

Ship & Offshore

Special SmartShip



CONDITION MONITORING



AUTONOMOUS SHIPPING



BIG DATA



3D VISUALISATION



THE DIGITAL AGE



THE SMART PORT



HARDWARE & SOFTWARE



NAVIGATION, COMMUNICATION & FLEET MANAGEMENT



CYBER SECURITY



Accessing sensitive equipment from anywhere

KVM SYSTEMS As ships become more automated and connected and the quantity of specialised computing equipment on board increases, it is essential to ensure that it is working correctly. The use of keyboard, video, mouse (KVM) extenders allows the switching, extension and conversion of these computer signals as well as DVI, HDMI, digital audio and USB. Thus, a number of computers can be controlled from one or more sets of devices. Germany's Ihse GmbH is a developer and manufacturer of advanced KVM devices and, in the following article, Dr Enno Littmann, the company's CEO, outlines the specs of KVM technology.



Reliable KVM technology is essential on board research vessels

Photo: Alfred-Wegener-Institut/M.Hoppmann

Shipboard computing equipment requires greater levels of care and management than similar shore-based systems. Conditions are far more challenging, with extremes of temperature in the surrounding environment, greater humidity and more cramped storage conditions. In addition, the hardware itself is subject to constant vibration and movement.

This hardware must not fail, or at least there should be sufficient redundancy to enable continued operation should an individual item fail. There is usually little opportunity to deliver spare parts quickly to vessels and often they can only

be picked up at the next port of call.

On land, computers are often housed together in a central equipment room in which they can be managed and maintained in a secure, climate-controlled environment. These locations are usually large dedicated rooms containing many racks of equipment and vast amounts of cabling. They are predominantly situated in the lower levels of the building.

At sea, the same philosophy holds, with computing equipment ideally located in controlled environments on the lower decks. Not only does this layout provide ad-

vantages through centralised management and consequent enhancement in reliability, but it frees up space in other areas of the vessel, removing the requirement to have noisy, heat-generating computer hardware in the working environment.

The need for KVM extenders

With users and operators of the computing equipment often located several decks higher, there is an issue relating to connectivity: users need to be able to run devices in real time, as though they were located locally – just under the operator's desk. This requirement can be solved through the use of key-

board, video, mouse (KVM) extenders.

These devices connect the operator's screen and interacting devices to the computer electrically without affecting performance in any way. That connection can be established over a substantial distance – 140m using cable and several kilometres with fibre cabling. Despite that long separation, the computer continues to operate normally.

KVM matrix switches

The next step in the process is to add a KVM matrix switch. By connecting all source computers to the input side of the matrix switch and all users to the

output ports, it is possible to arrange the system so that any operator can access any computer from any location. This has several advantages:

- › Access to multiple computers – individual users have the choice of which computer to use at any time. This allows them to change the focus of their work quickly by switching the direct connection from their workstation to any of the computers on board. They can also interact with several computer screens at once, using a single keyboard and mouse, simply by rolling the mouse across the screens thereby reducing desk clutter and keyboard confusion;
- › Access from any workstation or desk – operators are no longer tied to their own workstation or desk and can access any computer from anywhere. On large ships this gives the immediate advantage of being able to operate a computer, whatever its location, without the delay and inconvenience of returning to a dedicated location on another deck;
- › Sharing of resources – many of today's high-tech systems require expensive hardware and software, yet they are seldom used. It makes sense, therefore, to share these devices amongst users, allowing them to run the applications with their data, as and when needed. This can provide a significant saving in both cost and the volume of hardware required.

Areas of application

Various vessel types have different requirements when it comes to storage of sensitive machinery and equipment data.

Research and geophysical survey vessels

Sensitive measurement and recording equipment is housed in environmentally controlled and

protected equipment rooms within the hull of the vessel and remotely located from operators on the bridge or in the instrument room. KVM extenders and switches provide the essential links and connection flexibility so that researchers can analyse the seabed from the convenience of their individual workstations, without the noise and clutter associated with the sophisticated computing equipment they use.



The *Mittelplate* oil rig

Photo: DEA Deutsche Erdöl AG

Cruise vessels

Crew working on massive cruise liners need quick and easy access to information wherever they are. It is often not practical for them to move to a dedicated workstation in a distant part of the ship. With Ihse KVM matrix switches, crew members can connect to the computers that supply them with information from a convenient workstation, helping to maintain the operational status and safety of the vessel.

Super-yachts

Ihse KVM systems are used on integrated bridges on super-yachts. Undistracted focus on the bridge is extremely impor-

tant and KVM extenders help by removing the noisy and distracting computing equipment whilst maintaining clear and accurate information for officers on the bridge.

KVM systems are also used in the onboard integrated entertainment system, providing instant interactive control and viewing of audiovisual content whilst saving space and enhancing the luxury environment.

well away from the operators, whilst giving uninterrupted and immediate access to data and alarms.

Maritime control

Hong Kong Harbour's Vessel Tracking Centre is one of the most advanced systems in the world and responsible for ensuring safe passage of over 200,000 vessels moving through Victoria Harbour.

Operators and supervisors at the top of the control tower need accurate and timely information from the computers located several floors below. Connection between the equipment on these decks is provided by KVM extenders and switches. These devices ensure that 4K UHD video information is displayed exactly as produced by the computers so that operators do not miss vital information that could endanger vessels and lives at sea.

Access from any maritime device

In the busy, cramped and often hostile maritime environment, the ability to access essential equipment instantly is crucial to the safety and smooth passage of vessels as they navigate the world's oceans.

Ihse Draco tera KVM switches connect operators and engineers with essential systems, remotely, and from any workstation, giving greater flexibility, increased efficiency and enhancing system security and reliability. The Draco tera range extends from 8 to 576 non-blocking, assignable ports with mixed operation over copper and fibre cables. They connect all types of digital video up to 4K UHD resolution and capable of parallel USB 2.0 and USB 3.0 switching, providing transmission without loss, instant connectivity and extensive configuration and redundancy options. Draco tera connects and switches users to remote CPUs and servers instantly.