

# Laserpower Measurement Tutorial

## Instrument & measuring mode

- Use Powermeter PT 9610
- **Primary switch on** is at the top side of device (On/Off-slider)  
→ After use you always have to switch off the primary switch in order to avoid a shift in instruments precision!
- **Secondary switch on** at the bottom of control panel (On/Off-pushbuttons)
- Measure in RMS L Mode X
- Set mode by using buttons: **RMS** and **HF/LF/WB**
- Record the upper value in the spreadsheet
- The measuring field on the detector head is the white spot, try to center the beam in it

## General

Always use the same 10x objective (yellow ring, NA=0.3) for measurement. Lasers should be switched on at least 1 hour before measuring to warm up. Set the argon laser emission to approx. 30% for warming up. For measuring boost emission up to 100% (especially important for the argon laser).

Adjust the detector head with a weak laserline (like 458nm) with approx. 30-50% emission. The measuring field is the white spot on the head.

Don't forget to switch the different wavelengths on power meter, too (arrow keys). **Avoid outside light sources** because they will falsify the measurements. Record the values when they are stable.

Measurements are to be recorded in the spreadsheet of the particular microscope. URL:

[docs.google.com](https://docs.google.com)

## Measurements at OLYMPUS TIRF

### 15 minutes before measurement

- To start system according to start routine switch on power supply unit below the monitor
- First push the black button (left side) and then switch on the red buttons:
  - ⇒ 1<sup>st</sup> switch on the buttons for ALC & Cam
  - ⇒ 2<sup>nd</sup> after approx. 5 minutes switch on the button for monitor & pc

### Microscope settings

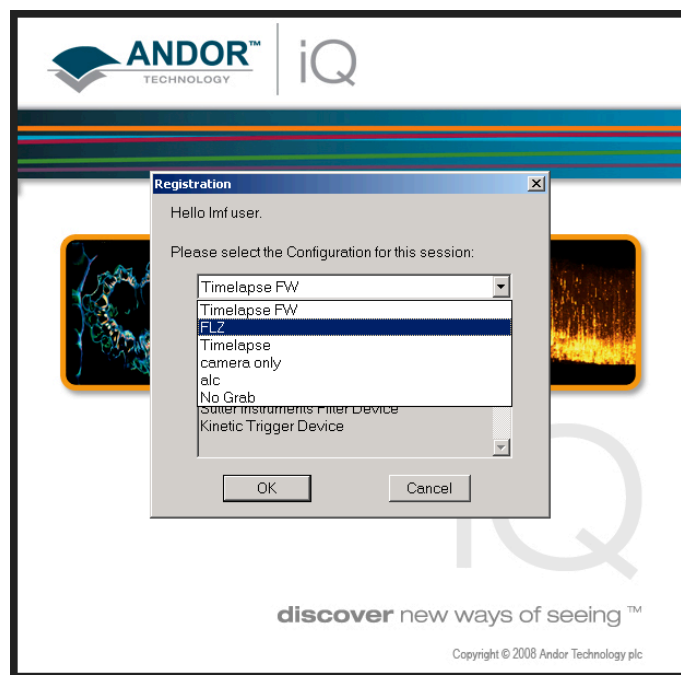
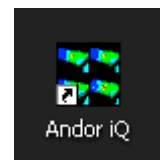
- Choose filter 4 on microscopes right side below objective revolver
- Switch upper controller in the front of the microscope to the camera-mode (camera symbol down left)

### Detector head

- Bring down the objective revolver
- Fix detector head with measuring field downwards on metal slide holder (use tape for fixing)
- While maximizing the first laser emission (later in procedure) center the beam in scan field (you can see the spot from right lower side)
- For this use a low wavelength with approx 5% emission
- **Attention: This laser tubes are very powerful!**

### Software start

- After boot up start the **Andor iQ Software** with the **FLZ** configuration in **Registration** window



Software

settings

- Choose **Device Setup** in main window (Figure A)

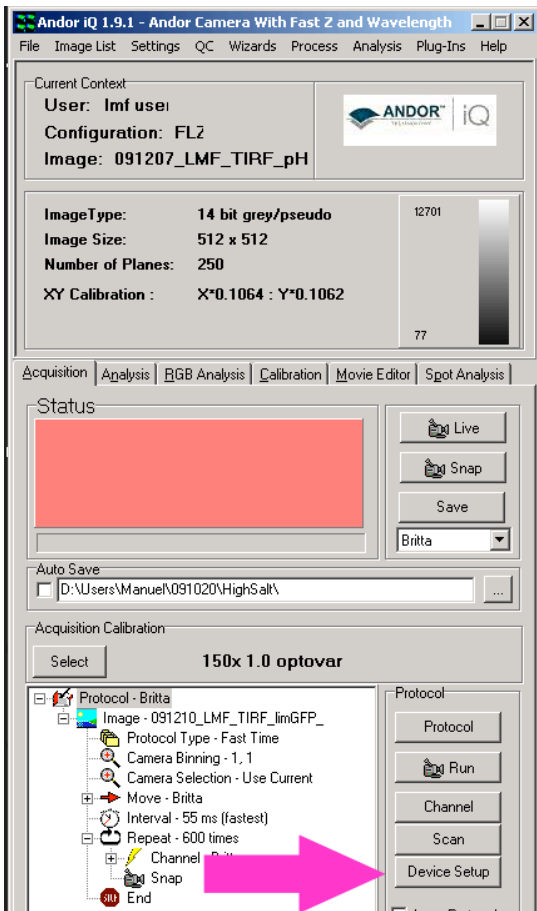


Figure A) Main window

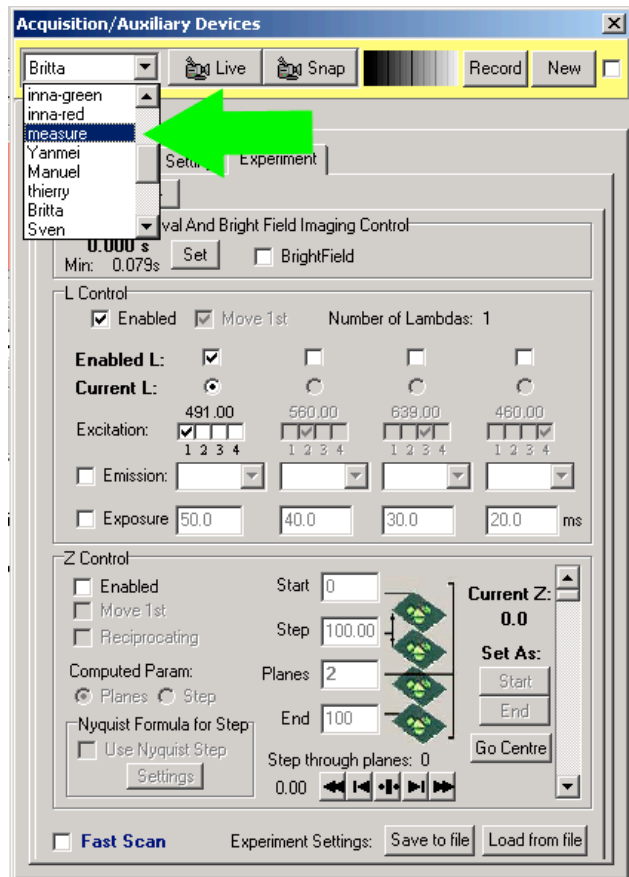
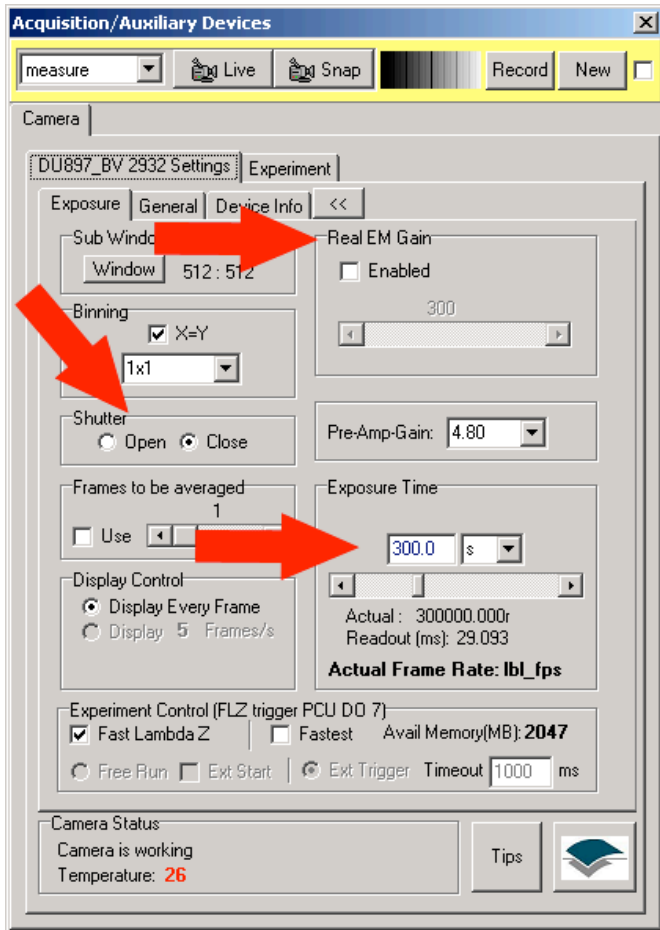
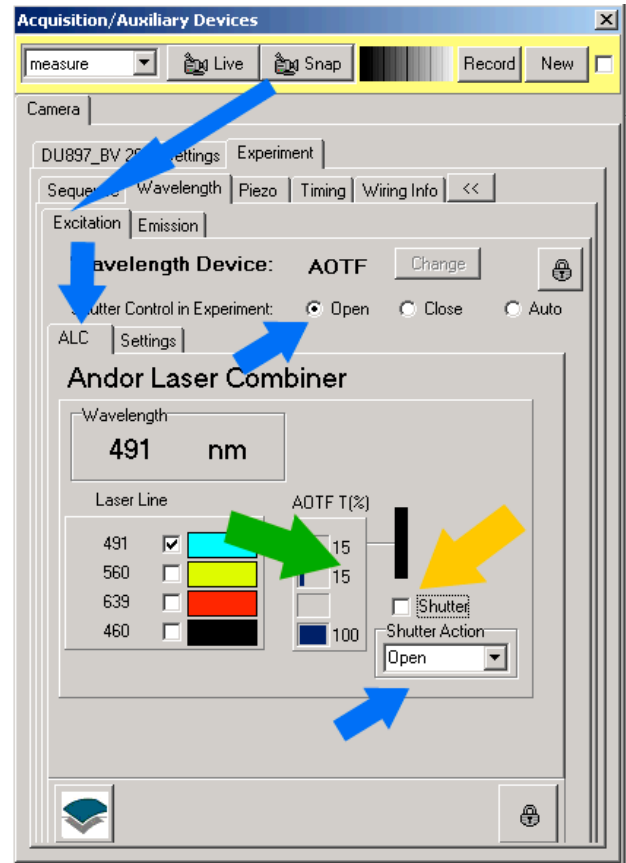


Figure B) Acquisition/Auxiliary Devices window

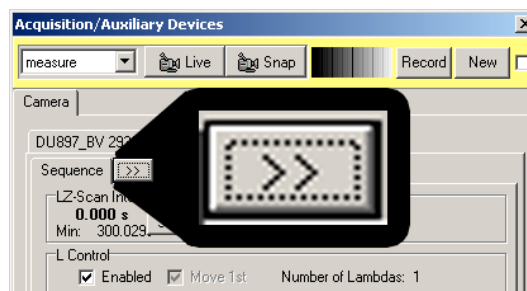
- Choose **measure** in **Acquisition/Auxiliary Devices** window (Figure B)
- Choose **DU897\_BV 2932 Settings** index card then the **Exposure** index in **Acquisition/Auxiliary Devices** window (Figure C)
- Check mark **Real EM Gain Enabled** and pull the slider to "0"
- Choose **Shutter Open**
- Type in an **Exposure Time** of 5 minutes (300 seconds)
- Choose the index cards **Experiment** → **Wavelength** → **Excitation** → **ALC** in **Acquisition/Auxiliary Devices** window (Figure D)
- If you just see the **Sequence** index card click the **arrows** on right side (Figure E)
- Now choose **Shutter Control in Experiment: Open** in Excitation index card (Figure D)
- Choose **Shutter Action Open** in **ALC** right bottom field and uncheck **Shutter**



**Figure C)** DU897\_BV 2932 Settings index card



**Figure D)** ALC index card

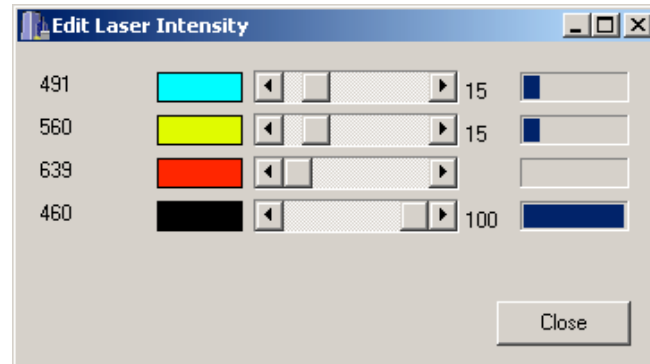


**Figure E)** Open the

index menu

Measurement

- Click on the **AOTF %** field (Figure D) to open the **Edit Laser Intensity** window (Figure F)



**Figure F)**

Edit Laser

Intensity window

- Now center the beam in measuring field with a low wavelength and 5% emission
- Therefore **Close** the **Edit Laser Intensity** window and check mark a low **Laser Line** in **ALC** index card (you can see the spot from right lower side)
- Now check **Shutter** for emission
- Afterwards return to the **Edit Laser Intensity** window and maximize the emissions to 100
- Then return to the **ALC** index card and check the lines one after another for measurement

## After measurement – shutting down routine

- Minimize the emissions in **Edit Laser Intensity** window to approx. 10%
- Return to the **ALC** index card and erase the check marks of the **Laser Lines**
- Now choose **Shutter Control in Experiment: Auto** in Excitation index card (Figure D)
- Choose **Shutter Action Open-Close** in **ALC** right bottom field and check mark **Shutter**
- Choose **Britta** in **Acquisition/Auxiliary Devices** window
- Choose in **DU897\_BV 2932 Settings** index card **the Exposure** index in **Acquisition/Auxiliary Devices** window (Figure C)
- Choose **Shutter Close**
- Close the program
- If no user is following shut down the computer
- If another user is coming, log off windows account
- After shut down switch off the power supply unit below the monitor
- Therefore first switch off the red buttons and then push the black button (left side):