

How do we help designers face System Mission Computer challenges today?

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There are multiple challenges that Systems Mission Computer designers are facing today. Their ultimate target is to design more powerful and complex deterministic systems, embedding a high amount of modern computing in a size, weight, and power-constrained (SWaP) space. These systems must be managed by powerful safety critical Real Time Operating Systems capable of displaying high resolution graphics, and come with requirements such as reduced solution size and power consumption, qualification for High Reliability environments, and also a reasonable

time to market and technology lifecycle. Add safety critical certification requirements to all of the above and it translates into an expectation of a high total cost of ownership for the complete system.

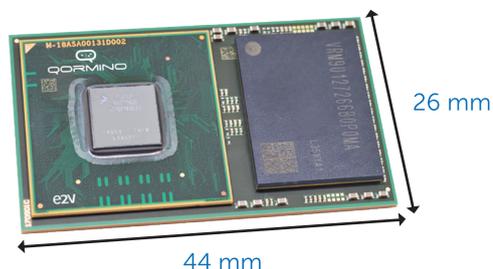
This technical brief highlights how the rapid insertion of emerging technologies and standards is achievable in a cost-effective way into Systems Mission Computing products, thanks to complementary hardware and software solutions serving the Aerospace & Defense industry and beyond.

QORMINO®, TELEDYNE e2V'S COMMON COMPUTER PLATFORM



Qormino® is one of the key pillars, highly recognized on the market, easing the development of such systems. QT1040-4GB Common Computer Platform from Teledyne e2v features the following:

- NXP T1040 Quad PowerArchitecture® e5500 core, at 1.4GHz.
- 4GB of DDR4 memory.
- Custom Teledyne e2v substrate, with 64 bits memory bus and 8 bits ECC (Error Correction Code).



Qormino has been designed to respond to SWaP (Size, Weight and Power) constraints and also offers:

- High performance packed into a small substrate.
- Reduced system design time, improved time-to-market.
- 15+ years availability for obsolescence management.

Qormino is a unique opportunity to combine a high performance processing platform, with DDR4 memory, without the risks associated with designing a high-speed memory interface from scratch. This leads to a reduced development time, and enables Systems Mission Computer project teams to meet challenging project timescales and provide capable hardware to customers sooner.

Processor	NXP T1040 - Quad e5500 @1400MHz NXP LS1046 - Quad ARM A72 @1600MHz
Memory	4GB DDR4 - 72 bits incl. 8 bits ECC
Features	Hi-Reliability up to -55/125C Small size 44 x 26 mm Long term support 20+ years Safety Critical Avionics (DO-254)

Teledyne e2v's long term support commitment also removes obsolescence management effort, therefore reducing risk and cost to any associated program.



For further information, please contact:

Thomas Guillemain,
Marketing & Business Development,
Data Processing Solutions.
Thomas.GUILLEMAIN@teledyne-e2v.com





COREAVI SAFETY CRITICAL GRAPHICS AND TEMPERATURE-SCREENED E8860 GPU

CoreAVI has pioneered the use of DO-178C/ED-12C certifiable OpenGL®-based graphics drivers in the military and aerospace industries and has supplied temperature-screened GPUs to a wide range of embedded commercial and military avionics platforms. A global leader in architecting and supplying real-time and safety critical graphics, compute, and video drivers, and "program ready" embedded graphics processors, CoreAVI's suite of products enables the design and implementation of complete safety critical embedded solutions that achieve the highest levels of safety certification with long-term support.



ArgusCore SC1™

CoreAVI's ArgusCore SC1 safety critical OpenGL scalable graphics driver is a superset of Khronos' OpenGL SC 1.0.1 API specification and is implemented to support a fixed function graphics rendering pipeline. Designed to enhance multicore

and virtualized graphics subsystems, the driver enables the best performance capabilities of lower and higher powered graphics processors and achieve the highest levels of safety critical certifications, including DO-178C / ED-12C.

ArgusCore SC is an industry proven solution that has successfully achieved rigorous avionics FAA/EASA certifications and is currently deployed in civil, commercial and defense aircraft display systems worldwide. Today, ArgusCore SC has been certified by EASA and the FAA for flight safety and has been deployed into a wide range of avionics display systems, such as primary flight displays, multifunctional mission computers, UAV ground control stations, and synthetic vision enhancement systems.

Temperature-screened GPU: AMD's Embedded Radeon™ E8860

CoreAVI supplies temperature-screened GPU's from AMD's family of Embedded Radeon GPUs. The E8860 GPU delivers advanced power, performance, and efficiency, and by providing integrated memory enables integrators to create smaller, SWaP-optimized systems than were possible in the previous generation of technology. The E8860 is tested for an extended temperature range, enabling its use in a wide variety of rugged, embedded applications. CoreAVI offers a long term supply program to extend the availability of our supported GPUs past the Last Time Buy date set by the manufacturer, allowing the integrator access to their chosen technology well into the future.



For further information, please contact:

Mary Beth Barrans,

Director of Marketing, Core Avionics & Industrial Inc.
marybeth.barrans@coreavi.com





WIND RIVER VXWORKS® SAFE AND SECURE RTOS PLATFORM

VxWorks® is the world's most widely deployed real-time operating system (RTOS), and powers more than 2 billion intelligent devices. It delivers unrivaled deterministic performance and sets the standard for a scalable, future-proof, safe, and secure operating environment which aerospace and defense companies have relied for over 35 years for their mission-critical and safety-critical systems.

VxWorks provides deterministic hard real-time performance even under system load, enabling applications to utilize the full performance capabilities of the mission computer platform. VxWorks is also scalable and highly configurable, enabling mission systems designers to fully benefit from the multi-core processing capabilities of the Qormino quad core architecture, and also to configure the software footprint to match the available resources of the underlying platform in SWaP-constrained environments. VxWorks also provides extensive security capabilities to enable mission computing platform designers to safeguard their platforms, connections, data and intellectual property against threats.

Wind River Workbench provides an Eclipse-based development suite for development of embedded applications, and provides best-in-class capabilities for both platform developers and application developers throughout the software development lifecycle, including multi-core development, debugging and visualization capabilities.

Wind River has a proven track record in avionics safety certification for more than twenty years, with VxWorks having successfully achieved DO-178C DAL A / ED-12C DAL A certification on multiple processor architectures on civil and military programmes through multiple certification agencies. This makes selecting VxWorks the low risk option for new safety certification projects.

VxWorks is backed by more than 30 years of embedded technology experience, a world-class support organization, a comprehensive partner ecosystem including Teledyne e2v and CoreAvi, and a global professional services team with a specialized Aerospace & Defense practice.



For further information, please contact:

Alex Wilson,
Director - EMEA, APAC & Japan A&D Market
alex.wilson@windriver.com



LEARN MORE:

PRODUCTS:

- [Qormino Common Computer Platforms](#)
- [QT1040-4GB Datasheet](#)
- [VxWorks RTOS](#)
- [Wind River in Aerospace & Defense](#)
- [Wind River Professional Services](#)

WHITE PAPERS:

- [Affordability by Design for Aerospace & Defense Systems](#)

WEBINARS:

- [Qormino Webinar](#)