

MICROSAR OS

The real-time Operating System from Vector for the AUTOSAR Standard

The specification for AUTOSAR OS defined by the AUTOSAR Consortium represents an extension of the practice-proven OSEK/VDX-OS operating system standard. This standard was extended by adding functions for time monitoring and memory protection, as well as functionalities to support distributed applications in networks.

MICROSAR OS is a preemptive real-time multitasking operating system whose properties are optimized for use on microcontrollers. Vector's many years of experience in developing operating systems and drivers for microcontrollers are bundled in a small, robust operating system core.

Vector implemented MICROSAR OS in full conformance to the AUTOSAR OS specification, and it supports all Scalability Classes:

SC1: Real-time operating system implemented in accordance with the OSEK/VDX-OS standard and extended to include Schedule Tables

SC2: Real-time operating system with time synchronization and monitoring of the time behavior of individual tasks and interrupt service routines

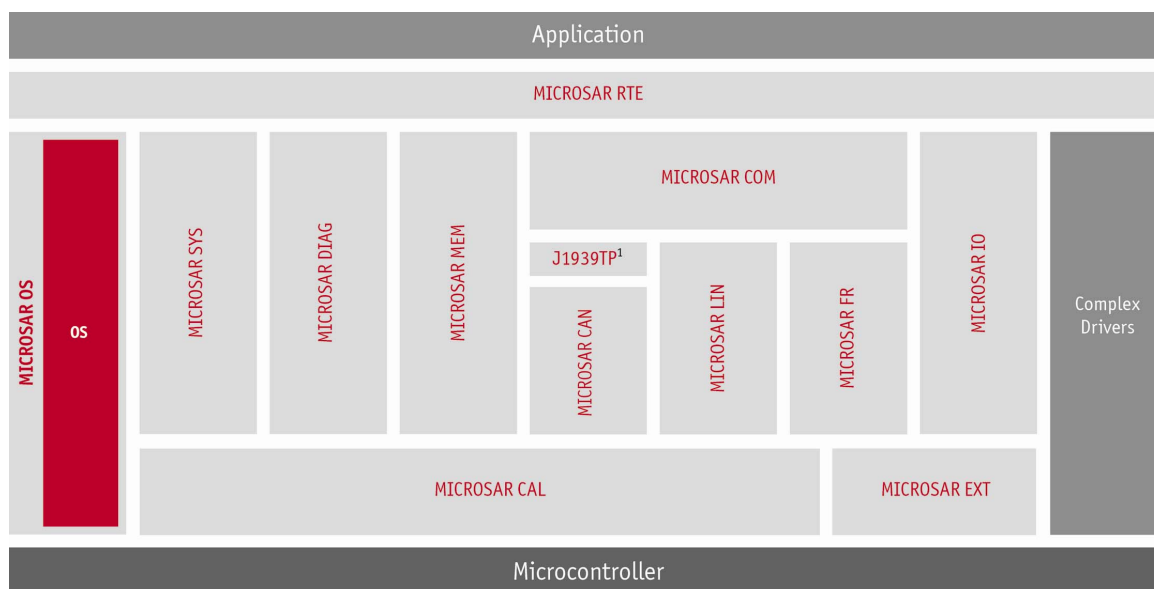
SC3: Real-time operating system with memory protection mechanisms on microcontrollers with related hardware support

SC4: Combination of Scalability Classes SC2 and SC3

In addition, experience acquired from many customer projects was applied to the design. This led to further improvements in system behavior and in its handling in development projects.

Properties and Advantages

- > Small, fast and resource-conserving operating system core
- > Accelerated development of software for microcontrollers
- > MICROSAR OS offers an ideal development environment for embedded software and is the foundation for migration to AUTOSAR-conformant applications
- > Protection of investments due to long-term availability and stability
- > Available for many of today's 8-, 16-, 32- and 64-bit micro-controllers
- > Supports all development processes, from design to simulation and testing, by integration in the Vector product lineup
- > Graphic configuration tool for easy configuration of the operating system
- > Testing the executability of MICROSAR OS applications based on specific ECU resources with the Timing Analyzer
- > Easy migration of existing OSEK/VDX operating systems to MICROSAR OS
- > Easy migration of the ECU software to other processors and compilers



**MICROSAR OS
module**

¹ Available extensions for AUTOSAR 3.0

Functions

Schedule Tables

Schedule Tables make it possible to clearly define action sequences with fixed, defined processing time. Schedule Tables may be executed either once or repeatedly.

Timing Protection

Timing Protection ensures that assumptions made about execution time during the design phase are preserved during runtime. Protection violations caused by a defective application section do not impair other applications that are running.

Synchronization with global system time

Schedule Tables may be synchronized with the global system time, which might be transmitted over the FlexRay bus, for example. This enables synchronized and simultaneous execution of tasks over the entire system.

Measurements

Functions of Scalability Classes 2 and 4 may be used to measure the execution times and interrupt blocking times of applications. These measured data later serve as practical target values when designing and integrating future applications.

Memory Protection

Memory protection enables reliable integration of applications by protecting the memory area. This ensures that defective application sections cannot destroy the data of other non-defective applications.

Integration of Timing Analyzer

The Timing Analyzer enables simulation of Schedule Tables and computation of time-based schedulability. The analysis is made for every task and every interrupt with the following information: Priority, period, execution time and deadline. The graphic user interface provides clear and compact visualization of the system behavior.

Special Functions

- > Analysis of the time-based executability of applications
- > Graphic display of the execution sequence
- > Measurement of execution times and Interrupt Blocking Time

Kernel Type:

- > Real-time multitasking operating system
- > AUTOSAR Scalability Classes 1 through 4

Size:

- > 1 – 20 KB ROM, depending on the platform and configuration

Schedule Strategies:

- > All (preemptive, not preemptive or mixed)

Product Components:

- > Operating system kernel as source code
- > Graphic operating system configurator
- > Documentation
- > Sample programs

Configuration Tool

- > User-friendly graphic user interface
- > Automatic checking for completeness and consistency
- > Easy system scaling
- > Support for ORTI

Availability

The real-time operating system MICROSAR OS from Vector is available for many of today's 8-, 16-, 32- and 64-bit microcontrollers.

You will find additional information on the Internet at:

www.microsar.com

Related Vector Products:

- > osCAN (OSEK/VDX)
- > CANoe osCAN Library
- > TimingAnalyzer
- > High Resolution Timer