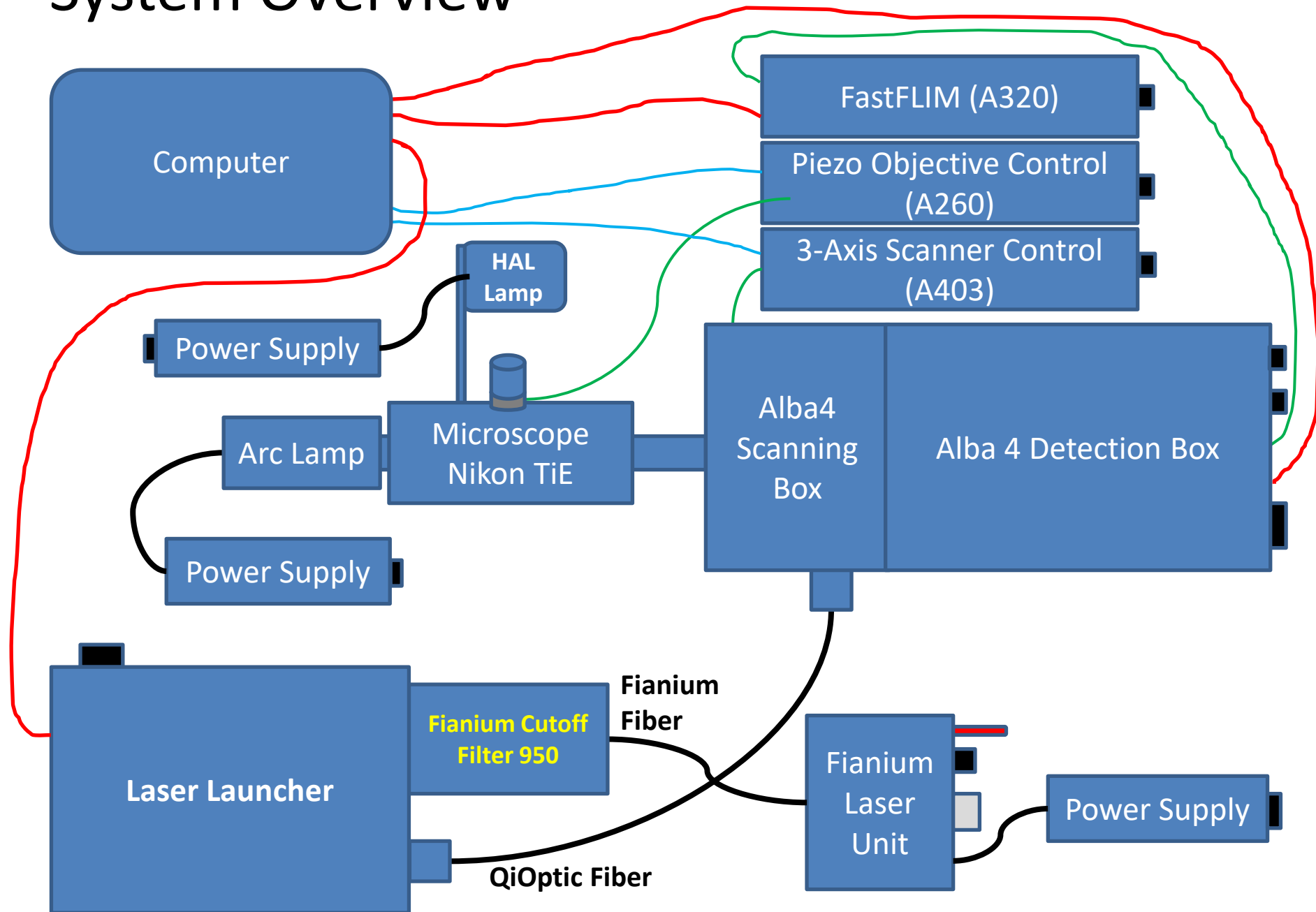




ISS Alba system FD FLIM/FCS System Overview

System Overview

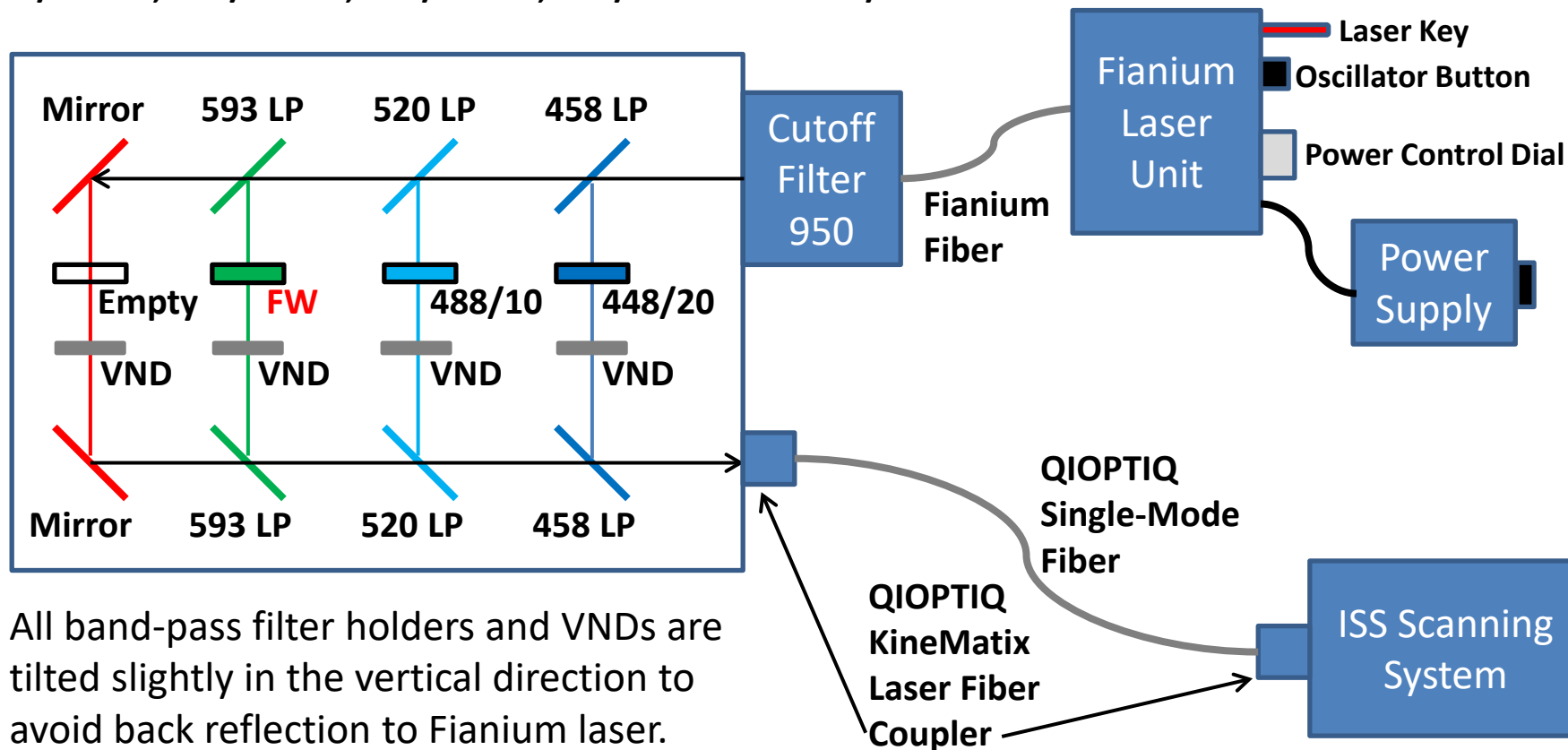


Laser Launcher

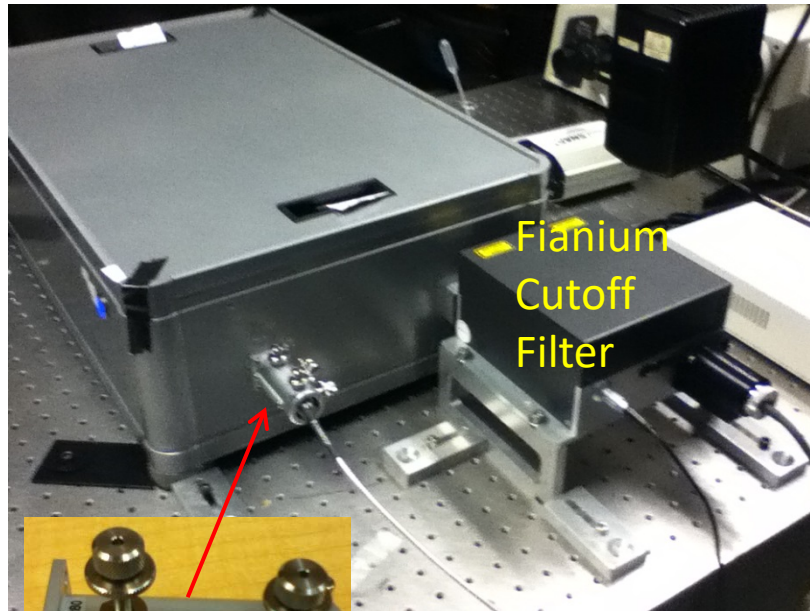
The laser entering the ISS laser launcher after the Fianium cutoff filter is from 440 to 950 nm.

Three pairs of “**LP Filters**” and one pair of “**Mirrors**” in combination of several excitation band-pass filters are used to select specific laser excitation wavelengths. The laser intensity is controlled by the variable neutral density filter (**VND**). Adjust each pair of the “**LP Filter**” and the “**Mirror**” holders for the alignment of the particular laser line to the QiOptiq fiber. Everything is controlled by the software.

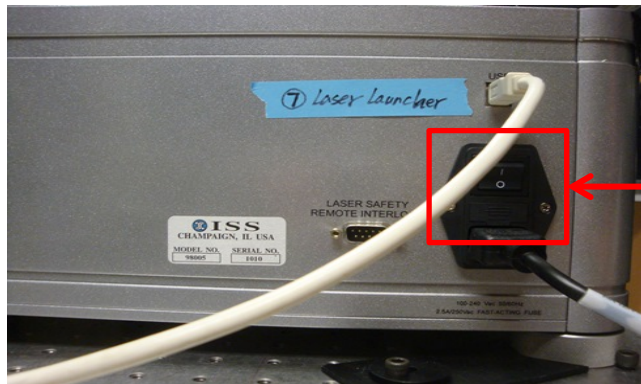
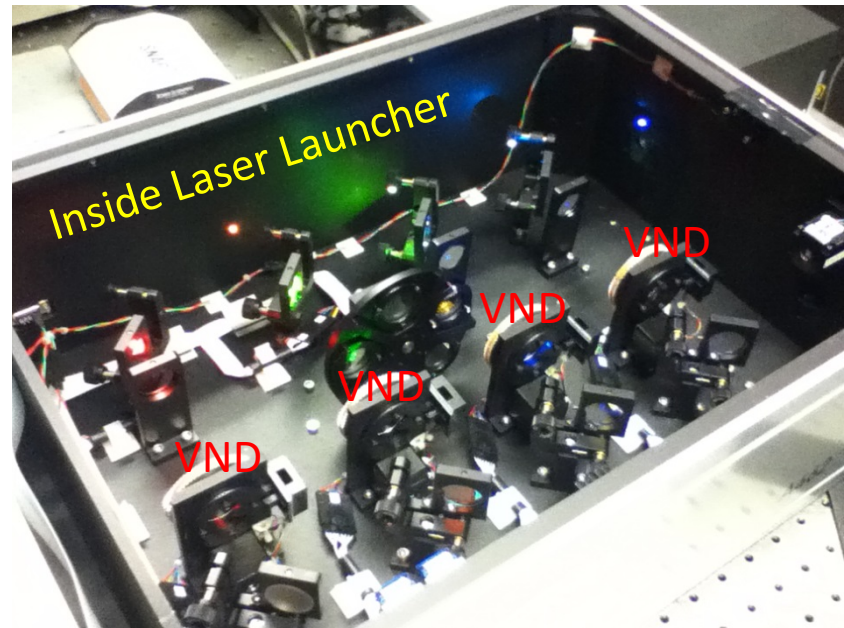
The filter wheel (**FW**) between the pair of 593 LP filters contains several excitation band-pass filters – **560/25 nm, 561/10 nm, 570/20 nm, 514/10 nm and 543/10 nm**.



Laser Launcher - Pictures



QiOptic KineMatix



Laser
Launcher
Switch

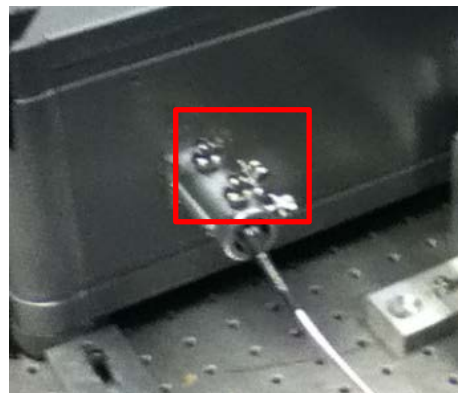
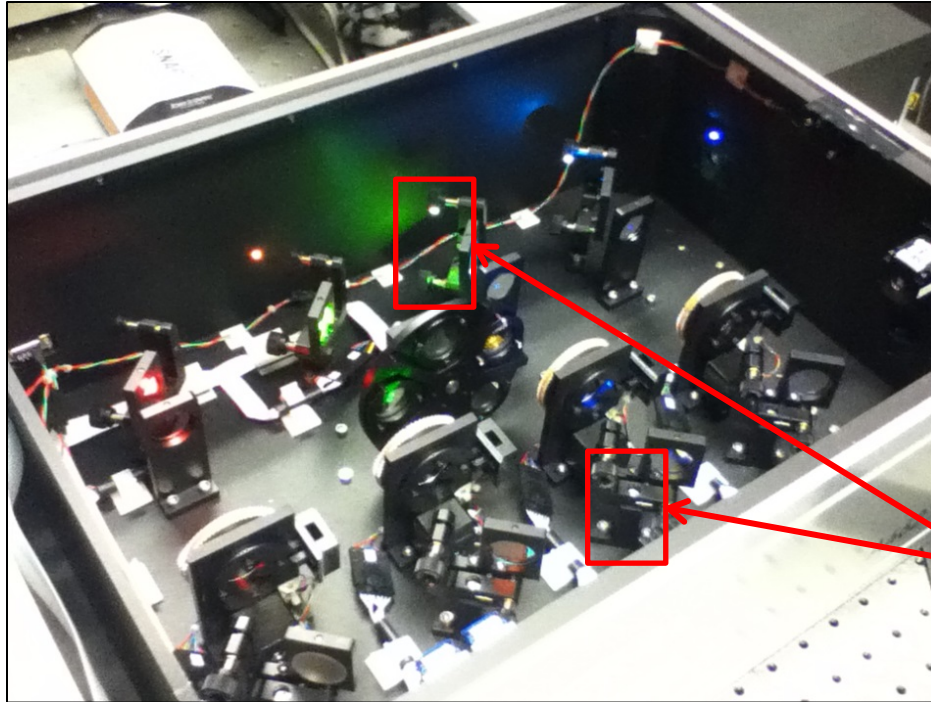


Oscillator
Button

Laser Key

Power
Control
Dial:
0 – 10
turns

Laser Launcher – Laser Alignment



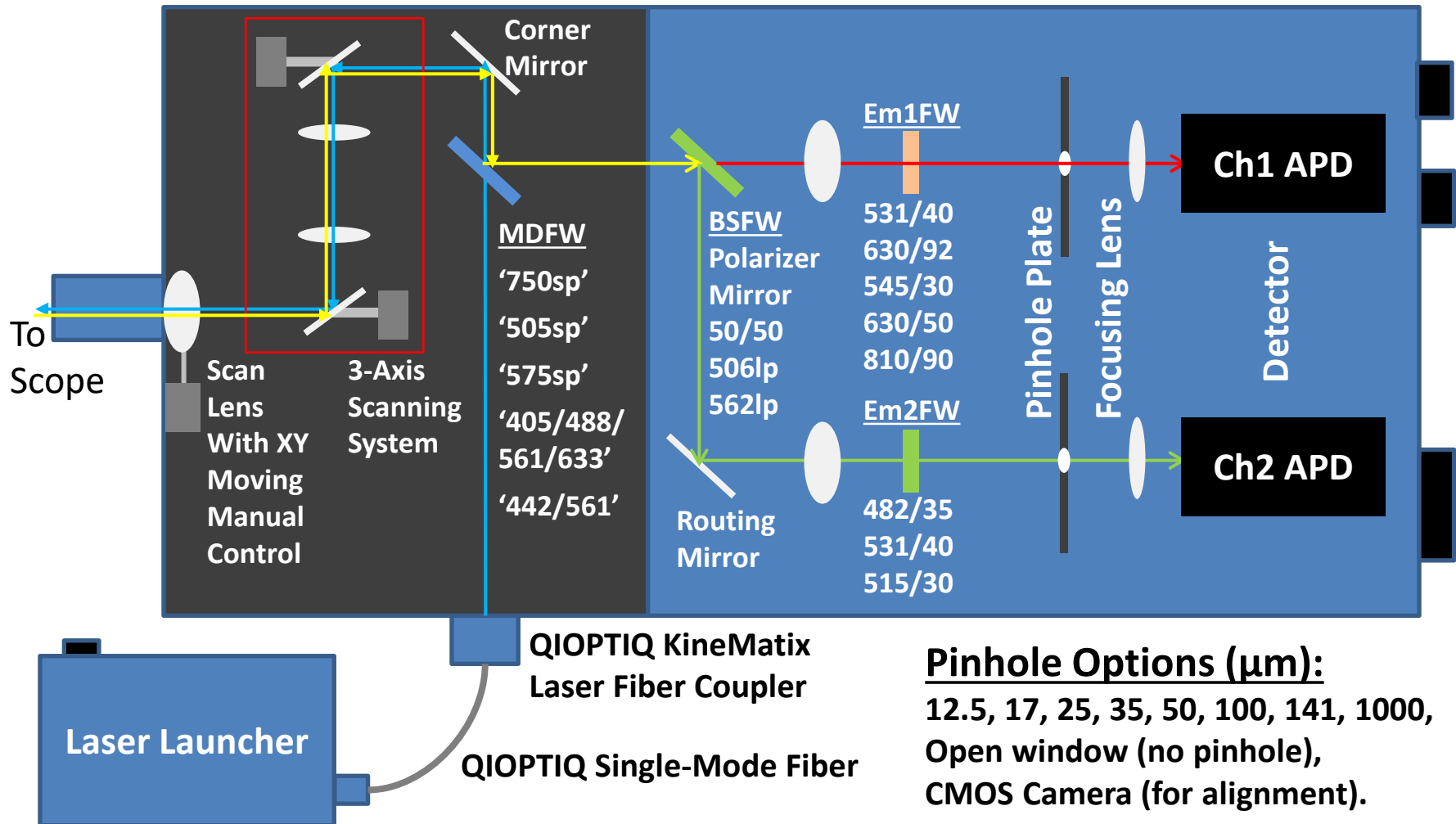
1. Take the fiber out of the KineMatix and insert the 'Pinhole' tube into the KineMatix.
2. Adjust the four screws of each pair of 'LP Filter/Mirror' holders to make sure to get a good laser beam shape and the maximum laser power out of the pinhole.
NOTE: Flip the Pinhole tube to make sure the laser beam travels through the pinhole at each end.
NOTE: Make sure that all laser lines follow the same path.
3. Take the Pinhole tube out of the KineMatix and put the fiber back.
4. Adjust the four screws of the KineMatix to reach the maximum power out of the fiber.

ALBA4 Scanning & Detection

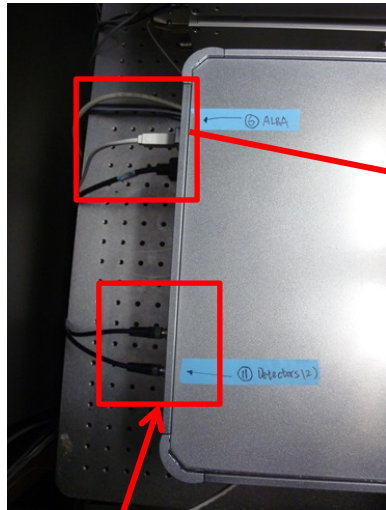
Each of filter wheels has 5 positions and is controlled by software:

MDFW - Main Dichroic Filter Wheel, BSFW - Beam Splitter Filter Wheel,

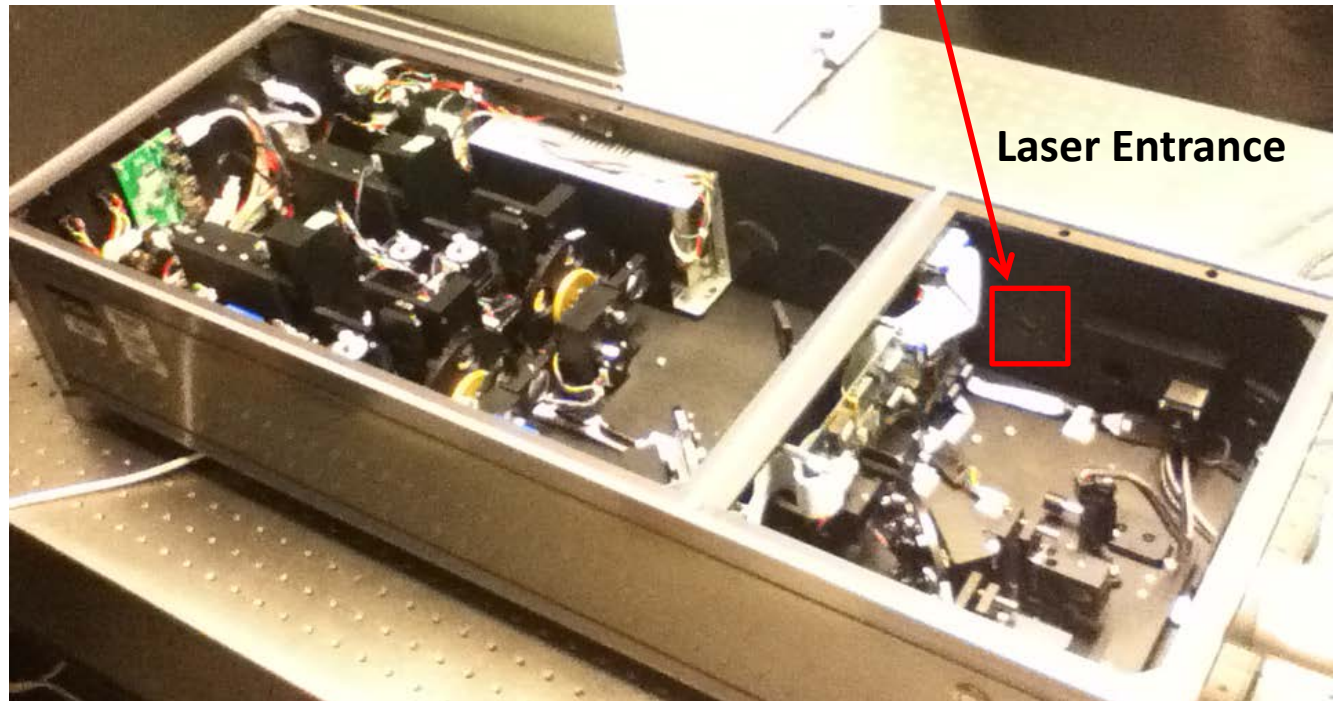
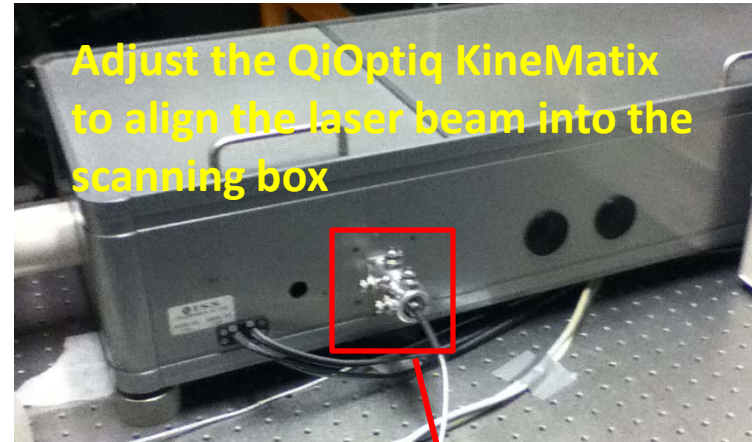
Em1FW - Ch1 Emission Filter Wheel, Em2FW - Ch2 Emission Filter Wheel.



ALBA4 - Pictures



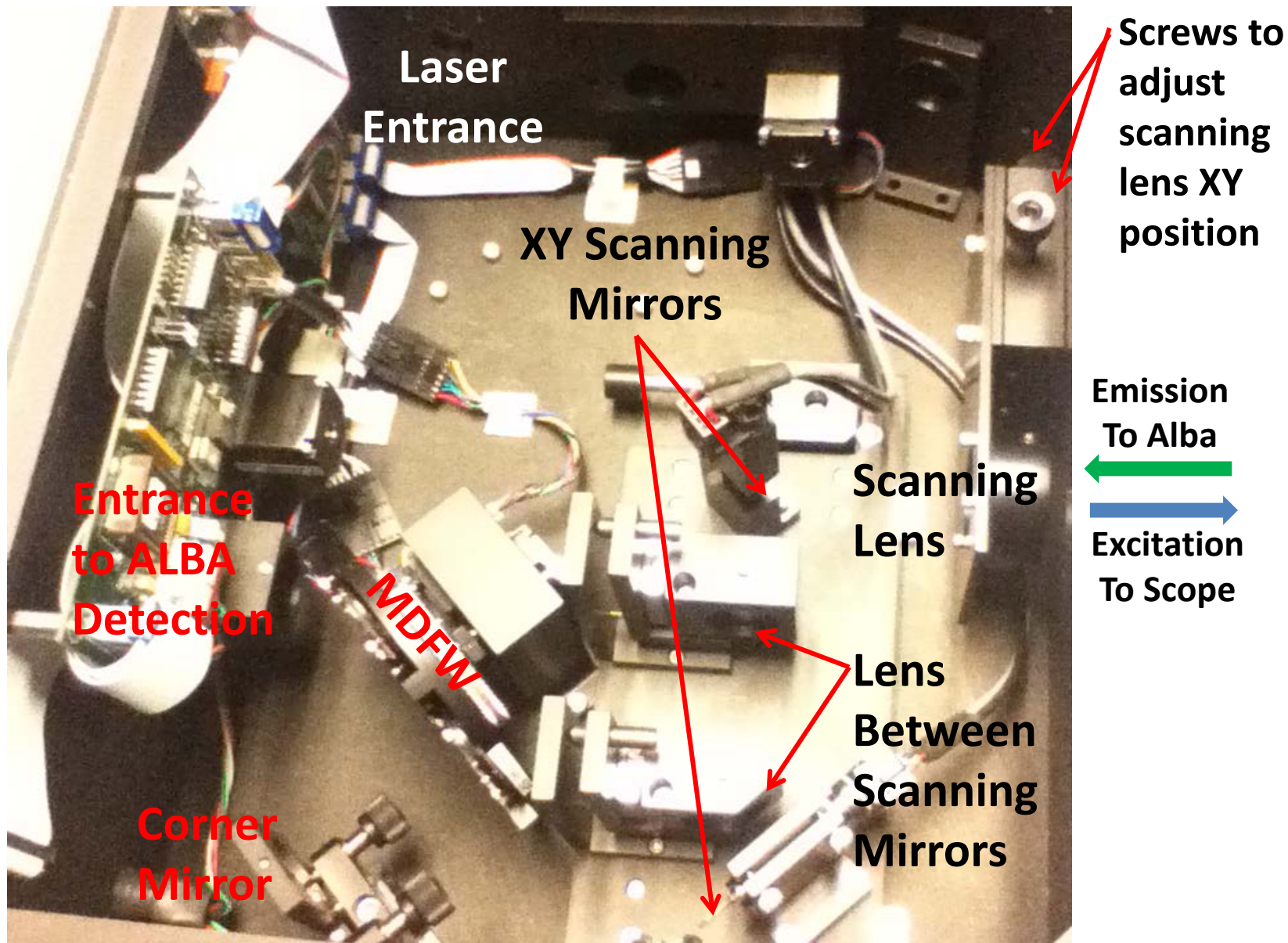
ALBA Switch



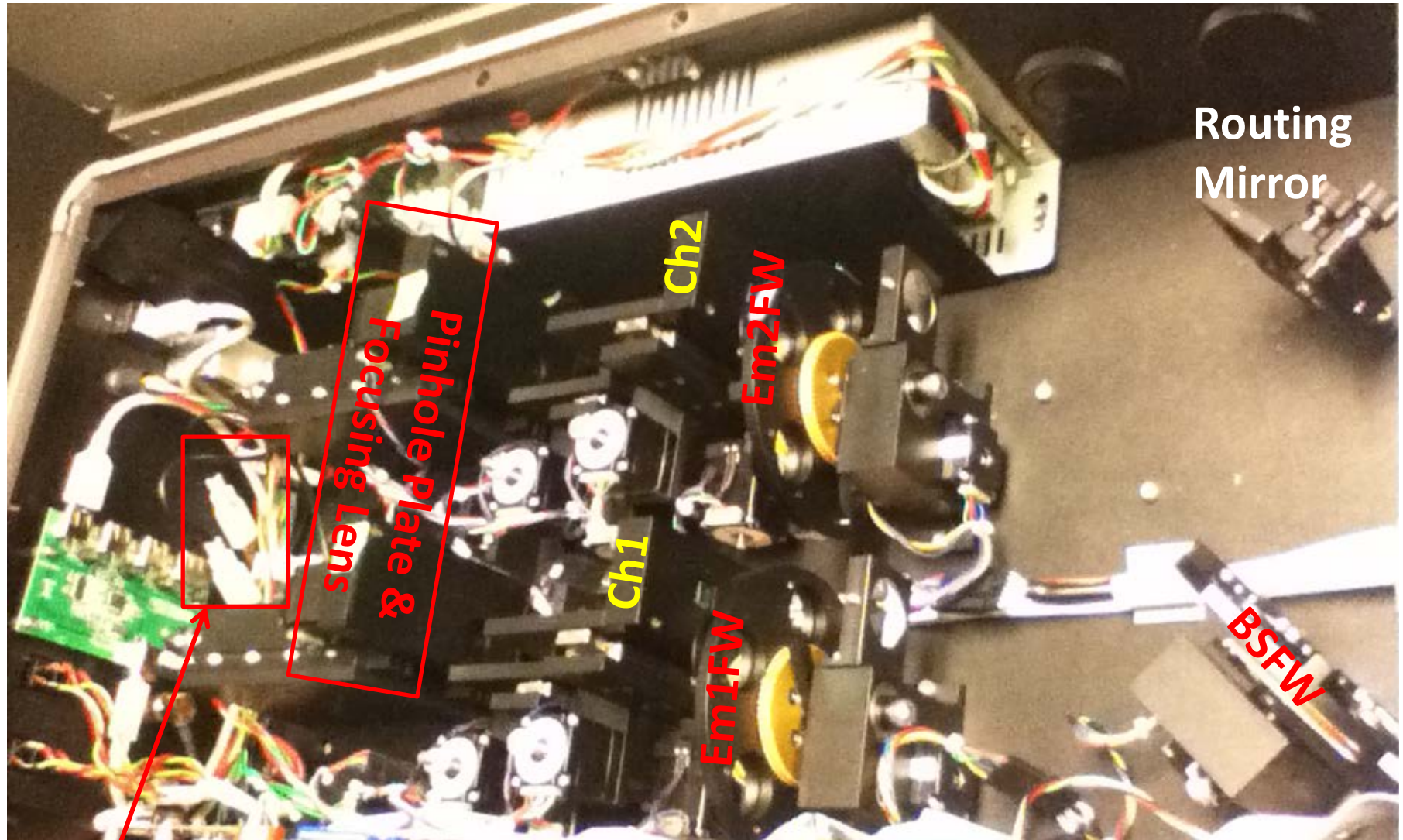
Each APD detector has its own switch – you can turn them on and off anytime without restarting software and any electronics.

Laser Entrance

ALBA4 Scanning - Pictures



ALBA4 Detection - Pictures



USB Connection for Ch1 and Ch2 CMOS Cameras

ALBA4 – Filter Installation & Alignment

You can change any filter on MDFW, BSFW, Em1FW and Em2FW and update the information accordingly in the software. The procedures are explained in details in **Chapter 3 (Device Configuration)** of the ISS VistaVision Manual. Alignment is NOT required for installing a new emission filter on Em1FW or Em2FW. **Alignment is required for installing a new dichroic filter on MDFW or BSFW – three screws are used to position a dichroic filter on MDFW or BSFW at a particular angle.**



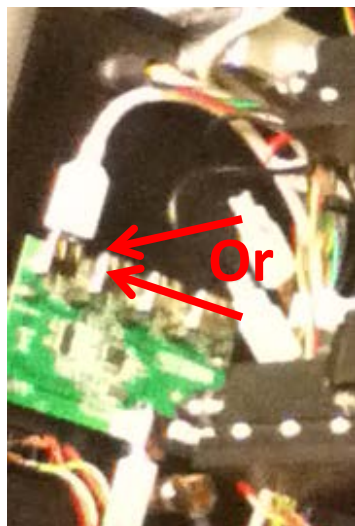
For installing a new dichroic filter on MDFW –

- Activate the CMOS camera in **Channel 1**;
- Use a reference dichroic (previously installed and aligned) on MDFW and a high concentration dye solution to get the reference imaging spot shown by the camera;
- Switch to the new dichroic and adjust the three screws to make its imaging spot agreeable with the reference spot.

For installing a new dichroic filter on BSFW –

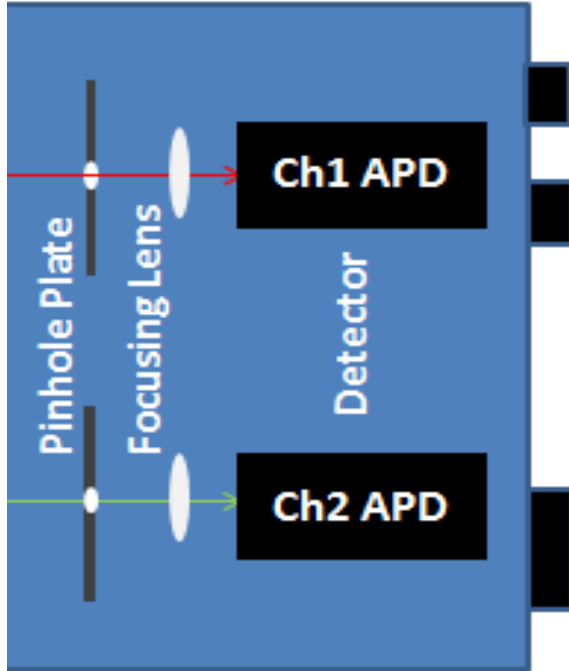
- Activate the CMOS camera in **Channel 2**;
- Use a reference dichroic (previously installed and aligned) on BSFW and a high concentration dye solution to get the reference imaging spot shown by the camera;
- Switch to the new dichroic and adjust the three screws to make its imaging spot agreeable with the reference spot.

See **Chapter 5 (Instrument Control and Alignment)** of the ISS VistaVision manual for the details on how to use the CMOS camera on the pinhole plate.



**Plug in
one USB
cable
(labeled)
to activate
a CMOS
camera**

ALBA4 Detection – Pinhole and Lens Alignment



Before each APD detector, there is a focusing lens and a plate containing pinholes of different sizes. They are all motor-controlled by the software for achieving the optimal detection. In the software, you can

- move each APD detector along the optical axis
- move the XY position of each focusing lens
- move the XY position of each pinhole plate (pinhole)

Every time when you select a new pinhole or choose a new dichroic mirror in MDFW or BSFW, it is better to re-align the pinhole and the focusing lens of each channel. However, the detector position typically needs not to be changed, except for dual-color FCS.

The procedures to align pinhole, focusing lens and detector are explained in details in **Chapter 5 (Instrument Control and Alignment)** of the ISS VistaVision manual.

