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UDS and SOVD in Hybrid Use from the ECU to the Vehicle

Softing supports the successful introduction of SOVD from ECU development to aftersales. With the hybrid diagnostic approach, Softing combines the classic UDS diagnostics with the advantages of the new SOVD standard for software-defined vehicles.

UDS and SOVD in Hybrid Use from the ECU to the Vehicle

The automotive world is changing – software-defined vehicles (SDVs) are setting new standards in terms of efficiency, functionality, and connectivity. At the same time, the demands placed on diagnostic systems are increasing – both in engineering and in after-sales. The industry is setting a benchmark with the new SOVD (Service Oriented Vehicle Diagnostics) diagnostic standard.

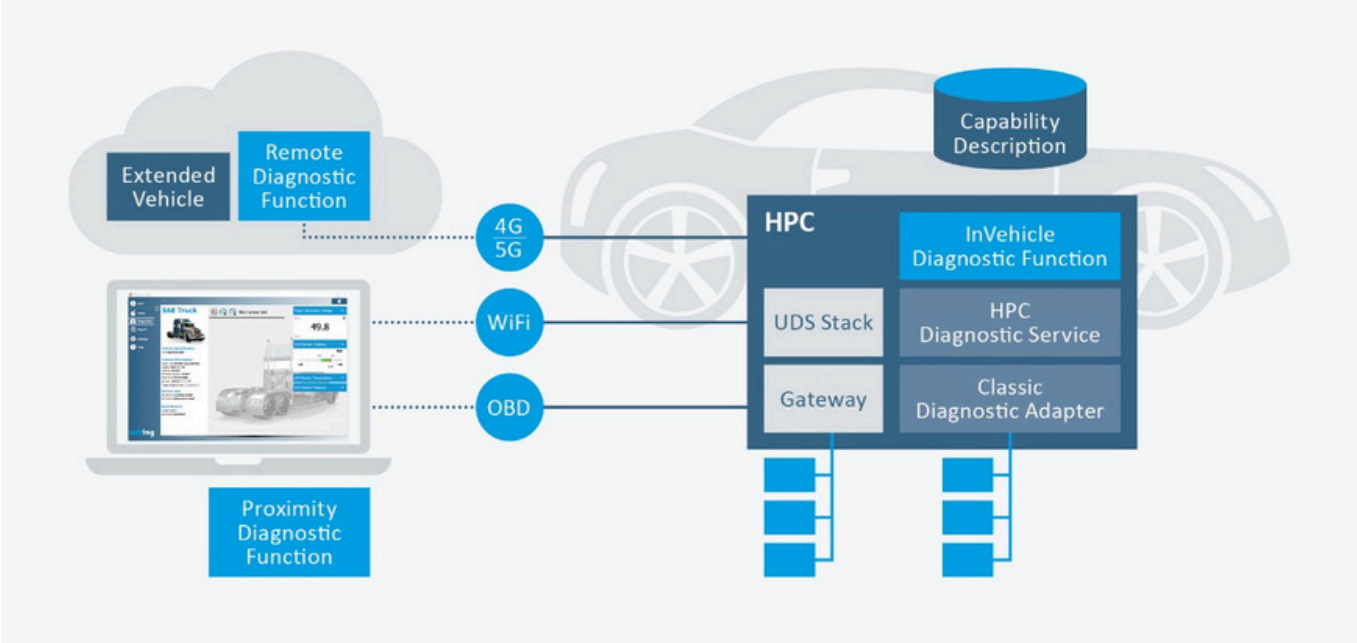
With its proven hybrid diagnostic approach, Softing enables the seamless, future-proof implementation of SOVD – from the ECU engineering phase to (remote) diagnostics in the field.

Rethinking Diagnostics: SOVD as a Game Changer

Established diagnostic protocols and data formats – in particular UDS and ODX – were developed for a world in which ECUs were addressed individually and analyzed locally. However, software-defined vehicles are fundamentally changing diagnostics: Functions are increasingly distributed across high-performance computers (HPC), software updates take place over the air (SOTA), and remote access to vehicle functions is no longer the exception, but a prerequisite.

SOVD closes this gap: The standard defines a service-oriented, remote-capable programming interface (API) for a diagnostic system integrated in the vehicle. SOVD supports three diagnostic scenarios regardless of connection quality:

- Proximity/ Co-Located: on-site diagnostics on the vehicle
- Remote Access: e.g., for expert support from technical centers
- In-Vehicle Diagnostics: e.g., for continuous state monitoring (Vehicle Health State)

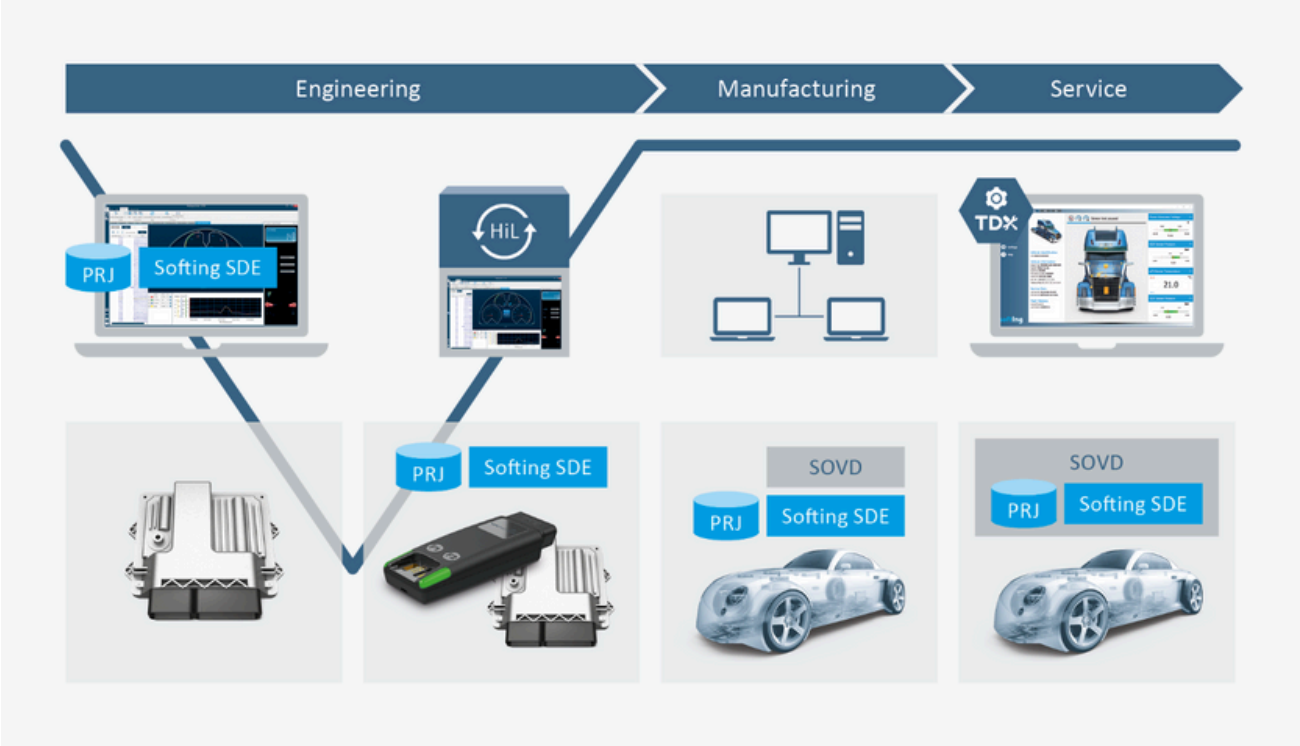


Standardized Vehicle Access: Proximity, Remote, In-Vehicle

However, it is often the case that only UDS is available during the engineering phase, especially for ECUs – SOVD is only integrated later during E/E integration. The solution: a hybrid diagnostic system that maps both standards throughout the entire vehicle life cycle and gradually supports the transition from UDS to SOVD. Softing meets this challenge with Softing SDE, a platform-independent diagnostic runtime environment based on ODX.

Softing SDE Combines Classic and Service-Oriented Diagnostics

Softing SDE uses the Smart Diagnostic API (SDA), which translates complex UDS commands into simple function calls. This API is not only easy to integrate, but also ideal for remote applications. The transition to the SOVD standard is also proceeding smoothly: The existing C++ API can be easily extended using a REST wrapper to comply with the SOVD standard. The vehicle data required for diagnostics – known as capability descriptions – can also be generated automatically and dynamically from the existing runtime format of the ODX data as needed.



Softing SDE as a Life Cycle Diagnostic Solution: Stand-alone or Integrated in the SOVD Server

The procedure enables a continuous diagnostic chain from ECU engineering and the test environment to manufacturing and the repair shop. First, diagnostics is implemented locally in the ECU and verified using an engineering tester. The integrated Softing SDE then continues to be used in test benches with the same data and configurations. It is easy to separate localization from the test sequence, e.g., in a VCI. The SOVD implementation based on the Softing SDE is then used on the road test and thus the final methodology released. Softing SDE can be used in manufacturing as long as the ECU is not yet connected to the SOVD server. In the finished vehicle, diagnostics are then only carried out via the SOVD server.

Remote scenarios are therefore possible at any time. The solution convinces with a service-oriented API that enables uncomplicated remote access to diagnostic functions. Thanks to its hybrid architecture, it can be seamlessly integrated into existing development processes and ensures consistent use across all phases. Its future-proofing results from full compatibility with the ASAM SOVD standard and REST-based interfaces. In addition, targeted data optimization for vehicle-specific runtime environments ensures high efficiency and reduced complexity in real-world applications.

Conclusion: More Efficiency – Fewer Interfaces

Softing's hybrid diagnostic solution offers the flexibility and scalability needed to meet the growing demands of SDV projects. It combines the best of the classic and service-oriented diagnostic worlds – for consistent results, stable processes, and future-proof investments throughout the entire vehicle lifecycle.