# GL STUDIO

GL Studio is a graphical development tool that enables users to create high fidelity, feature-rich 2D and 3D graphical interfaces for a wide range of product uses and domains. Using industry standard 2D/3D file formats, a flexible development environment, and support for modern graphics hardware, application developers can deliver on the industrial designer's vision. GL Studio enables the real-time creation of interactive 2D and 3D geometry through a WYSIWYG environment, alleviating the need to write cumbersome low-level graphical code. Geometry creation is performed using intuitive tools for drawing, grouping, ordering, and texturing. Designs are implemented using a powerful runtime engine which allows for real time cross-platform deployment.

Industries

- **Aerospace**
- **Automotive**
- **Medical**
- **Industrial**
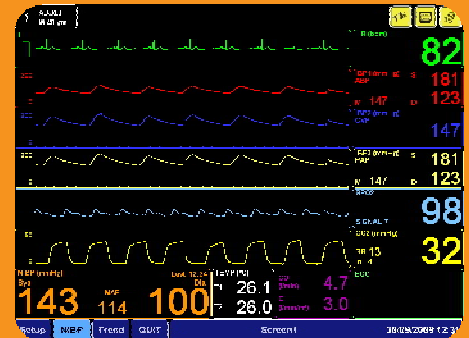
Applications

- **Design**
- **Prototyping**
- **Embedded**
- **Certification**

Key Features

- Advanced HMI Simulation Technology for Prototyping, Training and Deployment
- World's first and Object Oriented HMI tool
- Code Generators: C++, Java, EC++, SC++
- Human readable code generation
- RSO Philosophy
- Powerful WYSIWYG modeling system enables user to rapidly create rich, interactive graphical user interfaces
- Ready functionality for Knobs, Switches, Push Buttons and Odometers
- 3D support - out of the box
- Multi-touch capability
- Advanced font capabilities
- Multi-OS Support
- Generate .exe, .dll or activeX component
- Customizable & User friendly editor
- Python Script extension allows to automate common functions within GL Studio
- Supports and compatible with OpenGL and DirectX
- Integration with many IGs / Scene graphs (OSG, X-Plane, Unity etc)
- Add-On modules: MAP Tool Kit, GLS Menu, Video Tool Kit, Simulink Blockset, Approach Plate Tool Kit and Data Director Tool Kit
- GL Studio SC runtime Library qualifiable to RTCA DO-178 (B or C) and EUROCAE ED-12 (B or C) Levels E through A

GL Studio Automotive Solutions

Design , Prototype & Embedded

1. **Infotainment**

2. **Rear Seat Entertainment**

3. **Instrument Clusters**

4. **Connected Car Mobile Apps**

Embedded Displays & Infotainment Systems

With advanced 3D graphics, multi-touch and gesture support for touch screens entering every facet of the consumer's domain, the user experience (UX) is what separates your product from the competition. GL Studio ES rapidly prototypes advanced Human Machine Interfaces (HMI) that seamlessly transition to the target system, including instrument clusters, infotainment head units, rear seat entertainment systems, and connected car mobile interfaces. Today's vehicles demand the latest in hardware and software capabilities to complement the UX and provide a safer driving experience; let GL Studio take you there.
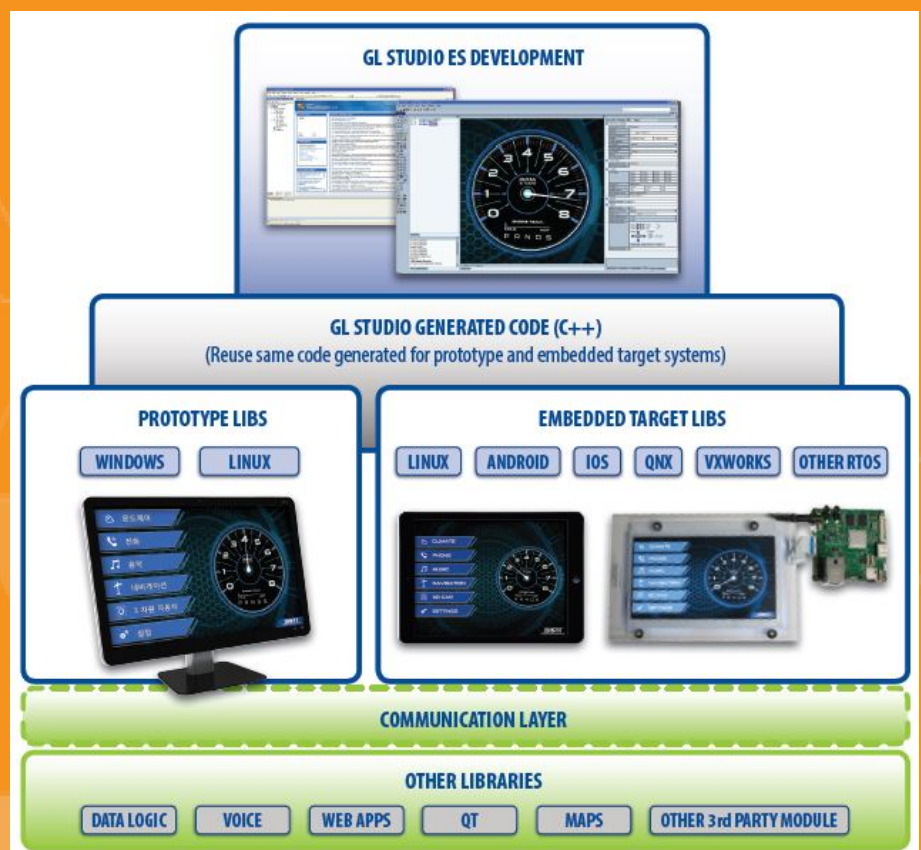
Why Choose GL Studio ES?

- Advanced OpenGL 3D graphics for the freedom to produce an immersive 3D UX
- Industry standard C++ open architecture for the flexibility to handle complex interface UX
  - Generates high performance human readable industry standard source code
  - 10 to 1 development time savings over hand coding
  - Highly optimized & portable interactive 2D and 3D display content
  - Same code for multiple deployment targets to simplify development
- Complete prototype reuse on embedded target
- Award winning WYSIWYG interface shows exactly how your HMI will look
- OS and graphic chip independent development insulates the UI creation experience
- Proven market history with 15+ years of visual interface experience
- Leverage scene graph technology tried and tested by the demanding Aerospace & Defense markets

GL Studio Safety Critical

Aerospace

Medical

Power Generation

GL Studio SC (Safety Critical) bridges the traditional implementation gap between the industrial designer's visions and the final engineering execution. This single tool chain offers essential features for developing certifiable embedded safety critical displays.

The GL Studio developer enables the creation of 2D and 3D geometry in real-time through a WYSIWYG environment, alleviating the need to write cumbersome OpenGL code by hand. Geometry creation features include basic tools for drawing, grouping, ordering and texturing. Designs are rendered in real-time and deployed with cross-platform speed and agility, using the GL Studio SC Runtime Library.

Features

- Safety Critical Embedded C++ Code Generator (SCEC++) with a WYSIWYG user interface
- GL Studio SC Runtime Library qualifiable to RTCA DO-178 (B or C) and EUROCAE ED-12 (B or C) Levels E through A
- Compact and OS independent runtime library
- Seamless integration with previously developed OpenGL code
- Certification Kit (optional)

Benefits

The interface components and controls created through GL Studio SC meet demanding requirements and provide significant benefits:

- 10x faster production time than traditional hand coding with SCEC++
- Runtime library with 4,000 lines of code reduces certification complexity and cost
- Development cost savings from building certified displays from the start

Aerospace
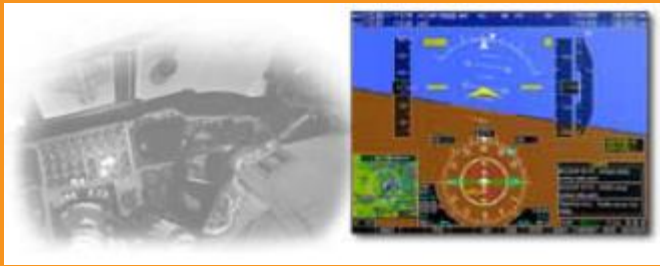
Rapidly create certifiable avionic displays independent of the operating system to simplify the development process, to test those displays within a training environment, and then to deploy the validated avionic displays to the actual aircraft.

Medical

Build visually compelling interfaces for Life Critical Class III medical devices to increase the graphical display fidelity, to aid in proper measurement of vital activities, and to reduce display response times.
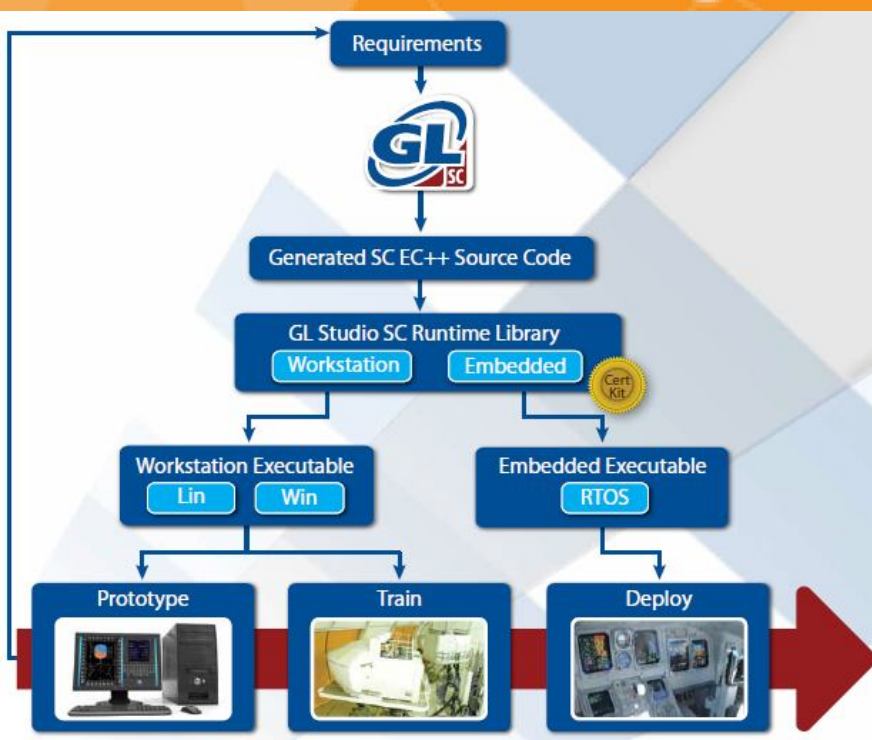
Power Generation

Monitor diagnostic control indicators that are essential to plant (steam turbine, nuclear, coal, natural gas) operation with advanced graphical user interface generation techniques.

GL Studio Safety Critical Development Work Flow

Safety Critical Embedded C++ Code Generator

The GL Studio SC Embedded C++ Code Generator produces Embedded C++ that conforms to the WP-AM-003 standard.

This standard is published by the Association for Computing Machinery (ACM) Special Interest Group on Programming Languages (SIGPLAN) and specifies the subset of the C++ language for use in safety critical systems.

GL Studio SC Runtime Library

Designed from the ground up to meet DO-178B/C and ED-12B/C Level E through A specifications, the runtime library for GL Studio SC is exceptionally compact, efficient, portable, and only requires an OpenGL library on the target system. With a compact memory

footprint, strict operating system abstraction, efficient rendering capabilities, and expandable support to allow the use of custom OpenGL shaders, this runtime library delivers an extremely optimized and portable embedded solution for executing digital human machine interfaces.

GL Studio SC Certification Kit

The Certification Kit, or "Cert Kit", includes source code to the GL Studio SC Runtime Library and full software life cycle documentation to meet DO-178B/C Level A standards. Our certification partner, a third party DER aviation certification company, has approved these available Certification Documents:

- SCMP – Software Configuration Management Plan
- SQAP – Software Quality Assurance Plan
- PSAC – Plan for Software Aspects of Certification
- SDP – Software Development Plan
- SDD – Software Design Document

- SVP – Software Verification Plan
- SRD – Software Requirements Document
- SCS – Software Code Standards
- SRS – Software Requirements Standards
- SDS – Software Design Standards

DiSTI / SIMLABS will work with the customer to complete these project-specific certification documents:

- SVCP – Software Verification Cases and Procedures
- SECI – Software Life Cycle Environment Configuration Index
- SCI – Software Configuration Index
- SAS – Software Accomplishment Summary

Support for Apple iOS & Android

With the support of OpenGL ES v1.1 and v2.0, the GL Studio SC runtime library also deploys to iOS or Android devices for prototyping, demonstrating, or supplementation of any safety critical application. This provides further usability of interface content beyond a developer's initial concept and allows for the proliferation of vital content to a ubiquitous hardware platform. Industries will have the opportunity to implement this capability in multiple ways, such as:

- Aviation - low cost electronic kneeboards
- Unmanned Vehicle - portable ground station repeaters
- Medical - remote patient monitoring
- Power Generation - portable plant diagnostics

GL Studio Blockset for Simulink
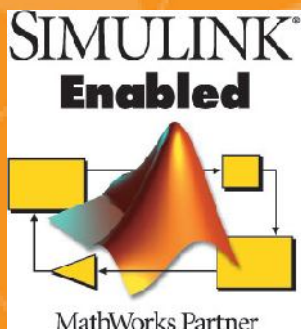
Expand your Mathworks' Simulink project functionality by easily adding feature rich graphical interface displays and controls from GL Studio. The GL Studio components easily drop into the Simulink canvas and connect to data without any coding. In just a few clicks you're up and running!

Highlights of the tool include:
- Drag and drop interfaces
- No code connections
- Bidirectional communication