SECURE CONNECTIONS
FOR A SMARTER WORLD

FACT SHEET
ELECTRIFICATION SOLUTIONS

ELECTRIFICATION SOLUTIONS BASED ON AUTOMOTIVE PROCESSORS AND MICROCONTROLLERS

The automotive industry is adapting itself to the new vehicle electrification trends by using renewable sources of energy. Both customer preferences for an eco-friendly lifestyle and government regulations around the globe are driving the growth in electrification systems.

Carmakers understand the need to provide a range of electric vehicle (EV) alternatives to ease the transition from internal combustion vehicles to fully electric. Most carmaker fleets offer progressively electrified vehicle options that cover both customer and government requirements. However, the automotive industry at large is working hard to overcome the hurdle of providing this range of different EV types with varying architectures within small delivery windows.

The automotive industry divided the architectures of new electric and hybrid vehicles (HEVs/EVs) types into 5 different categories: from the basic mild hybrid (M-HEV), full hybrid (F-HEV), and plugin-hybrid (P-HEV), up to the range-extended EV (RE-BEV), and fully electric vehicles (BEV). Each of these architectures has specific power needs. They also need dedicated hardware and software development for the specific systems; reusing hardware and software development across different architectures is helping automakers with the challenges that the market is demanding around costs and time.

NXP delivers electrified system solutions, incorporating optimal performance, robust functional safety, and power management features that automakers and developers require for their next generation of vehicles. We offer a robust, scalable portfolio of functional safety MCUs with associated power management ICs and SBCs, together with in-vehicle networking components for CAN, LIN, FlexRay™, and Ethernet.

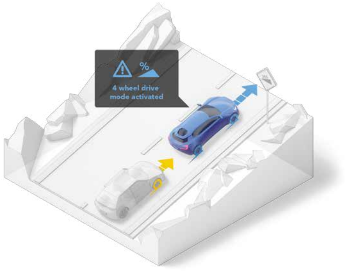
Our development platforms and comprehensive software offerings (partnered with MathWorks) plus worldwide automotive presence and support for engineers can help you develop the next HEV generation. Our broad range of fully qualified solutions helps improve fuel economy and enhance performance.

BATTERY MANAGEMENT SYSTEM (BMS)

Our products for industrial or automotive applications offer high measurement accuracy and ISO 26262 support up to ASIL D functional safety capability.

HYBRID ELECTRIC VEHICLE (HEV)

We developed a portfolio that provides the building blocks for all the different electric vehicle types, addressing the need for cleaner cars and lower emissions.



ELECTRIC VEHICLE (EV) POWER INVERTER

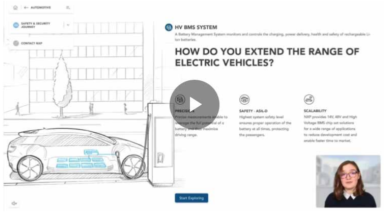
Our products target traction motor and onboard charging (OBC) applications.

BMS	**HEV Engine**	**Power Inverter**
 RDVCU5775EVM high-voltage BMS and Vehicle Control Unit (VCU) reference design, featuring MPC5775B-E	 GreenBox 3 To begin development on NXP's next generation of HEV and internal combustion engine MCUs, featuring S32Z and S32E Real-Time Processors	 EV-INVERTERHDBT power inverter control (ICP 2.0) reference design for electric vehicle high-voltage traction inverters, using IGBT power modules, featuring MPC5775B-E
 MPC5775B/E-EVB development board for BMS and inverter	 MPC5777C-DEVB development board	 EV-INVERTER power inverter control reference design for electric vehicle traction motors and DC to DC converters, featuring MPC5775B-E
 MPC5775B-BatterySystem high-voltage evaluation system	 MPC5777MEVB Evaluation system	
 NEWTEC-NTBMS e-mobility BMS solution targeting ASIL C functional safety, featuring S32K1 MCUs	 MPC5775BE-EVB evaluation system	
 RDDRONE-BMS772 3 to 6 cell BMS on mobile robotics (drones and rovers) reference design, featuring S32K1	 MPC5777CEVB Evaluation System	
 RD-K344BMU high-voltage Battery Management Unit (BMU) reference design, featuring S32K3	 MPC5746REVB Evaluation System	
 RD33771-48VEVM 48 V BMS reference design, featuring MPC574xP		

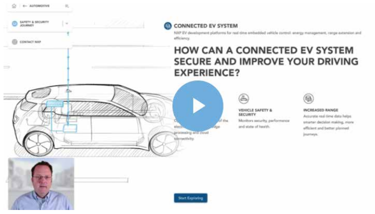
Model-Based Design Toolbox (MBDT) software

Estimating battery state of charge (SoC) is difficult and complex because of the non-linear character of the batteries and the internal environment assessments. Neural Networks and NXP's MBDT helps simplify the development of a battery SoC estimation algorithm for BMS

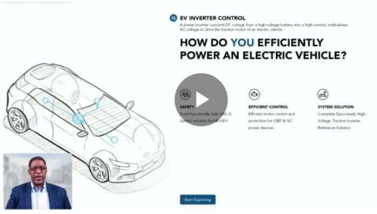
DEMOS



NXPLive Demo: High-Voltage BMS



NXPLive Demo: Connected EV System Solutions



NXPLive Demo: EV Inverter Control

ON-DEMAND TRAINING:

Electrification Training Academy

- Enabling a Connected EV Management System with NXP GoldBox and GreenBox Platforms plus AWS Cloud Services
- High-Voltage Battery Management System Reference Design Based on S32K3
- Deploying Battery Management System Algorithms on NXP S32K from Simulink®
- MathWorks' Deploying a Deep Learning-Based State-of-Charge (SoC) Estimation Algorithm to NXP S32K3 Microcontrollers

LEARN MORE:

nxp.com/electrification

- NXP Vehicle Electrification Solutions – brochure
- How Electrification is Changing Vehicle Architectures – community blog post
- The Significance of Extending the NXP S32 Automotive Platform with Real-Time Processors – blog post
- How to Maximize the Full Potential of EV Batteries – blog post
- Electrification and the Future of EVs – podcast

What is BMS?

Beyond Electrification: Monetization and Recyclable Vehicles

Sustainability in the Automotive Industry: Empowering Vision Zero

Electric Vehicles Edge Closer with NXP's Jens Hinrichsen

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