

## Install Guide for IR-Enabled Dome Cameras

Static and PTZ dome cameras alike have a clear covering to protect the camera lens and gear. While this provides many benefits, it also creates some potential installation issues not normally associated with surveillance cameras. This guide walks you through those, how they occur, and how to avoid them.

### Considerations

Most dome cameras are installed under the eaves of a roofline. The surfaces of the soffit and wall can cause infrared reflection issues.

When installing under an eave, the camera should be 6" or less from the edge of the roof, whether the edge is defined by the soffit or a gutter.

Similarly, because they can swivel, PTZs are often mounted at the corner of the roof, where there is often a downspout from the gutter. The PTZ should also be mounted at least 6" away from a downspout.

Internal testing has shown that a camera lens tilt of 13° avoids noticeable soffit glare. Similarly, the camera should be turned 34° away from a wall or downspout to avoid IR reflection.

Do not install the camera so that it faces the sun directly. This prevents potential daylight reflections.

With difficult installs, use a pendant or arm mount to improve your results.

### Tilt Test: Soffit Glare

With camera at 0° tilt, a halo of infrared reflection is noticeable in the live view. You can see some of its effects at the top of this snapshot; the sky and nearby roof are unnaturally light.

From 0° tilt to around 10° the IR reflection is still there, though it diminishes as the camera is tilted further down.

With the camera tilted down between 11°–13°, the reflection disappears and image looks good.



### Pan Test: Downspout Glare

The series of photographs below show the amount of reflection based on the angle of the camera from a nearby downspout. The series starts with the downspout barely visible in the upper left-hand corner of the image. You can see the massive glare it creates. Each subsequent image is rotated further from the downspout.



Downspout visible



+3°



+12°



+18°



+23°



+28°



+34°

## Daylight Test

Potential daylight reflection when camera is facing direct sunlight is shown in the picture below.



Home - Backyard PTZ (HIGH)

## Example of a Bad PTZ Install



This camera has several problems created by its install location.

1. It has half of its field of view blocked by a downspout.
2. It's tucked behind a corner, so the wall blocks another large portion of its field of view.
3. The areas where the camera can see are liable to have IR glare, especially near the house corner and the topmost part of the downspout.

All of these problems mean that the camera has a field of view that is free from glare for the roughly 90° toward the top of the picture; everything else is blocked or suffers infrared glare.

## Nighttime Image Issues

If your nighttime surveillance video looks foggy or soft-focus, one likely cause is that infrared reflection or bleed is affecting the image.

Infrared interference can be caused by

- Loose or missing foam ring (dome camera only)
- Problematic installation
- Dust or grease on the dome cover
- Nearby objects in the environment reflecting IR light

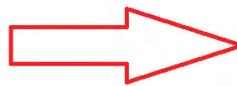
This sheet discusses the symptoms and solutions for each of these.

### Foam Ring

The most common error among inexperienced installers is removing the foam ring from around a dome camera. People have been conditioned to think of foam as disposable padding used to protect devices during shipping. In reality, the foam ring is an essential part of the camera, and must be kept for a proper installation.



**Without Foam Ring**



**With Foam Ring**

Even with the foam ring in place, an improperly installed ring can still leak infrared glare. When properly installed, the dome bubble should sit snugly against the foam ring. Note that a good contact seal with the dome bubble means the foam ring is slightly squished, thus negating all other possible sources of internal and external glare.

The photos below illustrate how improperly installed foam rings can affect your camera's infrared images. Daylight glare can cause similar effects.



**Normal Foam Ring**



**Foam Ring Loose-contact**



**Foam Ring Removed**

## Avoiding Internal Glare

There are three main ways that installers may accidentally create internal IR glare.

### IR Emitters

A second error is to aim the camera in a manner such that the emitters are below the edge of the camera skirt (1). Their light then reflects off the camera skirt and can be picked up by the lens.



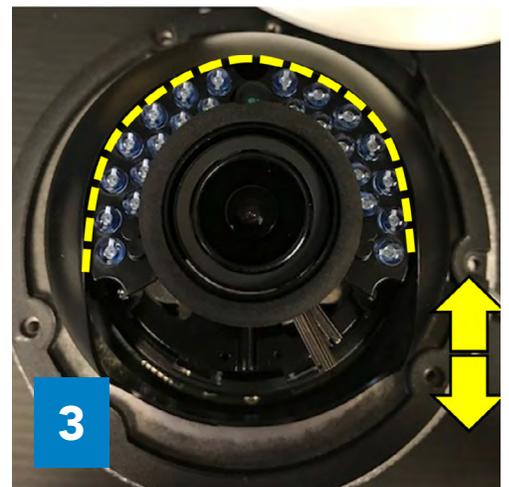
### Alignment of Cowl and Emitters

The cowl that surrounds the camera is designed to prevent IR leaks. Twisting the camera can result in a situation where the cowl no longer covers all the emitters (2). This can cause internal IR glare.



### Proper Install Technique

An improper install can also cause internal glare. Start with the emitters aligned with the cowl trim line (3), then rotate and angle the camera to find the best position. Avoid positioning the camera at a flat angle where the emitter might strike the casing.



## Problematic Installation

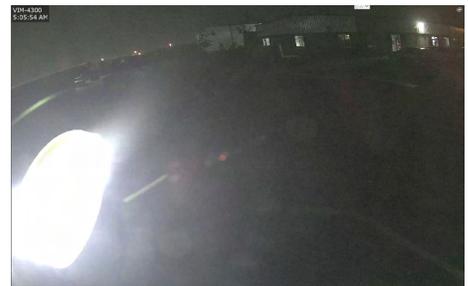
If the IR lamps are pointed into the camera housing (see image at left), this can cause reflective infrared issues. Note the daytime and nighttime photographs below, and how IR reflection against the housing affect the image.



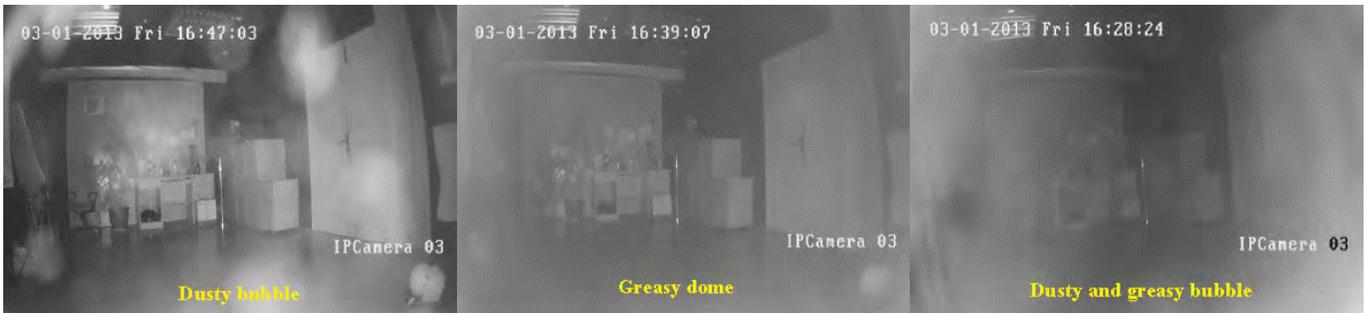
Other nearby cameras (with their own infrared emitters) can also cause poor nighttime images.

Cameras can cause this even if they are not in the field of view. Cameras that shine infrared on the same area, or on an area that is at the edge of another camera's field of view, can cause glare.

The image at right show one example of another camera's infrared causing glare.



## Dirty Dome



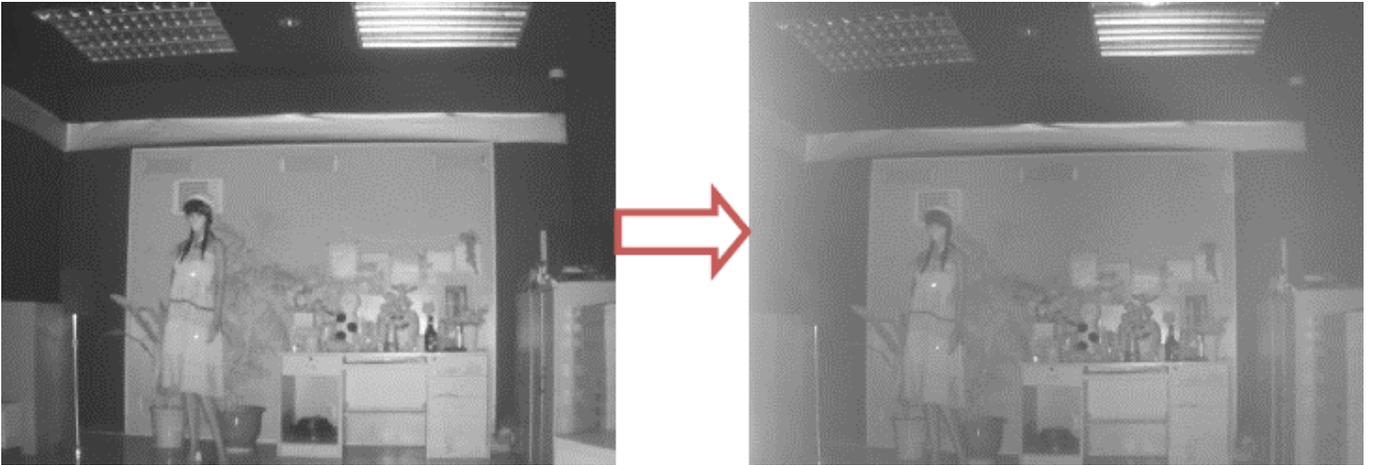
If the glass dome is dirty, the dirt can reflect infrared into the camera lens.

To keep the dome clean during installation, keep the protective film on the dome until you have completed installation. In addition, avoid touching the dome, which creates grease spots on the bubble. Such spots may not affect the daytime image but are an issue with infrared images.

Over time, domes also can get covered with dust, raindrop rings, and cobwebs, which cause the image quality to degrade and appear foggy. Clean the dome periodically to maintain a clear image. When you clean the dome, always use a soft cloth. Do not use an abrasive cleaner; use distilled water if you need a liquid.

## Nearby Objects

Nearby objects and barriers are another possible cause of “foggy” infrared images, even if they are not within the field of view.



The photos above show the glare effect of a small piece of cardboard positioned only 4 inches away from the side of the camera. Even though the cardboard is not visible in the picture, the effect is clear. Similar effects can be caused by the soffit, plants, and other items.

To avoid glare:

- Do not install the camera in a tight corner.
- Use wall mount brackets to set the cameras away from walls and soffits.
- Rotate the camera away from background surfaces as much as possible.
- Clear nearby vegetation from the field of view (plants leaves are highly reflective).