

# Checking and understanding USB settings in Device Manager

---

## Contents

- [Overview of USB](#)
  - [Viewing USB Controllers in Device Manager](#)
  - [Checking Properties of the Generic USB Hub](#)
  - [Checking Properties of the USB Enhanced Host Controller](#)
  - [Checking Properties of the USB 3.0 eXtensible Host Controller](#)
  - [Checking Properties of the USB 3.0 Root Hub](#)
  - [Checking Properties of the USB Composite Device](#)
  - [Checking Properties of the USB Root Hub](#)
  - [Viewing Devices by Connection](#)
- 
- 

## Overview of USB

Currently, four Universal Serial Bus (USB) standards are in use: USB 1.0, USB 1.1, USB 2.0, and USB 3.0. The new USB 3.1 was released in mid-2016 and will be 10 times the speed of 3.0. It will optionally use a different connector, called USB Type-C (or USB-C), which is reversible (meaning that you can plug it in both ways). USB 1.0 is now rarely used.

A USB hub is a device that expands a single USB port into several (similar to a power strip), so that more ports are available for connecting devices to a host PC.

Devices that can be connected to USB ports on the PC:

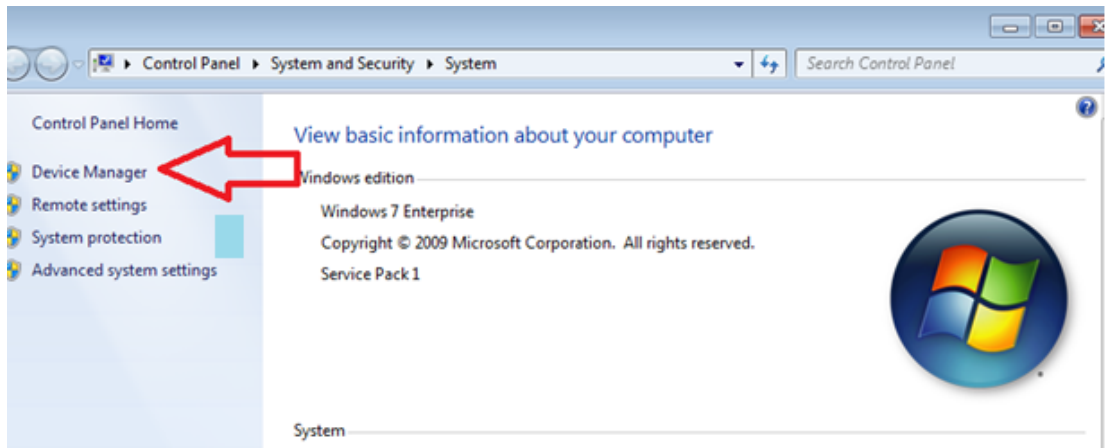
- Mouse
  - Keyboard
  - Cell phone
  - Thumb drive
- 

## Viewing USB Controllers in Device Manager

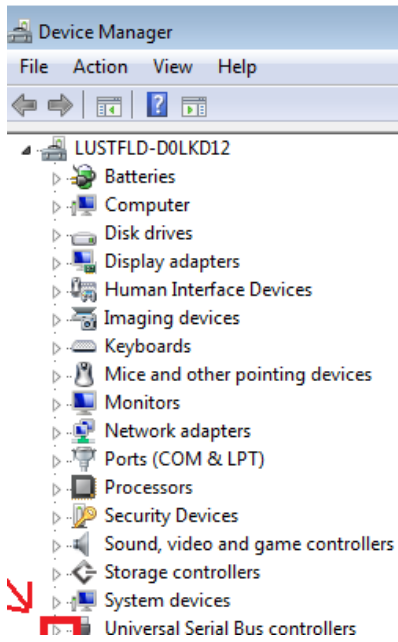
1. From the Home screen, click the Windows symbol.



2. Right click **Computer** and select **Properties**.
3. Click **Device Manager**.



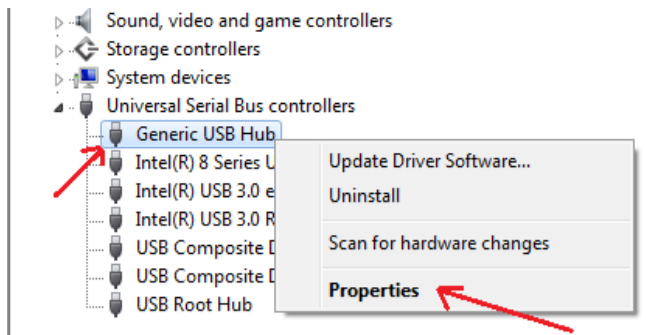
4. In Device Manager, click the arrow next to **Universal Serial Bus controllers** to expand the list.



## Checking Properties of the Generic USB Hub

The Generic USB Hub component supports USB hub devices. This component includes the **usbhub.sys** file, which is the Microsoft USB hub driver. There are no configurable settings for this component (%SystemRoot%\system32\DriverStore\FileRepository\usb.inf\_xxxxx).

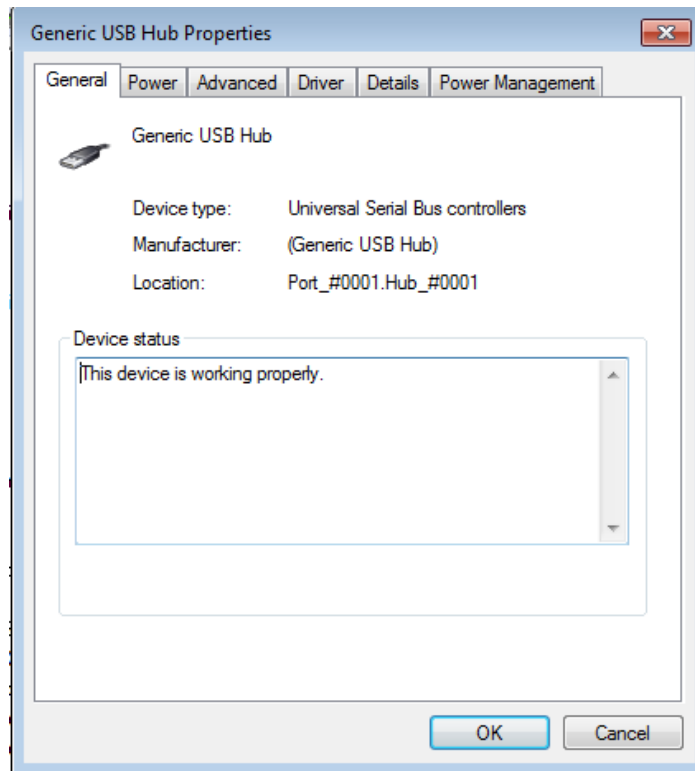
1. Under **Universal Serial Bus controllers** in Device Manager, right-click **Generic USB Hub** and select **Properties**.



NOTE: From the properties, you can access settings for different aspects of the USB hub on these tabs:

- **General**

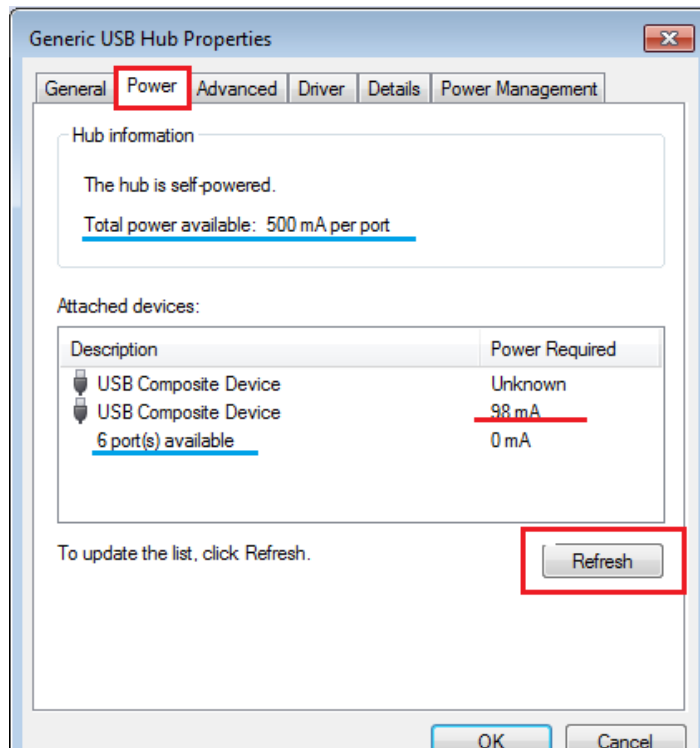
- **Power**
- **Advanced**
- **Driver**
- **Details**
- **Power Management**



2. Click the **Power** tab.

NOTE: In the example below:

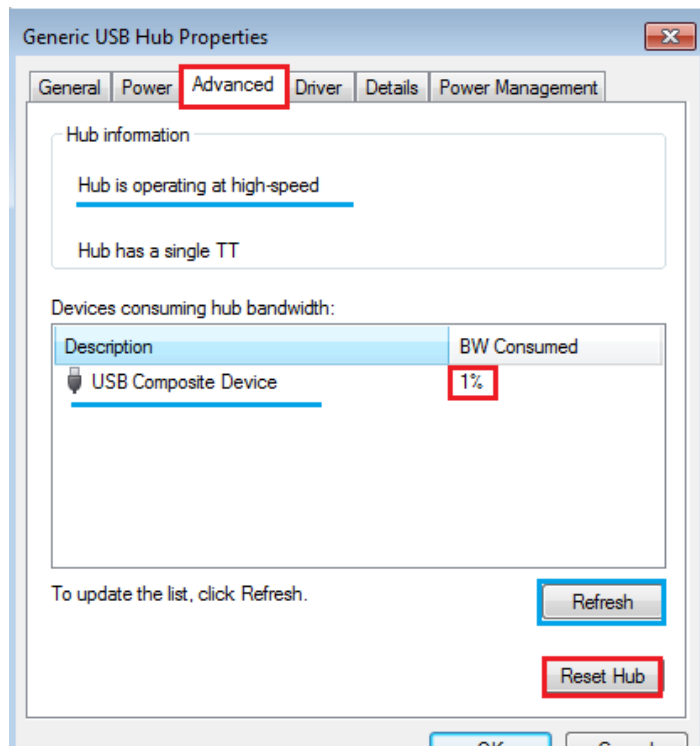
- The total power available is 500 mA per port.
- Two devices are attached to the hub, one that requires unknown power and one that requires 98 mA of the available 500 mA total.
- There are 6 ports available on the PC.
- Clicking **Refresh** will rescan the hub, refresh the screen, and report the latest findings.



3. Click the **Advanced** tab.

NOTE:

- This tab shows the amount of bandwidth consumed while the hub is operating at high speed. In the example below, 1% of bandwidth is consumed with one device connected.
- Clicking **Refresh** will rescan the hub, refresh the screen, and report the latest findings.
- Clicking **Reset Hub** will disconnect and reconnect the hub.
- This information is useful when a communication slowdown occurs or when configuring network overhead.



4. On the **Advanced** tab, double-click **USB Composite Device**.

NOTE: In the example below:

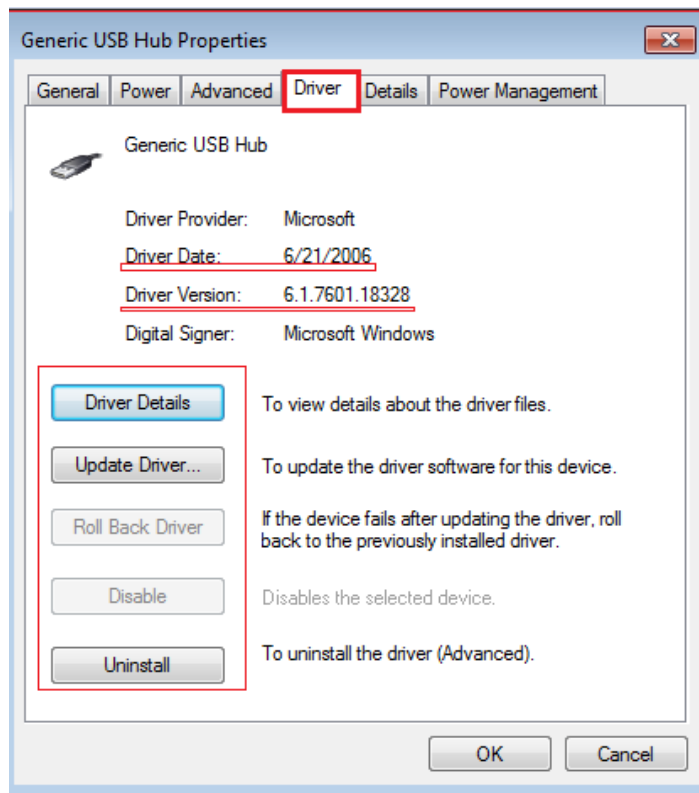
- Only one device is connected.
- The port is #6 and the hub is #2.
- The device is working properly.



5. Click **OK** to return to the **Advanced** tab of the **Generic USB Hub Properties** window.
6. Click the **Driver** tab.

NOTE:

- This tab shows the version of the driver for the USB hub and allows you to install, update, roll back, or uninstall the driver.
- This driver is critical for rendering dependable communications to all devices accessing the hub. The Generic USB Hub is usually 2.0 and does not require a specific USB driver, as long as the driver is 2.0-compliant. USB 1.1, which is rarely used, and FireWire are supported here.
- If communication problems occur, they may be caused by recently installed drivers.

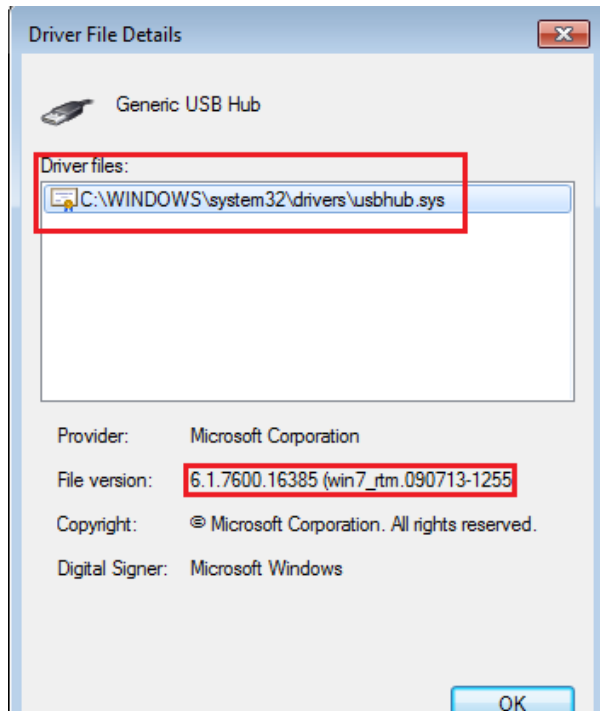


7. On the **Driver** tab, click **Driver Details**.

NOTE: This window shows the driver file's version and date, both of which should be current, and

directory path.

- Click **OK** to return to the **Driver** tab of the **Generic USB Hub Properties** window.



- If desired:

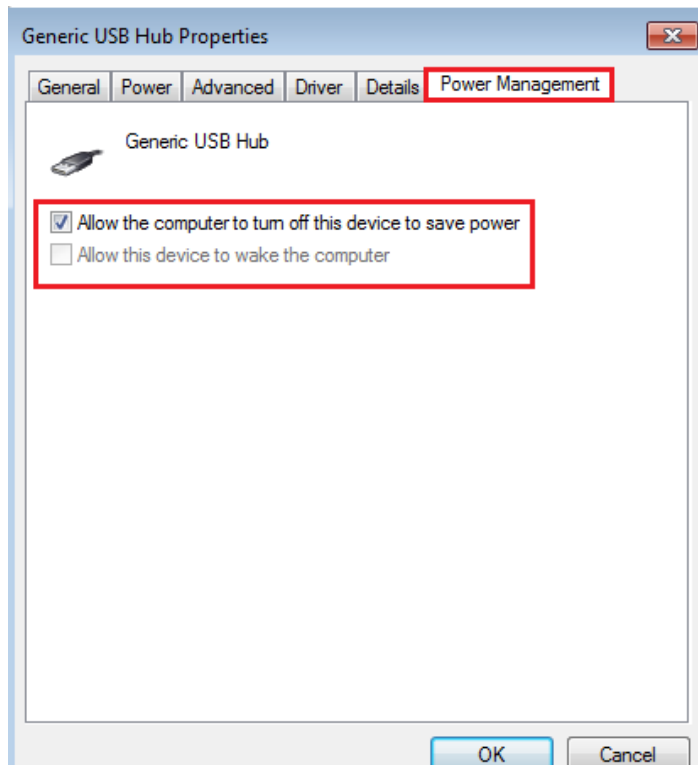
- Click **Update Driver** if you want to update the driver. You can find a driver from the Internet or from a folder, CD, or attachable drive.
- Click **Uninstall** if you want to remove the currently installed driver. Rebooting the PC will allow the Windows operating system to load the best driver.

- Click the **Power Management** tab.

NOTE:

- You can choose to have the host PC turn off power to the device (select the **Allow the computer...** check box) or allow the device to control the USB and wake the PC upon power up (select the **Allow this device...** check box).
- Choosing to allow the host PC to run the power saving option is an ideal way to conserve power. However, if you have devices connected to the USB hub that require charging, such as a cell phone, notebook, iPad, etc, the first option is not the best choice.
- Consider using the second option when attaching devices that are used frequently, such as a scanner, fax, printer, etc.
- The system BIOS also has a setting that stops the complete USB hub from going into sleep mode.

- Click **OK** to return to Device Manager.

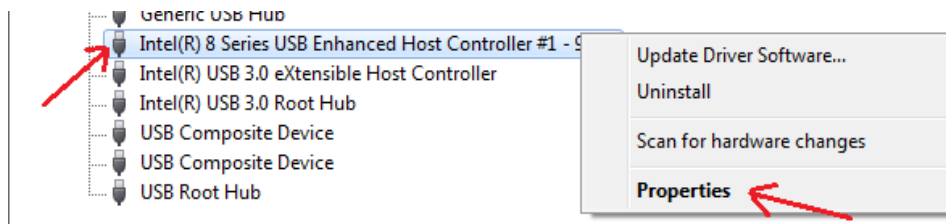


## Checking Properties of the USB Enhanced Host Controller

A Host Controller Interface (HCI) is a register-level interface that enables a host controller for USB or FireWire hardware to communicate with a host controller driver in the software. The driver software is typically provided with an operating system of a PC, but it may also be implemented by an application-specific device such as a microcontroller.

The Enhanced Host Controller Interface (EHCI) driver simultaneously supports USB 2.0 and 1.1 protocols and supports existing class drivers. The USB 2.0 common code uses the 1.1 common code as a base, with necessary changes to support 2.0. The EHCI driver attaches the same USB driver interface as the Open Host Controller Interface (OHCI) and the Universal Host Controller Interface (UHCI) do.

1. Under **Universal Serial Bus controllers** in Device Manager, right-click **USB Enhanced Host Controller** and select **Properties**. (Different PC manufacturers may designate a different name. Look for **USB Enhanced Controller**.)

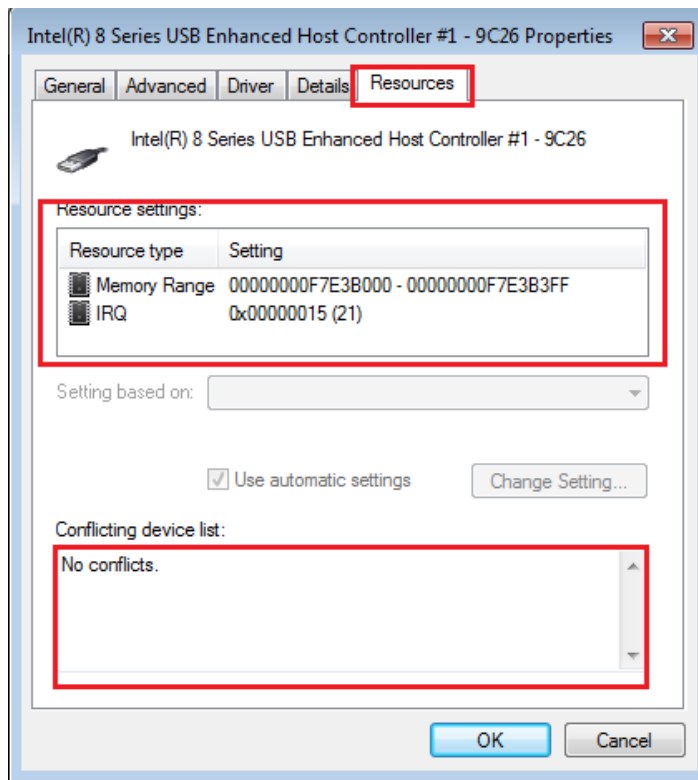


2. Click the **Resources** tab.

NOTE:

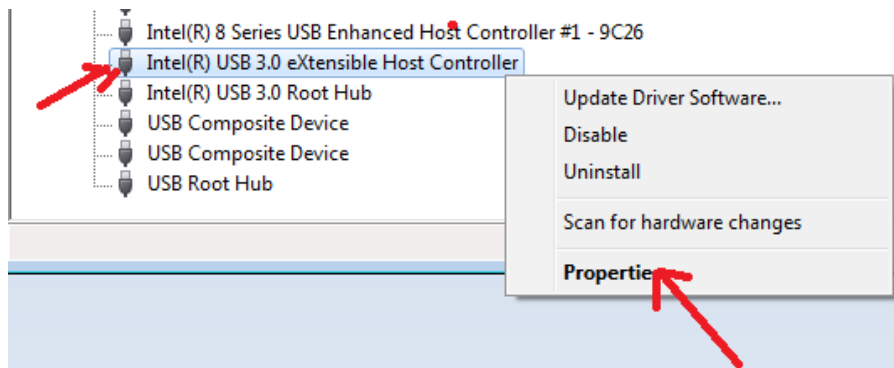
- The same tabs appear as for the Generic USB Hub, and they provide the same functionality. In addition, the **Resources** tab appears.
- This tab shows the resource memory settings and IRQ.
- Any conflicts appear in the **Conflicting device list**.
- You can select the **Use automatic settings** check box or manually change the settings to meet your needs.

3. Click **OK** to return to Device Manager.



## Checking Properties of the USB 3.0 eXtensible Host Controller

- Under **Universal Serial Bus controllers** in Device Manager, right-click **USB 3.0 eXtensible Host Controller** and select **Properties**.

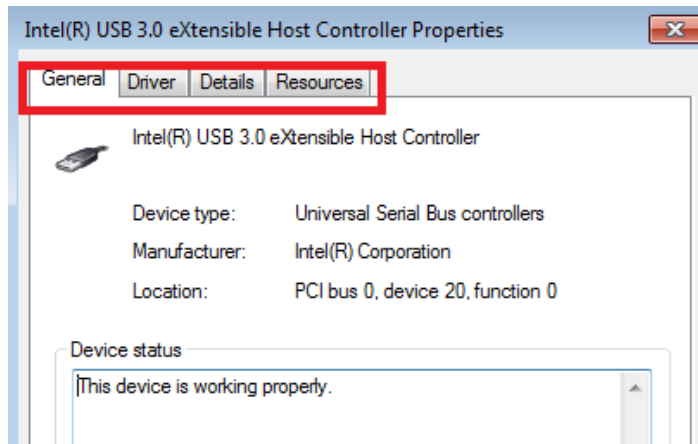


### NOTE:

- The **General** tab shows if the device is working correctly.
- The **Driver** tab shows the driver provider (in the example below, Intel). From this tab, you can also update, delete, disable, uninstall, or roll back the driver.
- The **Details** tab shows the driver version and dates.
- The **Resources** tab shows the memory range and IRQ number (not often changed).
- Until recently, USB 3.0 was the most current and fastest USB version. In mid-2016, the USB eXtensible Host Controller was updated to USB 3.1. If communication problems occur, it may be necessary to roll back 3.1 to 3.0.

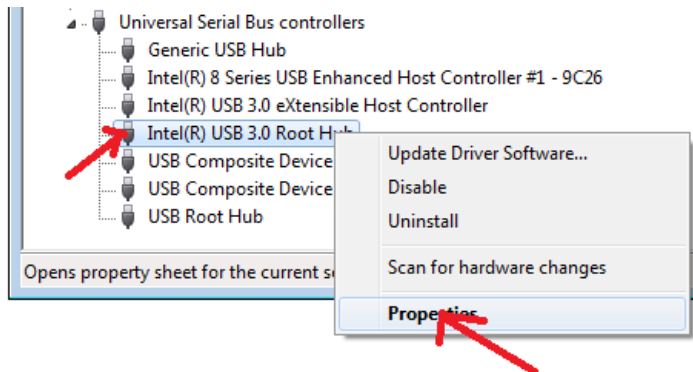
2. Click **OK** to return to Device Manager.





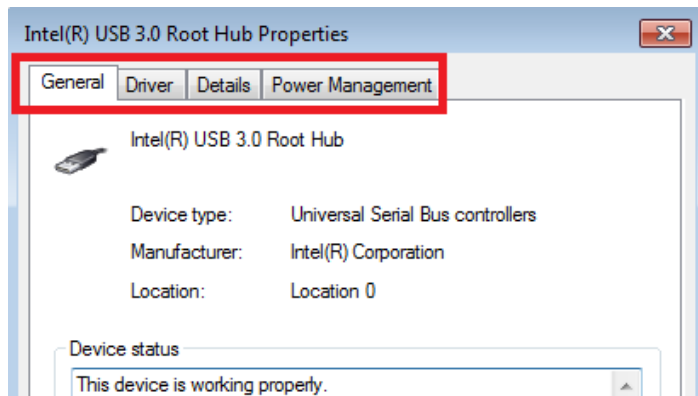
## Checking Properties of the USB 3.0 Root Hub

1. Under **Universal Serial Bus controllers** in Device Manager, right-click **USB 3.0 Root Hub** and select **Properties**.



NOTE: The same **General**, **Driver**, **Details**, and **Power Management** tabs appear as for the Generic USB Hub, and they provide the same functionality.

2. Click **OK** to return to Device Manager.

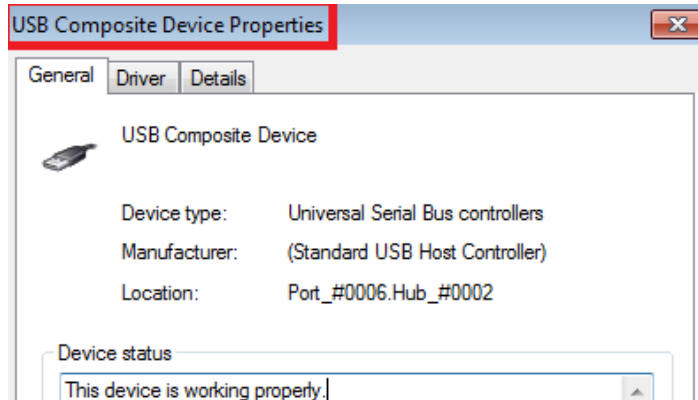
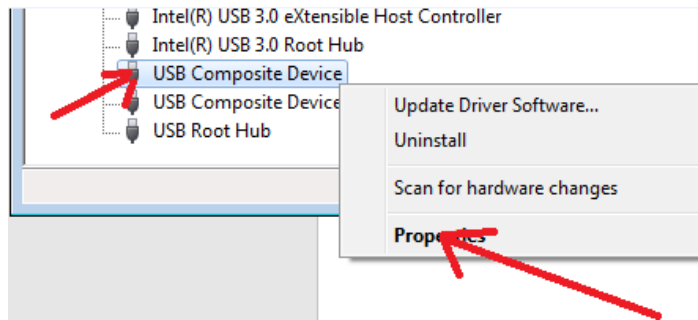


## Checking Properties of the USB Composite Device

When a new USB device is connected to a host PC, the USB driver creates a Physical Device Object (PDO) for the device and generates a PnP event to report the new PDO. The operating system then queries the USB driver for the hardware identifiers (IDs) associated with the PDO.

The USB driver also reports a compatible ID of USB\COMPOSITE, as long as the device meets the specified requirements. (For our purpose here, we are not concerned with the requirements.)

1. Under **Universal Serial Bus controllers** in Device Manager, right-click **USB Composite Devices** and select **Properties**.



2. Click **OK** to return to Device Manager.

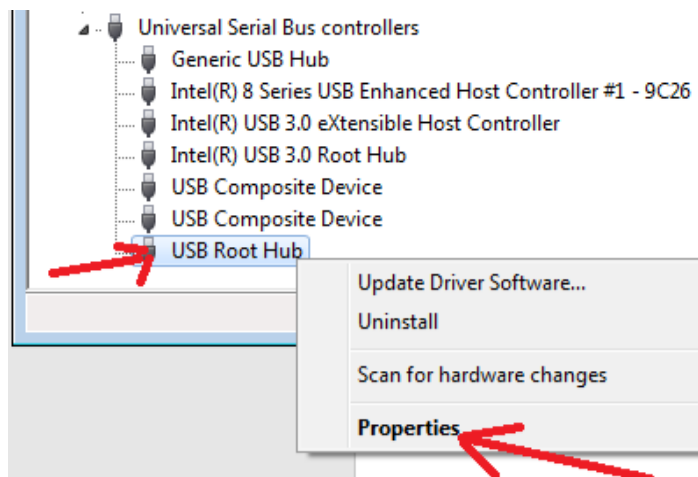
---

## Checking Properties of the USB Root Hub

It is a common design for USB 2.0 ports to be managed by two controllers: one for low speed and full speed (USB 1.1), and one for high speed (available beginning with USB 2.0). If this is the case, the third root hub is probably from the EHCI controller managing the high-speed connections, and the first and second root hubs are probably from a pair of OHCI or UHCI controllers managing the low- and full-speed connections. Each USB port on the PC is then connected to two of the controllers, the EHCI controller and one of the other two controllers. The one that is used depends on the speed chosen by the USB device connected to that port.

The number of ports displayed in Device Manager depends on the board architecture. (For example, a laptop can have only 4 USB ports while there are 7 USB Root Hubs in Device Manager.) If you see the word "enhanced," it's a safe assumption that the device is virtual, there to satisfy the driver requirements of Windows.

1. Under **Universal Serial Bus controllers** in Device Manager, right-click **USB Root Hub** and select **Properties**.

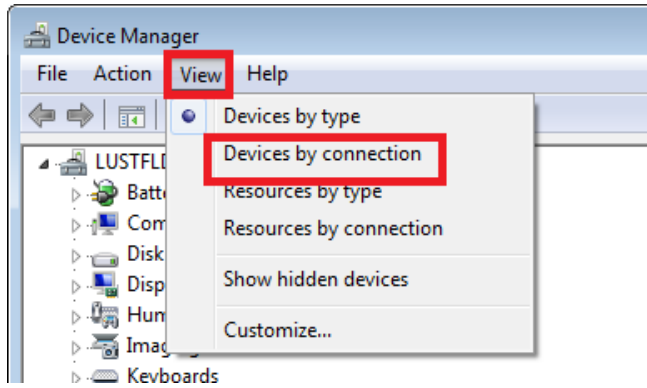


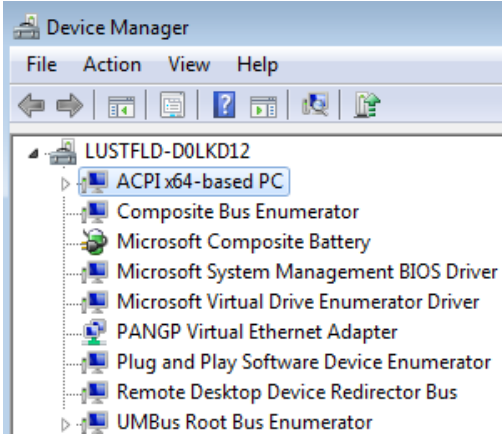
2. Click **OK** to return to Device Manager.

---

## Viewing Devices by Connection

1. At the top menu bar of Device Manager, click **View** and select an option, such as **Devices by connection**.



Option	Description
<b>Devices by type</b>	Displays devices by the type of device installed, such as a monitor or mouse. The connection name is listed below the type. This option is the default view.
<b>Devices by connection</b>	<p>Displays devices by how they are connected in the PC. Each device is listed under the hardware to which it is connected. For example, if a Small Computer System Interface (SCSI) card is listed, the devices attached to the SCSI card are listed beneath it.</p>  <p>The screenshot shows the Device Manager window with the 'View' menu set to 'Devices by connection'. The tree view shows a folder named 'LUSTFLD-D0LKD12' expanded to show 'ACPI x64-based PC'. Under this folder, several devices are listed, including 'Composite Bus Enumerator', 'Microsoft Composite Battery', 'Microsoft System Management BIOS Driver', 'Microsoft Virtual Drive Enumerator Driver', 'PANGP Virtual Ethernet Adapter', 'Plug and Play Software Device Enumerator', 'Remote Desktop Device Redirector Bus', and 'UMBus Root Bus Enumerator'.</p>
<b>Resources by type</b>	Displays the status of all allocated resources by the type of device using these resources. The resources are direct memory access (DMA) channels, input/output ports (I/O ports), interrupt request (IRQ), and memory addresses.
<b>Resources by connection</b>	Displays the status of all allocated resources by connection type. The resources are DMA channels, I/O ports, IRQ, and memory addresses.

2. Close Device Manager.