



## EMBEDDED GRAPHICS SOFTWARE DRIVERS

Presagis is an expert in embedded graphics and a worldwide leader in end-to-end embedded graphics solutions. In addition to being a GPU and software provider, Presagis also offers embedded graphics expertise to help customers bridge the gap between commercial graphics and project requirements. Our goal is to offer customers the best technology available for their programs.

The SeaWind family of embedded graphics drivers and porting services for specific platforms is an integral part of the Presagis product line. Our graphics drivers are high-quality, fully-tested, and fully-supported. They also include X Window System and OpenGL implementations for both standard and safety-critical embedded systems.

As one of the founding members of the Khronos Group, Presagis was instrumental in the creation of the OpenGL Safety Critical (SC) and OpenGL ES (Embedded Systems) graphics standards. Presagis currently holds the Chair of the Safety Critical Working Group within Khronos and is actively working to develop and improve appropriate standards over time.

### SeaWind Compatible Embedded Targets

#### RTOS

- Wind River VxWorks: 5.X, 6.X, 653, MILS & Linux
- Lynuxworks: LynxOS & LynxOS-178
- Green Hills Software: Integrity & Integrity-178
- RedHat Linux
- SYSGO eLinOS

#### Single Board Computers

- Curtiss Wright: e.g. VPX6-185, 184, 1901, 127
- GE Intelligent Platforms: PPC7d, SBC330, SBC340, IMP1a, PPC1, PPC1a, PPC2, PPC2A, PPC2EP, PPC4, PPC4A, PPC4{A-B}, PPC6, PPC7A, PPC7FW
- Extreme Engineering: XPedite8071, XPedite5070
- Many custom proprietary platforms

#### Graphics Boards

- GE Intelligent Platforms: GRA110, SE2, XMCGA6, OCT3, OCT3A, PMCGA4, PMCGA3
- Curtiss Wright: XMC-710
- Many custom proprietary platforms



## SEAWIND EMBEDDED DRIVERS

Presagis offers two types of OpenGL drivers:

- The first type is engineered for certification under DO-178B guidelines and is referred to as “certifiable”.
- The other driver is not engineered for certification and is referred to as “non-certifiable” or “standard”.

Certifiable drivers tend to be smaller and have fewer features than non-certifiable drivers.

Certifiable drivers also tend to be written from scratch while non-certifiable drivers tend to be based on GPU vendor-supplied source code.

### Non-Certifiable SeaWind Drivers

There is a rising customer demand for embedded products with capabilities that have until recently only been available on desktop systems. To meet the demand for these capabilities, Presagis offers production-quality source and object code products for OpenGL API-capable X11R6 and X11R7 environments that are compatible with real-time system constraints. Presagis implements the open-standard OpenGL-under-X (GLX) specification or the EGL 1.4 specification, both of which provide full OpenGL API capabilities in the X Window System environment. Designed from the beginning for portability, Presagis SeaWind X Window System products run on a wide range of processors and graphics devices.




OpenGL implementations from Presagis are built to optimize graphics rendering using the acceleration capabilities of the GPUs. In addition to running on a wide variety of platforms, SeaWind X Window System products also work with development tools provided by many real-time operating system vendors, including Wind River Systems, Lynuxworks, SYSGO and Green Hills Software.

### SeaWind-178 - Certifiable drivers for DO-178 Certification

Presagis is the world leader in safety-critical embedded graphics software for DO-178B certification and offers COTS OpenGL SC API-compliant and certifiable graphics drivers for safety-critical embedded environments. The SeaWind-178 product family, its complement of services, and its experienced staff support the entire software lifecycle needs of our customers, from requirements and design through to the certification process. By using Presagis COTS OpenGL graphics driver software, avionics manufacturers reduce cost, minimize risk, and free themselves to focus on their core business.

SeaWind-178 certifiable graphics software is built from the ground-up following the stringent DO-178B guidelines. This gives the software the ability to be certified up to Design Assurance Level A, the highest level. The SeaWind-178 family of products is based on the SeaWind-178 Core API and includes additional optional modules that support specific application requirements, including video, windowing, digital maps, built-in test functionality, performance monitoring, and custom APIs. Customers may purchase and certify only the software they actually need, minimizing the cost and memory footprint of the software as well as the amount of software that must be certified on the customer device.

Presagis can provide customers with a certification kit that includes all of the required documentation to assist with certification activities. Presagis can also perform the driver verification for the specific port on the customer’s hardware and deliver the full suite of evidence documentation specific to the platform configuration.

	 NVIDIA	 S3 GRAPHICS	 intel	
	G73	2300E	HD3000 (Sandybridge)	GM45
VIDEO INPUT	VIP and PCIe	VIP and PCIe	PCIe	
ARCHITECTURE	High-level shader-based	Low-level shader-based	High-level shader-based	
PERFORMANCE	High	Medium	High	Low
POWER	Standard	Low	Low	
DO-178B/C	D	A,B,C,D	No	
DO-254	No	A,B,C,D	No	

## SeaWind as a Software Renderer

Presagis offers standalone graphics software renderers that can be implemented purely as software without requiring a GPU or FPGA.

The benefits are the following:

- Since there is no additional hardware, there is no additional expense for a GPU and no additional power consumption.
- Extends the current graphics capabilities of an embedded system.
- Ideal for special cases in which using a hardware device is impossible.

## Leverage a combined GPU and Driver Solution

Presagis offers software drivers for a variety of GPUs manufactured by S3 Graphics, NVIDIA and Intel. This creates a uniquely compelling offering for customers who want the most comprehensive single-sourced support for some of the best COTS graphics products. The availability of several GPU/driver combinations provides additional flexibility and gives customers a wider selection to meet specific project requirements.

### Benefits:

#### 1. Long term part availability:

Presagis only selects GPUs with long term part availability to meet the requirements of the market in order to sustain the life of a program.

#### 2. Performance/power/packaging options:

Presagis offers a wide selection of GPUs and drivers so as to provide customers with the best match for the requirements of any program.

#### 3. Opportunity for upgrades:

Since the time from program creation to implementation can be lengthy, Presagis offers long term GPU options in order to enable customers to anticipate the needs of any program at the date of implementation.

#### 4. DO-254:

When DO-254 is a requirement, Presagis can supply the documentation required to fully support a certification submission.

Presagis also offers services for developing custom embedded graphics solutions, for example, developing custom drivers for specific or unique hardware and software environment configurations.

## 3 KEY REASONS FOR CHOOSING PRESAGIS

### Longevity and experience

Presagis has unmatched industry experience in the area of embedded graphics software and hardware. We are committed to supporting customers for the long term and have the resources to address any current or future embedded graphics requirement that customers may have.

### Certification Expertise: Graphics Software and Hardware

Presagis has delivered over 30 DO-178B certified programs worldwide, including both software and hardware components. We maintain several in house DO-178B experts in order to help customers through the certification of their embedded system.

### Driver, GPU and applications solution with VAPS XT

Because Presagis can provide the software driver, GPU, and the VAPS XT application development software together as an optimized solution, customers have a single point of contact for support for their entire embedded graphics solution. In addition, this solution is delivered with the best overall quality and performance since all of the components are jointly developed and tested.



## DRIVER DELIVERY PROCESS

**1** CUSTOMER REQUIREMENTS GATHERING

Understand the customer's requirements in terms of safety requirements (if any), graphics, hardware, and software environment.

**2** PROGRAM REQUIREMENTS GATHERING

Understand program requirements, such as long term support requirements and mid-life upgrades.

**3** SOLUTION PROPOSAL

Propose the ideal solution, whether COTS or custom, that meets the customer's needs, including hardware and software offerings. For GPU hardware, Presagis provides hardware engineering support services with GPU documentation to support the hardware design and reference design materials.

**4** SOFTWARE DRIVER CREATION

Creation of the actual software driver. All Presagis OpenGL drivers include, at a minimum, OpenGL SC support and may include full desktop OpenGL functionality. All Presagis drivers also include support for video-in capabilities, some form of windowing system, and reentrant libraries.

**5** SOFTWARE DRIVER PORT CREATION

If necessary, the Core SeaWind IP is ported to work in the customer's hardware and software environment.

**6** POST-DELIVERY FOLLOW-UP

Post delivery platform integration services are available to assist with integrating the application with the driver to meet system requirements and to optimize performance where possible.

## TRACK RECORD \ MAJOR PROGRAMS

