



BLACK BOX[®]
NETWORK SERVICES



March 2005
AC1034A

Video Test Pattern Generator DVI - VGA - Y Pb Pr

AC1034A



**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

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**FEDERAL COMMUNICATIONS COMMISSION
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 de 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 bloquear 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 debe 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 equipo 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 AC1034A is a video test pattern generator for high-resolution display devices.

The unit provides DVI, PC (VGA through SXGA), and HDTV Component Video (Y,Pb,Pr) outputs. The AC1034A features 28 static and dynamic video test patterns specially designed for testing, calibrating, and troubleshooting high end video gear & installations.

In addition to all of standard PC resolutions and refresh rates (up to SXGA at 85 Hz), it is capable of providing HDTV outputs from 480p to 1080i both in DVI digital and in YPbPr formats. The OSD indicates output resolution and refresh rate settings. Among the available 28 test patterns are: color bar, multi-bust, circle, and crosshatch.

The AC1034A comes in a sturdy metal case and it includes DVI, VGA, and VGA-to-Component cables to handle most high-end testing and installation requirements. The AC1034A is ideal to use with LCD, plasma, CRT monitors, and projectors that are equipped with PC, Component, or DVI inputs.

1.2 Features

- 3 devices in one. VGA, Component, and DVI video test pattern Generator
- Programmable PC output resolutions from 640x480 to 1280x1024 (VGA/SVGA/XGA/SXGA)
- Programmable HDTV output resolutions from 480p to 1080i (480i 576i 480p 567p 720p 1080i)
- 28 typical and custom video test patterns (both static and dynamic)
- Easy-to-use push-button OSD menu control
- Includes all cables required
- Packaged in highly portable EMI shielded enclosure

2. Installation

1. Plug the supplied AC adapter to the Power input connector located on the rear of the unit. Use the supplied adapter or a 100% equivalent only. There's a small green LED that turns on when the unit is powered up.

NOTE

The Video Pattern Generator requires 5 volts regulated DC Center positive input power, using any other voltage or reverse polarity will damage the unit and void the warranty.



Figure 1 – Rear Panel & Power Connection

2. Included in the package are all the cables that you may need: a DVI cable, a VGA cable, and a HD15 to component Cable (shown below)

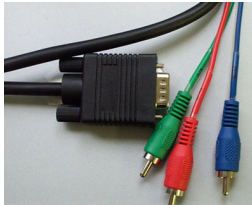


Figure 2 – HD15 to Component Cable

Choose and use the cable required for your application .

3. Operation

- The front panel of the unit is pictured below:



Figure 3 - Front panel

- There are two output connectors on the box that are both active simultaneously. One VGA (HD15) and one DVI.
- The VGA output is dual purpose. It can output standard RGBHV VESA signals similar to those that are output by most PC's, as well as YPbPr component video output. The output mode of the HD15 connector is determined by a small slide switch.
- There's an indicator LED next to the slide switch that comes on when the output resolution is one of the standard HDTV resolutions AND the slide switch is in YPbPr mode.
- To operate the unit you use 3 push-button switches. One button is used to walk through all the resolutions and refresh rates that are available (it is labeled OUTPUT MODE). The other 2 buttons are used to change the video pattern being generated - there are 28 patterns (these buttons are labeled + and -).
- For quick jump to a known resolution (instead of walking through them one by one using the MODE switch), pressing two buttons simultaneously jumps to a given resolution/refresh rate. Pressing the left two buttons gets you to XGA at 60 Hz (and subsequent pressing of the MODE button will take you up from there). Pressing the right two buttons gets you to 480p (a standard HDTV mode). Please note that in these HDTV modes, the DVI is outputting the proper signal and if the slide switch is in VGA you are getting RGBHV output and if in YPbPr you get component video (with sync on Y) and the LED will light to indicate that the unit is outputting a proper YPbPr output.

- Here is a list of output resolutions that the Mode button will walk you through (there's an on screen display OSD which indicates the mode setting):

PC Resolutions		
VGA	640 X 480 @ 50/60/72/75/85 Hz	
SVGA	800 X 600 @ 50/56/60/72/75/85 Hz	
XGA	1024 X 768 @ 50/60/70/75/85 Hz	---- (Quick Select)
WXGA	1280 X 768 @ 50/60 Hz	
SXGA	1280 X 1024 @ 50/60 Hz	

HDTV Resolutions		
480P	720 X 480 @ 50/60 Hz	---- (Quick Select)
576P	720 X 576 @ 50/60 Hz	
720P	1280 X 720 @ 50/60 Hz	
1080i	1920 X 1080 @ 50/60 Hz	

- As mentioned earlier the + and – buttons change the video output screen among the different patterns that are provided. Most standard patterns are included such as: Color bars, Color bar and Multi-burst on same screen, Grey-scale, Checkerboard, Circle, Crosshatch, etc. However several unique and interesting pattern are also available. There are 2 dynamic patterns one which changes the screen smoothly from black to full white, and another which is a checkerboard that switches white and black squares about once per second (this pattern may be useful for viewing compression artifacts in a situation where video is going to be compressed for lower bandwidth transmission or processed in some way).



Figure 4 – Some of the test patterns

- There are 2 patterns with Red Green and Blue horizontal bars over white and black background that are great for video distribution testing especially when long cables (both multi-coaxial, or Category5/6) are used. The high frequency loss in the long cable runs will cause the color of the horizontal bars to smear to the right. Black Box sells high quality video amplifiers and extenders have provisions for compensating for these losses (usually be means of

dip switches or potentiometers as in AC090A). These two patterns are perfect for these types of installations. The user can set the amount of compensation perfectly!

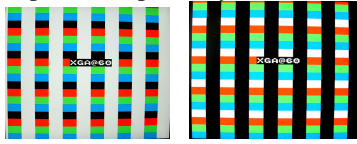


Figure 5 – Video transmission test patterns

The same 2 patterns are also useful for Video-over-UTP Category cable both for the high-frequency loss compensation (above paragraph), but also for Skew Compensation for those devices that give you this flexibility. The right and left edges of the RGB bars should vertically line-up. Again, this pattern gives you a convenient means for making this adjustment.

Operation Summary

- ❑ To change the resolution being produced press the OUTPUT MODE button repeatedly. The output screen has an OSD to indicate the resolution and refresh rate settings
NOTE: It is possible to set the output resolution to one that your monitor does not support. In this case you may not get a screen. You can either keep pressing the OUTPUT MODE button as it eventually goes through all the available outputs in a circular fashion, or use 2-button “QuickSelect” combinations.
- ❑ To change pattern press the + or – keys.
- ❑ To get analog high res. component video output at the HD15 connector (instead of VGA), slide the switch to YPbPr and press the 480p “QuickSelect”. The LED will turn on to indicate that there is a valid component output signal present.
NOTES: If the LED is not on that means you are not getting a proper analog component output! The DVI connector outputs all available resolutions (both PC and HDTV)
- ❑ When you change the output, the AC1034A memorizes your settings after 8 seconds and the next time the unit is tuned on it will recall the memorized settings.

4. Troubleshooting

4.1 FAQ

If your monitor goes blank or says “mode not supported”...

It is possible to set the output resolution to one that your monitor does not support. In this case you may not get a screen. You can either keep pressing the OUTPUT MODE button as it eventually goes through all the available outputs in a circular fashion, or use 2-button “QuickSelect” combination to jump to a specific output immediately

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 Splitter:

- 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

Compliance	CE; FCC Part 15 Subpart B Class A, IC Class
Standards	PC (RGBHV): VGA, SVGA, XGA, SXGA video. HDTV (YPbPr): 480P, 576P, 720P, 1080i DVI: All of the above
Interfaces Supported	Analog Video: VGA, and YPbPr Digital Video: DVI –I Single link
Video Level	0.7 volts peak-to-peak, on RGB, 3 v on H & V 1vp-p on Y signal, 0.7 vp-p on Pb&Pr in YPbPr mode
Connectors	HD15 for VGA and YPbPr 29 pin female DVI connector
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: 5v DC Center-Positive 1.5A, maximum
Size	7" W x 7" D x 1.2" H
Weight	1.3. lb box only; 3 lb shipping

6. Reference Information

DVI Connector pin-out

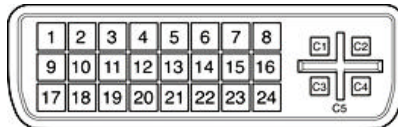


Figure 6 – Face of DVI Female connector

N/U = Not Used on this product

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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1000 Park Drive

Lawrence, PA 15055-1018

724-746-5500

Fax 724-746-0746