# ENUMERATING THE XR21B1411 USB UART BY LOCATION IN WINDOWS

## 1.0 INTRODUCTION

As described in Exar's application note AN213, a USB peripheral device may be identified by "location" or by "ID". All devices must have a Vendor and Product ID (VID / PID), but they may optionally have a serial number. Devices with a serial number must have a uniquely assigned number for each individual device, and the USB host uses this combination of VID / PID and serial number to identify the device "by ID". Devices without serial numbers are identified by their VID / PID and the port "location" to which they are connected to the host. The XR21B1411 single channel enhanced USB UART is an example of a uniquely serialized peripheral device.

## 2.0 BACKGROUND

In a manufacturing / test environment or when programming the on-chip OTP memory, repeated connection of Exar's XR21B1411 devices may be required. Each time a new part is connected to the Windows host PC, the host assigns the next available COM port number and a new instance of the driver is installed. Windows operating systems are typically limited to a maximum of 256 COM ports. After that point, more time is needed to reset the COM port numbering in the host PC. Additionally each connection would consume the time required for the driver to be installed for the new device. Finally, any test or OTP programming application needs to identify the proper port to be tested.

## 3.0 SOLUTION

To avoid the time consumption as well as usage of COM port numbers, Exar can provide a simple registry edit. Using this registry file, the XR21B1411 will enumerate by location instead of by ID. Following this registry change, the same COM port number will be assigned to all XR21B1411 devices connected to the same root hub port. If an external hub is used, the XR21B1411 must also be connected to the same port of the external hub in order to be assigned the same COM port number. Additionally, since each new device will be treated as the same device, the USB host will not need to reinstall the driver. Instead it will be immediately loaded upon device connection.

### *3.1 Enable enumeration of the XR21B1411 device by location*

- Step 1 - If the XR21B1411 has never been connected to the USB host, proceed to step 3, otherwise proceed to step 2.
- Step 2 - Connect the XR21B1411 device to the host PC. In the Device Manager under the ports section, select the XR21B1411 device, right click and uninstall the driver. Select the "delete files" checkbox if presented.

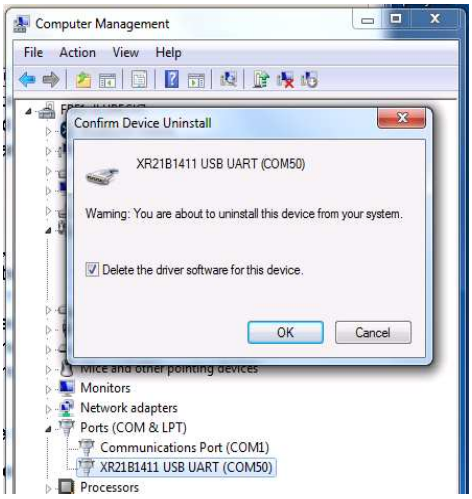


**FIGURE 1. DELETING DRIVER IN DEVICE MANAGER**

- Step 3 - Run the "xr21b1411_disable-serial-num.reg" file by double clicking on the file.
- Step 4 - Remove the XR21B1411 device. Reboot the host PC.
- Step 5 - Reconnect the XR21B1411 device and reinstall the driver.

All XR21B1411 devices will now enumerate to the same COM port number and the custom Exar driver be immediately loaded if they are connected to the same root hub / external hub port each time. A view of the registry with serial number identification disabled is shown in **Figure 2**.

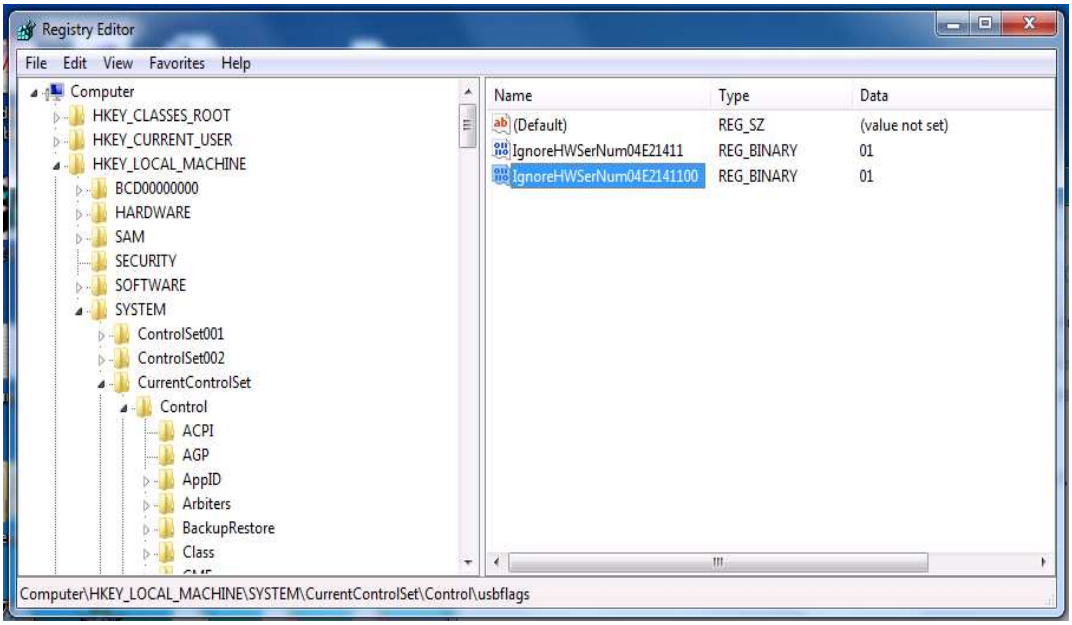


**FIGURE 2. SERIAL NUMBER IDENTIFICATION DISABLED**

### *3.2 Disable enumeration of the XR21B1411 device by location (enable enumeration by ID)*

- Step 1 - Connect the XR21B1411 device to the host PC. In the Device Manager under the ports section, select the XR21B1411 device, right click and uninstall the driver. Select the "delete files" checkbox if presented.
- Step 2 - Run the "xr21b1411_enable-serial-num.reg" file by double clicking on the file.
- Step 3 - Reboot the host PC.

All XR21B1411 devices connected to the host PC should now enumerate to individual COM port numbers and each device will install the driver instance. A view of the registry with serial number identification disabled is shown in **Figure 3**.

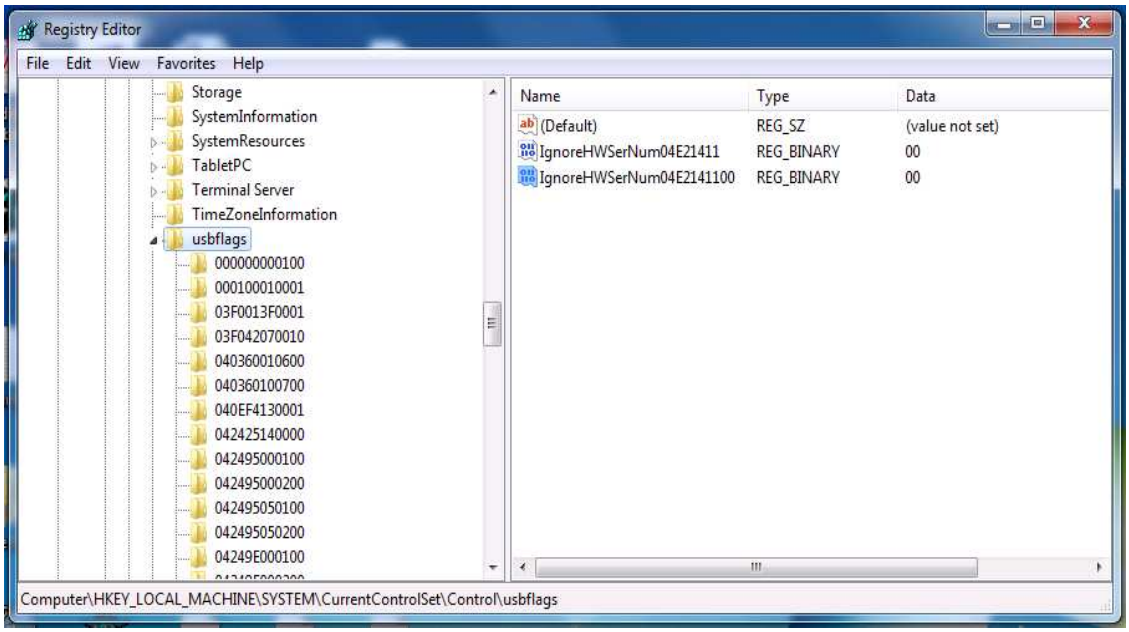


**FIGURE 3. SERIAL NUMBER IDENTIFICATION ENABLED**

## 4.0 SUMMARY

When testing or programming on-chip OTP memory in the XR21B1411 device, repeated connections to a host PC for each individual device are required. Each time a new device is connected, the COM port number is incremented to the next available port number and the driver is reinstalled each time. To simplify and expedite this process, a simple registry edit can be performed to disable the unique identification by serial number. The process is then easily reversed for normal identification of USB devices.

## 5.0 TECHNICAL SUPPORT

For technical questions about this application note, or to obtain the registry edit files, send email to uarttechsupport@exar.com.

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August 2012.

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