

## **Affordable alternative:**

### **Area scan camera with CMOSIS sensor versus line scan cameras**

The USB 3 uEye CP models with the latest CMOSIS 4.2 megapixel sensors with revision 3 (UI-3370CP) now offer a triggered line mode. This means that expensive line scan cameras can simply be replaced in many fields of application by the more affordable and extremely powerful UI-3370CP area scan camera.

#### **Background**

**Area scan cameras**, also known as matrix cameras, capture a specific area as an overall image, which is then processed.

Thanks to simple image display, area scan cameras are relatively easy to focus and control. They can therefore be adjusted extremely precisely. Area scan cameras are much cheaper than line scan cameras, although you do have to accept the fact that resolutions and speeds are often lower.

**Line scan cameras**, on the other hand, do not capture an area, but individual lines instead, which are then compiled by the respective software to form an image. By capturing individual lines, these cameras require much less light than area scan cameras. Line scan cameras also lead the way in terms of speeds and resolutions: For image widths of up to 12000 pixels, an object can be up to three times wider than with area scan cameras at the same resolution.

However, this performance has its price. Line scan cameras are not only more expensive than area scan cameras, but their color resolution is often poorer and their brightness sensitivity lower. In order to use a line scan camera, you also need movement - either of the material to be inspected or of the camera. A clock (encoder) is therefore required. The fact that there is no camera image means that a line scan camera cannot be adjusted precisely.

#### **Alternatives**

In order to circumvent the disadvantages of the line scan camera, area scan cameras try to use different methods, such as stitching, to simulate the way in which they work. The disadvantage of this is that the borders often overlap, thus making a 100 % control or inspection impossible.

## Solution

Thanks to the triggered line mode of the UI-3370CP, this area scan camera now works in the same way as an original line scan camera: Up to 4000 lines (mono) or 4000 double lines (color) are combined per image. This rules out any overlap of the borders. Thanks to an incremental decoder each line can be triggered individually in triggered mode. This results in distortion-free images even if assembly line delays occur.



The triggered line scan mode allows to combine up to 4000 lines(mono) or 4000 double lines (color).

## Application areas

Area scan cameras are used across the entire spectrum of machine vision, as well as in the ITS sector, medical technology, and a wide range of other non-industrial applications.

Line scan cameras are used almost exclusively in endless web inspection systems, for example of textiles, paper, wheel rims or even silicon wafers. They are not really suitable for print inspection or surface testing.

## Summary

The USB 3 uEye CP area scan camera with the 4.2 megapixel CMOSIS sensor is suitable for a wide range of simpler applications in endless web inspection systems, thanks to the triggered line mode. Simple setup and low system costs make it an affordable alternative to the original line scan camera.

Detailed information on setting up triggered line mode for the UI-3370CP is available in the [IDS camera manual](#).

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