BLACK BOX

Control Room Solutions

Signal Distribution and Visualization for 24/7 Critical Environments

A Control Room is the center of your organization's operations. With an efficient structure, a control room enables you to plan, manage, analyze, and even recover day-to-day activities. Black Box can help you build a modern control room using IP-based solutions that ensure maximum security in a multi-HMI environment. Live monitoring empowers operators to visualize and share critical, real-time data and content with key stakeholders in your organization, as well as make instantaneous decisions to avert problems.

Drawing on over 40 years of experience, Black Box can equip your control room with modern and redundant video wall displays, servers, keyboard-mouse (KM) sharing devices, keyboard-video-mouse (KVM) switches and extenders, control panels, power management, and other AV, IoT, and KVM product solutions to streamline workflows and optimize productivity.

Get a step closer to the future and stay one step ahead of the competition with Control Room Distribution Solutions from Black Box.

Black Box® Solutions for Control Rooms

Signal Switching and Extension

High-performance KVM solutions switch and extend critical sources.

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Video Wall Management

Make informed decisions from an easy-to-manage, shared video wall.

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Operator Workspace and Control

Real-time monitoring tools and room control solutions optimize operator workflows.

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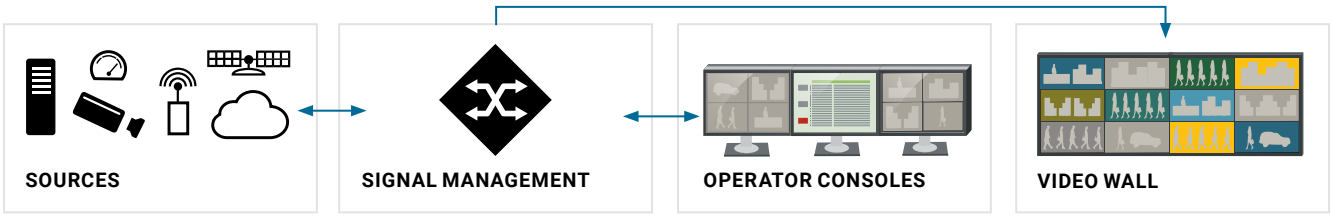
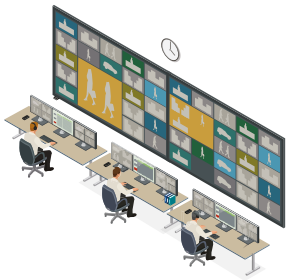
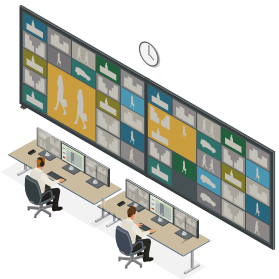
CONTROL ROOM SIGNAL FLOW

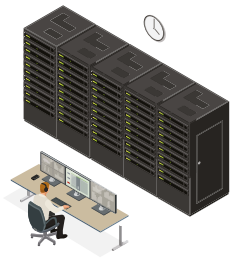




MAIN CONTROL ROOM
Video and data sources are accessible to multiple users at different consoles and various locations.



CONTROL ROOM 2
The matrix switch and control system enables users to switch between sources and show content on video walls.



ENGINEERING
Downtime is reduced because engineers can access sources from any equipment with a system receiver. Engineers are able to troubleshoot, switch operators and change sources quickly and easily Either local or 24/7 via secure remote access,

BACK-UP SITE
KVM-over-IP and decoding technology enable operators to access systems from a remote site (fail-safe design).

Signal Switching and Extension

KVM matrix switching gives operators access to remote computers, production assets, and virtual machines. It also allows users to monitor processes and provides flexible control of visual elements on common shared screens and video walls.

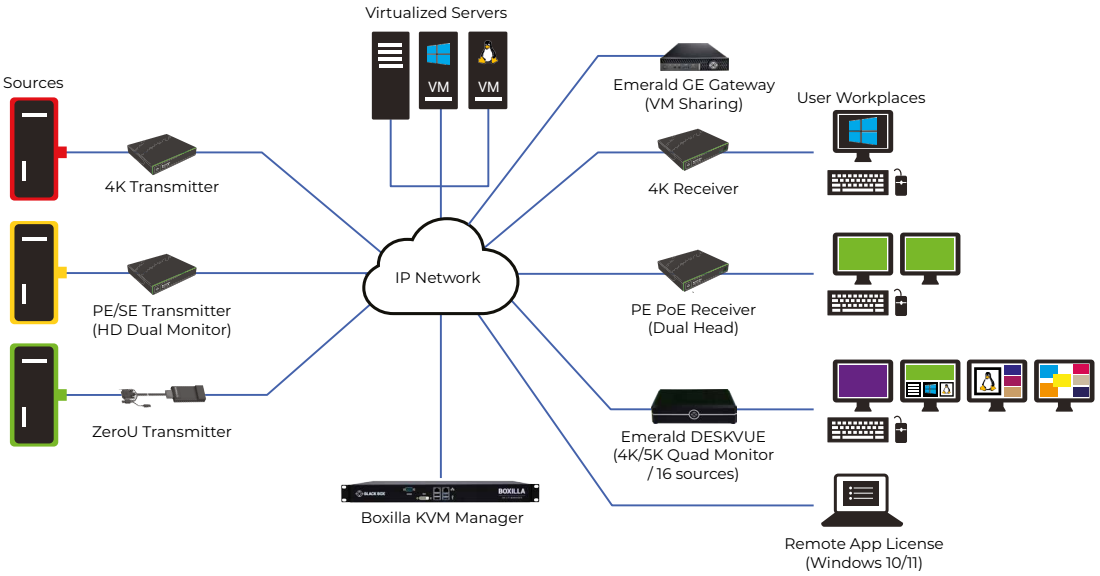
KVM signal extension enables organizations to place PCs, servers, and workstations in clean and secure locations. KVM technology can incorporate multiple levels of redundancy to ensure a fail-safe operation, and advanced security features to keep critical information safe, It also optimizes workflows by giving operators quick access to remote sources from their local workstations. Black Box offers KVM solutions that transmit pixel-perfect 4K video, USB, serial, and audio signals over CATx, fiber, and even IP.

Emerald – 4K KVM Matrix Switching over IP

Emerald® Unified KVM is an award-winning zero-client-based KVM extension and matrix switching platform that supports both point-to-point extension and IP-based KVM matrix switching of an unlimited number of users and computers. Distributing HD or pixel-perfect 4K video signals, with full interoperability high-speed USB 2.0, and bidirectional analog audio, it can connect users with both physical computers and virtual machines. Use managed IP switches to connect all end points and provide fast and reliable remote computer access as far as your network reaches – or even over the internet. Use the with an extremely low bandwidth usage Emerald Remote App to turn any Windows® 10/11 device into a software KVM receiver, eliminating the need for additional hardware receivers. To learn more about Emerald, visit **blackbox.com/emerald** ▸

- Switch and extend HD or pixel-perfect 4K video, bidirectional analog audio, and up to four USB 2.0 devices.
- Create a KVM matrix that supports up to 32 end points through the built-in management interface, or use the Boxilla® KVM Manager to construct matrices with hundreds of users and servers.
- Use Black Box-tested or third-party standard IP switches to build a KVM matrix.
- Get real-time virtual machine access and VM sharing via RDP 8.1/ RemoteFX or PCoIP/PCoiP Ultra.
- Enlist dual network ports for fail-safe operation (Emerald 4K, Emerald PE).

Emerald Unified KVM

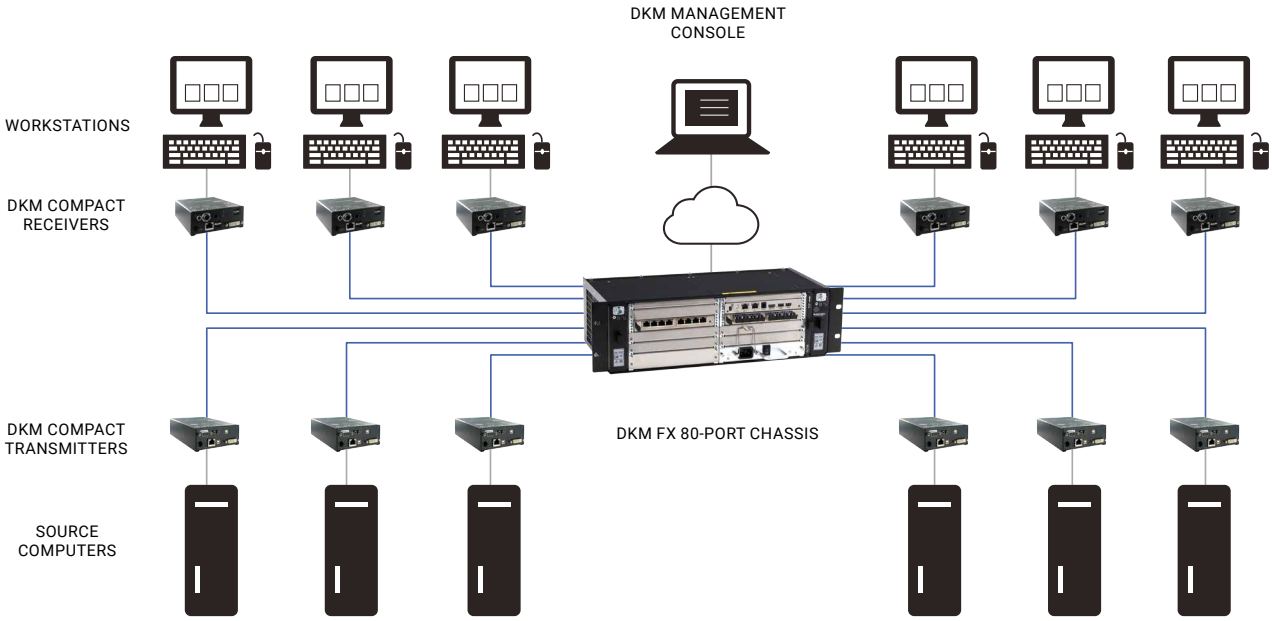


DKM – 4K Digital KVM Matrix Switching

DKM is a proprietary (non-IP) high-performance KVM matrix switching platform that allows cross-point switching and extension of up to 4K video, peripheral, audio, and serial signals. Choose from chassis-based matrix switches in multiple sizes (DKM FX), compact CATx, fiber or hybrid switches (DKM Compact II), and (modular) DKM extenders. The multilevel redundancy of the DKM family offers high reliability for 24/7 operation in critical environments, such as control rooms. DKM supports full redundant power, redundant link, and hot-swappable modules so you can perform field upgrades without interrupting signal flow. To learn more about DKM, visit **blackbox.com/kvm** ▸

- Choose DKM Matrix Switch chassis with 48, 80, 160, 288, or 576 ports.
- Use DKM Compact Switches with 8 up to 160 ports.
- Select from a variety of I/O cards for the switch or extender chassis to fit your application's requirements.
- Use preconfigured or modular extender units to connect sources/switches and switches/user stations.
- Supports multiple signal types, including DisplayPort, DVI, HDMI, VGA, digital or analog audio, USB 1/2/3, and serial.
- Manage via Controller Card and Java Management Tool.

DKM FX Modular Chassis



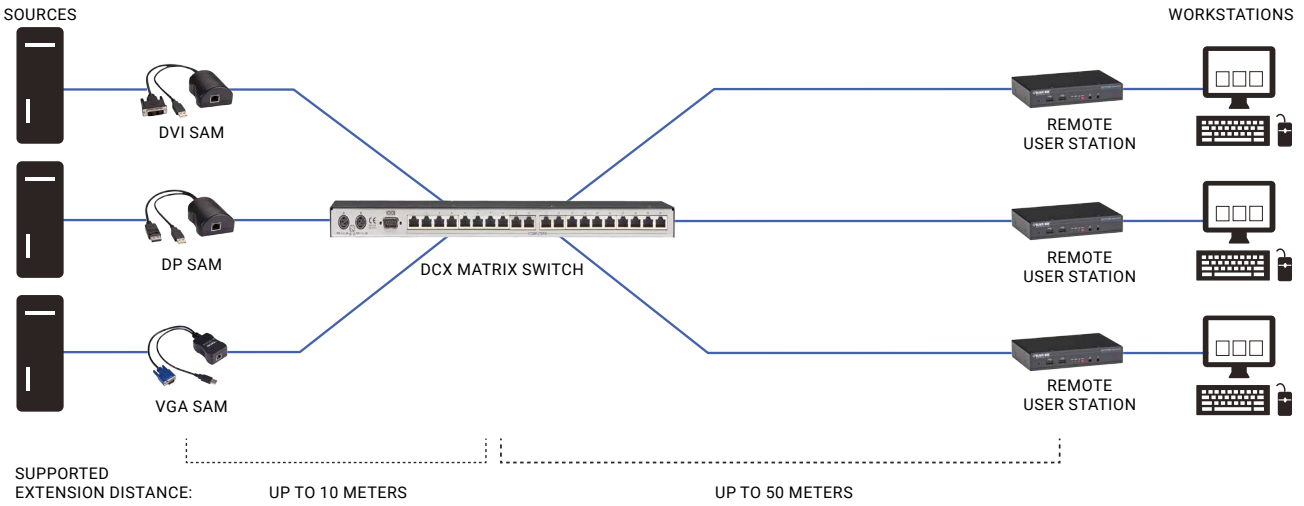
DKM KVM matrix switching setup connects multiple source PCs and operator workstations

DCX – Compact Matrix Switches

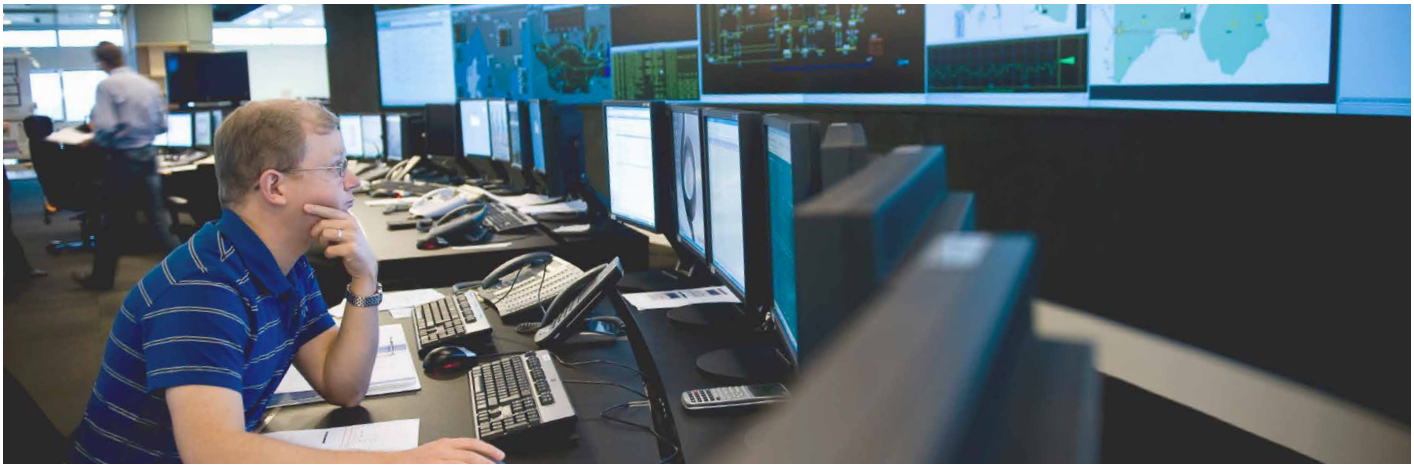
DCX is a flexible KVM matrix switching solution designed for small- and medium-sized applications where fast and reliable switching of uncompressed HD video, audio, and USB is essential. DCX offers 10 or 30 configurable ports that support any combination of users and servers (30-port model: maximum of 23 computer connections). A thumbnail preview of all connected sources provides an instant overview of all connected sources and enables intuitive, fast switching. Interface-powered Server Access Modules connect to sources, and Remote User Stations link to each workplace to extend DVI, DisplayPort, or VGA signals and USB over shielded CATx cabling. To learn more about DCX, visit **blackbox.com/dcx** ▸

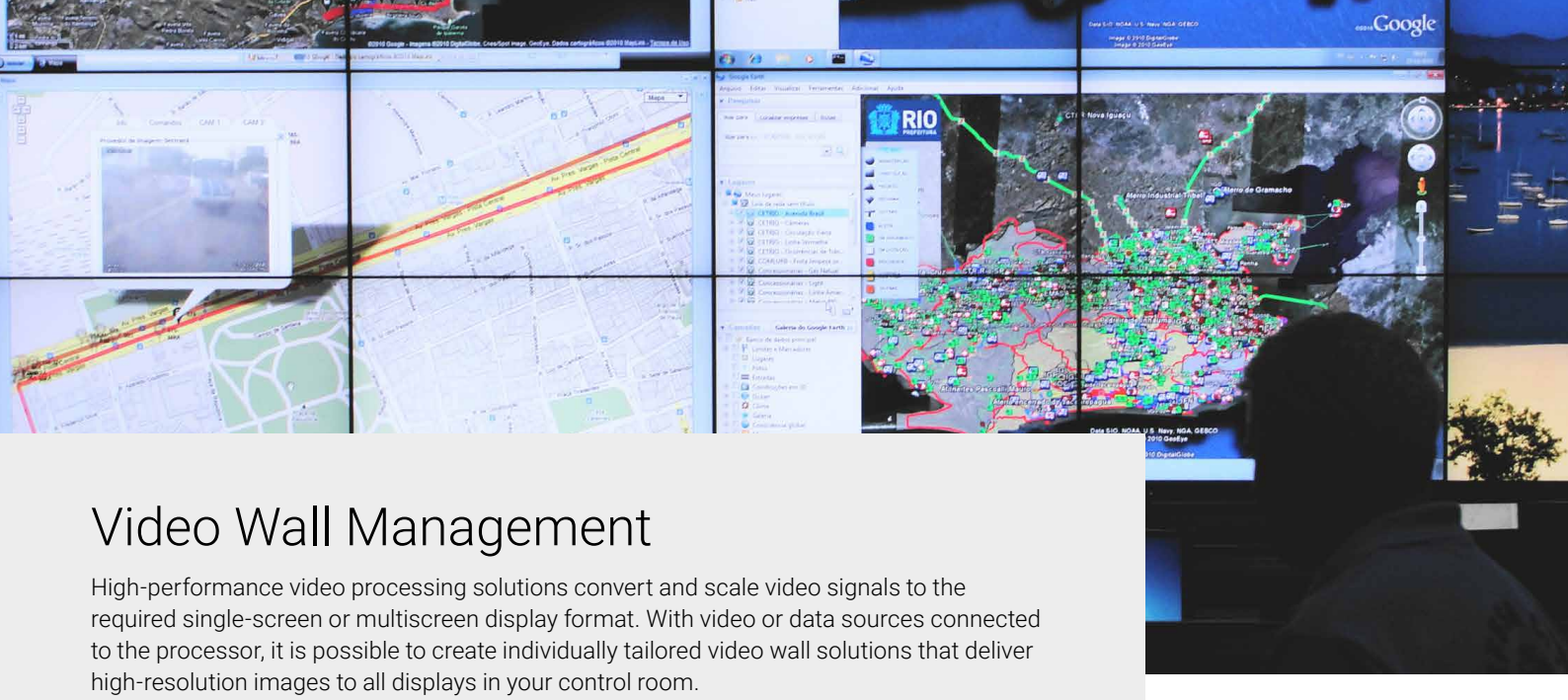
- Cost-effective digital KVM matrix switching for up to 30 endpoints.
- Features a multiview thumbnail OSD so you can preview all systems at the same time.
- Zero compression and zero latency with pixel-perfect video up to 1920 x 1200 at 60 Hz.
- Supports single-, dual-, or multi-head video operation.
- Add computers with DVI, DisplayPort, or VGA video ports and USB interfaces using compact Server Access Modules.
- Convenient server and user connections over shielded CAT6 (or higher) cable. Supports 10-meter server-to-switch connections and 50-meter switch-to-console connections.

Compact 30-Port KVM Matrix Switch (DCX3000)



DCX Compact KVM Matrix setup connects multiple source PCs and user workstations





Video Wall Management

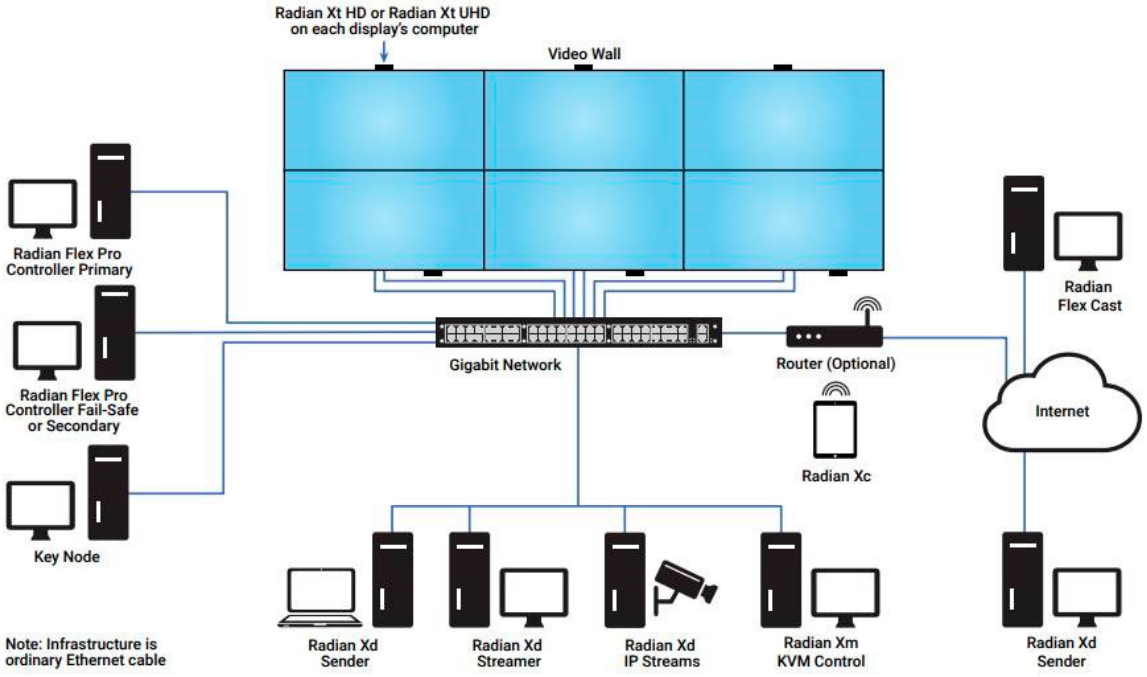
High-performance video processing solutions convert and scale video signals to the required single-screen or multiscreen display format. With video or data sources connected to the processor, it is possible to create individually tailored video wall solutions that deliver high-resolution images to all displays in your control room.

Radian Flex – Software-Based Video Wall Controller

Radian Flex is a 100 percent software-based video wall processing solution, which means no costly, confusing hardware upgrades and no bulky boxes that take up too much space. Infinitely scalable, it has no limit to the number of endpoints it can display to. Radian Flex gives you powerful control over all of your content, which lets you easily manage what, where, when, and how content is shown. To learn more about Radian Flex, visit **blackbox.com/radianflex** ▸

- Radian Flex is a 100 percent software-based video wall controller.
- Works over standard, managed 1-Gbps Ethernet.
- Supports 250+ displays for one or multiple video walls on a single controller PC.
- Works with today's 4K and is ready for tomorrow's 8K and beyond.
- Features high-performance HD and 4K at 60 Hz video playback.
- Handles video compressed in the H.264/AVC format and audio compressed in the AAC format.
- Globally share live feeds and content among connected walls.
- Powerful, fail-safe connectivity makes it ideal for mission-critical applications.

Radian Flex Video Wall Controller

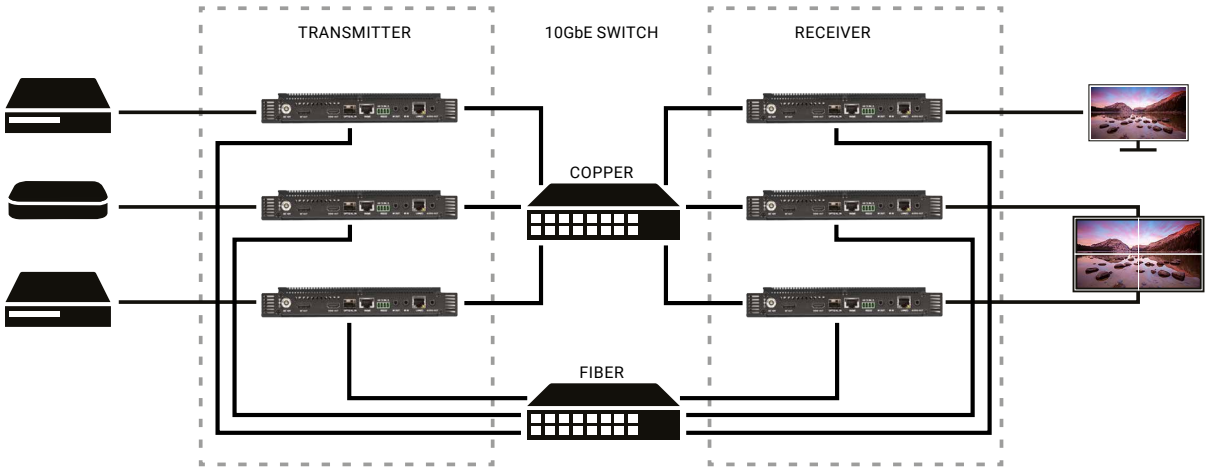


MCX – Advanced AV Distribution and Video Wall Control

MCX is the next-generation AV-over-IP solution that delivers up to 4K 60 Hz 4:4:4 video with the lowest latency and fastest switch times available in the AV marketplace. MCX makes it possible to handle video walls, video extension (point -to -point and point -to -multipoint), and digital signage on an IP network. It also gives you intuitive control over how content displays on every screen. This networked AV system brings versatility to video wall deployments with advanced video scaling options, such as multi-view, picture-in-picture, split screen, and more. To learn more about MCX, visit blackbox.com/mcx ▸

- Supports an unlimited number of displays without sacrificing latency, video quality, or bandwidth.
- Overcome source to display latency with glass-to-glass encoding and decoding that happens in real time (less than 0.03 milliseconds).
- Switch between video sources in less than 100 milliseconds with no artifacts or screen blink.
- Increase versatility in video wall deployments with advanced video scaling options, such as multiview, picture-in-picture, split screen, and more.
- Developed with Software-Defined Video over Ethernet (SDVoE™) – the latest software-based AV-over-IP platform for extension and control of AV systems.

MCX AV-over-IP System



MCX application diagram

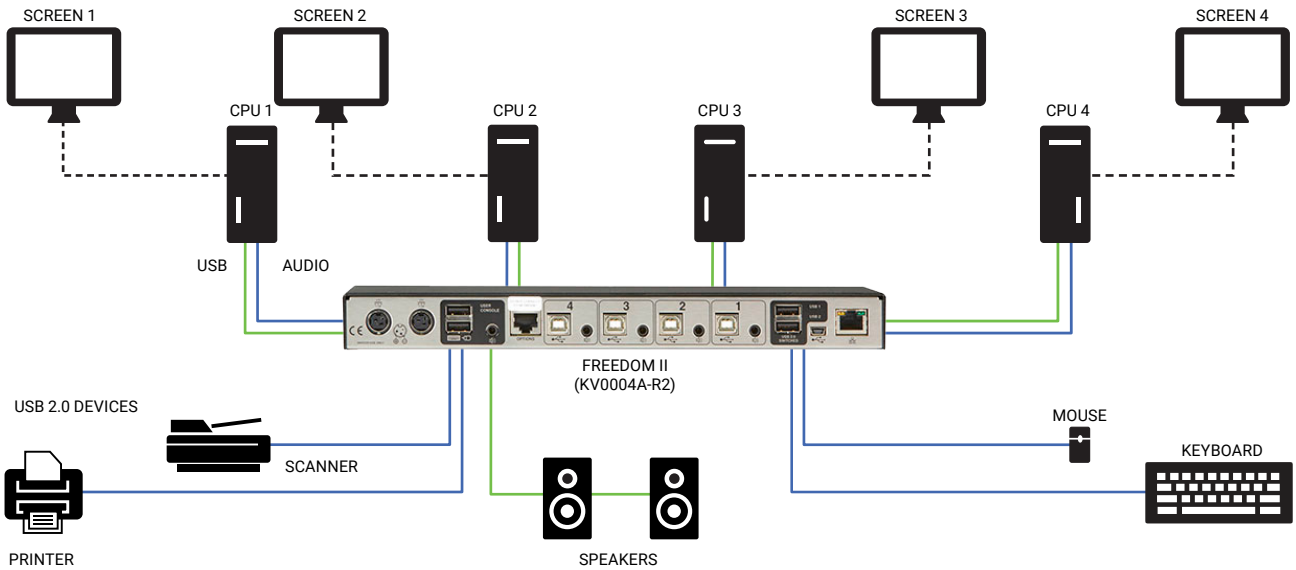
Operator Workspace and Control

Workspace and control solutions allow operators to use their systems and applications more efficiently. Black Box solutions range from AV control systems to KVM Multiviewers to keyboard mouse switches. With these solutions in place, operators can focus more closely on their work, rather than on the equipment affecting their work.

Freedom KM Switches

- Freedom KM Switches enable you to switch between four or eight computers by moving your mouse cursor from monitor to monitor.
- With only one or KVM receivers keyboard and mouse required to operate four or eight computer systems, desk space becomes more ergonomically effective.
- Monitors maintain direct computer connections. Only USB and audio switch between source PCs.
- Require no additional software or drivers on your computers.
- To learn more about Freedom, visit **blackbox.com/freedom**

Freedom KM Switch



KM switches allow you to switch between four or eight PCs by moving a mouse cursor from screen to screen

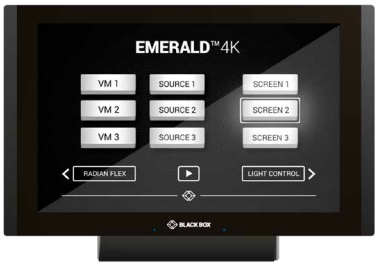
4Site KVM Multiviewer

- Control and monitor four computers on a single screen.
- Real-time, reliable switching of digital HD video, USB, and audio signals.
- Features KVM switching via hotkey, mouse, OSD, external program, or serial control device.
- Four display modes: full screen, quad, picture-in-picture, and windows mode (free scaling and transparent positioning).
- To learn more about 4Site, visit **blackbox.com/4site** ▸

4Site KVM Multiviewer
(SS4P-SH-DP-UCAC)

ControlBridge – Complete Multisystem and Room Control

- Control AV systems, room automation, software applications, KVM networks, and video wall controllers via Ethernet, serial, IR, digital I/O, and relays.
- Multiple control processors and touch screen devices for any control application.
- Control applications with an unlimited number of touch screens, pushbuttons, and mobile devices (iOS, Android).
- Pre-configured control room app available allows you Individual presets taylored to your application allow 1-click control room setups and personalized display condigurations to automatically discover, set up, and control DKM, Emerald, and Radian Flex solutions.
- To learn more about ControlBridge®, visit **blackbox.com/controlbridge** ▸



ControlBridge 12” Touchscreen


Advanced Monitoring
Logs
Frequency
12.75 GHz
Utilization
92 %
Speed
30 Gb/s
57691
1/72
750

About AlertWerks AW3000

AlertWerks AW3000 is a wireless IoT product available from Black Box. It is a new unique solution providing you with an all-in-one-box solution for IoT that leverages modern LoRaWAN radio transmission technology.

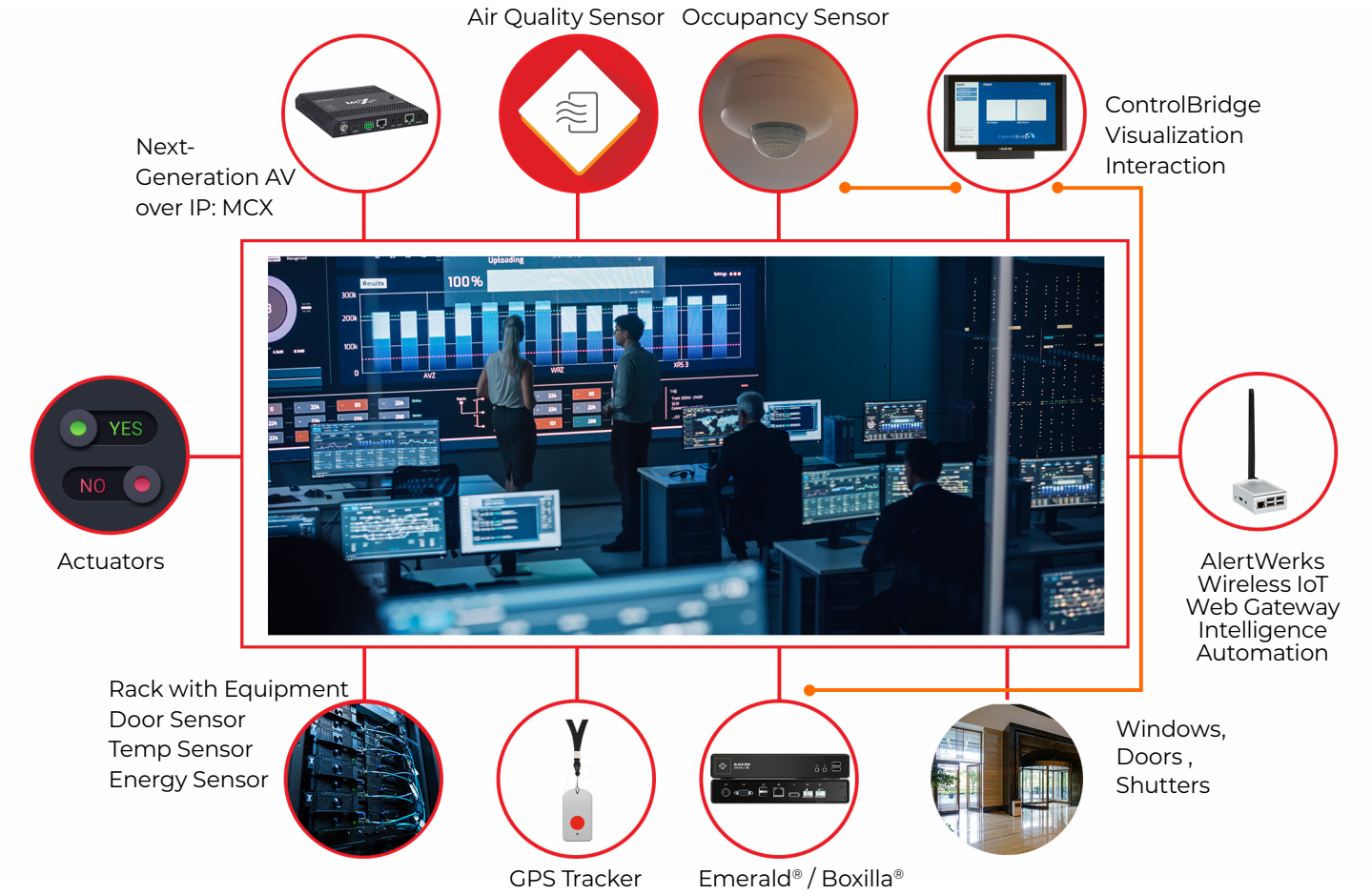
AW3000 is the only IoT Wireless solution that gives you a common database for multiple AW3000 units to build up an IoT Web domain. This futureproof IoT Web solution grows as your projects and needs change.

Since it works on an open platform, AlertWerks AW3000 enables you to use any LoRaWAN 1.0.x sensor on the market. It has a very easy connection (join) procedure to get LoRaWAN data from your sensor flowing into the system. It offers rich features to set up virtual sensors, actions, and notifications. Multiple dashboards can be set up and used.

LoRaWAN operates on sub 1-GHz frequencies using multiple modern technologies to transmit data wirelessly on a kilometer scale. It offers end-to-end encryption and security for your valuable data.

A Linux device with HDMI Output and USB Ports, AW3000 can connect to a touch monitor to visualize data directly from the unit. There is no command-line editing or Linux® knowledge necessary, since AlertWerks AW3000 boots directly into a graphical user interface.

AlertWerks AW3000 gives you highly customizable dashboards with world maps, floor plans, and more. Interactivity, drill-down functionality, and more is possible. All data is stored on a SQL database.



Case Studies

Police Station Command and Control Room

A new police station needed to upgrade its command and control room.

The Challenge

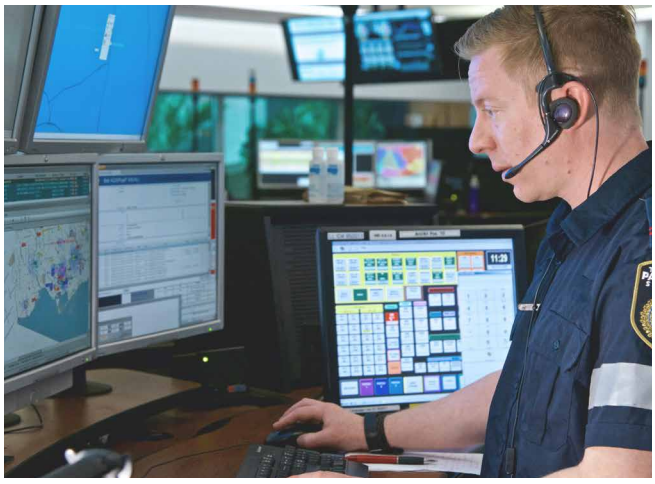
As part of the move to a new building, a police department in Norway planned to overhaul their command and control room equipment. Their existing control room used legacy analog technology and was a mix of KVM point-to-point extensions (VGA-PS2 and VGA-USB) and small desktop KVM switches. This setup only provided single-user access to one or two remote systems.

The Solution

The police department needed fast switching times, redundancy, and hot swappability to avoid potential downtime. Black Box suggested the DKM FX Matrix Switching System. Because of their scalability and flexibility, DKM FX Switches are great for command and control rooms. These switches provide multiple users with access to multiple computers and the ability to work over a mix of structured cabling (copper and fiber).

The DKM FX solution was configured with two video walls, one 4-by-2 and one 2-by-2. This setup connected multiple users throughout 24/7 shifts.

A Black Box MediaCento Control System was integrated with the DKM FX to add touchscreen compatibility for switching and control of video walls. The larger video wall has a tile function that allows a user to send an image to a 2-by-2 area. Operators have a mix of extension systems on their desks, enabling some of them to transmit to the video walls, while others are simply connected to remote servers.



WWE Enhances Production Efficiency with High-Performance KVM

Create a KVM system that could support the WWE's production load.

Customer Use Case: FOX

To broadcast NASCAR 2020 safely during the pandemic, FOX sports had to rearrange multiple roles. The usual team of 150 people was limited to 50 overall, which led to specific problems.
FOX reached out to Black Box for a bandwidth-efficient IP-based solution for broadcast video and control signals via the public internet.
Black Box provided FOX Sports with the Emerald PE to extend video, transparent USB 2.0 and audio signals over the internet with lossless video frame compression.
With one team working at a central facility during production of various live events, FOX can bring greater consistency to its broadcasts and establish a more collaborative creative environment, where talent working in other locations can more easily contribute to the broadcast.

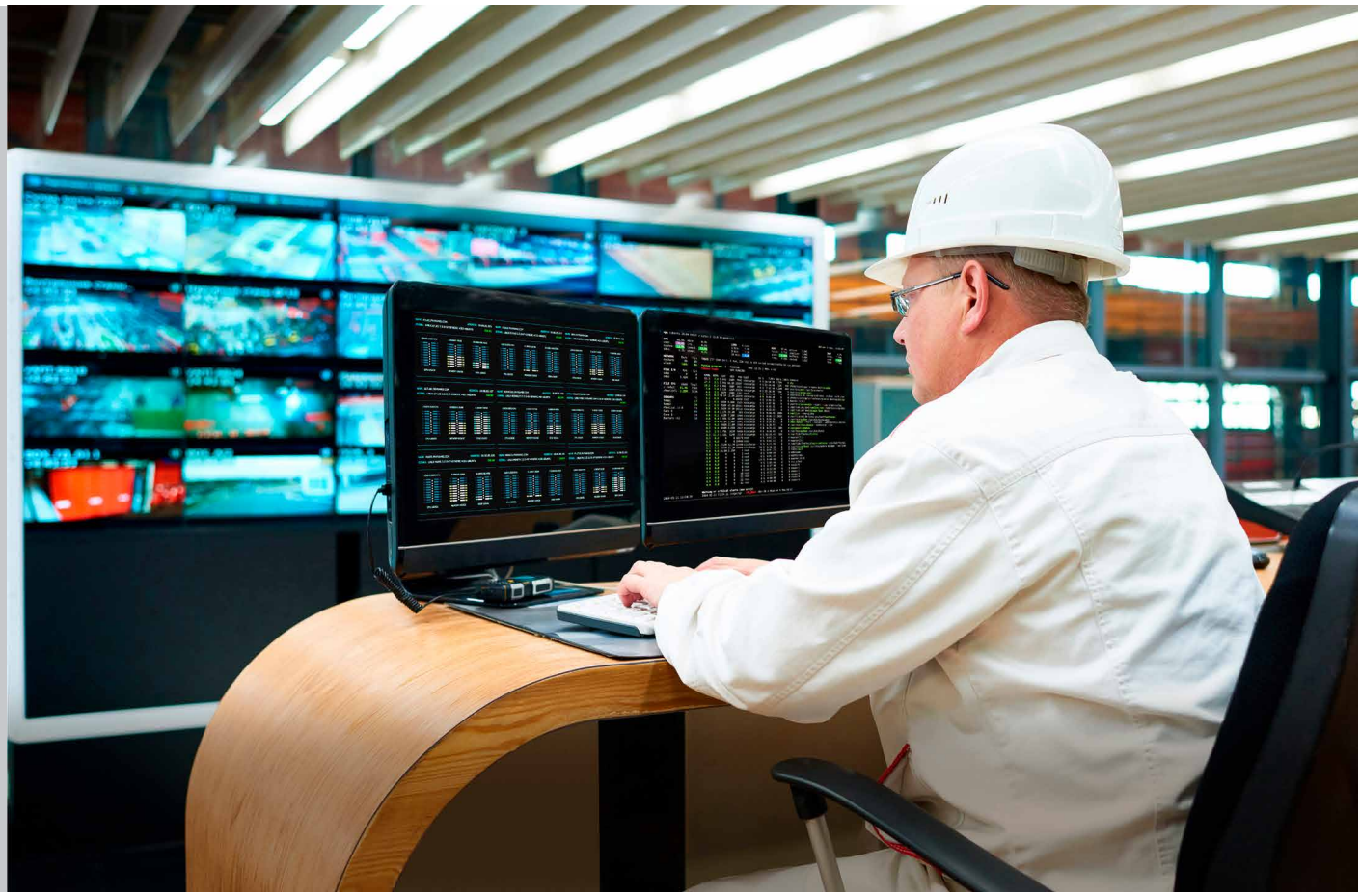
Thales Germany Installs DKM KVM in a Berlin Underground Control Room

The Challenge
With plans to relocate its office, Thales Germany needed to construct a new control room for Berlin in cooperation with BVG local transports. An important customer specification was to use fiber optic cabling to foster immunity to electromagnetic interference (EMI). They also wanted to create better working conditions and use futureproof technology. To round out their requirements, Thales requested a redundant system.

Thales recognized Black Box as a well-known problem-solver in the IT industry and reached out to us to build the control room. Doris Fritz, the project officer at Thales, claimed Black Box to be a “technology pioneering partner.”

The Solution
To create a highly secure and redundant control room, Black Box recommended switching to a digital system (DVI) and provided the client with the requested fiber optic cabling. We installed 30 DKM KVM extenders for increased security and greater flexibility. This KVM technology flawlessly transmits digital video signals with resolutions of up to 2048 x 1152, as well as keyboard and mouse information. The DKM KVM extenders also freed up more space in the control room by locating the computers 40 meters away in a secure room.

Results
Thales relied on Black Box as a “pioneering partner” to successfully migrate to a digital control room. The BVG staff now has an overview of the complete underground rail network at any time and can easily monitor and control underground traffic. Black Box Project Manager Richard Maraschi pointed out that the “time of perceptible latencies seen in the analog era are now behind us once and for all.”



India´s Largest Electric Company Deploys ServSwitch KVM to Control Room Processes

The Challenge
Today, KVM switches are used in just about every industry you can think of. Customers want remote access, and KVM switches, along with many other technical components, meet this need. In line with this trend, India´s largest electric company reached out to Black Box. The electric company wanted more than just a reliable KVM matrix switching system to provide remote access to 16 servers. The desired solution must also provide remote access to at least 4 users and support user authentication, distortion-free HD video at the user workstation, smooth switching, and a high MTBF rating. To guarantee access to LVS machines in the control room, the company demanded a KM switch, which also had to be able to extend signals 30 to 40 meters in order to space the USB peripherals and monitors properly. The Indian company reached out to Black Box because they knew we have some of the most reputable high-performance KVM and KM products on the market today.

The Solution
Meeting all of the customer's expectations, Black Box recommended a solution that also preserves the pre-existing setup. They installed the ServSwitch CX KVM to support the 16 servers and 4 users and extend the KVM signals up to 50 meters over CAT5e cable. Offers the requested user authentication and 1920 x 1200 video resolution on the monitors. To access the LVS machines, Black Box created a custom KM solution (using a Freedom KM Switch), exceeding the client's expectations.

Results
The KVM solution provides the customer with a perfectly working control room. Users now can remotely access and switch between 16 servers in the control room from their workstations for streamlined workflows and tremendously increased productivity. The employees now have a simpler workday and perform tasks with ease. The ServSwitch supports 1920 x 1200 video and displays crystal-clear images on the screens. User authentication ensures that important data is kept safe at all times.

WHY BLACK BOX

Expertise
Black Box project engineers can assist with system assessment, design, deployment, and training.

Breadth
Black Box offers the most comprehensive suite of engineered KVM, AV, and infrastructure solutions in the industry.

Support
Reflecting our commitment to complete satisfaction, our dedicated team of highly trained support technicians is available by phone free of charge.

Service Level Agreements
Our service level agreements give customers access to technical support, product training, dedicated application engineers, and more.

Experience
Providing leading technology solutions since 1976, Black Box helps more than 175,000 customers in 150 countries build, manage, optimize and secure IT infrastructures.

Warranties
Multi-year warranties with multi-year extensions and replacement options are available.

Centre of Excellence
Black Box offers a Center of Excellence, featuring professional services and support agreements that help optimize customers' systems and maximize uptime.