

## RA Ecosystem Partner Solution

# USB Stack Solutions

## Extensive Device, Host and OTG support



### Solution Summary

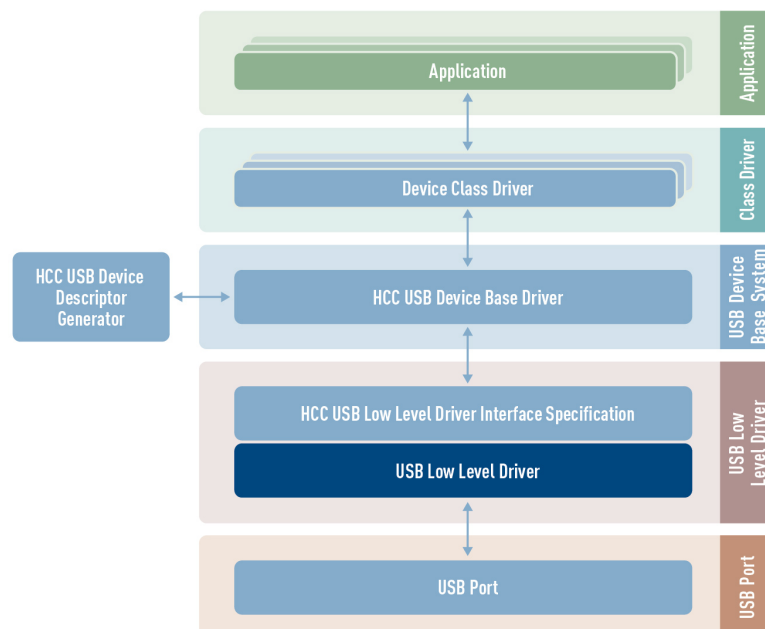
Embedded USB stacks from HCC are mature, widely-used stacks that can support almost any desired USB configuration. The USB suite includes solutions not only for common functions like HID, Hub and Mass Storage but also for more sophisticated requirements including isochronous, composite devices, and interfaces to file systems and Ethernet. This means developers can exploit USB to its full capability easily, without having to worry about developing highly specialized drivers on [RA MCUs](#).

HCC provides support for USB Device & Host class drivers, Device & Host Controllers, USB OTG and Mass Storage. Additional driver support is added continuously, check the actual offering on our website.

### Features/Benefits

- Interface speeds include Low (1.5Mbps), Full (12Mbps), and High Speed (480Mbps).
- Transfer types include Control, Interrupt, Bulk, and Isochronous
- Integrates easily with any RTOS, can work without RTOS
- Supports multiple devices connected simultaneously.
- Uses a system of callbacks for user-specified events.
- EHCI/OHCI
- Audio/Audio 2.0, MTP, Midi
- CDC-ACM (serial over USB)
- CDC-ECM, CDC-EEM, CDC-NCM, RNDIS (Ethernet over USB)
- HID, Mass Storage, Printer
- And much more

### Block Diagram



### Target Applications

- IoT devices
- Industrial equipment
- Medical equipment
- Mass storage devices
- Data logger
- Test equipment
- HID machine
- Measuring equipment
- Barcode reader

## About HCC

HCC Embedded develops deeply embedded software components “out of context”, which ensures that they can be used as core elements of any system, including those engineered to meet stringent requirements for safety, quality and portability. Built on a foundation of quality, HCC has a product portfolio of more than 250 embedded components, with deep competencies in reliable flash management, fail-safe file systems and IPv4/6 networking stacks with associated security protocols, as well as a comprehensive suite of USB host and function software.

HCC has developed a wide range of reusable software components for use in deeply embedded systems. HCC Embedded products are used, without modification, in thousands of customer projects with over 30 different RTOSes, in 8, 16, 32 and 64-bit systems, big- or little-endian, including many Renesas architectures/microcontrollers and tool chains.

HCC provides product support for the entire range of Renesas RA microcontroller variants and evaluation kits.

### Safety Elements (out of Context)

ISO 26262-10 defines a SEooC as a method for using components in a vehicle where the components were not originally designed for that specific project. This methodology can be applied to both hardware and software elements. HCC is setting a new level for development by using the SEooC approach to build software Safety Elements.

HCC creates each SEooC with a full V-Model process following ISO 26262-6, which can be mapped to other safety processes such as ISO 61508, IEC 62304, and DO-178C. Each SEooC is supported by full software lifecycle processes, such that they can be integrated with the OEM’s safety development process. The development process includes full traceability between DOORS-based requirements and test cases, as well as traceability between the requirements, design, and implementation.

SafeTCPIP, developed to ASIL/B, is HCC’s first SEooC product.

### For the complete embedded development lifecycle

HCC’s embedded engineering team has expertise in many areas of deeply embedded systems development. With indepth knowledge in file systems, flash management, networking and communications protocols, HCC’s development services team has built over 2,000 customer projects for a wide range of target environments across all industries.

Our 20 years of developing embedded software to high standards, independent of particular RTOS or tool-chain architecture, enable our engineering team to add focus and quality to specific challenges during product development.

## HCC offices

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A list of fully authorized distributors is available on [www.hcc-embedded.com](http://www.hcc-embedded.com)

HCC has built its organization on quality (ISO 9001:2015 and ISO 27001 certified) to deliver quality solutions.



ISO 27001: 2013 CERTIFIED  
HU-MSZT-ISMS/042-39



ISO 9001: 2015 CERTIFIED  
HU-MSZT-503/1367-1286

# Embedding Excellence

Networking

File Systems

Flash Management

USB