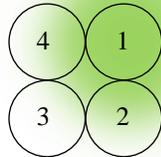
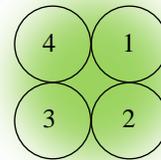


1. Patch cable alignment

The photometry system has one adjustment. The FC connector for the bundled end of the branching patch cable is held in an XY positioner. This allows the FC connector and thus the bundled end of the patch cable to be co-aligned with the output of the system. Each light source in the photometry system generates an approximately circular beam of light at the output. The beam is strongest near the center and the intensity tapers off radially. If the bundle of fibers is not concentric with the output beam (below left) then some branches will have high power (e.g. branch 1) and some branches will have low power (e.g. branch 3). The average power will be low and there will be a large variation in the amount of light that couples into each branch. When the bundle of fibers is made concentric with the output beam (below right) then there will be much less variation in power from branch to branch and the average power will be maximized.



Output & Fiber bundle NOT concentric



Output & Fiber bundle concentric

During manufacturing, the XY position of the connector/cable is adjusted to maximize the light output of the system and to ensure that the minimum light output specifications are met. This adjustment may need to be performed again if the system is used with a significantly different patch cable or if the system is handled roughly, for example during shipping.

To adjust the XY position of the fiber bundle:

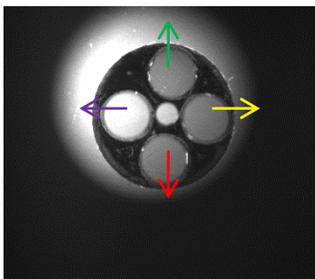
1. Turn on Lime LED at 500mA
2. Use a 2 mm hex screwdriver (or Allen wrench) to *slightly* loosen the two set screws indicated by the red arrows in the picture below:



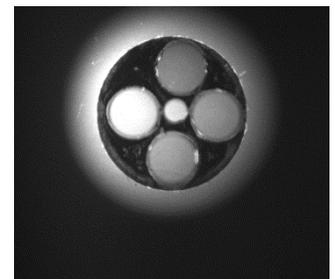
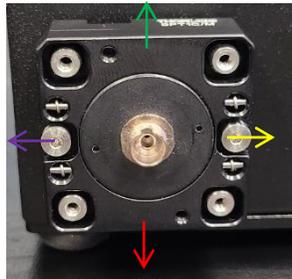
3. To shift the image of the fiber bundle:
positioner:

Gently push the face of the

	UP		UP	(green arrows)
arrows)	DOWN		DOWN	(red arrows)
	RIGHT		RIGHT	(yellow
	LEFT		LEFT	(purple
arrows)				



Poorly aligned

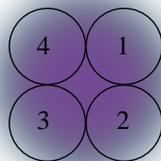


Better aligned

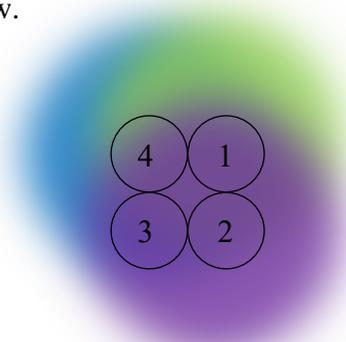
4. Re-tighten the two set screws when the image alignment is satisfactory.

2. Optimizing light output on a wavelength by wavelength basis

During manufacture, the systems are aligned using a test cable and the Lime light source. The Lime light source is used for the manufacturing alignment mainly because it is visually easier to see the end of the patch cable in the camera image when the Lime light is on as compared to the Blue or UV light sources. This raises an interesting question of how well aligned the Lime, Blue, and UV light sources are to each other. In an ideal system, the Blue output, Lime output, and UV output would all be perfectly concentric such that aligning the cable with one source aligned it with all three (below left). However in reality the Blue, Lime, and UV sources may not be perfectly concentric as exaggerated in the figure on the right below.



Ideal case



Reality

One way to probe this question is to compare the measured power outputs after the cable has been aligned for each particular light source individually. The expectation being that the average power output of a given source will be maximized and the branch to branch variation will be minimized when the patch cable is aligned specifically to that source.