



## Problem

A manufacturer of Engine Control ECUs is faced with the challenge to validate and optimize ECU timing over a range of engine speeds (RPM).

ECU load increases with larger RPM, since some functions have to be executed in sync with the crank shaft. Different techniques exist to compensate this load increase. The exact timing of functions further depends on the number and the angular setup of the cylinders.

However, the best application to achieve reliable performance is not obvious. One must select the most appropriate mechanisms that guarantee correct timing under all RPM values, and configure the schedule optimally.

## Solution

SymTA/S focuses on software integration effects on ECU performance and timing. These effects result from scheduling, interrupts or blocking, and can be calculated very efficiently.

Therefore, a customer only needs to characterize the function's net timing at one single RPM value, and import it into SymTA/S. SymTA/S projects this data on any other RPM value and calculates the best- and worst-case response time of each function and task in a matter of seconds. Characteristic curves spanning the complete RPM range can be calculated in minutes, significantly reducing test and measurement time.

Analysis speed makes comprehensive optimization possible. A customer can vary the exact RPM values when load-balancing techniques kick-in, thus converging on solutions that deliver the best reliable performance over the complete RPM range.