

Software Evaluation Guide for Pegasys TMPGenc* XPress 4.4



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Chapter 1

Pegasys TMPGenc* XPress 4.4

1.0 Application Description

TMPGenc* XPress gives you the freedom to quickly and easily change from one video format to another. For additional information, please visit <http://tmpgenc.pegasys-inc.com/>.

1.1 Workload Description

A High Definition video purist wants to share home movies with friends and family, but compromising on quality is out of the question. While standard DVDs may be acceptable for some people, only HD-DVD is good enough for this enthusiast. The final DVD would contain several HD video clips, but for this example we will measure the time required to change the original Variable Bit Rate encoded, 76 second, 29.97fps, 1440x1080 video clip into HDV format MPEG with 1440x1080 resolution, 29.97fps and 25000Kb/s Constant Bit Rate encoding.

Chapter 2

Measurement Methodology

The following is a description of the measurement methodology that should be used to evaluate performance and energy efficiency of the mobile platform while running this scenario.

2.0 System Setup

This section outlines the system setup recommended for all mobile benchmarks under Microsoft Windows* Vista Ultimate Edition:

- Always start with a clean, formatted hard disk.
- Set your system to boot from CD/DVD drive in the bios.
- Begin installation Windows* Vista Ultimate Edition* from the operating system CD.
- Format the file system to NTFS during installation if the drive if you have not already done so.
- After installation of the OS is complete restart your system.
- Immediately after installing the Windows Vista operating system, install the latest drivers (INF files) to allow the operating system to recognize the chipset and all the components on the motherboard. The drivers can be downloaded from the chipset software link at <http://downloadfinder.intel.com>
- Install the latest Intel Matrix Storage Manager. The install file can be downloaded from the chipset software link at <http://downloadfinder.intel.com>. (Windows Vista installs the basic driver for Intel Matrix Storage, and you should update the driver once the OS boots up.) The Intel® Matrix Storage Driver can provide better system performance because features like Native Command. Some system benchmarks with an I/O component, like BAPCo* SYSmark*, may show increased performance with the Intel Matrix Storage Driver installed and the system set to raid-ready.
- Install the Intel integrated sound driver from <http://support.intel.com> or from your motherboard CD.
- Install the latest LAN driver from <http://support.intel.com>.
- Download and Install the latest Windows Vista graphics driver for your graphics card from the manufacturer website.
- The table below describes how to perform an initial setup of Windows Vista.

Microsoft Windows* Vista Setup	Setting	Description of how to set up Windows Vista
Windows Aero	Enable	<p>Ensure Windows Aero is enabled - Right click on desktop -> Personalize -> Window color and appearance -> click on "Open classic appearance properties for more color options - Ensure "Windows Aero" is checked.</p> <p>Note: In order for Aero to work on Intel Graphics Media Accelerator X3000 and 3000, Vista drivers should be installed prior to setup Aero feature in Vista.</p>
Search Indexing	Enable	<p>Leave Search Indexing Enabled - You can check if Search Indexing is enabled by Open Control Panel -> System and Maintenance -> Indexing Options. The Indexing location will include: Offline Files, Start Menu, and Users.</p>
Internet Offline Files	Enable	<p>Leave Internet Offline files Enabled - You can check if Offline files is enabled, Open Control Panel -> Network and Internet -> Offline Files. On the general tab, the "Disable Offline Files" button should appear.</p>
Disable Screen saver	Disable	<p>Right click on desktop -> Personalize -> Screen Saver. Set the screen saver to "None"</p>
Disable Power Management	High Performance	<p>Right click on desktop -> Personalize -> Screen Saver -> Change Power settings -> Select "High Performance" and click "Change plan settings" below this option. A new view will appear called "Edit Plan Settings." Change "Turn off display" to "Never." Click Save Change. (Note: Exceptions include MobileMark* and other standardized benchmarks that measure battery life; these should be run with their own power management settings.)</p>
Vista Desktop Display resolution, monitor refresh	Custom	<p>Right click on desktop -> Personalize -> Display Settings. In the "Display Settings" dialog choose Resolution=1024x768 and Colors= Highest (32bit). Click the "Advanced Settings" button. Select the "Monitor" tab and change the "Screen refresh rate" to 75 Hz.</p>
Remove always on top	Disable	<p>Right click on Windows task bar at the bottom -> Properties -> Taskbar -> uncheck "Keep the taskbar on top of other windows"</p>
Remove hide inactive icons	Disable	<p>Right click on Windows task bar at the bottom -> Properties -> Select the "Notification area" tab and uncheck "Hide inactive icons"</p>

Disable Windows Defender	Disable	Open Control Panel -> Security -> Windows Defender. Click on "Tools" in the toolbar at the top. Click on the Options link in the next view. Uncheck all boxes.
Disable Windows "Welcome screen"	Disable	Open Control Panel -> System and Maintenance -> Welcome Center, Uncheck "Run at Startup" at the bottom of the Windows Welcome screen
Disable System Protection (previously "System Restore")	Disable	Open Control Panel -> System and Maintenance -> System. Under the tasks link on the left side select System Protection. Uncheck "Local Disk" found in the "Automatic restore points" section.
Disable Security Center Alerts	Disable	Open Control Panel -> Security Center. On the left side at the bottom click on the link, "Change the way Security Center alerts me." In the dialog select "Don't notify me and don't display the icon (not recommended)"
Adjust Folder Options for hidden files	Custom	Open Control Panel -> Appearance and Personalization -> Folder Options. On the view tab select "Show hidden files and folder" uncheck "Hide extensions for known file types" and uncheck "Hide protected operating system files (Recommended)"
Disable backup on Recycle bin	Disable	Right click on the recycle bin and choose properties. On the general tab select "Do not move files to the Recycle Bin. Remove files immediately when deleted"
Disable Windows Sidebar	Disable	Remove "Windows Sidebar" by right click on the Windows sidebar, click properties, Uncheck "Start Sidebar when windows Starts"
Disable Disk Defragmentation	Disable	Click on "My Computer", right click on the C: drive. Click "Properties", "Tools", "Defragment Now". Uncheck "Run on Schedule"
Disable User Account Control	Disable	Open Control Panel -> User Accounts and Family Safety -> User Accounts -> Turn User Account Control on or off -> Continue -> Uncheck Use User Account Control (UAC) to help protect your computer -> OK -> Restart Computer

2.1 Evaluation of Mobile Platform Performance

This section outlines the recommended methodology for evaluating mobile platform performance.

Enable or Disable Intel® Turbo Memory

If you are testing a system with Intel® Turbo Memory, you should follow the following instructions when enabling or disabling the Intel® Turbo Memory feature.

- In order to enable Intel® Turbo Memory, perform the following steps:
 - Ensure that the system is running with Advanced Host Controller Interface (AHCI) turned on. AHCI usage is usually configurable in the system BIOS.
 - Ensure that an Intel® Turbo Memory module is installed in the system either on the motherboard or inserted into a mini-PCI Express slot.
 - Install the Intel® Turbo Memory software package. Upon completion this package will prompt you to reboot the system.
 - Reboot the system
 - When the system reboots, run the Intel® Turbo Memory console to confirm the state of the Intel® Turbo Memory device. Be sure that both Vista ReadyBoost and Vista ReadyDrive functionality are enabled. As the OS recognizes and prepares the Intel® Turbo Memory device for use, it may take several minutes for both features to become enabled and ready for use.
 - Reboot the system again before running any performance tests.
- In order to disable Intel® Turbo Memory, perform the following steps.
 - Using the Control Panel, uninstall the Intel® Turbo Memory and Intel Matrix Storage Manager software package. You should reboot the system after uninstalling it.
 - Reinstall the Intel Matrix Storage Manager (which can be downloaded at <http://support.intel.com>)
 - In the Device Manager, under Storage Controllers, verify that the Intel® Flash Cache Logic Chip is no longer recognized. If your Intel® Turbo Memory module has not been removed from the system, you should see an unrecognized device listed in the Device Manager.
 - Reboot the system again before running any performance tests.

Clean up Windows prefetch

1. Delete the contents of the c:\windows\prefetch directory between testing of **individual** benchmarks.

Allow your system to settle into an idle state:

1. Reboot your computer.
2. Open the Task Manager by right clicking on the Taskbar and clicking the option for Task Manager. Click on the Performance tab in the Task Manager.

3. Click on the Resource Monitor button in the Task Manager. This will bring up the Resource Monitor Window below.
4. Click on the panel that says Disk. This will allow you to view the various active requests to the disk drive.
5. Watch the Resource Monitor. The number of requests to the disk will gradually decline. Wait until there are no more requests to the disk as shown below.
6. After there are no more requests to disk, close the Resource Monitor.

Process Idle Tasks

1. Call the ProcessIdleTasks API from advapi32.dll using the command line or create and execute a batch file with the following command: *rundll32.exe advapi32.dll,ProcessIdleTasks*

Benchmark Run:

1. After you have run the ProcessIdleTasks API, run the workload 5 times in a row without reboots in between each run.
2. Take the median of the 5 runs.

2.2 Evaluation of Mobile Platform Energy Efficiency

This section outlines the recommended methodology for evaluating mobile platform energy efficiency.

2.2.1 Procedure for Measuring Energy Efficiency

When measuring energy consumption of a system running a given benchmark, the power consumption of the total platform should be measured by an external watt-meter or power analyzer. One common tool used to measure power is the Extech 380803 Power Analyzer Datalogger. The Extech 380803 unit allows the measurement of both AC and DC power measurement and includes software to log the power consumption of the test system on another computer system.

- When measuring the DC power consumption of a system, you will need to isolate the positive and negative power lines running between the notebook power adapter and the system. From the power adapter, attach the power lines to the appropriate red and black power terminals of the “Input Voltage” on the Extech unit. Then attach the power lines from the notebook plug to the red and black power terminals of the “Output Load” of the Extech unit. Using the Datalogger software, record the power consumption of the system for the duration of the benchmark using 1.0 second sampling intervals. From the resulting power log, you can derive the average DC power consumption (in Watts) of the system while executing the benchmark.
- When measuring the AC power consumption of a system, plug a power cord into the “Input Voltage” on the Extech unit and into an electrical socket. Then plug in the system’s AC power adapter into the “Output Load” of the Extech unit. Using the Datalogger software, record the power consumption of the system for the duration of the benchmark using 1.0

second sampling intervals. From the resulting power log, you can derive the average AC power consumption (in Watts) of the system while executing the benchmark.

Power measurement should begin when the timed portion of the workload begins and should stop when the timed portion of the workload ends. If using the provided script for the scenario then you will be prompted by the script when to start and stop power measurement.

2.2.2 Calculating Workload Energy Consumption in Watt-Hours

Analysis of power consumption results should be performed using the following methodology:

- Calculate the Workload Energy Consumption (WEC) in Watt-seconds by multiplying the average total AC or DC power usage (P_{total}) times the time taken to complete the workload (t_{workload}).

$$\text{WEC (Watt-seconds)} = P_{\text{total}} \times t_{\text{workload}}$$

- Convert the WEC measurement into Watt-hours (Wh) by dividing the WEC in Watt-seconds by 3600 (the number of seconds in an hour).

$$\text{WEC (Wh)} = \text{WEC (Watt-seconds)} \div 3600$$

The resulting quotient in Watt-hours is the amount of energy consumed by the system in completion of the workload.

Chapter 3

Procedure for Evaluating Pegasys TMPGEnc XPress 4.4

The following is a procedure for evaluating application load performance during content creation using Pegasys TMPGEnc XPress 4.4. Run this test on a system running *Windows* Vista*.

Setup Instructions:

1. Copy your workload directory to your hard drive.
2. Open the Vista Control Panel.
3. Click on "Clock, Language and Region". (if you are in the Classic Control Panel view, you will need to pick on Control Panel Home on the left side first)
4. Click on "Regional and Language Options".
5. Click on the "Administrative" tab at the top.
6. Click on the "Change system locale..." button.
7. A dialog entitled "Regional and Language Settings" will appear. Under "Current system locale", select "Japanese (Japan)".



8. Click on OK to close the "Regional and Language Settings" dialog.

9. You will be prompted to restart Windows. Click on "Restart now" to restart your system.
10. After the system has restarted, navigate to your installation binaries and run the file entitled "PV3-AviUtl-301.exe". (this will install the PV3 DV codec that will allow you to read the workload file)
11. Install the application (the binary will be in Japanese) using default installation options. (the default installation options for the three dialogs in the installation process are selecting the left button, then the right button, then the single button at the bottom of the dialog)

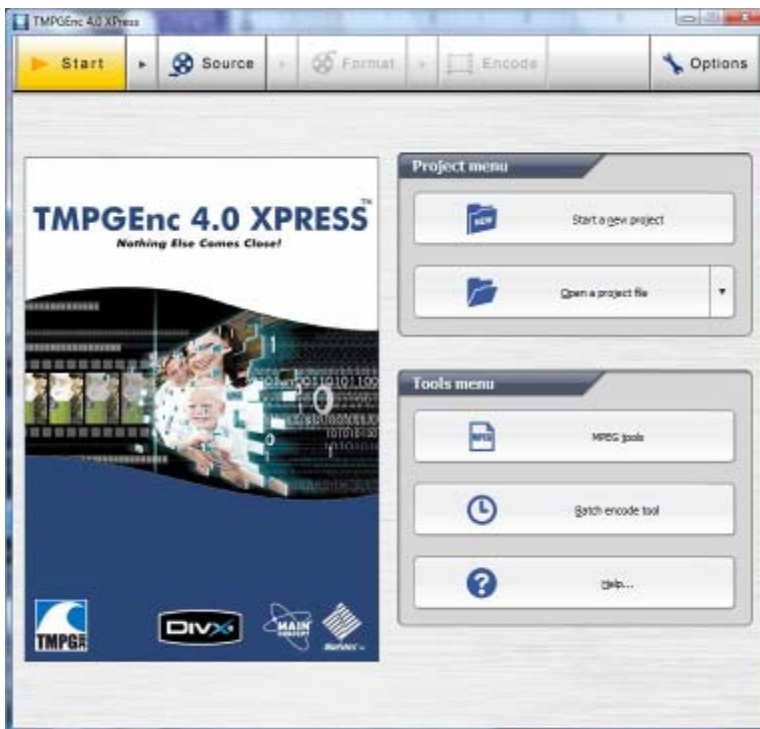




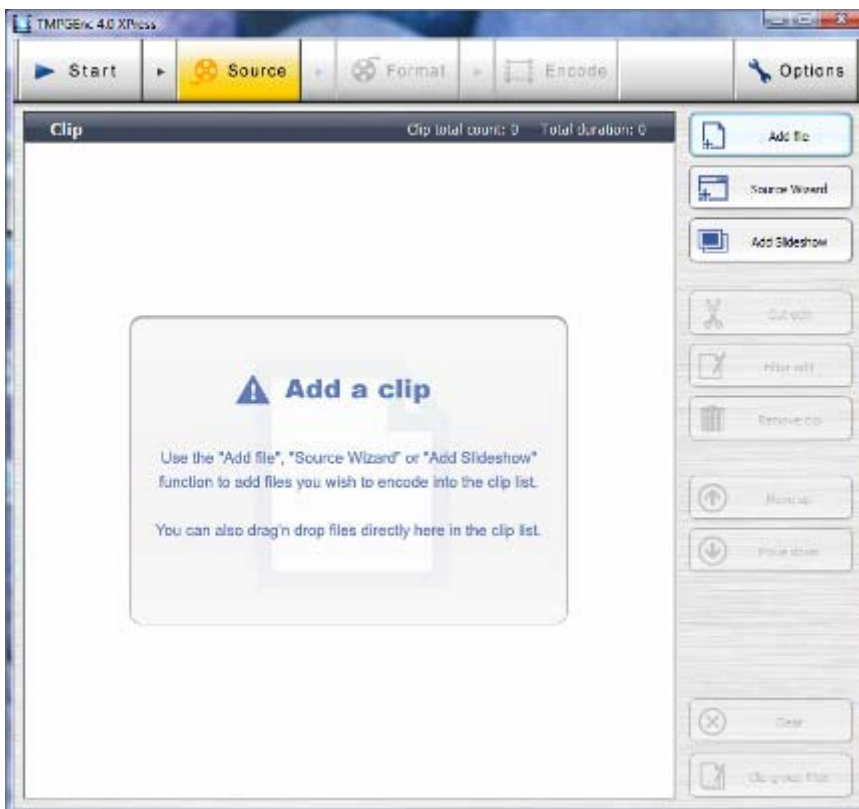
12. Repeat steps 2-9 but change the language back to the original selection. (in the United States, this will be "English (United States)")
13. Install TMPGEnc XPress with the default installation options.
14. Launch TMPGenc* XPress by double-clicking on the desktop icon.
15. On first-time launch of the application, you will be prompted to enter your serial number and name. Do so and click on "Obtain a license" to activate TMPGEnc XPress (you will need to be connected to the Internet).
16. Close TMPGenc* XPress.
17. Reboot your system.

Run Instructions

1. Upon reboot your system, defragment your hard disk.
2. Delete the contents of your c:\windows\Prefetch directory.
3. Launch TMPGEnc Xpress.

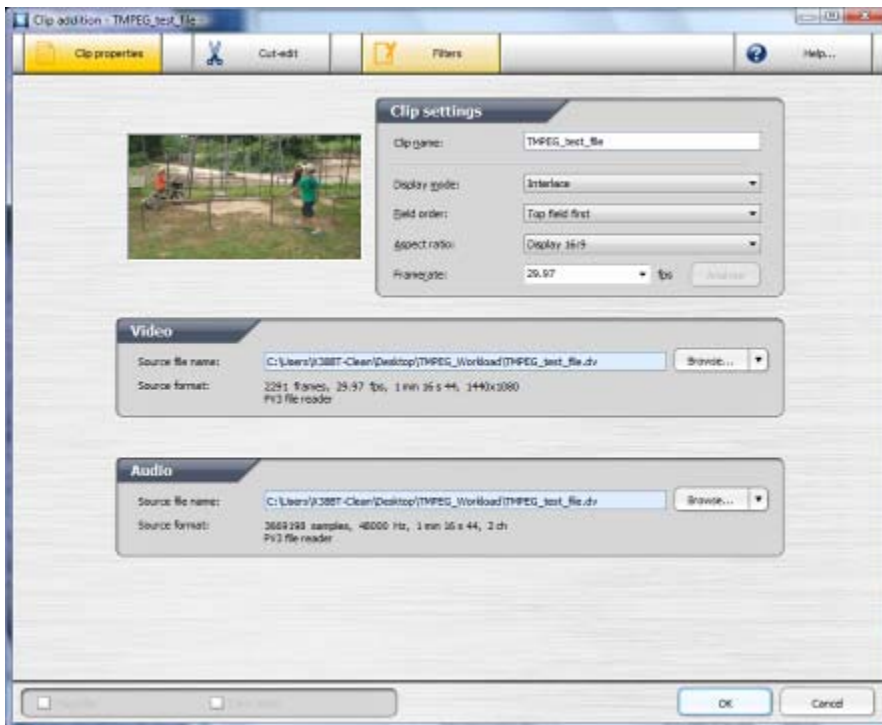


4. At the top of the application window, click on "Source".

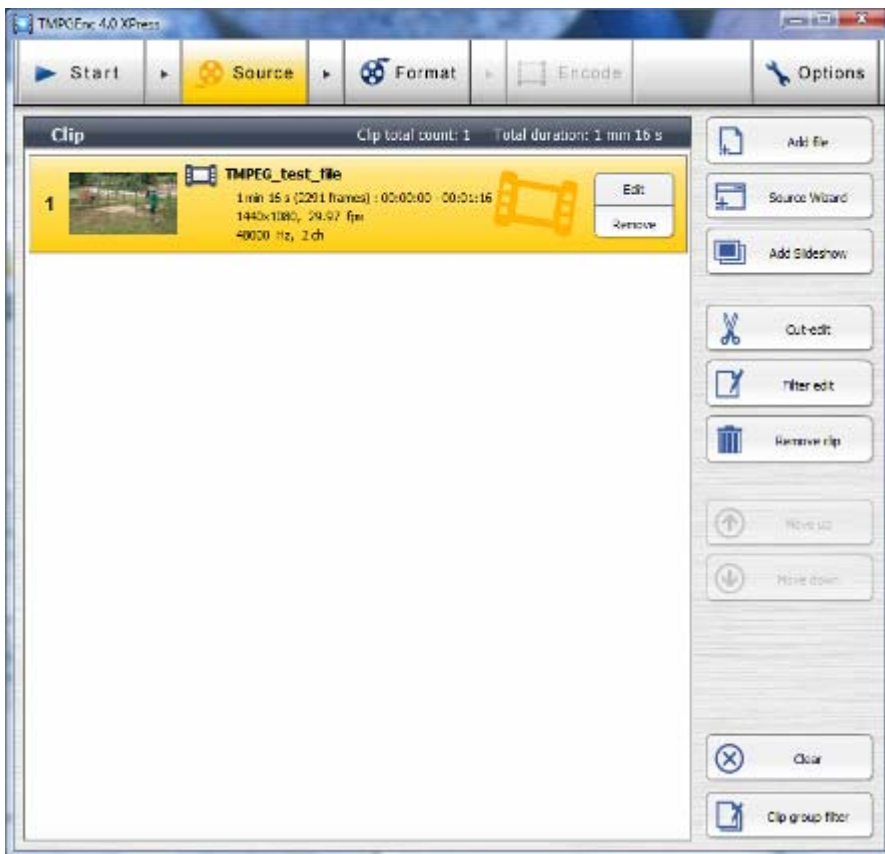


5. Click on "Add file" on the right hand side.

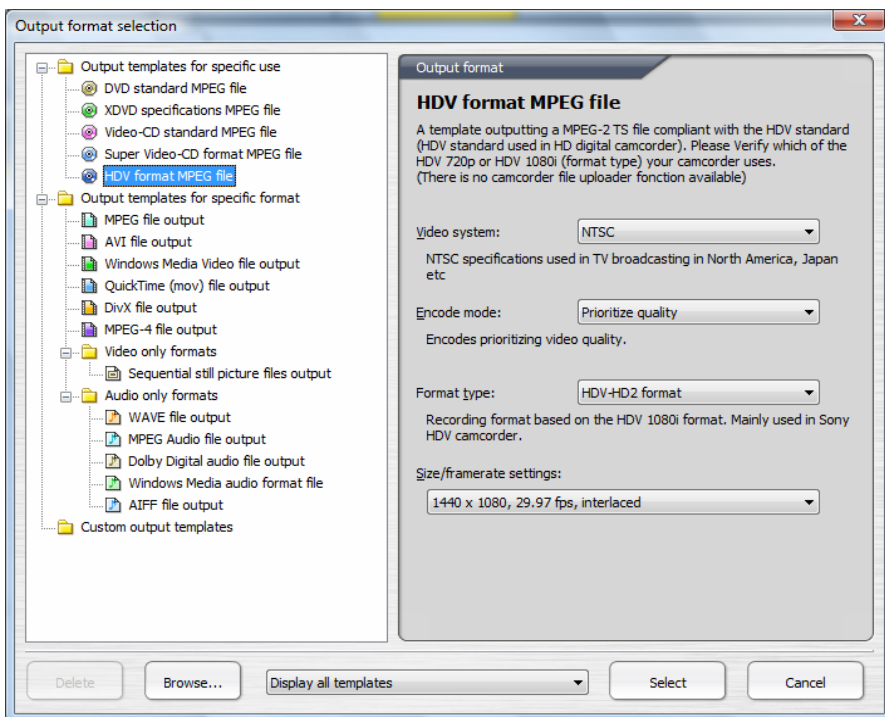
6. Locate and select your workload file. Click on Open. A window entitled "Clip addition - <workload filename>" will open that describes the contents of the file.



7. Click on OK.

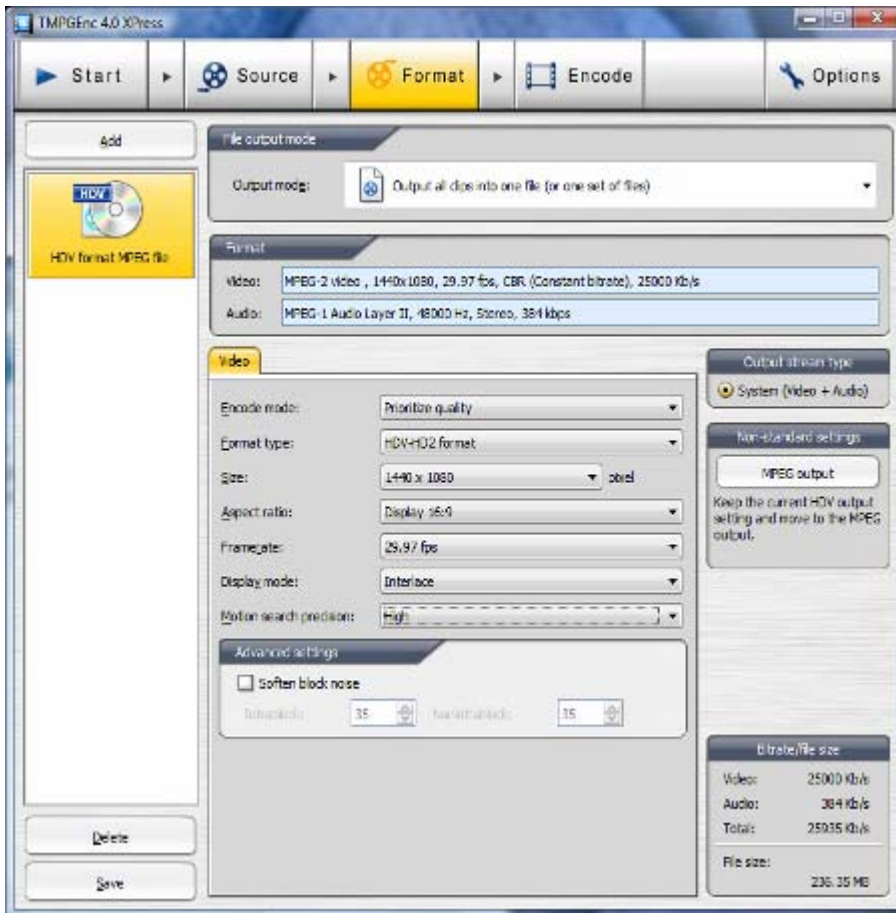


- At the top of the application window, click on "Format". A window entitled "Output format selection" will appear.

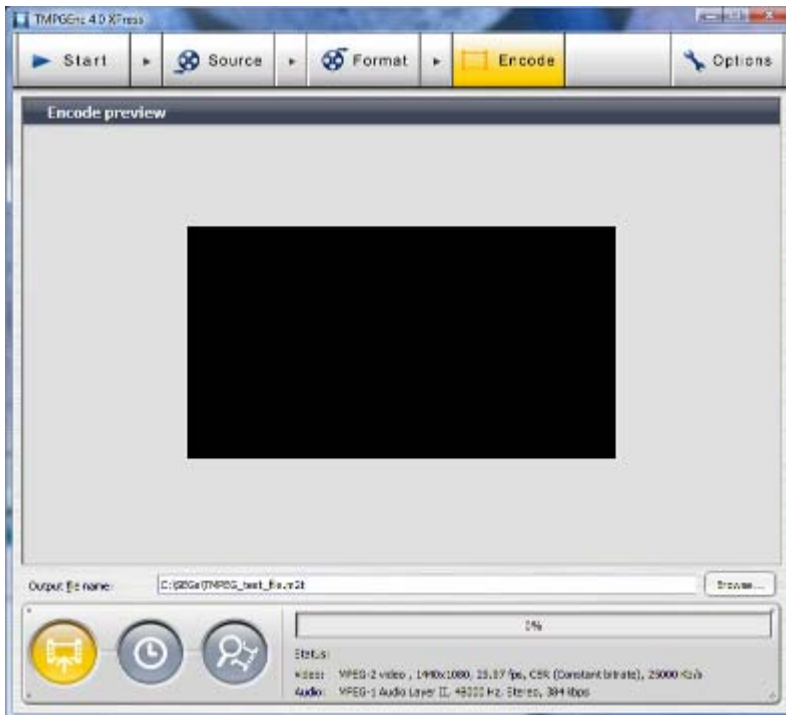


9. Select "HDV format MPEG file" and click on "Select" at the bottom.

10. In the middle of the window, under "Motion Search precision", select "High".

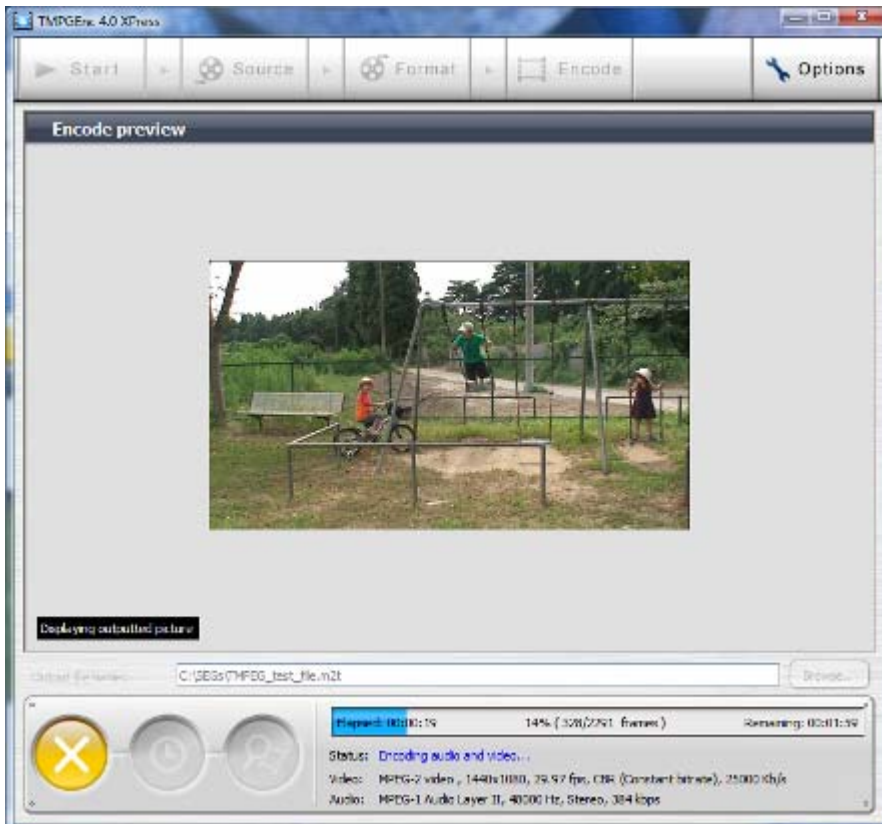


11. At the top of the application window, click on "Encode".

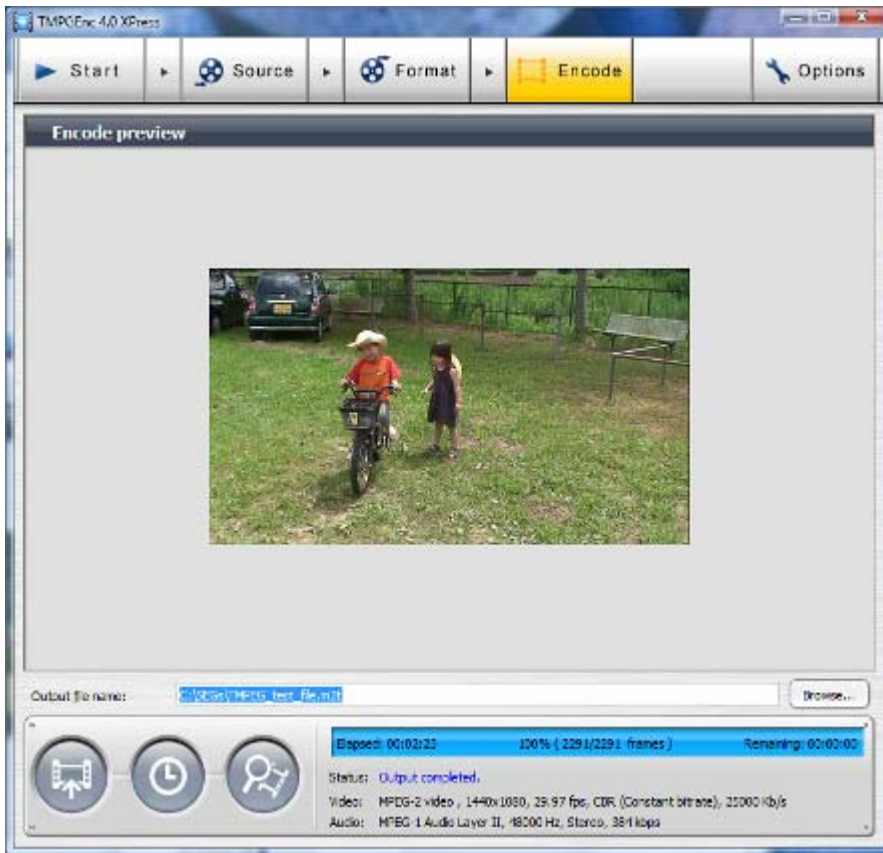


12. Under "Output file name:", enter the desired path and filename for the output file.

13. Click on the left-most button grey button (it turns yellow when moused over) on the bottom-left to begin encoding. Progress will be shown in the progress bar at the bottom of the window.



14. When the encoding has finished, a window entitled "Output completed" will be displayed.



15. The progress bar at the bottom will display the Elapsed time. This is the **encoding task time** for this scenario.

16. Click OK to close the "Output completed" window.

17. Close the TMPGEnc XPress window.

18. Delete the encoded output file.

19. Repeat steps 3-18 four more times. Take the **median value** of your five encoding task times as your result.

Running the Test Using a Script (Optional)

- You also have the option of running this workload with an automated script.
- The script will look for application and workload files in specific directory locations. Please make sure that:
 - i. The TMPGenc* XPress application executable can be found at: C:\Program Files\Pegasys Inc\TMPGEnc 4.0 XPress\TMPGEnc4XP.exe
 - ii. Your workload files (TMPEG_test_file.dv and TMPEG_test_file.dvi) are in c:\SEGS\TMPGenc*Xpress\Workload\
- Before running the script, install the application. Open the application once and then close all of the application windows.

- Run the application once manually as a cross check on your script times. The script timing measures the same function as measured in hand-timing and is expected to be close to the stopwatch time.
- Close other open windows before running the script.
- Double-click on the script .exe to start execution. It is best to create a desktop shortcut to the .exe so that no other windows are open when the script starts.
- The script will close all application windows by itself after displaying the results. Wait for it to finish closing all windows before rerunning the script. You do not need to delete any of the output files generated by the workload if you are using the script.

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