

VoverlayHD

PCI-Express Card to Realtime Overlay High-Definition Text and Graphics on High-Definition Video Input

Application User Manual

Version 1.0.0.0

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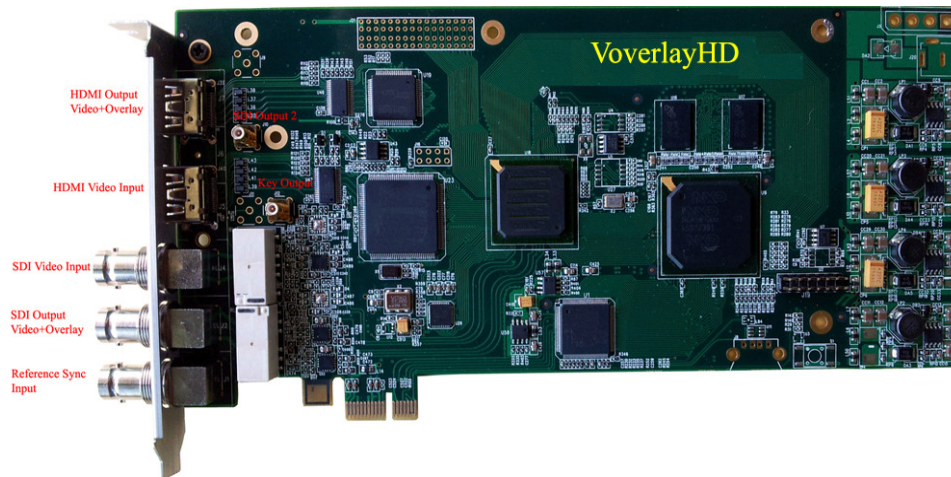


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1. Main Features & Functions:

VoverlayHD is a **Realtime High-Definition Text & Graphics on HD Video Overlay PCIe Card** with many features & functions:

- On-board ICs instantly mix PC text/graphics/video with live input HD/SD video and output to SDI/HDMI ports
- Full **256-Level Alpha blending** control on every pixel mixed with incoming video up to **1920X1080-Pixels**
- Each pixel within video input frame up to **1920X1080 pixels** can have different overlay colour & transparency
- Full **24-bit overlay colour** and 8-bit alpha (ARGB) assignable to and readable from every input video pixel
- HD/SD I/O for 720X480/576 ~ 1920X1080-Pixels, 24/25/50/30/60/29.97/59.94/23.97Hz, Interlaced & Progressive
- Every output video frame can be grabbed and saved as graphics file and/or raw YUV file
- Instant overlay add / delete without visual delay on outputting video signal
- Un-limited PC-generated colour text, graphics and video can be overlaid simultaneously on incoming video
- Use full Windows GDI/GDI+ power to generate un-limited vector & bitmap graphics overlaid on input video
- Up to 16 Multiple cards can be run on the same PC controllable by the same software
- Full software control at software level on video Sync, Mixing, Resolution, Progressive/Interlace etc
- **SDI & HDMI video Input/Output** supported and software selectable: 3G-SDI, HD-SDI, SD-SDI, HDMI
- Simultaneous **SDI** and **HDMI video output** ports outputting same content
- Output ports can be software configured to display video only, video plus overlay, overlay only
- Internal, External and SDI Signal Sync Modes supported and software selectable
- Separate Reference Sync BNC Port available on card back panel
- Overlay Content can appear on output ports when no input signal is available
- SDI Video Input to Output Pass-through on power loss (PC reboot or powered off)
- Input SDI or HDMI Audio is passed onto Output Ports
- **Live Video Preview on PC Screen** in resizable floating window always displaying the output video content
- Overlay Text String support different colour, font name, size, background mode, transparency & Unicode
- Overlay Graphics Files support for BMP, JPEG, GIF, PNG, TIFF and Targa format
- Apply single or a range of "Transparency Colours" on Graphics & Text for Blue-Screen/Chroma-Key effect
- Overlay Timer support for time, date, mille-second, frame number
- Overlay Card Operation support for screen area clear, alpha change & content rotate, I/O select, etc.
- Overlay Windows support for constantly displaying any window's content to external HD Video Devices
- Constant Alpha Channel Value Change under software control for timing and increment
- Horizontal and Vertical Moving Text & Graphics Overlay with software configurable steps and times
- Instant Overlay Display to external HD Video Devices from multiple overlay items constructed & loaded
- Save and Open Overlay Item List Files for repeated use of complicated overlay schemes and patterns
- Save & Read **EEPROM** data for card/software identification or other usage: 48 bytes can be read and written.
- Full **SDK** for Software Development inc. full **C++, VB, C# source codes** of fully functioning executables
- SDK & Application run on Microsoft 32-bit/64-bit Windows XP/Vista/7/8 Operating Systems

2. Package Contents:

VoverlayHD PCI-Express Card (1XPCIe)
One Installation CD
One User Manual
One SDK Manual

3. Minimum System Requirement

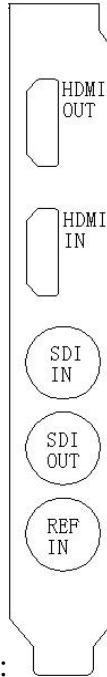
Hardware: Intel/AMD CPU based PC, one empty 1-Lane (or 4X, 8X, 16X Lane) PCI-Express slot.

Software: Microsoft Windows XP, Vista, Windows 7 or Windows 8, 32-Bit or 64-Bit, DirectX 9 and above. Please note although running the main **VoverlayHD.exe** application does not require it, running the **CSharp.exe** or **VoverlayHDVB.exe** application will need the Microsoft .Net Framework 3.5 to be installed.

4. Hardware Installation

Un-plug the PC's power cable, open PC case, locate an empty PCI-Express slot, plug in the **VoverlayHD** card and screw it firmly to the back-panel.

Plug in video cables between the external HD video input/output devices and **VoverlayHD**, according to

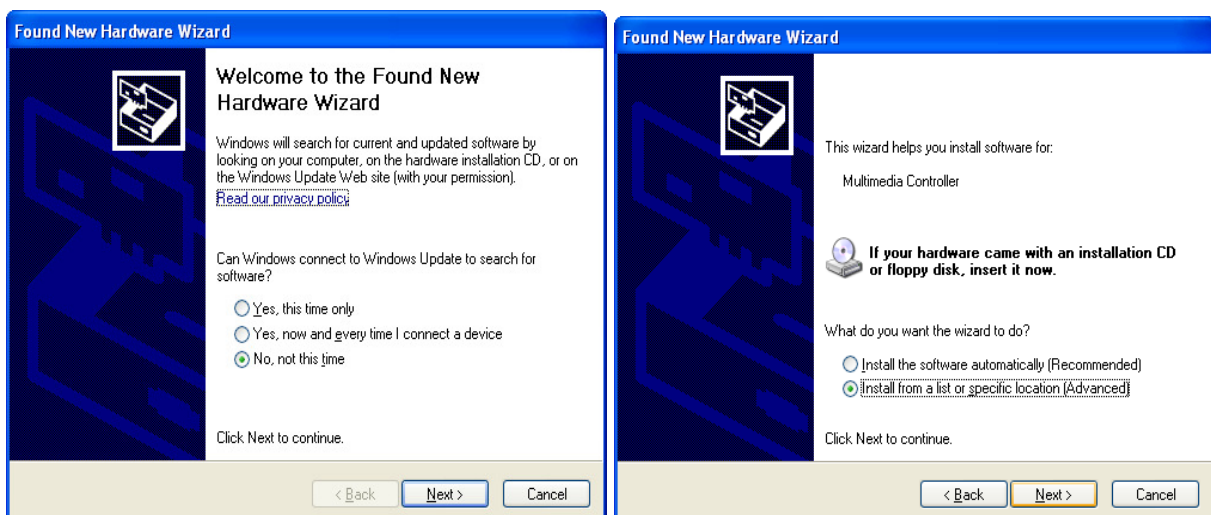


the socket Input/Output types illustrated here: , Input socket SDI or HDMI is in use by software selection to be either one at a time, while Output SDI and HDMI ports always simultaneously output the same Video + Overlay (or Video only, Overlay only, depending on Card Operation Selection) content. There are also an optional **SDI Output 2** (Same Content as SDI Out on the back panel) Socket JD10 and a **Key Output** (Overlay Output Only) Socket JD12 on the PCB that require additional cables to connect to them. The **Video Preview** function of the **VoverlayHD.exe** application can be used to view the incoming video mixed with overlaid text/graphics on PC screen inside a floating resizable window, while external HDMI / SDI TV, Bluray Recorders, Video Capture Devices etc. can be connected to the output SDI/HDMI sockets of the **VoverlayHD** card to receive its live video output including overlaid text and graphics. When PC power is lost the **SDI Input** signal will pass through to the **SDI Output** port via an internal relay. The **Ref. In** can be from a Y luminance or CVBS signal for external Sync Mode.

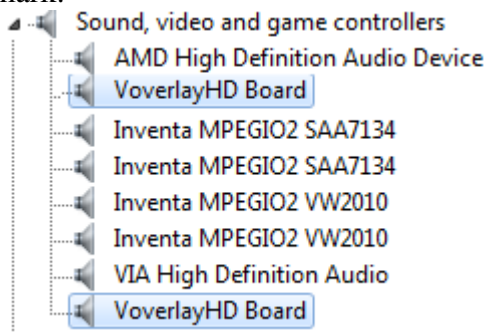
5. Software Installation

Software installation has two steps: device driver software installation and application software installation.

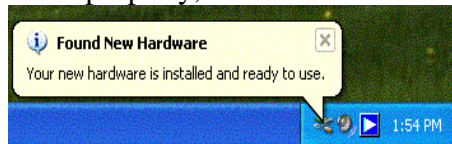
5.1 After hardware installation, the MS Windows will inform that new hardware is found:



5.2 Put the **VoverlayHD** installation CD into PC's CD/DVD drive, click "Next" button, let Windows search for device driver specifically from one of the sub-folders (winxp, vista, win7, use win7 sub-folder for both Windows 7 and Windows 8) under "**driver/32bit**" or "**driver/64bit**" folder according to the PC's current Windows version and if Windows is 32-Bit or 64-Bit. During the driver installation, ignore those warnings claiming the device driver "has not passed Windows Logo testing..." etc, press "Continue Anyway" to keep going, until the driver is installed, then **Reboot the PC**, then (after rebooting) check the Windows' "ControlPanel" to make sure the "System->Hardware->DeviceManager ->Sound, video and game controllers" category has a driver line "**VoverlayHD Board**" listed for each **VoverlayHD** card without question or exclamation mark:

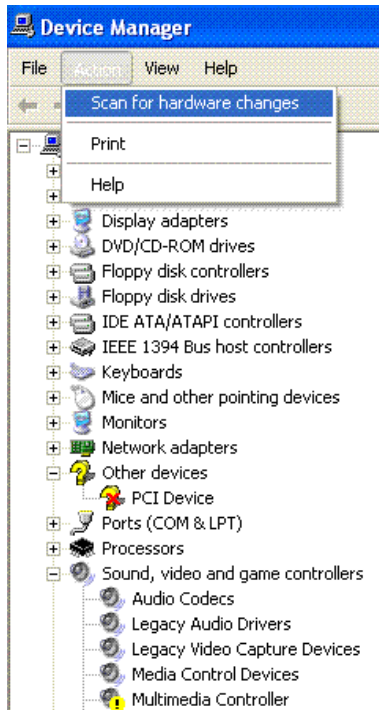


When device driver has been installed properly, Windows will have a pop-up message box at the

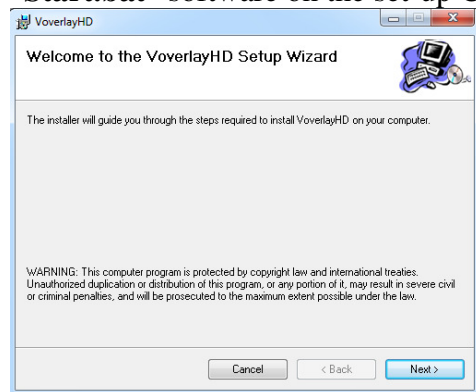


lower right corner of the screen:

Please note: after re-installing MS Windows on a PC with VoverlayHD card remaining seated in PCIe slot, one "Multimedia Controller/PCI Device" or similar line will appear in the Windows' **ControlPannel->System->Hardware->DeviceManager** window, preceded by a yellow question mark or exclamation mark, since Windows will not(cannot) install the device driver software. This item will need "update driver" operation(right-mouse click then select "Update driver...") to install the proper driver software from the "driver" folder on the Setup CD, before the VoverlayHD card and application software can be used properly. Alternatively, you can delete this question-mark/exclamation-mark preceded item(right-mouse click them then select "Uninstall"), highlight the PC's name in the DeviceManager window then select "Scan for Hardware Changes", then follow the same steps as at the start of this section to install the device driver:

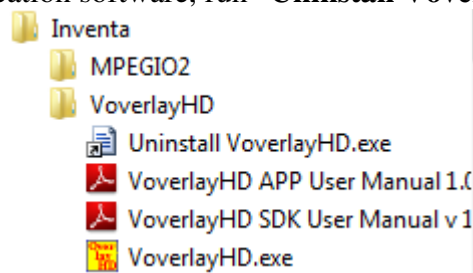


5.3 To install the application software **VoverlayHD.exe**, click “**N**ext” on the “VoverlayHD Setup Wizard” window --- which normally starts up automatically after inserting the set-up CD, or will appear after double-clicking the “**S**tart.bat” software on the set-up CD:



then follow the on-screen instructions to install the application software. Please note the **Start.bat** batch file calls MS Windows command **reg.exe**: if **reg.exe** (usually under C:\Windows\system32) is missing **Start.bat** will fail, so make sure **reg.exe** is executable from the **Windows**’ command path.

5.3 To remove the installed application software, run “**U**ninstall **V**overlay**H**D.exe” from the



VoverlayHD program group: —

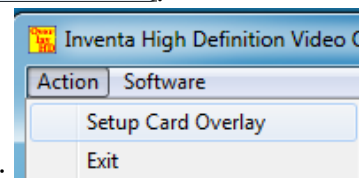
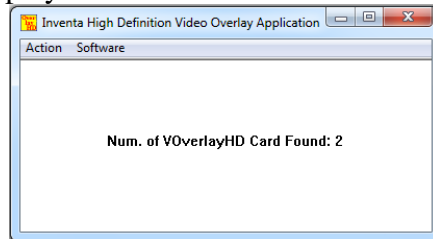
6. Starting the Software



After a successful application software installation, a “**VoverlayHD.exe**” shortcut icon will appear on the Windows’ desktop. Mouse double-clicking this icon will start the software. The software can also be started from Window’s “Start->Program Files->Inventa->VoverlayHD” group.

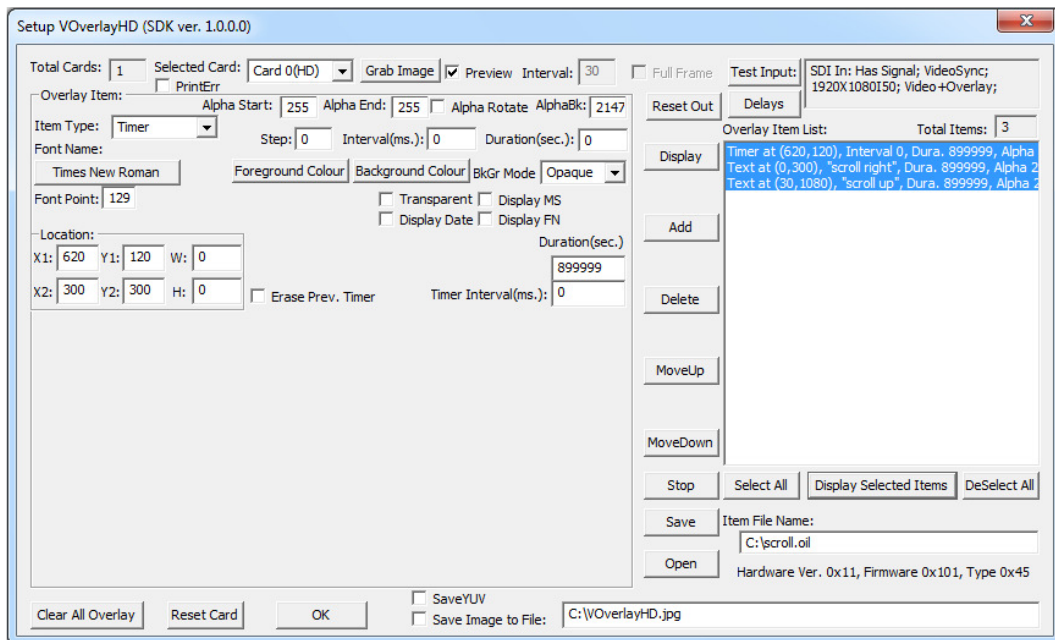
7. Operate VoverlayHD Card

Once started, **VoverlayHD.exe** will display its main window:



Mouse-clicking the “**Action**” menu will show its menu items:

Selecting the “**Setup Card Overlay**” item will start the “**Setup VOverlayHD**” window, where all the major operations for **VoverlayHD** card can be accomplished:



The Setup Window arranges its functions in several main areas: on the top line is the **Generic Operation** area, below it on the left is the **Overlay Items** area, on the right is the **Overlay Item List Box**, and in between the **Item** and **Item List Box** areas there are **Operation Buttons** that can be used for **Overlay Items** and **Item List**, such as **Display** Current Item, **Add** Item to Item List, **Save** and **Open** Item List File, etc.

7.1 Generic Operations

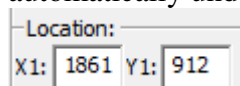
The upper part of the **Setup Window** lists several generic operations, inc. **overlay card selection** (when multiple **VoverlayHD** cards are installed), **still image grabbing** which will display the grabbed video and/or overlay image in the application's main window and optionally save them into graphics/YUV files, **live video preview**, and **Input Test** operation.

Checking the ☒ **Preview** box will start a separate floating and resizable **Video Preview Window** for the current **VoverlayHD** card:



VoverlayHD Card 0: 1920X1080P25
Maximize
TopMost
Exit Preview

which also has a right-mouse clicking popup menu to operate: . When mouse cursor is moving inside **Video Preview Window** without pressing any mouse button, if **Ctrl** key is pressed then the approximate video frame position the current mouse cursor is pointing to will be automatically undated in the **X1/Y1** edit fields of the **Location** group in the **Setup** dialog window:



Inside the **Video Preview Window**, double-clicking left mouse button will toggle between the full-screen and normal window mode. While at the full-screen mode, pressing the space button also brings the window back to normal size. When in the normal window mode, pressing down the left mouse button then moving the mouse will move the window around.

The video displayed inside the preview window is always the same as the video output on the card's SDI and HDMI output ports.

The "**Full Frame**" check box is to select if the previewed video is getting full frame resolution of the actual video input frame, or 1/4 of the actual video frame resolution. Getting full frame resolution (box checked) will display higher quality preview video on PC screen, in particular the added overlay contents, but requires much more CPU power and the displayed video is less smooth than using 1/4 frame resolution ("**Full Frame**" box cleared).

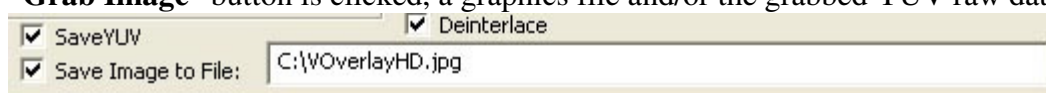
The "**Interval**" edit box appears only when Windows is not XP: this is the time the application program pauses between displaying two consecutive video frames: smaller value makes the preview smoother but consumes more CPU power.

Please note when using multiple **VoverlayHD** cards on Windows XP, only one card can have live video preview at any time, trying to preview video while another **VoverlayHD** card is already previewing causes a DirectDraw error warning dialog advising to close the other card's preview first.

Clicking the **Grab Image** button will grab the current video frame into the application's main window:



if the “**Save Image to File**”/”**Save YUV**” box at the lower right part of the window is checked when “**Grab Image**” button is clicked, a graphics file and/or the grabbed YUV raw data file will be created:



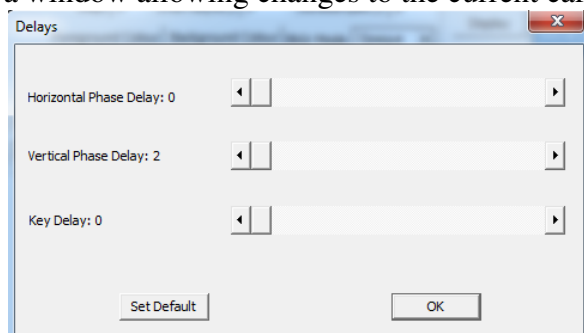
The graphics file will have one of the **.bmp**, **.jpg**, **.gif**(WinXP)/**.tif**(Non-WinXP), **.png** file extensions as typed in the edit field, plus a serial number appended before the ‘.’ character, such as VOverlayHD0.jpg, VOverlayHD1.bmp etc. The graphics file's image is the current frame at the currently selected video input port (SDI or HDMI), with the same video resolution (from 720X480 ~ 1920X1080 pixels) without any scaling.

The grabbed YUV file is of packed UYVY 4:2:2 format, useful for some YUV play/analysis programs.

The “**Deinterlace**” check box only shows under Windows XP, checking it will capture de-interlaced image.

The “**Reset Out**” button disables then re-enables the SDI and HDMI output ports.

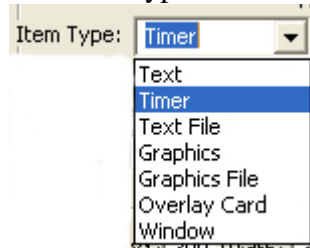
The “**Delays**” button pops up a window allowing changes to the current card's line and frame delays:




A “**Reset Card**” button at the lower-left corner of the Setup Window will close and restart the current **VoverlayHD** card, this can be used to rectify any erroneous situation of a card.

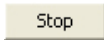
7.2. Overlay Items

Below the Generic Operation area, on the left is the **Overlay Item Selection** area. Overlay Items have **Item Types** such as Text, Timer, Graphics File, Card Operation, and Window --- these are used to differentiate functions and features each type of item operate. Overlay Item Types are selected through



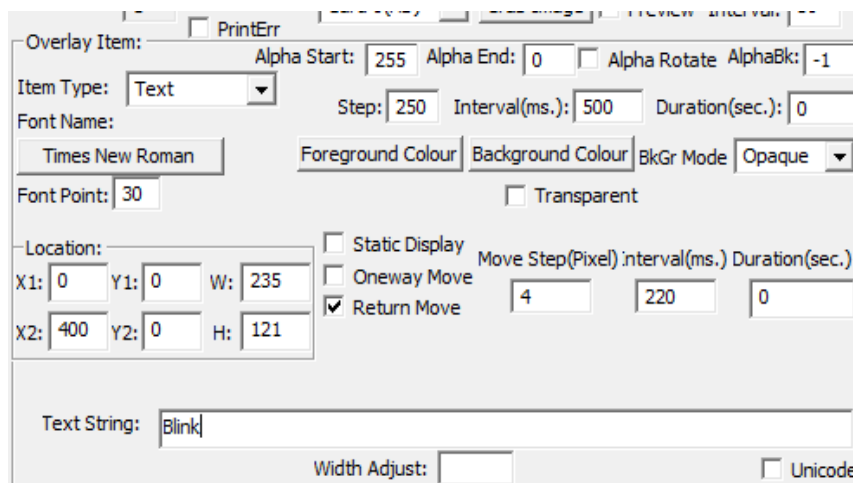
the “**Item Type**” Combo box: Each time a different Item Type is selected, specific buttons and combo-box etc controls relevant to that Item Type will be displayed.

Pressing the “**Display**” button  between the “**Overlay Item**” and “**Overlay Item List**” areas will display the currently selected Overlay Item content onto the video output ports and on-screen video preview window immediately.

Pressing the “**Stop**” button  will stop displaying the current item if it is dynamic one like timer or moving text etc. Previously displayed item’s image normally remains on screen without being erased.

Clicking  button erases all currently displayed overlays on preview window & output ports.

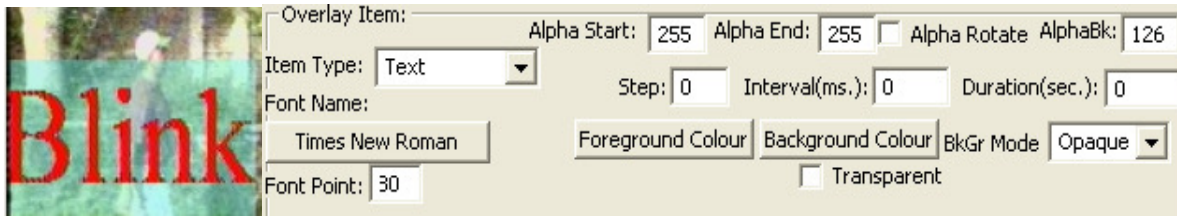
7.2.1 Text Overlay Item



Text Overlay Items allow static or moving text to be displayed over incoming video. Many parameters, inc. alpha blending, colour, font, transparency, location, duration, etc can be selected and changed. Appropriately combining these parameters, text with numerous different effects can be output on external HD video devices overlaid on the incoming video, or by themselves without incoming video. For example, the settings in the previous screenshot will create a blinking text “Blink” blinking every half a

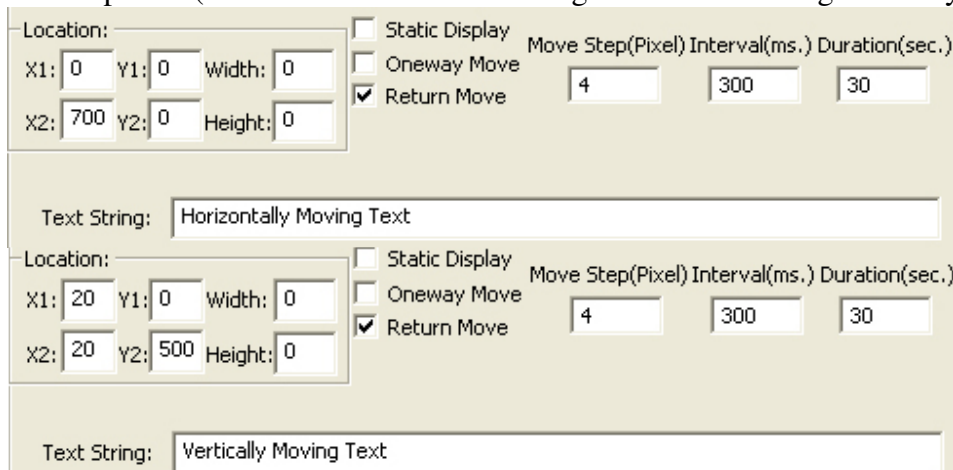


second, while slowly moving across the top of the video screen: . The following settings (note “**AlphaBk**” is set to 126) will create a word “**Blink**” with half-transparent background colour:



As shown in the screenshot, the **Text Overlay Item** has two time-changing parameter sets:

- (1) **Alpha Start & Alpha End Change:** Setting these parameters to different values and giving some values to the Alpha **Step**, **Interval** parameters will cause the displayed text to have a changing visibility every “**Interval**” time in “**Step**” increment/decrement, such as gradually fading in or fading out. The “**Alpha Rotate**” controls when the changing “**Alpha Start**” value reaches the “**Alpha End**”, if it will gradually change back from the “**Alpha End**” back to “**Alpha Start**” in “**Step**” increment/decrement, or it will abruptly jump back to the original “**Alpha Start**” value. The Alpha “**Duration**” (below **AlphaBk** field) controls how long this **Alpha Start**→**Alpha End** visibility change will last: a zero duration means the changes will last forever until being cancelled specifically.
- (2) **X/Y Location Change:** Setting the (X1, Y1) and (X2, Y2) values different will cause the text to move horizontally or vertically, in the increment of “**Move Step**” value, every “**Interval**” time, for “**Duration**” period (zero **Duration** means moving forever until being manually stopped):



The “**Oneway Move**” and “**Return Move**” check boxes control if the movement will repeat when reaching the (X2, Y2) position.

As shown in the previous example, the “**AlphaBk**” value controls the visibility of the text’s surrounding background colour when the “**BkMode**” is **Opaque** and the **Transparent** CheckBox is cleared:



The text **Font Name**, **Font Point**, **Foreground Colour**, **Background Colour**, **Background Mode**, **Transparency** can all be changed by using the corresponding buttons.

Note to create those Transparent Background text as shown above, the “**Background Colour**” must be set to **Black** (RGB = 0,0,0), the **BkGr Mode** must be “**Opaque**”, and the “**Transparent**” checkbox must be cleared. If the **Background Colour** is non-black then the resulting text will have a background of **Background Colour** such as this (**Background Colour** is green): 10:28:43

Ticking the “**Transparent**” box can make 2 partially overlapped text items both appear properly like this:

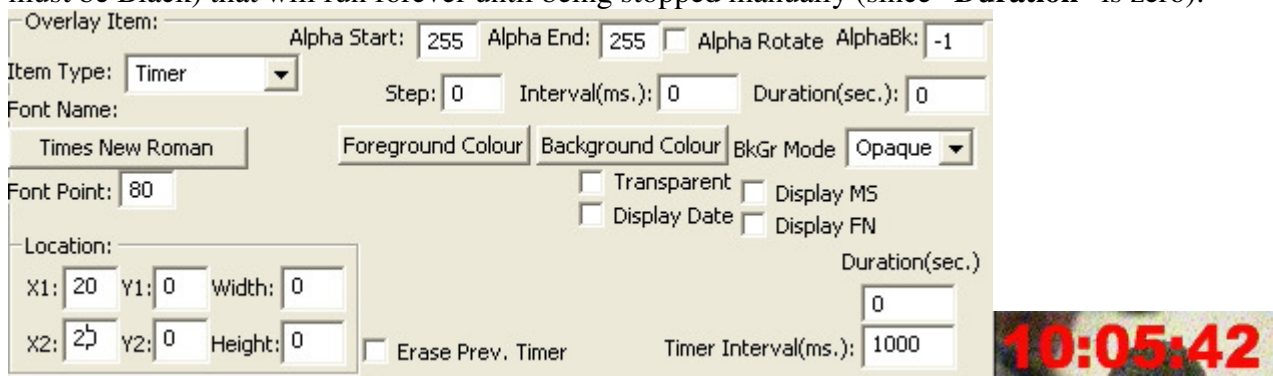


The “**Width Adjust**” value indicates empty pixels extending beyond the right-most area of the text string, useful at some high-resolution (such as 1920X1080) video mode to compensate right-most clipping.

The “**Unicode**” box allows input of multi-byte characters (Japanese/Chinese/Korean etc.) as overlay text.

7.2.2 Timer Overlay Item

Timer overlay item has similar parameters as **Text** overlay items, except the displayed text is always the current time (and date if “**Display Date**” checkbox is checked). The setting in the screen shot below displays a one-second interval timer at (20, 0) position with transparent background (Background Colour must be Black) that will run forever until being stopped manually (since “**Duration**” is zero):



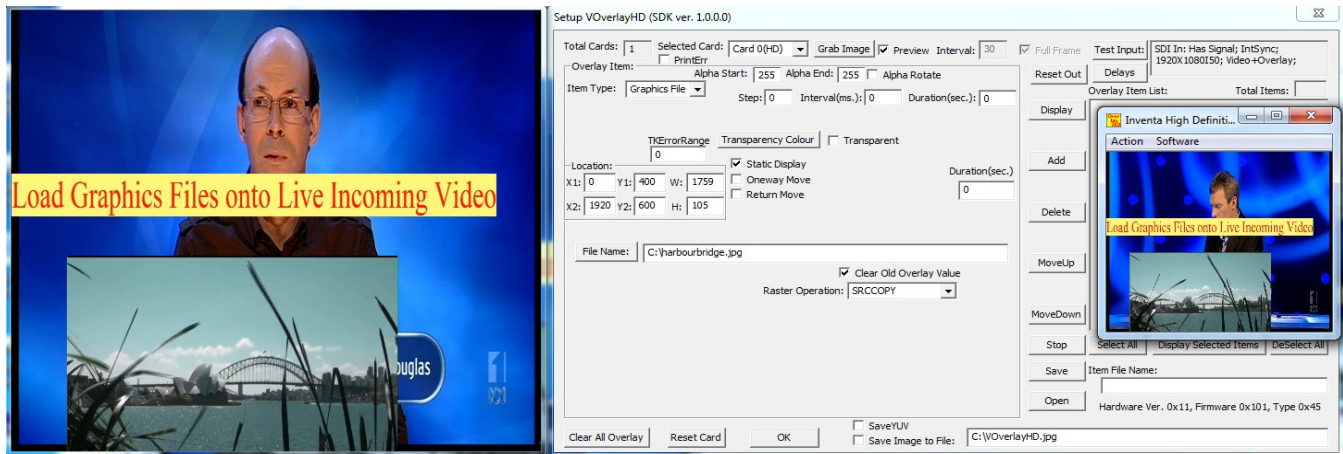
The “**Erase Prev. Timer**” checkbox controls if to clear the previously displayed timer (if any) when the current timer item is displayed. Note when a new **Timer** is defined and the “**Display**” button is clicked, any previously defined **Timer** will be automatically stopped since one **VoverlayHD** card can have one **Timer** at any time, although this can be overcome by writing customized application software using the SDK.

The “**Timer Interval**” field can have values from 1ms up.

Similar as the “**Display Date**” checkbox, the “**Display MS**” controls if the **Mille-Second** will be displayed, while the “**Display FN**” controls if the incoming video’s **Frame Number** will be displayed.

The **Font** and **Alpha** parameters have the same effects for the **Timer Items** as for the **Text Item**, but the **Timer Item** will not move its X/Y location as the **Text Item**.

7.2.3 Graphics File Overlay Item



Graphics File Items allow graphics files to be displayed over incoming video or by themselves at the output video ports. Supported graphics file types are .BMP, .JPG, .GIF, .PNG, .TIF, and .TGA.

Apart from the file name selection, this item has several new parameters:

(1) Transparency Colour

When “**Transparent**” checkbox is ticked, the overlay process will not display the pixels from the graphics file whose colour RGB values and the “**Transparency Colour**” value have minimum difference, that is:

$$\text{abs}(R_p - R_t) + \text{abs}(G_p - G_t) + \text{abs}(B_p - B_t) \leq \text{TKErrorRange};$$

where $\text{abs}(X)$ is the absolute value of X ,

$R_p/G_p/B_p$ is the RGB value of the pixel on the graphics file,

$R_t/G_t/B_t$ is the RGB value of the **TransparencyKey** Colour,

TKErrorRange is a value \geq zero as supplied on the screen.

For example, when “**Transparent**” checkbox is ticked and the “**Transparency Colour**” set to “blue” (RGB= (0,0,255)), a graphics file with people in front of a blue background will be displayed only with the people over the incoming video, the blue background becomes invisible thus exposing the video underneath, achieving a “blue-screen” effect.

(2) TKErrorRange

This value makes pixels on the graphics file whose colour values and the “**Transparency Colour**” value have minimum difference as indicated above to be invisible(exposing the underneath video content).

Setting this value to be larger than zero will be useful when the area to be made invisible contains non-uniform colour, e.g., a white background contains pixels with colours close to but not exactly the pure white, as illustrated in the following example where the same overlay graphics file is applied on the same video but on the left **VoverlayHD** card with $\text{TKErrorRange} = 0$, while on the right **VoverlayHD** card with $\text{TKErrorRange} = 220$:



(3) Clear Old Overlay Value

This box is only meaningful when box “**Transparent**” is also ticked:

If **Clear Old Overlay Value** is ticked, then those pixels in the graphics file whose colour values and the “**Transparency Colour**” have the minimum difference (as described in the “**Transparency Colour**” above) will become totally transparent, i.e., the video underneath them will be exposed.

If this box is cleared, then those pixels in the graphics file whose colour values and the “**Transparency Colour**” have minimum difference as described in the “**Transparency Colour**” above will combine (logical or) their old alpha value with the new alpha value on screen, so that if the resulting alpha is nonzero then some degree of overlay will appear on top of the video – this is useful for example to display an half-transparent background exposing some of the video underneath. The following are examples using the same graphics file with red text **ABCD** in front of a white background, and **Transparency Colour** is white, **Alpha Start / Alpha End** are 128:

(1) **Transparent & Clear Old Overlay Value Ticked**



(2) **Transparent Ticked, Clear Old Overlay Value Cleared**



(4) Raster Operation

This controls how the pixels of the graphics file will be combined with the overlay pixels already being displayed on the same position by previous Overlay operations(if there is any): **SRCCOPY** means the new pixels completely replace the original pixel, **SRCCAND** means the new pixels do logical AND with the original pixels, the **BLACKNESS** means display black at the positions, etc.

Alpha change, **X/Y** change, duration, etc parameters have the same meaning as in **Text** and **Timer** items.

Graphics File Item has no “**AlphaBk**” parameter since it has no background colour.

Each time a non-targa(not .tga) graphics file is loaded, its width and height are automatically loaded into the

Location:

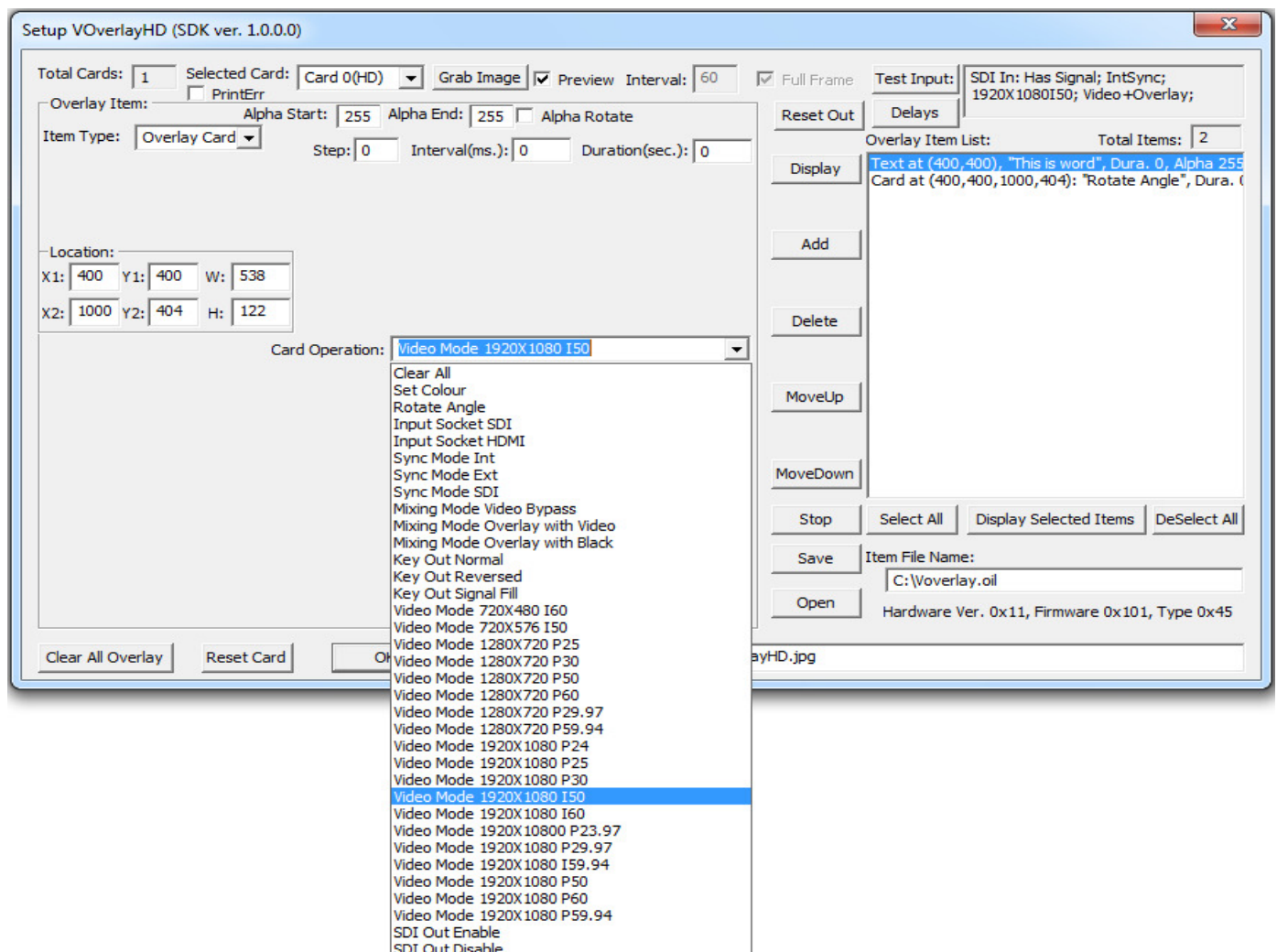
X1: 320 Y1: 300 Width: 381

X2: 0 Y2: 0 Height: 366

File Name: E:\1.gif

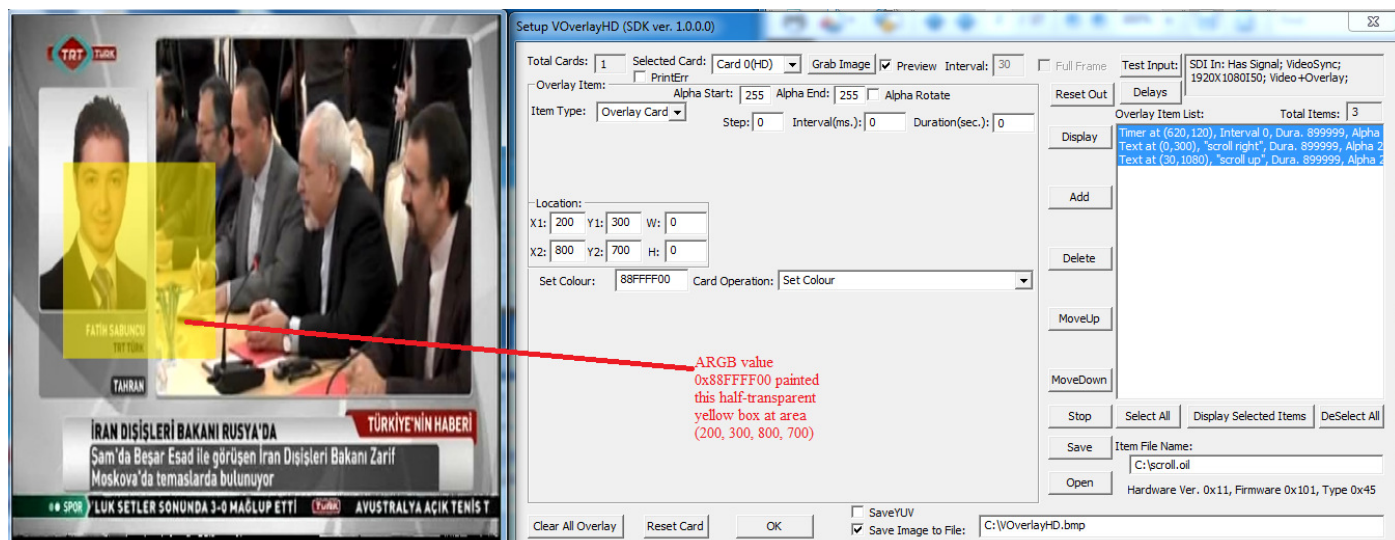
“Width” and “Height” fields: . When displaying a graphics file item, using these width and height, or making these two fields all zeroes, will put the graphics exactly as their original width and height (in pixels) onto the external TV. If supplying a width or height different from the graphics file’s original width and height, the displayed graphics will be shrunk or expanded accordingly. Targa graphics files (.tga) will not have their width and height automatically calculated and they can not be shrunk or expanded.

7.2.4 Card Operation Overlay Item



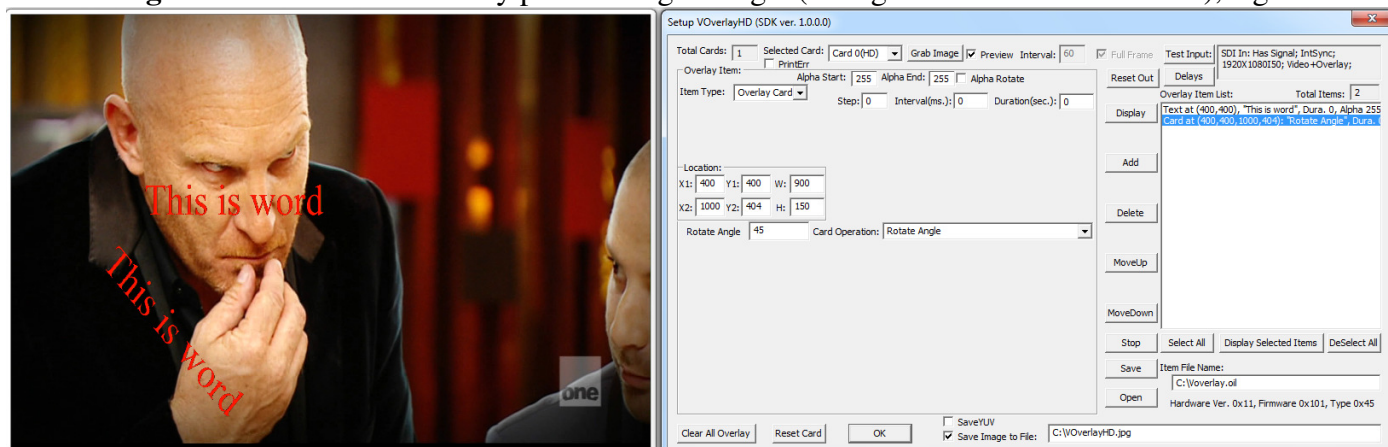
Card Operation Overlay Item operates the **VoverlayHD** card directly, some explanations for these:

“Set Colour”: Once this operation is selected, the **“Set Colour”** Edit Box appears indicating the ARGB value in Hex used for setting colour and transparency, and the (X1, Y1) ~(X2, Y2) values will be used as the video area to be painted with the ARGB overlay value: e.g.,



Note **Set Colour** can be used to erase any area's overlay contents by setting the A(lpha) value to 0x00.

Rotate Angle: Rotate an area's overlay pixels using an angle (in degree unit between 1 ~ 359), e.g.:



Rotate Angle operation uses the (X1, Y1) as the rotating area's upper left corner, the W/H as the rotating area's width and height (in pixels), and the rotation is at point (X1, Y1) as origin, rotation angle is specified as between 1 ~ 359 degrees (values > 359 will be modulus with 360, 0 degree does no rotation). On finishing the rotation the (X1, Y1) and W/H values will be updated to the newly rotated area's bounding rectangle. Any overlay pixels falling off the video frame's edges will be lost.

Input Socket SDI/HDMI: select either SDI or HDMI as current video input source.

Sync Mode Int/SDI/Ext: select the clock mode, **Sync Mode Int** is suitable for HDMI input, **Sync Mode SDI** is suitable for SDI input, **Sync Mode Ext** is when an external Y Luminance or CVBS video is connected to the **REF IN** BNC socket supplying clock signal to the card. Internal (**Sync Mode Int**) sync is automatically used if no video signal is input.

Mixing Mode: This controls output port (SDI and HDMI) content --- Video Bypass is video only, Overlay with Black is overlay only, Overlay with Video shows both input video and overlay.

Video Mode 720X480 I60... Video Mode 1920X1080 P59.94: Setting various video I/O mode, must match the actual video signal at the video input port or distorted display will appear. **I** or **P** means Interlaced or Progressive respectively. Selecting these then clicking "Display" button will cause the card to reset itself.

SDI Out Enable/Disable: Enable or Disable video output at output ports.

Some Card Operations, such as selecting a new Video Mode (1920X1080I50 etc.), will involve resetting the card so if Video Preview window is on those card operations will automatically close it.

After selecting a card operation, clicking the “**Display**” button will apply the selected operation to the card, also the “**Test Input**” button will be automatically clicked to show the new input status.

Card configuration set by Card Operation will be remembered by the **VoverlayHD** card so when the software is re-started, even after power is lost or PC is restarted, the previously selected configuration will be used.

7.2.5 Window Overlay Item

Overlay Item: Alpha Start: 255 Alpha End: 255 ☐ Alpha Rotate

Item Type: Window Step: 0 Interval(ms.): 0 Duration(sec.): 0

TkErrorRange: 0 Transparency Colour: ☐ Transparent

Location: X1: 0 Y1: 0 Width: 565 X2: 0 Y2: 0 Height: 400 Duration(sec.): 0

☒ Clear Old Overlay Value

Raster Operation: SRCCOPY

Window Handle: 0212D2 Class Name: VLC DirectX video Title: Root Window Class Name: wxWindowClassNR Title: VLC media player

☒ Client Area Only ☐ Window Content Static

☒ Erase on Exit Pause Time(ms.): 0

Get A Window Handle

Window Overlay Item allows any window on the Windows’ desktop to be displayed at video output ports, in front of the incoming video or by itself. This is useful to create a “Video in Video” result on external HD TV, or display live animation to external HD TV, etc.

The window selection is through a window’s handle, or its class name, title, or its root window’s class name and title. Pressing the “**Get A Window Handle**” button once, then move the mouse cursor(now changed to I-Beam shape) to any window and single click that window, that clicked window’s handle, class name, title and root window’s class name, title values will be copied into the corresponding fields

Window Handle: 0209CC Class Name: VideoRenderer Title: ActiveMovie Window

Root Window Class Name: PlayWndASFMediaPla Title: chicken.wmv [Video]

on the **Setup Overlay Window**:

Clicking the “**Client Area Only**” checkbox means only displaying the selected window client area’s contents. Clicking the “**Erase on Exit**” checkbox means the window’s display will be cleared when the display duration expires or the display is manually stopped.

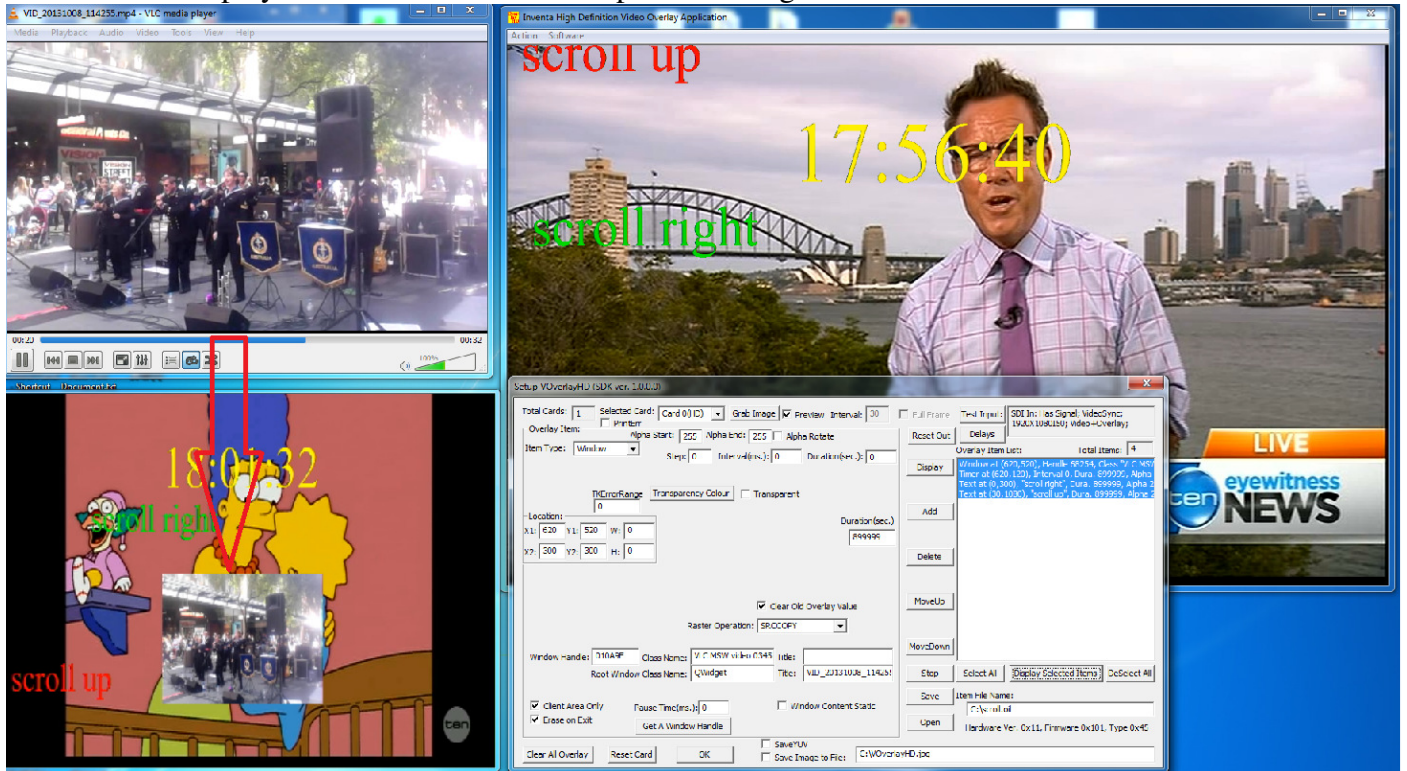
The “**Pause Time**” means how long the executing thread will pause in between displaying consecutive frames of the selected window. For a live video/animation displaying window, set this time to 40~80 mille-seconds will give good smooth moving result on the output video ports.

Click the “**Window Content Static**” if the content of the window is not changing constantly.

Click the “**Transparent**” check box and select a colour from the “**Transparency Colour**” button initiated colour dialog, if you wish to make some portion of the window transparent (invisible), e.g. making the blue background to disappear on the live video (Blue Screen effect).

Click the “**Clear Old Overlay Value**” to make the “**Transparency**” effect clean without shivering pixels flying around. This box has the same significance as explained in the “**Graphics File Overlay Item**” section, and it is only meaningful when the “**Transparent**” box is ticked.

Window item can overlay movie-play-back or dynamic Internet page windows on input video, such as this VideoLan video play-back overlaid on live Simpson TV Program:

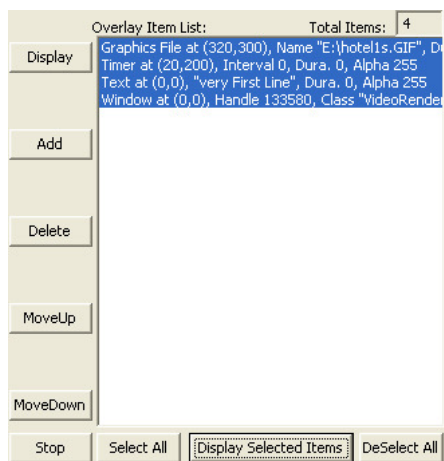


7.3 Overlay Item List

The “**Overlay Item List**” is for holding multiple **Overlay Items**, so that they can be displayed simultaneously on external HD Video device, or they can be saved as files for later repeated use.

Pressing the “**Add**”, or “**Delete**” button in the middle of the screen will add or delete the current item into or from the **Overlay Item List** box, while with one item selected in the list box, pressing “**MoveUp**” or “**MoveDown**” button will change the selected item’s position in the list.

When some items have been selected in the Item List box, pressing the “**Display Selected Items**” button will display these items’ contents on the video output ports and the live **video preview** window, in the order of their positions in the list box:



Pressing the “**Stop**” button will stop the displaying.

The “**Save**” and “**Open**” buttons are used to save all items inside the **Item List Box** to file, and to load a file’s contents back into the **Item List Box** (when loading from an item list file, items already in the list box will be cleared), respectively.

7.4 Using Multiple VoverlayHD Cards

To operate multiple (2~16) **VoverlayHD** cards on the same PC, select each card’s number from the “**Selected Card:**” Combo box (first card is number 0), then apply any operation on this card.

When using timer-based overlay items such as **Timer** or moving text, manual start of an item will automatically stop other timer-based items previously defined even on another **VoverlayHD** card. For example, whenever a “**Timer**” Overlay Item is started on the currently selected card, the previously applied **Timer** item on another **VoverlayHD** card will be automatically stopped. To make multiple cards all displaying their own **Timer** Overlay Items simultaneously, the **Overlay Item List** needs to be used: define a **Timer** for each individual **VoverlayHD** card then click the “**Add**” button to add this **Timer** into the **Overlay Item List** ---- when all timers for all cards are added to the **Overlay Item List**, click the “**Select All**” button below the Overlay Item List ListBox, then click “**Display Selected Items**” button next to it, all **VoverlayHD** cards with **Timer** defined will start displaying overlaid timers simultaneously.

8. Source Code

The **VoverlayHD.exe** software is supplied with full C++ source code together with the **VoverlayHD** card’s SDK. A sample **VisualBasic** application **VoverlayHDVB.exe** and a sample **C#** application **CSharp.exe** are also supplied with full source codes: all source codes and their VisualStudio 2008 Pro project files are under the “**src**” folder of the Setup CD: note MS .net framework 3.5 is needed to run the **VB** and **C#** programs.