

# Micrium

Empowering Embedded Systems

## μC/CPU

V1.23

### Release Notes

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

## Revision History

Version	Date	Description
V1.23	2009 Jul	CPU timestamp, timer, & time measurement features First version with release history & user manual

## New Features

### Version 1.23

#### V1.23-001

Added new CPU timestamp, timer, & time measurement features. [Note that an application **MUST** call `CPU_Init()` to initialize CPU timestamp **OR** time measurement features prior to any other calls to CPU time functions.]

#### V1.23-001a

Added `CPU_CFG_TS_EN` in `cpu_cfg.h` to enable/disable CPU timestamps :

<code>CPU_TS_Get()</code>	gets the current, real-time value of 64-bit CPU timestamp, returned via two 32-bit values
<code>CPU_TS_GetLo()</code>	gets only the lower 32-bits of 64-bit timestamp
<code>CPU_TS_Update()</code>	updates the real-time value of 64-bit CPU timestamp (see 'New Features V1.23-001c <code>CPU_TS_TmrRd()</code> ')

#### V1.23-001b

Added `CPU_CFG_INT_DIS_MEAS_EN` & `CPU_CFG_INT_DIS_MEAS_OVRHD_NBR` in `cpu_cfg.h` to enable/disable measuring interrupts disabled times :

<code>CPU_IntDisMeasMaxGet()</code>	gets the maximum time interrupts are disabled, returned via a 32-bit timestamp value; this maximum value is non-resetable
<code>CPU_IntDisMeasMaxCurGet()</code>	gets the current maximum time interrupts are disabled, returned via a 32-bit timestamp value; this maximum value is resetable
<code>CPU_IntDisMeasMaxCurReset()</code>	resets the current maximum time interrupts are disabled

#### V1.23-001c

The following timer functions **MUST** be implemented in an application if either CPU timestamps **OR** interrupts disabled time measurements are enabled :

<code>CPU_TS_TmrInit()</code>	initializes & starts a hardware (or software) timer to update CPU timestamps & time measurements
<code>CPU_TS_TmrRd()</code>	gets current hardware (or software) timer value to update CPU timestamps or time measurements
<code>CPU_TS_to_uSec()</code>	convert (up to) 64 bits of a CPU timestamp value into microseconds, returned via two 32-bit values

## Improvements

Version 1.23

**V1.23-001**

Added **CPU\_CFG\_MODULE\_PRESENT** header guard to ensure `cpu_cfg.h` is processed only once, regardless if `#include`'d by multiple source or header files.

## Changes

Version 1.23

**V1.23-001a**

Moved **CPU\_ERR** data type definition from each `cpu_cfg.h` to `cpu_core.h`.

## Corrections

Version 1.23

N/A

## Known Problems

Version 1.23

N/A

## Limitations

**001**

Support for 64-bit data **NOT** available for all CPUs

## Contacts

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