Arclight Holo

Binocular Indirect Ophthalmoscope (BIO) User Guide

University of St Andrews

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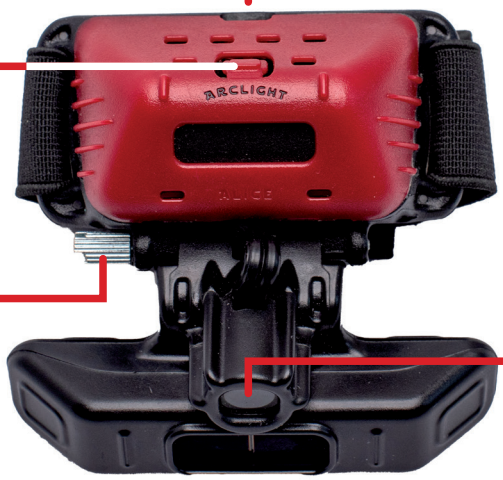

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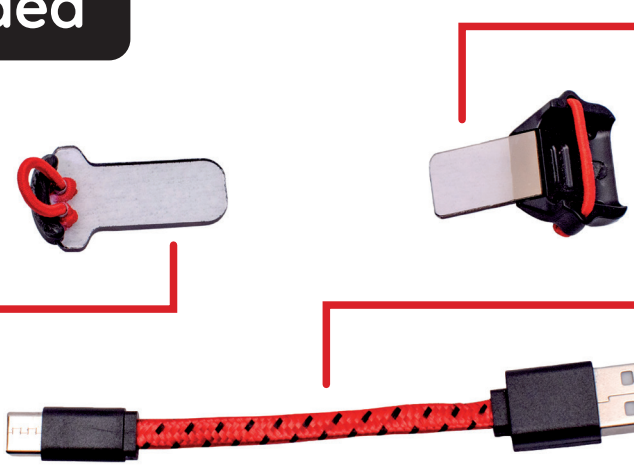


LED light

The Holo uses a ‘warm’ white light which is lower in blue or shorter wavelengths. This aids patient comfort and renders eye tissues accurately and evenly.

- There are five brightness settings. The device starts on the lowest setting. Press the raised button on top of the device to switch on and increase brightness.
- Check brightness by shining the light on your hand before examining the patient.
- The light turns off automatically after 120 seconds to save the battery and reduce heat.

Adjust the brightness to suit the examination you’re about to perform. With infants, begin on the lowest illumination. Gradually increase brightness, until you see enough detail, without causing discomfort to the patient. You will quickly find what works best for you and your set up.

Charging

For an initial full charge, connect your Holo to a USB power supply for a few hours. The green LED will turn off once the device is fully charged.

A quick charge for a few hours of use only takes 20 minutes via USB or 3-4 hours via the solar panel in direct sunlight.

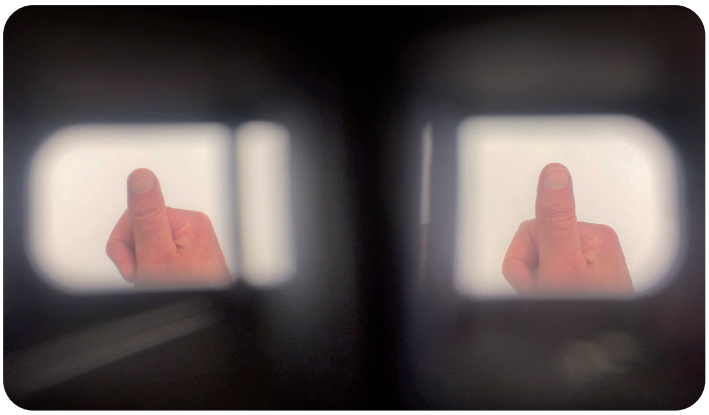
- A green light near the solar panel indicates charging.
- A USB-C charging cable is included.

Positioning the Holo

The headband is elastic. Adjust by pulling the strap through the buckle to achieve a snug fit.

- Position the Holo centred to your nose.
- Bend the eyepieces over your eyes at 90 degrees to line of sight.
- The foam pad should sit between your forehead and the device. You can remove the pad if you prefer the Holo closer to your eyes. The gap created by the pad can give space for both your nose bridge or any spectacles.
- Steady the device on your head with one hand, then pivot the eyepieces to align with your natural line of sight when looking down slightly. This will be at roughly 90 degrees.

Once in position, check alignment by looking at your outstretched thumb at arm's length. Check it appears in the centre of each field by closing one eye after the other.



Fixed IPD

The Holo has fixed prisms which makes it mechanically less complex than orthodox instruments. Users with inter-pupillary distances (IPD) from 55–68mm should have no trouble getting a stereo view. If your IPD is narrower, removing the foam pad brings the eyepieces closer to your eye.

Portability

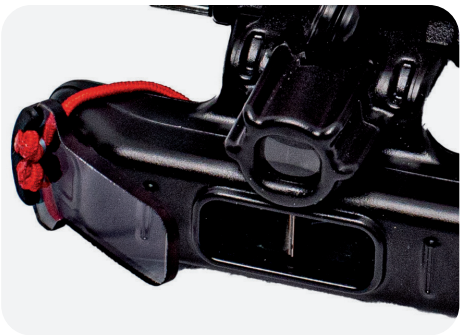
Weighing only 97g, the Holo is light and small enough to be carried in a pocket or in the palm of your hand.

The Holo can also be worn around your neck in between examinations or when speaking with the patient. The adjustable elastic headband allows for quick and comfortable fitting and removal.

Maglens

The maglens provides an extra +3.00D for magnification. When combined with the integral +2.00D eyepieces and a condensing lens, a more zoomed in detailed view of the fundus can be achieved. For instance, a +20D lens combined with the Maglens gives the equivalent view with a +14D lens. This is useful for seeing new vessels or exudate in those with diabetic retinopathy.

Without the condensing lens, the Holo with maglens becomes a hands-free binocular anterior segment loupe for lids, cornea, sclera, conjunctiva and iris examinations.



Using the Maglens:

- Slide the red elastic loop over one side of the prism body.
- Ensure the red knots face outwards until covering the exit window.
- It can be attached from either side.
- Slide it on for detailed viewing and off when not needed.
- Push it aside so the elastic remains around the eyepieces without blocking the viewing window.

Teaching mirror

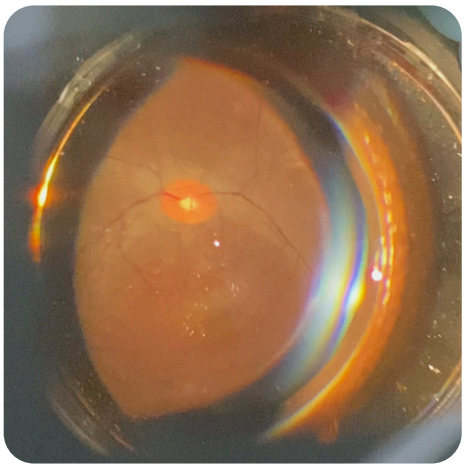
This mirror lets an observer see a monocular view of the examiner's full binocular view. It is ideal for teaching and learning the basics of live examinations.

A teacher can use the mirror to demonstrate the view through the Holo or to check if a student is using it correctly.

The 50:50 mirror allows half of the light through while reflecting the other half. This can make the image appear duller, so the observer should stand at 90° to the line of sight for a clearer view.

Attaching the teaching mirror:

- Slide the red elastic loop onto one side of the prism body
- Ensure the red knots face outwards
- The mirror should clip into position at 45° to an exit sight hole
- The teaching mirror can be attached to either side.



Condensing lens

You need to use a hand-held condensing lens to see the fundus with the Holo. We can provide the most commonly used lens powers of +20D and +28D.

Different lenses create different fields of view and different degrees of magnification:

Lens	Magnification	Field of view
+20D	X3.00	46o
+28D	X2.27	56o

+20D is an excellent ‘general purpose’ choice and is widely used for examining adults and screening for diabetic retinopathy.

+28D lenses with their wider field of view are commonly used for paediatrics and especially retinopathy of prematurity screening.

Condensing lenses are aspheric lenses with one side more curved than the other. This means the orientation of the lens is important. To get the best view hold the lens with the flatter side facing the patient. In the lenses we supply this means holding the lens with the ridged edge towards the patient.

Patient preparation and environment

When using the Holo for fundoscopy it is best to dilate the patient's pupils. If indenting, topical anaesthetic can improve comfort. A dim examination room will maximise contrast.

The patient can be sitting upright but better in a reclining chair or most preferably lying down.

Fundoscopy

- Select your preferred light setting
- Hold the condensing lens at a comfortable arms-length (~40cm) distance.
- Lift the upper eyelid and brace fingers on the patient's face with one hand.
- Align the light beam, lens and patient all together to maximise the view.
- Adjust the condensing lens in response to the fundal view until it looks in focus.

Throughout the examination, ensure the patient's eye is in line with the light beam and condensing lens. Shadows on the edge of the view usually mean that one of these is incorrectly aligned. Slight tilting of the lens can avoid unwanted glare.

To see other areas of the fundus and the periphery ask the patient to look in different directions. If the patient struggles, try a fixation target, such as the patient's own finger or thumb held at arm's length. Ask them to look at that and move its position to suit where you want them to look.

Cleaning

The Holo is easy-to-clean and disinfect by wiping the surfaces with alcohol wipes or a 70% alcohol solution.

The device's smooth surfaces allow for easy cleaning. However, avoid rough actions on optical surfaces and do not immerse the Holo in liquid.

- The Maglens and Teaching Mirror can be briefly immersed and agitated for deep cleaning.
- Dust should be removed by blowing then wiping away with a lens cleaning cloth or cotton wool buds.

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This guide is not a substitute for proper study and training. Use clinical judgment: minimise light intensity and exposure. Disinfect by wiping surfaces with alcohol. No user serviceable parts. Avoid fluids or flammable gases, using force, exposing to high temperatures or use if damaged.

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