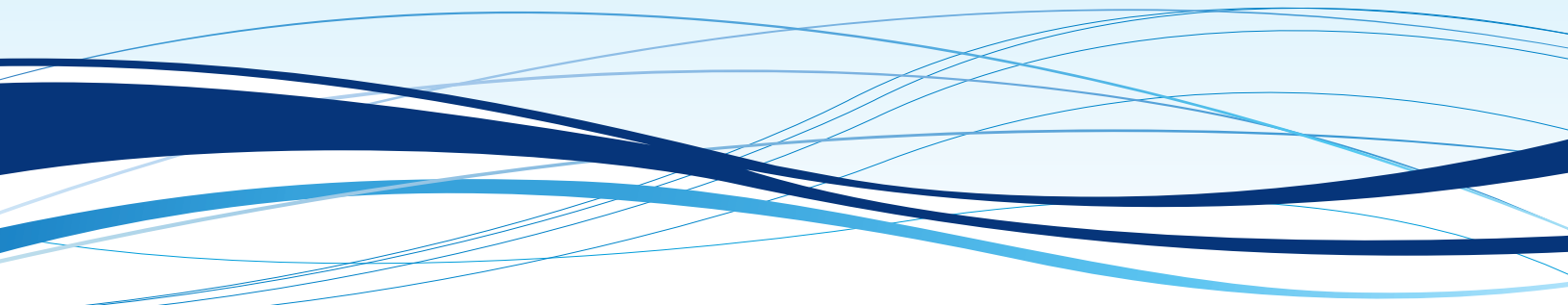


MATROX DIGITAL SIGNAGE SOLUTION

Finding a simple solution for multi-channel and digital video extension

How Matrox Veos Works



What is Matrox Veos?

Veos is a multi-channel, digital video extension product. It captures the video signal from a PC, then processes the signal to digitally extend and output it to as many displays as necessary, as far away as required.

Based on the same graphics expansion technology as Matrox DualHead2Go and Matrox TripleHead2Go, Veos was designed to extend up to three channels of content to multiple monitors—at a distance.

Made up of three components—master, display, and repeater units—Veos provides over 100m (330ft) of extension per component. You can use either digital (DVI) or analog (DB15) inputs or outputs, but no matter which you choose, Veos always transmits **digital** signal between units, along a single, coax cable. The plug-and-play components make Veos a highly flexible and scalable solution. The following guide explains the basic connectivity and functionality of Veos and its key advantages—namely the concept of multi-channel extension on a single cable.

Components and Connections

Connecting the Master Unit to the Computer

When setting up your Veos installation, the component you attach to your computer is the Master unit. The Master unit captures the video signal from your system's graphics processor unit (GPU) from its analog or digital outputs, and reports an ultra-wide resolution of, say 4080x768 (3x 1360x768), depending upon how many channel you choose to output.



It then converts the ultra-wide resolution to a zero-loss, digital video extension signal and transmits it up to 100m (330ft) to the next Veos component, either a Display unit, or a Repeater unit if you need to cover more than 100m to the display. It's up to you to decide the horsepower of the computer system—you can use integrated graphics, or an add-in graphics card; Veos can output from whatever option you choose.

The Master unit comes with an external power supply and a USB connection for communication with the PC/operating system. This USB connection is used to establish display resolutions and timings for the Veos setup. Finally, the Master unit can also connect directly to the serial port of the PC via standard DB9 cable to extend a simplex RS232 communication path along the same output coax cable as the video signal.

From the Master Unit to the Display Unit

Typically, the second component used in any Veos installation is the Display unit. The Display unit captures the extended signal on the coax cable and converts it back to digital (DVI) or analog (DB15) output signal for use with a display monitor. The Display unit accepts the coax extension signal from all other Veos components: the Master unit, another Display unit, or a Repeater unit. **(A)**



Each Display unit has two DVI digital outputs to which you can attach two displays. These DVI outputs can easily be converted to analog/DB15, and the adapters are included in the box. Each output is independent, so you can choose to display the same or different channels of content. The channel displayed on each output can be changed by pushing the buttons on the units themselves, or by using the software included with Veos on the control PC.

The display unit also captures the RS232 feed on the extended signal over coax cable and processes this signal to be output on the Display unit's serial connection. The serial signal can then be daisy chained from one display to the other. Note that this requires the compatibility of daisy chainable serial ports of commercial displays. Check with your display manufacturer to make certain of compatibility.

The Display unit also outputs an additional extension signal for daisy chaining another 100 meters or more of the video and RS232 signals on coax cable. This daisy chaining feature enables the use of many more Display and Repeater units to be used. Finally, the display unit also has an external power supply and optional USB connection for potential firmware updates.

Extending the Signal with Repeater Units

The final Veos component is the Repeater unit. The Repeater unit is optional, and is the simplest of the Veos components. It captures the extended video and RS232 signals on coax cable and rebroadcasts them on each of two outputs for an additional 100 meters of crystal clear extension on each coax output. **(B)**

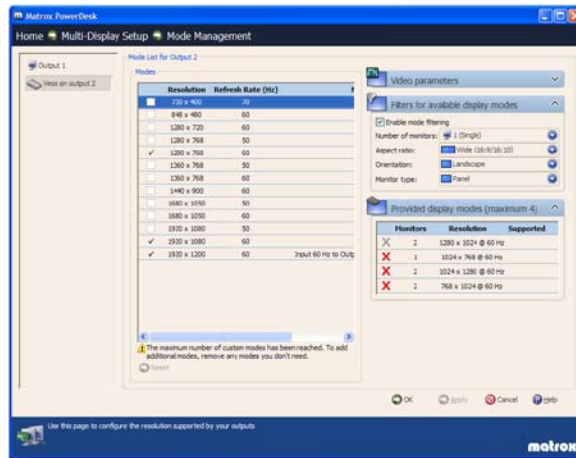
The Repeater is powered by a Power over Ethernet (PoE) power supply, so there's no need for an electrical outlet nearby, or having an electrician on-site during installation in remote or hard to reach locations. One power supply can be daisy chained via Ethernet cable to supply power to up to ten Repeater units.

Operation

The Master unit's communication with the PC and operating system is very similar to that of a display and the EDID (Extended Display Identification Data) a computer display will communicate to the OS and graphics processor. The EDID typically contains the capabilities and timings of the display but, in this case, contains the capabilities and timings of Veos. Veos is capable of a very large array of detailed timings and display modes but is limited in its communication with the graphics processor and OS by the EDID protocol at boot-up. Because of this EDID/OS limitation, only four display timing sets are programmed into the Veos firmware at any given boot-up. The Veos PowerDesk software allows these timings to be removed or added to the EDID from the very large array of timings that Veos supports. Because of this limitation in the EDID protocol, a reboot may sometimes be required to change to a specific resolution's support.

Digital extension

Veos was designed for perfect and guaranteed image quality with zero loss from point A to point "Z" of an extension run. The nature and quality of the digital signal that is employed between Veos components was designed for live transmission of "Full HD" 1080p broadcast and has no compression used whatsoever. The signal is complete and includes full transmission of all bits and bytes of the video signal over the entire Veos extension network. This allows for a "zero loss" transmission over the 100 meter or more specification of all Veos components and results in a virtually unlimited number of extended display outputs as far away as needed and all are guaranteed to have source picture quality due to the digital nature of the signal.



Veos's large array of detailed timings includes support for single, dual, and triple outputs, landscape and pivot modes, as well as standard and widescreen display modes.

Veos Multi-Channel Capabilities

Veos can achieve the following multi channel capabilities, providing the system's graphics processor is capable of outputting them:

Resolution	Total Display Area		
	1 Channel	2 Channels	3 Channels
Widescreen 16:9 / 16:10			
1920 x 1200	1920 x 1200	3840 x 1200	—
1920 x 1080*	1920 x 1080	3840 x 1080	—
1680 x 1050	1680 x 1050	3360 x 1050	5040 x 1050
1440 x 900	1440 x 900	2880 x 900	4320 x 900
1360 x 768*	1360 x 768	2720 x 768	4080 x 768
1280 x 768*	1280 x 768	2560 x 768	3840 x 768
1280 x 720*	1280 x 720	2560 x 720	3840 x 720
852 x 480	852 x 480	1704 x 480	2556 x 480
848 x 480	848 x 480	1696 x 480	2544 x 480
Standard 4:3			
1600 x 1200	1600 x 1200	3200 x 1200	—
1280 x 1024	1280 x 1024	2560 x 1024	3840 x 1024
1024 x 768	1024 x 768	2048 x 768	3072 x 768
800 x 600	800 x 600	1600 x 600	2400 x 600
640 x 480	640 x 480	1280 x 480	1920 x 480

Multiple Channels

The key to understanding the multi-channel capabilities of Veos is in understanding the nature of a “stretched desktop” and also understanding the way typical digital signage applications allow for zones or frames of content to be placed independently in the overall content.

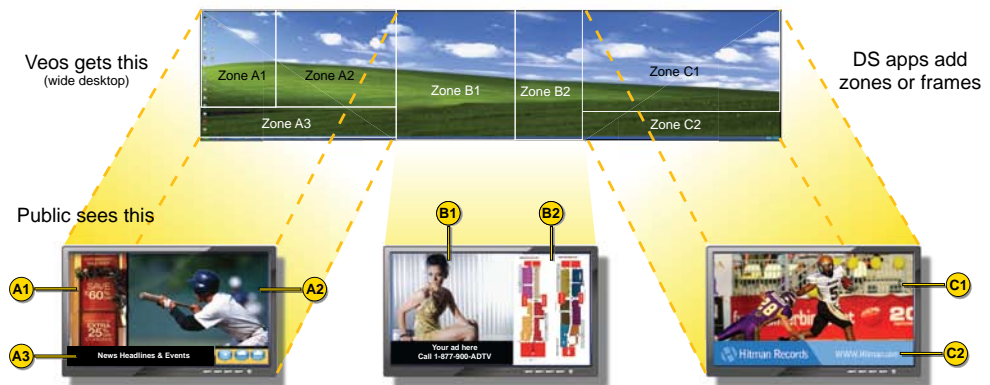
A “stretched desktop” is a computer graphics output resolution that spans across several displays and has the Windows™ taskbar stretched across all the displays, such that Windows™ applications can be opened to full screen across all the displays (Word™ or Excel™ for example). An example of a stretched desktop resolution is 4080x768 and although no single monitor has this resolution – it is the multiple of three standard resolution monitors of 1360x768. Even though the graphics card is outputting the very wide, stretched desktop of 4080x768 onto three monitors, Windows sees the display output as one large display and performs accordingly. Veos understands this concept and employs it in order to take a single display output from the PC of 4080x768 into the Master unit and capture it and extend it along a single coax cable to Veos Display units. The Display units then separate the very wide signal into three separate signals of 1360x768. Standard displays understand this resolution and the Veos Display units allow each of them to be output on each of the two Display unit outputs.

Typical digital signage software applications can manage this “stretched” desktop in the same way they manage zones or frames of content in a typical single screen setup. The zones of content are made to manage three screens of content instead of just one. For example where there was one screen before with zones “1”, “2”, and “3” of content on that screen, with Veos there are now two or three screens of content with zones “A1”, “B2”, “C2” and more per the illustration below.

Typical Digital Signage



Digital Signage with Veos



“See More” for Less

Veos allows an entire digital signage network with three distinct channels of content to be driven from one PC to a virtually unlimited number of displays. Finally today's multi-core CPUs and their tremendous potential can actually be fully tapped to create a very attractive and cost effective solution for today's digital signage networks. Why waste today's processor potential on a single display or a single channel? Veos and DS applications can drive three channels of varied, eye catching, vibrant content from a single PC and across an entire digital signage network spanning a virtually unlimited number of displays.

The day of driving the entire Las Vegas “Strip” with multiple channels of sexy, attention grabbing, cost effective content on unlimited numbers of displays from one PC is here. It's dawn came with Matrox Veos.

Contact us for a demo today – digitalsignage@matrox.com



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