

Calibrated Measurement of Transient Noise on High-Voltage Traction Networks in Vehicles

HPK Measurement Coupler & RCTD – Software

TEST & MEASUREMENT





HPK Measurement Coupler

Advantages

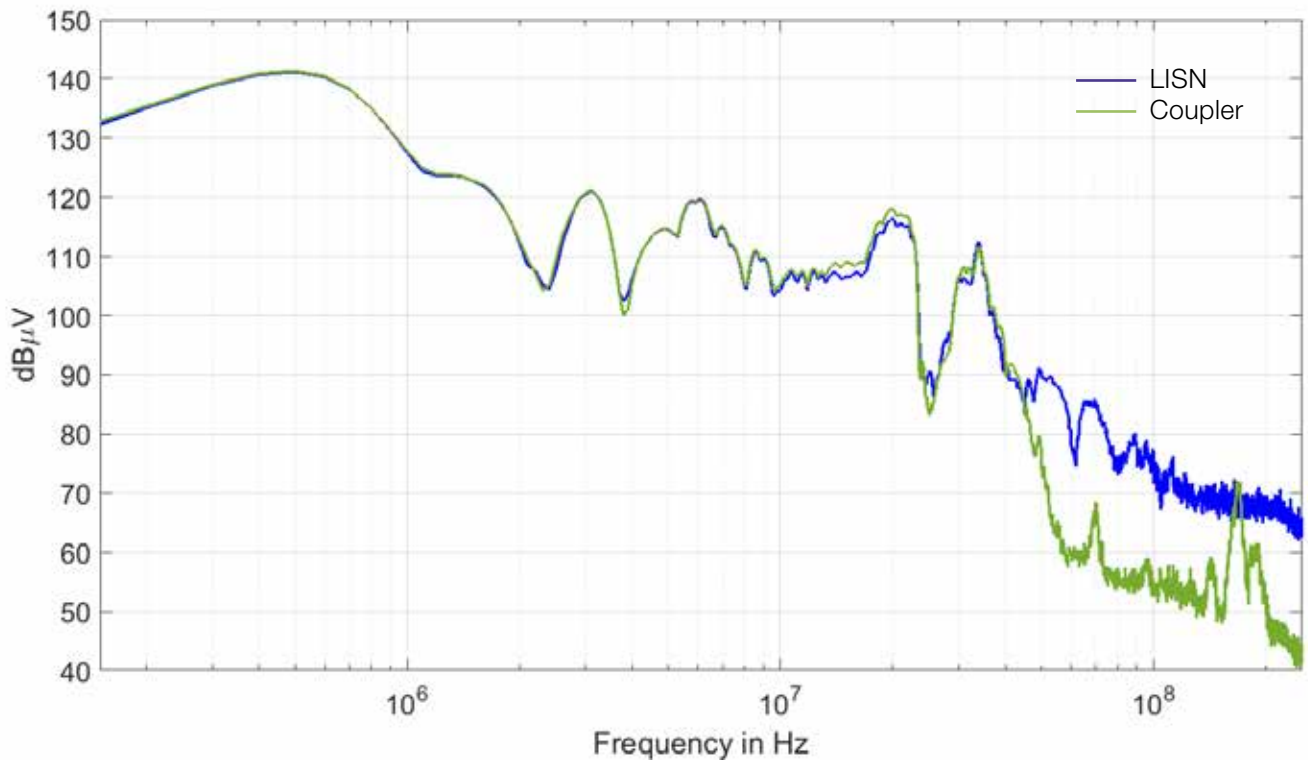
- Transients and non-linear effects can be displayed in time domain or frequency domain
- Calibration allows accurate definition of a reference plane even for high-frequency, position-dependent voltage and current distributions
- Calibration performed in advance with a vector network analyzer using specifically designed high-voltage standards for the highest accuracy
- Coupler concept is compatible to special type of Rosenberger HPK connector without coding
- No impairment of harness performance under test conditions
- Waterproofness enables tests under any environmental conditions
- Output of coupler is galvanically isolated to high-voltage conductors; every device is high-voltage tested
- Low-voltage output of coupler can be connected directly to standard test equipment
- Independent determination of voltage and current
- Determination of source and load impedance during operation possible

HPK Measurement Coupler

Rosenberger No.	Remarks
H4CK10A-110	The Rosenberger HPK Measurement Coupler kit is delivered in a stable wooden box with SMA measurement cables, SMA terminations and calibration data on a USB-Stick.

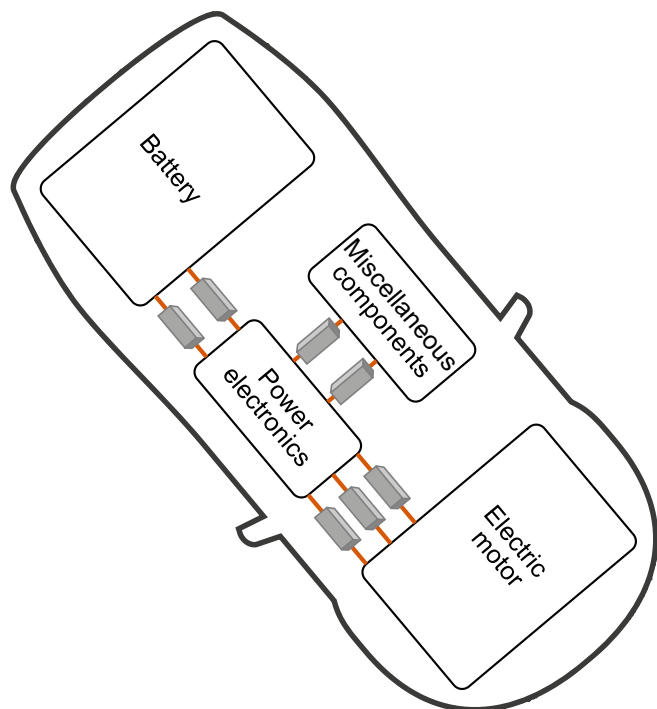
HPK Calibration Kit

Rosenberger No.	Remarks
H4CK10B-110	The Rosenberger HPK Calibration kit is delivered in a stable wooden box and includes all the components necessary for calibrating the HPK Measurement Coupler in combination with the RCTD software calibration routine.



The newly developed HPK Measurement Coupler from Rosenberger enables a minimally invasive testing method in order to measure reliable RF voltages and currents.

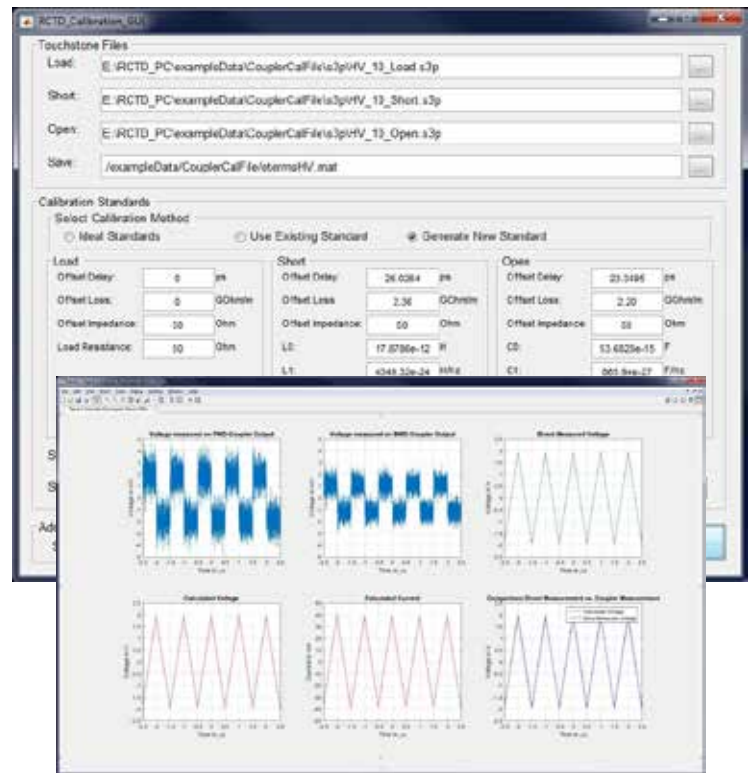
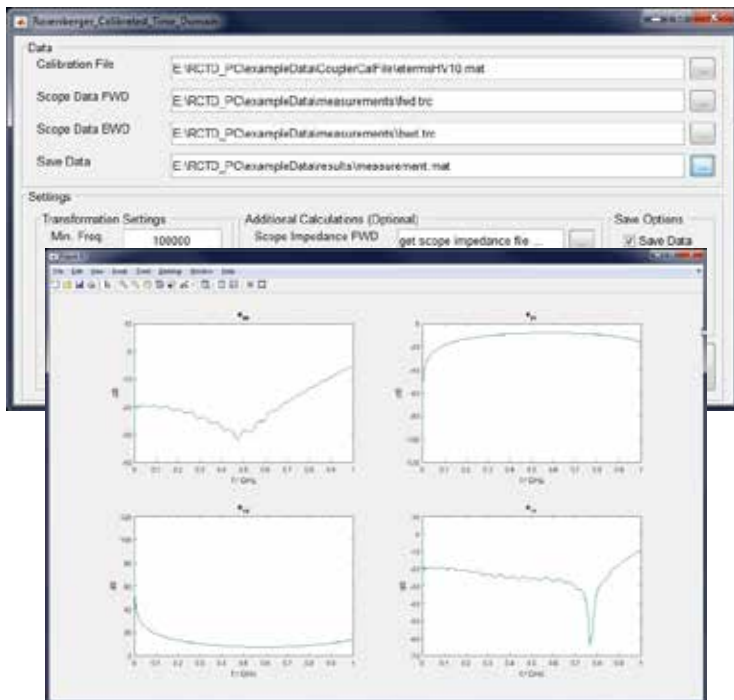
In conjunction with a dedicated calibration process, the patented algorithms (WO2013143650, WO2015117634) can accurately calculate the RF currents and voltages in the calibration reference plane. This enables EMC experts to get a deep insight into the EMC behavior of automotive traction networks.



Applications

- Broadband measurement of voltage and current on high-voltage cables in vehicles including transients and harmonics
- Identification of possible sources of radiated emissions
- Determination of complex source or load impedances at a predefined reference plane
- On-board EMC measurements during test drives
- EMC measurements possible on battery lines, motor lines and power lines for miscellaneous components.

Schematic drawing of a vehicle's traction network including potential positions of couplers



Rosenberger Calibrated Time Domain Software


Rosenberger Calibrated Time Domain Software (RCTD) was developed to enhance EMC-related, automotive, high-voltage measurement capabilities.

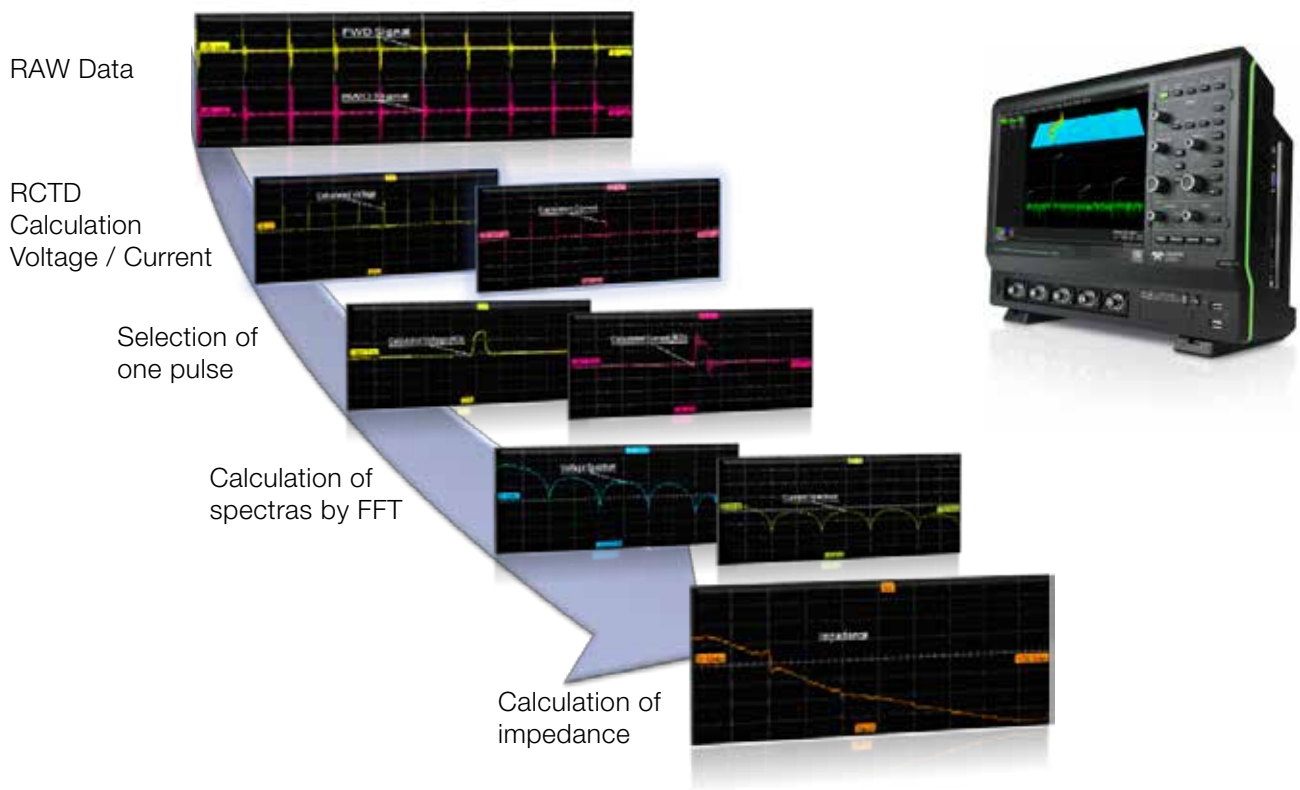
Within the RCTD Software, the time domain data captured by an oscilloscope using the high-voltage coupler is post-processed to calculate current and voltage at the given calibration plane within the high-voltage power train. Therefore, calibration data are taken into account, which are created before the measurements.

RCTD on a PC

- Matlab® based algorithms
- Calculation of voltage and current based on the scope raw-data and coupler calibration data
- Calculation of calibration error terms based on Vector Network Analyzer (VNA)-captured high-voltage coupler S-parameters
- Usage of other directional couplers for different measurement applications possible
- Simple Graphical User Interface (GUI) to improve user experience
- Usage of the RCTD functions within user-specific Matlab® programs with common syntax
- Open-source code of the GUI allows users to adapt the GUI for special measurement purposes

Rosenberger Calibrated Time Domain Software

Rosenberger No.	Remarks	
RCTD-Software	Rosenberger Calibrated Time Domain Software is delivered on a USB-Stick in a stable wooden box. The Software has a hardware-bound license where the USB-Stick is used as dongle. The Software includes the functions for PC, LeCroy HDO oscilloscopes and the calibration routines.	



As an additional feature, the post-processing algorithms have been adapted to run on LeCroy HDO oscilloscopes equipped with the XDEV option to allow real-time evaluation of the measurement results.

RCTD on LeCroy HDO

- Matlab® based algorithms
- Real-time evaluation of signals including average and trigger features
- Usage of LeCroy's XDEV advanced customization software package
- Simple insertion of RCTD algorithms by LeCroy's processing web editor
- Access to additional oscilloscope post-processing and measurement functions for voltages and currents ensures maximum flexibility
- Maximum utilization of RCTD algorithms due to the 12-bit dynamics of the oscilloscope

For further information please see our video "Rosenberger Calibrated Time Domain (RCTD) Measurement":
https://www.youtube.com/watch?v=NaoL-_tF3zM





Website

For more information refer to our website:
www.rosenberger.com/en/products/tm/coupler_metrology.php

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