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Adaptive Control Unit (ACU): X-in-1 Powertrain Domain Controller

This demo showcases a 5-in-1 electric powertrain controller with dynamic voltage control. It features the Adaptive Control Solution from Intel® Automotive, a full stack solution including the new Adaptive Control Unit U310 (ACU U310) – and the Adaptive Control App software platform for electrified powertrain applications. Using a Hardware-in-the-Loop (HiL) simulation environment, we will learn how the ACU U310 ensures freedom of interference between multiple applications within a single chip and enable further energy savings by combining real-time energy supervision, dynamic voltage scaling and optimal control strategies.

Key Benefits

- Unprecedented Integration: Consolidates five to seven traditional microcontroller units (MCU) into a single chip, drastically reducing system complexity and cost.
- Enhanced Energy Efficiency: Dynamic voltage control optimizes energy consumption, leading to extended range and smaller battery requirements.
- Uncompromised Performance: High-speed control loops (1 megahertz for inverter, 500 kilohertz for DC/DC converter) ensure optimal system performance.
- Functional Safety: Intel® Hardware Integrated Safety Integrity Level (HISIL) technology provides physical safety firewalls for freedom from interference between critical functions.
- Flexible Architecture: Supports various power train topologies and configurations, offering versatility for diverse EV designs.

Intel Product and Technology



Intel © Adaptive Control Unit

Intel® Adaptive Control Unit (ACU) U310 is a single-chip solution that enables X-in-1 powertrain domain control, consolidating multiple critical functions onto a single device for unprecedented cost savings, energy efficiency and performance.