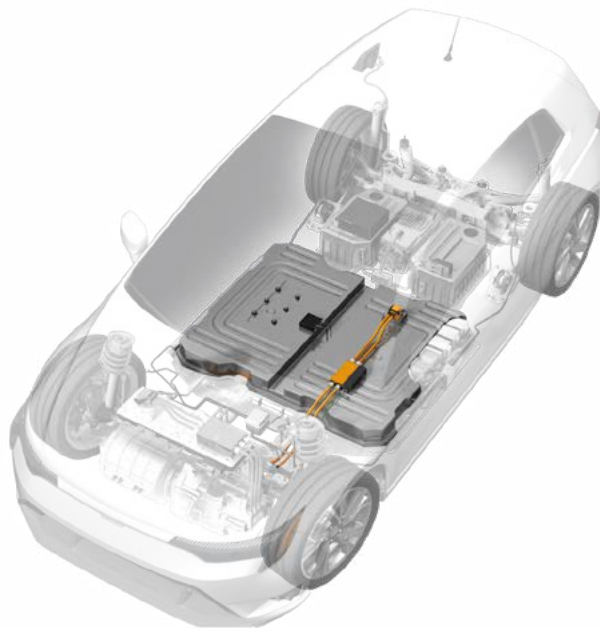


Current and voltage measurements in the HV environment: testing both performance and safety



HV Current and Voltage Measurement

During the development and validation of electric vehicles, a series of tests must be carried out in the high-voltage environment. HV-safe measurements of currents and voltages must not only be made from the perspective of a power calculation, but also to rule out hazards from potentials applied to the vehicle. Measurement modules that can carry out several voltage and current measurements simultaneously and process data directly are therefore ideal for the efficient execution of many measurements.



Mandatory testing

Due to the high voltages with which electric vehicles are operated, tests that serve the safety of persons are not only essential, but also obligatory. One of these tests must ensure that the HV potentials are symmetrical to and separate from the vehicle

ground. This safety check is also specified in the car manufacturers' factory standards. This is intended to rule out or minimize any threat to life and limb in the event of a fault.



Viele Messungen gleichzeitig notwendig

Da für die Sicherheits- und Leistungsberechnungen viele Messungen notwendig sind, aber gleichzeitig Kosten und Zeit gespart werden müssen, ist es erforderlich, den Instrumentierungsaufwand möglichst

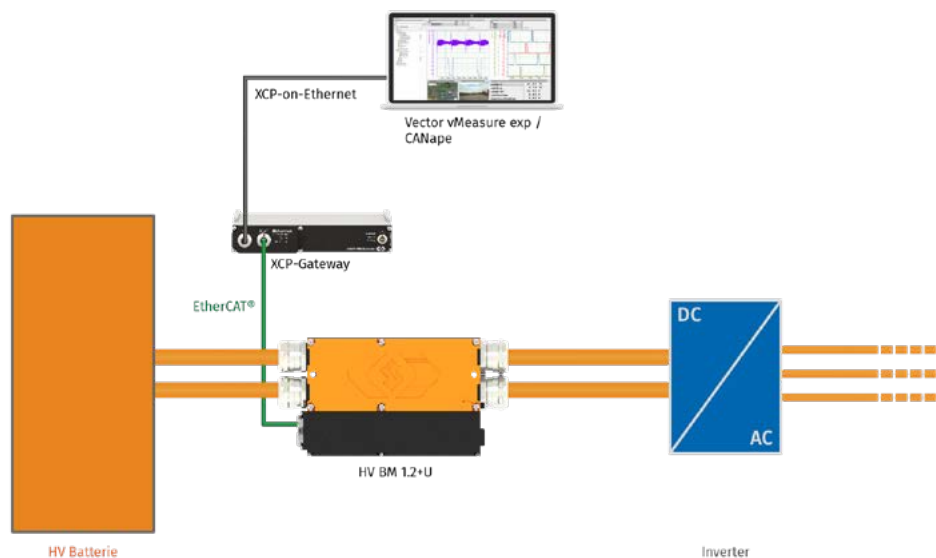
gering zu halten, indem mehrkanalige Messmodule verwendet werden. Daneben muss die verwendete Messtechnik HV-sicher sein und eine schnelle, synchrone Erfassung der Werte ermöglichen.



Only equip once

With the **HV Breakout Module (HV BM) 1.2+U**, up to four measurements can be carried out with just one measurement module. For single-phase measurements on HV live cables, the cables are simply fed through cable glands into the interior of the HV BM 1.2+U module and connected there using ring terminals. The inner conductor current

and voltage can be measured simultaneously, for example to characterize a DC consumer and investigate its interaction with the vehicle electrical system. The module also measures two other voltages simultaneously: that of the HV+ inner conductor and that of the HV- inner conductor to the housing.



With the housing connected to the vehicle ground, possible potential differences can be determined. Safety-relevant investigations regarding the

relative position of the potentials to the vehicle ground can be verified by these measurements.



The HV BM 1.2+U outputs the measurement data with a maximum data rate of up to 1 MHz via Ethernet and simultaneously with a data rate of up to 10 kHz via the additional CAN interface. With the Calc. option, active, apparent power and

reactive power, power factor and the effective values for current and voltage can also be calculated directly in the module. This enables initial analyses without the use of additional hardware and software.



A complete solution in one module

Performing development and safety-relevant measurements in electric vehicles with just one measurement module minimizes the effort required for instrumentation. With the HV BM 1.2+U, asymmetrical potentials outside the HV battery can

also be detected in addition to recording current and voltages for power calculation. This makes the measurement setup more efficient, while measurements can be carried out in a HV-safe and synchronized manner.



Featured Products

HV Breakout-Modul – Typ 1.2+U

Das HV Breakout-Modul (BM) 1.2+U wurde speziell für einphasige Messanwendungen an HV-Spannung führenden Kabeln konzipiert. Es eignet sich wie die HV Breakout-Module 1.2 und 1.2C, um gleichzeitig Innenleiterstrom und Spannung zu erfassen. Zusätzlich werden die Spannungen von HV+ zum Potentialausgleich (PA) und HV- zum PA gemessen.



Kompletttlösungen aus einer Hand.

CSM stellt Ihnen umfangreiche Komplettpakete aus Messmodulen, Sensoren, Verbindungskabeln und Software zur Verfügung - zugeschnitten auf Ihre individuellen Bedürfnisse.

Weitere Informationen zu unseren Produkten erhalten Sie auf www.csm.de oder per E-Mail unter sales@csm.de.



CSM GmbH Headquarters (Germany)

Raiffeisenstr. 36 • 70794 Filderstadt
☎ +49 711 77 96 40 ✉ sales@csm.de

CSM Office Southern Europe (France, Italy)

ArchParc – Site d'Archamps • Immeuble ABC 1 – Entrée A
60, rue Douglas Engelbart • 74160 Archamps, France
☎ +33 4 50 95 86 44 ✉ info@csm-produits.fr

CSM Products, Inc. USA (USA, Canada, Mexico)

1920 Opdyke Court, Suite 200 • Auburn Hills, MI 48326
☎ +1 248 836 4995 ✉ sales@csmproductsinc.com

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