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INAVATE + IHSE | KVM Matrix Switchers

Video switches are perfect for distributing moving and static images, but when integrators need to add interactivity and ensure ultimate reliability and security, only KVM can meet the need. Enno Littmann, managing director of leading KVM manufacturer IHSE, explains why matrix switches are the preferred option.

KVM matrix switches – an essential tool for professional AV integrators



KVM matrix switches are used in a variety of pro AV installations, from museums to control rooms and theatres.

Digital matrix switches perform a great job in sending high quality, high definition video content and digital audio streams around a building or public site: in delivering uncorrupted HD and UHD video to remote screens to displays wherever they are located. One that is flexible and controllable, and can be scaled to meet the needs of large projects. Switches are readily available from renowned manufacturers like AMX, Crestron, Wyrestorm, Lightware and Gefen, ranging in size from 4 to 128 inputs and outputs.

Most video matrix switches use the HDBaseT connectivity standard; created initially through collaboration between Samsung, Sony Pictures, LG and Valens and are aimed squarely at domestic and video-based commercial applications. They are widely used for home-entertainment or TV or digital signage distribution around a large building or arena.

However, when professional system integrators are faced with the task of creating large-scale workstation deployments, video matrix switches are not suitable. Whilst they are able to route the video output throughout a network, they are normally unable to handle the return keyboard, mouse and touch interfaces in a reliable and responsive manner. In addition, they do not have the inherent capability to handle the additional features and facilities generally required by commercial and industrial enterprises: security and access levels and limitation, user control, instant switching and the capability to transfer large amounts of USB data.

In professional AV installations in which users require full access to remote computers from

their own workstations, the KVM matrix switch is the only viable solution. This type of device enables full interaction as though the computer being used was situated under the user's desk, whilst allowing the significant advantages of centralised and remote computer management.

This class of device permits 'dumb' workstations, comprising just a monitor, keyboard and mouse, to connect instantly to any source; which gives the immediate advantage of sharing of applications. Users can access any application as needed, without having to have it installed on their own computer. A KVM matrix system not only simplifies and makes software management more efficient, but reduces the total number of copies of software that need to be purchased by a commercial organisation. This technique is regularly used in video production facilities to create virtual editing studios – each one capable of being used for any purpose and instantly reconfigurable as required.

The KVM matrix switch, with its inherent ability to extend connections delivers a range of benefits:

KVM matrix switches offer:

- Instant switching - any source to any display
- Lossless image distribution up to 4K
- Massive flexibility in signal switching and extension
- Low-latency interactive touch screen response
- Inherent data security prevents unauthorised access
- Extensive access control, 3rd party controller API
- TEMPEST certified extenders for military environments



Central and local switching of sources through in-band and out-of-band control. Administrators and users are able to select sources and swap instantly between them: either through keyboard hotkey sequences or web-based interfaces. In addition, third party controllers (AMX, Crestron etc) can be interfaced through comprehensive APIs.

Comprehensive security capability. Beyond the obvious physical and electrical security advantage achieved through centralised computer storage, KVM switches can be configured to prevent unauthorised access to servers. Connection history and usage reports can be maintained and the use of fibre connections makes eavesdropping and electrical intervention without detection almost impossible.

Simple expansion and non-square system configuration. Modular KVM matrices with dynamic port allocation enable systems of almost any size to be created with any ratio of inputs to outputs (not limited to the same number of inputs to outputs). Currently, non-blocking (totally unrestricted input to any output) single switch frames of 576 total I/O ports are available and methods of interconnecting multiple frames permit even larger sizes.

Single keyboard, single mouse operation. Operators accessing multiple computers on multiple screens benefit greatly from being able to use a single keyboard and mouse, rather than having to change as their attention shifts. KVM matrix switches help, by allowing an active

cursor to move from one screen to another, and from one computer to another as the operator rolls the mouse.

Integrated USB interface. USB-HID, 2.0 and 3.0 interaction is an inherent and fundamental element of the KVM extender system, not an add-on requiring an additional cable or output port.

Screen synchronisation. Blank screens are the bane of many installations as sources are switched and regularly encountered in video transmission. KVM systems maintain independent frame buffers and synch outputs to ensure instant switching; an indispensable feature in many professional installations.

There are many professional AV installations, across every sector, in which KVM matrix switches have been proven to be the only possible method of delivering the required functionality, security and ease of use required by the end user.

KVM matrix switches and extenders, like IHSE's Draco tera, have already proven themselves in critical installations in government control centres for NATO, in port management and systems such as the Haifa RCC (Rescue Coordination Centre), onboard ocean-going seismic research vessels, in massive airport information and display walls with several hundred displays at Vienna airport, as well as air traffic control systems in Frankfurt, Jersey, Saudi Arabia and London and in large entertainment venues, including the Han show theatre in China and Star



KVM matrix switches in sizes up to 576 I/O ports.

Performing Arts Centre in Singapore. As well as forming an integral and critical element in numerous broadcast centres, OB vans and editing suites.

Applications where the system must continue to operate, whatever the circumstances; and all requiring a level of professional system application that match and demonstrate the capabilities and performance needed at the very top of the AV industry. ∞

Deployed in a wide range of broadcast and AV sectors and applications:

- Venues and entertainment
- Control rooms
- Education and training
- Government and defence
- Banking
- Broadcast and post production
- Air traffic control
- Industrial and commercial industries
- Maritime and offshore
- Medical and healthcare