







# „Designed for Diagnostics“

**Diagnostics requirements must be taken into consideration at an early stage in the design of a control unit. The distribution of functions among several control units also requires the realisation of cross-ECU diagnostics functions in the vehicle.**

Today, on-board diagnostics functions are mainly realised in individual control units. Here, a variety of methods from simple signal monitoring to complex, model-based analyses are used to detect malfunctions.

A diagnostics-relevant exchange of information between control units does not generally take place. Nevertheless, the increasing networking of control units and the distribution of functions has led to a situation where knowledge of the state of the other function partners is essential for correctly assessing malfunctions.

Dedicated control units for coordinating diagnostics are a first step along this path. They make it possible to centrally evaluate and correlate error signatures and provide support for differentiation between causes and subsequent errors, which is of vital importance.

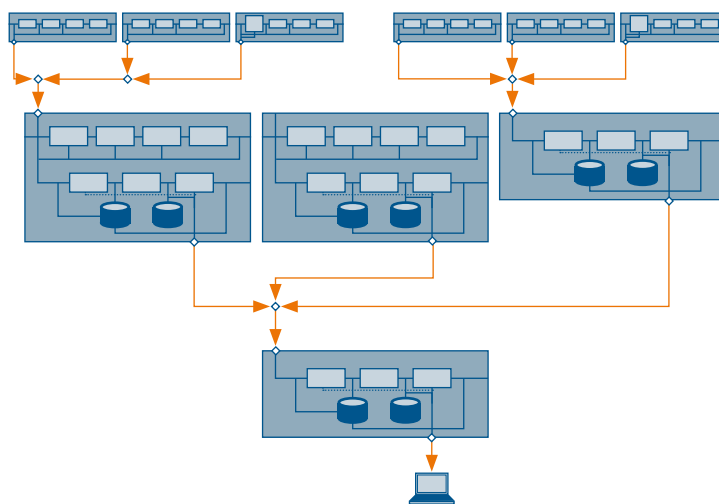
Assessment and consolidation of diagnostics information by a function group spanning several aggregation levels, typical in the aircraft industry today, helps to filter out subsequent errors and avoids „no error found“ situations when replacing control units.

There is no simple solution to this problem. The DiC knows current solution approaches from its own experience and can support you in analysing and developing new procedures.



## Services/Topics

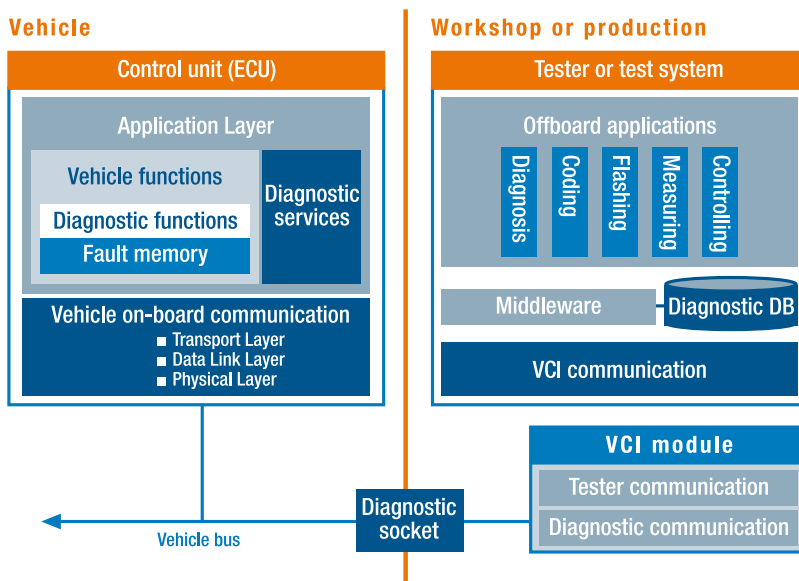
- Analysis of diagnostics coverage
- Distribution of diagnostics functions
- Concepts for diagnostics control units
- Design of distributed diagnostics functions
- Expression of error-cause relationships



# Standardising diagnostics communication



**For the first time, ODX is offering the option of exchanging diagnostics-relevant information between development departments and suppliers, production and workshops without loss and redundancy, and assessing it using standardised tools.**



## Services/Topics

- Concepts for the ODX/UDS implementation
- Creating communication style guides
- Diagnostics architecture of control units
- Analysis/evaluation of communication solutions

The new standard ISO 22901-1 „Open Diagnostic Data Exchange“ (ODX, since 2007) defines a form for describing diagnostics-relevant data and diagnostics communication paths regardless of the underlying implementation details and communication protocols. It especially enables diagnostics information to be stored in a single, uniform structure and to operationalise it for different applications and user groups.

The new communication standard UDS ISO 14229 expands the diagnostics communication protocol „KWP2000,“ widespread in the automobile industry by an important function: not only being able to call up data directly from the control units, but also have it sent by the vehicle, controlled by an event.

In control units, efforts are being made to standardise the diagnostics portions by using standard libraries (for example, AUTOSAR).

All these developments aim at bringing the quantity of information in the control unit and the ways of gaining information from the tester to a constant high level of quality spanning different types of control unit.

As a transfer agent between the automobile and the commercial vehicle industry, the DiC supports its customers in implementing this and related technologies.



# Modular application concept

**Production plants and workshops at sites all over the world have different requirements and different IT infrastructures in which testers and diagnostics systems are applied. Therefore, application environments must be easy to scale and adapt.**

Diagnostics systems on the tester should become the „single point of entry“ for all information in and about the vehicle for auto technicians. The functions range from expert diagnostics and guided fault search to flashing, coding and calibrating. Service literature of all kinds, appropriate to the vehicle type and the variant, must be available.

Data on the state of the vehicle and the text, fault search and repair processes executed must be returned to the central office to enable ongoing system improvement.

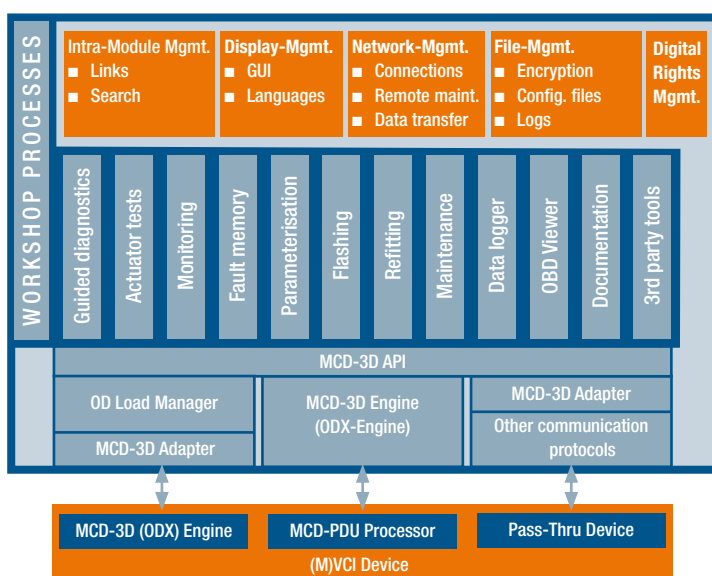
This range of functions goes hand in hand with a heterogeneous IT landscape ranging from high-performance computers with permanent network connections to single PCs that only have a cost and time-intensive telephone network available for their communication needs.

Application systems must have a modular structure so that different functions only have to be delivered, installed and updated as required. At the same time, it must be ensured that every site is provided with the functions it requires.

The DiC employees have long-standing experience in the concept development, architecture and implementation of modular application systems.

## Services/Topics

- Efficiency of application processes
- Consultancy for IT system concepts
- Integration concepts for EoL systems
- Data exchange with workshop information systems
- Diagnostics for mechatronic systems



## Selected references for DiC consultancy services

### Automotive

- BMW
- PSA
- Volkswagen

### Commercial vehicles

- DAF
- MAN
- KION



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As a specialist for complex processes, we support you in planning, implementing and operating information management systems throughout the product life cycle. We concentrate our systems and services on the areas of marketing/sales, development and after-sales service. Our solutions are based on the concept of integrated data management for technical product information.

The ServiceXpert GmbH Diagnostics Centre (DiC) is a pool of experience gained from several projects with renowned car and commercial vehicle manufacturers in everything to do with the diagnostics process. Our task is to advise and support you in improving your diagnostics processes or implementing new diagnostics solutions. As a transfer agent of the ESG Group for the area of commercial vehicles, we can draw on tried and tested technologies, methods and solutions from the automobile industry and adapt these to your market-specific requirements.

