



**EMBEDDED SYSTEMS SOLUTIONS**

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**LEADING  
ONE STOP  
PROVIDER FOR  
EMBEDDED  
SYSTEMS**

## ESS AUTOMOTIVE PRODUCT PORTFOLIO

ESS's synergetic Automotive Product Portfolio holistically supports design, development and debugging of High Performing Mission and Safety Critical Automotive Solutions.

MODEL BASED DESIGN TOOLS SAFETY RTOS LV 124, LV 148  
 AUTOMOTIVE ETHERNET MULTI CORE DEVELOPMENT  
 MICRO-KERNEL RTOS **TOOLS** SAFETY COMPILER  
 ISO 26262 INFOTAINMENT  
 ADAS MISRA-C **ECOSYSTEM** HYPERVERSOR  
 QUALIFICATION TOOLKITS AUTOMOTIVE MIDDLEWARE  
 AUTOSAR STATIC CODE ANALYSIS FUNCTIONAL SAFETY



## Debuggers from the Automotive Specialist

Debug Support for

**CLASSIC AUTOSAR**

**ADAPTIVE AUTOSAR**

**AUTOMOTIVE HYPERVISOR**

**LAUTERBACH**  
DEVELOPMENT TOOLS

### • Universal Debug and Trace Support

- ARM / Cortex-M / ARMv7 / ARMv8
- Infineon / Tricore / AURIX / ARIX2G / HSM / GTM
- Power Architecture / Qorivva MPC5XXX / S32RXXX / SPC5XXX
- Renesas / RH850 / V850 / R-CAR

### • AUTOSAR ORTI /OSEK Debug

- Onchip and Off-chip Trace
- Multicore Tracing
- AMP and SMP Debugging
- Debugger for Synopsys Virtualizer
- ISO 26262:2011 Tool Qualification Support-Kit

### • Code Coverage

- Vector Integration: Software Debugging via XCP
- QNX 7.0 Aware Debugging Capabilities
- Hypervisor-Awareness Debugging
- Support for the Benchmark Counting Registers of the RH850 Family of microcontrollers
- Test Automation via Scripts & API
- PIL Simulation - Support for Mathworks Simulink

IEEE 100BASE-T1 and  
1000BASE-T1

Inline Packet Capture  
and Protocol Analyzer



Network Impairment  
Emulator

Traffic Generator  
and Analyzer

### Aukua MGA2510 All-In-One Automotive Ethernet Test System

## APPLICATION HIGHLIGHTS

### TRAFFIC GENERATION

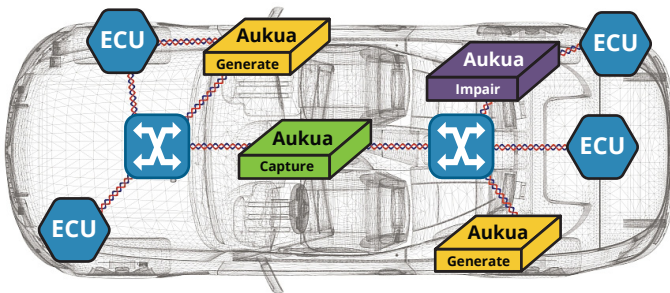
- Bit error rate testing (BERT) for integrity validation
- Latency characterization of automotive devices, components, and applications
- Throughput performance testing
- Functional testing
- Media conversion: BASE-T <--> BASE-T1

### PACKET CAPTURE / PROTOCOL ANALYSIS

- Layer 1 and Layer 2 visibility with PCS and MAC layer capture (at line rate)
- Layer 1 - Layer 7 protocol filters and triggers
- Latency monitoring of automotive application traffic flows
- Event timing correlation and analysis
- Real-time stats and graphical analysis
- Media conversion: BASE-T <--> BASE-T1

### DELAY / IMPAIRMENT EMULATION

- Inject delay and impairments inline
- Real-world performance validation
- Negative and functional testing
- Reproduce production environments for more effective troubleshooting
- Media conversion: BASE-T <--> BASE-T1



**OPEN  
ALLIANCE**

Aukua is an active member of the  
OPEN Alliance SIG

# architecture and static code analysis

## software architecture

- + verification
- + modelling
- + recovery
- + AUTOSAR

## technical debt

- + clone detection and management
- + dead code and cycle detection
- + include profiler
- + metrics (including HIS)

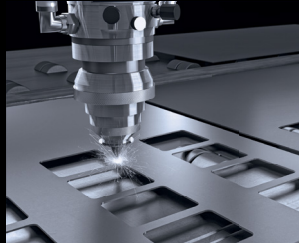
## coding rules

- + MISRA C:2004, C:2012
- + MISRA C++:2008
- + CERT® rules
- + AUTOSAR C++14



## compliance

- + SPICE®
- + ISO 25119, ISO 26262, IEC 61508, IEC 62304, DO-178B/C
- + FDA, VDI 5702



## DevOps integration

- + UML® tools + XMI
- + CI integration
- + reporting API
- + delta analysis
- + web user interfaces
- + IDE plugins



# FOUNDATIONAL SOFTWARE SOLUTIONS FOR THE MODERN VEHICLE

## ADAS AND ACTIVE SAFETY

BlackBerry QNX offers ISO 26262 certified OS and frameworks that power advanced driver assistance systems (ADAS) modules and enable automated driving.

### Products

- QNX Platform for ADAS
- QNX OS for Safety

## INSTRUMENT CLUSTERS

BlackBerry QNX offers a reliable, functionally safe, solution for digital instrument clusters.

### Products

- QNX Platform for Instrument Clusters
- QNX OS for Safety

## INFOTAINMENT

BlackBerry QNX offers market-leading technologies for the development of connected and secure infotainment systems.

### Products

- QNX CAR Platform for Infotainment

## DIGITAL COCKPIT

BlackBerry QNX enables digital cockpits that integrate multiple in-car systems while separating safety-critical systems from non-safety critical systems.

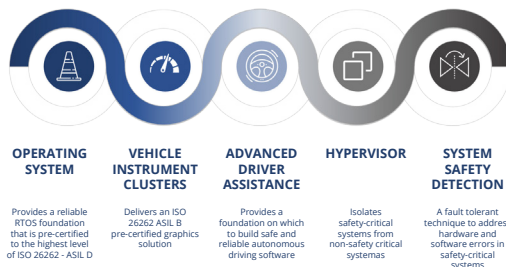
### Products

- QNX Hypervisor
- QNX Platform for CAR Infotainment

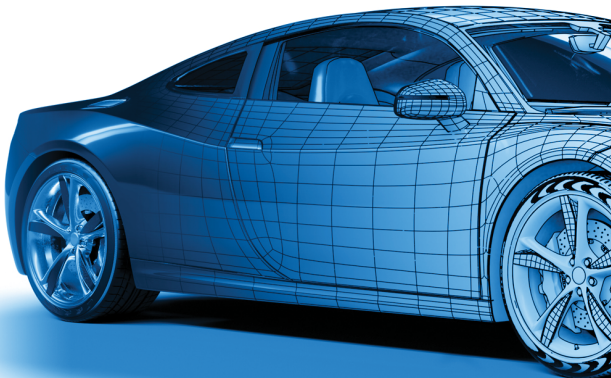
**QNX offers safety-certified and secure software solutions to build automotive subsystems and ECUs.**

BlackBerry QNX eases the challenges of building ISO 26262 compliant automotive systems through its solutions

## BLACKBERRY QNX FUNCTIONAL SAFETY SOLUTIONS



BlackBerry QNX's safety solutions mitigate risk of non-compliance and reduce development and certification costs.

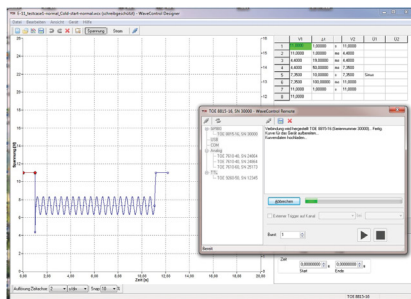


## DC and Arbitrary Power Supplies Arbitrary & Function Generators 4-Quadrant and Broadband Amplifiers Special Instruments

### Comprehensive Test Bench For Automotive Testing

TOELLNER offers flexible solutions for on-board network simulation and testing of components, e.g. for the automotive and avionics industries. The Software WaveControl provides waveforms and controls the TOELLNER system components at the test station, which can be individually tailored to your requirements. Using a DAQ-Card, any signal waveform can be provided with Arbitrary Power Supplies or 4-Quadrant Amplifiers with outputs from 160 W to 5200 W. For fast interruptions, TOELLNER offers electronic switches with switching times below 500 ns.

WaveControl Software includes a comprehensive library of waveforms supporting these standardized automotive industry tests:



The Software WaveControl provides

- ✓ Extensive Waveform Libraries for Normative Tests, e.g.
  - LV 124, LV 148
  - VDA 320
  - VW 80000-1
  - VW 82148
  - GMW 3172
  - MBN 10615
  - ISO 16750-2
  - BMW GS 95024-2-1
  - BMW GS 95026
- ✓ Import & Export of recorded Data
- ✓ Visual Generation of individual Waveforms
- ✓ Sequence Controlling and Timing

- Electronic Switch for short interruptions up to 60V / 100A; tr / tf < 500 ns
- 4-Quadrant-Power-Supply up to  $\pm 100$  V /  $\pm 40$ A; > 100 kHz, 320W / 1kW, modularly expandable up to 6,4 kW / 20 kW
- Arbitrary Power Supply up to 100 V / 320 A, AC-superimposition up to 70 kHz, 320 W / 1 kW up to 5.2 kW / 16 kW
- Software to create arbitrary waveforms, an extensive library of normative waveforms included
- All instruments can also be used individually



# Multi-Core Multi-Architecture



**COMPILER**  
BUILD TOOL



**PXROS-HR**  
REAL-TIME OS



**QKIT**  
TOOL QUALIFICATION



**B2B**  
CONSULTING & SUPPORT



## • Automotive Development Platform

- AURIX 2G TC3xx, AURIX TC2xx and TriCore TC1xx variants
- STMicroelectronics SPC56x, SPC57x, SPC58xPower Architecture
- NXP Qorivva MPC56xx, MPC57xx, MPC58xx
- RH850
- GTM/MCS (C compiler supports GTM/MCS v3 and v4 core level)

## • Advanced Multi-Core C/C++ Compiler with Multi-Architecture Support

## • Leading Compiler Optimization Technology

## • Industry Shortest (Compile-Link) Build Times

- HSM Compiler and GTM Assembler
- PXROS-HR SIL-3 Certified Micro Kernel RTOS
- Toolkit Qualification ISO26262 ASIL D, IEC 61508 SIL4, EN 50128 SIL4
- AUTOSAR MCAL Driver Support (including sales and on-site training)
- 3<sup>rd</sup> Party Debugger Support (Lauterbach Trace32)
- Commercial Standard and Math Libraries (no open source, no viral GPL implication)



## Hardware

- Can FD Connections for High-speed USB 2.0, PCI Express, PCI Express Mini, and M.2
- Can/LIN interfaces for conventional PC Interfaces and Embedded Applications
- I/O mModules with CAN Connection for Control, Measured Data Recording, and Processing
- Converters for Different Physical Transmission Types (bus converter modules)
- Routers and Gateways for the forwarding of messages between CAN buses and other Networks
- Data Loggers and Diagnostic Hardware
- Products for Education, Demonstrations, & Test Setups
- Chip Solutions for the CAN and CAN FD Connection to USB and PCI Express

## Software

- CAN Development Systems for Windows 10, 8.1, 7, CE 6.x and for Linux
- Programming Interfaces for Various Protocols and Standards
- Software to Monitor and Diagnose CAN and LIN Busses
- Programs for Recording, Playback, and Simulation of Message Traffic
- Configuration Software for CAN Hardware from PEAK-System

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