

Release Notes

DRIVER VERSION: 15.36.3.3907 & 15.36.3.64.3907

DATE: September 5th, 2014

SUMMARY:

Support for the new Intel® Core™ M Processor with Intel® HD graphics 5300 has been added with this driver. Please visit <http://intel.com/core-m> for details on the features and benefits of Intel Core M.

Note that this driver was previously posted for 4th Generation Intel Core Processors only; the new features and performance enhancements described in the previous posting still apply. An additional game was added to the performance enhancement table for 4th Generation Intel Core Processor.

This driver provides significant gaming performance for 4th generation Intel Core processors with Intel HD, Iris™ and Iris Pro graphics provides improvements while enhancing battery life through newer power conservation techniques such as CMAA* and Adaptive Rendering Control. Experience up to 30% improvement in performance in certain OpenCL workloads and up to 10% improvement certain games. The new and enhanced control panel offers additional media and display customization capabilities.

This document provides information about Intel's Graphics Driver for:

- Intel Core M with Intel HD graphics 5300 for Microsoft Windows* 8.1, Microsoft Windows* 8 and Microsoft Windows* 7 operating systems.
- 4th Generation Intel Core Processors with Intel HD graphics, Intel Iris graphics and Intel Iris Pro graphics and select Pentium®/ Celeron® Processors with Intel HD graphics for Microsoft Windows* 8.1, Microsoft Windows* 8 and Microsoft Windows* 7 operating systems.

We continuously strive to improve the quality of our products to better serve our users and appreciate [feedback](#) on any issues you discover and [suggestions](#) for future driver releases.

SUPPORTED PRODUCTS:

SOFTWARE

This driver supports 64-bit and 32-bit variants of operating systems -

- Microsoft Windows* 8.1
- Microsoft Windows* 8
- Microsoft Windows* 7

HARDWARE

All platforms with the following configurations are supported:

Intel® Graphics ¹	DirectX* ²	OpenGL*	OpenCL*	Intel® Quick Sync Video	Intel® Wireless Display	Intel® Insider™	InTru™ 3D	Intel® Clear Video HD Technology
Intel® Core™ M with Intel® HD Graphics 5300	11.2	4.3	2.0	Yes	Yes ^{3,4}	Yes	Yes	Yes

4th Generation Intel® Core™ Processors with Intel® Iris™ Pro Graphics 5200	11.2	4.3	1.2	Yes	Yes ^{3,4}	Yes	Yes	Yes
4th Generation Intel® Core™ Processors with Intel® Iris™ Graphics 5100	11.2	4.3	1.2	Yes	Yes ^{3,4}	Yes	Yes	Yes
4th Generation Intel® Core™ Processors with Intel® HD Graphics 5000/4600/4400/4200	11.2	4.3	1.2	Yes	Yes ^{3,4}	Yes	Yes	Yes
Intel® Pentium® Processor 3558U/3560M/3561Y/G3220/G3220T/G3240/G3240T/G3250/G3250T/G3258/G3320TE/G3420/G3420T/G3430/G3440/G3440T/G3450/ G3450T/G3460 with Intel® HD Graphics	11.2	4.3	1.2	Yes	No	No	No	No
Intel® Pentium® Processor 3550M/3556U/3560Y with Intel® HD Graphics	11.2	4.3	1.2	No	No	No	No	No
Intel® Celeron® Processor 2957U/2961Y/2970M/2981U/G1820/G1820T/G1820TE/G1830/ G1840/G1840T/G1850 with Intel® HD Graphics	11.2	4.3	1.2	Yes	No	No	No	No
Intel® Celeron® Processor 2000E/2002E/2950M/2955U/2980U with Intel® HD Graphics	11.2	4.3	1.2	No	No	No	No	No

Note:

1. If you are uncertain which Intel processor is in your computer, Intel recommends using the [Intel Processor Identification Utility](#) or [Intel Driver Update Utility](#) to identify your Intel processor.
2. In the Intel® Iris™ and HD Graphics Control Panel (under Options > Options menu > Information Center), the 'Installed DirectX* version' refers to the operating system's DirectX version. The Information Center's 'Supported DirectX* Version' refers to the Intel Graphics Driver's supported DirectX version. The DirectX 11.2 API is supported but some optional features may not be available. Applications using the DirectX 11.2 API should query for feature support before using specific hardware features.
3. The Intel® Wireless Display software application is available only for Microsoft Windows 7 and Windows 8 operating systems.
4. Intel Wireless Display native Miracast* support under Windows 8.1 is now supported through the operating system's Charms menu. For more information, see the [Miracast FAQ](#).

CONTENTS OF THE PACKAGE:

- Intel® Iris™ and HD Graphics Driver
- Intel® Display Audio Driver
- Intel® Media SDK Runtime
- Intel® OpenCL* Driver
- Intel® Graphics Control Panel

NEW FEATURES:

This driver adds support for the new Intel® Core™ M processor with Intel® HD graphics 5300. Please visit <http://intel.com/core-m> for details on the features and benefits of Intel Core M.

In addition, Intel is bringing in multiple enhancements with this driver to provide a rich graphics experience on the 4th Generation Intel® Core™ Processors with Intel® Iris™ Graphics and HD Graphics. Some of the key enhancements are:

- Up to 30% performance improvement seen in OpenCL applications

- Battery life improvement in casual games
- Up to 10% performance improvement in select games
- Improvements to control panel for media and display features

Details:

OpenGL, OpenCL and 3D improvements

- This driver adds support for SPIR (Standard Portable Intermediate Representation) extension. Additional information available at <http://www.khronos.org/registry/spir/>
- Developer Feature: Added support for LLVM IR mapping to OpenCL* source - This feature will be useful for debuggers and enables performance profiling for program optimizations
- OpenCL performance improvements brings benefits of up to 30% (on 4th Generation Intel Core) in multiple applications and benchmarks such as Basemark CL*, CompuBench*, and LuxMark* (Refer to Notes section at bottom of document for system configuration)
- This new driver adds support for OpenGL 4.3 (previous driver supported OpenGL 4.2)
- Support for the following OpenGL extensions now added:
 - GL_ARB_texture_view
 - GL_ARB_fragment_layer_viewport
 - GL_ARB_texture_query_levels
 - GL_ARB_invalidate_subdata
 - GL_ARB_clear_buffer_object
 - GL_ARB_ES3_compatibility
 - GL_ARB_robust_buffer_access_behavior
 - GL_ARB_copy_image
 - GL_ARB_explicit_uniform_location
 - GL_ARB_texture_stencil8 (OpenGL 4.4)
 - GL_AMD_vertex_shader_layer
 - GL_AMD_vertex_shader_viewport_index
 - GL_EXT_direct_state_access - allows for reduced application overhead and makes multithreaded rendering easier by avoiding state selectors
- Added support for Primitive Boundary preemption during 3D rendering which enables finer granularity for preemption of 3D applications providing better responsiveness when multiple applications are running concurrently

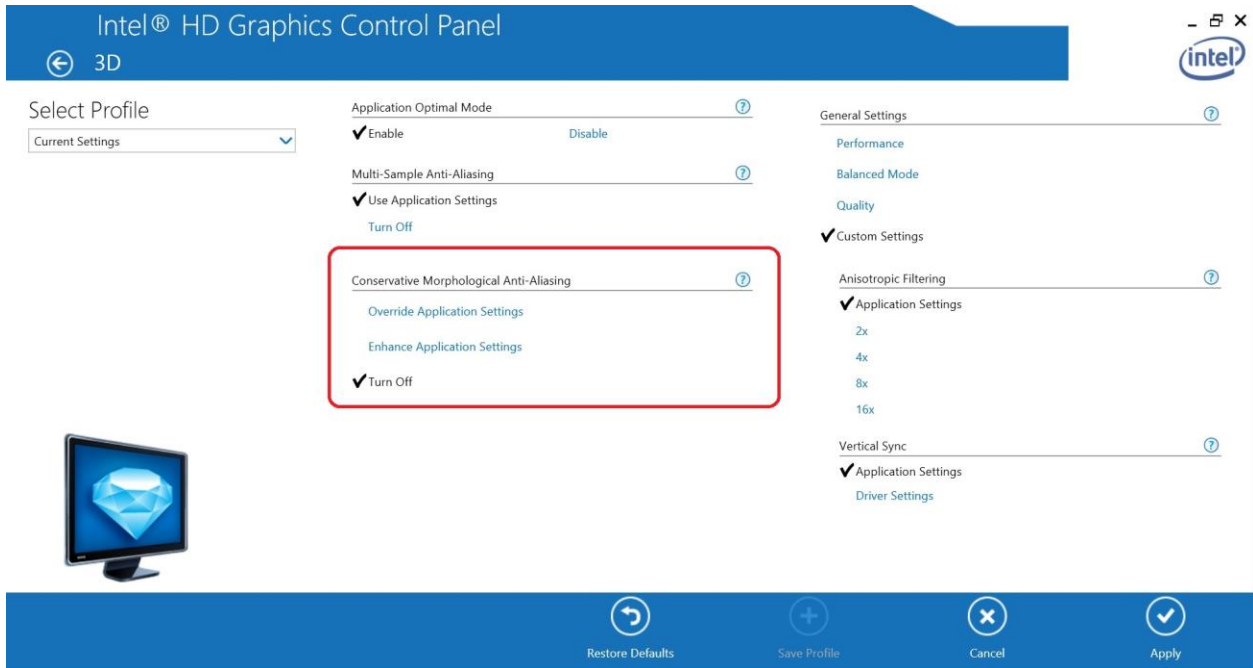
Improvements for Gaming Applications

CMAA (Conservative Morphological Anti-Aliasing)*

The driver includes CMAA* (Conservative Morphological Anti-Aliasing) for DirectX, a post-processing effect in games that reduces the jagged edges during gaming.

Benefits and utilization:

- CMAA offers higher quality anti-aliasing effect than MLAA (Multi-sample Anti-Aliasing)*, FXAA (Fast Approximate Anti-Aliasing)* and without performance impact. See this [white paper](#) for more information.
- This effect can be initiated through Intel Graphics control panel.
- Enable the feature via Intel Graphics control panel before launching a game and disable after game is exited to avoid any unintended blurring in other applications.
- To reduce the probability of unintended blurring, certain applications are automatically excluded from the support list: Windows* explorer, login screen, Windows* home screen, Internet Explorer*, Google* Chrome, and Firefox* browsers, and the Windows 8.1 Photo application



Adaptive Rendering Control:

This driver update also supports Adaptive Rendering control, a technique that can improve battery life by saving power while running casual games.

This is how Adaptive Rendering Control works:

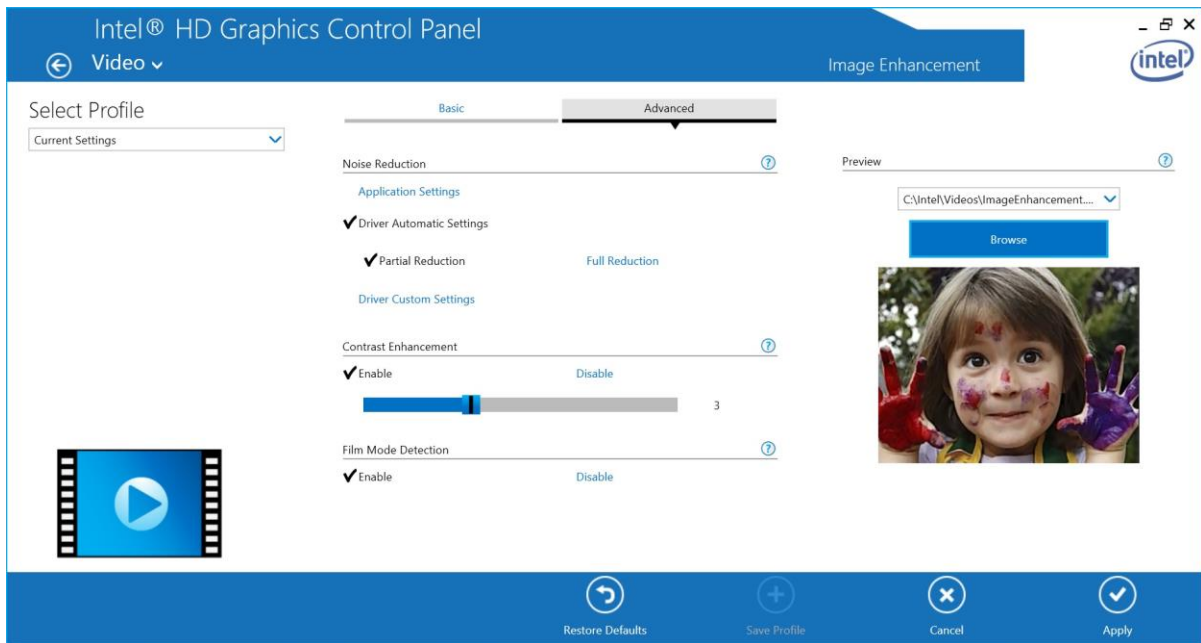
- Many casual games have periods where little or nothing is changing on the screen but the games continue rendering the same scene at high frame rates. This results in power wastage and impacts battery life.
- With Adaptive Rendering Control, the graphics driver now compares consecutive frames and based on the difference in frames manages the frame rate for rendering to save power.
- In cases where the frames keep changing, this feature does not kick-in.
- The feature is disabled when the system is connected to AC power or when 'Maximum Performance' option is selected in power plan of Intel Graphics control or operating system.

The popular games with which it is found to work:

3rd Floor Blackjack*	Hills of Glory 3D Free*	Nightmares*
Angry Birds*	Jewel Fever*	Nightmares 2*
Angry Birds Space*	Jewel ³ *	Pocket Sheep*
Angry Birds Star Wars*	Joining Hands*	Shark Dash*
Angry Birds*Fruit Ninja*	Joining Hands 2*	Shuffle Party*
Astrovaders*	Mahjong Artifacts*	SketchBook Express*
Bejeweled LIVE*	Microsoft Mahjong*	Spider Solitaire HD*
Candy Fun*	Microsoft Minesweeper*	Supermarket Mania*
Freddy*	Microsoft Solitaire Collection*	Taptiles*
Fruit Ninja*	My Country*	The Treasures of Montezuma 3*

Improvements in Media

- This driver provides an option to end users to adjust the strength of Adaptive Contrast Enhancement through the Intel graphics control panel

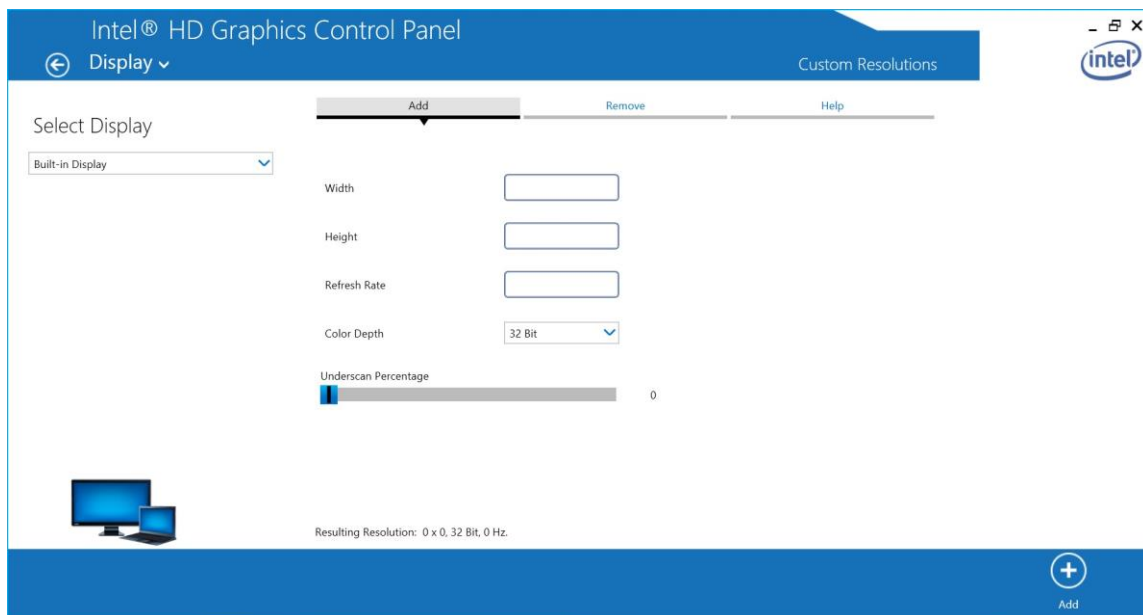


Improved gaming experience with wirelessly connected displays

- This driver brings in improvements in color buffer formats to enhance support for gaming using dual display screens connected wirelessly using Intel WiDi

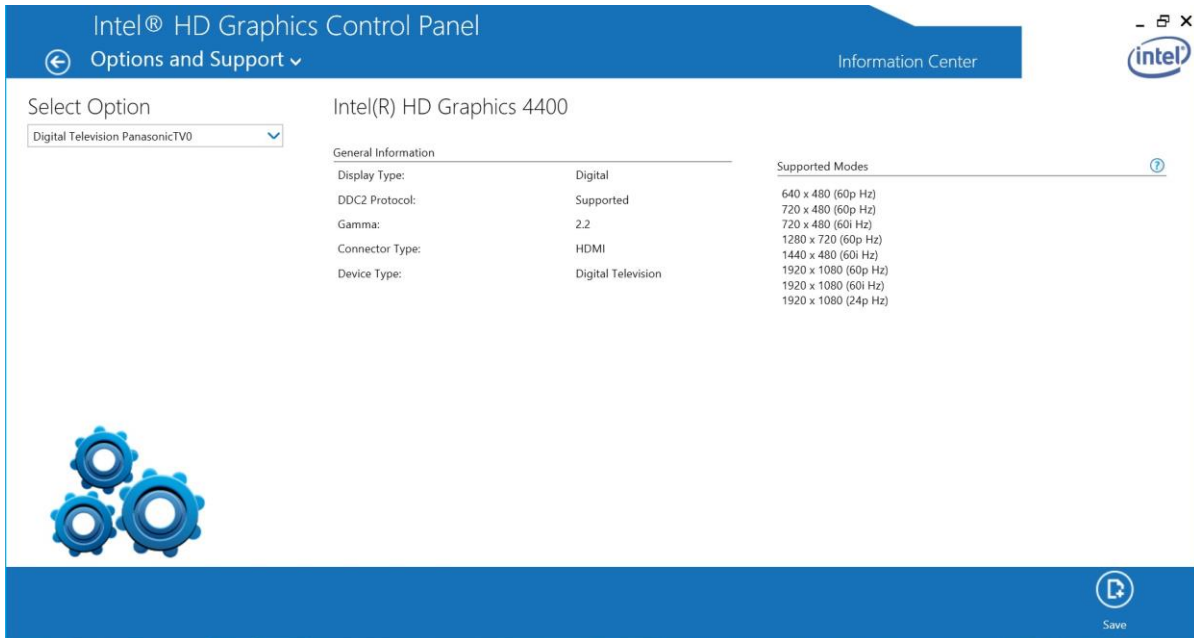
Intel Graphics Control Panel improvements

- Supports addition of custom display modes (display resolutions)



- The control panel layout now fits portrait modes in a better way with all supported languages

- The control panel provides a slider bar to control the Adaptive Contrast Enhancement
- The information center now provides additional information on the connected display devices



Gaming Performance Improvements on 4th Generation Intel® Core™ Processors

The driver brings in significant performance enhancements in the following games -

Game	FPS Gain ⁴
Batman: Arkham City* ¹	10%
Brink* ¹	12%
Doom 3: BFG Edition* ²	84%
F1 2012* ²	8%
Hitman: Absolution* ¹	10%
Sleeping Dogs* ¹	11%
League of Legends* ¹	106%

Performance benefits with FPS Gain between 3-7% seen with the below games:

Game
Battlefield 4* ¹
Civilization V* ¹
Deus Ex* ¹
Metro 2033* ¹
Rage* ²
Skyrim: The Elder Scrolls* ¹
Sniper Elite 2* ¹

Notes:

1. Game tested with display resolution set to 1366x768
2. Game tested with display resolution set to 1920x1080

3. Test results based on a comparison between driver versions 15.36.3.64.3907 and the previous version 15.33.22.64.3621
4. Refer to the Notes section at the bottom of this document for the system configuration

Additional Changes:

- The driver now supports DisplayID version 1.3 specifications providing support for the latest 4k2k monitors
- The driver now allows applications to send information through information frames to HDMI display devices that can re-adjust according to the input information
- Driver adds enhancements for improved cursor responsiveness for wirelessly connected displays using Miracast*
- On some PCs, the computer manufacturer might customize the Intel graphics driver to change features, incorporate customizations, or make other changes to the graphics driver software. Intel® Graphics Drivers downloaded from the Intel Web site will not install on such systems and will generate errors.

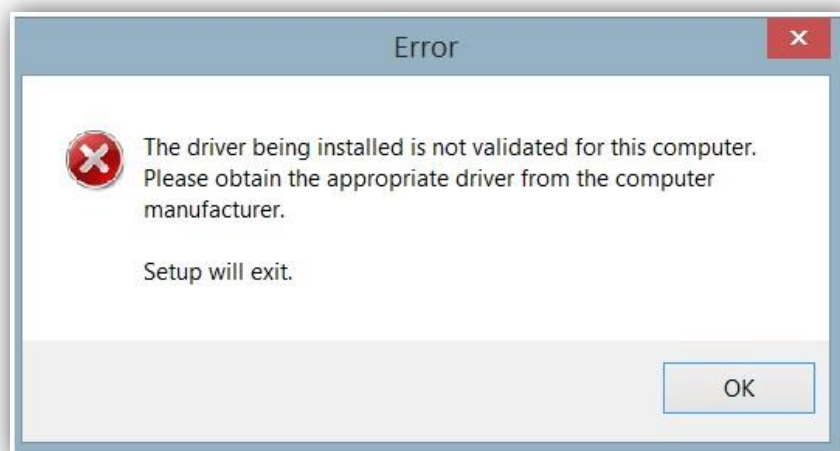
To provide assistance in such cases, the driver now provides a link along with the error message to redirect you to Intel's support page to help identify the right driver for your computer.

Error Message on this driver:



Clicking 'Yes' takes a user to here: <http://www.intel.com/support/graphics/graphics-havedisk>

Error Message on older drivers:



KEY ISSUES FIXED:

Resolved an issue where the video and audio playback would slow down on an Intel® NUC unit while running a Netflix* application using Dolby Digital Plus 5.1*	Windows* 8.1
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KNOWN ISSUES:

- Google Earth* application: Display corruption may be seen when activating ground level view.
- After a hibernate or sleep cycle, the video preview in Intel graphics control panel stops playing the video and does not show the setting changes in real time.

*Other names and brands may be claimed as the property of others.

Notes

1. System Configuration: Intel Core i5-4200U processor with Intel HD Graphics 4400, 8 GB (2x4GB) DDR3L-1600 memory, Intel 530 Series 180 GB SSD, 64-bit Microsoft Windows 8.1 Pro
2. Test results based on a comparison between the latest Intel HD Graphics 4400 driver version 15.36.3.64.3907 and the previous version 15.33.22.64.3621.
3. Game configurations set to "medium" and Intel Graphics Control Panel power setting set to "Balanced" mode. Performance results may vary depending on individual settings within a game. Not all games have the same configuration options.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel® products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit Intel Performance Benchmark Limitations.