



# COP UK Support Document

## Using and setting up lenses

Support file No 3/A/LI

File name :- usinglenses.pdf

Issue:- 1.0

Date:- 25 September 2000

*The information contained in this document is intended as a guide and as such COP UK take no responsibility for the accuracy or for any resulting damage that may occur from following this guide.*

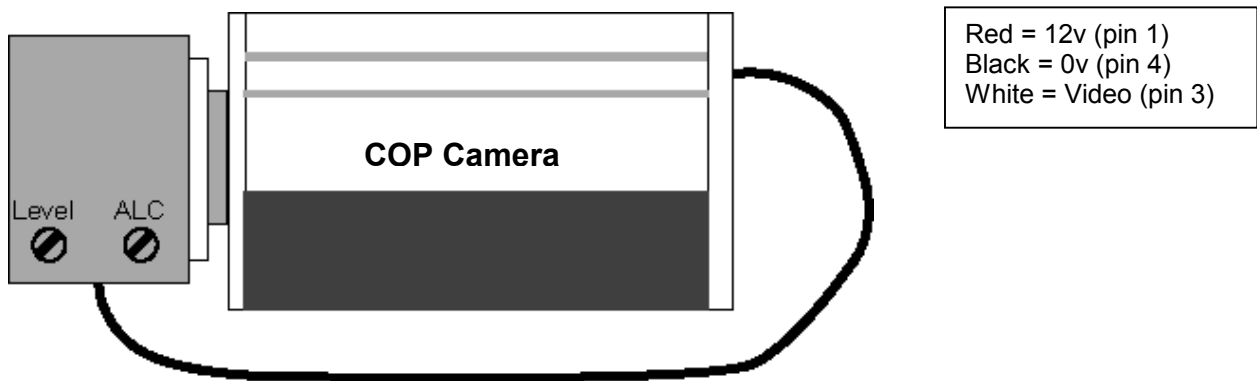
## Control methods for lens iris.

### Manual Iris lenses

The simplest type of iris control is termed 'Manual Iris'. The lens is equipped with a ring on the body that can be turned to alter the aperture directly. In CCTV systems this can only be used generally in fixed lighting conditions or where the camera is readily accessible and it is not inconvenient to have to continually adjust the lens for correct picture brightness.

### Auto-Iris Lenses

A far more common arrangement is to use auto-iris lenses where the iris vanes are driven by a galvanometer or servo motor which is controlled by an 'iris-amplifier' circuit within the lens, the control input of which is the video signal from the camera itself. Hence an auto-iris lens is used where the lighting level is liable to continuous changes e.g. outdoors where lighting can change from full sunlight down to near total darkness. The connections for an auto-iris lens are as shown below :-



In this arrangement, as a scene gets brighter the video level increases. This is sensed by the lens and the iris is driven to give a smaller aperture, hence letting less light onto the sensor and so causing the video level to be reduced. Damping is applied to prevent the lens from hunting i.e. causing the picture to continually change brightness.

The relationship between actual video level and corresponding aperture size can be adjusted by the installer using two control potentiometers on the lens. These pots are usually marked 'Level' or 'Gain' and 'ALC' or 'P-A', abbreviations for Average Level Control and Peak-to-Average respectively.

### Direct-Drive Lenses (FCS)

These are a development on auto-iris lenses where the motor or galvanometer coil moving the iris vanes in the lens is driven directly by the camera, hence 'Direct-Drive'. There is no active electronics in the lens and hence they are simpler, smaller and cheaper than an equivalent auto-iris lens. They must be used with a camera capable of driving 'DD' lenses and this is normally identified by the presence of the characteristic 4-pin square 'Hi-Rose' (Panasonic) plug on the side of the camera.

Direct Drive lenses have no adjustment controls other than focus (and angle of view in the case of Vari-focal lenses).

Picture brightness is now controlled by a level setting on the camera.

DD lenses slightly less flexible and optimisable for outdoor use.

### Correct setting of an auto-iris lens

The iris controls of a lens should be adjusted when the lighting levels are at or near the highest that the camera will be subject to. Never adjust an iris setting of an outdoor camera when light levels are low. If you do then it will almost certainly be necessary to re-adjust them in daylight.

Set the P-A pot to fully average. Point the camera at a bright scene or the brightest part of the scene to be viewed and adjust the level pot until the bright part of the picture just over-exposes and then adjust the pot down slightly until the bright areas are not overexposed. If it is required to make the lens stop down when a highlight enters the picture, e.g. a door opening, then adjust the P-A pot towards peak. If the average control is adjusted then the level control setting should again be checked and adjusted if necessary.

**Zoom lenses**

For CCTV applications these are almost exclusively motorised types to enable zooming and focusing of the lens from remote control positions.

Zoom ratios i.e. the ratio of maximum to minimum focal lengths are most commonly either 6:1 or 10:1. The viewing angles obtained are shown below:

<b>1/2" format Zoom Ratio</b>	<b>Focal Length Range</b>	<b>Horiz. View Angle (Wide)</b>	<b>Horiz. View Angle (Telephoto)</b>
6:1	8-48mm	44deg.	8deg.
10:1	8-80mm	44deg.	4.7deg.

<b>1/3" format Zoom Ratio</b>	<b>Focal Length Range</b>	<b>Horiz. View Angle (Wide)</b>	<b>Horiz. View Angle (Telephoto)</b>
6:1	5.7 - 34.2 mm	46 deg.	8.1deg.
10:1	6 - 60mm	44deg.	4.7deg.

Nearly all zoom lenses used in CCTV surveillance applications are auto-iris type although 'motorised iris' types are available where the iris can be driven directly by a suitable control system.

**Suggested settings for COP body cameras.**

**V Phase adjust 240 volt cameras only**

This is used to adjust the vertical phase on the 240-volt cameras, this is to ensure that the cameras will display correctly when using a quad display unit.

**BLC**

The cameras are fitted with a backlight compensator, this is used to compensate for very bright areas in the picture. In order to counter this problem switch the BLC switch to ON and the camera will try and adjust to compensate for this problem.

**AGC**

The Auto Gain Control can be switched off by selecting off on the AGC switch. This controls an amplifier that is used to boost the video signal; this may also amplify any noise and may result in a poor picture quality.

**AES**

The Automatic Electronic Shutter is used when a manual or fixed iris lens is fitted this will allow the camera to adjust to varying light levels. The AES should be switched off when an Auto iris lens is fitted.

**Video Drive Lens**

If a Video Drive lens is fitted connect the Iris lead to the four-pin connector on the camera and set the auto iris selection switch to Video Drive.

**Direct Drive Lens**

If a Direct Drive lens is fitted connect the Iris lead to the four-pin connector on the camera and set the auto iris selection switch to DC Drive the level may be adjusted by turning the Level adjust.

**Level Adjust**

The level adjust is used when a direct drive lens is fitted, the level adjust is used to set the size of the aperture for normal conditions. Turn the level adjust so that the picture appears very dark then turn the level adjust the opposite way until the picture is just to bright, then turn the level adjust back until the desired picture brightness is achieved.

The diagram shows the camera's control panel with labels for: V Phase adjust (240v only), BLC Switch (UP = On), AEC Switch (UP = On), AGS Switch (UP = On), Auto Iris Connector, Level adjust, and Auto Iris Selection Switch.

**Suggested switch settings**

Manual lens	Video Drive lens	Direct Drive lens
BLC = Down (off)	BLC = Down (off)	BLC = Down (off)
AES = UP (on)	AES = Down (off)	AES = Down (off)
AGS = Down (off)	AGS = Down (off)	AGS = Down (off)
Selector = Any	Selector = Video	Selector = DC
Video  DC	Video  DC	Video  DC