



# HIGH SPEED CAMERA AND MICROSCOPE SYSTEM

## USER INSTRUCTIONS



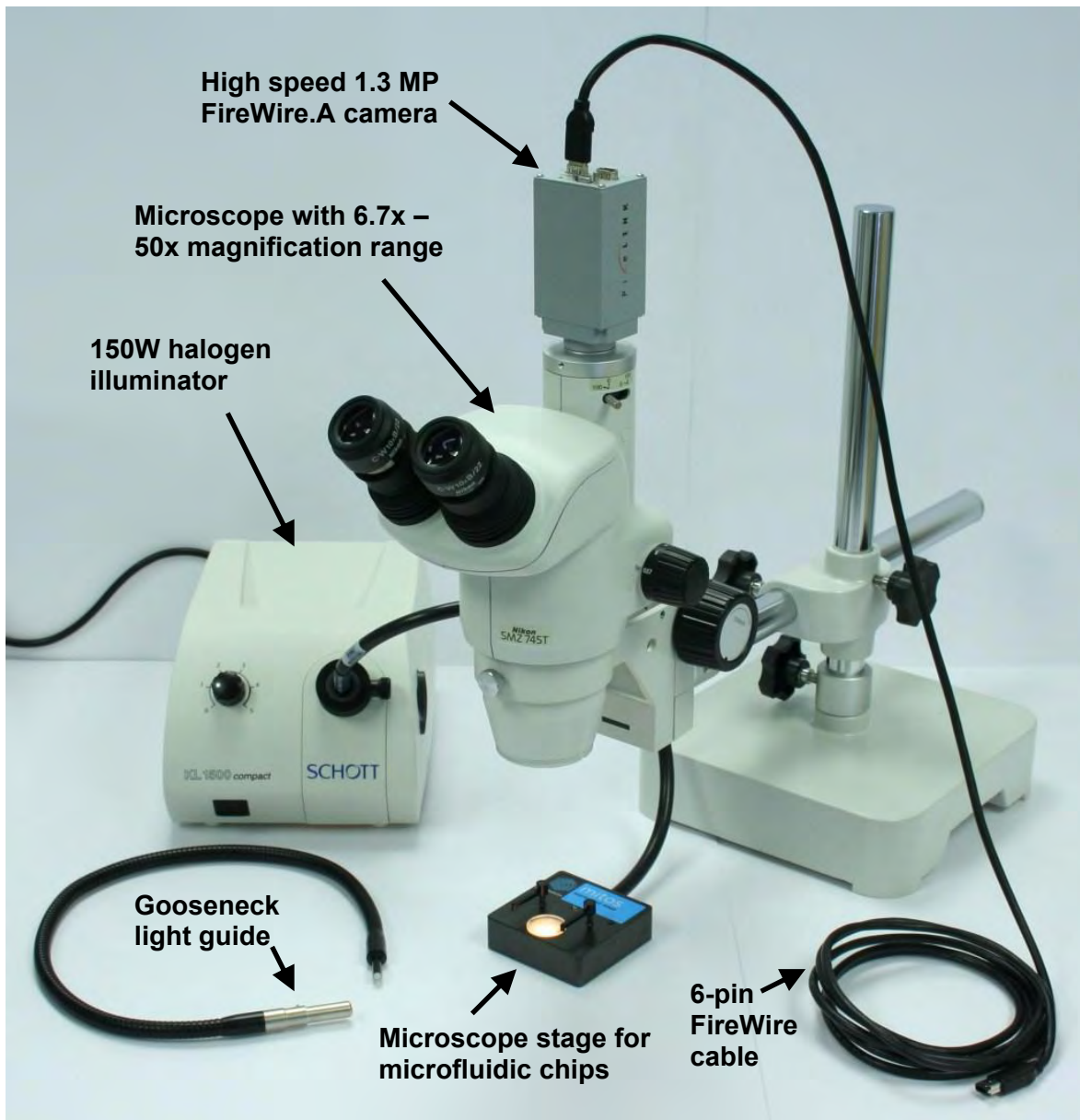
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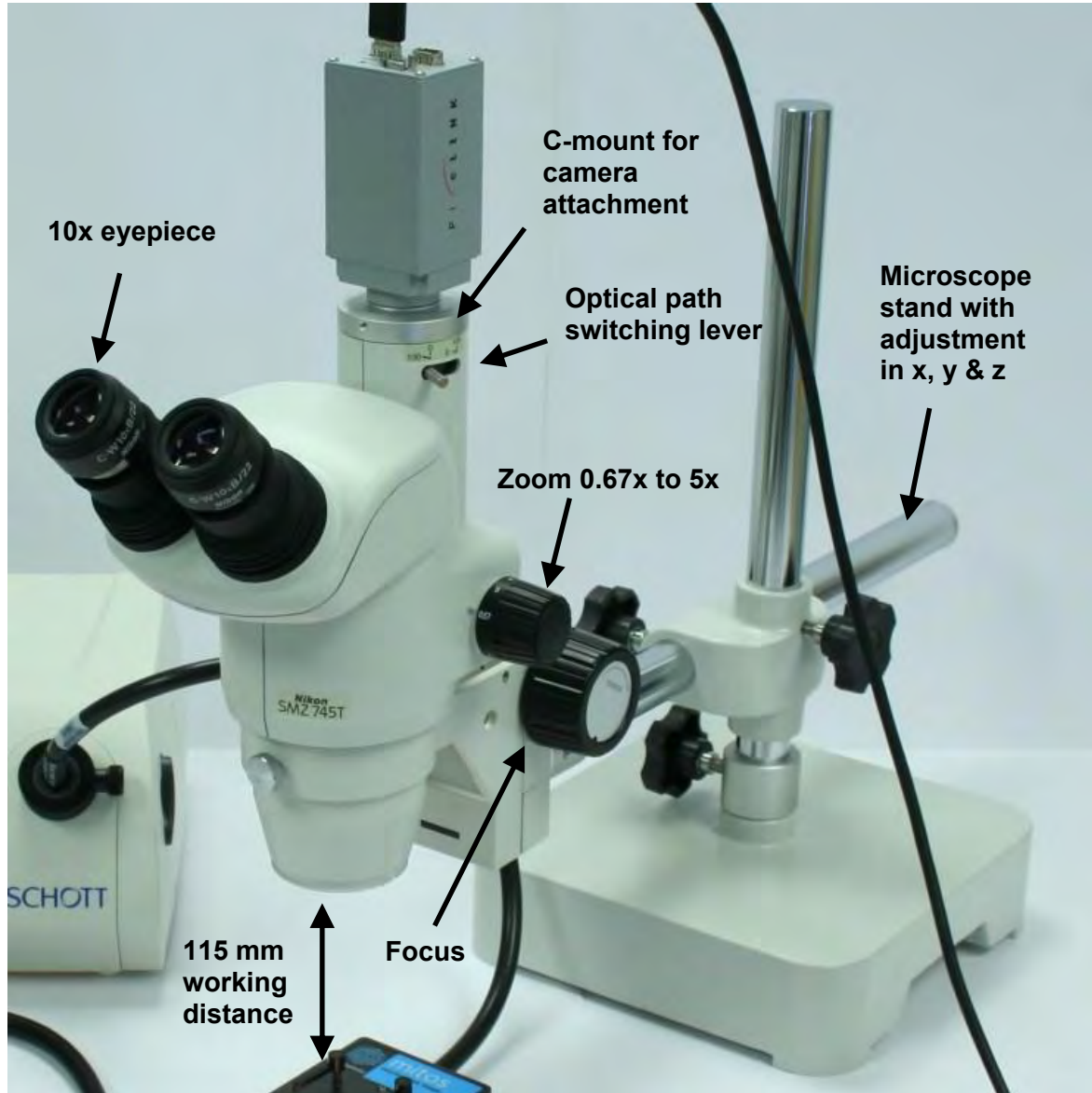
## 1. System Components

The High Speed Camera and Microscope System contains the following components:





## 2. Microscope Set-up



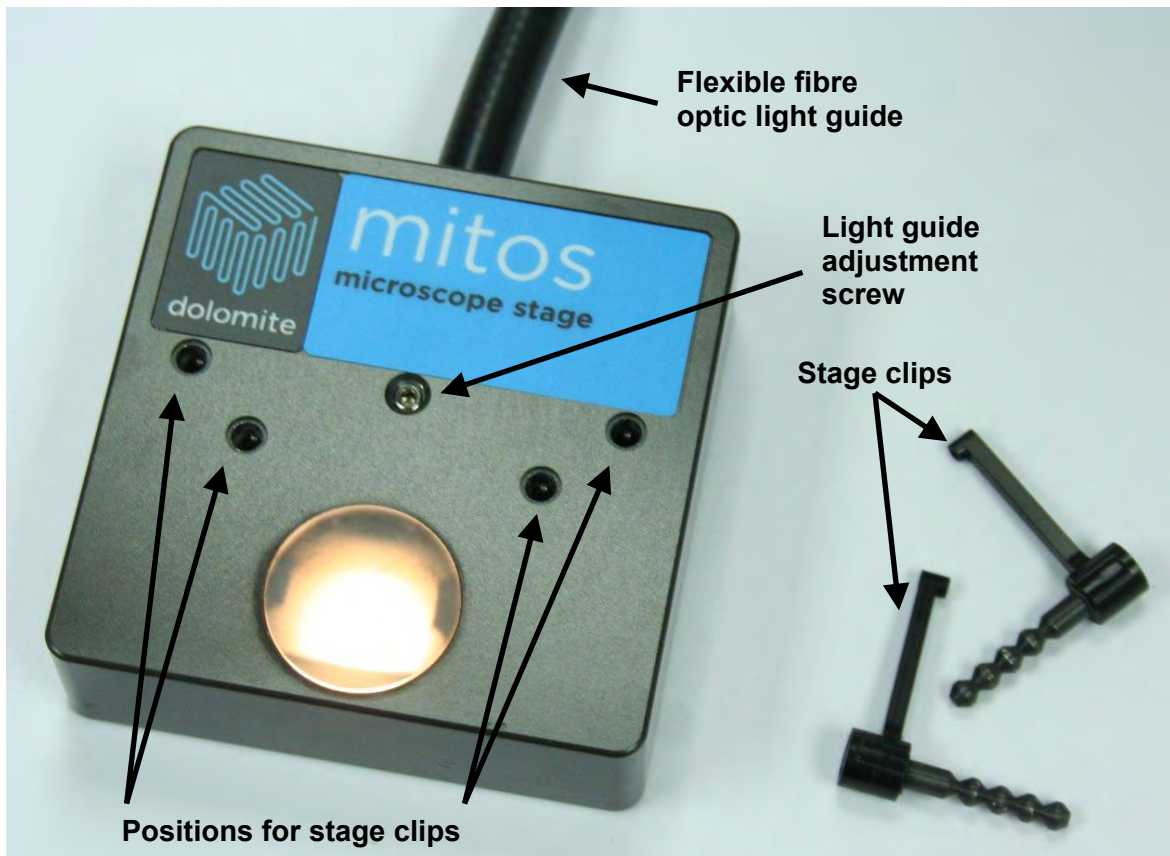
*Optical path switching lever position for microscope viewing*

### Notes on microscope use:

- Ensure optical path switching lever is in the position shown in the image on the left.
- Adjust stand to approximately the right height before focussing.
- Eyepieces can be adjusted sideways to fit the user.
- Do not use the microscope with the illuminator at full brightness.

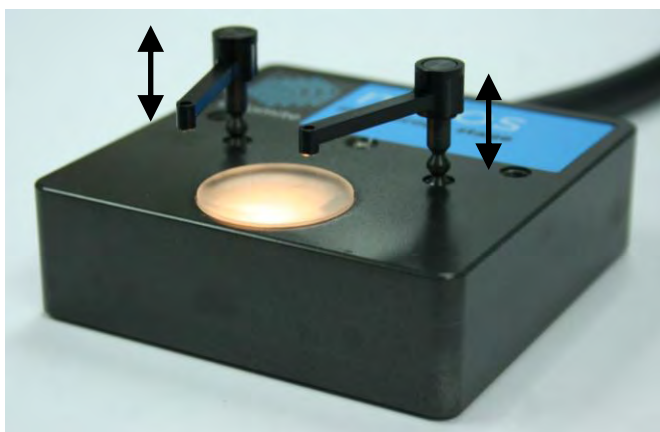


### 3. Microscope Stage Set-up



Notes on microscope stage use:

- Stage clips can be inserted into 2 different positions to accommodate samples with different footprints.
- Stage clips can be adjusted to 4 different height positions to accommodate samples with different heights.
- The flexible fibre optic light guide is supplied fixed in place to give the highest brightness. If required, the brightness can be decreased and size of bright spot increased by releasing the adjustment screw and adjusting the light guide position.
- Place the chip onto the stage with the area of interest central over the light source.



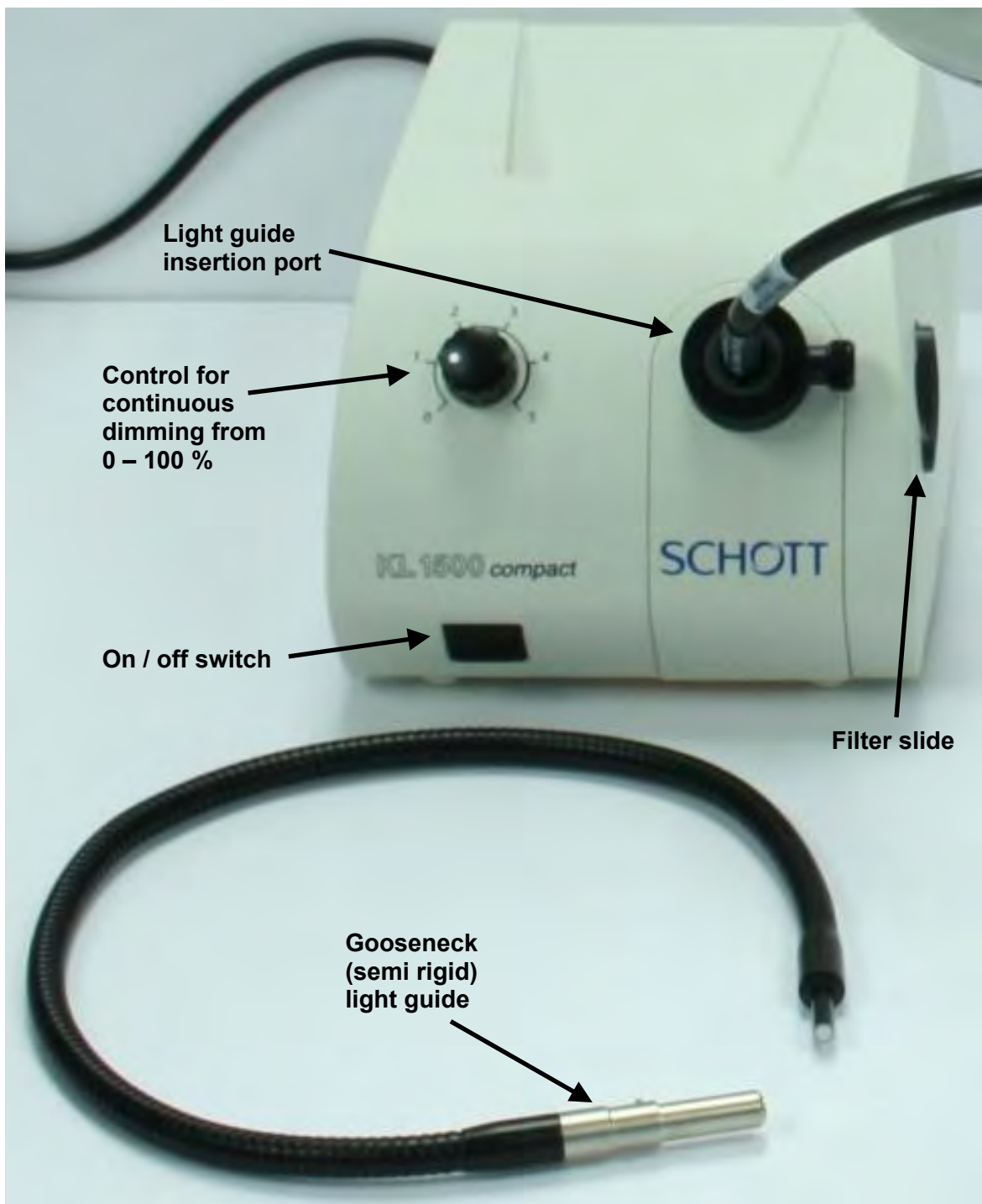
*Stage clip height adjustment*



*Chip placed on microscope stage*



## 4. Illuminator Set-up



*Diagram showing the main features of the illuminator*

### Notes on illuminator use:

- The dimming control will generally be in position 1 – 2 for use with the microscope. When the high speed camera is in operation then maximum brightness may be required.
- When illumination from above or the side is required, then the gooseneck light guide can be used in place of the microscope stage and flexible light guide.



## 5. High Speed Camera Set-up



*Optical path switching lever position for camera use*

Notes on High Speed Camera use:

- Download “PixelINK Capture OEM” software from [www.pixelink.com](http://www.pixelink.com)
- Screw camera into C-mount on microscope. Camera can be rotated to obtain the correct image orientation.
- Check that optical path switching lever is in the correct position as shown above.
- Connect 6-pin Firewire.A cable from “status” port on the camera to a PC and use software for image capture.



## 6. Image Capture and Conversion Software

### 6.1 PixelINK Capture OEM

The PixelINK Capture OEM software is used to capture high speed videos and still images. Full documentation is available at [www.pixelink.com](http://www.pixelink.com), but the following notes on use may be helpful.

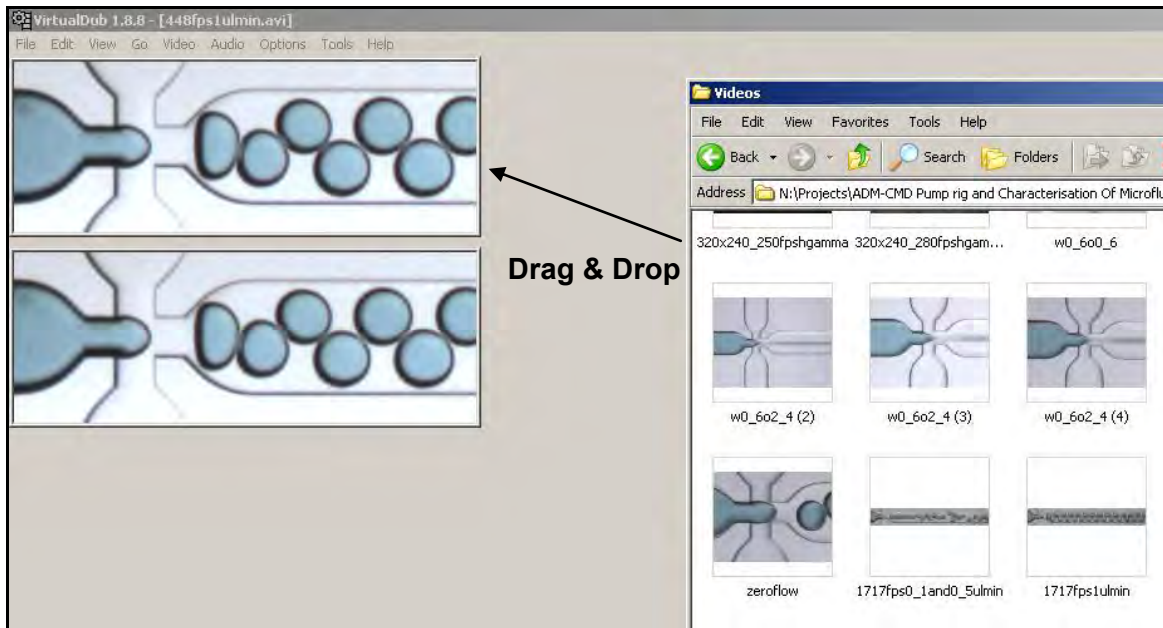
- Turn on **advanced mode**: View / Advanced mode. This gives you access to the **region of interest** tab (ROI). As you reduce the size of the ROI the number of frames per second (fps) available to you increases. For example, at 1280x1024 only ~17fps are available, at 320x240 this increases to ~319fps and at 160x96 this increases further to ~1000fps.
- A histogram of the image is available: View / Histogram.
- Increasing **Gamma** and **Gain** can improve brightness, but decrease image quality. Gamma defaults to 1.
- **Exposure time**. Increasing the exposure time increases the brightness but decreases the frames per second available.
- **Frames per Second**. At high frames per second the image will get very dark, as the exposure tends towards 0.04ms. In this case, the illuminator should be at full power. **Warning: DO NOT LOOK DIRECTLY AT THE FIBRE OPTIC**. By reducing the ROI to, for example 160x96, footage at >1000fps can be achieved.
- **Image Capture**. This section, under the basic controls tab, allows the user to choose the type of file (still image or video) they want to capture and for videos, the number of frames. Videos must be captured as AVI files. These files are large, so long periods of video should not be captured.
- **File names**. Check the **Increment File Name After Capture** and the files will save in the form Image1, Image2 etc, OR change the name of the file after each video is captured. Otherwise, previous files will be overwritten.

### 6.2 VirtualDub (freeware)

After capturing high speed video, it may be necessary to slow the footage down and perform other editing operations such as brightness adjustment. This can be achieved with VirtualDub, free software available for download from the internet.

#### 6.2.1 Importing a video file

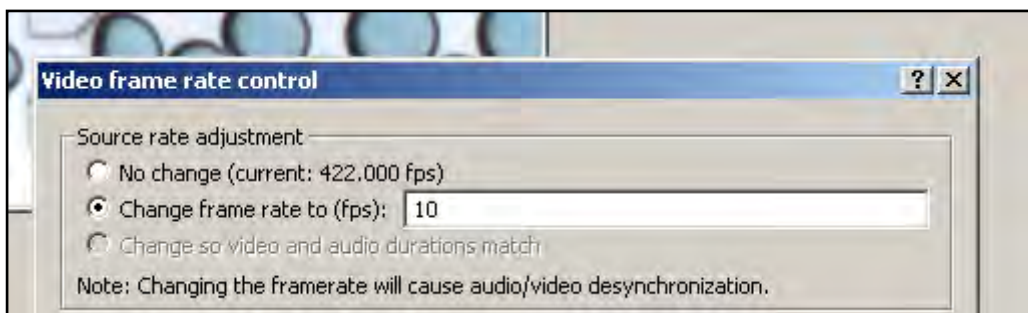
Open the folder that contains the video file. Drag and drop the video for editing into the VDub window.



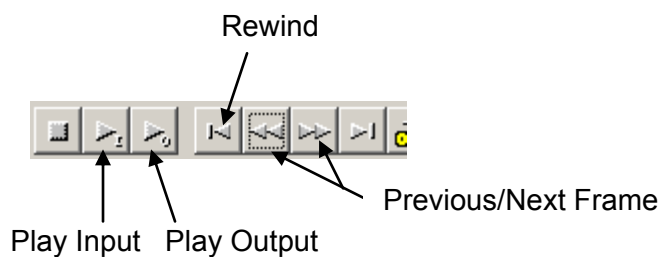
VDub displays two windows: the input window on top and the output window below. These can be turned on and off in the View tab.

### 6.2.2 Changing the FPS

- Video / Frame Rate... (or Ctrl + R)
- Source rate adjustment / Change frame rate to (fps): ENTER DESIRED FPS



- To play back the footage at this new fps click play output button (below). The input can also be played for comparison.





### 6.2.3 Changing the brightness / contrast

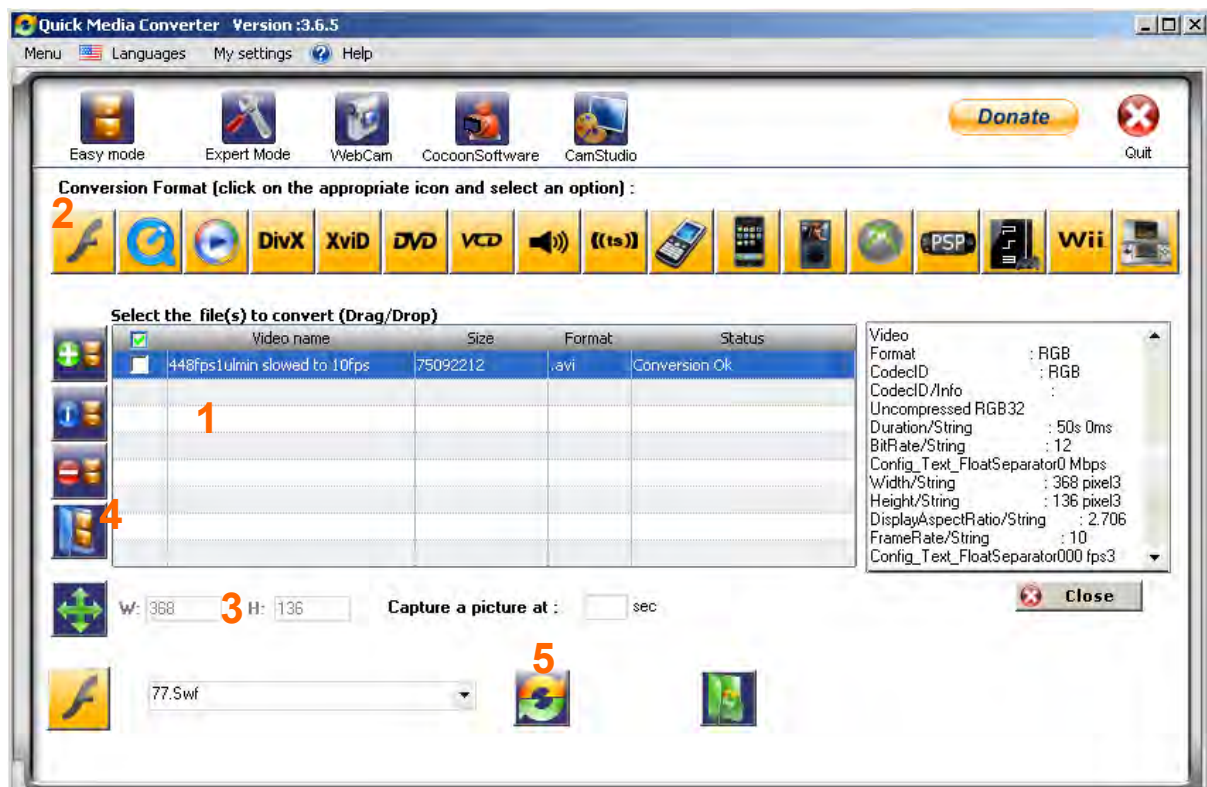
- Video / Filters... (or Ctrl + F)
- Add
- Brightness/contrast / OK
- Click to show preview and adjust as desired
- Click OK and OK
- On returning to the filters window, double click on the filter to edit it, or click „Delete“ to remove it. Further filters can be added using the above process.

### 6.2.4 Saving the video file

- File / Save as AVI... (or press F7)

## 6.3 Quick Media Convertor (freeware)

To decrease the file size of large video files, conversion to a different format is required. Quick Media Convertor is free software available for download from the internet that can be used for this function.



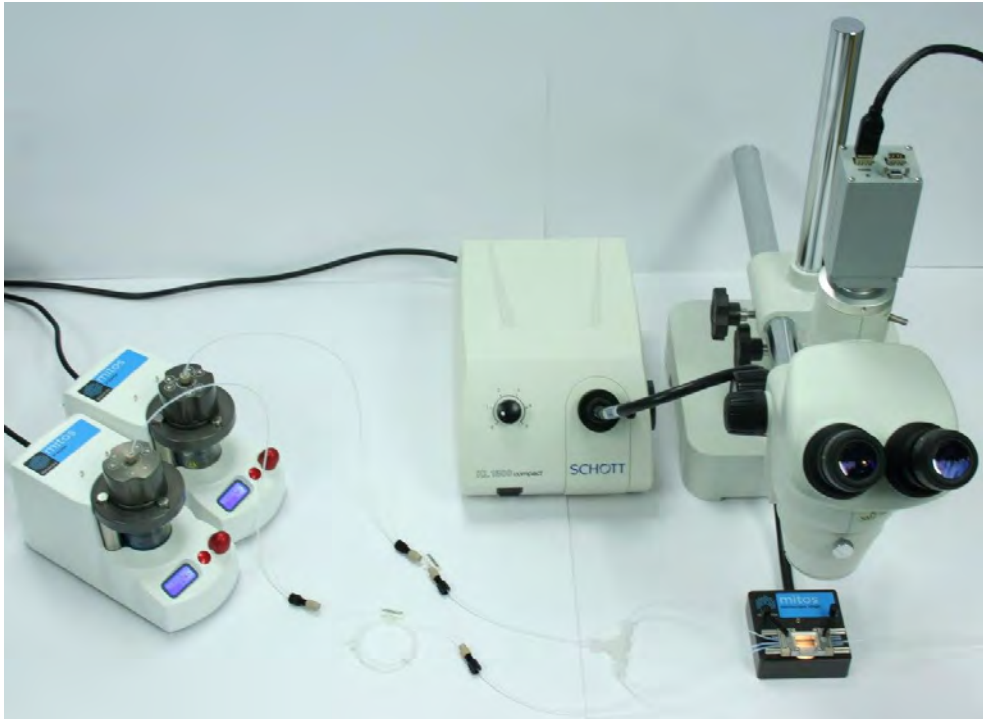


1. **Drag and drop** the file to be converted.
2. Select a **file type**.
3. **Custom size**. Right click on the video file and select „Technical info on the media file“ to display the current width and height, which can be entered in the relevant boxes. Ignore the ‘**Capture a picture at:**’ box.
4. **Select a target directory**. This is where the file will be saved.
5. **Start Conversion**. Progress towards completion will be displayed.

It is recommended that the original .avi file is kept for future conversions.



## 7. Application Examples



*High Speed Camera and Microscope System in use with the Advanced Droplet System*



*High Speed Camera and Microscope System in use with the Droplet Emulsion System*



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