

Cyclopital3D

Lighted Print Viewer Owners Manual



Viewer Package Includes:

- Main Body, Book Viewer
- Print Holder
- CD or flash with two image processing templates
- 10 Sample Prints
- Owner's Manual

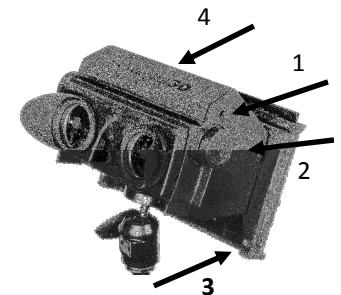
Benefits, Features & Specifications:

- Perfect for modern sized images taken with the Fuji W3/W1
- Detachable print holder allows easy viewing of standard 4 x 6 prints or custom photo books
- Focus adjustment allows glasses-free viewing for most people
- Tripod mount for tabletop viewing or handle grip
- Efficient, white LED lamps provide bright, uniform illumination. Color temperature is 5000K
- Portable, 6 hours of continuous viewing using two AA batteries
- Stunningly wide 47 degree field of view accommodates ortho-stereo viewing for photos taken with the Fuji W3, W1 or other digital camera capable of capturing wide-angle stereo photos.
- Fully coated, precision optics with large achromatic lenses and collapsible eye-cups to block stray light
- Automatic power saving timer turns off lights after 2 minutes
- Formatting templates included for convenient printing locally or at an online print shop or service. Print holder accommodates 10 prints at once
- Image size is 61mm x 48mm (per side) centered on standard 4 x 6 prints with 2mm center spacing.
- Dimensions: Viewer size 146 x 90 x 115mm (5.75 x 3.5 x 3.5") WxHxD
Print holder 160 x 102 x 23mm (6.3 x 4 x .9")
- Weight with batteries: 510g (18oz)

*Note: not compatible with antique-sized stereo cards

Viewer Usage

- Insert photos into photo holder
- Push button on top, right-side of unit to turn on the lights (1)
- Adjust focus as needed to achieve clarity (2)
- If glasses are needed, eye-cups are collapsible
- To use for photo books, detach photo holder by pushing in two tabs at the base of the Viewer (3)
- Batteries are located at the top, front of Viewer secured with a single screw. Rechargeable AA batteries are recommended (4).
- Clean lenses with optical lens clothes only
- Attach optional handle grip or tripod as desired for comfort



Preparing Your Images for the Viewer

For best results, it's important that your prints are formatted and sized properly and printed with a printer that utilizes the "Continuous Tone" print process, such as the Fuji Frontier used by Walgreens Drug Stores.

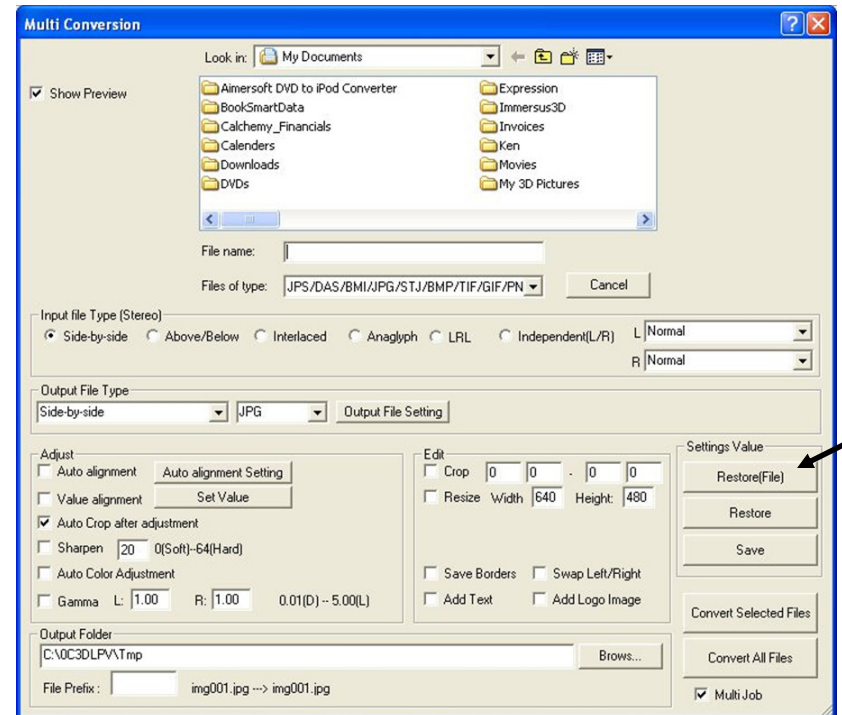
The recommended formatting procedure is detailed here. The process requires that you download two free software programs from the internet, StereoPhoto Maker and IrfanView, instructions are given below.

Preliminary Set-up:

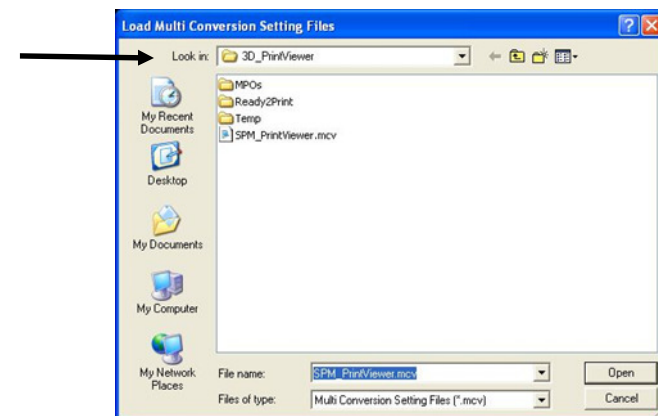
- Confirm that you have the latest version of StereoPhoto Maker (SPM), v4.32 or newer. If you need a free download or update for SPM, go to <http://stereo.jp/eng/stphmkr/>
- Confirm that you have the latest version of IrfanView, v4.28 or greater. If you need a free download or update, go to <http://www.irfanview.com/>
- Create a new folder on the root of your C Drive to be used exclusively for your Print Viewer image processing, named: 3D_PrintViewer. Within the 3D_Print Viewer folder create 3 folders with the names: MPOs, Temp, Ready2Print. If you use these exact names, the templates will pre-fill the dialogs and make the formatting process easier.
- Your Print Viewer package includes a CD or flash drive containing two image processing templates, "LPV_SPM_Tmpl.t.mcv" and "LPV_IV_Tmpl.ini"; copy the templates into your new 3D_PrintViewer folder. The templates can also be downloaded from the Cyclopital3D website at <http://www.cyclopital3d.com/support/>

STEP 1:

- Sort your photos and select the MPO files you wish to print. Copy them into the MPOs folder you created under the 3D_PrintViewer folder
- Start SPM. When it opens, you will see a black screen
- Click: "File" from top menu, then "MultiConversion..." to see dialog box shown on page 4

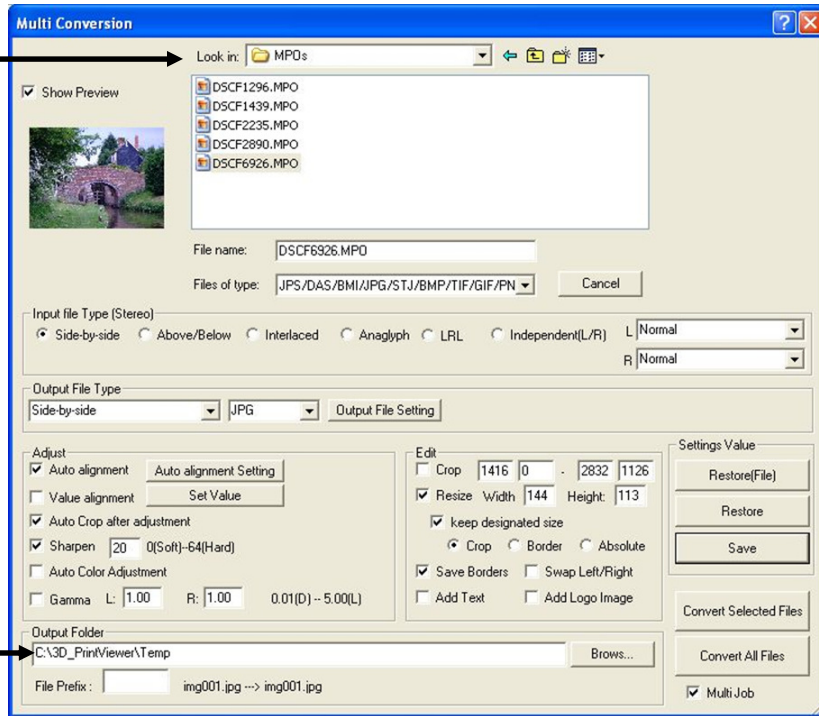


- Click "Restore(File)" near the bottom right of screen and a new, smaller dialog box will appear as shown below:



- Using the "Look in" drop down box, locate the template file: "LPV_SPM_Tmpl.mcv" (in the 3D_PrintViewer folder) select it and click "Open" to load it and revert to "Multi Conversion" dialog.

“Restoring” the dialog from the template file in the last step will populate the Multi Conversion Dialog with parameters appropriate for converting MPO files from your Fuji W1 or W3 camera to intermediate files that will be further processed with IrfanView (shown below). The end result will be .jpg files that are ready to be printed by a print service provider (recommended) or possibly on your own high quality printer. Of course, alternate workflow and formatting options are possible.

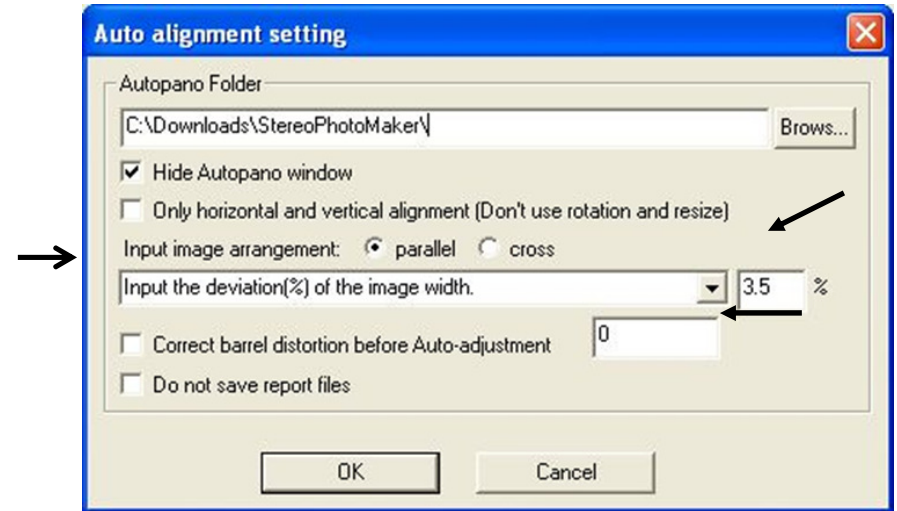


- In the “Multi Conversion” Dialog change “Look In” to the folder that contains the MPO images you want to format for use in the Print Viewer.
- The “Output Folder” should be set to the “Temp” folder you created to hold the temporary image files that will be generated by this step.

The fields in the Multi Conversion Dialog should look similar to what is shown above. Note that the “Width” field is set to 1441 and the “Height” to 1134, this is done for you when you “Restore(File)” but the fields in the dialog don’t show the whole numbers, the LS digits are hidden.

- Click the “Auto alignment Setting” button and set the window adjustment field in the dialog box, as shown on next page (6).

- From the drop down list, select “Input the deviation(%) of the image width” and also set the value to 3.5% as shown below. Important: Performing Auto Alignment on the MPO images will set the spacing of homologous “far points” in the prints to the proper distance for the Lighted Print Viewer.
- Note, If images were taken using the Cyclopital3D Auxiliary Lens Adapter, you may want to check the box to “Correct barrel distortion” and set it’s parameter appropriately (value is dependent on which lens was used with the ALA, for Raynox HD-5050 set value to 35).

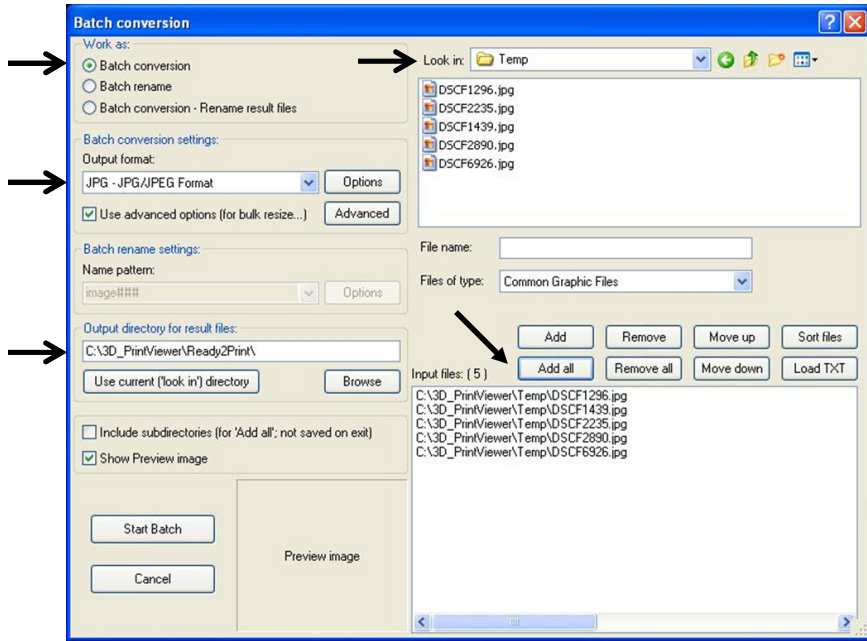


- Click “OK” to close Auto Alignment Setting dialog and revert to “Multi Conversion” dialog box.
- Click “Convert All Files” and wait for the conversion process to complete. Note; if “Multi Job” was checked you will see two processing dialogs, this is normal. The “Multi Job” will use two cores of a multi-core processor and image processing will complete twice as fast.
- When image processing is complete, exit the processing dialog(s) and close SPM. Proceed on to step 2.

IMPORTANT!!! Unfortunately, the actual value for the percent deviation is not stored in the .mcv file, so you **MUST SET** the percentage value in the Auto alignment setting dialog before you start the batch process in SPM

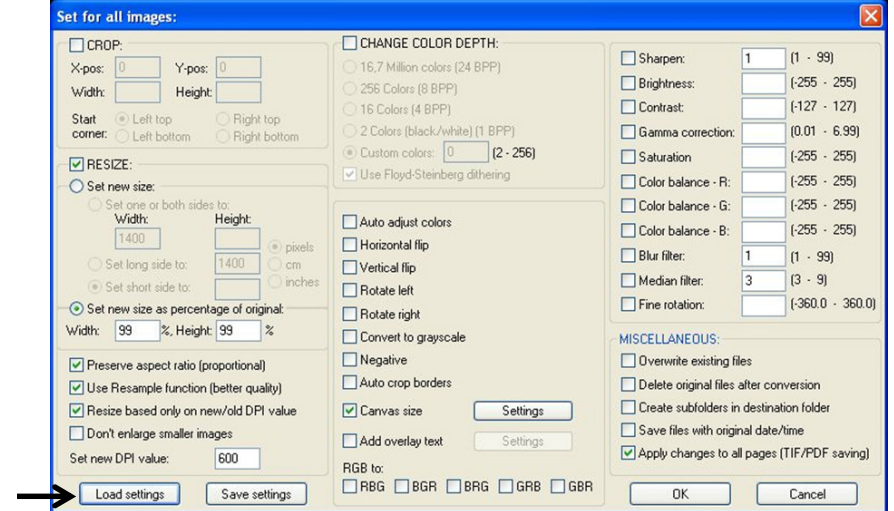
STEP 2:

- Start IrfanView
- Click: “File->Batch Conversion/Rename...” to see screen shown below:



- Set the radio button under “Work as” to “Batch conversion”
- Set “Look in” to the directory that contains the temporary image files generated by SPM in the previous process. (“Temp” under “3D_PrintViewer”)
- Click “Add all” and all the images will be added to the “input files” list at the bottom of the page.
- Set the “Output directory for result files” to the folder you created “Ready2Print.” This folder will contain the image files you will take or send to your print service provider.
- Make sure the box for “Use Advanced options for bulk resize...” is checked.

- Click “Advanced” under Batch conversion settings”, you will see the “Set for all images” dialog



The “Batch conversion settings” should be set as shown above- don’t worry; you don’t have to set any of this stuff yourself.

- Click “Load Settings” (lower left) and browse for the template file: “LPV_IV_Tmplt.ini” and open it; this will populate the variables in dialog box. This file should be found in the 3D_PrintViewer Directory you created.

The important parameters in this box are the “Settings” for the canvas size and the value for DPI. This step centers the image on the print “canvas” and fills the borders with black.

- Click “OK” to close the “Set for all images” dialog and revert to the “Batch conversion” dialog.
- Click “Start Batch” in the “Batch conversion” dialog.
- When the process completes you are finished, click “Exit batch” and close out of IrfanView.
- Delete the temporary image files (all files in the “Temp” folder under “3D_PrintViewer”) created by SPM

STEP 3:

Transfer the finished print files to your print service provider and have them printed on 4X6 inch glossy paper. Be sure your print service provider is using a “continuous photographic process” and not ink-jet or screen printing to make the prints; otherwise you will see “pixels” in the prints.

If the prints are made with a Fuji Frontier printer you can be assured they are using the right process. We know Walgreens uses this process, others do as well. Please check our web site for an updated list of print service providers that use a continuous photographic process to make 4X6 prints.

Note: Edited photos or .jpg files can be formatted for use with the LPV using a similar process. Read advanced Concepts for a more detailed explanation.

Advanced Concepts: Image Formatting

In the previous section we provided step by step instructions for formatting MPO files from a Fuji camera for the LPV. There was no explanation of “why” you were doing what you were doing, just how. This section will explain the theory behind the process and provide instructions for printing from various other (Non-MPO) stereo image formats. This assumes that you already have digital stereo photographs on your computer that you wish to print and that you are somewhat familiar with the operation of StereoPhoto Maker (SPM). The actual process will be similar to what was described previously in the step by step instructions however, depending on the format of your source images you will need to make a few decisions and change some of the settings in SPM from the values contained in the supplied image processing templates. When you get things set up the way you want them you can save your own SPM and IrfanView (IV) templates to make future processing easier.

You may be able to use the step by step procedure “as is” or with very little modification if all you are doing is processing a different image storage format. For example, if your sources are parallel side-by-side images in .jpg format you can use the procedure directly with no change, just use the .jpg files in place of the .mpo files. Similarly, if your source images are cross-eyed side-by-side jpg files, all you have to do is select the "cross" radio button in the "Auto alignment setting" dialog, AND check the box "Swap Left/Right" in the "Multi Conversion" dialog, everything else remains the same. If the aspect ratio of your stereo files is much different from 4:3 or if you are interested in the theory of mounting prints for a stereoscope, then please, read on.

The Image Size:

Printed images for use with the LPV are formatted as side-by-side pairs, with the left eye image on the left side and the right eye image on the right. The size of the image for each eye is the same, with the maximum viewable area being 61mm wide and 48mm tall. There is an area 2mm wide between the right and left images, the “septum,” that cannot be seen with the viewer. This area, which separates the right and left images should be black. The image pair should be centered horizontally and vertically in the 4X6 print “canvas,” and the “borders” around the image should be black.

The step by step process formats Images for printing with a file “resolution” of 600 dpi, which results in a “chip width” of 61mm consisting of 1441 “dots” or “pixels,” (chip means one side of the pair, either the left or right image). The vertical dimension is 48mm or 1134 dots, which is why the “re-size” parameters in the “Multi-conversion” dialog are set to 1441 by 1134.

The space between the chips is set by the value of the “L/R Space(Only Print/Save available)” option in the “View->Border Options” dialog. This is a little obscure because you might expect to find the parameter in the “Multi conversion” dialog itself, but it’s not. Fortunately, the value is stored in the processing template (.mcv file) and set when the “Restore(File)” option is used in the “Multi conversion” dialog.

Infinity Spacing

The lenses of the LPV are separated by 65 mm. Therefore the “infinity spacing” (far point spacing) of homologous far points in the right and left images should also be 65mm (or slightly less). If the far point separation is the same as the separation of the lens axis, then there is no need for an interocular adjustment on the viewer. This is a result of the “prismatic effect” of the lenses which exactly compensate for use “off axis” by persons with eyes that are spaced narrower or wider than the lenses. Instead of having an interocular adjustment, large lenses are used to accommodate a wide range of users eye spacing however, for this to work well the images MUST be formatted properly (with the correct “far point spacing”).

If an image pair has a far point spacing that is larger than the lens separation (65 mm), the user’s eyes will have to diverge in order to fuse the cyclopean image (the 3D image seen by the “mind’s eye”); this should be avoided because it can cause viewing discomfort and may even make the image impossible to fuse. You can use a ruler to measure the far point spacing in a mounted pair.

First, find the object that is furthest away in the scene, then select a point on this object in the left image and measure from this point to the same (homologous) point on the same object in the right image. If the print is properly formatted for the LPV this distance will be 65mm or a bit less.

You can use the “Auto alignment” function in SPM to achieve a constant infinity spacing for all the images processed in a batch which is why the “Auto alignment” option is selected in the step by step process. With the auto alignment parameters set to: “Input the deviation(%) of the image width” and a value of “3.5%” the result is an infinity spacing in the re-sized mounted pairs of 65mm (61 mm + (3.5% of 61mm = 2mm) + 2mm septum).

The Aspect Ratio

One big difference between MPO files from a Fuji W1 or W3 and other stereo formats is that MPO files from a Fuji camera generally have an aspect ratio that is close to that of the LPV (by design). However, the aspect ratio of a stereo image is really a matter of artistic choice of framing. Even though your camera may produce images that have an aspect ratio of say 4:3, you can always crop the images to be whatever you like. You are not limited to the specific aspect ratio of the LPV. However, if the aspect ratio of your image does not match the aspect ratio of the LPV, then some of the viewable area will be black. In this case an image may show “full width” but not full height, (with “black bars” top and bottom), where others may show full height but not full width (with black bars on both sides).

The native aspect ratio of the LPV is 61:48 (pretty close to 4:3). If your images have an aspect ratio that is much different then you have 3 choices:

1. Let SPM automatically crop the images to match the aspect ratio of the LPV. This cropping is what happens in the “step by step” process, because the “Crop” option is selected in the “Multi conversion” dialog. The images are cropped symmetrically, top and bottom, or left and right, whichever is required. If the source images are MPO files from a Fuji not much is lost. Note, in this case a “vertically oriented” image will have a lot cut off the top and the bottom to turn it into a “horizontally oriented” image to match the viewer.
2. Manually crop each image to match the aspect ratio of the viewer. This is similar to option #1, but you make the choice of what to crop out instead of just taking the “center” of the image. Obviously, if you crop manually then you must crop each picture individually, it's a bit more work, but it's probably worth it.

The Aspect Ratio (cont.)

2. (Cont.) To crop an image manually use the "Free Cropping Option..." from the pull down on the crop tool in SPM. Make sure "Keep Aspect-ratio" is checked and set the Aspect-Ratio is 61, 48. Crop the image and save it as a stereo side-by-side image, being careful about your current "viewing" mode; if your viewing mode is cross-eyed then a cross-eyed image will be saved and this may or may not be what you want. Once the aspect ratios of all your images match the viewer, you can batch process them for printing using the same parameters as described for the MPO files.
3. The last option is to let SPM automatically add borders around your images to maintain the aspect ratio of the sources. To do this simply select the “Border” option instead of the “Crop” option in the “Multi conversion” dialog in the step-by-step process. Note that the color used for this border is the background color of the SPM photo viewer. If it's not already black, you should set it to black before you start batch processing. If you're wondering, the “Absolute” option (next to the “Border” option) stretches each axis of the source image to fit the output size, which probably isn't very useful because it can severely distort the image by making the X and Y scales different.

If you want some images "cropped" and some "bordered" or you have some cross-eyed sources and some parallel sources, you must batch process the pictures of each case into the "temporary files" as separate batches. All the temporary files will end up the same size, in side-by-side parallel format, so you can batch process all the temporary files using IrfanView (as described in the step by step process) from all the source variants in one go.

The purpose of the step that uses IrfanView is simply to center the (temporary) images created using SPM in a 4X6 “Canvas” and to fill the outside borders around the image with black. Note, the parameters loaded into IrfanView from the supplied template also scale the image down by 1% before the border is applied. This is to make up for the 1% growth most print services apply to make sure the image fills the print edge to edge. This can be changed if your print service provider uses a larger number, but if you change the percentage you also have to change the “Canvas Size” border settings. The end result should be an image that is 3600 pixels wide and 2400 pixels tall.

The Stereo Window

The stereo window is an important concept in stereoscopic viewing experience. If you don't already understand what the stereo window is and why it's important, you should take some time and look it up on the internet.

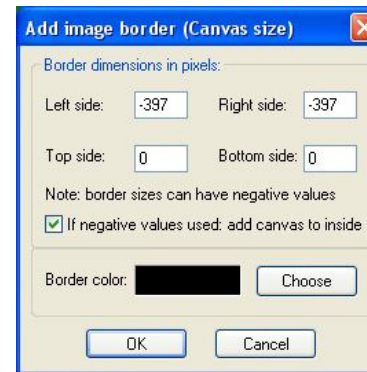
Although it's technically possible, SPM does not have a UI mechanism to set the stereo window position independent of the far point spacing. However, if the far point spacing and image width are constant, then distance from the observer to the stereo window will also be constant. When you use the procedure described in the step-by-step process, the stereo window is set to be about 6 feet in front the camera and is perceived to be closer if the far point is closer than infinity. This window position also matches the "natural" stereo window of the LPV.

Although SPM does not have a UI method to set the window position independent of the far point spacing, it can be done when batch processing by manipulating the parameters for "Auto alignment" and "Multi Conversion." If the method for setting the stereo window in the "Auto alignment Setting" dialog is set to "Input the deviation(%) of the image width," the percentage value specified can be thought of as the maximum amount of deviation allowed in the image if all the objects in the image are to remain "behind" the stereo window. It's OK for an image to have more deviation than this if the parts of the image that end up in front of the stereo window do not intersect the sides of the frame, then there is no "window violation." However, if the image has more total deviation than is defined by the "% deviation" parameter AND the near objects intersect the image frame, then there will be a window violation. Because the view is so wide in the LPV, a "window violation" may or may not be troublesome; if it is, there are several ways to fix it, as explained below:

1. You can crop the image to reduce the total deviation to less than 3.5%. This probably means trimming off the foreground (bottom).
2. You can make the border "fuzzy" so there are no hard edges to make a window frame
3. You can move the stereo window back (towards the observer) by cropping a little off the outside vertical edges of the mounted pair.

The Stereo Window (cont.)

If you want to move the window back by cropping off the outside edges, open the finished image (from the directory "Ready2Print") in Irfanviw and select "Image->Change canvas size..." you will see the following dialog:



Make sure "If negative values used: add canvas to inside" is checked, and that the "Border color:" is set to Black. Negative values for "Left side:", "Right side:", "Top side:" and "Bottom side:" will add borders from the outside of the print inwards, leaving the overall canvas size unchanged. We want to increase the size of the existing borders on the left and the right by a little bit in order to move the window closer. The side borders are already 350 pixels wide, so to crop 2mm off of each side of the image in the center we would add 47 pixels, (2mm @ 600 dpi = 47 dots) making the side borders -397 pixels wide. We don't want to change the image vertically, so the "Top side:" and "Bottom side:" parameters should be set to 0. Press "OK" and the image will be cropped, save it and it's ready to be printed.

Exactly how much you need to move the stereo window back of course depends on the image. Cropping 2mm from each side as described above will allow for a total deviation of about 5%, cropping 4mm from each side (-444 pixels) will allow for more than 7% total deviation. Any more than this and you are probably pushing the limits of "comfortable viewing".

If you got this far I congratulate you on your tenacity. It's possible I've been too explicit in my instructions for image formatting. Basically you just need to make the stereo pair fit the front opening of the viewer. That's really about all there is to it, for the most part everything else just falls out naturally.

Viewer specifications:

Overall dimensions: Width : 146mm, Height : 90mm, Depth: 115mm

Weight: 510 grams

Tripod Mount: Stainless Steel insert, 1/4-20 threaded hole

Image “chip” size: 61mm X 48mm per side

Chip separation: 2mm

Lens separation: 65mm

Lens focal length: 70mm

Lens diameter: 34mm

Lens type: Achromatic doublet, with anti-reflection coating on both sides

Eye cups: Elastomeric, fold back for use with eyeglasses

Maximum Horizontal Field Of View (HFOV): 47 degrees

Maximum Vertical Field Of View (VFOV): 38 degrees

Focus System: Rack and Pinion

Focus range: +2 to -1 Diopters

Eye Relief: 2mm

Distance from observer to the “Natural” Stereo Window: 7.5ft (2275mm)

Lighting System:

Power Source: Two AA batteries, NiMH recommended

Battery Life: Six Hours of light between charges

Emitters: Ten high output white LEDs

Color Temperature: 5000K, near black body spectrum

Operation: Press button to turn light on, auto off, 2 minute timer, timer can be reset by pressing button.

Print Holder specifications:

Overall dimensions: Width : 160mm, Height : 102mm, Depth: 23mm

Weight: 96 grams

Print size: Standard 4X6, 4 inches high (102mm) by 6 inches wide (152.4mm)

Print Capacity: 10 prints

Formatting & Printing Services Available!

Too busy to format and print your own photos? Let us do it for you! Cost is only \$1.00 per photo, plus \$5 shipping and handling.

Simply send us a flash drive with the raw MPO images you wanted printed to:

Cyclopital3D

323 S. Washington Ave

Fort Collins, CO 80521

Include your phone number or email address with your order details and we will call or email you to confirm your order and payment preference. Payment are accepted via check, Paypal or credit card. Your photos will be mailed to you within 5 days of confirmation communication.

For processing of edited or .jpg images, an additional processing fee may apply. Also, please indicate if photos were taken using a Cyclopital3D Adapter, which model and if an auxiliary lens was used.

Care and Maintenance

Cleaning: use an optical grade lens cleaning cloth. Do not spray liquid directly onto the Viewer and avoid getting any moisture in any openings.

Product Warranty

The Cyclopital3D Lighted Print Viewer comes with a 90-day warranty against manufacturing defects in material or workmanship. It is warranted for normal

Caution: this is a delicate precision product and should be treated with the same care given to any fine camera or lens. Do not apply excessive force to the focus mechanism or the print holder when removing or attaching.