IData® Tool Suite
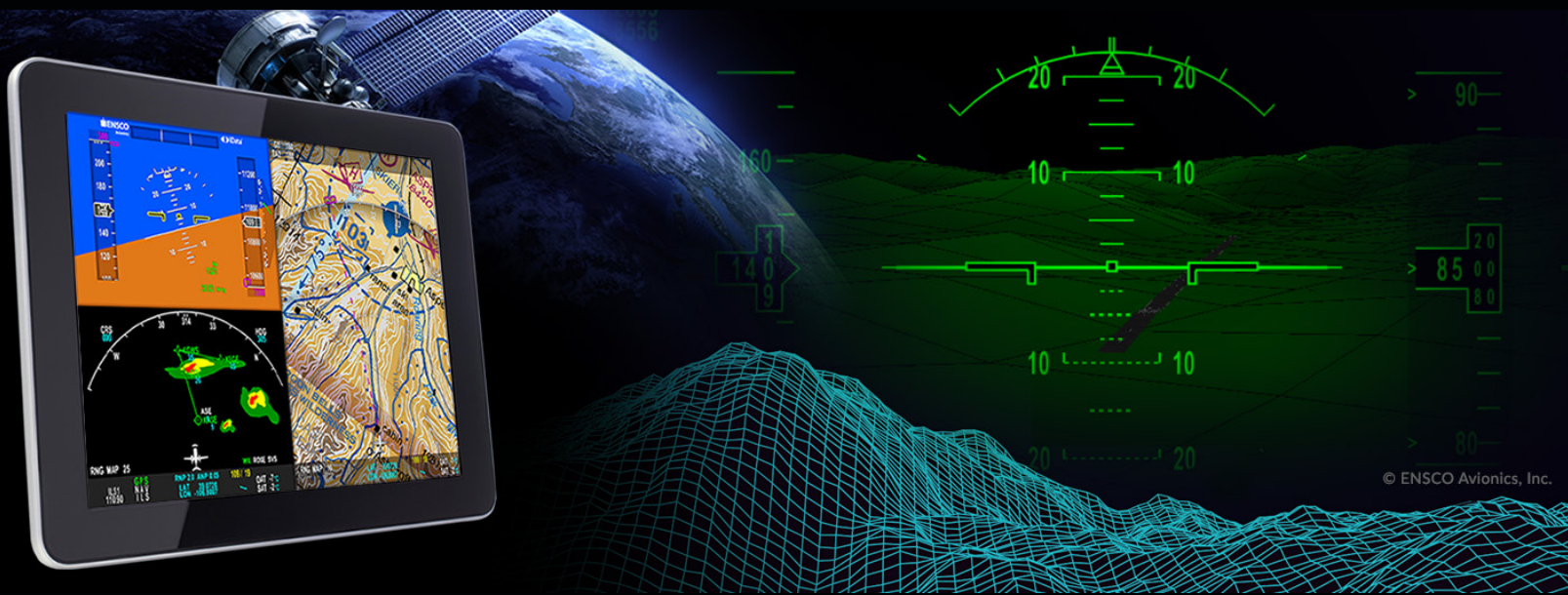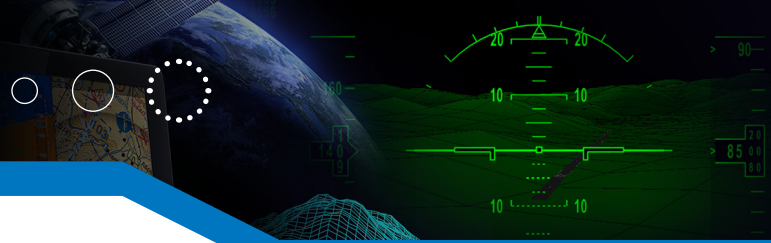
Streamline and accelerate the design, development, prototyping, certification, and deployment of HMI graphical displays for safety and mission-critical environments.

ENSCO®

Introducing IData®

IData® delivers a display development solution that saves time, money, and effort across the entire product lifecycle. Developed by avionics engineers, IData combines the power of a platform-independent, integrated tool suite with a data-driven open architecture and flexible development framework. This one-time environment enables certification for multiple displays (e.g., primary flight displays, digital moving maps, training and simulation, and command and control) without the need to write code and streamlines re-certification after implementing design changes.
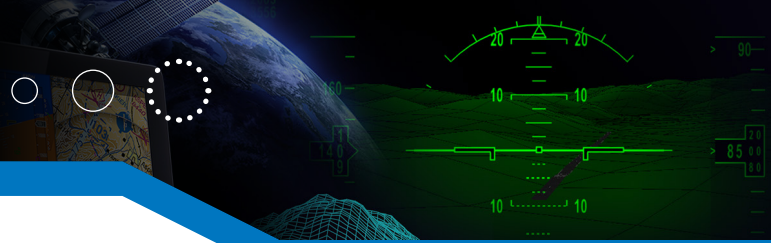
IData directly addresses rapidly evolving challenges when creating safety-critical systems. Its robust design and flexible workflow help developers quickly accommodate changing technology, increased complexity, evolving human/machine relationships, and the need for a cost-effective balance between software reliability and time to deployment. IData also includes a module for creating 2D and 3D digital moving maps (IDataMap) that expand IData's value for HMI avionics. This integrated toolset drives down time, cost, and risk across the entire development lifecycle.
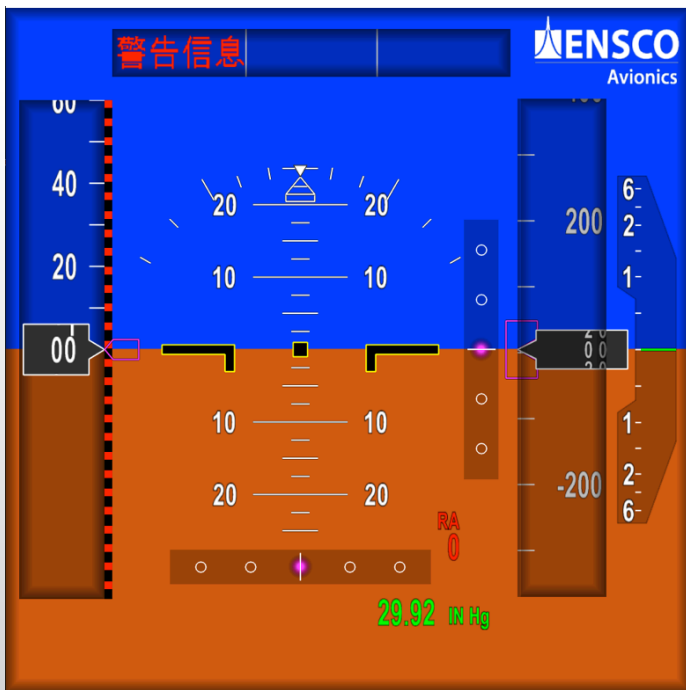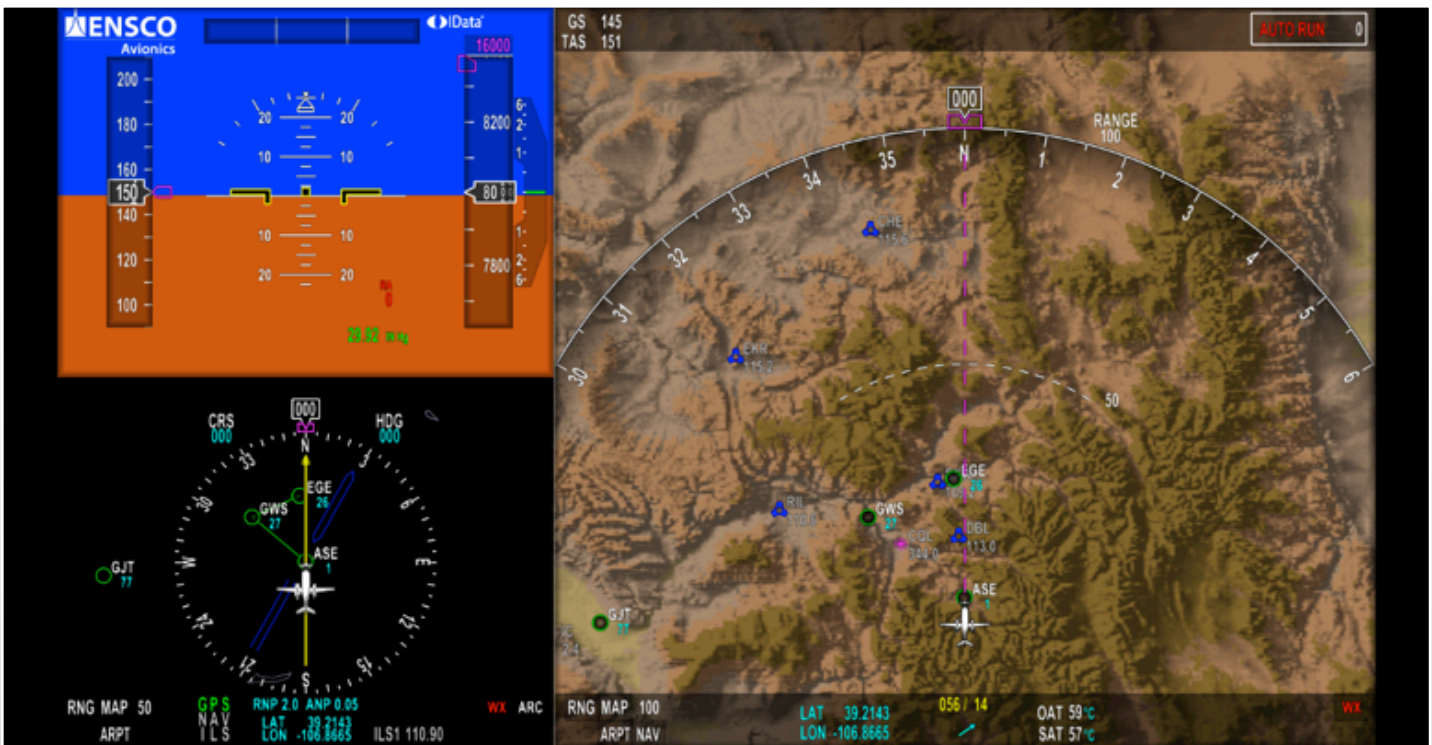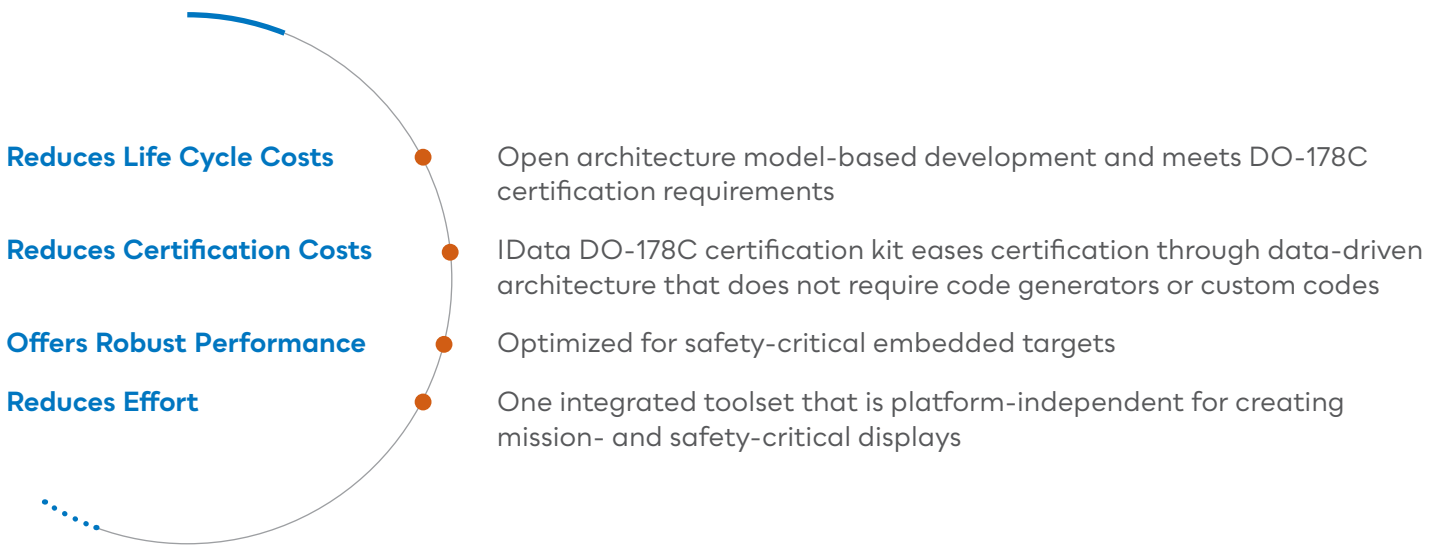

ADI created with IData

HSI created with IData

Powerful Benefits Across the Entire Development Cycle

Reduces Life Cycle Costs ● Open architecture model-based development and meets DO-178C certification requirements

Reduces Certification Costs ● IData DO-178C certification kit eases certification through data-driven architecture that does not require code generators or custom codes

Offers Robust Performance ● Optimized for safety-critical embedded targets

Reduces Effort ● One integrated toolset that is platform-independent for creating mission- and safety-critical displays

Wide Multifunction display created with IData and IDataMap. ADI and HSI were reused and added to a digital map display
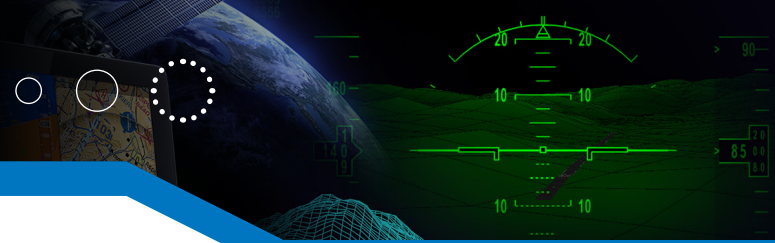
Designed by Avionics Engineers for Avionics Engineers

Integrated Tool Suite
- Offers one integrated toolset including a mapping module for creating mission- and safety-critical displays

Multi-Touch Cockpit Functionality
- Supports flight deck customization, interface flexibility, and space efficiency to reduce pilot workload and fatigue and meet reduced SWAP requirements by eliminating switches and knobs.

OpenGL SC 2.0 Shader-Based Graphics
- Maximizes the power of modern graphics programmable shader engines so developers can explore new possibilities in HMI design and performance while meeting industry safety standards and certification.

2D/3D Digital Moving Maps
- Improves situational awareness in any display (synthetic vision, degraded visual environment, terrain warning systems, etc.) using the newly upgraded and integrated IDataMap module. Display designers can design, build and certify customized maps to meet application needs

Aligned with Industry Standards
- ARINC661, FACE, Khronos OpenGL ES/ SC, AS9100
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True Rapid Prototyping
- No need to reboot, restart or reload the target system. The data produced from the HSL Generator can be overlaid on-the-fly in the target system
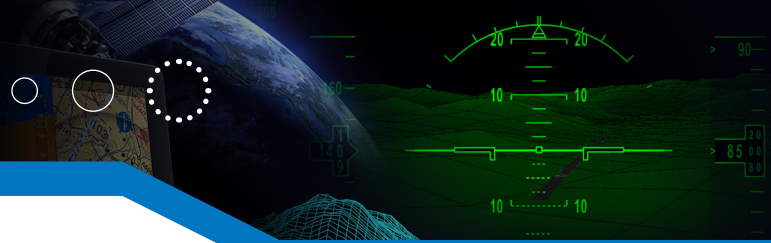
Behavior-Based Animations
- Assign animation behaviors to each primitive for unique runtime animations.

Design Once, Deploy to Many
- The IData Runtime runs on all targets, i.e., embedded, simulator, tablet, etc.
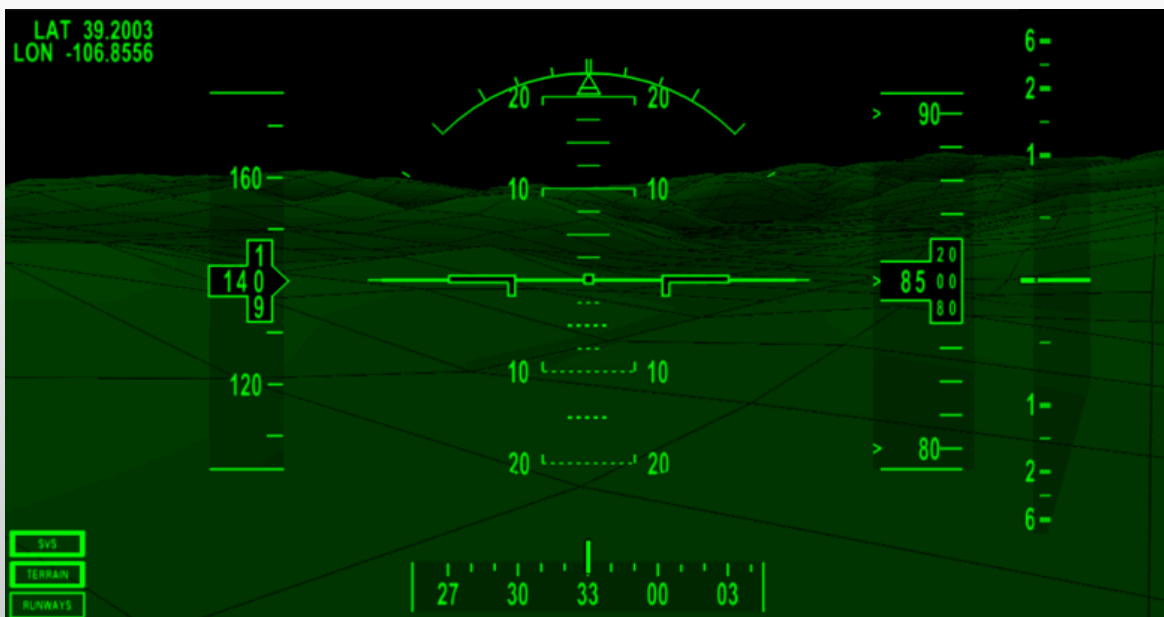
Heads Up Display with Synthetic Vision, created with IData and IDataMap

Eliminate Hand-Coded Displays

The IData software development kit for HMI displays removes the need to hand-code displays in OpenGL for any target system. There's no need to understand the complex OpenGL code that the tool produces when developing displays.

Programmers and non-programmers use IData to develop rich quality graphics for display applications. Human factor engineers, including those without a programming background, produce displays in an intuitive WYSIWYG environment. IData's Open Architecture approach also promotes collaboration within and across teams via Templates and External Groups.

IData Advantages Over Hand Coding

- Saves time and enables development without specific OpenGL knowledge
- Enables intellectual property to be used easily by the entire team, not just select engineers
- Generates code that is easier to understand and maintain by standardizing coding styles, techniques, and features
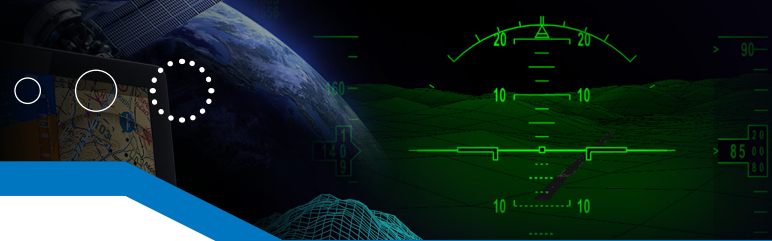

Portrait Synthetic Vision version of Primary Flight Display with Terrain Awareness Warning enabled, created with IData and IDataMap.

Portrait Synthetic Vision version of Primary Flight Display, created with IData and IDataMap.

**Portrait Primary Flight Diplay, created with IData and IDataMap.**

Data-Driven Design vs. Code Generation

IData is a data-driven toolset. This architecture provides a greater portability level than traditional code generation architectures in which the designer generates the code for the target environment. With code generation approaches, the designer must have a keen awareness of the limitations and setup of the target environment, including the RTOS used, the processor compiled against, the libraries available, and which graphics are supported.

IData's data-driven environment generates a data file of the graphics, behaviors, and variables within HMI display designs. This platform-independent datafile applies easily to different contexts. Whether simulation, embedded, or even handheld environments, the same datafile applies.

The IData Runtime configures once for the target system (e.g., Windows, Linux, or any embedded device) then receives the generated data file for the HMI display. This "Design Once, Deploy to Many" concept reduces the designers' workload, placing the focus on the HMI display itself rather than where the display will reside.
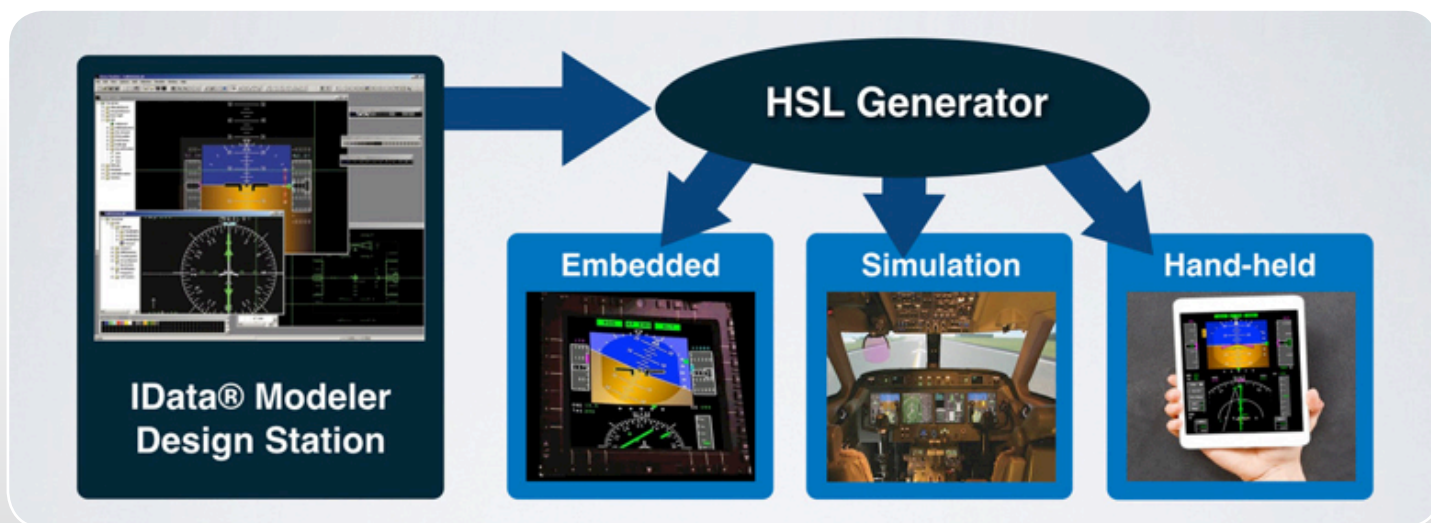
Display developers using IData's data-driven architecture quickly test designs in a target test environment without the need to reset the target for every test. Rapid prototyping incorporates the test pilot or test engineer within the test environment, accelerating feedback and updated data files. Developers integrate those changes and see the results in real-time without iterative stop-and-start cycles across the target environment. This pilot-in-the-loop testing capability saves time and resources by enabling the development team to quickly and easily see results and review updates for any change to the HMI display.
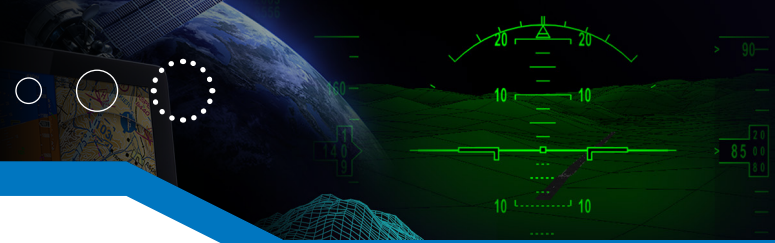
One Unified Toolset for Simulation and Airborne Displays

IData is a lifecycle development tool for cockpit displays, and is ideal for airborne, simulation, and training displays, ensuring the highest quality displays for any pilot. It operates from design and prototyping through testing, certification, and deployment. This same environment also supports training, simulation, and pilot-in-the-loop. IData's cohesive process leads to displays with the same look and feel without redesigning to fit different criteria across different environments. One consistent toolset for all phases of the development lifecycle also maximizes reuse.

By comparison, a more fractured approach quickly runs into challenges. Tools used in simulation and training may not follow the same rigor as airborne software development requirements, which leads to delays, cost inefficiencies, and a different look and feel from the simulators to the actual aircraft.

Built on Industry Standards

IData aligns with industry standards to maintain its open architecture concept for display development. IData and IDataMap support MOSA (Modular Open Systems Approach) for open systems out of the box. ARINC 661 and FACE Technical Standard support ensure a modular, open core architecture. Both IData and IDataMap are platform agnostic and run on any combination of processor, GPU, or RTOS that adheres to safety-critical versions of OpenGL SC 1.0 and OpenGL SC 2.0. Designed and built as a safety and mission-critical tool for airborne display applications, IData meets all safety and certification requirements and objectives for a DO-178C Certifiable display.
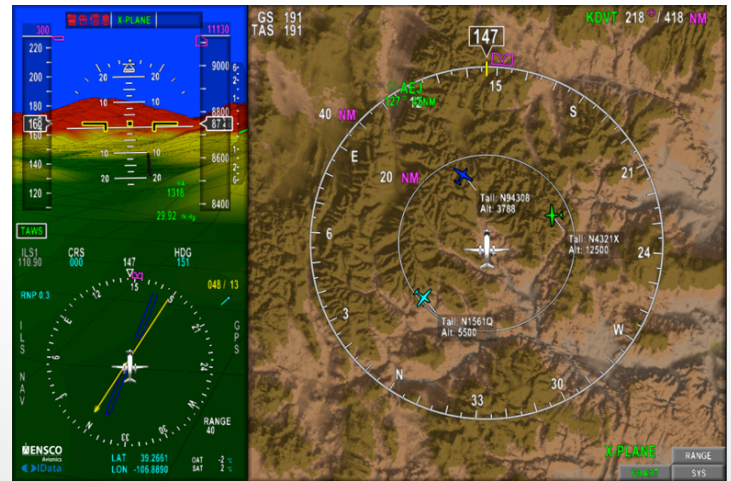
Portrait Synthetic Vision version of Primary Flight Display with Terrain Awareness Warning enabled, created with IData and IDataMap. 2D Situational awareness display added to Synthetic Vision PFD was reused from previous demo
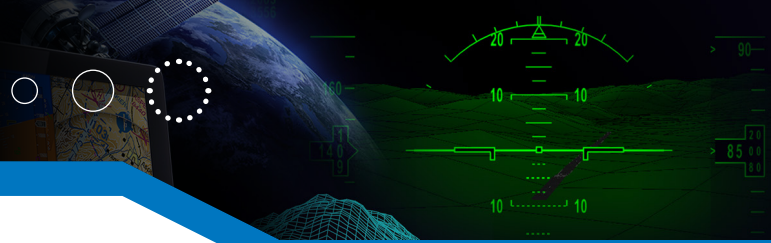
DO-178C Certification – IData & IDataMap Runtimes

ENSCO Avionics developed the IData Runtime and IDataMap Runtime with critical systems in mind, including DO-178C compliant processes. ENSCO Avionics' years of experience and recognized airworthiness expertise produce DO-178C life cycle datasets that accelerate commercial and military system certification.

IDataMap Plugin

The IDataMap Plugin, the only DO-178C certifiable map toolkit on the market, creates 2D and 3D digital maps. This toolkit helps design engineers build map displays to custom specifications. IDataMap's open architecture gives complete control to the designer, allowing customization and eliminating vendor lock (as mandated by Open Architecture tri-services. IData and IDataMap combine for superior design capabilities for any situational awareness or synthetic vision display, reducing reduce pilot workload within an environment designed for safety-critical applications. IDataMap is platform-independent and integrates with any processor, RTOS, or GPU combination.

For more information, contact:

Mike Tolfree

✉ **tolfree.mike@ensco.com**

📞 **+1 (607) 741-6472**

🌐 **www.ensco.com/idata**

Connect with ENSCO:

COM-6545