

DVI/USB Extender

Compact modules which allow you to place your high resolution video display and peripherals up to 492 feet from your system.

Extend video resolutions up to 1920 x 1200 @ 60Hz using just a single run of structured cabling.



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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.

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 a 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 deber 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.

Contents

1. Specifications..... 6

2. Overview..... 7

 2.1 Introduction..... 7

 2.1.1 Higher rate or longer reach?..... 7

 2.2 Hardware Description..... 8

 2.3 Tips for achieving good quality links..... 10

 2.3.1 Patch cables..... 10

3. Installation..... 11

 3.1 Locations..... 11

 3.2 Mounting..... 11

 3.3 Connections..... 12

 3.3.1 Local video connection..... 12

 3.3.2 Local USB connection..... 12

 3.3.3 Local audio connection..... 13

 3.3.4 Local serial port connection..... 13

 3.3.5 Local power connection..... 14

 3.3.6 Remote video connection..... 16

 3.3.7 EDID management..... 16

 3.3.8 Remote USB connections..... 17

 3.3.9 Remote audio connection..... 18

 3.3.10 Remote serial port connection..... 18

 3.3.11 Remote data link connection..... 19

 3.3.12 Remote power connection..... 20

4. Configuration..... 22

 4.1 Mode switch settings..... 22

 4.2 Firmware upgrades..... 23

 4.2.2 Errors during the upgrade process..... 24

5. Operation..... 25

 5.1 Indicators..... 25

 5.1.1 Red status indicators..... 25

 5.1.2 Green and amber status indicators..... 25

Appendix A. Options port pin-out..... 26

Appendix B. Link cable interference protection..... 27

 B.1 Interference protection codes..... 27

Appendix C. Safety information..... 28

1. Specifications

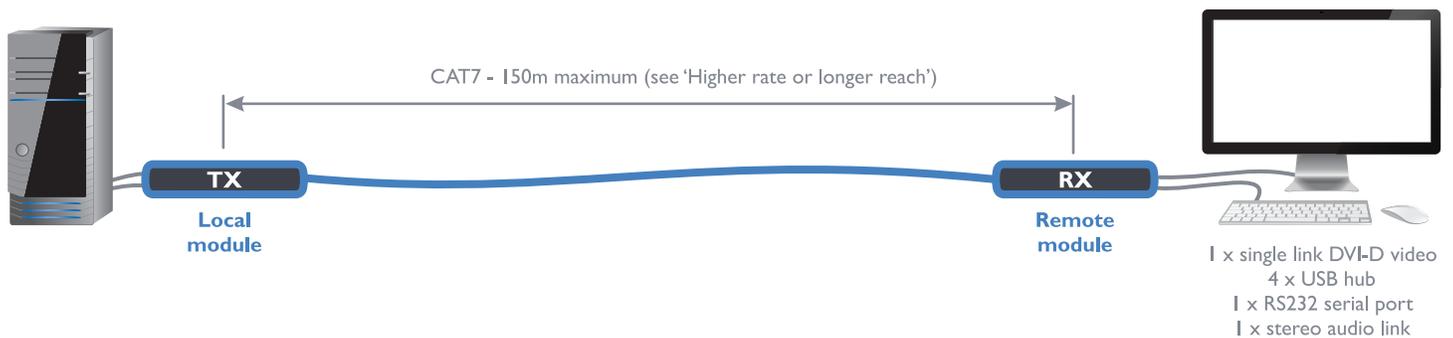
Approvals:	CE, FCC
Hardware Compatibility:	All computers with USB interfaces
Software Compatibility:	Operates with all known software and operating systems including Windows®, Linux®, Unix®, BSD, all Sun® OS, all Mac® OS, NetWare®, etc.
Connectors:	Video: DVI-D Keyboard/Mouse: 4 x USB Type A female Audio: 3.5-mm stereo jack Link: Modular 10p10c Other: Modular 10p10c for RS232 Mini USB for firmware upgrade
Operating Temperature:	32 to 104°F (0 to 40°C)
Power:	DC connector (two power adapters included) Input: 100–240 VAC, 50/60 Hz Output: 12VDC Consumption: 18 watts
Size:	1.22"H x 6.65"W x 4.8"D (31 x 169 x 120 cm)
Weight:	1.3lbs. (0.6 kg)

2. Overview

2.1 Introduction

Thank you for choosing the DVI/USB Extender modules. These compact modules allow you to transfer the following connections up to 150 meters from your computer via a single link cable:

- High quality single link DVI digital video,
- USB keyboard and mouse plus two other USB devices (up to version 2.0),
- An RS232 serial device at speeds up to 115200 baud,
- Stereo speakers.



Thanks to our long involvement and investment in extender technology we have succeeded in overcoming the numerous problems associated with extending high speed signals.

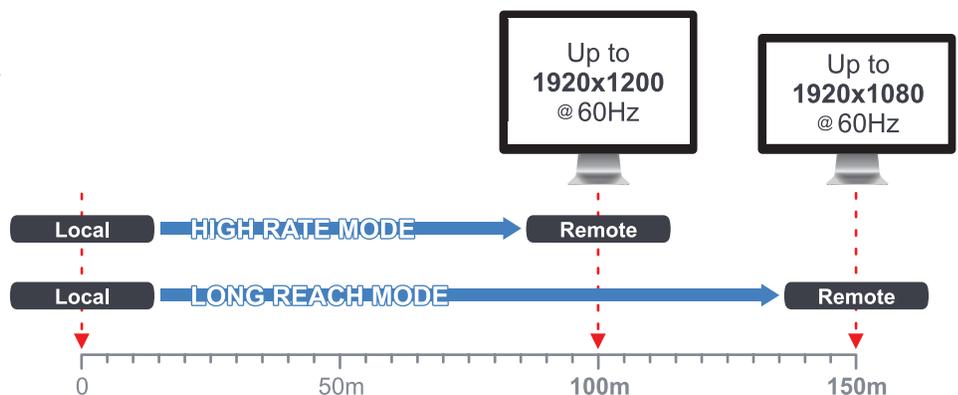
The DVI/USB Extender modules are totally transparent in operation, leaving you free to use your computer as though you're still sitting next to it.

2.1.1 Higher rate or longer reach?

The DVI/USB Extenders provide two operational modes so that you can choose your priority: To support a higher resolution display (up to 1920 x 1200 @ 60Hz) or to cover a greater distance (up to 150 meters). A simple switch setting on the local module determines the required mode. When the high rate mode is enabled, the DVI/USB Extender system will continually monitor the data link to ensure that image quality is being maintained. If the data link is not sufficient, the local module will automatically fall back to long reach mode.

See also:

- 2.3 Tips for achieving good quality links
- 4.1 Mode switch settings



2.2 Hardware Description

The local and remote modules are contained within slimline metal casings that measure just 1.22"x 6.65"x 4.8" (31 x 169 x 120 cm).

2.2.1 Local module

Figure 2-1 shows the local module:

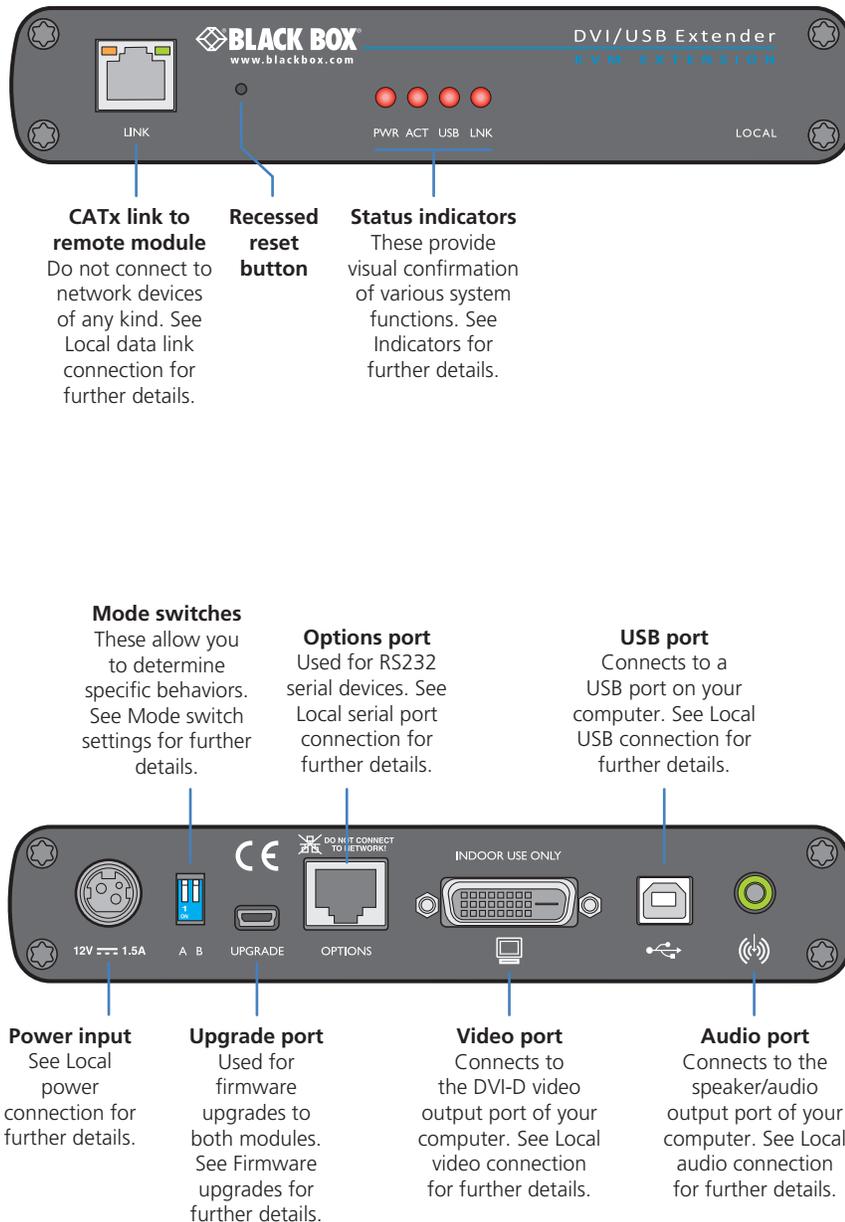


Figure 2-1. Local module.

2.2.2 Remote module

Figure 2-2 shows the remote module:

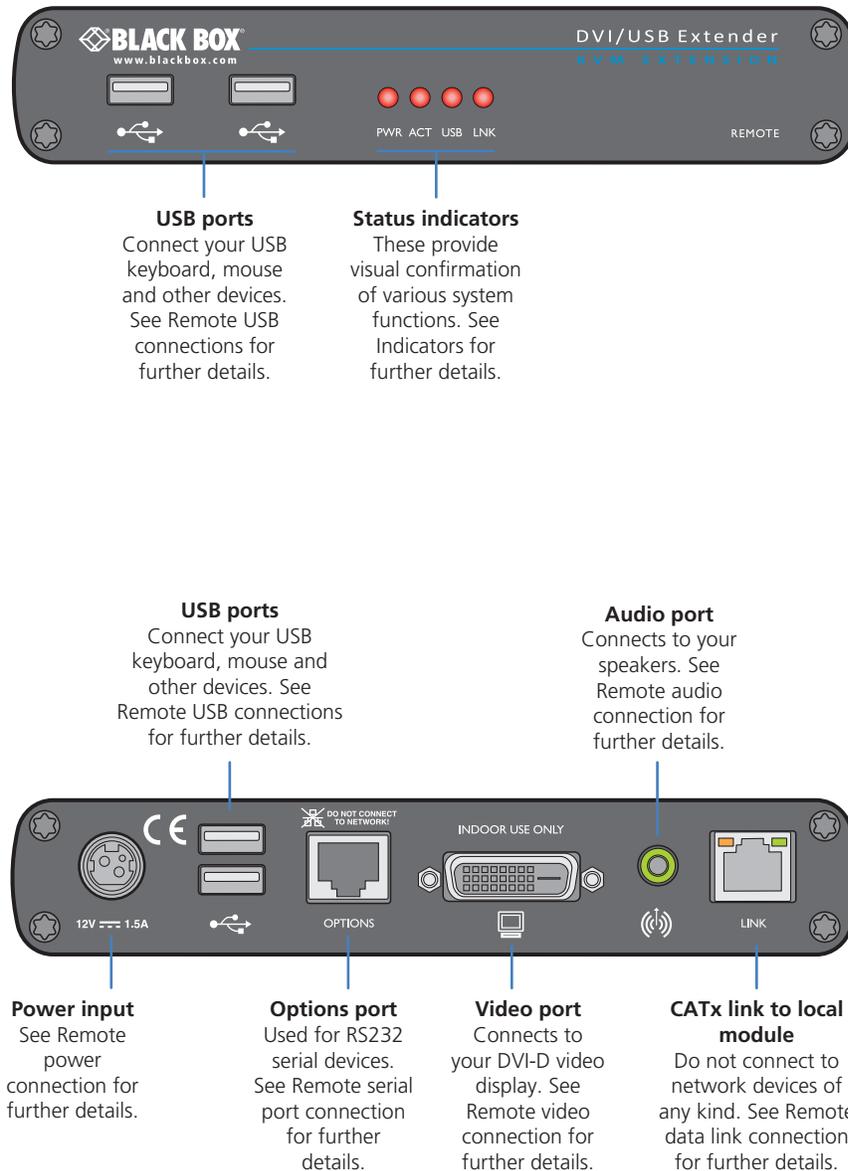


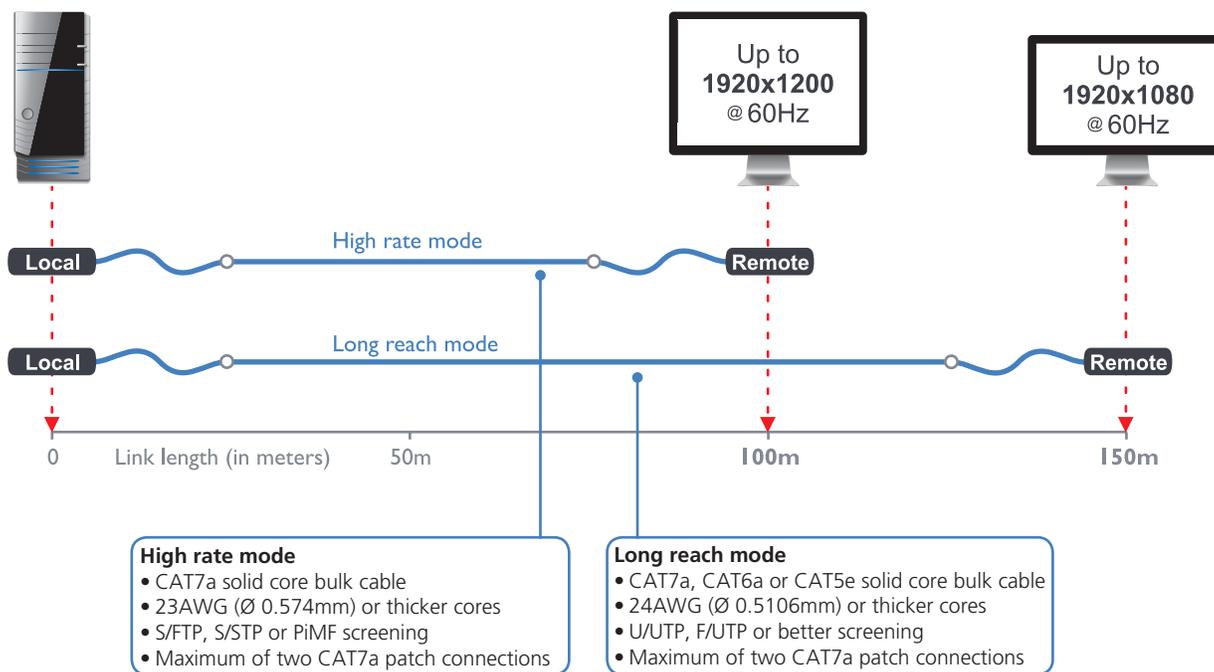
Figure 2-2. Remote module.

2.3 Tips for achieving good quality links

Due to the large volumes of data that must be transferred between the local and remote modules, every DVI/USB Extender installation is highly dependent upon good quality CATx cable links. Video performance is particularly reliant on high speed communication channels. For this reason, the DVI/USB Extender units test the link quality to determine which of two transfer modes can be supported: High rate or Long reach.

The main factors that affect link quality are:

- The length and type of CATx cable used,
- The number, length and type of intermediate patch connections,
- The quality of the cable terminations.



2.3.1 Patch cables

As mentioned above, patch links affect performance. For each additional break/patch within a run, you will need to reduce the distance given above by roughly 5 meters.

For best results, patch cables should be of type CAT 7a and be less than 2 meters in length. If patch cables are greater than 2 meters, then they must be CAT 7a.

We recommend the following CAT 7 and CAT6a shielded, foiled, twisted pair cables:

- Flexible patch cable Daetwyler 7702 (26AWG S/FTP)
- Bulk cable CAT6a 650-MHz F/UTP Solid Bulk Cable - PVC CMR, Blue, 1000-ft. (304.8-m), part number EYN770A-RL-1000

Please see Appendix B - Link cable interference protection for details about cable screening and shielding.

3. Installation

3.1 Locations

Please consider the following important points when planning the position of the DVI/USB Extender modules:

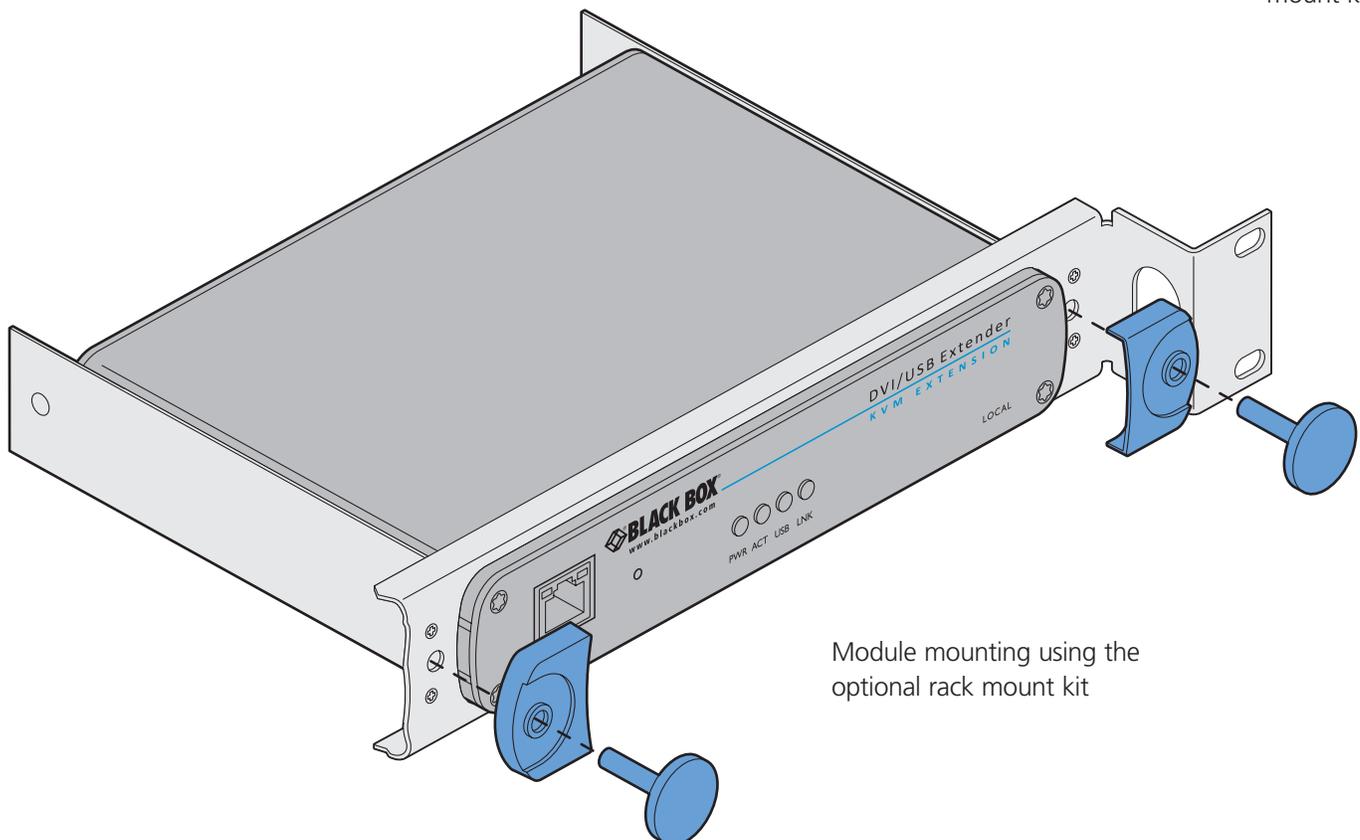
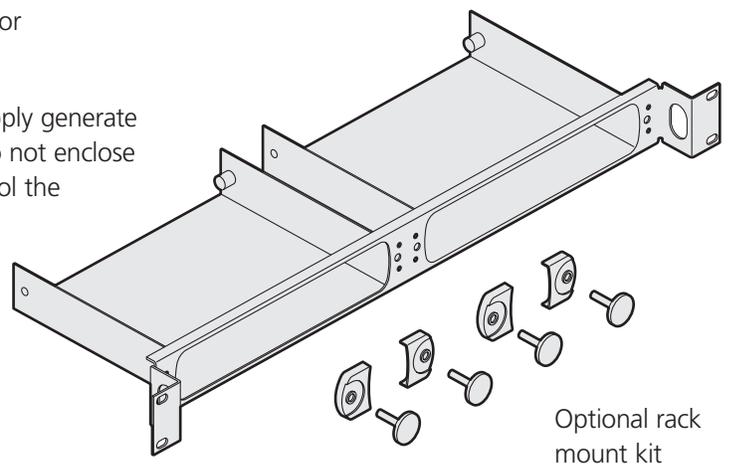
- Situate the local module close to the system to which it will be connected and near to a source of mains power. Place the remote module in similar close proximity to the peripherals that it will connect with, plus a source of mains power.
- Consult the precautions listed within the Safety information section.

3.2 Mounting

Before you begin connecting the DVI/USB Extender modules, it is advisable to mount them in place, either:

- In a standard 19" rack mount cabinet (using the optional rack mount kit) - see below, or
- On a horizontal surface using the supplied self adhesive feet, or
- Among the cabling at the rear of the desk.

NOTE: Both the DVI/USB Extender modules and their power supply generate heat when in operation and will become warm to the touch. Do not enclose them or place them in locations where air cannot circulate to cool the equipment. Do not operate the equipment in ambient temperatures exceeding 104° F (40° C). Do not place the products in contact with equipment whose surface temperature exceeds 104° F (40° C).



Module mounting using the optional rack mount kit

3.3 Connections

Connections do not need to be carried out in the order given within this guide; however, where possible connect the *power in* as a final step. The local module connects to your computer while the remote module links with your peripherals.

3.3.1 Local video connection

When operating in *High Rate* mode, DVI/USB Extender can support one Single Link DVI video display at pixel clocks up to 165MHz (equivalent to a maximum resolution of 1920 x 1200 at 60Hz - aka 'WUXGA'). If the *Long Reach* mode is selected, pixel clocks up to 148.5MHz (equivalent to a maximum resolution of 1920 x 1080 at 60Hz - aka '1080P') are supported. This allows greater separation between the local and remote modules to be achieved. Please see the section Mode switch settings for details.

3.3.1.1 To connect the video port

1. Connect the supplied digital video link cable between the DVI-D socket on the local module rear panel and the DVI-D video output socket of your host computer. See Figure 3-1.

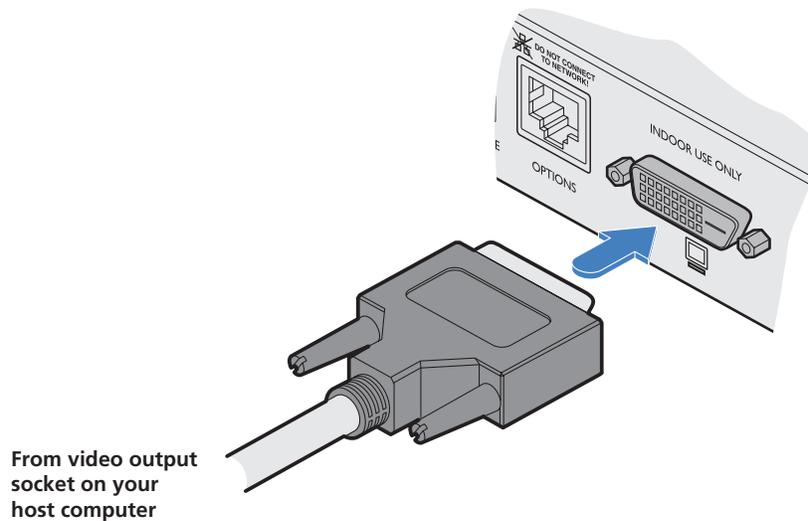


Figure 3-1. Connecting the video link to the local module.

3.3.2 Local USB connection

If USB connectivity is required, then a single USB connection is necessary between the local module and your computer; the DVI/USB Extender remote module acts as a USB 2.0 hub and thus provides four sockets for your peripherals.

3.3.2.1 To connect the USB port

1. Connect the supplied USB cable between the USB port on the local module rear panel and a vacant USB socket on your host computer. See Figure 3-2.

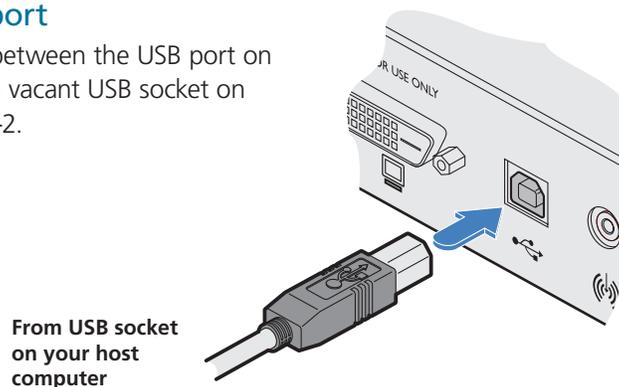


Figure 3-2. Connecting a USB link to the local module.

3.3.3 Local audio connection

The DVI/USB Extender modules support stereo speakers. A connection to the audio output port of the host computer is required at the local module.

3.3.3.1 To connect the audio port

1. Connect an audio link cable between the audio socket on the local module rear panel and the speaker/audio output socket of your host computer. See Figure 3-3.

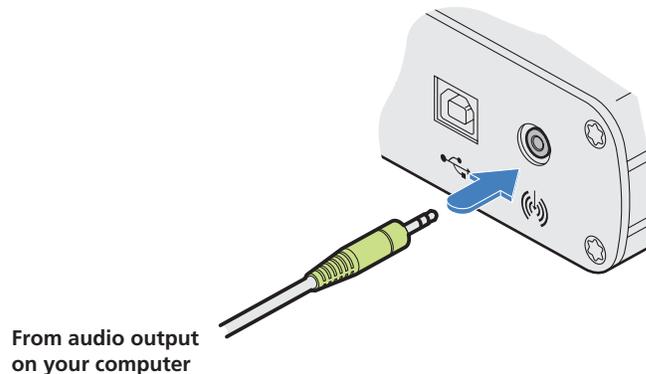


Figure 3-3. Connecting an audio cable to the local module.

3.3.4 Local serial port connection

The Options port provides an RS232 serial connection with the remote module. When serial devices are attached to the Options ports on the local and remote modules, the units transparently convey the signals between them, via the CATx link, at rates up to 115200 baud - no serial configuration is required. An optional serial cable is available from Black Box.

3.3.4.1 To connect the serial port

1. Use the optional serial cable to link the Options port on the rear panel of the local module with a vacant RS232 serial port on your host computer. See Figure 3-4.

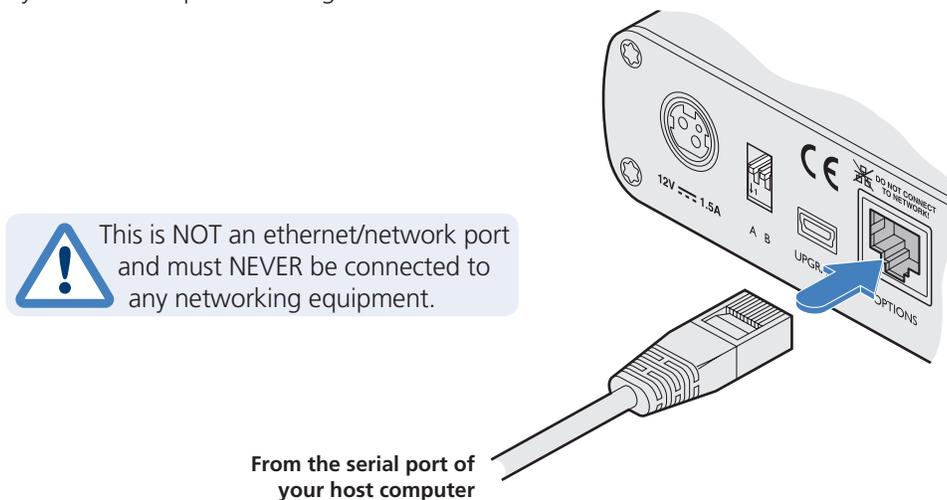


Figure 3-4. Connecting a serial cable to the OPTIONS port on the local module.

Please see Appendix A for pin-out details of the Options port.

3.3.5 Local power connection

There is no on/off switch on either of the DVI/USB Extender modules, so operation begins as soon as power is applied. The power adapters supplied with the modules use locking-type plugs to help prevent accidental disconnections; please follow the instructions given right whenever disconnecting a power adapter.

3.3.5.1 To connect the power adapter

1. Attach the output plug of the supplied power adapter to the power input socket on the left side of the rear panel. See Figure 3-5.

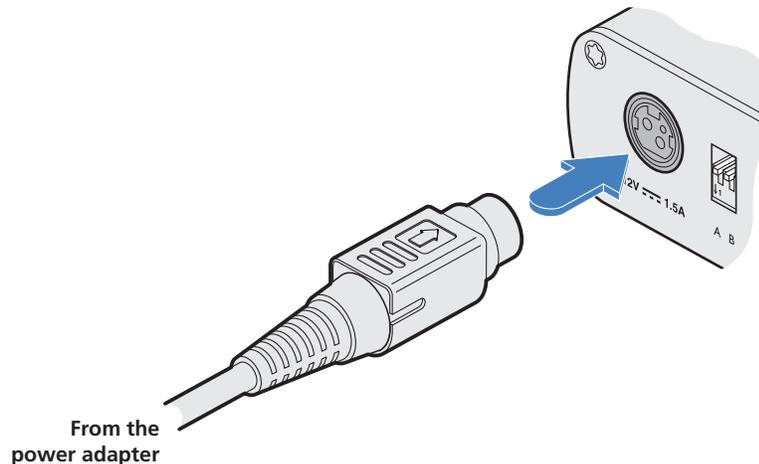


Figure 3-5. Attaching the power adapter output plug to the input socket.

2. If any mode changes need to be made, adjust the switch settings before applying power to the local module. Please see the section 4.1 Mode switch settings for details.
3. Connect the IEC connector of the supplied country-specific power cord to the socket of the power adapter. See Figure 3-6.

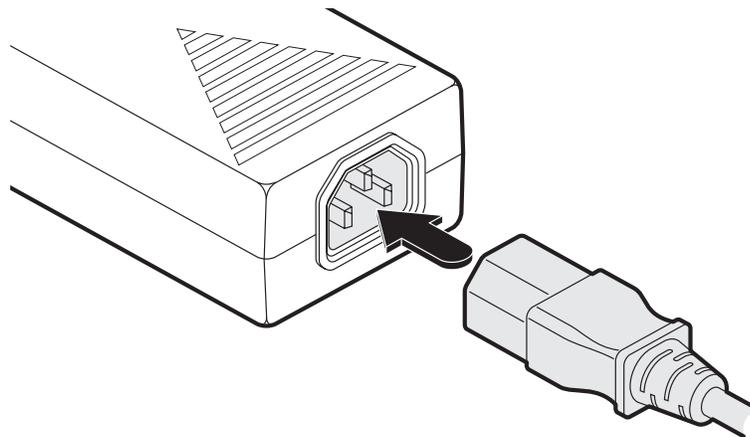


Figure 3-6. Attaching the IEC connector of the power lead to the adapter.

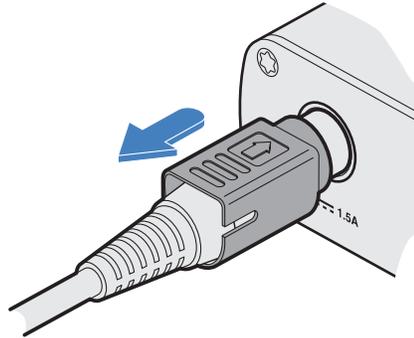
4. Connect the power cord to a nearby main supply socket.

IMPORTANT: Please read and adhere to the electrical safety information given within the Safety information section of this guide. In particular, do not use an unearthed power socket or extension cable.

Note: Both the switch and its power supplies generate heat when in operation and will become warm to the touch. Do not enclose them or place them in locations where air cannot circulate to cool the equipment. Do not operate the equipment in ambient temperatures exceeding 40 degrees Centigrade. Do not place the products in contact with equipment whose surface temperature exceeds 40 degrees Centigrade.

3.3.5.2 To disconnect the power adapter

1. Isolate the power adapter from the mains supply.
2. Grasp the outer body of the power adapter plug where it connects with the module.
3. Gently pull the body of the outer plug away from the module. As the body of the plug slides back, it will release from the socket and you can fully withdraw the whole plug. See Figure 3-7.



**Gently pull back the plug
outer body to release the lock**

Figure 3-7. Disconnecting the power adapter plug.

3.3.6 Remote video connection

A Single Link DVI-D port is provided on the rear panel of the remote module. The bandwidth available at the port is determined by the video input at the local module and also the mode in which the DVI/USB Extender system is running. When high rate mode is used, the modules will continually check the link quality to ensure that it is capable of supporting the higher pixel clock. If excessive data errors are detected, the modules will fall back to *Long Reach* mode until the local module is reset or the link is broken and re-established.

DVI/USB Extender can support one Single Link DVI video display at pixel clocks up to 165MHz (equivalent to a maximum resolution of 1920 x 1200 at 60Hz - aka 'WUXGA') when operating in *High Rate* mode. If the *Long Reach* mode is selected, pixel clocks up to 148.5MHz (equivalent to a maximum resolution of 1920 x 1080 at 60Hz - aka '1080P') in order to allow greater separations between the local and remote modules to be achieved. Please see the section 4.1 Mode switch settings for details.

3.3.6.1 To connect the video display

1. Connect the DVI-D video cable from your video display to the video output port on the rear panel of the remote module. See Figure 3-8.

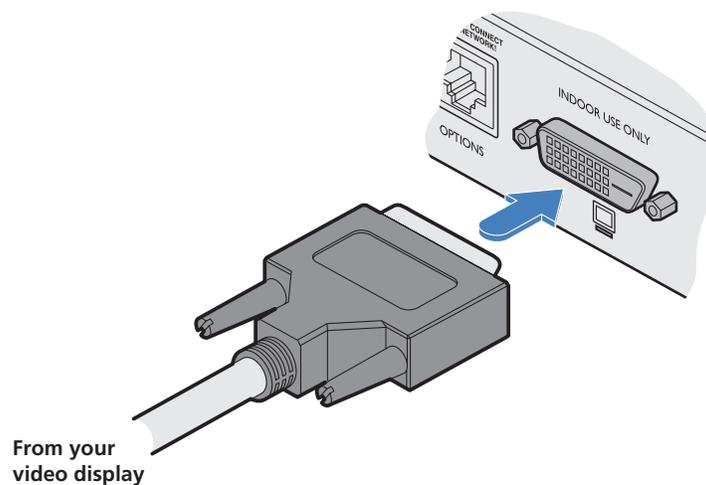


Figure 3-8. Disconnecting the power adapter plug.

3.3.7 EDID management

When a remote module is connected and the video display attached to it is detected, the EDID (Extended Display Identification Data) information is cloned and stored at the local module. Once this is done, a transparent DDC/CI (Display Data Channel/Command Interface) two way communication link is provided between the video display and the video source (your host computer). If the remote monitor is removed then the cloned EDID stored at the local module will still be presented to the video source.

3.3.8 Remote USB connections

The remote module contains a USB hub that can support up to four v1.1 or v2.0 USB devices (in any combination). All four USB sockets are identical in operation.

3.3.8.1 To connect USB devices

1. Connect your USB keyboard, mouse and any other two USB devices to the four sockets distributed on the front and rear panels of the remote module. See Figures 3-9 and 3-10.

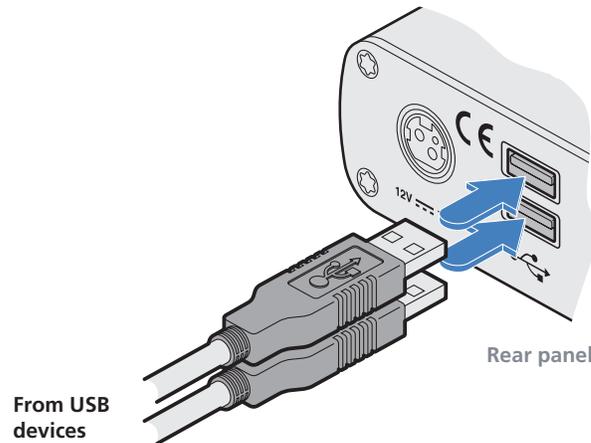


Figure 3-9. Connecting USB devices on the rear panel.

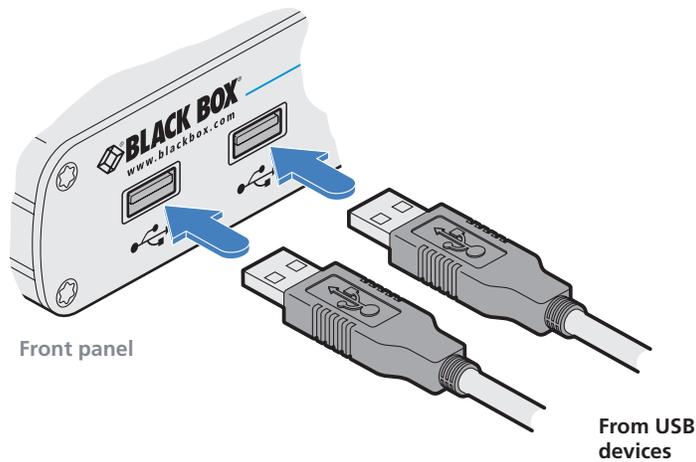


Figure 3-10. Connecting USB devices on the front panel.

3.3.9 Remote audio connection

The DVI/USB Extender modules support stereo speakers.

3.3.9.1 To connect your speakers

1. Connect your speakers to the audio socket on the remote module rear panel. See Figure 3-11.

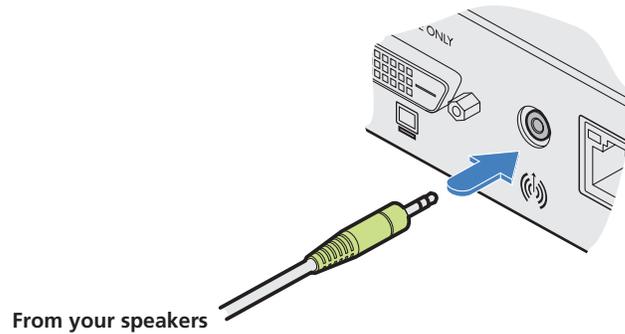


Figure 3-11. Connecting speakers on the rear panel.

3.3.10 Remote serial port connection

The Options port provides an RS232 serial connection with the local module. When serial devices are attached to the Options ports on the local and remote modules, the units transparently convey the signals between them, via the CATx link, at rates up to 115200 baud - no serial configuration is required. An optional serial cable is available from Black Box.

3.3.10.1 To connect the serial port

1. Use the optional serial cable to link the Options port on the rear panel of the remote module with your RS232 serial device. See Figure 3-12.

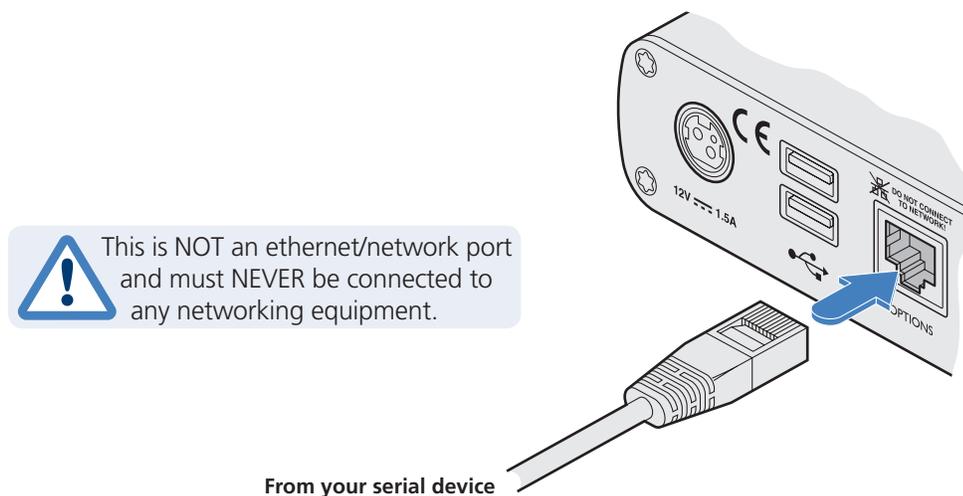


Figure 3-12. Connecting the serial OPTIONS port on the rear panel.

Please see Appendix A for pin-out details of the Options port.

3.3.11 Remote data link connection

The local and remote modules require a direct connection between them using standard CATx cables and connectors. This is a proprietary data link and is NOT network compatible; the modules must NEVER be connected to any networking equipment, such as switches and routers.

When operating in *High Rate* mode, DVI/USB Extender can support cable distances up to 100 meters. If the *Long Reach* mode is selected, the separation between the local and remote modules can be raised up to 150 meters. Best results will be gained when single lengths of CAT7 cable are used without the need for patch cables.

3.3.11.1 To connect the data link cable

1. Connect the CATx cable from the local module to the LINK port on the rear panel of the remote module. See Figure 3-13.

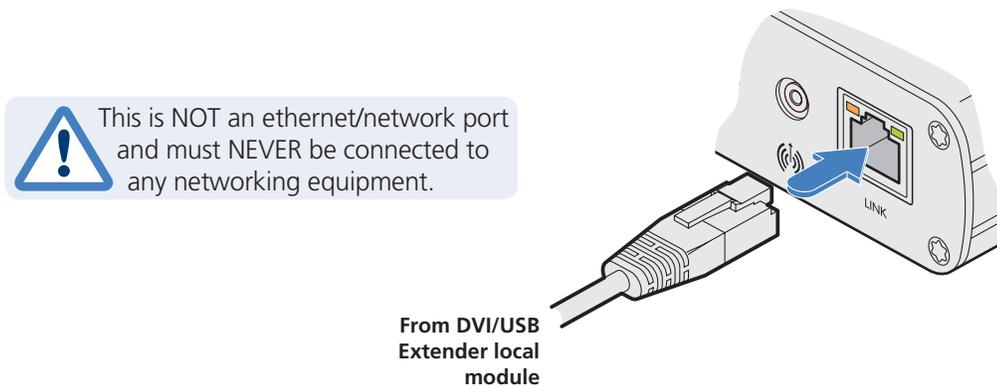


Figure 3-13. Connecting the remote data link on the rear panel.

3.3.12 Remote power connection

There is no on/off switch on either of the DVI/USB Extender modules, so operation begins as soon as power is applied. The power adapters supplied with the modules use locking-type plugs to help prevent accidental disconnections; please follow the instructions given right whenever disconnecting a power adapter.

3.3.12.1 To connect the power adapter

1. Attach the output plug of the supplied power adapter to the power input socket on the left side of the rear panel. See Figure 3-14.

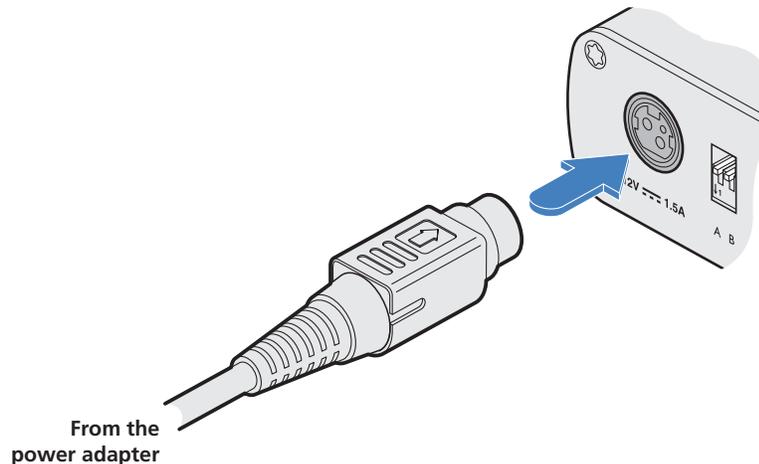


Figure 3-14. Attaching the power adapter output plug to the input socket.

2. If any mode changes need to be made, adjust the switch settings before applying power to the local module. Please see the section 4.1 Mode switch settings for details.
3. Connect the IEC connector of the supplied country-specific power cord to the socket of the power adapter. See Figure 3-15.

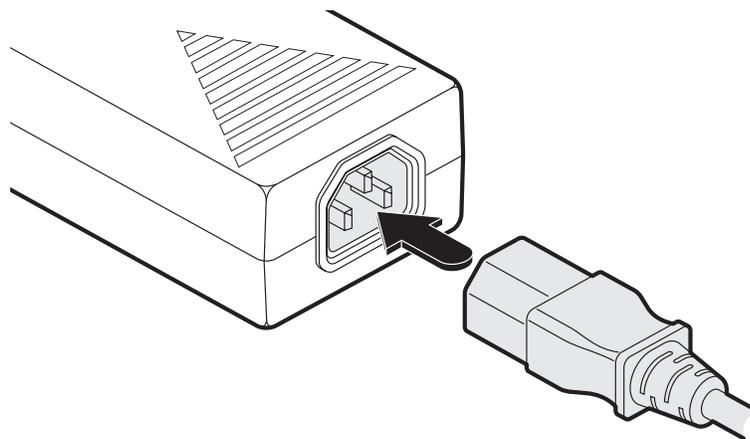


Figure 3-15. Attaching the IEC connector of the power lead to the adapter.

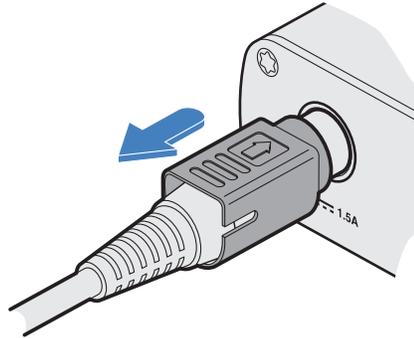
4. Connect the power cord to a nearby main supply socket.

IMPORTANT: Please read and adhere to the electrical safety information given within the Safety information section of this guide. In particular, do not use an unearthed power socket or extension cable.

Note: Both the switch and its power supplies generate heat when in operation and will become warm to the touch. Do not enclose them or place them in locations where air cannot circulate to cool the equipment. Do not operate the equipment in ambient temperatures exceeding 40 degrees Centigrade. Do not place the products in contact with equipment whose surface temperature exceeds 40 degrees Centigrade.

3.3.13.2 To disconnect the power adapter

1. Isolate the power adapter from the mains supply.
2. Grasp the outer body of the power adapter plug where it connects with the module.
3. Gently pull the body of the outer plug away from the module. As the body of the plug slides back, it will release from the socket and you can fully withdraw the whole plug. See Figure 3-16.



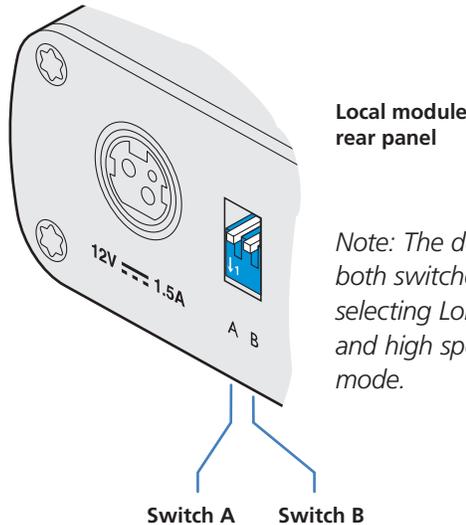
**Gently pull back the plug
outer body to release the lock**

Figure 3-16. Disconnecting the power adapter plug.

4. Configuration

4.1 Mode switch settings

The local module has two small switches on its rear panel. These are used to determine which operation modes should be used. You will need to re-power the local module whenever a switch setting is changed.



Local module rear panel



Changes to the mode switches are not recognized until you re-apply power to the local module.

Note: The default position for both switches is UP, thus selecting Long reach mode and high speed (normal) USB mode.

Switch A

USB compatibility mode

Determines whether USB compatibility mode should be used.

UP - Normal mode - Use this if the modules are not connected to a KVM switch.

DOWN - Compatibility mode - Use this if either the local or remote modules are connected to a KVM switch. This mode ensures robust and reliable operation with KVM switches but also reduces the maximum USB data rate.

Switch B

Link mode

Determines the priority for the data link: Longer distance or higher screen resolution.

UP - Long reach mode - Limits the pixel clock (148.5MHz) so that longer stretches of link cable (exceeding 100m) can be used. This will restrict the achievable screen resolution to a maximum of 1920 x 1080 at 60Hz (aka '1080P').

DOWN - High rate mode - Allows a higher pixel clock (165MHz) to support screen resolutions of up to 1920 x 1200 at 60Hz (aka 'WUXGA'). This will limit the maximum link cable length to around 100m or less, depending on the type of link cable used.

Note: When high rate mode is used, the modules will continually check the link quality to ensure that it is capable of supporting the higher pixel clock. If excessive data errors are detected, the modules will fall back to Long Reach mode until the local module is reset or the link is broken and re-established.

4.2 Firmware upgrades

Both modules can be upgraded simultaneously by linking them together and then connecting them to your computer using a USB type-A to mini-B cable.

IMPORTANT: During the upgrade process, do not remove power from either module.

4.2.1.1 To enter upgrade mode

1. On your computer, download the latest DVI/USB Extender upgrade file from Black Box support.
2. Connect the local and remote modules together using a CATx cable, and power on both modules. It's not important whether any peripherals (if any) are attached to either module.
3. Connect the local module to your computer using the mini USB socket on the rear panel and a USB type-A to mini-B cable (not supplied). See Figure 4-1.

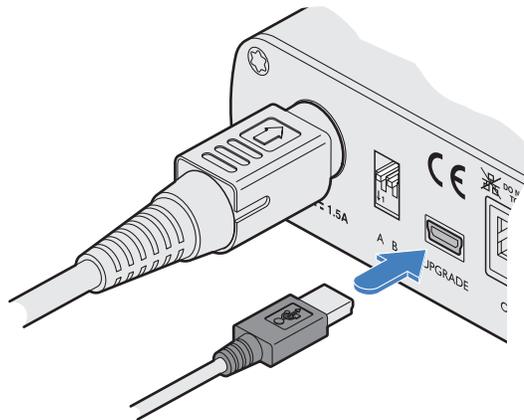


Figure 4-1. Connecting the mini USB cable to the rear panel.

4. On the front panel of the local module, use a small implement or straightened paperclip to press and hold the recessed reset button for approximately 10 seconds. See Figure 4-2.

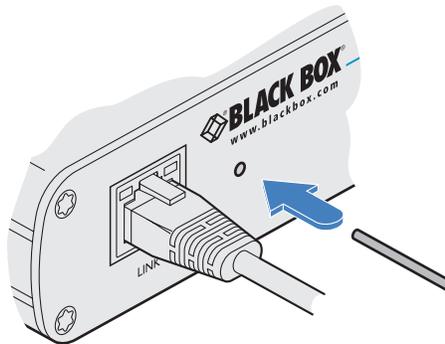


Figure 4-2. Press and hold the recessed reset button for approx 10 seconds.

The front panel indicators will begin to flash in sequence: The outer two followed by the inner two and so on.

The module should be declared on your computer as a mass storage device with the volume label 'FIRMWARE'.

5. Use your computer's file manager application to copy the upgrade file downloaded earlier to the mass storage device that has the volume label 'FIRMWARE'. Once the local module has received all of the data, the front panel indicators of the local module will chase from side to side to show that the upgrade procedure is underway.
6. Once the upgrade has been successfully completed both modules will reset themselves and return to normal operation.

4.2.2 Errors during the upgrade process

If the upgrade process encounters an error then one or more of the indicators on the local module front panel will flash rapidly, i.e. they will cease chasing in sequence.

4.2.2.1 If the firmware upgrade fails

1. Check that the CATx cable is correctly connected between the **LINK** sockets of the local and remote modules and that power is applied to both modules.
2. On the front panel of the local module, re-press the recessed reset button for approximately 10 seconds to re-invoke upgrade mode. The module should again be declared on your computer as a mass storage device with the volume label 'FIRMWARE'.
3. Follow step 5 above.
 - If the upgrade process fails again, contact Black Box technical support for assistance.

5. Operation

The DVI/USB Extender modules are designed to be transparent in operation. Providing the link cable is sufficient to reliably carry the signals across the separation distance, all peripherals should respond exactly as they would when situated next to your host computer.

5.1 Indicators

The local and remote modules contain various indicators to provide you with status information. Both modules have four red indicators on their front panels; both also have green and amber indicators on the link connectors.

5.1.1 Red status indicators

The red status indicators on the front panels of each module mostly behave in the same manner at the same time. See Figure 5-1.

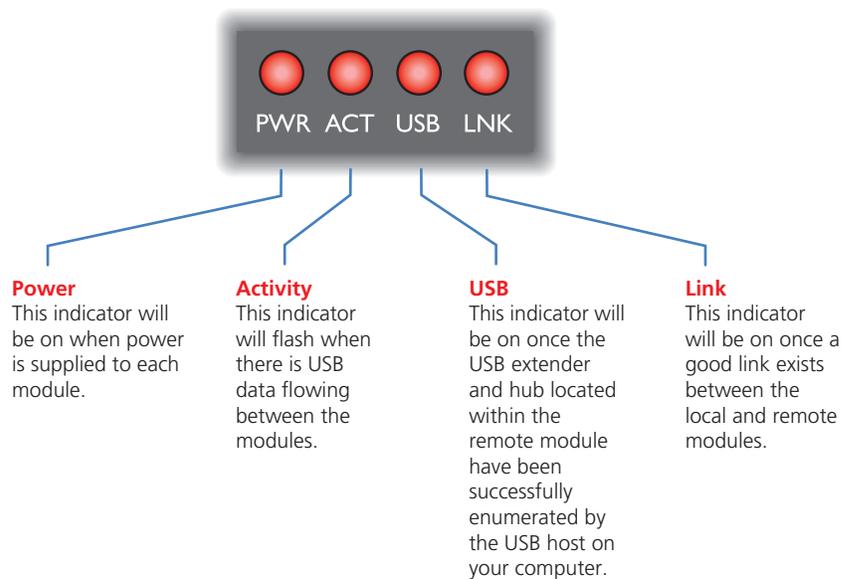


Figure 5-1. The front panel red status indicators

5.1.2 Green and amber status indicators

The green and amber status indicators on the link connectors of each module provide further status information. See Figure 5-2.

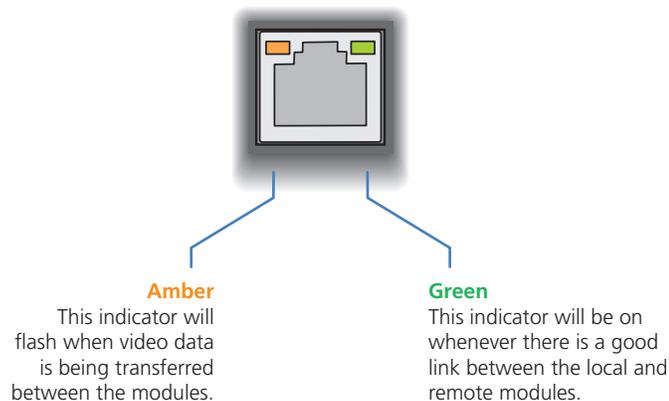
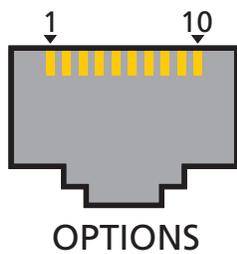


Figure 5-2. The link status indicators

Appendix A. Options port pin-out

The OPTIONS port uses a 10p10c socket which can accommodate both 10p10c connectors as well as the much more common 8p8c connectors, which are used on Ethernet leads and patch cables. The pin-outs are listed in this section for both types of connector.

Note: Although the pins labeled 'Not used' are inactive, they are still connected internally and so no links should be made at all to these pins.



8p8c	10p10c	Signal
	1	Not used
1	2	5VDC power output (100mA max)
2	3	GND reference for all signals
3	4	RS232 (RXD) data receive
4	5	Not used
5	6	Not used
6	7	RS232 (TXD) data transmit
7	8	Not used
8	9	Not used
	10	Not used

Appendix B. Link cable interference protection

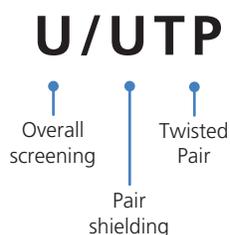
While the Category rating (e.g. CAT 5e, CAT 6a, CAT 7, etc.) determines the electrical performance of a cable, another vital part of the overall cable specification is its protection from interference. As cabling distances and data rates increase, so too does the susceptibility to interference, from both external and internal sources.

Proximity to other electromagnetic sources are the main external threat and these can be subdued using overall screening that surrounds all four of the cable pairs. However, interference is also possible from neighboring twisted pairs within the same cable and this can be just as hazardous to data integrity. Such *crosstalk* is countered by shielding each cable pair separately.

Within each Category rating, you can specify different combinations of external screening and internal shielding to suit the environment into which the link is being placed. Please see the section 2.3 Tips for achieving good quality links for suggested combinations.

B.1 Interference protection codes

Interference protection is now classified in the following manner:



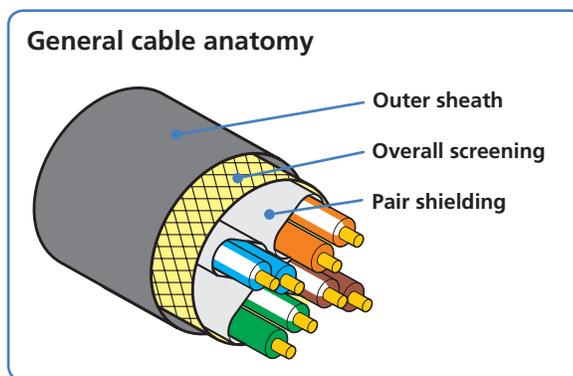
where

U = unshielded

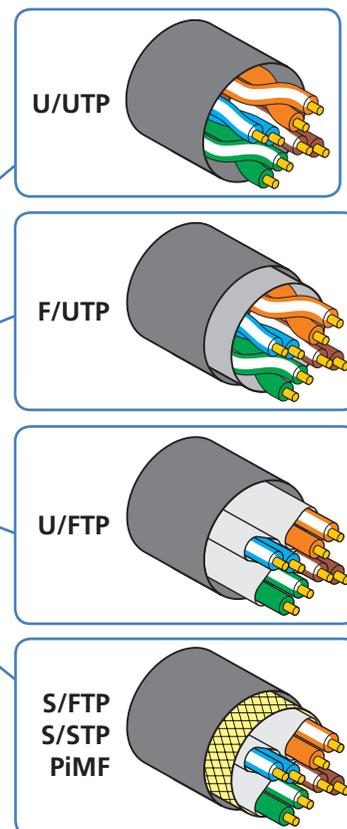
F = foil shielding

S = braided shielding

PiMF = Pairs in Metal Foil



Name	Overall Screening	Pair Shielding
U/UTP	✗	✗
F/UTP	✓	✗
U/FTP	✗	✓
S/FTP or S/STP or PiMF	✓	✓



Appendix C. Safety information

- For use in dry, oil free indoor environments only.
- Both the unit and its power supply generate heat when in operation and will become warm to the touch. Do not enclose them or place them locations where air cannot circulate to cool the equipment. Do not operate the equipment in ambient temperatures exceeding 40 degrees Centigrade. Do not place the products in contact with equipment whose surface temperature exceeds 40 degrees Centigrade.
- Warning - live parts contained within power adapter.
- No user serviceable parts within power adapter - do not dismantle.
- Plug the power adapter into a socket outlet close to the module that it is powering.
- Replace the power adapter with a manufacturer approved type only.
- Do not use the power adapter if the power adapter case becomes damaged, cracked or broken or if you suspect that it is not operating properly.
- If you use a power extension cord with the unit, make sure the total ampere rating of the devices plugged into the extension cord does not exceed the cord's ampere rating. Also, make sure that the total ampere rating of all the devices plugged into the wall outlet does not exceed the wall outlet's ampere rating.
- Do not attempt to service the unit yourself.

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