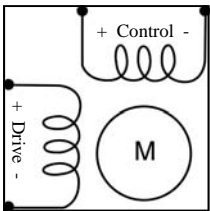


GEViCAM Auto-iris Lens Control

Auto-iris lens input signal

There are two types of auto-iris lenses commonly used in surveillance applications. Video input models and DC-iris control models.

The majority of auto-iris lenses today are using a galvanometric aperture control. In some special situations, motorized iris lenses are also used but in this Tech Note, the galvanometric auto-iris lens is discussed



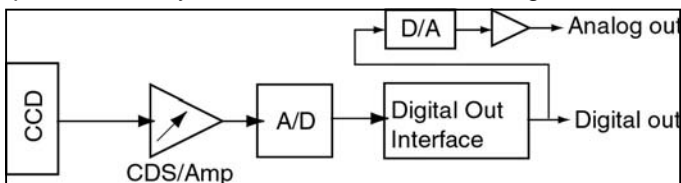
The galvanometric lens mechanism uses control signals. One is for drive and the other is for damping. These control signals are derived from the video by circuits located either within the lens or within the camera.

A DC direct drive auto-iris lens receives these control signals directly from the camera. A video drive lens receives the video stream from the camera and derives the control signals internally from video amplitude.

The GEViCAM platform includes these conversion circuits and is capable of driving both video signal and DC drive lenses. Generally, DC-auto-iris lenses are more compact and lower cost than video versions for the obvious reason.

Aperture Priority Exposure Control.

Some video cameras provide analog video signal in order to drive an auto-iris lens. The analog signal can be the same as the video output signal used for image display or capture. This means that the signal went through internal amplification and image preprocessing such as Gamma correction and AGC. In this case, the auto-iris lens must react to the internal gain variations. If the scene is dark, internal gain increases and video output goes high, then the auto iris reacts to close the aperture even further. The image gets noisier as the internal gain tries to increase even more. This feed back seriously degrades camera performance. With digital camera, this practice is very common because the analog video is

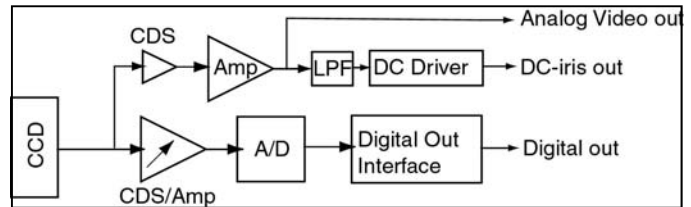


created by D/A conversion from the digital output.

The best result of using auto-iris lens is to perform **“Aperture priority exposure control”**, a term quite often used in photography.

With this, the lens reacts to a direct signal from the CCD (with fixed amp gain) independent of camera gain and internal preprocessing. Therefore, when scene is dark, the lens opens for better exposure. The camera can

control the gain and processing functions without affecting the lens control.



The GEViCAM platform has a specific circuit for auto-iris lens control which is separate from the main digital path. The CCD works as an accurate photometer to drive the lens aperture even as the digital output is going through internal gain control, electronic shutter (exposure control) and image preprocessing (LUT).

Async Signal and Auto-iris Lens

Most surveillance applications do not need async shutter or interrupted image capturing. So typical auto-iris lenses are designed for a standard continuous video signal. The DC-iris lens also uses a signal derived from continuous video before conversion to DC drive. However, in applications such as for ITS (Intelligent Transportation Systems), a camera is only activated when an external trigger occurs. In this case, the camera outputs an image (one frame) per trigger. If the traffic is not heavy, there is no video for iris control. When the next trigger arrives, it is too late for the iris to react. The GEViCAM platform has two modes for the auto-iris lens drive. One is for common continuous video, the same as for surveillance. Mode 00 23 00 00 00 00 and 00 23 00 00 00 10 (partial scan) are the normal modes. Another mode is ITS mode (00 23 00 00 00 04 or 00 23 00 00 00 14). For auto-iris application, select “1 frame capture” (default on 00 29 00 00 00 00). The shutter speed can be adjusted by 00 24. In this mode, the video output from the CCD and Auto-iris circuit is continuous. When the external trigger arrives, only one frame of the immediate image is output from the digital block via GigE for image capture and processing by the host computer.

