

# The PicoPak Virtual Serial Port USB Interface

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The PicoPak Clock Measurement Module uses a virtual serial port USB interface to supply its power and connect to a PC. This interface is based on an industry-standard FTDI FT232RL USB UART IC and generally provides excellent behavior. In particular, its virtual COM port drivers seem to install automatically. Nevertheless, there can be considerable frustration when PicoPak modules and similar hardware is connected and reconnected to a system because the Windows® Plug-and-Play features do not always work as desired. This article offers some suggestions for dealing with those difficulties.

Each PicoPak module is factory-programmed with the same “PicoPak Clock Measurement Module” device ID and has a unique S/N. The Windows operating system keeps track of those parameters and associates them with a particular COM port number (e.g., COM1). That works nicely when the same module is reconnected, but it can make it hard to change the system configuration, especially when multiple modules are used.

The Windows user interface includes several ways to examine virtual COM port connections, with some details dependent on the particular Windows version. Perhaps the simplest of these is invoking Devices and Printers from the Start menu, which will display a list of connected devices, including PicoPak Clock Measurement Modules, as shown as unspecified devices in Figure 1. This view, however, does not provide much information (e.g., no module S/Ns). Clicking on a PicoPak icon brings up more details as PicoPak Clock Measurement Module Properties (see Figure 2A and B), where the Hardware tab shows the COM port number. Clicking deeper with Properties brings up more information that is of little relevance.

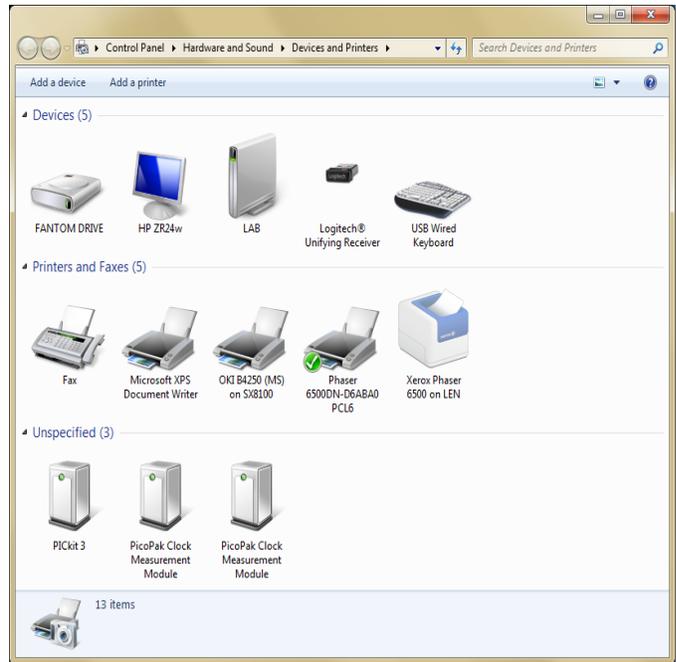


Figure 1. Devices and Printers Screen

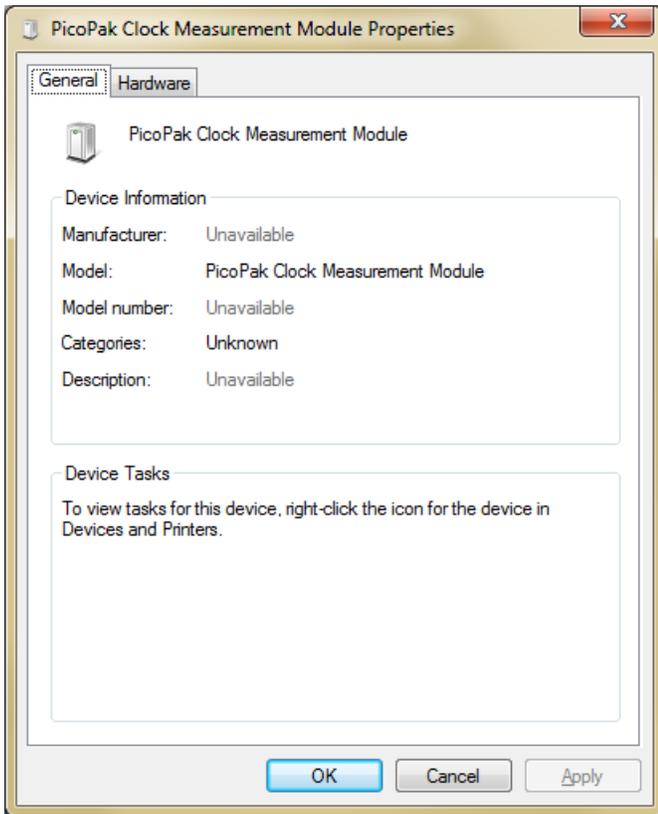


Figure 2A. General Tab

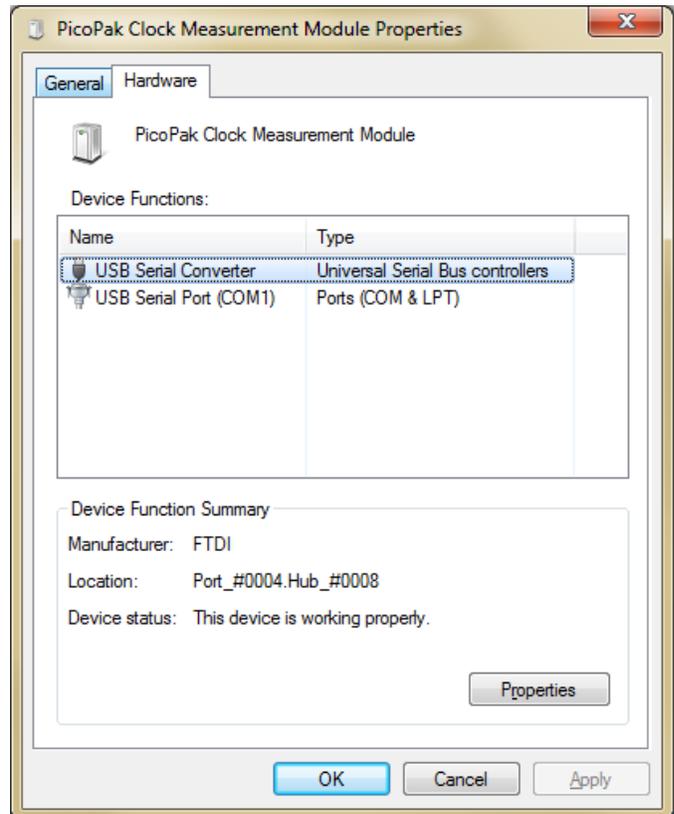


Figure 2B. Hardware Tab

Control Panel/Device Manager, with Ports (COM and LPT) expanded, provides better information as shown in Figure 3. It can be important to click on the View menu item and check the Show hidden devices checkbox [1]. That allows unused COM port numbers to be seen and be removed.

Clicking on one of the COM ports brings up a secondary window that offers several useful choices as shown in Figure 4.

It can be helpful to disable or even uninstall a COM port in order to make Windows “forget” a previous port assignment.

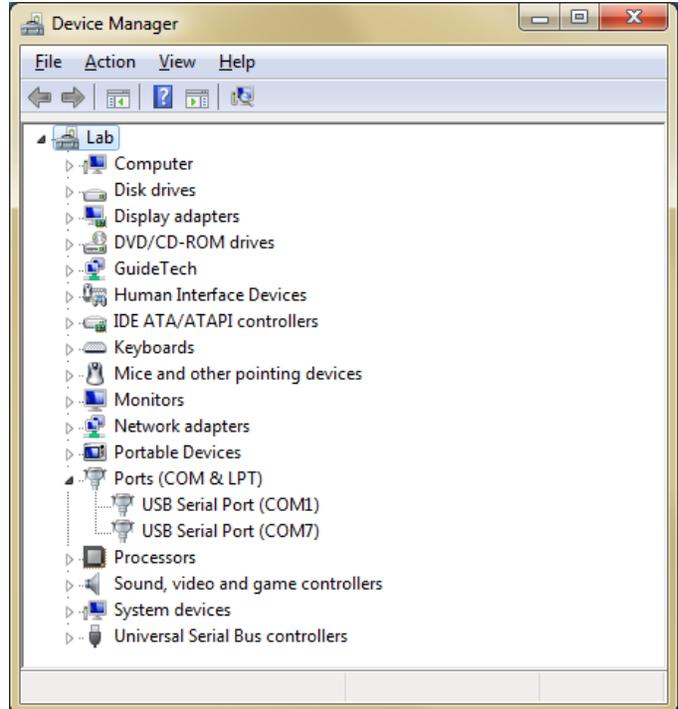


Figure 3. Device Manager Screen

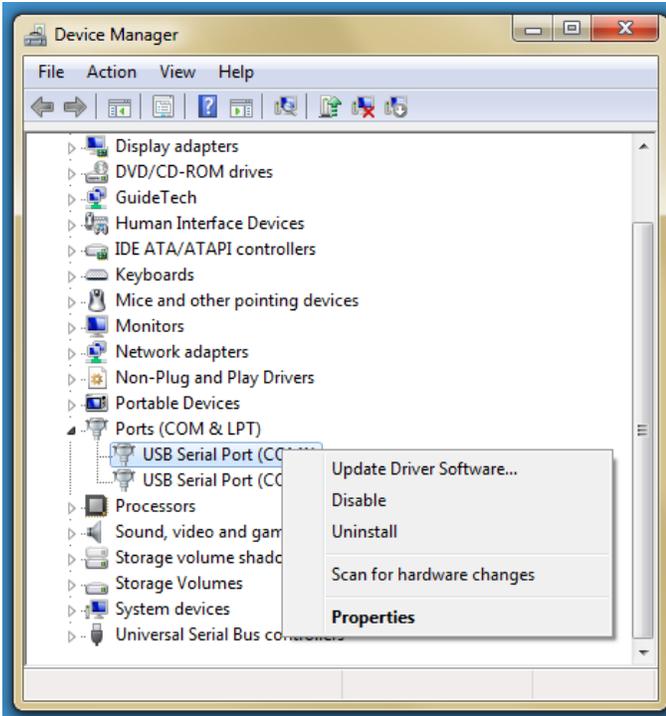


Figure 4. Port Subscreen

Clicking on the bold Properties label brings up the associated Properties screens (see Figure 5A and B). The Port Settings tab shows the communications setting for the port. It can be helpful at times to set these manually to the PicoPak values as shown.

It is generally not necessary to manually load or change driver software.

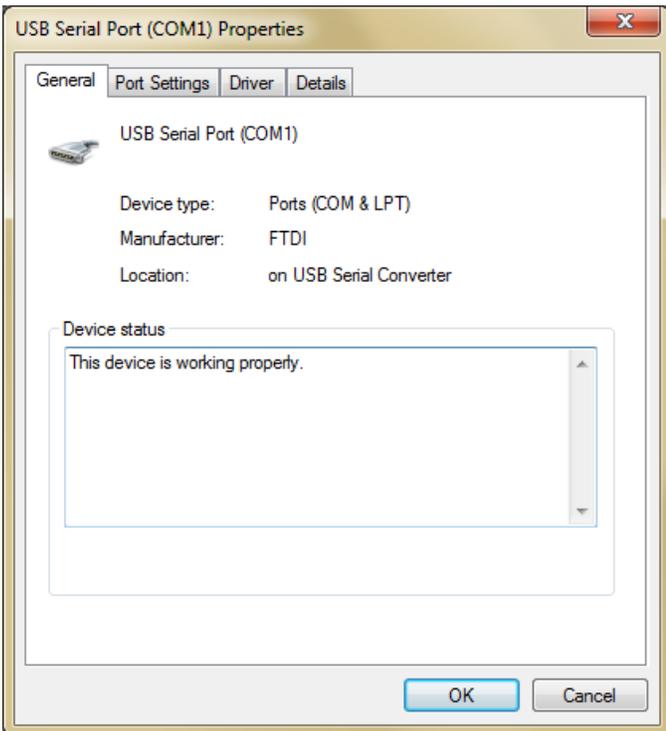


Figure 5A. Properties General Tab

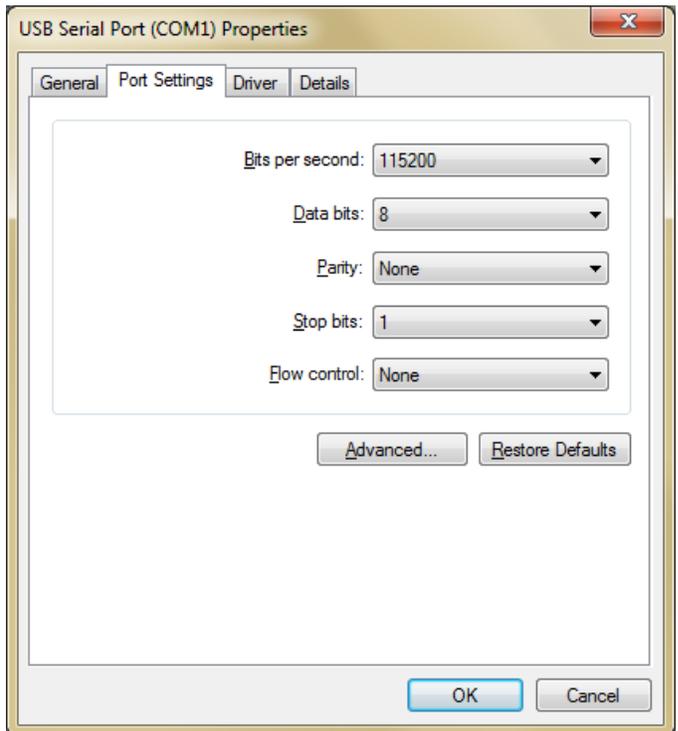


Figure 5B. Properties Port Settings Tab

The Advanced button in the Port Settings tab is a portal to changing the COM port settings. The COM Port Number pulldown list allows the COM port number to be changed. The (in use) note may simply indicate that the port is still assigned to a previously-used device and can actually be selected.

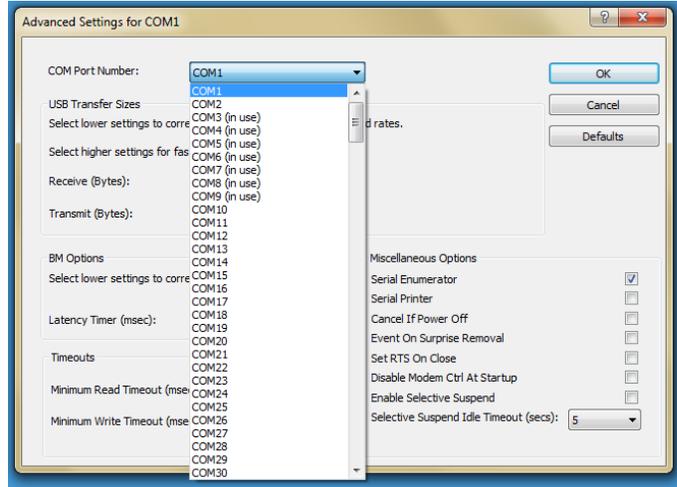


Figure 6. Advanced Setting Screen

From time-to-time, it may be necessary or desirable to remove previous device/COM port associations that flag inactive COM ports as In Use. One way to do that is to enter:

```
start devmgmt.msc
```

from the command line to open Device Manager, select Show hidden devices [1], and expand the section on COM ports. Non-present COM port assignments will be shown in grey and can be right-clicked and uninstalled. Device manager can also be brought up via its graphical user interface.

The PicoPak Windows user interface can detect available PicoPak modules when it is launched with a COM port number that does not have an associated device (otherwise it will automatically reconnect). This is shown in Figure 6 where the selected COM2 does not have an associated PicoPak device and messages are displayed enumerating modules at COM1 and COM7 along with their S/Ns.

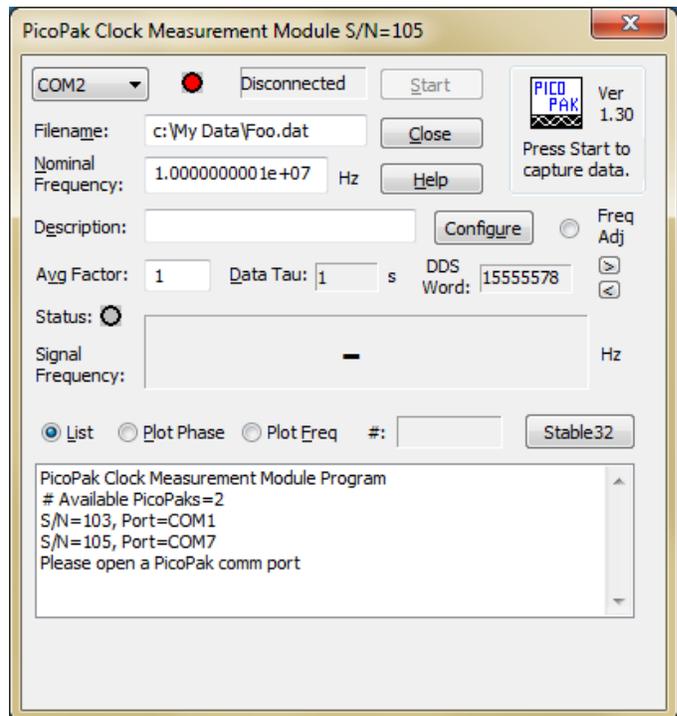


Figure 6. PicoPak UI Device Enumeration

The PicoPak distribution includes a custom command line program called Enumerate that will show information about all connected PicoPak modules as shown in Figure 7. Active devices will be listed without device information, while the S/N and COM port numbers will be shown for inactive devices. This listing seems more robust than making a connection with the PicoPak user interface, probably because it does not actually open communications with the module firmware.

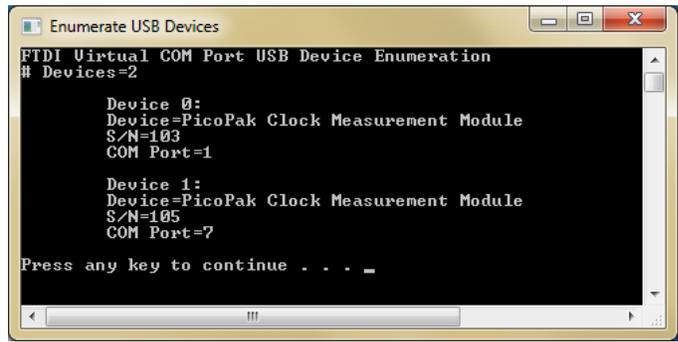


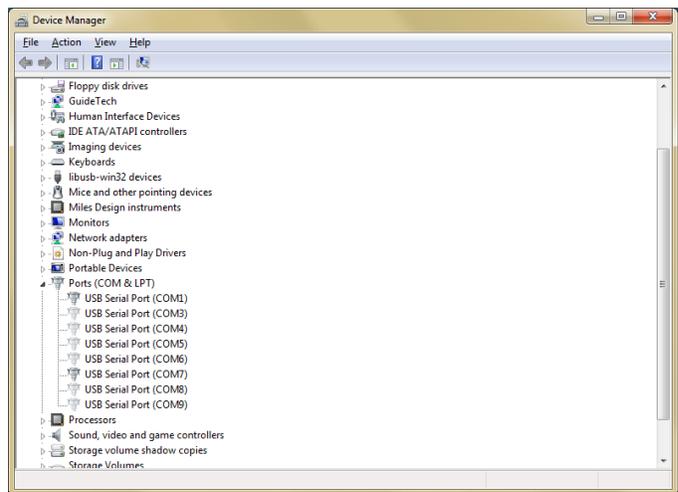
Figure 7. Command Line PicoPak Enumeration

The main difficulty with the PicoPak virtual COM port interface seems to be when a connected but inactive module will fail to communicate with the PicoPak Windows user interface application. This can happen as modules are plugged/unplugged or otherwise disturbed. The serial communications with the Windows user interface may refuse to work even if the module can connect via an ASCII terminal program. This can obviously be very frustrating. Various combinations of unplugging/replugging, resetting, disabling/re-enabling and uninstalling/re-installing can sometimes help. Uninstalling/re-installing seems the most likely to succeed. Restarting the computer seldom helps, and is obviously not an option when a run is in process with another PicoPak module.

[1] It may be necessary to execute the following command line command to see the hidden devices:

```
set devmgr_show_nonpresent_devices=1
```

This can be done by right clicking on Command Prompt in Accessories and choosing Run as Administrator. Its can also be done by setting this environment variable via My Computer/System Properties/Advanced System Settings/Environment Variables. This allows previous device/port associations to be seen and removed as shown dimmed in this figure.



Another alternative is to use `regedit` to modify the `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\CPM Name Arbiter\ComDB` registry item.

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