High**Integrity**Systems

WITTENSTEIN

8 Reasons to use an RTOS

There are many ways to implement task scheduling within an embedded system. In small systems with limited functionality, super loops provide an adequate method of scheduling tasks. However, as software designs become larger and more complex, the designer should consider the benefits of using an RTOS.

1 Hard Real Time Responsiveness

A priority based, pre-emptive RTOS permits the prioritisation of tasks according to their real time requirements. Tasks that have strict timing constraints are able to take precedence over those that have greater scheduling flexibility, improving the application's responsiveness to time critical events.

2 Maximize System Performance

For many larger, complex embedded applications, using an event driven RTOS (especially a micro kernel) instead of a polled super loop architecture can produce a more effective design, resulting in a smaller memory footprint and making more processor time available to the application.

3 Reduces Complexity

An RTOS allows the application to be broken down into a set of smaller, autonomous tasks. Each task executes within its own context, with no dependency on other tasks within the system or the scheduler itself. This results in a set of small, easy to understand tasks, scheduled by the RTOS.

4 Peak Load Management

An RTOS provides an effective method of managing systems with high peaks of activity. Higher priority levels are allocated to the tasks performing the peak load activities, ensuring they obtain access to the processor at critical times, whilst lower priority tasks are delayed during this time.

5 Tight Middleware Integration

The modular RTOS design makes it easy to add middleware components. Middleware components are integrated as tasks and drivers. They communicate with other tasks using the RTOS resources provided and are scheduled by the RTOS upon the relevant event.

6 Larger Development Teams

Each task can be seen as a project by itself, making use of the RTOS resources provided (queues, semaphores etc) to define inputs and outputs. Defining the system as a set of standalone tasks makes it easier to deploy more developers to a project.

7 Easier Debug and Verification

As the system is split into a set of individual tasks with well-defined functionality and no dependencies on other tasks, it makes it easier to debug and verify each task before integration with the remaining system.

8 Code Re-use

The modular design used within an RTOS system encourages software functionality to be created as independent and verified tasks. As there are no dependencies on other tasks, the re-use of these modules within other designs is made simple.

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8 Reasons to use an RTOS from WITTENSTEIN

Experts in embedded RTOS and Middleware technology with a specialization in safety certified software. Supplying advanced RTOS and Middleware components across a broad range of market sectors and applications, from basic embedded designs, up to complex safety systems demanding the highest levels of certification.

1 Comprehensive Product Range

The WHIS RTOS ecosystem consists of:
- OPEN**RTOS**: The only commercial license for FreeRTOS, the market leading RTOS.
- SAFE**RTOS**: A safety certified RTOS supporting 34 different processor architectures, 18 different tool chains, and numerous International Safety Standards.

2 Huge User Base

FreeRTOS was downloaded in excess of 107,000 times in 2013 alone.

FreeRTOS was top in class in the 2011, 12, 13 & 14 EETimes embedded systems surveys in two areas: RTOS currently used, and RTOS considered for the next project.

3 Strong Product Philosophy

WHIS RTOS and Middleware products are designed to have a small memory footprint, be easy to use, robust and responsive.

4 Compelling Middleware Solutions

WHIS Middleware products (File Systems, USB, Networking components and BSP packages) are available with a tight integration for FreeRTOS, OPEN**RTOS** or SAFE**RTOS**. This close integration results in a higher throughput of data, faster response times, and a reduced memory footprint.

5 Analysis Tools

WHIS provides a range of development tools for use with our RTOS product range. These tools are invaluable for troubleshooting, optimization, or for analyzing performance, ensuring that individual tasks are working in harmony together.

6 Training, Consultancy and Support

Our consultancy services are designed to support our customers, allowing us to share our knowledge and experience to help optimise the final design, improve the design processes and smooth the route to certification. Alternatively increase your development proficiency by attending one of our comprehensive training courses.

7 Flexible Licensing

We aim to provide customers with the license model that best suits their needs, supported with a transparent pricing policy. Our standard licensing model uses a royalty free, perpetual license.

8 Part of a Stable and Mature Corporation

WITTENSTEIN high integrity systems is part of the WITTENSTEIN Group, a global technology company established in 1948, with locations in 45 countries, and employing in excess of 1500 employees.