

# iolight

Precision Microscope Model 1

## USER GUIDE

Thank you for purchasing the ioLight microscope, we very much appreciate your support.

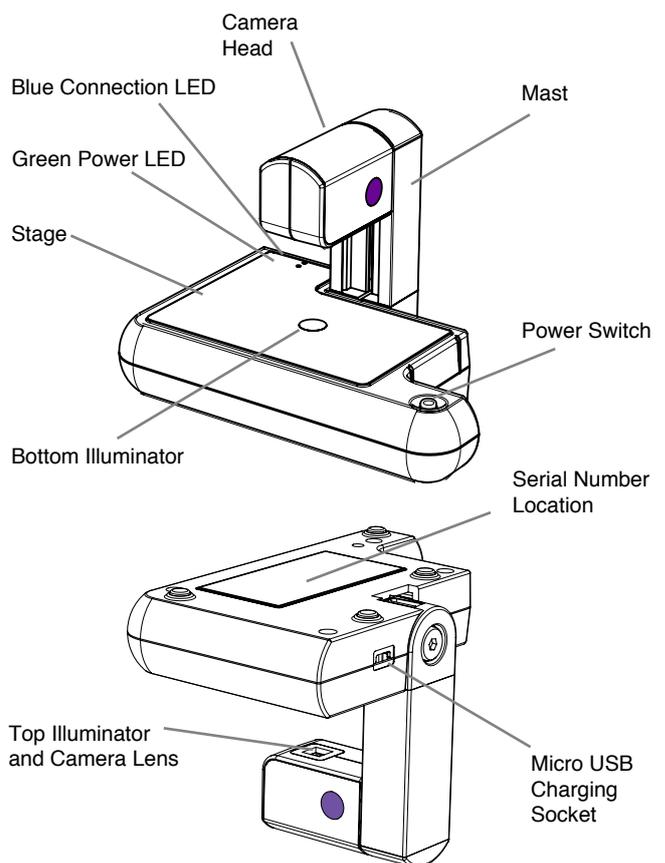
Do contact us on [info@iolight.co.uk](mailto:info@iolight.co.uk) if you have any problems or questions.

## BEFORE YOU START

The current version of the ioLight microscope needs an Apple® iPad® running iOS 8.1 or higher. iPhone® will currently not work with the microscope. Go to the app store and download the ioLight app.

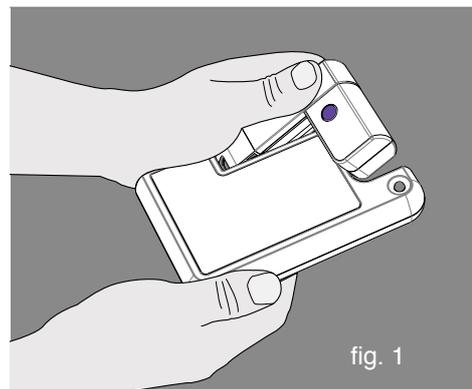
It is a good idea to charge the microscope using its micro USB socket before its first use. You could use any USB charger, but we have included one that is tested to work efficiently and safely with the ioLight microscope. You can use the microscope while it is charging.

## MICROSCOPE ANATOMY



## CONNECTING THE MICROSCOPE TO THE IPAD

1. Unfold the mast to the vertical position (fig1)
2. Press and release the power button. The blue LED will flash when the microscope is ready to connect to the iPad. The bottom illuminator may also come on briefly. If you do not see the blue LED, try charging the microscope by connecting the ioLight USB charger.
3. Switch on the iPad.
4. Once the blue LED on the microscope is flashing, you can connect the microscope to the iPad. Tap the settings icon. If you do not see this press the iPad's HOME button.
5. The microscope makes its own Wi-Fi network. Tap the settings icon and Scroll to the top of the settings menu, Tap on WiFi.
6. Wait a minute or two for the iPad to scan WiFi networks and find the ioLight microscope.
7. Select ioLight xx xxx (the serial number of the microscope which is printed on the bottom of the microscope).
8. When the microscope is connected you will see ioLightxx with a blue tick against it under the WiFi connections on the iPad settings page.
9. Tap the HOME button to return to the home screen.



## YOUR FIRST IMAGE

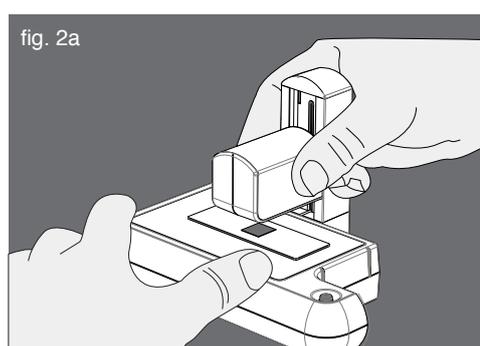
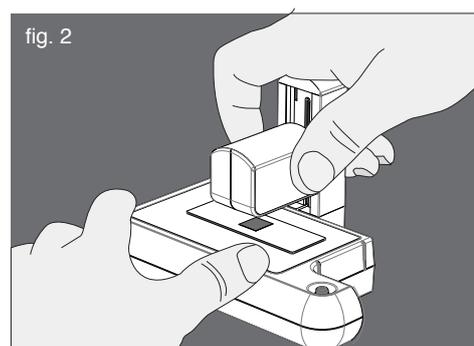
1. Place your sample on the stage aligned over the bottom illuminator. It is easiest to look at samples that are flat, so for thin samples you might find it helpful to place your sample on a microscope slide and place a cover slip on top.
2. Open the ioLight app. You may see a button marked 'Connect to ioLightxx', tap this. If the microscope is not connected, tap on Settings and repeat the connection procedure above.
3. The top and bottom illuminators may come on and the blue LED should stop flashing. You will see an out of focus image on the screen. You can test that the image is live by waving your hand between the camera head and the stage, and watching the image on the iPad change.

## YOUR FIRST IMAGE (continued)

4. To focus the microscope gently slide the camera head down the mast, until the image is in focus. This will happen when the lens is about 2mm above the sample.

The purple buttons release brakes on the slide so you can press these to change the amount of force needed to slide the camera head. Fig 2 shows the hand position we find easiest for focusing.

5. You may want to use the fine focus adjustment bar on the right hand side of the iPad screen. Tap the white triangle button in the centre of the scale to set the focus in the middle of its range before you start. You can then find approximate focus by moving the camera head to about 2mm above the sample, then getting a more precise focus by 'stroking' the fine focus adjustment bar on the iPad up and down



## WHEN YOU HAVE FINISHED

1. Turn off the microscope by pressing in the on/off switch and holding it until the blue light goes out. This may take 10 seconds or more.
2. Charge the microscope's battery by connecting the charger to the USB socket. The green LED indicates that the microscope is charging. Don't forget to charge your iPad too.
3. Remove any dirt or liquids from the microscope body using a damp or dry cloth.
4. Don't clean the lens unless it is clearly dirty since cleaning risks scratching the lens. If you do need to clean the lens use a fresh cotton bud dipped in cleaning alcohol. Clean gently to avoid scratching.

## EXPERT TECHNIQUES

1. The microscope includes top and bottom illumination for your subject. These are controlled by the two icons in the middle of the left hand side of the screen. Tap on one of these icons to adjust each illuminator from 0 (off) to 4 (full). In general the bottom illuminator gives the best images for transparent samples (for example biological slides) and the top illuminator gives the best images for opaque samples (for example pebbles or printed circuit boards). We recommend that you experiment using the top and bottom illustrators together at different settings to get the best image.

## EXPERT TECHNIQUES (continued)

2. You can capture an image or video by tapping one of the icons in the bottom left corner of the iPad screen. The images will be saved to the iPad's photo gallery. Disconnect the iPad from the microscope WiFi and connect to the internet to share the images, just as you would with any photograph or video.
3. The resolution of live video can be switched between 'high' and 'standard' using the following process:
  - Open 'Settings' on the iPad.
  - Scroll to the bottom of the settings menu on the left hand side of the screen and select the ioLight app.
  - Turn High Resolution on or off as required..
  - Tap the home button on the iPad to go back to the home screen and select the ioLight app.
4. The resolution of the still images is even higher, using the full 5MP capability of the camera compressed to give a smaller file without significant loss of resolution.  
To see the finest detail save the image and then open it in the camera roll to get the highest resolution. This extra resolution also allows you to zoom in on the image to increase the magnification even more. Using this digital zoom magnifications of x400 or more are easily achievable without visible deterioration of the image.

## TROUBLESHOOTING

Problem	Try this
I can't find my sample !	Move the head to the top of the mast and position the sample so that it is centred on the bottom illuminator. Then move the head down to get the best focus.  Like laboratory microscopes, the depth of focus is narrow, so you can miss your sample if it is not properly focused. Check that you are not focusing on the top of the cover slip or the bottom surface of the slide. Check that the head is not touching the slide.
Image freezes, is jumpy or pixilated and difficult to focus	This can happen in high resolution mode where several other Wi-Fi networks are present. Try moving away from Wi-Fi networks (perhaps to a pond or jungle for some interesting samples).  Switch to standard resolution mode, This transmits less data and is less susceptible to interference - see Expert Techniques
Blue connection LED is flashing	This means that the video stream has stopped. Open the ioLight app to start it again.
Image completely black (black cat in a coal cellar!)	Check that one or both of the illuminators are switched on. The bottom illuminator will not help with opaque samples.  The current version does not work on opaque shiny surfaces, like polished rocks or metals. If the surfaces are rough or textured, you should see a really good image with the top illuminator. Position the camera head about 2mm from the sample, so the light from the top illuminator can get to the sample.

