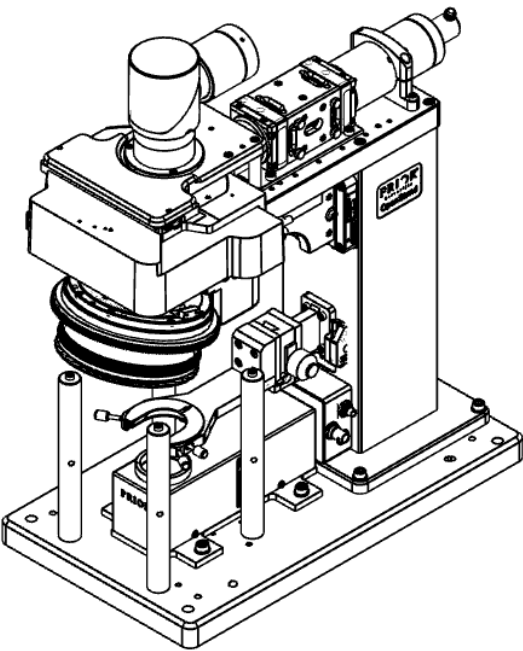


Upright OpenStand: User Manual



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Safety Information

- Save this manual as it contains important safety information and operating instructions.
- Use only as specified by these operating instructions or the intrinsic protection provided by the unit may be impaired.
- Before using the stage system, please follow and adhere to all warnings, safety and operating instructions located on the product and in this User Manual.
- It is safe for use in an ambient temperature from 5 to 40°C with relative humidity (RH) to 80% up to 31°C decreasing linearly to 50% above 31°C.
- **Do not** expose the product to water or moisture while energized.
- **Do not** expose the product to extreme hot or cold temperatures.
- **Do not** expose the product to open flames.
- **Do not** allow objects to fall on or liquids to spill on the product.
- Make sure the focus cable is located so that it will not be subject to damage.
- Make sure the system is installed so that the focus cable is easily accessible.
- For use in a manner not specified in this manual contact Prior Scientific before any work is done.
- To reduce the risk of damage, do not plug or unplug the product from the

controller while it is switched on.

- **Do not** attempt to disassemble the product. Doing so will void the warranty. This product does not contain consumer serviceable components. Service should be performed by Authorized Service Centres.
- Only the exterior of this product should be cleaned using damp lint-free cloth.
- We recommend at least 2 people lifting the system from the packaging. Follow good lifting practice when doing so.
- Some of our actuators are capable of producing forces in excess of 300N. During active use please ensure body parts are kept away from moving parts. Trap hazards may be formed between our actuators and other items in close proximity which are out of our control. Please be aware to minimize this risk during the installation of our equipment into your wider system
- If the sample contain hazardous material the user must ensure that Good Laboratory Practice is followed.



This warning sign indicates there is a hazardous voltage.



This warning symbol indicates that there is a strong magnetic field.



This warning sign indicates that there is a potential hazard – read instructions before continuing.



In accordance with The Waste Electrical and Electronic Equipment Regulations, this symbol indicates that the product must not be disposed of as unsorted municipal waste but should be collected separately. Refer to your local authority in the EU for return and/or collection systems available in your country.



Unpacking the System

Carefully unpack the OpenStand and accessories. **Retain the packaging should you need to return the unit.** If it appears to be damaged, immediately return the unit to the factory in its original packaging. Prior Scientific will not assume liability for damage arising from the use of non-approved packaging.

Ensure all items and accessories specified below are present. If not contact either your sales outlet or Prior Scientific directly.

The system includes

Part Number	Description	Quantity
Upright OpenStand U/M	Upright OpenStand	1
Stage	ProScan Stage	1
ProScan III Controller	Main Controller	1
Joystick	XY Joystick	1
Digipot	Z Digipot	1



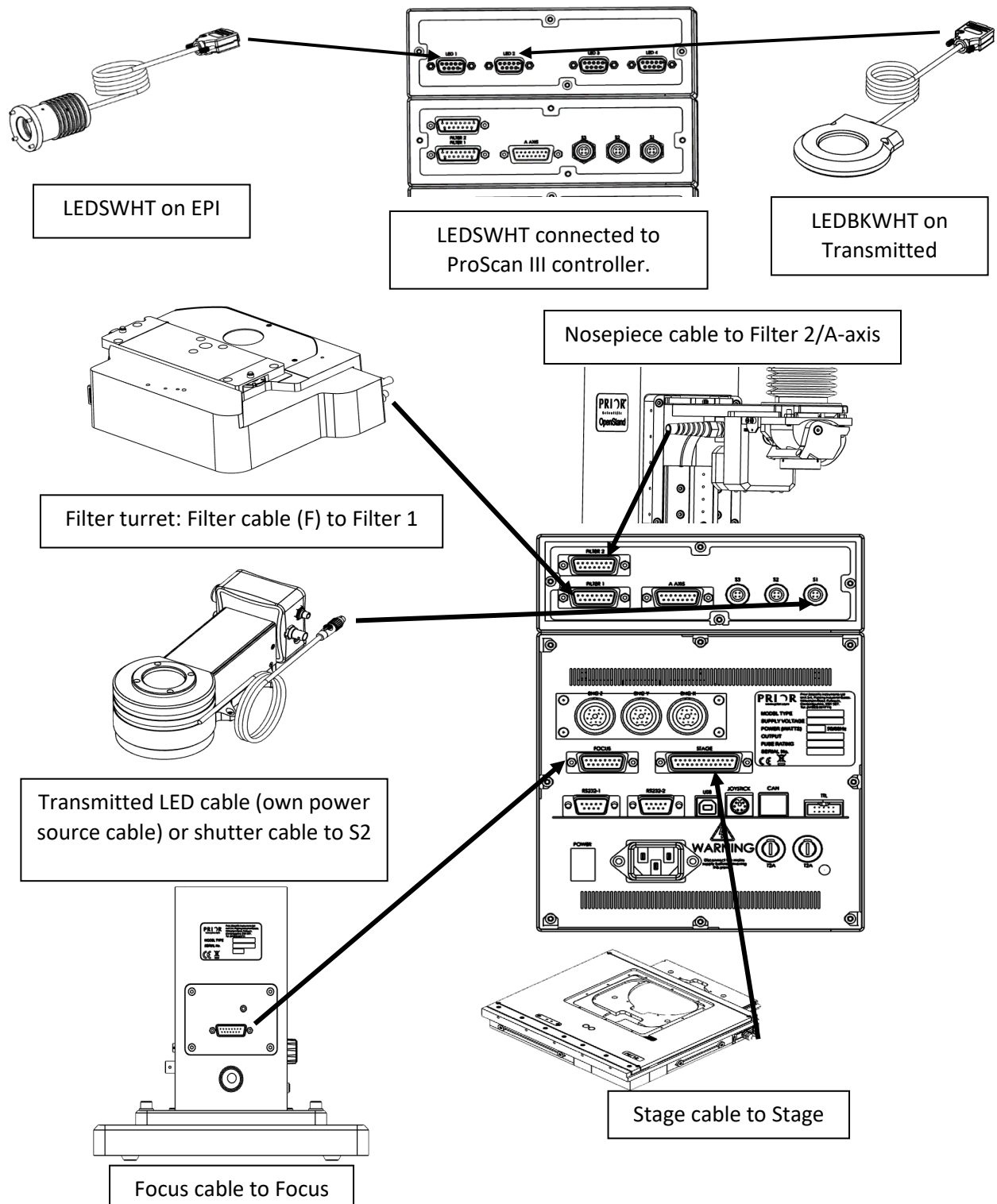
Be careful when transporting the unit.
Lift properly and do not attempt to lift it on your own.



The unit **MUST** be positioned close to the controlling PC terminal, such that the operator has a clear and unobstructed view of the OpenStand.

Connections to ProScan III Controller

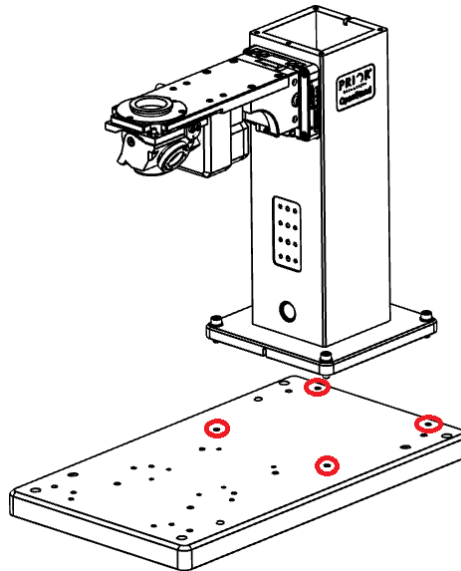
Please refer to our ProScan III Quick Start Guide before connecting any components.



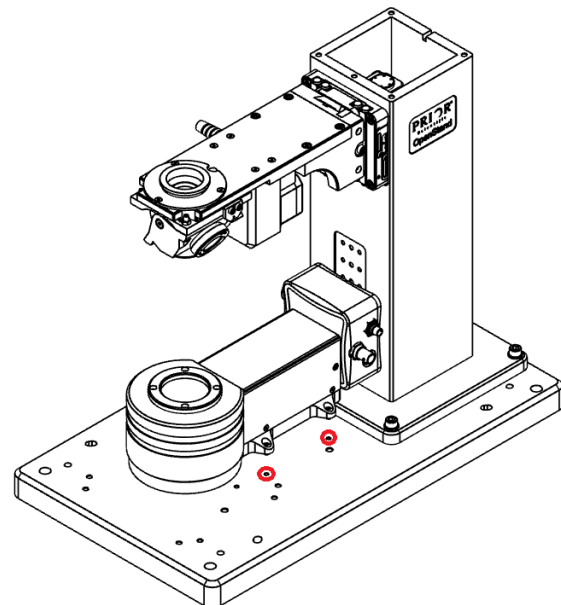
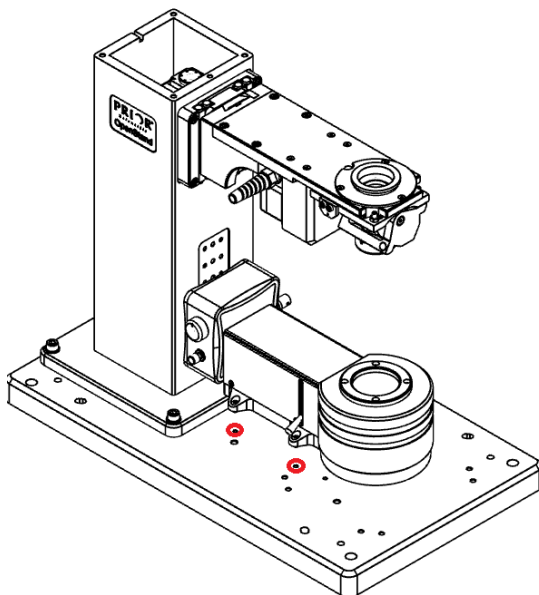
Connecting OpenStand components to ProScan III controller

Fitting the Upright OpenStand

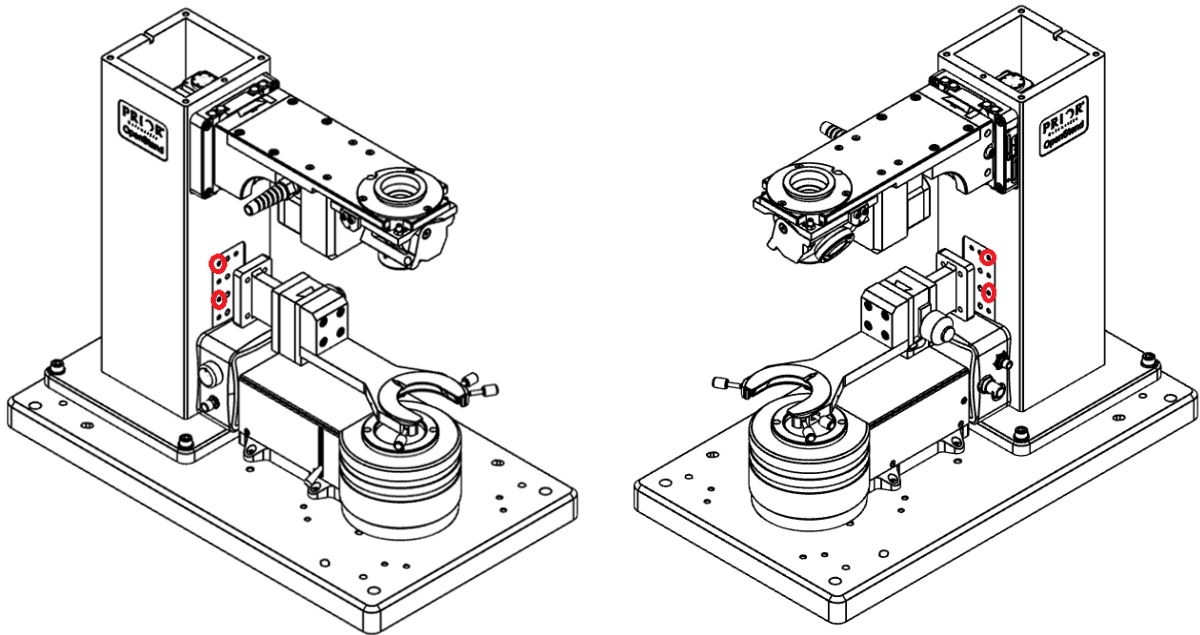
1. Attach the OpenStand extrusion with the nosepiece arm or 2-position nosepiece onto the base plate on the holes circled in red using 4 x M6 x 20mm cap head screws and washers.



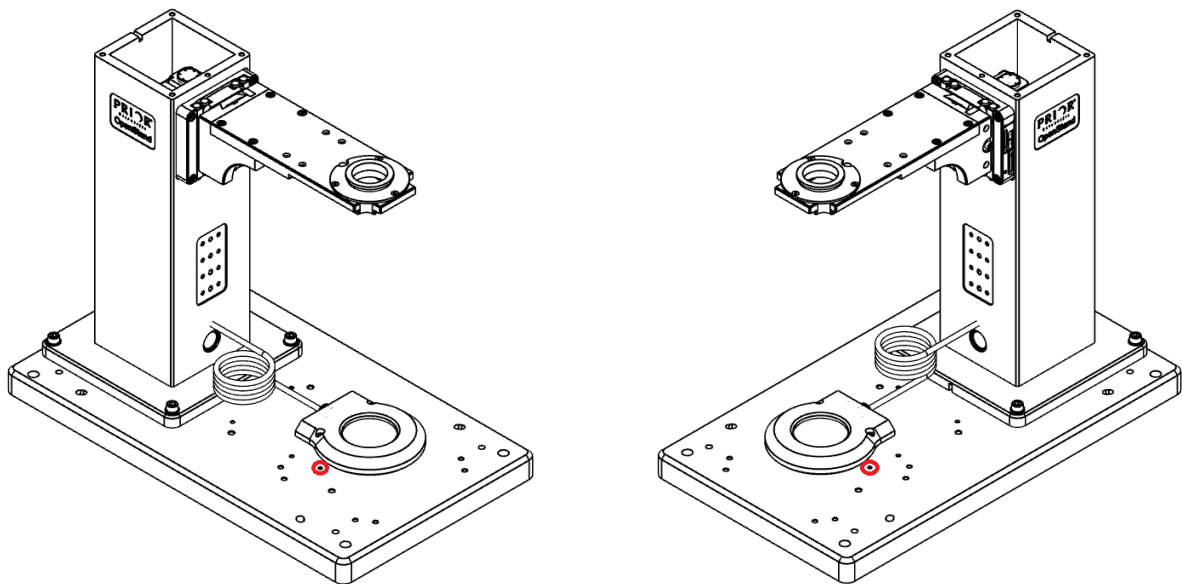
2. Attach the transmitted Köhler illumination using 4 x M4 x 8mm button head screws.



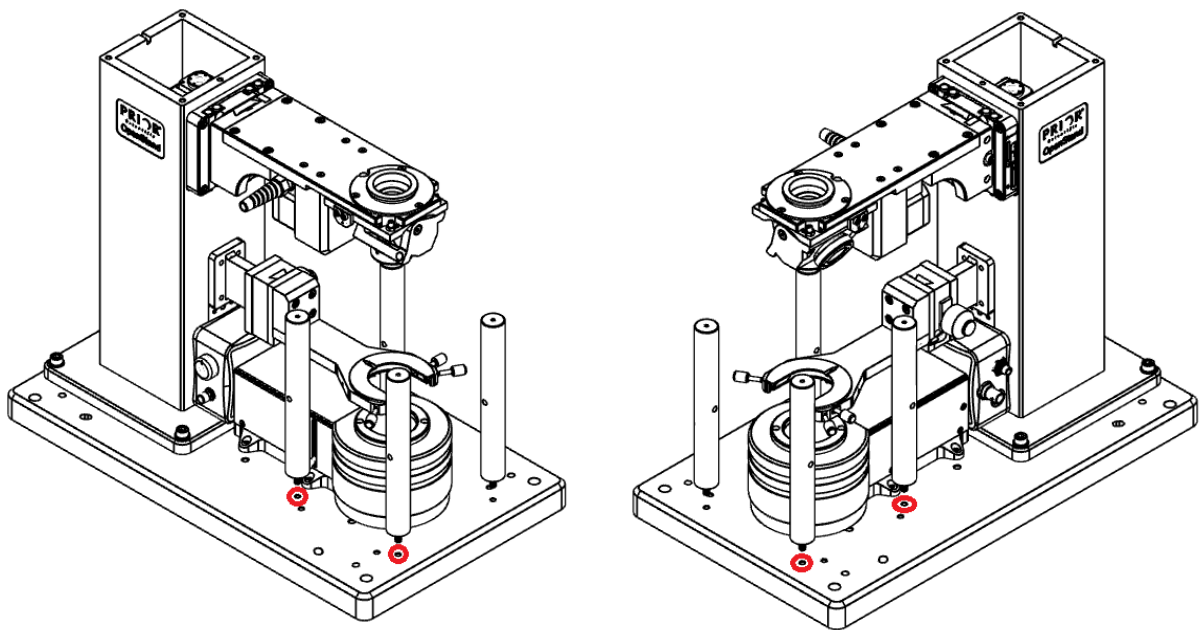
3. Locate the dowel pins on the condenser arm (HH380) on the OpenStand and screw the condenser arm in the red circles using 4 x M4 x 12mm cap head screws.



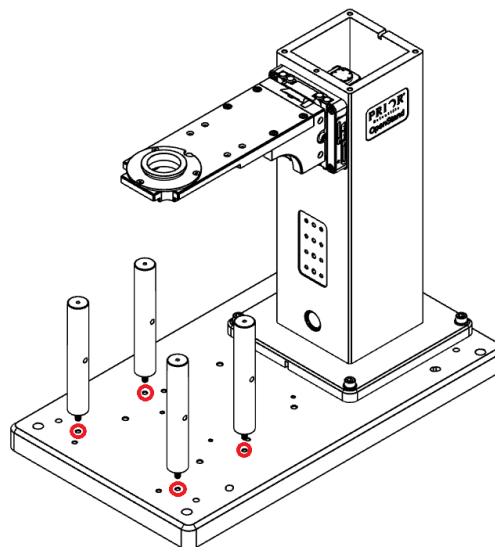
4. If using a flat field transmitted light, attach the LED using 2 x M4 x 8mm cap head screw in holes circled in red.



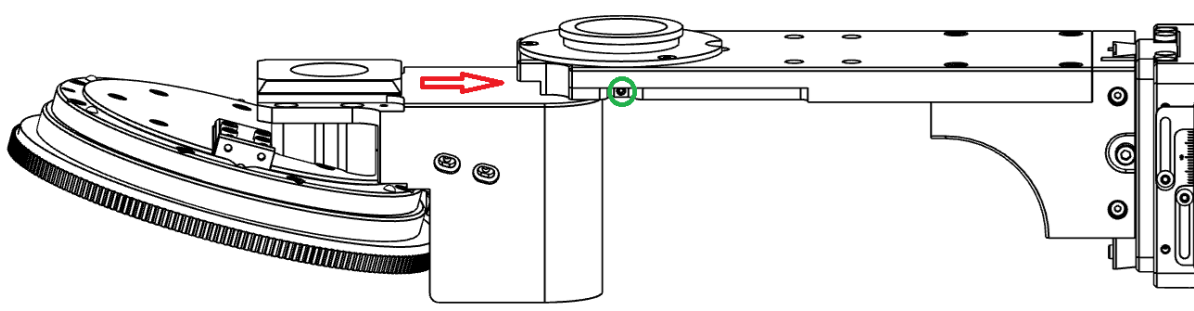
5. Attach the pillars. If using ES111, H100A, H101A, H138A, H101N2F stages attach the pillars as shown in the picture below.



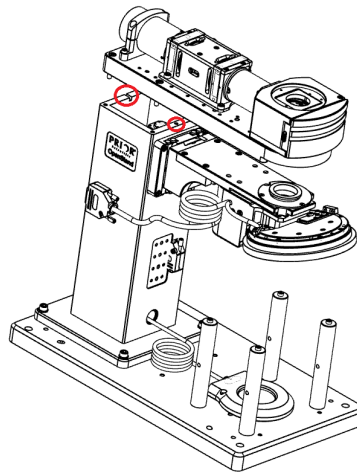
6. If using H105NL/2 or H105/2U stages attach the pillars as shown in the picture below.



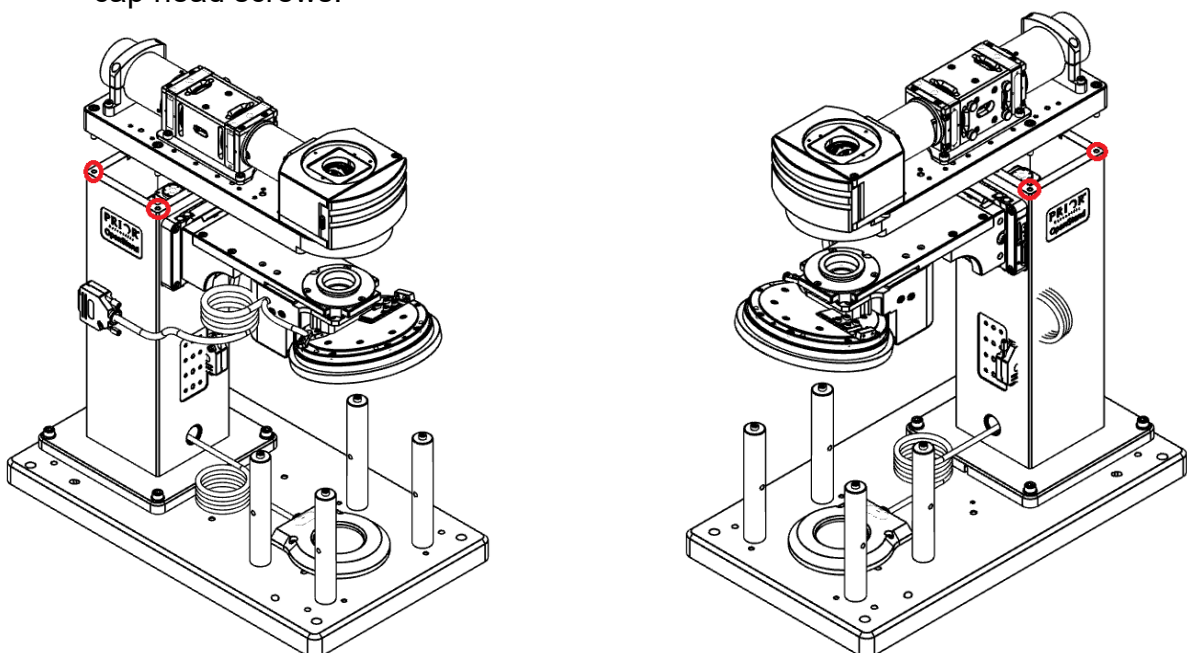
7. Attach the 6-position nosepiece onto the nosepiece dovetail as shown below.

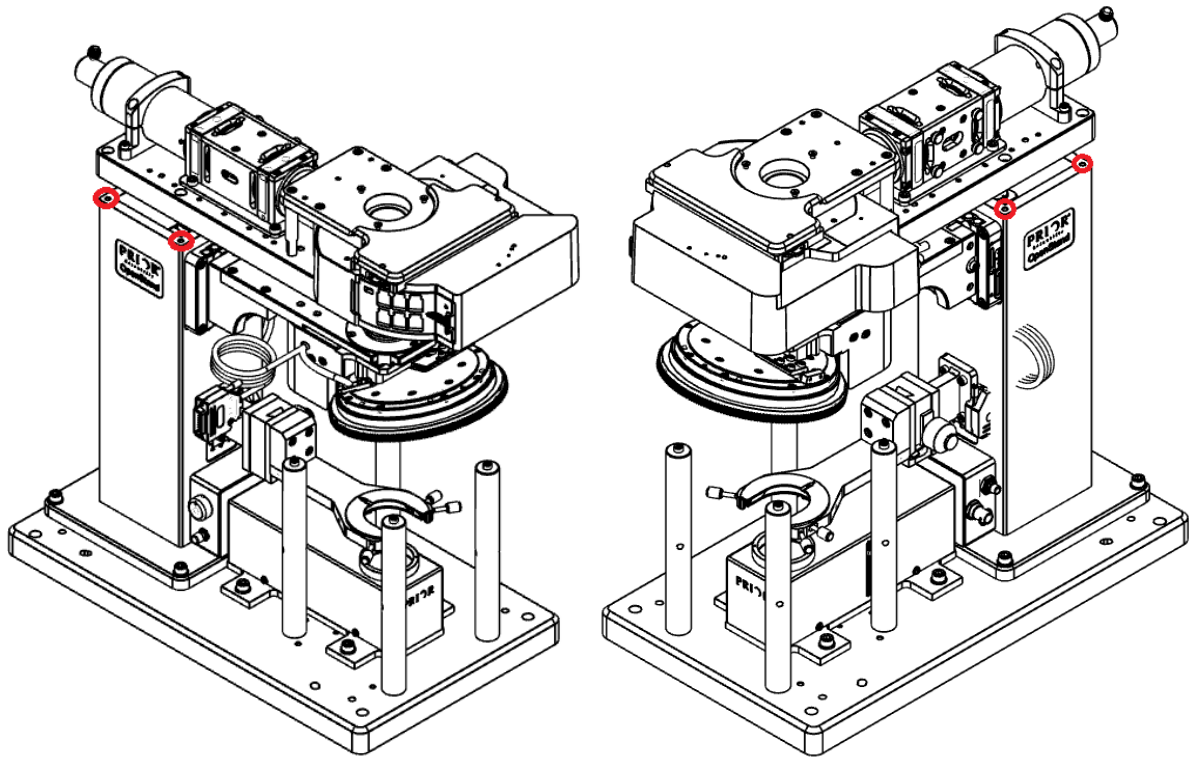


8. Attach the Epi module on the top. It could be empty or with single/double/six/eight position turret. There should be two dowel pins (circled in red) on the binocular arm which should sit squarely on the extrusion.

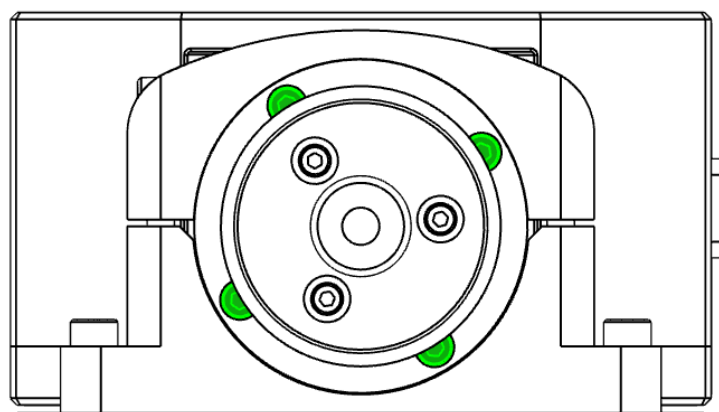
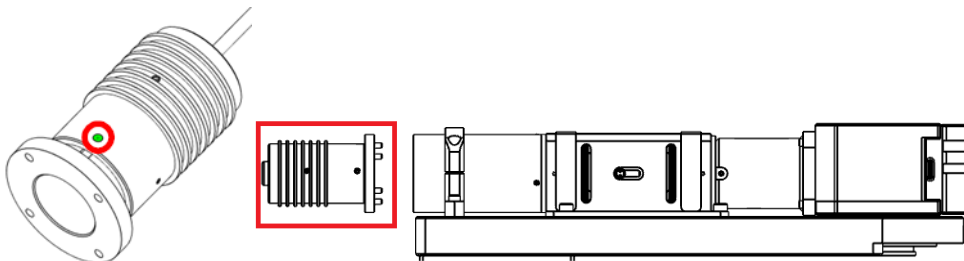


9. Once the dowel pins are in screw the Epi arm into place using 4 x M5 x 30mm cap head screws.

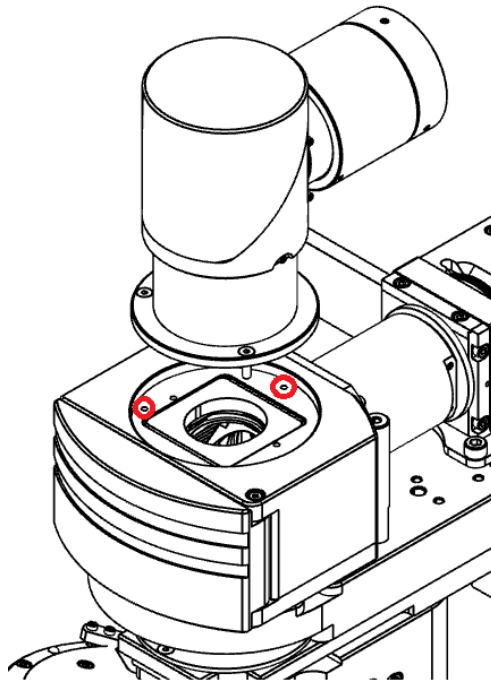




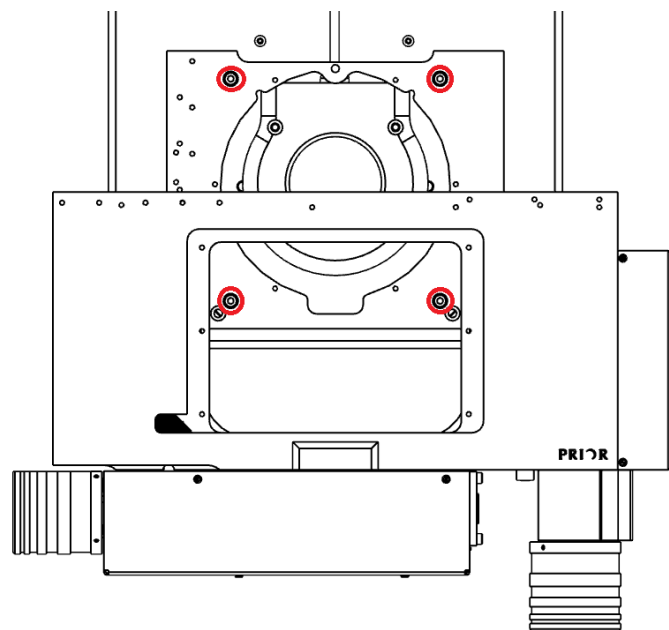
- 10.** Attach the LED light to the Epi module using 4 x M3 x 8mm cap head screws. This may require the LED case to be loosened by releasing the highlighted grub screw and pulled the body towards the rear to allow access to the screws.



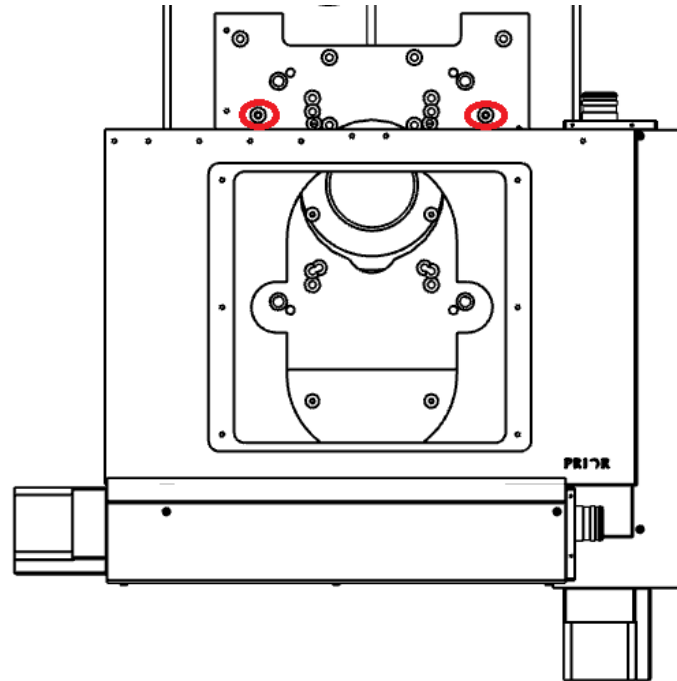
- 11.** Attach the tube lens on top of the Epi module as shown below using 3 x M3 x 12mm countersunk screws.



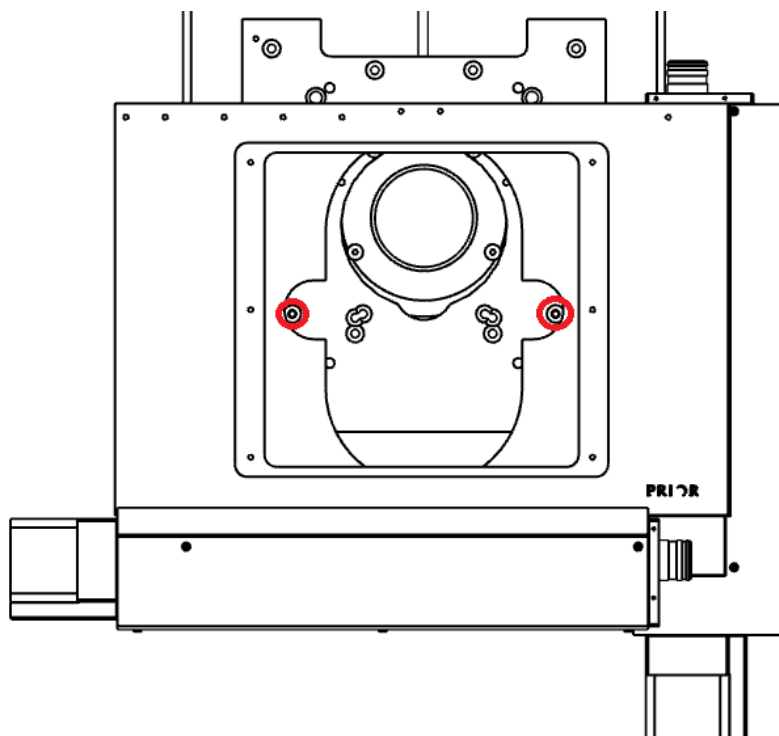
- 12.** To attach the ES111/H101A/H101N2F/H100A stages, connect the stages to the ProScan III controller (refer to ProScan III Quick Start Guide) and move the Y axis using the joystick to reveal the holes shown below. Attach the stage to the pillar using 4 x M4 x 10mm cap head screws.



- 13.** To attach the H105/2U and H105NL/2 stages, connect the stage to the ProScan III controller (refer to ProScan III Quick Start Guide) move the Y axis using the joystick to reveal the holes shown below. Attach the stage to the pillar using 2 x M4 x 10mm cap head screws.

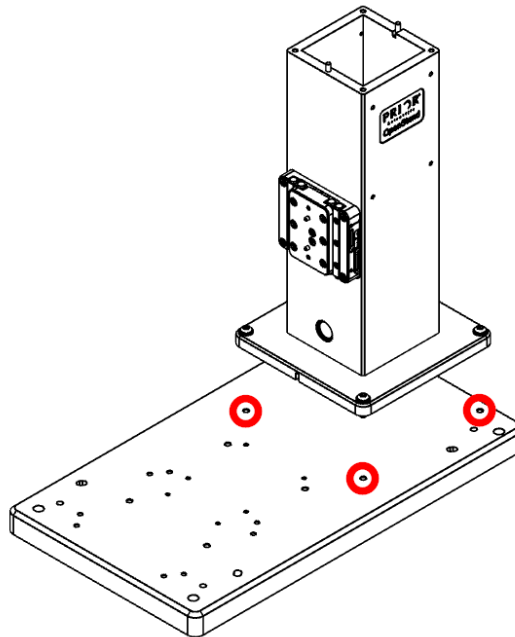


- 14.** Move the stage again in the Y axis using the joystick to reveal the other two holes to the front of the stage. Bolt 2 x M4 x 10mm cap head screws to secure the stage onto the OpenStand.

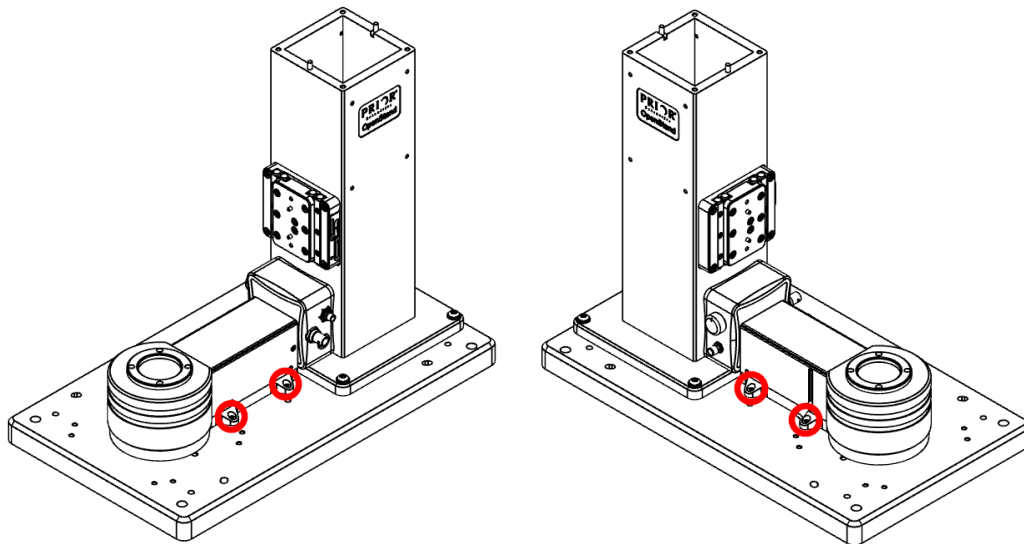


Fitting the Upright Focusing Stage OpenStand

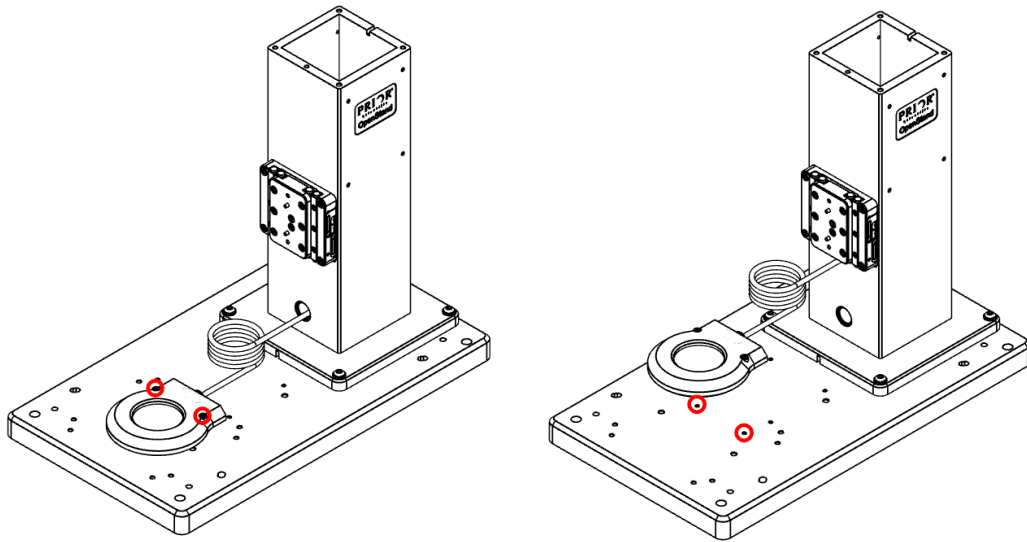
1. Attach the OpenStand extrusion onto the base plate on the holes circled in red using 4 x M6 x 20mm cap head screws and washers.



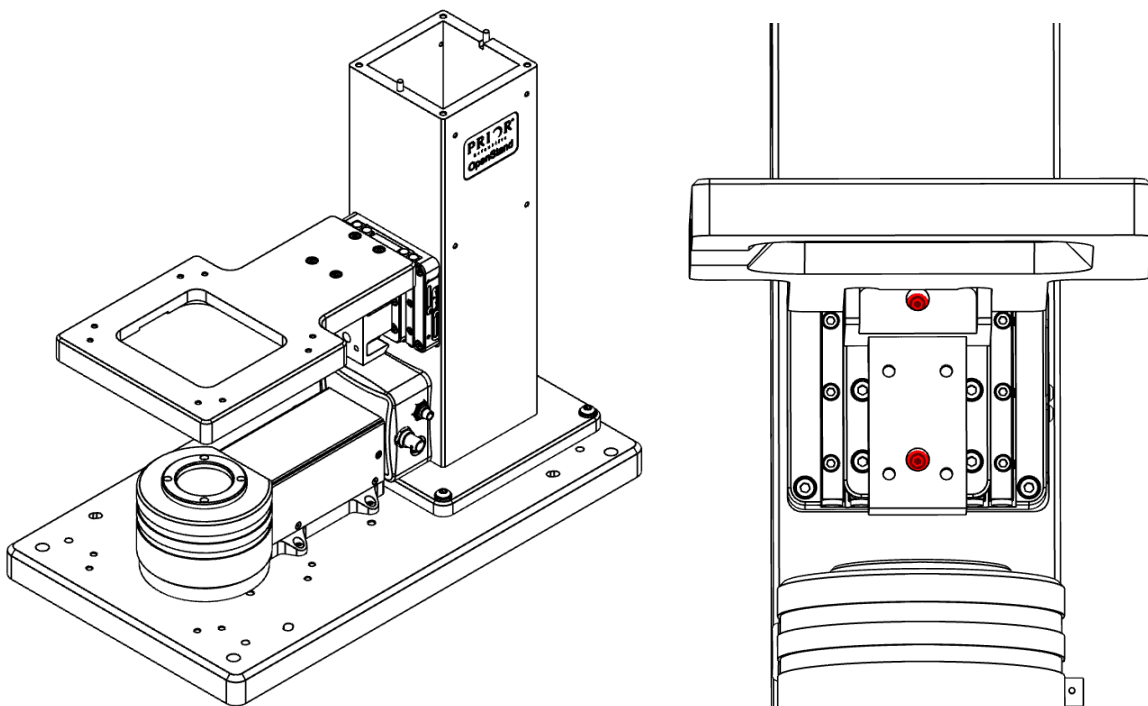
2. Attach the transmitted Köhler illumination using 4 x M4 x 8mm button head screws.



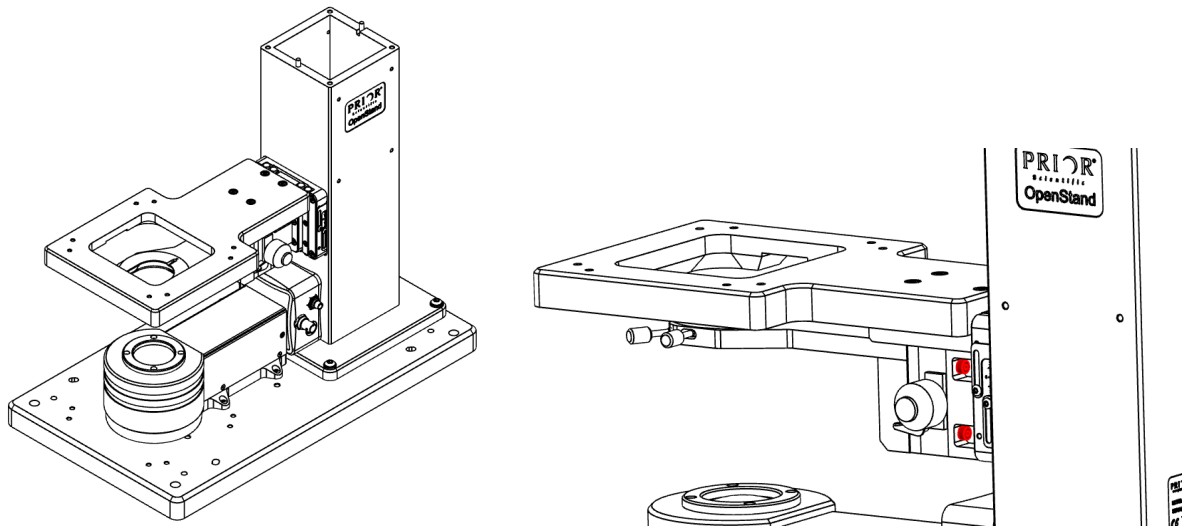
3. If using a flat field transmitted light, attach the LED using 2 x M4 x 8mm cap head screw in holes circled in red.



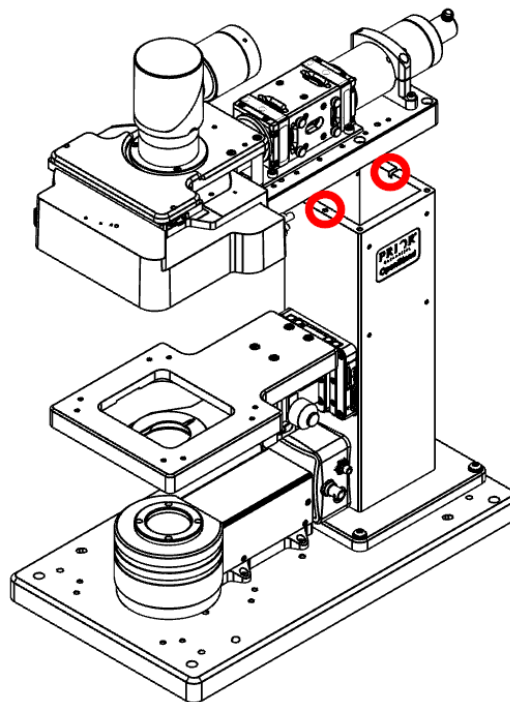
4. Attach the stage mount to the focus block mechanism using M4 x 25mm cap head screws.



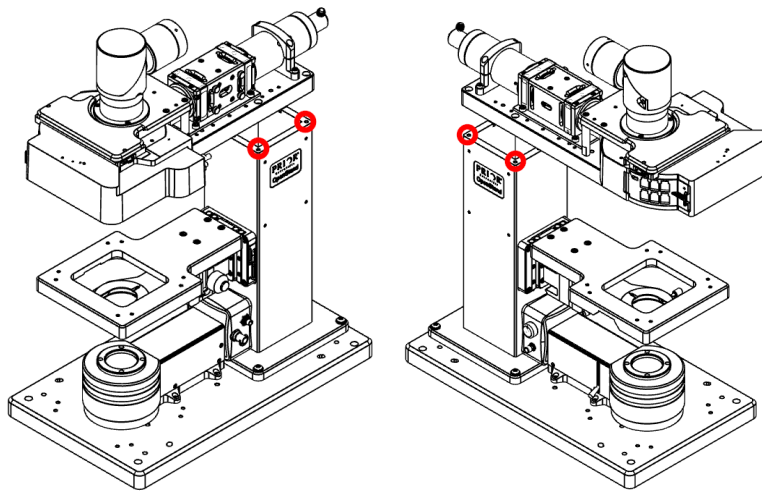
- 5.** Secure the condenser mount with M4 x 8mm screws from the rear.



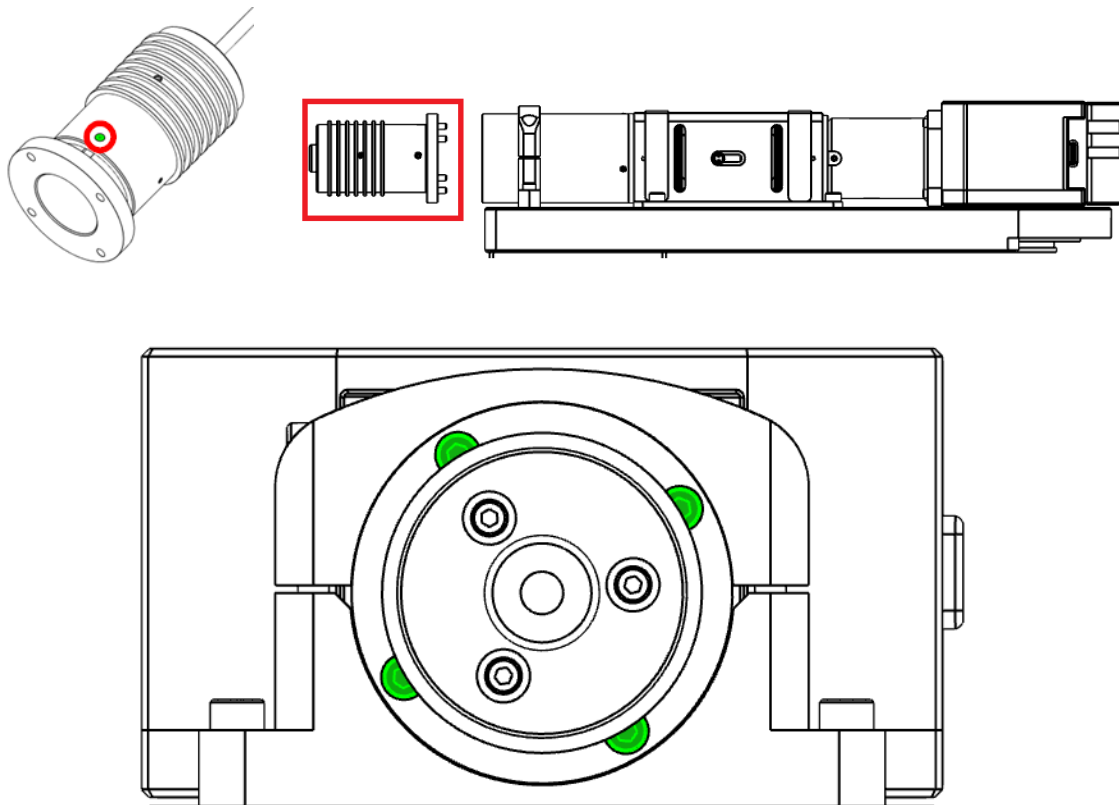
- 6.** Attach the Epi module on the top. It could be empty or with single/double/six/eight position turret. There should be two dowel pins (circled in red) on the binocular arm which should sit squarely on the extrusion.



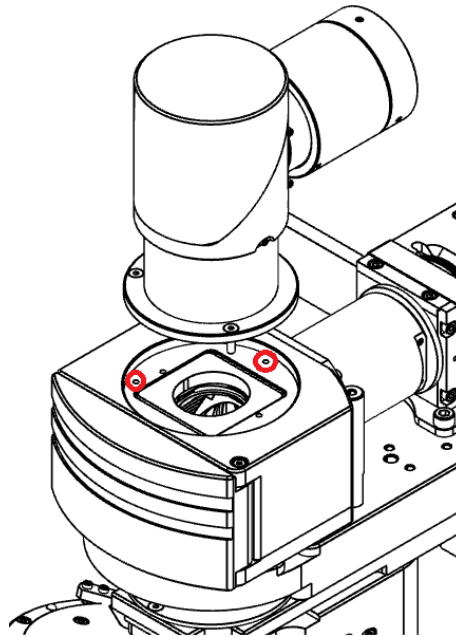
7. Once the dowel pins are in screw the Epi arm into place using 4 x M5 x 30mm cap head screws.



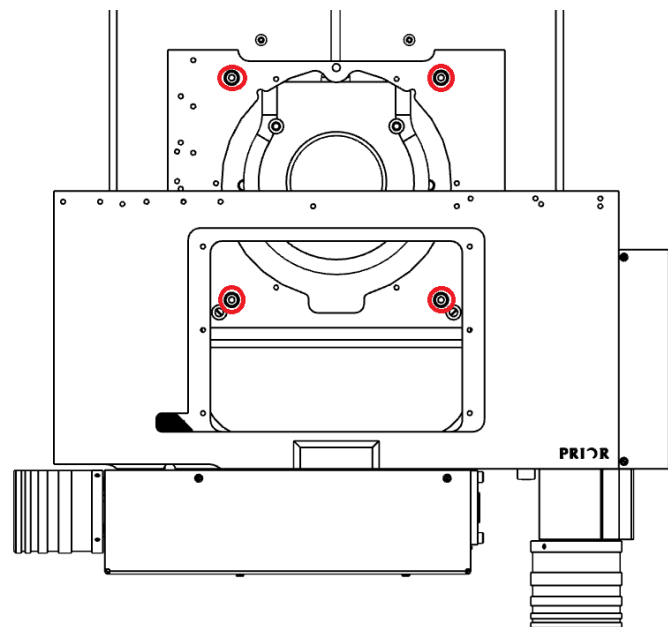
8. Attach the LED light to the Epi module using 4 x M3 x 8mm cap head screws. This may require the LED case to be loosened by releasing the highlighted grub screw and pulled the body towards the rear to allow access to the screws.



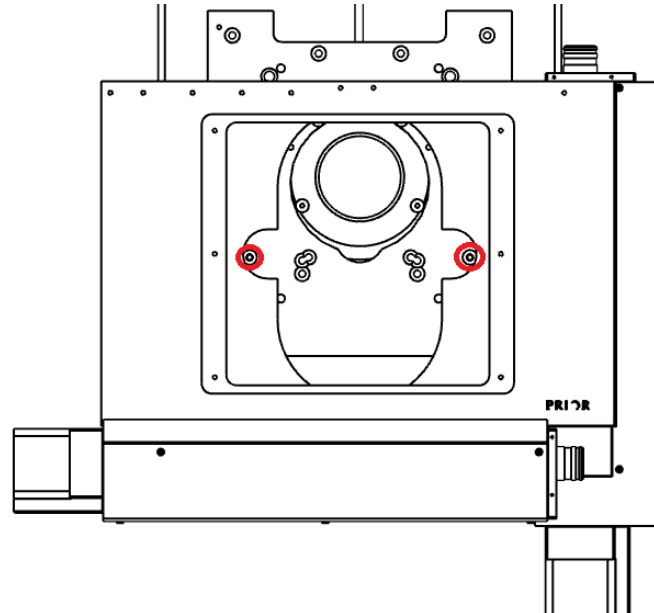
9. Attach the tube lens on top of the Epi module as shown below using 3 x M3 x 12mm countersunk screws.



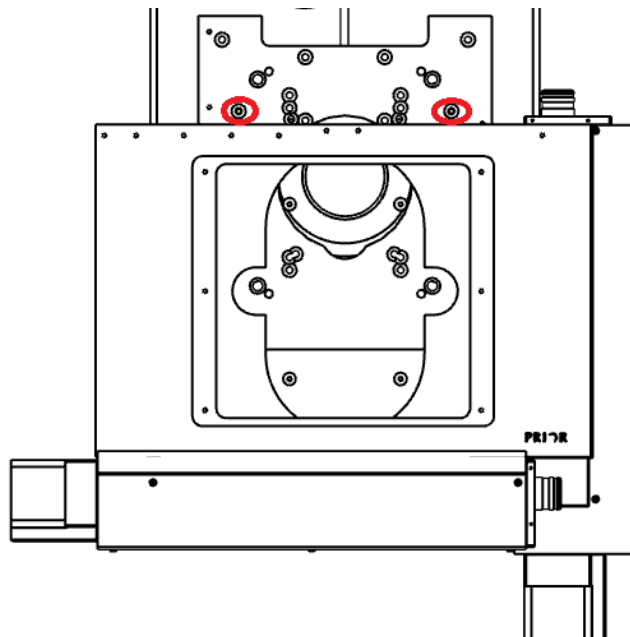
To attach the ES111/H101A/H101N2F/H100A stages, connect the stages to the ProScan III controller (refer to ProScan III Quick Start Guide) and move the Y axis using the joystick to reveal the holes shown below. Attach the stage to the stage focusing mount using 4 x M4 x 10mm cap head screws.



- 10.** To attach the H105/2U and H105NL/2 stages, connect the stage to the ProScan III controller (refer to ProScan III Quick Start Guide) move the Y axis using the joystick to reveal the holes shown below. Attach the stage to the focusing mount using 2 x M4 x 10mm cap head screws.



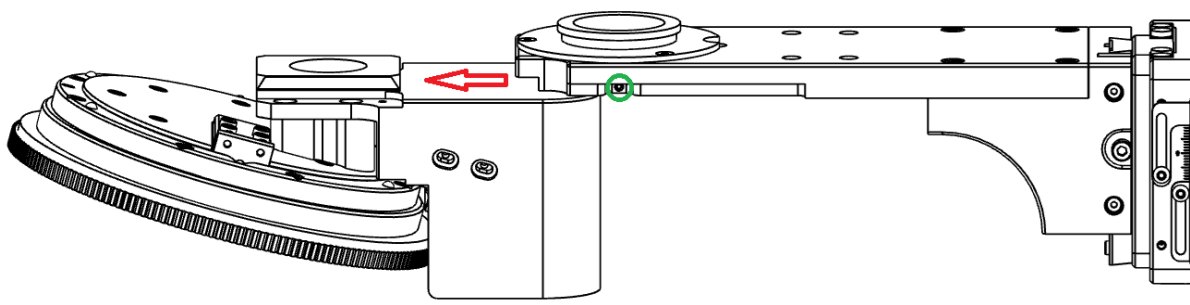
- 11.** Move the stage again in the Y axis using the joystick to reveal the other two holes to the front of the stage. Bolt 2 x M4 x 10mm cap head screws to secure the stage onto the focusing mount.



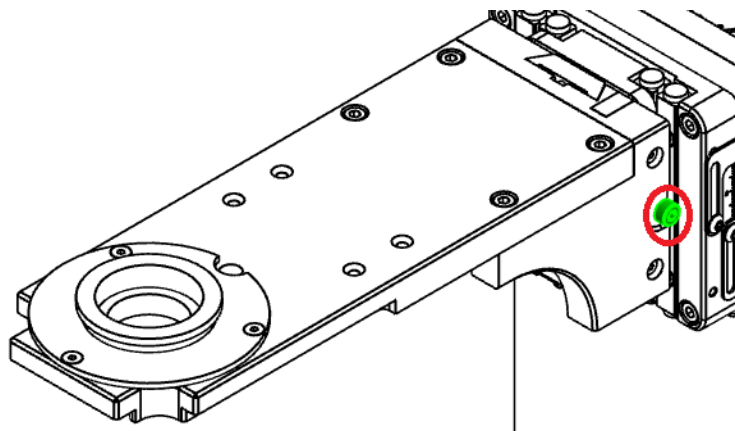
Adjusting the Position of the Nosepiece Arm

This option is available if you have a thicker sample.

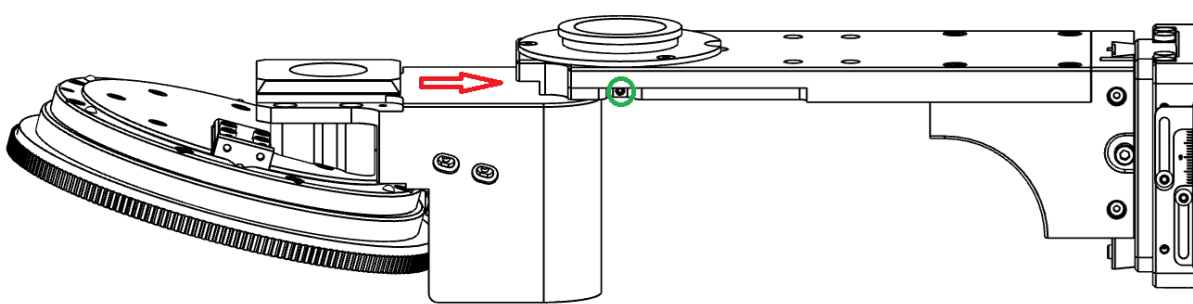
1. Remove the objectives and remove the nosepiece by unscrewing the grub screw circled in green and remove the nosepiece outward as shown below.



2. To adjust the nosepiece arm dovetail, hold the nosepiece arm with one hand and unscrew highlighted screw slightly so you can slide the nosepiece arm dovetail up or down to the level that you require. Retighten the screw to secure the nosepiece arm dovetail. The range of movement of the nosepiece arm on the dovetail is around 15mm.

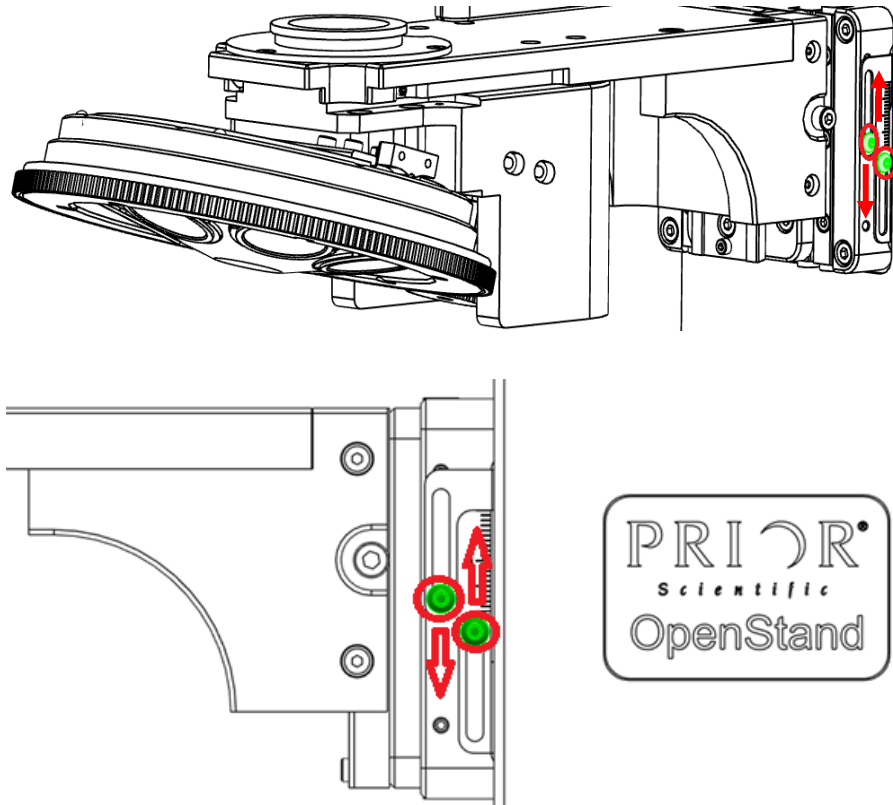


3. Once the desired height is reached the nosepiece can be attached to the arm. Slide it in fully and secure it by tightening the grub screw.



Limiting the Z Travel Range on OpenStand

The travel range can be adjusted. There are two limit sliders located behind the nosepiece dovetail. You can either limit the travel going up or the travel going down. The focus block has a total travel range of 20mm, the scale has a 0 reference in the middle, and it is scaled at a 1mm pitch. Unscrew slightly and move either up or down to limit your travel range accordingly and tighten the screw again to secure it in place.



Preparing PureFocus850 Installation on OpenStand Microscope

Please ensure the focus block is moved down so there is enough space between the binocular arm and the objective arm. The OpenStand is now prepared for installation of PF850/PF850M head.

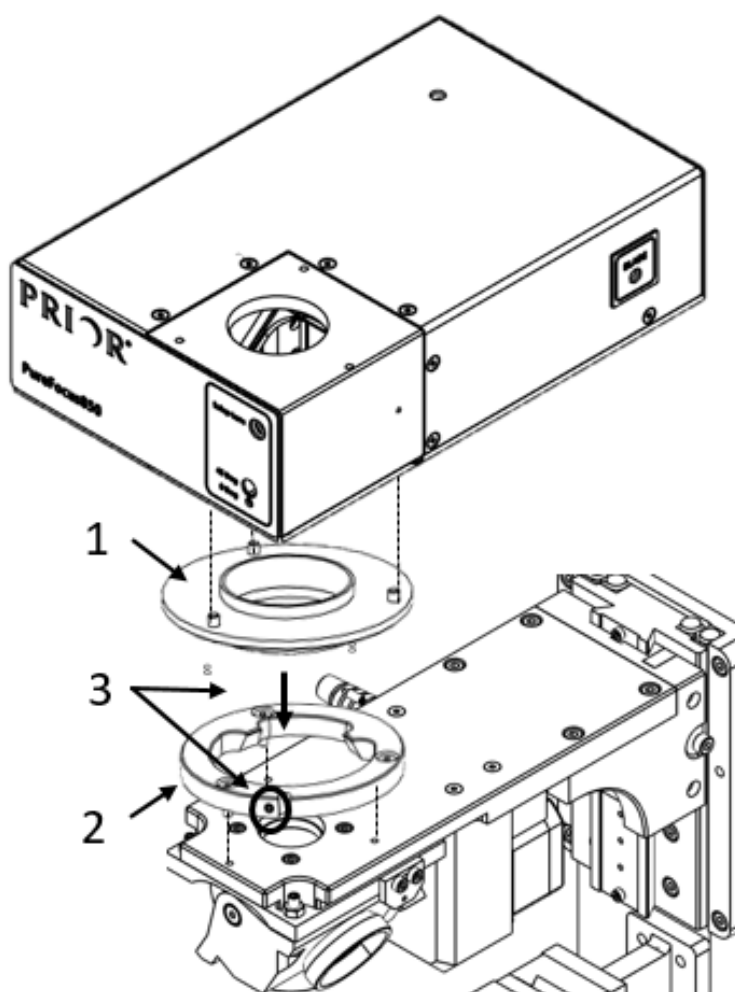
Attaching the PF850 Head on the Objective Arm

OpenStands with 20mm Z travel will require a spacer to attach the PF850 head.

Installing the PF850/PF850M Head Using the LF335 Flange on Objective Arm with 40mm Z travel

Part Number	Description	Quantity
LF335	LF522 (upper dovetail flange) and LF523 (lower dovetail flange)	1
T123	M3 X 10mm screw	3
T173	M3 X 6mm screw	3
T91	M3 x 6mm screw	1

1. Attach the lower dovetail onto the bottom of the PF850/PF850M using the 3 x T173 screws.
2. Attach the LF522 (upper dovetail flange) to the objective arm using the 3 x T123 screws.
3. Secure the PF850 by tightening the T91 grub screw on the upper dovetail.

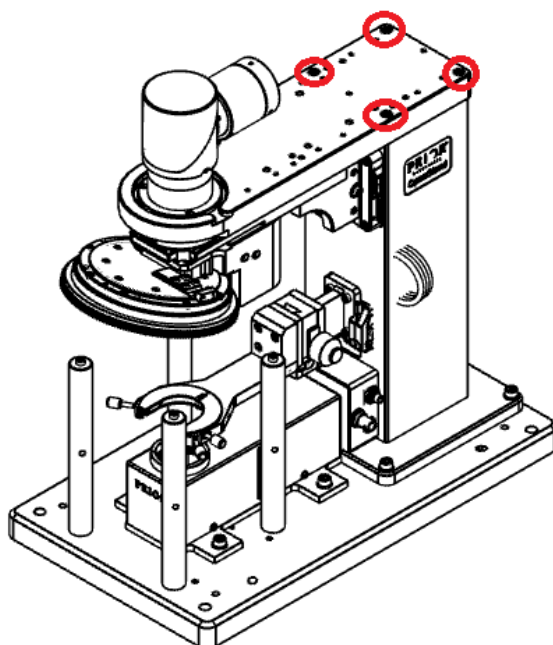


Installing the PF850 Head on the Binocular Arm on the OpenStand With 20mm Z travel

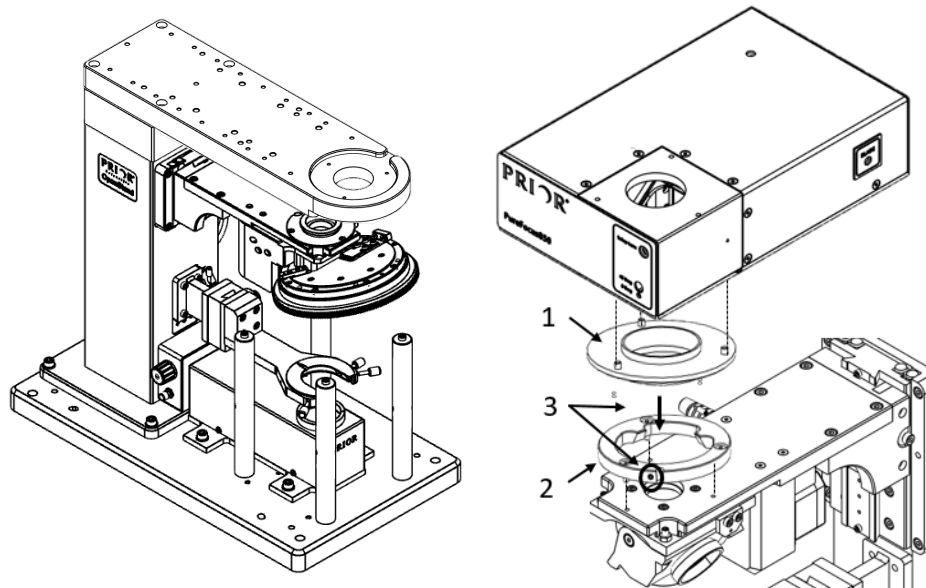
To fit the PF850 head on to the OpenStand with 20mm travel range you will require a spacer. To attach the spacer please follow the instructions below:

Part Number	Description	Quantity
LF335	LF522 (upper dovetail flange) and LF523 (lower dovetail flange)	1
T123	M3 X 10mm screw	3
T173	M3 X 6mm screw	3
T91	M3 x 6mm screw	1
H6100	OpenStand PureFocus extrusion spacer	1
T260	M5 x 70mm screw cap head	4

1. Remove the 4 x M5 screws on the binocular arm. Ensure one person holds the binocular arm while a second person removes the screws.



2. Align the spacer to the frame and place the binocular arm on top of the spacer so that the dowel pins are inserted properly. Screw the spacer and binocular arm to the frame using T260 (M5 x 70mm) screws shown below.

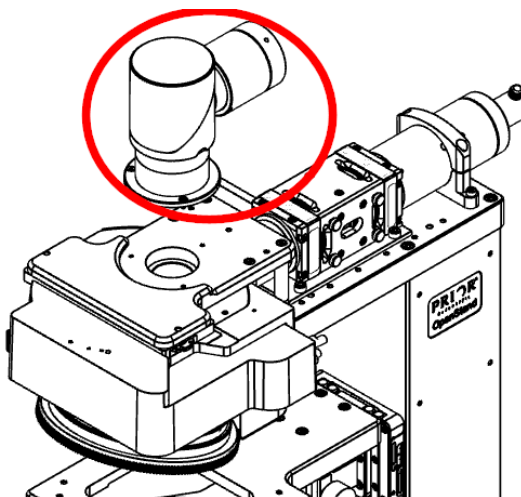


3. Ensure there is enough space to insert the PF850 head between the nosepiece dovetail and the binocular arm. If there isn't enough space move the Z focus down using the digipot or via software. Please refer to our PF850 manual.
4. Attach the lower dovetail onto the bottom of the PF850/PF850M using the 3 x T173 screws.
5. Attach the LF522 (Upper dovetail flange) to the objective arm using the 3 x T123 screws.
6. Secure the PF850 by tightening the T91 grub screw on the upper dovetail.

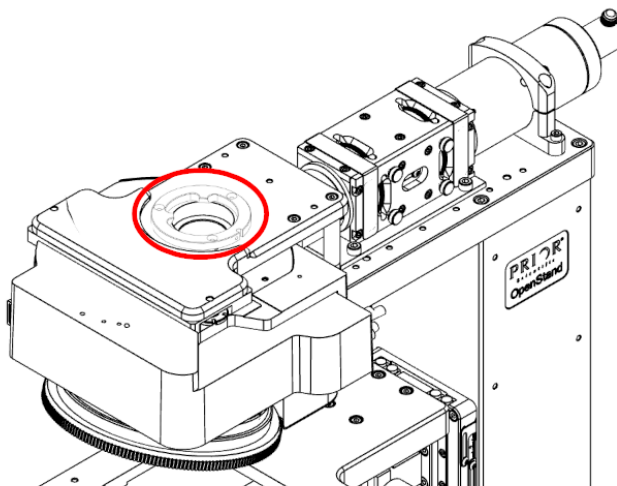
Installing a PF850/PF850M onto a Focusing Stage OpenStand

Part Number	Description	Quantity
LF335	LF522 (upper dovetail flange) and LF523 (lower dovetail flange)	1
T123	M3 X 10mm screw	3
T173	M3 X 6mm screw	3
T91	M3 x 6mm screw	1

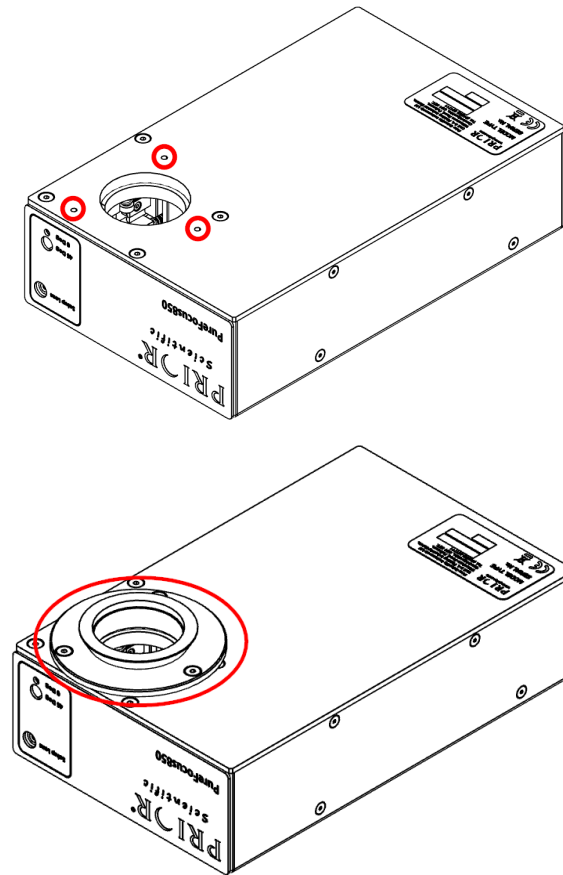
1. Remove the tube lens attached to any present filter turret.



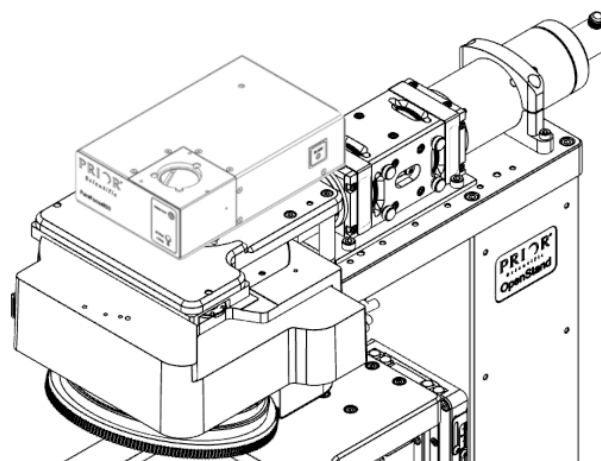
2. Attach the LF522 upper dovetail flange, from the LF335, to the same holes the tube lens was removed from.



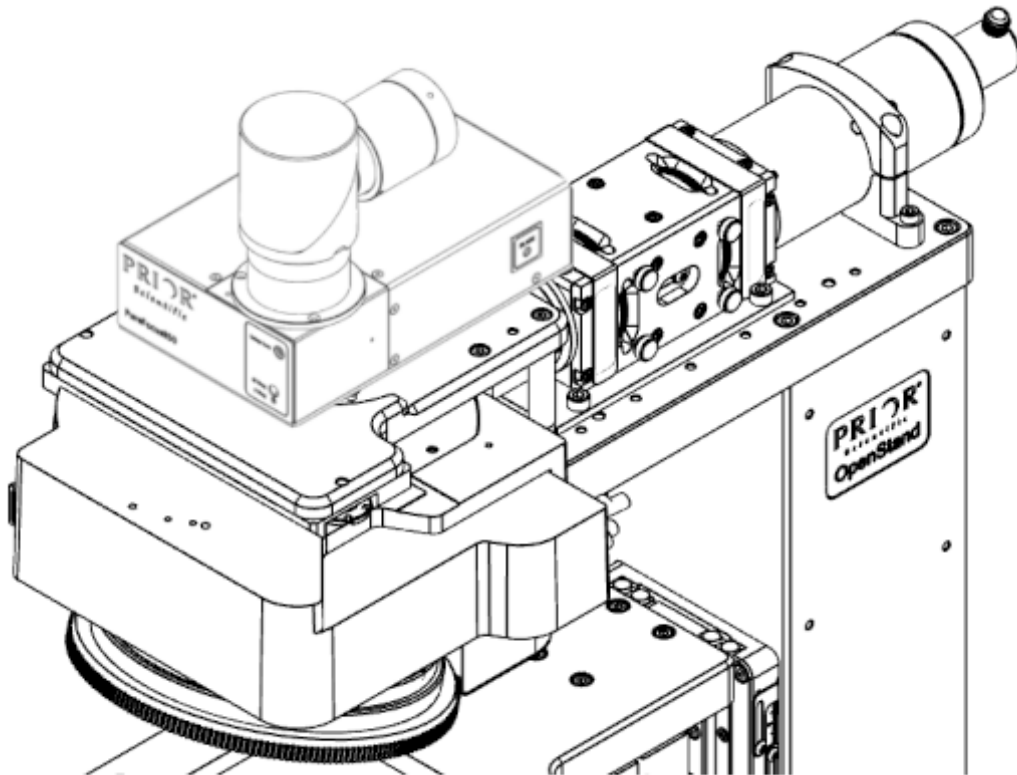
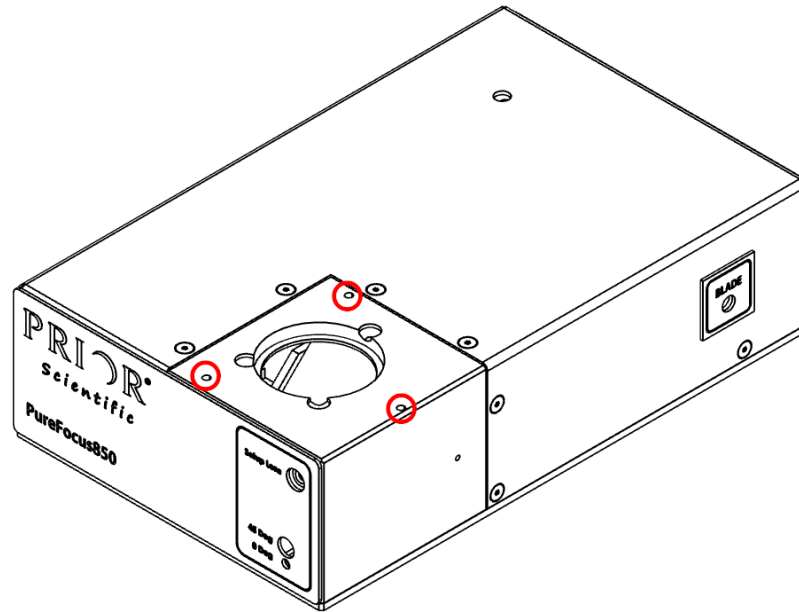
3. Attach the LF523 lower dovetail flange to the mounting holes on the underside of the PF850 head unit, ensuring the dovetail part is mounted outwards.



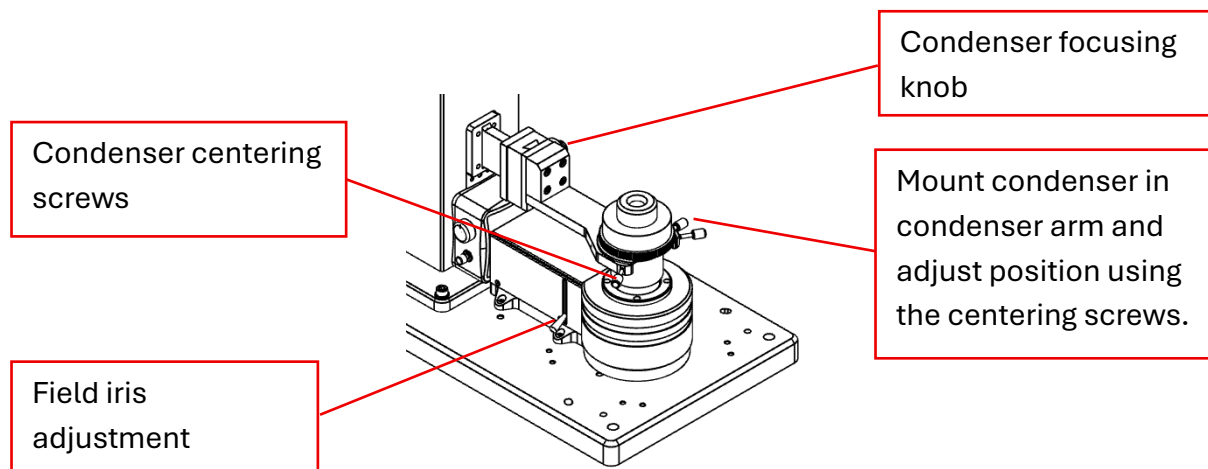
4. Connect the two halves of the LF335 flange, ensuring that the PureFocus head is mounted straight, relative to the light path, or at a perpendicular angle to it.



5. Remount the tube lens on top of the PureFocus head, using the three circled screw holes.

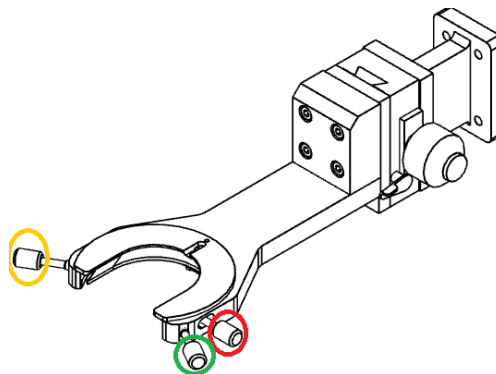


Fitting and Adjusting a Condenser on Upright OpenStand

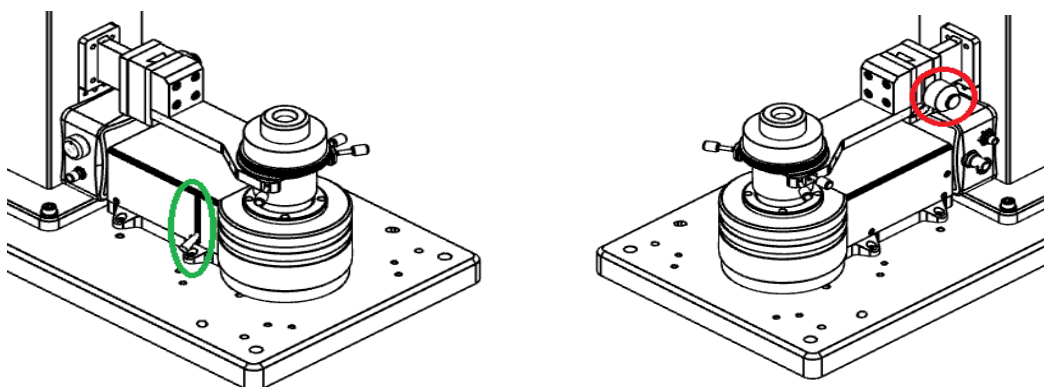


Setting Up Condenser Arm for Köhler Illumination – Transmitted Light

1. Mount the condenser onto the condenser arm. Use the thumb screw circled in red secure the condenser in position.



2. Adjust the condenser height (circled in red) so the top lens is just underneath the surface of the slide but not touching.

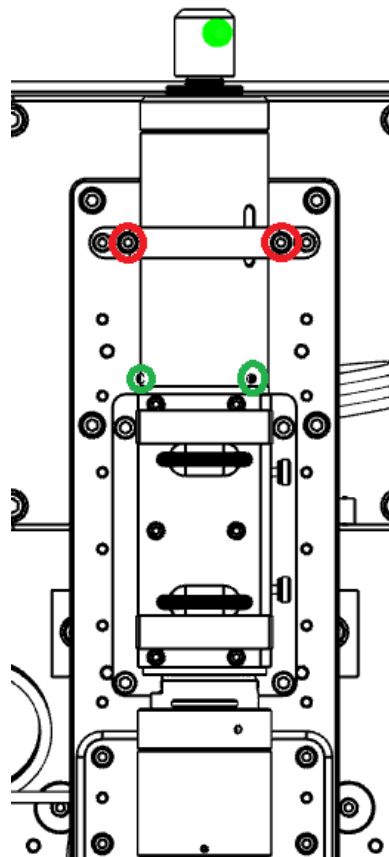


3. Switch on illumination and using a 10x objective focus on the sample.

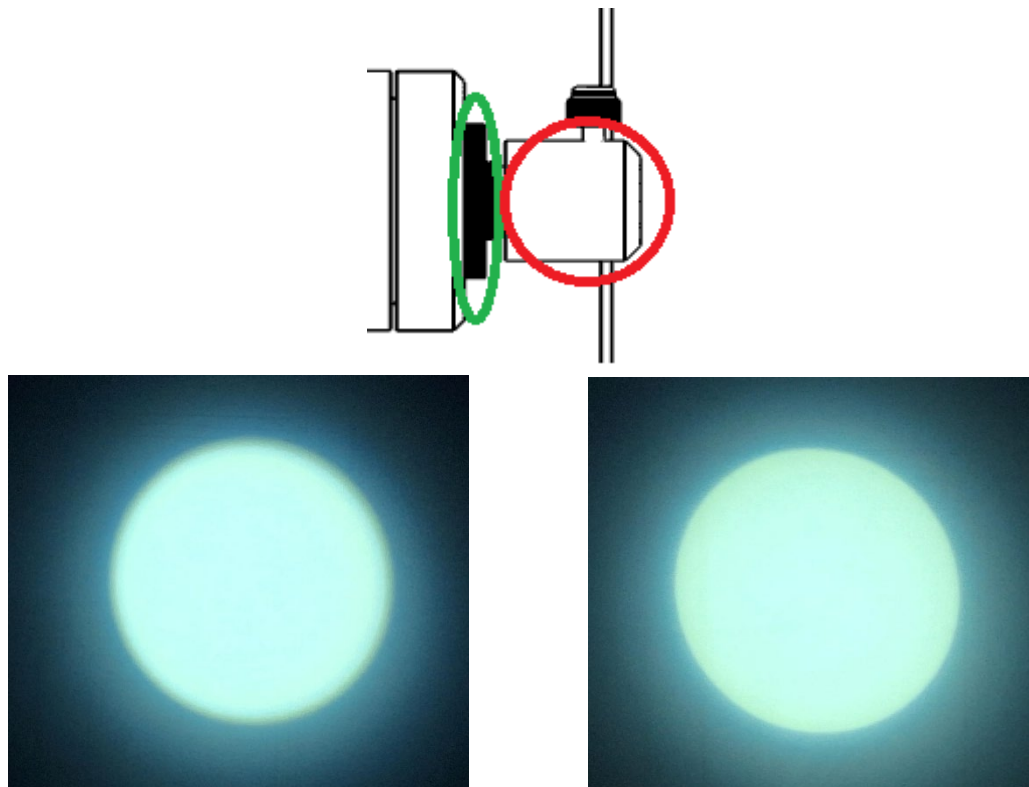
4. When the sample is in focus, close the field iris to 1/3 of the field of view using the lever on the side of the illuminator (as circled in green).
5. Adjust the height of the condenser until the edge of the field iris are in sharp focus.
6. Using thumb screws circled in orange and green to center the aperture of field iris.
7. Open the field iris until it's just outside the field of view.
8. Adjust the aperture of the condenser to 80% the NA of the objective i.e. 20x NA 0.75 adjust the condenser to read 0.6 NA.

Collimating Liquid Light Guide (required before setting up Köhler Illumination)

1. Remove the 2 screws circled in red. Remove 3 grub screws highlighted in green to remove the collimator from the OpenStand. 2 grub screws should be visible on one side and then rotate the tube slightly to reveal the last grub screw.



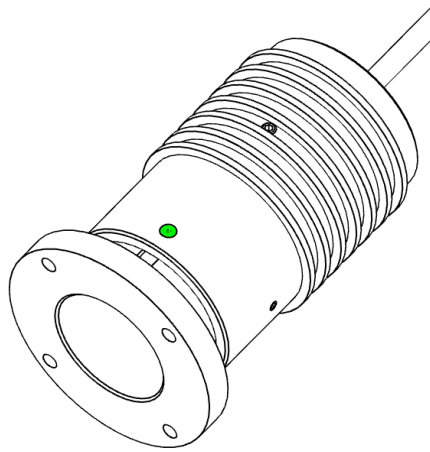
2. Firmly push the light guide into the aperture until it has reached the end-stop and tighten the thumbscrew (highlighted in green) to secure the light guide.
3. The illumination is collimated by adjusting the collimating optics by screwing the LLG holder (circled in red) and locknut (circled in green) in or out to focus the beam on a nearby flat surface. When the light is in focus screw the locknut fully to fix this position (circled in green).



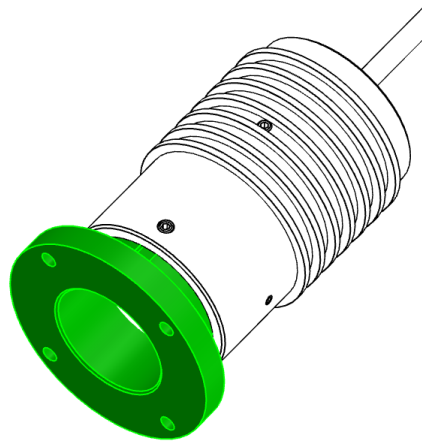
4. An example of LLG uncollimated (above, left) and collimated LLG (above, right) are shown. You should be able to see the edges of the light guide clearly.
5. Reattach the collimator back onto the EPI using the 3 grub screws.
6. The field stops and aperture stops will need to be optimized for Köhler illumination. Please follow the instructions below to set up the Köhler illumination.

LED Collimation

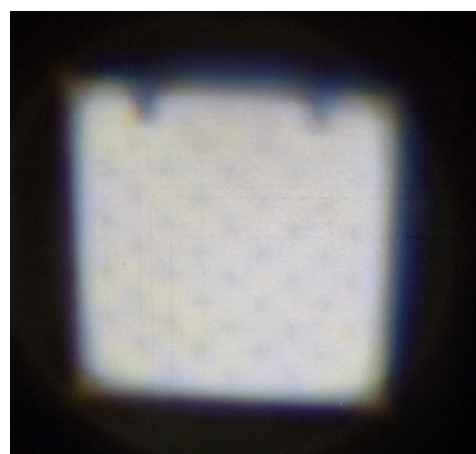
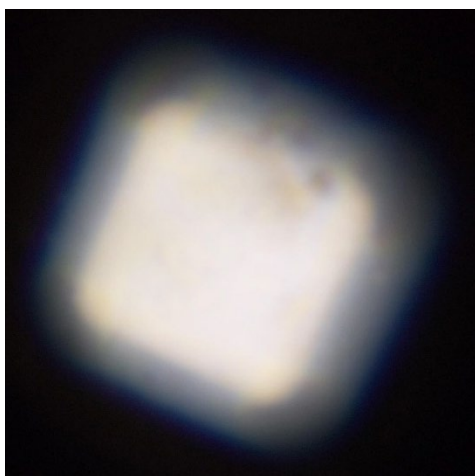
1. Before attaching the LED, connect the LED to the ProScan III controller using Prior terminal or Prior demo software to switch on the LED.
2. Darken the room and face the LED to a wall 5 feet away.
3. To collimate the LED, unscrew the grub screw on the LED slightly.

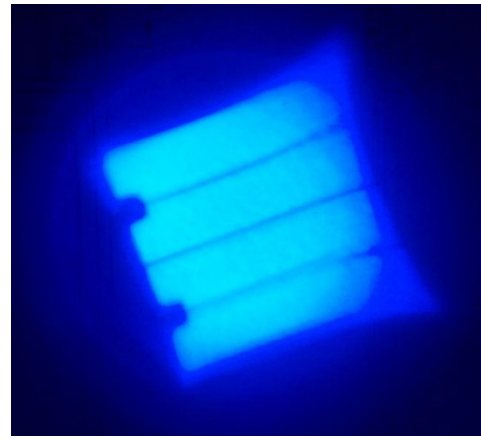
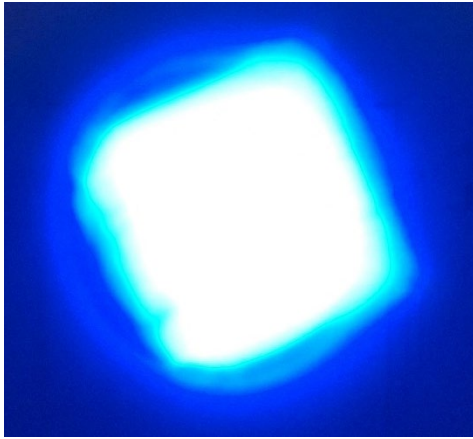


4. Move the sleeve in and out to bring the LED in focus. With a white LED you should be able to see the dots on the LED when the LED is focused.



5. Some examples of LED uncollimated LED (below, left) and collimated LED (below, right) are shown here.

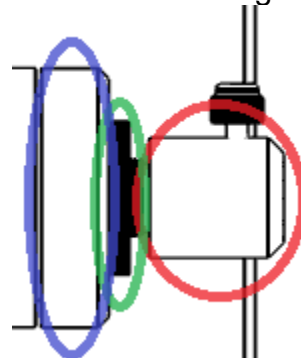




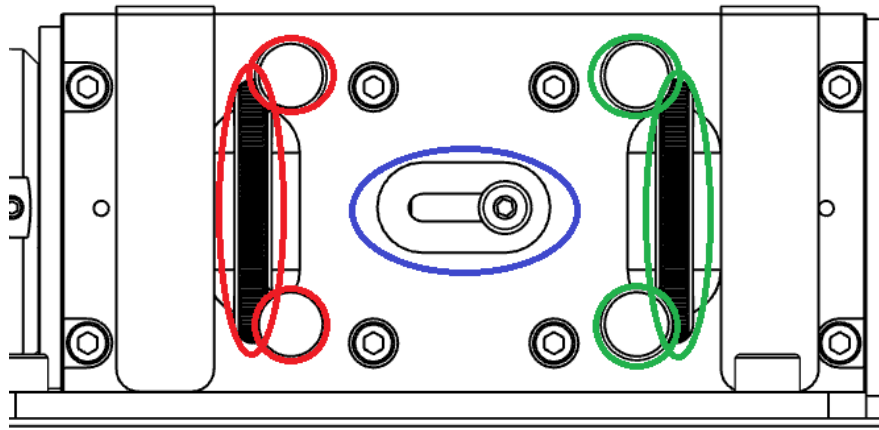
Setting up the Köhler Illumination on EPI

Please ensure the field stop / aperture stop adjustments are facing towards the table not the ceiling unlike upright OpenStand.

1. The liquid light guide illumination may not be centered in the aperture stop. To correct this, slightly release the black locking piece (circled in blue) of the collimator and the silver lock ring (circled in green). Now the silver lock ring can slide around and be used to center the illumination. Once finished, relock the two parts, being careful not to move the alignment.



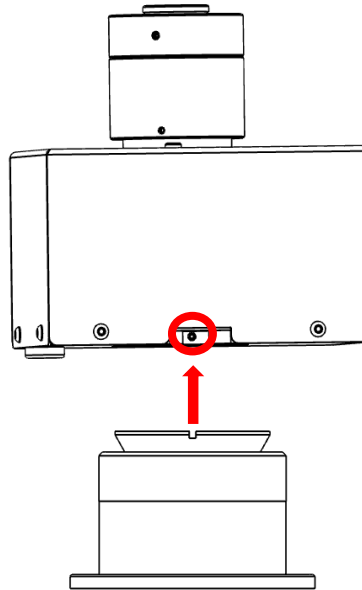
2. To adjust the aperture, stop (circled in green) you will need to see the back focal plane of the objective.



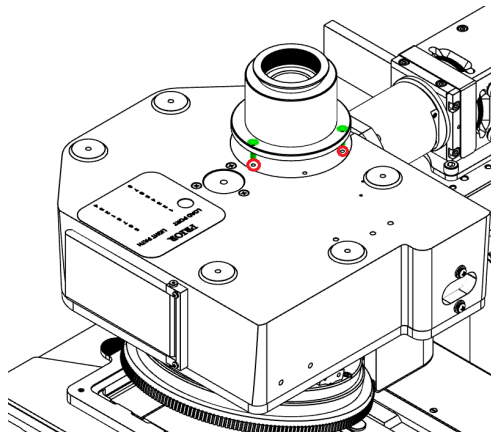
3. Remove one of your objectives and place a tissue paper or a target at the nosepiece aperture.
4. Adjust the aperture iris and center using two grub screws adjacent to the thumbscrew (circled in green).
5. If the aperture iris is not in focus, use the slider (circled in blue) to focus the iris.
6. Open the iris to 80% of the full aperture to give a contrast to the image.
7. Focus on the sample with the objective.
8. When in focus, adjust the field iris (circled in red). Stop down the iris using the adjusting ring so that the leaves of the iris are in view. Check that the iris aperture is centered.
9. If not, use the two-thumbscrew adjacent to the adjusting ring (circled in red) to center the iris in the field of view. Once centered open the iris until the leaves are just out of the field of view.
10. Köhlering has completed. Replace the objective.

Fitting and Aligning the Camera Changer

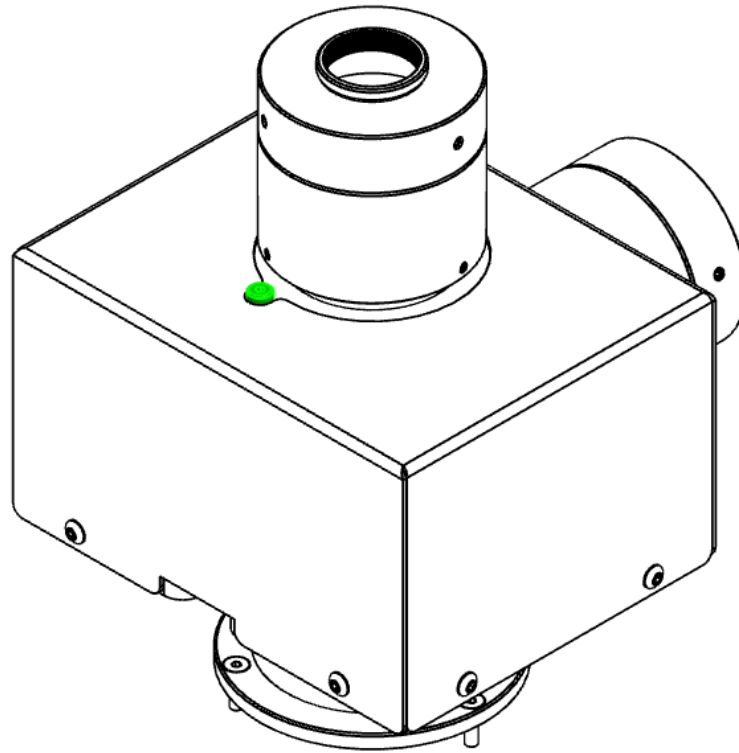
1. To fit the camera changer onto the OpenStand frame, unscrew the grub screw and lift the camera changer.



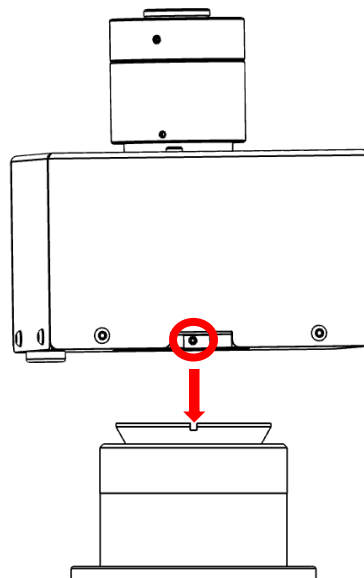
2. Fit the tube lens onto the OpenStand using 3 x M3 x 12mm countersunk screws.



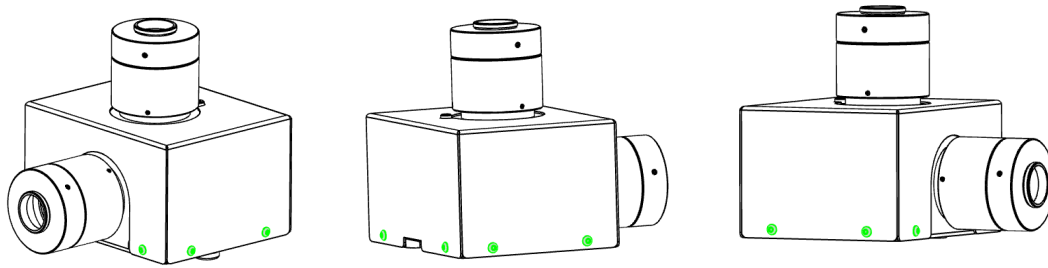
3. Unscrew the transit bolt on the camera changer (highlighted in green).



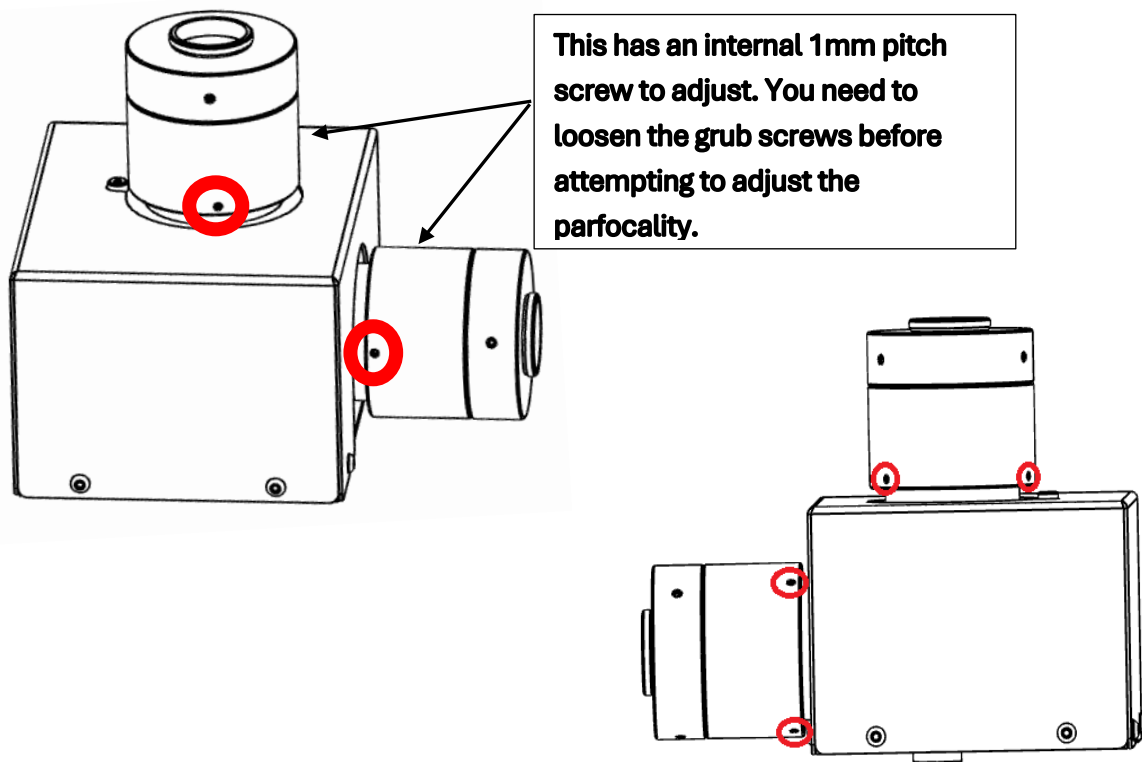
4. Fit the camera changer on top of the tube lens holder as shown in the picture below and tighten the grub screw (circled in red) to hold the camera changer in place.



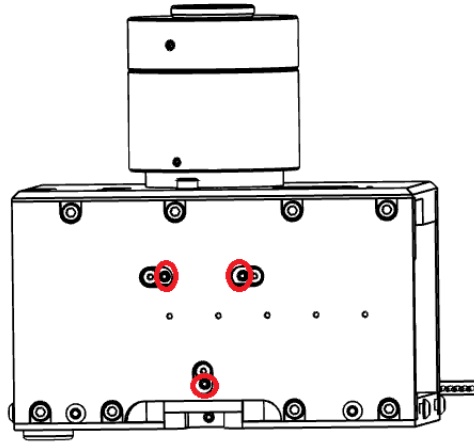
5. Before attaching the cameras remove the 8 screws around the camera changer as highlighted in the picture below. Once the cover is off, attach the camera.



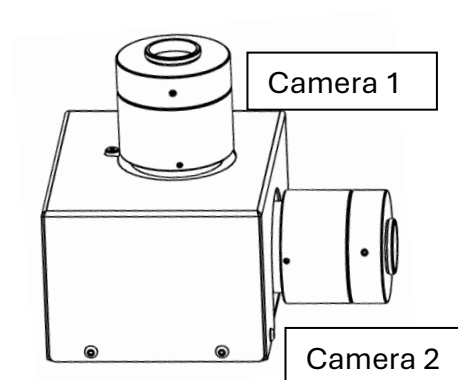
6. To adjust the cameras for parfocality, unscrew the 3 x grub screws around the C-mount (circled in red) in the picture below. Using the threaded pieces, you can adjust both the camera and screw the grub screw to secure it in place.



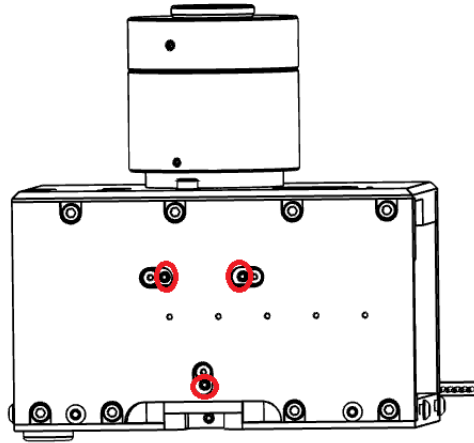
7. The 3 small black grub screws are used to adjust the cameras, so they are coaxial to each other. This procedure has been carried out in the factory, but it may require slight adjustments to suit your choice of cameras. We recommend using calibration slides, Graticule slides or similar to aid the camera alignments.



8. Choose the camera at the top (Camera 1). It is position 1 on the Camera changer.



9. Insert a Graticule slide onto the sample holder and focus on the slide using a 10x or less magnification objective.
10. On the camera application introduce crosshairs on the image. Find a unique reference point on the slide and center the image to the center of the crosshairs.
11. Change the camera changer position from position 1 to position 2. Now this will display an image from the camera at the back.
12. There should be a mirror image of camera 1 not fully aligned on camera 2. Introduce crosshairs on the image.
13. Using the 3 small grub screws adjust the position of the image so that the cameras are coaxial to each other. So that the unique reference point is centered on the crosshairs on Camera 2 similar to Camera 1.



Software Commands

Please refer to the ProScan III manual from Page 47 – 56 for commands to control the stage, OpenStand, filter turret, the transmitted LED illumination and the L200S unit. Prior Terminal software is available here (<https://www.prior.com/download-category/software>) as “64/32 Bit Prior Scientific DLL SDK”. Please select the download that fits your operating system’s bit and install the Prior software. To integrate the system into your own software please download Prior SDK - 2.0.0 from the website link provided above.

About Prior Scientific

Prior Scientific has manufactured precision optical and electromechanical equipment and instrumentation for over 100 years.

As the leader in the development of systems for precision motion control and microscope automation, we work closely with our partners and customers to develop customized optical and automation systems as well as providing a wide range of standard microscopy components.

We partner with system integrators and OEMs to develop prototypes, custom-built products, and complete imaging system solutions according to individual customer requirements for a variety of applications. Our integrated design and manufacturing facilities enable us to seamlessly transition from concepts to production systems. Typical applications for our products are found in photonics, life science research, material science, nanotechnology, medical devices, metrology, and semiconductor manufacturing.

Our mission

We understand that every problem requires a unique approach. Our team works closely with customers and partners to identify their specific needs and design a cost-effective and tailored solution that meets their unique requirements. We continue to push scientific boundaries and constantly build on and improve our expertise in automated precision optical and mechanical systems.

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