

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

Measurements at OLYMPUS FV 1000 Confocal

1 hour before measurement

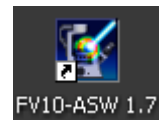
- To start system according to start routine switch on the power supply unit below the monitors
 - ⇒ Therefore first push the black button (left side) and then switch on the several red buttons
- **405nm-tube** switch-on is on power supply unit: continuous "LD405" & pulsed laser "405nm CUTTER"

Switch on laser-units (left rack):

- **561nm-tube** on top position
 - ⇒ Turn key to "1" position for power supply → green "power on" control light turns on
 - ⇒ Push green button "laser on" → yellow "laser emission" control lights turn on
- **633nm-tube** on middle position
 - ⇒ Switch key to "1"
- **Argon-tube** on bottom position
 - ⇒ 1st switch button to "1" for power supply and fan function
 - ⇒ 2nd turn key to "1" for laser emission
 - ⇒ 3rd maximize emission by turning the controller wheel to the right until it stops

Directly before measurement

- After boot up start the **Olympus FV10-ASW 1.7 Software** and enter for userID: "Maker" and for Password: "Access"



Microscope settings

- Take out the DIC-slider and push in magnification slider in for 1x both below objective revolver on right micro side
- Open shutter by shifting from white-filled to non-filled circle (on right revolver side)
- Push "ESC" next to focus wheel to get objectives to bottom position

Detector head

- Place detector head with measuring field downwards on dish holder
- While maximizing the first laser emission (later in procedure) center the beam in scan field (you can see the spot from left lower side)
- For this use a low wavelength with approx 50% emission

Software settings

- Choose menu → **Tools** → **Maintenance** → Index: **System Registration** for the **FV 1000 Setup** window (Figure A)
- Change the three buttons on right side to **Blanking Off**
- Save and close and click OK

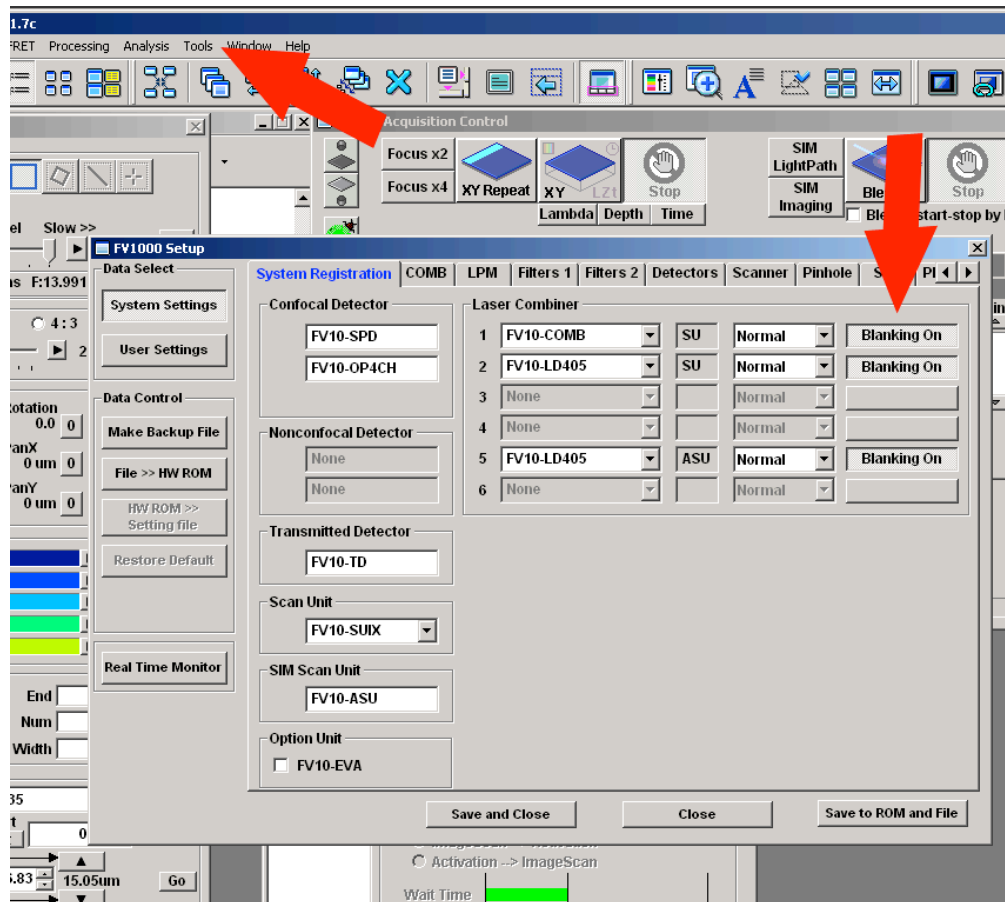


Figure A) FV 1000 Setup window

- Choose the **LightPath & Dyes** button in **Image Acquisition Control** window (Figure B)
- Choose beam splitter **BS20/80** in **Excitation DM** field in the **LightPath & Dyes** window (Figure C)
- Set **Sim light path** button to OFF in **Image Acquisition Control window** (Figure B) for **None** in the light path in **LightPath & Dyes window**

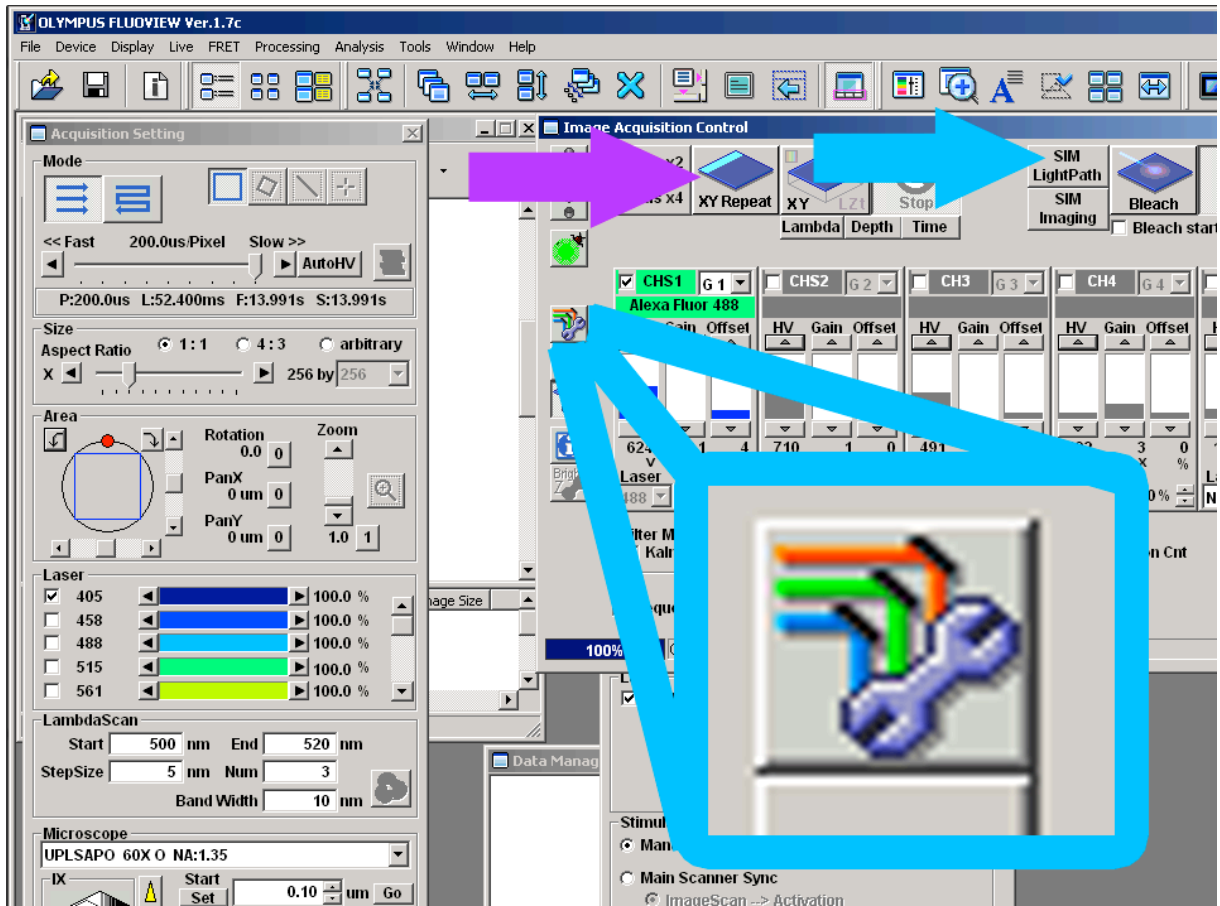


Figure B) LightPath & Dyes button

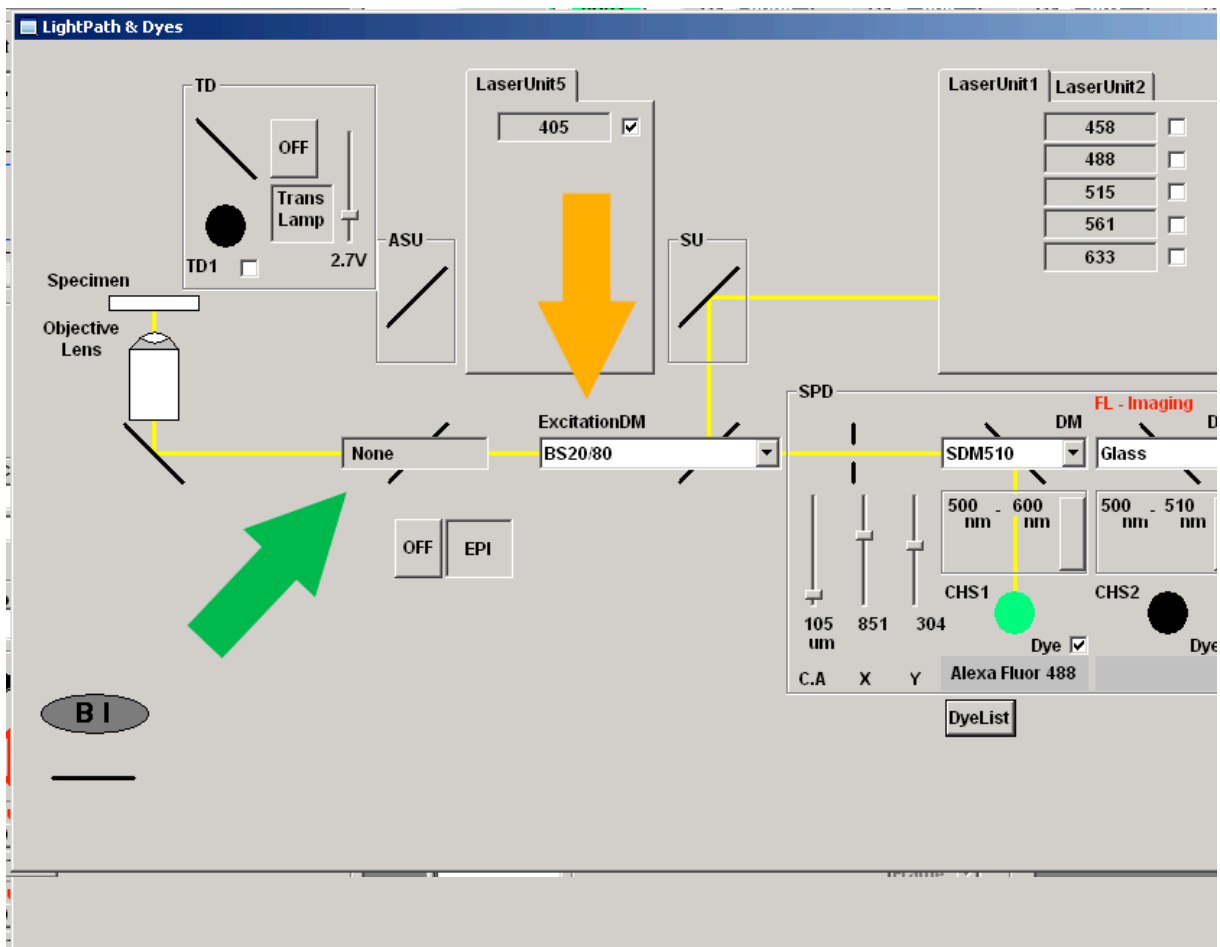


Figure C) LightPath & Dyes window

- Click **X/Y-Repeat** in **Image Acquisition Control window** to scan one field (will appear on right screen as black field "live fiew") then click stop
- Click the **Point** button in **Acquisition Setting** window and set a scan point in the center of the "live fiew" mask (Figure D)
- Choose the slowest pixel speed at the top slider of the **Acquisition Setting** window
- Type 32766 in the **Num** field in **Time Scan** menu at bottom of **Acquisition Setting** window

Measurement (Figure D)

- Push **laser emission** of the several wavelengths to 100% in **Acquisition Setting** window
- Check mark the **tube** you want to measure and go through the several wavelengths

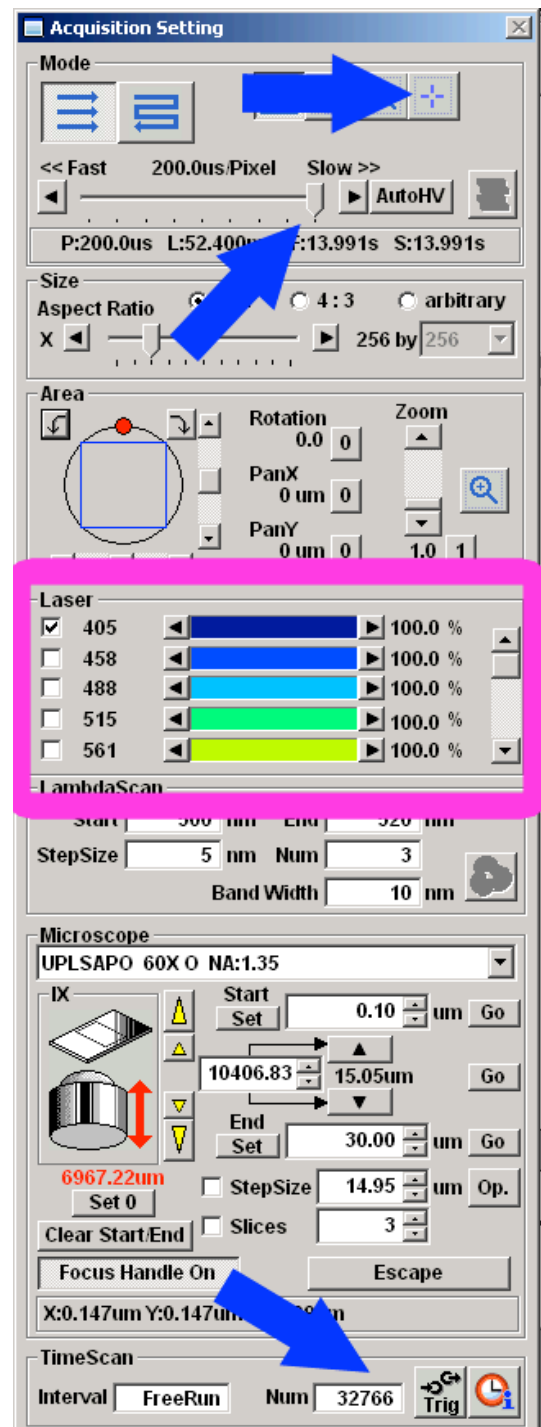


Figure D) Acquisition Setting window

405 Cutter Measurement

- Choose **Stimulus Setting** button in **Image Acquisition Control** window (Figure E)
- Set **Sim light path** button to ON in **Image Acquisition Control** window (Figure B) for **ADM450** in the light path in **LightPath & Dyes** window

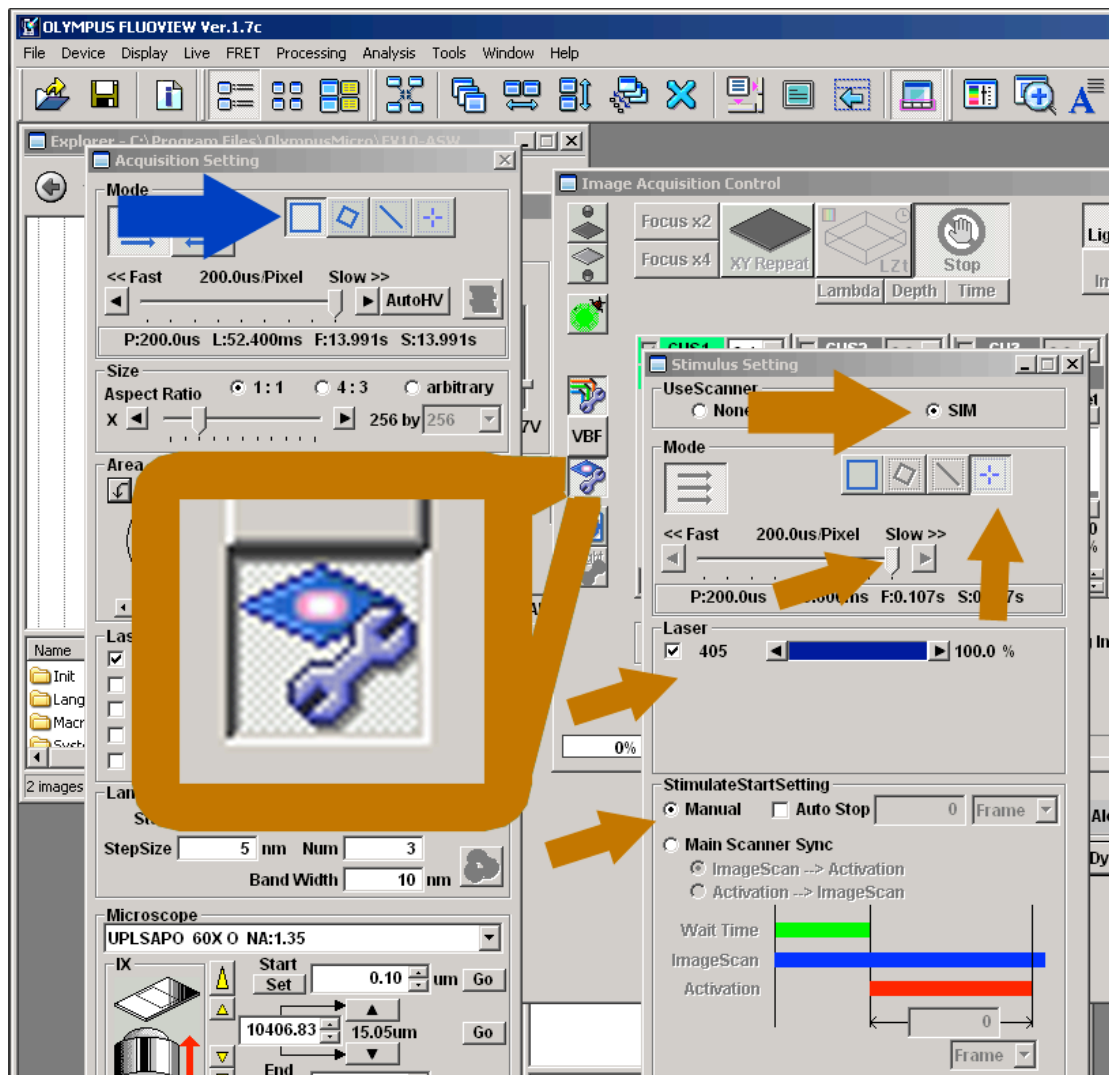


Figure E) Stimulus Setting window

Stimulus Setting window (Figure E)

- Choose **SIM** in **UseScanner** menu and **Manual** in **Stimulate Start Setting**
- Choose the slowest pixel speed in **Mode** menu
- Change scan Mode in **Acquisition Setting** menu to **Normal**
= full scanfield (Figure E)

- Change scan **Mode** in **Stimulus Setting window** to **Point** and set a scan point in the black scan field center on popup Reference Live window
- Check mark the **405** laser and push laser **emission** to 100%
- Make sure power is turned up fully at controller

After measurement – shutting down routine

- Choose menu → **Tools** → **Maintenance** → Index: **System Registration** for the **FV 1000 Setup** window
- Change the three buttons on right side to **Blanking On**
- Save to ROM and file and click OK in popup menu + Save and close and click OK twice in popup menus
- Close program and don't save anything

If any user is following

- log off windows account
- just turn down the **Argon-tube emission** on bottom laser controller
 - ⇒ 1st minimize emission by turning the controller wheel to the left until it stops and then a half turn to the right

If no user is following

- Switch off the computer
- Switch off the power supply unit below the monitors
 - ⇒ Therefore first switch off the red buttons then push the black button (left side)

Switch off laser-units (left rack):

- **561nm-tube** top most controller
 - ⇒ Push red button "laser off" → yellow "laser emission" control lights turn off
 - ⇒ Turn key to "0" position → green "power on" control light turns off
- **633nm-tube** middle controller
 - ⇒ Switch key to "0"
- **Argon-tube** bottom most controller
 - ⇒ 1st minimize emission by turning the controller wheel to the left until it stops and then two turns to the right
 - ⇒ 2nd turn key to "0" for laser emission
 - ⇒ 3rd after cooling switched off, switch button to "0"