



**Future Technology Devices International Ltd.**

**Application Note AN\_174**

**Determining USB Peripheral Device  
Class**

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This document will demonstrate how a USB peripheral device class can be obtained. This information can be helpful in determining if the peripheral is supported by the current Vinculum host controller firmware.

*Use of FTDI devices in life support and/or safety applications is entirely at the user's risk, and the user agrees to defend, indemnify and hold harmless FTDI from any and all damages, claims, suits or expense resulting from such use.*

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## 1 Introduction

Many users enquire if a certain device is supported by the Vinculum host controllers. Although the VNC2 generation supports all USB transfer types (Control, Bulk, Interrupt and Isochronous) the real answer to the question depends on the device class reported back by the device and whether a VOS driver currently exists for that device class or has still to be created. This document will demonstrate to users how a device class can be determined.

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## 2 What are Device Classes?

Not all USB peripherals are the same. Each device type is defined by a number referred to as the device class. The class definitions are defined and controlled by the USB Implementers Forum. For example a keyboard is a Human Interface Device (HID) class device and therefore has device class 0x03. A full list of device classes can be found at: [http://www.usb.org/developers/defined\\_class](http://www.usb.org/developers/defined_class)

The device class is reported back to the USB host controller during device enumeration as part of the device descriptors.

### 3 Determining the Device Class

#### 3.1 Using PC Utilities

The simplest method to read the device class is to plug the peripheral into a windows PC and use the free USBVIEW utility from the FTDI website: <http://www.ftdichip.com/Support/Utilities/usbview.zip>

Set the utility to display "Config Descriptors" under the options tab and then select the required device from the device tree.

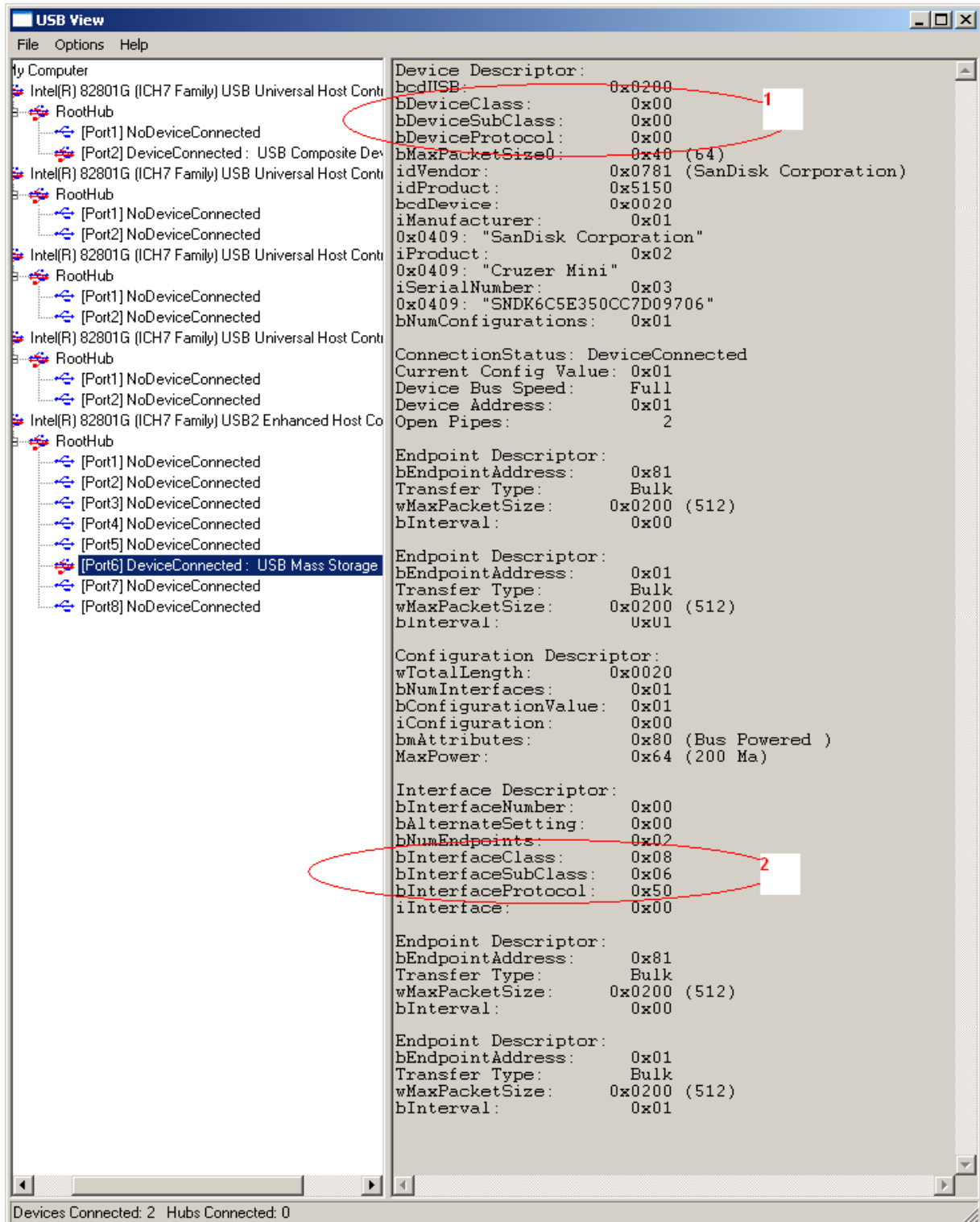


Figure 1: USBVIEW Screenshot

The key information to look for first is:

```
bDeviceClass  
bDeviceSubClass  
bDeviceProtocol
```

This is highlighted at the top of the screenshot in figure 1.

Many device classes can be determined from these fields.

In the example shown the values are defined as 0x00. This indicates that the values are defined in the interface class section and as such the user must then check:

```
bInterfaceClass  
bInterfaceSubClass  
bInterfaceProtocol
```

This is highlighted at the bottom of the screenshot in figure 1.

0x08 in the bInterfaceClass in the example defines the device as Mass Storage class.

In this case the class is supported by both VNC1L and VNC2 firmware drivers.

If the class is returned as 0xFF then this is vendor specific and as such the device normally uses a vendor supplied driver as opposed to a generic USB driver. Such devices, with the exception of FTDI devices, are unlikely to appear as part of the generic Vinculum library.

To allow the Vinculum device to support such a class would require the user to obtain the device API and create their own driver.

## 3.2 Using the VNC2 firmware

The Vinculum device, VNC2, is supplied with an IDE and sample projects. One of these projects is called "USBDescriptors.vproj".

If a VNC2 device is available then this project can be built and loaded onto the device to allow the descriptors of any device plugged into the USB ports of the VNC2 to be read out over the UART interface.

Using a utility such as HyperTerminal the printout follows a similar format to USBVIEW.

A getting started guide for VNC2 tools is available at:

[http://www.ftdichip.com/Support/Documents/AppNotes/AN\\_142\\_Vinculum-II\\_Tool\\_Chain\\_Getting\\_Started\\_Guide.pdf](http://www.ftdichip.com/Support/Documents/AppNotes/AN_142_Vinculum-II_Tool_Chain_Getting_Started_Guide.pdf)

## 4 Classes of devices currently supported by the Vinculum firmware

Classes of devices supported by the Vinculum firmware at the time of writing (corresponds to toolchain release version 1.4.0) are:

| Class                            | VNC1L | VNC2                |
|----------------------------------|-------|---------------------|
| Bulk Only Mass Storage (BOMS)    | YES   | YES                 |
| Human Interface Device (HID)     | YES   | YES                 |
| Printer                          | YES   | YES                 |
| Hub                              | YES   | YES                 |
| Communication Device Class (CDC) | YES   | YES                 |
| FTDI peripherals                 | YES   | YES                 |
| Video                            | No    | Under Consideration |
| Audio                            | No    | Under Consideration |
| Wireless controller              | No    | Under Consideration |
|                                  |       |                     |

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## Appendix A – References

### A.1 Websites

FTDI home page

<http://www.ftdichip.com/index.html>

Vinculum II Home page

<http://www.ftdichip.com/Products/ICs/VNC2.htm>

USB Implementers Forum Device Class List

[http://www.usb.org/developers/defined\\_class](http://www.usb.org/developers/defined_class)

### A.2 Technical Documentation

What is USB? – Technical Note

[http://www.ftdichip.com/Support/Documents/TechnicalNotes/TN\\_110%20What%20is%20USB.pdf](http://www.ftdichip.com/Support/Documents/TechnicalNotes/TN_110%20What%20is%20USB.pdf)

VNC2 tools getting started guide

[http://www.ftdichip.com/Support/Documents/AppNotes/AN\\_142\\_Vinculum-II\\_Tool\\_Chain\\_Getting\\_Started\\_Guide.pdf](http://www.ftdichip.com/Support/Documents/AppNotes/AN_142_Vinculum-II_Tool_Chain_Getting_Started_Guide.pdf)

### A.3 Utilities

USBVIEW

<http://www.ftdichip.com/Support/Utilities/usbview.zip>

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## Appendix B– Revision History

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|--------------------|---------------|------------|
| <b>Version 1.0</b> | First Release | 2011-05-23 |
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