

case study

► Softing with VW:

The VW Group requests the description of the diagnostic services of its ECUs in the **ASAM MCD-2 D (ODX)** format

SUMMARY

Challenge: The VW Diagnostic Tester VAS 5163 contains the same diagnostic services like the various VW repair shop testers. Additionally, this system contains enhancements, that have been especially designed for the needs of the development departments, like additional macro functions, the direct selection of the ECUs and bus systems (also with bypassing the communication via the gateway ECU), the

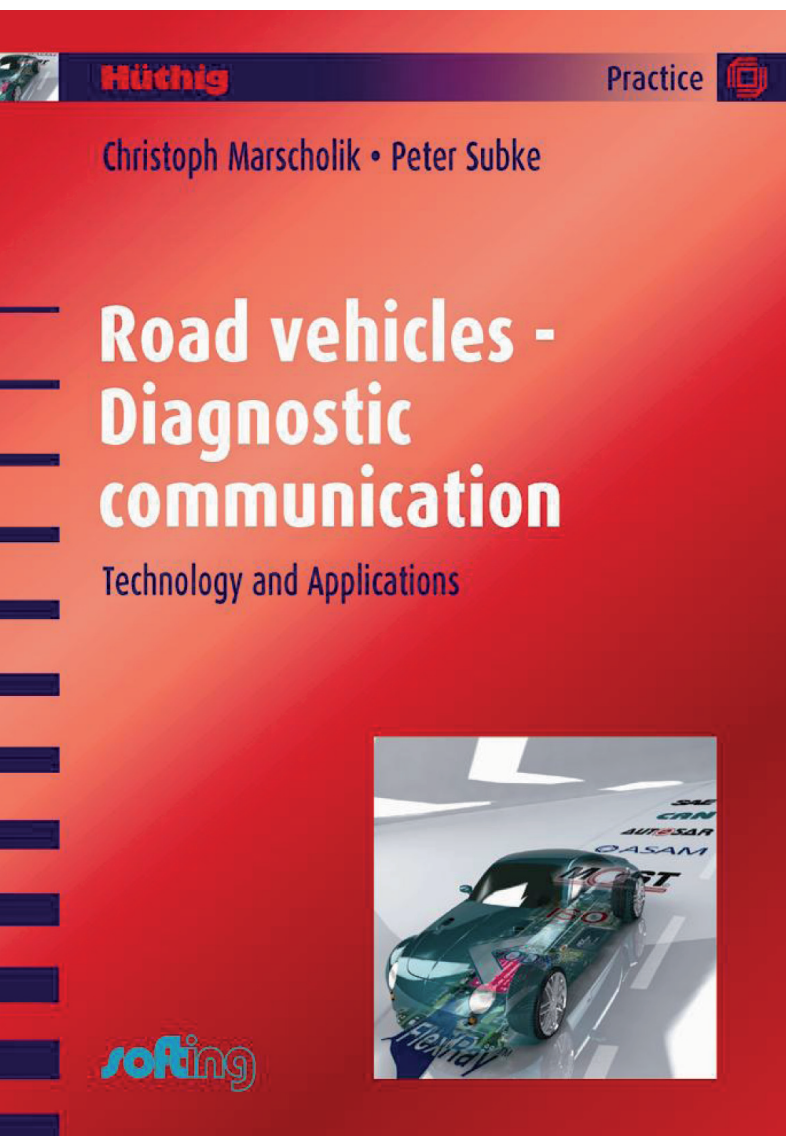
manual selection of the “diagnostic session” as well as the expert mode with bus monitoring. Initiated by new vehicle systems and their diagnostic services being described already during their development, along with the help of the standardized data format ODX, the demand rose for these systems to be diagnosed by the VAS 5163 tester as well.


Solution: The VAS 5163 tester was enhanced step-by-step with the interpretation of ODX databases in parallel to the introduction of ODX descriptions for the ECUs. Now this tester is able to talk to ECUs, using their legacy as well as the new UDS / ODX approach.

Key Benefits: The new ECUs use the UDS diagnostic protocol (Unified Diagnostic Services). The EDIC hardware from SOFTING, used together with the VAS 5163 application (the PCMCIA card EDICcard2 and the wireless diagnostic head VAS 5054 using Bluetooth), already supported UDS, so adoption to the VW specific requests was simple and with little effort to be done. This use case gives an overview on the flow of the enhancement projects and the system status currently achieved.

SITUATION

The successful serial introduction of electronically controlled vehicle systems already requires in the development phase, an indemnification of those diagnostic functions, which later on shall support the vehicle repairs with the help of the GFS (Guided Functions). The diagnostic services of the ECUs are also used during the production process. Earlier test systems in production and repair shops used separate diagnostic base systems. Thus an additional effort was necessary to implement the diagnostic services in parallel for production and repair shop applications.





Hüthig Practice 

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Road vehicles - Diagnostic communication

Technology and Applications



Very early the VW Group introduced ODX in its vehicles with the light truck CRAFT. Its ECU's diagnostics services were described in an early ODX format, while the standardisation works were still under way. The ODX format was derived from the 1.x versions of the ASAM MCD-2 D format. Since V2.0 ASAM MCD-2 D is also called ODX. The SOFTING diagnostic server DTS-COS was supported as one of the first products of ASAM MCD-2 D, and later also the ODX format. Several SOFTING products for various applications build on this server, e.g. DTS-MONACO for interactive tests of the diagnostic interface or TestCASE, which is used for automated tests of ECUs. This diagnostic server may also be accessed through its API by any custom application.

To support the development and the after sales service of the CRAFT, both the VAS 5163 and the VOLKSWAGEN repair shop testers VAS 5051B and VAS 5052(A) were enhanced with DTS-COS while maintaining their application interfaces.

SUCCESS STRATEGY

With the introduction of an ODX data based process chain, the effort for describing the diagnostic services of the various ECUs can now be reduced. Among other reasons, the VW group has therefore selected the ODX format. For all new ECUs, the delivery of the diagnostic services in the machine readable format ODX, is part of the requirements specification.

Current vehicle systems of e.g. AUDI A4 contain such ECUs. At the same time the protocol UDS was introduced. The parameterization of the diagnostic protocols is part of the ODX databases. Therefore, the diagnostic access is currently available for every system responsible engineer, after loading the respective ODX databases. Now these engineers no longer

have to clumsily "reinvent" this access by themselves. UDS is supported by the current SOFTING EDIC products, so that a transfer of the UDS protocol onto the VAS 5163 hardware could be done at once, and the transfer to the EDIC based communication systems in the VAS 5051B, the VAS 5052(A), the VAS 5054(A) and the VAS 5055 could be done with little effort.

To be able to use the ODX databases unchanged with further systems, not being based on the SOFTING EDIC hardware, the VAS 5163 as well as the VW repair shop testers have been enhanced with the D-PDU API, set forth in the ISO 22900-1. On this platform, it is now possible to use ODX databases independently from the hardware platform in use.

BUSINESS BENEFITS

The VW testers for development and repair shops now support the ODX based data process chain with its consistent description of the diagnostic services. The cumbersome "reinvention" and implementation of the diagnostic access may be omitted. Considerable savings in time and effort (e.g. for test stands) are the results. Therefore, new vehicle systems for the VW Group may be introduced faster and with greater safety. The plenitude of systems, being in development currently, remains controllable. Concepts, which point into the future, like modular building blocks for the various vehicle segments are more simply designed, with regards to the diagnostic services of ECUs are involved, because variants of these ECUs and their diagnostic services may be simply mapped to an ODX database.

The system VAS 5163 and its ODX support offers the technological basis for future diagnostics requirements in the vehicle development.