

Investigation of Compatibility Problems When Using Callisto with Windows 7

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1. Introduction

Windows 7 is problematic when running application programs that use a USB-Serial Adapter. Apparently, Windows 7 uses different processes to communicate with a serial port than Windows XP. The problems are more severe with the 64-bit version of Windows 7 (x64) than the 32-bit version (x32).

Most problems are traceable to out-of-date and incompatible drivers and, in some cases, incompatible integrated circuits (chips) used in the adapter. Of particular concern in this report is Callisto software, callisto.exe version 117 (the current version as of this writing), which communicates with the Callisto instrument at 115,200 b/s.

2. Serial communications interface

Callisto uses an EIA-232 serial interface based on three wires (TD, RD and Common) and no flow control (figure 1). Modern PCs do not have a native serial port but, instead, are equipped with USB ports. Therefore, it is necessary to use a USB-Serial Adapter and a virtual communication port (VCP) driver that provides the necessary serial communications.

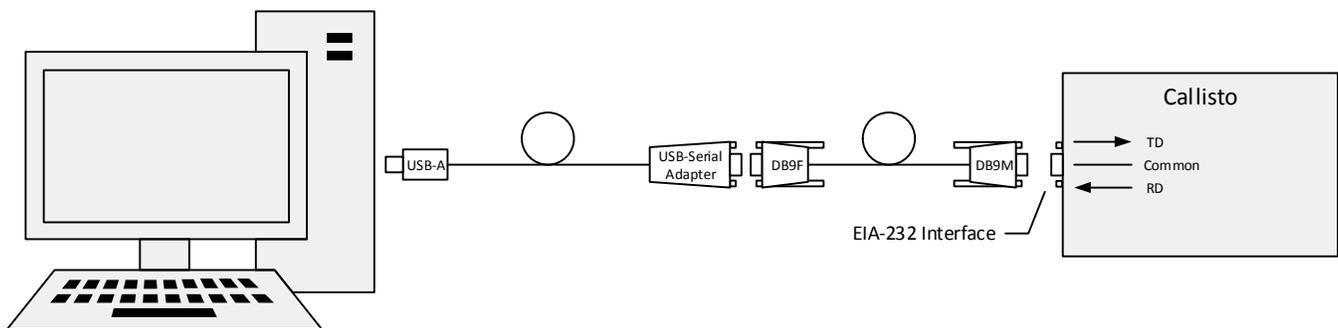


Figure 1 ~ Callisto serial port interface connections.

3. Callisto incompatibility symptoms

A number of problems have been observed when using Callisto with Windows 7:

1. Windows updates have made drivers inoperable that previously worked with callisto.exe
2. USB-Serial Adapter devices and drivers that worked with application programs at lower speeds (for example, 9600 b/s) do not work at the higher speed required by Callisto (115200 b/s)
3. Older USB-Serial Adapters that worked with Windows XP do not work with Windows 7 even though the driver may be current or claimed by the manufacturer to be Windows 7 compatible

- Nothing happens when callisto.exe is opened – the Callisto software window is not visible on the Windows desktop. Subsequent attempts to open callisto.exe do not work, resulting in one or more instances of callisto.exe (called “zombies”)
- Opening callisto.exe the first time after PC restart or plugging in an adapter may not be successful (the Callisto software window is not visible), resulting in a “zombie” instance.

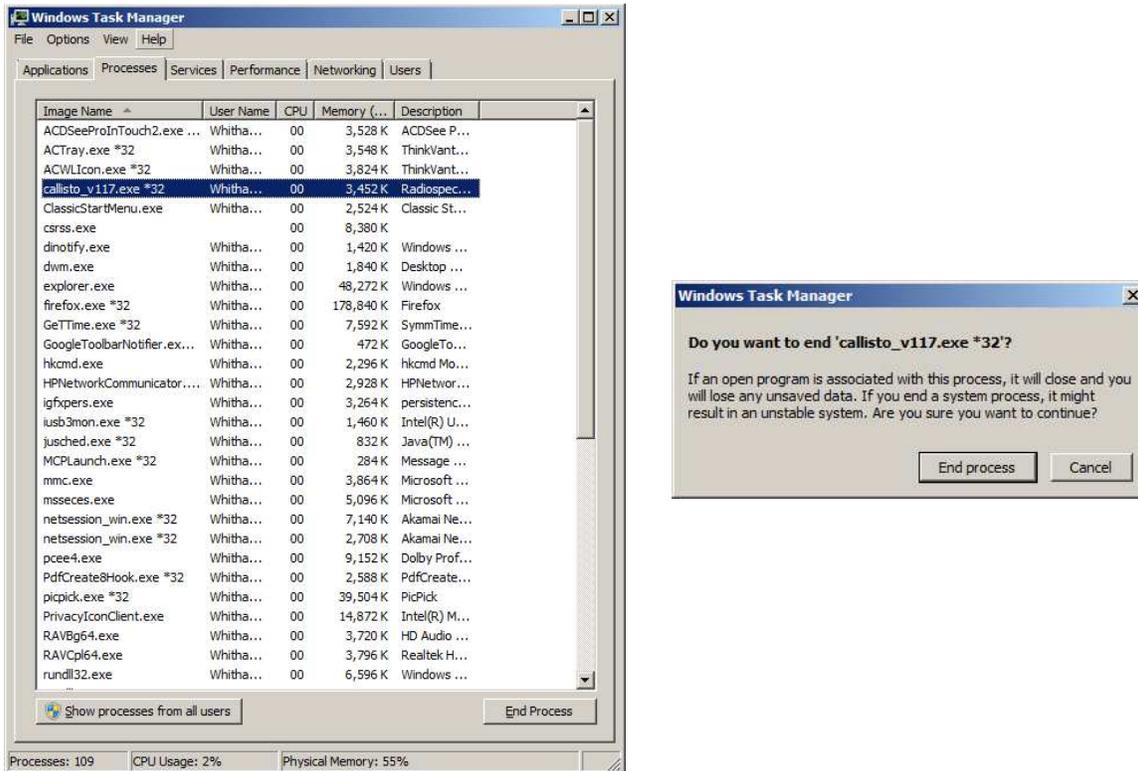


Figure 2 ~ If callisto.exe is opened but its window does not appear on the desktop, then it is a “zombie” (left). Task Manager is used to close (End Process) callisto.exe (right)

- When callisto.exe is opened, it may load very slowly as indicated by the “Yield” status bar in the callisto.exe window. This can happen when Callisto is not powered On or no USB-Serial Adapter is plugged into the PC. Correct the problem and try again.
- If callisto.cfg is setup for the wrong COM port (parameter [rxcomport]), the Callisto software window indicates “Can’t open RCU-port” (figure 3). Correct the problem and try again. After correction, the window should indicate “COM-port available” as callisto.exe loads. When callisto.exe finishes loading, “Receiver connected” should appear (figure 4). If callisto.exe is unable to establish communications with the Callisto, the text “COM-port available” will remain.

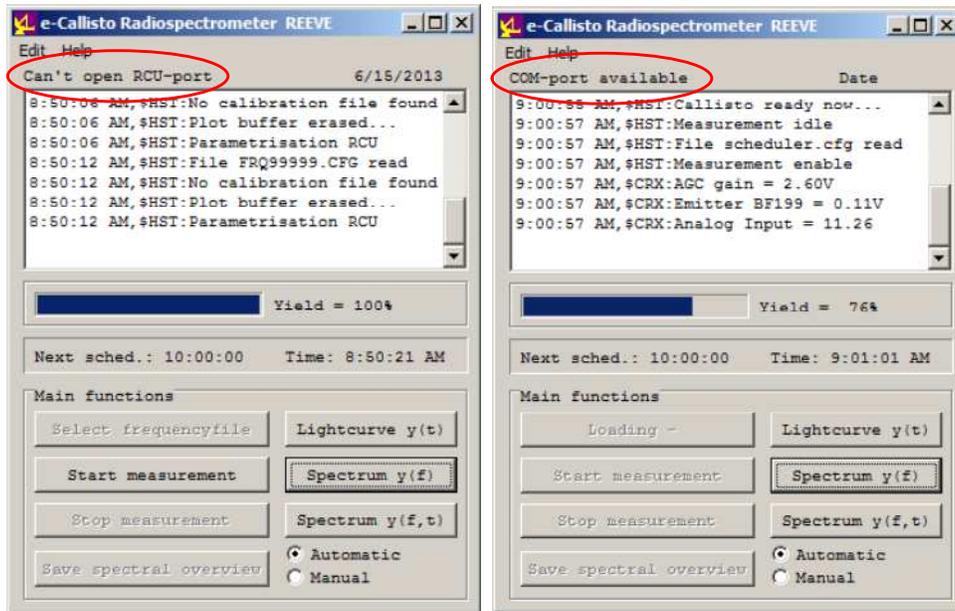


Figure 3 ~ When callisto.exe is opened and no COM port is available, it indicates “Can’t open RCU-port” (left). If a COM port is available, it indicates “COM-port available” (right)

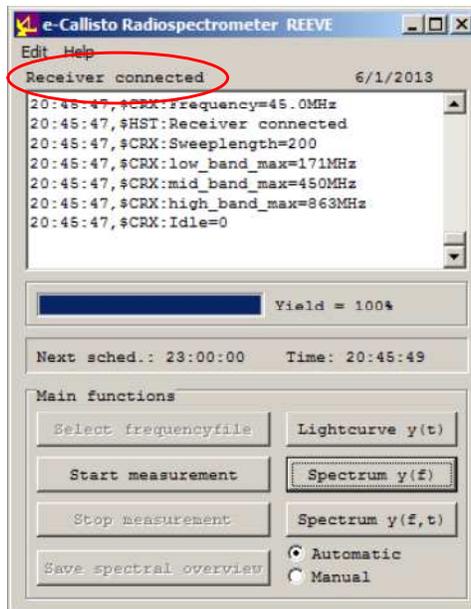


Figure 4 ~ If callisto.exe is able to establish communications with Callisto, the text “Receiver connected” appears when it is finished loading.

8. When callisto.exe is opened and communicating with the Callisto, the spectrum on the Spectrum y(f) plot appears to shift by multiples of 2x or 4x (figure 5). This problem has been traced to an out-of-date USB-Serial Adapter driver and was corrected by updating the driver (the old driver was dated 2012 and supposed to be Windows 7 compatible but a newer driver dated 2013 corrected the problem)

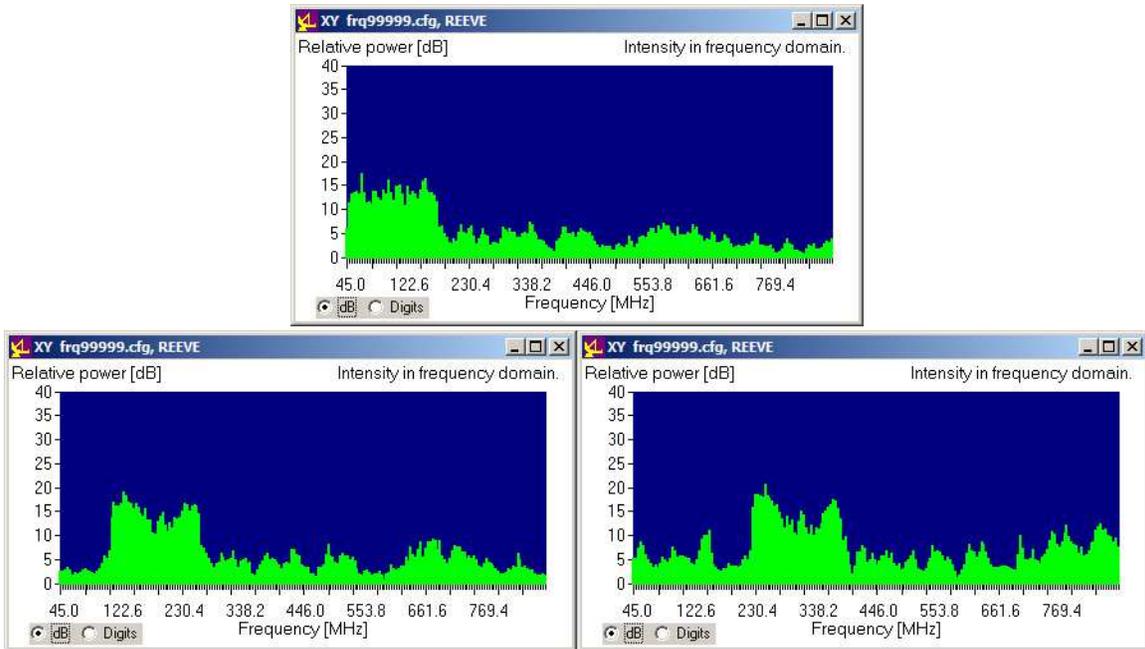


Figure 5 ~ If callisto.exe is able to establish communications with Callisto, but experiences serial communications problems, the spectrum shown in the Spectrum $y(f)$ plot may shift by a factor of 2 or 4. A normal spectrum is shown top followed by 2x and 4x spectrum shifts (bottom-left and right)

- When callisto.exe is opened and communicating with the Callisto, it momentarily loses communications and “Check RS-232 connection” appears in the status window (figure 6) occasionally or as often as every few seconds, sometimes accompanied by spectrum shifts as previously described. This is caused by an older adapter that should be but is not compatible with Windows 7 in this application.

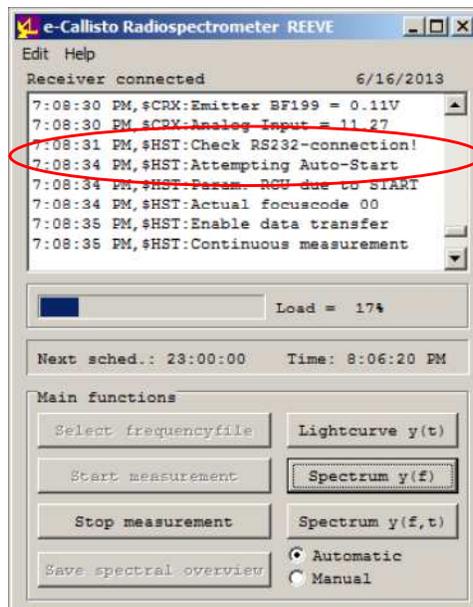


Figure 6 ~ If callisto.exe is able to establish communications with Callisto, but momentarily loses communications, the text “Check RS-232 connection” appears in the status window. Callisto software automatically attempts to re-establish the connection and indicates with text “Attempting Auto-Start”.

4. USB-Serial Adapters that have been tested with Window 7

Adapters that have been tested with Windows 7 x32 and x64 are tabulated (table 1). Two adapters known to be incompatible are included in the list. Note that only adapters using the FTDI and Prolific chips were tested. Other chip manufacturers exist (for example, MOXA) but have not been tested.

Table 1 ~ Tested USB-Serial Adapters

Manufacturer	Model Number	Chip	Website	Remarks
StartTech	ICUSB2321F	FTDI	www.startech.com	Note 1
USConverters	XS880	FTDI	www.usconverters.com	Ultimate, Note 2
USConverters	XS8801	FTDI	www.usconverters.com	Professional, Note 2
USBGear	USBG-10ft-232-STF	FTDI	www.usbgear.com/	Note 2, 3
Plugable	USB Serial Converter	Prolific HXD	plugable.com/	
Trendnet	TU-S9 V2 (white)	Prolific HXD	www.trendnet.com/	
Trendnet	TU-S9 V1 (blue)	Prolific HXD		Incompatible, Note 4
IOGear	GUC232A	Prolific HXA		Incompatible, Note 5

Table Notes:

1. The “F” in the model number indicates FTDI chip. StarTech supplies several versions of the ICUSB232 adapter, including some with different chips, but only the model number shown was tested
2. These adapters are equipped with Rx, Tx and power LEDs, which are very helpful for troubleshooting
3. The model shown has a 10 ft cable; a similar model with 6 ft cable, USBG-6ft-232-STF, is available. The “F” in the model number indicates FTDI chip
4. The TU-S9 V1 (blue) is an older model and is not recommended even though it uses the HXD chip
5. The GUC232A is an older model with an incompatible chip (HXA) and ATEN drivers and is not recommended

5. USB-Serial Adapter drivers

If the adapter was obtained prior to 2010, it probably will not work with Windows 7 even though a Windows 7 x32 or x64 driver may be available. A web search or the manufacturer’s website may yield the necessary compatibility information. However, many adapters are unbranded, making it impossible to find reliable information on them and, for this reason, are not recommended.

Before attempting to update, troubleshoot or repair USB-Serial adapter problems, remove all unused drivers using the procedures described here (this does not uninstall the driver, it only deletes the instance of the driver for a particular adapter):

http://www.reeve.com/Documents/Articles%20Papers/USBPortManagement_Reeve.pdf

Next, determine the chipset used in the adapter. This usually can be found by examining the Device Manager as follows:

- Unplug all adapters except the one being investigated
- Right-click My Computer, click on Properties and then select the Device Manager
- Click the + next to Ports (COM & LPT) to expose the adapter
- Right-click the adapter, select Properties and then select the Driver tab. The driver provider should be indicated (figure 4)



Figure 4 ~ Device Driver Properties – Driver tab for a USB-Serial Adapter

- Alternately, click the Details tab and select Manufacturer and then Driver Assy Version from the drop-down (figure 5)

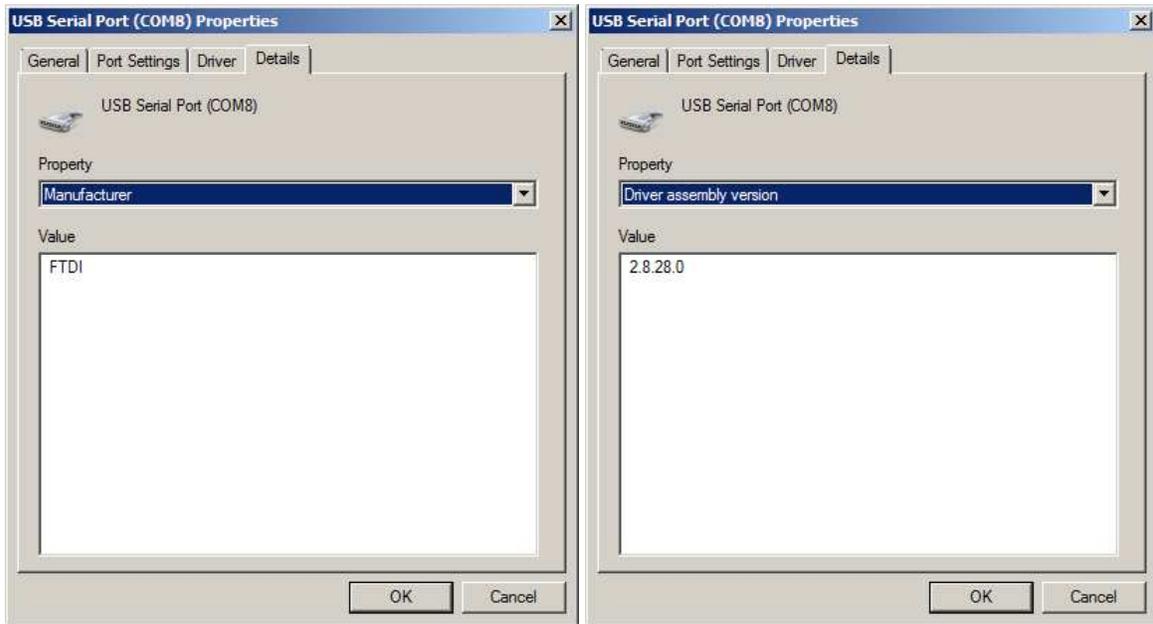


Figure 5 ~ Device Driver Properties – Details tab for a USB-Serial Adapter

- Make a note of the driver date and version. If the driver is dated prior to 2013, then it is out of date and likely will not work with callisto.exe under Windows 7. However, it is not guaranteed to work even if it is dated 2013.

Websites for FTDI and Prolific drivers are provided in the next section. Prolific provides a program with their driver software that identifies the chipset used (figure 6). This may indicate an older, incompatible chip.

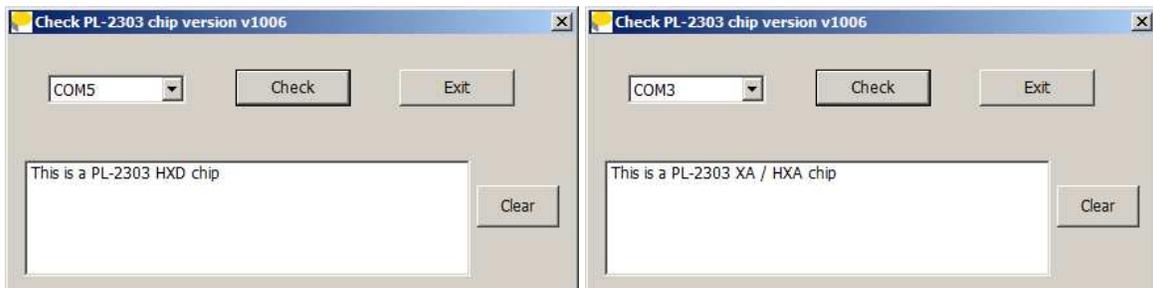


Figure 6 ~ Prolific chip identification tool. If the chip is identified as HXD (left), it is compatible with Windows 7. If it is identified as any other, such as HXA (right), it is incompatible.

6. Driver updates

The USB-Serial Adapters that were tested use either FTDI or Prolific chips. The respective websites for the drivers are:

<http://www.ftdichip.com/FTDrivers.htm>

<http://prolificusa.com/pl-2303hx-drivers/>

Do not attempt to update device drivers from the Device Manager, Driver tab. It has been found that this method often does not find the latest drivers, so avoid using it. The recommended procedure is to visit the website of the adapter chipset manufacturer and obtain the driver directly.

Some driver update programs will first uninstall the old driver. This means the update program must be run twice – first to remove the old driver and second time to install the new driver. When the new driver is installed, the update program may indicate the PC must be restarted. Do not skip this step.

If the new driver does not automatically uninstall the old one, then the old driver must be manually uninstalled. This may be done from the Device Manager, Driver tab. The USB-Serial Adapter must be plugged in for the Uninstall process.

Some driver installation programs require that the USB-Serial Adapter be plugged in when running the update program. When a new adapter is plugged in, and no driver exists for its chip, Windows 7 will attempt to automatically install the needed drivers, and this can lead to an out-of-date driver. Allow Windows to finish its process and then go to the Device Driver Properties – Driver or – Details tab to check the driver version . If a newer one can be found on the adapter manufacturer’s website, then uninstall the existing driver and install the new driver.

After installing the new driver and restarting the PC, go once again to the Device Manager and check the driver date and version. It should correspond to the information on the driver provider’s website.

After the correct, up-to-date driver is installed for a given type of chip, it can be applied to any USB-Serial Adapter that uses that chip. When a new USB-Serial Adapter is plugged in, Windows 7 should automatically use the new driver. However, if that adapter was previously installed, Windows 7 may use the old drivers if they still exist. Otherwise, it will use the new driver. If Windows 7 selects the old driver, then follow the above procedures to install the new driver.

The driver update process needs to be repeated for each USB-Serial Adapter.

7. Callisto software installation

The Callisto software should be installed in a dedicated folder as discussed in the Software Setup Guide. Go to the folder, right-click callisto.exe and select Properties. Alternately, if a short-cut was setup to callisto.exe, right-click the short-cut and select Properties (figure 7).

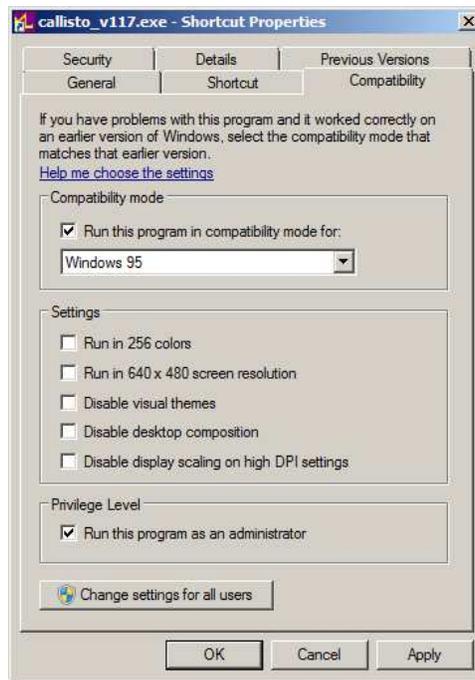


Figure 7 ~ File properties window allows Compatibility Mode and Run as Administrator

First, check "Run this program in compatibility mode for:" and select Windows 95 from the drop-down box. Second, at the bottom of the window check "Run the program as an administrator".

Document Information

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