

# Manual Addendum

## Possible Damage of Sensor Due to Overexposure

This information applies to the above mentioned camera systems with Kodak (TrueSense) CCD interline sensors.

### 1 LASER light

High power light sources like pulsed LASER will eventually damage the sensor. Appropriate use of the camera is therefore mandatory. The scope of this note, however, is limited to imaging applications with natural light (noncoherent). Issues related to short wavelength radiation and physical damage due to excessive heating are not addressed here.

### 2 High Intensity Visible Lighting Conditions

According to the sensor manufacturer (TrueSense, formerly Kodak), a helpful rule of thumb is if the scene would be considered painful or harmful when viewed by the human eye, then it might be damaging to the image sensor. Conditions such as imaging a direct reflection of the sun from a shiny surface or imaging the sun directly through a wide aperture are examples of potentially damaging illumination levels (Kodak paper "MTDPS-1197InterlineCCDs in High Intensity Visible Lighting Conditions"). PCO designed the sensors into the camera systems striving for lowest noise and highest image quality performance and can not guarantee 100% protection against harmful overexposure. In order to stay on the safe side, PCO advises its customers to keep illumination within the following boundaries.

Camera	Typical Sensor Read-Out Time (full frame, 2 taps, fast read-out)	Illumination level is probably too high, if pixels get already saturated at the following exposure times
pco.1600	33 ms	25 $\mu$ s
pco.2000	68 ms	50 $\mu$ s
pco.4000	200 ms	210 $\mu$ s

CCD degradation will appear under continuous light conditions after repeated exposure events. CCD degradation will not appear in auto sequence mode under the following condition: exposure time > read-out time.

### 3 Image Example

CCD degradation is due to overexposure, but is only visible under low light condition.

