

## case study

### ▶ Eberspächer Electronics:

**ASAM MCD-2 NET (FIBEX)**  
contents easily useable by the  
toolchain from Eberspächer  
Electronics

*The ASAM MCD-2 NET (FIBEX) standard and applications based on it permit uniform, efficient exchange of data about bus users and their communication between OEMs and suppliers.*

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#### SUMMARY

Challenge: FlexRay interfaces are used for the development and debugging of series control units (rapid prototyping) and in test environments and test rigs. The configuration parameters of the FlexRay network are usually available in the form of FIBEX files, which often have to be adapted and must be available in several different versions.

Solution: FlexConfig is a tool that provides a clear representation of FIBEX files. It enables you to modify the content of the files and to create your own FIBEX files. The program can export \*.chi (Controller Host Interface) files for the hardware, and allows integration of plug-ins with further functions, such as C/C++ code generation for RBS and gateways.

Key Benefits: The benefits lie in the simple, uniform, user-friendly creation and editing of FIBEX-based network configurations. An important aspect is the direct support of the most frequently used FlexRay hardware.

#### SITUATION

In the automotive environment, the interest in driver-assistance systems and by-wire applications is increasing all the time. In recent years, the deterministic FlexRay bus system has been coming more and more to the forefront, and its use in series is becoming more and more widespread.

To handle the development of control units, and above all the data transfer between OEM and supplier, ASAM has standardized the description format FIBEX (Field Bus Exchange Format). FIBEX describes the structure and communications of the entire vehicle network, and is currently the standard for FlexRay and Most.

#### CHALLENGES

Prototype development of new control units, test systems and diagnosis require versatile FlexRay hardware platforms that can be configured simply via existing FIBEX files, and that are easy to operate, even for beginners.

Although FIBEX is based on XML, the format is unclear to the developer, and cannot be understood without the help of software tools.

Eberspächer Electronics offer a software tool (FlexConfig) that processes FIBEX files and provides them with graphics support for the user. It makes it very simple for the user to create his own configurations. The tool can create configuration files in CHI format from the FIBEX description for the FlexRay hardware. It is also designed to provide the user with a simple way of generating code for RBS and gateway applications on the hardware platforms. Enhancements for customer-specific requirements are possible in the form of plug-ins.

#### SUCCESS STRATEGY

Eberspächer Electronics (formerly TZ Mikroelektronik) has been a member of ASAM since the middle of 2007, and is involved in the FIBEX Expert Group, which develops and updates the FIBEX standard. New developments and alterations in the FIBEX standard can thus be implemented and verified without delay.

FlexConfig supports all FIBEX Versions from Version 1.2.0a onwards, and offers converters for conversion of:

- FIBEX 2.0 to 3.0.0
- FIBEX+ (AUDI FIBEX derivative) to FIBEX 3.0.0
- CANdb to FIBEX 2.0

### CHALLENGES DURING THE PROJECT

One of the challenges faced during development of FlexConfig was the great freedom of interpretation that FIBEX offers. The same or similar states can be mapped in FIBEX in different ways. In the early days especially, this freedom was exploited by the various tools. Flex-

Config, which is intended to read any FIBEX file and display it correctly, has to know these different configurations and processes them in a way that can be understood by the user.

### BUSINESS BENEFITS

FlexConfig provides a quick, simple overview of FIBEX files, and helps even inexperienced users to create and work with FlexRay configurations. FlexConfig thus contributes to cost reduction, and saves time in handling FIBEX files. The integrated wizards and comprehensive sets of rules for checking FlexRay parameters and FIBEX configurations can lead to improved quality in routine tasks.

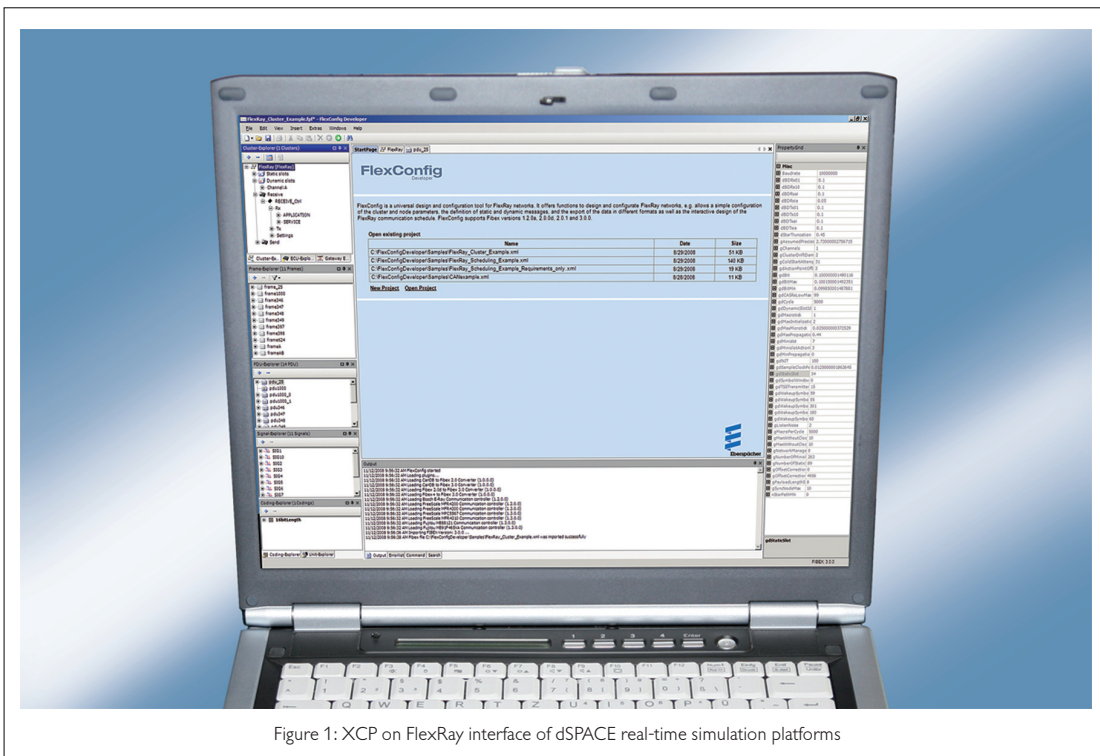


Figure 1: XCP on FlexRay interface of dSPACE real-time simulation platforms