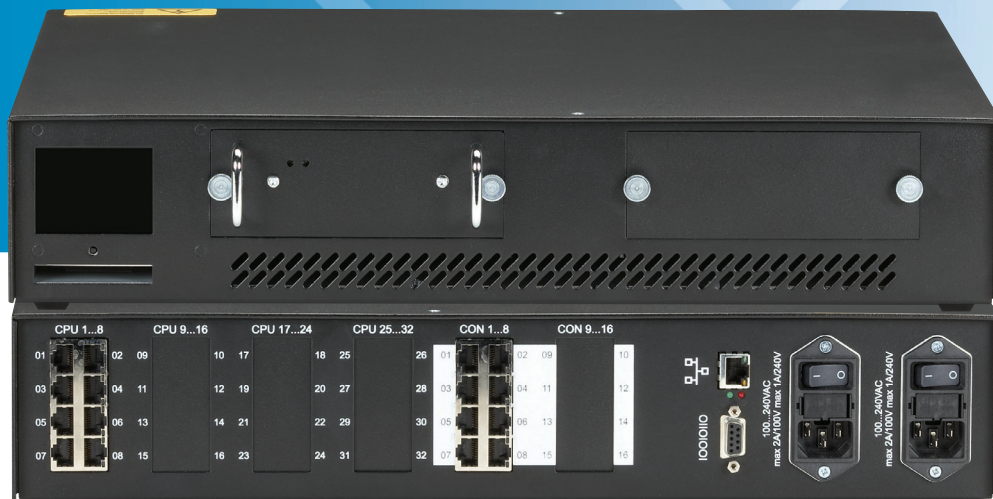


ServSwitch DKM

Distribute and switch monitor, keyboard, and mouse signals remotely over long distances.

Use in airports, industrial plants, call centers, or in distributed computer centers.



Federal Communications Commission and Industry Canada Radio Frequency Interference Statements

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

CE Mark

These products conform to the provisions of the following European Directives:

2004/108/EG Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility
CE-marking 2009

The products conform to the following standards:

EN 55022: 09/2006 Class A

IEC 61000-4-2: 02/2001

IEC 61000-4-3: 05/2006

IEC 61000-4-4: 12/2004

IEC 61000-4-5: 11/2006

This declaration certifies the conformity to the specified directives but contains no assurance of properties. Consider the safety documentation noted in this manual in detail. The attached CPU or Console Cable's length must not exceed 0.9 feet (3 meters). You must use the suggested interconnect cables.

Instrucciones de Seguridad (Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá de lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico debe ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
 - A: El cable de poder o el contacto ha sido dañado; u
 - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
 - C: El aparato ha sido expuesto a la lluvia; o
 - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
 - E: El aparato ha sido tirado o su cubierta ha sido dañada.

Trademarks Used in this Manual

Trademarks Used in this Manual

Black Box and the Double Diamond logo are registered trademarks, and ServSwitch is a trademark, of BB Technologies, Inc.

Java is a registered trademark of Oracle Corporation.

Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

We're here to help! If you have any questions about your application or our products, contact Black Box Tech Support at **724-746-5500** or go to **blackbox.com** and click on "Talk to Black Box." You'll be live with one of our technical experts in less than 30 seconds.

Safety Precautions and Installation Guidelines

For reliable and safe long-term operation, note the following installation guidelines:

- Do not use CATx devices to link between buildings—use fiber devices.
- Only use in dry, indoor environments.
- If the building has three-phase AC power, make sure that equipment connected to the local and remote units is on the same phase.
- Try not to route a CATx- link cable alongside power cables.
- The Remote Unit, Local Unit, and any power supplies can get warm. Do not locate them in an enclosed space without any airflow.
- Do not place a power supply directly on top of a unit.
- Do not obscure a unit's ventilation holes.

To safeguard against personal injury and avoid possible damage to equipment or property, please observe the following:

- Only use power supplies originally supplied with the product or manufacturer-approved replacements. Do not attempt to dismantle or repair any power supply. Do not use a power supply if it appears to be defective or has a damaged case.
- Connect all power supplies to grounded outlets. In each case, make sure that the ground connection is maintained from the outlet socket through to the power supply's AC power input.
- Do not attempt to modify or repair this product, or make a connection from the CATx-link interface (RJ-45) to any other products, especially telecommunications or network equipment.

Cautions and Notes

The following conventions are used in this guide:

CAUTION: This indicates an important operating instruction that should be followed to avoid any potential damage to hardware or property, loss of data, or personal injury.

NOTE: This indicates important information to help you make the best use of this product.

IMPORTANT! ServSwitch DKM Notes: PLEASE READ!

IMPORTANT ServSwitch DKM Notes: PLEASE READ!

1. The Web interface is currently being developed and may have limited or no functionality. Use the Java applet instead.
2. Some transmitters and receivers might not be available at the time of the writing of this user manual, but are referenced for future releases (for example: fiber transmitters and receivers; media transmitters and receivers).
3. Information, feature sets, and part numbers may change as this product undergoes future development.
4. This is an international manual. Some part numbers may not be available in certain locations, but are referenced in this user manual. To find out if accessories are available in your country, contact Black Box Technical Support (724-746-5500 in U.S. or e-mail info@blackbox.com) for more information.
5. As the product advances, some parts/components and/or accessories may no longer be compatible with older versions. If you need to verify compatibility, contact Black Box Technical Support (724-746-5500 in U.S. or e-mail info@blackbox.com).
6. There are many components in this system, including replacement parts and accessories. Some of these parts and accessories may not be available at this time, but will be released as the product is developed. Contact Black Box Technical Support if you have any questions.
7. Fiber and copper devices cannot be used together as of this time, however, they can still be on the same system/ServSwitch DKM Switch (for example, fiber transmitters work with fiber receivers but not copper receivers).
8. The ServSwitch DKM chassis ships with a single internal power supply, but you can order a redundant power supply (part number ACXPSR).
9. The system contains RJ-45 connectors that look like TCP/IP or network ports, but they might not be a network port. Be sure you know which ports support an Ethernet connection before installation or you could damage the unit/system. As of now, the only TCP/IP or network port available is found on the back of the ServSwitch DKM chassis. It's labeled with a network icon.
10. Terms such as "Control Room" and "Teacher/Student" are references to applications and not settings within the switch that would be selectable.
11. The term "CON Port" references a port on the ServSwitch DKM and stands for control port. A compatible receiver must be used to interconnect to these ports.
12. This version of the manual covers the initial release of the ServSwitch DKM and is relevant to hardware version 1.01 and OSD firmware version F01. Any firmware released that is not hardware version 1.01 and OSD firmware version F01 or above will require a different user manual. Please check the Black Box web site for the latest version.

Contents

Quick Setup	10
1. Specifications	11
1.1 General	11
1.2 Connector Pinouts	12
2. Overview	13
2.1 Introduction	13
2.2 Product Codes Described in this Manual.....	14
2.3 Glossary	14
2.4 Example of a ServSwitch DKM System	15
2.5 Features	15
2.6 Product Range	16
2.7 Compatibility	17
2.8 How to Use This Guide	17
2.8.1 Connection and Compatibility.....	18
2.8.2 DDC Information	18
2.8.3 Selecting the Moment of Switching to the Next Frame	18
2.8.4 Selection of Color Reduction for Transfer Acceleration	18
3. Installation	19
3.1 What's Included	19
3.2 Hardware Description	20
3.2.1 ACX0808 Front and Back Panels.....	20
3.2.2 ACX0816 Front and Back Panels	21
3.2.3 ACX0832 Front and Back Panels.....	22
3.2.4 ACX1616 Front and Back Panels.....	23
3.2.5 ACX1632 Front and Back Panels	24
3.3 Interconnection Cable Requirements	24
3.4 System Setup	25
3.5 Installation Instructions.....	26
4. Diagnostics	27
5. ServSwitch DKM Configuration	29
5.1 Configuration via Console.....	29
5.1.1 On-Screen Display (OSD)	29
5.1.2 Open Configuration Menu	33
5.1.3 Load Configurations	34
5.1.4 System Configurations	35
5.1.5 Touchscreen Settings.....	38
5.1.6 User Attributes Configuration.....	38
5.1.7 User Matrix Configuration	40
5.1.8 CON Ports Configuration.....	41
5.1.9 CON Matrix Configuration	43
5.1.10 CPU Ports Configuration	45
5.1.11 Network Parameters Configuration	46
5.1.12 Macros Programming	46
5.1.13 Saving Configurations inside the Switch	48
5.1.14 Saving Configurations into File	48

Table of Contents

5.1.15	Restart Your Switch	49
5.2	Configuration via Browser and Web Interface	49
5.3	Configuration via Serial Interface	50
5.4	Configuration via IR Remote Control and LCD Display	50
5.4.1	IR Remote Control	50
5.4.2	Home Page.....	51
5.4.3	Menu Page.....	51
5.4.4	Configuration Page.....	51
5.4.5	Configuration of Network Parameters.....	52
5.4.6	Configuration of System Parameters	52
5.4.7	Restart Your Switch	54
5.4.8	Reset Your Switch.....	54
6.	Status Information	55
6.1	Status Display via Console and OSD	55
6.1.1	Open the Status Menu	55
6.1.2	CON Ports Status Display.....	56
6.1.3	CPU Ports Status Display	57
6.1.4	Network Status Display.....	59
6.1.5	Firmware Status Display.....	60
6.2	Status Display via Browser/Web Interface	62
6.3	Status Display via Serial Interface.....	62
6.4	Status Display via LCD Display	62
6.4.1	Home Page.....	62
6.4.2	Menu Page.....	62
6.4.3	Status Page.....	62
6.4.4	Display of CPU-/CON-Ports Status.....	63
6.4.5	Display of Network Status	64
6.4.6	Display of Flash Status	65
6.4.7	Display of Tasks Status.....	68
7.	ServSwitch DKM Control	69
7.1	Instant Switching.....	69
7.1.1	Keyboard Hotkeys	69
7.1.2	Changing the Default Instant Switching Hotkey	69
7.1.3	Macro Keyboard (Under Development).....	70
7.1.4	Macros via Function Keys of a Standard Keyboard.....	70
7.2	Switching in OSD/KVM Mode	70
7.2.1	Switching in KVM List Page.....	71
7.2.2	Switching in KVM Switch Page	72
7.2.3	Switching in Follow Me Page	74
7.3	Switching in OSD/Crosspoint Mode.....	75
7.3.1	Open the CP-Switch Menu.....	75
7.3.2	Switching in Crosspoint Switch/CON Ports Page.....	76
7.3.3	Switching in Crosspoint Switch/CPU Ports Page.....	77
7.4	Switching via Browser/Web Interface.....	79
7.5	Switching via Serial Interface.....	79
7.6	Switching via LCD Display	79
8.	Operating Modes	80
8.1	Single-Head KVM Switch.....	80
8.2	Dual-Head KVM-Switch	81

8.3 Quad-Head KVM Switch..... 82

8.4 Single-Head KVM/USB 2.0 Mode..... 82

8.5 Triple-Head KVM/USB 2.0 Mode..... 84

8.6 Teacher/Student System 15..... 85

8.7 Crosspoint Switch 86

9. Troubleshooting..... 87

9.1 Monitor..... 87

9.2 USB HID 87

Appendix A: Example Applications 89

Appendix B: Rackmount Options..... 91

Appendix C: Serial Interface 95

Appendix D: Network Interface 99

Appendix E: Contacting Technical Support 100

Appendix F: List of Supported USB Devices 101

Appendix G: ServSwitch KVM Extender 102

G.1 ServSwitch DKM KVM Extender..... 102

G.2 Diagnostics..... 111

G.3 Service Setup Extenders..... 112

G.4 Setup at the Local Unit 113

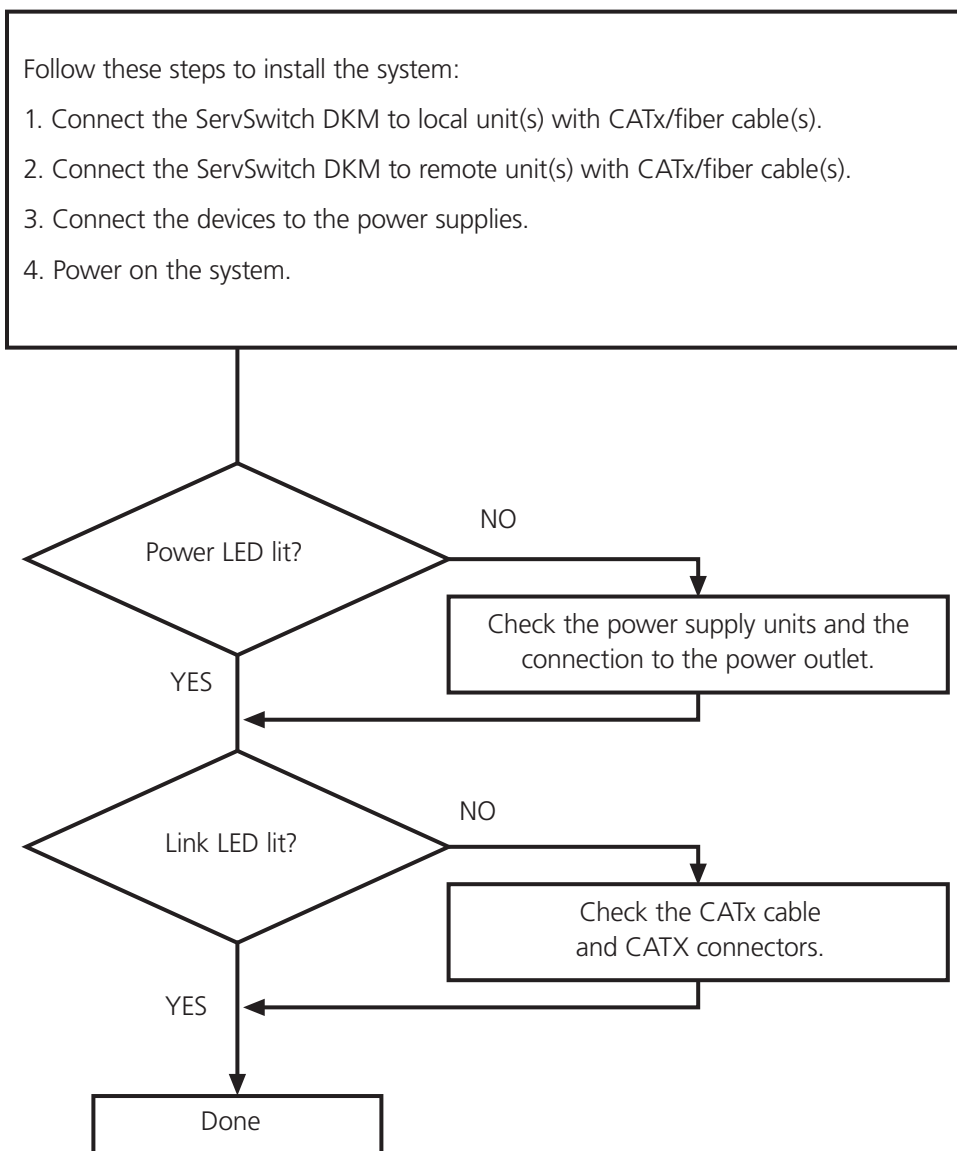
G.5 Setup at the Remote Unit 113

G.6 Devices with Serial/Audio Option..... 114

G.7 Connectors for the ServSwitch KVM Units 115

Quick Setup

This section briefly describes how to install your ServSwitch DKM system. Unless you are an experienced user, we recommend that you follow the full procedures described in the rest of this manual.



1. Specifications

1.1 General

CE Approval: Yes

RoHS: Yes

Connectors: ACX0808: Console: (8) RJ-45;

Computer: (8) RJ-45;

ACX0816: Console: (8) RJ-45;

Computer: (16) RJ-45;

ACX0832: Console: (8) RJ-45;

Computer: (32) RJ-45;

ACX1616: Console: (16) RJ-45;

Computer: (16) RJ-45;

ACX1632: Console: (16) RJ-45;

Computer: (32) RJ-45;

All: Network: (1) RJ-45 10/100;

Configuring: (1) DB9 F;

Power: (2) IEC320 M, C14, dual power inputs

Environmental: Operating Temperature: +41 to +113° F (+5 to +45° C);

Storage Temperature: -13 to +140° F (-25 to +60° C);

Relative Humidity: Maximum 80%, non-condensing

Power: 100 to 240 VAC, 47 to 66 Hz

Size: 3.3"H x 17.6"W x 17.4"D (8.4 x 44.7 x 44.2 cm)

Weight: ACX0808: 12.9 lb. (5.8 kg);

ACX0816: 13.1 lb. (5.9 kg);

ACX0832: 13.5 lb. (6 kg);

ACX1616: 13.5 lb. (6 kg);

ACX1632: 13.7 lb. (6.2 kg)

Shipping Box Size: 20"H x 20"W x 4"D (50 x 50 x 10 cm)

Shipping Box Weight: 17.2 lb. (8 kg)

Interfaces:

RJ-45 (interconnect): 1000-Mbps high-speed transmission, wiring according to EIA/TIA 568B Gigabit Ethernet (does not use TCP/IP protocols);

LC (glass fiber): 1000-Mbps high-speed transmission; corresponds to Gigabit Ethernet (does not use TCP/IP protocols);

RJ-45 Ethernet (control port): Standard Ethernet access for HTTP, FTP, TELNET (subject to change);

DB9 serial (control port): 115.2 kbps, 8 data bits, 1 stop bit, no parity; limited hardware handshake (DSR)

Maximum Length of CATx Interconnection Cable:

CATx installation cable: 400 ft. (140 m), 24 AWG (solid conductor cable)

CATx patch cable 200 ft. (70 m), 26 AWG/8 (stranded conductor cable)

Type of Interconnection Cable:

CATx installation cable 24 AWG (solid-conductor cable): S/UTP (CAT5) cable acc. EIA/TIA 56A, TSB 36 or Digital STP 17-03170. Four pairs 24 AWG. Wiring acc. EIA/TIA 568A (1000BASE-T) (does not use TCP/IP protocol).

CATx patch cable 26 AWG/8 (stranded-conductor cable): S/UTP (CAT5) cable acc. EIA/TIA 56A, TSB 36, or Digital STP 17-03170. Four pairs 26 AWG 8. Wiring acc. EIA/TIA 568A (1000BASE-T) (does not use TCP/IP protocol).

Maximum Length of Fiber Cable (LC Connector):

Singlemode, 9 μm: 32,750 feet (10,000 m)

Multimode, 50 μm: 1300 feet (400 m)

Multimode, 62.5 μm: 650 feet (200 m)

1.2 Connector Pinouts

Serial Interface

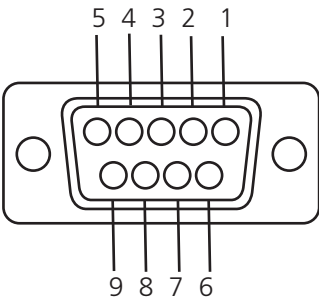


Figure 1-1. DB9 female connector.

Table 1-1. DB9 female connector pinout.

Pin	Signal
1	Not connected
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	Not connected

CATx Interfaces

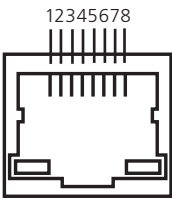


Figure 1-2. RJ-45 connector.

Table 1-2. Wiring for EIA/TIA 568A (1000BASE-T).

Pin	Signal	Pin	Signal
1	D1+	5	D3-
2	D1+	6	D2-
3	D2+	7	D4+
4	D3+	8	D4-

2. Overview

2.1 Introduction

The ServSwitch™ DKM can be set up to support four different applications:

1. Crosspoint Switch: The maximum configuration (without cascading) uses 32 input ports and 16 output ports (using ACX1632).

Setup: Local units are installed at up to 32 DVI signal sources. The Crosspoint Switch may be installed up to 6.2 miles (10 km) away from the sources. The received signals (DVI + optional serial/audio) can be switched to the respective output ports. One input signal may be distributed simultaneously to several output ports.

From these output ports, the displays (again, up to 6.2 miles [10 km] away) are controlled via remote units installed at each display. You can change this remotely using the serial interface (RS-232) and/or the built-in Web interface (the Web interface is currently being developed).

2. KVM Switch: As a KVM Switch, the device supports several operation modes: 16 user ports on 32 CPU ports for single-head access, 8 user ports on 16 CPU ports for dual-head access or even 4 user ports on 8 CPU ports for quad-head access (using ACX1632).

Single-head/dual-head/quad-head CPUs and user ports may also be operated in mixed mode. In this case, the maximum number of user ports depends on the detailed configuration.

Connect a maximum of 32 CPUs (up to 6.2 miles [10 km] away) to the KVM switch via local units to be installed at each CPU.

The received signals (DVI, keyboard, mouse + optional serial/audio) can now be switched to the respective output ports. From these output ports, up to 16 consoles (again, up to 6.2 miles [10 km] away) are controlled via remote units installed at each console.

Do this remotely by a hotkey sequence (only in KVM mode), using the serial interface (RS-232) or by the Java® based applet. An easy-to-use on-screen display (OSD) enables you to select the CPUs, and offers user and administrative functions.

A special function called “Follow Me” enables you to copy one (or more) display signal(s) to one or more additional displays. This mode is especially useful, for example, if one display signal is shown on both the user display and a projector or if the monitor information is shared with an administrator. The “Follow Me” function ensures that the monitor information is updated whenever the original display signal source is changed.

Use the ACX1632 to get 32 CPU ports and 16 console ports. The ports can be configured as single-head ports (a “single-head” extender system supports one monitor, one keyboard, and one mouse), dual-head ports (a dual-head extender system supports two monitors, one keyboard, and one mouse) or even quad-head ports (a quad-head extender system supports four monitors, one keyboard, and one mouse).

In KVM Switch Mode, CPU Ports and CON Ports can be configured as USB 2.0 ports. This can be done for single ports as well as for combinations of one single-head port and one USB 2.0 port. In the latter case, the respective consoles will always be switched together with its assigned USB 2.0 port.

You can do this via the OSD, the serial interface (RS-232), and/or by the Java based applet.

3. “Control Room” Mode: In one application of the KVM Switch, you can choose the “Control Room” Mode. In this mode, several displays are assigned to a work place. The OSD enables you to choose from a list of available CPUs to the CPU you want to display on a specific monitor. With a hotkey sequence, you can switch keyboard and mouse to any of these monitors for operation without needing to know the associated CPU. Now you can operate this CPU.

Also in this mode, one (or more) display signal(s) can be copied to one or more additional displays (“Partner Viewing”).

You can also use the “Control Room” Mode with 2, 4, or 8 monitors. In “Control Room” mode, up to 8 CPUs are permanently displayed on up to 8 monitors. With a hotkey, you can switch to any of these monitors for operation.

4. “Teacher/Student” System: Attend up to 15 students: Each student work place is connected by CATx cable. Each CPU can be displayed at any workplace—both student and teacher workplace—even simultaneously. The teacher can observe every student workplace.

Position the ServSwitch DKM (CATx version) up to 448 feet (140 m) from both your signal source and display device. The DKM uses proven ServSwitch Extender technology for transmitting DVI monitor and USB keyboard and mouse signals over CATx cable.

A ServSwitch DKM system consists of a ServSwitch DKM and one or more local/remote units. The ServSwitch DKM and the local/remote units are attached by CATx or fiber interconnection cables.

Operating a ServSwitch DKM always requires you to use ServSwitch Extender local units and remote units.

The ServSwitch DKM can support up to 16 users and 32 computers in a single chassis.

Wherever long distances cause problems for remotely locating and switching a monitor (keyboard/mouse) signal, for example, airports, industrial plants, call centers, or in distributed computer centers, the ServSwitch DKM can distribute and switch keyboard, mouse, and monitor signals. Its flexibility allows it to tackle almost every task.

For fiber applications, all switch elements and extenders are also available in multimode or single-mode versions, requiring the respective cabling (requires fiber CON/CPU card).

This manual will tell you all about your new ServSwitch DKM, including how to install, operate, and troubleshoot it.

2.2 Product Codes Described in this Manual

The product codes covered in this manual are:

ServSwitch DKM Devices for CATx:

ACX0808: ServSwitch DKM for 8 User and 8 CPUs

ACX0816: ServSwitch DKM for 8 User and 16 CPUs

ACX0832: ServSwitch DKM for 8 User and 32 CPUs

ACX1616: ServSwitch DKM for 16 User and 16 CPUs

ACX1632: ServSwitch DKM for 16 User and 32 CPUs

CATx Local and Remote Units:

ACS4001A-R2-T: ServSwitch CATx transmitter

ACS4001A-R2-R: ServSwitch CATx receiver

ACS4002A-R2-T: ServSwitch-KVM Local Unit, 4x USB 2.0, Single-Head CATx transmitter

ACS4002A-R2-R: ServSwitch-KVM Remote Unit, 4x USB 2.0, Single-Head CATx receiver

ACS4004A-R2-T: ServSwitch-KVM Local Unit, Single-Head, 4x USB-HID CATx transmitter

ACS4004A-R2-R: ServSwitch-KVM Remote Unit, Single-Head, 4x USB-HID CATx transmitter

NOTE: If you purchase the TX/RX kits, you will need to set Jumper 11 on the receiver so that the hotkeys work. The separate RX units are already set.

2.3 Glossary

The following terms are used in this guide:

CATx: Any Category 5, 5e, 6 or higher cable, with 24 AWG solid conductors. If patch cables are used, double the distance.

CON Ports: User ports or console ports.

Console: Keyboard, mouse, and monitor.

Dual Access: A system that connects Local and Remote User consoles.

Dual-Head: An extender system that supports two monitors + keyboard/mouse.

DVI: Digital Video standard, installed by Digital Display Working Group (www.ddwg.org) R, G, B, CLOCK in a data stream with up to 1.65 Gbit/sec. x 3 data pairs (single-link). Signals are TMDS Level.

Fiber: Single-mode or multimode fiber cable.

HID: Human interface devices are units, which are used for human access to the CPU: keyboard and mouse, touchscreen, light pen, fingerprint sensor, graphics tablets, etc.

KVM: Keyboard, video, and mouse.

Multimode: 62,5-µm multimode or 50-µm multimode fiber cable.

PSU: The internal or external power supply connected to the ServSwitch DKM or to the Local/Remote Unit.

Quad-Head: An extender system that supports four monitors + keyboard/mouse.

Single-Head: An extender system that supports one monitor + keyboard/mouse.

Single-mode: 9-µm single-mode fiber cable.

2.4 Example of a ServSwitch DKM System

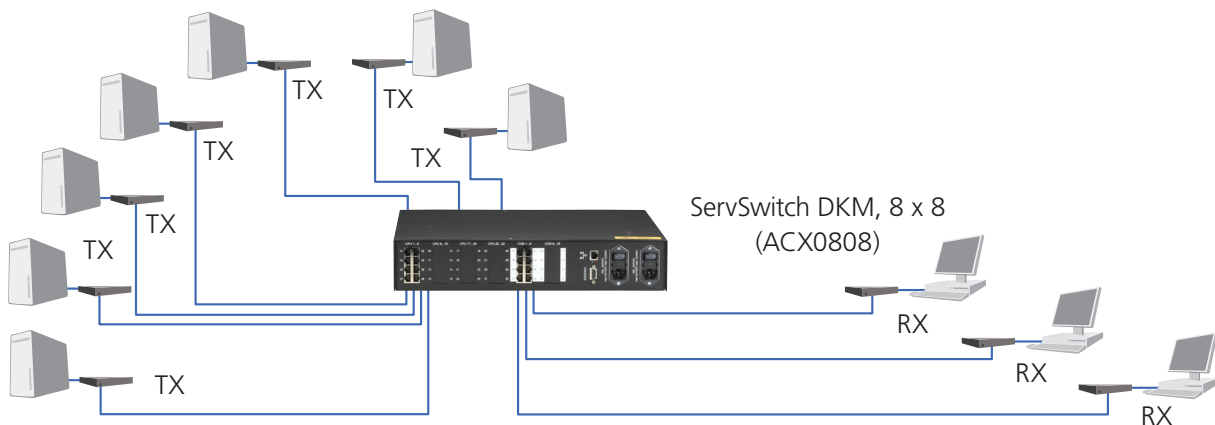


Figure 2-1. Typical application of a ServSwitch DKM system (single-head KVM switch).

2.5 Features

The ServSwitch DKM offers the following features:

- Support for DVI-D Graphics cards (all devices)
- Support for USB-Keyboard and USB-Mouse (KVM-Extender)

NOTE: ServSwitch DKM standard devices with USB-HID connectors support the extension of keyboard and mouse ONLY; use with other HID devices such as touchscreens, graphics tablets, bar-code readers, or similar devices may be successful—but there is no guarantee: The ServSwitch DKM standard device is NOT suitable for use with other USB devices such as scanners, webcams, data sticks, etc.

Chapter 2: Overview

NOTE: ServSwitch DKM standard devices support only two devices simultaneously—keyboard and mouse or keyboard and touchscreen, etc., but not keyboard, mouse, and touchscreen simultaneously. You can extend the distance via a USB hub, but this does not increase the number of supported devices.

- Maximum length of interconnection cable from a Local Unit to a ServSwitch DKM, between two ServSwitch DKMs or from a ServSwitch DKM to a remote unit).
 - 448 feet (140 m) with CATx cable
 - 640 feet (200 m) with multimode 62.5-µm cable
 - 1280 feet (400 m) with multimode 50-µm cable
 - 3200 feet (10,000 m) with single-mode 9-µm cable
- Maximum resolution (DVI): 1920 x 1200 @ 60 Hz
- Supports 16-/24-bit auto-switching or 24-bit (= full) color depth (selectable)
- Status indicator LEDs for Power and Link on each device.
- Compact footprint chassis.
- Rackmount options available.
- International power supplies included.
- Options:
 - USB 2.0 support
 - Bidirectional audio interface
 - Serial interface
 - Single-head devices support a transparent serial interface with up to 19.2 kbps and hardware handshake. Use this serial interface to control a single device requiring full hardware handshake or up to three devices without handshake (X-ON/X-OFF).
 - Dual-head devices support TxD and RxD ONLY—no hardware handshake (X-ON/X-OFF).

2.6 Product Range

The following products are available as well as various upgrade kits:

ServSwitch DKM and Accessories:

ACX0808: ServSwitch DKM for 8 Users and 8 CPUs (CATx)

ACX0816: ServSwitch DKM for 8 Users and 16 CPUs (CATx)

ACX0832: ServSwitch DKM for 8 Users and 32 CPUs (CATx)

ACX1616: ServSwitch DKM for 16 Users and 16 CPUs (CATx)

ACX1632: ServSwitch DKM for 16 Users and 32 CPUs (CATx)

ACXDIS: DKM LCD Display Board

ACX8CAT: DKM CATx I/O Board

ACX80SD: DKM OSD Board for 8 Users

ACXREMOTE: Replacement IR Remote

ACXPSR Power Supply Unit: (slide-in version) for spare or for upgrade to redundant power supply unit

KVM Extenders for CATx:

ACS4001A-R2-T: ServSwitch KVM Local Unit, Single-Head

ACS4001A-R2-R: ServSwitch KVM Remote Unit, Single-Head

ACS4002A-R2-T: ServSwitch KVM Local Unit, Single-Head, 4x USB 2.0

ACS4002A-R2-R: ServSwitch KVM Remote Unit, Single-Head, 4x USB 2.0

ACS4004A-R2-T: ServSwitch KVM Local Unit, Single-Head, 4x USB HID

ACS4004A-R2-R: ServSwitch KVM Remote Unit, Single-Head, 4x USB HID

Accessories:

AC1038A: DVI-D to VGA Converter, to connect the local output to a traditional VGA KVM switch

ACXCWDM4: CWDM MUX/DEMUX to send up to four ServSwitch fiber interconnections simultaneously over only one fiber port

ACX1000: CATx Repeater to double the maximum allowed distance up to 896 ft. (280 m) (also available for multi-/single-mode)

ACX1000-CM: CATx/Multimode Cross Repeater to convert from CATx to multimode or back (also available for single-mode)

ACX1000-DM: CATx/Multimode dual-head cross repeater

ACX1000-MM: Multimode/Multimode cross repeater

ACX1000-MS: Multimode/Single-mode Cross Repeater to convert from multimode to single-mode or back

2.7 Compatibility

Interface Compatibility

- Digital Video (DVI-D): Digital Video standard, installed by Digital Display Working Group (www.ddwg.org) R, G, B, CLOCK in a data stream with up to 1.65 Gbps x 3 pairs. Signals are TMDS Level.
- USB Keyboard: Compatible with all standard keyboards. Keyboards with built-in hub are also supported—but there are never more than two HIDs supported.
- USB Mouse: Compatible with all standard 2-button, 3-button, and wheel mice.

NOTE: ServSwitch DKM standard devices with USB-HID connectors support the extension of keyboard and mouse ONLY; use with other HIDs such as touchscreens, graphics tablets, bar-code readers, or similar may be successful—but there is no guarantee for this! The ServSwitch DKM standard device is NOT suitable for use with other USB devices such as scanners, webcams, data sticks, etc.

NOTE: ServSwitch DKM standard devices support only two devices simultaneously—keyboard and mouse or keyboard and touchscreen, etc. but not keyboard, mouse, and touchscreen simultaneously. You can extend the distance with a USB hub, but this does not increase the number of supported devices.

- Fiber/CATx devices: A ServSwitch DKM may be equipped with both CATx GBICs, and fiber GBICs. This enables you to switch both fiber and CATx signals with one ServSwitch DKM.

NOTE: Currently, it is NOT possible to connect devices of different topologies (CATx and fiber). The related signals are switched correctly, but the data format is not compatible. If this feature is required, consider using our Cross Repeater. For details, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

2.8 How to Use This Guide

This guide describes the installation and configuration of the ServSwitch DKM. Although the connection and operation of the system is relatively straightforward, you should consider the following before getting started:

2.8.1 Connection and Compatibility

- ServSwitch DKM includes one internal power supply with each chassis.
- ServSwitch KVM Local Unit includes the device, power supply, and all cables required to connect the ServSwitch KVM Local Unit to your CPU/Signal source.
- ServSwitch KVM Remote Unit includes the device and power supply.

See also Section 3.1, What's Included.

For information about connection and installation, see Chapter 3, Installation.

2.8.2 DDC Information

Normally, you won't need to make any adjustments to the ServSwitch DKM and associated transmitters and receivers. However, in some circumstances, you might need to redefine the source of DDC information for the CPU. By default, the ServSwitch DKM and associated transmitters and receivers use its own internal DDC table. If this setting does not satisfy your requirements, the DDC table can be switched to the DDC table of the locally attached screen.

2.8.3 Selecting the Moment of Switching to the Next Frame

The transmission of screen data is not synchronous to the screen changes of the graphics card. Normally, the transmission is terminated during the display of a frame on the screen (at the remote unit). If the device switches to the new frame during the displaying period of the old frame (somewhere on the screen), you might see horizontal screen breaks at the moment of switching (default). On the other hand, if the device idles until the actual frame is displayed completely (until VSYNC), then the number of frames per second transmitted may be reduced.

To modify the switching behavior, see Setup at the Remote Unit (Appendix G.5).

2.8.4 Selection of Color Reduction for Transfer Acceleration

You can select, whether always 24-bit colors (=full color depth) are transmitted or whether the compression algorithm automatically switches between 16- and 24-bit colors to accelerate the data transfer (default). Normally, you might not recognize the difference between 24-bit and 16-bit, but under some special circumstances (for example in photo processing installations) there might be disturbing color aberrations. While the automatic color switching enhances the number of frames transmitted per second, fixed 24-bit color depth gives smooth color grades under all circumstances. Select your preferred mode.

To modify the color depth, see Setup at the Local Unit (Appendix G.4).

3. Installation

For first-time users, we recommend that you set up a test installation, confined to a single room, before installing the entire system. This will allow you to identify and solve any cabling problems and experiment with the ServSwitch DKM System more conveniently.

3.1 What's Included

You should have received the following items in your ServSwitch DKM for CATx package:

- ServSwitch DKM
- Rackmount brackets for 19" rails
- (1) 5-VDC universal power supply for the ServSwitch DKM (internal)
- (2) U.S. power cables
- (1) 6-foot (1.8-m) DB9 M/F serial cable
- (1) IR Remote Control
- (1) CD-ROM with software utilities and this user's manual in PDF format

The following parts should be in your ServSwitch KVM Transmitter and Receiver Unit package:

- ServSwitch DKM transmitter and/or receiver
- (1) 5-VDC universal power supply for the ServSwitch KVM Local/Remote Unit
- (1) U.S. power cord
- (1) 6-foot (1.8-m) DVI-I video cable (male-to-male) (included with transmitter only)

Also with the dual-head devices:

- (1) 6-foot (1.8-m) DVI-I video cable (male-to-male)

If anything is missing or damaged, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

3.2.2 ACX0816 Front and Back Panels

Figures 3-3 and 3-4 show the front and back panels of the ACX0816.

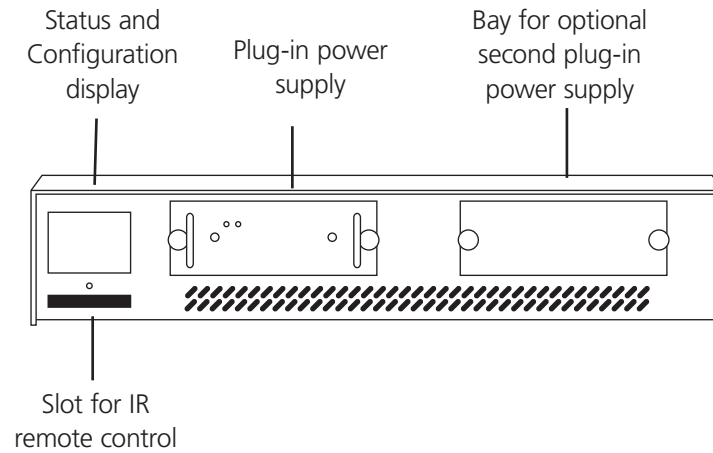


Figure 3-3. ACX0816 front panel.

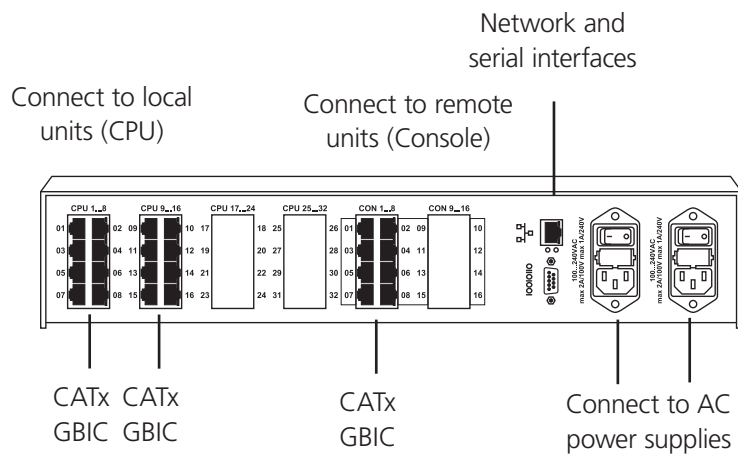


Figure 3-4. ACX0816 back panel.

3.2.3 ACX0832 Front and Back Panels

Figures 3-5 and 3-6 show the front and back panels of the ACX0832.

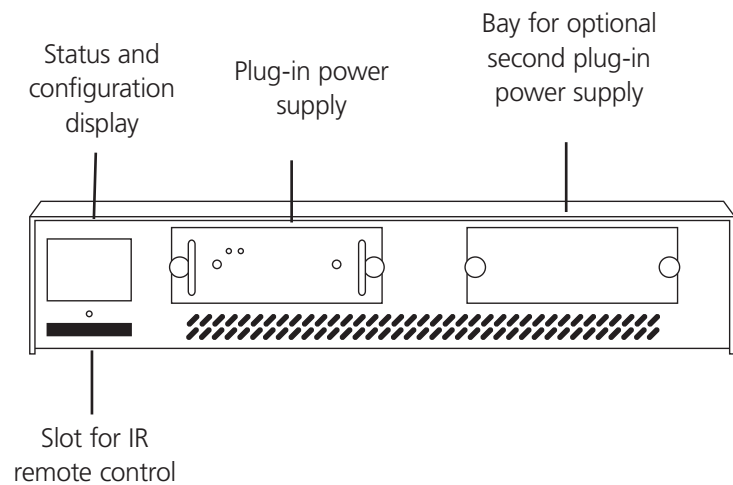


Figure 3-5. ACX0832 front panel.

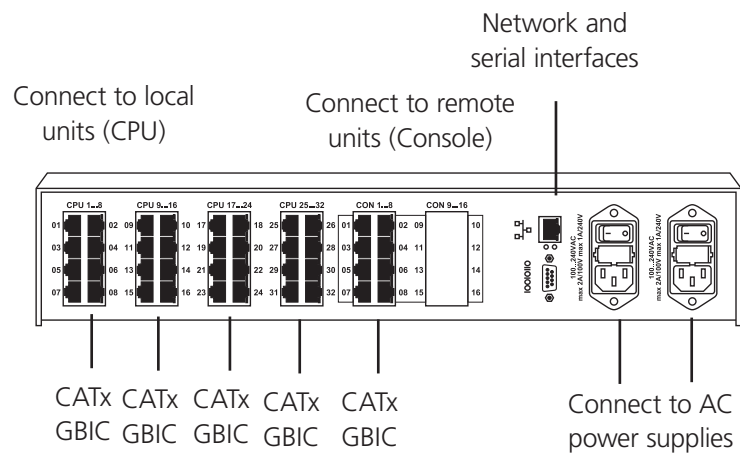


Figure 3-6. ACX0832 back panel.

3.2.4 ACX1616 Front and Back Panels

Figure 3-7 and 3-8 shows the front and back panels of the ACX1616.

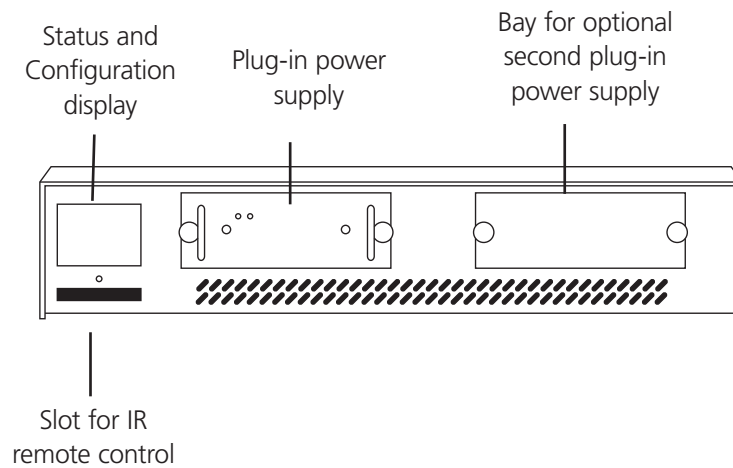


Figure 3-7. ACX1616 front panel.

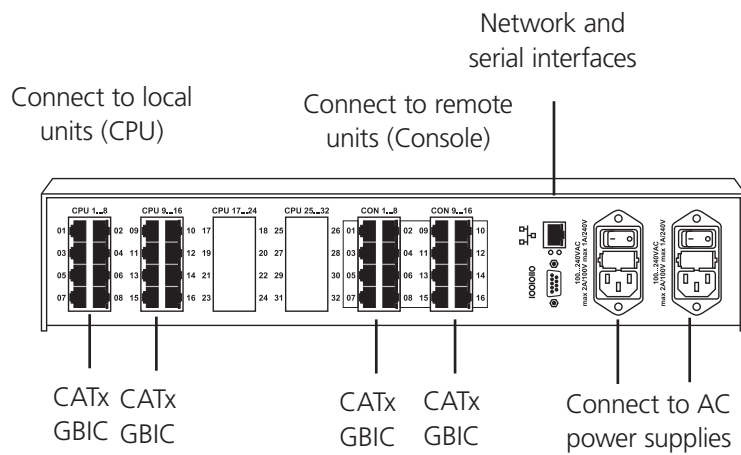


Figure 3-8. ACX1616 back panel.

3.2.5 ACX1632 Front and Back Panels

Figures 3-9 and 3-10 show the front and back panels of the ACX1632.

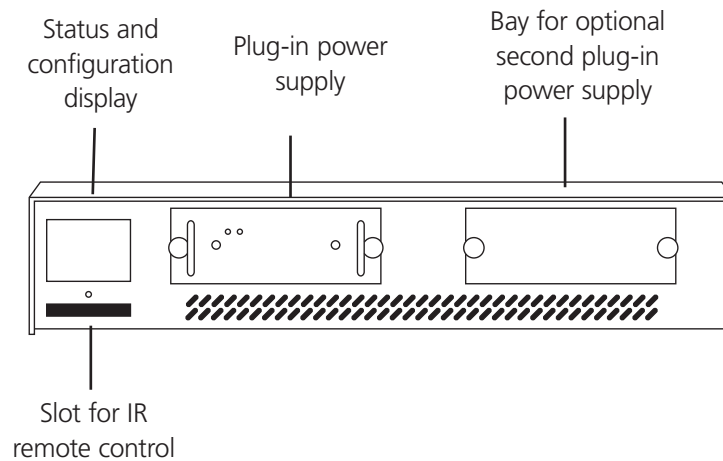


Figure 3-9. ACX1632 front panel.

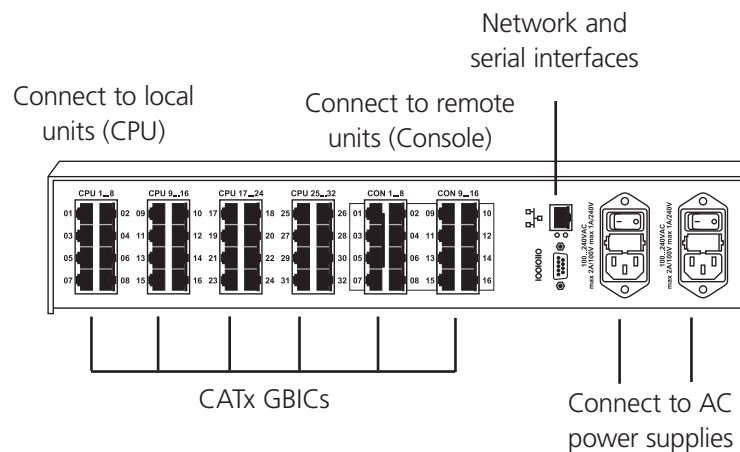


Figure 3-10. ACX1632 back panel.

3.3 Interconnection Cable Requirements

To connect the ServSwitch DKM Local Unit to your CPU/signal source, you will need the following:

NOTE: Make sure that the connection is tension-free.

DVI: Connect a 6-foot (1.8-m) DVI cable (DVI-I male to DVI-I male) to your CPU (KVM Switch, DVI signal source, etc.).

USB: Connect a 6-foot (1.8-m) USB cable (USB Type A to USB Type B) to your CPU (KVM Switch, DVI signal source, etc.).

Serial/Audio (Combo) cable: Connect a serial/audio (combo) cable to your CPU/signal source (select devices only).

Serial cable: Connect a serial cable to your CPU/signal source (DB9 male to DB9 female).

Audio cable: Connect a audio cable to your CPU/signal source ([2] 3.5 stereo audio jacks).

CATx Cable: Recommended cable: S/UTP (CAT5) that conforms to EIA/TIA 56A, TSB 36, or Digital STP 17-03170. Four pairs 24 AWG. Wiring according EIA/TIA 568A (10BASE-T). You can also use cables from a higher category (CAT5e, CAT6, or CAT7).

NOTES: You can use unshielded CATx cable, but because of the higher electromagnetic noise/sensitivity, the device class may not be reached.

You may use flexible cables (patch cable) type AWG 26/7 but because of the higher loss of the stranded cables, the maximum extension distance is reduced to approximately half the value of solid-conductor cables.

You may use one or more patch panels in line. Do not connect the CATx link interface (RJ-45) to any other products, especially telecommunications or network equipment. When using couplers or patch panels in the installation, you may notice the maximum distance is reduced because of impedance.

Fiber optic cable: Two fibers are required for single-head transmission and four fibers for dual-head transmission.

NOTE: The achievable distance depends on the cable type, the device type, and any coupling devices in between.

Recommended Fiber cables:

Multimode type 50/125 μm : Achievable distance approximately 1300 feet (400 m)

Multimode type 62.5/125 μm : Achievable distance approximately 650 feet (200 m)

Single-mode type 9/125 μm : Achievable distance approximately 32,750 feet (10 km)

NOTE: You may use one or more patch panels in line. Do not connect the fiber link interface (LC duplex) to any other products, especially telecommunications or network equipment.

Single-mode devices work well with multimode cables but not vice versa. Single-mode devices with multimode cables might double the achievable distance via multimode cable. We can't guarantee this, and the user must verify it at his own risk and cost.

Power Supply: Connect the supplied 5-VDC power supply to the "POWER" socket on the ServSwitch DKM local or remote unit.

3.4 System Setup

To install your ServSwitch DKM system:

1. Switch off all devices.
2. Connect the keyboard(s), monitor(s), and mouse (mice) to the remote unit(s) (depending on device type).
3. Connect the CPU/signal source to the local unit using the supplied cable(s).
4. Connect the ServSwitch DKM local and remote units with the interconnect cable(s) (CATx or fiber).
5. Connect the ServSwitch DKM with the interconnect cable(s) (CATx or fiber).
6. Depending upon your application, you might need to make a connection to a controller over the serial interface. Attach the provided DB9 cable at the socket of the serial interface and connect it with your controller. You can find more information for control through the serial interface in Appendix C: Serial Interface.

7. Connect the 5-V power supplies to the units.

NOTE: Only use the power supply originally supplied with this equipment or a manufacturer-approved replacement.

8. For a dual-access system, connect the monitor for the local console to the appropriate port on the local unit. You can also use the port to feed into a KVM switch.

Chapter 3: Installation

To attach a local (USB) keyboard/mouse, use additional USB port(s) at your CPU or use a USB hub between the CPU and local unit's USB connector. Typically, the local USB keyboard and mouse would plug into the local computer/target and the local display would connect to the local KVM transmitter.

9. Power on the system.
10. Log in at any console as Administrator. (Use Left-Ctrl + Left-Shift+O to bring up the OSD.)
11. Configure your system. The default username and password for the administration screen is "admin" and "admin" respectively.
12. Done!

3.5 Installation Instructions

Make sure that the ServSwitch DKM has sufficient ventilation space by ensuring the following distances between the unit and other devices and/or mounting parts:

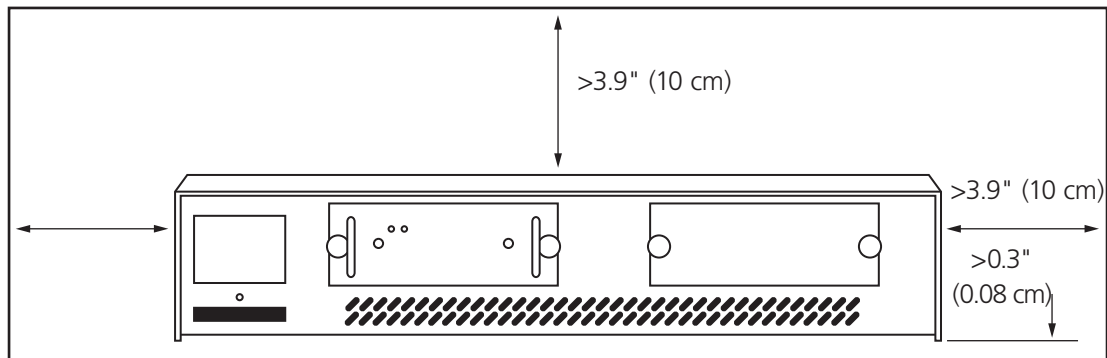


Figure 3-11. Space requirements when placing the device onto a desk.

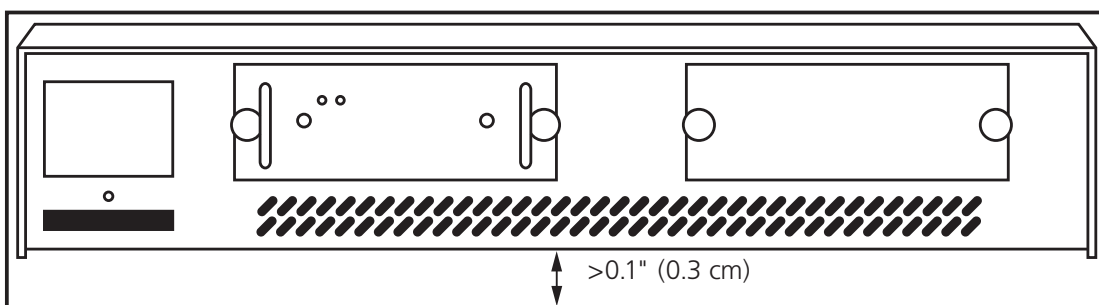


Figure 3-12. Space requirements when mounting the device into a 19" rack.

NOTE: The ServSwitch DKM, its extenders, and power supplies may become warm. Do not install the unit in closed areas without adequate ventilation.

Never place the power supplies on top of the devices.

Make sure that the existing ventilation openings on the device are free at all times.

4. Diagnostic

ServSwitch DKM—I/O Boards

Each ServSwitch DKM I/O Board is fitted with indicator LEDs for status diagnostics. The location of the LEDs is shown in Figure 4-1.

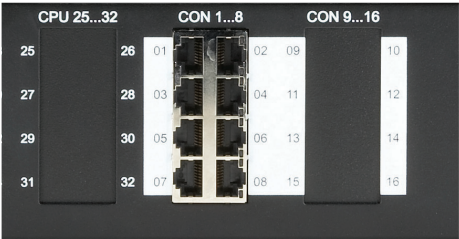


Figure 4-1. LED locations.

Diagnostic LEDs at CATx I/O Boards

The Link Status LEDs are to the right of the CATx sockets in the upper and lower corner. The LEDs in the upper corners show the status for the left CATx connection, the lower LEDs for the right CATx connection.

Table 4-1. CATx LEDs.

LED	Appearance	Diagnostics
Link Status (Green/Orange LED)	Green blinking	CATx cable connection OK Data transmission active
	Green on	CATx cable connection OK No data transmission
	Orange blinking	Port active, no CATx cable connection (no cable, cable defective, local / remote unit off or attached to wrong port)
	Off	Port deactivated

Diagnostic LEDs at Fiber I/O Boards

The Link Status LEDs are located between the upper and the lower fiber sockets.

The left-arrow LED indicates the status of the left connection; the right-arrow LED indicates the status of the right connection.

Table 4-2. Fiber LEDs.

LED	Appearance	Diagnostics
Link Status (Green/Red LED)	Green blinking	Port activated, signal OK
	Green on	Port deactivated, signal OK
	Red blinking	Port activated, no signal detected
	Red on	Port activated, module error signal
	Off	Port deactivated

5. ServSwitch DKM Configuration

The ServSwitch DKM has its own operating system that can be configured in five different ways:

- Via a console connected to a CON port and the On-Screen Display (OSD) at a DKM receiver (preferred method)
- Via a PC, using the Web interface (under development)
- Via a PC and the serial interface (under development, limited functionality)
- Via the supplied IR Remote Control at the LCD display (limited functionality)

5.1 Configuration via Console

With the OSD, the ServSwitch DKM can be completely configured from any console. Settings in the Configuration menu are described next. All other menus are described in later chapters.

5.1.1 On-Screen Display (OSD)

Enter into the OSD

Enter into the OSD by simultaneously pressing the following button combination:

<Left-Ctrl>+ <Left-Shift>+ <O> (Letter "o")

NOTE: Instead of using <Left-Ctrl>, you may also use <STRG> on select keyboards.

The character input is NOT case-sensitive.

<SHIFT> indicates the button for capital letters.

<Button1>+< Button2>+ ... means that all buttons must be pressed simultaneously.

<Button1>,< Button2>, ... means that the buttons must be pressed sequentially.

Leave the OSD

Leave the OSD by simultaneously pressing the following button combination:

<Shift> + <ESC> Leave the OSD Mode, <ESC> alone will not leave the OSD.

General frame structure of the OSD

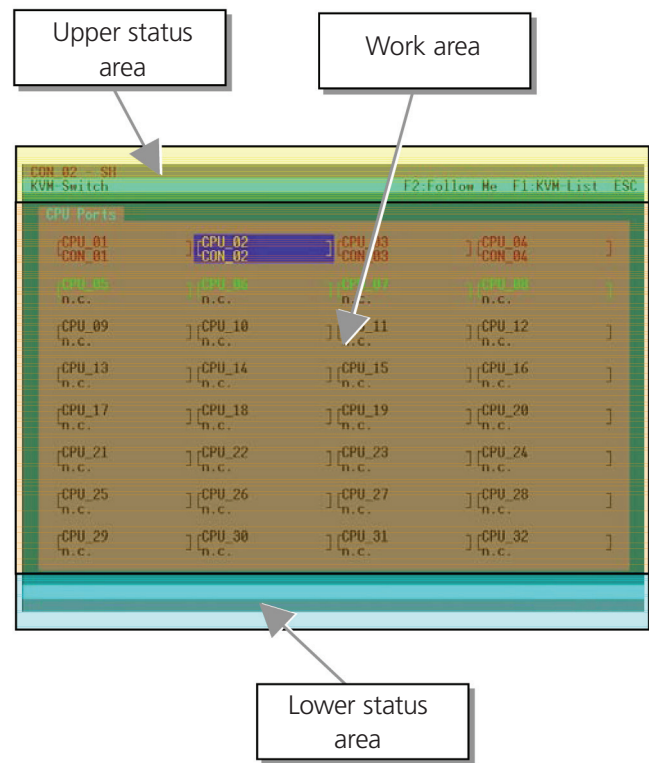


Figure 5-1. OSD frame structure.

Upper Status Area (left corner)

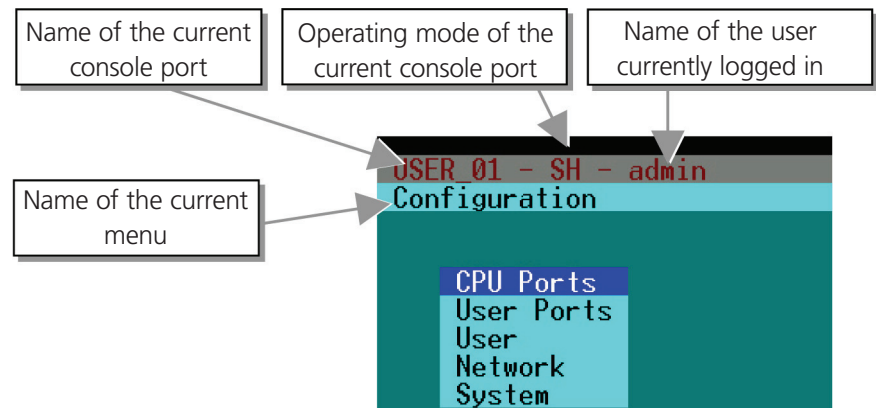


Figure 5-2. Upper status work area (left corner) of the OSD.

Upper Status Area (right corner)

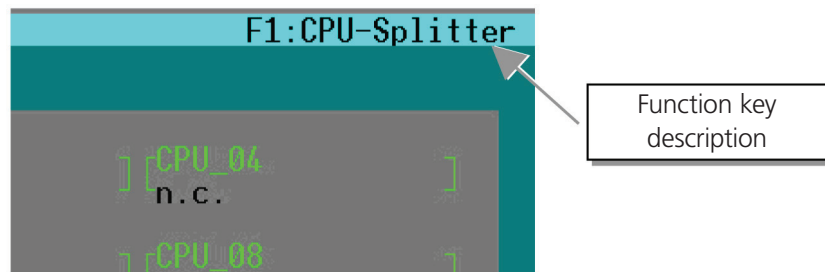


Figure 5-3. Upper status work area (right corner) of the OSD.

Lower Status Area (left corner)

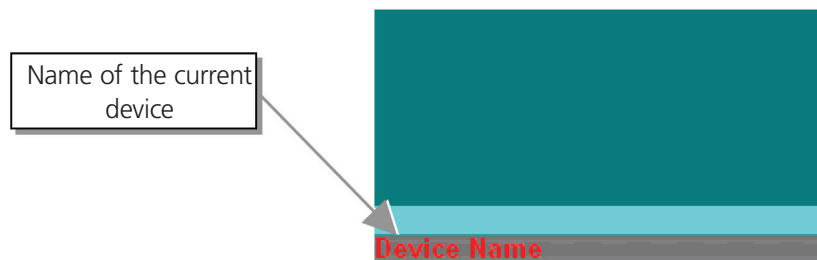


Figure 5-4. Lower status work area (left corner) of the OSD.

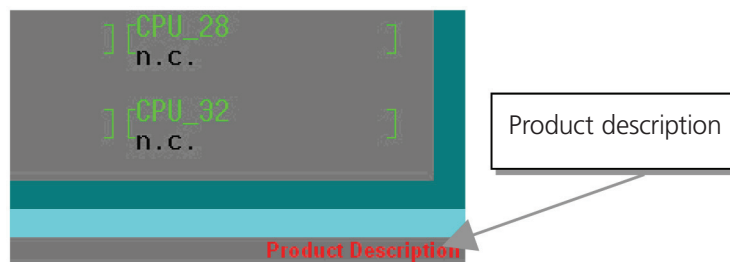


Figure 5-5. Lower status work area (right corner) of the OSD.

Working Area

The possible inputs are described with the respective OSD frame description.

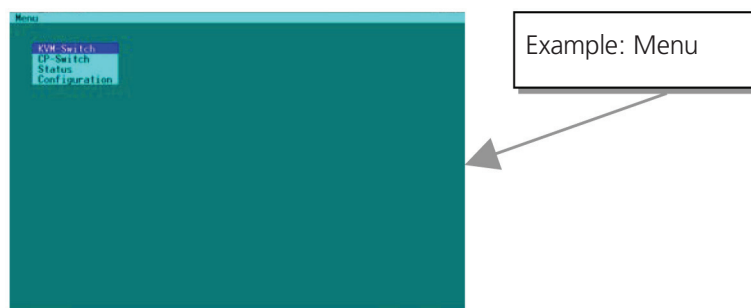


Figure 5-6. Menu.

Name	Type	CON	Name	Type	CON
01 CPU 01	SH	1	02 CPU 02	SH	2
03 CPU 03	DH	0	04 CPU 04	DH	4
05 CPU 05	DH	0	06 CPU 06	DH	0
07 CPU 07	DH	0	08 CPU 08	DH	0
09 CPU 09	DH	0	10 CPU 10	DH	0
11 CPU 11	SH	0	12 CPU 12	SH	0
13 CPU 13	SH	0	14 CPU 14	SH	0
15 CPU 15	SH	0	16 CPU 16	SH	0

Example: Input page

Page fields:

Name: Text field with xx characters to name computer ports

Type: Selection field (SH=single-head, DH=dual-head, etc.)

CON: Numerical field with xx digits

See page 48 for details

Figure 5-7. Input page.

Keyboard Control

Table 5-1. Key sequences and their functions.

Key Sequence	Function
<Cursor left>	Cursor left—only inside an Input field or Switch Page
<Cursor right>	Cursor right—only inside an Input field or Switch Page
<Cursor up>	Line up (with wraparound) in Input fields or Switch Page, Line up (without wraparound) in Menus
<Cursor down>	Line down (with wraparound) in Input fields or Switch Page, Line down (without wraparound) in Menus
<Page up>	Page up in Input/Status Pages with several pages
<Page down>	Page down in Input/Status Pages with several pages
<Tab>	Next field in Input Pages
<Shift> + <Tab>	Previous field in Input Pages
<+>	Next Option in Select fields
<->	Previous Option in Select fields
<SPACE>	Switch in selection fields with two options only (On/Off or No/Yes) Only if "Allow Sharing" active: Apply and save data in Page "KVMSwitch"
<RETURN>	Apply and save data—in Input Pages Select option—in Menus
<ESC>	Cancel data input without saving—in Input Pages Back to Menu—in Selection pages and Menus
ALL	Select all options
CLEAR	Clear all options
CANCEL	Cancel data input without saving
SAVE	Apply and save data

5.1.2 Open Configuration Menu

Please perform the following steps:

Enter into the OSD with key sequence <Left-Ctrl>+ <Left-Shift>+ <O> (Letter "o") or <Strg>+<Shift>+ <O> (Letter "o").

The "KVM List" Page is displayed full screen (If Option "Listview" is not active, "KVM Switch" Page will be displayed instead).

Leave the "KVM List" Page by pressing <ESC>

The "Menu" is displayed full screen:

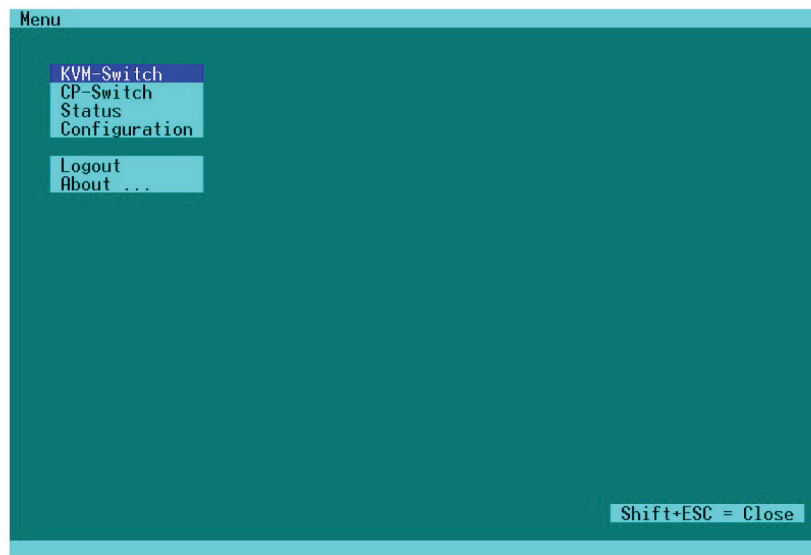


Figure 5-8. Menu.

Select the menu option "Configuration" by using the cursor buttons and confirm with <RETURN>.

If you are not yet logged into the OSD as Administrator, the LOGIN Dialog is now displayed:

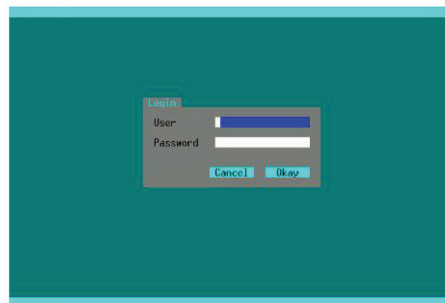


Figure 5-9. Login dialog box.

All configuration adjustments require administrator rights. When you receive the ServSwitch DKM, the following default user account is pre-defined:

User: admin (case sensitive)

Password: admin (case sensitive)

NOTE: Please modify this password at the first login.

After successful login the "Configuration" menu is displayed:



Figure 5-10. Configuration menu.

The default selection is "System." Select the desired menu option by using the cursor buttons and confirm with <RETURN>.

5.1.3 Load Configurations

Select the option "Open" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN>

The "Open" page is displayed full screen.

In this menu, you can load any switch configuration that has been previously stored within the switch.

The current configuration is shown as "Active."

Besides the Default configuration, up to eight further configurations can be loaded.

The configuration to be loaded is selected by cursor buttons or mouse and must be confirmed by <RETURN> or double click.

The selected configuration will be set immediately and will be displayed as "Active." The former configuration is deleted.

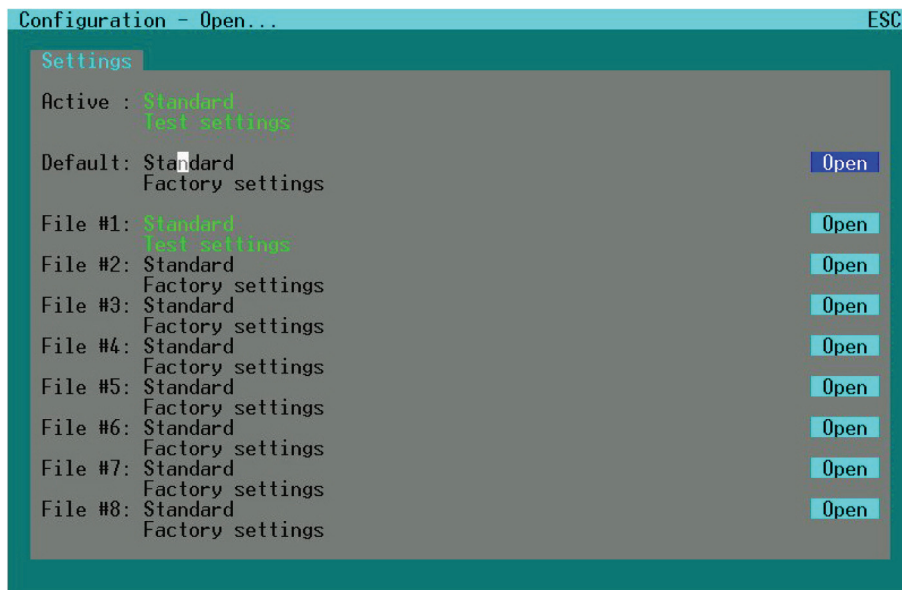


Figure 5-11. Open page.

5.1.4 System Configurations

Select the option "System" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN>.

The "System" page is displayed full screen.

In this menu, you can set and modify the switch configuration.

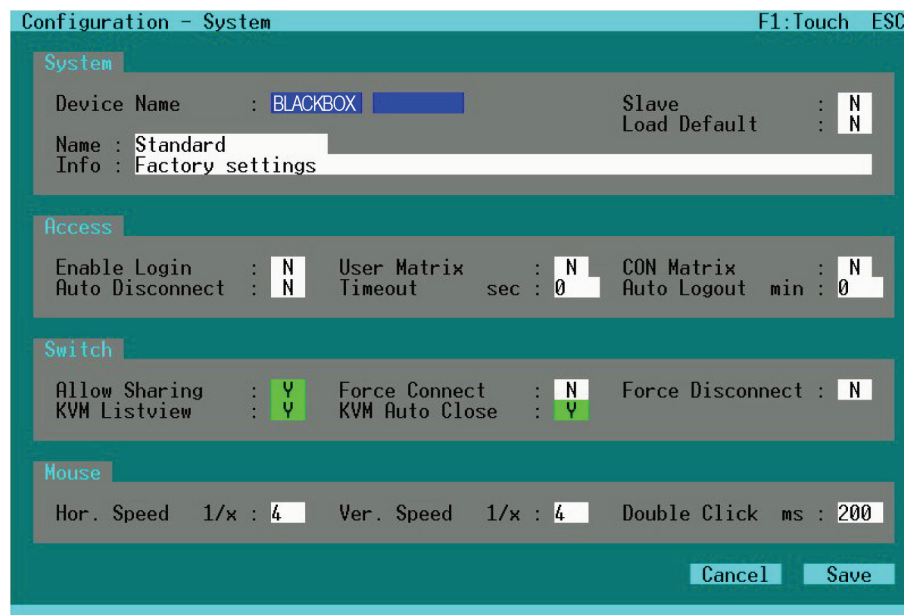


Figure 5-12. System page.

Table 5-2. System Options.

Field	Selection	Description
Name	CHR16	(Input) Configuration name. Used for saving the current configuration to file.
Device	CHR16	(Input) Device name (displayed in all menus at the lower left)
Info	CHR64	(Input) Detailed information about the current configuration.
Slave	Y/N	Y—This switch is configured according to a master switch and remotely controlled. No configuration is possible.
		N—No slave mode.
Load Default	Y/N	Y—Upon “Power On” or “Restart” the switch will boot with the Default configuration.
		N—Upon “Power On” or “Restart” the switch will boot with the last configuration.
Auto Save	Y/N	Y—Switch saves periodically the current configuration into flash.
		N—No automatic saving.
Enable COM Echo	Y/N	Y—Switch sends echoes of all performed switch commands (see Appendix D).
		N—No Echoes.
Lock COM Ports	Y/N	Y—While an OSD is open, all commands via external interfaces are rejected (LAN, serial).
		N—No rejection.

Table 5-3. Access Options.

Field	Selection	Description
Enable Login	Y/N	Y—Login required to access the OSD with user name and password. After login, the user will remain logged in until he explicitly logs out or an Auto Logout has been performed (see below). KVM Switching with Hot Keys requires the user to be logged in.
		N—No Login required.
User Matrix	Y/N	Y—User access restricted to CPUs explicitly unlocked in the User Matrix (see Section 5.1.7). User matrix mode requires user login and implies “Enable Login” = “Y.” KVM Switching with hotkeys requires the user to be logged in.
		N—User Matrix disabled.
CON Matrix	Y/N	Y—CON Port connectivity restricted to CPUs explicitly unlocked in the CON Matrix (see Section 5.1.9).
		N—CON Matrix disabled.
Auto Disconnect	Y/N	Y—Only active if “Enable Login” or “User Matrix” are activated: CON Port is disconnected from current CPU Port upon entering into the OSD.
		N—Current Connection is held

Table 5-3 (Continued). Access Options.

Field	Selection	Description
Timeout	seconds	###—Time of inactivity, after which OSD is closed automatically. 0 sec—No Timeout.
Auto Logout	minutes	###—Time of inactivity, after which the user at this console is logged out from OSD access automatically. 0 min—Immediate Logout from OSD after closing the OSD.

Table 5-4. Switch Options.

Field	Selection	Description
Allow Sharing	Y/N	Y—User may connect to any unlocked CPU with Video Access only. NOTE: Switch with <Space> Key, not <Return>.
		N—No Sharing.
Force Connect	Y/N	Y—User may connect to any unlocked CPU with full control pushing any previous user to Video Access only. NOTE: Switch with <Return> Key.
		N—No Force Connect.
Force Disconnect	Y/N	Y—User may connect to any unlocked CPU with full control with any previous user being disconnected. NOTE: Switch with <Return> Key.
		N—No Force Disconnect.
KVM Listview	Y/N	Y—OSD is opened with Menu “KVM List” (default) (Dynamic display of available CPU Ports).
		N—OSD is opened with Menu “KVM Switch” (Static display of available CPU Ports).
KVM Auto Close	Y/N	Y—Immediate exit from OSD after switching CPU Port in Menu “KVM List” or “KVM Switch” with immediate display of the new CPU.
		N—No Auto Close.

NOTE: If “Allow Sharing” is activated, the current user of a CPU will not note if other users gain video access to his CPU.

Table 5-5. Mouse Options.

Field	Selection	Description
Hor. Speed	VAL2	Setting up the horizontal mouse speed (default 4).
Ver. Speed	VAL2	Setting up the vertical mouse speed (default 4).
Mouse Click	VAL3	Setting up the time frame for “double click” (default 200).

NOTE: Mouse settings are CON Port specific and can be adjusted for each CON Port separately.

5.1.5 Touchscreen Settings

The ServSwitch DKM OSD supports touchscreens.

NOTE: USB HID-based touchscreen protocols are supported. Support of Vendor specific protocols only upon request.

From "System" page, you can enter into "Touchscreen" Page by pressing <F1>.

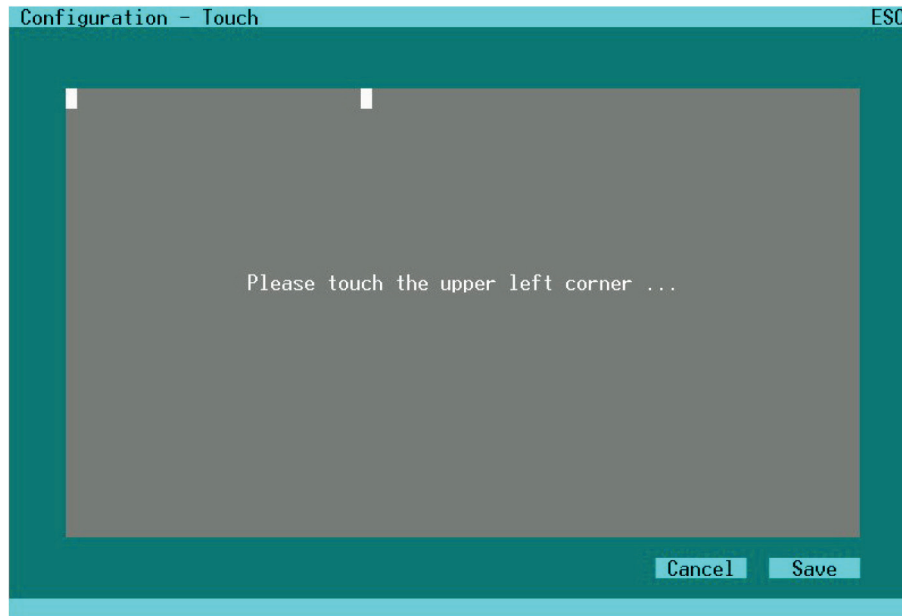


Figure 5-13. Touchscreen page.

In this page, you can calibrate your touchscreen. You will be asked to touch twice on a point at the upper left, then at the lower right-hand side of the screen. Thereafter, you may test the calibration result, cancel or save the calibration.

This calibration is CON Port specific and must be repeated for each touchscreen at its CON Port.

Touch Control

Control by touch is mostly similar to mouse control. Confirmation of a selection is performed by a second touch instead of double click.

5.1.6 User Attributes Configuration

Select the option "User" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN>.

The "User" page is displayed full screen.

In this menu, you can setup users with their names and privileges.

	Name	Password	HTP	FTP	PPP	TEL	POW	ADM
01	admin	password	Y	Y	Y	Y	Y	Y
02	power	power	N	N	N	N	Y	N
03			N	N	N	N	N	N
04			N	N	N	N	N	N
05			N	N	N	N	N	N
06			N	N	N	N	N	N
07			N	N	N	N	N	N
08			N	N	N	N	N	N

Figure 5-14. User page.

Table 5-6. Configuration options.

Field	Selection	Description
Name	16 characters	User Name (case-sensitive)
Password	16 characters	User Password (case-sensitive)
HTP	Y/N	User may login and access via HTTP (for configuration and management)
FTP	Y/N	User may login and access via FTP (for configuration)
PPP	Y/N	User may login and access via Internet (reserved for future use)
TEL	Y/N	User may login and access via Telnet
POW	Y/N	User is "Power-User" and may activate/toggle, for example, the CrossPoint Mode
ADM	Y/N	User is Administrator and may change the configuration or activate/toggle the CrossPoint Mode

NOTE: Some of the options above may never be used, but are shown for reference.

5.1.7 User Matrix Configuration

Select the option "User Matrix" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN>.

The "User Matrix" page is displayed full screen.

In this menu, the administrator can define for each user a specific set of CPU's that this user might connect to. The use of this matrix is activated in the "System" Menu by setting the option "User Matrix." If the option "User Matrix" is active, any switching requires the user to be logged in. Only then, switching by Hot keys will be supported.

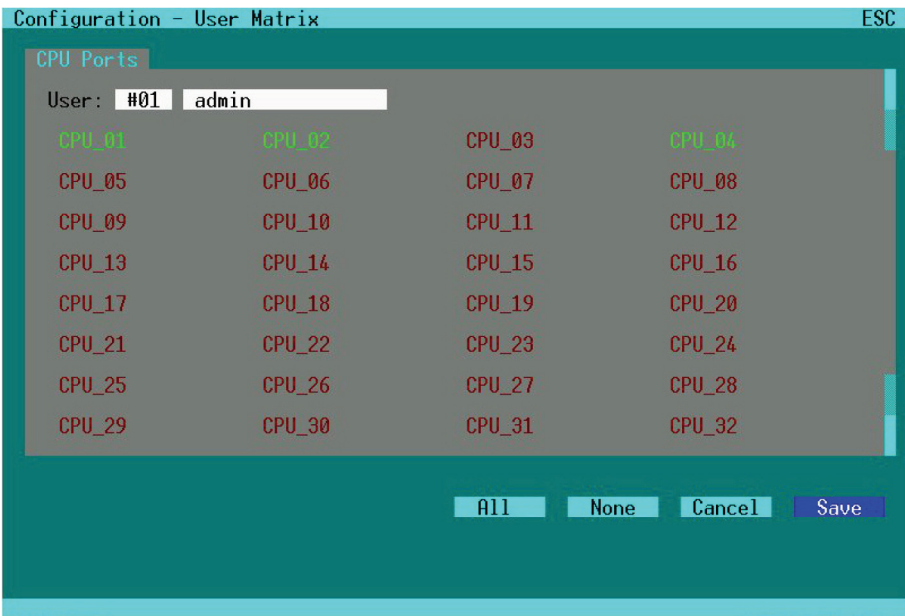


Figure 5-15. User Matrix page.

Table 5-7. Keyboard Control.

Command	Description
<Page up>:	Page up to previous user
<Page down>:	Page down to next user
<Cursor left>:	Move to left field
<Cursor right>:	Move to right field
<Cursor up>:	Line up
<Cursor down>:	Line down
<Tab>:	Next field
<Shift> + <Tab>:	Previous field
<SPACE>:	Release selected CPU-Port for selected User
<RETURN>:	Release selected CPU-Port for selected User
<ESC>:	Back to "Configuration" Menu
ALL :	Select all CPU's
SAVE :	Apply and save data
NONE :	Clear all CPU's
CANCEL :	Cancel data input without saving

NOTE: The options "All" and "None" need to be confirmed by "Save" or may be cancelled by "Cancel."

5.1.8 CON Ports Configuration

Please select the option "CON Ports" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN>.

The "CON Ports" page is displayed full screen.

In this menu, the administrator can define for each CON Port the name, the type, the OSD representation and the connected CPU.

Note the following guidelines for type selection:

- Single-head ports and USB 2.0 ports can be switched separately.
- Dual-head ports, quad-head ports, single-head/USB 2.0 ports and triple-head/USB 2.0 ports are always switched in parallel.
- Only odd port numbers (#01, 03, 05, etc.) may be configured as dual-head ports or single-head/USB 2.0 ports.
- Only every fourth Port (#01, 05, 09, etc.) may be configured as quad-head port or triple-head/USB 2.0 port.

Chapter 5: ServSwitch DKM Configuration

- Only the first CON-Port can be switched by hotkeys, all other ports behave like slaves.
- If you switch from a multi-head CPU port to a differently configured CPU port, one or more monitors may remain dark.
- If the user switches from a quad-head console to a single-head CPU port, all other three monitors will remain dark.
- If the user switches from a quad-head console to a dual-head CPU port, the last two monitors will remain dark.
- If the user at a triple-head/USB 2.0 console switches to a single-head/USB 2.0 CPU port, two monitors will remain dark and the USB port remains inactive.
- If the user at a single-head/USB 2.0 console switches to a single-head CPU port with a subsequent USB 2.0 CPU port, the USB Port still remains inactive.

CAUTION: If CPU ports or CON ports are re-configured from DVI/KVM to USB 2.0 or vice versa, the change will only become active after the new switch configuration has been saved in the "System" menu or the switch has been restarted. It further might require to re-power the ServSwitch DKM. We recommend that you configure and test your switch layout in a test installation before final installation/creation.

NOTE: For the OSD selection: Selection "VAR"(default) displays the OSD with 800 x 600 size at the center of the monitor without changing the current monitor resolution. Accordingly, the OSD appears with different size on monitors with different resolutions.

Selection of a specific resolution displays the OSD with such resolution in full screen size. This may cause delays in displaying the screen content while going into the OSD but also when leaving the OSD. Those delays are monitor specific.

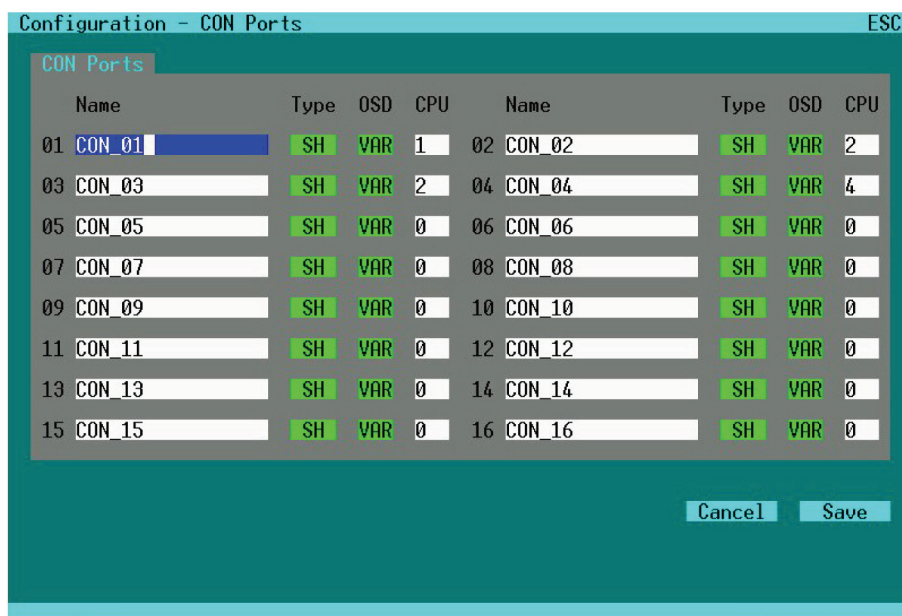


Figure 5-16. Configuration CON ports screen.

Table 5-8. Configuration Options.

Field	Type	Description
Name	16 chars	Name of the CON Port connected to this CPU Port
Type	SELECT	SH = Single-Head Port
		DH = Dual-Head Port
		QH = Quad-Head Port
		0U = USB 2.0 Port
		1U = Single-Head Port with USB2.0 Port
		3U = Triple-Head Port with USB 2.0 Port
OSD	SELECT	VAR = OSD embedded in current resolution
		800 = OSD with full-screen resolution (800x600)
		1024 = OSD with full-screen resolution (1024x768)
		1280 = OSD with full-screen resolution (1280x1024)
		1600 = OSD with full-screen resolution (1600x1200)
		1920 = OSD with full-screen resolution (1920x1200)
CPU	VAL2	No. of CPU port connected to this Console (Status) or to be connected by <SAVE>

5.1.9 CON Matrix Configuration

Select the option "CON Matrix" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN>.

The "CON Matrix" page is displayed full screen.

In this menu, the administrator can define for each console a specific set of CPU's that this console might connect to. The use of this matrix is activated in the "System" Menu by setting the option "CON Matrix."

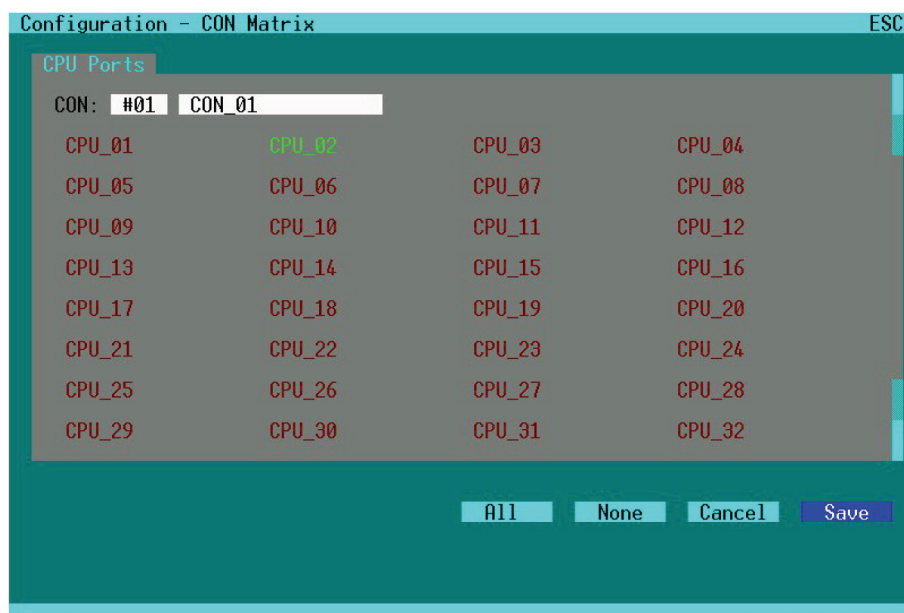


Figure 5-17. CON Matrix page.

Table 5-9. Keyboard Control.

Command	Description
<Page up>:	Page up to previous CON port
<Page down>:	Page down to next CON port
<Cursor left>:	Move to left field
<Cursor right>:	Move to right field
<Cursor up>:	Line up
<Cursor down>:	Line down
<Tab>:	Next field
<Shift> + <Tab>:	Previous field
<SPACE>:	Release selected CPU-Port for selected CON port
<RETURN>:	Release selected CPU-Port for selected CON port, apply and save data
<ESC>:	Back to upper Menu
ALL :	Select all CPUs
SAVE :	Apply and save data
NONE :	Clear all CPUs
CANCEL :	Cancel data input without saving

5.1.10 CPU Ports Configuration

Select the option “CPU Ports” in the “Configuration” menu by using the cursor buttons and confirm with <RETURN>.

The “CPU Ports” page is displayed full screen.

In this menu, the administrator can define for each CPU Port the name, the type, and the number of connected CON Ports. For further details, see Configuration of CON Ports in Section 5.1.8.

Name	Type	CON	Name	Type	CON
01 CPU_01	SH	1	02 CPU_02	OU	2
03 CPU_03	DH	0	04 CPU_04	DH	4
05 CPU_05	QH	0	06 CPU_06	QH	0
07 CPU_07	QH	0	08 CPU_08	QH	0
09 CPU_09	1U	0	10 CPU_10	1U	0
11 CPU_11	SH	0	12 CPU_12	SH	0
13 CPU_13	SH	0	14 CPU_14	SH	0
15 CPU_15	SH	0	16 CPU_16	SH	0

Cancel Save

Figure 5-18. CPU Ports Page.

Table 5-10. Configuration Options.

Field	Type	Description
Name	16 chars	Name of the CON Port connected to this CPU Port
Type	SELECT	SH = Single-Head Port
		DH = Dual-Head Port
		QH = Quad-Head Port
		OU = USB2.0 Port
		1U = Single-Head Port with USB2.0 Port
		3U = Triple-Head Port with USB 2.0 Port
CON	VAL2	No. of CON Port connected to this CPU (Status) or to be connected by <SAVE>

5.1.11 Network Parameters Configuration

Please select the option "Network" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN> The "Network" page is displayed full screen.

In this menu, the administrator can define the parameters for the ServSwitch DKM IP network interface. The functionality of the network interface is described in Appendix D: Network Interface.

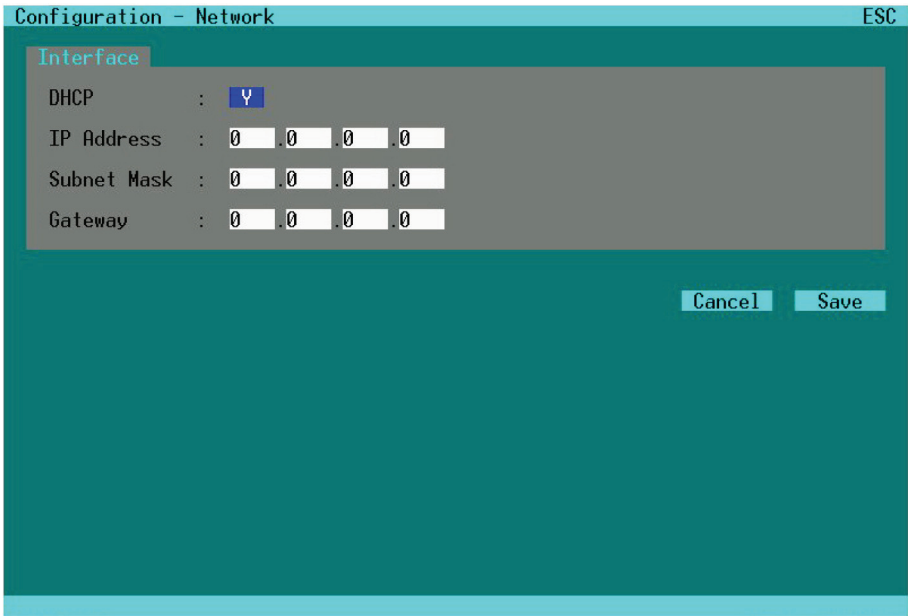


Figure 5-19. Network page.

Table 5-11. Configuration Options.

Field	Type	Description
DHCP	Y/N	Select dynamic network configuration ("Y" or "N")
IP Address	4x BYTE	Enter IP Address (format "192.168.1.1") without DHCP
Subnet Page	4x BYTE	Enter Subnet Page (format "255.255.255.0") without DHCP
Gateway	4x BYTE	Enter Gateway Address (format ,192.168.2.1') without DHCP

CAUTION: Contact your System administrator before changing these settings; otherwise, connection to the network might cause undesired results or malfunctions.

NOTE: If the IP address does not register after selecting "Restart" on the main menu, you may need to manually power cycle the ServSwitch DKM.

5.1.12 Macros Programming

Select the option "Macro Keys" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN>.

The "Macro Keys" page is displayed full screen.

This section describes the programming of switch macros. The macros will be stored for each console separately. (The macro keyboard is still under development.)

NOTE: If you want to use Keyboard, mouse and macro keyboard simultaneously, you will need an extender kit with four USB HID Ports (for example, ACS4004A-R2).

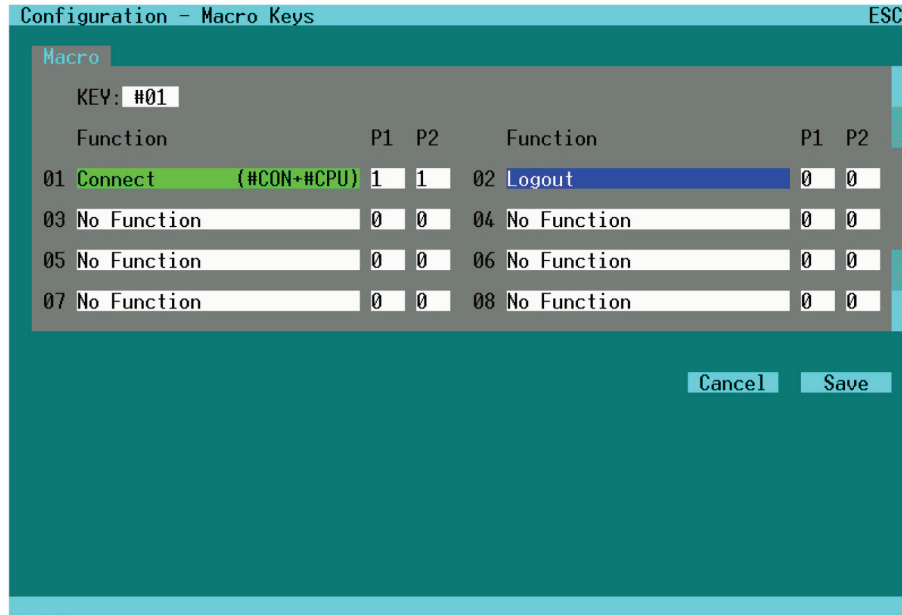


Figure 5-20. Macro Keys page.

Table 5-12. Configuration Options.

Field	Type	Description
No	Select	Number of the command (8 commands max)
Command	Select	"Connect P1 to P2" Bidirectional Connection of CON Port P1 with CPU P2
		"Connect Video P1 to P2" Video Connection of CON Port P1 with CPU P2
		"Disconnect P1" Disconnect CON Port P1
		"Open P1" Open Configuration File P1
		"Save" Save current configuration inside the switch
		"Save As P1" Save current configuration in Configuration File P1
		"Logout"
P1	VAL2	1) Number of CON Port (0 = own CON Port) 2) Number of Configuration File (0 = Default)
P2	VAL2	1) Number of CPU Port to be connected with CON Port P1

Table 5-13. Keyboard Commands.

Command	Description
<Page up>:	Page up to previous macro
<Page down>:	Page down to next macro
<Cursor left>:	Move to left field
<Cursor right>:	Move to right field
<Cursor up>:	Line up
<Cursor down>:	Line down
<Tab>:	Next field
<Shift> + <Tab>:	Previous field
<->:	Select next function
<+>:	Select previous function
<RETURN>:	Apply and save macros in current configuration
<ESC>:	Back to upper Menu

5.1.13 Saving Configurations inside the Switch

Select the option "Save" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN>.

By selecting this option, the current configuration will be saved into the internal switch memory. The last configuration that has been saved into the internal switch memory will be restored upon "Restart."

NOTE: The SAVE operation requires "Blocking Access" for the Switch-Memory and causes up to several seconds lasting freeze of all OSD Menus. The data paths and switching routes are not affected by this.

By selecting the option "Auto Save" in the system settings the current Switch configuration will further be periodically saved into the internal switch memory, which will also cause all OSD instances to be frozen momentarily.

5.1.14 Saving Configurations into File

Select the option "Save as" in the "Configuration" menu by using the cursor buttons and confirm with <RETURN>.

The "Save as" page is displayed full screen.

In this menu, you can save your current switch configuration to file. This does not replace saving the configuration within the switch.

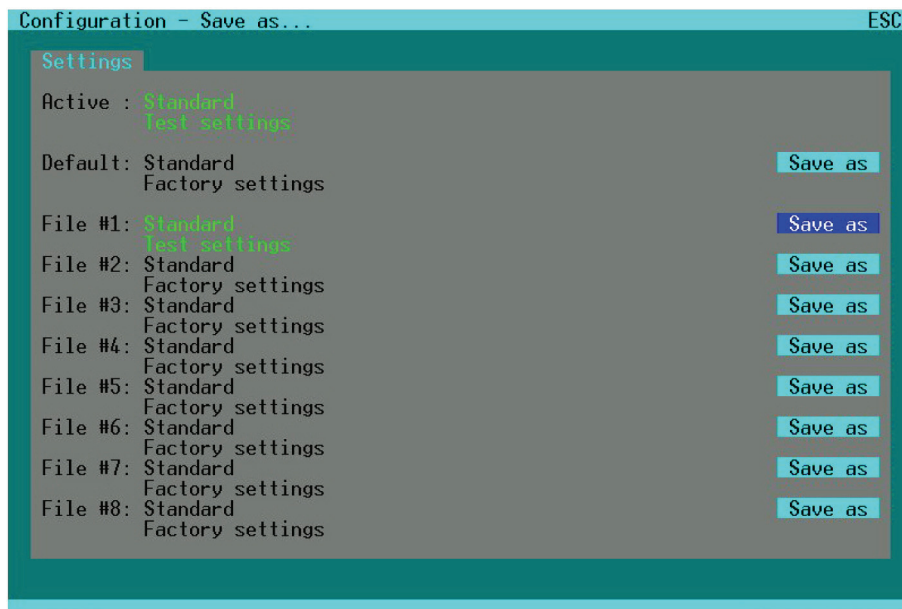


Figure 5-21. Save as page.

The current configuration together with name and detailed information is shown as “Active.”

This configuration can be stored either to the “Default” configuration file or to up to eight further configuration files.

The file for the configuration to be saved to is selected by cursor buttons or mouse and must be confirmed by <RETURN> or double click. The configuration previously stored in the selected file is deleted by this operation and cannot be recovered.

For saving configurations externally, please refer to External Saving of Configuration Files in Section 5.5.2.

5.1.15 Restart Your Switch

In the “Configuration” menu you can select from three options to restart the ServSwitch DKM: Restart, Default, and Reset.

Restart

By selecting “Restart,” the ServSwitch DKM will reboot with its current configuration.

Exception: If the parameter “Load Default” in menu “System” has been selected, the switch will boot with the default configuration.

Default

By selecting “Default” the ServSwitch DKM will reboot with the default configuration.

Reset

By selecting “Reset” the ServSwitch DKM will reboot with the original factory configuration.

Exception: After a firmware update the ServSwitch DKM will reboot with the firmware configuration.

5.2 Configuration via Browser and Web Interface

The Web Interface is under development and at the time of the writing of this manual is non-operational. Currently available is a Java based application. The Java applet can be obtained from the Black Box Web site and can be used for switching.

5.3 Configuration via Serial Interface

The ServSwitch DKM can currently be switched but not be configured via serial interface.

All available RS-232 commands are listed in Appendix C: Serial Interface.

5.4 Configuration via IR Remote Control and LCD Display

The ServSwitch DKM can be configured via the IR remote control and the LCD display in the following limited way. For full functionality, refer to the OSD interface.

5.4.1 IR Remote Control

Table 5-14. IR remote control buttons.

Button	Function
	<RETURN>
	<ESC>
	<NEXT>
	<PREV>
	<LINE UP>
	<LINE DOWN>
	<PAGE UP>
	< PAGE DOWN>

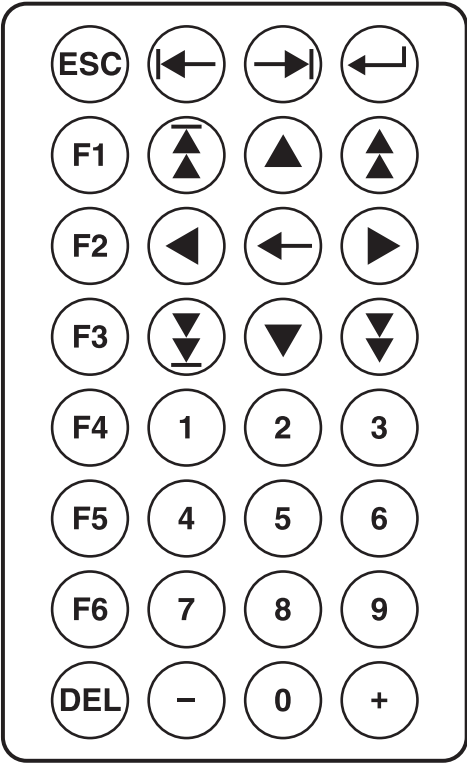


Figure 5-22. Remote control.

5.4.2 Home Page

During regular operation, the Home Page is displayed. In this display you'll find some device information:



Figure 5-23. Home page.

5.4.3 Menu Page

From the "Home" Page you open the "Menu" Page by pressing <RETURN>.

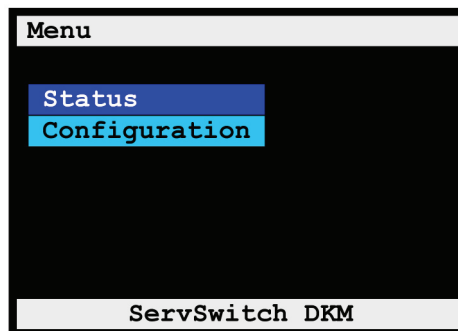


Figure 5-24. Menu page.

5.4.4 Configuration Page

Please select the option "Configuration" in the "Menu Page" by using the cursor buttons and confirm with <RETURN>.

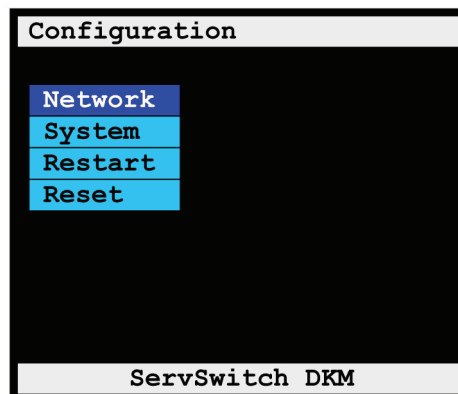


Figure 5-25. Configuration page.

5.4.5 Configuration of Network Parameters

Select the option "Network" in the "Configuration Page" by using the cursor buttons and confirm with <RETURN>.

The "Configuration Network" page is displayed full screen.

In this menu, you can define the parameters for the ServSwitch DKM IP network interface. The functionality of the network interface is described in Appendix D: Network Interface.

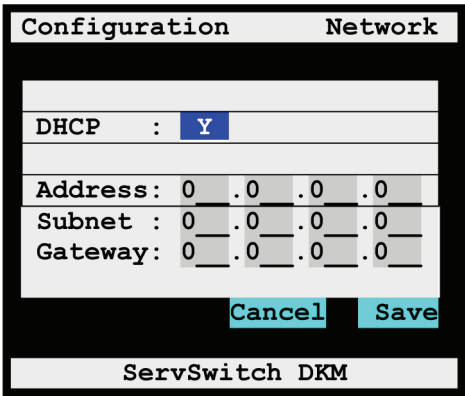


Figure 5-26. Configuration Network page.

Table 5-15. Configuration options.

Field	Type	Description
DHCP	Y/N	Select dynamic network configuration ("Y" or "N")
IP Address	4x BYTE	Enter IP Address (format "192.168.1.1") without DHCP
Subnet Page	4x BYTE	Enter Subnet Page (format "255.255.255.0") without DHCP
Gateway	4x BYTE	Enter Gateway Address (format ,192.168.2.1') without DHCP

CAUTION: Contact your System administrator before changing this data. Otherwise, connection to the network might cause undesired results or malfunctions. The ServSwitch DKM may need to be power cycled after network settings are altered.

5.4.6 Configuration of System Parameters

Select the option "System" in the "Configuration Page" by using the cursor buttons and confirm with <RETURN>.

The "Configuration System" page is displayed full screen.

In this menu, you can define some parameters for the ServSwitch DKM system configuration.

Configuration		System
Slave	:	N
Load Default	:	N
Login	:	N
User Matrix	:	N
CON Matrix	:	N
		Cancel Save
ServSwitch DKM		

Figure 5-27. Configuration System page.

Table 5-16. System Options.

Field	Selection	Description
Slave	Y/N	Y—This switch is configured according to a master switch and remotely controlled. No configuration is possible.
		N—No slave mode.
Load Default	Y/N	Y—Upon “Power On” or “Restart,” the switch will boot with the Default configuration.
		N—Upon “Power On” or “Restart,” the switch will boot with the last configuration.

Table 5-17. Access Options.

Field	Selection	Description
Login	Y/N	Y—Login required to access the OSD with user name and password. After login, the user will remain logged in until he explicitly logs out or an Auto Logout has been performed (see below). KVM Switching with Hot Keys requires the user to be logged in. N—No Login required.
User Matrix	Y/N	Y—User access restricted to CPU’s explicitly unlocked in the User Matrix. User matrix mode requires user login and implies “Enable Login” = “Y.” KVM Switching with Hot Keys requires the user to be logged in. N—User Matrix disabled.
CON Matrix	Y/N	Y—CON Port connectivity restricted to CPU’s explicitly unlocked in the CON Matrix. N—CON Matrix disabled.

5.4.7 Restart Your Switch

Select the option "Restart" in the "Configuration Page" by using the cursor buttons and confirm with <RETURN>

Restart

By selecting "Restart" the ServSwitch DKM will reboot with its current configuration.

Exception: If the parameter "Load Default" in menu "System" has been selected, the switch will boot with the default configuration.

5.4.8 Reset Your Switch

Select the option "Reset" in the "Configuration Page" by using the cursor buttons and confirm with <RETURN>.

Reset

By selecting "Reset" the ServSwitch DKM will reboot with the original factory configuration.

Exception: After a firmware update the ServSwitch DKM will reboot with the firmware configuration.

6. Status Information

The status information of the ServSwitch DKM can be displayed in four different ways:

- Via a console connected to a console port via OSD.
- Via a PC, a Java based applet.
- Via a PC and the serial interface (limited functionality).
- Via the supplied IR Remote Control at the LCD-Display (limited functionality).

In all operation modes, the same pages are generated and displayed.

A description of the general frame structure as well as keyboard control is given in Configuration via Console in Section 5.1.

6.1 Status Display via Console and OSD

6.1.1 Open the Status Menu

Perform the following steps:

Toggle the OSD with key sequence, <Left-Ctrl> + <Left-Shift> + <O> (Letter "o") or <Strg>+ <Shift>+ <O> (Letter "o")

The "KVM List" Page is displayed full screen (If Option "Listview" is not active, "KVM Switch" Page will be displayed instead).

Leave the "KVM List" Page by pressing <ESC>

The "Menu" is displayed full screen:

Please select the menu option "Status" by using the cursor buttons and confirm with <RETURN>

The "Status" page is displayed full screen:

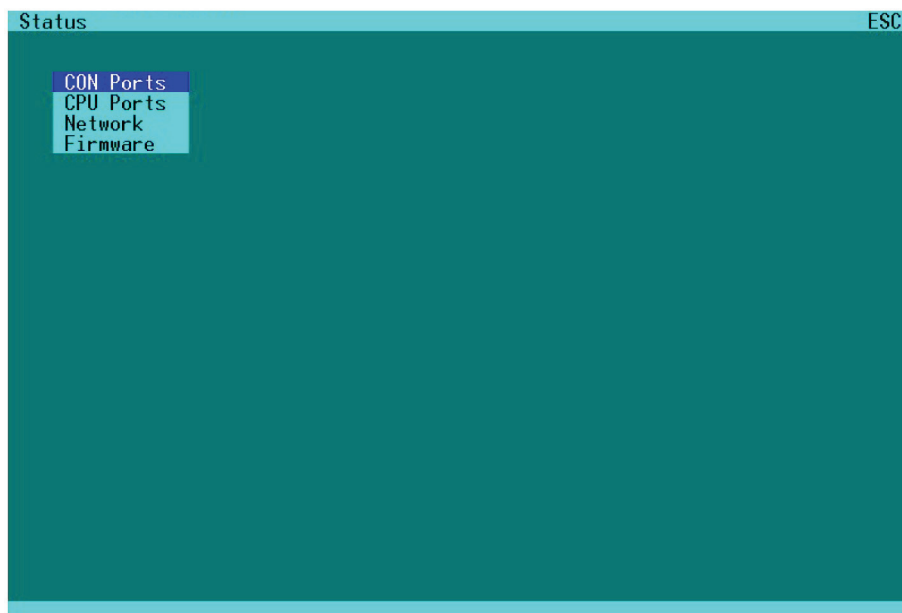


Figure 6-1. Status page.

6.1.2 CON Ports Status Display

Select the option "CON Ports" in the "Status" menu by using the cursor buttons and confirm with <RETURN>.

The "Status CON Ports" page is displayed full screen.

This status view shows which console has connections to which CPU. Pressing the "F1" key opens the "CPU Port view."

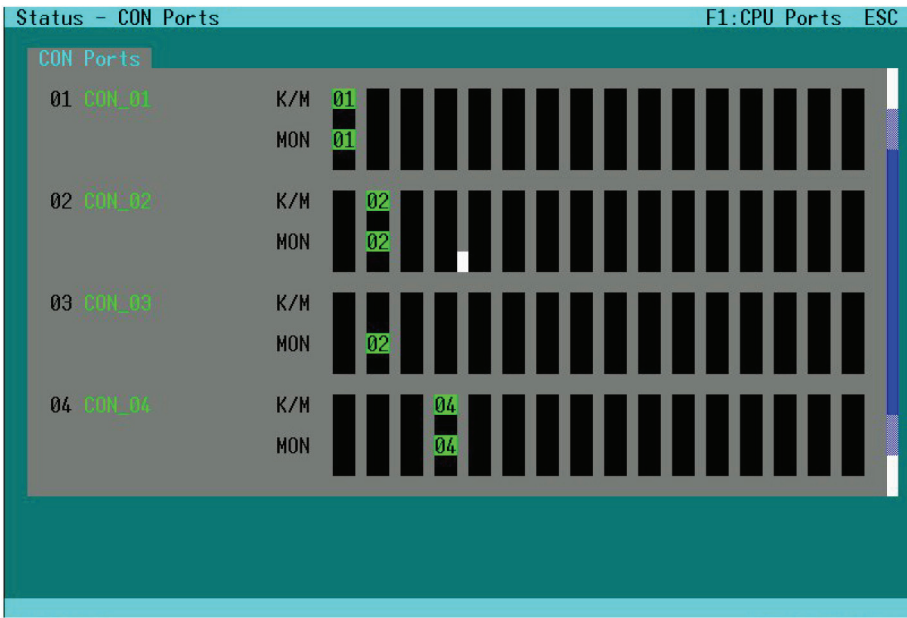


Figure 6-2. Status CON Ports page.

Navigation Options:

Table 6-1. Navigation options.

Option	Description
<Page up>	Page up in Input-/Status Pages with several pages
<Page down>	Page down in Input-/Status Pages with several pages
<F1>	Switch to Status Display of CPU Ports
<ESC>	Return to "Status" Page

Displays

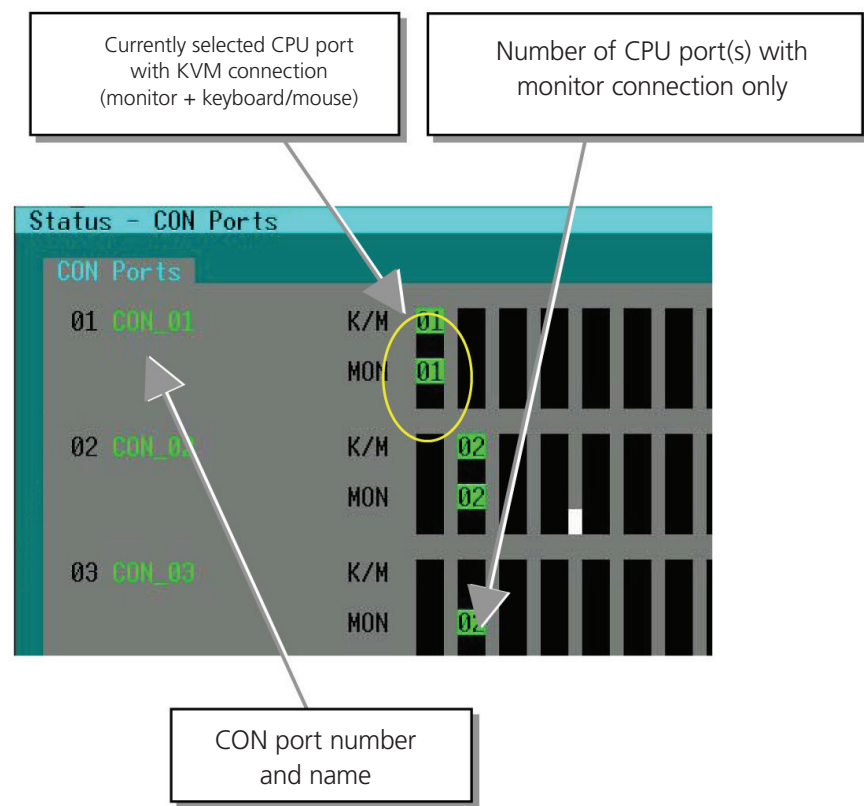


Figure 6-3. Displays screen.

6.1.3 CPU Ports Status Display

Select the option "CPU Ports" in the "Status" menu by using the cursor buttons and confirm with <RETURN>.

The "Status – CPU Ports" page is displayed full screen.

This screen shows which CPU has connections to which console. It will also show any CPU that is being displayed on several monitors.

Pressing the "F1" key switches to the "User Port view".

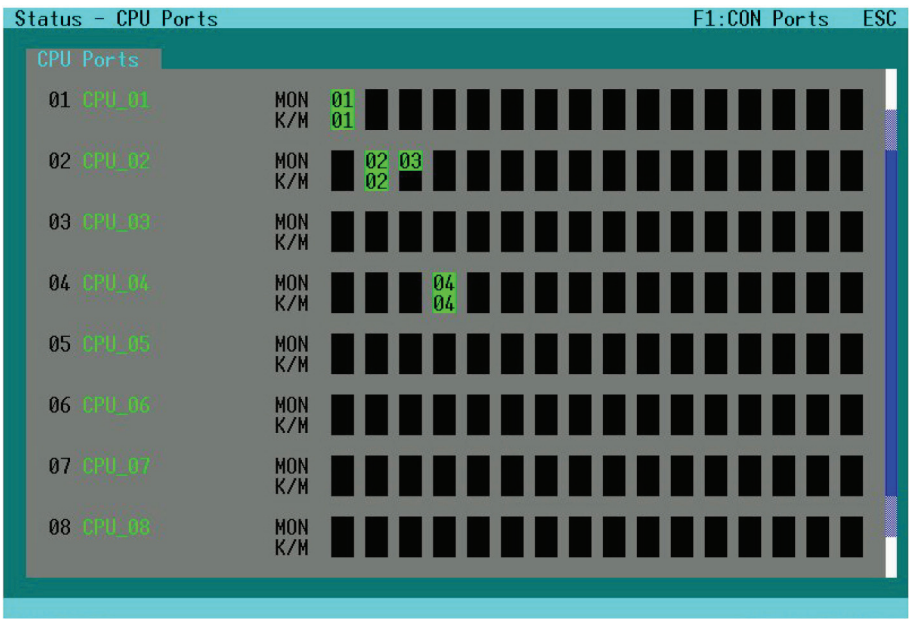


Figure 6-4. CPU ports page.

Navigation Options:

Table 6-2. Navigation options.

Option	Description
<Page up>	Page up in Input-/Status Pages with several pages
<Page down>	Page down in Input-/Status Pages with several pages
<F1>	Switch to Status Display of User Ports
<ESC>	Return to "Status" Page

Displays

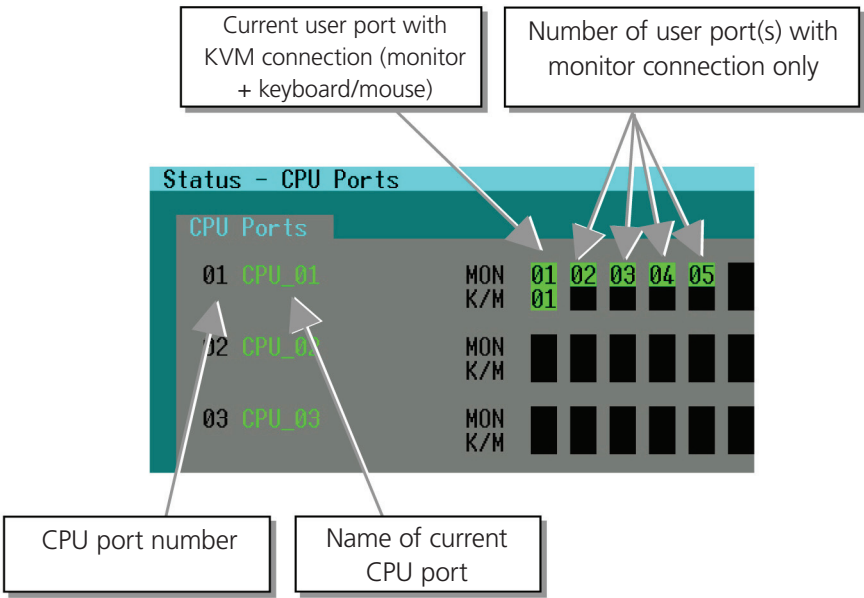


Figure 6-5. CPU ports displays screen.

6.1.4 Network Status Display

Please select the option "Network" in the "Status" menu by using the cursor buttons and confirm with <RETURN>.

The "Network" page is displayed full screen.

This status view shows the complete network configuration.

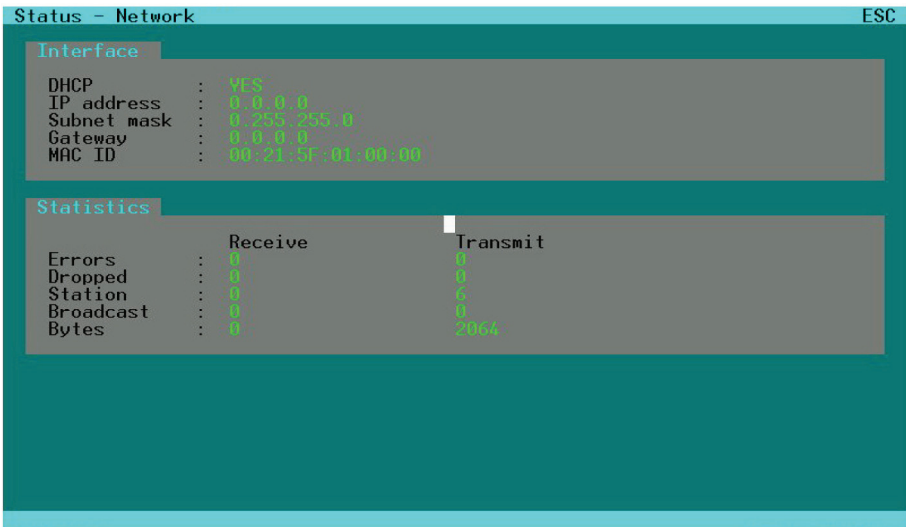


Figure 6-6. Network page.

Table 6-3. Interface display.

Field	Description
DHCP	Display of dynamic network configuration status ("YES" or "NO")
IP Address	Display of IP Address (as entered manually or received by DHCP)
Subnet Mask	Display of Subnet Mask (as entered manually or received by DHCP)
Gateway	Display of Gateway Address (as entered manually or received by DHCP)

Table 6-4. Number of packets received/transmitted display.

Field	Description
Errors	Number of packets with errors
Dropped	Number of packets dropped
Station	Incoming packets
Broadcast	Outgoing packets
Bytes	Number of Bytes received/transmitted

6.1.5 Firmware Status Display

Select the option "Firmware" in the "Status" menu by using the cursor buttons and confirm with <RETURN>.

The "Status Firmware" page is displayed full screen.

This status view shows the firmware versions of the currently installed boards inside the switch. To scroll down, use the <PageDown> button.

Status - Firmware			ESC
Modules			
Slot	Type	Firmware	
01	I088	IOMCHT5 CAT 8 F10.04.12.12.08	
02	I088		
03	I088		
04	I088		
05	I088	IOMCHT5 CAT 8 F10.04.12.12.08	
06	I088		

Figure 6-7. Status Firmware page, page 1 of 2.

Navigation Options:

Table 6-5. Navigation options.

Option	Description
<Page up>	Page up in Input-/Status Pages with several pages
<Page down>	Page down in Input-/Status Pages with several pages
<ESC>	Return to “Status” Page

Status - Firmware			ESC
Modules			
Slot	Type	Firmware	
07	OS088	Oscad OSD OSD 8 F01.10.27.02.09	
08	OS088		
09	LCD	Display DSP 1 F01.03.06.11.08	
10	MODFW	DMMFWR CPS 0 F10.03.28.10.08	
11	SWITCH	MOTRIR CPS 0 F10.04.04.11.08	
12	CPU	DMMCPW CPU 1 B01.08.03.03.09	

Figure 6-8. Status Firmware page, page 2 of 2.

6.2 Status Display via Browser/Web Interface

The Web Interface is under development. Currently instead of a Web browser, you can use our Java based applet to communicate with the switch. This application can be found at the Black Box Web site.

In Browser mode, the status display screens of the ServSwitch DKM will be performed similarly to the OSD mode. Similar pages are generated and displayed.

6.3 Status Display via Serial Interface

The ServSwitch DKM provides limited functionality via Serial Interface.

RS-232 commands provide information about the current ServSwitch DKM configuration.

All available RS-232 commands are listed in Appendix C: Serial Interface.

6.4 Status Display via LCD Display

The ServSwitch DKM provides various functions to display status information via LCD Display.

6.4.1 Home Page

During regular operation, the Home Page is displayed. In this Display you'll find some device information.



Figure 6-9. Home page screen.

6.4.2 Menu Page

From the "Home" Page, you open the "Menu" Page by pressing <RETURN> on the remote.

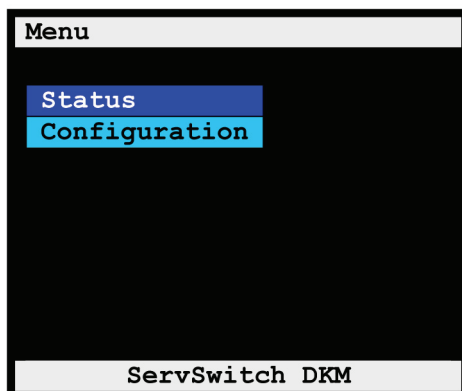


Figure 6-10. Menu page screen.

6.4.3 Status Page

From the "Menu" Page, you can open the "Status" Page by pressing <RETURN>.

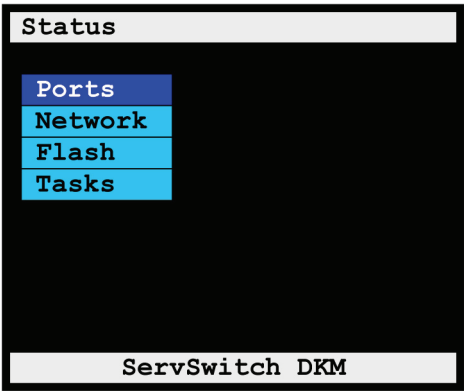


Figure 6-11. Status page screen.

6.4.4 Display of CPU-/CON-Ports Status

Select the option "Ports" in the "Status Page" by using the cursor buttons and confirm with <RETURN>.

The "Status Ports" page is displayed full screen.

In this menu, you can see which console each CPU is linked to. There are four pages about the Status of the CPU Ports and two pages about the Status of the CON-Ports.

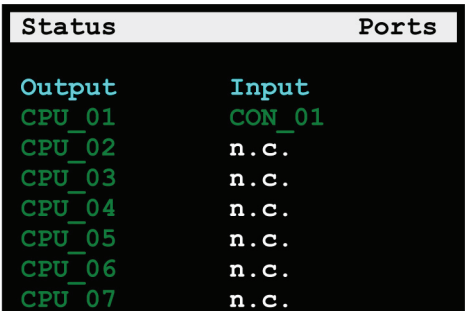


Figure 6-12. Status ports screen.

Navigation Options:

Table 6-6. Navigation options.

Option	Description
<Page up>	Previous page
<Page down>	Next page
<ESC>	Return to "Status" Page

Displays

The diagram illustrates the mapping of CPU port numbers to CON port numbers. Two callout boxes are present:

- CPU port number**: Points to the 'Output' column of the table.
- Number of CON port connected to this CPU**: Points to the 'Input' column of the table.

The table below shows the output of the `ServSwitch DKM` command:

Status	Ports
Output	Input
CPU_01	CON_01
CPU_02	n.c.
CPU_03	n.c.
CPU_04	n.c.
CPU_05	n.c.
CPU_06	n.c.
CPU_07	n.c.
CPU_08	n.c.

ServSwitch DKM

Figure 6-13. CPU-/CON-ports status screen.

6.4.5 Display of Network Status

Select the "Network" option in the "Status Page" by using the cursor buttons and confirm with <RETURN>.

The “Status Network” page is displayed full screen.

```
Status                                     Network
```

DHCP :	YES
IP address :	0.0.0.0
Subnet mask:	0.255.255.0
Gateway :	0.0.0.0
MAC ID :	00:21:5F:01:00:0E
	RX TX
Errors :	0 0
Dropped :	0 0
Station :	0 6
Broadcast :	0 0
Bytes :	0 2064

ServSwitch DKM

Figure 6-14. Status Network page.

Navigation Options:

<ESC>: Return to "Status" Page

Table 6-7. Interface display.

Field	Description
DHCP	Display of dynamic network configuration status ("YES" or "NO")
IP Address	Display of IP address (as entered manually or received by DHCP)
Subnet Page	Display of subnet page (as entered manually or received by DHCP)
Gateway	Display of gateway address (as entered manually or received by DHCP)
MAC ID	MAC address of the ServSwitch DKM
Field Description	(TX—Transmit; RX—Receive)
Errors	Number of packets with errors
Dropped	Number of packets dropped
Station	Incoming packets
Broadcast	Outgoing packets
Bytes	Number of Bytes received/transmitted

6.4.6 Display of Flash Status

Select the "Flash" option in the "Status Page" by using the cursor buttons and confirm with <RETURN>.

The "Status Flash" page is displayed full screen.

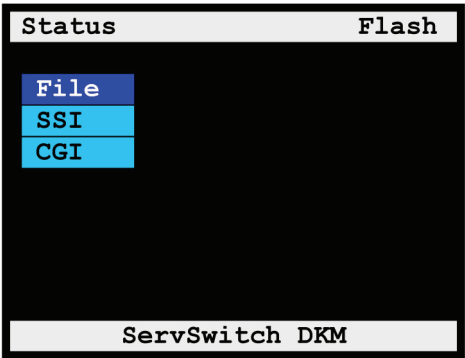


Figure 6-15. Status Flash page screen.

Navigation Options:

Table 6-8. Navigation options.

Field	Description
<Line up>	Move up a selection
<Line down>	Move down a selection
<RETURN>	Select option
<ESC>	Return to "Status" screen

Menu "File":

Select the option "File" in the "Status Flash Page" by using the cursor buttons and confirm with <RETURN>

The "Status Flash File" Page is displayed full screen.

These pages show the name and the size of the configuration files.

Status	Flash File
Filename	Size
config.sys	3920 *
default.sys	3444
config01.sys	3444
config02.sys	3444
config03.sys	3444
config03.sys	3444
config04.sys	3444
config05.sys	3444
config06.sys	3444
ServSwitch DKM	

Figure 6-16. Page 1 of "Status Flash Page."

Status	Flash File
Filename	Size
config07.sys	3444
config08.sys	3444
modul.sys	528
ServSwitch DKM	

Figure 6-17. Page 2 of "Status Flash Page."

Navigation Options:

Table 6-9. Navigation options.

Button	Description
<Page up>	Move up a selection
<Page down>	Move down a selection
<ESC>	Return to "Status Flash" screen by using the cursor buttons and confirm with <RETURN>

System files that may not be modified are marked with an asterisk.

Menu "SSI":

Select the option "SSI" in the "Status Flash Page" by using the cursor buttons and confirm with <RETURN>.

The "Status Flash SSI" Page is displayed full screen.

Status	Flash SSI
Script	Procedure
ssiTest1	0x00020E70
ssiTest2	0x00020E98
ServSwitch DKM	

Figure 6-18. Diagnostic data for internal use.

Navigation Options:

<ESC>: Return to "Status Flash" Page

Menu "CGI":

Select the option "CGI" in the "Status Flash Page" by using the cursor buttons and confirm with <RETURN>.

The "Status Flash CGI" Page is displayed full screen.

Status	Flash CGI
Script	Procedure
cgiTest1	0x00000D64
cgiTest2	0x00000D94
ServSwitch DKM	

Figure 6-19. Diagnostic data for internal use.

Navigation Options:

<ESC>: Return to "Status Flash" Page

6.4.7 Display of Tasks Status

Select the option "Tasks" in the "Menu Page" by using the cursor buttons and confirm with <RETURN>.

The "Status Tasks" page is displayed full screen.

Status		Tasks
taskMain	waiting	16E6
taskLAN	stopped	0000
taskSOCKEZ	waiting	2C54
taskUART	waiting	16E4
taskSWITCH	waiting	1671
taskLCD	active	16E8
taskOSD1	waiting	1E2B
taskOSD2	waiting	16E6
taskOSD3	stopped	003D
taskOSD4	stopped	003D
ServSwitch DKM		

Figure 6-20. Status Tasks page.

Navigation Options:

<ESC>: Return to "Home" Page

7. ServSwitch DKM Control

The ServSwitch DKM can be operated in three different ways: via instant switching, input pages, or external switch commands.

a) Instant Switching:

- Via a standard keyboard connected to a console port using hotkeys
- Via a macro command using a keyboard connected to a console port

b) Via Input Pages:

- Via a standard keyboard connected to a console port and the OSD
- Via a PC, using a Java based Applet
- Via a PC, a dedicated utility and the serial interface

In all operation modes, the same pages are generated and displayed. Accordingly, the switching is similar, independent from the method of access.

c) Via external switch commands:

- Via the network interface (under development)
- Via the serial interface

A description of the OSD, the general page concept and keyboard commands are provided in Configuration via Console in Section 5.1.

7.1 Instant Switching

7.1.1 Keyboard Hotkeys

Instant Switching with keyboard hotkeys is the fastest way for a user to switch between various CPUs.

By pressing <Left-Ctrl>+<Left-Shift> +<i> (Letter "i") or <Strg>+ <Shift>+ <I> (Letter "i") the Hotkey Mode is activated: Shift-Lock- and Scroll-LED will begin to flash when in hotkey mode.

The user enters the number of the desired CPU port and confirms with <RETURN>.

Instantaneously, the keyboard LEDs stop flashing, the Hotkey Mode is terminated, and the new CPU is connected to the console.

NOTE:

- *With Hotkeys you can only switch to available or accessible CPU's. The Options "Force Connect" and "Force Disconnect" as well as constraints provided by "User Matrix" and "CON Matrix" are considered.*
- *Hotkeys are only supported if neither the option "Enable Login" nor the option "User Matrix" are selected OR if the user is logged into the OSD.*

7.1.2 Changing the Default Instant Switching Hotkey

The hotkey <Left-Ctrl>+<Left-Shift> +<i> (Letter "i") or <Ctrl>+ <Shift>+ <I> (Letter "i") can easily be changed to the following alternatives described in Table 7-1.

Table 7-1. Hotkey options.

Hotkey	Description
1. Hotkey A (default)	<CTRL> + <SHIFT> + <I> simultaneously
2. Hotkey B	<Scroll lock>, <Scroll lock> press twice rapidly
3: Hotkey C	left <SHIFT>, left <SHIFT> press twice rapidly
4: Hotkey D	left <CTRL>, left <CTRL> press twice rapidly
5: Hotkey E	left <ALT>, left <ALT> press twice rapidly
6: Hotkey F	right <ALT>, right <ALT> press twice rapidly
7: Hotkey G	left <CTRL> + right <CTRL> simultaneously
8: Hotkey H	left <CTRL> + <SHIFT> + right <CTRL> + <SHIFT> simultaneously
9: Hotkey I	left <CTRL> + <ALT> + right <CTRL> simultaneously

To perform the change, use the following command: <CTRL> + <SHIFT> + <C>, <x>, <RETURN>

Change of the initialization-string for the command mode (with x = number of the initialization-string; default status = 1)

NOTE: The Hotkey Mode is performed in the attached Remote Unit. So if you change the default Instant Switching Hotkey, this is limited to the actual console. You need to change this at all attached Remote Units manually—if desired. This allows you to have different default Instant Switching Hotkeys on different consoles (if desired).

7.1.3 Macro Keyboard (Under Development)

Switching of the ServSwitch DKM can be performed very efficiently via a Macro Keyboard with 16 buttons (Macro keyboard is still under development).

To make use of the macros, the macro keyboard must be connected to one of the USB HID Ports of the Remote Unit.

NOTE: If you want to use keyboard, mouse and macros concurrently, you need an Extender-Kit with four USB HID Ports (ACS4004A-R2).

Programming of the Macros is console-specific, which requires Administrator rights and is performed in the OSD (see Section 5.1.12). Per macro key, up to eight commands can be stored, which are executed sequentially.

For switching, you only have to press the respective key. The monitor will go dark for a short period.

7.1.4 Macros via Function Keys of a Standard Keyboard

Switching the ServSwitch DKM can also be performed very efficiently via a standard keyboard and its Function keys <F1>, <F2>... <F12>.

Other than the macro keyboard, the standard keyboard will only offer twelve different macros.

To issue a macro command simply use the Instant Switching Hotkey (default: <CTRL>+<SHIFT>+<I>) and the required Function key (<Fxx>).

Programming the macros themselves is described in Section 5.1.12.

7.2 Switching in OSD/KVM Mode

In KVM Mode, the user can only switch his own console. To control other consoles, refer to the Crosspoint switch section (see Section 7.3).

7.2.1 Switching in KVM List Page

This page will appear by default as you enter into the OSD. Alternatively, the configuration can be modified to come up with the KVM Switch Page (see Section 7.2.2).



Figure 7-1. KVM List page.

In this page, all CPU ports are displayed that are currently accessible to the current user at this console.

All constraints given by CPU ports already connected to other consoles as well as access restrictions imposed by the user matrix or by the console matrix are considered. Constraints given by CPU ports already connected may be overwritten if “Allow Sharing”, “Force Connect,” and/or “Force Disconnect” have been selected. (see Section 5.1.4).

Table 7-2. Color Codes.

CPU Port	CON Port	Meaning
Green	Not connected	CPU port not connected Video may be shared to other console
Green	Yellow	CPU port not connected Video shared to own console
Yellow	Yellow	CPU port connected to own console
Red	Red	CPU port connected to other console
Red	Yellow	CPU port connected to other console Video shared to own console

Keyboard Control:

Table 7-3. Keyboard control commands.

Command	Description
<Cursor up>	Line up
<Cursor down>	Line down
<Tab>	Next field
<Shift> + <Tab>:	Previous field
<SPACE>	Select CPU Port Video only (Only if "Allow Sharing" active or CPU available)
<RETURN>	Select CPU Port Video and Control with keyboard and mouse
<F1>	Select "KVM Switch" page
<F2>	Select "FollowMe" page
<ESC>	Back to upper menu

NOTE: With mouse or touchscreen the user can select a CPU Port Video only if the CPU Port is already connected to another console and neither "Force Connect" nor "Force Disconnect" has been selected. In all other cases, you will have full control of the selected CPU port.

7.2.2 Switching in KVM Switch Page

This page will appear as you enter into the OSD if the configuration has been modified accordingly.

In this page, all CPU Ports are displayed regardless of their accessibility.

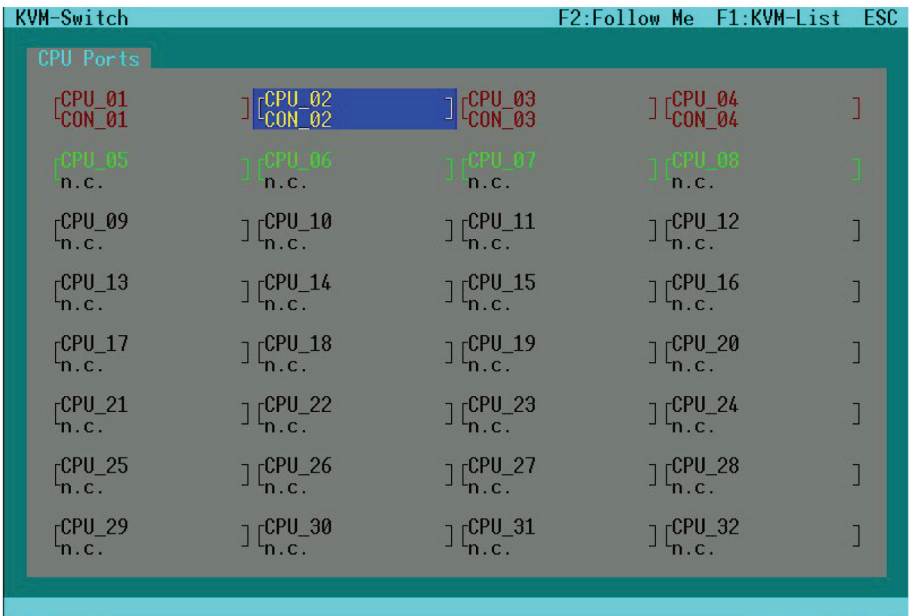


Figure 7-2. KVM Switch page.

Table 7-4. Color codes.

CPU Port	CON Port	Meaning
Green	Not connected	CPU port not connected Video may be shared by another console
Green	Yellow	CPU port not connected Video shared to own console
Yellow	Yellow	CPU port connected to own console
Red	Red	CPU port connected to another console
Red	Yellow	CPU port connected to another console Video shared to own console
Black	Not connected	CPU port not available

Keyboard Commands

Table 7-5. Keyboard commands.

Command	Description
<Cursor left>:	Cursor left
<Cursor right>	Cursor right
<Cursor up>	Line up
<Cursor down>	Line down
<Tab>	Next field
<Shift> + <Tab>	Previous field
<SPACE>	Select CPU port video only (Only if "Allow Sharing" is active or CPU is available)
<RETURN>	Select CPU port video and control with keyboard and mouse
<F1>	Select "KVM-List" page
<F2>	Select "Follow-Me" page
<ESC>	Back to upper menu

NOTE: By default, the user can only switch to unlocked CPU.

In the "Configuration - System" menu (Section 5.1.4) the administrator can activate the options "Allow Sharing," "Force Connect," and "Force Disconnect."

If "Allow Sharing" is active, the user may connect to any CPU using the <SPACE> key gaining Video Access only. The current user will not notice this sharing access.

If "Force Connect" is active, the user may additionally connect to any CPU using the <RETURN> key gaining full access. The current user will lose KM control but retain the monitor signal.

"Force Disconnect" is similar to "Force Connect" except for the current user being completely disconnected.

7.2.3 Switching in Follow Me Page

With the “Follow Me” option, you can copy the display content from the CPU connected to your console to several other consoles (video only). Thus, your own display content can easily be displayed on one or more additional monitors. Obviously, if you switch your current CON Port to another CPU Port, the additional displays will also show the new display content (“Follow Me” function).

The function does NOT provide access to display contents shown on other user stations.

The function is valuable, for example:

- If a presentation shall be displayed concurrently on a projector.
- For supervision of control rooms, if a control display shall be accessible to all users.
- In case of requests, if you want to show your display content to a colleague or administrator.

To enter into the “Follow Me” Page, press <F2> from either KVM List page or KVMSwitch page.

For better orientation, the “Follow Me” Page shows the current connection status.

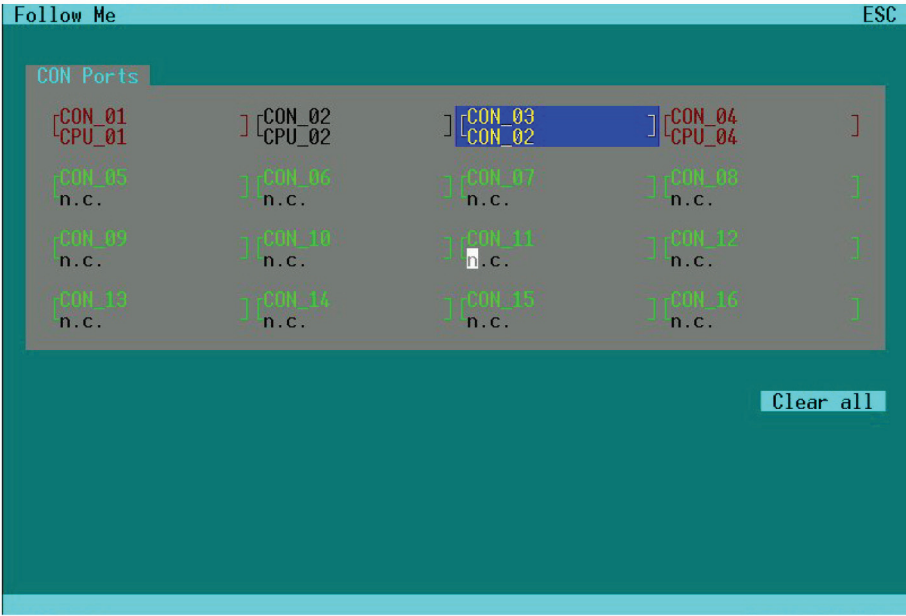


Figure 7-3. Follow Me page.

Table 7-6. Color codes.

CPU Port	CON Port	Meaning
Green	Not connected	Available CON port
Red	Red	CON port # connected to CPU Port # or to CON Port # in “Follow Me” mode
Black	Black	Own CON port connection
Black	Not connected	CON port not available

Keyboard Commands:

Table 7-7. Keyboard commands.

Command	Description
<Cursor left>:	Cursor left
<Cursor right>	Cursor right
<Cursor up>	Line up
<Cursor down>	Line down
<Tab>	Next field
<Shift> + <Tab>	Previous field
<RETURN>	Select CON port for "Follow Me"
<F1>	Select "KVM-List" page
<F2>	Select "Follow-Me" page
<ESC>	Back to upper menu
<div>Clear All</div>	Cancel splitting function and release all additional monitors connected to the CPU at your CON port.

7.3 Switching in OSD/Crosspoint Mode

In Crosspoint Mode, any CON port can be connected to any CPU port. Although the video signal of a CPU port can be connected to several CON ports, the keyboard/mouse signal of a CPU can only be connected once and must be connected to a CON port that also receives the video signal of this CPU port.

In CP mode, any existing connection can be overwritten. Therefore, this mode is only available for power users.

For utmost flexibility, no plausibility check is performed. Admissibility of configuration remains the responsibility of the user.

7.3.1 Open the "CP-Switch" Menu

Perform the following steps:

Enter into the OSD with key sequence <Left-Ctrl> + <Left-Shift> + <O> (Letter "o") or <Strg>+ <Shift>+ <O> (Letter "o")

The "KVM List" Page is displayed full screen (If Option "Listview" is not active, "KVM Switch" Page will be displayed instead).

Leave the "KVM List" Page by pressing <ESC>.

The "Menu" is displayed full screen.

Select the menu option "CP-Switch" by using the cursor buttons and confirm with <RETURN>.

If you are not yet logged into the OSD as a Power User, the LOGIN Dialog is now displayed.

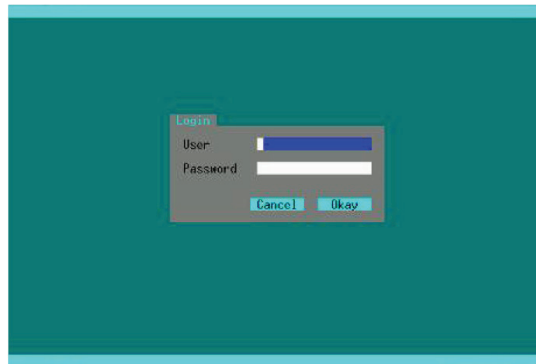


Figure 7-4. Login dialog box.

Access to the Crosspoint switch mode requires Power User rights. By default, the following default user account is predefined. For information about who can define additional users or Power Users (see Section 5.1.6).

User: *admin* (case sensitive)

Password: *admin* (case sensitive)

NOTE: Modify this password at the first login.

After successful login, the “Crosspoint Switch/CON Ports” menu is displayed:

7.3.2 Switching in “Crosspoint Switch/CON Ports” Page

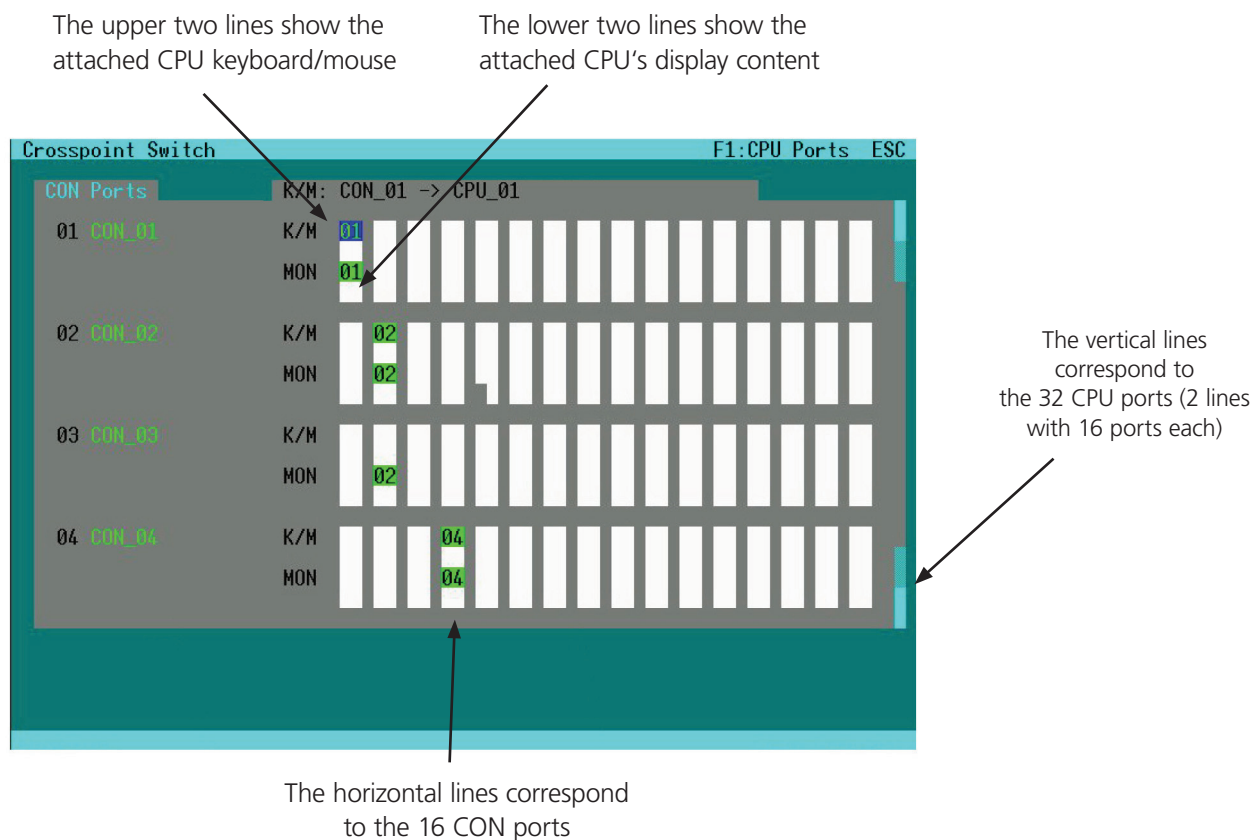


Figure 7-5. Crosspoint Switch/CON Ports page.

To each CON port, only 1x monitor and 1x keyboard/mouse (K/M) may be assigned. If another CPU is selected (K/M or monitor), any existing assignment of this CON Port is released.

To each CON port, you may assign only 1x monitor without keyboard/mouse (K/M). If you assign 1x K/M, however, you must assign the corresponding monitor as well.

Assignment of a single signal (K/M or MON) is performed by <SPACE>. Assignment of both K/M and MON is performed by <RETURN>. Any assignment is performed immediately. Existing assignments are canceled.

Keyboard Commands:

Table 7-8. Keyboard commands.

Command	Description
<Cursor left>	Select CPU port to the left
<Cursor right>	Select CPU port to the right
<Cursor up>	Line above: Select keyboard/mouse assignment for CPU/user port one line above
<Cursor down>	Line below: Select monitor for current user port one line below
<RETURN>	Confirm selected monitor AND keyboard/mouse assignment (for CPU/user port at cursor position) <i>NOTE: Switch commands are executed immediately.</i>
<SPACE>	Confirm selected monitor OR keyboard/mouse assignment (for CPU/user port at cursor position) <i>NOTE: The switch command is executed immediately without a plausible check. Configuration is the responsibility of the user.</i>
<ESC>	Return to "Menu"

7.3.3 Switching in Crosspoint Switch/CPU Ports Page

To enter into the "Crosspoint Switch/CPU Ports" page from the Crosspoint Switch/CON Ports Page, press <F1>.

CAUTION: Expert mode allows free switching. Responsibility for switch result lies with the user.

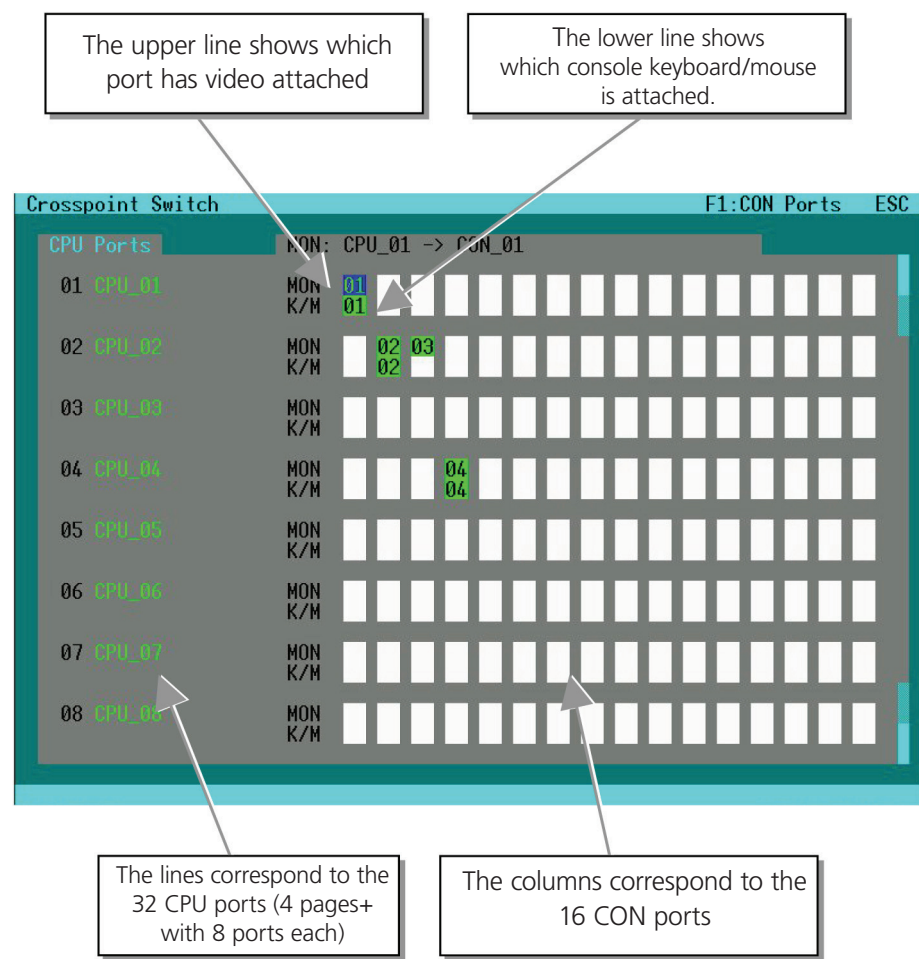


Figure 7-6. Crosspoint Switch/CPU Ports page.

To each CPU, any number of monitors can be assigned but only one keyboard/mouse (K/M).

Keyboard Commands:

Table 7-9. Keyboard commands.

Command	Description
<Cursor left>	Select CPU port to the left
<Cursor right>	Select CPU port to the right
<Cursor up>	Line above: Select monitor for current CPU port or select keyboard/mouse for CPU port one line above
<Cursor down>	Line below: Select monitor for current CPU port or select monitor for CPU port one line below
<RETURN>	Confirm selected monitor AND keyboard/mouse assignment (for CPU/user port at cursor position). <i>NOTE: Switch commands are executed immediately.</i>
<SPACE>	Confirm selected monitor OR keyboard/mouse assignment (for CPU/user port at cursor position). <i>NOTE: Switch commands are executed immediately.</i>
<ESC>	Return to Select Menu

7.4 Switching via Browser/Web Interface

The Web Interface is under development. Use the Java based Applet in the interim.

In Browser mode, switching of the ServSwitch DKM will be performed similarly to the Switching in OSD/Crosspoint Mode (Section 7.3). Similar pages are generated and displayed.

7.5 Switching via Serial Interface

The ServSwitch DKM provides full crosspoint switching functionality via the serial interface. RS-232 commands allow switching of video only, switching of the K/M only, and bidirectional switching.

All available RS-232 commands are listed in Appendix C: Serial Interface.

7.6 Switching via LCD Display

The ServSwitch DKM cannot be switched via IR Interface and the LCD display. There are only options available to restart the switch (Section 5.4.7).

8. Operating Modes

The ServSwitch DKM provides full flexibility for configuration of your switch environment. One part of the ServSwitch DKM can be configured as single-head ports, another part as dual-head- or even quad-head Ports. Additionally, there are mixed configurations of KVM and USB 2.0 ports available.

With the "CPU-Splitter" function, you can copy your own display content to one or more additional monitors, for example, if a presentation will be displayed concurrently on a projector.

The operating mode "Control Room" allows the selection of several CPUs that are permanently displayed on a set of monitors. Using hotkeys, you can quickly and easily switch between the monitors for operation.

Also, in each operating mode, the device can be controlled like a "Crosspoint Switch." This functionality can be used, for example, to perform all switch activity from one single workplace or to set up specific configurations that are not allowed in regular operating modes. Obviously, this is the only possible operating mode for pure video switching environments.

Presumably, standard access will be done via the OSD by means of a connected keyboard. Nevertheless, additional access options are available:

- Via the supplied IR remote control at the LCD display
- Via Java Applet
- Via the serial interface

8.1 Single-Head KVM Switch

In single-head mode, up to 16 users can access up to 32 CPUs. Non-blocking access for all users is granted, that is, none of the users is constrained by the activity of another user.

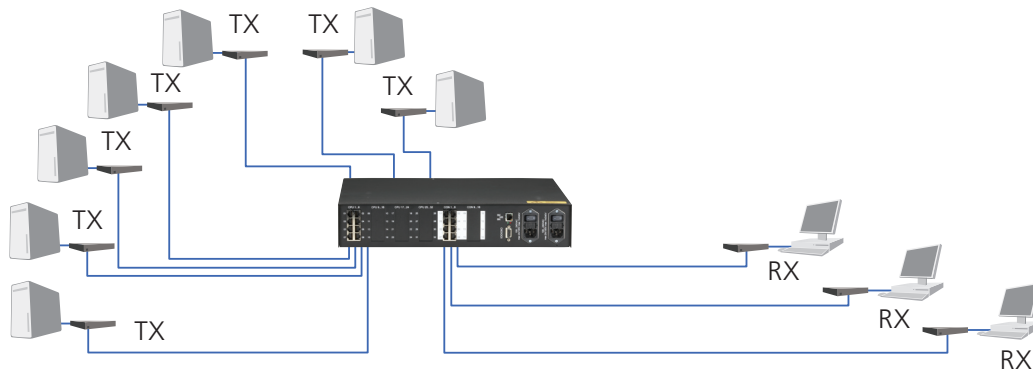


Figure 8-1. Switch example: Single-head KVM-switch.

Via the OSD, each user can select the CPU that he wants to connect to. The OSD display shows if the desired CPU has already been assigned to another user. Depending on the switch configuration, access to this CPU Port will be denied or the former user will be replaced by the new user (see Section 5.4.6, Configuration of System Parameters).

Depending on the switch configuration, access to the OSD is possible at any time or is requiring an authentication. With the authentication, access to CPU ports and/or user ports can further be restricted by assigning specific user levels. Alternatively, the user can be assigned to one or more user groups with access to a defined set of CPU ports and/or user ports.

With the “Follow Me” function, you can copy your own display content to one or more additional monitors.

From a single-head user port, you might also access a dual-head- or quad-head CPU. Operation, however, is limited to the first monitor in this case.

8.2 Dual-Head KVM Switch

In dual-head mode, up to 8 users can access up to 16 CPUs. Non-blocking access for all users is granted, that is, none of the users is constrained by the activity of another user.

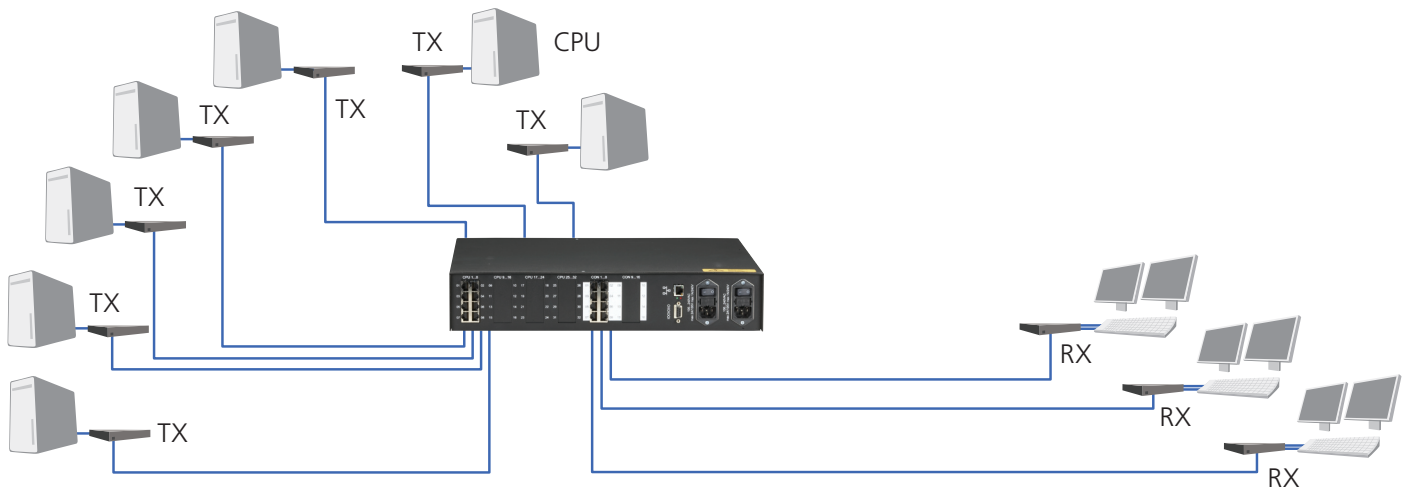


Figure 8-2. Dual-head switch application.

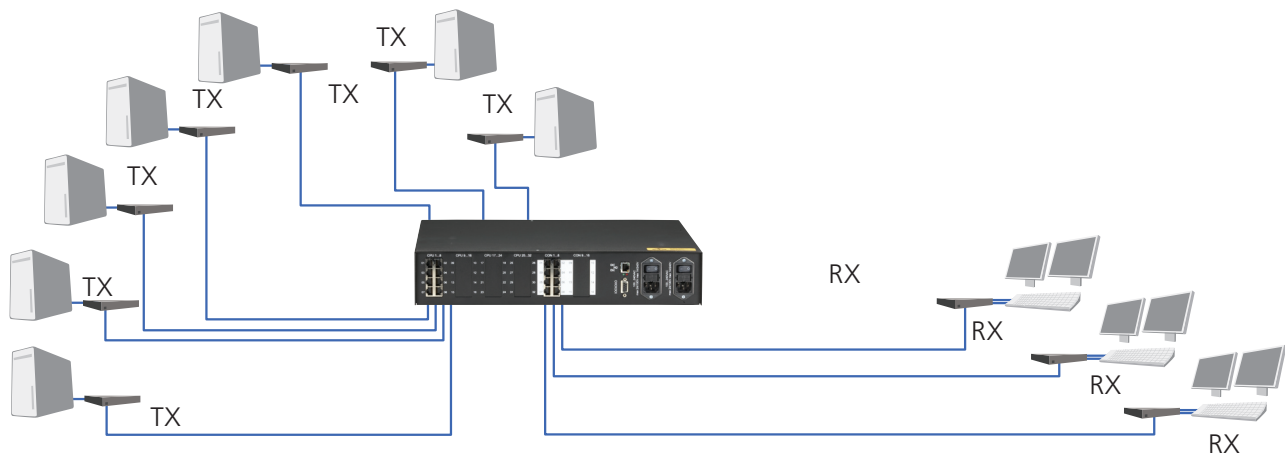


Figure 8-3. Switch example: Dual-head KVM switch with CPU splitter.

Via the OSD, each user can select the CPU that he wants to connect to. The OSD display shows if the desired CPU has already been assigned to another user. Depending on the switch configuration, access to this CPU port will be denied or the former user will be replaced by the new user (Section 5.4.6, Configuration of System Parameters).

Depending on the switch configuration, access to the OSD is possible at any time or is requiring an authentication. With the authentication, access to CPU ports and/or user ports can further be restricted by assigning specific user levels. Alternatively, the user can be assigned to one or more user groups with access to a defined set of CPU ports and/or user ports.

With the “Follow Me” function, you can copy your own display content to one or more additional monitors.

From a dual-head user port, you might also access a single-head or quad-head CPU. With a single-head CPU, the second monitor will remain dark (not connected), and with a quad-head CPU, operation is limited to the first or second monitor.

8.3 Quad-Head KVM Switch

In quad-head mode, up to 4 users can access up to 8 CPUs. Non-blocking access for all users is granted, that is, none of the users is constrained by the activity of another user.

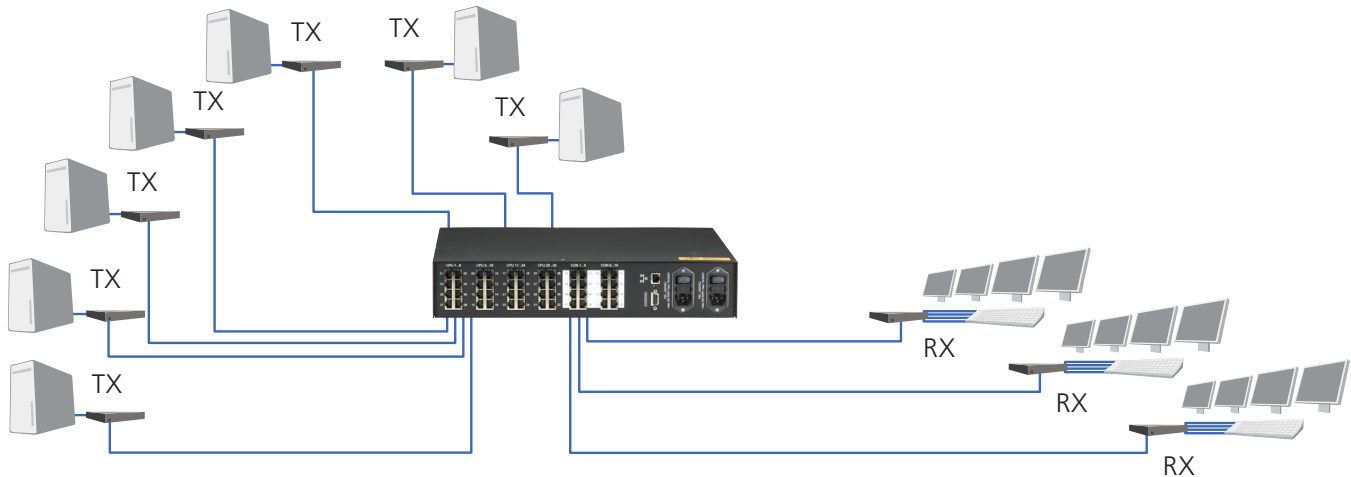


Figure 8-4. Switch example: Quad-Head KVM Switch.

Via the OSD, each user can select the CPU that he wants to connect to. The OSD display shows if the desired CPU has already been assigned to another user. Depending on the switch configuration, access to this CPU port will be denied, or the former user will be replaced by the new user (see Section 5.4.6, Configuration of System Parameters).

Depending on the switch configuration, access to the OSD is possible at any time or is requiring an authentication. With the authentication, access to CPU ports and/or user ports can further be restricted by assigning specific user levels. Alternatively, the user can be assigned to one or more user groups with access to a defined set of CPU ports and/or user ports.

With the “CPU-Splitter” function, you can copy your own display content to one or more additional monitors.

From a quad-head user port, you might also access a single-head or dual-head CPU. With a single-head CPU, Monitors 2, 3, and 4 will remain dark (not connected) and with a dual-head CPU, Monitors 3 and 4 will remain dark (not connected).

8.4 Single-Head KVM/USB 2.0 Mode

In Single-Head KVM/USB 2.0 Mode, up to 8 Users with one USB 2.0 link (for peripheral devices such as storage devices, printers, etc., in addition to keyboard and mouse) can access up to 16 CPUs. Up to 4 peripheral devices can be attached directly to the remote unit, more by using regular USB 2.0 hubs.

Non-blocking access for all users is granted, that is, none of the users is constrained by the activity of another user.

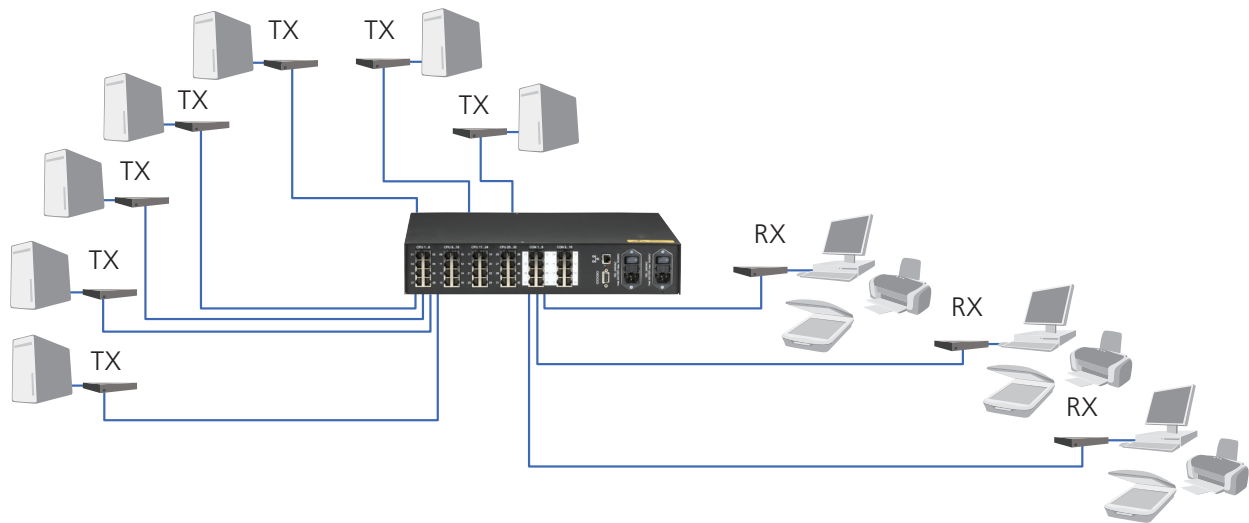


Figure 8-5. Switch example: Single-head KVM/USB 2.0 switch.

Via the OSD, each user can select the CPU that he wants to connect to. The OSD display shows if the desired CPU has already been assigned to another user. Depending on the switch configuration, access to this CPU port will be denied or the former user will be replaced by the new user (see Section 5.4.6, Configuration of System Parameters).

Depending on the switch configuration, access to the OSD is possible at any time or is requiring an authentication. With the authentication, access to CPU ports and/or user ports can further be restricted by assigning specific user levels. Alternatively, the user can be assigned to one or more user groups with access to a defined set of CPU ports and/or user ports.

With the "Follow Me" function, you can copy your own display content to one or more additional monitors.

From a single-head KVM/USB 2.0 port, you might also access a triple-head KVM/USB 2.0 CPU. Operation, however, is limited to the first monitor in this case.

If you access a CPU without a related USB port, your USB peripheral devices will not be available.

8.5 Triple-Head KVM/USB 2.0 Mode

In Triple-Head KVM/USB 2.0 Mode, up to 4 users each with one USB 2.0 link (for peripheral devices such as storage devices, printers, etc., in addition to keyboard and mouse), can access up to 8 CPUs. Up to 4 peripheral devices can be attached directly to the remote unit, more by using regular USB 2.0 hubs.

Non-blocking access for all users is granted, that is, none of the users is constrained by the activity of another user.

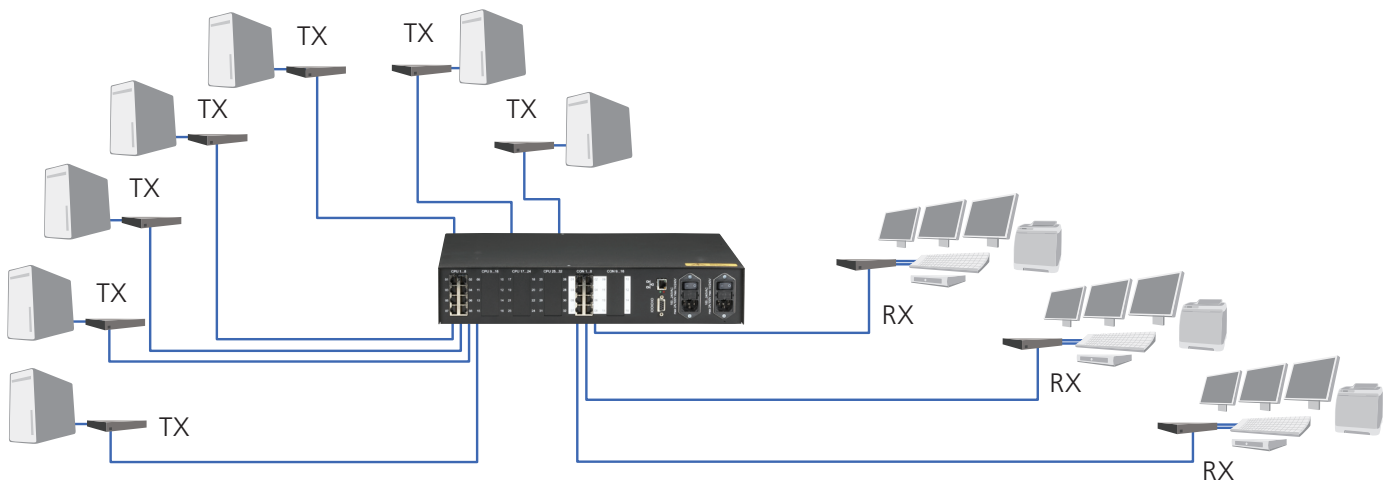


Figure 8-6. Switch example: triple-head KVM/USB 2.0 switch.

Via the OSD, each user can select the CPU that he wants to connect to. The OSD display shows if the desired CPU has already been assigned to another user. Depending on the switch configuration, access to this CPU port will be denied, or the former user will be replaced by the new user (see Section 5.4.6, Configuration of System Parameters).

Depending on the switch configuration, access to the OSD is possible at any time or is requiring an authentication. With the authentication, access to CPU Ports and/or user ports can further be restricted by assigning specific user levels. Alternatively, the user can be assigned to one or more user groups with access to a defined set of CPU ports and/or user ports.

With the "Follow Me" function, you can copy your own display content to one or more additional monitors.

From a triple-head KVM/USB 2.0 port, you might also access a single-head KVM/USB 2.0 CPU. In this case, however, monitors two and three will remain dark (not connected).

If you access a CPU without a related USB port, your USB peripherals will not be available.

8.6 Teacher/Student System 15

The most flexible configuration can be granted if the system is used for up to 15 students. Each student workstation and the teacher's workstation are connected by CATx cable.

The following functions are available:

- The teacher can duplicate the display content of any student to his/her display and take control, if required.
- The teacher can copy his/her own display content to one, more, or all student displays.
- The teacher can copy any student's display content to one or more or all displays.

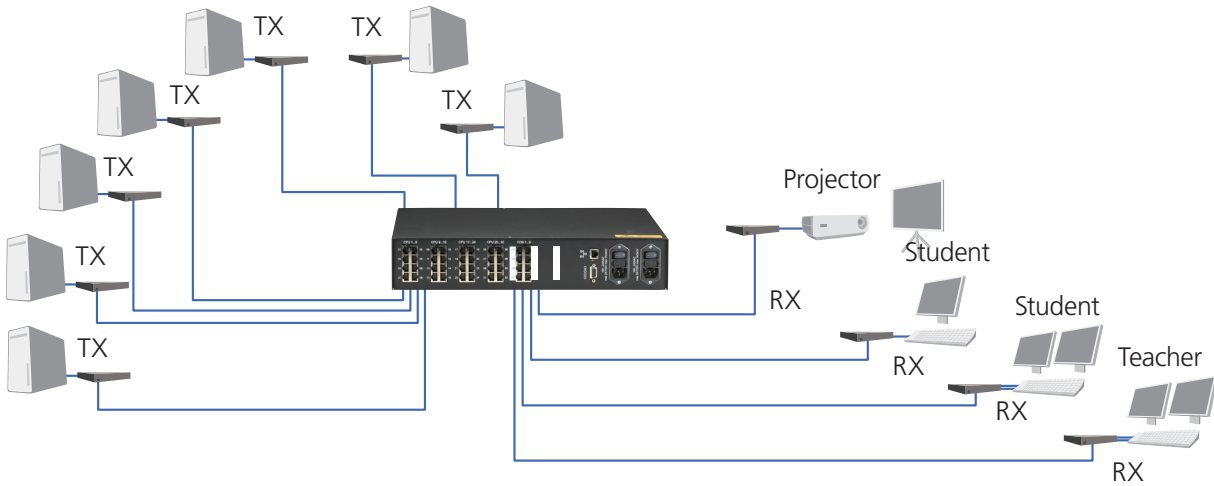


Figure 8-7. Switch example: Teacher/Student System.

The assignment of a CPU to the respective display can be selected at any time via the OSD (On Screen Display) or via a control board with function keys.

With the "Follow Me" function, the teacher's display content may be copied to one or more additional displays (for example, a projector). In this case, the number of available student workstations is reduced accordingly.

8.7 Crosspoint Switch

The operation as a Crosspoint Switch allows the most flexible application of the switch functions. Usually, this operating mode will be used to connect up to 32 video sources (and, optionally, audio sources) to up to 16 displays.

Switching can be realized in various ways:

- Via the OSD menu at a console connected to a CON port
- Via a PC, using a Java applet
- Via switch commands via the serial interface

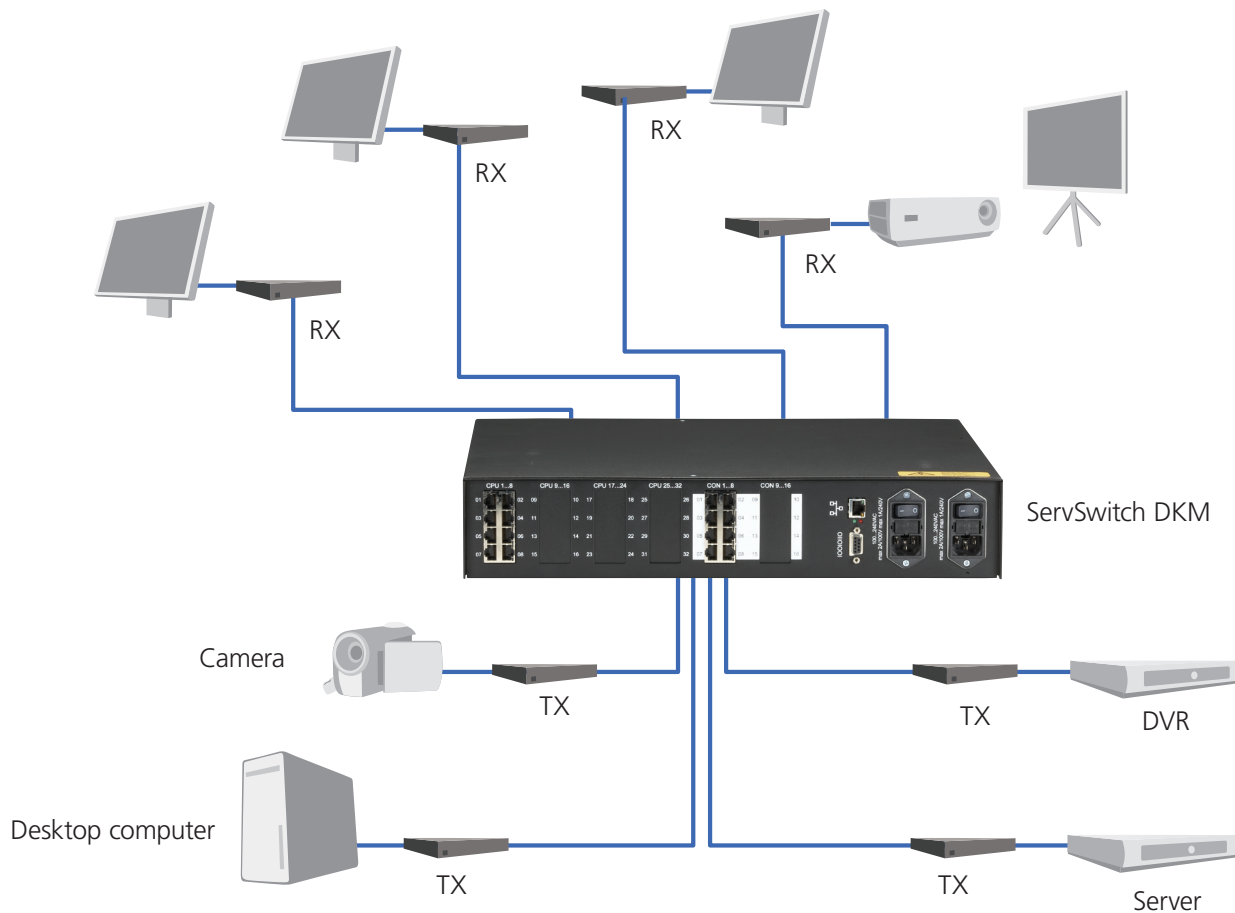


Figure 8-8. Switch example: Crosspoint Switch.

Any signal source can be assigned to any number of displays, where the picture will be displayed in parallel. Additionally, (optional) audio signals will be transmitted as well.

9. Troubleshooting

If the system begins to show quality loss or malfunction, try using a short (6-10 ft.) CATx cable between units. Most issues can be easily resolved by fixing cable problems.

9.1 Monitor

Problem: There is no picture.

Possible Solution:

Check the power supply connection at the Local and Remote Unit. Is the Power LED at the Local and Remote Unit illuminated? If not, the internal power supply may be damaged or there may be an internal error.

Check that the interconnection cable is connected at the Local Unit and the Remote Unit. Is the Link Status LED illuminated? If not, there may be a problem with the interconnection cable:

Are there errors through data transmission over CATx cable (cable too long, too high attenuation, or too much EMI interference)? Is the Data Error LED illuminated or blinking? If yes, check cable length and environment.

Video Okay LED is dark: CPU does not provide a video signal. Check the settings of the graphic card. Try connecting a monitor to the local output to see whether or not there is a signal.

Problem: “Juddering” pictures at video presentations

Possible Solution:

With high monitor resolutions, the data volume that can be transferred may exceed the available bandwidth, so the data throughput must be reduced. For this, the device uses an RLE compression algorithm. If the necessary compression factor is not reached, not all pictures of the graphics card are transferred (frame dropping), and the video presentation may begin to “judder.”

Use a lower resolution that’s a little larger than the resolution of the stored film material. If the monitor has a higher resolution, then the monitor can take over the scaling of the video data. For the image quality, it is irrelevant whether the scaling is done via the CPU or via the monitor.

Set the color depth to 16-/24-bit AUTOSELECT. Usually the human eye is not able to differentiate between so many different colors with moving pictures. A reduction to 16 bits reduces the data volume that has to be transferred without loss of image quality.

9.2 USB HID

USB Keyboard/Mouse

Problem: Your USB keyboard/USB mouse does not work.

Possible Solution:

Although we tried to design the devices as transparent as possible, we can’t ensure that all devices are running. Check Appendix F: List of supported USB devices. Typically, if the keyboard or mouse is not standard (built-in hubs, card readers, gaming keyboards, etc.) and requires drivers to be installed, you are entering a gray area.

Problem: Your USB mouse makes “jerky leaps.”

Solution:

With high monitor resolutions, the data volume that can be transferred may exceed the available bandwidth, so the data throughput must be reduced. For this, the device uses an RLE compression algorithm. If the necessary compression factor is not reached, not all pictures of the graphics card are transferred (frame dropping), and the mouse may make jerky leaps.

Use a lower resolution or a background, which can be compressed better: Please avoid photo backgrounds or color gradients—single-colored backgrounds are optimal and permit the highest possible compression rates and highest frame rates.

Chapter 9: Troubleshooting

Problem: Your USB mouse moves like it's on "elastic."

Solution: This problem is caused by several factors that lead to a time delay between mouse movement and display on the screen. Contributions to the total delay consist of (numerical data are approx. values):

- Mouse movement/transmission of data to the CPU (5–15 ms)
- Processing time in the CPU until mouse movement at the graphics output appears (50–70 ms)
- Transmission of the graphic data into the extender system and transmission to the Remote Unit (15–45 ms)
- Processing time in the graphical output device (15–100 ms, where 15 ms are only reached with CRT tubes)

The delay, between 85 and 230 ms, is not a consequence of the extender system. The extender system is responsible for 5–15 ms mouse movement/ transmission to the CPU plus 15–45 ms acquiring the graphic data and transmitting it to the Remote Unit. Our measurements show that time delays greater than about 100–150 ms become noticeable and bothersome. Therefore, if an extender system increases the mouse signal delay from, say, 100 to 140 ms you may begin to experience the "elastic" delay problem.

If you use a slow response TFT screen, you may already have a total response time of up to 175 ms, right at the threshold level. The addition of an extender line to such a system will appear to cause the "elastic" mouse delay problem even though the extender system is responsible for only a small part of the total problem.

Use a display with a shorter response time. (*NOTE: the response time indicated by the manufacturer is a measure of how quickly two successive pictures can be displayed, not how long it takes for a signal from the input interface to reach the ServSwitch DKM screen*). Use a lower resolution or a background that can be compressed better: Avoid photo backgrounds or color gradients—single-colored backgrounds are optimal and permit the highest possible compression rates. If the transmission needs to drop frames (because the RLE compression algorithm does not reach the required data reduction), you need to add approximately 17 ms @ 30 fps and approximately 34 ms @ 20 fps.

USB HID Devices

Problem: Your USB HID device does not work.

Solution: Although our interface supports HID devices, we can't ensure that every connected device will operate successfully. If you have any compatibility problems, contact Black Box technical support at 724-746-5500 or info@blackbox.com.

Other USB Devices

Problem: Your USB device does not work.

Solution: You have connected a non-HID device. The extender system supports HID devices only. All other devices are incompatible with the ServSwitch DKM system. Typically, if the device requires drivers to be installed, you will be entering a gray area.

Appendix A: Example Applications

This section illustrates some specific applications using the ServSwitch DKM.

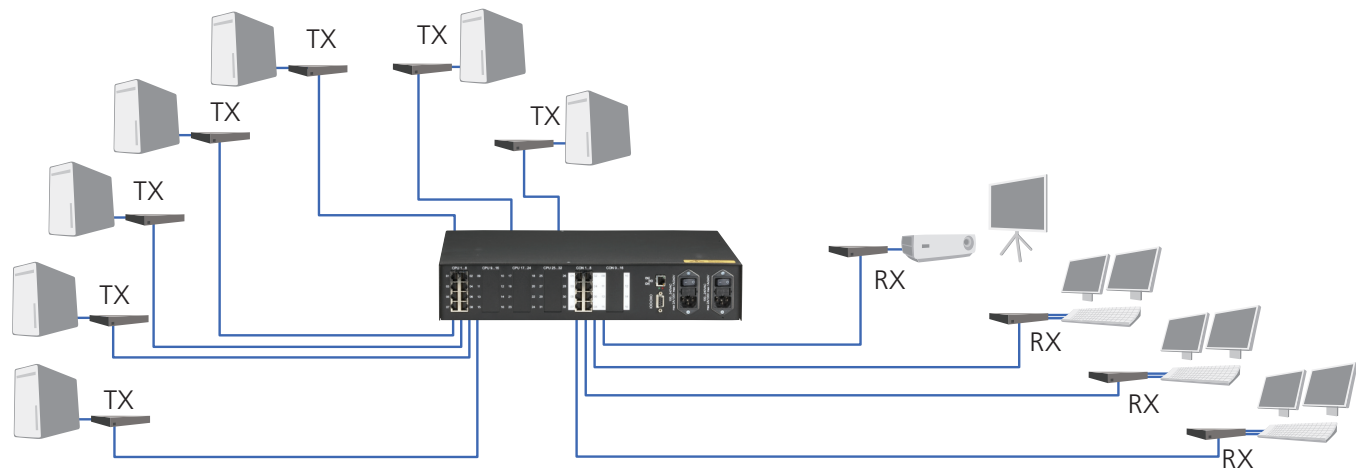


Figure A-1. ServSwitch DKM as a Dual-Head KVM Switch with additional display (projector).

NOTE: As of now, each video head needs to have a dedicated CATx/interconnect cable.

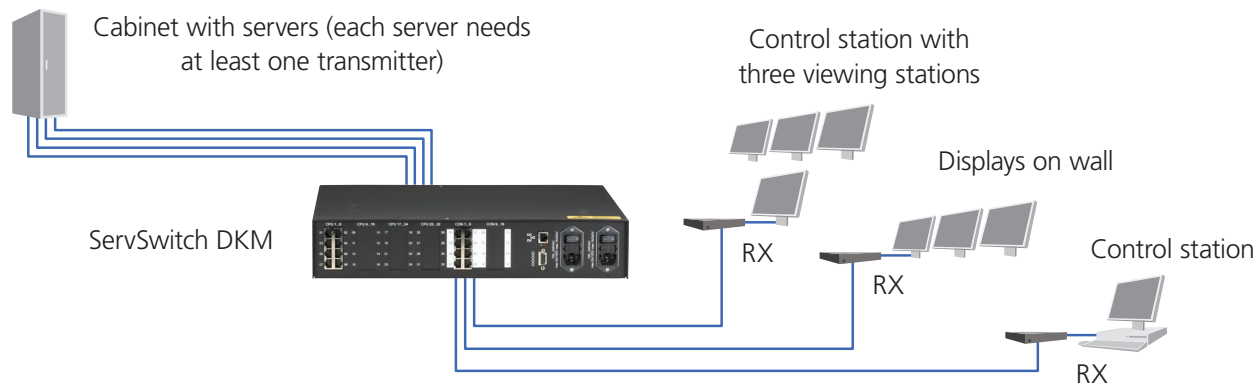


Figure A-2. ServSwitch DKM in "Control Room" Mode for 3 Monitors each—=1x with optional monitor for operation.

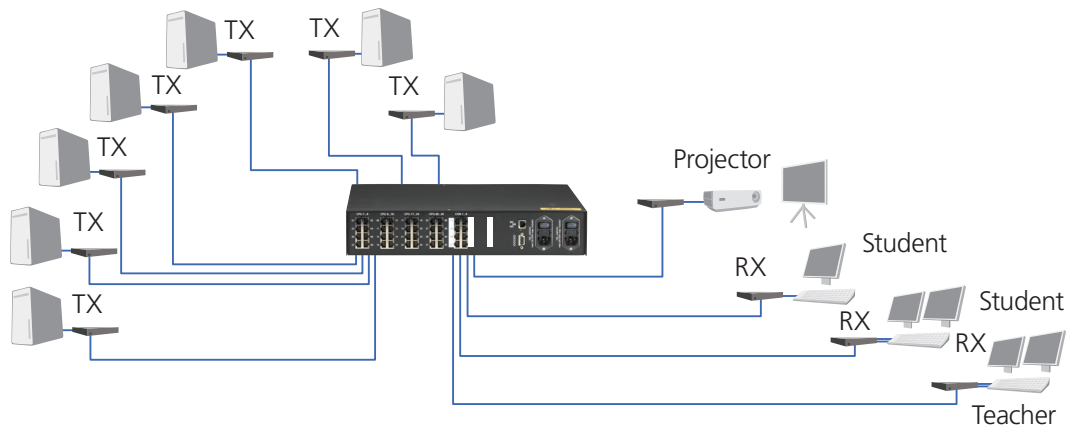


Figure A-3. ServSwitch DKM as a Teacher/Student system for up to 15 students.

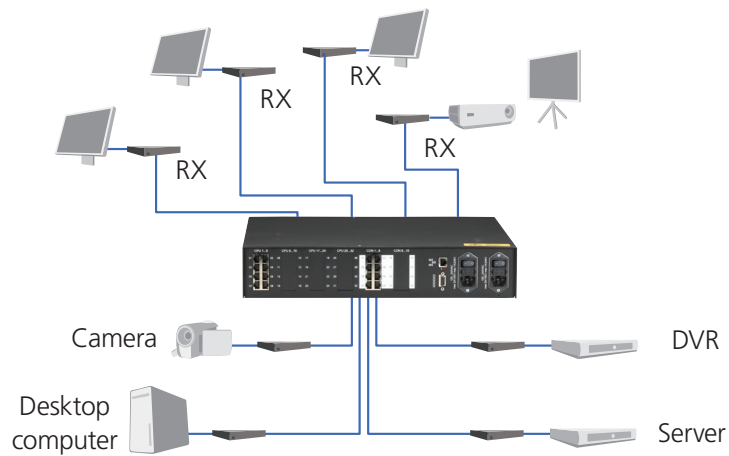


Figure A-4. ServSwitch DKM as a Crosspoint Switch with optional serial/audio support.

Appendix B: Rackmount Options

The ServSwitch DKM can be mounted into a 19"/2U rack space using mounting plates (included).

ServSwitch DKM Extenders can be mounted into 19" racks using rackmount kits. Two types of rackmount kits are available—for single-head and for dual-head devices.

Mounting Instruction Rackmount Kit ACS1009A-RMK

Using the rackmount kit ACS1009A-RMK, up to 4 devices of the device size 1.3"H x 4.1"W x 5.6"D (2.9 x 10.3 x 14.3 cm) (single-head devices) can be mounted into a 19" server rack. The rackmount kit requires 1U rack space. Blind plates (in the list of parts delivered) allow covering unused device positions.

Rackmount kit ACS1009A-RMK—List of parts delivered:

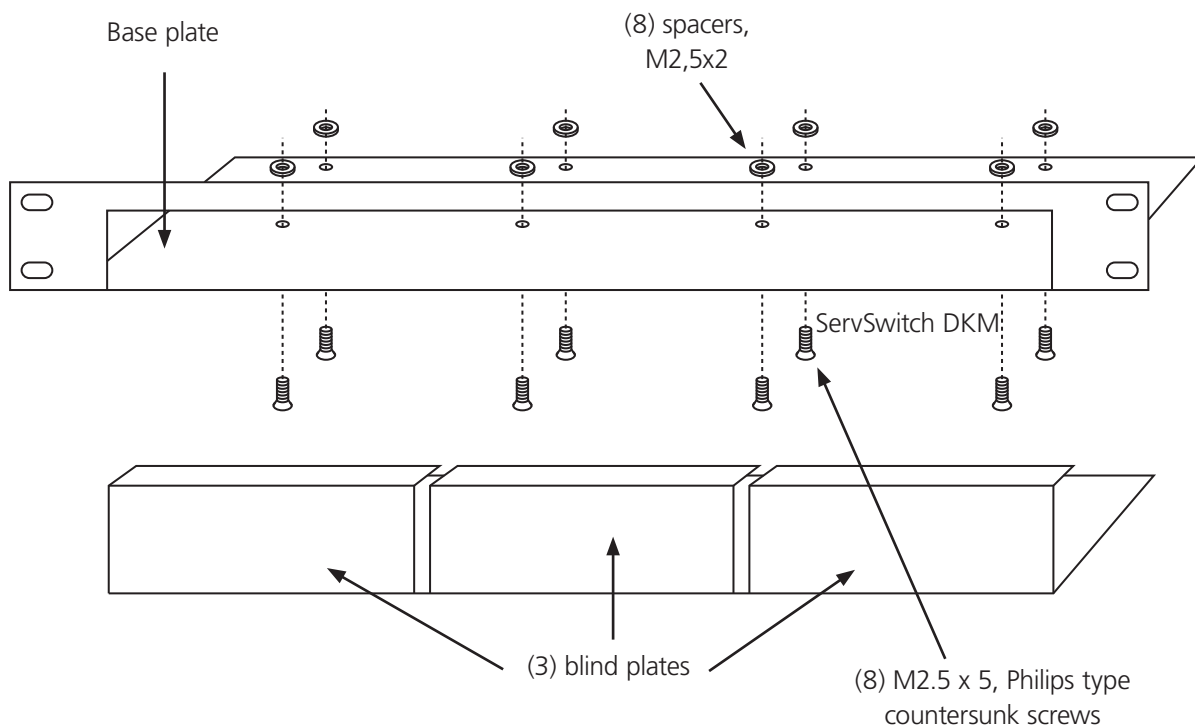


Figure B-1. ACS1009A-RMK.

Mounting instructions:

- Align the holes on the base plate with the vacant screw holes on the base of the device.
- Fasten the base of the unit to the plate of the mounting kit

NOTE: Only use the supplied, short screws, to prevent damage to the PCBs.

- Close the remaining gaps with blanking plates.

The rackmount kit ACS1009A-RMK allows mounting of up to four devices:

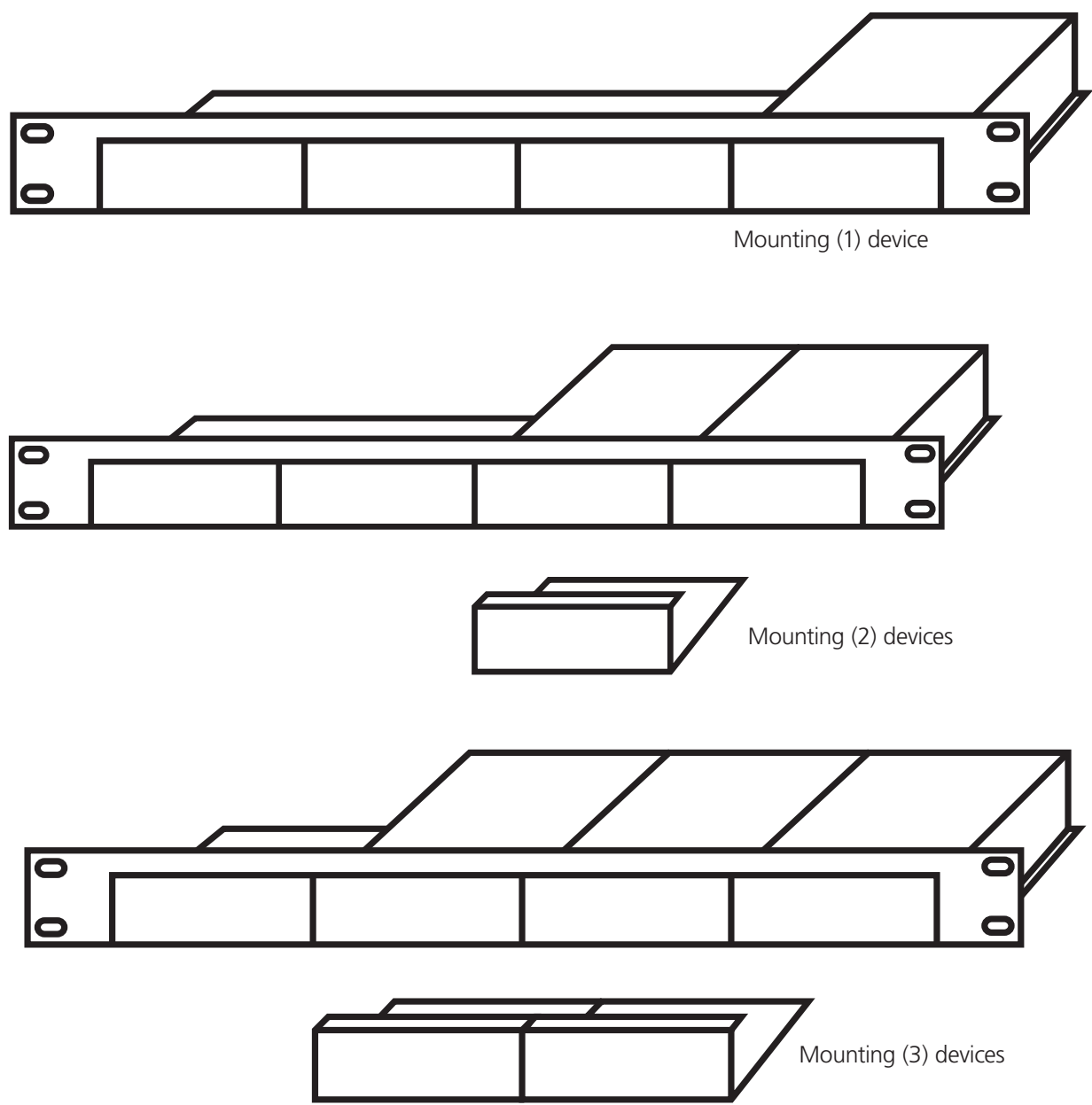


Figure B-2. Mounting up to four devices using the ACS1009A-RMK.

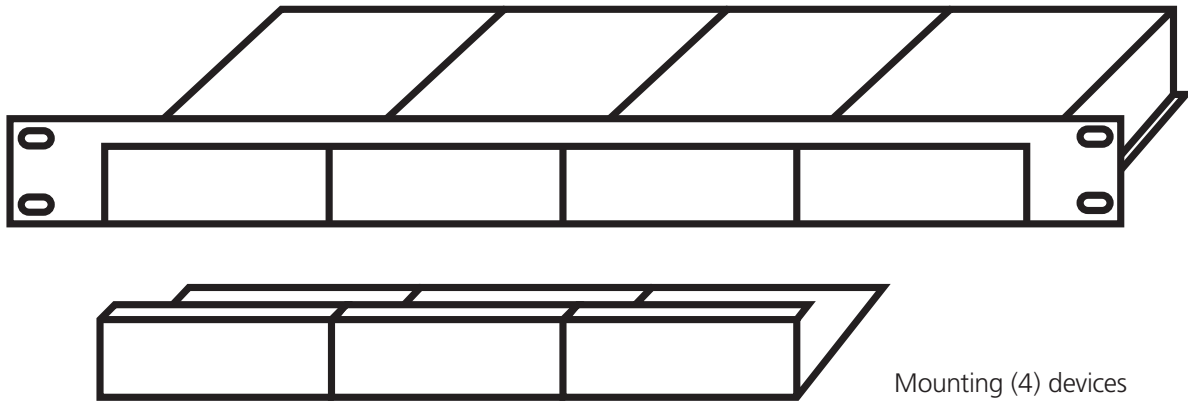


Figure B-3. Mounting up to four devices using the ACS1009A-RMK.

Mounting Instruction Rackmount Kit ACS2209A-RMK

Using the rackmount kit ACS2209A-RMK, up to four devices of the device size 1.7"H x 4.1"W x 5.6"D (4.2 x 10.3 x 14.3 cm) (dual-head devices) can be mounted into a 19" server rack. The rackmount kit requires 1U rack space. Blind plates (in the list of parts delivered) allow covering unused device positions.

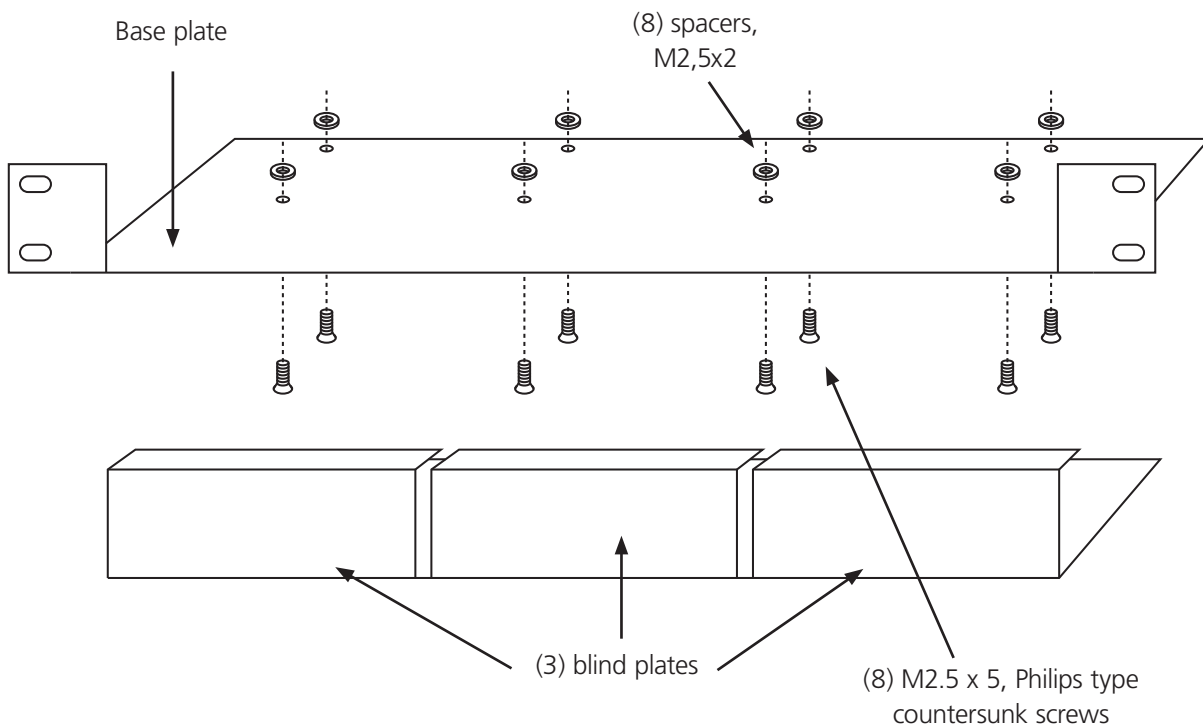


Figure B-4.

Appendix B: Rackmount Options

Mounting instructions:

- Align the holes on the base plate with the vacant screw holes on the base of the device.
- Fasten the base of the unit to the plate of the mounting kit

CAUTION: Only use the supplied short screws to prevent damage to the PCBs.

- Close the remaining gaps with blanking plates.

The rackmount kit ACS2209A-RMK allows mounting of up to four devices:

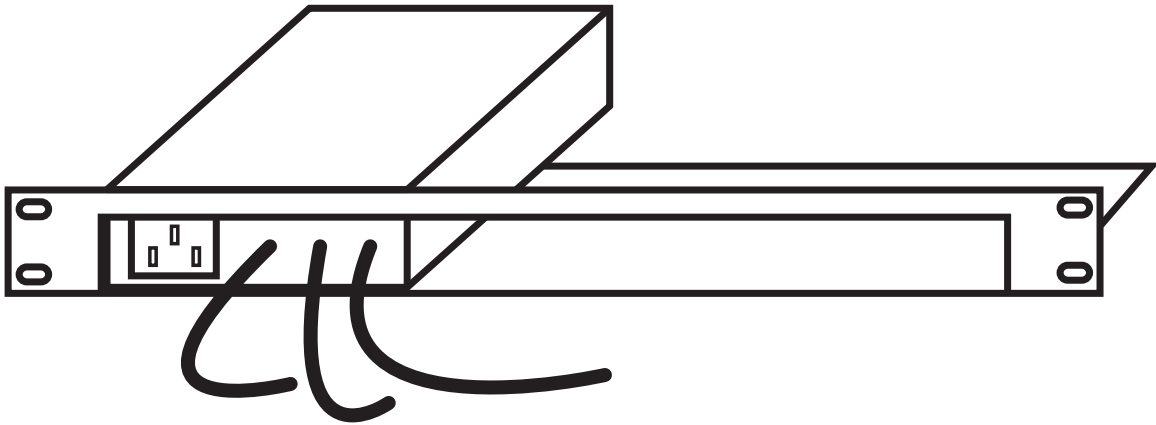


Figure B-5. ACS2209A-PS to power up to (3) TX/RX units from the ServSwitch DKM system.

Appendix C: Serial Interface

Via the serial interface, the whole switch matrix of the ServSwitch DKM can be controlled. The functionality corresponds to the Switching in OSD/Crosspoint Mode (Section 7.3).

Optionally, the ServSwitch DKM echoes all executed switch commands via either the serial interface or the network interface. By means of this echo, the actual switch status can be monitored at any time and user applications can be realized based on this echo.

As an additional application, the serial interface may be used to clone a master switch to additional ServSwitch DKM slaves (daisychain).

Communication Format

For communication, please set up the format of the serial data communication to:

115,2K,8,1,NO
(115.2 kbps, 8 data bit, 1 stop bit, NO parity)

RS-232 Structure (Command)

<STX>, <command byte (CMD)>, [data bytes (D0..DN)], <ETX>
[] = optional elements

RS-232 Structure (Response)

<ACK>, [<ECHO>]
[] = optional elements

<ECHO> reports the switch sequences solicited by a command and thus the new switch status of the switch. The echo can be used to update user applications and to operate several switches in parallel.

Parameter Description

Command byte in the range of 0x40...0x6F. See the list of allowed commands below:

Data bytes:

- a) Binary data: During the transmission of binary data, control statements or control commands are transferred, the data are divided into low-nibble and high-nibble. The data is distributed to the low-nibbles of two bytes and provided with an offset by 0x60, for example, 0x1F => 0x61 + 0x6F
- b) 7bit-data (0x0...0x7F) are provided with an offset by 0x80, for example, 0000011 => 0x83
- c) ASCII-data => 0x20... 0x7E are unencrypted transmitted

(Special-)Character

ACK	0x06
NAK	0x15
STX	0x02
ETX	0x03
CR	0x0D
ESC	0x1B
HTAB	0x09
LF	0x0A

Appendix C: Serial Interface

NOTE: The Serial Interface can be blocked while an OSD has been opened.

Table C-1. RS-232 Switching functions Console ("Video signal").

No.	Function	RS-232 Command	Reply
1	CON# Output signal from CPU#	STX, 0x47, <CON#>, <CPU#>, ETX	ACK, ECHO
2	CON# Output off	STX, 0x48, <CON#>, ETX	ACK, ECHO
3	CON01...CON16 Output signal from CPU#1...CPU#16, resp. <ul style="list-style-type: none">• requires 16 CPU#• 0x80 for "No Output"	STX, 0x49, <CPU#1>, <CPU#2>, ..., <CPU#16>, ETX	ACK, ECHO
4	All CON ports Output off	STX, 0x4A, ETX	ACK, ECHO

Table C-2. RS-232, Switching functions CPU (K/M "Return Channel").

No.	Function	RS-232 Command	Reply
5	CPU# Output signal from CON#	STX, 0x4B, <CPU#>, <CON#>, ETX	ACK, ECHO
6	CPU# Output off	STX, 0x4C, <CPU#>, ETX	ACK, ECHO
7	CPU01...CPU32 Output Signal from CON#1...CON#32, resp. <ul style="list-style-type: none">• requires 32 CON#• 0x80 for "No Output" Attention: only 16 CON ports available, requires 16x 0x80!	STX, 0x4D, <CON#1>, <CON#2>, ..., <CON#32>, ETX	ACK, ECHO
8	All CPU ports Output off	STX, 0x4E, ETX	ACK, ECHO

Table C-3. RS-232 Switching functions Bidi Connections.

No.	Function	RS-232 Command	Reply
9	Establish Bidi-Connection CON#<—> CPU#	STX, 0x4F, <CON#>, <CPU#>, ETX	ACK, ECHO
10	Disconnect CON#	STX, 0x50, <CON#>, ETX	ACK, ECHO

Table C-4. RS-232 Switching functions for Switch Matrix.

No.	Function	RS-232 Command	Reply
11	Set switch matrix (complete setup): <ul style="list-style-type: none"> requires 48 values (first 16 CPUs, then 32 CON ports) 0x80 for "No Output" CON01...CON16 Output signal from CPU#1...CPU#16 (reference RS-232 command 3) CPU01...CPU32 Output Signal from CON#1...CON#32 (reference RS-232 command 7) Attention: Correct assignment must be ensured by user! Attention: only 16 CON ports available, requires 16x 0x80!	STX, 0x51, <CPU#1>, <CPU#2>, ..., <CPU#16>, <CON#1>, <CON#2>, ..., <CON#32>, ETX	ACK, ECHO
12	Reset Switch Matrix	STX, 0x52, ETX	ACK
13	Report Switch Matrix (complete setup) <ul style="list-style-type: none"> Output of 48 values 0x80 for "No Output" The first 16 values describe CON port Output (reference RS-232 command 3) The next 32 values describe the CPUOutput (reference RS-232 command 7) 	STX, 0x53, ETX	STX, 0x53, <CPU#1> <CPU#2>, ..., <CPU#16>, <CON#1>, <CON#2>, ..., <CON#32>, ETX
	Save/Load Switch Matrix		
14	Save Matrix Configuration to Flash	STX, 0x66, 0x8C, <Config File No >, ETX	ACK
15	Load Matrix Configuration from Flash	STX, 0x67, 0x8C, <Config File No >, ETX	ACK, ECHO (contains complete setup)

Table C-5. Assignment of Configuration Files to RS-232.

Configuration Files	Config File No.
Default.sys	0x80
Config01.sys	0x81
Config02.sys	0x82
Config03.sys	0x83
Config04.sys	0x84
Config05.sys	0x85
Config06.sys	0x86
Config07.sys	0x87
Config08.sys	0x88

Appendix D. Network Interface

The network interface offers the following ports and protocols:

FTP Server (Port 21)

Port 21 provides access to an FTP server, for example, for the upload and download of configuration files. For login, user account information of the current configuration has to be applied. Access to the FTP server is granted according to the user rights defined there.

Telnet Server (Port 23)

Port 23 has been reserved for a future Telnet server. For login, current user access rights will be applied, as described for Port 21.

HTTP Server (Port 80)

Port 80 provides access to an HTTP server. For access to restricted areas, current user access rights will be applied, as described for Port 21. Currently, the HTTP server provides no pages yet. In a future version, however, pages for configuration, control, and status monitoring will be available. Necessary files can be loaded or updated via FTP server. Thus, users may store own Java applications there that could access the device via FTP server or socket server and control the switch or change configuration.

Socket Server (Port 5555)

Port 5555 provides access to a socket server supporting the same protocol like the serial interface. Access to this port is NOT restricted by user rights. Functionality and protocol correspond to the serial interface described in Appendix C: Serial Interface. The switching functionality corresponds to the Switching in OSD/Crosspoint Mode (Section 7.3).

Optionally, the ServSwitch DKM echoes all executed switch commands via either the serial interface or the network interface. By means of this echo, the actual switch status of the switch can be monitored at any time and user applications can be realized based on this echo.

NOTE: The features above are subject to modification at any time. They depend on the firmware.

Appendix E: Contacting Technical Support

Appendix E: Contacting Technical Support

If you determine that your ServSwitch DKM is malfunctioning, do not attempt to alter or repair it. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

Before you do so, please make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- The firmware revision level is printed on the bottom of the ServSwitch DKM (very important):

Version Number Format:

Board: xxLO/RE Myyy Pzzz Auuu Gvvvvvv

Transceiver: C/M/S xx Pyy Mzz

- The nature and duration of the problem.
- When the problem occurs.
- The components involved in the problem—that is, what type of computers, what type of keyboard, brand of mouse, make and model of monitor, type and make of cable, etc.
- Any particular application that, when used, appears to create the problem or make it worse.
- The results of any testing you've already done.

To solve some problems, it might be necessary to upgrade the ServSwitch DKM's firmware. If this turns out to be the case for your difficulty, our technical support technicians will arrange for you to receive the new firmware and will tell you how to install it.

Shipping and Packaging

If you need to transport or ship your ServSwitch DKM:

- Package it carefully. We recommend that you use the original container.
- If you are shipping it for repair, please include the unit's external power supplies. If you are returning it, please include everything you received with it. Before you ship the extender back to your dealer for repair or return, contact him/her to get a Return Material Authorization (RMA) number.

Appendix F: List of Supported USB Devices

Although the USB connection's implementation allows all keyboards and mice, we can not guarantee that all available keyboards/mice are compatible with the ServSwitch DKM system.

The implementation is constructed for "HID" devices. HID is a device class enabling inputs to a CPU. Touch screens, graphics tablets, fingerprint sensors are also HID devices.

Some devices install additional devices, for example, to set parameters. Such devices are NOT supported by our extenders.

CAUTION: Using more than two devices is not possible even if you use a USB hub.

The following devices are tested and have been found to be compatible with the ServSwitch DKM:

Keyboards (Logitech)

- Classic Keyboard 200
- Media Keyboard 600
- Wave Keyboard
- Ultra Flat Keyboard
- Cordless Desktop EX 110
- Cordless Desktop LX 710 Laser
- Cordless Desktop MX 3200 Laser

Mice (Logitech)

- Pilot Optical
- Cordless Mini
- Cordless Click! Plus
- G3 Laser
- G5 Laser
- LX3 Optical
- LX5 Cordless Optical
- LX7 Cordless Optical
- MX 620 Cordless Laser
- MX 400 Performance Laser
- MX 1000 Laser
- V100 Optical
- V150 Laser
- V220 Cordless Optical
- V320 Cordless Optical
- V450 Laser Cordless
- VX Nano
- VX Revolution

Appendix G. ServSwitch DKM Extenders

G.1 ServSwitch DKM KVM Extender

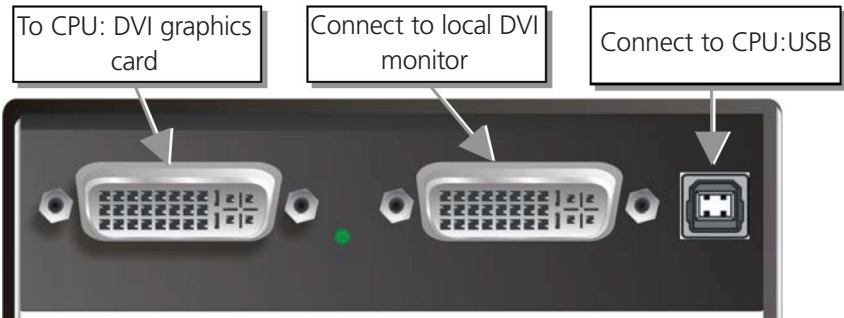


Figure G-1. ServSwitch KVM local unit.

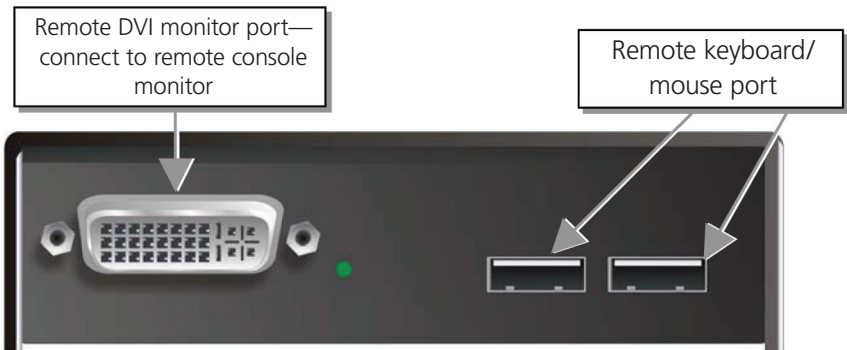


Figure G-2. ServSwitch KVM remote unit.

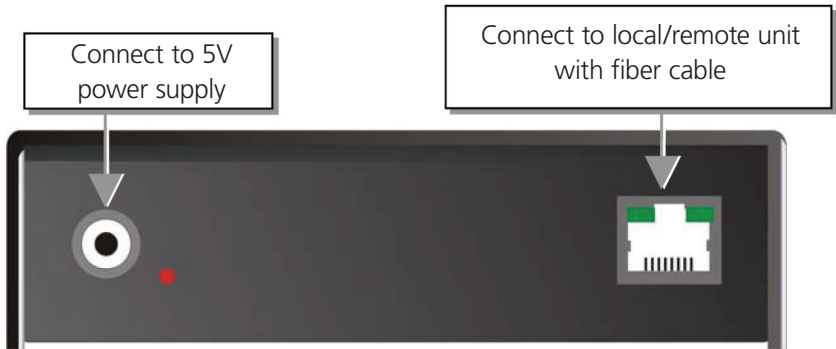


Figure G-3. ServSwitch KVM extender local/remote unit (CATx)—back view.

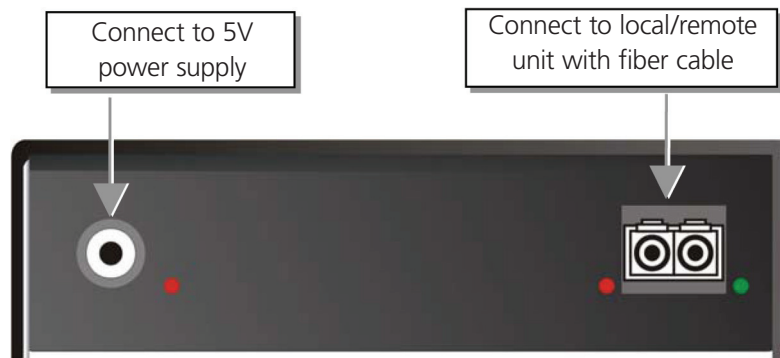


Figure G-4. ServSwitch KVM Extender local/remote unit (fiber)—back view.

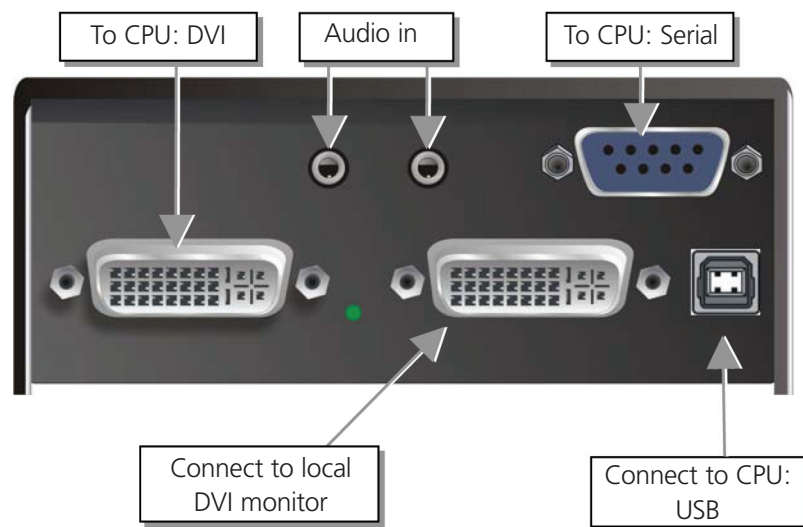


Figure G-5. ServSwitch KVM local unit with audio.

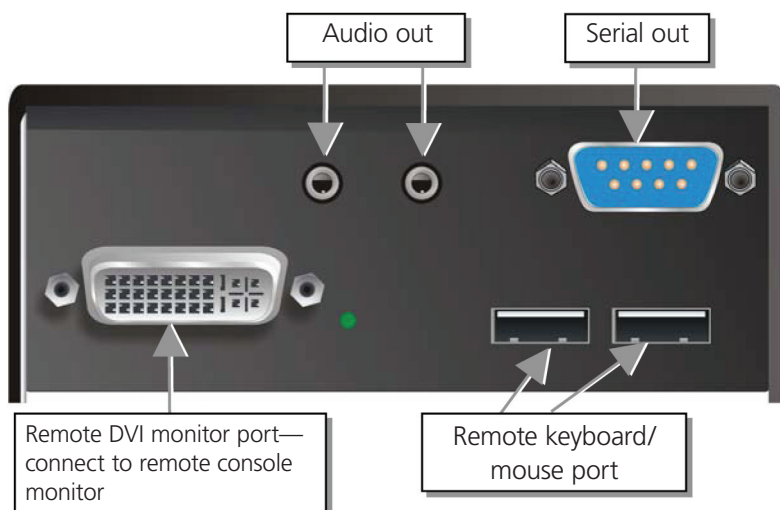


Figure G-6. ServSwitch KVM remote unit with audio.

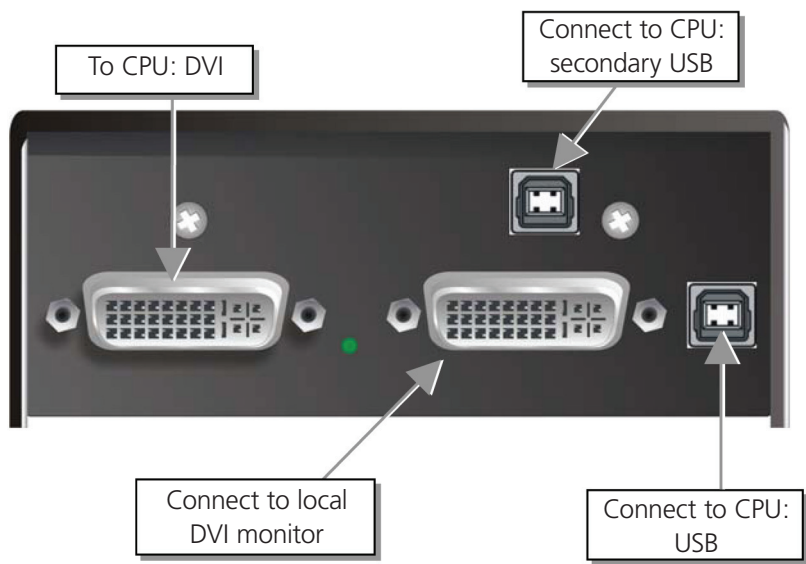


Figure G-7. ServSwitch KVM local unit with 4x USB—HID.

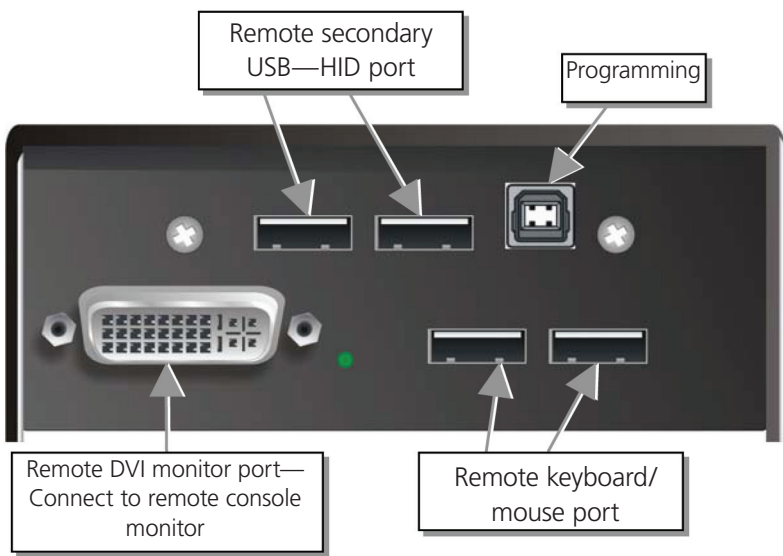


Figure G-8. ServSwitch KVM remote unit with 4x USB—HID.

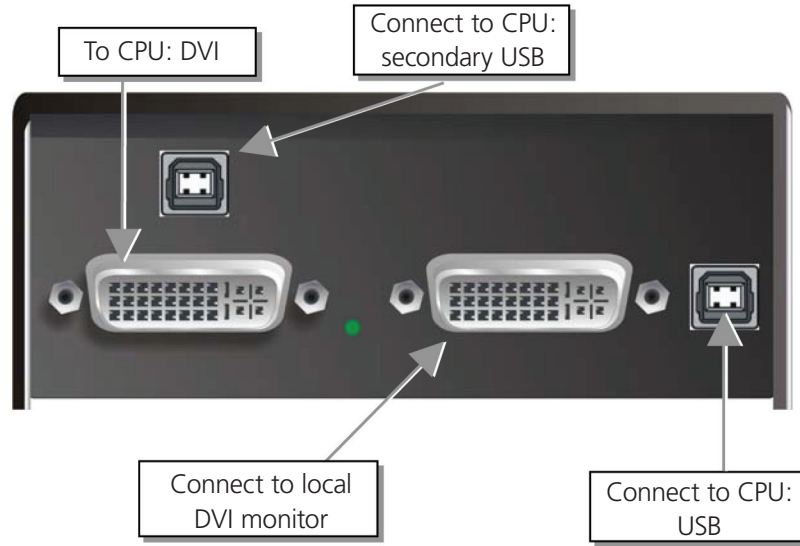


Figure G-9. ServSwitch KVM local unit with 2x USB—HID + 4x USB 2.0.

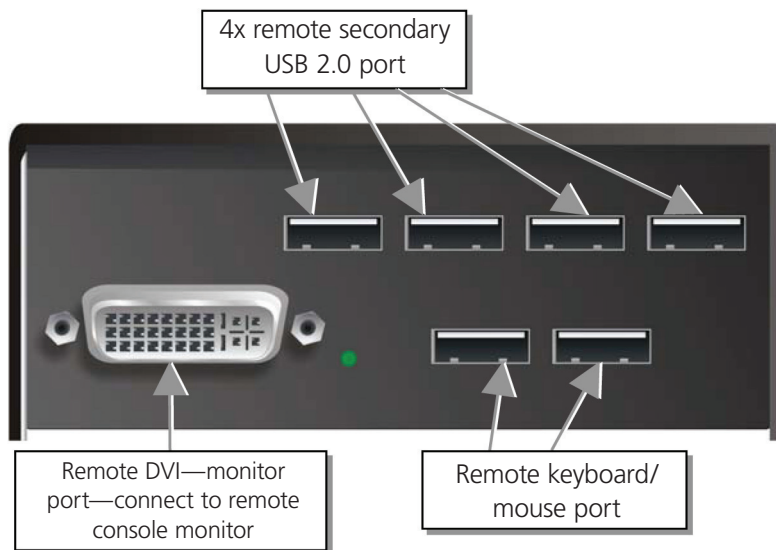


Figure G-10. ServSwitch KVM remote unit with 2x USB—HID + 4x USB 2.0.

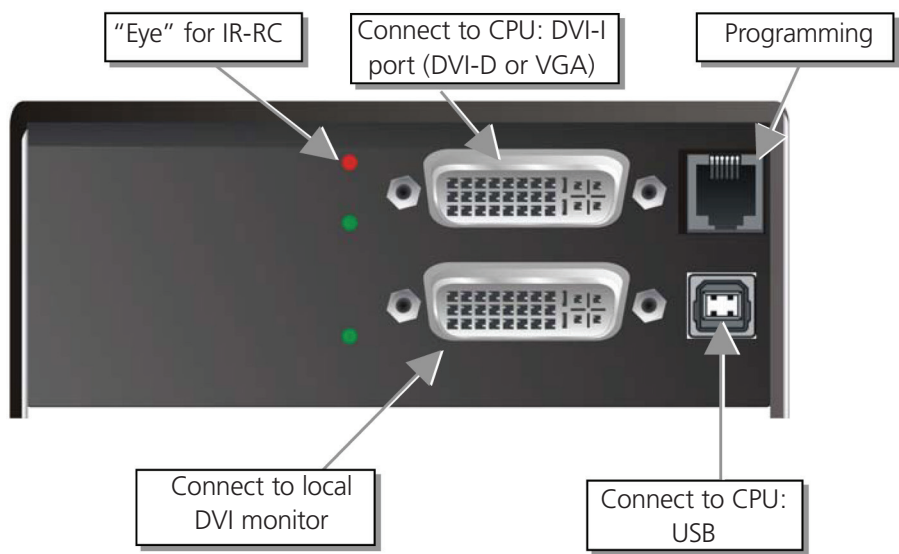


Figure G-11. ServSwitch KVM local unit with DVI-I input (DVI-D + VGA).

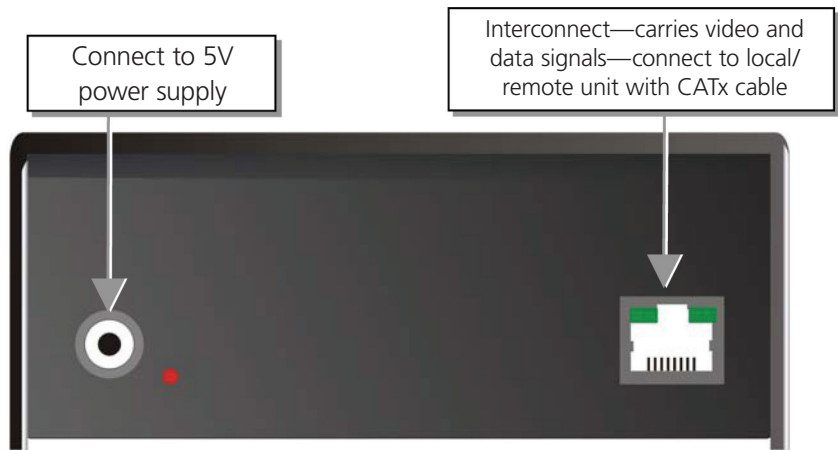


Figure G-12. ServSwitch KVM with audio local/remote unit (CATx)—back view.

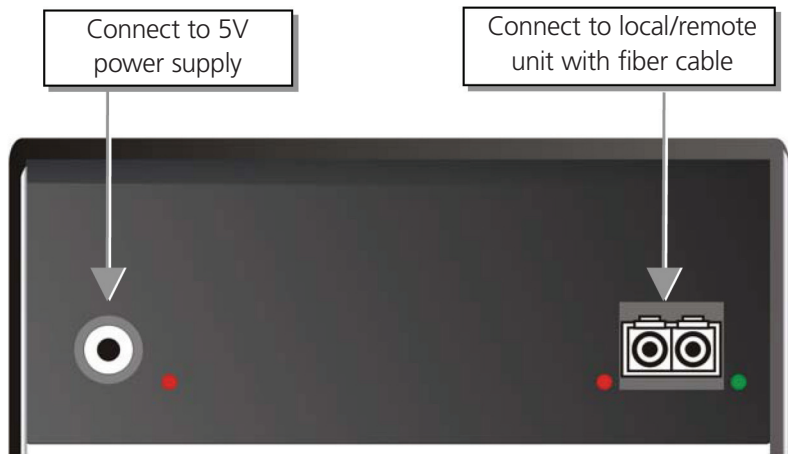


Figure G-13. ServSwitch KVM with audio local/remote unit (fiber)—back view.

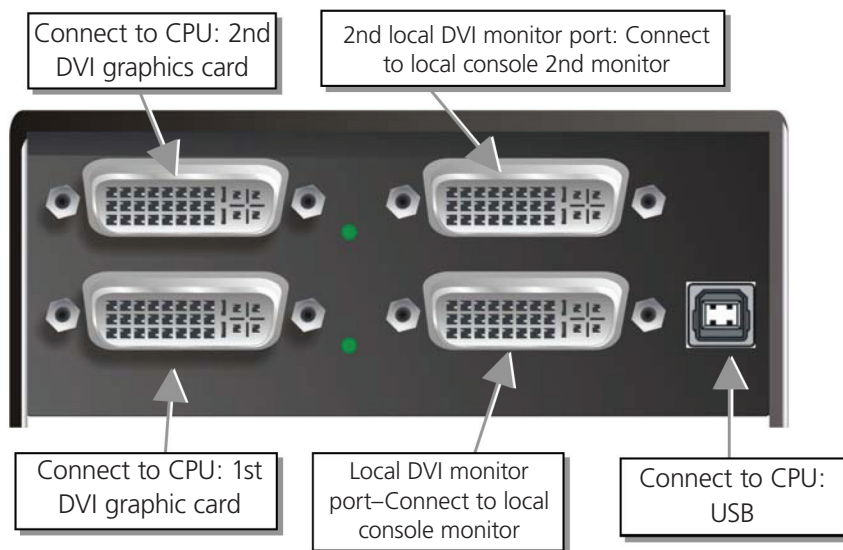


Figure G-14. ServSwitch KVM dual-head local unit.

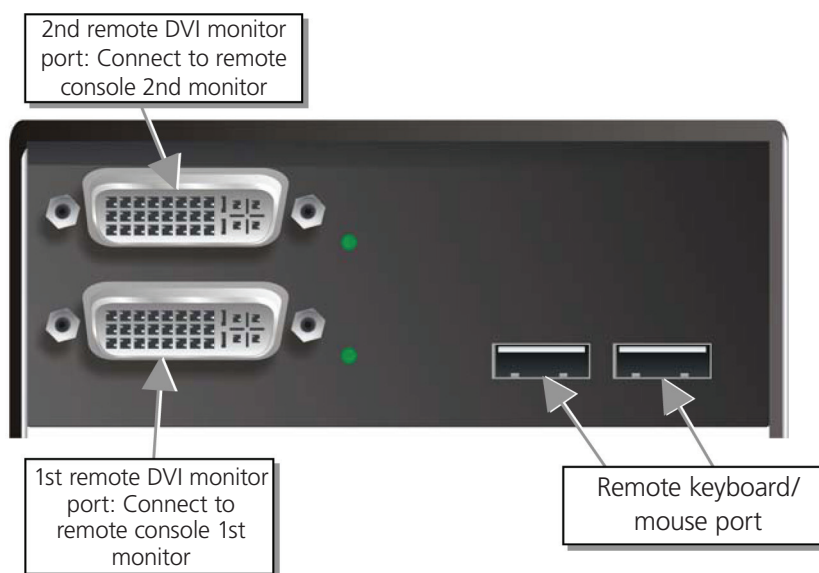


Figure G-15. ServSwitch KVM dual-head remote unit.

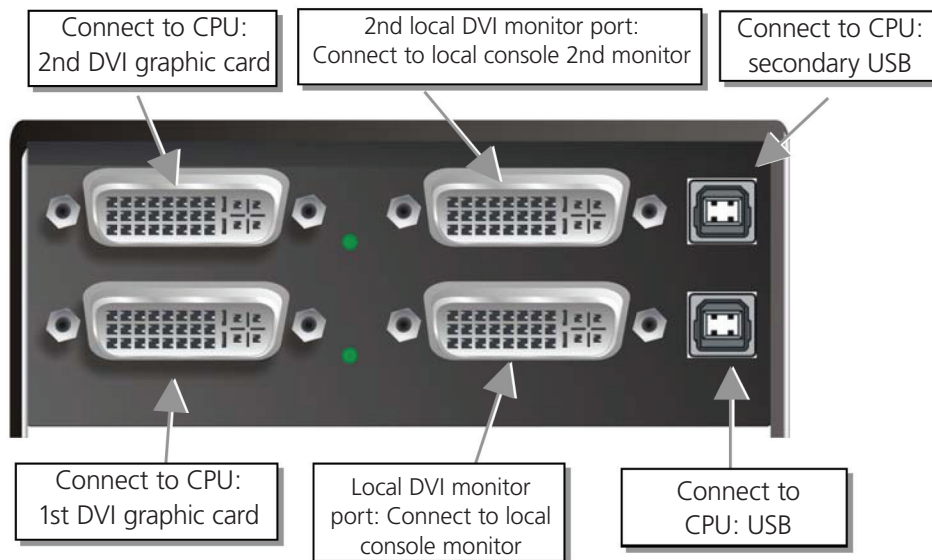


Figure G-16. ServSwitch KVM dual-head local unit with 4x USB HID.

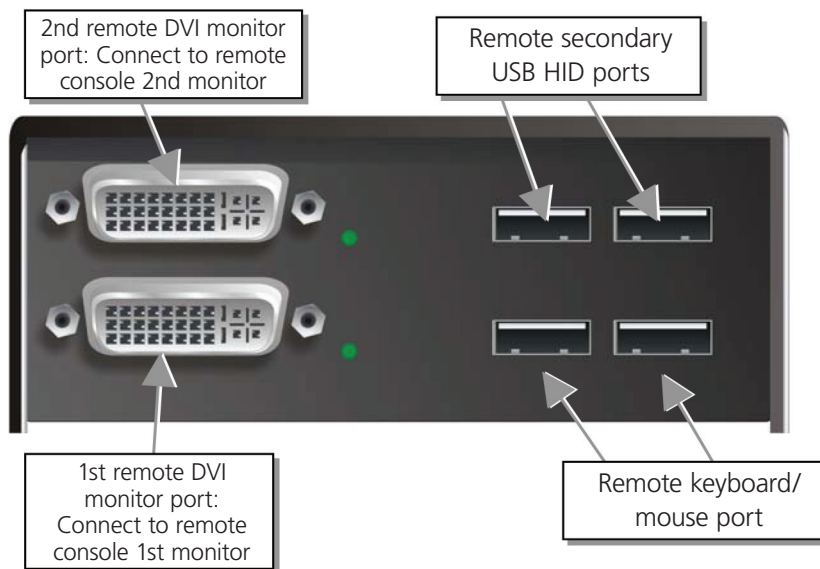


Figure G-17. ServSwitch KVM dual-head remote unit with 4x USB HID.

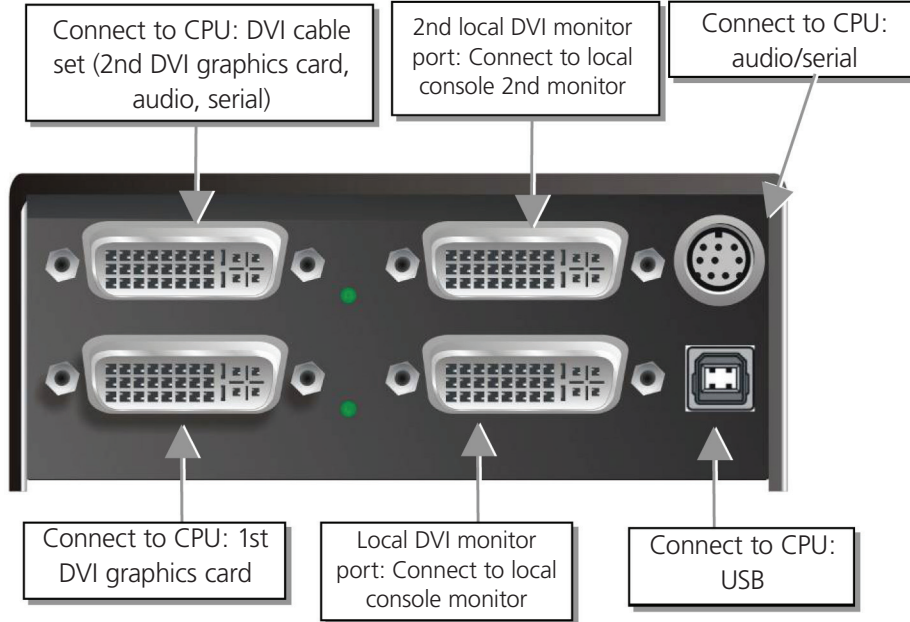


Figure G-18. ServSwitch KVM dual-head local unit with audio.

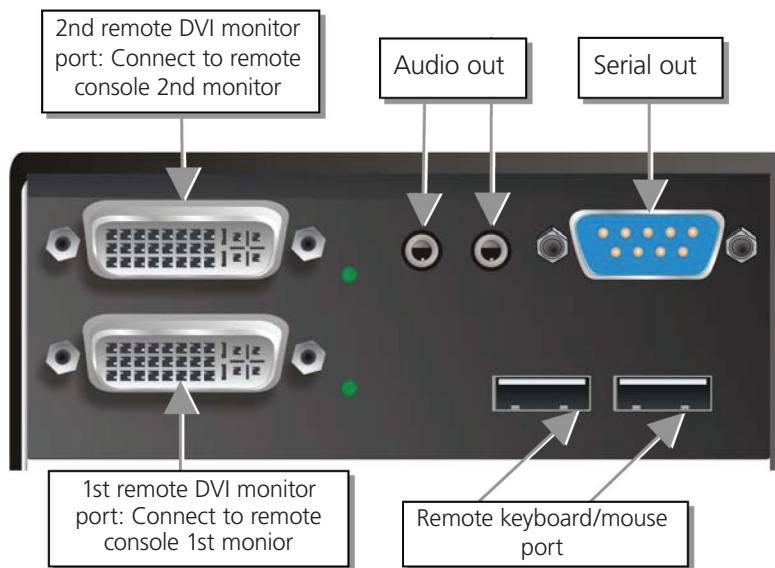


Figure G-19. ServSwitch KVM dual-head remote unit with audio.

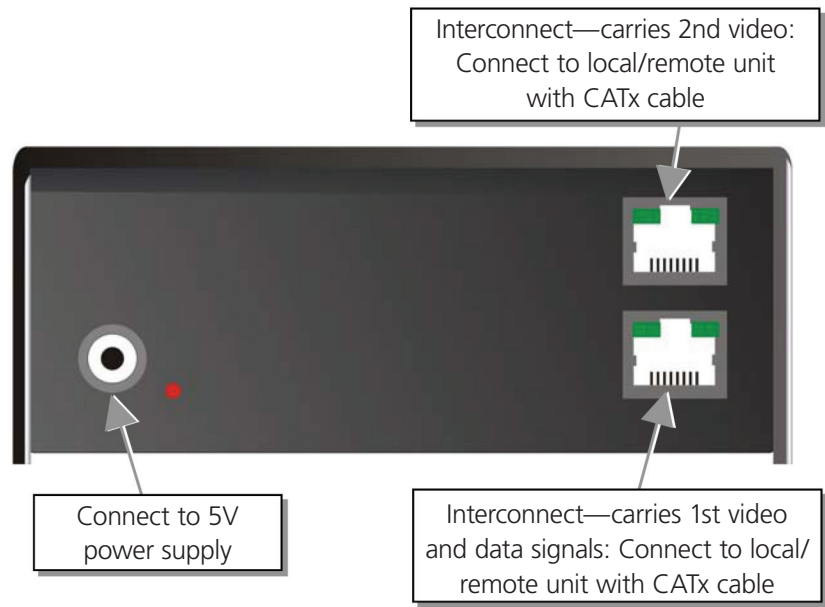


Figure G-20. ServSwitch KVM dual-head, local/remote unit, with optional audio—back view.

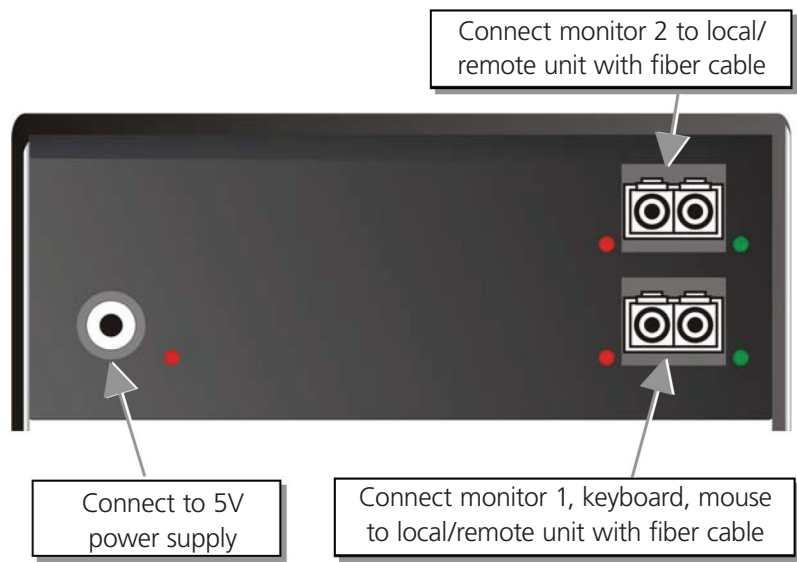


Figure G-21. ServSwitch KVM dual-head, with optional audio—back view.

G.2 Diagnostics

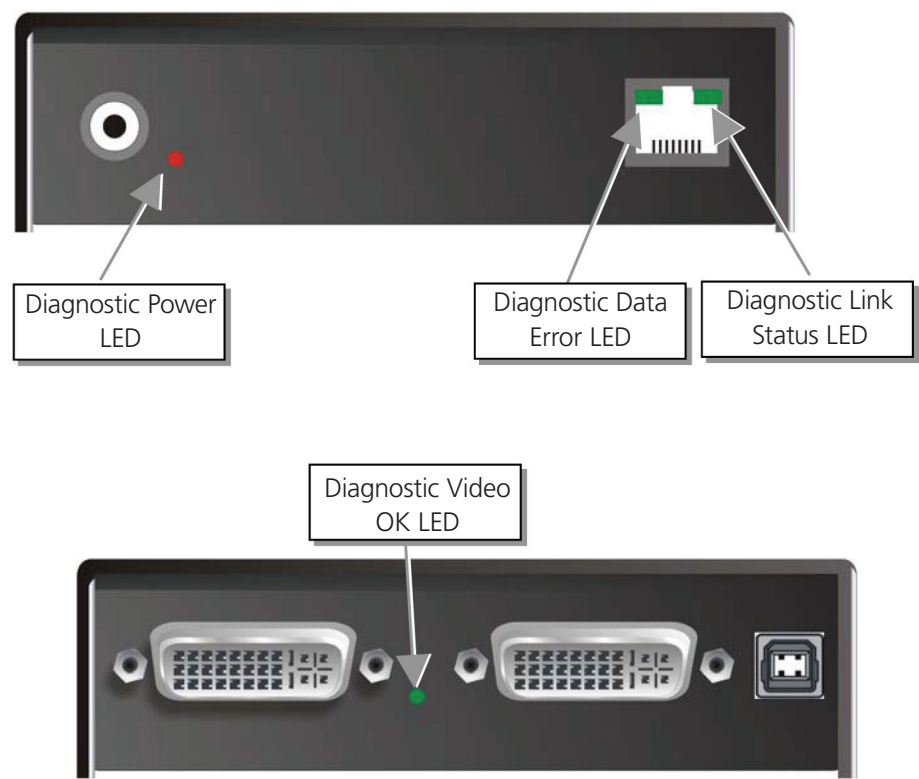


Figure G-22. Diagnostic LEDs at ServSwitch KVM/Media Extender.

Table G-1. Diagnostic LEDs at ServSwitch KVM/Media Extender.

LED	Appearance	Diagnostics
Power LED (Red LED)	Off	Device not ready
	On	Device ready
Video Okay (Green LED)	Off	No or invalid video signal detected
	On	Device ready
Link Status (Green LED)	Blinking	No CATx connection
	On	Device ready
Data Error (Green LED)	Off	Device ready
	Blinking/On	Errors through data transmission over CATx cable (cable too long, too high attenuation, or too much EMI interference)

G.3 Service Setup Extenders

For standard applications, you shouldn't need to make any adjustments to your ServSwitch DKM Media/KVM Extender. However, in certain circumstances, you may need to open the Local Unit and/or the Remote Unit. To open one of the units, unscrew the Philips-type screws at both sides at the bottom of the device. Unscrew the UNC type screws on each side of the monitor connectors. Carefully displace the lower and upper shells of the case.



Figure G-23. Fastening screws on the extender base.

The following diagnostic LEDs are used to indicate configuration changes:

The diagnostic LED "Video OK" is located at the Local Unit between both DVI connectors.

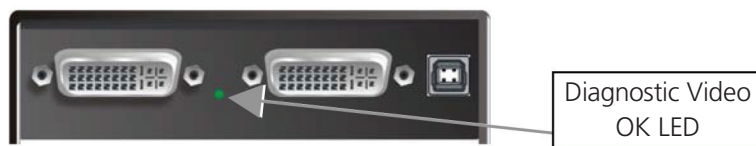


Figure G-24. Diagnostic Video OK LED at local unit.

The diagnostic LED "Video OK" LED is located near the CATx/fiber connectors.



Figure G-25. Diagnostic Link Status LED (CATx).



Figure G-26. Diagnostic Link Status LED (Fiber).

G.4 Setup at the Local Unit

After unscrewing and opening the upper shell, place the device with the CATx connectors to the right and the monitor connectors to the left.

The main PCB then will look like this:

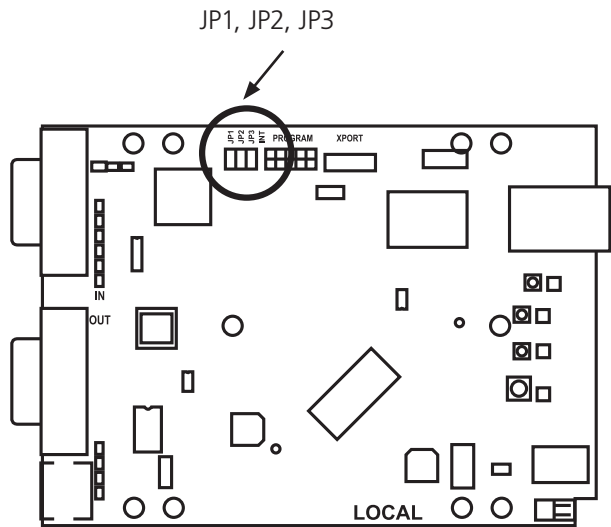








Figure G-27. Main PCB layout.

Use the diagram to locate jumpers.

DDC/color depth

You can select whether the DDC information is taken from internal DDC table, from the local monitor, or downloaded from the remote monitor and stored in internal table.

Table G-2. DDC color depth.

DDC	JP1	JP2
From internal table (default)	 Closed	 Open
From local monitor	 Open	 Closed
Loading the DDC information from the remote monitor into the internal DDC table (see also below: loading the DDC information from the remote monitor into the internal DDC table)	 Closed	 Closed

G.5 Setup at the Remote Unit

Loading the DDC information from the remote monitor

- Switch on the system: Local and Remote Unit, CPU, and monitor. Connect CPU with Local Unit and Remote Unit with monitor (On dual-head devices, connect both monitors). Connect Local and Remote Unit with the CATx interconnect cable.
- Unplug the remote monitor’s video-cable from the Remote Unit (on dual-head devices, unplug both monitors).
- Switch on the monitor if it is switched off. (On dual-head devices, connect and switch on both monitors.)

Appendix G: ServSwitch Media Extenders

- Replug the remote monitor’s video cable into the Remote Unit (on dual-head devices, replug both monitors).
- The DDC information of the remote monitors is read automatically, transferred to the Local Unit and stored into the DDC EPROM.
- After a successful reprogramming, the Video OK LED at the Local Unit blinks rapidly for approximately 1 second.
- Done.

Selection of color depth



You can select, whether always 24-bit colors (=full color depth) are transmitted or whether the compression algorithm automatically switches between 16- and 24-bit colors to accelerate the data transfer (default).

Normally, the difference between 24-bit and 16-bit is not recognizable but under some special circumstances, for example, in photo processing installations, there might be disturbing color aberrations.

While the automatic color switching enhances the number of frames, transmitted per second, fixed 24-bit color depth gives smooth color grades under all circumstances.

Please select your preferred mode.

Table G-3. Selecting color depth.

Color Depth	JP3
16/24 bit Autoselect, color depth depends on frame content (default)	 Closed
24 bit	 Open

Enabling the Hotkeys

When integrating Extender Kits ACS4xyzA-R2(-xx) in a DKM setup, make sure to have Jumper 11 (JP 11) set! If JP 11 is not set neither of the hotkeys will work and you will be unable to open the OSD or issue switching commands.

G.6 Devices with Serial/Audio Option

The audio/serial option consists of daughter boards that allow bidirectional stereo audio and a full-duplex serial data link to be sent across the regular interconnection cable in addition to keyboard, mouse and VGA/DVI video.

- To set up the extender’s audio and serial link, follow all the instructions detailed below. If you have any questions, contact Black Box Technical Support at 724-746-5500 or info@blackbox.com.

Technical Data

Serial link:

Serial Speed: Any up to a maximum of 19,200 bps

Serial Data Format: Format independent

Flow Control: RTS, CTS, DTR, DSR are sent across link

Audio link:

Description: Bidirectional stereo audio link

Transmission Method: Digitised virtually CD quality audio (16-bit, 38.4 KHz)

Signal Levels: Line level (5 Volts Pk-Pk maximum)

Input Impedance: 47K

Local Unit Connectors: 2 x 3.5-mm stereo jack socket (Line In and Line Out)

Remote Unit Connectors: 2 x 3.5-mm stereo jack socket (Line/Mic In and Line Out)

Microphone Support: A microphone may be connected to the Remote Unit. A pull-up resistor provides bias for condenser microphone. Option to set microphone amplification to +17 dB

Setup and Operation Serial Interface

CAUTION: Dual-Head KVM extenders and all media extenders support a 3-wire protocol (Tx/Rx/GND) only. Connected devices must support a software handshake (X-ON/X-OFF).

NOTE: No setting up or user adjustments are required. On the dual-access model, the serial link is always active. The Remote Unit's serial port is wired as DTE (that is, the same as that on a CPU). To connect a serial printer (or other DTE rather than DCE device) to the Remote Unit, you will need a null-modem (crossover) cable between the Remote Unit and the printer (or other device). A serial touchscreen may be plugged directly into the Remote Unit.

Serial Interface—Handling Multiple Serial Devices

The serial interface transmits/receives six signals (three signals in each direction). Normally four of these signals are used for hardware handshaking (in addition to Tx and Rx). However, because each handshaking line can support signals up to 19,200 bps, it is possible to configure the serial interface to handle up to three simple 2-wire (Tx/Rx only) serial links. To do this, you will need to construct a custom breakout cable. Contact Tech Support for further information. Select X-ON/X-OFF software flow control on the printer and CPU.

Audio Interface—Setup and Operation

The audio interface is line level and is designed to take the output from a sound card (or other line-level source) and be connected to a set of powered speakers at the other end of the link. Stereo audio may be transmitted either way across the link (simultaneously). No setup is required unless a microphone is connected to the Remote Unit. Connect as follows:

- Take the line-level output from your sound card (green connector) and connect to “Line In” on the extender.
- A set of powered speakers may be connected directly to “Line Out” at the opposite end of the link.

Audio Interface—Using a Microphone

A microphone may be plugged into the “Line In” connector on the Remote Unit. There are two ways of setting up a microphone:

- The Local Unit's ‘Line Out’ connection should normally be wired to the microphone input (red) on your sound card. The sound card should then be set up to provide additional amplification (+20 dB). This is the preferred connection method.
- Alternatively, the Remote Unit itself can provide microphone amplification. To set this, open up the Remote Unit and locate the jumper labeled “MIC” on the daughterboard. Connect this jumper across the pins. The Local Unit's “Line Out” connection should then be wired to ‘Line In’ (blue) on your sound card.

If your microphone is already amplified, follow the second method but do not install the amplification jumper in the Remote Unit.

G.7 Connectors for the ServSwitch KVM Units

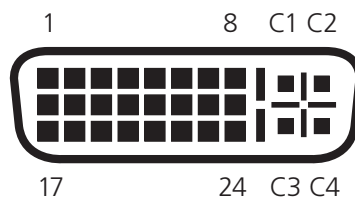


Figure G-28. DVI-I connector (female).

Table G-4. DVI-I connector pinout.

Pin	Signal	Pin	Signal	Pin	Signal
1	T.M.D.S. data 2-	9	T.M.D.S. data 1-	17	T.M.D.S. data 0-
2	T.M.D.S. data 2+	10	T.M.D.S. data 1+	18	T.M.D.S. data 0+
3	T.M.D.S. data 2 GND	11	T.M.D.S. data 1 GND	19	T.M.D.S. data 0 GND
4	Not connected	12	Not connected	20	Not connected
5	Not connected	13	Not connected	21	Not connected
6	DDC Input (SCL)	14	+5V high impedance	22	T.M.D.S. clock GND
7	DDC Output (SDA)	15	GND	23	T.M.D.S. clock +
8	Internal use	16	Hot plug detect	24	T.M.D.S. clock -
C1	Internal use			C3	Internal use
C2	Not connected	C5	GND	C4	Internal use

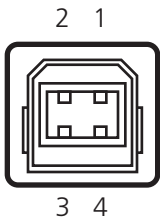


Figure G-29. Keyboard/mouse connector, USB Type B (socket at local unit).

Table G-5. Keyboard/mouse connector, USB Type B pinout.

Pin	Signal	Color
1	VCC (+5V)	Red
2	Data -	White
3	Data +	Green
4	GND	Black

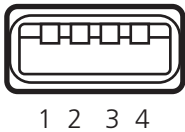


Figure G-30. Keyboard/mouse connector, USB Type A (socket at remote unit).

Table G-6. Keyboard/mouse connector
USB Type A pinout.

Pin	Signal	Color
1	VCC (+5V)	Red
2	Data -	White
3	Data +	Green
4	GND	Black

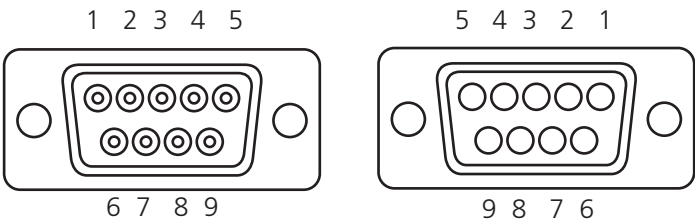


Figure G-31. Serial interface (single-head devices only).

Table G-7. Serial interface (single-head devices only) pinout.

Pin	Signal	Pin	Signal
1	Not connected	1	Not connected
2	RxD	2	RxD
3	TxD	3	TxD
4	DTR	4	DTR
5	GND	5	GND
6	DSR	6	DSR
7	RTS	7	RTS
8	CTS	8	CTS
9	Not connected	9	Not connected

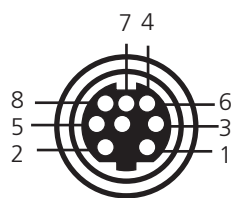


Figure G-32. Audio/serial socket audio/RS-232 at dual-head local unit.

Table G-8. Audio/serial socket audio/RS-232 at dual-head local unit pinout.

Pin	Signal
1	Audio GND
2	RS-232 GND
3	Audio out right channel
4	Audio out left channel
5	RS-232 RxD
6	Audio in right channel
7	Audio in left channel
8	RS-232 TxD

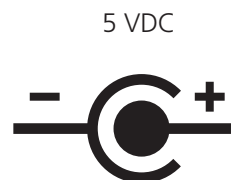


Figure G-33. Power supply.

Table G-9. Power supply pinout.

Pin	Signal
Inner	+5 V
Outer	GND

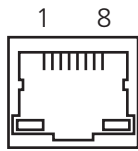


Figure G-34. CATx interface wiring according to EIA/TIA 568A (1000BASE-T).

Table G-10. CATx interface pinout.

Pin	Signal	Pin	Signal
1	D1+	5	D3-
2	D1-	6	D2-
3	D2+	7	D4+
4	D3+	8	D4-

Black Box Tech Support: FREE! Live. 24/7.

Tech support the
way it should be.



Great tech support is just 30 seconds away at 724-746-5500 or blackbox.com.



About Black Box

Black Box Network Services is your source for an extensive range of networking and infrastructure products. You'll find everything from cabinets and racks and power and surge protection products to media converters and Ethernet switches all supported by free, live 24/7 Tech support available in 30 seconds or less.

© Copyright 2012. All rights reserved.