

## Iris

An iris is an adjustable aperture (opening) that controls the amount of light passing through a lens. There are 3 primary iris types: fixed, manual, and auto.

### Fixed Iris

Fixed iris lenses have a fixed aperture. They are not adjustable and are completely dependant upon the camera to compensate for light changes. They are common on board, bullet, dome, covert, and vandal resistant cameras. Although they are available for full body cameras, they are not very common.

### Manual Iris

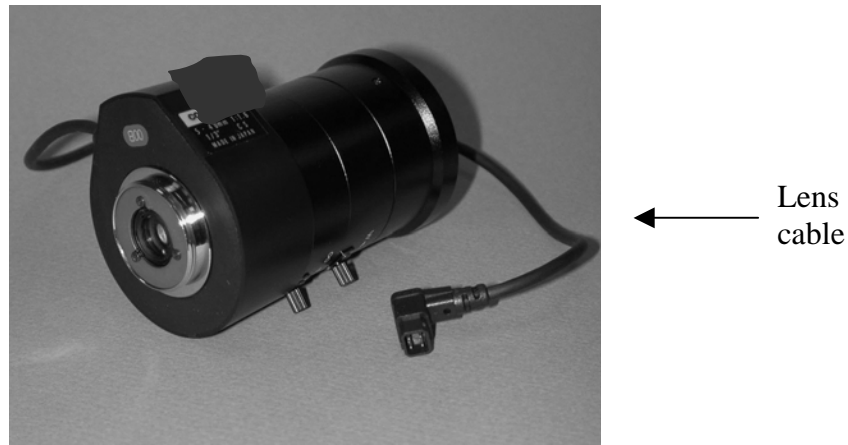
Manual iris lenses have an adjustable aperture. They can be adjusted by turning a ring on the lens to open or close the iris. They are very common for full body cameras, and seldom seen on other camera styles.



## Auto Iris

Auto iris lenses have a motor-driven adjustable aperture. The lens automatically adjusts based on changing light conditions, and is connected to the camera via a cable.

They are very common for full body cameras, and are sometimes offered as an option on other camera styles.



## Outdoor Cameras

Auto iris lenses are preferred for outdoor camera applications, or any place that a camera will experience broad changes in lighting. The cost difference of an auto iris lens compared to a manual iris lens for a full body camera is minor.

However, auto iris lenses are not always available (or affordable) for non-full body cameras (bullet, vandal resistant, etc). Manufacturers of these types of cameras will sometimes offer auto iris lens as an upgrade, but usually at a significantly higher cost than the standard fixed iris lenses they normally use. Since these cameras

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typically do not use a standard lens style, substituting a full body camera lens is not an option.

The fixed iris lenses on non-full body cameras work very well in most outdoor applications, thanks to the automatic electronic shutter (AES) built into these cameras. Scenes with high contrasts (many area of dark and light objects), and high reflectivity will sometimes cause the glare, hot spots, and wash out problems. This problem is common in parking lot applications.

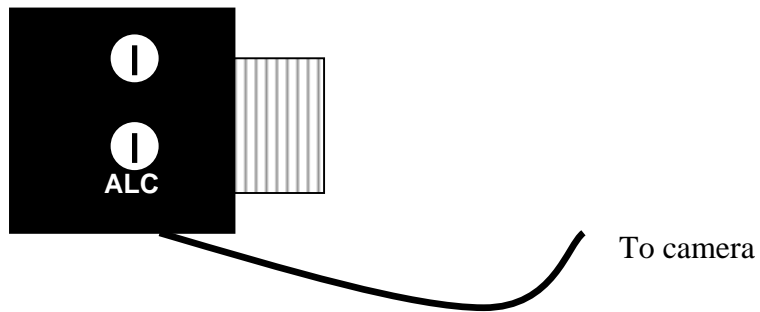
### Auto Iris Lens Types

There are two types of auto iris lenses: video and DC.

### Video Auto Iris Lenses

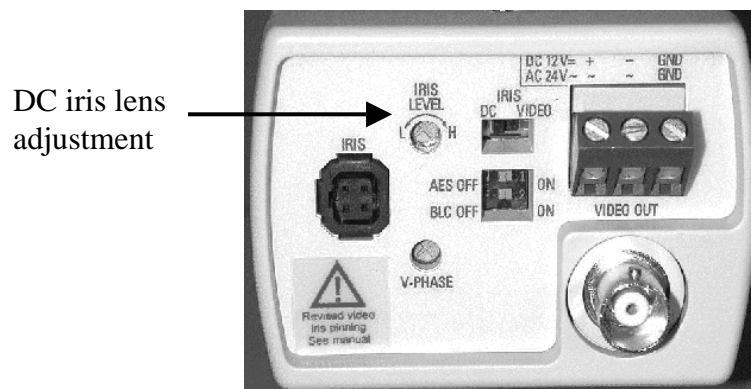
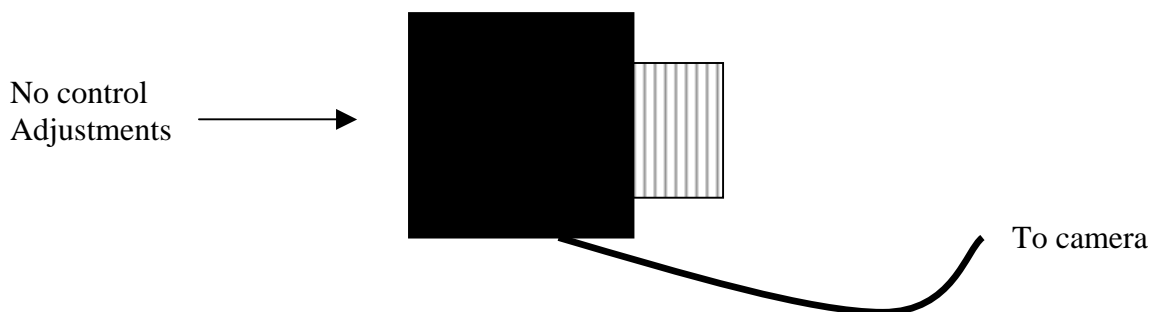
Video auto iris lenses are “smart.” They have circuitry that samples the video signal and responds to changes of light levels in the scene. The lens, based on this sampling, makes aperture open and close decisions. Additionally, the lens has adjustments to make the lens responses more suitable for the application.

The lens adjustments are on small screw trim pots on the lens. The “level” adjustment controls the iris response; it can be used to make the picture brighter or darker. The “ALC” adjustment controls the iris response speed; it can be used to adjust the picture contrast.



## DC Auto Iris Lenses

Video auto iris lenses are dumb. DC auto iris lenses have only a motor. They do not have control circuitry. The camera makes all iris control decisions. The lens has no control adjustments, and any adjustments to the iris reaction are made at the camera.

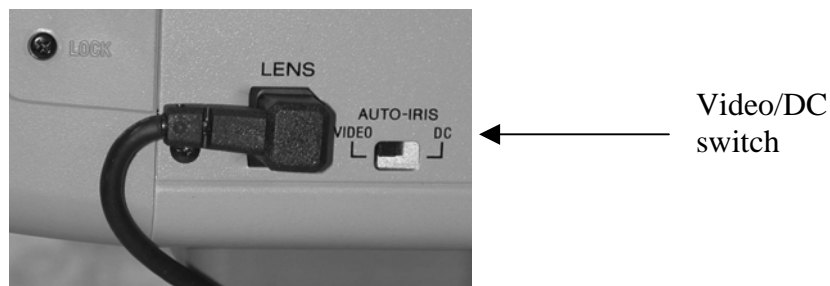


## Video vs. DC Auto Iris Lenses

Video lenses give you more flexibility in tough applications, but at a cost. DC auto iris lenses are typically much cheaper than video auto iris lenses, and is much more common.

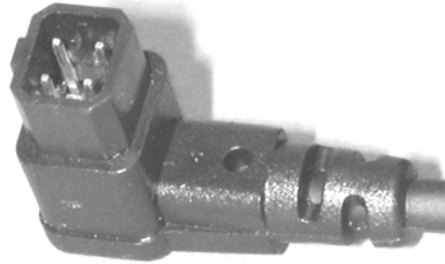
## Lens / Camera Compatibility

There are typically little or no auto iris lens/camera compatibility issues when designing/installing a new system. The problem comes in when working with existing equipment and trying to retrofit lens and cameras. Some cameras have no auto iris drive at all. Some older cameras only support video auto iris lenses, some newer cameras only support DC auto iris lenses. Many cameras support both types, selectable by a switch on the camera.



## Auto Iris Lens Plug

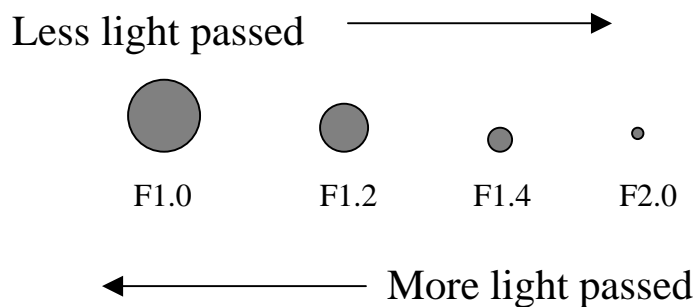
Most new cameras use the industry standard 4-pin plug configuration for auto iris connection, with the industry standard wiring configuration, and the plug on the side of the camera. Some older cameras used a different connector, a different wiring configuration on the same 4-pin plug, or had the connector on the back of the camera.



Lens vendors can usually cross-reference camera model numbers and tell you what connector and pin configuration is required. Most will even install the connector for you at the factory for a small fee. Lenses can be purchased with wire leads for field connector installation, but buying the lens with the connector factory installed is *highly recommended!* Lens connectors are very small and easy to damage while soldering.

### F-Number

A lens's ability to pass light is stated in f-stop (or f-number). The lower the f-stop of a lens, the more light it will pass. An f/2.0 will pass *half* as much light as an f/1.4 lens, conversely, and f/1.0 lens will pass twice as much light as an f/1.4 lens.



This document is part of a complete book entitled:  
**CCTV System Design & Installation**

By Charles Aulner and Bryan McLane

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