

Cyclopital3D Digital Stereoscopic Hand Viewer

Owner's Manual (10/2009)



Congratulations for purchasing the Cyclopital3D Digital Hand Viewer, the first commercially marketed handheld digital stereoscope. We expect this to be the first in a line of digital stereoscopic viewing products from Cyclopital3D and hope that you are completely satisfied with your purchase. Please contact us if you have any questions or problems with your Viewer as we are committed to providing you with the highest level of customer service and quality products. We appreciate your business!

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Viewer Features

- Bright stereoscopic images with no ghosting
- Stunningly wide field of view (FOV) provides the ortho-stereo perspective for most digital stereo camera- you see the same FOV as seen by the camera
- Stereoscopic zoom and pan
- Holds thousands of stereo pairs on 16GB combined memory
- Completely portable, provides 4 hours of continuous viewing before recharging
- Focus adjustment allows glasses free viewing for most people
- Images can be organized into folders for rapid access
- Fully coated precision optics with large perfectly matched achromatic lenses
- High quality front surface mirrors provide a crisp, bright and perfectly aligned image

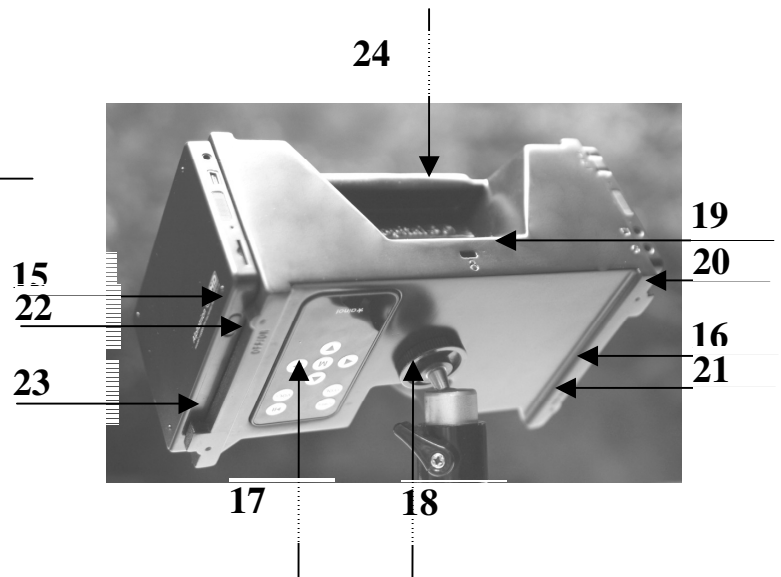
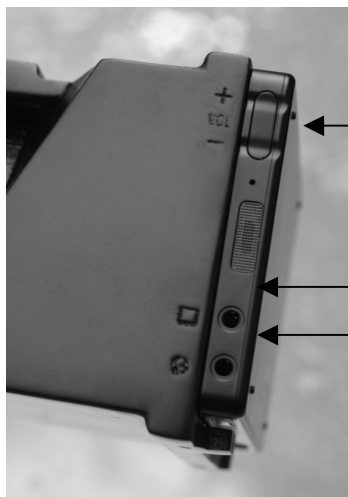
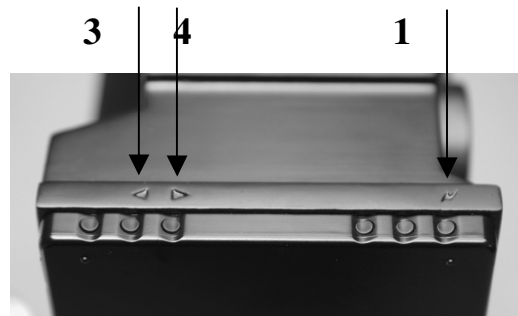
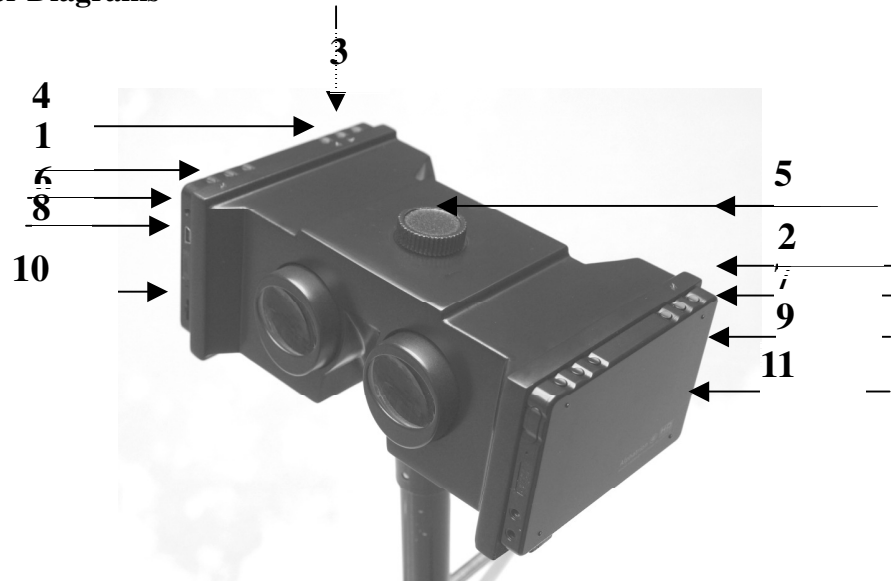
Viewer Package Includes

Viewer unit with 2 Ainol V6000HDV Personal Media Players (PMP units)
2 Chargers
2 USB cables
1 set of earphones
1 Allen wrench/Hex wrench size .050 inch
1 Microfiber lens cleaning cloth
1 Quick Start Guide, (this) full manual is saved in PMP memory

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Viewer Diagrams



Viewer Diagram Legend

Note: Right and Left are referenced looking into the lenses.

1. Left PMP power button (on top), press for two seconds to power Right PMP on
2. Right PMP power button (on top), press for two seconds to power Left PMP on

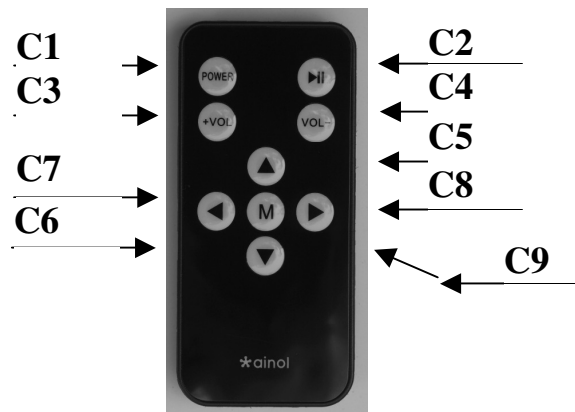
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3. Left PMP “Down Arrow” (on top), use for correcting mis-sync condition
4. Left PMP “Up Arrow” (on top), use for correcting mis-sync condition
5. Focus knob, adjust for best focus
6. Left PMP DC power-in port
7. Right PMP DC power-in port
8. Left PMP USB port
9. Right PMP USB port
10. Left PMP microSD card slot
11. Right PMP microSD card slot
12. Left PMP Volume control
13. Left PMP Video out jack
14. Left PMP Audio out / headphone
15. Right PMP power switch (on bottom, MUST be ON to Use or Charge)
16. Left PMP power switch (on bottom, MUST be ON to Use or Charge)
17. Control panel, operates both PMP units simultaneously
18. ¼ – 20 Tripod mount, for tabletop tripod or handle (not supplied)
19. Port for Kensington cable lock
20. Left PMP mounting set screws (4-40)
21. Right PMP mounting set screw (4-40)
22. Right PMP mounting set screw (4-40)
23. Right PMP mounting set screw (4-40)
24. Handle, for picking the Viewer up off a table or out of a box

The Control Panel:

- C1. Power button. Used to power off the PMP units (will not turn the units on)
- C2. >|| button. Used to start and stop slide shows and exit image zoom
- C3. +Vol. Used to turn the audio volume up, and to zoom in on images
- C4. –Vol. Used to turn the audio volume down, and to zoom out on images
- C5. Up-Arrow. Used to go “up” in menus and backwards when viewing images
- C6. Down-Arrow. Used to go “down” in menus and forwards when viewing images
- C7. Left-Arrow. Used to go “right” in menus and as an “escape” or “back” button
- C8. Right-Arrow. Used to go “left” in menus
- C9. “M” button. Used to “select” a function or as an “enter” button



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Viewer Usage

Your Viewer comes preloaded with a sample set of some of Ken's favorite photos; we thought you might be excited to view the samples before loading your own images.

1. Turn on power for PMP units by pushing and holding for two seconds buttons 1 and 2 - Switches 15 & 16 should always be in the "ON" position. Look into eyepieces to see the menu light up and confirm that both PMP units are powered up. Note: Menu text will be reversed due to the Wheatstone design of the Viewer.
2. Using the control panel on the bottom of the Viewer (17), Press the right arrow key (C8) to advance the function menu until the photo (camera) icon is highlighted. Then press the middle "M" button (C9) on the control panel to "select" the function. Note, if you accidentally select the wrong icon, the left arrow key (C7) on the control panel acts as your "back" or "escape" button. When you select the photo function you will see a menu of folders identifying which "Disk" to access. "Local Disk" is the memory built into the PMP unit; "External Disk" is the optional microSD card. Select "Local Disk." Now you will see a folder named "Samples", select it and you see a list of images, select again to view the image highlighted in 3D.
3. When your images are on the screen you should use the focus knob on top (5) of the Viewer to find the best position for your clearest viewing.
4. Advance to the next image by pressing the down-arrow button (C6) on the control panel, press the up-arrow button (C5) to go backwards through the images.
5. When you are done viewing turn off the Viewer using the power button (C1) on the control panel (17).

Notes:

- **Very important!!** When charging the PMP units, the switches on the bottom of each unit (15 & 16) MUST be in the ON position.
- The Viewer has a power save function that comes preset to turn the Viewer off after 15 minutes of no activity.
- It's possible for the two PMP units to become mis-synchronized when viewing 3D images; there are a few ways that this can happen, but the most common is when a button is accidentally pressed on one PMP unit that advances the picture on that unit, but not the other. There are a few ways to recover from a mis-synchronized condition:
 1. Press one of the buttons labeled with an arrow on the top of the Viewer (3 or 4). One of the buttons advances to the next image on that side and the other goes back. Which one you need to press depends on which unit is "ahead" of the other. Just try one, if that doesn't work, try pressing the other one (twice).
 2. Another way to recover from mis-sync is to keep pressing the left arrow button (C7) on the control panel until both units are showing the same thing (menu), and then navigate back to where you were.
 3. Lastly you can turn both the units off (C1) and start over from power up.

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The Ortho-Stereoscopic Perspective and 3D “Realism”

One of the main benefits of a lensed stereoscope is the ability to view images with an “Ortho-Stereoscopic Perspective” (OSP). The OSP is obtained when the physical Field Of View (FOV) of the viewed image is the same FOV that the camera recorded. This is a very important factor in achieving the realism promised by 3D photography.

Most digital 3D viewing systems (computer monitors or “picture frames”) provide only a very narrow FOV as compared to “what the camera saw,” resulting in severe 3D distortion. When a stereoscopic image is viewed with a FOV that is narrower than the FOV of the camera, the “stretch” in the z-axis makes objects in the scene look smaller than real life, like a scale model, the scene does not look “real.”

In the “old days” the stereoscopes sold with stereoscopic cameras were “matched” to the cameras so that one always saw an ortho-stereoscopic perspective in the viewer. This was accomplished by using a lens in the viewer that had the same focal length as the (fixed fl) lens in the camera. Modern cameras with zoom lenses, and the numerous widely varied digital 3D viewing methods make Ortho-Stereo viewing much less common these days. As a result most digital 3D is viewed with a FOV that is way too narrow (except for telephoto shots that don't look real for other reasons).

The Cyclopital3D Digital Hand Viewer (C3DV) is capable of presenting images with a physical FOV of 50 degrees. This is wider than the FOV of most digital cameras, so for a true OSP the image may not use the entire width of the screen.

For instance the Fuji Real 3D W1 camera takes a picture with a FOV of about 45 degrees at its widest (power on default) zoom. Un-cropped images with an aspect ratio of 4:3 that fill the C3DV screen vertically will have a horizontal FOV of about 40 degrees. This is slightly short of the OSP, but close enough to look real. If you set the Fuji to an image size that has an aspect ratio of 3:2 the un-cropped result will have a horizontal FOV of 45 degrees. This is pretty much exactly that of the camera. When set to a 3:2 aspect ratio, the Fuji W1 is essentially perfectly “matched” with the viewer to provide the OSP.

The old “Stereo Realist” had a fairly narrow FOV (32 deg) compared to today's cameras. It turns out that (by design) if you digitize a Realist image the un-cropped result will fill the C3DV screen vertically and have exactly the correct width to provide the OSP!

For any camera, pretty much all but the most wide angle shots can be cropped to provide the OSP in the Cyclopital3D viewer. Usually this means cropping the image vertically so it shows up “wide enough”.

Zooming in with your stereo camera can produce some “special 3D problems” which are much too complex to cover here. Suffice it to say that for realistic 3D it's best not to zoom in too far, but some interesting affects can be had if you can also vary the stereo base...

The “immersive” nature of a lensed stereoscope also blocks out visual distractions, really putting you in the picture. Interestingly, the feeling of realism can also be enhanced by pointing the viewer up or down in the direction the picture was taken; the Cyclopital3D hand-held Viewer gives you the ability to do this. For instance if a picture was taken looking up a tree, point the viewer up when you're looking at that scene. It's really quite remarkable! It's all about reproducing the sensory input exactly, for each eye- and for the gravity sensors in each ear!

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Loading Images (the short version)

1. Convert your stereo images to separate left and right image files. The files should be mirrored (horizontal flip) for correct viewing and may be re-sized from the originals to save space and reduce load time.
2. Copy the left images of stereo pairs from your computer to the left PMP unit, and the right images to the PMP unit on the right (referenced looking into the lenses). For convenience, images may be organized hierarchically in a tree of folders.

Note: The structure of folders and files must be identical on both the left and right PMP units. Any folder that exists on the left PMP unit must have a compliment on the right PMP unit. Complimentary folders should contain the same number of files (and folders) with “similar” names. The complimentary files and folders should be named so that they appear alphabetically in the same sequence. One way to do this is to have all folders and files named identically on both the left and right PMP units, but this is not absolutely necessary. The characters may differ toward the end of a complimentary name pair, as long as they sort alphabetically in the same order on both PMP units. For instance, folders and files on the left PMP unit could have “_L” appended to the names, where and “_R” is used on the right PMP unit.

Some people like to keep both the left and right images of a stereo pair in the same directory, with the left images identified by a trailing “_L” (or _l) in the file name, while a trailing “_R” (or “_r”) identifies the right image of the pair. This is fine but it can make it difficult to copy just the left images to the left PMP and visa versa using “Windows Explorer”. A program called CopyToC3DV.exe is supplied (on the root of each PMP unit) to help copy image files stored this way to the correct PMP unit. If you point CopyToC3DV to a directory that contains both sides of stereo pairs in separate image files, it will copy only the images with the trailing “_L” (or “_l”) in the file name to the left PMP unit and only the images with a trailing “_R” (or “_r”) in the file name to the right PMP unit.

It is no longer necessary to use CopyToC3DV to copy stereo images to the PMP units, as it was with PMP firmware versions prior to 10810. You may now use “Windows Explorer”, or “Finder” (on Apple computers) for this purpose.

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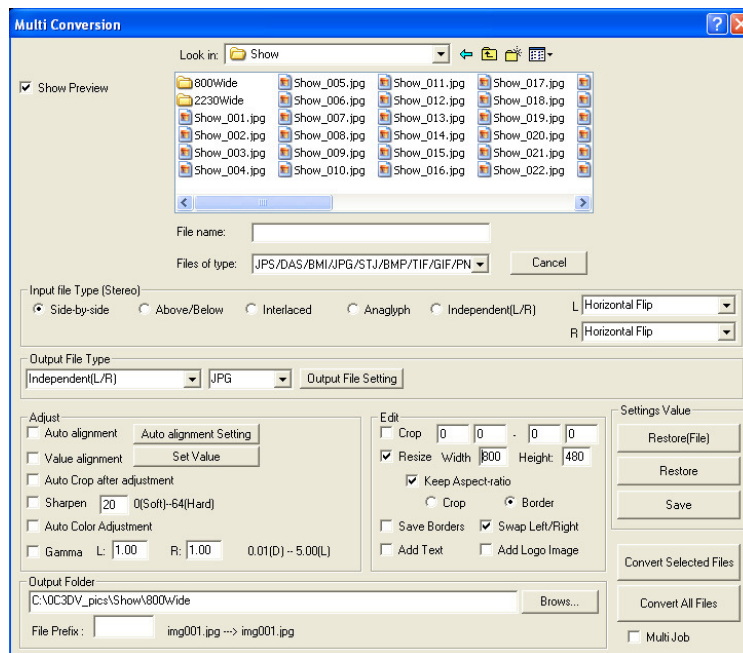
Loading Images (the long version)

Your Viewer is of a Wheatstone design, and uses separate left and right image files for viewing stereoscopically. The image files are stored in memory on the PMP units, in either built in memory or on optional microSD memory cards. Each PMP unit must be loaded separately, or memory cards containing left and right images can be inserted into the respective PMP units.

Because the images are viewed in a mirror they should be reversed (mirrored) before loading. It's also prudent to resize the images to match the PMP display capabilities as this saves storage space, reduces load time, and allows you to have more pictures on your Viewer.

You may use any software to mirror and resize your stereo photos, but we recommend StereoPhotoMaker (<http://stereo.jpn.org/eng/stphmkr/>) it's free and it works really well!

In StereoPhotoMaker (SPM) use the “File->Multi Conversion” function to prepare your images for the Viewer. For example, to convert from single image side by side cross eyed pairs to the individual left and right images used by the Viewer, configure the “Multi Conversion” dialog in SPM as shown in the screen capture below.



Note that the input images are flipped horizontally (mirrored). If you are resizing, be sure to check “Keep Aspect-ratio” and select the “Border” option. The “Swap Left/Right” option should be checked if your source images are in “cross eye” format, and unchecked if they are “normal”. The left images go in the Left PMP unit, and the right in the Right. Both the left and right images will be put into the “Output Folder” specified. Left images will be designated with a trailing “_l” in the filename, and right images with “_r”. To maximize the number of images that can be stored on the PMP units the images are resized to 800x480, however the viewer does have a “zoom” function that can display more detail than this (up to 3X zoom), if you intend to use zoom you should resize your images to be 2400x1440.

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Note: Once you get the dialog configured correctly you can save the settings by pressing the “save” button, then next time you want to convert images to put in your Viewer you can simply press “Restore” (or “Restore(file)”) to restore the settings.

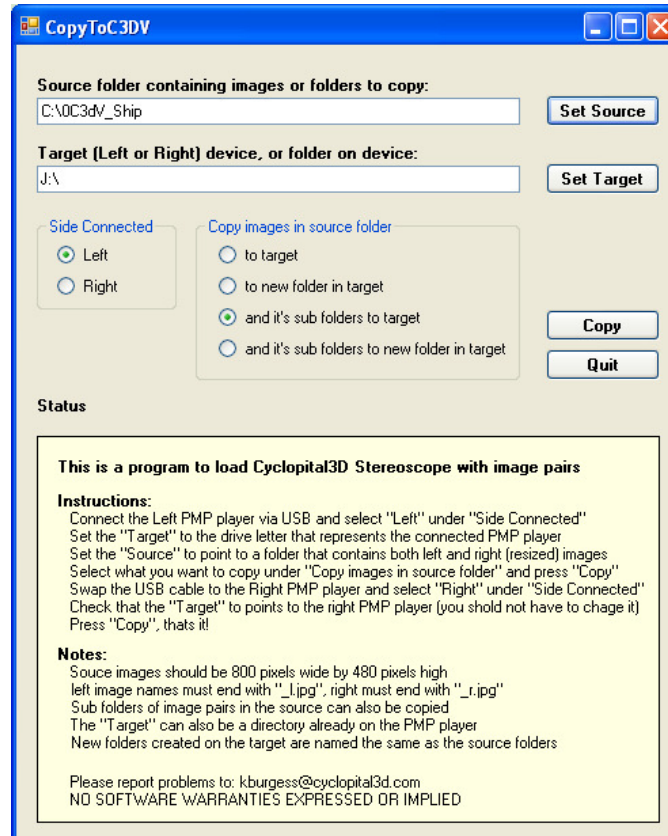
If you are transferring a lot of images to the Viewer at one time it is best to build a “tree” of Output Folders. Using “Windows Explorer”, create a top level folder to hold sub folders of images organized by subject. Then for each input folder, create a separate Output Folder under the top level using SPM. When you copy the images to your Viewer in the next step your entire “tree” of Output Folders will be duplicated on the Viewer, allowing you to find what you want to view quickly using the folder hierarchy.

After you have converted your stereo photos using SPM you can load them into the Viewer with software Cyclopital3D has written specifically for the purpose. The program is named “CopyToC3DV.exe” and may be found at the root of either of the PMP units file system. (C3DV stands for Cyclopital3D Viewer).

There is no installation required for CopyToC3DV, you may execute it “in place” by double clicking on it in “Windows Explorer”, or you may wish to copy it to your desktop for easy access. The program is Windows only and requires that you have Microsoft's “dotNet” installed on your computer. If you don't already have it you will get an error message when you run CopyToC3DV, in that case just go to:

<http://www.microsoft.com/NET/> and click “Install It Now...”. Any version 2.0 or later all work fine.

When you run CopyToC3DV you will see the following dialog:



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Just follow the “Instructions” to load your converted images onto the PMP units in your Viewer.

It is important that both PMP units contain EXACTLY the same file structure (sorted alphabetically), otherwise they will not “synchronize”. When they are mis-synchronized the left and right views will be from different pictures, which is an obvious error.

Note that CopyToC3DV never deletes files from the PMP units, it only adds folders and files. To delete files and folders from the PMP units you should use Windows Explorer.

Using microSD memory cards

Memory cards work just like internal memory in the PMP units, just be sure the file structures on the cards for the left and right units match, meaning that all files and folders sort alphabetically in the same sequence. With microSD cards image storage capacity can be extended up to 64 GB.

For Apple Users

Sorry, we have no specialized support for converting images (splitting, mirroring and resizing) on your Mac, or for transferring images from your Mac to the Viewer. However Mac computers will recognize the PMP units and present their file systems as per normal. Just copy the left and right directory trees of images to the PMP units using “finder”.

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Loading and Viewing Video and Video “Slide Shows”

The Viewer was developed primarily for the purpose of viewing 3D still images, however the PMP units do support video playback, with sound, in the following video formats: AVI, RM, RMVB, FLV, DAT, MOV, MPG, PMP, VOB. An impressive list, but each of these formats may also have different “flavors” or options, you will have to do a bit of testing yourself to make sure your video files are compatible with the PMP units.

The way stereoscopic video is synchronized in the Viewer is by starting both sides playing at the same time. The units are not “gen-locked” and do not support “frame accurate” video synchronization, however synchronization might be “good enough” depending on how much motion is in your video recordings. If all your doing is playing still image “slide shows” using a video format to do the sequencing, pan and zoom (ala Ken Burns) and synchronized audio it should work fine.

The PMP units also support wired video out (13) that shows everything seen on the LCD panels (menus, images, video etc.) on a alternate video display when connected. The wired video output formats supported by the PMP units range from NTSC Composite video to HD (1980x720p) component (RGB) output. So, at least theoretically you could drive two AV projectors and a sound system with the Viewer for stereoscopic projection to a group. How practical this is yet to be proven.

Please check the Cyclopital3D website for more information on the subject of video support in the Viewer. We will be posting more information as we hear from customers about their desires, successes and issues with 3D video.

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Miscellaneous Functions

- Setting background wallpaper. When viewing an image you may decide you would like to use it as the “system background” or “wallpaper”. To do so press “M” (C9) on the control panel, you will be presented with a list of options. “Set Wallpaper” is the last one on the bottom, use the “Down-Arrow” button (C6) on the Control Panel to highlight it and then press “M” again. Press the “Left-Arrow button (C7) to exit the menu.
- Setting image transition format. You can setup different graphic effects for the transition from viewing one image to the next in the viewer. The “default” is a simple replacement, but you can do sweeps etc. instead. To change the transition type, press “M” (C9) while viewing any image. You will get the menu described above, select “switch mode” and choose the transition you like.
- Automatic slide shows. You can enter a mode that automatically switches to the next image after a preset time by pressing the >|| button (C2) on the control panel while viewing an image. Press the same button again to stop the automatic slide show. The time images remain on the screen can be set using the same menu described above for setting the wallpaper. It is the first option called “timeslot”. You can set it to 1, 3, 5 or 10 seconds. Note, unfortunately the timing for switching to the next picture is not really accurate enough to work for very long when viewing in 3D, after a time the two PMP units will fall out of Sync. This may be fixed in a future PMP firmware update, but for now the slide show function is not really very usable.
- Zooming and Panning on images. You can zoom in and pan around on images while you are viewing them in 3D. Pressing the +Vol button (12) on the control panel zooms in, and pressing the -Vol button zooms out. While you are zoomed in the arrow buttons on the control panel can be used to pan around on the image. There are three zoom levels up to a maximum of 3X 800x480 or 2400 x 1440, if you are going to use zoom your images should be sized to be at least this big.
- We set some of the options in the PMP units different than their “factory default” values, specifically as follows:

In the Settings menu:

- Language → EnglishAuto
- Power Off (inactivity time before power off) → 15 min
- Screen Close (inactivity time before backlight turns off) → 1 min
- Brightness → Level 5 (maximum brightness)

In the menu obtained by pressing “M” (C9) while viewing an image:

- Timeslot → 5s (for “slide shows”)
- Switch Mode → Default (no “transition” between images)
- Wallpaper → To one I happen to like ;-)

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Power Management and Charging

- **IMPORTANT:** The power switches (15 and 16) on the bottom of the PMP units **MUST** be in the ON position when charging. If the power switches are in the OFF position the PMP units will **NOT** charge. To avoid confusion it is recommended that you always leave these power switches in the ON position.
- You must press both buttons (1 and 2) on the top of the PMP units for at least two seconds to turn the PMP units on. You can turn both PMP units off by pressing the “POWER” button (C1) on the control panel.
- Your Viewer has built in batteries and can operate for up to 4 hours of continuous use on a single charge. Recharging of fully drained batteries can take up to 3 hours. A battery charge indicator is displayed in the upper left corner when the main menu is showing, they may be different for right and left so close one eye to see them separately.
- Your Viewer control panel (17) uses a 3V lithium battery, CR2025. The control panel is attached to the bottom of your Viewer with several sturdy pieces of Velcro and can be removed when a battery change is necessary.
- To charge your PMP units simply plug in your AC adapters and connect them to the PMP units (6 and 7). Each PMP unit has its own battery and must be charged separately.
- There are two types of chargers available, one that plugs into the Power-In Port (6 and 7) and another that plugs into the USB port (8 and 9). You received two of one type or the other. In any case you may charge the PMP units through their USB ports by plugging them into a computer or a generic USB charger.
- When you plug the units in to charge they will turn on automatically. However, when charging is complete and you unplug the units they will stay on and may drain the batteries. Be sure to turn the units off after charging if you don't intend to use them right away.

Care and Maintenance

Use the lens cleaning cloth that was provided with your Viewer, or a similar microfiber lint free cloth to clean lenses. Do not spray liquid directly onto the Viewer and avoid getting any moisture in any openings.

If it becomes necessary to clean the LCDs on the PMP units, the mirrors, or the backside of the lenses you may gain access by removing the PMP units from the side. Simply loosen the two set screws that hold each one in place using the 0.050” Allen Wrench provided and pull the unit outward. Be careful not to scratch the front surface mirrors, they are coated for scratch resistance but are still somewhat vulnerable.

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Technical Notes

- The PMP units used in the Viewer are manufactured by Ainol, a Chinese company. We chose these units because they are currently the best available for the purpose of hand held 3D viewing. The displays are of the LTPS variety which have the smallest spacing between pixels of any LCD type and the colors are rich and beautiful. The units are too complex to document all the features they support here, this manual documents the functions you need to view 3D photos.
- Keep an eye on our web site and we'll let you know if Ainol provides an update that significantly improves the function or usability of the 3D Viewer. If that happens we will post the update and instructions for how to do it on our web site.

We will also be updating this manual and the Viewer support software as we get suggestions from our customers. So check in once and a while and please do let us know what we can do to make the system better.

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Troubleshooting

- Left/Right image synchronization errors. At some point the two PMP units may get “out of sync”. There are a few ways that this can happen, but the most common is when a button is accidentally pressed on one PMP unit that advances the picture on that unit, but not the other. There are a few ways to recover from a mis-synchronized condition:
 1. Press one of the buttons labeled with an arrow on the top of the Viewer (3 or 4). One of the buttons advances to the next image on that side and the other goes back. Which one you need to press depends on which unit is “ahead” of the other. Just try one, if that doesn't work, try pressing the other one (twice).
 2. Another way to recover from mis-sync is to keep pressing the left arrow button (C7) on the control panel until both units are showing the same thing (menu), and then navigate back to where you were.
 3. Lastly you can turn both the units off (C1) and start over from power up.
- Image folders out of sync in Photo->Local Disk menu. If you accidentally enter “Record” mode (microphone icon in the main menu) a folder on the “Local Disk” named “record” will be automatically created by the PMP unit. If this happens on one unit and not both the folders on the two PMP units will be “out of sync”, to remedy the situation simply delete the “record” folder. There are two ways to do this:
 1. Connect the PMP unit to your computer using USB (8 or 9) and delete the folder using Windows Explorer.
 2. Delete the folder by using the buttons on the PMP unit itself (not the control panel). To delete the folder first highlight it under Photo->Local Disk using the control panel. Then quickly press the top power button (1 or 2) on the PMP unit that has the “record” folder highlighted. You will get a menu with the first option “delete” highlighted. Press the button on the opposite end of the same PMP unit twice (the button is not labeled on the case, but actually performs the “enter” or “select” function). The first press is to select the “delete” function, the second is to confirm the deletion.
- If somehow a PMP unit gets set to a language other than English it can be set back to English using the icon that looks like a “globe” in the settings menu (gear icon). Choose the middle option for English. Unfortunately the only languages supported are Chinese, simplified Chinese, and English.

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Technical Support

Your Viewer purchase comes with a lifetime of free technical support and firmware upgrades, and 90 days of hardware repair coverage, which commences on the shipping date.

If you experience persistent technical problems after reading the troubleshooting recommendations in this manual and checking our website, <http://www.cyclopital3d.com> for additional troubleshooting information, you may send an email to kburgess@cyclopital3d.com for technical support. Support requests will normally be responded to in 24 hours.

Viewer Specifications

- 800 x 480 resolution (each eye)
- Fully coated achromatic lenses
- Scratch resistant front surface mirrors
- Uses two Ainol V6000HDV PMP Units for image storage and display
- 8GB of storage per PMP unit for a total of 16GB
- Size: 200mm x 120mm x 95mm (7.9" x 4.75" x 3.75")
- Weight 850 grams (1 lb 14 oz)

Product Warranty

The Cyclopital3D Digital Hand Viewer includes with a 90-day warranty against manufacturing defects in material or workmanship. It is warranted for normal use; abuse of the product is not covered. If you drop it, it will break.

The Ainol Personal Media Players include a separate manufacturer warranty that is transferred to the owner of the Cyclopital3D Viewer. But, if a PMP unit should fail you may contact Cyclopital3D and we will attempt to provide technical support or possibly replace the unit for you.

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 lens barrels.