

How to Select an Iris Camera



Miles Research offers a range of iris cameras that are designed for maximum image quality, with superior illumination, versatility, and ease of use. As the owner and developer, Jon Miles has been designing eye cameras since 1981, initially for ophthalmology research at University of Michigan. During the last 27 years in southern California, the iris camera and illuminators have been perfected to a high degree.

It is best to select a high-resolution iris camera that is modular and can be used for many imaging subjects, not just the iris. Miles Research iris cameras include both a precision macro lens as well as a general-purpose zoom lens (18-55mm) which is ideal for all sorts of imaging including indoor and outdoor photos. This alternate lens is included in the carry case, and any other Nikon lens can also be used with the camera.



The camera systems are presently based on the 24 megapixel Nikon DSLRs and use the Nikon macro lens. The illuminators can be adapted to work with most any type of DSLR but Nikon is the preferred choice.

Each camera comes with unlimited technical support and each illuminator includes a lifetime warranty. Lens-Illuminator Kits are available to work with any Nikon DSLR, and Illuminator-Only Kits are available to work with any Nikon DSLR and the Nikon 85mm or 105mm VR macro lens.

The professional iris camera models range from \$2300 to \$3500, and custom configurations are also available.

1-channel (Central Lighting):

Single Central Lighting (SCL) - \$2300



Single Central Lighting (HCB) - \$2700



2-channel (Side Lighting):

Fixed Side Lighting (FSL) - \$3000



Adjustable Side Lighting (ASL) - \$3100



3-channel (Central and Side Lighting):

Central & Fixed Side Lighting (CFSL) - \$3400



Central & Adjustable Side Lighting (CASL) - \$3500



The first consideration in selecting an iris camera is whether to get central lighting (SCL or HCB), or side lighting (FSL or ASL), or the newer combo model that has both (CSL model, Central and Side Lighting).

The best all-around model is the Fixed Side Lighting (\$3000). For more simplicity, consider the Single Central Lighting (\$2300). For more versatility, consider one of the 3-channel models that offers both central and sidelighting (CFSL or CASL, \$3400/\$3500).

The illuminators are designed to last a lifetime (has lifetime warranty) and the camera body can be upgraded at any time in the future. The chinrests also have a lifetime warranty and are designed to last a lifetime.

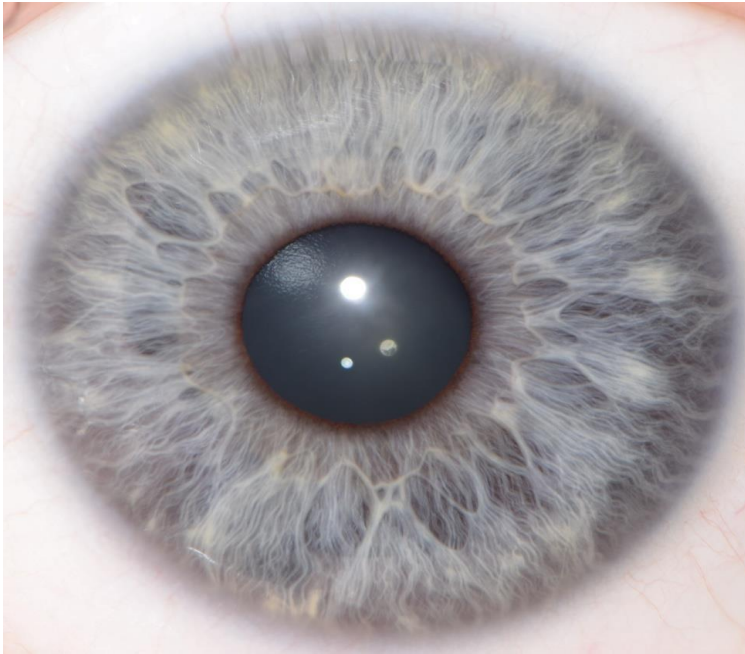
Miles has been developing both eye cameras and best practice for many years – currently, the preferred approach is to take all client photos with both central and side-lighting, so the CSL combo illuminator is the preferred option, especially for research. It was found that with most blue iris, the central lighting is

preferable, for the darker brown iris, the side-lighting is preferable. However for routine clinical documentation, either illuminator works well.

The advantage of central lighting is simplicity of use, repeatability of imaging parameters, and lower cost; the advantage of the ASL or CSL is more versatility and more control over the lighting angle. Any of these cameras are a better solution than a photo-slitlamp.

The iris-pics folder has samples of iris photos. To compare the same iris with central and side lighting see the CSL subfolder: <https://drive.google.com/?authuser=0#folders/0B5OBp4zckpLnZIJXTTJzU3BFMWs>

Example iris photo using Central Lighting:



Note: The Nikon DSLR Camera body of the iris camera can be operated from a computer using the free downloadable control program (Windows) at www.digicamcontrol.com . Besides storing and showing the just-taken photo on the computer monitor, the software also supports LiveView mode for onscreen focusing.

Example iris photo using Side Lighting:

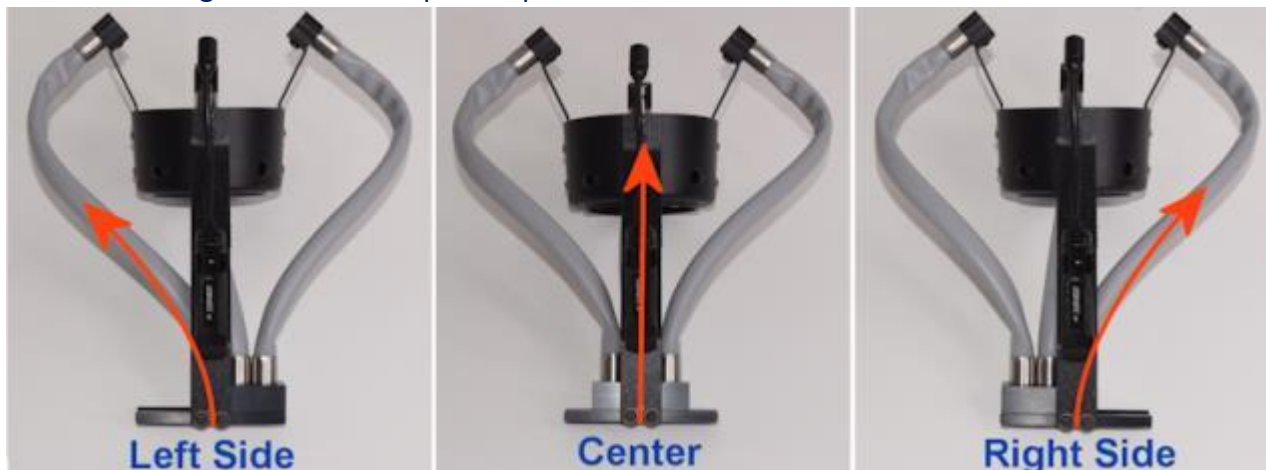


CFSL (Central and Fixed Side-Lighting) - \$3400



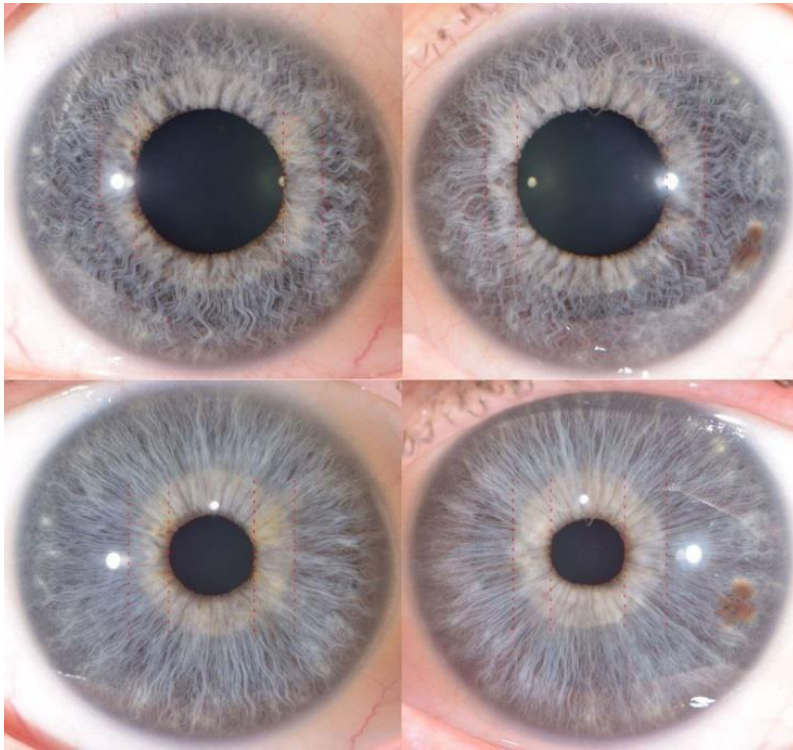
The CFSL is the newest 3-channel illuminator, and is designed to allow for quick and simple switching between either central lighting, or side lighting from either side at a standard 45-degree angle.

The 3-channel light shutter is simple to operate:



The model depicted above also includes the newest type of focus light: the **Integrated Adjustable-Brightness LED Focus Light (IAB-LFL)**. The brightness of the LED focus light can be adjusted to control pupil size and for maximum client comfort. Appearance of both iris color and texture is affected by pupil size and some types of imaging protocol (e.g. IPB imaging) can best be done with either a large pupil or small pupil. This focus light is designed to allow the brightness to go to zero right before taking the focused photograph. This focus light can be powered by AC, DC, or USB cord (included).

Example of effect of focus light brightness on apparent iris color and texture:



In this example, the same iris was photographed with the focus light on (bottom pair) and then with the focus light switched off (top pair). Various textural features are easier to identify when the pupil is large, while color features (pigment deposits) are more visible with the smaller pupil.

A similar camera model is the CASL – this 3-channel illuminator has side-lights that can be adjusted to any angle (20 to 90 degrees):

CASL (Central and Adjustable Side-Lighting) - \$3500



This is also a new model, and is like the CFSL, except the side-lighting has adjustable angles (20 to 90 degrees from lens axis). This gives maximum versatility but may be more than necessary for routine clinical use. The CFSL illuminator can also be made with the 4-point central or the upper central light. The version shown here is somewhat preferable.

FSL (Fixed Side-Lighting) - \$3000



The Fixed Side-Lighting model is also new and is ideal for quick and consistent images. Side lighting is preferable for the darker brown iris.

ASL (Adjustable Side Lighting) - \$3100



This is also versatile with a range of adjustable lighting angles. The ASL illuminator is ideal for imaging the IPB or other more advanced techniques where the angle of lighting needs to be varied. It does take a bit more time, so for routine iris photography the FSL is preferred. Central lighting can be approximated by putting the two side lights nearest to the center (about 20 degrees from lens axis).

HCB (Central Lighting) - \$2700



This is the classic simple, central lighting camera. It is ideal for biometric or biomedical use. The light is positioned at 11 degrees from the axis to avoid shadows and other artifacts. The model depicted above includes the new Adjustable-Brightness Focus Light. *Not available until 2018.*

SCL (Single Central Lighting) - \$2300



This is the simple, easy-to-use central lighting camera. It is ideal for both human and animal iris imaging. The light is positioned at 12 degrees from the axis to avoid shadows and other artifacts, and to keep the reflection off cornea in the pupil area.

Camera Setup & Operation Videos

How to set up and use the Single Central Lighting Iris Camera (MEC-SCL)

<https://www.youtube.com/watch?v=bBb7N2r4odA>

This video shows how the Single Central Lighting (SCL) iris camera works. This camera is simple to operate and the illuminator reflection is always in the pupil area.

SCL User Guide: <http://www.milesresearch.com/pdf/Quick-Setup-Guide-for-MEC-5-SCL-D3200-N85.pdf>

How to set up and use the Fixed Side Lighting Iris Camera (MEC-FSL-E)

<https://www.youtube.com/watch?v=l-Q6ZBTsx14>

How to set up the Fixed Side Lighting Iris Camera (MEC-FSL-E, with economy softcase option).

This video shows the 2-channel standard (lights are fixed at 45-degree position) side-lighting illuminator - how to set it up and use it.

FSL User Guide: <http://www.milesresearch.com/pdf/Quick-Setup-Guide-for-MEC-5-FSL-D3200-N85.pdf>

How to set up and use the Adjustable Side Lighting Iris Camera (MEC-ASL)

<https://youtu.be/wFxTJCj1OyU>

How to set up the Adjustable Side Lighting Iris Camera (MEC-ASL).

This video shows the Miles Eye Camera with the 2-channel adjustable side-lighting (ASL) illuminator - how to set it up and use it. In this model, the flash illumination lights on the left and right can be set independently to any angle between 20 and 90 degrees from the lens axis. Also shown is a brief overview of using the chinrest, and using the free camera control software from www.digicamcontrol.com

ASL User Guide: <http://www.milesresearch.com/pdf/Quick-Setup-Guide-for-MEC-5-ASL-D3200-N85.pdf>

How to set up and use the Central and Fixed Side Lighting Iris Camera (MEC-CFSL-C)

<https://youtu.be/j503zFtEBUc>

How to set up the Central and Fixed Side Lighting Iris Camera (MEC-CFSL-C, with Canon DSLR and 100mm macro lens option). This video shows the 3-channel Central and Fixed Side Lighting (CFSL) illuminator - how to set it up and use it. This version uses a Canon DSLR (T6) and the Canon 100mm macro lens. The illuminator works with any Canon EOS DSLR and the 100mm macro lens.

CFSL User Guide: <http://www.milesresearch.com/pdf/Quick-Setup-Guide-for-MEC-5-CFSL-SC-500D-C100.pdf>

How to set up the Central and Adjustable Side Lighting Iris Camera (MEC-5-CASL)

<https://youtu.be/2i8wEnkbFjl>

This video shows the 3-channel adjustable side-lighting iris camera - how to set it up and use it. This is the most versatile and top-of-the-line iris camera – it can be set to right-side, left-side, or central illumination. The left and right side-lights can be set to any angle (relative to lens axis) between 20 and 90 degrees. This allows for optimal brown iris exposure using the side-lighting and optimal blue iris exposure using the central lighting mode. This video also shows the use of the compact pro chinrest.

CASL User Guide: <http://www.milesresearch.com/pdf/Quick-Setup-Guide-for-MEC-5-CASL-D3200-N85.pdf>

Summary

The complete Miles Eye Camera system (MEC) prices

(each kit includes a 24-megapixel Nikon camera, a macro lens, a zoom lens, illuminator, accessories, and a carry case)

MEC-D3400-N85-SCL	\$2300
MEC-D3400-N85-HCB	\$2700
MEC-D3400-N85-FSL	\$3000
MEC-D3400-N85-ASL	\$3100
MEC-D3400-N85-CFSL	\$3400
MEC-D3400-N85-CASL	\$3500

The Lens Illuminator Kits (LIK) prices:

(each kit includes a Nikon macro lens, illuminator, accessories, and a carry case) – Deduct \$550

Note: Most illuminators can also be made for the Nikon 105mm VR lens and the Canon 100mm macro lens. For an *Illuminator-Only Kit* (IOK: no macro lens included), deduct \$550 from the Lens-Illuminator Kit.

Chinrest Options

For a chinrest, there is also a range of options priced from a few hundred dollars to the preferred professional model. The two main types of chinrest are **CRCS-UF** (\$500, *left*) and **CRCS-FH4** (\$1200, *right*):



CRCSR-UF-TTB - Compact Portable U-Frame Style
Miles Research – Iris Camera Models 2017



CRCS-FH4 – Premium Pro Deluxe

CRCSR-UF-TTB (\$500) - breaks down easily (no tools) into a 14x12x8-inch box/bag (or a 12" cube), weighs about 8 lbs.

CRCS-FH4 (\$1200) - breaks down easily into a 28x12x6 inch box, weighs about 12 lbs.

Use of a chinrest allows for expedited imaging and more consistent results; it is also a more professional option and is particularly well-suited to the busy clinic or instructional environment. For clients who are in a wheelchair or bed ridden, the camera is easily dismounted from the chinrest via a quick release and handheld photography is also easy to do. Another advantage of the chinrest is that one can attach the camera to a computer via a USB cord and see the image immediately on the computer screen (using the excellent and recommended free camera control software from www.digicamcontrol.com – *Windows only*).

The FH4 model is the more deluxe, but both are very good and very stable.

Chinrest Setup Videos and User Guides

How to set up the Compact Chinrest (CRCS-UF)

<https://www.youtube.com/watch?v=eANGeT-Un7s>

This is the twin-pillar tabletop base model. Note that the horizontal crossbar can alternatively be mounted on a tripod (tabletop or floor-standing). Price is \$500.

CRCS-UF User Guide: <http://milesresearch.com/pdf/Use-of-Chinrest-CRCS-UF-TTB.pdf>

How to set up the Premium Chinrest (CRCS-FH4)

<https://www.youtube.com/watch?v=zKtmqJywiA8>

This is the deluxe professional tabletop base model. Provides excellent head stabilization for all eye photography, and works with all macro cameras. Price is \$1200.

CRCS-FH4 User Guide: <http://milesresearch.com/pdf/Use-of-Chinrest-CRCS-FH4.pdf>

If you use a Windows computer, then the free software from www.digicamcontrol.com is recommended - this allows you to see the photo on a computer screen right after taking it. You can also see the live video image from the camera on the monitor before taking the photo. For Apple, you can either use a card reader or get the \$150 Nikon Camera Control Pro.

The current generation of camera (Nikon D3400) supports both Wi-Fi downloading of images and Bluetooth.



Also recommended is an inexpensive overbed table (about \$50 from Amazon.com), which has a convenient height adjustment. Both the photographer and client should be seated in a pneumatic-lift office or task chair for best results.

There are many sample images and articles on iris photography (as well as camera product info) available on the Google Drive at:

<http://www.tinyurl.com/iris-pics> <http://www.tinyurl.com/iris-cameras>
<http://www.tinyurl.com/eye-photography>

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See Also: <http://www.milesresearch.com/pdf/Chinrest-Models-2017.pdf>

See Also: <http://www.milesresearch.com/video/Iris-Photography.mp4>

