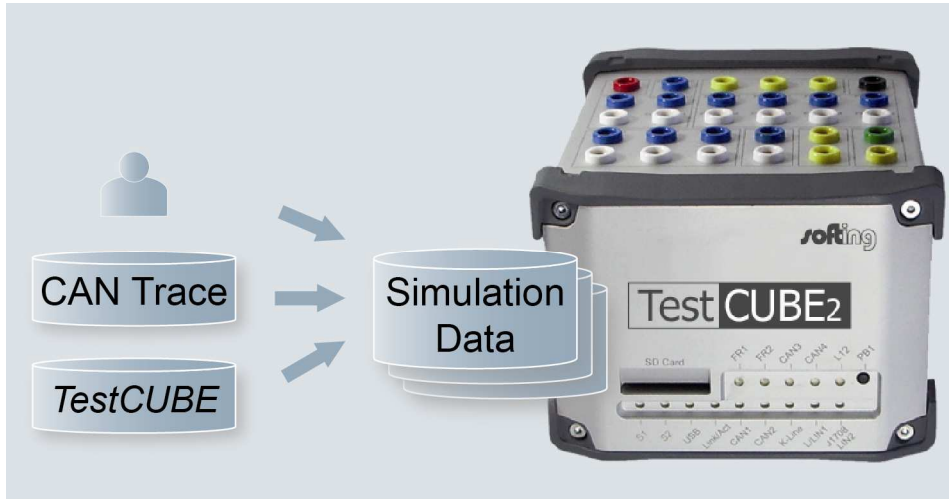# TestCUBE$_2$

Configurable Simulation of ECU Diagnostics

TestCUBE$_2$ is a configurable hardware and software solution for simulating ECU diagnostics with real bus communication. With just one device, you can simulate several ECUs or even an entire vehicle at the same time.

Availability of ECUs
Creating test sequences is often challenging along the entire process chain: The ECU required as a test counterpart is missing. This begins with the engineering tester and continues through production systems right through to after-sales service. For example, software updates at regular intervals ensure that the repair shop testers used are assigned all the latest functions. A suitable counterpart, with which the tester communicates, is required in order to execute automated regression "tester tests". The ECUs required must be available in entirety and in all variants to be able to ensure sufficient test coverage. As this is usually impossible, a simulation is the required solution.

Regression Test – Without Changing ECUs
Whereas previously the different ECUs had to be toggled in a time-consuming manual procedure or with complex electronics, now all you have to do is reshuffle the simulation files. You can take care of this manually using the intuitively operable graphic user interface or in test automation with the DLL interface.

Test Quality
With TestCUBE$_2$ you can be sure of a reliable communication partner. You have a whole range of possible configurations for your test preparation – both in terms of communication parameters (address, timings) and in terms of diagnostic services (ECU responses and chains of reaction). This allows you to simulate all kinds of best-case and worst-case scenarios.

Residual bus simulation
After the automatic import of a CANdb file and editing at symbolic level, residual bus simulation is quick to set up.

Application Example

The following example shows how TestCUBE₂ can easily and efficiently be used for tester regression tests.

- Creating a trace: With an existing tester, diagnostic sequences are run on the vehicle or lab equipment and the CAN bus communication recorded. The CAN trace can be recorded with TestCUBE₂.
- Generating a simulation: The TestCUBE₂ application automatically parses the CAN trace for diagnostic messages and assigns these to the vehicle ECUs. Timings can also be simulated if required - as can response pending responses of the ECU.
- Editing a simulation: If required, the simulation can be extended manually. Complex sequences can be realized with C commands.
- Test with tester and simulation: Without changes to the tester, diagnostic sequences can now be executed with the simulated vehicle. If the tester can be controlled remotely, fully automatic testing is possible. The relevant simulation file simply has to be loaded into TestCUBE₂ via the API before the tester is stimulated.

Note: In cases in which the simulation does not have to be reloaded, it can be stored permanently in the device and can thus run even without a connected PC.

Technical Data

Interface	32-bit embedded controller with PowerPC-Core 384MHz Supply voltage 8 to 28V Housing dimensions 143mm x 113mm x 84mm
Interfaces	2 CAN ports (high-speed, low-speed, single-wire) 2 K-line ports 3 analog inputs / 3 digital in-/outputs signals via banana jacks and 26-pin MDR-jack
PC interfaces	USB 2.0 Ethernet
Protocols	ISO15765 VW TP 2.0 SAE J1939 On request
Operating systems	Windows XP 32 Bit SP3 Windows 7 32/64 Bit SP1
Delivery scope	Software and documentation on CD
System requirements	PC, IBM-compatible, at least 2200 MHz, 2 GByte RAM

Order Numbers

TestCUBE2-BU	Basic TestCUBE₂ device for ECU simulation
TestCUBE2-BU/TRACE	Basic TestCUBE₂ device for ECU simulation Incl. creation of ECU simulations from CAN trace data
TestCUBE2-ODX	Generator ODX data to ECU simulation
TestCUBE2-KLINE	Protocol extension K-line
TestCUBE2-TP20	Protocol extension VW TP2.0
TestCUBE2-J1939	Protocol extension SAE J1939
TestCUBE2-TRACE	Creation of ECU simulations from CAN trace data
TestCUBE2-BUSSIM	Residual bus simulation
TestCUBE2-CANEXT	Additional board with two CAN-channels