



Miles Research

Biometric Imaging



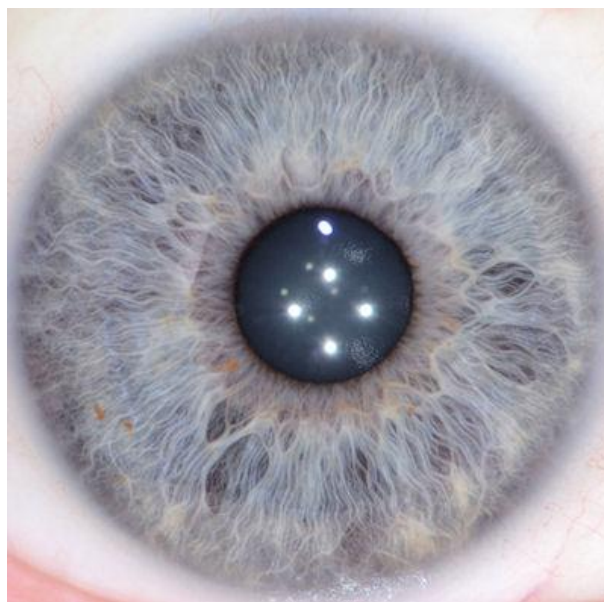
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Choices in Iris Cameras: Illuminator Comparison

You basically have a choice between **simple central lighting** (the **HCB**=Hood-Mount Coaxial Biometric illuminator) and the more **complex side-lighting** (the **ASL**=Adjustable Side-Lighting Illuminator). For simplicity, go with the HCB illuminator. For more control and versatility, select the ASL illuminator. The ASL illuminator takes more time to use and adjust for each iris lighting condition, however you can just leave both lights at the standard 45-degree position and not do any adjustments, other than switching between right, left or both sidelights. Likewise you can set them to 20 degrees for near-central lighting. A kit with both illuminators is also available. For more in-depth info, see User Guide.

Here are the choices for the camera (most popular options):

- ASL** Adjustable Side Lighting Illuminator
- HCB** Hood-Mount Coaxial Biometric Illuminator
- CSL** Central and Side Combo Lighting Illuminator
- SAL** Single Adjustable Lighting Illuminator
- SCL** Single Central Lighting Illuminator



The first two options are the most common.

There are **two basic choices** today –

- **HCB** (Hood-mount Coaxial Biometric), which provides the most uniform illumination and is optimized for image measurement
- **ASL** (Adjustable Side Lighting), which serves all side-lighting needs

HCB -- Hood-Mount Coaxial Biometric Illuminator:



The overall best go-to solution for routine clinical iris imaging is one of the central lighting illuminators. Currently, the recommended solution for central lighting is the **Hood-Mount Coaxial Biometric Illuminator (HCB)**. This unit allows for maximum user simplicity and maximum image uniformity. It is ideal for biometrics or where you need to estimate the relative brightness of iris regions. Since the lighting is coaxial, the brightness is very uniform and this is also ideal for clinical applications. The HCB is very simple and you just point and shoot. The reflection patten is a tight grouping of the four reflection dots usually inside the pupil area so the iris can be 100% visible.

The HCB is \$200 less than the ASL kit. These kits include as the standard camera the 24-megapixel Nikon D3200, along with a zoom lens (18-55mm VR) and the macro lens and a second battery for the camera. Illuminator systems can be made for some other non-Nikon camera/lens..

HCB kit:



Advantages of the hood-mount HCB illuminator over the lens-mount version (LCB):

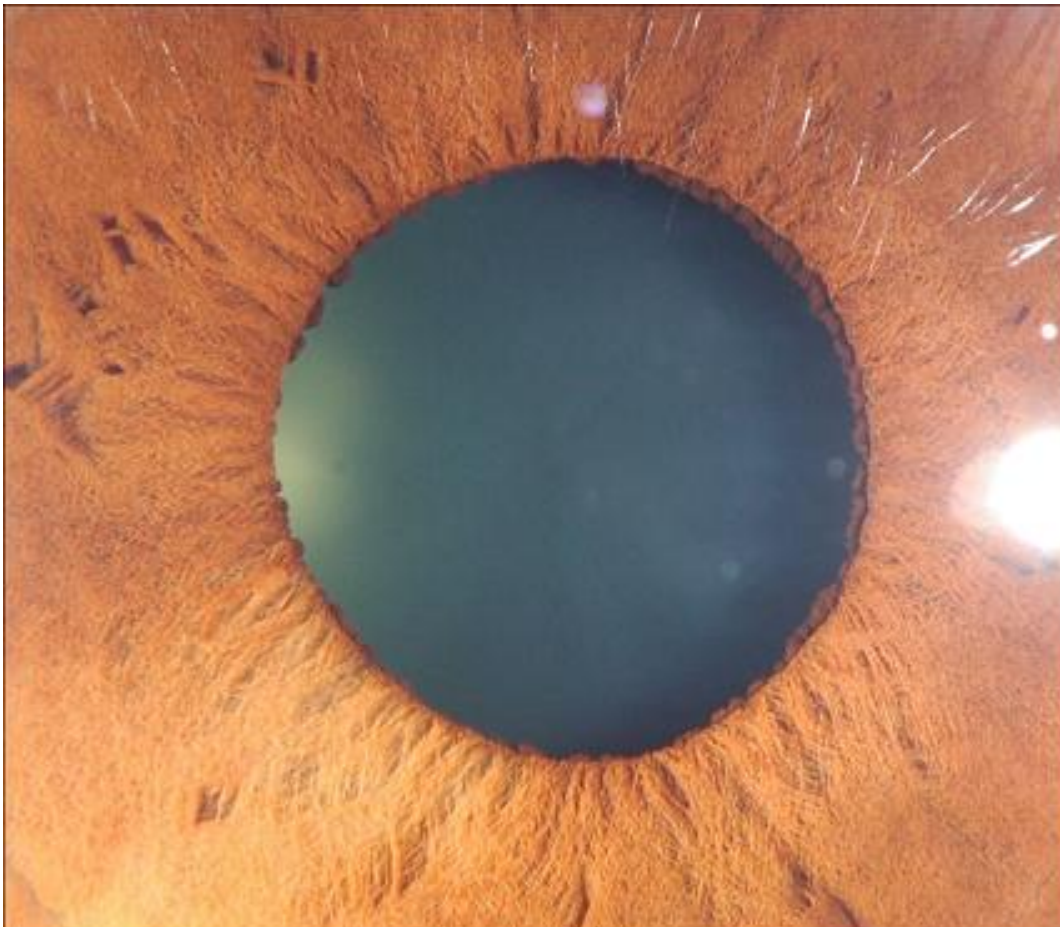
1. Inexpensive – better value
2. Simple – Quick setup
3. Lightweight – easier to hold (6oz for Hood-Mount vs. 11 oz for Lens-Mount)
4. Compatible with ASL illuminators – can switch illuminators easily (more options)
5. Small lighting angle (12 degrees vs. 14 degrees for LM)
6. Good working distance (3 inches vs. 1.5 inches for LM)
7. the Hood-mount creates a smaller reflection and is more likely to be entirely in the pupil
8. Works better with autofocus
9. Non-permanent attachment
10. Can use macro lens for other imaging
11. Smaller carry case available – easier to carry or transport
12. Best camera for horse or other animal iris imaging

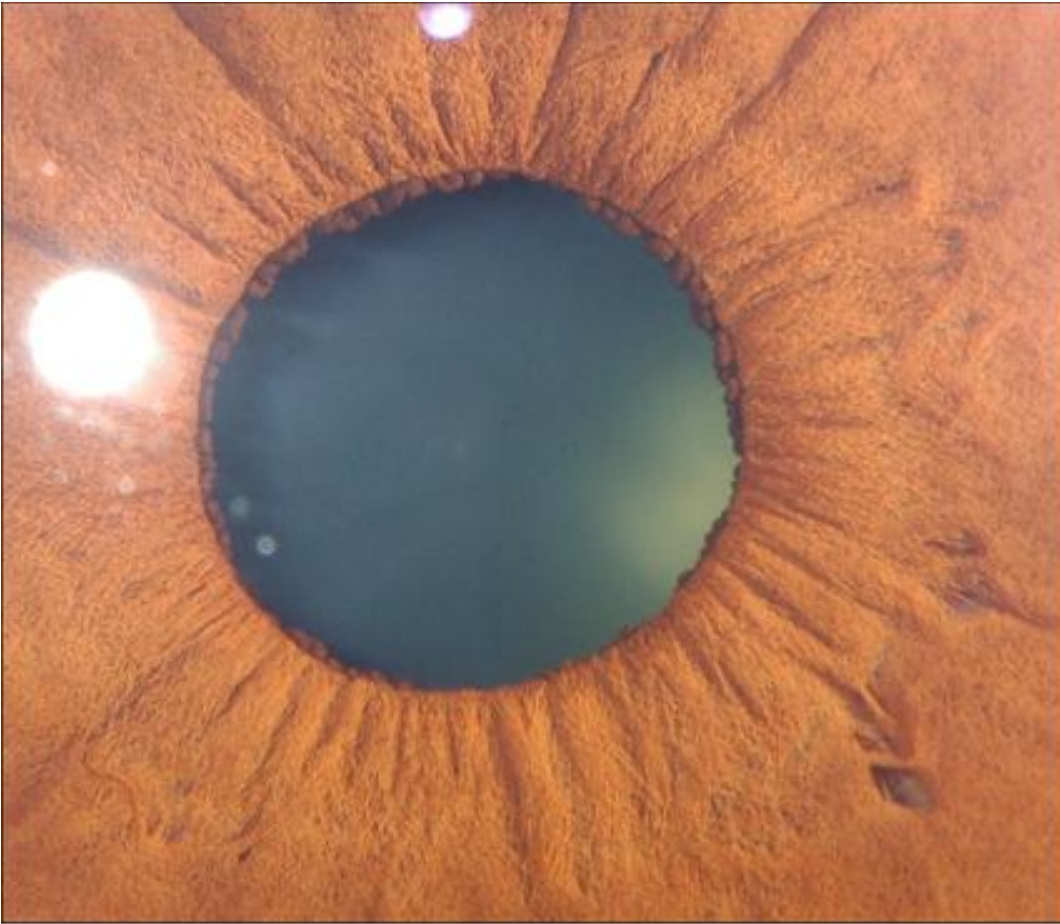
ASL -- Adjustable Side Lighting Illuminator:



The ASL gives maximum versatility (can be set up for central lighting also), but it is more complex to operate – one must mind the light angles and often re-adjust the angles between each eye.

The ASL can be used to create visual impressions of depth and texture, and is intended for the close study of the inner zone (IPB). The following two photos were taken at only 6 megapixel resolution but illustrate the textural illumination of the ASL:





Illuminators for cameras other than Nikon

It is possible to make this illuminator for the Canon 100mm and the Nikon 105mm VR. The Canon is not recommended (unless you already have it) because it has a relatively “dumbed-down” interface; you have less control over the camera – specifically, you cannot set the on-board flash to manual (constant) mode – the camera will always be trying to guess the exposure and you have to do some tricks to get it to brighten up an image for example (dialing up the flash and exposure value (EV) compensation). You cannot do manual flash exposure with Canon, and trying to ramp the EV value up does not work very well. With the Nikon you have full control over the exposure – you can set the flash power to manual full-power, half, quarter, eighth etc. This allows you to use various aperture ranges in A (Aperture priority) Mode. Ability to overexpose is especially important for brown iris imaging, to bring out low-contrast detail.

Nikon is recommended over Canon since only with Nikon can you use the flash in manual power mode and have more control over the result.

MEC-5-CSL– Combination Adjustable Side-Lighting and Coaxial Biometric

Also available is the two side-arms mounted on the same hood that has the HCB lights. Here is an early model:



This design uses the 3-position (Right, Both, Left) sliding shutter to enable either or both of two lightguides to be active – in this case the right channel is the HCB (1-to-4 central lighting) lightguide for the 4-point central lighting, and the left channel is the single side-lighting lightguide. The side-lighting lightguide can easily be switched to the left or right clip:



It is basically an ASL illuminator with one of the lightguides replaced with a 1-to-4 branched lightguide that uses channel 2 (Right side). This model is the MEC-5-D3200-N85-CSL.

Note: *additional accessories have been developed for this camera..*

List of components in the MEC-5-D3200-N85-HCB kit:



Part#	Description						
MEC-2-D3200-N85-HCB	Pro Eye Camera, Nikon D3200+N85+HCB 24 megapixel digital SLR camera with macro lens/illuminator Nikon D3200 Nikon 85mm macro lens Nikon 18-55mm VR zoom lens 2 Nikon type batteries with charger (MH-24)						
USB-Mini-B AV-3.5mm NDVD-D3200 SDHC-16GB CR-P7-8 CCS22000 UG-D3200-N85-HCB	USB cord for camera A/V cord for camera Nikon School DVD for D3100/3200 16GB high-speed SecureDigital memory card Deluxe Card reader USB 2.0 with hub Custom modified foam-padded carry case Printed and bound user guide for the camera						
HMI-N85-HCB-K HMI-N85-HCB FL-V8F LG-10 LFD-37 LR44x4	<table border="1"> <tr> <td>Macro HCB Photo-illuminator (includes below items)</td> </tr> <tr> <td>Hood-Mount Coaxial Biometric Illuminator (for Nikon 85mm)</td> </tr> <tr> <td>Focus Light</td> </tr> <tr> <td>Lightguide 1-4, 8" grey silicone housing</td> </tr> <tr> <td>Lightguide fixture</td> </tr> <tr> <td>Spare batteries for Focus Light (4)</td> </tr> </table>	Macro HCB Photo-illuminator (includes below items)	Hood-Mount Coaxial Biometric Illuminator (for Nikon 85mm)	Focus Light	Lightguide 1-4, 8" grey silicone housing	Lightguide fixture	Spare batteries for Focus Light (4)
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Focus Light							
Lightguide 1-4, 8" grey silicone housing							
Lightguide fixture							
Spare batteries for Focus Light (4)							
SHIP-UPS	Shipping for camera system San Diego, CA to USA via UPS (free for US states) Illuminator has lifetime warranty Camera includes free lifetime technical support.						