



# 802.15.4 MAC and Core RTOS

The Software Technologies Group (STG) 802.15.4 Medium Access Control (MAC) software includes operating system support services to provide not just a 802.15.4 compliant MAC implementation but a complete set of services and facilities to support higher layer applications. When using the STG MAC, you have an 802.15.4 MAC implementation ready to drop onto your hardware and start developing applications.

Software Technologies Group provides a full suite of software and services to complete your 802.15.4 and ZigBee wireless products.

## 802.15.4 MAC and Core RTOS

ZigBee Protocol Stack

MAC Extender

Multiplatform Porting Services

Reference Design Development Services

OEM Customization and adaptation

Embedded Software Development

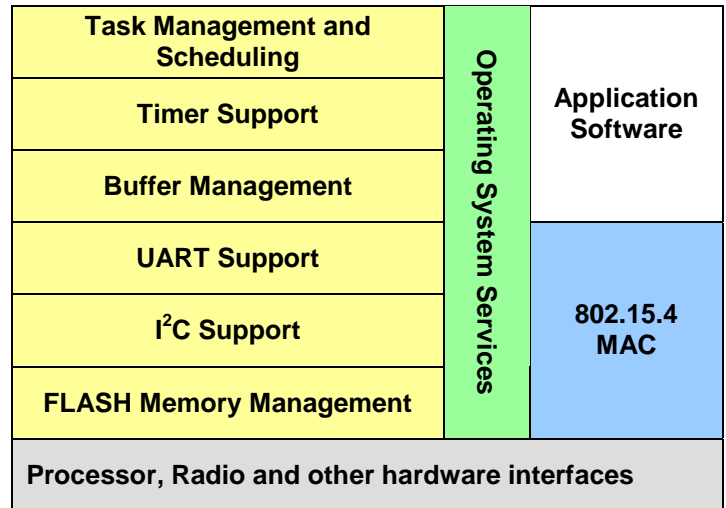
Application Programming Interface Development

For information, please call 708.547.0110 or write sales@stg.com

## MAC System Support Services

### Task Management and Scheduling

- Round Robin style scheduling with scheduler pause capability
- Variable time slice with the ability for applications to relinquish their time slice under application control
- Dynamic task creation and destruction
- Priority task scheduling
- Fast context switches (under 20µs on an Atmel ATmega128)
- Stack bounds checking support
- Mutex support to protect critical code sections
- Task state display for debugging support
- Designed to support highly deterministic systems



### Timer Support

- Timers support for putting the system to sleep and waking after predefined delays (requires appropriate processor support for sleep mode timers)
- User defined number of timers
- Flexible timer expiration processing
  - AND/OR bits in specific memory locations upon timer expiration
  - Function call on time expiration
  - Periodic and one-shot timer support
- Deterministic actions if all timers are in used (times out instantly)
- Fine granularity (specific granularity dependent on underlying processor support and processor operating mode in effect)

### Buffer Management

- Configurable fixed buffer pool
- "Lost" buffer recovery support
- Time deterministic buffer allocation and freeing algorithm
- Manager is robust enough to correctly free a buffer using a pointer to any location in the managed buffer



Software Technologies Group, Inc.  
10330 W. Roosevelt Rd, Suite 310  
Westchester, IL 60154 USA

www.stg.com

Software Solutions for Product Developers

708.547.0110  
708.547.0783 (fax)

## UART Support

- Interrupt driven receive and transmit support
- Block data and single character support
- Priority transmit support
- Timed receive capability
- Variable baud rate support
- Specific functionality may be impacted by UART used

## I2C Support

- Interface library to access I2C-based data via a processor supplied I2C interface

## FLASH Memory Management

- Allows overwriting code space from inline code
- Block erase
- Block and character-based write modes supported
- Designed to support wireless driven FLASH updating

## Support for Standards

Implements MAC layer primitives as defined by IEEE Std 802.15.4™-2003 standard with the exceptions of:

- Beacons
- Guaranteed Time Slice (GTS)

The STG ZigBee Protocol Stack will be a direct drop onto the MAC to provide an easy upgrade path to ZigBee mesh networking support with no integration efforts or additional low level changes.

## Supported Processors

- Atmel ATmega128L
- Specific processor support available on request

## Licensing

Standard licensing covers binary licenses ready for use on a hardware platform using a supported processor. Porting to other specific processors and source licenses are available.

---

## About Software Technologies Group, Inc.

Software Technologies Group, Inc. (STG) provides software solutions for product developers allowing its customers to fully implement hardware and software technologies in their products. Since 1990, STG has provided end-to-end software related services including design, development, testing and support. STG's broad expertise in a variety of commercial, real-time and embedded operating systems and proven development methodology enable delivery of total solutions for a variety of markets. STG can be reached at 708.547.0110 or at its website <http://www.stg.com>.

"ZigBee" is a trademark of the ZigBee Alliance which can be reached at <http://www.zigbee.org>.



Software Solutions for Product Developers

Software Technologies Group, Inc.  
10330 W. Roosevelt Rd, Suite 310  
Westchester, IL 60154 USA

[www.stg.com](http://www.stg.com)

708.547.0110  
708.547.0783 (fax)