Introduction

Copley provides a reliable, fast, and convenient USB to Serial adapter based on authentic Prolific parts. Copley conforms to ANSI RS232 standard logic levels. Communication is reliable and over twice as fast compared to side-by-side testing of third-party adapters. All Copley drives can communicate at 230kb, and as the adapter can communicate with speeds up to 1mb, even Copley's fastest 460kb drives can take full advantage.

Model Number: SER-USB-RJ11

The serial adapter is plug and play with Windows, as authentic parts are registered and find drivers already installed in Windows. If using a scaled down version of Windows, like an embedded system, then drivers are easily found and downloaded from Prolific. The adapter is compatible with USB 1,2,3 Type A, and SS port.
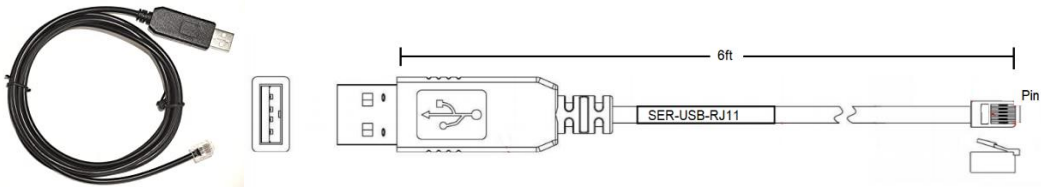
White pin 2 Adapter RX to Copley TX
Black pin 3 Adapter GND to Copley GND
Green pin 5 Adapter TX to Copley RX

ANSI Logic Levels

RS232 Standard 13Vp-p Logic Levels are critical for PWM noise immunity and fast 10us bit communication. This ensures operation with all Copley circuits, even the modern miniature servo drives using 3V logic on drive. Copley reference designs show external pcb mounted RS232 transceivers for compatibility with low quality TTL adapters (not compatible with 3V logic).
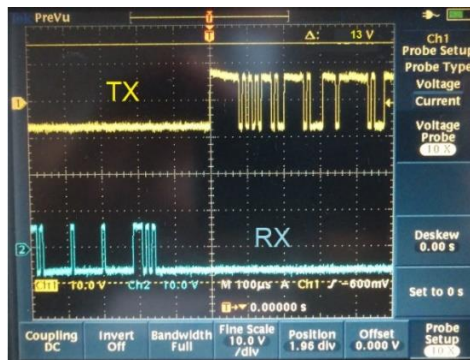
TX from Adapter to Drive. Rx from Transceiver to Adapter.

## RS232 Adapter Transceiver Specifications

Authentic Prolific Chip

Parameter	Condition	Min	Typ	Max	Unit
DC Characteristic					
Supply Current	no load, T_{AMB}=+25 $^{\circ}$C		11		mA
Shutdown Supply Current	SHTDN_N=GND, TAMB = +25 $^{\circ}$C,		0.6		uA
Transmitter Outputs					
Output Voltage Swing	3kΩ load to ground at all transmitter outputs, TAMB = +25 $^{\circ}$C		± 9		V
Output Resistance	Vcc=V+=V-=0V, T_{OUT} = ± 2V		0.05		uA
Output Short-Circuit Current	T_{OUT} = 0V		17		mA
Output Leakage Current	Transmitter disable, T_{OUT} = ± 12V		0.12		uA
Receiver Inputs					
Input Voltage Range		-22		22	V
Input Threshold LOW	Vcc=5.0V		1.25		V
Input Threshold HIGH	Vcc=5.0V		1.5		V
Input Hysteresis			0.25		V
Input Resistance			4.6		kΩ
Timing Characteristics					
Maximum Data Rate	R_L=3KΩ, CL=1000pF, one transmitter switching			1000	kbps
Receiver Propagation Delay	t_{PHL}, RxIN to RxOUT, CL=150pF		0.5		μs
	t_{PLH}, RxIN to RxOUT, CL=150pF		1		μs
Transmitter Propagation Delay	t_{PHL}, RL = 3K, CL=1000pF		1.9		μs
	t_{PLH}, RL = 3K, CL=1000pF		1.3		μs

Note: Unless otherwise noted, the above specifications apply for Vcc=5V $\pm 10\%$ with T_{AMB}= T_{MIN} to T_{MAX}, C1 to C4= 1μF.

Copley Circuits and Reference Designs

As the Copley adapter is compatible with all Copley circuits, it is recommended to add an RS232 transceiver when using Copley's mounting boards in the case of unreliable third-party adapters. All Copley Panel drives come with an RS232 transceiver, so compatibility is guaranteed. However, the miniature servo drives to a 3V logic format that is compatible with ANSI RS232 logic levels, but not with TTL RS232.

Typical Copley Circuits
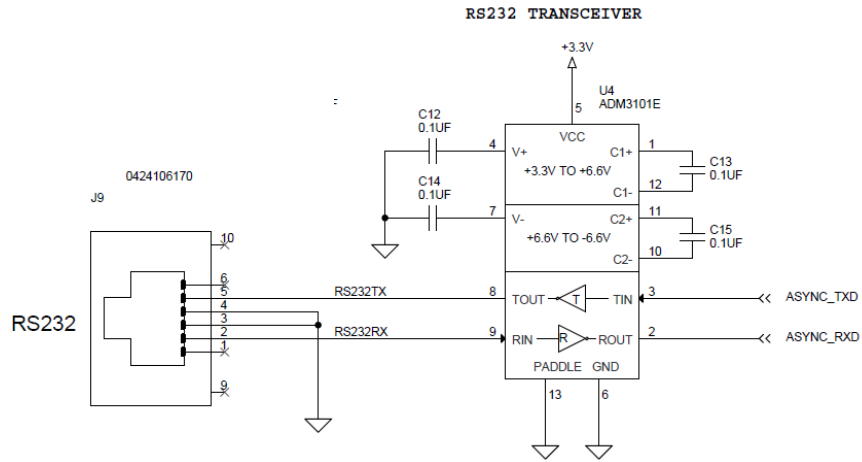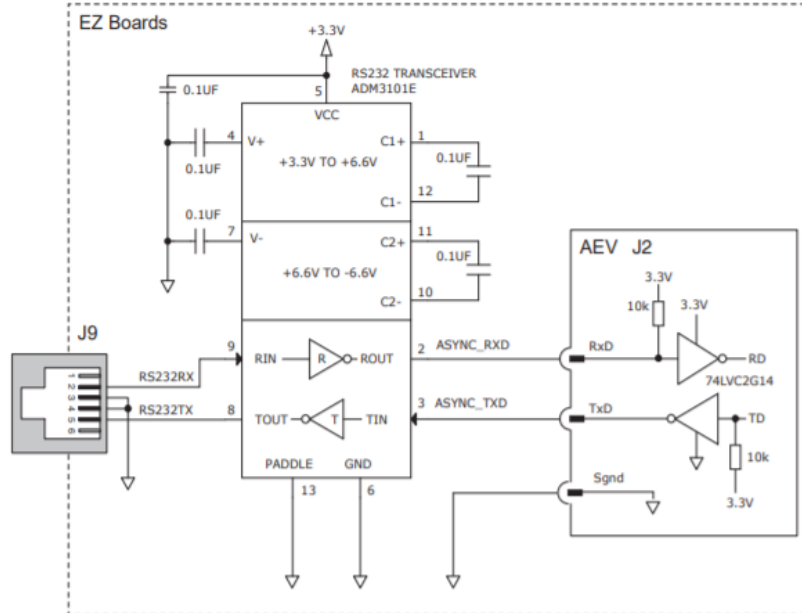
*Panel/Mounting Board Reference designs use RS232 Transceiver if not part of Module.

*Module AEV/APV/NES/NPS/NEP/NPP/IES/IEL/IEP use 3V logic.

High Speed Serial

CME V8.1 will support 115kb and 230kb and has been tested with the Copley SER-USB-RJ11 to confirm twice the data rate as compared to the old 115kb limit imposed by slower adapters. Message update rates of 10ms or 100Hz are possible using Serial binary. The Copley CME Scope was tested during current loop tuning at trace updates at lighting fast rates of less than 800ms.
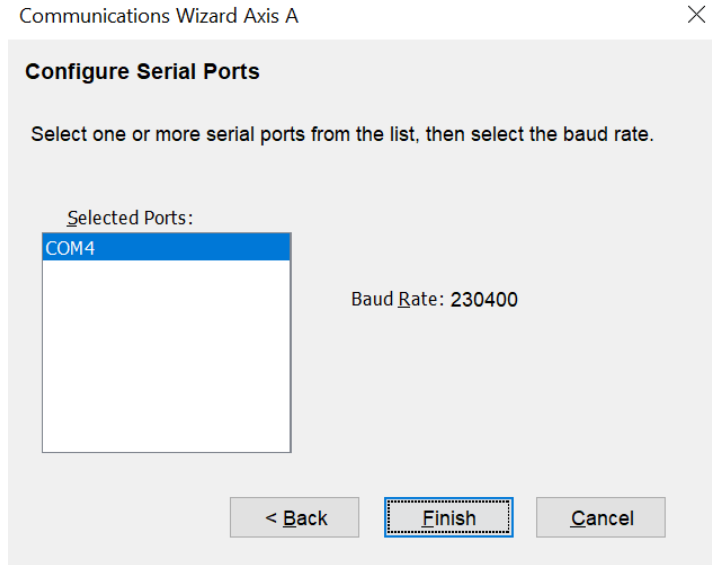
Drivers

Drivers should already be a part of most Windows installations, as the parts are authenticated Prolific chips. However, if using Linux or some nonstandard Windows the drivers are available from Prolific's website.
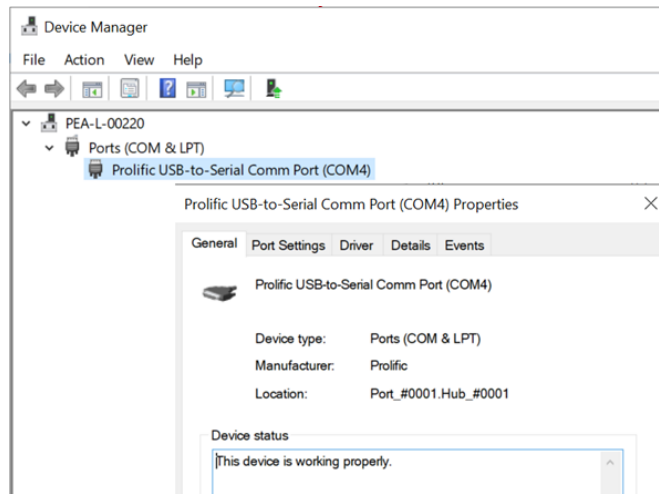
Copley Controls

Device Manager Advanced Settings

There are no required settings, but it is recommended to check to make sure the drivers are installed and enabled.

To gain faster communication rates, some computers have an update rate delay of 16ms between message packets. This is typically unnecessary and slows down commutation by a factor of 8. Copley recommends setting the delay to 1ms as this increases the update rate considerably. Windows 10 has a slider for increasing and decreasing the buffer size. Actual update rates using the slider seem subjective, but may have an effect on some operating systems.
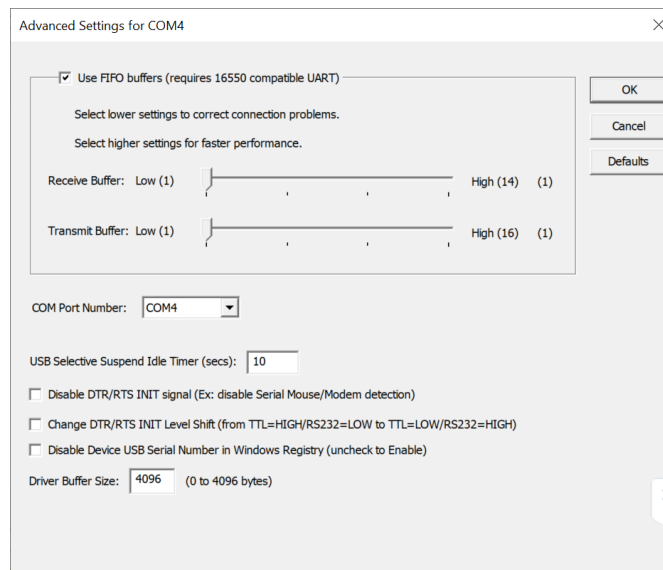
Revision History

Date	Version	Revision
8/03/2021	Rev 00	Initial release