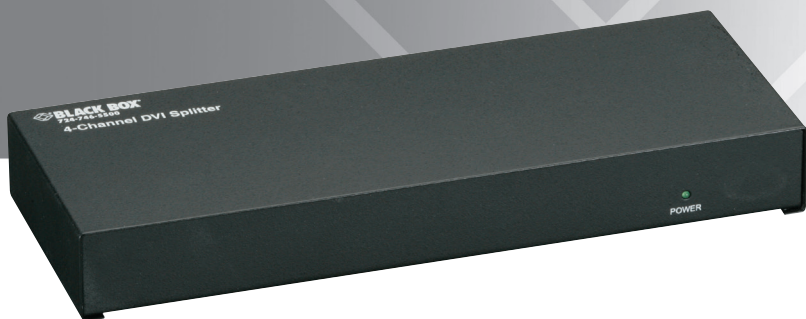


## 2- or 4-Channel DVI Splitter/Extender

Split your PC's DVI signals to two  
or four separate DVI displays.



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Support  
Information**

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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.

### 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 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 fisica 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. Specifications

**Standards** — DVI-I single-link, compliant with DVI 1.0 standard

**Resolutions** — PC resolutions up to 1920 x 1200 @ 60 Hz and HDTV to 1080i

**Temperature Tolerance** — Operating: 32 to 122°F (0 to 50°C);  
Storage: -40 to +185°F (-40 to +85°C)

**Enclosure** — Steel

**MTBF** — 90,000 hours (calculated estimate)

**Power** — From utility-power (mains) outlet, through included external power supply;

Output voltage: 12 VDC center-positive at 1 A

**Size** — AC1031A-R2-2: 1.4"H x 7.8"W x 2.7"D (3.6 x 19.8 x 6.8 cm);

AC1031-R2-4: 1.4"H x 10.6"W x 4"D (3.6 x 26.9 x 10.2 cm)

**Weight** — AC1031A-R2-2: 1.4 lb. (0.6 kg);

AC1031A-R2-4: 2.2 lb. (1 kg)

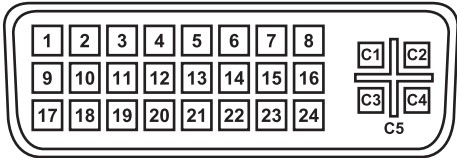


Figure 1-1. DVI connector.

Table 1-1. DVI connector pinout.

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		

NOTE: N/U = Not Used



### 2. Overview

#### 2.1 Introduction

The 2- and 4-Channel DVI Splitter/Extenders enable routing of a single DVI equipped device (such as a PC) to multiple DVI displays (such as plasma or LCD screens). The splitters support single-link, DVI-I (integrated Analog and/or Digital) video signals at resolutions of up to 1920 x 1200. They feature a front-panel LED indicator for power on state, plus they can be used to extend the DVI output to 32 feet (10 meters). A DVI-I input cable is included with the unit.

#### 2.2 Features

- Clear and sharp image at resolutions up to 1920 x 1200 (including 1080i).
- Supports both digital and analog DVI signals (DVI-I), enabling you to connect a DVI-I equipped PC to monitors that have DVI-I or legacy monitors with VGA inputs only (in this case, you will need a HD15 to DVI cable or adapter).
- Can be cascaded (2-levels deep) for more outputs.
- Installs in minutes.
- Complies with the DVI 1.0 specification.
- Includes a high-quality DVI-I input cable.
- Includes a universal (110-220 VAC) power supply.

#### 2.3 What's Included

Your package should include the following items. If anything is missing or damaged, contact Black Box Technical Support at 724-746-5500 or [info@blackbox.com](mailto:info@blackbox.com).

- 2- or 4-Channel DVI Splitter/Extender
- (1) DVI-I input cable
- Universal 110-220 VAC, 12 VDC, 1 A power supply and U.S. power cord
- This user's manual

## 2.4 Hardware Description

### 2.4.1 2-Channel DVI Splitter/Extender (AC1031A-R2-2)

Figures 2-1 and 2-2 show the front and back panels of the AC1031A-R2-2. Table 2-1 describes its components.



Figure 2-1. AC1031A-R2-2 front panel.

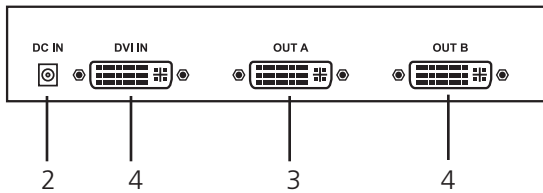


Figure 2-2. AC1031A-R2-2 back panel.

Table 2-1. AC1031A-R2-2 components.

Number	Component	Description
1	Power LED	Lights when power to the unit is on.
2	Barrel connector	Links to 12 VDC power.
3	(1) DVI connector	Connects to DVI input.
4	(2) DVI connectors	Link to DVI outputs.

2.4.2 4-Channel DVI Splitter/Extender (AC1031A-R2-4)

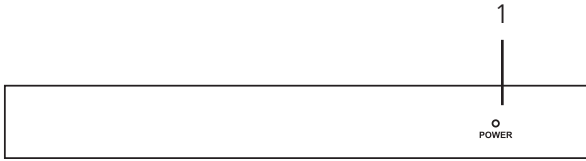


Figure 2-3. AC1031A-R2-4 front panel.

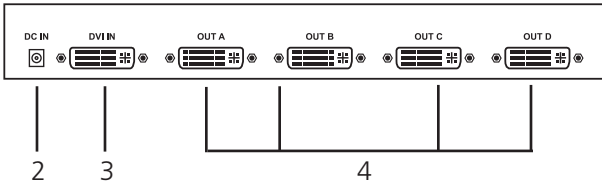


Figure 2-4. AC1031A-R2-4 back panel.

Table 2-2. AC1031A-R2-4 components.

Number	Component	Description
1	Power LED	Lights when power to the unit is on.
2	Barrel connector	Links to 12 VDC power.
3	(1) DVI connector	Connects to DVI input.
4	(4) DVI connectors	Link to DVI outputs.

### 3. Installation

1. Your package includes the Splitter box, a power supply, an input cable, and this user manual. You may need to purchase additional long DVI cables for connection to your monitors. Black Box sells high quality DVI cables and adapters at various lengths. Contact Tech Support at 724-746-5500 or [info@blackbox.com](mailto:info@blackbox.com) for details.

2. Make sure the PC, the Splitter, and the monitors are all turned off.

3. Plug the monitor's cables into the DVI OUT ports of the splitter.

*NOTE: At least one monitor needs to be connected to the output A of the splitter.*

4. Plug a male-to-male extension cable from the PC's DVI port to the splitter.

*NOTE: A DVI-I input cable is included with the splitter.*

The DVI-I cable has the analog pins surrounding the ground blade (see Figure 3-1).

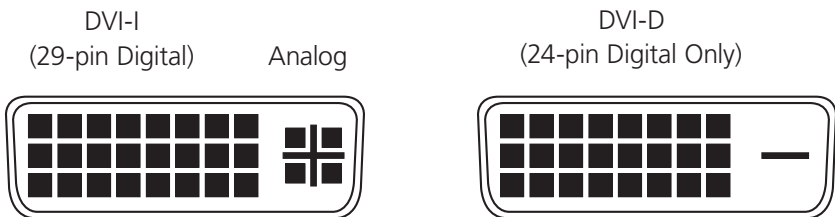


Figure 3-1. Basic DVI connector types.

*NOTE: Since the Splitter is DVI-I, its connectors have all the sockets, and since most PCs have DVI-I output connectors with all the pin sockets, in most cases you can use the supplied cable to make the connection to your video source.*

*However, if your video source is purely digital DVI-D, then the connector may not have the sockets for the additional analog pins. In this case, you will not be able to use the supplied cable because it cannot plug in to your PC's output and you need to purchase a DVI-D cable that does not have the extra analog pins.*

*The DVI-D cable can plug in to the Splitter, it just does not have the extra analog pins. Furthermore, it does not make any difference if the cable is single or dual link. (The splitter is a single-link unit but you can physically plug either a dual-link or a single-link cable into it.)*

5. Plug the supplied power adapter to the unit (the green LED on the front panel turns on).
6. Turn on the monitors.
7. Turn on the PC.

Figure 3-2 shows a sample application diagram.

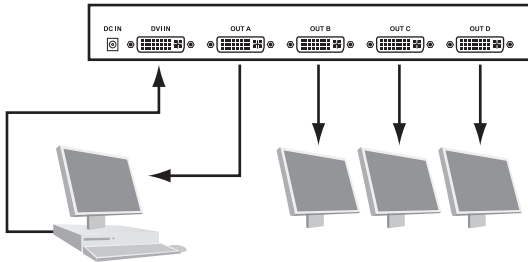


Figure 3-2. Example application.

### Cascade Operation

For more outputs, you can connect output #1 of the splitter to the input of a slave splitter. We recommend that you do not cascade splitters more than two levels deep.

### 4. Troubleshooting

#### 4.1 Problem-Solving Frequently-Asked Questions (FAQs)

##### 1. What are the cable length limitations?

The splitter can accept up to 16 feet (5 meters) of cable on its input and 32 feet (10 meters) on its output for a total of 48 feet (15 meters) total. At long distances, if you start to experience video degradation, you should 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 Splitter is designed to primarily work with PCs with DVI outputs. If you want to use it in a home-theater setup with DVI connections, it may or may not work. The splitters 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 splitter 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 2- or 4-Channel DVI Splitter/Extender is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500 or [info@blackbox.com](mailto:info@blackbox.com).

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.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

### 4.3 Shipping and Packaging

If you need to transport or ship your 2- or 4-Channel DVI Splitter/Extender:

- Package it carefully. We recommend that you use the original container.
- If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, contact Black Box to get a Return Authorization (RA) number.

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way it should be.



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## About Black Box

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