1.0 Introduction

Concens Actuator Studio (CAS) is running under Microsoft Windows. All drivers will automatically update when using the Concens USB programming tool.

The tool is based on FTDI technology to interface with a PC. For detailed information and additional downloads, please refer to FTDI's website (www.ftdichip.com).

This application note covers how to install Concens USB programming tool on the following versions of Windows 10 in 32- and 64-bit versions:

- Windows 10
- Windows 10 Home
- Windows 10 Pro
- Windows 10 Enterprise
- Windows 10 Education

Windows 10 IoT, Embedded and Mobile are not covered.



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2.0 Installing Concens USB Device Drivers

The Windows Combined Driver Model (CDM) may be installed on XP, VISTA, Windows 7, Windows 8 or Windows 10 allowing applications to access FTDI devices through either the D2XX DLL or a COM port without having to change driver type. However, it should be noted that an application can only communicate through one of these interfaces at a time and cannot send commands to the D2XX DLL and the associated COM port at the same time.

The CDM driver comes in two parts as shown in the block diagram below. The first part is the bus layer (FTDIBUS.sys) that provides D2XX style functionality and is always installed. The second part is the serial COM port layer (FTSER2k.sys) and the CDM driver will determine whether a COM port should be exposed by reading the EEPROM of FT232R, FT245R, FT2232D, FT2232H, FT4232H, FT232H, FT-X series and other FTDI devices. In the case of FT232BM, FT245BM, devices, the CDM driver will default to always installing both the bus and COM port parts.



The FTDI driver download page is available here https://ftdichip.com/drivers/

Figure 2.1 Windows CDM Driver Architecture





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3.0 Installing CDM Drivers

To install CDM drivers for an FTDI device under Windows 10, follow the instructions below: Connect the device to a spare USB port on your PC.

3.1 Windows Update

If there is an available internet connection, Windows 10 will silently connect to the Windows Update website and install any suitable driver it finds for the device. Figure 3.1 shows the automatic driver installation taking place.

Installing USB <-> Serial Converter



Figure 3.1 Windows Update Installation

3.2 Pre-Installation using the FTDI setup executable

The Windows 10 CDM driver is also available as a setup.exe from the FTDI Web Site, as shown in Figure 3.2.

The executable copies the default FTDI driver to the PC's driver store prior to the FTDI device being plugged into the PC.

Q Device Overview	2XX Drivers D3XX Drivers	
PLEASE NOTE – When editing driver INF files, refer to the foll	owing document: AN_107 - Advanced Driv	ver Options
New drivers are now available to support the FT4222H - for	D2XX drivers please <u>click here</u> .	
Click here to download the Windows 7 to Windows 11 and W	indows Server driver installer. The Window	ws driver installer contains both VCP and D2XX drivers.
under and the second se	ethors	
windows Certified	Others	Legacy
Windows 11 (64)	Linux	Windows Vista (32/64)
Windows 10 (32/64)	MAC OSX	Windows XP (32/64)
Windows 8.1 (32/64)	Windows CE (Version 4.2 and	d greater) Windows 2000
Windows 8 (32/64)	Windows RT	Windows ME
Windows 7 (32/64)	Android	MAC OS9
Windows Server 2012 R2 x64		Windows 98
Windows Server 2008 B2 x64		MAC OS8

Figure 3.2 Setup Executable Location



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Figure 3.3 Setup Executable Run as administrator

A message from 'User Access Control' may pop up, asking 'Do you want to allow this app to make changes to your PC?'. If so, click Yes to continue.

Press the Extract button as shown in Figure 3.4.



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EXCELLENT ELECTRIC ACTUATORS.

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Figure 3.4 Extract CDM Drivers

Follow the installation instructions shown in Figure 3.5 including license terms agreement acceptance shown in Figure 3.6 and the driver will be automatically installed. From a legal point of view, the user must accept the license terms of the driver. Successful installation is shown in Figure 3.7.



Figure 3.5 Driver Installation Wizard



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X	To continue, accept the followi agreement, use the scroll bar o	ng license agreement. r press the Page Dowr	To read the entire hey.	
	IMPORTANT NOTICE: PLEASE READ CAREFULLY BEFORE INSTALLING THE RELEVANT SOFTWARE: This licence agreement (Licence) is a legal agreement between you (Licensee or you) and Future Technology Devices International Limited of 2 Seaward Place, Centurion Business Park, Glasgow G41 1HH, Scotland (UK Company Number SC136640) (Licensor or we) for use of discontingent and the Licenser (Schware)			
	BY INSTALLING OR USING T	THIS SOFTWARE YO	U AGREE TO THE	•
	accept this agreement	Save /	As <u>P</u> rint	
	OI don't accept this agreement	nt		

Figure 3.6 Driver Installation Wizard License Agreement

Device Driver Installation Wizard



Figure 3.7 Driver Installation Completion



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Whenever an FTDI device is plugged into the PC, VCP and D2XX drivers will be installed, depending on EEPROM settings, and listed in device manager as shown in Figure 3.8. Device Manager can be found as shown in Figure 3.9.



Figure 3.8 Device Manager View

NOTE: The device must be physically plugged in after running the setup exe to complete the installation.



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3.3 Manual Installation

If no suitable driver is automatically found, then the following procedure should be followed.

Firstly, download the latest FTDI windows driver files from https://ftdichip.com/drivers/ and save the driver .zip file to a known folder on the PC. The desktop can be used so that the driver folder can be easily located then extract the .zip file.

To locate the device manager on windows 10, right click on the Microsoft logo at the bottom left-hand corner of the screen and select Device Manager as shown in Figure 3.9.

Programs and Features
Power Options
Event Viewer
System
Device Manager
Network Connections
Disk Management
Computer Management
Command Prompt
Command Prompt (Admin)
Task Manager
Control Panel
File Explorer
Search
Run
Shut down or sign out >
Desktop
Search the web and Windows

Figure 3.9 Device Manager Access





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In the Device Manager window there should be a device under Other Devices with a yellow warning symbol to indicate a problem i.e. no driver installed, as shown in Figure 3.10. The text next to this device will depend on the device attached. In this example the device was a USB Serial Cable.



Figure 3.10 Device Manager View

Right click on the other device (USB Serial Cable in this example) to bring up a menu as shown in Figure 3.11. From the displayed menu select "Update Driver Software..."





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Device Manager		- 0	>
e Action View Help			
-	■ & × ●		
🕂 embedded			_
> 🛯 Audio inputs and outp	uts		
> 💻 Computer			
> 👝 Disk drives			
> 🌄 Display adapters			
> 📓 DVD/CD-ROM drives			
> 🎽 Firmware			
> 🐺 Human Interface Devi	es		
> 📷 IDE ATA/ATAPI control	lers		
> 🚠 Imaging devices			
> 🥅 Keyboards			
> 🧾 Memory technology d	evices		
> 🚺 Mice and other pointing	ng devices		
> 🥅 Monitors			
> 🚅 Network adapters			
✓ ▲ Other devices			
USB Serial Cable			
> 🛱 Print queues	Update Driver Software		
> Processors	Disable		
> Software devices	Uninstall		
> 🖬 Sound, video and g			
> 🍇 Storage controllers	Scan for hardware changes		
> 🏣 System devices	Properties		
> 🕴 Universal Serial Bus	roperues		

Figure 3.11 Update Driver Software

This then displays the option for an automatic search or a manual search. Select the second option to browse manually as shown in Figure 3.12.



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\rightarrow	Search automatically for updated driver software Windows will search your computer and the Internet for the latest driver software for your device, unless you've disabled this feature in your device installation settings.	
Ŷ	Browse my computer for driver software Locate and install driver software manually.	

Figure 3.12 Browse my computer for Driver Software

In the address box put the exact location where the drivers have been saved to. The location should be the top-level folder of the extracted files and contain two *.INF files. It is not necessarily the exact same location as shown in Figure 3.13. The drivers could have been saved anywhere on the PC by the user.



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Update Driver Software - USB Serial Cable		
Browse for driver software on your computer		
Search for driver software in this location:		
C:\Users\apps\Desktop\2.12.10	Browse	
→ Let me pick from a list of device drivers on my com This list will show installed driver software compatible with the devi	outer ce and all driver	
→ Let me pick from a list of device drivers on my com This list will show installed driver software compatible with the devi software in the same category as the device.	outer ce and all driver	

Figure 3.13 Search Location

After entering or browsing for the address, select "Next" to start the installation as shown in Figure 3.14.



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Figure 3.14 Installing driver software

When the installation has finished a completion screen is displayed as shown in Figure 3.15.



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Figure 3.15 Successful Driver Software Update

Press Close to close this window and go back to the Device Manager Window. If the Virtual Com Port option has been selected, then the Device Manager will show a device under Other Devices but in addition to this there is a new entry under Universal Serial Bus Controllers indicated in Figure 3.16 as the USB Serial Converter. This indicates the bus layer of the driver is installed. Installing the Virtual Com Port layer of the driver is almost a repeat of the last few steps.



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Device Manager	- 1) X
le Action View Help		
> 🥅 Monitors > 💭 Network adapters		
✓ Y Other devices W USB Serial Port		
> 🚍 Print queues		
> Processors		
Software devices		
Sound, video and game controllers		
Sustem devices		
Iniversal Serial Rus controllers		
AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)		
Standard Enhanced PCI to USB Host Controller		
Standard Enhanced PCI to USB Host Controller		
Standard OpenHCD USB Host Controller		
Standard OpenHCD USB Host Controller		
USB Composite Device		
USB Composite Device		
USB Composite Device		
🟺 USB Root Hub		
🏺 USB Root Hub		
🟺 USB Root Hub		
🟺 USB Root Hub		
USB Root Hub (xHCI)		
USB Serial Converter		

Figure 3.16 Device Manager View

Right click on the other device (USB Serial Cable in this example) to bring up a menu as shown in Figure 3.17. From the displayed menu select "Update Driver Software..."



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e Action View Hel	D	
-	i 🖳 🖡 🗙 🖲	
> 🛄 Monitors		
> P Network adapters		
✓ M Other devices	1	
USB Senal Pc	Undate Driver Software	
> Print queues	Dischie	
Processors	Disable	
Software device	Uninstall	
Storage controll	Scan for hardware changes	
Sustem devices		
Universal Serial F	Properties	
aMD USB 3.0	eXtensible Host Controller - 1.0 (Microsoft)	
Standard Enh	inced PCI to USB Host Controller	
Standard Enha	inced PCI to USB Host Controller	
Standard Ope	nHCD USB Host Controller	
🖗 Standard Ope	nHCD USB Host Controller	
USB Composi	te Device	
USB Composi	te Device	
🖞 USB Composi	te Device	
🕴 USB Root Hub		
🏺 USB Root Hub		
🖞 USB Root Hub		
USB Root Hub		
🟺 USB Root Hub	(xHCI)	
USB Serial Cor	nverter	

Figure 3.17 Update Driver Software

This then displays the option for an automatic search or a manual search as shown in Figure 3.18. Select the second option to browse manually



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Figure 3.18 Browse my computer for Driver Software

In the address box put the exact location where the drivers have been saved to. The location should be the top-level folder of the extracted files and contain two *.INF files. It is not necessarily the exact same location as shown in Figure 3.19. The drivers could have been saved anywhere on the PC by the user.



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	Update Driver Software - USB Serial Cable			
Browse for driver software on your computer				
Sea	arch for driver software in this location:			
C	:\Users\apps\Desktop\2.12.10	~	Browse	
	Include subfolders			
	 Include subfolders Let me pick from a list of device drivers on This list will show installed driver software compatible w software in the same category as the device. 	my comp ith the device	outer e and all driver	
	 Include subfolders Let me pick from a list of device drivers on This list will show installed driver software compatible w software in the same category as the device. 	my comp ith the devic	outer e and all driver	

Figure 3.19 Search Location

After entering the address select "Next" to start the installation as shown in Figure 3.20.



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When the installation is finished a completion screen is displayed as shown in Figure 3.21.



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Figure 3.21 Successful Driver Software Update

Note this screen also displays the COM port number assigned to the device. Press Close to close this window and go back to the Device Manager Window as shown in Figure 3.22.



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E Device Manager	– 🗆 X
ile Action View Help	
• • • • • • • • × •	
> 🛄 Monitors	^
> 🖵 Network adapters	
V 💭 Ports (COM & LPT)	
USB Serial Port (COM3)	
> 🛱 Print queues	
> Processors	
> Software devices	
Sound, video and game controllers	
> Storage controllers	
> 🏣 System devices	
 	
AMD USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)	
Standard Enhanced PCI to USB Host Controller	
Standard Enhanced PCI to USB Host Controller	
Standard OpenHCD USB Host Controller	
Standard OpenHCD USB Host Controller	
USB Composite Device	
USB Composite Device	
🏺 USB Composite Device	
🖗 USB Root Hub	
🖗 USB Root Hub	
USB Root Hub	
USB Root Hub	
USB Root Hub (xHCI)	
USB Serial Converter	

Figure 3.22 Device Manager View

This time the Device Manager does not have an entry under Other Devices but does show entries under Universal Serial Bus Controllers and Ports (COM & LPT). Figure 3.22 displays a correct installation. The device is now ready to use on COM3.

NOTE: Not all devices will install to COM3. The COM port allocation is determined by the installation wizard on the basis of the next free com port as designated in the PC registry. The COM port can be reassigned to another free port in advance properties as shown in Figure 3.23. FTDI have also produced a utility called COM PORT Assignment.

Device Manager	Utill Senial Port (COMI) Properties		×	Advanced Settings for COM3			7	×
File Action View Help	General Post Settings Dever Details	Events		COM Port Number: COM3		1	OK	
> 🚰 Monitors > 💇 Network adapters	Bits per second	9600	÷	USB Transfer States COM4 Salect lower actions to come COM5	-		Cancel	đ
Ports (COM & UPT) USB Serial Port (COM3)	Data bits	8	5	Select higher settings for fail COMB		D rates	Default	As .
Processors Entry and evices	Faity Stop bits	None	~	Receive (Sytes): CON10 CON10 CON11 CON12				
Sound, video and game controllers Sea Storage controllers	Row control	None	~	CON13 CON14 CON15				
System devices Universal Serial Bus controllers AMD USB 3.0 eXtensible Host Controller - 1.0 (Micros	Ad	enced	Restore Defaults	Select lower settings to corre COM15 COM15 COM15		Serial Brumerator		20
Standard Enhanced PCI to USB Host Controller Standard Enhanced PCI to USB Host Controller				Latency Timer (msec)) COM20 COM20 COM22		Cancel If Power Off Event On Surprise Removal		
Standard OpenHCD USB Host Controller Standard OpenHCD USB Host Controller USB Compared Device				Timeouts CON23 CON24 CON25		Set RTS On Oxee Deable Modern Ctrl At Startup		
USB Composite Device				Minimum Read Taneout (Indel COM26 COM27 Minimum Write Timeout (Indel COM28		Erable Selective Suspend Selective Suspend Idle Timeout (secs):	5	
USB Root Hub		0	K Cancel	COM29 COM30				

Figure 3.23 Advanced Settings



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4.0 Troubleshooting

4.1 Windows 10 cannot find drivers for my device

This error can occur if the VID and PID programmed into the device EEPROM do not match those listed in the INF files for the driver. The VID and PID programmed into the device EEPROM may be found by using the USB View utility from the FTDI web site. These can then be checked against the VID and PID entries in the driver INF files. If they do not match, that driver cannot be installed for that device without either re-programming the device EEPROM or modifying the list of VID and PID numbers in the INF files.

Please note that only specific VID and PID or FTDI's VID (0x0403) and associated PID issued by FTDI should be used in the EEPROM and INF files. If the FTDI driver files are edited in any way, the certification is invalidated, and the default drivers may not install.

For further details, please contact support@concens.com

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