

# Light-O-Rama



## *RS485 Adapters*

SC485 • USB485B • USB485 • USB485-ISO

User Manual  
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## Introduction

The Light-O-Rama (LOR) network of controllers uses the RS485 electrical protocol for data communication. This is a differential transmission standard which is highly immune to interference and allows for up to 4000 ft of cable. PC serial ports and USB ports limit cable length to less than 100 ft.

In order to use a Windows PC to configure and control a LOR network you must use one of the LOR RS485 adapters. There are adapters for PC serial ports and USB ports. See the *Adapter Feature Matrix* section to help you choose the best adapter for your situation.

You can mix and match these adapters on a single PC. Each adapter appears as a separate COM port. The S2 Showtime software supports up to four adapters at one time. Each adapter can be connected to a LOR accessory, a network of controllers or both.

The SC485 serial RS485 Adapter does not require any software installation. The SC485 is simply plugged into a serial port on the PC and used.

All USB adapters require the installation of device drivers. Do not plug the adapter in until you have read the instructions in the *Software Installation (USB Only)* section.

## What's in the Box

### ***SC485 Serial to RS485 Adapter***

The SC485 plugs directly into a PC 9-pin serial port. It requires no driver software; you just plug it in and use it. It does not come with a manual or a serial port extension cable. If you need an extension cable, you can find one by going to [www.lightorama.com](http://www.lightorama.com) ► Web Store ► Accessories ► DB9 Extension Cable (6ft)

### ***USB485 USB to RS485 Adapter***

The USB485 is supplied with a 6ft USB cable to connect it to a PC USB port. Also included are a manual and a CD with the Windows drivers.

### ***USB485B USB to RS485 Adapter***

The USB485B is supplied with a 6ft USB cable to connect it to a PC USB port. Also included are a manual and a CD with the Windows drivers.

### ***USB485-ISO USB to RS485 Adapter***

The USB485-ISO is supplied with a 6ft USB cable to connect it to a PC USB port. Also included are a manual and a CD with the Windows drivers.

## Important Considerations

Follow the installation instructions for USB adapters. Failure to do this may cause Windows to install a random driver for the device which will not work.

If you do not have the Driver Installation CD that came with your USB adapter, the latest drivers are available directly from the chip manufacturer's web site: <http://www.ftdichip.com> -> Drivers -> VCP -> (Select the correct driver for your operating system) – It is best to use the “setup executable” on the right-hand side of the page to install the drivers if one is available for your Windows version.

If a USB485B or USB485-ISO is powering LOR accessories, like an RF-V4 Wireless Module, a DC-MP3 Show Director or an mDM-MP3 miniDirector, the USB485B or USB485-ISO should be connected to a USB port on the PC, not to a hub. Using a USB hub may severely restrict the power available to the adapter which in turn may not be able to power the accessory.

If your LOR Hardware Utility does not have “LOR MP3” and “LOR RF” tabs, it will NOT work with the USB485B or the USB485-ISO. The latest version of the Hardware Utility may be obtained by going to [www.lightorama.com](http://www.lightorama.com) ► Support ► Hardware Utility.

You should not unplug a USB adapter from the PC while it is in use. This may confuse the USB drivers and hang the application using the adapter.

## Troubleshooting USB Adapter Problems

If you have a problem with the installation or use of your USB adapter, please consult this troubleshooting guide for help: (upper/lower case is important)

[www.lightorama.com/Documents/RS485\\_Adapter\\_Troubleshooting.pdf](http://www.lightorama.com/Documents/RS485_Adapter_Troubleshooting.pdf)

## Adapter Feature Matrix

The table headings are defined below.

Adapter Model	PC Port	Cable to controller	Accsry Power	Quick Trnarnd	Double RJ45	Isolation
SC485	Serial	100 ft	No	No	No	No
USB485	USB	4000 ft	No	No	No	No
USB485B	USB	4000 ft	170ma	Yes	Yes	No
USB485-ISO	USB	4000 ft	150ma	Yes	Yes	2500V

### PC Port

The type of port that must be available on your PC to support this type of adapter. The SC485 requires an old style serial communications port not usually available on modern PCs. Please note that the SC485 contains electronics, it is not simply a connector changer. This means that devices obtained from places like RadioShack that look like an SC485 will not work.

### Cable to controller

This is the maximum number of feet of Cat5 cable between the adapter and the first controller. The SC485 is powered by the controller(s), so the voltage drop on the cable sets this limit. The USB adapters derive their

power from the USB port so they are limited only by RS485's capability.

### Accessory Power

LOR accessories like the RF-V4 Wireless Module, DC-MP3 Show Director and mDM-MP3 miniDirector require power to operate. Accessories are usually powered by attached controller(s). In the case where there are no attached controllers, power must come from another source. The USB485B and the USB485-ISO have power boosters in them to up the USB +5v to a level that can power accessories.

### Quick Turnaround

LOR controllers have the ability to respond to polls from the show director (your PC, a DC-MP3 Show Director or mDM-MP3 miniDirector.) The S2 Interactive Showtime software supports polling the controllers so that the inputs can be sensed and used to control shows.

The USB485B and the USB485-ISO have additional components in them that allow the communications line to be quickly turned around (from pointing at the controllers to pointing at the show director and back again) so that inputs can be read without disrupting the show. These two adapters are preferred but not required for interactive shows.

### Double RJ45

The USB485B and the USB485-ISO adapters have two RJ45 connectors that are in parallel. These allow for more flexible placement of the adapter in a LOR network.

## RS485 Adapters

Another way of looking at this is that the adapter has two paths from the PC to the LOR network. Each path can have one or more LOR devices. Remember, the connectors are in parallel, so if a device on one connector path transmits on the network, devices on the other connector path will see the transmission.

### ***Isolation***

The USB485-ISO completely isolates the RS485 and power supply for accessories from the PC. There are two main reasons for doing this:

1. You have multiple networks (more than one adapter on the PC directing your show.) Multiple networks usually mean a larger display where the display is powered by multiple power distribution points or transformers. In this situation, isolation is often required for proper operation. If you find that any one network works properly but when two or more networks are connected controllers do not respond properly, then isolation is needed.
2. You want additional protection from problem situations. For example, if a controller were to fall over and then fill with water, the AC line voltages in the controller could travel to the low voltage network connection cable through the water. An isolated adapter prevents these voltages from entering your PC and harming you or your PC.

### **USB485-ISO LED Indicators**

ISO Power The isolated accessory power supply is functioning

## RS485 Adapters

USB Power The USB port on the PC is supplying power to the adapter

RX Adapter is receiving data from the PC that is being sent out on the RS485 network

TX Adapter is sending data to the PC that was received from the RS485 network

### **USB COM Port Behavior**

After the software installation is done, the COM port assigned to a particular USB adapter will appear when the adapter is plugged in and disappear when it is unplugged from the PC. This particular adapter will always have the same COM port number on a particular PC. For example, if a USB485 is connected and appears in the Ports list as COM6, it will always be COM6 on that PC regardless of which USB port it is plugged in to. It is a good idea to write the COMn port on the adapter to avoid confusion if you are using multiple adapters.

If this adapter is plugged into a different PC, it will mostly likely get a different COM port number.

If you add another USB to RS485 adapter, it will automatically install using the software already on the PC. It will get its own unique COM port number that will also appear and disappear depending upon whether or not this adapter is plugged into the PC.

To uninstall the USB COM ports, go to Control Panel's "Add or Remove Programs" and select "FTDI USB Serial Converter Drivers." Note that the name of the software to remove varies slightly for the different Windows versions.

## Software Installation (USB Only)

The SC485 serial adapter requires no software installation. If you have an SC485, just plug it into a 9-pin serial connector on your PC.

### **USB485, USB485B & USB485-ISO USB to RS485 Adapters**



The pages that follow are quick instructions to install the USB device and virtual serial port drivers on your PC. A properly installed USB adapter will appear in the **Device Manager** list of devices under “Ports (COM & LPT)” as “USB Serial Port (COMn).”

## **Windows 2000/XP/Vista Installation**

Do NOT plug the USB adapter in before installing the drivers. This may install a random driver selected by Windows that will not work.

If you do not have the USB Drivers CD from Light O Rama, go to [www.ftdichip.com](http://www.ftdichip.com) -> Drivers -> VCP -> (select the driver version for your Windows operating system.) Download and save the “setup executable” from the rightmost column.

If you do have the Light O Rama USB Drivers CD, place it in a CD drive on your PC and use Windows Explorer to display the top level folder.

The driver install executable will have a name like “CDM 2.04.06.exe” You may not see the “.exe” part of the name depending upon you Windows Explorer settings. Double-click the executable downloaded from ftdichip.com or from the top level directory of the LOR USB Drivers CD.

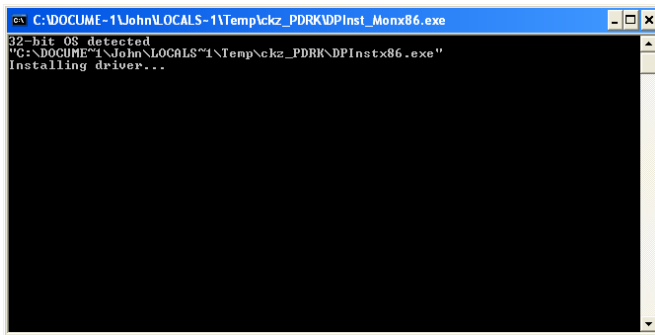
You may see a security window like the following:



Click the “Run” button to proceed with the installation.

Windows Vista may also pop-up a “User Account Control” window, again click “Continue” to proceed with the installation.

You will momentarily see the following DOS window, when it disappears, the drivers are installed.



```

C:\DOCUMENT~1\John\LOCALS~1\Temp\ckz_PDRK\DPInst_Monx86.exe
32-bit OS detected
"C:\DOCUMENT~1\John\LOCALS~1\Temp\ckz_PDRK\DPInstx86.exe"
Installing driver...
  
```

You may plug in one or more LOR USB adapters. The first time you plug in a USB adapter Windows will go through an install process. Subsequent plug-ins will just give the two-tone install/remove sounds.

See the *USB COM Port Behavior* section for information on how USB adapters map into COMn ports on your PC. The document linked to in the *Troubleshooting USB Adapter Problems* section contains procedures that you can use to determine the COM port number if you want to know this.

### ***WinXP/2000 USB [OLD] Installation***

This section should only be used when the previous section on Windows 2000, Windows XP or Windows Vista fails to work for your PC because it is an older system.

#### **WinXP Step 1 (Before you plug the adapter in)**

If you do not have the USB Drivers CD from LOR, go to [www.ftdichip.com](http://www.ftdichip.com) -> Drivers -> VCP -> select the driver version for your Windows operating system. Download and extract the appropriate ZIP file on your PC.

If you do have the LOR USB Drivers CD, place it in a drive on your PC.

#### **WinXP Step 2**

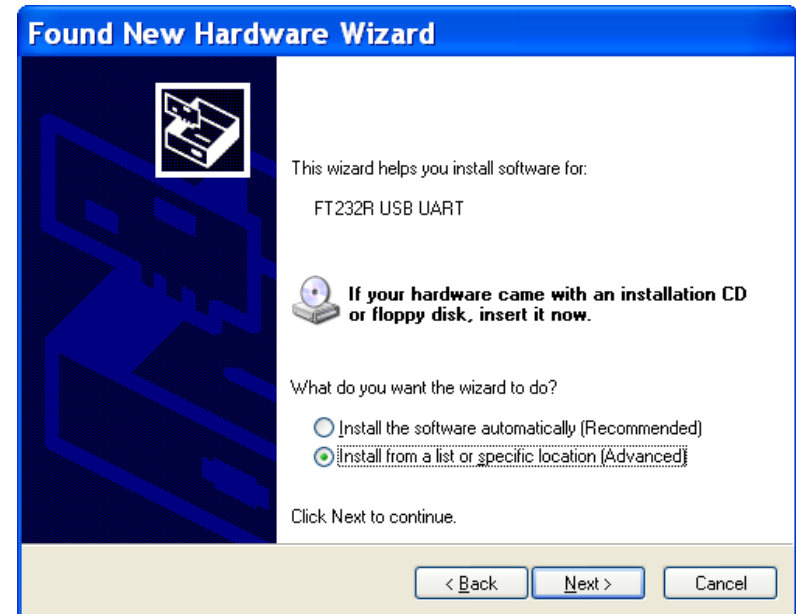
Plug the adapter into your PC. This will start the Install New Hardware Wizard.

**WinXP Step 3**

On the following screen, click “No, not this time” and then click Next>.

**WinXP Step 4**

On the following screen click “Install from a list or specific location (Advanced)” and then click Next>. (Note that the device name may be different from what is shown on the screen below.)





**WinXP Step 5**

On the following screen click “Search for the best driver in these locations,” click “Include this location in the search,” *Browse* to the location of the WinXP drivers, usually D:\WinXP\_2000 and then click Next>.

**WinXP Step 6**

On the following screen, click “Finish.” You will then see the screen from Step 3 above again. Windows needs to install the virtual serial port on top of the USB device you just installed. Repeat WinXP Steps 3 through 6. After the second round, a new COM port will appear in your hardware configuration.



## Win98/ME USB Installation

### Win98 Step 1 (Before you plug the adapter in)

If you do not have the USB Drivers CD from LOR, go to [www.ftdichip.com](http://www.ftdichip.com) -> Drivers -> VCP -> select the driver version for your Windows operating system. Download and extract the appropriate ZIP file on your PC.

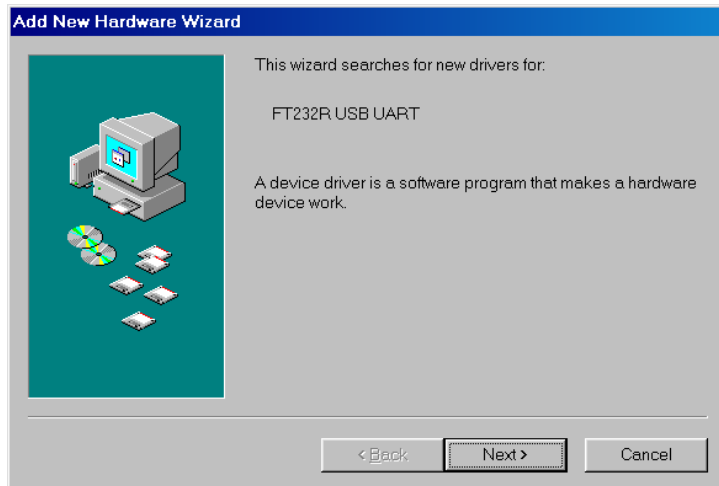
If you do have the LOR USB Drivers CD, place it in a drive on your PC.

### Win98 Step 2

Plug the adapter into your PC. This will start the Install New Hardware Wizard.

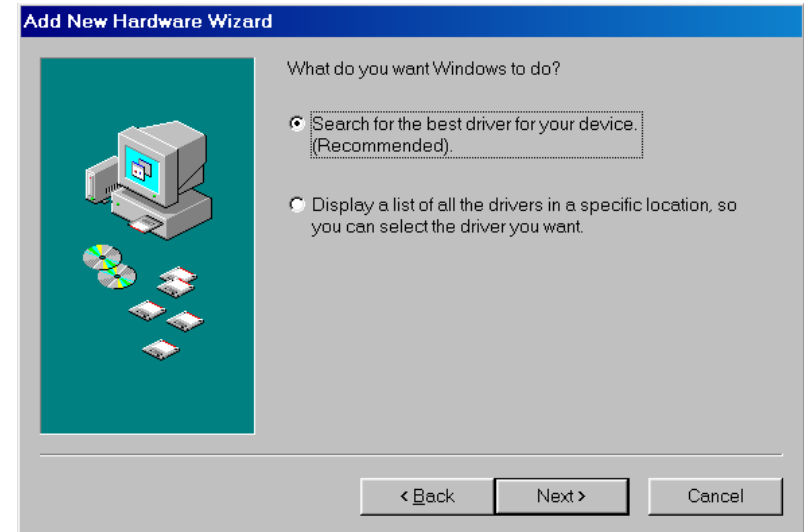
### Win98 Step 3

On the following screen click Next>. (Note that the device name may be different from what is shown on the screen below.)



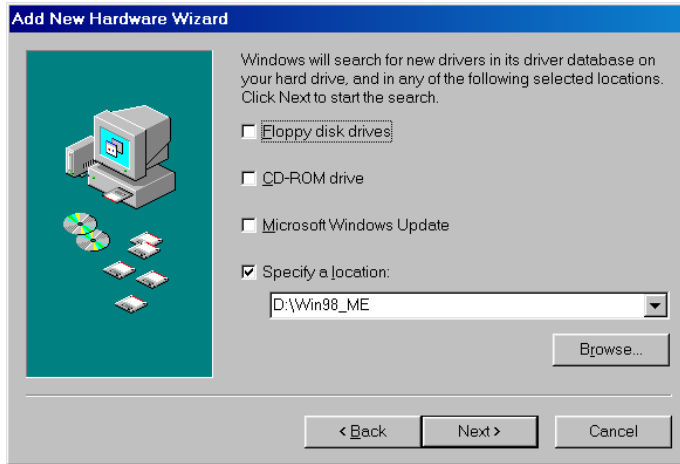
### Win98 Step 4

On the following screen, select “Search for the best driver for your device. (Recommended)” and then click Next>.

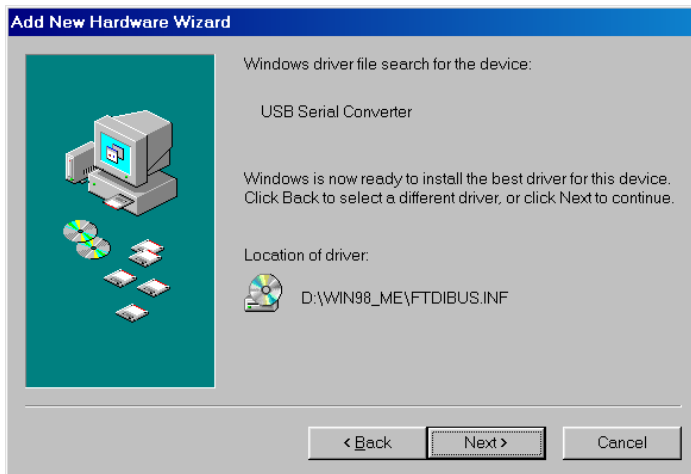


**Win98 Step 5**

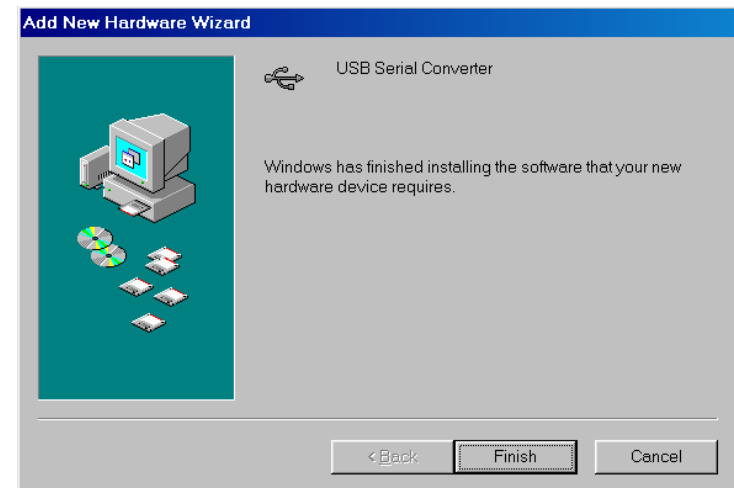
On the following screen, click “Specify a Location:,” then *Browse* to the directory where the driver files are, usually D:\Win98\_ME, and then click Next>.

**Win98 Step 6**

On the following screen, click Next>.

**Win98 Step 7**

On the following screen, click “Finish.” Windows has finished installing the USB device. Windows needs to install a virtual serial port driver for the device. Some versions of Win98 go ahead and do this without further interaction, on others you will see the screen in Win98 Step 3 again. If you do, repeat Win98 Steps 3 through 7. After the second round, a new COM port will appear in your hardware configuration.



## Specifications

Device	
SC485	$\frac{5}{8}$ "h x $1\frac{3}{8}$ "w x 2"d
USB485	$\frac{5}{8}$ "h x $1\frac{3}{8}$ "w x 2"d
USB485B	$1\frac{1}{8}$ "h x $2\frac{5}{8}$ "w x $2\frac{5}{8}$ "d
USB485-ISO	$1\frac{1}{8}$ "h x $2\frac{5}{8}$ "w x $3\frac{3}{4}$ "d
USB485B power	10 vdc @ 170 ma
USB485-ISO power	12 vdc @ 150 ma

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