

Reconfiguration Instructions

From: Andrew Kalman To: CubeSat Kit (TM) Users Date: October 13, 2018 750 Naples Street • San Francisco, CA 94112 • (415) 584-6360 • http://www.pumpkininc.com

Instructions for using the CubeSat Kit over USB in Windows 10 and above

Changelog

_	Rev	Date	Author	Comments
	А	20181018	AEK	Initial revision.

Overview

Since the mid-2000s, Pumpkin has shipped CubeSat KitTM (CSK) components that utilize FTDI¹ USB-toserial converters, using a custom USB PID issued to Pumpkin by FTDI.

Since the advent of Microsoft® Windows® 10 and its driver signing requirements, it is difficult to install drivers for these CubeSat Kit components. Rather than instruct CubeSat Kit users in how to bypass driver signing, Pumpkin has decided to stop using its unique PID on these products. By (re-)programming the CubeSat Kit devices with FTDI's default PID (and VID) while keeping the other CubeSat-Kit specific configuration settings, Windows 10 will automatically recognize a compliant device and install the correct drivers.

This document outlines a procedure to "wipe" the non-default PID from a CubeSat Kit's FTDI FT232R serial-to-USB converter chip, so that Windows 10 will automatically install the requisite drivers when the newly-reprogrammed CubeSat Kit components is attached to the Windows 10 PC via USB.

Requirements & Prerequisites

This procedure requires access to a Windows machine running Windows 7 or earlier.²

Windows CubeSat Download and unzip Pumpkin's 7 Kit driver package from http://cubesatkit.com/driver/usb/windows/win7/cskdriverswin7.zip onto a Windows 7 PC.

Download and unzip FTDI's MProg.exe v3.5 FTDI chip reprogramming utility https://www.ftdichip.com/Support/Utilities/MProg3.5.zip onto a Windows 7 PC.

Download the MProg configuration file CSK with FTDI default PID and VID.ept from Pumpkin.

¹ <u>http://www.ftdichip.com/</u>.

 $^{^{2}}$ It may also be possible to achieve the same results using Linux or a Mac, but that is not covered here.

Procedure

1. Attach a CubeSat Kit Development Board (Dev Board) or Motherboard Module (MB) to the Windows 7 PC via USB. When Windows asks for drivers, navigate to the folder where you unzipped the Pumpkin CSK USB drivers. Using the drivers in that folder, Windows will install both a USB device and a virtual COM port associated with the attached CSK hardware. Confirm that a new virtual COM port has successfully been installed by checking the Ports (COM & LPT) type of connection in Windows Device Manager.



Figure 1: Win7 Device Manager with Pumpkin CSK module connected

- 2. Disconnect any other USB devices from the PC.
- 3. Launch MProg.
- 4. In MProg, select Device \rightarrow Scan. Upon success, MProg will show that it has found one programmed device, the CSK hardware.

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Basic Detais Device Type FT232R VENDER VD /PD FTD Suppled PD Vender D 9403 Product D F020 BM / C Device Specific Options USB Version Number USB 2.0 D Bisable USB Serial Number Product and Manufacturer Descriptor String Manufacturer Product Descriptor String			FT232R FT232H FT423_ Invert RS232 Signals Invert RXD Invert RXD Invert RXD Invert RXD Invert RXB Invert RXB Invert OTS# Invert OSR# Invert OSR# INVERT OSR# Invert OSR#
Pumpkin	CubeSat Kit /0		SLEEP# C4
Programming Options Only Program Blank Number Of Blank Devic Number Of Programmed	High Current VO's		

Figure 2: MProg having detected connected Pumpkin CSK module

5. In MProg, select File → Open, and select the CSK with FTDI default PID and VID.ept configuration file that Pumpkin provides for this purpose. MProg will display a screen as shown below. Note in particular that the FT232R has been chosen, the FT232R is configured for 500mA max bus power, and FTDI's default VID and PID will be used.

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Basic Details FT232R Jewice Type FT01Default JSB VID / PD FT01Default Vendor ID 0403 Product ID 600 BM / C Device Specific Options USB Version Number USB VS Serial Number USB 2/20 Serial Number	USB Power Options Bus Powerd Set Powered USB Secial Number Control USB Secial Number Prefix (2 digts) Fred Secial Number Fred Secial Number PUSSFU	FT232R FT2232H FT2232H FT423 Invert RS232 Signals Invert RXD Invert RXD Invert RS# Invert OTR# Invert OTR# Invert OSR# Invert OSR# Invert OSR#	
Pull Down IO Pins in USB Suspend Product and Manufacturer Descriptor Manufacturer Product Desc	Frable USB Remote Wake Up	VO Controls TXLED# ▼ C0 RXLED# C1 TXDEN ▼ C2 PWRON# C3	
Pumpkin CubeSat Kit	SLEEP# C4		
Programming Options		High Current VO's	

Figure 3: MProg ready to reprogram Pumpkin CSK module

6. In MProg, select Device → Program. This will re-program the CSK hardware with the settings from the .ept file. When done, the result will be a newly programmed FTDI FT232R on the CSK hardware, compatible with the CSK hardware, with FTDI's default VID and PID, and with a (semi-random) new serial number, as shown below:³

³ It's important to use the Pumpkin-supplied .ept file, as it sets certain features like the C0 and C1 settings that differ from FTDI's default settings for the FT232R chip.

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	32R	USB Power Options Bus Powered Self Powered Max Bus Power 500 mili Amps	FT232R FT2232H FT423 Invert R5232 Signals Invert RXD Invert RXD Invert RTS# Invert RTS# Invert CTS# Invert OT# Invert DT# Invert DT# Invert CT# Invert R#	
/endor ID 0403 BM / C Device Spec USB Version Numb	er USB 2.0	USB Serial Number Control Serial Number Prefix (2 digts) PU Use Fixed Serial Number Fixed Serial Number (8 digts) PU2X3FTU		
Pull Down IO Pi	ns in USB Suspend	USB Remote Wake Up	VO Controls	
		Enable USB Remote Wake Up	TXLED# -	CO
			RXLED# -	C1
			TXDEN -	C2
Product and Manufa Manufacturer	acturer Descriptor S Product Desc		PWRON# •	• C3
Pumpkin	CubeSat Kit		SLEEP# -	C4
Programming Option	18			
Only Program Bla	nk Devices			
Programmed Serial N	High Current VO's			

Figure 4: MProg having successfully reprogrammed Pumpkin CSK module

- 7. Close MProg.
- 8. Remove the CSK device from the Windows 7 PC.
- 9. Connect the CSK device to a Windows 10 PC. Windows 10 will recognize the device, and will install signed drivers from FTDI. This process make take a few minutes, if this is the first time an FTDI device has been attached to the Windows 10 PC.



Figure 5: Win10 Device Manager with Pumpkin CSK module connected ⁴

⁴ Note that despite the CubeSat Kit /07F0 product description programmed into the FT232R, the CubeSat Kit module appears as a generic USB serial converter and USB serial port.



Summary

By changing the USB PID of a Pumpkin CubeSat Kit module to FTDI's default, it can easily be connected to a Windows 10 PC over USB, because in this configuration, Windows 10 will use the default, signed FTDI drivers.

Sincerely,

Andrew Kalman President & CTO Pumpkin, Inc.