

## BLOOMING AND ANTI-BLOOMING CORRECTION

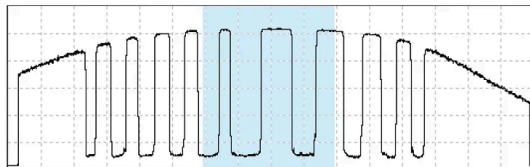
When the line sensor is saturated from excessive illumination and cannot accumulate more charges, the overloaded pixels transfer some of the excess charge to adjacent pixels – an effect termed blooming. Blooming leads to the corruption of the geometrical assignment of both the signal and the image generated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

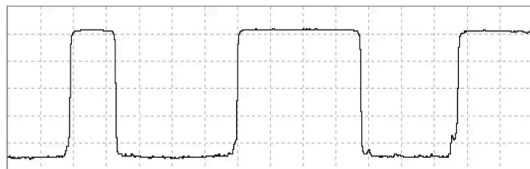
Line scan camera signal from a bar code using a midtone incident light and the SK2048U3JR line scan camera without an anti-blooming sensor.

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



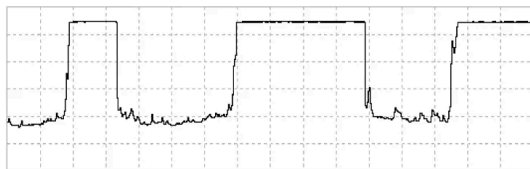
### STANDARD LINE SIGNAL

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

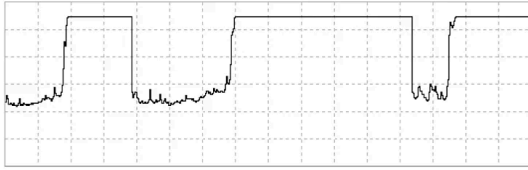


### BLOOMING BEGINS

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.

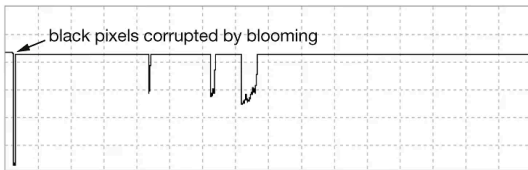
**BLOOMING: SEVERE SIGNAL AND DATA CORRUPTION**

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 5/14/2026

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