



BLACK BOX[®]
NETWORK SERVICES



January 2006
AC136A

TV-to-VGA / HDTV Video Scaler Pro

Component, S-Video, Composite, and PC Inputs

IR Remote, RS-232 Serial Control & Time-base Correction



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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.

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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 AC136A is a high-end video scaler that up-converts composite, S-video, or Component (YCbCr) inputs to high resolution PC or HDTV output. It also provides an input from a PC.

The VGA output resolution can be selected to be VGA, SVGA, XGA, or SXGA.

It can also be set to output HDTV resolutions of 480P, 576P, 720P and 1080i. The output signal under HDTV mode is YPbPr (a 15-pin HD to 3 RCA adaptor cable is included).

The AC136A can be controlled via the front panel through OSD menus, by using the included remote control, or via RS-232 Serial interface. The controls include input selection, choice of output resolution, picture adjust (tint, color, brightness, contrast, sharpness), aspect ratio (16/9 or 4/3), digital noise reduction, 3D comb filter ON/Off and many other advanced features.

The AC136A is ideal for use with LCD projectors, CRT/LCD monitors, and plasma or HDTV displays with improved picture quality.

The Unit is shipped with all required cables and adapters and also includes an IR remote.

1.2 Features

- Professional-quality Video Scaler/Deinterlacer
- Can provide VGA, SVGA, XGA, SXGA(1280x1024) outputs
- Can also provide HDTV outputs of 480p, 576p, 720p, 1080i,
- State-of-the-art frame buffer (time-base correction)
- Reverse 3:2/2:2 pull down provides clear and crisp de-interlacing of video originating from 24 film, such as DVD movies.
- Digital noise reduction
- Brightness, Color, Contrast, Sharpness and Tint adjustment
- Dynamic format 4:3 or 16:9 output

- 3-D comb filter for composite input ensures jitter-free picture
- Compatible with NISTC and PAL video input
- Easy to use IR remote control
- RS-232 interface allows control from an external device.
- OSD display

2. Installation

2.1 Connecting the Video inputs:

The video scaler can accept a composite video, an S-Video or a YCbCr input signal for scaling, as well as a computer signal input that is passed through the unit when the PC in (Bypass) is selected or the unit is tuned off (Please see figure 2.1).

Rear Panel

Composite Video: Use a Composite video cable to connect the composite video output of the source equipment to the connector labeled “C-Video” on the back of the Video Scaler.

S-Video: Use an S-Video cable to connect the S-Video output of the source video equipment to the connector labeled “S-Video”. S-Video provides improved performance over Composite Video and is recommended whenever available.

YCbCr input: Use a 3 RCA-to-3 BNC YCbCr cable to connect the YCbCr output of the source video equipment to the connectors labeled “YcbCr”. Note the plug’s colors must match with the color of the RCA Jacks. YCbCr component provides the best picture quality among all three inputs, and should be used whenever possible.

Computer RGB with H&V Sync: Connect the source computer's VGA output signal to the HD 15 connector labeled “PC In” on the Video Scaler. *Note:* This Computer inputs signal is not scaled, but is available for pass-through when the Video Scaler is in the PC In (Bypass) mode or if unit is turned off.

2.2 Connecting the Scaled Output:

The output can be connected to any VGA compatible LCD, Projector, or Plasma display. It can also output HDTV compatible YPbPr in various formats as described below.

The same HD-15 connector is used to output VGA (RGBHV) output or HDTV/YPbPr output. When VGA (RGBHV) output is selected, use an HD-15 to HD-15 VGA cable to connect the output to the PC input of your display monitor. When HDTV/YPbPr output (480p, 576p, 720p, 1080i) is selected, use a HD-15 to YPbPr 3 x RCA cable to connect the output to the YPbPr input of your HDTV display. Both cables are provided.

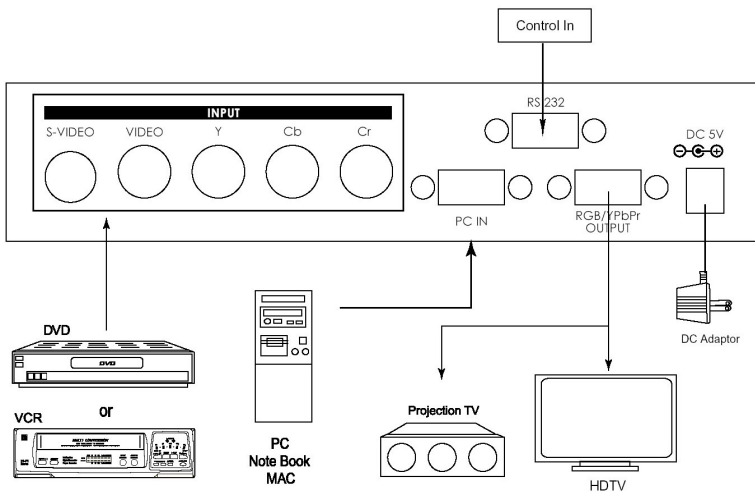


Figure 2.1

2.2 Other Connections:

RS232: This 9-pin D-sub connector is for connecting to your PC or other serial control device for remote control of the AC136A.

DC power jack: 5V 2A DC power input (center positive 2.1 mm jack).
From provided Universal Power supply

NOTE: The range of power input is 5 to 9VDC at 1A nominal operating current

3. Configuration & Operation

3.1 Front Panel

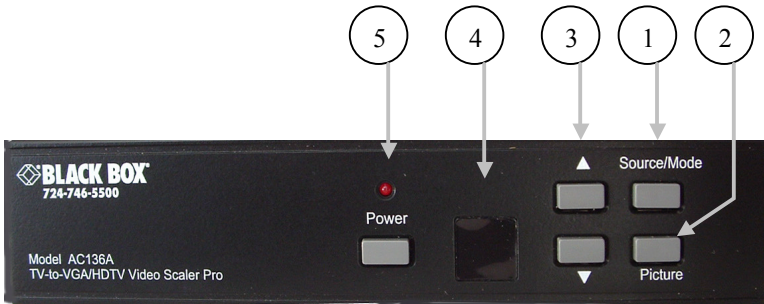


Figure 3.1

1. Source / Mode: Press the button repeatedly will toggle through the following adjustment controls:

Source > Resolution > Output > Aspect > 3D Enhance > Digital NR

Source: While under this mode, press ? or ? buttons to choose your desired input source from Composite Video, S-Video, or Component Video inputs. *Note:* To select the PC input from the front panel turn the unit off. The AC136A has a Power off bypass from the PC input to the VGA output. However, if you don't want to turn the unit off to get the PC pass-thru, you can select the PC input (with the unit on) from the IR remote or the Serial Input (please see following sections).

Resolution mode: If output is set to RGB (PC-type), press ? or ? buttons to choose from 640 x 480(VGA), 800 x 600 (SVGA), 1024 x 768(XGA), or 1280 x 1024(SXGA) PC output. If output is set to YPbPr press ? or ? to choose from 480p, 576p, 720P or 1080i HDTV output.

Output mode: Press ? or ? to select between PC RGB output or HDTV YPbPr output.

Aspect mode: Press ? or ? to choose between standard (4:3) aspect and wide (16:9) aspect ratio.

3D Enhance mode: To turn on or off the 3D comb filter function.

When VCR or non-standard video source is connected to the input the output picture may be jittering. If this occurs, please turn off the 3D Enhance function.

Digital NR mode: To turn on or turn off the digital noise reduction function.

2. Picture: Press the button to toggle through picture adjust parameters as follows:

Contrast > Brightness > Color > Tint > Sharpness

Contrast: Press ? or ? to adjust contrast level. The range of adjustment is 0~48. Factory default value is 40.

Brightness: Press ? or ? to adjust Brightness level. The range of adjustment is 0~48. Factory default value is 24.

Color: Press ? or ? to adjust color level. The range of adjustment is 0~48. Factory default value is 24.

Tint: Press ? or ? to adjust NTSC Tint level. The range of adjustment is 0~48. Factory defaults value is 24.

Sharpness: Press ? or ? to adjust sharpness level. The range of adjustment is 0~48. Factory defaults at 10.

3. ? or ? : Press to toggle through various adjustment controls to alter settings

Note

Under picture adjust mode, pressing ? and ? simultaneously will revert the selected parameter back to factory preset value. Pressing both buttons for over 5 seconds will revert all picture parameters back to their factory preset values.

4. IR Sensor: Infrared remote control sensor.

5. Power and LED button: Press once to power on the unit, press again to turn off. *Note:* with power off the PC input is passed to the output.

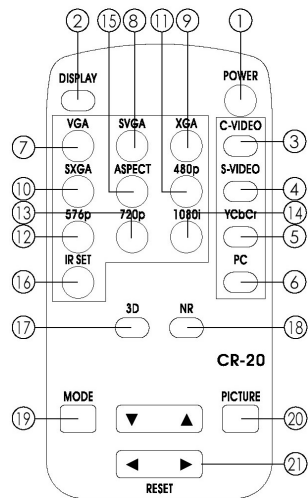
Front Panel Lockout - Under certain circumstances it may be desirable to disable the front panel controls (e.g. to prevent unauthorized or accidental changes to the settings while the unit is in use). To disable the front panel controls you must use the RS-232 port (see Serial Control section for details)

It is still possible to lift this lockout from the front panel by performing a full factory default reset operation !

To reset all parameters back to factory preset value, press the “Source/Mode” and “Picture” buttons simultaneously for over 10 seconds.

3.2 Infra-Red Remote control (IR Remote)

1. Power: Power ON/OFF.
2. Display: To enable or disable the on screen display of the resolution information.
3. C-Video: Select composite video as input.
4. S-Video: Select S-Video as input source.
5. YCbCr: Select YCbCr as input source.
6. PC: Select PC input loop-thru to the output.
7. VGA: Select 640 x 480 output resolution.
8. SVGA: Select 800 x 600 output resolution.
9. XGA: Select 1024 x 768 output resolution.
10. SXGA: Select 1280 x 1024 output resolution.
11. 480p: Select 852 x 480p output resolution.
12. 576p: Select 852 x 576p output resolution.
13. 720p: Select 1280 x 720p output resolution.
14. 1080i: Select 1920 x 1080i output resolution.
15. Aspect ratio: Switch between standard (4:3) and wide (16:9) aspect ratio.
16. IR-Set: When front panel is locked out by RS-232, Press this button for over 15 seconds will lift the lock out.
17. 3D: Press to turn ON/OFF the 3D enhance.



18. NR: Press to turn ON/OFF digital noise reduction.
19. Mode: Same as "mode" button on front panel.
20. Picture: Same as picture button on front panel.
21. Reset: Press this button will revert picture adjust back to factory preset.

4. Serial Control

The video input selection and signal parameter settings for the AC136A can be controlled via an external control system by using the RS-232 port on the unit. A Windows® control software is available upon request that permits control of the unit from a PC via RS-232.

Use a M/F DB9 serial cable to connect the unit to the PC. Only the TX, RX and GND pins are implemented in the connector. Set port operates at 9600 baud, no parity and 1 stop bit. Control codes are 3 bytes long. In the table shown below, the 1st 2 characters are ASCII and the 3rd argument is binary.

Code	Comment
'PW' + 0 'PW' + 1	POWER power off (standby) power on (normal)
'IN' + 0 'IN' + 1 'IN' + 2 'IN' + 3	INPUT Composite video S-Video YCbCr PC Bypass
'OU' + 0 'OU' + 1 'OU' + 2 'OU' + 3 'OU' + 4 'OU' + 5 'OU' + 6 'OU' + 7	OUTPUT VGA 480p SVGA XGA SXGA 576p 720p 1080i
'OS' + 0 'OS' + 1	OSD osd OFF osd ON
'DI' + 0 'DI' + 1	DISPLAY display OFF display ON
'BR' + value 'CO' + value 'SA' + value 'SH' + value 'TI' + value 'RE' + 0	Brightness value= 0~48 Contrast value= 0~48 Saturation value= 0~48 Sharpness value= 0~48 Tint value= 0~48 reset video adjustment reset
'IR' + 0 'IR' + 1	IR IR sensor OFF IR sensor ON
'FP' + 0 'FP' + 1	PANEL front panel lockout ON front panel lockout OFF
'TD' + 0 'TD' + 1	Three D 3 D enhance OFF 3 D enhance ON
'NR' + 0 'NR' + 1	NR Digital NR OFF Digital NR ON
'AS' + 0 'AS' + 1	ASPEC aspect 16:9 aspect 4:3
'AL' + 0	retrive video scaler all status 'PW'+? 'IN'+? 'OS'+? 'OU'+? 'DI'+? 'IR'+? 'FP'+? 'BR'+? 'CO'+? 'SA'+? 'SH'+? 'TI'+? 'TD'+? 'NR'+? 'AS'+?

5. Troubleshooting

3.1 Resetting the AC136A to factory defaults

There are no field serviceable parts or circuits in the device. If you think that the device is malfunctioning, please first try to reset to factory default settings:

To reset all parameters back to factory preset value, press the “Source/Mode” and “Picture” buttons simultaneously for over 10 seconds.

3.2 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.

3.3 Shipping and Packaging

If you need to transport or ship your AC136A:

- 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.

4. Specifications

Computer input		RGB with HV Sync					
Max computer input resolution		1600 x 1200					
Computer input connector type		HD 15 Female					
Computer input signal level		RGB @ 0.7V Analog, H&V Sync TTL					
Video inputs		Composite Video @ 1 Vp-p 75 ohm S-Video @ 1 Vp-p 75 ohm YCbCr Y : 1 Vpp 75 ohm CbCr : 0.7 Vp-p 75 ohm					
Video standard		NTSC 3.58, PAL B/D/G/I					
Video input connectors		Composite video on BNC S-Video on 4-pin Mini-DIN Component on BNC					
Scaled output resolutions		PC Resolution		Format	Scan		
		VGA	640 x 480	RGBHV	Progressive		
		HDTV Resolution		Format	Scan		
		16:9	1280 x 720p (720p)	YPbPr	Progressive		
		16:9		YPbPr	Interlaced		
		852 x 480p(480p)		YPbPr	Progressive		
		852 x 576p(576p)		YPbPr	Progressive		
Scaled output vertical refresh rates & Horizontal scan rates		Output resolution		Vert. (Hz)			
				Hori. (Hz)			
		VGA		59.94		31.469	
		SVGA		60.320		37.880	
		XGA		60.000		48.360	
		SXGA		60.020		63.981	
		480p		59.940		31.469	
		576p		50		31.25	
720P		59.94		44.995			
1080i		59.94		33.716			
Manual control		Front panel buttons					
RS-232 control		Via rear panel DB9F connector					
IR remote control		Yes					
Video adjustments		Brightness, Contrast, Color Saturation, Tint (NTSC), Sharpness					
Weight		3 lbs					
Dimensions		8 inch(D)x 6 inch (W) x 1.83 inch (H)					
Power source		100~240VAC to DC 5V/2A Desktop switching adaptor					



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