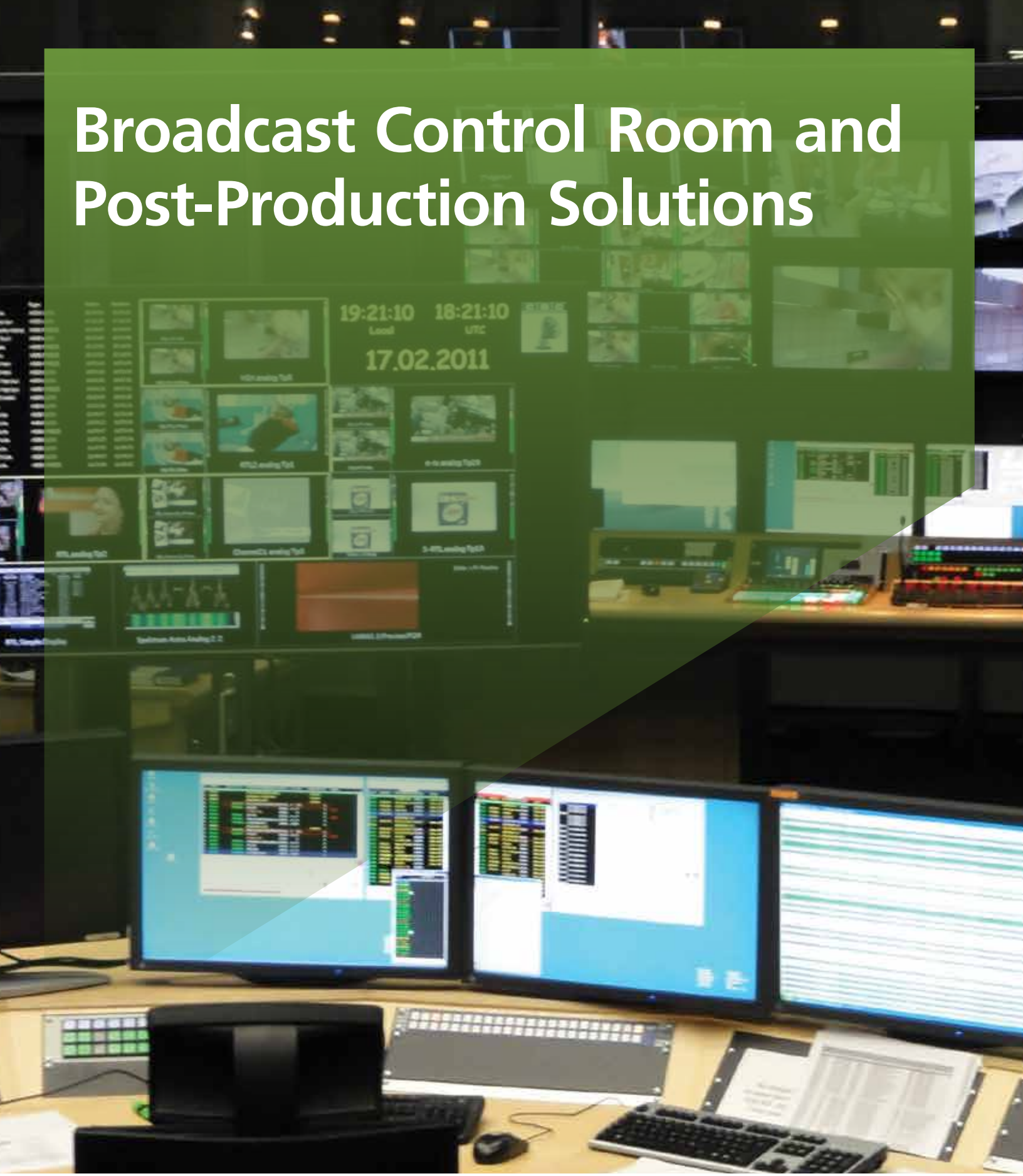
Broadcast Control Room and Post-Production Solutions



BLACK BOX®

724-873-6557 | blackbox.com/Broadcast

Broadcasting and Post-Production Solutions

In the last several years, the broadcast industry has begun making the rapid transition of collapsing multiple functions that previously required dedicated hardware into a software-centric and IT infrastructure both for new facilities as well as upgrades of old facilities. The convergence of IT-based infrastructure within the broadcast facility and upcoming demand for higher resolution image delivery demand the need to design must-have efficient collaborative workflows.

Black Box provides cost-effective solutions that dramatically improve collaborative workflows providing many users at once, in real time, video resolutions including 1080p and 4K, and audio, serial, and USB peripherals.

Broadcasting and production studios need access for multiple users and instantaneous switching for live broadcasts and updates.

Black Box Solutions

- KVM and hybrid KVM peripheral switching platforms
- HD video extension, including DVI, SDI, HD-SDI, 3G, and DisplayPort
- Signal conversion and signal distribution
- Support for high-definition resolutions including 1080p and 4K
- Multiscreen viewing, instantaneous switching, multiple monitor viewing
- Video delivery via IP multicast

Applications

- Master control rooms
- Post-production suites and service bureaus
- Encoder and transcoder farms
- Trucks and mobile broadcasting vans
- Equipment rooms
- Display and signage

Benefits

- Collaboration is supported between broadcast personnel and studio teams without a major redeployment of equipment for infrastructure redesign, saving time and money.
- Editors, directors, live production, post-production, and broadcast engineers have full access to all equipment allocated to them via KVM peripheral matrix switching.
- Desktop peripherals function with no latency, and desktop users have access to dual-screen and dual-link capable equipment.
- Extend and distribute completely lossless, pristine video quality regardless of format: DVI, SDI and HD SDI, 3G, HDMI, and more.
- Transparent, effective collaboration for media professionals.
- Control and monitoring of mission-critical workflow.
- Flexible control of visual tools and peripheral elements
- Real-time instant switching and display of HD video and peripherals.

Case Studies

Project: **Upgrade servers and KVM systems to DVI and USB extension and switching, and make them work with existing infrastructure.**

The challenge: A public television station in Southern Germany was planning the construction of its broadcasting center. The station wanted to expand existing capacity by replacing old hardware. Servers and KVM systems were to be upgraded to DVI video and USB interfaces for extension and switching.

The servers are located in a central equipment room. Several directing and editing rooms are connected to the servers via CATx and fiber cables. The workstations within the directing suites are equipped with one or two monitors. Some jobs also require a USB 2.0 connection for special input devices. The system needs to be controlled in real time and down to the BIOS level from the central equipment room via the KVM matrix switch. Additionally, the KVM system needs to work with an external matrix controller, which also handles automatically switching the broadcast signals.

The solution: The broadcast station required switching and extension flexibility, the ability for multiple users to collaborate in real time, instantaneous switching of HD video, and a workflow that would not be interrupted. The broadcast company chose the Black Box DKM FX platform to implement the requirements, with the 288-port matrix switch controlling the signals required by the application. Within the 288 ports, the matrix switch features freely scalable inputs and outputs, plus the ability to mix copper and fiber cabling.

Using DKM FX extenders, users' consoles, including multiple monitors and USB peripherals, are smoothly integrated into the KVM peripheral matrix switch system, which requires little space. The connections of the consoles and servers are, depending on the distance requirement by the building structure, transmitted via CATx or fiber, which has no effect on the signal quality, maintaining the same high level of resolution whatever distances or media are used. The final application includes 150 to 160 servers and 120 to 130 user consoles being freely connected and switched over the DKM FX platform.

The compilation of the servers for the individual directing rooms is nearly the same. This simplifies disaster recovery in an emergency. With assistance of the DKM FX and an external controller, all servers can be switched altogether to another directing room, where users can then take over active control with no hesitation. Even directors don't experience any problems, as their front-end remains unchanged. Thus the automated studio operation is ensured with the greatest individual flexibility.

Project: **Set up a multi-user video extension and matrix switching system that operates over a LAN.**

The challenge: BA major network broadcasting studio in Chicago wanted to set up a video extension and peripheral matrix switching system over its existing Ethernet network. The system needed to enable forty producers, directors, studio technicians, and operators to gain access to more than sixty computers, servers, video sources, and camera feeds from any desk location.

A competitor's system that had been deployed caused daily problems, including delayed switching times, lack of simultaneous access for multiple users, limited device support for USB peripherals, uneven video and audio quality, and unreliable system durability. Additionally, it used an older infrastructure that needed to be updated..

The solution: AThe Chief Hardware Engineer of the studio came to Black Box because he had worked with us on another project for digital signage. He wanted an entire switching and extension solution. The studio is responsible for producing live broadcasts, and the list of issues that needed to be addressed was long. The system needed to be as free of glitches as possible, and extremely reliable and flexible. The current system and its faults left end users frustrated and had IT support dealing with endless trouble tickets. Plus, technical support had to be available 24/7 all the way through the process (pre- and post-sale).

The solution decided upon was the ServSwitch™ Agility Extender platform, which is a system of single-head and dual-head transmitters and receivers that extend DVI, USB, and audio over the local area network (LAN). Since time was of the essence, the Black Box team of product engineers, application engineers, sales specialists, and product managers worked together to review the application and its challenges. Demo equipment was configured at Black Box and shipped to the studio, where the Chief Hardware Engineer was able to install the setup with minimal online and phone support help from our engineering specialists. Agility transmitters were installed at each server, computer, video source, and camera feed; receivers were connected to each user station. A single point of management and control, the Agility iPATH™ controller, was installed in the server room and deployed over the existing network.

Because this HD video and peripheral matrix switching system is incredibly flexible and scalable, the engineer is able to continue to expand his broadcast configuration, adding equipment and users as required. The Chief Hardware Engineer stays in contact with the engineers from Black Box, and often inquires about feature sets he would like to see on our products. Black Box product development and support teams also continually release updated firmware to fulfill this client's needs.

High-Performance KVM: Leading-edge technologies that deliver unparalleled performance.

DKM FX KVM Matrix Switching Platform

Black Box provides a hybrid matrix switching solution for multiple signal types in an innovative product system, the DKM FX HD Video and Peripheral Matrix Switching system. The DKM FX platform replaces multiple devices with one hybrid solution by supporting routing, switching, and multi-point distribution of HD-SDI, HDMI, and DisplayPort, as well as state-of-the-art KVM functionality. This product replaces up to four single-purpose devices with one robust solution, thereby saving customers time, money, complexity, and potential integration hassles.

DKM FX Matrix Switches

- A scalable, highly reliable video and peripheral matrix switching and routing system supporting high-resolution HD-SDI, HDMI, and KVM in one flexible, scalable product.
- Supports high-quality, full frame digital video. Digital resolutions including 2560 x 1600 and all the way up to 4K, are supported
- Modular platform with up to 288 bidirectional ports per chassis makes moves, adds, and changes quick and easy. Scales up to 4000 ports.
- Choose from CATx and single-mode fiber SFP modular card interfaces. Single-mode fiber interface cards also work over multimode fiber.
- Supports CATx or fiber interfaces.
- Switches in less than one frame. Hot-key switching enables user to bypass the standard on-screen display for truly instant access to critical systems.

DKM FX Compact Matrix Switches

- Use the DKM FX Compact switches to establish connections from consoles (monitor, keyboard, mouse, and other peripheral devices) to various sources, such as computers and CPUs.
- Ports can be input or output.
- Series supports from 8 to 48 ports in a 1U chassis for easy mounting in server cabinets.
- Supports CATx cabling or fiber interfaces.
- Redundant power supplies included.

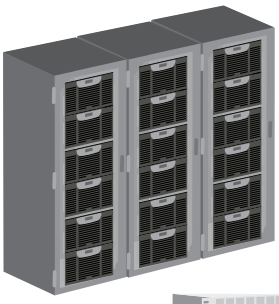
DKM FX Modular Housing and Interface Cards

- Choose 2-, 4-, 6-, or 21-slot housing for modular interface cards to extend HD video, USB, audio, and serial signals.
- DisplayPort interface cards support 4K resolutions at 60 Hz. Interface card video standards also include DVI-D up to 2560 x 1600; HDMI up to 2560 x 1440.
- Supports CATx cabling or fiber interfaces.
- Can be used with chassis-based and compact matrix switches.

DKM FX Compact Extenders

- Transmit a mix of signals over CATx or fiber cabling.
- Expand signal extension options in the DKM FX matrix switching system.
- These compact extenders can also be used as point-to-point video and KVM extenders. Signal types supported included DVI, HDMI, SDI, DisplayPort, USB HID, USB 2.0, serial, and audio.
- Learn more at **blackbox.com/DKM-FX.**

Application Diagram

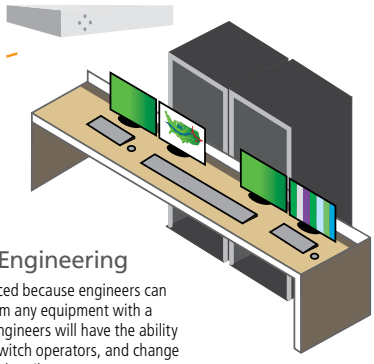


Post-Production Digital Video Editing

Server cabinets for video source and data feed transmitters.

Compact Extenders in Rackmount Chassis

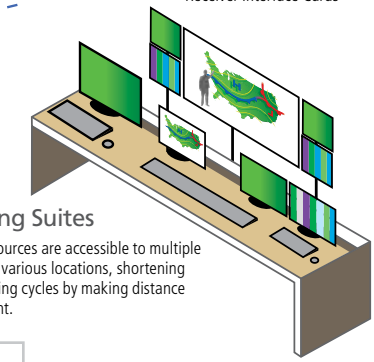
Modular Housing with Receiver Interface Cards



Broadcast Engineering

Downtime is reduced because engineers can access sources from any equipment with a system receiver. Engineers will have the ability to troubleshoot, switch operators, and change sources quickly and easily.

Modular Housing with Receiver Interface Cards

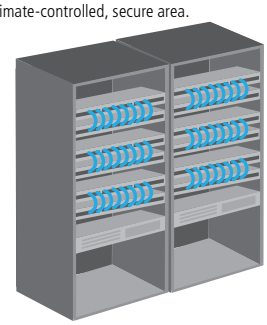


Editing Suites

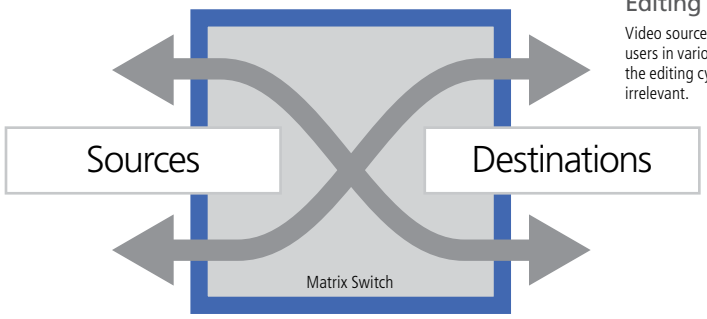
Video sources are accessible to multiple users in various locations, shortening the editing cycles by making distance irrelevant.

Machine Room

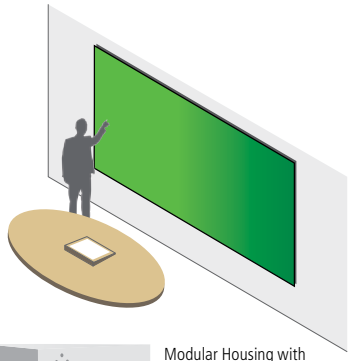
Computer assets are backracked in a climate-controlled, secure area.



Compact Matrix Switch



Fiber



Modular Housing with Receiver Interface Cards

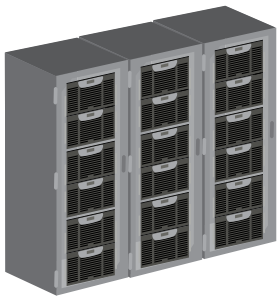
Studios

Equipment is controlled and managed via a central matrix controller unit. USB peripherals enable control and management of signal distribution as well.

CATx

Source Library

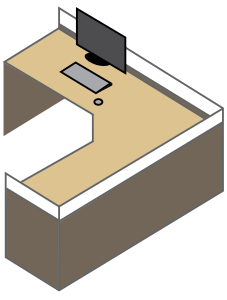
Broadcast feeds, images, and video can be accessed by multiple users; converted, scaled, and corrected; then distributed via fiber to multiple editors in various locations.



Modular Housing Chassis

Desktop Workstations

Single-user consoles for system administration.



Compact Extender Receiver Units

IP-based matrix switching providing loss-less extension of DVI, USB, and audio over a LAN.

Agility IP-Based KVM Switch

- Pure digital media extension and matrix switching over IP.
- Supports multiple application architecture: point-to-point extension, KVM switching, single-target sharing, or multicasting.
- Features keyboard/mouse emulation and emulation for other standard human interface devices (HIDs), such as touchscreens or flash drives.
- Learn more at **blackbox.com/Agility.**

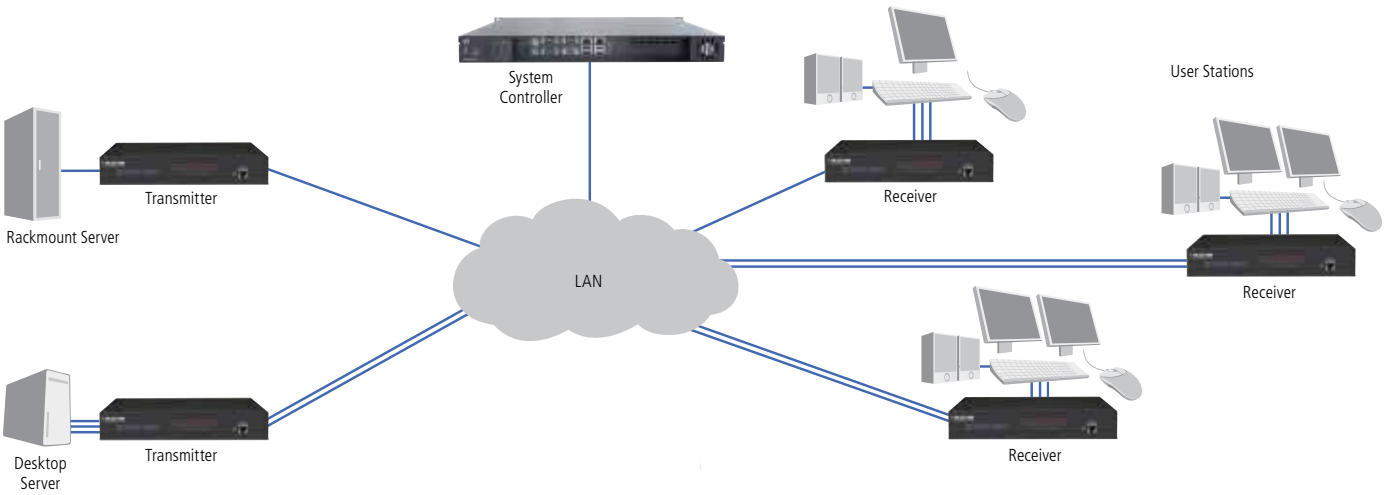
Broadcasting

Media post-production suites become collaborative with Agility. Machine rooms store the media assets and hardware, and can distribute them throughout a post-production facility. Editors, producers, and directors can instantly communicate with animators and colorists.

Control Rooms

In command and control room setups, multicast video and data to receiver units between LCD display walls. Users can interact with any of the computers using separate keyboard, mice, and DVI displays.

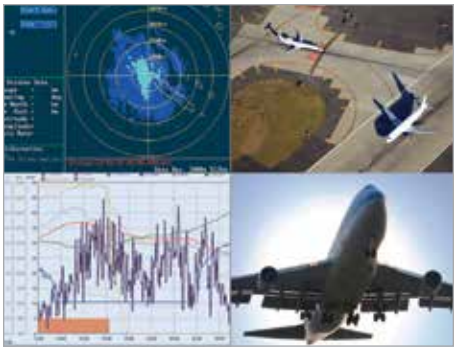
Multiple User Remote Access and Content Sharing



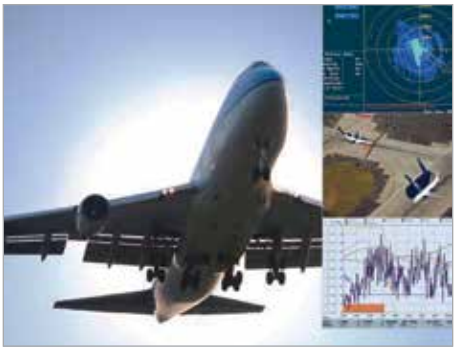
Fluid video performance in a multiscreen viewer with KVM and video processors for monitoring and control.

4Site Flex

- Simultaneously manage up to four CPUs and video windows on a single monitor.
- 4-to-1 KVM switching with smooth, real-time image processing: DVI, VGA, HDMI, HDCP support.
- Ensures short reaction times in mission-critical applications.
- Learn more at **blackbox.com/4Site**.



Quad Mode



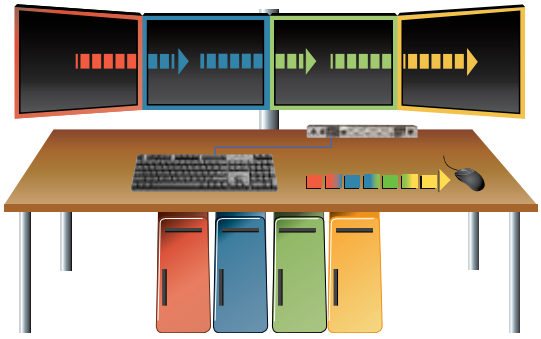
PiP Mode

Win Mode

Zero-touch, fast, reliable switching between computer systems simply by moving a mouse from screen to screen.

Freedom II KVM Switch

- A single user can easily access information and control operations across four computer systems and monitors.
- Configure the screen layout for the attached PCs and switching between them is as simple as moving your mouse from screen to screen.
- Also access the connected peripherals including USB 2.0 devices.
- Simplifies USB keyboard/mouse access across multiple computers.
- Learn more at **blackbox.com/go/Freedom.**



Control, Convenience, and Total Cost Savings

KVM switches and extenders give users access to a variety of target devices, such as CPUs, servers, and other signal or data sources. Users can monitor workflow and gain flexible control of visual and peripheral elements. Switching and extension provide effective management of technology elements within the collaborative environments of the entire broadcast facility.

About Black Box

Black Box is a provider of high-end, broadcast-ready products to help clients in the media and broadcasting industries design, build, deploy, and upgrade mission-critical monitoring and control solutions. The company has been a leading technology partner since 1976. Black Box is a public company (NASDAQ:BBOX) with nearly $1 billion in revenue annually. The Black Box Quality Management System is ISO 9001:2008 Certified. Black Box services more than 175,000 clients in approximately 150 countries with approximately 200 offices throughout the world.

Available | Optional Services

- System engineering and design assistance
- System pre-configuration and labeling
- System commissioning
- System training
- Optional Tier 2 and 3 technical support
- Extended warranties

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