

CCTV CAMERA FOCUS PROBLEM SOLVING

BY: Don McClatchie
FM SYSTEMS, INC.
SANTA ANA, CA.
TEL: 1-800-235-6960

Have you ever wondered why Auto Iris cameras seem to go out of focus at night? Many installers have had to return to the job site at night and reset the focus of a camera to solve this problem. This can be costly to your company's pocket book and reputation. There is a solution to the problem that will enable you to set the cameras focus correctly every time, day or night.

Let's examine what causes the Auto Iris camera to go out of focus when the lighting level changes, as it does day to night. All lenses and Auto Iris cameras exhibit this effect to a greater or lesser degree.

THE CAUSES, DEPTH OF FIELD, WHAT IS IT?

All lenses have a characteristic called Depth of Field. Depth of Field is a zone in front of the lens that is in focus. It is measured as the minimum distance and maximum distance from the lens where objects are in focus. All objects inside this minimum and maximum bracket zone will be in focus. The further away you go from this bracketed "in focus zone", either toward or away from the camera the more out of focus the objects become.

THE PROBLEM WITH AUTO IRIS LENSES:

The Auto Iris lens has a movable aperture inside the lens that controls the amount of light allowed to pass through it. This aperture also directly controls the Depth of Field of the lens. So an Auto Iris lens will have a variable Depth of Field depending on the amount of light entering the lens. This causes the minimum and maximum bracket zone of focus to change when the lighting level changes.

During the day or in bright lighting conditions the Iris is closed down to a small opening, and the Depth of Field is quite large. So called Pin Hole cameras exhibit this effect where all objects in the scene are in focus. However with movable iris cameras at night or in low lighting conditions the Iris is open wide, this causes the Depth of Field to collapse down to a smaller minimum and maximum bracketed zone of focus. An object that was inside the zone of focus during the day can be outside the zone of focus at night.

THE SOLUTION:

One way to set up the camera to minimize the Depth of Field problem, is to adjust cameras focus at a time when the light level is at its lowest. This may not be convenient for your installers.

The best way is to use a SHADE 5 FILTER PLATE also called a #5 welders glass filter. It is the filter plate that welders look through to protect their eyes during welding operations. When you have full daylight or bright lighting conditions the filter plate is placed over the cameras lens to simulate half lighting conditions.

This filter plate costs only a few dollars and should be carried by installation personnel to every job site for use with Auto Iris lenses, especially those jobs using outdoor cameras. By using the filter plate to adjust the Auto Iris, you will be centering the control range of the Auto Iris system. This will give you optimum performance from your cameras Iris control system.

Hand held focus meters such as the CM-1 Camera Master are also useful in determining the maximum focus of any scene. They are more accurate than large screen monitors and much easier to take up a ladder. They display the maximum focus numerically on an LCD type display. By eliminating the subjective nature of focus setting, you will insure that all cameras will be set to their maximum focus by any installer.

An understanding of Depth of Field and the proper setting requirements for Auto Iris cameras will save you time and reduce the frustration of having to return to the job site to refocus cameras.

