



VPG -1101 Operators Manual



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1.0 General Description

The VPG 1101 is a low cost and portable solution for DisplayPort testing. It has features and functions normally found in much higher priced units.

Utilizing the RS-232 port with the optional programmable keypad and interface convertors, this device can do almost anything you need it to do.

The high performance DisplayPort output ensures that it will be around for years of hard work.

A one year factory warranty is included.

2.0 Hardware

Included in the shipment:

1. VPG 1101 DisplayPort Video Test Pattern Generator
2. Power adapter
3. USB cable
4. Standard DP cable, Standard to mini DP cable

3.0 Connections

3.1 Power

Power is supplied to the VPG 1101 on the rear panel. The required power is +5V DC at approximately 500mA. A USB power adapter and cable are included with the VPG 1101. It can also be powered by the USB port if you want to use it directly with your laptop while using the GUI.



3.2 Remote Control

The VTG-1101 can be controlled by the GUI application which works only on 32 bit Windows™ Operating Systems. More information regarding the use of the GUI is found in Section 5 of this manual.

The VPG-1101 can be remotely controlled by either the USB or RS-232 interfaces..

An optional Programmer's Manual is available to assist in the creation of custom applications for a PC.

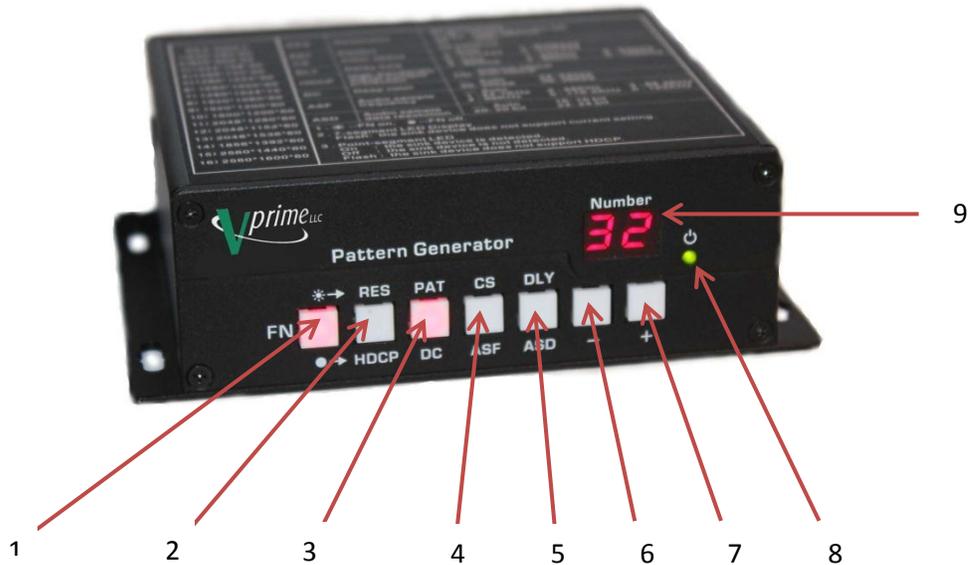
4.0 Front Panel Controls

The VPG-1101 front panel consists of 7 push buttons used to control most features of the VPG 1101. There are some advanced settings that can be set using the GUI which are explained in Section 5.4.1 “Advanced Settings”.

Short descriptions of what is available via the front panel controls are listed on the top of the unit.

RES INDEX: 1)640*480*60 2)800*600*60 3)1024*768*60 4)1280*720*60 5)1280*1024*60 6) 1680*1050*60 7) 1280*1024*75 8) 1920*1080*60 9) 1920*1200*60 10) 1600*1200*60 11) 2048*1280*60 12) 2048*1152*60 13) 2048*1536*60 14) 1856*1392*60 15) 2560*1440*60 16) 2560*1600*60	RES	Resolution	24 resolutions. 1-16 : showing on the left. 17-23 : user-defined. 24 : auto.			
	PAT	Pattern	32 patterns			
	CS	Color space	--: Auto	1 : RGB444		
			2 : YUV444	3 : YUV422		
	DLY	Delay time	0 : 0ms	1 : 200ms	2 : 400ms	
			3 : 600ms	4 : 800ms	5 : 1000ms	
	HDCP	High-bandwidth digital content protection	--: without HDCP HD: with HDCP			
	DC	Deep color	--: Auto	24: 24bpp		
			30: 30bpp	36: 36bpp		
	ASF	Audio sample frequency	--: Auto	1 : 44.1KHz	2 : 48KHz	
			4 : 96KHz	5 : 176.4KHz	6 : 192KHz	
	ASD	Audio sample data resolution	--: Auto	16: 16 bit		
			20: 20 bit	24: 24 bit		
		1 . ☀ --FN on, ● --FN off.				
		2 . 7-segment LED Display Flash: the sink device does not support current setting.				
		3 . Point-segment LED On : the sink device is detected. Off : the sink device is not detected. Flash : the sink device does not support HDCP.				

4.1 Control Descriptions

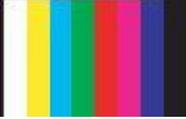
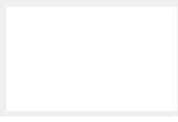
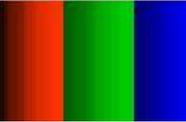
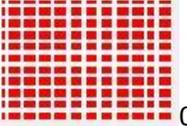
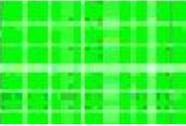
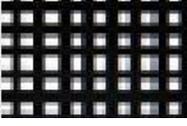
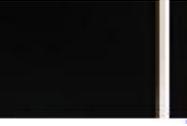
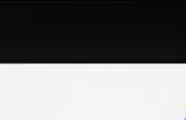
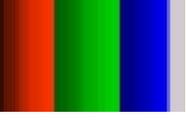


- 1) Function Select: When lit the top row of functions are selected/controlled
- 2) Resolutions: When selected the different resolutions/timings are selected using buttons 6 & 7
 - a. HDCP: HDCP can be turned on-off using buttons 6 & 7
- 3) Patterns: When selected the different patterns are selected using buttons 6 & 7
 - a. DP: Deep Color options can be selected using buttons 6 & 7
- 4) Color Space: Lets you select different versions of color space using buttons 6 & 7
 - a. ASF: Audio Sampling Frequency can be selected using buttons 6 & 7
- 5) Delay: Allows different delays for loading new resolutions using buttons 6 & 7
 - a. ASD: Audio Sample Data resolution can be selected using buttons 6 & 7
- 6) Decrement (-): Changes selection in minus /negative direction
- 7) Increment (+): Changes selection in positive/plus direction
- 8) Power indicator: Must be on to operate
- 9) Number: Indicates which Resolution or Pattern is active and outputting

Selecting Timings/Resolution

Location and Timing	HEX
1: 640x480x60	00
2: 800x600x60	01
3: 1024x768x60	02
4: 1280x720x60	03
5: 1280x1024x60	04
6: 1680x1050x60	05
7: 1280x1024x75	06
8: 1920x1080x60	07
9: 1920x1200x60	08
10:1600x1200x60	09
11: 2048X1280X60	0A
12: 2048X1152X60	0B
13: 2048X1536X60	0C
14: 1856X1392X60	0D
15: 2560X1440X60	0E
16. 2560X1600X60	0F
User 1 (custom)	10
User 2 (custom)	11
User 3 (custom)	12
User 4 (custom)	13
User 5 (custom)	14
User 6 (custom)	15
User 7 (custom)	16

Selecting patterns

<p>1: 100% COLOR BARS</p>  <p>00</p>	<p>2: 75% COLOR BARS</p>  <p>01</p>	<p>3: 8-STEP GRAY SCALE</p>  <p>02</p>	<p>4: 100% RED</p>  <p>03</p>
<p>5: 100% GREEN</p>  <p>04</p>	<p>6: 100% BLUE</p>  <p>05</p>	<p>7: 100% YELLOW</p>  <p>06</p>	<p>8: 100% CYAN</p>  <p>07</p>
<p>9: 100% MAGENTA</p>  <p>08</p>	<p>10: 16 STEP GRAY</p>  <p>09</p>	<p>11: 100% WHITE</p>  <p>0A</p>	<p>12: RGB RAMP</p>  <p>0B</p>
<p>13: CROSSHATCH BLK</p>  <p>0C</p>	<p>14: CROSSHATCH RED</p>  <p>0D</p>	<p>15: CROSSHATCH GREEN</p>  <p>0E</p>	<p>16: CROSSHATCH BLUE</p>  <p>0F</p>
<p>17: WHITE SQUARES</p>  <p>10</p>	<p>18: WHITE DOTS</p>  <p>11</p>	<p>19: CHECKER BOARD</p>  <p>12</p>	<p>20: VERTICAL SCROLL</p>  <p>13</p>
<p>21: HORIZ SCROLL</p>  <p>14</p>	<p>22: MULTIBURST</p>  <p>15</p>	<p>23: HORIZONTAL SPLIT</p>  <p>16</p>	<p>24: VERTICAL SPLIT</p>  <p>17</p>
<p>25: SCROLL RED RAMP</p>  <p>18</p>	<p>26: SCROLL GRN RAMP</p>  <p>19</p>	<p>27: SCROLL BLUE RAMP</p>  <p>1A</p>	<p>28: SCROLL RGB RAMP</p>  <p>1B</p>
<p>29: 4-LINE FRAME</p>  <p>1C</p>	<p>30: POWER MAP</p>  <p>1D</p>	<p>31: TARGET CIRCLE</p>  <p>1E</p>	<p>32: MOVING BALL</p>  <p>1F</p>

Color Space

Color space can be selected either by the front panel control buttons or by using the GUI.

Available settings are:

- -- :Auto – which reads the preferred color space from the EDID
- 1: RGB444
- 2: YUV444
- 3: YUV422

Deep Color

Pixel color depth can be set by the front panel controls or by the GUI.

Available settings are:

- --: Auto
- 24: 24 bpp
- 30: 30 bpp
- 36: 36 bpp

Delay

Delays can be used if the display you are testing has problems locking on to resolution changes.

The available delays are:

- 0: 0 second delay
- 1: 200 ms delay
- 2: 400 ms delay
- 3: 600 ms delay
- 4: 800 ms delay

HDCP On/Off

HDCP can be turned on or off either by the front panel controls or settings in the GUI. (HDCP does not support repeater function)

Audio Sample Frequency

Audio sampling frequencies are set either by front panel controls or by the GUI.

Available ranges are:

- --: Auto
- 1: 44.1 KHz
- 2: 48 KHz
- 3: 88.2 KHz
- 4: 96 KHz
- 5: 176.4 KHz
- 6: 192 KHz

Audio Sample Data Resolution

Audio sample data resolution is set either by the front panel controls or by the GUI. Available settings are:

- --: Auto
- 16: 16 bit
- 20: 20 bit
- 24: 24 bit

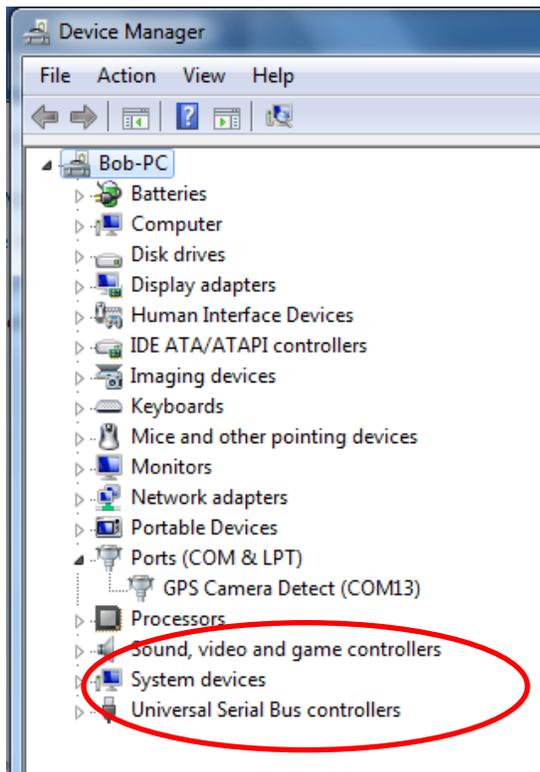
5.0 Using the GUI

5.1 Installing the USB Drivers and Software Application

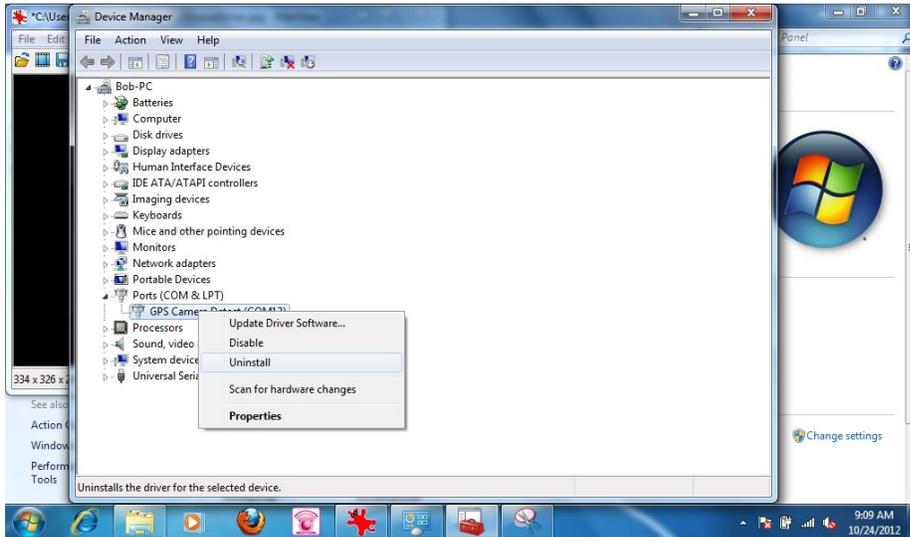
Windows™ will by default install a “GPS Camera” or similar driver for the VPG-1101. This is not the correct driver and will not work with the VPG-1101; the correct driver is ATMEL AT91xxxx Test Board”. The following steps will help you determine if the correct driver is installed and how to update if necessary.

1. Download and extract the “VPG1000_software” from <http://download.vprime.com/>. Note the location of the extracted files. You should have a folder called “USB Driver” which contains the files “atm6124.inf” and “atm6124.sys”.
2. Run the setup from the extracted file to load the GUI software.
3. Check the installed version in the Device Manager. If the driver did not install as indicated by a yellow exclamation point next to “Unknown device”, proceed to step 5.

Open Device Manager: click Start, right-click Computer, select properties, and then select Device Manager.



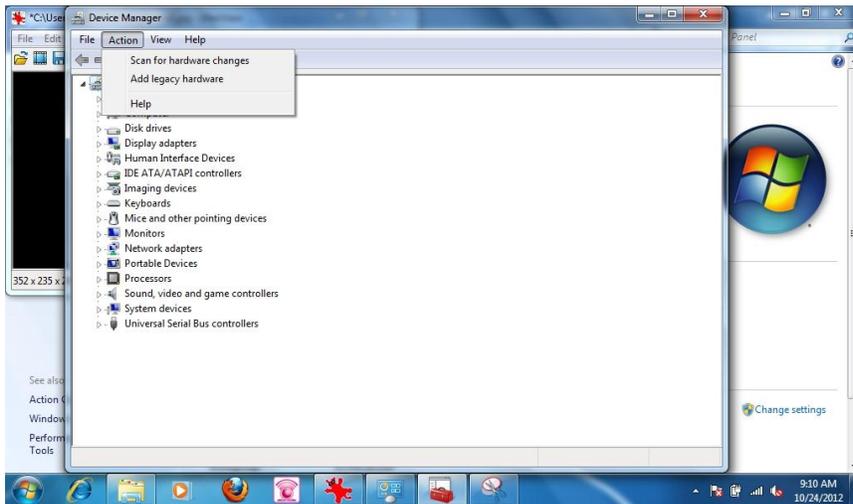
4. Right-click the GPS Camera and uninstall the driver:



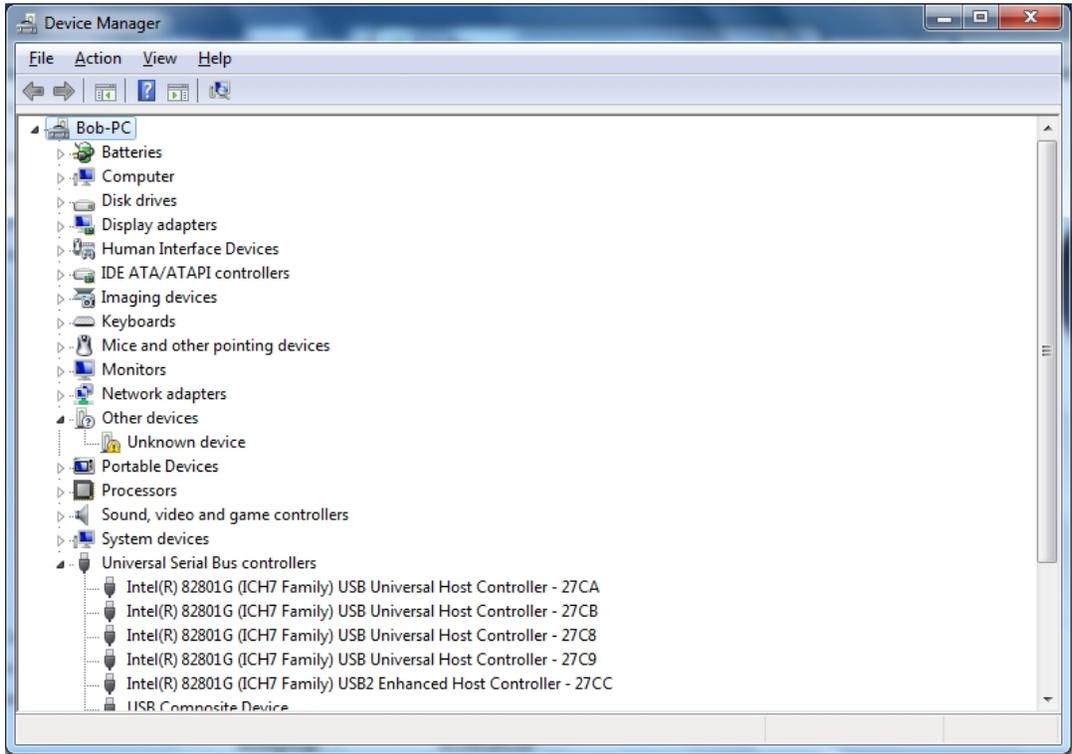
Confirm the Uninstall and check the “Delete the driver software” box:



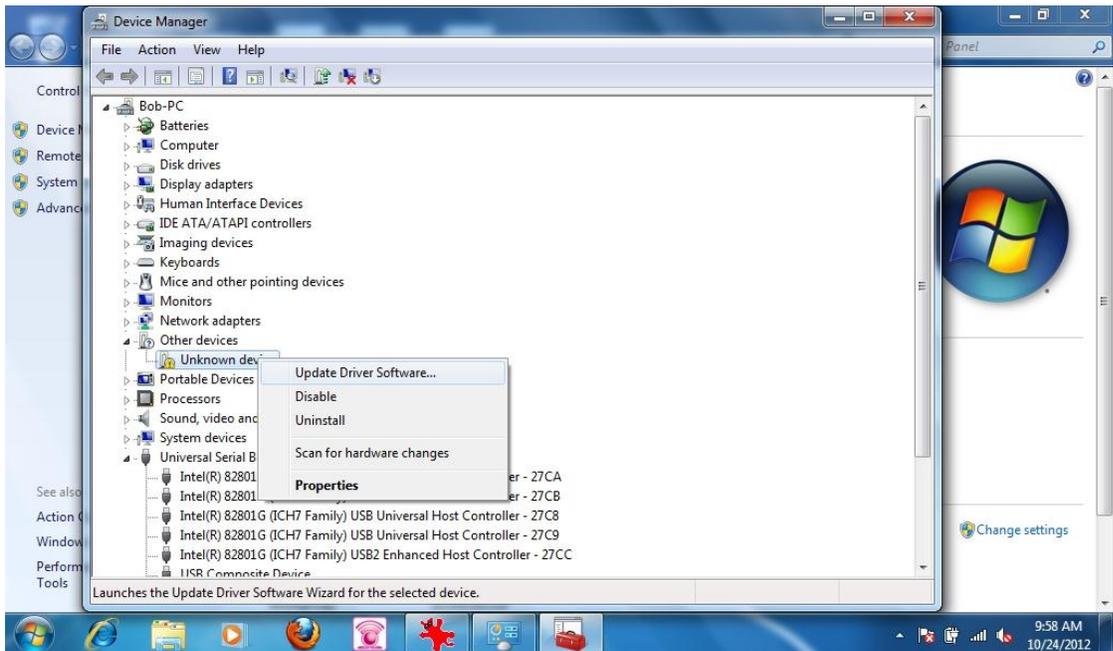
5. Next, Go to Action and Scan for Hardware Changes:



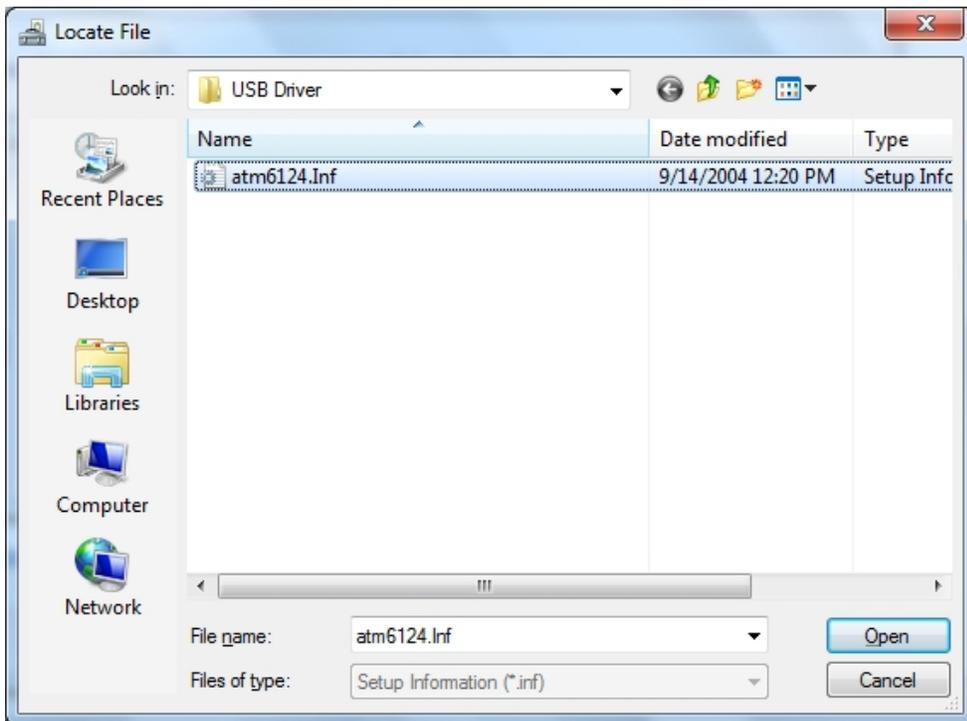
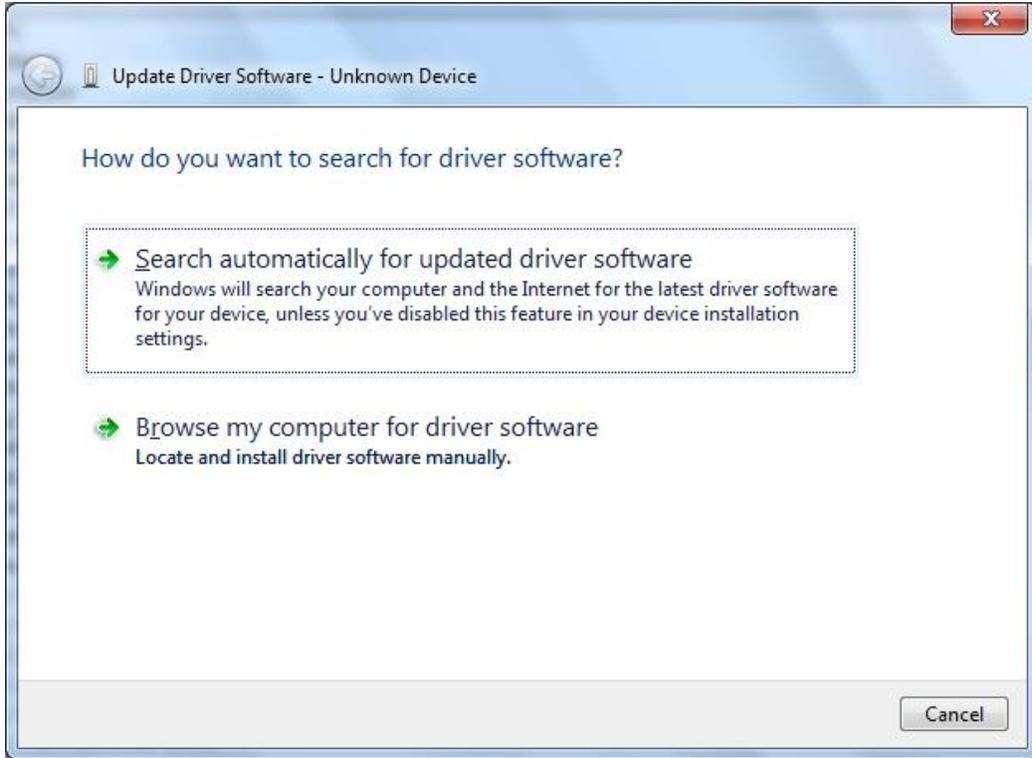
A message that driver installation was not successful will appear. In Device Manager, an Unknown Device will appear.



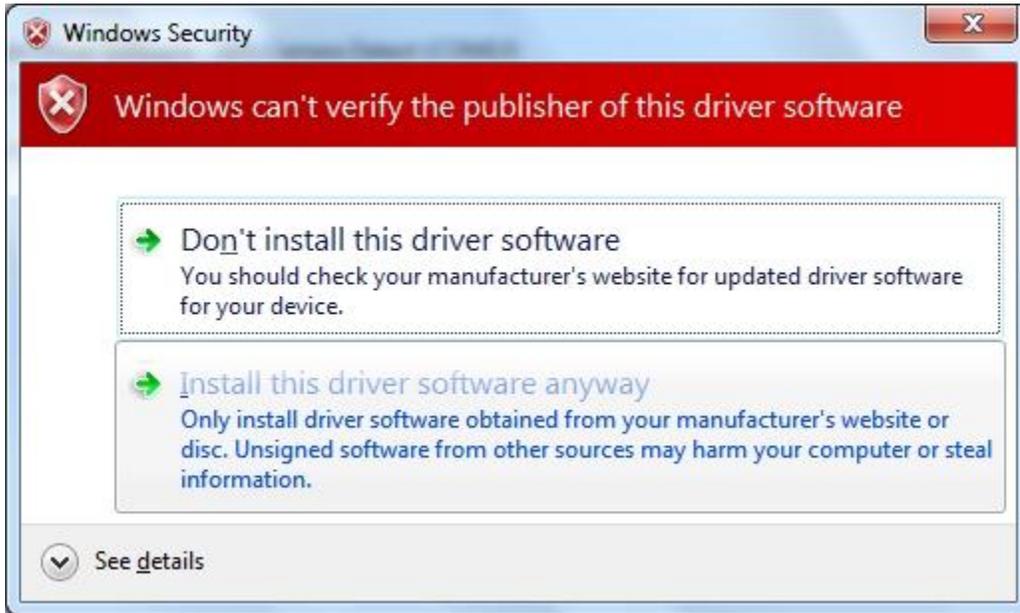
6. Right-click the Unknown Device and select "Update Driver Software":



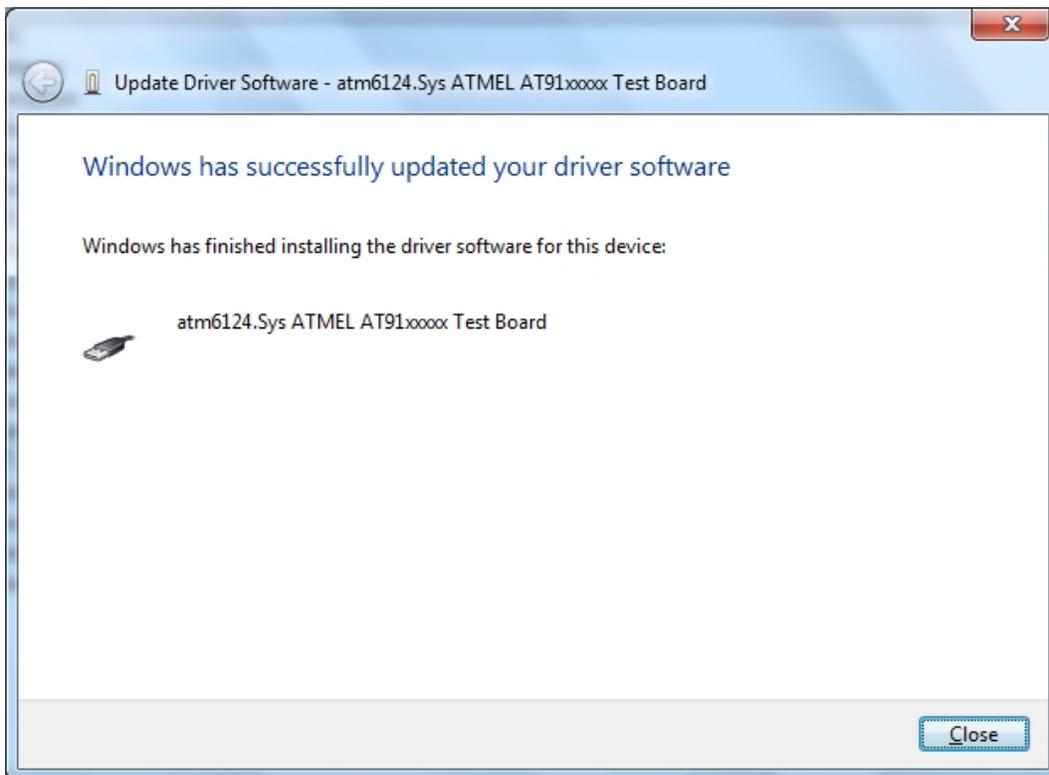
Select "Browse my computer..." and navigate to the USB Driver folder:



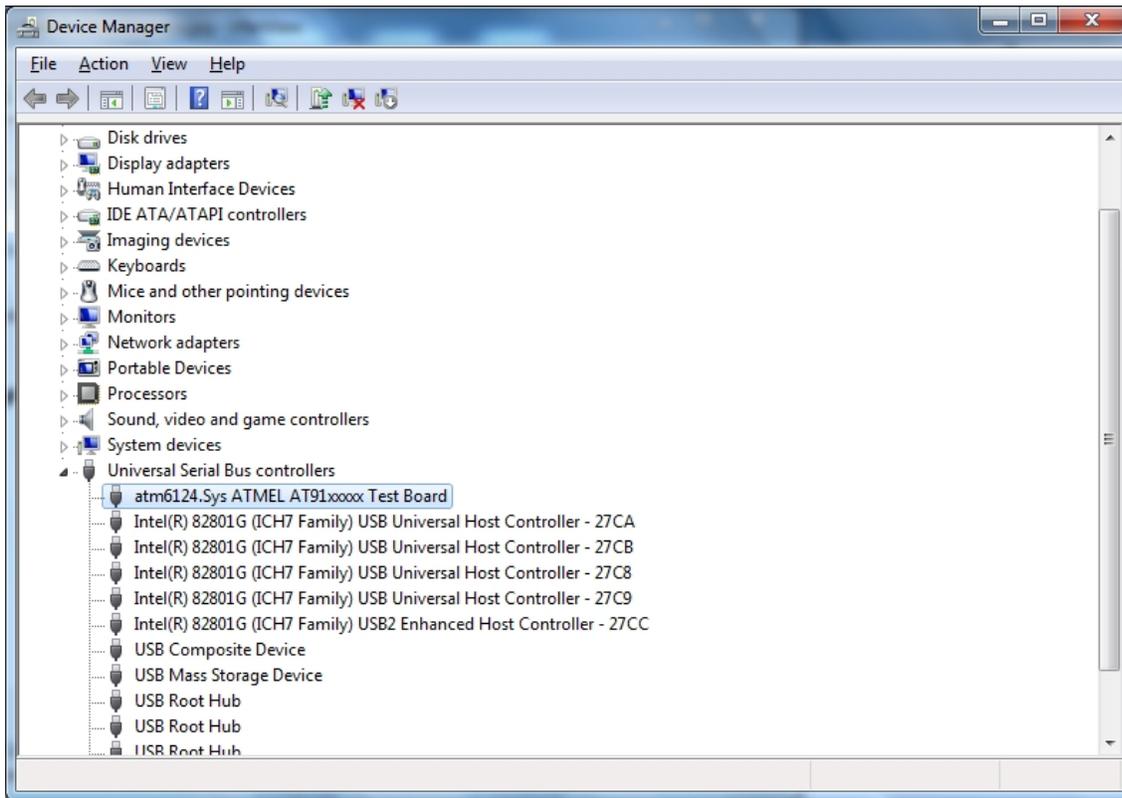
After locating the driver and selecting next, a warning “Windows can’t verify...” will appear.



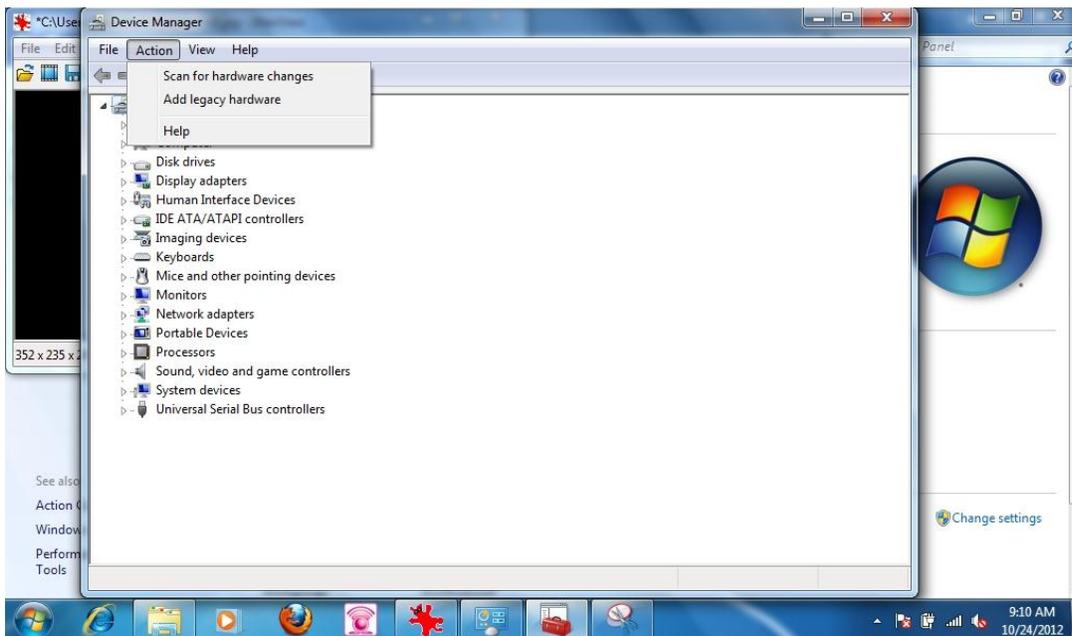
Select “Install this driver software anyway”. After a pause of a minute or so, the “Windows has successfully updated your driver” message will appear:



7. Device managers shows "ATMEL AT91xxxxx...":

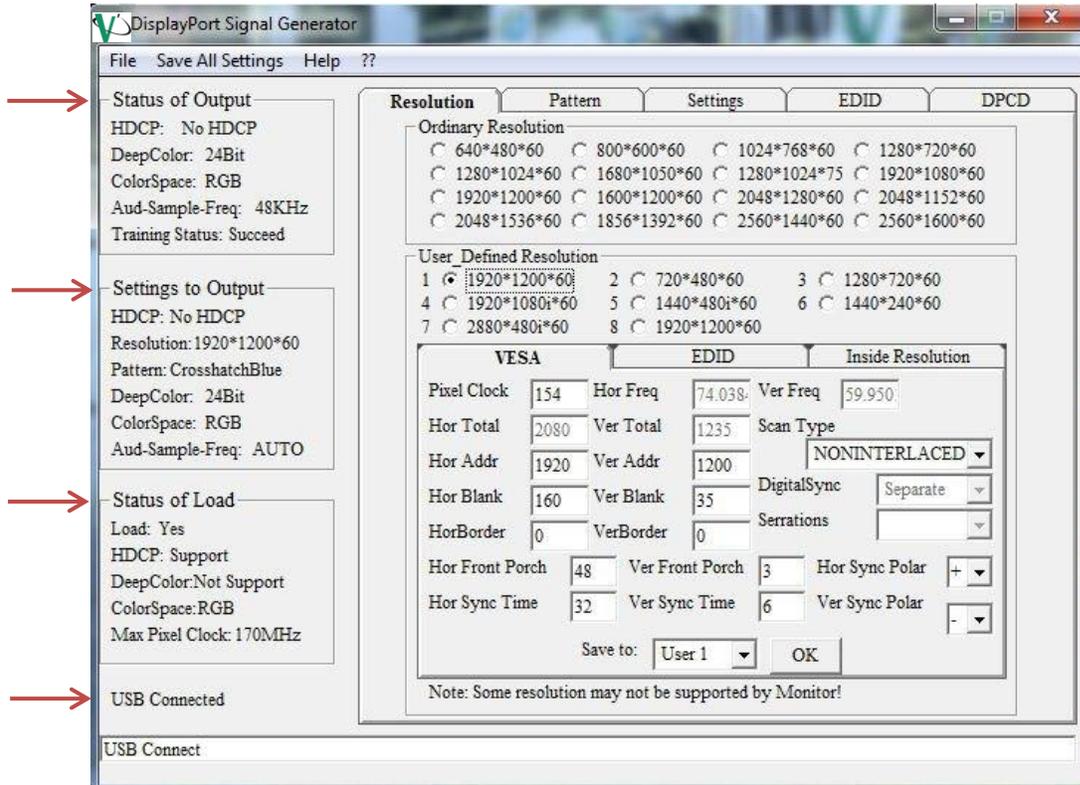


Driver Installation is complete.



5.2 Control Tabs

Start the “DisplayPort Signal Generator” application.



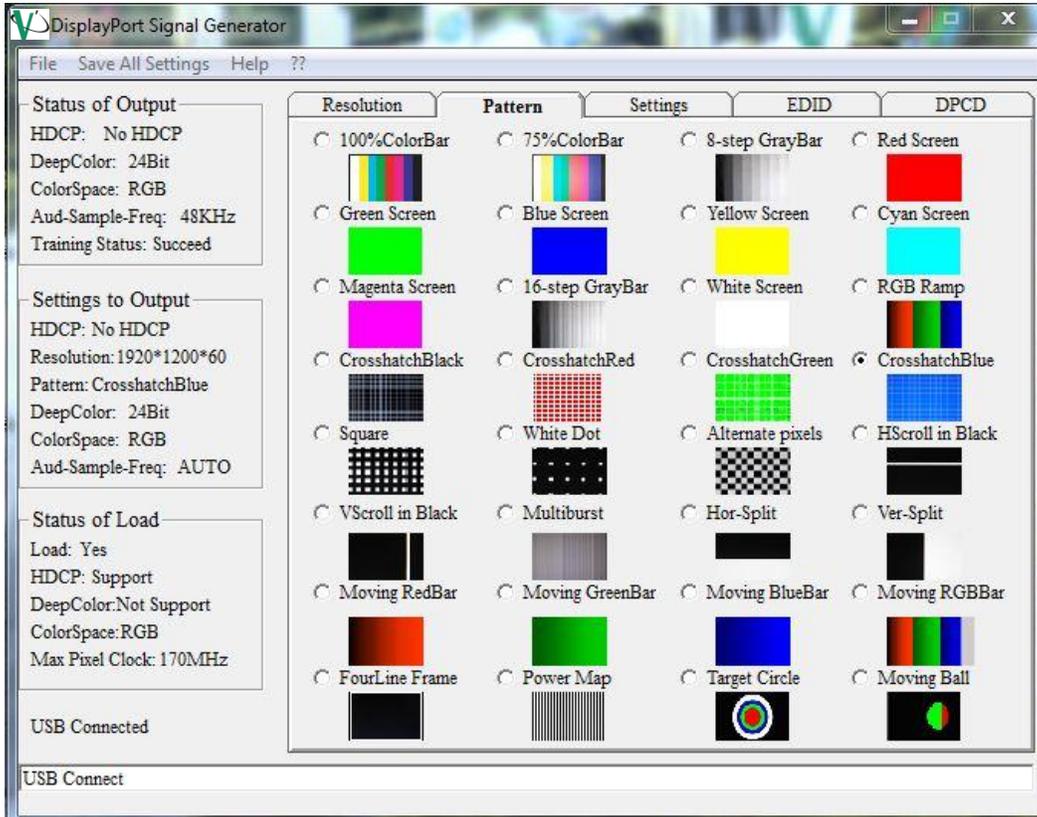
Status of Output- Shows the present status of the outputs which are set in the “Settings” tab

Setting to Output- Shows which items are selected to be output to the DUT

Status of Load- Information read from the DUTs EDID

USB Connected- Shows status of the interface from the controlling PC to the VPG

5.3 Controlling the different functions

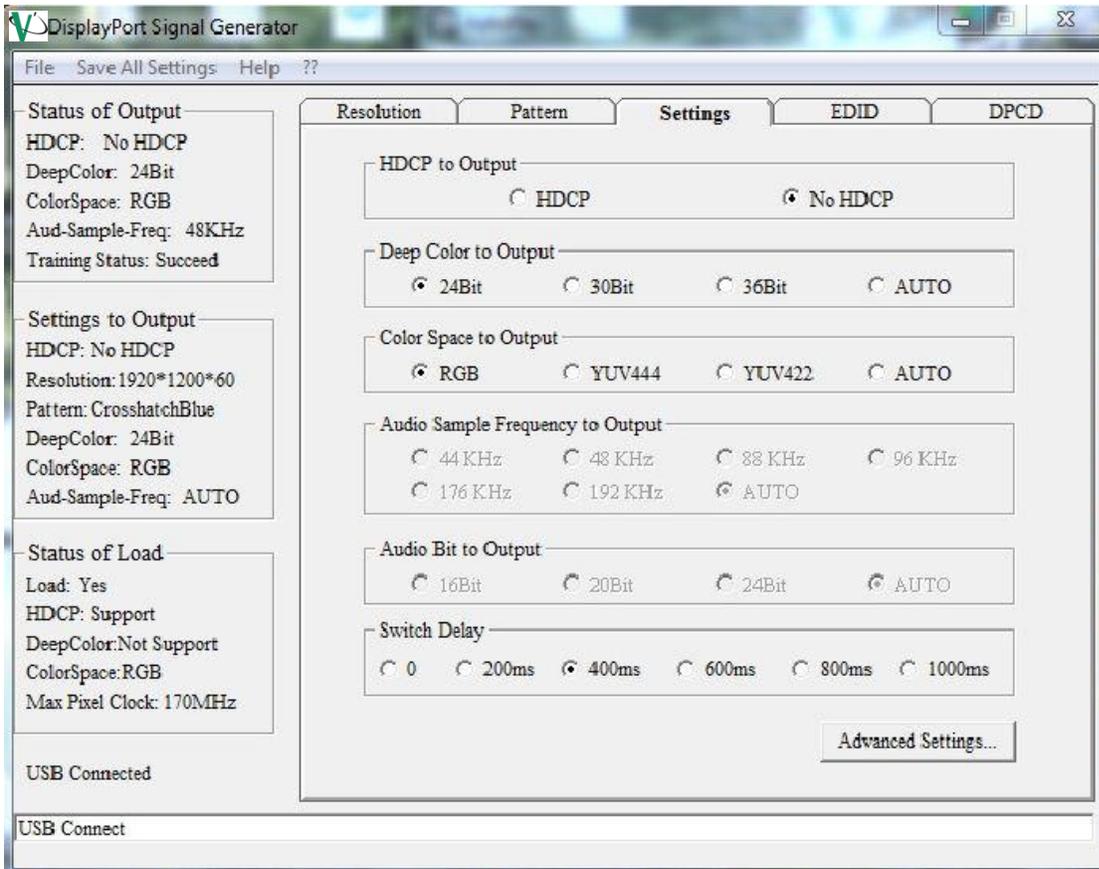


After clicking the “**Pattern**” tab, patterns may be selected by clicking on the name of the desired pattern. If the pattern is changed by the selector buttons on the VPG 1101, the rendered pattern will also be shown on the GUI (which is continuously updated).

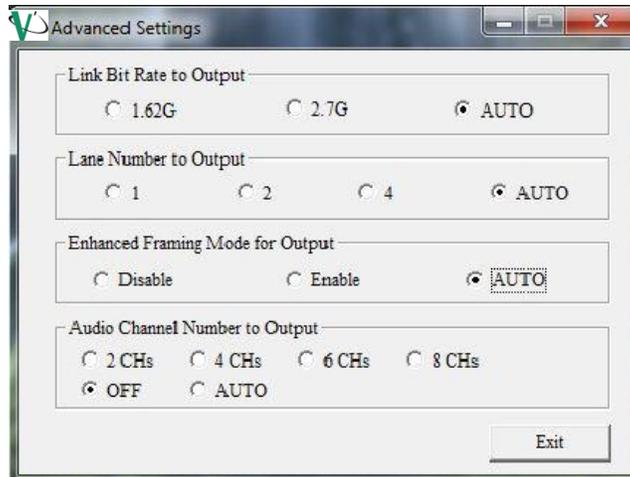
The patterns are fixed and cannot be altered.

5.4 Advanced Functions

5.4.1 Settings



The “**Settings**” refer to the actual hardware settings of the VPG output. Once they are set, they remain at the selected settings until actively changed. The settings can also be controlled remotely. The switch delay refers to the switching time between resolutions.



In the “**Advanced Settings**”, additional hardware controls can be modified. It’s recommended these be set to “**AUTO**” unless the device under test being tested has a fixed Bit Rate and or Lane count. Once set the selections will be maintained until changed.

Note: This control the only way to turn off the audio output. Audio will remain off until turned back on by this control.

5.4.2 Extended Display Identification Data (EDID)

The screenshot shows the 'DisplayPort Signal Generator' application window. The interface is divided into several sections:

- Status of Output:**
 - HDCP: No HDCP
 - DeepColor: 24Bit
 - ColorSpace: RGB
 - Aud-Sample-Freq: 48KHz
 - Training Status: Succeed
- Settings to Output:**
 - HDCP: No HDCP
 - Resolution: 1280*720*60
 - Pattern: 100%ColorBar
 - DeepColor: 24Bit
 - ColorSpace: RGB
 - Aud-Sample-Freq: AUTO
- Status of Load:**
 - Load: Yes
 - HDCP: Support
 - DeepColor: Not Support
 - ColorSpace: RGB
 - Max Pixel Clock: 500MHz
- USB Connected:** USB Connect

The main configuration area is titled 'Resolution', 'Pattern', 'Settings', 'EDID', and 'DPCD'. Under the 'EDID' section, there are radio buttons for 'Block 0' (selected), 'Block 1', 'Block 2', and 'Block 3'. A 'Monitor EDID' button is visible, along with the text 'EDID from Monitor'.

Below the buttons is a table of EDID data:

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	38	A3	0E	68	00	00	00	00
10	09	15	01	04	A5	26	1E	78	E2	B7	F5	A0	58	56	9F	28
20	0B	50	54	BF	EF	80	71	4F	81	40	81	80	01	01	01	01
30	01	01	01	01	01	01	30	2A	00	98	51	00	2A	40	30	70
40	13	00	78	2D	11	00	00	1E	00	00	00	FD	00	32	4C	1F
50	52	0E	00	0A	20	20	20	20	20	20	00	00	00	FC	00	45
60	41	31	39	32	4D	0A	20	20	20	20	20	20	00	00	00	FF
70	00	31	33	31	32	32	39	37	31	54	41	0A	20	20	01	7F

Below the table is a section titled 'Display Range Limits--FDH' with the following values:

- Min Ver Rate: 50 Hz (0--510)
- Max Ver Rate: 76 Hz (0--510)
- Min Hor Rate: 31 KHz (0--510)
- Max Hor Rate: 82 KHz (0--510)
- Max Pixel Clock: 140 MHz (0--2550)

The EDID can be read from the device under test by clicking the “**Monitor EDID**” Button. By clicking on the HEX code area, the information is interpreted and displayed in the lower section of the window as in the above picture.

5.4.3 DisplayPort Configuration Data (DPCD)

DPCD data can be read from the device under test. Once acquired the data it is interpreted. The field of interest is chosen by the “Choose Field” pull down. Then by right clicking on the different area of the field the information is displayed below in the “Basic information” view area.

The screenshot shows the 'DisplayPort Signal Generator' application window. The interface is divided into several sections:

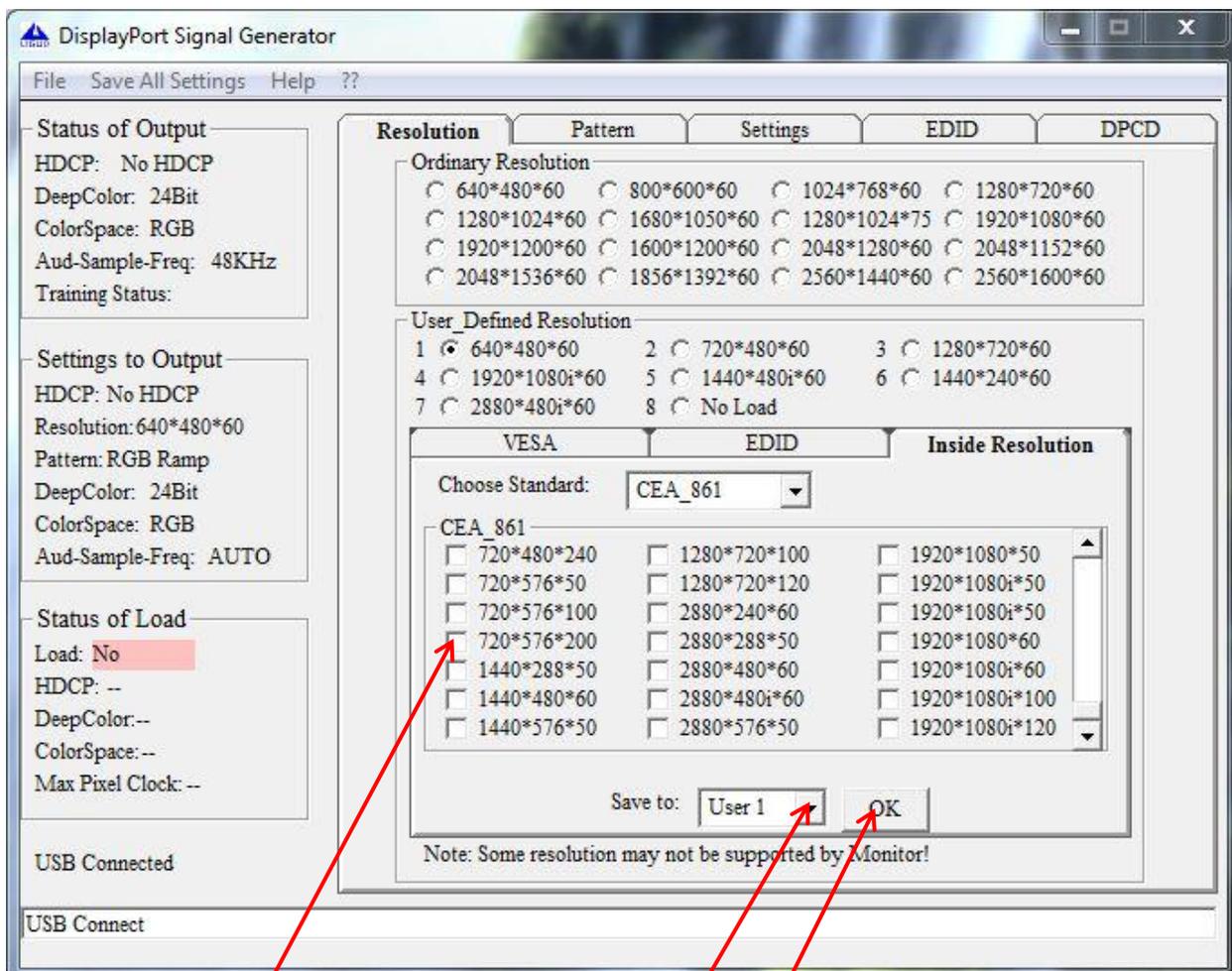
- Status of Output:** HDCP: No HDCP, DeepColor: 24Bit, ColorSpace: RGB, Aud-Sample-Freq: 48KHz, Training Status: Succeed.
- Settings to Output:** HDCP: No HDCP, Resolution: 1280*720*60, Pattern: 100%ColorBar, DeepColor: 24Bit, ColorSpace: RGB, Aud-Sample-Freq: AUTO.
- Status of Load:** Load: Yes, HDCP: Support, DeepColor: Not Support, ColorSpace: RGB, Max Pixel Clock: 500MHz.
- Resolution, Pattern, Settings, EDID, DPCD:** This section contains a 'Choose Field' dropdown menu set to 'Receiver Capability Field 000H-0FFH' and an 'OK' button. Below this is a 16x8 grid of hexadecimal values representing DPCD data. The values are:

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	11	06	84	01	01	00	01	00	02	02	06	00	00	00	00	00
01	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
02	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
03	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
04	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
05	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
06	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
07	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
- Basic Information:** DPCD Revision: 1.1 (0-15), Max_Link_Rate: 1.62 Gpbs/Lane(0-68.85), Max_Lane_Count: 4 (0-31), Enhanced Frame.
- USB Connected:** USB Connect

5.5.0 Setting User Defined Resolution

The User Defined Resolutions can be selected from the internal timing lists. This can be done either by aspect ratio or the CEA_861 list. These can be seen by using the pull down next to “Choose Standard”. Once set the User Defined Resolutions will be saved in memory until changed.

1. Click on the resolution you want to select
2. Using the Save to select the User position 1-7
3. Click OK to save it

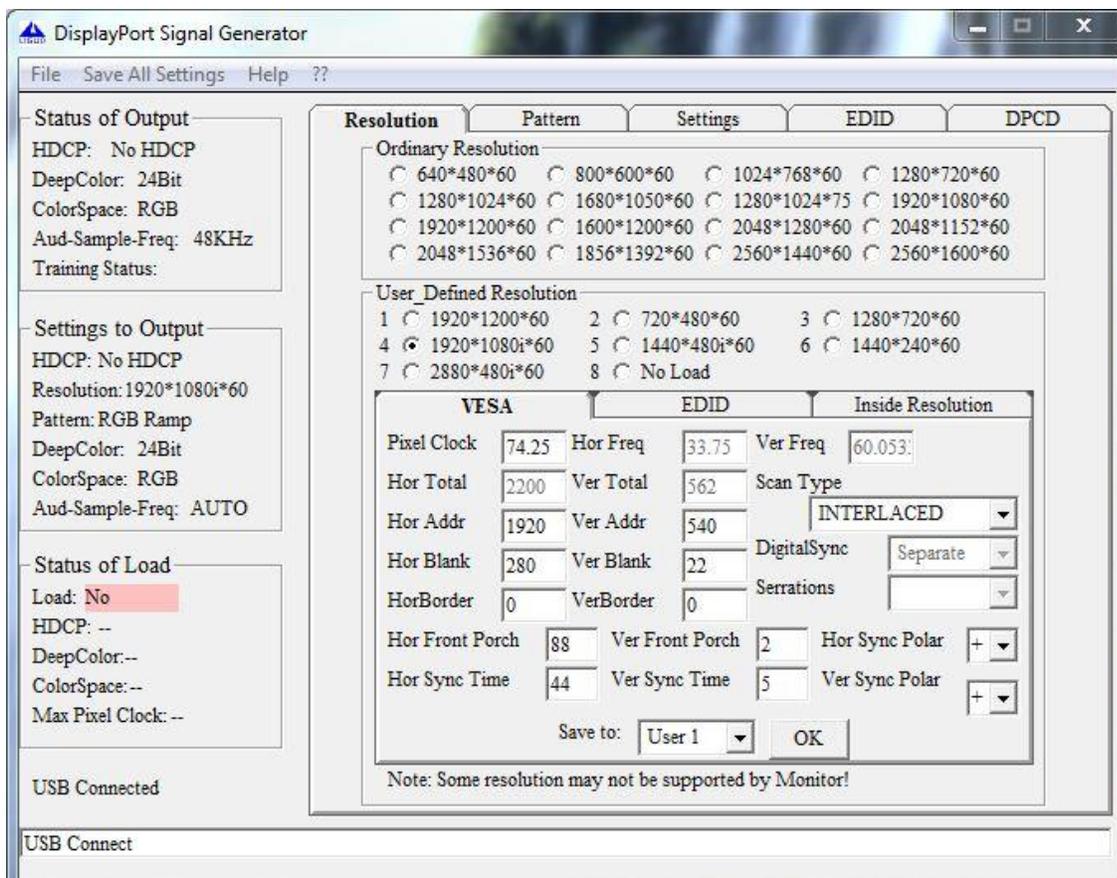


5.5.2 Programming custom Timing/Resolutions

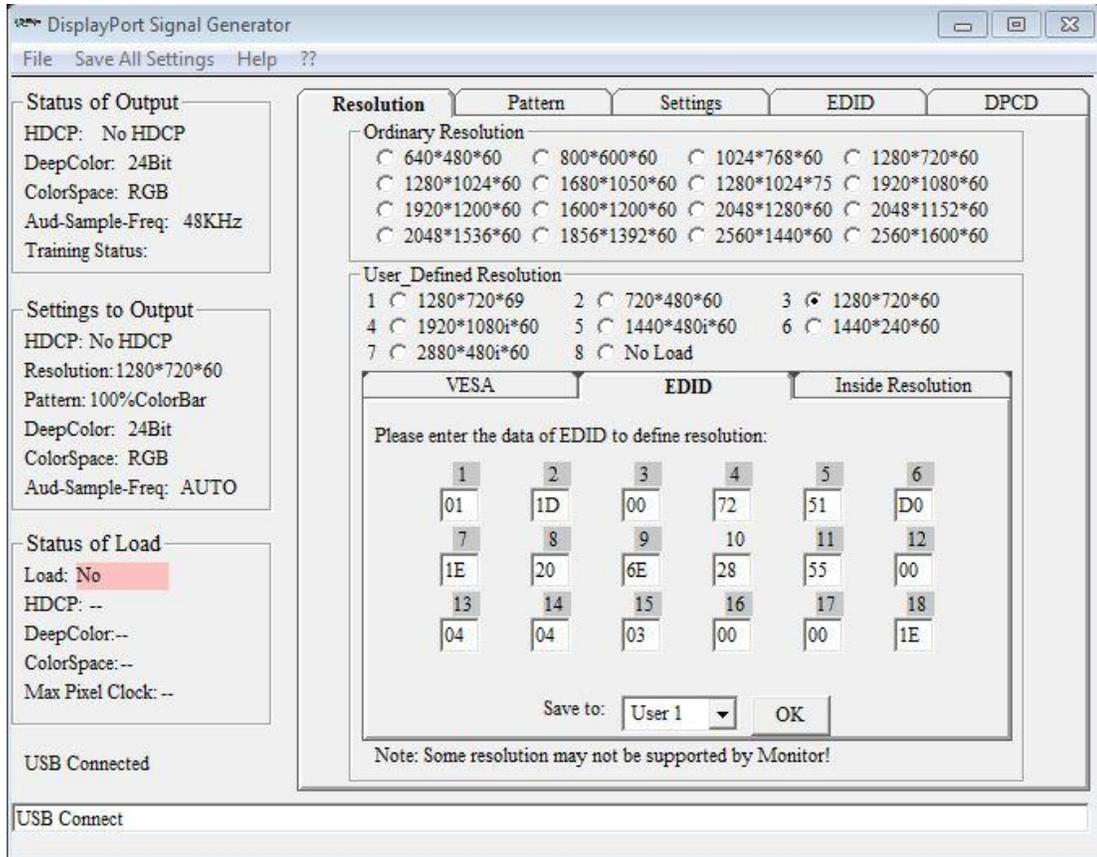
Custom resolutions can be modified and saved to one of the “User_Defined Resolution” locations.

There are three methods to accomplish custom timing changes:

1. An existing timing resolution can be modified by the GUI editor. By changing the timing value, scan type, or sink settings and then selecting the user location and then clicking on <OK>. This change will remain until being over-written with a new timing resolution.
2. If you are remotely controlling the VPG-1101 using the optional control protocol commands, the timing resolutions can be loaded using the EDID descriptor values. Refer to the “optional Programmer’s Manual”.



- The other method is to select the “EDID” tab and input the EDID information and then save it to one of the user locations.



6.0 Support

Questions regarding operation and technical issues can be sent to:
support@vprime.com.

For immediate help call: +1 (503)619-2439