

## Welcome to the RGB to DVI(VGA) Converter Family!

Thank you for purchasing an RGB to DVI(VGA) Converter! We appreciate your business, and we think you'll appreciate the many ways that your enhanced RGB Graphic system will save you money, time, and effort.

That's because our ACU315A Converter is all about breaking away from the traditional model of attaching a new display to an old graphic source. You can encounter many potential problems in connecting a flat screen to an RGB graphic source – unless you use our ACU315A Converter products! Attach a flat screen to any graphic source and match the output to your requirements. The ACU315A Converter – the one-stop answer for all your RGB adapting needs! And with a special adaptor cable (not supplied as standard), you can also attach a screen to a CGA or EGA source.

This manual will tell you all about your new ACU315A Converter, including how to install, operate, and troubleshoot it. For an introduction to the Converter, see **Chapter 2**. The Converter product codes covered in this manual are:

**ACU315A**

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## **Disclaimer**

While every precaution has been taken in the preparation of this manual, the manufacturer assumes no responsibility for errors or omissions. Neither does the manufacturer assume any liability for damages resulting from the use of the information contained herein. The manufacturer reserves the right to change the specifications, functions, or circuitry of the product without notice.

The manufacturer cannot accept liability for damage due to misuse of the product or due to any other circumstances outside the manufacturer's control (whether environmental or installation related). The manufacturer shall not be responsible for any loss, damage, or injury arising directly, indirectly, or consequently from the use of this product.

## **Cautions and Notes**

The following symbols are used in this guide:



**CAUTION.** This indicates an important operating instruction that should be followed to avoid any potential damage to hardware or property, loss of data, or personal injury.



**NOTE.** This indicates important information to help you make the best use of this product.

**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.

Shielded PC-equipment cables must be used with this equipment to maintain compliance with radio frequency energy emission regulations and ensure a suitably high level of immunity to electromagnetic disturbances.

*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 is to certify that, when installed and used according to the instructions in this manual, together with the specified cables and the maximum cable length <3m, the Units are shielded against the generation of radio interferences in accordance with the application of Council Directive 89/336/EEC as well as these standards:**

<b>EN 55022:</b>	1999	Class B
<b>EN 55024:</b>	1999	
IEC 61000-4-2:	2001	
IEC 61000-4-3:	2001	
IEC 61000-4-4:	2001	
<b>EN 61000-3-2</b>	2001	
<b>EN 61000-3-3</b>	2002	

The device was tested in a typical configuration with PC.



## 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 pedestals 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.

### Safety Precautions and Installation Guidelines

To ensure reliable and safe long-term operation, please note the following installation guidelines:

- Only use in dry, indoor environments.
- The Converter and any power supplies can get warm. Do not locate them in an enclosed space without any airflow.
- Do not place a power supply directly on top of a unit.
- Do not obstruct a unit's ventilation holes.



To safeguard against personal injury and avoid possible damage to equipment or property, please observe the following:

- Only use power supplies originally supplied with the product or manufacturer-approved replacements. Do not attempt to dismantle or repair any power supply. Do not use a power supply if it appears to be defective or has a damaged case.
- Connect all power supplies to grounded outlets. In each case, ensure that the ground connection is maintained from the outlet socket through to the power supply's AC power input.
- Do not attempt to modify or repair this product

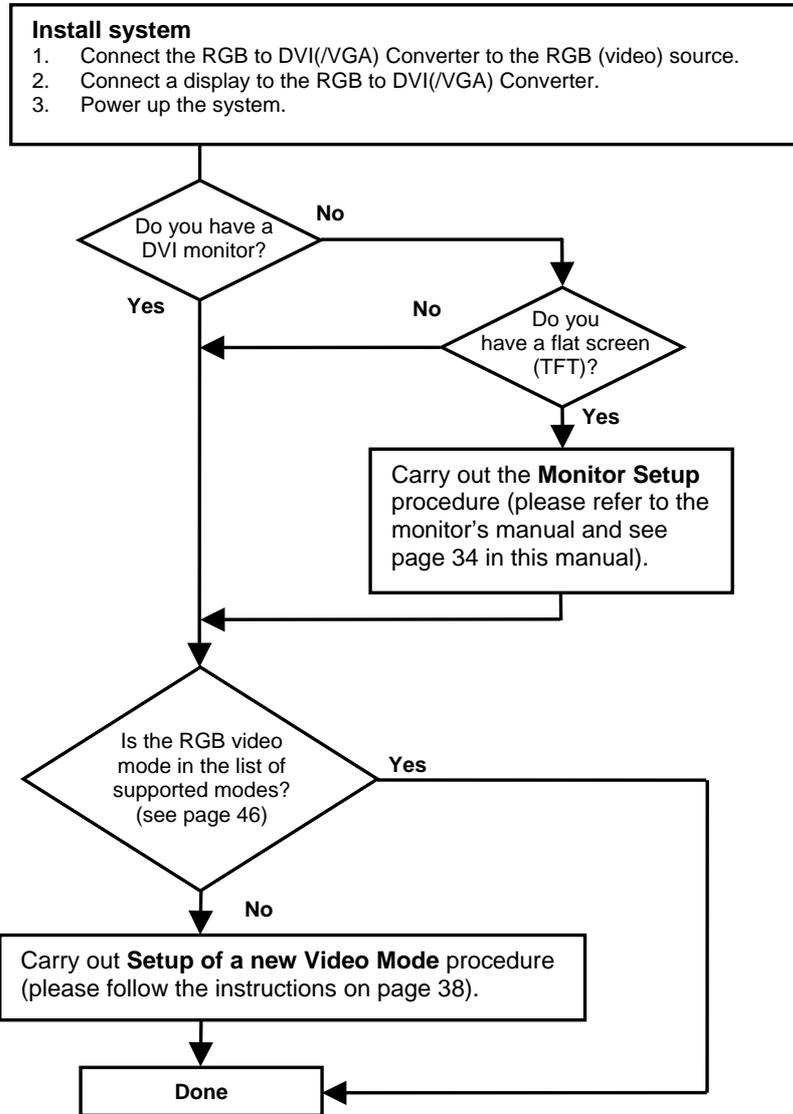
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# 1. Quick Setup

This section briefly describes how to install your RGB to DVI(VGA) Converter and optimize the video signals. Unless you are an experienced user, we recommend that you follow the full procedures described in the rest of this manual. Refer to the command summary on page 12 when following this procedure.



## 1.1 Video Input/Output

If possible, always use a DVI output to a monitor from the ACU315A Converter, especially with flat screens. This provides the optimum video signal. If you use a VGA output from the ACU315A Converter, it must convert the digitized data to analogue values. Similarly, if your TFT screen uses a VGA input, it must digitize the signal from the ACU315A Converter. In these cases, the built-in video processors (in the TFT) must determine the resolution and pixel phase for an optimized digitization. Your ACU315A Converter allows you to optimize the video signal manually or automatically using its on-screen utility (see **Chapter 4**). If you are using a VGA input to a TFT monitor, please follow the manufacturer's instructions.

You may have several possible options for video source output/monitor input. If this is the case, for the optimum video quality, please select the highest ranked available combination from the following table:

<i>Video Quality</i>	<i>RGB to DVI(/VGA) Converter input</i>	<i>RGB to DVI(/VGA) Converter output</i>
1	RGB progressive scan RGSB progressive scan	DVI
2	RGB video (e.g. from SCART) interlaced	DVI
3	RGB progressive scan RGSB progressive scan	VGA
4	RGB video (e.g. from SCART) interlaced	VGA

## 1.2 Command Summary

The following table summarizes the remote control buttons and 'hot' key command sequences used in system configuration and video tuning on the ACU315A Converter.

<i>Infrared Remote Control (IR-RC)</i>	<i>Command</i>	<i>Utility*</i>
	Exit OSD	<X>
	Enter OSD	<O> + <S> + <D> + <Enter>
		
	Accept and store modified parameter	
	Select Submenu	<S>
	Select parameter modification	
	Select next position	<R>
	Increase parameter	
	Select previous position	<L>
	Decrease parameter	
	Direct Brightness Control	
	Direct Contrast Control	
	Reset to factory defaults (press twice!)	
	Back to the Menu selection	

\* Commands are not case-sensitive.

## 2. Overview

### 2.1 Introduction

VGA is the most familiar of the various graphics data standards or protocols for connecting a display (monitor or flat screen) to a graphic source. For many years, computers have generally connected to a display through a VGA interface. However, with the increased popularity of TFT flat screens, a new standard has been developed: DVI. In DVI, graphic data is transmitted digitally; VGA is an analogue standard.

Over the years, other analogue standards have also found popularity: CGA, EGA and also RGB. An RGB Video transmission consists of R (red), G (green) and B (blue) signals at a level of 0.7Vpp. The Green signal also carries the (composite) synchronisation signals.

A screen designed for VGA cannot normally display RGB signals for two reasons:

- A VGA screen requires H/V-Synchronisation as TTL signals
- Many RGB sources generate HSYNC frequencies below of 30kHz – to slow for modern VGA displays.

With TFT screens, there is an additional problem: the incoming video signal has to be digitized. Horizontal and vertical resolutions are normally selected from an internal table with several, common, video modes. Unusual resolutions, often generated by older RGB graphic sources cannot be detected.

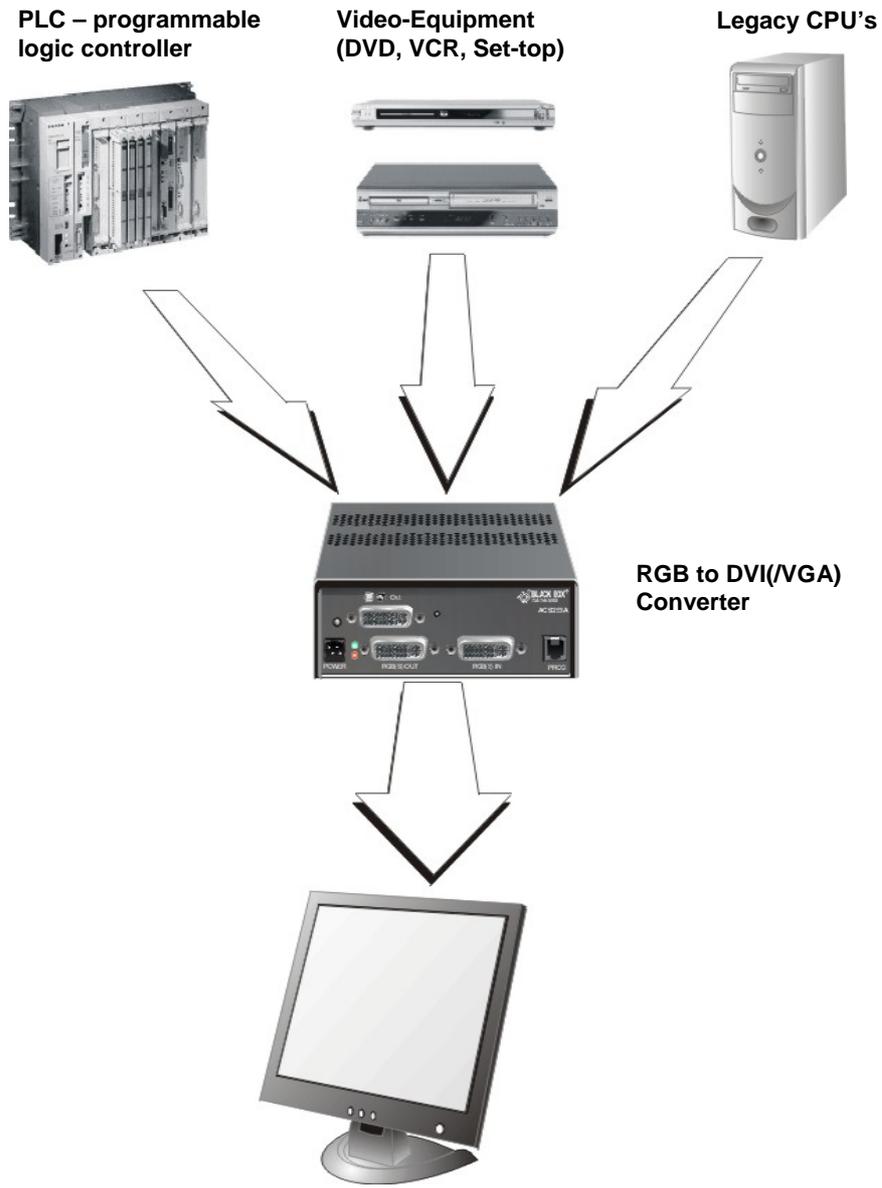
To display RGB data on a modern VGA or DVI display, the ACU315A Converter digitizes the incoming signals, stores them in an internal video memory and displays them from there in a common resolution. The picture can be displayed in original size or format filling. The ACU315A Converter is equipped with various automatic and manual video correction tools in an on screen utility (see page 24).

### 2.2 Glossary

The following terms are used in this guide:

<b>RGB</b>	Video signal consisting of R (red) G (green) and B (blue) signals. The signals have a level of 0.7Vpp. The Green signal also carries the (composite) synchronisation signals.
<b>RGBS</b>	Video signal consisting of R (red) G (green) and B (blue) signals and the additional (composite) SYNC signal. All signals have 0.7Vpp.
<b>CGA/EGA</b>	Legacy graphic standard - all signals are TTL level.
<b>VGA (also called RGBHV)</b>	Video signal consisting of R (red) G (green) and B (blue) signals and the additional horizontal/vertical synchronisation signals. The color signals have a level of 0.7Vpp; the synchronisation TTL (5Volts).
<b>DVI</b>	Digital Video standard established by the Digital Display Working Group ( <a href="http://www.ddwg.org">www.ddwg.org</a> ). R, G, B, CLOCK signals in an up to 1.4 Gbit/sec data stream. The signals have a TMDS level.
<b>PSU</b>	The desktop power supply for the ACU315A Converter.

**THE RGB TO DVI(VGA) CONVERTER**



**Figure 1 ACU315A Converter system**

## 2.3 Features

ACU315A Converter offers the following features:

- Support for RGB and RGBS in progressive scan or interlaced mode.
- Support for EGA/CGA using the optional Adaptor + Cable (ACU315A-EGA).
- Support for CGA using the optional Adaptor Cable (ACU315A-CGA).
- Selectable output for attached display: 640x480, 800x600, 1024x768, 1280x1024.
- Refresh rate selectable for best match to CRT or TFT – 50Hz, 60Hz or 75Hz.
- Picture scaling available:
  - *No scaling* – original picture is centered into a black box.
  - *Format filling* – the picture is stretched to fit the screen.
  - *Proportional stretching* – the picture is stretched linearly in both dimensions with the same factor, until one dimension fits the screen size.
  - *Fixed scaling* – scaled to 1:2 and displayed with (eventually) black borders.
- All control and video tuning carried out using an on screen display (OSD) with settings stored in EEPROM memory.
- A large table of known RGB resolutions (more than 80) preinstalled.
- Private video mode available through OSD.
- RGB to DVI(/VGA) Converter firmware and settings flash-upgradeable.
- Status indicator LEDs on each device.
- Small footprint chassis.
- Rack mount options available.
- Video cables and adaptors included.

### Optional accessories:

- EGA/CGA to DVI Adaptor + Cable:           Type ACU315A-EGA
- Rack mount Kit 19"/1U:                    Type RMK315A

## 2.4 Product Range

This table lists the product codes for the converter and its various upgrade kits:

---

***ACU315A Converter***

---

ACU315A	RGB to DVI (or VGA) Converter
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---

***Upgrade Kits***

---

ACU315A-EGA	EGA/CGA to DVI Adaptor + Cable
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---

RMK315A	19"/1U Rack mount Kit for up to 3 devices
---------	---

---

## 2.5 Compatibility

### Interface Compatibility

- **RGB:** Video signal consisting of R (red) G (green) and B (blue) signals. The signals have a level of 0.7Vpp. The Green-Signal also carries the (composite) synchronisation signals.
- **RGBS:** Video signal consisting of R (red) G (green) and B (blue) signals and the additional (composite) SYNC signal. All signals have 0.7Vpp.
- **VGA (also called RGBHV):** Video signal consisting of R (red) G (green) and B (blue) signals and additional horizontal/vertical synchronisation signals. The color signals have a level of 0.7Vpp; the synchronisation TTL (5Volts).
- **Digital Video (DVI):** DVI single link for resolution up to 1280x1024 at 60/75Hz. Digital Video standard established by the Digital Display Working Group ([www.ddwg.org](http://www.ddwg.org)) R, G, B, CLOCK in an up to 1.4 Gbit/sec data stream. The signals have a TMDS level.
- **CGA (Colour Graphic Adaptor):** Legacy graphic standard, established by IBM, supporting text with 40 or 80 characters in 25 lines with 16 colours or graphics in 640x200 with 2 colours or 320x200 with 4 colours.
- **EGA:** Legacy graphic standard (Enhanced Graphic Adaptor), established by IBM, supporting text with 80 characters in up to 43 lines graphics in 640x350 in 16 colours from a palette of 64.

### Supported SYNC forms

- **RGsB:** RGB with SYNC on Green. The colour signals have a level of 0.7Vpp. The Green-Signal also carries the (composite) synchronisation signals (app. -0.3V)
- **RGBs:** RGB with composite SYNC signal. All signals have 0.7Vpp.
- **RGBS:** RGB with composite SYNC signal. The colour signals have 0.7Vpp, the SYNC Signal is TTL-Level (5V)
- **RGBHV:** RGB with separate SYNC signals. The colour signals have 0.7Vpp, the SYNC Signals have TTL-Level (5V)
- **MDA:** black and white with separate SYNC signals (e.g. HERCULES). All Signals have TTL-Level (5V) (with EGA/CGA to DVI Adaptor only)
- **CGA:** colour with separate SYNC signals. All Signals have TTL-Level (5V) (with EGA/CGA to DVI Adaptor only)
- **EGA:** colour (2 pins per colour) with separate SYNC signals. All Signals have TTL-Level (5V) (with EGA/CGA to DVI Adaptor only)

## 2.6 How to Use This Guide

This guide describes the installation and configuration of the ACU315A Converter. Although the connection and operation of the system is relatively straightforward, you should consider the following before getting started:

### Connection & Compatibility

If you have purchased an ACU315A Converter Kit, this will contain PSU and all the cables/adapters required to connect the RGB to DVI(VGA) Converter to your graphic source. See also **Package Contents** (page 19)

For information about connection and installation, see **Installation**, page 19.

### Adjusting the ACU315A Converter to RGB Video

Although there are several preconfigured resolutions stored in the internal resolution table of the ACU315A Converter, under some circumstances it is required to manually adapt the ACU315A Converter to your specific resolution: see **ACU315A Converter Setup** (page 37).

### Adjusting the monitor to the ACU315A Converter

If you use a flat screen with VGA input, you will need to adjust the monitor to the picture width and the pixel phase. You can do this using the Auto Adjust or Manual Adjust procedures (see page 37).

- For experienced users there is a **Quick Setup** section at the start of this guide (see page 10).
- For the full procedure, see **Monitor Setup** (page 36) and/or **ACU315A Converter Setup** (page 37).

## 3. Installation

For first-time users, we recommend that you carry out a test placement, confined to a single room, before commencing full installation. This will allow you to identify and solve any cabling problems, and experiment with the ACU315A Converter more conveniently.

### 3.1 Package Contents

You should receive the following items in your ACU315A Converter package:

- RGB to DVI(/VGA) Converter unit.
- RGB(S) to DVI-I cable
- 6V DC 12W universal power supply for ACU315A Converter.
- DVI-I to VGA adaptor (DVI-I dual link male to HD15 female) connector.
- Programming cable (DB9 female to RJ11 4p4c).
- User manual (Quick Setup).
- US-type power cord.
- Infrared Remote Control (IR-RC)

The CGA/EGA to DVI Adaptor is supplied with:

- EGA/CGA to DVI-I adaptor
- DB9 female to DB9 male cable

If anything is missing, please contact Technical Support (see **Appendix E:** ).

## **3.2 Connection Cable Requirements**

To connect the ACU315A Converter to your graphic source you will need:

- **RGB(S):** 3 (4 with RGBS) coaxial cables type RG59B/U or similar, terminated with BNC connectors at the converters end. Please ensure that the connection is tension-free.
- **CGA:** CGA to DVI Adaptor (with ACU315A-EGA upgrade kit only)
- **EGA:** EGA to DVI Adaptor (with ACU315A-EGA upgrade kit only)
- **Power Supply**  
Connect the supplied 6V/DC power supply to the *Plug* terminal on the rear of the ACU315A Converter.

### 3.3 System Setup

To install your ACU315A Converter:

1. Switch off all devices.
2. Connect your TFT directly to the device; connect a VGA screen by using the equipped DVI-I to VGA adapter. **Connect the VGA monitor cable to the adapter; then plug in the adapter into the device.** Otherwise, the VGA mode is not detected, DVI output is generated and there will be no picture on the screen (see also **Diagnostic LEDs** on page 23).



*Under some circumstances, if your TFT supports both DVI and VGA through a DVI-I cable, it might be necessary to use an additional DVI-I to DVI-D adaptor to get a DVI output. Please contact technical support for this accessory.*

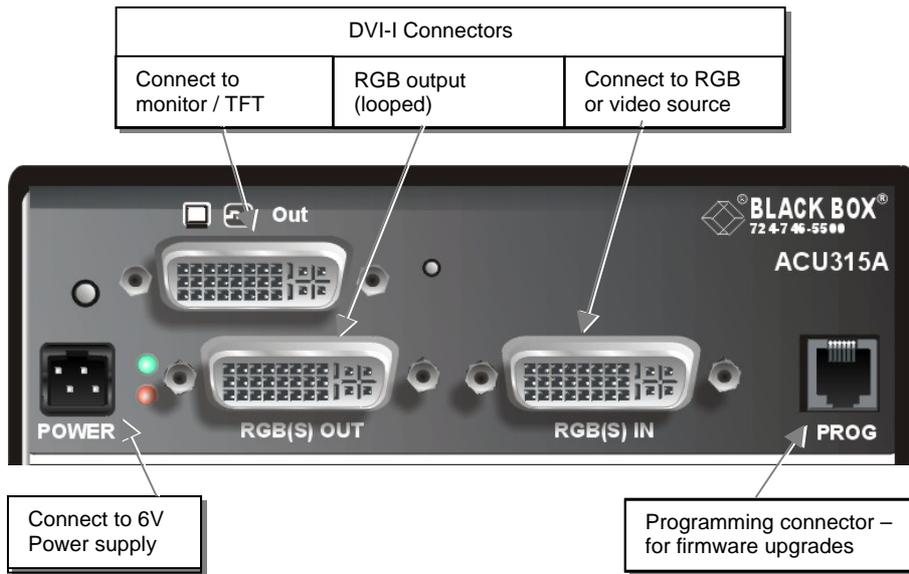
3. Connect the graphic source to the input connectors as shown in Figure 1, using the equipped 4xBNC-to-DVI adaptor. Please note, for connecting a CGA or EGA source, connect the optional CGA-to-DVI adaptor or EGA-to-DVI adaptor instead of the 4x BNC-to-DVI adaptor.
4. Connect the 6V power supply to power the unit.



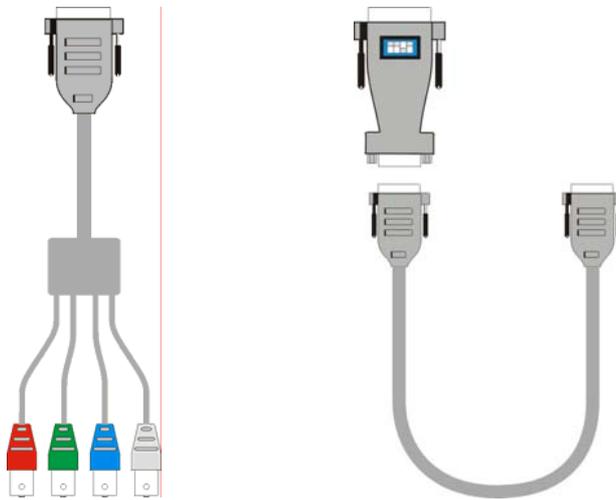
Only use the power supply originally supplied with this equipment or a manufacturer-approved replacement.

5. Power up the system.

**THE RGB TO DVI(VGA) CONVERTER**



**Figure 2 ACU315A Converter**



**Figure 4 RGB-to-DVI Cable**  
(in list of parts)

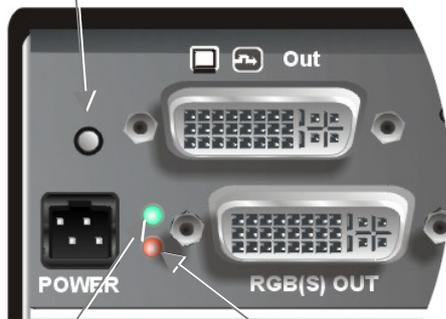
**EGA/CGA to DVI Converter**  
type ACU315A-EGA  
(NOT in list of parts - Option)

### 3.4 Diagnostic LEDs

Each ACU315A Converter is fitted with three indicator LEDs: *Monitor Detect*, *Device Ready* and *Video Signal*. The *Monitor Detect* LED is to the left of the video output connector. The *Device Ready* and *Video Signal* LEDs are next to the Power socket.

The location of the LEDs is shown below:

**Monitor Detect**



**Video Signal  
(Green)**

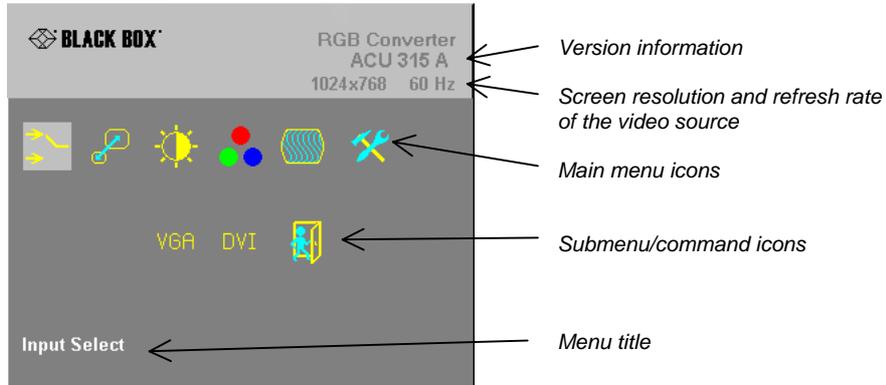
**Device Ready  
(Red)**

**Figure 3 Diagnostic LEDs on ACU315A Converter**

<i>LED</i>	<i>Appearance</i>	<i>Diagnostics</i>
<b>Monitor Detect</b>	On	Attached DVI monitor (TFT) detected
	Flashing	Attached VGA monitor (CRT) detected
	Off	No monitor detected
<b>Device Ready (Red LED)</b>	Off	Device not ready
	On	Device ready
<b>Video Signal (Green LED)</b>	Off	No video signal or valid mode detected
	On	Attached and valid mode detected

## 4. Device Control

If you are using the CGA/EGA input (with adaptors only) or use an RGB format stored in the internal table, no adjustment should be required. In other cases, you may need to optimize the output using the ACU315A Converter's on-screen display (OSD). You can access to the OSD, even if there is no input signal detected!



**Figure 4** OSD Utility

You can adjust the following properties using the IR-Remote Control:

- Brightness/contrast

You can adjust the following properties using the OSD:

- Auto Configuration ON/OFF
- Color, Color Temperature adjustments
- Brightness/contrast
- Input Image Sizing
- Output Image Scaling and Sizing
- Video Mode selection for similar Video Modes (see **Appendix D: Supported Video Modes** on page 47).
- OSD operation, factory reset.

## 4.1 Opening the OSD

You can access the OSD in three ways:

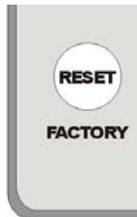
- Using the equipped Infrared Remote Control (IR-RC).
- Using our WINDOWS™ program with a serial connection to the programming port.

There is a summary of OSD commands on page 12.

### Using the IR-RC

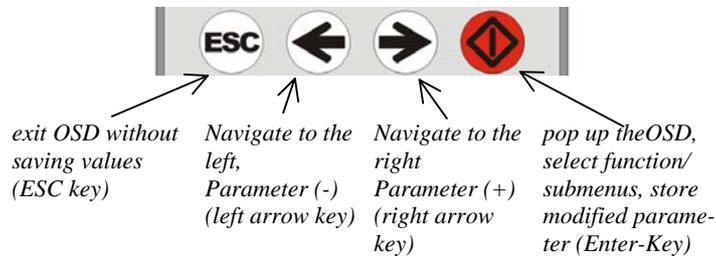
For direct brightness adjust	For direct contrast adjust
 <i>more brightness</i>	 <i>more contrast</i>
	
 <i>less brightness</i>	 <i>less contrast</i>

### Reset to factory defaults



*Reset to factory defaults (from flash)  
= resetting user presets  
(press twice !!)*

### To navigate within the OSD:



## THE RGB TO DVI(VGA) CONVERTER

### Using our *WINDOWS™* program

On all devices, you can use our small *WINDOWS™* program, running on a *WINDOWS™* computer for OSD access:

1. Download the program from our server.  
[http://www.blackbox.com/tech\\_support/ts\\_upgrades/ts\\_ss.html](http://www.blackbox.com/tech_support/ts_upgrades/ts_ss.html)
2. Connect the programming cable to the programming port.
3. Connect the programming cable to the serial port of your computer, where the program is running.
4. Start the program and follow the on-screen instructions.
5. Type in the following key sequence:  
<O> + <S> + <D> followed by <ENTER>

When the OSD starts, it displays information about the attached device and firmware version, for example:

```
Company Name : BlackBox
Modul Name   : ACU315A
Version      : Vers.1.3
Date         : 03/05/15
```

To navigate within the OSD:

- Use the <L> and <R> keys to highlight a submenu and/or function.
- Press the <S> key to select the highlighted submenu or function.
- Select the Exit button to go back to the previous menu level.
- Press the <X> key to exit the OSD mode.

## 4.2 Using the OSD

The OSD is an icon-based utility. The top line of symbols shows the main menu categories:



### Input Select

Specify whether the input is RGB (RGRS) or digital (for future expansion)



### Scale Mode

Select the screen resolution of the attached display and select one of four scaling modes.



### Brightness – Contrast

Adjust brightness or contrast or reset to default values.



### Color

Adjust color calibration, temperature, flesh/skin tone, hue and saturation.



### Image

Adjust pixel clock and phase. Define picture size and position.



### Tools

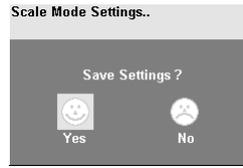
Set OSD position and size, factory reset.

1. Use the left and right arrow keys (<L> and <R> keys in Windows program) to highlight the icon you want. The OSD displays additional icons relating to commands in the selected menu category.
2. Press the Enter key (<S> key in Windows program). The OSD highlights the first command icon.
3. Use the Left and Right arrow keys (<L> and <R> keys in Windows program) to highlight the command or submenu you want. In the case of the latter, your selection will cause the OSD to display additional command icons (Color Temperature commands, for example).
4. Press the Enter key (<S> key in Windows program) to accept a highlighted command. If this requires the increase or decrease of a value (Contrast, for example), the OSD displays a value bar:



5. Use the Left and Right arrow keys (<L> and <R> keys in Windows program) to change the value as required.

6. In many cases, after you have chosen a new setting, the OSD displays the following confirmation message (or similar):



7. Highlight the *Yes* button and press the Enter key (<S> key in Windows program) to confirm your choice. Alternatively, highlight the *No* button and press the Enter key (<S> key in Windows program) to discard the new setting and restore the previous value.
8. Select the Exit icon to close a submenu.
9. Press the Esc key (<X> key in Windows program) to close the OSD, saving all settings, and restore normal mouse and keyboard functions.

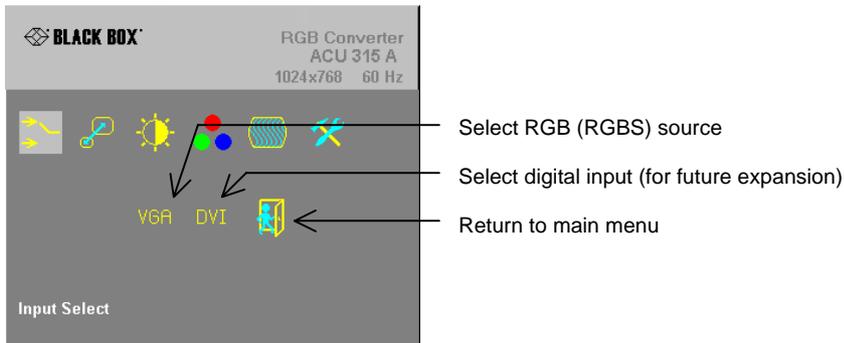
The following table summarizes the keyboard actions and icons used to navigate the OSD utility, and to select and adjust the ACU315A Converter's parameters:

<i>IR-RC</i>	<i>Key/Icon</i>	<i>Terminal or Windows program</i>	<i>Action</i>
	<X>		Close the OSD, restore normal keyboard and mouse functions.
			Return to previous Menu selection.
	<S>		Open the highlighted menu or submenu Accept the highlighted command
	<L>		Select the previous menu or command icon Decrease the highlighted parameter
	<R>		Select the next menu or command icon Increase the selected parameter

**Input Select (for future expansion)**



disabled function for this firmware level

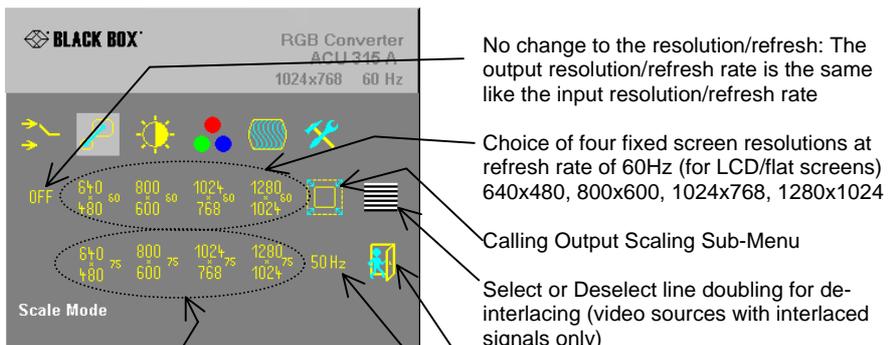


**Figure 5 Input Select menu**

**Physical Resolution of attached screen**



Use the Scale Mode menu to specify the physical resolution of the attached screen; this ensures the best matching pictures on a TFT screen. Use output scaling (see below) to stretch the picture to the maximum available screen space.



**Figure 6 Scale Mode menu**

Choice of four fixed screen resolutions at refresh rate of 75Hz (for CRT/tube screens) 640x480, 800x600, 1024x768, 1280x1024

No change to the resolution/refresh: The output resolution/refresh rate is the same like the input resolution/refresh rate

Choice of four fixed screen resolutions at refresh rate of 60Hz (for LCD/flat screens) 640x480, 800x600, 1024x768, 1280x1024

Calling Output Scaling Sub-Menu

Select or Deselect line doubling for de-interlacing (video sources with interlaced signals only)

Return to main menu

Select 50Hz Output-Mode for Video-Applications (resolution keeps unchanged – select before from Choice of four)

### Output Scaling

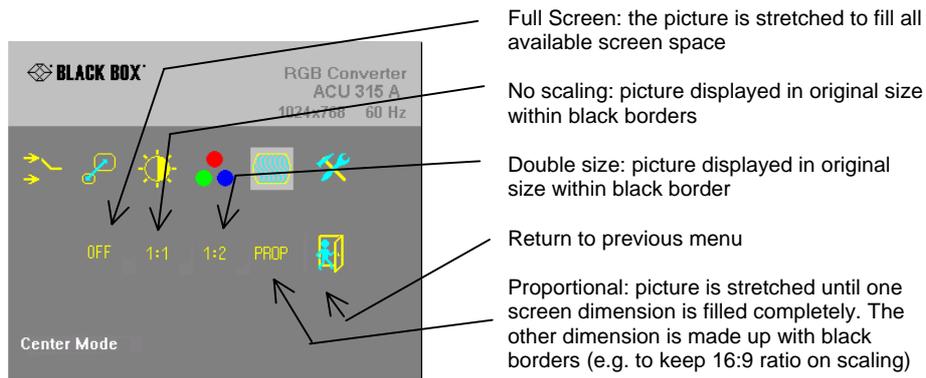


Use the Output Scaling submenu to specify the best match between screen size and user requirements. Four modes are available:

**1:1** – the picture is displayed with its original size and aspect ratio within a black frame. All pixels remain 1 wide and 1 high. Pictures with less than 300 lines are displayed in double height. Interlaced pictures are displayed in double height (deinterlaced)

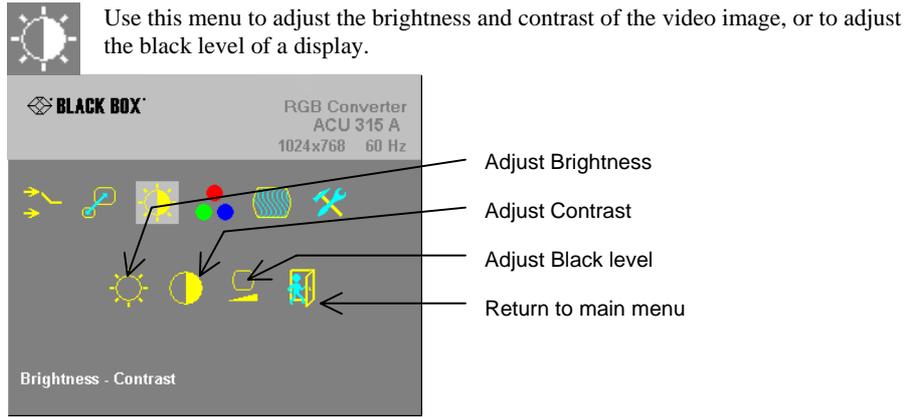
**OFF (Full screen)** – The picture is stretched to fill all available screen space (non-proportional). **PROP (Proportional)** – The picture is stretched (up scaling only!) to fill one screen dimension completely. The other dimension is made up with black borders (e.g. to keep a 16:9 ratio on scaling - proportional) Horizontal and vertical size of the screen must be both at least the size of the appropriate picture dimension.

**1:2** – the picture is displayed at double the original size within a black frame. All pixels become 2 wide and 2 high. Horizontal and vertical size of the screen must be both at least the double size of the appropriate picture dimension.



**Figure 7** Output Scaling sub-menu

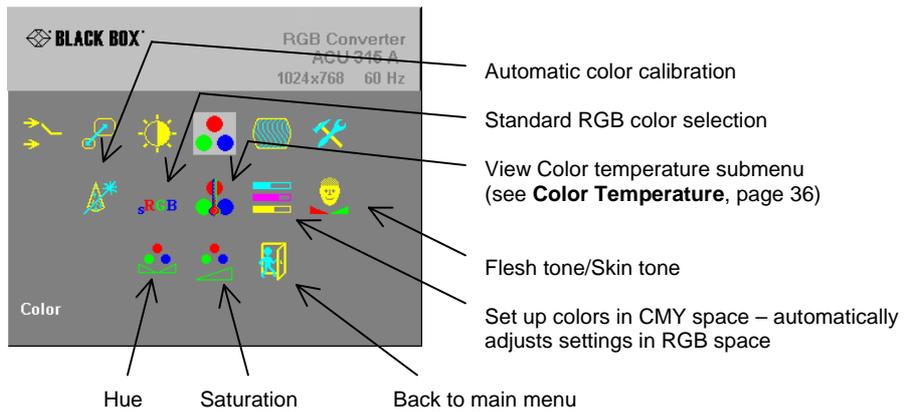
### Brightness/Contrast



**Figure 8** Brightness-Contrast menu

### Select Colors and Color Temperatures

Use the Colors menu to adjust the color balance of the video image. The menu provides a number of options including automatic calibration, manual adjustment in RGB or CMY color space, hue and saturation adjustment and the setup of flesh/skin tone.

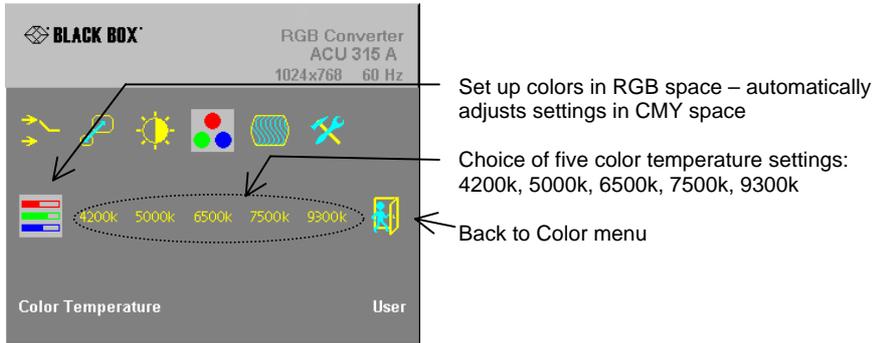


**Figure 9** Color menu

**Color Temperature**



Use the Color Temperature submenu to set up the color profile in RGB color space or by using one of five predefined color temperatures. To view this menu, select the Colors icon from the main menu and then select the Color Temperature icon.

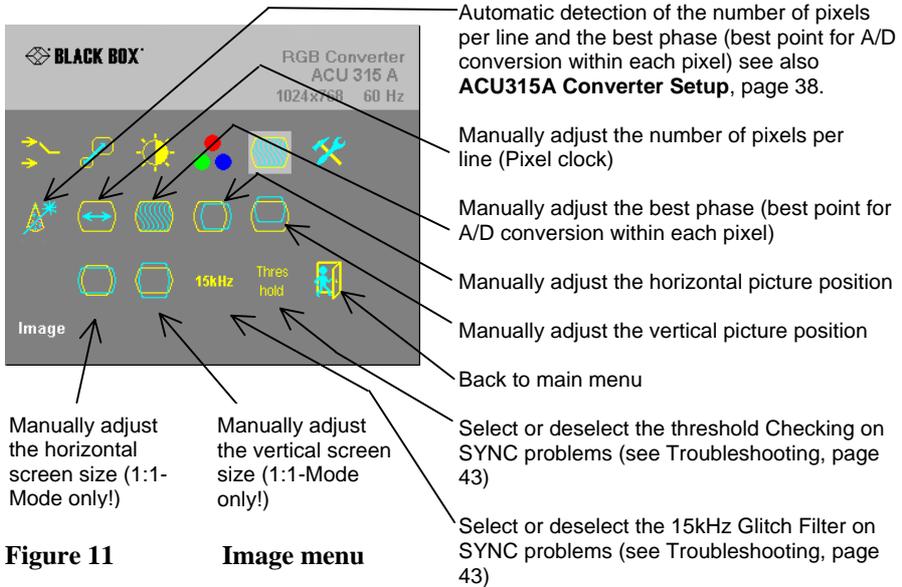


**Figure 10 Color Temperature sub-menu**

**Image**



Use the Image menu to adjust the vertical and horizontal screen position, picture size and to set the pixel clock and phase. Doing some tunings on SYNC problems.

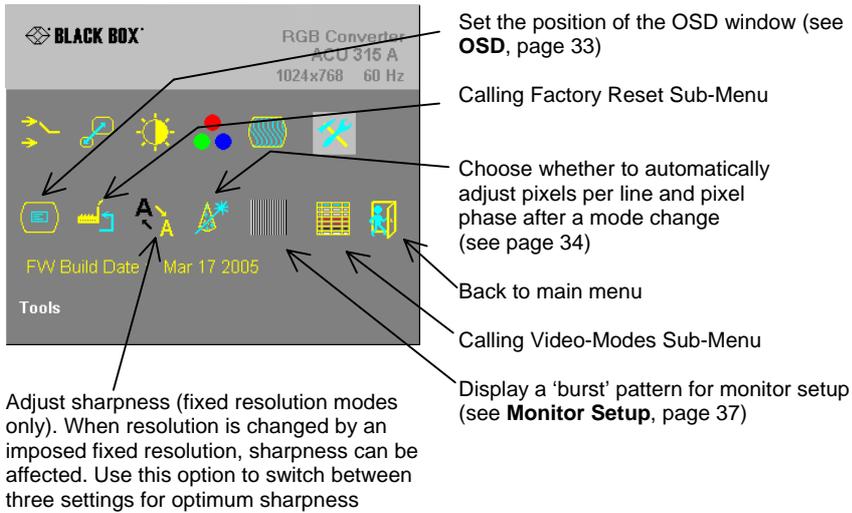


**Figure 11 Image menu**

**Tools**



Use the Tools menu to set the position and size of the OSD window, adjust the sharpness for a fixed resolution setting, reset the ACU315A Converter system to its factory default settings or provide a test pattern.

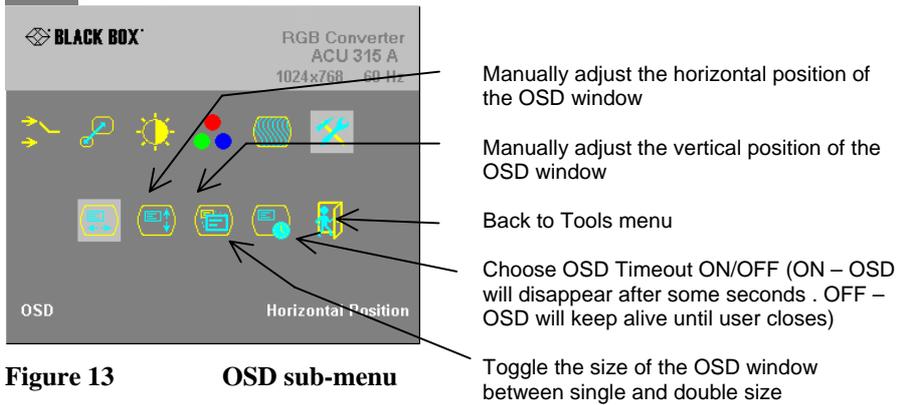


**Figure 12 Tools menu**

**OSD**



Use the OSD submenu to define the position and size of the OSD window. To view this menu, select the Tools icon from the main menu and then select the OSD icon.

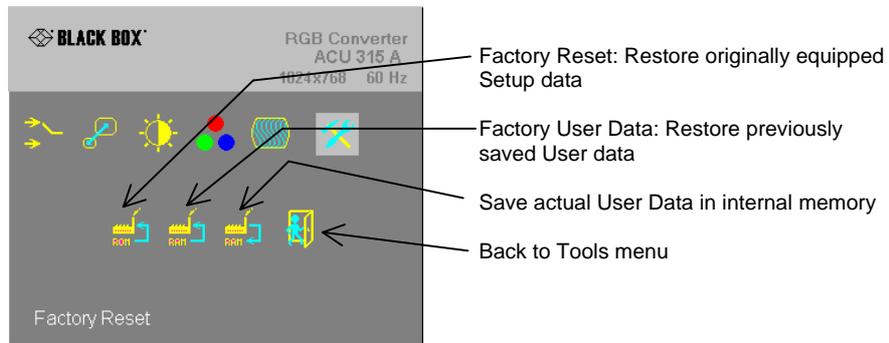


**Figure 13 OSD sub-menu**

**Factory Reset**



Use the Factory Reset submenu to reset the unit to factory defaults, save user presets or restore user presets



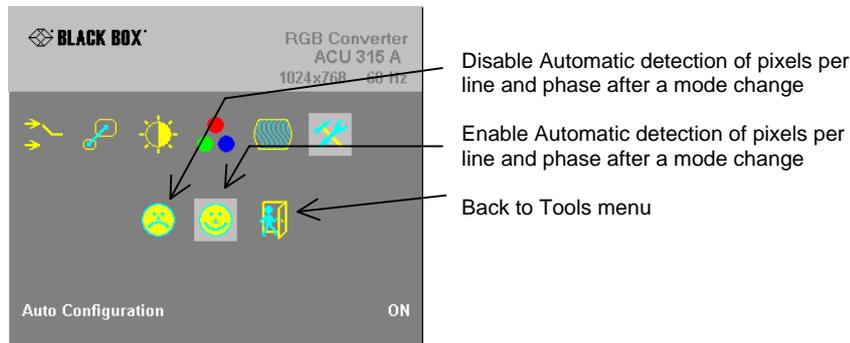
**Figure 14** Factory Reset sub-menu

**Auto Configuration**



Use the Auto Configuration submenu to define whether the ACU315A Converter carries out automatic detection of the number of pixels per line and the best phase after a mode change (a change of screen resolution and/or refresh rate at the graphic source). Using automatic detection (while displaying an appropriate test pattern) ensures an optimized image but the procedure introduces a delay in the picture appearing on the attached console screen. If you want the picture to appear as fast as possible, you may want to disable this feature. Auto Configuration is disabled in the default factory settings.

To view the Auto Configuration menu, select the Tools icon from the main menu and then select the Auto Configuration icon.

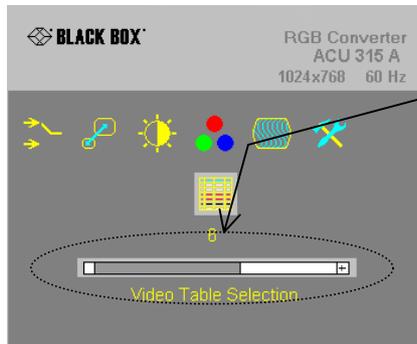


**Figure 15** Auto-Configuration sub-menu

**Video Mode Sub-Menu**



Use the Video Mode menu to select one of six Video Modes for a specific resolution. Please see **Appendix D: Supported Video Modes** (page 47) for more information about Video Modes and supported screen resolutions.



Choice of six different video modes.  
Please see also **Appendix D: Supported Video Modes** (page 46)

**Figure 16** Video Mode sub-menu

## 5. Monitor Setup

This procedure is designed to correct for discrepancies in the video signal due to analogue/digital video conversion by the Monitor. You do not need to follow this procedure if you have:

- A CRT monitor connected to the ACU315A Converter through the VGA input
- A TFT monitor connected to the ACU315A Converter through the DVI input

In these cases, there is no need to adjust the monitor because the video format is not converted.

Please make sure that you carry out this procedure before setting up the ACU315A Converter (page 37). If you are using a TFT monitor at the ACU315A Converter with a VGA cable, the TFT monitor digitizes the video data stream and this may affect video quality. By setting up the TFT monitor first, you ensure that you are correcting discrepancies due solely to the ACU315A Converter system in the ACU315A Converter Setup procedure.

1. Connect the ACU315A Converter system and display the regular desktop in the desired screen resolution. Monitor Setup may vary depending on screen resolution and/or refresh rate.
2. Display the OSD utility (see page 25).
3. Select the Tools menu option (see page 33).
4. Select the 'burst' pattern option. Your TFT should show fine, 1 pixel wide, black and white vertical stripes over the entire screen. The OSD will stay visible in the middle of the screen.
5. Depending on the type of TFT, press the 'AUTO' Button on the monitor control panel or select *Auto Adjust* in the TFT Setup Menu. Refer to the manual supplied with your monitor for more information.
6. If the vertical stripes are sharp and without jitter or smearing, the adjustment has been successful. Go to step 8.
7. If the picture quality is not acceptable after the automatic adjustment, you will have to manually adjust the pixel clock and pixel phase (in this order). Please follow the instructions in your monitor's user manual.
8. Press any key to exit the test pattern display.
9. Exit the OSD.

## 6. ACU315A Converter Setup

### 6.1 Overview

You need to optimize the video signal across your ACU315A Converter system if it undergoes one or more conversions between analog and digital formats. The exact procedure depends on your ACU315A Converter setup:

<i>Graphics card</i>	<i>Monitor type</i>	<i>Monitor Input used</i>	<i>Video Optimization Procedure(s)</i>
RGB/ CGA/ EGA	TFT	VGA	TFT adjustment (see <b>Monitor Setup</b> , page 36) Optimization using OSD (see <b>Setup Instructions for RGB Input</b> , page 38)
RGB/ CGA/ EGA	CRT	VGA	Optimization using OSD (see <b>Setup Instructions for RGB Input</b> , page 38)
RGB/ CGA/ EGA	TFT	DVI	Optimization using OSD (see <b>Setup Instructions for RGB Input</b> , page 38)
VIDEO	TFT	VGA	TFT adjustment only (see <b>Monitor Setup</b> , page 36)
VIDEO	CRT	VGA	No setup required
VIDEO	TFT	DVI	No setup required

## 6.2 Setup Instructions for RGB Input

This procedure is designed to correct for discrepancies in the video signal due to analogue/digital video conversion by the ACU315A Converter. You do not need to follow this procedure if you have a digital signal, connected to the ACU315A Converter. In this case, the video signal is already converted into a digital format and digitally processed through the ACU315A Converter.

If you are using a TFT monitor at ACU315A Converter with a VGA cable, you should carry out the Monitor Setup procedure first (see page 36). In this configuration, the TFT digitize the video data stream and affect video quality. By setting up the TFT monitor, you ensure that you are correcting discrepancies due solely to the ACU315A Converter in this procedure. Alternatively, you could replace the TFT monitor with a CRT monitor while you carry out this procedure or use a TFT with DVI-cable. You can then reconnect the TFT monitor and optimize its video image afterwards.

1. Display from your graphic source a picture with as much detail as possible. If possible, display a 'burst-pattern' (see Figure 17) - a picture with alternating, 1-pixel wide, black and white, vertical stripes.

If you are unable to view the test card, display some black text on a white background. For example, you could open Notepad, maximize it to full screen, and fill the page with letter 'I's in a 12pt *sans serif* font. Proceed with step 2.

2. Display the OSD (see page 25).
3. Select the Image menu option:



4. Select the first command icon:  
*Automatic detection of number of pixels per line and the best phase.*



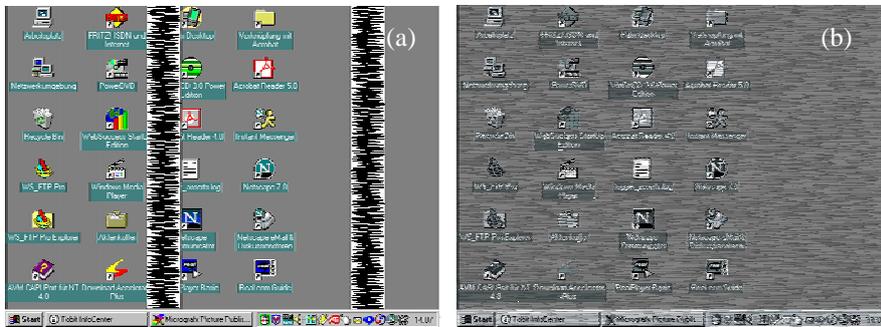
5. Assess the desktop test pattern. If the vertical stripes are sharp and without jitter or smearing, the adjustment has been successful. Go to step 9.
6. If the picture quality is not acceptable after the automatic adjustment, you will have to manually adjust the pixel clock and pixel phase (in this order).
7. With a poorly adjusted pixel clock you may see one or more vertical areas, where the lines are smeared (see Figure 17a):

- a. Return to the OSD utility and select the menu command:  
*Manually adjust the number of pixels per line (Pixel clock)* from the Image menu.



- b. Adjust the pixel clock value until all stripes have disappeared.
- c. Confirm the setting.

8. Problems with the pixel phase will cause horizontal noise, horizontal wave-formed lines, flicker or smearing with zebra-pattern (see Figure 17b):
  - a. From the OSD's Image menu, select the menu command:  
*Manually adjust the best phase (best point for A/D conversion within each pixel).* 
  - b. Modify the phase until all distortions have disappeared.
  - c. Confirm the setting.
9. If necessary adjust the size of the visible part of the picture. (The horizontal and vertical size is displayed in numeric values for exact adjustment)  
10. If necessary adjust the position of the visible part of the screen. It may be necessary to adjust the picture size (step 9) again  
11. If appropriate, re-attach your TFT monitor and adjust its image according to the manufacturer's instructions.



**Figure 17** Burst test pattern applied to desktop showing problems with (a) pixel clock setting, (b) pixel phase setting.

### 6.3 Setup of a new Video Mode

The ACU315A Converter is preinstalled with several video modes and screen resolutions in various refresh rates suitable for using with an RGB source. If the mode generated by your RGB graphic source is not represented, you need to Setup a custom mode. The steps are similar to **6.2 Setup Instructions for RGB Input**. Your custom mode is stored automatically and can be used in the same way as the preinstalled modes.

1. Display from your graphic source a picture with as much detail as possible. If possible, display a ‘burst-pattern’ (see Figure 17) - a picture with alternating, 1-pixel wide, black and white, vertical stripes.  
  
If you are unable to view the test card, display some black text on a white background. For example, you could open Notepad, maximize it to full screen, and fill the page with letter ‘I’s in a 12pt *sans serif* font. Proceed with step 2.
2. Display the OSD (see page 25).
3. Select the Scale Mode Menu (Physical Resolution of attached Screen – see page 29) and select the size of your used monitor (resolution must be equal or higher than the resolution, generated by your graphic card)
4. Select the Output Scaling Submenu (see page 30). Select *NO SCALING* – Mode (1:1)
5. Select the Video Mode Submenu (see page 35). Try-out all available modes and select the best matching one (all rows and all columns of your screen picture are displayed)
6. Select the Image menu option (see page 32)
7. Select the command icon:  
*Automatic detection of number of pixels per line and the best phase.* 
8. The picture size may have been changed! Assess the desktop test pattern. If the vertical stripes are sharp and without jitter or smearing, the adjustment has been successful. Go to step 12.
9. If the picture quality is not acceptable after the automatic adjustment, you will have to manually adjust the pixel clock and pixel phase (in this order).
10. With a poorly adjusted pixel clock you may see one or more vertical areas, where the lines are smeared (see Figure 17a on page 39):
  - a. In the Image menu option (see page 32) select the command icon:  
*Manually adjust the number of pixels per line (Pixel clock)* 
  - b. Adjust the pixel clock value until all stripes have disappeared.
  - c. Confirm the setting.

11. Problems with the pixel phase will cause horizontal noise, horizontal wave-formed lines, flicker or smearing with zebra-pattern (see Figure 17b on page 39):
  - a. In the Image menu option (see page 32) select the command icon: *Manually adjust the best phase (best point for A/D conversion within each pixel).* 
  - b. Modify the phase until all distortions have disappeared.
  - c. Confirm the setting.
12. If necessary, adjust the position of the visible part of the screen. (Image menu option - see page 32)  
13. If necessary, adjust the size of the visible part of the picture. (The horizontal and vertical size is displayed in numeric values for exact adjustment).  
14. Select the Output Scaling Submenu (see page 30). Select the desired Scaling Mode
15. If appropriate, re-attach your TFT monitor and adjust its image according to the manufacturer's instructions.

## 7. Troubleshooting

### 7.1 Video

---

#### *There isn't a picture.*

Check the power supply connection at the ACU315A Converter. Is the *Device Ready* (Red LED) illuminated (see page 23)? If not, the internal power-supply may be damaged or there may be an internal error.

Check if the *Monitor detect* LED is illuminated (see page 23)? If not, there may be a problem with the Interconnection cable.

Check that you are using a supported video mode (see **Appendix D: Supported Video Modes**). At the ACU315A Converter, is the *Video Signal* LED illuminated (see page 23)? If not, do you need to setup a new video mode?(see **Setup of a new Video Mode** on page 40)?

---

#### *The green LED is blinking*

This problem normally occurs only with RGB Signals if you have long coaxial cables, EMI noisy environment, high current power cables nearby or glitches from old graphic cards.

For Video Signals with HS< app. 20kHz, try to select 15kHz Glitch Filter to ON in Image Menu (Refer to page 32)

For Video Signals with HS> app. 20kHz, try to deselect Threshold Checking (OFF) in Image Menu (Refer to page 32)

---

#### *After several seconds (minutes) intermittent loss of picture*

This problem normally occurs only with RGB Signals if you have long coaxial cables, EMI noisy environment, high current power cables nearby or glitches from old graphic cards.

For Video Signals with HS< app. 20kHz, try to select 15kHz Glitch Filter to ON in Image Menu (Refer to page 32)

For Video Signals with HS> app. 20kHz, try to deselect Threshold Checking (OFF) in Image Menu (Refer to page 32)

---

#### *I Can't access to the OSD because of intermittent loss of picture*

Disconnect the input signals from the Video Source. Wait until the message „No Signal detected“ appears. Now you can access to the OSD and make your settings. After doing the setup, reconnect the signal source.

---

***There is horizontal jitter on the picture.***

The pixel clock and/or phase is misaligned: Refer to page 38.

---

***Characters are smeared.***

The phase is misaligned: Refer to page 38.

---

***Thin vertical lines are missing.***

The phase is misaligned: Refer to page 38.

---

***No output to a connected CRT or TFT with VGA input.***

First connect your VGA monitor cable to the adapter and then plug in the adapter to the device. Otherwise, the VGA mode is not detected, DVI output is generated and there is no picture on the screen (See also **Diagnostic LEDs** on page 23).

Alternatively do a power-cycle with the device, while the screen stays attached.

---

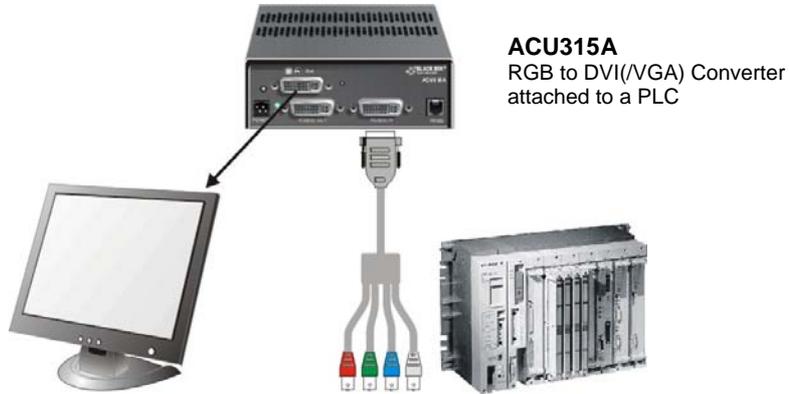
***There are parts of the picture missing.***

The picture size is incorrect: refer to page 40 (**Setup of a new Video Mode**).

## Appendix A: Example Applications

This section illustrates some specific applications using the ACU315A Converter:

For more details, please discuss suitable converter architecture with Technical Support (see **Appendix E:** ).



**Figure 18** ACU315A Converter attached to a PLC

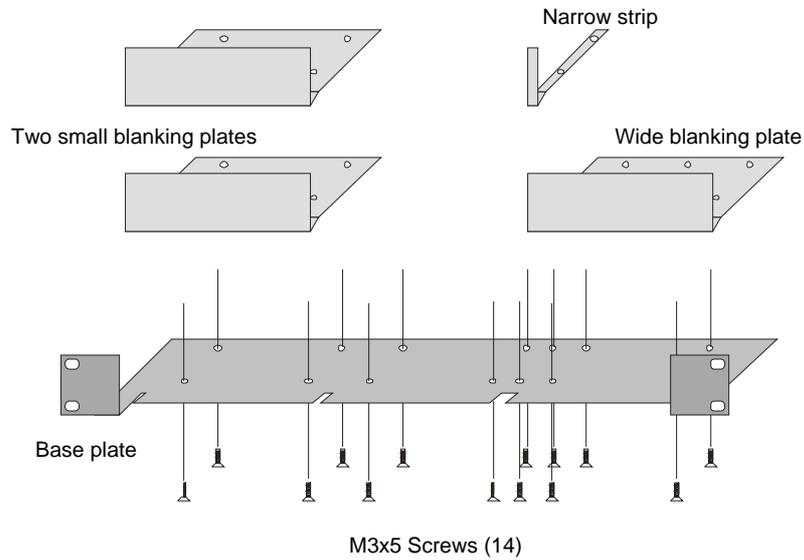


**Figure 19** ACU315A Converter with optional EGA/CGA support, attached to an old fashioned Computer

## Appendix B: Rack Mount Options

ACU315A Converters can be mounted in a 19" rack using the mounting kit:

This contains the following parts:



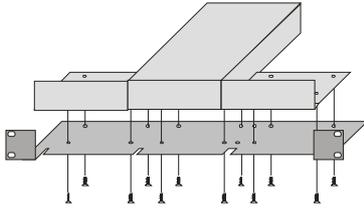
**Figure 20**      **Rack Mounting Kit**

To mount a unit:

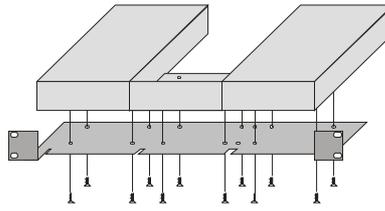
1. Align the holes on the base plate with the vacant screw holes on the base of the ACU315A Converter unit.
2. Fasten the base of the unit to the plate of the mounting kit using the supplied screws.
3. Close the remaining gaps with blanking plates.

The kit allows you to mount various combinations of regular and double width housings:

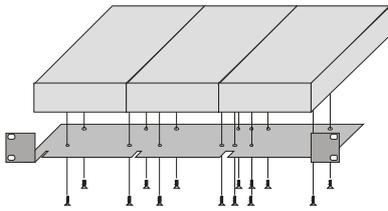
1. One regular unit (using two small plates)



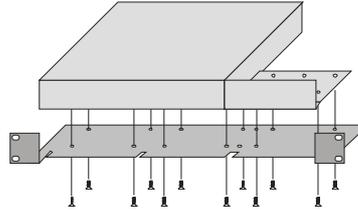
2. Two regular units (using one small plate)



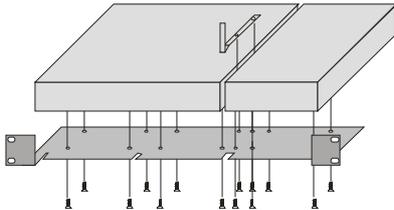
3. Mounting of three regular units



4. Mounting of one double width unit (using wide plate)



5. Mounting of double width and regular units ( using narrow strip)



## Appendix C: System Upgrade

### System Update / Onboard Programming

It is occasionally necessary to update the firmware of the system. Normally, this procedure is carried out in the factory. If you want to update the firmware yourself, contact Technical Support. You will need a programming cable and software to carry out the update. Please follow the supplied instructions carefully.

## Appendix D: Supported Video Modes

The following table shows the video modes originally supported by the ACU315A Converter.

<i>Video Mode</i>	<i>Video Mode Name</i>	<i>Resolution</i>		<i>Refresh Rates</i>		<i>Pixel-clock</i>
		<i>Horiz.</i>	<i>Vert.</i>	<i>Vertical (Hz)</i>	<i>Horizont. (kHz)</i>	
3	MONA S5	442	416	54,4	24,3	14,0
0	AS 230 / 235 / OS 252	448	288	50,0	15,6	10,0
7	GBE 3977 - 64x32	448	288	50,0	15,6	10,0
1	WF 470	512	240	49,1	15,6	12,0
2	WF 470 neu	512	245	50,1	15,6	12,0
1	WF 470 / AS 215	512	256	50,1	15,6	12,0
2	WF 470 / AS 215	512	512	50,0	31,3	24,0
5	GEM 80 graph i	560	224	50,0	15,6	11,8
5	GEM 80 graph i	560	224	60,0	15,8	11,8
5	GEM 80 graph i	560	224	75,0	18,2	12,0
8	GBE 3977 - 80x48	560	288	50,0	15,6	13,0
10	DISET - 80x25	560	288	50,0	15,6	12,2
1	MONA-C	560	413	58,2	25,8	20,0
5	GEM 80 graph progr.	560	448	50,0	31,3	23,5
5	GEM 80 graph progr.	560	448	60,0	31,5	23,7
5	GEM 80 graph progr.	560	448	75,0	36,4	24,0
2	WF 480	580	480	60,0	30,6	25,0
0	CGA	640	200	60,0	15,8	14,2
6	CP526/527	640	234	50,1	15,4	13,1
4	IVE1	640	284	50,0	15,7	12,3
6	GEM 80 text	640	288	48,8	15,6	13,0
1	Prokon 2	640	288	83,1	27,4	23,0
1	EGA (TTL)	640	350	59,9	21,9	16,3
2	DOS graphic Mode	640	350	70,0	31,4	25,1
0	Vesa Standard	640	350	85,0	37,9	31,5
1	IVE3	640	379	50,0	21,8	17,3

## THE RGB TO DVI(VGA) CONVERTER

<i>Video Mode</i>	<i>Video Mode Name</i>	<i>Resolution</i>		<i>Refresh Rates</i>		<i>Pixel-clock</i>
		<i>Horiz</i>	<i>Vert</i>	<i>Vertical (Hz)</i>	<i>Horizont. (kHz)</i>	
1	IVE4	640	385	50,0	20,0	16,1
1	IVE2	640	398	50,0	21,9	17,8
0	VGA	640	400	56,0	24,6	20,9
1	OP 398 K	640	400	60,0	27,5	22,2
0	VGA	640	400	70,0	31,4	25,1
1	Vesa Standard	640	400	85,0	37,8	31,5
1	COROS LS-C	640	405	59,1	25,4	21,8
1	Prokon 1	640	432	53,8	25,5	23,0
1	Prokon 3	640	432	59,0	27,4	23,0
1	CP 526 highres. 50 Hz	640	468	50,0	31,2	26,2
1	CP 526 highres. 60 Hz	640	468	60,0	30,9	26,2
3	CP 528 highres. 60 Hz	640	468	60,0	30,9	28,3
1	WF 480 / Gracis	640	480	59,9	30,6	27,6
0	Vesa Standard	640	480	60,0	31,5	25,2
2	MAC Mode	640	480	66,7	35,0	31,4
0	Vesa Standard	640	480	72,8	37,9	31,5
0	Vesa Standard	640	480	75,0	37,5	31,5
0	Vesa Standard	640	480	85,0	43,3	36,0
1	NEC	642	200	60,0	15,0	13,5
1	Std.- VGA	656	496	59,9	31,5	25,2
4	NTSC (halfline)	680	240	60,0	15,7	12,9
3	NTSC Interlaced	720	240	60,0	15,8	13,5
3	PAL Interlaced	720	288	50,0	15,6	13,5
1	ABB DSAV110	720	336	50,0	17,9	15,5
1	ABB DSAV111	720	336	61,2	21,8	19,7
1	Hercules monochrom	720	350	49,8	18,4	16,3
1	DOS Text Mode	720	400	70,0	31,4	28,3
2	Vesa Standard	720	400	85,0	37,9	35,5
2	VDU 2000 Coros	720	405	59,1	25,4	24,5
1	Teleperm / DS 078	720	408	60,0	25,7	23,1
3	NTSC progressive	720	480	60,0	31,5	27,0
3	PAL progressive	720	576	50,0	31,3	27,0
3	PC-Textmode	738	414	70,1	31,5	28,3
2	MTBI	746	246	60,0	15,7	14,1
2	CP 527/ 60	800	468	59,9	30,9	32,7
4	Vesa Standard	800	600	56,2	35,1	36,0
0	Vesa Standard	800	600	60,3	37,9	40,0
0	Vesa Standard	800	600	72,1	48,0	49,9
0	Vesa Standard	800	600	75,0	46,9	49,5
0	Vesa Standard	800	600	85,0	53,6	56,2

<i>Video Mode</i>	<i>Video Mode Name</i>	<i>Resolution</i>		<i>Refresh Rates</i>		<i>Pixel-clock</i>
		<i>Horiz</i>	<i>Vert</i>	<i>Vertical (Hz)</i>	<i>Horizont. (kHz)</i>	
1	MAC Mode	832	624	75,0	49,5	55,4
0	Vesa Standard	1024	768	60,0	48,4	65,0
0	Vesa Standard	1024	768	70,0	56,4	74,9
1	SUN Mode	1024	768	72,0	58,0	75,2
0	Vesa Standard	1024	768	75,0	60,0	78,7
0	Vesa Standard	1024	768	85,0	68,7	94,5
2	Industrie Standard (I)	1024	768	87,0	35,5	44,9
11	DISET oversample	1120	288	50,0	15,6	24,5
1	DMT1185	1152	864	70,0	63,5	100,1
0	Vesa Standard	1152	864	75,0	67,5	108,0
1	SUN Mode	1152	900	66,7	62,5	95,5
9	GBE 3977 oversample	1164	288	50,0	15,6	26,0
1	TV Mode	1280	768	60,0	48,1	81,2
0	Vesa Standard	1280	960	60,0	60,0	108,0
1	DMT127A	1280	960	75,0	75,0	126,0
0	TV Mode	1280	1024	50,1	53,4	90,1
0	Vesa Standard	1280	1024	60,0	64,0	108,0
1	SUN Mode	1280	1024	66,7	71,7	117,0
1	SXGA Unix	1280	1024	73,0	77,2	131,0
0	Vesa Standard	1280	1024	75,0	80,0	135,0

## Appendix E: Calling Black Box

If you determine that your ACU315A Converter is malfunctioning, *do not attempt to alter or repair it*. It contains no user-serviceable parts.

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 firmware-revision level printed on the bottom of the ACU315A Converter (very important):

**Version Number Format:**

Board:                    **xxLO/RE Myyy Pzzz Auuu Gvvvvvv**  
Firmware:               **C/M/S xx Pyy Mzz**

- The nature and duration of the problem.
- When the problem occurs.
- The components involved in the problem—that is, what type of graphic source, what type, make and model of monitor, type and make of cable, etc.
- Any particular application that, when used, appears to create the problem or make it worse.
- The results of any testing you've already done.

To solve some problems, it might be necessary to upgrade the ACU315A Converter's firmware. If this turns out to be the case for your difficulty, our Technical Support technicians will arrange for you to receive the new firmware and will tell you how to install it.

### Shipping and Packaging

If you need to transport or ship your ACU315A Converter:

- Package it carefully. We recommend that you use the original container.
- If you are shipping it for repair, please include the Unit's external power supply. If you are returning it, please include everything you received with it. Before you ship the ACU315A Converter back to Black Box for repair or return, contact us to get a Return Material Authorization (RMA) number.

**How to contact your local Black Box**

**Great Britain:**

Black Box Network Services (UK) Ltd.  
464 Basingstoke Road  
Reading  
Berkshire  
RG2 0BG

**Technical Support (Product)**

**Tel:** 0118 965 6000  
**Fax:** 0118 965 6001  
**email:** [techhelp@blackbox.co.uk](mailto:techhelp@blackbox.co.uk)

**Order Line and Sales**

**Tel:** 0118 965 5100  
**Fax:** 0118 965 5001  
**email:** [sales@blackbox.co.uk](mailto:sales@blackbox.co.uk)

**Italy:**

Black Box Italia S.P.A.

**Tel:** 0227400280  
**Fax:** 0227400219

**Web Site:** [www.blackbox.it](http://www.blackbox.it)

**Australia:**

Black Box Catalog Australia PTY LTD

**Tel:** 0398797100  
**Fax:** 0398702955

**Brazil:**

Black Box Do Brasil

**Tel:** (011) 5515-4000  
**Fax:** (011) 5515-4002  
**Web Site:** [www.blackbox.com.br](http://www.blackbox.com.br)

**Canada:**

Black Box Canada Corp.

**Tel:** 0416-736-8000  
**Fax:** 0416-736-7348  
**Web Site:** [www.blackbox.com](http://www.blackbox.com)

**Netherlands:**

Black Box Datacom BV

**Tel:** 03032417799  
**Fax:** 0302414746  
**Web Site:** [www.blackbox.nl](http://www.blackbox.nl)

**Mexico:**

Black Box De Mexico S.A. de C.V

**Tel:** 05-420-0100  
**Fax:** 05-420-0123  
**Web Site:** [www.blackbox.com.mx](http://www.blackbox.com.mx)

**How to contact your local Black Box**

**Belgium:**

Black Box

Tel: 027258550

Fax: 027259212

Web Site: [www.blackbox.be](http://www.blackbox.be)

**Japan:**

Black Box Catalog

Tel: 03-3820-5011

Fax: 03-3820-5010

Web Site: [www.blackbox.co.jp](http://www.blackbox.co.jp)

**Deutschland:**

Black Box Deutschland

Tel: 0811/5541-0

Fax: 0811/5541-499

Web Site: [www.blackbox.de](http://www.blackbox.de)

**Switzerland:**

Datacom Black Box Services AG

Tel: 0554517070

Fax: 0554517075

Web Site: [www.black-box.ch](http://www.black-box.ch)

**France:**

Black Box Catalogue

Tel: 0145606700

Fax: 0145606747

Web Site: [www.blackbox.fr](http://www.blackbox.fr)

**U.S.A:**

Black Box Corporation

Tel: 724-746-5500

Fax: 724-746-0746

Web Site: [www.blackbox.com](http://www.blackbox.com)

**Spain:**

Black Box Comunicaciones S.A.

Tel: 34 91 663 0200

Fax: 34 91 661 84 35

Web Site: [www.blackbox.es](http://www.blackbox.es)

**Chile:**

Black Box Chile

Tel: 00 562 223 8811

Fax: 00 562 225 1002

Web Site: [www.Blackbox.cl](http://www.Blackbox.cl)

## Appendix F: Specifications

### Power Requirements

<i>Voltage</i>	PSU: 90..240VAC-0.5A-47..63Hz/6VDC-2000 mA
<i>Power required</i>	ACU315A Converter: approx. 8W

### Interface

(Depending on type of device)

<i>Monitor</i>	VGA (res.: 1280x1024@75Hz, plug&play supported) DVI (res.: 1280x1024@60Hz, plug&play supported)
<i>Colour Depth</i>	15 Bit for converting to DVI/VGA (5 Bit per colour)
<i>Bandwidth</i>	165 MHz
<i>RGB/RGBS</i>	0,7Vpp for color signals without Sync, 1Vpp for GREEN (with Sync), 0,7Vpp for composite Sync
<i>CGA/EGA</i>	TTL for colours and Sync
<i>FBAS / Composite</i>	1Vpp composite video signal
<i>Y/C</i>	0,7Vpp for luminance signal and chrominance

### Size and Shipping Weight

<i>ACU315A Converter</i>	6.7"x5.2"x1.7" (170x133x44mm) Weight: 2.2lb (1.0kg) each
<i>Shipping box</i>	Shipping Box: 18.1"x9.8"x4.7" (460x250x120mm) Weight: 9.5lb (4.3kg)

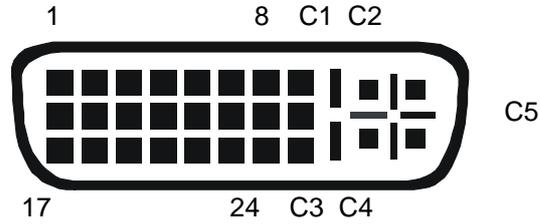
### Environmental

<i>Operating Temperature</i>	41 to 113°F (5 to 45 °C)
<i>Storage Temperature</i>	-13 to 140°F (-25 to 60 °C)
<i>Relative Humidity</i>	max. 80% non-condensing

## Appendix G: Connectors and Cables

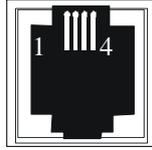
### ACU315A Converter Connector Pinouts

DVI-I Female connector (for Input and Output)



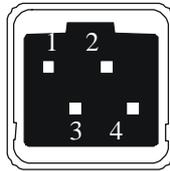
<i>Pin</i>	<i>Signal</i>	<i>Pin</i>	<i>Signal</i>	<i>Pin</i>	<i>Signal</i>
1	T.M.D.S data 2-	9	T.M.D.S data 1-	17	T.M.D.S data 0-
2	T.M.D.S data 2+	10	T.M.D.S data 1+	18	T.M.D.S data 0+
3	T.M.D.S data 2 GND	11	T.M.D.S data 1 GND	19	T.M.D.S data 0 GND
4	n.c.	12	n.c.	20	n.c.
5	n.c.	13	n.c.	21	n.c.
6	DDC Input (SCL)	14	+5V Power	22	T.M.D.S clock GND
7	DDC Output(SDA)	15	GND	23	T.M.D.S clock +
8	Analog VSYNC	16	Hot Plug recognition	24	T.M.D.S clock -
C1	Analog Red			C3	Analog Blue
C2	Analog Green	C5	Analog GND	C4	Analog HYSNC

Programming



<i>Pin</i>	<i>Signal</i>
1	TxD (to PC RxD)
2	RxD (from PC TxD)
3	DTR from PC
4	GND

Power

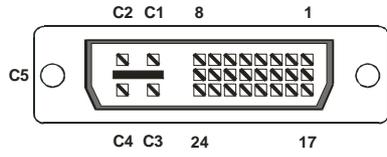


<i>Pin</i>	<i>Signal</i>
1	GND
2	Earth
3	n.c.
4	+6VDC
Housing	Shield

**Adapter Cables**

**DVI/VGA Adapter**

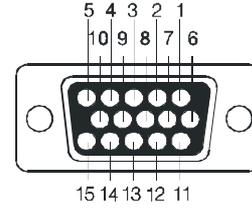
ACU315A Converter:  
DVI-I male connector



<i>Pin</i>	<i>Signal</i>
6	DDC Input (SCL)
7	DDC Output(SDA)
8	Analog VSYNC
C1	Analog Red
C2	Analog Green
C3	Analog Blue
C4	Analog HYSNC
C5	Analog GND

Monitor:

HD15 female connector



<i>Pin</i>	<i>Signal</i>
15	DDC Input (SCL)
12	DDC Output (SDA)
14	Analog VSYNC
1	Analog Red
2	Analog Green
3	Analog Blue
13	Analog HSYNC
6,7,8	Analog GND