





NEXT-GENERATION CONTROL ROOM TECHNOLOGY



Agenda

Black Box Webinar “Next-Generation Control Room Technology” – May 06, 2020

- Trends and challenges of KVM and AV in control rooms
- Technology drivers and virtualization benefits
- Complete control, visualization, and connectivity solutions
- Operator workspace and control
- How can Black Box help





Trends and Challenges of KVM & AV in Control Rooms

Control Rooms – Then and Now



2000

- Centralized analog monitoring, CRT monitors
- Basic networks and network security
- Non-ergonomic environment
- Static system output



2020

- Digital communication, standardized platform
- Multi-HMI environment (BYOD/live monitoring)
- Ergonomic regulations, increased # of devices
- IP distribution – connected backup solutions
- (Network/cyber) security everywhere!



Trends & Challenges (KVM in Control Rooms)

TECHNOLOGY TRENDS: “THE DIGITAL REVOLUTION”

- Ongoing digital migration
- IP, virtualization, backup solutions
- Energy efficiency
- Multi-system landscapes
- Collaboration/sharing of content



CHALLENGES: EFFICIENCY AND SECURITY

- Cost-efficient digital migration, ROI
- Cybersecurity/monitoring
- Multi-system management/administration
- Reaction times/operator efficiency
- Visualization of more data



Trends & Challenges (AV in Control Rooms)

TECHNOLOGY TRENDS:

“THE DIGITAL REVOLUTION”

- Projector vs. display vs. LED
- Room purpose (meeting room vs. huddle space)
- Collaboration and (wireless) sharing of content
- Interactivity
- Ongoing digital migration - IP
- Central AV management
- Energy efficiency



CHALLENGES:

CONNECTIVITY AND INTERFACE

- Access to content
- Adapt infrastructure
- Cost-efficient migration/future-proof solutions
- Energy efficiency and cost reduction
- Multi-system management/administration
- Software vs. hardware





Technology Drivers & Virtualization Benefits

Key Technology Drivers

- The Networked World: Everything IP



The Networked World – Everything IP



The Networked World – Everything IP

- Standardized protocol
- Interconnectivity and compatibility
- Transmission reliability
- Organizational efficiency
- Extremely scalable
- IOT and smart devices
- One critical factor: Bandwidth



Key Technology Drivers

- The Networked World: everything IP
- Critical infrastructures and control



Critical Infrastructures and Control

“...a computer system is no more secure than the persons responsible for its operation...”

- More critical infrastructures are IP based
- Cyberattacks are rising
- Network planning: technical and processes
- IP network components
 - Proper setup and configuration
 - Manage access and security
 - Enforce rules of operation
- Partnering during specification



Key Technology Drivers

- The Networked World: everything IP
- Critical infrastructures and control
- Big data to information
 - Move to the Cloud
 - Processing and visualization
 - IoT
 - Everything-as-a-Service



Big Data to Information and Green IT

- Cloud services advance data processing
- Advanced data processing drives information
- Effective visualization improves use of information
- Power usage effectiveness (PUE) monitoring drives data center relocation to colder regions



Key Technology Drivers

- The Networked World: everything IP
- Critical infrastructures and control
- Big data to information
 - Move to the Cloud
 - Processing and visualization
 - IoT
 - Everything-as-a-Service
- Virtualized workloads



What is Virtualization?

General Scope

- Replace physical PCs/machines with virtual PCs/machines

What Is a Virtual PC/Machine?

- Software instead of hardware
- A virtual PC/machine is running on a server emulating the hardware environment
- One server can host multiple virtual PCs/machines



Benefits of Virtualization (1)

- One physical server instead of multiple
 - Reduced costs
 - Faster provisioning and deployment
- Requires less physical space
- More secure in terms of data protection because
 - Back up of only one server needed
 - All data is hosted in one computing center
- Management/administration is easier
- If software is corrupt, copy a new virtual machine from templates



Benefits of Virtualization (2)

- Improved hardware utilization
- Desktop virtualization/thin client computing
- Saves power and emits less heat and CO2
- Continued support of special/legacy OS (e.g., Windows XP/7 are no longer supported by current hardware)
- Stop/pause and resume virtual machines
- System Pools: next user gets the next free virtual machine assigned



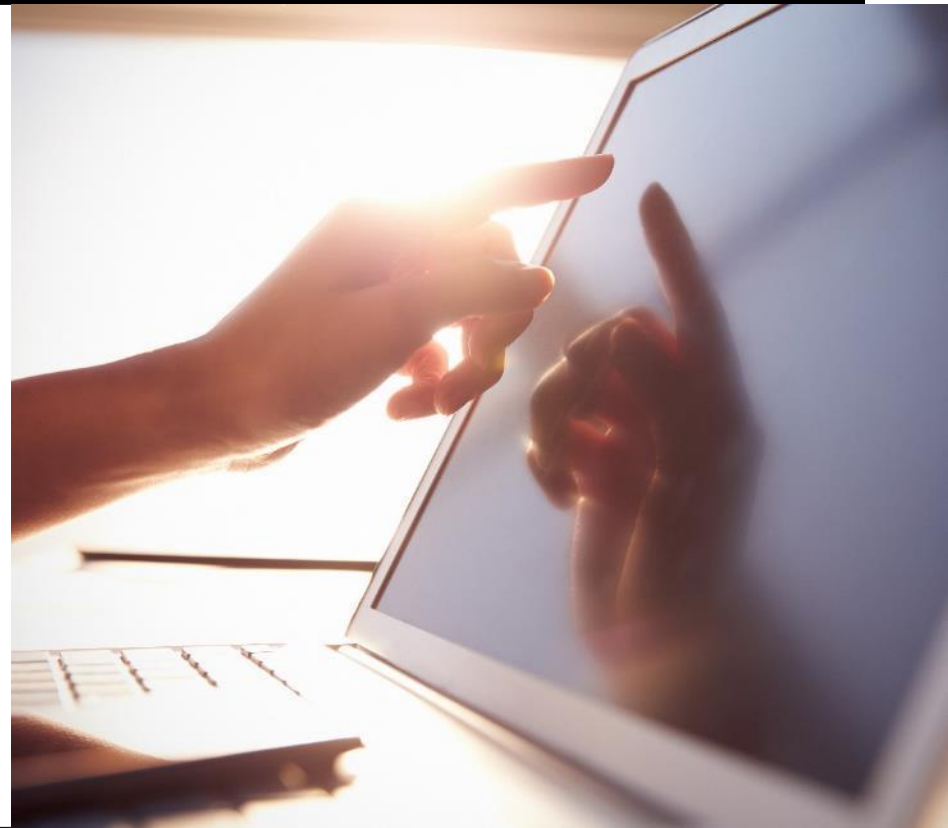
Physical Device Challenges

ISSUE		SOLUTION
Computers generating a lot of heat	➡	Computers moved to the data center
Computers generating a lot of noise	➡	Computers moved to the data center
Computer fans sucking in dust and dirt	➡	Computers moved to the data center
Computers available to fiddle with	➡	Computers moved to the data center
Computers moved to the data center	➡	AV / KVM extension to provide user access
No sharing of devices	➡	AV / KVM matrix switch installed



Future of Control Room Technology

- User friendliness: hotkeys vs. touch screens, glide & switch, multi-viewers, user profiles
- Long distance WAN or fiber extension for distributed facilities
- IP-based extension/scalable, easy-to-deploy matrix systems
- 4K/8K video resolutions, implications for bandwidth
- Integrated, result driven software/hardware solutions
- Virtualization, RDP/PCoIP vs. end to end
- Event driven, IoT





Complete Control, Visualization
& Connectivity

Black Box Control Room Solutions



Signal
Management



Visualization
& Collaboration



Operator Workspace
& Control

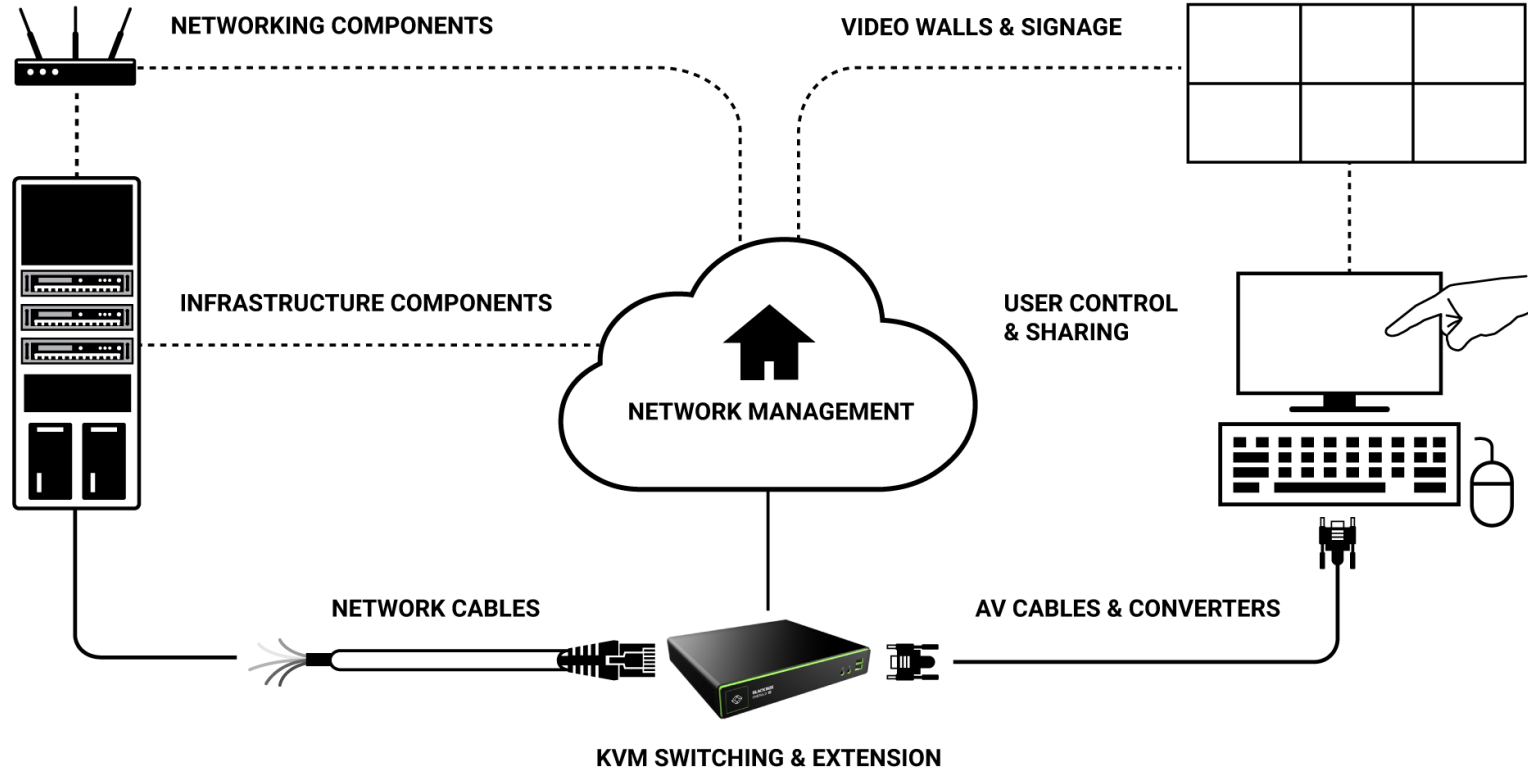


Remote Sharing
& Control



BLACK BOX CONTROL ROOM SOLUTIONS

COMPLETE CONTROL



COMPLETE CONNECTIVITY

COMPLETE VISUALIZATION

Black Box High-Performance KVM Portfolio



Direct Connect



IP Based

DCX

- 10/30 ports fixed I/O
- Uncompressed video

DKM

- Widest range of I/O types
- Max 576 I/O per chassis

Agility

- LAN connectivity
- DVI, USB, audio, serial

Emerald®

- Pixel-perfect HD and 4K over IP
- Access to virtual machines

SCALABILITY



Emerald[®] Unified KVM

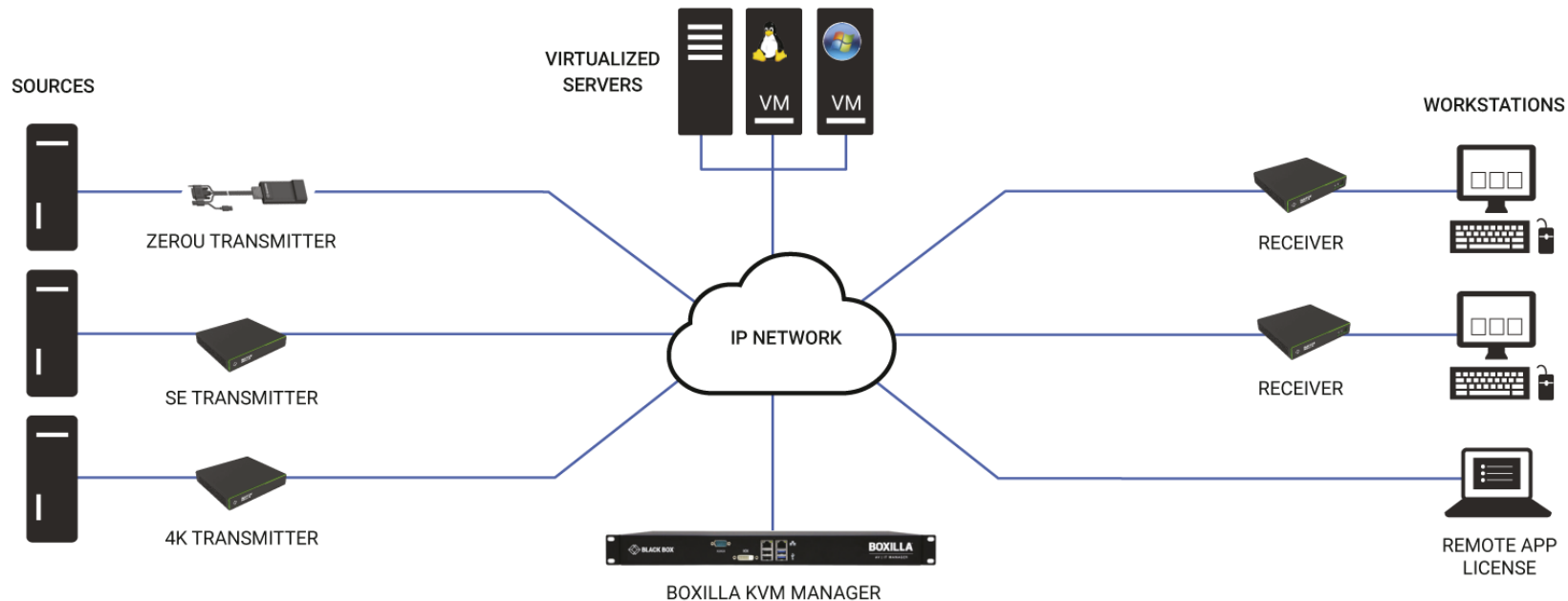
High-performance KVM platform developed by Black Box R&D

Why Unified KVM?

- Highly scalable, compatible and future-proof KVM platform
- Transmission over existing LAN infrastructure *or* a dedicated network (CATx or fiber via SFP+ slots)
- HD *and* 4K video resolutions
- Connections to physical PCs *and* virtualized servers
- KVM hardware *and* software receiver
- No single point of failure
- No compromise in user experience



Bridging KVM and Virtual Servers



Emerald® KVM over IP Matrix Switching & Extension

Matrix Features:

- Zero-client based extender units connect to IP switch
- Supports small to large size KVM deployments
- Managed by Boxilla® KVM Manager

Extender Features:

- Supports pixel-perfect 4K video (Emerald 4K, DisplayPort) and HD video (Emerald PE, DVI), and visually lossless HD video (Emerald SE, DVI)
- Supports physical and virtual servers
- Network resilience features like redundant network connections and target pooling
- ZeroU transmitter, requiring no additional rack space
- Emerald Remote App: Use any Windows 10 device as a software KVM receiver



Emerald® Unified KVM

www.black-box.co.in/Emerald

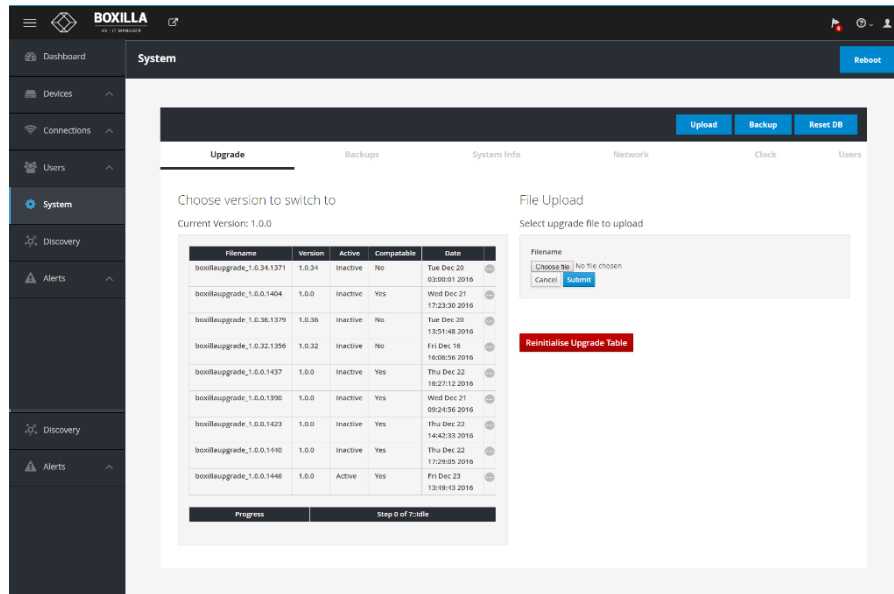
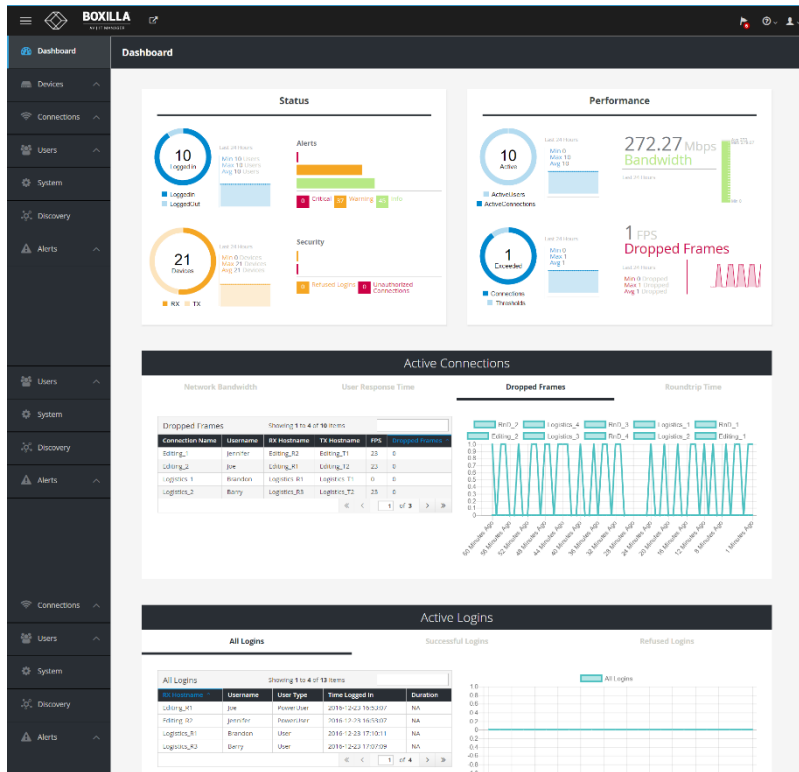


Boxilla® KVM Manager

- Centralized management of Emerald KVM networks
- Proactively diagnose and address potential performance problems before they occur
- Control user access
- Monitor device status
- Streamline upgrades for thousands of remote endpoint devices with one click
- Manage and monitor network switches
- Active Directory Support
- Redundant controllers
- Dual-network connections



Boxilla® KVM Manager



Network Security and Fail-Safe Options

- **Pooling:** create groups of PCs serving a similar/same purpose; if a PC is down, Emerald® allows fast switchover to PC from same pool
- **Create backup systems:** create a backup connection to a remote control room over direct connection, LAN or WAN for fast switchover in case of an emergency
- **Redundant network ports:** if one network connection fails, Emerald® automatically switches to the redundant connection
- **No single point of failure:** all system configuration is stored on all Emerald® units and on the central KVM management unit (Boxilla®)
- **Boxilla® KVM Manager:** automated alerts for system intrusion, user access management





Use case:

Public Safety, Emergency Centers

- Connecting multiple operators with PCs, video walls and additional end points at any time
- Fast response times to critical events/alerts: intuitive operator workspace
- Operators have to monitor multiple IP live streams and various control systems
- Reliable, fast switching with very low mouse latency
- Central management of users/access rights





Use case:

Process Monitoring & Control

- Operator has to monitor process variables, environmental conditions and HD camera feeds
- Computers are located in a secured equipment room so remote access is required
- No need for massive matrix switching solutions - only few users/servers are connected
- Detailed preview of all connected PCs, servers and software environments





Use case: ATM/Virtual Towers

- Tower: redundant fiber connections between securely stored servers and operator desks
- Control vital systems from a virtual backup tower at a safe distance.
- Operator administration: touchscreen switching of presets and content to central video wall





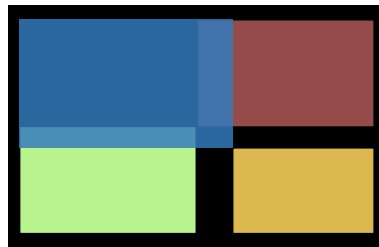
Operator Workspace & Control

Real-Time Access and Control

Multi-OS Extended Desktop



Multi-View KVM



User-Friendly Control Interface



Freedom II

- Control up to four PCs “as one”
- Switch by moving the mouse
- Mix screen sizes, multi-OS
- Mix local PCs and extended PCs

4site Flex

- View/control four PCs on one screen
- Save space on user desks
- Multiple viewing modes
- Mix local PCs and extended PCs

ControlBridge®

- Control anything
- Integrate multiple systems
- Unlimited inputs



Freedom II – Glide-and-Switch KM Switch

- Switch between separate computer systems simply by moving a mouse cursor from monitor to monitor
- Automatic channel switching with Glide-and-Switch technology
- Multiple switching options: mouse, hotkeys or front panel
- Share stereo audio, USB HID and independently switched USB 2.0 peripherals
- Built-in web server for easy configuration and management
- Works with Mac OS®, Windows® and Linux
- Add to Emerald® to enable Glide-and-Switch support



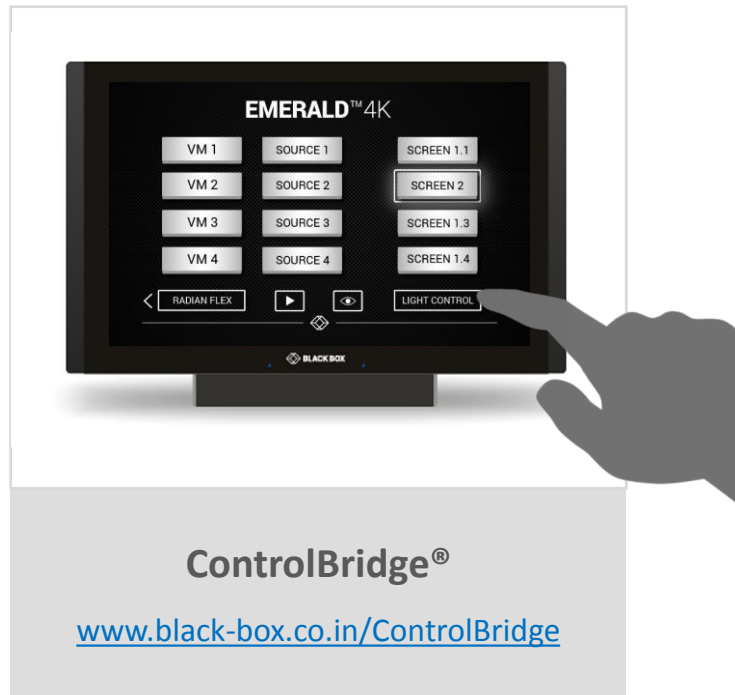
4site Flex – Multi-View 4-to-1 KVM Switch

- Access up to four CPUs and monitor all simultaneously in real-time on one display
- Four display modes: Quad, Full Screen, Picture-in-Picture and Win Mode
- Image rotation for vertical mounted displays
- Switching via hotkey, hotmouse, OSD, external program or serial control device
- Full scaling capability supporting resolutions up to 1920 x 1200 at 24-bit deep color
- Can be cascaded with a 2nd tier, providing support for up to 16 servers
- Compatible with many touch screens



ControlBridge® – Integrated KVM/AV Control System

- Control KVM switching, room automation, lights, etc. via Ethernet, serial, IR, or digital I/O relay
- Intuitive and fast control through a touch panel
- Auto device detection, auto UI generation
- Create simplified and custom operator interfaces
- Improve operational productivity
- Individual programming by Black Box
- Available for Emerald® KVM matrix applications

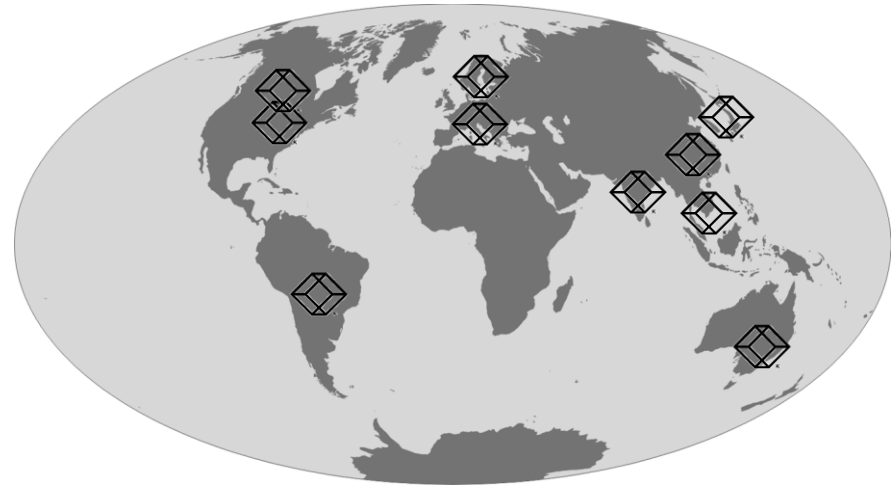




How Can Black Box Help

Black Box: A Global, Trusted Technology Provider

- ◆ Established in 1976
- ◆ 175,000+ customers in 150+ countries
- ◆ Worldwide coverage through Black Box offices and partners
- ◆ ISO 9001 certified
- ◆ Build / manage / optimize / secure professional KVM, AV signal distribution, and digital signage networks
- ◆ 24/7 pre- and post-sales technical support



Black Box Company Brief



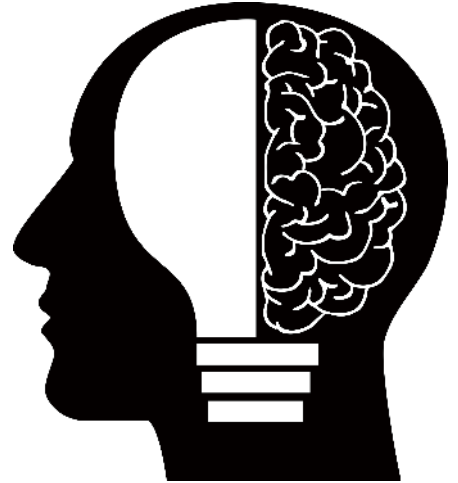
- **Delivering and Developing Technology Solutions for over 40 Years**
Control Rooms | Visual Solutions | Pro AV | KVM | Collaboration | IT Infrastructure
- **Global Presence and Extensive Technical Taskforce**
On-Site Assessments | Project Consultation | Tech Support and Maintenance | SLAs
- **Helping Our Clients**
Solve Problems | Leverage Technology | Achieve Their Missions and Goals



How Black Box Can Help

Assessment, Planning, Implementation

- More than 500 control room-related projects per year
- Help with choosing the right components
- Technology leaders in KVM for VDI
- Individually optimized technology mix from extensive portfolio
- Pre-sales project planning by experienced technicians
- Free post-sales technical support
- Optional installation services
- Individual SLAs



Black Box India

- Black Box India started in 2013-14
- we have sales, presales, support operations based in Mumbai.
- We have worked with many end customer through partners which are from various industries, focused on Signal Management, Networking and PRO AV Solutions



Premier Customer Base

Black Box customers include **85 percent of the Fortune 500**, all major U.S./European federal defense and civilian agencies, and numerous state and local governments.

Black Box has a strong presence in the Asia Pacific region by forming strategic channel partnerships and building on trusted relationships with our customers.



Industry Recognition



Q&A



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Upcoming Sessions

May 13	Remote Solutions for the Distributed Workforce
May 20	Reliable Industrial Ethernet Connectivity
May 27	KVM Switching, Management, and Control
June 3	Video Wall Technology for Critical Visualization
June 10	AV/KVM Signal Extension and Distribution
June 17	Flexible, Scalable Digital Signage with iCOMPEL®

Find out more at black-box.co.in/Webinars2020



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KVM AND PRO AV WEBINAR SERIES

Live technology solutions webinars

In these unprecedented times, we are happy to live and work in a digital world. Since meeting each other is not possible at the moment, Black Box will host a series of free technology solutions webinars every Wednesday from May 6 through June 17 to connect with you.

These 45-minute sessions focus on industry trends, new KVM and AV product technology, and real-world applications. Find out more about the upcoming sessions below, and join us for as many sessions as you'd like!

We encourage you to not only register, but also attend your session(s) of interest. Take full advantage of the knowledge and experience of our speakers and engage in discussion with them.

You are not able to attend one of our live sessions? Register anyway; the recording of the session will be made available to all those who registered.

Upcoming Webinars

Next-Generation Control Room Technology Webinar topics: <ul style="list-style-type: none">Trends and challenges of KVM and AV in control roomsTechnology drivers and virtualization benefitsComplete control, visualization, and connectivity solutionsOperator workspace and control May 6, 2020 11:00 IST English REGISTER	Remote Access Solutions for the Distributed Workforce Webinar topics: <ul style="list-style-type: none">Remote PC/server access with KVM over IPRemote virtual machine accessOut-of-band server managementRemote environmental monitoring May 13, 2020 11:00 IST English REGISTER	Reliable Industrial Ethernet Connectivity Webinar topics: <ul style="list-style-type: none">Industrial Ethernet benefits, limitations, and trendsBlack Box solutions for extending Ethernet connectionsPower over Ethernet (PoE): new standard and applications May 20, 2020 11:00 IST English REGISTER
KVM Switching, Management, and Control Webinar topics: <ul style="list-style-type: none">What is high-performance KVM?Benefits of direct-connect vs. IP	Video Wall Technology for Mission-Critical Visualization Webinar topics: <ul style="list-style-type: none">Video wall specifications and	AV/KVM Signal Extension and Distribution Webinar topics: <ul style="list-style-type: none">Different signals and applicationsRemote computer access



