

Universal Chassis Controller

Version 1.0



Excellence in R&D

The design of the Universal Chassis Controller (UCC), realized by IAV as a flexible automotive development platform, established a multi-functional controller system compatible, if necessary, with test fleet equipment. Comprised of two integrated target processors, the controller is supplemented by a model-based software development and application environment based on MATLAB®/Simulink®. Advantages of the UCC include the compact size, integrated power output stages, and the ease with which functions are portable from concept to production. This is accomplished through the immediate use of target prototyping hardware that represents production intent designs. As a part of IAV's development services, in-house synergies are utilized in the coordination and management of complete projects within the field of chassis concepts and controls.

To demonstrate and achieve:

- ▶ New algorithms bypassed to the customer's existing system (HiL)
- ▶ Completely new controller strategies

Field of application (examples):

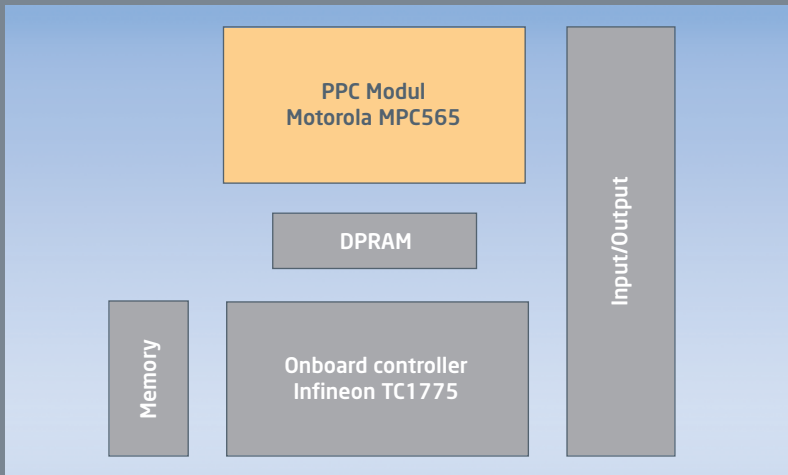
- ▶ Damping control
- ▶ Air suspension
- ▶ Dynamic ride control (stabilizer)

IAV has extended its universal controller unit (UCU) line with the Universal Chassis Controller (UCC).

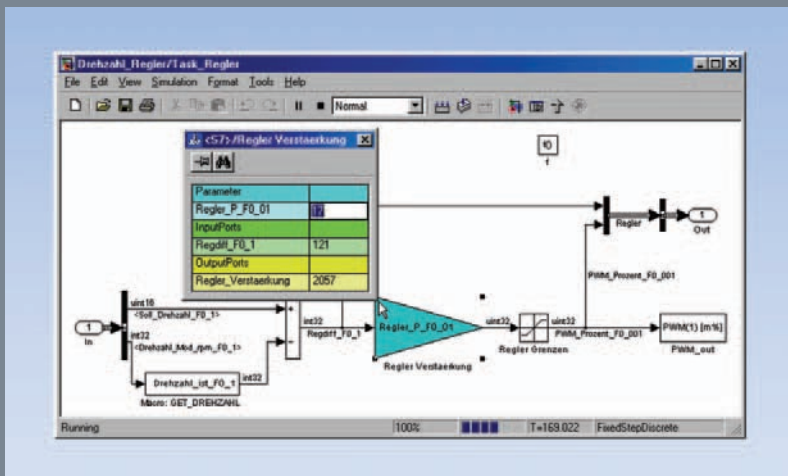
Due to IAV's increased activities in the field of electronic chassis control, the UCC was designed to satisfy the needs of customers and expert teams. Similar to other UCU's, it is the optimal base for pre-development of electronic systems, transferring to series application at a later date.

IAV UCU Standard

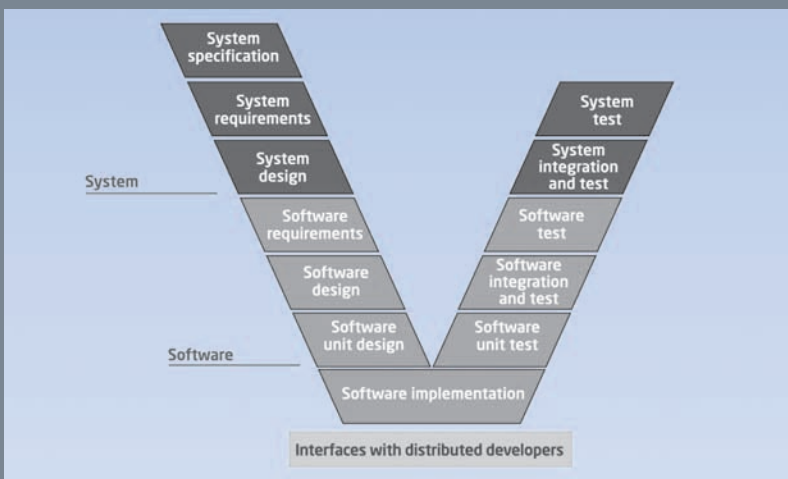
- ▶ Calibration via CAN
- ▶ Measurement via CAN
- ▶ Software Download via CAN



Hardware overview with configurable target processor



Simulink based function development and calibration



Service within the development process

The architecture of the UCC contains the capability to use two powerful micro-controllers. The first, an Infineon TC1775 is integrated as part of the main board. Following the modular structure of IAV's UCU family, a daughter board can be connected to an available expansion slot on the main baseboard. For example, a daughter board with a MPC565 micro-processor is available. Both micro-controllers communicate with each other via a DPRAM and all necessary inputs and outputs can be controlled by both processors. This architecture is ideally structured for the implementation of functional safety concepts.

Model Based Design with MATLAB®/Simulink®

- ▶ Off the shelf development environment
- ▶ Function development, automatic code generation in one step
- ▶ Software in the loop test
- ▶ Abstraction of the hardware
- ▶ In-model debugging

Input/Output:

- ▶ Output stages up to 4 amps current-controlled
- ▶ Output stages up to 4 amps PWM
- ▶ Output stages up to 4 amps (Universal)
- ▶ Output stages up to 1 amps (Universal)
- ▶ Analog/Digital Input/Output
- ▶ CAN

Design and Development Support for:

- ▶ Brake controls
 - ▶ Active air spring and damper
 - ▶ Active stabilizer bar
 - ▶ Steering
 - ▶ Torque vectoring
 - ▶ Tire pressure monitoring
- = Global Chassis Control**

Active Member of



Domain 10.3, Chassis

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