

CAST

USBFS-51-SS

USB Full-Speed Controller Software Stack

The USBFS-51 Software Stack is a USB 1.1 / 2.0 compliant software layer dedicated to support applications built upon a variety of different 8-bit microprocessors. It provides a device Application Programming Interface (API), which allows users to develop their own software without detailed knowledge of the USB hardware.

The rich set of optional applications reduces the learning curve and enables writing robust embedded software for the CAST USB Full-Speed IP core.

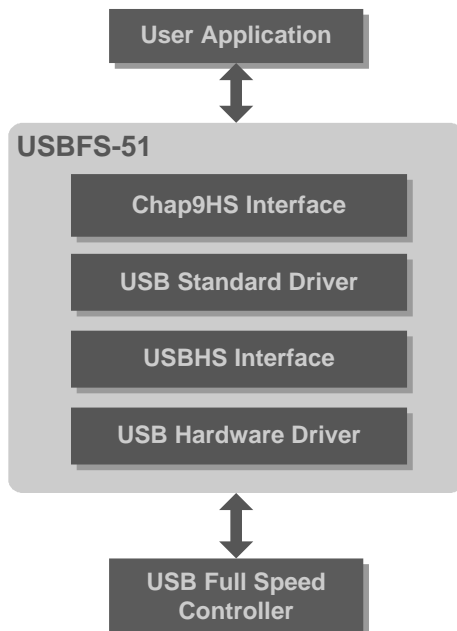
Benefits

- Minimal memory footprint (simple applications requires 7 Kbytes)
- Does not require detailed knowledge of USB hardware
- Intuitive API

Applications

- Game pad
- Mouse
- Joystick
- Keyboard
- Volume control
- Vendor interrupt specific device: communication with PC through custom PC USB driver

Block Diagram



Features

- Complies with USB 1.1 & USB 2.0 specifications
- Complete support for the Evatronix USB 1.1 Full-Speed device controller:
 - Low and Full speed data rates
 - Control, bulk, interrupt and isochronous transfers
 - Power saving modes
- Written in ANSI-C
- CPU independent
- OS independent
- Rich set of example applications for devices of various USB classes
- Intuitive API
- Meets USB-IF certification requirements
- Designed for applications of the following USB classes:
 - Mass Storage
 - HID – mouse, keyboard, joystick, game pad, volume control
 - Audio – speaker, microphone
 - CDC – serial port, Ethernet sharing device
 - Vendor specific – developed as design services

Functional Description

The USBFS-51 Software Stack is partitioned into modules as shown on the block diagram and described below.

Chap9 HS Interface

This interface contains set of functions used for standard enumeration. All class specific requests or vendor specific request are redirected to user application.

USB Standard Driver

This block implements the Chap9 HSInterface interface and is responsible for USB standard request service.

USBHS Interface

It contains a set of intuitive functions for accessing the USB hardware.

USB Hardware Driver

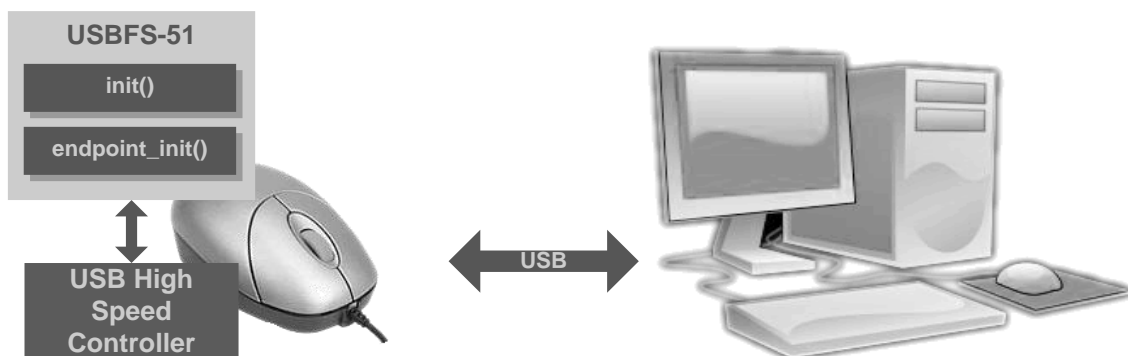
This block implements USB interface. It operates directly on the USB controller registers and should be written individually for different USB controllers. All layers up to the USB Hardware driver layer are hardware independent.

Deliverables

- Software Stack C source code
- Software Stack Keil C compiler libraries
- User documentation
- Example applications

Example Application

The USBFS-51 Software Stack uses two basic callback functions, `init()` and `endpoint_init()`, to implement mouse functionality. The basic task of the `init()` function is to register application specific descriptors. The USBFS-51 stack facilitates application development by implementing a set of already written descriptors. Another task of the `init()` function is the registration of a class specific requests handler. Since the USBFS-51 implements the request service from the hardware layer up to the chapter 9 level, the user has only to write his own class or vendor specific request service (placed above the chapter 9 layer). The `endpoint_init()` function is used mainly for endpoint initialization. When initialized, a built-in USBFS Interface allows endpoints to work in each transmission type: bulk, control, isochronous, interrupt.



Related Products

CUSB – USB 1.1 Full-Speed device controller that meets the 1.1 revision of the USB specification. The CUSB logic handles bytes transfer autonomously and bridges USB interface to a simple read/write parallel interface. The CUSB can be customized and optimized for a specific application. It contains a set of Special Function Registers that is similar to the Cypress EZ-USB FX chip.

CUSB2 – USB 2.0 Hi-Speed function controller that implements a built-in FIFO-like data port to speed up USB data transfers. The controller supports UTMI and ULPI interfaces for USB PHY, while a generic, AMBA™ or PVCI interfaces are available for the CPU.

USB Full Speed Development Platform – Complete System-on-Chip design solution that integrates the proven R8051XC microcontroller IP core with the USB Full-Speed Controller and further facilitates application development by providing an optimized software stack together with the EB-5 Tiny – Evatronix proprietary evaluation board.

Support

The software stack as delivered is warranted against defects for ninety days from purchase. Thirty days of phone and email technical support are included, starting with the first interaction. Additional maintenance and support options are available.