

USB-232 Isolated USB-RS232 Interface Converter



Installation and Operation

General

The USB232 is a general purpose USB to RS232 isolated interface converter. It is intended to provide an RS232 port on a PC which has only a USB port available. Drivers are included to create a virtual COM port within the operating system, compatible with standard Windows application programs. The isolation barrier is between the USB interface and the RS232 (DB9) interface.

The RS232 connector has standard IBM PC pinouts, and all of the signals are fully supported.

For more information, to download the latest drivers or to purchase the USB232 and related products please refer to the [KK Systems' web site](http://www.kksystems.com).

Driver Installation

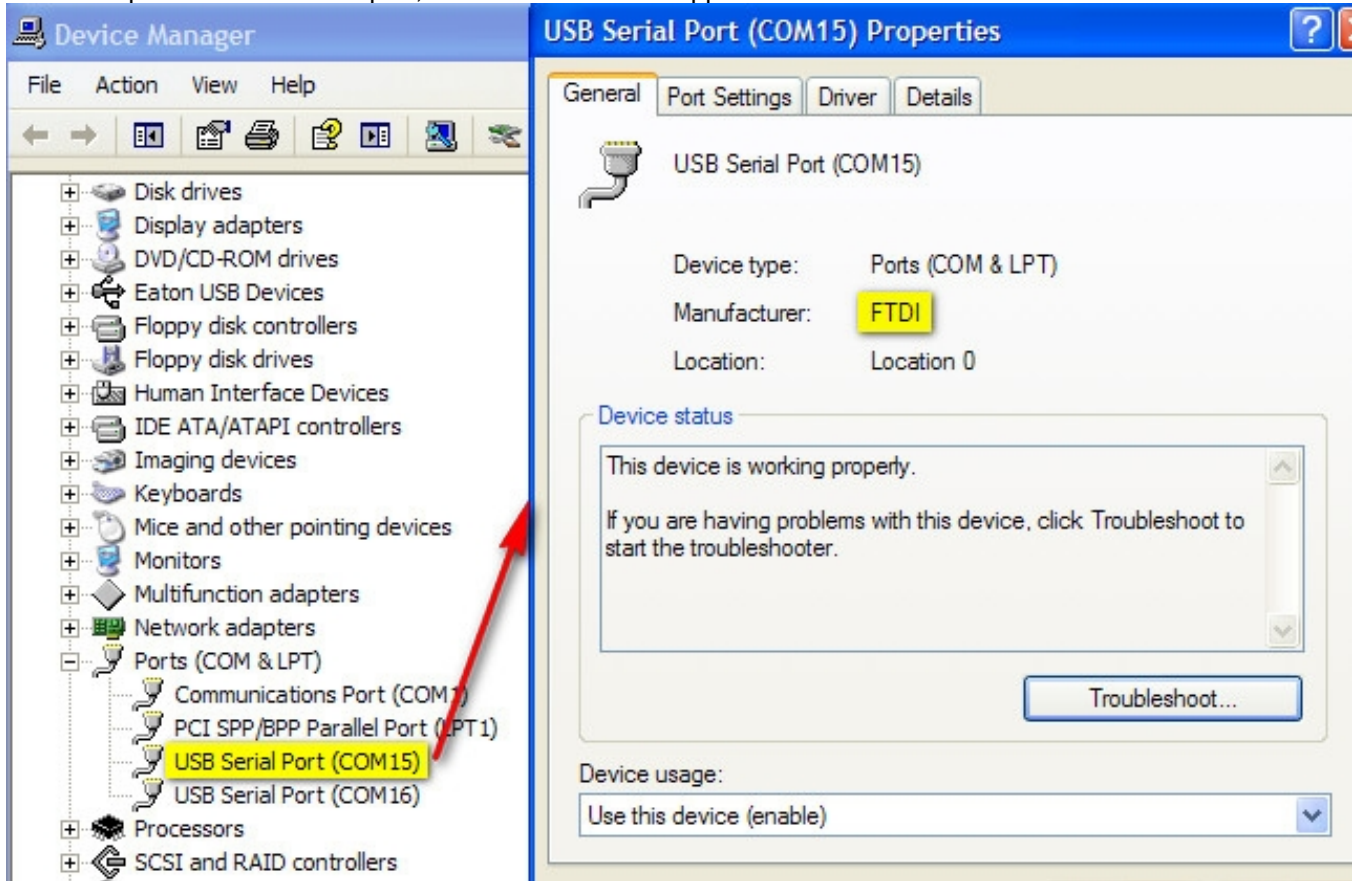
A driver is required within the operating system, to create the virtual COM port. As with many Windows devices, there are three approaches:

1. Install the driver before connecting the USB-232 to the PC. This is the safest way. On the CD, navigate to the folder appropriate to your operating system and choose Manual Installation.
2. Connect the USB-232 to the PC. Windows will detect the new device and will ask where the driver is. Direct Windows to the folder on the CD appropriate to your operating system (choosing Automatic Installation).
3. Connect the USB-232 to the PC. Windows will detect the new device and will ask where the driver is. Direct Windows to search the internet. With the USB-232 this method works on Windows 7 and above, but there is a risk of loading a driver which has not been tested properly.

Having done the above, now you need to find out which COM port number has been allocated:

Open up Control Panel / System / Hardware / Device Manager (the exact location varies with Windows version) and look under Ports (COM and LPT).

Under Properties for the serial port, the USB-232 should appear as "FTDI":



Configure your application software to use this COM port number.

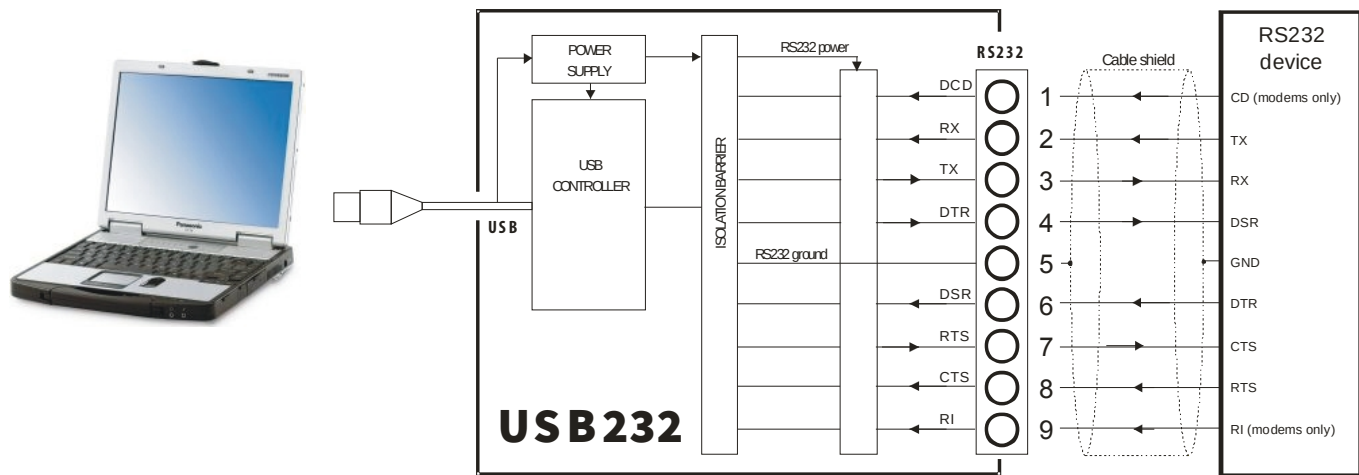
Note: The USB-232 contains a unique USB device ID which ensures that whichever USB port it is plugged into, it always appears under the same COM port number. Usually, this is the desired behaviour for application software configuration reasons. However, it has two side effects:

- (1) If you are going to be using multiple USB-232 converters on one PC, Windows will prompt to install the drivers for the installation of each one - because it thinks each one is a different device. In this case, copying the CD contents to a suitable folder on the PC and pointing the "new hardware found" function to that folder will save time.
- (2) If you want the converter to always appear under the same COM port number, you need to always use the one specific USB-232 converter. If you plug in another USB-232 converter (even into the same USB port) it will appear under a new COM port number.

Connections

USB Connector	Pin Function		RS4xx DB9 Connector	Pin Function	Input/Output
1	USB +5V		1	DCD	I
2	-- Data		2	RX	I
3	+ Data/Clock		3	TX	O
4	USB Ground		4	DTR	O
Shield	Shield		5	GROUND	-
			6	DSR	I
			7	RTS	O
			8	CTS	I
			9	RI	I

Ground: always connect the RS232 ground terminal (pin 5 of the USB-232) to the comms ground of the other RS232 device. This is essential for RS232 to function.



USB-232 Configuration

The USB-232 has no switch or software configuration. The selection of baud rate and character format is done by the Windows application program.

Required RS232 Connections

The cable which works between your RS232 device and a standard IBM compatible PC will also be correct for connecting the USB-232 to your device.

If you are making up a custom cable, in most applications only USB232 pins 2,3,5 (bidirectional data and ground) need to be connected. Often pins 2,3 need swapping in the cable. For others the following may be useful: RS232 **printers** usually need only the data and one hardware handshake i.e. USB232 pins 2,3,5,8 and sometimes 4 also.

RS232 **modems** need all of them and usually the cable between the USB232 and a Hayes-compatible modem will be a 9-way straight-through cable (1-1, 2-3, 3-3 etc).

Power Requirements

The USB-232 is powered entirely via the USB interface. It contains an isolated inverter which powers the isolated RS232 interface. The USB power consumption depends somewhat on the baud rate and cable capacitance; the worst case is around 90mA. However, if connecting several USB-232 converters to a hub, the hub may need to be a powered hub because many laptops do not have the full-specification (500mA) USB ports.

Software Driver Compatibility

There are two main vendors of USB-serial: Prolific (China) and FTDI (UK). They are completely different and can usually co-exist on the same PC. Most "cheap" USB-serial converters on the market use the Prolific chip. The USB-232 uses the FTDI chip, so if you are using one of the other converters you will still need to install the FTDI drivers which are supplied with this product. Furthermore, most of the Prolific-based products do not have a unique USB device identifier and plugging them into different USB ports generates new COM port numbers.

Troubleshooting

The application program does not find the RS232 device

- (1) Look in Control Panel / System / Hardware / Device Manager / Ports and check that the COM port number appearing there for the FTDI device matches your application program configuration.
- (2) Check that the COM port settings (baud rate, etc) in your application program match those of the RS232 device.
- (3) Check the RS232 connections - there are two standards which are the mirror image of each other (DTE/DCE). The USB-232 pinouts are DTE and are the same as those on the back of a standard IBM compatible PC.

The USB-232 installs under a too-high COM port number and the application program doesn't support it

This is often the result of creating Bluetooth COM ports. Windows does not offer a clean means of removing unused port numbers; please contact KK Systems for instructions. Alternatively it is usually possible to force the USB-232 driver (under Ports / Properties / Advanced) to use a different COM port number; be sure it isn't used by another device.

Specification

USB interface: USB1.1 (USB2 compatible).
Current consumption 90mA max.

RS232 interface: Standard specification drivers and receivers. All signals implemented.

Serial parameters: All baud rates supported by the Win32 API
up to and including 230400 baud

Isolation: Test voltage 1500V AC RMS for 1 second

Environmental: Operating -25C to +50C, storage -40C to +70C
RH 0 to 90% non-condensing

CE compliance: Emissions EN50081-2. Immunity EN50082-2

Dimensions: 130mm x 53mm x 21mm (case only)

Contact

KK Systems Ltd tel +44 1273 857185
Brighton fax +44 1273 857186
West Sussex email: support@kksystems.com
BN45 7ED, UK <http://www.kksystems.com>

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