

# MICROSAR FlexRay

## AUTOSAR Basic Software Modules for FlexRay Communication

FlexRay is a scalable, flexible and deterministic high-speed communication system that is capable of meeting growing safety-related requirements in automobiles. To best support the development of your FlexRay system, Vector offers the MICROSAR FR package for FlexRay.

### Properties and Advantages

The Basic Software Modules of MICROSAR FR are intended for use in series-production. Together with the other products MICROSAR CAL, MICROSAR COM and MICROSAR EXT, they form a complete FlexRay stack. Each of these MICROSAR products contains a number of Basic Software Modules that you can integrate in your FlexRay stack, either partially or fully, depending on your needs.

All MICROSAR Basic Software Modules conform to AUTOSAR specifications 2.0 and 2.1 (3.0 too in Q2/2008). The FlexRay-specific modules also support further functions such as:

- > FR bus self-diagnostics
- > Sending/receiving in interrupt mode
- > Access to customer-specific callbacks directly from MICROSAR FRTP
- > Measurement and calibration via XCP based on FlexRay

The MICROSAR Basic Software Modules are flexible. In their implementation, special emphasis was placed on efficient memory utilization as well as short run times. Therefore, they form an ideal foundation for your AUTOSAR FlexRay stack.

As a part of the seamless Vector AUTOSAR solution, during integration you can combine the MICROSAR FR Basic Software Modules with the rest of the MICROSAR Basic Software. This gives you a reliable foundation for your ECU, so that you can focus on development of your application.

### Application Areas

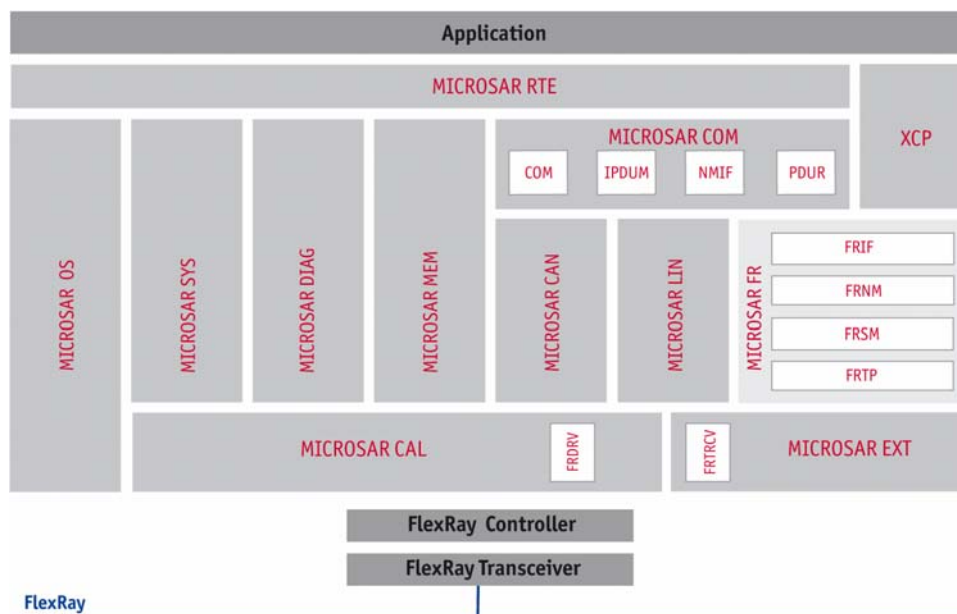
MICROSAR FR contains all Basic Software Modules that a FlexRay stack needs for fundamental FlexRay communication. Furthermore, you can use this stack to measure and calibrate AUTOSAR ECUs with XCP via FlexRay.

### Note

For complete integration of a FlexRay stack in your application, depending on the situation you will need other modules from the following MICROSAR packages: MICROSAR DIAG (DCM, DEM), MICROSAR SYS (DET, ECUM, COMM), MICROSAR RTE.

### Operating System

The FlexRay Basic Software Modules do not require any operating system, but use of a conventional OSEK-OS (e.g. Vector osCAN) or AUTOSAR OS is recommended. Vector's MICROSAR OS is ideally suited for FlexRay applications.



**The MICROSAR FlexRay Stack is Part of the MICROSAR Basic Software**

**Training Events**

As part of our training program, we offer various courses and workshops on the topic of AUTOSAR and FlexRay conducted in our classrooms or at your company site.

For more information and the dates of our training events please visit: [www.vector-academy.com](http://www.vector-academy.com)

**Contact and Availability**

Vector offers you FlexRay communication modules for hardware platforms with different integrated or external FlexRay communication controllers. For additional information visit our homepage at [www.flexRay-solution.com](http://www.flexRay-solution.com) or contact us directly:

Tel.: +49 711 80670-400

**Functions**

The following properties of the MICROSAR Basic Software Modules help to minimize the effort required in creating the application:

- > Pre-compile/Link-time/Post-build support
- > Development error detection (reporting to DET)
- > Production error detection (reporting to DEM)

**MICROSAR FR**

- > FRIF - The FlexRay Interface has a number of access functions that convert asynchronously to the FlexRay global time PDUs of higher communication layers into frames.
- > FRNM - FlexRay Network Management implements the FlexRay specification for Network Management.
- > FRSM (effective with AUTOSAR 3.0) - The FlexRay State Manager controls and monitors synchronization of the node in the FlexRay cluster.
- > FRTP - The AUTOSAR FlexRay Transport Protocol segments and de-segments larger data packets.

**Other relevant MICROSAR Products with separate Datasheets:**

- > MICROSAR CAL (FRDRV) - The controller-specific FlexRay Driver forms a hardware-independent interface for the FRIF module.
- > MICROSAR COM - This package supports signal-based communication between different ECUs.
- > MICROSAR EXT (FRTRCV) - The Transceiver Driver supplies a hardware-independent interface to the FRIF module.

**Configuration**

The configuration of the modules is performed easily, conveniently and consistently using the GENy tool of the MICROSAR Configuration Suite and a Network description file in FIBEX format. For example, This might be created with DaVinci Network Designer FlexRay. Effective with AUTOSAR Version 3.0, GENy also supports the AUTOSAR ECU Configuration Description Format for FlexRay.

**Product Components**

The following items are supplied with MICROSAR FR:

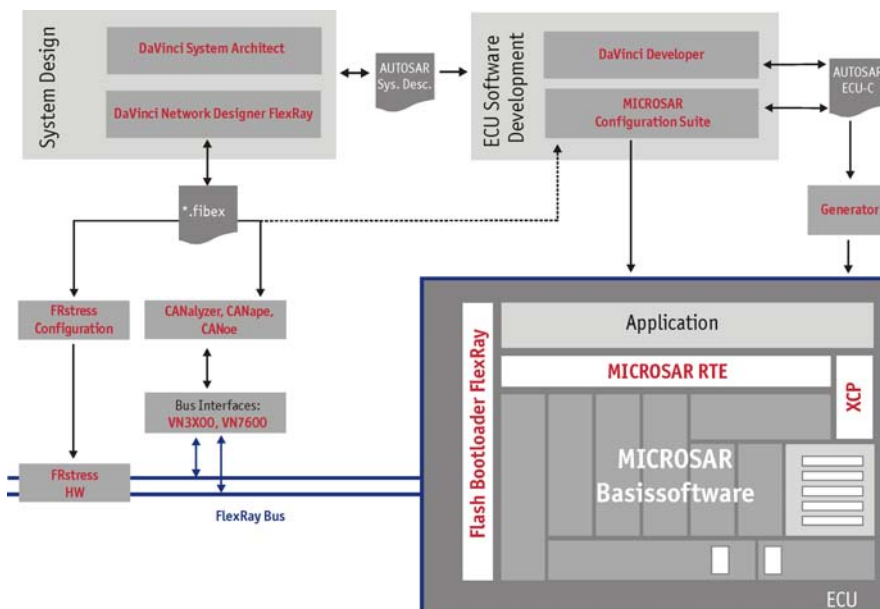
- > Command line based Generator (can be integrated in MICROSAR Configuration Suite)
- > Depending on license: Source or object files and C header files
- > Documentation/Operating instructions/Readme
- > Sample programs

**License and Maintenance**

The MICROSAR licensing and maintenance model applies.

**Additional Services**

- > Consultation on system design
- > Integration of the Basic Software in existing ECUs
- > Extension of standard modules per customer wishes
- > Hotline, special workshops and training courses on the topics of embedded software and AUTOSAR



**Vector offers you a comprehensive Lineup of Products and Services for your FlexRay Projects**