

## ESA AUTOMOTIVE PRODUCT PORTFOLIO

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

**AUTOSAR** Multicore Development Qualification ToolKits  
 Computer Vision Functional Safety Driver Monitoring Static Code Analysis  
 SPC5xxx/NXP MPX5xx NXP S32K EV Test Solutions SafeTPack  
 Automotive Ethernet  
**ASIL D Solutions** **AUTOMOTIVE** Safety RTOS  
 Model Based Design Tools LV 123, LV 124, LV 148  
**HYPERVISOR SOLUTIONS** CAN/CAN-FD  
 TriCore Aurix Automotive Stacks JTAG Debuggers  
 High Speed Data Acquisition MCAL ISO 26262 ADAS  
**TESTING (MIL, SIL, PIL, HIL)**





# Multi-Core Multi-Architecture



**COMPILER**  
BUILD TOOL



**PXROS-HR**  
REAL-TIME OS



**QKIT**  
TOOL QUALIFICATION



**B2B**



## • Automotive Development Platform

- AURIX TC4xx, TC3xx, AURIX TC2xx and TriCore TC1xx Variants, C compilers for HSM , Compilers for GTM/MCS, Assembler for GTM
- NXP S32Z and S32E Processor Families
- STMicroelectronics SPC56x, SPC57x, SPC58xPower Architecture
- NXP Qorivva MPC56xx, MPC57xx, MPC58xx

## • Compiler ASIL D Qualified

- Toolkit Qualification ISO26262 ASIL D, IEC 61508 SIL4, EN 50128 SIL4

## • PXROS-HR SIL-3 Certified Micro Kernel RTOS

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

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

## • Commercial standard and math libraries (no open source, no viral GPL implication)

## • Preferred Design House by Infineon & Preferred Compiler Partner by STMicroelectronics

- Infineon and ST AUTOSAR MCAL
- Infineon SafeTLib for AURIX and SafeTPack for AURIX 2G

## • 3<sup>rd</sup> Party Debugger Support (Lauterbach Trace32)

**TRACE32®**

## Debuggers from the Automotive Specialist



TRACE32® supports technologies like JTAG, SWD, NEXUS or ETM with embedded debuggers and software and hardware trace.

Supports almost 100 cores deployed in over 5000 chip families like ARC, Arm® Cortex®-A/-R/-M, Neoverse and Armv9, RISC-V®, Power Architecture®, TriCore™, RH850, Xtensa® etc.

### • Universal Debug and Trace Support

- ARM - Cortex-A/-R/-X Armv8/Armv9, Neoverse Armv8/Armv9, Cortex-A/-R ArmV7, Cortex-M
- Infineon - TC4xx: TriCore, CSRM (TriCore), SCR (XC800), PPU (ARC), GTM. TC2xx/3xx: TriCore, HSM (Cortex-M), SCR (XC800), GTM
- Power Architecture- Qorivva MPC5XXX / SPC5XXX, QorIQ, PowerQUICC
- Renesas - RH850/U2B, V850. R-CAR

### • AUTOSAR Debugging with new ARTI Support

- Multicore Tracing, Onchip and Off-chip Tracing, Trace Based Code Coverage

### • AMP and SMP Debugging

- Debugger for Synopsys Virtualizer
- ISO 26262 Tool Qualification Support-Kit
- Vector Integration: Software Debugging via XCP
- OS & Hypervisor-Awareness Debugging (QNX, Nucleus, VxWorks)
- Test Automation via Scripts & API
- PIL Simulation - Support for Mathworks Simulink

# AUTOSAR solutions from ETAS

Tools, basic software, and services

## AUTOSAR Classic Platform RTA-CAR

### Complete solution ready-to-go

- Comprehensive AUTOSAR solution
- One development framework for multiple OEM platforms
- Wide range of hardware support across many components like OS, HSM, MCAL, transceivers and switches
- World's smallest and fastest AUTOSAR OS
- OEM extensions and flash bootloaders
- Enhanced solutions by non-AUTOSAR extensions

### Market leading state of the art security

- Cutting edge AUTOSAR security stack combined with CyscurHSM
- Functional safety and ISO26262 certified up to ASIL-D

### Proven and reliable

- More than 3 billion ECUs on the road
- Qualified by several OEMs
- Proven at hundreds of customers



RTA-SAFE	RTA-SEC	RTA-DIAG	RTA-M939	RTA-COM	RTA-MEM	RTA-IDAE
WdgM	CSM	Dem	J11939Tp	Com	Num	Ecu_IA
WdgM	CAL	Dec	J1939Dcm	PduR	Memlf	Ecu_ID
EZE	CRY	Fim	J1939Rm	IpduM	Fec	Ecu_PWM
CAC	CyscurHSM		J1939Nm	ComM	EsS	Ecu_PM
				Nm		Ecu_PO

RTA-BASE	RTA-CAN	RTA-FRAY	RTA-LIN	RTA-ETH	RTA-XCP	RTA-HWD
WdgM	CanTp	FrTp	LinTp	Ethlf	XCP	Ecu_IA
WdgM	CanSM	FrSM	LinSM	EthSM	XCPW	Ecu_ID
E2E	CanNM	FrNM	LinNM	SoAd		Ecu_PWM
CAC	Canlf	FrIf	Linlf	UDPNm	RTA-CD	Ecu_PM
				Tcplp	CD	Ecu_PO
				Sd		

RTA-MCAL									
WDG	ICU	ADC	OCU			CAN	LIM	FRAY	ETH
MCU	PORT	DIO	PMW	SPI	FLS				

Hardware-department modules available today for a wide range of microcon combinations with further ports available on request

Hardware-department modules

# AUTOSAR solutions from ETAS

Tools, basic software, and services

## AUTOSAR Adaptive Platform RTA-VRTE



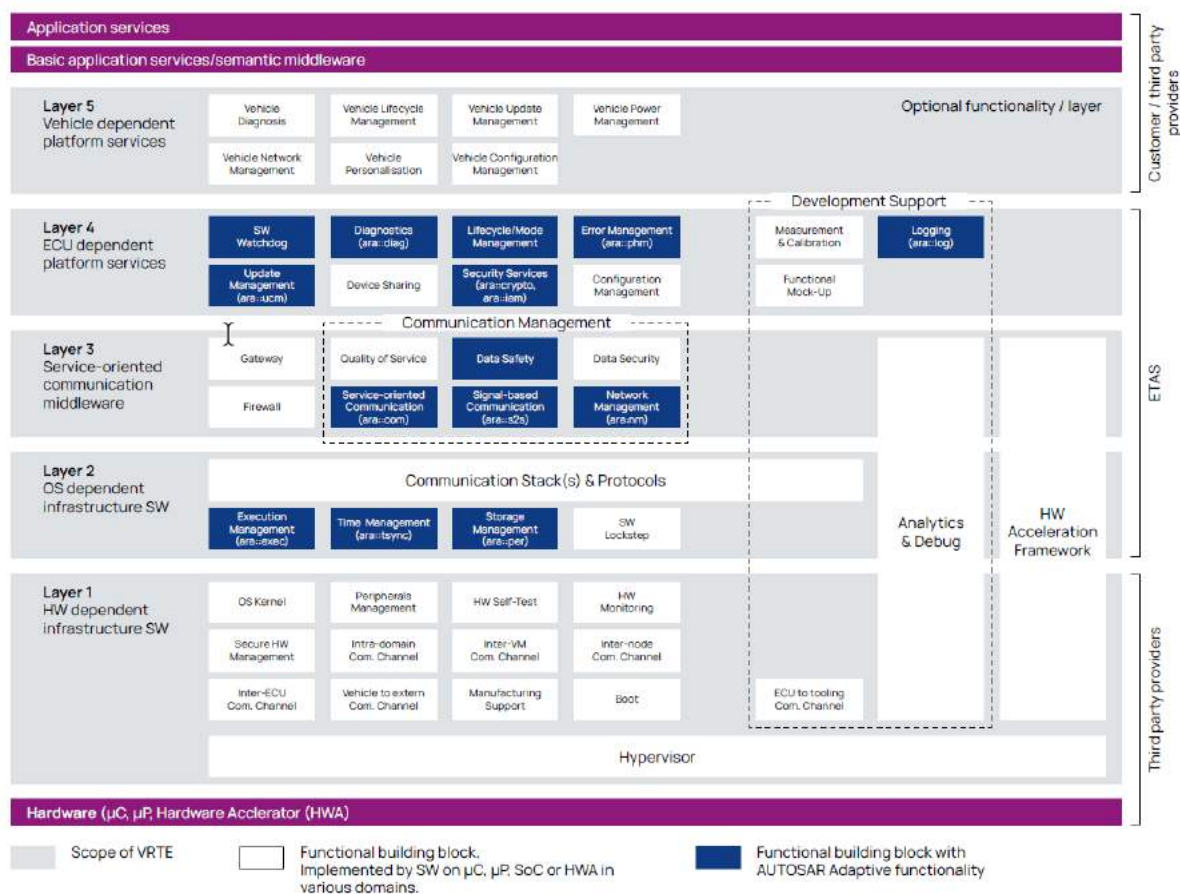
### Off the shelf solution

- Cloud development ready
- Integrates with a wide range of 3rd party software solutions
- Runs on POSIX OS (Linux and QNX out of the box)
- Easy and user-friendly configuration
- Nominated by various customers for upcoming series cars
- Supporting the newest standards
- Starter kit, which gets you running immediately



### Safety & security from the inside out

- Ready for integration in safety related ECUs up to ISO26262 and ASIL-B (up to ASIL-D on request)
- Cutting edge security extensions in combination with ETAS security solutions



# FOUNDATIONAL SOFTWARE SOLUTIONS FOR THE MODERN VEHICLE



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

## BLACKBERRY QNX FUNCTIONAL SAFETY SOLUTIONS



### OPERATING SYSTEM

Provides a reliable RTOS foundation that is pre-certified to the highest level of ISO 26262 - ASIL D

### VEHICLE INSTRUMENT CLUSTERS

Delivers an ISO 26262 ASIL B pre-certified graphics solution

### ADVANCED DRIVER ASSISTANCE

Provides a foundation on which to build safe and reliable autonomous driving software

### HYPERVERSOR

Isolates safety-critical systems from non-safety critical systems

### SYSTEM SAFETY DETECTION

A fault tolerant technique to address hardware and software errors in safety-critical systems

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

## QNX OFFERS SAFETY-CERTIFIED AND SECURE SOFTWARE SOLUTIONS TO BUILD AUTOMOTIVE SUBSYSTEMS AND ECUS.



### ADAS & AUTOMATED DRIVE

BlackBerry QNX powers advanced driver assistance systems (ADAS) with an OS certified to ISO 26262 ASIL D, as well as frameworks and middleware to enable automated drive features.

**Products:** QNX OS for Safety, QNX Hypervisor for Safety, QNX<sup>®</sup> Sensor Framework



### 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 Hypervisor for Safety, QNX<sup>®</sup> Advanced Virtualization Frameworks, QNX<sup>®</sup> Acoustics Management Platform, QNX<sup>®</sup> Sensor Framework, QNX<sup>®</sup> Multimedia Suite, QNX<sup>®</sup> Speech Framework, QNX<sup>®</sup> SDK for Smartphone Connectivity



### INSTRUMENT CLUSTERS

BlackBerry QNX offers a reliable, functionally safe solution for digital instrument clusters. Its one-of-a-kind ISO 26262 ASIL B pre-certified graphics solution and ISO 26262 ASIL D pre-certified RTOS

**Products:** QNX<sup>®</sup> Graphics for Safety, QNX OS for Safety

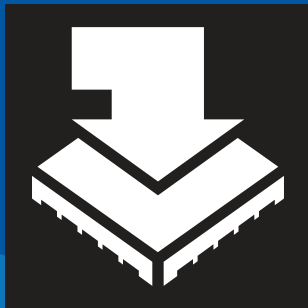


### INFOTAINMENT

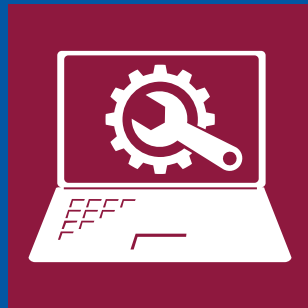
BlackBerry QNX offers market-leading technologies for the development of connected, safe and secure infotainment systems.

**Products:** QNX Acoustics Management Platform, QNX Sensor Framework, QNX Multimedia Suite, QNX Speech Framework, QNX SDK for Smartphone Connectivity

# Embedded development tools by SEGGER



## Debug & Trace probes



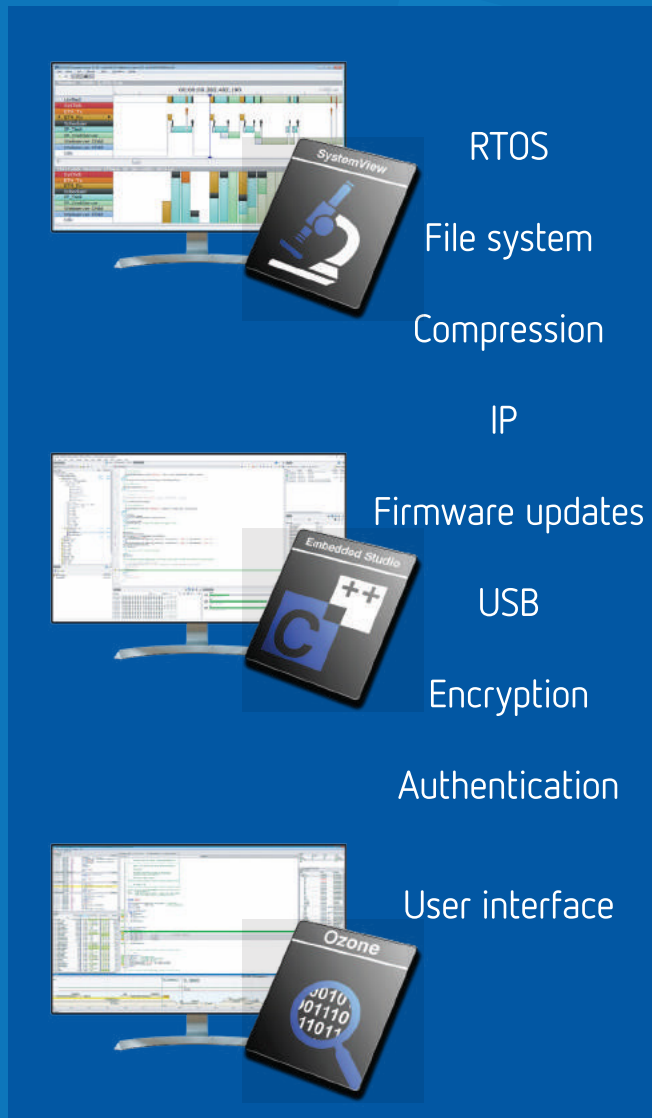
## Software Tools



## Embedded Software



## Production Tools



RTOS

File system

Compression

IP

Firmware updates

USB

Encryption

Authentication

User interface



# MES MODEL EXAMINER®

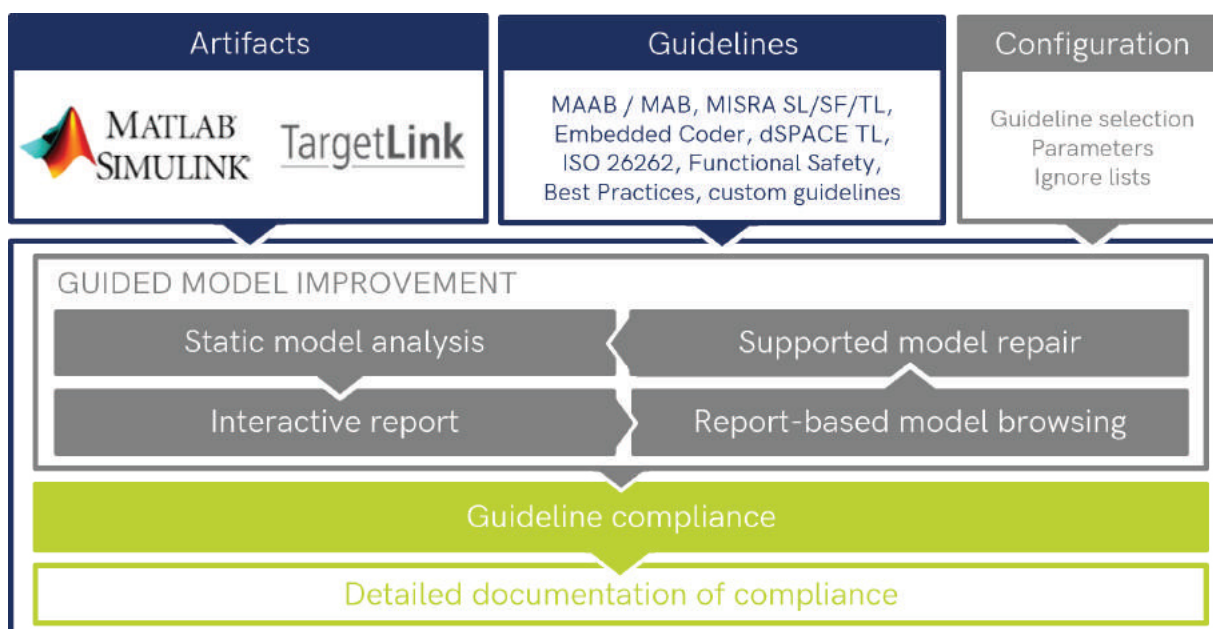
*The first choice for static model analysis*

## Easy Checking of Modeling Guidelines

The Model Examiner (MXAM) is your first choice for a comprehensive static model analysis. MXAM offers an easy way to check modeling guidelines, analyze model structure, and evaluate model metrics, all in a single tool. Comprehensive user guidance through analysis results as well as the repair and improvement process effectively ensures ISO 26262 standard compliance for your software models.

## Ensuring ISO 26262 Compliance

MES Model Examiner® is certified by TÜV SÜD as a T2 Offline Support Tool for use in safety-relevant software development in compliance with ISO 26262, IEC 61508 & ISO 25119.



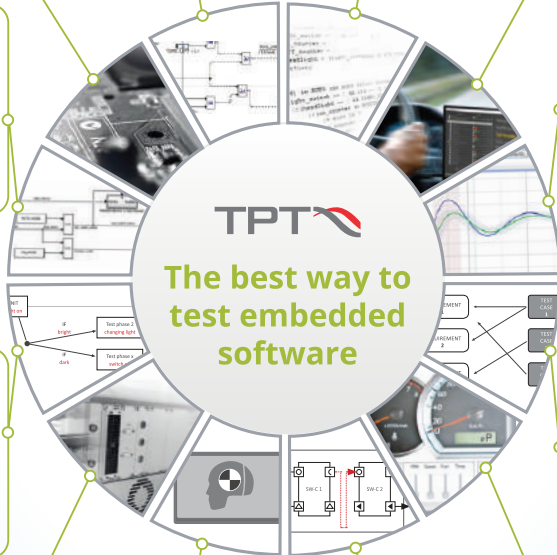
MES Model Examiner® analyzes software models for guideline compliance and guides the user through the repair and improvement process.

## Key Benefits

- Automated checks and repairs for Simulink®, Stateflow®, Embedded Coder®, TargetLink®, ASCET® and Excel® guideline violations
- Efficiently ensure ISO 26262-, ASPICE-, and MISRA®-compliant software models
- API for developing and integrating company-specific checks
- Simple integration into existing development environments
- Support system for guideline and check development



# Run. Test. Drive. TPT



## Testing ASCET models

TPT supports **fully automated** ASCET model testing for both, **physical models and implementation models**. Automatic test harness generation for module and integration testing with many features allows very efficient tests, even for large-scale control software.

## Testing C code

C/C++ code can be tested using TPT on every Windows PC. TPT can handle many C/C++ **modules in parallel**. It **automatically analyses** your C/C++ code interfaces, **creates function & variable stubs**, generates a test harness and much more.

## PiL testing

TPT has a close integration with TRACE32 (Lauterbach) and UDE (PLS). Automated fine grained control of the underlying debugger allows access to all software variables and functions as well as control flow manipulation.

## Vehicle testing

During vehicle test drives, TPT assists the driver with **automated driving instructions**, **permanent monitoring** of test goals, parameter application, and data recording. With TPT, vehicle testing becomes easy, effective and reproducible.

## Testing Simulink models

Testing Simulink or TargetLink models with TPT is very easy and powerful. No matter if **HiL or SiL**. No matter if 2 or 2000 signals. No matter if unit or integration model. No matter if busses, triggered subsystems, model referencing, AUTOSAR, ... TPT masters them all.

## Assessment of tests and reporting

TPT supports **fully automated assessment & documentation** of test results. It is a really powerful feature of TPT that supports all kinds of assessments, from very simple to highly complex ones.

## TPT test design and test generation

TPT was made for testing signal-oriented systems. Test case design with TPT is powerful, easy to handle and **easy to maintain**. Additionally, TPT comes with smart automatic test generation tools.

## Requirements based testing

In TPT, requirements can be **linked to test cases** and reported along with the tests, including **coverage analysis**. Seamless traceability and impact analysis assist the tester during the whole development life cycle.

## HiL testing

Use TPT for HiL test automation independently of your HiL vendor. TPT supports many HiL systems off-the-shelf, including **dSPACE HiL**, **Concurrent iHawk**, **Vector CANoe**, **NI Veristand**, and all ASAM XiL HiL systems.

## Dashboard

Complex test cases are often hard to understand if you only look at the signals. The TPT dashboard allows **intuitive visualization** of complex states and data. The tester can also interactively change, validate, and record tests. Its usage is extremely simple.

## Testing safety systems

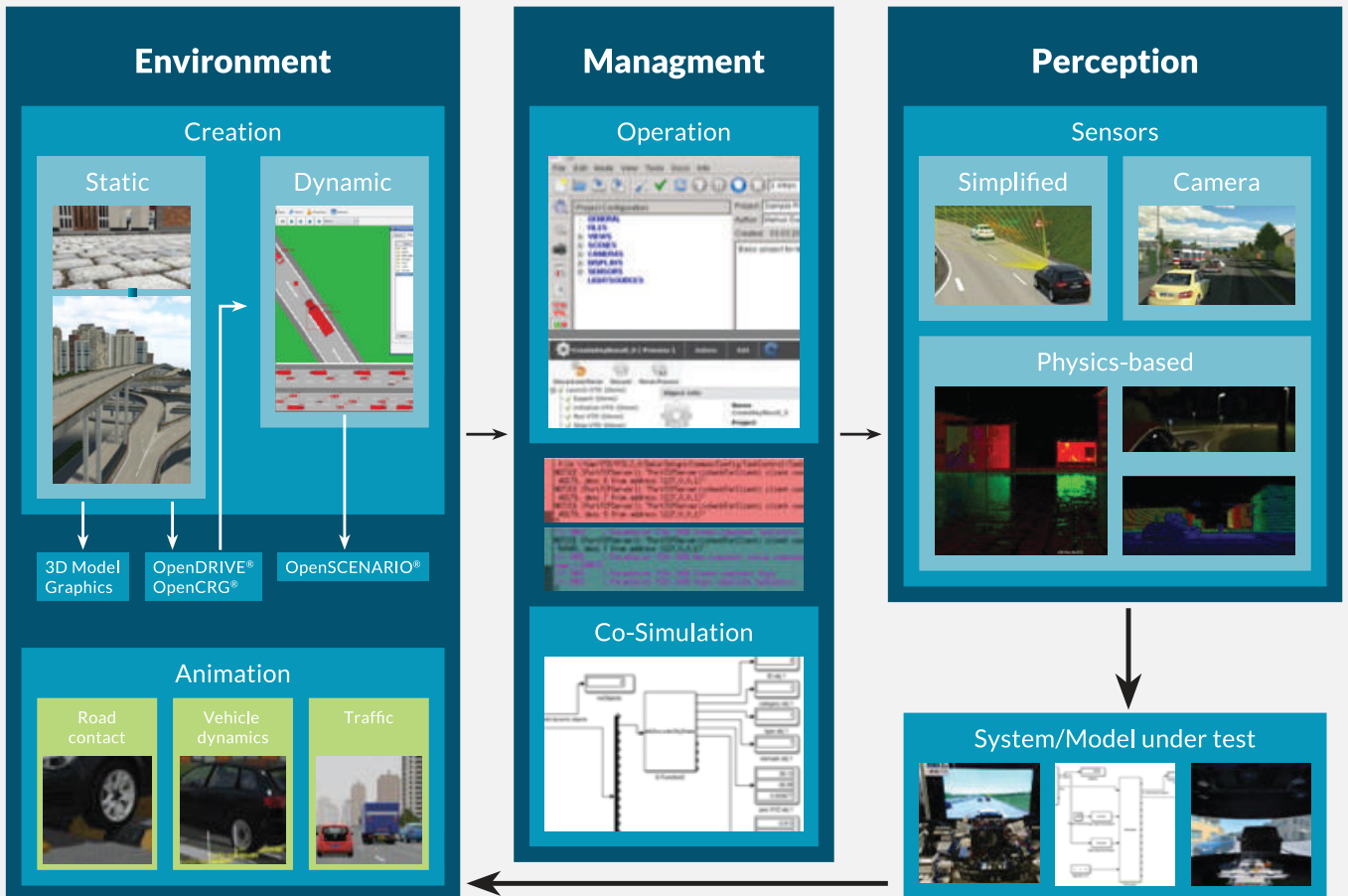
Safety standard directives can be satisfied while testing with TPT up to the highest safety level. Relevant standards, such as ISO26262, are supported. The TPT tool qualification is certified by TÜV.

## Testing AUTOSAR

TPT simplifies AUTOSAR application software component testing. Test setup is lean and easy with automatic test RTE generation. All common kinds of **AUTOSAR interfaces, ports, data types, scheduling** can be tested with TPT on every PC.

# Virtual Test Drive®

VIRES Virtual Test Drive (VTD®) is a complete tool-chain for driving simulation applications.



VTD provides a modular tool-set for road network creation, scenario definition, vehicle dynamics, traffic and sound simulation, simulation control, image generation, sensor perception etc. It uses established standard file formats.

VTD provides open interfaces for 3rd party components and a plugin concept with API for 3rd party modules; it allows for wide-ranging customization of its functionality.

VTD is an established software package which is in service at numerous installations in the automotive and railroad industry.

**VTD supports:**

- OpenDRIVE®
- OpenCRG®
- OpenSCENARIO®

For more information, visit:  
[www.hexagon.com/products/virtual-test-drive](http://www.hexagon.com/products/virtual-test-drive)



# LOOKING TO IMPROVE YOUR FLEET SAFETY?

**95%** OF ALL CRASHES ARE CAUSED BY **HUMAN ERROR**



**Driver Monitoring**



**Real-Time Alerts**



**Fleet Management Software**



**Facial Recognition**



**Easy to Install**



# VJDrive

We've got you covered

- ✓ **Prevent road accidents**
- ✓ **Reduce vehicle downtime**
- ✓ **Lower insurance costs**
- ✓ **Maximize fleet productivity**
- ✓ **Save lives**

Acute Technology Inc., product lineup includes the TravelScope digital storage oscilloscope, TravelLogic logic analyzer, BusFinder eMMC, SD, MIPI D-PHY Protocol Analyzer, LA4000 Logic Analyzer, DG4000/TraveData Digital Pattern Generator, ADP series high-voltage differential probes, TravelBus 2 in 1 analyzer, and MSO2000/3000 Mixed Signal Oscilloscope.


Compact and light weight, they are designed for convenient portability, aiming to provide customers with convenient and efficient solutions.



**MSO3124V  
MIXED SIGNAL OSCILLOSCOPE**  
MSO3000 Mixed Signal Oscilloscope

- DSO: 4 Channels, 1 GS/s S/R, 200 MHz bandwidth
- Logic / Protocol Analyzer: 16 Channels, 2 GS/s Timing Analysis, 250 MHz State Analysis
- Data Logger (HDD / SSD Storage)
- Total Memory: 4 Gb
- Digital Voltmeter: 3 digits
- Frequency Counter: 5 digits

**6-in-1 Instruments:** DAQ, DSO, DVM, Frequency Counter, Logic Analyzer, Protocol Analyzer



**LA4136B  
LOGIC ANALYZER**  
LA4000 Logic Analyzer

- 136 channels
- 4GHz Timing Analysis / 400MHz State Analysis
- 32Gb Memory
- Logic, State and Protocol triggers
- Stackable with a DSO to form an MSO

\*TravelBus, TravelLogic

**Ideal for applications requiring high-speed timing analysis or dealing with complex state analysis**



**BF7264 PRO  
PROTOCOL ANALYZER**  
BusFinder Protocol Analyzer

- Real-time data display, post-capture waveform
- Trigger for commands or data
- 64 channels Logic Analyzer
- 32Gb total memory Protocol Analyzer
- Protocol Option: eDP1.4a, eMMC 5.1, MIPI D-PHY 1.2, NAND Flash, SD 3.0(SDIO 3.0), SD 4.1 (UHS-II), SGMII, UFS2.1



**TS3124V DSO**  
TravelScope DSO

- Record length: 128Mpts/ch
- Channel: 4
- Sample rate: 1 GS/s
- Bandwidth: 200 MHz
- Data Logger (HDD / SSD Storage)
- Digital Voltmeter: 3 digits
- Frequency Counter: 5 digits

## PROTOCOL ANALYZER

BiSS-C	I2S	PMBus	SMBus
CAN2.0B/CAN FD	LIN2.2	Profibus	SPI
DALI	MDIO	PWM	SVID
DP_Aux	MII	RGMII	UART (RS232)
eSPI	MIPI I3C 1.1	RMII	USB PD 3
HID over I2C	MIPI RFFE 3	RS-232	USB1.1
I2C	Modbus	RS-482	

## ETHERNET

10BASE-T1S, MII/RMII/RGMII/GMII/SGMII

## ADP5100-B HI-VOLTAGE DIFF. PROBE ; BATTERY

### Hi-voltage Diff. Probe

- Powered by Battery
- Bandwidth : 100MHz
- Bandwidth limit : 5MHz / Full
- Over-range indicator
- Over-range alarm
- Double-layer probe cable for power insulation
- EC conformity : EN 61010-031:2002 +A1:2008
- Works for any grounded DSO with an BNC port



## Protocol Analyzer

- Show real-time protocol data.
- Application timing: massive protocol data with some idles in between.



## Protocol Logger

- Like data logger, save massive data into SSD hard drive.
- Application timing: massive protocol data.



## Protocol Monitor

- Like dash cameras, record protocol data by the device's memory only.
- Application timing: trigger event only happens in very long time.



# Innovation that solves your Bluetooth® Test Challenges

- CS RF PHY & Part H CS Layer Tests
- HDT & higher bands ready
- BLE/Classic/802.15.4 RF PHY Tests
- Smallest, lowest power sniffer
- Bespoke protocols on request
- Production & Development Options
- Android sniffer/coverage app
- LE Audio latency measurements
- Runs in Windows, MacOS & Linux
- Configurable GUI & API
- Bespoke protocols on request
- Perpetual SW Licenses - no OPEX

With NXP, future chip development  
**mini-m•reph.**



- World's smallest USB powered Protocol Analyser
- BR/EDR, BLE, Qualcomm QBHSL, MediaTek mHDTV2.0, IEEE 802.15.4, LE Audio and CS (Single/Dual/+++ options)
- Simultaneous RX & TX over the entire 2.4 GHz ISM band
- Live or post-capture decryption with blueSPY GUI
- 16 channel Logic Analysis & WiFi Packet Timing
- Custom 2.4 GHz PHYs available upon request

**m•rephE.**



- Specifically designed for PHY Layer Testing
- Options for BR/EDR, BLE, QBHSL, IEEE 802.15.4
- RF Spectrum Record and Playback option - 3 hrs 40 mins
- C/I, blocking & intermodulation signals generated internally
- Accurate power control to -115dBm for coded PHY tests
- Full support for in-band emissions
- Production Line or Development options available

**m•rephcs.**  
channel sounding



- Support for all CS RF-PHY test cases, including BT=2.0 modulation index & CS Layer tests via HCI
- Simple control via comprehensive GUI or Python/C++ dll.
- Log of all HCI traffic and key events
- Export of raw IQ data, spectrogram or the entire capture
- Capture of GPIO time aligned with IQ data
- Production Line or Development options available

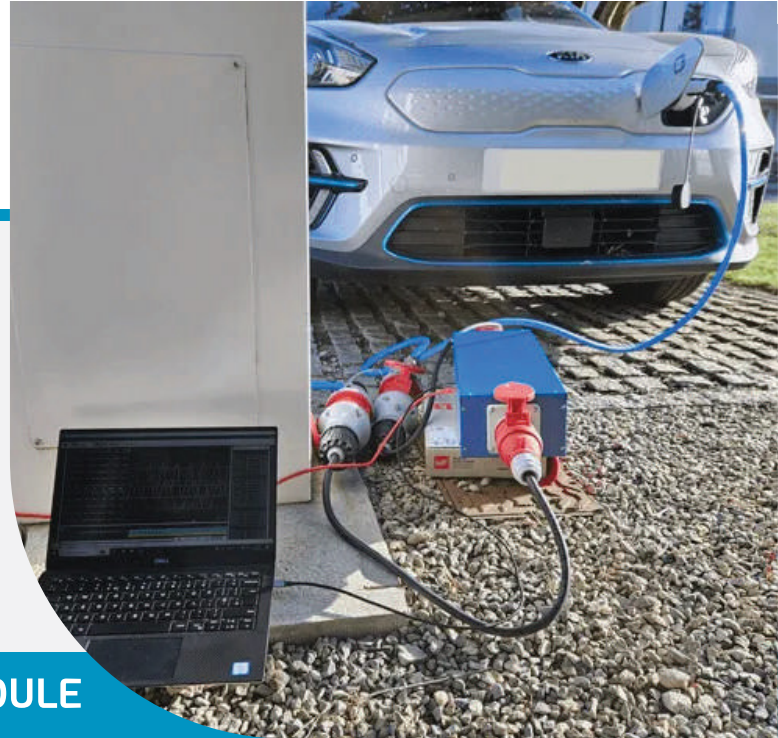
**pod.**  
audio



- Audio latency measured end-to-end, between-channels or relative to on-air packets in real-time
- Audio capture and generation accurately timestamped relative to Bluetooth packets
- Measures LE Audio Presentation Delay
- Measures SYNC between Left and Right channels

# HOW TO ANALYZE AN EV CHARGER

EV charging is a complex process. With many different vehicles and chargers, we would expect to see a range of compatibility issues and charging speeds. Understanding and solving problems requires data, and this is where the 3-phase AC PAM (Power Analysis Module) comes in.



## 3-PHASE MAINS POWER ANALYSIS MODULE



### FEATURES

- Measure 3-phase supplies
- Monitor voltage, current and power
- Capture data in Power Studio or direct to your own files
- Powerful automation option for capture and analysis

This device can capture high resolution AC traces for long periods of time:

- 8,000 Samples per second
- 16, 32 and 63 Amp versions
- Plug-and-play setup
- Manual and fully automated capture options
- PoE powered
- USB and LAN connectivity
- Supports upto 400v AC

### QUARCH POWER STUDIO

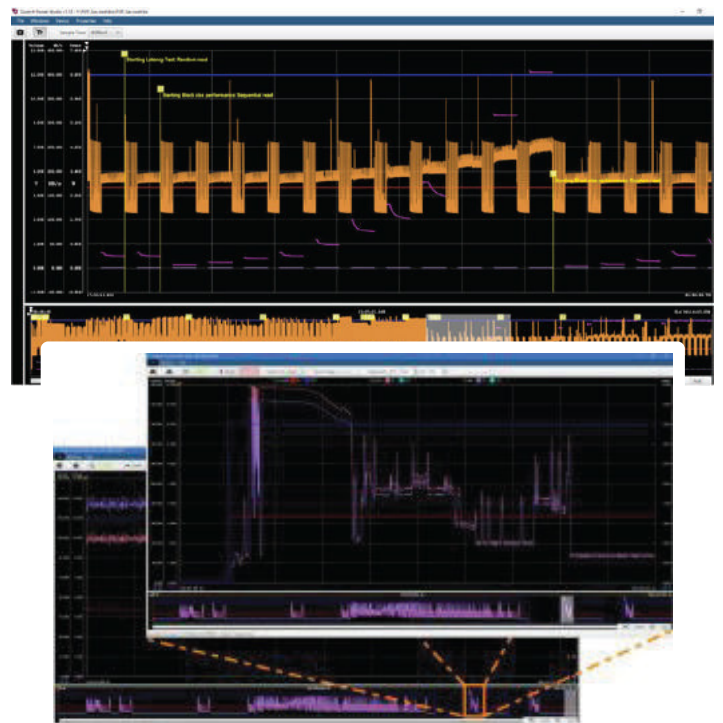
QPS (Quarch Power Studio) allows you to view and capture power data over extended periods of time, and easily analyze the power performance

### FEATURES

- Record any length of power trace
- High resolution capture for detailed analysis
- Annotate traces
- Export screenshots and trace sections
- Measure detailed features and view area statistics

### TECHNICAL

- Server (QIS)
- Handles multi-gigabyte files Java based application
- Built on Quarch Instrument
- No additional drivers needed



# THE NEXT GENERATION OF 2-IN-1 HIGH PRECISION POWER MONITORING HARDWARE AND BENCHTOP POWER SUPPLY IS HERE

Eliminate the need to buy a separate power supply and power monitoring device. Save space and test setup cost using the highly scalable solution of Monsoon High Voltage Power Monitor (HVPM).

## POWERFUL SOFTWARE

Full featured Windows GUI-PowerTool.  
Multiple APIs support for Linux, Mac and Windows platforms which allow for fully-automated testing

## WIDE VOLTAGE AND CURRENT RANGE

Main Channel- Output Voltage Range 0.8-13.5 V  
USB- Up to 5.5 V  
Aux Channel -Up to 13 V supplied externally  
0.01 V Increments  
Continuous Current 6 A

## PORTABLE MODULAR DESIGN

Very flexible; Can be deployed individually at a single workstation or scaled up to rack mount style configurations for large scale testing

## HIGH ACCURACY

Main Channel- Fine Current Range  
50µA-60 mA; Resolution 0.9 µA  
(+/- 50µA) in low current measurements  
Coarse Current Range 60mA-6A;  
Resolution 125 µA

## WIDE APPLICATIONS

Development and testing of Smartphones, Tablets, Software App, Automotive, IOT devices with respect to Battery drain

## APPLICATION HIGHLIGHTS



## INDUSTRY LEADING CERTIFICATIONS

UL, FCC and CE certified

## AFFORDABLE

## BRIEF SPECIFICATIONS

- Size: 8 in x 6 in x 2 in (20 cm x 15 cm x 5 cm)
- Weight: 1.1 lb (0.5kg)
- Input power 115V to 240V, 47-63Hz
- Main channel 0.8V to 13.5V range
- USB channel 2.1V to 5.4V
- Aux channel input 0.5V to 13V
- UL, CE, FCC certified

## TYPICAL USE CASES

- Smartphones, Tablets or Laptops
- Smartphone Apps
- Internet of Things (IoT) Devices, Medical Devices
- USB Devices
- Automotive Sub-circuits
- Prototype Designs
- Power measurement of Arduinos, Raspberry Pi and Microcontrollers
- Burn in testing

## WHAT'S INCLUDED?

- High Voltage Power Monitor (HVPM)
- Power supply
- 2 alligator clips
- 2 USB cables
- Information card with links to PowerTool software and support documentation

neXt generation in data acquisition and signal conditioning

For analog, digital, optical and MHz signals

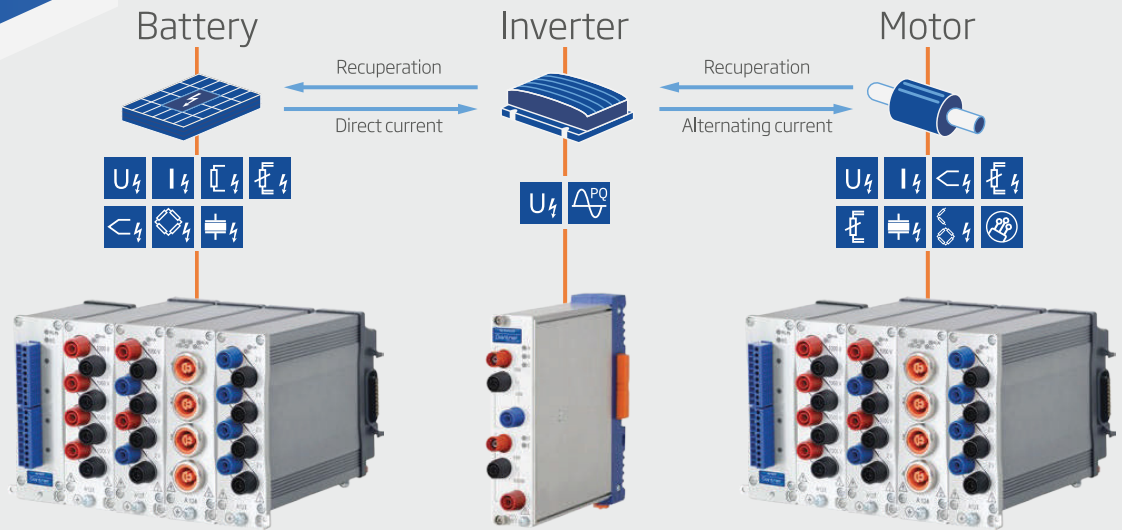
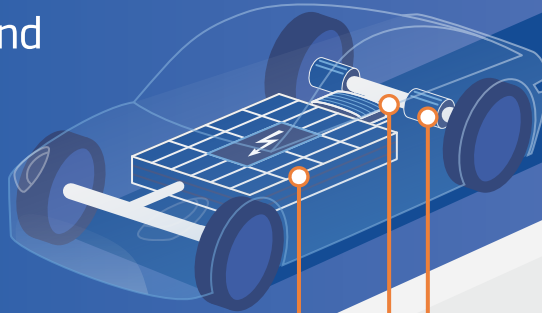
**MHz**

High isolation I/O modules for electric vehicle testing



1200 VDC continuous isolation

**5000 VDC peak**



**Q.series X**  
Continuous  
1200 VDC isolation

**Q.boost**  
Up to 4 MHz per  
channel, triggered  
or continuously

**Q.series X**  
Up to 100 kHz  
per channel



[www.gantner-instruments.com](http://www.gantner-instruments.com)  
info@gantner-instruments.com | T +43 5556 77 463-0



# Test Equipment of Automobile Electrical Parts and Environmental Loads



**ASR-2000/ASR-3000 Series**  
500VA-4KVA AC/DC Power Source



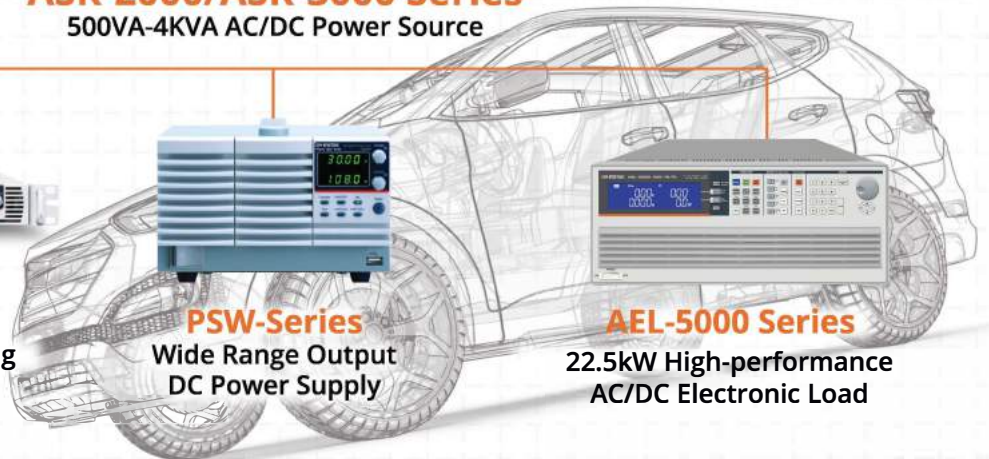
**PSU-Series**  
6kW Programmable Switching  
D.C. Power Supply



**PSW-Series**  
Wide Range Output  
DC Power Supply



**AEL-5000 Series**  
22.5kW High-performance  
AC/DC Electronic Load



Automotive Test waveforms for ISO16750 & ISO7637 included

## Reliability Test



**GPT-12000/9000 Series**  
200VA/500VA Safety Analyzer



**GDS-3000A Series**  
650MHz /350MHz BW, 2  
Input Channels, 5-2.5GSa/S



**GDM-906x Dual  
Measurement Multimeter**  
Vehicle Temperature Measurement and  
Monitoring Solution

### ISO16750-2 Electric Load Tests

Simulates a Residual Alternating Current on the Direct Current Supply

Simulate Starting Profile

Simulate Short Voltage Droptest

Simulate Slow Decrease and Increase of Supply Voltage

Simulate the Supply Voltage Profile for Reset Test

Transient Load Drop Test



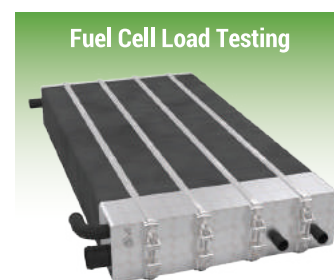
Power (kW)	12kW	25kW	37kW
Voltage (V)	Maximum Current (A)		
600	50	100	150
1500	–	50	50
2000	–	50	50

\*Global pricing for base units without options, Incoterms Ex Works (EXW) San Diego, California, USA.

## High Performance, Modular Bidirectional, Regenerative Programmable DC Power System

- Full DC source and sink capabilities with power levels from 12 kW up to 37 kW
- Fully scalable up to 1.2 MW with parallel systems
- Available voltage ranges of 600V, 1,500V and 2,000VDC in a 4U rack chassis providing full power up to +/-150A within a single system.

The Mi-BEAM Series is designed for testing today's complex, high power electronics for the automotive, energy storage, industrial, and aerospace markets in a variety of applications. This platform covers all test needs through the product life cycle from advance research and development (R&D), to design validation, and production test requirements.



## High Performance Programmable AC / DC Power Source



### Asterion AC Series Advanced Features

- High power density in 1U / 2U / 4U / 14U chassis up to 18kVA
- Auto paralleling for higher power
- Voltage: 0-400VAC/0- 500VDC, Current: 0-60Arms/phase, Power: 500VA - 36000VA
- Complete avionic test suites (optional)
- Standard LXI LAN, USB and RS232, optional GPIB

### Asterion AC Series Advanced Features

- Commercial and military avionics test
- AC power simulation
- Frequency & voltage conversion
- IEC standards testing

## High Performance Solar Array Simulation Power Supply



- ▶ 2 independent, isolated 600W channels or 1 1200W channel in 1U
- ▶ Voltage: 40 V to 220 V
- ▶ Current: 2.72A to 20A
- ▶ 2μ second shunt switching recovery
- ▶ Peak Power Tracking
- ▶ Primary and secondary over voltage and over current
- ▶ Output electronic circuit breaker
- ▶ Built in fault data recorder
- ▶ Power On Self-Test
- ▶ Active power factor correction (PFC)
- ▶ Color touch panel monitoring
- ▶ Standard LAN interface
- ▶ Full remote control via AMETEK SAS software or SCPI commands

Example of a fully integrated Solar Array Simulator

30 channel  
600W/ch  
18KW total



## SEQUOIA SERIES

California Instruments™

### PRECISION PROGRAMMABLE REGENERATIVE GRID SIMULATORS FEATURES AND CAPABILITIES

- ▶ 0 - 333VAC, 0 - 3.000A / PHASE 15KVA - 1.08MVA
- ▶ Single Solution for: AC/DC Programmable Power Source, AC/DC Grid Simulator, AC/DC Resistive or Complex Electronic Load
- ▶ Dual Voltage ranges that support over voltage testing on 480V based systems
- ▶ 500uS time resolution for Transients
- ▶ Virtual Panels control software included
- ▶ Non-Linear current waveform programming during Load mode
- ▶ Phase coordination among multiple units (LKM/LKS)
- ▶ Powerful set of analog controls for PHIL and Modulation tests
- ▶ Trigger In & Out to permit extensive coordination with external systems
- ▶ Extensive Onboard diagnostics
- ▶ Digital I/O, including RS232, USB, Ethernet (GPIB optional)
- ▶ Auto-paralleling for maximum flexibility with multi-chassis configurations





# MOST COMPREHENSIVE PROGRAMMABLE POWER SOLUTIONS

The EA-10000 series includes more than 180 devices: programmable DC power supplies EA-PS & EA-PSI, bidirectional DC power supplies EA-PSB, & regenerative electronic DC loads EA-ELR.

All series come in power form factors of 2U, 3U and 4U



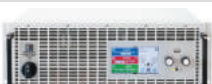
### EA-PSB 10000 2U

- 1.5 kW and 3 kW
- Up to 750Vdc & up to 120 Adc
- Parallel up to 192 kW



### ELR 10000 4U

- Power 30 kW
- 0 - 80 V up to 0 - 2000 V
- 0 - 40 A up to 0 - 1000 A



### EA-PSB 10000 4U

- 15 kW to 30 kW
- Up to 2,000Vdc
- Parallel up to 1.92 MW

# EV TESTING SOLUTIONS



## EA Advantages

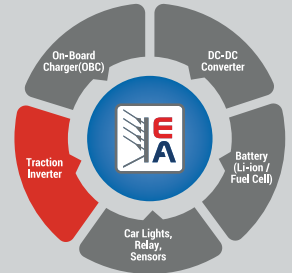
- Autoranging
- Power Density
- Battery simulation
- Arbitrary waveform and function generator
- Low EMC
- Output voltage up to 2000V
- Plug and play paralleling up to 2MW
- High efficiency up to 96%
- Battery and fuel cell test functions



Programmable DC Power Supplies

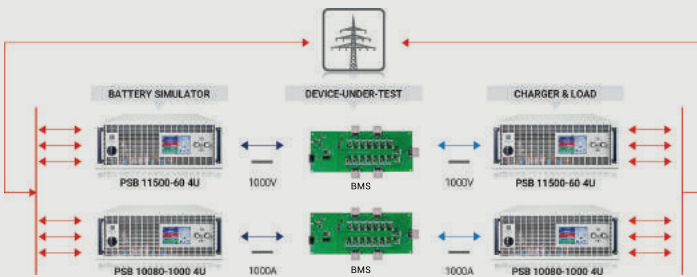


Programmable DC Electronic Loads (Conventional and regenerative)

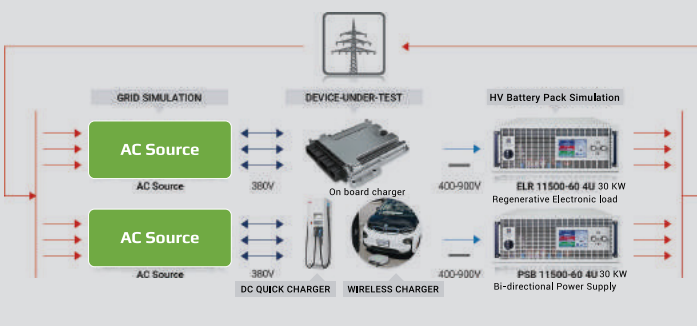


## Electric Vehicles Testing Solutions

### Battery Management Test Solutions



### Testing On Board Chargers & DC Charging Stations

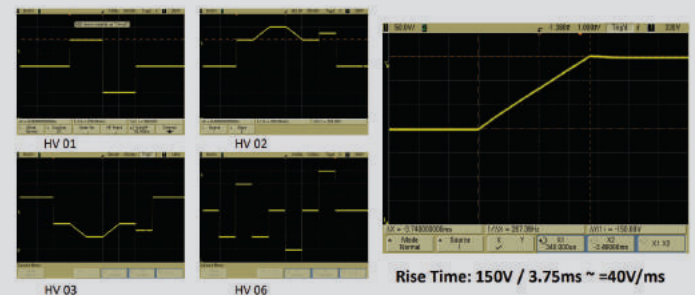


## Automotive Test Standards

- LV 123
- ISO 16750-2
- VW 80300



- Integrated function generator provides the ability to create non-linear voltage and current waveforms in both Source & Sink mode.
- VW 80300 requires high voltage transient testing.
- Transients required to be 20V/msec for 450Vdc based hardware and 40V/msec for 900Vdc based hardware.
- Function generator allows users to program customizable transients.

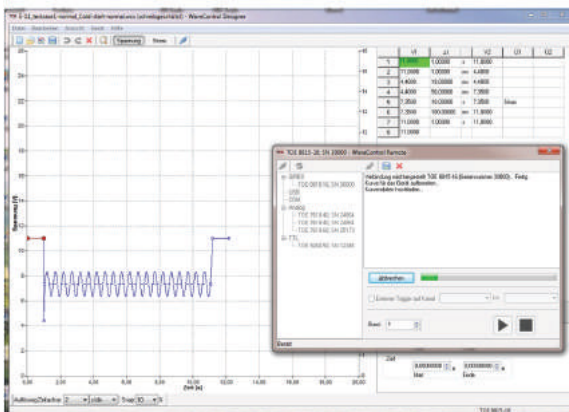


## DC and Arbitrary Power Supplies Arbitrary & Function Generators 4-Quadrant and Broadband Amplifiers Special Instruments

### 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:

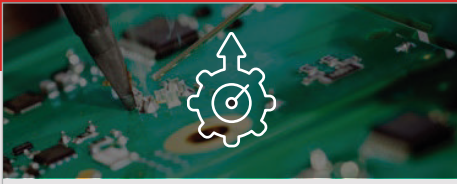


The Software WaveControl provides

- ✓ 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

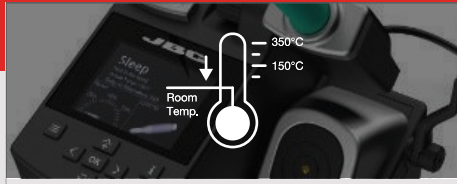


- Electronic Switch for short interruptions up to 60V / 100A; tr / tf < 500 ns
- 4-Quadrant-Power-Supply up to  $\pm 100$  V /  $\pm 40$ A; > 100 kHz, 320W / 1kW, modularly expandable up to 6,4 kW / 20 kW
- Arbitrary Power Supply up to 100 V / 320 A, AC-superimposition up to 70 kHz, 320 W / 1 kW up to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



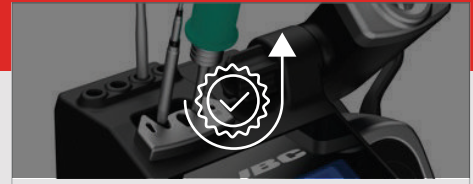
## HEATING SYSTEM

JBC provides the **Most Efficient Soldering System** which leads to quality improvement & an efficiency increase.



## HEAT MANAGEMENT

Thanks to both **Sleep & Hibernation Modes**, tip life increase exponentially.



## INCREASE PRODUCTIVITY

Use **Quick Cartridge Extractor** to change quickly & safely without switching the station off.

# NANO REWORK SOLUTIONS

A complete tooling range for High Precision

**NAS 2-Tool Nano Rework Station**

**RHS Right Hand Support Set for PHSK**

**JNA High-Precision Hot Air Station**

**DPM Solder Paste Hand Dispenser**

**PHSK Small Preheater Set**

**B-iRON Battery Soldering Stations**

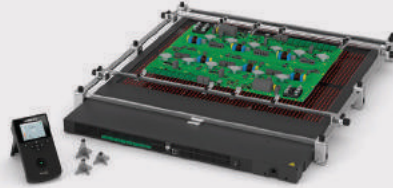
**NAS Station**, with the JBC Most Efficient Soldering System and the Intelligent Hibernation Mode, is the best solution for soldering and rework of SMT components requiring the highest precision. JNA, is the only Hot Air Station to rework, position and remove SMDs without affecting nearby components. PHSK Small Preheater Set is used as a secondary heat source to reduce the amount of heat supplied by the main soldering tool, reducing thermal shock to components & PCBs



## SMD REWORK SYSTEM

The ideal solution for your entire rework tasks.

Includes Hot Air Station, Preheater with PCB Support, and Rework Arm.



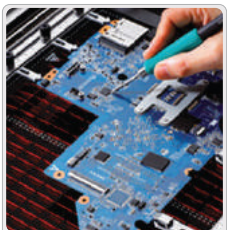
## JBC PREHEATER RANGE

For rework on multi-layered PCBAs and/or large ground planes in order to avoid thermal shock and facilitate soldering as well as desoldering processes.

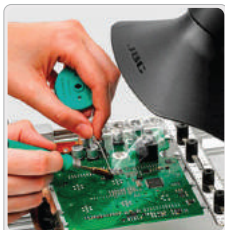


## ADJUSTABLE TWEEZERS RANGE

Provide the highest precision when soldering or reworking SMD components.



Preheaters



Fume Extractors



Tip Cleaners



Auto Feeder



Wire Stripper



Auto-Feed Stations

## BGA/SMT REWORK STATIONS

PDR designs, manufactures, and distributes IR Rework Stations, Industrial X-Ray Inspections Systems, and IR Thermal Test equipment for the electronics component and PCB assembly industry.

PDR isn't just a brand, it's a revolution delivering unmatched control and effortless execution.

At the forefront of SMD rework technologies, PDR are working with many of the world's top names in:

- Electronic Manufacturing
- Defence
- Automotive
- Medical
- Research & Development



## PDR IR-E3

- Advanced Focused IR component heating
- Quartz IR PCB preheating with up to 3 zones
- Split Beam prism system for simultaneous PCB/component viewing
- Precision Components Pick & Placement up to 10um
- Precision PCB handling
- Component Nest/Flux Application Facility
- Closed Loop Non-Contact Temperature Sensing
- Advanced Automatic Thermal Process Control
- Reflow Process Observation Camera
- PCB Forced Air Cooling

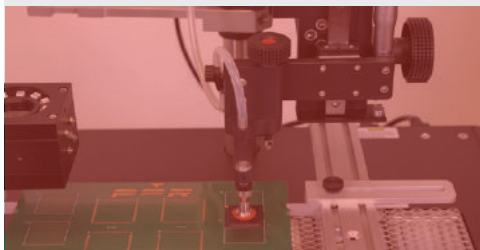
## FOCUSED INFRARED

What you see you heat.  
No collateral damage.  
Instantaneous control.



## PLACEMENT TECHNOLOGY

Our placement technology  
allows every operator to achieve  
the same standard of quality.



## INTELLIGENT SOFTWARE

One profile to rework nearly all  
applications.



# Aukua MGA2510

## Automotive Ethernet

IEEE 100/1000BASE-T1,  
2.5G/5G/10GBASE-T1 and  
1000BASE-RH

Network Impairment  
Emulator



Inline Packet Capture  
and Protocol Analyzer

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

Traffic Generator  
and Analyzer

## APPLICATION HIGHLIGHTS

### TRAFFIC GENERATION

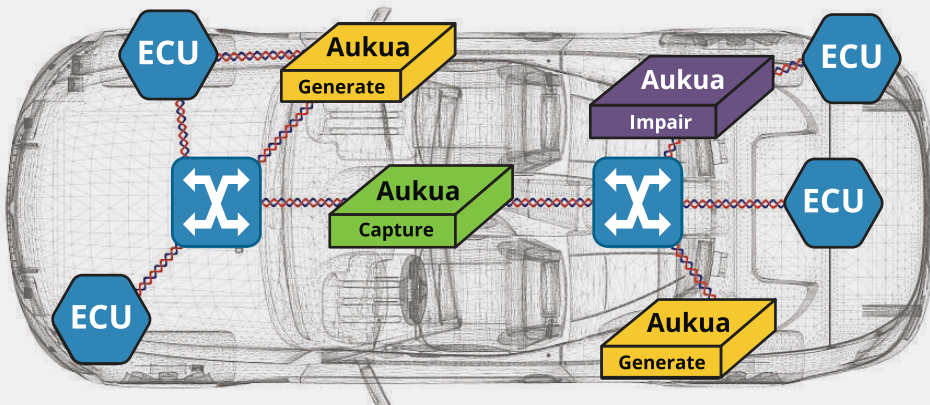
- Bit error rate testing (BERT) for integrity validation
- Latency characterization of automotive devices, components, and applications
- Throughput performance testing
- Functional testing
- Media conversion: BASE-T <--> BASE-T1

### 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



# HARDWARE AND SOFTWARE TOOLS FOR TESTING AND VALIDATING AUTOMOTIVE NETWORKS

## CAPTURE MODULES

Capture and log messages from a variety of bus topologies are captured, timestamped (the same timestamp across different bus systems) offers five variants to cover Automotive Ethernet (100BASE-T1 and 1000BASE-T1), as well as common IVN technologies (CAN, CAN-FD, FlexRay, LIN).

### CM MULTIGIGABIT

CAPTURE YOUR AUTOMOTIVE MULTIGIGABIT TRAFFIC IN THE CAR WITHOUT INTERFERING THE ORIGINAL NETWORK



The **CM MultiGigabit**, enabled through new PHY technology, can be set to log three different data rates:

- 2.5 Gbit/s (2.5 GBASE-T1)
- 5 Gbit/s (5 GBASE-T1)
- 10 Gbit/s (10 GBASE-T1)

### CM CAN COMBO

CAPTURE RELIABLY ALL RELEVANT IN-VEHICLE-NETWORK (IVN) TRAFFIC FROM DIFFERENT COMMUNICATION TECHNOLOGIES INSIDE THE VEHICLE



The **CM CAN COMBO** can capture traffic from the conventional CAN buses, as well as CAN-FD, FlexRay, and RS-232 can be captured without interfering with the original networks



## MEDIA CONVERTORS

Establish a physical layer conversion between Automotive Ethernet connections (100BASE-T1 or 1000BASE-T1) and any device with a standard Ethernet Network Interface Card (NIC) with an RJ-45 connector.

### 100BASE-T1 MEDIA CONVERTER\_BCM



Converts IEEE 100BASE-T1 100 MBit/s full-duplex (1 x unshielded twisted pair - UTP) to Fast Ethernet 100BASE-TX

### 1000BASE-T1 MEDIA CONVERTER



Converts IEEE 1000BASE-T1 (1000 MBit/s full duplex) 1x unshielded twisted pair (UTP) to Gigabit Ethernet (1000BASE-T)

## SWITCH-BASED PRODUCTS

Allow for a managed, multi-directional exchange of Ethernet messages

### ENHANCED ETHERNET SWITCH

AUTOMOTIVE ETHERNET SWITCH WITH AVB/TSN FEATURES TO TEST AND ANALYZE VEHICLE NETWORKS



- 8x 100/1000BASE-T1 ports (MATenet, H-MTD variants) or 8x 1000BASE-T ports (RJ-45 variant)
- 2x SFP+ ports for Logging data output (up to 10Gbps each)
- 1x 100BASE-TX Fast Ethernet Port for configuration
- Selectable connector interface between MATenet, H-MTD, or RJ-45 connector, depending on the intended customer use case




Control system/  
Logger

1000BASE-T Ethernet  
(RJ-45)  
10Gigabit Ethernet  
(SFP+)

Enhanced Ethernet Switch  
MATenet, H-MTD or RJ-45

IEEE regular 1000BASE-T  
100/1000BASE-T1

Vehicle Ethernet  
Devices

-  Streamlined Debugging
-  Fully IDE-Integrated
-  Simple to Configure & Operate



## Multilink Overview

Multilink debug probes allow a PC access to the Background Debug Mode (BDM) or JTAG interface on wide range of ARM Cortex and 8-16-/32-bit devices, in order to halt normal processor execution and use the PC to control the processor. The user can then directly control the target's execution, read/write registers and memory values, debug code on the processor, and program internal or external FLASH memory devices.

Supported manufacturers include NXP, STMicroelectronics, Cypress, Infineon, Silicon Labs, and many others. Multilink connects between a USB port on a Windows machine and the standard debug connector on the target. Microcontrollers are supported via the multiple headers located under a flip lid on the Multilink case. Ribbon cables suitable for a variety of architectures are included.

## Standard Features

All Multilink debug probes offer these standard features:

- USB interface from PC to Multilink allows for fast, easy programming and debugging -- with the ease and compatibility of the USB interface.
- Draws power from USB interface-- no separate power supply required (draws less than 1mA from the target).
- Works with target voltage: 1.8V-5.25V
- Supports JTAG daisy chaining of multiple ARM MCUs
- ARM device support includes both the JTAG and SWD protocols
- Includes USB cable, Type A Male to Type B Male, 6-ft.

### 8/16/32 BIT DEVICES:

NXP:	S32
	ColdFireR V1
	ColdFireR V2/V3/V4
	MPC55xx-57xx
	DSC
	S12Z
	HC(S)12(X)
	HCS08, RS08**
	MPC5xx/8xx <b>FX only</b>
	HC16/683xx <b>FX only</b>
Micro:	SPC5

## "Universal" Features

**MULTILINK UNIVERSAL LC** and **MULTILINK UNIVERSAL FX** also include these features:

- Pipelined programming algorithms for some Power Architecture families that dramatically increase programming speed.
- Auto-frequency detection + trimming capabilities for HCS08 devices
- Auto-frequency detection for HC(S)12(X) devices.
- Generates programming voltage on RESET line for RS08 devices.
- Target Frequency: 16Khz-50Mhz (applies to HCS08, RS08, CFV1, S12Z, or HCS12X only)



# CYCLONE PROGRAMMERS

**In-system, stand-alone programmers for internal & external flash.**

Versatile programming tools built for reliability on the production line. Rich feature sets offer terrific value. Support for ARM Cortex, AURIX TriCore, Renesas, PowerPC and 8-/16-/32-bit architectures.



## Cyclone LC Programmer Features

Program with one touch, with or without a PC, after configuring a programming image. Programming can also be fully automated with the included Cyclone Control Suite.

- Simple To Configure & Operate
- Extensive Device Support
- Reliable & Feature Rich
- Easily Automated

## Cyclone FX Advanced Features

The Cyclone FX programmer adds a tremendous boost in speed and storage size, allows expandable memory via the SD card slot, ProCryption Security, advanced automation & useful control port features.

- ProCryption Security (AES/RSA Encryption)
- WiFi Control, High-Speed Programming
- Massive Internal & Expandable Storage
- Advanced Automation & Gang Programming

## EASY SETUP & POWERFUL FEATURES SAVE VALUABLE TIME



**SIMPLE SETUP/  
PC-BASED**



**STAND-ALONE  
MODE**



**CONTROL MULTIPLE UNITS  
w/ CYCLONE FX or Advanced License**

## Device Support

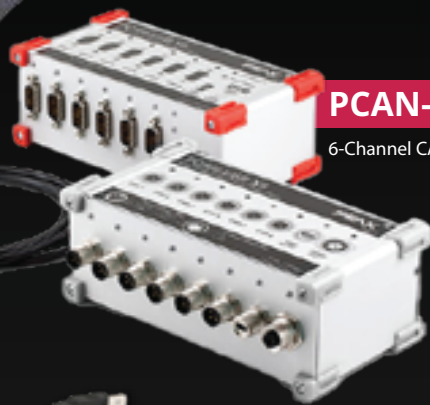
**NXP:** kinetis/S32, LPC, i.MX, HC08, HCS08, HC(S)12(X), S12Z, ColdFire V2/V3/V4, RSO8, Power MPC5xx/8xx, DSC, CPU3xx, QORIVVA MPC5xxx, 68HC16

**STM:** SPC5, STM8, STM32

**Renesas:** H8 and H8s/Tiny, MC16C and M16C80, M32C, R8C, RH850, RL78, RX600

**Infineon TriCore:** AUDO TC1xx, AURIX TC2xx/TC3xx

**Legacy Devices:** HC05, HC11, MAC7xxx, MCORE



Leading provider of hardware, software, and services for automotive and industrial communication with emphasis on the fieldbuses CAN & LIN.

Support for Automotive APIs



## CAN/CAN FD/LIN Interfaces

- Single, dual and six Channels Interfaces for classic CAN/CAN FD/LIN/J1939 etc protocols
- Complies with CAN specifications 2.0 A/B and FD
- CAN/CAN FD bit rates for the data field (64 bytes max.) up to 12 Mbit/s
- LIN interfaces are compliant with all LIN specifications (up to version 2.2) and can be used as a LIN master or slave

## CAN Analyser: PCAN Explorer6

- Cost effective, life time tool - no AMC
- Recording and playback of CAN/CAN FD / J1939 traffic
- Create your own database
- Import/Export existing DBC & ARXML files
- Automation with macros or VBScript
- Plotter, Instruments Panel analysis support for CAN/CAN FD and J1939 protocols

## Diagnostic Tools: PCAN-Diag FD

- Measurement of CAN bit rate, bus load, termination, voltage level and CAN/CAN FD /J1939 data without PC
- Built in oscilloscope and supports sample rate of 100 MHz
- Load .DBC/ARXML file formats
- Built in memory card upto 3GB
- Connectors : USB, HDMI, DB9
- Operated via battery or external power supply

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