Mac Latency

The standard latency on the FTDI driver is 16milli-Seconds this is too slow for reliable serial control. On Windows the FTDI driver allows you to set the latency, on Mac the latency is fixed. We provide a low latency FTDI Driver for MAC OSX. On OS X Mavericks and later you also have to disable the Mac X default FTDI driver

First download the MACLOW Driver from

http://www.colinbroad.com/cbsoft/usb422/usb422.html

Then install the Low latency driver as follows

1) Download and install "Kext Drop", this will be used to install the new driver, you will find a link on the USB422 product page
2) Download and unzip the low latency driver
3) Open "Kext Drop" (Aplications Folder)
4) Drag and drop the low latency driver onto Kext Drop.
5) When Finished Close "Kext Drop"

OS X Mavericks and Yosemite

Apple have added their own FTDI driver which also has a 16 milli-Second Latency, this must be disabled before the FTDI driver can be used as follows. For Yosemite the driver must be certified!

1) Open the Terminal and enter the following (You can cut and paste from this document)
2) cd /System/Library/Extensions/IOUSBFamily.kext/Contents/PlugIns
3) sudo mv AppleUSBFTDI.kext AppleUSBFTDI.disabled – You will be asked for the password – type in and hit return
4) Restart the computer and connect

```
Last login: Fri Feb 20 13:13:07 on ttys000
colins-MacBook-Air:~ colinNewAir$ cd /System/Library/Extensions/IOUSBFamily.kext/Contents/PlugIns
colins-MacBook-Air:PlugIns colinNewAir$ sudo mv AppleUSBFTDI.kext AppleUSBFTDI.disabled
colins-MacBook-Air:PlugIns colinNewAir$
```

OS X El Capitan

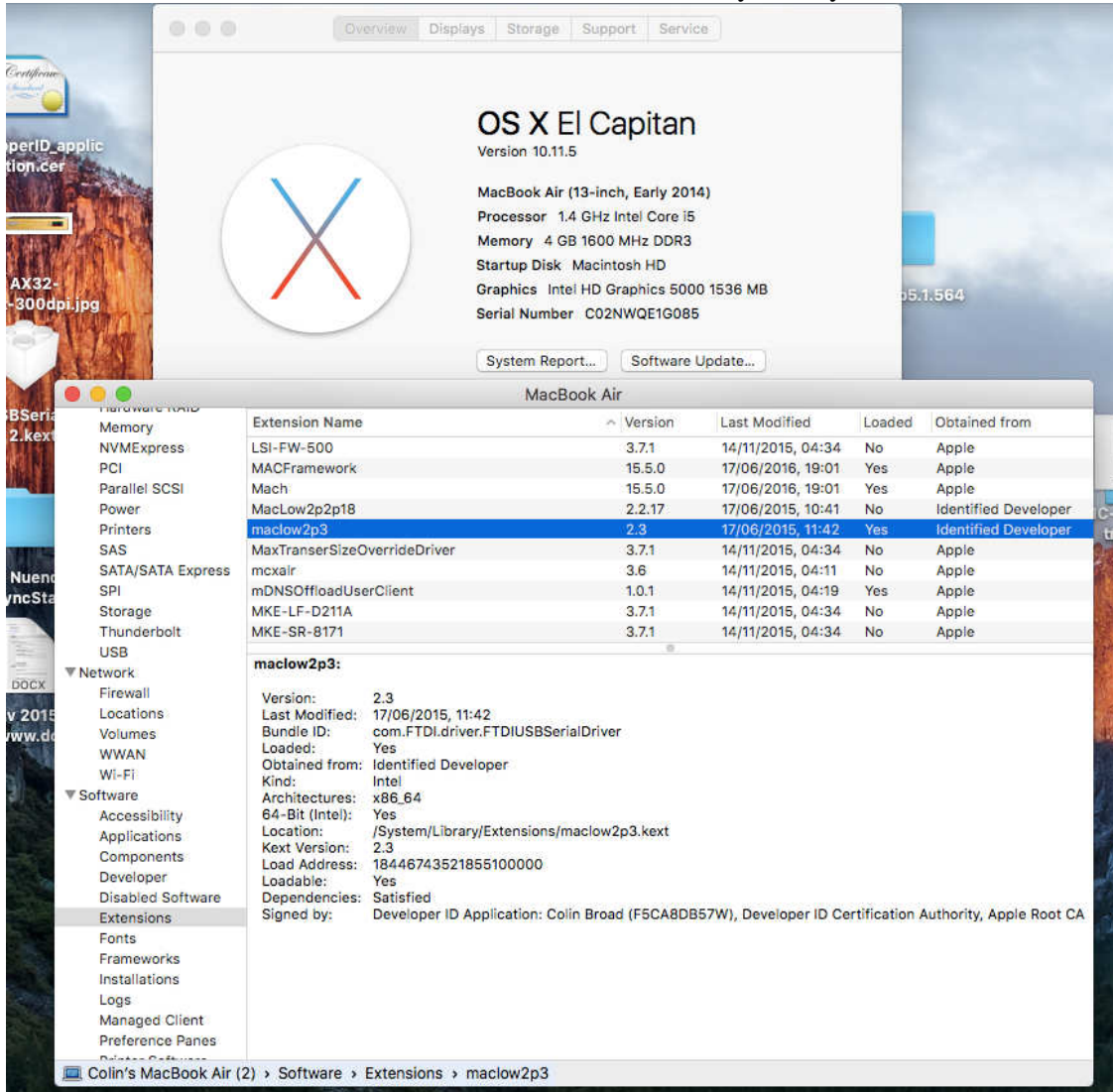It may be necessary to boot using the Recovery partition to change the name of the AppleUSBFTDI.kext directory.

The Driver is called AppleUSBFTDI.kext and is located in /System/Library/Extensions
Users of El Capitan should read this article

http://osxdaily.com/2015/10/05/disable-rootless-system-integrity-protection-mac-os-x/

You can use the "ls" command to list the Directory showing the new FTDIUSB driver


```
Last login: Wed Jun 17 11:30:29 on ttys000
colins-MacBook-Air-2:~ colinNewAir$ cd /System/Library/Extensions/IOUSBFamily.ke
xt/Contents/PlugIns
colins-MacBook-Air-2:PlugIns colinNewAir$ ls
AppleUSBCDC.kext                AppleUSBMergeNub.kext
AppleUSBCDCACMControl.kext       AppleUSBOHCI.kext
AppleUSBCDCACMData.kext          AppleUSBOpticalMouse.kext
AppleUSBCDCDMM.kext              AppleUSBUHCI.kext
AppleUSBCDCECMControl.kext       AppleUSBVideoSupport.kext
AppleUSBCDCECMData.kext          AppleUSBXHCI.kext
AppleUSBCDCEEM.kext              IOUSBCompositeDriver.kext
AppleUSBCDCWCM.kext              IOUSBHIDDriver.kext
AppleUSBEHCI.kext                IOUSBHIDDriverSafeBoot.kext
AppleUSBFTDI.disabled            IOUSBLib.bundle
AppleUSBFTDI.kext                IOUSBUserClient.kext
AppleUSBHub.kext
colins-MacBook-Air-2:PlugIns colinNewAir$
```

Check that the correct driver is loaded by looking in /Apple/About this Mac/More Info/system report/Software/Extensions to se if the MacLow Driver is loaded, you may have to restart to see this.

Sierra and High Sierra

Sierra and High Sierra Low Latency Driver Installation

To Install the Low Latency driver the existing AppleUSBFTDI.kext driver must be disabled. On Sierra and High Sierra this requires the System Integrity Protection to be temporarily disabled

System Integrity Protection in MacOS Sierra

- AppleUSBFTDI.kext is located in a different folder
- The macOS needs the System Integrity Protection to be disabled first before renaming kexts

1) Disable SIP
- Restart the Mac on the recovery session (CMD+R depressed during start-up)
- Open Terminal
- Type "csr disable" or "csrutil disable" depending on the exact version of MacOS and validate
- You should see a warning message saying that you are disabling System Integrity Protection
- Restart Normally

2) Deactivate the AppleUSBFTDI.kext
- Open Terminal (Be sure to be logged as an administrator account of MacOS)
- Type "cd /System/Library/Extensions"
- Disable the Mac driver "sudo mv AppleUSBFTDI.kext AppleUSBFTDI.disabled"
- Type Enter and password to validate
- Type "ls" to show the contents of the directory and verify that the AppleUSBFTDI.kext is renamed as AppleUSBFTDI.disabled

3) Deactivate the FTDIUSBSerialDriver.kext if installed

4) To Reactivate SIP
- Restart the Mac on the recovery session (CMD+R depressed during start-up)
- Open Terminal
- Type "csr enable" or "csrutil enable" depending on the exact version of MacOS and validate
- Terminal should warn you that you are enabling System Integrity Protection
- Restart Normally

4) Verify that the maclow2p3 is loading and that AppleUSBFTDI is not as follows:-
- Open System Information of macOS - Apple Menu/About this Mac/More Info/system report/Software/Extensions
- AppleUSBFTDI should not be present
- maclow2p3 should be present AND loaded (if a USB422 is connected).

That's it!

Please note that Apple OS big updates could reactivate the AppleUSBFTDI.kext. It's then important to verify that it stays disabled after any major OS upgrade.
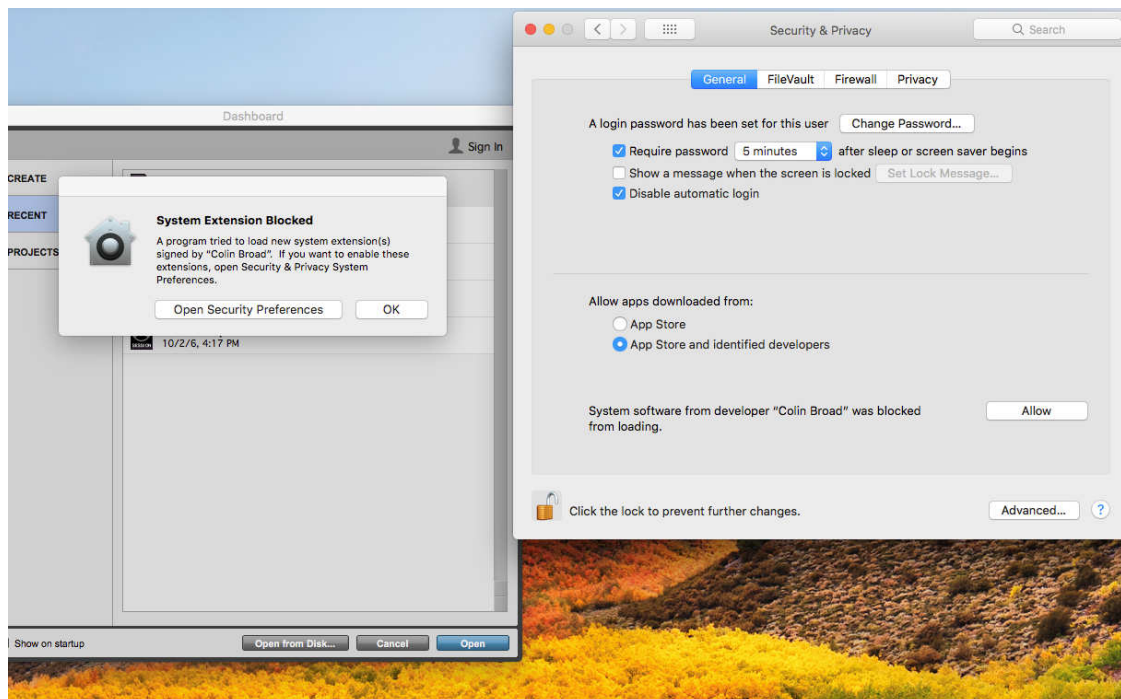
Thanks to Jonathan Martins for the concise information above!

High Sierra Performance:

The driver performs the same on High Sierra as it does on Sierra. Tested with ProTools release 2018.3 and with the latest ProTools beta release.

High Sierra Installation:

There is one Apple issue that everybody (including Avid, Adobe...) suffer from (see picture below). The only solution is to open they system preferences and click on "Allow", sometimes you will need to repeat the driver installation.
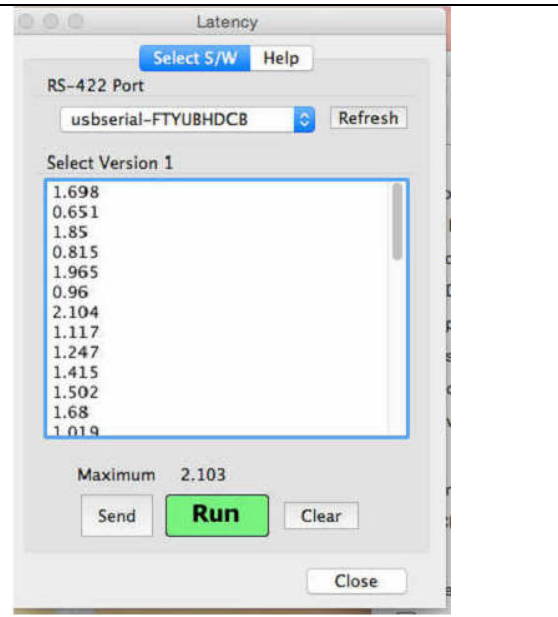

Thanks to Alicja Golianek, Avid Audio QA Team Leader

Checking the Latency

The best way to check the latency is with a dual beam oscilloscope, trigger on the Tx data and look at he difference between the tx and rx. The latency is also determined by the program you are running, not just the driver.

You can also check the Latency with our latency check program available from the USB422 page.

The instructions to make a special test plug are on the help page of the program!

CB Electronics
Loddonside, Lands End House, Beggars Hill Road, Charvil, Berkshire, RG10 0UD, UK
Tel +44 (0) 1189 320345   Fax +44 (0) 1189 320346
http://www.colinbroad.com E-mail Support@colinbroad.com