

VkCoreGL[®] SC1 Application Library

FEATURES & BENEFITS

- Provides an OpenGL[®] SC 1.0.1 API along with EGL 1.4
- Designed and developed from ground up for high performance, and safety critical certification (including RTCA DO-178C / EUROCAE ED-12C Level A, ISO 26262 ASIL D and IEC 61508 SIL 3).
- Compatible with popular safety critical HMI tools such as ANSYS[®] SCADE, Presagis' VAPS XT, ENSCO's iData[®] and DiSTI's GL Studio[®].
- Contains no open source and no 3rd party software
- Supports the EGL_EXT_compositor
- Supports RTOS, including Wind River[®] VxWorks[®]/VxWorks 653, SYSGO PikeOS[®], QNX OS, Green Hills Software[®] INTEGRITY[®]/INTEGRITY178 tuMP, DDC-I Deos[™], Lynx Software Technologies LynxOS[®]/LynxOS-178/LynxSecure, Linux, and is configurable for proprietary RTOS or 'bare metal' (no RTOS)
- Available with CertCore[™] 178 (Avionics DO-178C / ED-12C Level A, B, C and D) and CertCore 26262/61508 safety certification packages
- Solutions aligned with latest Future Airborne Capability Environment (FACE[™]) Technical Standard

INTRODUCTION

CoreAVI's VkCoreGL[®] SC1 is an application library designed to run seamlessly on CoreAVI's VkCore[®] SC Vulkan[®]-based safety critical graphics and compute driver. VkCoreGL SC1 provides an OpenGL SC 1.0.1 API that enables integrators to run legacy OpenGL SC 1.0.1 applications while simultaneously taking advantage of the advanced capabilities of Vulkan. VkCoreGL SC1 supports fragment and vertex shaders and supports the following extensions:

- Supported Extensions: GL_ARB_multisample, GL_ARB_multitexture, GL_ARB_vertex_buffer_object, GL_EXT_blend_color, GL_NV_blend_square, GL_EXT_copy_texture, GL_EXT_draw_range_elements, GL_SGIS_texture_edge_clamp
- Additional Functions (from OpenGL 1.3): glBlendFunc, glDepthFunc, glReadBuffer, glCallList, glDeleteAllLists, gl_DeleteAllTextures, glTexCoord2f, glTexCoord2fv, glVertex4f

VkCore SC utilizes EGL 1.4 for the platform interface which includes the EGL_EXT_Compositor extension for multiple window composition.

Built with a similar superset of Khronos' OpenGL SC 1.0.1 specification as CoreAVI's ArgusCore[™] SC1 safety critical graphics drivers, the VkCoreGL SC1 application libraries support a fixed function graphics rendering pipeline⁽¹⁾. VkCoreGL SC1 enables users to deploy modern GPU shader programs in safety certifiable environments.

(1) Please contact CoreAVI for a list of specification extension differences.

EGL PLATFORM INTERFACE

The interface between VkCoreGL SC1 rendering and the underlying native platform window system is provided by EGL 1.4 including the EGL_EXT_Compositor extension. The extension minimizes application effort, enabling composition of multiple windows within a single or multi-partition graphics system. It provides a standard windowing API and can be used to enable mixed criticality design requirements, making it an ideal choice for embedded automotive, avionics, industrial and transportation applications.

The EGL_EXT_Compositor may also reduce the cost of making changes to the application. The application could be separated into different sub-applications with the compositor amalgamating the sub-applications' output into a complete display where only a sub-set of the applications affected by a change would need to go through the change process.

CERTIFICATION DATA

CoreAVI provides complete DO-178C/ED-12C certification data packages called CertCore 178, which support the use of VkCore SC graphics drivers in any FAA DO-178C / EASA ED-12C avionics safety certification. CertCore 178 can be licensed for DAL A, B, C or D and used to meet program requirements while managing costs.

For automotive and industrial applications, CoreAVI also provides CertCore 26262/61508 to support automotive and industrial certifiable designs.

USER INTEGRATION MANUAL

In addition to a User Manual and Porting Guide, a User Integration Manual is also available to describe usage, assumptions and issues to put VkCoreGL SC1 into context. The User Integration Manual describes requirements to be considered by the application developer, such as:

- Potential safety requirements fulfilled by VkCoreGL SC1
- How VkCoreGL SC1 must be configured and integrated
- Any post-integration testing of VkCoreGL SC1
- Any known safety impacting issues with VkCoreGL SC1.

Requirements Transfer

VkCoreGL SC1 is developed as a Safety Element out of Context (SEooC)/Compliant Item. This is an industry standard approach to developing safety elements where the end application is unknown. CoreAVI has made assumptions based on market data that are captured within the Safety Manual. CoreAVI is willing to discuss acceptance of new customer safety requirements for future designs. Please contact CoreAVI Sales for further information.

Availability of Safety Documentation

The following table lists the safety documentation for the library:

DELIVERABLE	CONTENTS	AVAILABILITY	DELIVERY
Safety Manual	Document usage, assumptions, issues, etc. of SEooC to put the SEooC into a safety context (application)	NDA material	TBD

Evaluation Support

VkCoreGL SC1 application libraries are available for Windows 10 on a 12 month evaluation license which includes support.

External Product Audits

CoreAVI works with industry accredited independent authorities for assessment and certification of products.

Contact Sales@CoreAVI.com for more information on VkCoreGL SC1.