



**Future Technology Devices International Ltd.**

## **Application Note AN\_101**

# **Using Microsoft's WHQL Process for Customer Modified FTDI Driver Files**

**Document Reference No. FT\_000063**

**Version 3.11**

**Issue Date: 2011-11-23**

**Device drivers are signed and certified by Microsoft to provide the end user a smooth experience when installing new hardware. This Applications note provides instructions on the required steps an OEM needs to take in order to obtain certification under their own company name.**

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## 1 Introduction

FTDI provide device drivers for use with its 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).

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 and 0x6011) values are deleted before submitting the WHQL 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Once an INF file has been edited, its original digital signature is no longer valid.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 in Figure 1.1.

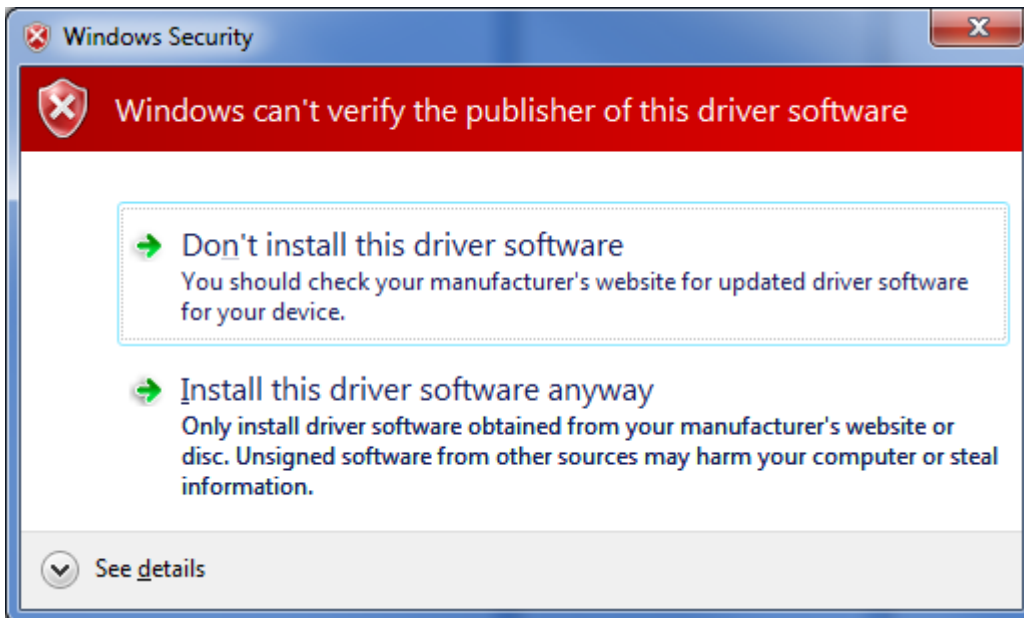


Figure 1.1 Logo Test Warning Pop-Up Window

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 WHQL 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 edition and Windows 7 64-bit editions, Microsoft require signed device drivers.** It is likely that this requirement will carry forward to new future operating system releases as well.

A WHQL certified driver becomes part of Microsoft's Windows Update Driver Distribution service, allowing plug and play driver installation.

**Note: The current FTDI driver package – CDM 2.08.02 WHQL Certified, 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

## 2 Introducing WHQL for FTDI drivers

**WHQL** stands for Windows Hardware Quality Labs. WHQL certification is a process designed to test and certify new Windows hardware device drivers.

### 2.1 How does WHQL Work?

Formal driver testing and certification are performed 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 which 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 Driver Update certification.

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

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. In order to eliminate conflicts, it is necessary for FTDI to review customer edited INF files prior to authorizing Reseller requests to a customer.

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

**Note:** Although some Microsoft documents claim that the DUA process will be phased out, it is still being used at the time of writing this applications note.

If Microsoft suggests that a customer driver package requires a complete hardware test, it is recommended that the customer informs them that they have only changed the INF files, and they are making a Reseller/DUA submission request. The complete driver hardware test is not required.

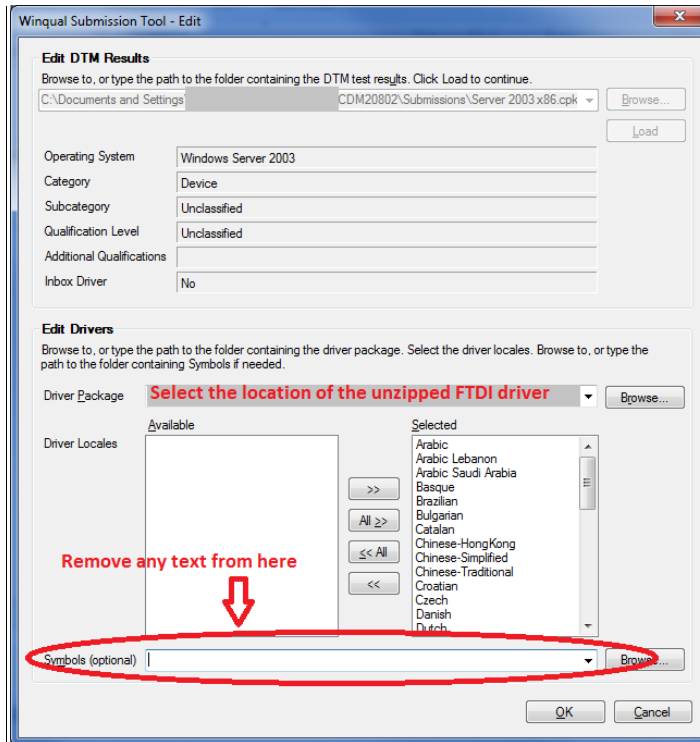
**Note:** FTDI will only authorize reseller rights on the currently released version of the device drivers.

### 2.2 How to start a Reseller/ DUA Test Submission

1. Establish a WHQL account and obtain a VeriSign Code Signing Digital ID: (A VeriSign Digital ID is required for submissions to Winqual) Refer to this link:
  - o <https://winqual.microsoft.com/SignUp/>
  - o Request a VeriSign Microsoft Authenticode Code Signing Certificate Digital ID from:
    - <http://www.verisign.com/code-signing/content-signing-certificates/microsoft-authenticode/index.html>. This link is typically available from the Winqual web site noted in step 1. The VeriSign Code Signing for Microsoft Authenticode product is required as files must be digitally signed with this certificate during submission to Microsoft.
  - o Download “winqual.exe”, apply the new digital signature and submit it to the Winqual account. The digital signature must also be updated any time the computer used to sign the files is changed as well as at time of renewal. See this link: [https://winqual.microsoft.com/Help/Updating\\_your\\_digital\\_certificate.htm](https://winqual.microsoft.com/Help/Updating_your_digital_certificate.htm) for more details.

**NOTE:** FTDI have received reports that the 64-bit “signtool.exe” does not properly sign the files due to an unsupported DLL. The 32-bit “signtool.exe” is reported to work on both 32- and 64-bit operating systems for file signing tasks.
  - o The Winqual account being used for submissions will need “Logo Submission” permission.
2. Send a request for “Reseller Rights” to the FTDI UK Support email: [support1@ftdichip.com](mailto:support1@ftdichip.com). Include the following information in this request:
  - o “Reseller Rights Request” and the OEM company name in the subject line.
  - o 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".*
3. Upon receipt of this data, FTDI UK will review the request and submitted INF files. Valid requests will be granted through Winqual 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 the modifications prior to submission.**
4. Follow the instructions to modify the user account and obtain the various submission tools as outlined by this link:  
[https://winqual.microsoft.com/Help/default.htm#preparing\\_for\\_a\\_logo\\_submission.htm](https://winqual.microsoft.com/Help/default.htm#preparing_for_a_logo_submission.htm)
- As part of this process, Microsoft requires execution of certain license agreements. Internet Explorer set up for displaying Adobe PDF files "inline" is required. Ensure all legal agreements are signed.
  - The Windows Submission Tool (WST) is required to create the driver package that will be submitted to Microsoft. Be sure to install the latest tool available at the time of submission.
5. At this point, do *not* start the Windows Submission Tool.
6. Accept the resold submission. Refer to the following link for details:
- [https://winqual.microsoft.com/Help/how\\_to\\_accept\\_resold\\_submission.htm](https://winqual.microsoft.com/Help/how_to_accept_resold_submission.htm)
  - If the licenses were not executed as part of Step 4, follow the links to each license file, wait for the license to load and execute the license electronically. Additional "Exhibits" indicated in the license agreement(s) are completed later in the submission process.
  - After clicking "Finish" to accept the submission, a summary will be displayed that shows the "process status". **DO NOT proceed further** until the status shows "Succeeded" for all line items.
7. After accepting the resold submission, follow the instructions at this link to create the Driver Update Acceptable submission package:
- [https://winqual.microsoft.com/help/driver\\_update\\_acceptable\\_help\\_content.htm](https://winqual.microsoft.com/help/driver_update_acceptable_help_content.htm), which includes building the submission through the WST.
  - Within the instructions of this link, inside of Step 5, modify each entry listed with the current location of the *modified* driver to be submitted. Delete the text in the "Symbols" entry at the bottom of the dialog box.



**Figure 2.1 – Windows Submission Tool Driver Location**

- The output of the WST (CAB file) must be signed with the VeriSign certificate prior to submitting the DUA package through the Winqual site. See this link for details on signing the CAB file: <https://winqual.microsoft.com/Help/default.htm#code-sign-files-with-your-verisign-id.htm>
8. **After the above steps have been successfully completed on the WHQL website, the submission will be checked by the Winqual system and notified by email that the submission is complete. The WHQL process also checks for a valid USB-Implementers Forum (USB-IF) assigned Vendor ID (VID).**
  9. At this point when viewing the submission, an option to download the “Signed Catalog File” is presented. There should be at least two files in the CAB file that’s downloaded:
    - ftdibus.cat
    - ftdiport.cat (if the COM port is enabled and submitted the DUA with ftdiport.inf)
  10. Copy *all* the files contained within the CAB file to the root the *modified* driver directory.
  11. The *modified* driver directory now contains the complete SIGNED driver.
  12. Test the installation on a clean system. The driver will install without any warnings.
  13. Distribute this directory as the OEM-specific WHQL certified driver.
  14. Distribution options through Windows Update are available (Driver Distribution Service). FTDI encourages use of the Windows Update service.
    - **Note: The Winqual account will show two logo submissions, “Resell” and “DUA”. ONLY enable Windows Update on the DUA submission.**

**Note: FTDI is only involved in granting reseller rights to the device driver (Steps 2 and 3 above). All other steps involve interaction with VeriSign and/or Microsoft. Please contact VeriSign and/or Microsoft for assistance in the other steps.**

**Note: Maintenance, distribution and support of any new driver is the responsibility of the OEM. Please check our website ([www.ftdichip.com](http://www.ftdichip.com)) on a regular basis for driver updates.**

**All end-user support requests received by FTDI for an OEM product will be referred to the OEM.**

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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.

At the time of writing this document (September 2010) the costs involved are shown below.

Please note that the costs given are provided for information only and are subject to change.

- VeriSign Microsoft Authenticode Code Signing Certificate ID fee: \$499.00/1 year
- Reseller Rights Submission fee: \$100.00
- DUA Submission fee: \$100.00  
This covers all Windows Operating Systems which are certified in the original FTDI Resold driver version.

This document may not be kept up to date with the most up to date fees.

Please consult the appropriate Microsoft website for latest costs.

### 3 Acronyms and Abbreviations

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

Table 3.1 Acronyms and Abbreviations

## 4 Contact Information

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

### Distributor and Sales Representatives

Please visit the Sales Network page of the FTDI Web site for the contact details of our distributor(s) and sales representative(s) in your country.

## Appendix A – Revision History

### Revision History

Version 1.00	Initial Release	19/08/08
Version 2.00	Additional information added and contact information updated.	09/06/09
Version 2.1	Corrected references to VeriSign certificate types.	10/09/09
Version 2.11	Added reference to the WHQL process checking for a valid VID Formatted ToC	05/02/10
Version 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.	10/02/10
Version 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 (Sections 2.1 and 2.2) General edits throughout the document	13/09/10
Version 3.1	Updated section 2.2 to clarify instructions and updated code signing link	26/05/11
Version 3.11	Added note regarding 64-bit signtool.exe in section 2.2	23/11/11