

SDBX-Cat5-KVM-Extender monitor, keyboard and mouse (PS2) 1600x1200@200m, 1280x1024@300m 1-port-, 2-port- and 4-port-devices

Dear Customer,

congratulations to purchase the SDBX-Cat5-KVM-Extender for VGA-monitor, mouse, keyboard. This product correspond to the ultimate requisitions for quality and technics. If you still have problems with your device, please refer to your sales office.

The SDBX-Cat5-KVM-Extender allows you to remotely position your UXGA monitor, keyboard and mouse up to 300 Metres from your PC System unit using a single Category 5 UTP/STP 4-pair cable.

Please read this manual before installing and operating the units. Please record the serial number, the date of purchase and your sales office. The serial number is located on the backside of the units. These data would be important, if you ever need to repair one of the parts.

SDBX-Cat5-KVM-Extender

1 port without local access	K434-S1
1 port with local access	K434-D1
1 port without local access with audio/serial support	K434-A1
1 port with local access with audio/serial support	K434-DA
2 port without local access	K434-S2
2 port with local access with audio/serial support	K434-A2
4 port without local access	K434-S4 (Q4/2003)
4 port with local access with audio/serial support	K434-A4 (Q4/2003)



You have purchased a valuable device, which should meet best all requirements. To do this, it is necessary, to get an overview of behavior of the device, its functions and the different setup possibilities and options.

Please read this manual carefully. Please record the serial number and the date of purchase inside of this manual. The serial number is located on the backside of the units. These data would be important, if you ever need to repair one of the parts. For competent users, we suggest, to read at least the part 'Quick Startup'.

If you have any question to the product, or if you need aid at installation time, please do not hesitate to contact your dealer. He will like to support you.

Serial Number

date of purchase

Your dealer

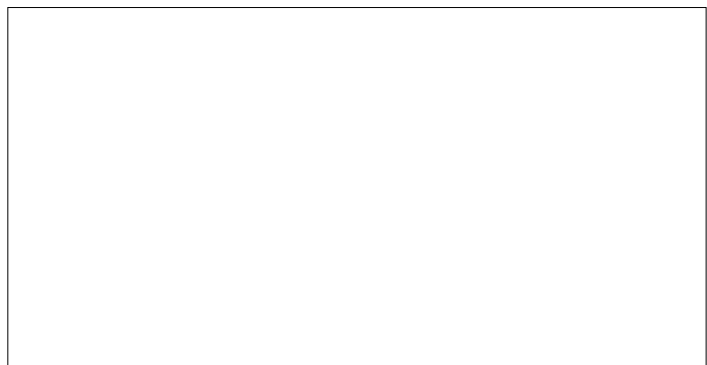


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Introduction

Features

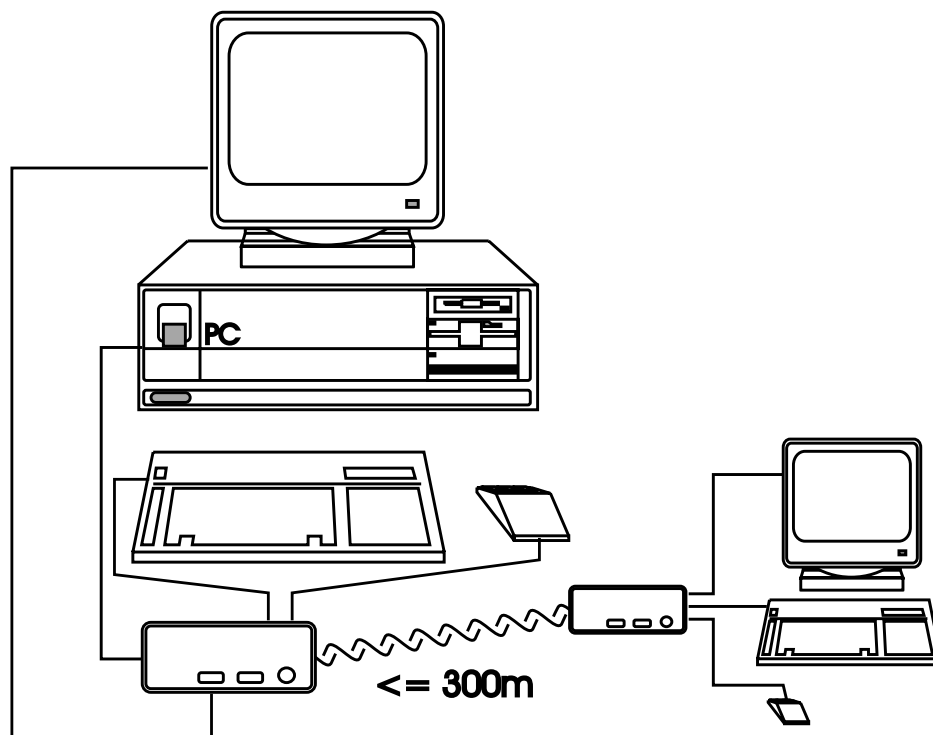
This product has a number of unique features that allow transparent remote operation of your PC.

- Access your CPU up to 300 Meters away. You need only a single CAT 5 twisted pair cable per each VGA channel. Please use installation cables (with solid wires) - patch cables (with stranded wires) are not useful for bridging distances.
- Keyboard adjustable Video Equalisation - Compensates for loss of image quality due to cable length
- Fully buffered signals to ensure consistent remote operation of you PC
- PS/2 keyboard and PS/2 mouse emulation allowing you to 'Plug & Play' - Intelligent keyboard and mouse emulation ensures the PC boots and operates correctly under all possible circumstances as well as allowing 'Plug & Play' initialisation of the remote keyboard and mouse.

Operation

The SDBX-Cat5-KVM-Extender is simple to operate and works with all operating systems - no software is required. Just connect the units up as described and you're ready to work. Complete keyboard and PS/2 mouse emulation allows you to 'Plug & Play'. Your PC will boot even if the remote end of the link is not powered or the keyboard and / or mouse are disconnected.

Mounting arrangement



Technical data

power supply

local unit	:	from PC
remote unit	:	9V DC Regulated, 1000mA, Floating Output

interfaces

monitor	:	VGA, SVGA, XGA, RGB resolution up to 1280x1024 NO Plug&Play!
keyboard	:	IBM-PS/2 (AT with adaptor)
mouse	:	IBM-PS/2 Two Button, Microsoft Intellimouse Logitech 3-Button PS2
serial (only SDLink/AM)	:	transparent with handshake up to 19200 BAUD
audio (only SDLink/AM)	:	bidirectional, virtual CD-quality 38,4kHz, 16 Bit
interconnect cable (not in schedule of parts)	:	simplex S-UTP Cat5 4x2xAWG24, e.g. type 402-0J or wiring according EIA/TIA
max. distance	:	up to 50m (app. 160 ft)

dimensions

weight	:	app.1.5 kg Complete package, 0,25 each unit
length/width/height	:	app. 110 x 80 x 25 mm: SDLink/LC (2 devices) app. 110 x 80 x 44 mm: SDLink/DM + /AM (2 devices)
temperature operation	:	app. 10°C ... 45°C

Compatibility

To operate in various environments and with hardware from many manufacturers, this product has a number of specific features, and has been tested with a wide variety of hardware.

However, it is impossible to guarantee correct operation with every keyboard, monitor, mouse and motherboard currently on the market.

The CAT5 KVM Mini Extender is compatible with the following equipment:

System Unit:	PC/AT, PS/2 and 100% compatible clones.
Keyboard:	PC/AT, Enhanced Keyboard. Some older XT/AT auto-sensing keyboards may not be compatible
PS/2 Mouse:	Standard PS/2 Mouse, Microsoft Intellimouse, Logitech 3-Button PS/2 Mouse
Monitor:	VGA, Super VGA, XGA, RGB (Sync-on-Green)

Note: If your PC does not have a PS/2 style mouse port, the Mini Extender may be connected to a serial port of your PC via an additional mouse protocol converter (MDAPT).

Features:

- Supports High Video Resolutions for use with TFT displays
1600x1200 (60Hz) @ 200 Metres
1280x1024 (75Hz) @ 300 Metres
Higher resolutions may be possible at shorter distances. Maximum distances quoted will be less with higher refresh rates
- Integrated Skew Compensation for operation with any CATx cable. Skew compensation available on all video channels. Skew compensation available on any (or all) colours. Maximum compensation of 42nS is sufficient for most applications. Compensation step size is 2.8nS
- Independent Low-Frequency (LF) and High-Frequency (HF) Equalization Adjustment ensures optimum video tuning





- All Control and Video Tuning made through attached Keyboard - Simple to set up. *Quick Skew*, *Assisted EQ* and *Channel 0* features help make video tuning almost automatic
- Settings stored in EEPROM Memory. Set the system up once only. Settings restored on power up
- Flash Upgradeable (cable required)
- Single and Multi-Head (Dual/Quad) Video Support - One CATx cable required per channel
- Status Indicator LED(s) on each RJ45
- Small Footprint Chassis:
SDBX/R1, SDBX/R2: 140x145x29mm
SDBX/RA1, SDBX/RA2: 140x145x44mm (1U)
SDBX/L2: 110x146x29mm
SDBX/LA2 110x146x29mm (1U)
SDBX/R4, SDBX/RA4: To be defined
- Rack Mount Option - Plate will be available to mount three units across 1U
- 9V (Isolated) Universal PSU (Supplied for Remote Unit)

Connectors/Cables

Pinout local unit (SDBX/Dx) and remote unit. Please use only the genuine PC cables for connecting the local unit to the CPU

VGA connector

<p>HD15-female</p>	1	RED	6	Red GND	11	n.c.
	2	GREEN	7	Green GND	12	n.c.
	3	BLUE	8	Blue GND	13	HSYNC
	4	GND	9	n.c.	14	VSYNC
	5	n.c.	10	GND	15	n.c.

mouse connector

<p>miniDIN 6p-female</p>	1	mouse-Data	4	monitor/+5V
	2	n.c.	5	mouse-Clock
	3	GND	6	n.c.

keyboard connector

<p>miniDIN 6p-female</p>	1	keyboard-Data	4	monitor/+5V
	2	n.c.	5	keyboard-Clock
	3	GND	6	n.c.

Cat5 interconnect cable

The Local and Remote Units are interconnected by industry standard structured cabling (Category 5, Cat5e, Cat6, Cat7 UTP/STP, 4-pair) terminated with RJ45 connectors. This cable is not supplied with the Extenders.

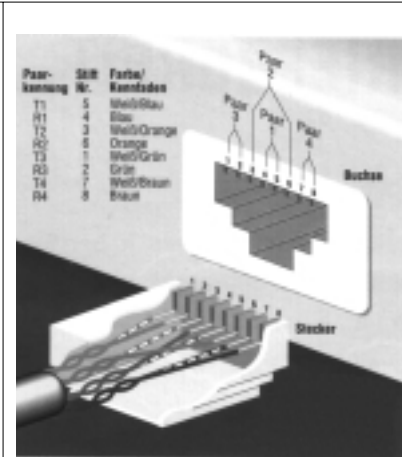
The cable used should be solid trunk cable. Stranded patch cable will result in poor quality video. **Note: That failure to wire the twisted pairs correctly will impair the video quality dramatically and / or prevent correct operation.**

The Mini Extender is designed for use up to a maximum cable length of 300 Meters. At this length the video quality should still be acceptable even at a screen resolution of 1280x1024 (75Hz).

Although a single continuous length of interconnect cable is preferable, operation is possible through multiple patch panels. However, the more patch panels the cable is routed through, the greater the chance of video signal degradation.

Using other types of structured cabling

Although specified for Category 5 cabling, the Mini Extender system has been tested on CAT 3 cable and on pairs within a 25-pair UTP trunk cable.



SDBX/S1, SDBX/SA1, SDBX/D1 and SDBX/DA1 use single CATx cable, which carries all video and data signals

SDBX/S2, SDBX/SA2, SDBX/S4 and SDBX/SA4 use one single Cat5 cable per VGA port. The CATx cable connected to 'Interconnect 1' carries Video Channel 1 & all data signals. This is the primary interconnect. Secondary CATx cables (Interconnects 2 - 4) carry Video Channels 2 - 4.

In order to send Keyboard, Mouse, Audio and Serial signals to the PC the primary interconnect must be connected.

The primary interconnect does not have to be connected in order to use the keyboard attached to the Remote Unit for set-up. However, if the primary interconnect is disconnected the keyboard cannot be used for configuration for 15 seconds after disconnection (to maintain data integrity).



LED Indicators

There are two status LED(s) on each RJ45 connector:

Green Led: OFF Remote Unit is not powered
 ON Remote Unit is powered & no video found
 FLASH Remote Unit is powered, Video sync found

Yellow Led: OFF No data transfer with Local Unit
 FLASH Data transfer with Local Unit
 ON Remote Unit in Command Mode

The Yellow LED is only active on the Primary Interconnect (Channel 1)

Getting started

The SDBX CAT5 Extender consists of a Local and a Remote Unit interconnected by a single or up to four structured cables. The CATx cable connected to 'Interconnect 1' carries Video Channel 1 & all data signals. This is the primary interconnect. Secondary CATx cables (Interconnects 2 - 4) carry Video Channels 2 - 4. The Local Unit is connected to the PC's keyboard, VGA and PS/2 mouse ports. The keyboard, monitor and mouse are connected directly to the Remote Unit, which is powered by a power supply whilst the Local Unit is powered by the PC.



Connecting Up

- Switch off your PC and power up the Remote Unit by connecting the mains adapter and switching it on. Only use the mains adapter supplied.
- Connect all remaining cables as shown in Figure 2.
- Power on your PC and check that the keyboard operates correctly. Boot an operating system (such as Windows) or application you intend to use. Check that the mouse functions (if required).
- Check that the link integrity LED on the local unit flashes on and off.

We recommend that the complete system is tested in one room before permanent installation. If a long interconnect cable is not available, use a patch lead to test basic unit operation with your PC.


























All configuration and video tuning is carried out using the keyboard connected to the Remote Unit. A hot-key sequence is used to enter command mode where settings may be adjusted and certain modes of operation configured.

Commands - Overview

If there is not mentioned something else, the **Ctrl** - key and the **Shift** - key refer to those keys, which are located at the left side of the keyboard. Keys on the right side of the keyboard will regularly **NOT** cause to execute the respective command! Keys, oted together with a '+' sign, must be pressed simultaneously or sequentially, by holding each key pressed, until all keys of this sequence are pressed.

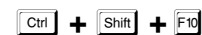
Enter Command Mode
 Exit Command Mode & Save
 Exit Command Mode Without Save
 Select Individual Video Channel For Adjustment
 Select **ALL** Video Channels
 Increase LF Equalization (Coarse)
 Increase LF Equalization (Fine)
 Decrease LF Equalization (Fine)
 Decrease LF Equalization (Coarse)
 Increase HF Equalization (Coarse)
 Increase HF Equalization (Fine)
 Decrease HF Equalization (Fine)
 Decrease HF Equalization (Coarse)
 Next Assisted EQ Setting (+25m)
 Previous Assisted EQ Setting (-25m)
 Reset EQ & Delay Values
 Reset EQ Values

Ctrl + Shift + F10
 Esc
 Ctrl + Esc
 1 or 2 or 3 or 4
 0
 L + ↑
 L + →
 L + ←
 L + ↓
 H + ↑
 H + →
 H + ←
 H + ↓
 Ctrl + Tab
 Ctrl + Caps
 Ctrl + Num
 Ctrl + End

Increase RED Delay	 + 
Increase GREEN Delay	 + 
Increase BLUE Delay	 + 
Decrease RED Delay	 + 
Decrease GREEN Delay	 + 
Decrease BLUE Delay	 + 
Quick Skew – Toggle RED Delay	 + 
Quick Skew – Toggle GREEN Delay	 + 
Quick Skew – Toggle BLUE Delay	 + 
Reset Mouse and Keyboard	
Send NULL Mouse Byte	
Local Unit Scroll Lock Key Mode	
Local Unit Initial Hot Key	
Factory Reset	 + 
Toggle Local Unit Private Mode	

Commands

Enter Command Mode



In Command Mode the keyboard LED(s) will flash (as described below) to indicate which video channel is currently selected. In Command Mode the front panel yellow LED will be continuously lit. Command Mode will automatically time out after 30 sec of inactivity and all settings will be saved to EEPROM.

Exit Command Mode & Save



Exit Command Mode and save all settings to EEPROM.

Exit Command Mode Without Save



Exit Command Mode without saving changes to EEPROM.

Select Individual Video Channel For Adjustment



Apply subsequent video adjustments to the selected channel. On Command Mode entry the **default video channel is 1** You may only select video channels that are available on the Remote Unit model being used. The keyboard LED(s) will regularly blink a number of times to indicate which video channel is currently selected.

Select ALL Video Channels



Use **Channel 0** to apply subsequent video adjustments to ALL video channels simultaneously. Useful for setting up multi-head systems, where the cable lengths are almost identical. Only applicable on dual/quad video models. The keyboard LED(s) will flash slowly to indicate that **Channel 0** (ALL video channels) is selected.

- **Increase LF Equalization (Coarse)** L + ↑
- Increase LF Equalization (Fine)** L + →
- Decrease LF Equalization (Fine)** L + ←
- Decrease LF Equalization (Coarse)** L + ↓

Adjust Low-Frequency for the selected video channel(s). Use to remove 'video smearing' prior to setting HF EQ. Adjust until black smears to the right of large objects such as window title bars just disappear. Too much compensation will cause white streaks to appear.

- **Increase HF Equalization (Coarse)** H + ↑
- Increase HF Equalization (Fine)** H + →
- Decrease HF Equalization (Fine)** H + ←
- Decrease HF Equalization (Coarse)** H + ↓

Adjust High-Frequency for the selected video channel(s). Use to sharpen image after setting LF EQ. Adjust until a white edge to the right of small characters just starts to appear. After adjusting HF you may need to finely adjust LF EQ again.

- **Next Assisted EQ Setting (+25m)** Ctrl + Page Up
- Previous Assisted EQ Setting (-25m)** Ctrl + Page Down

Assisted EQ steps through a table of preset LF & HF EQ values for different cable lengths (in 25m increments calibrated from 0 to 375m). Use **Assisted EQ** to save time by quickly setting the approximate EQ for the currently selected video channel(s). Fine adjustments may then be made.

- **Reset EQ & Delay Values** Ctrl + Home

Set all video EQ (HF & LF) and delay values to zero for the currently selected video channel(s). Reset all video channels by selecting **Channel 0** prior to issuing this command.

- **Reset EQ Values** Ctrl + End

Set all video EQ (HF & LF) values to zero for the currently selected video channel(s). Current delay values are not affected. Reset all video channels by selecting **Channel 0** prior to issuing this command.

- **Increase RED Delay** R + →
- Increase GREEN Delay** G + →
- Increase BLUE Delay** B + →
- Decrease RED Delay** R + ←
- Decrease GREEN Delay** G + ←
- Decrease BLUE Delay** B + ←

Compensate for Cat5e & Cat6 skew on any colour for the currently selected video channel(s). Cat5e and Cat6 cables have a different skew on the different pairs of wires. Because of this, the wires do not all have the same length, there are delays on the synchronous data stream on different pairs. This causes, that i.e. the green component of a pixel is faster than the red or blue component. Now all characters and graphics get a green fringe at the left side. Skew

compensation is available on all video channels. Skew compensation is available on any (or all) colours. Maximum compensation of 42nS is sufficient for most applications. Compensation step size is 2.8nS.

Use **Channel 0** to compensate for skew on all channels simultaneously. Simplifies setting up large multi-head installations where a consistent cable type is used and the adjustments required are always the same.

The preferred way to adjust for skew is by using a Test Card such as the one available at <http://testcard.kvmextender.info>. Adjust until the three vertical lines (RGB) are perfectly aligned. Alternatively, display some text in a large font on a white background and adjust until there is no visible colour fringing at the edges of characters.

The direction of skew adjustment will be different depending on whether you have a back or white background. Sometimes the optimum skew adjustment will actually be one step out from that suggested by the test card. The maximum amount of skew correction available is 42nS. This is more than adequate for the vast majority of cables. However, it may not be enough if you are using a particularly long run of a cable which exhibits severe delay skew. In this case an additional external delay line (such as the SDLY1) may be required or pair-swapping considered to minimise skew.

- **Quick Skew – Toggle RED Delay** Ctrl + R
- **Quick Skew – Toggle GREEN Delay** Ctrl + G
- **Quick Skew – Toggle BLUE Delay** Ctrl + B

Use **Quick Skew** to set the delay (in one step) to the typical value required in many installations for eliminating skew. Issuing a **Quick Skew** command will toggle between the delay on a particular colour between zero and fixed amount (~19nS). The delay can then be fine tuned from this point.

Use the **Quick Skew** toggle to rapidly determine which main colour requires delaying or to quickly set the delay on a colour back to zero. In many instances using **Quick Skew** on green is all that is necessary.

Configuration Commands (processed in Command Mode)

- **Reset Mouse and Keyboard** F1

Request Local Unit to reset the keyboard and mouse. Useful if the keyboard gets stuck in the wrong mode or the mouse is not initialised correctly. Automatic exit from Command Mode after issuing this command

- **Send NULL Mouse Byte** F3

Send a null mouse byte to the system should the mouse get out of sync (erratic movement & windows opening etc). You may need to enter this command a number of times to re-sync. Alternatively, stop moving the mouse for a few seconds and the operating system's mouse drivers may automatically re-synchronise. Automatic exit from Command Mode after issuing this command





Note: Issuing the Null Mouse Command when the mouse is operating correctly will cause it to go out of sync (unless the mouse driver is auto-correcting). If you issued this command while the mouse was working correctly, please enter this command a several times, until the mous is resynchronized again.

■ Local Unit Scroll Lock Key Mode

In most cases the scroll lock key (Local & Remote) operates as normal. However, certain SDLink dual-access Local Units (such as the SDLink2) use the scroll lock key to lock out the Remote Unit (Private Mode) in which case the scroll lock key is not passed to the system. Use this command to toggle this feature (setting stored in EEPROM) if normal scroll lock operation is required. This command only applies to firmware versions lower than 'S50'.

The scroll lock key on the remote will always function as normal. However, if the Local Unit Private Mode function is enabled then the scroll lock LED on the keyboard will never light when this key is pressed because the indicator is used to show that the Remote Unit is disabled (Private Mode). Automatic exit from Command Mode after issuing this command

■ Local Unit Initial Hot Key

Dual-Access Local Units with firmware version of 'S50' and above (all SDBX range and SDLink with Audio/Serial) use a hot-key sequence for control (see '**Dual Access - Commands at the local units**'). The initial hotkey is right  by default. Use this command to toggle it to left  if required. Automatic exit from Command Mode after issuing this command.

■ Factory Reset

Use this command to set ALL extender settings (video & configuration) back to their factory defaults. Automatic exit from Command Mode after issuing this command.

■ Toggle Local Unit Private Mode

Use this command to enable/disable a dual-access Local Unit (Private Mode).

Scroll Lock LED on remote keyboard will flash slowly to indicate Private Mode. All three LED's on the local keyboard will be lit when disabled. Local monitor will be blanked and it's keyboard and mouse locked. Enter command again to release Private Mode. This command only applies to firmware versions 'S50' and above. Automatic exit from Command Mode after issuing this command

Firmware Upgrade & External Setup

Consult Technical Support regarding this feature

Through the use of a special cable connected between the Remote Unit's mouse port and a PC's serial port the unit's firmware may be upgraded and various set-up parameters retrieved or downloaded. A small software utility called 'ConfigXt' runs on a PC using Windows 98 or above. The application and firmware upgrades may be downloaded from the internet. The software will be able to read the current settings from a Remote Unit and save them for downloading to other

units. This could save valuable time when installing multiple units having similar length cable runs. Currently, SDBX Local Units are not flash upgradeable.

Video Tuning

Use the following method to quickly adjust the video compensation on the

- Enter Command Mode (**Ctrl** + **Shift** + **F10**).
- Bring up the test card (not full screen).
- Select the video channel(s) to adjust.
- Reset the selected channel(s) (**Ctrl** + **↵**).
- Use **Assisted EQ** to get an approx EQ setting (**Ctrl** + **↵**).
- Adjust the colour delays until the testcard's RGB vertical lines are aligned. (Try using **Quick Skew** too)
- If you are using a TFT, set it to auto-adjust.
- Fine tune HF & LF EQ for the best picture. LF removes smearing and HF adjusts sharpness. You may obtain a better result by slightly overcompensating the LF EQ before adjusting the HF EQ.
- If you are using a TFT, set it auto-adjust, or if you are an advanced user, manually adjust the monitor's clock and phase. Some TFT require a special test pattern for doing the auto adjust. Please refer to your monitor user manual. If there is nothing mentioned, or you can't retrieve your original test pattern, you may use a so called 'burst-image' with alternating white and black, single pixel wide vertical stripes. If you do not have such a burst-image, you may do like following: Download the burst image from our server at: <http://www.ihse.de/images/burst.htm>. Follow the instructions in the user manual of your computer/operating system and make this picture the background picture. (i.e. Start/Settings/System/Display/Background). Search the previously stored file with the burst-image. Now select 'tiled' for displaying. Your display now should have thin vertical black and white lines. Now you can process auto or manual adjust.
- Exit Command Mode and save settings (**↵**).

Improving Video Quality on Cables Requiring Large Delays on Green

Some cables require a large delay to be inserted on green. In these cases, video quality may often be vastly improved by simply using a cross-over patch cable at each end of the link (normally a straight patch cable would be used to connect to a wall outlet). When using a cross-over cable, the large delay will then be required on blue rather than green.

Explanation: Inserting delays inevitably introduces some distortion at the highest resolutions. This may result in pixels being sampled twice on TFT screens. The human eye is much more sensitive to green distortion than blue, so a simple pair swap (using a cross-over cable) can improve video quality. In any pair swapping scheme it's best to ensure green is the reference signal (slowest) requiring zero delay and that red and blue are delayed accordingly.



Quick Startup

For advanced users, we recommend to take an overview over the system, by reading the 'Quick Startup' section.

- Switch off your PC and connect up the KVM Extender (CAT 5), keyboard, monitor and mouse as shown.
- Power up the Remote Unit by connecting the mains adapter and switching it on. Only use the mains adapter supplied.
- Power on your PC and check that the keyboard operates correctly. Note that the image quality may be poor at this point.
- Boot an operating system (such as Windows) or application you intend to use. Check that the mouse functions (if required).
- Check the link integrity (LED at the local unit - flashing)
- Enter Command Mode (**Ctrl** + **Shift** + **F10**).
- Use **Assisted EQ** to get an approx EQ setting (**Ctrl** + **F5**).
- Fine tune HF & LF EQ for the best picture. LF removes smearing and HF adjusts sharpness. You may obtain a better result by slightly overcompensating the LF EQ before adjusting the HF EQ.
- With cables, 100m+ it might be possible to obtain a better screen picture by processing Quick Skew – Toggle GREEN Delay (**Ctrl** + **G**).
- Exit Command Mode and save settings (**Esc**).

Operation

The Remote Unit (when installed in its final location) may be left permanently powered up.

Keyboard & Mouse Emulation

The SDBX KVM Extender uses a microprocessor to emulate the keyboard and mouse. This means that a keyboard and / or mouse do not have to be connected to the Remote Unit for your PC to boot. In fact the PC will boot with only the Local Unit connected.

This feature ensures that your PC will always operate regardless of whether the Remote Unit is actually connected or powered. The remote keyboard and mouse may be plugged in and out at any time. In addition, emulation allows multiple Local/Remote Units to be used by simply swapping over CAT 5 cables.

Dual Access

at local units - K434-D1 and K434-DA only

The KVM Extender Dual version allows you to connect an additional keyboard, monitor, and mouse to your system through the Local Unit. The PC may now be operated from either of two locations though not simultaneously.

To activate a console, simply press any key on the keyboard (ignored). This console is now active. The other console cannot operate whilst the active console is in use. Console switching


may only occur when the active console's keyboard or mouse are not used for more than inactivity timeout period (2 seconds).



Note: Using normal mice (with a trackball on the bottom), there are possible circumstances, where the mouse is placed disadvantageously, where the mouse sends, depending on small vibrations, continuously data to the PC. Due to this, there is no access possible from the other console. In this case please move the mouse for a short way, to reach a stable position. To prevent this, or in cases with strong vibrations, please unplug the mouse and reseal it only during access.

Commands at the local units

All SDBX Local Units that feature dual access (SDBX/D1, SDBX/DA1) as well as SDLink Local Units with Audio/Serial may have certain commands entered at the Local keyboard. All SDBX dual access local units have **Enhanced Private Mode** where the local unit can disable the remote or vice-versa.

To enter a command, press and release the initial hot-key followed the command key on the LOCAL keyboard: (Initial Hot-Key: right  might to be modified, see above - **Local Unit Initial Hot Key**)

■ Toggle Local Unit Private Mode

Use this command to enable/disable a dual-access Local Unit (Private Mode).

Scroll Lock LED on remote keyboard will flash slowly to indicate Private Mode. All three LED's on the local keyboard will be lit when disabled. Local monitor will be blanked and it's keyboard and mouse locked. Enter command again to release Private Mode. This command only applies to firmware versions 'S50' and above. Automatic exit from Command Mode after issuing this command

■ Reset Mouse and Keyboard

<Num Pad> 

Request Local Unit to reset the keyboard and mouse. Useful if the keyboard gets stuck in the wrong mode or the mouse is not initialised correctly. Automatic exit from Command Mode after issuing this command

■ Send NULL Mouse Byte

<Num Pad> 

Send a null mouse byte to the system should the mouse get out of sync (erratic movement & windows opening etc). You may need to enter this command a number of times to re-sync. Alternatively, stop moving the mouse for a few seconds and the operating system's mouse drivers may automatically re-synchronise. Automatic exit from Command Mode after issuing this command



Note: Issuing the Null Mouse Command when the mouse is operating correctly will cause it to go out of sync (unless the mouse driver is auto-correcting). If you issued this command while the mouse was working correctly, please enter this command a several times, until the mouse is resynchronized again.

Local Units

The SDBX remote units will work with **ALL** local units of SDBX and SDLink series. Therefore there are only local units for 2port devices available (SDBX/S2 and SDBX/SA2). Explanations to these devices:

- Port 1: Primary channel which carries primary KVM.
Connect to Remote Unit Port 1.
- Port 2: Carries second video channel.
Connect to Remote Unit Port 2.
- Power: Local unit is powered by through the keyboard port (on Port 1).
A 5V PSU (optional) may be connected to provide additional power if the PC is incapable of providing sufficient current.
- Port 1 LED: ON – Unit Powered.
Flashing – Data transfer with Remote Unit.
- Port 2 LED: ON – Unit Powered & Power OK.
VERY DIM – Insufficient power. Use external PSU.
- CPU Connectors: DB25(F) – Rose compatible.

Power is supplied to the unit through the CPU connected to Port 1 or an optional 5V PSU. No power is taken through the CPU (video) connector on Port 2.

Addendum

Extender with serial/Audio link

These extender products contain daughter boards which allow bi-directional stereo audio and a full-duplex serial data link to be sent across the CAT5 interconnection cable in addition to PS/2 keyboard, mouse and SuperVGA video.

To set up your video, keyboard, mouse follow the instructions in the user guide. To set up the extender's audio and serial link, please follow all of the instructions detailed in this addendum. If you have any questions, contact Technical Support.

serial link:

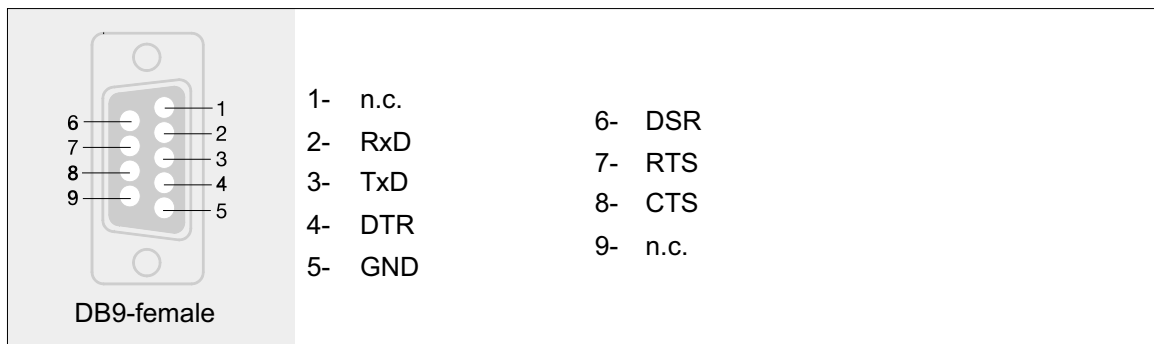
serial speed	:	Any up to a maximum of 19,200 Baud
Serial Data Format	:	Format Independent
Flow Control	:	RTS, CTS, DTR, DSR are sent across link

AUDIO link:

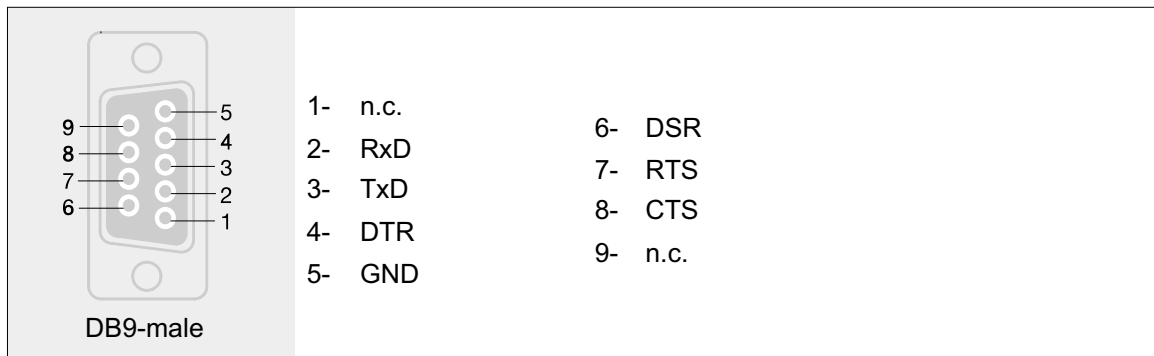
Description	:	Bi-directional stereo audio link
Transmission Method	:	Digitised virtually CD quality audio (16-bit, 38.4KHz)
Signal Levels	:	Line-Level (5 Volts Pk-Pk maximum)
Input Impedence	:	47K
Local Unit Connectors	:	2 x 3.5mm stereo jack socket (Line In & Line Out)
Remote Unit Connectors	:	2 x 3.5mm stereo jack socket (Line/Mic In & Line Out)
Microphone Support	:	A microphone may be connected to the Remote Unit Pullup resistor provides bias for condenser microphone Option to set microphone amplification to +17dB

Connectors and cables

serial in



serial out



Serial Interface - Set Up and Operation

No setting up or user adjustments are required. Please note that on the dual access model, the serial link is always active

Please bear in mind that the Remote Unit's serial port is wired as DTE (i.e. the same as that on a PC). 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. Select Xon/Xoff software flow control on the printer and PC.

A serial Touchscreen may be plugged directly into the Remote Unit.

Serial Interface – Handling Multiple Serial Devices

The extender's serial interface transmits/receives six signals (3 signals in each direction).

Normally four of these signals are used for hardware handshaking (in addition to TX & RX). However, because each handshaking line can support signals up to 19,200 Baud 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. Please contact technical support for further information.



Audio Interface - Set Up 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 set up is required unless a microphone is connected to the remote unit.

Connect up the extender 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 (+20dB). 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 labelled '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.

Order Notation

SDBX-Cat5-KVM-Extender 1port without local access

order notation : SDBX/S1
part number : K434-S1

SDBX-Cat5-KVM-Extender 1port with local access

order notation : SDBX/DM
part number : K434-D1

SDBX-Cat5-KVM-Extender 1port without local access mit Audio/RS232

order notation : SDBX/SA1
part number : K434-A1

schedule of parts supplied:

SDBX-Cat5-KVM-Extender 1port with local access mit Audio/RS232

order notation : SDBX/DA1
part number : K434-DA

SDBX-Cat5-KVM-Extender 2port without local access

order notation : SDBX/S2
part number : K434-S2

SDBX-Cat5-KVM-Extender 2port without local access mit Audio/RS232

order notation : SDBX/SA2
part number : 434-A2

ATTENTION! The following devices are not available before Q4/2003!

SDBX-Cat5-KVM-Extender 4port without local access

order notation : SDBX/S4
part number : K434-S4

SDBX-Cat5-KVM-Extender 4port without local access mit Audio/RS232

order notation : SDBX/SA4
part number : K434-A4

schedule of parts supplied:



All SDBX come with local uni, remote unit, CPU cables and international p.s.u. for remote unit. Local unit regularly is powered by the CPU through the keyboard connector. A 5V PSU (optional) may be connected to provide additional power, if the PC is incapable of providing sufficient current or on VGA only transmission.

List of parts supplied:

- 1 KVM Extender Local Unit
- 1 KVM Extender Remote Unit
- 1 9V 1000mA DC Regulated Power Supply (Universal Input – Isolated Output)
- 1 IEC Power Cord
- 1 CPU Cable Assembly (1 Metre) 2 pieces with 2port devices and 4 pieces with 4port devices
- 2 Audio serial cables with all devices with serial/Audio Extension
- 1 User Manual

Interconnect cable between local interface and remote interface is **not included**. The KVM Extender has been tested with all major makes of CAT 5 cable including BICC-VERO, Mohawk, AT&T.



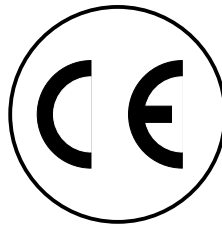
Caution: Only use the power supply originally supplied with this product. The KVM Extender has a PS/2 type keyboard connector. If your system uses the AT type 5-pin DIN connectors adapters will be required. If your PC does not have a PS/2 mouse port, please refer to the note under the 'Compatibility' section of this manual.

Order notation accessories

junction cable:	Cat5 simplex, 4x2xAWG24	402-0J
plug-mounting (incl. plug set):	Cat5 simplex	402-0A
p.s.u.:	optional for local unit	434-3N
p.s.u.:	spare for remote unit	434-2N

CE declaration of conformity declaration of manufacturer

This Equipment complies with the requirements of the European EMC directive 89/336 EEC in respect of EN55022 Class B, EN50082-1 and EN 60555-2 and the Low Voltage Directive.



This equipment has been found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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 other circumstances outside the manufacturer's control. And the manufacturer will not be responsible for any loss, damage, or injury arising directly or indirectly from the use of this product.

