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/Offpushbuttons)
- 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 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:
 - $\Rightarrow~1^{st}$ switch on the buttons for ALC & Cam
 - \Rightarrow 2nd 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 cameramode (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



Registration X Hello Imf user. Please select the Configuration for this session: Timelapse FW Timelapse FW Timelapse camera only alc No Grab Sumerns memorevice Kinetic Trigger Device OK	
discover new ways of seeing TM Copyright © 2008 Ander Technology plc	setting

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

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Repeat - 600 times	Fast Scan Experiment Settings: Save to file Load from file
Device Setup	
End End	Figure B) Acquisition/Auxiliary Devices

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 E) Open the

index menu

Measurement

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

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Figure F)					Edit Lase	er

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):