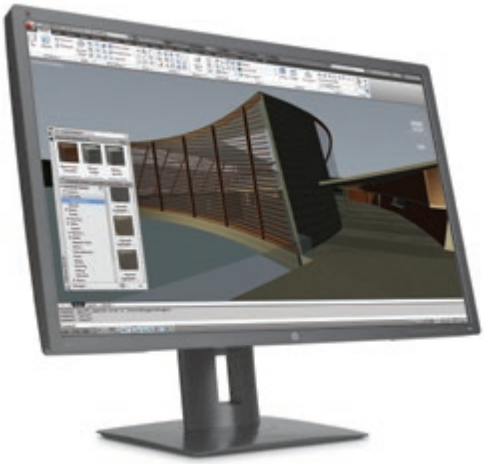
Tech Insights

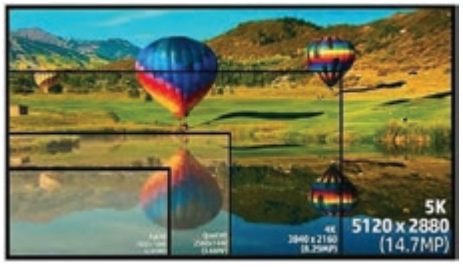
4K Displays for 3D CAD

As CAD workstations and their components have become more powerful many companies have upgraded their workstations but are still using the same old 1280x720 (HD) or 1920x1080 (FHD) monitors they've been using for years. But with mainstream acceptance of 4K televisions this new ultra-high definition (UHD/4K) standard is starting to become mainstream. By upgrading your workstation with a 4k display (like the HP Z27s or Z32x) Autodesk users can zoom/pan less and see more detail on a single screen. 4k also produces renderings with amazing, realistic lighting, finishes and detail. In this article we'll explain the difference between HD/FHD and the new 4K/UHD standard and why 4K may be a good fit for your company.



4K UHD vs HD/FHD

The easiest way to understand how 4K improves visual quality is to consider how many display pixels will be shown on an equal size monitor. As more pixels are displayed in the same space, a clearer image emerges. This increased clarity effect can be seen in the sample image below as you go from Full HD (FHD) up to 4K[1] (UHD) at 3840x2160.



Simply put, 4K displays allow you to get a lot more information on a single screen so you can visualize a design without having to zoom and pan so much since more detail can be seen with a 4K display. The resulting lack of zooming/panning saves time and generates a more productive work experience.

Single monitor or multiple?

When equipped with a 32-inch 4K monitor like HP's Z32x DreamColor Display, you may not even need a second monitor. With this sized screen, a 24x36 (A1) engineering blueprint/PDF can be displayed on a single screen and read easily without any panning or zooming. I've heard many users say over the years, "When they have a high resolution screen as big as a sheet of engineering paper I'll go electronic!" That day is now. And when partnered with HP's new Display Assistant software,[2,3] configurations can be built to automatically open applications in prescaled windows, greatly reducing time spent scaling and positioning windows.

4K for 3D CAD software

Since many Autodesk software users create 3D models that must be visualized on screen during key development phases of a project, simply being able to see your designs better in 4K gives you a design advantage. Consider the difference in clarity you'd experience looking at complex Inventor models, Revit designs or Navisworks coordinated models and the advantage of 4K visualization becomes clear[1].

But as designs go through reviews and client presentations are given you'll need to visualize and manipulate your designs on screen and/or produce high quality presentation print/video materials to convey design intent. By being able to capture your presentation materials at 4K resolution you'll have the highest resolution that can be presented on large format monitors now prevalent in boardrooms and demo environments.

And while it is easy to convert 4K content down to a lower resolution HD/FHD format, converting lower resolution materials to 4K is at best a compromise that will always lack clarity. If presentation materials are at all a part of your job, then moving to a 4K workflow will give you the best results.

Color considerations

So far we've paid attention to the increased resolution of HP Z 4K displays but with greater resolution and detail comes the expectation of greater color as well. As an example, as you create buildings in Revit you'll want the paint and materials to look as good on screen as they will in real life. To provide great color accuracy HP Z27s and Z32x displays provide the following advantages:

Factory calibration. Industry standard color display calibration out of the box.

True 10-bit color depth. Over one billion possible color combinations (as opposed to 8-bit color depth displays providing a maximum of 16 million colors) for photorealistic results in renderings and video capture[4].

Wide IPS viewing fields. A 178 degree viewing angle to make collaborative demos at your desktop or in a conference room clearly visible to persons not seated directly in front of the monitor.

Helpful links

hp.com/go/AEC
hp.com/go/engineering
hp.com/go/autodesk
hp.com/go/displays

Hardware considerations

Of course it doesn't do any good to have a 4K monitor if the graphics processor unit (GPU) in your workstation can't support it. Make sure to specify GPU's that support 3840x2160 resolutions at a 60HZ refresh rate[1] and 10-bit color depth[4] to take full advantage of HP's 4K displays and be sure your graphics card has a Display Port 1.2 or HDMI 2.0 connector.

Another hardware factor to consider is that many 4K work products (like real time manipulation of complex models, animations or videos produced from CAD software) use large data models that require substantially higher processing and system resources beyond the GPU. For this reason, consider equipping your 4K enabled workstations with high clock rate Intel® Xeon® or Intel® i7® processors and high bandwidth solid state disks (SSD's) like the HP Z Turbo Drive G2 to support more aggressive 4K workflows.

In summary

If you use Autodesk design applications to work in 3D sooner or later you'll need to visualize your designs and produce compelling visual output. By using 4K workflows you'll be able to better see your designs, spend less time zooming, present more compelling design reviews and create presentation materials at twice the visual clarity of conventional monitors.

About the author

Robert Green provides CAD management consulting, programming, speaking, and training services for clients throughout the United States, Canada, and Europe. A mechanical engineer by training and alpha CAD user by choice, Robert is also well known for his insightful articles and book, Expert CAD Management: The Complete Guide.
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1. 4K content required. The video card of the connected PC must be capable of supporting 3840x2160 at 60 Hz to drive the monitor at the Preferred Mode.
2. HP Display Assistant will only function correctly with supported HP monitors.
3. To avoid compatibility issues, it is recommended that customers upgrade their graphics driver to the latest version published from their graphics card software support website.
4. Graphics Processor Unit (GPU) must be capable of supporting 10-bit color depth. Some HP Z Displays have 8 bit + 2 bit FRC.

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