



Technical Note

TN_152

USB 3.0 Compatibility Issues Explained

Version 1.0

Issue Date: 2014-07-01

USB 3.0 is the latest superspeed version of the universal serial bus interface. It is designed to allow for higher (super) data rates while being backward compatible with existing devices. However the roll out of USB 3.0 has created some compatibility issues with FTDI products which this document endeavours to explain.

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 FTDI harmless from any and all damages, claims, suits or expense resulting from such use.

Future Technology Devices International Limited (FTDI)

Unit 1, 2 Seaward Place, Glasgow G41 1HH, United Kingdom

Tel.: +44 (0) 141 429 2777 Fax: + 44 (0) 141 429 2758

Web Site: <http://ftdichip.com>

Copyright © 2014 Future Technology Devices International Limited

Table of Contents

1	Introduction	2
2	Drivers	3
2.1	Known Issues (Pre Windows 8)	3
2.1.1	Installation	3
2.1.2	Location ID Returned As 0.....	3
2.2	Windows 8	4
3	Conclusion.....	5
4	Contact Information.....	6
Appendix A – References		7
Document References.....		7
Acronyms and Abbreviations		7
Appendix B – List of Tables & Figures		8
List of Tables		8
List of Figures		8
Appendix C – Revision History		9

1 Introduction

USB 3.0 is the latest superspeed version of the universal serial bus interface. It is designed to allow for higher (super) data rates while being backward compatible with existing devices. However the roll out of USB 3.0 has created some compatibility issues with FTDI products which this document endeavours to explain.

2 Drivers

All hardware that is used to construct a PC must have software driver support to enable applications to communicate with the hardware. In the case of USB solutions there will be USB host controller drivers with support for different USB classes. This is typically provided with the Operating System. Additional drivers for the peripherals connecting to the USB host are typically provided by the hardware vendor e.g. FTDI provide driver downloads to support their silicon.

The windows variant of this driver should be operational on all windows platforms from Windows 2000 onwards and support all USB host controllers.

2.1 Known Issues (Pre Windows 8)

USB 3.0 did not exist prior to Windows 8 and as such Microsoft did not have driver support for USB 3.0 host controllers.

To allow silicon vendors to add USB 3.0 into pre windows 8 systems the vendors developed their own drivers. This has led to a different registry structure from that observed with USB 1.1 and USB 2.0 host controllers leading to compatibility issues.

In the registry pre Windows 8 there is:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Enum\USB\ROOT_HUB  
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Enum\USB\ROOT_HUB20
```

Following this system, the expectation for USB 3.0 hosts would be:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Enum\USB\ROOT_HUB30 to follow on for 3.0
```

However, despite this being the case in Windows 8 with the Microsoft driver, it is different pre windows 8, with one example being:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Enum\IUSB3\ROOT_HUB30
```

2.1.1 Installation

Some users of FTDI silicon have reported that an FTDI device will not install if connected to a USB 3.0 port. This is partly related to some descriptors not being returned correctly or stored in unexpected registry locations. There are a number of workarounds.

- I. If the PC has a USB 2.0 port then the device may be installed by connecting to the USB 2.0 port and then moving to the USB 3.0 port after installation.
- II. Ensure your device has a serial number.

2.1.2 Location ID Returned As 0

Location IDs are not strictly part of the USB spec in the format provided by FTDI. The feature was added as an additional option to back up identifying and opening ports by index, serial number or product description strings.

When connected to a USB 2.0 port the location is provided on the basis of the USB port that the device is connected to. These values are derived from specific registry keys. As the registry tree for 3rd party USB 3.0 host drivers is different to the Microsoft generic driver the Location ID cannot be calculated.

There is no workaround to this current issue and as such devices should be listed and opened by index, serial number or product description strings.

2.1.3 Device names

It is further noted that existing host ports on a Windows machine are given a name in the format: \device\usbpd0-# where # is a number.

One USB 3.0 card tested by FTDI gives the name in the format \device\device# where # is a number.

All these discrepancies add up to unpredictable behavior.

2.2 Windows 8

With Windows 8, Microsoft have provided USB 3.0 driver support as part of the OS. This has removed the need for 3rd party host drivers. As a consequence of moving to the default Microsoft driver all the problems so far reported with earlier versions of Windows and USB 3.0 are resolved. There is no need for special modifications in the FTDI driver for this configuration.

3 Conclusion

Although it is theoretically possible to make changes to support every host controller it is highly probable that the next host device discovered on the market (e.g. different manufacturer) will have another variant requiring a different modification.

As such, to create a range of device drivers for all the USB host vendors would not be a sustainable model and goes against the PnP ethos of USB.

On the basis that USB 3.0 issues are largely confined to windows 7 (or earlier) machines and the problems experienced go away with Windows 8 (using a Microsoft host driver) it is FTDI's view that the problem lies with the USB host vendors and the issue should not be passed to all USB device manufacturers.

4 Contact Information

Head Office – Glasgow, UK

Future Technology Devices International Limited
Unit 1, 2 Seaward Place, Centurion Business Park
Glasgow G41 1HH
United Kingdom
Tel: +44 (0) 141 429 2777
Fax: +44 (0) 141 429 2758

E-mail (Sales) sales1@ftdichip.com
E-mail (Support) support1@ftdichip.com
E-mail (General Enquiries) admin1@ftdichip.com

Branch Office – Tigard, Oregon, USA

Future Technology Devices International Limited
(USA)
7130 SW Fir Loop
Tigard, OR 97223
USA
Tel: +1 (503) 547 0988
Fax: +1 (503) 547 0987

E-Mail (Sales) us.sales@ftdichip.com
E-Mail (Support) us.support@ftdichip.com
E-Mail (General Enquiries) us.admin@ftdichip.com

Branch Office – Taipei, Taiwan

Future Technology Devices International Limited
(Taiwan)
2F, No. 516, Sec. 1, NeiHu Road
Taipei 114
Taiwan, R.O.C.
Tel: +886 (0) 2 8791 3570
Fax: +886 (0) 2 8791 3576

E-mail (Sales) tw.sales1@ftdichip.com
E-mail (Support) tw.support1@ftdichip.com
E-mail (General Enquiries) tw.admin1@ftdichip.com

Branch Office – Shanghai, China

Future Technology Devices International Limited
(China)
Room 1103, No. 666 West Huaihai Road,
Shanghai, 200052
China
Tel: +86 21 62351596
Fax: +86 21 62351595

E-mail (Sales) cn.sales@ftdichip.com
E-mail (Support) cn.support@ftdichip.com
E-mail (General Enquiries) cn.admin@ftdichip.com

Web Site

<http://ftdichip.com>

System and equipment manufacturers and designers are responsible to ensure that their systems, and any Future Technology Devices International Ltd (FTDI) devices incorporated in their systems, meet all applicable safety, regulatory and system-level performance requirements. All application-related information in this document (including application descriptions, suggested FTDI devices and other materials) is provided for reference only. While FTDI has taken care to assure it is accurate, this information is subject to customer confirmation, and FTDI disclaims all liability for system designs and for any applications assistance provided by FTDI. 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. This document is subject to change without notice. No freedom to use patents or other intellectual property rights is implied by the publication of this document. Neither the whole nor any part of the information contained in, or the product described in this document, may be adapted or reproduced in any material or electronic form without the prior written consent of the copyright holder. Future Technology Devices International Ltd, Unit 1, 2 Seaward Place, Centurion Business Park, Glasgow G41 1HH, United Kingdom. Scotland Registered Company Number: SC136640

Appendix A – References

Document References

[Installation Guides](#)

Acronyms and Abbreviations

Terms	Description
FTDI	Future Technology Devices International
USB-IF	USB Implementers Forum

Appendix B – List of Tables & Figures

List of Tables

No table of figures entries found.

List of Figures

No table of figures entries found.

Appendix C – Revision History

Document Title: TN_152 USB3.0 Compatibility Issues Explained
Document Reference No.: FT_000871
Clearance No.: FTDI# 398
Product Page: <http://www.ftdichip.com/FTProducts.htm>
Document Feedback: [Send Feedback](#)

Revision	Changes	Date
1.0	Initial Release	2014-07-01