

BuiltSAFE™ GS Multi-Core Renderer

- **Portable** - Across many CPU and OS combinations
- **Powerful** - Highest performance 3D software GPU available
- **Certifiable** - DO-178C, IEC-61508, ISO-26262
- **Open standard** - Supports multiple graphics APIs
- **Customizable** - Easily add custom APIs and features
- **Eliminates GPU obsolescence** - No graphics ASIC required



Mercury's BuiltSAFE™ GS Multi-Core Renderer is the fastest pure software 3D rendering technology for safety-critical applications. This renderer provides the perfect combination of performance and flexibility, enabling advanced graphics on devices without a Graphics Processing Unit (GPU), rendering purely in software. Eliminating the necessity for a GPU results in less hardware, less complexity and lower certification costs for many applications.

Our flexible, high-performance safety certifiable rendering engine can be used for diverse applications and platforms ranging from avionics, to automotive displays. The technology is easily reconfigured to support a variety of popular processor and Operating System (OS) architectures. All data items required to achieve the highest levels of safety certification are readily available.

For 2D and 3D rendering, where a dedicated GPU is unavailable or unsuitable, our BuiltSAFE GS Multi-Core Renderer has no equal in performance and ease of integration.

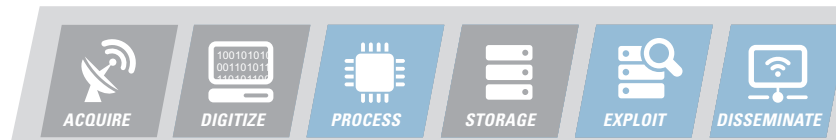
Application Domains

- Cockpit display systems
- Tactical displays
- Infotainment/driver information
- Consumer mobile devices
- Industrial control systems
- Video and imaging processing
- Telematics

Mercury Mission Systems

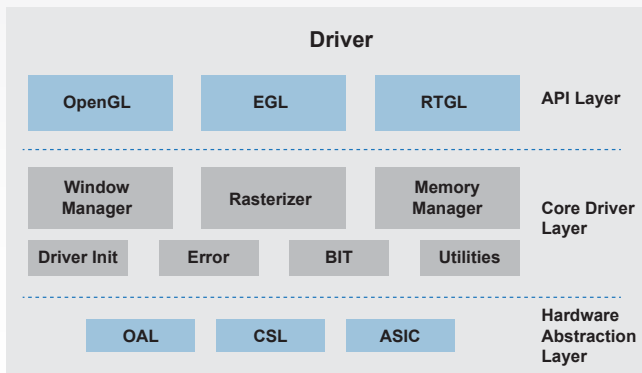
- Safety-critical and high-integrity systems and software for the aerospace, defense, automotive and industrial control industries
- World-class technology enabling graphics content to be deployed across different platforms
- Leading supplier of advanced 3D graphics and OpenGL enabling solutions for embedded systems
- DO-178C, DO-254, IEC-61508, ISO-26262 and IEC-62304 domain expertise with comprehensive development, verification and certification client services

Mercury Systems is a leading commercial provider of secure sensor and mission processing subsystems. Optimized for customer and mission success, Mercury's solutions power a wide variety of critical defense and intelligence programs.



Key Features

- Modular architecture for rapid portability
- Photorealistic rendering
- Sophisticated support for CPU vector operations
- State-of-the-art performance optimization
- Flexible and configurable multi-core support
- Sophisticated client-server model for efficient partition management
- Advanced, platform independent, window manager
- Multi-rate rendering
- Integrated with industry leading graphics design tools



GS Multi-Core Renderer functional block diagram

Customization

Mercury provides customization services to accommodate various system configurations and to add functionality to our drivers. Our experience and industry alliances have made us experts with most major real-time OSs, graphics APIs, bus architectures and processors. We provide custom business, mission and safety critical graphics solutions, including driver, application level and middleware solutions. We are certified to AS9100-C and ISO-9001:2008 for DO-178C and DO-254 commercial avionics certifications and engineering support.

BuiltSAFE GS Multi-Core Renderer in High-reliability Systems

- Purely software implementation allows end-to-end access to all lifecycle data
- Eliminates GPU hardware DO-254 certification
- Innovative approach to implementing deterministic shader-based rendering techniques
- Strong relationship with leading safety-critical real-time OS vendors
- Developed in collaboration with specialists in certification of advanced cockpit display systems
 - System Safety Assessment
 - Full DO-178C lifecycle expertise
- Modular software architecture minimizes recertification impact and costs as hardware environment evolves
- Eliminates hardware obsolescence issues related to GPU
- Easy integration in partitioned real-time OS architectures
- Certification evidence for DO-178C DAL A, IEC-61508 SIL 4, ISO-26262 ASIL D

Rendering - The Future

There are now two converging trends that are making software graphics a reality. CPUs are becoming increasingly parallel through multiple cores - with greater throughput handled within each core using vector processing. Simultaneously, GPU workloads are becoming increasingly similar to CPU workloads, requiring complex branches and memory management. Ultimately, this will result in the full convergence of CPU and GPU, creating a single unified computing architecture. Mercury graphics engineers are continually evolving our products to address the latest graphics technology trends.

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INNOVATION THAT MATTERS™

MERCURY MISSION SYSTEMS
3305 Breckinridge Blvd, Suite 100
Duluth, GA 30096
(678) 825-8093

CORPORATE HEADQUARTERS

50 Minuteman Road • Andover, MA 01810 USA
(978) 967-1401 • (866) 627-6951 • Fax (978) 256-3599