Test Pattern Generator
VTG-5225

User Manual

// U N I G R A F

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CE Mark

The VTG-5225 unit meets the essential health and safety requirements, is in conformity with and the CE marking has been applied according to the relevant EU Directives using the relevant section of the corresponding standards and other normative documents.

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Table of Contents

QUICK START GUIDE

This is a reduced version of the Software and Driver CD Installation procedure. If you feel quite confident with installing new hardware and software in your PC you can attempt this procedure.

WinVTG and DLL Software Installation

▶ Start your PC

▶ Insert Unigraf VTG Installation CD in your PC

▶ WinVTG installation will start

Windows USB Driver Installation

▶ Connect the provided USB cable to VTG-5225 and to a USB port in your PC

▶ Power up VTG-5225

▶ Make sure that Unigraf VTG Installation CD is inserted

Using WinVTG

▶ Start WinVTG and select the VTG-5225 device by double clicking the icon on the left hand side panel

▶ Use the Timing Tool, Pattern Tool, Palette Tool or Output Control on the top of the WinVTG panel for selecting the requested test timing / pattern combination

▶ Congratulations. You are ready to start using the VTG-5225

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1.   GENERAL

About This Manual

This guide leads you through the installation of VTG Video Test Generators and the WinVTG software. It also provides you the general introduction for the functionality.

The purpose of this guide is to

- Give an overview of the VTG-5225 test pattern generator and its features.
- Give instructions for the user on how to install the related software and the drivers to the PC.
- Assist the user in configuring the output signal with the WinVTG tool.

Product and Driver Version

This manual introduces functions in the following set of hardware, firmware and software versions. You can find this information in the Release Notes of your Unigraf VTG Installation Disk.

	Version	Issued
VTG5k Software Release	**v. 1.6.4**	**07.04.2008**
WinVTG3.exe	v.3.1.6	07.04.2008
dpctsgui.exe	v.1.0.3	31.03.2008
Vtg32.dll	v.6.0.8	02.04.2008
Vlib32.dll	v.6.0.4	20.03.2008
vtgpnpserv.exe	v.1.0.1	12.02.2008
VTG5k SW	v.1.6.5	07.04.2008
VTG5k FPGA	v.0b.00.0a.04	07.03.2008
VTGUSB Driver	v.2.0.2	30.11.2007
USB chip SW	v.1.1.3	12.02.2008
UG DP Source	v.2.0.0	02.04.2008

Notes

On certain sections of the manual, when important information or notification is given, text is formatted as follows. Please read these notes carefully.

Note	This text is an important note

2.   INTRODUCTION

Unigraf VTG

VTG is a family of video test pattern generator PCI plug-in boards and independent units intended for providing a high quality video test signal for testing video displays, flat panels modules and other video equipment. The family includes models for sourcing video signal for most display interface types. This manual introduces functions found in VTG-5225, a USB connected video pattern generator.

VTG-5225 Device

Block Diagram
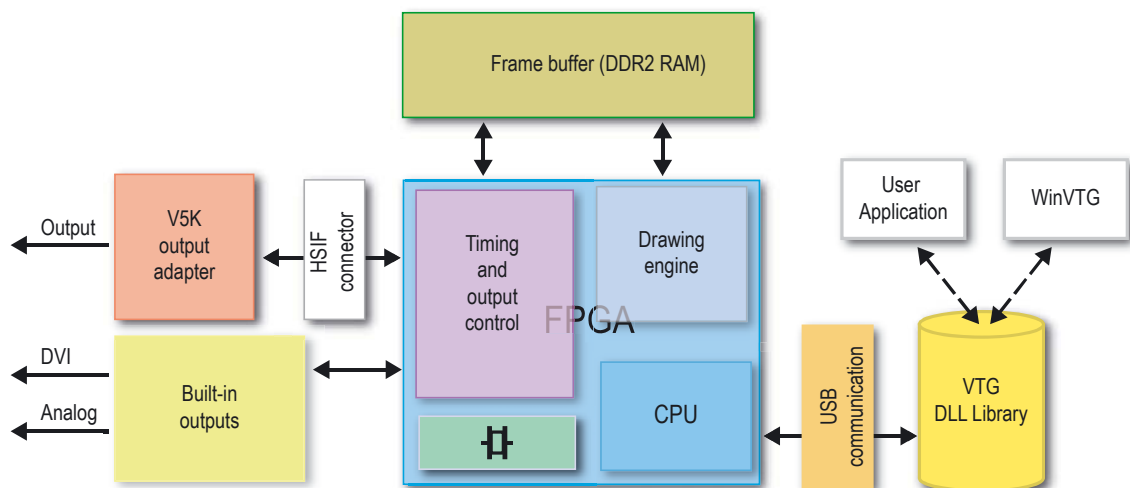
VTG-5225 design is based on an advanced high speed FPGA. The FPGA consist the program execution unit *CPU*, the *Drawing engine* and the *Timing and output control*. The test patterns are stored in the *Frame Buffer* and clocked out to *Built-in outputs* or *V5K output adapters* via the *HSIF connector*.

WinVTG user interface or a customer application uses the *VTG DLL library*. The library communicates with the CPU over the *USB communication* instructing it to execute drawing functions, set the timing or perform other tasks.

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Identifying Connectors

The image below shows the built-in connectors of the VTG-5225 device. Each *V5K output adapter* will have its own connections not shown in this image.
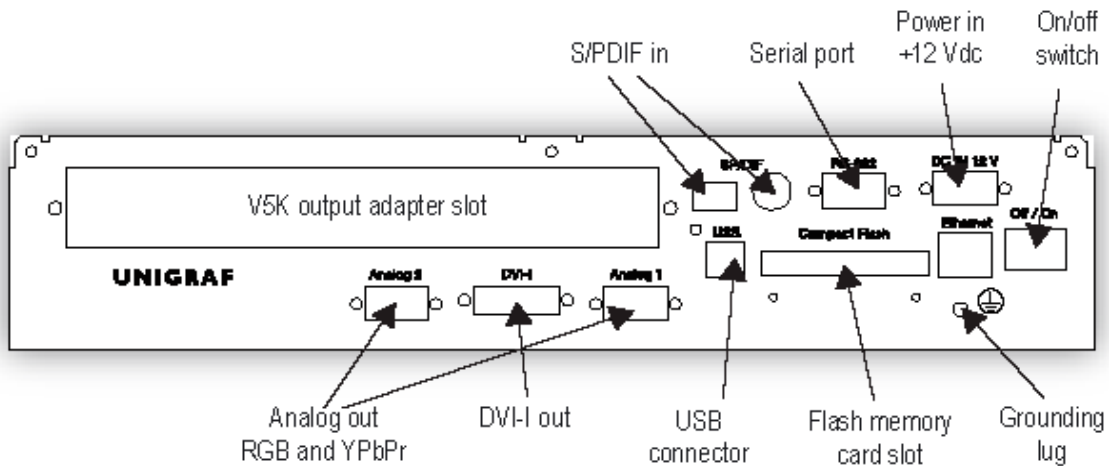
WinVTG

Unigraf **WinVTG** tool provides powerful, straightforward and illustrative way of configuring the VTG devices and their functions. It allows the user to define the full details of the output video.

- Timing of the output signal with detailed adjustments
- Patterns created by the VTP pattern definition language
- The optional color palette for use with legacy 256 color patterns
- The control of the options for various outputs of the unit

The definitions can be saved in the PC for later use. The tool recognizes individual VTG unit type, the *V5K output adapter* installed and outputs available. It only shows the user the controls featured.

DLL Library

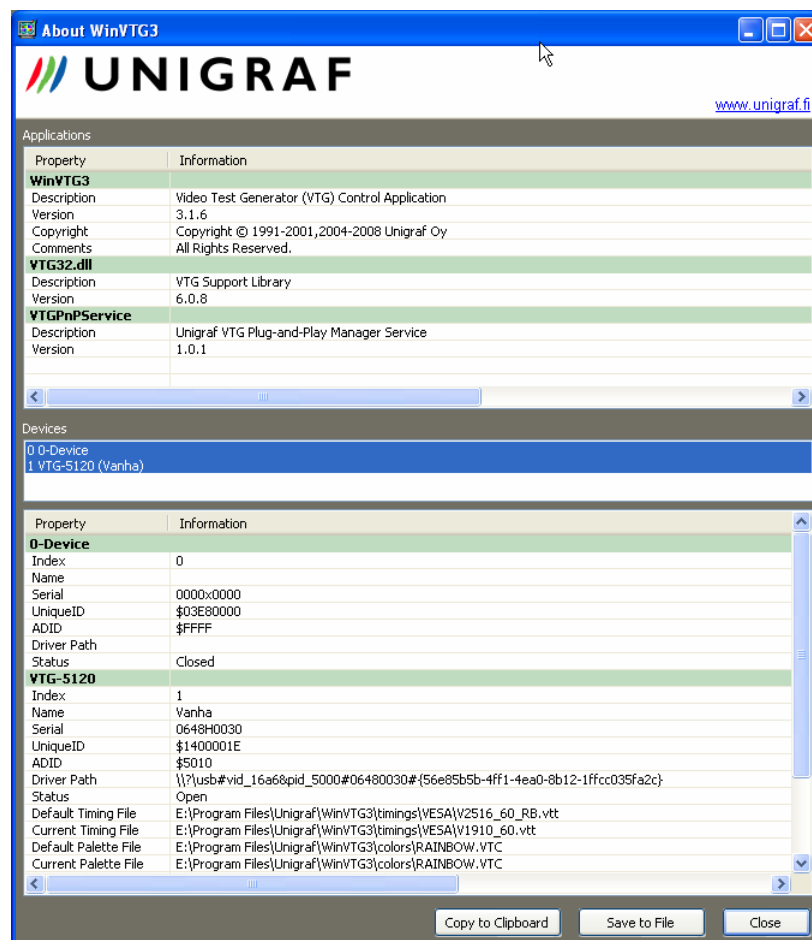All functions that can be controlled through the **WinVTG** tool are also available for user applications in the comprehensive DLL library. The DLL library provides a very powerful and flexible platform for the designer of a factory automation system. All tasks and functions required in display testing can easily be created and automated. Please refer to *VTG DLL User's Manual* for an explanation of the DLL functions.

VTG System Information

Whenever contacting Unigraf for support. Please read and copy the system information by selecting **Help > About…** in the WinVTG pull-down menu. This status panel will provide information for the VTG applications installed in your PC and their versions.

The panel will also list you the VTG devices present in your PC. You can get the Serial number, the drivers used to control it the firmware version loaded etc.

Note	When requesting support from Unigraf, please save this information to a file to be sent with the problem description.

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3. INSTALLATION

Contents of the Delivery

The VTG-5225 unit delivery includes the following items:

- VTG-5225 main unit
- Unigraf VTG Installation CD
- This manual on the CD
- USB Cable
- AC/DC Power Adapter

Software Setup

The software installation consists of the installation of the WinVTG tool and the installation of the USB communication driver. The installation procedure of the WinVTG tool automatically starts when you install the CD. Windows operating system installs the USB driver when the VTG-5225 unit is connected to the PC.

The WinVTG software uses the VTG DLL library for controlling the VTG unit. The DLL library will be installed at the same time as the WinVTG software and the user does not need to install it separately. It is important that the WinVTG software, the DLL library and the USB driver software all have compatible revision. Therefore it is highly recommend that you uninstall any previous WinVTG software, VTG DLL libraries and VTG drivers before starting this installation.

| Note	System administrator privileges are needed for installing new software to your PC.

| Note	It is highly recommend that you uninstall any previous WinVTG software, VTG DLL libraries and VTG drivers before starting this installation.

Installation of WinVTG Tool

►   Start the PC and log to the WindowsXP operating system.

►   Insert the VTG Installation CD. The installation utility will start automatically and extract the installation package. You can also start the utility manually by selecting Start > Run… > d:setup. "d:" indicates the CD drive used.
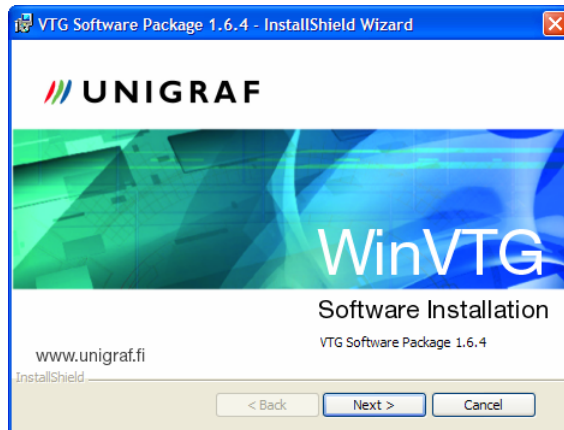

►   Click Next >, note the copyright information and note the reminder for uninstalling the previous versions of the software.

►   Click Next > and read the Release Notes. They explain the changes from the previous versions and instruct you if special measures are needed for the installation. Please also verify the installed software to the list on Product and Driver Version chapter of this document. If they are not the same, please verify the list of changes by scrolling further down in the Release Notes. Click Next >
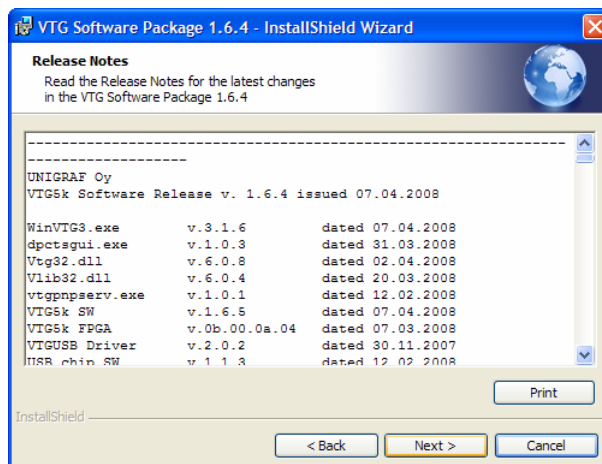

►   The software is by default installed into folder C:\Program Files\Unigraf\. If you want to assign another directory then click Change… and in the new dialog select one. Click Next >

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▶ In the following dialog select either **Complete** to install all software, example timings and example patterns. By selecting **Custom** you can select which individual components you would like to install. You can also see the amount of hard disk space will be needed for each individual feature. By clicking Space the tool calculates the available storage space on your hard disk.
Each feature will allow you to specify options for the installation. Please click **Help** for more information.
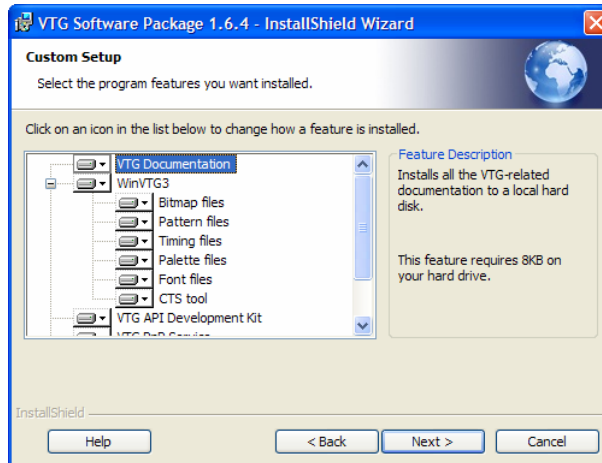

▶ Click Next >

▶ The installation is now ready to start. Click < Back to review or chance your selections or click Install to start the installation.
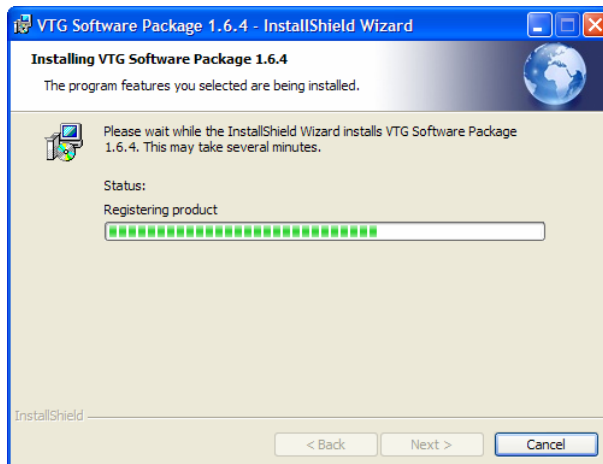
VTG File Structure

The installation wizard creates a file structure where each file type is stored within its own category and further subcategories. Some of the files will be used during normal operation of the WinVTG tool or by the DLL functions. Other files will be needed for special tasks only. The folder structure of a *Complete* installation is the following.
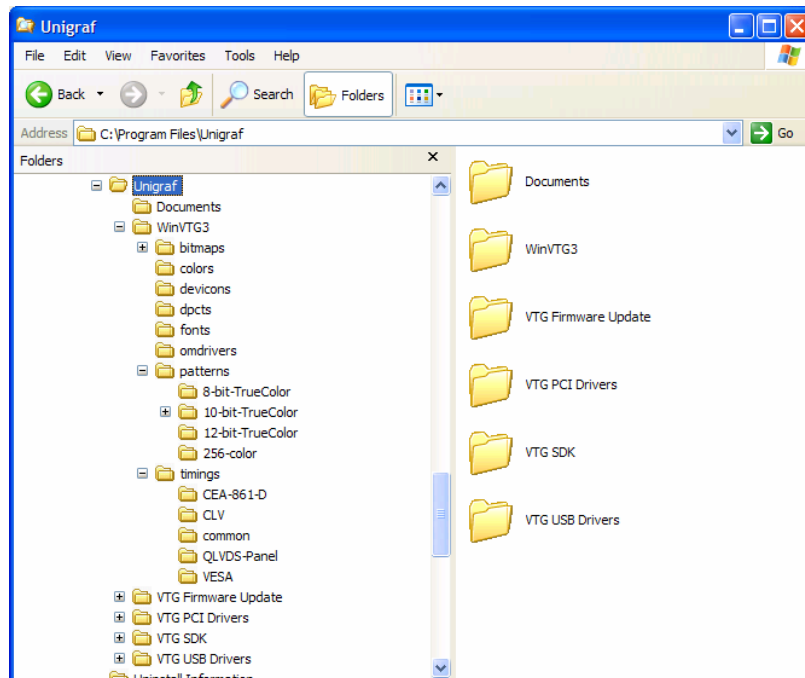

The WinVTG tool and the DLL libraries will use the following file types. They contain settings for video timing, test patterns, palette definitions, and bitmaps. The extension defines the type of information stored in each file:

Extension	Name	Function
*. vtt	Timing	Defines the timing used for the output. The user can create and store new timings with the Timing Editor of the WinVTG tool.
*.vtp	Pattern	Pattern definition file. Uses a proprietary VTP pattern definition language. Can consist of basic drawing instructions, text or bitmaps. The user can create and store new palette files with the Pattern Editor of the WinVTG tool.
*.vtc	Palette	Color look-up table file for the legacy 256-color system. The user can create and store new palette files with the Palette Editor tool of the WinVTG.
*.v5kimg	Image	Bitmap images converted to the proprietary format. The user can create and store new palette files with the Bitmap Manager tool.
*.vtf	Font	Font files used within the VTP patterns.

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Installation of the VTG USB Driver

When WinVTG software installation has been completed, plug in the provided USB cable between your PC and the VTG-5225 device and turn on the power (Please refer to the explanation of the VTG-5225 connectors in *Chapter 2 Introduction* of this manual). Windows will now recognize the connection of a new device and launch the driver installation.
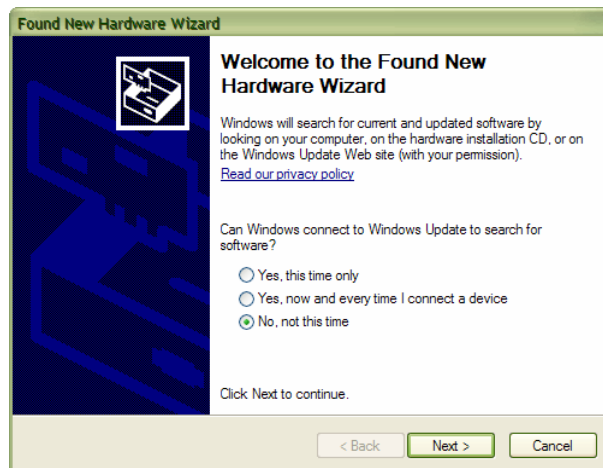
▶ In the *Welcome to the Found New Hardware* Wizard dialog Select **No, not this time** and click **Next >**

▶ Insert the VTG Installation CD, select **Install the software automatically** and click **Next >**

▶ Select **Continue Anyway** to the warning

The driver will now be installed in your PC. Click **Finish** to close the dialog.

Start the WinVTG tool. You should now have the VTG-5225 visible on the left hand side panel of the tool.
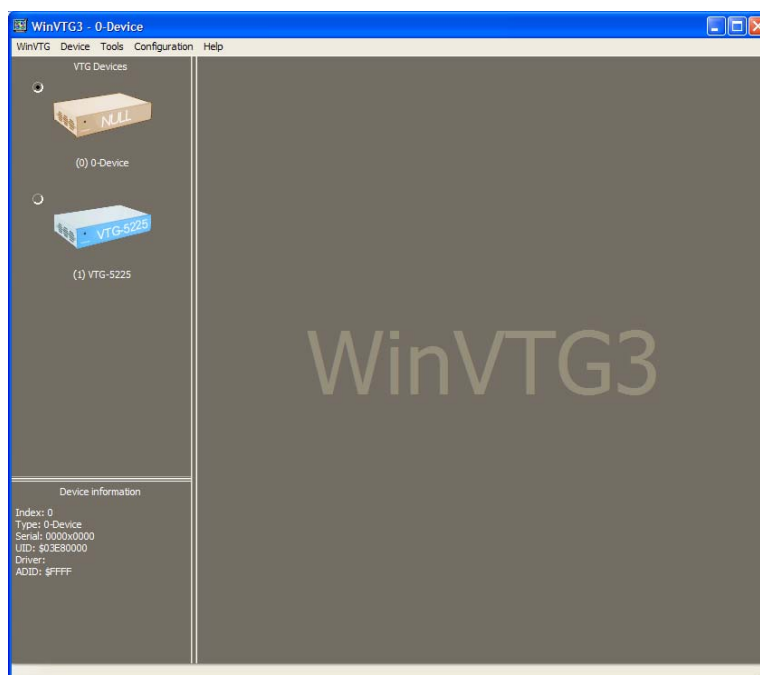
4. USING WINVTG

WinVTG is the graphical user interface for configuring and using the VTG devices. WinVTG3 is mainly targeted for controlling the USB connected VTG devices VTG-4000 series and VTG-5000 series. The VTG-3000 series PCI card products can be best controlled with the earlier version of the WinVTG.

WinVTG user interface utilizes the VTG DLL library to control the unit. All unit control functions found in WinVTG, and more, can be found in the VTG DLL library. For factory automation the VTG DLL library is the most flexible way of controlling the VTG units. Timing and pattern files created with WinVTG can be also called from the VTG DLL library. This makes the WinVTG and the VTG DLL library a combination of tools that support each other.

WinVTG3 Main Screen

WinVTG3 main screen is divided horizontally in two parts. On the left hand panel the tool shows the available VTG devices. The topmost device is the *0-Device*, a virtual device that e.g. lets you examine and modify the timing and pattern files. Below the 0-device are icons of all other VTG devices present in the PC. When you place the mouse cursor on top of a unit, the bottom part of the left hand side panel shows the Device Information of that particular unit.
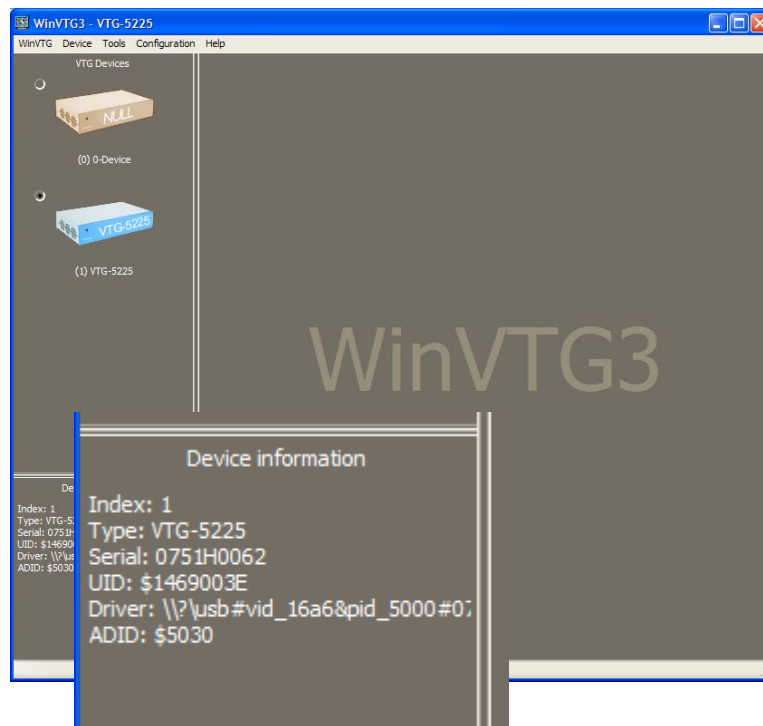
The *Device Information* lists the type designation, the serial number, and ADID, the identification of the V5K output adapter if one is present.

You can assign a specific name to each unit by selecting **Device > Rename**, clicking F2 or the right mouse button and selecting **Rename**. You can get the default name again by clicking the right mouse button and selecting **Reset Device Name**.

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Working with VTG Devices

You can open any of the devices either by double clicking its icon or clicking the right mouse button on top of the icon and selecting **Open**. The software now initiates the user interface, loads the device-dependent settings and initiates the device. The device is now ready for use. On the left hand side panel the opened devices have a green radio button associated with them.

Please notice also the *Events*, *Errors* and *Both* information tabs in the bottom of the WinVTG Main Screen. In case of abnormal situations, you will see messages here. This occurs for example if you are entering incompatible values to the Timing Editor's fields or if your pattern definition file contains syntax errors.

You can now control the device by using the icons in the top of the right hand side Device Screen. They are from left to right: the *Timing* selector and editor the *Color Palette* selector and editor, the *Pattern* selector and editor and the *Output Control* for controlling the syncs and other details of the output signals.
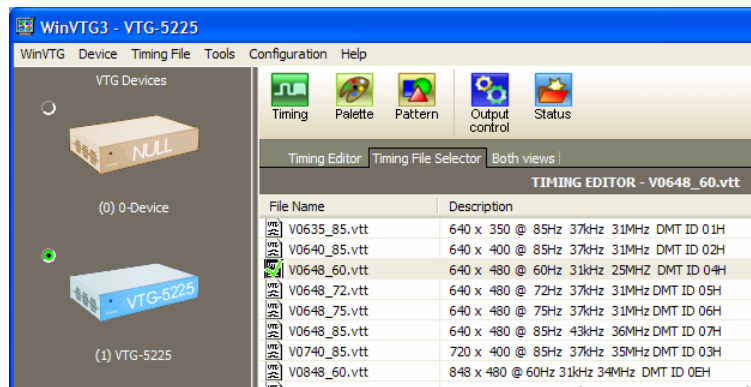
Selecting one of the icons will bring you the associated tool. The tabs below the icons and the pull-down menu will change according to the selected tool, providing the controls needed for that tool. Please note that the tool is only affecting the selected device. The currently selected device is associated with a black dot in the center of the green radio button.

You can close the active VTG device by selecting **Device > Close** from the top down menu or right clicking the mouse and selecting **Close.** You can restart the VTG device for example to clear an abnormal situation by selecting **Device > Reset Device** from the top down menu or right clicking the mouse and selecting **Reset Device.**
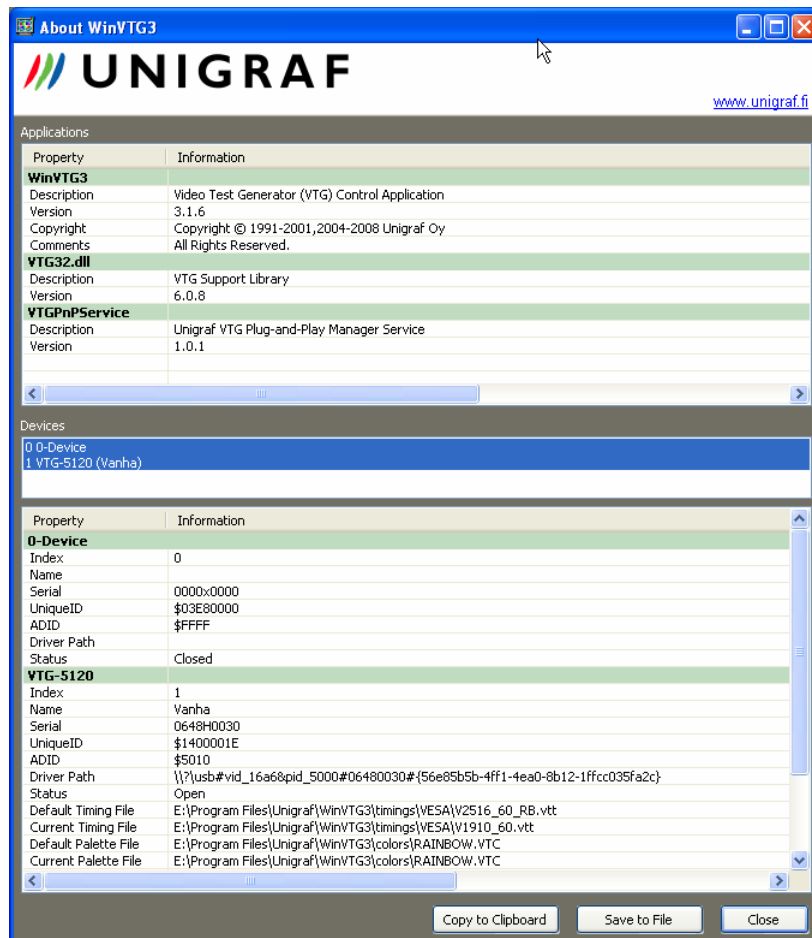
If you want that WinVTG remembers all timings, patterns and controls that you have selected for all open VTG devices next time that you open the WinVTG, please select **WinVTG > Save state for all opened devices**.

VTG System Information

By selecting **Help > About…** in the WinVTG pull-down menu you can open the VTG System Information panel. It will provide information for the VTG applications installed in your PC and their versions.

The panel will also list you the VTG devices present in your PC. You can get the Serial number, the drivers used to control it the firmware version loaded etc.

Note   When requesting support from Unigraf, please save this information to a file to be sent with the problem description.

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Timing Tool

You can select the Timing Tool by selecting the associated icon on the Device Screen. The tool has three views: the *Timing Editor* view, the *Timing File Selector* view and *Both views* combination view. All three views provide information to the same selected timing.

WinVTG timings are saved in timing files. Each timing file holds the details of one specific timing. The file extension of the timing files is *.vtt*. The timing files are human readable so you can view the information also without the WinVTG tool.

| Note	In order to avoid unwanted effects, it is highly recommended that the timing files are modified only by using the Timing Editor tool in WinVTG.

Timing Editor

The timing editor is the tool for viewing, modifying and creating the *.vtt timing files. The *File description* field on the top of the tool is a free form text definition for the timing. The numeric input fields on the left hand side of the tool's view allows you to insert the timing parameters either based on *Time* and *Frequency* or by *Dots*. The right hand side of the tool illustrates the various timing parameters in all three forms.
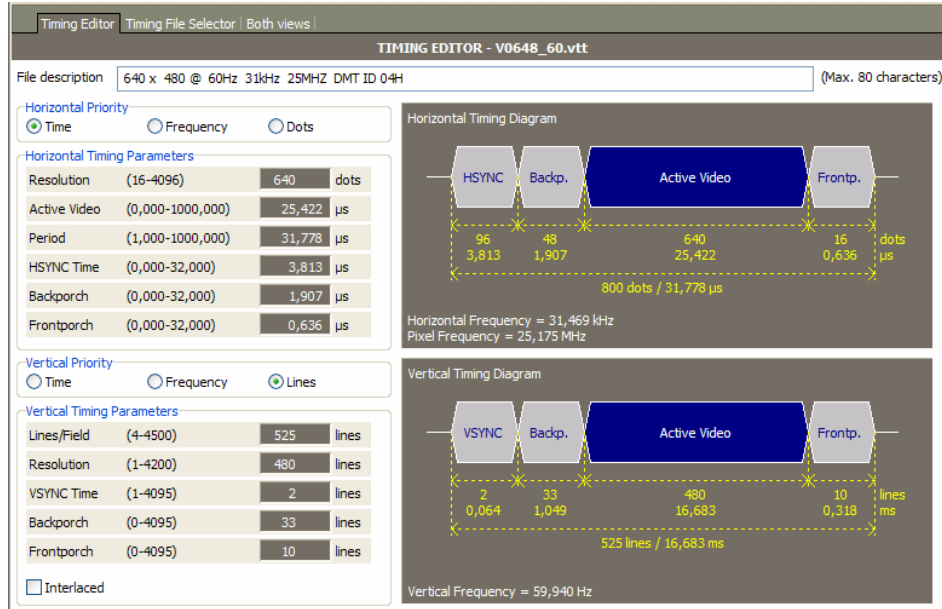
By defining the parameters based on *Time* or *Frequency* the horizontal Active Video, and the horizontal and vertical sync and porch timing are expressed in microseconds. In *Time* mode the horizontal and vertical total is expressed in microseconds and milliseconds, while in *Frequency* mode they are expressed in kHz and Hz respectively. In both cases the horizontal and vertical resolution is expressed in horizontal dots and vertical lines. In the *Dots* parameter mode all parameters are indicated in horizontal dots and vertical rows.

Timing File Selector

In *Timing File Selector* or *Both views* tab you can select an existing timing by double clicking either the the Filename or the description field or by clicking the **OpenFile** button. Only timings in one file folder of your PC will be shown in the list. For selecting an alternative folder either click the ellipsis button (**…**) for browsing your PC or the down arrow for selecting from folders below the *timings* folder of the WinVTG3 file stucture created during the installation.
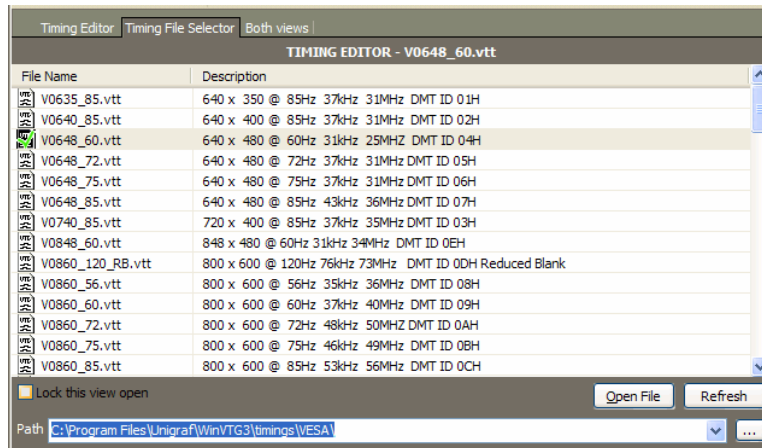
If you would like to open the Timing Tool with the Timing File Selector instead of the Timing Editor, select the **Lock this view open** box in the dialog.

Editing a Timing

The recommended parameter input order for creating a new timing or modifying a timing file is the following.

▶   From the pull-down menu select **Timing File** > **New**. For editing an existing timing double click the file in the file selector view or from the pull-down menu select **Timing File** > **Open…**

▶   First edit the *Horizontal Resolution* field, and then edit the horizontal *Active Video*.

▶   Edit *Horizontal Period*.

▶   Edit *HSYNC Time* and the horizontal *Backporch*. The horizontal fields are now ready.

▶   Edit *Lines/Field*.

▶   Edit vertical *Resolution* and then *VSYNC Time* and vertical *Backporch*.

For sync signal control please refer to the description of the *Output control* function later in this manual.

If you enter a conflicting value for one of the fields, an error message will be shown on the error panel in the bottom of the screen.

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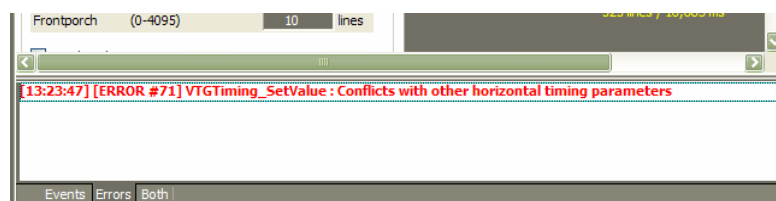
Pattern Tool

You can select the *Pattern Tool* by selecting the associated icon on the Device Screen. The tool has three views: the *Pattern Editor* view, the *Pattern File Selector* view and *Both views* combination view. All three views provide information to the same selected pattern.

WinVTG patterns are saved in pattern files. Each pattern file holds the details of one specific display pattern. The file extension of the pattern files is *.vtp*. The pattern files are text files so you can view and edit the information also without the WinVTG tool. Please refer to *VTP Pattern Definition Language Manual* for syntax of the VTP language.

Pattern Editor

Pattern editor allows you to edit the VTP language definition of the pattern and attach a bitmap, color palette or font file to the pattern. The whole definition of the pattern, except for the bitmap image information is in the VTP pattern file. The *File description* field on the top of the tool is a free form text definition for the pattern.
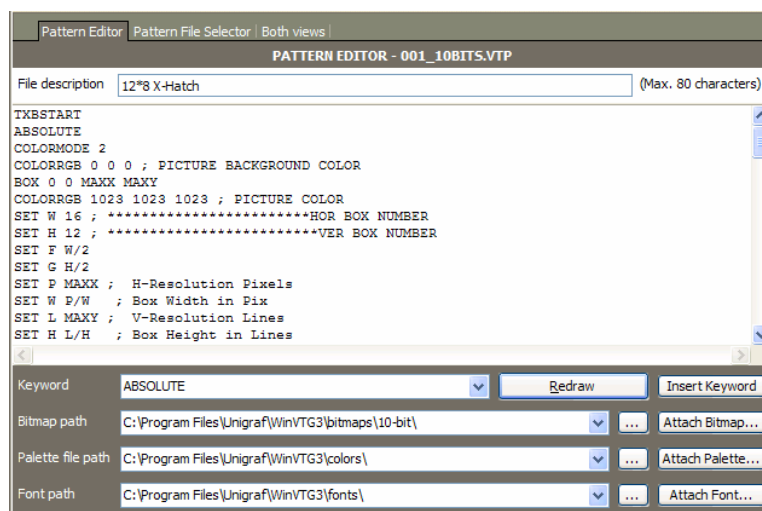
After editing the pattern definition click **Redraw** or press <F4> for updating the displayed pattern. The VTP language keywords with their parameters can be selected from the pull-down menu in *Keyword* field. Select one of the commands and click **Insert Keyword**.

For attaching a bitmap in the pattern click the **Attach Bitmap…** button and browse for the file. You can insert the bitmaps either in the proprietary *V5KIMG* or *VTB* formats. You can convert PNG files to the V5KIMG format with the Bitmap Manager tool in the *Tools* pull down menu. Please refer to the introduction of the Bitmap Manager later in this manual. The VTB format is the legacy format supported by earlier WinVTG versions.

The Palette files are color definition files for Colormode 0. Please refer to their description either in *VTP Pattern Definition Language Manual* or the description of the Palette tool later in this manual.

Font files are VTF used in the VTP language for drawing text in the pattern. Please refer to their description in *VTP Pattern Definition Language Manual*.

Pattern File Selector

In *Pattern File Selector* or *Both views* tab you can select an existing pattern by double clicking either the the Filename or the description field or by clicking the **OpenFile** button. Only patterns in one file folder of your PC will be shown in the list. For selecting an alternative folder either click the ellipsis button (**…**) for browsing your PC or the down arrow for selecting from folders below the *patterns* folder of the WinVTG3 file stucture created during the installation.
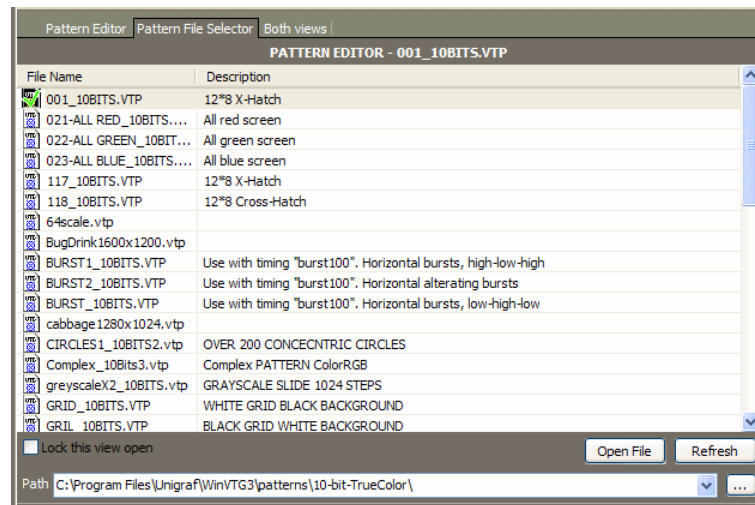
For refreshing the list, click the **Refresh** button. For redrawing a pattern, double click the file name.

If you would like to open the Pattern Tool with the Pattern File Selector instead of the Pattern Editor, select the **Lock this view open** box in the dialog.

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Palette Tool

In VTG-5225 the user can assign the drawing colors in two basic ways: either by giving the actual Red, Green and Blue (or R, G and B) color component values or using pre-defined color palettes. The first method is referred as *True Color Mode* and the latter as *Palette Mode*.

In True Color Mode the numerical values given for R, G and B will be the actual output signal intensity values for the pixel in question. The numerical color value in Palette Mode will act as an address (or index) to a pre-defined color in a 256 color table. The output signal intensity will be the R, G and B value entry in the cell where the address points to. The 256 color table is called "*palette*".

You can select the *Palette Tool* by selecting the associated icon on the Device Screen. The tool has three views: the *Palette Editor* view, the *Palette File Selector* view and *Both views* combination view. All three views provide information to the same selected palette.

Palette Editor

The palette editor is the tool for viewing, modifying and creating the *.vtc palette files. The *File description* field on the top of the tool is a free form text definition for the palette.
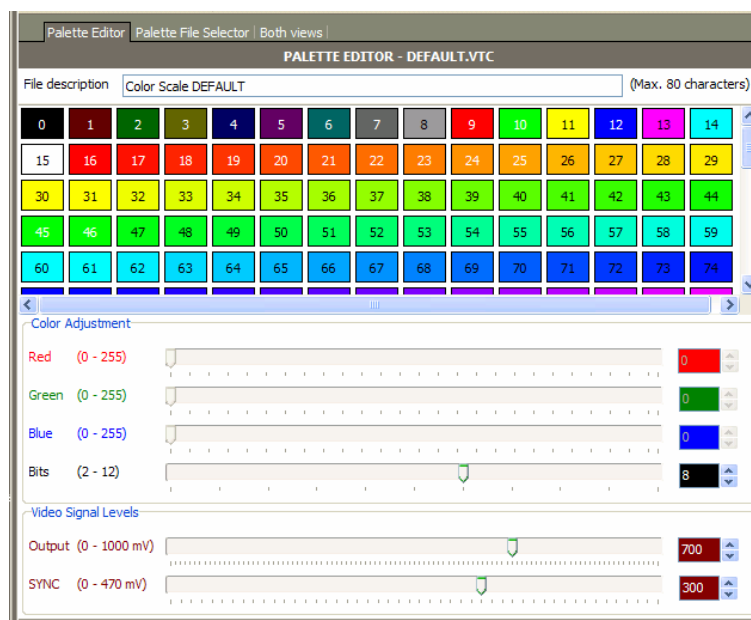
The colored rectangles with a number each represent one color in the selected palette. The number of distinct colors in each palette is 256. Color number 0 (zero) will always be black. You can see the rest of the colors by using the scroll bar in the right hand side of the panel. The 256 colors can be selected from a total number of 16.7 million color shades.

Select a color by clicking the corresponding rectangle. You can examine and change the intensity of each of the Red Green and Blue component of the color either by using the corresponding slider, typing in the value number or using the up and down arrows near the number field. Select the slider with your mouse or by pressing the Tab key. Change the value of the slider by using the left and right or up and down keys of your keyboard.

The lowest slider of the *Color Adjustment* panel sets the color depth of the definition. The table below shows the range of Red, Green and Blue for each color depth

Color Depth (Bits)	Nr of color bits per pixel	Range of values for Red, Green and Blue
6	18	0 to 63
8	24	0 to 255
10	30	0 to 1023
12	36	0 to 4095

The *Video Signal Level* panel in the bottom of the Palette editor defines the output level of the Analog1 and Analog2 outputs.

You can save the palette by selecting **Palette File > Save** (Ctrl+S) or **Save As…** (F12) from the pull-down menu. You can create a new palette file with all colors black by selecting **Palette File > New** (Ctrl+N).

Palette File Selector

In *Palette File Selector* or *Both views* tab you can select an existing palette by double clicking either the the Filename or the description field or by clicking the **OpenFile** button. Only patterns in one file folder of your PC will be shown in the list. For selecting an alternative folder either click the ellipsis button (**…)** for browsing your PC or the down arrow for selecting from folders below the *colors* folder of the WinVTG3 file stucture created during the installation.
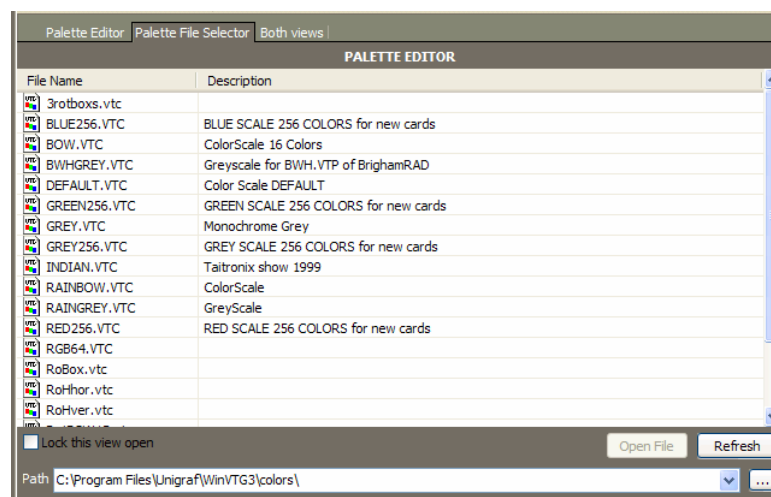

If you would like to open the Palette Tool with the Palette File Selector instead of the Palette Editor, select the **Lock this view open** box in the dialog.

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Output Control

You can monitor and control the signaling of the outputs of the VTG-5225 by using the **Output control** dialog. The contents of the dialog will change according to which *V5k output adapter* is mounted in the VTG-5225 unit. The dialog for the built in analog and DVI outputs is always present.

Analog Synchronization Control

The controls for VTG-5225 built-in analog outputs consist of the synchronization signal controls.
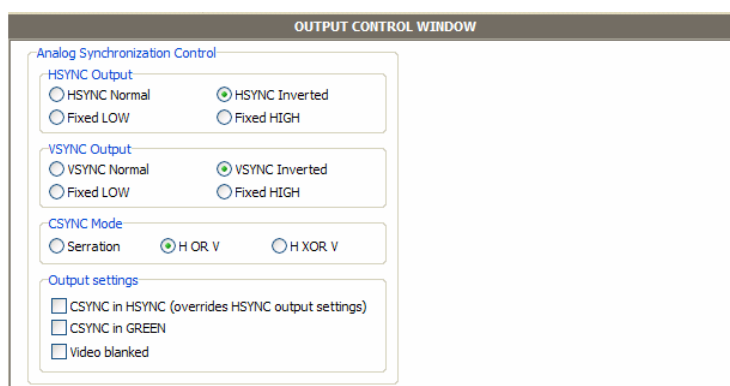
You can set the Horizontal sync options from the **HSYNC Output** panel, the Vertical sync options from the **VSYNC Output** panel and the Composite sync mode from the **CSYNC Mode** panel. From the **Output settings** panel you can define where the composite sync appears. When **Video blanked** option is selected, no syncs are present in the output.

V5k Output Adapter Control

Each *V5k output adapter* features its specific output controls. The VTG software identifies the adapter type from the *Adapter ID* and provides the specific outputs for the user or the custom SW interface.

Controls for VTG-5225 DVI

The following controls are available for the *v5k DVI output adapter* (Adapter ID = $5050). *v5k DVI output adapter* features a DVI output with HDCP compatibility. It is used in VTG-5225 DVI and VTG-5120 DVI products.

The HDCP encryption can be enabled by selecting **Enable HDCP**. The HDCP status can be seen in the *Status window*. Status window is opened by clicking the **Status** icon in the top of the right hand side Device Screen.

The horizontal and vertical sync polarities of the *v5k DVI output adapter* is controlled in the **HSYNC polarity** and **VSYNC polarity** fields.

HSYNC polarity	0 = active low, 1 = active high, 2 = always low, 3 = always high
VSYNC polarity	0 = active low, 1 = active high, 2 = always low, 3 = always high

When HDCP is enabled the *Status window* shows the state of various HDCP status flags. The updating of the window can be seen as a blinking marker on the upper right hand corner of the panel.

Preliminary

Controls for VTG-5225 QLT

The following controls are available for the *v5k quad LVDS output adapter* (Adapter ID = $5030). *v5k quad LVDS output adapter* features a four channel LVDS output. It is used in VTG-5225 HLV and VTG-5120 HLV products.

HSYNC polarity	0 = active low, 1 = active high, 2 = always low, 3 = always high
VSYNC polarity	0 = active low, 1 = active high, 2 = always low, 3 = always high
Reduced_swing	LVDS output swing control: when "0" VOD = 350 mV, when "1" VOD = 200 mV
Mapping_mode	LVDS mapping table selected: when "1" Mapping Mode 1 , when "2" Mapping Mode 2. See the THine TH63LVD1023 datasheet
Quad_mode	Operation mode selected. Mode 0: Standard "single pixel" mode, where all pixel data is output on CH1. Data output on CH1 is copied also to CH2 to CH4. Mode 1: Standard "double pixel" mode, where all pixel data is output on CH1 and CH2. First pixel appears on CH1 and second one on CH2. Data output on CH1 and CH2 is copied also, respectively, to CH3 and CH4. Mode 2: "Quad pixel" mode, where pixel data is output on all four channels. First pixel appears on CH1, second one on CH2, third on CH3 and fourth on CH4.
GPO0	General Purpose Output 0: connected to CH2 and CH4 connectors pin 3. Logic "0" or "1"
GPO1	General Purpose Output 1: connected to CH2 and CH4 connectors pin 18. Logic "0" or "1"
GPO2	General Purpose Output 2: connected to CH2 and CH4 connectors pin 9. Logic "0" or "1"
GPO4	General Purpose Output 4: connected to CONT21 bit (7th bit of pair TD of CH2 and CH4). Logic "0" or "1"
GPO5	General Purpose Output 4: connected to CONT21 bit (7th bit of pair TE of CH2 and CH4). Logic "0" or "1"

Please, note that GPO0 to GPO2 are 3V digital CMOS outputs directly available on the channel connectors. GPO4 and GPO5, instead, are user programmable data bits that are encoded together with the pixel data stream and available at the receiver (LCM) side only after being decoded by the receiver chipset.

Output pin mapping

With output pin mapping the order of output color bits can be reconfigured. Output pin mapping can be used for bit shifting or e.g. with some LCD modules whose color bit order is not consecutive.
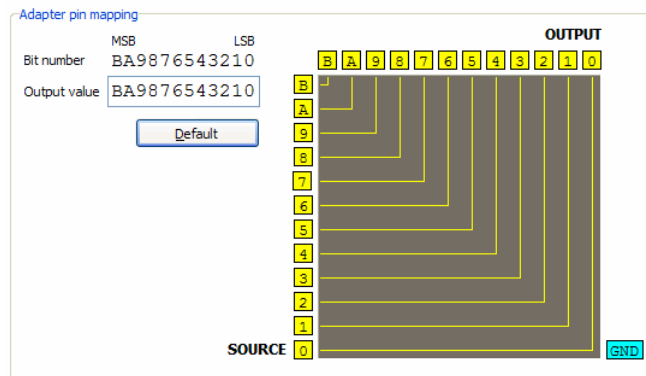
In order to change the output bit order, please enter in the **Output value** field the desired order.

Example:

Output value: 9876543210__ all bits shifted with two. Input 10 bits/color output 12 bits/color. Input data bit 9 is mapped to output data bit B (11, eleven) Two lowest output bits are set to GND (logic LOW).

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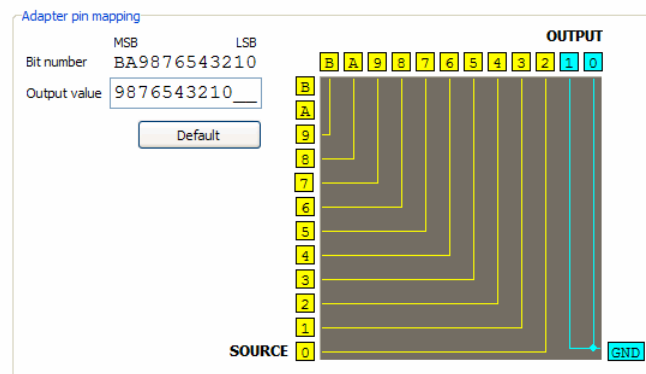
APPENDIX A TOOLS

Bitmap Manager

The bitmap images used in VTG-5225 have to be converted to the proprietary "v5kimg" bitmap format. It is a non-loss format with up to 12 bits per color component. The WinVTG *Bitmap Manager* is a conversion utility form PNG format to v5kimg format.
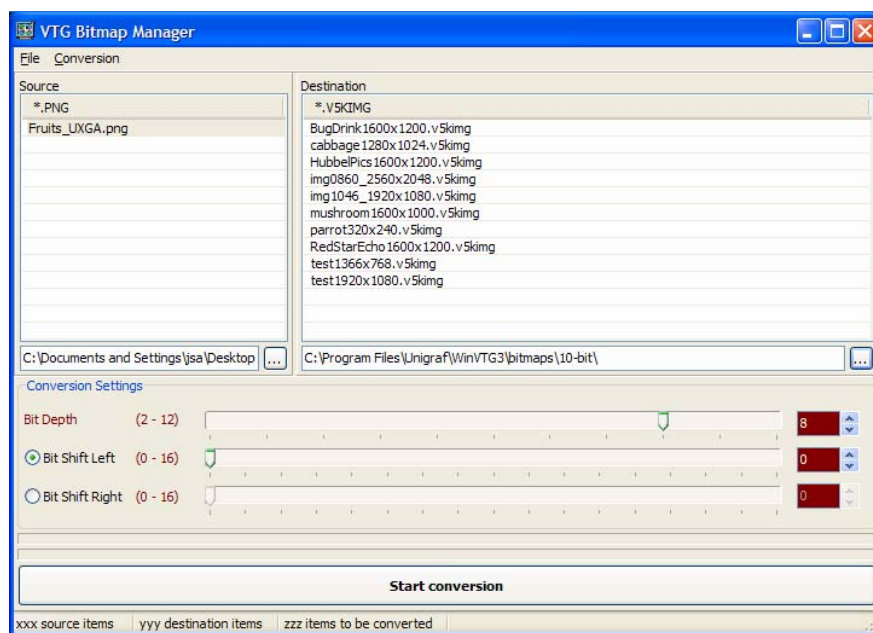
▶ You can launch the *Bitmap Manager* from the **Tools** pull-down menu.

The left hand side panel shows the folder with PNG images to be converted and the right hand side shows the contents of the destination folder. Click "**…**" below each panel for selecting the folder

The sliders in the bottom of the panel and the menus when pressing the right key of the mouse are not supported in this version of WinVTG.

▶ Click **Start conversion** for converting the files.

APPENDIX B CONNECTORS

USB Connection

The VTG USB interface is implemented by using a Cypress CY7C68013A chip. The input connector in VTG-5225 unit is a USB B connector. The interface is USB 2.0 compliant. Data rates: full speed (12 Mbps) or high speed (480 Mbps).

The pin-out of the USB connector is the following:

Pin	Function	Pin	Function
1	WAKEUP	4	GND
2	DATA-	5	GND
3	DATA+	6	GND

Serial Interface

The VTG *Serial interface* is a RS-232 compatible interface for control of the VTG-5225 unit. The instruction set of the serial interface is limited, allowing only some basic timing and pattern functions. The baud rate of the interface is fixed at 115200 bps (8, None, 1).

Serial interface has also two special functions:

(1) By short circuiting pin 2 and pin 3 of the connector while the VTG-5225 unit is powered up, the unit starts in *Update Mode*. Please refer to *Appendix C Firmware Update*.

(2) The serial interface is used for uploading the USB communication firmware to the unit. This task is not necessary in normal firmware update process. It requires special instructions and should be done by Unigraf authorized personnel only.

The pin-out of the serial interface connector is the following:

Pin n.	Function	Pin n.	Function
1	NC	6	NC
2	TX	7	NC
3	RX	8	NC
4	NC	9	NC
5	GND		

Preliminary

APPENDIX C FIRMWARE UPDATE

VTG-5225 functionality is created with the combination of the dll library in the PC, and the firmware in the VTG-5225 device itself. The firmware controls and performs the low level functions of the hardware. The firmware can be updated using the WinVTG tool when the VTG-5225 hardware is started up in a special *update mode*. In this mode the basic pattern generator functions are not functional and the main emphasis is in updating the firmware of the device.

You can verify the latest firmware version from Help > About … panel of the WinVTG.

Update Mode

The VTG-5225 is turned to *Update mode* by short circuiting pins 2 and 3 of the 9-pin SubD RS-232 connector for power-up.

▶   Short circuit pins 2 and 3 of the RS-232 connector.
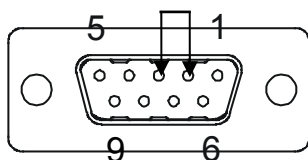
▶   Start the WinVTG tool

▶   Switch on power to the VTG-5225 unit

Your PC will now detect a new device and will load the driver for that. Please use the same driver what was used for the normal operation of the VTG-5225 unit. You will find it typically in c:\Windows\Drivers\ or in the VTG installation CD.

▶   Click **Continue anyway** and **Next** to install the driver.

You can now see a VTG-5001 device icon in the WinVTG with a special arrow mark indicating the update mode.
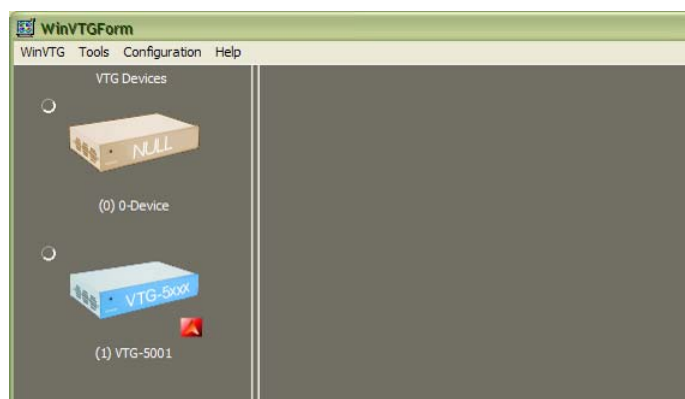
▶   Double click the icon to open the device for updating.

▶   On the right hand side of the **Firmware file** field on the top of the panel click **…** to browse for the .vfc file.

▶ Please indicate the location of the file. After WinVTG installation the folder C:\Program Files\Unigraf\VTG Firmware Update\VTG-5225\ will contain the latest firmware at the time of the release. Please contact Unigraf for the latest version.

▶ Click **Start update**. The firmware will now be loaded from your PC to the VTG-5225 device and stored in a non-volatile memory. You can follow the process in the *Events* panel of the WinVTG.
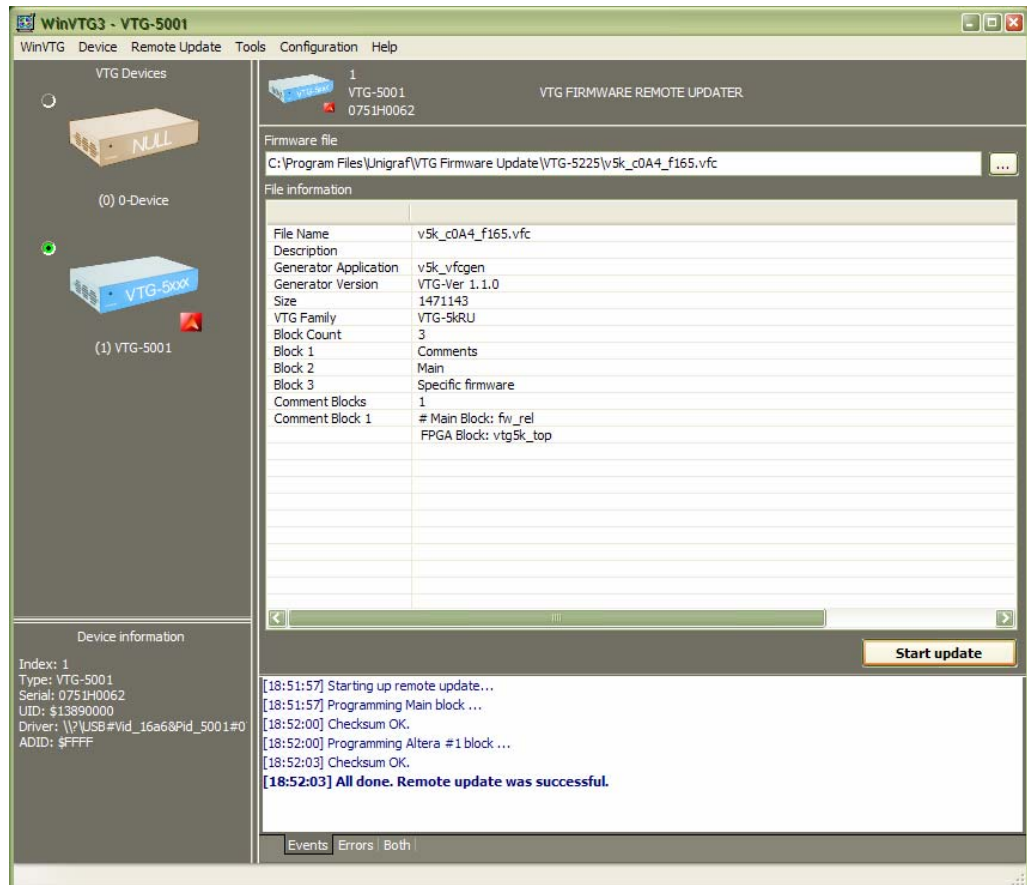
The last message should be **Remote update was successful.** Your VTG-5225 device has now been updated.

▶ Power down your VTG-5225 device. When you turn on the device again it is ready to be used. Please remember to remove the short circuit from the RS-323 connector.

Preliminary