USB422

Dual RS-422 USB Interface
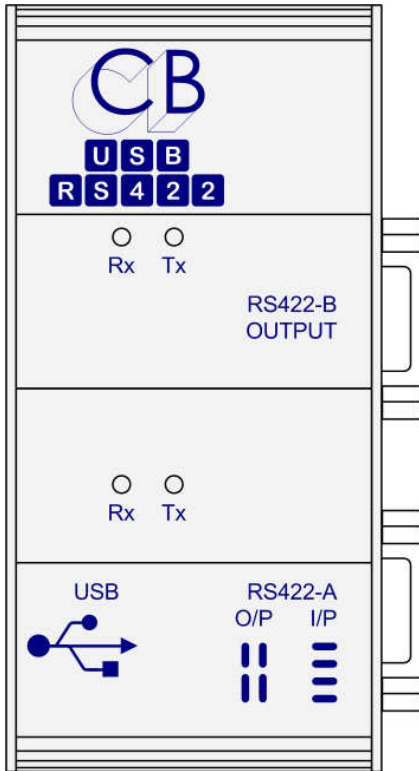
Main **Features**

- Two RS422 ports, Connections to Standard Sony RS-422 pin-out
- Port A may be configured as a Controller (O/P) or Device (I/P) using internal links
- Port B is configured as a Controller (O/P)
- Windows 98, ME, 2000 and XP Drivers
- MAC OS-X Driver
- Linux Driver
- Optional Video Sync Reference input
- Tx and Rx LED's on both ports
- Slew Rate Limited RS422 drivers to minimise EMI and reduce reflections
- Sample Windows Program on website
- Rugged extruded aluminum box
- WEEE/RoHS Compliant

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Table of Contents

USB Interface:

CB Electronics have for a number of years used USB-RS232 interfaces both with and without RS232-RS422 converters. In designing the USB422 we used the experience with many different manufactures to choose the best combination of hardware and drivers.

RS422 Interface:

Slew Rate Limited RS422 drivers to minimise EMI and reduce reflections on incorrectly terminated connections. Pin-out and termination as per standard Sony connection. Port A may be configured as a Device (I/P) or as a Controller (O/P). Port B is configured as a Controller (O/P), to use as a Device a Tx/Rx invert lead must be used.

Drivers:

Drivers for Windows 98, ME, 2000 and XP with MAC OS-X and Linux are all available from the USB-422 product page on our web site (www.colinbroad.com/cbsoft/usb422/usb422.html).The USB422 windows drivers are optimised for minimum latency. When installed on Windows the port numbers are set to the last two free port numbers, this may be changed using the driver parameters

Driver Installation

1) Drivers available from the product page
   www.colinbroad.com/cbsoft/usb422/usb422.html or www.ftdichip.com/FTDrivers.htm
2) Download appropriate instructions from www.ftdichip.com/Documents/InstallGuides.htm
3) Note: you may be asked to install 4 times, twice for each port this is normal as for each port you have to install the hardware driver and the serial emulation.
4) Note: if you connect the USB-422 to a different USB port on your computer you may have to install the drivers again.

Test Program:

A test programme that provides both machine control and a virtual machine is available from our web site. The program locks both the virtual machine (Port-A) and machine control (Port-B) to video syncs. The program is written in Delphi (Object Pascal).

RS422 Port A:

Supplied configured as an Input (Device/Emulation) Pinout as follows
      2= Tx-, 7= Tx+, 8= Rx-, 3= Rx+, 1= Frame Ground, 4,6,9= Ground

May be changed to an Output (Controller) using the internal links as per diagram on unit.

RS422 Port B:

Configured as an Output (Controller) Pinout as follows
      2= Rx-, 7= Rx+, 8= Tx-, 3= Tx+, 1= Frame Ground, 4,6,9= Ground

Size:

4.4 x 2.1 x 1.2 (112 x 55 x 31) excluding connectors

Appendix A: ProTools :

Windows and Mac Version

As Supplied Port A should be used as a Machine Emulation Port (Input) and Port B should be used as a Machine Control Port (Output). If you do not need Machine Emulation then by changing the links on Port A to "Output" you can switch between two Machines on separate ports.

Windows Version

The windows version of ProTools (Version 7.2) can only address COM1 and COM2. To use the USB-422 with windows you must first move the internal Com ports to two free locations then move the USB-422 COM ports to COM1 and COM2. By default move Port A to COM1 and Port B to COM2. See Appendix C: Changing the COM Port Number

# Appendix B: RS422 Cable and Tx-Rx Invert Cable

T5.03 RS422 (Sony 9 pin) CABLE			
Function (Controller)	9 pin 'D' Male on cable (Both Ends)	Cable Colour	Function (Controlled Device)
Chassis	1		Chassis
Rx-	2	Red	Tx-
Tx+	3	Yellow	Rx+
Tx Ground	4	Screen	Rx Ground
	5		
Rx Ground	6		Tx Ground
Rx+	7	Blue	Tx+
Tx-	8	White	Rx-
	9		

T5.04 Tx-Rx Invert Sony 9 pin CABLE			
Function Device	9 pin 'D' Male on Cable	9 pin 'D' Male on cable	Cable Colour
	1	1	
Tx-	2	8	Red
Rx+	3	7	Yellow
Ground	4	4	Screen
	5	5	
	6	6	
Tx+	7	3	Blue
Rx-	8	2	White
	9	9	

# Appendix C: Changing the COM Port Number and Latency on Windows

Changing the Com port Number

1. Select the Control Panel from "My Computer" or the "Start" menu
2. Select "System"
3. Select the Hardware window
4. Click on Device Manager and wait for list of devices
5. Expand "Ports(COM & LPT)"
6. Double Click on the port you wish to change or Right Click and select properties.
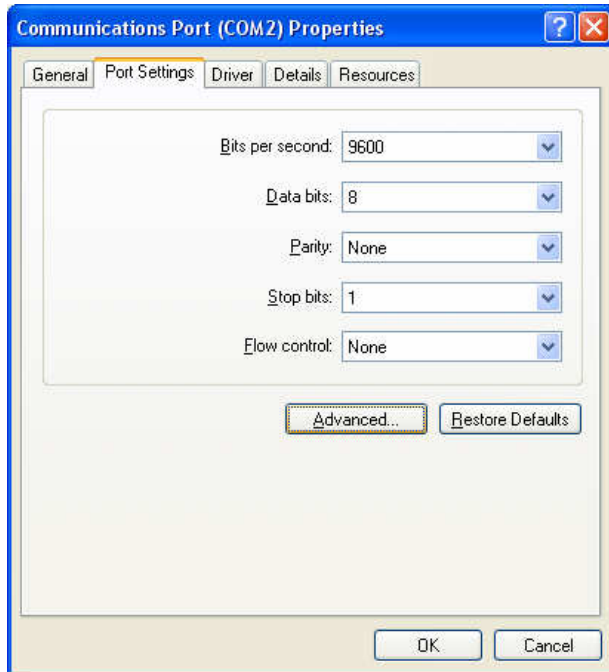
7. Select Port Settings
8. Click on Advanced
9. Change the COM Port Number as required
10. Click on OK
11. To see the new Com Port Numbers you will have to close and re-open the Device Manager

Internal Com Port Advanced settings
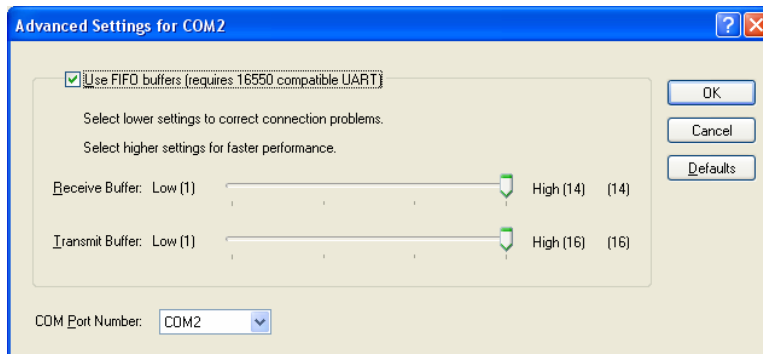
USB-422 Advanced settings

Changing the Latency

Lowering the Latency Timer will reduce the latency for the short machine control messages but reduce the overall data rate. With machine control the data rate is very low and latency is important. We recommend a latency setting of 1 or 2 mSec , 2 mSec is equivalent to a maximum USB delay of $1/20^{th}$ frame for PAL systems and $1/16^{th}$ frame for NTSC systems. Note this is the USB delay and not the overall system delay which will depend on the operating system and the software that you are running.

Appendix D: Changing the Latency on Mac software

To change the latency on Mac based systems it is necessary to update and install the driver. A low latency driver, installation program and instructions can be found on the USB-422 product page

http://www.colinbroad.com/cbsoft/usb422/usb422.html