Quick Setup Guide for MEC-5-DFL1-D3400 Iris Camera

Contents of the Camera Carry Case – MEC-5-DFL1-D3400-N85

Note: Kit Contents may vary depending on economy options selected.

Contents:

1. Nikon DSLR Camera (D3400) with Macro lens (Nikon 85mm VR)
2. Direct Flash Lighting Illuminator
3. Camera battery charger
4. Camera Battery (and optional spare)
5. SDHC Memory Card (16GB)
6. Focus Light Batteries (CR2025 x 2)
7. SDHC Card Reader
8. HDMI-to-miniHDMI (optional)
9. Camera-to-computer USB cord (micro-B to A) – optional
10. Camera body cap and lens rear cap
11. Camera carry bag (optional, not shown)

Preparing the Iris Camera for Use – MEC-5-DFL1-D3400-N85

1. Open Camera Carry Case and lift camera out

2. In most cases the illuminator will already be mounted as it is stored, so in this case, just remove the lens cap:

3. Remove lens cap and turn the camera on. Mode dial is set to **A**=Aperture priority


4. Pop up the built-in flash by pressing button on left side


5. Place illuminator onto lens at the 3:00 position (Flash is in the up position, Mode=A):

6. Rotate Illuminator 90 degrees (1/4-turn) until it snaps into place at 6:00 position:

7. Slide focus light power switch towards rear of camera to L position to turn it on:

Note: this is for the left Focus Light, which is best for Right Eye photography)

8. **Your camera is now ready to take iris pictures.** When complete with the photography, reverse these steps to put the camera away.

For more info see this instructional video:
http://www.milesresearch.com/video/Iris-Photography.mp4

Techniques in Iris Photography
by Jon Miles
About this video:
This presentation details how to set up a DSLR camera for iris photography, and best practices in getting high-quality iris photos. Topics covered include types of cameras, illumination, exposure, focus, use of chinrest, and client interaction, such as seating, gaze direction, and lid retraction.

Getting Correct Exposure

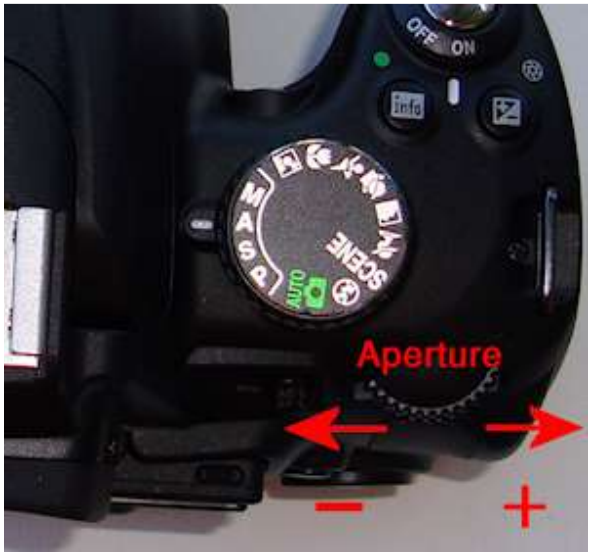
Using Auto-Exposure (Recommended)

1. The camera is shipped with **Auto-Exposure**, via the Control for Built-in Flash set to the TTL (Through-the Lens) setting in the Set-Up Menu. In this auto-exposure mode, the flash will automatically be adjusted for a good exposure. The aperture should be in the range of f/16 to f/22.
2. This camera-lens-illuminator is optimized for auto-exposure photography of the iris; it is especially easy to take consistently good iris images when using the Auto-Exposure Flash Mode. In this mode the flash power is adjusted by the camera to give a suitable exposure regardless of the aperture setting.
3. There is a tradeoff between the sharpness of a lower aperture such as 5.6 thru f/20 (sharpness improves with a lower f/number) due to less diffraction blurring when the aperture is at the lower number, and the depth of field, which becomes too small to get the entire iris in focus when the aperture is less than f/16. Consequently the best overall sharpness for iris photography is between f/16 and f/25.
4. With Auto-Exposure you can dial in whatever aperture you want, but best results will be found within this range of f/16 and f/25. Miles Research recommends f/22 for iris photography.
5. For sclera photography, having the larger depth of field is very important in order to get the entire visible surface of the sclera (including the bulbar conjunctival vessels) in focus, so the recommended aperture for scleral photography is the maximum aperture value – normally (with the 85mm lens) at f/45.

Using Manual Exposure (for the Advanced User)

6. It is also possible to use **Manual Exposure** where the aperture can be adjusted through a range of values and the best exposure later selected from the series of photos. To see how the camera settings can be changed, see Section M, Reference for Nikon D3400 Camera Settings (page 35).

7. Use the main command dial at the upper rear of the camera for **adjusting the aperture**.



The Main Command Dial is operated with the right thumb and is used to adjust aperture. Normally, the best practice is to take 3 or 4 pictures of each iris, each picture shot with a different consecutive aperture.

The **aperture dial** (situated where the right thumb would be when holding the camera with the right hand) is changed by the thumb; clicking the wheel **inboard (to left) decreases** aperture number and clicking the wheel **outboard (to the right) increases** it. Larger aperture values mean smaller aperture diameter -- less light will be allowed in. Images with higher f/numbers will be darker than those taken with lower f/numbers

Getting Correct Focus

Using Fixed Focus (Recommended)

1. For best results, use **Fixed Focus** mode, which is where the lens is set to its minimum (closest) focus, and the whole camera-lens is moved closer or further from the iris until proper focus is viewed in the viewfinder.
2. For using **fixed focus**, the lens is set to the **M** setting and the lens focus is dialed to a **minimum focus** (rotate focus ring all the way to 1:1, the opposite end from the "infinity" symbol), which is about 0.286 meters or 11.25 inches (as measured from the subject to the image sensor plane).
3. Hold the camera up to the client's eye, and while viewing through the viewfinder, move closer or further from the eye until the image is sharply in focus, then take the picture.
4. It is also possible to use **manual focus**. For using **manual focus**, the **lens switch** is changed from the M/A setting to the **M** setting. The focusing is accomplished by rotating the focus ring of the lens until the iris is in focus as viewed through the viewfinder. The downside to this method is that the images will not all be at the same magnification.

Using Auto-Focus (for the Advanced User)

5. This camera-lens-illuminator can also be used for autofocus photography of the iris, however the autofocus is not as reliable as your own focusing. Use of Auto-Focus works fairly well with the blue iris but often does not work with the brown iris.
6. Using Auto-Focus effectively requires considerable skill and experience and should be considered only by the more experienced iris photographer.

For imaging animal iris, it is usually best to use autofocus.

Lens Settings – Nikkor 85mm or 105mm VR Lens

1. *For using Manual or Fixed Focus:*
   Manual Focus Mode: Set the lens setting to M (to the right, toward the lens mount). Set the lens to minimum focus and **always** keep it on minimum focus (closest focus is 0.286m, 1:1).

2. *For using Autofocus:*
   Auto-Focus Mode: Set the lens setting to M/A (to the left, toward the lens front). Set the lens to minimum focus to start.

3. Put the lens in **Non-VR mode**: the bottom switch for VR should be set off (to the right, toward the lens mount). This setting is not critical, but VR (Vibration Reduction) is not useful for flash photography so it may as well be disabled (the camera battery will last longer this way).

Setting for Manual Focus Setting for AutoFocus

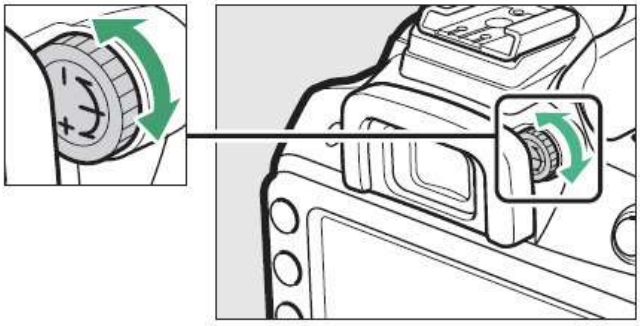
Setting the Viewfinder Focus (very important for all users)

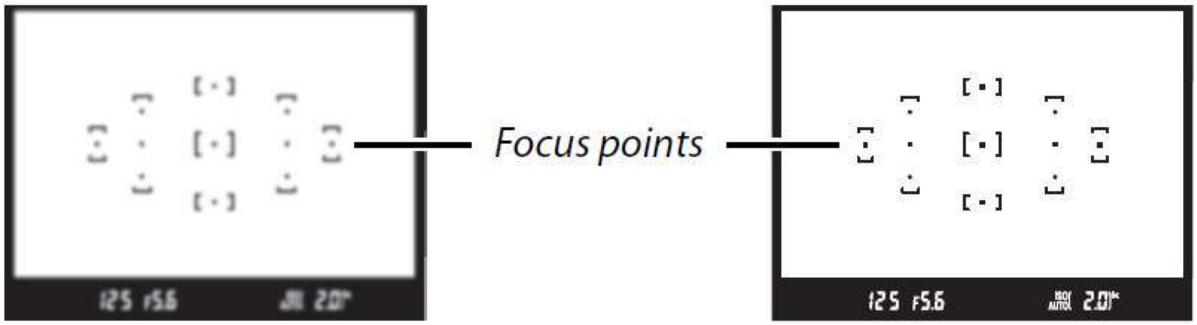
8. **<u>IMPORTANT: Adjust the Eyepiece Dioptric setting</u>. (Initial Setup Only)** This is a small rotary switch to the right of the viewfinder that can go up or down through several positions, and is designed to match the viewfinder optics to your vision. When this is set: if you see the subject in focus, the camera sees it in focus. If you normally wear corrective lenses, always wear them when taking a picture. To make this adjustment for your eye:

How to Set Eyepiece Focus

1. Move the rotary switch to one end of the range (all the way up or down).
2. Look through the viewfinder at a bright surface (such as a white wall) that is in the distance (this white surface should appear blurry).
3. While viewing through the viewfinder, move the switch up and down through the range of positions until you can **see the black brackets ([ ]) in the viewfinder** with **maximum clarity** and **focus**.
4. Note the optimal position of this switch for your vision, and **always use this setting**. Once you set it for your eye's vision, you do not need to change it. If someone else uses the camera, they need to find the correct setting for their vision (and when you resume using the camera, you need to return this switch to the setting you found for your vision).

Focus the viewfinder.
After removing the lens cap, rotate the diopter adjustment control until the focus points are in sharp focus.





Viewfinder not in focus

Viewfinder in focus