

Welcome to the VGA to DVI Converter!

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

That's because our VGA to DVI Converter is all about breaking away from the traditional model of attaching a new display to an old graphic source. The VGA to DVI Converter – the one-stop answer for all your VGA adapting needs!

And that's not all: With our VGA to DVI Converter you can also process DVI-D signals and use the built in scaling function to resize the screen resolution depending on your special demands.

This manual will tell you all about your new VGA to DVI 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:

K238-4V: VGA to DVI Converter

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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.

THE VGA TO DVI CONVERTER

EC DECLARATION OF CONFORMITY

The products listed below in the form as delivered are in conformity with the provisions of the following European Directives:

2004/108/EG Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility

CE-marking 2009



Product list:

K238-4V

Conformity to the Directives is assured through the application of the following standards:

EN 55022:	09/2006	Class A
IEC 61000-4-2:	02/2001	
IEC 61000-4-3:	05/2006	
IEC 61000-4-4:	12/2004	
IEC 61000-4-5:	11/2006	

This declaration certifies the conformity to the specified directives but contains no assurance of properties. The safety documentation noted in this manual shall be considered in detail. The length of the attached CPU- or Console Cables must not exceed 3m. The use of suggested interconnect cables is mandatory.

Oberteuringen, June 23rd, 2009

The management

A handwritten signature in black ink, appearing to read 'Peter Prigel'. The signature is written in a cursive, flowing style.

manufacturer: IHSE GmbH
Maybachstrasse 11
88094 Oberteuringen
Germany

WARNING: This equipment has been found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

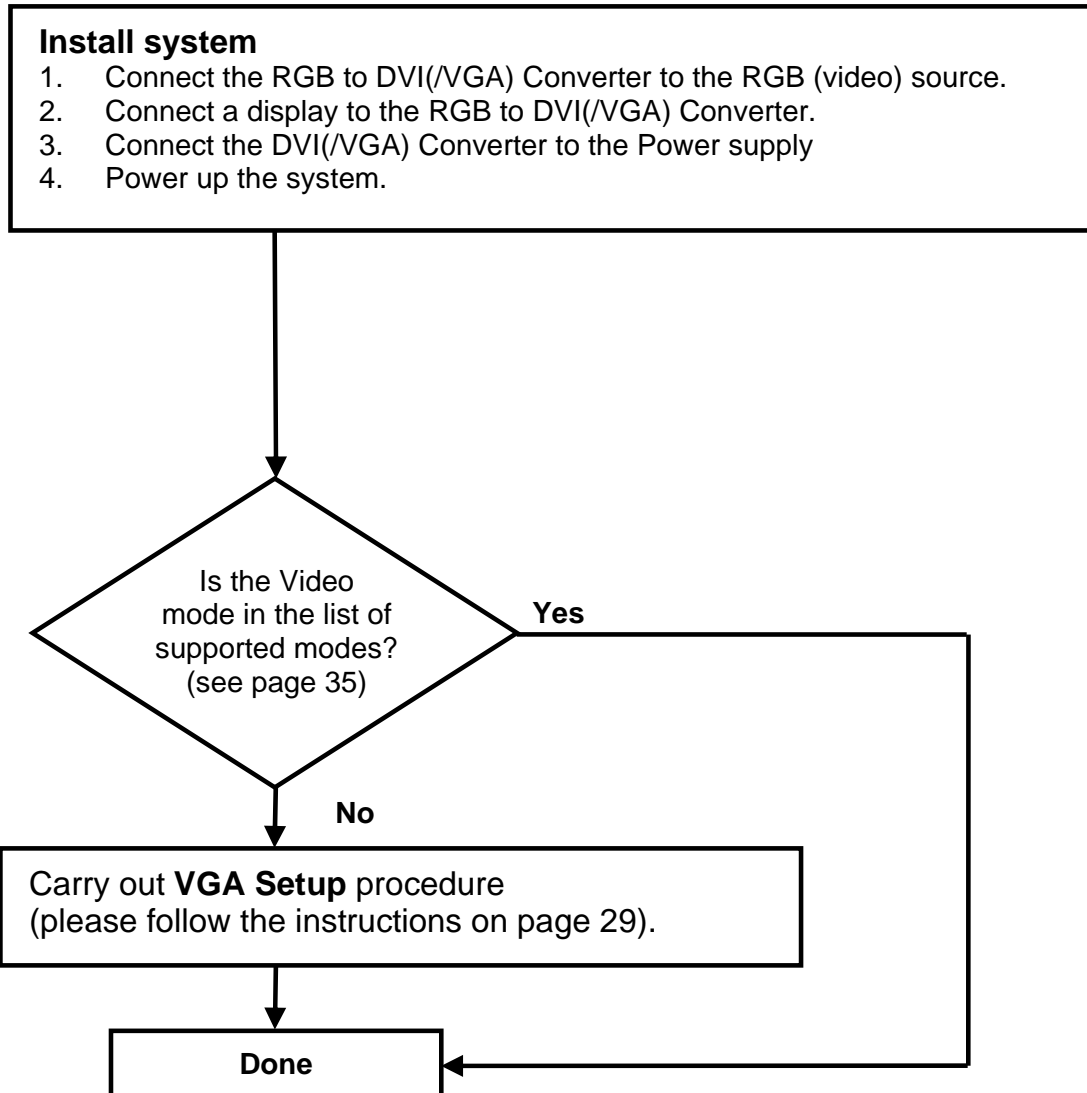
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1. Quick Setup

This section briefly describes how to install your VGA to DVI 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 9 when following this procedure.



1.1 Command Summary

The following table summarizes the remote control buttons sequences used in system configuration and video tuning on the VGA to DVI Converter.

Infrared Remote Control (IR-RC)	
	Exit OSD
	Select next position / increase parameter
	Select previous position / Decrease parameter
	Enter OSD
	Direct Brightness Control
	Direct Contrast Control
	Reset to factory defaults
	Back to the Menu selection

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.

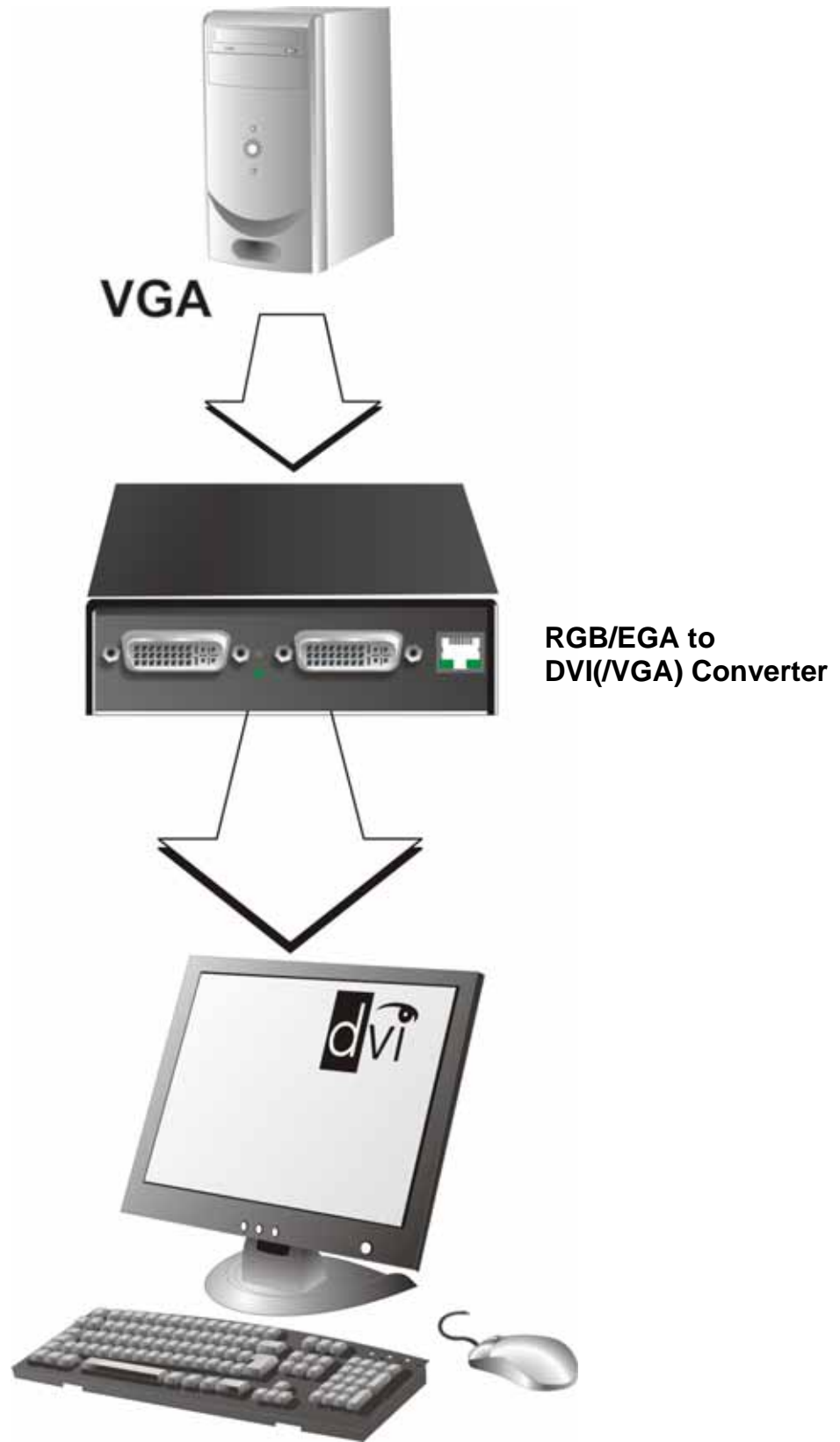
Newer TFT screens do not longer support VGA input. To use them with a VGA source, you need a VGA to DVI converter. To do this job, the converter needs to know the exact count of pixels per line and the phase of the pixels within the line. Without this information, the converter is not able to convert properly.

To display VGA data on a modern DVI display, the VGA to DVI Converter digitises 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 scaled. The VGA to DVI Converter is equipped with various automatic and manual video correction tools in an on screen utility (see page 19).

2.2 Glossary

The following terms are used in this guide:

VGA (also called RGBHV)	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).
DVI	Digital Video standard established by the Digital Display Working Group (www.ddwg.org). R, G, B, CLOCK signals in an up to 1.4 Gbit/sec data stream. The signals have a TMDS level.
PSU	The desktop power supply for the VGA to DVI Converter.



VGA to DVI Converter system

2.3 Features

VGA to DVI Converter offers the following features:

- Support for VGA and DVI-D.
- Selectable output for attached display: 800x600, 1024x768, 1280x1024 or resolution unchanged



Please note: while scaling the picture, the refresh rate is not altered! For a best result in displaying on a flat screen, please change the settings of your graphic card to a refresh rate of 60Hz!

- All control and video tuning carried out using an on screen display (OSD) with settings stored in EEPROM memory.
- A large table of known VGA resolutions (more than 55) preinstalled.
- VGA to DVI 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:

- Rack mount Kit 19"/1U: Type 455-4G

2.4 Product Range

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

<i>VGA to DVI Converter</i>	
K238-3V	VGA to DVI Converter
<i>Upgrade Kits</i>	
436-ID	DVI-D to DVI-I cable (optional)
436-IA	DVI-A to DVI-I cable (Option)
455-4G	19"/1U housing for up to 4 devices
455-1K	Mounting Plates (screw-fixed)
455-2K	Mounting Plate (snap-on)
260-6H	Universal switch mode p.s.u. 90...230VAC/6VDC-2A

2.5 Compatibility

Interface Compatibility

- **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) R, G, B, CLOCK in an up to 1.4 Gbit/sec data stream. The signals have a TMDS level.
- **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).

2.6 How to Use This Guide

This guide describes the installation and configuration of the VGA to DVI 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 VGA to DVI Converter Kit, this will contain PSU and all the cables/adapters required to connect the VGA to DVI Converter to your graphic source. See also **Package Contents** (page 15)

For information about connection and installation, see **Installation**, page 15.

Adjusting the VGA to DVI Converter to RGB Video

Although there are several preconfigured resolutions stored in the internal resolution table of the VGA to DVI Converter, under some circumstances it is required to manually adapt the VGA to DVI Converter to your specific resolution: see **VGA to DVI Converter Setup** (page 29).

DDC Information

In default settings, the DDC of the connected monitor is looped through to the graphic card. Under some circumstances, it might be necessary, send other data than those in this DDC table to the graphic card. There are two possible scenarios:

1. **Intern** – The data from the internal table are transmitted to the graphic card. The data, stored in the internal table you may find on **Appendix E: Content of internal DDC table** on page 37. In mode ‘Create VGA’ you may replace the content of the internal table by the information of the attached monitor and converted to a (analogue) DDC. To undo this step, please procure a ‘reset to factory defaults’.
2. **Create VGA** – In mode ‘Loop through’, the connected monitor provides a (digital) DDC. A VGA graphic card possibly does not show a picture (because the graphic card expects, to have a digital (DVI) monitor attached. To solve this problem, you may convert the internal table to a (VGA/analogue) DDC. Selecting the mode ‘Create VGA’ will cause automatically to translate the internal (digital) DDC to a (VGA/analogue) DDC.

If you do not want to use the originally delivered data in the internal table, you may download it from the attached monitor and convert it. To do this, please connect and power all devices. Now unplug and re-plug the cable between converter and monitor. The monitor DDC is automatically downloaded and converted.

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 VGA to DVI Converter more conveniently.

3.1 Package Contents

You should receive the following items in your VGA to DVI Converter package:

VGA to DVI Converter unit.

HD15male to DVI-I cable



5V DC universal power supply for VGA to DVI Converter.

Programming cable (DB9 female to RJ11 4p4c).

User manual (Quick Setup).

German-type power cord.

Infrared Remote Control (IR-RC)

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

3.2 Connection Cable Requirements

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

- **DVI-D:** DVI-D male/male
- **VGA:** Special VGA to DVI-I Cable HD15male-DVI-male
- **Power Supply**

Connect the supplied 5V/DC power supply to the **Plug** terminal on the rear of the VGA to DVI Converter.

3.3 System Setup

To install your VGA to DVI Converter:

1. Switch off all devices.
2. Connect your TFT directly to the device.
3. **VGA:** Connect the graphic source to the input connectors using the VGA to DVI-I Cable.

DVI-A (VGA at DVI connector): Connect the graphic source to the input connectors using the optional DVI-A to DVI-I Cable.

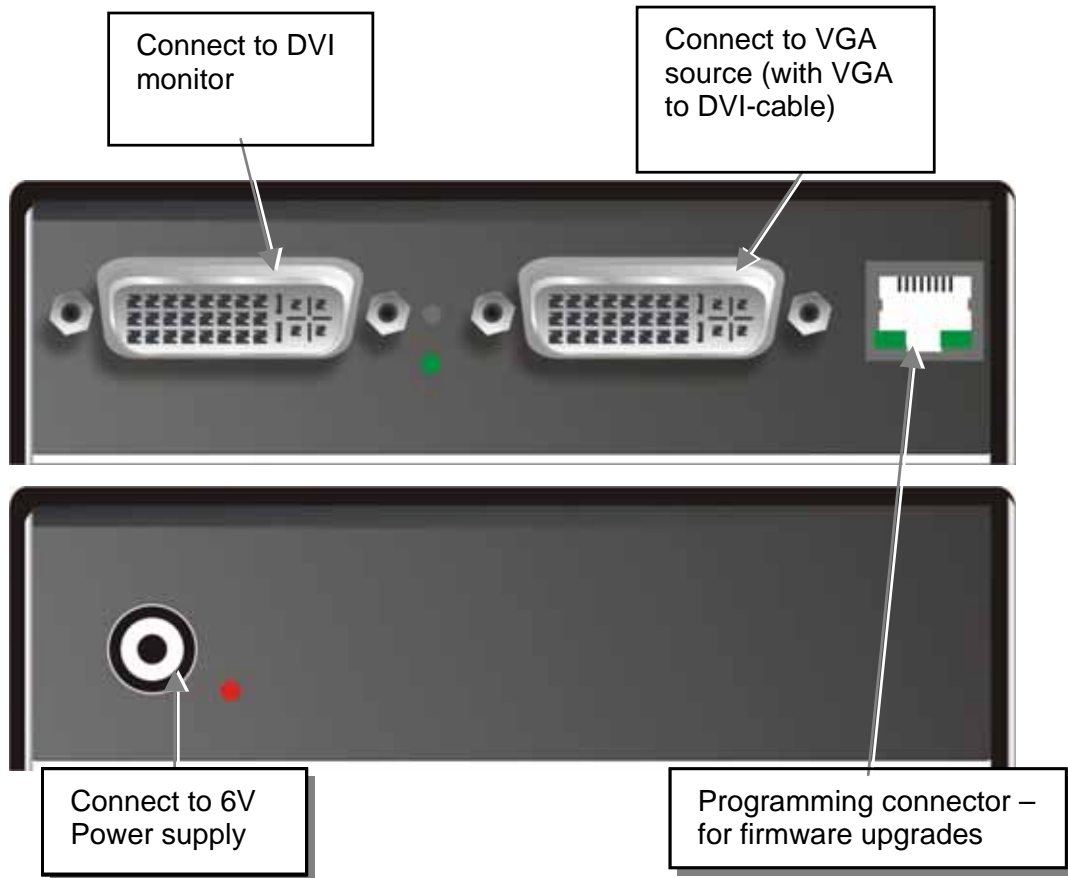
DVI-D: Connect the graphic source to the input connectors using the optional DVI-D to DVI-I Cable.

4. Connect the 5V 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.



VGA to DVI Converter

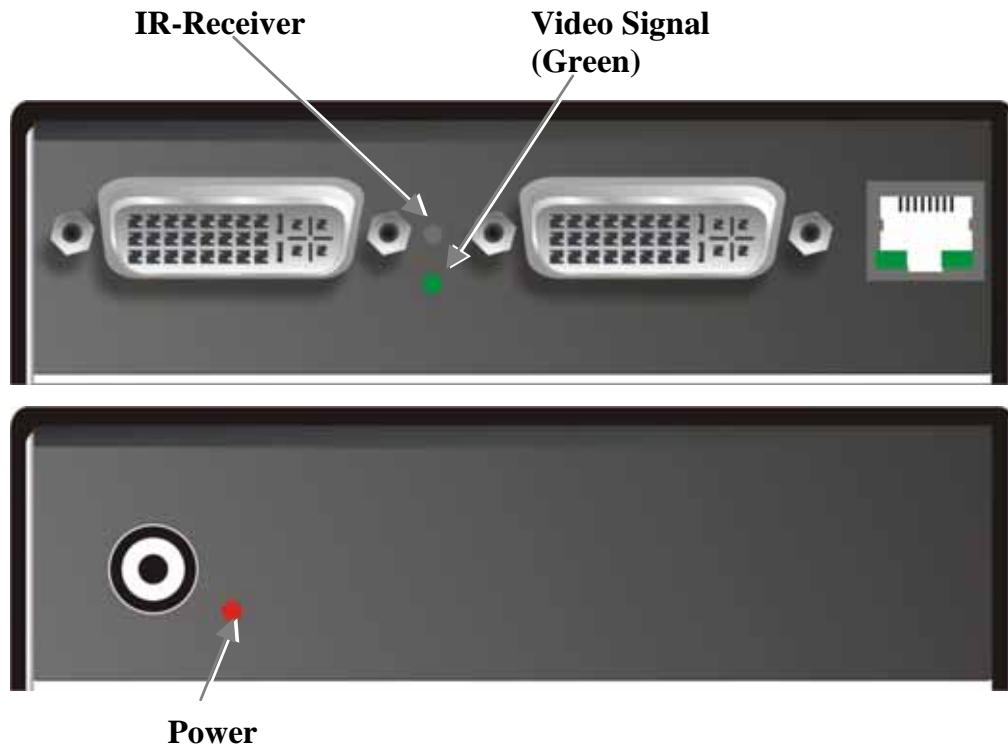
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3.4 Diagnostic LEDs

Each VGA to DVI Converter is fitted with two indicator LEDs: *Video Signal* and *Power*.

The *Power* LED is to right of the power supply connector. The *Video Signal* LEDs is right to the DVI Input connector.

The location of the LEDs is shown below:



Diagnostic LEDs on VGA to DVI Converter

<i>LED</i>	<i>Appearance</i>	<i>Diagnostics</i>
Video Signal (Green LED)	On Off	Attached and valid mode detected No video signal or valid mode detected
Power LED (Green LED)	On Off	Device ready Device not ready

4. Device Control

If you are using a VGA input stored in the internal table, no adjustment should be required. In other cases, you may need to optimize the output using the VGA to DVI Converter's on-screen display (OSD).

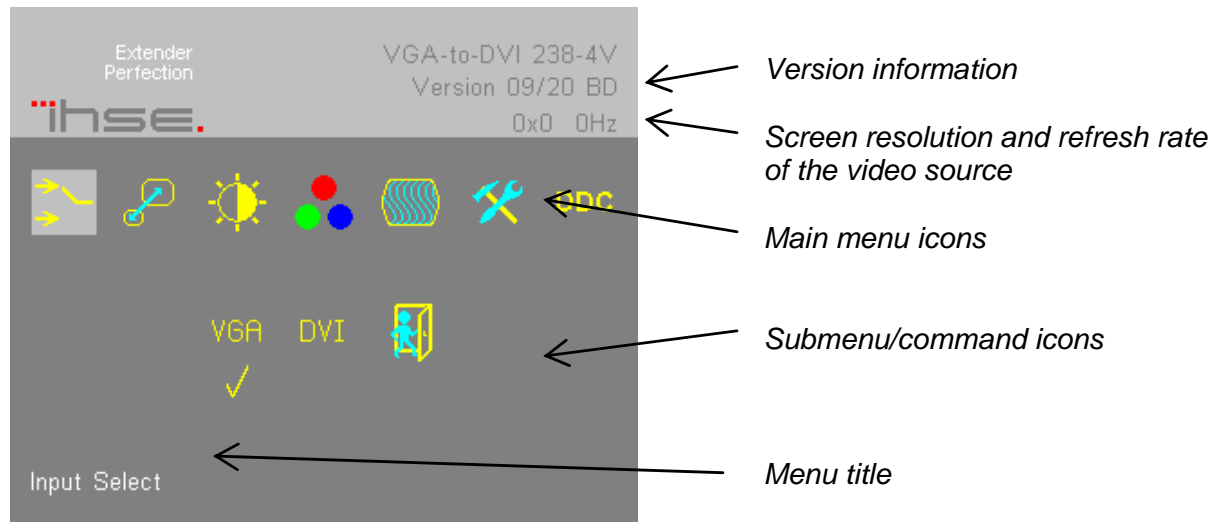


Figure 1 **OSD Utility**

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

- Brightness/contrast
- Selection of Input Signal

You can adjust the following properties using the OSD:

- Auto Configuration ON/OFF
- Color, Color Temperature adjustments
- Brightness/contrast
- Output Image Scaling and Sizing
- OSD operation, factory reset.
- DDC Settings

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4.1 Opening the OSD

You can access the OSD by using the equipped Infrared Remote Control (IR-RC).

Using the IR-RC

For direct brightness adjust

For direct contrast adjust



more brightness

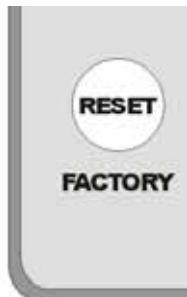
less brightness



more contrast

less contrast

Reset to factory defaults



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

To navigate within the OSD:



exit OSD without saving values (ESC key)

Navigate to the left, Parameter (-) (left arrow key)

Navigate to the right Parameter (+) (right arrow key)

pop up the OSD, select function/ submenus, store modified parameter (Enter-Key)

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, RGBS, RGBHV (VGA), EGA, CGA, MDA



Scale Mode

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



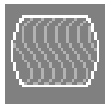
Brightness – Contrast

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.

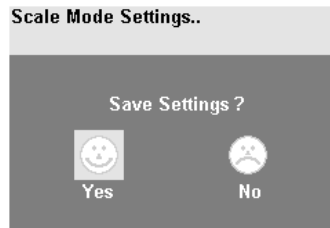
1. Use the left and right arrow to highlight the icon you want. The OSD displays additional icons relating to commands in the selected menu category.
2. Press the Enter key. The OSD highlights the first command icon.
3. Use the Left and Right arrow keys to highlight the command or submenu you want. In 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 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 to change the value as required.






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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 to confirm your choice. Alternatively, highlight the *No* button and press the Enter key to discard the new setting and restore the previous value.
8. Select the Exit icon to close a submenu.
9. Press the Esc key to close the OSD, saving all settings, and restore normal mouse and keyboard functions.

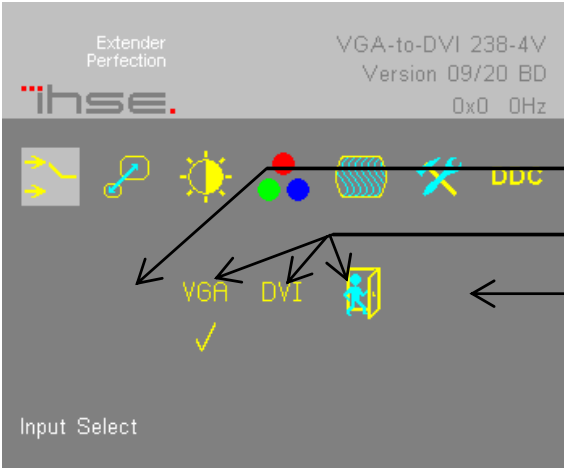
The following table summarizes the keyboard actions and icons used to navigate the OSD utility, and to select and adjust the VGA to DVI Converter's parameters:

<i>Key/Icon</i>	<i>Action</i>
	Close the OSD, restore normal keyboard and mouse functions.
	Return to previous Menu selection.
	Open the highlighted menu or submenu Accept the highlighted command
	Select the previous menu or command icon Decrease the highlighted parameter
	Select the next menu or command icon Increase the selected parameter

Input Select



Choose the type of the connectes graphic source



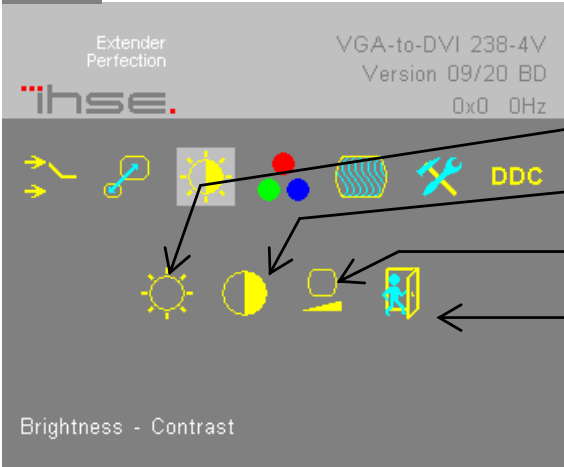
- Select VGA source
- Select DVI source
- Return to main menu

Input Select menu

Brightness/Contrast



Use this menu to adjust the brightness and contrast of the video image, or to adjust the black level of a display.

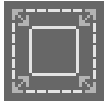


- Adjust Brightness
- Adjust Contrast
- Adjust Black level
- Return to main menu

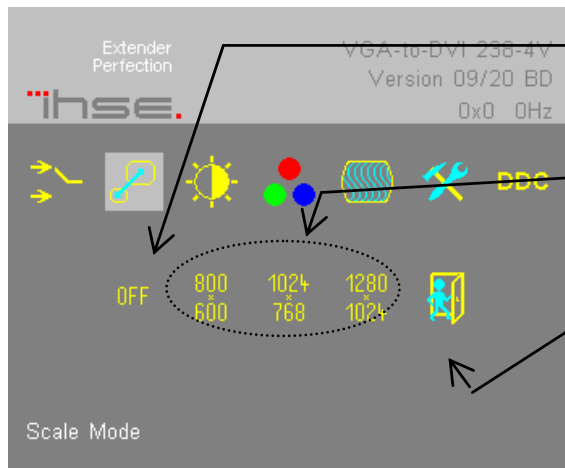
Brightness-Contrast menu

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Scaling



Use the Output Scaling submenu to specify the best match between screen size and user requirements. Neither transparent conversion nor conversion with scaling alters the refresh rate!



No scaling: picture displayed in original size, output refresh rate = input refresh rate

Choice of 3 output resolutions for scaling (output refresh rate = input refresh rate)
800x600, 1024x768, 1280x1024

Return to previous menu

Output Scaling sub-menu



It is not possible, to alter during conversion the refresh rate! If you source 50Hz or 75Hz VSYNC – please make sure, that your flat screen is able to display a picture with this refresh rate. Otherwise please select 60Hz refresh rate in the settings of your graphic card.

Please note, that scaling of a 16:9 resolution to a 4:3 resolution will result in misaligned aspect ratio of the displayed picture.



If your input signals are DVI-D and you use scaling for downsizing your picture, please note, that there are limits for the scaling factor: The pixel clock of the input signal needs to be at maximum 1.9x output pixel clock.

This means:

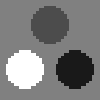
Output 800x600 → max. input resolution 1024x768

Output 1024x768 → max. input resolution 1680x1050 (Reduced Blanking)

Output 1280x1024 → each input resolution possible

If your input signals are VGA, there are no restrictions in respect to down- or upsizing your picture!

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.

Automatic color calibration

Standard RGB color selection

View Color temperature submenu (see **Color Temperature**, page 36)

Flesh tone/Skin tone

Set up colors in CMY space – automatically adjusts settings in RGB space

Hue

Saturation

Back to main menu

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.

Set up colors in RGB space – automatically adjusts settings in CMY space

Choice of five color temperature settings: 4200k, 5000k, 6500k, 7500k, 9300k

Back to Color menu

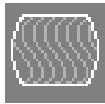
Color Temperature

Exit

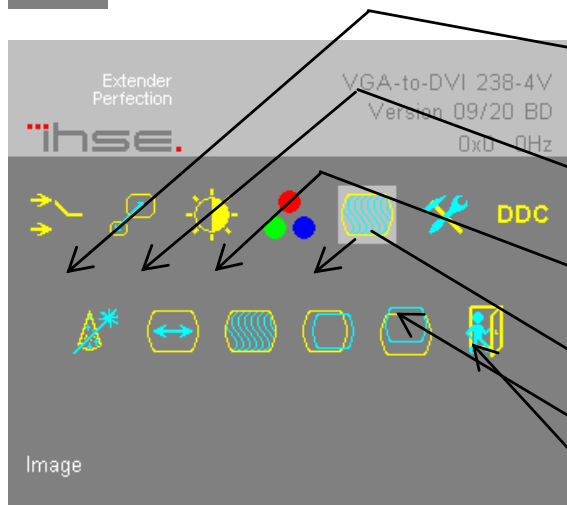
Color Temperature sub-menu

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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.



Automatic detection of the number of pixels per line and the best phase (best point for A/D conversion within each pixel) see also **VGA to DVI Converter Setup**, page 35.

Manually adjust the number of pixels per line (Pixel clock)

Manually adjust the best phase (best point for A/D conversion within each pixel)

Manually adjust the horizontal picture position

Manually adjust the vertical picture position

Back to main menu

Image menu

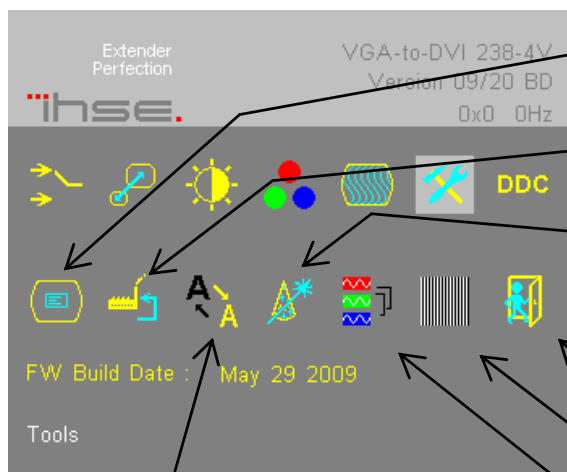


Diese Einstellmöglichkeiten gibt es nur bei VGA Eingangssignalen. Bei DVI Eingangssignalen sind diese Funktionen nicht anwählbar.

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 VGA to DVI Converter system to its factory default settings or provide a test pattern.



Set the position of the OSD window (see **OSD**, page 31)

Calling Factory Reset Sub-Menu

Choose whether to automatically adjust pixels per line and pixel phase after a mode change (see page 32)

Back to main menu

Display a 'burst' pattern for monitor setup (see **Monitor Setup**, page 34)

Select color depth for conversion

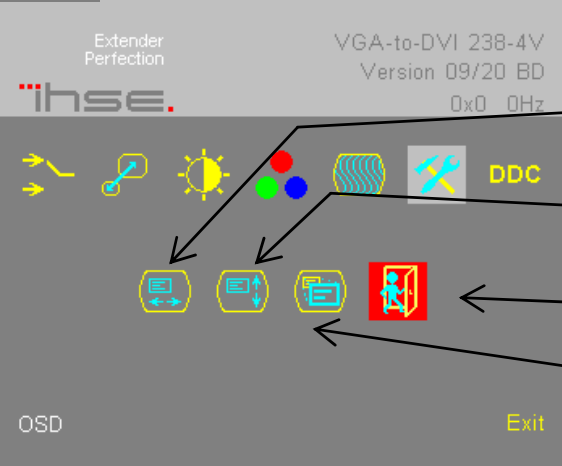
Adjust sharpness (fixed resolution modes only). When resolution is changed by an imposed fixed resolution, sharpness can be affected. Use this option to switch between three settings for optimum sharpness

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.



Manually adjust the horizontal position of the OSD window

Manually adjust the vertical position of the OSD window

Back to Tools menu

Toggle the size of the OSD window between single and double size

OSD sub-menu

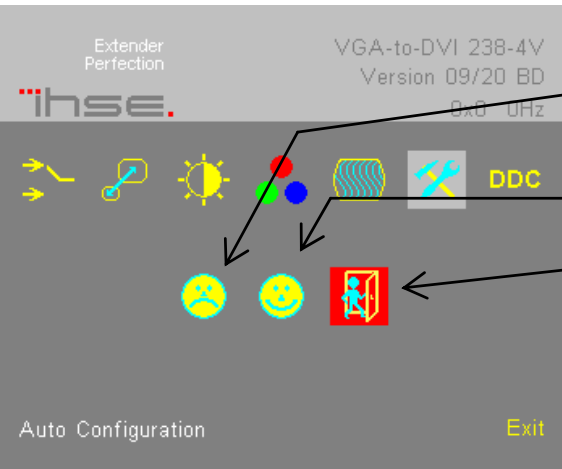
Auto Configuration



Use the Auto Configuration submenu to define whether the 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.



Disable Automatic detection of pixels per line and phase after a mode change

Enable Automatic detection of pixels per line and phase after a mode change

Back to Tools menu

Auto-Configuration sub-menu

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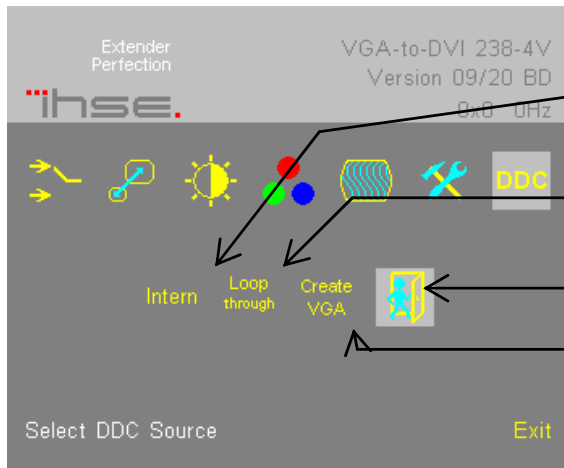
DDC Configuration



Use the DDC Configuration menu to select, which DDC information shall be transmitted to the graphic card. Default the signals of the monitor attached are transmitted. Under some circumstances, it might be necessary, to send a modified table to the graphic card – in this case, please select ‘INTERN’. Please note, that there is the possibility, to download a foreign DDC table into the internal table. Please read therefore how to do on **DDC Information** on page 14

Under some circumstances, the Local unit should identify itself as a ‘VGA monitor’ providing DDC information like a VGA screen (DVI-DDC and VGA-DDC are different!). In this case, you can convert the internal DDC table to a VGA-DDC by hitting the ‘Create VGA’

To view the DDC Configuration menu, select the DDC icon from the main menu. button.



Use the information from the internal DDC table

Connect DDC lines directly from locally attached monitor

Back to main menu

Create a VGA-DDC from DVI DDC in the internal table

DDC Configuration menu

5. VGA to DVI Converter Setup

5.1 Overview

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

5.2 Setup Instructions for RGB Input

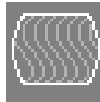
This procedure is designed to correct for discrepancies in the video signal due to analogue/digital video conversion by the VGA to DVI Converter.

1. Display from your graphic source a picture with as much detail as possible. If possible, display a 'burst-pattern' (see picture on next page) - 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 20).

3. Select the Image menu option:



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



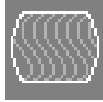

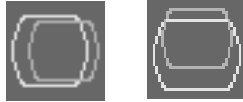
5. Assess the desktop test pattern. If the vertical stripes are sharp and without jitter or smearing, the adjustment has been successful. Go to step 9.
6. If the picture quality is not acceptable after the automatic adjustment, you will have to manually adjust the pixel clock and pixel phase (in this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

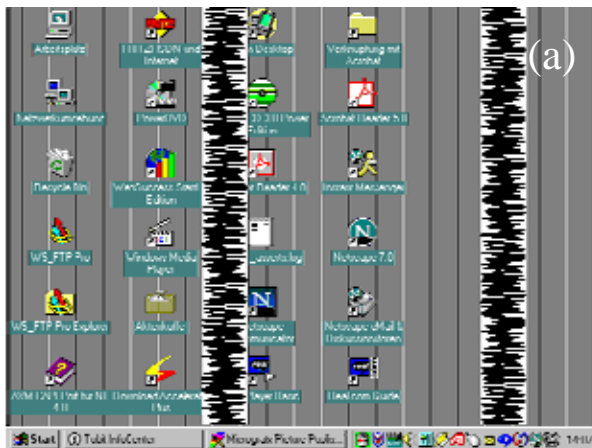
- a. Return to the OSD utility and select the menu command:
Manually adjust the number of pixels per line (Pixel clock) from the Image menu.



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

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8. Problems with the pixel phase will cause horizontal noise, horizontal wave-formed lines, flicker or smearing with zebra-pattern (see picture b below):
 - 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.



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

6. Troubleshooting

6.1 Video

There isn't a picture.

Check the power supply connection at the VGA to DVI Converter. Is the *Device Ready* (Red LED) illuminated (see page 18)? If not, the internal power-supply may be damaged or there may be an internal error.

Check that you are using a supported video mode (see **Appendix D: Supported Video Modes**). At the VGA to DVI Converter, is the *Video Signal* LED illuminated (see page 18)? If not, please proof, whether the graphic card provides a picture. Often the graphic card shows no picture because of missing or wrong DDC information. Please check additionally, whether the graphic card requires an analogue DDC – see also **DDC Information** on page 14.

There is horizontal jitter on the picture.

The pixel clock and/or phase is misaligned: Refer to page 29.

Characters are smeared.

The phase is misaligned: Refer to page 29.

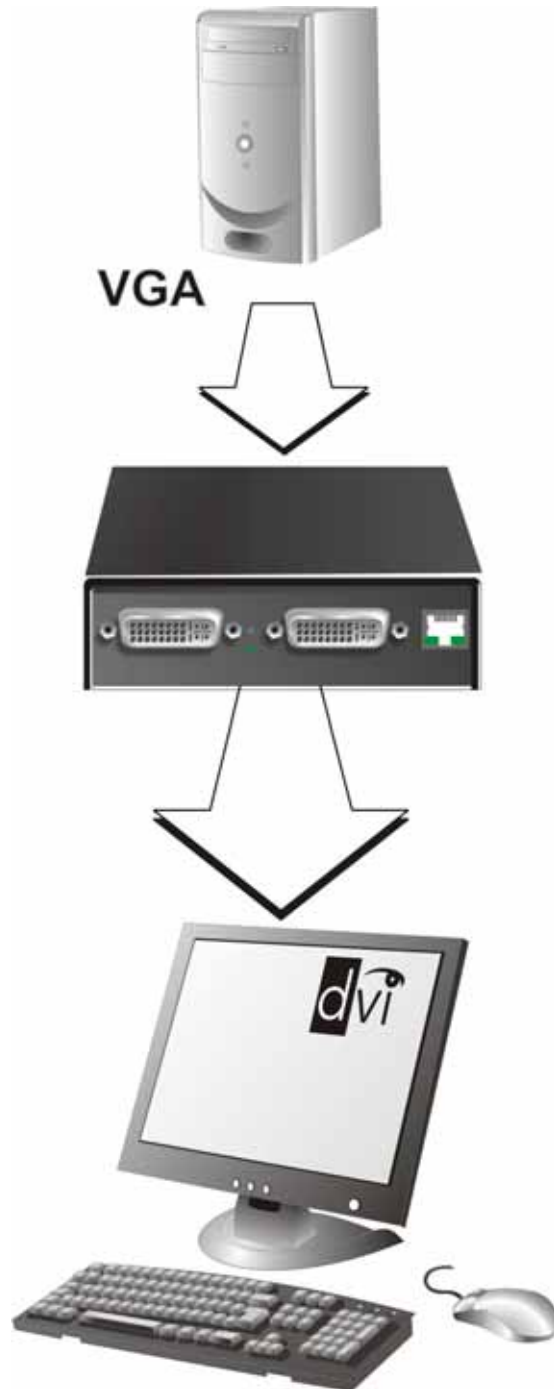
Thin vertical lines are missing.

The phase is misaligned: Refer to page 29.

Appendix A: Example Applications

This section illustrates some specific applications using the VGA to DVI Converter:

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



VGA to DVI Converter attached to a PC

Appendix B: Rack Mount Options

VGA to DVI Converters can be mounted in a 19" rack using the mounting kit:
RGB to DVI (VGA) Rackmount Kit

This contains the following parts:

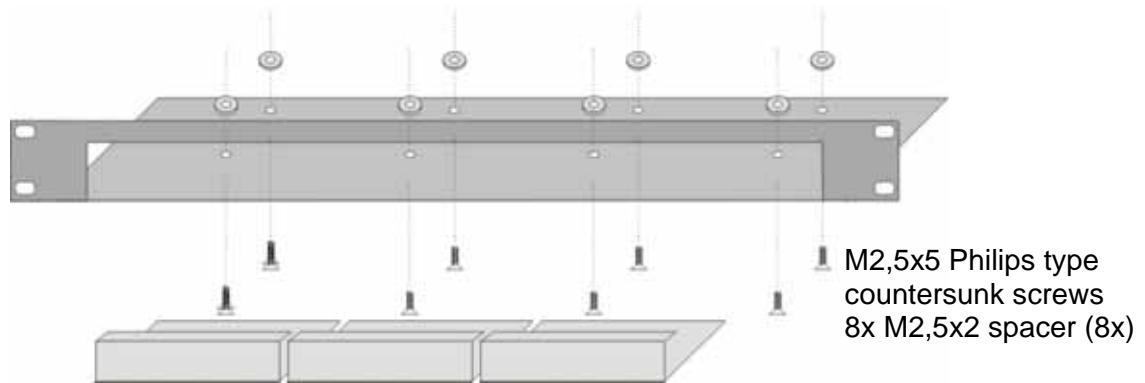


Figure 2 **Rack Mounting Kit**

To mount a unit:

1. Align the holes on the base plate with the vacant screw holes on the base of the VGA to DVI Converter unit.
2. Fasten the base of the unit to the plate of the mounting kit using the supplied screws.



Only use the supplied, short screws, to prevent damages on the PCB's

3. Close the remaining gaps with blanking plates.

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The kit allows you to mount a different count of devices
(1...4 devices):



Einbau 1 Gerät
mounting 1 device



Einbau 2 Geräte
mounting 2 devices



Einbau 3 Geräte
mounting 3 devices



Einbau 4 Geräte
mounting 4 devices

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 Converter.

description	Hres pixels	Vres lines	V-freq Hz	H-freq kHz	DotCLK MHz
DOS graphic Mode	640	350	69,6	31,3	25,0
Vesa Standard	640	350	85,1	37,9	31,5
VGA	640	400	56,3	24,7	21,0
VGA	640	400	69,6	31,3	25,0
Vesa Standard	640	400	85,1	37,9	31,5
Vesa Standard	640	480	60,2	31,5	25,3
Mac Mode	640	480	67,0	35,0	31,5
Vesa Standard	640	480	72,8	37,9	31,5
Vesa Standard	640	480	75,0	37,5	31,5
Vesa Standard	640	480	85,0	43,3	36,0
DOS Text Mode	720	400	69,6	31,5	28,1
Vesa Standard	720	400	85,0	37,9	35,5
NTSC progressive	720	480	59,9	31,5	27,0
PAL progressive	720	576	50,0	31,3	27,0
Vesa Standard	800	600	56,3	35,2	36,0
Vesa Standard	800	600	60,3	37,9	40,0
Vesa Standard	800	600	72,2	48,1	50,0
Vesa Standard	800	600	75,0	46,9	49,5
Vesa Standard	800	600	85,1	53,7	56,3
Mac Mode	832	624	75,1	49,7	55,5
Vesa Standard	1024	768	60,0	48,4	65,0
Vesa Standard	1024	768	70,1	56,5	75,0
SUN Mode	1024	768	72,0	57,8	75,2
Vesa Standard	1024	768	75,0	60,0	78,8

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Vesa Standard	1024	768	85,0	68,7	94,5
DMT1185	1152	864	70,0	63,8	100,0
Mode	1152	864	70,0	63,8	94,5
Vesa Standard	1152	864	75,0	67,5	108,0
SUN Mode	1152	900	66,0	61,8	94,5
Vesa CVT16:9	1280	720	60,0	44,8	74,5
WXGA	1280	768	60,0	48,1	81,2
WXGA	1280	768	60,2	47,8	80,0
WXGA16:10 CVT	1280	800	59,8	49,7	83,5
Vesa Standard	1280	960	60,0	60,0	108,0
DMT127A	1280	960	75,0	75,0	126,0
Vesa Standard	1280	960	85,0	85,9	148,5
TV	1280	1024	50,0	53,4	90,0
Vesa Standard	1280	1024	60,0	64,0	108,0
SUN mode	1280	1024	66,0	71,7	115,8
SGI	1280	1024	72,0	76,7	128,8
HP Workstation B123L	1280	1024	72,0	78,1	135,0
Vesa Standard	1280	1024	75,0	80,0	135,0
Vesa Standard	1280	1024	85,0	91,1	157,5
TV Mode16:9	1360	765	60,1	47,6	84,5
Plasma TV16:9	1360	768	60,0	47,7	85,5
NVIDIA4:3	1400	1050	59,8	65,2	121,5
TV Mode16:10	1440	900	60,0	55,6	89,0
TV Mode16:9	1600	900	59,9	55,8	118,8
SGI	1600	1024	72,0	77,6	158,3
UXGA genlocked	1600	1200	50,0	75,0	138,0
Vesa Standard	1600	1200	60,0	75,0	162,0
UXGA reduced blank	1600	1200	60,1	75,4	140,6
WSXGA+16:10 DVI	1680	1050	59,9	64,7	119,0
WSXGA+16:10 VGA	1680	1050	60,0	65,3	146,3
TV Mode16:9	1920	1080	50,0	56,4	148,5
TV Mode16:9	1920	1080	59,9	66,6	138,5
EIA861B16:9	1920	1080	60,0	67,5	148,5
WUXGA	1920	1200	60,0	74,0	154,0

Appendix E: Content of internal DDC table

Die folgende Tabelle zeigt Ihnen die DDC Informationen wie sie nach einem ‚Rücksetzen auf Werkseinstellungen‘ aussehen:

Standard Timings :	
720 x 400	at 70Hz - IBM VGA
720 x 400	at 88Hz - IBM XGA2
640 x 480	at 60Hz - IBM VGA
640 x 480	at 67Hz - Apple Mac II
640 x 480	at 72Hz - VESA
640 x 480	at 75Hz - VESA
800 x 600	at 56Hz - VESA
800 x 600	at 60Hz - VESA
800 x 600	at 72Hz - VESA
800 x 600	at 75Hz - VESA
832 x 624	at 75Hz - Apple Mac II
1024 x 768	at 60Hz – VESA
1024 x 768	at 70Hz - VESA
1024 x 768	at 75Hz - VESA
1280 x 1024	at 75Hz - VESA
1152 x 870	at 75Hz - Apple Mac II
1280 x 720	at 60Hz - VESA STD
1280 x 960	at 60Hz - VESA STD
1280 x 1024	at 60Hz - VESA STD
1360 x 765	at 60Hz - VESA STD
1400 x 1050	at 60Hz - VESA STD
1600 x 900	at 60Hz - VESA STD
Native/preferred timing :	
1024 x 768	at 60Hz – VESA
Detailed Timings :	
1280 x 800	60 Hz 83,5 MHz
1360 x 768	60 Hz 85,5 MHz
1680 x 1050	60 Hz 119 MHz
1600 x 1200	60 Hz 162 MHz
1920 x 1080	50 Hz 148,5 MHz
1920 x 1080	60 Hz 148,5 MHz
1920 x 1200	60 Hz 154 MHz

Appendix F: Calling Technical Support

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

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 VGA to DVI 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 VGA to DVI 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 VGA to DVI 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 VGA to DVI Converter back to your dealer for repair or return, contact him to get a Return Material Authorization (RMA) number.

Appendix G: Specifications

Power Requirements

<i>Voltage</i>	PSU: 90..240VAC-0.5A-47..63Hz/5VDC-2000 mA
<i>Power required</i>	VGA to DVI Converter: approx. 8W

Interface

<i>Monitor</i>	DVI (1280x1024@60Hz, plug&play supported)
<i>Colour Depth</i>	24 Bit for converting to DVI/VGA (8 Bit per colour)
<i>Bandwidth</i>	165 MHz
<i>VGA (RGBHV)</i>	0,7Vpp for color signals and TTL for Sync
<i>DVI</i>	Digital Video standard established by the Digital Display Working Group (www.ddwg.org) R, G, B, CLOCK in an up to 1.4 Gbit/sec data stream. The signals have a TMDS level.

Size and Shipping Weight

<i>VGA to DVI Converter</i>	4.0"x5.6"x1.1" (103x143x29mm) Gewicht: 0.55lb (0.25kg)
<i>Shipping box</i>	18.1"x9.8"x4.7" (210x150x165mm) Gewicht: 3.5lb (1.6kg)

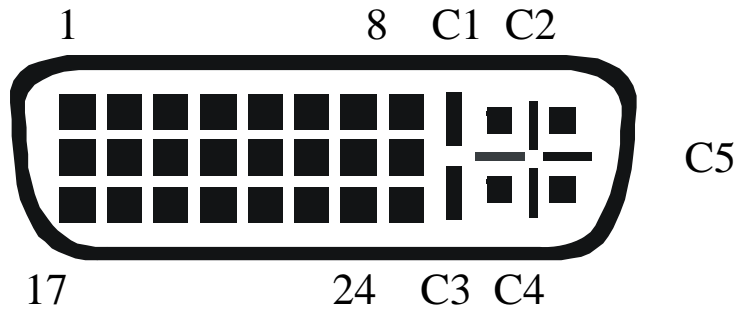
Environmental

<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 H: Connectors and Cables

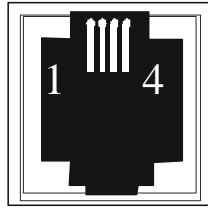
VGA to DVI Converter Connector Pinouts

DVI-I Female connector (for Input and Output)



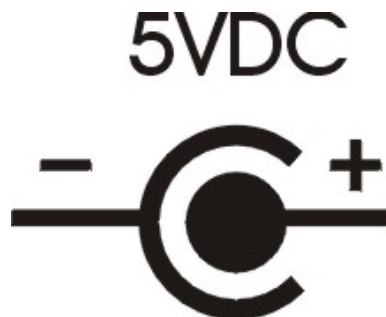
<i>Pin</i>	<i>Signal</i>	<i>Pin</i>	<i>Signal</i>	<i>Pin</i>	<i>Signal</i>
1	T.M.D.S data 2-	9	T.M.D.S data 1-	17	T.M.D.S data 0-
2	T.M.D.S data 2+	10	T.M.D.S data 1+	18	T.M.D.S data 0+
3	T.M.D.S data 2 GND	11	T.M.D.S data 1 GND	19	T.M.D.S data 0 GND
4	n.c.	12	n.c.	20	n.c.
5	n.c.	13	n.c.	21	n.c.
6	DDC 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>
innen	+5V
außen	GND

NOTES