

FAQs for Dinion^{XF} Day/Night Cameras (LTC 0495 & LTC 0620)

Q: What is the difference between NightSense and Day/Night?

A: In NightSense mode, the camera turns off the DSP color processing to achieve higher sensitivity (9dB more). A Day/Night camera has an IR filter in front of the CCD that switches automatically. The IR filter is necessary for daytime color reproduction. Without the IR filter, the camera can produce monochrome images – and it has extended sensitivity because IR illumination (artificial or background) is detected.

Q: If the application is not using IR illuminators, should I use NightSense or Day/Night cameras? Why?

A: This depends on the presence of IR background radiation. If there is no IR radiation, NightSense is the preferred solution. If there is IR background illumination, a Day/Night camera will generally provide higher sensitivity and better images.

Q: What type of light source is best for good color rendition, and how does that impact Day/Night camera operation?

A: In Day mode, a Day/Night camera is the same as a color camera. For both cameras, the best results come from broad-spectrum white illuminators, such as halogen spots. Good color reproduction is also possible with incandescent and fluorescent illuminators.

Q: Why does IR light give an out-of-focus image (vs. visible light), and is there any way to correct that problem?

A: Focus differences between IR and visible light are caused by the lens. The refractive index of the lens glass light is different for IR illumination and visible light. Lens suppliers (including Bosch) offer IR-corrected lenses that are designed to avoid a focus shift in cases of IR illumination.

Q: Do all lens types have IR-corrected versions, such as fixed focal length, varifocal, and motorized zoom?

A: In practice, not all versions are available as IR-corrected lenses. Bosch offers a range of varifocal and motorized zoom lenses to cover the vast majority of applications.

Q: Which type of filter is in the optical path during color operation?

A: In color mode, the camera has an IR filter in the optical path. This filter is necessary to keep IR background radiation from falling on the CCD, since this would prevent a good color reproduction.

Q: Which type of filter is in the optical path during monochrome operation?

A: In monochrome operation, a “dummy” glass filter is in the optical path. The sole function of this filter is to make sure that the path length between the lens and CCD is identical for color and monochrome operation. Otherwise, there would be a loss of focus in either operation.

Q: Can you explain the parameters that cause switching from color to monochrome mode? (What level of IRE or what percentage of IR scene illumination? Will it oscillate between modes in certain conditions?)

A: In automatic Day/Night switching mode, the video level is the condition for switching into Night mode. The actual switching level (20 to 80 IRE) is adjustable through the setup menu. Switching to Day mode is based upon meeting two criteria:

The light level is above a certain threshold, which is a fixed offset on top of the level for switching into Night mode. The offset creates hysteresis to prevent oscillation. Through the lens, the camera determines whether the dominant light source is IR. If it is IR illumination, the camera will not switch back to Day mode. The benefit of this algorithm is that it will not oscillate, even when strong IR illuminators are used.

Q: Will the camera go back to color operation if the IR light level is high enough to generate full video 1 Vp-p?

A: The light level for switching to Day mode is a threshold (a fixed offset on top of the level for switching into Night mode – it’s needed to create hysteresis to prevent fluctuations). The offset is approximately 15 IRE.

Q: How does the camera differentiate between IR and visible light?

A: The camera runs an algorithm using the white balance circuitry inside the Dinion IC to detect whether IR or visible light is the dominant light source. (White balance circuitry is available since the camera is in monochrome mode, and white balance operation is not necessary.)

Q: What is the best wavelength of light to use when selecting an IR illuminator?

A: The closer the infrared is to visible light, the higher the camera’s sensitivity. However, visibility of the light or light source to the human eye is also possible. Since IR illumination ranges from 780 to 900 nm, a light source in the 800 nm range usually provides the best of both worlds.



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Q: What is the highest wavelength of IR light I can use with the Bosch Dinion^{XF} Day/Night camera?

A: 920 nm

Q: Can IR light damage the imager if a bright source is in the field of view?

A: No. Reflected IR radiation is always at a safe operating level.

Q: What percentage of nighttime light is in the IR spectrum?

A: At full moon (and depending the moon zenith), about seven percent of the total radiation is in the IR spectrum between 780 and 900 nm.

Q: What is the advantage of using the 1/2-inch imager over the 1/3-inch imager?

A: The 1/2-inch imager is more sensitive and, depending on the quality of the lenses, its image contrast and sharpness can outperform a 1/3-inch camera.

Q: What impact does IR light have on the camera's wide dynamic range?

A: IR illumination itself does not change the wide dynamic range. However, the reflection of IR light is different from the reflection of visible light for most materials. When the IR reflection is about equal for all objects in a scene, it can cause images with less contrast. The Dinion^{XF} Day/Night camera offers the option to enhance the contrast in Night mode – delivering the full benefit from wide dynamic range behavior even in IR illuminated scenes.

Q: Can IR light be used to improve camera vision in foggy scenes?

A: With the Dinion^{XF} Day/Night camera in Night mode, exceptional images can be produced even in clubs and restaurants where the camera is looking through smoke.

Q: Which version of Bilinx software is required to operate the Dinion Day/Night cameras?

A: V2.20 and later are fully prepared for the Day/Night cameras.

Q: What is 15-bit technology and why is it important to me?

A: Dinion^{XF} 15-bit technology increases the accuracy with which it processes the signal coming from the CCD. The camera can process the signal to reveal details in the dark and highlight parts of a scene simultaneously (due to increased dynamic range). Increased accuracy also leads to better color reproduction. Most CCTV cameras are limited to 10-bit – so Dinion^{XF} 15-bit technology is, therefore, 32 times more accurate for signal processing.

Q: How does the camera switch from day to night mode (automatic, alarm input, Bilinx, profile mode switching)?

A: Users can choose the method. The camera can switch itself in automatic mode, but it can also be set up with different modes (profiles) for daytime and nighttime operation. Profile switching can be controlled via Bilinx or the camera's alarm input. The alarm input can also be programmed to control Day/Night switching without changing the profile. Of course, Bilinx can be used to trigger the switching as well.

Q: Are the switching levels for Day/Night mode adjustable?

A: In automatic Day/Night switching mode, the video level is the condition for switching into Night mode. The actual switching level (20 to 80 IRE) is adjustable through the setup menu. The light level for switching to Day mode is a threshold (a fixed offset on top of the level for switching into Night mode that is needed to create hysteresis to prevent oscillation). The offset is approximately 15 IRE.

Q: IR-illuminated scenes sometimes appear dull, and don't show enough detail; is there anything to help restore contrast?

A: In Night mode operation in an IR-illuminated environment, the Dinion^{XF} camera offers the option to enhance contrast. This prevents images from looking dull and flat.

Q: My monitor is still showing a monochrome image and the camera switched back to color mode; how can this be resolved?

A: When going from Day to Night mode, some monitors have difficulty if the camera switches the color burst off and on. The Dinion^{XF} Day/Night camera offers the option to have the color burst in the signal during Night mode also (Mono Burst ON).

Q: How many years of operation can I expect from the Dinion^{XF} Day/Night IR switching mechanism?

A: The IR switching mechanism is specified for 15,000 cycles (approximately 20 years of continuous camera operation) with one switch to Night mode and one switch to Day mode every 24 hours.

Q: What is the function of Auto Black and XF-dynamic?

A: Both ensure optimal contrast reproduction in weather conditions such as fog, rain, and snowfall. The combination of functions lets the camera fully exploit its dynamic range capabilities, thus revealing all of a scene's details.



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