WELL CONNECTED

Digital KVM solutions are helping to increase safety and efficiency in the air traffic control and management sector, from take-off to landing and beyond

Steve Montgomery, senior marketing manager, IHSE

Modern air traffic control and management operations rely on up-to-the-second information that is true and accurate. It is essential that the equipment providing that information must be of the highest order of reliability and must perform as expected, constantly, and without fail.

Throughout the air industry – across flight operations, around airports and over whole airfields – staff must be able to access data to perform their duties to the highest level. Information is crucial to safe and efficient air operations and it has to be made available to operators wherever they are.

In many cases, the source computers providing that information are remotely located and the data has to be transmitted over a considerable distance to operators. As an example, the systems that provide critical services to ATC controllers in most airports are located in secure, environmentally maintained server rooms at the base of the airport's control tower. This provides considerable benefits:

- Operators in the control rooms benefit from a more comfortable environment devoid of noisy, heat-generating computers.
- The tower can be constructed more efficiently. Space does not need to be allocated in the control rooms or high tower levels. There is also a reduction in weight at the higher levels, which can also help in architectural design.
- Computers housed in an environmentally controlled room can be managed and maintained more efficiently. IT teams have constant access and do not need to disrupt controllers to reach machines.

Keyboard, video and mouse (KVM) extenders, such as those from IHSE, provide that connection between computers in the computer room and controllers in the tower.

Ultimate reliability and continuous operation

It is essential that data transmission within air traffic control operations is totally reliable. KVM technology supports this through the integration of redundancy and fail-over schemes. Extenders are available with multiple internal circuits, dual wiring and intelligent link monitoring. Should the main connection in either device fail, or the cable between them be compromised, an automatic circuit within the extenders instantly switches to the backup connection to ensure continued operation. Secondary, backup power supplies can also be added.

The next step – KVM switching

In addition to point-to-point extension of single computers, it is possible, and often desirable, to incorporate a KVM switch into the installation. All source computers and all operator workstations are connected to it. Any operator can instantly reach any system from their own station.

Supervisory staff can access the same devices to oversee operations and, if necessary, take control. With simple keyboard commands, the supervisor can monitor several operators to maintain a full overview of all activities in a live environment. A complete workstation can even be replicated simply and easily, and made live in a fraction of a second, should the need arise.

This concept is applied to the airport expansion at King Abdulaziz International Airport in Jeddah. A redundant KVM switch matrix has been installed in a new tower and directly linked to the older ATC tower over 3km (1.8 miles) away. Operators can manage air traffic from either location.

Beyond the tower

The skies are becoming busier. To cope with this, new systems are being developed under the SESAR program and implemented at a rapid pace. New airfields are being built and more refurbished. ANSPs have increasing workloads and depend on technology to ensure safety in all operations.

Completely new concepts – such as remote towers – are being developed, tested and implemented, taking advantage of modern, high-bandwidth communications and imaging systems. Airports are also becoming busier and even more security-aware. They are responding to a heightened level of threats with increased surveillance, tighter security, and other safety measures.

KVM also offers great opportunities to enhance and streamline operations in other areas. In ground operations, security systems and training/simulation rooms, the technology simplifies and enhances live connectivity. Operators receive the information they need and can quickly and easily switch between data streams.

Several programs to modernize and secure ATM infrastructure, including those associated with NextGen and SESAR, incorporate KVM switches, offering full 4Kx2K video capability and bringing visual clarity and other benefits to the latest system implementations.

NATS

Above: Reliable technology and a quiet workspace are integral to safe and efficient air traffic control

Left: Technological advancements are allowing more airports to implement remote air traffic control systems

New concepts in air traffic management, such as remote towers, will rely heavily on secure and robust video and data connectivity over ever-increasing distances. KVM-over-IP solutions will help deliver that capability, ensuring safe operations, wherever and whenever they are implemented.

Future proofing

KVM extenders and switches include extensive features, functionality and performance that make them ideally suited to many applications across the whole air industry. As Manuel Greisinger, head of sales at IHSE points out, "KVM technology is well proven in the air traffic control, management and airport operation sectors. The pace of development of KVM devices and IHSE's commitment to add dedicated industry-specific features means that this technology can be deployed with confidence in its performance and in the knowledge that future requirements can be met, often through simple and quick changeover of individual components." ❖