Product Overview
The Intel® Embedded Media and Graphics Driver (Intel® EMGD), based on an optimized architecture, specifically addresses the needs of embedded platform developers by offering a long-life production commitment (up to seven years for new devices), and also enables new graphics features that support non-traditional yet growing computing segments such as netbooks, tablets, slates, and consumer handheld gadgets. Enhancements provide additional Linux* features to support In-Vehicle Infotainment (IVI) usage models, increased size of the VBIOS, increased splash screen file size, and improved Linux installation experience using the RPM method.

The Intel® EMGD v1.16 is ideal for systems based on the Intel® Atom™ processor E6xx series, which integrates the processor core, graphics and video encode/decode, plus memory and display controllers into one package. It is also validated for platforms based on the Intel® Atom™ processor Z5xx series with the Intel® System Controller Hub US15W, US15WP and US15WPT.

Intel® Dynamic Display Configuration Technology
This technology allows embedded customers to expand usage models beyond typical desktop and laptop configurations through numerous advanced display configuration capabilities, including:

- Multi-display using any combination of available display ports
- Dynamic display detection, hot-plug display support and enablement according to configurable display port order
- Simplified specification of customized flat-panel timings
- Use of extended display identification data (EDID) for panels on the integrated LVDS port
- In-display configuration via support of the new VESA display ID standard
- Setup of conditional behavior when EDID and/or non-EDID panels are detected
- Advanced configuration for clone display mode on different-sized displays
- Use of integrated display ports in conjunction with PCI and PCI Express*-based graphics cards
- Ability to display power on self-test (POST) messages and boot to DOS* in clone display mode (VESA modes only)

Driving Graphics Into a Wider Range of Applications
The Intel EMGD, when paired with the Intel Atom processor E6xx series, is an ideal fit for many embedded applications including, but not limited to:

- In-Vehicle Infotainment (IVI) systems
- Industrial computing such as traffic signs and home appliances
- Utilities and transportation systems
- Residential gateway
- Internet television
- Point-of-sale systems
- Digital signage
- Security sensors and digital security
- IP media phones and cameras
- Homes and factory automation
- Robotics
- Portable medical devices

Supported Devices, Operating Systems and APIs

### Devices
- Intel® Atom™ processors E620/E640/E660/E680
- Intel® Atom™ processors E620T/E640T/E660T/E680T with industrial temperature (-40°C to +85°C)

### Operating Systems
- Microsoft Windows® XP (SP3), Microsoft Windows® XP Embedded (SP3)
- Microsoft Windows® Embedded for Point of Service* (SP3)
- Microsoft Windows® Embedded Standard 2009
- Microsoft® Windows® Embedded CE (R3) with EMGD v1.5.3 for E6xx B0
- Microsoft® Windows® Embedded Compact 7 with EMGD v1.14/v1.16 for E6xx B1
- Microsoft® Windows® 7 Professional, Microsoft® Windows® 7 Ultimate, Microsoft® Windows® Embedded Standard 7
- MeeGo® 1.2 IVI Linux* (kernel 2.6.37 and 2.6.39, X Server 1.9, Mesa 7.9)
- Timesys Fedora® Remix v14 (Timesys kernel 2.6.35, X Server 1.9, Mesa 7.9)
- Android® 2.3.7 (Gingerbread kernel 2.6.39) with EMGD v1.14

### 3D Support for Linux*
- OpenGL® on supported 2.6 kernel Linux distributions for advanced 3D graphics acceleration on dual independent displays
- OpenGL ES 1.1 and 2.0, OpenGL 2.1

### 3D Support for Android*
- OpenGL ES 1.1 and 2.0 support for 3D hardware acceleration on Intel Atom processor E6xx series

### OpenGL® for Windows*
- OpenGL 2.0, Mesa 7.1
Supported Devices, Operating Systems and APIs (Continued)

Flexible Display Outputs
- Internal LVDS and dual digital transmitter support (e.g., Display Magic MAG-7308-UT dual LVDS ADD2 card)*
- External sDVO interface to Chrontel and Silicon Image* sDVO DVI, HDMI, LVDS transmitters and VGA/CRT, TV-out encoders via port drivers
- Lapis Semiconductor ML7213 - sDVO
- Chrontel CH7308* support for conversion from LVDS to HDMI/DVI and VGA; Chrontel CH7022* TV-Out support with YPbPr on Linux

Features

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<th>Features</th>
<th>Benefits</th>
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| Configuration Editor (CED) | - Graphical pre-installation utility program allows easy creation of consolidated driver installation packages for Windows* Embedded CE [EMGC 1.5.3], windows* (32-bit and 64-bit environments supported), Linux* and VBIOS.
- CED Lite, provided as a browser-based GUI utility, can be used on Windows* - or Linux*-based systems.
- CED supports EFI splash screen configuration of up to 500 KB. |
| Port driver device extensibility | - Software development kit allows the addition of customized devices (beyond those supported by default). |
| Configurable display support | - Simplified mechanism for adding new or custom display modes.
- Advanced configuration capabilities instruct the driver how to detect and select appropriate timings for system displays.
- Display rotation and full configuration based on DDC physical orientation information. |
| Control APIs | - Supports non-standard features, such as display switching and toggling, and sDVO device control.
- Linux* APIs support overlay plane selection, sharing of EGL surfaces between applications with MSAA, freeze/resume of framebuffer rendering and UI ColorKey support via XV. |
| Boot configurability | - Driver and video BIOS may be customized specifically for OEM display and platform configurations.
- Video BIOS multi-configuration support of only 12K for Intel Atom processor E6xx series. |
| Overlay support | - Improves video playback performance using the X11 Xv, or Microsoft DirectDraw* interface; up to two displays. |
| Multiple display support | - Dual independent head (DH) or extended mode display available.
- Clone mode supported (same content but different timings via two pipes to two displays).
- Dual Independent head-to-clone/reverse clone mode runtime switching and vertical extended mode support on MeeGo* 1.2. |
| Multi-GPU Multi-Monitor | - Discrete PCI- and PCI Express*-based GPU functions as primary or secondary display concurrently with integrated graphics (on Windows* XP).
- Discrete PCI Express*-based GPU as secondary graphics adapter with integrated graphics as the primary (on Windows* 7 and Windows* Embedded Standard 7). Support for Intel* Atom* processor E6xx series only.
- Triple or quad displays are possible with integrated LVDS and sDVO ports and one or more display outputs from a third-party graphics card. |
| ACPI on Microsoft Windows* and Linux* | - Advanced configuration and power management. |
| 2D acceleration | - Improved performance of applications, which take advantage of OS acceleration APIs, including the XRender API and Microsoft Direct3D interface.
- OpenGL 1.1 (for Linux) used for acceleration of 2D vector graphics.
- 2D GDI hardware acceleration for Windows* 7 and Windows* Embedded Standard 7. |
| Microsoft Direct3D* support | - Improved performance for 3D applications utilizing Microsoft DirectX* 9.0c APIs for Windows operating systems.
- DirectX* 9.0Ex (also known as 9.0L) support for Windows* 7 and Windows* Embedded Standard 7. |
| Upscaling | - Lower-resolution modes can be displayed as full screen configurations that support upsampling (example: internal LVDS, and Chrontel CH7308*). |
| Certified Output Protection Protocol | - Enables applications to copy-protect video stream outputs using HCF, CCAPS-A and Analog Copy Protection (ALF) available on Windows* XP. |
| Hardware Video Decode Acceleration | - Removes decode burden from processor, reduces power consumption and need for software CODECs.
- MPEG-2, MPEG-4 (FFmpeg), and VC-1 formats supported in Timesys Fedora* Remix x14 and MeeGo*.
- MPEG-2, H.264 and VC-1 formats supported in Windows* Embedded Standard 2009, Windows* XP, Windows* XP Embedded, and Windows* Embedded for Point of Service* (VEPOS) via DXVA.
- MPEG-2, H.264 AVC, VC-1, and WMV9 via DXVA 2.0 formats supported in Windows* 7 and Windows* Embedded Standard 7.
- Adobe Flash* 10.1 video decode support with third-party plug-in.
- MPEG-4, H.264 AVC, VC-1, and H.263 formats supported through OpenMAX* in Android*.
- Texture streaming supported on Linux* and Android*. |
| Hardware Video Encode Acceleration (available with Intel* Atom* processor E6xx series) | - Multiple video encode output profiles including 720p@30Hz, H.264 baseline profile encode.
- H.264 simultaneous encoding and decoding available with integrated graphics.
- Video encode via USB camera and BT656 interface in Linux* and Android*.
- Video encode for H.264 video format via USB camera (any YUV input format) in Windows* 7 and Windows* Embedded Standard 7. |
| Anti-Aliasing | - Minimizes distortion when displaying high-resolution video at a lower resolution. Supported on Linux* and Microsoft Windows* XP. |

For further product information, visit edc.intel.com/software/downloads/EMGD

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1 Windows* 7 and Windows* Embedded Standard 7 do not support the Intel® Atom™ processor E620/E620T [0.6 GHz] due to minimum system requirements of 1.0 GHz 32-bit (x86) processor.

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† Intel® Atom™ processor E6xx series supported as a secondary GPU desktop display when integrated graphics are not supported or enabled.

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