

# **DVI-D-CatX-KVM-Extender Single and DualHead**

## **Manual**

**<http://www.blackbox.com>**

## Welcome to the DVI-D Cat X KVM-Extender Family!

Thank you for purchasing an DVI-D Cat X KVM-Extender! We appreciate your business, and we think you'll appreciate the many ways that your enhanced RGB Graphic system will save you money, time, and effort.

That's because our DVI-D Cat X KVM-Extender is all about breaking away from the traditional model of attaching a new display to DVI graphic source. Using the DVI-D Cat X KVM-Extender, you can remotely locate monitor, keyboard and mouse up to 140m away from your CPU.

Wherever long distances are usual, e.g. airports, industrial plants, call-centres or in distributed computer centres, the DVI-D Cat X KVM-Extender is the best way, to solve all problems in remotely locating your console. 4 different types are available: Singlehead and Dualhead devices for PS2 keyboard/mouse and Singlehead and Dualhead devices for USB keyboard/mouse.

This manual will tell you all about your new DVI-D Cat X KVM-Extender, including how to install, operate, and troubleshoot it. For an introduction to the Converter, see **Chapter 2**. The Converter product codes covered in this manual are:

**ACS1009A: KVM-Extender Singlehead DVI-D, PS2-Keyboard/Mouse**

**ACS2209A: KVM-Extender Dualhead DVI-D, PS2-Keyboard/Mouse**

**ACS4001A: KVM-Extender Singlehead DVI-D, USB-Keyboard/Mouse**

**ACS4201A: KVM-Extender Dualhead DVI-D, USB-Keyboard/Mouse**

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## Disclaimer

While every precaution has been taken in the preparation of this manual, the manufacturer assumes no responsibility for errors or omissions. Neither does the manufacturer assume any liability for damages resulting from the use of the information contained herein. The manufacturer reserves the right to change the specifications, functions, or circuitry of the product without notice.

The manufacturer cannot accept liability for damage due to misuse of the product or due to any other circumstances outside the manufacturer's control (whether environmental or installation related). The manufacturer shall not be responsible for any loss, damage, or injury arising directly, indirectly, or consequently from the use of this product.

## Cautions and Notes

The following symbols 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.



# DECLARATION OF CONFORMITY

## EUROPEAN UNION DECLARATION OF CONFORMITY

This is to certify that, when installed and used according to the instructions in this manual, together with the specified cables and the maximum cable length <3m, the Units are shielded against the generation of radio interferences in accordance with the application of Council Directive 89/336/EEC as well as these standards:

EN 55022:	1999	Class B
EN 55024:	1999	
IEC 61000-4-2:	2001	
IEC 61000-4-3:	2001	
IEC 61000-4-4:	2001	
IEC 61000-4-5:	2001	
EN 61000-3-2	2001	
EN 61000-3-3	2002	

The device was tested in a typical configuration with PC.



## Safety Precautions and Installation Guidelines

To ensure reliable and safe long-term operation, please note the following installation guidelines:

- Do not use CATx-devices to link between buildings – please use fiber devices.
- Only use in dry, indoor environments.
- Do not use CATx-devices to link between buildings – please use fiber devices.
- If the building has 3-phase AC power, try to ensure 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 obstruct a unit's ventilation existing holes.



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

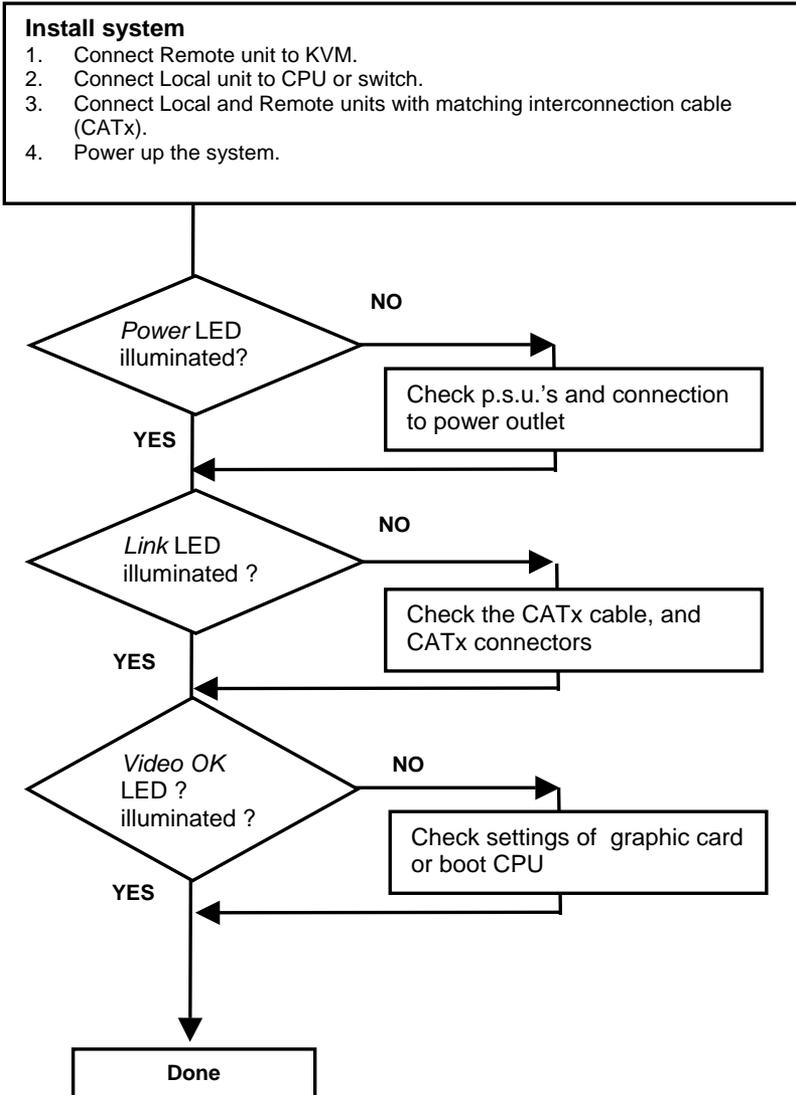
- Only use power supplies originally supplied with the product or manufacturer-approved replacements. Do not attempt to dismantle or repair any power supply. Do not use a power supply if it appears to be defective or has a damaged case.
- Connect all power supplies to grounded outlets. In each case, ensure 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 (RJ45) to any other products, especially telecommunications or network equipment.

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# 1. Quick Setup

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



## 2. Overview

### 2.1 Introduction

A Cat5 KVM Extender is mainly used, to extend the maximum distance between a CPU and his Keyboard / Monitor / Mouse considerably. In addition they are irrecoverable in installations in electromagnetic hazardous environments (EMI). Normal Keyboard-/ Monitor-/ Mouse extender cables (and Extender using traditional cables) cannot go so far and EMI interferences may reduce the maximum distance and/or reliability. Using a DVI-D Cat X Extender system, these limitations are past. Remain your CPU in a secure rack cabinet or data center while accessing from a 140m remotely located place.

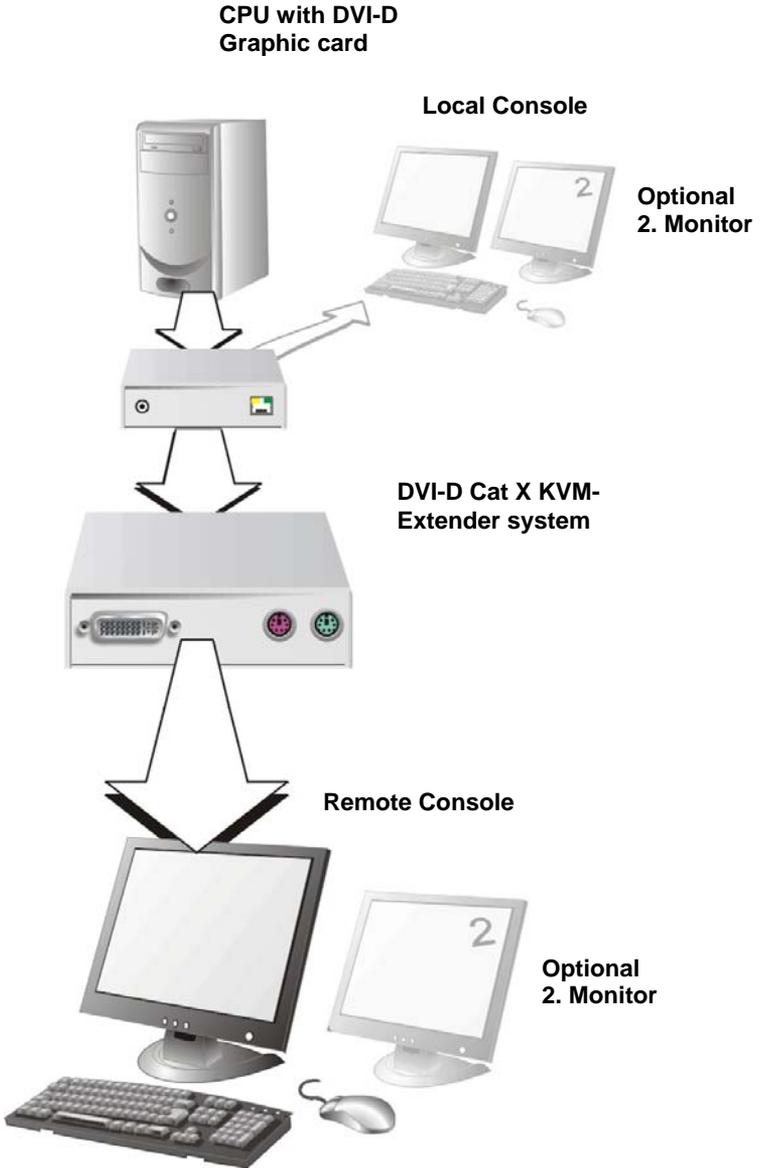
A basic KVM extension system comprises a *Local* unit (transmitter) and a *Remote* unit (receiver). The Local unit connects directly to the computer (or a KVM switch system) using the supplied cable(s). The user *console* (keyboard, mouse and monitor) attaches to the Remote unit. The Remote and Local units communicate video and data information along the interconnecting cable. Local units offer dual access, allowing the connection of a second user console close to the computer.

### 2.2 Glossary

The following terms are used in this guide:

<b>CATx</b>	Any Category 5, 5e, 6 or higher cable, solid wires type AWG24.
<b>KVM</b>	Keyboard, Video and Mouse.
<b>Console</b>	Keyboard, Mouse and Monitor
<b>Dual Access</b>	A system allowing connection of Local and Remote user consoles.
<b>Singlehead</b>	An extender system that supports one monitor + Keyboard/Mouse
<b>Dualhead</b>	An extender system that supports two monitors + Keyboard/Mouse
<b>DVI</b>	Digital Video standard, installed by <b>Digital Display Working Group</b> ( <a href="http://www.ddwg.org">www.ddwg.org</a> ) R, G, B, CLOCK in a data stream with up to 3x 1,6 Gbit/sec. Signals are TMDS Level.
<b>PSU</b>	The desktop power supply connected to the Local/Remote unit.

# DVI-D CAT X KVM-EXTENDER



**DVI-D Cat X – KVM Extender system (example)**

## 2.3 Features

All members of the DVI-D Cat X - DVI KVM Extender Series offer the following features:

- Support for DVI-D Graphic cards (all devices)
- Support for PS2-Keyboard and PS2-Mouse (ACS1009A and ACS2209A)
- Support for USB-Keyboard and USB-Mouse (ACS4001A and ACS4201A)
- Maximum resolution: DVI-D: 1600x1200@60Hz over all allowed distances all lower resolutions with refresh rates of at least 75Hz
- Supporting 18 Bit color depth = 256,000 colors
- Status indicator LEDs on each device.
- Small footprint chassis.
- Rack mount options available.
- CPU cables + Adapters included.

## 2.4 Product Range

There are four products in the range and various upgrade kits:

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***DVI-D Cat X - Extender***

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ACS1009A	KVM-Extender 1x DVI, PS2-Keyboard, PS2-Mouse (Singlehead)
ACS2209A	KVM-Extender 2x DVI, PS2-Keyboard, PS2-Mouse s (Dualhead)
ACS4001A	KVM-Extender 1x DVI, USB-Keyboard, USB-Mouse (Singlehead)
ACS4201A	KVM-Extender 2x DVI, USB-Keyboard, USB-Mouse (Dualhead)

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***Upgrade Kits***

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ACS1009A-RMK	19"/1HE Rackmount- Kit to mount up to 4 Singlehead devices
ACS2209A-RMK	19"/1HE Rackmount- Kit to mount up to 4 Dualhead devices
ACS1009A-BP	Blanking Plate for Single Head Rackmountkit
ACS2209A-BP	Blanking Plate for Dual Head Rackmountkit

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## 2.5 Compatibility

### Interface Compatibility

- **Digital Video (DVI-D):** Digital Video standard, installed by Digital Display Working Group ([www.ddwg.org](http://www.ddwg.org)) R, G, B, CLOCK in a data stream with up to 3x 1,6 Gbit/sec. Signals are TMDS Level.
- **PS/2 Keyboard:** Compatible with all standard keyboards. Certain keyboards with enhanced features may also be supported with custom firmware.
- **PS/2 Mouse:** Compatible with all standard 2-button, 3-button and wheel mice.
- **USB Keyboard:** Compatible with all standard keyboards. Certain keyboards with enhanced features may also be supported with custom firmware. Keyboards with built-in hub are also supported – but there are never more than two HDI devices supported.
- **USB Mouse:** Compatible with all standard 2-button, 3-button and wheel mice.



*INFO: devices with USB- connectors do only support Keyboard and Mouse. It's possible, that other HDI devices (Human Device Interface) like Touch-Screen, Graphic tablet, Barcode reader or similar are supported – but there is no guarantee for this! Regardless of your devices, the extender will not support more than two devices at once. The DVI-D Cat X KVM-Extender is NOT suitable for to use with other USB devices like Scanner, WEB- Cams, data sticks etc.*

## 2.6 How to Use This Guide

This guide describes the installation and configuration of the DVI-D Cat X – Extender Series. Although the connection and operation of the system is relatively straightforward, you should consider the following before getting started:

### Connection & Compatibility

If you have purchased an *Extender Kit*, this will contain all the cables required to connect the Local unit to your PC or KVM switch. Please see also: Fehler! Verweisquelle konnte nicht gefunden werden. (page Fehler! Textmarke nicht definiert.)

For information about connection and installation, see Fehler! Verweisquelle konnte nicht gefunden werden., page Fehler! Textmarke nicht definiert..

### DDC Information

Normally it is not necessary to make any adjustments to the DVXi- Extender. However, in some circumstances, it may be necessary to redefine the source of DDC Information for the CPU. By default, the DVI-D Cat X KVM-Extender uses its own internal DDC table. If this setting does not satisfy your requirements, the DDC table can either be switched to the locally or remotely attached screen.

To modify the DDC-Setup, please ask Technical support for additional information.

### Compatibility

Devices with PS2 connectors are NOT compatible to devices with USB connectors.

## 3. Installation

For first-time users, we recommend that you carry out a test placement, confined to a single room, before commencing full installation. This will allow you to identify and solve any cabling problems, and experiment with the KVM extender system more conveniently.

### 3.1 Package Contents

**You should receive the following items in your extender package (all types):**

- DVI-D Cat X KVM-Extender- pair (Local Unit + Remote Unit)
- 2x 5V DC universal power supply for the DVI-D Cat X - Extender
- 2x German type power cord
- User manual (Quick Setup)

**ACS1009A and ACS2209A (additionally):**

- KVM CPU cable set (1.8m) with one side: PS/2 (6-pin mini-DIN male) keyboard and mouse connector and DVI-I video (DVI-I dual link male) connector – other side: DVI-I video (DVI-I dual link male) connector
- PS2-Keyboard-/ Mouse adapter to connect K/M to the Local Unit (keyboard can be plugged in directly, without using an adapter)

**ACS4001A and ACS4201A (additionally):**

- DVI-I (1,8m) video cable (DVI-I dual link male-to-male)
- USB (1,8m) cable (USB type A to type B)

**ACS2209A and ACS4201A (additionally):**

- DVI-I (1,8m) video cable (DVI-I dual link male-to-male)

If anything is missing, please contact Technical Support (see **Appendix F – Calling Technical Support**).

## 3.2 Interconnection Cable Requirements

To connect the Local and Remote units you will need:

- **DVI, PS2-Keyboard, PS2-Mouse:** Connect the supplied KVM CPU cable set to your CPU (KVM.- Switch, etc.). Please ensure that the connection is tension-free! Devices ACS1009A + ACS2209A
- **DVI, USB-Keyboard, USB-Mouse:** Connect the supplied KVM CPU cable set to your CPU (KVM.- Switch, etc.). Please ensure that the connection is tension-free! Devices ACS4001A + ACS4201A
- **DVI:** Connect the supplied DVI CPU cable set to your CPU (KVM.- Switch, etc.). Please ensure that the connection is tension-free! Devices ACS2209A + ACS4201A
- **CATx Cable:** Recommended cable: S/UTP (Cat5) according EIA/TIA 56A, TSB 36 or Digital STP 17-03170. Four pairs AWG 24. connection according EIA/TIA 568A (10BaseT). Use of cables from a higher category (Cat5e, Cat6, Cat7) is possible.

The use of unshielded CATx Cable is possible, because of the higher electromagnetic noise/sensitivity the device class may not be reached.

The use of flexible Cables (Patch cable) Type AWG26/8 is possible. Because of the higher loss of the stranded cables, the maximum distance is reduced to app. half the value of solid cables.



*A point to point connection is required. Having one or more patch panels in the line is possible and allowed. Not allowed is a connection from the CATx link interface (RJ45) to any other products, especially telecommunications or network equipment.*

- **Power Supply**

Connect the supplied 5V/DC power supplies to the **Plug** terminal on the rear of both Local and Remote units.

### 3.3 System Setup

To install your DVI-D Cat X – Extender system:

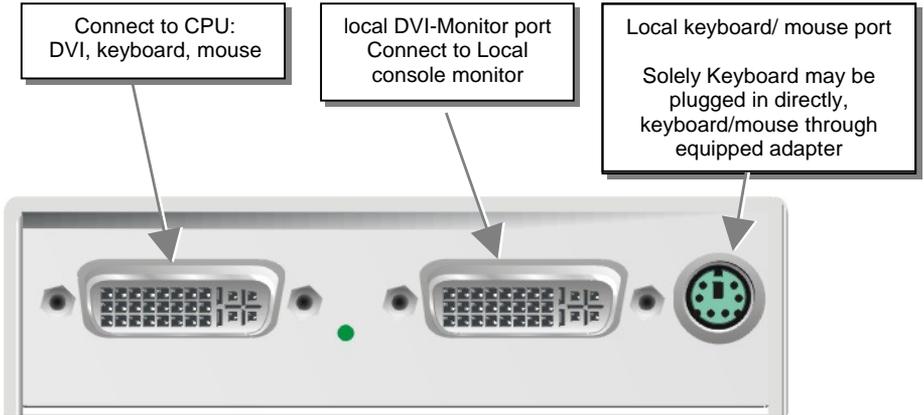
1. Switch off all devices.
2. Connect your keyboard, monitor(s) and mouse to the Remote unit (depending on device type). Please ensure, to not swap Mouse- and Keyboard connector. The Keyboard connector is purple and the Mouse connector is green.
3. Using the supplied CPU KVM cable(s), connect the keyboard, monitor(s) and mouse connectors on the computer (or KVM switch). Please ensure, to not swap Mouse- and Keyboard connector. The Keyboard connector is purple and the Mouse connector is green.
4. Connect the interconnect cable to the INTERCONNECT socket(s)
5. Connect the 5V power supply to power the unit.



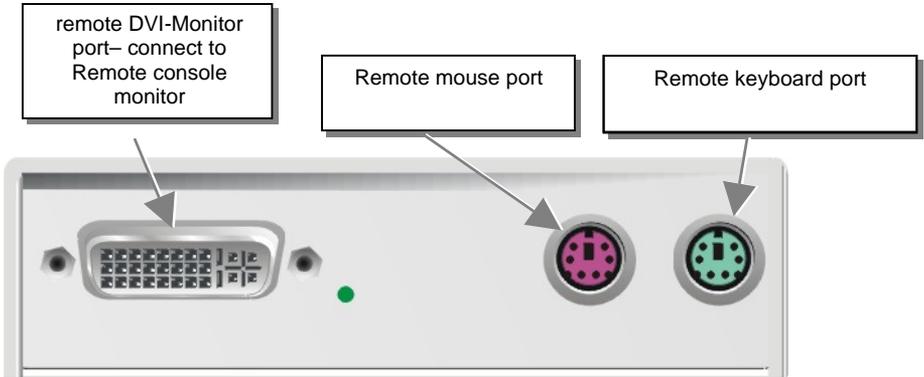
Only use the power supply originally supplied with this equipment or a manufacturer-approved replacement.

6. For a dual access system, connect the keyboard, mouse and monitor for the Local console to the appropriate ports on the Local unit. The ports may also be used to feed into a KVM switch. To the local (PS2-) Keyboard-/ Mouse port you can attach a Keyboard directly or Mouse/ Keyboard together, using the delivered adapter.
7. Power up the system.

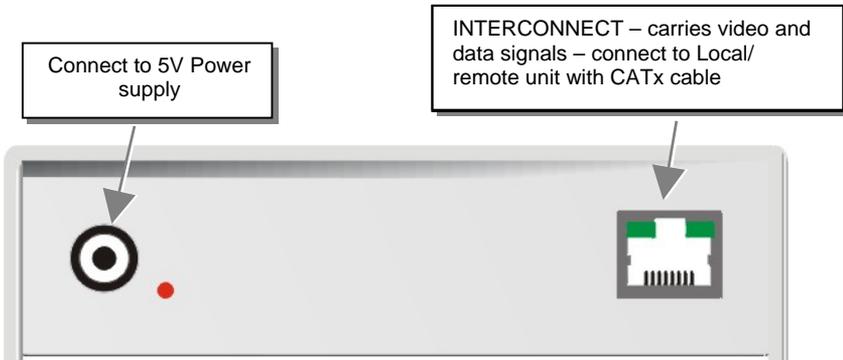
# DVI-D CAT X KVM-EXTENDER



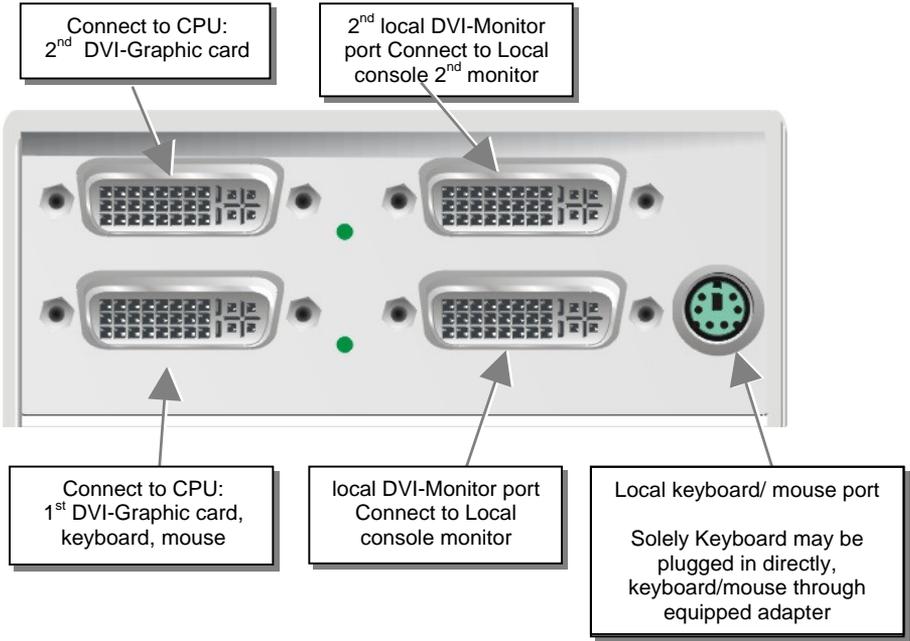
## DVI-D Cat X KVM-Extender Type ACS1009A Local Unit



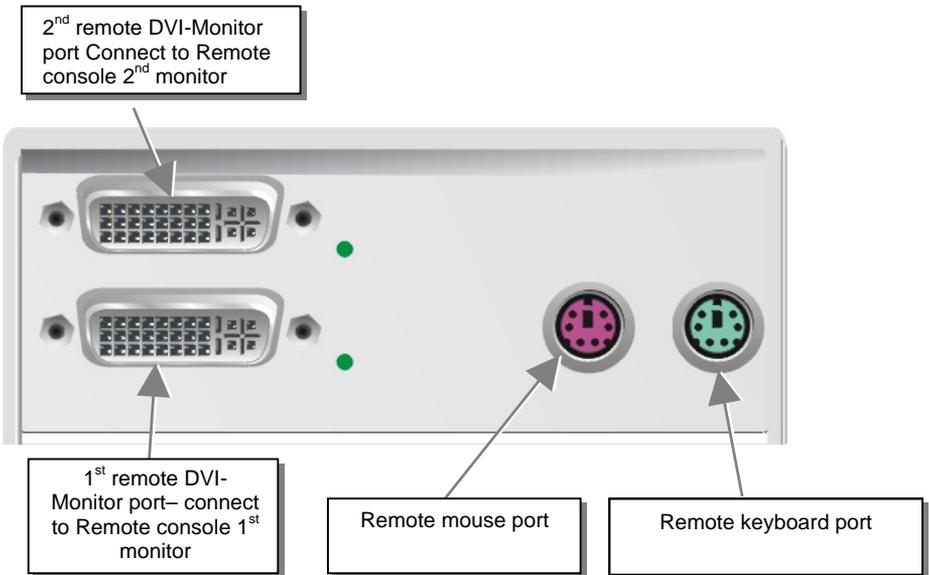
## DVI-D Cat X KVM-Extender Type ACS1009A Remote Unit



## DVI-D Cat X KVM-Extender Type ACS1009A Local/ Remote Unit



## DVI-D Cat X KVM-Extender Type ACS2209A Local Unit



## DVI-D Cat X KVM-Extender Type ACS2209A Remote Unit

# DVI-D CAT X KVM-EXTENDER

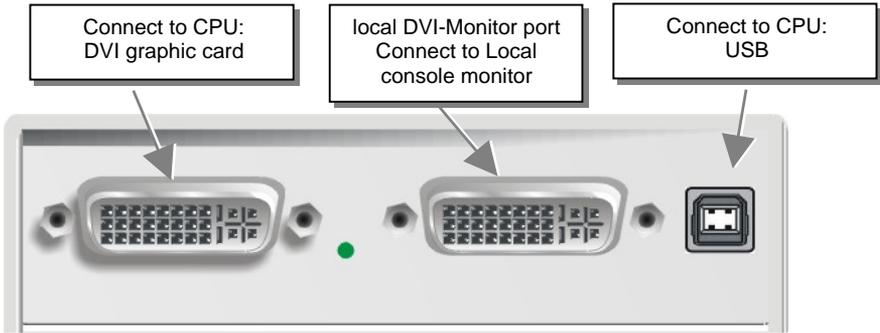
INTERCONNECT – carries 2<sup>nd</sup> video – connect to Local/Remote unit with CATx cable



Connect to 5V Power supply

INTERCONNECT – carries 1<sup>st</sup> video and data signals – connect to Local/Remote unit with CATx cable

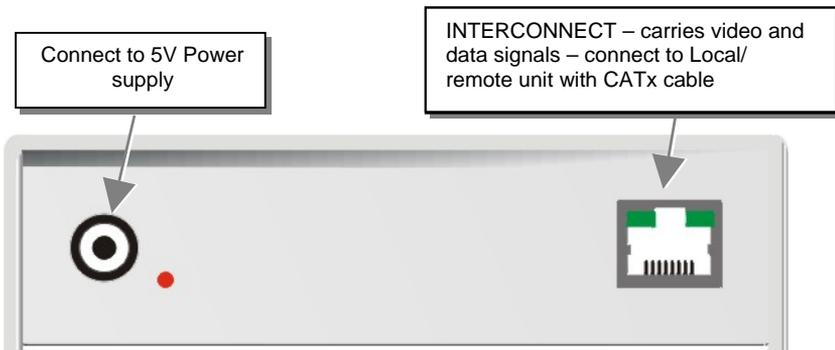
## DVI-D Cat X KVM-Extender Type ACS2209A Local/ Remote Unit



**DVI-D Cat X KVM-Extender Type ACS4001A Local Unit**

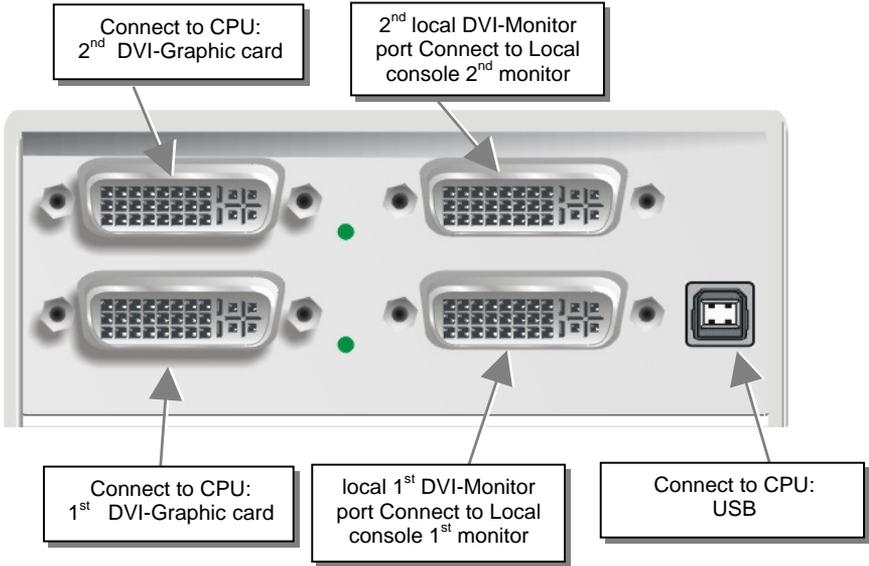


**DVI-D Cat X KVM-Extender Type ACS4001A Remote Unit**

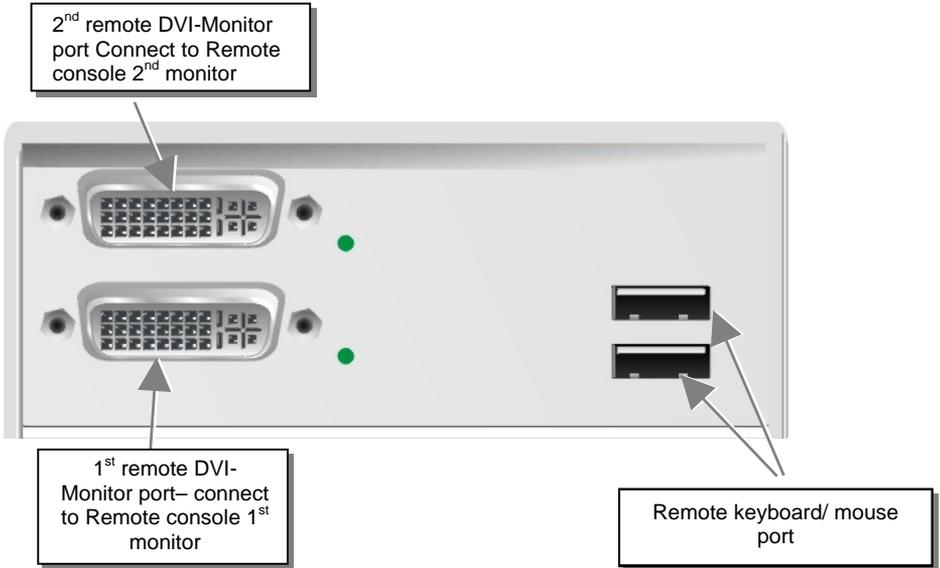


**DVI-D Cat X KVM-Extender Type ACS4001A Local/ Remote Unit**

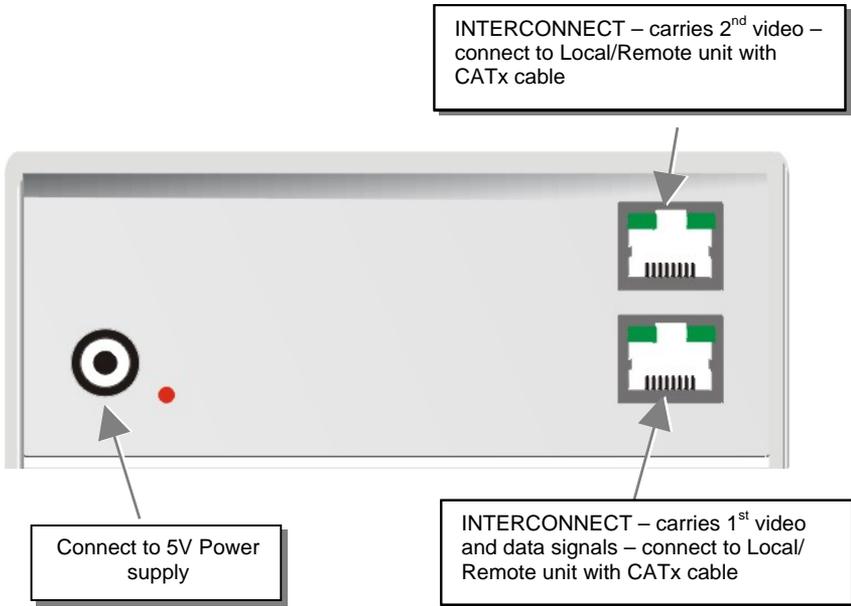
# DVI-D CAT X KVM-EXTENDER



## DVI-D Cat X KVM-Extender Type ACS4201A Local Unit



## DVI-D Cat X KVM-Extender Type ACS4201A Remote Unit

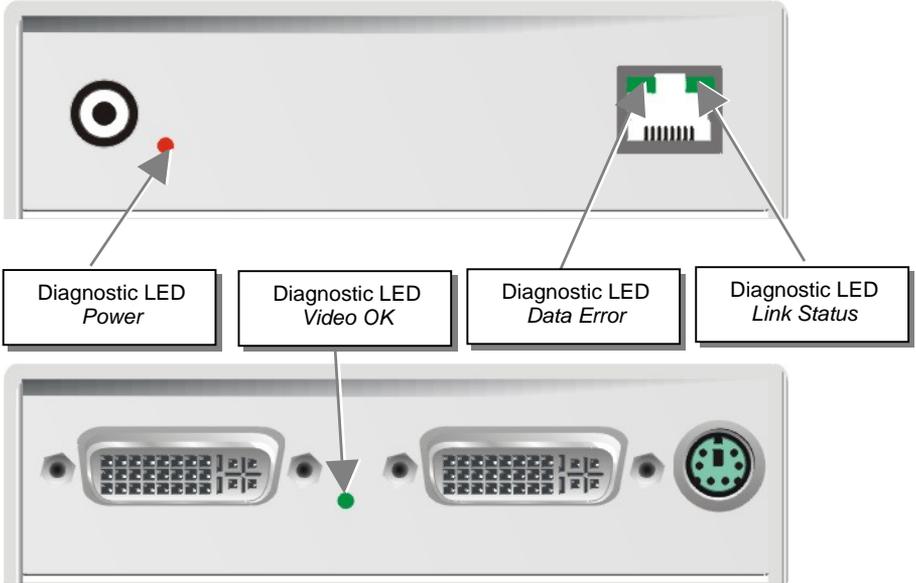


**DVI-D Cat X KVM-Extender Type ACS4201A Local/ Remote Unit**

## 3.4 Diagnostic LEDs

Each DVI-D Cat X KVM-Extender is fitted with four indicator LEDs: *Power*, *Video OK*, *Data Error*, *Link Status*: The *Power* LEDs are next to the Power socket.

The location of the LEDs is shown below:



**Diagnostic - LEDs at DVI-D Cat X - Extender**

<i>LED</i>	<i>Appearance</i>	<i>Diagnostics</i>
<b>Power LED</b> (Red LED)	Off On	Device not ready Device ready
<b>Video Okay</b> (Green LED)	Off On	No or invalid video signal detected Device ready
<b>Link Status</b> (Green LED)	blinking On	No CAT5 connection Device ready
<b>Data Error</b> (Green LED)	Off blinking / On	Device ready Errors through data transmission over CAT5 Cable (Cable too long, too high attenuation or too much EMI interferences )

## 4. Troubleshooting

### *There isn't a picture.*

Check the power supply connection at the Local unit. Is the *Power* (Red LED) at the Local unit illuminated (see page 24)? If not, the internal power-supply may be damaged or there may be an internal error.

Check the power supply connection at the remote unit. Is the *Power* (Red LED) at the Remote unit illuminated (see page 24)? 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 (see page 24)? If not, there may be a problem with the Interconnection cable:

Are there Errors through data transmission over CAT5 Cable (Cable too long, too high attenuation or too much EMI interferences )? Is the *Data Error* LED illuminated or blinking (see page 24)? If yes, check cable length and environment.

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

### *Keyboard*

#### ***The PC boots fine with no error messages but the keyboard does not work at all***

Wrong cable plugged in, keyboard and mouse cables reversed.

Try a different model of keyboard. If the new keyboard works then original one may be incompatible

Check that the Interconnection cable is connected at the Local Unit and the Remote Unit. Is the *Link Status* LED illuminated (see page 24)?

### *PS2-Mouse*

#### ***A mouse cursor appears on the screen, but the mouse does not work***

Wrong cable plugged in, keyboard and mouse cables reversed.

Try a different model of mouse

#### ***The system does not detect a PS/2 mouse, or the application cannot find the mouse.***

Wrong cable plugged in, keyboard and mouse cables reversed.

Ensure that the Local Unit is connected to the PC keyboard port to provide power.

## Appendix A: Example Applications

This section illustrates some specific applications using the DVI-D Cat X - Extenders:

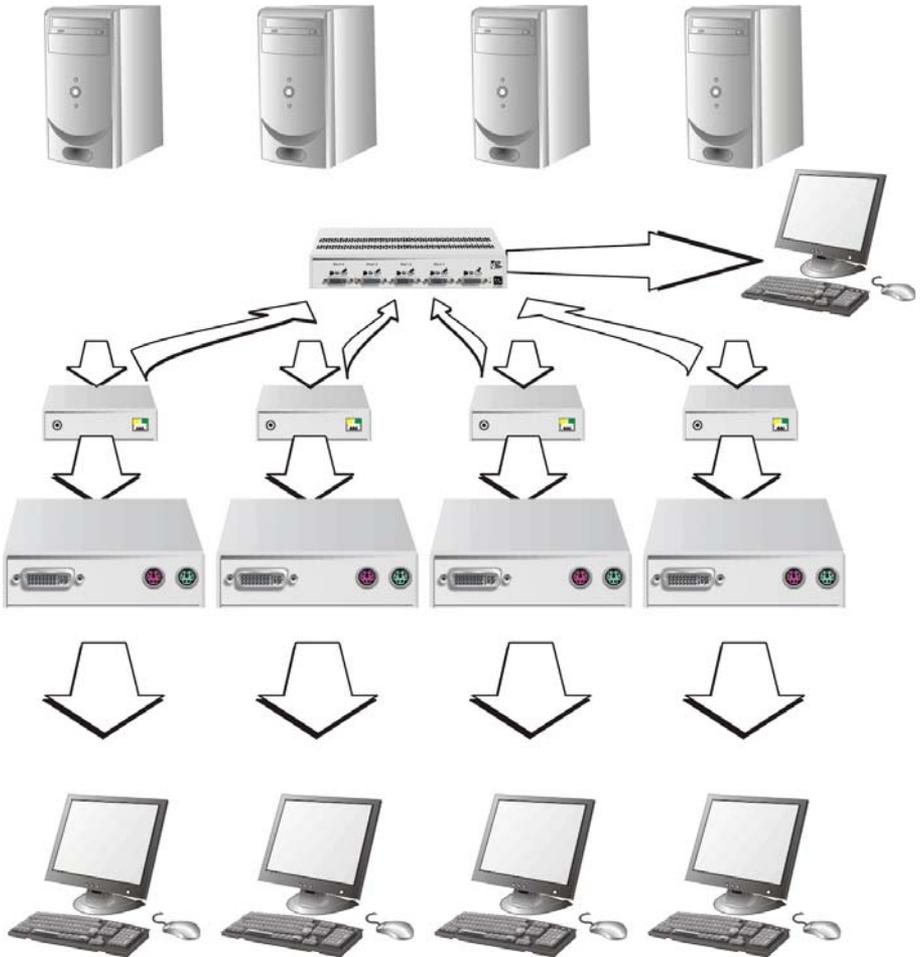
- DVI-D Cat X KVM-Extender with optional, secondary screen.



**DVI-D Cat X KVM-Extender with optional, secondary screen**

## APPENDIX A: EXAMPLE APPLICATIONS

- 4 CPU's – local outputs managed through a KVM- Switch and a single console. Remote Consoles up to 140m away.

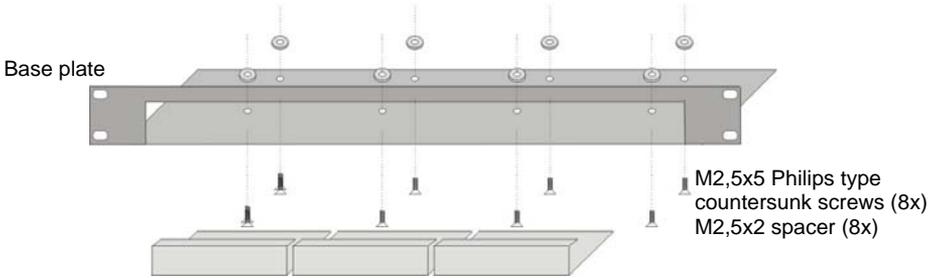


**DVI-D Cat X KVM-Extender – local Consoles through a KVM- Switch**

## Appendix B: Rack Mount Options

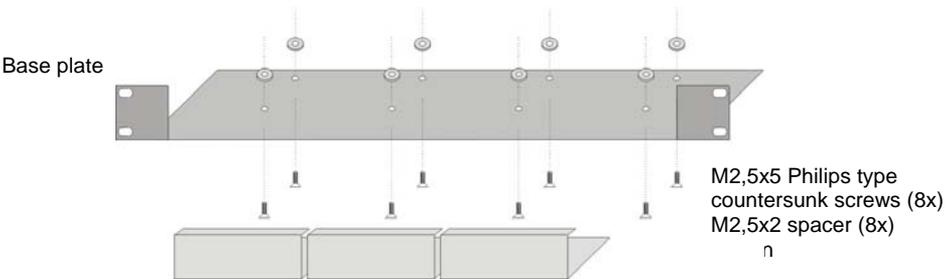
DVI-D Cat X KVM- Extender units can be mounted in a 19” rack using the mounting kit: **DVI-D Cat X- Rackmount Kit**. Two different versions are available – one each for Singlehead and for Dualhead devices.

**DVI-D Cat X- Rackmount Kit for Singlehead devices** consists of:



### 19” Rackmount Kit for Singlehead devices (ACS1009A-RMK)

**DVI-D Cat X- Rackmount Kit for Singlehead devices** consists of:



### 19” Rackmount Kit for Dualhead devices (ACS2209A-RMK)

**To mount a unit:**

1. Align the holes on the base plate with the vacant screw holes on the base of the DVI-D Cat X KVM- Extender unit.
2. Fasten the base of the unit to the plate of the mounting kit using the supplied screws.



Only use the supplied, short screws, to prevent damages on the PCB's

3. Close the remaining gaps with blanking plates.

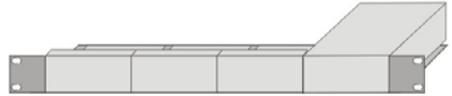
The kit allows you to mount a different count of devices  
(1...4 devices):

## Single-Head

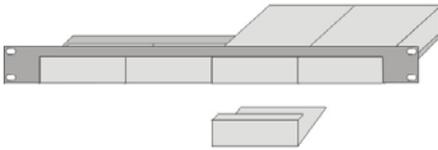
## Dual-Head



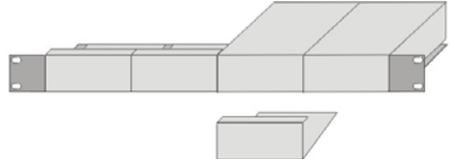
Einbau 1 Gerät  
mounting 1 device



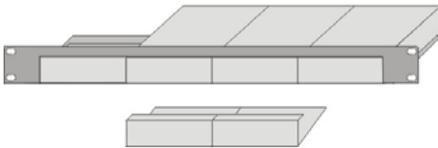
Einbau 1 Gerät  
mounting 1 device



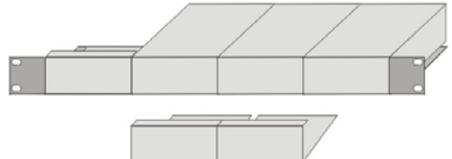
Einbau 2 Geräte  
mounting 2 devices



Einbau 2 Geräte  
mounting 2 devices



Einbau 3 Geräte  
mounting 3 devices



Einbau 3 Geräte  
mounting 3 devices



Einbau 4 Geräte  
mounting 4 devices



Einbau 4 Geräte  
mounting 4 devices

## Appendix C: Calling Technical Support

If you determine that your DVI-D –Cat X KVM Extender is malfunctioning, *do not attempt to alter or repair it*. It contains no user-serviceable parts. Contact Technical Support at Black Box!

Before you do, 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 printed on the bottom of the Extender (very important, especially for keyboard and mouse problems); The DVI-D CAT X - KVM extender's firmware revision level:

### Version Number Format:

Board: ***xxLO/RE Myyy Pzzz Auuu Gvvvvvv***

Transceiver: ***C/M/S xx Pyy Mzz***

Keyboard/Mouse: ***P/U xx Vyyy***

- 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 Extender'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 DVI-D CAT X - KVM Extender:

- 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 to get a Return Authorization (RA) number.

## APPENDIX C: CALLING TECHNICAL SUPPORT

### Black Box Technical Support

Country	Web Site/E-Mail	Phone	Fax
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## Appendix D: Specifications

### ***Stromversorgung***

<i>Voltage</i>	90-240VAC-0.5A-47-63Hz/5VDC-2000 mA
<i>Power required</i>	Local Unit : max. 750mA Remote Unit : max. 750mA

### ***Interface***

(Depending on type of device)

<i>Videoquelle/Monitor</i>	DVI-D up to 1600x1200@60Hz
<i>Keyboard</i>	PS2 or USB (depending on model)
<i>Mouse</i>	PS2 or USB (depending on model) 2-/3-button and wheel mouse

### ***Maximum Length of Interconnection Cable***

<i>CATx Installation cable AWG24</i>	120m (400ft)
<i>CATx Patchcable AWG26/8</i>	60m (200ft)

### ***Type of Interconnection Cable***

<i>CATx Installation cable AWG24</i>	S/UTP (Cat5) cable acc. EIA/TIA 56A, TSB 36 or Digital STP 17-03170. Four pairs AWG 24. wiring acc. EIA/TIA 568A (10BaseT).
<i>CATx Patchcable AWG26/8</i>	S/UTP (Cat5) cable acc. EIA/TIA 56A, TSB 36 or Digital STP 17-03170. Four pairs AWG 26/8. wiring acc. EIA/TIA 568A (10BaseT)..

***Size and Shipping Weight***

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*DVI-D Cat X* 103 x 143 x 29mm (4"x5.6"x1.1") (2 devices)  
Weight: 0,6kg (1.3lb) each

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*Shipping box* Weight: 1,6 kg (3.5lb)

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***Environmental***

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*Operating Temperature* 41 to 113°F (5 to 45 °C)

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*Storage Temperature* -13 to 140°F (-25 to 60 °C)

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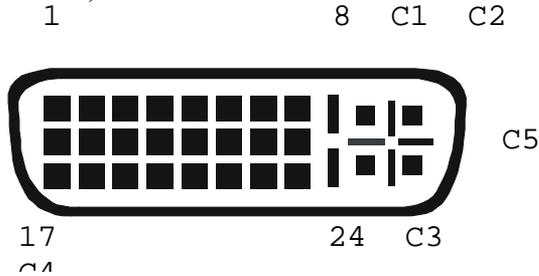
*Relative Humidity* max. 80% non-condensing

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## Appendix E: Connectors

### DVI-D Cat X KVM-Extender Connector Pinouts

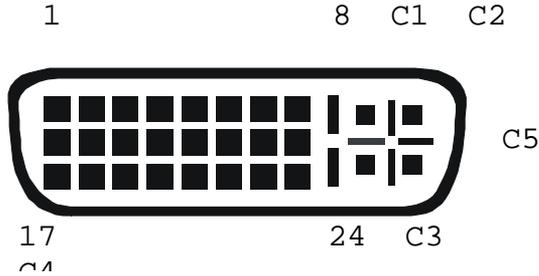
DVI-I female connector (Output connector for ALL devices and Input connector Dualhead devices 2<sup>nd</sup> Monitor)



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	n.c.	12	n.c.	20	n.c.
5	n.c.	13	n.c.	21	n.c.
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 recognition	24	T.M.D.S clock -
C1	Internal use.			C3	Internal use.
C2	n.c.	C5	GND	C4	Internal use.

**DVI-I female connector (Input connector for ALL Singlehead devices and Input connector Dualhead devices 1<sup>st</sup> Monitor)**

**DVI-I Buchse (PS2 Singlehead Eingangsbuchse und PS2 Dualhead Eingangsbuchse 1. Monitor)**



<i>Pin</i>	<i>Signal</i>	<i>Pin</i>	<i>Signal</i>	<i>Pin</i>	<i>Signal</i>
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	PS2-KBD CLK	12	PS2-MOUSE CLK	20	PS2-MOUSE VCC-IN +5V (not required)
5	PS2-KBD DATA	13	PS <sup>2</sup> -MOUSE-DATA	21	PS2-KBD VCC-IN +5V (always required)
6	DDC Input (SCL)	14	+5V In for DDC	22	T.M.D.S clock GND
7	DDC Output(SDA)	15	GND	23	T.M.D.S clock +
8	Analog VSYNC	16	Hot Plug recognition	24	T.M.D.S clock -
C1	n.c.			C3	n.c.
C2	n.c.	C5	GND	C4	n.c.

# DVI-D CAT X KVM-EXTENDER

## Combined Keyboard/Mouse connector (output connector Local Unit)



<i>Pin</i>	
1	KBD-DATA
2	MOUSE-DATA
3	KBD/MOUSE-GND
4	VCC (+5V)
5	KBD-CLK
6	MOUSE-CLK

## Keyboard/Mouse connector (output connector Remote Unit)



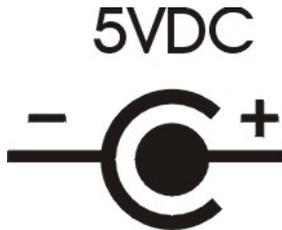
<i>Pin</i>	<i>Keyboard</i>	<i>Pin</i>	<i>Mouse</i>
1	KBD-DATA	1	MOUSE-DATA
2		2	
3	KBD-GND	3	MOUSE-GND
4	VCC (+5V)	4	VCC (+5V)
5	KBD-CLK	5	MOUSE-CLK
6		6	

## Keyboard/Mouse Adapter to connect Keyboard/Mouse to Local Unit



<i>Pin</i>	<i>Connector (device)</i>	<i>Pin</i>	<i>Keyboard</i>	<i>Pin</i>	<i>Mouse</i>
1	KBD-DATA	1	KBD-DATA	2	
2	MOUSE-DATA	2		1	MOUSE-DATA
3	KBD-GND	3	KBD -GND	3	MOUSE-GND
4	VCC (+5V)	4	VCC (+5V)	4	VCC (+5V)
5	KBD-CLK	5	KBD -CLK	6	
6	MOUSE-CLK	6		5	MOUSE-CLK

### Power



<i>Pin</i>	<i>Signal</i>
inner	+5V
outer	GND

# NOTES