

BLOOMING AND ANTI-BLOOMING CORRECTION

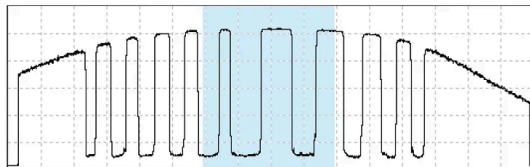
When the line sensor is saturated from excessive illumination and cannot accumulate more charges, the overloaded pixels transfer some of the excess charge to adjacent pixels – an effect termed blooming. Blooming leads to the corruption of the geometrical assignment of both the signal and the image generated by the line sensor.

A line scan camera with an anti-blooming sensor can effectively dissipate the surplus charge arising from over-exposure by using a 'drain gate'. The less exposed neighboring pixels are no longer corrupted. Over-exposures of up to 30-fold can be drained successfully, depending on the pixel frequency and spectral range of the line sensor.

EXAMPLE: LINE SCAN CAMERA WITHOUT ANTI-BLOOMING

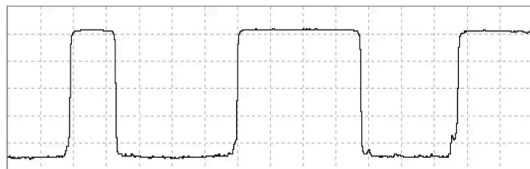
Line scan camera signal from a bar code using a midtone incident light and the SK2048U3JR line scan camera without an anti-blooming sensor.

The following example shows how a standard camera reacts to overexposure.



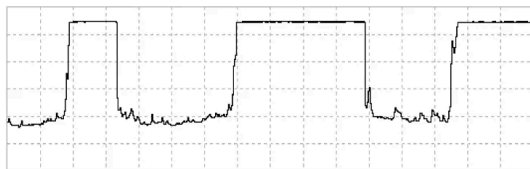
STANDARD LINE SIGNAL

Line signal with enhanced illumination of the central range.



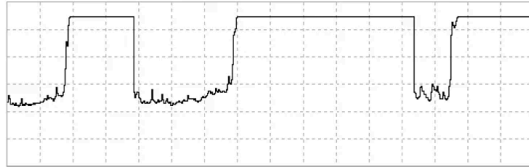
ZOOM INTO THE IMAGE

Zoom of the signal depicted in the first image showing the steep signal edge



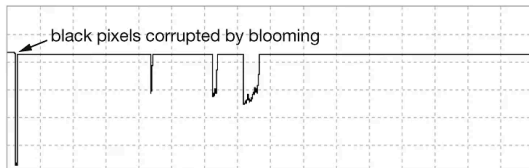
BLOOMING BEGINS

Extension of the integration time by a factor of 3.81 produces edges that are no longer vertical and have noticeable shoulders – the blooming of the sensor has begun.



BLOOMING: SEVERE SIGNAL AND DATA CORRUPTION

Over-exposure caused by too large an integration time leads to severe signal and data corruption when using line scan cameras without antiblooming.



EXTREME BLOOMING

Extreme over-exposure floods the dark pixels of the sensor, the offset control is disturbed and the line scan camera produces an attenuated signal.

This is a printout of the page <https://sukhamburg.com/support/technotes/linescancamera/basics/blooming.html> from 6/4/2026

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