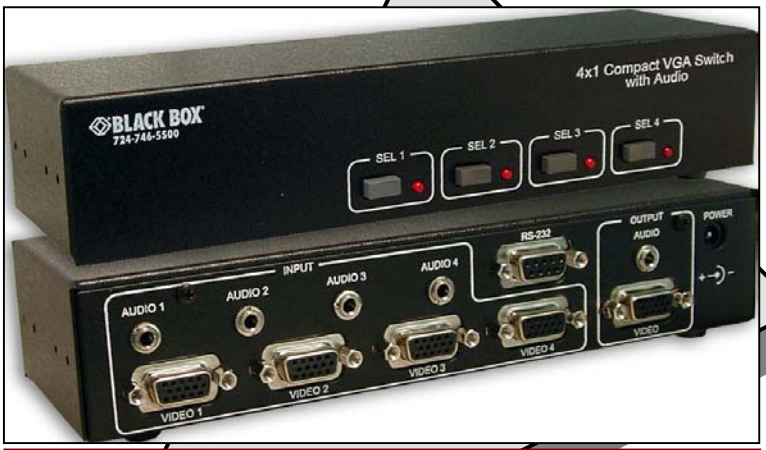
BLACK BOX
NETWORK SERVICES

AC506A-4A

4x1 Compact VGA Switch w/Audio



- **Switches Between 4 PC Video and Audio Signals**
- **Manual or Auto Switching Based on Active Video**
- **RS-232 Serial Control**

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** • E-mail: **info@blackbox.com**

UMA1124
Rev B

Trademarks Used in this Manual

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FCC and Canadian Dept 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 their 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 connectado 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 lineas de energia.
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 objectos liquidos 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: Objectos 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. Introduction

1.1 General

Thank you for purchasing Black Box AC506A-4A 4x1 Compact VGA Switch with Audio & Serial Control.

This unit provides a video along with audio output that can be switched between four video and audio sources. The unit is housed in a small RFI shielded enclosure and is supplied with a universal AC power adapter.

The AC506A-4A unit provides all the A/V and control connections on the rear panel; the front panel has push-button switches with corresponding LED indicators for the selection of the video source. This unit can be controlled either manually using the front panel switches, automatically based on video detection, or remotely through an RS232 serial port.

The unit can be configured to operate in three different modes, which are: Auto, Scan and Normal. There is a priority selection that can be used to set for the video inputs. The switched output can be blanked and un-blanked from the PC command sent through the serial port. The front-panel buttons can be 'locked' to prevent accidental changes to the settings from a PC command sent through the serial port.

The unit also has EEPROM (internal non-volatile flash memory) to restore the last operating mode from when the unit is powered off.

1.2 Features

- ✓ Allows four video & stereo audio input sources to be switched to one output
- ✓ Can be manually controlled by push-button, via RS232 communication port or by detecting active video input
- ✓ Auto mode automatically scans and selects the input with active video with selectable input priorities
- ✓ Front panel buttons can be 'Locked' out
- ✓ Switched output can be blanked and un-blanked
- ✓ Stores the last selection and mode in EEPROM
- ✓ In scanning mode inputs are shown for pre-determined periods
- ✓ Ships with universal (100~240 VAC) power supply
- ✓ Compact, Rugged, Reliable, and Economical

2. Installation

2.1 Required Cables

The video input cables are generally HD15 (VGA) male to male (customer furnished). The Audio inputs are 3.5 mm mini-stereo plugs (customer furnished). If you are going to connect the unit to a Serial port (such as PC's COM) you would need a straight-through Male/Female DB9 Serial Cable (customer furnished).

2.2 Inputs & Outputs

The AC506A-4A has 4 video and audio inputs marked Video 1 through 4 and Audio 1 through 4. The unit has 1 video and audio output marked Video and Audio Output. The unit has 1 serial port connector labeled RS232.

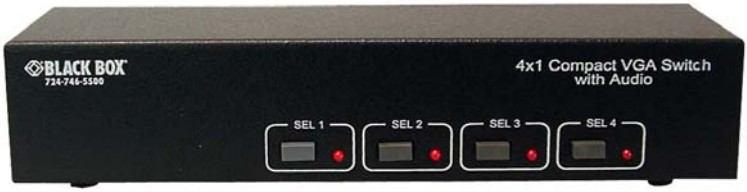
2.3 Connecting the AC506A-4A

Connect your video and audio sources such as computer or notebook PC to any of the Video and Audio Inputs 1 through 4.

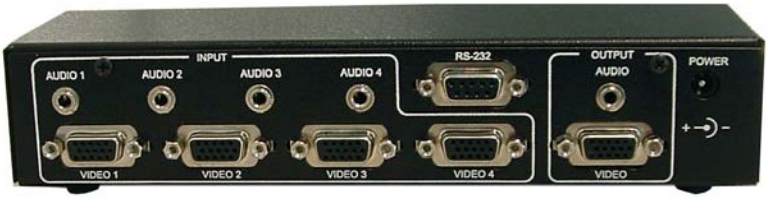
Connect the display device such as a monitor (or a video projector) to the switched video and audio outputs (Video and Audio Output).

Connect the included power supply to the AC506A-4A.

Select the desired video source or mode of operation for your video and audio output using the front panel switched buttons. If preferred, the selection can also be done through RS-232 serial commands by connecting a DB9 RS-232 Serial cable to your PC and the AC506A-4A.

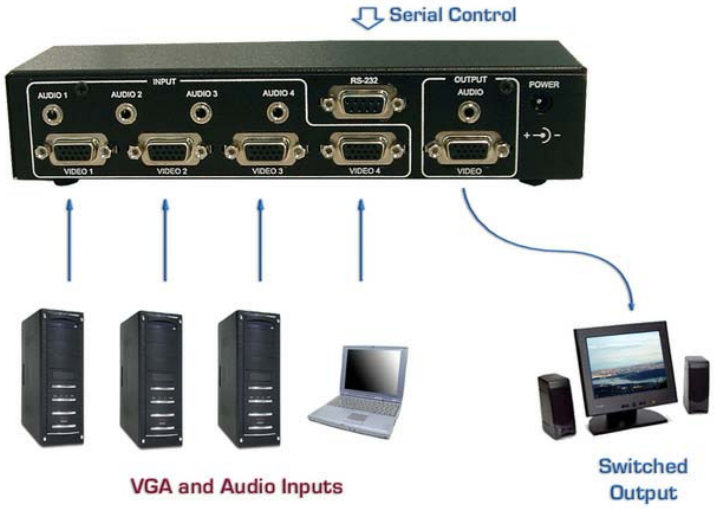


AC506A-4A Front Panel



AC506A-4A Rear Panel

2.4 Connection Diagram



3. Configuration & Operation

3.1 Modes of Operation

Auto Mode - This will select the VGA and Audio input with the highest priority that has an active VGA signal.

Scan Mode - Will select each active VGA and Audio input signal for a specified number of seconds, 1-60, and then switch to the next active VGA input. The AC506A-4A can also be configured to scan the non-active VGA inputs as well as the active VGA inputs.

Normal Mode - VGA inputs are selected based on front panel push-button selections.

The AC506A can only be in one of these modes at a time. You can specify mode of operation either from the Serial port or from the front panel (by pressing switch combinations simultaneously).

Pressing SEL 1 & SEL 2 simultaneously selects “AUTO” mode.

Pressing SEL 3 & SEL 4 simultaneously selects “SCAN” mode.

The AC506A-4A retains the last mode that it was in after power off and upon power up, will enter the last mode that it was in.

3.2 Front-Panel Switches

The front panel switches may be locked out so pressing them has no effect. Locking and unlocking the front panel switches can only be accomplished via the serial RS-232 commands.

The first function of the front panel buttons is to switch from one VGA & Audio signal to another. Just press the button and the VGA signal you selected will be displayed when the front panel is not locked. If there is no VGA signal to be displayed then you will see a black screen. The AC506A-4A will enter the Normal Mode any time a single front panel button is pressed and the front panel is not locked.

The second use of the front panel buttons is to put the AC506A-4A into Auto Mode. Press buttons 1 and 2 simultaneously and the AC506A-4A will enter the Auto Mode when the front panel is not locked.

The third use of the front panel buttons is to put the AC506A-4A into Scan Mode. Press buttons 3 and 4 simultaneously and the AC506A-4A will enter the Scan Mode when the front panel is not locked.

The time interval between switching will be the time interval last specified via the serial port. If no interval has been specified via the RS232 port then the default is 5 seconds.

Whether or not to scan non-active VGA inputs along with active VGA inputs will be determined from the last user input via serial port as well. If there has been no user input, the default is to not scan the non-active VGA inputs.

3.3 RS-232 Control

The AC506A-4A can also be controlled via a serial device. The unit operates at a baud rate of 4800 bps. From the serial port, you have full control over the operation of the switched output; mode, priorities, scan time and front-panel lock status.

Note on RS-232 port availability on your PC

Most PCs and notebooks do not have a serial port. So to program the Switch you may need a USB to RS-232 Serial converter. Please contact your Black Box sales representative if you need to buy one.

The AC506A-4A will output a menu to a serial port on power-up. This menu will also be displayed when a “List” command is sent to it via a serial port. To view the menu, An ASCII serial terminal or terminal emulator software is needed. An example is Microsoft Windows® HyperTerminal (generally found in Accessories\Communication folder)

. To configure HyperTerminal

- Connect direct to any available COM port
- 4800 Baud, 8 bits, No Parity, 1 Stop bit, No flow control

After power-up the unit will output the following menu in ASCII through its serial port:

```
        Ver1.0
        ------
1 = #1 In
2 = #2 In
3 = #3 In
4 = #4 In
a = Auto mode
s = Scan
b = Blank
u = Un-Blank
p = Priorities
r = Reset
l = Lock/Unlock
```

3.4 Serial Port Control Codes

(1 byte commands from external control device)

ASCII 1 (or Hex 31)

Selects Video input #1

ASCII 2 (or Hex 32)

Selects Video input #2

ASCII 3 (or Hex 33)

Selects Video input #3

ASCII 4 (or Hex 34)

Selects Video input #4

ASCII a (or Hex 61)

Enters 'Auto' mode.

In Auto mode, the device automatically switches to the video & audio input source that is active. "Active" means that video signal has sync signal, it does not mean there is a non-static screen!

ASCII s (or Hex 73)

Enters 'Scan' Mode.

The user is first prompted to enter the switching time delay from 1-60 seconds.

"Seconds between switching? (1-60)"

The users are then prompted to select whether 'non-active' video input channels should be scanned or not.

"Scan non-active? (Y/n)"

ASCII b (or Hex 62)

Blanks the output. When the output is blanked, only the color intensities of the output are reduced to zero (resulting in a black screen), the unit still operates in normal fashion and sync signals are still routed to the output. Audio output is muted.

ASCII u (or Hex 75)

Un-blanks the output.

ASCII p (or Hex 70)

Selects video input priorities.
The device will ask for the priorities for each of the four inputs via a prompt the user must respond to.

"In X is [Y] (1-4)?" Where 'X' is the Video input and 'Y' is its current priority.

Entering '0' for a video input priority will keep the existing priority.
Priority can range from 1 to 4, 1 being the highest and 4 being the lowest.

For example, if Video #1 priority is set at 1, the unit will select input #1 automatically whenever the presence of the video at Video 1 input is detected even if the input from the Video 2 input is currently playing. If no video is detected for a specific video input, the next video input is selected based on the priority setting in order.

ASCII r (or Hex 72)

Reset the unit back to factory defaults.
Priorities are set to 1,2,3,4
Scan time is set to 5 seconds
Front panel is unlocked

ASCII l (or Hex 6c)

Toggles the Front Panel key lock setting.

4. Troubleshooting

4.1 In Case of Trouble

There are no field serviceable parts or circuits in the device. If you think that the device is malfunctioning, please first make sure that all your connections are solid, and check the state of the LED's on the front of the unit to access the mode it is in.

If you still cannot overcome the problem, disconnect the video and audio input connections from the unit. Unplug the power from the unit and after a few seconds reconnect power. Connect your audio and video signals after the unit is powered up. Check performance.

4.2 Calling Black Box

If you determine that your unit 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 AC506A-4A:

- 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

Video Inputs	VGA, RGBHV, RGBS, RGsB, or Component Video (YPbPr – would require HD15 to 3 RCA adapter)
Resolutions Supported	PC from VGA to UXGA (640x480 to 1600x1200) HD from 480p to 1080p
Audio Inputs	PC or Consumer audio (standard line-level)
Video Level	0 to 0.7V p-p on RGB, 0 to 5 V for H and V Sync
Bandwidth	200 MHz
Max Altitude	10,000 ft (3048 meters)
Temperature	Operating: 32 to 122°F (0 to 50°C); Storage: –40 to +185°F (–40 to +85°C)
Humidity	Up to 95% non-condensing
Enclosure	Steel
MTBF	90,000 hours (calculated estimate)
Power	6V center positive via supplied Universal power supply (100~240VAC).
Size	1.7”(43mm) H x 8.42"(213mm) W x 2.75”(70mm) D
Weight	2.0 pounds (800 grams) Shipping

1000 Park Drive Lawrence, PA 15055-1018 724-746-5500 Fax 724-746-0746