Hands-on demonstration of Multi-Rate Control

Outline of the Presentation

- This tool significantly reduces the burden of developing multicore software to handle multi-rate control.
- It conforms with the de-facto standard JMAAB control modeling guidelines for automotive model-based development.
- Overall operational verification of ECUs in which multiple systems are combined is also possible.

Related Product

- Cycle-accurate simulator for RH850/P1H-C devices in the CS+ integrated development environment (released in the summer of 2018)

Acquire accurate estimate based on MCU information with multicore MBD environment: Reduce risk of reworking

- Cycle-accurate simulator
  - Accuracy: 90%
  - Multicore code estimate
  - Multicore raises performance N times.
  - Automatic multicore code generation
  - Simulink model-based parallelization
  - System design
  - Module design
  - Parallelization policy can be unified from estimate to implementation

- System test
  - Implemented multicore code
  - Implemented multicore code accuracy 100%
  - Parallelization policy can be unified from estimate to implementation

- Product test
  - System test
  - Module test
  - Simulink MBD
  - Use/do
Supporting Software Development for Multi-Rate Control

Multicore Model-Based Environment

Using a Simulink model to verify the execution of multicore RH850 devices prevents the need for reworking in the form of returning to previous processes.

**Features**

- **Automatic creation of multicore code, even for multi-rate control**
  Even for multi-rate control models with multiple control periods, automatically structuring parallel code in a PILS environment can significantly reduce the burden of multicore software development.

- **Designing multicore performance at the beginning of the V-process**
  The provided Simulink scheduler block, conformant with the JMAAB guidelines, simplifies the evaluation of MCUs with single task systems.

- **Verifying the overall operation of ECUs in which multiple systems are combined**
  Multicore execution is visualized with the acquisition of accurate execution times by running systems with multiple control periods in a highly accurate simulator.

**Solutions**

(2) MATLAB and the target code of the simulator are executed in cooperation.

Products covering multi-rate control will be released in the fall of 2018.