

TimingAnalyzer

Schedulability Analysis/Trace Visualization

The basis of designing real-time systems is the analysis of the schedulability. Systems using a real-time operating system like the OSEK/VDX or AUTOSAR operating system consist of tasks and interrupt service routines (ISR).

The schedulability analysis shows that no task and interrupt service routine misses its deadline for any situation.

Features and Advantages

The TimingAnalyzer allows the simulation of schedule tables and the calculation of the schedulability. The analysis is based on the information priority, period, execution time and deadline for each task and ISR. Several algorithms known from the theory of schedulability analysis can be selected. The best fitting algorithm for a given set of information is selected automatically.

Using the TimingAnalyzer avoids the need for the difficult and time-consuming determination of the worst case timing situation by testing. This provides the software developer a tool to integrate known software components together in a system, allowing for reduced costs and timesaving during the program development and the test phase.

The processor utilization is calculated and given as a percentage value. By changing parameters of the application the processor utilization can be optimized and as such leads to an efficient design in respect to hardware resources.

The graphical representation gives an intuitive overview of the timing. The application engineer gets a better understanding of the processing in the control unit. The risks of creating unreliable systems are considerably reduced.

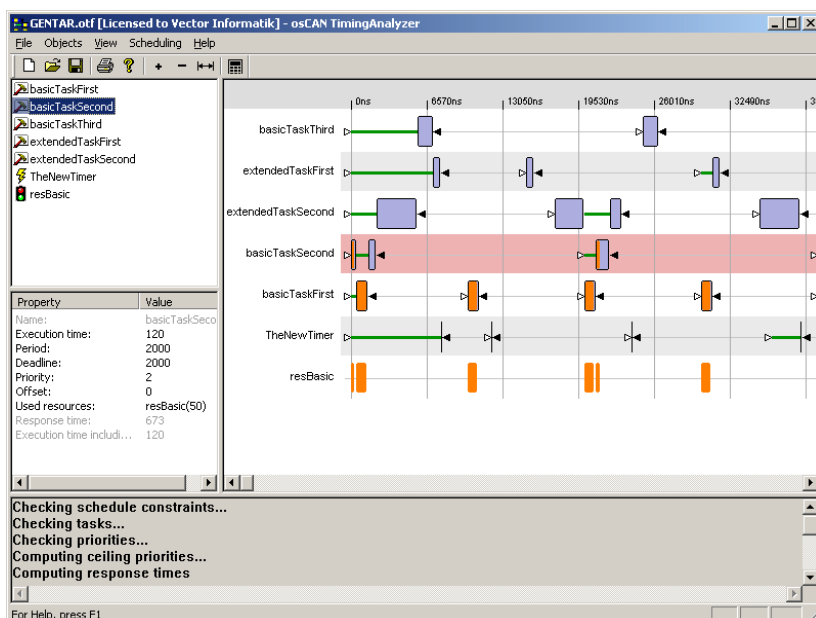
The TimingAnalyzer is hardware independent. However effects of real OS implementations on different processors like task switching times or interrupt latencies can be included into the analysis by configuration.

Functions

The TimingAnalyzer considers tasks and ISRs with their timings. In addition OSEK resources can be configured together with the time each task or ISR occupies the resource. A special algorithm takes resources into account.

The information can be edited directly in the tool or can be imported from OIL files (OSEK Implementation Language files). Editing of values in the configuration tool for the Vector operating systems and launching the TimingAnalyzer from this tool is supported.

The graphical representation is a simulation of a possible task switching sequence. The simulated schedule can be investigated by zooming in and out as well as by measuring time distances. Bit-maps of the graphic can be saved for documentation purposes.



Typical Configuration of the TimingAnalyzer

The TimingAnalyzer can be used to visualize traces recorded by other tools, for example by an emulator. An easy to generate exchange format is defined. The information from traces can be used to obtain the basis for further analysis.

Special Functions

- > Schedulability analysis
- > Graphical simulation of schedules
- > Import and display of emulator traces
- > osCAN and MICROSAR OS/OIL Integration

Fields of Applications

The TimingAnalyzer is an efficient tool for all development departments where real-time operating systems are used. Special care has been taken to support OSEK/VDX and AUTOSAR operating systems and their applications.

Availability

The TimingAnalyzer is available in combination with the OSEK/VDX compliant operating system osCAN and with the AUTOSAR-compliant MICROSAR OS.