

SEALEVEL[®]

SYSTEMS INCORPORATED

SeaLINK+232I[™]

USER MANUAL



Part # 2103

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Introduction

Overview

The Sealevel Systems **SeaLINK+232I** equips the PC with 1 isolated USB to RS-232 Asynchronous serial port providing a versatile interface for common RS-232 needs (i.e. modem, mouse and plotter). The **SeaLINK+232I** connects through the PC's external USB port, so it does not require opening the computer case. Resources such as IRQ's 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+232I** is shipped with the following items. If any of these items is missing or damaged, contact the supplier.

- **SeaLINK+232I** Isolated USB to RS-232 Serial I/O Adapter
- USB Cable Part Number CA179 for Connecting to Upstream Host/Hub
- DB25 to DB9 Converter, Part number CA 140
- Sealevel Software

Installation

Operating System Installation

Please note that you should install the software before installing the hardware.

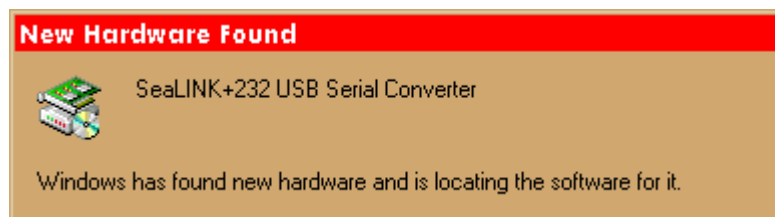
Choose **Install Software** at the beginning of the CD and select the **Serial I/O** software drivers and install **SeaCOM**.

System Installation

The screen captures below are taken from a Windows ME installation. Your particular operating system may differ slightly from what is shown based on your version of Windows.

The **SeaLINK+232I** can be connected to any Upstream Type “A” port either at the PC host or an Upstream Hub. The **SeaLINK+232I** is hot-pluggable, meaning there is no need to power down your computer prior to installation. The **SeaLINK+232I** requires no user hardware configuration since there are no jumpers present on the card.

1. After installing the software connect **SeaLINK+232I** to an Upstream Host or Hub.



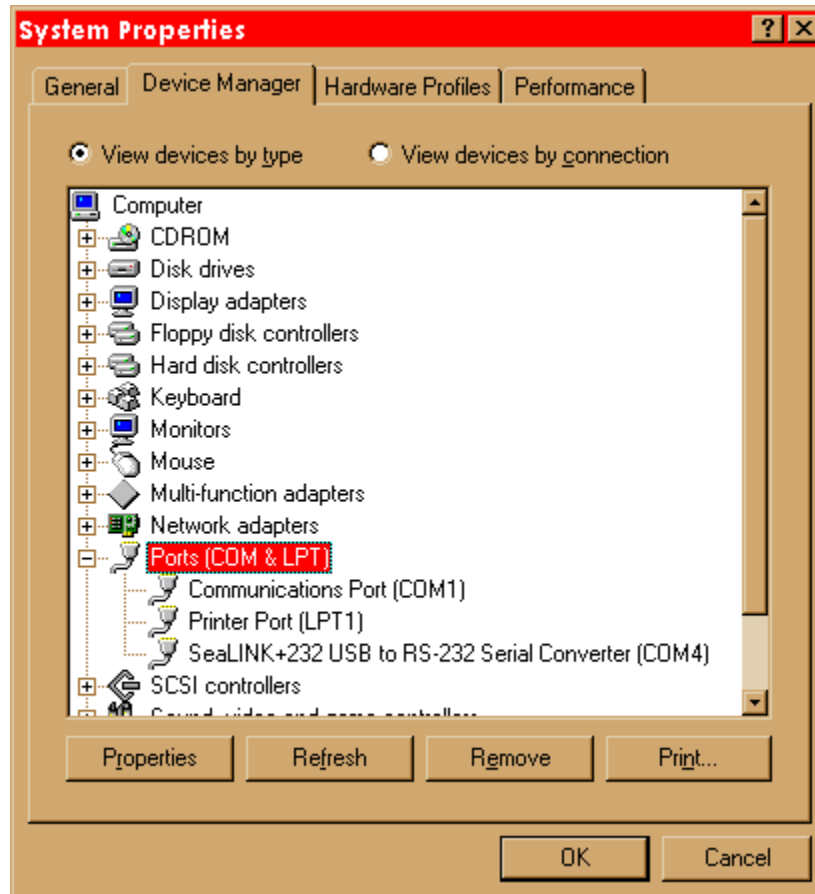
This indicates that the system has recognized the new device and will now proceed to locate a driver.



Since you have already installed the software by running “Setup”, simply click “Next” to proceed. The drivers that were installed during setup will automatically be used to configure the adapter.



Windows has now located a driver and installed the software. Click “Finish” to proceed. You should see one more “New Hardware Found”, indicating the actual port being created. If you view your systems’ Device Manager at this point, you should have a new “COM” port in the Ports (COM & LPT) Device Class. It should look similar to the screen shot on the following page.



You can access your new COM: port by using the assigned COM: identifier shown above. In this case, it is COM4: but this assignment will vary from system to system. At this point, the hardware is recognized. To verify operation use Sealevel Systems supplied WinSSD diagnostic utility. WinSSD can be found in the Start, Programs group.

Technical Description

The **SeaLINK+232I** 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-232 transceiver supports data rates up to 460.8K baud. Refer to Appendix C for cable length limitations.

Features

- Hot-Pluggable device that does not require opening the case
- No system resources are required (i.e. I/O ports or IRQ's)
- LED status indicators for “USB Enabled”, “TD”, and “RD”

Connector Pin Assignments (DB25 Male)

Name	Pin #	Mode
TD Transmit Data	2	Output
RD Receive Data	3	Input
RTS Request To Send	4	Output
CTS Clear To Send	5	Input
GND Ground	7	

Note: These assignments meet EIA/TIA/ANSI-574 DTE specifications for DB-25 type connectors.

Technical Note: The remaining modem control signals are biased in the following fashion: DTR is connected to DCD and DSR, and RI is tied inactive.

Specifications

Environmental Specifications

Specification	Operating	Storage
Temperature Range	0° to 50° C (32° to 122° F)	-20° to 70° C (-4° to 158° 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	100 mA

Mean Time Between Failures (MTBF)

Greater than 150,000 hours. (Calculated)

Physical Dimensions

Package Length	3.8 inches	(9.66 cm)
Package Width	2.3 inches	(5.84 cm)
Package Height	1.0 inches	(2.54 cm)

Appendix A - Troubleshooting

Serial Utility test software is supplied with the Sealevel Systems adapter and will be used in the troubleshooting procedures. Using this software and following these simple steps, most common problems can be eliminated without the need to call Technical Support.

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 either the Windows 98/ME or Windows 2000 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.
3. When the **SeaLINK+232I** is configured properly, the USB Enabled LED (EN) will be lit. This should allow you to use Sealevel's WinSSD utility and the supplied loopback plug to check communications. The supplied loopback plug connects TD to RD. If you decide to test the Modem Control Signals, a full pin loopback plug will be required. Details on loopback plugs are included within WinSSD. Contact Sealevel Systems if you need further assistance
4. When testing the **SeaLINK+232I** in loopback mode, you should see both the TD and RD LED's flashing as well as seeing echoed data on the screen. The loopback test first transmits a HEX pattern, 55AA, and then an ASCII string of data. If this test passes, then the **SeaLINK+232I** is ready for use in your application.

Appendix B - How To Get Assistance

1. Read this manual thoroughly before attempting to install the adapter in your system.
2. When calling for technical assistance, please have your user manual and current adapter settings. If possible, please have the adapter connected in a computer ready to run diagnostics.
3. Sealevel Systems provides an FAQ section on its web site. Please refer to this for many commonly asked questions. This section can be found at <http://www.sealevel.com/faq.htm>
4. Visit Sealevel's website at www.sealevel.com for the latest software updates and newest manuals.
5. Technical support is available Monday through 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 - Electrical Interface

RS-232

Quite possibly the most widely used communication standard is RS-232. This implementation has been defined and revised several times and is often referred to as RS-232 or EIA/TIA-232. The IBM PC computer defined the RS-232 port on a 9 pin D sub connector and subsequently the EIA/TIA approved this implementation as the EIA/TIA-574 standard. This standard is defined as the *9-Position Non-Synchronous Interface between Data Terminal Equipment and Data Circuit-Terminating Equipment Employing Serial Binary Data Interchange*. Both implementations are in wide spread use and will be referred to as RS-232 in this document. RS-232 is capable of operating at data rates up to 20 Kbps at distances less than 50 ft. The absolute maximum data rate may vary due to line conditions and cable lengths. RS-232 is a single ended or unbalanced interface, meaning that a single electrical signal is compared to a common signal (ground) to determine binary logic states. The RS-232 and the EIA/TIA-574 specification define two types of interface circuits, Data Terminal Equipment (DTE) and Data Circuit-Terminating Equipment (DCE). The **SeaLINK+232I** is a DTE device.

Appendix D - Ground Loop Phenomenon

What is Ground Loop?

Ground loop Phenomenon occurs when two (or more) pieces of equipment are connected together with a common ground and a different ground potential exists at each location. This current can cause the connected equipment to experience noise that in turn causes data transmission errors. In the extreme this ground current can cause equipment malfunction or even destruction.

Cabling Recommendations

When connecting the **SeaLINK+232I**, care should be taken that both ends of the connection are not isolated from ground (see Figure 1). This “floating” ground condition could cause the capacitive or inductive coupling of voltages that will cause a break down in the DC to DC converter circuit or in the opto-isolator circuit. This condition will cause data errors and possibly destruction of the receiver circuit.

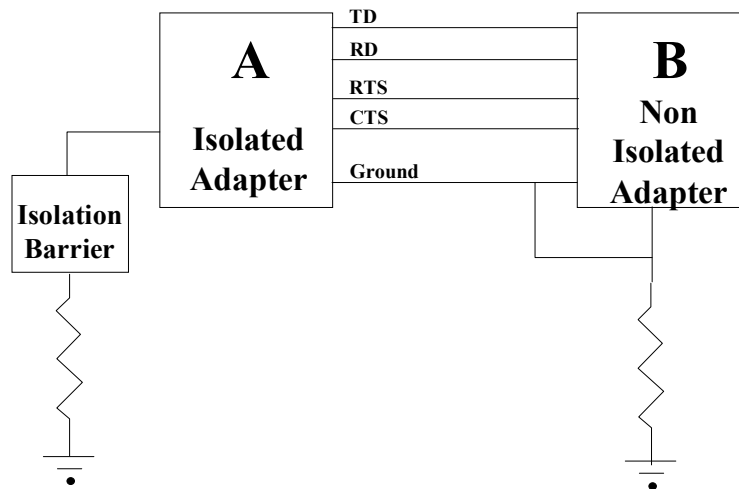


Figure 1- SeaLINK+232I cabling example

Appendix E - 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.

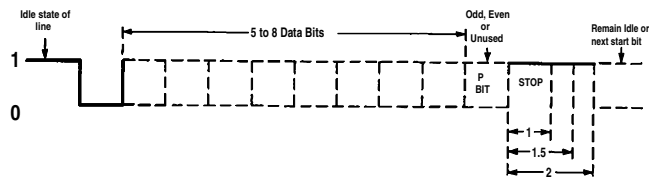
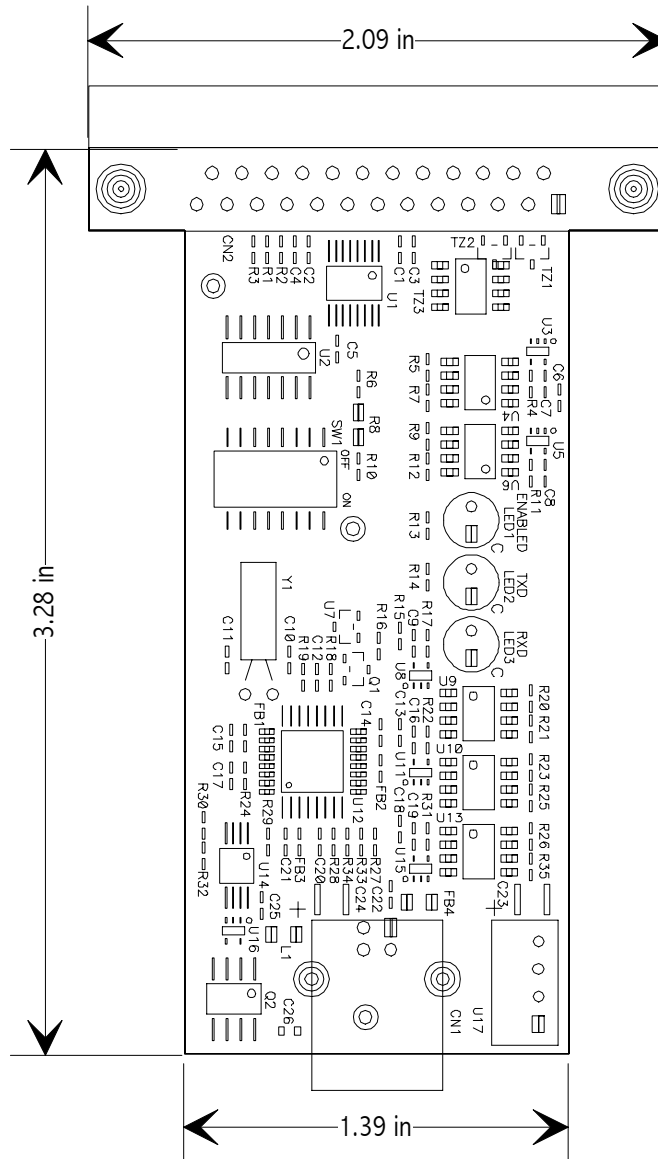


Figure 2 - Asynchronous Communications Bit Diagram

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 referred 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 F - Silk-Screen



Appendix G - Compliance Notices

Federal Communications Commission Statement

FCC - This equipment has been tested and found to comply with the limits for Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. In such case the user will be required to correct the interference at his own expense.

EMC Directive Statement



Products bearing the CE Label fulfill the requirements of the EMC directive (89/336/EEC) and of the low-voltage directive (73/23/EEC) issued by the European Commission.

To obey these directives, the following European standards must be met:

EN55022 Class B - 'Limits and methods of measurement of radio interference characteristics of information technology equipment'

EN55024- 'Information technology equipment Immunity characteristics Limits and methods of measurement.'

EN60950 (IEC950) - 'Safety of information technology equipment, including electrical business equipment'

Always use cabling provided with this product if possible. If no cable is provided or if an alternate cable is required, use high quality shielded cabling to maintain compliance with EMC directives.

Warranty



Sealevel Systems, Inc. provides a lifetime warranty for this product. Should this product fail to be in good working order at any time during this period, Sealevel Systems will, at its option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

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.

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