Application Note

AN_101

Submitting Modified FTDI Drivers for Windows Hardware Certification

Version 4.1

Issue Date: 2013-05-03

Device drivers are signed and certified by Microsoft to provide the end user a smooth experience when installing new hardware.

This applications note provides information to help an OEM obtain certification under their company name.

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.

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1 Introduction

FTDI provide device drivers for use with its USB Bridge ICs. These drivers are available for a number of operating systems. In particular, Microsoft® instituted a device driver certification process for its Windows® desktop and server operating systems to ensure the drivers are functional with their products.

Many FTDI customers are interested in changing the FTDI drivers to reflect their corporate identity through custom USB Vendor IDs (VID), Product IDs (PID), product names, company names and performance options. OEM customers can do this by editing one or both of the driver INF files (FTDIPORT & FTDIBUS). Technical Note TN_100 describes the various scenarios and when customized device drivers are required.

INF (or Information) files are scripts which tell the Windows Operating System how to install and configure peripheral hardware drivers (.SYS, .DLL and related files).

When adding custom VIDs or PIDs, FTDI require the default FTDI VID (0x0403) and PID (0x6001, 0x6010, 0x6011, 0x6014 and 0x6015) values are deleted before submitting the driver DUA package to Microsoft.

Once an INF file has been edited, its original digital signature is no longer valid. Any attempt to load a driver package that includes a modified INF file as a clean install will result in a warning window to appear, as shown for Windows 7 in Figure 1.1.

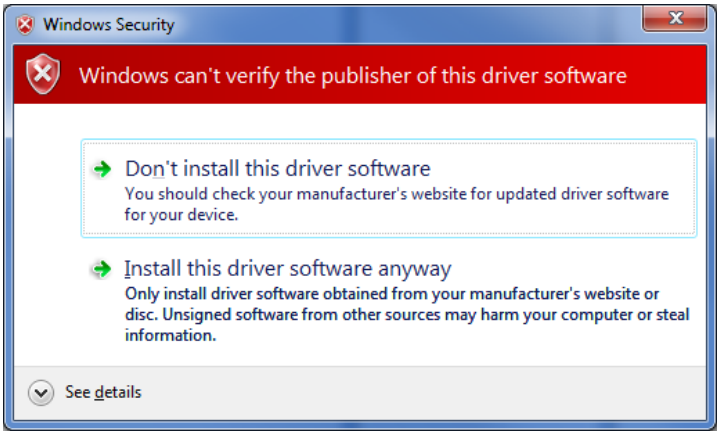

Figure 1.1 Logo Test Warning Pop-Up Window

This warning is not fatal to the install, but many FTDI customers desire a more professional look and feel to the products that they are distributing to their customers. The Windows Hardware Certification process provides new "CAT" signature files for the modified device driver and prevents the warning window from appearing.

With the release of Windows Vista 64-bit, Windows 7 64-bit and Windows 8 64-bit editions, Microsoft require signed device drivers. Unsigned drivers cannot be loaded through the typical user environment. This requirement will carry forward to new future operating system releases as well.

A Windows Hardware Certified driver becomes eligible for automatic distribution through the Microsoft Windows Update service, allowing plug and play driver installation.

Note: The current FTDI driver package – CDM 2.08.28, consists of the following files that implement and control the VCP and D2XX drivers.

- **INF files** – These files tell Windows how to install the driver – ftdibus.inf for D2XX driver, ftdiport.inf for VCP driver
- **SYS files** – driver core files – ftdibus.sys for D2XX driver, ftser2k.sys for VCP driver
- **CAT files** – Windows catalogue files – contain digital signatures
- **DLL files** – Windows dynamic link library – support driver operation
- **LIB files** – Contain API commands used by driver application programs

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2 Windows Hardware Certification for FTDI Drivers

An OEM will participate in the Windows Logo Program to obtain Hardware Certification for their modified version of the FTDI drivers.

2.1 How does driver certification work?

Formal driver testing and Windows Hardware Certification are performed by FTDI for each release of the FTDI device drivers. With this formal certification, any customer hardware design that uses FTDI ICs also carries this formal driver certification. OEM designs which use the default FTDI VID and PIDs carry this full certification since no modifications are made to the device driver.

OEM designs that use a unique PID (assigned by FTDI), or their own VID (assigned by the USB-IF at http://www.usb.org) require edits to the INF files and must obtain a new driver certification.

After an OEM submits a driver package with modified INF files for certification, a new digitally signed driver package, including new "CAT" signature files, will be available by Microsoft for download upon successful completion. This new driver package will install without warning messages on the Windows OS versions selected during the submission process.

As noted in Technical Note TN_100, the OEM must remove the default FTDI VID/PID combinations and indicate the OEM company name within the modified INF files. FTDI has a utility called FT_INF which can help in creating the modified INF files. FT_INF can be downloaded from the FTDI Website. In order to eliminate conflicts, it is necessary for FTDI to review customer edited INF files prior to authorizing Reseller requests to a customer. See Section 2.3 for details on requesting Reseller rights.

There are two submissions that must be made – "Reseller" acceptance and "Driver Update Acceptable" (DUA) submission.

Note: The Reseller / DUA submission is the correct type. Complete hardware tests have already been performed by FTDI and not required of the OEM.

Note: FTDI will only authorize reseller rights on the currently released version of the device drivers.

2.2 OEM participation in the Microsoft Logo Program

A FAQ published by Microsoft contains the latest information on OEM participation in the Windows Logo Program: http://msdn.microsoft.com/en-us/windows/hardware/gg463054.aspx

This FAQ contains links on how to establish the accounts and signing certificates required for a successful submission. In particular, take note of the "Driver Update Acceptable" section.

All logo certification is based upon participation of the OEM and Microsoft, including certain legal agreements. FTDI only facilitates the OEM submission to Microsoft by issuing "Reseller Rights" for our latest device drivers. This is the *only* involvement that FTDI has in the process.

Additional details can be found at this link.

http://msdn.microsoft.com/en-us/library/windows/hardware/hh852370.aspx

When reviewing the linked document, remember that FTDI has gone through full testing of the device driver. Be sure to check the following topics along with the entire document:

- "Submission requirements"
- "Submissions types that don't require complete testing"
- "Fee structure"

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2.3 Creating a DUA submission – FTDI-specific details

As noted above, the only FTDI involvement in the Windows Hardware Certification process is to issue Reseller Rights to an OEM.

1. Send a request for "Reseller Rights" to the FTDI UK Support email: support1@ftdichip.com. Include the following information in this request:
    - "Reseller Rights Request" and the OEM Company Name in the subject line.
    - The body of the email must contain the following information:
        - Company name *as it is registered with the Winqual account.*
        - Company contact person and contact details, including mailing address, telephone number and email address.
        - Product name(s).
        - The intended VID and range of PIDs that will be assigned to this DUA submission
        - The intended FTDI part number(s) associated with the DUA submission
    - Attach copies of the edited INF files. Be sure to rename the files to end in ".TXT" rather than ".INF". *The FTDI mail servers will remove files ending in ".INF".*
2. Upon receipt of this data, FTDI UK will review the request and submitted INF files. Valid requests will be granted through the Windows Dev Center account and the company contact will be notified by a response to the request email. The response will include the Reseller Submission ID.
    - ***Note: FTDI are not responsible for the contents or suitability of the INF files. FTDI expects the OEM to test all modifications prior to submission.***
    - ***Note: FTDI will only grant reseller rights based on the most recent certified device driver release.***
3. Reseller Rights appear under the "Manage submissions" link of the Hardware certification section of the dashboard. FTDI drivers will fall under the "HCK" kit type.
4. Submission instructions can be found here: http://msdn.microsoft.com/library/windows/hardware/BR230784.aspx. Follow the HCK instructions.
5. When accessing the approved reseller package, download both the "Signed files" CAB file *and* "Dua shell package" The Dua shell package is used with the HCK Studio to create the new submission.

The Microsoft procedures for submitting driver certification requests have changed significantly due to the release of Windows 8. Be sure to check the Microsoft links throughout this document and the Microsoft websites.

2.4 Windows Hardware Certification Kit (HCK) – FTDI-specific details

The resold submission will be submitted through the Windows HCK Studio tool. This tool is available at the Microsoft Windows Dev Center. When installing the tool, select the "Studio Only" installation option.

Ensure the VeriSign Microsoft Code Signing key is installed on the *same* computer on which the HCK studio will be installed. The code signing key is used to create the DUA submission files.

When going through the HCK steps, be sure to take note of the following:

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1. Open the HCKX package and select "Driver Update" at the bottom of the file dialog:

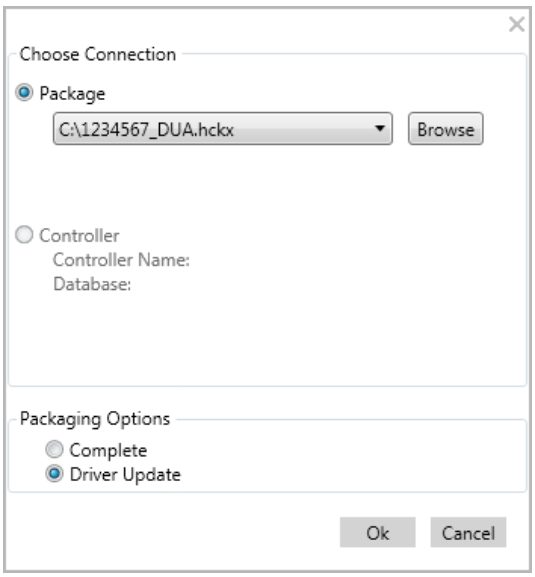

Figure 2.1 HCK Driver Update Package Selection

2. Select the "Package" tab.

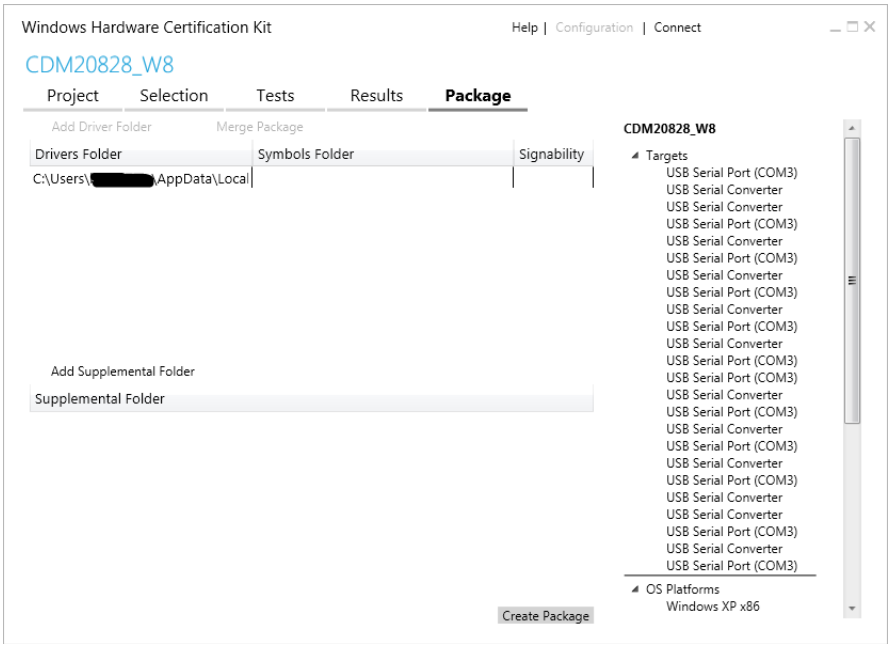

Figure 2.2 HCK Package Tab

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a. Right-click the single entry under Drivers Folder, then select "Replace Driver".

b. Browse to the directory containing the driver with the edited INF files (Remember to remove the original FTDI files if different INF file names are being used).

3. Select "Create Package".

a. When prompted to select a Signing Option, select "Use the certificate Store".

Figure 2.3 HCK Driver Signing Options

b. Select the appropriate key.

c. Select the location to save the resulting HCKX file.

4. Continue with the instructions provided by Microsoft to complete the DUA submission.

2.5 Additional Information

1. ***Maintenance, distribution and support of any new driver are the responsibility of the OEM. Please check our website (www.ftdichip.com) on a regular basis for driver updates.***
2. ***All end-user support requests received by FTDI for an OEM product will be referred to the OEM.***
3. The Microsoft Windows Logo and Hardware Certification programs are continually changing. Be sure to consult the various help pages and FAQs available through your Windows Dev Center account.
4. The Windows Update program is available for automatic driver distribution, especially under Windows Vista and later. FTDI encourages OEMs to leverage this service to provide a positive end-user experience.
5. Binary files and filenames cannot be changed in any way in order to qualify for a DUA submission. Any edits to the binary files require a full re-test of the driver and is outside the scope of this application note and FTDI Customer Engineering Support activities.
6. The INF filenames may be modified. FTDI suggests retaining "bus" and "port" in the filenames to differentiate between the two types of interfaces, D2XX and VCP, respectively (e.g. ABCbus.inf and ABCport.inf). The CAT file references within the INF files may also be changed. FTDI suggests matching the name to those chosen for the INF files (e.g. ABCbus.cat and ABCport.CAT).
7. Additional files, such as a README file or the Windows Logo Report generated by the DUA process, may be included in an OEM driver distribution.
8. FTDI do not charge a fee for granting reseller rights; however, there is an associated fee charged by Microsoft for each Windows Driver Certification application. Consult Microsoft and Symantec/VeriSign for the latest fees and special offers.
9. Windows RT is not supported. From the Microsoft Windows Certification site: "Windows RT uses class drivers and in-box drivers exclusively, departing from a common driver added scenario on the x64 or x86 architectures. Connected devices on Windows RT are tested and certified using only the in-box or class driver."

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2.6 Alternative Solution – Self-Signed Driver

As noted above, 32-bit versions Microsoft Windows Vista, 7 and 8 allow driver installation of an unsigned driver even though a warning is displayed.

At the time of publication of this application note, a "self-signed" driver may be installed on all 32-bit and 64-bit Windows versions. When a self-signed driver is installed, Windows will display a warning indicating that the source of the signature is unknown and give the option to continue.

It is important to note that although the drivers are not submitted to Microsoft, a current VeriSign Code Signing Certificate is necessary. In addition, self-signed drivers are not eligible for distribution through Windows Update which may lead to a non-ideal end-user experience.

FTDI employ this technique for the release of beta versions of the device drivers. See Technical Note TN_129 for details on self-signing driver releases.

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Appendix A – References

Website References

Microsoft Windows Dev Center: http://msdn.microsoft.com/en-us/windows/

Microsoft Windows Hardware Logo Program FAQ: http://msdn.microsoft.com/en-us/windows/hardware/gg463054.aspx

FTDI FT_INF Utility

FTDI TN_129 Driver Release Signing

Acronyms and Abbreviations

Terms	Description
DLL	Windows Dynamic Link Library
DUA	Driver Update Acceptable
HCK	Hardware Certification Kit
INF	Windows Information File
PID/VID	Product ID/Vendor ID
SYS	Windows peripheral hardware driver file
USB	Universal Serial Bus
USB-IF	USB Implementers Forum
WHQL	Windows Hardware Quality Labs
Clean Install	A first time driver install on a PC, or a re-install of the driver after it has been deleted from the system
Reseller Rights	Conformation sent by FTDI UK to the customer giving permission to continue with the driver certification process

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Appendix C – Revision History

Document Title: AN_101 Submitting Modified FTDI Drivers for Windows Hardware Certification

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Document Feedback: Send Feedback

Revision	Changes	Date
1.0	Initial Release	2008-08-19
2.0	More information added and contact information updated	2009-06-09
2.1	Corrected references to VeriSign certificate types	2009-09-10
2.11	Added reference to WHQL process checking for a valid VID, formatted table of contents	2010-02-05
2.2	Added instruction to sign the CAB file produced by the WST tool (step 7), corrected small type, added full VeriSign price for 1 year.	2010-02-10
3.0	Formatted with sub-headings, updated figures with screen shots from Windows 7, added text indicating FTDI now reviews INF files prior to authorizing reseller rights, minor edits	2010-09-13
3.1	Updated section 2.2 to clarify instructions, updated code signing link	2011-05-26
3.11	Added note regarding 64-bit signtool.exe in section 2.2	2011-11-23
3.2	Added section 2.3, added feedback links, edited Microsoft web address	2012-03-20
4.0	Updated formatting to new application note template, updated procedures to reflect new Microsoft certification naming schemes and procedures	2012-07-03
4.1	Updated for Windows 8 HCK-style submission Updated US Office address	2013-03-01

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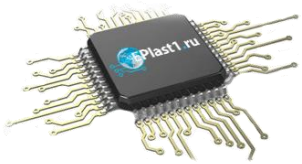

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