Future-Proof Air Traffic Operations with Digital ATC Bundle Solutions

The air traffic control (ATC) market continues to grow and is set to reach USD$9.45 billion by 2027 at a rate of 6.96% CAGR during the 2020-2027 forecast period, according to Fortune Business Insights. This is due to the growing number of airports worldwide, the need for better airspace management technology, and even a rise in passenger numbers. Cyber security is also a growing concern among ATC operators as well since its attack surface has grown as part of greater digitization of systems operations, delivering passenger services, and communication lines. Thus, ATC operators need reliable, secure solutions in place more than ever. To support the ever-evolving and mission-critical demands of air traffic control technology for operators, ATEN offers four bundled solutions that support the latest in redundancy, screen resolutions, customization, and security. ATC depends on fast and secure information and communication for safe operations and ATEN knows this, which is why we’ve developed KVM over IP solutions that meet the challenges posed by this crucial global industry.

With these solutions in place, air traffic operators can quickly and easily switch between two servers and can do so with LAN and power redundancy, secure data transmission, vivid resolutions for radar monitoring, and much more. ATEN KVM over IP solutions help airports create a future-proof, secure air traffic solutions that make it easy and efficient for air traffic controllers to remotely monitor the UHD output of computers and serial devices from single-display workstations at short distances and dual-display workstations at distances up to 6.5 meters, while providing a smooth, ergonomic desktop experience.

Challenges Facing Air Traffic Controllers:

- ATC operators need solutions that allow for the installation of devices to be separated from the operators’ desks in an air traffic control room, which creates an optimal work environment away from the heat and noise of servers. This in turn also lowers the chance for human error.
- Setups need to allow for system backup on a secondary PC for power and network redundancy purposes in case of system failure.
- Specific video resolutions are required for radar monitoring, in particular 2K x 2K screen quality (2048 x 2048 @60Hz).
- Air traffic controllers demand easy and fast switching between computers without going through a management software.

ATEN Solutions

To accommodate control room requirements for air traffic control, ATEN offers 3 KVM over IP ATC Bundle solutions:

<table>
<thead>
<tr>
<th>KE6910 ATC Bundle</th>
<th>KE6920 ATC Bundle</th>
<th>KE9950 ATC Bundle</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x KE6910T + 1x KE6910R</td>
<td>2x KE6920T + 1x KE6920R</td>
<td>2x KE9950T + 1x KE9950R</td>
</tr>
</tbody>
</table>
With two (2) transmitters connected to two (2) PCs/servers (both in the control room) and one (1) receiver connected to the workstation, air traffic control operators can quickly and easily switch between two servers, enhancing point-to-point extension with no distance constraints. One of the PCs/servers is meant to be the primary one (with fiber connectivity) whereas the other one (with copper network connectivity) serves as a secondary server and as a backup. In response to any contingency, switching between both PCs/servers can be as seamless and fast as 1 second via a pre-defined hotkey setting. In addition, each KVM over IP extender is equipped with a LAN port and power redundancy.

With ATEN ATC bundle solutions in place, ATC operations can greatly reduce the risk of network threats and security vulnerability, and also avoid the need to go through software for complex device management. What’s more, ATEN KVM over IP ATC Bundle solutions support customizable hotkey switching for network ports.

In addition to Air Traffic Towers, ATEN ATC Bundle Solutions can be implemented in Approach Control Room, and Area Control Center applications. ATEN ATC Bundle Solutions support exceptional 2K x 2K screen resolutions dedicated to radar monitoring in Approach Control Room and Area Control Center air traffic control scenarios.

**Enhanced Point-to-Point IP Extension**
Enhances point-to-point IP extension with utmost system reliability and cyber security, enabling a faster response to mission-critical control room operations.

**2K**
Supports 2K x 2K screen resolution for radar monitoring in Approach Control Rooms and Area Control Centers in air traffic control scenarios.

**LAN & Power Redundancy**
Supports dual power and network connections for system failover, ensuring robust system uptime.

**Secure Data Transmission**
Utilizes AES-128 bit encryption to secure all data before it’s transmitted over a network and decrypts the data on the receiver.

**Primary & Secondary Architecture**
Enables connection to a primary and a secondary computers, allowing instant system failover via hotkey switching without moving around workstations.

**Hotkey Switching**
(a) With the KE6920R, hotkey switching enables switching of network ports between 2 or 3 PCs/servers connected to the KE6920T devices. When two LAN connections are established between the transmitter and the receiver, port switching will automatically go to the backup LAN connection when the primary one goes down.

(b) With the KE6910R / KE9950R, hotkey switching enables switching between only 2 PCs/servers connected to KE6910T / KE9950T devices.
ATC Bundle Solutions to Reinforce Air Traffic Control Digitization

In fast-paced air traffic scenarios, timely information and communication is crucial to safe and efficient operations. To reduce the risk of cybersecurity threats, ATEN’s ATC Bundle Solutions can be easily deployed in control rooms in the following air traffic control scenarios to enable simplified installation and ensure secure and dedicated workstation operations:
ATEN ATC Solution in Action

In a successful deployment that integrated one of ATEN's ATC Bundle solutions, an airport wanted to extend the distance between operators and servers in both an air traffic control tower and an area control center. In addition, the solution needed to allow smooth, stable switching between primary and secondary servers. The ATEN solution was to install various KE9950 transmitter and receiver models as follows, which allowed for 2K x 2K resolution, and customizable hotkey switching between 1Rx to 2Tx to switch network ports in case of any unexpected network downtime. The solution chosen was:

<table>
<thead>
<tr>
<th>Air Traffic Control Tower</th>
<th>Area Control Center</th>
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</thead>
<tbody>
<tr>
<td>KE9950T x 4</td>
<td>KE9950T x 44</td>
</tr>
<tr>
<td>KE9950R x 2</td>
<td>KE9950R x 22</td>
</tr>
</tbody>
</table>

![Diagram of ATEN ATC Solution in Action]
Applications

Although ATC Bundle Solutions are purposed to reinforce ATC control room operations, they’re also perfectly suited to many other industrial applications where point-to-point KVM over IP extension, robust system failover, real-time monitoring and lossless video clarity matter.

- Broadcast Center
- Air Traffic Control Center
- Emergency Command Center
- Industrial Control Room
- Network Operation Center
- Operation Control Center
- Security Control Room
- Tactical Operation Center
- Traffic Control Center
## Product Comparison

<table>
<thead>
<tr>
<th>Model</th>
<th>KE6910R</th>
<th>KE6910T</th>
<th>KE9950R</th>
<th>KE9950T</th>
<th>KE6920R</th>
<th>KE6920T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundless Switching</td>
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<tr>
<td>USB Peripheral</td>
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<td>N/A</td>
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<td>N/A</td>
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<tr>
<td>Over IP</td>
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<td>RS-232 Support</td>
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<td>USB Storage Transmission</td>
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<tr>
<td>SFP Fiber Module Support</td>
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<tr>
<td>Tx Local Console</td>
<td>N/A</td>
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<td>N/A</td>
<td>·</td>
<td>N/A</td>
<td>·</td>
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<tr>
<td>Network Fail over</td>
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</tr>
<tr>
<td>Power Fail over</td>
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<tr>
<td>Dual SFP Slot</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>·</td>
</tr>
</tbody>
</table>
Air Traffic Control Solutions
for Enhanced Point-to-Point IP Extension

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Simply Better Connections

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