# *SeaLink+422*
# *Users Manual*

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# Introduction

## Overview

The Sealevel Systems **SeaLINK+422** equips the PC with 1 USB to RS-422 Asynchronous serial port providing a versatile interface for common RS-422 needs. The **SeaLINK+422** connects through the PC's external USB port, so it does not require opening the computer case. Resources such as IRQs and I/O addresses are also not utilized. It does require a system that supports USB in hardware and operating system.

## What's Included

The **SeaLINK+422** is shipped with the following items. If any of these items is missing or damaged, contact the supplier.

- **SeaLINK+422** USB to RS-422 cable
- Sealevel Software CD

# Installation

## Windows 98/ME/2000/XP Installation

**Do not connect the Adapter to the machine until the software has been fully installed.**

1.  Start Windows.

2.  Insert the Sealevel Systems CD in to your CD drive.

3.  If 'Auto-Start' is enabled for this drive the software will automatically launch. Otherwise, point your browser to the 'Index.htm' on the root directory of the CD

4.  Select 'Install Software'.

5.  Select the Part Number for your adapter from the listing.

6.  Select 'Windows 98/ME/2000/XP'. The setup file will automatically detect the operating environment and install the proper components. Next (depending on the OS version) select the 'Run this program from its current location' or 'Open' option. Follow the information presented on the screens that follow.

7.  A screen may appear with the declaration: "The publisher cannot be determined due to the problems below: Authenticode signature not found." Please select the 'Yes' button and proceed with the installation. This declaration simply means that the Operating System is not aware of the driver being loaded. It will not cause any harm to your system.

8.  During setup the user may specify installation directories and other preferred configurations. This program also adds entries to the system registry that are necessary for specifying the operating parameters for each driver. An uninstall option is also included to remove all registry/INI file entries from the system.

**Windows NT Note**: Windows NT is not USB aware and thus cannot support the adapter.

## Physical Installation

The **SeaLINK+422** can be connected to any Upstream Type "A" port either at the PC host or an Upstream Hub, and since it is hot pluggable, there is no need to power down your computer prior to installation. The **SeaLINK+422** requires no user hardware configuration. Once you have installed the software simply plug the USB cable into an available USB port. The drivers that were installed during setup will automatically be used to configure the adapter. You should see one or more "New Hardware Found" windows, indicating the actual device being created.

# Technical Description

The **SeaLINK+422:** utilizes a USB UART. This chip features programmable baud rate, data format, 128 byte Dual Port TX Buffer, and 384 byte Dual Port RX Buffer. The RS-422 transceiver supports data rates up to 921.6K baud.

## Features

- Hot-Pluggable device

- Does not require opening the case

- No system resources are required (i.e. I/O ports or IRQs)

## Connector Pin Assignments (DB-9 Male)

| Signal | Name | Pin # | Mode |
|--------|------|-------|------|
| RX+ | Receive Positive | 1 | Input |
| RX- | Receive Negative | 2 | Input |
| TX+ | Transmit Positive | 4 | Output |
| TX- | Transmit Negative | 3 | Output |
| GND | Ground | 5 | |
| NC | | 6,7,8,9 | |

# Specifications

## Environmental Specifications

| Specification | Operating | Storage |
|---|---|---|
| **Temperature Range** | 0º to 70º C (32º to 158º F) | -50º to 105º C (-58º to 221º F) |
| **Humidity Range** | 10 to 90% R.H. Non-Condensing | 10 to 90% R.H. Non-Condensing |

## Manufacturing

All Sealevel Systems Printed Circuit boards are built to UL 94V0 rating and are 100% electrically tested. These printed circuit boards are solder mask over bare copper or solder mask over tin nickel.

## Power Consumption

| Supply line | +5 VDC |
|---|---|
| **Rating** | 70 mA |

# Appendix A - Troubleshooting

Serial Utility test software is supplied with the Sealevel Systems adapter and should be used in the troubleshooting procedures. Using this software and following these steps, most common problems can be eliminated.

1.  If your adapter isn't working, first check to make sure that USB support is enabled in the System BIOS and it is functioning properly in the operating system. This can be done by using the Windows Device Manager.

2.  Ensure that the Sealevel Systems software has been installed on the machine so that the necessary files are in place to complete the installation.

# Appendix B - How To Get Assistance

Please refer to Troubleshooting Guide prior to calling Technical Support.

1.  Begin by reading through the Trouble Shooting Guide in Appendix A. If assistance is still needed please see below.

2.  When calling for technical assistance, please have your user manual and current adapter settings. If possible, please have the adapter installed in a computer ready to run diagnostics.

3.  Sealevel Systems provides an FAQ section on its web site. Please refer to this to answer many common questions. This section can be found at http://www.sealevel.com/faq.asp.

4.  Sealevel Systems maintains a web page on the Internet. Our home page address is http://www.sealevel.com. The latest software updates, and newest manuals are available via our web site.

5.  Technical support is available Monday to Friday from 8:00 a.m. to 5:00 p.m. eastern time. Technical support can be reached at (864) 843-4343.

**Return Authorization Must Be Obtained From Sealevel Systems Before Returned Merchandise Will Be Accepted. Authorization Can Be Obtained By Calling Sealevel Systems And Requesting A Return Merchandise Authorization (RMA) Number.**
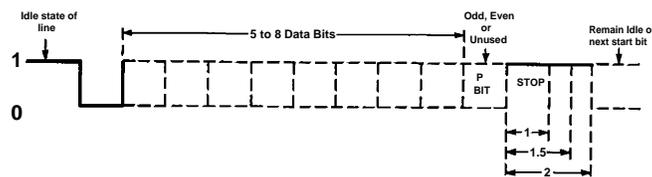
# Appendix C – RS-422 Electrical Interface

The RS-422 specification defines the electrical characteristics of balanced voltage digital interface circuits. RS-422 is a differential interface that defines voltage levels and driver/receiver electrical specifications. On a differential interface, logic levels are defined by the difference in voltage between a pair of outputs or inputs. In contrast, a single ended interface, for example RS-232, defines the logic levels as the difference in voltage between a single signal and a common ground connection. Differential interfaces are typically more immune to noise or voltage spikes that may occur on the communication lines. Differential interfaces also have greater drive capabilities that allow for longer cable lengths. RS-422 is rated up to 10 Megabits per second and can have cabling 4000 feet long. RS-422 also defines driver and receiver electrical characteristics that will allow 1 driver and up to 32 receivers on the line at once. RS-422 signal levels range from 0 to +5 volts. RS-422 does not define a physical connector.
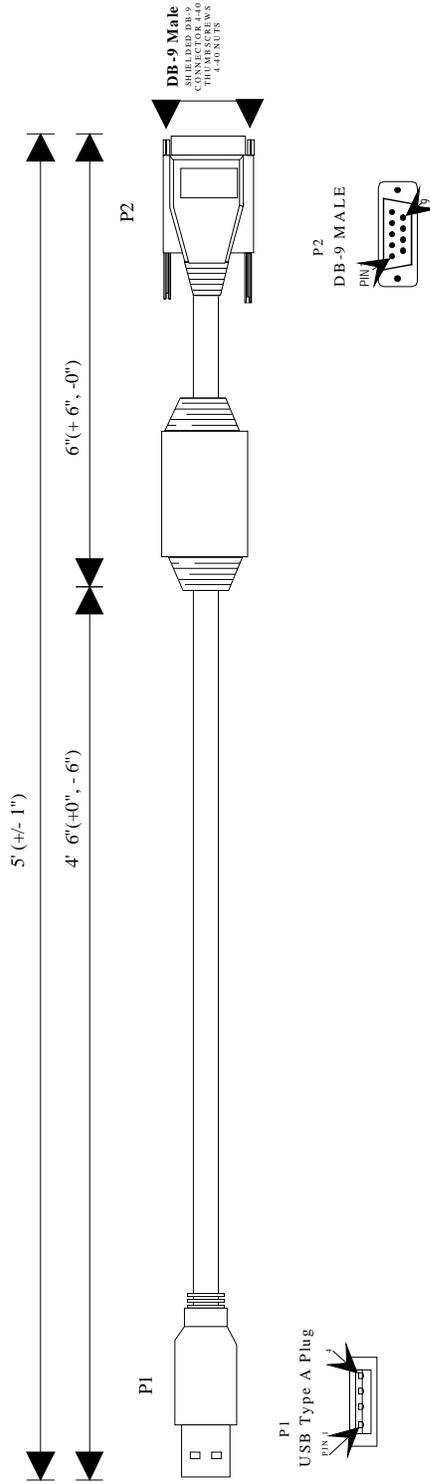
# Appendix D - Asynchronous Communications

Serial data communications implies that individual bits of a character are transmitted consecutively to a receiver that assembles the bits back into a character. Data rate, error checking, handshaking, and character framing (start/stop bits) are pre-defined and must correspond at both the transmitting and receiving ends.

Asynchronous communications is the standard means of serial data communication for PC compatibles and PS/2 computers. The original PC was equipped with a communication or COM: port that was designed around an 8250 Universal Asynchronous Receiver Transmitter (UART). This device allows asynchronous serial data to be transferred through a simple and straightforward programming interface. Character boundaries for asynchronous communications are defined by a starting bit followed by a pre-defined number of data bits (5, 6, 7, or 8). The end of the character is defined by the transmission of a pre-defined number of stop bits (usually 1, 1.5 or 2). An extra bit used for error detection is often appended before the stop bits.



This special bit is called the parity bit. Parity is a simple method of determining if a data bit has been lost or corrupted during transmission. There are several methods for implementing a parity check to guard against data corruption. Common methods are called (E)ven Parity or (O)dd Parity. Sometimes parity is not used to detect errors on the data stream. This is refereed to as (N)o parity. Because each bit in asynchronous communications is sent consecutively, it is easy to generalize asynchronous communications by stating that each character is wrapped (framed) by pre-defined bits to mark the beginning and end of the serial transmission of the character. The data rate and communication parameters for asynchronous communications have to be the same at both the transmitting and receiving ends. The communication parameters are baud rate, parity, number of data bits per character, and stop bits (i.e. 9600,N,8,1).

# Appendix E – Measured Drawing

# Warranty

Sealevel's commitment to providing the best I/O solutions is reflected in the Lifetime Warranty that is standard on all Sealevel manufactured products. We are able to offer this warranty due to our control of manufacturing quality and the historically high reliability of our products in the field. Sealevel products are designed and manufactured at its Liberty, South Carolina facility, allowing direct control over product development, production, burn-in and testing.

Sealevel Systems, Inc. (hereafter "Sealevel") warrants that the Product shall conform to and perform in accordance with published technical specifications and shall be free of defects in materials and workmanship for life. In the event of failure, Sealevel will repair or replace the product at Sealevel's sole discretion. Failures resulting from misapplication or misuse of the Product, failure to adhere to any specifications or instructions, or failure resulting from neglect or abuse are not covered under this warranty.

Warranty service is obtained by delivering the Product to Sealevel and providing proof of purchase. **Return authorization must be obtained from Sealevel Systems before returned merchandise will be accepted. Authorization is obtained by calling Sealevel Systems and requesting a Return Merchandise Authorization (RMA) number.** The Customer agrees to insure the Product or assume the risk of loss or damage in transit, to prepay shipping charges to Sealevel, and to use the original shipping container or equivalent. Warranty is valid only for original purchaser and is not transferable.

Sealevel Systems assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Sealevel Systems will not be liable for any claim made by any other related party.

This warranty applies to Sealevel manufactured Product. Product purchased through Sealevel but manufactured by a third party will retain the original manufacturer's warranty.

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Technical Support is available from 8 a.m. to 5 p.m. Eastern time.

Monday - Friday

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