

# Customer order for extending ROSA functionality

## Order overview

We would like to order extensions to the ROSA real time operating system. The extensions need to be integrated into the existing ROSA without breaking the old functionality. The API for the extended functionality is included in the Appendix.

We need the following features:

- Fixed priority scheduler.
- Dynamic creation and termination of tasks.
- To be able to realize periodic activation and preemptive scheduling of tasks. System clock ticks and delay functionality have to be added.
- Binary semaphore handling.

It would also be highly desirable to include a semaphore protocol that avoids deadlock and bounds blocking time.

## Order details

### Fixed priority scheduler

The scheduler in ROSA is too simple for our needs. Some tasks need to be at higher priority. Arrangements for this in the code would be really helpful.

### Pre-emptive scheduling

We need better control over the periodicity of our task execution. Therefore we need to have clock tick interrupts that keeps track of system time. Preferably we would like to have clock ticks in the millisecond range. Furthermore we need to have both relative and absolute delay functionality.

### Dynamic creation of tasks

We would like to be able to create and remove tasks on during run-time. That, is a task should be able to create other tasks on the fly.

## **Semaphores**

Today we have no option to protect critical code section and access to shared resources. Thus, semaphores has to be included in ROSA.

With semaphores we can foresee some problems with deadlocks and unbounded priority inversion. Preferably we would like to use protocol to solve those problems.