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The Source for Connectivity®

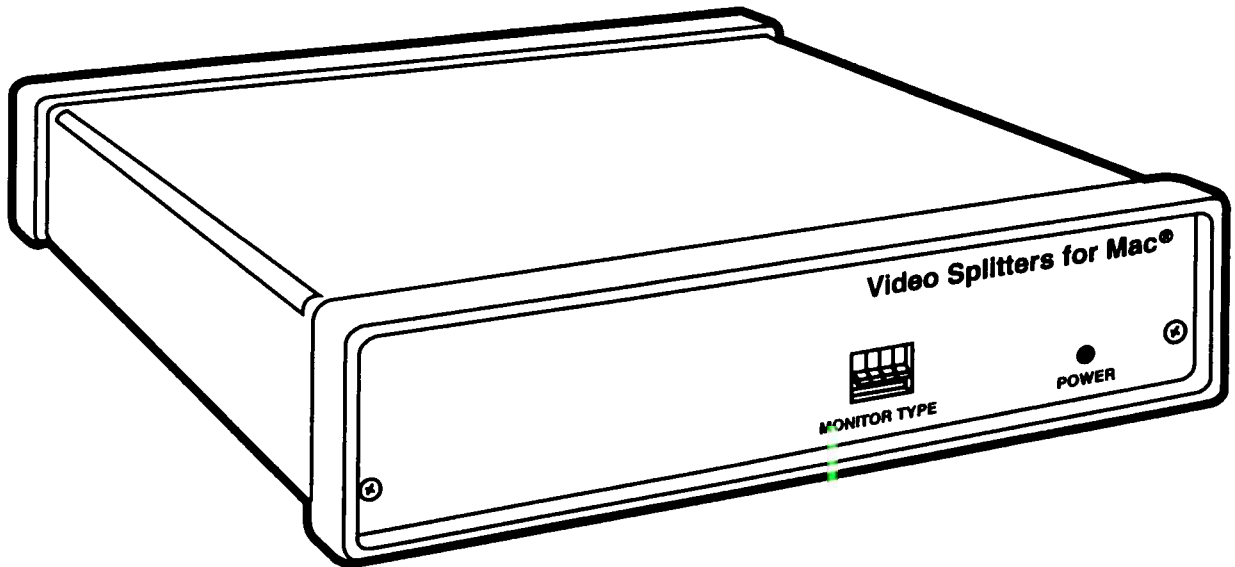
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AC129A  
AC130A  
AC131A

AC129AE  
AC130AE  
AC132A  
AC133A

## Video Splitters for Mac®



**CUSTOMER  
SUPPORT  
INFORMATION**

Call our Technical Support Specialists to discuss your application.  
For 24-hour technical support: Call (412) 746-5500 or fax 1-800-321-0746  
To order: Call (412) 746-5500, 7:00 A.M. to 8:00 P.M. EST  
Mail order: **Black Box Corporation**, P.O. Box 12800, Pittsburgh, PA 15241

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## 1. Specifications

Approvals —	FCC Part 15 Class A, DOC Class/MDC classe A
Standard/ Interface—	Apple Macintosh video
Maximum Resolution —	1600 x 1200 pixels; however, image quality and attainable distance degrade relatively rapidly above 1280 x 1024 pixels
Maximum Refresh Rate —	75 Hz
Maximum Distance —	See the table on page 12
Rise Time —	Less than 1 ns
Bandwidth —	300 MHz (~3 dB)
User Control —	(1) Front-mounted 4-position DIP switch for selecting monitor type
Indicator —	(1) Front-mounted POWER LED
Connectors —	All rear-mounted: All models: (1) 5-pin mini-DIN female for power; (1) DB15 female for video input; AC129 models: (2) DB15 female for video output; AC130 models: (4) DB15 female for video output; AC131A: (6) DB15 female for video output; AC132A: (8) DB15 female for video output; AC133A: (10) DB15 female for video output

**Power —**

AC129A, AC130A:

From wallmount power supply:

Input: 115 VAC, 60 Hz, 12 watts;

Output:  $\pm 5$  VDC at 300 mA to 1 amp;

AC129AE, AC130AE:

From desktop power supply:

Input: 230 VAC, 50 Hz, 5 watts;

Output:  $\pm 5$  VDC at 500 to 600 mA;

AC131A, AC132A, AC133A:

From desktop power supply:

Input: 95 to 250 VAC, 47 to 63 Hz, 10 watts;

Output:  $\pm 5$  VDC at up to 2 amps**Temperature —**

32 to 125° F (0 to 50° C)

**Humidity —**

5 to 95% noncondensing

**Enclosure —**

Metal

**Size —**

AC129A, AC129AE:

1.5"H x 7.25"W x 3.25"D (3.8 x 18.4 x 8.3 cm);

All models except AC129A, AC129AE:

2.5"H x 7.25"W x 3.25"D (6.4 x 18.4 x 8.3 cm)

**Weight —**

2- and 4-port (AC129, AC130) units: 2.5 lb. (1.1 kg)

6-port (AC131A) units: 3 lb. (1.4 kg)

8-port and 10-port (AC132A, AC133A) units:

3.5 lb (1.6 kg)

## 2. Introduction

Normally, Apple® computers and compatibles are designed to drive their Macintosh® video output to only one nearby monitor. Often, however, circumstances call for Mac® output to be driven to one or several monitors (or other display devices) far away from the computer. That's where our family of Video Splitters for Mac comes in. A typical application for one of these Splitters involves a Macintosh CPU simultaneously sending video output to its own monitor, usually placed nearby, and to as many as nine remote monitors, video projectors, and/or LCD panels, located around the room or in another room up to 250 feet (76.2 m) away. This makes your Splitter perfect for conference rooms, classrooms, public information displays, show exhibits, and demonstrations. For more about Video Splitter for Mac applications, see [Chapter 5](#).

If you need to send video to more places than one Splitter can accommodate, you can “cascade” Splitters by attaching one or more secondary units to the MONITOR ports of the primary unit. See [Section 3.4](#).

These Video Splitters for Mac come in compact, attractive desktop enclosures. They are powered by an external power supply and draw no power from the sending computer. Each Splitter can be located up to 6 feet (1.8 m) away from this computer.

With bandwidths of 300 MHz, these Video Splitters for Mac can handle Mac resolutions as high as 1152 x 870 pixels or VGA-mode resolutions as high as 1600 x 1280 pixels, at refresh rates as high as 75 Hz. They support a variety of synchronization options, including H & V (separate horizontal and vertical) sync, composite sync, sync-on-green, sync-on-RGB, and 75-ohm sync loads.

## 3. Installation

### 3.1 The Complete Package

You should have received all of these things with your Splitter order:

- (1) Video Splitter for Mac of the appropriate model;
- (1) External transformer (power supply);
- (1) 6-ft (1.8-m) DB15-male-to-DB15-male video cable for connecting a Macintosh CPU or other video source to the Splitter; and
- (1) Copy of this manual.

If any of these items are missing, call Black Box right away. If any of these items are damaged, call Black Box and the shipping carrier immediately.

### 3.2 The Procedure

Follow these steps to install the Video Splitter for Mac:

1. Place the Video Splitter for Mac within 6 feet (1.8 m) of the computer.
2. Run the included video cable from the computer's Video output to the connector marked **MAC IN** on the rear of the Splitter.
3. Connect your primary monitor (the one that was previously attached directly to the computer) to the connector marked **MONITOR 1** on the rear of the Splitter.
4. Connect the additional monitor(s) or other display device(s) to the remaining **MONITOR** connector(s) on the rear of the Splitter. You will need special cables for some equipment; see Section 3.3. You can also use video extension cables to extend the distance you can run to as much as 250 feet (76.2 m); see Section 3.4.
5. Plug the output cord of the included power supply into the jack marked **POWER** on the rear of the Splitter.
6. Plug the power supply into an AC wall outlet. The Splitter's front-panel LED should glow red to show that the unit is properly powered.

7. The four-position DIP switch marked **MONITOR TYPE** on the front panel of the Video Splitter for Mac tells the video adapter in your computer what type of monitors you have connected when the computer boots up. For a standard application in which your remote monitor(s) are pretty much interchangeable with your primary monitor (the one on **MONITOR 1**), move all four switch positions to the "UP" setting; this will cause the Splitter to pass the "ID bits" from the primary monitor through to the video adapter. Moving all the positions to UP will not work for applications in which:
  - there is no monitor on **MONITOR 1**;
  - the primary monitor is connected to **MONITOR 1** with a video extension cable that doesn't carry the ID-bit leads;
  - the primary monitor uses higher-grade video than one or more of the remote monitors (for example, color vs. monochrome, or high-resolution vs. low-resolution).

In these situations, set the **MONITOR TYPE** switch this way:

DIP Switch Positions	Monitor Type	
1	2	3
DOWN	UP	DOWN
DOWN	UP	UP
UP	UP	DOWN
DOWN	DOWN	DOWN
UP	DOWN	UP
		Apple 12" (512 x 384)
		Apple 13" & 14" (640 x 480)
		Two-page monochrome
		Apple 21" (1152 x 870)
		Apple 15" portrait

#### NOTE

If your monitors don't belong to any of these five types, you must set all four **MONITOR TYPE** switch positions UP and connect a representative monitor to **MONITOR 1** with cable that carries the monitor's ID-bit leads. If you don't have such a cable, call Black Box for a quote on a cable that carries all ID-bit leads.

8. Turn on the computer and the monitors. The monitors should now display the computer's output.

This completes the Video Splitter for Mac installation. Once installed, the Splitter shouldn't require any adjustments; you can keep it out of sight. It should now be ready for continuous operation.

### 3.3 Connecting RGB, RGBS, and Other Types of Output Devices

To connect an RGB (sync-on-green or sync-on-RGB) monitor, video projector, LCD panel, etc., to the Video Splitter for Mac, you can use our 6-ft. (1.8-m) EVMA13 cable; it has a DB15 male connector on one end and 3 BNC male connectors on the other. To connect an RGBS device to the Splitter, you can use our 6-ft. (1.8-m) EYRGBSS-0006 cable; it has a DB15 male connector on one end and 4 BNC male connectors on the other.

To connect equipment that uses other types of connectors or other kinds of synchronization (RGBHV, loaded sync, etc.), call Black Box for technical support.

### 3.4 Extending Your Distance

The maximum distance to which a Video Splitter for Mac can drive signals to a monitor depends primarily on the quality of the cable being used and the pixel resolution and refresh rate of the video image coming from the computer. *Never* use twisted-pair cable as video-extension cable, because this will cause "ghosting" of the on-screen images. Table 3-1 below is a guide for maximum distance at various resolutions with high-quality video-extension cable.

**Table 3-1. Maximum Distances**

Pixel Resolution and Refresh Rate	Max. Cable Length in Feet (Meters)
512 x 384 at 60 Hz	250 (76.2)
640 x 480 (VGA) at 60 Hz	250 (76.2)
640 x 480 (Mac) at 66 Hz	250 (76.2)
640 x 480 (VGA) at 75 Hz	175 (53.3)
800 x 600 (VGA) at 60 Hz	200 (61)
800 x 600 (VGA) at 75 Hz	150 (45.7)
832 x 624 at 66 Hz	200 (61)
1024 x 768 at 60 Hz	175 (53.3)
1024 x 768 at 75 Hz	125 (38.1)
1152 x 870 at 75 Hz	100 (30.5)
1280 x 1024 (VGA) at 75 Hz	100 (30.5)

To run the cable the full distance, you must not route it near motors, generators, air compressors, or other sources of electromagnetic noise.

We carry DB15-male-to-DB15-female Macintosh video-extension cable in several stock lengths. Our product codes are EVMA16 for 6-ft. (1.8-m) cable and EVMA30, EVMA50, EVMA100, EVMA150, and EVMA250 for 30-ft. (9.1-m), 50-ft. (15.2-m), 100-ft. (30.5-m), 150-ft. (45.7-m), and 250-ft. (76.2-m) cable respectively. If you would like to use video-extension cable in your application, call Black Box for technical support.

#### **CAUTION!**

As with any long-distance cabling, only plug video-extension cable into devices, or unplug it from them, while the devices are OFF and are disconnected from AC power. Using long runs of cable to attach powered devices, or even unpowered devices that are connected to separate grounds, could expose you and your equipment to potentially hazardous differences in ground potential.

### 3.5 Cascading

If you need to display your computer's video output on more monitors, screens, etc., than a single Video Splitter for Mac can handle, you can always "cascade" Splitters: You can connect secondary Splitters to the **MONITOR** ports on the primary Splitter with short DB15-male-to-DB15-male cables. (If you need any of these cables, call Black Box.) Then you can plug as many as a hundred display devices into the **MONITOR** ports on the secondary Splitters.

If you'll be cascading Splitters, we have several suggestions for maintaining image quality and reducing the complexity of your system:

- Begin connecting secondary Splitters to the highest-numbered port on the primary Splitter and work backwards from there. For example, attach the first secondary Splitter to **MONITOR 8**, the second to **MONITOR 7**, etc.
- Avoid connecting secondary Splitters to primary Splitters with fewer ports. For example, rather than attaching a ten-port secondary to a four-port primary, use the ten-port unit as the primary and retire the four-port until you need to use it as a secondary.
- In general, use as few Splitters and as short runs of cable as possible to reach all of your monitors.
- You can cascade to more than two "layers" of Video Splitters for Mac; that is, you can begin plugging tertiary Splitters into the **MONITOR** ports of secondary Splitters when you run out of **MONITOR** ports on the primary Splitter. However, the more Splitters that come between your computer and your monitors, the more signal degradation you will get. Try not to go to a third layer of Splitters unless you absolutely have to—if you have to send video output to more than a hundred monitors, for example.

## 4. Operation

The Video Splitters for Mac provide a reliable means of getting your Macintosh video images to widespread arrays of monitors: They use equalized amplification to compensate for the normal signal losses that occur when you run cable to Mac monitors at longer distances. With this technique, the signals that reach the monitors closely match the signal that left the video adapter, and you get the truest representation of your video images in terms of detail and color fidelity.

*Each monitor output is independently buffered.* This ensures isolation and proper signal levels regardless of the number of monitors used.

The Splitter's external transformer will feel warm after the unit has been on for a period of time. This is normal, because the unit draws a significant amount of current.

If, during operation, you find that you need to send your images to more monitors than a single Splitter can support, you can "cascade" Splitters (use two or more in combination). See [Section 3.5](#).

## 5. Applications

Video Splitters for Mac are used where a number of monitors need to be connected to one computer. Typical applications would include classrooms, business meetings, and trade shows.

In a conference room or demonstration room, for example, the Video Splitter for Mac can feed images to the monitor of the source Macintosh plus other monitors located around the room or on the demonstration table. This eliminates the need for people to crowd around the Mac for a look at the **display**.

In a classroom, instructional material on your computer can be easily viewed by all the students at their desks.

Also, you can give presentations by creating an “electronic slide show” on your computer and using the Video Splitter for Mac to drive the “slides” to the computer’s own monitor plus a large-screen projection monitor that has either (a) a Macintosh video input, (b) a VGA video input (will require a video converter or adapter—call Black Box for technical support), or (c) a TV/VCR-style video input (will require a video converter—call Black Box for technical support).

## 6. Troubleshooting

### 6.1 Common Concerns

If the display colors on all the monitors seem to be “reversed,” this might be caused by improperly setting the **MONITOR TYPE DIP** switch on the front panel. Recheck the switch setting (see **Section 3.2**, step 7).

If one or two colors are missing on one of the attached monitors, make sure all connections to the Video Splitter for Mac are secure. Make sure the **monitor connector’s jackscrews are tightened**.

If problems persist, call for technical support.

### 6.2 Calling Black Box

If you determine that your Video Splitter for Mac is malfunctioning, *do not attempt to alter or repair the unit*. It contains no user-serviceable parts. Contact Black Box: The problem may be solvable over the phone.

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.

### 6.3 Shipping and Packaging

If you need to transport or ship your Video Splitter for Mac:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the Splitter for repair, include its power supply. If you are returning the Splitter, make sure you include everything you received with the unit. Before you ship, contact Black Box to get a Return Materials Authorization (RMA) number.