

MISRA™ Compliant TCP/IP Stack

Many networking products are available for embedded systems. The key to developing a stable and successful software application is to use high-quality, verifiable software that ensures a stable, low-risk development environment. HCC's TCP/IP was developed to the highest possible level of MISRA¹ compliance and was validated using advanced verification tools. With the benefit of more than a decade's experience in developing efficient, high-quality software for medical, transport, industrial and aerospace markets, HCC's TCP/IP stack brings new levels of performance, quality and reliability to the embedded networking market.

TCP/IP Key Features

HCC's MISRA-compliant TCP/IP Stack has the following features.

- TCP
- IPv4
- UDP
- ARP
- ICMP
- DNS client
- DHCP
- HTTP server
- FTP server
- TFTP server
- SMTP
- Full MISRA-compliant source code
- No dynamic memory allocation (no malloc/free)
- Standard BSD sockets interface
- Zero copy
- Small footprint (RAM/ROM)
- High speed data transfer
- Low power consumption due to low CPU overhead
- Verified compatibility with most popular embedded RTOSes
- Efficient operation without an RTOS

MISRA Compliance and Validation

HCC Embedded's TCP/IP stack is fully compliant with MISRA-C:2004.

First introduced by the automotive industry, MISRA has become a 'best practice' coding standard, widely used in the medical, industrial, telecom and aerospace industries. HCC has combined MISRA with its own rigorous coding standard to create a concise subset of the C language for use in embedded communications systems. The result is clean, clear and robust code without ambiguities. It is appropriate for use on the most critical embedded applications.

Full compliance documentation, developed using the LDRA² Tool Suite, is supplied for customers to help integrate with existing development processes and to confirm that the highest standards of compliance have been met.

¹"MISRA" is a registered trademark of MIRA Ltd, held on behalf of the MISRA Consortium. No endorsement by MISRA is claimed or implied for any product.
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Small Footprint, High Throughput, Low CPU Cycle Operation

An innovative approach to design has resulted in an extremely high-speed data transfer rate, with minimal system resource requirements. Tests have shown that packet processing runs up to **four times faster** than comparable embedded stacks, while using around **14K of ROM**, in a typical application scenario³. RAM requirements can vary widely depending on application needs but are typically as low as **12K**. It is possible, with a minimum configuration UDP application, to use less than **5K of ROM** and a few hundred bytes of RAM (plus network buffers).

Broad Range of Target Processors & Tools

HCC's MISRA-compliant TCP/IP can operate efficiently on a broad range of target processors. Designed so that it can be ported easily and quickly to new architectures, the stack is available with drivers for a range of leading processors, including these:

- ARM: ARM7, ARM9, Cortex-M3, Cortex-M4
- Freescale: ColdFire v1/V2, Kinetis
- Renesas: RX600, SuperH
- Microchip: PIC32
- STMicro: STM32
- NXP: LPC24xx, LPC17xx, LPC31xx
- Texas Instruments: Stellaris, OMAP
- Atmel: AVR32, SAM3/7/9

HCC supports popular compilers and toolchains, including:

- IAR Embedded Workbench
- Keil uVision
- Code Composer Studio
- CodeWarrior
- CodeSourcery
- Renesas HEW
- AVRStudio
- Atollic True Studio
- Eclipse and GCC
- Green Hills Multi

Flexible Choice of Real-time Operating Systems & Middleware

HCC has spent a decade focused on supplying efficient storage and communications software. During this period it has developed the world's leading expertise in efficiently inter-operating with many different types of scheduling mechanisms and environments. We have abstraction layers for most popular RTOSes and we also supply aemSync, a light-weight scheduler for handling interfaces to 'in-house' scheduling mechanisms or super-loops. This means that developers can choose our robust quality and outstanding performance irrespective of their legacy software. Developers can also utilize tight integration with HCC's range of middleware including file systems, USB, RNDIS, ECM and standard Ethernet.

Further Information

If you would like to check availability of our TCP/IP stack for your target environment, or if you have questions regarding pricing and licensing, please contact your local HCC distributor or sales representative.

³Based on measurements taken using the LPC2468 MCU