ATEN
Simply Better Connections

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Control Room

Solutions Guide

January 2023

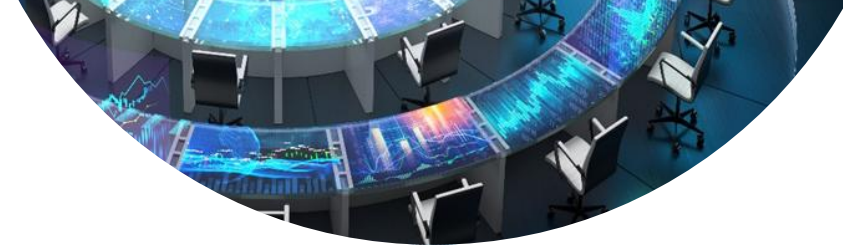
Contents

The Control Rooms of the Future

Control rooms have always been the dynamic nerve centers of organizations that adapt and reconfigure to support evolving needs, and the last few years have been no exception. While the control room's core purpose, to effectively visualize data to improve situational awareness and support collaborative decision-making, remains paramount, catalysts such as the pandemic, massive digitalization, and the explosion in data to be analyzed have forced us to re-imagine faster and better solutions. The control rooms of the future are here.

Command Agility,
Control Evolution

Fast Facts



Security Control Room Market in USD by 2028

7.1 Billion

The Security Control Room market exceeded USD$4.5 billion in 2021 and is anticipated to grow at over 6% CAGR from 2022 to 2028, as reported by GMI[1].

Savings from Optimizing Ergonomics at the Console

1000s Hours

Adopting a human-centered approach to control room console design can save thousands of work hours per year when aggregated to the whole system level.[2]

Increase in AI & Machine Learning Adoption

85%

Researchers[3] highlight 85% of responders citing they used/were looking to adopt AI-assisted analytic systems to enhance control room operations.

Control Room LED Displays More Energy Efficient

75%

Direct view & fine pitch LED displays meet the demanding requirements for command and dispatch center control rooms and are up to 75% more energy efficient than LCD panels.[4]

Trends

Flexible Visualization is Key to Agile Data Management

With IoT in full swing, control room data flows are becoming more numerous and more complex. These massive amounts of data need to be organized and visually presented to drive effective decision-making in the shortest period of time. In order for this increase in data complexity to not become overwhelming, powerful collaborative tools and a high degree of flexibility are required when it comes to visualization and data integration.[1]

Advances in AI Overcoming Structural Obstacles

For quite some time, control room offerings from solution providers have been moving towards applications for AI and machine learning implementations. These are now on the verge of overcoming the structural hurdles that have held them back, especially in the fields of AI threat detection in surveillance control rooms. Soon, for any control room utilizing metadata platforms, decision-making will be made using visual classifications supported by AI-augmented analytics.[2]

Trends

Improved Ergonomics can Streamline Cognitive Processes

Moving on from physical comfort, screen line-of-sight, lighting, and uncluttered workspaces, advanced ergonomics now embraces not only biophilia[3] but also how operators interface with the technology they are using to perform their tasks. Data management agility tools can help to provide user-focused environments that minimize the risk of human error and maximize performance and efficiency.[4]

Cybersecurity Concerns Driving Security Infrastructure by Design

In critical control room environments, information security concerns should be at the forefront of planning. An increase in data sources, access points, and content management systems brings an increase in cybersecurity concerns. Many of these threats can be mitigated in the server room, where data security management can be strengthened through mechanisms such as multi-level access control, encrypted transmission, and operational logging.[5]

Challenges

1. **More Data requires More Screens, More Flexibility**
   More screens and larger video walls are required for effective data visualization, along with multiple display options such as split screens and zooms for flexible monitoring.

2. **Informed Decision-making requires Intuitive Multi-system Access**
   Access to controls should be intuitive in order for operators to stay agile while monitoring multiple subsystems so that data can be processed quickly and resources can be rapidly deployed.

3. **Decentralized Workflows require Collaboration Technologies**
   Prompt collaboration, data sharing, and troubleshooting tools between workstations and the video wall are needed for streamlined workflows that include field-based remote workers.

4. **No Interruption of Service requires Reliable 24/7 Operation**
   Control rooms must be supported by reliable technology with back-up and redundancy mechanisms for equipment, power, and network that support ever-shifting workflow priorities.

ATEN Control Room Solutions

M

MONITORING

KVM over IP Switch & KVM over IP Matrix Solutions

For situational awareness to monitor system status for abnormalities and to ensure that faults can be debugged immediately.

R

REPORTING

Video Matrix Switch, KVM over IP, & Control System Solutions

To gather experts and competent authorities, provide information to persons in charge, and discuss optimal strategies.

D

DISPATCH

KVM over IP Extender & Cat. 5 Extender Solutions

To dispatch front-line support as quickly as possible after operators are notified of an incident in the field.

O

OPERATION

KVM over IP Switch & KVM over IP Matrix Solutions

To perform workflows that require high concentration and efficiency in order to ensure the smooth functioning of an overall process.

Monitoring

1 KVM over IP Switch & KVM over IP Matrix Solutions for Monitoring

The main demands of this control room scenario are maintaining monitoring efficiency, so target system status/situation awareness must be clearly shown via remote video in real-time along with relevant supplemental information.

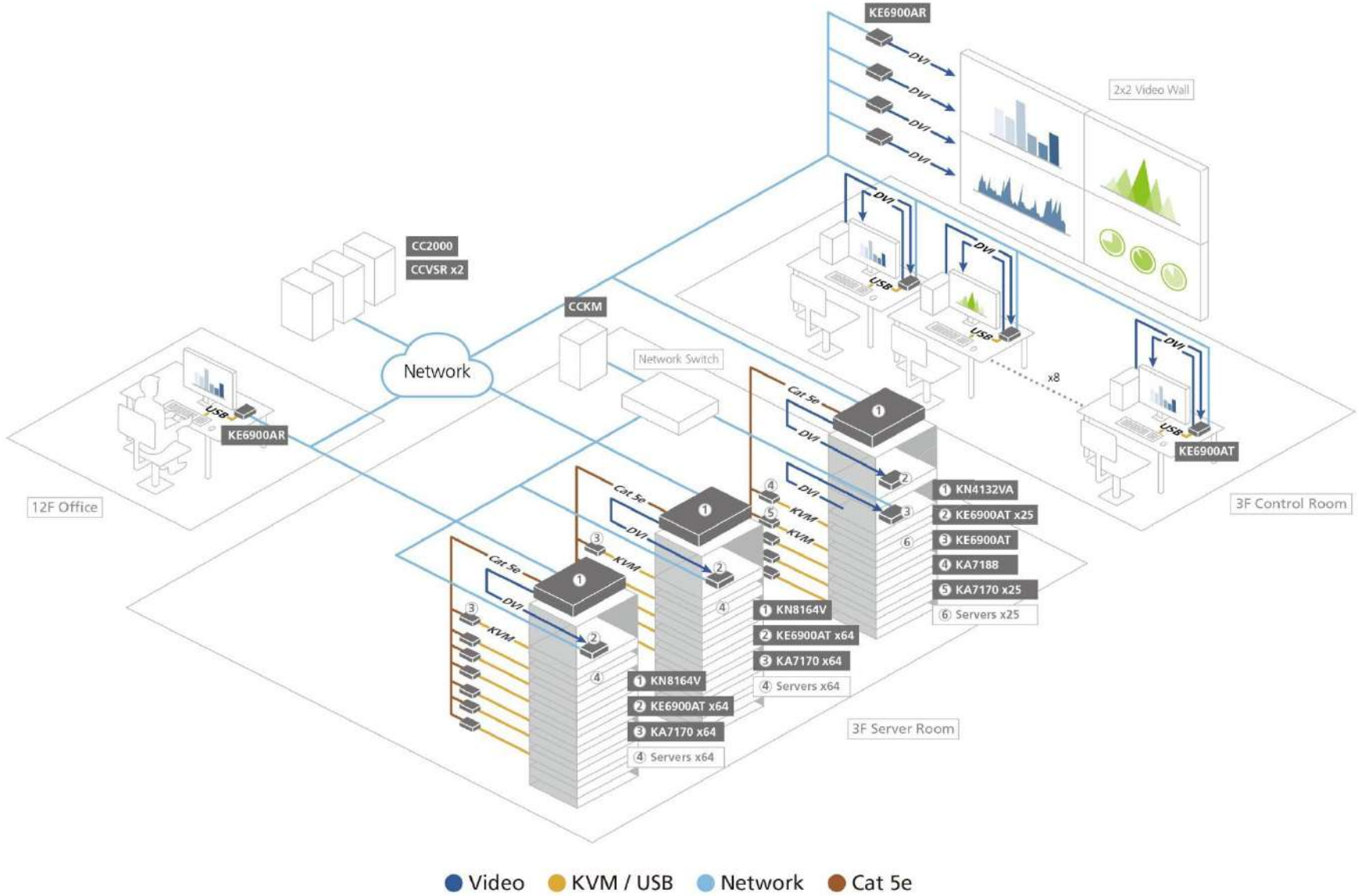
- Video wall for information visualization and integration plus comprehensive overall operation status
- KVM extension so the least amount of operators can monitor multiple systems as well as manually handle emergencies
- Multiple display options so that different video sources can be monitored on the same screen, such as multi-view, split-screen, etc.
- Push/pull content sharing so control room operators can collaborate effectively

Example applications:

Network Operation Center / Operation Control Center / Security Control Room / Industrial Control Room / Traffic Control Center

Recommended Products

Monitoring – Solution Diagram



Reporting

2 Video Matrix Switch, KVM over IP, & Control System Solutions for Reporting

For critical situations such as disasters and emergences, a response team is established in a space similar to a conference room that provides the chairperson/commander with the most actionable insight for decision-making reference.

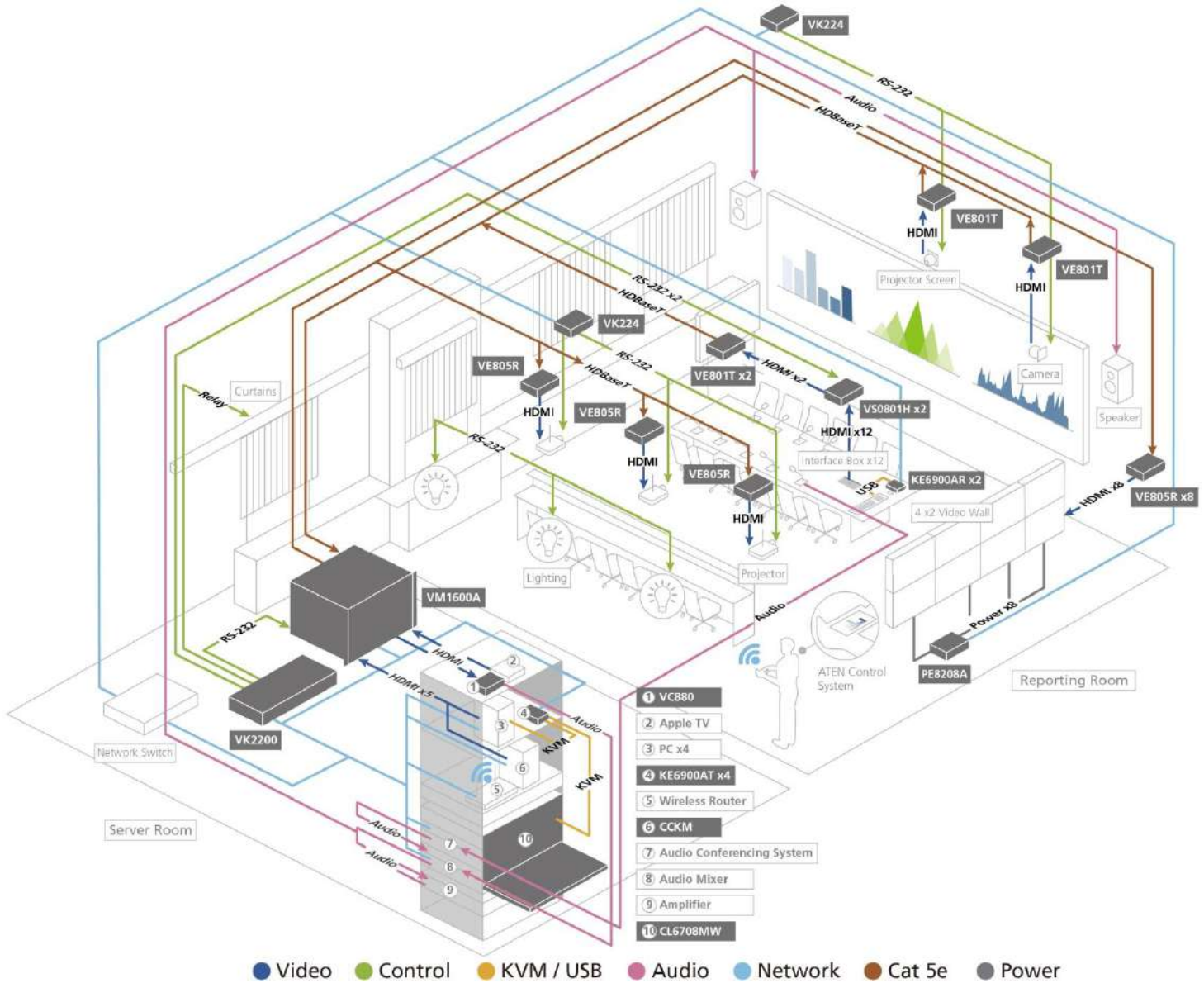
- Video wall for information visualization and integration plus complete overall operation status for effective decision-making
- Audio functionality for reporting and giving commands
- Real-time switching of the console display content and the video wall for the highest accuracy

Example applications:

War Room / Tactical Operation Center

Recommended Products

Reporting – Solution Diagram



Dispatch

3 KVM over IP Extender & Cat. 5 Extender Solutions for Dispatch

The biggest challenge in this field is to shorten the time from receiving a notification to dispatching support; a clear presentation of available resources and real-time display of case processing progress can help operators make effective logistical decisions.

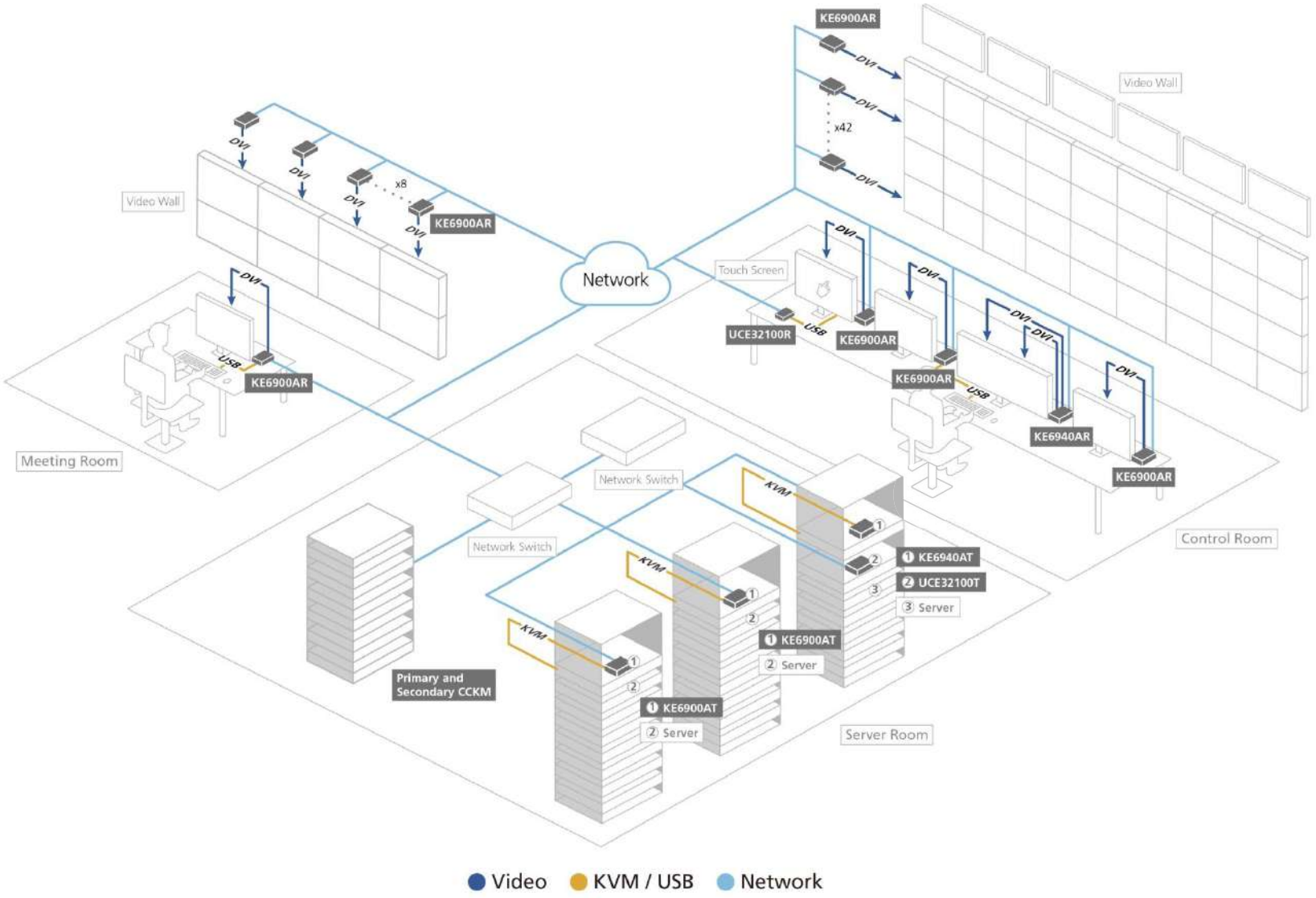
- Video wall to overview dispatch status and all resources in the field
- KVM extension so even a single operators can monitor multiple systems
- Multiple display options so that different video sources can be monitored on the same screen, such as multi-view, split-screen, etc.
- KVM data management agility so that dispatch can sync with communication and operations
- Push/pull content sharing so control room operators can collaborate effectively

Example application:

Emergency Command Center

Recommended Products

Dispatch – Solution Diagram



Operation

4 KVM over IP Switch & KVM over IP Matrix Solutions for Operation

Operators in this field have a high workload and need to focus on multi-tasking workflows. They also need a high degree of collaboration and cooperation, so that the system can operate smoothly.

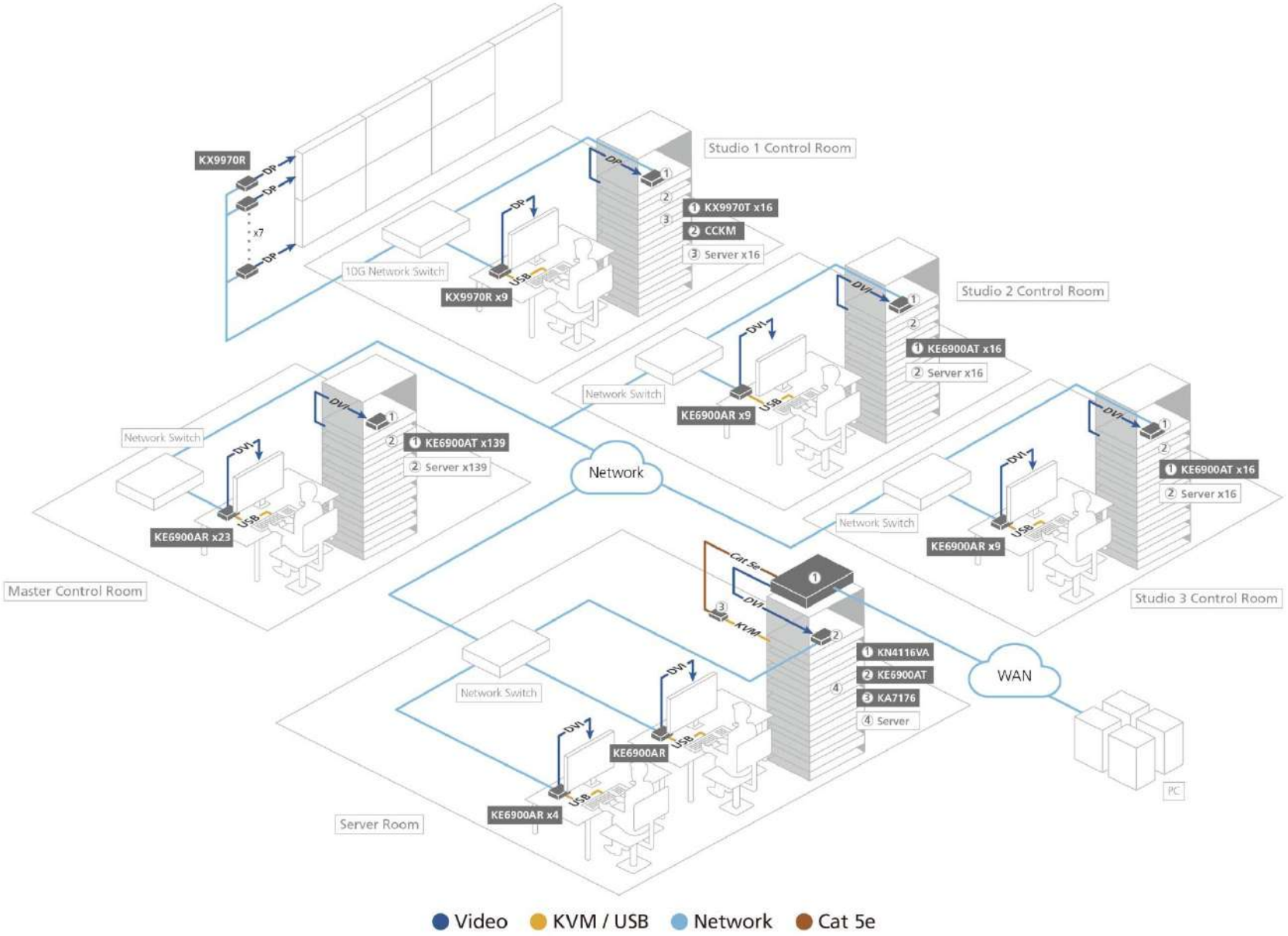
- Video wall to confirm task status of each control room operator
- KVM extension so even a single operator can monitor multiple systems as well as manually handle emergencies
- KVM data management agility so that operations can sync with communication
- Push/pull content sharing so control room operators can collaborate effectively

Example applications:

Air Traffic Control Center / Broadcast Center (SCR)

Recommended Products

Operations – Solution Diagram



Solutions in Action

1. **MONITORING** **Police Surveillance**
   Control Rooms for City Surveillance, State Police
2. **MONITORING** **Oil Refinery**
   SCADA System Control for Process Automation, Oil Refinery
3. **MONITORING** **Traffic Control Center**
   Control Room for Traffic Management, Municipal Government
4. **REPORTING** **Military Control**
   Tactical Operations Center for Military Command & Communication
5. **DISPATCH** **Disaster Relief**
   Information Visualization for Disaster Relief & Rescue Center
6. **OPERATION** **Air Traffic Control**
   New Control Center for Air Traffic Control System Optimization
7. **OPERATION** **Broadcasting**
   Media Management & Visualization for Production & Broadcasting

Monitoring – Police Surveillance

1 Control Rooms for City Surveillance, State Police

The State Police in Turin, Italy, required a system of new public surveillance control rooms to improve public safety and coordinate crime prevention efforts on a day-to-day basis, while also being able to double as operations rooms for major events, such as football matches, international summits, or crisis control scenarios.

They needed a solution that took into account the importance of visualization and information integration for fast decision-making and responses in these situations, so that they could improve operational flexibility with control room operators monitoring different urban areas, allowing them to inform agents in the field in real time.

Police Surveillance

Challenges	The ATEN Solution
Mass Media Distribution Multiple video walls were to be installed in three different control rooms with a wide variety of source devices. **Remote Access** Operators needed to instantly access any of the computers, which were stored safely in a separate server area. **Easy to Manage** Operators without any technical knowledge need to be able to control the video wall in each control room.	**Centralized Control** Centralized control via a dedicated, custom-designed interface on handheld devices. **Real-time Monitoring** Connects a large amount of screens and sources for real-time monitoring of feeds from multiple cameras in various locations. **Improved Workflows** A unified, intuitive and workflow-based user environment that is highly flexible, configurable, and responsive.

Police Surveillance – Products

KE6900A
KE6940A
VE805R
VM3200
VK2100

VE805R
HDMI HDBaseT-Lite Receiver with Scaler (1080p@70m) (HDBaseT Class B)

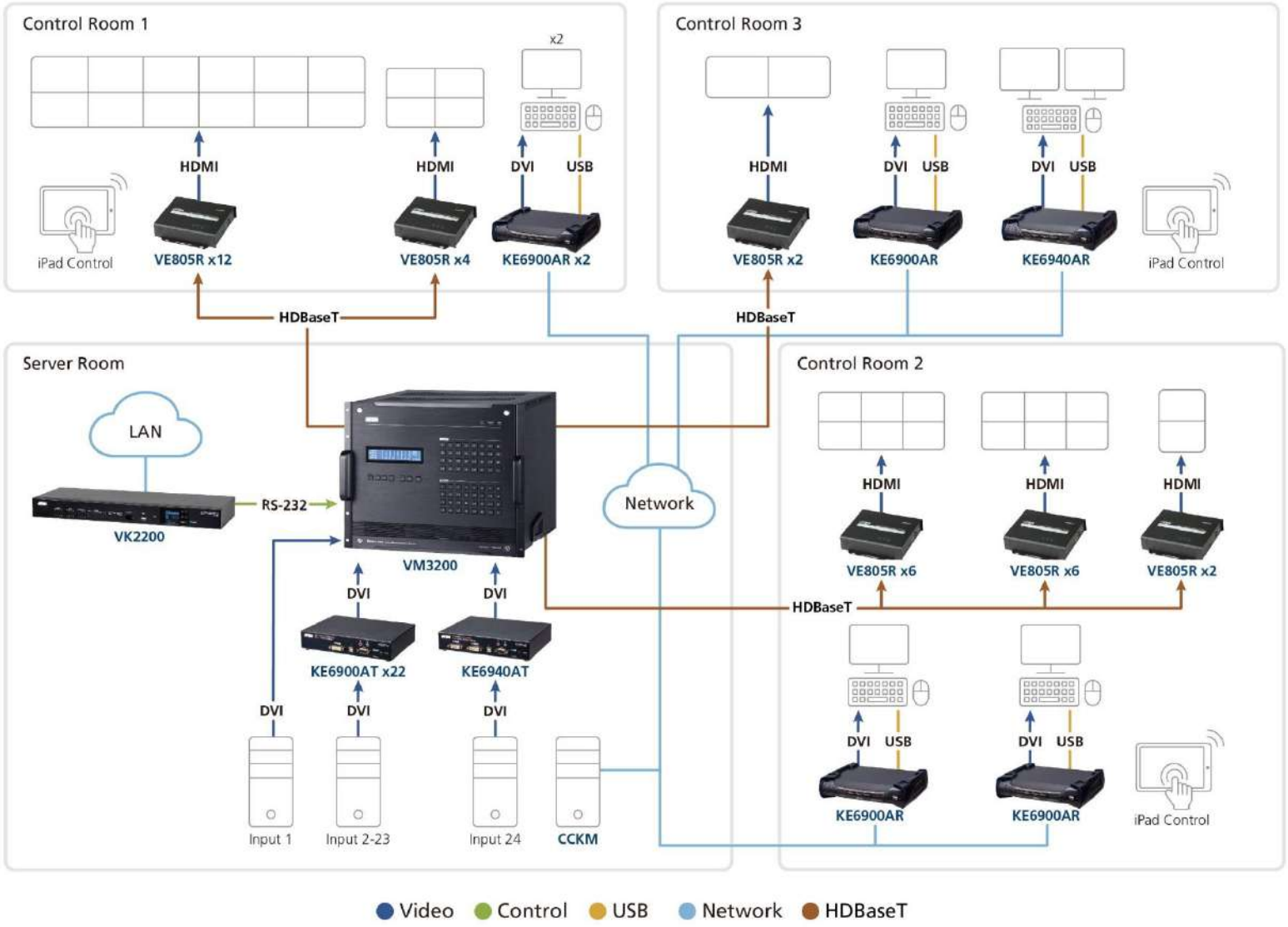
VK2100
ATEN Control System - Control Box

KE6900A/KE6940A
USB DVI-I Single / Dual Display KVM Over IP Extender

VM3200
32x32 Modular Matrix Switch

Police Surveillance – Solution Diagram

KE6900A
KE6940A
VE805R
VM3200
VK2100



Monitoring – Oil Refinery

2 SCADA System Control for Process Automation, Oil Refinery

An oil refinery with the capacity to process around 230,000 barrels of crude oil per day needed a solution that allowed operators to control SCADA servers both locally and remotely in order to manage large amounts of information from their process automation systems. The facility has server rooms at four separate sites that, in addition to running various automated processes, also monitor downstream sensor information via long range wireless. The server rooms required local control functionality, but for security reasons, no PCs or notebooks were allowed in the remote site control room, while the solution also had to support FHD, be rack-mountable, and support barcode scanners.

ATEN | Oil Refinery

Challenges	The ATEN Solution
Process Monitoring To enable local and remote monitoring and control of process infrastructure and equipment statuses. **Secure Solution** For security reasons, no PCs or notebooks are allowed in the remote site control room. **High Definition Visuals** Solution needed to support FHD for accurate information visualization. **Convenient Installation** Required a full-featured yet small-size, space-saving solution with low power consumption.	**Dual-view Display** Dual-view console stations allow for real-time monitoring of process flow with simultaneous operation. **Panel Array Mode™** Allows information integration for optimized visualization of video output from all installed SCADA servers on one screen simultaneously. **Hardware-based Security** Standalone 0U hardware client device component eliminates security concerns of PCs/NBs. **Visual Clarity** Supports HDMI at FHD resolution of 1920 x 1200 @ 60Hz for accurate monitoring

Oil Refinery – Products

KN4116VA
KA8288
CL3800
KA7166

KN4116VA
1-Local/4-Remote Access 16-Port Multi-Interface Cat 5 KVM over IP Switch

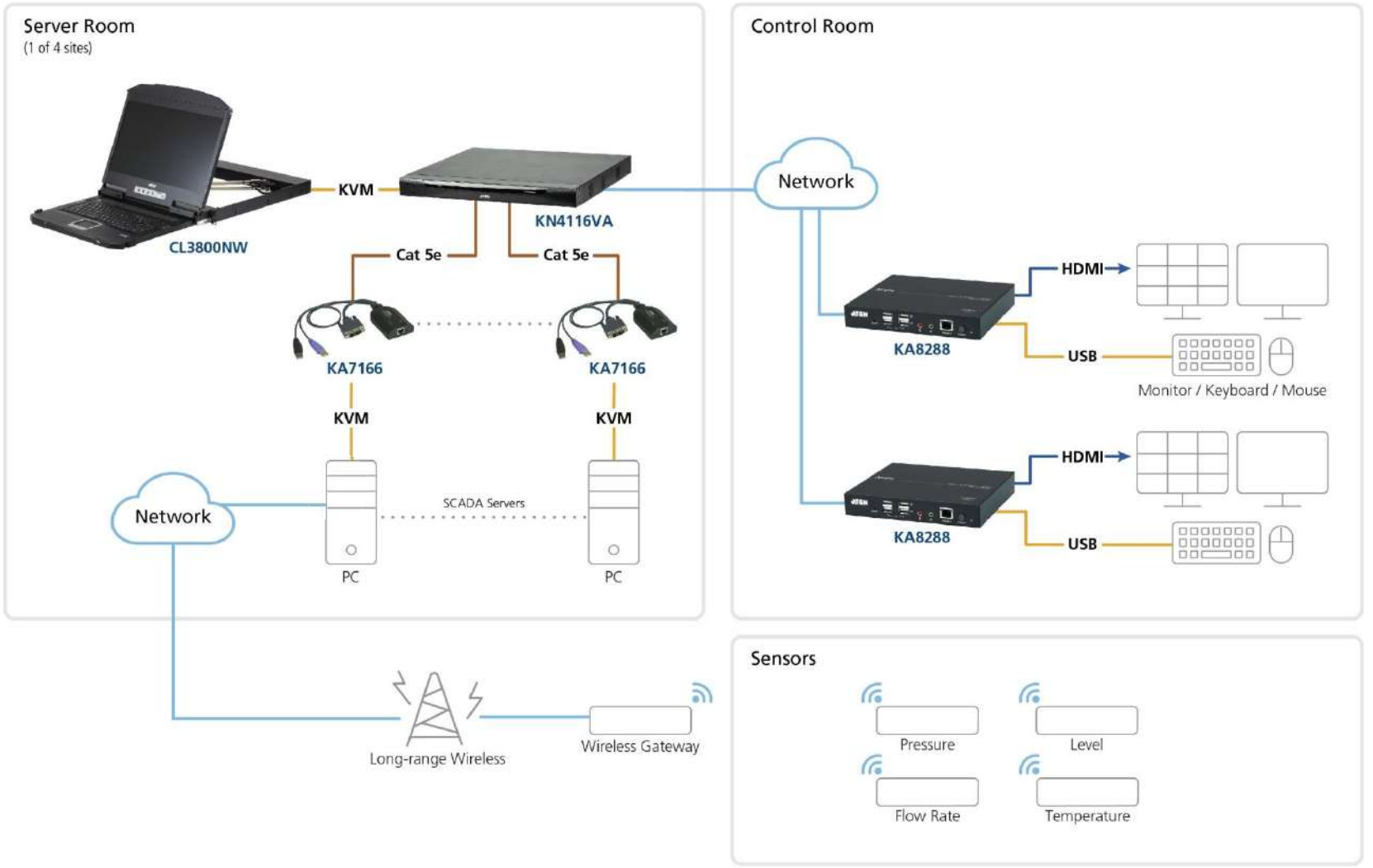
KA8288
Dual HDMI KVM over IP Console Station

CL3800
Ultra Short Depth Dual Rail WideScreen LCD Console (USB, HDMI / DVI / VGA)

KA7166
USB DVI Virtual Media KVM Adapter with Smart Card Support

Oil Refinery – Solution Diagram

KN4116VA
KA8288
CL3800
KA7166



Monitoring – Traffic Control Center

3 Control Room for Traffic Management, Municipal Government

A large city in Southeast Asia has an increasing number of tourists each year. Due to the growth in the number of cars on the road, traffic incidents, and other related crimes in the city, the municipal government decided to implement an upgrade of the digital surveillance system on the city's main streets to monitor public areas and to help ensure public safety via a centralized control room. Other vital tasks to be undertaken include proactive real-time traffic signal management to avoid congestion and providing video support for law enforcement.

ATEN | Traffic Control Center

Challenges	The ATEN Solution
Centralized Monitoring Real-time monitoring of surveillance footage from cameras located around the city and transmitted to the control room. **4K HDMI Video Wall** High-quality video transmission for a multi-screen video wall with support for up to 4K resolutions. **Ultra-Smooth Transitions** Real-time switching of sources with stable and continuous streams for quick incident detection and optimal response. **Multiple Input Resolutions** Surveillance infrastructure is to be rolled out in stages so a mix of 5MP and 4K cameras needs to be supported.	**Seamless Switch™** Enables real-time control and zero-delay switching between multiple sources for uninterrupted surveillance while transitioning from one video source to another. **Centralized Control** Provides multiple built-in control interfaces, including serial, Ethernet, pushbuttons, an award-winning GUI, and a control app. **Video Wall with Scaler** Delivers smooth, synchronized video rendered at optimum output resolutions with uncompromised precision across the video wall. **Stunning 4K** Displays crystal-clear, stunning images up to 4K with the fine details required for fast event analysis and law enforcement support.

Traffic Control Center – Products

VM3200
VE816R
VS182A

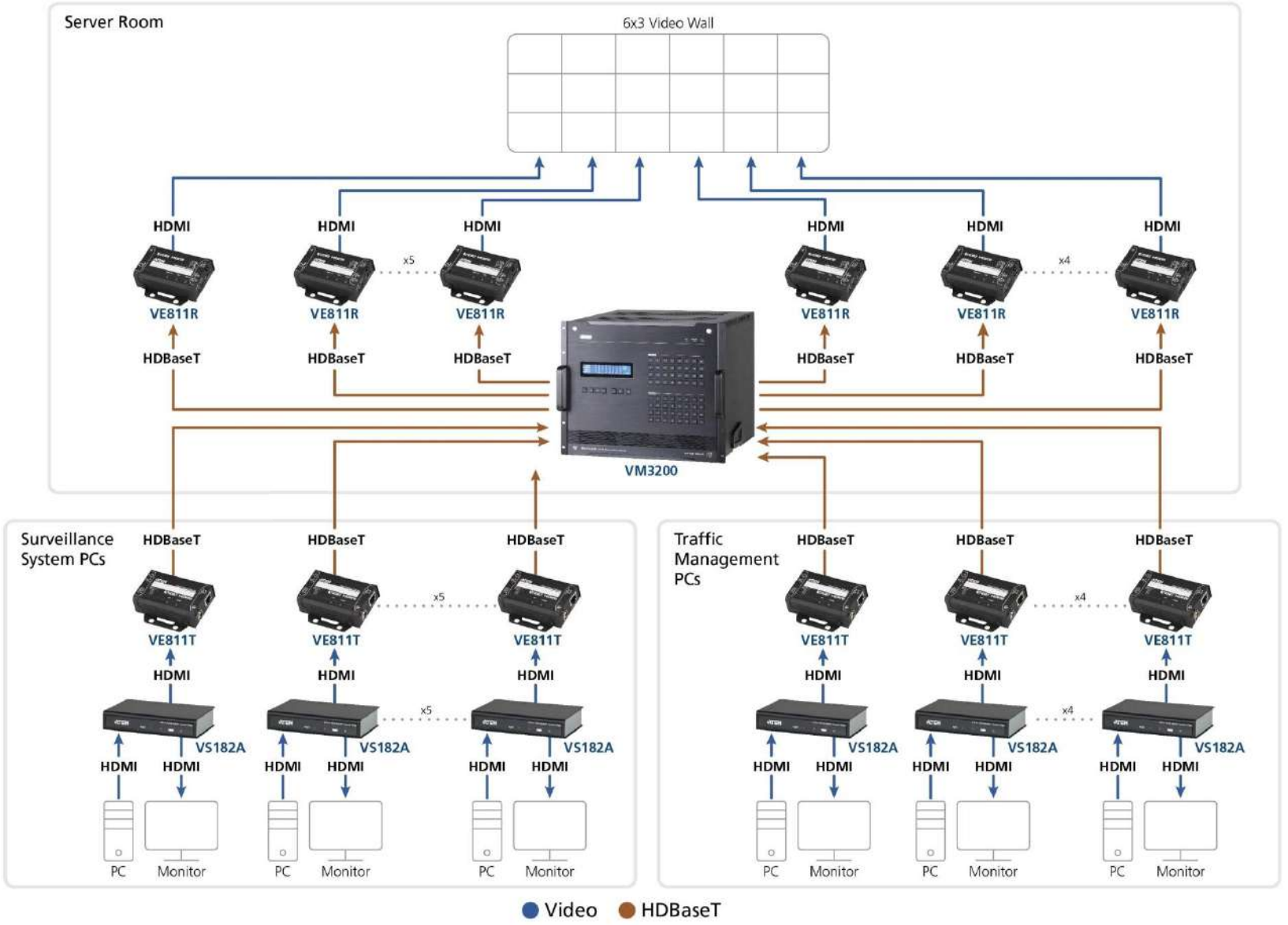
VM3200
32x32 Modular Matrix Switch

VE816R
4K HDMI HDBaseT Receiver with Scaler (4K@100m) (HDBaseT Class A)

VS182A
2-Port 4K HDMI Splitter

Traffic Control Center – Solution Diagram

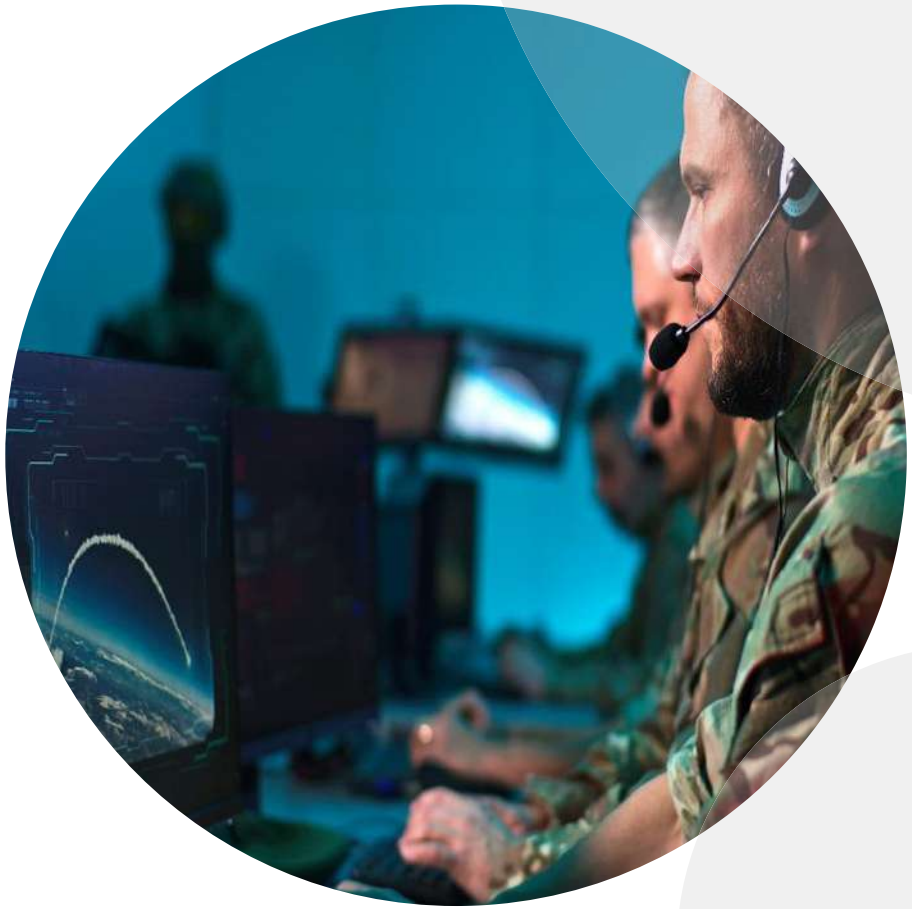
VM3200
VE816R
VS182A



Reporting – Military Control

4 Tactical Operations Center for Military Command & Communication

A government defense ministry wanted to establish a new tactical operations center that was designed around a large, main video wall with extra displays, optimized for reporting. Quick switching between AV sources was imperative, since commanders rely on the video wall for real-time reports on dispatch status and all combat resources. They were looking for a flexible solution that was able to be easily and quickly customized to support the fast-paced display needs required for effective decision-making efficiency. Furthermore, stability and reliability are vital in military control rooms, so the solution needed to provide backup mechanisms to suit the 24/7 operational needs.



ATEN | Military Control

Challenges	The ATEN Solution
Video Wall for Information Visualization HDMI video wall was needed to clearly present images and information sent back from the front line for immediate response processing. **Flexible Access** The AV distribution should be simple to control but cater to a wide range of display configurations, while also facilitating fast switching between video sources in real-time. **Uninterrupted 24/7 Operation** The system requires high availability and information visualization cannot be interrupted during critical operations.	**Customized Configuration Options** Integrates different video input and output interfaces and encode the various formats to deliver customized flexibility and video wall configuration options. **Seamless Switch™** This exclusive ATEN technology ensures smooth transitions when switching video wall sources and close-to-zero second switching for continuous and reliable video streams. **Reliable Power Redundancy Design** Dual power supply design provides the reliable power redundancy that is critical for the 24-7 operations of a military control room.

Military Control – Products

VM1600A
VS92A
VS182A
VC810

VM1600A
16 x 16 Modular Matrix Switch

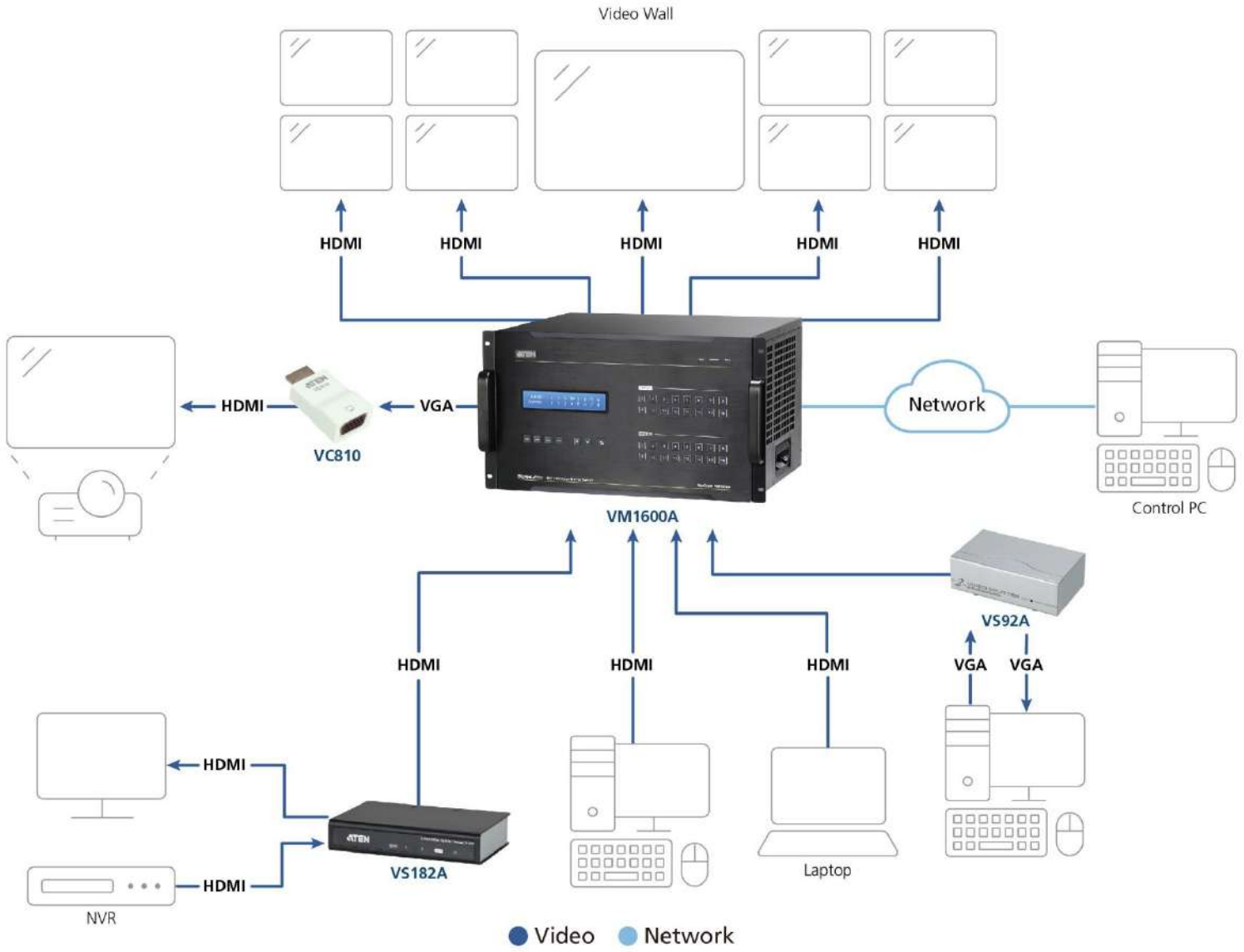
VS92A
2-Port VGA Splitter (350MHz)

VS182A
2-Port 4K HDMI Splitter

VC810
HDMI to VGA Adapter

Military Control – Solution Diagram

VM1600A
VS92A
VS182A
VC810



Dispatch – Disaster Relief

5 Information Visualization for Disaster Relief & Rescue Center

A government organization planned to relocate its Disaster Relief and Rescue Center to a new building. As the front-line contact window in the event of emergencies, the center must be able to dispatch personnel and vehicles quickly and properly allocate all relief resources. Since this was a new build, a dedicated server room was set up, with two teams of personnel working in the main control room and a second conference room. The status of disaster relief and resource information needed to be displayed on the main control room video wall for real-time monitoring to increase efficiency and avoid delays, as well as a separate meeting room video wall for overview procedures.

Disaster Relief

D

Challenges	The ATEN Solution
Information Visualization Multiple system images must be simultaneously displayed in different spaces, with switching between critical image content as delay-free as possible. **Man-machine Separation** Extend the signals from the server room to the control terminals in the disaster relief center at distances up to 70 m. **Flexible Operation Modes** A single console must be able to operate multiple servers at the same time to execute the shortest possible dispatch windows, while teams must also be able to share critical information. **24/7 service uninterrupted** During the execution of critical dispatch tasks system operation cannot be interrupted, and so a backup mechanism must be provided.	**Versatile Video Wall Extension & Control** Native video wall functionality offers outstanding flexibility and scalability, with a visually-lossless image experience and 0.3 second Fast Switching. **Boundless Switching** Operators can simply move the mouse cursor across screen boundaries to switch between different receivers (Rx) to operate the keyboard and mouse on the connected systems. **Supports both Collaboration & Centralized Control** Operators can push and pull shared content across displays for optimized cooperation, while KE receivers can be grouped for single console operation and control. **Primary-Secondary Backup Architecture** When any CCKM server fails, the backup server can still ensure the continuous operation of the system and ensure 24/7 availability.

ATEN | Disaster Relief – Products

KE6900A
KE6940A
UCE32100
CCKM

KE6900A
USB DVI-I Single Display KVM Over IP Extender

KE6940A
USB DVI-I Dual Display KVM Over IP Extender

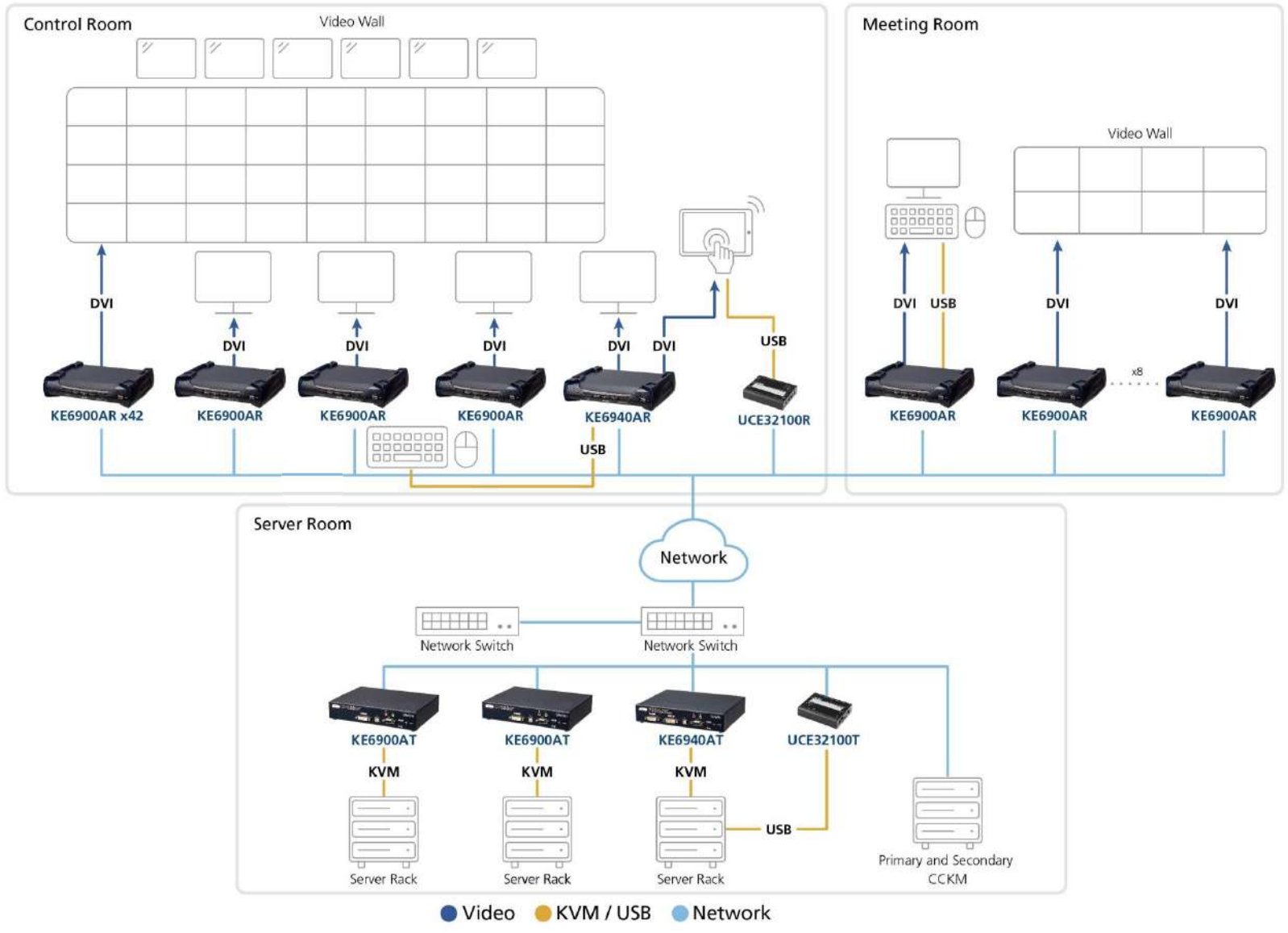
UCE32100
4-Port USB 2.0 CAT 5 Extender (100m)

CCKM
KVM over IP Matrix Manager

Disaster Relief – Solution Diagram

D

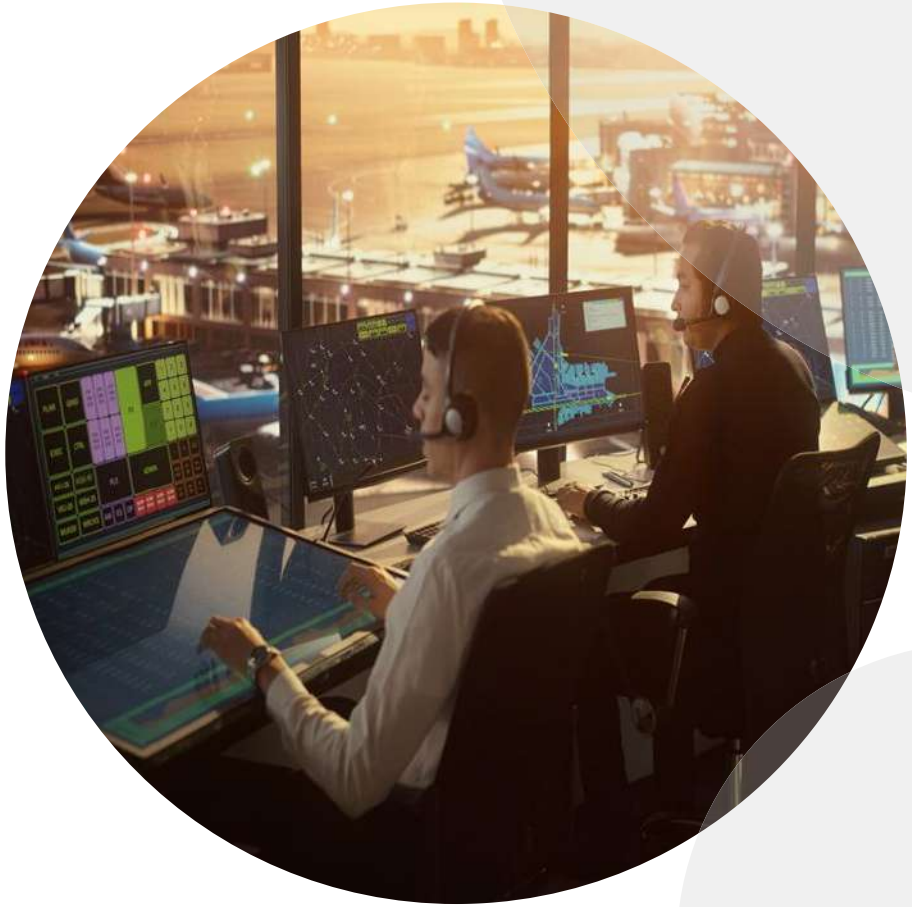
KE6900A
KE6940A
UCE32100
CCKM



Operation – Air Traffic Control

6 New Control Center for Air Traffic Control System Optimization

As part of a regional modernization effort to maximize safety while handling increased air traffic, a civil aviation agency upgraded its existing control tower and built a new tower and server room with the latest ATM (air traffic management) system in order to enable their airspace capacity to be fully optimized. Along with the new FDP (flight data processing) system, they also needed to install a new HMI (human/machine interface) for 2K x 2K radar data display and monitoring. The old and new towers are connected through IP network optical fiber, and the controllers needed to remotely operate the old and new tower servers.



ATEN | Air Traffic Control

Challenges	The ATEN Solution
Remote Access to Integrated Systems To provide reliable access to ATM/FDP information systems from multiple workstations to enable the air traffic controllers to perform data analysis and incident reconstruction. **Ergonomic Workspace** Due to limited tower space, to provide the controllers with a comfortable working environment, the centralized servers needed to be located on a lower floor. **Flexible Equipment & Access Expansion** Requires flexible operation access and unlimited scale deployment with options for further RJ45 and SFP expansion.	**Multiple Consoles, Flexible Access** Provides flexible local and remote access to critical information systems through a diversified KVM product selection that meets the different budget needs of the new and the old towers. **Real-time KVM over IP Operation** With sub-0.3 second switching between different remote sources on the control room displays, operation feels like a direct connection to the servers with extremely low latency. **High Usability & Integrability** Easy to deploy with user-friendly software that integrates with third-party ATM and FDP systems to provide extension for visually lossless data visualization.

Air Traffic Control – Products

KE6920R
KE6940AT
KE6940AR
CCKM
CS1788
CM8600
CL6700MW

KE6920R
2K DVI-D Dual-Link KVM over IP Receiver with Dual SFP

KE6940AT
DVI-I Dual Display KVM Over IP Transmitter

CCKM
KVM over IP Matrix Manager

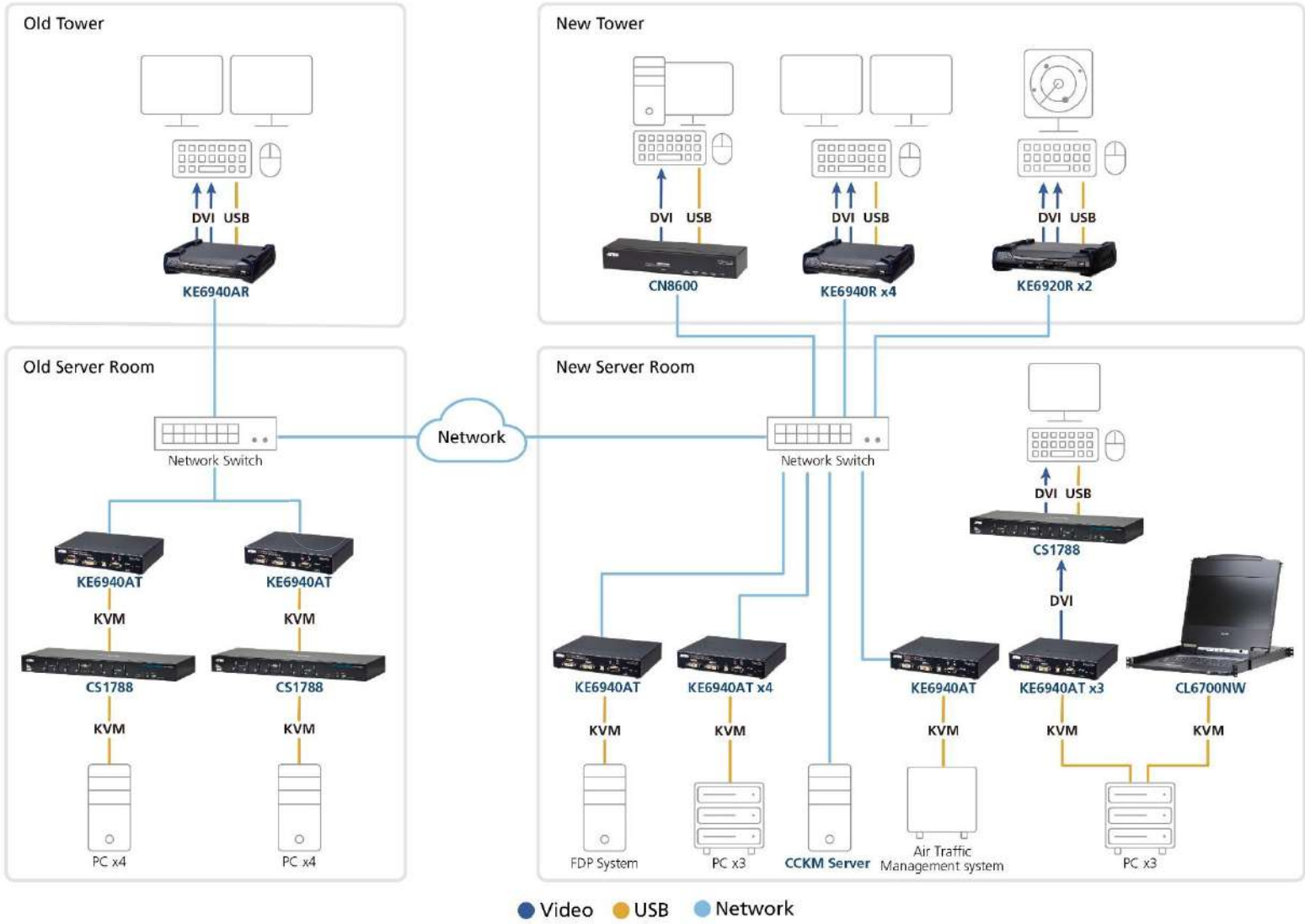
CS1788
8-Port USB DVI Dual Link/Audio KVM Switch

CM8600
1-Local/Remote Share Access Single Port DVI KVM over IP Switch (1920 x 1200)

CL6700MW
Single Rail LCD Console (USB, HDMI / DVI / VGA)

Air Traffic Control – Solution Diagram

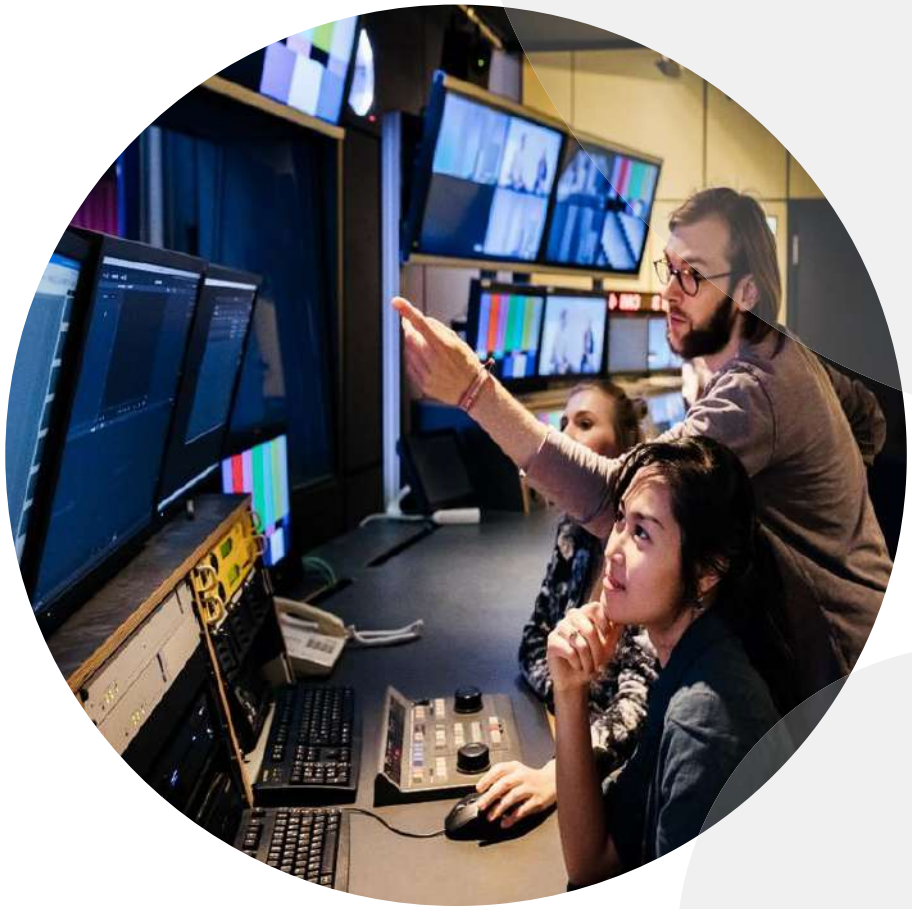
KE6920R
KE6940AT
KE6940AR
CCKM
CS1788
CM8600
CL6700MW



Operation – Broadcasting

7 Media Management & Visualization for Production & Broadcasting

In order to effectively manage increasing amounts of media content, a TV company planned to renovate its production and broadcasting center. This was comprised of a master control room that incorporated both the transmission division (TD) and the centralized equipment room (CER), with a further three studio sub control rooms, plus a server room. In this fast-paced environment, operators need to collaborate on multi-tasking workflows in order to improve program production, scheduling and distribution efficiency, as well as monitor key media services, studio environment, equipment health and network traffic status. The production and broadcasting center also needs to comply with the highest security and reliability standards.



ATEN | Broadcasting

Challenges	The ATEN Solution
24/7 Delivery of Services Ensure smooth delivery of services and fault detection for production and broadcast workflows by monitoring outgoing playout, service loads, and studio equipment health in the highest image quality. **Flexible Access** Operators need to use one console to flexibly operate servers with different functions to manage simultaneous workflows. **High Information Security** Since they offer studio services and server rack units for the content of private companies and public agencies alike, the system must maintain the highest levels of security and accountability.	**Superior Video Quality** Visually lossless compression provides a perfect image quality experience in DVI at Full HD resolutions to avoid image editing misjudgments. **Boundless Switching** Operators can simply move the mouse cursor across screen boundaries to switch between different receivers (Rx) to operate the connected systems. **Maximized Collaboration Efficiency** Operators can push and pull to instantly share content across displays for optimized cooperation on broadcast operations. **CCVSR** Supports automatic recording of remote-accessed computer operations that are completely transparent and use a proprietary file format suitable for broadcasting regulatory compliance.

Broadcasting – Products

KE6900AT
KE6900AR
CCKM
KN4116VA
KA7176
CCVSR

KE6900AT
DVI-I Single Display KVM over IP Transmitter

KE6900AR
DVI-I Single Display KVM over IP Receiver

KN4116VA
1-Local/4-Remote Access 16-Port Multi-Interface Cat 5 KVM over IP Switch

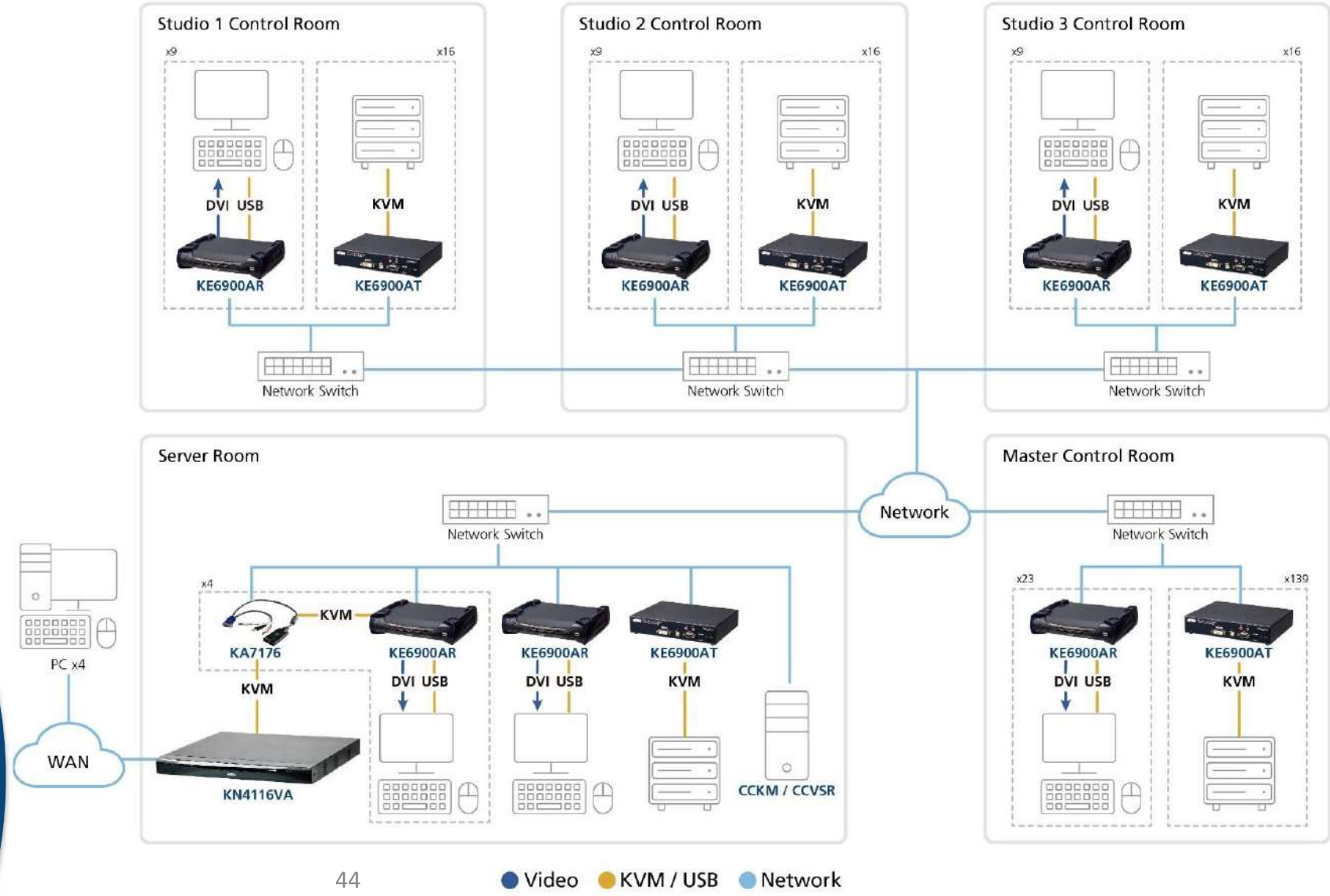
CCKM
KVM over IP Matrix Manager

CCVSR
Video Session Recording Software

KA7176
USB VGA/Audio Virtual Media KVM Adapter

Broadcasting – Solution Diagram

KE6900AT
KE6900AR
CCKM
KN4116VA
KA7176
CCVSR



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