

# Development Tools for the CP3000 Family

Micrium, Inc.

## Introduction

Headed by world-renowned author and embedded systems developer Jean J. Labrosse, Micrium, Inc. is a provider of embedded software solutions, including the real-time operating system (RTOS) MicroC/OS-II (also known as  $\mu$ C/OS-II). MicroC/OS-II is currently used in network routers, switches, cell phones, avionics/navigation systems, and medical devices. Micrium additionally licenses and supports other reusable software modules written in ANSI C:  $\mu$ C/GUI (a graphical user interface) and  $\mu$ C/FS (an embedded file system).

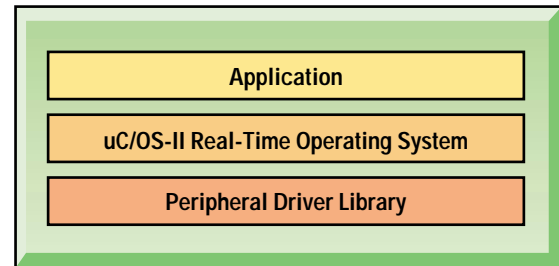
## Support for the CP3000 Family

The  $\mu$ C/OS-II real-time kernel is a portable, ROMable, scalable, preemptive, real-time, multi-tasking kernel that provides the following services:

- Semaphores
- Event flags
- Mutual exclusion semaphores (to reduce priority inversions)
- Message mailboxes
- Message queues
- Task management (create, delete, change priority, suspend/resume, etc.)
- Fixed-sized memory block management
- Time management

The execution times for most services provided by the  $\mu$ C/OS-II kernel are constant and deterministic—e.g. the execution times do not depend on the number of tasks running in the application. The  $\mu$ C/OS-II kernel is also extremely fast, with the scheduler consisting of only four simple lines of C. The CR16C's PUSH and POP instructions help to improve OS efficiency because the bulk of a task's context (CPU general purpose registers) can be saved or restored in just 2 PUSH instructions or 2 POP instructions. Together they consume as little as 40 clock cycles.

The internal workings of the  $\mu$ C/OS-II are described in MicroC/OS-II, The Real-Time Kernel by Jean J. Labrosse.



## Products and Licensing

The MicroC/OS-II CR16C port is supported by National Semiconductor. The  $\mu$ C/OS-II kernel is licensed on an end-product basis. To find out more about the costs associated with the distribution of the  $\mu$ C/OS-II in object form for an unlimited number of units over the life of a product, please contact Micrium, Inc. directly. An object code license is required for each processor that contains  $\mu$ C/OS-II and runs a different binary executable.

The source code for  $\mu$ C/OS-II is described in 'MicroC/OS-II, The Real-Time Kernel' written by Jean J. Labrosse (ISBN 1-57820-103-9). This book also includes a CD containing the source code.

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