Aonix
Product Fact Sheet

EN 50128 C/C++ safety critical Java partitioning DO-178B ARINC-653 security Ada

SmartKernel

Core Services Provided

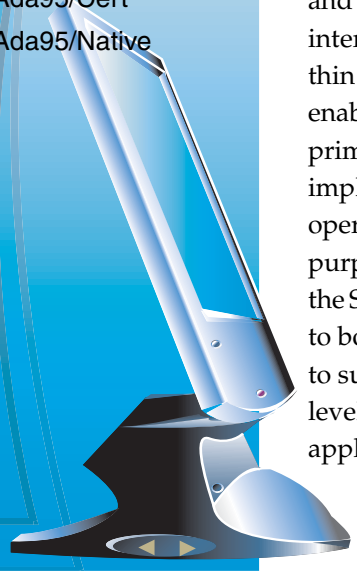
- Threads
- Schedulers
- Timing
- Memory Allocation
- Basic IO
- Health Monitoring

Standards and Support:

- Safety and Security Support
- DO-178B Level A Certified
- EN50128 SIL4 Certified
- ARINC-653 API compliance
- MOPS for ACR compliance
- Memory Partitioning Support
- Time Partitioning Support

SmartKernel Configurations:

- SmartKernel OS653 (interface)
- SmartKernel C/C++
- SmartKernel Java/Embedded
- SmartKernel Ada95/Embedded
- SmartKernel Java/Cert
- SmartKernel Ada83/Cert
- SmartKernel Ada95/Cert
- SmartKernel Ada95/Native



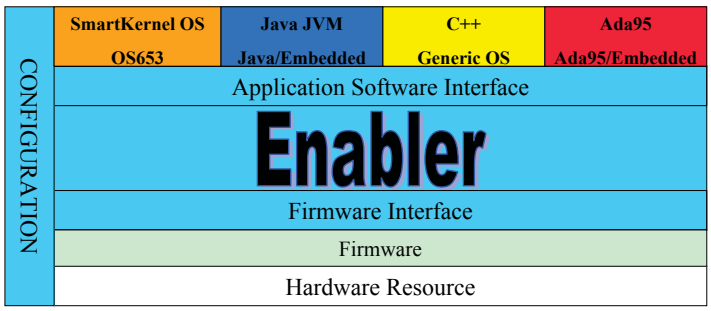
SmartKernel™: Safety and Security in a Single Kernel!

SmartKernel provides a fast, efficient, safety and security certified kernel that supports language-specific, higher-level operating systems. Certified to the FAA's DO-178B Level A and an ARINC-653 interface, SmartKernel provides time and memory protection through partitioning. SmartKernel enables multiple applications to safely run on a single board and supports applications involving multiple safety levels on a single board. Using language-specific enabling technology, SmartKernel also supports all of today's more popular programming languages.

Architecturally, SmartKernel's core, known as the Enabler, sits directly between the hardware/firmware resources and the application software interface. The Enabler consists of a thin portable operating system enabling layer that provides just those primitive features necessary to implement a language-specific operating system or full general-purpose OS. Because of its small size, the SmartKernel core is easily certified to both safety and security standards to support certification of the higher level operating systems and applications. Operating systems and applications utilizing the primitives provided by the Enabler easily port to new boards and architectures.

Safety and Security

SmartKernel is built from the ground up to satisfy the strictest standards for both safety and security. The small size of the SmartKernel Enabler makes it more easily contained for certification documentation, traceability and formal coverage testing. The Enabler is certified to the FAA's DO-178B Level A commercial avionics standard, EN50128 SIL4, and can be certified for compliance with other safety and security standards.



Language-specific kernels or general OSs are then certified to these same criticality standards. Certification is more easily accomplished since the core OS enabling features are certified in the lower-level Enabler leaving less to certify in the higher-level kernels.

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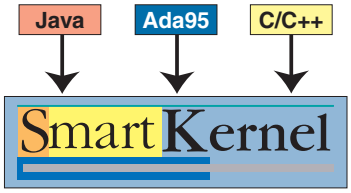
Making Ideas a Reality



SmartKernel

Certified kernels are available for Java, C/C+ (via ARINC-653), Ada83 and Ada95.

Built-in partitioning support within SmartKernel ensures that each higher-level kernel (partition) needs to be qualified only once because it is protected from having its execution affected by development or changes within other partitions. This reduces the cost of testing, qualification, and certification.

Time and Memory Partitioning Support

The SmartKernel core fully supports time and memory partitioning, enabling multiple higher level kernels to be isolated from each other. In addition to protection of the entire system from an error in one of the applications, this capability provides out-of-the-box support for multiple safety and security levels on a single board or architecture.

SmartKernel supports:

- Multiple Language Kernels/ Executives on a single board
- Multiple Applications on a single board
- Time and Memory Protection Between Applications/Kernels
- Safety and Security Protection Between Applications/Kernels

Multiple Languages / Multiple Kernels

SmartKernel is available in a number of language-specific configurations which can purchased individually or in any combination needed for the development and support of a specific application. Each configuration is a slice from the top-level kernel through the needed features in the Enabler.

Each SmartKernel configuration is accompanied by a full development environment targeted to the desired language or kernel. Included is a full set of development tools to support user customization of the SmartKernel configuration for the architecture, board, data layout, language, kernel, coverage, analysis, and qualification tools.

Thus SmartKernel provides a completed kernel and development environment to meet any application need for:

- General embedded applications
- Hard real-time embedded applications
- High reliability / criticality applications
- Safety and security conscious applications
- Multiple applications and kernels on a single board
- Protected applications and kernels on a single board
- Full multi-language support
- Qualification tools

Other Support:

- Flexible toolset packaging for every level of development need
- Board Support Package (BSP) sources provided for user customization
- Real-time kernel sources available

SmartKernel Strengths

Thanks to its architecture, SmartKernel provides for:

- Smaller kernels,
- Faster kernels,
- Highly portable kernels, and
- Highly portable user applications.

To obtain more information, please contact Aonix at **www.aonix.com** or your local Aonix office.

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