

**Application-Specific Chassis
for a Naval ISR Upgrade**



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Challenge

- Tech upgrade to new DSP boards with Gen3 10.3 Gbaud fabric
- ESD and power surges
- Legacy form factor and mounting requirements
- Legacy display interfaces
- Compressed schedule

Solution

- Patent-pending Gen3 backplane
- Signal conditioning & protection for I/O interfaces
- Customized existing design for form factor & mounting
- Display interface conversion circuitry

Results

- Chassis design that meets performance and cooling demands
- Ruggedization and environmental protections
- Support for legacy space, mounting and I/O interfaces
- Chassis delivered on schedule

Challenge

Atrenne Computing Solutions recently engaged with a customer tasked with upgrading a threat protection system for a mission-critical NATO naval surface program. This system will be used to detect and identify small craft, determining if they pose a potential threat and transferring information to a fire control system if they do.

Our customer's technology refresh used a new COTS-based architecture based on 6U OpenVPX with high-bandwidth Gen-3 10.3 Gbaud backplane fabric connections; these high-bandwidth connections pose signal integrity challenges that had to be addressed to insure system success. The upgrade also included new high performance 6U OpenVPX DSP processor modules, which increases the cooling requirements relative to the legacy system.

While performance and cooling requirements increased with the upgrade, a number of legacy factors still needed support. First, a need to maintain a DVI display interface. And second, a requirement that the chassis physically fit within the legacy form factor and mounting constraints.

The physical location of this system also meant that environmental requirements covered maritime ruggedization as well as protection against ESD and power surges generated by lightning. And lastly, all these requirements needed to be satisfied within a compressed schedule timeframe.



Solution

The chassis' challenging performance, legacy support and ruggedization requirements were met by a Atrenne Computing Solutions Engineered Packaging application-specific chassis solution that addresses all the key program risk areas.

The chassis design team was able to leverage Atrenne Computing Solutions investment in Gen-3 backplane technology to eliminate the Gen-3 signal integrity risk. Conversion circuitry was implemented to provide support for the DVI interface and an existing physical design was customized to meet legacy form factor and mounting requirements.

The team was also able to leverage experience and existing IP building blocks to address the ruggedization requirements as well as the high power OpenVPX thermal management and lightning protection risks. An advanced air-cooling design was implemented to ensure proper cooling of the high power DSP payload, while signal conditioning and protection was applied to multiple I/O interfaces including Fiber Optics, Ethernet, DVI, and Serial lines.

Results

The application-specific chassis was delivered to meet the customer's schedule, providing support for advanced processing and display that is critical to the mission requirements.

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