## 一种汽车电子控制器（ECU）嵌入式软件的综合开发需求

**A comprehensive system requirement for an embedded application of ECU based on OSEK OS**

系统的任务分为初始化相关任务、周期任务和同步相关任务。其中：

The target system consists of several types of tasks, namely, initialization tasks, periodic tasks, synchronization tasks and communication tasks, with the following functions:

* 初始化任务：包括ini\_LLD、HLS\_ini、HLS\_ini2、ini\_LLD2等任务，完成各种初始化操作；StartOS执行后，按下列顺序执行初始化任务：ini\_LLD、HLS\_ini、HLS\_ini2、ini\_LLD2。其中ini\_LLD为是自动启动的，而其他初始化任务则由其上一个初始化任务启动。初始化任务设置为不可被抢占；

Initialization tasks: including tasks named as ini\_LLD, HLS\_ini, HLS\_ini2, ini\_LLD2, which will execute as the listed sequence after StartOS has been called. The ini\_LLD task gets ready after the system is initialized, and each of the other tasks is activated by its previous task. All initialization tasks are non-preemptable. The concrete behavior of each task is defined as you will.

* 周期任务：有50ms任务、100ms任务、200ms任务、1000ms任务（可假设1ms为10tick）。根据任务的周期设置其优先级，周期越短优先级越高。各周期任务可通过alarm被激活，并具有可被抢占的性质；

Periodic tasks: including tasks with execution period of 50ms, 100ms, 200ms, 1000ms respectively, where 1ms=10 ticks. It’s suggested that these tasks be activated by corresponding alarms, which can be set by corresponding initialization tasks respectively. The priority of each task is determined by its period, namely, the shorter the period, the higher the priority. All these tasks are preemptable.

* 同步相关任务：有HLS\_inisyn、HLS\_rstsyn、HLS\_firstsyn、HLS\_syn等任务。这些任务的具体功能（即输出信息）自行定义，但需要事件机制与前述的周期任务进行同步，在得到相应周期任务的事件通知后启动运行，输出相关信息。这些同步任务的优先级需要与相关的周期任务优先级相适应。

Synchronization tasks: including tasks named as HLS\_inisyn, HLS\_rstsyn, HLS\_firstsyn, HLS\_syn respectively. The concrete behavior of each task is defined as you will, but each needs to synchonize with an aforementioned periodic task. After corresponding event is set by related periodic task, a synchronization task continue its execution. The priority of each task should be appropriately set according to its related periodic task.

* 通信任务：设计4个任务与同步任务进行通信。

Communication tasks: design 4 tasks to communicate with the synchonization tasks.