

## Tutorial about how to use USBView.exe and Connection Optimization for VNWA.

It has been discovered that certain VNWA functions can be interfered, pending which USB port on the computer the VNWA is connected to, when other USB devices, like an external Keyboard or e.g. an USB Mouse also is connected to another USB Port than the VNWA. It is in particular important for VNWA3, which has added functions compared to VNWA2, but VNWA2 might also be interfered.

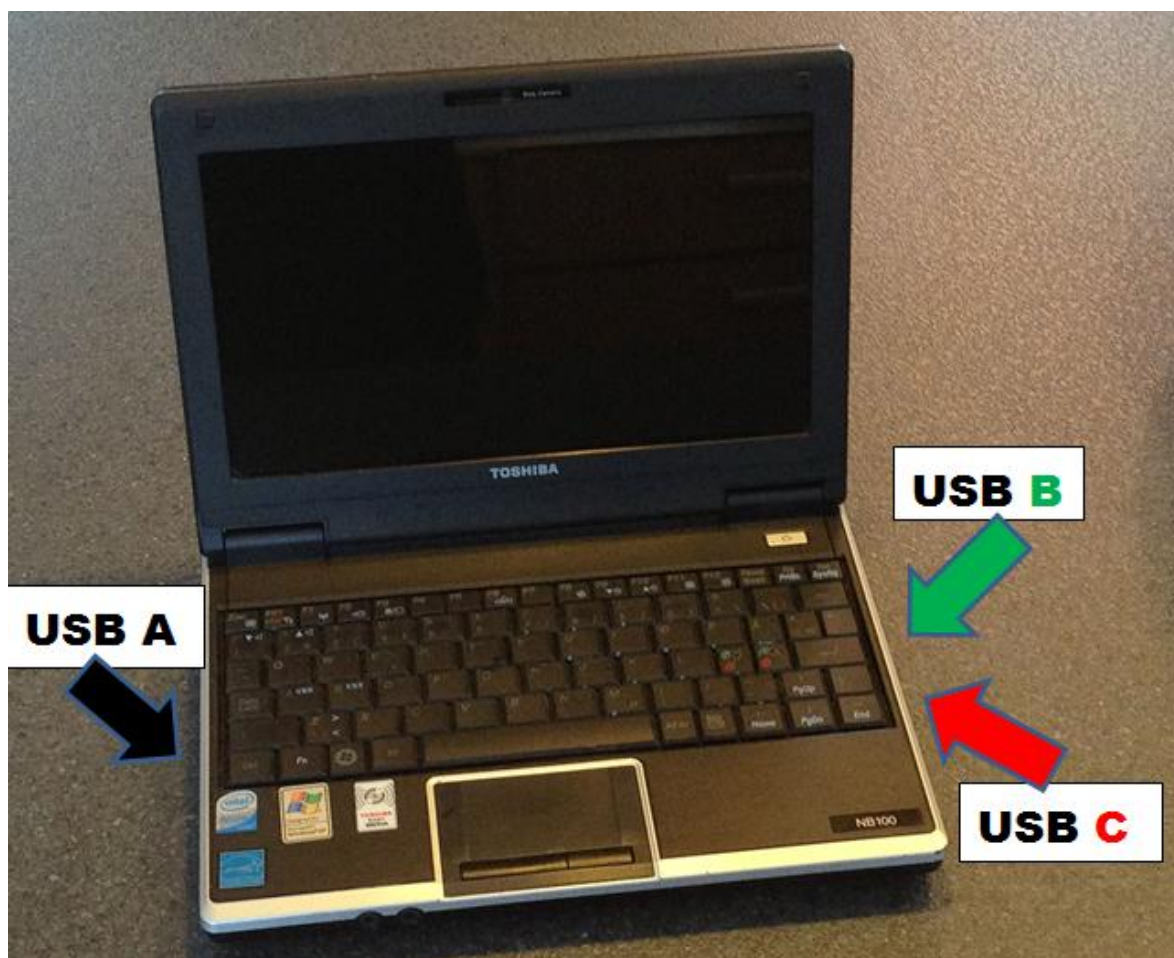
To find out, when such interference happen, the free USBView.exe is a very helpful application. Search with Google for Microsoft USBView.exe or use the link provided here provided.

Use <http://www.ftdichip.com/Support/Utilities.htm> and then look for “Microsoft USBView - USB Connection Viewer” to be download as a zip file.

When using USBView, remember to enable in “Options” the “Auto Refresh”, otherwise you have to press F5 to update the reading of the USB System.

### Investigation.

A small 10 inch laptop has been used for the demonstration, provided with three USB ports, One on the left side called USB A, and two on the right side called USB B and USB C.



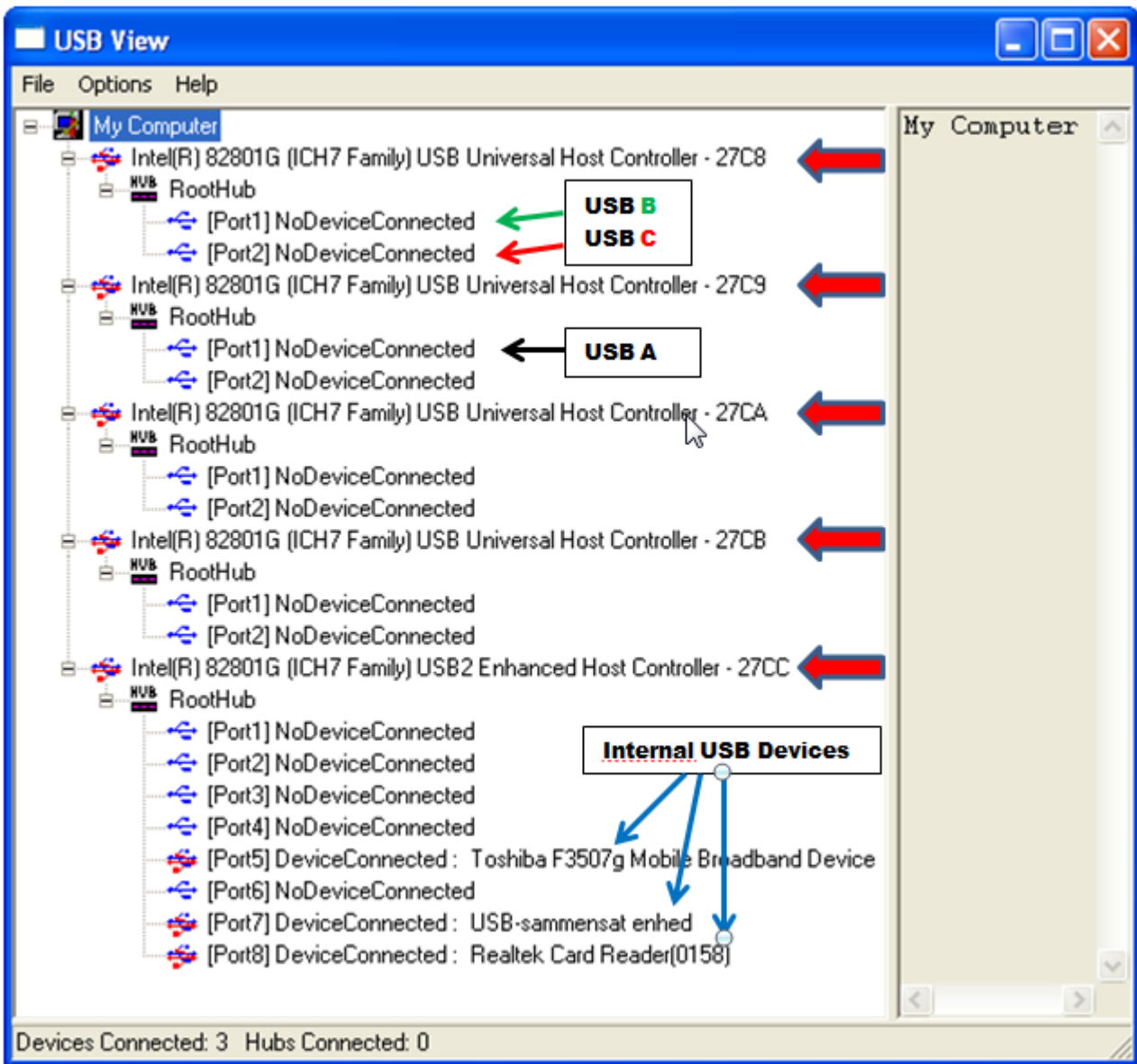
**Preface:**

I will be shown that connecting e.g. the VNWA3 and an external USB device, like an external keyboard, to USB **B** and **C**, the modulation for the Signal Generator is modulated by the scanning of the keyboard, such that the modulation has a “stuttering” sound. Whereas, if the VNWA3 is connected to USB **A**, this “interference” is not present. The conclusion drawn is that if the VNWA3 (and probably also VNWA2) when sharing a USB Universal Host Controller (a RootHub,) with another USB device, performance is likely to be influenced, pending the intensity of the “foreign device” data/traffic. To play it the safe way, test with USBView.exe how the VNWA can be solely serviced by a USB Universal Host Controller not shared. For a PC with three USB ports it is possible to find which the USB Port which never will share, but for a PC with e.g. 4 USB Ports there is most likely two USB Universal Host Controller, each with two ports, which is servicing the 4 USB Ports, and thus two combinations will cause trouble.

However it shall be demonstrated in the following, how an External HUB can solve the problem on old PC's not having more than 2 USB ports and those USB ports serviced by the same USB Universal Host Controller.

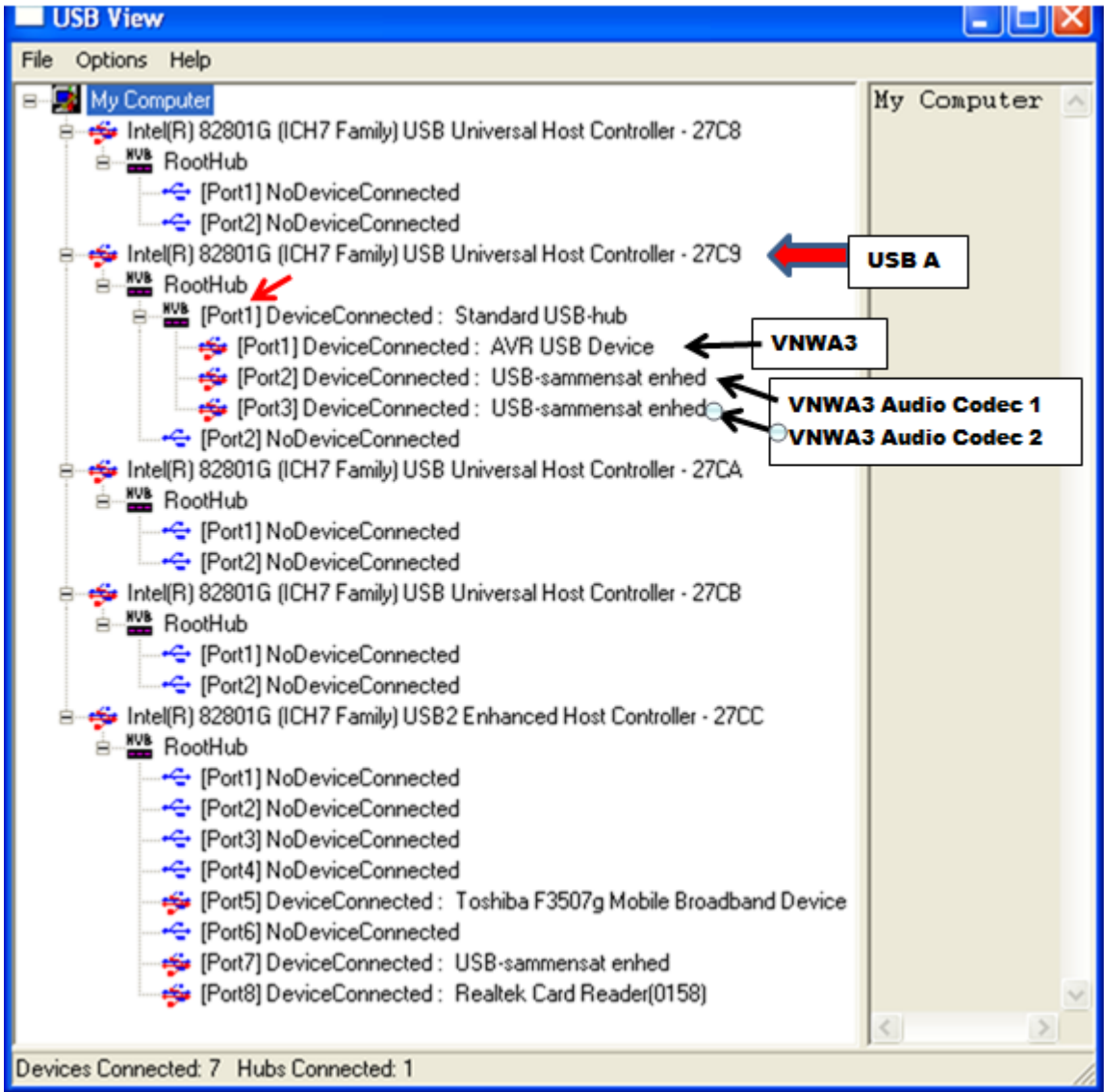
**Demonstration of above statements.**

Running USBView without any devices connected to USB **A**, **B** or **C** is shown below.



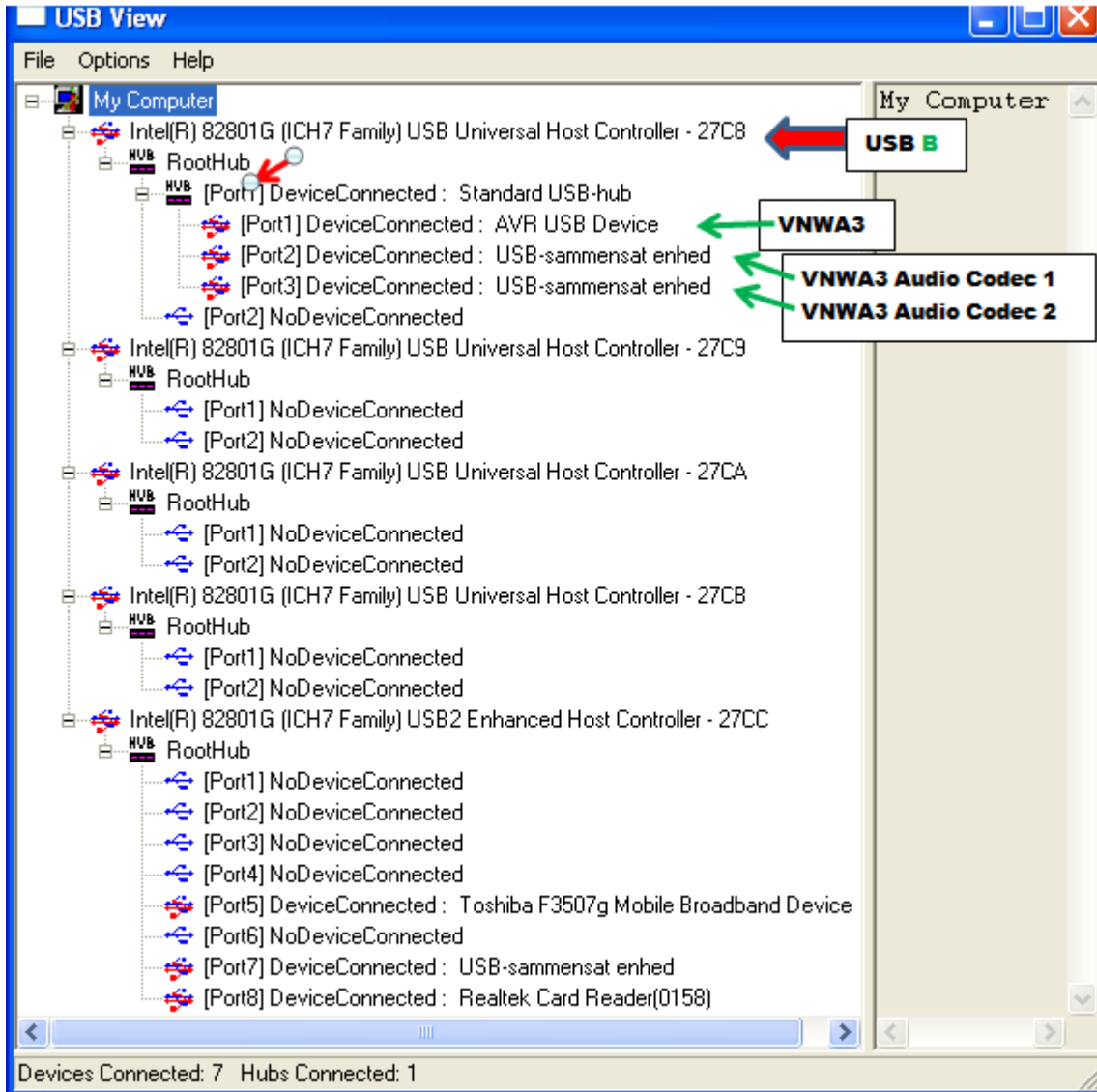
It will in the following be shown that USB **A** is serviced by USB Host Controller **27C9 port1**, and that USB **B** and **C** both are serviced by USB Host Controller **27C8**, the USB **B** by **port1** and USB **C** by **port2**. In the bottom status line is indicated 3 Devices Connected, and the blue arrows indicates these devices are some Laptop build in USB devices, thus 0 Hubs connected, as no external devices connected. Note that the USB2 Enhanced Host Controller **27CC** has 8 ports. All other has two ports.

Below is shown the situation where VNWA3 is connected to USB A serviced by **27C9** USB Universal Host Controller, occupying **port1, 2 and 3** of the associated RootHub on **port1** where the VNWA USB-hub now is connected.



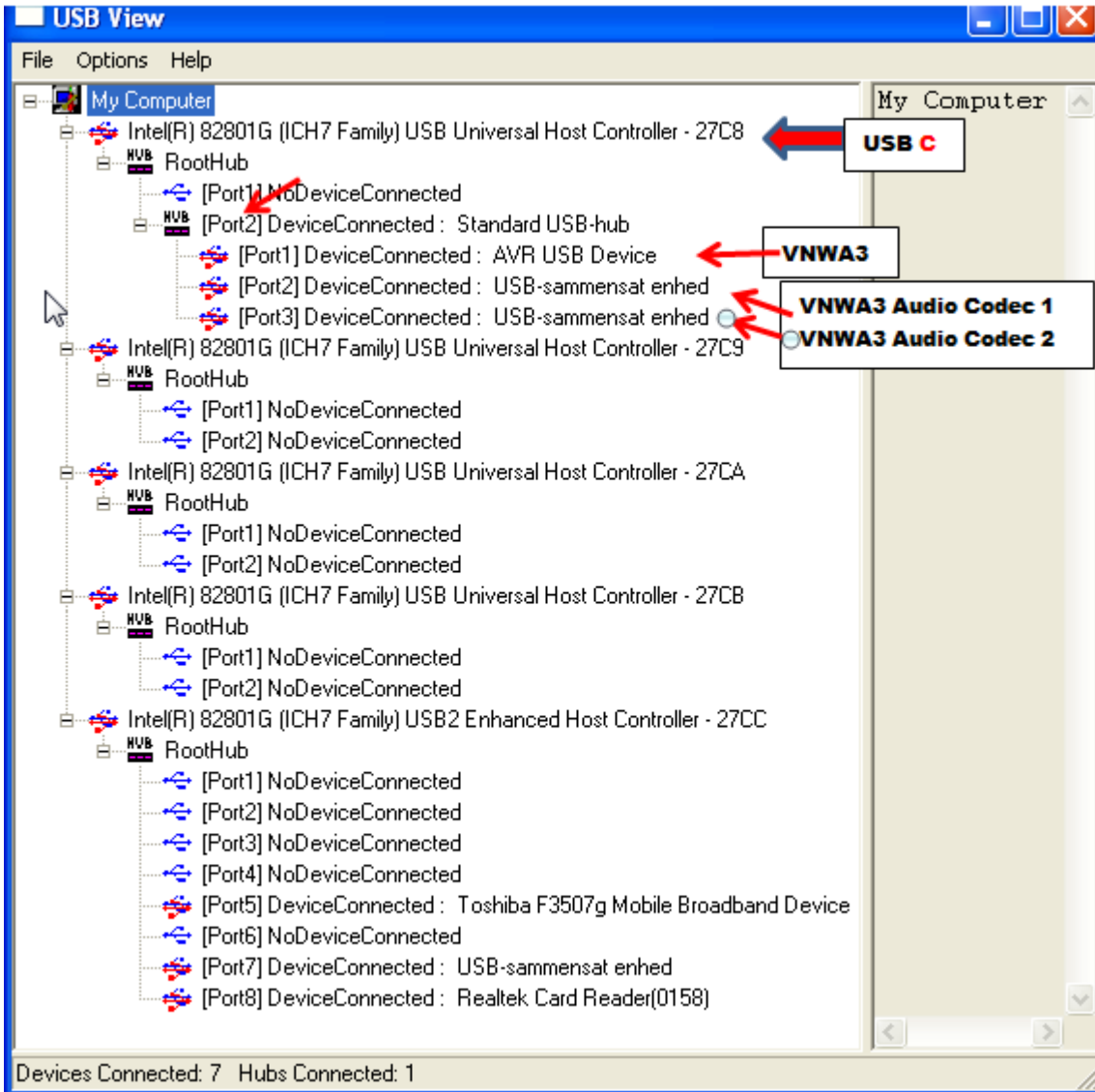
As said the **27C9** USB Universal Host Controller is servicing the three VNWA USB elements, the AVR USB Device and the two USB Codecs. If you are using the VNWA2 or your VNWA3 is not having the option board then there will be only one Audio Codec indicated connected.

Below is shown the situation where VNWA3 is connected to USB B serviced by 27C8 USB Universal Host Controller, occupying port1, 2 and 3 of the associated RootHub on port1 where the VNWA USB-hub now is connected.



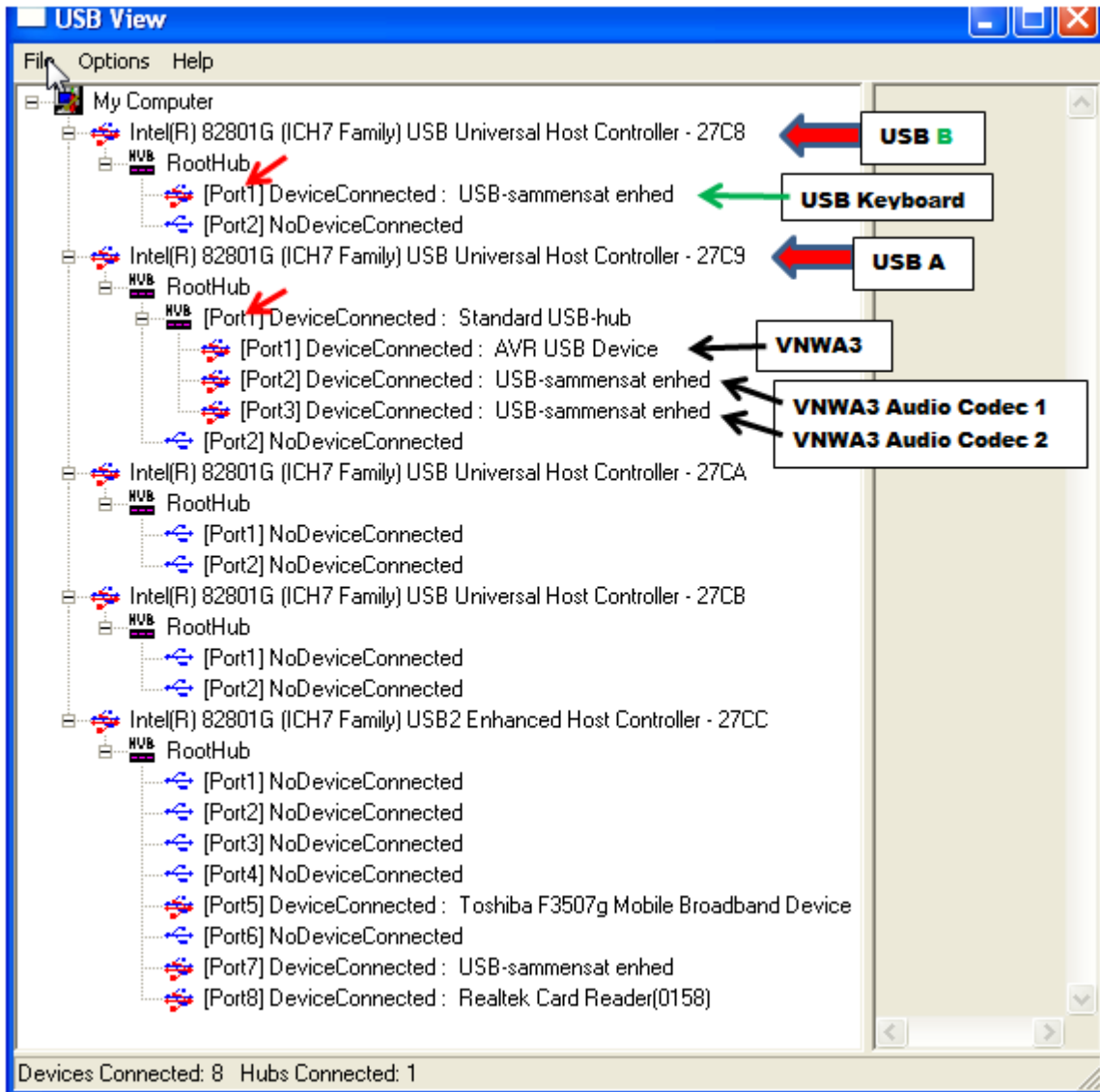
Likewise the 27C8 USB Universal Host Controller is now servicing the three VNWA USB elements, the AVR USB Device and the two USB Codecs. If you are using the VNWA2 or your VNWA3 is not having the option board then there will be only one Audio Codec indicated connected.

Below is shown the situation where VNWA3 is connected to USB **C** also serviced by **27C8** USB Universal Host Controller, occupying **port1, 2** and **3** of the associated RootHub on **port2** where the VNWA USB-hub now is connected.



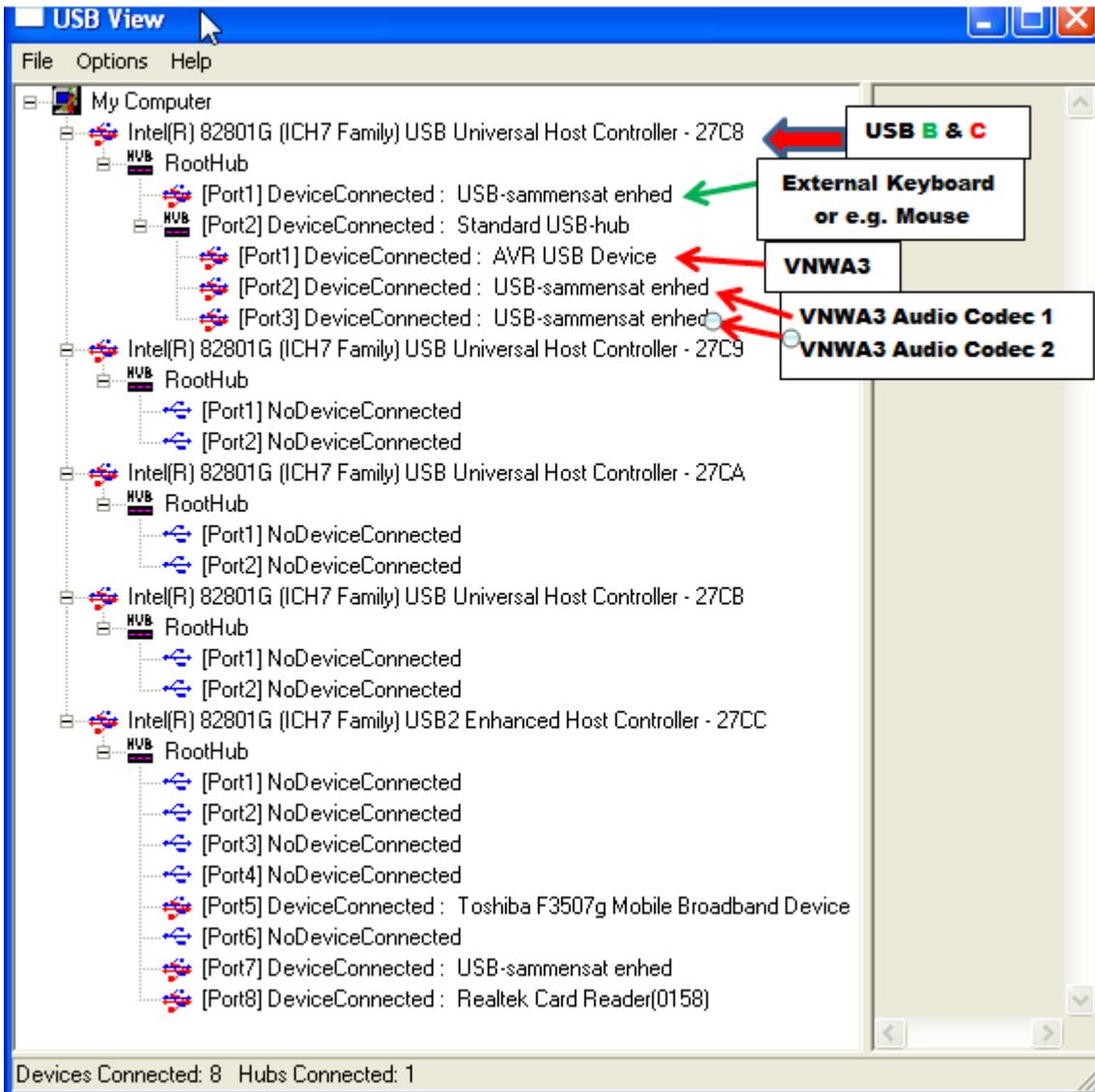
Likewise the **27C8** USB Universal Host Controller is now servicing the three VNWA USB elements, now via **port2**, the AVR USB Device and the two USB Codecs. If you are using the VNWA2 or your VNWA3 is not having the option board then there will be only one Audio Codec indicated connected.

Below is shown the situation where VNWA3 again is connected to USB A serviced by **27C9** USB Universal Host Controller, occupying **port1, 2** and **3** of the associated RootHub on **port1**, where the VNWA USB-hub now again is connected. In addition an External USB keyboard is connected to USB B serviced by **27C8** USB Universal Host Controller.



This situation is not causing any conflict between VNWA and other external USB devices, as VNWA is solely service by **27C9** USB Universal Host Controller.

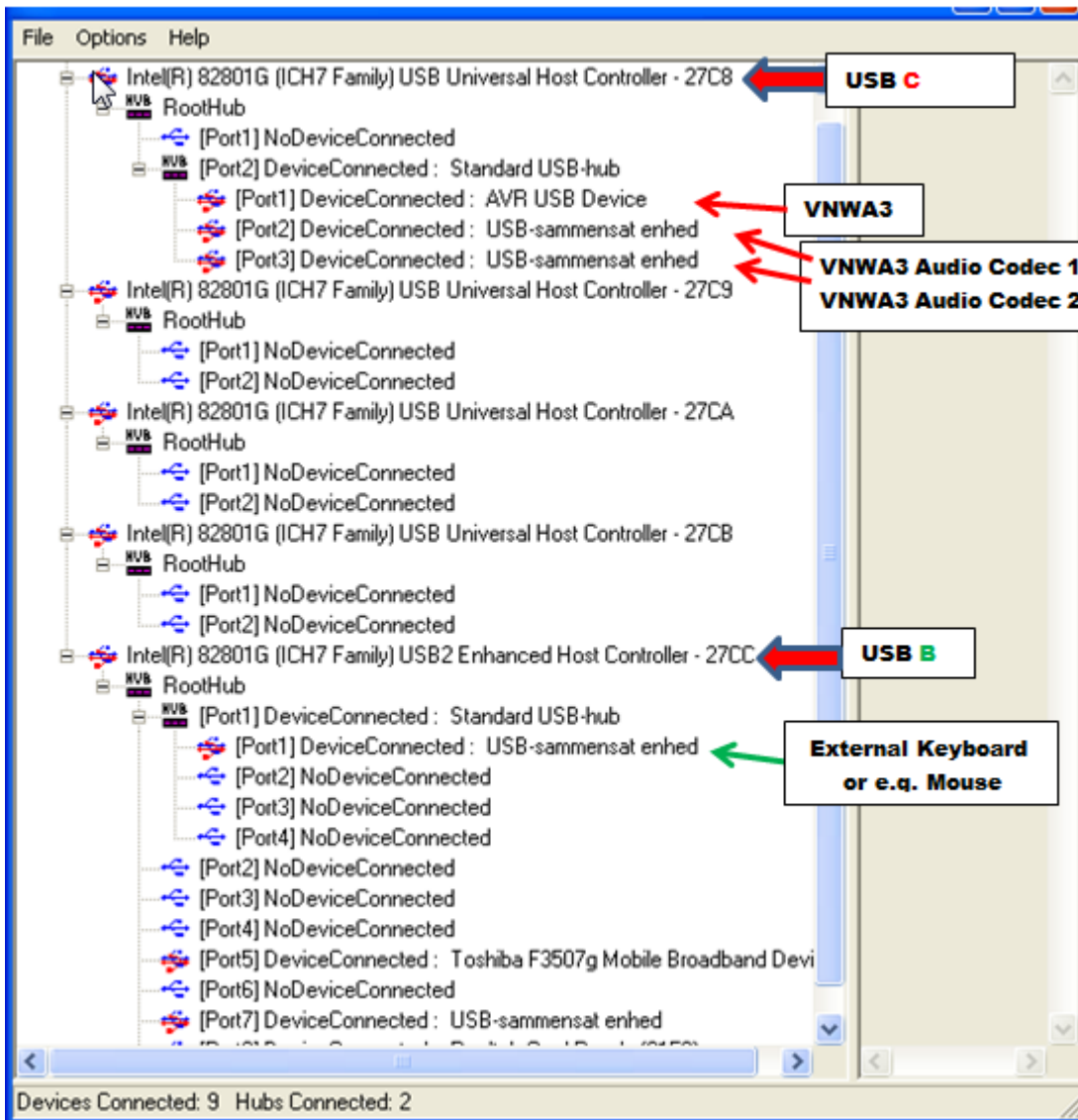
Below is shown the situation where VNWA3 is connected to USB **C** as described and serviced by **27C8** USB Universal Host Controller port2, occupying **port1, 2** and **3** of the associated RootHub on **port2**, where the VNWA USB-hub now is connected. In addition the external USB Keyboard is connected to USB **B** and thus sharing USB Universal Host Controller **27C8** with VNWA. **This situation is causing problems with advanced features of the VNWA3, e.g. the Signal generator modulation will have “stuttering” sound. It might also be the cause for other observation like fragmented traces although now proven yet.**



However this situation can be resolved if the USB keyboard is connected via an external USB Hub connected to USB **B**. See below....



Below is shown the situation where VNWA3 is connected to USB **C** and as described serviced by **27C8** USB Universal Host Controller port2, and occupying **port1, 2** and **3** of the associated RootHub on **port2** where the VNWA USB-hub now is connected. In addition an external USB Hub is connected to USB **B**, and the External USB Keyboard connected to the External Hub's **port 1**



As seen the USB **B** is service by the **27CC** USB2 Enhanced Host Controller and no longer sharing a RootHub with the VNWA3 and the Signal Generator Modulation clean as “a whistle”.

### Conclusion:

It is essential for “playing the safe way” that VNWA is not sharing the USB Universal Host Controller Host, from which it is serviced, by any other External USB device. The USBView.exe is the tool to use for analyzing how YOUR PC is configured internally.