

Introduction

The Linx SDM-USB-QS-S module requires that device drivers be installed on the host PC before they can interact. The drivers tell the PC how to talk to the module. There are two different drivers for Windows 98, NT, 2000, and XP and one set for Linux.

The first set for Windows are the direct drivers, which offer a set of program functions that allow a custom application to directly control the module through the USB port. These functions are described in detail in the Programmer's Guide, available for download on the Linx web site, www.linxtechnologies.com or www.instantusb.com.

The other set of drivers and the set for Linux are Virtual COM Port drivers that make the module look like an additional serial port to the PC, but they will route the data to the USB port instead of the COM port. These drivers make upgrading legacy devices very easy as no additional software is required, just selection of the appropriate COM port.

Only one set of drivers can be used at a time. This means that only one set of drivers can be installed on the PC or that one set of drivers must be completely uninstalled before another one can be used.

The drivers are available for download from the Linx Technologies web site, www.linxtechnologies.com or www.instantusb.com.

Installing The Direct Drivers

The drivers are included with the module's development system or may be downloaded from the Linx web site (www.linxtechnologies.com or www.instantusb.com) and should be saved onto the hard drive of a PC or onto a floppy disk. When the module is attached to the PC for the first time Windows will automatically detect the device and launch the Found New Hardware Wizard, as shown below.



Figure 1: Installing the Drivers

Click "Next" to begin the driver installation and bring up the screen shown below.



Figure 2: Installing the Drivers

This screen will tell Windows to either search for a driver or to let the user select a specific driver. Select “Search for a suitable driver for my device” and click “Next”.



Figure 3: Installing the Drivers

This screen will tell Windows where to look for the drivers. If they were downloaded and saved onto a floppy disk, load that disk into a drive and check the “Floppy Disk Drives” box. If the QS Master Development Kit software CD is available, load the CD into the CDROM drive and check the “CD-ROM drives” box. If the drivers were downloaded onto the hard drive, then check “Specify a location”. Click “Next” to continue.

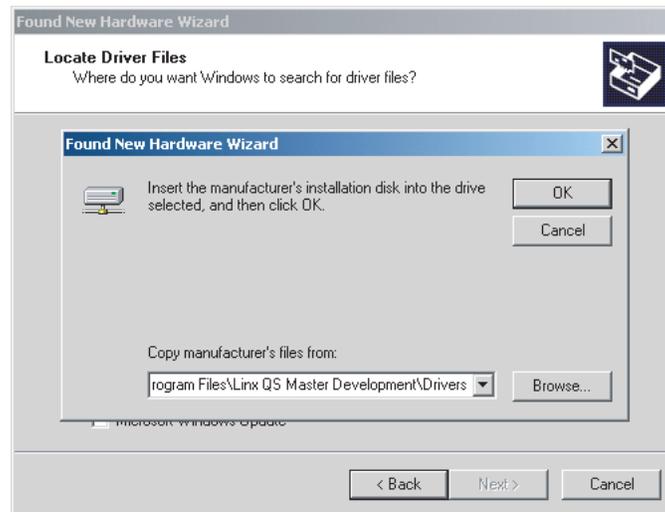


Figure 4: Installing the Drivers

If the “Specify a location” box was checked, then Windows will display the screen in Figure 4. This will allow the user to browse to the location of the drivers on the computer’s hard drive. Once there, click “OK” to continue.

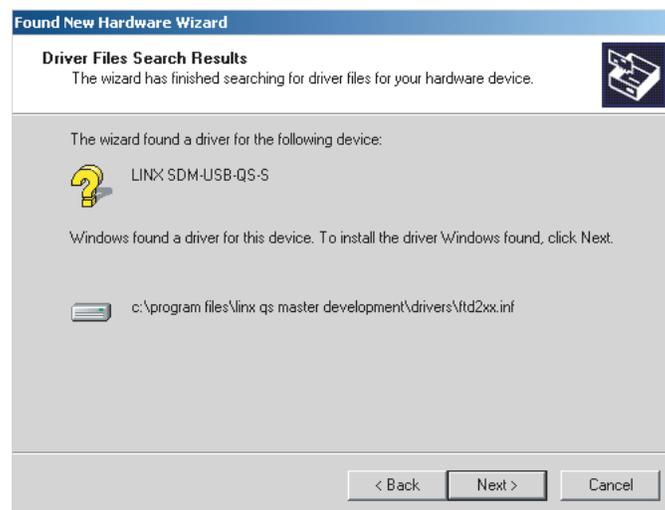


Figure 5: Installing the Drivers

If Windows was able to find the drivers in the selected location, then the screen in Figure 5 will be displayed. Click “Next” to install the drivers. Once the installation has completed, the screen below will be displayed.



Figure 6: Installing the Drivers

Click “Finish” to complete the installation process. This installation was for Windows 2000, but Windows 98, NT and XP will be similar.

Windows XP may return an error window shown in the figure below.



Figure 7: Windows XP Driver Error Window

This window is simply a warning that the driver has not gone through Microsoft’s certification process and could potentially pose a problem for the system. The drivers provided for the QS module have been independently tested and should not pose any problems unless modified by the user. Click the “Continue Anyway” button to finish the installation process.

Installing The Virtual COM Port Drivers

The installation of the Virtual COM Port (VCP) Drivers has two parts. The first part proceeds exactly as described for the Direct Drivers, but the VCP drivers require the installation of an additional serial port. Immediately after the the first installation concludes, the port installation will begin with the screen below.



Figure 8: USB Serial Port Installation

This installation will proceed exactly as the first installation and Windows should be directed to the same file location as before. Once this installation is complete, Windows may ask to be rebooted. USB devices can be added and removed on the fly, but serial ports cannot. Once the computer has been restarted, a new serial port named “USB Serial Port (COMx)” will appear in Windows Device Manager. The x will be a number representing the lowest available COM port number on the computer.

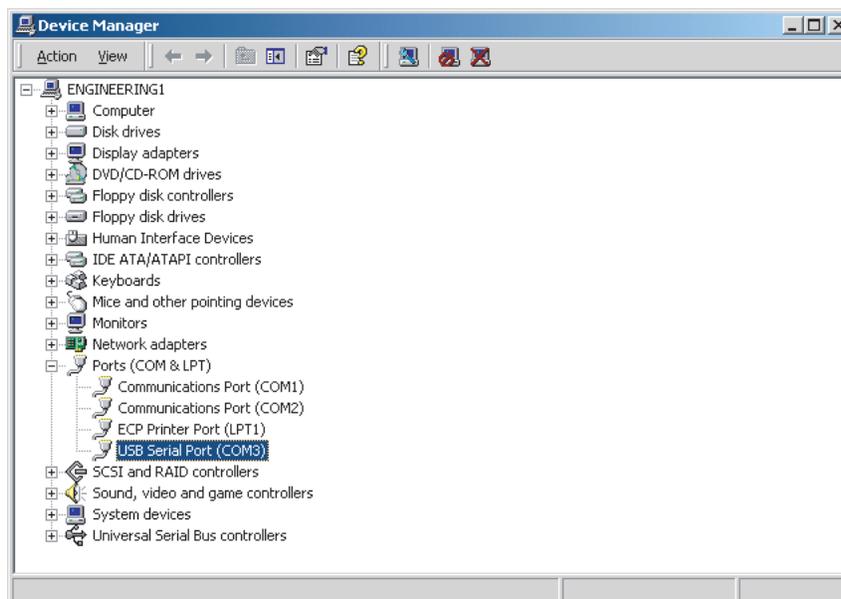


Figure 9: USB Serial Port In Windows Device Manager

Double click on USB Serial Port in the list to open the Properties window shown below.

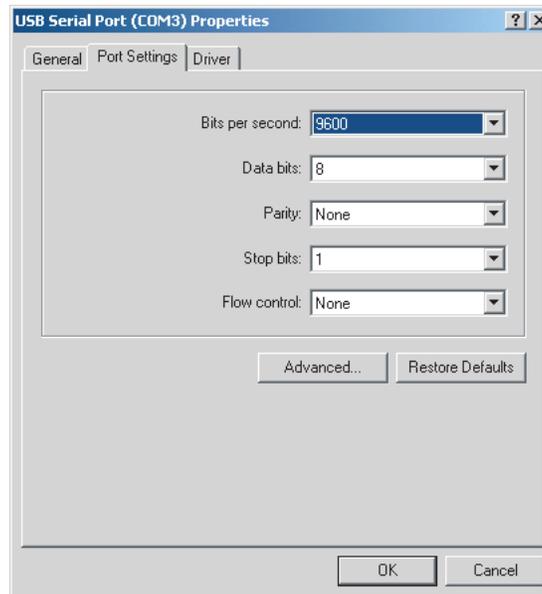


Figure 10: USB Serial Port Properties

This window allows the COM port settings to be adjusted to suit a particular application. Clicking on the “Advanced” button will open the Advanced Properties window.

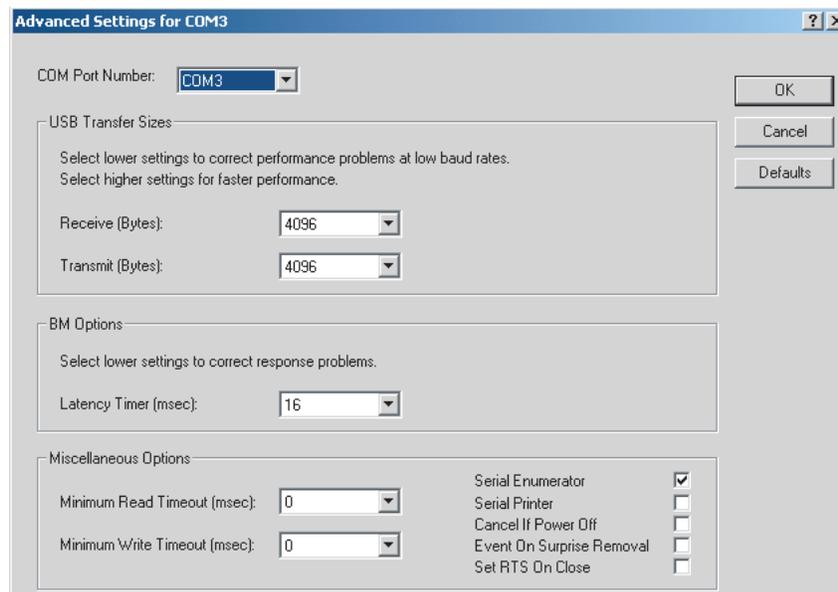


Figure 11: USB Serial Port Advanced Properties

The default settings will usually be sufficient for proper operation, but the values can be changed to optimize the performance of a specific application. Of particular interest is the ability to change the COM port number of the module. This is done simply by selecting the desired number from the drop down list at the top of the window. Be sure to select a port that is currently open otherwise conflicts could occur that potentially make the computer unstable. If “COM4” were selected from the list and “OK” pressed on both properties windows, then the Device Manager window will now show “USB Serial Port” as COM4.

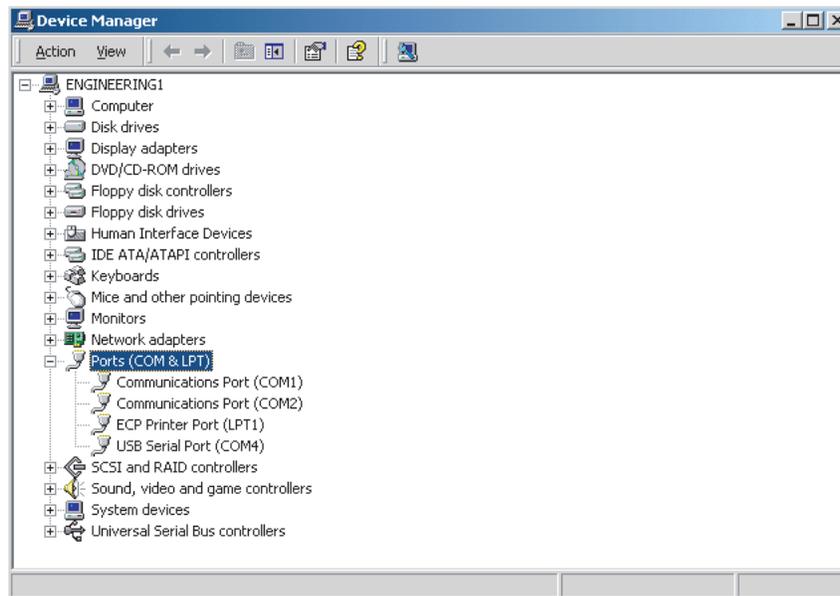


Figure 12: USB Serial Port In Windows Device Manager

Installing the Linux Drivers

First, download the latest kernel, which at the time of this writing is 2.4.25 from www.kernel.org. It is also included on the Master Development Kit CD. Untar the kernel.

```
$ tar xjf linux-2.4.25.tar.bz2
```

Patch the ftdi_sio driver.

```
$ cd linux-2.4.25
```

```
$ patch -p1 </mnt/cdrom/linux/2.4.25-patch
```

Make sure the ftdi_sio driver is enabled in the kernel config. The option is named CONFIG_USB_SERIAL_FTDI_SIO and is located here:

```
USB Support -->
```

```
    USB Serial Converter Support -->
```

```
        USB FTDI Single Port Serial Driver
```

Configure, compile and install kernel as documented in the Kernel-HOWTO (www.tldp.org/HOWTO/Kernel-HOWTO/) then reboot into the new kernel.

Load the ftdi_sio driver

```
# modprobe ftdi_sio
```

Plug the device into the USB port. The driver will attach the device to the next available USB serial port, i.e. /dev/ttyUSB0 or /dev/ttyUSB1. If you are using devfs this will be /dev/usb/tts/0. The device can now be accessed just like any standard serial port. See the Serial-Programming-HOWTO for details (www.tldp.org/HOWTO/Serial-Programming-HOWTO/).

Uninstalling The Drivers

Uninstalling the drivers begins the same for the Direct and Virtual COM Port drivers. Select “Add/Remove Programs” from the Windows Control Panel. Scroll down until the listing for the driver is found. Selecting the driver causes the “Change/Remove” button to be shown, as seen in the figure below.



Figure 13: Add/Remove Programs Window

Click the “Change/Remove” button to open the uninstaller window.



Figure 14: Uninstaller Window

If the QS module is plugged in, unplug it and click “Continue”. Once the drivers are removed the uninstaller will display that the process is complete.

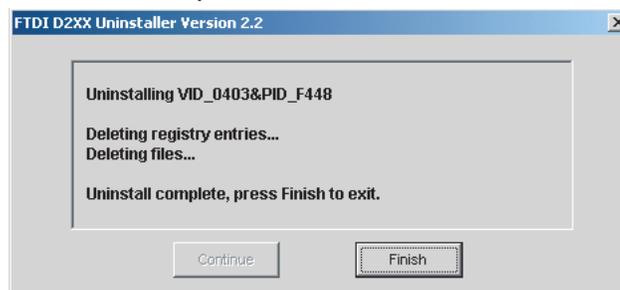


Figure 15: Uninstaller Window

Click “Finish” to close the window and the USB drivers have been successfully removed. If the Virtual COM port drivers were used, then the USB Serial Port must also be removed. Select “Add/Remove

Hardware” from the Windows Control Panel to start the Add/Remove Hardware Wizard.



Figure 16: Uninstaller Window

Click “Next”. The next window will tell the wizard what task to perform.

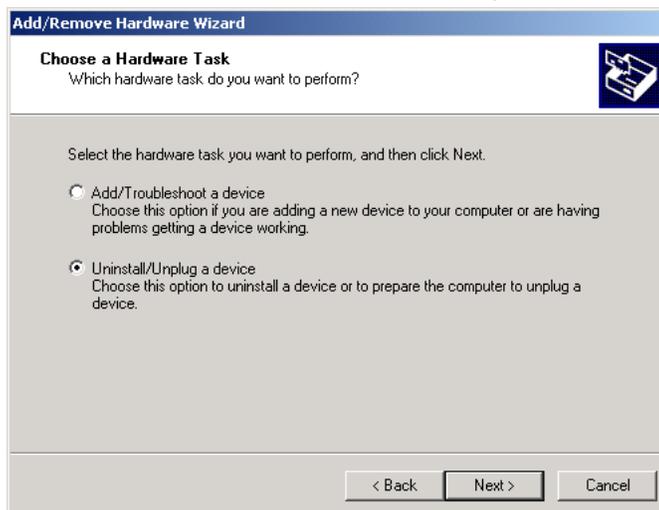


Figure 17: Uninstaller Window

Select “Uninstall/Unplug a device” and click “Next”.



Figure 18: Uninstaller Window

Select “Uninstall a device” and click “Next”.

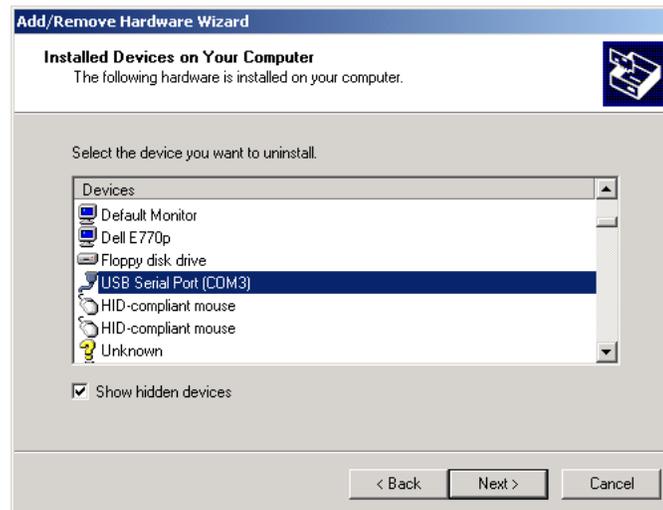


Figure 19: Uninstaller Window

Check the “Show hidden devices” box and scroll through the list until “USB Serial Port” is found. Select this item and click “Next”.



Figure 20: Uninstaller Window

Confirm that you want to remove the serial port by selecting “Yes, I want to uninstall this device” and click “Next”. The computer will uninstall the USB Serial Port and then display the finished screen.



Figure 21: Uninstaller Window

Click “Finish” to complete the process. At this point the drivers are completely removed.

Modifying The .inf Files

Windows will use the data in the .inf files to load the drivers and to display the device in the Windows Device Manager screen. This file can be changed so that Device Manager will show the name of the product rather than “LINX SDM-USB-QS-S”. Follow the instructions below for the appropriate drivers.

The Direct Drivers

Open the ftd2xx.inf file with any text editor, such as Notepad, scroll to the bottom of the page, and locate the [Strings] tag. It will look like the list below:

```
[Strings]
Ftdi="Linx"
USB\VID_0403&PID_6001.DeviceDesc="Linx Blank QS Device"
USB\VID_0403&PID_F448.DeviceDesc="LINX SDM-USB-QS-S"
USB\VID_0403&PID_F449.DeviceDesc="Master Development 2.0"
FTD2XX.SvcDesc="Linx USB Drivers"
WINUN="Software\Microsoft\Windows\CurrentVersion\Uninstall"
DriversDisk="Linx USB Drivers Disk"
```

The fourth line shown above can be changed from “LINX SDM-USB-QS-S” to the product’s name, which will then be shown in Windows Device Manager. The lines below change the product’s name to “New Widget”:

```
[Strings]
Ftdi="Linx"
USB\VID_0403&PID_6001.DeviceDesc="Linx Blank QS Device"
USB\VID_0403&PID_F448.DeviceDesc="New Widget"
USB\VID_0403&PID_F449.DeviceDesc="Master Development 2.0"
FTD2XX.SvcDesc="Linx USB Drivers"
WINUN="Software\Microsoft\Windows\CurrentVersion\Uninstall"
DriversDisk="Linx USB Drivers Disk"
```

Save the files and install the drivers as described above. The new product name should now be shown in Windows Device Manager. Do not make any other changes to the files as it could result in system errors and instability.

The Virtual COM Port Drivers

The VCP drivers have two .inf files that need to be modified, FTDIBUS.inf and FTDIPORT.inf. First, open the ftdibus.inf file with a text editor, scroll to the bottom of the page, and locate the [Strings] tag.

It will look like the list below:

```
[Strings]
Ftdi="Linx"
DriversDisk="Linx USB Drivers Disk"
USB\VID_0403&PID_8372.DeviceDesc="USB Serial Converter"
USB\VID_0403&PID_6001.DeviceDesc="Linx Blank QS Device"
USB\VID_0403&PID_F448.DeviceDesc="Linx SDM-USB-QS-S"
USB\VID_0403&PID_F449.DeviceDesc="Master Development 2.0"
WINUN="Software\Microsoft\Windows\CurrentVersion\Uninstall"
FtdiBus.SvcDesc="USB Serial Converter Driver"
```

The sixth shown above can be changed from “LINX SDM-USB-QS-S” to the product’s name, which will then be shown in Windows Device Manager. The lines below change the product’s name to “New Widget”:

```
[Strings]
Ftdi="Linx"
DriversDisk="Linx USB Drivers Disk"
USB\VID_0403&PID_8372.DeviceDesc="USB Serial Converter"
USB\VID_0403&PID_6001.DeviceDesc="Linx Blank QS Device"
USB\VID_0403&PID_F448.DeviceDesc="New Widget"
USB\VID_0403&PID_F449.DeviceDesc="Master Development 2.0"
WINUN="Software\Microsoft\Windows\CurrentVersion\Uninstall"
FtdiBus.SvcDesc="USB Serial Converter Driver"
```

Next, open the ftdiport.inf file and find the [Strings] tag:

```
[Strings]
FTDI="Linx"
DriversDisk="Linx USB Drivers Disk"
PortsClassName = "Ports (COM & LPT)"
VID_0403&PID_8372.DeviceDesc="USB Serial Port"
VID_0403&PID_6001.DeviceDesc="USB Serial Port"
VID_0403&PID_F448.DeviceDesc="USB Serial Port"
VID_0403&PID_F449.DeviceDesc="USB Serial Port"
FtdiPort.SvcDesc="USB Serial Port Driver"
SerEnum.SvcDesc="Serenum Filter Driver"
```

The seventh line above can be altered to display the new name. The lines below change the product’s name to “New Widget”:

```
[Strings]
FTDI="Linx"
DriversDisk="Linx USB Drivers Disk"
PortsClassName = "Ports (COM & LPT)"
VID_0403&PID_8372.DeviceDesc="USB Serial Port"
VID_0403&PID_6001.DeviceDesc="USB Serial Port"
VID_0403&PID_F448.DeviceDesc="New Widget"
VID_0403&PID_F449.DeviceDesc="USB Serial Port"
FtdiPort.SvcDesc="USB Serial Port Driver"
SerEnum.SvcDesc="Serenum Filter Driver"
```

Save the files and install the drivers as described above. The new product name should now be shown in Windows Device Manager. Do not make any other changes to the files as it could result in system errors and instability.