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Empowering Embedded Systems

μC/LIB

V1.31

Release Notes

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Revision History

Version	Date	Description
V1.31	2009 Dec	New features, bug fixes, & improvements
V1.30	2009 Jun	New features, bug fixes, & improvements
V1.29	2009 Apr	New features & improvements
V1.28	2009 Mar	New features & improvements
V1.27	2009 Jan	New features, bug fixes, & improvements
V1.26	2008 Nov	New features, bug fixes, & improvements
V1.25	2008 Jul	New features & improvements
V1.24	2007 May	Improvements
V1.23	2007 Mar	Bug fixes & improvements
V1.22	2006 Sep	Improvements
V1.21	2006 Aug	New features & improvements
V1.20	2006 Jun	New features & improvements
V1.19	2006 Apr	Improvements
V1.18	2005 Oct	Bug fixes & improvements First version with release history
V1.17	2005 Jul	Improvements
V1.16	2005 Jun	Improvements
V1.15	2005 May	Improvements
V1.14	2005 Apr	Improvements
V1.13	2005 Feb	Improvements
V1.12	2004 Dec	Improvements
V1.11	2004 Nov	Improvements
V1.10	2004 Sep	Improvements
V1.00	2004 Feb	First release

Requires the following versions of needed Modules

Version 1.31
µC/CPU Version 1.22

Version 1.30
µC/CPU Version 1.22

Version 1.29
µC/CPU Version 1.22

Version 1.28
µC/CPU Version 1.22

Version 1.27
µC/CPU Version 1.20

Version 1.26
µC/CPU Version 1.19

Version 1.25
µC/CPU Version 1.18

Version 1.24
µC/CPU Version 1.17

Version 1.23
µC/CPU Version 1.16

Version 1.22
µC/CPU Version 1.15

Version 1.21
µC/CPU Version 1.14

Version 1.20
µC/CPU Version 1.14

Version 1.19
µC/CPU Version 1.14

Version 1.18
µC/CPU Version 1.13

Version 1.17
µC/CPU Version 1.12

Version 1.16
µC/CPU Version 1.12

New Features

Version 1.31

V1.31-001
Added new Boolean-related defines :

```
DEF_INVALID
DEF_VALID
```

V1.31-002
Added new string functions :

`Str_Char_Last_N()`	searches a string for a character starting from the end of the string limited to a maximum number of characters
`Str_Str_N()`	searches a string for a sub-string limited to a maximum number of characters

See also ‘New Features V1.20-001, V1.26-003, & V1.30-004’.

Version 1.30

V1.30-001

Added new template configuration file **`lib_cfg.h`**.

V1.30-002

Added **`LIB_MEM_CFG_OPTIMIZE_ASM_EN`** to enable/disable assembly-optimized memory functions. See also 'Changes V1.30-001'.

V1.30-003

Added new math module functions :

`Math_Init()`	initializes mathematical library
`Math_Rand()`	generates a (pseudo-) random number
`Math_RandSeed()`	generates the next (pseudo-) random number after a specified seed value
`Math_RandSetSeed()`	sets the next (pseudo-) random number seed value

V1.30-004

Added new string functions :

`Str_Len_N()`	calculates a string's length limited to a maximum number of characters

See also 'New Features V1.20-001, V1.26-003, & V1.31-001'.

Version 1.29

V1.29-001

Added new time-related defines :

```
DEF_TIME_NBR_DAY_PER_WK
DEF_TIME_NBR_DAY_PER_YR
DEF_TIME_NBR_DAY_PER_YR_LEAP

DEF_TIME_NBR_HR_PER_WK
DEF_TIME_NBR_HR_PER_YR
DEF_TIME_NBR_HR_PER_YR_LEAP

DEF_TIME_NBR_MIN_PER_WK
DEF_TIME_NBR_MIN_PER_YR
DEF_TIME_NBR_MIN_PER_YR_LEAP

DEF_TIME_NBR_SEC_PER_WK
DEF_TIME_NBR_SEC_PER_YR
DEF_TIME_NBR_SEC_PER_YR_LEAP
```

Version 1.28

V1.28-001

Added **LIB_MEM_CFG_HEAP_BASE_ADDR** to (optionally) specify the heap memory base address.

Version 1.27

V1.27-001

Added new memory allocation function :

Mem_PoolClr()	clear a memory pool

See also 'Changes V1.26-001' & 'New Features V1.25-001'.

Version 1.26

V1.26-001

Added new memory allocation function :

Mem_HeapAlloc()	get memory from the heap

See also 'Changes V1.26-001' & 'New Features V1.25-001'.

V1.26-002

Added new ASCII module functions & macro's :

ASCII_IsDigOct() **ASCII_IS_DIG_OCT()**	indicates whether a character is an octal digit

See also 'New Features V1.25-002'.

V1.26-003

Added new string compare functions :

Str_CmpIgnoreCase()	compares two strings, ignoring case
Str_CmpIgnoreCase_N()	compares two strings, ignoring case, up to a maximum number of characters

See also 'New Features V1.20-001, V1.30-004, & V1.31-001'.

V1.26-004a
Added new string format functions :

Str_FmtNbr_Int32U()	formats an unsigned number into a string
Str_FmtNbr_Int32S()	formats a signed number into a string

V1.26-004b
Added new string parse functions :

Str_ParseNbr_Int32U()	parses an unsigned number from a string
Str_ParseNbr_Int32S()	parses a signed number from a string

Version 1.25

V1.25-001
Added new memory allocation functions :

Mem_PoolCreate()	create a memory pool
Mem_PoolBlkGet()	get a memory block from a memory pool
Mem_PoolBlkFree()	free a memory block back to a memory pool

See also ‘Changes V1.26-001’.

V1.25-002
Added new ASCII module functions & macro's :

ASCII_IsAlpha() **ASCII_IS_ALPHA()**	indicates whether a character is alphabetic
ASCII_IsAlnum() **ASCII_IS_ALNUM()**	indicates whether a character is alphanumeric (see also 'Changes V1.27-001')
ASCII_IsLower() **ASCII_IS_LOWER()**	indicates whether a character is lowercase
ASCII_IsUpper() **ASCII_IS_UPPER()**	indicates whether a character is uppercase
ASCII_IsDig() **ASCII_IS_DIG()**	indicates whether a character is a decimal digit
ASCII_IsDigHex() **ASCII_IS_DIG_HEX()**	indicates whether a character is a hexadecimal digit
ASCII_IsBlank() **ASCII_IS_BLANK()**	indicates whether a character is blank
ASCII_IsSpace() **ASCII_IS_SPACE()**	indicates whether a character is a space
ASCII_IsPrint() **ASCII_IS_PRINT()**	indicates whether a character is printable
ASCII_IsGraph() **ASCII_IS_GRAPH()**	indicates whether a character is graphic
ASCII_IsPunct() **ASCII_IS_PUNCT()**	indicates whether a character is punctuation
ASCII_IsCtrl() **ASCII_IS_CTRL()**	indicates whether a character is a control
ASCII_ToLower() **ASCII_TO_LOWER()**	converts uppercase to lowercase
ASCII_ToUpper() **ASCII_TO_UPPER()**	converts lowercase to uppercase
ASCII_Cmp()	compares two characters (case insensitive)

See also 'Changes V1.25-001'.

Version 1.24

V1.24-001

Added new CPU-related integer defines :

- **DEF_INT_CPU_NBR_BITS**
- **DEF_INT_CPU_MASK**
- **DEF_INT_CPU_U_MIN_VAL**
- **DEF_INT_CPU_U_MAX_VAL**
- **DEF_INT_CPU_S_MIN_VAL**
- **DEF_INT_CPU_S_MAX_VAL**
- **DEF_INT_CPU_S_MIN_VAL_ONES_CPL**
- **DEF_INT_CPU_S_MAX_VAL_ONES_CPL**

Version 1.23

N/A

Version 1.22

N/A

Version 1.21

V1.21-001

Added new memory data value macro's :

MEM_VAL_GET_???()	decode data values from any memory address
MEM_VAL_SET_???()	encode data values to any memory address
MEM_VAL_COPY_GET_???()	copy & decode data values from any memory address to any other memory address
MEM_VAL_COPY_SET_???()	copy & encode data values from any memory address to any other memory address
MEM_VAL_COPY_???()	copy data values from any memory address to any other memory address

Version 1.20

V1.20-001

Added new string functions :

`Str_Copy_N()`	copies a string limited to a maximum number of characters
`Str_Cat_N()`	concatenates two strings limited to a maximum number of characters
`Str_Char_N()`	searches a string for a character limited to a maximum number of characters

See also ‘New Features V1.26-003, V1.30-004, & V1.31-001’.

Version 1.19

N/A

Version 1.18

N/A

Improvements

Version 1.31

V1.31-001

Updated µC/LIB's MISRA-C compliance :

V1.31-001a1

Appended unsigned 'u' qualifier to all unsigned integer constants.

V1.31-001a2

Removed redundant 'L' qualifier from all long integer constants.

V1.31-001b

Replaced all instances of '???' comments with '&&&' (to avoid possible usage of C trigraphs).

V1.31-001c

Refactored the following functions to copy any function arguments into local variables before modifying :

```
Mem_HeapAlloc()
Mem_PoolCreate()

Str_Len_N()
Str_Copy_N()
Str_Cat_N()
Str_Cmp_N()
Str_CmpIgnoreCase_N()
Str_Char_N()
```

V1.31-002

Improved the following string functions to call their corresponding length-limited functions :

`Str_Char_Last()`	calls `Str_Char_Last_N()`
`Str_Str()`	calls `Str_Str_N()`

See also 'New Features V1.31-002' & 'Improvements V1.26-001'.

V1.31-003

Improved the following functions to terminate, & return errors when possible, if any strings point or overlap with the **`NULL`** address (i.e. the terminating **`NULL`** character is **NOT** found prior to the string pointer overflowing to the **`NULL`** address) :

- **`Str_Copy_N()`**
- **`Str_Cat_N()`**
- **`Str_Char_N()`**
- **`Str_Char_Last_N()`**
- **`Str_Str_N()`**

See also 'Corrections V1.31-001'.

Version 1.30

V1.30-001

Improved the following bit macro's to be called from within conditional expressions :

- **`DEF_BIT_SET()`**
- **`DEF_BIT_CLR()`**

Version 1.29

V1.29-001

Improved the configuration of optional memory allocation argument checking.

Version 1.28

V1.28-001

Replaced all '**`cpu_sr`**' local variable declarations with µC/CPU's new **`CPU_SR_ALLOC()`** macro.

Version 1.27

N/A

Version 1.26

V1.26-001
Improved the following string functions to call their corresponding length-limited functions :

`Str_Copy()`	calls **`Str_Copy_N()`**
`Str_Cat()`	calls **`Str_Cat_N()`**
`Str_Cmp()`	calls **`Str_Cmp_N()`**
`Str_Char()`	calls **`Str_Char_N()`**

See also ‘New Features V1.20-001’ & ‘Improvements V1.31-002’.

V1.26-002a
Improved unsigned integer macro definitions by explicitly declaring unsigned constant.

V1.26-002b
Improved signed integer macro definitions by avoiding twos-complement arithmetic underflow.

Version 1.25

N/A

Version 1.24

V1.24-001
Added **`LIB_VERSION`** to indicate current library module software version number.

V1.24-002
Improved several **`DEF_BIT_???()`** macro’s to handle overflow boundary conditions.

V1.24-003
Added several **`LIB_STR_???`** common string defines.

Version 1.23

V1.23-001
Removed **`malloc()`** & all other references to standard library memory functions.

Version 1.22
N/A

Version 1.21
N/A

Version 1.20
V1.20-001
Improved ARM assembly port files to be compatible for both ARM & Thumb modes.

Version 1.19
N/A

Version 1.18
V1.18-001
Added macro function headers for all **`lib_def.h`** macros.

V1.18-002
Improved consistency for all **`lib_str.c`** functions.

Changes

Version 1.31

N/A

Version 1.30

V1.30-001

Replaced assembly-optimized configuration from generic '**uC_CFG_OPTIMIZE_ASM_EN**' to library-specific '**LIB_MEM_CFG_OPTIMIZE_ASM_EN**'. See also 'New Features V1.30-002'.

Version 1.29

N/A

Version 1.28

N/A

Version 1.27

V1.27-001

Renamed the following **lib_ascii.h** macro's & functions :

ASCII_IsAlnum()	renamed to **ASCII_IsAlphaNum()**
ASCII_IS_ALNUM()	renamed to **ASCII_IS_ALPHA_NUM()**

V1.27-002
Modified **`Str_FmtNbr_???()`** leading character parameter from a Boolean ('**`lead_zeros`**') that specified whether leading zeros were prepended to the formatted number string when necessary, to the desired ASCII character ('**`lead_char`**') to prepend to the formatted number string :

```
CPU_CHAR  *Str_FmtNbr_Int32U(CPU_INT32U     nbr,
                             CPU_INT08U     nbr_dig,
                             CPU_INT08U     nbr_base,
                             CPU_CHAR       lead_char,
                             CPU_BOOLEAN    lower_case,
                             CPU_BOOLEAN    nul,
                             CPU_CHAR      *pstr);

CPU_CHAR  *Str_FmtNbr_Int32S(CPU_INT32S     nbr,
                             CPU_INT08U     nbr_dig,
                             CPU_INT08U     nbr_base,
                             CPU_CHAR       lead_char,
                             CPU_BOOLEAN    lower_case,
                             CPU_BOOLEAN    nul,
                             CPU_CHAR      *pstr);

CPU_CHAR  *Str_FmtNbr_32    (CPU_FP32       nbr,
                             CPU_INT08U     nbr_dig,
                             CPU_INT08U     nbr_dp,
                             CPU_CHAR       lead_char,
                             CPU_BOOLEAN    nul,
                             CPU_CHAR      *pstr);
```

Version 1.26

V1.26-001
Changed memory pool configuration to memory allocation configuration — '**`LIB_MEM_CFG_POOL_EN`**' to '**`LIB_MEM_CFG_ALLOC_EN`**'.

V1.26-002
Changed the following **`lib_mem.h`** error codes :

`LIB_MEM_ERR_INVALID_ADDR` changed to
`LIB_MEM_ERR_INVALID_BLK_ADDR`

V1.26-003
Changed the following **`lib_def.h`** macro constants :

`DEF_INACTIVE` redefined to `0`
`DEF_ACTIVE` redefined to `1`

Version 1.25

V1.25-001

The following macro's in **lib_str.h** have been deprecated & replaced with new macro's & functions in **lib_ascii.h** :

Str_IsAlpha()	replaced with	**ASCII_IsAlpha() / _IS_ALPHA()**
Str_IsDigit()	replaced with	**ASCII_IsDig() / _IS_DIG()**
Str_IsSpace()	replaced with	**ASCII_IsSpace() / _IS_SPACE()**
Str_IsPrint()	replaced with	**ASCII_IsPrint() / _IS_PRINT()**
Str_IsUpper()	replaced with	**ASCII_IsUpper() / _IS_UPPER()**
Str_IsLower()	replaced with	**ASCII_IsLower() / _IS_LOWER()**
Str_ToUpper()	replaced with	**ASCII_ToUpper() / _TO_UPPER()**
Str_ToLower()	replaced with	**ASCII_ToLower() / _TO_LOWER()**

See also 'New Features V1.25-002'.

Version 1.24

N/A

Version 1.23

N/A

Version 1.22

N/A

Version 1.21

N/A

Version 1.20

V1.20-001

The following macro names in **lib_str.h** have been changed to comply with standard naming conventions :

Is_Alpha()	changed to **Str_IsAlpha()**
Is_Digit()	changed to **Str_IsDigit()**
Is_Space()	changed to **Str_IsSpace()**
Is_Print()	changed to **Str_IsPrint()**
Is_Upper()	changed to **Str_IsUpper()**
Is_Lower()	changed to **Str_IsLower()**
To_Upper()	changed to **Str_ToUpper()**
To_Lower()	changed to **Str_ToLower()**
Str_To_Long()	changed to **Str_ToLong()**
Str_Format_Print()	changed to **Str_FmtPrint()**
Str_Format_Scan()	changed to **Str_FmtScan()**

Version 1.19

V1.19-001

Macros **Str_Format_Print()** & **Str_Format_Scan()** in **lib_str.h** have been corrected to be compatible with some compilers.

Version 1.18

V1.18-001

DEF_BIT_MASK() macro & **DEF_BIT_FIELD()** macro switched names.

V1.18-002

Renamed **Str_Char_R()** to **Str_Char_Last()**.

Corrections

Version 1.31

V1.31-001

Refactored the following functions to fully comply with their standard library equivalents (see also 'Improvements V1.31-003') :

V1.31-001a

`Str_Copy_N()` incorrectly always appended a terminating **`NULL`** character to the destination string, regardless of the specified maximum number of characters to copy. Fixed by only copying the source string's terminating **`NULL`** character if available within the specified maximum number of characters to copy.

V1.31-001b

`Str_Str_N()` incorrectly returned a pointer to the string's terminating **`NULL`** character if the search string was a zero-length **`NULL`** string. Fixed by returning a pointer to the string if the search string is a zero-length **`NULL`** string.

Version 1.30

N/A

Version 1.29

N/A

Version 1.28

N/A

Version 1.27

V1.27-001

`Str_ParseNbr_Int32()` failed to always set negative sign ('**`neg`**') during validation. Fixed by always setting '**`neg`**' for all conditions.

Version 1.26

V1.26-001

`Mem_PoolCreate()` incorrectly calculated the number of additional octets required to successfully allocate all requested memory (returned by '**`p_octets_reqd`**') for certain fault conditions. Fixed by calculating & returning the actual additional octets required to successfully allocate all requested memory for all error/fault conditions.

Version 1.25
N/A

Version 1.24
N/A

Version 1.23
V1.23-001
ARM assembly port files were not completely compatible for both ARM & Thumb modes (see 'Improvements V1.20-001'). Corrected by using only ARM & Thumb mode instructions.

Version 1.22
N/A

Version 1.21
N/A

Version 1.20
N/A

Version 1.19
N/A

Version 1.18
V1.18-001
`Str_Str()` incorrectly assigned unsigned string lengths to signed variables. Corrected by assigning string lengths to unsigned variables.

V1.18-002
`lib_mem_a.asm` did not correctly terminate the memory copy during the **`Pre_Copy_1`** label if no more data octets to copy. Corrected by terminating the memory copy if no more data octets.

Known Problems

Version 1.31
V1.18-001b (Unresolved)

Version 1.30
V1.18-001b (Unresolved)

Version 1.29
V1.18-001b (Unresolved)

Version 1.28
V1.18-001b (Unresolved)

Version 1.27
V1.18-001b (Unresolved)

Version 1.26
V1.18-001b (Unresolved)

Version 1.25
V1.18-001b (Unresolved)

Version 1.24
V1.18-001b (Unresolved)

Version 1.23
V1.18-001b (Unresolved)

Version 1.22
V1.18-001a (Unresolved)
V1.18-001b (Unresolved)

Version 1.21
V1.18-001a (Unresolved)
V1.18-001b (Unresolved)

Version 1.20
V1.18-001a (Unresolved)
V1.18-001b (Unresolved)

Version 1.19
V1.18-001a (Unresolved)
V1.18-001b (Unresolved)

Version 1.18
V1.18-001a

`lib_mem.h` includes some standard library files and functions. **ALL** references to standard library files and functions **SHOULD** be removed once all custom library functions are implemented.

V1.18-001b

`lib_str.h` includes some standard library files and functions. **ALL** references to standard library files and functions **SHOULD** be removed once all custom library functions are implemented.

Limitations

001
Does not support variable argument library functions

Contacts

Micriμm
949 Crestview Circle
Weston, FL 33327
USA
+1 954 217 2036
+1 954 217 2037 (FAX)
e-mail: Licensing@Micrium.com
WEB: www.Micrium.com