MULTICAM

VERSION: AUG 2017 (SN 7072 - PRESENT)

The MultiCam is a powerful and stable device for pixel aligning images captured using different wavelengths, polarization states, fields of view or other imaging modalities onto up to four camera sensors. It is designed to meet the most demanding requirements for the sub-pixel mapping of Super Resolution imaging and is compatible with most scientific C mount and F mount cameras.

Please contact us if you require any assistance during setup or use (Tech@cairn-research.co.uk).

For the purpose of this Quick Start Guide, please refer to the MultiCam diagram on Page 3. All words in **bold blue** text are labelled on this diagram.

A) Mounting to your microscope

1. Connect the MultiCam to your existing 1x camera c-mount.
2. If using an inverted microscope, three support jacks are normally supplied to support the weight of the unit. Position the support jacks in the **jacking point** on each output. The height can be adjusted and locked in position with the blue locking collar.
3. Remove the **C-mount camera tube** and protective **dust cap**. The **clamping screw** may need to be loosened (using the 2.5mm allen key provided)
4. Screw each camera onto the **C-mount camera tube** and replace on each arm of the MultiCam with the **calibration ring** still in place.

B) Mounting and positioning four cameras

1. Identify the **transmitted port (1)** on the MultiCam diagram
2. View a live image on the corresponding camera (ideally of a graticule using transmitted light) on the transmitted port. For initial setup, it is essential to be able to view all four edges of the rectangular aperture, therefore it is not advisable to use a fluorescent sample at this stage.
3. Close the **rectangular aperture** until in view on the image and rotate the camera until square.
4. Lock off the **clamping screw**
5. Insert the calibration cubes (each containing a 50% mirror) into the three **combiner cubes** by removing the magnetic **door covers**. Magnets will ensure the cube locates correctly.
6. Repeat steps 1 to 4 on the remaining camera ports.
7. If the sample focus on any of the other cameras is not precisely matching the focus of the transmitted camera, an adjustment is provided (to allow for any slight differences between positioning of the camera sensor). Remove the **calibration ring** and move the camera in Z until focused. Lock off the **clamping screw** once again.

C) Centre the transmitted image

1. With the **rectangular aperture** still in view, centre the **transmitted port (1)** (using the 1.5mm allen key provided) by adjusting the **transmitted H&V** controls. It's useful to use a centred square or central cross-hair as a reference point in your imaging software (if available).

D) Centre the remaining images

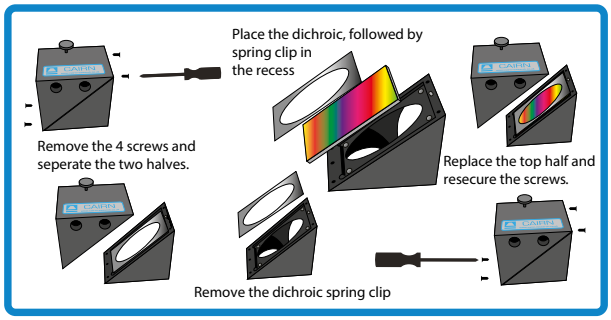
For the remaining images, an additional method of XY alignment on the three **combiner cubes** allows fine adjustment of the position of each image for precise pixel alignment in your imaging software.

1. Identify **port (2)*** and **combiner cube (1)**
2. With the **rectangular aperture** still in view, centre the image on **port (2)** (using the 1.5mm allen key provided) by adjusting the **H&V controls** on **combiner cube (1)**
3. Similarly, centre the camera on **port (3)** with the **H&V controls** on **combiner cube (2)**
4. Finally, centre **port (4)** with the **H&V controls** on **combiner cube (3)**
5. Note all the reflected images will be mirrored and will need to be flipped in your imaging software if overlaid.
6. Replace the calibration cubes with populated filter cubes for multi-channel imaging (see section E).
7. Open the **rectangular aperture** to slightly larger than the camera(s) field of view to minimize scattered light.

* MultiCam units may also be supplied with three output ports as an option, with upgrade potential for a forth camera. If so, port 2 will be absent, however, alignment steps for all other ports remain the same.

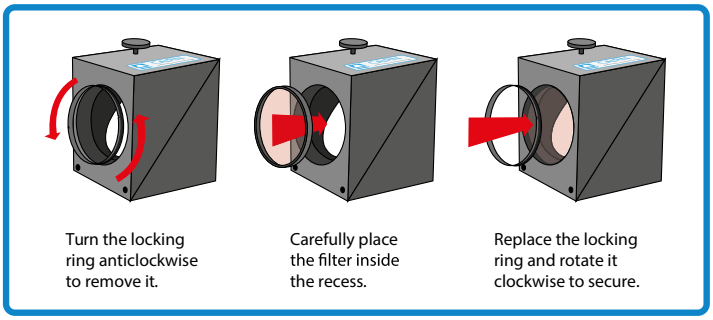
E) Filter cube assembly

Often MultiCam units are supplied with populated filter cubes, however (if required), these can be installed using the guidance notes below. Please note for all our emission splitter range we only recommend Chroma Ultra-Flat 2mm dichroic mirrors to minimise distortion. Please let us know if you require any filter assistance.



Installing Dichroic Mirrors into the Cairn Filter Cube

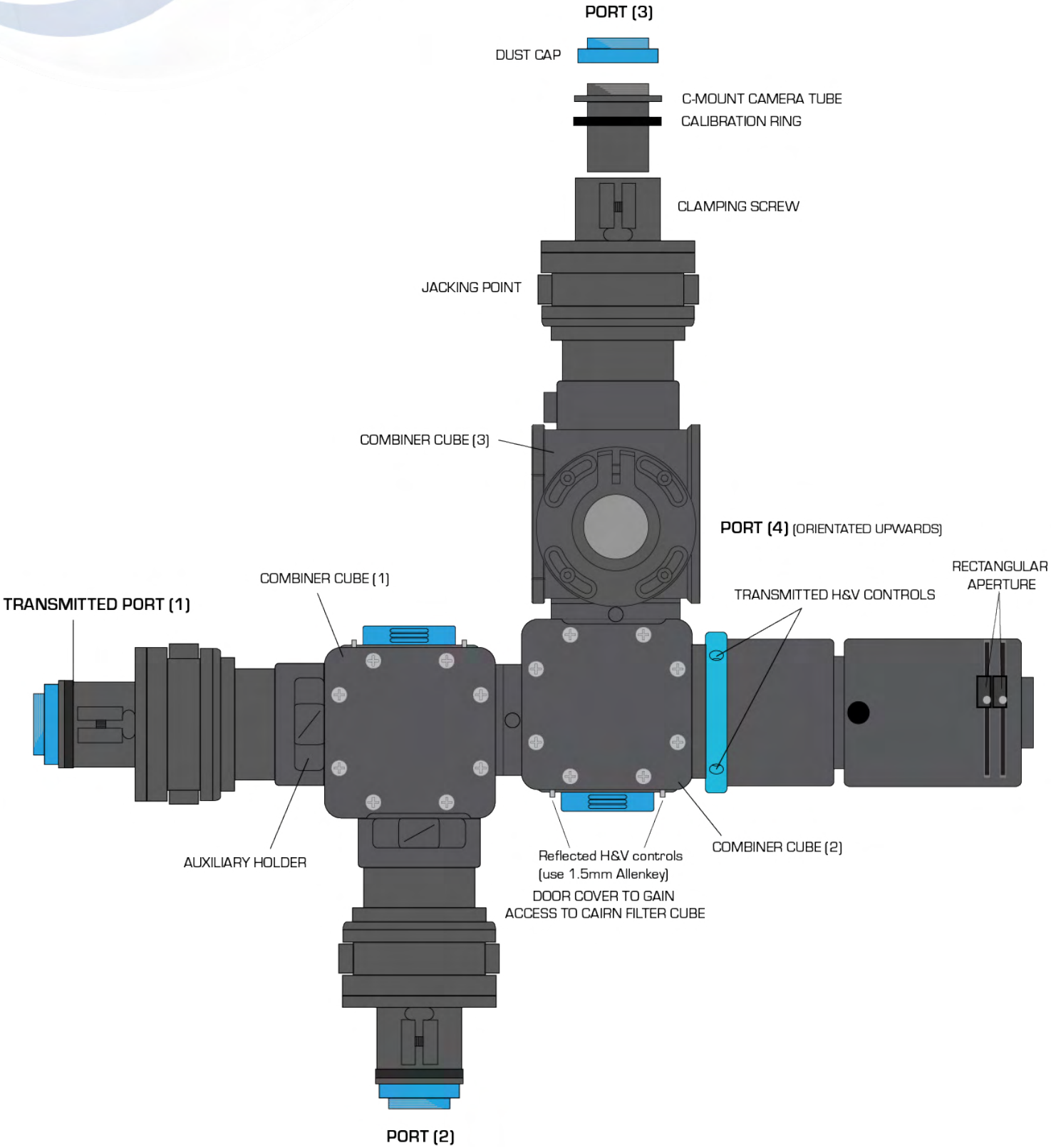
Please consult filter manufacturers instructions regarding orientation of the filter.



Installing Filters into the Cairn Filter Cube

F) Auxiliary component mounts

In addition to the two positions in the filter cube, there is also an **auxiliary holder** on each camera output port to accommodate interference (bandpass) filters, long pass filters, ND filters, rotating polarisers, cylindrical lenses or Z-plane shifting lenses. The holders supplied with the unit have an angled thread (indicated by angled line on the top) to avoid back reflections from filter surfaces, however if using lenses or a polariser, then a flat holder is required. These can be purchased separately.



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