

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.

| | | P # F ? 0 | L |
|--|--|---|---|
| Basic Details Device Type FT2 USB VID / PID FTT Vendor ID 0403 BM / C Device Spec USB Version Spec Disable USB Se F Pull Down ID Pi Product and Manufi | 2322 Product ID F020 add D F | USB Power Options Max Bus Power © Bus Powered F00 milk Amps USB Serial Number Control Serial Number Prefix (2 digts) PU U Use Fixed Serial Number (8 digts) 1234576 USB Remote Wake Up V Enable USB Remote Wake Up | FT232R FT232H FT423 Invert R5232 Signals Invert R5232 Signals Invert R5232 Signals Invert R5232 Minuter T54 Invert R754 Invert R754 Invert R754 Invert R754 Invert R754 |
| Rumpkin | Product Descrip | lion | SLEEP# C4 |
| Programming Option Only Program Ble Number Of Blank Dev Number Of Programm | ns ink Devices /ices = 0 ned Devices = 1 | | ☐ High Current VO's ☐ Load D2XX driver |

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.

| the second se | | |
|--|---|---|
| Basic Details FT232R evice Type FT232R SB VID / PD FTDI Default vendor ID 0403 Product ID 600 BM / C Device Specific Options USB Version Number USB Version Number USB 2/s rein Number | USB Power Options Bus Powerd Set Powered USB Secial Number Control USB Secial Number Prefix (2 digts) Fred Secial Number Fred Secial Number PUSCRTU | FT232R FT2232H FT423 Invert RS222 Signals Invert RXD Invert RXD Invert RTS# Invert CTS# Invert CTS# Invert OS# Invert OS# Invert OC# Invert OC# Invert OC# |
| Pull Down IO Pins in USB Suspend Product and Manufacturer Descriptor Insertingtures Descriptor | USB Remote Wake Up | VO Controls TXLED# ▼ C0 RXLED# C1 TXDEN ▼ C2 PWRON# C3 |
| Pumpkin CubeSat Kit | /07F0 | 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.

| Basic Details USB Power Options Hax Bus Power 0 evice Type FT232R FT232R SB VD / PD FTD Default Evice Specific Options Invert RS232 Signals SB VD / PD FTD Default USB Serial Number Control Invert RS232 Signals SB VD / PD FTD Default USB Serial Number Control Invert RS232 Signals SB VD / PD FTD Default USB Serial Number Prefix (2 digts) PU USB Version Number USB Serial Number Prefix (2 digts) PU Deable USB Serial Number Public USB Serial Number Invert RS2 Post Durbs in USB Suppend USB Remote Wake Up Invert R8 Product and Manufacturer Descriptor Strings USB Remote Wake Up Invert N2 Product and Manufacturer Descriptor Strings Invert N2 Invert N2 Product Berk/Devices Invert N2 Invert N2 Organming Options Invert N2 Invert N2 Organmed Serial Number : PU2X/FTU Implication Controls Invert N2 | 2 🖉 🔳 | | $\left \right\rangle$ | 2 | ? | 0 | 4 |
|---|--|-----------------|--|---|-------------------------|-------------------|--|
| Product and Manufacture: Description Strings Manufacture: Product Description Pumpkin CubeSat Kit /07F0 Programming Options Image: Compared String Strings * Orny Program Elank Devices Image: Compared String Strings ogrammed Serial Number : PU2XVFTU Image: Compared String Strings | ssic Details stvice Type FT232R SB V/D / P/D FTDI Default andor ID 0403 Product M / C Device Specific Option USB Version Number USB □ Deable USB Serial Numb ⊽ Pull Down IO Pins in USB | ▼ | USB Power Option © Bus Powered C Self Powered USB Serial Number Serial Number Profix USB Fixed Serial Fixed Serial Number PUZXIFTU USB Remote Wake VSB Remote Wake VSB Remote Wake | S Max B 500 Control — (2 digits) Number (8 digits) Up — ote Wake I | us Pow mili Au PU | er nps | FT232R FT232R FT423 Invert RS232 Signals Invert RS232 Signals Invert RXD Invert RXD Invert RXD Invert RXD Invert RXD Invert RXD Invert RXD Invert DTR# Invert DTR# Invert DTR# Invert DTR# Invert DCD# Invert R# VO Controls TALED# C controls TALED# C c1 TODEN C 2 |
| Pumpkin CubeSat Kit /07F0 SLEEP# SLEEP# SLEEP# G Programming Options Only Program Ellenk Devices Image: Superior | roduct and Manufacturer De Janufacturer Proc | scriptor String | s n | | | | PWRON# C3 |
| Programming Options Only Program Ellenik Devices Ogrammed Serial Number : PUZXVFTU | Pumpkin Cut | eSat Kit /07F0 | | | | | SLEEP# C4 |
| | Programming Options | | | | | 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.