USB Software Suite

Device, Host & OTG with Class drivers for almost any application.

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 with ease without having to worry about developing highly specialized drivers. Software is generally provided as a source code project for most popular RTOS, MCUs and compilers. This means that embedded developers no longer need feel constrained by limited support available on their chosen target. HCC provide software for all interface speeds, all transfer types, USB 1.1/2.0, Host, Device and OTG modes. Having one of the broadest selections of class drivers available in the embedded market ensures that, irrespective of your future needs, HCC can provide long-term support.

■ USB Features

USB Host: HCC's USB Host stack is a scalable suite that enables an embedded host to control a variety of USB devices including pen-drives, printers, audio devices, joysticks, virtual serial ports and network interfaces. The embedded USB host stack supports EHCI, OHCI and non-standard USB controllers.

USB Device: HCC's USB device stack allows developers to integrate USB device functionality into their embedded devices. It is available with a comprehensive suite of class drivers that gives the device many functional possibilities, including operating as a pen-drive, virtual serial port, joystick, audio system or a network card.

USB OTG: On-the go acts as a switch between the USB host and device stacks, determined by the state of the ID pin. In many cases, OTG software is not required. HCC provides the hooks for this configuration as standard with the EUSB host and device stacks. HCC also provides a full software OTG stack that supports the SRP and HNP protocols for negotiating between two connected devices in order to decide which one shall operate as the host.

All Speeds & Transfer Types: HCC USB comprehensively supports all USB End-point/Transfer Types and Interface Speeds including Low (1.5Mbs), Full (12Mbs) and High Speed (480Mbps). Transfer types include Control, Interrupt, Bulk, and Isochronous, providing the base for the widest possible range of class drivers.

Composite, Compound & Complex Devices: HCC provides support for multiple USB class functions to be used on the same device.

■ Class Driver Support

	Host	Device
Connectivity	HID, Hub	HID
File System & Storage	Mass Storage	Mass Storage
Ethernet & Serial Interface	RNDIS, CDC-ACM, CDC-ECM, CDC-EEM, CDC-OBEX, CDC-FTDI	RNDIS, CDC-ACM, CDC-ECM, CDC-EEM
Audio	AUDIO, MIDI	AUDIO, MIDI
Multi-media & Printing	MTP, Printer	MTP, Pictbridge, Printer PCL
Healthcare	-	PHDC

■ USB Controller Support

HCC provide support for an extensive range of MCUs with on-chip USB controllers as well as a large number of standalone USB controllers including Maxim MAX3421E, NXP SAF176x, ISP1161, ISP1181, ISP136x, ISP156x and ISP1761. All OHCI, EHCI and many non-standard Host interfaces are supported.

■ Advanced Network Integration

HCC's unique position as a middleware developer means that we can offer tight integration of file systems, serial and Ethernet interfaces to support communications between different protocols.

Connecting different devices to a PC used to involve many hardware interfaces and protocols — e.g. Ethernet ports, serial ports, ATA/IDE interfaces, audio ports, video adapters etc. HCC USB provides the capability to share a single high-speed bus between many peripheral types - connecting TCP/IP networks over USB interfaces either as local or remote network adapters. To achieve this HCC supplies the following Control Device Class Drivers

RNDIS
'Remote Network Driver Interface Standard' to provide a virtual Ethernet link

CDC-ACM
'Abstract Control Module' provides serial interface for devices such as modems

CDC-EEM
'Ethernet Emulation Module' used to send and receive Ethernet frames over USB

CDC-ECM
'Ethernet Control Module' used to present the USB device to the system as a Network Adaptor

CDC-OBEX
'Object Exchange' used to create a virtual com port over USB

CDC-FTDI
used to build an interface to FTDI serial interface

■ Broad Range of Target Processors & Tools

HCC's USB Suite can operate efficiently on a broad range of target processors. Designed so that it can be ported easily and quickly to new architectures, it is available with drivers for a range of leading embedded processors.

RTOS Abstractions

RTOS abstractions are available for the following systems: CMX RTX, eCOS, emBOS, EUROS, FreeRTOS, Keil RTX, Nucleus, Quadros RTXC, ThreadX, µ-velOSity, µC/OS-II, and many others. Importantly, for custom schedulers and super loops, HCC offers an abstraction for 'No RTOS'. We also offer our own eTaskSync, a small cooperative scheduler, which is designed to handle all processing and interface requirements of HCC middleware. This means that developers can choose our robust quality and outstanding performance irrespective of their legacy software.

Extensive Compiler Support

Eclipse/GCC, IAR Embedded Workbench, Keil ARM Compiler, Freescale CodeWarrior, Atmel AVR Studio, Green Hills Multi, Microchip MPLAB, Renesas HEW, TI Code Composer Studio, Mentor CodeSourcery, Atollic True Studio and many more.

Microcontrollers

ARM Cortex-M0/M1/M3/M4/R4/A8, ARM7/9/11; **Atmel** AVR32, SAM3/4/7/9; **Freescale** ColdFire, Kinetis, PowerPC, i.MX, Vybrid, QorIQ; **Infineon** C164, XMC1000, XMC4000; **Microchip** PIC24, PIC32; **NXP** LPC1300/1700/1800/2000/3000/4000; **Renesas** SuperH, RX, RL, 78k; **SiliconLabs** EFM32, SIM3; **Spansion** FM0/FM3/FM4; **STMicroelectronics** STM32; **Texas Instruments** MSP430, Stellaris, C2000, Hercules, DaVinci, Sitara, Tiva; **Toshiba** TMP M0/M3;

■ Licensing & Purchasing

All HCC reusable software components are royalty-free and distributed in source form with support and maintenance included for one year with all purchases. We deliver sample projects tailored to an environment agreed with customers to ensure the quickest possible start. Visit HCC's website to find a sample license and to obtain the contact details of your local sales representative. Or, simply send an email to info@hcc-embedded.com and we will send all the details you require.

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