

# Software for Camera Control and Image Acquisition for FOCUS Cameras

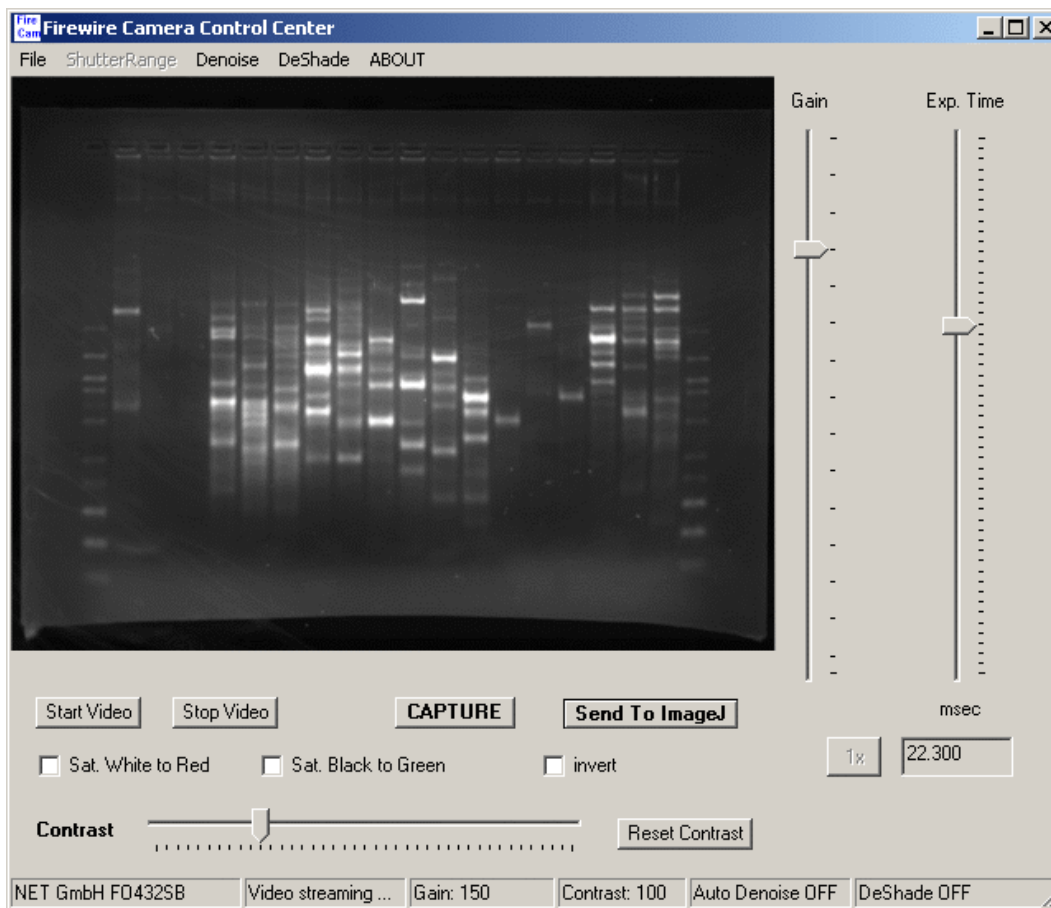


Fig. 1  
Application Surface

## Main Software Functions

- Live video, Freeze video
- colorize over/under exposed pixels in live display
- invert live display
- Controls for: Gain, Shutter, Contrast
- Save / Recall Camera settings
- Auto denoise (not required for gel imaging)
- DeShade: Correction for uneven illumination
- Capture single image
- Text insertion of actual camera settings into captured image
- Save image as BMP or TIFF16
- Setup print dimensions
- Print Image
- Copy Image to Clipboard
- Send image to [ImageJ](#)

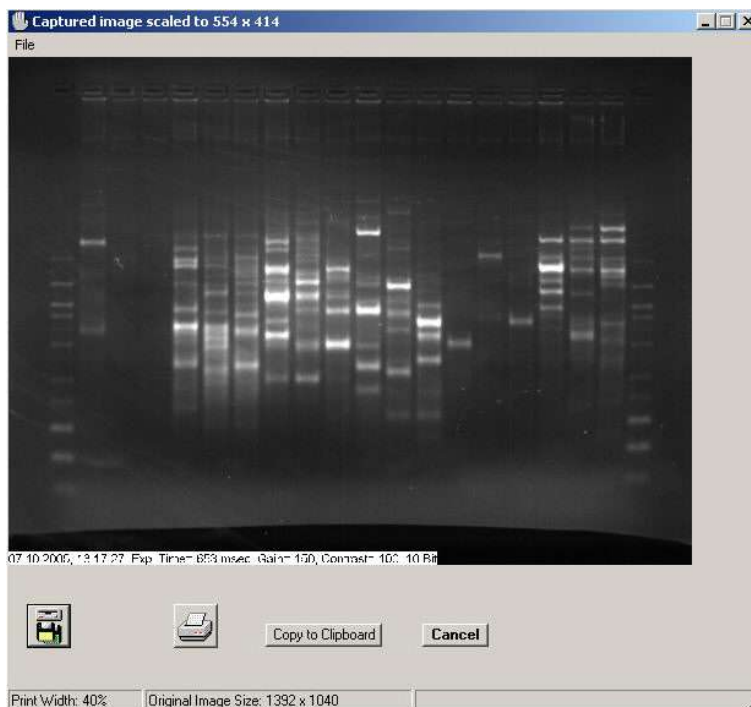


Fig. 2  
Extra window, when **Capture** button was clicked



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## Common Operations

After loading the **FireCam** software a program window similar to fig. 1 is shown. The optimal exposure time is set by the “**Exp. Time**” slider. The gain slider is yielding a similar visual effects as the Exp. Slider, but noise is more strongly increasing with increasing gain. The scaled live preview gives full control over the effects due to changes of the camera settings.

If it is intended to submit images to densitometry analysis, over-exposure of interesting bands should be avoided. Over-exposed white pixels have gray level value 4095 (12 bit resolution) or 255 (8 bit resolution). In case of bright EthBr. bands, select option “**Sat. White to Red**”. This will give over-exposed white pixels red color in the **live preview**. You may now change the exposure time, gain or contrast appropriately to let the red color vanish.

When the optimal exposure conditions are found click on the “**Capture**” button (fig. 1). This crops a single image which is then displayed scaled in an extra window (fig. 2). This image may now be printed and/or saved (BMP, TIFF or TIFF16 when camera running in 12 bit mode). Before printing, the print size may be selected in wide ranges as % of available paper width. The image is always set to the center of the paper.

When EthBr. images are to be printed by Ink Jet Printers, it is recommended to use the invert option (fig. 1). The originally bright bands on dark background will then appear as dark bands on bright background. On printing, this will save a lot of ink and also the human eye is more accustomed to such representations.

## FireCam Software and Image Analysis

If densitometry of bands (mass estimations), chain length or Molecular Weight analysis are required, we recommend software package **ImageJ** (NIH, National Institute of Health, USA). **ImageJ** is a powerful software package for scientific image analysis and is completely free. It may therefore run on several computers simultaneously without any license fees. The **PHASE** company developed some **ImageJ** tools to couple to the **FireCam Control** software and to perform image analysis of gels.

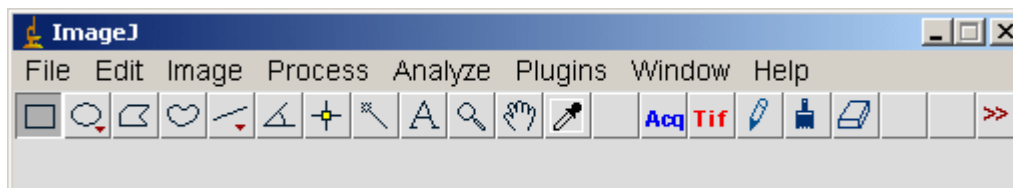


fig. 3

**ImageJ** toolbar, please notice **Tif** and **Acq** buttons. These buttons are generated by appropriate **ImageJ** macros

On clicking the **Send To ImageJ** button (see Fig. 1 above) a single image is sent directly to the ImageJ work space and is also displayed there.

On clicking to the **Tif** button (fig. 3), the last image captured by the **FireCam Control** software (by action of the **Capture** button, see fig. 1) is loaded directly into the **ImageJ** work space.

The **Acq** button executes an **ImageJ** Plugin which is triggering the **FireCamControl** software to capture a single image from the live image stream and export it to the **ImageJ** work space.

Of course, it is also possible to load an image file from hard disk. The user may now start his image analysis such as densitometry of bands or estimations of DNA chain length.

**ImageJ** is part of the software package distributed with the **FOculus** cameras. Customers who are ordering a complete gel documentation system including PC, will find a fully installed version of **ImageJ** on their system including the above mentioned macros and plugin.



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