

# Camera Application Considerations

## Location

Camera location will determine the mounting and accessory hardware required. Physical mounting location will determine if a wall mount or ceiling mount is required. Most indoor camera mounts are universal. Specialty mounts allow the camera to be secured to a drop ceiling t-bar, attached via a heavy-duty clip, or adhered using a magnet.

## Purpose

Why the camera is at that particular location. What is the customer trying to accomplish? The view may be for observation or identification. If the camera is intended as a deterrent, it will typically be more overt.

## Target/Distance

The target area the camera is viewing and the distance to that target area determine the lens required. Telephoto lenses (for viewing object distance from farther away) are typically more expensive. Ideally, the camera is as close as reasonably possible to the target area.

## Protection

The camera may need protection from environment or tampering. If the camera is not in an environmentally controlled area, it may need its own environmental control system (heating/cooling). If the camera is prone to physical damage, it may need additional protection. If the camera is

intended to be semi-covert or covert, it may need additional hardware to make it more discrete.

### Tech Tip

For indoor installations, feeding the camera cabling through a wall plate makes for a neater and more professional looking installation. Blank or pre-punched plates are available at most hardware stores and supply houses. For outdoor installations, protecting the cabling with flexible conduit from the wall to the camera/housing adds protection and increases the appearance of professionalism. Be sure to add a drip loop to help prevent water from seeping into the housing.

### Lighting

Many camera scene lighting problems can be avoided by considering them during the design phase. Today's cameras are remarkably sensitive, and there are many ways poor lighting can be augmented. The key is to identify the problem before the installation and build the solution into your equipment costs. Many customers are not agreeable to handing over additional funds due to an oversight by the system designer.

### Light Levels

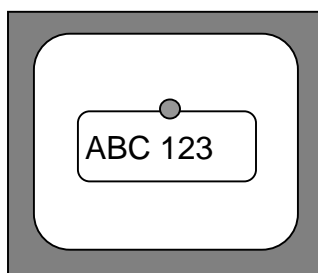
The light level required is dependent upon scene lighting, reflectivity, and camera sensitivity. The scene could be checked with a light meter, but considering the lack of standard for manufacturer specifications, there is not sure way of knowing if lighting is sufficient. When light levels

are questionable, take a camera to the site during the worst lighting conditions and test it. If testing is not practical, put a clause into the contract stating that providing sufficient light levels are the responsibility of the customer.

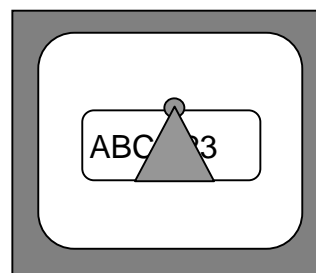
### Light Source in Scene

Cameras are designed to view reflected light. Any bright light source in the scene that can shine into the camera may cause problems. Bright light sources will “bloom” in the picture, possibly obscuring critical information.

There are two possible solutions to this problem. Repositioning the camera to avoid the light source is the simplest and most economical solution. Evening the lighting in the scene with additional lighting not in the camera view is another. This will provide light levels, which are more uniform throughout the scene. The most common occurrence of this problem is outdoor applications with lighting in the scene, such as streetlights or landscape lighting. Another common occurrence is viewing vehicle license plates. When viewing license plates at night, the plate light tends to bloom, obscuring some of the numbers on the plate and make it unreadable.



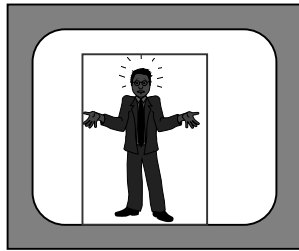
License Plate - Daytime



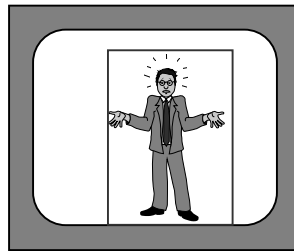
License Plate - Nighttime

## Light Source Behind Target

A light source behind the subject will result in the subject appearing silhouetted. Repositioning the camera to avoid the backlight problem, illuminating the subject to even the scene lighting, or using a camera with backlight compensation can resolve the situation. This problem commonly occurs with indoor cameras viewing doorways leading to the outside, and on automatic teller machine (ATM) applications.



No Backlight Compensation



Backlight Compensation

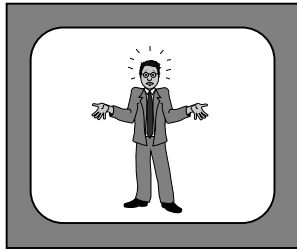
## Depth of Field Change

A camera has a great picture during the daytime, and then gradually goes out of focus as the sun goes down. What happened? The depth of field changed. Depth of field is the range of which all objects in a lenses field of view are in focus. Since cameras focus based on available light, more light means a broader range of focus. Less light means a narrower range of focus. A focus under lower light conditions will work well under higher light conditions.

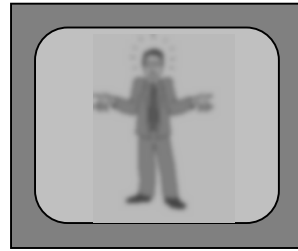
The best way to focus under the worst lighting conditions is to be there when they occur. Since this is not always practical, nighttime conditions can be simulated. Filter material such as non-prescription sunglasses, #5 welders goggles, or a #2 neutral density filter will all work. The camera must be back focused to achieve the best depth of field balance.

To back focus the camera, turn the focus ring to infinity (full clockwise as viewed from the front of the camera). Place the filter material in front of the lens to simulate nighttime conditions. Adjust the back focus of the camera until the picture is in focus. The back focus adjustment moves the imager closer to or farther from the lens. The back focus adjust may be the same adjustment used for C/CS adjustment on cameras that accept both mounting styles. Fine focus (if necessary) using the lens focus adjustment.

Before Backfocus

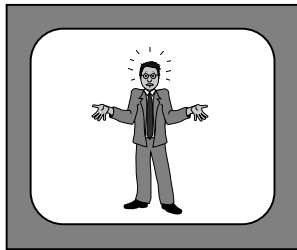


Daytime

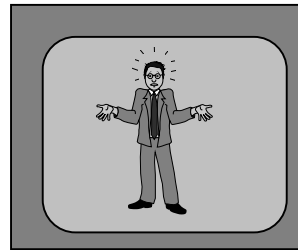


Nighttime

After Backfocus



Daytime



Nighttime

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**CCTV System Design & Installation**

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