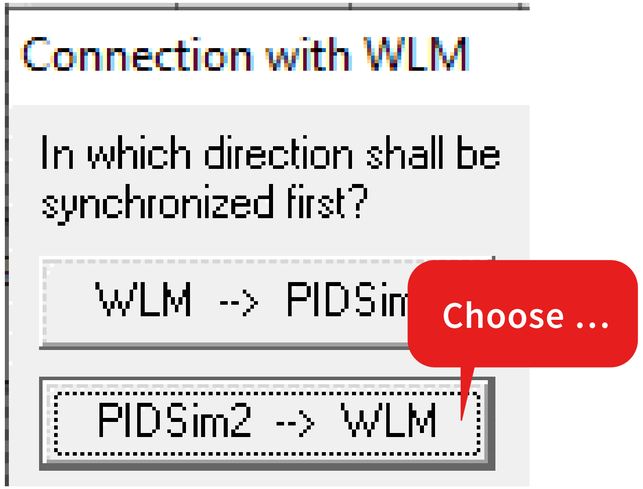
Set the **resolution** to obtain a realistic simulation of your system.

9



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

9a

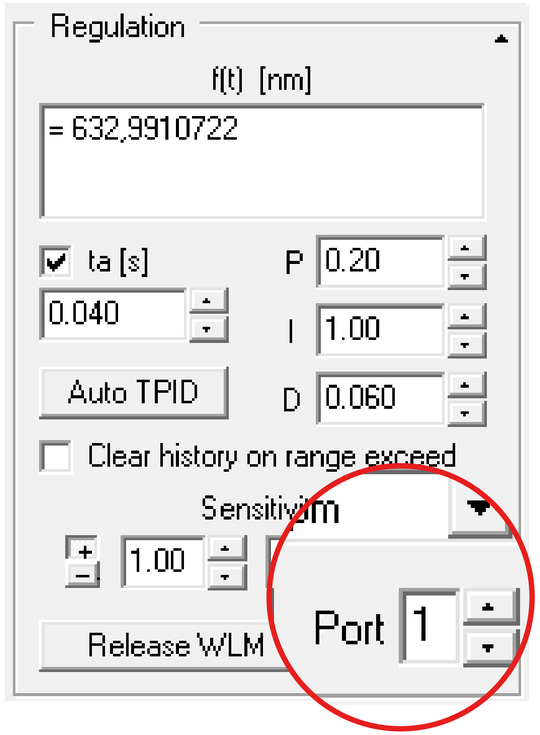


Choose to **synchronize the PIDSim2** in the **section regulation.**

Choose **PIDSim --> WLM.**

You can **alternatively also transfer all settings** you have made from the wavelength meter to the PIDsim2 tool.

9b



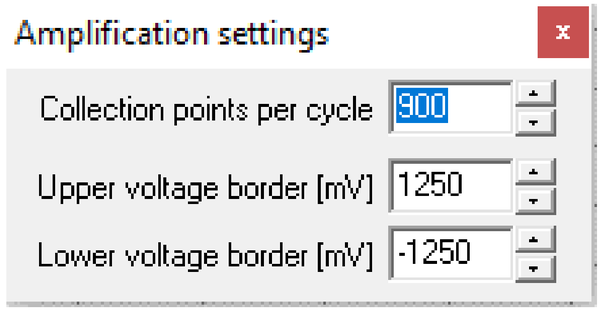
After that **set the port** that you would like to adjust.

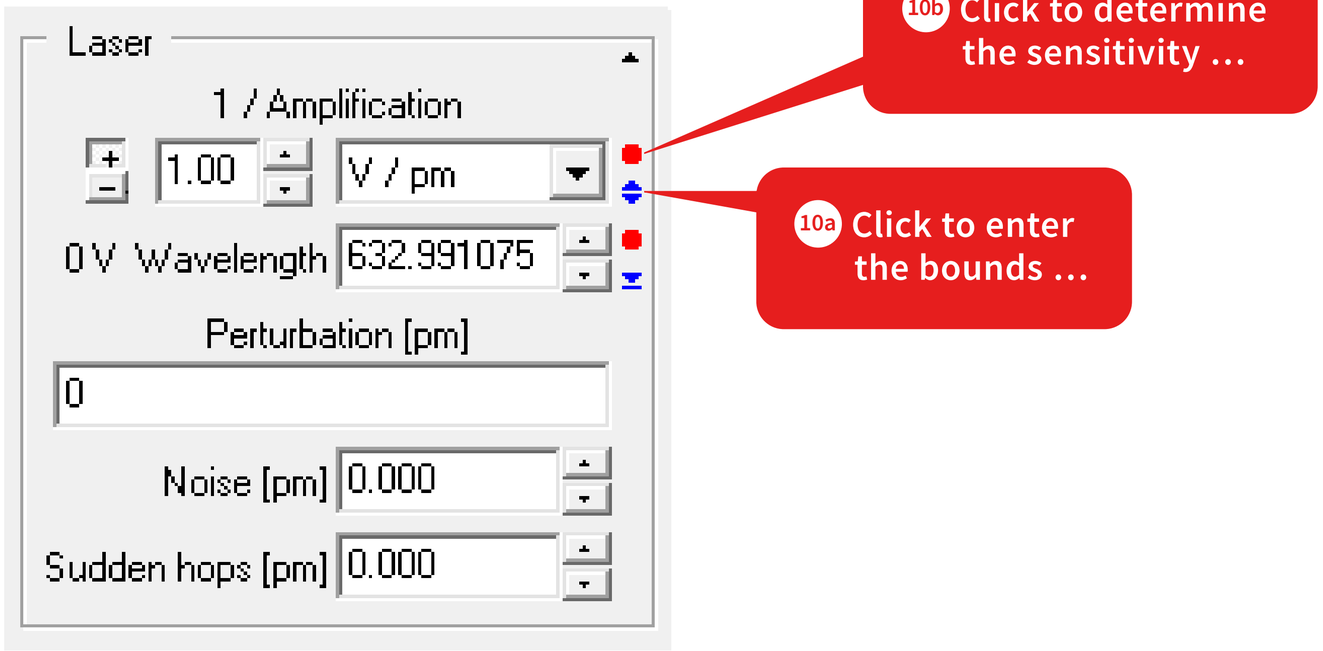
10

Click on the blue triangles to enter the bounds 10a (range should be smaller or equal to the bounds in 1.) and number of collection points used for calculation.

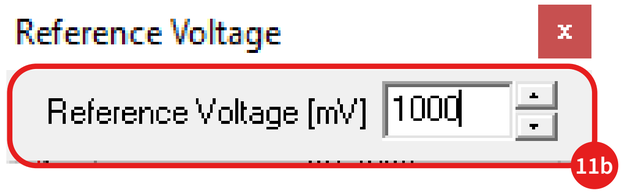
Then click on the red dot 10b to automatically **determine the sensitivity.** Once this is determined transfer the result to the frame “Regulation” and enter it as the “Sensitivity” of the laser.

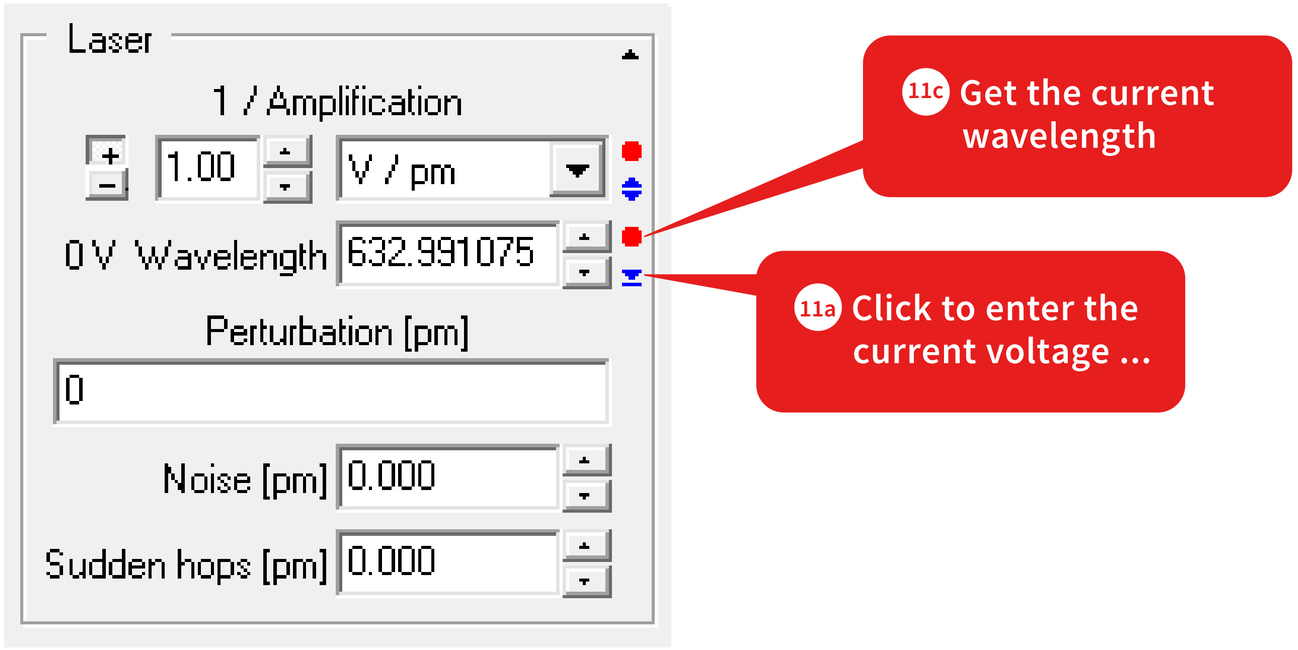
Caution: this will vary the output voltage, so a safe choice for the bounds is important.





11



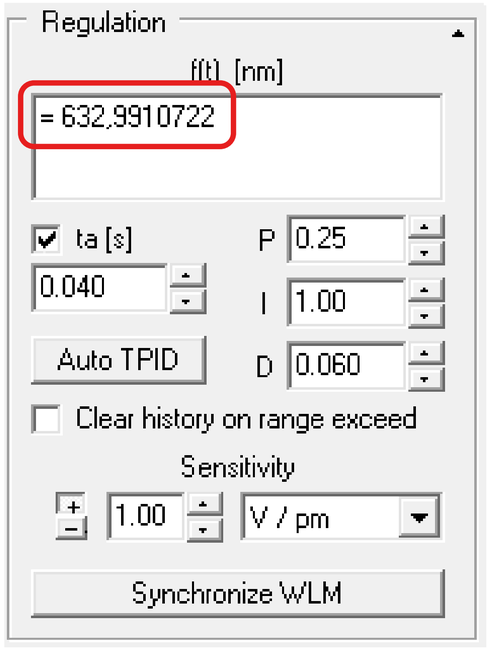


Click on the **blue triangle** 11a.

Enter the **current voltage** 11b.

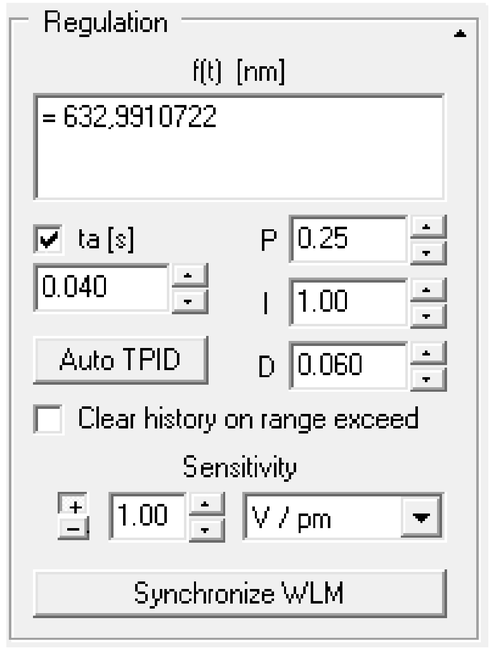
Get the corresponding wavelenth by **clicking on the red dot** 11c.

12



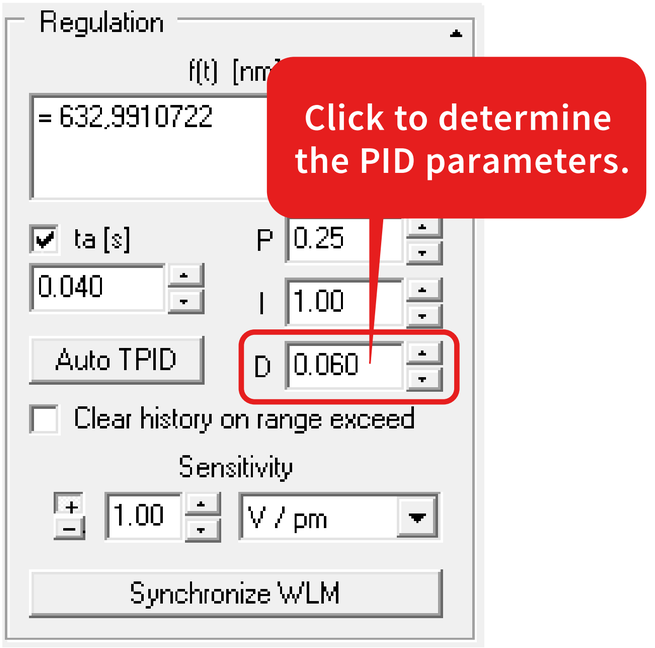
Enter a target **wavelength or a function**.

12a



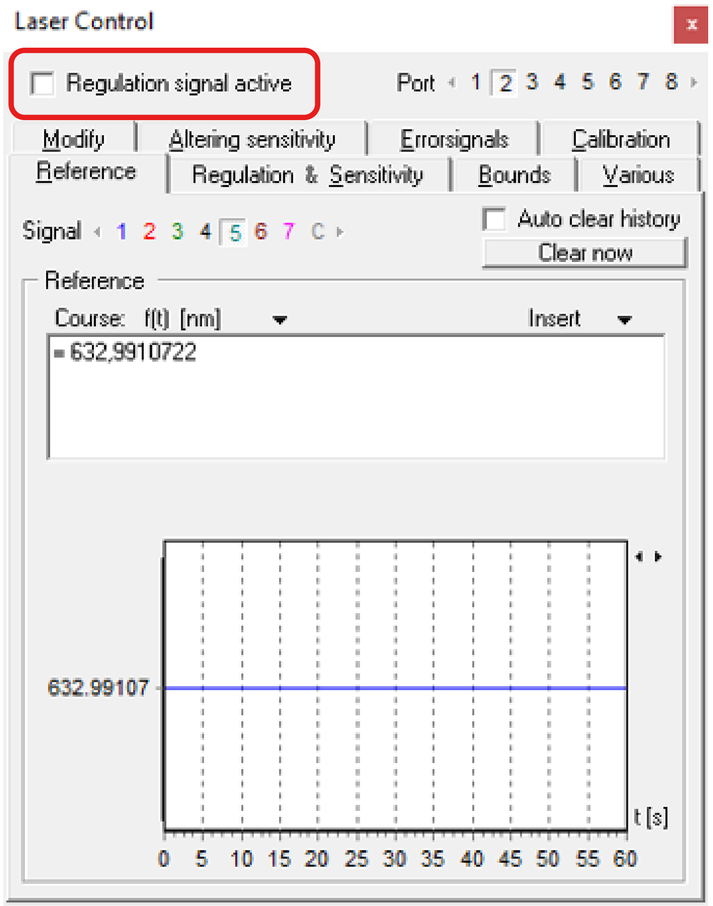
In this example the laser should be **stabilized at 632.9910722 nm.**

12b



Press **“Auto TPID”** to determine the PID parameters. **Finally, you can close the PIDSim2.** Now the system should be ready for a test.

13



For this **start the Regulation.**

You can **optimize the regulation** further by **using the LongTerm application** and **minimizing possible unwanted effects by altering the PID parameters.**

HighFinesse

The Standard of Accuracy

HighFinesse GmbH
Neckarsulmer Straße 5
72072 Tübingen, Germany

+ 49 (0) 7071 - 53 918 0
info@highfinesse.com
www.highfinesse.com

Find further information on products, data sheets and distributors on our website