



VkCoreGL™ SC2 Application Library

Features & Benefits

- Provides and OpenGL SC 2.0 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 B).
- Integrated and 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 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 CertCore178™ (Avionics DO-178C / ED-12C Level A, C and D) safety certification packages
- Available with ISO 26262 Accredited Safety Assessment Certificate
- Solutions aligned with latest Future Airborne Capability Environment (FACE™) Technical Standard

Introduction

CoreAVI's VkCoreGL SC2 is an application library designed to run on CoreAVI's VkCore® SC Vulkan®-based safety critical graphics and compute driver. VkCoreGL SC2 provides an OpenGL SC 2.0 API that enables integrators to run legacy OpenGL® SC 2.0 applications while simultaneously taking advantage of the advanced capabilities of Vulkan. VkCoreGL SC2 supports fragment and vertex shaders and supports the following extensions:

OES_depth24, OES_depth32, OES_element_index_uint, OES_rgb8_rgba8, OES_standard_derivatives, OES_texture_npot

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 2.0 specification as CoreAVI's ArgusCore™ SC2 safety critical graphics drivers, the VkCoreGL SC2 application libraries support a programmable graphics rendering pipeline (1). This allows safety critical applications to take greater advantage of the performance gains by utilizing modern graphics processor shader engines while still maintaining the ability to achieve the highest levels of safety certification. VKCoreGL SC2 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 SC2 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 for FACE alignment and can be used in mixed assurance level situations, making it an ideal choice for embedded avionics, defense and automotive 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.

CertCore178™

CoreAVI's complete RTCA DO-178C and EUROCAE ED-12C Level A certification data packages support the use of VkCoreGL SC2 application libraries in any avionics safety certification.

Development Interface Agreement

The intent of a Development Interface Agreement (DIA) is to define the responsibilities of the customer and supplier in facilitating the development of a functional safety system.

In custom developments, the DIA is a key document executed between customer and supplier early in the process of developing both the system and the CoreAVI drivers and libraries.

As the CoreAVI libraries are Commercial-Off-The-Shelf (COTS) products, CoreAVI has prepared a standard DIA which describes the support that CoreAVI can provide for customer developments. Please refer requests for custom DIAs to CoreAVI Sales.

The following sections highlight key points of the standard DIA.

Requirements Transfer

The VkCoreGL SC2 product is developed as a Safety Element out of Context (SEoC). Detailed safety requirements were not available from lead customers during development. Therefore, the safety requirements used were based on CoreAVI analysis of target safety applications. 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 SC2 application libraries are available for Windows 10 on a 12 month evaluation license which includes support.

External Product Audits

CoreAVI works with TUV Rhineland® for an external audit of VkCoreGL SC2 to ISO 26262 standards.

Contact Sales@CoreAVI.com for more information on VkCoreGL SC2.