

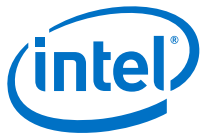
Intelligent
Systems

Intel[®] Embedded Media and Graphics Driver v1.15.1 for Intel[®] Atom[™] Processor N2000 and D2000 Series

Specification Update

| *December 2012*

Notice: The Intel[®] Embedded Media and Graphics Drivers may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.



INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.

A "Mission Critical Application" is any application in which failure of the Intel Product could result, directly or indirectly, in personal injury or death. SHOULD YOU PURCHASE OR USE INTEL'S PRODUCTS FOR ANY SUCH MISSION CRITICAL APPLICATION, YOU SHALL INDEMNIFY AND HOLD INTEL AND ITS SUBSIDIARIES, SUBCONTRACTORS AND AFFILIATES, AND THE DIRECTORS, OFFICERS, AND EMPLOYEES OF EACH, HARMLESS AGAINST ALL CLAIMS COSTS, DAMAGES, AND EXPENSES AND REASONABLE ATTORNEYS' FEES ARISING OUT OF, DIRECTLY OR INDIRECTLY, ANY CLAIM OF PRODUCT LIABILITY, PERSONAL INJURY, OR DEATH ARISING IN ANY WAY OUT OF SUCH MISSION CRITICAL APPLICATION, WHETHER OR NOT INTEL OR ITS SUBCONTRACTOR WAS NEGLIGENT IN THE DESIGN, MANUFACTURE, OR WARNING OF THE INTEL PRODUCT OR ANY OF ITS PARTS.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined". Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.

The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

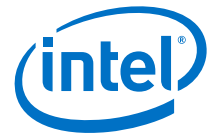
Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or go to: <http://www.intel.com/design/literature.htm>

Intel, the Intel logo, and Intel Atom are trademarks of Intel Corporation in the U.S. and/or other countries.

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

Copyright © 2012, Intel Corporation. All rights reserved.



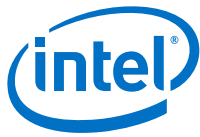
Contents

Revision History	4
Introduction	5
Purpose/Scope/Audience	5
Conventions and Terminology	6
Summary Tables of Current Product Issue Activity	7
Errata	9

Tables

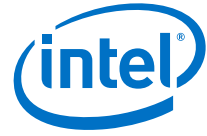
1	Affected Documents, Related Documents, and Reference Information	6
2	Conventions and Terminology	6
3	Summary Tables Legend	7
4	Errata for Intel® EMGD v1.15.1 for Atom N2000/D2000*	7

§ §



Revision History

Date	Revision	Description
December 2012	007	Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series v1.15.1 release
September 2012	006	Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series v1.15 release
August 2012	005	Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series Preliminary v1.15 release
July 2012	004	Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series v1.12 release
June 2012	003	Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series Preliminary v1.12 release (Beta 2, Build 2502)
April 2012	002	Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series Preliminary v1.12 release
December 2011	001	Initial release for the Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series v1.12.



Introduction

Intel® Embedded Media and Graphics Driver (Intel® EMGD) comprise a suite of multi-platform graphics drivers designed to meet the requirements of embedded applications. Featuring Intel® Dynamic Display Configuration Technology (DDCT), the drivers run on the following Embedded Intel® Architecture (eIA) chipsets:

- Intel® Atom™ Processor N2000 and D2000 Series

Intel® EMGD is designed to work with fixed-function systems, such as In-vehicle Infotainment (IVI) devices, Point-of-Sale (POS) devices, ATMs, gaming devices, etc. It can be configured to work with various hardware and software systems and supports Microsoft Windows* operating systems, including embedded versions of these operating systems.

The Intel Embedded Graphics Suite consists of both the Intel® EMGD graphics driver and a Video BIOS (vBIOS) component. These two components are configurable and work together to provide a wide range of features.

Please refer to the *Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series User Guide* and RELNOTES.txt in the software package for a detailed description of the supported features and display devices.

Purpose/Scope/Audience

This document is a compilation of Errata. It is intended for those who need to work with the graphics subsystem. This includes, but is not limited to: platform designers, system BIOS developers, system integrators, original equipment manufacturers (OEMs), system control application developers, as well as end users.

This document may also contain information that was not previously published.

This document provides information on open errata in all supported Intel® EMGD packages for version 1.15.1 of the Intel® EMGD product. It includes information on the following packages:

- Windows* XP with SP3, Windows* Embedded Standard 2009, Windows* Embedded for Point of Service (WEPOS 1.0) with SP3.
- Microsoft Windows Compact Embedded 7
- vBIOS and EFI video driver
- BIOS version V065-32:
<http://fmec.fm.intel.com/htbin/ipdcvs/viewcvs.cgi/bios/TNC/2225>
- BSP version 3.2.0:
http://pgles17.png.intel.com/SFF/WEC/WEC7/BSP_3.2/BSP_3.2.0_ALPHA_01.0/T_EST_CYCLE/

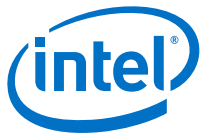


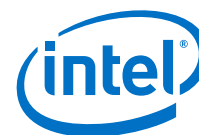
Table 1. Affected Documents, Related Documents, and Reference Information

Title	Number
<i>Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series User Guide</i>	493848
<i>Intel® System Controller Hub (Intel® SCH)</i>	319537
<i>Display Panel Debugging with the Intel Graphics Memory Controller Hub</i>	305964
<i>Intel® Embedded Media and Graphics Driver for Intel® Atom™ Processor N2000 and D2000 Series Technical Product Specification (TPS)</i>	493851
<i>Framebuffer Overlay Blending Configuration and Proof of Concept with Intel® EMGD White Paper</i>	324707

Conventions and Terminology

Table 2. Conventions and Terminology

Term	Definition
Errata (plural) Erratum (singular)	Errata are design defects or errors. These may cause the Intel® Embedded Media and Graphics Driver' behavior to deviate from published specifications. Hardware and software designed to be used with any given release must assume that all errata documented for that release are present on all devices.



Summary Tables of Current Product Issue Activity

Table 4 shows the [Errata](#) that apply to the Intel® EMGD product. Intel may fix some of the [Errata](#) in a future release of the software as noted in [Table 3](#). Table 4 uses the codes listed in [Table 3](#).

Table 3. Summary Tables Legend

Status Indicator	Column	Definition
X	Driver Version	Indicates that an erratum eXists
Plan Fix	Status	This erratum may be fixed in a future release.
Fixed	Status	This erratum has been previously fixed.
No Fix	Status	There are no plans to fix this erratum.
TBD	Status	This erratum still under investigation. Status to be determined.
A change bar to the left of a table row indicates an item that is either new or modified from the previous version of this Specification Update.		

Table 4. Errata for Intel® EMGD v1.15.1 for Atom N2000/D2000* (Sheet 1 of 2)

ID	Impacted Platform	Package	Errata	Status
204162	Atom N2000/D2000	Windows XP	Setting up internal LVDS display as extended by disconnecting VGA display followed by changing LVDS display color bit causes the LVDS display to go blank and the system to reboot.	No Fix
204171	Atom N2000/D2000	VBIOS	Abnormal clone mode behavior in Intel® Atom™ Processor N2000 and D2000 Series.	No Fix
204190	Atom N2000/D2000	Windows Embedded Compact 7	Intel® Atom™ Processor N2000 and D2000 Series running Windows Embedded Compact 7 not able to display 85Hz refresh rate resolution.	No Fix (Hardware limitation)
204212	Atom N2000/D2000	VBIOS	Intel® Atom™ Processor N2000 and D2000 Series vBIOS causes the LVDS screen to flash several times during the system boot up.	No Fix (Working as designed)
204585	Atom N2000/D2000	Windows XP	Driver displays incorrect resolution in DP-B Clone mode.	No Fix (Hardware limitation)
204589	Atom N2000/D2000	Windows XP	Display corrupted when selecting 1080i resolution for DP-B port.	TBD
204596	Atom N2000/D2000	Windows XP	Windows XP Display Properties interface does not include 640x240.	TBD
204611	Atom N2000/D2000	VBIOS	eDP VBIOS boots up with corruption on screen using EDID 1 2 4 and 6.	No Fix (Hardware limitation)



Table 4. Errata for Intel® EMGD v1.15.1 for Atom N2000/D2000* (Sheet 2 of 2)

ID	Impacted Platform	Package	Errata	Status
204767	Atom N2000/D2000	Windows XP	Unable to run Quake 3.	Will not fix
204775	Atom N2000/D2000	Windows XP	DX9SDK09 application content lost and certain applications produce a blank screen.	No Fix
204872	Atom N2000/D2000	Windows XP	ACPI issue - Some systems take too much time to go into hibernation.	Not a defect
204905	Atom N2000/D2000	Windows XP	Video Playback blank screen after adding alpha blending value.	No Fix (Hardware limitation)
204910	Atom N2000/D2000	Windows XP	eDP or LVDS cannot extend CRT with OS GUI simultaneously with EMGDGUI application.	No Fix (OS limitation)
205031	Atom N2000/D2000	VBIOS	CDV common to port settings not booting according to the Boot Type selected.	TBD
205174	Atom N2000/D2000	VBIOS	Windows XP loading bar missing on secondary screen on CLONE mode during boot up stage.	No Fix (OS limitation)
205189	Atom N2000/D2000	Windows XP	BurnIn Test pro V6 & V7 3D test distortion.	No Fix
205253	Atom N2000/D2000	Windows XP	Pixel anomalies appear on entire desktop background upon resuming from S4.	No Fix (OS limitation)
205282	Atom N2000/D2000	WEPOS, Windows XP	System experiences blue screen and/or reboots repeatedly if Windows File-based-write-filter (fbwf) is set to greater than 256MB.	No Fix (Working as designed)
205318	Atom N2000/D2000	CED, Windows Embedded Compact 7, Windows Embedded Standard 7, Windows XP, Windows eXP	Spread Spectrum Clock setting not working on Intel® Atom™ Processor N2000 and D2000 Series.	TBD



Errata

1. Setting up internal LVDS display as extended by disconnecting VGA display followed by changing LVDS display color bit causes the LVDS display to go blank and the system to reboot.

Reference #: 204162

Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows XP

Resolution: This issue can be worked around by turning off `display_detect`. When display detect is off VGA will be initialized anyway, even if the VGA cable is unplugged.

Status: No Fix

2. Abnormal clone mode behavior in Intel® Atom™ Processor N2000 and D2000 Series.

Reference #: 204171

Driver: VBIOS

Platform: Atom N2000/D2000

Package: VBIOS

Resolution: The VBIOS does not support the special mode handling required to support Clone mode in all situations. Please expect to have only a single display in standard VGA DOS mode or during XP start up. Supporting Clone mode universally is not planned at this time.

Status: No Fix

3. Intel® Atom™ Processor N2000 and D2000 Series running Windows Embedded Compact 7 not able to display 85Hz refresh rate resolution.

Reference #: 204190

Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows Embedded Compact 7

Resolution: The maximum dot clock of the hardware cannot support high resolution and high refresh rates. Please use an appropriate refresh rate so as to not exceed the hardware capabilities.

Status: No Fix (Hardware limitation)



4. Intel® Atom™ Processor N2000 and D2000 Series vBIOS causes the LVDS screen to flash several times during the system boot up.

Reference #: 204212

Driver: VBIOS

Platform: Atom N2000/D2000

Package: VBIOS

Resolution: The flashing is expected behavior during mode switches. This occurs if the VBIOS does not have control of the backlight so the backlight can be switched off. If you use the recommended backlight control hardware this issue will not occur.

Status: No Fix (Working as designed)

5. Driver displays incorrect resolution in DP-B Clone mode.

Reference #: 204585

Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows XP

Resolution: In clone mode with HDMI upscaling may not work in all cases. This is an expected behavior with the hardware.

Status: No Fix (Hardware limitation)

6. Display corrupted when selecting 1080i resolution for DP-B port.

Reference #: 204589

Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows XP

Resolution: 1080i mode in DisplayPort may exhibit corruption. This issue will be addressed in a future release.

Status: TBD

7. Windows XP Display Properties interface does not include 640x240.

Reference #: 204596

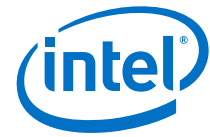
Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows XP

Resolution: Windows XP does not allow resolutions below 640x480. When using a smaller resolution display use the EMGD GUI for mode and configuration settings.

Status: TBD

**8. eDP VBIOS boots up with corruption on screen using EDID 1 2 4 and 6.**

Reference #: 204611

Driver: VBIOS

Platform: Atom N2000/D2000

Package: VBIOS

Resolution: Some eDP panels can experience distorted display when relying only on the EDID in the panel. To workaroud this issue it is recommended to specify a user DTD in addition to the EDID for the driver configuration in CED. On eDP configuration page in CED under "EDID Option" you should check the "Use user-defined DTD's" then either create a custom DTD to match your panel or use one of the predefined DTDs that matches your panel parameters.

Status: No Fix (Hardware limitation)

9. Unable to run Quake 3.

Reference #: 204767

Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows XP

Resolution: Quake utilizes older DX7 fixed functions calls which are not supported at this time in the Intel® EMGD XP driver and therefore does not run with the Intel® EMGD XP driver. If the program's fixed function calls were updated to modern DX9 calls, the application would function.

Status: Will not fix

10. DX9SDK09 application content lost and certain applications produce a blank screen.

Reference #: 204775

Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows XP

Resolution: The Microsoft DX9 SDK utilizes some DX7 Fixed Function calls which are not supported by the XP driver at this time. As such, any application that uses the SDK framework may attempt to use those fixed function calls and fail. Many demo applications in the 2009 release of the SDK utilize fixed function calls and will not work properly. Later releases of the SDK minimized the use of fixed functions (implementing true DX9 functionality) and therefore work better with the Intel® EMGD XP driver.

Status: No Fix

11. ACPI issue - Some systems take too much time to go into hibernation.

Reference #: 204872

Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows XP

Resolution: Going into hibernation and sometimes standby may take 5-10 seconds longer than it should. The system will successfully standby and hibernate if given time. This issue is not occurring in the graphics driver and appears to be related to HDD cache flushing or other system delays.

Status: Not a defect



12. Video Playback blank screen after adding alpha blending value.

Reference #: 204905
Driver: Graphics
Platform: Atom N2000/D2000
Package: Windows XP
Resolution: The N2000/D2000 hardware does not support ARGB format on the overlay thus hardware alpha blending is not possible with the hardware. The driver will fall back to software blending/compositing.
Status: No Fix (Hardware limitation)

13. eDP or LVDS cannot extend CRT with OS GUI simultaneously with EMGDGUI application.

Reference #: 204910
Driver: Graphics
Platform: Atom N2000/D2000
Package: Windows XP
Resolution: The OS GUI (**Advanced** button on screen properties page) and the EMGD application EMGDGUI.exe should not be used simultaneously. Doing so may result in crashes or black screens. Intel recommends using the OS GUI to set EMGD features. If a crash or black screen results from this situation, rebooting the system should correct the display.
Status: No Fix (OS limitation)

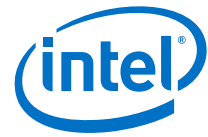
14. CDV common to port settings not booting according to the Boot Type selected.

Reference #: 205031
Driver: VBIOS
Platform: Atom N2000/D2000
Package: VBIOS
Resolution: The wrong display may be enabled when the Boot Display in BIOS is set to anything other than “BIOS default,” CRT, or EFP1 with AMI BIOS. It appears that AMI has changed the meanings of some of the standard Boot Display settings commonly used on previous chipsets. This causes EMGD VBIOS and driver to select the wrong display in certain settings. For example:

```
MNEMONIC NAME Standard AMI on CDV
-----
CRT VGA display 0 0
TV1 television 1 1 ?
EFP1 external flat panel 1 2 2
LFP1 local flat panel 1 3 7
TV2 television 2 4 ?
EFP2 embedded flat panel 2 5 ?
```

For common to port to work, you must ask AMI to revert back to the standard bit settings for the display devices.

Status: TBD

**15. Windows XP loading bar missing on secondary screen on CLONE mode during boot up stage.**

Reference #: 205174

Driver: VBIOS

Platform: Atom N2000/D2000

Package: VBIOS

Resolution: Windows XP uses VGA mode 12h to display the loading screen. No high resolution mode is set until after the loading screen and immediately before the Welcome Screen is displayed. Because the graphics controller only supports output to a single display when operating in VGA mode the loading screen appears only on one display. When the Welcome screen appears all configured displays should become active. This is expected behavior.

Status: No Fix (OS limitation)

16. BurnIn Test pro V6 & V7 3D test distortion.

Reference #: 205189

Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows XP

Resolution: This is not a defect as fixed function is not supported in the XP driver.

Status: No Fix

17. Pixel anomalies appear on entire desktop background upon resuming from S4.

Reference #: 205253

Driver: Graphics

Platform: Atom N2000/D2000

Package: Windows XP

Resolution: This is a known OS issue and the workaround is to right-click on the desktop, click **Refresh** and then the desktop reappears. Microsoft has a KB article regarding this KB #887238. (<http://support.microsoft.com/kb/887238>)

This will not be fixed in the driver.

Status: No Fix (OS limitation)

18. System experiences blue screen and/or reboots repeatedly if Windows File-based-write-filter (fbwf) is set to greater than 256MB.

Reference #: 205282

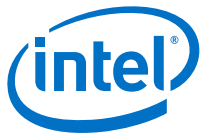
Driver: Graphics

Platform: Atom N2000/D2000

Package: WEPOS, Windows XP

Resolution: Intel® EMGD allows video memory pre-allocation value up to only 256MB. Using video memory pre-allocation ≥ 256 MB is not supported.

Status: No Fix (Working as designed)



19. Spread Spectrum Clock setting not working on Intel® Atom™ Processor N2000 and D2000 Series.

Reference #: 205318

Driver: CED

Platform: Atom N2000/D2000

Package: CED, Windows Embedded Compact 7, Windows Embedded Standard 7, Windows XP, Windows eXP

Resolution: This issue is under investigation and there is no planned workaround at this time.

Status: TBD

§ §

