



**BLACK BOX**<sup>®</sup>  
NETWORK SERVICES



March 2005  
AC1032A-2  
AC1032A-4

## 2 & 4-Port DVI Switch



**CUSTOMER  
SUPPORT  
INFORMATION**

Order toll-free in the U.S. 24 hours, 7 A.M. Monday to midnight Friday: **877-877-BBOX**  
FREE technical support, 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**  
Mail order: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018  
Web site: [www.blackbox.com](http://www.blackbox.com) • E-mail: [info@blackbox.com](mailto:info@blackbox.com)

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AND CANADIAN DEPARTMENT OF COMMUNICATIONS  
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 the Canadian Department of Communications.*

*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 le ministère des Communications du Canada.*

**EUROPEAN UNION DECLARATION OF CONFORMITY**

This product complies with the requirements of the European EMC directive 89/336/EEC



## Normas Oficiales Mexicanas (NOM)

### Electrical Safety Statement

#### INSTRUCCIONES DE SEGURIDAD

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.

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# 1. Introduction

## 1.1 General

The Black Box Model AC1032A-2 and Model AC1032-4 DVI Switches allow routing of multiple DVI equipped devices (such as PC's) to a single DVI display (such as plasma or LCD screen). The switchers support single-link, DVI-I (integrated Analog and/or Digital) video signals at resolutions of up to 1280x1024. The DVI Switches feature front panel switches and indicators for easy operation, plus they have intelligence to switch to active video input when an input is unplugged or there is no video present.

## 1.2 Features

- Clear & sharp image at resolution up to 1280x1024 (including 1080i).
- Supports both digital and analog DVI signals (DVI-I), allowing you to connect or switch between a DVI equipped PC and a VGA equipped one (*In this case HD15 to DVI cable will be necessary, and your DVI monitor should be able to support DVI-I signal*)
- Hot pluggable
- Auto skips over the powered off input (no video) and/or unplugged cable
- Supports the DDC2 standard for all input ports
- Includes Universal (110-220 Vac) Power supply

## 2. Installation

1. Your package includes the Switcher box, a power supply and this Manual. You need to purchase input cables for connection to your video sources. Black Box sells high quality DVI cables and adapters at various lengths.



Figure 1.  
Example of DVI Cable



Figure 2.  
Example of DVI-to-VGA Adapter



Figure 3.  
Basic DVI Connector Types

2. Make sure the PCs , the switch, and the monitor are all turned off
3. Plug the monitor's cable into the DVI OUT port of the Switch
4. Plug male-to-male extension cables from PCs DVI ports to the Switch

*(A note about cables: A DVI-I cable has the analog pins surrounding the ground blade. Since the Switch is DVI-I, its connectors have all the sockets, and since most PCs have DVI-I output connectors with all the pin sockets, you can use either a DVI-D or a DVI-I cable to connect to your video source. However, a DVI-D cable does not bring in the analog signals to the switch and hence you will not be able to use an analog monitor on the output. Furthermore, it does not make any difference if the cable is Single or Dual Link. The Switch is Single-Link and you can physically plug either a Dual or a Single Link cable into it)*



5. Plug the supplied power adapter to the unit
6. Turn on the monitor first. All red LEDs will flash back and forth (telling you that the unit is searching for video on the inputs).
7. Turn on the PCs. The green LEDs turn on (telling you that the unit sees a connection and valid signal on the inputs).

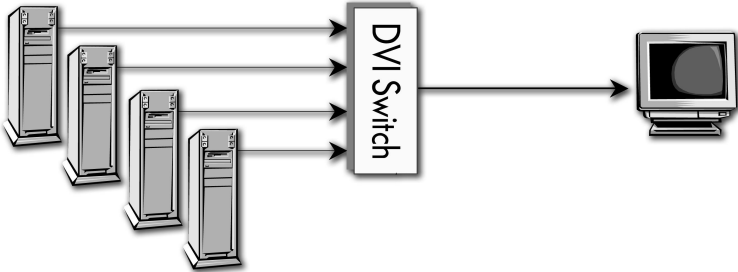


Figure 4.  
Setup Block Diagram

### 3. Operation

The LED's indicate which input is selected and which inputs are present. Simply press the switch next to the LEDs on any of the inputs that have their green LEDs lit to select that input.

Note that you cannot select an input that is not preset or has no video (the switch will not allow you). Furthermore, if you select an input that has video and later that input is disconnected (or the Pc to which it was plugged in is turned off), then the unit will select the next valid input.

## 4. Troubleshooting

### 4.1 Problem Solving FAQ

#### 1. What are the Cable Length Limitations?

The switcher cannot be used as an extender. Therefore it is best to plug the output of the switch directly to the display device and use input cables that are 5 meters (16 ft) maximum. In other words, try to keep the total length of cables from the video source to the box and from the box to the monitor should not exceed 16 feet. At longer distances you may experience video degradation. If you cannot use shorter cables, try to turn the refresh rate and/or resolution of the video signal lower.

#### 2. What about HDCP (High-bandwidth Digital Content Protection) in home entertainment systems?

The switcher is designed to primarily work with PC's with DVI outputs. If you want to use it in a Home-Theatre setup with DVI connections, it may or may not work. The switchers do not provide compatibility with HDCP encoded video sources. For example if you have a DVD player with DVI output, depending on the brand, or the DVD, it could enforce HDCP content protection. If HDCP is not enforced, then the switcher will function well, however if HDCP is enforced, then at best the DVD player will output at 480p mode, and at worst it will not output any video on its DVI output instead a message will be displayed to use another output!.

## **4.2 Calling Black Box**

If you determine that your switcher is malfunctioning, do not attempt to repair the unit. Contact Black Box Tech. Support at 724-746-5500.

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 nature and duration of the problem;
- The components involved in the problem—that is, what type of cable, makes and models of computers and monitors, etc.
- The results of any testing you've already done.

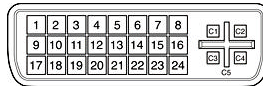
## **4.3 Shipping and Packaging**

If you need to transport or ship your Switcher:

- Package it carefully. We recommend that you use the original container.
- Before you ship the unit back to Black Box for repair or return, contact us to get a Return Authorization (RA) number.

## 5. Specifications

<b>Standards</b>	DVI-I Single Link, DDC 2 (Plug and Play EDID)
<b>Resolutions</b>	PC resolutions up to 1280x1024 @ 60 Hz & HDTV to 1080i
<b>Temperature</b>	Operating: 32 to 122°F (0 to 50°C); Storage: -40 to +185°F (-40 to +85°C)
<b>Enclosure</b>	Steel
<b>MTBF</b>	90,000 hours (calculated estimate)
<b>Power</b>	From utility-power (mains) outlet, through included external power supply. Output Voltage: 9v DC Center-Positive at 1.7 A
<b>Size (hxwx d)</b>	2-Port: 1.0" x 6.0" x 2.8"    4-Port: 1.0" x 10.7" x 3.8"
<b>Weight</b>	2-Port: 1.1 pounds    4-Port: 2.1 pounds



DVI Connector pinout

N/U = Not Used

Pin	Signal name	Pin	Signal name
1	TMDS Data2-	13	TMDS Data3+ (N/U)
2	TMDS Data2+	14	+5V Power
3	TMDS Data2/4 Shield	15	Ground for +5V Power
4	TMDS Data4- (N/U)	16	Hot Plug Detect
5	TMDS Data4+ (N/U)	17	TMDS Data0-
6	DDC Clock	18	TMDS Data0+
7	DDC Data	19	TMDS Data0/5 Shield
8	Analog vertical sync	20	TMDS Data5- (N/U)
9	TMDS Data1-	21	TMDS Data5+ (N/U)
10	TMDS Data1+	22	TMDS Clock Shield
11	TMDS Data1/3 Shield	23	TMDS Clock+
12	TMDS Data3- (N/U)	24	TMDS Clock-
C1	Analog red	C4	Analog horizontal sync
C2	Analog green	C5	Analog ground
C3	Analog blue		



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