RoweBots Limited

Software Data Sheet

Unison RTOS version 5.3

Ultra tiny embedded Linux™ or POSIX™ compatible RTOS

Unison and USB

Overview

Universal Serial Bus or USB is the most widely used interconnect standard today. It comes in several performance levels related to the v1, v2 and v3 specifications. It includes a host and a client or device in the most common mode of operation as well as the ability to have either side act as the host (USB On the Go (OTG)).

Unison currently supports USB v2 which has v1 as a subset. This provides performance levels as follows:

- USB high speed mode 480Mb/s
- USB full speed mode 12Mb/s
- USB low speed mode 1.5Mb/s

For microcontrollers and medium performance microprocessors this meets all needs today. This provides data rates up to 480Mb/sec with host, device and OTG capabilities depending on the MCU/MPU, traffic load and the DMA capabilities utilized.

The Unison USB capabilities provide a seamless and integrated approach to use USB devices with a broad set of other file systems, I/O devices and protocol stacks. Emulating the Linux approach, Unison USB services offer automatic creation of file devices after enumeration and clear event notification upon device removal. It is an easy to configure and easy to use solution with off the shelf capabilities.

USB Embedded Host and USB Device servers are implemented separately.

USB OTG is an additional protocol that bridges between the USB host and USB device protocol stacks.

Architecture

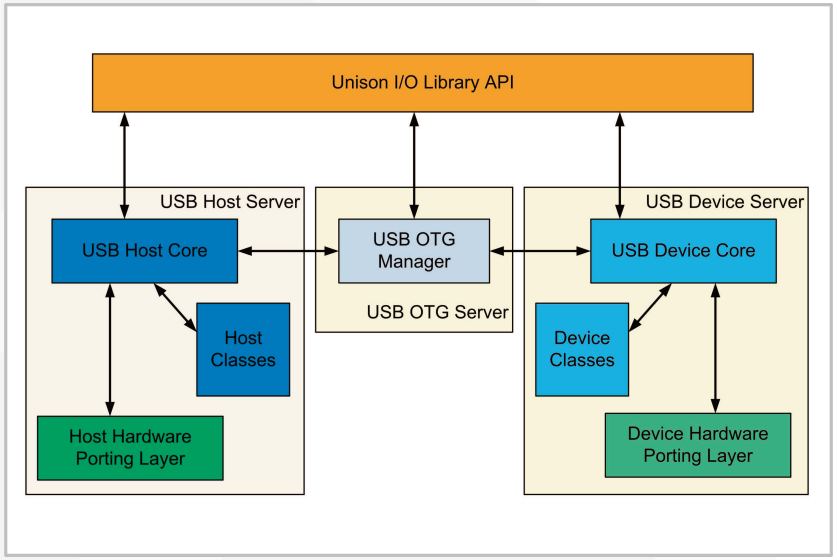

Figure 1: RoweBots USB Implementation

USB Embedded Host Features

- Emulation of Linux USB implementation makes this module very easy to use.
- Seamless integration into Unison for access to other devices including serial I/O , file systems and networking.
- Small footprint (GCC ARM CM3 compiler, 20.7K flash load size, .9K RAM with class drivers and hardware driver)
- High performance
- Configurable and Scalable for minimal footprint
- POSIX API – very easy to use
- Transfer types include Bulk, Control and Interrupt
- Hub support
- Hub, MSC and CDC serial classes included
- Additional classes optional
- POSIX test suite verification
- Field tested with consumer devices
- Optional DMA support

USB Embedded Host Class Support

- Mass storage class (MSC)
- CDC Serial
- Hub
- HID
- Printer
- Wireless (Bluetooth)
- Video

USB Embedded Device Features

- Emulation of Linux USB implementation makes this module very easy to use.
- Seamless integration into Unison for access to other devices including serial I/O and networking.
- Small footprint
- High performance
- Configurable and Scalable for minimal footprint
- POSIX API – very easy to use
- Transfer types include Bulk, Control and Interrupt
- CDC serial class included

- Additional classes optional
- POSIX test suite verification
- Field tested with consumer devices
- Optional DMA support

USB Embedded Device Class Support

- CDC Serial
- Hub
- HID
- Printer
- Wireless (Bluetooth)
- Video

USB On The Go (OTG)

USB OTG offers an extra protocol (used with different physical connectors) to allow the host and device to be selected at enumeration time. It uses the underlying USB host and USB device support with the class drivers.

Additional Information

Other seperately available RoweBots files for Unison OS:

- File Systems
- System Security
- Wireless
- Remedytools
- IoT or M2M Communication
- Internet Protocols
- Unison for Specific Processor Families

Software Version

- Unison 5.3

Availability

- USB Embedded Host* - Now
- USB Device* - Now
- USB OTG - Now

** Included classes only*

UNISON RTOS version 5.3

Contact: sales@rowebots.com
+1 519 279 46 00

RoweBots Limited