



## FSI Product and Engineering Updates

### Product News: FSI Machine Vision Lenses

FSI Technologies introduces our newest line of machine vision lenses – CLH Lenses. Hand selected by our machine vision engineers in order to simplify the process, these lenses are versatile and work well with most common machine vision equipment and applications. CLH lenses provide high accuracy and resolution. They can be bought in a variety of focal lengths depending on the needs of your application and are designed to work with high shutter speeds. CLH lenses are robust enough to be used in industrial applications. They are designed with a c-mount configuration and feature dual locking methods and threaded mounts to accommodate filters.

Take the guesswork out of selecting the right lens for your machine vision system and get “focused” on a real vision solution. For more information about our line of Machine Vision lenses, visit [www.fsinet.com/Express/Express-Lenses-Home.htm](http://www.fsinet.com/Express/Express-Lenses-Home.htm)



### Variables to consider when selecting the right lens

The choices our engineers have made for our family of CLH lenses help simplify the most difficult aspects of the lens selection process. However, one of the main tasks and engineer will need to do for a successful machine vision system is to establish a proper field of view.

A proper field of view is one in which you can see what you need to see (even if its position changes) and not much more beyond that. It may be a large object that is moving or it may be the details on a product that is stationary. Two variables that you can adjust to change your field of view are:

- **Lens Focal length:** This is measured in mm (ie: 35mm lens) and relates to the angle of view that will be achieved. Short focal lengths show a wider angle of view, but the objects within that view appear farther off and smaller. Longer focal lengths provide a narrower field of view. Objects within that type of view appear closer and, therefore, larger.
- **Distance:** This is how far from the object your camera will sit. For some applications, it is important the camera be separated from the product it is imaging. In other cases, the camera can be positioned next to the object being imaged. The farther away the camera sits, the larger the field of view, the closer the camera sits, the narrower the field of view.

The appropriate focal length of the lens and the distance of the camera to the object will affect not only what you see in your field of view, but how well you can see it. Adjust as necessary until you find the combination that works for you.

### FSI/EVT “Smart Inspection” System

This “trifecta” of inspection systems offers a camera, lighting and software all within one compact, protective housing. Small in size, the unit measures 140 X 70 X 35 mm and weighs a mere 400 g in



total. This machine vision system can be used on a wide range of industrial applications. The camera/software is an extension of the EyeSpector smart camera series. As such, the camera is a 1/3" CMOS sensor with up to 2592 X 1944 pixels and the EyeVision image processing software can be programmed easily through drag and drop functions on the graphical user interface. The unit has a 32 MB Flash and 128 MB DDRAM for program and data storage. Lighting is a high-output and high powered LED, positioned on an angle to view even difficult surface inspections reliably.

### NEUROCHECK 6.0: LOOK-UP-TABLE TOOL

Would your application benefit from an image that has greater contrast? The Look-Up-Table tool in NeuroCheck software transforms the image to create greater contrast in either gray scale or color images. The tool accomplishes this by assigning every gray or color level a new gray or color value. The amount of contrast the look-up table creates depends on the values assigned, either through an existing function or a user-defined function.

For example, we have an image of a car brake assembly with printed text. As you can see in the first image, the printed text is visible but not easily readable. For a character recognition program to better detect the printed text, greater contrast is needed. We can use the look-up table tool to create greater differentiation between the text and the background on this image. On the second image we used the Gaussian function to create sharp transition between dark and light areas (dark areas become darker and light areas become lighter).

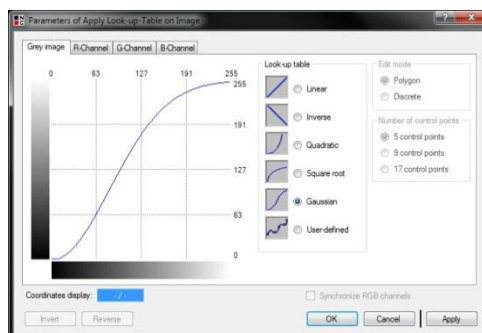


Before Look-Up-Table tool



After Look-Up-Table tool: Gaussian

NeuroCheck version 6.0 now offers full color capabilities for the look-up table tool (see "Parameters of Apply Look Up Table" image below). Here, RGB values can be modified collectively on color images, or separately using channel controls for each value. Also, the user-defined mode allows the user to define the transformation curve freehand or mathematically.



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