AN170

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USB BULK EXAMPLE DRIVER - REFERENCE MANUAL

Relevant Devices

This application note applies to the following devices:
C8051F320, C8051F321.

Introduction

The Silicon Laboratories Bulk Driver is an example Universal Serial Bus (USB) device driver for use with the Silicon Laboratories C8051F320 target board and USB_BULK example device firmware. The device driver is a Windows Driver Model architecture driver which is compatible with Windows 98 SE, Windows 2000, and Windows XP operating systems.

The driver fully supports Plug and Play (PnP) and Power Management (PM). Please refer the DDK documenation to understand the handling of PnP and PM features and implementations. The Microsoft Windows Driver Development Kit is available free of charge from Microsoft at http://www.microsoft.com/whdc/ddk/winddk.mspx.

The USB device used for this sample is the Silicon Laboratories C8051F32X evaluation board programmed with a the USB Bulk example provided in the examples directory by default in the *Silabs\MCU\Examples\C8051F32x\c\USB_BULK* directory.

Driver Architecture

The SiBulk.sys is a driver that transfers bulk data packets to and from this board. USB request blocks (URBs) and associated interrupt request packets (IRPs) allow an abstracted chip-independent transfer to and from the core USB stack. The sample also consists of the windows application USBTEST.exe which communicates with this device driver.

The following section describes the driver that allows a user-mode application to perform bulk reads and writes. The interface for the devices consists of two endpoints, an Bulk IN endpoint which receives data from the device and an Bulk OUT endpoint which sends data to the device.

Bulk IN Pipe

The Bulk IN pipe is implemented such that it submits an input URB each time the Windows application makes a read request using the IRP_MJ_READ request. For more information on handling these read requests please refer to the comments in the request's handler function *IntUsb_DispatchReadWrite(bulkrwr.c)*

The data transfer sizes for this request are 0 to 64Kbytes.

Bulk OUT Pipe

The Bulk OUT pipe is implemented such that it submits an output URB each time the Windows application makes a write request using the IRP_MJ_WRITE request. For more information on handling these write requests please refer to the comments in the request's handler function *IntUsb_DispatchReadWrite(bulkrwr.c)*

The data transfer sizes for this request are 0 to 64Kbytes.

Implementation Notes

The *BulkUsb_DispatchCreate (intdev.c)* routine allows Windows applications to open handles to the device or a specific pipe.

The *BulkUsb_DispatchClose (intdev.c)* closes open a handle to a specific pipe and/or the device.

Pipe # 0 and Pipe # 1 on the device correspond to the Bulk IN and Bulk OUT pipes respectively. .

The USBTest.exe console application is used to initiate Bulk OUT and Bulk IN transfers. The application also demonstrates how to use Microsoft GUID (Globally Unique Identifier) based device names and pipe names generated by the operating system.

Interface Specifications

Silicon Laboratories USB Bulk Device GUID:

//DEFINE_GUID(GUID_INTERFACE_SILABS_BULK,
//0x37538c66, 0x9584, 0x42d3, 0x96, 0x32, 0xeb, 0xad, 0xa, 0x23, 0xd, 0x13);
#define INTERFACE_SILABS_Bulk_IID {0x37538c66, 0x9584, 0x42d3, {0x96, 0x32, 0xeb, 0xad, 0xa, 0x23, 0xd, 0x13}}

Silicon Laboratories USB Bulk Device Interface:
"PIPE00" = Bulk IN type
"PIPE01" = Bulk OUT type

Silicon Laboratories Vendor ID 0x10C4h
Product ID 0x0003h

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Notes:

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