

VIN|ING 2000 THE VCI FOR EVERYONE

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New Vehicle Interface for the Entire Lifecycle

Today's vehicles feature a wide range of ECUs. These control and monitor various electronic areas; errors which have occurred are saved permanently. For their evaluation there are all kinds of different requirements in the various phases of the vehicle life cycle. This is why the market needs a flexible vehicle interface to cover these use cases as comprehensively as possible. The new VIN|ING 2000 from Softing Automotive supports both wired and wireless access and, what is more, is already prepared for future remote use.

The requirements for accessing vehicle ECUs differ considerably in the various phases of the vehicle life cycle. Diagnostics in vehicle manufacturing requires as flexible a use of VCIs (Vehicle Communication Interfaces) as possible with concurrent support of the current standard protocols. Fast booting procedures and fast log-ins to the WLAN network are often expected because VCIs have to be integrated during the manufacturing process or restarted with a change of vehicle current feed. Fast roaming along the line is also an important requirement. Data exchange starts under the most varied of conditions, e.g. when the ignition is switched on, over CAN messages or when a vehicle is moved after

a rest period (making the support of wake-up functionality necessary). The electromagnetic effects often experienced require high EMC interference immunity. As considerable savings can be made by not having to purchase additional hardware and tools, the transmission of additional information, e.g. of measured values from the bus, is also desirable.

In after-sales service, vehicles of different ages are connected using the OBD interface. This necessitates the support of a large range of standardized protocols, such as Diagnostics over IP (DoIP), and of conventional bus systems, such as for example one to two CAN interfaces, the bus system CAN-

FD for forthcoming vehicles as well as an Ethernet interface. There are also application cases requiring wireless diagnostics as this avoids problems that occur due to damaged cables and also enables simple execution of road tests. Fast diagnostics when a vehicle comes in for a repair or during a breakdown is also supported.

In vehicle engineering, VCIs are ultimately used in very different environments. One area of use is the development and approval of ECU diagnostics. The assemblies used here do not normally have an OBD jack; but because this could represent cost savings depending on the functionality, it is often advisable to add an OBD jack to be able to use the same VCIs as in manufacturing and after-sales service. Alongside this, vehicle interfaces are also used for the development of diagnostics in the ECU network, programming at the test bench and test vehicle programming. For vehicle engineering at the test benches as well as in the vehicle, access using a cable connection is necessary as network-compatible devices normally cannot be incorporated into corporate networks in an unregulated form. The vehicle interface must support standard protocols as well as widely implemented buses such as CAN, Ethernet or K-Line.

Alongside these standard use cases, new areas of implementation, such as remote diagnostics, are emerging for the future, necessitating 4G-network support. However, for mobile use, the diagnostic system will then have to be run for all vehicle data on the vehicle interface because the occurring latencies and the supported bandwidth could otherwise lead to problems. This additional functionality makes the VCI a telematic control unit, TCU.

VIN|ING 2000 – The Next Generation is Available

In the past, Softing already provided a tried and tested high-performance VCI for diagnostic applications and flash programming: the vehicle interface HSC. Vehicle manufacturers and their Tier1 suppliers currently implement a large number of these vehicle interfaces in vehicle manufacture and after-sales service. It has an integrated OBD connector for plugging in in the vehicle.

To cover upcoming challenges, Softing initiated the development of the next VCI generation based on this proven design. The first result of this development is now available as the new vehicle interface VIN|ING 2000. For PC connections, VIN|ING 2000 supports wireless data exchange in compliance with the latest standards. These include the WLAN stan-



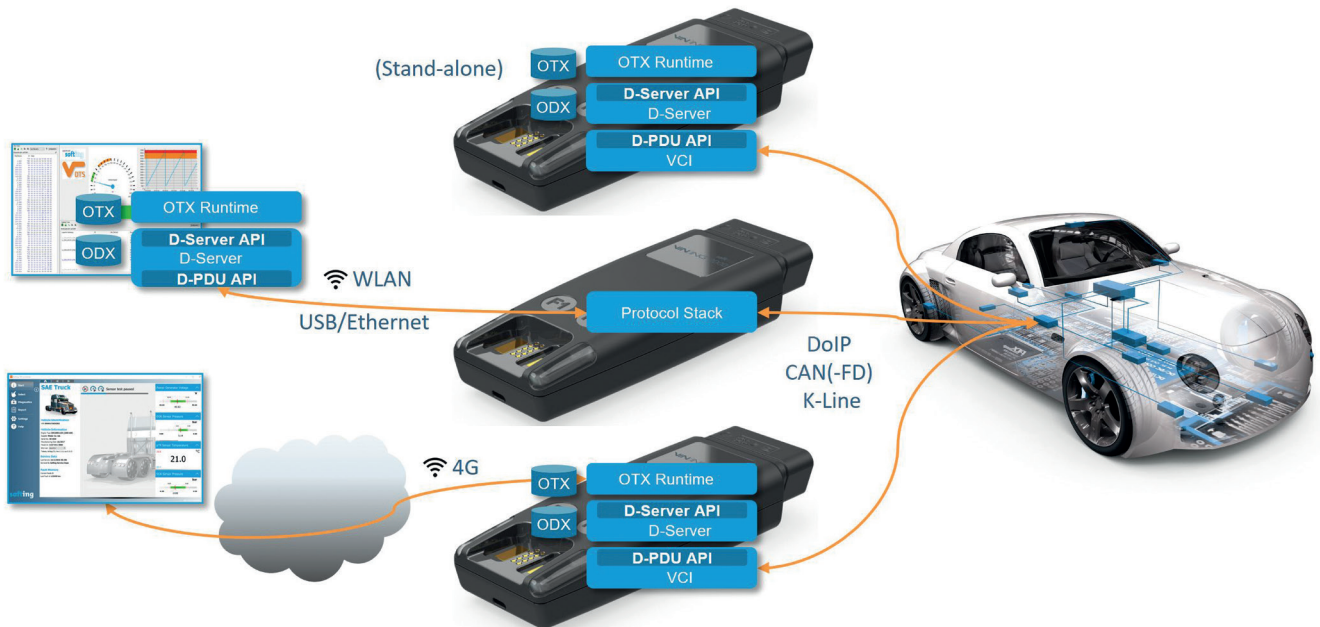
Figure 1: The new vehicle interface VIN|ING 2000 from Softing

dard IEEE 802.11 a/b/g/h/n, fast roaming and WiFi direct for a 1:1 connection with the host. Alternatively, 100 Base T-Ethernet or a connection via the USB interface can be used for data exchange. When wired, the use of MagCode technology makes a safe connection with magnet fixing available which dissolves with a higher force in a predefined and non-destructive way. Thus the VCI, the OBD jack and the cable are protected from being destroyed.

VIN|ING 2000 uses a 12 V or 24 V power supply and can thus be used in cars and trucks. The vehicle interface supports the bus systems CAN or CAN-FD, Ethernet and K-Line and can be used with the standard protocols Unified Diagnostic Services (UDS), DoIP and SAE J1939, as well as with many manufacturer-specific protocols. Two programmable capacitive buttons for running functions, such as starting a test routine or programming, provide additional functionality. Furthermore, VIN|ING 2000 offers various wake-up possibilities (e.g. over CAN, on the basis of a motion sensor or using a real-time clock). The VCI also has two RGB LEDs for issuing status information such as "Connection established" or "Communicating". Specially for use in vehicle engineering, Softing's VIN|ING product family also includes the vehicle interfaces VIN|ING 3000 and VIN|ING 6000. These use the same software basis as the VIN|ING 2000 and ensure the same reliable behavior throughout the entire vehicle life cycle. Using plug-in boards, these VCIs can be scaled for use with different bus systems.

Implementation in a Wide Range of Scenarios

With its flexibility, VIN|ING 2000 is ready for a whole range of application scenarios in the life cycle of a vehicle. In the PC environment, it can be connected to the ECU either as a wired version (for example if the WLAN connection is not sufficiently stable or the PC already has to be linked in to the network environment via WLAN) or via WLAN, as is standard in manufacturing and after-sales service.



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Figure 2: VIN|ING 2000 – A vehicle interface for all application scenarios

Together with a smartphone, data is exchanged with the VIN|ING 2000 via WLAN or WiFi direct. VIN|ING 2000 also supports other application scenarios which will become increasingly significant in the future. In remote use, users in manufacturing or in the repair shop can be given help from experts at head office. This means fewer specialists are required on site. In a road test, VIN|ING 2000 can act as a data logger and automatically record diagnostic and bus data. Furthermore, the vehicle interface can also be used as an independent diagnostic device. Not only the diagnostic system but also the test procedure is stored on the VCI; the test is either initiated when the ignition is switched on or via the integrated buttons. Finally, VIN|ING 2000 is also an independent flash device via which new software versions can be uploaded to the vehicles of a test fleet. The flash sequences are specified using tools such as Softing OTX.studio.

All Doors Open for the Future

The development of the VIN|ING 2000 involved extensive coordination with vehicle manufacturers and Tier1 suppliers. This ensured that the new vehicle interface perfectly covers the various requirements for its use. In particular, it provides the functionality for use over the entire vehicle life cycle. It also ensures that the functionality that will be required in the future, for example for implementing challenging Diagnostics 4.0 tasks, is already available today.

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