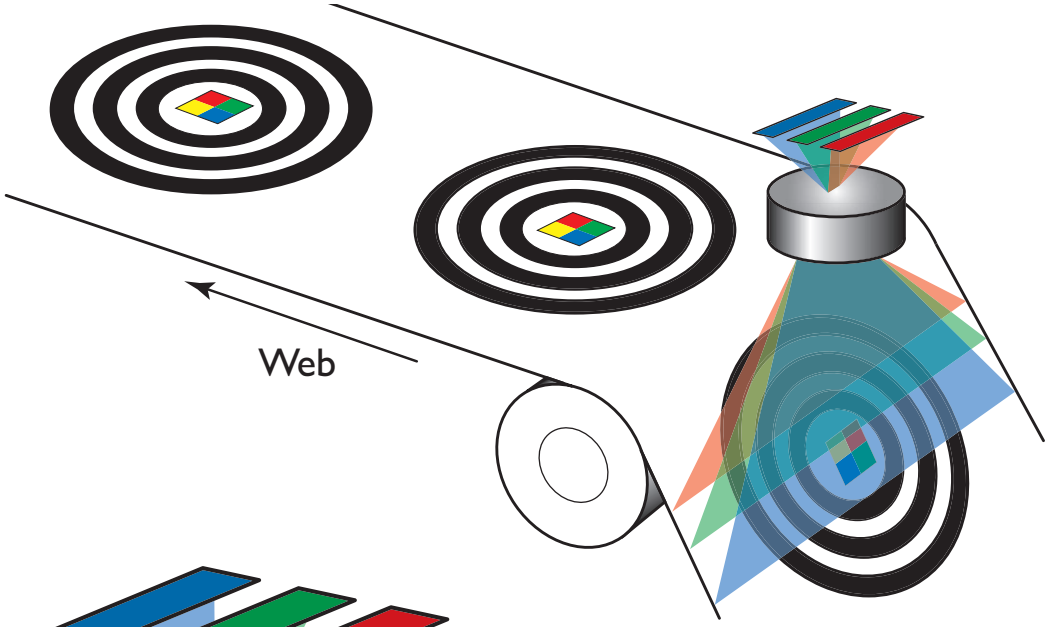
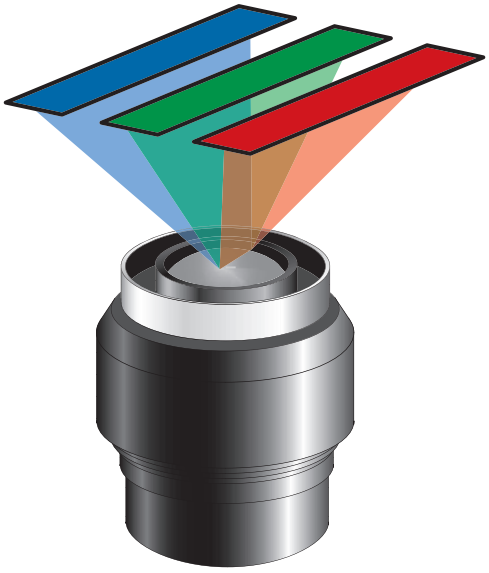
Scary Linescan Part Two.
Colour Linescan

Linescan cameras are available in colour versions as well as the more common monochrome, but in general, the priciples are the same as we discussed in part one. Colour models generally use 3 sensors, one for each colour, Red, Green and Blue, and these can be arranged in two ways:

3 CCD 'Tri Linear' Linescan

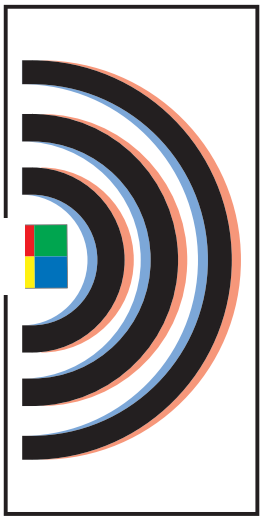
In this type of colour linescan technique, the three sensors are positioned next to each other, seperated by an equal space, to form what is called a tri-linear camera. This space between the three linear sensors is dealt with by the software which re-combines the red, green and blue lines to make a colour image. This type of sensor arrangement has good light sensitivity (similar to a monochrome set up) but is limited to flat, 2D objects as the diagram below shows. This is because the distance between an irregular object and the three sensors is different for each colour, which produces a colour misalignment in the eventual image. However if your target is flat as it would be in a web inspection application, then these cameras can perform very well indeed. Tri-linear linescan cameras represent the most cost effective way of getting into colour linescan.





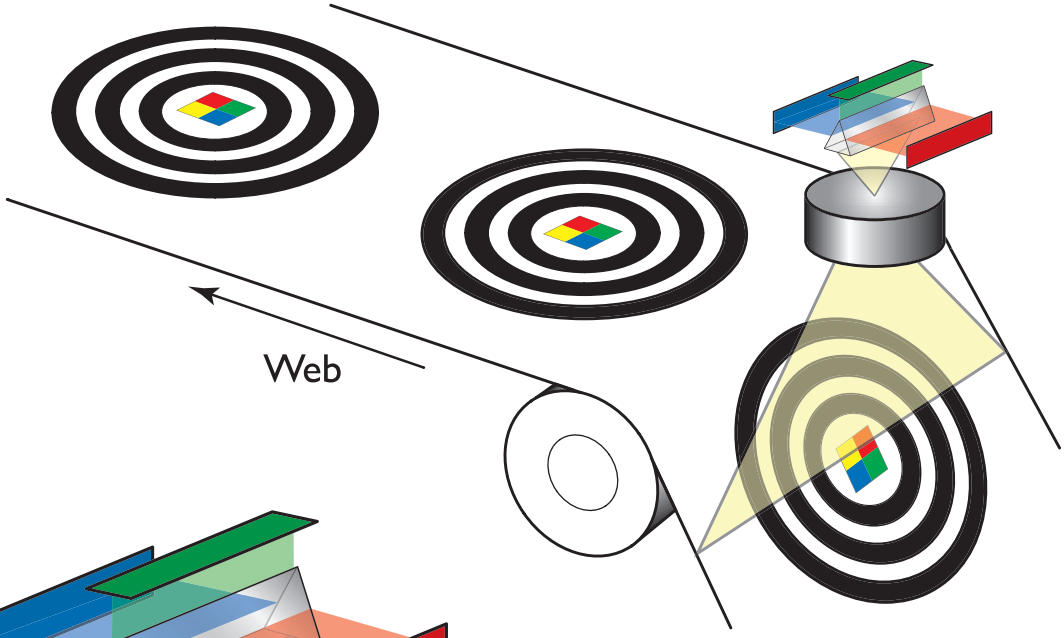
Detail of lens/sensor arrangement

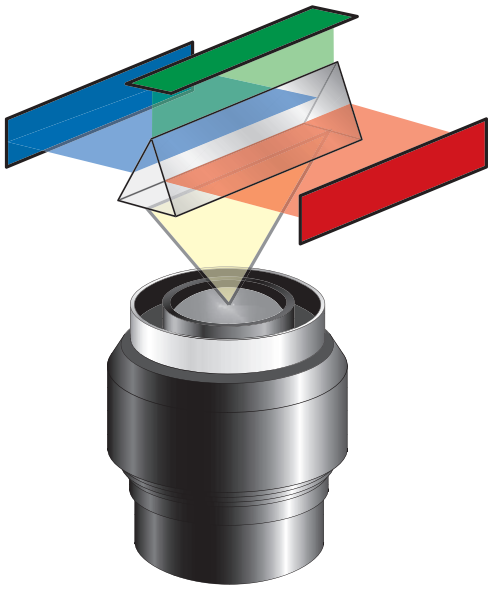
This is how the image will look if this camera is used on a sloping or uneven surface, and shows the misalignment of the images



3 CCD 'Prismatic' Linescan

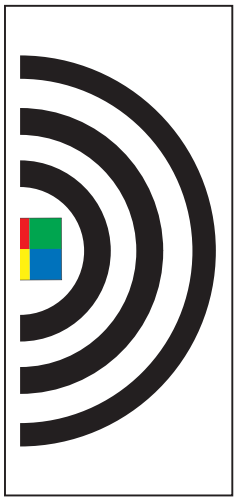
In this type of linescan camera, the 3 sensors are arranged around a prism, just as they would be in a 3CCD area-scan camera. This arrangement of sensors can cope with uneven objects without any problem, because the red, green and blue lines are coincident; in other words they come from the same place on the object as you can see in the diagram below. The trade-off with this technique is that the addition of a prism makes the camera less sensitive because the glass in the prism reduces the amount of light that makes its way to the sensors. These type of linescan cameras also tend to be more expensive the the tri-linear type, but they are more flexible and can handle more challenging inspections.





Detail of lens/sensor arrangement

This is how the image will look if this camera is used on a sloping or uneven surface, and shows the correct alignment of the images



This Tech-Tip is abridged from the 'Vision Elements - The Machine Vision Handbook' which is avaliable free of charge on request, and contains a huge amount of machine vision technology and product information.

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