



**Future Technology Devices
International Ltd.**

**AN232R-04 Windows Combined
Driver Model**

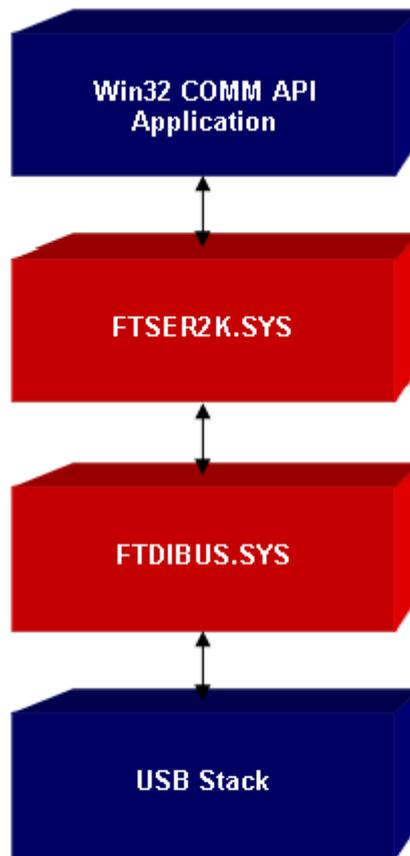
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1 Introduction

This document describes the Combined Driver Model (CDM) for the implementation of FTDI drivers on Windows 2000, Windows XP, Windows XP x64, Windows Server 2003 and Windows Server 2003 x64 operating systems.

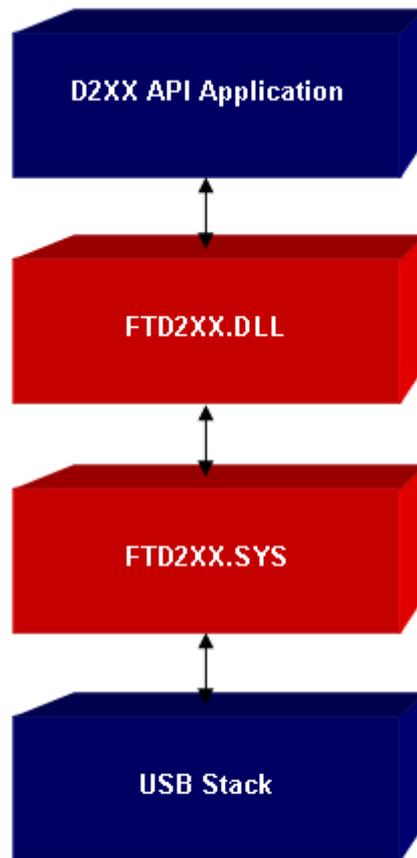
2 Background

FTDI has evolved two types of driver for its ICs: VCP and D2XX. The VCP driver makes the device appear in the system as a serial port. Applications access the port using the Win32 COMM API as if it was a normal serial port. The driver consists of two layers: FTDIBUS and FTSER2K. FTDIBUS handles the creation of the serial port and access to the hardware and FTSER2K is the implementation of the serial port. These drivers communicate using the FTDIBUS class interface.



VCP Architecture

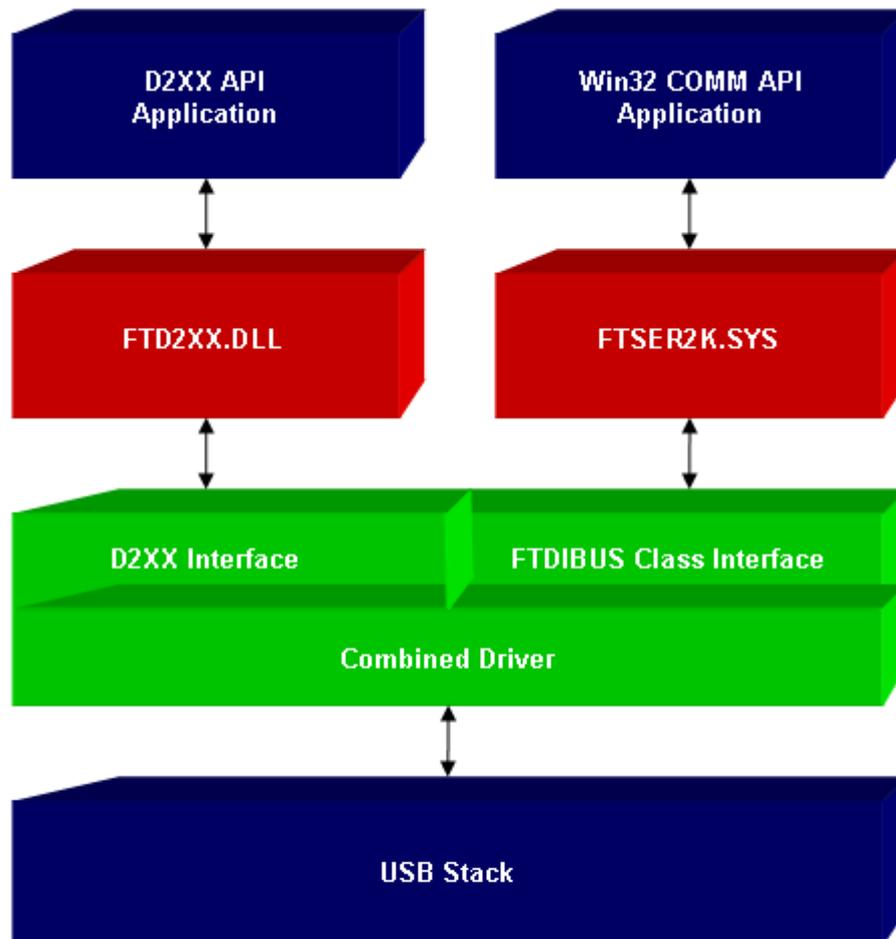
The D2XX driver is used in situations where a serial port is not required. It allows access to the device via the proprietary D2XX API. The driver is implemented as a single layer, FTD2XX.SYS, and is normally accessed through the library FTD2XX.DLL.



D2XX Architecture

3 Architecture

The key component of CDM is a new driver that supports D2XX and FTDIBUS class interfaces. The combined driver replaces FTD2XX and FTDIBUS, and an application can use either interface, although not both simultaneously.



Combined Driver Model Architecture

A feature of the newer FTDI devices (FT232R, FT245R and FT2232) is a configuration setting held in EEPROM that indicates what type of driver should be loaded for the device, thus determining the device type. This setting is read when the device is enumerated and determines whether a COM port is exposed or not. For example, if a device is programmed as D2XX then no COM port will be exposed for that device. In the case of older FTDI devices (AM and BM series) where there is not an EEPROM setting for driver type, a serial port will be exposed by default. This is to ensure compatibility with existing applications which could use either the D2XX or FTSER2K interface.

The EEPROM settings can be overridden by changing the driver INF files or by changing the "Load VCP" option on the Advanced tab of the USB Serial Converter property page (see [AN232B-10 Advanced Driver Options](#)). Please note that CDM 2.00.00 is Microsoft WHQL certified and changing any of the files in the driver package, including INF and INI files, invalidates the certification.

4 Advantages

The main advantages to using the CDM driver are:

- A single driver package removes uncertainty over which driver to install.
- CDM 2.00.00 is Microsoft WHQL certified for Windows 2000, Windows XP, Windows Server 2003, Windows XP x64 and Windows Server 2003 x64. This provides a Microsoft WHQL certified D2XX interface which has not been available before CDM.
- CDM is compatible with driver pre-installation tools such as DPInst (see [AN232R-03 FTDI Windows Driver Pre-Installation](#)). FTDI provide the certified CDM driver as an executable which uses DPInst to install the drivers (see <http://www.ftdichip.com/Drivers/VCP.htm>).
- No longer a need to uninstall VCP drivers and install D2XX drivers to reprogram device EEPROMs. So long as only one application is communicating with the device, either interface can be used.

5 Document Revision History

Version	Release Date	Comments
1.0	June 2006	Initial release.

6 Disclaimer

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7 Contact Information

Head Office - Glasgow, UK

Future Technology Devices International Limited
373 Scotland Street
Glasgow
G5 8QB
United Kingdom
Tel: +44 (0) 141 429 2777
Fax: +44 (0) 141 429 2758

E-Mail (Sales): sales1@ftdichip.com
E-Mail (Support): support2@ftdichip.com
E-Mail (General Enquiries): admin1@ftdichip.com
Web Site URL: <http://www.ftdichip.com>
Web Shop URL: <http://apple.clickandbuild.com/cnb/shop/ftdichip>

Branch Office - Taiwan

Future Technology Devices International Limited (Taiwan)
4F, No 16-1, Sec. 6 Mincyuan East Road
Neihu District
Taipei 114
Taiwan
ROC
Tel: +886 2 8791 3570
Fax: +886 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
Web Site URL: <http://www.ftdichip.com>

Branch Office - Hillsboro, Oregon, USA

Future Technology Devices International Limited (USA)
5285 NE Elam Young Parkway
Suite B800
Hillsboro, OR 97124-6499
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
Web Site URL: <http://www.ftdichip.com>

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