

SLX for AUTOSAR CLASSIC

- SLX for AUTOSAR Classic is a programming tool that helps you meet your most challenging system requirements. It improves your time-to-market, your feature set, and lowers costs and power, all while keeping your application compliant with the AUTOSAR stack.

SLX makes it easier and quicker to benefit from AUTOSAR interoperability and legacy systems, while taking full advantage of the very latest multicore ECUs. SLX can operate in three stages to enable you to get the best performance possible from your project.

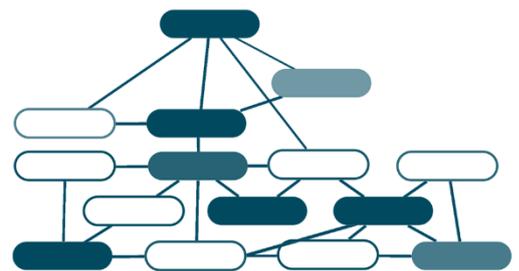
■ FEATURES AND CAPABILITIES

ANALYZE

Analyze Code

Optimal scheduling requires knowledge of the dependencies between runnables and tasks and how often data is accessed. SLX puts analytical results in the human domain.

- **Task Data Dependencies**
Find and display data dependencies across task boundaries
- **Runnable Dependencies**
Display data dependencies of runnables assigned to a single task
- **Function Call Graph**
Get deeper insights to the implementation of your runnables utilizing the function call graph
- **Code Analysis Graph**
Get a system wide overview of data elements and accessing functions
- **Interactive Dependency Graph**
Add or remove dependencies between runnables graphically to better fit the requirements of your project



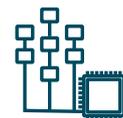
AUTOSAR

*AUTOSAR support/
AMELTHEA Model
Export Support*



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*Automatic memory
mapping using
AUTOSAR MemMap*



*Automatic insertion of
multicore
synchronization
primitives*

Runnable Parallelization

The next step in the flow sees SLX optimize the execution of runnables and tasks mapping in an AUTOSAR system. Runnable Level Parallelization applies the proven technology Silexica developed for sequential code to runnables, as they are also sequential program elements.

Scheduling

Runnable Level Parallelization speeds the execution of tasks without changing the properties of the original application. SLX implements a scheduling algorithm to distribute task's runnables among multiple processors, ensuring data-dependencies are satisfied. The results can be visualized as Gantt charts and generated schedules can be applied to a legacy or AUTOSAR system.

SLX also supports Task Level Parallelization by decoupling producer-consumer dependencies, given that the most recent data is not critical for the application behavior. This enables the producer and consumer to run in parallel, for an additional gain in efficiency.

Memory Mapping

When migrating from a single to a multicore platform, memory locality adds further complexity. Based on the analyzed variable accesses and the generated multicore schedule, SLX maps variables to the selected platform's memories efficiently. The mapping can be shown visually using mapping tables and charts to help investigate the memory consumption of your application. The variable mapping reduces the amount of costly cross core communication. The approach is compatible with the AUTOSAR MemMap feature and support automatic generation of configuration files and 3rd party code generation.

Power Optimized Parallelization

Combining the tool's Runnable Level Parallelism and Task Level Parallelism capabilities, SLX reduces the overall execution time of a sensor-actuator system allowing changes to system voltage and frequency. Thus, reducing power consumption while still meeting sensor and actuator latency constraints. Alternatively, the increased capacity can be used to augment application features.

AUTOMATIC CODE GENERATION

SLX supports the export of AMALTHEA and AUTOSAR data exchange formats to allow for seamless integration with 3rd party tools.

AMALTHEA is a xml-based exchange format for embedded multi-core systems. The AMALTHEA format allows for storing both the software and hardware model of the system. The type of information stored in the model consists of Task, Runnable, Variable, Scheduler, OS, Memory and Microcontroller information.

AUTOSAR uses a xml-based exchange format to store configuration and design details. As optimization choices and changes are made, Silexica automatically updates the AUTOSAR design and configuration files.

- Generate the desired code
- Configure basic software
- Update RTE - scheduling, communication, integration

THE SILEXICA SOLUTION

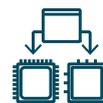
SLX improves your time-to-market, your feature set, and lowers costs and power, all while keeping your application compliant with the AUTOSAR stack.



*AMALTHEA model
import support*



*Runnable based
scheduling
optimization*



*Complete
Amalthea Support*



*Faster time to
market*