### 3D Ready Projectors - Frequently Asked Questions

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| **How does 3D work for Projection?** | - For the human brain to interpret 2D image as 3D, each eye must be able to see a slightly different image.  
- The images need to be separated in their viewpoint by approx. 60 mm.  
- The visual cortex of the brain interprets these 2 different images as 3D.  
- There are three primary types of 3D used in projection: Anaglyph, Polarized and Stereoscopic. Sharp projectors incorporating DLP® Link™ technology utilize the Stereoscopic format. |
| **What is “Anaglyph 3D”?** | - Uses different color filters to produce two images within one picture.  
  - Can be Red/Blue, Red/Green or Red/Cyan.  
- Pros: Inexpensive glasses; content is easy to create.  
- Cons: Quality is very poor. |
| **What is “Polarized 3D”?** | - Image separation achieved by polarizing the light differently.  
- Glasses filter the light so that each eye perceives the different image.  
- Pros: Inexpensive glasses  
- Cons: High setup cost; many polarized 3D systems require two projectors. Projectors must be perfectly aligned with one another. |
| **What is "Stereoscopic 3D"(*)?** | - Image is generated in a frame sequential format (alternating left and right frame).  
- Shutter glasses are synchronized with the image and turn on/off with each frame of data.  
- Pros: Image quality is better; additional hardware cost is less than polarized option.  
  *DLP Link, which has become the standard among many projector manufacturers, utilizes this 3D format.*  
- Cons: Glasses are more expensive than the passive polarizing type. |
| (*) DLP Link uses the Stereoscopic format. | |
| **What 3D technology does Sharp use for 3D projectors?** | - DLP Link  
- DLP Link is the technology that synchronizes the 3D display to the active glasses.  
- DLP Link was developed by Texas Instruments several years ago initially for the DLP HDTV market.  
  - The goal was to use the stereoscopic format, and eliminate the need for a separate external emitter.  
  - This solution takes advantage of the high switching speed of the DMD to include the synchronization with the glasses with the projected image.  
- The cost of the glasses may be higher than the passive polarizing type, but the need for additional hardware is removed.  
- DLP Link has become the standard for 3D among many projector manufacturers, including Sharp.  
- For additional details, please visit the following web pages:  
  - DLP Link: [www.dlp.com/projector/dlp-innovations/dlp-link.aspx](http://www.dlp.com/projector/dlp-innovations/dlp-link.aspx) |
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| What Sharp projectors are 3D Ready? | - Starting in Q1 2010, Sharp will begin offering a wide lineup of 3D ready projectors incorporating DLP Link Technology.  
- Portable and Conference / Classroom models will initially include the PG-D2500X (2500 ANSI Lumens, XGA), PG-D2710X (2700 ANSI Lumens, XGA), PG-D3010X (3000 ANSI Lumens, XGA), PG-D3510X (3500 ANSI Lumens, XGA), PG-D40W3D (4000 ANSI Lumens, WXGA) and PG-D45X3D (4500 ANSI Lumens, XGA). The retail model XR-55X (2700 ANSI Lumens, XGA) additionally will be 3D ready.  
- When used with compatible 3D field sequential content and optional active shutter 3D glasses that support the DLP Link system, all of the above models captivate audiences with breathtaking 3D imagery. These models offer 3D support with both 60 Hz and 120 Hz XGA (1024 x 768) and SVGA (800 x 600) sources. Please refer to each model's product operation manual and the www.sharpusa.com website for more specific 3D compatibility information.  
- When not being used for 3D projection, all of these Sharp projectors offer full compatibility with traditional “2D” content.  
- The above lineup will be followed up with additional higher resolution, higher brightness, and special application 3D Ready Projectors during Q2 2010. |
| Who are the 3D glasses suppliers, and how can I obtain 3D glasses compatible with the DLP Link system? | - Currently, XpanD™ (www.xpand.tv) and RealD™ (www.realdd.com) are two of the primary manufacturers of compatible 3D glasses.  
- XpanD brand glasses compatible with the DLP Link system and Sharp 3D Ready projectors are available through the Professional Display Division of Sharp Electronics. |
| Who are some of the current 3D content providers? | - Some of the current 3D content providers include: EON Reality™ (www.eonreality.com); Stereoscopic Player™ (www.3dtv.at); Neotek™ (www.neotek.com); nVidia® (www.nvidia.com)  
- There also are DVD titles which support 3D content in HQFS format. (HQFS stands for High Quality Field Sequential.)  
- 3D content may be downloaded from the following website:  
  - http://www.3dtv.at/Movies/Index_en.aspx |
| Who are some of the target end-users for 3D Ready Projection? | - Education (K-12 and Higher-Ed): arts, sciences, geography, etc.; Corporate / Government / Military: training, presentations, simulation; Medical; Architecture; Gaming. |
| What display technology projectors are currently available that are compatible with the 3D Stereoscopic DLP Link format? | - As of now, Stereoscopic DLP Link 3D-Ready projectors are only available utilizing DLP technology.  
- LCD projectors currently cannot provide high quality 3D-Ready Stereoscopic images due to limitations of the component panel performance. |
| What are the requirements for a PC [desktop or laptop] and graphics card to work with a 3D Ready (DLP Link) Projector? | - PC Requirements: Microsoft® Windows® Vista™ (32 bit), XP (32 bit) SP2 or equivalent. CPU: Intel® Core™2 Duo and higher required. 1GB memory or higher (2GB recommended). Recommended 1GB hard disk space.  
- Graphics Card: NVIDIA GeForce® GPU required:  GeForce GT 240 or equivalent;  GeForce 9800 GT or equivalent; GeForce 8800 GTS or equivalent; Graphic Card NVIDIA driver version R191.00 or equivalent.  
- Software: DirectX® 9.0c or equivalent; Windows Media Player 11 or equivalent.  
- For content rendered in OpenGL format (e.g. EON Reality, Stereoscopic Player), the PC must have a quad buffered graphics card to work with a 3D projector.  
- If the content is natively frame sequential (e.g. HQFS DVDs), no special hardware is required. |
| Are Sharp 3D Ready Projectors able to display 3D content from a 3D Blu-ray Disc™ Player? | - As the 3D Blu-ray Disc standard is just now being finalized, there initially may not be compatibility between 3D Blu-ray Disc Players and 3D Ready projectors. |

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